Virtual Memories in WaveMaster
Here is a way to make more than 4 memory channels.

Measuring skew between multiple waveforms often requires the storage of many waveforms for recall and measurement. However, most digital scopes only have two or four waveform memories for trace storage. This small number of memory locations limits the number of traces recalled into the scope simultaneously. For applications where measurements must be made on more than 4 traces, (such as skew measurements in memory chips, or propagation delay in fanout buffers), a more powerful solution must be used.

The following example uses the customization capability in the WaveMaster to create 8 virtual memory traces that can be displayed simultaneously. The embedded Excel Math Function (part of the XMAP option) in the WaveMaster is used to send waveform data to Excel columns, and then recall the data back to the WaveMaster. Since recalled traces will be treated as normal math traces, it will greatly enhance the processing and analysis time.

IDEA :

1) Use excel function within the WaveMaster to capture the waveform information and put them into an excel worksheet.
2) Capture and store the channel data directly into the excel worksheet using visual basic script.

Figure 1 – Excel Math Function in WaveMaster

Figure 2 – Excel Cell configuration for input and output

3) The maximum column length and maximum number of column is limited by Excel. Remember each column is each trace data.

4) By using above captured waveform information, corresponding to each column, we can send back the trace data into the scope using math function F1 through F8.

DEMO :

1) Recall or setup scope as Figure 1 and Figure 2.
2) In "Cells" configuration, the header and source information is placed on right side section of the worksheet. V1 is source trace and M2 is the header information. (Figure 2)
3) By using ActiveDSO script, the channel data is pulled into worksheet column A3, and next one to B3, C3 and so on…..
4) Math channel F1, Excel Function, will import the trace data from column A3 and then will display on the screen. F2 will import the trace data from B3, and so on……(Figure 2 "output" and Figure 3).
5) All the column data is now imported to scope and displayed! Of course you can display each trace in a separate grid. (Figure 4)
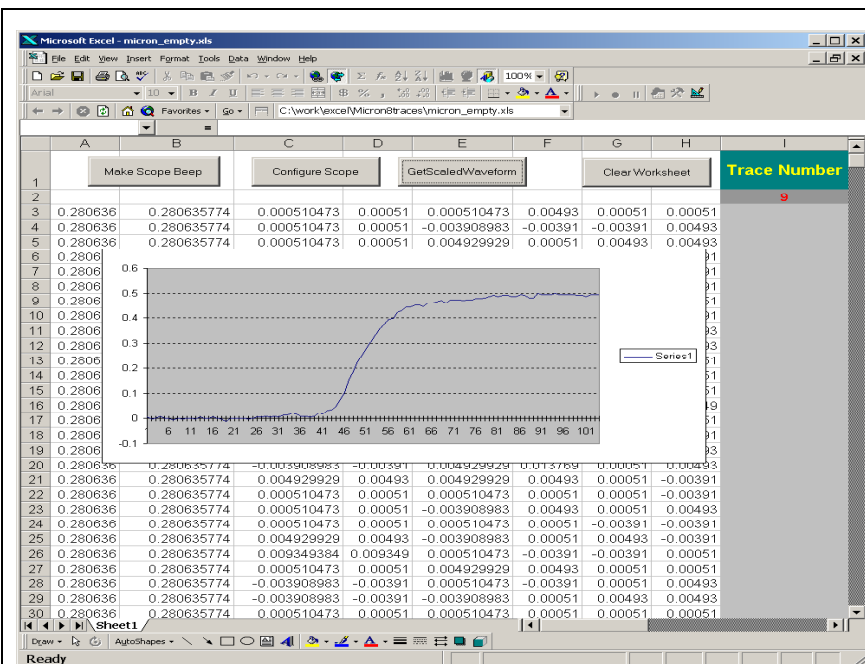

