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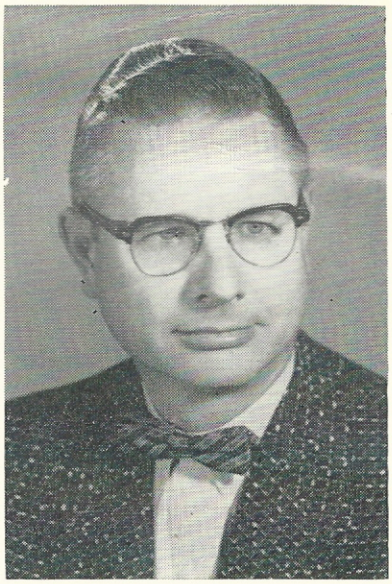
ARIZONA PROFESSIONAL ENGINEER

A.S.P.E.

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
FOUNDED 1934

May, 1965



ASPE 1964-65

President's Message

Dr. George C. Beakley, P.E.

Last year when NSPE increased the national dues by $3.00 per member the Arizona Society was one of the few state societies, if not the only one, which voted to absorb the national dues increase. In other words, the ASPE portion of the $29.00 annual dues ($10.00) was voluntarily reduced to $7.00 to compensate for the national dues increase. At the same time other state societies were increasing their dues in order to carry out aggressive public relations, legislative, educational, and professional programs of benefit to the membership. By such dues increases some state societies were able to employ full-time executive secretaries. Those state societies with memberships of less than 1000 who now have executive secretaries are:

Alabama	669	Mississippi	723
Connecticut	685	Nebraska	596
Indiana	997	New Mexico	584
Iowa	557	North Dakota	239
Kansas	815	Tennessee	816
Kentucky	481	West Virginia	683
Maryland	655	Wyoming	154

We in Arizona should begin planning for the employment of a full-time executive secretary. I believe this could be achieved in 1966.

The 1965 budget adopted by the ASPE Board of Directors is $5550. According to Secretary-Treasurer David Harmon, P.E. our April 1, 1965 net worth was $5550.08 — in spite of the $2000 loss in dues to ASPE which resulted from the 1965 dues decrease. Since several members have yet to pay their 1965 dues, the adopted budget seems secure — even if the factor of safety is a bit on the minimum side. During the past year ASPE has carried out several vigorous programs including the launching of a professional engineering magazine, a successful membership campaign, and an introductory legislative program. By comparison, the total worth of ASPE on April 1, 1964 was $9059.63. Our P.E. membership a year ago was 464. Today it is 653 and climbing steadily.

If ASPE is to continue programs of challenge, and I believe that the 205 new members who have joined ASPE since July 1, 1964 give us this mandate, then a dues increase for 1966 for ASPE wil be required. (The net increase in membership is less than 205 due to deaths, resignations, and transfers to other states.)

Some sister states have the following dues structure:

Alaska	$30	Minnesota	$38
California	36	New Jersey	35
Florida	41	New York	42
Georgia	35	Ohio	40
Indiana	39	Pennsylvania	41
Iowa	41	Texas	35
Kansas	53	Washington	40
Kentucky	48	West Virginia	38
Michigan	44	Wisconsin	43

Comparable dues for some other professions in Arizona are:

Medical Doctor	$225.	
Attorney	70.	
Certified Public Acct.	49.	
Architect	125.	+ % of Gross Income
Dentist	145.	

Comparable dues for some labor unions in Arizona are:

Bricklayers	$114.	
Carpenters	95.	
Electricians	90.	+ % of gross wages
Plumbers	72.	+ $0.50 per day when working
Laborers & Hod Carriers	72.	

I believe that the newly elected 1965-66 Board of Directors will want to consider seriously a new dues structure for ASPE which will enable us to continue our expanding growth and influence.

George C Beakley

Arizona Professional Engineer

Arizona Society of Professional Engineers
Affiliated with the N.S.P.E.

