General Electric invites you to...

Join the cerebration

No bands, fanfare, ground-breaking or speeches.

Nothing spectacular. At least not at any given moment. But, each time a software professional joins our systems staff he adds an estimated 94 cubic inches of mental capacity. At 21,275,000 binary decision making units per cubic inch we expect, and get, some pretty exciting throughput.

Why not. That 94 cubic inches gets plenty of exercise. Flexing muscles in multi-programming and multi-processing (while stretching our already significant lead in time sharing technology.) Reaching out for new, powerful concepts like IDS—a radical departure in data storage units and filing systems.

Our software must be powerful if it is to serve our many users in such diverse areas as an information support system for Apollo; real-time processing for business; and remote inquiry Management Information Systems for the aircraft, aerospace, steel, lumber, and packaging industries.

How powerful? Well, how about GECOS III for openers?

If your 94 in.² isn’t being fully utilized where you are, come to where the accent is on software systems—and advancement.

In other words, come on out and join the cerebration!!!

Please write to Mr. George Callender, General Electric Co., Information Systems Equipment Division, Sect. 164-J, 13430 N. Black Canyon Highway, Phoenix, Arizona 85029.
QUICK DRAW

to the rescue
of spiraling
programming costs!

General Custer didn't have a chance.
You do.
It's simple enough to call for reinforcements. By return
tail we'll rush a copy of a Quick Draw Management
Report that shows how spiraling programming costs
can be halted.
Quick Draw is a newly announced programming tool
for most computer users that standardizes program
documentation. It actually frees your programmers from
the burden of documenting their programs. You simply
use the power of your own computer and save up to
30% of present programming costs.
Your programmer does nothing. In a matter of minutes,
your computer prints out a flow chart, a reference for-
mat listing, a cross reference to data name and a cross
reference to paragraph name.
You can use Quick Draw to automatically document new
and current programs (or even incomplete ones), for
standardizing documentation, for efficient program
maintenance and for dollar saving debugging. And all
with complete accuracy from your source program
decks and tapes. Whether they're written in COBOL,
Does every hour at work seem like two?
You can have it the way you want it here.

Time flies for programming people at Honeywell, Computer Control Division because there are so many interesting, challenging things to do with a multitude of advanced computer systems... because of the freedom you have in doing them... because of the pleasant, stimulating people you'll be doing them with... and because of the great company you'll be doing them for.

If you fill the bill for any of our current openings, let's get together. It's about time, isn't it?

PROGRAMMERS

SENIOR PROGRAMMER — responsible for software design and development for our Series 32 computer-based systems. Will work as project leader and programmer for a wide variety of basic software and special systems software development projects. Requires 10-15 years software development activity.

COMPUTER TEST PROGRAMMER — To specify and design original programs for test and analysis of computer systems. Will design programs which determine symptoms of malfunctions in prototype hardware, and evaluate and analyze new hardware concepts with logic designers and checkout engineers. Requires 6-9 years digital computer design, logic design or test engineering.

SPECIAL SYSTEMS PROGRAMMERS — Several specialists are needed to participate in development of proposals, cost estimates and contract obligations for new computer-based systems applications. Will coordinate applications of special systems software requirements, provide software assistance and consultation within the Division, and develop special applications software. Requires 3-4 years intensive experience in systems software.

STAFF PROGRAMMER — for software support of our Series 16 time sharing system. Will provide representation on time sharing system software development team. Requires 10 years programming experience.

For more information about these opportunities, call or wire collect, J. Paul Costello (617) 879-2600. Or, send resume with salary history, to Honeywell, Computer Control Division, Old Connecticut Path, Framingham, Massachusetts 01701.

Honeywell
COMPUTER CONTROL DIVISION
An Equal Opportunity Employer
At Xerox, programmers are involved in virtually every phase of business operations. As the need arises, depending upon your background and career goals, you'll be concerned with programs that may range from marketing research to business modeling to manufacturing to accounting to engineering.

Providing people with this kind of varied exposure helps develop a strong, innovative staff for us, and helps you to develop broad experience...which is the best preparation for better things to follow. As a point in fact, that's one reason why most of our programmers are called programmer/analysts.

Since our most important product is better customer service, we are looking for talent that can utilize EDP and systems thinking in their broadest sense to provide practical, business-like solutions to multi-faceted problems. It's the kind of talent that is going to help direct our operations in the future.

If you have a Bachelor's degree and/or experience with an IBM 360 or 7000 system, or a Univac 1108, using COBOL or AUTOCODER, there could be a future management opportunity waiting for you at Xerox. To find out more about the opportunities on all levels, send your resume, including salary, history and requirements, to M. H. Hartigan, Dept. MZ-69-J1, Xerox Corporation, P.O. Box 1995, Rochester, New York 14603.

An Equal Opportunity Employer (m/f).
Once again, the proposal has been revived to form a “public interest” corporation (ala-TVA or Aerospace Corp.) to operate the nation’s postal system on a more businesslike basis.

At the present state of postal service, any proposal for change has a certain amount of appeal. However, we cannot envision the Congress turning the postal service over to such a body without saddling the new “corporation” with the same asinine regulations which currently make it impossible for the government itself to perform the job.

We would like to offer another alternative. Why does not the government issue a Request for Proposals from private industry? Let it be a requirement of the RFP that each proposal must include at least one class of mail (special restrictions as to dimensions, labeling, etc., being acceptable) on which overnight delivery anywhere within the contiguous states is guaranteed.

Let it not be a requirement that the proposed service be financially self-sustaining; but that it should offer substantially improved service, at present mail volume, without requiring a subsidy of more than $500-million/year or some other fixed limit.

The applicability of the “systems” approach to many other problems of government—land usage, transit and highway needs, crime control, etc.—has been recognized. Why not let some of the expertise developed in industry, in aerospace and defense work, be put to work on this problem? Surely no operation of any such magnitude was ever in such crying need of system.

We suspect that at least 20 firms might be willing to perform preliminary studies and submit preliminary proposals mainly or entirely at their own expense. Any real government expense would begin with sharing the cost of developing the two or three most promising proposals in a “run-off” like that used in the SST competition or in various other space and defense undertakings.

Responsible officials of companies which might be interested in preparing such preliminary proposals for improved postal service are invited to notify us of their interest and we pledge to make this interest known to both the Executive and Legislative departments. Write: H. L. Rothra, Pres., PRESS-TECH, Inc., 1020 Church St., Evanston, Ill. 60201.

We have had many enthusiastic comments about our July cover by Artist Alan Daugherty depicting the manifold role of the computer in modern industrial management.

A few persons (while still hailing Daugherty’s imaginative representation) objected to one of his anthropomorphic machines shown in an attitude of prayer.

It is interesting that, in submitting this art, Daugherty noted that there might be some such objections but defended his inclusion of the vignette this way:

“Believe me, there’s no sacrilege intended. I did quite a bit of research into what management tasks the computer is now performing; and my overall conclusion from what I learned is expressed there: If the computer is going to take over every other function of management, somebody better program it for this final human function!”

Josef Broz Tito has been rather luckier than most in his efforts to run a republic in the shadow of the alleged “union of republics,” but who is to say whether Moscow’s then-current troika may decide to pull the string while IFIP-71 is in progress? The track record of those who have attempted to be, simultaneously, communist and free is not impressive!
EDP SALESMEN & APPLICATIONS SPECIALISTS

Not everyone will like the Washington, D.C. area...

That's why we have 46 other locations.

But they're all the same from one viewpoint. Opportunity. It's there. As much as you can handle. Of course, that's what everybody says. But not everybody is the leader in time sharing. Only GE. And we're extending that lead. With a broadened library of user programs that's still growing. More powerful systems software. Third-generation hardware. And pioneering—in a big way new applications like time-shared N/C programming.

Right now, you're probably wondering what this means to you. Besides a more marketable product, that is. For one thing, it means diversity: sales careers in all shapes and sizes. Including customer liaison, influencing market planning...even suggesting, educating and exploiting whole new markets. Plus whatever else your ingenuity can add to the spectrum.

There's another facet to a GE job you won't want to neglect, either. It's the kind of company we are. In terms of recognition. Promotion. Stability. And success.

But we'd rather tell you about all the other pluses in person. If you've EDP experience (preferably in the customer applications area) and know your FORTRAN as well as your goals, you'll want to look into the opportunities at any of our locations throughout the country. For specific information, write to the Regional Manager of whatever location interests you.

Information Service Department

GENERAL ELECTRIC
An Equal Opportunity Employer m/f

SEPTEMBER, 1968
A Compact Finite State Machine For Program Control

E. W. Ver Hoef
Informatics, Inc.
Bethesda, Md.

The principles of a finite state machine are reviewed herein and a compact version of the representative transition and output tables is developed. Then an application is discussed wherein a finite state machine is used to control the dispatching of programs in a large file management system.

Work reported herein was performed as the Data Storage Level Changer, sponsored by Rome Air Development Center, Griffiss Air Force Base, Rome, New York, under Contract Number AF3 (602)—3794.

Much has appeared in the literature regarding and describing finite state machines. Gill, in his book, gave a very definitive description of finite-state machines as well as describing techniques for analysis using such representations (1). Burks and Wang describe several interesting types of finite-state machines (2). Thus the notion of a finite-state machine is not particularly new. Nor, for that matter, is the idea of using a finite-state machine to control a complicated computer process. Heistand has given an excellent description of such an application (3). However, in all such applications your author has seen there has been one recurrent problem—the design of the transition tables was such as to foster a great deal of waste space. It is the purpose of this article to show a new form for these tables which eliminates this problem without increasing the complexity of the programs which exercise the tables. For the benefit of those who are not overly familiar with finite-state machines, in the first part of this paper we will first review the principles of such a machine, then display the usual form for the transition tables and discuss ways in which they can be made more compact. The second part of the paper describes how the technique is used in the Data Storage Level Changer of the INTIP System.

Description of Finite-State Machine

Any system displaying the following four characteristics can be considered as a finite-state machine:

1. There is a finite set of discrete inputs.
2. There is a finite output set.
3. There is a finite set of states.
4. There are a pair of characterizing functions by which the output and the next state, respectively, are determined as functions of the current state and the current input.

Such a system generally assumes a time $t_i$ corresponding to the initial state $S_0$. The system remains in this state until an input is received (or until the received input is sampled.) Then, utilizing the functions in (4), an output is generated and a new state is determined. Implicit in this new state is the significant history of how the system got to that state. This process continues to conclusion, with each output and next state being determined by the current state of input.

Implementation Techniques

One of the more obvious means of representing the functions charac-
In this example each kind of input was assigned a unique number, but note that no single state expected more than three of the four different kinds of input. Therefore, if the assignment of numbers to types of input was made locally rather than universally, the matrix could be reduced from 4x4 to 4x3, i.e., one column could be eliminated. The matrix would then appear as in Figure 3.

However, even in this compact form, 3 entries are blank representing a 25% waste. In general, the dimensions of such a matrix are \( m \times n \) where \( m \) is the number of states and \( n \) is the maximum number of distinct inputs which could be received while in any one state. It can be seen readily that if there is not a high degree of uniformity in the number of inputs receivable by each of the states, the amount of waste space in the matrix can be rather high. Taking a somewhat extreme example, assume a 10 state machine in which one state could receive 6 different inputs but the remaining 9 states could each receive only 2 different inputs. The matrix for this system would then be 60% void.

By reorganizing the data in the matrix into a linear array, eliminating void entries, and substituting the address of the state record in place of the state number itself, further reductions can be effected. Such an array would consist of a string of state records where each state record is one row from the compact matrix (with void entries deleted). Figure 4 shows such a representation of the system in Figure 3.

Comparison of Figures 3 and 4 reveals that they are indeed equivalent. Note that if the system were in state 1 and received a number 1 input, the matrix indicates that the next state should be 3 whereas the table indicates that the next state record starts in word 5 of the table which is indeed the origin of the state 3 record. Further comparison is left as an exercise for the reader.

The last several paragraphs have only concerned themselves with the determination of the next state. However, the determination of the output can be performed in somewhat the same manner. If there is no simplifying relationship between next state and output such as enabled the construction of a table shown in Figure 2, i.e., if the output is strictly as function of current state and input rather than a function of next state, then the table in Figure 4 can simply be doubled in size so as to incorporate the output (Figure 5). Note that the space savings is still the same percentage because we now have a table twice as big as that in Figure 4 replacing two matrices, each as big as the one in Figure 3.

Again, an inspection reveals that if the system were in state 1 and received a number 1 input, the table would produce the origin of the state 3 record (word 9) as well as the output A. However, if the current state were 1 and a number 3 input were received, although the next state address would again be 9 (state 3), the output would be C.

Just as the compact table in Figure 2 was made possible by a strict relationship between next state and output, so the same relationship...
would enable the reduction of the table in Figure 5. In this case rather than treating the output as a function of the current state and input, it is treated as a function of the next state and inserted as the first word of each state record (Figure 6).

As shown by this table, if the system were in state 1 and received a number 1 input, the next state record would begin in word 7 (state 3) and the output (found in word 7) would be A. Thus we now have two techniques (Figures 5 and 6) for representing the characterizing functions of a finite-state machine, one which can be used when there is a strict relationship between next state and output and one for the more general case. Yet both techniques are, at worst, as efficient as the matrix method and generally are much more efficient.

**Application**

Thus far we have concerned ourselves only with the somewhat abstract concept of finite-state automata and an interesting exercise in table construction. However, let us examine an actual application of the techniques developed. We will use the technique shown in Figure 6.

One of the primary functions of the Data Storage Level Changer (DSLC) in the INTIP (INTegrated Information Processing) System (4) is the processing of file commands sent to it by other computers in the system. The processing of any given file command can be considered to consist of a number of discrete routines, some of which may be utilized more than once for a given command and some of which might also be used in the processing of other commands. These routines were identified and coded as separate entities. The sequence in which these routines are to be used is data dependent, i.e., the routines operate on the file command parameters and/or DSLC indices and upon the completion of any routine (say A), based on determinations made internal to that routine, one might want to go to routine B or C. Furthermore, if routine A is used again at a later point in the processing of this command, the same two conditions dictate that the next routine should be D or E, respectively. Likewise, if one were processing a different command which utilized routine A, these two conditions might indicate the need for routine F or G, respectively.

One way in which the above capabilities would be provided would be to write each routine as a closed subroutine with multiple return points and then write a driving routine which calls upon the routines in the necessary order. However, this approach requires that such a driver be written for each type of command. Furthermore, system requirements make it mandatory to be able to process multiple file commands in parallel, including even multiple instances of the same type of command with possibly different parameters. This imposes the additional requirements on the driver that means must be provided for keeping track external to the driver itself of the progress of each user. Such a driver while not too difficult to write, could not be easily modified. For the above reasons it was decided to use a finite-state machine for the driver. This simply required a transition table of the type shown in Figure 6 for each type of command and a relatively simple routine capable of exercising all such tables. The state, input, and output for each command are retained in the respective entry for that command in a list called the Command Process Queue.

Each command processor routine is written as an open subroutine...
If you're the kind of systems programmer who has a mind that's deep enough for Kant,

and sufficiently precise to enjoy the esoteric language of the computer,

broad enough for science fiction,

look into RCA. You're our kind of person.

You probably think far ahead of your time.
You want to take software out of its infancy. Into the 4th, 5th and 6th generations.
You want a chance to influence hardware design, instead of the other way around.
You want a variety of projects with definite objectives, instead of an endless task.

SEPTEMBER, 1968

You want challenging work and inspiring rewards.
If this is what you're looking for, find it at RCA.
Write to us if you've had experience in language processors, operating systems, utility systems or communications systems.
We also have openings in Sales, Field Systems Support, and Product Planning and Engineering.
Contact Mr. J. C. Riener, Dept. SW-5, RCA Information Systems Division, Bldg. 202-1, Cherry Hill, New Jersey 08101. We are an equal opportunity employer.
which operates on some parameters in the command and/or the contents of one or more of the DSLC indices and, based on this operation, selects an exit number and then transfers to some fixed location in the DSLC Executive. This exist number is some number from 1 to p where there are p different possible exit conditions associated with this routine. The exit number serves as the input to the finite-state machine which, utilizing this number and the current state, determines the output and the next state. The output, in this case, is the identification of the next such routine to be entered.

The standard unit of storage in the INTIP System is a block of 6144 bits which, in the PDP-8 (the computer on which the DSLC is implemented), is 512 words of 12 bits each. Such a block, if it contains any DSLC programs or tables, is referred to as a program module. The command processor routines are generally considerably smaller than one block allowing two or more to be packed in one program module. Therefore n (variable) routines are inserted in a program module with the first n words of the module specifying the origin of each of the n routines within that module; a transfer vector table, if you will. A unique routine identification consists of the module number and the address of one of the transfer vectors. Thus the output (word 1 of each state record of the process control table, Figure 6) of the finite state machine consists of the ordered pair: module number, transfer vector number.

The control of the processing of a command then is carried out in the following fashion:

(1) Upon receipt of a command the appropriate process control table is selected, the system is set to state 1, and the finite-state machine (hereafter called the process control routine) produces the corresponding command processor routine identification.

(2) The command processor routine performs its task, selects the appropriate exit number to be used as input to the process control routine, and returns to the executive.

(3) The process control routine, utilizing the current state and the input, determines the next state and the associated output (next command processor routine identification).

(4) Steps (2) and (3) are repeated for successive command is completed. Completion is indicated to the process control routine when the input number, as applied to the current state record, produces a next state record address of 77778.

**Additional Features**

Each process control transition table is stored in an aforementioned 512 word program module. Since it is entirely possible for such a table to exceed the length of one program module, provision had to be made for continuation of the table to another module. This is done by the insertion of a three word continuation record in place of any state record for which there is no room. The first word of this record contains 77778 identifying it as a continuation record. The second word contains the module number of the program module to which the table is continued and the third word contains the address within that module of the origin of the state record for which there was no room in the original module.

In analyzing the steps required in the processing of any given command one can usually identify what might be considered subprocesses, i.e., a string of steps that are used repeatedly in the same sequence and in the same sense. Similar subprocesses can be identified as being common to the processing of several commands though not necessarily repeated in any one command. By extracting from the transition table for a given command that portion which represents such a subprocess and making it into a separate transition table callable by the original table, the original table can be reduced in size substantially. Such a sub-process table is represented in the original table by a special state record in which the first word is 77008 identifying it as a sub-process call. The second and third words identify the origin of the subprocess transition table in the same manner as the continuation record. There follows one word for each possible exit condition from the subprocess. Each such word contains the address of the next state record to be selected in the event the corresponding exit is chosen. When a sub-process call is encountered, the module number of the current transition table and the origin of the current state record in that module are stored in a push-down list and the new transition table is activated. The return from a sub-process to the calling process is indicated by a special state record in the subprocess transition table. The first word of this record contains a 70708 identifying it as a sub-process exit. The second word contains the exit number to be used in determining the address of the next state record in the calling process transition table (identified in the last entry of the push-down list). The use of a push-down list enables the nesting of subprocesses, i.e., allowing one subprocess to utilize another subprocess. The degree of such nesting is limited only by the size of the push-down list.

**Conclusion**

The analysis presented above plus the experience gained in the implementation of the process control function as a finite-state machine indicate there are some distinct advantages to be derived from the application of the technique.

(1) The logic of the command processor system is contained in a table where it is more easily modified than a program where modifications can be traumatic.

(2) Representation of logic in the form of a finite-state machine lends itself more readily to analysis than the more obscure form of a program.

The objection to the waste space generally associated with the matrix form of transition tables is largely ameliorated by use of the linear array described above.

**REFERENCES**

Software Age
Resume Center
at FJCC

San Francisco, California, St. Francis Hotel
Union Square
10:00 A.M., Monday, December 9—5:00 P.M., Wednesday, December 11
(Over 75 Local and National Companies will be participating)

Software Age magazine is sponsoring a free employment center during the upcoming FJCC Show in San Francisco, December 9–11, 1968. The S/A Resume Center will be located at the St. Francis Hotel, Union Square. The center opens Monday, December 9 at 10:00 A.M. and will continue to be the hub of employment activity until 5:00 P.M., Wednesday, December 11.

1. Fill out the special resume form from magazine or at Center.
2. Our Remington R-2 operator will photocopy the resume free and return all copies to you.
3. You place your resume in the company lock boxes of your choice.

Your job is simple. You follow the same procedure at the center that you do in S/A—but on a highly accelerated basis. Fill out the special resume form that will be available at the center. At the center our Remington R-2 operator will immediately provide you with as many free photo copies of your resume as you require. You personally deposit them in the lock boxes of those companies which interest you. The resume form includes blanks where you can enter your hotel, telephone number and room number. If you wish, you may bring your own resumes to the center.

Only the participating company representative has access to the lockbox. At his convenience, he can take the resumes to the privacy of his room, examine them and, if interested, contact you at your hotel to arrange an interview.

The entire operation of the S/A Resume Center is designed to provide speed, convenience, simplicity and maximum confidence with no middlemen involved. You determine exactly the companies you want (over 75 companies participating)—no others will see your resume or know of your interests. You can relax, enjoy the convention while you know your resumes are working for you!

The S/A Resume Center is FREE. There is no charge to you or the company for this valuable service. The resume center is sponsored solely by the advertisers in Software Age magazine.

San Francisco, California, St. Francis Hotel, Union Square
10:00 A.M., Monday, December 9—5:00 P.M., Wednesday, December 11

The first non-profit central clearing house of job opportunities, managed by a publication, another service for engineers from the only publication dedicated to their career advancement. ENGINEERING OPPORTUNITIES MAGAZINE, 1020 Church St., Evanston, Ill. 60201
Norman Jacobs, Advertising Director

September, 1968

13
Send in your request now for advance information on the first journal in the world devoted to the fast-developing use of computer techniques in engineering design.

Already widely used in electronic circuit design and problems of chemical engineering, CAD techniques are being increasingly employed in shipbuilding; structures; mechanical-chemical-nuclear-automotive-railway- and aerospace-engineering.

COMPUTER AIDED DESIGN will be launched in October. By returning the coupon you will receive advance details of this important new quarterly publication. You will also be on the first list to receive details of how to obtain a FREE COMPUTER AIDED DESIGN PROGRAM.

FREE PRE-PUBLICATION OFFER!

To: COMPUTER AIDED DESIGN,
Heywood-Temple Industrial Publications Ltd.,
33-39 Bowling Green Lane, London EC1, ENGLAND.
Please send me advance information on COMPUTER AIDED DESIGN and how to obtain a free C.A.D. program.

Name

(BLOCK LETTERS)

Company

Address

Position in Company

SA

If your problem can be put in human language, our experts throughout the world can put it into any of the 82 machine languages now in use!

If you deal with datamatech you'll know, in advance, what your total cost will be. Contract rates include systems design (if required) programming, complete documentation and debugging on your installation with your personnel. In other words, the rate covers a working system and program(s) ready for an operator to run!

Consider that before you contract with anybody for software services!

datamatech

9208 Hermitage Pl. New Orleans, La. 70123
(504) 737-8139
By GEORGE N. VASSILAKIS
of TRW's Software and Computing Center

PROBLEM OF THE MONTH

Here is a good one for those who think that prior TROUBLE-TRAN problems have been too easy or too compiler depended.

Given two subroutines (A, B) such that subroutine A contains a statement numbered 100 and subroutine A calls subroutine B, show the coding that would enable subroutine B to transfer to subroutine A at statement 100 without subroutine B using the RETURN or CALL statements. The position of statement 10 is irrelevant.

```
C      MAIN
CALL A
STOP
END

SUBROUTINE A
IF (L.GT.01) GO TO 10
100
WRITE (3, 110)
RETURN
END

SUBROUTINE B
IF (L.LT.01) RETURN
END
```

The problem was intended to illustrate what may happen when literals are used as arguments in a CALL statement and the corresponding DUMMY argument in the subroutine changes value, which in turn changes the literal in the calling routine and any subsequent use of that literal leads to trouble. This happens when a programmer uses a subroutine written by someone else and the user knows only the calling sequence and not what is inside the routine.

After statement CALL XTRAN (2,K) is executed, the literal 2 is changed to 0 and K (which corresponds to J in the subroutine) equals 20.

The integer 2 in DO 10 J = 1,K,2 is not the same as the 2 in CALL XTRAN (2,K). In the case of the DO statement the integer 2 is imbedded in the instruction that is used to increment the index register. This is done at compile time and can not be altered during execution.

The correct answer to our problem is: The message "YOU ARE WRONG" will be printed 10 times.

P. S. Some TROUBLE-TRAN readers have complained about the fact that these problems are too compiler depended. I agree with them, but I also feel this column helps to point out the differences in compilers and the fact that FORTRAN is not as machine independent as some people think.

If my readers are interested, I would like to alternate the publication of these problems with FORTRAN Algorithms that may be of interest to many readers. Perhaps, Software Age could pay $25.00 for each algorithm that is accepted for publication. Please write if you like this idea.

XTRAN

ANSWER TO LAST MONTH'S PROBLEM

"THOU SHALL NEVER USE LITERALS IN A CALL STATEMENT."

The problem was intended to illustrate what may happen when literals are used as arguments in a CALL statement and the corresponding DUMMY argument in the subroutine changes value, which in turn changes the literal in the calling routine and any subsequent use of that literal leads to trouble. This happens when a programmer uses a subroutine written by someone else and the user knows only the calling sequence and not what is inside the routine.

After statement CALL XTRAN (2,K) is executed, the literal 2 is changed to 0 and K (which corresponds to J in the subroutine) equals 20.

The integer 2 in DO 10 J = 1,K,2 is not the same as the 2 in CALL XTRAN (2,K). In the case of the DO statement the integer 2 is imbedded in the instruction that is used to increment the index register. This is done at compile time and can not be altered during execution.

The correct answer to our problem is: The message "YOU ARE WRONG" will be printed 10 times.

P. S. Some TROUBLE-TRAN readers have complained about the fact that these problems are too compiler depended. I agree with them, but I also feel this column helps to point out the differences in compilers and the fact that FORTRAN is not as machine independent as some people think.

If my readers are interested, I would like to alternate the publication of these problems with FORTRAN Algorithms that may be of interest to many readers. Perhaps, Software Age could pay $25.00 for each algorithm that is accepted for publication. Please write if you like this idea.

XTRAN
The FORTRAN-IV formatted READ and WRITE statements cause transfer of alpha-numeric data to or from the external input or output device selected by the unit number. However, for some applications it is convenient if such data can be transferred, instead, to or from an area in memory, so that further operations can be performed on it. These are the functions performed by the ENCODE and DECODE statements in some versions of FORTRAN.

Such facilities can be added to a FORTRAN-IV system by adding a suitable I/O subroutine to the library, appropriating a unit number that is not otherwise used. The subroutine is written to transfer the data to or from an array. Such a routine has been written for the FORTRAN-IV system on our DDP-24 computer.

The array is designated by the statement

```
CALL BUFDEF(M,N)
```

where M is the name of the integer array that receives or supplies the alpha-numeric data. N is an integer constant or variable indicating the number of data words transferred. It must not be larger than the length of the array M and must never be greater than the length of the buffer area used by the I/O conversion routines. These assignments apply to all subsequent operations until altered by another CALL BUFDEF statement. The number of characters per word (four for the DDP-24) depends on the particular computer.

The unit number 8 was here selected for this use. The statement

```
READ(8,n) list
```

takes N words of alpha-numeric data from the array M, and converts them according to FORMAT statement n to fulfill the list. In the process, the input-output buffer area is loaded with N words of data from M. If N is less than the buffer length, the remainder of the buffer area is filled with space codes. The contents of M are not altered. (If the list and FORMAT statement are such as to call for multi-line input, the contents of M are transmitted repeatedly.)

Going in the other direction, the statement

```
WRITE(8,n) list
```

converts the list according to FORMAT statement n, and stores the first N words of the result in the array M. (If the list and FORMAT statement produce multi-line output, the contents of M are transmitted repeatedly.)

Example: An example of the usage of this facility is as follows: Suppose an input deck contains eight different types of data cards, randomly intermixed. Each type must be read with a different list and FORMAT statement. The types are distinguished by an index digit, from 1 through 8, punched in Column 1. A card with 9 in Column 1 indicates the end of the deck.

