

Shauna Call  
MBA 614  
Dr. Gove Allen  
13 April 2010

## **Final Project: Copy Report Automation**

### **Executive Summary**

As an accountant for the BYU School of Music, one of my job responsibilities is to prepare journal entries each month. One type of journal entry stems from downloading the number of prints and copies each faculty/staff make and to charge their area accounts via journal entry. Because the School of Music is one of the largest departments on campus with over 100 copy codes and four major copiers/printers, I decided to create a program that would automate the data downloading and journal entry process as much as possible. (Note: a “copy code” is a 5-digit code given to faculty/staff/etc. to type into the copy machine when making prints. This is similar to using a Signature Card at a Pharos Station.)

Prior to this project, I would manually enter in the number of copies for each copy code per printer, and then summarize the data and manually enter in the total cost for each code and charge it to its accompanying account (via the Financial Services Journal Entry Template). Once uploaded, these charges would show up on their monthly area financial reports. This whole process was very tedious and took several hours to accomplish. Oftentimes, amounts and/or account numbers were mis-typed and corrections had to be made after-the-fact. Also note that some copy codes are for administration or ward use and aren’t to be charged via journal entry. Thus, there needs to be a distinction between which copies/prints need and don’t need to be charged.

Thus, my project involves an automated data downloading process (for only two out of the four printers because not all the printers allow it) and an automated journal entry population process for those copy codes that need to be charged each month. This has made it possible to reduce human error and to save a lot of time when performing this task.

*\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU’s financial system and to protect copy code holders in the BYU School of Music.*

## Implementation Documentation

To solve this problem, I did the following (please note that “Ref.” stands for “References”; its accompanying screen shot can be found after the end of the table):

| Ref. | Solution component  | Why it was included   | How it is intended to be used   |
|------|---|---|---|
| 1.1  | The first thing I did was entered in all the copy code information into the “Data” worksheet. This worksheet contains the copy code, description, the four printers (C-550, E-579, C-580, and 1128-RB), total cost, price per sheet, the operating unit/account/class and whether or not the copy code needs to be charged (in hidden columns C – F). It also includes the “Add New Copy Code,” “Download C-550 & C-580 Data,” and “Prepare Journal Entry” buttons that are assigned to macros. | The “Data” worksheet and its contents were included so that the user can easily work with the copy report template that includes all the pertinent information on a single worksheet. Prior to this project, multiple worksheets were required and were confusing to deal with. | The preparer will be able to use the “Data” worksheet by simply populating the fields of the four printers every month. The C-550 and C-580 printers have the capability of downloading their data through the BYU internet network; however, the other printers’ data will need to be downloaded directly from the printers. Thus, from the “Data” sheet, the user will be able to take this data and prepare a journal entry to charge their associated accounts. The purposes of the three different buttons are described in more detail below. |
| 1.2  | “Add New Copy Code” button on the “Data” worksheet. This is tied to the “Add New Copy Code” user-form.  | This was included so that the user can add a new copy code to the list of existing codes on the spreadsheet. However, the user will still need to enter in the new code and description into the printers themselves. This part was not planned for in the scope of my project. | The preparer will easily be able to add a copy code to the “Data” spreadsheet. This button will also perform some (but not all) field checks and make sure that data isn’t left out. Warnings will be given via message boxes.  |

*\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU’s financial system and to protect copy code holders in the BYU School of Music.*