VOL. 17 MAY NO. 5

ROBERT HUDNALL, MANAGING EDITOR
P. O. BOX 156, TEMPE, ARIZONA 85282 967-5660

POLICY AND CIRCULATION

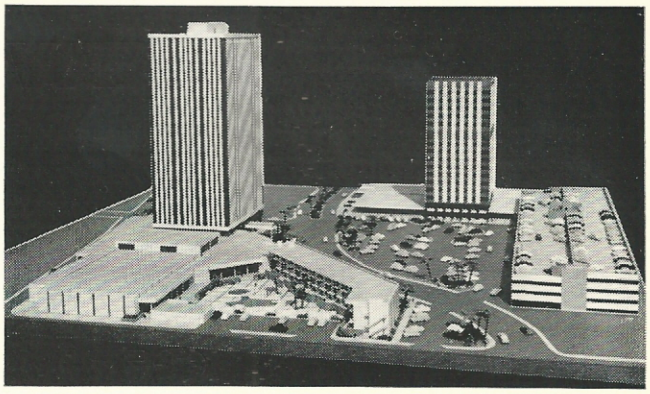
Arizona Professional Engineer, monthly publication, is the official organ of the Arizona Society of Professional Engineers. Its purpose is to provide a means of dissemination of technical and non-technical information pertinent to members of the Engineering profession. It seeks and welcomes articles of interest to the Society's members. It neither prescribes to, nor opposes, the views expressed in signed articles. It seeks the best information available, but makes no positive guarantee of the accuracy of articles submitted. Circulation is free to all professional engineers registered in Arizona; all architects registered in Arizona, all engineer members of societies affiliated with the Engineers Joint Council, and A & B Contractors.

PREAMBLE TO THE A.S.P.E. CONSTITUTION

The Arizona Society of Professional Engineers, recognizing that service to Society, to our State and to our Profession is the premise upon which individual opportunity must be built does hereby dedicate itself as an educational institution to the promotion and protection of the profession of engineering as a social and economic influence vital to the affairs of men and of the community.

1965 ASPE Annual Meeting

Sponsored by Central Chapter



Del Webb's TowneHouse

Phoenix, Arizona

June 11— 8:00 p.m. Board Meeting
Registration

June 12— 7:00 a.m. Breakfast meeting
8:15 a.m. Registration
9:00 a.m. General meeting
12:00 a.m. Luncheon
1:30 p.m. Meeting reconvenes
7:00 p.m. Cocktail Party
8:00 p.m. Dinner & Dancing

Plan now to attend. This year's growth of ASPE warrants the largest participation ever in the coming annual meeting. Please return reservation forms promptly. Ladies auxiliary will have a special program for the ladies.

Consulting Engineers Council of America

Officers

Dwaine Sergent, President
Robert R. Lockerby, Vice President
John E. Stephens, Secreatry
Jim Sorensen, Treasurer
ARIZONA Robert A. Kesner, Executive Secretary

Directors

Frank Foltz
Wm. B. Keller
Earle V. Miller

Arizona Section, American Society of Civil Engineers

Officers

James H. Deatherage, President
David J. Hall, Vice President
Kenneth Florian, Vice President
Ben T. Dibble, Secretary-Treasurer

Directors

Mathew J. Betz
Donald Linger
Oscar T. Lyon, Jr.

Guest Editorial

The Engineer's Role in Industrial Development

by Dr. Robert Kersten, P. E.

There are now approximately 4,500 engineers in the State of Arizona. This is in comparison to approximately 1,300 lawyers, 3,300 accountants and auditors, and 2,741 medical doctors.

Professional Group	*Number Per Population 1,000 in Arizona*
Engineers	2.75
Accountants	2.02
Medical Doctors	1.67
Lawyers	.80

The projected Arizona population for year 1975 is 2,750,000. Just to maintain 2.75 engineers per 1,000 population will require an additional 3,100 engineers within the decade. The national average in 1959-60 was 4.3 engineers per 1,000 population.

Arizona leads the nation in percentage growth of manufacturing employment and is second in percentage growth of non-agricultural employment. One of the key requisites to a continuation of this growth record is the technical acumen of the engineer. Increased industrial activity will require considerably more engineers than the current engineer-population ratio.

Engineering schools in Arizona must continue regional leadership and strive for national prominence if the state is to live up to expectations. The top 25 schools in terms of Ph.D. degree production produced over 75 per cent of Ph.D. degrees, over 42 per cent of M.S. degrees, and over 28 per cent of B.S. degrees and had research expenditures of slightly more than 60 per cent of the national total.

While it may have been the circumstances of history and geography that dictated the locale of these major institutions, it is no accident that modern industry relies heavily on them. All of the "Top 25" lie within the Boston-New York-Washington megalopolis, the Big Ten Midwest, the California west coast, and the developing complex along the Texas Gulf Coast.

It is not at all surprising that in 1961, 59 per cent of all defense contracts went to California, New York, and Massachusetts. The engineering schools in these three states granted 20 per cent of all engineering B.S. degrees, 37 per cent of all engineering graduate degrees, and handled one-third of all engineering research expenditures in 1962-63. Such contracts are the life blood of modern industry. These industries in turn seem to be relying heavily on the academic (teaching, extension, service, research, etc.) resources wherever they may be found.

