

ATTRINFO: MACROS TO CONCISELY DISPLAY AF CATALOG ATTRIBUTES

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Background and Organization

The Problem. The scenario is familiar to SAS/AF(r) system developers. As the number of catalog entries grows and as screens become "busier" the need for documentation and summary information becomes acute. The developer needs to be able to identify entry-level characteristics such as PMENU and HELP modules, window type, and so on. Field-level information is also needed. The developer needs to know field names and their aliases, their protection, pad characters, and formats, among other items.

One way to obtain this information is to use the BUILD procedure interactively. The GATTR and ATTR windows give a wealth of information about entry and field-level characteristics, respectively. This method is acceptable for quick memory-jogging activity ("what was the name of that selection group", "is the entry a dialog box?", etc.). For documentation purposes and for larger, cross-entry questions, however, it is inappropriate.

The BUILD procedure may be used interactively to produce plain-text ("ASCII") files of catalog entry information. The user may control which entries are reported and the amount of details from each. Output from BUILD for a PROGRAM entry is presented in Figure 1 at the end of this paper.

The output presented in the sample is notable for several drawbacks. First is its bulk. Each field requires 11 lines of output to display. The file size and, in turn, readability of the listing make casual scanning difficult. Another drawback is that the only form of output is a print file. Unlike many other SAS System(r) procedures, BUILD does not produce an output SAS dataset. Ad-hoc manipulation of and reporting from the procedure is, in Version 6.06 at least, impossible. A final drawback related to the previous points is related to querying. You cannot restrict output to, say, only include fields which belong to choice groups or entries which use a particular PMENU.

A Solution. The ATTRINFO macros were written to address these shortcomings. They run the BUILD

procedure with the proper options, use its output file as input to a DATA step which creates a SAS dataset, and produces entry and field-level reports. A major advantage of the macros' reports is brevity: summary information for each catalog entry fits on a single line, as do details for each field in PROGRAM entries.

Organization. This paper is divided into three sections. The first describes the syntax and execution of the three macros which comprise ATTRINFO. The second presents report examples. The last section discusses limitations of the macros and suggests possible extensions of their capabilities.

Syntax and Execution

The ATTRINFO macros run the BUILD procedure, process its output to create SAS datasets, and report in a variety of formats. This section discusses the macros following this sequence of events.

%SETUP. The SETUP macro creates the SAS datasets from which reports are written. Its syntax is shown below.

```
%SETUP(path=, catid=, et=, select=);
```

In the above:

- . "path" indicates the name of the directory in which the catalog to be analyzed resides. Status: required.
- . "catid" identifies the catalog. To distinguish one from two-level names, use the first-level name ATTR. Status: optional. If omitted, the BUILD procedure is not run and the macro creates the SAS datasets from an earlier invocation of SETUP.
- . "et" identifies a catalog entry type (program, help, etc.) to process. Status: optional. If omitted, all entries in the catalog are processed.
- . "select" identifies specific entries to process. Its syntax follows the same rules

as the BUILD procedure. Thus a "select" value of READ: will process any entry whose name begins with the string "READ". Status: optional. If omitted, all entries matching the "et" type will be processed.

Execution of SETUP is straightforward. If necessary, the BUILD procedure is invoked with the appropriate type and entry restrictions. Output is written to the file ATTRINFO.BLD in the directory indicated by "path."

The next part of SETUP is a DATA step which uses ATTRINFO.BLD as its input. The program reads a line from the file, determines if it is one containing needed information, and uses a variety of scanning and character-handling functions and macros to extract the information. Two datasets, GENERAL and FIELD, are written to the location indicated by the "path" parameter. GENERAL contains one observation per catalog entry, while FIELD's observations correspond to fields within each PROGRAM entry.

%FIELD and %GENERAL. Reporting from the datasets may proceed once %SETUP has run successfully. The FIELD macro, as one would suspect, reports field-level information. GENERAL creates an entry-level report. Their syntax is shown below:

```
%field(path=, type=);
%general(path=);
```

In the above:

- "path" identifies the location of the ATTRINFO.BLD file created by %SETUP. Its syntax resembles that of the "path" parameter in %SETUP. If %SETUP was run earlier in the same program "path" may be omitted.
- "type" identifies the style of field-level report. Choices are "alias" (sort by alias within entry), "choice" (display only fields belonging to choice groups), or blank (the default - sort by order of appearance on the screen).

