

... A Fresh VIEWPOINT

VIEWPOINT contains several new facilities which make the 3270 display terminal a tremendously productive tool. You can browse and edit an entire data file in full screen mode. You have complete control over the order, selection, and presentation of the data. For example, in a data file that tracks customer information, you might enter:

RED RECORDS (PASTDUE GT 0)

This will highlight in red, on an IBM 3279, the records of all customers who have past due amounts.

You can use an analogous command to edit the field definitions of the data file in full screen mode. Also, you can define full screen data entry panels for data entry and reporting.

New commands extend existing MABRA

VIEWPOINT contains several commands to meet the most commonly expressed needs of MABRA users. You can enter and display a description document for each data file. Using two new commands, you can define and print line-oriented reports such as financial statements. With another new command, analogous to the Generate Report (GR) command in MABRA, you can summarize a data file, and then store it away as another file. You can also merge data files together using data from more than one system.

Fourth-generation report writer

Fourth-generation computer languages give you the capability to specify what you want to do in an English-like notation. These languages do not require the technical expertise to tell the computer how to process the task.

VIEWPOINT's powerful reporting functions require only that you state what summary, listing, or projection you need—detailed instructions describing how to generate that output are not necessary.

For example, the following statements produce a report titled "Sales Representative Performance":

- [1] SHOW AMTPAID, CUSTNUM
- [2] WITHIN SALESREP, RCVDATE
- [3] SUMMARIZE AMTPAID AFTER SALESREP
- [4] TITLE 'SALESREP PERFORMANCE'

The first statement displays the fields *Amount Paid* and *Customer Number*. The second statement sorts by *Sales Representative* and the *Received Date* of the order. The third statement totals the *Amount Paid* after a change in value of *Sales Representative*. And the last statement assigns the report title. You can produce the report on either an asynchronous terminal or on an IBM 3270 display.

SALES REPRESENTATIVE PERFORMANCE			
SALESREP	RCVDATE	AMTPAID	CUSTNUM
033-11-3311	83/05/06	0.00	27
	83/06/07	453.00	11
	83/06/22	152.00	38
	83/10/04	0.00	30
	83/10/27	0.00	9
	83/12/08	325.00	24
	83/12/14	0.00	29
	84/01/27	318.00	36
	84/04/26	0.00	34
	84/06/15	0.00	8
	84/12/20	0.00	16

		1,248.00	
096-41-2611	83/01/05	64.00	40
	83/02/05	0.00	11
	83/05/17	741.00	1

		805.00	

You can also use this report writer to:

- Select fields
- Select records
- Sort records
- Summarize groups of records
- Insert text or results of calculations before or after groups of records
- Summarize records multidimensionally
- Control the positions and texts of titles, field headings, and footnotes
- Control the position and format of data fields
- Create new fields with summarizing functions

Using graphics to report data

To report data in graphic form, you select and summarize the data using the report writer.

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VIEWPOINT—a people productivity tool

VIEWPOINT is an information management system for end users to query, report, maintain, and create data files. VIEWPOINT is easy to learn and to use by users at any level of expertise—from the data processing novice to the professional. It features:

- Fast and easy data retrieval
- Flexible reporting
- Access to all corporate data in the computing environment
- Tools for data manipulation and analysis
- Graphics
- Shared access to data by users around the world
- Convenient and efficient data maintenance

VIEWPOINT increases productivity by:

- Allowing end users to work easily, quickly, and independently
- Providing an application generator to help the data processing professional reduce programming backlogs

Then, instead of specifying how the report should be printed, to generate the appropriate plot, you just enter **BARCHART**, **PIECHART**, **LINEPLOT**, or **POINTPLOT**. For complete control over every aspect of your plot, you can have the power of I. P. Sharp's **SUPERPLOT** at your fingertips.

Updating data with an IBM PC

VIEWPOINT offers an IBM PC front-end which cuts the costs of data entry into VIEWPOINT data bases by offloading some of the processing onto a PC. This IBM PC interface provides four major features:

- Full screen browsing and editing of records
- Full screen forms entry of new records
- Downloading data to the IBM PC and uploading it to the mainframe
- Printing data on the IBM PC's printer

Transferring external data

Another significant feature VIEWPOINT offers you is the ability to transfer data to and from non-VIEWPOINT files. These can be APL files or OS data sets. This means that you can produce reports or graphs from data generated by another application, or even in another language.

You also have access to data from popular data base management systems, such as **IMS**, **ADABAS**, and **IDMS**.

VIEWPOINT is for programmers, too

VIEWPOINT has an application generator. This collection of programs provides all the commands and facilities of VIEWPOINT as parameter-driven subroutines. Thus, APL programmers can build their own special applications around the core of VIEWPOINT.