The National Defense Education Improvement Act envisages expansion of centers of academic excellence from 20 to 70. This demand for dispersion of centers of strength follows, in part, from the realization of the role of the university as a major factor influencing the location of industry. Certainly engineering is a vital force in this endeavor.

The importance of nonprofit research activities to industrial development, further growth of consulting firms, additional business services, etc. cannot be overlooked. Aerospace Corporation (Calif.), Institute of Defense Analysis (Washington, D.C.), Mitre Corp. (Mass.), Rand Corp. (Calif.), and System Development Corp. (Calif.), for example, employed over 11,000 persons in 1963.

The location of industrial research laboratories and scientifically oriented enterprises also seem to be concentrating near university centers of excellent such as the dominant centers of Boston, New York, San Francisco-Palo Alto, Washington-Baltimore, and Los Angeles.

Secondary centers include such areas as Chicago, Philadelphia, Pittsburgh, Cleveland, Detroit, St. Louis, Minneapolis-St. Paul, Buffalo-Rochester, Milwaukee-Madison, and Columbus-Cincinnati. Some newly emerging centers include Ann Arbor, Boulder, Raleigh-Durham-Chapel Hill, Austin, Dallas-Fort Worth, Huntsville, Norman-Oklahoma City, and State College, Pennsylvania.

The fourth category hopeful centers — those undertakings in an early stage of development include Houston, **Phoenix-Tucson,** Santa Barbara (one industrial laboratory built before first building on new campus), West Lafayette, Lincoln-Omaha, Champaign-Urbana, San Diego, Seattle, Albuquerque, and Fairbanks.

It is estimated that production, distribution, and consumption of knowledge in all its forms accounts for 29 per cent of our gross national product. The importance, then, of the role of the university via its professional schools, particularly those serving the engineering profession, in the productive enterprises of the state and national cannot be overlooked. Clearly, the professional engineer is, or should be, the key individual in many of the facets of any industrial development program.

No. 1 Electronic Switching System

by

John Underwood

A new electronic telephone switching system will soon begin to replace present-day electromechanical systems in Bell Telephone central offices.

The result of ten years of research and development by engineers from Bell Telephone Laboratories and Western Electric Company, the No. 1 Electronic Switching System will be able to offer a variety of new telephone services and will have the flexibility of providing in the future additional services that are not yet even dreamed of.

This is possible because the new system uses "stored program control"; that is, instructions for providing services and processing telephone calls are stored in large-capacity temporary and semi-permanent magnetic memories. New services can be provided by simply removing magnetic memory cards and rewriting the information on them. (To make such changes in present-day electromechanical switching systems, electrical circuits often must be rewired and equipment changed.)

Among the possible services which No. 1 ESS can provide are:

Abbreviated dialing – Frequently called local or long distance numbers can be reached by dialing two to four digits instead of the usual seven or ten digits.

Dial conference – A caller can set up a telephone conference by dialing the other conferees in turn.

Add on – A third party can be brought into a conversation in progress by dialing him.

Variable call transfer – A person who leaves his phone can dial a code and the number of another nearby telephone. This will cause incoming calls to be transferred to the second telephone.

Fixed call transfer – A party can arrange to have all incoming calls switched to an alternate nearby telephone.

Call waiting – The system can signal a customer who is using his telephone that another call is trying to get through.

The No. 1 Electronic Switching System will be introduced this summer in Succasunna, New Jersey. All customers in Succasunna will be served from this central office, but only a preselected group will be offered special services on a trial basis. By about the year 2000, it is expected that all Bell System telephone connections will be established through electronic offices.

The major sections of the No. 1 Electronic Switching System are:

The **central control** (logic circuits of transistors and diodes) which coordinates and commands all system operations.

The **program store** (semipermanent twistor memory) which contains the information the system needs to switch calls and provide services, as well as maintenance instructions.

The **call store** (temporary ferrite sheet memory) which, among other duties, keeps track of the status of lines, trunks, etc., and registers digits being received and transmitted.