The deck may be read by the following coding, which assumes four characters per word, and 3 as the card-reader unit number:

```
DIMENSION MBUF(20), . . .
. . .
10 READ(3,20)(MBUF(I),I=1,20)
20 FORMAT(20A4)
30 READ(8,31)INDEX
31 FORMAT(I1)
GO TO(11,12,13,14,15,16,17, 18,19),INDEX
11 READ(8,21)list 1
21 FORMAT(IX, .)
GO TO 10
12 READ(8,22)list 2
22 FORMAT(I9, .)
. . .
19 . . .
```

Here, statement 10 reads the information on a card into the array MBUF in alpha-numeric form. Statement 30 then decodes the first column to obtain the index digit. A computed GO TO branches to the appropriate READ statement (11 through 18) for the particular card. The information in MBUF is then decoded according to the appropriate format (with the first column now ignored in each case) and loaded into the appropriate list. After the information is processed, return is made to statement 10 to read another card. When a card is read having an index digit of 9, control passes to the remainder of the program, starting with statement 19.
HAWAII
A rare opportunity to relocate to our most beautiful state. Prefer individuals with experience in one of the following: 360, COBOL, JOVIAL, COMMAND/CONTROL. This large international firm will pay excellent salaries, relocation costs plus benefits, and a 17% cost of living differential.

EUROPE
A large international firm is seeking senior technical individuals ($18-$30,000) in the following categories: 1. London—on-line banking systems; 2. Paris—real time communications or reservations; 3. Switzerland—real time banking systems; 4. Algeria—petroleum systems; 5. Madrid—banking systems. A marketing personality and communications in the native tongue would be helpful but not necessary.

SAIGON
A rare chance for high earnings and tax-free benefits is offered by this international organization. High salaries, excellent per diem, plus 75% cost of living and additional overtime; this is a two year assignment, and a tax-free. Experience on IBM 360/40/50/65, or COBOL or COMMAND SYSTEMS will qualify. Your choice of stateside assignment after your tour is complete. Many programmers can have $60-80,000 saved by the time they return.

MANAGEMENT
Over 30 of the nation’s leading computer manufacturers, users and consultants are currently seeking managers in a diversity of applications. Salaries range from $18,000 to $75,000, from project leaders to vice presidents; many also offer liberal stock options and executive benefit plans.

TIME SHARING
A large chain of data centers is currently being established in 30 major cities. Prefer programmers with non-scientific applications who desire to be trained on time-sharing applications. All management is staffed internally; rapid professional and financial advancement is virtually assured.

INFORMATION SYSTEMS
A large computer-oriented company with an international network of data centers is seeking computer personnel; junior programmers, senior programmers, systems analysts, designers, and managers to staff their rapidly growing systems. Opportunities exist in 17 states and 8 foreign countries. Salaries range from $8,400 to $24,000. This is a chance to participate in total systems design and implementation from the ground up. Outstanding benefits.

BUSINESS
Several programmers and analysts who have experience in manufacturing industries are needed to staff a new and rapidly growing multi-computer complex. Areas such as accounting, inventory/production control, and general manufacturing applications would be helpful. This progressive firm pays excellent salaries and gives their professionals 4½ weeks vacation and liberal bonuses, plus a fully company-paid benefit package.

SCIENTIFIC
Should have a degree in Math, Physics or Engineering, and a knowledge of FORTRON. Apply your academic background to all facets of the latest state-of-the-art advances. This is a large, non-profit organization paying outstanding salaries, 4 weeks vacation, and extended academic leave in a stimulating university-affiliated environment.

Never a cost or obligation to you at any time, as we are a professional recruiting firm sponsored by the computer industry. All replies held in strictest confidence.

free:
Hot off the press! Our brand new Summer 1968 Professional Advancement Brochure—40 pages packed with detailed job descriptions representing over 4,000 computer opportunities in all 50 states and 35 foreign countries and the latest wage and salary surveys for eight different categories of computer specialists.

EAST COAST
1025 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 296-0340

WEST COAST
1212 Wilshire Boulevard
Los Angeles, California
(213) 481-7461

For more information, circle No. 9 on the Reader Service Card
new products

SIAM—a geographic data base file handler that permits access by street and intersections was announced by Systems Science Corp. The system is designed to operate on the IBM/360 computer and the RCA SPECTRA/70.

SIAM is designed to provide street and intersection access to computer stored urban data bases. According to Systems Science Corp., organizations such as local governments, law enforcement agencies, emergency service organizations, and public utilities that maintain urban data bases, will now be able to quickly search and retrieve information by street address, intersecting street designation, or by the coordinates of a premise address.

For more information, circle No. 60 on the Reader Service Card

PERT-PROGRAMMING

MAGNETIC SYMBOLS
Reduce Work and Speed Operations for
- SYSTEMS ANALYSTS
- PROGRAMMERS
- METHODS SPECIALISTS

MINUTEMAN Magnetic Symbols provide fast, simple and highly visual means of handling PERT, flow charts, diagramming and scheduling problems. Made of sturdy Vinyl “write-on” plastic, in colors. Symbols are easily marked with grease pencil and wiped off. Last indefinitely. The ultimate in convenience, efficiency and economy. Write for FREE catalog on the most modern and flexible visual programming and scheduling systems.

For more information, circle No. 65 on the Reader Service Card

A Tape Reader/Spooler that operates at 300 characters per second has been announced by Ferranti-Packard Electric Limited, Electronics Division. Designated the Type 4010/4020, the unit is intended to be used in the input to digital computers, numerical control of machine tools, automatic testing and checkout equipment, automatic message transmission and industrial process control.

The 4010/4020 tape reader/spooler can store 500 feet of 0.0025” paper tape and rewind it at the rate of 40 inches/second. It can stop on character at 300 characters/second, with stop/start speeds from 0 to 240 characters/second, and is capable of handling tapes up to an 8-channel width.

The unit comes in a standard 19” rack size and is 7” high. It is durably mounted on a 3” aluminum panel.

For more information, circle No. 62 on the Reader Service Card

EPSCO, Incorporated, has introduced its Edityper 200 System, an all-solid state automatic typewriting system with editing capabilities and single or dual punch and reader.

Designed for higher reliability and easier maintenance, the Edityper 200 is a modular design to which can be added readers and punches.

Information used repeatedly is recorded on a punched paper tape and stored for future use. The original text has to be typed only once. Reproduction, at the rate of up to 175 words a minute, is completed automatically on the tape. The Edityper System can be programmed to stop at any point in the text to permit revisions, additions or deletions.

The punch and reader unit can be connected to add a dual reader. When not used in its automatic mode, the Edityper 200 automatic typewriter serves as a standard IBM Selectric typewriter. Five keys have been added to each side of the basic keyboard.

The Edityper 200 System can be used as a data terminal as well as for applications in business office procedures and volume letter-writing.

For more information, circle No. 63 on the Reader Service Card

The 3M Company has announced expansion of its Scotch brand computer tape line to include a new “Guaranteed Performance” tape.

To be known as “777GP”, the tape utilizes the same binder formulation and oxide coating as Scotch brand “777” computer tape and differs only in the certification process. New “777GP” is electronically tested throughout the entire manufacturing process which, according to 3M, provides a reliable computer tape that no longer requires the bit-by-bit individual roll certification.

As a result the “777GP” will be offered to users at a lower price. The original Scotch brand “777” will continue to be offered as part of the 3M computer tape line.

777GP is designed for, and fully compatible with the new third generation computers and offers long term dependability over thousands of passes and is fully compatible through all bit densities to 3200 FCL.

For more information, circle No. 64 on the Reader Service Card

MAGNETIC AIDS, INC.
11 WEST 42nd STREET, NEW YORK 36, N Y

For more information, circle No. 65 on the Reader Service Card

SOFTWARE AGE
... in our

SCIENTIFIC & COMMERCIAL
COMPUTER-BASED
ANALYSIS &
DESIGN SYSTEMS

You can. You'll like what you see at Sikorsky Aircraft—a company dedicated to producing the most advanced VTOL airborne and surfaceborne transportation systems.

And you'll like working with a select group of stimulating, top-talent people... on abundant and provocative challenges. You would be applying your professional talents to specifying, designing and implementing advanced computer-based technical and commercial systems.

Our current equipment includes Univac 1108's and IBM 360's with Graphics and Teleprocessing. Current and planned applications include—

Scientific: Man/Machine Interactive Graphics in Engineering Analysis and Design.

Development of Batch Programs and Systems in all engineering disciplines.

Commercial: Data Base and Real Time applications in Accounting, Manufacturing, Purchasing, Inventory Control and other related areas.

We have exceptional assignments at all levels of experience for:

COMPUTER SYSTEMS
PROGRAMMERS AND ANALYSTS
FOR BOTH COMMERCIAL
AND SCIENTIFIC FIELDS

You and your family will find the unique cultural and recreational advantages of pleasant Connecticut to be abundantly satisfying. And our interest in your continuing professional development is exemplified by our corporation-financed Graduate Education Programs. They are available at these fully accredited schools: Bridgeport • Brooklyn Poly • CCNY • Columbia • Connecticut • NYU • Rensselaer (Hartford Grad. Center) • Stevens • Trinity • Yale.

Send your resume in confidence, stating salary requirements, to Mr. Leo J. Shalvoy, Professional Employment.
Basic systems training for programmers...

...a prospectus from Systemation, Inc. tells about a new 25 week on-the-job training program. The training is designed to qualify a programmer to do administrative systems work in the data processing department.

It covers 17 basic areas of administrative systems work which are covered with 125 study units. The course was written by Leslie H. Matthies, Executive Director of The Foundation for Administrative Research and W. Norman Wood, Assistant Director.

For more information, circle No. 66
on the Reader Service Card

Color coded data processing folders designed for inter-office transporting or storing of tapes, tab cards or edge punched folders are available with left or right side to equalize file buildup. Standard size folders are available in green, orange, brown, pink, yellow, blue and manila for color coding by department, product, operation or other classifications. Legal size folders are also available in 2 styles.

For more information, circle No. 67
on the Reader Service Card

An advanced proprietary program and related services capable of automating systems design and providing management information for computer evaluation and selection has been announced by Software Products Corporation.

The new system, called CASE (Computer Aided System Evaluation), is currently being offered as an integral part of a consulting service.

A principal feature of the CASE System, which uses a large scale computer to perform repetitive simulation of a user's workload on specific hardware/software configurations, is its use of the "man in the loop" concept.

After each simulation, CASE presents output to a system analyst which suggests ways to improve the system. The analyst can then make both design and configuration changes with simple control card revisions and repeat the process until the optimum combination of system design and configuration has been achieved.

The system can be used to simulate 3rd generation computers of any manufacturer, including multiprocessing/multiprocessing systems and for a mixture of business, scientific, and real-time applications. The simulator is designed for a large scale computer with at least 65k words of memory and is currently demonstrable.

For more information, circle No. 68
on the Reader Service Card

Datacraft Corporation has announced a high performance, general purpose digital computer system designated the Series 6000 which it is said, will perform more than 1,500,000 operations per second. A full line of compatible peripheral equipment will also be introduced by the company.

The heart of Series 6000 is the DC-6024 digital computer which is designed for use in simulator, process control and scientific applications including multi-programming, time sharing, real-time and off-line uses.

The basic DC-6024 processing unit includes five 24 bit general purpose registers, three of which may also be used as index registers; 4K-word memory (12,288 bytes); hardware multiply/divide/square root; and four true levels of priority interrupt. The basic I/O includes an ASR-33 Teletype.

Add and subtract time for fixed point is 1.2 microseconds; multiply and divide times are 4.8 and 9.0 microseconds respectively for full length operands, and hardware square root is 8.4 microseconds. Floating point hardware is optional.

The DC-6024 uses the international and American (ASCII) standard codes for information interchange.

The mainframe and memory cycle time is 600 nanoseconds, said to be the fastest in a 24 bit machine. The memory may be expanded up to 65K words (196,608 bytes) in 4K or 8K word increments. The Central Processing Unit (CPU) can address memory at the word, byte and double word levels. It also has multilevel indexing and indirect addressing.

In excess of 500 instructions are available including more than 120 generic types. Standard instruction capabilities include: register/register manipulation, operand manipulation, byte manipulation, logical and algebraic compares and double precision load, store, add and subtract. Instructions are also included for stack manipulation and complete external interrupt control.

For more information, circle No. 69
on the Reader Service Card

A new 3500 series magnetic tape recorder/producer which incorporates both reel-to-reel and loop operation has been developed and is being marketed by Sangamo Electric Company.

The new recorder/producer features a loop adapter which can be used to record or reproduce in a continuous loop mode. The adapter consists of a tape storage bin, independent capstan servo, low-mass power supply and a vacuum system. A tape loop, up to 150 feet, is easily formed and is under tension in the head area only. This method increases tape loop life substantially over that of conventional multi-roller transports.

The vacuum tape tensioning system cleans the tape prior to its contact with the head area and a winding device provides a convenient means of removing the loop for storage.

The new unit utilizes a bi-directional, low-mass, fast-response drive system, any six adjacent automatically switched tape speeds from 15/16 to 120 ips, high recording density and accepts up to 16-inch reels.

For more information, circle No. 70
on the Reader Service Card

Jonker Corporation (Information Retrieval Systems) of Gaithersburg, Maryland, has announced the development of a new, completely automatic data entry machine, the J410.

This new machine allows the user to convert punched cards directly into Jonker term cards. Each Jonker card represents a single characteristic, an "inverted" approach to information handling.

The desired punched cards are fed into the card reader, which transmits the accession number to the J410's electronic circuits. The J410 is thereby directed to the appropriate matrix location and the hole is drilled in the Jonker card.

Entry is performed automatically, on a term-by-term basis. Accession numbers can be entered into 25 Jonker cards simultaneously at an input speed up to 3,000 entries per hour.

The J410 is 60" long, by 30" wide, by 51" high, and weighs 400 pounds.

For more information, circle No. 71
on the Reader Service Card

A user-oriented on-line FORTRAN programming system is now available for INTERDATA Model 3 and Model 4 digital computers. The system is a sub-set of ASA Basic FORTRAN having free format input/output and two dimensional arrays. All values are real and global.

INTERDATA FORTRAN features a direct or "desk calculator" mode of operation as well as stored program mode. The interactive feature eliminates the tedious phases of tape preparation, compiling, and object program loading. No program preparation other than keyboard entry of source statements is required; corrections are made while programs remain in core.

For more information, circle No. 72
on the Reader Service Card

 SOFTWARE AGE
how to use the index of...

primary employers

WHAT FACTS ARE Indexed?
The purpose of the Software Age Career Guide is to provide you with a concise and informative index to the nation’s primary employers of programmers, analysts, EDP managers and operators. This directory is made for your continual reference throughout the year.

In this section, listings of primary employers include:

ALPHA SOFTWARE COMPANY
Div. of American Software Products, Inc.
Indiana Blvd., Indianapolis, Ind. 48573
(317) 782-3206
Darrel W. Faucett, Computer Personnel Relations
Empl: Total this location 600; Total EDP Employees 70; Programmers 50; Analysts 20.
Electronic Central Office Telecommunications Switching Systems Development.
Optimize equipment and information utilization associated with electronic switching systems, and maximize traffic economies through analysis of engineering information.
See Ad Page 99

1. company name and division
2. mailing address and phone number
3. name and in-house mailing address of company representative to whom applications should be addressed
4. an asterisk (*) indicating company brochures available by writing the company representative
5. total, technical and software employment figures
6. brief description of operations, services and/or products manufactured
7. principal computer applications at this location
8. major EDP equipment located and used at this location

The names of those companies who are advertising in this issue appear in extra-bold face type, and an additional line in the listing states where to find their advertisement.

HOW IS THE INDEX ORGANIZED?
The main index section is a geon-alpha listing; it is organized alphabetically by state and the companies alphabetized within each state.

If you care to use an employment or search agency, use our index on page 65.

HOW TO USE THE INDEX
As an example of how to use this directory, let us assume that you are interested in the ABC Company. First, you turn to the Alphabetical Index and find that the ABC Company is located in California. Second, you check the State Index to find where the California listings start.

If the company name is in extra-bold type, you know that the company has an advertisement in this issue detailing its needs. And, by the bold-italic reference line at the end of the listing, you know where to look for their ad.

If an asterisk (*) follows the name and in-house address of the contact man, you know that you can obtain literature or brochures on software employment with the company by writing the indicated individual.

To answer listings in our primary index section, send your resume directly to the company. To answer advertisements in the magazine, you may send your own resume directly to the company or send our Confidential Inquiry Form on page 69 to us and we will duplicate and forward it to the advertisers you indicate.

INDEX OF EMPLOYMENT AND SEARCH AGENCIES
If you care to use an employment or search agency, use our index on page 65.
To find any particular employer by name alone, check this alphabetical index. Following the name of the company, division or organization, you will find the state in which located. In the state index (below) you may find the page on which listings for that state begin. (Boldfaced listings indicate advertisers in this issue.)

### STATE INDEX

<table>
<thead>
<tr>
<th>State</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALABAMA</td>
<td>28</td>
</tr>
<tr>
<td>ARIZONA</td>
<td>28</td>
</tr>
<tr>
<td>CALIFORNIA</td>
<td>28</td>
</tr>
<tr>
<td>COLORADO</td>
<td>34</td>
</tr>
<tr>
<td>CONNECTICUT</td>
<td>34</td>
</tr>
<tr>
<td>DELAWARE</td>
<td>34</td>
</tr>
<tr>
<td>DISTRICT OF COLUMBIA</td>
<td>34</td>
</tr>
<tr>
<td>FLORIDA</td>
<td>34</td>
</tr>
<tr>
<td>GEORGIA</td>
<td>36</td>
</tr>
<tr>
<td>IDAHO</td>
<td>36</td>
</tr>
<tr>
<td>ILLINOIS</td>
<td>36</td>
</tr>
<tr>
<td>INDIANA</td>
<td>39</td>
</tr>
<tr>
<td>IOWA</td>
<td>40</td>
</tr>
<tr>
<td>KANSAS</td>
<td>40</td>
</tr>
<tr>
<td>KENTUCKY</td>
<td>40</td>
</tr>
<tr>
<td>LOUISIANA</td>
<td>40</td>
</tr>
<tr>
<td>MARYLAND</td>
<td>40</td>
</tr>
<tr>
<td>MASSACHUSETTS</td>
<td>40</td>
</tr>
<tr>
<td>MICHIGAN</td>
<td>43</td>
</tr>
<tr>
<td>MINNESOTA</td>
<td>44</td>
</tr>
<tr>
<td>MISSOURI</td>
<td>46</td>
</tr>
<tr>
<td>NEW HAMPSHIRE</td>
<td>46</td>
</tr>
<tr>
<td>NEW JERSEY</td>
<td>46</td>
</tr>
<tr>
<td>NEW MEXICO</td>
<td>50</td>
</tr>
<tr>
<td>NEW YORK</td>
<td>50</td>
</tr>
<tr>
<td>NORTH CAROLINA</td>
<td>55</td>
</tr>
<tr>
<td>OHIO</td>
<td>55</td>
</tr>
<tr>
<td>OKLAHOMA</td>
<td>57</td>
</tr>
<tr>
<td>OREGON</td>
<td>58</td>
</tr>
<tr>
<td>PENNSYLVANIA</td>
<td>58</td>
</tr>
<tr>
<td>RHODE ISLAND</td>
<td>61</td>
</tr>
<tr>
<td>SOUTH CAROLINA</td>
<td>61</td>
</tr>
<tr>
<td>TENNESSEE</td>
<td>61</td>
</tr>
<tr>
<td>TEXAS</td>
<td>61</td>
</tr>
<tr>
<td>UTAH</td>
<td>63</td>
</tr>
<tr>
<td>VIRGINIA</td>
<td>63</td>
</tr>
<tr>
<td>WASHINGTON</td>
<td>64</td>
</tr>
<tr>
<td>WISCONSIN</td>
<td>64</td>
</tr>
</tbody>
</table>

### A

<table>
<thead>
<tr>
<th>Company</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbott Laboratories</td>
<td>Ill.</td>
</tr>
<tr>
<td>Able Computer Systems, Inc.</td>
<td>N.J.</td>
</tr>
<tr>
<td>AC Electronics</td>
<td>Wis.</td>
</tr>
<tr>
<td>Advanced Research &amp; Development Inc.</td>
<td>Fla.</td>
</tr>
<tr>
<td>Aeroflight-General Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Aerospace Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Airco/B.O.C. Cryogenic Plants Corp.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Allegheny Airlines</td>
<td>Pa.</td>
</tr>
<tr>
<td>Allied Chemical Corp.</td>
<td>Va.</td>
</tr>
<tr>
<td>Alphanumeric Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>American Airlines, Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>American Airlines, Inc.</td>
<td>Okla.</td>
</tr>
<tr>
<td>American Fletcher National Bank &amp; Trust Co.</td>
<td>Ind.</td>
</tr>
<tr>
<td>AMP Inc.</td>
<td>Pa.</td>
</tr>
<tr>
<td>Analog Digital Systems Div.- Control Data Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Analytic Services Inc.</td>
<td>Va.</td>
</tr>
<tr>
<td>Applied Data Research, Inc.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Argonne National Laboratory</td>
<td>Ill.</td>
</tr>
<tr>
<td>Armour-Dial, Inc.</td>
<td>Ill.</td>
</tr>
<tr>
<td>Army &amp; Air Force Exchange</td>
<td>Tex.</td>
</tr>
<tr>
<td>Service</td>
<td></td>
</tr>
<tr>
<td>Atlantic Software Inc.</td>
<td>Pa.</td>
</tr>
<tr>
<td>Automate</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Automated Information &amp; Management Systems, Inc.</td>
<td>Ohio</td>
</tr>
<tr>
<td>Automobile Club of Michigan</td>
<td>Mich.</td>
</tr>
<tr>
<td>Avco Lycoming, Div. of Avco Corp.</td>
<td>Conn.</td>
</tr>
</tbody>
</table>

### B

<table>
<thead>
<tr>
<th>Company</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badger Meter Mfg. Systems Div.</td>
<td>Wis.</td>
</tr>
<tr>
<td>Becton, Dickinson &amp; Co.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Bell Aerosystems Co.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Bell Telephone Laboratories, Inc.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Bendix Corp.</td>
<td>Mich.</td>
</tr>
<tr>
<td>Bendix Corp.-South Bend Regional Data Center</td>
<td>Ind.</td>
</tr>
<tr>
<td>Blue Cross-Blue Shield</td>
<td>Iowa</td>
</tr>
<tr>
<td>Blue Cross-Blue Shield of New Jersey</td>
<td>N.J.</td>
</tr>
<tr>
<td>Blue Cross of Southern California</td>
<td>Calif.</td>
</tr>
<tr>
<td>Bourns, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Brandon Applied Systems, Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Brooklyn Union Gas Co.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Bruce Publishing Co.</td>
<td>Wis.</td>
</tr>
<tr>
<td>Burroughs Corp., Business Machines Group</td>
<td>Calif.</td>
</tr>
<tr>
<td>Burroughs Corp.</td>
<td>Mich.</td>
</tr>
<tr>
<td>California Computer Products, Inc., Calif.</td>
<td></td>
</tr>
<tr>
<td>Caywood-Schiller, Assoc.</td>
<td>Ill.</td>
</tr>
<tr>
<td>CF-1-R, Inc., Control Data Corp.</td>
<td>D.C.</td>
</tr>
<tr>
<td>Centralab, Div. of Globe-Union Inc.</td>
<td>Wis.</td>
</tr>
<tr>
<td>Chaffey Union High School District</td>
<td>Calif.</td>
</tr>
<tr>
<td>Chalke Manufacturing Co.</td>
<td>Ill.</td>
</tr>
<tr>
<td>Cities Service Oil Co.</td>
<td>Okla.</td>
</tr>
<tr>
<td>Code, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Collins Radio Co.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Collins Radio Co.</td>
<td>Iowa</td>
</tr>
<tr>
<td>Collins Radio Co.</td>
<td>Tex.</td>
</tr>
<tr>
<td>Colorado University of Colorado</td>
<td>Colo.</td>
</tr>
<tr>
<td>Columbus Carbon Co.</td>
<td>Ohio</td>
</tr>
<tr>
<td>Community Corp.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Com-Pete, Inc.</td>
<td>Mich.</td>
</tr>
<tr>
<td>Compress, Inc.</td>
<td>D.C.</td>
</tr>
<tr>
<td>Computer Aid Companies, Inc.</td>
<td>Tex.</td>
</tr>
<tr>
<td>Computer Applications Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Computer House Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Computer Industries, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Computer Procedures Corp.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Computer Processing Unlimited, Inc.</td>
<td>Ill.</td>
</tr>
<tr>
<td>Computer Sciences &amp; Systems</td>
<td>D.C.</td>
</tr>
<tr>
<td>Computer Sciences Div.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Computer Usage Development Corp.</td>
<td>Ill.</td>
</tr>
<tr>
<td>Computer Usage Development Corp. Md.</td>
<td></td>
</tr>
<tr>
<td>Computer Usage Development Corp. Tex.</td>
<td></td>
</tr>
<tr>
<td>Computer Usage Education, Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Computing &amp; Software, Inc.</td>
<td></td>
</tr>
<tr>
<td>Com-Share Southern Inc.</td>
<td>Tex.</td>
</tr>
<tr>
<td>Comtek, Inc.</td>
<td>Ore.</td>
</tr>
<tr>
<td>Concept Implementation Corp.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Conrac Corp.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Consolidated Aluminum Corp.</td>
<td>Tenn.</td>
</tr>
<tr>
<td>Consolidated Analysis Centers, Inc. Calif.</td>
<td></td>
</tr>
<tr>
<td>Continental Can Co.</td>
<td>Ill.</td>
</tr>
<tr>
<td>Control Data Corp.</td>
<td>Minn.</td>
</tr>
<tr>
<td>CRC Computer Radix Corp.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Cybernetic Systems, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Cybertronics, Inc.</td>
<td>Mass.</td>
</tr>
<tr>
<td>Cyrus Wm. Rice &amp; Co.</td>
<td>Pa.</td>
</tr>
</tbody>
</table>

### C

<table>
<thead>
<tr>
<th>Company</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Computing Corp.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Data-Control Systems, Inc.</td>
<td>Conn.</td>
</tr>
<tr>
<td>Data Corp.</td>
<td>Ohio</td>
</tr>
<tr>
<td>Data Dyne Industries, Inc.</td>
<td>Ill.</td>
</tr>
<tr>
<td>Data Processing Financial &amp; General Corp.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Data Research Corp.</td>
<td>Okla.</td>
</tr>
<tr>
<td>Data Sciences, Inc.</td>
<td>D.C.</td>
</tr>
<tr>
<td>Data Systems Analysts, Inc.</td>
<td>N.J.</td>
</tr>
</tbody>
</table>
Design your own job and our computer system will help you find it

☐ Real-time Data System: Now, for the first time you can literally specify the job you want and stand a good chance of finding it. Our real-time GE 265 computer system helps make this possible. Stored in its memory are hundreds of top positions expressly for professionals in the data processing industry.

☐ 63 Offices Nationwide with Remote Terminals Gather Job Openings The job data in our computer system is collected and continuously updated by our 63 affiliated offices who are in contact with literally thousands of employers. Their job is to ensure that we have the best possible range of opportunity available for you.

A tremendous diversity of opportunity is available for computer professionals right now. We have open positions with industrial giants and many new, up-and-coming firms of which you are probably unaware. This entire service is employer sponsored...there are never any costs to you of any kind.

☐ Computer Used as Tool: The computer alone is not the complete answer to the challenge of professional employment. We are all smart enough to realize that without the nation's top job developers and placement specialists, the best computer system in the country wouldn't be worth the electricity to run it. The most important feature of the NMR system is the fact that the only way that you can be considered for a position is for one of our professional placement managers to make the on line match and then to contact you to arrange potential interviews. All of this insures maximum confidentiality in your job search.

☐ New Data Base for Computer Professionals: Because of the enormous success of our previous recruitment data base systems in other technical fields such as Electronics, and Chemical Process (jointly sponsored with the McGraw-Hill Publishing Company), and our program for the American Institute of Industrial Engineers, we are now opening a special service devoted exclusively to Data Processing professionals. So go ahead — design your own job. If it exists — and that may depend on how serious a job designer you are — we'll help you find it.

