Wang Systems Newsletter 7

February 1978

Things will change

The major change this month should be obvious. We have gone to a new format in order to make the *Newsletter* more readable as well as more aesthetically pleasing. As usual, your comments and criticisms are encouraged.

We are also adding a new section to the *Newsletter*. Beginning this month, the Technical Information Center will be submitting articles and miscellaneous information which should be valuable to you as software consultants and technical people.

New Products
2200 MVP WCS 40

The 2200MVP/WCS40 is here! Several systems have already been delivered and the shipping schedule has been dropped from 30 weeks to 12 weeks. This product provides Wang with an excellent low-end multi-user system that competes very effectively against other multiterminal systems, such as Data General's CS/40, IBM System 34, and the BASIC/FOUR line.

Some of the major features of this system include:

Local/Remote Terminal and Printer Operation

The 2200MVP supports up to 8 terminals.

These terminals may be directly connected into the 2236MXD terminal controller or attached to compatible TC modems for remote long distance operation. A printer may be connected to any or all of the 2236D terminals for local print requirements.

Excellent System Performance/Response Time

Many low-end multi-user systems have performance limitations and suffer from inefficient operating system software. The 2200MVP offers the outstanding performance of the VP processor and an extremely responsive and efficient operating system that allows the same high degree of interactivity as our single-user systems. (For example, some comparative customer tests have shown the 2200MVP to be as much as 3 to 4 times faster than a multi-user PDP 11/34).

Excellent Expandability

We can now offer the customer a competitive low-cost system which has both an economical expansion path and the processor power to support it, thus avoiding obsolescence almost indefinitely.

Compatible Software

One of the major design objectives of the 2200MVP was compatibility with the 2200T and VP processors. The changes required to run existing 2200 series software on the 2200MVP are the normal changes required in going to any multi-user system. Most existing single-user "T" or "VP" software will run on the MVP, in a single-user mode.

Global Program Text

This feature reduces total memory requirements by allowing common program text to be shared by more than one program. For example, KFAM would reside in memory only once and would be shared by any of the other partitions in the system.

Global Variables

Global variables are specially named variables that can be referenced by programs in all of the system partitions. They provide a means of interpartition communication and data sharing.

Partition Configuration

The allocation of memory to various partitions and the assignment of terminals to partitions is extremely flexible and is accomplished at "power on" time. Up to 10 different configuration combinations can be defined and stored under user identifiable names.

Ease of Use

Although the 2200MVP uses a sophisticated fixed-partition operating system, it is designed to appear to each user as if he has a 2200VP Processor of his own. Each operator can write, load, or execute a program in the same manner as he would on a 2200VP Processor.

Configuration Questions

There have been many questions on how to configure a 2200MVP. The following questions and answers may help to clarify some of these issues:

1. How many 2236 terminals are reasonable?

   The design goal of the WCS-40 is based on a typical small business commercial installation which could often be one terminal supporting a

batch job(s) and 2 or 3 supporting data entry/inquiry. (Similar to a WCS-30/Disk workstation configuration.) This is a reasonable typical configuration for the 2200MVP. How effectively systems with up to the full eight terminals can be supported depends primarily on what applications will be run on the terminals. The main limiting consideration is the maximum available memory (64K maximum) to hold programs and data, plus to a lesser degree required performance. For example, if all terminals were used to do data entry/inquiry and if most program text (such as Easy Form) could be shared globally, memory could be sufficient. Eight terminals all doing problem solving which requires only 6 to 7K could be supported. Since the MVP has about 8 times the performance of the 2200T, as more terminals are added each terminal would have a performance approaching that of the 2200T, which for many applications could be satisfactory. It's generally fair to say, 3 to 5 terminals are normally reasonable, when a combination of batch and foreground (data entry/inquiry) are being run at the same time. If however, the system is reconfigured to run only data entry/inquiry, more terminals could be supported. (Many small businesses tend to run their batch jobs in concentrated periods, at the end of a day, week, or month.)

