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May, 1958
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The oldest application of radio frequency heating. Courtesy—Electronics.

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Personnel Staff, Detroit 2, Michigan

*The Rose Technic*
"I'm in the business and I know..."

"Not too long ago I was in the same situation you fellows are in now. Senior year and the big decisions. What am I going to do with my education? What am I going to do for a living?

"Well, I talked to a number of people and did as much letter writing and looking around as I could. The way I figured it, I wanted opportunity... a fair chance to put my capabilities to work and to be recognized for what I could do. Of course, I wanted to be well paid, too. It all seemed to add up to the aircraft industry... and to me it still does.

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Probably no other industry in America has grown so fast and advanced so far in a short time as has the aircraft industry. And yet there is no limit to how far man's inventiveness and imagination can push the boundaries. Radical new concepts that would have been unthought of just a few years ago are the drawing-board problems of today.

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October 18, 1958

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- CHEMICAL ENGINEERING
- ELECTRICAL ENGINEERING
- MECHANICAL ENGINEERING
- CIVIL ENGINEERING

*The next freshman class will be admitted September 8, 1958*
This Is Your Magazine

“In the arena of college journalism a new factor today appears — The Rose Technic. In character and in scope its predominating idea shall be the promotion of all interests of the Rose Polytechnic Institute, and that this may most effectively be done, the editorial board solicits the warmest co-operation of every person connected with the institute.”

Those were the first words written in the first Rose Technic ever to be published. Its editor was W. A. Layman and it came out on June 12, 1891. Since that first issue, published just eight years after Rose was opened to the public, many TECHNICs have gone under the printing presses, and now, we can boast of having the oldest engineering magazine in continuous publication. To be sure, the appearance has changed considerably from those first few issues, but the ideals and goals are still there. The Rose Technic deals with campus news, prints technical, scientific, and other articles that are of interest to an engineer, and keeps up to date on newsworthy alumni. All of this is written, compiled, and edited by students, and over 1500 copies are put out each month of the school year.

With this issue, the Technic completes another successful year, but with a three short month vacation will take off on another new volume. Graduation is going to deplete all of the staffs and leave them dangerously low, placing a burden on the few remaining. Freshmen and sophomores especially, now is the time to show some interest in Your magazine! Let’s see a good number of you up in the office early next fall. “The editorial board solicits the warmest co-operation of every person connected with the institute.” Keep the Technic going!

D. L. R.
BEAUTY ON WHEELS

The Sports Car

By James Funk, frosh.

Maybe it’s the howl of air rushing past your ears — or the thunder that pounds from your exhaust. Maybe it’s the scream of your tires as they bite in on a sharp curve. It could be the feeling of complete mastery over every move your four-wheeled guided missile makes as it maneuvers exactly around the seat of your pants. Whatever the motivation, you know you eat it up like strawberries and whipped cream.

And what is it that sends you into fits of insanity, even to the point of buzzing around in a blizzard with your top down? Why driving a sports car, of course!

Before starting a discussion of sports cars, perhaps we should first of all define the term. Some feel that you’re in a sports car when, after intersecting the path of a semi-trailer, you can still brush your teeth. A more precise definition would say that the car should be designed for everyday use, weatherproof, licenseable, and capable of winning formal races against other cars of its engine size which are not designed for racing only. We are eliminating from our discussion the bulky personal cars such as the U.S.S. T-Bird. The words “weatherproof” and “licenseable” eliminate, too, such formidable sports-racing machinery as the Maserati 4.5 and the Ferrari 4.9. The true sports car is, therefore, a dual purpose automobile. It is equally at home hauling a load of groceries or collecting trophies at a weekend airport road race.

Sports cars, unlike all Detroit castings, aren’t in style one day and jaloopies the next. This is a major reason depreciation, the chief expense of car ownership, is so low with a sports car. True, to a man accustomed to oodles of chrome and massive fins, a sports car may seem quite nude at first glance. This is explained by the fact that a sports car doesn’t need to be bedecked like a variety store window. It is a basic law of nature that anything which performs its function perfectly is beautiful. To prove this, look to the falcon, which is swifter than the duck, or to the leopard, which is speedier than the pig. In each case that which is more efficient is also more beautiful. Thus, if a car’s lines are aerodynamically sound, that car must necessarily be beautiful. And since any chrome panels or massive grilles would only retard an automobile from its purpose of slicing through the air with the least possible resistance, they are omitted on sports cars.

This isn’t all that sports cars don’t have. They don’t have power-stealing power brakes, power steering, power seats, or power windows, all of which would add unnecessary weight. Nor do they have automatic transmissions. Besides weighing too much, automatic transmissions are inefficient, and they don’t provide for control of engine speed.

But before we become too engrossed with the American iron, let’s see what this contraption they call a sports car really is. We’ll start with the engine.

The aim of engine design in a sports car is the achievement of more power from a lighter unit, since if increased power is accompanied by an increase in weight, nothing is accomplished and the roadability of the vehicle suffers. Progress toward this goal is encouraged by the ruling bodies of road racing who periodically lower the displacement limits of the various formulae, or classes. This was done recently at Indy.

Much has been said about the proper balance between bore and stroke in four-cycle hardware. Actually, it doesn’t seem to make a lot of difference if the engine is oversquare or undersquare as long as the plan is well executed. Neither argument has the upper hand since the major races are won by cars of both types.

On the other hand, virtually all winning cars are equipped with one common item: double overhead cams, or more simply, “d.o.h.c!” The d.o.h.c. system utilizes a camshaft for each row of inclined valves. Gone forever are pivoted rocker arms, pushrods, and extra-heavy valve springs. Flying iron is kept to a minimum as is weight.

While we’re on the subject of valves, the best way to eliminate valve float and thus open the door to higher “revs” is with the development called desmodromic valving. This is a valving set-up wherein the valves are not only cam-opened, but also cam-closed. The only limitation on this system is cam speed. Although too costly for production use, des-
modup up soon in the more expensive marques since many feel that it is the only clear path to higher specific output.

A design element which, along with d.o.h.c., is shared by most sports cars is the four cylinder layout. Experience has shown that this is the most efficient arrangement, although many other arrangements have been tried. There are, nevertheless a few six's in the market basket.