ABOUT THE AUTHOR

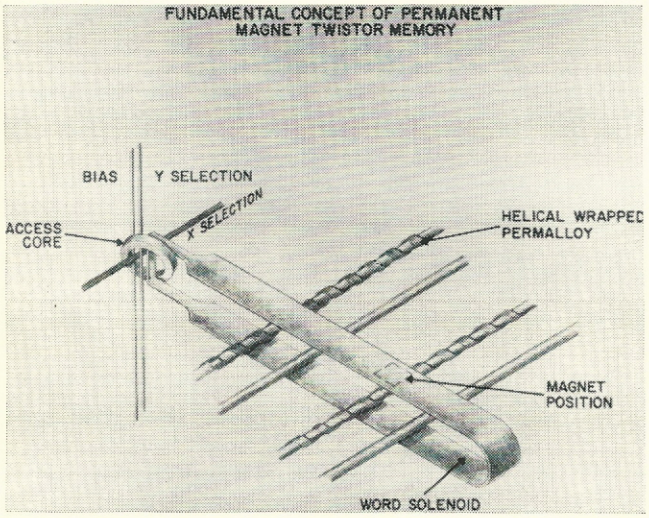
John Underwood is a transmission engineer for the Mountain States Telephone. He was born in Nogales, Arizona where he attended school. After graduating from high school, he attended the University of Arizona. He began his telephone career in 1946 as a dial coordinator in the Plant Department at Tucson. In 1949 he was transferred to the General Plant office in Denver as a staff technician. He returned to Arizona in 1957 to his present position of transmission engineer, in Phoenix. Underwood served during World War II in the Air Force and now is a Lieutenant Colonel in the United States Air Force Reserve.

The **switching network** (ferreed switches, lines and trunks) which connects one telephone line to another.

The line **scanners** (ferrod sensors) which determine whether a phone is on or off the hook.

A typical telephone call is processed in this manner: The central control unit, acting on instructions from the program store, checks each ferrod sensor every tenth of a second and compares its state with one entered in the call store on the preceding scan. When a telephone is taken off its hook, current flows in the line and a ferrod sensor in the scanner detects the change.

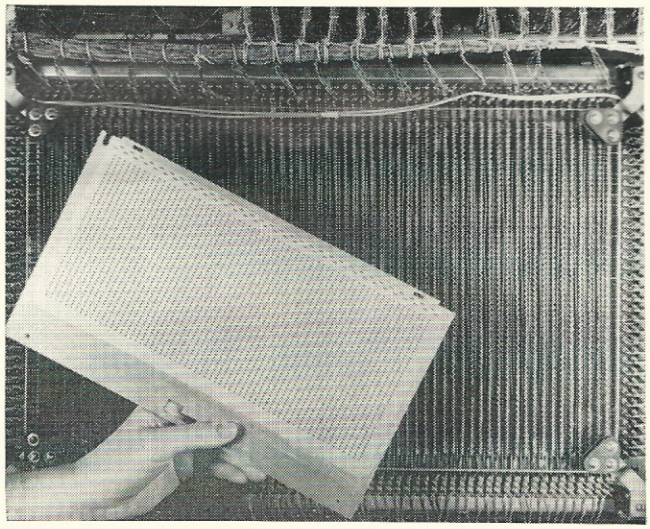
The program store then instructs the central control unit to indicate in the call store that the line is now busy. A dial pulse detector is connected to the line, dial tone is given, and the detector is scanned at a rapid rate to detect dial pulses. The digits are kept in the call store until central control, which has been giving its attention to other lines, reads out and acts upon the number. The control unit does this in a few microseconds, acting on orders from the program store.



Program Store. No. 1 ESS semipermanent twistor memory operates as follows: Information is stored in the vicalloy magnet next to the intersection of the twistor wire and the copper solenoid. A current pulse sent through the x and y wires will cause the ferrite core to send a pulse through the copper "word" solenoid. If the magnet at the intersection of the solenoid and the twistor is not magnetized, the pulse will reverse the direction of the magnetic field that links the intersection and generate a "read-out" pulse in the twistor wire. If the magnet at the intersection is magnetized, its field will prevent the reversal at the intersection and there will be no significant voltage produced in the twistor wire.

Central control then sets up a connection through a series of ferreed switches. The called line is rung; and when the party answers, the telephone conversation proceeds.

