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Education Service District**

***VARPG: An  
Implementation***

**September 14, 2000**

**Presented by: Kevin Silbernagel**

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# *How we got to VARPG:*

- Years of trying many things
  
- Fall 1999 Common
  - ☑ Mission: Domino
  - ☑ Looked at ASNA Visual RPG
  - ☑ Decided to check out IBM's offering

# *Why am I doing this?*

- It only makes sense to leverage what I know to get where I want to be.
- IBM has committed to take VARPG down the road to JAVA (or wherever the destination ends up being).

# *The real reason I'm doing this:*

- If more people don't start using this product, it will probably disappear.
- I like it, and don't want to lose it.

# *I will not spend a lot of time:*

- Showing off the GUI drag and drop sales hype.
  - ☑ Most have already seen it.
  - ☑ I'm a programmer, and want to talk **CODE**.
    - ✓ I want it to be easier to go back to work and use VARPG.



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*I will:*

- Give a brief demo of the code editor.
- Talk about Event Driven
  - ☑ power
  - ☑ pitfalls
- Talk about GUI part attributes
  - ☑ The flexibility that they bring
  - ☑ How to use them



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## *Disclaimer:*

- I recognize that I still have a lot to learn.
- I am happy to share what I know.
- I will not pretend to know everything.
- This session is geared for Programmers.

# *Example: Scheduling Application*

## ■ Key Features:

- ☑ Thick client model
- ☑ Variability
- ☑ Auto-magic scroll bars
- ☑ Volume of data on a single screen
- ☑ "bite sized" events to spread out processing

## *Since October I've also:*

- Prototyped another VARPG GUI for the classroom.
- Been the focal point for nearly all maintenance.
- Worked on other application development.
- To start I actually only had 2 hours a day to work on VARPG.



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**Change Schedule...** [Close] [Maximize] [Minimize]

**SILBERNAGEL, CASEY**      **Next Student**

Course	S1 0	1	2	3	4	5	6	7	8	S2 0	1	2	3	4	5	6	7	8
COMPUTER NETWC		002									002							
COMPUTER NETWC						001									001			
CONCERT BAND						048									049			
JAZZ BAND		017									017							
LANGUAGE ARTS III			027					033				028					036	
MATH ANALYSIS II							003									003		
MODERN AMERICAI		026		038							032		029					

**Next Student** [Close]

Enter student name:

00/01     01/02

S1	1	COMPUTER NETWORKIN	Poley, Chris	9/05	1/25	CHS
S1	2	LANGUAGE ARTS III	Higginbotham, Dennis	9/05	1/25	201
S1	3	MODERN AMERICAN HIS	Higginbotham, Dennis	9/05	1/25	201
S1	4	AIDE-ELEMENTARY SCH	Poley, Chris	9/05	1/25	
S1	5	CONCERT BAND	Bevington, Mike	9/05	1/25	301
S1	6	MATH ANALYSIS II	Miller, Royce	9/05	1/25	221
S1	7	YEARBOOK	Manning, Mark	9/05	1/25	405



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**Change Schedule...**

**SILBERNAGEL, CASEY**      **Next Student**

Course	S1								S2										
	0	1	2	3	4	5	6	7	8	0	1	2	3	4	5	6	7	8	
COMPUTER NETWC		002									002								
COMPUTER NETWC						001									001				
CONCERT BAND						048									049				
JAZZ BAND		017									017								
LANGUAGE ARTS III			027				033					028				036			
MATH ANALYSIS II							003									003			
MODERN AMERICAN HIS																			
PHYSICS																			
YEARBOOK																			

**Next Student**

Enter student name:      

00/01       01/02

S1	1	COMPUTER NETWORKIN	Poley, Chris	9/05	1/25	CHS
S1	2	LANGUAGE ARTS III	Higginbotham, Dennis	9/05	1/25	201
S1	3	MODERN AMERICAN HIS	Higginbotham, Dennis	9/05	1/25	201
S1	4	AIDE-ELEMENTARY SCH	Poley, Chris	9/05	1/25	
S1	5	CONCERT BAND	Bevington, Mike	9/05	1/25	301
S1	6	MATH ANALYSIS II	Miller, Royce	9/05	1/25	221
S1	7	YEARBOOK	Manning, Mark	9/05	1/25	405



