

Developing Resourcefulness in SAS® Programmers

Brian Varney, COMSYS, Kalamazoo, MI

ABSTRACT

As a SAS programmer or developer, you are often asked to obtain results by using SAS and related technologies in new and innovative ways. As a manager of these resources, you often ask yourself, "Why is it Larry always gets the job done with minimal instruction, Moe very quietly never gets the job done and Curly gets the job done after seemingly hundreds of questions and interactions. One difference in these resources is most likely their level of resourcefulness.

INTRODUCTION

This paper intends to discuss the attribute of being resourceful, how it affects team dynamics, how it affects the speed and quality of project deliverables and how to develop/enhance resourcefulness in your SAS programmers and developers. A few definitions of resourceful are included below.

- Able to meet situations
- Capable of devising ways and means
- resourcefulness = necessity + creativity + persistence

Being resourceful means being proficient at gathering the information you need and producing the results you want. This involves leveraging trusted processes and information sources as well as being a creative problem-solver. By now, you are probably envisioning ...



Yes, MacGyver!

While you do not want your solutions being patched together using duct tape and paper clips, you do want the spirit of a creative problem solver who is calm and cool under pressure. For those of you who are not familiar with MacGyver, he was the star of a television show called "MacGyver" about a guy who was the poster boy of resourcefulness.

INTERVIEWING FOR RESOURCEFULNESS

Some are born with it, some learned it growing up and some develop it on the job. Resourcefulness is a very handy attribute to have in the culture of your project teams. How do you end up with resourceful project teams? Do you screen candidates that are being interviewed for resourcefulness intentionally? Here are a few questions/requests that may help identify if a potential candidate is resourceful.

- What steps do you take when you need to write a program using SAS but you have not written one like it before and you are not quite sure how to approach it?
- Describe a situation on a project when you had to be resourceful to accomplish the task at hand.
- Name some of the sources you use as references when developing a program in SAS.

HOW RESOURCEFULNESS AFFECTS TEAM DYNAMICS

Teams with members that are not resourceful can end up with the following situations.

- A team member does not contribute as much as others
- A team member bothers others on the team with questions they should know how to figure out and hinders the productivity of others
- It takes a larger team to perform a project because of inefficiencies
- Deadlines are missed
- Deliverables of inconsistent quality

DEVELOPING/ENHANCING RESOURCEFULNESS IN SAS PROGRAMMERS

- Make resourcefulness an expectation. Discuss it during interview and performance review time.
- Measure resourcefulness by observing the team as it is working in meetings and by being copied on project e-mails
- Provide examples and training
- Make sure that team members asking questions see how to find the answer, not just given the answer
- Keep standard operating procedures available and up to date
- Encourage code review meetings so team members can see each other's approaches to problems
- Encourage your developers to review problems and solutions in other companies and even industries. This will broaden their perspective when solving problems.
- Have your programmers ask themselves the following questions when solving a problem
 - Am I reinventing the wheel?
 - Would reinventing the wheel in a better way be beneficial in the long run?
 - Is there somewhere to look up the information I need?
 - What is something very similar to the problem I am solving?
 - Have I done this in the past?

DEVELOPING RESOURCEFUL SAS PROGRAMS

Yes, even programs can be resourceful. Programs that are written using data driven techniques and minimize hard coding require much less maintenance. This is a different topic and there are many papers about using data driven techniques when developing SAS programs. A resourceful programmer would look into it.

RESOURCES FOR SAS PROGRAMMERS

There is a plethora of information that is easily obtainable and free for any SAS user or administrator whether they are new to SAS or just new to a particular area of SAS. Some of the reference materials will be obvious while some of the others will not be so obvious. There is often information from your company and colleagues that will be particularly helpful as a resource in your day to day work. The remainder of this section will provide some examples of resources typically used by SAS developers.