2. How many partitions are reasonable?

Again, the typical commercial installation would probably not use more than 5 or 6 partitions. For example, a large partition running a batch job, a large partition with possibly a data entry/KFAM/inquiry package which could be globally shared by 2 or 3 data entry terminals; and, finally, the 2 or 3 smaller partitions which support each data entry terminal, hold each terminal's data and variables, and globally call the data entry shared partition. For end of the month processing, two large batch partitions might be set up. Although the MVP can support up to 16 partitions, the primary limitation on how many are set up is generally available memory. It can be useful to have more than 8 partitions, even though the system is limited to 8 terminals. This is because one terminal might support several background jobs such as batch, TC, inquiry, etc. In addition, it may be efficient to have several global partitions available to be called by smaller partitions supporting each terminal.

3. Is there a rule of thumb for real memory per partition and/or per terminal?

Since we already have a fairly good feel for what present 2200 single user software takes, a good estimate can be made from analysis of that. Generally, memory requirements for most batch jobs are between 12K and 32K with 16K to 24K being typical. Data entry or inquiry programs can be shared globally by a number of terminals, but the program data and variables are individually stored in each partition. Thus, a data entry/inquiry program to be globally shared may typically take 12K to 16K with 4K or 6K required for data in each calling partition. System overhead is 3K plus approximately 1K for each partition. Thus, a typical batch/data entry configuration consists of:

(1)	Batch Job (including globally shared KFAM)	20K
(2)	Globally Shared Data Entry	12K
(3)	3 Data Entry Partitions (mostly data) (3)x(6K)	18K
(4)	System Overhead Five Partitions 3K + (5 x 1K)	8K*
		58K

* 3K = SYSTEM OVERHEAD
5 x 1K = OVERHEAD PER PARTITION x 5 PARTITIONS

A typical data entry only configuration might be:

(1)	Shared Data Entry Program	16K
(2)	Six Data Entry Partitions (6)x(4K) (mostly data)	24K
(3)	Overhead for 7 Partitions 3K + (7x1K)	10K
		50K

Therefore, 16K or more per terminal/partition is a rule of thumb. A smaller amount of memory per terminal/partition might result if all terminals were sharing one global program and doing similar functions (Data Entry/Inquiry).

4. What level of concurrent access/loading can be placed on the disk(s)?

   Disk loading would be similar to that of a multiplexed 2200 system. As with multiplexed 2200's, programs would probably reside fully in memory for many applications. Therefore, disk loading activity could be primarily data accesses, with batch jobs providing more loading, data entry/inquiry being limited more by manual keystroke speeds.

   Programs designed with many frequent overlays can produce heavier disk usage.

5. Can an MVP be reasonably configured with just floppy disks?

   In applications where there is not a heavy rate of disk accesses required, this can be a very effective configuration. For example, typical data entry applications such as those supported by many versions of Easy Form access a disk generally when a form has been completely entered, or infrequently during the entry. (The 2236D/2236MXD terminal operation also provides 32 characters of keyboard buffering which is important for multi-user data entry.) Similarly, data inquiry applications with limited data requirements are appropriate. Similarly, multiterminal problem solving and forms-filling can also be effectively supported. Finally, an MVP with floppies is a good entry level system for a customer that desires maximum provision for expansion. It immediately provides a low-cost system that has foreground/background capability and excellent expandability.

One final note relative to system overhead:

Memory overhead required by a partition in the MVP relates to the "T" and "VP" as follows:

MVP	1K overhead per partition
VP	3K overhead
T	700 bytes

Thus, for an unmodified VP program, partition size can be approximately 2K less in the MVP than the minimum VP size. Note, however, that the MVP also requires 3K of system overhead in addition to the 1K per partition.