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Change Schedule... \_ □ ×

SILBERNAGEL, CASEY Next Student

Loading:

Click on Grid =  Schedule course  Class List  Show MS Choices  MS detail  Add course

New Course:   Current  Proposed Print

S1	0	OPEN SCHEDULE	000	9/05	1/25		▲
S1	1	COMPUTER NETWORKIN	Poley, Chris	9/05	1/25	CHS	
S1	2	LANGUAGE ARTS III	Higginbotham, Dennis	9/05	1/25	201	
S1	3	MODERN AMERICAN HIS	Higginbotham, Dennis	9/05	1/25	201	
S1	4	AIDE-ELEMENTARY SCH	Poley, Chris	9/05	1/25		
S1	5	CONCERT BAND	Bevington, Mike	9/05	1/25	301	
S1	6	MATH ANALYSIS II	Miller, Royce	9/05	1/25	221	
S1	7	YEARBOOK	Manning, Mark	9/05	1/25	405	▼

**START**



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**Change Schedule...** [ - ] [ 5 ] [ X ]

**SILBERNAGEL, CASEY**      **Next Student**

Course	S1 0	1	2	3	4	5	6	7	8	S2 0	1	2	3	4	5	6	7	8
COMPUTER NETWC		002									002							
COMPUTER NETWC						001									001			
CONCERT BAND						048									049			
JAZZ BAND		017									017							
LANGUAGE ARTS III			027				033					028				036		
MATH ANALYSIS II							003									003		
MODERN AMERICAI		026		038							032		029					
PHYSICS									025									024
YEARBOOK								027										025

Click on Grid =  Schedule course    Class List    Show MS Choices    MS detail    Add course

New Course:     Current    Proposed  

S1	0	OPEN SCHEDULE	000	9/05	1/25	
S1	1	COMPUTER NETWORKIN	Poley, Chris	9/05	1/25	CHS
S1	2	LANGUAGE ARTS III	Higginbotham, Dennis	9/05	1/25	201
S1	3	MODERN AMERICAN HIS	Higginbotham, Dennis	9/05	1/25	201
S1	4	AIDE-ELEMENTARY SCH	Poley, Chris	9/05	1/25	
S1	5	CONCERT BAND	Bevington, Mike	9/05	1/25	301
S1	6	MATH ANALYSIS II	Miller, Royce	9/05	1/25	221
S1	7	YEARBOOK	Manning, Mark	9/05	1/25	405



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## *To load this screen:*

- **Approximately 112 Reads from the AS/400 database**
  - ☑ Schedule requests
  - ☑ Student Schedule
  - ☑ Course Catalog
  - ☑ Master schedule
  - ☑ Staff Directory
  - ☑ Department table
  - ☑ Student Enrollment/Demographic



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**Change Schedule...** [Icons]

**SILBERNAGEL, CASEY**      **Next Student**

Course	S1 0	1	2	3	4	5	6	7	8	S2 0	1	2	3	4	5	6	7	8
COMPUTER NETWC		002									002							
COMPUTER NETWC						001									001			
CONCERT BAND						048									049			
JAZZ BAND		017									017							
LANGUAGE ARTS III			027				033					028				036		
MATH ANALYSIS II							003									003		
MODERN AMERICA I		026		038							032		029					
PHYSICS									025									024
YEARBOOK								027										025

Click on Grid =  Schedule course    Class List    Show MS Choices    MS detail    Add course