<http://www.support.sas.com>

The screenshot shows the SAS Customer Support website in a Mozilla Firefox browser window. The browser's address bar displays the URL <http://support.sas.com/index.html>. The website header includes the SAS logo with the tagline "THE POWER TO KNOW." and the text "Providing software solutions since 1976". A search bar is located in the top right corner. Below the header is a navigation menu with tabs for "support.sas.com", "Knowledge Base", "Support", "Training & Bookstore", and "Community". The main content area is titled "SAS CUSTOMER SUPPORT /" and features a left-hand navigation menu with sections: "KNOWLEDGE BASE", "SUPPORT", "TRAINING & BOOKSTORE", and "COMMUNITY". The main content area includes a prominent announcement for the "SAS Global Forum 2011 Call for Papers" in Las Vegas, Nevada. Below this are several featured articles and notes, such as "SAS Web Report Studio Performance Improvements", "Creating an Ad-Hoc Measure on an OLAP Cube", and "How numeric, non-date variables are handled when exported to Microsoft Excel". A right-hand sidebar contains sections for "SAS Software", "SPOTLIGHT", "Featured Book", and "Training News".

You will notice that along the left hand side of the page, there are four major sections: Knowledge Base, Support, Training & Bookstore and Community.

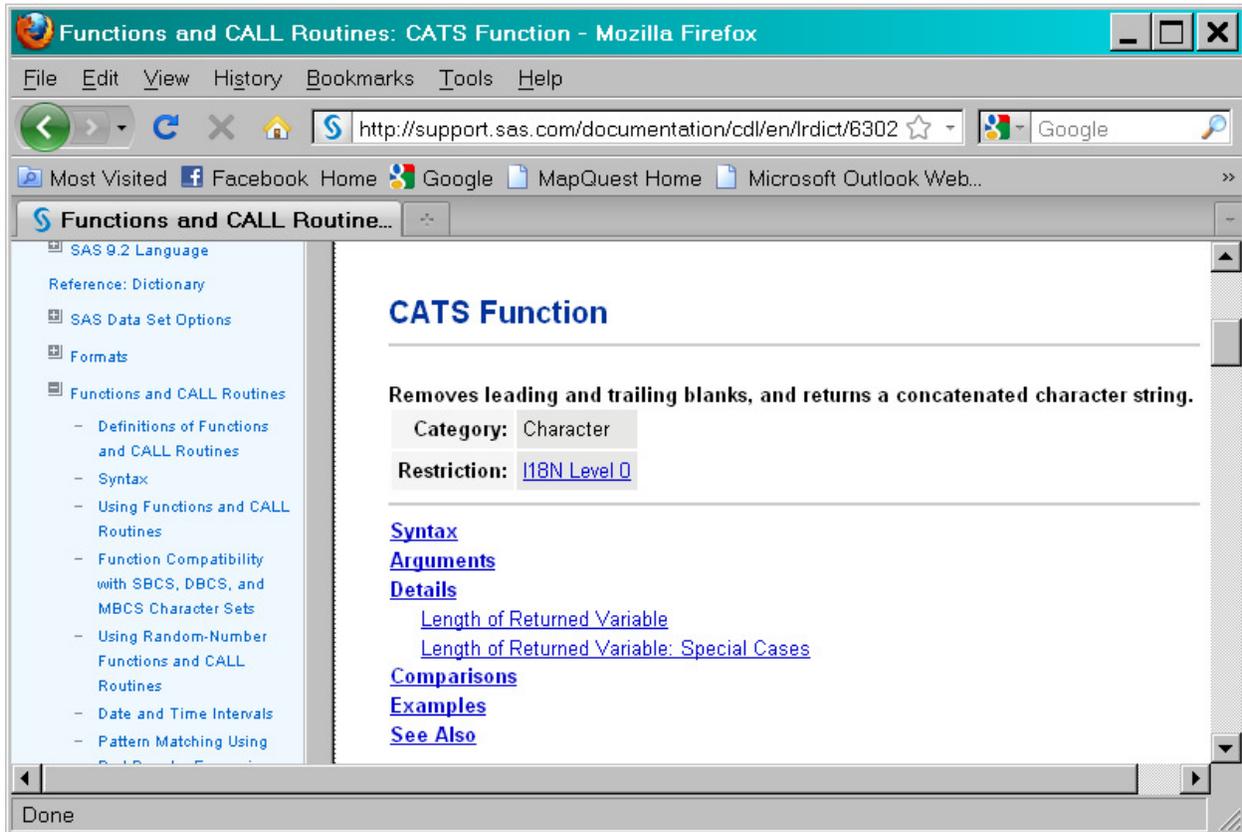
Knowledge Base

The Knowledge Base is a very useful area for reference materials. This section is further divided into more sub-sections.

