1. Introduction

This paper had its genesis at a Birds of a Feather session at SUGI 11 when someone asked why SAS Institute does not provide more information on some aspect of system use. After several years as an installation representative I knew that the help desired and more is available on the distribution tape and its accompanying material, and said so. That led to my being asked to conduct a tutorial on the practice of being an installation representative, or site rep.

The task would have been easier had I not retired soon after, as I could have kept notes on my activity for the next few months as a guide to what a site representative actually does. Looking back on the past ten years I see a few main points that are easy to discuss and a lot of little tricks of the trade that are more easily shown, like those of a carpenter or plumber. My formal presentation will be brief, and I expect plenty of questions. It is probably more accurate to take what I have to say as a sermon rather than as practical instruction. While I will be as general as I can, my experience is on IBM mainframe and PC installations so specific examples will often refer to these.

2. Organization

My SAS system support model begins with the officially designated site representative. I believe this position should be the principal and preferably full time assignment for the person selected. Good management recommends having a fully qualified alternate designated, even in an organization so small that the alternate and other staff serve only in a collateral capacity.

The ideal site rep is characterized, like the Elephant's Child, by satiable curiosity, together with the Ancient Mariner's compulsion to tell his story. If your associates flee when you appear you may be overdoing it, but perhaps not by much. Certainly it is a great job for a hacker, in the non-pejorative sense. In any case the site rep should be the person actually responsible for the SAS system, as the distribution tape and technical correspondence are addressed to him or her. At the Federal Reserve Board the chief of the systems programming section was designated as the official contact for all software, and for the first three or four years SAS tapes and other material would wait in his "in" basket until he got around to them. On one occasion installation of a new release was delayed for several weeks during which time end users impatiently awaited the changes that made possible a new application.

The other support staff comprises the SAS consultants. The site rep and consultants, designated as such to SAS Institute, should be the end users' point of contact with Institute technical support staff. In the case of Version 6, the SAS System for Personal Computers, they are the only people to whom Institute staff will talk on the telephone. The consultants may be members with the site rep of a separate group formed for the sole purpose of SAS support, or they may be identified members of end user units. In either case they should be familiar with both SAS practice and the applications that they support. An organization with a separate SAS support group might assign end user staff to it for a year, at the end of which they return to their permanent positions and are replaced by others.

For the rest of my presentation the term site rep means the SAS support staff, whether an individual or a group. In my opinion installations will benefit by having a fully qualified alternate designated, even in an organization so small that the alternate and other staff serve only in a collateral capacity.

To prepare for his or her duties the site rep should review the relevant SAS Companion (US, CMS, DVS/VSE, and VMS™), Technical Report P-159 (AOS/VS) or P-160 (PRIMOS™), and Technical Report U-103 or U-107, and G-102. The ones appropriate to your installation will be provided as part of your distribution materials. Site reps at minicomputer installations will probably find Technical Report U-104 informative, and P-143 for VMS.

3. Installing the distribution tape

The site rep's job begins with receipt of the installation tape and its accompanying instructions. READ THEM. SAS Institute has put a lot of thought into the installation process, and has simplified and automated it almost completely. I will not linger over the process, as it is covered far better in the instructions. READ THEM COMPLETELY BEFORE DOING ANYTHING.
It is convenient to use the SAS system itself as a utility tool for the installation. If you have an earlier release and are VERY experienced with the process you can use it to help install any other products. The following simple minded example illustrates how I use the SAS system with a philosophy like that of Kernighan and Plauger in Software Tools.