Use VIEWPOINT on a test basis

I. P. Sharp encourages you to use VIEWPOINT or its report writer on a test basis. Selected in-house SHARP APL sites are already participating in a beta test programme. Their comments and suggestions will be reviewed and the best ideas will be incorporated into the final product. Timesharing customers can use the report writer and IBM PC front end on a trial basis. They too will summarize their findings and overall impressions of the product. If you would like to try the report writer or IBM PC front end on a trial basis, contact your I. P. Sharp representative. ■

Robert Metzger, Rochester

New Improved MAILBOX System

In 1971, I. P. Sharp Associates announced a new MAILBOX system in its *APL Newsletter*. At that time, the future of electronic messaging services was uncertain. The article stated, "We are not altogether certain that this new APL facility is legal, but it is very useful, so it has been implemented."

Since then, MAILBOX has proved to be a highly effective means of communicating with other SHARP APL system users. Today, I. P. Sharp's MAILBOX is used by 500 international companies for intraoffice communication, and by all 550 employees in 57 I. P. Sharp offices in their day-to-day communication. At I. P. Sharp, this extensive use of MAILBOX has virtually eliminated the use of interoffice memos and reduced the number of employee meetings held. Many decisions are made through conferences on the MAILBOX.

Not only has the environment changed since MAILBOX was first introduced, but so has the system itself. Now when you use MAILBOX, you benefit from these enhancements:

- Improved handling of errors in action lines
- Addition of subject lines to message headers
- Major extensions to *MAIL*, *WHOIS*, and *VALIDATE* programs
- Eight new MAILBOX programs
- Mentors for MAILBOX groups
- User-defined special interest groups
- Faster execution of many operations with less storage overhead
- New capabilities for *FILE* messages

Errors in action lines. Our users have asked for a more natural dialogue sequence to help them correct errors. For example, a mistake at the *TO* prompt, in the *SEND* program, now gives you an error message *INVALID CODE* and reprompts you with *TO*.

Subject lines. MAILBOX messages can contain subject lines in their headers. You set the subject line using the *SUBJECT* action within the *SEND*, *TRANSMIT*, *XMIT*, and *WITHDRAW* programs. Now you can quickly scan the subject of a message before reading the entire contents.

Extensions to the *WHOIS* program. Two new qualifiers have been added to the *WHOIS* program. The *<* qualifier causes the program to print a *short* report of entries which matched the specified string. For matching groups, user enrollment is suppressed and instead the number of members is displayed in parentheses (thereby identifying the match as a group). For matching users, group membership is suppressed.

The *?* qualifier causes *WHOIS* to find matches to the specified string *anywhere* within a user's code or full name, or a group's code or full name. For example:

```
WHOIS '?PEAR'  
PEAR:  
PEARSON, LESTER B.          LBP   GOV   PM  
SHAKESPEARE, WILLIAM      WMS   GLOBE MACB
```

Eight new MAILBOX programs. There are eight new functions to help you write robust, non-interactive front-ends to certain MAILBOX facilities. Included, for example, are functions to cancel messages you have sent, to decompose the MAILBOX message headers, and to return the members of a MAILBOX group.

MAILBOX group mentor. MAILBOX groups can now have a mentor designated, who is visible to everyone. A mentor is the person who is primarily responsible for the organization and enrollment of the group. The mentor can also establish a file in which all group mail is collected.

Special interest groups. The creation and maintenance of MAILBOX groups has always been the responsibility of the MAILBOX stewards. While this will continue to be the case, MAILBOX usage patterns have shown a growing need for the ability for users to create and maintain their own ad hoc groups to discuss a particular topic. Frequently, the theme will have emanated from a discussion among a much larger group of people (typically, a MAILBOX group). By creating a special interest group (SIG), only those members of the original distribution list who are actually interested in the topic need receive correspondence on it.

As an example, suppose a general broadcast message is addressed to a group comprised of 100 individuals. Five replies are received. Typically, each reply is carbon-copied to the original group, thereby generating five messages with the same large distribution list. In prac-

... New Improved MAILBOX

tice, perhaps ten members of the group would have wanted to see the response given the choice to do so. A preferable scheme for handling this situation would be to create a SIG.

The *ATTACH* program adds a new special interest group, or enrolls new users into an existing one. The mentor of a non-SIG may promote the group to a SIG using the *ATTACH* program. Only a MAILBOX steward can convert a SIG into an ordinary MAILBOX group.

SIGs are similar to ordinary groups, but differ in the following respects:

- SIGs are created, maintained, and disbanded by MAILBOX users.
- SIGs are automatically purged after a period of inactivity.
- SIGs do not affect which addresses an external user can send messages to.

Each special interest group has associated with it a mentor, namely its creator. The mentor of a SIG may designate the group as either *restricted* or *unrestricted*. In a restricted SIG, its mentor must make the enrollment changes. In an unrestricted SIG, enrollment is open, and anyone may add himself to the group. The only exception to this is external users, who cannot add themselves to internal SIGs nor to external SIGs containing any member not already visible to themselves.