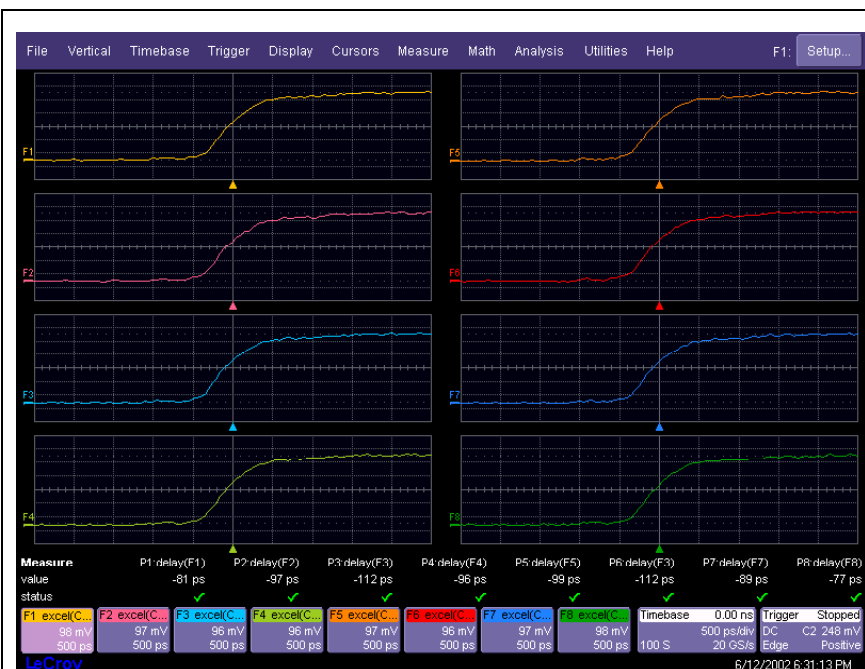**Figure 3 – Excel with embedded ActiveDSO scripts**

Figure 4 – Traces had been recalled into F1 through F8

Example script for excel sheet

[Make Scope Beep]
'Check if the scope is alive

```
Private Sub MakeScopeBeepButton_Click()
    Dim o As Object
    Dim txt As String

    Set o = CreateObject("LeCroy.ActiveDSOCtrl.1")
    Dim deviceAddress As String
    deviceAddress = Worksheets("Sheet1").Cells(12, 13).Value
    Call o.MakeConnection(deviceAddress)
    ' check connection error status
    If (o.ErrorFlag = True) Then
        MsgBox o.ErrorString
    End If
    Call o.SetRemoteLocal(1)
    Call o.WriteString("buzz beep;*idn?", 1)
    txt = o.ReadString(500)

    ' check accumulated error status
    If (o.ErrorFlag = True) Then
        MsgBox o.ErrorString
    End If

    ' release the control
    Set o = Nothing
End Sub
```

[Configure Scope]
'Configure the Trace number variable, so it can only take 8
'traces. By running this script the trace number will become 1
'Trace Number 1 will put captured data into first column(A3)

```
Private Sub ConfigureScopeButton_Click()
    Dim o As Object
    Set o = CreateObject("LeCroy.ActiveDSOCtrl.1")
        Dim deviceAddress As String
    deviceAddress = Worksheets("Sheet1").Cells(12, 13).Value
    Worksheets("Sheet1").Cells(2, 9).Value = 1

    ' check accumulated error status
    If (o.ErrorFlag = True) Then
        MsgBox o.ErrorString
    End If

    ' release the control
    Set o = Nothing
End Sub
```

[GetScaledWaveform]
'This script will take the trace data from scope and put it
'into "Trace Number" column (A3 ~ H3).

```
Private Sub GetScaledWaveformButton_Click()
    Dim o As Object
    Dim k As Integer
    Set o = CreateObject("LeCroy.ActiveDSOCtrl.1")

    Dim deviceAddress As String
    deviceAddress = Worksheets("Sheet1").Cells(12, 13).Value
    Call o.MakeConnection(deviceAddress)
        ' check connection error status
        If (o.ErrorFlag = True) Then
            MsgBox o.ErrorString
        End If
    Call o.SetRemoteLocal(1)
    Dim waveArray

    k = Worksheets("Sheet1").Cells(2, 9).Value
    waveArray = o.GetScaledWaveform("C2", 1000, 0)

        Dim i As Long
        For i = 0 To UBound(waveArray)
            Worksheets("Sheet1").Cells(i + 3, k).Value = waveArray(i)
        Next i

        Worksheets("Sheet1").Cells(2, 9).Value = k + 1
End Sub
```

[Clear Worksheet]
'This will clear the trace data in column A3 ~ H3 for new
'traces.

```
Private Sub CommandButton3_Click()
    Dim i As Integer
    Dim j As Integer
        For i = 3 To 406
            For j = 1 To 8
                Worksheets("Sheet1").Cells(i, j).Value = " "
            Next j
        Next i
End Sub
```

Example to make the " Make Scope Beep" button in excel

1) View→Toolbars→check mark "Control Toolbox"
2) Highlight the "Design Mode" and "Command Button" in control toolbox.
3) Click at the cell location where you want to put the command button, then right click at the button.
4) Select the "properties" to change the (Name) to be "Make Scope Beep" from "Command Button1", then return.
5) Close the "properties" window.
6) Right click at the command button, then select the "view code" – You can also rename the button at "CommandButton Object"
7) Insert the above example script code, [Make Scope Beep], into the code sheet.