A six cylinder or even a four cylinder block with one carburetor poses an interesting problem. At high level of rpm, the long row of intake valves demand to be fed so insistently that the gas-air mixture dumped by the carburetor into the intake manifold can't get past the center ports to the end ports, and the outer cylinders are starved out. Carving the manifold in tortuous patterns equalizes distribution somewhat, but it also restricts the flow of the mixture. To solve the problem, the carburetors are arranged so that the carb ports are equidistant from the intake ports of the cylinders. A straight 4 and a V-8 would require two carbs, while a straight 6 or a V-12 would require three.

The carburetor location issue can be avoided entirely two ways. The first is supercharging, which automatically moves a car into the next class, and so is itself avoided. The second is fuel injection. F.I., although used on some Mercedes and Corvettes, is expensive and usually looks much better on paper than it does under a hood. The fastest road cars still use carburetors.

In order for sports cars to retain their 'dual purpose' classification, many modifications used on sports racing automobiles are not embodied in sports cars. Magnetos, dual ignition, and straight exhausts fall into this category. Then, too, windshields and fans are incorporated to make life a little more pleasant for the sports car owner.

Amazingly enough, the factor of acceleration is being driven into the background somewhat as more and more races are being won by cars superior in their deceleration. The car that can maintain speed for the longest period of time before finally braking for a curve has a definite advantage over his opponents. This is why you are hearing so much about new braking developments such as fade-proof spot and disc brakes, finned drum brakes, even liquid-cooled brake shoes linked with hoses to the radiator.

Drum brakes you know about. Spot brakes consist of an iron flange rotating in a plane parallel to that of the wheel which is pinched by varying numbers of pads on either side. They are available on the Triumph TR-3, giving it true fade-proof brakes since heat cannot expand friction elements out of contact with each other. This also applies to disc brakes, which operate on the same principle as a clutch.

To help dissipate the large amounts of heat that accumulate in the brakes, wire wheels are sometimes given the nod, since they don't impede the free flow of air over the brake drum. However, if the standard disc wheels are drilled, they offer little resistance to the air flow, approaching the wire wheel in this respect. Besides this, the disc wheels are stronger and much easier to wash. In addition, if a wire wheel is bumped against a curb and knocked out of line, it must be sent to Indianapolis where it is hammered back into round until each spoke, when struck, sounds the same note. Needless to say, this is very expensive music.

Wheel assemblies, whether wire or disc, are attached by either the regular handful of bolts or by a giant knockoff hub, depending on how "gung-ho" you are. Needless to say, the knock-off hub looks quite a bit sharper.

There is a harem of different types of tires, and deciding which one to settle down with can be a problem. Whether you're interested in cotton, nylon, or steel fabric carcasses, remember that a tire either grips well or wears well, but not both. If tire rubber is soft, adhesion in curves will be high, but the road will chew them up. If tires are hard, they may last forever, but don't feel shocked when you end up in a bean field every time you try to execute a four wheel power slide. So tire material is always a compromise between those two requirements.

We now come to the two highly related factors which lend a sports cars the distinction they so richly deserve: Chassis and suspension. These are united in that their common goal is the maintenance of equal road adhesion of all four wheels under all conditions.

To qualify for consideration, the chassis must have strength to resist not only pounding, but also twisting tendencies encountered in the corners. This strength must be engineered with a minimum of weight. The happiest solution to the whole problem is the "space-frame," comprised of a multitude of light tubes criss-crossing within the skin to
S. A. M. E.

Elections were held the 18th of April. Joe Vendel was elected president, vice-president Fred Wernicke; secretary Warren Griffith; treasurer Joe Bronnert.

The campus commandos took a trip to Louisville and were taken on a 25-cent tour of the locks on the Ohio River. They were reportedly in good humor that day. By the way, who is this guy, Crockett? I don't remember him in military history.

The Military Ball was discussed for next year. Rumor has it that Capt. Tucker is leaving for Korea. He was former adviser for S.A.M.E.; Good luck, Capt. wherever Uncle Sam's adventures may lead you.

TAU BETA PI

Tau Beta Pi had a test for the pledges on the 11th of April, and they became actives on the 13th of April. Keep those keys shiny men. They may be used for later reference.

CONVOCATIONS

Mr. John Biel gave a lecture to the sophomores on the Dow-Jones theory the 18th of April. His discussion was on the way a follower of the theory would anticipate a rise and fall in stock prices could be anticipated from a curve which was almost a straight line. He said the maximum and minimum had to be within five percent of each other to make this curve work. If the maximum parts of the curve out numbered the minimum parts there would be an up trend in prices. He remarked that a follower of this theory had to keep in close contact with the market and to the graphs Dow-Jones publishes. This calls for very hard and patient study on the part of the man who follows this theory. He seemed to be a firm believer of this theory. According to him, the U. S. is in for a blizzard in the economic field.

JUNIOR PROM

The Junior Class put in a lot of work and considerable expense to provide an outstanding Junior Prom. It was held Saturday April 19, and is considered one of the best social events of the year.

A French Theme, "Moulin Rouge," was carried out effectively with a large model of the Eiffel Tower in one corner of the Terre Haute House, Mayflower Room. Each individual place was set with a small china cup and saucer.

Al Cobine and his Midlanders pro-

Continued on page 26
On April 10, 1958, the U. S. Army Engineer District, Louisville were the hosts of 21 Advanced R.O.T.C. cadets from Rose. While on this trip the cadets visited and inspected several flood control points around Louisville. The cadets also visited an electrical generating station of the Louisville Gas and Electric Company. On Friday, the tour included the construction on the post of Fort Knox, home of armor for the U. S. Army. On Saturday the new markland dam project was visited.

The first thing visited was the Beargrass Pumping Station. All flood construction around Louisville is based on the height of the 1937 flood. There is a levee built along the bank on the Ohio River. The height of this levee is three feet above the highest level of the 1937 flood. There are also several pumping stations that are placed on or behind the levee for the purpose of pumping the excess water behind the levee into the Ohio River. One pumping station drains all the sewers in downtown Louisville. All of the sewers have been reconstructed so that they may be closed when the river rises and would normally flood the downtown area. This pumping station pumps the sewage and rain runoff over the levee into the Ohio River.