The *DETACH* program removes users from a special interest group, and disbands the group if there are no members after the operation is complete. You can use *DETACH* to remove yourself from *any* MAILBOX group of which you are a member, including non-SIGs. Thus, you don't have to request removal formally from groups through the MAILBOX stewards.

For more information on these enhancements to MAILBOX, see the online MAILBOX public address message by typing *DISPLAY 'MBPA'* in the workspace 666 *BOX*. ■

Leslie Goldsmith, Toronto

A Full Screen Designer for IBM 3270 Terminals

To keep pace with today's demands for application software, programmers need productivity tools that reduce the tedious, time-consuming tasks of development. I. P. Sharp's full screen designer, FSDESIGN, is one such tool for customers with their own SHARP APL systems.

With FSDESIGN, both programmers and end users can quickly and easily custom design screens on the IBM 3270 family of terminals for their particular applications.

All programs are under function-key control. These programmed function keys make it very simple to change or delete a format or text, or add to it. For example, you only have to hit two function keys to move a field to another position on the screen.

Besides being easy to use, FSDESIGN offers you:

- the ability to move text around on a screen
- the ability to control colour and intensity, and to specify which fields are or are not to be protected
- error messages and prompts that guide you to self-correction or to the next step
- functions to store and retrieve screens from a file called *SCREENS*
- programmed function keys for help; switching modes; resizing, copying and moving fields; scrolling and paging; status query; quitting and clearing most recent entries
- the ability to design screens for any size of terminal

Designing a screen

There are three steps involved in designing a screen. FSDESIGN prompts you at each step in a cyclical manner until you are finished your job. Once you finish with a mode or a help message, you just hit ENTER to get the next one.

When you start using FSDESIGN, you first define the field positions and sizes in the *definition mode*. You can move the fields or change their sizes easily. Then you enter the text in *text mode*. And finally, you specify the colour, intensity, and other field attributes in the *attribute mode*. Here the format matrix is

... A Full Screen Designer

displayed in a more readable form: the screen is displayed above the table so changes can be seen immediately without having to switch from attribute to text mode. However, switching between modes is very simple; you just hit the appropriate function key. And once you have designed the format matrix, entering data is a quick procedure.

Using FSDESIGN

FSDESIGN can act as a visual aid when used in conjunction with other SHARP APL Application Software, such as MABRA. For example, you could specify how you would like your MABRA records to appear on the screen—the colours, the locations, inverse video, and any other option available on the IBM 3270 terminal.

For further information, see the detailed *DESCRIBE* in the workspace 5 *FSDESIGN*, or contact your I. P. Sharp representative. ■

Yudi Plonka, Toronto

Forecasting Update: Enhancements to Box-Jenkins

The workspace 39 *BOXJENKINS* is based on material in G.E.P. Box and G.M. Jenkins' *Time Series Analysis: Forecasting and Control*. Although this text remains the standard reference, numerous advances in the field of time series analysis have been made since the publication of the revised edition in 1976. Now a new workspace on the I. P. Sharp timesharing service, 539 *BOXJENKINS*, reflects many of these advances.

The tasks of identifying an appropriate model and diagnostic checking after a model is estimated are not always straightforward. The new software makes these tasks easier for the forecaster. In particular, its major enhancements are concerned with either graphic display or maintaining a library of saved models.

Most decision-making in time series analysis is based on the interpretation of plots; that is, the most important tools for model identification and diagnostic checking are all graphic representations of some aspect of the behaviour of the time series or its residuals. A number of such displays are new to 539 *BOXJENKINS*. Using the default state settings, you can get monochrome point plots on your terminal. Or you can produce more sophisticated versions of these same graphs using *SUPERPLOT*. They are highly effective for presentation or publication (as shown here).

The ability to save models in a library has a number of practical advantages. You can estimate an identified (preliminary) model, or forecast an estimated (fitted) model, by referring to a saved model name. This means that you no longer need to specify the various components of a univariate model every time it is estimated, or a forecast generated. A number of different forecast sets can be generated at once (possibly over different forecast horizons, for example). You can also produce forecasts within a program that you define, since no additional input is required. And you can have the forecasts updated automatically as new observations become available.

The variable *DESCRIBE* in 539 *BOXJENKINS* tells you how to use the workspace; you don't need any programming experience or prior computer knowledge. In addition, ask for the manual *Changes to Box-Jenkins*, which includes a comprehensive sample session, from your local I. P. Sharp office. ■

Andrew North, Ottawa



I. P. Sharp

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Generating Credible Test Data

Testing programs is one of the least practised phases of software development. While sound design reduces the number of bugs introduced in development, testing or verification by proof is the most reliable way to check that the program actually works. Current program verification methods are limited in scope and usually not practical.