If you are a person responsible for deploying SAS software, the following sections will be very valuable: "System

Requirements”, “Install Center” and “Third-Party Software Reference”. These sections contain materials with step by step processes for pre-installation, installation, and post-installation activities.

The “Documentation” section contains online documentation for versions spanning from SAS 8.2 through SAS 9.2. The reference area for each version contains a section called “What’s New in SAS” as a handy area to keep up with the new features and functionality when that version was released. For example, under “documentation”, if I click on “SAS 9.2”, a search facility comes up. If I need information on the CATS function, I can easily drill down to documentation as below:



As you can see, complete documentation along with examples and similar functions is right at your fingertips.

Support

The support area is a convenient place to interact with SAS Technical Support. If you are experiencing a problem and you need input from SAS, this area, use the links “Submit a Problem”, “Update a Problem”, and “Check Problem Status”. You can also call in using the SAS Technical Support line of 919-677-8008. You will need your SAS Site number from the top of your SAS log to use these services.

Training & Bookstore

In addition to a plethora of SAS books, Books by Users and SAS Tip Sheets, there is also information about “Training” and “Certification”. Although, these are not free, it is a place to plan your SAS training.

Community

The SAS Community area is a place to explore for information about events, discussions, tips, etc. Below is an excerpt from the SAS Community website with supporting detail.

[Users Groups](#)

Whether you’re a seasoned SAS software user with experiences to share or a newcomer who’d like to interact with other users, a users group is an excellent way to help you get the most value from the SAS System. These autonomous organizations can be found around the globe on the local, regional, international, special-interest, and in-house levels. Many users groups hold regular meetings and sponsor conferences and Web sites.

[Events](#)

We have expanded the events calendar to include a permanent listing of major SAS-sponsored conferences and events. The events page also includes a list of up-coming webcasts and podcasts that are of interest to SAS customers.

[e-newsletters](#)

SAS e-newsletters deliver timely news right to your desktop via the Web. The following newsletters are written for current SAS users. They provide SAS software users with technical tips, information about new books and training classes, announcements about online documentation and general news items, as well as a current list of technical events.

[Author with SAS](#)

SAS Press books are written by SAS users for SAS users. Get the scoop on our publishing program, authors, featured articles and promotions, author podcasts, free sample code, and more.

[RSS & Blogs](#)

If you want real-time information from SAS, be sure to subscribe to our RSS feeds. You can get feeds for SAS Notes, SAS Samples and customer success stories, among others. Our blogs allow you to hear from SAS personnel, in their own words. SNOTES-L and TSNEWS-L, two Listservs from Technical Support, distribute information about the availability of SAS Notes and technical information to customers. Find out what's happening on support.sas.com and in SAS R&D.

[Discussion Forums](#)

SAS Discussion Forums are an online resource for peer-to-peer information exchange. SAS employees occasionally drop into a forum with an informational post or help for a difficult question. The discussion forums are not a replacement for SAS Technical Support.

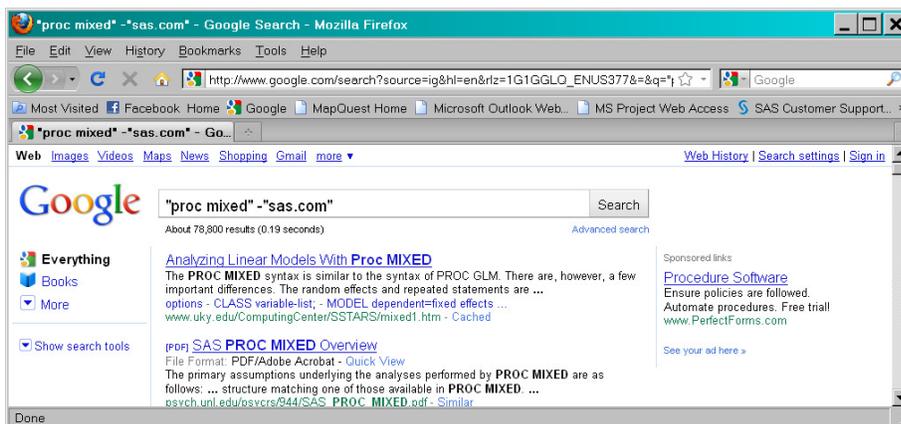
[sasCommunity.org](#)

sasCommunity.org is a Web site managed and populated by SAS users. You are invited to add technical articles to the site to share your knowledge and help other users of SAS software. If you aren't ready to share, stop by, visit, and learn.