New Course:     Current    Proposed  

S1	5	CONCERT BAND	Bevington, Mike	9/05	1/25	301	
S1	6	MATH ANALYSIS II	Miller, Royce	9/05	1/25	221	
S1	7	YEARBOOK	Manning, Mark	9/05	1/25	405	
S1	8	WORK EXPERIENCE	Poley, Chris	9/05	1/25		
S2	0	OPEN SCHEDULE	000	1/29	6/08		
S2	1	COMPUTER NETWORKIN	Poley, Chris	1/29	6/08	CHS	
S2	2	LANGUAGE ARTS III	Higginbotham, Dennis	1/29	6/08	201	
S2	3	MODERN AMERICAN HIS	Higginbotham, Dennis	1/29	6/08	201	



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## *Where it is at now*

- Piloting at 6 schools
- Approx. 30 users (who don't like change) and growing
  - ☑ But they like this and refuse to give it up
- Started piloting in August
  - ☑ Worst/busiest time of year for them



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## *Difference made*

- One school reports that New Student conferences had been scheduled to last 1 1/2 hours, now they are down to just 1/2 hour.
- Counselors can focus on advising, not data entry.



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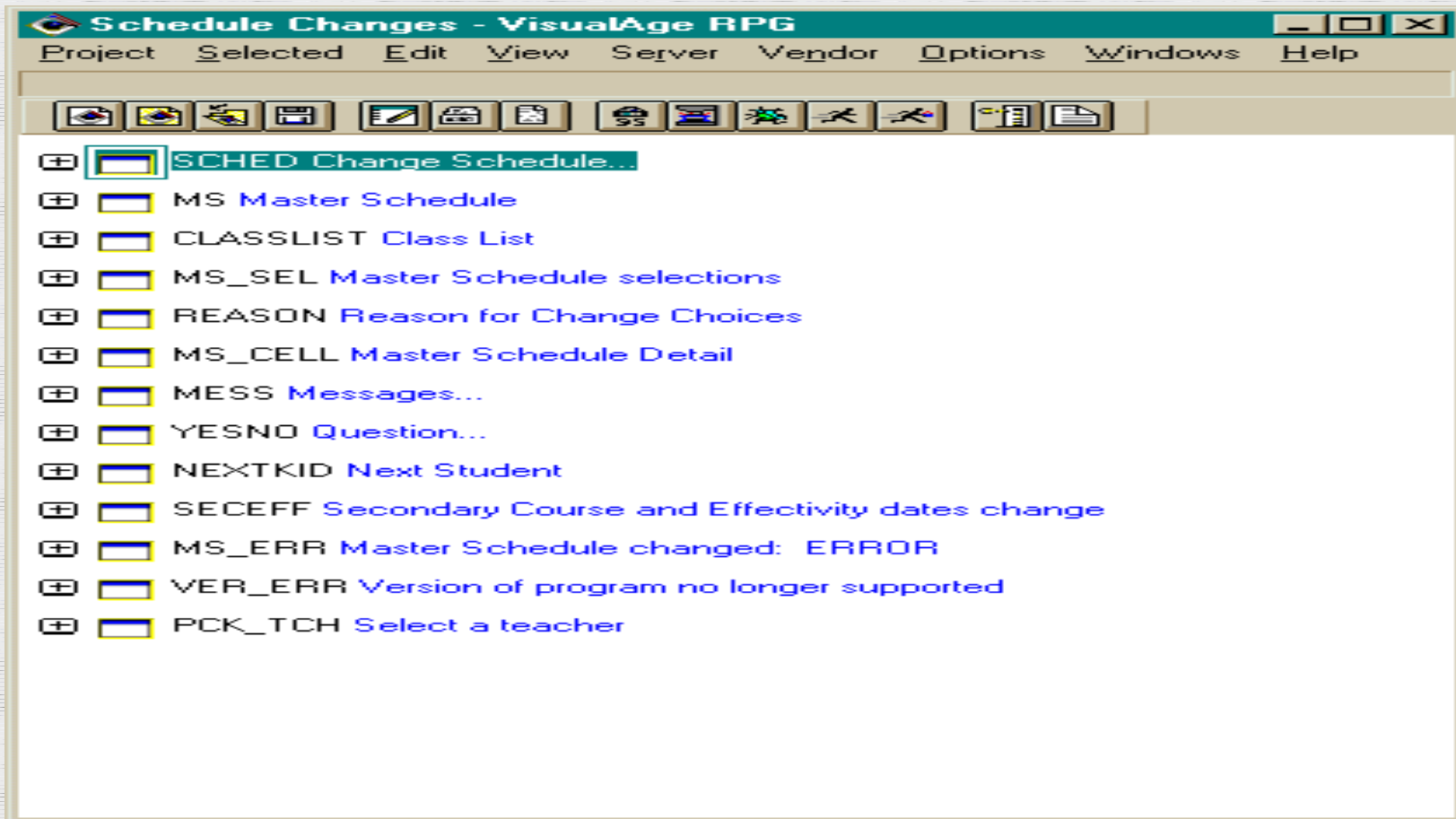
# *GUI designer*

