October, 1973

Vol. 22, No. 10

computers and automation

and people

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Vol. 22, No. 10
October, 1973

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"Computers and Automation" is published monthly, 12 issues per year, at 815 Washington St., Newtonville, Mass. 02160, by Berkeley Enterprises, Inc. Printed in U.S.A. Second Class Postage paid at Boston, Mass., and additional mailing points.

Subscription rates: United States, $11.50 for one year, $22.00 for two years. Canada: add $1 a year; foreign, add $6 a year.

NOTE: The above rates do not include our publication "The Computer Directory and Buyers' Guide". If you elect to receive "The Computer Directory and Buyers' Guide", please add $12.00 per year to your subscription rate in U.S. and Canada, and $15.00 per year elsewhere.

Please address all mail to: Berkeley Enterprises, Inc., 815 Washington St., Newtonville, Mass. 02160.

Postmaster: Please send all forms 3579 to Berkeley Enterprises, Inc., 815 Washington St., Newtonville, Mass. 02160.

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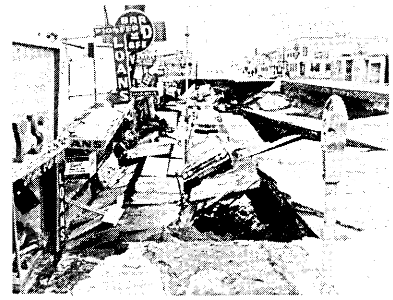

Front Cover Picture

Forecasting earthquakes like this one in Anchorage, Alaska, in 1964, may be possible if a new computer project underway in Rome, Italy, achieves success. For more information, see page 43.

Departments

Key

[A] – Article
[C] – Monthly Column
[E] – Editorial
[F] – Forum
[G] – The Golden Trumpet
[NT] – Not Technical
[T] – Technical

NOTICE

Effective October 20, the subscription rate of *Computers and Automation* will be:

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Canada, $12.50 for one year, $24.00 for two years.
Foreign, $17.50 for one year, $34.00 for two years.

The above rates do not include *The Computer Directory and Buyers' Guide.* If you elect to receive *The Computer Directory and Buyers' Guide,* please add $12.00 per year to your subscription rate in U.S. and Canada, and $15.00 per year elsewhere.

No discounts are allowed to any subscription agencies for the first 40 subscriptions to *Computers and Automation* received in any calendar year. After the first 40 subscriptions to *Computers and Automation,* the maximum discount allowed is 10%.

The price of a back copy is $2.00 for 1971 to date and $3.00 for 1970 and earlier. *The Computer Directory and Buyers' Guide* is $6.00 for 1971 and earlier, and $18.50 for 1972 and 1973.

Our second publication, *The Notebook on Common Sense, Elementary and Advanced,* will remain at $12.00 per year for the first year (24 or more issues); any person subscribing to both publications at the same time, direct to us, may deduct $2.00 per year from the total cost.

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EDITORIAL

The Nine Most Important Problems in the World, and their Relation to Computers

Recently I was asked to specify what I thought were the most important problems for human beings in the world. My questioner and I agreed upon a definition: a "most important problem in the world" is a problem which if not solved prevents the survival of human beings on this planet. In other words, if such a problem is not solved, then one of the following things happens:

- Millions of human beings will die; or
- The environment which human beings need for living will disappear; or
- The techniques with which human beings can hope perhaps to solve the great problems of human survival cannot be attained.

Let's begin with an example: the problem of modern technology for weapons.

The stockpile of nuclear weapons in the possession of the United States is sufficient to destroy all human life on earth. The same is true of the stockpile of nuclear weapons in the possession of the Soviet Union. France, England, and China have demonstrated nuclear weapons. The "club" of nations that have nuclear weapons is expanding and will expand further. Suppose another psychotic dictator like Hitler came to power in any country with nuclear weapons. Then before accepting defeat in a war, he would use them. There exists no world-wide safety from them. A famous exploration of the meaning of large-scale nuclear war may be found in the novel *On the Beach* by Nevil Shute.

This condition constitutes a huge and fearful danger. A realistic international solution has not even begun. Only an unnegotiated balance of terror exists, which effectively applies only to rational governments.

Besides nuclear weapons, there are many other very dangerous branches of modern weapons technology: chemical warfare; bacteriological warfare; radiological warfare; electronic warfare; etc. It is true that the North Vietnamese and the Provisional Revolutionary Government of South Vietnam from 1965 to 1973 resisted almost the worst weapons that the United States government could apply to them; they defeated the atrocity engineering of the Pentagon; they won the war in South Vietnam; and accordingly they will rank among the great heroes of world history. But this kind of heroism is unusual, and may not be forthcoming often in the future.

No inventory of the most important problems in the world can be definitive – but I count nine of them, and here is my list:

1. Modern Technology for Weapons, as mentioned above.
2. War-Making Industry: the vested interest in war in almost every country in the world: the munition makers, owners, managers, workers, scientists, whose jobs and whose profits are linked to war.
3. The Population Explosion – and its handmaidens, starvation and famine.
4. The Exhaustion of Resources – and its handmaiden poverty; a condition in which the accumulated deposits (iron, oil, copper, etc.) over geological eras of hundreds of millions of years are being exhausted in a century or two by "modern" scientific and technological exploitation of the earth's resources.
5. Pollution of the Environment, as, for example, the steady increase of carbon dioxide, lead, and other foreign materials, in the atmosphere of the earth.
6. Waste: waste of time watching TV, waste of food by eating too much, waste of paper distributing advertising messages, ... all of this constituting fiddling while Rome burns.
7. Deficiencies of Language, Education, and Communication – so that great numbers of human beings cannot exchange ideas with each other, cannot discuss and resolve their differences, cannot easily appreciate the humanity of other human beings.
8. Advertising, Propaganda, and Lies – the information techniques by which vested interests keep their possessions through exerting controls over the information allowed to reach the public.
9. Arresting of the Tendency to Love, and its handmaidens, hatred and genocide.

Let's try to explain that last problem.

Most people go through a steady development of their loving. They start off by loving their mother, then other members of their family, then their schoolmates, then the community in which they live, then their region, then their country (a kind of love which is patriotism in its best sense), then the world of nature (conservation of wilderness, etc.). But then they stick fast – they do not go on to loving people all over the world, all humanity, the human race. (Even so, children nearly everywhere are loved; the American soldiers in Vietnam were continually giving candy, pennies, and other trifles to Vietnamese children – instead of thinking more deeply about what better things they could do.) I would like to see encouragement all over the world of the tendency to love.

But sometimes the arresting of the tendency to love becomes driven in the opposite direction, and leads to hatred and genocide.

Genocide is the crime of slaying all or almost all of a very large group of persons. Here are four less familiar examples, two recent, two historical: (1) During 1914-1918, the Turks killed about 2,000,000 Armenians who were in Turkey. (2) In late 1965 in Indonesia the Army and the Mohammedans killed 100,000 to 200,000 persons who were denounced as Communists. (3) The Romans, when they finally captured Carthage about 140 B.C., killed about 600,000 to 650,000 Carthaginians; the few thousands surviving disappeared into slavery. (4) In August and September, 1752, French Catholics killed some 50,000 French Protestants (Huguenots, the "Massacre of St. Bartholomew").

It seems to me this phenomenon is another huge danger. Yet no important studies are proceeding anywhere, so far as I know, to analyze this problem, to discover the general reasons for genocide, when and why it occurs, and to try to prevent the development of situations that lead to genocide. The annual editions of the *World Almanac* list certain disasters and catastrophes, but never include the historical instances of genocide.

Of course computers can apply to these problems: the collecting of data about them; the study of them; the solving of them. Computers apply as pencil and paper applies – and they make possible studies and investigations that are not possible with only pencil and paper.

The first step in combating these nine evils is to strip off their disguises, to push them into the news, to collect information about them, to think about them, to discuss them, to agitate about them, and to try to do something intelligent about them.

"The evil that lies concealed is always the most serious."
– Publilius Syrus, c. 43 B.C.

Edmund C. Berkeley

Edmund C. Berkeley
Editor

The Automotive Industry and the Computer Industry : Common Language, Common Future

Edward N. Cole, President
General Motors Corp.
Detroit, Mich. 48202

"The computer is doing for the human mind what the machine did for human production."

The Human Interface

The computer industry and the automobile industry have much in common, and they need to communicate with each other.

The primary challenge of the computer is not technology. It is relatively easy to increase computer speed, memory, or even versatility. The big challenges are computer applications and computer relationships to people. To use one of your vogue phrases, the human interface.

Both of these challenges — new applications and the human interface — reduce to one challenge, good management. That's the important point. Management must know when to use the computer and how to use it. The computer involves major human questions as well as technical. The computer must be used more as a management tool, to match the pace of change in markets, processes, and products. The computer must meet objectives of pay-out, profit generation.

Two hundred years ago the educated man did not need to know anything about science. Twenty-five years ago the educated man did not need to know anything about computers. But today, no educated man can be ignorant of computers, and no executive can successfully plan and manage a business or engineer a product without using the computer.

The future belongs to the businessman who finds new computer applications and is able to successfully and profitably correlate them with his employees, customers, and suppliers. The problem is a case of common language programmed to a common future.

Bridge of Understanding

One of our greatest difficulties over the years has been to develop a common language that would be a bridge of understanding between computer people and the men of the automotive industry ... between computer specialists and those in marketing, manufacturing, and other areas. Many of our employees at all levels of responsibility have viewed the computer as a strange device surrounded by scientists, mystery, and jargon.

To correct this, a short hands-on computer course was developed for management by our Manufacturing Staff. Over a period of time, it was presented to over 300 of our top manufacturing people in small groups of 10 to 12. For the first time, many of these men understood the role of the computer and its potential to help them. They learned the language and were able to talk it. Today management sees the computer for what it is — a powerful new tool to get the job done more effectively than ever before, a tool that depends on the quality and understanding of people for effective use.

Based on a talk at the National Computer Conference, New York, N.Y., June, 1973.

Communication May Become More Difficult

As you become more specialized, your computer language and the communication problem with others may become more difficult. This is true not only between different kinds of computer language, but even more so between your computer world and the non-computer world around you.

The problem is evident in a supposedly typical want ad:

> "Wanted — Programmer proficient in the following languages: Cobol, PL/1, Fortran, RPG, and BAL-360. English optional."

To understand the computer, we must know ourselves.

Perhaps you heard that recently there was a sign in a Japanese computer firm. It said:

> Man — slow, slovenly, but brilliant.
> Computer — fast, accurate, but stupid.

Peter Drucker calls the computer "the dumbest tool we have ever had. All it can do is say either zero or one, but it can do it awfully fast."

Most of us — even at a computer conference — would agree that people are smarter than machines, but that is only the people's side of it. On the other hand, if machines get too smart, we can always organize them into committees.

Computer Applications

The trend of computer applications is significant for management. For a variety of reasons, the computer, as a business tool, started as a bookkeeping device and graduated to a highly versatile data processing and research tool.

While all three of these applications are still growing, the computer's biggest growth in the automobile industry may very well be in manufacturing and the management of the business. It is a basic tool in the drive for higher efficiency and productivity for manufacturers and a higher standard of living for employees. As much as the wheel, the hammer, or even electricity, the computer will liberate mankind. The computer is doing for the human mind what the machine did for human production. Almost 200 years ago, Eli Whitney, to meet a government contract for muskets, developed mass production for the first time in America. Today we are seeing an increasing emphasis upon computer control of mass production. There are many computer applications in General Motors.

Growth of Computer Applications in General Motors

At General Motors, the number of employees involved with computers has grown from just under 4,500 in 1959, to 8,300 today. Hundreds of these employees do what many of you do — try to find new, profitable uses for the computer.

The first information system in General Motors to be adapted to computers dates back to the mid '50s. Since then, the number has increased dramatically. In 1959, there were around 30 systems. Today we have 500, all of which are far more powerful and complex than the 1959 models.

Initially, computers were used almost exclusively in well-defined areas like payroll, billing, inventory, accounting, and the like. Today, they are being applied in nearly every facet of our business. As I said earlier, the biggest growth is in the operations end of the business. We expect more emphasis on systems and decision-making, more on managing our business better, and correspondingly less emphasis on routine bookkeeping functions.

Computers in Management

Computer management starts with a management information center — a system for a current overview of corporate operations. On a real time basis, management can have a wide range of information on inventories, production, distribution, facilities, and tools. Decisions can be made from more information and more current information than would otherwise be available.

GM staffs and divisions have developed a number of specific applications. GM Research serves as a center for scientific and engineering computing in the corporation. It has pioneered in the basic technology of time-sharing and computer graphics for corporate use. The Manufacturing Staff was responsible for the development stage of many of the applications which I am about to discuss.

In our Design Staff and Fisher Body, the computer is used to take the car from the designer's clay to the production engineer's die. Computer graphics are used by divisions in product and tool engineering. Mathematical modeling and simulation are being used for the planning and evaluation of new manufacturing installations and the improvement of existing ones.

Computers in Assembly

In many of our assembly plants we are using the computer for line balancing, controlling the mix of models and options to equalize labor content and handle the flow of materials more efficiently. In manufacturing, the computer is widely used for quality control. Applications include exhaust emission tests, carburetor flow testing, hydrostatic motor and pump tests, suspension design and fastener tests.

In traffic, the movement of freight cars and the special rail cars used for the shipment of finished automobiles are closely monitored by computers.

In marketing, the computer is used in a wide variety of ways. We have developed a warranty information system. Dealer communications terminals are being used for parts ordering, car ordering, warranty, dealer service bureau and 10-day reporting.

Computers within Automobiles

On the product itself, the computer is already a necessary component.

Our "true-track" braking system, an option on the Oldsmobile Toronado, uses a small on-board computer to monitor braking action and prevent brake "lock-up".

The "Max Trac" drive control, a Buick option, uses a computer to assure maximum traction and prevent wheelspin.

Electronic devices in our ignition systems replace the conventional distributor rotor and ignition breaker points.

In the near future, we expect a centralized on-board computer to handle these functions, plus many new ones.

Three other computer applications may be of special interest.

Computers in Parts Supply

The GM Parts Division has been one of the leaders in computer communications since it installed its nationwide system in 1966. Its network connects 4,000 dealers into the parts system. A dealer can order directly any of the 300,000 different parts stocked in distribution warehouses and get a prompt response as to availability and shipment. On a day-to-day basis, this system processes about 350,000 orders.

The advantages are obvious. Dealer orders are handled quickly, reducing the need for large dealer inventories. At the same time, the system gives the GM Parts Division better inventory control in its 32 field distribution centers. When stocks reach a critically low point, they are automatically reordered in appropriate quantity.

Computers in Scheduling

The second computer application that I would like to detail has to do with scheduling and distribution. We have to start with a basic premise. The automobile is custom-built but mass produced. For example, in General Motors we not only have five car lines but hundreds of models, engines, colors and options. Considering all possible combinations, it would be possible for General Motors to build an entire year's production of more than five million cars without ever duplicating a car.

Our objective is to sell the customer the car he wants, complete with all the options he wants, and deliver it as soon as possible. This is good merchandising. At the same time, we want to produce the thousands of variations in the most efficient way possible. That is the computer's problem.

GM divisions use the computer in forecasting and distribution. Chevrolet is just one example. It has established a Responsive Distribution System to each of its nine Regional and 48 Zone offices. All distribution of cars and trucks is reported weekly. Immediate status reports on orders are available through terminal communications and a weekly mailed report. Order errors can be identified immediately. Dealers have a mechanism for changing the priority and sequence of their orders, if they wish.

Also, with the help of the computer, Chevrolet forecasts more accurately for production the models, trims and options it will need. Instead of forecasts being based on a manufacturing plant's past history, they are now based on the demand of each Zone's weekly distribution. This selling pattern is correlated with plant production schedules, transportation conditions, and economics. This not only improves the availability of cars for customers but more efficiently establishes production schedules.

Chevrolet also has computerized its "Vehicle Price Schedules" and "Truck Specification Books". As a result, these publications can be issued two weeks sooner than before.

Computers in Readability Measurement

My third computer application was a bit of a happy accident. Our Service Research Center was given the assignment to evaluate the readability of a service manual — the instruction book used in a dealer's service department. After considering the formulae of several readability specialists, the reading ease formula of Rudolph Flesch was selected. This formula is based on the average number of words per sentence and the number of syllables per hundred words. These were programmed into a computer. Then the fun began. A number of GM publications were selected and sample paragraphs tested by the computer. The analyses came out as grade level equivalents, which we are using as guides to improve the readability of a number of GM publications.

Readability can also apply to a speech. Just to play the game fair, I had the computer analyze seven sections of my remarks today. According to the read-out, the grade ranged from 8.6 to 16.8 — which should cover most of you.

This project is relatively new. We are calling it STAR — Simple Test Approach (for) Readability. We don't know all of the ways we may use it, but we do feel it will improve our communications, make us more conscious of readability, and help service personnel and others do a better job. Outside the Corporation we have heard of another possible use.

In some states educators are suggesting that the education level of textbooks be certified. They want to make sure that the reading level of a sixth grade textbook, for example, does not require seventh or eighth grade reading skills. California has already passed a law requiring the certification of textbooks and one is pending in Michigan. The GM readability program might make textbook certification relatively quick and easy. We are prepared to make our knowledge available.

Future Applications

Looking into the future, we see many new or expanded computer uses.

Today the computer controls many individual manufacturing processes. For tomorrow, industry is looking at the potential for controlling more complex manufacturing systems. This is probably the key software problem of manufacturing.

Part programming must graduate to process programming — planned work scheduling for machines and people to achieve the maximum efficiency in flow-through production. At the same time, integrated manufacturing systems must meet the test of manufacturing flexibility.

In addition, the computer will be used more for automobile service diagnostics. The cars are becoming more complicated and the effectiveness of safety and emission control equipment more critical.

We also expect automobiles to use on-board computers much more in the future, as I mentioned earlier. Solid state electronics are essential for the seat belt interlock scheduled for 1974, and will be needed for the crash sensors of the air cushion. GM is experimenting with the computer to prevent a person from operating his vehicle while intoxicated. The system gives the operator three tries to quickly and precisely center a needle indicator on a special gauge. If he fails, the ignition stays locked.

Computer Traffic Control

Looking even farther ahead, we expect some form of computer traffic control. For many years, General Motors has been working on a system built around a cable buried in the highway. This was a part of a proposal GM submitted recently to the government for a special mass transit project. Small buses would pick up passengers in residential and business areas and then be controlled on a high-speed highway by cable and computer control.

Performing a Function Better

In all applications, I would like to emphasize one thing. The objective is not to improve a machine, an automobile, or a computer. The real objective is to perform a function better — not just a better car but better transportation, and not just a bigger or faster computer, but a more efficient management tool.

For more than 20 years, the computer industry has been in the forefront of change. The rest of industry is counting on this to continue. Computer innovation is important not only to the computer industry but also the automotive industry. American industry needs your needle. We need to be stimulated to innovation and not immunized by past successes.

The computer industry is reported to be the eighth largest in the United States. By 1990, it is expected by some to be the third largest.

The automotive industry and computer industry need to keep communications channels open. We need a common language. We need to stay abreast of what both industries are doing.

In many respects, the two industries are converging. The computer industry is looking for applications, and the automotive industry is looking for solutions to difficult problems. This is our common future.

The problems we face today are an inheritance from the past, but they are also a stimulant for progress tomorrow. Problems are the price of progress.

"Boss" Kettering used to say: "Don't bring me anything but trouble. Good news weakens me."

If he was right, the automobile industry is very strong ... but leaning heavily on the computer industry. □

Latest Computers See, Hear, Speak and Sing — and May Outthink Man

David Brand
Staff Reporter
The Wall Street Journal
22 Cortlandt St.
New York, N.Y. 10007

"Like people, intelligent computers learn from experience and from their mistakes."

In a University of Utah laboratory, the magnificent tenor voice emerges from the loudspeakers with all of the sparkle of high-fidelity sound. The last time this voice was heard with such lifelike clarity was in a concert hall more than 50 years ago. It is the voice of Enrico Caruso.

At Stanford University in California, a television camera guides a mechanical arm — the same way your eye guides your arm movements — as it picks up the pieces of a water pump, assembles them and screws them together. There are no human operators in sight.

At Bell Laboratories in Murray Hill, N.J., the chief of acoustical research, James Flanagan, flicks a switch. From a loudspeaker comes a strange, rolling voice that is struggling for speech: "Good morning, I am a computer. I can read stories and speak them aloud...."

These are the forerunners of the "intelligent machines" of the future. They are computers that not only can perform such technical alchemy as recreating Caruso's voice from a morass of distorted recording sounds, but also can imitate man through movement, speech and, most significantly, thought processes.

Intuition, Too

Within a generation, researchers say, these machines could be operating whole assembly lines and communicating with people through human speech, thus turning the nearest telephone into a computer keyboard. They could be performing such complex tasks as medical diagnosis, weather forecasting, and reading books and storing the information contained in them.

To some extent, the researchers say, such machines are acting independently of their human creators. "I think you can say that the computer is now showing intuition and the ability to think for itself," says Herbert Simon, professor of computer science and psychology at Carnegie-Mellon University, Pittsburgh. "Some of us don't see any principle or reason that would prevent machines from becoming more intelligent than man."

Despite its public image as an infallible machine, the computer's role in the past has been basically that of a servile calculator and record-keeper. But the development of computers with ever larger memories, and, more important, the discovery of new ways to instruct computers to carry out tasks, have given birth to a new technology loosely called artificial intelligence.

Computer scientists see intelligent machines as causing a revolution of sorts. Whereas in the first phase of the technological age, engineering has improved the physical comfort of the human race by developing such things as the automobile, the jet plane and a whole host of appliances, the next phase, they say, is the improvement of man's mental comfort.

A Steam Engine for the Mind

By relieving man of dull, repetitive tasks, by readily providing him with information and instruction and by solving problems, the computer of the future will be "a steam engine as applied to the mind," says Carnegie-Mellon's Mr. Simon.

The only thing standing in the way of this evolution is a potential shortage of funds to support the enormously costly research. The Department of Defense, which until now has been the major sponsor of artificial-intelligence research (in fiscal 1973 it paid out about $6 million) is under pressure from Congress to drop research that isn't related to defense. There is only a smattering of interest in industry (even IBM says it's "too long-range") and the only other source of funds is the government's National Science Foundation, which spent about $250,000 on this sort of research in fiscal 1973.

In giving birth to the intelligent machines, man is designing them in his own image. Some will have a voice like a human's and the ability to understand speech. Some will have eyes (a television camera), ears (a microphone), arms (an industrial manipulator), legs (a wheeled robot).

Even the thought processes are being modeled on those of humans. Scientists are trying to understand more about the brain's reasoning powers so that they can be simulated in a program, or set of instructions fed into a computer.

Trial-and-Error Checkers

Marvin Minsky, professor of electrical engineering at Massachusetts Institute of Technology and director of the artificial-intelligence laboratory there, explains how human reasoning can be built into a program that instructs a computer to, say, play a game of checkers. A person playing the game doesn't attempt to calculate all possible future plays every time a piece is moved — it would be impossible because the permutations could run into the billions. Even for a computer the calculations required for such an extensive search would be ridiculous.

Instead, the human player uses judgment, memory and plain trial-and-error in planning the next move. The intelligent computer figures out its move in much the same way. Instead of making many calculations, it makes just a few based on what it knows has worked well in the past. Such a computer program is the very basis of artificial intelligence.

Like people, intelligent computers learn from experience and from their mistakes, Mr. Minsky says. In this way they are able to improve on their performance. "The evidence is strong," Mr. Minsky says, "that there is a similarity in the learning processes used by humans and by some of these new computers."

Voice Analysis and Synthesis

The Caruso experiment at the University of Utah is one example of how people and computers are beginning to work closely together. The original Caruso recording was made in 1907, and the muffled sound of Caruso's voice was barely audible through the background noise and tinny musical accompaniment.

Researchers Tom Stockham and Neil Miller worked out a unique voice-analysis and voice-synthesis program that they fed into a computer. The old Caruso record was then played to the computer so that the machine could analyze the sound signals and extract such information from them as pitch, intensity and vocal resonance.

The computer was then able to construct an artificial voice signal (a sort of synthetic Caruso), based on what the information indicated Caruso probably sounded like, and put it on recording tape.

Trial and error are involved in an ambitious effort at Carnegie-Mellon to instruct computers to understand continuous human speech. In one experiment a computer has been programmed to play chess using spoken commands. For this it has been taught to understand a variety of simple spoken sentences.

The use of chess is simply a convenient method of showing that a computer understands; the computer has to demonstrate its understanding by replying with its own move, and that move will clearly show whether the computer has understood or not. This method is popular for another reason, too: Many computer scientists are chess nuts.

The computer's human opponent first identifies himself to the machine by speaking a few simple sentences into a microphone. As the computer "hears" the sounds, it stores them in its memory by assigning mathematical values to the various phonetic features of the voice. This takes about 30 minutes and gives the computer what researcher Raj Reddy calls "a model" of an individual's voice.

When this person speaks to the computer again, the machine will compare these sounds with the model in its memory. Once the correct phonetic features have been identified (which takes only a fraction of a second) the computer can, over a loudspeaker, repeat what has been said by rearranging tape-recorded words. But this, says Mr. Reddy, is simply "parroting". The computer has to show it understands what has been said by printing out the words and then replying with its own move.

To do this the computer must use the vocabulary, grammar and semantics in its memory and judge which words match up with the acoustical signals from the voice. This, says Mr. Reddy, may be the process by which humans understand each other's speech.

It takes the computer only a few guesses, in the space of less than 10 seconds, to recognize what its human opponent has said (despite the five million spoken moves it can understand) and to print the words on a television screen. The computer then prints out its own move.

Slowed by Strangers

Complete strangers bewilder the computer at first, just as human understanding is slowed when someone is confronted with a strange accent. A recent visitor challenged the computer to a game of chess and opened with the move "pawn to king four". The computer began printing out versions of what it thought had been said, rejecting each version as it failed to match the information in its memory. Finally, after two minutes and 109 guesses, it found the answer and printed out "pawn to king four". Then it made its own move.