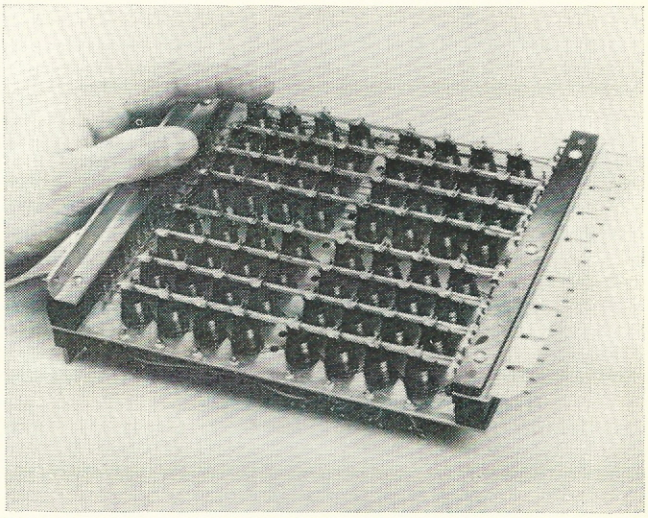
When the parties hang up, the scanner detects another change of state. Central control compares this state with the last one entered in the call store, determines that the conversation is finished, and takes down the connection.



Program Store. Information that the No. 1 ESS needs in order to switch calls and perform other services is stored on this aluminum card which is inserted between folds of stacked twistor memory planes. A card contains 2,816 vicalloy spots arranged in a 64 x 44 array. There are 128 cards in a twistor module and 16 modules in a Program Store. From two to six Program Stores form the semipermanent memory in an electronic central office.

The central control handles a call by performing one simple step at a time, then goes on to handle one step of another call. Because of its high-speed electronic circuits, it can do each step in a few microseconds and process thousands of calls simultaneously. Only one control unit is needed, whereas in the slower electromechanical switching systems, many control units, called "markers", and "registers" are needed in a central office.

Dependability and maintainability: No. 1 ESS is designed to operate with less than one hour "downtime" in 40 years.



Switching Network. The basic 8-by-8 crosspoint array of ferreed switches that was designed for the Bell System's No. 1 Electronic Switching System. The coils are wound directly on coil forms by a machine developed by the Western Electric Company. The machine winds eight rows of crosspoints simultaneously in a continuous succession, each with a single length of wire. This eliminates soldered connections between coils thus reducing the winding costs and improving the reliability of the assembly.

To achieve this dependability and maintainability, every important part of the system is duplicated. The duplicate parts operate concurrently. No. 1 ESS continually tests itself, comparing the performance of each unit with its duplicate. If something goes wrong in one of the units, it is automatically switched out of service and its duplicate takes over. This happens so quickly that the system is able to continue processing telephone calls without interruption.

A teletypewriter prints out a diagnosis of the trouble — a series of numbers which a maintenance technician looks up in a "trouble dictionary." The "dictionary" tells the technician which circuit pack is likely to be at fault. He replaces it with a new one. The system then checks that, and the faulty unit is again operable and switches it back into service.

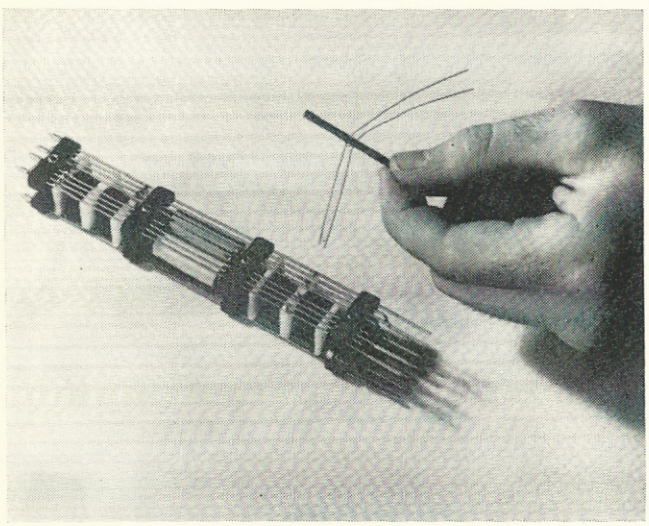
The programs for detecting troubles, controlling tests and diagnosing component failures are stored in the twistor memory. More than half of the programs in the twistor memory are for maintenance operations.

The first Electronic Switching System office in the Mountain States area to be cut into operation will be for the North American Air Defense headquarters in Colorado Springs, Colorado.