- Uses CODE/400 Editor
- Has tools for code positioning
  - ☑ List of Action (event) routines
  - ☑ List of user subroutines
- My favorite feature: Control + I



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# GUI designer





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# Editor

```

VisualAge RPG Editor - C:\ADTSWIN\Schedule\Schedule.VPG
File Edit View Actions Options Windows Help
[Icons]
Row 1      Column 1      Replace
..... *..1.....+.....2.....+.....3.....+.....4.....+.....5.....+.....6.....+.....7.....+.....8.....+.....9.....
00001      *****
00002      * Program ID . . : SCHEDULE *
00003      * Description . . : MAINTAIN STUDENT SCHEDULES *
00004      * Programmer . . : Kevin F. Silbernagel *
00005      *****
00006      *
00007      H
00008      H COPYRIGHT ('2000 by Linn-Benton-Lincoln Education Service District')
00009      H datedit(*YMD)
00010      *
00011      fsrcmst12  if a e          k disk  remote
00012      fssmst110  uf a e          k disk  remote usroprn
00013      fssmst11   if e          k disk  remote rename(ssmst:ss01) usroprn
00014      fsuot101   if e          k disk  remote usroprn
00015      fsuat102   if e          k disk  remote usroprn
00016      fseam108   if e          k disk  remote
00017      fseam118   if e          k disk  remote prefix(s18) rename(seamst:s18)
00018      fsasm101   if e          k disk  remote
00019      fdemst11   if e          k disk  remote usroprn
IBM Live Parsing Editor

```



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# Action Routine List

The screenshot shows a VisualAge RPG window titled "Action subroutines : Events View - VisualAge RPG". The window is divided into four panes: "Windows", "Parts", "Events", and "Action subroutines".

- Windows pane:** Contains a list of window names: CLASSLIST (highlighted), MESS, MS, MS\_CELL, MS\_ERR, MS\_SEL, NEXTKID, PCK\_TCH, REASON, SCHED, SECEFF, VER\_ERR, and YESNO.
- Parts pane:** Empty.
- Events pane:** Empty.
- Action subroutines pane:** Contains a list of action routines: ADDCRS+SELECT+SCHED, BEGDAT+GOTFOCUS+SECEFF, BEGDAT+VKEYPRESS+SECEFF, BUT\_KID+PRESS+SCHED, CLASSLIST+CLOSE+CLASSLIST, CRUISE+PRESS+SCHED, CURRENT+SELECT+SCHED, CURYR+SELECT+NEXTKID, C\_LIST+SELECT+SCHED, ENDDAT+GOTFOCUS+SECEFF, ENDDAT+VKEYPRESS+SECEFF, GRID+COLSELECT+SCHED, GRID+SELECT+SCHED, KID+KEYPRESS+NEXTKID, KID+VKEYPRESS+NEXTKID, MS+CLOSE+MS, MSCHED+SELECT+MS, MSGSFL+SELECT+SCHED, MS\_BTN\_PRESS\_MS\_ERR.