|     |   |  |   |
|-----|---|--|---|
| 1.3 | <p>“Download C-550 &amp; C-580 Data” button on the “Data” worksheet.</p>  | <p>This button was included so that the user could automatically download the C-550 &amp; C-580 copy report data over the internet. Pressing this button would also clear the historical copy data (though my Excel submission does not currently have that part of the code activated for purposes of my job).</p>  | <p>The user would just need to press this button at the end of every month when gathering the data. Ideally, the downloading process and saving to the computer should all work quite smoothly; however, an extra step may need to be taken in order to fully accomplish this task (depending on the computer you’re on). Please refer to the difficulties encountered section of this write-up.</p>  |
| 1.4 | <p>“Prepare Journal Entry” button on the “Data” worksheet, the “Journal ID” input box, the “Insert Date” user-form with combo boxes to select the month and year of the journal entry, and the “Journal Entry” worksheet.</p> | <p><i>This was the main goal of my project.</i> This button was included so that once all the data was entered into the “Data” worksheet for the four printers, then the journal entry would automatically populate to reduce human errors when charging different operating units (accounts) and when entering in the amounts to be charged. The journal entry can be found on the “Journal Entry” worksheet. The code can be found under the PrepareJE module and includes a ClearContents function to clear out old journal entries every time this button is selected.</p> | <p>Once the data is all entered in, the user would simply click on this button. It will then prompt the user to enter in his/her Journal ID (this ID is a unique identifier with Financial Services and the BYU financial database). After the journal ID is entered, the “Insert Data” user-form will pop up and ask that the user chooses a month and year for which the journal entry is being made. These dates will show up on the journal header of the journal entry and also on the description line of the credit entry on the “Journal Entry” worksheet. (Note: “Debit” means money is being taken out and “Credit” means money is going in.)</p> |

*\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU’s financial system and to protect copy code holders in the BYU School of Music.*

|     |  |  |  |
|-----|--|--|--|
| 1.5 | End(xlUp) function to copy and paste from the “Data” worksheet into the “Journal Entry” worksheet when populating the journal entry. | This function was included so that the correct data from the “Data” worksheet could be transferred over to the “Journal Entry” worksheet after pressing the “Prepare Journal Entry” button. This function prevents the overriding of cells when pasting and it also prevents blank rows in between entries of data on the journal entry template. The Clear-Contents function is tied to this in that it prevents the duplication of existing data (i.e. pasting below rows in the JE that have already been processed). | This function is written in the code under the PrepareJE module and will automatically occur and correctly paste the data into the journal entry template after pressing the “Prepare Journal Entry” button (since not every code from the “Data” sheet will be charged, I needed some way to correctly transfer the data to the journal entry without skipping or overriding lines). See the screenshots/programming code section in the following pages for more detail. |
|-----|--|--|--|

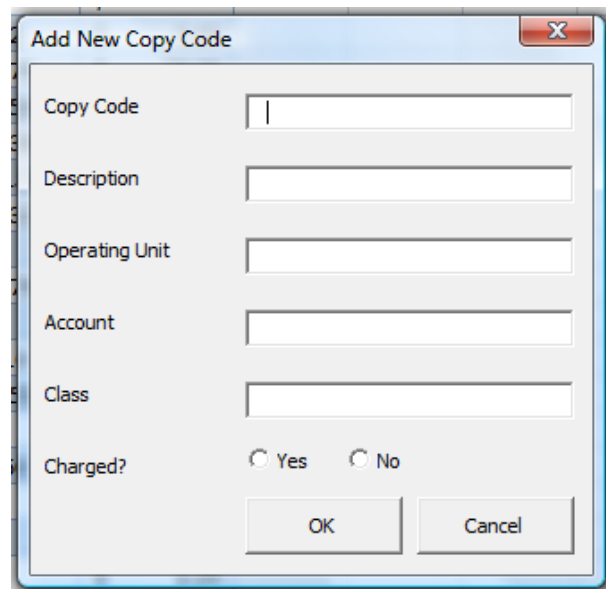
## Screenshots and Programming Code:

### 1.1 The "Data" worksheet:

|  | A                           | B                           | G                       | H       | I       | J         | K          |
|--|-----------------------------|-----------------------------|-------------------------|---------|---------|-----------|------------|
| 1  | BYU School of Music         |                             |                         |         |         |           |            |
| 2  | COPY REPORT                 |                             |                         |         |         |           |            |
| 3  | Add New Copy Code           |                             | Prepare Journal Entry   |         |         |           |            |
| 4  | Download C-550 & C-580 Data |                             | Price Per Sheet \$ 0.05 |         |         |           |            |
| 5  |                             |                             |                         |         |         |           |            |
| 6  | Copy Code ▾                 | Description ▾               | C-550 ▾                 | E-579 ▾ | C-580 ▾ | 1128-RB ▾ | Total Cost |
| 7  | 59111                       | Administration              | 1912                    | 1024    |         |           | \$ 146.80  |
| 8  | 21629                       | ALMA Lab                    |                         |         | 15      |           | \$ 0.75    |
| 9  | 25780                       | American Piano Quartet      |                         | 10      |         | 2         | \$ 0.60    |
| 10   | 50210                       | American Viola Society      |                         |         | 211     | 170       | \$ 19.05   |
| 11   | 25862                       | Ammons, Mark                | 10                      | 31      |         | 158       | \$ 9.95    |
| 12   | 25726                       | Anderson, Richard           | 156                     | 108     |         | 138       | \$ 20.10   |
| 13   | 25782                       | Applonie, Jean              | 25                      | 121     | 48      | 2151      | \$ 117.25  |
| 14   | 20031                       | Asplund, Christian (Barlow) | 40                      | 190     | 4       | 232       | \$ 23.30   |
| 15   | 25795                       | Asplund, Christian (T/C)    | 2                       | 687     |         |           | \$ 34.45   |
| 16   | 25992                       | Babidge, Darrell            |                         | 14      | 2       | 479       | \$ 24.75   |
| 17   | 25809                       | Belknap, Monte              | 186                     |         |         |           | \$ 9.30    |
| 18   | 25768                       | Bevan, Julie                | 45                      | 70      |         | 16        | \$ 6.55    |
| 19   | 25736                       | Bigelow, Claudine           |                         | 25      |         | 255       | \$ 14.00   |
| 20   | 25739                       | Blackinton, David           |                         |         | 1       |           | \$ 0.05    |
| 21   | 25790                       | Bounous, Barry              |                         |         |         | 60        | \$ 3.00    |
| 22   | 25804                       | Brady, Nicole               | 69                      |         | 465     |           | \$ 26.70   |
| 23   | 25721                       | Broomhead, Paul             | 300                     |         |         |           | \$ 15.00   |
| 24   | 25722                       | Brough, Ron                 | 6                       | 39      |         |           | \$ 2.25    |
| 25   | 25724                       | Brown, David                |                         | 28      | 1       | 11        | \$ 2.00    |
| 26   | 25777                       | Busby, Jim                  | 17                      |         |         |           | \$ 0.85    |
| 27   | 25725                       | Bush, Doug                  | 453                     | 583     | 62      |           | \$ 54.90   |
| 28   | 25733                       | Call, Steve                 | 4                       | 442     | 42      |           | \$ 24.40   |
| 29   | 12786                       | Children of Eden Musical    |                         |         | 1027    | 3         | \$ 51.50   |
| 30   | 25769                       | Christensen, Janielle       |                         |         |         |           | \$ -       |
| 31   | 25738                       | Clayton, April              | 4                       |         |         | 68        | \$ 3.60    |
| 32   | 45403                       | Concert Choir               |                         |         | 65      |           | \$ 3.25    |
| 33   | 25737                       | Cook, Don                   | 118                     | 1       |         |           | \$ 5.95    |
| 34   | 25740                       | Dabczynski, Andrew          | 461                     | 349     |         | 48        | \$ 42.90   |
| 35   | 57066                       | Dunn, Robert                | 78                      |         |         |           | \$ 3.90    |
| 36   | 25741                       | Durham, Tom                 | 20                      | 907     | 55      |           | \$ 49.10   |
| 37   | 82660                       | E-579 Secretaries           |                         |         |         |           | \$ -       |
| 38   | 50187                       | Fifth Stake 187th Ward      | 616                     |         | 199     |           | \$ 40.75   |
| 39   | 50203                       | Fifth Stake 203rd Ward      | 232                     |         |         |           | \$ 11.60   |
| ◀ ▶ 🔍 Data Journal Entry Ward Copies Sheet1 🗑️ |                             |                             |                         |         |         |           |            |
| Ready 🖨️                                       |                             |                             |                         |         |         |           |            |

*\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU's financial system and to protect copy code holders in the BYU School of Music.*

## 1.2 The “Add New Copy Code” user-form:



The image shows a Windows-style dialog box titled "Add New Copy Code". It has a standard title bar with a close button (X). The dialog contains several input fields: "Copy Code", "Description", "Operating Unit", "Account", and "Class". Below these is a "Charged?" section with two radio buttons labeled "Yes" and "No". At the bottom of the dialog are two buttons: "OK" and "Cancel".