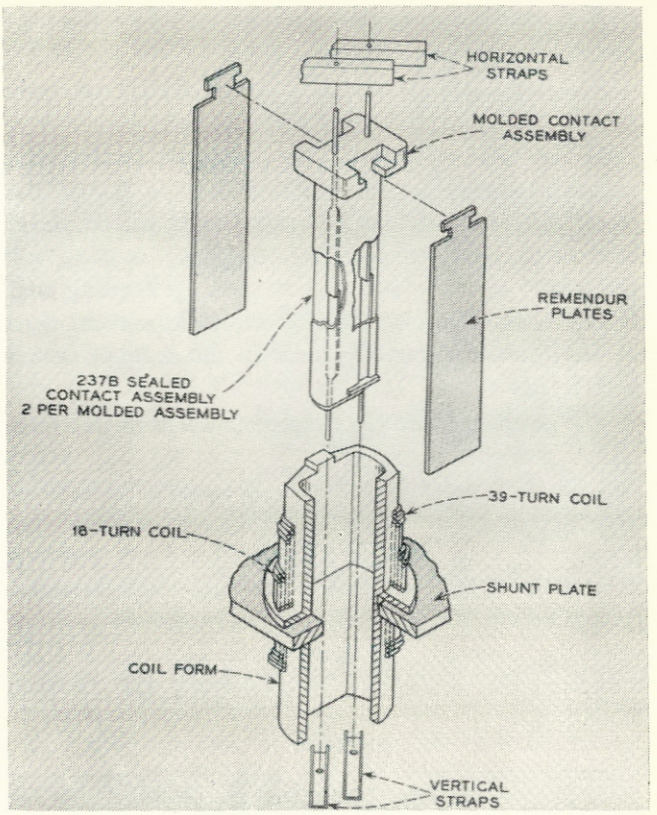
Plans are under way for installations in Phoenix, Denver, Albuquerque and Washington, D. C.

The proposed Phoenix installation will relieve a fast growing central office electromechanical switching system and be able to house it in only one-half the building floor space of the present system.

Mountain States Telephone is proud to be a part of what has been called the biggest single development project ever undertaken by the Bell System.



Scanners: The ferrod, a magnetic current sensing device, is the building block for the scanners used in No. 1 ESS. It consists of a ferrite stick around which is wound a pair of solenoid coils. Two wires threaded through holes in the stick carry interrogating and read-out pulses. Two sensors are combined into one unit. Sixteen ferrods are interrogated simultaneously and their output is sent to central control which checks the temporary memory to determine whether a telephone line is on or off hook.



Switching Network. This diagram shows the structure of the two-wire ferreed crosspoint that will be used in the Bell System's No. 1 Electronic Switching System. This ferreed is an improvement over one invented at Bell Laboratories a few years ago.

Southern Chapter News

It's rare when any Arizona based engineering firm turns down a job as unique as the following:

The following correspondence resulted from a bid request from Cornell University for aerial photography within the Walnut Gulch Experimental Watershed area in the vicinity of Tombstone, Arizona. The specifications are roughly as follows:

1. Vertical aerial photography at a scale of 1:12500 on a strip flight which would run along Walnut Gulch from immediately north of Tombstone approximately 13 miles west to the San Pedro River, *when this area is in flood.*

2. The aircraft and photographer must be on call for a telephoned order to proceed with the flight, which was intended to be done as a flood condition was in its receeding stage.

3. There could be cloud cover above the aircraft but no more than 10% cloud cover below the aircraft and the sun angle should not be less than 30°.

4. The period of time during which this bid would prevail was from *March thru June.*

Cornell University
Ithaca, New York
Dear Mr. Rogers:

We were pleased and amused to get your request to bid on the photography of a flood in the Walnut Gulch floodplain region near Tombstone, Arizona. We are not filling out the bid sheet as your request. Our proposal will involve a much more detailed contractual relationship and perhaps a rather prohibitive cost for this project. The details are below:

We suggest that inasmuch as you are limited to the specified months for this project you permit us to design and build a storage dam at the easternmost limit of your area B. We would suggest a capacity of somewhere between 20 and 25 thousand acre feet. This could be filled by approximately 5 wells drilled within the San Pedro River Basin to feed into a 24 inch pipeline to fill the dam before the end of March. You could then on a clear day, and there are many of them during this period, dynamite the dam and thus synthesize a flood condition. By this means almost any sun angle you desire could be obtained.

The cost of this proposal should not exceed one or two million dollars, part of which might be offset by an admission charge. This is normally a dull time of the year and we are sure that many of the residents of Tucson and Tombstone would be interested in witnessing the show. It is certain that a project of this nature would get Federal government approval since it would take many man hours to build the dam and clean up after the devastation, and this would fit nicely into the war on poverty. Some adventurous souls may even want to ride the crest on a raft. It should be at least equivalent to going over Niagara Falls in a barrel.

Sorry, there just ain't no rain in that part of the country during that time of year.