Like %SETUP, execution of %FIELD and %GENERAL is fairly simple. The input datasets are sorted by the appropriate keys and processed by a _NULL_ DATA step. Reports are written to files with a name of ATTRINFO. File extensions identify

the type of report: POS indicates field-level report by position; ALS, an alias-ordered report; CHC, a choice group listing; and GEN, the general, entry-level report. To achieve the line-per-item brevity goal of the macros, all reports are written with a line size of 132.

Examples

This section presents representative examples of ATTRINFO macro usage. Short programs are shown first, followed by discussion of the output in Figures 2 through 4 at the end of this paper.

The first example uses all macros, and uses %INCLUDE to make the macros known to the system. All PROGRAM entries from permanent catalog QUERY are processed. All field-level reports and a general report are requested

```
%include '[sys.macros]attrinfo.macros';
%setup(path=[dss],
        catid=attr.query,
        et=program);
%field(type=alias);
%field(type=choice);
%field;
%general;
```

The next example assumes that %SETUP ran in an earlier program. That is, the datasets FIELD and GENERAL already exist in the directory pointed to by the "path" parameter. The default field-level report is written to file [DSS]ATTRINFO.POS.

```
options sasautos=('[sys.macros']);
%field(path=[dss]);
```

Figures 2 through 4. Figures 2 through 4 at the end of this paper present output from the FIELD and GENERAL macros. Figure 2 presents the general, entry-level report. The entry name and window name begin each line. If a window's name exceeds the allowed display space an ellipsis (...) is printed. The window's position and dimensions are then shown, followed by the banner type, window options, window type, and scroll bar usage. Here, as in the field-level reports, the report uses a reasonable one-letter abbreviation instead of simply marking an X to indicate presence or absence. For example, a V indicates vertical scroll bars. This makes

the characteristic of the entry immediately apparent: rather than have to trace up to the column header, the user knows right away that vertical scroll bars are used.

Other general report items are the Help, Key, PMENU, and Lookup dataset names. Entry types of KEYS and PMENU may be assumed in some cases. Help and Lookup names are presented in full.

Figure 3 is taken from a field-level report. The style of report is indicated in the title, and the entry name in the line below the title. Each entry's report begins with several lines about entry characteristics (similar to %GENERAL's output).

We see from the line at the bottom of the Figure that the entry presented in Figure 3 did not have any screen variables. This occurs when an entry is used, in effect, as a subroutine or when it is used simply for displaying information, with no need to display or retrieve data.

Figure 4 presents a field-level report for a PROGRAM entry with screen variables. The top of the display resembles that of Figure 3. Once general characteristics are displayed, however, there is field-level information to report. Field name and alias, choice group, and data type are displayed first. Location, pad, justification, and format values follow. Abbreviated error attributes are displayed (here, as elsewhere, abbreviations and headings are displayed in each page's footnotes).

The field's help entry and list value/entry are identified, followed by initial values and field options. Note that the order of columns roughly follows that of the BUILD procedure's output. The difference, of course, is that it is condensed to a single line. Notice that for the sake of brevity the List and Initial values are only partially displayed. An ellipsis indicates the presence of information which could not fit in the display space. Note also that the Replace value is omitted entirely from the display.

Limitations, Extensions

Limitations. Developing utilities such as AT-TRINFO is usually prompted by the heat of job-related necessity. The intended audience of AF developers would probably nod their heads in recognition when reading the previous sentence. The author's immediate reasons for writing the macros and their intended users contribute to some of the

limitations of the macros.

These limitations include a lack of parameter checking (presence or absence, valid values, etc.). Also, some information is truncated on display (window, list entry names) or omitted entirely (Replace values). Another restriction is the requirement of at least Version 6.06 of SAS. Finally, the path parameter and file naming conventions are oriented toward the UNIX, VAX/VMS, and DOS environments.

Extensions. The SETUP macro extracts virtually all pieces of the BUILD output (Initial, List, and Replace values may be truncated). So, since the FIELD and GENERAL datasets are complete, it is possible to reformat the reports and develop new ones to suit the developer's needs.