GBS

Mod 4 - Payroll

The GBS MOD 4 — Payroll is on its way. Although it will be a few more months before its official release, we thought we would give you a preview. The following are some facts and features:

- Six sectors of information per employee (Master File).
- Four sectors of company-wide information (Control File).
- Payroll processing is driven by parameters in the Master File and Control File which are "user" modifiable.
- A company can have up to 30 earnings types, 30 taxes, and 30 deductions.
- Each employee can have up to 10 earnings types, 10 taxes, and 10 deductions.
- Payroll processing may be done weekly, biweekly, monthly, yearly, . . . etc., up to 8 processing categories available.
- Handles hourly, hourly-exempt, and salaried employees (automatic processing of hourly-exempt and salaried, no data entry required).
- Pay by check, bank deposit, or cash. Check reconciliation report issued, Bank Deposit List provided for each bank and Cash Denomination Breakdown provided. All bank deposit and cash employees receive memos.
- Contains current, quarter-to-date and year-to-date figures for all earnings units, earnings amounts, taxes, and deductions per employee.
- Each employee can have federal taxes, two state taxes, and one local tax.
- Daily Cash File can produce totals for each day of the year on all earnings, taxes, and deduction categories.
- Produces all necessary registers and yearly reports including 3-column 941-A's and W-2's.
- FICA % and limit can be changed by the "user."
- Offers limits and constant fields which may be used with any earnings, tax, or deduction.

•Allows user to override automatic deductions.

•Data entry (time-card posting), etc., only allows "eligible" entries.

Distributor Version

The Distributor version of GBS will be released the end of February under the title of "GBS for Wholesale Distribution." This new package may be used in conjunction with GBS MODS 1 & 2 to provide a system covering order entry, back orders, inventory control, recommended purchases, invoicing, accounts receivable (with simplified service charge calculations) and sales analysis. It exists only in the hard disk version and runs on the same configuration as the current GBS package. It is a single-user system. Since this package was specifically aimed at the Distributor marketplace, file size requirements ruled out the necessity of creating a diskette-based version.

GBS for Wholesale Distribution may be obtained in the same manner as the current GBS package. Checklists will be distributed to our field analysts. A qualified vendor, one who has signed a GBS licensing agreement, may contact his local Wang analyst to place an order.

GBS for Wholesale Distribution consists of a set of diskettes which contain some "new" programs and some "replacement" programs. These programs replace certain portions of the existing GBS MODS 1 & 2 software. Thus, to achieve a full operating system with back orders and recommended purchases, a vendor must obtain the current GBS MODS 1 & 2 (hard disk version) and the GBS for Wholesale Distribution package. Included in the documentation for this new package (Systems Manual and Operator's Guide) are instructions for installing the two packages together. Also included are instructions and software to facilitate upgrading an existing MODS 1 & 2 installation to include the Distribution capabilities. This software contains conversion programs to reformat certain files which have additional fields.

Hints and Suggestions

A frequent modification to GBS is changing standard terms and sales tax information. One of our analysts submitted this handy table to use as a quick reference when making these changes.

GBS STANDARD TERMS AND SALES TAX ID MODIFICATION TABLES

—Hard Disk Version Source—

Mod	Program	Diskette	Line(s)	Variable(s)
I	Prog-A	Source #2	4380 4390	I9$ (Terms) I8$ (Terms)
II	Prog-3A	Source #1	4510 4520	I9$ I8$
I	Prog-D	Source #2	4100-4150	K(1,1)-K3,2) (Tax ID)
II	Prog-6D	Source #1	7600-7650	K(1,1)-K(3,2)

—Hard Disk Version System—

Mod	Program	Diskette	Line(s)	Variable(s)
I	INVC030A	System #2	4380	I9$, I8$
II	OREN030A	System #2	4450	I9$, I8$
I	INVC030D	System #2	4060	K(1,1)-K(3,2)
II	OREN060D	System #1	7500 & 7630	K(1,1)-K(3,2)

—Diskette Version Source—

Mod	Program	Diskette	Line(s)	Variable(s)
I	Prog-A	Source #1	4380 4390	I9$ I8$
II	Prog-3A	Source #2	4510 4520	I9$ I8$
I	Prog-D	Source #1	4100-4150	K(1,1)-K(3,2)
II	Prog-6D	Source #1	7600-7650	K(1,1)-K(3,2)

—Diskette Version System—

Mod	Program	Diskette	Line(s)	Variable(s)
I	INVC030A	Invoicing	4285	I9$, I8$
II	OREN030A	Utility	4450	I9$, I8$
I	INVC030D	Invoicing	4060	K(1,1)-K(3,2)
II	OREN060D	Utility	7500 & 7630	K(1,1)-K(3,2)

