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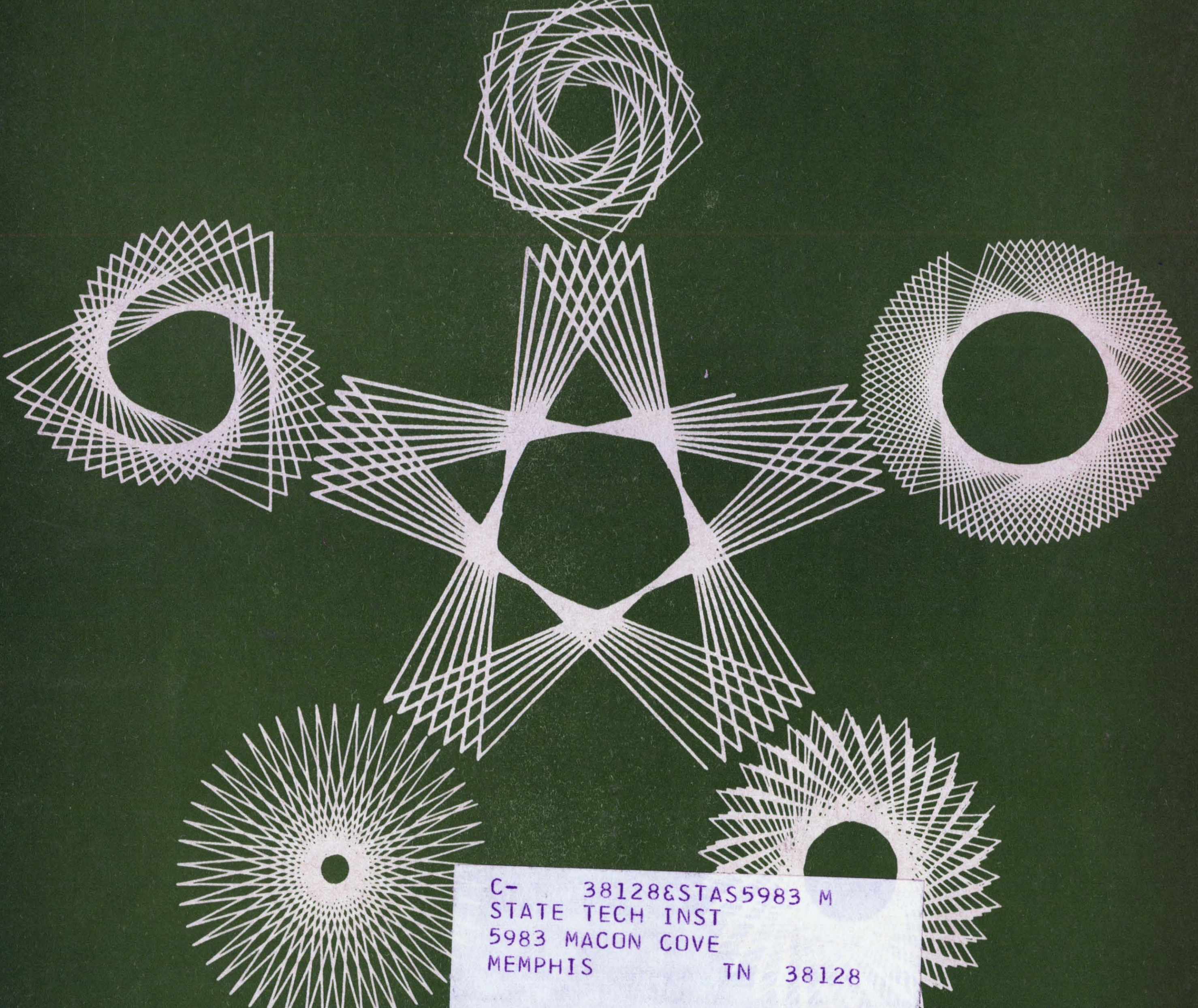
DECEMBER 1968



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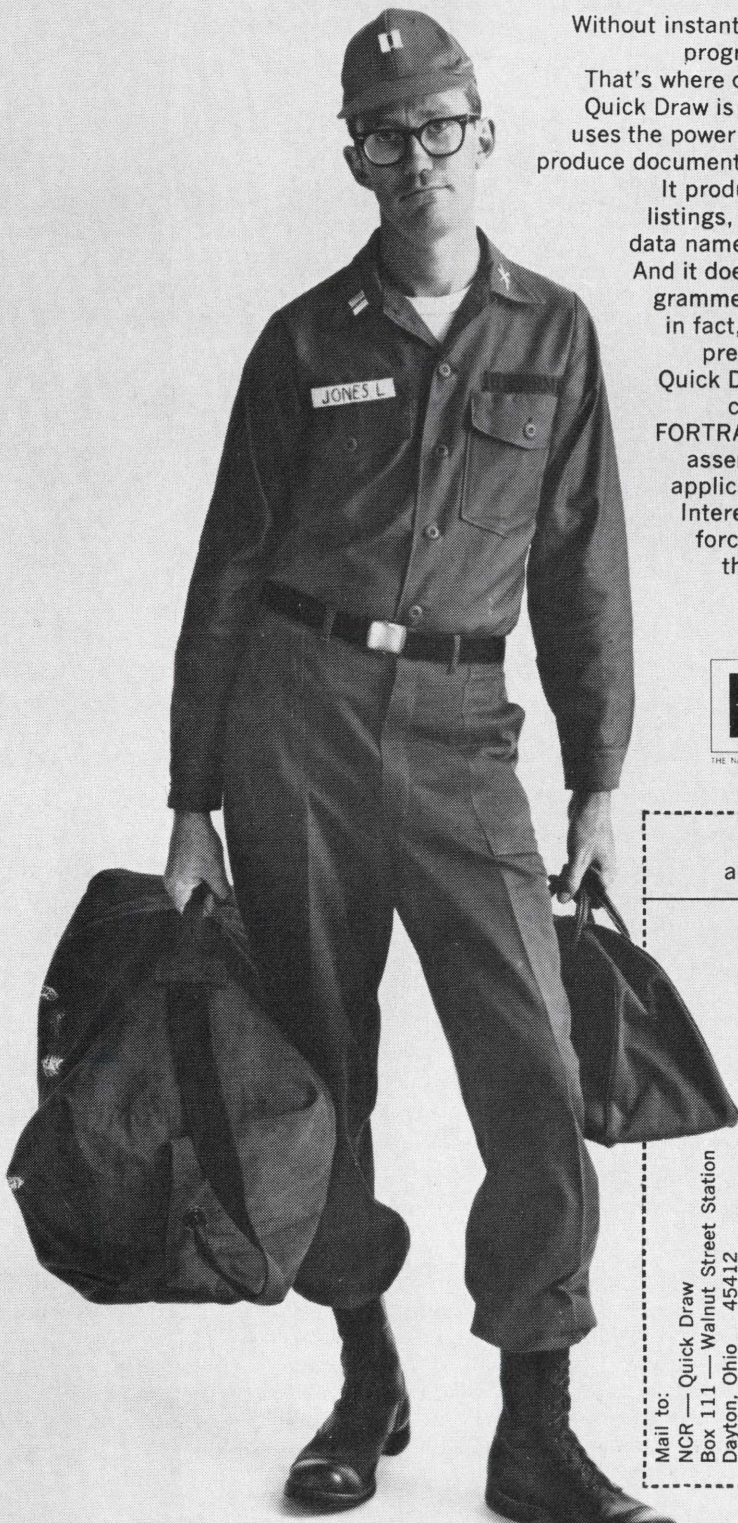

