NOVADYNE™

Technical Operations
ON-LINE

Published for System Software Users

Novadyne Computer Systems, Inc. — *Santa Ana, Ca.*

Volume 5 — *Number 1* — *1st Quarter 1992*

LOGON:

New *ON-LINE* Editor

With the new year we also have a new *ON-LINE* editor. My sincerest thanks go to Terry Smithton for the tremendous job she did as the 1990-91 editor.

Editing any kind of a publication has to be a labor of love. I have been involved with *ON-LINE* since its inception and have worked behind the scenes as well as contributing an occasional article.

My goal is to make *ON-LINE* the best technical publication possible. This is no small task since I believe that, with each new issue, we have forged new ground and made improvements in one area or another; my objective is to continue that tradition.

We have always believed that *ON-LINE* is *your* newsletter and have endeavored to shape it into what we think you want in a newsletter. If no news truly is good news, then I guess we have succeeded in that effort, since unfortunately, we receive very little written correspondence. So I will take this opportunity to encourage you to drop us a line (or even phone if you prefer) with any suggestions, comments, questions, etc. Our address is on the back page. My phone number is (714) 566-2133. As always, we enjoy hearing from our customers and learning what new things we can do to delight you.

• Steve Gill

Highlights inside ON-LINE

SOME Available for Series 9000

Novadyne is pleased to announce the availability of the System On-Line Maintenance Executive (SOME) for the Series 9000 5.3 Operating System. SOME provides the ability to perform many disk drive maintenance functions while the system remains on-line and fully operational. Track formatting, verification, and retirement can all be performed on-line and remotely by a Novadyne field engineer. "The days of down time to FILE-SAVE and restore, just to repair disk errors are history," remarked Bill Kersten, Vice-President of Technical Operations. Of course, catastrophic disk failures still require drive replacement; however, the majority of disk drive failures are not of a catastrophic nature and can now be rectified without affecting system operation.

SOME is a value-added feature of Novadyne maintenance and will be installed free of charge at a mutually agreeable time by your Novadyne field engineer. To schedule installation, call Central Dispatch at 1-800-678-3399.

• Steve Gill

MARKETING

Series 14/200 a Hit

Novadyne's first production delivery of a Series 14/200 system received high marks for its outstanding performance and features from end user, Knox Tile.

Knox Tile previously operated their business with a McDonnell Douglas 1.X Series 6000 system. Their 14/200 system has 16 terminals connected to it with about 12 operating simultaneously. Knox Tile's primary application is the RESULTS Distribution Software Package and Knox representative Rich Anderson reports that terminal response

is faster with the 14/200 than with their 1.X Series 6000 system. Rich called the 14/200, "an awesome little machine."

Mr. Anderson was also impressed with the 14/200's concurrent DOS/REALITY feature and the increased productivity they have experienced. Knox Tile runs a lot of LOTUS spreadsheets and, prior to installing the 14/200, had to run them separately on PCs. Now, all their data processing needs are being met by the Series 14/200.

The Series 14/200 supports up to 16 REALITY serial connections plus the console. It also supports two parallel Centronics interface printers. The 14/200 can be configured with up to 1.3 Gb of hard disk. A 1.44 Mb 3.5-inch diskette drive and a 150 Mb quarter-inch tape drive are provided as standard equipment for data interchange and file backups.

Series 14/200 users will be able to upgrade their system (while retaining their entire investment) later this year for increased connectivity and greater performance.

For more information on the Series 14/200, contact your Authorized Novadyne Reseller.

- Fred Landis

Novadyne Disk Exchange Program Expanded!

Novadyne launched a program some time ago, offering low priced disk exchanges in support of customers with expanding disk storage requirements. This program has been highly successful and many users have taken advantage of this economical means of keeping abreast of their disk needs. Also, many of the Series 6000 users have gained significant disk I/O throughput improvement as a result of upgrading their disk subsystems to newer technology with 18 millisecond (ms) average access in place of older 33ms average access drives.

Along with this upgrade, their system benefits by the addition of 2 Mb Disk Cache Controllers and the ability to expand memory to 4 Mb instead of a 2 Mb memory maximum.

The disk exchange program has recently been expanded to include the 670 Mb disk drives. Ask your Authorized Novadyne Reseller for information on how to configure one or more of the following Models:

Series 6000	Model	Description
	6-1896	Primary 300 MB Disk Exchange w/Cntlr
	6-4398	300 MB Disk Exchange
	6-1898	Primary 670 MB Disk Exchange w/Cntlr
	6-4399	670 MB Disk Exchange

Series 18	Model	Description
	18-1897	300 MB Disk Exchange
	18-1898	Primary 670 MB Disk Exchange w/Cntlr
	18-1899	670 MB Disk Exchange

Note:

Configuration rules must be observed when ordering disk exchanges. There are many configuration dependent compatibilities that must be maintained between disk drive type and disk controller type. Contact your Authorized Novadyne Reseller for configuration management assistance.

When replacing older disk drives with new larger disk drives, it is important not to reduce the number of drives. All Series 6000 and Series 18 systems are designed to take full advantage of overlapped seeks on all drives possible. Therefore, reducing the number of drives can reduce the effects of this feature on overall system performance.

- Hugh Sheean

Novadyne Gearing Up for Spectrum '92

Preparations are well under way for this year's Spectrum Manfacturers Trade Show to be held at the Anaheim Convention Center April 21-23, 1992. Novadyne's theme for this year's show will center around new product orientation and how these products complement our current offerings. Some highlights include:

* NovaPort Asynch Expander for Sun Microsystems connectivity
* Series 14 for multi-user DOS and REALITY
* Series X for parallel symmetrical multi-processor multi-user REALITY and UNIX
* PCi (Personal Computer Integration) for high speed multi-session LAN Terminal Emulation and File Transfer, NetBIOS Network Bridging and a 'Toolkit' for integrating PC-based applications with REALITY host systems.
* A "surprise" showing Novadyne's commitment to be a Price/Performance leader in the REALITY/UNIX marketplace.

In addition, we will be 'teaming up' with one of our Value Added Dealers, Creative Synergy, to show how powerful and solutions-oriented our combined integration capabilities really are.

It will be an exciting show with abundant opportunities to attend the many product and educational sessions being offered. We are pleased to be able to provide you with a free pass compliments of International Spectrum. Be sure to stop by and see us in booth 553. We look forward to seeing you!

- Pat Dwight

Booth	Company
414	ADDS/NCR
858	ADDS Displays Division
242	Alcyona Computer Group
522	Alpha Microsystems
257	Atkin/Jones
529	Automation Consultants
259	Cambex
367	C. Hoelzle Associates/ American Computer Hardware
337	Cableworks
157	Cherokee Systems/ Myers Computing Solutions
760	Central Data
608	COGENT Information Systems
342	Comprehensive Computer Services
730	Computech Incorporated
745	Computer Clinic
743	Comtrol
461	Cornerstone Data
652	Creative Synergy
358	Data Base Publications
348	Data General
503	Deltec
137	Dickens Data Systems
820	Digital Equipment Corp.
657	EDI Able
734	Emulex
246	Everex
361	Exide Electronics
617	First Choice
422	General Automation
453	GP Solutions
339	Group Three Electronics
237	Hall-Mark Electronics
748	Hewlett-Packard
505	Hitech Systems
243	Houston Data Center
408	IBM
666	IDBMA, Inc.
344	Ingram Micro
604	IntoX
531	Intuitive Technology
163	JES & Associates
848	KEO/SOFT International Corp.
637	Merit Digital Systems Corp.
605	Microdyne
832	Mini Business Systems/ Saguaro Data Systems
230	Modular Software Corp.
460	Motorola, Inc.
436	NCE
615	NIS
★ 553	Novadyne
236	Online/AAA Power
262	Orange County Business Journal
250	Pick Systems
708	PICKTel
660	Point Information Network
500	Prime Computer, Inc.
552	PROMARK
514	Pyramid Technology
628	Rag Software
714	RC Electronics
715	Reseller Magazine
635	Revelation Technologies, Inc.
457	Rimage Corporation
622	R.O.I. Syngineering/Vertex, Inc.
631	Royce Digital Systems, Inc.
523	RTW, Inc.
659	San Diego Pick Users Group
530	SANYO/ICON
508	SB Tech
322	Sequent Computer Systems
642	Sequoia Systems, Inc.
808	SMI
256	Solid Logic
742	SYNEX Systems Corp.
222	Tandem Computers
661	Target Data, Inc.
231	Tingley Systems, Inc./ Integrated Applications
614	Texas Instruments
630	THOR Agency, Inc.
448	The Ultimate Corp./ Apscore North America
330	UniData
335	USC Software Systems
430	VIA Systems
634	VMark Software
454	Word Marc/IQ Software
434	Western Telematic
736	Wizard Software
338	Wyle Laboratories
442	Wyse Technology