One major obstacle to testing software is the lack of motivation to do it at all. There are two reasons why people are reluctant to run tests. First of all, professional programmers are usually pathological optimists. They have to be. They work all day with a tool that is constantly pointing out their failings and errors. Their compensating optimism all too often leads to unsubstantiated belief in the robustness of a program. If you think that a program is correct, you are less likely to test it ruthlessly.

Another reason that people are not motivated to test programs is that they consider many of the tasks involved to be drudge work. For some people, entering test data is beneath them. Added to that, to check test results properly, you must pore over the output with a calculator and a magnifying glass. On the other hand, creating good test cases requires much creativity. Since most people are not acquainted with the methods available to do this, however, they find it an exercise in frustration.

These problems are not insoluble. People can learn the methods for generating test cases, and these can even be partially automated. The computer can generate the test data. And

then the computer and the end user can check the output. To help you get started, this article explains ways to generate credible test data in APL.

Purely random numbers and characters do not make very good test data. In fact, most of the time, randomly selected numbers and characters won't even be valid input to a system. So if you want to generate useful test data, you must generate credible test data.

There are five attributes of credible test data:

- 1) Format
- 2) Content
- 3) Frequency
- 4) Order
- 5) Relationships

Test data values which have the same format, content, frequency, order, and relationships as live data values will appear to be live data.

Credible format

Many of the most commonly used data values have strictly specified formats. Common examples are dates, times, currencies, identifying numbers, and postal codes. For example, in the U.S., we have dates in MM/DD/YY format, time as HH:MM AM/PM, currency in dollars and cents with two decimal places, Social Security numbers in 999-99-9999 format, and five-digit postal (ZIP) codes.

These fields can all be stored as numbers. There are also credible formats for literal data. These tend to be groups of letters or digits, separated by delimiters (such as blanks), which form a "word". For example,

... Credible Test Data

an address consists of a building number, a street name, and a street label (Road, Avenue, etc.). Each of these subfields must be in the proper order, separated by blanks, for the address to have a credible format.

Credible content

Ensuring credible content of data values in a test data base is not very complicated. For numeric data, it normally means ensuring that the values fall within a set of upper and lower bounds, or are found in a finite list of values. For character data, it usually means that the text has to contain real words from the appropriate natural language, in the proper order.

All of this data will be generated, using the random number generator (?). You will recall that when used monadically, a single random number is selected for each element of the argument. The selection of each number is independent of the rest. When used dyadically, the value of the left argument tells how many numbers to select from the range specified by the right argument. No duplication of values is possible.

All U.S. ZIP codes are five-digit numbers. So the expression

```
COUNT?99999
```

will choose *COUNT* ZIP codes which are within the range of legitimate ZIP code values, and each value will be unique. The expression

```
?COUNTp99999
```

will choose *COUNT* legitimate ZIP code values, with the possibility of repetition, since they are being chosen independently.

Generating credible dates is a slightly more difficult problem. Each of the individual parts (day, month, year) has a different limit. The following function creates credible dates by generating random six-digit numbers, and then removing those numbers that aren't valid dates in the YYMMDD format. The right argument is the number of dates to be generated. The left argument is a vector of valid years that the dates should fall in. The program loops until it has selected the proper number of dates.

```
▽ DATES+YEARS RANDOMΔDATES COUNT;TRY;BAD
[1] DATES+10
[2] BAD+ 229 230 231 431 631 931 1131
[3] LOOP:→(COUNT=ρDATES)ρEND
[4] TRY+?(COUNT-ρDATES)ρ1231
[5] TRY+((0<100|TRY)^(31≥100|TRY)^(TRY>101))/TRY
[6] DATES+DATES,(~TRY∈BAD)/TRY
[7] →LOOP
[8] END: DATES+DATES+(ρDATES)ρ10000×100|YEARS ▽
```

```
83 84 RANDOMΔDATES 4
830223 840803 830616 840723
```

Credible frequency

Some data values must occur once or not at all. Others can be repeated. One value which must be unique is numbers issued by governments to identify taxpayers; for example, the U.S. Social Security number. The following function generates these numbers and the argument specifies how many numbers are required. The program generates arbitrary integers that are below the maximum value. Then it removes those which are less than the minimum value. Finally, it removes any values that were chosen in a previous iteration. When the result vector has the correct number of values, it is done.

```
▽ SSNUM+RANDOMΔSOCSEC COUNT;TRY
[1] SSNUM+10
[2] LOOP:→(COUNT=ρSSNUM)ρEND
[3] TRY+?(COUNT-ρSSNUM)?1000000000
[4] TRY+?(TRY>1000000)/TRY
[5] SSNUM+SSNUM,(~TRY∈SSNUM)/TRY
[6] →LOOP
[7] END: ▽
```

```
RANDOMΔSOCSEC 3
274588148 414293264 268762391
```

Of course, a more efficient way to obtain this result would be:

```
1E6+COUNT?1E9-1E6
```

But, in general, it may be convenient to generate data from a larger domain than desired and refine the result.