Yours very truly,
s/John H. Stitzer

Mr. John H. Stitzer
Stitzer, Pafford & Associates
1815 East Broadway
Tucson, Arizona 85719
Dear Mr. Stitzer:

I wish to thank you for yours of March 17, in response to mine of March 9. Your imaginative proposal has whetted the thinking of our staff, and I am sure that we will be able to work something out as far as getting a sponsored research grant to underwrite this program as you have so clearly outlined it.

It is unfortunate that nature has dealt your state such a cruel blow as far as this situation is concerned. Without question, Walnut Gulch is potentially one of the finest flood plain areas in the country. Criminal is the only word that can be used to describe the fact that the Federal Government, particularly your native son, Mr. Udahl, hasn't moved ahead on the program to get you a good batch of flood water before this. Now that you've gotten this deal started, I intend to see it through. It may take a little time since Upstate New York Republicans are having trouble getting their letters to Washington answered right now. Maybe you've got some ideas on this, too?

There is only one refinement to your suggestion that we will probably make when we file our grant application. Rather than use the San Pedro River Basin, we'll use the Peranales River for our water source. This should go over big in Washington and run the cost up to the point where we are apt to get some fast action.

As soon as we hear from Washington, I'll be in touch with you. We're obviously both cut from the same bolt of cloth and will be able to work in harmony toward the successful completion of this dream.

s/W. B. Rogers

Nominees for Officers

Official nominees for officers for the Southern Chapter:

President: Ramon Elias, P.E.
1st Vice President: William H. Wheeler, P.E.
2nd Vice President: John S. Collins, P.E.
Secretary: Frolilan Cota, P.E.
Treasurer: Roy Stahl, P.E.
State Director: John Carlson, P.E.
(Two)
Howard King, P.E.
Frances Walker, P.E.

Chapter members are reminded to return ballots by May 11 to the Secretary.

Southern Chapter, meets on the second Tuesday of each month at 6:30 p.m., Vaughan's Monterey, Tucson.

Northern Chapter News

President Syler, on behalf of the State Board of Technical Registration, presented Frank M. Findlay his certificate of registration as a Professional Engineer and congratulated him at the April meeting.

Nominations for 1965-66 officers were reported by the Nominating Committee:

Frank M. Findlay, P.E., President
Robert G. Welman, P.E., First Vice-President
Paul H. Peters, P.E., Second Vice-President
E. D. Voekler, Jr., P.E., Secretary
P. N. Syler, P.E., Director

Mr. Donald Keller, General Manager of the Ponderosa Pulp and Paper Co., reviewed the art of papermaking and explained the various processes which will be used in their new mill at Flagstaff.

Northern Chapter, meets on the second Monday of each month at 7:00 p.m., in the Dining Room of the Monte Vista Hotel, Flagstaff.

American Society of Certified Engineering Technicians

At the March meeting of the Central Chapter, officials of the American Society of Certified Engineering Technicians explained the background and the need for establishing a chapter.

The following is a reprint of a letter that was sent out to all Central Chapter members. Its explanation is one of statewide appeal.

Dear Engineer:

There are a number of Certified Engineering Technicians in this area and they have appealed to Central Chapter to aid them getting more tcehnicians certified and to establish a chapter of the American Society of Certified Engineering Technicians. Your Board of Directors has voted to do these things and now appeal to each and every member, and industry employing engineering technicians, to aid and encourage such technicians in becoming certified.

In 1961, the NSPE authorized the establishment of an Institute for the Certification of Engineering Technicians. This Institute has been established and is functioning. It is an examining body only and exists to perform the function of determining the competency of those who voluntarily apply for certification.

DEFINITION OF AN ENGINEERING TECHNICIAN: "An engineering technician is one who can carry out in a responsible manner either proven techniques which are common knowledge among those who are technically expert in this branch of engineering, or those specially prescribed by professional engineers. Under general professional engineering direction, or following established engineering techniques, he shall be capable of carrying out duties which may comprise: working on design and development of engineering plant; draftsmanship; the erecting and commissioning of engineering equipment or structures; estimating inspection and testing engineering equipment; use of surveying instruments; maintaining engineering machinery or engineering services and locating faults; operating, maintaining and repairing engineering plant; or activities connected with research and development, sales engineering and representation, servicing and testing of materials and components, advising consumers; and training and education.

"In carrying out many of these duties, the competent supervision of the work of skilled craftsmen will be necessary. The techniques employed demand acquired experience and knowledge of a particular branch of engineering, combined with the ability to work out the details of a job in the light of a well-established practice.

"An engineering technician, therefore, requires a background sufficient to enable him to understand the reasons and purposes of the operations for which he is responsible."