Computers that can recognize limited human speech are already finding their way onto the market. One, made by Threshold Technology of Cinnaminson, N.J., was installed by Trans World Airlines in January to route outgoing luggage at New York's Kennedy Airport. As a bag is put onto the conveyor belt the handler reads the flight number into a microphone. The computer "hears" the number and channels the bag into the correct loading area.

Going from Written Words to Spoken Ones

If Carnegie-Mellon scientists are giving the computers ears, then the scientists at Bell Labs are giving them their voices. Already the Bell Labs computer has 1,600 words in its pronouncing dictionary and is capable of reciting a short story.

The computer, of course, doesn't make up this story itself. It is typed into the machine in ordinary English. Then the computer "reads" the text and looks up each word in its pronouncing dictionary.

A host of calculations follow. The computer analyzes the syntax in order to time its speech delivery in such a way that the listener will be able to distinguish between such phrases as "a nice man" and "an ice man". Then it must determine correct pitches — whether the voice should be raised or lowered for a particular phrase. Finally it has to figure out how the human vocal tract would pronounce each word, so that the computer can generate an accurate electric speech signal. The signal's sound waves are then fed to an ordinary loudspeaker or recorded on magnetic tape.

In order to give the computer details about the vocal tract, Bell Labs researchers first had to find out what rules govern the way in which the throat and mouth move to produce words. The rules were put together from a study of people speaking with an American accent "typically Midwestern in character". Says researcher Cecil Coker, "We strung optical fibers (fibers that carry light) down their throats and even X-rayed them".

These rules have produced a computer voice with an accent all its own. It has been described by some as vaguely Swedish-American after several martinis. Mr. Flanagan of the Bell Labs, who heads the voice-synthesis project, says that the strangeness of the voice is due to the fact that "we haven't yet been able to duplicate all of the things a human can do in speaking. We still don't understand all of the vagaries of vocal inflection." But one day, he says, it may be possible to command the computer to imitate any accent.

Instructions for Assembling

Talking computers have already been used in a limited way in industry. In the past, Western Electric production-line workers have routinely assembled complex equipment on the basis of tape-recorded instructions. These are calculated by a computer, printed out and then recorded on tape by an announcer.

In an experiment to shorten this process, the Bell Labs researchers have told the computer to calculate the instructions and then speak them directly to an automatic recorder. These instructions in recorded computer speech have been successfully used on a Western Electric assembly line in Oklahoma City.

The voice-synthesis experiments have shown that a computer can readily understand English text. Now Carnegie-Mellon scientists have taken this one step further: Converting English text into a computer program.

Mr. Simon and researcher John Hayes devised a problem in the form of prose. It was called "The Himalayan tea ceremony" and in flowery English it set up a puzzle that required the transfer of five tasks among three persons. It took the computer just 40 seconds to read the problem, change it to computer code and produce its own program to solve the problem of finding the sequence of transfers from the beginning of the ceremony to the end.

Such a simple method of programming could revolutionize industrial processes, scientists say. Already MIT researchers have shown that a computer can be told in ordinary written English to do a variety of tasks usually performed by humans and to improve on its performance with each task.

Picking Up Blocks

The computer is instructed, for example, to pick up blocks of different shapes and colors and arrange them in various ways. Thus the instructions might be, "Build a stack that has two green cubes and a red pyramid." (The computer will know from past experience that the pyramid must go on top of the stack.)

A glimpse of the assembly line of the future can be had at Stanford University. Here researchers have instructed the computer to assemble a water pump made up of three parts and six screws. A television camera sends images of the pieces to the computer, which has in its memory a description of the shape of each component. The computer directs a mechanical arm as it grasps the pieces of the pump, assembles them and screws them together.

Simulation of Paranoia

The Stanford scientists have also produced one of the more startling examples of how an intelligent machine can communicate with people. The researchers have programmed a computer to simulate paranoia. When questioned over a terminal the computer will provide written answers that even psychiatrists are unable to distinguish from those of a person suffering from paranoia.

Recently eight psychiatrists were asked to question the persecuted computer as part of an experiment. One conversation went:

Doctor: What problem brought you to the hospital?
Computer: I am quite upset.
Doctor: Could you tell me why you have been upset?
Computer: People get on my nerves sometimes.
Doctor: How do they get on your nerves?
Computer: It bothers me when people stare at me.
Doctor: Why do people stare at you?
Computer: What about my looks?

The doctors were also asked to question actual patients via a computer keyboard. Then transcripts of all the interviews with patients and computer were sent to psychiatrists around the country who were asked to judge whether each interview was conducted with a patient or with the computer. Only 51% of the answers were correct. □

Performance Measurement: Now You Can Find Out What Really Goes On Inside Your Computer

ADL Systems, Inc.
A Subsidiary of Arthur D. Little, Inc.
Acorn Park
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"Every time a request for more hardware comes to me for approval, I ask for a report on how we're using what we already have. And every time I ask, I never get a clear answer. It's like buying in the dark."

This comment by a senior insurance executive sums up a major concern of many managers who have responsibility for data processing costs in their companies: how well are their computers being used, and how can they be used more efficiently?

To measure "efficiency," it is necessary to know "capacity" and "workload." To improve efficiency, then, knowledge about the inner workings of a system is needed. In simple machines, operating sequentially, this knowledge is readily obtainable. In more complex systems, with their overlapped operations and multiple-program resource sharing, the task is much more difficult.

Compounding this difficulty is the inability to observe directly the internal operations of a computer because of the high level of program control over many simultaneous operations. The necessary facts that help identify what should be changed, and with what potential benefit, are often hidden from view.

Management insistence on efficiency has, in recent years, led to the development of a number of tools and techniques – using both hardware and software – that can provide the necessary data on a computer's "capacity" and "workload."

These techniques are referred to under the heading "performance measurement."

And What Is Performance Measurement?

Computer performance can be measured in many ways – use of CPU cycles per task, main memory utilization, rates of data access to I/O devices, data transfer levels, interlocks, etc. Special instrumentation and software have been developed to count, or measure, these specific events, which occur at microsecond speeds.

The actual use of these measuring techniques is in itself simple. It is the selection of the events to be measured, the amount of measurement, and the interpretation of results that require a high degree of skill.

In fact, the parallel between the diagnosis of human ills and computer ills is quite appropriate. Using a variety of instruments, a physician obtains a set of complex data – temperature, pulse, blood pressure, EKG readings, etc. – on which to base his diagnosis. His choice of what to measure, and its interpretation, depends upon the perceived problem: headache, internal pain, lack of energy, and so forth.

- A merge of 200,000 records required 2 hours and there were plans to rewrite the program to use a second channel. Analysis of monitoring showed that actually the job was CPU-bound and further checking identified some particularly inefficient code. When corrected, the run time was reduced to 45 minutes.
- Through analog monitoring, it was found that several jobs were interacting and queuing for access to the same channel. Reorganizing the data files led to 40% reduction in run time for the job stream.
- Digital measurements were used in a history update run to cut CPU time 25% and elapsed time 30% by reducing the movement of data in work areas.
- Elapsed time for an inventory update run was reduced 60% by using digital techniques to identify the potential benefit of using core indices for ISAM files.
- The 90 minute elapsed time of a job was reduced to 20 minutes by using digital techniques to identify the benefit of changing the blocking and buffering of a master file.
- Measurements of CPU and I/O activity on a small processor showed how to reschedule a job stream to bring about a 27% reduction in partition hours for a job stream – from 314 hours to 230.

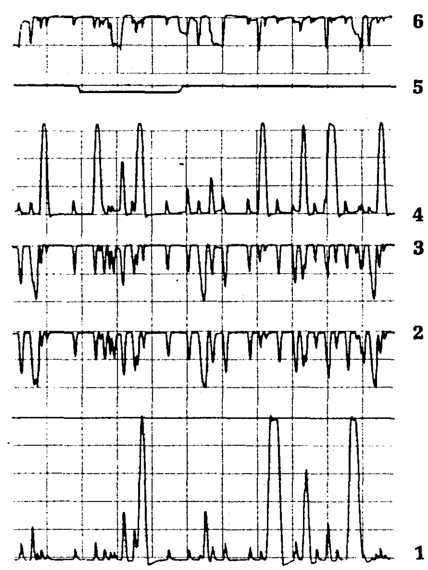
Figure 1: Users' Experience with Performance Measurement.

With computers, the symptoms may be excessive run time, channel thrashing, poor I/O performance, or a number of other problems. Identifying the cure for these ailments depends upon the proficiency of the analyst's diagnosis, his interpretation of measured data, and his skill in altering programs and data flow.

As with physical ills, the cure for computer ailments is often worth the effort. Table 1, for example, describes some specific user results after applying performance measuring techniques. The 30-60 per cent reported improvements convert, in repeated operation, to tens of thousands of dollars of annual savings.

Two Ways to Measure – Internal and External

Performance measurement techniques use two principal approaches – analog measurements, which are external, and digital measurements, which are internal:



Key	Signal
1.	program interrupt key (scaled from 0 to 15)
2.	problem state
3.	wait state
4.	selector channel (with 2314 discs)
5.	time signal (1/25 of a second subdivision)
6.	multiplexor channel

Figure 2. Analog recording of an IBM 360/50 operating under DOS for .28 seconds.

- ANALOG. Like a stethoscope, analog devices are attached at various points in a computer system and signals, generally voltage readings, are recorded continuously on some type of recording surface, usually a strip chart, as illustrated in Figure 2. Voltage changes in CPU circuits or data channels indicate the activity level of the system at

** MEASUREMENT SESSION DATA **

DATE OF SESSION -	04/19/72	MODULE ATTACHED -	USERPROG
TIME OF SESSION -	18.39.12	INITIAL SAMPLE INTERVAL -	5/300 SEC
RUN TIME -	1 MIN 10.06 SEC	ACTUAL SAMPLE INTERVAL -	5/300 SEC
EXECUTION TIME PERCENT -	96.90	TOTAL SAMPLES TAKEN -	3,939
TASK WAIT TIME PERCENT -	3.10	TOTAL SAMPLES PROCESSED -	3,939

** RESOURCE DEMAND DISTRIBUTION **

TASK	— PERCENT OF RUN TIME --			---- PERCENT OF RUN TIME SPENT ----			
OR FILE	SERVICED BY CPU	SERVICED BY I/O	SERVICED BY EITHER	SOLO IN CPU	SOLO IN I/O	SOLO IN EITHER	CAUSING CPU WAIT
USERPROG	91.29	0.00	91.29	63.29	0.00	63.29	0.28
SAMEUNBK	1.93	12.16	13.48	1.14	0.89	2.64	1.04
.OPN/CLS	1.24	1.80	1.80	0.99	1.50	2.56	1.78
SAMEVARL	1.52	11.73	12.19	0.36	0.00	1.27	0.00
STEPLIB	0.00	0.23	0.23	0.00	0.23	0.23	0.00
SYS010	0.86	10.89	11.75	0.20	0.03	0.23	0.00
SYSOUT	0.05	0.00	0.05	0.05	0.00	0.05	0.00

Figure 3. Sample of outputs from one digital measurement system.

given points, without regard for the specific program then running. Recording these changes over a period of time provides useful general information for determining utilization rates.

- DIGITAL. Like a barium trace, digital measuring techniques work inside the system, in the form of separate programs which run concurrently with the applications or operating software, interrupting and sampling the program at specific intervals, and recording its data on tape or disc files. Figure 3 depicts a typical print-out of a digital measuring technique.

Although there are variations and combinations of both techniques, it is safe to make a generalization: analog measurements look at forests, while digital techniques look at individual trees. From analog, therefore, you can expect to gather sound general data about overall system performance, while digital data can provide very precise information about the performance of specific programs.

Figure 4 summarizes the principal benefits and shortcomings of each technique, and from them one may conclude, in rule-of-thumb fashion, that on the basis of both cost and results:

- For a modest effort, analog techniques normally yield more useful and analyzable data than digital.
- For an extensive effort, digital techniques will be more effective, with greater analysis required.

Furthermore, analog techniques work best in relatively simple environments, with a modest multiprogramming load. Digital approaches, while working well in less complex environments, are essential where high-speed equipment and heavy multiprogramming is in use.

Some Tips On Making It Easier For Your Staff

Looking at these techniques from the process of diagnosis-treatment-cure, there are several points which your staff should keep in mind.

Newer operating systems have optional facilities which can collect and perform some analysis of program performance and core, CPU and channel activity. If you plan to make use of these facilities, it should be only after careful definition of the data needed, the sampling interval, and the format of reports. In practice, a great quantity of measured data is rendered virtually useless because prior groundrules were not established.

Finally, in both techniques, the interval at which samples are taken is most important. It presents a trade-off which should be anticipated. On the one hand, small sampling intervals provide much more accurate pictures of actual internal activity. On the other, such sampling not only generates a potentially massive volume of data for later analysis, but also can significantly distort production operations.

Now, How Do You Get Started?

Obviously, it takes awareness of a problem before one becomes concerned with a solution. Lack of awareness of computer inefficiency is rapidly becoming a problem of the past, as noted by the increasing frequency of complaints like that of the insurance company executive.

Once you've reached the point of nagging suspicion, three essentials can get you started towards sound performance measurement – a plan, the tools, and the skills.

The plan starts with a written description of the problem – or syndrome – and some hypotheses as to cause. It should then describe the required data to be collected, and the intended utility of that data in finding a cure. And it should define the technique to be used, the sampling plan, decision breakpoints, and appropriate alternative diagnostic approaches.

Selection of the tools is important. Based on symptoms, budgets and resources, either or both techniques may be employed. In fact, there are a variety of commercially available analog, digital and hybrid techniques combining both hardware and software, and they vary widely in cost and capability. The important criterion is certainly that the tools you choose will provide the data you need. A stethoscope won't help much in detecting ulcers.

Finally, apply your best analysts to the problem. Like a good physician, they should understand the applications system, the operating system, the equipment in use and the interrelationships of them, as well as being proficient in using the measurement tools.

You can anticipate this process will require from one- to four-man-weeks per problem under investigation. In larger installations, in fact, it might be advisable to establish an ongoing but loosely organized group to define and measure periodically computer equipment efficiency, as problems and priorities shift.

The payoff, of course, will be measurable in dollars and cents – as well as in better vision when making decisions on additional equipment. □

	Advantages	Disadvantages
ANALOG	1. Easy to use – requires no software modifications 2. Information available quickly – can be observed as system operates 3. Good measure of overall activity 4. Can readily modify data gathering plan 5. Little disturbance to the system	1. Detail information not readily available 2. Difficult to focus on a particular program while multi-programming 3. Requires experienced technician for proper analysis 4. Requires knowledge of, and access to, internals of the hardware
DIGITAL	1. Can provide very detailed data about activity within a program 2. Can focus upon particular programs while multi-programming 3. Can be used to analyze activity in operating systems 4. Can be used to analyze interaction between programs	1. Requires software setups 2. Best used to research a particular problem 3. Cannot make variations within a test session 4. Measurement and output operations when using this technique can impair system performance

Figure 4. Pros and Cons of Analog and Digital Measurement Techniques.

Remote Terminal Systems for Computers — Part 2

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"The buyer should not rely solely on vendor data in developing his user job requirements specifications."

CRT's can be generally classified into two types: those with graphics capability and those without. Graphics capability means that the CRT can be programmed to display pictures and graphs to represent mathematical functions and can be programmed to manipulate those graphs to show changes in the functions. CRT's with graphical capabilities can also be used to draw circuit diagrams or structural diagrams for engineering analysis. The electronics in these CRT's causes their prices to be in the five or six figures range. In addition, because of the sophisticated computer programs required to generate the pictorial display, graphical CRT's represent a very small portion of the market. Therefore, they will not be discussed further.

The non-graphical CRT's are referred to as alphanumerical CRT's because they only display characters in much the same fashion as a teleprinter prints characters. Therefore, not considering the medium for information display (i.e., television screen versus paper), these alphanumerical CRT's can be substituted for teleprinters.

Cathode ray tubes can be described as shown in Figure 3.

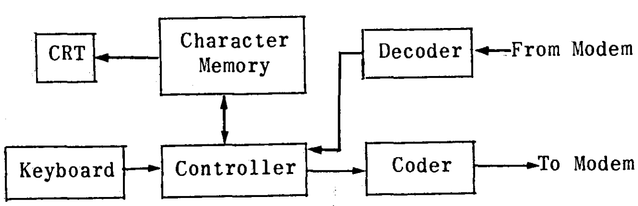

Figure 3
Functions of a CRT Terminal

The heart of a CRT terminal is the cathode ray tube (hence the name CRT). The CRT is similar to a television in that the picture results from a rapidly moving beam of electrons which sweep the face of the tube which is covered with a phosphor. Since the phosphor will glow for only a fraction of a second, the picture must be constantly refreshed. In order to accomplish this a CRT terminal needs a small memory which electrically stores the characters that are being presented on the screen. The memory and screen are scanned in synchronization so that the electronic beam can form the characters that are in the memory in the proper place on the screen.

CRT terminals, like teleprinters also have keyboards, coders, and decoders which perform functions similar to those in teleprinters. In addition, CRT's have a control unit which controls entry and exit of signals between the keyboard and coder, the keyboard and memory, the decoder and memory, and the memory and coder. The complexity of the controller and the memory of the CRT terminal determines the sophistication of the text editing and formatting capability of the terminal and whether it is buffered or unbuffered. An unbuffered terminal operates in much the same way that a teleprinter does. Each time a key is pressed on the keyboard a character is transmitted. With a buffered terminal, characters typed from the keyboard or received from the computer can be loaded into the memory and displayed for editing or formatting purposes without being transmitted. After the message is edited, pressing a key then sends all or part of the message to the computer.

As with teleprinters, compatibility between the terminal and the modem and the terminal and the distant computer is an important consideration. Fortunately, standardization has all but eliminated compatibility considerations. Most terminals use the 8-level ASCII code and conform to EIA standard RS-232B for modem interfacing.

Display Characteristics

Since several of the characteristics and features of CRT terminals are the same as these for teleprinters they will not be discussed here. The following is a description of those characteristics unique to CRT terminals.

1. Display Characteristics. Since CRT terminals, unlike teleprinters display their information on a screen, a different listing of characteristics is used to describe the performance capabilities of CRT terminals.

a. Display area: The area of screens varies between 4 x 3 inches to 12 x 9 inches. Larger screens mean more information can be displayed or the character size will be larger and thus easier to read.

b. Spot diameter: This yields an indication of the clarity of the characters. It is the diameter of a focused spot or dot on the screen in mils (.001 inch).

c. Brightness: CRT terminals vary in brightness from 10 to 100 foot lamberts. Low brightness may mean that the CRT must be viewed in a room with subdued light. In a few terminals, brightness can be adjusted.

d. Character generation technique: There are numerous techniques for generating characters on the screen. Some produce clearer characters than others. In many CRT's, characters are made up by a series of dots in a matrix. In general, the more dots in the matrix, the clearer the characters. Common matrix sizes are 5 x 7 and 7 x 9. In other techniques the electron beam passes through a mask or stencil with the characters etched in it before the beam is deflected to the correct position on the screen. These methods, called monoscope or shaped beam, produce clearer characters than the dot matrix method.

In another method, called stroke pattern, the electron beam is deflected to a character position where it is further deflected through a series of short horizontal and vertical strokes to describe a character. At the position of a character the electron beam may make five vertical strokes and then seven horizontal strokes with the beam turned on (unblanked) during those strokes or portion of the strokes necessary to create the character. The rest of the time the beam is shut off (blanked).

e. Characters per line: This is the maximum number of character positions per line.

f. Number of lines: This is the maximum number of lines on the screen.

g. Maximum displayable character positions — simply the characters per line times the number of lines.

h. Character size — height and width, in inches, of the character font used. The larger the size the more visible the characters.

i. Characters in memory: This is the maximum number of characters that can be stored in the memory at one time. This does not necessarily have to equal the maximum displayable character positions since a few CRT terminals do not store blank characters and some CRT terminals have additional character storage for local information storage.

j. Character code: The vast majority of terminals use the ASCII Code and can display 64 different characters. A few can display more, which generally indicates they can display both upper and lower case characters.

Keyboard Editing

2. Keyboard Entry and Editing: Practically all CRT terminals use a "cursor" symbol to show the position of the next character to be keyed in and to help in editing functions. A cursor is a character-size symbol such as a line underlining the character position on the screen where the next character is to be displayed. It may also be a pair of brackets, a square, a cross, an inverted "L" or some other symbol. The cursor is normally non-destruct, meaning it can be moved over the display screen freely without erasing any characters it bypasses. Cursor movement is controlled by a set of control keys which permit moving the cursor left or right, up or down, or to the leftmost character of the next, previous, or top line. The following are the majority of editing functions which can be provided by a given terminal.

a. Character replace: Typing a character on the keyboard will place it at the cursor (erasing any character previously there) and move the cursor one space to the right.

b. Character insert: This feature is used to make room for inserting a character in the middle of a line. With the cursor over a character, pressing an "insert" key displaces that character, and all others on its right, one space to the right.

c. Character delete: With the cursor over a character, pressing the "delete" key erases the character, and all characters on its right move one space to the left.

d. Line insert: Pressing this key moves all lines below the cursor down one making room for the insertion of a new line.

e. Line delete: Pressing this key erases the line which contains the cursor and moves all subsequent lines up one.

f. Roll up: With the screen full, all lines move up one and the top line is lost when a new line is typed.

g. Roll down: Pressing this key causes all lines to move down and the top line to reappear (the last line disappears).

h. Tabulation: Tabs can be set so that pressing the tab key causes the cursor to move to the tab stop to the right or down.

i. Split screen capability: This facilitates the entry of formatted data. One part of the screen contains fixed or protected format and the rest of the screen variable data that can be entered via the keyboard.

j. Partial transmit capability: Data in various parts of the screen can be transmitted without sending the entire display.

Options

3. Options: Many CRT terminals can be purchased with the optional capability of producing a hard page copy of the information being displayed. This can be a useful option if occasional copies are required.

Some CRT's can be linked to a cassette or cartridge magnetic tape transport. The inherent speed of the CRT means that the magnetic tape can be "read" very quickly, a useful feature when trying to find a record.

Because of their inherent advantages over teleprinters of speed and the fact that they require no paper, CRT's are most applicable in situations where pieces of information are to be retrieved from computer stored files. They are much faster than scanning printer listing information. They are also used when formatted data is to be loaded into a computer file. However, if the size of the screen is too small to display all the data with which the operator must work at one time, then their advantage over teleprinters is reduced.

Gathering Data for the System Selection Decision

To make a sound selection decision, the manager or buyer must consider his user's needs in conjunction with the available products and services, including their performance characteristics, features, compatibility constraints, and costs. But the key to the system selection decision, it must be emphasized, is a clear understanding and a definitive statement of computing performance requirements and of system operating constraints. Moreover, the specification of these requirements and constraints must consider not only the expected current operating environment and utilization rate, but also should reflect all projected changes in workloads and operating conditions for the anticipated life of the system. Otherwise, the system selected is likely to become uneconomical before the end of its useful life.

Performance Requirements

The chief initial problem, then, in the selection of a computer remote terminal system is how to specify performance requirements, criteria, and constraints. In other words, how does the system buyer describe the job the system must perform? Although the buyer could simply list or describe verbally the general nature of the job for which the system is intended, to make a valid, rational comparison among competing systems or system components it is necessary to state the job requirements specifications in the <u>same</u> dimensions or attributes which are used to describe the performance <u>capabilities</u> and identifying characteristics of the services and hardware available.

Translating

In specifying job requirements, there are two kinds of problems which arise. The first problem is in <u>translating</u> known requirements of the job into the various performance capabilities of the hardware or of the services advertised by the vendors. Although, for example, the user may indicate that he needs to be able to display simultaneously three different data fields, what does this mean in terms of number of lines of print, retrieval response time, split screen capability, etc.? Therefore, in stating his job requirements, the user must be able to phrase then fairly precisely in terms of the capabilities of the hardware or services he is procuring.

The second problem is that of discovering what types of hardware and services are available to solve certain firm but ill-defined user requirements. Here, the user can often rely upon an aggressive

Table 1
CENTRAL SITE COMPUTERS — TIME SHARING VENDORS
Performance, Features, and Configurations

Characteristic	Company A	Company B	etc
Equipment			
CPU	CDC 6400	IBM 360/65	
Software and Languages			
Operating System	Kronos	OS/360	
General Purpose Languages	ALGOL	ALGOL	
	BASIC	COBOL	
	COBOL	FORTRAN	
	FORTRAN	JOVIAL	
		PL/I	
		APL	
Simulation & Special Languages	SIMSCRIPT	GPSS	
	SNOBOL	GASP	
	DYNAMO	LISP	
	BMD Series	OMNITAB	
File Structure	Random	Random	
	Sequential		
Application Packages	Business	Business	
	Education	Banking	
	Scientific	Text Editing	
	Text Editing	Engineering	
		Program Debug	
		Reports Generator	
Supported Activities			
Remote Batch	No	Yes	
Conversational			
Teleprinters	Yes	Yes	
CRT's	No	Yes	
Portable	No	No	
Special Purpose Terminals			
OCR	No	Yes	
Badge readers	No	No	

Characteristic	Company A	Company B	etc
Supported Activities (continued)			
Customer Applications			
Programming	Yes	Yes	
Data Bases for Online Multiple Users	Financial	Credit Checking	
	Bldg & Const	Medical	
	Chem Trades	Agricultural	
Number of Users	200	150	
Core Available to User Programs	150K	44K	
Response Time (peak/nonpeak)	2 sec/2 sec	3 sec/1 sec	
Operating Hours	24 hrs per day, excluding scheduled maintenance	22 hrs per day, (Unavailable between 0130 & 0330 EST daily.)	
Costs on Chargeable Items			
Connect Time:			
Remote Batch (Priority, Standard, Weekend)	----	$5.00/job	
Conversational	$8.50/hr	$10.00/hr	
CPU Time	$ .02/sec	$ .05/sec	
Storage			
Disk-Drum (per month)	----	$14.00/100K	
Tape (per month)	$3.00/reel	----	
Other Features	Some Real Time Application Packages		
File Security Arrangements			
Backup Modes Available			

vendor sales force to demonstrate how a given machine or communications device can solve his particular computer system requirement problem. But now the two-sided approach to job specification can be seen more clearly. On the one side, the user is asking the vendor, "What have you got?", and on the other side, the vendor is asking the user, "What do you want?" The conclusion to be drawn is that the buyer should very actively seek performance data and operating characteristics of many different kinds of available, state-of-the-art, off-the-shelf hardware and services while he proceeds with the development of his job requirements.