Recent Publications

The following items have been released from Lowell between December 1, 1977 and January 31, 1978:

Errata Sheets:

- Addendum to Application Bulletin #23 Graph Utility System (700—4448)
- 2200 CASH User Manual Update #2 (700-4442)
- 2200 RIADS User Manual Update #1 (700-4471)

Data Sheets:

- Word Processor 5508 Photocomposition Option Data Sheet (700-4420)

Manuals:

- WCS/15 Introduction (700-4414)
- Terminal Access Method (TAM) User Manual (700-4444)
- PCS-II Text Editing Utilities User Manual (700-4452)
- 2231W-2 Line Printer User Manual (700-4457)
- Graph Utility System User Manual (700-4335)

Product Bulletins:

- #157 2282 Graphic CRT/Model 2231W-3 Printer

REPRINTS

WCS/25 Data Sheet (700-4161A)
Model 2231W-3 Line Printer Data Sheet (700-4375B)
Word Processor 10A Data Sheet (700-4170B)
Option 62 Buffered Asynchronous Communications Controller Data Sheet (700-4243A)
2250 or Option 67 8-Bit-Parallel I/O Interface Controller Data Sheet (700-3253D)
Work Station Introduction (700-3887A)
PCS-II Introduction (700-4255A)
Analysis of Variance (ANOVA) Manual (Diskette/Minidiskette) (700-3867B)
Model 2263 Line Printer User Manual (700-4251A)
2271 Printer Data Sheet (700-4147A)
2200 Text Editing Utilities User Manual (700-4043B)
Word Processor Ribbon Cartridge & Print Wheel Replacement (700-4066B)
Word Processor 30 Power-On Procedures (700-4176B)
2200 Software List (700-3798A)
2282 Graphic CRT Data Sheet (700-4378B)
5528 Communications Controller for Synchronous Communications Data Sheet (700-4382A)
Word Processor 5581 Daisy Wheel Printer Data Sheet (700-4179B)
2200VP Introductory Manual (700-4082A)

Miscellaneous:

- Word Processing Glossary of Terms (700-4417)

Questions, Corrections and Amplifications

We had an easy month with no research questions submitted. That tells us something.

There are, however, a few miscellaneous items that fit here.

- For VP people, the latest version of the VP Operating system is Release 1-7. It was issued on October 18, 1977. Every effort was made to distribute this release to all users. As is usually the case, however, some people did not receive the update. If you find yourself in this category, you can receive the latest release by contacting Paula Welch in Software Distribution. Request Release 1-7, VP Operating System, Part Number 701-2118F.
- The latest issue of the Software Handbook is currently available, also from Paula Welch. This is a publication which lists, by industry, software packages available from various sources. It is issued with our disclaimer because, in many cases, we haven't seen the software and you're on your own. The part number for this publication is 700-3520C.
- We received an anonymous mailer back asking who and where questions should be sent to. To that questioner, you did the right thing. Questions, comments, criticisms, etc. should be sent, the on enclosed mailer, to the Director of Consultant Relations in Lowell.
- We also received, on a mailer, a request for some VS information. Unfortunately, we don't know where to send it. If your name is D. Setyotomo, Systems Analyst, please identify yourself, send your address, and we'll be glad to fill your request.

Technical Information Center May we help you?

Jerry Boyer, Michael Chen, Chris Glueck, Nina Horowitz, Russell Howard, Ted Leonsis, Wayne Sandberg

1. **2281 Print Rates**

The Model 2281 has been conservatively rated in Wang specifications as having a print rate of 30 characters-per-second. In actuality, the print rate ranges from 30 to 45 characters-per-second, dependent upon character text printed and the print format.

With simple print statements as an output to the Model 2281, it will run at maximum speed on the T, VP, MVP, PCS and WS processors. When a series of calculations are performed along with the print statements, the print rate will be slower on the T processor due to the slower processing of the calculations, when compared to the VP. However, the print speed of Model 2281 will not change significantly.