In general I think you will want to install all modules of a product. One exception is in the case of SAS/GRAPH®, which has drivers for every device supported. There are many load modules involved and the typical installation needs only a very few. Selecting only those you need you can save a lot of disk space. This is easier with version 5 than in earlier releases, as their names are now regular expressions, all beginning with a "G". One way to do this, not necessarily the most efficient, is to install SAS/GRAPH software with

```
PROC PDSCOPY ...; EXCLUDE G: ;
```

excluding a lot of other modules as well. Then use

```
PROC PDSCOPY ...; SELECT G: ;
```

to load these onto a work pack, use the PRINT file to see which members you want, and code their names in the SELECT statement of another PROC PDSCOPY to move them to the load library. If you are as lazy as I about key strokes, send the PRINT output of the second PDSCOPY to a file, edit it so only the names you want are left, code the PDSCOPY control statement around them, and submit that to do the move.

Similarly, if you use the SAS/FSP® product and do not want to incur the storage and processing cost of PROC FSCALC,

```
PROC PDSCOPY ...; EXCLUDE FSC: ;
```

will prevent installing the modules.

If you have ISPF it is easy enough to tag module names on the selection list of the MOVE/ COPY utility menu once they are in a load library on disk, but I think you will find it less tedious to edit SAS command streams than to work your way through screens of directory entries and wait for each group to be moved.

The editor of the SAS Display Manager is a convenient place to do the editing, whether the resulting code is to be submitted interactively or saved to a file and submitted as a batch job. One handy file to use for code fragments is the PARMCARDS file, unit 15 in an MVS installation. Another useful device is to keep the JCL for a batch SAS job ready to go, editing code in its SYSIN or a $INCLUDE file with the Display Manager and submitting it by the SAS X, TSO, or CMS command. Remember that a write file must be freed from the interactive session before it can be allocated in batch, at least in the IBM environment.

If you do not install the recommended SAS system modules in your link pack area, it would be a good idea to use SMF data to see what is happening to disk access. Your system programmers may want you to put the SAS system near the home tracks of the disks on which it resides, and even install the most heavily used members separately to help optimize head travel. If not, you may find that the SAS system has a dramatically bad effect on your system when use becomes heavy, as I am sure it will be as its utility is discovered.

4. ZAPs

Once the load libraries are in place and the test stream has been run to verify a working system, the real work of the site rep begins. One of the files on the installation tape is the ZAPs, or program patches, some of which may apply to your installation.

If you know the work of your installation as well as I claim you should, you may identify some of the appropriate ZAPs and apply them at installation time. Generally it will probably be necessary to apply them from time to time as questions and anomalies arise.

As new ZAPs are created they are made available online from SAS Institute through the DIAL-A-ZAP service, described in Technical Report U-101.

5. Usage Notes

You will find which ZAPs you need, and the answers to a lot of other questions and user problems, by reviewing the
If you have SAS/FSP the easiest access to the Usage Notes is by PROC FSBROWSE, using the screens provided to make the content more readable. The variable PROD contains the product name to which the note refers and MODULEN the name of the PROC. The topic is in TITLE and the discussion in TEXT1-TEXT20. You can use the F, L, S, and S: commands. Ter strings that are relevant to a question. This becomes easier with practice.

Since the Usage Notes data set is quite large you may want to copy a subset into the WORK library before direct searching. For such subsetting and for searching if you do not have SAS/FSP, this is a good way to practice using the SAS string functions. Use the SAS Display Manager to write and run DATA steps in which functions like SCAN and INDEX locate substrings that match parts of words which describe the applications with which you are concerned. You can handle mixed case by using the TRANSLATE function to map the string being SCANed to upper or lower case before comparison to the target string. Unfortunately the SAS string functions do not incorporate the notion of a regular expression as in UNIX, but if you become ambitious the techniques necessary to code a regular expression recognizer are given in Kernighan and Plauger.

A KWIC (keyword in context) index would be very useful for searching the Usage Notes, and would be a good project. There is one in the SHARE program library, written in PL/I, that might be a starting point. I know of a demonstration program for SAS/DMTM that provides access to the Usage Notes, but have not asked the author's permission to publicize it.