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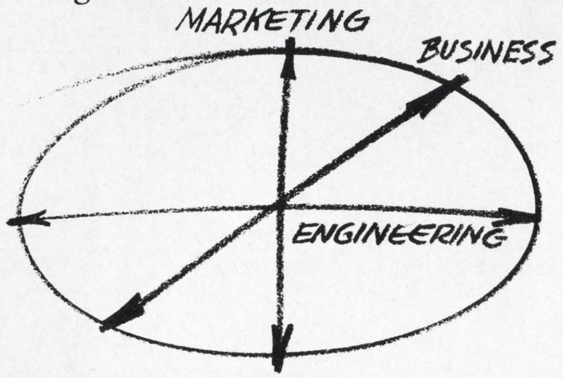

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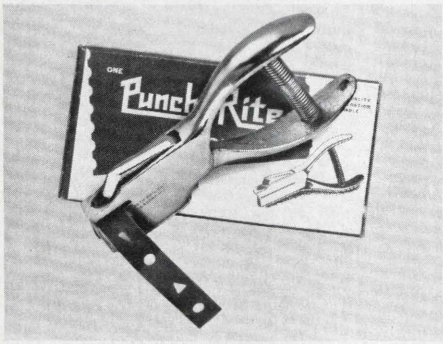

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Presently available as a special order item, Mieth's new mylar tape punch can be supplied within a maximum delivery time of 3 weeks.

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Development of Information Systems is the title of a new book by Donald F. Heany, consultant in the area of advanced systems development to General Electric and member of the Institute of Management Sciences. The book, published by Ronald Press, New York, is the newest (and one of the more successful) attempts to bridge the communications gap between those management people who need information and those data-processing people who must provide it. Written more or less "down the middle of the road," the book will give EDP specialists some insight into what management needs to know, and why, and give managers some insight into the problems involved in providing the information they need. Winds up with an excellent glossary and bibliography.

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* * *

A unique approach to **automatic documentation of computer programs,** which brings the benefits of such systems to small computer users, has been developed by Data Usage Corporation. Called DOCUMATIC, the system produces English language descriptions, rather than programmer-oriented flow charts, for applications written in IBM System/360 Report Program Generator (RPG) language.

Output from DOCUMATIC includes narratives which describe (1) the nature of the information being processed, (2) how it is being processed, and (3) what is the final output from the computer. There are also pictorial descriptions of the entire program as well as the organization of the input and output.

The proprietary system documents RPG programs written for any System/360. It can run on as small a configuration as a Model 20 with an 8K memory, any card reader and printer.

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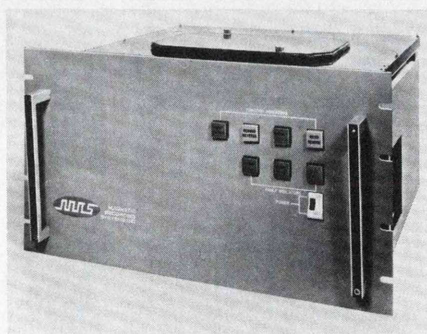

Digital magnetic tape storage and speed conversion device is capable of accepting and storing digital information and transmitting it as required at the necessary speed and format. The "Digi-Buffer" uses independently-controlled dual capstan drives, one for recording and one for reading. Information is stored on a loop of standard magnetic tape; Model MS 200 is capable of storing 40,000 characters while Model MS 3000 stores up to 250,000 characters. Speeds are 0 to 200 WPM and 300 WPM respectively.

The capstans utilize the unique characteristics of the DC printed motor for high speed synchronous or asynchronous incremental operation. The tape is driven directly from the motor shaft without the use of pinch rollers, brakes or clutches. No pressure or shock is applied to the tape, preventing tape damage or the loss of information. Tape life is increased and frequent adjustments and repairs are eliminated.

Typical applications are data storage, speed conversion and data filing. With the proper interface it may be used with electric typewriters, card and paper tape readers and punches, tabulating machines and as an input/output device for computers.

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* * *

(Continued on page 23)

TERP
A METHOD OF SOFTWARE-CONTROLLED ERROR RECOVERY PROCEDURE TESTING FOR THE DOS/TOS SYSTEM/360

R. A. Greene
Systems Development Division
IBM Corp.
Endicott, New York

ABSTRACT: The development of the Testing Error Recovery Procedures (TERP) program was a successful pioneer effort in the area of software-controlled Error Recovery Procedure (ERP) testing. TERP met the need for a standard method of ERP testing and satisfied the requirements of both the error recovery procedure programmer and the systems test programmer.

TERP is an ERP test case generator. Test cases generated by TERP can simulate I/O errors and machine check errors. TERP provides self-checking facilities which aid in the verification of test case results. The writing of ERP test cases is minimized to coding in a macro language because TERP is implemented through the use of assembler macros. The time required for testing ERP is also considerably reduced because there are no prerequisites or special operating procedures for executing TERP test cases.