Other extensions to the current system may include: error checking of parameters; an AF front-end to guide the user's choice of options and prevent incorrect or incompatible selections. Such an interactive environment would make the macros a more powerful, ad hoc analytical tool.

Contact

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Figure 1: Default BUILD procedure output

```

Tuesday, May 5, 1992                12:03:08                PAGE 16

ENTRY: SELECT.PROGRAM   MAIN SCREEN: Build Selection Criteria
Last updated:

***** ATTRIBUTES *****

      Window name: Build Selection Criteria
      Start row: 1      col: 1
      Number of rows: 31      cols: 79      Banner: COMMAND

      General help:
      Function keys:
      Lookup data set:
      Command menu: BUILDSEL
      Prompt char: ?
      System Options:
      Parent:
      Window Type: DIALOG
      Scroll Bars:

-----
      Field name: FIELD1  Frame: 1  Row: 2  Col: 26  Length: 5
      Alias:   ESTATC1    Choice group:  ESTAT_C    Pad:  _
      Type:    CHAR      Protect: INITIAL
      Format:                Just: LEFT
      Informat:
      Error color: WHITE      attr:  NONE      Help:
      List:
      Initial:  Clear
      Replace:
      Options:

-----
      Field name: FIELD2  Frame: 1  Row: 2  Col: 32  Length: 1
      Alias:   ESTATC2    Choice group:  ESTAT_C    Pad:
      Type:    CHAR      Protect: YES
      Format:                Just: LEFT
      Informat:
      Error color: BLUE      attr:  NONE      Help:
      List:
      Initial:
      Replace:
      Options: CAPS NON-DISPLAY

-----
      Field name: FIELD3  Frame: 1  Row: 2  Col: 39  Length: 4
      Alias:   ESTAT_H1    Choice group:  ESTAT_H    Pad:  _
      Type:    CHAR      Protect: INITIAL
      Format:                Just: LEFT
      Informat:
      Error color: WHITE      attr:  NONE      Help:
      List:
      Initial:  Help
      Replace:
      Options:

```

Figure 2: %GENERAL output

Path: c:\attrinfo\ Catalog: <not specified>												Date: 01APR92 Time: 15:28 Page: 1			
Name	Window Name	-Start- Row Col	-Size-- Row Col	Bn	Sys opts. E R N	Win. type S B D L H	Scrl bar H V	Prompt Help	Keys	PMenu	Lookup				
BILDWHER.PROGRAM		2 2	31 79	NO				?							
BYWHERE.PROGRAM		6 1	13 80	NO		B		? ASSTCOM.CBT1		MOREA					
COUNTOBS.PROGRAM	Record Counting	10 2	9 77	NO		D		?		OK					
EDITWHER.PROGRAM	WHERE Statement Editin...	1 2	35 76	NO	E		D	V ?		EDITWHER					
GETTEXT.PROGRAM	Build Selection Criter...	1 1	32 80	CO	R		D	?		BUILDSEL					
OPERATOR.PROGRAM	Operator Selection	10 50	18 27	NO		B		?	SELEXTND	END					
SELECT.PROGRAM	Build Selection Criter...	1 1	31 79	CO		D		?		BUILDSEL					
SELEXTND.PROGRAM		2 2	31 79	NO	E	B		V ?	SELEXTND	END					
TEMPLATE.PROGRAM	Template Maintenance	2 2	31 79	CO	E	B		V ?		TEMPL					
TMPLTEXT.PROGRAM	Template Maintenance	2 2	31 79	CO	E	B		V ?		TEMPL					
WHERE2GO.PROGRAM	Screen Selector	9 38	11 40	NO		D		?							
WHEREGEN.PROGRAM				CO											
WHEREERW.PROGRAM	Read/Write WHERE claus...	1 2	35 76	NO		S	D	?							