6. HELP

The SAS system includes a HELP processor, invoked by the function key in the Display Manager or the keyboard HELP and the name of the topic. The SAS Institute provided HELP documents are contained in a file on the distribution materials, typically as the sequential image of a partitioned data set as and IEBUPDT input under MVS and a subdirectory in Version 6. If you examine these you will find that some, like SITEINFO, are actually dummy text to be replaced by installation-dependent information. Do so, at least for SITEINFO, which is intended to tell who is the site rep and how to reach him/her/them, and other important information about your installation.

Note that SASNEWS (in MVS, SASNEWSB for batch and SASNEWST for TSO) is the vehicle provided to publish current information about the state of the system, problems and solutions, and any other interesting material. You should cultivate the habit of keeping NEWS up to date, but be careful not to exhaust your users' patience by forcing endless message streams upon them every time they execute the SAS system. To do so risks causing them to ignore the NEWS, throwing it away unread on a batch printout and letting it scroll away interactively. Keep your messages brief and pertinent, with emphasis on new information. Where a long message is needed, use a short one appearing automatically to alert users and point to a longer HELP member containing the full text.

It is of course easier to tell you to do this than it is to do it, but just about the best support that you can provide for your users is a comprehensive file of locally developed HELP messages to share the content of your site and all users. This can be tedious to do, and especially to do well. It is easy to let this slide into the pool of good intentions, but if done conscientiously it can do as much or more than anything else to raise the overall skill of your users and with it the usefulness of your installation. If the effort is shared, it is more likely to be done than if the site rep tries to do it alone. Encourage users to write up helpful hints that they discover to contribute to this library. Another benefit is the development of a sense of participation and shared responsibility for the success of the installation. Everything, however, should be edited to be sure that the information is complete and the English understandable. The words of even the most articulate among us should always be read by at least one other person before they are exposed to
the gaze of the general audience, to ensure that they really do carry our message.

Don't forget that each installation tape contains a complete and growing HELP library. Keep a copy of your own HELP in a separate file either to concatenate to the Institute provided library, or as a backup file. When installing, it is much easier to just delete an entire old file and load the new than it is to go through sorting out your members from the Institute supplied ones, or trying to identify which are new or changed to add them.

7. Sample Programs

Another file on the distribution tape that may be very useful to both the site rep and the end user is the SAS Sample Library, described in Technical Report U-101. As a teaching device it can serve as a model of good SAS style and help illuminate questions about the use of SAS facilities. Many of them perform useful functions in their own right and others, suitably changed, can serve as skeletons for similar applications in your environment. If at all possible you should find space to keep this library on line, provide easy tools to retrieve members into end users' jobs, and advertise its availability.

For each SAS product the sample programs include all the examples from the corresponding manual, and an extensive selection of other well chosen examples to illustrate use of the product. The samples for the base SAS product demonstrate comprehensively the use of all SAS functions. One program, INDEX, shows the use of MERGE statements and PROC FORMAT to create a topical index of the samples themselves. Similarly, for each product there is another, xxxINDEX, where xxx is GRP for SAS/GRAPH, etc.

If end users know about the sample programs and have easy access to them, it can save a lot of telephone calls and visits to the site rep for help with apparent problems and the question, "How do I...?" Encourage users to hack working copies of the sample programs to specialize them to their own applications. It will help them to improve their knowledge of SAS practice and broaden the base of experience for the whole organization. Set up your own sample library and solicit user submissions.

Access to the Institute provided samples should be read only, to establish a known reference. Contributed programs should be refereed as a teaching device and to avoid duplication. As with anything new, people will rediscover existing knowledge and write code that is less effective than that which they will write after they have some experience. Submitting their work to the criticism of the site rep and other users will help sharpen their skill, if the criticism is not cast in such a form that they hesitate to expose their inexperience. As fresh eyes often will, new users will discover unexpected and improved ways to use the SAS system, if they are not made to feel so green that they hesitate to expose their inexperience.