A standard method of DOS/TOS ERP testing has been established through the use of TERP. Although TERP was developed around a specific operating system, its underlying principles can be applied to testing error recovery procedures of operating systems in general.

I. INTRODUCTION: *This paper describes a procedure for testing the error recovery routines of an operating system. Although the procedure was developed around a specific operating system, namely DOS/TOS System/360, the underlying principles can be applied to testing error recovery procedures of operating systems in general. It is assumed the reader possesses a basic knowledge of the System/360 hardware and software at the DOS/TOS level.*

Testing the error recovery procedures of an operating system has traditionally been an area which has not lent itself to the standard systems testing approach. This standard approach is the creation, through software, of a given set of conditions to be presented to the operating system and the verification, through software if possible, of the correct reaction by the operating system to these conditions.

The awkward characteristics of previous ERP testing methods, such as hardware fixes, core patches, special system generations, etc., often resulted in wasted time and incomplete testing. Simulation techniques were developed, but due to the nature of their implementation, they were also time consuming. In short, there was clearly a need for a standard method for ERP testing which satisfied the requirements of both the development programmer and the systems-test programmer. A method was needed which, due to its tailored implementation for ERP testing, reduced to a minimum the effort involved in generation, execution, and evaluation of ERP test cases.

This lack of a standard method for ERP testing led to the development of TERP. TERP is a tool for generating ERP test cases which conform to systems testing standards. Test cases generated by TERP can simulate I/O errors and machine check errors. TERP also provides self-checking facilities which aid in the verification of test case results. The writing of ERP test cases is minimized to coding in a macro language because TERP is implemented through the use of assembler macros. The time required for testing ERP is also considerably reduced because there are no prerequisites or special operating procedures for executing TERP test cases.

This paper explains in detail the TERP logic and function of the TERP components. It outlines existing TERP applications and furnishes information necessary for generating software-controlled ERP test cases with TERP.

II. TERP IMPLEMENTATION

A. TERP PHILOSOPHY

The TERP philosophy is to provide a means for ERP test case generation which permits software-controlled testing in conformity with the standard systems testing approach.

B. TERP METHOD

TERP is written in the System/360 assembler language and is implemented under DOS/TOS through the use of two B-transients and six assembler macros.

The basic TERP test case logic is as follows:

1. Initial ERP test case entry code fetches a B-transient which dynamically establishes an interface for error simulation between the supervisor being tested and the TERP, macro-generated, I/O interrupt monitor.
2. Control is then returned to the ERP test case which requests, through use of TERP macros, simulation of a specific error.
3. The TERP I/O interrupt monitor or machine check simulation routine next interfaces with the supervisor and simulates the specific error requested. The monitor may contain an optional I/O trace facility which aids in verification of commands issued by system ERP.
4. The number of system ERP retries attempted to correct the simulated error is logged upon test case termination, if cancellation occurred, or after error simulation, if cancellation did not occur.
5. If test case cancellation did not result from the supervisor's handling of the simulated error, the ERP test case proceeds to normal completion or attempts additional error simulation.
6. Upon termination of the ERP test case, the system EOJ routines fetch a B-transient which dynamically returns the supervisor to its normal operating state by removing the TERP interface.

C. TERP COMPONENTS

The two TERP B-transients must be cataloged in the core image library at ERP test case execution time. The six TERP macros must be cataloged in the source statement library at ERP test case generation time. Appendix A contains a detailed description of the TERP components.

1. *TERP B-transients*
   a. *$$BSTIOP.* This B-transient is fetched and executed only at initial ERP test case entry. It dynamically establishes an interface between the supervisor being tested and the TERP I/O interrupt monitor. This interface permits I/O error simulation. In addition, $$BSTIOP changes the system EOJ B-transient name stored within the supervisor to the TERP exit B-Transient name, $$BMEXIT. This causes the TERP exit B-transient to be fetched by the system at either normal or abnormal test case termination. $$BSTIOP exits by returning control to the ERP test case.
   b. *$$BMEXIT.* This B-transient is fetched by the system EOJ routines and is executed only at ERP test case termination. It dynamically returns the supervisor to its normal operating state by removing the TERP interface and restoring the system EOJ B-transient name. In addition, if test case cancellation occurred, $$BMEXIT logs the number of system ERP retries attempted to correct the simulated error. $$BMEXIT exits by fetching the system EOJ B-transient.
2. *TERP Macros*
   a. *IOCTL.* This macro must be the first source instruction in the ERP test case. IOCTL generates the following code:
      (1) *Initialization Routine.* This routine is entered only at test case initiation. It performs initialization and fetches $$BSTIOP. Upon return from $$BSTIOP, processing continues with the next sequential instruction following the IOCTL generated code.

(2) *TERP I/O Interrupt Monitor.* This monitor is inactive until after $$BSTIOP has been executed. The TERP I/O interrupt monitor is entered whenever an I/O interrupt occurs or when the supervisor issues a SIO instruction for error sense to the device for which an error has been simulated. When the monitor gets control and the conditions for I/O error simulation are satisfied, the monitor presents the error status to the system and gives control to either the supervisor I/O interrupt handling routine or error sense routine. If the conditions for error simulation are not satisfied, control is given to the supervisor for normal processing. The TERP monitor may be gener-

ated with an I/O trace routine. This option provides a means for verification of I/O commands issued by system ERP.

(3) *I/O Interrupt Subroutines.* Four subroutines are provided for user convenience and are available for issuing I/O commands to devices on which error simulation is requested.

b. *PUTMSG.* This macro generates code for logging the expected test case results. Since system messages accompany the majority of ERP functions, this macro is merely a convenience for test case output verification. The expected results of the error simulation can be logged preceding the system ERP message and TERP ERP retry count.

c. *STATUS.* This macro generates code which provides

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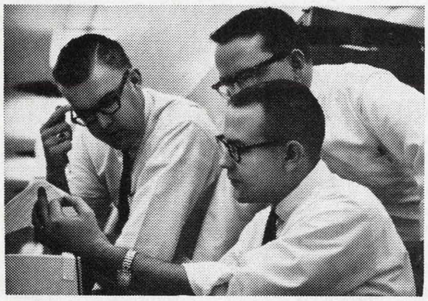

IBM programmers and systems analysts work in small teams on an IBM System/360 computer.

the TERP monitor with information required for I/O error simulation.

d. *IOINT*. The code generated by this macro causes the I/O interrupt which triggers the requested I/O error simulation. This macro also generates code for logging the ERP retry count, upon return to the test case, following the requested error simulation.

e. *MCINT*. This macro generates code for simulating a machine check or channel inboard error. This code presents machine check or channel inboard error status to the system.

f. *ENDTST*. This macro generates code which terminates the ERP test case.