Attach this form to your resume. If you don't have one, drop us a line and we'll send you a Computer Registration Form.

COMPUTER JOB DESIGN FORM

SALARY DESIRED $ ____________________ Your present salary: $ ____________________

KIND OF COMPANY DESIRED
Size: ☐ Large ☐ Medium ☐ Small ☐ Size immaterial
Type: ☐ Predominantly commercial ☐ Predominantly government contractor ☐ Either
Industry: Indicate two choices of industry you'd prefer to work in, such as data processing, electronics, government.
(First choice): ____________________ (Second choice): ____________________

LOCATION DESIRED
☐ East Coast ☐ West Coast ☐ Midwest ☐ South ☐ Depends on Opportunity ☐ Other ____________________

POSITION DESIRED
☐ Commercial ☐ Scientific ☐ Programming ☐ Systems Design ☐ Systems Analysis
☐ MIS/OR ☐ Software Development ☐ Sales or Marketing ☐ Teaching ☐ Other ____________________

LEVEL DESIRED
☐ Executive ☐ Manager ☐ Staff member ☐ Technician ☐ Engineer

WHAT IS MOST IMPORTANT TO YOU?
☐ Salary advancement ☐ Professional challenge ☐ Congenial environment ☐ Other ____________________

ARE YOU A U.S. CITIZEN? ☐ Yes ☐ No

WHEN AVAILABLE ☐ Immediately ☐ Within one month ☐ Within three months

I AM ☐ Actively seeking a better position ☐ Only interested in "special" opportunities.

NATIONAL MANPOWER REGISTER 635 Madison Avenue New York, N.Y. 10022

SEPTEMBER, 1968
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Technology, Inc.</td>
<td>Mass.</td>
</tr>
<tr>
<td>Data Technology Instrument Co.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Data Trends, Inc.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Datacraft Corp.</td>
<td>Fla.</td>
</tr>
<tr>
<td>Dataman Associates</td>
<td>Mass.</td>
</tr>
<tr>
<td>Datasonics, Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Dayton, University of Research</td>
<td>Ohio</td>
</tr>
<tr>
<td>Decision Systems, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Deere &amp; Co.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Delta Data Systems, Inc.</td>
<td>Md.</td>
</tr>
<tr>
<td>Desoto, Inc.</td>
<td>Ill.</td>
</tr>
<tr>
<td>Digital Design Assoc., Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Digitek Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Dikewood Corps, Inc.</td>
<td>N.M.</td>
</tr>
<tr>
<td>Dresser Systems, Inc.</td>
<td>Tex.</td>
</tr>
<tr>
<td>Dunhill International, Inc.</td>
<td>Ohio</td>
</tr>
<tr>
<td>Francis I. duPont &amp; Co.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Durham Life Insurance Co.</td>
<td>N.C.</td>
</tr>
<tr>
<td>Eastern Air Lines Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Ebasco Services Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>EDP Resources, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Electrac, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Electronic Communications Corp.</td>
<td>Ohio</td>
</tr>
<tr>
<td>Emco Corp.</td>
<td>Utah</td>
</tr>
<tr>
<td>Esoo Mathematics &amp; Systems, Inc.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Exact Systems &amp; Programming Corp., Inc.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>IBM Corp.</td>
<td>Md.</td>
</tr>
<tr>
<td>Ilt Research Institute</td>
<td>III.</td>
</tr>
<tr>
<td>Illinois Dept. of Personnel, Recruitment Section</td>
<td>III.</td>
</tr>
<tr>
<td>Industrial Nucliecorporations Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Informatics, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Applications, Inc.</td>
<td>Md.</td>
</tr>
<tr>
<td>Information Development Co.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Information Science Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Information Systems Institute, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Internal Revenue Service Data Center</td>
<td>Mich.</td>
</tr>
<tr>
<td>International Data Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>International Harvester Co.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Interpace Corp.</td>
<td>Pa.</td>
</tr>
<tr>
<td>ITT Data Services</td>
<td>N.J.</td>
</tr>
<tr>
<td>Jantzen, Inc.</td>
<td>Ore.</td>
</tr>
<tr>
<td>Jet Propulsion Laboratory</td>
<td>Calif.</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>N.J.</td>
</tr>
<tr>
<td>Johnson Service Co.</td>
<td>Wis.</td>
</tr>
<tr>
<td>Kkip Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Kellogg Co.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Keltec Industries—Computer Aided Design Laboratory</td>
<td>Calif.</td>
</tr>
<tr>
<td>Keystone Computer Associates, Inc.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Arthur S. Kranzley &amp; Co.</td>
<td>N.J.</td>
</tr>
<tr>
<td>Lawrence Radiation Laboratory</td>
<td>Calif.</td>
</tr>
<tr>
<td>Lear Siegler, Inc.</td>
<td>Mich.</td>
</tr>
<tr>
<td>Lessea Corp.</td>
<td>R.I.</td>
</tr>
<tr>
<td>Link Group, General Precision Systems Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Lockheed Aircraft Corp.</td>
<td>Tex.</td>
</tr>
<tr>
<td>Lockheed–California Co.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Logicom, Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Loral Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Medical Methods Research, Perma-Res.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Mm, S. Merrell Co., Div. of McDonnell Douglas Corp.</td>
<td>Mo.</td>
</tr>
<tr>
<td>Midland–Rossa Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Midwest Research Institute</td>
<td>Mo.</td>
</tr>
<tr>
<td>Minnesota Aerospace Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Minnesota Mining &amp; Manufacturing Co. GM Company.</td>
<td>Calif.</td>
</tr>
<tr>
<td>University of Minnesota</td>
<td>Calif.</td>
</tr>
<tr>
<td>Mobil Oil Corp.</td>
<td>N.Y.</td>
</tr>
<tr>
<td>Montgomery Ward, Corporate Data Center</td>
<td>Ill.</td>
</tr>
<tr>
<td>Magnavox Research Laboratories</td>
<td>Calif.</td>
</tr>
<tr>
<td>Management Data Corp.</td>
<td>Pa.</td>
</tr>
<tr>
<td>Management Sciences Div.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Marathon Oil Co.</td>
<td>Ohio</td>
</tr>
<tr>
<td>Marion Power Shovel Co., Inc.</td>
<td>Ill.</td>
</tr>
<tr>
<td>Mastech Inc.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Medical Methods Research, Perma-Res.</td>
<td>Calif.</td>
</tr>
<tr>
<td>National Aeronautics &amp; Space Adm.</td>
<td>Md.</td>
</tr>
<tr>
<td>National Cash Register Co.</td>
<td>Ohio</td>
</tr>
<tr>
<td>National Computer Analysis</td>
<td>Calif.</td>
</tr>
<tr>
<td>National Oceanic &amp; Atmospheric Research</td>
<td>Colo.</td>
</tr>
<tr>
<td>National Datacentre Corp. LTD.</td>
<td>Colo.</td>
</tr>
<tr>
<td>National Distillers &amp; Chemical Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>National Institutes of Health Div. of Computer Research &amp; Technology</td>
<td>Md.</td>
</tr>
<tr>
<td>National Lead Co.</td>
<td>Ohio</td>
</tr>
<tr>
<td>New Mexico Institute of Natural History &amp; Research</td>
<td>N.M.</td>
</tr>
<tr>
<td>Nuclear-Chicago Corp.</td>
<td>Calif.</td>
</tr>
<tr>
<td>Nuclear Research Instruments</td>
<td>Calif.</td>
</tr>
</tbody>
</table>

**PROBLEMS REDUCING ANALOG DATA?**

**SOLUTION!**

Our service bureau for data reduction and analysis offers you the most accurate results attainable at the lowest possible cost. Each task receives specialized attention at the supervisory level to ensure that the results will meet your complete satisfaction. Our Gerber, Auto-kol, Vanguard, Benson-Lehner and E.A.I. data reduction systems enable us to process any type of visually recorded data. We have had specific experience in digitization of maps for traffic and census studies; strip charts, graphs and special requirements for astronomical research and oceanographic research studies; and 16 and 35mm film for various types of wind tunnel data. Satellite telemetry and communications data, radar cross-section plots and meteorological data records have also been reduced in support of a variety of projects. Contract completion is tailored to meet your specifications.

**CALL OR WRITE**

**GLENN ENGINEERING SERVICES, INC.**

5706 FREDERICK AVENUE  ROCKVILLE, MARYLAND 20852

(301) 427–3830

For more information, circle No. 52 on the Reader Service Card
Programmers:

You'd do a lot more than program at IBM in Houston.

Our programmers do analyses. And our analysts do programming. We start with basic problems and look for basic solutions.

If you have experience in large systems and a college degree, this opportunity could be for you.

**A challenge for you.** Over 90% of our work is with the IBM System/360. And in real time. While we do a lot of work for NASA on the manned space program, we are also actively involved with commercial work in areas such as simulation modeling, self-monitoring, self-optimizing, operations research, systems hierarchy, systems architecture and systems software.

We work with Fortran IV and Hand the latest simulation languages. We are also involved in software systems assembly language.

**Why come to Houston?** Houston is one of the most active space-science areas in the nation. And Houston is growing larger and more exciting every day. There’s major league baseball and football, the Houston Symphony and, as always, the Gulf of Mexico.

**Your future at IBM.** At IBM, you’ll find completely company-paid benefits that include life insurance and medical and hospital coverage. IBM also offers you job stability, growth opportunities and a Tuition Refund Program.

**Call or write IBM now.** To learn the details, send a resume or brief letter describing your background and experience to Mr. W. J. Baier, IBM Corporation, Dept. BJ 1009, 1322 Space Park Drive, Houston, Texas 77058. Or call (713) 591-3300, ext. 3463.

IBM
An Equal Opportunity Employer
All cards are interchangeable. Cuts costs and prevents errors. Operations, spotlighted in color. You Personnel and many other uses. Aluminum. Over 1,000,000 in use. Scheduling, Inventory, Sales, Traffic, or type on cards and post on board.

Q.

With The BOARDMASTER System

Compact and Attractive. Made of

Radiation Inc. Fla.
RCA, Inc. Commercial Electronics
Systems Div. N.J.
RCA Inc. Corporate Staff N.J.
RCA Inc. Electronic Components
RCA Inc. Information Systems Div. N.J.
Recognition Equipment, Inc. Tex.
Regional Education Laboratory for the Carolinas & Virginia N.C.
Rocketdyne, North American Rockwell Corp. Calif.
Rogers Corp. Conn.
Rohr Corp. Calif.

Kurt Salmon Associates N.Y.
San Diego City Schools Calif.
Sanders Associates, Inc. N.H.
Science/Systems III.

Scientific Computer Applications, Inc. Md.
Scientific Control Corp. Tex.
Scientific Data Systems, Inc. Calif.
SCM Corp. N.Y.
Shelby Business Corp. Ohio
Shepard Laboratories, Inc. N.Y.
Sikorsky Aircraft Conn.
Simulators, Inc.
Sinclair Refining Co. Ill.
Skelly Oil Co. Okla.
Space Nuclear Corp. Calif.
Spear Information Systems Div. of Spear & Stuff Mass.
Spindletop Research, Inc. Ky.
Standard Oil Co. Ohio
Statistical Tabulating Corp. N.Y.
Stellarmetrics, An Aydin Co. Calif.
Strategic Datacenters, Inc. N.Y.
Strategic Systems Inc. N.Y.
Stromberg Datagraphics, Inc. Calif.

Structo Mfg. Ill.
Suray DX Oil Co. Okla.
Systemation, Inc. Colo.
Systems Science Corp. Md.

Tally Corp. Wash.
Talon Co., Div. of Textron Pa.
Teledyne Systems Co. Calif.
Topas Computer Corp. N.Y.
Transitron Electronic Corp. Mass.
Trans World Airlines, Inc. Mo.
Triangle Universities Computation Center N.C.
TRW Systems Calif.
TRW Systems D.C.

Union Carbide Corp. N.Y.
United Computing Corp. Calif.
U.S. Air Force Logistics Command, Ohio
U.S. Army Weapons Command III.
U.S. Atomic Energy Commission D.C.
U.S. Bureau of Naval Personnel D.C.
U.S. Gypsum Co. Ill.
U.S. Naval Intelligence Processing System Support Activity D.C.
U.S. Naval Material Command Support Activity D.C.
U.S. Office of Education, Div. of Automatic Data Processing D.C.
Univac Calif.
Univac Pa.
Universal Data Systems, Inc. Calif.

Varian Aerograph Calif.
Virginia Polytechnic Institute Va.
Vitro Corp. Md.
Vogue Instrument Corp. N.Y.

Washington Data Exchange D.C.
Webcrafters, Inc. N.Y.
Webcrafters, Inc. Va.
Western Electric Co., Inc. Ill.
Western Plastics, Western Coil & Electrical Co. Wis.
Westinghouse Air Brake Co. Pa.
Weyerhaeuser Co. Wash.
Wolf Research & Development Corp. Md.
Wolf Research & Development Corp. Mass.
Worthington Corp. N.J.

Xerox Corp. N.Y.
Programmers have a rising future at JPL.

We need programmers right now who can grab hold and fly. Who can take off in any direction. And soar with the best of them.

System Programmers — You'll be responsible for design, implementation and conversion of computer programs for real-time data processing and control function in large general-purpose computers.

Qualifications: BS in math plus three years' experience with real-time data reduction systems desirable.

Data Reduction and Processing Programmers — You'll work in JPL's Flight Telemetry Processing Group designing, developing, implementing and documenting telemetry processing computer programs in support of flight projects. Spacecraft telemetry to be processed includes engineering, scientific command and television data. Related programs such as star mapping, communications predictions and command generations are also developed in the Group.

Qualifications: BA or BS minimum with a major in math preferred, but not mandatory. One to two years' minimum experience in programming. Background in telemetry processing/data reduction preferred. Machine language (FAP, IBMAP) experience preferred.

Real-Time Programmers — You'll be responsible for design, implementation and documentation of computer program systems supporting various flight projects. Particular areas of work include real-time processing of spacecraft telemetry, ground support operations and simulation modeling.

Qualifications: BA or BS minimum with a major in math, physics, engineering or related areas. Two years' minimum experience in programming with experience in real-time applications on medium to large scale computers. Machine language experience required.

Software Research and Advanced Development Programmers — You'll do independent research and advanced development in computer program applications such as real time spacecraft simulation, telemetry data storage and retrieval, and analytical mathematics by time-shared computers.

Qualifications: Programmer/Analysts with advanced degrees, MS or beyond, and at least four years' experience in technical computer applications.

Send your resume in confidence to Mr. Wallace Peterson, Supervisor, Employment.

JET PROPULSION LABORATORY
4800 Oak Grove Dr, Pasadena, Calif. 91103
Attention: Professional Staffing Dept. 611

"An equal opportunity employer." • Jet Propulsion Laboratory is operated by the California Institute of Technology for the National Aeronautics and Space Administration.
primary employers

See Page 21 for instructions on how to use our Directory of Primary Employers.

ALABAMA

BROWN ENGINEERING—A TELEDYNE CO. Research Park
Huntsville, Ala. 35807
(205) 532-1316
G. F. Sedberry, Personnel Director
Empl: Total this location 1,800; Total EDP Employees 35; Programmers 40; Analysts 80; Operators 10.
Data processing, services systems analysis, management services. Business application. IBM 360/30, 360/50.

ARIZONA

GENERAL ELECTRIC COMPANY—INFO SYSTEMS SALES & SERVICE
13430 N. Black Canyon Highway, Phoenix, Ariz. 85029
(602) 941-3563
G. C. Partridge, Spec. Personnel Practices
Empl: Total this location 4,455; EDP Employees 6,000.
Data processing, services systems analysis, management services. Business application. IBM 360/30, 360/50.

CALIFORNIA

AEROJET—GENERAL CORPORATION
Div. of General Tire and Rubber Company
P. O. Box 15847, Sacramento, Calif. 95813
(916) 355-6340
D. E. Cook, Mgr., Empl.*
Empl: Total this location 7,200; Total EDP Employees 230; Programmers 75; Analysts 40; Operators 80.

THE AEROSPACE CORP.
P. O. Box 95085, Los Angeles, Calif. 90045
(213) 648-5000
S. L. Robinson, Empl. Mgr. *
Empl: Total this location 2,916; Total EDP Employees 145; Programmers 35; Analysts 79; Operators 31.
Systems engineering and technical direction of ballistic and military space programs, together with applied, theoretical and experimental research. Engineering and business applications. IBM 360/30-40; CDC 6400 & 6600.

ANALOG—DIGITAL SYSTEMS DIV.—CONTROL DATA CORPORATION
4455 Eastgate Mall, San Diego, Calif. 92037
(714) 453-2500
George Savage, Empl. Supvr.
Empl: Total this location 480; Total EDP Employees 75; Programmers 55; Operators 8.
Analog-Signal processing equipment such as Analog-Digital, Digital-Analog Converters, Multiplexers.
Systems design in (1) Process Control, (2) Highspeed Data Acquisition, (3) Simulation Applications Programming; Standard software development. CDC 1700; CC 3100, 3200, 3300.

BLUE CROSS OF SOUTHERN CALIFORNIA
4777 Sunset Blvd., Los Angeles, Calif. 90027
(213) 666-3117
Gene R. Corkill, Employment Representative.
Empl: Total this location 1,350; Total EDP Employees 35; Programmers 12; Analysts 9; Operators NA.
Group health coverage—medicare/medicad intermediate.
Financial systems, accounting, COBOL, Blue Cross claims processing and payment system, COBOL, Medicare claims processing and payment system, Easy II, Medi-Cal claims processing and payment system, Easy II. Honeywell 1400 and H-2200.

BOURNOIS, INC.
6135 Magnolia Ave., Riverside, Calif. 92506
(714) 684-1700
Richard Smith, Mgr.
Empl: Total this location 1,500; Total EDP Employees 43; Programmers 13; Analysts 10; Operators 22.
Commercial digital computer systems. Software design and development, design automation, engineering design applications, business applications. Burroughs 2500/3500 computer systems and B 5500 system.

BURROUGHS CORP., BUSINESS MACHINES GROUP
460 Sierra Madre Villa, Pasadena, Calif. 91109
(213) 355-8061
Empl: Total this location 3,100; Total EDP Employees 147; Programmers 91; Analysts 11; Operators 29.
Commercial digital computer systems. Software design and development, design automation, engineering design applications, business applications. Burroughs 2500/3500 computer systems and B 5500 system.

CALIFORNIA COMPUTER PRODUCTS, INC.
305 N. Muller St., Anaheim, Calif. 92803
(714) 635-2812
Ed Smith, Personnel Administrator
Empl: Total this location 760; Total EDP Employees 80; Programmers 40; Analysts 20; Operators 4.
Digital computer plotting systems. Hundreds of digital plotter applications. Software is developed in a wide variety of scientific and business applications covering fields in essence as wide as are the applications of digital computer.

CALIFORNIA COMPUTER PRODUCTS, INC.
305 N. Muller St., Anaheim, Calif. 92803
(714) 635-2812
Ed Smith, Personnel Administrator
Empl: Total this location 760; Total EDP Employees 80; Programmers 40; Analysts 20; Operators 4.
Digital computer plotting systems. Hundreds of digital plotter applications. Software is developed in a wide variety of scientific and business applications covering fields in essence as wide as are the applications of digital computer.

CHAFFEY UNION HIGH SCHOOL DISTRICT
211 W. Fifth St., Ontario, Calif. 91762
(714) 986-2711
G. Michael Jaynes, Dir. of Data Processing
Empl: Total this location 756; Total EDP Employees 29; Programmers 10; Analysts 7; Operators 16.
Hundreds of digital plotter applications. Software is developed in a wide variety of scientific and business applications covering fields in essence as wide as are the applications of digital computer.

CODE, INC.
8939 S. Sepulveda Blvd., Los Angeles, Calif. 90045
(213) 670-3200
Clifford D. Brunn, Empl. Mgr.
Empl: Total this location 10; Total EDP Employees 9; Analysts 9.
Computer programming systems. Operating systems, scientific and business programming and assembly languages. IBM, CDC.

COLLINS RADIO CO.
Newport Beach Div.
19700 San Joaquin, Newport Beach, Calif. (714) 833-0600
Phil Chamberlin, Mgr., Prof. Empl.
Empl: Total this location 1,900; Total EDP Employees 90; Programmers 60; Analysts 15; Operators 15.
Communication systems using company's computer, modems and terminal units. Computer used as an automatic message switching device in a teletype network. Teletype message switching and direct digital control programs are developed at the Newport facility. Bryant disk files, Potter tape drives, Data Products printers, CDC card readers.

COMPUTER INDUSTRIES, INC.
Graphics Systems Division
14761 Califa St., Van Nuys, Calif. 91401
(213) 781-7100

COMPUTER SCIENCES DIV.—COMPUTER SCIENCES CORPORATION
650 N. Sepulveda Blvd., El Segundo, Calif. 90245
(213) 678-8592
Richard Neumann, Mgr. Employment
Empl: Total this location 3,000; Total EDP Employees 800; Programmers 780; Operators 20.
Computer software. Commercial, scientific, command and control systems.

COMPUTING & SOFTWARE, INC.
8155 Van Nuys Blvd., Suite 250, Panorama City, Calif. 91402
(213) 988-3400
Bill Baranick, V. P.*
Empl: Total this location 2,000; Total EDP Employees 1,250.
Commercial and scientific data processing. Computer software development and training in data processing field. Custom programming; feasibility studies, system analysis, programming and maintenance services. Software packages: commercial applications, scientific applications, systems.

CONSOLIDATED ANALYSIS CENTERS INC.
225 Santa Monica Blvd., Santa Monica, Calif. 90401
(213) 451-5771
Joseph S. Annino, Mgr. Systems Programming
Empl: Total this location 23; Total EDP Employees 14; Programmers 3; Analysts 6; Operators 2.
Software development. Information retrieval, digital simulation, compiler development.

CYBERNETIC SYSTEMS, INC.
395 Vernon, Oakland, Calif. 94610
(415) 653-5066
P. Lomasney, Vice Pres.
IBM 360.
... the system that says any program is good enough as long as it works. At Factsystem, you'll have to fight the system ... we're not looking for programmers to just write any program — we want creative individuals who will write the best program.

We can offer you a fresh new approach to your job, working with stimulating people, in a creative atmosphere. Our whole business relies on people with ideas ... with ability ... with imagination, who are ready to accept a challenge and turn out the best possible solution for universal application. Factsystem's management information software package — uniquely integrated and comprehensive, is applicable to virtually any commercial structure. As a professional in the computer field, you'll understand how this concept challenges your capabilities — gives you room for growth — room to put your ideas to work.

We need qualified individuals for these positions:

PROGRAMMERS ... with at least one year of experience on 360 and a working knowledge of 360 COBOL and/or assembly language.

SENIOR PROGRAMMERS ... with heavy experience on IBM 360 for systems software — OS, DOS, TP.

SYSTEMS ANALYSTS ... with a minimum of 5 years experience in systems analysis, and knowledge of programming. The specific areas: accounting and financial analysis, IMPAC and BMP, production scheduling, simulation and management science. Knowledge of IBM 360 series helpful.

You can grow with us and share in profits based on your creative contribution. Now is the time to get into this great new branch of a going industry. We have an excellent benefit package that includes free hospitalization and insurance. Send your resume or call collect in complete confidence. David Fay (312) 944-2530.
Empl: Total this location 10; Total EDP Employees 8; Programmers 2; Analysts 6. EDP consulting. Real time commercial applications.

DATA TECHNOLOGY INSTRUMENT CO., DIV. OF DATA TECHNOLOGY CORPORATION 2370 Charleston Road, Mountain View, Calif. 94040 (415) 964-6260 George Glenn, Marketing Mgr., Computer Div.* Empl: Total this location 200; Total EDP Employees 190; Programmers 12; Analysts 15; Operators 1. Digital voltmeters, digital panel meters, A to D small computers and logic card converters, digital interface equipment, low level measuring systems, transducer interface.

DIGITEK CORPORATION 5410 West Imperial Highway, Los Angeles, Calif. 90045 (213) 644-4421 Jack A. Strong, Exec. Vice Pres. Empl: Total this location 80; Total EDP Employees 70; Programmers 50; Analysts 15. Entire spectrum of Computer Sciences software.

ELECTRAC, INC. 1614 Orangethorpe Ave., Anaheim, Calif. 92801 (714) 879-6021 Tracking filters, tracking receivers, tracking demodulators, PCM bit synchronizers.

FAIRCHILD CAMERA & INSTRUMENT CORP., FAIRCHILD SEMICONDUCTOR 313 Fastaci Drive, Mountain View, Calif. 94040 (415) 962-2833 M. E. Hawkins, Supervisor of Professional Employment* Empl: Total this location 7,000; Total EDP Employees 1,288; Programmers 171; Analysts 19; Operators 14. Design, develop, and mfg. of silicon semiconductor devices. O.R., mfg., scientific (E.E.) and commercial. 360/30, 360/50.

FARRINGTON MANUFACTURING CO. 1545 Wilshire Boulevard, Los Angeles, Calif. 90017 (213) 482-2215 Marketing. Optical character recognition.

FMC CORPORATION P. O. Box 760, San Jose, Calif. 95106 (408) 289-2914 D. J. Locke, Empl. Supvr., * Empl: Total this location 4,500; Total EDP Employees 1,000; Programmers 15; Analysts 14; Operators 38. Machinery fabrication. IBM 360 used primarily, business applications. IBM 360

FRIDEN, INC. Div. of the Singer Co. 2350 Washington Ave., San Leandro, Calif. 94577 (415) 357-6800 Mr. George W. Tansill, Empl. Mgr. Empl: Total this location 2,500; Total EDP Employees 92; Programmers Yes; Analysts Yes; Operators Yes. Electronic business machines and EDP systems. Manufacturing systems, Software development, scientific programming, design automation and graphic displays. IBM 360 DOS/MOS, Honeywell 200.

GENERAL DYNAMICS—ELECTRONICS DIV. P. O. Box 127, San Diego, Calif. 92112 (714) 299-4641 Vincent Finley, Professional Placement* Empl: Total this location 900; Total EDP Employees 40; Programmers 24; Analysts 14; Operators 2. Airborne and ground radar; transponders; tracking systems. Scientific programming; real time; data communications. Univac 1230.

GENERAL ELECTRIC CO.—NUCLEAR ENERGY DIV. 175 Curtner Ave., San Jose, Calif. 95125 (408) 297-3000 J. J. Leonard, Professional Placement. Empl: Total this location 3,600; Total EDP Employees 145; Programmers 45; Analysts 30; Operators 60. Nuclear reactors, fuels, instrumentation. Nuclear reactor simulation and analysis, thermohydraulics, dynamic and stability analysis, general scientific, management decisions and forecasting, nuclear plant monitors. GE-635 (Large GE-635 with remote terminal GE-115's).

HEWLETT-PACKARD CO. 1501 Page Mill Road, Palo Alto, Calif. 94304 (415) 326-7000 N. O. Williams, Prof. Empl. Mgr.* Empl: Total this location 5,000; Total EDP Employees 800; Programmers 20; Analysts 15; Operators 5. Small digital computers and electronic test instrumentation. Electronic test systems, data acquisition, scientific and commercial applications. HP-2115, HP-2115, HP-2114, HP-2000, IBM 360/40.

HUGHES AIRCRAFT CO. P. O. Box 3310, Fullerton, Calif. 92633 (714) 733-9292 D. K. Horton, Supervisor, Professional Staffing Empl: Total this location 7,500; Total EDP Employees 700; Programmers 125; Analysts 100; Operators 25. Computer systems, digital data processing systems, tactical air defense and space support systems, land-and ship-based frequency-scanning and interferential multirack 3-D radar systems, communication, electronic displays and systems analysis. Real time air defense and air traffic control systems, data reduction, aircraft performance data curve fitting, simulations of tracking and weapon control systems, management information systems. Hughes 3118, Hughes 4118, IBM 360/50, GE 635.