The point expressed above about commingling locally written and Institute supplied HELP applies equally to sample programs. Keep the local material separate so the next installation is only a matter of deleting the old, loading the new, and adding or concatenating your own.

Finally, don't forget to share any good stuff with the rest of us through SAS Communications® or by offering it for inclusion in the Institute supplied sample program library.

8. Specializing to your installation

Your distribution materials include model command procedures (JCL PROCs, ISO CLISTS, CMS EXECs, or DOS BAT files) for invoking the SAS system in your environment. These are adequate for the general case, but naturally do not foresee the peculiarities of your installation, and these always exist.

Your command procedures should include file allocations of local extensions to libraries such as SASHELP, site and personal SAS data libraries such as SASUL and SASUSER in IBM environments, described in Technical Reports U-106 and U-108, and files particular to your applications. Under MVS at least there is a SASMACRO library. As suggested with SASHELP and the sample programs, you should provide macros specific to your installation and encourage users to contribute their own.

If you have SAS/AF®, try out the sample menu system, described in Technical Report P-141, and consider extending it with menus, programs, HELP, and CBT type tutorials for your users. SAS/AF is a very impressive product and can more than repay the cost of its acquisition, in my opinion. Here again is an area requiring a lot of effort by the conscientious site rep, and better served by a community effort rather than an individual. Examples of the use of SAS/AF software to provide information center support services can be found in
the papers by Lind, Patterson, and McSharry in the Proceedings of SUGI 11, by Lind and Harwood in the Proceedings of SUGI 10, and others.

9. Conclusion

I have touched my subject only lightly. It is impossible to sum up all I have learned in the past ten years, not to mention what I have forgotten or failed to learn. At best I can only offer a summary of my experience and try to indicate useful directions.

The site rep, whether individual or group, is in a position with great potential to exhibit leadership. There is a wealth of material, particularly from SAS Institute but also from contacts made at SUGI and at local users' groups, that can do much to ease the task of learning the SAS system and getting the greatest value for your own installation and applications. Most of this, and particularly the Institute-provided material, comes first to the site rep, who can be a megaphone to pass it on or a clogged funnel that blocks it entirely. If you or your site rep is the latter, I hope that I have offered a little intellectual drain cleaner.

I have promoted my notions of the site rep as a group rather than an individual, and of an installation's users as collective assistants to the site rep. At the other end of the scale we have SAS Communications, SUGI, and local users' groups as information sources. I would like to close with two further ideas.

First, SAS Communications contains useful tips as well as company news and product and training announcements, but not nearly enough for the journal of a community as large, mature, and diverse as ours. By now, or an independent publication if SAS Institute does not want the task, should appear monthly or every other month in issues at least as thick with articles and short notes for the benefit of the entire community. Such a periodical would probably have to charge for subscriptions and carry advertising, and perhaps should be distinct. A useful comparison is The Data Based Adviser, which originated for dbaseII and dbaseIII.

Finally, for some time I have felt that there should be a users' group, say an interest group within SUGI, specifically for site reps. I do not suggest restricting it to site reps only, but that it should focus primarily on matters that interest site reps and trainers. Such a group should help site reps to improve their competence and understand-
ing of their position in their organization. Similarly site reps in local user groups might consider organizing to share their experience.

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References

Technical Report: G-102 Consultant/User Communications System
Technical Report: P-143 Writing Interfaces for Special External Files under the VNS™ SAS® System, Version 5
Kernighan, Brian W., and Plauger, P. J., Software Tools, Addison-Wesley, Reading, MA, USA, 1976


Lind, Janet C., "Using SAS/AF® Software to Build and Test End-User SAS/AF® Software Applications", Proceedings of the Eleventh Annual SAS Users' Group International Conference, pages 240-244


Lind, Janet C., "Executing SAS Utilities from a Menu-Driven System", Proceedings of the Tenth Annual SAS Users' Group International Conference, pages 553-558


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