D. TERP ERP TEST CASE LOGIC

1. *TERP I/O Error Simulation Logic*

The IOINT macro-generated code provides linkage to a subroutine which issues I/O to the device on which error simulation is desired. TERP I/O error simulation occurs only during the supervisor's processing of the interrupt(s) created by execution of this subroutine.

To accomplish I/O error simulation, the TERP monitor must provide CSW and sense byte error status when the system is ready to process them. The TERP monitor replaces the CSW status bytes with error status bytes when the desired interrupt occurs from execution of the specified I/O subroutine. Control is then given to the supervisor for I/O interrupt processing. If a unit check condition exists in the CSW, the supervisor issues a sense command to the device in error. When this command is issued, control is again returned to the TERP monitor, at which time the error sense information is appropriately placed in the supervisor error queue. Control is then returned to the supervisor for processing the sense information.

As a result of processing the

(Continued on page 20)

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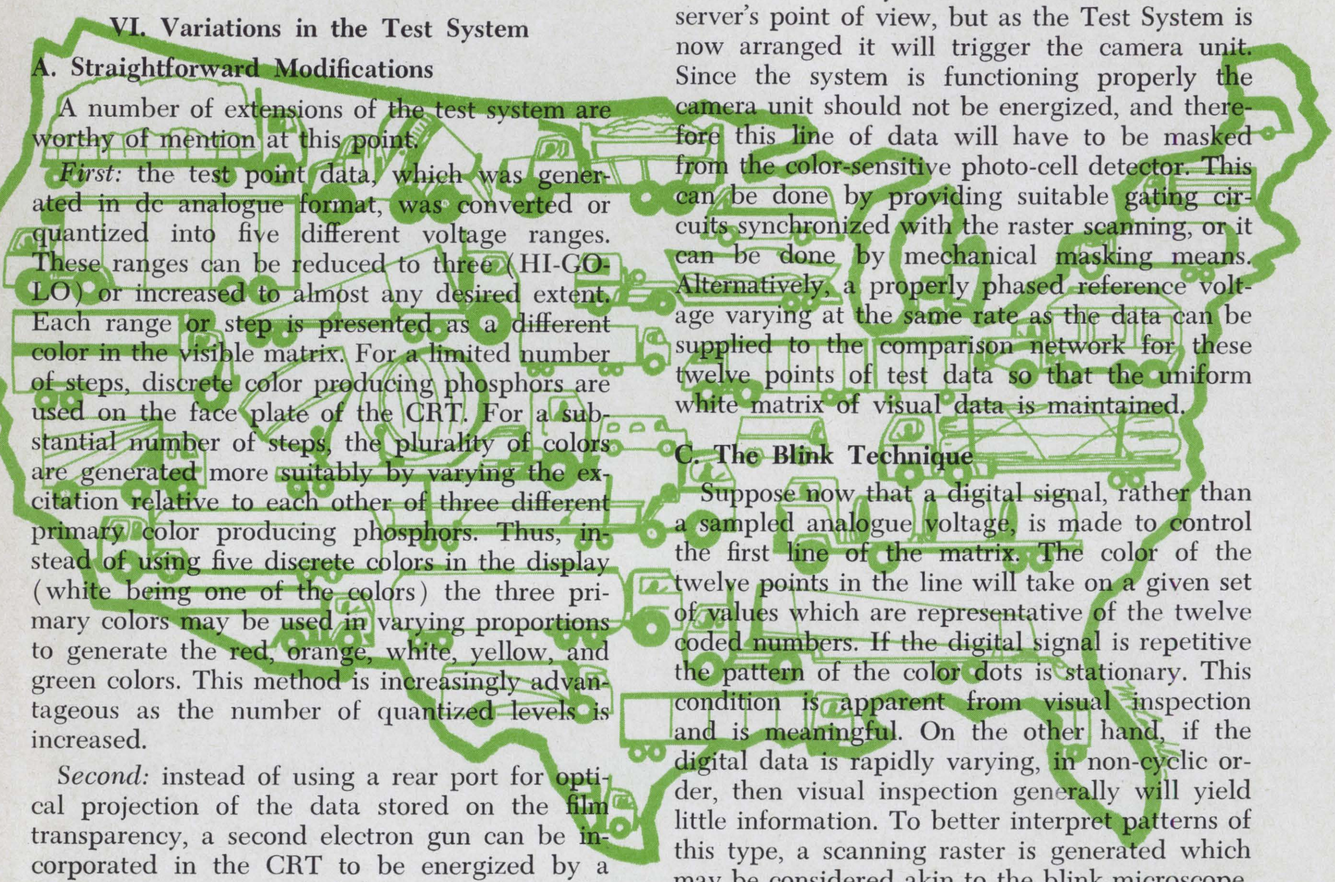

VI. Variations in the Test System

A. Straightforward Modifications

A number of extensions of the test system are worthy of mention at this point.

First: the test point data, which was generated in dc analogue format, was converted or quantized into five different voltage ranges. These ranges can be reduced to three (HI-GO-LO) or increased to almost any desired extent. Each range or step is presented as a different color in the visible matrix. For a limited number of steps, discrete color producing phosphors are used on the face plate of the CRT. For a substantial number of steps, the plurality of colors are generated more suitably by varying the excitation relative to each other of three different primary color producing phosphors. Thus, instead of using five discrete colors in the display (white being one of the colors) the three primary colors may be used in varying proportions to generate the red, orange, white, yellow, and green colors. This method is increasingly advantageous as the number of quantized levels is increased.

Second: instead of using a rear port for optical projection of the data stored on the film transparency, a second electron gun can be incorporated in the CRT to be energized by a flying spot scanner which has as its input the same film strip.