Google It!

We cannot have a discussion about resources without mentioning Google. Most of the results that come up when using Google will point back to the SAS support website. However, there are times when good reference materials are discovered at SAS consulting and university web sites. This is especially true for finding information involving third party software. One way to avoid SAS web site results returned is to add a "-sas.com" to the search request.

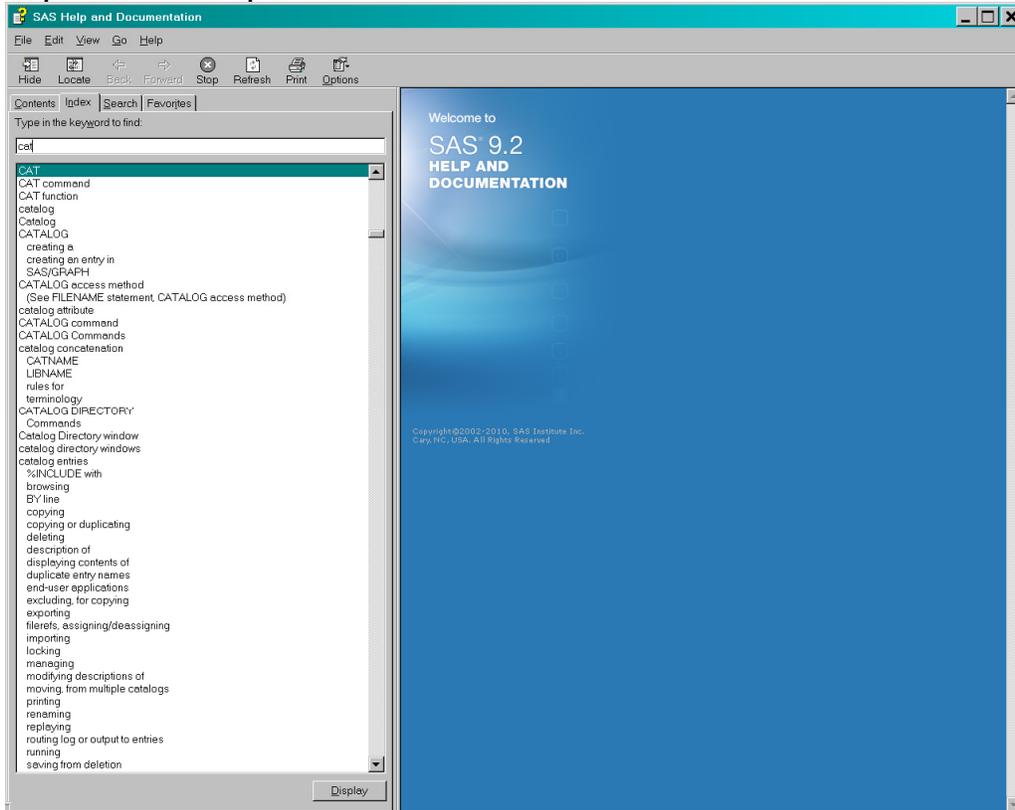
For example, if you wanted to find information about PROC MIXED but wanted to find sources other than the SAS web site, just specify **"proc mixed" -"sas.com"**