At the bottom of the window, there are several buttons: "Create", "Create link", "Delete link", "Locate", "Delete", "Close", "View subroutines", and "Help".



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# Action Routine

```

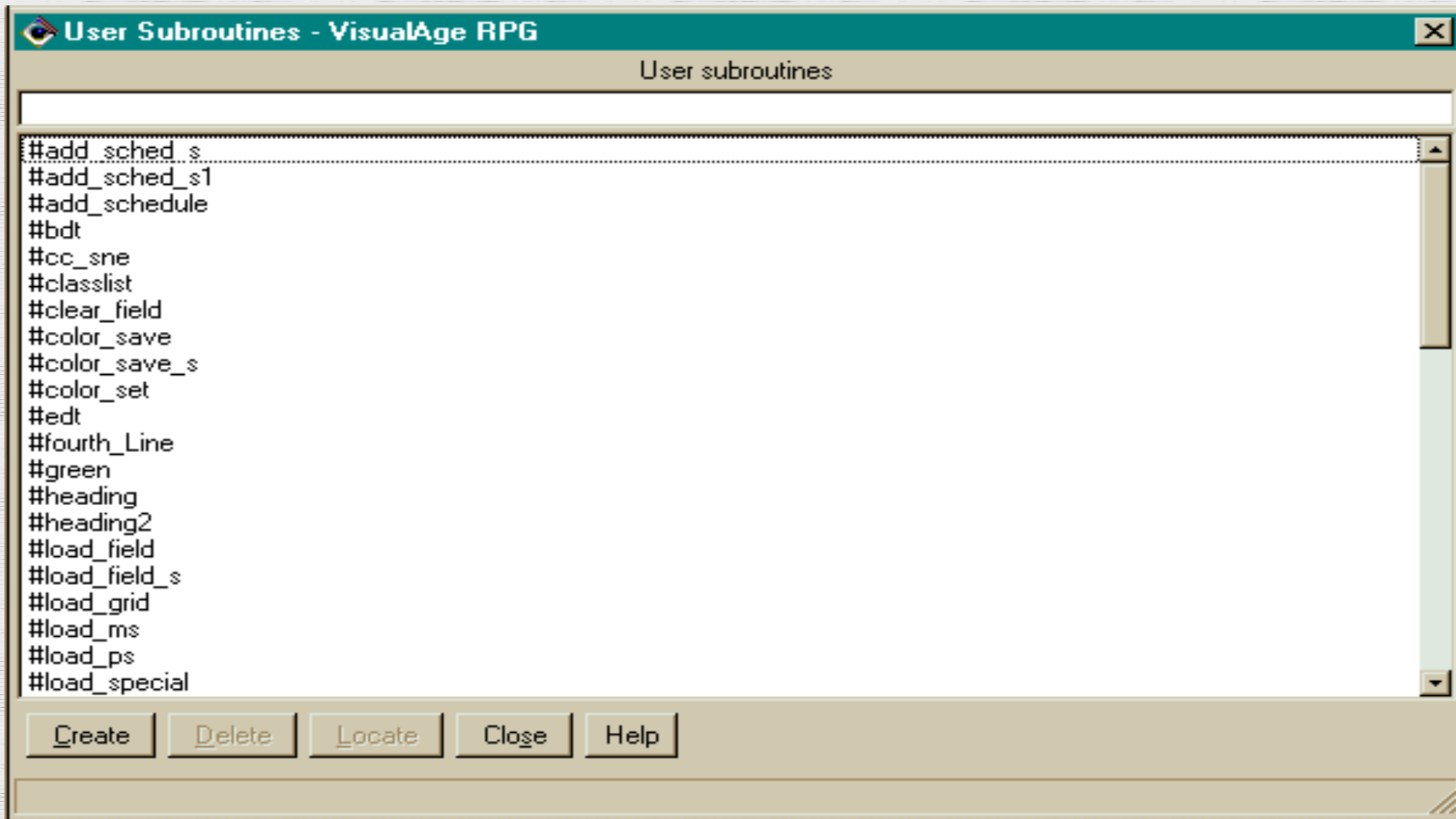
VisualAge RPG Editor - C:\ADTSWIN\Schedule\Schedule.VPG
File Edit View Actions Options Windows Help
[Icons]
Row 9231 Column 1 Replace
.....CSRNO1Factor1+++++Opcode(E)+Factor2+++++Result+++++Len++D+HiLoEq....Comments+++++
09228 * so that the character count for the SNE does not get messed up.
09229 *****
09230 *
09231 C REQ BEGACT CLICK SCHED
09232 *
09233 C eval %setatr('SCHED':'REQ':'TextStart')=
09234 C (ccstart + 1)
09235 C eval %setatr('SCHED':'REQ':'TextEnd')=25
09236 *
09237 C ENDACT
09238 O*****
09239 Ooutput e head 1 03
09240 O MELNAM 30
09241 O udate y 79
09242 Ooutput e head 1
09243 O 80 '(SS0400.EXE)'
09244 Ooutput e head 0
09245 O 15 'Schedule for:'
09246 O name_35 52