Third: instead of using punched cards, the failure selection slots and instructional information may be recorded magnetically on cards; or on tape, drums, discs, or cores.

Fourth: the scan rate may be altered, or the test system may be time-shared to better suit the needs of testing. Thus, if the assembly under test has a high inertial mechanical or thermal component there may be no need to sample the data 60 times each second.

Fifth: devices other than CRT's can be used for display purposes especially if the rate of data presentation does not require high resolution and high scanning speed.

B. Color Synchronism

Suppose the twelve different test voltages to be displayed on the first line of the 8 x 12 matrix are not steady in value, but that they vary at a rate slow in comparison to the sampling time of 16.6 milliseconds. Suppose further that all voltages vary in magnitude at the same rate. Then, the twelve points in the line will change color in synchronism to yield a pleasing visual sensation.

This often may be desirable from the observer's point of view, but as the Test System is now arranged it will trigger the camera unit. Since the system is functioning properly the camera unit should not be energized, and therefore this line of data will have to be masked from the color-sensitive photo-cell detector. This can be done by providing suitable gating circuits synchronized with the raster scanning, or it can be done by mechanical masking means. Alternatively, a properly phased reference voltage varying at the same rate as the data can be supplied to the comparison network for these twelve points of test data so that the uniform white matrix of visual data is maintained.

C. The Blink Technique

Suppose now that a digital signal, rather than a sampled analogue voltage, is made to control the first line of the matrix. The color of the twelve points in the line will take on a given set of values which are representative of the twelve coded numbers. If the digital signal is repetitive the pattern of the color dots is stationary. This condition is apparent from visual inspection and is meaningful. On the other hand, if the digital data is rapidly varying, in non-cyclic order, then visual inspection generally will yield little information. To better interpret patterns of this type, a scanning raster is generated which may be considered akin to the blink microscope. As is well known from the field of astronomy, the repetitive flashing of two patterns in the field of view of an observer creates an image which enables the observer to detect quite small differences between the two patterns. In this manner, the planet Pluto was discovered after many years of comparing thousands of photographs of the sky.

This principle of the blink technique for pattern comparison is applied to compare two groups of test signals to each other. Thus, by way of example, an assembly under test is arranged to process a digital signal which activates all the components in the assembly. This digital test signal may be the test message "See the quick brown fox jump over the lazy dog's back" often used in teletype systems. The response of the assembly is picked off at some suitable point and is displayed bit by bit across the matrix pattern. When the test signal is made repetitive, and is timed to be in synchronism with the scanning of the raster which generates the matrix pattern, and with a stable response from the assembly under test, a fixed pattern is generated on the display device which is easily recognized. Furthermore, a typical overall response from such an assembly will have the input signals identical in character. Under these circumstances, the display is made to generate on the first scanning cycle a pattern representative of the input signal. On the second scanning cycle, the display is made to generate a pattern representative of the output signal. On the third cycle the input signal again controls the pattern, etc. Therefore the observer sees the alternate presentations of the input and output digital data in matrix format. If the input and output signals are identical, signifying proper operation of the equipment under test, the matrix of data reappears with each scan in a smooth and uniform fashion. On the other hand, if there is a lack of correspondence between input and output signals the observer will see a blink or color alternation, at the point in the matrix where the discrepancy exists.

D. Computer Tester

A digital computer serves as another example for demonstrating the usefulness of this color blink phenomena. In this case, special test programs are used to exercise the computer. For each programmed exercise a response is obtained from the computer which is compared to a predetermined response. Here again, the two responses are compared on a bit-by-bit basis across and down the matrix on the CRT display. Both the program and the correct response may be stored in the memory section of the computer, be it on magnetic drum, disc, core, or delay line. The test sequence and the response thereto is programmed from this memory section in synchronism with the CRT raster scanning cycle to provide a stationary pattern. On the first scanning cycle, the measured response is displayed; on the next cycle the "calculated" response is displayed; and so forth. Therefore, a discrepancy between the measured response and the predetermined response shows up as a color blink on the face of the CRT at each point in the matrix where a discrepancy exists. Since this condition reflects a failure mode, there is advantage in recording this failure pattern. Again, it is convenient to photograph the display whenever a blink appears. But since the matrix ordinarily is filled with a plurality of test data in different colors, a photo-cell detector responsive to these colors cannot be used to trigger the camera; and masking the CRT as earlier proposed will be ineffective. Instead, a parity check is made of the data from one scanning cycle to the next. This parity check consists of first counting the bits displayed for a given scanning cycle to establish a reference count. Then, if the bit-count on the next cycle is the same, no photograph will be taken. If the bit-count is different, a photograph will record the matrix pattern. This is a much desired mode of recording the failure data for the camera is not triggered to take repetitive pictures of the same failure pattern.

To cite a simple example, let the digital data be in such format that a "yes" or "1" bit is displayed on a CRT as a green dot; and that a "no" or "0" bit is displayed as a red dot. These dots result from the excitation by the electron beam of a green phosphor and a red phosphor, respectively. For convenience in visual comparison, all color dots are produced by phosphors having decay times which are approximately equal. The first line of dots in the matrix is controlled by a first sequence of bits and therefore has a series of green and red color dots. The next row has a second sequence of green and red dots, etc. This display is used in the block diagram of Figure 6 where an arrangement is shown for checking the memory section of a digital computer. The scanning of the electron beam on the face of the CRT is synchronized with the scanning of the storage elements on a magnetic drum, a core matrix, or the like.

The readout of each bit of data in the storage medium is delayed in time so that the CRT displays a matrix of points which corresponds to the position at which the data is stored. This "electronic development" of the surface of the magnetic drum is repeated fast enough so that a steady image is seen by the operator. In between each scan of the data in the memory, there is alternately presented an image of the comparison data previously stored on a film chip. Towards this end the raster generated by the flying spot scanner is also synchronized with the rotation of the memory drum. When the pattern of the magnetic drum and that of the film chip is properly matched the display is continuous or even. When there is a discrepancy in the patterns, a blink occurs at the position where the discrepancy exists. This blink may be observed in position, in brightness, and in color variation.