Comparative Listings

One way the buyer can exploit vendor literature and data in developing his user job requirements specification is to prepare worksheets with side-by-side comparative listings of performance characteristics and features. Tables 1 through 5 are examples of these worksheets for the different remote terminal system components described in the preceding section. These worksheets not only provide a source of possible job requirements characteristics to be considered in the selection decision, but also permit an immediate comparison of vendor or product performance.

However, there are also risks involved in using vendor performance descriptions in guiding the statement of job requirements. One hazard is that the job requirements will be strongly biased in favor of a particular vendor, thereby defeating much of the purpose of the system analysis. Another risk is that because of the rapidly changing technology, the buyer may defer the system selection decision indefinitely while he "gathers more data," looking for the "golden system" which will solve all of his problems with 100 percent reliability and accuracy for only a few pennies per month.

Table 2
COMMUNICATIONS CHANNELS – COMMON CARRIERS
Performance, Features, and Configurations

Characteristic (Optimal Cost)	To Company A	To Company B	etc
Direct Distance Dialing (DDD)			
a. Bandwidth (Hertz)			
b. Speed (bits per second)			
c. Error Rate			
d. Conditioning			
e. Duplex Mode (2 or 4 wires)			
f. Distance			
g. Costs			
(1) fixed (per month)			
(2) variable $\frac{\$}{\text{bit-hour}}$			
Leased Line			
a. Bandwith (Hertz)			
b. Speed (bits per second)			
c. Error Rate			
d. Conditioning			
e. Duplex Mode (2 or 4 wires)			
f. Distance			
g. Costs			
Other Alternative Communications Arrangements (List)			

Table 3
MODEMS – TERMINAL INTERFACE
Performance, Features, and Configurations

Characteristic	Vendor A	Vendor B	etc
Bandwidth (Hertz)			
Speed (bits per second)			
Error Rate			
Synchronization			
Modulation Method			
Conditioning Requirement			
Duplex Mode (2 or 4 wire)			
Figure of Merit			
Costs			
a. purchase; installed			
b. rented			
(1) fixed			
(2) variable			

Table 4
TERMINALS – TELEPRINTERS
Performance, Features, and Configurations

Characteristic	Vendor A	Vendor B	etc
Speed (bits per second)			
Duplex Mode			
Keyboard			
a. ease of use			
b. layout			
Platens and Paper			
a. size			
b. flexibility			
c. ease of changing paper			
Printing Characteristics			
a. number of characters			
b. ability to change font			
c. delay			
Formatting			
a. horizontal tabs			
b. vertical tabs			
c. backspacing			
d. half space			
e. position of next character			
f. position on line			
Physical Characteristics			
a. size			
b. portability			
c. room for modem			
Options			
a. double as typewriter			
b. magnetic tape			
c. paper tape			
d. automatic answer			
Special Features			
Special Applications			
Cost			
a. purchase			
b. rental			
(1) fixed			
(2) variable			

Non-vendor Information

Therefore, the buyer should not rely solely on vendor data in developing his user job requirements specifications. Other extremely useful sources of information on remote terminal system products and services are a number of recent and current articles in the electronic data processing trade journals. Many of these articles have summarized in convenient tabular form the numerous characteristics and performance data for the products and services available from most of the important vendors and manufacturers. Once this data has been gathered, compiled, and translated into a user job requirements specification, the next task is to integrate the information about each of the system components and its characteristics to arrive at a total terminal system.

Table 5
TERMINALS – CATHODE RAY TUBES
Performance, Features, and Configurations

Characteristic	Vendor A	Vendor B	etc
Speed (bits per second)			
Duplex Mode			
Keyboard			
a. ease of use			
b. layout			
Display Characteristics			
a. area			
b. spot diameter			
c. brightness			
d. characters per line			
e. lines			
f. character generation technique			
g. number of characters			
h. size of memory			
Formatting			
a. character typeover			
b. character delete			
c. line insert			
d. line delete			
e. roll up			
f. roll down			
g. tabulation			
h. type cursor			
i. split screen			
j. partial transmit			
Physical Characteristics			
a. size			
b. portability			
Options			
a. magnetic tape			
b. hard page copy			
Special Features			
Special Applications			
Cost			
a. purchase			
b. rental			
(1) fixed			
(2) variable			

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The Framing of Lee Harvey Oswald

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"That is not a picture of me; it's my face, but my face has been superimposed — the rest of the picture is not me at all. I will prove that it is a fake."
— Lee Harvey Oswald

On November 22, 1963, in Dallas, Texas, President John F. Kennedy, while riding in an open limousine through Dealey Plaza and waving to the surrounding crowds, was shot to death. Lee Harvey Oswald, an ex-Marine, and former visitor to the Soviet Union, was arrested that afternoon in a movie theatre in another section of Dallas; that night he was charged with shooting President Kennedy from the sixth floor easternmost window of the Texas School Book Depository Building overlooking Dealey Plaza. This act Oswald denied steadily through two days of questioning (no record of questions and answers was ever preserved). Two days later while Oswald was being transferred from one jail to another, he was shot by Jack Ruby, a Dallas night-club owner, in the basement of the Dallas police station, while millions of Americans watched on television. The commission of investigation, appointed by President Lyndon B. Johnson, and headed by Chief Justice Earl Warren of the U.S. Supreme Court, published its report in September 1964, and concluded that Oswald was the sole assassin and that there was no conspiracy.

In view of the authority of the Warren Commission, that conclusion was accepted by many Americans for a long time. But the conclusion cannot be considered true by any person who carefully considers the crucial evidence — such as the physics of the shooting, the timing of a number of events, and other important and undeniable facts. In other words, Oswald was not the sole assassin, and there was a conspiracy.

Introduction

On Saturday, November 23, 1963, Lee Harvey Oswald said to his captors in his Dallas jail cell, "I'm a patsy". The president had been dead for a little over twenty four hours. Oswald had by then been charged with his murder. Few, if any, people attached much significance to Oswald's remark at that time, or for some period of time afterward. Ten years later many Americans said the statement was typical of the lies Oswald told before his death and after his arrest.

Yet, in that one short phrase Oswald neatly summed up the essence of the most remarkable murder in the history of the United States. It was remarkable not only because Oswald was framed, but also because the truth about who framed him and why remains hidden from the American public and avoided by the American press after ten years.

This article examines the evidence showing that Oswald was "a patsy"; explores the possibilities of who framed him and why; and deals with his probable role in the assassination of President Kennedy.

"I'm a Patsy"

The Oswald remark is on target. He was a patsy. That is to say, he was unknowingly framed as the lone assassin of the president. Evidence was manufactured, an assassination site was created; and evidence was planted in such a manner that Oswald would be judged to be the assassin. All of this happened without his knowledge, even though he knew there was to be an assassination, and had reported this fact to the FBI.

Early Indications

The earliest indications of framing came from Oswald himself. In the light of ten years of collecting and analyzing evidence, it is now clear that every statement Oswald made in jail was true. Three of his statements are important here. First, he said, "I didn't kill anybody". Second, he said, "I'm a patsy". Third, he said, "That's not a picture of me; it's my face, but my face has been superimposed — the rest of the picture is not me at all. I will prove that it is a fake." The latter statement was made when he was shown a photograph of himself purportedly taken by Marina Oswald in the back yard of their house in Irving, Texas. The photo showed Oswald standing near a fence holding a rifle in one hand, a copy of the Daily Worker in the other hand, and wearing a pistol on his hip.

All three of these statements were true. The second and third statements pointed toward his being framed. Had the Warren Commission cared to look very hard, they could have followed these suggestions by Oswald and discovered evidence of framing. As we shall see, researchers have done just exactly that.

The Evidence Against Oswald

In order to examine evidence of framing, it is first necessary to review the evidence purportedly showing that Oswald assassinated President Kennedy. The evidence cited by the Warren Commission as hard core evidence is as follows:

1. A "sniper's nest" was found near a window on the sixth floor of the Texas School Depository

Building (TSDB) where Oswald worked.
2. The sixth floor window of the TSBD had a clear view of the area in front of the building where the shots struck the President.
3. Oswald was seen on the sixth floor prior to the assassination.
4. Oswald's rifle was found among some cartons on the sixth floor of the building.
5. Three shells were found on the floor beside the window. Tests proved the shells had been ejected from Oswald's rifle.
6. A bullet was found at Parkland Hospital on or near the stretchers of Governor Connally and President Kennedy. Tests proved this bullet had been fired from Oswald's rifle.
7. Two photographs of Oswald holding rifle and Daily Worker and wearing a pistol were found in a box in the garage at his house in Irving, Texas.
8. A witness, Howard Brennan, saw a man fire shots from the sixth floor window. Brennan subsequently identified Oswald in a line-up as the man he had seen.
9. Two witnesses saw Oswald place a paper bag in his friend's car and subsequently one of the two saw him carry the bag into the TSBD. A bag made of paper available in the TSBD was found on the sixth floor. The Commission concluded that Oswald had carried his rifle in the bag.*
10. Oswald's palm print was found on one of the boxes in the window upon which he presumably rested the butt end of his rifle and his hands and arms.
11. Bullet fragments found in the President's limousine matched Oswald's rifle.

The Sixth Floor Window

One single fact, proved beyond any reasonable doubt by photographic evidence alone, is enough to start anyone interested in the truth, on the path toward evidence of a frame-up. That fact is: "No one fired any shots from the sixth floor window of the TSBD".

The proof of this fact was largely given in an article by the author on the photographic evidence of the Kennedy assassination.[1] In summary, the proof consists of a series of photographs of the window and of the President taken at the time of the assassination. These photos show that the window was empty at the time the shots were fired and that a large oak tree blocked the view from the window at the time of the first shot. Two of these photos (#6 and #7) are reproduced herein.

Additional proof is offered herein by photographs 1 through 5. Photo #1 is the official police, FBI, and Warren Commission exhibit[2] showing the "sniper's nest" and the positions of the boxes surrounding the sixth floor window. The photograph was taken by Dallas police photographer, Robert Studebaker at approximately 6 p.m., November 22, 1963. The time can be confirmed not only by Studebaker's testimony[3] but also by the lack of shadows in the photo, and the appearance of dusk outside the window in this and other photos taken by Studebaker at the same time.

Photo #2 was taken by Dallas Morning News photographer Jack Beers, of the "sniper's nest" and the boxes at 4 p.m., November 22, 1963.[4] The time of this photo can be determined from Jack Beers' testimony and from the shadow angles in this photo and #3[4] taken at the same time.

A careful examination and comparison of the Beers and Studebaker photos will show that the boxes were all moved between 4 p.m. and 6 p.m. The three boxes piled one on top of the other near the window were changed to form two piles with a sloping angle such as would be found if a rifle were to be rested on them and pointed downward out the window. The Commission concluded that Oswald rested the block of the rifle on top of the two boxes and the barrel on the single box.

In the Beers photo, the wall of boxes shown on the left were moved back from the three boxes in the window in order to allow more room for a sniper to stand, kneel or sit. The Commission concluded that Oswald had enough room to sit or stand. One of the boxes in the solid wall was moved out and placed in the position where a sniper could have been sitting on it as he aimed his rifle. The police, FBI and Warren Commission concluded Oswald sat on that box. The circle drawn on the upper of the two boxes piled in the window in the Studebaker photo indicates a palm print of Oswald which the Commission concluded was imprinted when he fired the rifle.

To complete the frame it was necessary to raise the window to the fully open position shown in both photos #1 and #2. Photo #3 by Beers shows the view Oswald would have had looking out of the window toward the spot where the shots struck the President on Elm St. The exception to the real situation in this photo, and the clinching piece of evidence that no one fired any shots from that window, is the relative position of the top of the third box and the bottom of the raised window.

In photo #3 the window is completely open, as it is in photos #1 and #2. However, at the time of the shots, the window was only half way open (i.e., open half as far as it would go). This is proved by photo #4 taken by James Murray, Black Star photographer, less than 15 minutes after the shots were fired. It is also confirmed by photo #5 taken by Jack Beers about 15 minutes after the shots were fired.

Both of these photos were taken before anyone moved the window or the box showing in the window.

Photo #6 taken by Robert Hughes and photo #7 taken by Tom Dillard were reprinted in the May 1970 article, and substantiate the fact that neither box nor window were moved by the time of the Willis and Murray photos. The Hughes photo was taken 5.7 seconds before the first shot and the Dillard photo was taken 3.5 seconds after the last shot.

All four photos prove that the window bottom was too close to the top of the top box in the pile of three boxes to allow a rifle with telescopic sight to extend out of the window in the manner described by the Warren Commission. The dotted line in the Beers photo #3 shows where the bottom of the window was at the time of the shots. The gray silhouette area above the box shows how high the rifle with telescopic sight would have been if it had been resting on top of the box.

The question might arise as to whether the boxes were moved twice; once from their true position into the positions shown in the Beers photo #2 at 4 p.m., and a second time back into their original positions as shown in the Studebaker photo #1 at 6 p.m. For this to have happened, whoever moved the boxes would

* The expression "Oswald's Rifle" will be used herein to mean the rifle found on the sixth floor of the Depository Building. There is still considerable doubt as to whether it was actually Oswald's rifle and which rifle it was.

have to have moved the entire wall of boxes up closer to the window for Beers, and then moved them back again for Studebaker. This seems highly unlikely since it was known that Beers, a news photographer, would probably publish his photos. If a sniper's nest really had existed at the time of the shots, it seems unlikely that the boxes would have been moved into positions eliminating that sniper's nest so that Beers could take a photo of them.

The clincher on this point is the comparison between the four photos (4, 5, 6 and 7) of the box in the window from the outside, against Beers' two photos (2 and 3) and Studebaker's photo (1). The upper corner of the box is the point on which to focus. Compare the horizontal and vertical position of the corner with respect to the sides and top and bottom of the window, as well as the position with respect to the window sill in the distance from the edge of the sill.

The Beers' photos of the box corner match. The Studebaker photo does not match. Beers' photos show the true position of the box at the time of the shots. Beers photo #18 shows how tight the space was between the wall of boxes and the three boxes in the window. Here there was no room for any of the three newsmen or Beers and the second cameraman to stand between the boxes and the window while the Dallas police official was standing there. In this photo, the window is still only half way open.

The Frame-Up

Once the conclusion has been reached that no one fired shots from the sixth floor window, all of the evidence pointing to Oswald firing shots from the window becomes suspect. It seems logical to carefully examine each piece of evidence to see whether it could have been planted, and to examine other evidence to see whether Oswald was framed and how. The Warren Commission certainly did not do this. There is no indication that the FBI or the Dallas police did either. Each piece of evidence against Oswald will now be examined in this way.

The "Sniper's Nest"

The foregoing section on the photographs of the "sniper's nest" clearly indicates there was no "sniper's nest" at the time the shots were fired. The boxes in the window were randomly stacked from the earlier part of the day. A floor repair crew had moved them over to the southeast corner while working in the southwest corner of the sixth floor.

Someone moved the boxes and rearranged them to look like a "sniper's nest" between 4 p.m. and 6 p.m. on November 22, 1963.

The Clear View from the Sixth Floor Window

As has been illustrated, there was no clear view from the sixth floor window of the positions on Elm St. where the President was located when he was hit. At the time of the first shot, a large elm tree blocked the view. At all times during the shots, not enough space existed between the top one of three boxes and the bottom of the half open window for a rifle with telescopic sight to fit through the opening.

Oswald's Presence on the Sixth Floor

Several other authors, notably Mark Lane in Rush to Judgement[5] and Sylvia Meagher in Accessories After the Fact,[6] have destroyed the credibility of any evidence that Oswald was on the sixth floor of the TSBD at the time of the shots. In summary, their conclusions based on available evidence from Warren Commission documents point to Oswald being on the first floor or second floor in a lunchroom area of the building at the time the shots were fired. No witnesses saw him on the sixth floor for nearly half an hour before the shots, while three witnesses saw him on the first and second floors about 15 minutes before the shots and within a minute or two after the shots. Oswald himself said he was on the first floor when the shots were fired and on the second floor when police officer Baker and Roy Truly of the TSBD management met him drinking a coke.

Oswald's Rifle

There is little question in the mind of most researchers that Oswald's rifle was found on the sixth floor almost one hour after the shots were fired. There is considerable doubt, however, about how the rifle got there, who brought it into the building, how it was obtained from Oswald's house, and how and when the bullet and three shells were fired and ejected from it. As was pointed out earlier, if the conclusion is reached that no one fired shots from the sixth floor window, then evidence of planting of the rifle, shells and bullet becomes interesting.

The Commission concluded that Oswald carried the rifle into the building in a brown paper bag which was made of materials available in the TSBD. This conclusion is based on testimony from Buell Wesley Frazier, Oswald's associate who drove him to work that morning, and Frazier's sister, Annie May Randle. Both of them saw Oswald put a package about two feet long in the back seat of Frazier's car. Frazier saw Oswald carry the package into the building.

Oswald claimed the package contained curtain rods for his room in Oak Cliff. He lived in a room by himself during the week. The Dallas police claimed that a paper bag was found on the floor near the window and that this was the bag Oswald used to carry in the gun.

The police, FBI, and Warren Commission were unable to produce a photograph of the bag lying on the floor. The best they could do was Studebaker Exhibit F shown in photo #8. It has a dotted line showing where the bag was lying when it was supposedly found.

Photo #9 shows Dallas policeman, Lt. Montgomerey, carrying the purported Oswald bag out of the TSBD. This photo, taken by Jack Beers, also was snapped at 3:30 p.m. The time can be established by other photos taken by Beers at the same time which show the time of day on the Hertz clock atop the TSBD. Also, Beers' statements confirm the time.

Two questions arise: why is the bag more than four feet long when Frazier and his sister said it was no longer than two feet? The second question is why are there no official police photos of the bag inside the building, and why did it take the police so long to remove it (around 3 hours) from the building?

One possible answer to all of these questions is that Oswald carried real curtain rods into the building and someone else carried the rifle in. Someone manufactured the large paper bag from materials in the TSBD between 12:30 p.m. when the shots were fired, and 3:30 p.m. when the bag was carried out. Whoever made the bag constructed it long enough to enclose the rifle assembled (40 inches), not realizing that it should be shorter for a disassembled rifle. No photo of the bag on the floor exists because the bag was never there.

Photo #10, taken by Gene Daniels of Black Star, proves that Oswald's room was in need of curtains.

It shows his landlady on Saturday morning, November 23, putting up curtains in Oswald's room. Daniel's statement confirms the time and he also stated that the landlady would not let him in. He sneaked in with a reporter and snapped the photo without the landlady's knowledge. There were curtain rods in Oswald's garage and what's more, they were just the right length, 27½ inches long.[7]

The entire episode of the rifle, the bag, the curtain rods, and the official police story smells highly of frame-up. As to how the rifle was removed from Oswald's room and fired, with a whole bullet plus three shells being recovered to be subsequently planted, no evidence has been brought forth. Two possible explanations will be explored. First, that someone did fire the bullet into a recoverable material prior to the assassination. Someone did remove the rifle from the Paine garage where Oswald kept it. Someone did carry the rifle into the building and plant it in the area near the stair well. Someone did plant the shells on the floor near the sixth floor window. Someone did plant the bullet in Parkland Hospital. Someone did manufacture the paper bag.

The second explanation is that someone fired three shots with Oswald's rifle from another location and then planted the rifle and the shells after the assassination. This will be discussed in more detail at the end of this article.

The Three Shells

Photo #11 is the official picture of the police, FBI, and Commission, showing the three shells lying on the floor near the window. There are two pieces of evidence proving this was frame-up planted evidence. The first is the statement of Roger Craig, deputy sheriff of Dallas County.[8] Craig was with the first group of officials arriving on the sixth floor. He saw the shells lying neatly stacked against the wall of the building, about three inches apart and parallel to each other perpendicular to the wall. In other words, not at all in the positions shown in the Studebaker photo (which was taken at 6 p.m.) and not at all in random positions as they would have been if they had been ejected from a rifle.

The second piece of evidence is a recent Commission document indicating that only two shells were found on the floor.[9]

The indications are that one person or group planted the shells on the floor without realizing they should be scattered randomly. A second person or group scattered them and added a third shell to match the rest of the frame-up story in time for Studebaker to take the photo at 6 p.m.

Bullet 399

The bullet found at Parkland Hospital which was fired from Oswald's rifle has been variously labeled: bullet 399 (because it became Commission Exhibit 399); "The Magic Bullet" (because it would have had to perform magic tricks to have done everything the Warren Commission concluded it did); and the "Bastard Bullet".

The latter title was awarded by Ray Marcus[10] in a thorough scientific analysis proving that it was planted in the hospital. Other authors, Josiah Thompson[11] and Robert Cutler,[12] have also shown it was a planted bullet, and Harold Weisberg[13] has speculated about a Cuban working in Parkland Hospital who may have planted it. A second possible explanation of how that bullet reached Parkland Hospital is given at the end of this article.

The implications of this evidence framing Oswald are widespread. First, someone had to gain access to Oswald's garage in advance of the assassination. Second, someone had to plan the frame-up well enough to fire the bullet and then to recover it and plant it in whatever hospital the President might have been taken for treatment. Parkland was the logical choice with the assassination being executed in Dealey Plaza, since it was directly on the route via the Stemmons Freeway to the Trade Mart where the President was scheduled to speak. The bullet could have been planted elsewhere, however, if plans had changed. The hospital planting was not accomplished with much finesse since the bullet was recovered from an area near Governor Connally's stretcher rather than from President Kennedy's stretcher directly.

The prime reason to believe the bullet was planted is its pristine condition. The Commission concluded the bullet passed through President Kennedy and three parts of Governor Connally, striking bone in several places, and deflecting its trajectory, leaving many more grains of material than were actually missing. Cutler also shows that the bullet would have had to make two nearly right angle turns and have paused for a good fraction of a second in mid-air between Kennedy and Connally.

The second possible explanation of the bullet's pristine condition is that it actually did hit President Kennedy in the back, but penetrated only to finger depth and later fell out of his back or clothing in the hospital.

The Fake Photographs

One of the most blatant portions of the Oswald frame-up were the two photographs of him planted in a box in his garage at the Paine house in Irving sometime before they were "found" by the police on Saturday afternoon, November 23.

A comprehensive study of the two photographs (which were published in Life magazine) has been made by researcher Fred Newcomb[14] in California. A forty slide presentation analyzing many features in the two photos proves conclusively that they were both fakes. Someone superimposed a photo of Oswald's head on two photos of a body of another person who was photographed holding a rifle and a copy of the Daily Worker and wearing a pistol.

Photos #12, 13, 14, 15 and 16 are reprints from Newcomb's slide series. Photo #12 shows the two fake pictures as printed in Life magazine in 1964. Photo #13 shows the real chin of Oswald compared to the chin in the fake pictures. It is obvious that the chin, sans cleft, belongs to someone else. Photo #14 showing the head in both fake pictures, makes it clear that the Oswald head photo was joined to the other body just above the chin.

Photos 15 and 16 show that the two body lengths differ by about a foot when the two heads are made to match exactly. The nose shadows in photo #12 are vertical while the body shadows fall at an angle. The ring on the body in photo 12 is on the wrong hand. Oswald always wore his ring on the other hand.

There are a number of other points indicating that Oswald was right when he said the photos were faked.