1.3 The “Download C-550 & C-580 Data” programming code (note: this can also be found under the DownloadData module of my workbook. *The password has been changed for security reasons*). This is only a PORTION of the code I used:

```
Sub down1()  
    DownloadData "10.5.58.122"  
    DownloadData "10.5.60.252"  
End Sub  
  
Sub DownloadData(ip As String)  
    Dim IE As Object  
  
    Application.ScreenUpdating = True  
  
    'Create Internet Explorer Object  
    Set IE = CreateObject("InternetExplorer.Application")  
    IE.Visible = True  
  
    'Open webpage for printer & submit username and password  
  
    With IE  
        .navigate "http://" & ip & "/login.html?/main.html"  
        Do While .busy: DoEvents: Loop  
        Do While .readystate <> 4: DoEvents: Loop  
        .document.all("element10007").Value = "59111"  
        .document.all("login").all(7).Click  
        Do While .busy: DoEvents: Loop  
        Do While .readystate <> 4: DoEvents: Loop  
  
        'Navigate & download the data:  
        'Select User Count  
        'Under User Count, select Save User Count  
        'Then check the Save and Delete the Data box and click the Save(C) button  
  
        'IE.navigate "http://" & ip & "/account_count_save.html?usernum=130&del=1" '!!!THIS WILL DELETE THE DATA!!!  
        IE.navigate "http://" & ip & "/account_count_save.html?usernum=130" 'THIS WILL NOT DELETE THE DATA
```

*\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU's financial system and to protect copy code holders in the BYU School of Music.*

1.4 “Prepare Journal Entry” button, “Journal ID” input box, “Insert Date” user-form, and “Journal Entry” worksheet:

The diagram illustrates the process of preparing a journal entry. It begins with a button labeled "Prepare Journal Entry". Clicking this button opens a "Journal ID" dialog box where the user enters the Journal ID "shauna001". This then leads to an "Insert Date" dialog box where the user selects the month "April" and the year "2010". Finally, the data is entered into the "Journal Entry" worksheet, which displays a table of journal entries for April 2010.

| Line | Journal Id | Journal Header (254)/<br>Line Description (30)                       | OperUnit | Acct | Class | Debit  | Credit | Reference | mm-dd-yyyy<br>Date |
|------|------------|--|----------|------|-------|--------|--------|-----------|--------------------|
| 8    | shauna001  | This is an entry for School of Music prints/copies during April 2010 |          |      |       |        |        |           |                    |
| 9    |            | Anderson, Richard  | 14263014 | 6120 | 25726 | 20.10  |        |           | 04-12-2010         |
| 10   |            | Applonie, Jean   | 14263010 | 6120 | 25782 | 117.25 |        |           | 04-12-2010         |
| 11   |            | Asplund, Christian (Barlow)  | 24262362 | 6120 | 20031 | 23.30  |        |           | 04-12-2010         |
| 12   |            | Asplund, Christian (T/C)   | 14263009 | 6120 | 25795 | 34.45  |        |           | 04-12-2010         |
| 13   |            | Babidge, Darrell   | 14263016 | 6120 | 25992 | 24.75  |        |           | 04-12-2010         |
| 14   |            | Belknap, Monte   | 14263012 | 6120 | 25809 | 9.30   |        |           | 04-12-2010         |
| 15   |            | Bevan, Julie   | 14263012 | 6120 | 25768 | 6.55   |        |           | 04-12-2010         |
| 16   |            | Bigelow, Claudine  | 14263012 | 6120 | 25736 | 14.00  |        |           | 04-12-2010         |
| 17   |            | Blackinton, David  | 16263071 | 6120 | 25739 | 0.05   |        |           | 04-12-2010         |
| 18   |            | Bounous, Barry   | 16263092 | 6120 | 25790 | 3.00   |        |           | 04-12-2010         |
| 19   |            | Brady, Nicole  | 14263012 | 6120 | 25804 | 26.70  |        |           | 04-12-2010         |
| 20   |            | Broomhead, Paul  | 14263010 | 6120 | 25721 | 15.00  |        |           | 04-12-2010         |
| 21   |            | Brough, Ron  | 14263014 | 6120 | 25722 | 2.25   |        |           | 04-12-2010         |
| 22   |            | Brown, David   | 14263014 | 6120 | 25724 | 2.00   |        |           | 04-12-2010         |
| 23   |            | Busby, Jim   | 16262340 | 6120 | 25777 | 0.85   |        |           | 04-12-2010         |
| 24   |            | Bush, Doug   | 14263014 | 6120 | 25725 | 54.90  |        |           | 04-12-2010         |
| 25   |            | Call, Steve  | 16263073 | 6120 | 25733 | 24.40  |        |           | 04-12-2010         |
| 26   |            | Clayton, April   | 14263003 | 6120 | 25738 | 3.60   |        |           | 04-12-2010         |
| 27   |            | Concert Choir  | 16263077 | 6120 | 45403 | 3.25   |        |           | 04-12-2010         |
| 28   |            | Cook, Don  | 14263014 | 6120 | 25737 | 5.95   |        |           | 04-12-2010         |
| 29   |            | Dabczynski, Andrew   | 14263010 | 6120 | 25740 | 42.90  |        |           | 04-12-2010         |
| 30   |            | Dunn, Robert   | 14263010 | 6120 | 57066 | 3.90   |        |           | 04-12-2010         |
| 31   |            | Durham, Tom  | 14263009 | 6120 | 25741 | 49.10  |        |           | 04-12-2010         |
| 32   |            | SCM Copies April 2010  | 14263002 | 6120 | 00000 |        | 487.55 |           | 04-12-2010         |

