

# SOURCE DATA

THE DATAPoint SOFTWARE NEWSLETTER

No. 2

August, 1979

## ARCSTAT

Users of Datapoint's Attached Resource Computer™ system can enhance their system's configuration and performance through ARCSTAT, the ARC™ system statistical software package. ARCSTAT provides detailed information on a wide variety of operations performed by the ARC system. With the information provided by ARCSTAT, users can:

- optimize ARC system performance
- examine the effect of modifications or upgrades of hardware on system performance
- examine the effect of modifications or upgrades of software on system performance
- assess ARC system performance over a period of time by recording the ARCSTAT statistics to disk files

ARC systems are composed of three functional components:

1. *File processors*- manage the ARC system's common disks, performing the data storage and retrieval functions for the other processors in the system.
2. *Applications processors*- execute programs, enter data, communicate, and perform other business information processing tasks.
3. *Interprocessor bus*- provides for communications between the processors.

ARCSTAT uses a screen menu to access the five different screen displays of system statistics. The command menu screen display appears as soon as ARC-STAT is executed. The menu includes a "help" feature, and makes use of operator prompting messages. The command menu also allows the operator to specify which file processor is to be examined and at what time period. ARCSTAT may be used with any ARC system applications processor.

*continued next page...*

## Editor's Note

In the first newsletter we asked you what you'd like to see in upcoming issues of *Source Data*. Some of you have said that *Source Data* is hard to read because of the dark grey paper. In response (as you can see!) we have changed the color, and hope it's easier on your eyes.

*Ken Hatten*

## Datapoint Users Groups

Local Datapoint Users Groups are active and growing in areas across the country. Here is a list of those groups we know about:

Chicago Area Datapoint Users  
P.O. Box 218  
Park Ridge, Illinois 60068

Columbus Datapoint Users Group  
1560 Fishing Road  
Columbus, Ohio 43221

Datapoint Users  
P.O. Box 38648  
Denver, Colorado 80238

Datapoint Users Group  
ATTN: Tony Renner  
215 N. Fifty  
Fargo, North Dakota 58102

Houston Area Datapoint Users  
P.O. Box 19233  
Houston, Texas 77055

Southern California Datapoint Users Group  
7407 Gloria Avenue  
Van Nuys, California 91406

Wichita Datapoint Users Group  
906 N. Main  
Wichita, Kansas 67211

## *The Five Statistical Functions*

### **Screen 1 - Task Timers**

The task timers screen display is a bar graph that shows the percentage of time the file processor spends performing each of the seven major file processor tasks. These tasks are:

1. *Automatic volume recognition* - continuously scans the on-line disk drives to determine the availability of disk file volumes.
2. *Disk input/output manager* - services requests for disk file information from ARC system applications processors.
3. *Disk operation initiating task* - performs physical disk input/output tasks as directed by the disk I/O manager.
4. *Link transfer monitor* - handles the transfer of information between the file processor's RIM(s) and the other file processor tasks.
5. *Request interpreter* - receives requests from applications processors via the link transfer monitor and directs them to the proper area for servicing.
6. *Enqueue/dequeue* - services enqueue and dequeue requests from applications processors.
7. *Console command monitor* - recognizes and routes operator commands entered into the file processor console.

By comparing the percentages obtained from the task timers screen display to the typical values furnished in ARCSTAT documentation, users may examine the workload of the file processor. If appropriate, task load changes may be made to speed the work being done in the processor.

### **Screen 2 - All Statistics**

The All Statistics function displays the raw statistics counters maintained by the file processor. While not often necessary for operator analysis, these statistics may be used by any other program for detailed statistical analyses of ARC system operations.

### **Screen 3 - Absolute Reads**

The Absolute Reads function tracks the data retrieval load of a file processor. This screen displays the total number of disk read requests handled by the file processor since the processor became active. By examining data, users can often determine if system throughput can be increased by file relocation, application program restructuring, or the addition of another file processor.

### **Screen 4 - Comparative Reads**

The Comparative Reads function helps determine the workload of a file processor at a specific time (such as peak usage periods). The Comparative Reads function displays the same statistics as does the Absolute Reads function, but the time period to be measured starts at the time of initiation of the function.

### **Screen 5 - Interprocessor Bus Monitor**

The Interprocessor Bus Monitor provides a graphic display of the level of activity of the interprocessor bus of the ARC system. Through this function, users may pinpoint off-line or malfunctioning processors anywhere within the system. The level of interprocessor bus activity may also gauge the usage rate of the entire ARC system.

Each ARCSTAT statistical operation can be instructed to write a copy of its screen display to a disk file. These disk files can then be used as data by a user-written program to provide even more detailed statistical analyses. In addition, these data files may be recorded in order to compare system performance throughout changes in system size and configuration. They can also be used as a tool to identify peak load periods without visually monitoring the system. The output file is written in standard Disk Operating System (DOS) format, permitting its use by any Datapoint programming language or utility program.

ARCSTAT functions only as a monitoring device, and does not permit the inspection of data files or any other ARC system software component.

ARCSTAT - Model No. 20527, 1 cassette, \$15.00

User's Guide - Document No. 50383, \$2.50

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## **DATASHARE<sup>®</sup> V Version 2**

DATASHARE is Datapoint's multiuser, multiapplication business processing system. It is a combination of hardware and software elements which extends data processing capabilities to functionally dispersed sites. Users can execute the same or different programs, enter data, communicate, and perform many other operations, all working from a common data storage base.

All program execution in DATASHARE occurs in the DATABUS<sup>®</sup> language. DATASHARE V is a program which interprets the user's DATABUS programs. Only one DATASHARE release is needed - DSV Version 2 replaces the following Version 1 interpreters:

DS56600 for 6600, 6020 processors

DS55500 for 6010, 5500 processors

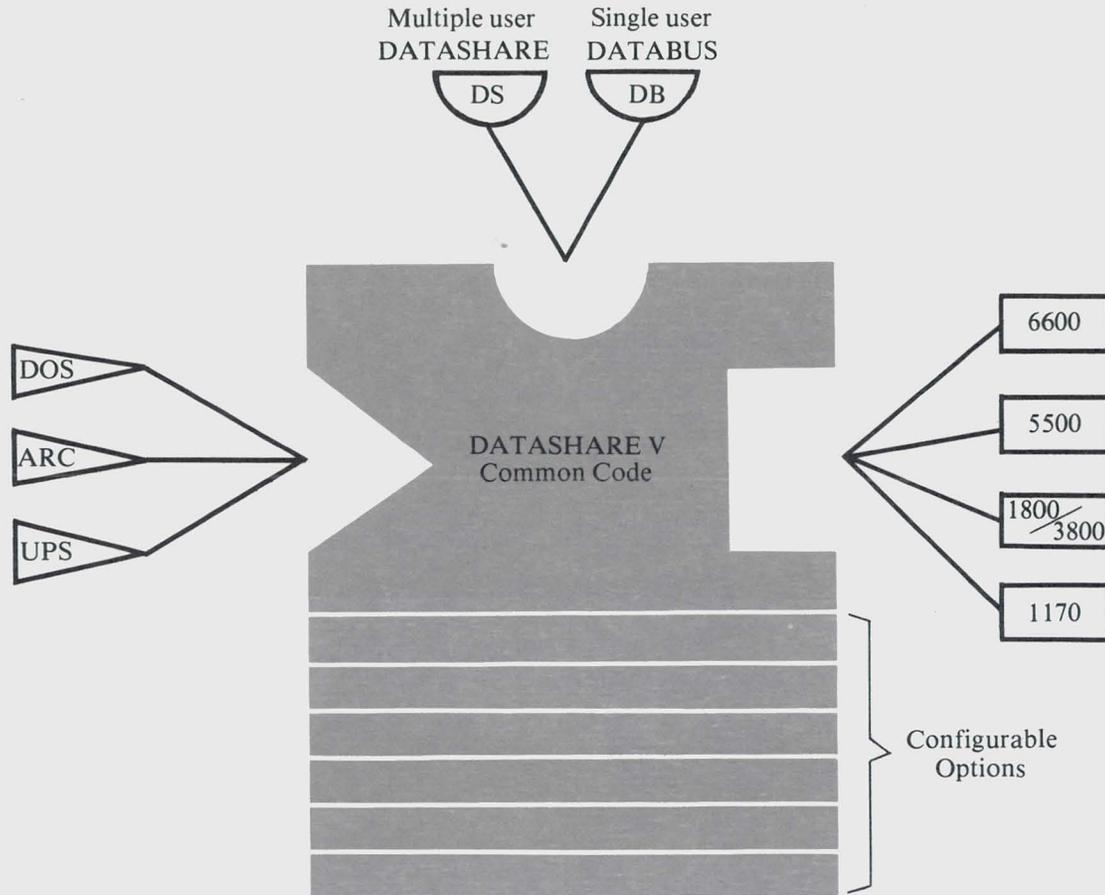
DS51170 for 1170 processors

DS51800 for 1800, 3800 processors

DBML18 for 1800, 3800 processors

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## Configuring DATASHARE V Version 2



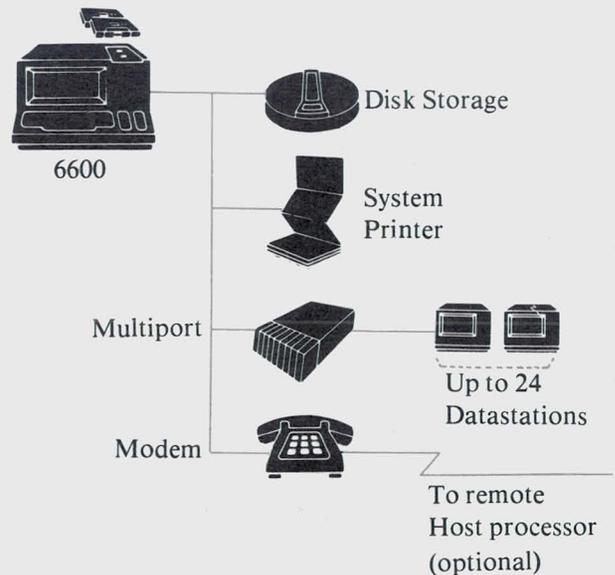
DATASHARE V allows concurrent execution, from a single 6600 processor, of up to 24 programs (16 from a 5500, 4 from an 1170, 1800, or 3800), each dealing with its own terminal. DSV Version 2 has many new features in the areas of list controls, logic, and string handling, with user program area expanded to 63.5K bytes.

A configuration file specific to each user is established at the time of system initialization -- the processor environment, the interpreter features, and the ports are all configured using the CHAINPLUS program. Numerous features of DS5 can be optionally configured, allowing the DATASHARE V system to be tailored to each user's needs. Among the options which are available are:

- a variable sized ACALL area
- external and internal communications (MULTILINK™)
- ISAM disk input/output package
- automatic creation of print spooling files
- POLLINK modules to build a polling DATASHARE
- remote slave processing
- Universal Partition Supervisor (UPS)

These enhancements supply increased processing power and allow faster program implementation. The new file handling techniques offer more programming flexibility to the user of common data storage handling facilities.

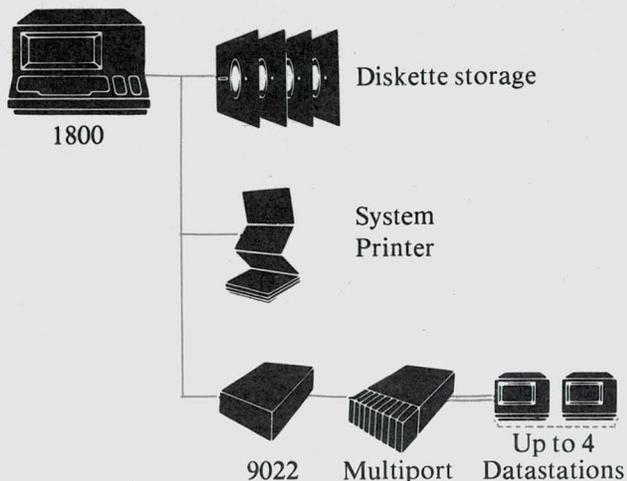
### Typical DATASHARE Configurations



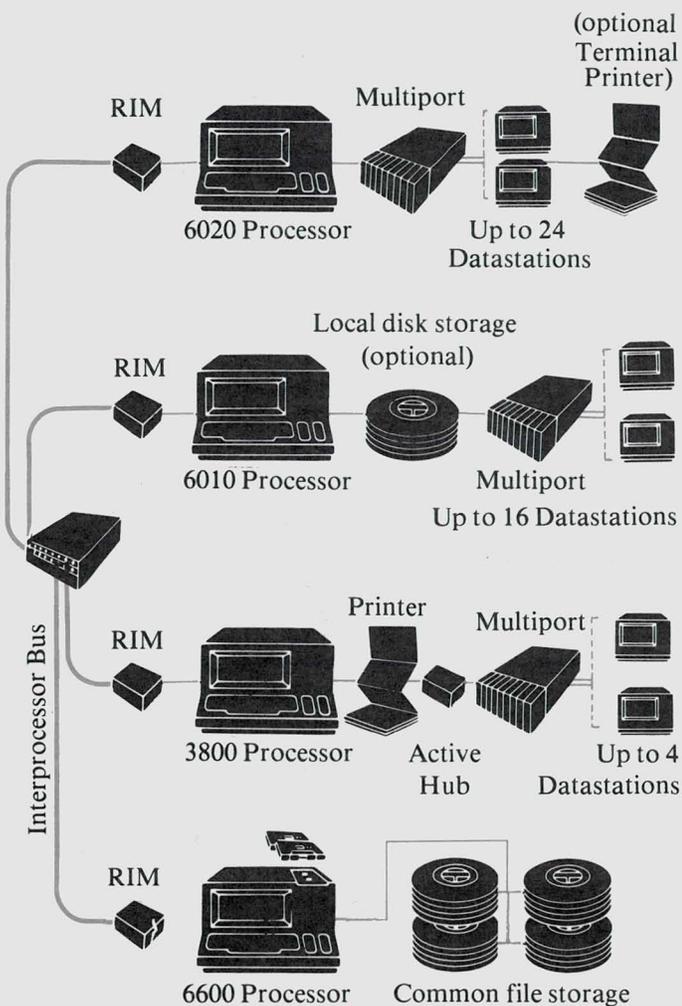
With a disk-based system ...

The 6600 processor extends DATASHARE processing capabilities to as many as 24 Datastations.

*continued...*



With a diskette-based system ...  
The 1800 processor enables up to four users to enter, store, process, and communicate data.



**DATASHARE under ARC ...**  
Nearly any number of DATASHARE systems sharing common data storage facilities may participate in an ARC system.