SAS Software Help / Tutorials

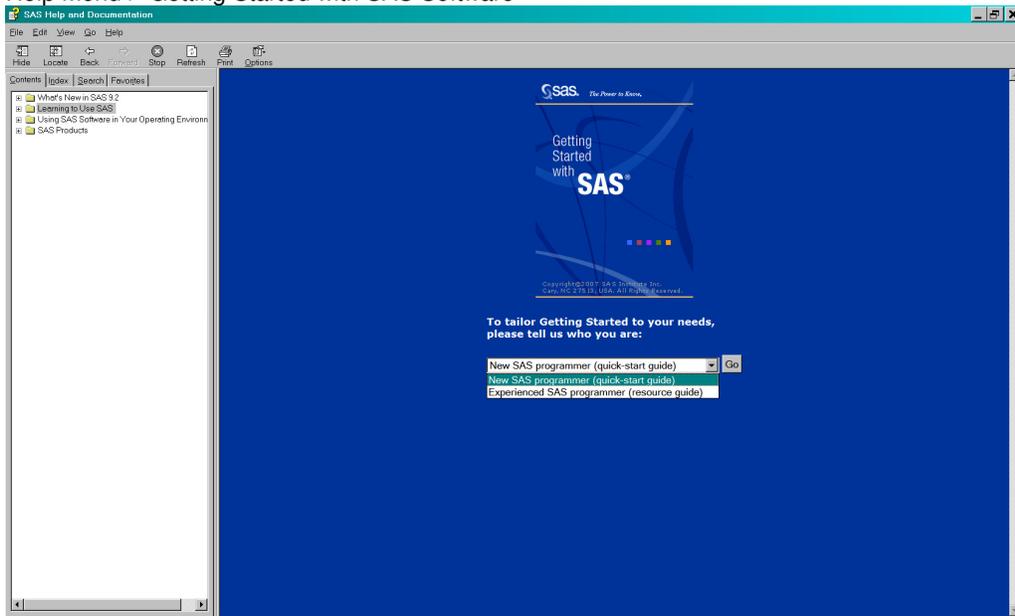
The SAS Help and Documentation is similar to the online documentation from support.sas.com web site. The look and feel is a little different because this is a thick client that is within SAS Display Manager versus a web based application.

Help Menu > SAS Help and Documentation > Index Tab



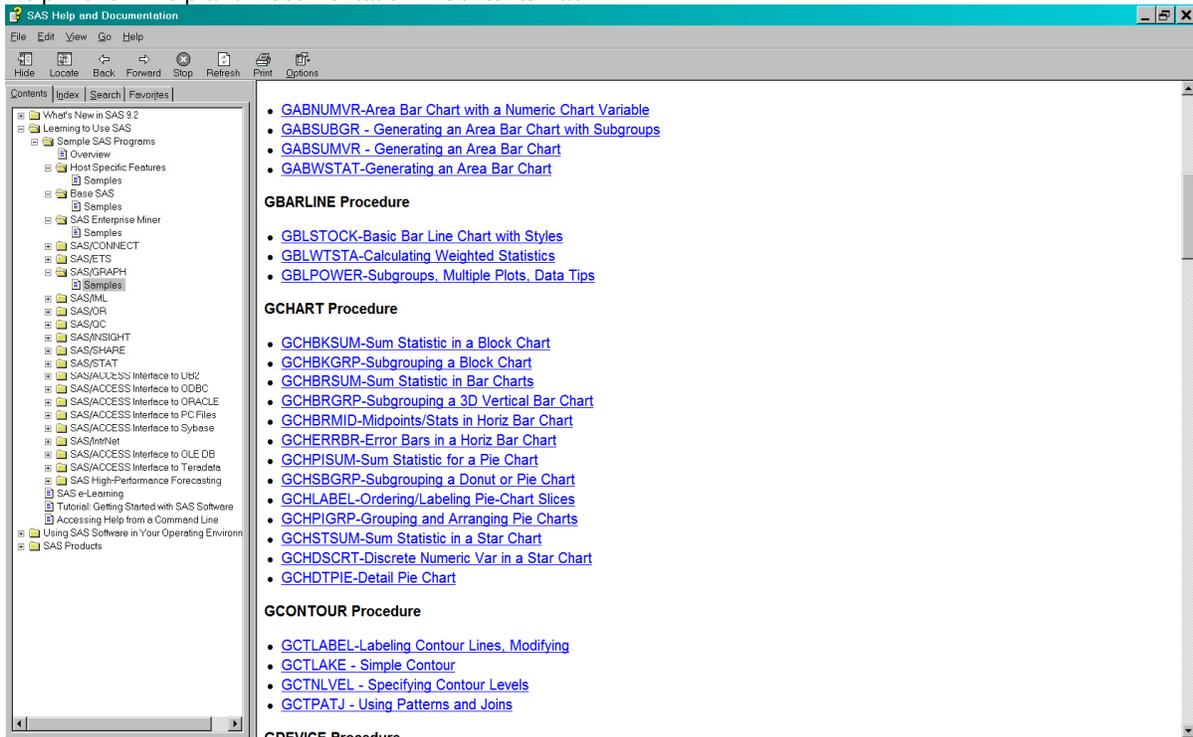
SAS Tutorial

Help Menu > Getting Started with SAS Software



SAS Sample Programs

Help Menu > Help and Documentation > Contents Tab



These sample programs match up with sample programs within your SAS installation. Many of these sample programs are also available from the SAS online documentation at support.sas.com.