Someone photographed a man standing in Oswald's backyard with the two guns and the Daily Worker. Someone obtained a photo of Oswald's head and using photographic techniques made two composition photos. Someone planted the two photos in Oswald's garage

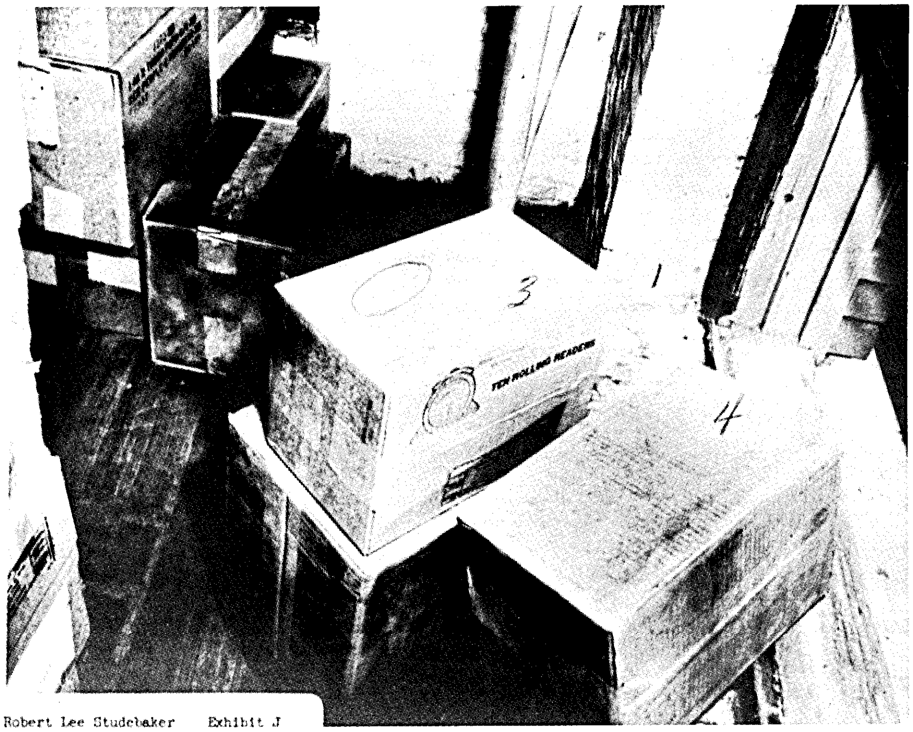


Photo 1. Studebaker, Exhibit J – *Warren Commission Exhibits,* Vol. XXI, Page 649, "Sniper's Window"

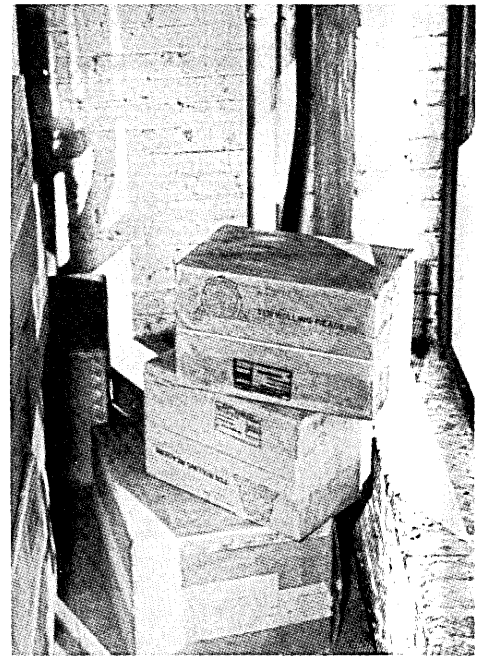


Photo 2. Jack Beers Photo – *Dallas Morning News,* "Sniper's Window"

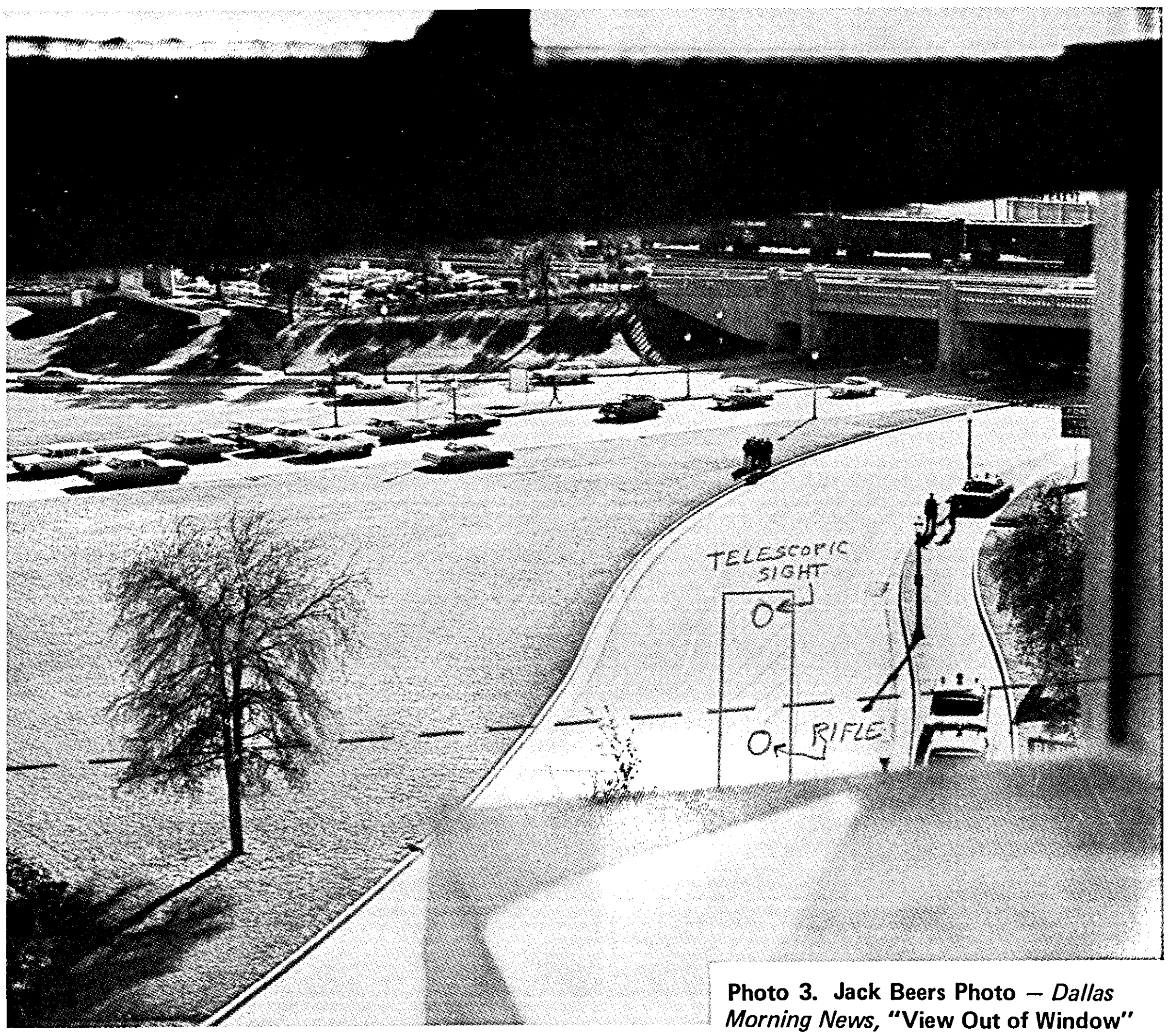


Photo 3. Jack Beers Photo – *Dallas Morning News,* "View Out of Window"

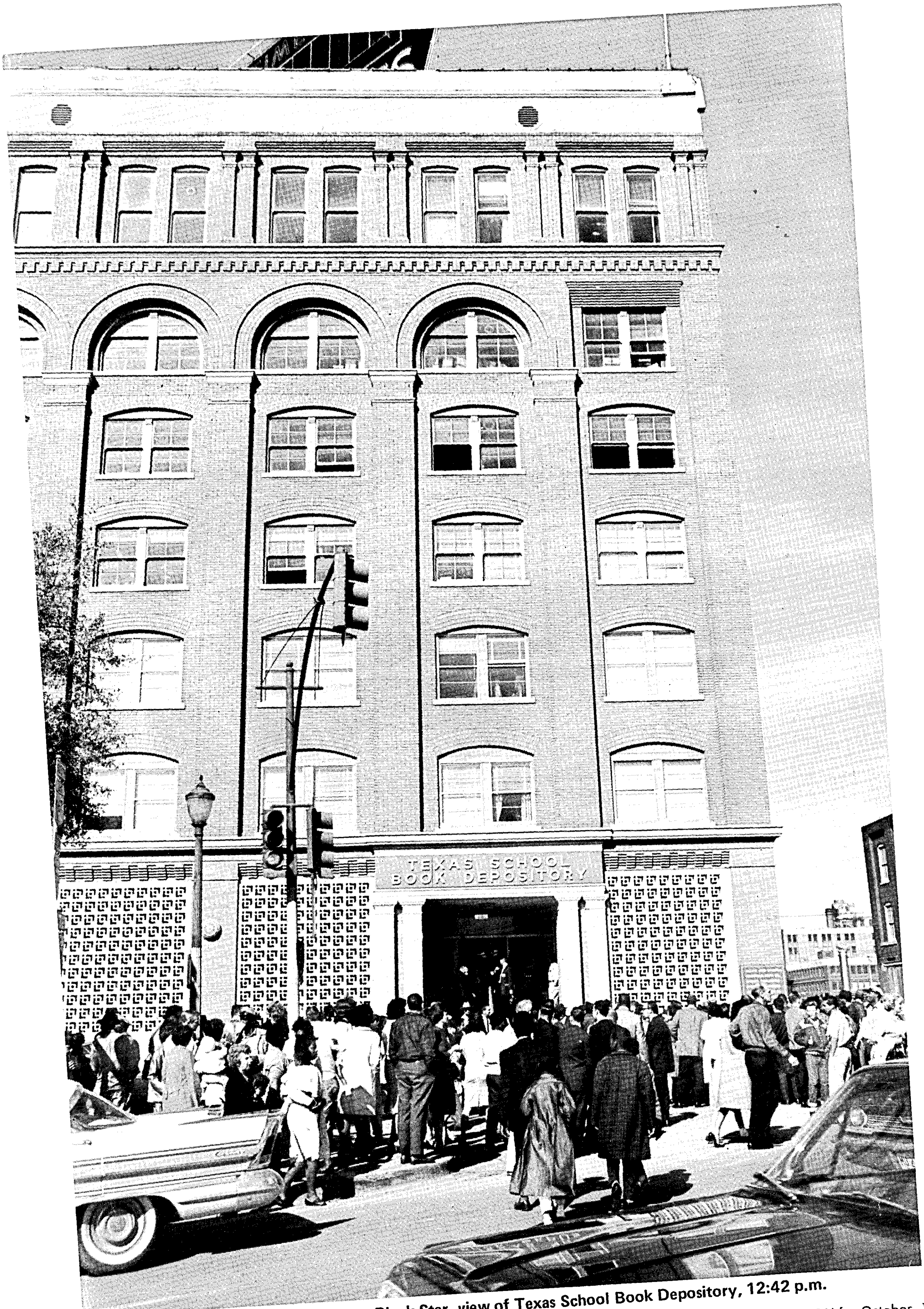


Photo 4. James Murray Photo — Black Star, view of Texas School Book Depository, 12:42 p.m.

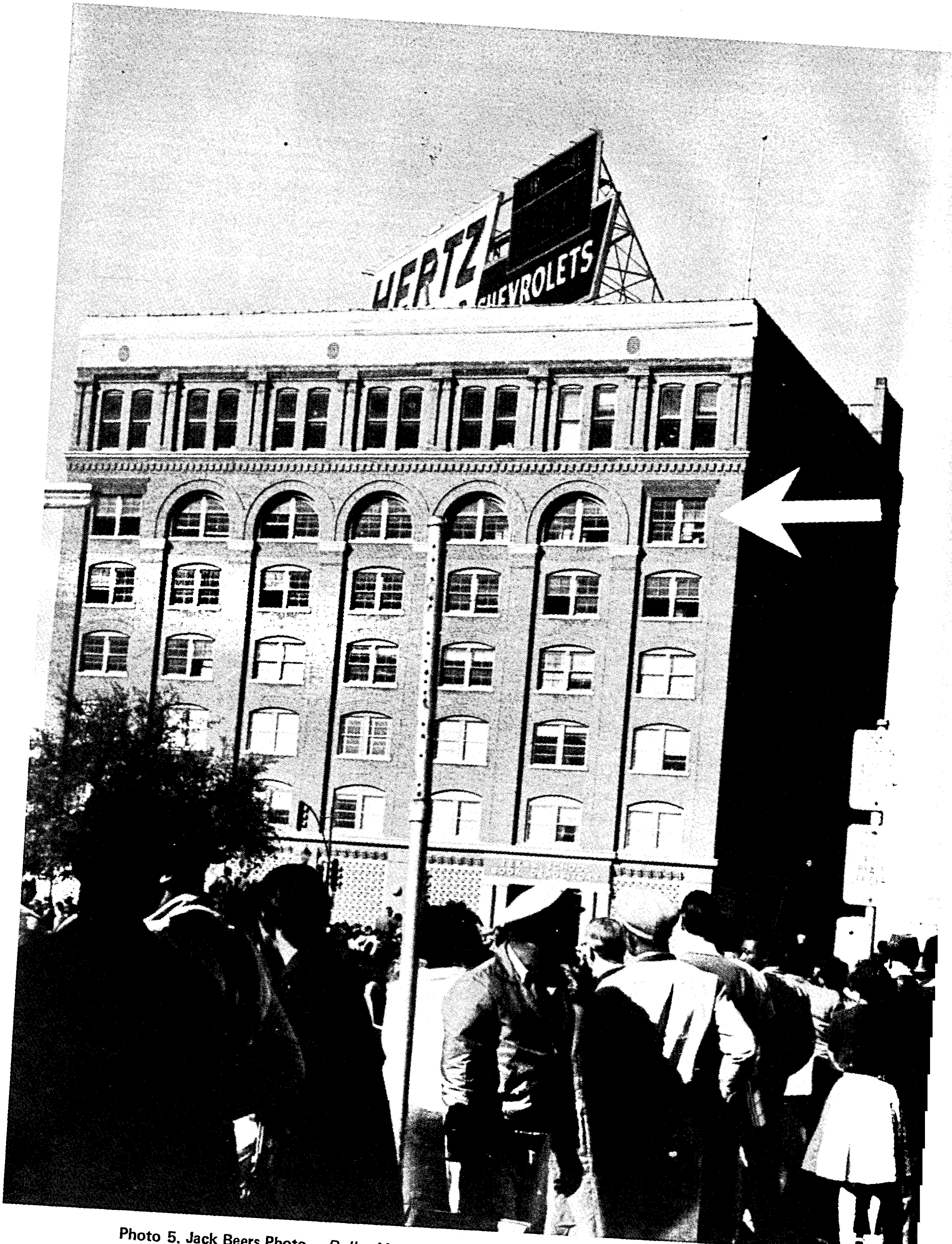


Photo 5. Jack Beers Photo – ***Dallas Morning News,*** **view of the Texas School Book Depository**

Photo 6. Robert Hughes – Frame from movie, *Dallas Amateur,* President Kennedy and the Texas School Book Depository, 12:30 p.m.

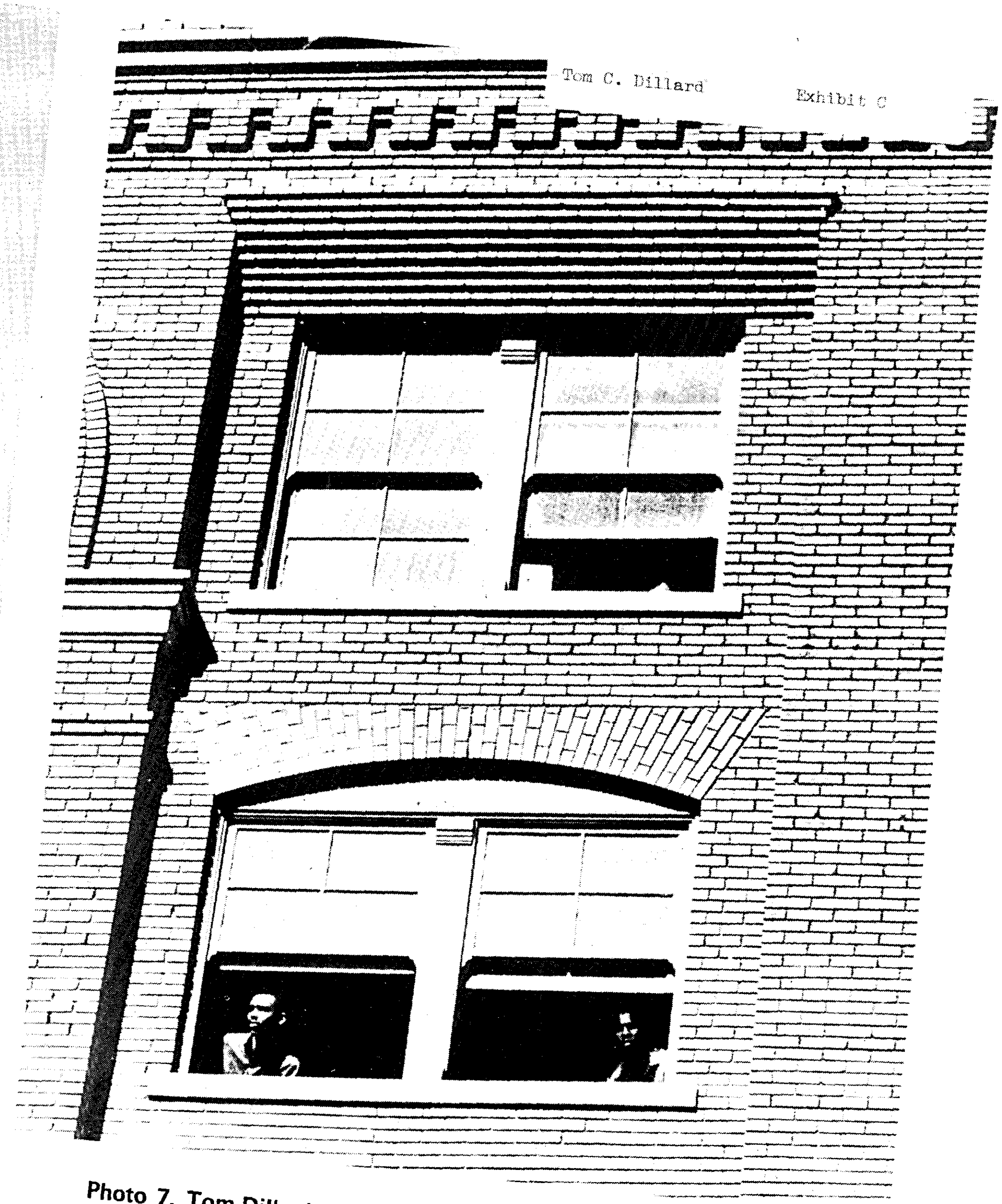
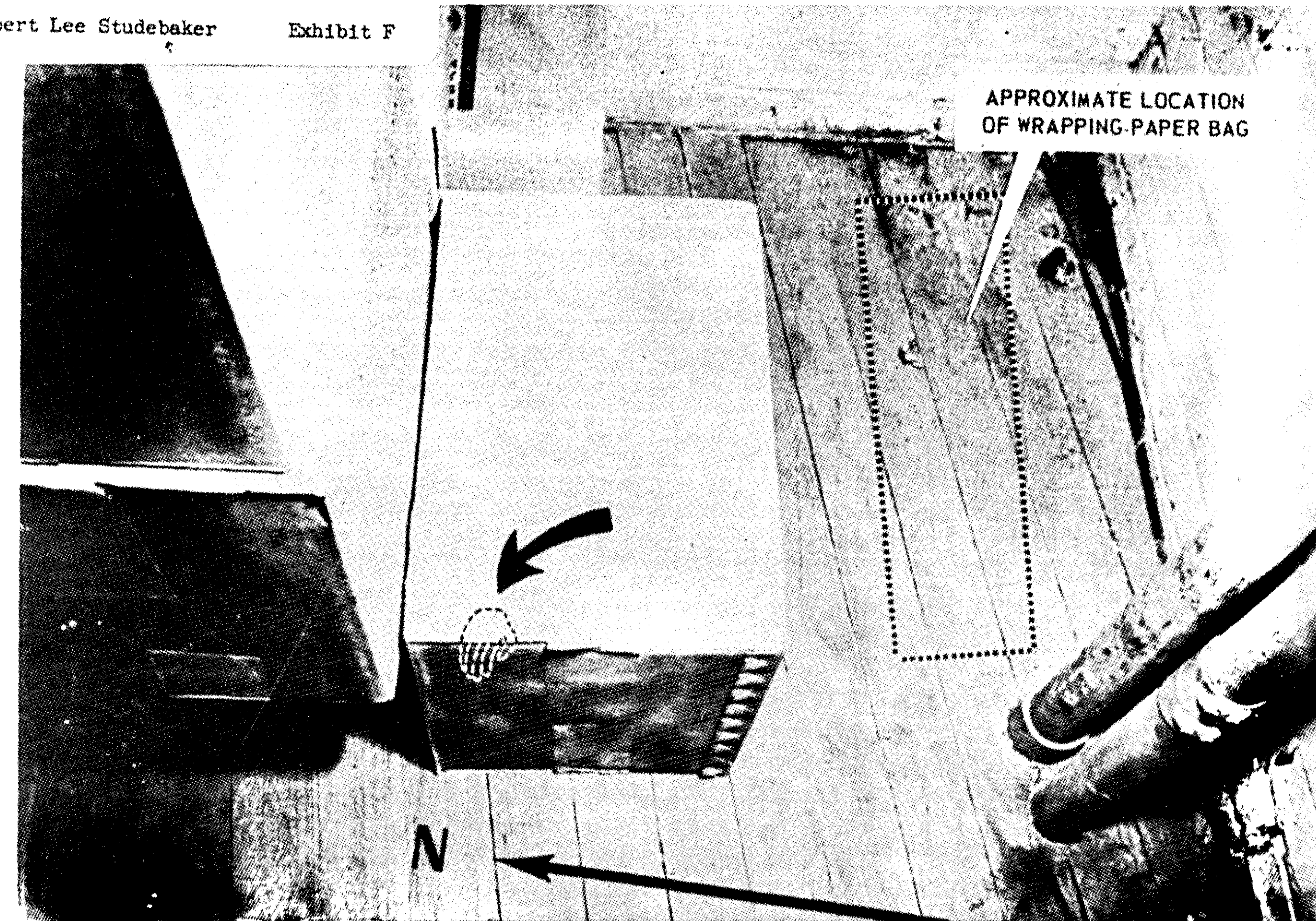


Photo 7. Tom Dillard Photo – *Dallas Times Herald,* view of the Texas School Book Depository, 12:30 p.m.

Robert Lee Studebaker Exhibit F



33. APPROXIMATE LOCATION OF WRAPPING-PAPER BAG AND LOCATION OF PALM PRINT ON CARTON NEAR WINDOW IN SOUTHEAST CORNER. (HAND POSITION SHOWN BY DOTTED LINE ON BOX)

Photo 8. Studebaker Exhibit F, Vol. XXI, Page 647, Photo of spot where paper bag was

Photo 9. Jack Beers Photo — *Dallas Morning News,* Bag supposedly used by Oswald to carry rifle

Photo 10. Gene Daniels Photo — Black Star, shows Oswald's landlady putting up curtains

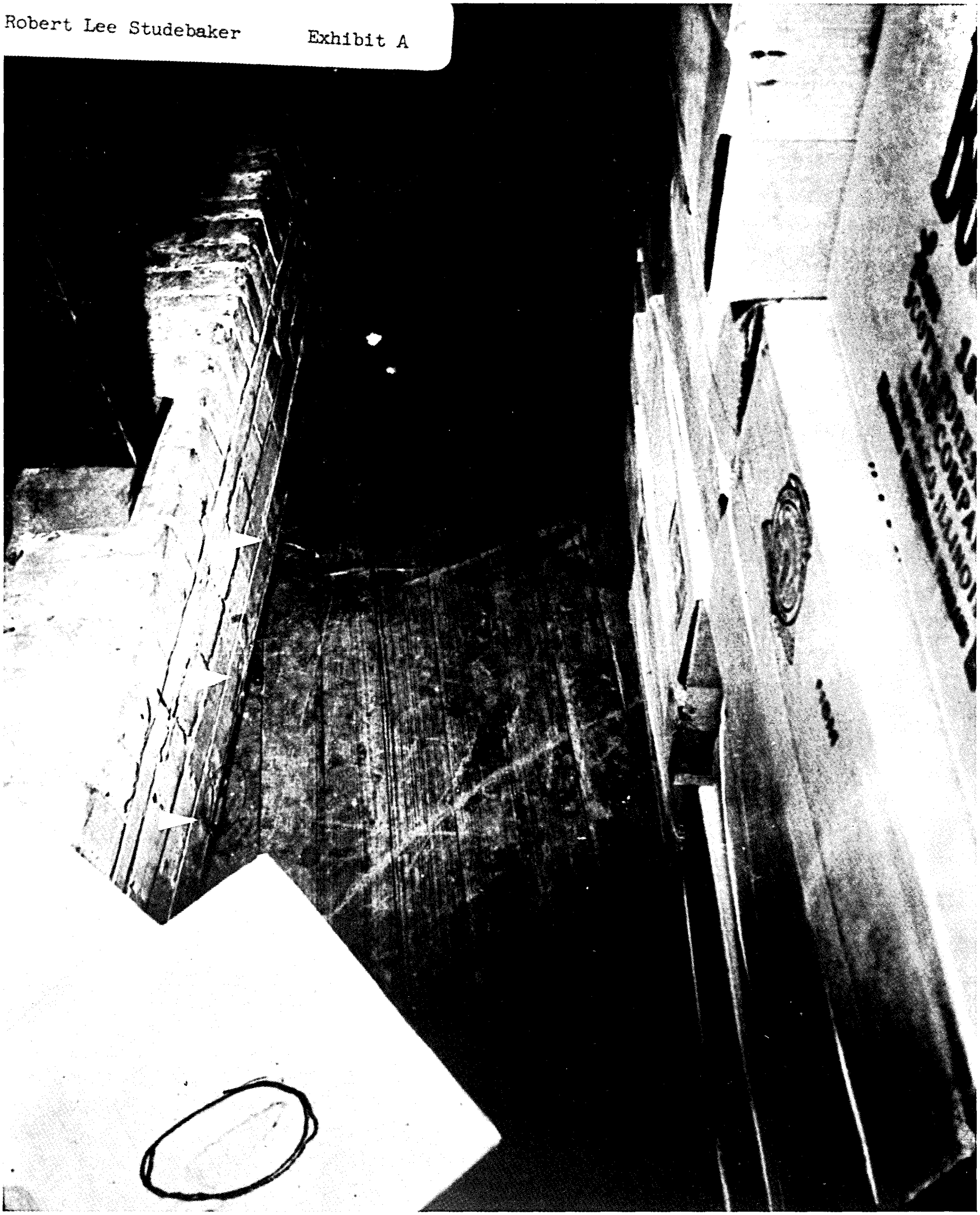


Photo 11. Studebaker Exhibit A — shows three shells on floor (each pointed to by an arrowhead)