The following features have been added since DATASHARE V Version 1.

### List Controls

List controls are provided to allow more flexibility for data input and output. They may be used to control the manner in which data is requested, stored in variables, displayed, and printed. The following list controls can help reduce code and coding time, and allow for easier operator interface.

#### 1. KEYIN list controls

- \*RV - Retain Variable - retains contents of a variable if ENTER is the only input received
- \*DV - Display Variable - displays a variable's contents on the terminal screen
- \*B - Beep - causes an audible "beep"
- \*W[n] - Wait n seconds
- \*T[n] - Time-out if n seconds elapse between entering any two characters

#### 2. DISPLAY list controls

- \*B - Beep
- \*W[n] - Wait n seconds

#### 3. PRINT list controls

- \*[nvar] - Print position is set to the column specified by the numeric variable

### Logic Considerations

These new additions can reduce both the amount of source code and the time to write it, as well as give the programmer greater control of procedure execution.

1. CLOCK has been expanded to allow access to the DATASHARE V's version number, time clock, port number, and port characteristics (screen size, port type, maximum user's data area [UDA] available).
2. NORETURN permits program modification of the CALL stack, thereby making the logic flow more flexible. When a subroutine is CALLED, the return address is saved in the CALL stack. The NORETURN instruction removes the last entry from the stack so that control can be transferred to the next instruction rather than returning to the address specified on top of the stack.
3. TRAP specifies that program control will be transferred to a certain program location if a specified event occurs. TRAP can now sense the depression of the interrupt key and one selected character key. This offers the user more control of the DATASHARE operation itself.
4. Function key support for the GOTO and TRAP instructions (above) provides the operator with more program control.

*continued...*

## String Manipulation

Character strings can contain any type of data (except numeric data which is to be used for arithmetic computation). Every character string has two pointers associated with it -- the logical length pointer and the form pointer. The character string manipulation instructions can change the contents of character strings or move the character string pointers. These enhancements permit easier coding by simplifying string control, and are among the extra verbs which are optionally configured.

1. The MOVEFPTR instruction allows the user to observe a string variable's form pointer value.
2. The MOVELPTR instruction allows the user to observe a string variable's logical length pointer value.
3. Direct manipulation of the logical length pointer is possible with the SETLPTR instruction.
4. The EDIT instruction can be used to aid in formatting arithmetic and character output.
5. The BUMP instruction allows the user to move the form pointer an indicated number of character positions by using a numeric variable.

## ROLLOUT

The ROLLOUT feature allows the execution of all programs to be temporarily suspended while a DOS command such as SORT or INDEX is executed. Modifications have been made to ROLLOUT for implementation of DATASHARE under ARC.

1. The rollfile may be specified on the DATASHARE command line. Under ARC, each applications processor may now have its own rollfile.
2. The SHUTDOWN instruction allows DATASHARE to end execution and immediately return to the operating system without affecting the ROLLOUT file.

## File Handling

These features enhance the flexibility of DATASHARE by making it easier for the programmer to manipulate files.

1. The FPOSIT instruction allows access to the current file position. It can be used to observe the current position, or to save it and restore it later.
2. ISAM OPEN sets the pointer to the beginning of an index file. READKS (READ Key Sequential) need no longer be preceded by a file positioning instruction.
3. DELETEK will delete only the key of an ISAM index file without affecting the data file. This greatly benefits users with multiple key files.
4. INSERT makes it possible to insert a single key into more than one index file. This instruction is used in conjunction with indexed READs and WRITEs. INSERT after READ facilitates use of the DELETEK instruction.

## Communications

Communications support of terminals is greatly enhanced with these features of DSV Version 2. (MULTILINK is implemented as in prior versions.)

Networking: (Slaves)

1. DIAL allows central station dialing. This enables operator unattended distribution to "slave stations" using ASYNC or SYNC communications.
2. DATASHARE can support synchronous communications with remote slaves at a maximum rate of 4800 baud.

Polling:

1. Addressing of pollable devices may now be achieved with a user-written assembler routine and the KEYIN, DISPLAY, and POLL verbs.
2. The POLL instruction is used to improve throughput when handling pollable terminals by reducing system overhead.
3. With a multiport adapter, DSV can support multidropped RS232C compatible terminals. This support can be configured on up to 8 ports.

## Print Spooling

Print spooling allows the DATABUS program to direct output to a disk file instead of directly to the printer. Spooling can help to eliminate the conflict of multiple ports attempting to print at the same time. Existing systems can be easily changed, and new programs easily implemented.

1. Print spooling is accomplished through the use of SPLOPEN and SPLCLOSE. SPLOPEN directs printer output to a disk file. SPLCLOSE returns the output to the printer.
2. DATASHARE offers support of a single print file per port.
3. SPOOL trap senses an error that occurs while printer output is being spooled to a disk file. The error could mean the disk space is full, or the drive is off-line, or a parity error has occurred.

*Model Codes for the new software and documentation will be announced shortly.*

# The Ten Commandments of DATASHARE

(This article is intended primarily for programmers, and as such, a knowledge of DATASHARE is assumed.)

DATASHARE, like any other language, may show increased performance through coding optimization techniques. The intent of this article is not to promote scrutiny of existing code, but to offer helpful hints for future programming and development. The best rule of thumb, in most cases, is a combination of straight forward code and good old common sense. However, some rules are not so obvious. Therefore the following aids in optimizing DATASHARE code are offered:

## 1. SIZE

Ideally, the size of executable instructions (/DBC) should be kept as small as possible. DATASHARE's interpretive code is already very well compressed but the replacement of literals with constants will also help the cause.

Example -

```
Satisfactory: ADD "1" TO COUNT
Optimal:     ONE FORM "1"
            :
            ADD ONE TO COUNT
```

The first example requires the interpreter to fetch nine bytes of object code, the second only five. This difference will be even more apparent in KEYIN and DISPLAY prompts.

However, if exceeding the bounds of the User Data Area (UDA) is a concern, the above roles are reversed. The literal "1" embedded in the ADD will help conserve UDA, with the sacrifice being larger /DBC Code.

## 2. REDUNDANT CODE

In some cases, highly active redundant routines should be placed in a subroutine and CALLED when needed. If several ports are executing the same program, pages of /DBC code (equivalent to one disk sector) containing commonly used subroutines will tend to become resident in memory. This action reduces the number of disk accesses for the needed /DBC page. In all cases, retrieval of a page from memory will be faster than from disk.

## 3. INTERRUPTS

The KEYIN and DISPLAY instructions will cause an interrupt to occur. A single KEYIN statement that requests ten variables is far more efficient than ten KEYIN statements each requesting a single variable. Also, in the case of DISPLAY, it is ideal to display as much as possible in a single instruction. The new controls in DSV Version 2, such as \*DV-Display Variable, and \*B-Beep, can also help reduce interrupts by cutting down the need for multiple KEYINs and DISPLAYs.

Example-

```
PROMPT  INIT  "YOUR NAME PLEASE -"
NAME    DIM   20
RESPONSE INIT  "THANK-YOU"
      :
```

```
Satisfactory: DISPLAY *ES,*P10:5,PROMPT;
              KEYIN  NAME
              BEEP
              DISPLAY *P15:7,RESPONSE,NAME
```

```
Optimal:     KEYIN
              *ES,*P10:5,*DV,PROMPT,NAME,*B:
              *P15:7,*DV,RESPONSE,*DV,NAME
```

Because of the DSV V2 list controls used in the this example, one instruction achieves the same result as four instructions did in previous versions.