SAS Internal / SAS Automatically Generated Programs

Within your SAS installation are SAS programs that have been written by SAS Institute developers. What better place to pick up tips and tricks for SAS development? An example follows:

SAS Supplied Macros such as %left

Code executed when %left(<text>) is called. (SASROOT!\core\sasmacro\left.sas)

```
%macro left(text);
%*****;
%*   MACRO: LEFT                               *;
%*                                       *;
%*   USAGE: 1) %left(argument)                *;
%*                                       *;
%*   DESCRIPTION:                             *;
%*   This macro returns the argument passed to it without any *;
%*   leading blanks in an unquoted form. The syntax for its use *;
%*   is similar to that of native macro functions.             *;
%*                                       *;
%*   Eg. %let macvar=%left(&argtext)          *;
%*                                       *;
%*   NOTES:                                    *;
%*   The %VERIFY macro is used to determine the first non-blank *;
%*   character position.                               *;
%*****;
%local i;
%if %length(&text)=0 %then %let text=%str( );
%let i=%verify(&text,%str( ));
%if &i %then %substr(&text,&i);
%mend;
```

There is also SAS code generated from SAS applications such as SAS Enterprise Guide and SAS Data Integration Studio. Reviewing this code may be helpful to you to learn features of SAS.

Existing SAS Programs at your Site

In the SAS Software language, there are many different ways to code a solution to the same problem. It is beneficial to review SAS programs written by others at your company to pick up on styles for coding and documentation (or lack thereof!). When reviewing others programs, you will run across features and functionalities that you are unfamiliar with. Much can be learned from discussing programming approaches with peers at your site.

One of the best ways to learn and share insights is to have code walk-through sessions with your colleagues as a brown bag lunch or meeting. It is very important to keep the comments and questions positive in these meetings or people will not want to participate.

Standard Operating Procedures / Best Practices at your Site

At many companies that use SAS, there are written standard operating procedures or best practices for writing, documenting, maintaining and placing SAS code into production. This is a must read in order to learn and exist in your SAS coding environment.

SAS Global Forum /User Group Proceedings

Even if one cannot make it to a user group meeting, the proceedings can be a valuable resource. The following web sites have facilities for searching past conference proceedings.

SAS Global Form

<http://support.sas.com/events/sasglobalforum/2011/index.html>

Southeast SAS Users Group (SESUG) Conference

www.sesug.org

MidWest SAS Users Group (MWSUG) Conference

www.mwsug.org

Western Users of SAS Software (WUSS) Conference

www.wuss.org

South Central SAS Users Group (SCSUG) Conference

www.scsug.org

NorthEast SAS Users Group (NESUG) Conference

www.nesug.org

There are also many local, in-house and special interest user groups that are more local in scope but have many great resources available.

<http://support.sas.com/sasusersupport/usergroups/findGroup>

SAS Reference Documentation

There are numerous SAS reference documents that can be downloaded as a PDF document from the SAS web site that are very good resources to use for learning SAS. One such document is "Step by Step Programming with Base SAS Software".

Other SAS Web Sites

As mentioned earlier, there are numerous other web sites available from SAS Partners and Universities.

CONCLUSIONS

The resources for learning about SAS features and functionalities are plentiful if you know where to look. It is important to understand what resources are available and where to find these resources if you want to become knowledgeable and efficient when using the SAS applications and language. As a manager of SAS developers, you can interview for, develop and expect resourcefulness from your team members. Your company will be much more efficient with resourceful team members.

REFERENCES

How to Promote Resourcefulness in Yourself and Others

<http://www.lifehack.org/articles/lifehack/how-to-promote-resourcefulness-in-yourself-and-others.html>

SAS Technical Support Website

<http://www.support.sas.com>

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

Name:	Brian Varney
Enterprise:	COMSYS, a Manpower Company
Address:	5220 Lovers Lane
City, State ZIP:	Portage, MI 49002
Work Phone:	269-553-5185
Fax:	269-553-5101
E-mail:	bvarney@comsys.com
Web:	www.comsys.com

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