> NOTE: The special functions of backspace, underline, line feed, carriage return, tab (etc.), consume time as the carriage must reverse direction frequently. Using an output with an excessive amount of these functions will cause the printer to appear to operate slower.

2. **Printer Paper and Ribbon Specifications.**

2221W/2221V

Paper not to exceed 11 in. (27.9 cm)
Single part forms — 15 to 20 lb bond multipart
2-ply — 15/15 lb bond — 7 lb carbon
3-ply — 15/12/15 lb bond — 7 lb carbon
4-ply — 12/12/12/15 lb bond — 7 lb carbon
5-ply — 12/12/12/12/15 lb bond — 5 lb carbon

Paper Part # — 615-0210 (14 7/8" X 11") $25/Box of 1,000 sheets

Ribbon — Fabric or Carbon Spool

725-0158 Blue/Black Ribbon (1" X 18 yds. Nylon)	$9.00 each/or, $7.00 for 10 or more
725-0159 Plain Black Ribbon	"same as above."

(1" X 18 yds. low abrasion double spooled nylon)

2231W -1, -2, -3/2231V
Paper — (12-3/4 X 11) Printer Paper
Paper Part # — 615-0217-1
Box of 1,000 sheets $25.00

Ribbon Part # — 279-0181
(2231W ribbon cartridge) $12.00 each/ $10.00 for 10 or more

2251
Paper — Continuous roll paper
3.75 in. (9.54 cm)
Paper Part # — 615-0218 6/$6.00

Ribbon — standard
Part # — 725-0161 3/$6.00

2261 W/2261V
Paper Part # — 615-0210 (14/-7/8" X 11")
Box of 1,000 sheets $25.00

Ribbon Part # — 279-5077-66$15.00
(Double spooled, 5 mil, nylon, 1-1/2" wide)

2263, -1, -2/2263V
Paper — adjustable range of paper with settings
3.5 in. (8.89 cm) minimum width
19.5 in. (49.5 cm) maximum width
0.02 in. (0.5 mm) maximum thickness
Paper Part # — 615-0210 (14-7/8" X 11")
Price $25.00
Ribbon Part # — 725-0162 Price $25.00
(5 mil nylon, black 14" X 10 yds)

2271/2271P
Paper — 13-1/8 in. maximum width
up to four copies plus original can be printed
Paper Part # — 615-0204 Price $25.00/Box of 1,000 sheets

Ribbons Part # — 725-0155 $3.00 each

2281/2281P/2281V
Paper — 15 in. (38 cm) maximum length
up to 5 copies in addition to original can be printed
Paper Part # — 615-0211 (8 1/2" X 11" cont. form)
Price $25.00/Box of 1,000 sheets

Ribbon — red and black
Part # — 725-0054-R3 $5.00 each

3. **MVP Problem**

Problem: When designing a program to perform a random disk read followed immediately by a random disk write placed in two or more partitions, all partitions will "hang-up" except the partition started first.

Solution: In order to free the peripherals, a partition must release said peripheral for a minimum of 30MS. In the tight loop mentioned above, a 30MS processing break never occurs. A delay or $BREAK placed between the reads and writes solves this indigenous MVP problem. (Release 1.1 will be updated appropriately.)

4. **Programmable Interrupt on the VP**

The BASIC-2 Language Interrupt Capability allows up to eight different external devices to interrupt execution of a BASIC program. The programmable interrupt automatically transfers program control to an interrupt processing subroutine and, subsequently, returns control to the main program. A point to consider when utilizing this feature is that all interrupt subroutines are *interrupt immune*. In addition, all levels of subroutines which are initiated from the interrupt subroutine, also, cannot be interrupted.

5. **2281P (With OP 122) Pin Feed Platen Specs**

The pin feed platen on the 2281P measures 13.2 inches and is not adjustable.
The part number for this new product is 725-0054-P2.

Software Package Listing

The trend toward cross-licensing of software packages is on the increase. The number of vendors cross-licensing and the number of requests from vendors looking for available packages indicates that there is considerable interest in this method of doing business.

