

## Tips and Techniques for the Telecommuting SAS® User

Orion V. Hanger, Nielsen Media Research

### ABSTRACT

This is the second in a series of two papers/posters to be presented in regards to issues, ideas and experiences with telecommuting as a primary means of doing one's job. As businesses turn to telecommuting as a way to solve other operational problems, more and more users of the SAS System of Software (researchers, analysts and programmers) could very well find themselves as being likely candidates for telecommuting. With the availability of highspeed phone lines, SAS software for OS/2®, Windows®, Windows/NT® or UNIX and powerful desktop (even laptop) computers, a SAS user can easily perform much their work remotely from the business site. This paper presents a telecommuting user's experiences with using the SAS System for Windows to 'drive the information highway'. Some tips and techniques in regards to the user interface, developing portable applications, uploading/downloading and remote processing are provided. Just as important (or many even more so), some personal tips in regards to 'home office' setup and the telecommuting working style are discussed.

### INTRODUCTION

Telecommuting is becoming a reality for more and more information workers in the 90's and will continue to grow as businesses, workers and society turn to this 'work style' as a means to address a variety of problems. Professionals that extensively use the SAS System of Software to do their jobs (researchers, analysts and programmers) are increasingly finding themselves to be likely candidates for telecommuting. This is due to the computer intensive nature of the work which makes it easy for their primary office location to be decentralized from the main business facility. The technology to support this subgroup of the work force is currently available and is continually improving in terms of cost and capabilities. The formal business structure and methodology for selecting and managing remote workers has begun to evolve and will continue to do so as the size of the telecommuting workforce grows. Many SAS users are probably already familiar with 'dialing into' the main computer facility from home after normal office hours (so that they can do more work). But, for the full time telecommuting worker in the 90's and beyond, the difference

will be that they will no longer have an office at the main business facility. Their primary office and place for productive work will be in their home. For this arrangement to be truly effective, it requires the proper office setup (location, hardware, software, equipment), work habits, technical knowledge and understanding by all parties involved (managers, workers, family, friends).

### SETTING UP THE HOME OFFICE

One of the main selling points for telecommuting is that it can generate greater productivity from the employee. This increased productivity can be for a variety of reasons (fewer distractions, greater independence, decreased daily startup time, higher morale, ect.). But the potential for productivity increase can be jeopardized if the home office is not conducive as a work environment. The cost for setting up the worker for telecommuting should be less for the business then doing so at the main facility (or there's one less reason for having them telecommute in the first place). Some of the costs can be easily managed by the business (such as hardware, software and phone bills). But the burden of other costs (such as the actual space, maintenance and electricity) must be assumed by the employee. As a full time worker at home, the employee is entitled to deduct these costs from their taxable income.

**Location.** The home office will be the central place where the telecommuter will work for 30 or more hours per week. As such, it should be located someplace in the home away from the various distractions of daily home activity (such as a den or spare bedroom). This can be particularly important to telecommuters with families. The space should have proper lighting, heating and air conditioning (remember,... computers are involved). The home office should also be someplace that the worker can be away from when they are not working.

**Hardware.** Telecommuting the Information Highway without a modem, computer or phone line would be like driving to work without a car or road. Businesses that do not already have some facilities for remote dial-ins and electronic mail will probably find the communications startup costs for telecommuting to be a bit high. Even where these data communications capabilities are already existing, the business should ensure that higher trans-

mission speeds are available for the remote user (I say that 9600 baud is the current minimum standard .... anything less is like driving a Model T to work). Though some work will be done 'connected' to the main facility, more work can be done 'off-line' with the telecommuter periodically connecting throughout the day to upload, download, run programs and check electronic mail. There is a variety of hardware available and what is actually needed will depend upon the employee and their job requirements. It is assumed in this paper that the telecommuter will be running the SAS System of Software on their workstation which will basically require a minimum configuration of a 486 processor, 8 megabytes of memory and a 300 megabyte hard drive. I have found that this and more capacity to be readily available for notebook sized systems which have the added features of using less space and being easy to take to the data center (or on business trips) when necessary.

**Software.** The telecommuting employee that is the focus of this paper would require the SAS System of Software (naturally) which is available for a variety of workstation operating systems (DOS, Windows, Windows/NT, OS/2 and UNIX). The SAS System is composed of a number of products that are licensed separately. A 'starter kit' would include Base SAS (data step/macro/base procedure programming and the display manager system), SAS/FSP® (for full screen data entry/editing), SAS/AF® (for developing full screen, menu driven SAS-based applications), SAS/GRAPH® (data presentation) and SAS/CONNECT® (remote cooperative processing).

In addition to the desired operating system and SAS, the telecommuter is likely to also require communications software for terminal emulation and Email, as well as, other software to perform tasks specific to their work and (hopefully) standard in their business enterprise (word processing, spreadsheet, project/time management, etc.). Though they are working remotely and technically independent to a certain degree, a telecommuter will be easier to support if the software they are using is common within the employer/manager's computing environment.