The Beargrass Pumping Station is located on the levee straddling Beargrass Creek. The purpose of this pumping station is the same as the other pumping stations; in that it removes excess water from behind the levee and discharges it into the river. Beargrass Creek drains 54 square miles of downtown Louisville. The channel of the creek flows under the pumping station through two 20 by 22 feet concrete channels. There are two massive doors or gates that close off the channels when necessitated by high water. When the gates are closed, pumps inside the station are started. There are a total of eight pumps. There are seven pumps that have a capacity of 430,000 gallons per minute and one pump of 110,000 gallons per minute capacity. The seven large pumps are powered by synchronous motors developing 4000 hp. at 4000 volts. The field current is 315 ampere with a 15% service factor. The speed is 240 rpm. and 2320 Kva. The intake for the pumps are 10 feet in diameter. This pumping station is the largest in the world with a total capacity of approximately three million gallons per minute. One very impressive thing at the station was the cleanliness. Every thing was spotless. There is one operator at the station at all times. Though all of the construction and cost of construction was assumed by the Federal government, the maintenance and operation is assumed by the city of Louisville.

On Thursday afternoon, the tour took in the Locks and Dam number 41. This lock and dam was also built by the federal government but the operation and maintenance is done by civilians. An electric generating station is also located at this lock and dam site. The purpose of this lock is to make navigation of the Ohio River at Louisville possible. There is a 26 foot drop in three miles of the river at this point. The rapids extend all the way across the river making the river impassible except at high water. In 1830 a canal around the falls was completed by a stock company organized for the purpose. The canal had a width of 64 to 68 feet and a depth of three feet at low water. A three flight lock was provided at the lower end of the canal with a total lift of 26 feet at low water stage.

The canal was widened and new locks were put in by the federal government in 1872. In 1930 the present lock was finished also by the federal government. The present locks consist of two locks. The main lock is 110 feet wide and 600 feet long. The secondary lock is 56 feet wide and 360 feet long.

The moveable dams are quite unusual. The dam is constructed of heavy timbers anchored to the river bed. They are raised and lowered by a crane mounted on a barge. The dam timbers are braced by a strut that moves in a track on the anchor system. The purpose of the movable dam; when the water rises the dam is dropped providing for navigation of the river channel. The movable dam is raised to provide a higher pool for the lock at the lower water level.

(Continued on page 27)
By John C. Fenoglio, jr., ch.e. and Elwood Stroupe, soph., ch.e.

BASEBALL

The 1958 baseball season has been as dismal for Rose as the weather. Out of nine starts R.P.I. has only been able to produce one victory. In conference play Rose has a 1-5 record.

The team's ability to make errors at the worst times have cost Rose some close games. Of the eight losses, three were decided by one run, one by two runs, and one in extra innings. Two of the three games lost by one run were lost in the last half of the last inning.

Dave Spoonamore has provided a few bright moments this season with some fine pitching. Dave pitched a two hit shutout over Principia for Rose's only win. Against Greenville he pitched a one-hitter, but two unearned runs cost him a 2-0 defeat. Bob Manning has also pitched some nice ball, but again unearned runs cost him some wins.

Three pitchers are leading the batting column. Manning, Spoonamore, and Jerry Heiniger lead with .389, .385, and .375 respectively. Gene Blastic follows with a .305. Louie Roehm heads the team in extra base hits with a double and two triples. Roehm also heads the R.B.I. column with five.

Several games have been rained out, but if the weather clears up and the players tighten up, the season record can be improved.

INTRAMURAL TRACK

The annual intramural track meet is approaching. The meet will not be held on one day. The trials on some of the events are being held this week. This method of running the meet is to account for the condition of the men who will be entering the meet. The meet's primary purpose is to give the men of Rose a chance to run off some of their spring fever or summer laziness (for those more advanced cases). The events of the meet are the 50 and 100 yard dashes, ¼ mile run, 880 yard relay, and an 880 yard medley relay. Last of the track events is the 120 yard low hurdles. In the field events, the high jump, broad jump, and shot put are the main events. Unofficial field events, including grass blade splitting, wrestling, and cloud observing will no doubt have many participants.

There are 10 independent freshmen entered in the meet and 8 each from Deming Hall and the Senior class. But the sophomores only have

(Continued on page 27)

The 1958 Rose Baseball Team

Larry Logue Wins.

The Rose Technic
During the past thirty years, the world has slowly drifted towards socialism. The same can be said for our own country, where at the present time, socialism, and capitalism are well balanced. We are using the advantages offered by both systems; but yet, there is much fear of government control. Socialism has become a bad word, especially for politicians. Much of this unfortunate misconception stems from the Nazi and Communist totalitarianistic movements, which have used socialism as a front to gain popular support. Today, England and West Germany represent states which have undergone much socialization with a minimum loss of personal freedom.

Let us now look at the forces which are bringing about more centralized control. One of the most important forces is the rapidly increasing world population. With few frontiers left, people are forced to live closer and closer together. In the days of early American frontiersmen, one man was little affected by the actions of his distant neighbor. Now each man is a specialist; his actions and skills affect people, not only in his own country, but all over the world.

Hand in hand with increased population and specialization has come rapid technological advances and mass production. Engineers and scientist devote their lives to better the materialistic life of man. Yet the heart of the engineer is heavy when a worker tells him, “Your new machine has put me out of work.” But does it? This question has been often debated, but let us look at it from a long-range point of view. In the ultimate technological society, machines will do all the work. A handful of men will always be necessary to adjust the output in accordance with the demand, and also, some maintenance men will be needed. It is true that new products and inventions will take up part of the slack; but with automation, these new industries will require but few workers. The picture we must face is one of a higher standard of living with many products and conveniences, but with a smaller percentage of the population engaged in the production of consumer goods.

With the coming of nuclear energy, and food from the sea and chemicals, the world will soon have the potential to supply its inhabitants with ample material articles. The real problem is the distribution of these products so that no one will fear hunger or endure unnecessary hardship. Thus, the need for a better controlled society exists. A world federation headed by rational and unprejudiced men could achieve a world free of material want. But at what price to the individual freedom we enjoy today.