Ware-House:
Interstate Network Services
Lightening Systems, Inc.
Mountainside Software
Spectra Logic

IDBMA, Inc.'s INTERNATIONAL Spectrum

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April 21-23, 1992

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Anaheim, California

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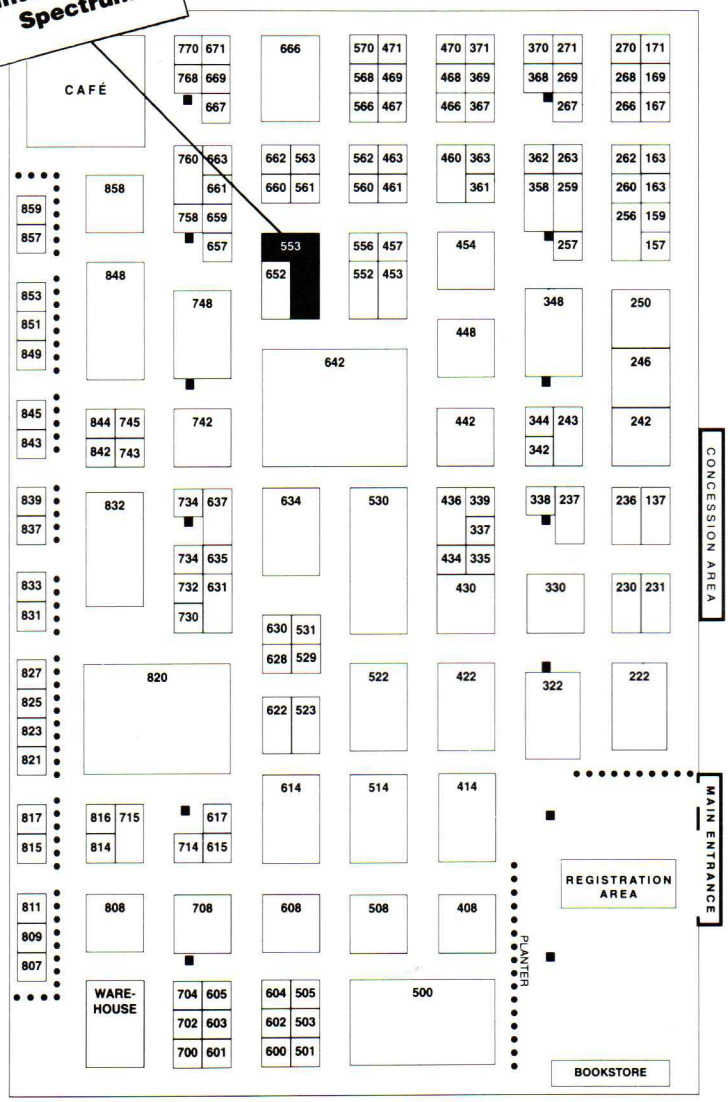


8mm Tape Backup Available for Series 9000

Novadyne is pleased to announce the availability of an 8mm tape backup device for Series 9000 systems using the REALITY 5.3 Operating System. The 8mm tape backup has been available on Series 6000 and Series 18 systems since the 1st quarter of 1991.

The 8mm tape drive can store up to 2.3Gb of data on a single 112 meter 8mm data grade cartridge. It has taken MegaTape (the drive manufacturer), McDonnell Douglas Information Systems and Novadyne a full year to complete development and certification of this 8mm tape unit. This exceptional effort was made to ensure that the integrity of your system and database is maintained.

8mm tape drives daisy-chain to existing M29000 Streamer Tape Drives in Series 9000 systems. On systems where there are already two M29000 1/2-inch tape drives, it will be necessary to add a second tape controller and move one of the 1/2-inch drives to the new controller. On systems with four 1/2-inch tape drives, one of the drives will have to be eliminated in order to accommodate the 8mm drive.

As mentioned in previous issues, only the MegaTape unit as sold through Novadyne's Authorized Resellers will be supported and accepted under maintenance.

- Brian McKinstry

Did You Know???

While Novadyne is the maintenance provider for your McDonnell Douglas computer systems and related peripherals, we *also* maintain DEC, Sun and Tandem systems. Novadyne services customers on a nationwide basis in the government, health, manufacturing, communications, retail and banking industries, as well as many others.

If your company would like to explore the advantages of having a single-source maintenance supplier and you have Tandem, DEC or Sun systems, please call Leslie Cavic at (314) 739-6336. She will be happy to prepare a custom proposal for you and show you how all of your MIS operations may receive the benefits of Novadyne's service expertise that you currently enjoy on your McDonnell Douglas hardware.

Penril Sale

NovaDirect (Novadyne's Catalog Sales unit) is offering great savings and unprecedented warranties on selected Penril products through the month of April. This is *not* a stock reduction, but true discounts on leading edge technology modems and multiplexers.

Order Number	Description	Catalog Price	Sale Price
3-3616	Penril Alliance V.32 Modem	$995	$795
3208	Penril VCX-100 8-Port Mux	$1,295	$1,100
3216	Penril VCX-100 16-Port Mux	$1,995	$1,750

In addition to these substantial discounts, Novadyne is also offering one year warranties (one month on site, eleven months return-to-factory) on the above products! And, as with all NovaDirect products, we service what we sell.

For more information or to receive a catalog, give us a call at (800) 926-6823.

- Charlotte Chadwick

STARPOWER

Inserting Null Attributes

It seems like everyone has their own unique method for inserting null attributes with the Line Editor. Some people insert a character of their choosing (like a period) and then R/.// to replace it with a null. Others insert an attribute mark *(Control^)*, which actually creates two null attributes, and then delete the extra one.

The following method is undocumented (as far as we can tell), but seems to work on everything from .3 forward. Use the 'G' command or just enter the line number after which the null attribute is to be inserted. Then at the '.', enter 'I space Return.'

```
004 This is a test.
.I  <cr>
```

Flip the item and then display it and you will see that you have one null attribute on line 005.

- Steve Gill

Editor TR Command

Also under the heading of undocumented features is the Line Editor 'TR' command. This command seems to have appeared in the '.3' releases (2.3, 5.3, 6.0). Even though it has not been documented, it works quite well and it is not likely that it will ever be removed. TR stands for TRuncate or TRim if you prefer. TR/X will delete everything in an attribute beginning with the first occurrence of X. 'X' can be a single character or a string of characters.

```
004 This is a test.
.TR/is

004 Th
```

Since truncation begins with the first occurrence of 'X' (as with all Editor functions), be sure to specify enough characters in the string so as to accurately identify the data to be eliminated.

- Steve Gill

More On Printer Slow Down

In the last issue of *ON-LINE* we discussed some causes of printer slow down that were related to the operating system. There are also a number of hardware considerations that can have an effect on printer throughput.

Insufficient BAUD Rate : A printer operating in serial mode connected to an asynchronous port may run slowly if the BAUD rate is not sufficient to keep the printer operating at its rated capacity. The number *.045* can help you in these situations. By multiplying the BAUD rate times .045, the product will be the approximate number of lines per minute that can be printed for that BAUD rate at 132 characters per line (CPL). For 80 column printers, multiply by .075. Both of these constants assume worst-case conditions (e.g., every line of print has 132 or 80 characters).

These constants also work to give you the required BAUD rate for a particular printer. If you have a 300 LPM printer, divide 300 by .045 to determine the BAUD rate required to allow the printer to operate at its rated capacity (300 -:- .045 = 6666). Since this is a non-standard BAUD rate, increase it to the next standard BAUD rate which is 7200.

Character printers are a bit easier to figure out since they are usually rated in characters per second (CPS). It is easier because BAUD rate refers to the number of bits per second (more or less). This is made even simpler when you consider that each character is made up of approximately 10 bits (including overhead). This means that at 4800 BAUD, a printer should be able to print at 480 CPS (4800 -:- 10). Conversely, if you have a 300 CPS printer, it will need to run at a minimum of 3000 BAUD to avoid significant slow downs. Again, 3000 is non-standard, so bump it up to 3600.

