"Driving the SAS® System Along the Information Superhighway"
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ABSTRACT

More and more computer based professionals and the businesses that employ them are turning to telecommuting as an alternative to additional office space, congested highways and wasted time. In addition, the growing 'Information Highways' provide businesses with a greater region from which they can build their work force. In the next few years, users of the SAS System of Software (researchers, analysts and programmers) could very well find themselves as being likely candidates for telecommuting based employment. Indeed, many probably already have two offices (work and home). With the availability of high speed phone lines, SAS 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 actual business site. This paper provides a general overview of telecommuting, it's benefits to the individual, the organization and society, some philosophy, a little history and a telecommuting user's experiences with using the SAS System for Windows to 'drive the information highway'.

INTRODUCTION

For those employed in information intensive occupations, the technologies that will enable them to perform much of their work related activities from their own homes (and thereby avoiding the costs and frustrations of daily highway commuter trafficking) has begun to arrive. Information workers are particularly benefited by these advances in that many of their daily tasks require no more than the proper computer hardware/software equipment and the right telecommunications tools that fit their job (phone, fax and/or electronic mail). The current costs and capabilities of these technologies have come to a point where they can justify the cost/benefits aspects of decentralizing some (or more) of an information based work force. Though not quite there yet, video telecommunications technology will soon offer the capabilities for "face-to-face" (actually video-to-video) interactions between members of a decentralized work force (3-5 years is my guess for when the cost/benefit curve swings the right direction for this technology). As all good businesses should, companies have begun to employ or consider some form of "telecommuting" in their work force.

Pressures for doing this are coming from social and environmental based concerns, government regulations, a desire to widen the effective area from which to hire employees, the ever increasing cost of office space, frustrated and tired commuting employees and, ultimately, "the bottom line".

WHAT DOES THIS HAVE TO DO W/SAS?

The SAS System of Software is a tool for data processing, management, analysis and delivery that is available on a wide variety of computer platforms. It has components for the uploading and downloading of data and other files and it can supports cooperative processing between host and remote computer systems (where each are running the proper SAS System software products). Having been in the large computing arena for many years, the SAS System has a base of users that do many of the kinds of jobs that could likely be good candidates for successful telecommuting. Large, data and information intensive organizations that could really reap the benefits of telecommuting on a grand scale most likely already license SAS and have a solid base of employees that use it.

Professionals that extensively use the SAS System of Software to do their jobs (researchers, analysts and programmers) are likely candidates for telecommuting due to the computer intensive nature of their 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 work force 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).

A QUICK DEFINITION

There are two means by which a business can decentralize some or more of their work force. One way is by the creation of TeleWork Centers. These are set up remotely from the central office in areas close to where enough employees live to make this satellite work center cost-effective. The second way is to allow select employees to volunteer (notice the words "select" and "volunteer") to work at home one or more of the normal weekly workdays. Both the selection of the right jobs/employees and the volunteering nature of the implementation are very important to the success of telecommuting.

Recently, the IRS ruled that unless most of your income is generated from the work done in the home office, you can't take a deduction for the cost of having that office at home. Though there is an effort under way to get this changed, we will assume/define a "telecommuter" in this paper as a full time employee who works from their home for most of their "working days" and who has no office at the normal business facility. It is this type of telecommuting that can bring the greatest benefit to all parties (employer, employees and the community).

SOME HISTORY

Working at home really isn't a new idea (anyone who has put in their 9 to 5 and then gone home to dial into the computer systems back at the business site to do more work could attest to that reality). In fact, it could be one of the oldest of places for gainful employment (do farmers work at home?...... if you live were you work, like a sailor, are you working at home?...... what is home?...... what is work?........). But to keep all this in perspective, view the idea of telecommuting in terms of work and life over the past few hundred years. This period of time is often referred to as the Industrial Age (a result of the Industrial Revolution). Built upon the foundations of the Agricultural Age, this period of time has been characterized by the accelerated growth of inventions and technology, their use for the creation of marketplace goods and services, the rise of factories and corresponding changes in the way many people live, work and play.