There is no reason why democratic socialism will not work; but let socialism extend only into the fields of economy and material welfare. The fields of education and politics must remain free for the individual. Better educational systems will serve two purposes. First, greater enlightenment and more sound judgement may be developed among the majority of the people. Second, much of the leisure time brought about by automation will be used for something both useful and enjoyable.

It has been said that man will not work or survive without competition. While friendly competition is a fine thing, this writer does not consider war, murder, and destruction as friendly competition. We must work with each other; we must at all times make sacrifices. While we submit to the will of the majority, every man must be allowed personal freedom and thought. If we can socialize materials, without socializing the thoughts and actions of people themselves, then the battle will be won.

It is generally accepted that when people become well educated, they no longer fear what was once foreign to them. Also, their wide knowledge tends to make them less susceptible to propaganda. The only apparent road to a peaceful and understanding world is education. Trends in education in both the Communist and free world are encouraging. Here, in the United States, the job is especially difficult because of the lack of prestige given to education by the people. The recent interest in educational television in-

(Continued on page 29)
By Gerald Gaskins, jr., e.e.

Ever since television broadcasting began, there has been a need for the recording or transcribing of the programs. This can be clearly shown by the following example: a television show is transmitted via coaxial cable from New York at 7:00 AM Eastern Standard Time; it would be viewed in California at 4:00 AM Pacific Standard Time, providing that the viewer was able to arise soon enough to watch it. In order to meet this need, some method of delaying presentation had to be developed. The motion picture seemed to offer the best possibilities because of the comparative ease in adapting it to television. Magnetic video taping held too many unsolved problems to be practical at the outset of television broadcasting.

There are various methods of approach to tape recording of a television signal. Among these, two appear significant. One method involves moving the tape past the heads fast enough to achieve the required picture fidelity. The other method is arranged so that the recording (and play back) heads are rotated at right angles to the tape. This article will discuss and compare the characteristics of each system.

In the spring of 1953, the research department of RCA laboratories demonstrated the first color video recorder which utilizes the stationary head principle. It will also handle monochrome programs as well as color.

In the reproduction of the picture, the tape speed is very critical. “The order of constancy required can be illustrated by stating that a sudden speed change of one part in one million will put a jog of about 1/5 inch in the picture on a 12-inch kinescope.” The slow speed changes must be limited to one “dot” per line of scanning in order to obtain a watchable picture. In fact, the control of the tape is so critical that compensation must be made for even stretching of the tape. To obtain this precise regulation of the tape speed, the RCA engineers used a very heavy flywheel attached to the drive capstan. It is the design of the tape transport mechanism that controls the speed and feeding of the tape to the recording and reproducing heads. The actual tape speed presently in use is 360 inches per second.

The recording and reproducing heads also presented several problems. One was that the heads had to be practically impervious to wear. They could not be affected by temperature changes or by humidity, and the mounting space and mechanical problems had to be surmounted.

The present recorder has the sound head first, situated in such a manner that the sound track is in the middle of the other tracks. The video head is actually a composite arrangement of independent recording and playback heads. During the recording and playback, five signals are impressed on the tape. They are synchronization, green, sound, red, and blue signals. During monochromatic programs, only two tracks are used instead of the five for color. The two tracks used for monochromatic programs are a sound track and a video or picture track. Figure 2 is a pictorial diagram of the RCA transmitting and receiving system based on the five-track color tape.

The method of utilizing both the moving tape and rotating heads has been developed by the Ampex Corporation solely for monochromatic use. This system is based on recording (and playback) heads which
are rotated at right angles to the two-inch wide tape.

The tape used on the Ampex machine is a special type developed by the Minnesota Mining and Manufacturing Corporation. The base is a mylar polyester material. It also uses a special binder to prevent loss of the oxide coating. Another development is cross-orientation of the oxide coating to facilitate ease of recording. A tape speed of 15 inches per second and a rotating head velocity of 1440 revolutions per minute (using a two-inch diameter head) gives a relative head-to-tape velocity of 1500 inches per second.

The tape transport mechanism in the Ampex recorder is similar to that of many good tape machines found on the market today. The tape leaves the supply reel, passes around guides and take-up rollers, passes the heads, is fed through an idler, and onto the take-up reel. The Ampex recorder differs from the standard tape machines, however, in several respects. Prominent variations are the vacuum guide and the revolving video heads. Other changes include separate audio, video, and erase heads. The purpose of the vacuum guide, the most unique feature of the transport system, is to guide the tape precisely across the face of the heads.

Four heads are mounted on a rotating disk two inches in diameter in order to produce the necessary composite tape speed. The heads are then rotated at right angles to the tape at 1440 revolutions per minute. The signal recorded by each succeeding head overlaps the proceeding one very slightly so that there is no picture jump when the tape is started. It also allows a better job of editing to be done.

As in the RCA video recorder, some method of very accurate control of the tape speed had to be devised. The Ampex system uses a photocell which is placed behind the take-up reel. This photocell controls a 240-cycle per second oscillator. The photocell, through a system of amplifiers and filters, places the control note on the bottom edge of the tape. This control note is analogous to the sprocket holes in a strip of film. During the replay this control note is picked up and compared through another system of amplifiers and "compare equipment" to the signal passed by the photocell. The "compare equipment" uses the note of the tape compared to the note from the photocell, and when the two coincide, the machine is precisely on the required speed. The output of the "compare equipment" is then fed to a servo-mechanism which controls the motor speed. If the machine is running slightly faster than the recorded program, it will speed up the recorder.

The heads are located on the rotating drum. As the drum rotates, each head is allowed to come in contact with the tape. The heads are then fed information by a switching arrangement in the recorder. The same manner, during playback, the heads pick up information and pass it back through the same switching arrangement. It must be understood that these rotating heads only have the video portion of the television program.

A stationary head similar to any other tape recorder places the sound portion on the tape. It picks up the sound and feeds it to a series of amplifiers during the playback also. Also in a narrow channel along with the sound is a "cue" channel that gives information as to the number of minutes to the commercial break, cues, etc. This is multiplexed by a switching arrangement with the normal sound track. Since the tape moves linearly at 15 inches per second, the sound is recorded and played back at essentially the same speed as the ordinary tape recorder except for the multiplex arrangement.

The video portion of the tape recording is obtained by placing the picture information perpendicular to the moving tape and recording it. The signal is picked up in the same manner as it is recorded.