Following is a summary of the six equations discussed above:

```
BAUD rate x .045 = LPM (@132 CPL)
BAUD rate x .075 = LPM (@80 CPL)
LPM -:- .045 = required BAUD rate (@132 CPL)
LPM -:- .075 = required BAUD rate (@80 CPL)
BAUD rate -:- 10 = CPS
CPS x 10 = required BAUD rate
```

[LPM = Lines Per Minute; CPL = Char. Per Line; CPS = Char. Per Second]

Printer Buffer Too Small: Most serial printers have an input buffer that receives the data to be printed from the system. Some printers have a buffer of a fixed size; others (Printronix, for one) have adjustable buffers. If a printer has no buffer at all, or the buffer size is set too small, the printer may pause noticeably depending on system loading. The best way to avoid this is to set the buffer to its maximum capacity and to set the BAUD rate as high as possible. This will put as much data as possible per timeslice into the printer's buffer. (Remember, do not set P-LAN ports higher than 9600 BAUD.)

Data Transmission Problems: If your printers are connected to the system through a modem or mux of some sort, you could be experiencing bandwidth saturation problems with the mux or data transmission errors/retries with either the modem or the mux.

With this in mind, be aware that P-LAN Nodes are, in effect, muxes of sorts. Therefore, three or four printers connected to one Node, set for high BAUD rates, and all trying to print at one time, may result in printer slow downs. To optimize printer distribution, try not to put more than one or two serial printers on each Node if they will receive heavy usage.

Likewise, it may be desirable to balance devices with heavy input/output demands across the two channels of the P-LAN Controller. (Each P-LAN Controller has two channels, each supporting 63 physical ports. Contact your Field Engineer if you think you may have a load balance problem.)

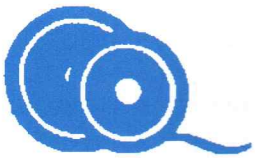
P-LAN Errors : If the system is logging P-LAN errors, there is some level of data retransmission taking place. If severe enough, this can cause both serial and parallel printers (as well as terminals) to slow down. (P-LAN errors are not a normal occurrence and should be reported.)

System Very Busy : There may be times of peak system usage when both serial and parallel printers run slowly. These occasions should be rather obvious and, most likely, pauses during printing will be the least of your concerns.

- Steve Gill

ROS

Wild Carets



The REALITY Operating System has a special feature that has come to be referred to as the 'wild card'. This so-called wild card is the ^ character; also sometimes called a *caret* or *up arrow.* On most keyboards, the ^ is a Shift 6. The wild card can be used in both the Line Editor and in ENGLISH to accomplish similar objectives.

In the EDITOR, it is used to delineate "don't care" or "ignore" characters in conjunction with the L (Locate) and R (Replace) commands. For example:

```
004 7033180845
.R/^^^/714

004 7143180845
```

replaces the first three characters in line 004 (no matter what they may be) with 714. Practical applications for this feature may not be immediately apparent, but consider the following examples.

How many times have you found garbage data or spurious characters imbedded in your data? Many control characters are unprintable and, therefore, displayed as periods. If you are the curious type, you will probably want to go into the HEX Mode and see what the character really is. Learning the hex value of a character may provide some clues as to how it got there. If you are not so inquisitive and just want to get rid of it, consider the following example:

```
005 The quick brown fo.  jumped etc.
.R/fo^/fox

005 The quick brown fox jumped etc.
```

The following example results in a null attribute:

```
005 The quick brown fox etc.
.RU/^//

005
```

This last Editor example replaces all characters in an attribute with some other specified character (asterisks in this example).

```
005 The quick brown fox etc.
.RU/^/*

005 ************************
```

If you have data that actually contains up arrows (such as RUNOFF documents) you will probably want to disable the caret function. The wild card function can be disabled by entering ^ at the Editor prompt as below:

```
TOP
.^
.^OFF
```

The wild card is probably most useful in ENGLISH. It can be used to designate don't care characters or strings in both item-id's as well as data attributes.

If your item-id's are chosen arbitrarily and have no relationship to the data, then the following examples may not be very meaningful. Many users, however, have item-id's that are very meaningful and often reveal much about the data contained within. DMV, for example, may use vehicle license numbers as item-id's to store information about vehicles. Novadyne, as you probably already know, uses the date and a sequential number to assign item-id's to incidents opened through Central Dispatch. The following examples show some possible uses for the wild card when selecting item-id's.

:SELECT {filename} = '^^^'	will select all item-id's that are exactly three characters in length.
:SELECT {filename} = '1^^^'	will select all item-id's that begin with 1 and are exactly four characters in length.

The second example above could be used instead of the longer statement:

```
:SELECT {filename} GE '1000' AND LE '1999'
```

←as it will select all item-id's between 1000 and 1999 inclusive.

The same rules apply for using the wild card with data attributes.

```
:SELECT {filename} WITH PHONE = "703^ ^ ^0845"
```

will select all items with a phone field that is exactly ten characters in length, the first three being "703" and the last four being "0845".

Note:

If the Attribute Definition for PHONE has a Correlative Code that adds ( ) and - to the phone number output, the above example will indicate "NO ITEMS PRESENT" since it is looking for

something 10 characters in length when the data is actually 13 characters in length [e.g., (703) ^ ^ ^-0845].

The wild card is particularly useful when playing detective or in dealing with situations where all the information desired is not available. For example, an eye witness to a hit and run accident may have an incomplete description of the fleeing vehicle, but using the wild card in the following ENGLISH sentence will definitely narrow the list of suspects.

```
:SELECT VEHICLES = '1MS^ ^ ^7' WITH COLOR = "WHITE"
AND WITH MAKE = "TOYOTA" OR "MAZDA"
```

This sentence will identify all white Toyotas and Mazdas with license numbers seven characters long, beginning with "1MS" and ending with "7".

At the risk of generating more mail than *ON-LINE* has received to date, the following example will assist WORDMATE users in tackling those nasty New York Times crossword puzzles. Clue: a five letter word for 'Emulate Cicero' with the first letter 'o' and the fourth 't'.

```
:LIST MASTER-SPELLING-GLOSSARY = 'o^ ^t^'
```

This should list two possibilities, the first, I suspect, is incorrect. A word of caution; don't try this during peak usage times as it may have an effect on response time.

Hopefully, you have already thought of some uses for this feature which apply to your own data and are anxious to get to the keyboard to try them out. Please let us know about any other unique applications you may discover for the wild card.

- Steve Gill

Current OS Releases And Patches

The following table contains the most current Operating System (OS) revisions and patch levels for each supported system. Novadyne Computer Systems, Inc. is responsible for installing all REALITY Operating System patch tapes. If your computer system is under maintenance with Novadyne, OS patches will be installed as a value-added service at a time mutually agreeable to you and Novadyne. Systems not under Novadyne maintenance may have OS patches installed on a billable basis.

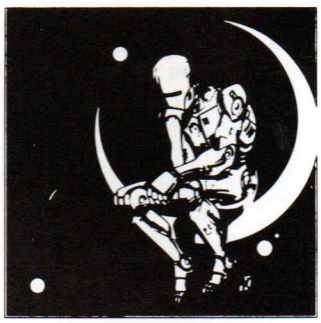
If you do not have the current patch tape installed for your particular Operating System, please contact your Field Engineer (FE) through Central Dispatch to schedule a time for installation.

Series	Release	Patches (PP = Paper Patches)
4700	4.3RevD	PP1-2
6000	2.3RevD	RevC Tape (Includes PP 1-175)
	1.1RevD	RevB Tape
	7.0RevP	Block Tape 4 Courtesy Tape C
6000 Enhanced	2.4RevA	RevA Tape (Includes PP 1-175)
	7.0RevP	Block Tape 4 Courtesy Tape C
9000	5.3RevD	RevD Tape (Includes PP 1-157)
	1.3RevC	RevA Tape
18	6.0RevF	RevC Tape (Includes PP 1-165)
	7.0RevP	Block Tape 4 Courtesy Tape C

Correction: The matrix contained in the last issue incorrectly listed Release 7.0 for Series 9000. This was an oversight and we apologize for any confusion it may have generated.

- Mike Bingman

THINK TANK



[This installment of Think Tank is Part One of a two-part series on new features and functionality of REALITY 7.1. REALITY 7.1 is currently undergoing Alpha testing in the United Kingdom and is scheduled for U.S. production release during the third quarter of 1992. Many thanks to Henry Eggers for taking time from his busy schedule to share this sneak preview of 7.1 highlights. -Ed.]