In short, get as much work done as feasible between interrupts.

## 4. LIST CONTROLS

Use of the built-in KEYIN edit checks, which are \*ZF (zero fill), \*DE (digit entry), \*JL (left justify), \*JR (right justify), is recommended, rather than editing the field with actual DATABUS code. These internal checks execute faster and require less object code than DATABUS instructions do.

Example-

```
Satisfactory: GETDATE KEYIN *P25:12,DATE
              TYPE  DATE
              GOTO
              GETDATE IF NOT EQUAL
Optimal:     KEYIN *P25:12,*DE,DATE
```

In this case \*DE insured digital entry, thereby eliminating the TYPE and conditional GOTO.

## 5. LOOPS

A loop should be kept as small as possible while still getting the job done. Also, avoid loops that cross page boundaries. In other words, a highly active loop that could fit in one program page ends up overflowing to a second, because it started near the end of the first page. In this case, DATASHARE would fetch two pages instead of one each time the loop is executed.

```
Example-     LOOP COMPARE FIVE TO COUNT
              GOTO  GETOUT IF EQUAL
              01774  ADD    ONE TO COUNT
              02001  GOTO  LOOP
```

continued.....

A page boundary (equivalent to the end of a disk sector) occurred between 01774 and 02001. A quick way to recognize a page boundary change is that the middle digit (underlined above) of the instruction address will change. A TABPAGE instruction located before the COMPARE would have caused the loop to start in the beginning of the next sector instead of crossing a page boundary. Because of the TABPAGE instruction, only one fetch is required instead of two.

Warning: TABPAGE can result in many unused bytes in a /DBC page. Be frugal and utilize TABPAGE on only the high activity routines and loops. One convenient characteristic of TABPAGE is that it can be inserted and deleted without affecting program logic. If performance does not increase, removal of the TABPAGE instruction and recompiling the program cannot hurt.

## 6. CONFIGURATION

When configuring the DATASHARE system, include only those routines that will be used by your programs.

For example, if none of the programs use the ACALL answer "N" to the ACALL question, eliminate that routine. Also, bear in mind that configuring port 1 on the console imposes extra processor overhead.

It is a good idea to be economical with the User Data Area. DATASHARE can use some of the non-allocated UDA pages for buffering of /DBC pages. Therefore, allocate only the required amount of data area needed for each port. This tailoring of each port to only the necessary amount of UDA may improve performance.

There is no need to configure a specific baud rate unless a port is accepting data from a non-keyboard device. DATASHARE has to work harder to adhere to a special baud rate than to work at optimal speed.

## 7. ISAM Files

A few key points for improving ISAM performance are:

- \* Setting up dummy records with expected keys saves adding to the /ISI tree.
- \* Try to keep the length of ISAM keys to a minimum.
- \* Write protect a read only ISAM file under ARC. This signals DATASHARE that there is no need to reread from disk an /ISI page that is already resident in memory.
- \* When possible, it is more efficient to add ISAM records in descending sequence in a "high-add" environment.

## 8. UTILITIES

Utilities such as REFORMAT and INDEX should be run as often as possible. Using CHAIN, these functions can be run during off-hours to prepare for the next day's production.

In a generic search environment, a SORT of the /TXT file before INDEXing will permit sequential access after the first find.

## 9. PI and FILEPI

A PI instruction gives a program exclusive access to all logical drives (volumes) connected to a DATASHARE system. Under ARC, a PI instruction would cause a program to have exclusive access to all of its ARC MOUNTed drives, thus temporarily locking out other processors which might be accessing different files on the same drive. Instead of all drives, FILEPI locks out only specified files. It is therefore highly recommended that all ARC programs use FILEPI instead of PI. In the non-ARC environment, FILEPI works the same as a PI instruction. In short, it is safe to use FILEPI whether stand-alone or on ARC.

## 10. THROUGHPUT CONSIDERATIONS

Following is a potpourri of general considerations.

- \* Exception checking is best performed outside a main loop.
- \* A BRANCH instead of a series of COMPAREs can normally save time.
- \* LOAD and STORE are extremely convenient instructions, but they do cause extra overhead.
- \* A TYPE rather than RESET is best used for null entry testing. The form pointer is left unchanged and the EOS flag will be set if the field is null.
- \* Remember that TRAP uses the CALL mechanism. If you exit a TRAP by a GOTO instead of by a RETURN, use the new NORETURN verb in DSY V 2 to avoid stack overflow.
- \* If your system has more than one physical drive, it is often a good idea to separate text files (/TXT) and their corresponding index (/ISI) files. You can move the /TXT file anywhere but you must reINDEX if the /ISI has been repositioned.
- \* Doing CLOSE on multiuser files risks unwanted deallocation.
- \* A :VOLID directed OPEN is more flexible than drive directing and much faster than no direction at all.

It should be pointed out that the above suggestions are greatly dependent on your existing operation. It is possible that some of these techniques will show little, if any, increase in throughput. Many times a single bottleneck elsewhere in a system will cause even good code to perform poorly. Remember, also, that there is a point of diminishing returns -- to save a few seconds of processing time per day is hardly worth a week's work.

The number one priority should always be the satisfaction of end-user's needs by building an application that works with people and not the computer.

## Disk Maintenance Under ARC

Time should be made available on a regular basis to perform normal disk maintenance on the volumes at a file processor running under ARC. The multiuser nature of the Attached Resource Computer system necessitates that some special provisions be made for accomplishing these maintenance tasks.

Maintenance utilities such as DOSGEN, BACKUP, and DSKCHECK in the fix mode will not run under ARC (see below) -- a volume at a file processor is available to more than one user, and therefore the volume could be in use while a maintenance utility is being run. DSKCHECK may be run under ARC in a check-out only mode.

The best way to perform the necessary disk housekeeping under ARC is in one of two ways:

1. Set aside a period for maintenance and take down the appropriate file processor to run the utilities.
2. Remove the disks from the file procesesor one at a time and perform the maintenance work on a stand-alone system (an applications processor or a spare file processor not running under ARC at the time).

If backups of a disk must be made while ARC is active, the files on the disk can be copied to magnetic tape using DCTAPE, or transferred to a disk reserved for the backup using COPY. These methods could lead to copying a file which is in the process of being updated.

The BACKUP command provides for making copies of DOS disks. If BACKUP were to run under ARC, files being updated could be copied, and for a time two volumes with identical VOLIDs (volume IDs) and files would exist.

DOSGEN prepares a disk for use by writing on it the basic system tables required by DOS for support of its file structures. DSKCHECK repairs a logically damaged DOS volume (it replaces REPAIR in DOS 2.5). If DOSGEN or DSKCHECK in the fix mode were executed under ARC, the result could be volumes with incomplete or incorrect system tables.

## COBOL SUBSCRIBING CONSIDERATIONS

Datapoint's ANSI COBOL, like most other vendors' COBOL, is sensitive to the number of levels of subscripts being used for table or array processing. Datapoint COBOL execution is generally faster when the fewest number of subscript levels is used for any type of matrix manipulation.

The following chart indicates the percentage of increased throughput that may be experienced as a result of reducing the number of subscript levels in a COBOL program.

1 Level of Subscripts	2 Levels of Subscripts	3 Levels of Subscripts
39% Faster than 3 levels	20% Faster than 3 levels	Imposes highest amount of execution overhead
23% Faster than 2 levels		

These findings are based on a program which read from the same memory table area via single, double, and triple subscript access techniques. The program was executing on a 6600 Applications Processor under ARC.