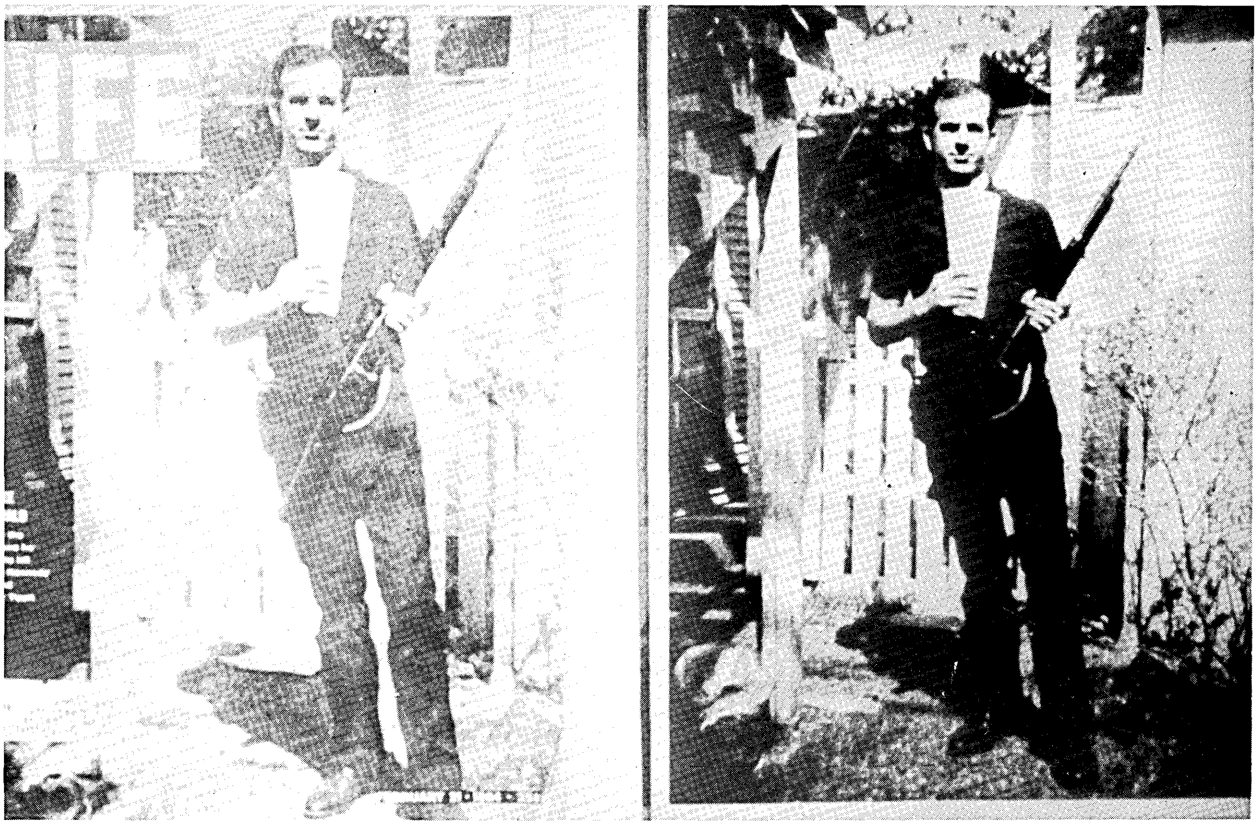


Photo 12. Fred Newcomb Slide Series — reprints of two photos of Oswald's head and another body

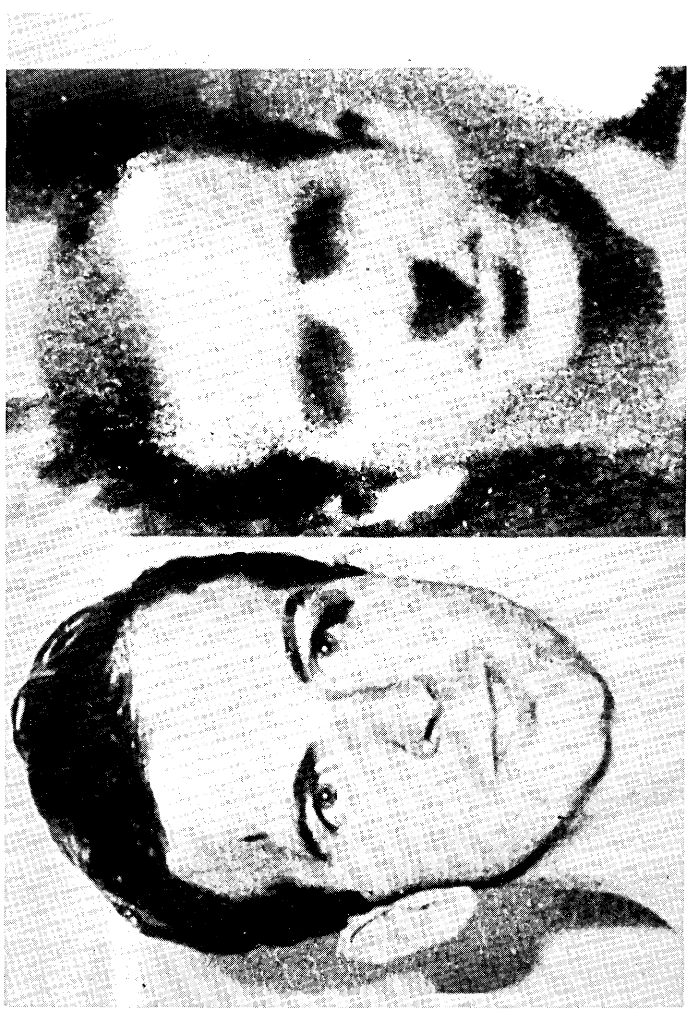


Photo 13. Fred Newcomb Slide Series — Oswald's chin, compared to chin in fake photo

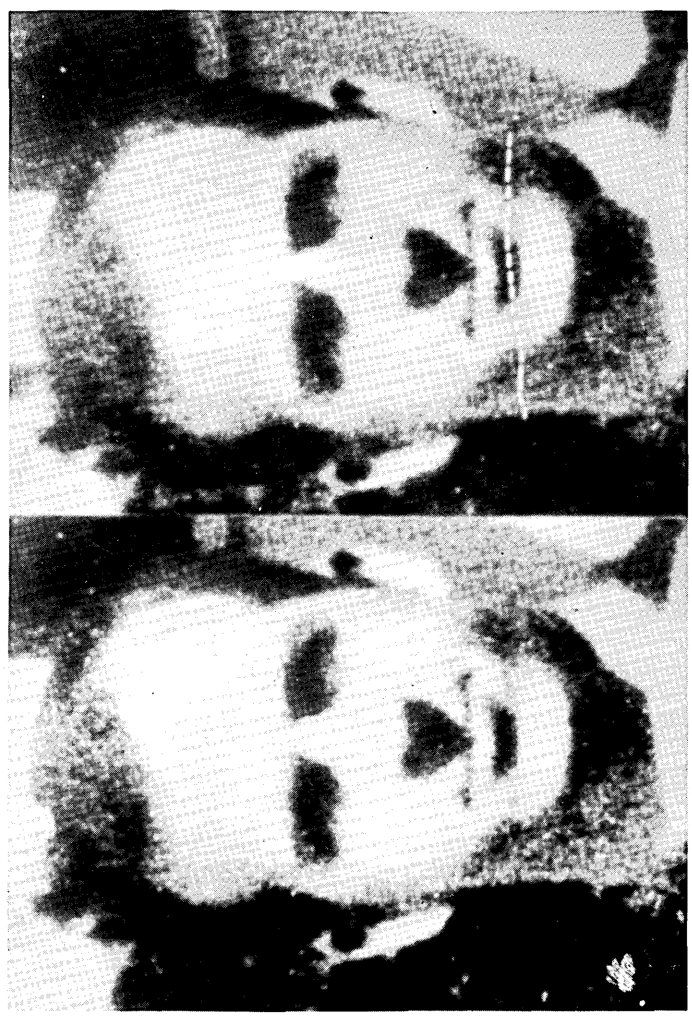


Photo 14. Fred Newcomb Slide Series — Blowups of both fake chins and Oswald's head

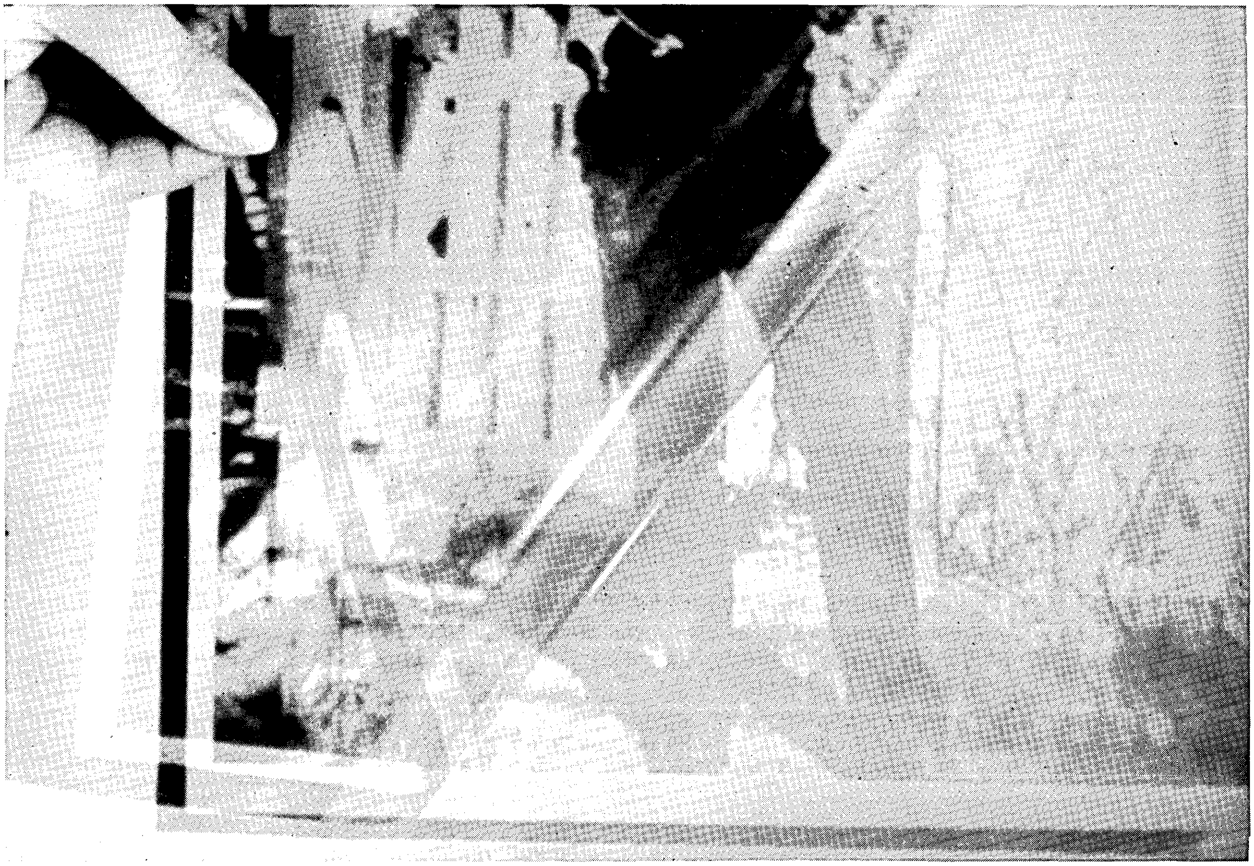


Photo 15. Fred Newcomb Slide Series — Body from one fake photo

Photo 16. Fred Newcomb Slide Series — Bodies from both fake photos, overlaid

Photo 17. Murray photo — Black Star, Howard Brennan in front of Dal-Tex Building

Photo 18. Jack Beers photo — *Dallas Morning News,* Newsmen observing "sniper's nest"

prior to the afternoon of November 23. Since the above actions would certainly have required more than twenty-four hours, it would seem that the framing arrangements using the photos were made well ahead of the assassination. It is possible that the police planted the photos when they searched the Paine house on Friday, November 22, but the photographic work had to have been accomplished some time before that.

Howard Brennan

The Warren Commission's star witness against the dead Oswald was Howard Brennan, who was a construction worker sitting on a wall near a reflecting pool across Elm St. from the TSBD. Brennan testified that he looked up from his position and saw a man fire the shots from the sixth floor window, pause after the last shot and slowly withdraw the rifle. Later he identified Oswald as the man after some difficulty.

Three photos prove Brennan was lying. The first one is the Dillard photo #7 showing no one and no rifle in the window at 3.5 seconds after the last shot. The second photo, #17, shows Brennan in front of the Dal Tex building at 12:34 p.m., four minutes after the shots were fired. He is the construction worker in the background talking to some officials and looking up at the Dal Tex building. The fact that he is not looking at the TSBD after four minutes is not conclusive by itself. However, the third photo, the Zapruder film (which cannot be reproduced here), shows Brennan sitting on the wall wearing his helmet.

Brennan looks at President Kennedy all during the Zapruder film and <u>never looks up</u>. His helmet is always horizontal. From his position almost directly below the sixth floor window, he could not have seen the window, unless he tilted his head back, because of the helmet. He is also looking down Elm following the President rather than looking directly across to the TSBD.

While Brennan may not have been directly involved in the frame-up, his fabrication of the story and subsequent "identification" of Oswald certainly seem suspicious.

The Paper Bag

This piece of evidence has been sufficiently proven to be a planted fake in previous paragraphs.

Oswald's Palm Print

The palm print of Oswald shown circled in photo #1 need not have been planted. Oswald worked on the sixth floor and undoubtedly handled and touched most of the boxes on that floor.

The Bullet Fragments

Of all the physical evidence linking Oswald's rifle to the assassination, the strongest are the bullet fragments found on the floor of the limousine. The FBI tests reviewed by the Warren Commission were not completely conclusive as to whether all of these fragments had come from Oswald's gun. However, the FBI experts testified that the <u>two largest</u> fragments had been fired from the rifle, "to the exclusion of all other weapons".

The lack of mention by the FBI of spectrographic and neutron activation analyses of the fragments, the rifle and bullet 399, seemed suspicious at the time the Warren Report was issued. In 1973, the National Committee to Investigate Assassinations (NCTIA) discovered that both types of tests had actually been conducted by the FBI and the results suppressed. Freedom of information suits were initiated by Harold Weisberg, the NCTIA, and others, to make public the results of those suits.

If neutron activation tests confirm that the two large bullet fragments were fired from Oswald's rifle, the case for planting them in the limousine must be examined. The only opportunity for planting the fragments was just after the arrival at Parkland Hospital, unless one permits the possibility that they were planted by the Secret Service or the FBI.

The Dal-Tex Building and Oswald's Rifle

A second explanation of how the rifle, shells, bullet 399, and bullet fragments might have wound up where they did was suggested in late 1972 by some of Dr. Cyril Wecht's findings when he examined the autopsy materials. The wounds in President Kennedy's back, head and throat, including a possible exit wound at the central base of the skull, suggest the following scenario, when coupled to other known facts:

The assassination team stole Oswald's rifle from his garage and positioned one of the shooters in the second floor window of the Dal-Tex Building with the rifle. This rifleman got off three of the six shots fired. The first was at Z226, the second at Z269 and the last at Z312.

The first shot hit President Kennedy in the upper back, penetrating to finger depth, creating the back shot phenomenon seen in the Zapruder film between Z226 and Z227. This was bullet 399 which fell out of President Kennedy's back into his clothing, and later fell out of his clothing onto a stretcher at the hospital.

The second shot missed and struck the curb near Tague. The third shot struck President Kennedy in the head driving him forward for 1/18 of a second, when the final shot struck from the grassy knoll driving him backward.

The third shot from Oswald's rifle shattered into many pieces, two large fragments landing on the floor of the car. Immediately following the shots, the Dal Tex rifleman or an associate picked up the three shells ejected by the shots and took them with the rifle down the rear stairwell, out the freight entrance, across Houston St., in the rear freight entrance of the Depository Building and up the elevator or the rear stairs to the sixth floor. He planted the three shells by the sixth floor window and the rifle in the northwest corner and left.

The man would have had plenty of time to do this since the first officials to reach the sixth floor, Roger Craig and Weitzman, did not arrive up there for about fifteen minutes.

This explanation accounts for all of the matching of bullet shells, fragments and bullet 399 with Oswald's rifle.

Summary of Frame-Up

After examining the evidence of frame-up, it seems obvious that many people were involved and that careful advanced planning and work was involved. Here is what the framers did:

1. Obtained Oswald's photo
2. Obtained Oswald's rifle
3. Took photos of a man in Oswald's back yard
4. Created two fake composite photos of Oswald and another man prior to the assassination
5. Fired at least two shells and one bullet from Oswald's gun prior to the assassination or during the assassination from the Dal Tex Building; they fired three shots

6. Planted the fired bullets at Parkland Hospital (under explanation one)
7. Planted the two or three shells from the Dal Tex Building on the sixth floor of the TSBD Building
8. Planted Oswald's rifle on the sixth floor
9. Moved boxes to look like a "sniper's nest"
10. Made a large paper bag out of TSBD materials
11. Arranged for Brennan to falsely identify Oswald and to lie about seeing a man with a rifle in the window
12. Arranged for Marina Oswald to lie about taking the two fake photos of Oswald. (She told the Commission she could only remember taking one photo at first.)

Who Framed Oswald

By now the reader is sure to have obtained some clues about who framed Lee Harvey Oswald. It is obvious that selected members, if not all of the Dallas police force, faked, planted, rearranged and created some of the framing evidence. This does not mean that the Dallas police members were the assassins of the President, or the sole framers of Oswald.

Marina Oswald obviously lied about taking the fake photo. Either she was involved in the frame-up, or coerced or bribed to lie. Howard Brennan is subject to some suspicion. The Cuban in the Parkland Hospital may have been involved. Oswald's cohorts in the assassination team were also no doubt involved in framing him.

Oswald was informing on the team to the FBI, prior to the murder. He was quite surprised when the assassination took place in front of the TSBD, as evidenced by his change in behavior from calmly drinking a coke to a fast exit and trip to his room to pick up his pistol.

His dual role as an informer for the CIA and the FBI[15] led him to a point where he had infiltrated the assassination group and was considered by them to be part of the team. It is conceivable that they made him the patsy after discovering he was reporting their activities to the FBI. At any rate, he did not seem to realize he had been made the patsy until after his arrest and being charged with the assassination.

Because of this dual role situation and because of the necessity for gaining access to Oswald's possessions and his house, the people closest to him must also come under suspicion. Michael and Ruth Paine, his landlord and landlady, Marina Oswald herself, Jeanne and George DeMohrenshildt, his close friends from Russia, and his friend Buell Wesley Frazier, must all be viewed with skeptical attitudes as possible framers.

Marina especially, after Lee's death, did more to frame him and hang him in effigy in the minds of many, than anyone else. Her testimony before the Commission was packed with provable lies and innuendoes helping to convict him in death.[16] The Paines could have known about or participated in providing the framers with his rifle, and in planting the fake photographs, perhaps even in taking the body shots. Frazier was in the unique position of gaining access to the rifle and also in a position to have seen Oswald carry a package into the building. Frazier owned a British 303 rifle, was a crack shot, disappeared for several hours after the assassination, and when finally located at his father's house, said he hadn't heard the news.

Early reports on TV and radio described the assassin's rifle as a British 303. The police raided Frazier's house while he had disappeared and confiscated his 303 rifle and many rounds of 303 ammunition.

George DeMohrenschildt was obviously involved in Soviet and possibly CIA espionage activities. Several authors (notably Sauvage,[17] Flammonde,[18] and Joesten[19]) have postulated his participation in the assassination and framing of Oswald.

As for the individuals within the Dallas police department, those most immediately involved with the planted evidence and those who were "on the scene," so to speak, must be viewed with suspicion.

Robert Studebaker, the official Dallas police photographer, was either the world's greatest foil for a frame-up, or else he was deeply involved. Certainly no professional, by the time Studebaker testified (April 1964) before the Warren Commission, could have failed to notice the photographic discrepancies pointed out in this article.

The police officers who "found" the fake photographs, the rifle, the shells, the paper bag, and the "sniper's nest" are logical suspects. The people who moved the boxes around to look like a "sniper's nest" were either Dallas police officers or Dallas County Sheriffs. The were no other possible suspects on that sixth floor prior to 6 p.m. Newsmen and photographers who were there were tightly controlled at the entrance to the TSBD and on the sixth floor.

Finally, there had to be a photographic expert, equipped with delicate enlarging and developing equipment, to make the fake composite photos. The evidence for framing is strong indeed and points to infiltration and recruiting by the conspirators of the Dallas police and perhaps other Dallas authorities.

Mother in History

One person has stoutly maintained since November 24, 1963, that Lee Harvey Oswald was innocent and was framed. Lee's mother, Marguerite Oswald, has not only believed and stated this contention, but has also conducted extensive research on her own initiative into the assassination. She has been criticized, ridiculed, and berated by many. Through the years she has been proven right about a number of things.

Marguerite Oswald was the first person to obtain a lawyer (Mark Lane) to defend her son and to try to arrive at a just hearing for him. She was the first person to maintain that her son was working for the CIA. She was right about that. She is right about his innocence and about his being framed. And finally, she has much yet to contribute to the solution of this century's greatest crime. After all, she was Lee's mother and does know a great deal about his habits and personality.

Congressional Investigation

If a Congressional Investigation is ever brought into being, it would do well to begin with the framers of Lee Harvey Oswald in pursuing the assassins and conspirators who murdered our President.

List of Photographs and Exhibits

1. Studebaker Exhibit — Warren Commission Exhibits Vol. XXI, Page 649, "Sniper's Window"
2. Jack Beers Photo — Dallas Morning News, "Sniper's Window"
3. Jack Beers Photo — Dallas Morning News, "View Out of Window"

4. James Murray Photo — Black Star, view of TSBD 12:42 p.m.
5. Jack Beers Photo — Dallas Morning News, view of TSBD 12:45 p.m.
6. Robert Hughes — Frame from movie, Dallas Amateur, President Kennedy and TSBD 12:30 p.m.
7. Tom Dillard Photo — Dallas Times Herald, view of TSBD 12:30 p.m.
8. Studebaker Exhibit F, Vol. XXI, Page 647, Photo of spot where paper bag was
9. Jack Beers Photo — Dallas Morning News, Bag supposedly used by Oswald to carry rifle
10. Gene Daniels Photo — Black Star, shows Oswald's landlady putting up curtains
11. Studebaker Exhibit A — shows three shells on floor
12. Fred Newcomb Slide Series — reprints of two photos of Oswald's head and another body
13. Ibid. — Oswald's chin, compared to chin in fake photo
14. Ibid. — Blowups of both fake chins and Oswald's head
15. Ibid. — Body from one fake photo
16. Ibid. — Bodies from both fake photos, overlaid
17. Murray photo — Black Star, Howard Brennan in front of Dal Tex Building
18. Jack Beers photo — DMN, Newsmen observing "sniper's nest"

Footnotes

1. Richard E. Sprague. "The Assassination of President John F. Kennedy: The Application of Computers to the Photographic Evidence." Computers and Automation, May, 1970
2. Hearings and Exhibits of the Warren Commission, Vol. XXI, p. 649.
3. Ibid., Vol. VII, p. 142.
4. Photos 2 and 3 were published in a book, Destiny in Dallas by Jack Beers and H. B. Denson. The photos have not been and are not available from the Dallas Morning News.
5. Mark Lane. Rush to Judgement. New York: Holt, Rinehart and Winston, 1966.
6. Sylvia Meagher. Accessories After the Fact. New York: Bobbs Merrill, 1967.
7. Hearings and Exhibits of the Warren Commission, Vol. IX, p. 425.
8. Reference, Craig's statement.
9. Reference, new document.
10. Ray Marcus. The Bastard Bullet. Privately published, 1966.
11. Josiah Thompson. Six Seconds in Dallas. New York: Bernard Geis, 1967.
12. Robert Cutler. The Flight Path of Bullet 399. Privately published.
13. Harold Weisberg. Oswald in New Orleans. New York: Canyon Books, 1967.
14. Fred Newcomb. Slide series on fake Oswald, photos and text. Sherman Oaks, Calif.: Privately published.
15. For evidence of Oswald as paid informer, see: Paris Flammonde, The Kennedy Conspiracy, New York, Meredith Press, 1969.
16. See Joachim Joesten, Marina Oswald, London, Peter Dawnay, 1967.
17. Leo Sauvage. The Oswald Affair. Cleveland: World Publishing Co., 1966.
18. Paris Flammonde. The Kennedy Conspiracy. New York: Meredith Press, 1969.
19. Joachim Joesten. Marina Oswald. London: Peter Dawnay, 1967. Joachim Joesten. Oswald: The Truth. London: Peter Dawnay, 1967. □

Unsettling, Disturbing, Critical . . .

Computers and Automation, established 1951 and therefore the oldest magazine in the field of computers and data processing, believes that the profession of information engineer includes not only competence in handling information using computers and other means, but also a broad responsibility, in a professional and engineering sense, for:

— The reliability and social significance of pertinent input data;

— The social value and truth of the output results.

In the same way, a bridge engineer takes a professional responsibility for the reliability and significance of the data he uses, and the safety and efficiency of the bridge he builds, for human beings to risk their lives on.

Accordingly, Computers and Automation publishes from time to time articles and other information related to socially useful input and output of data systems in a broad sense. To this end we seek to publish what is unsettling, disturbing, critical — but productive of thought and an improved and safer "house" for all humanity, an earth in which our children and later generations may have a future, instead of facing extinction.

The professional information engineer needs to relate his engineering to the most important and most serious problems in the world today: war, nuclear weapons, pollution, the population explosion, and many more.

Nixon and the Mafia — Part 2

Jeff Gerth
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"Organized crime will put a man in the White House someday, and he won't even know it until they hand him the bill."

— Ralph Salerno

$1,000 Bills

A good example of the unifying nature of the politics of corruption, Cuban style, are the vast investments during the Forties in south Florida real estate by the Ansan group. The group's visible partners were the Minister of Education, Jose Aleman, his wife Elena Santiero and Dr. Anselmo Alliegro, Batista's close friend and Minister of Finance in the Forties. Aided by Miami allies like Smathers' law firm, Keyes company, and the Hunt firm, the Ansan group managed to buy large chunks of real estate in anonymity. By failing to register changes in stock ownership with the state incorporation office, by presenting false ownership information, by paying for the land in cash, and by shielding the real ownership behind an elaborate maze of real estate fronts, the real roots of the Ansan group and their capital remained a mystery.

Aleman is considered responsible for the siphoning of between $60,000,000 and $174,000,000 from the Cuban Treasury in the years before his death in 1950. The story goes that Aleman simply pulled up to the Treasury with a truck and hauled off the loot. Aleman is guilty, of that there is no doubt. As for how much he took, that can never be answered, for all the pertinent records relating to the Cuban Treasury were later stolen and never recovered.