In the Industrial Age, the most effective implementations of technology in "industry" (a place where goods and services are created) required a great deal of centralization. This included the centralization of energy sources, raw materials, manufacturing sites, distribution facilities and employees. Around these Industrial Centers cities grew, the urban sprawl spread, roads and highways were expanded and modern suburbs were created. The workplace in the Industrial Age is the hub of daily activity. Commuter traffic jams in the highly urbanized areas are the result of the daily massive effort to move the workers to the job. In some respects, telecommuting is a means to move the work to the worker.

With the "factory" way of life, a "factory" mentally has consequently evolved. It is recognizable in most of our social institutions (schools as education factories) and, as such, has shaped our daily habits in work and play. This is not to say that the Industrial Revolution was wrong but is meant to underscore the idea that telecommuting is a very new idea and a new way to work and live that requires the right jobs and employees. The centralized work place and work force is the current "norm" and the successful implementation of work force telecommuting in the "Information Age" depends upon this understanding by managers and non-managers and telecommuters and non-telecommuters alike.

PHILOSOPHY AND WORKING-STYLES

Centralization means a certain amount of control and simplicity. For employers, there's the sense of having all your resources (things and people) within reach, easily managed and observed. For employees, there's the sense of assuming responsibility for your employer's business goals and expectations when you get there and, then, letting go of it all when you leave. In the Industrial Age of thinking, an employer has no concern (and has no right of knowing) what the employee is doing and thinking when they are not at work (at the work site). Yet, it is the basis of the "American Way of Life" that each individual is entitled to privacy in their own home (" ... life, liberty and the pursuit of happiness .... "). So what does that mean for employment in the Information Age when employees work at home? For managers, it means new ways to manage their employees and for employees it means new ways of managing your own work, time and working environment.

Employers essentially "rent" an employee's behavior for a specified period of time. The manager is the guardian, director and coach of the collective behavior of those that fall within their managerial realm. Communication and reward are the primary tools that the manager uses to motivate the employee to behave in a manner that would be most beneficial to meeting business goals. As a multifaceted medium, communications not only has verbal and written forms but can also includes body language, gestures, facial expressions and other forms of non-verbal
communications. Being mostly unavailable for face-to-face communications, an employee that is telecommuting to work requires more effective verbal and written forms of communications from the manager because non-verbal forms are generally not possible. Managers that have become accustomed to 'managing by wandering' can no longer use this technique to check up and 'manage' the behavior of their employees (maybe they will be able to wander in the virtual reality world yet to come). In the traditional way of working, if you're not 'on-site' (in sight) then you must not be working (for a number of years the author had an arrangement where he worked at home on Wednesdays ...... which were frequently referred to as his 'day off'!!).

The problem with managing employee behavior as a means to obtain business goals is that it lacks in terms of trusting the employee to make the proper decisions on how to behave to get the desired results. A manager of a telecommuting employee will need to focus on effectively communicating the desired results and trusting that the employee will be able to independently select and perform the proper behaviors to achieve those results. With this need for trust and independence, it is generally recommended that telecommuting be implemented for employees that have been with the company for at least 6 months. Hopefully, within this period, communication styles and trust have been well established in the manager-employee relationship (if not, telecommuting by the employee is probably not a viable alternative). This is why it is important that telecommuters are selected.

IT'S NOT FOR EVERYONE

There are two basic components for identifying potential employees for telecommuting: the work they do and their working styles. Identifying jobs that would be good for telecommuting is a matter of looking at all the tasks that are a part of that job and determining how much/many of those tasks require face to face interaction with others (or local interaction with things not feasible to have at the employee's home). When identifying tasks that require face to face contact with others, it's important to question whether that kind of interaction is truly required (or has it just always been done that way). A job whose task content is such that it is highly direct contact independent, information work intensive and whose resource requirements for equipment and facilities can be cost effectively provided at an employee's home is a likely telecommuting candidate.

