The Computer Girls

BY LOIS MANDEL

A trainee gets $8,000 a year ...a girl "senior systems analyst" gets $20,000—and up! Maybe it's time to investigate....

Ann Richardson, IBM systems engineer, designs a bridge via computer. Above (left) she checks her facts with fellow systems engineer, Marvin V. Fuchs. Right, she feeds facts into the computer. Below, Ann demonstrates on a viewing screen how her facts designed the bridge, and makes changes with a "light pen."

Twenty years ago, a girl could be a secretary, a school teacher . . . maybe a librarian, a social worker or a nurse. If she was really ambitious, she could go into the professions and compete with men . . . usually working harder and longer to earn less pay for the same job.

Now have come the big, dazzling computers—and a whole new kind of work for women: programming. Telling the miracle machines what to do and how to do it. Anything from predicting the weather to sending out billing notices from the local department store.

And if it doesn't sound like woman's work—well, it just is.

("I had this idea I'd be standing at a big machine and pressing buttons all day long," says a girl who programs for a Los Angeles bank. I couldn't have been further off the track. I figure out how the computer can solve a problem, and then instruct the machine to do it."

"It's just like planning a dinner," explains Dr. Grace Hopper, now a staff scientist in systems programming for Univac. (She helped develop the first electronic digital computer, the Eniac, in 1946.) "You have to plan ahead and schedule everything so it's ready when you need it. Programming requires patience and the ability to handle detail. Women are 'naturals' at computer programming."

What she's talking about is *aptitude*—the one most important quality a girl needs to become a programmer. She also needs a keen, logical mind. And if that zeroes out the old Billie Burke-Gracie Allen image of femininity, it's about time, because this is the age of the Computer Girls. There are twenty thousand of them in the United *(cont. on page 54)*

Photos by Henry Grossman. Dress by Gino Charles.

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States already, and the computer industry is growing fast, there'll soon be another twenty thousand. (But don't get the idea that programming is an all-female field. For every computer girl, there are eight computer men.)

Every company that makes or uses computers hires women to program them. If a girl is qualified, she's got the job. There's no sex discrimination in hiring. The girl with a college degree in math, physics or engineering can start off her computing career—as a trainee—at eight thousand dollars a year. Depending on her ability and ambition, she can work her way up the "computer ladder" to be a senior systems analyst at twenty thousand dollars a year or more. (Just look at the Sunday want ads for an idea of the pay scale.) But the field isn't closed to the girl with a general education—or to the girl with no college training.

Women are found at all levels of work involving computers—from key punching the machine cards to systems analysis (a highly skilled job that requires full knowledge of how computers can solve any given problem).

Most computer girls "program." They design the solutions to specific problems and write the step-by-step instructions that tell the computers what to do.

Let's meet a few.

Sally Brown, for one, is a redhead from South Bend, Indiana, who was a stenographer for a Chicago insurance company. When the insurance company put its data on computers, Sally was trained by the computer company to write her own programs. Now she's earning twice as much as she did as a stenographer. (Her present salary is eighty-six hundred dollars a year)—and she loves the work—"even if I sometimes have to wait until 2 A.M. for a machine to be free so I can test out a program." But working late has its compensations. There's sometimes a nice male programmer around to take a girl home. . . .

Diane Johnson, twenty-three, could easily be a high-fashion model. She was a math major at Vassar, and is now a "systems engineer" for one of the big computer manufacturers (a company that hires most of its girls through college recruitment). Her job is to help "customers" (the people who use *her* company's machines) solve their data-processing problems. (Specialists in this field work with publishing companies, department stores, utility companies, etc.) She designs programs for her financial customers, supervises the installation of new equipment, and confers with the customer's management people. Diane, too, works long hours, meeting deadlines and debugging errors. "Sometimes I could collapse . . . you can't always anticipate the delays," she says. "But I'm satisfied. I knew what I was getting into when I took the job."

Emily Blake went to an employment agency and stated simply that she wanted an interesting job that paid one hundred and twenty-five dollars a week. Instead of laughing, the interviewer suggested programming. She now works for a small company, helping customers in many different *types* of businesses. "I like the variety," says Emily. She'd rather be what her company calls a "customer service representative" than a straight programmer because "I don't like being kept at a desk."

After earning a master's degree at Harvard in astrophysics, Helene Carlson suddenly found that there wasn't much a woman could do in astronomy. Helene got a job with a computer consulting firm (a company that programs and designs computer systems for other companies on an "as-needed" basis). After two years, she moved on to a computer research laboratory, working out new programming systems. "I'm fully accepted as a professional, and this is much better than looking at stars, anyway," she says.

The stories could go on all day—each one a little different. The computer girls have a thousand different jobs, and come from as many different backgrounds.

They may work for a computer manufacturer (IBM, GE, Univac, Control Data, RCA, Honeywell, NCR, etc.), a university doing computer research, a service bureau that rents out computers by the hour to smaller businesses, the Government (which uses about 40 percent of the twenty-five thousand computers in the United States) . . . or any company, large or small, that solves its problems on the big machines.

The girls may work in science, where a college background in math or physics is an absolute necessity, or in business, where the girl without a degree has the best chance of finding her first job.

The girls may even work at home—while the children are napping. One New Jersey housewife, who worked for a computer research laboratory before her children were born, has started her own little programming business. Now she and a few other retired programmers in the neighborhood, are all making "flow" charts (the jargon word for diagramed computer instructions) in her kitchen . . . at five dollars to ten dollars an hour.