```



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# Subroutine List





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# Subroutine

```
VisualAge RPG Editor - C:\ADT\SWIN\Schedule\Schedule.VPG
..... *..1.....+.....2.....+.....3.....+.....4.....+.....5.....+.....6.....+.....7.....+.....8.....+.....9.....
03814 * #sne: read file to get first kid that matches
03815 *****
03816 c #sne begsr
03817 *
03818 c eval txtstart=%scan(' ':kid)
03819 *
03820 c* determine which key to use (is there a comma, so first name too?):
03821 c eval n = %scan(',':kid)
03822 c n ifne *zero
03823 c if n = (txtstart - 1)
03824 c eval txtstart=%scan(' ':kid:(n+2))
03825 c endif
03826 c endif
03827 *
03828 c n add 2 n1
03829 c clear name
03830 c movea kid name
03831 c clear l1
03832 c clear f1
```



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# *Filter (Ctrl 'I')*

**Filter** ✕

**Include all lines with this string**

**ccmst1** ▼

**Case sensitive**

**Pattern match**

**Filter**

**Cancel**

**Help**



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# Filter results

```
VisualAge RPG Editor - C:\ADTSWIN\Schedule\Schedule.VPG
File Edit View Actions Options Windows Help
[Icons]
Row 20 Column 1 Replace
.....FFilename++IT.A.FRlen+.....A.Device+.Keywords+++++++Comments+++++
00020 fccmst11 if e k disk remote usropr
00915 c close ccmst11 97
01187 c cckey8 chain ccmst11
01280 c cckey8 chain ccmst11
01932 c open ccmst11 97
01937 c cckey998 chain ccmst11
01997 c cckey1 chain ccmst11
02281 c cckey3 chain ccmst11
02473 c cckey3a chain ccmst11
03054 c cckey2a chain ccmst11
03056 c cckey2 chain ccmst11
03154 c cckey998 chain ccmst11
03465 c open ccmst11 97
03470 c cckey998 chain ccmst11
03749 c open ccmst11 97
03754 c cckey998 chain ccmst11
04334 c cckey6 chain ccmst11
04565 c endif
%Found ccms
ALL found 28 occurrences.
```



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# EVENT DRIVEN

## *Two routine types:*

- User Subroutines
- Action

The logo for Linn Benton Lincoln Education Service District (LBL ESD) features the letters 'LBL' in a large, bold, black sans-serif font, followed by 'ESD' in a smaller, outlined sans-serif font.