VII. Summary

A review of the preceding descriptions will show that the major objectives set forth earlier have been achieved. A multi-color easy-to-interpret pattern of test data has been displayed on a cathode ray tube. The test data which is displayed during a malfunction is retained on photographs taken with color film, or is recorded in some other way. These photographs preferably are taken during the design stages of the prime equipment and are used in the preparation of a handbook, or library, of predicted drift and failure patterns. Experimentation and experience augment this library so that with time it becomes full and complete, even in the presence of design modifications. The information thus stored in the handbook is provided for manual use by a human observer; and that stored in the library is in machine form for use with electro-mechanical or electronic information-retrieval systems. An example of a punched card information-retrieval system was described which makes searches of the failure patterns, selects failure cards corresponding to faults in the unit under test, and projects the failure patterns upon the CRT so that a comparison may be made between the test data furnished by the unit under test and the pre-stored data.

A television type CRT display, employing NTSC color signals, generates a rectangular raster pattern of 525 horizontal lines at a 16kc rate. The display can be designed for 400 active horizontal lines with ease. A 20 inch CRT (measured in the horizontal direction) with vertical color strips that are each 40 mils wide provides a vertical resolution of 500 lines. If 450 of these lines are active, and if a three color arrangement is used for the display of the test data, it is clear that $400 \times \frac{450}{3}$ or 60,000 test points can be presented for display. Even with a five color display of the data, each color having its own vertical strip, there would be room for $400 \times \frac{450}{3}$ or 36,000 test points. This amount of data is substantial and obviously would be derived from a complex system comprised of many equipments and assemblies. The display of the data is arranged so that different "blocks" of the matrix correspond to the different equipments, assemblies, or major components making up the system under test. A color change, or a blink, at a single point in this matrix of 60,000 test points will show up as a distinct disturbance in an otherwise regular pattern. Many techniques can be used for investigating this disturbance. The technique described entails the projection of a pre-recorded pattern upon the section of the test matrix where the disturbance is located. Another technique might use a second CRT where a blown up view is presented of the disturbed area. In an extremely large or major system where 600,000 points of test data are being generated, this greater amount of data can be displayed by improving the resolution of the CRT, by using a larger display, and by going to projection type CRT's. Alternatively, the test patterns may be controlled so that only those that are defective are transmitted for display. This transmission may be to a central monitoring station where it is desired to observe and evaluate the test results of the overall major system.

VIII. Conclusions

It should be evident from the foregoing that it is proposed, via these pattern recognition displays, to enhance the role played by operating and maintenance personnel in the day-to-day use of complex electronic systems by providing a more attractive man–machine interface. This might be done in the aerospace environment by time-sharing some of the lesser used displays already contained in the vehicle. For example, a display used for airborne rendezvous or for a blind landing system can be used for maintenance purposes for extensive periods of time without compromising its original intended application. There are undoubtedly other displays which can be used. If the original equipment display is small in size; then the data it is called upon to display is small; perhaps so that it only tests itself. This display of the data in block format makes it possible for judgements to be rendered which presently are not possible. The pattern recognition type of display lessens the need for the numerous dials and digits that are characteristic of present maintenance efforts. The conventional voltmeter, the digital voltmeter, the oscilloscope, and the mechanical printer with its reams of machine-oriented data have been replaced with a real-time multi-color display. The instant arrangement yields a simultaneous display of significant data from tens, hundreds, or thousands of test points. The data presented is up-dated 60 times each second, the data is quantized so that crisp changes in the display are made whenever test signals change their quantum levels. This new test system thus can provide detailed status displays needed for maintenance purposes. At the same time, it may provide a central display for making the operational decisions that depend upon equipment availability and equipment performance. These decisions be they maintenance or operational are made by humans; and the information on which these decisions are made is displayed in the foregoing arrangements in a format well suited to human comprehension. ■

TERP

(Continued from page 14)

simulated error, the supervisor performs one of the following actions. It cancels the ERP test case, retries the error condition, takes an equipment error exit, takes an operator intervention exit, returns control to the ERP test case, or puts the system into a hard wait state.

2. *TERP Machine Check and Channel Inboard Error Simulation Logic*

TERP machine check and channel inboard error simulation is accomplished through execution of the code generated by the MCINT macro. Machine check and channel inboard error simulation is supported for CPU Models 30, 40, and 50. Errors which can be simulated include CPU machine check, channel control check (CCC), channel data check (CDC), and interface control check (ICC). Error status is provided in the CPU logout area. If CPU machine check simulation is requested, an exit is directly made to the supervisor machine check handling routine by loading the machine check new PCW. If CCC, CDC, or ICC error simulation is specified, and the error is to be received by the specific CPU model via a machine check interrupt, an exit is also made to the supervisor machine check new PSW. If tine by loading the machine check new PSW. If CCC, CDC, or ICC error simulation is requested and the error is to be received by the specific model CPU via an I/O interrupt, an I/O subroutine is executed which causes the I/O interrupt. Linkage with the TERP monitor causes CSW error simulation after this interrupt occurs. The monitor then gives control to the supervisor I/O interrupt handling routine which detects CCC, CDC, or ICC error status in the CSW and gives control to the supervisor machine check handling routine.

The supervisor processes the simulated error with either normal I/O ERP or machine check and channel inboard ERP, depending on the capabilities of the specific supervisor being tested. If the supervisor does not support machine check or channel inboard ERP, the system is put into a hard wait state. Otherwise, users of a damaged device could be cancelled, users of a damaged channel could be cancelled, control could be returned to the test case, the test case could be cancelled, or the system could be put into a hard wait state. ■

Mr. Greene's article will be concluded in the January issue of software age

NEW PRODUCTS

(Continued from page 6)

A colorful, four page brochure from Liskey Aluminum, Inc., features Liskey–Aire **environmental control systems for computer rooms,** which are engineered exclusively for precision control of temperature, humidity, and air cleanliness in data processing centers.

The brochure illustrates the aesthetic quality of the modular units which are available in a choice of blue, red, gray, or custom color finishes to blend perfectly with other equipment.

The brochure also takes the aesthetic ouside panels off the Liskey–Aire and lets the reader see the inner workings of the unit. Enlarged photographs of various sections offer visual details of how Liskey–Aire provides filtered and tempered air to men and machines. Easy access features for maintenance, via hinged front service doors and removable side and back panels, are also described.