Both methods described here provide acceptable reproduction of video programs. At the present time, the Ampex recorder will not handle color, but "engineers are already approaching a solution to the problem of color T.V." As such, these two systems are not in direct competition—RCA providing both color and black-and-white from the same outfit, while the Ampex offers a "high fidelity" black-and-white-reproduction.
PRECISION ELECTRONIC CLOCK.

Delivery of a highly accurate Time Signal Generator to the U.S. Army Electronic Proving Ground at Fort Huachuca, Arizona, was announced by Burgess Dempster, president of the Electronic Engineering Company, Santa Ana, California.

The equipment is to be used by Army Electronic Proving Ground personnel to provide timing signals with an accuracy of six-thousandths of a second per day. The precise timing signals are used to record the time-of-day on magnetic tape, to provide event markers on special strip chart recorders and also to provide coded time-of-day signals to operate neon lamp drivers in remotely located instrumentation equipment. The complete system consists of the electronic clock unit and 40 terminal units which are remotely located at instrumentation sites. This Time Signal Generator will be used at the U.S. Army Electronic Proving Grounds to provide precise timing for tests throughout the instrumented range.

The Time Code Generator consists of a seven-foot, blower-cooled rack or cabinet, and a small, three-section console. All controls, adjustments, and indicators are located on the front panels of the equipment, except those on the regulated power supplies.

Highly accurate 24-hour coded timing signals modulate a 1,000 cps sine wave carrier. Three coded timing signals are generated by the equipment, two 17-digit codes with repetition rates of 20 and 100 PPS, and one 13-digit signal with a repetition of 1 PPS.

In operation, a crystal controlled oscillator generates a 100 kc sine wave. The 100 kc signal is converted to a 100 k-PPS square wave. A pulse rate used in coding time-of-day information from the 100 k-PPS rate, and another pulse rate divider derives the 1 PPS, 20 PPS, and 100 PPS. The pulse rate divider also produces the 1,000 cps sine wave which is used as a carrier for the output pulse code.

During its 10 years in electronics research and development, Electronic Engineering Company has delivered $6,433,000 worth of electronic timing equipment for instrumentation of missile test ranges in the United States and Canada.

NEW PUBLICATION

Engineers in the nuclear energy field will soon have a new source of detailed information on all major reactor plants, here and abroad. The American Society of Mechanical Engineers announced today that it will publish, beginning in March, a series of books containing up-to-date design and construction data on reactors. The first volume in the series, entitled Power Reactors, will cover sixteen units used for generation of power.

A detailed data sheet, based on replies to questionnaires sent to all known projects in the United States and abroad, will include information under the headings of: general description, power data, nuclear data, fuel elements and blankets, reactor, control, primary coolant systems, secondary coolant systems, and steam systems. There will also be a schematic flow diagram for each unit described.

The series will include not only data on new plants, but revised data on current efforts as they progress through the design stage.

The series is under the sponsorship of the Reactor Plant Data Committee of the ASME Nuclear Engineering Division, which compiles and prepares the basic information. The committee has also begun preparation of the second book of the series, Research and Educational Reactors, which will be ready in approximately one year.

Power Reactors is priced at $3.00 and is available from the Order Department, ASME, 29 West 39th Street, New York 18, N.Y.

THE VULCAN

The new version of the “Gatling gun,” the name given last year to the 20 millimeter Vulcan because of its similarity in operation to the original “Gatling gun,” invented by Richard Jordan Gatling in 1862, was unveiled here at the Air Power Panorama of the Air Force Association. It was developed in 10 months by General Electric armament engineers of the Missile and Ordinance Sys-
tems Department at Burlington, Vermont, for the U.S. Air Force under a U.S. Army contract.

The earlier Vulcan is now used on the Lockheed F-104A Starfighter. The new gun weighs the same as the earlier Vulcan, also has a high rate of fire, but is eight inches shorter.

Though it fires shells only 50 percent larger than the earlier gun, the new can inflict far more damage. Actual rate of fire on both Vulcan guns are classified.

Designated the Vulcan T212, the 30 millimeter gun employs the same firing method as the 20 millimeter, mounting six rotating barrels from a central feed and firing housing.

Modern computing means, such as digital and analog computation, were used by the designers to develop the new, higher-powered Vulcan in such relatively short time. The gun met Army Ordinance specifications within 10 days after the first unit was put in test, General Electric engineers reported.

ON TIME

A "world time clock" which measures the exact moment of any event, anywhere on earth, to the nearest thousandth of a second, was described by Edgerton, Germeshausen & Grier, Inc., who developed it primarily for use in testing nuclear devices.

The firm has had sole responsibility for designing and operating equipment that times, controls, and detonates nuclear devices during test operations carried out by the Atomic Energy Commission. The clock was developed to help determine the exact world time of nuclear detonations, but EG&G men have foreseen many other useful applications for it.

Suppose that a thermonuclear device is to be fired at Eniwetok. At another location, perhaps a thousand miles away, there is a recording mechanism collecting some scientific data related to the explosion. If the data is to be related accurately to the event, the time must be known—to within a tiny fraction of a second—the moment the detonation begins. This world time clock will tell the operator.

Time signals are taken from WWV, the radio station operated by the U.S. Bureau of Standards. These signals are extremely accurate at their point of origin, but in traveling great distances around the earth, they develop inherent errors due to many variables: the speed of radio waves, atmospheric conditions that vary that speed, the so-called "bounce" or reflection between earth and sky, and other certain conditions. The world time clock may be set so as to compensate for these variations and obtain an "approximate" time, correct to within a few hundredths of a second. Then comes the task of setting the time, exactly, to a split second.

This is done by means of a differential gear and precision gear train, used in conjunction with a stroboscopic device. The dial has the usual hour hand, minute hand, and sweep second hand; but in addition it has a hand that registers tenths of a second and a multi-second hand. This latter hand records thousandths of a second, by virtue of rotation at a speed of 10 revolutions per second around a dial divided into one hundred parts.