REALITY 7.1

ROS 7.1 is a relatively small release, compared to 7.0, which was intended to demonstrate rapid turnaround and the delivery of the features desired by marketing, to marketing's time-table. It has been successful in this, and includes some other things which may be of interest.

Logging Spooler Files

Logging Spooler Files includes print files, which are now held in data files, so that they may be easily and naturally included in Transaction Logging. There are a number of other significant advantages achieved by keeping all Spooler data in files, which we will consider below.

In order to make the recovery of failed machines faster and more straightforward, a number of extensions have been made to Transaction Logging. The first is Logging To Non-virtual Disk.

Logging To Non-virtual Disk

What this means is that there may be one or more disks which are not part of the virtual address space attached to a system, and that one or more of these non-virtual disks may be taken to be a rotation of tapes. When logging to non-virtual disk, a non-virtual disk server process writes each 'change' to the system on the non-virtual disk sub-system in sequence.

Some of these 'changes' relate to the transaction management environment, such as 'FILE-SAVE started here' or 'checkpoint here.' These delimit 'volumes' on the disk subsystem. Others are the data which is written into the volumes, such as transaction boundary markers, item updates, or increments of print files. If there isn't a 'volume' delimiter for 'too long' (about 10 percent of the disk subsystem devoted to non-virtual disk), the process will write a 'default volume marker.'

The intent of the default volume marker is so that, when the non-virtual disk fills up, the system doesn't have to either say 'mount new disk,' or simply invalidate all of the contents of the system. Rather, the process continues to write in the now new volume, leaving the next volume mark as the 'beginning' of the non-virtual disk -- the place where the oldest data resides. Of course, how old this data is depends on how fast the system is updating and how much disk there is.

The structure of the 'volumes' is displayable and usable by a family of verbs. These enable the system manager to determine how much data is in each volume, how old it is, the reason for the volume marks, and to set particular marks at the beginning and ending points for Transaction Logging restores.

The particular advantage of disk over tape is that multiple processes may be restoring simultaneously, while the system process is writing to the non-virtual disk. For the purposes of bringing a failed system current, the non-virtual disk has the advantage of being able to transfer the data by Ethernet rather than 'sneaker net,' and it can record current updates while transferring the past updates.

When the remote restore process gets 'close enough' to the active machine, the restore process switches its data source to the Transaction Logging table. When this occurs, the secondary machine is being updated from the table of current transactions, while the non-virtual disk is also being updated from this table.

Multiple Machine Transaction Logging

Since the updates to the secondary machine are to its transaction table, its non-virtual disk can also receive all transactions from another process, while the log-to-database process on the secondary is updating the same files as the users are updating on the primary machine.

In general, several 'log-to-node' processes, (which send to other machines), a log to non-virtual disk process, a log to tape process, and (on the secondary machine) a log to database process, which puts the data back on file, may run concurrently from a single table.

Also, the table may receive data from users on its own machine, and from other machines' log to database processses, resulting in both bi-directional and multi-directional Transaction Logging. This is assisted by having the originating machine's name in each transaction record, so that a cluster of machines can't get into an endless loop of updates.

More Transaction Logging and Management Features

The use of Transaction Logging is simplified by the addition of a number of new or refined capabilities. There is a 'shut-down' process which aborts all open transactions. For instance, there is a 'checkpoint' command which allows all open transactions to complete, but none to start, in order to have a 'clean' FILE-SAVE start. There is the ability to redirect a log process from one device to another, (or from one kind of device to another), so that one could switch from one tape drive to another, (or from a failed network to a tape drive), if need be.

For those with a lot of tape or disk, we offer the 'audit trail' capability, which will save the before-and-after image of every item updated. We have also improved the performance of both the transmission system and the database update processes, to the point that the log to database can be expected to stay ahead of most normal update operations. This is impressive, given that what's actually happening here is that we are funneling the update activity of a multi-process timesharing machine into a single-threaded single process. As with the FILE-SAVE, there are cases which will cause the restoring process to slow down.

Spooler Data In Files

The Spooler data has moved to files, with the intent to retain the look and feel of its predecessor on 7.0 and earlier releases. There are a few things to note, however.

Because print jobs are in files, they are protected by update and retrieval keys rather than passwords. Any file may, of course, be the file where print files are kept by any particular user, which means that print files are not 'all in one place.' The 'view' of the Spooler subsystem given each user is through their specified print job file so that different users see different Spooler data sets.

The control data for all of the spool jobs on the machine is kept in a single file. This file contains an item for every print job on the machine, including such control information as the file name and item name of the actual print job, size, status, owner, and so on. Print files and print job control data are FILE-SAVEd and may be Transaction Logged.

Specification of the file into which the print files are to be stored is done by the SP-ASSIGN verb, as is the 'job name' which is the prefix of the item-id, and a 'job description,' which is held in the print job control record. If 'job name' is not specified then ascending numerics, which are not resident in the specified file as item-ids, will be used. If 'job name' is specified, that will be used, unless that name is already an item-id in the specified file. If it is, a numeric will be right concatenated to 'job name,' which numeric is incremented until one is found that isn't on file. The number of print files is only limited by the storage capacity of the machine.

Printed Page Size Comes From The Form Queue Definition

SP-ASSIGN will also change the printer page width and page depth of the process to that defined for the form queue; this will be overridden if a TERM statement changes these values later.

Each printer can now operate on more than one form queue, and each form queue can be operated by more than one printer. Each form queue specifies whether a banner is to be printed before each job, as well as a prolog and epilog to wrap around each job. These are intended to setup a laser printer for the particular printer characteristics required for all jobs in a particular printer queue. All of this information is file resident, of course.

Each printer is represented by a phantom process which takes care of that printer. The result being that there is no difference between a parallel printer, a serial printer or a network printer. All printers are activated by starting a device named in the NETDEVS file. This data structure contains all of the information necessary to make any possible connection. This means that it is possible to connect to an arbitrary printer in an X.25 or an Ethernet network.

What isn't allowed is attaching a printer locally connected to another machine. In that case, spool the print job to a file local to that machine, with the SP-ASSIGN indicating the form queue associated with the desired printer.

The capabilities in the Spooler menu system have been extended both to take advantage of the extended underlying data, and to control the added possible complexity. Most of the utilities are now written in BASIC rather than Assembly code. Additionally, a Spooler Maintenance routine includes form queue, despooler, and prolog and epilog maintenance routines. In short, there are many more things which the 7.1 Spooler can now do, and it will be easier to do them.

Actually, there isn't a Spooler any more. The process is gone, leaving phantom processses for each printer, and data structures and routines to be used by all of the user tasks. No more hung Spooler!

The network subsystem has been extended to allow alternate routing, multiple route load balancing, and route definition by naming a logical device, as above. The General Asynchronous Driver has particularly benefitted.

The SSM function has also been extended to include the maintenance of the network files information.

- Henry V. Eggers
  Manager, Operating Systems Development
  McDonnell Douglas Information Systems International

[In the next issue, Henry will cover DATA/BASIC, Printer Independence, ENGLISH, PROC and various system maintenance enhancements. -Ed.]

PGM

Preventive Programming

I recently received a call from a fellow employee for whom I had written a data entry program. She said that she had entered several items, but could not retrieve them for updating. She had entered the items several times. When the file is listed, the item-ids show up in the listing, but could not be displayed on the screen.

When I teach a DATA/BASIC Programming class, I always stress the importance of writing programs to test for incorrect input. Well, I didn't follow my own advice. It never occurred to me that the data entry person would use the arrow keys (in-

cont'd on page 11

stead of the destructive backspace key) to correct input!