HUGHES AIRCRAFT CO., FIELD SERVICE AND SUPPORT DIVISION P. O. Box 90155, Los Angeles, Calif. 90009 (213) 670-1515 John G. Wilhite, Professional Recruiter.* Empl: Total this location 1,800; Total EDP Employees 38; Programmers 12; Analysts 5; Operators 6. Aerospace electronics.

INFORMATICS INC. 5430 Van Nuyis Blvd., Sherman Oaks, Calif. 91403 (213) 783-7500 Robert F. Foster, Mgr./Adm.* Empl: Total this location 165; Total EDP Employees 140; Programmers 60; Analysts 80. Computer systems analysis and programming for commercial and scientific applications. Use a variety of computers, generally located at customers’ sites. See Ad Page 54

INFORMATION DEVELOPMENT COMPANY 1621 East Seventeenth Street, Santa Ana, Calif. 92701 (714) 547-8861 George J. Vasilekos, Exec. Vice-Pres. Empl: Total this location 60; Programmers 50. Software consulting.

INFO SCI INC. Box 464, Menlo Park, Calif. 94025 (415) 365-1111 Mr. John L. McTop, Office Supvr. Empl: Total this location 14; Total EDP Employees 14; Programmers 8; Analysts 6. Consulting services, systems analysis and design services, programming services, documentation services, with stress on the commercial applications and on management information systems. Statistical programs (proprietary), and custom-designed programs.

JET PROPULSION LABORATORY Div. of California Institute of Technology 4800 Oak Grove Dr., Pasadena, Calif. 91103 (213) 354-3830 M. Wallace Peterson, Empl. Supvr. Empl: Total this location 4,000. Responsible for conceiving, designing and supervising the fabrication, testing and instrumenting of spacecraft for the nation’s unmanned lunar and planetary explorations, and for communications with the spacecraft, flight operations, and data handling. See Ad Page 27

LAURENCE RADIATION LABORATORY Div. of University of California P. O. Box 808 65-69, Livermore, Calif. 94550 (415) 447-1100 John Glaeckler, Pers. Rep.* Empl: Total this location 5,700; Total Scientific EDP 190; Total Administrative EDP 20; Programmers 125; Analysts 4; Operators 87. Nuclear research and development. Scientific research and administrative data processing. IBM, CDC, PDP, Remington Rand.

LOCKHEED AIRCRAFT CORPORATION—LOCKHEED—CALIFORNIA COMPANY P. O. Box 551, Burbank, Calif. 91503 (213) 847-6978 C. R. Alexander, Prof. Empl. Supvr. Empl: Total this location 22,500; Total EDP Employees 270; Programmers 150; Analysts 70; Operators 30. Military and commercial aircraft and helicopter. Cost accounting, work measurement, logistics, material inventory, order control. IBM 7080, IBM 360-65, NCR 315, RCA Spectra 45.

LOGICON, INC. 255 W. 5th Street, San Pedro, Calif. 90733 (213) 831-0611 George E. Kellenberger, Pers. Admin.* Empl: Total this location 230; Total EDP Employees 150; Programmers 110, Analysts 40. Systems engineering, and computer sciences. Data acquisition and control information systems, training and simulation, scientific analyses. Included almost all major computer systems both commercial and military.

MAGNAGOVX RESEARCH LABORATORIES Government & Industrial Products Division 2829 Mariposa St., Torrance, Calif. 90503 (213) 328-0770 Fred A. Peters, Supvr., Empl. R&D digital anti-jam pseudo-noise communication systems.

MANAGEMENT SCIENCES DIV., URS SYSTEMS CORPORATION 1819 Teusdale Drive, Burlingame, Calif. 94010 (415) 697-9641 Robert A. Harker, General Manager* Empl: Total this location 56; Total EDP Employees 56; Programmers 25; Analysts 15; Operators 2. Computer software systems analysis, design programming, documentation and training. Management information systems development including administrative, accounting and inventory systems; language and conversion techniques, operating research. All—depending on client.
SOFTWARE PROFESSIONALS

WE'RE LOOKING FOR PEOPLE WITH PROBLEMS

We have plenty of solutions. What we need are problems...and people who are good at thinking them up.

We're lucky to have some of the most outstanding software people in the country out here in Sunnyvale, California. And we need the best. Because our assignment is the total information system segment of orbiting satellite systems. Includes planning, commanding, data management and post flight analysis. We not only design information systems to fill present needs, but anticipate and project information system segments of space systems that will most likely be needed in 1970 or '75.

It should come as no surprise to learn we have more operational software development and more operating on-orbit experience in complex spacecraft than anyone in America.

Now, since most people are trained as problem-solvers, the people we hire will be quite extraordinary. In a way, we're asking for trouble. That is, we're asking for people who habitually create more problems than they're worth...to most other companies.

What we'll do when we find them is make their problems worth more. With us, they'll be creating more worth than problems, even though they're still creating problems.

Get it?
If you do, you may have real problems. The kind we're looking for.
If you're one of the professionals with a degree in EE, Physics or Math and have 2-10 years applicable experience, see if you can create problems for us in any of the following areas:

MATH SPECIALISTS—COMPUTER APPLICATIONS Provide detail design, development, maintenance, modification and improvements for command and control, event and data evaluation computer programs for use on assigned satellite projects.

PROGRAMMERS Coordinate with systems engineers, ops analysis engineers, and users and/or the customer to determine basic requirements for computer program development and modification. Document, design, flow chart, code, check-out and validate computer programs.

ANALYSIS ENGINEERS—COMMAND AND CONTROL Provide technical coordination to assure compatibility of computer software programs and data base for operational vehicles and on-orbit operational support for the hardware/software interface areas. Background in analysis and operation of airborne systems and sub-systems with emphasis on digital command and telemetry systems. Knowledge of computers, associated software. An understanding of software logic and Jovian language required.

SPECIALISTS—VALIDATION AND TEST Establish test procedures, at the system, sub-system, and module level from preliminary and final design specifications of software programs. Conduct extensive validation tests to ensure compatibility with all developed programs.

Please send details of your educational background and experience, including salary requirements, to Mr. I. Cutter, General Electric Co., Space Systems, Room 168-J, 1003 West Maude Ave., Sunnyvale, California 94086.

SEPTEMBER, 1968

Command & Information Systems Operations
GENERAL ELECTRIC
An Equal Opportunity Employer (M/F)
MEDICAL METHODS RESEARCH, PERMANENTE MEDICAL GROUP
3779 Piedmont Ave., Oakland, Calif. 94611 (415) 653–6121
Mr. Lou S. Davis, Mgr., Computer Center* Empl.: Total this location 75; Total EDP Employees 42; Programmers 18; Analysts 3; Operators 20.
Medical service and medical research. Medical information systems, medical data acquisition, processing, retrieval and research. 2 IBM 360/50's, Telecommunication terminals, Sanders clini-call system.

NUCLEAR RESEARCH INSTRUMENTS
Div. of Houston Fearless Corporation
2800 Seventh St., Berkeley, Calif. 94710 (415) 841–7011
Barrett J. Jennings, Adm. Mgr. Empl.: Total this location 44; Total EDP Employees 2; Programmers 2.
Precision photometric measuring devices involving computer controls. Control of precision measuring equipment. Minneapolis Honeywell 516; SDS 910.

PHILCO–FORD CORP., SPACE & RE-ENTRY SYSTEMS DIV.
3870 Fabian Way, Bldg. L, Palo Alto, Calif. 94303 (415) 843–6000
Gus Dedo, Prof. Empl. Specialist Empl.: Total this location 1,500; Total EDP Employees 35; Programmers 15; Analysts 12; Operators 8.
Research and development of space electronics instrumentation, communications satellites and re-entry capsules. Management information systems, simulation exercises, scientific problem solution. IBM 360/40

PROGRAMMING SCIENCES CORP.
14937 Ventura Blvd., Sherman Oaks, Calif. 91403 (213) 783–1441
Victor Sampson, Corporate Administrator* Systems analysts, computer software. Full spectrum of computer software; systems, real-time, scientific/engr. and commercial applications, compliers, exec. systems, language processors and proprietary program development.

PLANNING RESEARCH CORP.
1100 Glendale Ave., Los Angeles, Calif. 90024 (213) 479–7725
Frank S. Dietz, Jr., Adm., Prof. Staffing* Empl.: Total this location 300; Total EDP Employees 20; Programmers 25; Analysts 25.
Computer systems design and software. Commercial (i.e. management information systems, information storage and retrieval, automatic stock brokerage, inventory control, accounting), Scientific (i.e. orbit and trajectory determination, math modeling and simulation, numerical analysis), Systems Software (i.e. assemblers, compliers and operating systems in various languages), Real Time, Bio-Medical. Any and all types of equipment as dictated by given projects.

ROCKETDYNENORTH AMERICAN ROCKWELL CORPORATION
6633 Canoga Ave., Canoga Park, Calif. 90005 (213) 634–3114
Norm S. White, Employment Supvr.* Empl.: Total this location 9,500; Total EDP Employees 450.
Propulsion systems research and development. Present areas of activity include multi-processing, multi-programming, on-line teleprocessing, large random access data-base files, graphics, time sharing, digital high speed data transmission, advanced data collection systems, large-scaled scientific/business applications, mgt. info. system. IBM 360 system.

ROHR CORP.
P. O. Box 778, Chula Vista, Calif. 92012 (714) 422–7111
S. M. Main, Supvr.—Professional Placement Empl.: Total this location 9,347; Total EDP Employees 200; Programmers 50; Analysts 25; Operators 25.
Aerospace—manufacturing of major aircraft components. Management information, WIP, material, engineering, etc. Strong N/C and automated machinery. On-line mass storage-multiple programming system. 360, models 65 and 50, 512K, four 2314's, 16 tapes, 3 printers, 200 touchtone phones and 16 CRT's on line in operation over one year.

SAN DIEGO CITY SCHOOLS
4100 Normal St., San Diego, Calif. 92103 (714) 298–4681
Martin Leahy, Pers. Analyst* Empl.: Total this location 13,000; Total EDP Employees 30; Programmers/Analysts (combined jobs) 12; Operators 12.
Management information system concept; major business applications in 3 functional areas: financial information, personnel information, pupil information. Real-time financial control system; fully integrated personnel/payroll system combined purchasing—warehouse—distribution system; comprehensive student record, modular class scheduling and grade reporting systems; computer-directed instruction. Developmental work in telecommunications applied to above areas. IBM 360/30, 64K, tape/disc, tie-in with Digikey Optical scanner, almost exclusive use of COBOL.

SCIENTIFIC DATA SYSTEMS, INC.
701 South Aviation Boulevard, El Segundo, Calif. 90245 (213) 772–4511
W. V. Kendall, Empl. Mgr.* Empl.: Total this location 3,900; Total EDP Employees 250.
Applied research, design, development, test, production and sales of digital computer systems. Development of real time, scientific and business software. Sigma 7, Sigma 5, Sigma 2, 940, 945.

SPACE NUCLEAR CORPORATION
10884 Santa Monica Boulevard, Los Angeles, Calif. 90025 (213) 474–4538
William Coleman, President* Empl.: Total this location 11; Total EDP Employees 3; Programmers 5; Analysts 4; Programming services. On-line systems, data analysis and reduction, financial data and management information. 360/30.

STANFORD LINEAR ACCELERATOR CENTER
P. O. Box 4349, Stanford, Calif. 94305
G. F. Renner See Ad Page 41

STELLARMETRICS—AN AYDIN COMPANY
416 E. Cota St., Santa Barbara, Calif. 93102 (805) 963–3566
M. K. Aldrich, Pers. Admin. Empl.: Total this location 100; Total EDP Employees 1; Programmers 1.
Computer peripheral interface ground stations. PAM and PCM computer-controlled equipment fabricated for direct computer interface where computer processing of flight or test data is required.

STROMBERG DATAGRAPHICS, INC.
A Subsidiary of General Dynamics
P. O. Box 2449, San Diego, Calif. 92112 (714) 298–8833, ext. 301

TELEDYNE SYSTEMS CO.
Div. of Teledyne Inc.
19601 Nordhoff St., Northridge, Calif. 91324 (213) 886–2211
J. W. Oldenkamp, Mgr. Prof. Empl.
Empl.: Total this location 1,500; Programmers 8; Analysts 4; Operators 5.
Avionic computers and support equipment, integrated helicopter Avionic systems. Scientific and business programming, Cobol, Fortran II & IV.

IBM 360, MOD 30 & 40, DOS systems.

TRW SYSTEMS
One Space Park, Redondo Beach, Calif. (213) 679–8711
D. Wong, Prof. Placement
Empl.: Total this location 16,000; Total EDP Employees 1,000.
Design and build satellites, systems engineering, spacecraft propulsion, operations analysis, applied research, electronics, civil systems. Information systems, mathematical techniques, mission analysis, signal analysis, engineering analysis, real time applications. CDC 6500, IBM 7094, IBM 360/65, IBM 8000, SDS 930 serving 50 remote terminals.

UNITED COMPUTING CORP.
802 Torrance Blvd., Redondo Beach, Calif. 90277 (213) 376–8438
C. T. Shepherd, Vice Pres.* Empl.: Total this location 26; Total EDP Employees 24; Programmers 14; Analysts 10. Systems design and program development for real-time, business, scientific, computer software and numerical control applications. 360/65, Sigma 5/7, L-3050, PDP 8, B-3000, B-5500, 1108, 3200 and others.

UNIVAC DIVISION OF SPERRY RAND CORPORATION
1901 Avenue of the Stars, Suite No. 940, Los Angeles, Calif. 90067 (213) 277–0565
K. E. Bury, Regional Personnel Supvr.* Empl.: Total this location 1,000 (serviced from this location).
Computers—3 Regional Services: Marketing and Field Engineering.
See above—Primarily Marketing and Field Engineering.

UNIVERSAL DATA SYSTEMS, INCORPORATED—THE RUCKER COMPANY
14482 Beach Boulevard, Suite No. B, Westminster, Calif. 92683 (714) 897–1033
James J. Milanesia, Vice-Pres.* Empl.: Total this location 9; Total EDP Employees 9; Analysts 7.
Information systems consulting, scientific and engineering programming, operations research, process control system design, orbit determination, simulation and process control programs. Weapons systems analysis, wargaming.

VARIAN AEROGRAF, VARIAN ASSOCIATES
2700 Mitchell Drive, Walnut Creek, Calif. 94598 (415) 929–2400
Terry L. Beckley, Personnel Mgr.* Empl.: Total this location 350; Total EDP Employees 12; Programmers 1; Analysts 2; Operators 9.

Software Age
DIGICOMP II - the "second generation" of the famous DigiComp,
enormously more "sophisticated" as additional "switches" and "core positions" permit many more decisions and "branching" possibilities.

Like its predecessor the DigiComp-I (see below) it is entirely mechanical in operation but affords the functions common to electronic computers in a form far more comprehensible. The best way ever to learn (or to teach) the principles of modern data processing.

$16.95 Postpaid

WFF 'N PROOF

Developed in the course of the ALL Project (Accelerated Learning of Logic) Wff'nProof incorporates 21 games of progressive difficulty; has been used to teach propositional calculus to elementary school children but challenges the intellect of professional logicians. Complete with 224-page manual which is an introduction to the world of modern logic; filled with valuable tips to clear thinking.

$6.25 Postpaid

OH WAH REE

The ancient game of mathematical strategy which has intrigued millions for more than 30 centuries. A game at once so simple in its basics that a pre-schooler can enjoy it yet so complex in its possibilities that its fascination multiplies with the mathematical grasp of the player.

$7.95 Postpaid

TWIXT

Another famous "bookshelf" game, package matches that of Oh-Wah-Ree. A stimulating game with a fascinating chess-like strategy of move and countermove. Two or four players.

$7.95 Postpaid

CONFIGURATIONS

Based on concepts from the geometry of incidence, CONFIGURATIONS is a series of intriguing mathematical and geometric puzzles that will challenge and delight those who enjoy careful reasoning. It is authored by Professor Harold L. Dorwart, Chairman of the Mathematics Department, Trinity College, Hartford.

$4.95 Postpaid

DIGICOMP·I COMPUTER

Ingenious mechanical equivalent of an electronic digital computer. Can be "programmed" to perform, individually, every operation of a digital computer. Best thing ever for teaching binary math, how a computer operates, how and why problems must be broken down for machine solution. In kit form—1 hr. to assemble. $5.98 Postpaid

Please send me at the address below:

(name)
(address)
(city) (state) (zip code)

Illinois residents add 5% S&H

P.O. Box 1176
Evanston, Ill. 60204

Games are shipped from separate warehouses

(Please write for postage quote for foreign mailing)

September, 1968
Gas turbine engines, re-entry vehicles, constant speed drives.
Scientific engineering, financial and administrative operations.
4 IBM 360 units (1 model 30, 2 model 40, 1 model 65); 1130 Terminal System, Calcomp Plotting Equipment.

DATA-CONTROL SYSTEMS, INC.
East Liberty St., Danbury, Conn. 06810
(203) 743-9241
Harold Landfield, Manager, Technical Publications
Peripheral computer products.

PINNEY-BOWES, INC.
69 Walnut St., Stamford, Conn. 06904
(203) 327-3000
Christopher P. Wales, Mgr., Prof. & Tech. Empl. Empl: Total this location 3,000; Total EDP Employees 40; Programmers 12; Analysts 12; Operators 10.
Postage meters, automated paper handling equipment, copier products. Manufacturing and business applications. IBM 360/30 tape and disc.

PRATT & WHITNEY AIRCRAFT
East Hartford, Conn. 06108
H. M. Heldmann, Professional Placement
See Ad Page 44

ROGERS CORP.
Main St., Rogers, Conn. 06263
(203) 774-9605
Robert A. Poor, Mgr. Personnel Development Empl: Total this location 800; Total EDP Employees 6; Programmers 1; Analysts 2; Operators 3.
Two divisions here—1) paper products, 2) electrical components. Production and inventory control.

SIKORSKY AIRCRAFT, UNITED AIRCRAFT CORP.
North Main Street, Stratford, Conn. 06602
(203) 378-6361
Leo J. Shalvoy, Supvr. Professional Employment
Empl: Total this location 10,500; Management Information Systems 150; Total EDP Employees: Technical Computing 36; Programmers 25; Analysts 56; Operators 17.
VTOL aircraft. Manufacturing, production control, accounting, engineering analysis.
IBM 360 Model 65, Model 40, Model 30; UNIVAC 1108; PDP 10 Model 40, AD 4 Analog. See Ad Page 19

DELTA

UNIVERSITY OF COLORADO GRADUATE SCHOOL COMPUTING CENTER
Boulder, Colo. 80320
(303) 443-2211 Ext. 8181
Ray Pilsker, Mgr.
Empl: This location 22; Total EDP Employees 22; Programmers 8; Analysts 4; Operators 10.
Computing services. Scientific research. CDC 6400 with Graphic I/O.

CONNECTICUT

AVCO LYCOMING DIV. OF AVCO CORP.
South Main St., Stratford, Conn. 06697
(203) 378-8211
Empl: Total this location 10,000; Total EDP Employees 90; Programmers 29; Analysts 6; Operators 13.

SOUTHEASTERN JOB OPPORTUNITIES

Manufacturers, programmers, analysts and systems analysts for SE industrial openings. Stability, opportunity starting from $8,000 to $16,000. Dick Terry, Continental Consultants, 1316 Main St., Columbia, S. C. 29202.

C-6-I, INC.
A Subsidiary of Control Data Corp.
5272 River Road, Washington, D. C. 20016
(301) 652-2268
Empl: Total this location 250; Total EDP Employees 200; Programmers 125; Analysts 75.
Computer related professional services. Design automation, management systems, mathematical programming, operations research, scientific and engineering systems analysis, statistical analysis, project mgmt. systems. Urban studies, economics and econometrics, market research.

CDC, IBM, GE.

COMPUTER SCIENCE AND SYSTEMS—JOHN I. THOMPSON & COMPANY
1118 22d St., NW, Washington, D. C. 20019
(202) 337-4200
Robert S. Vondiver, Sr. Vice Pres. * Empl: Total this location 225; Total EDP Employees 20; Programmers 5; Analysts 4; Operators 3.
Engineering design, systems analysis, library sciences. Support services for above products. IBM 360/30 with 5 tape drives/2 disk packs; EAM.

COMMESS, INC.
2120 Bladensburg Rd., N.E., Washington, D. C. 20018
(202) 529-0360
James M. Hayes, Pers. Mgr. * Empl: Total this location 120; Programmers 25; Analysts 20; Operators 6.
EDP consulting. EDP feasibility studies systems design, systems analysis, commercial applications programming, development of proprietary software. UNIVAC 1050.

DATA SCIENCES, INCORPORATED
1225 Connecticut Ave., N.W., Washington, D. C. 20036
(202) 659-2929
Robert W. Roth, Vice Pres. * Empl: Total this location 7; Total EDP Employees 6; Programmers 1; Analysts 2; Operators 1.
Magnetic tape to microfilm services including microfilm plotting and microfilm oriented information and retrieval system. Software systems and studies in general support of microfilming.

GENERAL SERVICES ADMINISTRATION
18th and F Streets, N. W., Washington, D. C. 20004
343-4012
(Mrs.) Patricia S. Haight, Pers. Mgmnt. * Empl: Total this location 4,000; Total EDP Employees 300; Programmers 200; Analysts 100. Business oriented services for federal agencies. Accounting, supply, telecommunications, buildings construction. GE, IBM, Honeywell.

TRW SYSTEMS
Div. of TRW, Inc.
1725 Eye St., Washington, D. C. 20006
(202) 265-1616
Donald C. Bird, Empl. Mgr. * Empl: Total this location 500; Total EDP Employees 65; Programmers and Analysts 30; Operators 16.

U. S. ATOMIC ENERGY COMMISSION
Washington, D. C. 20545
(301) 972-4091
E. E. Hamilton, Coordinator of Recruitment Empl: Total this location 2,000; Total EDP Employees 57; Programmers 8; Analysts 10; Operators 7; Other 32.
Administering the nation’s atomic energy program. Agency wide automated management information systems. IBM 360/50.

U. S. BUREAU OF NAVAL PERSONNEL
Chief of Naval Personnel, Navy Department Washington, D. C. 20370
(202) 4X 4441
Stop playing Russian roulette with your career!

SYSTEMS ANALYSTS
ANALYST/PROGRAMMERS
SYSTEMS PROGRAMMERS
APPLICATIONS PROGRAMMERS

In today's age of specialization, only a computer career specialist can assure that your next move is the right one!

WE ARE COMPUTER PEOPLE. Our EDP career specialists have both the educational background and the actual "hands-on" experience essential to understanding your experience, background, achievements and goals...and relating them to the opportunities in today's job market.

OUR SPECIALIZED KNOWLEDGE WILL HELP YOU. We have our fingers on all the important trends in the computer industry. We know the directions in which the state-of-the-art is evolving. We are familiar with the personnel and facilities of prospective employers and their installations. All this knowledge and more will be placed at your disposal.

OUR CONTACTS WILL HELP YOU. We serve over 200 clients with current openings in the area of our metropolitan Washington, D. C. headquarters, plus thousands nationally...in every one of the 50 states...and overseas, too. We have had long associations with many of these clients, and we visit their facilities and installations repeatedly.

OUR FREE SALARY ANALYSIS CAN MEAN A GREAT DEAL TO YOU. Are you short-changing your career? Should you be earning much more than you are making now? After an in-depth interview and thorough discussion of your capabilities and objectives, we can help you make the most of the opportunities in today's computer community.

A RESUME IS NOT REQUIRED. CONTACT US TODAY. Resumes and application forms often obscure more than they reveal. Just call us or write us, and we'll take it from there.

Meet two of our people:

JAMES F. RYAN came to us from IBM's Federal Systems Division (Gaithersburg, Maryland) after 9 years with IBM, most recently as Professional Employment Manager. He is a graduate of Georgetown University.

AL STARR came to us from a position as Personnel Director with Computer Usage Development Corporation, before which he held management positions with Control Data Corporation, Computer Science Corporation, Vitro Laboratories and RCA. A graduate of Long Island University, he has more than 12 years of computer-oriented technical recruiting background.

These men and others like them stand ready to advance your career interests with meaningful, intelligent assistance. They await only the opportunity to serve you.

Contact or send your resume to:

EDP Search

A Division of Professional Career Centers, Inc.

Suite 515, 4641 Montgomery Avenue, Washington, D. C. 20014. Phone: (301) 657-2760

All our clients are equal opportunity employers.
U. S. OFFICE OF EDUCATION—DIV. OF AUTOMATIC DATA PROCESSING  
400 Maryland Avenue, S. W.,  
Washington, D. C. 20202  
(202) 963-2232  
Jaxton Taylor, Exec. Officer, Office of Mgmt. Info.*  
Emp: Total this location 3,080; Total EDP Employees 66; Programmers 27; Analysts 25.  
U. S. Government.  
Educational statistics and management information systems.  
RCA 3301.  
WASHINGTON DATA EXCHANGE  
Div. of American Data Exchange, Inc.  
1025 15th Street, N. W.,  
Washington, D. C. 20005  
(202) 659-8460  
Byron Thompson, Staff Consultant*  
Emp: Total this location 300.  
International Personnel Brokers utilizing automated systems techniques in the exchange of information between industry and interested individuals.  
( Honeywell computer and equipment at home office in Canada). Washington is a sales office.  

FLORIDA  
ADVANCED RESEARCH & DEVELOPMENT INC.  
P. O. Box 20125, Orlando, Fla. 32814  
(305) 841-1581  
Allen Kaplan, Pers. Admin.*  
Emp: Total this location 300.  
Supply professional technical help to the electronics and commercial industries.  

DATA CORPORATION  
776 N. E. 40th Court/Box 23550,  
Fort Lauderdale, Fla. 33307  
(305) 565-9441  
Personnel Manager  
Emp: Total this location 90; Total EDP Employees 10; Programmers 6; Analysts 3; Operators 1.  
Manufacture of digital computers and associated peripheral equipment.  
Payroll/Inventory.  
Datacorp 6024 Computer, IBM Key Punch, Sorobon Card Reader, Paper Tape Punch/RDR, 1000 LPM Line Printer.  

EASTERN AIR LINES INC.  
Miami International Airport, Miami, Fla. 33148  
(305) 634-3571  
Robert O. Hack, Senior Management Recruiting Specialist*  
Emp: Total this location 10,000; Total EDP Employees 553; Operators 253; Programmers/Analysts 226.  
Passenger name record, flight planning, schedules, forecasts, revenue, payrolls, inventory.  
Six 360/65.  

ELECTRONIC COMMUNICATIONS, INC.  
1501-72nd Street North,  
St. Petersburg, Fla. 33733  
(813) 347-1121  
P. R. Jordan, Empl. Supvr.*  
Emp: Total this location 2,250; Total EDP Employees 41; Programmers 13; Analysts 5; Operators 9.  
Design and Manufacture of military communication equipment.  
700 applications, communication applications including payroll, accounts payable, program  

OUR AD IS SMALL  
but our needs are too huge to list here. Investigate and advance your career by forwarding your resume to Aerospace & Oceanography Personnel Placement, Box 398, Melbourne Beach, Florida 32951.
market place

The Classified Ad Department
of SOFTWARE AGE

SOFTWARE OFFERED

BUY OR SELL USED COMPUTERS through DA-PEX Computer Brokers, 334 Lincoln Federal Building, Louisville, Kentucky 40202; 451-7457, 585-5454.

MOONLIGHT SERVICE

MOONLIGHTERS WANTED: Whatever your experience—COBOL, RPG, NEAT or BAL in business applications, or the wildest machine languages for math/science applications—we have part-time work in your area. Best contract rates, your hours, for analysts, programmers, documentation specialists and top-flight operators qualified for debugging adequately documented programs. Send complete qualifications—areas of experience, machines and languages with which you are familiar to: Dept. 890, SOFTWARE AGE, 1020 Church St., Evanston, Ill. 60201.

NON-MILITARY SCIENTIFIC AND ENGINEERING applications programs written, tested, debugged, and documented using your machine or a commercial time-sharing service. Dale Hurliman, Long Hill Road, Neshanic Station, New Jersey 08853.