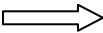
\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU's financial system and to protect copy code holders in the BYU School of Music.

**1.5 End(xlUp) function when populating the journal entry (this function was also used elsewhere in the code):**

```
'POPULATING THE JOURNAL ENTRY
Worksheets("Journal Entry").Range("C9").Value = "This is an entry for School of Music prints/copies during " & _
Worksheets("Sheet1").Range("D1").Value & " " & Worksheets("Sheet1").Range("E1").Value

For Each Cell In Worksheets("Data").Range("K8:K150")
    Cell.Select
    If Cell.Value > 0 Then
        If ActiveCell.Offset(0, -5).Value = "Yes" Then
            ActiveCell.Offset(0, -9).Select
            ActiveCell.Range("A1:D1,J1").Select
            Selection.Copy

            'This populates the journal entry
            Worksheets("Journal Entry").Activate
            Range("C150").End(xlUp).Offset(1, 0).Select
            Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlNone, SkipBlanks _
            :=False, Transpose:=False
            ActiveCell.Offset(0, 7).Value = Range("J1").Value
            Worksheets("Data").Select
            Application.ScreenUpdating = False
        Else
            End If
    Else
        End If
Next
```



## Learning & Difficulties Encountered

Through this project, I learned the following:

- How to use the End(xlUP) function when pasting values into rows of a worksheet
- How to program combo boxes from a user-form to be pasted in another worksheet as text
- How to program the value in an input box to be pasted in another worksheet as text
- How to use the IsNumeric function when doing field checks on the “Add New Copy Code” user-form
- How to automate Internet Explorer by opening a webpage and submitting a username and password
- How to view a webpage’s source by first saving the file to my computer:
  - saveFile ThisWorkbook.path & “\source.html”, IE.document.all(1).outerHTML
- How to automatically save a file downloaded from Internet Explorer to my computer (and to delete any old versions of the saved file)
- How to ALMOST upload data to the “Data” worksheet from the copy data file that is saved on my computer (see difficulties encountered)

*\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU’s financial system and to protect copy code holders in the BYU School of Music.*



Through this project, I experienced the following difficulties:

- I couldn't figure out a simple way to set the field length requirement on the "Add New Copy Code" user-form. Luckily, the password-protected Financial Services Journal Entry Template (see [http://home.byu.edu/webapp/finserve/content/page/Journal\\_Entry\\_and\\_Buget\\_Adjustment\\_Forms.html](http://home.byu.edu/webapp/finserve/content/page/Journal_Entry_and_Buget_Adjustment_Forms.html)) can make these field checks when you click on the "Validate" combo box.
- It was also difficult setting up the PrepareJE module. It took quite a while to figure out what function to use and how to use it when populating the journal entry from the "Data" tab. Eventually, I discovered the End(xlUp) function which allowed my program to easily copy and paste data in the journal entry template without overriding or skipping any lines.
- I couldn't include the actual journal entry template from the BYU Financial Services website because it is password-protected. Thus, I merely copied and pasted the formatting of the worksheet template into my own project as the "Journal Entry" worksheet. Thus, at the end of every month, the preparer will need to make sure that they copy and paste the populated items from my workbook over into the actual FS Journal Entry Template and submit it to our department's Controller for approval and upload into the financial database. Before they submit it, though, they will need to make sure that the journal entry is "validated" by clicking on the "Validate" combo box in the password-protected worksheet.
- A major difficulty I encountered was automating Internet Explorer using Excel. Unfortunately, the programming to log in, grab the data, delete the old data, and download it from the printers' websites to my computer is extremely complex. Luckily, Dr. Allen was able to help me with this task. However, the actual saving of the document to my computer does not work as it did on Dr. Allen's computer. I have to manually click the "Save" button in order for it to work...such a small price to pay. 😊
- The last major difficulty I've had is getting the data from the downloaded copy report files to correctly upload into my "Data" worksheet. I've been trying to use the "Find" function in finding the correct copy codes and copying/pasting their information over to the "Data" worksheet from the downloaded printers' files. It seems as though I haven't missed anything in my code, but the data is not pasting properly as it should. I've tried recording macros several times to go through the process of transferring this data, but to no avail. The Sub seems to ignore my ActiveCell code when switching back and forth between workbooks. Thus, the data gets pasted across rows (instead of down the column) and in the wrong spots. Each piece of data seems to be offset by a set number of cells. The following is a portion of my code that I believe is going wrong:

*\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU's financial system and to protect copy code holders in the BYU School of Music.*

```

Windows("Shauna Call Final Project.xls").Activate
ActiveSheet.Range("G7:G150").ClearContents
Windows("10_5_60_252_data.csv").Activate
Range("H2").Select

For Each Cell In Range("H2:H150")
    Cell.Select
    If Cell.Value > 0 Then

        'Find the copy code description in the Final Project file
        ActiveCell.Offset(0, -7).Select
        Description = Cell.Value
        Selection.Copy
        Windows("Shauna Call Final Project.xls").Activate

        ActiveWindow.WindowState = xlNormal
        ActiveWindow.WindowState = xlNormal
        Cells.Find(What:=Description, After:=ActiveCell, LookIn:=xlFormulas, _
            , LookAt:=xlPart, SearchOrder:=xlByRows, SearchDirection:=xlNext, _
            MatchCase:=False, SearchFormat:=False).Activate

        'Copy the data over into the Final Project file
        Windows("10_5_60_252_data.csv").Activate
        ActiveCell.Offset(0, 7).Select
        Application.CutCopyMode = False
        Selection.Copy
        Windows("Shauna Call Final Project.xls").Activate
        ActiveCell.Offset(0, 5).Select
        ActiveWindow.WindowState = xlNormal
        ActiveWindow.WindowState = xlNormal
        Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlNone, SkipBlanks _
            :=False, Transpose:=False
        Application.CutCopyMode = False
        Windows("10_5_60_252_data.csv").Activate
        'ActiveCell.Range("A1,H1").Select
        'Selection.Copy
        'Range("J150").End(xlUp).Offset(1, 0).Select
        'Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlNone, SkipBlanks _
            :=False, Transpose:=False
        Application.ScreenUpdating = False
    Else
        Exit Sub
    End If
Next

```

## Conclusion

Overall, this was a fun project to do and will definitely help simplify my job in the School of Music. After showing my supervisors the capability my project has in automatically populating the journal entry once the data is entered, they were very impressed. This project will be implemented immediately for future use in the School of Music and will save hours of work every month when it comes time to prepare the copy report.

*\*Note: all copy codes, operating units, classes, and passwords have been changed to prevent unauthorized access in BYU's financial system and to protect copy code holders in the BYU School of Music.*