**Other Equipment.** The telecommuter is likely (though not necessarily) to require a printer of one kind or another and should have at least one phone line that is separate from the home phone. I have two 'work phones' at home which allows the home phone to be unaffected by all my work activity. It also allows me to conduct both voice and data communications at the same time. A phone with an answering machine is important for the home office but something like a fax machine can be excluded in lieu of software on the computer that can perform the same functions.

## WORK HABITS, WORKING STYLE

Someone who has been selected by the company to be a full time telecommuting employee has probably already shown a certain amount of self-supervisory independence in their manner of working. If you don't already have these traits in your working style then you will either learn them quickly or eventually not be a telecommuter anymore. Being away from the normal office workplace also means being away from the various verbal and non-verbal cues that shape the way we work in that 'formal' environment. To better leverage the productivity potential of the 'home office' environment, you need to ensure that there are minimum distractions there and that your work habits minimize the "remoteness" from the main office due to lack of physical proximity.

**Understanding from others.** Successful telecommuting generally requires the understanding of others that the home office is a true home office and should be treated in that manner. Though you are at home now, it doesn't mean that your neighbors can start having you watch their kids or friends can drop to visit you during your normal working hours just because they know you're home. Family will quickly come to know that when you are in your office then you are at work. Since you are no longer physically available in general, you and your co-workers will need to depend upon voice and email for daily communications. This will take some adjustment.

**Normal working hours.** In some respects the normal working hours of the telecommuter are more flexible and in other ways they are not. Since everything that is required for you in the way of tools and materials is readily available 24 hours a day, it seems that you can choose your own normal working hours. But when you consider the fact that your work occurs in concert with many others that are 'remote from you', the normal business working hours will generally still be the best schedule to keep. Telecommuting as 'social evolution' is not likely to change the typical 40-hour, Monday-Friday work week schedule that synchronizes the working masses in time.

**Don't answer the home phone.** If you were at work away from your home, you would not be able to answer the home phone (and it, therefore, would not be a distraction from work). You should treat the home phone in the same manner when you are in 'home office'. Having separate phone lines for work at home is a must.

**Understanding for others:** If telecommuting is new to the business that employs you, there is likely to be a period of adjustment for you and your co-workers. You may encounter unexpected attitudes such as jealousy, distrust (the belief that you aren't working) or the expectation

that this new working style is going to fail. On the other hand you may also encounter support, excitement and the desire for telecommuting to prove to be a viable alternative. Be sensitive to other people adjusting to this change.

**Watch out for over-indulgence.** For many reasons, the traditional office environment sometimes acts as a barrier for over-indulgence in such things as smoking, eating, drinking and drugs. As a 'home worker', you will be left to your own devices for managing the avoidance of over-indulgence. In addition, it's very easy to over-indulge in work at home. Though working hard is good, working hard for too long can be bad in the long run. Know when it's time to turn off the computer and not work anymore.

**Stay in contact.** Both you and your manager will need to develop new ways to communicate via the phone and electronic mail. You and your co-workers will not be able to simply stop each other's offices anymore for informal communications so you will have to get better at stopping by electronically. Don't let your "remoteness" keep you out of touch with what's going on with others. It's also a good idea to update the message on your answering machine on a daily basis. Since they can't come to your office to see if you are in when they can't reach you by phone, then it's important to provide a means for callers to know whether or not you will be able to return their call within a reasonable amount of time. Updating the answering machine daily reassures callers that the message they are hearing is for the current day.

**Manage and keep track of time.** A lot of the traditional office activity that helps to shape our work habits (the manager checking in, others around you going to work, the smell of coffee in the morning, going to lunch with co-workers, etc.) will be absent in the 'home office'. You will be managing your time mostly on your own. Don't forget to take breaks and eat lunch. These pauses in working do serve a useful purpose: they give the mind a rest (and your mind is your most important tool).

**Don't forget to backup your workstation.** In many office sites, backups are generally done automatically on a regular basis with no intervention by the employee. In the home office, nobody will be there to backup your workstation for you. It is now your responsibility.

## USING THE SAS SYSTEM

The telecommuting SAS user is assumed in this paper to have the SAS System available both locally (on their workstation at home) and remotely (at the business office location via dial-up over the phone line). This might not always be the case but is generally the best arrangement

for the telecommuting SAS user. Of the various SAS products, the most important are Base SAS (required in order to run any of the others) and SAS/CONNECT. You will also need a terminal emulation/communications package. The right software for this depends upon the operating system you are running locally and the remote system to which you will be connecting. SAS generally supports async, 3270 or TCP types of connections (in the Windows environment, SAS does not support async). If you don't know what communications package you should be using or what communications protocols/access methods your site supports for remote connections, then your technical support staff probably does. The point here is that the SAS System does not establish the actual communications session. SAS uses the communications session that has already been created by other software.