Obviously, no human being could possibly follow such a motion with the eye. For that reason, a stroboscope, which creates the familiar optical illusion of making moving objects appear to stand still is used. This is a special stroboscope, however. By means of special circuitry, its pulse, which is at one-second intervals, can be changed so as to be brought into coincidence with the time-ticks from WWV in such a manner that the instrument can be set precisely. Thereafter it acts simply as a super-accurate stop-watch in timing phenomena.

While it may seem incomprehensible to the layman that any event need be timed to such precise standards, the company stated that its engineers are working on versions of the clock which will be able to record in the microsecond range—millions of a second—because there is an actual need for a world time clock which will offer this order of accuracy. The major problem that remains is the rapid and accurate setting of the clock to world time to microsecond accuracy, which is approaching solution in the study of very low frequency radio propagation.

May, 1958
SIGMA NU NOTES

As this issue is being written H-week is still not quite with us, so all the little surprises due to fall on all the little probationers must still be kept under cover. But by the time the Technic is released, this time, the world’s worst week will be over and done with. Perhaps the pledges will even have caught up on some sleep. I will say, however, congratulations to you all as I know you will come through in fine shape—in some places.

The paint has been flying thick and fast down in the lower levels of the house. It seems that the pledges have been holding a clean up, fix up, paint up session for the last few weeks, and the results are truly amazing. There is almost enough light now to tell a club from a spade. You see there are a few people, Brother Light, that think they can play such games as Euchre, Pinochle, and some such games as that.

Just prior to tests there is a party planned for all who want to attend, probably at Turkey Run. There is also a house party planned with the Gamma Phi’s, but this will already have taken place by press time.

We have the honor to report that Brother Jerry Parr was tapped for T.B.Pi. Well done Jerry. Also, it’s about time for Brother “ammeter” Clark to come around again—nuf said.

In case you all don’t know, Brothers Anderson, Brownell, Miller, and Parr were elected Commander, Lt. Commander, Secretary, and Treasurer in the recent elections. I’m not slighting the other electees and am including them all in an all around wish for a good year in your new offices. I was also asked by the whole chapter to give, from them, a sincere vote of thanks to Brother Tom Clark—our ex-Commander. We have had a good year with you at the helm, Tom, the best that Beta Upsilon has ever had.

That’s all for this time, so remember, if you really have troubles, “Dear Abby” has all the answers.

Fred Ryker

LAMBDA CHI ALPHA

It seems as though the green stuff on the trees is spring foliage, which naturally means that spring has finally sprung. The Theta Kappa softballers have already played one game in the I-F league, but they came out on the short end of the score. However, the season is still young and the chances of keeping the softball trophy are very good. The team is performing under the tutelage of senior Frank Molinaro. The track and baseball men have also started their seasons. Larry Logue and Vern McKenzie are out for track and Carl Herakovich, Larry Kirts and others are spending their afternoons on the ball diamond.

Bart Gronberg has been elected to the newly created office of assistant treasurer and Bruce McDowell was elected assistant ritualist.

While speaking of Brother McDowell it might be well to mention that he has pinned Miss Rosemary Cox of Honey Creek. Also on the pinning list is “Casey” (Bill Payne) who lost his pin to Colleen Downham of Logansport. Miss Downham is the 1958 Crescent Girl of Theta Kappa, crowned at the White Rose Dance.

The Rose Lambda Chi chapter had a sizeable delegation to the Midwest Conclave, held April 12. Those making the trip to Indianapolis were: John Davis, Tom Feutz, Dick Kirby, Don Weidner, and Conrad McGinnis.

Well the pledges have done it again. Stolen the silverware and plates from the chapter house, that is. On top of it all they even went up to the dormitory and played hookey with the sheets, blankets, etc. They have been presented with a bill for their actions, but the missing articles are still missing except for some bowls which mysteriously returned. So who knows what may happen in the future?

This is the last issue of the Technic for this school year, so till we meet again, have a pleasant summer.

Jim Barrick

ALPHA TAU OMEGA

The April showers brought a lot of grand times to the Tau house at 1454 South Center. Perhaps the most outstanding event of the month was the terrific mixer held with the Chi Omega sorority from Indiana State on Friday evening, April 11.

(Continued on page 30)
KEITH LYNN, B.S.E.E., PURDUE, '52, INVITES YOU TO

"Spend a day with me at work"

"I'm an Equipment Engineer for Illinois Bell Telephone Company in Chicago. Speaking personally, I find Bell Telephone engineering darned interesting and very rewarding. But judge for yourself."

8:30 a.m. We start at my desk. I'm studying recommendations for additional dial facilities at the central office in suburban Glenview. This is the beginning of a new engineering assignment for me."

10:20 a.m. I discuss a proposed layout for the additional central office equipment with Supervising Engineer Sam P. Abate. Since I'll want to see the installation area this afternoon, I order a car."

11:00 a.m. At an interdepartmental conference I help plan procedures for another job I'm working on. Working with other departments broadens your experience and know-how tremendously."

2:00 p.m. After lunch I drive out to the Glenview office. Here, in the frame room, I'm checking floor space required by the proposed equipment. The way our business is growing, every square foot counts."

3:10 p.m. Then I drive to the office at nearby Skokie where a recent assignment of mine is in its final stages. Here I'm suggesting a modification to the Western Electric installation foreman."

3:30 p.m. Before starting back to Chicago, I examine a piece of Out Sender equipment being removed from the Skokie office. This unit might fit in just fine at another office. I'll look into it."

"Well, that was today. Tomorrow will be different. As you can see, I take a job from the beginning and follow it through. Often I have a lot of jobs in various stages at the same time. I think most engineers would agree, that keeps work interesting."

Keith Lynn is one of many young engineers who are finding rewarding careers in the Bell Telephone Companies. Find out about opportunities for you. Talk with the Bell interviewer when he visits your campus. And read the Bell Telephone booklet on file in your Placement Office.

MAY, 1958
“Books are the compasses and telescopes and sextants and charts which other men have prepared to help us navigate the dangerous seas of human life.”

Jesse Lee Bennett

NEW STACKS

When the fall semester opens, the Rose Library will have a new look. During the summer a second floor of book stacks is to be added, almost doubling our shelf space. The second tier will be erected above the present stack area and will have a cantilever walk along the north side. This should alter a great deal the appearance of the Library along with giving us space to expand for several years to come.