Given the current size and continuing growth of Wang's sales organization, cross-licensing is very desirable. Many vendors have written software packages tailored to specific industries with many prospective customers. The number of vendors who can successfully sell and install on a national or international basis, however, is very small. Some vendors have attempted to do this only to discover that the post installation support problem becomes impossible as the number of installations increase. In addition, there are the problems of being available for demos at remote locations and of selling Mr. Small Businessman on that fact that he will be adequately supported even though the installing vendor is located as far as 3,000 miles away. Unless the package is a very small, very simple, single task function this can be a difficult objection to overcome.

A number of vendors have overcome these problems by establishing relationships with vendors in other locales. Generally, an evaluation of the software by the potential installing vendor takes place and a license agreement is established. The type of agreement and the financial arrangements vary based on many factors. Some of the considerations are:

— the size of the package
— nature of the industry
— amount of effort spent in development
— amount of effort required to sell and install
— amount of tailoring or modification typically required
— amount and type of training needed by the installing vendor
— amount of post-installation support typically required
— etc., etc., etc.

The list goes on forever. The point is, there are an infinite variety of situations governed by an infinite number of variables.

We, at Wang, feel that cross-licensing of packages can be advantageous to all parties, (Wang, developing vendor, installing vendor and customer) if it is done properly. We will not attempt to control the methods of cross-licensing; that is up to the individual vendors to determine in each specific case. We do, however, wish to be of service, wherever possible, in identifying and publicizing vendors with packages available. We also feel that we can be of assistance in expediting communication between vendors on a widespread basis. That's what this newsletter is all about.

To that end, then, we are instituting the "Software Package List." The list will be printed each month in the newsletter and listings entered will be repeated until we are told that they are no longer valid. We are hoping to list valid, credible packages. The definition of a valid package can be as variable as the types of packages themselves, but we would like to establish some direction toward that definition.

> An application system, to be considered a package, should have been designed and written with the intention of its becoming a package. A system written for a specific user and then tailored and modified for another user is not necessarily a package. A package usually contains enough generalization that large scale modifications are not required for repeated installations. Some industries have rigid enough requirements or operating methods that variations from one company to another within the industry are minimal. In some other industries this is not possible.

A package should be written with fairly simple, straightforward methods and code; commonly recognized and accepted techniques should be used. The use of Wang utilities, access methods, and subroutines can be extremely beneficial in fostering universal understanding of a package. We realize that there are no universals in this business; but, in general, the simple method is the one most easily understood. Therefore, the package with the simple, straightforward approach has a better chance of being learned and installed by a vendor many miles away.

Adequate documentation is also critical. Complete, comprehensible, accurate documentation is a necessity. It can go very far toward shortening the training time and reducing the number of expensive phone calls.

One last point which is critical to the success of a package is its operator orientation. The most successful software packages we have seen are typically the easiest to operate. We are selling to people with little, if any, data processing knowledge. The easier the system is to operate, the fewer post-installation support problems there will be. The more operating simplicity that can be demonstrated, the easier the selling job will be.

Vendors with software packages available for cross-license installation by other vendors are encouraged to list them by completing the enclosed form and returning it to my office in Lowell. We will follow up on all forms submitted.

The above is not meant to be intimidating or pragmatic. It is meant to suggest a direction toward a standard for package development. Your comments and suggestions are welcomed and encouraged.

Bob Soucy
Director of Consultant Relations

Classified Ad Section

#10 — Software

CUSTOM/ACCOUNTING/WORD PROCESSING/RECORD MANAGEMENT SOFTWARE

Sales and Inventory systems; Disbursements, Job Accounting and Payroll Record keeping; Financial Reporting; Document and Text Assembler (D.A.T.A. 1500 and 2500); Professional Time and Billing; Record Management System — installed nationwide and in Canada.

S.P.E.E.D./W.C.S. — Subroutines and Programs for the Economical Efficient Development of Wang Computer Software — cuts application software development and maintenance time and labor costs by 80 percent.

WANTED: ASSOCIATE VENDORS to sell and/or represent software products and services.

WANTED: Software packages "almost ready for market." We will complete, test, debug, document, and market — any or all under a negotiated contract.