KEY: Bn: Banner type (None, Command, or Select)
Sys opts: E=extended table, R=resident N=no exit
Win. type: S=standard B=dialog box D=dialog L=list H=help
Scrl bar: H=horizontal scroll bar V=Vertical scroll bar

NOTE: An ellipsis (...) at end of Window Name indicates text not printed due to display space constraints

Figure 3: %FIELD output, no screen variables

```
Figure 01: XREF Output, No Screen Variables
```

Fields are arranged by Entry Name, Screen Position	Date: 01APR92 Time: 15:37 Page: 2
Path: c:\attrinfo\ Catalog: <not specified> Entry: BILDWHER.PROGRAM	
Description:	
Dimensions	
Size: 31 rows by 79 columns	
Top left: row 2 column 2	
Scroll Bars:	
Prompt character: ?	
Banner style: NONE	
System options:	
Window type: DIALOG	
Datasets used: Help	
Keys	
Lookup	
PMenu	
Parent	
*** The program did not have any screen variables ***	

Figure 4: %FIELD output, screen variables present

Fields are arranged by Entry Name, Screen Position

Path: c:\attrinfo\ Catalog: <not specified> Entry: SELECT.PROGRAM

Date: 01APR92 Time: 15:37 Page: 8

Description: Build Selection Criteria

Dimensions

Size: 31 rows by 79 columns

Top left: row 1 column 1

Scroll Bars:

Prompt character: ?

Banner style: COMMAND

System options:

Window type: DIALOG

Datasets used: Help

Keys

Lookup

PMenu

Parent

BUILDSEL

Field	Alias	Choice	Field	< Location>		Pad	Justification	Protected?	Informat	<Error>	Field Help	List	Initial	Field Options
		Group	Type	Frame	#col		Format			Col Att			Clear	curspn
FIELD1	ESTATC1	ESTAT_C	CHAR	1	2 26 5	-	L I			WHI NON				
FIELD2	ESTATC2	ESTAT_C	CHAR	1	2 32 1	-	L Y			BLU NON				
FIELD3	ESTATH1	ESTAT_H	CHAR	1	2 39 4	-	L I			WHI NON			Help	c d
FIELD4	ESTATH2	ESTAT_H	CHAR	1	2 44 1	-	L Y			BLU NON				c d
FIELD5	EEO	S1	ACTION	1	4 5 1	-	L N			WHI REV				u s
EEO2	EEO2	S1	CHAR	1	4 8 19	-	L I			WHI REV			EEO Headcount..	s
FIELD7	ACTIVE	S2	ACTION	1	6 5 1	-	L N			WHI REV				s
FIELD8	ACTIVE2	S2	CHAR	1	6 8 6	-	L I			WHI REV			Active	s
HF	HF		FIXED	1	9 25 6	-	L N YYMMDD6.	YYMMDD6.		RED NON				p
HT	HT		FIXED	1	9 35 6	-	L N YYMMDD6.	YYMMDD6.		RED REV				p
TF	TF		FIXED	1	10 25 6	-	L N YYMMDD6.	YYMMDD6.		RED REV				p
TT	TT		FIXED	1	10 35 6	-	L N YYMMDD6.	YYMMDD6.		RED REV				p
RF	RF		FIXED	1	11 25 6	-	L N YYMMDD6.	YYMMDD6.		RED REV				p
RT	RT		FIXED	1	11 35 6	-	L N YYMMDD6.	YYMMDD6.		RED REV				p
LF	LF		FIXED	1	12 25 6	-	L N YYMMDD6.	YYMMDD6.		RED REV				p
LT	LT		FIXED	1	12 35 6	-	L N YYMMDD6.	YYMMDD6.		RED REV				p
FIELD17	ETYPEC1	ETYPE_C	CHAR	1	15 26 5	-	L N			WHI NON			Clear	
FIELD18	ETYPEC2	ETYPE_C	CHAR	1	15 32 1	-	L Y			BLU NON				d
FIELD19	ETYPEH1	ETYPE_H	CHAR	1	15 39 4	-	L I			WHI NON			Help	
FIELD20	ETYPEH2	ETYPE_H	CHAR	1	15 44 1	-	L Y			BLU NON				d
FIELD21	ET1A1	ET1	ACTION	1	19 5 1	-	L N			WHI REV				
FIELD22	ET1A2	ET1	CHAR	1	19 8 9	-	L Y			WHI REV			Full-Time	

Note: <Error> displays first letters of Error Color (Col) and Attribute (Att)

"List" and "Initial" entries ending in .. indicates text not printed due to display space constraints

"Field Options": c=Capital u=Cursor r=Required s=Autoskip p=No prompt d=Non-display