The moral of the story is -- use single subscripts for maximum execution speed when performing matrix processing in COBOL.

## 1800 DATABUS MULTILINK

MULTILINK is an enhancement to Datapoint's DATABUS language. MULTILINK allows communications between a user's DATABUS programs and a variety of other computer systems via telecommunication facilities. The communications may be of an interactive or batch nature.

1800 DATABUS MULTILINK is a single terminal DATABUS interpreter which offers both internal and external MULTILINK capabilities. It operates on either a Datapoint 1800 or 3800 processor. The 1800 may use its local diskettes or may be operated under Datapoint's Attached Resource Computer system. The 3800 must be operated under ARC.

The 1800 DATABUS MULTILINK interpreter requires the 1800 processor to execute DOS.G, or, under ARC, to execute DOS.D. Since it operates under DOS, DBML18 can take advantage of DOS's file handling capabilities. It may also be used to access files randomly, sequentially, or index-sequentially, thus providing a powerful data entry and processing facility. In addition to file handling, DOS provides full control over either a local or servo printer. This configuration allows a flexible mix of batch and interactive processing, all under the control of a high-level language program.

There are two methods of utilizing DBML18 as a DATABUS interpreter:

- as a batch processing program
- as an interactive data entry program

*continued...*

DBML18 can be used for batch processing from a DOS CHAIN file. This application should require no interactive data key-in and can thus run unattended for long periods of time.

For example:

```
∴
//. SUM RECORDS BY CONTRACT
DBML18 PR008
//. SORT FOR JOB REPORT
SORT PRFILE1,PRFILE2;19-26
//. EXTRACT DETAIL RECORDS
DBML18 PR009
∴
```

The DATABUS programs in this example require no key in.

As a data entry program, DBML18 requires interactive key in and display.

DBML18 allows the use of the keyboard function keys F1 through F5, and screen highlighting. An optional "phantom" port may be configured for concurrent print spooling, data communications, or both. If the main DATABUS program is busy with the printer, the "phantom" port will wait until the main program releases the printer (or vice versa if the "phantom" port is busy with the printer).

DBML18 - Model No. 40309, 1 Double Density Diskette, \$25.00

Model No. 20480, 1 Cassette (for use on the file processor for the 3800 running under ARC), \$15.00

User's Guide - Document No. 50342, \$4.50

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## RPG and COBOL on the 1800

Datapoint's diskette-based 1800 offers both COBOL and RPG compiler support (in addition to DATABUS, DATASHARE, and BASIC). RPG programs can be compiled using RPGPLUS on a two-drive system, while COBOL programs use four drives. The addition of RPGPLUS and COBOL support on the 1800 make the system very versatile.

### Special Compilation Considerations

#### COBOL

With the larger capacity of the dual density diskettes on the 1800, it is possible to set up the COBOL files on two diskettes:

- one contains all files for the compiler pass
- the other is used during the linkage pass

This will permit the flexibility necessary for large or highly complex COBOL programs.

*continued...*

To provide adequate workspace for normally complex programs (up to 1500 lines) to be compiled, the best set-up on a four-drive system is:

- Drive 0 - scratch diskette
- Drive 1 - source program on an otherwise clear diskette
- Drive 2 - COBOL compiler files
- Drive 3 - COBOL compiler files

#### RPGPLUS

RPGPLUS files should also be organized into compiler and linkage diskettes. The RPGPLUS compiler code is more compact than COBOL. This allows room for workspace on the RPGPLUS diskettes. The setup on a two-drive system is:

- Drive 0 - source program on an otherwise clear diskette
- Drive 1 - compiler and linkage diskettes swapped as needed.

The setup for a system with four drives would be the same as for COBOL:

- Drive 0 - scratch diskette
- Drive 1 - source program on an otherwise clear diskette
- Drive 2 - RPGPLUS compiler files
- Drive 3 - RPGPLUS compiler files

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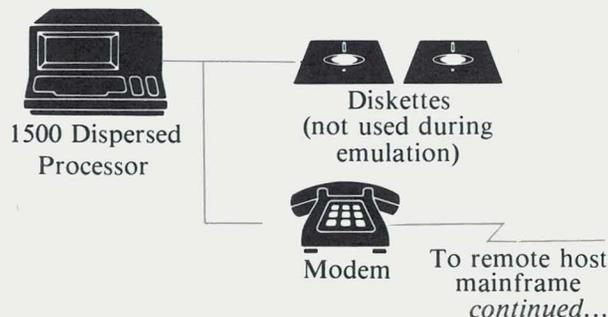
## 3275 Communications on the Datapoint 1500

A new feature has been added to the Datapoint 1500 Dispersed Processor to further increase its versatility and power -- IBM 3275 communications emulation. EM3275 enables a 1500 processor to emulate the IBM 3275 Model 2 Information Display System in a wide variety of interactive inquiry applications. With the 1500's remote processing ability, the remote 3275 locations gain the advantages of dispersed data processing, including on-site data entry.

#### How It Works

EM3275 may be executed on any 1500 processor, and requires only the addition of an RS232 compatible synchronous modem, 3275 keycaps, and a keyboard ROM kit. No modifications of either the hardware or software on the host mainframe are required.

#### 3275 configuration



EM3275 can provide the transition to dispersed data processing -- existing IBM 3275 software applications and mainframe hardware are supported, and remote processing power is added. With EM3275, benefits of the mainframe are retained:

- powerful batch data processing
- extensive data storage capacity
- sophisticated access methods
- large network support

In addition, the advantages of dispersed processing are added:

- remote processing and storage
- mainframe independence
- user developed and controlled applications
- economical system growth
- shorter development cycles

EM3275 supports the 1500's keyboard, display screen, and optional printer (from 80 cps to 340 LPM), but does not use the system's diskettes during emulation. The connection of the 1500 and emulator to the mainframe can be made over dial-up or leased telephone lines at speeds of up to 4800 baud.

EM3275 emulates the following IBM 3275 keyboard display features:

- repeat action keys
- program function keys
- program access keys
- cursor control keys
- field position keys
- selector pen simulation
- operator status information
- inverse video
- audible alarm

The following features are not emulated:

- key lock
- operator ID card reader
- SDLC operation
- ASCII transmission (line) code

#### Software

Along with EM3275, the 1500 includes the following software components at no charge:

- DOS (Diskette Operating System) and utilities
- DATAFORM® - local forms generation and data entry
- DATABUS - programming language
- DATAPOLL® - communications package
- TTY, 2780, and 3780 emulation

#### A Typical EM3275 Application

While only one of many possible applications, the following example serves to show some of the capabilities of EM3275.

One store in an auto parts chain is out of stock on several items. To determine item availability in the warehouse, an inquiry of the mainframe inventory file will be made. To begin 3275 emulation, the operator types a single-line command that initializes the system and specifies the configuration details (transmission line type, printer, etc.). For this example, the following details will be included in the command line specifications.

- Leased line transmission
- Multipurpose keyboard used
- Emulator is connected to a printer
- BEEP and CLICK options are enabled

A prompting message from the mainframe applications program is displayed on the 1500's screen to aid in the inquiry process. The operator types in the out-of-stock item numbers to make the inquiry of the mainframe inventory file. The request is then transmitted over the telephone line to the mainframe. The reply to the inquiry is transmitted back to the 1500 in the same way.