—Engineers Council for
Professional Development, 1953

By studying the opposite table you can see that you probably have one or more men working for you that would qualify to be Certified. You can also see what a difference it would make to you in employing such technicians if they had been certified. We firmly believe that certification of technicians can be an invaluable aid to engineers and, therefore, ask that you attempt to swell the ranks of Certified Engineering Technicians by enlightening and encouraging qualified men to apply for certification.

As to the American Society of Certified Engineering Technicians, it is merely a society, as the name implies, of men joined together to improve and upgrade the services of its members to engineers and the public and to gain recognition of their work. It is not a union. In fact, this Society will strongly resist unionization of its members. We, therefore, believe that it is to the advantage of Certified Engineering Technicians to join this Society, just as we believe that all registered engineers should belong to NSPE.

Please direct inquiries to:

C. R. Emmons, P.E.
P. O. Box 7767
Phoenix, Arizona

or

Earl Willis
6719 East Granada
Scottsdale, Arizona

Engineers on the Move

Richard T. Gaffney, P.E., has joined the staff of the City of Phoenix' Division of Engineering and has been assigned to the Special Projects Section.

Wayne C. Foster, P.E., had joined the staff of the City of Phoenix' Division of Engineering and has been assigned to be in charge of the Water and Sewers Section. This section includes the Water and Sanitary Sewer, the Storm Drainage and the Specifications and Estimates Group.

Legislation of Interest to Engineers

(Editor's Note: The legislation of interest to Engineers remains virtually in the same status as was reported in the April issue. It would be fair to say that if your committee has done nothing else with this year's Legislation it has made legislators aware that ASPE and engineers in this state are awakening to their civic responsibilities in the legislative field).

Table of Criteria for Engineering Technicians

	Age	Yrs. of Experience to Get Into Grade	Experience	Examination
Senior Engineering Technician	No max. 35 years minimum	17 years total	Demonstrates high qualifications. Knowledge of detailed technical character. Responsible performance.	None
Engineering Technician	No max. 25 years minimum	7 years total	Demonstrated technical knowledge. Endorsed by 2 P.E.'s (or equivalent).	Exam equiv. to ECPD accredited 2 yr. level* or graduate from ECPD accredited school.
Junior Engineering Technician	No maximum or minimum	2 years or graduation from an ECPD accredited program	Elementary technical ability. Endorsed by 1 P.E. (or equivalent).	None

*May be waived at discretion of Board.

Consulting Engineers Change Name

The Arizona Consulting Engineers Association at their recent annual meeting approved a change of name and insignia.

Their new name is, "Consulting Engineers Council of Arizona."

New officers for the council were elected and announced for the fiscal year 1965-66. They are Dwaine Sergent, President; Robert R. Lockerby, Vice President; John E. Stephens, Secretary; Jim Sorensen, Treasurer; Robert A. Kesner, Executive Secretary.

Directors, Frank Foltz, Wm. B. Keller, Earle V. Miller.

Jim Warren, director to Consulting Engineers Council in Washington, D.C., First Alternate, Earle V. Miller, Second Alternate, John E. Stephens.

John Girand, Phoenix Consulting Engineer, was cited for his outstanding service nationally in the areas of public health, welfare and safety.

John Girand, P.E., (left) receives the outstanding service award by E. Vernon Konkel, P.E., of Denver who is president of the consulting engineer firm of Ketchum, Konkel, Ryan and Fleming. Engineer Konkel is also Vice President of the Consulting Engineers Council in Washington, D. C.

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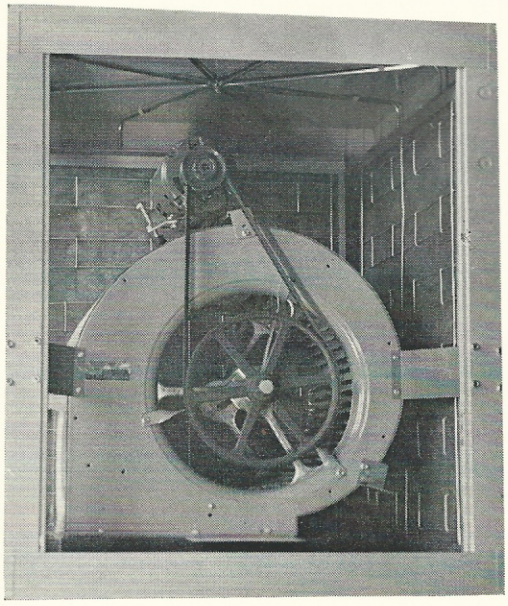

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