PROGRAMS

APPLICATION PROGRAMS WANTED for new time sharing service. We furnish proprietary packages to business and industry via time shared CRT display terminals. If you have developed a program which would benefit from an on-line conversational mode capability, we would like to talk to you about leasing your program on a royalty basis. Sample applications are estimating, design, planning, scheduling, pricing analysis, etc. However, we are interested in any program which would be of value to a large number of users as a daily working tool. No knowledge of time sharing or interactive programming necessary, since we do all conversion of your batch program. Write or call: INTERACTIVE COMPUTER GRAPHICS, 2208 White-Henry-Stuart Building, Seattle, Wash. 98101 (phone 206-MU 2-5292).

SCIENTIFIC PROGRAMMING: Complete service. ECH, 112 Beth Drive, Philadelphia Pa. 19115.

market place
where you can reach 91,000
programmers, mathematicians, analysts and EDP managers.

CLASSIFIED ADVERTISING

Non-Display Classified: For firms or individuals offering commercial products or services, 75¢ per word (including name and address). Minimum order $7.50. For Blind Ad Service, an additional $10.00. For "Positions Wanted" Ads, 55¢ per word (including name and address). No minimum. Payment must accompany copy except when ads are placed by accredited advertising agencies. Frequency discounts: 5% for 6 months; 10% for 12 months paid in advance.

Display Classified: One inch by one column, $70.00. Column width 2 1/4”. Photographs accepted for an additional $20.00. Advertiser to supply all photo, art, cuts, or camera ready copy.

General Information: One inch display Help Wanted and Employment Services ads will be accepted in the classified section. Employment ads ½ page or more will appear run of book, will be keyed to the resume form in back of publication, and will qualify to free daily resume service.

Closing Date: 1st of preceding month (for example, May issue closes April 1st).

Send order and remittance to: Classified Dept., Software Age, 1020 Church Street, Evanston, Illinois 60201.

CLASSIFIED ADVERTISING ORDER FORM

Please refer to the above information for complete data concerning terms, frequency discounts, closing dates, etc. Cash with order.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Words @ 75¢ (Commercial Rate)</td>
<td>=</td>
<td>$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Include Photograph @ $20.00 additional (Display Ads Only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

□ Run Ad Blind $10.00  Insert____ time(s) Total Enclosed $ |

NAME  

ADDRESS  

CITY___ STATE___ ZIP___

Signature  

WORD COUNT: Include name and address. Name of city (Des Moines) or of state (New York) counts as one word each. Zone or Zip Code numbers not counted. (Publisher reserves right to omit Zip Code if space does not permit.) Count each abbreviation, initial, single figure or group of figures or letters as a word. Symbols such as 35mm, COD, PO, AC, etc., count as one word. Hyphenated words count as two words.

September, 1968
THE HALLCRAFTERS CO.
Subsidiary of Northrop Corporation
600 Hicks Road, Rolling Meadows, Ill. 60008
(312) 259-9600
Roy C. Anderson, Mgr., Prof. Empl.
Empl: Total this location 900; Total EDP Employees 45.
Electronic systems. Hardware. Management information systems. Business controls, manufacturing systems, etc.
IBM 360/30 and 40. Disc.
See Ad Page 56

HARRIS TRUST AND SAVINGS BANK
111 West Monroe St., Chicago, Ill. 60690
(312) 461-2121
D. Bruce Frobes, Pers. Ass't.
Empl: Total this location 2,612; Total EDP Employees 184; Programmers 65; Analysts 20; Operators 35.
Information systems for financial institution and banking services. Demand deposit accounting systems, trust accounting systems, investment systems, payroll systems for clients, installment credit system, charge card system.
UNIVAC II, UNIVAC 418 On-Line, IBM 36-30, Burroughs B-5500, B-3500, Unit Record.

IIT RESEARCH INSTITUTE
10 West 35th St., Chicago, Ill. 60616
Empl: Total this location 1,800; Total EDP Employees 120; Programmers 40; Analysts 150; Operators 91.
Research, development, and product engineering. Engineering and scientific, also software system development.
IBM 7094 and peripheral computers.

ILLINOIS DEPARTMENT OF PERSONNEL
RECRUITMENT SECTION
622 East Adams St., Springfield, Ill. 62706
(217) 525-7121
Robert P. Gosnell, Recruitment Supervisor
Empl: Total this location, over 40,000 in Merit System agencies located state-wide; Total EDP Employees 193; Programmers 82; Analysts 20; Operators 91.
The Illinois Department of Personnel has administrative responsibility for the personnel services of the Merit System agencies, and recruitment of staff for State Government positions.
IBM System 360/40.

INTERNATIONAL HARVESTER COMPANY
401 North Michigan Ave., Chicago, Ill. 60611
(312) 527-0200
E. Morris, Supvr., College Relations
Empl: Total this location 114,000; Total EDP Employees 1,294; Programmers and Analysts 446; Operators 828.
Motor trucks; farm equipment; construction equipment; industrial/material handling equipment; steel; twins; aerospace components; gasoline, diesel, and gas turbine engines. Broad range of administrative data processing with emphasis on accounting and finance, and marketing; inventory control; extensive real-time applications, teleprocessing and product design, test and development engineering applications, systems.

MASTECH INC.
7026 W. North Ave., Chicago, Ill. 60635
(312) 622-9444
Dennis Duffey, Dir. of Data Processing*
Empl: Total this location 100; Total EDP Employees 30; Programmers 20; Analysts 10.
EDP consulting, systems help, programming aid, software packages. Accounts receivable, letter writing, payroll packages.

MONTGOMERY WARD—CORPORATE DATA CENTER
6th Floor, 140 S. State St., Chicago, Ill. 60603
(312) 408-4541
Empl: Total this location 110,000; Total EDP Employees 600; Programmers 110; Analysts 110; Operators 125.
Retail and catalog merchandising, manufacturing, insurance, credit corporation and bank. Retail and catalog merchandising, credit, accounting, payroll, employee benefits, parts distribution, inventory control, traffic, order processing and sales forecasting.
9 360's mods. 30, 40 and 50 tele processing, optical scanning, highspeed label making and retail log card center.

NUCLEAR—CHICAGO CORP.
Subsidiary of G. D. Searle & Co.
333 East Howard Ave., Des Plaines, Ill. 60018
(312) 827-4456
Jack W. Keenan, Placement Mgr.
Empl: Total this location 600; Total EDP Employees 21; Programmers 3; Analysts 2; Operators 10.
Manufacturer of radiation detection and measuring instrumentation for medical electronics and research. Various applications.
360/30.

SCIENCE/SYSTEMS
P. O. Box 1176, Evanston, Ill. 60204
Dale Fawcett, Mgr.
Empl: Total this location 220; Total EDP Employees 15; Programmers 1; Analysts 1; Operators 3.
Scientific games and toys.
List maintenance, accounting, sales analyses.
IBM 360/20 with tape.

SIMULATORS, INC.
3611 Commercial Dr., Northbrook, Ill. 60062
(312) 272-6310
A. Erickson, Pers. Dir.
Empl: Total this location 103.

SINCLAIR REFINING COMPANY
155 N. Wacker Drive, Chicago, Ill. 60606
(312) 656-5900 Ext. 352
Empl: Total this location 1,200; Total EDP Employees 120.
Regional HQ's—21 state marketing area. Credit card accounting, marketing mgmt. reporting real time on line system (Sinclair Petrochemicals).
360/65, Spectra 70/45.

STRUCTO MANUFACTURING
Div. of King Seeley Thermo
Highway 75 East, Freeport, Ill. 61032
(815) 232-9582
Tom Borden, EDP Supvr.
Empl: Total this location 700; Total EDP Employees 13; Programmers 3; Analysts 1; Operators 2.
Live action toys, barbecue grills, and art craft looms.
Billing, inventory control, payroll, accounts payable, purchasing, accounting.
4 Drive 1401 Disk System—360/25 on order.

UNITED AIRLINES
P. O. Box 6100, O'Hare Int'l Airport
Chicago, Ill. 60666
(312) 437-2300
Timothy C. Sullivan, Sup. of Emp.
Empl: Total this location 46,000; Total EDP Employees 200.
World's largest domestic air carrier. To develop a total management information
system including reservations, flight operations, crew scheduling, credit card billing systems, inventory control, traffic statistics, etc. Univac 1108-11, IBM 360/30, 40, and 50, IBM 7070, 7074 and 1401. Optical scanners and micro-filming.

U. S. ARMY WEAPONS COMMAND
Rock Island, Ill. 61201
(309) 794-5150
Robert I. Whitlott, Placement Specialist
Empl: Total this location 7,700; Total EDP Employees 250; Programmers 50; Analysts 25; Operators 50.

U. S. Army Installation responsible for the research, development, design, procurement and supply of conventional armament systems. Maintaining up-to-date status of repair and replacement parts and sub assembles on a world-wide basis for inventory management purposes.

RCA 3301, RCA 301, RCA 501, GE 225, UNIVAC 1005.

U. S. GYPSUM CO.
101 S. Wacker Dr., Chicago, Ill. 60606
(312) 321-4390
C. E. Sahlen, Empl. Mgr.
Empl: Total this location 1,000; Total EDP Employees 75; Programmers 10; Analysts 5; Operators 10.

Manufacturer of building materials. Analysis of markets, sales, profits, and transportation. Miscellaneous financial.

UNIVAC 111.

WESTERN ELECTRIC CO., INC.
Div. of American Telephone & Telegraph Company
Naperville & Warrenville Roads, Naperville, Ill. 60540
(312) 682-3206
Robert J. Male, Engineering Personnel Relations
Empl: Total this location 400; Total EDP Employees 70; Programmers 50; Analysts 20.


360/50, 360/40, 360/30, 360/20.

See Ad Page 51

INDIANA

AMERICAN FLETCHER NATIONAL BANK AND TRUST COMPANY
Indianapolis, Ind. 46204
(317) 633-2175
Norman J. McKinnon, Vice Pres.*
Empl: Total this location 1,600; Total EDP Employees 175-200; Programmers 13; Analysts 10; Operators 29.

Full service banking. Demand deposit accounting, trust, savings accounting, payroll services, mortgage loan, account reconciliation, and installment credit.

IBM 360/40, IBM 360/30, IBM 1460, and supportive tab and keypunch equipment.

BENDIX CORPORATION—SOUTH BEND REGIONAL DATA CENTER
401 Bendix Drive, South Bend, Ind. 46620
(219) 233-4141
Empl: Total this location 8,000; Total EDP Employees 130; Programmers 20; Analysts 15; Operators 24.

Service Divisions engaged in manufacturing missile aircraft and automotive equipment. Provide both engineering and commercial applications to four local divisions of The Bendix Corporation.

IBM 360/30 and 40; C.D.C. G-20 plus analog and hybrid units.

INDIANA

AMERICAN FLETCHER NATIONAL BANK AND TRUST COMPANY
Indianapolis, Ind. 46204
(317) 633-2175
Norman J. McKinnon, Vice Pres.*
Empl: Total this location 1,600; Total EDP Employees 175-200; Programmers 13; Analysts 10; Operators 29.

Full service banking. Demand deposit accounting, trust, savings accounting, payroll services, mortgage loan, account reconciliation, and installment credit.

IBM 360/40, IBM 360/30, IBM 1460, and supportive tab and keypunch equipment.

BENDIX CORPORATION—SOUTH BEND REGIONAL DATA CENTER
401 Bendix Drive, South Bend, Ind. 46620
(219) 233-4141
Empl: Total this location 8,000; Total EDP Employees 130; Programmers 20; Analysts 15; Operators 24.

Service Divisions engaged in manufacturing missile aircraft and automotive equipment. Provide both engineering and commercial applications to four local divisions of The Bendix Corporation.

IBM 360/30 and 40; C.D.C. G-20 plus analog and hybrid units.

INDIANA

AMERICAN FLETCHER NATIONAL BANK AND TRUST COMPANY
Indianapolis, Ind. 46204
(317) 633-2175
Norman J. McKinnon, Vice Pres.*
Empl: Total this location 1,600; Total EDP Employees 175-200; Programmers 13; Analysts 10; Operators 29.

Full service banking. Demand deposit accounting, trust, savings accounting, payroll services, mortgage loan, account reconciliation, and installment credit.

IBM 360/40, IBM 360/30, IBM 1460, and supportive tab and keypunch equipment.

BENDIX CORPORATION—SOUTH BEND REGIONAL DATA CENTER
401 Bendix Drive, South Bend, Ind. 46620
(219) 233-4141
Empl: Total this location 8,000; Total EDP Employees 130; Programmers 20; Analysts 15; Operators 24.

Service Divisions engaged in manufacturing missile aircraft and automotive equipment. Provide both engineering and commercial applications to four local divisions of The Bendix Corporation.

IBM 360/30 and 40; C.D.C. G-20 plus analog and hybrid units.

INDIANA

AMERICAN FLETCHER NATIONAL BANK AND TRUST COMPANY
Indianapolis, Ind. 46204
(317) 633-2175
Norman J. McKinnon, Vice Pres.*
Empl: Total this location 1,600; Total EDP Employees 175-200; Programmers 13; Analysts 10; Operators 29.

Full service banking. Demand deposit accounting, trust, savings accounting, payroll services, mortgage loan, account reconciliation, and installment credit.

IBM 360/40, IBM 360/30, IBM 1460, and supportive tab and keypunch equipment.

BENDIX CORPORATION—SOUTH BEND REGIONAL DATA CENTER
401 Bendix Drive, South Bend, Ind. 46620
(219) 233-4141
Empl: Total this location 8,000; Total EDP Employees 130; Programmers 20; Analysts 15; Operators 24.

Service Divisions engaged in manufacturing missile aircraft and automotive equipment. Provide both engineering and commercial applications to four local divisions of The Bendix Corporation.

IBM 360/30 and 40; C.D.C. G-20 plus analog and hybrid units.

INDIANA

AMERICAN FLETCHER NATIONAL BANK AND TRUST COMPANY
Indianapolis, Ind. 46204
(317) 633-2175
Norman J. McKinnon, Vice Pres.*
Empl: Total this location 1,600; Total EDP Employees 175-200; Programmers 13; Analysts 10; Operators 29.

Full service banking. Demand deposit accounting, trust, savings accounting, payroll services, mortgage loan, account reconciliation, and installment credit.

IBM 360/40, IBM 360/30, IBM 1460, and supportive tab and keypunch equipment.

BENDIX CORPORATION—SOUTH BEND REGIONAL DATA CENTER
401 Bendix Drive, South Bend, Ind. 46620
(219) 233-4141
Empl: Total this location 8,000; Total EDP Employees 130; Programmers 20; Analysts 15; Operators 24.

Service Divisions engaged in manufacturing missile aircraft and automotive equipment. Provide both engineering and commercial applications to four local divisions of The Bendix Corporation.

IBM 360/30 and 40; C.D.C. G-20 plus analog and hybrid units.

INDIANA

AMERICAN FLETCHER NATIONAL BANK AND TRUST COMPANY
Indianapolis, Ind. 46204
(317) 633-2175
Norman J. McKinnon, Vice Pres.*
Empl: Total this location 1,600; Total EDP Employees 175-200; Programmers 13; Analysts 10; Operators 29.

Full service banking. Demand deposit accounting, trust, savings accounting, payroll services, mortgage loan, account reconciliation, and installment credit.

IBM 360/40, IBM 360/30, IBM 1460, and supportive tab and keypunch equipment.

BENDIX CORPORATION—SOUTH BEND REGIONAL DATA CENTER
401 Bendix Drive, South Bend, Ind. 46620
(219) 233-4141
Empl: Total this location 8,000; Total EDP Employees 130; Programmers 20; Analysts 15; Operators 24.

Service Divisions engaged in manufacturing missile aircraft and automotive equipment. Provide both engineering and commercial applications to four local divisions of The Bendix Corporation.

IBM 360/30 and 40; C.D.C. G-20 plus analog and hybrid units.
PHILCO-FORD
Appliance Div., State Road #1, Connsville, Ind. 47331
Robert Chesnover
See Ad Page 58

IOWA
BLUE CROSS-BLUE SHIELD
Liberty Building, Des Moines, Iowa 50309
(515) 244-8961
Personnel Dept.
Empl: Total this location 700; Total EDP Employees 135; Programmers 16; Analysts 5; Operators 10; Health insurance. Random storage and retrieval of information with CRT display. IBM 360/50, 2314, 2260.

COLLINS RADIO CO
5200 "C" Avenue, N.E., Cedar Rapids, Iowa, 52302
(319) 365-8411
B. L. Bennett, Professional Employment Manager.
Empl: Total this location 12,000; Total EDP Employees 322; Programmers 40; Analysts 22; Operations & Data Conversion 260; Communications, Computer and Electronic Services & Systems. Material control, process manufacturing, General Accounting, Electronic switching. 5—7074, 12—Collins 8401, 4—C8500 (Collins 3rd Generation).

KANSAS
THE BOEING COMPANY—WICHITA DIV.
3801 S. Oliver, Wichita, Kan. 67210
(316) MV7-2239
Gerald Caywood, Professional Employment Manager.

KENTUCKY
SPINDLETOP RESEARCH, INC.
7315 Wisconsin Ave., Bethesda, Md. 20014
(301) 656-0200
Donald L. Capron, Jr., Personnel Director*

Maryland
COMPUTER USAGE DEVELOPMENT CORP.
Div. of Computer Usage Co., Inc.
7315 Wisconsin Ave., Bethesda, Md. 20014
(301) 656-0200

National Institutes of Health—Div. of Computer Research & Technology
9000 Rockville Pike, Bldg. 12A, Room 2019, Bethesda, Md. 20014
(301) 496-6951
A. L. Wade, Jr., Personnel Officer

Scientific Computer Applications, Inc.
100 Old Annapolis Boulevard, Severna Park, Md. 21146
(301) 647-7868
Warren G. Miller, Pres.*

WNG 320/370 Digital Computer.

Systems Science Corp.
1104 Spring St., Silver Spring, Md. 20910
(301) 587-4242
William C. Cunningham, Vice Pres.*
Empl: Total this location 75; Total EDP Employees 40; Programmers 20; Analysts 15; Operators 5. Systems analysis, computer programming. Operation reservation, systems consulting. State and local systems development (police information systems); proprietary systems development, including time-sharing applications. 360/40.

Vitro Corporation of America—Vitro Laboratories
14000 Georgia Ave., Silver Spring, Md. 20910
Harvey Weisberg, Mgr. EDP.
Empl: Total this location 2,500; Total EDP Employees 150. Systems engineering. Systems simulation, math modeling. 360/30/40—7090.

Wolfe Research & Development Corp.
5801 Annapolis Rd., Bladensburg, Md. 20710
(301) 779-2800
H. F. Wilder, Personnel Mgr.
Empl: Total this location 230; Total EDP Employees 150; Programmers 93; Analysts 57. Systems Analysis & Design, Applied Mathematical Analysis, Data Reduction & Analysis, Software Development, Computer Programming, Computer Application Studies, Facility Management & Operation, Training, Documentation.

Massachusetts
Adage, Inc.
1079 Commonwealth Avenue, Boston, Mass. 02215
(617) 783-1100
Larry Murphy, Eml. Adm.*
Empl: Total this location 250; Total EDP Employees 40; Programmers 25; Analysts 10; Operators 5. Digital processor, computer graphics systems. Computer graphics. DPRZ, AGT/30.

Analysis & Computer Systems, Inc.
Second Ave. Northwest Park, Burlington, Mass. 01803
(617) 272-5000
William A. Delaney, Pres.*
Empl: Total this location 51; Total EDP Employees 50; Programmers 35; Analysts 15. Math Analysis, Systems Analysis, Computer Programming and Data Reduction.

Cybertronics, Inc.
132 Calvary St., Waltham, Mass. 02154
(617) 899-0012
W. B. Mertz, Treasurer.
Empl: Total this location 85; Total EDP Employees 134 Congressional Lane, Rockville, Md. 20852
(301) 921-7724
James W. Dunn, Mgr., Professional Recruitment.*

Information and Communication Applications, Inc.
134 Congressional Lane, Rockville, Md. 20852
(301) 427-1011
Alan H. Blumenthal, Director of System Services.*
Empl: Total this location 19; Total EDP Employees 19; Programmers 3; Analysts 14. Systems analysis, design, and implementation. Communication systems, file management, medical automation, hospital information systems, scientific applications.

IBM.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Div. of Goddard Space Flight Center
Glen Dade Road, Greenbelt, Md. 20771
(301) 587-319
Gary R. Purvis, Head, Placement Branch
Empl: Total this location, approx. 3,600; Total EDP Employees 150; Programmers 125; Analysts, approx. 100. Conducts unmanned spacecraft and sounding rocket experiments in basic and applied research. Operate the Space Tracking and Data Acquisition Network and Manned Space Flight Network, NASA worldwide satellite tracking, data acquisition and data reduction networks. Determination of operational trajectory, attitude, spacecraft control and support calculations for satellite programs. Mission tracking systems. Celestial mechanics studies. Analysis of spacecraft data.

IBM 360 and 7094, Univac 1108, CDC 3600, Equal Opportunity Employer. All positions are within the Federal Competitive Service.

Software Age
New!
PORTABLE DRAFTING MACHINE
for
★ HOME
★ OFFICE
★ PLANT
★ FIELD
★ TRAVEL

No longer need you struggle with loose T-square, triangles, protractor and scales when you want to make precise sketches in-plant, in-flight, in the field or at home. The DRAFTETTE® gives you the familiar convenience of your office board in compact, portable form. The #9-B provides interchangeable 6 x 9" scale, 360° protractor reading in 5° increments. Scale calibrated in 16ths or in 50ths and millimeters (specify scale desired in ordering).

May be purchased ready-mounted on 16 x 21" light-weight board or unmounted to attach to your own board or to a pad of paper. When not in use, can be folded like a jack-knife to fit into desk or brief-case.

#9-B—including Board .... $19.90
#9—Same without Board 15.90
Extra 6"x9" Scales .......... 4.50
Extra 4"x5" Scales .......... 3.00
Carrying Case for #9-B .... 2.75

DATAMAN ASSOCIATES
1330 Beacon St., Boston, Mass. 02146
(617) 232-2253
Phoicn Lellos, Pres.*
Empi: Total this location 20; Total EDP Employees 16; Programmers 7; Analysts 4; Engineers 5.
Contract EDP personnel services. Sub-contract consulting computer personnel, software and hardware.
Business and scientific applications. See Ad Page 60

DATA TECHNOLOGY, INC.
65 Grove St., Watertown, Mass. 02172
(617) 924-1773
Philip Blake, Mgr.
Empi: Total this location 50.
PDP-8/S computer, ASR-33 Teletype, our own product line of coordinate digitizers.

DIGITAL EQUIPMENT CORPORATION
146 Main St., Maynard, Mass.
(617) 897-5111
Empi: Total this location 2,300; Total EDP Employees 100.
Computers, peripherals, logic modules. All kinds computer applications. PDP-8, PDP-9, PDP-10.

FACTORY MUTUAL ENGINEERING CORP.
1151 Boston Providence Turnpike,
Norwood, Mass. 02062
(617) 762-4300
Edward C. Drake, Pers. Dir.*
Empi: Total this location 1,000; Total EDP Employees 180.
Engineering (Insurance).

FOXBORO CO.
38 Nepsnet Ave., Foxboro, Mass. 02035
(617) 543-8750
Robert L. Ash, Supervisor, Technical Recruiting*
Empi: Total this location 4,000; Total EDP Employees 100.
Instrumentation and Process Controls.
Process Control (Digital).
See Ad Page 65

HONEYWELL INC., COMPUTER CONTROL DIVISION
Old Connecticut Path,
Framingham, Mass. 01701
(617) 879-2600
Empi: Total this location 1,600.
Design, development and marketing of digital logic modules, memory systems, general purpose digital computers, software and memory test equipment.

Industrial Process Control simulation data acquisition, communications.
DPP-124/224/S16/416, Series 632.
See Ad Page 4

INFORMATION & SYSTEMS INSTITUTE, INC.
14 Concord Lane, Cambridge, Mass. 02138
(617) 491-4471
Larry L. Constantine, Pers. *
Empi: Total this location 6; Total EDP Employees 6.
Educational, consulting, and system development services in hardware and software.
Language and compiler design, integral hardware/software design, symbol processing, management decision systems.
System development on all machines.

INTERNATIONAL DATA CORP.
Div. of Data Processing Dept.
60 Austin St., Newton, Mass. 02160
(617) 969-4020

SLAC
MATHEMATICIANS
SCIENTIFIC PROGRAMMER

30 miles south of San Francisco, the Stanford Linear Accelerator Center scientists are conducting basic research in high energy physics, using spark and hydrogen bubble chamber targets.

Mathematicians
Will organize and administer large codes, peripheral systems, and interface with other programs.

Programmer
Will link our analysis program to the new computer system. You can contribute to our research and become involved in developing and optimizing new and existing data programs and systems. Degree required and minimum 1–2 years' experience, using IBM 360 and FORTRAN IV.

Operated by Stanford University, this international center offers the same progressive benefits enjoyed by all professional employees of the University.

Please send résumé to:
G. F. Renner, P. O. Box 4349,
Stanford, California 94305.

STANFORD LINEAR ACCELERATOR CENTER
An Equal Opportunity Employer
software age

Please Fill In the Coupon and Include Check or Money Order for $1.00

SOFTWARE AGE
1020 Church Street
Evanston, Illinois 60201

Send ... additional copies of the S/A ACG to:

Address

R. McGrath, Employment Mgr.
Empl: Total this location 80; Total EDP Employees 16; Programmers 3; Analysts 3; Operators 7.

Market Research and Statistical Analysis.
Data File Processing and Analysis for Market Research.
IBM 360/30.

KEYSTONE COMPUTER ASSOCIATES, INC.
Subsidiary of University Computing Company
375 Concord Ave., Belmont, Mass. 02178
1617 489-2100

Salvatore Crisafulli, Mgr.*
Computer programming and systems design, operations research, systems analysis and systems evaluation.


NASA, ELECTRONICS RESEARCH CENTER
575 Technology Square,
Cambridge, Mass. 02139
1617 494-2351

Daniel S. Pilistone, Prof. Rect.
Empl: Total this location 800; Total EDP Employees 30; Programmers 20; Analysts 5; Operators 2.

Basic and applied electronics research for NASA Space and Air missions including Guidance, Controls, Optics, Instrumentation, Computers, Microwave radiation, Components, Qualifications and Standards, Systems, Power Systems.

Scientific programming in all of above areas including research and development towards improved software for advanced avionics and space systems. Improvements in pertinent areas of information processing, recording of raw data, data compression and transmission, pre-processing of data aboard spacecraft, data acquisition, storage and retrieval.
IBM 7094; UNIVAC 418; Analog-Hybrid comprising three (3) GSP-390-T, Beckman 2200 Analog, SDS-9300; CDC-8130, DDP-516; Lincl-8; DDP-124.

OMEGA ASSOCIATES, LEHIGH DESIGN CO., INC.
1065 Main St., Waltham, Mass. 02154
1617 899-6150

Edward Robinson, Div. Mgr.*
Empl: Total this location 60; Total EDP Employees 50; Programmers 30; Analysts 10; Operators 10.

Software, programming services, EDP consulting applications programming. Scientific, business, real-time, management information systems.
5/360.

PHILIP HANKINS, INC.
Subsidiary of Wang Laboratories, Inc.
800 Massachusetts Avenue,
Arlington, Mass. 02174
1617 648-8550

Robert Plachta, Treasurer.
Empl: Total this location 120; Total EDP Employees 120; Programmers 35; Analysts 30; Operators and Key punch, etc. 35.
1) Computer consulting and programming—commercial EDP, scientific programming, real time process control; 2) Data Center—360/65, 360/40, DDP-116; 3) Service Bureau.

Consulting and Software Group does design and programming for all types of EDP applications: (payroll, investment, inventory, ledger, accounting), scientific applications (mathematical, computer software, simulation), real time (process control, graphics), hardware evaluation and consulting. Data center sells machine time; business service provides service bureau functions.

IBM 360/65 (OS and 2314 disc system), 360/40 (OS, disc and tape), DDP-116 (paper-mag tape conversion), Telebatch—remote job entry system for 360/65, printout reduction equipment.