DISPLAY CASE

If you have been in the Library recently, you have probably noticed that a new display case has been added. The case was purchased to exhibit a permanent display of Chauncey Rose mementos.

NEW PERIODICALS

The following magazines have been added to our subscription list for 1958. (For a complete list of the magazines received in the Library, see the February Library Newsletter).

- Astronautics
- Automation
- Best Articles and Stories
- Engineer
- Engineering
- Hi Fi and Music Review
- Information and Control
- Microchemical Journal
- Petroleum Engineer
- Physics of Fluids
- Popular Electronics
- Punch
- Service
- Steel

FROM THE BOOK SHELF

Masters of Deceit, by J. Edgar Hoover

The Director of the Federal Bureau of Investigation explains the startling facts about the major menace of our time, communism: what it is, how it works, what its aims are, the real dangers it poses, and what loyal American citizens must know to protect their freedom.

And There Was Light, by Rudolf Thiel

Nontechnical, free of scientific jargon, yet accurate and up-to-date, And There Was Light provides just the right background for the space age. It offers recurrent delights, first for its own sake, and then for the heightened pleasure with which one can watch the exciting new developments of the International Geophysical Year and the launching of the first Earth Satellite.

We see the earliest ideas of space and the heavenly bodies develop step by step by dramatic step into the latest concepts. Among the sciences, astronomy has an unusually rich history. A huge number of astronomical observations was recorded before a genuine science of astronomy was founded by two Greeks, Hipparchus and Ptolemy. Until approxi-

mately A.D. 1500 the world rested on Greek laurels. Astronomy was in part subverted into astrology, about which Thiel tells us some amusing tales.

After 1500 the heroes come thick and fast: Copernicus, Tycho, Brahe, Kepler, Bruno, Galileo and Newton. Astronomy was patronized in France by Louis XIV, and Thiel paints a gay picture of perfumed couriers scampering about on the lawns of the Paris Observatory by night.

But England, a seafaring nation, was not to be outdone; and the Greenwich Observatory was founded as an aid to navigation. Herschel discovered a new planet, Uranus, and others speculated about life on other planets. The distance to the Sun was measured by triangulation for the first time.

The demand for better telescopes led to the growth of the science of optics. The camera and the prism were called into service. All over the world observatories were built. More and more great thinkers struggled to map the cosmos, and as their observations and intuitions bore fruit, they learned of the birth of stars, mysterious noises from the Milky Way, conflagrations of comets, lunar craters, and other marvels. Mr. Thiel describes the latest spectacular techniques of the astronomers, such as spectrum analysis, astrochemistry, and the very newest innovation, radio astronomy, now about to shed new light on the origin of the universe.
Recently AiResearch engineers were called upon to develop an accessory power motor for aircraft and missiles which would operate at +1000°F... a temperature area where present-day hydraulic and electrical devices fail.

Their answer was this cam piston air motor, pictured above in a specially built transparent shell. Operating on hot air or gas, its efficiency actually increases as temperatures rise.

This problem and its solution are typical of many encountered at AiResearch in aircraft, missile, nuclear and electronic fields. Specifically, you'll find them in system electronics; computers and flight instruments; gas turbine engines and turbine motors; cryogenic and nuclear systems; pneumatic valves; servo control units and air motors; industrial turbochargers; air conditioning and pressurization; and heat transfer.

Upon your employment, in addition to direct assignments, a 9-month orientation program is available to aid you in selecting your field of interest. This permits you to survey the project, laboratory and administrative aspects of engineering at Garrett. Also, with company financial assistance, you can continue your education at outstanding universities located nearby.

Project work is conducted by small groups where individual effort is more quickly recognized and opportunities for learning and advancement are enhanced.

* For full information write to Mr. G. D. Bradley.

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May, 1958
Donald McDaniel, m.e., has retired as Vice-president of the Hamilton Foundry and Machine Co., and as President of the Decatur Casting Co., but will continue to serve as a director of both companies. Both companies are in Cincinnati, Ohio.

Ronald E. Larson, m.e., has been promoted to Southeastern Regional Manager of sales engineering for Vapor Heating Corporation, St. Louis, Missouri.

William G. White, m.e., is a partner in the Barth Engineering Company, Oakland, California. Mr. White was previously Factory Manager, Aetna Manufacturing Company, San Lorenzo, California.

Wallover H. Nellis, c.e., is the president of the Nellis Company (men's wear), Mannington, Virginia. Mr. Nellis was formerly construction engineer with the Nellis Construction Company, East Liverpool, Ohio.

Professor Thomas A. Dewelius, c.e., was operated on, May 7, at St. Anthony hospital. Professor Dewelius will be back at Rose in about three weeks.

Max E. Lindley, m.e., is presently plant Engineer of the Terre Haute Malleable and Manufacturing Corporation. Mr. Lindley was formerly Engineer, Efficiency Department, Public Service Commission of Indiana, Terre Haute, Indiana.

Orville L. Stone, e.e., is a research engineer for the Jenn Air Products Company Incorporated, Indianapolis, Indiana. Mr. Stone was previously Chief Engineer of the Denbo Engineering and Sales Company, Indianapolis, Indiana.

Norman Hessler, ch.e., M.S., N.U., '55, is Assistant Chemical Engineer for Argonne National Laboratory, Chicago, Illinois.

Fred W. Goetsch, Jr., e.e., is a 2nd. Lieutenant at Fort Leonard Wood in the R.O.T.C. Cadre.

Gerald C. Rose, e.e., is also assigned to Fort Leonard Wood.

October 18, 1958, is a big day for all Rose alumni! This is the Diamond Jubilee Homecoming which every alumnus should try to attend. It has been suggested that each class have a reunion, and other special events have been discussed.

Although the charter for Rose Polytechnic Institute was granted in 1874, it wasn't until 1883 that Rose opened its doors. The curriculum was assembled and established by Dr. Charles O. Thompson, formerly President of Worcester Polytechnic, after he had spent a year visiting all American and European technical schools.

I know all of us here at Rose are looking forward to the Homecoming football game, the bonfire, the dance, the freshmen's parade with Rosie, and everything else that goes with homecoming. Let's see all the alumni there!
INDIANAPOLIS, IND.: (Special) Lockheed Aircraft Corporation and the Allison Division of General Motors Corporation have teamed up to produce a commercial passenger transport that promises to revolutionize air transportation on the medium-and-short-range flights. Cruising at more than 400-mph the Allison Prop-jet Lockheed Electra will bring jet-age speed and comfort to passengers and set new standards of operating economy for air lines of the world.