When not engaging in 3275 communications, the 1500 can be used in a wide variety of applications on a stand-alone basis.

#### Model Codes and Pricing

EM3275 is available as Model Code 9811. There is a \$500 one-time charge, which covers software and documentation. The monthly maintenance fee is \$10. One copy of the software is provided, which may be copied by the user (pursuant to the licensed agreement) to fill his or her needs.

Special 3275 keycaps and the new keyboard ROM for 3275 communications are Model Code 9033. The price is \$50, with installation being \$125. There is no charge for the keycaps and the keyboard ROM when specified on the initial 1500 order.



# Software System Releases

<i>Name/ Release Date</i>	<i>Description</i>	<i>Purpose</i>	<i>Release Items Model</i>	<i>Media Cost</i>
<i>DATASHARE Systems</i>				
S4620 2.2 Release 10 Apr. '79	6600 DATASHARE system (5MB) consists of one 2.5 MB cartridge disk containing the following Datapoint released programs:  DOS.E 2.4 Cartridge Disk Operating System DOS.E 2.4.1 Maintenance Release DOS.E 2.4.2 Maintenance Release DS56600 1.2 6600 DATASHARE V Interpreter DBCPLUS 1.1 DOS DATABUS Compiler DSTEXT 3.1 DATASHARE Text File Handling System DSGEN 1.2 DATASHARE Program Generation System LIBSYS 1.3 System Library Maintenance Utility S4620/RFM System Release Form Print File	Adds new features cancels S4620 2.1	24020	1 2.5 MB Disk \$110.00
S4630 2.3 Release 5 June '79	6600 DATASHARE system (20MB) consists of one 10MB cartridge disk containing the following Datapoint released programs:  DOS.D 2.5 Mass Storage Disk Operating System DS56600 1.1 6600 DATASHARE V Interpreter DBCPLUS 1.1 DOS DATABUS Compiler DSTEXT 3.1 DATASHARE Text File Handling System DSGEN 1.1 DATASHARE Program Generation System LIBSYS 1.3 System Library Maintenance Utility S4630/RFM System Release Form Print File	Corrects problems cancels S4630 2.2	24021	1 10MB Disk \$155.00
S4640 2.3 Release 4 June '79	6600 DATASHARE system (50MB) consists of a 25MB mass storage disk containing the same programs as above except:  S4640/RFM System Release Form Print File	Corrects problems cancels S4640 2.2	24022	1 25 MB Disk \$280.00

<i>Name/ Release Date</i>	<i>Description</i>	<i>Purpose</i>	<i>Release Items</i>	
			<i>Model</i>	<i>Media Cost</i>
S4650 1.1 <i>Release 22 May '79</i>	The 6600 DATASHARE system (120MB) consists of one 60MB mass storage disk containing the following released programs.  DOS.D 2.5 Mass Storage Disk Operating System DS56600 1.2 6600 DATASHARE V Interpreter DBCPLUS DOS DATABUS 1.1 Compiler DSTEXT 3.1 DATASHARE Text File Handling System DSGEN 1.2 DATASHARE Program Generation System LIBSYS 1.3 System Library Maintenance Utility LINK 2.2 Relocatable Link Editor S4650/RFM System Release Form Print File	New Software Package	24037	1 60MB Disk \$450.00
S4520 2.2 <i>Release 10 Apr. '79</i>	5500 DATASHARE system (5MB) consists of one LGO cassette containing the Universal DOS BOOT, UBOOT, and one 2.5MB cartridge disk containing the same programs as S4620 2.2, above, except:  DS55500 1.2 5500 DATASHARE V Interpreter S4520/RFM System Release Form Print File	Adds new features cancels S4520 2.1	24011  20373	1 2.5MB disk \$110.00 1 Cassette*
S4530 2.3 <i>Release 5 June '79</i>	5500 DATASHARE system (20MB) consists of one LGO cassette containing the Universal DOS BOOT, UBOOT, and one 10MB cartridge disk containing the same programs as above except:  DS55500 5500 DATASHARE V Interpreter S4530/RFM System Release Form Print File	Corrects problems cancels S4530 2.2	24018  20373	1 10 MB Disk \$155.00 1 Cassette*
S4540 2.3 <i>Release 4 June '79</i>	5500 DATASHARE system (50MB) consists of one LGO cassette containing the Universal DOS BOOT, UBOOT, and one 25MB Mass Storage Disk containing the same programs as above except:  S4540/RFM System Release Form Print File	Corrects problems cancels S4540 2.2	24016  20373	1 25MB Disk \$280.00 1 Cassette*

\*Media Charges -- 1 DMF Cassette - \$15.00

<i>Name/ Release Date</i>	<i>Description</i>	<i>Purpose</i>	<i>Release Items</i>	
			<i>Model</i>	<i>Media Cost</i>
<i>Batch Processing Systems</i>				
S4633 1.4 Release 22 Sept. '78	6600 Batch Processing System (20MB) consists of one 10MB cartridge disk containing the following Datapoint released programs: DOS.D 2.4 Mass Storage Disk Operating System DOS.D 2.4.1 Maintenance Release DOS.D 2.4.2 Maintenance Release DOS.D 2.4.3 Maintenance Release DB11 3.3 DATABUS 11 Interpreter DBCMP 2.1 DOS DATABUS Compiler S4633/RFM System Release Form Print File	Corrects problems cancels S4633 1.3	24027	1 10MB Disk \$155.00
S4643 1.4 Release 22 Sept. '78	6600 Batch Processing System (50MB) consists of one 25MB Mass Storage Disk containing the same programs as above except: S4643/RFM System release form print file	Corrects problems cancels S4643 1.3	24028	1 25MB Disk \$280.00
S4533 1.4 Release 22 Sept. '78	5500 Batch Processing System (20MB) consists of one LGO cassette containing the Universal DOS BOOT, UBOOT, and one 10MB top-loading cartridge disk containing the same programs as above except: S4533/RFM System Release Form Print File	Corrects problems cancels S4533 1.3	24024 20373	1 10MB Disk \$155.00 1 Cassette*
S4543 1.4 Release 22 Sept. '78	5500 Batch Processing System (50MB) consists of one LGO cassette containing the Universal DOS BOOT, UBOOT, and one 25MB mass storage Disk containing the same programs as above except: S4543/RFM System Release Form Print File	Corrects problems cancels S4543 1.3	24025 20373	1 25MB Disk \$280.00 1 Cassette*
<i>ARC File Processor Systems</i>				
S4634 1.3 Release 22 Sept. '78	ARC File Processor System (20MB) consists of one 10MB disk pack containing the following Datapoint released programs: DOS.D 2.4 Mass Storage Disk Operating System DOS.D 2.4.1 Maintenance Release DOS.D 2.4.2 Maintenance Release DOS.D 2.4.3 Maintenance Release ARC 1.1 ARC System (Model Code 9801) S4634/RFM System Release Form Print File	Corrects problems cancels S4634 1.2	20462	1 10MB Disk \$155.00