RAYTHEON CO., MISSILE SYSTEMS DIV.
Hartwell Rd., Bedford, Mass. 01730
1617 274-6083

Frank Dechristopher, Empl. Mgr.
Empl: Total this location 4,000; Total EDP Employees 200; Programmers 100; Analysts 75; Operators 25.

Tactical defensive missile, radar and avionics systems.
Mathematical analysis and data processing; operational programming; computer design and applications; systems and procedures; analog, digital and hybrid systems.
Raytheon 512, 7044, 7090, 1108, 6600.

RCA ELECTRONIC COMPONENTS DIVISION
150 "A" St., Needham, Mass. 02194
(214) 444-7200

Empl: Total this location 800—900; Total EDP Employees 10; Analysts 2; Operators 7.


SPEAR INFORMATION SYSTEMS—SPEAR & STAFF.
16 Babson Park Ave., Wellesley, Mass. 02154
1617 235-8500

Victor V. Vurpillat, Pres.
Empl: Total this location 90; Total EDP Employees 5; Programmers 5.

Stock Market Analysis.
Stock Market Analysis.
Lincl 8.

TRANSITRON ELECTRONIC CORP.
168 Albion St., Wakefield, Mass. 01880
1617 245-4500

W. F. Handley, Mgr., Systems/Programming.*
Empl: Total this location 3,800; Total EDP Employees 50; Programmers 15; Operators 10.

Semi conductor and allied products.
Financial and manufacturing.
360/30—65K—360/40 on order. Communication with 3—360/20.

WARREN ASSOCIATES—THE WARREN INSTITUTE
433 Putnam Ave., Cambridge, Mass. 02139
1617 356-3750

Jay Blum, Director.*
Empl: Total this location 10; Total EDP Employees 6; Programmers 4; Analysts 2.

EDP Systems and Management Consultants.
Computer software for IBM 360, Honeywell 1800 Series, etc. Bionics and Medical Applications our specialty. EDP Training Programs also available.

WASHINGTON ENGINEERING SERVICES CO., INC.
68 Rogers St., Cambridge, Mass. 02142
1617 492-6760

Z. W. Kohorn, Tech. Dir.
Empl: Total this location 20; Total EDP Employees 16; Programmers 6; Analysts 5.

Company serves as a consultant in the field of Information Management.
Systems analysis, design, and implementation.

WOLF RESEARCH & DEVELOPMENT CORP.
Subsidiary of EG&G, Inc.
P. O. Box 36, West Concord, Mass. 01781
1617 646-8192 or 369-2111

Empl: Total this location 110; Total EDP Employees 106; Programmers 17; Analysts 47; Operators 42.

Computer programming; consulting; R&D studies. Mathematical, physical, and management analysis. Systems analysis, design and implementation.
engineering. Facility management and operations. Information systems; software systems; computer graphics. Real-time control; on-line interaction; data reduction; simulation. Various aerospace, scientific, and commercial applications of digital and analog computers. None at this site. All major makes and models used, off-site.

MICHIGAN

ANN ARBOR COMPUTER CORPORATION
415 West Huron, Ann Arbor, Mich. 48103
(313) 761-2151
Larry Rotarr, Pers. Mgr.
Empl: Total this location 30; Total EDP Employees 10; Programmers 5; Analysts 3; Operators 2.
Design and implementation of fully programmed computer control systems for instrumentation and control.
Material Handling Controllers, Machine-Tool Controllers, Natural Gas Flow Measurement, Engine Horsepower and Efficiency Measurement, etc.
IBM 1800, IBM 1130, H-P 2100 Series, PDP-8.

AUTOMOBILE CLUB OF MICHIGAN
150 Bagley Ave., Detroit, Mich. 48226
(313) 963-2911
Empl: Total this location 2,800; Programmers 15; Analysts 25.
Insurance.

Baker Perkins Inc.
1000 Hess St., Saginaw, Mich. 48601
(517) 752-4121
Charles A. Shelley, Pers. Supvr.
Empl: Total this location 1,000; Total EDP Employees 12; Programmers 3; Operators 4.
Processing equipment for food and chemical industries, e.g., ovens, mixers, centrifugals, storage and handling equipment.
Production Control. Bill of material exp. Payroll General.

THE BENDIX CORPORATION
1104 Fisher Bldg., Detroit, Mich. 48202
(313) 875-5000, Ext. 371
L. B. Dooley, Mgr. of Prof. Placement* Empl: Total this location 500; Total EDP Employees 250; Programmers 50; Analysts 50; Operators 25.
Aerospace/Automotive/Electronic.
Commercial—Accounting, Production Control, Inventory Control, Sales Forecasting.
IBM 360, Real Time on Line Multi-Processing —COBOL and FORTRAN languages.

BURROUGHS CORP.
P. O. Box 299, Detroit, Mich. 48232
Ext. 8301, 875-2260
Robert M. Coyner, Pers. Mgr., Corp. General Office* Empl: Total nationwide 42,000; Total EDP Employees nationwide 2,000.
Electronic business machines, information processing systems, general and special purpose small, medium, and large scale digital computers.
B-3500, B-5500, B-6500, B-8500.

CLARK EQUIPMENT CO.
324 East Dewey, Buchanan, Mich. 49007
(616) 697-2260
John Raster, Salaried Personnel Coordinator Empl: Total this location 2,958; Total EDP Employees 144; Analyst Programmers 48; Analysts 13; Operators 25.

FEDERAL ELECTRIC CORPORATION
ITT's World-Wide Service Associate
A Plans for Progress Equal Opportunity Employer (m/f)

You'll be programming the moon, and doing everything under the sun.

- The closer the moon gets, the more exciting the work becomes. Important as they are, the successful Apollo-Saturn launches and the space journey of the lunar module are only preludes to the main task facing the NASA/industry team—putting men on the moon.

This is what you'll be programming. The moon shot and computation of all the factors that will assist NASA in the operation and maintenance of the communications and instrumentation which are the nervous system of the Kennedy Space Center. As a prime contractor this is the responsibility of ITT-Federal Electric Corporation's 1500-man team.

We'll give you the tools. For scientific, engineering and administrative support you can call upon two GE 635 multi-programmed digital computer systems with 16 magnetic tape units, 128K word storage, a 788K word drum and real-time input/output controllers on each system. We also use an IBM 7010 computer system for financial management and an IBM 1050 connected to a separate IBM 1440-7010 computer system for a real-time 30K item inventory system.

The work offers unparalleled opportunities for programmers. So does the living. There's something new to do every day... and the climate to do it in. You'll be living in the heart of Florida's fabled East Coast, at a cost well below the national average. There's boating, surfing, superb fishing, hunting, and golf. If you're more sedentary, you can cultivate the soothing art of shell collecting. Federal Electric Corporation, in Florida, is a great place to indulge your family while you're giving your career a big thrust forward.

Please forward your resume, including salary history, in complete confidence to Mr. L. A. Hamilton, Federal Electric Corporation, Suite 501, Cape Royal Building, Cocoa Beach, Fla. 32931.
PROGRAMMERS/SYSTEMS ANALYSTS

consider the advantages of a career in Connecticut

Come to Connecticut and enjoy sailing on the ocean, hunting and fishing in the rolling countryside, skiing in Vermont, a day trip to New York City or historic Boston. . . . golf, tennis, camping or what-have-you. It's all within easy reach when you join up with P&WA's Information Systems Department. For this is the place to combine the daily challenge of an action-oriented career in Business Information Systems with the four season stimulation of leisure-time living in Connecticut.

Pratt & Whitney Aircraft is the world's leading producer of dependable jet engines. Now, more than ever, continuing expansion, diversification and promotion from within afford every opportunity for healthy growth and achievement for EDP professionals with up to ten years experience. Attractive openings exist at all levels of responsibility; preference will be given to applicants with recent experience using assembly language and/or COBOL.

A multiplicity of projects vary from simple card systems to complex on-line systems involving such projects as a Full Production Information System, Automated Financial Analysis and Reporting, and an Integrated Material Control System, including procurement, forecasting and scheduling. Tools include 360 models 20, 30, 40, and 50; tapes and random devices; data collection equipment; on-line facilities; DOS and OS.

If this sounds like your kind of action, why not send your resume to Mr. H.M. Heldmann, Professional Placement, Office A-43, Pratt & Whitney Aircraft, East Hartford, Connecticut 06108. An equal opportunity employer.

Pratt & Whitney Aircraft

DIVISION OF UNITED AIRCRAFT CORPORATION

Corporate office and automotive division—planetary drive, drive steer axles, axle housings.
Material planning and control—financial processing—payroll—A/R—A/P (etc.)
G.E. 215, 225 and 235 systems, communications computer, dual Univac 1108 now being installed. Full 3rd generation time sharer will replace 12 existing computers.

COM-PETE, INC.
15 Research Drive, Ann Arbor, Mich. 48103
(313) 761-3133
J. G. Perkins, Pres.
Empl: Total this location 3; Total EDP Employees 3.

COM-SHARE, INCORPORATED
1919 West Stadium Blvd., Ann Arbor, Mich. 48106
(313) 769-2900
Robert E. Snavey, Exec. Dir. of Marketing*
Empl: Total this location 75; Total EDP Employes 30; Programmers 40; Operators 10.

META II, INC.
304 W. 3rd St., Detroit, Mich. 48202
(313) 872-9000
W. R. Short, Prof. Empl.*
Empl: Total this location 4,000; Total EDP Employees 27; Programmers 20; Analysts 7.

MINNESOTA
CONTROL DATA CORPORATION
8100 34th Ave. South, Minneapolis, Minn. 55440
(612) 888-5555

Software Age
You don't change a company the scope of Montgomery Ward with timid measures. You do it with a totally unique programming effort geared to serve a total management information system from 8 different areas simultaneously!

You do it with a battery of IBM 360/50's, 40's, 30's. With hardware that comprises one of the largest commercial 3rd generation installations in the nation!

Most of all, you do it with people. Young, restless, skilled people including programmers and systems analysts with COBOL or BAL experience who recognize the potential in helping re-structure an entire system.

If you're a person who wants to get things done, there's no better place to turn your energies loose than right here. At the changing Montgomery Ward. Contact: M. K. Fenwick, Personnel Representative, Corporate Systems Division.
MISSOURI
FARMLAND INDUSTRIES, INC.
P. O. Box 7305, Kansas City, Mo. 64116
(816) GL3-1400
Gene Switzer, Pers. Rep.*
Empl: Total this location 775; Total EDP Employees 75; Programmers 18; Analysts 6; Operators 12. Petroleum, fertilizer, agricultural chemicals, feed, farm supplies, etc. Business applications. IBM 360 models 20 and 30.

FEDERAL BARGE LINES, INC.
Div. of Pott Industries, Inc.
611 East Marceau St., St. Louis, Mo. 63111
(314) 232 8021
Gene Switzer, Pers. Rep. • MCDONNELL AUTOMATION COMPANY
Div. of Pott Industries, Inc.
91109

What Burroughs' total growth can mean to you.

Burroughs is now in an era of extraordinary expansion where the opportunities for individual advancement are unlimited. We are already Southern California's number-one producer of commercial digital computing equipment and by the end of this summer we will have doubled our manufacturing capacity.

In order to fill the newly created openings we are looking for number-one professionals who will enjoy rewards to match their talent and contributions. Since Burroughs has always practiced the policy of promotion from within, you will find that there could not be a better time to call us. You will discover that Burroughs growth can mean advancement advantages, pride of achievement and renewed dedication to your career commitment.

Current Burroughs' openings include:

SOFTWARE DESIGNERS AND PROGRAMMERS - To design, develop and implement the software programming for operating hardware and next generation computers. These are intermediate and senior level positions. BS degree and 2 or more years experience required.

DESIGN AUTOMATION PROGRAMMERS - To develop and implement computer programs, to aid the automatic design of logic equations for computer hardware. Candidates should have a BS degree in engineering or science and 1 year programming experience.

Send your resume now to: Mel Olson, Burroughs Corporation 460 Sierra Madre Villa, Pasadena, California 91109

Burroughs Corporation
An equal opportunity employer

MIDWEST RESEARCH INSTITUTE
425 Volker Blvd., Kansas City, Mo. 64110
(816) 56-0202
Martin N. Schuler, Mgr. Staff Development Empl: Total this location 430; Total EDP Employees 18; Programmers 9; Analysts 4; Operators 5. Consulting and support of Research Activities resulting from Contract Research for Industry and Government. Digital simulations, computer-assisted-menu-planning, automation studies, forecasting, programming and analysis support for research in the hard sciences and economics, information retrieval. IBM System 360/30, Remote 1050's, Off-Line Plotter.

NEW HAMPSHIRE
SANDERS ASSOCIATES, INC.
95 Canal St., Nashua, N. H. 03060
883-3321, Ext. 3863
Michael L. O'Connell, Mgr., Corporate Software Support
Empl: Total this location 9,000; Total EDP Employees 250; Programmers 80; Analysts 20; Operators 30. Electronics research, development, and manufacture. Financial, engineering, marketing, administrative and manufacturing. IBM system/360, Models 50, 40, 30.

NEW JERSEY
ABLE COMPUTER SYSTEMS, INC.
1329 Birch Hill Rd., Mountainside, N. J. 07092
(201) 233-6956
Personnel Dept.*
Empl: Total this location 20; Total EDP Employees 20; Programmers 6; Analysts 14. Consulting for S/360 computer systems design and programming (Cobol, Bal, RPG, Fortran) All commercial applications and most scientific. S/360 (all models).

AIRC/AMC. CRYOGENIC PLANTS CORP.
575 Mountain Ave., Murray Hill, N. J. 07971
(201) 464-6800
R. H. Fursdon, Mgr., Admin.
Empl: Total this location 120; Total EDP Employees 2; Analysts 2. Engineering design and construction. Engineering design—simulation and optimization of cryogenic processes. Time share machines—IBM 1130, 360-50.

APPLIED DATA RESEARCH, INC.
Route 206 Center, Princeton, N. J. 08540
(609) 921-8550
Warren F. Spalding, Vice Pres.
Empl: Total this location 45; Total EDP Employees 40; Programmers 40; Analysts 40. Programming and systems analysis and consulting services.
This unique collection has every page—every engraving faithfully reproduced just as they first appeared over a century ago during the American Civil War.

Young and old alike will thrill to this fascinating adventure in reading—from eye witness reporting to hilarious advertisements...from impressive panoramic illustrations to comical political cartoons...something of interest and value to everyone...all the great events that were destined to become a part of our heritage.

Seven key issues highlight the action of the Civil War. In addition, each issue offers a wide variety of general interest items. All with magnificent engravings—battlescenes, portraits, news of the day.

An informative preface sheet printed on simulated parchment tells the reader of the contents and describes the history of these famous old illustrated newspapers.

Seven complete issues, totalling 112 pages, cello-wrapped, neatly contained in a sturdy, handsome box 11¾" x 16¾" x 1¼".

The distinctively designed cover is printed in four colors, with a durable, clear plastic finish to protect against soiling.

Only $6.95—Postpaid

SCIENCE/SYSTEMS
P.O. Box 1176
Evanston, Ill. 60204

Please send me at the address below:

THE CIVIL WAR
(Reprints of Century Old Newspapers)

(name)

(address)

(city) (state) (zip code)

Illinois residents add 5% OES
If you are one of the relatively few (as yet) individuals who combine a knowledge of brokerage operations with systems analysis, we invite you to participate in the development of an entirely new computerized "Back Office" Brokerage Information System.

We require specialists with at least 2 years' experience in systems design. Articulate innovators with working knowledge of Margins, Cashiers and Accounting areas will expand our Back Office operations into a dynamic automated facility utilizing 3rd generation computer systems. Working closely with various operations units to determine management information requirements, you'll be responsible for systems feasibility studies, information requirement analysis, complete documentation for your systems designs, and the training of supervisory and production personnel involved in supporting these systems.

These are EXCELLENT career positions to challenge your full potential with a major Wall Street brokerage firm. In addition to the EXCELLENT salaries, fringe benefits, and tuition refund from a highly successful investment firm, experienced Line Managers, Supervisors and Area Leaders will enjoy working with a Management which welcomes your creative ideas and lets you realize their implementation.

Send resume with salary requirements, in strict confidence, to: Mr. F. BOWEN, Box No. 58, Bowling Green Station, N. Y. C. 10004.

FRANCIS I. duPONT & CO.
Your investment success is our business
An Equal Opportunity Employer

Engineering applications, simulation and management information and control systems. All EAI analog and analog/hybrid computers; IBM 360 for management information.

ESSO MATHEMATICS & SYSTEMS, INC.
P. O. Box 101, Park Avenue, Florham Park, N. J. 07932 (201) 474—6127
Bruce R. Jones, Empl. Repr.*

HARVARD INDUSTRIES, INC.
Div. of Frequency Engineering Laboratories P. O. Box 527, Farmingdale, N. J. 07727 (201) 938—9221
Howard Furman, Supvr., Prof. Empl.
Empl: Total this location 1,100; Total EDP Employees 30; Programmers 6; Analysts 3; Operators 6. Electronic systems and equipment. Engineering applications, circuit analysis, and business applications. IBM 360/30; IBM 1130; various peripheral equipment.

HOFFMANN—LA ROCHE INC.
340 Kingsland St., Nutley, N. J. 07110 (201) 235—3401
Robert A. Wald, Associate Personnel Manager—Administration Pharmaceuticals, fine chemicals, vitamins, and aromatic. Scientific commercial operations research. G.E. 635, IBM 360—30, Honeywell 120, Univac 1004.

INGERSOLL RAND RESEARCH, INC.
Div. of Ingersoll Rand Co. P. O. Box 301, Princeton, N. J. 08540 (609) 921—9103
Ben M. Goodman, Mgr., Scientific Data Processing
Empl: Total this location 100; Total EDP Employees 6; Programmers 3; Analysts 2; Operators 1. Research. Engineering and scientific. CDC 8090 terminal to CDC 6600.

ITT DATA SERVICES
Div. of International Telephone & Telegraph, Inc. P. O. Box 402, Rt. 17 and Garden State Parkway, Paramus, N. J. 07652 (201) 268—8700
John J. Mulvey, Professional Staffing Representative
Empl: Total this location 718; Total EDP Employees 419 (including sales & management); Programmers 50; Analysts 102; Operators 53. Programming and Computer Services (Batch & Time Sharing). Commercial, scientific and time sharing for wide range of customers. 360/30, 40, 50, 65, 67.
See Ad Page 39

JOHNSON & JOHNSON
501 George St., New Brunswick, N. J. (201) 524—6430

DATA SYSTEMS ANALYSTS, INC.
North Park Drive, Penasauken, N. J. 08109 (609) 665—6088; (215) 925—9550
Mrs. E. Giannone, Pers. Dept.
Empl: Total 76; Programmers and Analysts 62. Programs and systems; design and implementation; programmer training; data processing service. (Area of concentration—real-time, online systems.)

Systems experience—includes airline systems, management systems, command and control, on-line remote graphics, process control systems, store and forward switching, weapons systems, system simulators.

DECISION SYSTEMS INC.
East 66 Midland Ave., Paramus, N. J. 07652 (201) 261—8900
Joseph F. Fox, Mgr. Admin.*
Empl: Total this location 65; Total EDP Employees 50.
Systems analysis, computer programming audio-visual equipment. Scientific and commercial applications.

ELECTRONICS ASSOCIATES, INC.
185 Monmouth Parkway, West Long Branch, N. J. 07764 (201) 229—1100
Thomas J. Murdock, Empl. Repr.*
Empl: Total this location 1,800; Total EDP Employees 50.
Analog, digital and hybrid computers; peripheral equipment; and high quality components for computers.
Our computers have flown a lot of missions in our work in V/STOL systems definition. It's one of many jobs supporting our work in systems engineering, research and development. Our IBM 360/30-7090-360/40 facility provides operations research, analysis and prediction, information retrieval, and systems simulation in development of ASW fire control techniques, advanced torpedo design, underwater acoustics, acoustic imaging, oceanographic communications studies, and missile systems integration and management.

A degree in mathematics, physics, engineering or chemistry is necessary for scientific work; two years experience with a degree for commercial programming with knowledge of COBOL and/or assembly language coding.

Please send your resume to Mr. Harvey Weisberg, Employment Manager.
section, numerical control taxes, analysis, some engineering calculations.
C DC 3150, Univac 1005.

NEW MEXICO
THE DIKEWOOD CORP.
1009 Bradbury Drive SE,
Albuquerque, N. M. 87106
(505) 243-9781

Victor V. Myers, Mgr., Contract Adm.*
Emp: Total this location 130; Programmers 25; Analysts 19; Operators 2.

Systems analysis, computer applications, physics, administration and social systems, natural resources and others.

Scientific and commercial programming, data reduction, analysis and processing.

IBM 360-44, IBM 1050, 2780 and 2740 terminals.

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY
Campus Station, Socorro, N. M. 87801
(505) 835-5242

Dr. T. A. Nartker, Dir., Computing Center

Emp: Total this location 250; Total EDP Employees 12; Programmers 5; Analysts 4; Operators 2.

Research and development (atmospheric physics, explosives and mining technology), education.

IBM system 360 M44 and other data acquisition devices.

NEW YORK
ALPHANUMERIC INCORPORATED
10 Nevada Drive, Lake Success, N. Y. 11040
(516) 437-9000


IBM 360/30.

AMERICAN AIRLINES INC.
633 3rd Ave., New York, N. Y. 10017
(212) 867-1234, Ext. 2675

J. L. Pardoe, Empl. Repr.

Emp: Total EDP Employees 250; Programmers and Analysts 120; Operators 90.

Real-time reservations, commercial.

IBM 1401-7074/360/30, 360/40, 360/65; CDC 3100; CDC 3300.

AUTOMATE
511 So. Albany St., Ithaca, N. Y. 14850
(607) 272-5476

Mark Charles, Pres.

Emp: Total this location 10; Total EDP Employees 5; Programmers 3; Analysts 2.

Computer matchmaking; also consultant programmer and analysts.

CDC 1604; IBM 360/40, 65.

BELL AEROSYSTEMS CO., TEXTRON INC.
P. O. Box 1, Buffalo, N. Y. 14240
(716) 297-1000

Thomas C. Friedrich, Employment Manager*

Emp: Total this location 6,945; Total EDP Employees 234; Programmers 124; Analysts 19; Operators 65.

Research and development of aerospace vehicles, systems and components.

Engineering research and development computation. Mathematical analysis. Business programs and systems support.


BROOKLYN UNION GAS CO.
195 Montague St., Brooklyn, N. Y. 11201
(212) 643-3734
Richard D. Groff, Senior Personnel Assistant

Empl: Total this location 3297; Total EDP Employees 80; Programmers 30; Analysts 10; Operators 14.

Sale and distribution of Natural Gas.

On-line customer information system, Engineering, Payroll, Responsibility Accounting, Stockholder Records, Plant Accounting, Material and Supplies, etc.

IBM/360/30, IBM 360/30, IBM 7074, IBM 1287, IBM 1231.

BRANDON APPLIED SYSTEMS, INC.
30 East 42nd St., New York, N. Y. 10017
(212) 986-1518

Max Gray, V.P.-Professional Services*

Emp: Total this location 45; Total EDP Employees 35; Programmers 10; Analysts 12.

Data Processing consulting, systems design and programming and training.

CHICAGO PNEUMATIC TOOL CO.
2200 Bleecker St., Utica, N. Y. 13503
(315) 797-1400

J. W. Paul, Sup. of Empl. Rel.

Emp: Total this location 2100; Total EDP Employees 28; Programmers 7; Analysts 4; Operators 3.

Portable pneumatic tools.

Inventory control.

IBM (S-360) mod. 30.

COMPUTER APPLICATIONS INC.
555 Madison Ave., New York, N. Y. 10022
(212) 690-1310

Vincent L. Iannoli, Mgr. Industrial Relations*

Emp: Total this location 550; Total EDP Employees 350; Programmers 264; Analysts 55; Operators 31.

Computer software development and consulting.

Banking, transportation, urban systems, mgmt. information systems, financial systems.

Programming tools from —

CC SYSTEMS, Inc.
P. O. Box 522 • Elmhurst, Ill. 60126

For more information, circle No. 51 on the Reader Service Card

50

INDEX OF ADDRESSES

IBM SYSTEMS $12-16,000

SOFTWARE EXPERT $14-20,000

SYSTEMS ANALYSTS $12-15,000

PROGRAMMING MGR $14-17,000

ACCOUNTING MGR $12-14,000

SOFTWARE EXPERTS $11-15,000

FINANCE MGR $10-14,000

SERIAL MGR $9-13,000

BUYER $8-10,000

SPECIALISTS IN EXECUTIVE SEARCH

National Employment Consultants


National Employment Assn.

Society for Advancement of Mgt.

Society for Advancement of Job Eval.

M. C. Miller, Director

ALTOONA PERSONNEL AGENCY

Tel. 814/944-5371

102 Strand Plaza, 1109 15th Street

Altoona, Pennsylvania 16601

Send Your Resume Today For Confidential Consideration On Hundreds Of FEE PAID Positions In Our National File

State Your Salary

And Geographic Preferences.

 Hundreds Of FEE PAID Positions In Our National File . .

... A Few Of Our Current Searches . . .

MGMT INFO SERVICES $12-25,000

* Need all levels. Elect co.

EDP CONSULTANTS $13-30,000

* Planning Staff. Conglomerate

EDP MANAGER $14-16,000

* 360/20-30. Natl drug chain

SYSTEMS MANAGER $13-17,000

* Mfg/finl appl. Small mfr.

COMPUTER SYSTEMS $12-16,000

* Davep tele-comm network

Robert Half Personnel

ATTENTION: DAN KRANE

ONE ATLANTIC STREET, STAMFORD, CONN. 06901

(203) 325-4158

Software Age
COMPONENT TEST

Responsible for the design and development of specialized test equipment and methods to be used in conjunction with the manufacture of telecommunications components such as ferrite cores, solid state circuit packs and memory systems components. This position is located at Western Electric's Hawthorne Works in Cicero, Illinois.

SYSTEMS TEST

Design, develop and improve new and existing test equipment and methods used during installation of electronic central office switching systems. Technical knowledge of digital computers using stored program control is required. This position is available at the Indian Hill Bell Telephone Laboratories facility near Naperville, Illinois.

Both of these positions require a BSEE degree. Electronic circuit analysis and test experience are desired.

The positions offer professional environment, opportunity for development and personal advancement. Western Electric has very competitive salaries and liberal employee benefit programs.

For further information, send your resume to:

MR. ROBERT SMICK
Engineering Department 2013-F
Western Electric Company, Inc.
Hawthorne Station, Chicago, Illinois 60623
or call him at (312) 494-5067

Western Electric
MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

An Equal Opportunity Employer
NOW IS THE TIME

GILBERT LANE PERSONNEL

IS THE PLACE

We are a national network of experienced recruiters specializing in the Information Sciences. Our input from locations across the country is consistent.

GILBERT LANE PERSONNEL AGENCIES

PERSONNEL AGENCIES, INC.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
500 Boylston St.
Pittsburgh.
Boston, Mass.
903 N. Am. Bldg.
Software (Force III); On-Line Systems Design and Implementation. 
360/30–85; IBM 1130; SDS 940.


IBM System 360/30, 65K, 3 disks, 4 tapes.


LORAL CORP. 688 White Plains Road, Scarsdale, N. Y. 10583 (914) 723–6500 Robt. M. Shaw, Div. Information Systems Empi: Total this location corp. hqtrs 25; Total EDP Employees 40; Programmers 12; Analysts 10; Operators 5. We are a multi division co.—mfg. and sale of electric equip., semi conductors, wire products, plastic vials, high tolerance machine shop. Order entry inv. control, billing, a/c rec. inv. forecasting, payroll/job cost. mkt. forecasting. Honeywell 200, 32K 6 tapes.

MOBIL OIL CORP. 150 E. 42nd St., New York, N. Y. 10017 P. J. Harbaugh, Jr., Placement Specialist Empi: Total this location 3,000; Total EDP Employees 200; Programmers 50; Analysts 50; Operators 90. Corporate Headquarters—combined Scientific/Commercial Computer Center. Refinery Process Simulation, or Support, Corporate Accounting, Linear Programming, and Software Development & Support. IBM 360/75, 360/50, 360/40, 7094.