The person doing the job and their working style is the other most important aspect of selecting a potential telecommuter. Someone who would most likely be successful at telecommuting generally needs to be an independent self-starter who has shown that they can "get the job done" with minimal supervision. They should be capable of communicating well in writing and verbally and should have a good understanding of the technical aspects of the hardware and software that they will be using in their home office (though support is just a phone call away, the telecommuter will likely do more 'fixing it themselves' than if they were on site at the business site).

The traditional workplace can be a source of personal fulfillment in a variety of non-job related ways. This includes social (being around others), professional (getting on the company fast-track), learning (casual co-worker based information exchange) and supportive (smokers smoke less at the work site, there are weight watcher programs, less chance of problems with drugs or alcohol, more encouragement for physical fitness, etc.). The telecommuting employee would be more remote (but not totally) from these resources. In addition, the motivational influence of the "normal work routine" being done by others around them would not be directly available to the telecommuter. So a good potential telecommuter is someone who is capable of performing well without as much of the above personal fulfillment resources and who can establish their own work routine.

But just as importantly, the employee must understand how their job and working environment will be different and must be willing to make that change. Someone whose job and working-style might otherwise be perfect for telecommuting may not wish to telecommute for a variety of reasons (uncertainty as to how this might affect their status at work, conditions at home not conducive to effective working, other personal reasons, etc.). This is why the selected potential telecommuter must be allowed to "volunteer" for this new form of "going to work" and that it should be understood that both parties (employer and employee) have the option for changing the telecommuting status of that employee anytime in the future after a reasonable trial period (6-12 month minimum).

SO WHAT'S IN IT FOR ME?

Any important business or personal decision comes down to this bottom line: do the benefits outweigh the costs, do the positives outweigh the negatives, does the good outweigh the bad? Both the employer and the employee must concur in this matter. The employer (embodied by the manager with executive management support) would be unwise to embark upon a telecommuting arrangement without a sense of potentially improving the company bottom line. It would also be equally unwise for an em-
ployee to agree upon such an arrangement if it seemed like it would not improve their "personal bottom line".

Assuming that the right people/jobs have been selected for telecommuting, a typical business can expect a number of benefits for their "investment":

- **Increased productivity.** The various interruptions that can occur in the business tend to slow down information workers. Without these interruptions, a telecommuter can often show increase productivity of 10-20%.

- **Decreased costs for office space.** Any business can probably figure out the average cost for providing, furnishing and supporting (restrooms, maintenance, heating/cooling, parking, etc.) office space per employee. Some costs (such as computer and communications equipment) may be the same or more for a telecommuter. But it's likely that there will be savings in total.

- **Governmental regulations compliance.** In some parts of the country (such as Southern California), there are increasing pressures for businesses to meet certain requirements in support of reducing pollution caused by auto emissions. Though, ultimately, the benefit is to the community at large, business can increase their goodwill in the community and, in some cases, avoid fines and fees that might otherwise be levied for non-compliance.

- **A greater employment region.** Sometimes the best person for a job is unwilling to accept it because they do not want to move closer to the business site and they are unwilling to make the commute. With a telecommuting alternative, the business effectively increases the region from which it can attract potential employees.

For the employee, there are also a number of potential benefits for their role as a telecommuter:

- **Greater productivity.** I know that I like to be productive and I think that many people feel that way about their work. There is a real 'good' feeling about having a 'good' day and a real frustration to 'working hard at spinning your wheels'. The sense of success feeds more success.

- **Decreased costs.** There is the obvious likely reduction in the cost of gasoline, maintenance and auto insurance. In addition, the telecommuter is likely to spend less money on clothes/meals over the long run and be able to take some tax deductions for working mostly at home.

- **Time Savings.** Anyone who has spent much time commuting 1-2 hours per working day can easily count the amount of time that they would gain by not having to make that commute. There will also be less time needed for getting ready for and started with work.