The Ansan group purse strings, swelled by the Cuban Treasury as well as Batista money (in the person of Alliegro) had one other source. That was what George C. Vilas, IRS Intelligence Special Agent, had in mind February 20, 1948 when he filed a report "with regards to large real estate purchases in the Miami area." The IRS report states:

1. At the time "Lucky" Luciano was on board a ship at a New York dock prior to his deportation to Italy (Feb. 1946) he was visited by Frank Costello, who is alleged to have carried suitcases on board containing around $2,000,000, representing Luciano's share of gambling income during his incarceration. When Costello left the ship he did not have the suitcases.

2. When Luciano came to Cuba eighteen months ago (in violation of his deportation proceedings) he was visited by a number of underworld characters prior to his deportation to Italy by Cuban authorities. In connection with Cuban deportation charges Luciano employed Cuban Senator Santiero, the father of Elena Santiero y Garcia, the president of Ansan and other corporations that have made large investments in real estate in this area. It is believed that some of the funds being invested in this area by Mrs. Garcia may belong to Luciano or other underworld characters, which was turned over to Senator Santiero in Cuba.

Additional information reveals further contact between leading underworld figures and Cuban political officials connected to the Dade County investments. Meyer Lansky, who had helped arrange Luciano's deportation, paved the way for "Lucky's" illegal entry into Cuba, via Italy, then Mexico. Lansky had made arrangements with the Cuban government "to receive Luciano warmly, though unofficially."

During his brief stay in Cuba, "Lucky" managed to move in all the right circles. A report by a Federal Narcotics Bureau agent operating undercover in Havana stated "that Luciano had already become friendly with a number of high Cuban officials through the lavish use of expensive gifts."

The IRS noted that the funds used for Ansan's purchases "consisted entirely of currency in bills of $1,000 denomination." The IRS tried to ask Elena Santiero about the origin of the bills, many of which were consecutively numbered. She referred them to her lawyers, Hunt and Salley, who gave a simple response: the money had been "earned or acquired in Cuba." Of course they didn't mention how it was earned or acquired. The IRS's suspicions were increased when Vilas noticed that Elena was "transferring this sum to Miami in currency, rather than through [normal] banking channels." (The money was deposited by the escrow agent in Ed Ball's Florida National Bank and Trust of Miami. Ball figures later in the development of Key Biscayne.)

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Though shrouded in secrecy, the workings of the Ansan group remain a model of how the Miami/Havana connection shifted its emphasis from corruption to espionage. Political espionage, be it gun-running, invasions of Cuba or snooping in Washington, or laundering money through Miami banks, is the byword since 1959 of the Miami/Havana connection.

A good example of a Miami bank linked to this connection and Richard Nixon is the Pan American Bank. The bank was started in 1945 by George Salley of Hunt, Salley and Roman (attorneys for Wofford and Ansan). Early directors included Kenneth Keyes and William Roman, and down through the years leading executives of Keyes have been directors as well as Salley and Roman. The top fifteen stockholders in the Sixties included Anselmo, Alliegro, Hoke T. Maroon and Walter Frederich, the last two of whom are investment partners of Nixon and Smathers. In recent years, another Nixon/Smathers investment partner, Sloan McCrae, has been a director of the bank. In a 1960 stock suit involving his Pan American Bank stock, Alliegro was identified as fronting for Batista. The judge said "All inferences point to the startling fact that — the stock may be in the property of Batista and is being held by the Plaintiff [Alliegro] to prevent Dictator Castro from seizing it." The bank was identified in the McClellan hearings as helping to finance, in conjunction with some Teamsters officials in 1959, a proposed gun-running scheme that found weapons and ammunition going to Batista sympathizers.

The Key Biscayne Story

Before 1940 Key Biscayne was undeveloped and unlinked to the mainland, its land titles firmly in the hands of two wealthy northern estates — the Deerings, a family of Chicago industrialists and the Mathesons, a family of New York financiers.

In the Forties the Mathesons offered a large chunk of the Island — 808 acres — as a county park if the county would finance a causeway to the mainland. Working behind the scenes to set up the details was Ed Ball.

Ball is the brother-in-law of Alfred I. duPont, manager of the billion-dollar duPont empire in Florida. In 1950 Ball helped finance and organize the election of his close friend and vicious anti-Communist George Smathers to the U.S. Senate. Both men were friends with Smathers' old high-school buddy, Bebe Rebozo. In 1963 it was Ball, Rebozo, and another friend of Ball's — World War I flying ace, Eddie Rickenbacker — who "arranged the necessary introductions which led to Nixon joining a New York law firm" (Mudge, Rose, Guthrie and Alexander) according to a 1969 article on Rebozo in Women's Wear Daily. When the causeway was finished after World War II it bore the name Rickenbacker Causeway. The Causeway project brought skyrocketing land values to Key Biscayne, and it also brought some shady land deals. In March 1943, the Matheson estate sold 193 acres (tract six) on the southern end of the island to the head of Keyes Realty Company — Kenneth Keyes created a special company especially for this transaction, its principals being himself and three Cuban clients. Tract six was described in 1946 by the Miami Herald as "probably one of the most valuable pieces of land in the United States, not excepting the financial district of Manhattan."

Keyes and his friend paid only $200,000 — barely ten percent of the assessed value — for land whose value was conservatively estimated at $1,930,000. In 1946 Keyes set up a new affiliate company and transferred the title for $10.

In 1947, a 370-acre parcel of land owned by the Deerings — a parcel covering the southern tip of the island and adjacent to the Matheson tract six — passed to the Ansan group. The attorneys for the Deering estate "negotiated" a price of $1,700,000, well below the conservatively assessed value of $4,000,000. The First National Bank of Miami Beach — owned by the Smathers family — acted as trustee for the Ansan group. The Smathers law firm "convinced" the Miami newspapers in 1948 to withhold from the public information concerning land deals in the Miami area — including those on Key Biscayne — until after the Cuban elections of that year.

But the alliance of the Smathers family with the Ansan group and with Ball were only part of the story. In 1945, amidst some of Kenneth Keyes' juggling acts, a man named Wallace Groves, fresh from a term in Federal prison for fraud, caught some of the land action on Key Biscayne. A few years later Groves turned up in the Bahamas, working for Meyer Lansky, finance minister of American organized crime, developing plans for Bahamian casinos to be linked with the American underworld. To this day government informants maintain that "Groves is under obligation to cut Lansky in on all deals."

In 1952 the American Mercury magazine of Miami identified the Key Biscayne holdings of the Chicago-based Deering family as a front for "Capone interests."

The Mackle Brothers

Meanwhile, the three Mackle brothers — Robert, Bruce, and Frank — were making their first millions through the development of housing tracts on Key Biscayne. The Mackles had received their land in large chunks in suspicious deals from the Matheson Estate. By 1953, with the opening of the Mackle's Key Biscayne Inn and Villas, Richard Nixon had become a regular visitor. The series of intimate villas bordering the ocean have proved to be a favorite retreat and meeting place for Nixon down through the years. Another frequent guest was FBI Director J. Edgar Hoover. (It was the FBI that located Barbara Jane Mackle, daughter of Frank Mackle, buried in a box during a 1968 kidnapping. Both Hoover and Nixon personally visited Miss Mackle at the Villas shortly after the bizarre event.)

In December 1953 Nixon and William Rogers, then Deputy Attorney General, held a meeting at Key Biscayne with Joe McCarthy, telling the Wisconsin Senator to "ease off" on his attacks. (Interestingly enough, before the Key Biscayne resort opened, Nixon's visits to the Miami area, as well as those of Hoover, found them at two hotels owned by G. Meyer Schine, whose son David Schine was a prominent figure in the McCarthy hearings. Today the elder Schine is a director of the Boca Raton bank through which $114,000 in mysterious Watergate funds passed. Twenty years earlier, Schine, as a witness before the Kefauver Committee reluctantly admitted that he had lease arrangements with bookmakers at his Miami Beach hotels.)

The Mackles had even closer connections with organized crime. In 1958 they entered into a partnership in the General Development Company with Lou Chesler, a business associate of Meyer Lansky. Other investors in the land development company included two other Lansky business associates, one of whom — "Trigger Mike" Coppola — was a notorious syndicate "hit" man. The year the Mackles sold out, 1961, one of those Lansky associates was involved in the fraudulent trading of the company's stock, for which he was later convicted.

Enter the Teamsters

In 1958 the Ansan group "found" a buyer for 547 acres of Key Biscayne. His name was Arthur Desser, a close friend of Jimmy Hoffa. That year — 1958 — Desser got a $5,000,000 loan from the Teamsters which probably went to help cover the $13,000,000 price of the Key Biscayne acquisition.

About this time the Teamsters were taking control of the Miami National Bank and within a few years Desser and the real estate company he controlled had become closely connected with the bank.

Also connected to the bank was Meyer Lansky. According to a 1969 Federal indictment of Lansky and some of his associates, the Miami National Bank was used between 1963 and 1969 as a depository for skimmed and illicit funds, money which also flowed in and out of the interlocking Exchange and Investment Bank of Switzerland.

In 1959 — three years after its founding — the bank's control passed to the Teamsters Central, Southwest and Southeast States Pension Fund in the form of a loan. In 1964 a loan from Lansky frontman Sam Cohen (Cohen was indicted with Lansky in 1969) retired the Teamster loan and influence. With his foot already in the door, Cohen finished taking over the bank by 1966. Over that 1956-66 period of Hoffa-Lansky control, six top executives and three other directors of the bank were subject of government indictments.

Worldwide Realty

By 1964 a company called Worldwide Realty shared three common directors with the Miami National Bank as well as some mutual large stockholders. Worldwide also took loans from the Miami National for five of its subsidiaries and owned the building in which both companies operated.

Major figures in Worldwide had conducted numerous transactions with John Lansky (Meyer's brother) and other Lansky associates, and it is the belief of some organized crime investigators that these Worldwide figures are "respectable" business associates of Lansky's.

Through a number of joint ventures Worldwide was closely connected in the early Sixties with another Florida realty company — Major Realty. In 1968, when the Lansky-connected people had disappeared from control of the company, it was revealed that a director and a large stockholder (94,000 shares) in Major Realty was then-Senator George Smathers.

Nixon and the Miami National Bank

The worlds of Major and Worldwide Realty are marginally linked to Richard Nixon, but Nixon's links to the Lansky-related Miami National Bank are more direct.

There is, for example, a man named William Pallot, a Smathers-type Florida Democrat who was a chief executive officer and director of the Miami National Bank from 1959-1963. After leaving the Miami National, Pallot founded the International Bank of Miami, one of whose directors, James Angleton, is a member of the CIA. In 1968 Pallot headed the Florida State Chapter of United Citizens for Nixon/Agnew.

Furthermore, Miami National was the chief creditor in a bankruptcy case that resulted in a $3,000,000 damage suit against Nixon and other members of his New York law firm in 1968. The suit, which is still pending, involves the Atlas Sewing Company of Miami. It alleges that Nixon and his firm negotiated a contract between Atlas and Nixon clients, the Irving Trust and Beneficial Finance Company. According to the suit, Irving assigned $20,000,000 in Atlas accounts to Beneficial, which in turn "skimmed $5-6,000,000."

The key figure in the case, Irwin Ray, the court-appointed trustee, got his job through the efforts of the president of the Miami National Bank. (According to the court papers, the trustee had "underworld connections.") Before bankruptcy, Atlas turned to a small New York investment firm for its underwriting, a firm whose partners have given more than $25,000 to Nixon's Presidential campaigns.

Nixon's dealings with the Miami National Bank may also have brought him into contact with one if its directors — one James Lawrence King — for in October 1970, Nixon appointed King to be a judge in the U. S. District Court for Southern Florida. King has said he has "no comment" on Lansky's use of the Miami National.

One of King's first cases as a judge involved a suit against Bebe Rebozo's Key Biscayne Bank. It involved the passage of some stolen stock through the bank, and, according to several Miami reporters, King was in the process of quietly dismissing the case until the Miami News began looking into it.

The Cape Florida Development Company

Not all the Key Biscayne corporations met with success. In 1962 Worldwide Realty lost most of its Key Biscayne holdings. The Ansan group foreclosed on Worldwide's Key Biscayne acreage after Worldwide failed to meet two year's mortgage payments. The Ansan group then put an $8,000,000 price tag on their newly repossessed parcel.

Four years later the land was still unbought. That year Bebe Rebozo founded the Cape Florida Development Company. Other founders included Donald Berg, who became company president, Francisco Saralegui, a wealthy Cuban refugee newspaper publisher, Robert Haverfield, a Florida State Senator, and three others.

Largely through the efforts of Haverfield, the state of Florida decided to create a park on the southern end of Key Biscayne, to be called Cape Florida State Park. The state of Florida then forked over $25,000/acre for land assessed at $15,145/acre. Ansan and company received at least $1,000,000 more than their $8,000,000 asking price, even though the land had gone unbought for four years. In keeping with their history of sound government relations, the Ansan principals and their lawyers "persuaded" Dade county officials to forego taxes during the option period of the sale in return for the "granting of permission" for the public use of some of the property.

Thus twenty years after its northern end became a park through a deal tainted by conflict-of-interest, Key Biscayne's southern end also became a public park in a similar manner. Both deals involved Ed Ball, and both centered on land prices considerably out of line with their assessed value. While the causeway-park swap in the Forties benefited corrupt Cuban figures working within organized crime, the mid-Sixties' creation of the Cape Florida park benefited the organized-crime-tainted Ansan group Worldwide Realty, and Bebe Rebozo's Cape Florida Development Company, which in 1966 — the year the park was created — paid $1,000,000 to Worldwide for one hundred prime waterfront lots adjacent to the park.

For a short time Rebozo's development company claimed it was having trouble selling its high-priced lots. But in 1967 Rebozo brought in Richard Nixon for a promotional photo and sales picked up quickly. In return Nixon got two lots at a "substantial discount". In the usual care-and-feeding tradition, Nixon was allowed to pay a little more than $25,000 each for two lots worth $75,000 total at the time, and now worth well over $100,000.

Mysteriously, the yet-to-be President recorded only one of his new lots at the Dade County Courthouse. The other lot went unrecorded for four years — until June, 1971. The reason Nixon concealed his ownership of the lot for those four years was that there were two previous mortgages on the Cape Florida development held by Arthur Desser, who was associated with Lansky and Jimmy Hoffa through the mob-controlled Miami National Bank. The first of these mortgages was satisfied in February 1971, and the second in March 1971. Nixon waited until both mortgages were satisfied before he recorded his lot, thereby avoiding the stigma of a connection with Dresser.

Nixon made another strange land purchase in Cape Florida about this time. He bought George Smathers' house (next door to Rebozo's) in 1968 for $125,000. This would seem fair enough, but the very next year, 1969, the house was assessed at a value of only $76,000, just sixty percent of the President's buying price.

The Nixonization of Key Biscayne

With Nixon's promotional photograph for Rebozo's development company and the establishment a year later of the Florida White House, the Nixonization of Key Biscayne was in full bloom.

The story of Key Biscayne is complex and shrouded in mystery, but there are some indisputable truths and some irrepressible suspicions.

Clearly, Nixon left one of his Cape Florida lots — on which the Florida White House now sits — unrecorded for four years because of the taint of a financial connection with Arthur Desser. He was therefore aware of Desser's connections with Mafia kingpin Lansky, and he did not want the public to know that the President would become involved with such a man. The unrecorded lot is a good example of Nixon's attempts to cover his tracks whenever there is a threat of major scandal.

One wonders whether this explains why he concealed his employment with the OPA for so many years, or why the crucial court file in the Atlanta Records Center is so mysteriously unavailable.

One also wonders about Don Berg, the man who sold Nixon his lots. The Secret Service found Berg's "background" questionable enough to tell the President to stop eating at his Key Biscayne restaurant. Berg has told Newsday that he is "well-acquainted" with Lou Chesler, a Meyer Lansky business associate, and once entered a deal with Chesler, only to have it collapse because a third party died. Chesler then went ahead with the deal by enlisting the aid of another Cape Floridian, whose lot bordered Nixon's.

Berg's relationship with organized crime is of particular interest in light of the fact that the two previous owners of his subdivision in the previous twenty years — the Ansan group and Worldwide Realty — both have significant links with organized crime.

Now Nixon's island paradise seems more like a closed compound of corruption than the innocent resort home of an elected official. With the two ends of the island "reserved" as parks, the central district of homes is reserved for an elite group at least a few of whom reserved their places in highly questionable fashion. If you talk to enough residents of Key Biscayne you realize how tight the island is, how everybody knows what everybody else is up to.

For example, one local resident recounted for me in a long-winded forty-five minute rap, the history of just about every parcel of land in the island. Large pieces of land exchange hands rarely, rarer still among strangers.

For Richard Nixon, like most of the other Key Biscayne property owners, life on the island is fat and secure. The only bank is owned by the President's closest friend, Rebozo. The largest landowners are also good friends: for example, Harold Geneen, president of ITT and recent purchaser of six new lots. The ITT conglomerate itself also became an official Nixon neighbor recently, purchasing the last large (thirty-eight acre) tract of undeveloped land there.

On August 22 this year, as he drove from the island to a jam-packed "Youth-for-Nixon" rally following his coronation at the Republican Convention in nearby Miami, Nixon must have felt quite secure as he drove by the homes of men like Geneen, past Rebozo's bank, past the Mackle brothers' Key Biscayne Inn and Villas, past ITT's Royal Sheraton, all on land handled so profitably by people like the Ansan group, the Deering family, Donald Berg, Kenneth Keyes, Robert Haverfield, George Smathers, and all overshadowed by Meyer Lansky.

The rootless Mr. Nixon seems to have found a fitting home on Key Biscayne.

The Denixonization of Fisher Island

Nixon's Cape Florida deal wasn't his first private Floridian land venture, nor was it the first one cloaked in secrecy.

Sometime after his defeat in the 1962 California gubernatorial election, Richard Nixon began acquiring land in Fisher Island Inc., a secretive investment syndicate headed by Bebe Rebozo, whose sole holding was Fisher Island, an undeveloped 220-acre island just off the southern tip of Miami Beach. The dealings of Fisher Island Inc. are so secretive that there is no definite date as to when Mr. Nixon began buying it. The common guess is 1962, but the authors of American Melodrama put the date at 1960.

Nixon's Fisher Island investment was apparently intended to be a long-range one. Seemingly out of politics, Mr. Nixon could afford to do a little wheeling and dealing, particularly as he had left the Vice-Presidency with only $49,000.

As Nixon began to re-enter the national political scene in the late Sixties, discontent broke out in the ranks of Nixon's fellow investors, most of whom were close associates of Smathers and Rebozo. By 1968 Nixon's presence in the syndicate and the exact circumstances surrounding his investments became a liability. One investor, Hoke T. Maroon, told friends: "I wanted Nixon out. How can you pull a political deal when the President of the United States is your partner? Everyone in the world is looking over your shoulder."

Immediately after becoming President, Nixon maintained he "had no plans to sell the stock". But soon thereafter leaks — presumably from fellow investors — found their way into the Miami News. By February 1969, Nixon sold his 185,291 shares in the Fisher Island venture. (It is said that despite stockholder resistance Nixon was paid two dollars per share, double his money. The exact circumstances of Nixon's "investment" and "return" in Fisher Island remain a mystery.)

The political deal that Hoke Maroon complained Nixon's presence would hamper involved the building of a causeway linking Fisher Island to the Florida mainland, a maneuver requiring taxpayer assistance, and one that would provide a spectacular increase in the value of the real estate.

Interest in the causeway was intensified when Rebozo acquired most of the island in 1957, and with the progress of his plans for a resort-style development there. Testimony in the Bobby Baker hearings a few years later disclosed that Baker's business associates, the Texas Murchisons, were involved in the proposed building of that causeway.

Clint and John Murchison are Texas multi-millionaires who multiplied their father's $300,000,000 fortune in oil through construction, recreational concerns like the Dallas Cowboys, and publishing, among other ventures. The Murchisons are close friends of Lyndon Johnson and were featured guests at John Connally's Texas barbeque, held in 1972 for Nixon's benefit.

A Murchison associate named Thomas Webb testified at the Baker hearings that "we had been working on it [the causeway] for over a year. The purpose of the meetings [Webb's meeting with Murchison and others in the winter of 1959] there was with the city council and county commissioners whom we had been working with for quite a while ... [sic]"

Fisher Island Inc. had a lot of good friends in government to help swing the deal. Members of Miami city council included Robert Haverfield, later a Rebozo business partner and principal in the Key Biscayne deals, and Grant Stockdale, an aide to George Smathers. The city manager was Ira Willard, who later became the first president of Rebozo's Key Biscayne Bank.

Leonard Bursten

In his testimony, Webb identified a man named Leonard Bursten as "one of the people we were working with on this causeway."

Bursten's reputation as a man with "important connections" made him a logical choice for behind-the-scenes negotiating. Bursten was a Milwaukee attorney who was brought to Washington by Joe McCarthy to work on McCarthy's Senate Investigating Committee. The year 1959 was an exciting one for him, for while he was trying to swing the Fisher Island causeway deal he also concocted a scheme to get the ousted Cuban dictator Batista asylum in the U.S. and at the same time managed to get involved in an income tax evasion case which later led to his conviction. Bursten eventually gave up on the causeway, although Rebozo and friends are still trying.

Bursten is also close friends with Jimmy Hoffa and helped found the Miami National Bank, which Hoffa and the Teamsters controlled while Bursten was a director. Bursten has been indicted twice in 1971-72 in connection with the scandal-ridden Teamster-financed Beverly Ridge Estates project in Los Angeles.

The Beverly Ridge project is not far from another Teamster-financed project, the Truesdale Estates, in Beverly Hills. This choice development, built by the Murchisons, was where Nixon established his California residence in 1961. Bursten thought enough of Nixon to distribute anti-Catholic literature in Nixon's 1960 campaign against John Kennedy.

Nathan Ratner

While Bursten has strong links to the Fisher Island project and to the Teamster's dealings in the Miami National Bank and elsewhere, a man named Nathan Ratner has even closer links to both Nixon and organized crime.

The son of a prominent Cleveland builder, Ratner arranged and brokered the sale of Fisher Island to Rebozo. He handled plans for its development, owned land with Nixon, and helped Nixon and Rebozo distribute pieces of Fisher Island as favors to friends. Ratner was also a broker for Keyes Realty, which was deeply involved in Key Biscayne land, and a former president of the Keyes Company was also an investor in the Fisher Island project.

But it is Ratner's holding of 3,140 shares in the Bank of Miami Beach that is most interesting.

The Bank of Miami Beach was organized in 1953 to service organized crime based in the Havana gambling empire. Its incorporation papers were drawn up in Havana the same year the Casino Internacional opened there under the guidance of the Cleveland syndicate. The stock in the casino was transferred to Mohawk Securities Corp., a Panamanian company. Mohawk then opened an account at the Bank of Miami Beach, and thereafter cash from Havana and skimmed funds from the Las Vegas syndicate flowed into the account. There is considerable evidence that checks were drawn on Mohawk's account at the Bank of Miami Beach as a device for laundering black money and distribting it to syndicate members.

Meyer Lansky used the bank as a vehicle for funds from his Havana Riviera operations, among other things. On one occasion Meyer's brother Jake was searched by customs officials on returning to Miami from Cuba. Apparently Jake was on his way to make another deposit at the Bank of Miami Beach, as he was carrying $50,000 in checks.

Sworn testimony before the 1967 Royal Commission of Inquiry in the Bahamas showed that Lansky's Bahamian casinos continued to use the Bank of Miami Beach. For example, the Commission disclosed one case where over $500,000 in checks laundered through the bank by Lansky couriers in 1964, turned up with different names on them after they were cashed.
By 1963 the bank had changed hands, but the new "owners", continued the bank's fine service to organized crime. An FBI memo, dated July 29, 1964,

details a story of Boston Mafia gangsters bringing "hot money" to the bank and arranging "loans" in return. In reality it was their own money they were getting back, but the "loans" made it possible for them to explain the possession of extra cash.

The Bank of Miami Beach had a fraternal relationship with another syndicate-favoured Miami bank, the aforementioned Miami National Bank. Not only have the banks shared many of the same directors and stockholders, but one person has served as chairman of both banks simultaneously.

In 1965 Ratner, already a long-standing large stockholder, tried unsuccessfully to gain control of the Bank of Miami Beach. Like most mob-related ventures, the Bank of Miami Beach was a tight operation with very few stockholders. It would be difficult to believe that Ratner was unaware of, if not involved in, the activities of the bank in which he held so much stock and which he wanted to control.

In keeping with the traditions of Nixon business associates, Ratner has refused to comment on his role in the Bank of Miami Beach.

After Cuba, the Bahamas

The shift of organized crime's accounts at the Bank of Miami Beach from Cuban sources to Bahamian ones is symbolic of the major underworld realignments that took place after the Cuban revolution.

By mid-1959 most syndicate figures had left Cuba. With them went Frank Sturgis, a leading figure in the Watergate affair, who had overseen the Cuban casinos for Castro for a brief period in 1959. Sturgis later obtained U.S. citizenship with the help of George Smathers.

From its southern capital in Miami, organized crime sought a new home for its crucial Caribbean operations — smuggling, gambling, prostitution, narcotics, gun-running, and the passage of illicit funds. With its lush tropical climate ideal for the "legitimate" hotel/casino front operations, and with its legal structure loose enough to permit plenty of back door escapes, the Bahamas became the next underworld "gem" of the Caribbean.

Among others who found the Bahamas a suitable substitute for the "good old days" in Cuba was our old gambling friend, Richard Nixon. Nixon made three trips to the Bahamas between 1960 and 1962, two of them coming right after his election defeats.

As a result of many governmental investigations the story of organized crime in the Bahamas up to 1967 has received widespread publicity in the American press. The investigations have demonstrated the astounding influence of organized crime in the islands, and a brief synopsis of how it was all put together makes for a good case study in governmental relations as practiced by Meyer Lansky:

In 1960 Lansky turned up at the office of Sir Stafford Sands, Minister of Finance and Tourism for the Bahamas. Lansky offered him $1,000,000 to "see what he could do" about setting up some casinos on the islands.