NATIONAL DISTILLERS AND CHEMICAL CORPORATION 99 Park Ave., New York, N. Y. 10016 (212) OX7–0700 Ext. 342 Joseph F. Birch, Mgr., Data Processing Empi: Total this location 700; Total EDP Employees 60; Programmers 22; Analysts 8; Operators 30. Headquarters location—Corporate and Divisional Management plus Administrative Personnel. On-Line Inventory Control, Order Entry, plus full range of Batch Type Applications. IBM/360—Model 30 and 40.

PRO-DATA COMPUTER SERVICES, INC. 1431 Broadway, New York, N. Y. 10018 (212) 594–6400 Linda Heltnner* Empi: Total this location 85; Total EDP Employees 70; Analysts 70. Professional computer consultants serving both Government and Industry. Primarily commercial applications. The bulk of our current work utilizes IBM Equipment, we are especially interested in BTAM/QTAM for the IBM 360 series.


Equal Opportunities for EDP Employers!

When it comes to competing for experienced EDP personnel, our unique service and network of international offices puts you on an equal footing with any company recruiting. Of course, our “equal opportunity” service, works for EDP employees, too—over 4,000 of them placed last year.

Call our nearest office for details and prompt service.

ALL EDP POSITIONS SERVED:

EDP Systems & Management Salaries: $14,000 to $40,000 Tab/Computer Operators Salaries: $6,000 to $8,000

Computer Programmers Salaries: $8,000 to $14,000 Key Punch Operators Salaries: $4,000 to $6,000

LEAD SYSTEMS ANALYST SENIOR SYSTEMS ANALYST

Preferred candidates must have 4–9 years experience with a BS degree. Should be fully familiar with all phases of systems design including programming, test implementation and audit. Manufacturing environment i.e. heavy machinery, machine tool, materials control area would relate to our operation. Work with third generation computer with primary use of disc processing concepts helpful.

If your background and interests match these requirements, send resume in confidence to:

J. G. MIKOTA

CONTINENTAL CAN COMPANY, INC. 1200 W. 76th St. Chicago, Illinois 60620 An Equal Opportunity Employer

SEPTEMBER, 1968

53
INFORMATICS INC.
The State-of-the-Art Software Company (on the East Coast)

INFORMATICS INC. was formed in 1962 in California and in its short years has grown from the original three founders to a staff of over 400. With headquarters in Los Angeles, California, Informatics maintains major offices in metropolitan Washington, D. C., and New York City and has field offices in Boston, Omaha, Chicago, San Francisco, Sacramento, Vancouver, New York, N. Y., the Netherlands and in Switzerland. Informatics is involved in more state-of-the-art, on-line computer software than any company on the East Coast. Accordingly, Informatics, as a nationwide entity, is the only independent software firm specializing in on-line systems. We boast a senior staff averaging 14½ years experience in the information science field with an average of 9 years experience per employee.

Informatics is now increasing its staff by a significant number. We seek people who can contribute to our expertise and have the desire to advance their knowledge. We offer outstanding benefits including company-paid life and health insurance, tuition reimbursement, a generous vacation schedule, a highly liberal sick leave policy, a profit sharing plan unique to the industry, and cash bonuses to outstanding contributors.

We are seeking people with experience in the following areas:

- System Simulation
- Software Development
- Management Information Systems
- Information Retrieval
- Command & Control Systems
- Aerospace Applications
- Real Time/On Line
- Digital Logic Design
- Digital Circuit Design
- Systems Integration
- Soft Ware Analysis

Salaries range from $8,200 to $25,000. Our client companies assume all fees. Forward resume in confidence, or call (collect): Mr. Martin E. Sheridan (Area Code 703) 524-7660.

SHERIDAN ASSOCIATES INC.
1901 North Part Myer Dr., Suite 1010, Arlington, Virginia 22209
(Just over the Potomac from Washington, D. C.)
Personnel Consultants to the Computer Industry

HAVE YOU HEARD OF CASES
Let our 360 evaluate your qualifications against all orders in CASES (Computerized Applicant Search, Evaluation and Selection) for one year. Positions are located in all areas of the country.

Send us a resume along with your geographic restrictions and salary requirements and CASES will search for you. If you don't have a resume send us your address and we will forward you a simplified INPUT form. No cost or obligation. All replies strictly confidential.

N. T. McNichols

FOX-MORRIS ASSOCIATES
1500 Chestnut Street
Philadelphia, Pennsylvania 19102

SOFTWARE AGE
NORTH CAROLINA

DURHAM LIFE INSURANCE CO.
P. O. Box 1801, Raleigh, N. C. 27602
(1919) 822-2011
John B. Gray, Asst. Vice Pres.
Emp!: Total this location 160; Total EDP Employees 25; Programmers 5; Analysts 3; Operators 3.
Life Insurance.
Policy records and reserves, premium accounting, production statistics, payroll.
RCA Spectra 70/35.

REGIONAL EDUCATION LABORATORY FOR THE CAROLINAS AND VIRGINIA
Mutual Plaza, Durham, N. C. 27701
(1919) 688-8057
Paul W. Sire, Dir. Data Management Systems
Emp!: Total this location 45; Total EDP Employees 5; Programmers 2; Analysts 2; Operators 1.
Educational Development in four year, Junior and Community Colleges.
Generalized education management system; indexing and retrieval of educational information; statistical analysis.
IBM 1130 with 360/75 communications adapter.

TRIANGLE UNIVERSITIES COMPUTATION CENTER
P. O. Box 12175,
Research Triangle Park, N. C. 27709
(1919) 549-8291
M. S. Davis, Pres.
Emp!: Total this location 25.
Research and Education.
Full spectrum at supporting universities. Systems only at TUC Center.
IBM System 360/Model 75 with following terminals: 2 Model 40's; 2 Model 30's; 2 1978's; 2 1130's; 12 1050's; 6 2741's; 72 33.

OHIO

AUTOMATED INFORMATION & MANAGEMENT SYSTEMS, INC. (AIMS)
Suite 4, Carrousel Towers, 8075 Reading Rd., Cincinnati, Ohio 45237
(513) 761-9966
R. L. Lindenschmidt, Mgr. Systems Development
Emp!: Total this location 21; Total EDP Employees 15; Analysts 11; Operators 4.

CHEMICAL ABSTRACTS SERVICE
Div. of American Chemical Society
2540 Olentangy River Road,
Columbus, Ohio 43210
(614) 293-7412
Stanley M. Scott, Pers. Ass't.
Emp!: Total this location 914; Total EDP Employees 61; Programmers 32; Analysts 9; Operators 9.
Information Science operation publishing "Chemical Abstracts" and 3 Computer-based publications.
Computer-based Chemical Information system including Abstract and Index processing, information storage and retrieval, and composition for publication.
2—IBM 360/50.

COLUMBIA CARBON CO.
35 S. St. Clair Street, P. O. Box 945,
Dayton, Ohio 45401
(513) 224-1167
Emp!: Total this location 55.
We are manufacturers of Computer ribbons.

DATA CORPORATION
7500 Old Xenia Pike, Dayton, Ohio 45432
(513) 426-6871
Roger Geist, Pers. Coord.
Emp!: Total this location 300; Total EDP Employees 75; Programmers 35; Analysts 20; Operators 5.
Consulting, custom programming, systems design, seminars.
Information retrieval, scientific applications, management science applications, commercial applications.
IBM 360/40, NCR 315.

DUNHILL INTERNATIONAL, INC.
P. O. Box 965, 1801 Spielbusch Ave.,
Toledo, Ohio 43601
(419) 244-4951
Gary A. Miller, Mgmt. Recruit.
Emp!: Total this location 191; Total EDP Employees 49; Programmers 13; Analysts 5; Operators 5.
Corporate Headquarters.
Order Entry, Billing, Inventory Control, Production Scheduling, Sales Forecasting.
Honeywell 1200 32K, 6 magnetic tapes, paper tape, cards, 2 disc files, tele processing.

FORMICA CORP.
4614 Spring Grove Avenue,
Cincinnati, Ohio 45232
Richard Schneider, Pers. Mgr.
Emp!: Total this location 2,000; Total EDP Employees 41; Programmers 6; Analysts 4; Operators 6.
Decorative surface laminate. Inventory Control, Production Control, Order Entry Customer Billing.
IBM 3/360 Model 30 Computer (65K).

GOODYEAR AEROSPACE CORP.
Div. of Goodyear Tire & Rubber Co.
1210 Massillon Rd., Akron, Ohio 44315
(216) 794-4393
B. A. Watts, Mgr., Salaried Personnel
Emp!: Total this location 6,900; Total EDP Employees 46; Programmers 38; Analysts 3; Operators 25.
Space Systems and Electronics—Communications.

THE EXCEPTIONAL MAN
Wanted—for a challenging career position in industry or research. Background—scientific/business programming, mathematics, math and systems analysis, operations research, EDP management. Engineers, scientists and mathematicians at all levels are required by our clients throughout the United States. Are you The Exceptional Man? May we hear from you? (Please mail resume.)

Charles A. Binswanger ASSOCIATES INC.
EXECUTIVE SEARCH SPECIALISTS
725 J ACKSON TOWERS • (301) 728-5000
BALTIMORE, MARYLAND 21201

FLORIDA AND MARYLAND LOCATIONS

SOFTWARE

• ENGINEERS
• ANALYSTS
• PROGRAMMERS
• MIS
• PROCEDURES
• CONFIGURATION MANAGEMENT

RADIATION INCORPORATED, FLORIDA's largest (over 4,000) and fastest growing (20% this year) electronics company, has multiple software requirements to support ever increasing growth in the information handling systems marketplace.

MELBOURNE, FLORIDA

ENGINEERS—Senior level individuals with a broad communications background and oriented toward conceptual solutions related to data transmission, switching, multiplexing equipment.

PROGRAMMERS—Real time experience in automatic checkout and ground station programming for command and control applications, i.e., satellite ground stations.

ANALYSTS—Strong background in the design and analysis of numerical control systems; knowledge of programming desirable.

ENGINEER/PROGRAMMER—Computer aided design, circuit design and analysis; fault isolation programming.

ROCKVILLE, MARYLAND

ENGINEERS—Experienced in digital and/or computer systems, to perform hardware design analysis, fault isolation analysis, test analysis programming.

CONFIGURATION MANAGEMENT—To develop and maintain complex documentation and logistics control utilizing Univac 1218 for sophisticated avionics test systems.

Other requirements for Management Information Systems, Management Procedures and Scientific Programmers.

To explore opportunities in either location, forward your resume to: Mr. C. A. King

SUBSIDIARY OF HARRIS-INTERTYPE CORPORATION
Melbourne, Florida 32901
An Equal Opportunity Employer
Join the Idea People

Are you a Programmer or Systems Analyst who is not satisfied with common solutions—someone who constantly seeks better ways to improve business operations with systems thinking in the broadest sense?

For those of you who are restless, bored and discouraged working on assignments offering only redundant routine, take heart. We offer idea people a constant supply of fresh challenges to keep your mind alive and active. Here, you'll have the opportunity to discover new approaches and develop new ideas to apply to our constantly changing business.

We provide idea people with a unique atmosphere in which you'll be able to prove and improve your state-of-the-art. You'll be responsible for the planning, designing and implementation of computer systems, from inception through testing and documentation.

If you possess one or more years of IBM 360/30 & 40 experience, are ready to improve your career potential, come and join the idea people. Contact us now, while you're thinking about it. It could be the best idea you've ever had.

Roy C. Anderson, Professional Placement.

the hallicrafters co.
A Subsidiary of Northrop Corporation

Engineering & Administrative Center
600 Hicks Road, Rolling Meadows, Illinois 60008
An Equal Opportunity Employer

what's so good about our "TIME SHARING" SYSTEM?

we'll tell you!

When you're looking for a career challenge, you don't care to be a remote station. You want to come up with the right answer as quickly as the computer does when you feed it a problem. But you also wish to feel there is a human element involved.

That's where we come in. At MANAGEMENT SCIENTISTS we are on line at all times. As consultants to prestige firms here and abroad, we know WHERE the action is—WHERE your career future lies. And after evaluation of your background, we waste no time in directing you to the most rewarding job opportunities.

At present we are recruiting for talented professionals in:

- TIME SHARING/REAL-TIME
- SOFTWARE DEVELOPMENT
- OPERATIONS RESEARCH
- SYSTEMS DESIGN
- BUSINESS/SCIENTIFIC PROGRAMMING

For details, send us your resume, in confidence, including salary history and geographical preference.

Management Scientists, Inc.

101 Park Ave.—Dept. SA 9-68
New York, N. Y. 10017
(212) 532-7710

Exclusively: DATA PROCESSING & MANAGEMENT SCIENCES
Career Planners—Recruitment Specialists
General Offices (corporate headquarters).

THE STANDARD OIL CO. (OHIO)
40 High School Ave., Shelby, Ohio 44875
A Subsidiary of GAF Corporation

SHELBY BUSINESS FORMS, INC.
A Subsidiary of GAF Corporation
40 High School Ave., Shelby, Ohio 44875
(419) 342-3515
Empl: Total this location 750; Total EDP Employees 10; Programmers 2; Analysts 1; Operators 3.
Printed Business Forms.
Inventory, Billing and Payroll.
IBM 1401.

THE STANDARD OIL CO. (OHIO)
1511 Midland Bldg., Cleveland, Ohio 44115
(216) 575-5966
E. G. Glass, Jr., Mgr., Tech. & Prof. Empl.
Empl: Total this location 1,200; Total EDP Employees 250; Programmers 50; Analysts 25; Operators 25.

SHELBY BUSINESS FORMS, INC.
5104 Area A, WPAFB, Ohio 45433
(918) 836-5511
R. E. Whiteway, Director-EDP Administration
Empl: Total this location 350; Total EDP Employees 35; Programmers 10; Analysts 15; Operators 5.

UNIVERSITY OF DAYTON RESEARCH INSTITUTE
300 College Park Ave., Dayton, Ohio 45409
(513) 461-5500 Ext. 475
Empl: Total this location 350; Total EDP Employees 35; Programmers 10; Analysts 15; Operators 5.

U. S. AIR FORCE LOGISTICS COMMAND
Area A, WPAFB, Ohio 45433
(513) 257-1110
Earl Aler
Engineering, Logistics, Procurement, Supply, Production, Personnel, Maintenance and Transportation.

UNIVERSITY OF DAYTON RESEARCH INSTITUTE
300 College Park Ave., Dayton, Ohio 45409
(513) 461-5500 Ext. 475
Empl: Total this location 350; Total EDP Employees 35; Programmers 10; Analysts 15; Operators 5.

Research & Development.
Scientific programming and analysis on a wide variety of engineering problems.
IBM 360/40, IBM 360/20, IBM 360/50, NCR 304, IBM 7044-7094 Direct Coupled System.

OKLAHOMA

AMERICAN AIRLINES, INC.
3800 N. Mingo Road, Tulsa, Okla. 74151
(918) 836-5511
R. E. Whiteway, Director-EDP Administration
Empl: Total this location 5,400; Total EDP Employees 175; Programmers 45; Analysts 13; Operators 30.

CITIES SERVICE OIL COMPANY
P. O. Box 300, Tulsa, Okla. 74102
(918) LUTHER 2-1531
Empl: Total 10,000; Total EDP Employees 160; Programmers 90; Analysts 90; Operators 70.

CITIES SERVICE OIL COMPANY
5104 Area A, WPAFB, Ohio 45433
(918) NA7-1953
Leo A. McIntire, President
Empl: Total this location 15-20; Total EDP

SYSTEMS PROGRAMMERS
An unusually fine opportunity now exists for experienced scientific programmers in our expanding digital computer applications group. The opportunity applies process control techniques to improving transportation industry service.

Responsibilities include creating program logic, debugging scientific programs and coding from logic diagrams. Some travel required.

Candidates should have a minimum of three years programming experience and written programs in assembly language as well as real-time, on-line experience. Knowledge of DDP 1/16 and 5/16 or IBM 1800 desirable.

Salary commensurate with experience. Please send resume or inquiry to:

G. E. Meanor
Department C-9
WABCO

WESTINGHOUSE AIR BRAKE COMPANY
SIGNAL & COMMUNICATIONS DIVISION
Swissvale Post Office, Pittsburgh, Pa. 15228

An equal opportunity employer M/F
**PAN AMERICAN PETROLEUM CORP.**
P. O. Box 591, Tulsa, Okla. 74102
(918) 587-3504
Jerry Wilson, Empl. Coordinator*
Empl: Total this location 2,195; Total EDP Employees 39; Programmers-Analysts 175; Operators 60.
Petroleum Exploration and Production.
Development of largely on-line corporate information system, telecommunications, software development, development of access methods for extremely large data base, operating system modification and maintenance.
IBM 360/65, 360/75, remote IBM 1800's (40.8KB).

**SKELLY OIL CO.**
P. O. Box 1650, Tulsa, Okla. 74102
(918) 326-6600 Ext. 7413
Jim Boswall, Placement Director
Empl: Total this location 800; Total EDP Employees 15-20; Sales 4; Analysts 5; Operators 8.
Computer Services, Scientific and Technical Usage.
CDC 6400.

**PHILLIPS PETROLEUM COMPANY**
Room 104, Frank Phillips Building, Bartlesville, Okla. 74003
(918) 336-6600 Ext. 7413
James P. Jones, Director, Recruitment
Empl: Total this location 5,000; Total EDP Employees 9; Programmers-Analysts 73; Operators 14.
IBM 360/65; 360/75; remote IBM 1800's (40.8KB).

**SUNRAY DX OIL CO.**
P. O. Box 2039, Tulsa, Okla. 74102
(918) 583-4300
W. H. Boggs, Coordinator/Recruiting
Empl: Total this location 1,290; Total EDP Employees 140; Programmers 30; Analysts 9; Operators 11.
Integrated oil company.
Commercial and Engineering Applications related to oil industry.
IBM 360/30, IBM 360/50.

**OREGON**

**JANTZEN, INC.**
P. O. Box 3001, Portland, Ore. 97208
James P. Shea, Dir., Data Processing
Empl: Total EDP Employees 52; Analysts 12, Operators 9.
Sports and Casual Clothing.
Inventory Management, Production Control and Sales Analysis.
IBM 360-40, 360-20, (2314 Files).

**COMTEK, INC.**
4475 S.W. Scholls Ferry Road, Portland, Ore. 97225
(503) 292-9261
Lance W. Clifford, Vice Pres.
Empl: Total this location 10; Total EDP Employees 9; Programmers 5; Analysts 3; Operators 1.
Software Development and Data Processing consulting.
Business systems, Scientific Applications, Control programs, and Control systems.
IBM System/360 Model 40.

---

**PAH WE HAVE A GREAT PROGRAM for PROGRAMMERS**

If you are interested in challenge and reward, you should be interested in the new opportunities available as a result of our major expansion program.

**SENIOR PROGRAMMERS**
3 to 5 years computer program experience required.
Experience on GE415 and Cobol programming language preferred. B.S. in Industrial Management or Business Administration. In addition, we need an intermediate programmer with the same knowledge but less experience.
You will organize and direct programming projects, work directly with Systems personnel. You will participate in analysis, program design, coding and program documentation. You will prepare block diagrams and machine logic flow charts.
You will lead the good life and enjoy an exciting group of company benefits. For a confidential interview please send your resume to Mr. Robert Chesnover at the address below.

---

**PHILCO**

APPLIANCE DIVISION
State Road 21
Connersville, Indiana 47331
An Equal Opportunity Employer

---

**PENNSYLVANIA**

**ALLEGHENY AIRLINES**
Greater Pittsburgh Airport,
Pittsburgh, Pa. 15231
(412) 364-9000
J. C. Yeager, Empl. Mgr.
Empl: Total this location 1,000; Total EDP Employees 35; Programmers 5; Analysts 5; Operators 5.
Commercial Aviation—Business Applications.
Inventory Control, Reliability Engineering, Payroll, PERT, etc.
IBM 360.

**AMP INCORPORATED**
P. O. Box 3608, Harrisburg, Pa. 17105
(717) 564-0101
Frank Williamson, Area Employment Manager
Empl: Total this location 4,200; Total EDP Employees 63; Programmers 12; Analysts 6; Operators 9.
Soldiers wiring devices and other electronic components.
Business Applications, including Scientific In­
ventory Control, Production Scheduling, In­
voicing and Accounts Receivable, Sales Analysis,
Accounting, and Payroll. Also Scientific and Engineering Applications.
IBM 360/30, Univac 1004.

**ATLANTIC SOFTWARE INC.**
Lafayette Bldg., 5th and Chestnut Sts.,
Philadelphia, Pa. 19106
(215) 658-4294
R. W. Thatcher, Jr., V.P.
S/360, H200, Spectra/70.

**COMPUTER IMPLEMENTATION SYSTEMS, INC.**
201 Penn Center Blvd.,
Pittsburgh, Pa. 15235
Dr. Jack Belzer, Chairman of the Board

---

**It's free. The new 1968 Edition.**

Our National Computer Salary Survey and Opportunities Analysis.

This is it. The all-new 1968 edition of Source Edp's FREE 20-page Computer Salary Survey and Opportunities Analysis. It's a summary of computer salaries by 24 separate levels of professional and managerial experience ranging up to $75,000. Plus a comprehensive analysis of current trends in computer employment.

All of this information has been compiled, analyzed and put together by some of the most knowledgeable people in the business. The people of Source Edp. Source Edp is the only placement firm staffed by computer professionals for computer professionals. It's their business to know the data processing field.

To get your free copy of the 1968 Edition of Source Edp's Computer Salary Survey and Opportunities Analysis just circle the reader inquiry card.

To speed delivery write directly to:

---

**source edp**

Where computer professionals place computer professionals

---

**Chicago—David B. Grimes, 100 S. Wacker Drive (312) 782-9857**

**Detroit—Charles S. Walther, 2990 West Grand Blvd. (313) 871-5210**

**Los Angeles—Robert C. Davis, 3470 Wilshire Blvd. (213) 386-5500**

**Minneapolis—Fred L. Anderson, 801 Nicollet Mall (612) 332-8735**

**New York—Edward R. Golden, 3470 Wilshire Blvd. (213) 871-5210**

**San Francisco—Richard 0. Clark, 4475 S.W. Scholls Ferry Road, Portland, Ore. 97225 (503) 292-9261**

**For more information, circle No. 54 on the Reader Service Card**
We are a specialized Personnel Consulting Firm staffed and managed by individuals with proven experience and a thorough knowledge in all areas of data processing. The need for qualified management and support personnel is critical. Our objective is to fill this need. We can succeed only by understanding your individual requirements. We look forward to working with you.

- SYSTEMS/MATH ANALYSTS
- PROGRAMMERS/BUSINESS/SCIENTIFIC
- OPERATIONS RESEARCH
- MIS SPECIALISTS

THERE IS NEVER A CHARGE FOR OUR SERVICES

An Equal Opportunity Employer

DATA MANAGEMENT SERVICES INC.

— COMPUTER DIVISION
1515 Locust St., Philadelphia, Pa. 19102
(215) 546-0901
Jean Bender, Branch Manager* See Ad Page 57

HAMILERMILL PAPER CO.
East Lake Rd., Erie, Pa.
Charles E. Ferguson, Corp. Mgr. Data Processing* Empl: Total this location 2,050; Total EDP Employees 50.

IBM 1400 series, Unicov 490 series.

HONEYWELL, INC.—INDUSTRIAL PRODUCTS DIV.
1100 Virginia Drive, Ft. Washington, Pa. 19034
(215) 643-1300
M. La Sala, Jr., Mgr. manpower Development and Employment Empl: Total this location 3,800; Total EDP Employees 75; Programmers 18; Analysts 10; Operators 12.


INTERPACE CORP.
Div. of Shengano China Products Box 120, New Castle, Pa. 16103
(412) 652-6661
Richard L. Jones, Manager—Systems Empl: Total this location 1,500; Total EDP Employees 15; Programmers 2; Analysts 1; Operators 2.

Dishes.
IMMEDIATE SEATING

- if you're exceptionally knowledgeable in your field
- if you're willing to utilize your full potential
- if you've reached the limits of your present position

We are the leading Personnel and Management Consultant Organization concerned with EXCLUSIVE placement of Data Processing Personnel. Our extensive search facilities and specific recruiting place us in a unique position to fulfill the requirements of employers of Data Processors. Your application is processed by E.D.P. Specialists who know the industry, its needs and WHERE THE OPPORTUNITIES EXIST. All fees are paid by the hiring company; there is no charge to the individual. Please contact Mr. Henry J. Lloyd, President.

EMPLOYMENT FOR DATA PROCESSORS

140 Barclay Center, Cherry Hill, New Jersey 08034
(609) 428-7738

IMMEDIATE SEATING

- if you’re exceptionally knowledgeable in your field
- if you’re willing to utilize your full potential
- if you’ve reached the limits of your present position

We are the leading Personnel and Management Consultant Organization concerned with EXCLUSIVE placement of Data Processing Personnel. Our extensive search facilities and specific recruiting place us in a unique position to fulfill the requirements of employers of Data Processors. Your application is processed by E.D.P. Specialists who know the industry, its needs and WHERE THE OPPORTUNITIES EXIST. All fees are paid by the hiring company; there is no charge to the individual. Please contact Mr. Henry J. Lloyd, President.

EMPLOYMENT FOR DATA PROCESSORS

140 Barclay Center, Cherry Hill, New Jersey 08034
(609) 428-7738
including the latest solid state computer techniques.

Process Control.
Honeywell 116 and 516, IBM 1800.

See Ad Page 57

RHODE ISLAND

LEESONA CORPORATION
Warwick, R. I. 02887
(401) 739-7100
W. L. McGarry, Jr., Mgr., Professional Placement
Empl: Total this location 2,263; Total EDP Employees 43; Programmers 8; Analysts 3; Operators 9.
Manufacture textile machinery.
Manufacturing, Financial and related applications.
IBM 360/40 disk/tape system.

SOUTH CAROLINA

CRYOVAC DIV. W. R. GRACE & CO.
P. O. Box 464, Duncan, S. C. 29334
(803) 439-4121
James H. Scruggs, Mgr., Recruiting, Benefits & Salary Adm.
Empl: Total this location 450; Total EDP Employees 28; Programmers 5; Analysts 6; Operators 3.
Headquarters, Research and Development, Engineering.
Accounting, Order and Billing, Sales Analysis, Personnel, Payroll, Engineering.
RCA Spectra 70/45.

TENNESSEE

CONSOLIDATED ALUMINUM CORP.
1100 Richmond St., Jackson, Tenn. 38301
(901) 424-2000
Empl: Total this location 600; Total EDP Employees 9; Programmers 2; Analysts 1; Operators 3.
Aluminum—which is used in building materials, transportation industry, packaging and labelling.
General accounting functions; cost, budget, and sales analysis; payroll, etc.
IBM 360/20.

TEXAS

ARMY & AIR FORCE EXCHANGE SERVICE
3911 Walton Walker Blvd. at Ledbetter,
Dallas, Tex. 75222
(214) 330-2276
Malcolm W. Carter, Executive Recruitment Specialist
Empl: Total this location 2,000; Total EDP Employees 250; Programmers 40; Analysts 60; Operators 20.
Headquarters for worldwide retail, food and services organization, providing general direction and central management to 15 Sub-HQ using 12 or more EDP specialists, and numerous overseas operations.
Accounting Procedures, Management Information Systems, Inventory Control, Retail Merchandising Concepts, other management adaptations.
IBM 360 MOD 20/30/40—Disk/Tape/Card Systems using ALC or COBOL.