The computer girl could be just out of school, or a senior systems engineer—a former teacher, musician or secretary, or a housewife going back to work. The girl just has to have the aptitude. "If you don't have it, we don't hire you," says Calvin East, director of systems service for the National Cash Register Company.

It's that logical mind, that patience with detail, that Dr. Hopper of Univac was talking about. "Anyone who thrives on puzzles could be a good programmer," says one personnel director. "A good programmer doesn't read more into a problem than is already there," says another. "Two plus two *always* equals four."

Most companies test to see if you can think in a methodical, step-by-step way before they will even consider hiring you as a trainee. A classic example of the type of thinking involved: Suppose you want the machine to perform a command like "Pass the salt." You'd have to painstakingly detail each step of the operation: Extend right hand over table; poise right hand over shaker; lower right hand to shaker; close right hand on shaker . . . and so on, until the job is done.

Generally, you'll do well if you're the type of person who was good at those school aptitude tests where you're given 4, 16, —, 65,536 and asked to fill in the blank.

"At least half—and sometimes 80 percent—of the people fail our test," said James Greenberg, the programming manager for a Los Angeles service bureau. The personnel director of a Manhattan insurance company has found that "applicants with a master's degree in physics are as likely to fail the test as someone without a degree." He adds: "When there are a lot of openings, we'll take somebody without a degree if she has the aptitude. But don't slough off on your education . . . even our secretaries are college graduates these days.")

The trick, then, is getting the experience. And for the girl without a college degree, it's done the way Sally Brown did it—by moving up inside a company. An employment counselor advises: "A girl's best bet is to get a spot *anywhere* in a computer department, using skills like filing or typing or accounting, with the plan in mind to get on the firm's programmer-trainee list from the inside."

Or she can try the routes taken most successfully by the girl with a college background:

(1) Answer newspaper want ads.

(2) Phone or write the branch office of a computer manufacturer, saying you'd like to work for them . . . or asking how you can apply for a job.

(3) Take a professional-career test given by the Civil Service Board of the State and Federal Government. (The opportunities for a woman in government programming are almost unlimited.)

(4) Go to an employment agency, as some companies hire only through them.

Special computer courses may help a girl prepare for her career in programming, and many universities, as well as university extensions, offer them. There

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are also private data-processing schools that charge up to five hundred dollars for a six- to twelve-week course.

"These private schools vary in quality," says Stuart Longworth, Univac's manager of employee services. "People invest their time and money in these quickie courses and expect to get a high-paying job in programming when they're through. But they haven't learned that much. You need on-the-job experience. Programming is something you have to work with."

Although they do hire a number of already-trained programmers, each of the computer manufacturers trains its own people as well as the programmers who work for its customers. The training is on an earn-as-you-learn basis. "I'd never consider paying for my own training when I can get someone else to pay for it," says a girl who's learning to use Honeywell equipment. Yet some people prefer to take an introductory course in programming before applying for a job—just to make sure they'll like the work.

What about the chances of meeting men in computer work? The field is overrun with males. According to figures from the data-processing journals and the Data Processing Management Association there are some twenty thousand computer girls and one hundred sixty thousand computer men!

Why so few women in the industry?

"How many women have *heard* about it?" asks James M. Adams, Jr., director of education for the Association for Computing Machinery.

"Many of the programming jobs require a math background, and that's where the difficulty of getting women into the field lies. Many women still don't think it's feminine to be mathematical. In our culture, girls aren't encouraged along these lines. A little girl comes home from school with bad grades in arithmetic and her parents say, 'OK, as long as she can figure out the bank balance and tote up the grocery bill, she'll be all right.' But let her brother come home with bad grades, and the parents make him study so he can grow up and get a good job." Adams adds: "I don't know of any other field, outside of teaching, where's there's as much opportunity for a woman."

He suggests that a "computer appreciation course" be a mandatory part of high school education . . . and that more women be directed into computer work in college. Soon, mothers will be telling their daughters: "Now study your arithmetic so you can become a computer girl."

Why not? It's satisfying work for the girl with a mind for logic. It pays better than most fields. "And we like having the girls around," says one of those one hundred sixty thousand men in the field. "They're prettier than the rest of us."

Here is a sample problem from the NCR aptitude test to give you a general idea of what you're in for if you should take the test. It's in the form of a flow chart—a diagram that the programmer makes when she's preparing instructions that tell the computer what to do. (Here's a tip: The trick to working this problem is to do *exactly* what the directions tell you to do. Be careful not to read more into the problem than is really there.)

1	2	3	4	5	6	7	8
3	7	2	1	5	12	4	0

FLOW CHART—START

1 Replace number in box 1 with number in box 8.

2 Add: number in box 1 and number in box 2. Put result into box 1.

3 Change Instruction 2: increase the second *box number* mentioned in it (box number 2, the first time around, etc.) by 1.

4 Is the second *box number* mentioned in Instruction 2 greater than the number *in* box 7? If your answer is no, follow the arrow and start sequence again at its source.

END What number is now in box 1? ——

The answer is 10. Here's what your flow chart should look like now:

1	2	3	4	5	6	7	8
10	7	2	1	5	12	4	0

FLOW CHART—START

1 Replace number in box 1 with number in box 8.

2 Add: number in box 1 and number in box 5. Put result into box 1.

3 Change Instruction 2: increase the second *box number* mentioned in it, by 1.

4 Is the second *box number* mentioned in Instruction 2, greater than the number *in* box 7?

END What number is now in box 1? 10

THE END