The items went into the file with the cursor control keys as part of the item-id. When a LIST is done on the file, the offending item-ids appear to be correct.

```
LIST FILE      character          hex
1ABCD       12345....ABCD    3132333435151515154142434 4
```

Character 15 is the left arrow key. So, the actual item-id included the left arrow keys. So I changed the DATA/BASIC program to allow only the use of the "typewriter" keys. See lines 37 - 40 and 162 - 164.

```
022 ********** SCREEN DISPLAY SECTION *********
023 !
024 10   PRINT ERASE
025      PRINT @(20,0):"***** MANUALS MAINTENANCE *****   ":TIMEDATE( )
026      PRINT @(20,2):"DOC No., 'END' or <CR> to add: ":@(70):
       @(-128):@(50):@(-132)
027      PRINT @(5,4):"1. TITLE          :"
028      PRINT @(5,5):"2. MANUFACTURER    :"
029      PRINT @(5,6):"3. SYSTEM          :"
030      PRINT @(5,7):"4. COPYRIGHT       :"
031      PRINT @(5,8):"5. # OF PAGES      :"
032      PRINT @(5,9):"6. STORAGE LOCATION :"
033      PRINT @(5,10):"7. MASTER (Y/N)    :"
034      PRINT @(5,11):"8. TYPE (X = NEW)  :"
035      PRINT @(52,2):
036      INPUT ID
037 FOR I = 1 TO LEN(ID)
038 XX = SEQ(ID[I,1])
039 IF XX >= 32 AND XX <= 90 THEN NULL ELSE GOSUB 900
040 NEXT I
041 12   IF ID = "END" THEN GOTO 999
042 !
.
.
.
162 900 PRINT @(5,22):"ILLEGAL CHARACTER":
163 INPUT JUNK
164 GOTO 10
```

The input program is fixed. Now, to find and convert the bad items:

```
  FIX

001     * BP FIX
002     * WRITTEN BY J. McWILLIAMS & W. EDWARDS; JAN 23, 1992
003     * REMOVES CONTROL CHARACTERS FROM FILE
004     *
005     ********** INITIALIZATION **********
006     *
007     CLEAR
008     OPEN 'CARS' TO FILE ELSE STOP 201,'CARS'
009     EQUATE BKARW TO CHAR(21)
010     SELECT FILE
011     *
012     ********** SELECTION - REPLACEMENT SECTION **********
013     *
014     LOOP WHILE READNEXT ID DO
015       READ ITEM FROM FILE,ID THEN
016         ARWS = COUNT(ID,BKARW)
017         IF ARWS THEN
018           DELETE FILE,ID
```

```
019          NID = ''
020          X=0
021          LOOP
022            X=X+1
023            IDCHAR=ID[X,1]
024          UNTIL IDCHAR = '' DO
025            IF IDCHAR = BKARW THEN
026              NID.LEN = LEN(NID)
027              NID = NID[1,(NID.LEN-1)]
028            END ELSE
029              NID = NID:IDCHAR
030            END
031          REPEAT
032          WRITE ITEM ON FILE,NID; *** writes the new item to disk
033        END
034      END
035    REPEAT
036    *
037    END
```

This program found all the items with the arrow keys in the item-id, stripped them out, and corrected the item-ids.

- Joan McWilliams

MSGing on 7.0

Ports on 7.0 do not have a constant connection but require a circuit to be built when a port logs on. For this reason it is not feasible for the MSG (message) verb to send a message to a port until it logs on. The following program, however, will send a message to all ports *not* logged on by building a circuit to do so.

This program is setup to run from the SYSPROG account. If you wish to run it from another account then change 'SYSPROG' to the desired account name. (See line 70 of the GMSG program below, to make the change.)

To enable this program, a data section in the PORTS file is required. On the SYSPROG account, create a data section in the PORTS file called MSG.

```
CREATE-FILE PORT,MSG 11 (Inn)
ACCOUNT-NAME:SYSFILES
```

A user named 'GMSG.SERVER' must be set up and must be of type 'server'. (Refer to the *Configuring and Securing the System* manual in the 'Setting Up System Security' chapter for details on adding a user.)

Enter the following programs exactly as shown, then compile and catalog both programs. To execute, at TCL enter GMSG and when prompted enter a message to send. As the message is sent to each port a 'message sent' message will display.

```
Program GMSG
001 **** THIS PROGRAM OUTPUTS MESSAGES TO PORTS THAT ARE NOT LOGGED
002 **** ON.  THE PORT MUST BE DISSCONNECTED TO RECEIVE THE MESSAGE.
003 **** THIS PROGRAM 'GMSG' AND THE SERVER PROGRAM 'GMSG.SERVER' MUST BE
004 **** EXECUTED FROM A USER THAT IS ENABLED FOR INTERACTIVE PROCESSING.
005 **** PORTS FILE MUST HAVE DATA SECTION CALLED 'MSG'.
006 ***    CREATE-FILE PORTS,MSG 11 (I) {account name SYSFILES}
007 EQU AM TO CHAR(254), VM TO CHAR(253)
008 OPEN "ROUTE-FILE" TO ROUTE.FILE ELSE STOP 201,"ROUTE-FILE"
009 OPEN "PORTS" TO PORTS.FILE ELSE STOP 201,"PORTS"
010 OPEN "PORTS,MSG" TO PORTS.MSG.FILE ELSE STOP 201,"PORTS,MSG"
011 OPEN "DEVICES" TO DEVICES.FILE ELSE STOP 201,"DEVICES"
012 CLEARFILE PORTS.MSG.FILE
013 INTERACTIVE=NOT(SYSTEM(10))
014 ITIME=TIME()
015 IDATE=DATE()
016 IF INTERACTIVE THEN
017       PRINT "Enter message, use blank line to finish, port number will
          be appended to last"
```

```
018         PRINT "non-blank line. The following will be converted: @B = bell
            , @N = system name"
019         PRINT "@T = time , @D = date, @W = day of week, @P = port number."
020         PRINT "Use @d and @w for lower case output"
021         PRINT "Use / to replace previous line"
022         PRINT
023 END
024 N=0
025 MSG=""
026 LOOP
027         N=N+1
028         IF INTERACTIVE THEN PRINT "Line ":N:@(-4):
029 INPUT MSG.LINE
030 UNTIL MSG.LINE = "" DO
031 IF MSG.LINE = "/" AND N > 1 THEN
032         N = N - 2
033         PRINT @(-10):@(-10):
034 END ELSE
035         MSG.LINE = CHANGE(MSG.LINE,"@B",CHAR(7))
036         MSG.LINE = CHANGE(MSG.LINE,"@N",SYSTEM(52))
037         MSG.LINE = CHANGE(MSG.LINE,"@T",OCONV(ITIME,"MT"))
038         MSG.LINE = CHANGE(MSG.LINE,"@D",OCONV(IDATE,"D"))
039         MSG.LINE = CHANGE(MSG.LINE,"@d",OCONV(IDATE,"D":VM:"MCT"))
040         MSG.LINE = CHANGE(MSG.LINE,"@W",OCONV(IDATE,"DWA"))
041         MSG.LINE = CHANGE(MSG.LINE,"@w",OCONV(IDATE,"DWA":VM:"MCT"))
042         IF INTERACTIVE THEN PRINT @(-10):CHANGE(MSG.LINE,"@P",SYSTEM(1
            8)):@(-4)
043         MSG  = MSG.LINE:" "
044 END
045 REPEAT
046 PRINT
047 PERFORM "SSELECT PORTS" RTNLIST PORTS.LIST CAPTURING STUFF
048 PERFORM "SSELECT DEVICES = 'PLAN]' " RTNLIST DEVICES.LIST CAPTURING STUFF
049 D=0
050 LOOP
051         D=D+1
052 UNTIL DEVICES.LIST<D> = "" DO
053         READ DEVICES.FILE.REC FROM DEVICES.FILE, DEVICES.LIST<D>THEN
054         DEVICES.LIST,2=DEVICES.FILE.REC:DEVICES.FILE.REC<3>
055 END
056 REPEAT
057 N=0
058 LOOP
059         N = N + 1
060 WHILE NUM(PORTS.LIST ) AND PORTS.LIST  NE "" DO
061 WRITE MSG ON PORTS.MSG.FILE,PORTS.LIST<N>
062 READ PORTS.FILE.REC FROM PORTS.FILE,PORTS.LIST <N> THEN
063         IF PORTS.FILE.REC<10> =2 AND PORTS.LIST <N> # 0 AND PORTS.LIST
            <N> #  SYSTEM(18) THEN
064         CTRLCHAN = PORTS.FILE.REC<2>:PORTS.FILE.REC<3>
065         D=0
066         LOOP
067                 D=D+1
068         UNTIL CTRLCHAN = DEVICES.LIST,2 DO REPEAT
069         *** On following line change SYSPROG to account this
            program is run from ***
070         CONNECT SYSTEM(52):AM:"SYSPROG":AM:"GMSG.SERVER" TO MSG.SESSION
            TIMEOUT 1 SETTING ERR.NO THEN
071                 PORT.DATA=DEVICES.LIST,1:AM:PORTS.LIST :AM:MSG
072                 SEND PORT.DATA TO MSG.SESSION THEN PRINT "MSG SENT ":
                    PORTS.LIST ELSE PRINT "FAILED TO SEND MESSAGE"
073                 DISCONNECT MSG.SESSION ELSE NULL
074                 RQM
075         END ELSE PRINTERR ERR.NO
076     END
077  END
078 REPEAT
079 END
```