Sands turned down the money but liked the idea, and when it was all over Sands managed to collect at least $1,800,000 in "fees". In 1967, in a somewhat comic gesture, Sands told the Royal Commission of Inquiry that Lansky's original offer had actually been $2,000,000.

In 1960, the year that Lansky made his original offer to Sands, Wallace Groves, the free-wheeling promoter who was cut in by Kenneth Keyes in 1945 on Key Biscayne land, began setting up the Bahamas Amusement Company for Lansky. This company became the prime corporate vehicle for a gambling operation that would eventually include three casinos — the Freeport Casino, the Lucayan Beach Casino, and Nassau's Bahamian Club. Groves' attorney was Sir Stafford Sands.

Enter in 1960 also one Lou Chesler, a wheeler-dealer Canadian with all the right connections and $12,000,000. In the Fifties Chesler had worked with Lansky on some Canadian mining deals and was a partner with Lansky courier John Pullman in the MPC Corporation. The ensuing Chesler/Groves/Lansky marriage left the first two up front, with Lansky in the shadows back stage. In its 1967 series on the Bahamas, Life magazine disclosed that "Groves' silent partner in all three gambling saloons and spokesman for the syndicate is Meyer Lansky." The article went on to explain that "Lansky front men" received thirty percent of the net profits at the Lucayan Beach Casino and fifteen percent of the gross at Nassau's Bahamian Club.

By 1963 the Bahamian Amusement Company had procured a "certificate of exemption" from Bahamian gambling laws and the long-drawn blueprints were transformed into garish palaces. Running government interference was Sir Stafford Sands. In one of his tougher assignments the 300-pound Sands, acting as attorney for the Bahamas Amusement Company, negotiated a deal with the Minister of Finance and Tourism — himself.

Syndicate influence in the Bahamas had already reached its zenith by 1967 when the wave of press and government investigators began warming up the islands. As organized crime supposedly cooled out, Richard Nixon surfaces considerably. But there is considerable evidence that the fire never went completely out, and that the shadow of Richard Nixon had always been around. Some examples:

- Lou Chesler: For his $14,000 in contributions Chesler got to travel Nixon's 1960 campaign trail. Chesler's acquaintance Donald Berg was the man who sold Nixon his lots on Key Biscayne. Today Chesler travels around in a plane flown by Nixon's former pilot.

- Daniel Ludwig: Ludwig is a recluse billionaire who dredged the Bahamian harbor for Wallace Groves. He later built the King's Inn Casino and leased it to Lansky frontmen Sam Cohen and Morris Landsburgh. Ludwig's National Bulk Carriers, the chief source of his corporate wealth, is a long-time client of Nixon's New York law firm.

- Tex McCrary: A wide-ranging public relations "consultant", McCrary handled public relations work for Chesler's General Development Corporation before moving to the Bahamas and taking the account of Chesler's (and Groves' and Lanskys') Freeport Casino. One of McCrary's fellow PR men at the Grand Bahama Development Company was Dusty Peters, a Lansky courier.

  McCrary staged a few extravaganzas for the Eisenhower/Nixon campaign in 1952 and also helped Nixon with his 1960 campaign. In 1957 McCrary became involved in the Sherman Adams scandal, lending a hand to Maxwell Rabb, who was Bernard Goldfine's attorney. *(please turn to page 50)*

ACROSS THE EDITOR'S DESK

Computing and Data Processing Newsletter

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APPLICATIONS

FORECASTING EARTHQUAKES — A NEW ROLE FOR COMPUTERS?

Michael M. Maynard
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A new project underway in Italy may lead to computers eventually being used to forecast the occurrence of earthquakes. Seismologists attending the 5th Seismic Engineering World Congress in Rome recently witnessed a demonstration of computers being used for earthquake studies.

Data describing some 2,000 strong earthquakes that Italy has experienced since 1890 was fed into a UNIVAC 9400 computer system at the Ministry of Public Works, which was linked via data transmission lines to a large-scale UNIVAC 1108 computer at the University of Rome. The earthquake data consisted of date, locality, geographic coordinates of both the epicenter and focus, and the intensity. In addition, information on the geological characteristics of the Italian terrain as well as known seismological laws was also furnished to the computer. From the computer's data bank, a wide variety of statistical information on earthquakes was retrieved by the seismologists.

The earthquake data stored in the UNIVAC 9400 system is the first stage of the project which will utilize the data processing facilities of the Ministry of Public Works and the expertise of professional geophysicists at the Rome Geophysical Institute. In the near future, the Rome seismologists expect to acquire a comprehensive knowledge of the seismological characteristics of the terrain throughout Italy from which they can develop appropriate building standards.

Employing the computer-stored information, the seismologists hope eventually to be able to forecast earthquakes. If they can do this, it will be a boon to mankind. Since the end of the 19th Century to date almost half of the world's population has suffered from the effects of earthquakes.

SERVICE TO TAXPAYERS TO IMPROVE UNDER NEW COMPUTER SYSTEM

Roger A. Gelfenbien, Comptroller
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City of Bridgeport
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Bridgeport, Conn. 06604

City residents of Bridgeport, Connecticut, will have a better idea of where they stand on their personal property taxes with the help of a new computer-based system. Designed to produce increased revenue for the city as well as permit greater efficiency in collecting delinquent taxes and interest, the system also will provide taxpayers with a more legible quarterly tax bill.

The new bill — a "turnaround" document which the taxpayer mails or brings to a collection office with his payment — is scanned by an optical character reader and the payment data entered into an IBM System/370 Model 145 for account updating.

TV-like display terminals linked to the computer enable tax office employees to answer telephone, mail or in-person inquiries in a minimum of time. The clerk simply enters the taxpayer's name and other identifying data through the terminal's typewriter-like keyboard, and a display of all or part of the individual's payment record is flashed on the screen. This feature also will speed processing of in-person payments — reducing the time formerly spent waiting in line.

A taxpayer who wants to pay his entire year's tax bill at one time will get a new, updated bill automatically printed for him by a typewriter terminal also linked to the computer.

Under the new system, the city will be able to notify residents of delinquent taxes and interest due more promptly. Delinquency notices, showing the amount of back taxes and interest, will be mailed monthly — increasing current revenues and perhaps making possible lower tax rates.

Daily updating of tax collection figures by the computer should permit the city to make better projections of surpluses and deficits as an aid to planning the allocation of funds.

PENN STATE COMPUTER HELPS DOUBLE AMOUNT OF MILK COWS GIVE

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University Park, Pa. 16802

A Penn State University dairy herd management program, supported by a computer, has nearly doubled the amount of milk cows give. The increased milk yield over a fifteen year period is a result of selective breeding — based on computer generated reports on milk productivity by animal — and computer-calculated culling and feeding guides for some 235,000 Pennsylvania cows involved in the program (about one-third of the state's entire cow population). During the same 15 year period, the increased productivity of cows has boosted annual incomes of participating dairy farmers to $20,950 (based on a 50-cow herd), compared to the average income of about $7,000 for dairy farmers not in the program.

The dairy herd program, called the Dairy Herd Improvement Association (DHIA) testing program, is offered as a management system to dairy farmers by Penn State University's School of Agriculture for an annual fee of $5.50 to $8.25, based on the testing plan selected.

One cow, the most productive in the dairy herd management system, recently produced a record of almost seventeen tons of milk in a year, or 103 pounds of milk each day. The registered Holstein cow, Gladell Governess Bess, is owned by Gladell Farms in Millhiem, Pa. The average DHIA herd-managed cow now produces 12,965 pounds of milk a year, compared to the 6,562 pounds averaged by cows not in the program 15 years ago. This increased yield of 6,403 pounds interprets into more than 744 gallons, or 12,806 additional glasses of milk each year. Though DHIA herd management in the U.S. dates back to 1906, it wasn't until relatively recently that the computer was introduced to the job of analyzing factors contributing to dairy herd productivity.

On the campus at Penn State an IBM computer, the System/370 Model 155, contains a quarter of a million names such as "Bossie", "Mary" and "Alice". In addition, each cow is given a number, but printed reports to dairy farmers also identify the cows by name. The system analyzes the long-term milking records of each of the cows, evaluating her yield versus the amount and kinds of feed she consumes. Once a month, each dairyman enrolled in the program supplies the university with figures on how much feed each of his cows consumes, her milking record, and the butter fat content of her milk. The information is written by hand on pre-printed forms supplied by Penn State. At the university, the information is key punched and verified for entry into the IBM System/370 Model 155. The data is then processed against the stored records for the appropriate cow.

In addition to simply evaluating the cow's daily, monthly and yearly performance, the system notes trends and compares her performance with that of other cows to see, for example, if she's being overfed in relation to the amount of milk she produces. It also enables specialists to choose the proper month for the cow to be bred, whether the cow's weight is effecting productivity and — on a long range basis — how heredity is likely to effect any given animal. At the same time, the program has made it possible for the farmer to supply consumers with more milk, at no significant price increase.

The computer supported herd management program at Penn State was one of the first computer asasisted programs of its kind in the country.

NOVA COMPUTER TRACKS HURRICANES FOR U.S. AIR FORCE

Edgar Geithner
Data General Corp.
Southboro, Mass. 01772

A Nova minicomputer, made by Data General, is helping the U.S. Air Force's Hurricane Hunters quickly and accurately predict a hurricane's strength and the path it will take. The Nova 1200 Jumbo is part of the LO-CATE System, designed by Beukers Laboratories of Bohemia, N.Y., that gives meteorologists the exact speed and direction of hurricane winds. (Satellite photographers, previously used, showed only the storm's general movement.)

The minicomputer-based system uses Beuker's newly developed technique of signal retransmission to measure the wind in a hurricane by tracking an instrumentation package dropped into the storm from a plane. The package, called a dropsonde, pinpoints its position by receiving and retransmitting signals from long range navigation aids such as LORAN-C or OMEGA. The Nova 1200, mounted in the Air Force plane, receives the signals from the dropsonde, and computes the package's position. Using this information, the computer automatically calculates the direction and speed of the wind at the dropsonde's position, and records the temperature, air pressure, and humidity.

Similar systems are used with balloon-borne instrumentation packages to gather meterological data from the upper atmosphere, and to track pollution levels at lower altitudes.

STRAINS OF ITALIAN POULTRY SELECTED BY HONEYWELL COMPUTER

Brooks Robert
Carl Byoir & Associates, Inc.
800 Second Ave.
New York, N.Y. 10017

The Genetic Research Division of Avicola Aglietto, Bianze, Italy, recently reported that the first all-Italian poultry strains, Eureka (egg-layers) and Big White (broilers), introduced at the Verona Fair in 1972, have fully come up to expectations after one of year of trial by Italian poultry breeders. The company is the first in Italy to develop its own breeds rather than import eggs for hatching.

The strains were developed by the division with the aid of a Honeywell Model 58 computer system, on which 4.5 million items of information concerning 150,000 parent birds are stored each year. The company uses the computer to keep track of data on such characteristics as vitality, development and production in order to determine ratings on production and growth of the birds. Subsequent processing on the Model 58 makes it possible to select for breeding those birds that have the best characterisitics.

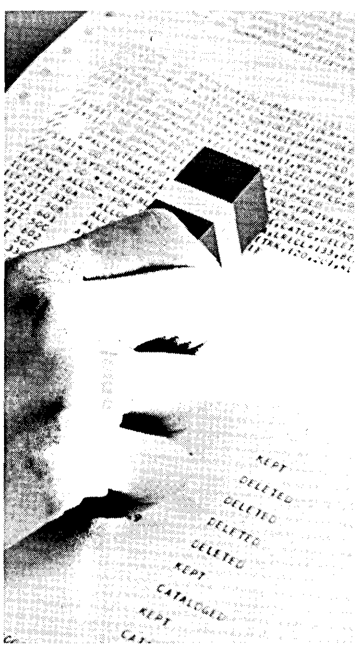
Besides processing information related to genetic selection, the computer is used to make continual comparisons between the results obtained by the Aglietto birds and those of competitive strains. It also is used for processing financial and administrative data and for production planning for its six breeding centers.

NEW PRODUCTS

PENCIL-SIZE ELECTRONIC CAMERA SCANS AND STORES PRINTED DATA

DataCopy Corp.
550 Hamilton Ave.
Palo Alto, Calif. 94301

A pencil-size electronic camera that "reads" printed matter as fast as it can be swept across a page has been developed by DataCopy Corporation. It can replace hand-written notes, keyboard input, and other tedious copying methods.



Built around a multi-element photodiode array with internal light source and optics, the SCANTRAC 1 electronic camera converts graphic images into electronic signals. The tiny unit is only a fraction of the size and weight of even miniaturized TV equipment. In addition to the data itself, the unit also generates a position-indicating signal to show location of the information. Since synchronization pulses are self-generated, the data and location signals are independent of the rate at which the camera is moved across the subject matter.

The SCANTRAC 1 camera, plus a cable-connected control unit, has many useful applications in the fields of document copy and optical character recognition. Data processing experts and accountants, for example, can run the SCANTRAC 1 across lines of computer print-out material and record the information on a selected basis. Later the data can be rearranged or displayed in a new sequence. This facilitates close inspection of a single audit trail in the case of an accounting procedure. For programmers with a need to make minor changes, the SCANTRAC can shift around the sequence and order of instructions as fast as a person can move the camera across the page.

INFORMATION SYSTEM FOR MOTOR CARRIERS

Sally Cahur
Teleprocessing Industries, Inc.
82 McKee Drive
Mahaw, N.J. 07430

The motor-carrier management information system, named "UNO", developed by Spector Freight System, Inc., Chicago, will be marketed to other motor carriers by Teleprocessing Industries, the information services subsidiary of Western Union Corporation.

Spector Freight System is one of the nation's largest motor carriers.

The agreement calls for Teleprocessing Industries to market to motor carriers a variety of computer-based services centered around Spector's highly developed software package. The services offered range from software license with system support to total turnkey systems and facilities management.

On-line for over two years, UNO has demonstrated its effectiveness in individual shipment control, as well as in equipment scheduling, overhead billing, centralized rating, and a broad spectrum of related operations, administrative and marketing functions.

ORGANIZATION NEWS

DIGITAL EQUIPMENT BUYS RCA MARLBORO PLANT

Digital Equipment Corporation
146 Main Street
Maynard, Mass. 01754

Digital Equipment Corporation has announced that it will purchase the former world computer headquarters of RCA for $2.8 million in cash and will assume the RCA bonds on the site which have a net principle outstanding balance of $10 million. DEC is expected to help pay for the RCA complex — four buildings and a 173 acre tract of land in Marlboro, Mass. — by putting some of its stock for sale through the Securities and Exchange Commission in Washington. Although the stock sale was not directly tied to the RCA purchase, some of the profit could be used to help pay for the Marlboro facility.

(please turn to page 47)

NEW CONTRACTS

TO	FROM	FOR	AMOUNT
Computer Sciences Corp., El Segundo, Calif.	Orange County, Calif.	Managing county's data processing center, developing new computer programs, and supplying all data processing needs over seven year period	$26 million
Honeywell, Inc., Wellesley Hills, Mass.	State of Arizona, Phoenix, Ariz.	A Honeywell Multics computer network providing 13 state agencies with common data base and virtually unlimited capability for developing and sharing large programs; system to be completed in 1975	$5+ million
Leader Corporation, Alamogordo, N.M.	Seattle Trust & Savings Bank, Seattle, Wash.	A five-year facilities management contract; Leader will assume full responsibility for bank's total data processing requirements	$4+ million
Mohawk Data Sciences Corp. (MDS), Utica, N.Y.	Department of the Army	67 intelligent communications terminals to support the Automated Telecommunications Centers (ATCC)	$2.8 million (approximate)
Singer Business Machines, San Leandro, Calif.	J.W. Mays, Inc., New York, N.Y.	A retail information system; calls for 800 MDTS electronic point-of-sale terminals and eight System Ten computers over an 18-month period	$2.75 million
Decision Data Computer Corp., Horsham, Pa.	TRW Electronics	96 and 80 column card equipment for the Datapoint 2200 System	$2.3+ million
Electronic Associates, Inc., West Long Branch, N.J.	U.S. Naval Weapons Center, China Lake, Calif.	Analog and digital computer systems for tie-in with other electronic equipment being used for research, development and testing of advanced weapons systems	$1.4 million
PRC Information Sciences Co., McLean, Va.	U.S. Navy	Continued development of computer software for automated Message Processing and Distribution Systems (MPDS)	$1.3 million
Di/An Controls, Inc., Boston, Mass.	Complanco, Inc., Des Plaines, Ill.	Keyboard/Printers that will be marketed as Complanco 9030, and will be used as both stand-alone Keyboard/Printers and incorporated into new Intelligent Terminal	$1+ million
Aries Corp., McLean, Va.	National Institute of Education, Washington, D.C.	Continuing evaluation of Minneapolis Experimental System for an additional 2 1/2 years	$877,000
National Cash Register Co., Dayton, Ohio	U.S. Postal Service	Providing electronic point-of-sale terminals for Flushing, N.Y. post offices	$678,000
Vogue Instrument Corp., Richmond Hill, N.Y.	Raytheon Data Systems Co., Norwood, Mass.	Airline ticket printers and boarding pass printers to operate in conjunction with Raytheon's PTS 100 Display Terminal System	$600,000+
Sanders Associates, Inc. (UK) Ltd., Nashua, N.H.	Eagle Star Insurance Group, Cheltenham, England	Programmable computer display terminals that will be installed at group's regional and branch offices throughout the U.K. for communication with company's central computers at administration offices	$450,000
Informatics Inc. Systems & Services Co., Rockville, Md.	National Institute on Alcohol Abuse and Alcoholism, National Institute of Mental Health, HEW	Processing vital data from 41 NIAAA Alcoholism Treatment Centers; also will provide special systems capability required to monitor various indicators of treatment outcome	$240,000
Auto-trol Corp., Denver, Colo.	Camsco, Inc., Dallas, Texas	Computerized digitizer station for Camsco's pattern grading and marking system which is being sold to the apparel industry	$220,000
University of Notre Dame, Notre Dame, Ind.	Alfred P. Sloan Foundation	Design and evaluation of computer assisted instruction (CAI) programs for two undergraduate economics courses and an undergraduate history course	$220,000
Action Communication Systems, Inc., Dallas, Texas	City Water Board, San Antonio, Texas	A TELECONTROLLER® data communications processor system that will link 50 South Texas law enforcement agencies to a regional computer center in San Antonio and to computer files at state and national levels	—
Control Data Corp., Minneapolis, Minn.	Wisconsin Electric Power Company System	Computer-based energy control system as part of new multi-million dollar power generation and transmission control center	—
Cable and Wireless Ltd., London, England	Japan Airlines	A computer-based departure control system for airline passengers and baggage to be installed at Heathrow Airport, London	—
Pinkerton Computer Consultants, Inc., Warminster, Pa.	Federal Aviation Administration	Providing total systems support for communications system at National Aviation Facilities Experimental Center, Atlantic City, NJ	—
Shared Medical Systems, King of Prussia, Pa.	Alexian Brothers of America, Inc., Chicago, Ill.	A complete financial and administrative on-line data processing system	—
Systems Control, Inc. (SCI), Palo Alto, Calif.	Control Data Corp., Minneapolis, Minn.	Development and implementation of advanced application software programs for a new energy control center at Wisconsin Electric Power Co.	—
Technicon Medical Information Systems, Mountain View, Calif.	New Britain General Hospital, New Britain, Conn.	Providing hospital data processing services	—
Xerox Corp., El Segundo, Calif.	Department of Public Safety, City of Shreveport, La.	A mobile printer system that utilizes two-way radio facilities to insure the instantaneous and fully accurate reception of all dispatches	—

NEW INSTALLATIONS

OF	AT	FOR
IBM System/3 Model 10	Coca-Cola Bottling Co. of Southern New England, Hartford, Conn.	More efficiently supplying Coca-Cola's six soft drink brands to its 8,000 dealers; sales analysis; and quarterly reports; future use includes vehicle maintenance scheduling, and maintenance of Coca-Cola machines and outdoor signs
Interdata Model 70 system	Physics Dept., Latrobe University, Hastings, Victoria, Australia	Studies of ionospheric irregularities; analyzes data from ground and satellite-based measurements to improve prediction of short-wave broadcasting reception, and distribution of standard frequency broadcasts
	John Lysaght, Ltd., Hastings, Victoria, Australia	Ensuring accurate classification and quality control of sheet steel; computer is interfaced to a tensile testing machine; also used to calculate information for setting up slitter heads required to cut steel
NCR Century 100 system	Bamfords Ltd., Uttoxeter, England	Inventory and materials control at main plant and at smaller factory in Mold, Flintshire; also payroll processing and sales purchase ledgers
NCR Century 200 systems	British Leyland's Truck and Bus Div., Southall, Middlesex, England (2 systems)	A variety of applications including a production scheduling program, purchasing control, and maintenance of a sales order file and engine library; replaces two smaller systems
	Establishments Chapuzet, Angouleme, France	Management of 1,500 building sites, including general, suppliers', and analytical accounting; calculating of heating installations, PERT calculations applied to construction work and personnel management of 2,500-strong workforce
	Moscow Narodny Bank Limited, London, England	Varied applications including statistics and list of balances, exception reports on customer balances, consolidated customer positions, maintenance of bank's portfolio of bills of exchange, discount apportionment, forward exchange contracts, bills for collection, and deposits; also automatic interest calculation and posting on accounts
SYSTEMS 72 system	Air Force Human Resources Laboratory (AFHRL), U.S. Air Force Systems Command, Williams AFB, Ariz.	Collecting data from five aircraft simulators simultaneously and storing it on magnetic tape; also to develop objective methods to measure pilot performance (system valued at approximately $128,000)
Univac 1106 system	British Gas Corp., London Research Station, Fulham, England	Augmenting and developing a number of advisory control programs for operation of National Transmission System
Univac 1110 1x1 system	Michigan Technological Univ., Houghton, Mich.	A wide variety of academic, administrative, business and research needs (system valued at approximately $1.65 million)
Univac 9400 system	Connecticut Natural Gas Corp., Hartford, Conn.	Faster service for customer billing and service requests; also preparation of 1,200,000 bills yearly, general accounting, labor distribution and payroll
Univac 9480 system	Odessa College, Odessa, Texas	Applications in administration, registration, student education, budgetary and general accounting
	Strother Drug Co., Justice Drug Div., Greensboro, N. C.	Billing and accounting applications
Univac 9700 system	Consolidated Textiles Ltd., Montreal, Canada	A total information system; includes order entry, inventory control, order processing and other applications; replaces current 9300-II
Xerox 530 system	Jordan Dennis, Co., Dorchester, Mass.	Use by firm's Return Data Division to manage a data base of four million records (system valued at approximately $200,000)

Across the Editor's Desk — *Continued from page 45*

SPERRY TO ACQUIRE RCA'S SUPERMARKET SYSTEM

Fred Fukuchi
Sperry Rand Corp.
1290 Avenue of the Americas
New York, N.Y. 10019

Sperry Rand Corporation has announced the acquisition of a supermarket automated developmental checkout system from the RCA Corporation. Sperry said its Univac division will take over rights to the point-of-sale checkout system for supermarkets now being developed by RCA. The acquisition will consist of two basic types of checkout systems, a fully automatic scanning type and a key entry type.

In addition to purchasing the developmental system, Sperry Univac will hire a number of RCA employees who have been engaged in the development of the system.

THE GAME ZOONAYMAN — ANSWERS

Edmund C. Berkeley
Editor, Computers and Automation

In the September issue of Computers and Automation we published an article on pages 39 to 43 entitled "ZOONAYMAN — A New Game for People and Computers", by Edmund C. Berkeley. It contained six puzzles in pictorial reasoning, each entitled "A throw of dice plus a move by Nature". The answers were promised in the October issue, and here they are:

Figure 1: Make 3's horizontal.
Figure 2: Move 1's outside.
Figure 3: Make 6's perpendicular.
Figure 4: Make cross of 5's.
Figure 5: Make 4's touch.
Figure 6: Make 1's show 4.

MONTHLY COMPUTER CENSUS

Neil Macdonald
Survey Editor
COMPUTERS AND AUTOMATION

The following is a summary made by COMPUTERS AND AUTOMATION of reports and estimates of the number of general purpose digital computers manufactured and installed, or to be manufactured and on order. These figures are mailed to individual computer manufacturers quarterly for their information and review, and for any updating or comments they may care to provide. Please note the variation in dates and reliability of the information. A few manufacturers refuse to give out, confirm, or comment on any figures.

Part 1 of the Monthly Computer Census contains reports for United States manufacturers, A to H, and is published in January, April, July, and October. Part 2 contains reports for United States manufacturers, I to Z, and is published in February, May, August, and November. Part 3 contains reports for manufacturers outside of the United States and is published in March, June, September, and December.

Our census seeks to include all digital computers manufactured anywhere. We invite all manufacturers located anywhere to submit infor- that would help make these figures as accurate and complete as possible.