- **Greater closeness to the family.** A telecommuter is basically (by proximity) more available to the family. Though they need to work (and the family needs to understand and support this), they have greater flexibility and opportunity to "be there" when necessary.

These are some of the potential benefits to employers and employees when telecommuting is successfully applied. The author (more elusive than I), being blinded by the goodness of telecommuting, is unwilling to commit to any potential negatives to telecommuting but in reality they are there: feelings of remoteness and isolation, jealousy by peers unable to telecommute, boondoggling, communications startup costs, family/friend/neighbor interruptions when trying to work and more. There are several recent books referenced at the end of this paper that review the pros and cons and the how's and why's of telecommuting in much greater detail than has been done in this overview and they are highly recommended to any individual or business that is seriously considering the potential of the "telecommuting working style".

**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, etc.). 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 generally entitled to reasonable deductions for 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 transmission speeds are available for the remote user (I say that 9600 baud is the current minimum standard and 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. And it also allows me to conduct both voice and data communications at the same time. A phone with an answering machine is important but 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 from 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 the 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. Make your working schedule known and up-to-date.

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 coworkers. 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 the success of your telecommuting alternative. Be sensitive to other people adjusting to your change. You may be one of the first employees in your company to be allowed to telecommute. You could easily find yourself in an enviable position. Be humble. Talking 'big' about your situation can be demoralizing to others.

Watch out for over-indulgence. For many reasons, the traditional office environment sometimes acts as 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 too hard for too long can be bad. Know when it's time to turn off the computer and not work anymore. You may miss the psychological effect of driving away from your work place. Learn how to shut the door and walk away.

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 coworkers 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 daily reassures callers that the message they are hearing is for the current day.

Manage and keep track of time. Many 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 coworkers, 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 delivery. Because of it's multi-vendor architectural design, the SAS software 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. The SAS Companion guides are very useful for reviewing and getting to know the operating system specifics of a SAS environment.

Deciding where to do your processing is dependent on where the data is, the amount of data, the speed of the remote connection 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/download 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'. Assuming that your local host is a DOS based Windows environment (not true multitasking), this is time that your workstation cannot be used for other work.

The addition of P MENU'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 P MENU 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 C P ORT 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 PMENU's 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 affect 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. As a last little bit of advise for the remote developer, I have found that using the double pound sign (\!) for concatenation in SAS code minimizes problems with concatenation characters (\ or /) not being properly translated by the communications software when the code is moved (uploaded or downloaded) to a different operating system environment. In the code that I have written to run on VM, MVS, Windows or UNIX, the double pound sign for concatenation has always worked without surprises.
CONCLUSION

Technology is making it possible to successfully implement telecommuting as a modern day working style. Many professionals in the Information Industry are likely to be candidates for telecommuting in the near future. There are many who already work at home to some degree. Because of the data/information intensiveness of their work and with more businesses seeking alternatives for cutting costs and increasing productivity, SAS users could be likely candidates for full time telecommuting. This paper has presented an overview of the issues and benefits of telecommuting for both employers and employees and briefly reviewed a few working style tips and techniques both in terms of work in general and using the SAS System of software for driving the Information Highway. A list of recent books that deal with telecommuting in much greater detail follows.

References


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And now ..........

for your enjoyment ....

presenting ..........

TOP 10 REASONS WHY I LIKE TELECOMMUTING

10. Traffic reports have become a new form of morning and evening entertainment.

9. There's no one looking over my shoulder (at least I don't think there is?).

8. "Power programming" immediately after a heavy workout (without first hitting the showers).

7. I have been able to come to a mutual understanding with the "cafeteria" staff on what I want, what I am willing to pay and how it should be fixed.

6. Wearing a tux to work & no one noticing.

5. Figuring out how to call in sick ("Hi ....... I won't be in today?).

4. Figuring out what to do with all that "spare" time.

3. Debugging other programmers' complex SAS macros to the sound of Led Zeppelin IV at loud volumes!

2. The feel of shag rug between bare toes...

1. Because there's always something better to do!!