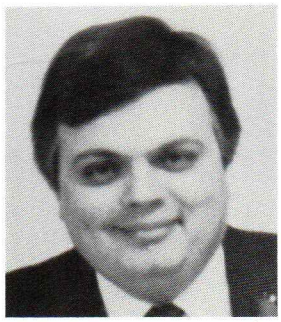
Program GMSG.SERVER

```
001 EQU CR TO CHAR(13), LF TO CHAR(10)
002 OPEN "ROUTE-FILE" TO ROUTE.FILE ELSE STOP 201,"ROUTE-FILE"
003 OPEN "PORTS,MSG" TO PORTS.MSG.FILE ELSE STOP 201,"PORT,MSG"
```

```
004 ACCEPT "GMSG.SERVER" TO MSG.SESSION TIMEOUT 1 ELSE STOP
005 RECWAIT PORT.DATA FROM MSG.SESSION ELSE STOP
006 DISCONNECT MSG.SESSION ELSE NULL
007 READU MSG FROM PORTS.MSG.FILE,PORT.DATA LOCKED STOP ELSE STOP
008 READU ROUTE.FILE.REC FROM ROUTE.FILE,"GAD.MSG.PORT" ELSE NULL
009 MSG = CHANGE(MSG,"@P",PORT.DATA)
010 ROUTE.FILE.REC = "C"
011 ROUTE.FILE.REC<2> = PORT.DATA<1>
012 ROUTE.FILE.REC<6> = PORT.DATA<2>
013 WRITEU ROUTE.FILE.REC ON ROUTE.FILE,"GAD.MSG.PORT"
014 ATTACH "GAD.MSG.PORT" TO GAD.SESSION SETTING ERROR.STATUS ELSE
015         RELEASE ROUTE.FILE,"GAD.MSG.PORT"
016         RELEASE PORTS.MSG.FILE,PORT.DATA<2>
017         STOP
018 END
019 RELEASE ROUTE.FILE,"GAD.MSG.PORT"
020 WRITEU "ATTACHED" ON PORTS.MSG.FILE,PORT.DATA<2>
021 N=0
022 LOOP
023         N = N + 1
024 UNTIL PORT.DATA<N> = "" DO
025         PUT CR:LF:MSG<N>  ON GAD.SESSION ELSE NULL
026 REPEAT
027 PUT CR:LF ON GAD.SESSION ELSE NULL
028 DETACH GAD.SESSION ELSE NULL
029 DELETE PORTS.MSG.FILE,PORT.DATA<2>
030 END
```

MICRU NEWS

Farewell to a Good Friend



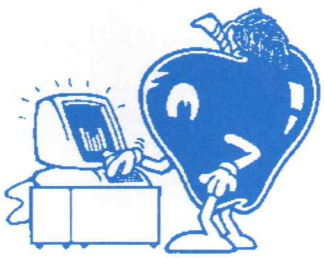
It is with heavy hearts that we inform you of the passing of Herbert C. Jackson. Many of you will remember Herb from the numerous MICRU Conferences which he coordinated from 1985 to 1990, during which time he served as president of MICRU.

Herb succumbed to a heart attack on December 24, 1991 and will be sorely missed by all whose lives he touched. He is survived by his wife, Janet and daughter, Holly.

- Kent Nickerson
  MICRU Board Member

SERIES 7000

Speeding Up A Slow Series 7000 System



This article provides some hints on researching a "slow" M7000 system. Obviously, many factors affect computer performance, such as number of users, efficiency of programming, and use of files. BASIC programming efficiency was already covered in depth in a previous ON-LINE article (VOL. 1 NO. 3).

Following is a list of factors that should be considered if you feel your system is running slowly:

a) When did you first notice that the system seemed slow?

b) What has changed since the system was performing satisfactorily? (Has software been upgraded; have any hardware changes been made; have any new users been added to the system; any changes to a major application program?)

c) Does it seem to run slowly at any particular time? If so, what else is running on the system that is different?

d) When there is degradation, what is happening on the system (number of users, any special application, using tape drive, heavy printing)?

e) Is the whole system running slowly or is it one particular application? (Comms, Data Entry, BASIC, etc.)

f) Does the poor performance occur on one processor or terminal?

It is a good idea to keep a log detailing periods of slowness and noting any of the aforementioned factors. Once you have accumulated a week's worth of notes, open a call and we can go over the details.

Another cause of slow systems is *fragmentation of files*. As the files grow, disk space that is not always contiguous must be used. This can result in delays when accessing even medium-size files. Performing a *Save and Restore* may speed up a slow system, since this arranges the files in contiguous frames on the disk.

Another way to speed up a system is through *file sharing*. The file processor allocates a certain amount of memory workspace for use by "logon" and opening system and user files. The first opening of a file takes up more workspace than subsequent openings of the same file; therefore, sharing of a file by a number of users reduces unnecessary overhead.

Lastly, remember that a Mirror system is slightly slower than a standalone system since each update must be written to the two disks and then compared. Of course, the safety of always having a back-up system more than offsets the extra nano seconds required to update the second disk.

If you have any questions on this topic or think you may be experiencing performance problems, please give us a call at 1-800-678-3399 and we'll be glad to help you resolve any problems you may have.

- Ann Connelly

COMMS

PC Integration (PCi)

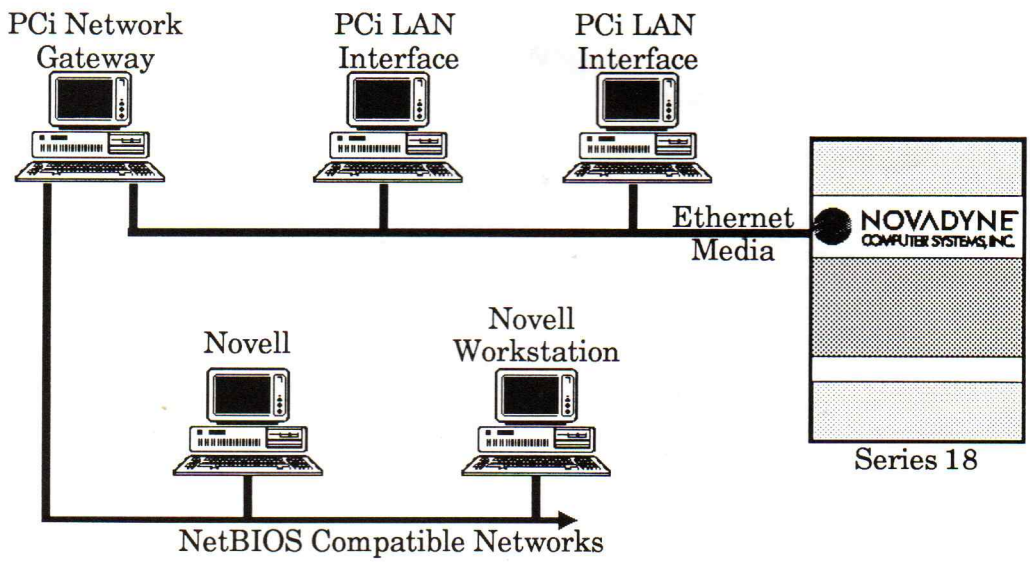
The Family of Products to Bridge ROS & DOS

In *ON-LINE* issue V4, No.4 (Q4 1991), a marketing perspective of PC integration (PCi) was presented. This article provides a technical description of the PCi products. While the products are user friendly, the product structure is complex enough to limit this presentation to basic functionality. Readers are encouraged to call Novadyne Marketing or Product Support to gain a better understanding of these exciting new products.

PCi is a family of products that enable PC functionality, such as color, graphics, imaging and optical storage to be combined with transparent host data access, remote processing and high speed data transfer, to achieve unequalled application functionality. A PC can be utilized for processor intensive activities, such as the user interface or image processing, while reserving the host to process data base management functions more efficiently.

PCi can utilize an OSI-based multi layered architectural design which complies with the Ethernet IEEE 802.3 standard. This product family was developed to create an advanced distributed application environment using a "Client-Server" or "Program-to-Program" architecture under which a REALITY 7.0 or REALITY X host can act as a File-Server to a group of PCs. It enables a PC to be used both as a standard terminal and as an intelligent workstation. The latter facility allows MSDOS/PCDOS in the workstation to access data either from its local disk drives or from a virtual disk on the host system. This access is totally transparent to the user. Each work-

cont'd on page 16.



station can have multiple concurrent network sessions.