For more information, circle No. 54 on the Reader Service Card

* * *

Access Corporation has announced the System 60, a new, high-speed, low-cost method of **records automation and information control.** Based on a random storage principle, it is designed to fill the gap between manual filing and the computer.

The System 60 automatically selects any desired document, or group of documents, from a file of many thousands in less time than dialing a telephone. Refiling in the conventional sense is eliminated because records can be replaced anywhere without regard to alphabetic or numeric sequence. This random return feature also prevents misfiling.

Access cards for the System 60 are available in both tabulating and 8″ x 5″ ledger formats. They can be custom imprinted with any desired form for manual or machine posting.

For more information, circle No. 55 on the Reader Service Card

* * *

The Programming Devices Division of Sealectro Corporation has developed a new Slide 'n Switch system which provides **illuminated digital data display** at both local and remote locations. Random access indication of digits 0–9 can be provided for any practical number of "stacked" Slide 'n Switch units such as the three-switch assembly shown in the photo above.

With the system shown, numerical readout can be provided away from the switches at some remote point or remotely and at the switching position as well. Applications include warehousing, trucking or in any area where this type of system is desirable.

For more information, circle No. 56 on the Reader Service Card

* * *

Photo Magnetic Systems' revolutionary **telephone computational time sharing system**—Comput-A-Phone—combines the use of the Touch-Tone telephone system, or standard rotary phones equipped with auxiliary dialers, with any automatic data processing machine anywhere.

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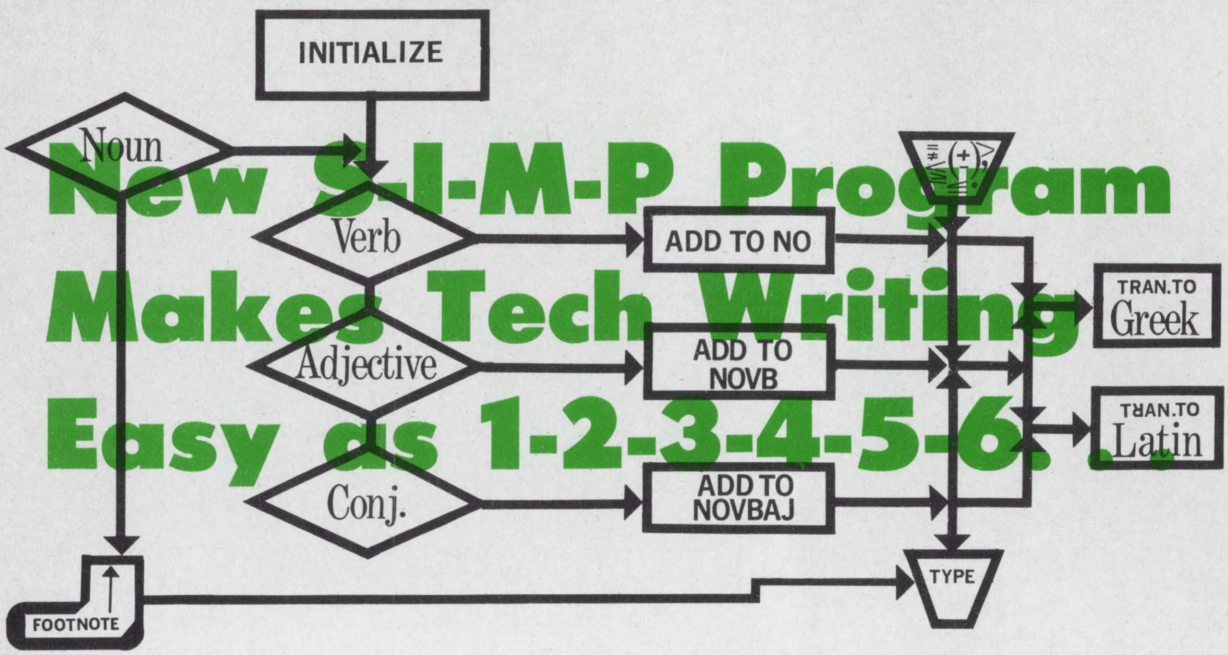

New S-I-M-P Program Makes Tech Writing Easy as 1-2-3-4-5-6 . . .

Raymond A. Deffry

▪ A new company, Techniprose, Inc., claims it has developed a way to make technical and scientific writing as easy as one, two, three, four. The company bases its new system on lists or tables of phrases as shown on the accompanying writing kit. Techniprose claims that the kit can be used to write thousands of "perfectly balanced, grammatically correct sentences, studded with the 'in-words' of your technology."

Naturally, some reservations have been expressed about the new writing system, called Simplified Integrated Modular Prose (SIMP). An interview was arranged with Dr. Ira Verbalmonger, president of Techniprose, to clear up the situation.

Q. Dr. Verbalmonger, I'd like to get right to the point. Do you expect us to believe that anyone can sensibly convey information just by pulling numbers out of the air?

A. Of course not! You miss the point. Our writing system is not designed to convey information. That's the last thing we want it to do. It is designed to fill up pages quickly, easily, and cheaply. It looks good, sounds authoritative, reads sonorously, but it doesn't say anything.

Q. Well, if you admit your writing system says nothing, whom do you expect to sell it to?

A. To lots of people. Whatever gave you the idea that everybody who sat down to write had something to say? Look, after three months of work in the lab, the scientist must come up with a report. After a year of study the graduate student must grind out a master's thesis. The college professor must publish or perish. Proposal writers must crank out the data.

Some of these people have something to say. The others just want to get 10 or 50 or 500 pages between two covers.

Before SIMP, they had to write like the dickens for days and weeks to grind out the stuff. And in the end they would wind up with a bunch of dangling participles and with "accommodate" misspelled.

Now, even with the manual system, they can give their secretaries several pages out of the phone book to translate into SIMP writing while they go out and play a quick 18 holes.

Q. I see. How did you develop your SIMP method?

A. Actually, I got the idea from a "buzz sheet" of "in-words" from the aerospace industry. It was only a three-digit system as opposed to Techniprose's multi-digit system and it had a limited capability, possessing only the potential to formulate three-word phrases, such as "integral system parameters." Moreover, the system was obviously devised and implemented for the express purpose and concept of elevating to a plateau of ridicule the . . .