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**NO MAINLINE  
CODE!**



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# *User Subroutines*

- What you are used to
- Tool for listing/finding them



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# *Action Routines*

- Start with BEGACT
- End with ENDACT
- One for each event



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# *Action Routines*

- **Warning: Don't try to code them without first recognizing them from the GUI designer.**



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# A sample Action Routine:

```
* Window . . : SCHED      Part: GRID subfile  Event: COLSELECT
* Description: SHOW MS CHOICES FOR THAT TERM/PERIOD
*****
C      GRID              BEGACT      COLSELECT      SCHED
c              eval              grid_col=%ColNumber
c* only show master schedule if period/term column selected
  (1 is course name)
c      grid_col          ifgt              1
c              move              htm(grid_col) term_wrk
c              move1(p)          hpr(grid_col) per_wrk
c              z-add              *zero              per_wrk
c              move1              per_wrk              per_wrk
c              exsr              #mschoices
c              endif
C              ENDACT
```

# *Take control of your EVENTS*

- A user can, and will, click anything
- Parts can be Enabled or disabled to control timing constraints



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# Layered Windows need special attention

**Change Schedule...** [min] [max] [close]

SILBERNAGEL, CASEY      Next Student

Course	S1 0	1	2	3	4	5	6	7	8	S2 0	1	2	3	4	5	6	7	8
COMPUTER NETWC		002									002							
COMPUTER NETWC						001									001			
CONCERT BAND						048									049			
JAZZ BAND		017									017							
LANGUAGE ARTS III			027					033				028					036	
MATH ANALYSIS II							003										003	

**Next Student** [close]

Enter student name:

00/01     01/02

S1	0	OPEN SCHEDULE	000	9/05	1/25	
S1	1	COMPUTER NETWORKIN	Poley, Chris	9/05	1/25	CHS
S1	2	LANGUAGE ARTS III	Higginbotham, Dennis	9/05	1/25	201
S1	3	MODERN AMERICAN HIS	Higginbotham, Dennis	9/05	1/25	201
S1	4	AIDE-ELEMENTARY SCH	Poley, Chris	9/05	1/25	
S1	5	CONCERT BAND	Bevington, Mike	9/05	1/25	301
S1	6	MATH ANALYSIS II	Miller, Royce	9/05	1/25	221
S1	7	YEARBOOK	Manning, Mark	9/05	1/25	405



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# Protect the prior window:

```
c      eval      %setatr('SCHED':'SCHED':'Enabled')=0
```

```
c      eval      %setatr('\Sched':'SCHED':'Visible')=0
```

# *Take control of your EVENTS: LR*

- **Warning:** If you do not leave your application with LR on, unpredictable results can occur.
- **Code for all events that can terminate the application.**

# *Events have attributes*

## ■ Example:

### ☑ VKEYPRESS

- ✓ %character returns which key was pressed
- ✓ %alt returns whether the <ALT> key was pressed too
- ✓ others too...(see the Parts Reference)

# *Many events to choose from:*

## ■ Subfile events:

"Change"	"ColSelect"	"Create"
"Destroy"	"Enter"	"FirstRec"
"GotFocus"	"KeyPress"	"LastRec"
"LostFocus"	"MouseEnter"	"MouseExit"
"MouseMove"	"NextRec"	"PageDown"
"PageEnd"	"PageTop"	"PageUp"
"Popup"	"PrevRec"	"Select"
"VKeyPress"		



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# *Consider all events:*

- Some need to be coded to avoid the default processing.

```
C      REQ          BEGACT   CLICK      SCH
c      eval        %setatr('SCHED':'REQ':'TextStart')=
c                        (ccstart + 1)
c      eval        %setatr('SCHED':'REQ':'TextEnd')=25
C      ENDACT
```



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**Attributes = GUI control**



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# *%SETATR*

- Changes a gui attribute

- Use EVAL opcode:

```
%setatr('Window': 'Part': 'Attribute')=x
```



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## *%GETATR*

- Returns the current value of an attribute
- Use EVAL opcode  
`x=%getatr('Window':'Part':'Attribute')`

• *%SETATR and  
%GETATR*

- Both are not available for all attributes
- See the parts reference for which



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# *Subfile attributes*

"AddItemEnd"

"AllowEdit"

"AutoSelect"

"BackColor"

"BackMix"

"Bottom"

"ButtonIdx"

"Buttons"