\*Media Charges -- 1 DMF Cassette - \$15.00

<i>Name/ Release Date</i>	<i>Description</i>	<i>Purpose</i>	<i>Release Items Model</i>	<i>Media Cost</i>
S4644 1.3 <i>Release</i> 22 Sept. '78	ARC File Processor System (50MB) consists of one 25MB disk pack containing the same programs as above except:  S4644/RFM System Release Form Print File	Corrects problems cancels S4644 1.2	20463	1 25MB Disk \$280.00
S4654 1.1 <i>Release</i> 22 May '79	The ARC File Processor System consists of one 60MB disk pack containing the following Datapoint released programs:  DOS.D 2.5 5500 Mass Storage Disk Operating System ARC 1.3 Attached Resource Computer System(Mo- del 980l) S4654/RFM 1.1 System Release Form Print File LINK 2.2 Relocatable Link Editor LIBSYS 1.3 General Purpose Library Facility	New Software Package	24038	1 60MB Disk \$450.00
<i>Miscellaneous Systems</i>				
S1800A 1.1 <i>Release</i> 4 May '79	The S1800A software system consists of one diskette containing the following programs:  DBCPLUS 1800/3800 DATABUS Compiler DBML18 1800/3800 DATABUS MULTILINK In- terpreter DCCONV18 1800 single/double-den- sity File Copy Utility DCDFMT18 1800 IBM Diskette Conversion Program DOS.G 1800 Diskette Operating System FASTSORT Fast Sort program LIBSYS System Library Maintenance Utility LINK Linking Editor for Relocatable Modules S1800A/RFM Release Form Print File	New Software Package	40395	1 DDD*
S1800B 1.1 <i>Release</i> 4 May '79	The S1800B software system consists of one diskette containing the following programs:  DS51800 1800/3800 DATASHARE V Interpreter DSGEN DATASHARE Program Generation System DSTEXT DATASHARE Text Processing System S1800/RFM Release Form Print File	New Software Package	40396	1 DDD*

\*Media Charges -- 1 Dual Diskette - \$25.00

Name/ Release Date	Description	Purpose	Release Items Model	Media Cost
S1800C 1.1 Release 4 May '79	<p>The S1800C software system consists of one diskette containing the following programs:</p> <p>DPSDMP18 1800/3800 DATAPOLL Synchronous Disk Master Program</p> <p>DPSMTM18 1800/3800 DATAPOLL Synchronous Magnetic Tape Master Program</p> <p>DPSDSP18 DATAPOLL Synchronous Disk Spooling Program</p> <p>S1800C/RFM Release Form Print File</p>	New Software Package	40397	1 DDD*
S1800D 1.1 Release 4 May '79	<p>The S1800D software system consists of one diskette containing the following programs:</p> <p>DPDMP18 1800/3800 DATAPOLL Disk Master Program</p> <p>DPMTM18 1800/3800 DATAPOLL Magnetic Tape Master Program</p> <p>DPDSP18 1800/3800 DATAPOLL Disk Spooling Program</p> <p>S1800D/RFM Release Form Print File</p>	New Software Package	40398	1 DDD*
S1500 1.5 Release 16 Apr. '79	<p>The 1500 software system consists of four diskettes containing the following Datapoint released programs:</p> <p>DOS.H 2.4.2 1500 Disk Operating System</p> <p>LIBSYS15 1.2 System Library Maintenance Utility</p> <p>CHARIN15 1.1 International Character Set Generator</p> <p>JOB15 2.1 Concurrent Job Loader</p> <p>PRINT15 2.1 Concurrent Print De-Spooler</p> <p>S1500/RFM S1500 Release Form</p> <p>DBCMP15 1.2 DATABUS Compiler</p> <p>DF15SYS 2.1 Data Entry System</p> <p>DCDFMT15 1.2 Diskette Converter</p> <p>DPS15M 3.4 DATAPOLL Synchronous Disk Master Program</p> <p>DPS15S 3.4 DATAPOLL Synchronous Disk Spooling Program</p> <p>UNITRM15 1.4 Universal Terminal Emulator</p> <p>DEMO15 1.1 DATABUS/DATAFORM Demonstration</p> <p><i>continued...</i></p>	Corrects problems cancels S1500 1.4	40296	4 Diskette \$45.00

\*Media Charges -- 1 Dual Diskette - \$25.00

<i>Name/ Release Date</i>	<i>Description</i>	<i>Purpose</i>	<i>Release Items</i>	
			<i>Model</i>	<i>Media Cost</i>
<i>continued...</i>	CCDP15 1.1 Concurrent DATAPOLL Programs DB15 2.1 DATABUS Interpreter CC378015 2.1 Concurrent 3780 Emulator CC278015 2.1 Concurrent 2780 Emulator			

## Software Program Releases

<b>DBCMP15 1.2</b> <i>Release</i> 26 Mar. '79	DBCMP15 compiles programs written in DATABUS for running under the 1500 DATABUS interpreter. It executes on either a 32K or 60K 1500 processor.	Corrects problems cancels DBCMP15 1.1	50302 40273	User's Guide \$15.00 1 Diskette
<b>DF15SYS 2.1</b> <i>Release</i> 27 Mar. '79	DATAFORM for the 1500 processor is a set of programs designed to provide a personalized data entry system. The system provides for generation of screen forms to be used for data entry. These forms are created by DF15GEN and may contain normal and highlighted prompting information and fields to be filled in by the operator.	Adds new features cancels DF15SYS 1.2	50305 40275	User's Guide \$7.00 1 Diskette
<b>UNITRM15 1.4</b> <i>Release</i> 11 Apr. '79	UNITRM15 is a terminal emulator for use on the Datapoint 1500. It handles communications in a teletype discipline and will replace a conversational remote job entry or remote access instant response terminal which operates in the same discipline.	Adds new features cancels UNITRM15 1.3	50320 40294	User's Guide \$4.00 1 Diskette
<b>DCCONV18 1.2</b> <i>Release</i> 5 Apr. '79	This utility program is designed to copy files between double density and single density diskettes. Single files, selected groups of files, or the entire diskette contents may be copied from one diskette to the other.	Corrects problems cancels DCCONV18 1.1	50343 40310	User's Guide \$.75 1 DDD
<b>RCOPY 2.2</b> <i>Release</i> 30 Mar. '79	RCOPY is a cassette tape duplication program which copies loader, source or object compressed, and multiple file tapes.	Corrects problems cancels RCOPY 2.1	50318 20028	User's Guide \$1.00 1 Cassette
<b>CC278015 2.1</b> <i>Release</i> 5 Apr. '79	CC278015 is a program which will emulate the on-line characteristics of an IBM 2780 Data Communications Terminal as a concurrent job on the 1500. It executes on either 32K or 60K systems.	New Software Package	50426 40394	User's Guide \$1.50 1 Diskette

Media Charges -- 1 DMF Cassette - \$15.00    1 Diskette - \$20.00    1 Dual Diskette - \$25.00