**Fundamentals.** The SAS System addresses the basic data processing paradigm: data access, management, analysis and presentation. Because of its multi-vendor architectural design, using the SAS is very similar across platforms (computer systems). The only differences are host specific ones: native file structure, external system commands, host system SAS options and the type of terminal emulation/display that you have. Become familiar with each of these aspects of all environments where you run SAS. Most everything else you know about and do with SAS will be pretty much the same no matter where you are doing your data processing.

Deciding where to do your processing is dependent on where the data is, the amount of data and what you want to do with that data. Typically, the business site/facility is the primary host for data management. The remote user connects to the primary host to perform basic data access and management activities. Smaller subsets or summaries of the data can be uploaded to the primary host or downloaded to the telecommuter's workstation for further analysis and/or preparation for reporting. The amount of data (the size of files) that can be reasonably considered for uploading/downloading varies with the speed of the modem you are using. You should avoid getting into a situation where too much time is spent 'moving data around'. This is time that your workstation cannot be used for other work.

The addition of PMENU's and the implementation of the SAS System on platforms that feature graphical user interfaces has made the SAS display manager a more attractive means of living and working in the world of SAS. If you are not already familiar with working within the display manager environment then it's time to get to know it. It offers a variety of windows for various functions and is easy to maneuver via the pull-down menus (enter PMENU on the command line if they aren't activated by default). If you know the SAS display manager

in one environment, then you will basically know it and be able to use it to navigate your SAS activity on any other platform you may use.

**Uploading and Downloading.** If you do not have the SAS/CONNECT software then you will have to use your communications software for moving files between your local workstation and remote hosts. Most SAS files (datasets and catalogs) can be ported by first creating a special 'transportable' version of that file, downloading or uploading the transportable file and creating a usable copy of the file on the receiving system. PROC CPORT is used to create the transportable version of the file and PROC CIMPORT is used to create the usable SAS data set or catalog (in Version 5, the XCOPY procedure was used for both porting and importing SAS files). When doing the porting/importing of the file, it's important that the upload or download is 'binary' (no ASCII to EBCDIC translation is done). On some systems it is also important that the file input to the CIMPORT procedure is composed of fixed length 80-byte records (check default output file formats for your software package).

If you have SAS/CONNECT (both on your workstation and the remote host), you do not have to go through the transportable file format steps to port your data. Once a 'cooperative processing' session has been established between the two systems, you can port both SAS and non-SAS files using PROC UPLOAD/DOWNLOAD. With these procedures, SAS files are automatically converted to a format usable by the receiving system.

**Cooperative Processing.** Besides direct uploading and downloading of files, SAS/CONNECT enables the local SAS session to submit SAS code to the remote host for execution. The local LOG and OUTPUT windows display the execution notes/messages and any 'printed' output. To establish a SAS/CONNECT session, the local host must first SIGNON to the remote host. The signon process requires values to have been assigned to the COMAMID (communications method) and REMOTE (remote session id) SAS system options. The SIGNON command accepts a parameter that identifies the signon script to use (different host operating systems require different signon scripts). A variety of these scripts are provided with the SAS System. Depending on the way that SAS is installed and invoked on the remote host, you may need to make some modifications to the script. When the 'cooperative processing' session has been successfully started, SAS code can be submitted to the remote host using the RSUBMIT command. To end the session, use the SIGNOFF command. This discontinues the SAS-to-SAS communications but does not terminate the communications package session. This whole process is greatly enhanced when working within the SAS display manager with the PMENUs turned on.

**Developing Applications.** When developing SAS-based applications and code on your local workstation that will be run on other hosts, there are some points to keep in mind. SAS file naming standards are basically the same from one system to another but the host native file structure is usually different for different operating systems. This would effect the physical file names and options used in FILE, INFILE, LIBNAME and FILENAME statements. Also, the native commands and command language for the operating system are likely to be different. It is recommended that these 'non-portable' items be kept to a minimum. If possible, centralize them to identifiable modules of code that can then be modified once the application has been ported. Or you can use the SYSSCP automatic macro variable to determine the operating system that the application is running on and then use macro variables to pass the proper 'text strings' to subsequent code before it executes.

In addition, it is also good to keep in mind that the user display that you design may not appear the same on someone's terminal or display (or may not even work if it is attempting to display a graphical object on a non-graphical display). The precision of numeric variables can also vary between operating systems. In this and similar situations, it can be advisable to 'program to the lowest common denominator' and accept defaults.

## CONCLUSION

Telecommuting is becoming a more common working style alternative. Because of the data/information intensiveness of their work and as more businesses seek alternatives for cutting costs and increasing productivity, many SAS users could become likely candidates for full time telecommuting. This paper has briefly reviewed a few telecommuting working style tips and techniques both in terms of work in general and using the SAS System of software for driving the Information Highway.

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