The software consists of two components, a host program and a terminal emulation program for the PC. Together they offer all the functionality of RealLink Version 2.1 and some additional features. A PC can be linked to REALITY using either an asynchronous connection up to 19.2K BAUD or across an Ethernet LAN with 10Meg bps speed. The effective throughput, however, could be somewhat lower due to the protocol overhead, the number of LAN nodes and the system configuration. The high speed data transfer across an Ethernet provides the user a tremendous speed advantage for bi-directional file transfer between REALITY and DOS. Please call Novadyne Product Support for performance data and to learn about the system configuration to gain optimum performance.

PCi is available on a Series 18 or Series 6000 with REALITY 7.0. Ethernet connectivity requires an S-LAN Controller (Model 3630) and Network User Licenses. PCi uses Distributed Data Access (DDA), a modified OSI architecture. This layered architectural design makes PCi a versatile product group which also maintains full functionality with UNIX-based REALITY X systems.

There are two possible scenarios for PCi connections to REALITY 7.0:

(1) Users without a PC network environment (e.g., Stand Alone) Connection:

In this situation, a PC is directly connected to an S-LAN with a Novadyne supplied Ethernet LAN Controller, LAN Driver (Software on diskette), Network software and terminal software. Host software resides on the host.

(2) Users with an Ethernet based Novell Network (e.g., Novell Gateway) Connection:

While the PCi design approach is to support all NetBIOS-based networks, current products support Novell with Ethernet mediums. Since Novell provides a proprietary network environment with Netware operating systems, a Gateway product is used to link Novell to REALITY 7.0. The Gateway consists of a Novadyne PC with two LAN controllers, one Novell (NetBIOS) supported and another Novadyne DDA supported. It also includes the respective LAN controller drivers and the Gateway software. The only PC Networks supported today are:

Novell Netware Version 2.15 or above and NetBIOS Version 3.01F over Ethernet.

A single Gateway supports multiple concurrent network sessions. A session can either be a terminal emulation session or a program-to-program session.

To ensure the accuracy and the viability of a proposed PC Network configuration and the LAN environment, it is crucial to complete the PCi Certification Process. Your Authorized Novadyne Reseller can provide the details of this process.

- Tony Duran, Randy Jordan and Mike Foreman

Current COMMS Releases

Shown below is a Product/Release matrix describing the current release of software for the various communications products. Any software fixes which may be required will only be produced for the most current release. If you plan to upgrade your system to the next hardware system or operating system release, contact your local dealer or analyst to make sure you have the required communications software prior to the upgrade. If in doubt, have your dealer or analyst contact the Novadyne Communications Support Group at (800) 678-3399.

COMMSPRODUCT RELEASE	Series 4700	Series 6000	Series 9000	Series 14	Series 18
MCC 3.1 (Rev 4)	N/A	1.1	N/A	N/A	N/A
MCC (2.3) 3.1 (Rev 5)	N/A	2.3	N/A	N/A	N/A
MCC (6.0) 3.1 (Rev 3)	N/A	N/A	N/A	N/A	6.0
MCC (7.0) 4.1 (Rev 4)	N/A	7.0	N/A	N/A	7.0
HSCC (SNA) 2.0 (Rev 5)	N/A	7.0	N/A	N/A	7.0
SLAN (Ethernet)	N/A	7.0	N/A	N/A	7.0
XCC (X.25) 2.1 (Rev 1)	N/A	7.0	N/A	N/A	7.0
FTU 1.2 (Rev I)	4.3	1.1, 2.3	1.3, 5.3	2.3	6.0
FTU 1.3 (Rev G)	N/A	7.0	N/A	N/A	7.0
M3800 (2780) 1.3 (A)	4.3	N/A	1.3, 5.3	N/A	N/A
M3800 (SNA) 5.3 (A)	4.3	2.3	1.3, 5.3	N/A	N/A
5750 (TCL COMMS) Rev 2	N/A	N/A	1.3,5.3	N/A	N/A
2602 BISYNC	4.3	N/A	N/A	N/A	N/A

NOTES:

The MCC software for 7.0 systems consists of two tapes: 1) MCC software in INSTALL format; 2) 2780-TERMLIB-BASE in ACCOUNT-SAVE format.

The S-LAN software is included on the 7.0 SysGen tape. The software requires a "Virtual Port License" available from your dealer or VAR.

In addition to the software tape, X.25 also requires a "Virtual Port License" available from your dealer or VAR.

5750 Communications Software no longer resides on the Sys-Gen tapes. If you require this software, have your dealer or VAR contact the Novadyne Communications Support Group.

2602 Bisync runs only on Series 4700 systems. The software is included on the Series 4700 4.3 SysGen tape.

- Richard Yeh

SERIES 14

New Parallel Printer Driver

For those 14/100 systems that have a printer attached to the parallel printer card, it is now possible to download a new printer driver that will substantially improve printer throughput.

Simply dial into the Novadyne 14/100 Bulletin Board at (804) 794-7063, and download a DOS file called LPT_BIOS.COM. It is always a good practice to rename your old LPT_BIOS.COM before you copy the new driver into your REALITY directory in the event that this driver is not compatible with your particular printer.

Reboot your system (CTRL-ALT-DEL) to allow the drivers to be installed, and continue to print your REALITY jobs through the spooler.

- Sam Craghead and Ray VanSluis

APPS

Vertical Formatting in WORDMATE

In the last issue, we discussed horizontal formatting of documents. This issue will conclude with vertical formatting of documents.

As we discovered in the article on horizontal formatting, there is a direct relationship between the way a *line* of characters is displayed on a data terminal and the way it appears when output to a printer. Unfortunately, this relationship does not exist to the same degree when dealing with the vertical format. This is because most data terminals only display a maximum of 24 or 25 lines of text. Most printers are capable of printing up to 62 lines of text on an ll-inch form.

This makes it much more difficult to get a mental image of how the printed page will look when the terminal can only display 40 percent of a printed page at a time. The best method available to determine the current cursor position is to use the '/' command in the Edit mode. The '/' command will display something like this on line 25:

Page: 2 Line: 25 Column: 44 Attribute: 41

The Page number displayed can be a bit misleading at times. Its calculation is based on the number of page breaks (\SB and \BP) in the document. It is also based on single spacing at six lines per inch. Therefore, using the \SPACING feature and/or the \LPI feature may cause the page number displayed to be in conflict with what actually comes out on the printer. The Line number represents the number of lines since the last \BP or \SB.

The Column number, as explained in the last issue, represents the horizontal orientation of the cursor from column 1 (not the left margin).

The Attribute number indicates the line (or attribute) in which the character indicated by the cursor resides in the document. Remember that an entire paragraph can reside in the same attribute if there are no hard carriage returns.

When dealing with the vertical format, only the Page and Line numbers are relevant. Following are some WORDMATE features which allow you to modify the vertical presentation of printed documents. Remember that the screen display is unaltered.

The *\LPI* command allows you to change the number of lines per vertical inch by altering the interline spacing. For example:

\LPI 8

will cause all text that follows to be printed at 8 lines per inch. As with the PITCH command, this assumes that your printer supports this feature. WORDMATE supports 4, 6 and 8 lines per inch with 6 being the default. The LPI may be changed at any time simply by issuing a new \LPI command:

\LPI 6

Using \LPI 6 and/or \LPI 8 will permit you to print more than 60 lines on an ll-inch page. Since WORDMATE defaults to a 60 line page break, you will have to begin your page with the *\PAGE LENGTH* command (e.g., \PAGE LENGTH 65) if you need to print more than 60 lines on any one page. Remember that at LPI 6, most printers can only print 62 lines per page.

The *\SPACING* command allows you to specify the number of carriage returns to be issued between lines of print. The default is single spacing or \SPACING 1. The \SPACING command may be used at any point in a document where spacing needs to be affected. \SPACING 2 (double spacing) will cause one blank line to be inserted between every two lines of text. \SPACING 3 and 4 are also supported.

As you can see, WORDMATE does provide the means to adjust vertical formatting, it does not, however, provide the means by which to view the format on most data terminals.

- Steve Gill

Current Application Overlays

The following matrix provides you with the release level of Application Overlays required by each supported Series and OS. It is important that you know which Overlay you should obtain prior to a planned upgrade . For example, if you are upgrading a Series 9000 from 5.1 to 5.3, which uses REAL-

CALC, then you will need to obtain the corresponding Overlay release (REALCALC 2.1C) before upgrading.