THE OFFICE MANAGER, INC., P.O. Box 88067, 550 Industry Dr., Seattle, WA 98188 (206) 575-0946.

Last minute items

ISS Errata

ERRATA SHEET

February 20, 1978

System Name — Release

I.S.S. (on the MVP) — 3.2

(1) As of this date, GIO is not supported on the MVP Keyboard. The initial loading routines of ISS include such a statement, the effect of which is to display a loading message for a short time unless input is received from the keyboard causing the display to terminate and execution to proceed. In order to use the ISS menus on the MVP, this keyboard controlled pause statement can be deleted, without altering the logic, as follows:

PROGRAM: ISSS000A

SOURCE: 170 $GIO/001 (0210 0300 1222 8600,A$)

ACTION: Delete

COMPRESSED:

Before: 130IF S2 <> OTHEN 200:S1$="ISS RELEASE 3.2 — 08/12/77":PRINT HEX(030A0A0A0A0A0A);TAB((64-LEN(S1$))/2);S1$:$GIO/001(0210 0300 1222 8600,A$)

After: 130IF S2 <> 0THEN 200:S1$="ISS RELEASE 3.2 — 08/12/77":PRINT HEX(030A0A0A0A0A0A);TAB((64-LEN(S!$))/2);S1$

(2) A second such statement is included in the "Messages" program (ISS-020A). As of this date, no quick patch has been written for its use on the MVP.

GBS Errata

A small bug has been discovered in GBS, MOD3, the Budget Report (GENL 130A). A problem occurs only if the user's fiscal year starts in any other month than January. (i.e. fiscal year runs July through June.) There is a formula used in this program to convert the current month to an appropriate subscript for reading the correct fiscal period budget field. The formula is incorrect. It was 4490 M9 = M9 + 12 - M(14). It should be 4490 M9 = M9 + 13 - M(14).

In the above example (fiscal year = July through June). January's Budget Report erroneously showed budget figures for December.

2200 T/VP/MVP Compatibility —

A paper is being prepared explaining the programming considerations involved in converting existing software to run in the MVP environment. This paper will be issued shortly to all vendors and Wang personnel.

SOFTWARE PACKAGE LISTING

DATE: _____

VENDOR: _____

CONTACT: _____ TELEPHONE: _____

INDUSTRY: _____

APPLICATION: _____

DESCRIPTION: _____

MINIMUM H/W CONFIGURATION: _____

INDUSTRY: _____

APPLICATION: _____

DESCRIPTION: _____

MINIMUM H/W CONFIGURATION: _____

INDUSTRY: _____

APPLICATION: _____

DESCRIPTION: _____

MINIMUM H/W CONFIGURATION: _____

WANG

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To help us to provide you with the best literature possible, please make your comments and suggestions concerning this publication on the form below. Then detach, fold, tape closed and mail to us. All comments and suggestions become the property of Wang Laboratories, Inc. For a reply, be sure to include your name and address. Your cooperation is appreciated.

700-3137G

TITLE: **WANG SYSTEMS NEWSLETTER**

COMMENTS, CRITICISMS, SUGGESTIONS, ETC.

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WANG

History: Dr. An Wang earned his Ph.D. in Applied Physics at Harvard University. His early work in magnetic core memory development contributed to one of the giant steps that made computers a part of modern life. Reliable, large-capacity memory was one of the biggest needs that had to be filled before the computer could become a commercial reality.

Wang Laboratories, Inc., then started in 1951, with the idea that we could find new and better ways to fill information handling needs.

Since then, we have grown to a $135 million company, listed among the top growth businesses in the United States.

Our main manufacturing facility is located in Tewksbury, Massachusetts. Another facility in Burlington houses the Wang Data Center.

To accommodate Wang's rapid growth, we recently relocated our administrative headquarters and research and development operations from Tewksbury to a new facility in Lowell, Massachusetts, which almost doubles available floor space.

In North America, we serve our customers through over 100 Wang-staffed sales and service centers.

Our worldwide business operations employ some 3,200 people, among them 1,800 highly trained sales and systems specialists and customer engineers. We maintain 50 Wang-owned sales and service offices in 17 countries and are represented in 48 additional countries.

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