Up till now, we have been assuming that the frequency of generated test data will be uniform. This is because the random number generator chooses integers with an equal probability. But very few things in the real world are equally probable. To generate truly credible data, we must ensure that the proportion of each value chosen closely resembles reality.

... Credible Test Data

The following program generates random street addresses. The argument specifies how many addresses are needed. The program relies on some common street names stored on a file. If you survey popular street names in the U.S., you'll find that the most popular are named after presidents, trees, and geographic locations. There are also a few generic names (like Main Street), and for those with no imagination, numbered streets (like Fifth Avenue). The list read from this file includes these common names. While no specific probability is assigned to them, selecting these most common values does in fact modify their frequency.

The program merges these street names with street labels, for example, "Road", "Avenue", etc. It does so based on frequency values assigned to those labels, expressed as a percentage. These frequencies actually vary from state to state—one man's highway is another man's freeway. You can fine tune the percentages to fit your particular needs.

```

▽ ADDR+RANDOMΔSTREETADDRESS COUNT
:TIE;NAMES;LABELS;FREQ
[1] '777 TESTDATA' □STIE TIE+1+[/0,□NUMS
[2] LABELS+□READ TIE,1 ◇ FREQ+□READ TIE,2
[3] LABELS+(□COUNT×0.01×FREQ)/LABELS
[4] NAMES+□READ TIE,3 ◇ □UNTIE TIE
[5] NAMES+NAMES[?COUNTρρNAMES]
[6] LABELS+LABELS[?COUNTρρLABELS]
[7] NUMBER+'I4,X1' □[FMT COUNT?9999
[8] ADDR+NUMBER,25+◊>NAMES, >LABELS ▽

```

```

RANDOMΔSTREETADDRESS 3
8030 SOUTH BOULEVARD
2479 ATLANTIC PARKWAY
6216 MADISON STREET

```

The street labels and street names read from the file are both vectors of enclosed literal vectors. On line 4, the labels are replicated in proportion to their frequency. On lines 5 and 6, the requested number of items is randomly chosen from each list. On line 7, street numbers are created; and on line 8, the numbers, names, and labels are catenated together and padded to a uniform length.

Credible order

Not only do values occur in special frequencies in real life, but some also occur in a special order. For example, a program that generates purchase order numbers or cheque numbers should generate them in ascending order.

That is how they are normally created in a business. Another example is the use of dates. If a file contains transaction data, the dates will normally be in ascending order, since transactions are recorded chronologically. Thus a reasonable enhancement to the date-generating program would be to add a final line to grade up the dates.

Credible relationships

The test data attribute that is most difficult to achieve but most effective in use, is credible relationships. If two data values always have a clearly definable relationship, it should be reflected in the test data. For example, Los Angeles is always in California (at least, until the next earthquake).

The normal way to handle such relationships is as follows:

- 1) Determine which of the values is dependent on the other. A city value of "Los Angeles" implies a state value of "California", but the reverse is not true. So the state value is dependent here.
- 2) Generate the independent values, by selecting them randomly from a list of possible values.
- 3) Look up the generated values in the list of all possible independent values, and select the corresponding dependent value.

The following function uses this approach, but extends it by computing valid ZIP codes based upon ranges which are dependent on the state name.

```

▽ ZIP+RANDOMΔZIP CODES
:TIE;STATES;ZIPLMT
[1] '777 TESTDATA' □STIE TIE+1+[/0,□NUMS
[2] STATES+□READ TIE,4
[3] ZIPLMT+□READ TIE,5
[4] □UNTIE TIE
[5] INDEX+(◊1 STATES)1<◊1 CODES
[6] ZIP+ZIPLMT[INDEX;1]+ 1+?(-/φZIPLMT)[INDEX]
[7] ZIP+( 1+?(ρZIP)ρ100)+100×ZIP ▽

```

```

RANDOMΔZIP 3 2ρ'NYILCA'
14640 62163 93043

```

Not all ZIP codes have been assigned yet. So this function generates ZIP codes which belong to the proper state, or which will belong to the proper state, when they are assigned in the future.

... Credible Test Data

Available software

You can find the functions explained in this article in the workspace 777 *TESTDATA* on the I. P. Sharp timesharing service. That workspace also contains the following related functions:

```
RANDOMΔCITYSTATE
RANDOMΔFIRSTNAME
RANDOMΔLASTNAME
RANDOMΔCORPNAME
RANDOMΔAREACODE
```

Of course, these functions are in a file accessible to all. ■

Robert Metzger, Rochester

SHARP APL System Reliability

1983

```
SATURDAYS INCLUDED IN STATISTICS
.....
      OUTAGES  MINS-OUT  % UP
JAN 83      2         32    99.9
FEB 83      2         9    100.0
MAR 83      3        38    99.9

APR 83     16       301    99.2
MAY 83      2        36    99.9
JUN 83      2        88    99.8

JUL 83      1        27    99.9
AUG 83      1         5   100.0
SEP 83      6       154    99.6

OCT 83      0         0   100.0
NOV 83      0         0   100.0
DEC 83      0         0   100.0

1983 TOT    35       690    99.9
.....
```

Bridge Hands Added to 91 FUNSPACE

A function that will deal as many bridge hands as you request has been added to the workspace 91 *FUNSPACE*. This function also chooses the dealer and vulnerability. The random link *RL* is reset when *HANDS* is invoked, so that the hands dealt should be different every time.