Q. Excuse me, Doctor, but you're losing me.

A. My apologies. I'm so involved in writing SIMP language that I sometimes lapse into it when I'm talking. What I meant to say was that the buzz list was dreamed up by some smart aleck as a joke, but I saw the real potential of the thing and took it over from there.

To understand the development of Simplified Integrated Modular Prose, I recruited, at no little expense, an outstanding team of specialists—nominativists, verbologists, adjectivists, and connectivists, supported by digitists. We began with an exhaustive search of the literature, and found a direct relationship between certain prose units and. .

Q. Prose units?

A. Yes, a prose unit is what you laymen would call a word.

Q. Well, "word" is a good word. Why call it a prose unit?

A. We felt that prose unit was a more descriptive term, and it interfaces more harmoniously with prose groups, or sentences. Besides, when you're breaking ground in a new technology, you're entitled to your own set of in-words. Anyway, we found a direct relationship between a haziness of meaning and certain prose units, especially those that were polysyllabic and that emanated from Latin roots. Our studies also showed that haziness could be enhanced by selecting the prose unit that was most remote from the item it identified. For example, we always use "system" for "aircraft" and "organism" for "girl."

From this basic research we were able to postulate a hazio/remotic scale of from one to ten to rate prose units. On this scale "girl" ranked 1 and parameter ranked 10. We applied this scale to aerospace industry words and accepted for SIMP only the prose units that rated 7 or more.

At the same time we had a separate group of sentence structural engineers performing destructive testing on prose groups (sentences to you.) This group postulated a ratio which served as a foundation for all subsequent sentence design efforts, namely

$L/D \longrightarrow 0.9$. Solve for least value.

Q. Just a minute! L/D stands for lift over drag and if lift is not more than drag, the airplane won't get off the ground.

A. Precisely. In this case, L stands for literacy and D stands for drivel, but the same principle applies. We guarantee, absolutely, that none of our sentences will ever get off the ground.

Q. Doctor, would you like to tell us a little about your plans for the future.

A. We see an unlimited future to SIMP writing. Right now we're drawing up customized SIMP kits for other disciplines, such as chemistry, physics, economics and sociology. Incidentally, we're really having a ball with sociology.

Q. Just what are your sales figures and potential?

A. Our sales figures are confidential, but I can tell you that SIMP writing is catching on like mad. If you look for it, you can find examples of SIMP writing almost everywhere.

Q. Thank you Dr. Verbalmonger. Just one more question: What was your pre-SIMP line of work.

A. Prior to becoming deeply committed, both financially and time-wise, in my present area of endeavor, various types of paramedical nostrums were devised, formulated, tested, produced and marketed through my efforts, enabling me to maintain a socio–economic level that was compatible with, but not in excess of, that which one might. . . .

Q. Would you break that down for the layman?

A. Oh, sorry. Before SIMP I made a pretty good living selling patent medicines that I mixed in my cellar.

TECHNICAL WRITING KIT

This technical writing kit is based on the Simplified Integrated Modular Prose (SIMP) writing system. Using this kit, anyone who can count to 10 can write up to 40,000 discrete, well-balanced, grammatically correct sentences packed with aerospace terms.

To put SIMP to work, arrange the modules in A–B–C–D order. Take any four-digit number, 8751 for example, and read Phrase 8 off Module A, Phrase 7 off Module B, etc. The result is a SIMP sentence. Add a few more four-digit numbers to make a SIMP paragraph.

After you have mastered the basic technique, you can realize the full potential of SIMP by arranging the modules in D–A–C–B order, B–A–C–D order, or A–B–C–D order. In these advanced configurations, some additional commas may be required.

SIMP Table A

1. In particular,
2. On the other hand,
3. However,
4. Similarly,
5. As a resultant implication,
6. In this regard,
7. Based on integral subsystem considerations,
8. For example,
9. Thus,
0. In respect to specific goals,

SIMP Table B

1. a large portion of the interface coordination communication
2. a constant flow of effective information
3. the characterization of specific criteria
4. initiation of critical subsystem development
5. the fully integrated test program
6. the product configuration baseline
7. any associated supporting element
8. the incorporation of additional mission constraints
9. the independent functional principle
0. a primary interrelationship between system and/or subsystem technologies

SIMP Table C

1. must utilize and be functionally interwoven with
2. maximizes the probability of project success and minimizes the cost and time required for
3. adds explicit performance limits to
4. necessitates that urgent consideration be applied to
5. requires considerable systems analysis and trade off studies to arrive at
6. is further compounded, when taking into account
7. presents extremely interesting challenges to
8. recognizes the importance of other systems and the necessity for
9. effects a significant implementation to
0. adds overriding performance constraints to

SIMP Table D

1. the sophisticated hardware
2. the anticipated third generation equipment
3. the subsystem compatibility testing
4. the structural design, based on system engineering concepts
5. the preliminary qualification limit
6. the philosophy of commonality and standardization
7. the evolution of specifications over a given time period
8. the greater flight-worthiness concept
9. any discrete configuration mode
0. the total system rationale

As will be obvious, the tables and methodology presented here have been grossly simplified to explain the workings of the system. As offered by Techniprose, Inc., the system is much more elaborate. A variety of software packages for various computers are offered by the firm. These range from four or six 50-phrase tables (recommended for second-generation equipment or the smaller third-generation machines using disc storage) to programs runnable only on the most sophisticated hardware presently available.

The most advanced program, for machines with core storage in excess of 560K, is the 64/200(LG). By the designation system adopted by Techniprose, this indicates 64 tables of 200 phrases each—including one table of obscure references and one of irrelevant footnotes. The parenthetical LG denotes that any phrase may be presented in Latin or Greek at will, the translation being triggered by a 12–9–7–4 punch in cc-80 (or 12–7–9–3 for Greek.) Tables of untried formulae and of random punctuation are also included.

This program, with the tables in direct-access storage, is run against the commercially available tape of "a million random numbers."

This particular package is still somewhat experimental, Dr. Verbalmonger reported; but it looks extremely promising in view of the fact that three of the first four papers produced in trial runs are currently being considered for Nobel prizes. One is in the running for the prize in biology, one for physics and the third is being considered both for the chemistry award and the literature award—this despite the fact that all were run using the tables of aerodynamic phrases. ■

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