See Ad Page 66

COLLINS RADIO COMPANY
Dallas, Tex. 75280
(214) ADS-9511
Don C. Peden, Mgr., Professional Employment

SEPTEMBER, 1968

PROGRAM YOUR CAREER FOR SUCCESS
EXPLORE NATIONWIDE EMPLOYMENT OPPORTUNITIES THRU ONE CONTACT

PROGRAMMERS  D P MANAGERS  ANALYSTS

STARTING SALARIES $8,000 TO $20,000 (ALL FEE PAID)
SEND YOUR FLOW CHART (RESUME) OR CALL (212) MU 3-6000

ROBERT BOOK, EDP/SYSTEMS MGR
KNorr ASSOCIATES INC
52 VANDERBILT AVE NEW YORK CITY 10017
THE PROFESSIONAL AGENCY SERVING THE EDP COMMUNITY

EDP-SYSTEMS
WE SPECIALIZE IN CAREER CORRECTION
ARE YOU "UNDERED"?
UNDER . . . PAID or UNDER THE WRONG BOSS . . . UNDER THE WRONG CLIMATE or UNDER PROMOTED
UNDER UTILIZED or UNDER THE WRONG HOURS . . . UNDER THE WRONG POLICIES . . . or just "UNDERED"?
FOR "OVERING" . . . CALL WA 3-2640

LAWRENCE PERSONNEL
1015 Chestnut, Philadelphia, Pennsylvania 19107
FEE PAID BY CLIENT COMPANIES • NO CONTRACTS • ALWAYS CONFIDENTIAL

NAVCOSSACT

Operating directly under the Chief of Naval Operations (and in support of the Secretary of Defense, Secretary of the Navy, Joint Chiefs of Staff, and other major commands), NAVCOSSACT—the Naval Command Systems Support Activity—has one of the most important and far-ranging missions ever assigned to any technological organization: To design, develop and implement data processing systems for the Navy's worldwide, multi-computer command and control network.

With several major systems centers operating in Hawaii, Norfolk and Washington, D.C., NAVCOSSACT applies systems analysis and advanced Automatic Data Processing (ADP) technology to the solution of complex command and management information problems.

NAVCOSSACT
Naval Command Systems Support Activity,
Washington Navy Yard,
Washington, D. C. 20390.

U. S. Citizenship Required
Empl: Total this location 8,088; Total EDP Employees 103; Programmers 65; Analysts 10; Operators 28.

Computer peripheral equipment, i.e., disc, tape, printers, readers, CRT's—Non-computer products include Commercial Broadcast, Microwave, Avionics, etc.

Systems, software and scientific.

Collins C-8500 Computer Group (Collins 3rd Generation).

COMPUTER AID COMPANIES INC.
2310 Fidelity Union Tower, Dallas, Texas 75201

(214) R18-1913

Lacy W. Goostree, Jr., Vice Pres.

Empl: Total this location 18; Programmers 3; Analysts 10.

Social, Business and Government Problems solved by operations research, statistical analysis, advanced planning simulation, modeling, etc.

Social, Business and Government Problems solved by operations research, statistical analysis, advanced planning simulation, modeling, etc.

COMPUTER USAGE DEVELOPMENT CORP.
Subsidiary of Computer Usage Company, Inc.
2020 Southwest Freeway, Houston, Texas 77006

(713) 526-3523

E. O. Savorin, Mgrs.*

Empl: Total this location 35; Total EDP Employees 30; Programmers 12; Analysts 18.

Software Consulting Company.

Commercial, Scientific and Systems Software.

COM-SHARE SOUTHERN INC.
Suite 150, 6400 Southwest Freeway, Houston, Texas 77036

(713) 785-3100

Empl: Total this location 67; Total EDP Employees 21; Programmers 5; Analysts 10; Operators 6.

Time-sharing.

Time-sharing.

Two—SDS490.

DRESSER SYSTEMS, INC.
Div. of DresserIndustries
P. O. Box 2928, Houston, Texas 77001

SU-1-1911

Jon McDermitt, Industrial Relations

Empl: Total this location 500; Total EDP Employees 30; Programmers 15; Analysts 10; Operators 5.

Digital Electronic Systems.


360/40, 1130, IBM 1800, H21, Sigma 5, and Dresser DEC-8000.

HOUSTON INSTRUMENT
Div. of Bausch and Lomb Inc.
4950 Terminal Ave., Bellaire, Texas 77401

(713) 667-7403

L. C. Bower, Head, Computer Graphics

Empl: Total this location 90; Total EDP Employees 5; Programmers 2.

Digital Plotting Systems for both on-line and off-line.

Time shared SDS 940.

LINK GROUP—GENERAL PRECISION SYSTEMS INC.
1740 A NASA Blvd., Houston, Texas 77058

(713) 488-3920

M. Wittwer Baynes, Pers. Specialist*

Empl: Total this location 450; Total EDP Employees 30; Programmers 27; Analysts 10; Operators 5.

Flight Simulation.

Real time scientific programming and engineering applications of spacecraft systems for the Command Module Simulator and the Lunar Module Simulator.

LTV AEROSPACE CORPORATION
Div. of Ling-Temco-Vought, Inc.
P. O. Box 5907, Dallas, Texas 75222

(214) AN2-3211 Ext. 3865

T. E. Wright, Prof. Placement Admin.*

Empl: Total this location 21,000; Total EDP Employees 525.


Scientific and Business, Simulations.

IBM 360 series; CDC 3000 series and others.

LTV ELECTROSYSTEMS, INC.
Subsidiary of Ling-Temco-Vought, Inc.
P. O. Box 6118, Dallas, Texas 75222

(214) BR6-7111

B. G. Hickey, Supvr.-Prof. Placement

Empl: Total all locations 12,000; Total EDP Employees 225; Programmers 110; Analysts 80; Operators 35.

Design and Development of Airborne Command and Control Systems.

Real-Time Engineering and Business Applications.

IBM 360/40/50; ambilog 200.

PHILCO-FORD CORP.
Div. of WDL-Houston Operations
1002 Gemini Ave., Houston, Texas 77058

(713) 488-1270

James F. Skarda, Employment

Empl: Total this location 1,300; Total EDP Employees 120.

Design, development, maintenance and operation of supervisory control centers.

Information processing and Real Time Programming for command and control.

People who will take advantage of the advancement opportunities offered at Blue Cross.

2 years' minimum experience required for systems analyst positions. COBOL or H-2200 experience required for programmer and senior programmer positions.

BLUE CROSS
4777 Sunset Blvd.
Los Angeles, California

An equal opportunity employer
WASHINGTON

THE BOEING CO.—COMMERCIAL AIRPLANE DIV.  
P. O. Box 707—888W, Renton, Wash. 98055  
William Denman, Prof. Emp. Staff  
Applied research, design, development, manu­facture, test and customer service of commer­cial jet aircraft. Research and development, advanced manned aircraft systems.  
Application of scientific and commercial com­puter techniques to design, development, test, manufacture and marketing of all Boeing jet­liners. Includes matrix methods of structural analysis, master dimensioning, mission profile programming, digital simulation, long-range price and cost forecasting. Application to ad­vanced communications and decisional net­works of computer graphics, remote input-output, time-sharing, economical mass storage and increased processing speeds.  
Analog computers, hybrid computer, advanced "real-world" pictorial displays, IBM-7094, 360 and CDC-6600.

TALLY CORP.  
1310 Mercer St., Seattle, Wash. 98109  
(206) 624-0760  
Thomas N. Wells, Dir., Systems & Planning  
Empi: Total this location 5,000; Total EDP Em­ployees 200; Programmers 4; Analysts 4; Operators 6.  
Perforated and magnetic tape equipment and data communication systems.  
Manufacturing Operating and Financial Sys­tems.  
IBM System 360 Model 20 Disk-Tape.

WYERBAUSER CO.  
Tacoma, Wash. 98401  
(206) FJU-3361  
Personnel Dept.  
Empi: Total this location 5,000; Total EDP Em­ployees 500; Programmers 200; Analysts 100; Operators 200.  
Wood products.  
Management Information Systems, Tele­Com­munications and Operations Research.  

WISCONSIN

A. C. ELECTRONICS  
Div. of GMC  
7929 S. Howell Ave., Milwaukee, Wis. 53201  
(414) 762-7000  
R. W. Schroeder, Professional Employment  
Empi: Total this location 5,500; Total EDP Em­ployees 200.  
Scientific applications include missile trajec­tory simulations, flight test data reduction, graph­ical techniques, design automation, proc­ess control, and programmed automatic check­out systems for airborne computer software.  
IBM 360/65/40/20, EAI 8800 and 2318 analog, Sigma 5 and 7 and hybrid interface unit.

BADGER METER MFG.—SYSTEMS DIVISION  
4545 W. Brown Deer Rd.,  
Milwaukee, Wis. 53223  
(414) 355-0400  
James L. Dawns, Mgr., Data Communications  
Empi: Total this location 750; Total EDP Em­ployees 35; Programmers 11; Analysts 6; Op­erators 4.  
Control Systems, Data Communications Sys­tems.  
Special Systems Software for above applica­tions.  
PDP-8, PDP-9, PDP-10.

Bruce Publishing Co.  
400 N. Broadway, Milwaukee, Wis. 53201  
(414) 271-9700  
Frank M. Bruce, Exec. V.P.  
Empi: Total this location 200; Total EDP Em­ployees, var. (new line).  
Books, periodicals, audiovisuals.  
Circulation, promotion, sales lists; accounting.  
IBM (but presently acquiring new equipment).

Centralab—Globe-Union Inc.  
5757 N. Green Bay Ave.,  
Milwaukee, Wis. 53201  
(414) 228-1200  
Jack Abell, Prof. Placement Co-ord.  
Empi: Total this location 2,173; Total EDP Em­ployees 52; Programmers 5; Analysts 10; Op­erators 37.  
Electronic components.  
H-2200 and H-200.

Harley-Davidson Motor Co.  
P. O. Box 653, Milwaukee, Wis. 53201  
(414) 342-4680  
John R. Joerg, Personnel Supvr.  
Empi: Total this location 1,736; Total EDP Em­ployees 13; Programmers 5; Analysts 2; Op­erators 11.  
Motorcycles, golf cars, commercial vehicles and Parts and Accessories.  
Production Control, Payroll and Accounting, Sales Order Writing, Parts & Accessories Sales Order Writing, and a Data Collection System.  
IBM—System 360—30 disk drive.

Johnson Service Co.  
518 N. Jefferson St., Milwaukee, Wis. 53201  
(414) 276-9200  
James J. Robersen, Empl. Supvr.  
Empi: Total this location 1,500; Total EDP Em­ployees 40; Analysts 11; Operators 23.  
Manufacture, design and install service tem­perature control systems.  
Production control, inventory control, cost ac­counting, budgets, accounts receivable, pay­rolls, product forecasting, sales reporting.  
Also, various teleprocessing applications.  
Burroughs B-3500, Univac SS-90, Univac 1004.

Perfax Corp.—Engineering Computer Div.  
Engineering Computer Div.  
500 W. Oklahoma Ave.,  
Milwaukee, Wis. 53207  
(414) 744-1000  
Empi: Total this location 1,550; Total EDP Em­ployees 20; Programmers 4; Operators 4.  
Heat exchangers.  
Heat exchanger design by computer.  
B-5500 time sharing.

Webcrafters, Inc.  
P. O. Box 1148, Madison, Wis. 53701  
Arnold Caucutt, Pers. Mgr.  
Empi: Total this location 150; Total EDP Em­ployees 20; Programmers 2; Analysts 1; Oper­ators 5.  
Printing.  
Accounting, billing, sales analysis.  
IBM 360/20.

Western Plastics  
Div. of Western Coil & Electrical Co.  
215 State St., Rocine, Wis. 53403  
(414) 632-4741  
W. Turner Lewis, Pres.  
Empi: Total this location 15.  
Plastic injection moulding, tools, dies, molds, packaging, packing, shipping.  
Light assembling and toys, games, novelties, etc.

Software Age
INDEX
of
EMPLOYMENT
and
SEARCH AGENCIES

The following companies work with leading employers throughout the nation. Most of them work with all disciplines and specialties. Your resume is welcomed for immediate placement consideration. (All work with Equal Opportunity Employers.)

CALIFORNIA

COMPUTER PERSONNEL AGENCY, INC.
12 Geary St., San Francisco, Calif. 94108
(415) 982-0840
Donald L. Bartlett, President
See Ad Page 64

ELECTRONIC SYSTEMS PERSONNEL AGENCY
3700 Wilshire Blvd., Los Angeles, Calif. 90017
(213) 386-3205
See Ad Page 53

SOURCE EDP
Suite 1102, 3470 Wilshire Boulevard,
Los Angeles, Calif. 90005
(213) 386-3500
Robert Davis
See Ad Page 58

SOURCE EDP
Suite 1300, 111 Pine Street,
San Francisco, Calif. 94111
(415) 434-2410
Mike Parr
See Ad Page 50

CONNECTICUT

DATA MANAGEMENT SERVICES INC.
—CAREER DEVELOPMENT DIVISION
31 Lewis St., Hartford, Conn. 06103
(203) 246-7481
Steven Weber, Branch Mgr.
Employment placement service.
See Ad Page 57

ROBERT HALF PERSONNEL AGENCIES
One Atlantic St., Stamford, Conn. 06901
(203) 325-4158
Dan Krane
See Ad Page 50

DISTRICT OF COLUMBIA

COMPUTER PROFESSIONS, INC.
1025 Connecticut Ave. N.W.,
Washington, D. C. 20036
(202) 296-0340
See Ad Page 17

EDP SEARCH
Division of Professional Career Centers, Inc.
4641 Montgomery Avenue,
Washington, D. C. 20014
(301) 657-2760
See Ad Page 35

EDP ASSOCIATES, INC.
Suite 802, 2000 L St. N.W.,
Washington, D. C. 20038

FLORIDA

AEROSPACE & OCEANOGRAPHY PERSONNEL PLACEMENT
P. O. Box 398,
Melbourne Beach, Fla. 32951
(305) 723-6144
Chester J. Kulik, Pres.
See Ad Page 62

ILLINOIS

OAK BROOK EMPLOYMENT BUREAU, INC.
1200 Harger Road, Oak Brook, Ill. 60521
John R. Ford, President

SOURCE EDP
Suite 212, 100 South Wacker Drive,
Chicago, Ill. 60606
(312) 782-0857
David N. Grimes, V. P.
See Ad Page 58

MARYLAND

CHARLES A. BINSWANGER ASSOCIATES, INC.
725 Jackson Towers, Baltimore, Md. 21201
(301) 728-5000
Gene H. Novak, Pres.
See Ad Page 55

COMPUTER CAREERS INC.
4720 Montgomery Lane, Suite 503,
Bethesda, Md. 20014
(301) 654-9225
Edward W. Maclaren, Jr., Pres.
See Ad Page 59

EDP SEARCH
Division of Professional Career Centers, Inc.
4641 Montgomery Avenue,
Bethesda, Maryland 20014
(301) 657-2760
See Ad Page 35

 MASSACHUSETTS

DATAMAN ASSOCIATES
1330 Beacon St., Boston, Mass. 02146
(617) 232-2253
Phocion Lellos, Director
See Ad Page 60

SEPTEMBER, 1968
Immediate opportunities in our expanding Systems Division for qualified programmers!

We need progressive professionals who know the hardware and the software it takes to get the right data fast in retailing. We'd like you to have a minimum of three years' experience in programming, preferably using ALC or COBOL on 360 MOD 20/30/40 Disk/Tape/Card systems, plus some supervisory experience in handling and EDP task force in problem-solving.

Our operations are worldwide—with EDP centers in many countries furnishing timely, accurate management information, including Accounting, Inventory Control, and Operating Reports.

Starting salary $9,200, with outstanding fringe benefits, including life and hospitalization, liberal vacations, retirement program, sick leave, plus opportunity for growth and advancement in EDP operations throughout our worldwide retailing systems.

For fast, confidential action to set up an interview, send your complete resume, including Salaries Earned, to:

Mr. Malcolm W. Carter
Personnel Division
ARMY & AIR FORCE EXCHANGE SERVICE
Dallas, Texas 75222
Equal Opportunity Employer

MANAGEMENT INFORMATION SERVICES MIS INC.
MIS INC.
173 Newbury St., Boston, Mass. 02116
(617) 262-1900
See Ad Page 59

MICHIGAN

ELECTRONIC SYSTEMS PERSONNEL AGENCY
1601 Fisher Bldg., Detroit, Mich.
(313) 872-7855
See Ad Page 53

SOURCE EDP
Suite 406, 2990 West Grand Boulevard,
Detroit, Mich. 48202
(313) 871-5210
Charles Waller*
The Source EDP computer salary survey and opportunities analysis.
See Ad Page 58

MINNESOTA

SOURCE EDP
Suite 1424, 801 Nicollet Mall,
Minneapolis, Minn. 55402
(612) 333-8735
Fred Anderson*
See Ad Page 58

NEW JERSEY

EMPLOYMENT FOR DATA PROCESSORS
140 Barclay Center, Cherry Hill, N. J. 08034
(609) 428-7258
Henry J. Lloyd, Pres.*
Emp. Total this location 4; Total EDP Employees 3.
See Ad Page 60

RSPV SERVICES
One Cherry Hill Mall, Cherry Hill, N. J. 08034
(609) 667-4488
Howard Levin, Director
See Ad Page 59

TEK-NEIL PROFESSIONAL PLACEMENT
500 Kings Highway North,
Cherry Hill, N. J. 08034
(609) 667-5333
Joseph L. Sarofim, Manager
See Ad Page 52

NEW YORK

KNORR ASSOCIATES, INC.
52 Vanderbilt Ave., New York, N. Y. 10017
(212) MU-3-6000
Robert A. Book, Dir., EDP Systems Div.
See Ad Page 61

MANAGEMENT GROUP
295 Madison Avenue, Room 503,
New York, N. Y. 10017
MU 5-4500
Bridgford Hunt, Owner

MANAGEMENT SCIENCES, INC.
101 Park Ave., New York, N. Y. 10017
(212) 532-7710
Gordon F. Jones, Pres.*
See Ad Page 56

UCI CONSULTANTS UNITED
COMPUTER INDUSTRIES, INC.
1180 Avenue of the Americas, Suite 2001
New York, N. Y. 10036
(212) 581-1200
Director, Personnel Services*
See Ad Page 66

SOURCE EDP
Suite 970, 1414 Avenue of the Americas,
New York, N. Y. 10019
(212) 752-8260
Edward H. Golden*
See Ad Page 58

PENNSYLVANIA

ALTOONA PERSONNEL AGENCY
102 Strand Plaza, 1109 15th St.,
Altoona, Pa. 16601
(814) 944-3371
Miss M. C. Miller, Director
Personnel service.
See Ad Page 50

CALLAHAN CENTER FOR COMPUTER PERSONNEL
Suite 414 Boulevard Bldg., 1819 John F.
Kennedy Boulevard, Philadelphia, Pa. 19103
(215) 567-4811
John P. Callahan, Pres.*
See Ad Page 59

ELECTRONIC SYSTEMS PERSONNEL AGENCY
2204 Lawyers Bldg., Pittsburgh, Pa.
(412) 391-6450
See Ad Page 53

FOX-MORRIS ASSOCIATES
1500 Chestnut St., Philadelphia, Pa. 19102
(215) LO 3-7992
Walter B. McNichols, Mgr. Data Processing Div.*
See Ad Page 54

LA SALLE ASSOCIATES
2136 Locust St., Philadelphia, Pa. 19103
(215) 567-7996
Frank Daniele
See Ad Page 63

LAWRENCE PERSONNEL
1015 Chestnut St., Philadelphia, Pa. 19107
(215) WA-3-2640
T. O. Falcone, Mgr. EDP Recruitment
See Ad Page 61

CONTINENTAL CONSULTANTS, INC.
1316 Main St., Columbus, S. C. 29202
(803) 253-6475
J. S. Rinehart, Pres.
See Ad Page 34

TEXAS

SHAW & ASSOCIATES
CERTIFIED EMPLOYMENT CONSULTANTS
815 Fisk Building, Amarillo, Texas 79101
(806) 376-5511

SYSTEMATION CONSULTANTS, INC.
1616 W. Loop South, Houston, Texas 77027
(713) NA-2-1370
J. L. Gresham

VANCE EMPLOYMENT SERVICE
217 Barfield Bldg., Amarillo, Texas 79101
(806) 372-3456
Berlin Vance, Recruitment Director
See Ad Page 63

VIRGINIA

SHERIDAN ASSOCIATES INC.
1901 N. Fort Myer Drive, Suite 1010,
Arlington, Va. 22209
(703) 524-7660
Martin E. Sheridan, Pres.
See Ad Page 54

TAURUS ASSOCIATES
Allan S. Lindes
110 N. Royal St., Alexandria, Va. 22314
(703) 548-2103
See Ad Page 52

WASHINGTON

ELECTRONIC SYSTEMS PERSONNEL AGENCY
400 108th St. N.E., Seattle, Wash.
(206) 425-1555
See Ad Page 53
Univac is looking for programmers and systems analysts. But not just any kind of programmer or systems analyst. We're looking for men who understand why sometimes you must fail before you can succeed. Men who understand that programming is an art, not a science. Men who can think beyond today. And maybe even beyond tomorrow. In short, men with that important extra ingredient: imagination.

If you're that kind of man, we'll give you, in return, all the work you could want. And all the challenge you can handle. Plus our important extra ingredient: unlimited opportunity.

Think it over. Think whether your current employer really cares about imagination. Then think Univac, where we speak imagination as fluently as FORTRAN.

For more details, write Federal Systems Division, International Division or Data Processing Division ...

An Equal Opportunity Employer M/F

Sophisticated defense and aerospace assignments

Mr. R. K. Patterson
Univac Employment Manager
Federal Systems Division
2750 West 7th Blvd
St. Paul, Minnesota 55116

Design large-scale commercial systems, hardware and software

Mr. J. D. Hallenberg
Univac Employment Manager
Data Processing Division
2276 Highcrest Drive
Roseville, Minnesota 55113

Advanced programming and systems analysis at world headquarters

Mr. L. G. Holliday
Univac Employment Manager
Data Processing Division
P. O. Box 8100
Philadelphia, Pennsylvania 19101

European assignments in airlines and hospitals
(Real-time experience required)

Mr. D. W. Uppman
Univac International Division
P. O. Box 8100
Philadelphia, Pennsylvania 19101

Advanced anti-submarine warfare and Navy systems

Mr. W. W. Cohen
Univac Employment Supervisor
P. O. Box 6248
San Diego, California 92106
Variety is the name of the game at RCA Service Company

Take a look at our wide choice of locations. Areas such as the Bahama Islands; Cape Kennedy, Florida; West Palm Beach, Florida; Patrick Air Force Base, Florida; Goddard Space Flight Center, Maryland; Cherry Hill, New Jersey.

Then consider the projects we're involved in—satellite tracking, orbital analysis, underwater exploration, weapons systems development, signature analysis, data reduction, business applications.

If this is the kind of variety you're looking for, RCA Service Company is looking for you.

Openings require that you have experience in any of the following areas:

**Scientific Programming**—COBOL, FORTRAN or other machine language on third generation systems. Real time or software development.

**Data Analysis**—Solution of data reduction problems, software development, preparation of test reports.

**Systems Analysis**—Telemetry, digital, data transmission, range instrumentation, weapons systems analysis.

**Mathematics**—Data reduction, real time reduction, orbital analysis, development of mathematical models, special experiments.

**Commercial Programming** (Cherry Hill, N.J.)—two years' experience in COBOL on third generation equipment for offline systems. Online inquiry systems require heavy communication systems programming experience, preferably on third generation equipment.

Write or send your resume to Mr. H. D. Storz, National Employment Manager, Dept. S-24, RCA Service Company, 201-1, Cherry Hill, New Jersey 08101. We are an equal opportunity employer.
CONFIDENTIAL INQUIRY
Your original copy of this form will be retained at the offices of SOFTWARE AGE and will be used for no other purpose than to notify the specific firms which you have checked (on the reverse side) of your interest.

TYPE OR PRINT CLEARLY FOR PHOTO REPRODUCTION

JOB DESIRED: ________________________________

List computer hardware knowledge (names of systems, tape, disk, terminals, etc.): __________________________________________________________

Programming specialties and years of experience (commercial, scientific, theoretical, experimental, analog, etc.): ________________________________________________________________

Systems programming on which you have had development experience (compilers, assemblers, executives, monitors, O.S., etc. Indicate for what computer): ________________________________________________________________

Programming languages used and extent of experience (COBOL, FORTRAN, etc.): ________________________________________________________________

Applications programmed (aerospace, banking, insurance, math subroutines, compilers, etc.): ________________________________________________________________

Systems analysis experience (card design, flow charting, operation analysis, etc.): ________________________________________________________________

EDP management experience (include years and number of people reporting to you): ________________________________________________________________

SALARY: ______ (current) ______ (desired) DATE OF AVAILABILITY: ______

EDUCATION: Indicate major as well as degree unless self-explanatory.

Degrees: ________________________________

Years: ________________________________

Schools: ________________________________

EMPLOYMENT: Indicate present employment and previous jobs below.

Employer: ________________________________

City: ________________________________

Years: ________________________________ to ________________________________

Title or Function: ________________________________

Name: ________________________________ Age: ________________________________

Home Address: ________________________________ Home Phone: ________________________________

(city) (state) (ZIP code) U.S. Citizen: ________________________________

Security Clearance: ________________________________ Location Preference: ________________________________

Marital Status: ________________________________

Military Status: ________________________________

BE SURE YOU HAVE CHECKED ON REVERSE SIDE THE COMPANIES YOU WANT TO SEE THIS INQUIRY. PUT FORM IN STAMPED ENVELOPE AND MAIL TO:

SOFTWARE AGE

SEPTEMBER, 1968

1020 CHURCH ST., EVANSTON, ILL. 60201
check your interests here

Fill in the confidential inquiry form on the other side of this sheet. This form provides all the information advertisers require to screen applicants. If further information is desired, you will hear from the advertiser direct. Then, check below the boxes of those companies to which you want copies of your form sent. Mail to SOFTWARE AGE, 1020 Church Street, Evanston, Illinois 60201. (Please do not send us your own resume. We will only process this form. A new form must be filled out for each issue in which you are answering ads.)

□ 1. Army & Air Force Exchange Service
   Page 66
□ 2. Blue Cross of Southern California
   Page 62
□ 3. Burroughs Corp.
   Page 46
   Page 53
□ 5. Francis I. du Pont & Co.
   Page 48
□ 6. Factsystem Inc.
   Page 29
□ 7. Foxboro Co.
   Page 65
   Page 7
   Page 2nd Cover
   Page 31
□ 11. Hallicrafters Co.
   Page 56
   Page 4
□ 13. IBM Corp.
   Page 25
   Page 54
□ 15. ITT Data Services
   Page 39
□ 16. ITT Federal Electric Corp.
   Page 43
□ 17. Jet Propulsion Lab.
   Page 27
□ 18. Montgomery Ward Data Center
   Page 45
   Page 71
   Page 58
□ 21. Pratt & Whitney Aircraft
   Page 44
□ 22. Radiation Inc.
   Page 55
□ 23. RCA, Information Systems Div.
   Page 11
□ 24. RCA, Service Co.
   Page 68
   Page 64
□ 26. Sikorsky Aircraft Co.
   Page 19
□ 27. Stanford Linear Accelerator Center
   Page 41
□ 28. U. S. Dept. of the Navy, NAVOCOSSACT
   Page 61
  Univac
□ 29. Data Processing Div., Philadelphia
   Page 67
   Page 67
   Page 67
□ 32. Vitro Lab.
   Page 49
□ 33. WABCO Westinghouse Air Brake Co.
   Page 57
□ 34. Western Electric Co.
   Page 51
□ 35. Xerox Corp.
   Page 5

EMPLOYMENT AND SEARCH AGENCIES
□ 36. Altoona Personnel Agency
   Page 50
   Page 55

□ I do not now receive S/A. Please enter my FREE subscription.

Name
Street
City State Zip

Prime Experience in What Industry
My Specialty
□ Technical Degree □ Non-Technical Degree □ No Degree
□ I Have Analog/Hybrid Experience

Year Born

PRODUCTS AND SERVICES
(Use Reader Service Card)

CC Systems, Inc. ........................................ 50
Computer Aided Design ................................ 14
Glenn Engineering Services, Inc. .................... 24
Graphic Systems .......................................... 26
Magnetic Aids, Inc. ..................................... 18
National Cash Register Co. .......................... 3
Tape-Stor Div. International Computer Appliances 20
Wilson Jones Co. ........................................ 4th Cover

software age
1020 Church Street
Evanston, Illinois 60201

SEPTEMBER, 1968
70