Bridge fans can practice both bidding and playing of the cards without wasting time dealing them. It is easy to go back and discuss the hand in detail, and get second opinions. Duplicate-bridge clubs could also use this function when computer-dealt hands are required for a tournament.

APL fans might be interested in looking at the function *HANDS* and the function *CARDS*, which it calls, to see how enclosed arrays and the rank operator simplify the problem considerably.

To use the function, just type *HANDS n* where *n* is the number of hands you need. The hands will print out as shown in the following example:

```
HANDS 1
BOTH VULNERABLE; WEST DEALER

      NORTH
      S-K 7 5
      H-K 7 6
      D-K Q 10 8 2
      C-A 6

      WEST                                EAST
      S-Q 9 8 3                            S-10 6 4 2
      H-Q J 10 9 8                          H-2
      D-9                                    D-A J 5 4
      C-K 8 4                                C-Q 7 5 3

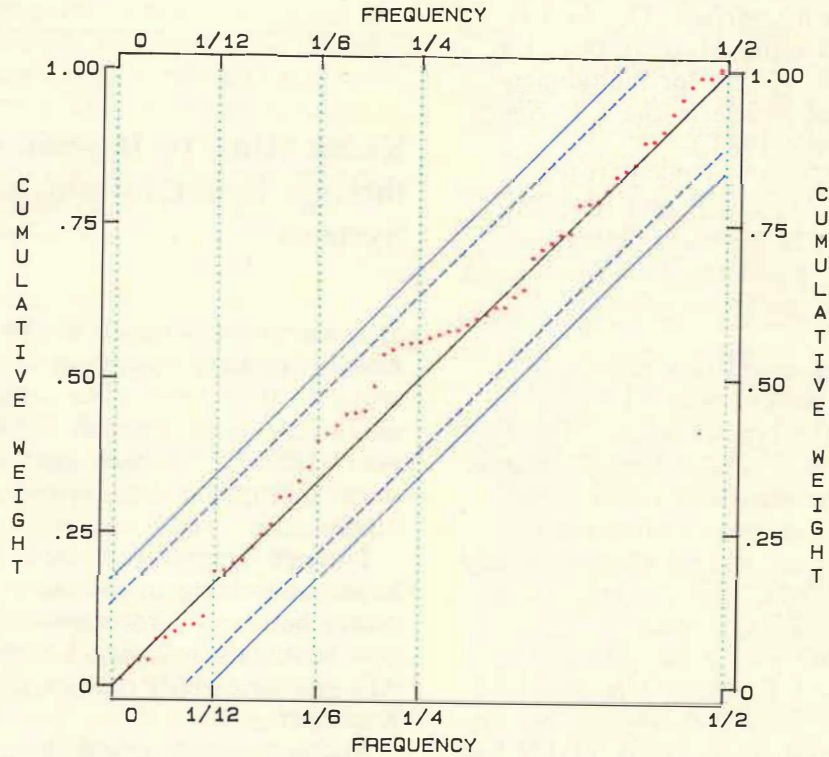
      SOUTH
      S-A J
      H-A 5 4 3
      D-7 6 3
      C-J 10 9 2
```

Sandra Eadie, Toronto

... Forecasting Update

$$A_T = (1 - B) (1 - B^{12}) \text{ LOG } Z_T / (1 - 0.40B) (1 - 0.61B^{12})$$

$\frac{0.08}{0.07}$



----- 25 PERCENT PROBABILITY LIMITS
 ——— 5 PERCENT PROBABILITY LIMITS

**customer
application**

Phototypesetting SHARP APL Files

Are you looking for a fast and easy way to typeset and print data from your SHARP APL files? Here's how the Federal Home Loan Bank of Boston (FHLB) used photocomposition to speed up a printing project, and at the same time, cut costs.

The Federal Home Loan Bank of Boston is a central bank for 230 New England mortgage-lending institutions. Each year, its Office

of Economic Research publishes the *New England Thrift Industry Fact Book*— a collection of balance-sheet and income-statement data for all types of depository institutions in New England. The data is presented as charts, plots, and tables showing various statistical breakdowns relating to the thrift industry. The *Fact Book* is the only comprehensive source of this type of information.