Application Overlay	Series 4700	Series 6000	Series 9000	Series 18	Series 14
A*L*L 1.1	4.3	1.1	1.3	N/A	N/A
A*L*L 1.2	N/A	2.3,2.4	5.3	6.0	2.3 D.4
(Paper Patches 1-59)					
A*L*L 1.3E		7.0		7.0	
(Block Tape 1)					
PCmicroREALITY 2.1	4.3	2.3	1.3,5.3	6.0	N/A
REALCALC 2.1C	4.3	1.1,2.3,2.4	1.3,5.3	6.0	2.3 D.4
REALCALC 2.1E		7.0		7.0	
REALGRAPH 1.0C	4.3	1.1,2.3,2.4	1.3,5.3	6.0	2.3 D.4
REALGRAPH 1.0D		7.0		7.0	
REALLINK 2.0	4.3	1.1	1.3	N/A	N/A
REALLINK 2.1 Rev. 4	N/A	2.3,2.4	5.3	6.0	N/A
REALLINK 2.1 Rev. 6		7.0		7.0	
REALISM DEVELOPER 1.0A	N/A	2.3,2.4	5.3	6.0	2.3 D.4
SHELL 1.0A	N/A	2.3	5.3	6.0	2.3 D.4
REALISM 1.0 Rev. 2		7.0		7.0	
REALITY Integrated Office 2.3	4.3	1.1,2.3,2.4	1.3,5.3	6.0	N/A
(Overload Patch Tape Rev B -- 2.3, 5.3 and 6.0 O/S only)					
REALITY Integrated Office 2.3 Rev. B		7.0		7.0	
WORDLINK 1.4C	N/A	2.3,2.4	1.3,5.3	6.0	N/A
WORDMATE 2.1C	4.3	1.1,2.3,2.4	1.3,5.3	6.0	2.3 D.4
(Overload Patch Tape Rev A and Paper Patches 1-7)					
(Overload Patch Tape Rev B -- 2.3, 5.3 and 6.0 O/S only)					
WORDMATE 2.1E		7.0		7.0	
TRANSACTION LOGGING 1.2	N/A	2.3,2.4	5.3	6.0	N/A

• Janet Altman

Q&A

Dear Editor,

I have a McDonnell Douglas M6000 release 2.3 RevD Patches 1- 48.

My question is this: in each account that is set up (e.g., RESULTS, RESULTS-OIS, etc.) I have four files: DL/ID, M/DICT, MD, and PROC.

These four files seem to be identical; is there a special reason for this? Seems this would take up an enormous amount of disk space. Please try to explain this to me.

Thank you,

Terry L. Edwards
Jones Lumber Corp.

P.S. Thanks for having ON-LINE available.

Dear Terry,

The question you ask is a good one. Let me first give you some background on the items MD, M/DICT, PROC and DL/ID and then I will explain how they are used today.

On the very early releases of REALITY, only the M/DICT and DL/ID were present in the Master Dictionary of accounts. The entry 'MD' was created to reduce the number of keystrokes required to edit items in the Master Dictionary. 'PROC' started life as a file; originally intended to store user's PROCs.

On your 2.3 system, the above mentioned default dictionaries should have the following format:

	MD	M/DICT	PROC	DL/ID
001	Q	Q	Q	D
002				Starting frame ID of data sec.
003				Modulo of data section
004				Separation of data section
005				
006				
007				
008				
009	L	L	L	L
010	10	10	10	10

PROC is no longer a file. It was originally changed to a duplicate D pointer to the account's Master Dictionary. On the Series 6000 2.3, Series 9000 5.3 and Series 18 6.0 releases, PROC, MD and M/DICT are now Q-Pointers. This change took place in preparation for multiple data section files which appeared on release 7.0. The item DL/ID still contains information regarding the data section of a file.

Even though PROC is no longer a file and M/DICT was essentially replaced with MD, these items are still necessary as there are several standard system functions that access these areas.

As for taking up large amounts of disk space, since MD, M/DICT and PROC are all Q-Pointers, they take up no more space than required to house them in the MD (about 20 to 30 bytes each).

By the way, Patch Tape C is now available for release 2.3 which includes patches up to #175 (see page 8).

• James L. Smith

CUSTOMER ED.

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"I'm interested in your classes but when you add in the travel expenses, it becomes too costly." "We would attend if your classes were held here (customer's location) instead of in California." "On-site training sounds like a good alternative, but we only need one person trained." These are very typical comments from people who would like to attend our training, but can't for a variety of reasons, not the least being financial. How about sharing expenses for on-site training? Novadyne's on-site training is $5000 per one week course for up to six students, plus instructor expenses. On tuition alone, that's a savings of $1000. If you add in typical travel expenses, a per-student cost for one week's training in California comes to approximately $2000. If your company needs three or more people trained, it would be more cost effective to have on-site training. However if your company only needs to train one person, maybe there are companies in your area who also need the same training. Through user groups and other professional networks you may hear of others who would benefit from the training. Let us know if we can help you in this manner. For further information please call Joan McWilliams at (714)566-2199.

• Joan McWilliams

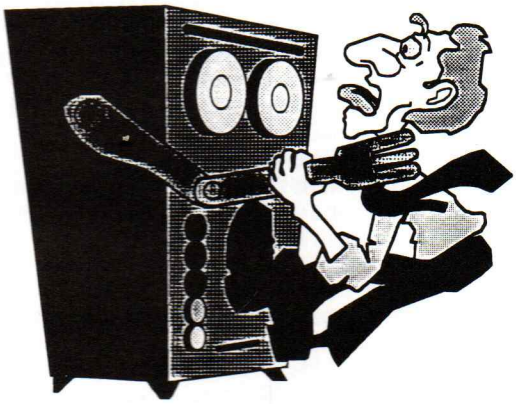
CUSTOMER EDUCATION SCHEDULE

	COURSES OFFERED	APR.				MAY				JUN.					JUL.				AUG.				
		6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31
NOVADYNE	INTRO TO REALITY O/S 5 Days $1000/Person						CH			SA								SA					
	7.0 ROS SYSTEM ADMIN. 4 Days $800/Person														SA/7								
	INTRO TO DATA/BASIC 5 Days $800/Person			SA																			
	PROC PROGRAMMING 3 Days $600/Person							CH	SA/27										SA				
	ROS SYSTEM ADMIN. 4 Days $800/Person															DA							
	SUN O/S 5 Days $1000/Person		SA									SA									SA		
	SUN SYS. MGR. 5 Days $1000/Person				SA								SA									SA	
	UNIX 5 Days $1000/Person																						SA
DISCOVERY	INTRO TO PICK/REALITY 4 1/2 Days $900/Person		DC							AT						DC					CI		
	ADVANCED PICK/REALITY 4 Days $900/Person				DC								TA							DC			
	ACCELERATED PICK/REALITY 4 1/2 Days $1000/Person							BO											DC				
	SYSTEM INTERNALS 4 Days $995/Person													DC									
	APPLICATION PROGRAMMING 4 Days $900/Person					DC												DC					
	ADVANCED APP. PROGRAMMING 4 Days $900/Person		CI							DC													
	ACCEL. APP. PROGRAMMING 5 Days $1000/Person																BO						
	ASSEMBLER PROGRAMMING 4 Days $950/Person																						
	INTRO TO UNIX 5 Days $1300/Person										DC										DC		
	UNIX SYSTEM ADMIN. 5 Days $1300/Person			DC													DC						
	UNIX SHELL PROGRAMMING 3 Days $800/Person											DC											

LOCATION CODES: AT = ATLANTA; BO = BOSTON; CH = CHICAGO; CI = CINCINNATI; DA = DALLAS; DC = WASHINGTON, DC; SA = SANTA ANA, CA; TA = TAMPA, FL.

NOTES:
1. All classes begin on Monday unless otherwise indicated; for example the 7.0 ROS System Administration class scheduled in July starts on 7 July instead of 6 July and is indicated as SA/7.
2. The ROS System Administration class is four days instead of five and the tuition is $800.
3. Tuitions shown for Discovery classes are prepaid; fees are $100 additional when not prepaid.

GooFiEs



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Technical Operations

ON-LINE

Published for System Software Users

Published quarterly by Novadyne Computer Systems, Inc. Technical Operations Department for users of McDonnell Douglas Computer Systems.

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