"ButtonTip"

"CapsLock"

"CellBGClr"

"CellBGMix"

"CellFGClr"

"CellFGMix"

"ColBGClr"

"ColBGMix"

"ColFGClr"

"ColFGMix"

"ColNumber"

"ColWidth"

"Count"

"DeSelect"

"EnableBtn"

"Enabled"

"ExtSelect"\*

"FirstSel"

"Focus"

"FontArea"

"FontBold"

"FontItalic"



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## *Subfile attributes (page 2)*

"FontName"	"FontSize"	"FontStrike"*
"FontUnder"*	"ForeColor"	"ForeMix"
"Handle"*	"HdgBGClr"	"HdgBGMix"
"HdgFGClr"	"HdgFGMix"	"HdgIdx"
"HdgText"	"Height"	"Hidden"
"HRule"	"Index"	"ItemCount"
"Left"	"MultSelect"	"NbrOfSel"
"OpenEdit"	"PageSize"	"ParentName"
"PartName"	"PartType"	"RemoveItem"
"RowBGClr"	"RowBGMix"	"RowFGClr"



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## *Subfile attributes (page 3)*

"RowFGMix"

"Scale"

"Selected"

"SelectItem"

"SelectList"

"SetTop"

"SfINxtChg"

"ShowTips"

"SizeToFit"

"StartAt"

"TipText"

"Top"

"TopRecord"

"UserData"

"Visible"

"VRule"

- The '\*/' beside some attributes in the parts catalog note that there are conditions that the attribute will not work.
- Most frequently it denotes not available for JAVA runtime changes.

# *Subfiles: a special case*

- Column attributes need to have ColNumber attribute set before any changes to a column.
- Row attributes need to have Index attribute set before any changes to a row.
- Cell attributes need to have both set before any changes to a cell.



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# *Subfiles: Columns*

- Can be dynamically sized
- Can hide columns
  - ☑ Must define maximum number of columns
- Can have columns with different colors



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## *Subfiles: Rows*

- READS opcode, for reading a selected record.
- Data is read, but attributes must be retrieved individually.

# *Subfiles: ROW and COLUMN*

- To get row and column of the selected record:

```
c  reads      GRID
c  eval      row=%getatr('SCHED':'GRID':'Index')
c  eval      col=%Colnumber
```



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# *Subfiles: READC*

```
c   readc   GRID
c   eval   row=%getatr('SCHED':'GRID':'Index')

c   eval   %setatr('SCHED':'GRID':'SflNxtChg')=0
- or -    (*new with V323)
c   eval   row = row +1
c   eval   %setatr('SCHED':'GRID':'StartAt')=row
```



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# *Changing a subfile cell color:*

```
c      eval      %setatr('SCHED':'GRID':'Index')=r  
c      eval      %setatr('SCHED':'GRID':'ColNumber')=c  
c      eval      %setatr('SCHED':'GRID':'CellBGClr')=15  
c      eval      %setatr('SCHED':'GRID':'CellFGClr')=0
```

This Code will set the Cell defined by the coordinates 'R' and 'C' to white letters on a pale grey background.

## *A note about subfile Attributes:*

- If you are working within a cell, save its coordinates.
- Reset them each time you reference the cell.
  - ☑ My experience is that other events can disconnect the Index and ColNumber attributes that had been set.



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## *A note about colors:*

- Can easily be overused
- GUI should be more self-explanatory not less



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**Things I learned  
the hard way:**

# *Other things to think about*

- Windows/xx is not OS/400
- Deployment
- Version Control

# *Favorite Reference Manual*

## VARPG parts reference

- All attributes for parts and events
- If you want to stay thin, watch those '\*' warnings



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# *Website of interest*

[www-4.ibm.com/software/ad/varpg/support/](http://www-4.ibm.com/software/ad/varpg/support/)

- Newsgroup
- PTFs

# *My E-mail*

**kevin\_silbernagel@lblestd.k12.or.us**



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# Questions & Answers(?)

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