With such detailed numerical data, keying in the figures once only ensures the integrity of the data. "It would be frustrating," says Allan Groves of FHLB's Office of Economic Research, "to have to repeat the proofreading process a second time when great pains are taken to make sure the numbers are entered into our data base accurately." For Groves, a second proofreading could mean hiring addi-

... Phototypesetting SHARP APL Files

tional personnel and a delay of five to seven days.

The data used to prepare the *Fact Book* is derived from FHLB's private data base on the I. P. Sharp timesharing service. The data is stored and analysed using MAGICSTORE, I. P. Sharp's management system for multidimensional data. (See the article in the *I. P. Sharp Newsletter*, May/June 1983.)

This year, I. P. Sharp ran the FHLB's MAGICSTORE file to tape and sent it to Datacomp Corporation in Bethesda, Maryland. Datacomp photocomposed the *Fact Book* using Dataset, its state-of-the-art composition software.

As part of its pre-production consulting service, Datacomp worked with FHLB to design a format for the typeset output. The *Fact Book* was typeset in a tabular format designed to accommodate the statistical tables. "Photocomposition requires greater attention to such details as spacing, control characters, and centering," says Groves, "but the result is a more professional-looking product."

Input was handled with great ease and efficiency, since the I. P. Sharp tape was loaded directly into the Datacomp system. No keying was involved, and consequently FHLB had no need to reproof the job. The Dataset system eliminated all manual intervention, including cutting and pasting the generated output that was fully paginated.

FHLB also uses SUPERPLOT, I. P. Sharp's business graphics package, to produce its *Thrift Industry Fact Book*. "With SUPERPLOT," Groves says, "we go right to camera with the plots and get a high-grade result."

In addition to typesetting services, Datacomp offers data entry, proofing, editing, artwork, design, printing, and distribution. For more information on these versatile services offered by Datacomp, contact:

Mary Ann Mandell
Product Manager, Publisher Services
Datacomp Corporation
925 Chestnut Street
Philadelphia, Pennsylvania 19107

Telephone: 215 627-2400

To increase your productivity, contact your I. P. Sharp representative and learn more about the complete range of products and services offered by I. P. Sharp. ■

Carolyn O'Neil, Boston

Kodak Aims to Improve Productivity through Better Information and Systems

Microcomputers in each of the 16 Eastman Kodak Company operations in Europe are linked to their head office computers in Rochester, New York, through the I. P. Sharp Network (IPSANET). Now users in Europe can share appropriate data, systems, training, and support.

Through seminars, all users have been given hands-on training in the use of personal computers both as microcomputers and as intelligent terminals accessing Kodak's SHARP APL system, which runs on their computers in Rochester.

Microcomputers linked through a timesharing network bring the I. P. Sharp timesharing service inhouse, which satisfies the major requirements of a European timesharing service. It gives European users access to a common timesharing service through a reliable, user-friendly, and cost-effective network. At the same time, the timesharing service enables the efficient use of Kodak's computers in Rochester. In addition, access is available in many of the world's major cities.

The introduction of IBM PCs in Kodak's European companies not only gives the user local computing power but also access to local, regional, and corporate systems and data. Such micros can run user-friendly analysis packages as well as very powerful programming languages such as BASIC and APL. Some users who have been using APL for several years quickly saw the potential of using the PCs as an alternative to timesharing for some applications. The user now has a choice of accessing many packages, developed on the timesharing service by Kodak personnel, either

...Kodak Aims to Improve Productivity

through the Rochester timesharing computers or by using his or her IBM PC as a stand-alone computer.

The European user community keeps in contact through I. P. Sharp's MAILBOX. Through this electronic mail system, Kodak's Administrative Services and Marketing Services can give local users additional support as needed. ■

This article has been adapted, with permission, from an article that appeared in *Kodakery International*, August 1983.

**communication
news**

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Frankfurt

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National Planning Association Data Bases

I. P. Sharp Associates is currently the only on-line supplier of the highly regarded regional data bases of the National Planning Association (NPA). Users value both the NPA historical data, derived from U.S. Government sources, and the NPA projections for the thoroughness of their preparation, for their convenience in use, and for their timeliness.

The NPA data bases are used for corporate planning, market analysis and projections, evaluation of corporate and municipal securities, and in the construction of special analytical models where the regional detail is of particular importance such as real estate market analysis, analysis of financial flows, or air traffic modelling.

The two NPA data bases provide a wealth of detailed economic and demographic information for the United States in great geographic detail. They contain a large collection of data down to the county level annually, including actual data for the period 1970-1980, estimates for 1981-1982, and projections for 1983-2000. The NPA projections are reported widely in the general press and in specialized journals. (In particular, see the articles in *American Demographics*, December 1979 and December 1983.) A total of 27 million items is available from these data bases for 3091 counties, 183 economic areas, 306 Standard Metropolitan Statistical Areas, 50 states, and the District of Columbia.