The following abbreviations apply:

(A) -- authoritative figures, derived essentially from information sent by the manufacturer directly to COMPUTERS AND AUTOMATION
C ---figure is combined in a total
(D) -- acknowledgment is given to DP Focus, Marlboro, Mass., for their help in estimating many of these figures
E -- figure estimated by COMPUTERS AND AUTOMATION
(N) -- manufacturer refuses to give any figures on number of installations or of orders, and refuses to comment in any way on those numbers stated here
(R) -- figures derived all or in part from information released indirectly by the manufacturer, or from reports by other sources likely to be informed
(S) -- sale only, and sale (not rental) price is stated
X -- no longer in production
\- -- information not obtained at press time and/or not released by manufacturer

SUMMARY AS OF SEPTEMBER 15, 1973

NAME OF MANUFACTURER	NAME OF COMPUTER	DATE OF FIRST INSTALLATION	AVERAGE OR RANGE OF MONTHLY RENTAL $(000)		NUMBER OF INSTALLATIONS In U.S.A.	Outside U.S.A.	In World	NUMBER OF UNFILLED ORDERS
Part 1. United States Manufacturers A-H								
Adage, Inc.	AGT 10 Series	4/68	X		32	3	35	X
Brighton, Mass.	AGT 100 Series	1/72	100-300	(S)	14	7	21	7
(A) (Aug. 1973)	Adage 400	1/74	30-50	(S)	0	0	0	1
Autonetics	RECOMP II	11/58	X		30	0	30	X
Anaheim, Calif.	RECOMP III	6/61	X		6	0	6	X
(R) (Jan. 1969)								
Bailey Meter Co.	Metrotype	10/57	40-200	(S)	8	0	8	0
Wickliffe, Ohio	Bailey 750	6/60	40-250	(S)	37	15	52	0
(R)(Aug. 1972)	Bailey 755	11/61	200-600	(S)	7	0	7	0
	Bailey 756	2/65	60-400	(S)	15	12	27	2
	Bailey 855/15	12/72	50-400	(S)	0	0	0	3
	Bailey 855/25	4/68	100-1000	(S)	16	0	16	0
	Bailey 855/50	3/72	100-1000		1	0	0	X
Bunker-Ramo Corp.	BR-130	10/61	X		160	-	-	X
Westlake Village, Calif.	BR-133	5/64	X		79	-	-	X
(A) (June 1973)	BR-230	8/63	X		15	-	-	X
	BR-300	3/59	X		18	-	-	X
	BR-330	12/60	X		19		-	-
	BR-340	12/63	X		19	-	-	X
	BR-1018	6/71	23.0	(S)	-	-	-	-
	BR-1018C	9/72	-		-	-	-	-
Burroughs	B100/500	7/65	2.8-10.0		1141	677	1818	25
Detroit, Mich.	B200	11/61	5.0		-	-	500	-
(N) (R) (Sept. 1973)	B205	1/54	X		19	2	21	X
	B220	10/58	X		23	2	25	X
	B300	7/65	7.0		-	-	600	-
	B1700	8/72	-		2	-	-	-
	B2500	2/67	4.0		277	123	400	30
	B2700	8/72	-		-	-	-	-
	B3500	5/67	12-14		572	285	857	110
	B3700	11/72	-		-	-	-	-
	B4700	10/71	-		4	-	-	-
	B5500	3/63	23.5		152	47	199	-
	B5700	12/70	32.0		27	8	35	22
	B6500	2/68	33.0		-	-	60	2
	B6700	8/72	30.0		8	4	12	60
	B7500	4/69	44.0		-	-	-	13
	B7700	2/72	85.0		-	-	2	4
	B8500	8/67	200.0		1	-	-	-
Computer Automation, Inc.	108/208/808	6/68	5.0	(S)	165	10	175	110
Newport, Calif.	116/216/816	3/69	8.0	(S)	215	20	235	225
(R) (April 1971)								
Consultronics, Inc.	DCT-132	5/69	0.7		75	65	135	-
Dallas, Texas								
(A) (April 1973)								
Control Data Corp.	G15	7/55	X		-	-	295	X
Minneapolis, Minn.	G20	4/61	X		-	-	20	X
(R) (Sept. 1973)	LGP-21	12/62	X		-	-	165	X
	LGP-30	9/56	X		-	-	322	X
	M1000	-	-		1	-	-	-
	RPC4000	1/61	X		-	-	75	X
	636/136/046 Series	-	-		-	-	29	X
	160/8090 Series	5/60	X		-	-	610	X
	921/924-A	8/61	X		-	-	29	X
	1604/A/B	1/60	X		-	-	59	X
	1700/SC	5/66	3.8		-	-	428-478	0
	3100/3150/3170	5/64	10-16		-	-	93-120	C
	3200	5/64	13.0		-	-	55-60	C
	3300	9/65	20-38		-	-	205	C
	3400	11/64	18.0		-	-	17	C
	3500	8/68	25.0		5	-	20	C
	3600	6/63	52.0		-	-	40	C
	3800	2/66	53.0		-	-	20	C
	6200/6400/6500	8/64	58.0		-	-	117	C
	6600	8/64	115.0		1	-	89	C

NAME OF MANUFACTURER	NAME OF COMPUTER	DATE OF FIRST INSTALLATION	AVERAGE OR RANGE OF MONTHLY RENTAL $(000)	NUMBER OF INSTALLATIONS In U.S.A.	NUMBER OF INSTALLATIONS Outside U.S.A.	NUMBER OF INSTALLATIONS In World	NUMBER OF UNFILLED ORDERS
Control Data (cont'd)	6700	6/67	130.9	-	-	5	C
	7600	12/68	235.0	-	-	12	C
	Cyber 70/72	-	-	3	9	12	-
	Cyber 70/73	-	-	3	5	8	-
Data General Corp.	Nova	2/69	9.2 (S)	-	-	930	-
Southboro, Mass.	Supernova	5/70	9.6 (S)	-	-	215	-
(A) (Sept. 1973)	Nova 1200	12/71	5.4 (S)	-	-	2960	-
	Nova 800	3/71	6.9 (S)	-	-	565	-
	Nova 820	4/72	6.4 (S)	-	-	220	-
	Nova 1210/1220	2/72	4.2;5.2 (S)	-	-	2135	-
Datacraft Corp.	6024/1	5/69	52-300 (S)	18	0	18	0
Ft. Lauderdale, Fla.	6024/3	2/70	33-200 (S)	100	26	126	6
(A) (Sept. 1973)	6024/4	8/73	19.9 (S)	2	0	2	2
	6024/5	5/72	11-80 (S)	101	2	103	35
	6024/5R	2/73	30-60 (S)	3	0	3	1
Datapoint Corp. San Antonio, Texas (A) (June 1973)	Datapoint 2200	2/71	151-292	-	-	2000	-
Digiac Corp.	Digiac 3060	1/70	9.0 (S)	78	0	78	8
Plainview, N.Y. (A) (Feb. 1973)	Digiac CT-10	-	9.0	20	0	20	1
Digital Computer Controls, Inc.	D-112	8/70	10.0 (S)	831	183	1014	-
Fairfield, N.J. (A) (Sept. 1973)	D-116	1/72	10.0 (S)	1006	99	1105	-
Digital Equipment Corp.	PDP-1	11/60	X	48	2	50	X
Maynard, Mass.	PDP-4	8/62	X	40	5	45	X
(A) (Sept. 1973)	PDP-5	9/63	X	90	10	100	X
	PDP-6	10/64	X	-	-	23	X
	PDP-7	11/64	X	-	-	100	X
	PDP-8	4/65	X	-	-	1402	X
	PDP-8/I	3/68	X	-	-	3127	X
	PDP-8/S	9/66	X	-	-	918	X
	PDP-8/L	11/68	X	-	-	3699	X
	PDP-8/E,8/M,8/F	5/72	3.9-4.9 (S)	-	-	9150	-
	PDP-9	12/66	X	-	-	436	X
	PDP-9L	11/68	X	-	-	40	X
	DECSystem-10	12/67	700-3000 (S)	-	-	250	-
	PDP-11/10,11/20/11R20, 11/40	-	10.8-13.8 (S)	-	-	3280	-
	PDP-11/05,11/15	-	10.8 (S)	0	0	3170	-
	PDP-11/45	-	-	0	0	650	-
	PDP-12	9/69	-	-	-	725	-
	PDP-15	2/61	17.0 (S)	-	-	625	-
	LINC-8	9/66	X	-	-	200	X
Electronic Associates Inc.	640	4/67	1.2	110	61	171	0
West Long Branch, N.J.	8400	7/67	12.0	21	8	29	0
(A) (Sept. 1973)	PACER 100	7/72	1.0	50	45	95	25
General Automation, Inc.	SPC-12	1/68	-	-	-	2000	-
Anaheim, Calif.	SPC-16	5/70	-	-	-	1500	-
(A) (Sept. 1973)	System 18/30	7/69	-	-	-	400	-
General Electric	GE-PAC 3010	5/70	X	25	1	26	X
West Lynn, Mass.	GE-PAC 4010	10/70	6.0	30	4	34	32
(Process Control Computers)	GE-PAC 4020	2/67	X	200	60	260	X
(A) (June 1973)	GE-PAC 4040	8/64	X	45	20	65	X
	GE-PAC 4050	12/66	X	23	2	25	X
	GE-PAC 4060	6/65	X	18	2	20	X
Hewlett Packard	2114A, 2114B	10/68	0.25	-	-	1182	-
Cupertino, Calif.	2115A	11/67	0.41	-	-	333	-
(R) (Oct. 1972)	2116A, 2116B, 2116C	11/66	0.6	-	-	1171	-
Honeywell Information Systems	G58	5/70	1.0	-	-	4	-
Wellesley Hills, Mass.	G105A	6/69	1.3	-	-	6	-
(R) (Sept. 1973)	G105B	6/69	1.4	-	-	-	-
	G105RTS	7/69	1.2	-	-	-	-
	G115	4/66	2.2	200-400	420-680	620-1080	-
	G120	3/69	2.9	-	-	-	-
	G130	12/68	4.5	-	-	-	-
	G205	6/64	X	11	0	11	X
	G210	7/60	X	35	0	35	X
	G215	9/63	X	15	1	16	X
	G225	4/61	X	145	15	160	X
	G235	4/64	X	40-60	17	57-77	X
	G245	11/68	X	3	-	-	X
	G255 T/S	10/67	X	15-20	-	-	X
	G265 T/S	10/65	X	45-60	15-30	60-90	X
	G275 T/S	11/68	X	-	-	10	X
	G405	2/68	6.8	10-40	5	15-45	-
	G410 T/S	11/69	1.0	-	-	-	-
	G415	5/64	7.3	70-100	240-400	310-500	-
	G420 T/S	6/67	23.0	-	-	-	-
	G425	6/64	9.6	50-100	20-30	70-130	-
	G430 T/S	6/69	17.0	-	-	-	-
	G435	9/65	14.0	20	6	26	-
	G440 T/S	7/69	25.0	-	-	-	-
	G615	3/68	32.0	-	-	-	-
	G625	4/65	X	23	3	26	X
	G635	5/65	47.0	20-40	3	23-43	-
	H-110	8/68	2.7	180	7	187	0
	H-115	6/70	3.5	30	-	-	-
	H-120	1/66	4.8	800	160	960	-
	H-125	12/67	7.0	150	220	370	-
	H-200	3/64	7.5	800	275	1075	-
	H-400	12/61	10.5	46	40	86	X
	H-800	12/60	30.0	57	15	72	X
	H-1200	2/66	9.8	230	90	320	-
	H-1250	7/68	12.0	129	55	184	-

NAME OF MANUFACTURER	NAME OF COMPUTER	DATE OF FIRST INSTALLATION	AVERAGE OR RANGE OF MONTHLY RENTAL $(000)	NUMBER OF INSTALLATIONS In U.S.A.	Outside U.S.A.	In World	NUMBER OF UNFILLED ORDERS
Honeywell (cont'd)	H-1400	1/64	14.0	4	6	10	X
	H-1800	1/64	50.0	15	5	20	X
	H-2015	-	-	2	-	-	-
	H-2040	-	-	3	-	-	-
	H-2050	-	-	1	-	-	-
	H-2200	1/66	18.0	125	60	185	-
	H-3200	2/70	24.0	20	2	22	-
	H-4200	8/68	32.5	18	2	20	-
	H-6030	-	-	-	2	-	-
	H-6040	-	-	-	3	-	-
	H-6060	-	-	-	4	-	-
	H-8200	12/68	50.0	10	3	13	-
	DDP-24	5/63	2.65	-	-	90	X
	DDP-116	4/65	X	-	-	250	X
	DDP-124	3/66	X	-	-	250	X
	DDP-224	3/65	X	-	-	60	X
	DDP-316	6/69	0.6	-	-	452	-
	DDP-416	-	X	-	-	350	X
	DDP-516	9/66	1.2	-	-	900	-
	H112	10/69	-	-	-	75	-
	H632	12/68	3.2	-	-	12	-
	H1602	-	-	-	-	-	-
	H1642	-	-	-	-	-	-
	H1644	-	-	-	-	-	-
	H1646	-	-	-	-	-	-
	H1648	11/68	12.0	-	-	20	-
	H1648A	-	-	-	-	-	-

NUMBLES

Neil Macdonald
Assistant Editor, Computers and Automation

A "numble" is an arithmetical problem in which: digits have been replaced by capital letters; and there are two messages, one which can be read right away and a second one in the digit cipher. The problem is to solve for the digits.

Each capital letter in the arithmetical problem stands for just one digit 0 to 9. A digit may be represented by more than one letter. The second message, which is expressed in numerical digits, is to be translated (using the same key) into letters so that it may be read; but the spelling uses puns or is otherwise irregular, to discourage cryptanalytic methods of deciphering.

This month's Numble was contributed by: Casper Otten, University of Massachusetts, Amherst, Mass.

NUMBLE 7310

```
           E A T
       x W H A T
         E O T A
       E P T S
     I I R R
   I H R W
 = I P S E P O A      13381  162
```

Solution to Numble 739

In Numble 739 in the September issue, the digits 0 through 9 are represented by letters as follows:

L = 0	E = 5
R,T = 1	P = 6
W = 2	O = 7
H,N = 3	G = 8
D,I = 4	S = 9

The message is: Doors open with gold.

Our thanks to the following individuals for submitting their solutions — **to Numble 738:** Edward Bruno, Daytona Beach, Fla.; Murray A. Chayet, Tucson, Ariz.; T. P. Finn, Indianapolis, Ind.; Abraham Schwartz, Jamaica, N. Y.; Susan Tygret, E. Moline, Ill. — **to Numble 737:** H. F. Greene, Rijswijk, The Netherlands; Thomas M. Kaegi, Sunnerain, Switzerland; Nihan Lloyd-Thurston, S. Nutfield, Surrey, England.

Gerth — *Continued from page 42*

• Maxwell Rabb and Harry Garfinkle: In turn Rabb and Harry Garfinkle, both of whom are friends of Nixon's, have mutual connections directly tied to organized crime. According to FBI files, Garfinkle has employed high-level Mafia members in his newspaper distribution business. In 1970 he attended — upon the invitation of President Nixon — a White House evening of champagne and entertainment for "official and personal friends of the President."

Both Garfinkle and Rabb were founders and large stockholders in International Airport Systems Inc. Among the company's other early major stockholders were Meyer Lansky, Morris Landsburgh, and other Lansky associates. Rabb is currently a director of a New York City bank which in 1969 helped found an SBA loan to a top figure in the New York Mafia.

• William Safire: Safire is one of the President's most trusted speechwriters. According to Julie Nixon (who worked with Safire on a book of Nixon family photographs) the Safire-Nixon friendship dates back to their days at the Moscow summit in the Fifties. Safire also worked as a PR official for Nixon in his 1960 campaign.

Safire learned his public relations trade as a "protege" of Tex McCrary, and it was the connection to McCrary that led Safire to PR work in the Bahamas in the years Nixon was out of office. According to a 1971 article in the Las Vegas Sun, Safire had the public relations account for the Lansky-connected Lucayan Beach Hotel and Casino. Safire also worked on the Grand Bahamian Development Company with McCrary and Dusty Peters, a Lansky man. *(To be concluded in the next issue)*

CALENDAR OF COMING EVENTS

Oct. 15-17, 1973: 14th Annual Switching and Automata Theory Symposium, University of Iowa, Iowa City, Ia. / contact: Prof. Gerard Weeg, Computer Science Dept., University of Iowa, Iowa City, IA 52240

Oct. 15-18, 1973: 28th Instrument Society of America International Conference and Exhibit, Astrohall, Houston, Tex. / contact: Philip N. Meade, Exhibit Director, ISA, 400 Stanwix St., Pittsburgh, PA 15222

Oct. 15-19, 1973: Fall Conference of USE, Hotel Radisson, Minneapolis, Minn. / contact: John H. Farber, USE Exec. Sec., Sperry Univac Div., Sperry Rand Corp., P.O. Box 500, Blue Bell, PA 19422

Oct. 16-18, 1973: Canadian Computer Show and Conference, East Annex, Coliseum, Exhibition Park, Toronto, Canada / contact: Industrial Trade Shows of Canada, 481 University Ave., Toronto, Ontario M5W 1A7, Canada

Oct. 16-18, 1973: Input/Output Systems Seminar '73, O'Hare International Tower, O'Hare Airport, Chicago, Ill. / contact: Dan Hrisak, DPSA, 1116 Summer St., Stamford, CT 06905

Oct. 17-19, 1973: 11th Annual Government-Industry Data Exchange Program Workshop, Kahler Motor Inn, Orlando, Fla. / contact: Ron Baldwin, Interstate Electronics Corp., 707 E. Vermont Ave., Anaheim, CA 92805

Oct. 18-19, 1973: Computer Science and Statistics: 7th Annual Symposium on the Interface, Memorial Union, Iowa State Univ., Ames, Iowa / contact: William J. Kennedy, Statistical Lab., Iowa State University, Ames, IA 50010

Oct. 21-25, 1973: 36th Annual Meeting, American Society for Information Science, Los Angeles Hilton Hotel, Los Angeles, Calif. / contact: H. W. Jones, Northrop Corp., Aircraft Div., Hawthorne, CA 90250

Oct. 28-30, 1973: 8th Annual Digitronics Users Association Conference, Atlanta, Ga. / contact: Glenn Lutat, IOMEC, Inc., 345 Mathew St., Santa Clara, CA 95050

Nov. 5-7, 1973: Automatic Support Systems for Advanced Maintainability, Inn of Two Flags, Forth Worth, Tex. / contact: O. R. Batchelder, Convair Aerospace Div., P.O. Box 748, MZ 2422, Ft. Worth, TX 76101

Nov. 5-7, 1973: Systems, Man & Cybernetics Conf., Sheraton Boston Hotel, Boston, Mass. / contact: S. A. Meer, Signatron Inc., 27 Hartwell Ave., Lexington, MA 02173

Nov. 7-8, 1973: High Level Language Computer Architecture Symposium, Univ. of Maryland, College Park, Md. / contact: E. I. Organick, Dept. of Computer Sci., Univ. of Utah, Salt Lake City, UT 84112

Nov. 7-8, 1973: Second National Conference on New Systems in Law Enforcement and Criminal Justice, Sheraton-Chicago, Chicago / contact: Robert E. Gitelman, Program Director, New York Management Ctr., 600 Third Ave., New York, NY 10016

Nov. 8-10, 1973: 3rd National Conference of the Society for Computer Medicine, Denver, Colo. / contact: Dr. Joseph M. Edelman, Society for Computer Medicine, 200 Professional Ctr., 244 Peachtree Blvd., Baton Rouge, LA 70806

Nov. 13-15, 1973: Data Networks, Analysis and Design, Tampa, Fla. / contact: Raymond Pickholtz, Sch. of Engrg., George Washington University, Washington, DC 20006

Nov. 28-30, 1973: 1st Annual Systems Engineering Conference, Statler-Hilton Hotel, New York, N.Y. / contact: Technical Services, AIIE, 25 Technology Park/Atlanta, Norcross, GA 30071

Dec. 4-5, 1973: 1973 Vehicular Technology Conference, Sheraton-Cleveland, Cleveland, Ohio / contact: Robert Wylie, Motorola Communications, Inc., 12955 Snow Rd., Cleveland, OH 44130

Dec. 6-8, 1973: National Symposium on Computer Applications in the Juvenile Justice System, Marriott Motor Hotel, Atlanta, Ga. / contact: Lawrence A. Boxerman, Project Dir., National Council of Juvenile Court Judges, Univ. of Nevada, Box 8000, Reno, NV 89507

Dec. 9-11, 1973: Computer Architecture, Flagler Inn & Reitz Union, Gainesville, Fla. / contact: G. Jack Lipovski, 229 Larsen Hall, Univ. of Florida, Gainesville, FL 32601

Jan. 16-18, 1974: 3rd Annual AIIE-MHI Seminar, Marriott Motor Hotel, Philadelphia, Pa. / contact: Technical Services, AIIE, 25 Technology Park/Atlanta, Norcross, GA 30071

Feb. 12-13, 1974: Computer Science Conference, Detroit Hilton, Detroit, Mich. / contact: Seymour J. Wolfson, 643 Mackenzie Hall, Wayne State Univ., Detroit, MI 48202

Feb. 13-15, 1974: International Solid State Circuits Conference, Univ. of Penna., Marriott Hotel, Philadelphia, Pa. / contact: Virgil Johannes, Bell Labs., Room 3E331, Holmdel, NJ 07733

Feb. 19-22, 1974: 3rd Annual National Communications Week Convention, Chase-Park Plaza Hotel, St. Louis, Mo. / contact: David C. Brotemarkle, Communications Systems Management Assoc., 1102 West St., Suite 1003, Wilmington, DE 19801

Feb. 26-28, 1974: Computer Conference (COMPCON), Jack Tar Hotel, San Francisco, Calif. / contact: Jack Kuehler, IBM Corp., P 35, Bldg. 025, Monterey & Cottle Rds., San Jose, CA 95114

Mar. 25-29, 1974: IEEE International Convention (INTERCON), Coliseum & Statler Hilton Hotel, New York, N.Y. / contact: J. H. Schumacher, IEEE, 345 E. 47th St., New York, NY 10017

April 8-11, 1974: Computer Aided Design, Int'l Conference & Exhibition, Univ. of Southampton, Southampton, England / contact: Inst. of Civil Engrs., Great George St., Westminister, London SW1, England

ADVERTISING INDEX

Following is the index of advertisements. Each item contains: product / name and address of the advertiser / name of the agency, if any / page number where the advertisement appears.

(Reprinted from *Computers and Automation,* February, 1970.)

c.a EDITORIAL

"The House is on Fire"

In the computer field, there are basically two kinds of attitudes about the applications of computers and data processing—information handling—to the solving of problems.

On the one hand there is the attitude:

> Computers are tools like matches—and we are just mechanics. We take the data as given (the kindling). Our responsibility is the processing—swift, economical, correct (making a fire with matches). The answers belong to our employer (he uses the fire as he sees fit).

The group who holds this attitude—let's call it Group I—takes the data and the problem as given—given by the corporation or the government, the employer or the client, who has the problem.

This group works on payrolls, etc.—and on the targeting of nuclear missiles and on calculations of the dissemination of nerve gases. And they work on the latter with the same "I'm just doing my job" attitude that they work on the former. In Nazi Germany Group I would have worked "under orders" on the design of ovens for efficient mass incineration of thousands of corpses from the gas chambers. (The Nazis put to death in concentration camps over 11 million Jews, Russians, Poles, Czechs, French, etc., in pursuit of the "final solution".) If you read "Treblinka" by Jean-Francois Steiner (Simon & Schuster, New York, 1967) you find out how one Nazi scientist graded corpses from fat to thin so the fires would burn better.

On the other hand there is the attitude:

> Computers are tools like bridges—and we are professional engineers. We take the data as given (the materials and the site) but we check the data independently. Our responsibility is not only processing—swift, economical, correct (building a bridge with girders)—but also worthwhile answers (bridges that work). The bridges we build must carry people, and we don't want them to crash.

The group who holds this attitude—let's call it Group II—works on payrolls, etc.—but they will refuse to work on calculations for the dissemination of nerve gases, or on calculations for targeting of nuclear weapons, or on calculations for the design of crematoria for thousands of human corpses. They see a responsibility greater than that to their government or employer—they see a primary responsibility to their fellowman.

A recent vote of members of the Association for Computing Machinery indicated that the proportion of Group I to Group II is about two to one. In other words, two-thirds of the computer people who replied to the survey on the "questions of importance", voted that the ACM should not "take a stand on deeply political questions."

The attitude of Group I is a characteristically conservative attitude: "The world is going along pretty well"—"Let us not rock the boat"—"The existing system should be tolerated"—"Things will eventually work out all right"—"Professional people have their major allegiance to the persons who pay them"—"A computer professional has no social responsibility different from that of the nonprofessional man". . . .

The attitude of Group II is a characteristically liberal attitude: "The world can be a much better place than it is now"—"It is important to try to improve the world"—"Such a vast number of sad and evil things happen in the world that everybody must do something significant to help prevent them"—"The fact that thousands of human beings have been killed by both sides in the Viet Nam conflict requires people everywhere to seek withdrawal of foreign armed forces from that unhappy civil war."

Scientifically it is easy to show that the attitude of Group I will lead to the destruction and extinction of the human race, just as the dinosaurs became extinct. Scientifically it is not possible to show that the attitude of Group II will lead to the survival of human beings on the earth: it is only possible to show that the attitude of Group II offers human beings some hope of survival in the increasingly more difficult environment on earth, the "house" for all of us.

For "the house is on fire": the earth as an environment for human beings has changed enormously in the last 25 years and is deteriorating fairly rapidly. Before 1945, the factor of sufficient distance from a danger could almost always save human beings alive. Now, distance is not enough. Now, because of interlocking planet-wide systems of consequences, the environment of the earth is no longer safe for human beings. For example:

> Large-scale nuclear war (and its radioactivity) between two countries in the Northern hemisphere can kill all the inhabitants of that hemisphere. International anarchy allows this to break out at the choice of one government.
>
> The explosive increase in the number of human beings alive—the so-called population explosion—seriously threatens the power of the earth to support them. Worldwide anarchy allows any man and woman to bear children unrestrictedly.
>
> Pollution of the air, the water, and the land by man's activities is becoming world-wide. Again, international anarchy allows this to happen everywhere.
>
> Etc.

"The house is on fire". So it is necessary for all persons living in the "house" to take some time away from their play rooms, their work rooms, and their bedrooms, their computer rooms, their laboratories, and their ivory towers—and to try to help put out the fire. The fire is licking at the edges of the roof and the walls and the floors—and time is pressing and will not wait.

Accordingly, **Computers and Automation** with this issue is starting a department in the magazine which for the present will bear the subtitle "The House is on Fire" and the title "The Profession of Information Engineer." Here we plan to publish information from time to time which will help focus the attention of computer professionals in the direction of becoming information engineers, "bridge" engineers,—not mechanics, not artisans. For we are, first of all, human beings with professional training, and secondly, we are computer professionals. We need to shed light on major urgent problems of the earth today. These are the great problems which cause our children to be "a generation in search of a future," to use the phrase of Professor George Wald, Nobel prizewinner in biochemistry. These are the great problems which raise the great question:

Will there be any future at all for our children?

Edmund C. Berkeley
Editor