<i>Name/ Release Date</i>	<i>Description</i>	<i>Purpose</i>	<i>Release Items</i>	
			<i>Model</i>	<i>Media Cost</i>
CC378015 2.1 <i>Release</i> 2 Apr. '79	CC378015 is a program which will emulate the on-line characteristics of an IBM 3780 Data Communications Terminal, in a point to point environment, as a concurrent job on the 1500. It executes on 32K or 60K systems.	Corrects problems cancels CC378015 1.2	50327 40293	User's Guide \$3.00 1 Diskette
DOS.D 2.5 <i>Release</i> 2 Apr. '79	DOS.D is the Disk Operating System for the 5500 and 6600 processors, and the 9370/9374 disk drives or the Storage Module System (9390). Features and corrections from the version 2.4 DOS and its maintenance releases are included in the 2.5 release.	Adds new features cancels DOS.D 2.4	50432 20581	User's Guide \$15.00 5 Cassette \$60.00
ARC 1.3 <i>Release</i> 9 May '79	The Attached Resource Computer System (ARC) makes it possible to construct a flexible and powerful dispersed processing system using Datapoint's wide variety of processors. Any number of processors may be connected to provide the processing power and common data storage of a large computer with the flexibility and growth ability of functionally dispersed smaller computers.	Corrects problems and adds new features	50299 9801 9807 20464	User's Guide \$3.50 File processor: 1 Cassette Applications Processor: 1 Cassette 1 Diskette
DB15 2.1 <i>Release</i> 16 Mar. '79	DB15 is a stand-alone interpreter for the DATABUS language on the 1500. It may be run interactively using the 1500 keyboard and console display, or in the batch mode via a DOS CHAIN file. It is capable of printer I/O and either ISAM, sequential, or random access diskette I/O.	Adds new features cancels DB15 1.2	50309 40278	User's Guide \$3.00 1 Diskette
DSGEN 1.2 <i>Release</i> 17 Apr. '79	DSGEN is a DATABUS program for generating data entry programs using DATASHARE terminals. Using this program, a data entry form is composed on the screen, and field edit definitions, range checks and table look-ups are specified. The output from DSGEN is a data entry, source program in DATABUS, ready for compilation and use.	Corrects problems cancels DSGEN 1.1	50246 20346 20347 40391	User's Guide \$3.00 1 Cassette 1 Diskette 1 DDD
SNAP/3 2.1 <i>Release</i> 16 Oct. '78	The SNAP3 Macro Assembler can assemble programs for any Datapoint processor, and runs on any processor with at least the 5500 instruction set. SNAP3 contains all the features of SNAP1 and SNAP2, but runs much faster, especially when assembling programs with many macros. SNAP3 can produce either an absolute object program file or a relocatable object file.	Corrects problems cancels SNAP/3 1.2	50296 20426 20427 40328	User's Guide \$4.50 1 Cassette 1 Diskette 1 DDD

Media Charges -- 1 DMF Cassette - \$15.00    1 Diskette - \$20.00    1 Dual Diskette - \$25.00

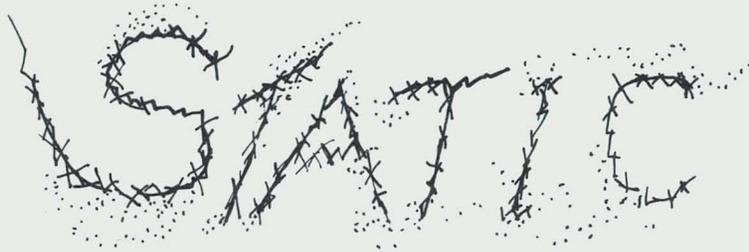
<i>Name/ Release Date</i>	<i>Description</i>	<i>Purpose</i>	<i>Release Items</i>	
			<i>Model</i>	<i>Media Cost</i>
DPMTM 3.2 Release 12 Dec. 78	DPMTM is a DATAPOLL system asynchronous master program for disk systems equipped with a magnetic tape. DPLOG will dial a predefined list of telephone numbers, and either write data from the slave station to magnetic tape, or read data from tape to the slave stations.	Corrects problems cancels DPMTM 3.1	50193 20273 20314	User's Guide \$1.75 1 Cassette 1 Diskette
DPSMTM 3.2 Release 5 Jan. 79	This is the same as DPMTM (above) but is for synchronous communication systems.	Corrects problems cancels DPSMTM 3.1	50201 20278 20319	User's Guide \$2.50 1 Cassette 1 Diskette
MSCRIBE 2.1 Release 3 Oct. 78	A technical manual pre-processor and table of contents generator to aid in writing technical manuals. Features such as automatic chapter and section numbering and conditional print suppression simplify text maintenance. Can optionally create a table of contents and/or index.	Adds new features cancels MSCRIBE 1.2	50238 20335 20336 40361	User's Guide \$1.50 1 Cassette 1 Diskette 1 DDD
MSINDEX 1.1 Release 29 Dec. 78	Manual index preprocessor, to be used in conjunction with MSCRIBE, which facilitates creation of an index to technical manuals.	New Software Package	20539 20538 40360	1 Cassette 1 Diskette 1 DDD
ML378018 2.1 Release 19 Oct. 78	ML378018 is the Datapoint MULTILINK communications interface that emulates a point-to-point IBM 3780 on the 1800. It makes use of the 1800's internal communications module.	Corrects problems cancels ML378018 1.1	50340 40326	User's Guide \$2.00 1 DDD
DPDMP 4.1 Release 4 Jan. 79	DPDMP is a master station program for disk systems in the DATAPOLL asynchronous communications system. Data can be collected from slave stations, processed, and data or reports distributed to the slaves.	Adds new features cancels DPDMP 3.2	50192 20279 20453	User's Guide \$1.75 1 Cassette 1 Diskette
DPSDMP 4.1 Release 23 Jan. 79	DPSDMP is the same as DPDMP (above) but is for synchronous communication systems.	Adds new features cancels DPSDMP 3.2	50200 20283 20425	User's Guide \$1.75 1 Cassette 1 Diskette
DPDSP 4.1 Release 4 Jan. 79	This is an unattended, automatic spooling program for disk systems in the DATAPOLL asynchronous communications system. DPDSP can be used to communicate with cassette, magnetic tape or disk master programs. Slave stations running DPDSP can receive data directly to a printer, or can be instructed to print the data off-line.	Adds new features cancels DPDSP 3.2	50194 20281 20452	User's Guide \$1.00 1 Cassette 1 Diskette
DPSDSP 4.1 Release 23 Jan. 79	This is the same as DPDSP (above) but is for synchronous communication systems.	Corrects problems cancels DPSDSP 3.2	50202 20285 20286	User's Guide \$2.00 1 Cassette 1 Diskette

Media Charges -- 1 DMF Cassette - \$15.00    1 Diskette - \$20.00    1 Dual Diskette - \$25.00

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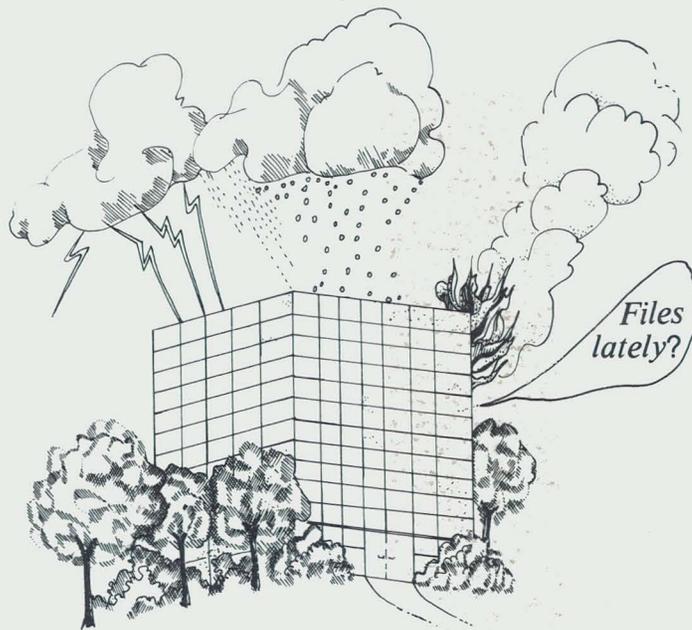
*Beware - the Silent Enemy!*



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*Have you backed up your.....*



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