The NPA economic (NPAECO) data base contains 57 time series covering employment and earnings data for 17 industrial sectors on the basis of place of employment and the total population, and 7 items of personal income on the basis of place of residence. The NPA demographic (NPADEMOG) data base contains for each of the geographic units 156 time series detailing population by age, sex, and race, with the age detail provided by five-year age cohorts. Both data bases are updated at regular intervals each year. There is no subscription fee to access either NPA data base.

The following examples illustrate the level of detail available in the NPA data bases. ■

Nestor E. Terleckyj, National Planning Association, Washington, D.C.

... National Planning Association

*FLORIDA AND SELECTED SMSA
POPULATIONS IN THOUSANDS*

	1970	1980	1990	2000
<i>POPULATION - ALL AGES</i>				
<i>FLORIDA</i>	6,845	9,863	11,788	13,260
<i>FORT LAUDERDALE; FL</i>	628	1,018	1,302	1,524
<i>MIAMI; FL</i>	1,275	1,722	1,964	2,124
<i>WEST PALM BEACH; FL</i>	352	577	739	867
<i>FORT MYERS; FL</i>	107	206	271	320
<i>TAMPA; FL</i>	1,100	1,575	1,858	2,050
<i>ORLANDO; FL</i>	458	703	856	979
<i>JACKSONVILLE; FL</i>	623	739	811	877

*TOTAL EMPLOYMENT
(THOUSANDS)*

	1970	1980	1990	2000
<i>TOTAL EMPLOYMENT</i>				
<i>MICHIGAN</i>	3,418	3,803	4,201	4,453
<i>DETROIT; MI</i>	1,745	1,821	1,975	2,067
<i>WAYNE; MI</i>	1,174	1,041	1,021	984

conferences



APL84: Register Now

You're invited to attend the annual conference of the international APL community in Espoo, Finland, from 11 to 15 June 1984. The conference is organized by FinnAPL, the Finnish APL Association, in cooperation with the Association for Computing Machinery (ACM) and its Special Interest Group on APL (SIGAPL). Kenneth Iverson, of I. P. Sharp's Development Group in Toronto, and Fred Perkins, I. P. Sharp's Managing Director for Europe, are among the invited speakers.

Of 121 papers contributed, the Program Committee has selected 59 to be presented at the conference. The following I. P. Sharp employees have authored or coauthored papers that have been selected: Sylvain Baron of Paris, France; Robert Bernecky of Toronto, Canada; Stephen Taylor of Sydney, Australia; Paul Berry and Roland Pesch of Palo Alto, U.S.A.; Michel Boucher of Ottawa, Canada; and Gottfried Bach of Vienna, Austria.

Registrations for APL84 are now being accepted. For more information, contact:

FinnAPL
APL84 Organizing Committee
P.O. Box 1005
SF-00101 Helsinki 10
Finland

I. P. Sharp MAILBOX: PC84
IBMVNET Address: APL84 at HEKVM ■

publications

Bookends

SHARP APL Pocket Reference (revised)

The new *Pocket Reference* possibly covers every aspect of both SHARP APL/370 and SHARP APL/PC that an APL programmer may need to know. It contains capsule definitions of all the APL primitives, tables of characters, transmission codes, file access permissions, system functions, auxiliary processors, S-tasks, B-tasks, N-tasks, arbitrary output, *HSPRINT*, and diagrams of various keyboard configurations.

March 1984, 50 pp., \$2.00

Public Data Bases Catalogue (revised)

This catalogue describes I. P. Sharp's public online data bases: their contents, frequency, updates, data sources, access instructions, and online and printed documentation. There are approximately 100 data bases concentrated in five subject areas: aviation, economics, energy, finance, and actuarial.

March 1984, 108 pp., no charge

AECC: Australian Export Statistics Data Base (new)

The Australian Export Statistics Data Base comprises current and historical monthly statistics on commodities exported to all of Australia's overseas trading partners. The information is supplied by the Australian Bureau of Statistics. The AECC data base is of interest to financial institutions, commodity market traders, industrial companies manufacturing for export, potential exporters, shipping agents, and government departments. There is no surcharge for the use of AECC data.

January 1984, 29 pp., \$4.00

Changes to Box-Jenkins (new)

The new workspace 539 *BOXJENKINS* on the SHARP APL system contains functions to perform univariate time series analysis according to the methodology of Box and Jenkins. This manual describes the many enhancements in the new workspace that update the original workspace 39 *BOXJENKINS*. (See the article in this issue of the *Newsletter*.)

March 1984, 34 pp., no charge



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The I. P. Sharp timesharing service is accessible from over 600 places via a local telephone call. Please ask your nearest I. P. Sharp office or representative for a complete list of access points and access procedures. The I. P. Sharp Network also connects with the worldwide Telex network via the Amsterdam and Rochester, New York nodes.