Teamwork within Allison, just like the Lockheed-Allison team, is highly prized by newly graduated engineers. If you would like to know more about the Allison team, write Personnel Department, College Relations, Allison Division of General Motors Corporation, Indianapolis, Indiana.

May, 1958
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SPORTS CARS
(Continued from page 11)

strenthen vital points. Such a frame is stronger, lighter, and stiffer for its weight than any other type. It is also hard to fit with doors, as evidenced by the famous gull-wings on the Mercedes Benz 300 SL.

A good chassis should carry everything as low as possible to reduce frontal area and to lower the center of gravity, which in turn improves adhesion. It should also suspend as much of the total weight of the car as possible. If the drive shaft and differential are permitted to bounce around, it is almost impossible to keep the wheels in continuous contact with the ground. This brings us into the area of suspension and serves as the basis for independent rear suspension, in which the drive shaft and differential are bolted to the frame. Power is transmitted by them to the rear wheels through universally jointed half-axles. A fancy pipe called the de Dion tube attaches both wheels to the frame and to each other. The de Dion system, in one form or another, is employed by most high performance cars, except for the OSCA and the D-Jag, both of which use the old-fashioned “live” rear axle set-up and consequently suffer when the road surface gets rough.

Front suspension is usually the conventional double “A” type in which the bases of two “A” members are hinged to the frame with a coil spring inside and between the “A’s.” The tips of the “A’s” are connected to the top and bottom of the wheel mounts. Torsion bars and leaf springs can be substituted for the coil springs if desired.

When you drive a sports car for the first time, the biggest adjustment you will have to make will be getting used to the fast steering. If you bobble the wheel back and forth as you can in a utility car, you’re amazed to find the car bobbling from one side of the road to the other. When you move the wheel, the car reacts. This establishes a definite, intimate “feel” of the road, trans-

CAMPUS SURVEY
(Continued from page 12)

vided the music. The fifteen piece dance band, the largest seen here this year, was enjoyed by everyone.

During the intermission, facilities were provided for couples to have their pictures taken in front of the Tower.

RADIO CLUB

The Radio Club has been conducting morse code classes for those students interested in becoming “Ham” operators. One freshman, Lindsey Cleveland, has already received his license and has been conversing with fellow hams in this and surrounding states. The Freshman Class President, Bill Carter, is almost ready to take his license examination also. The regular operators have been talking to other stations via radio teletype recently since Rick Slater built the necessary addition to the transmitter. The Club plans to present some interesting programs at forthcoming meetings.

ROSE RIFLES

Our crack drill team went to Chicago to participate in the Chicago Invitational R.O.T.C. Drill Team Competition on April 12. There were 19 teams entered in the competition in which only 17 participated. The teams were graded on the basis of 100 points, this being broken down into precision, sharpness of uniforms, leadership ability of commander, etc. Out of the possible 100, the Rose Rifles scored 82.46, which placed them in the upper half of the participating teams. Rose was the smallest school represented at the competition.

CONVOCATION

“Our Town,” by Thornton Wilder, was presented by the DePauw University “Little Theater” on the 30th of April in the auditorium.

The director was Dr. Harold T. Ross and the players were members of Duzer Du Dramatic Fraternity and the National Collegiate Players. The star of the show was Eddie Dix, who played the part of Emily Webb. The play was very well received by a crowd of students, faculty, and townspeople.
FLOOD CONTROL
(Continued from page 13)

The generating station was finished in 1927 for the Louisville Hydro-Electric Company, a subsidiary of the Louisville Gas and Electric Company. All the construction of the generating station and the dam was done by the Bylleaby Engineering and Management Corporation. The generating plant has an annual output of 400,000 kwh. There are eight generators with a capacity of 10,000 kw, each at a speed of 100 rpm. There are arrangements for two more generators to be installed if necessary. The total weight is 125 tons per unit. The power is generated at 13,800 volts and stepped up to 66,000 volts for transportation to the company network. The generating plant is expected to be shut down for approximately 45 days each year. The shut down may be caused by high water when the fall is wiped out, or for repairs. The amount of water is controlled by wickets and bear traps of the dam.

Saturday morning the Markland Dam project was visited. In 1824 Congress passed a bill for the improvement of the Ohio River for navigation. The construction was started by the Corps of Engineers. The first work done was the removal of restrictive bars. In 1878 the first navigation dam was started, and in 1910 the present system of locks was authorized by Congress, being completed in 1929.

In 1909 Congress recognized that some of the original works were obsolete and needed replacement. Therefore, the River and Harbor Act of 1909 provided authority for reconstruction of navigation works when essential to economical maintenance and operation upon recommendations of the Board of Engineers for Rivers and Harbors and approval by the Secretary of the Army. Replacement of Dams number 35, 36, 37, 38, and 39 was approved in 1953.

The Markland Dam is located 26.5 miles above Madison, Indiana. The locks are on the Kentucky side of

(Continued on page 29)

LOCKER RUMORS
(Continued from page 14)

6 men entered and the juniors and BSB II have 4. BSB I comes along with only three men. Let’s back this track meet men, it is well worth your time to get a little exercise, especially in the springtime.

INTERFRATERNITY SOFTBALL

The Interfraternity League has proven to be quite good this year with errors, mistakes, etc., held to a minimum. Most of the games have gone into extra innings or have been decided in the last few innings. The participation seems to be greatly improved this year. The winner of the league will have to work hard for his wins until the last game is over. This is the crucial year for Lambda Chi, for if they win this year, they will retire the softball trophy. The standings of the first round’s play are as follows:

ATO 3-0 TX 1-2
Sigma Nu 2-1 Lambda Chi 0-3

TABLE TENNIS

The singles and doubles matches are under way in the Student Center now and the table tennis players are really putting up a scrap for the championship. The winner of the singles is Kuykendal. There are only four teams competing in the doubles play.

HORSESHOES

The courts near the fieldhouse are getting their expected workout. The faculty is also using them quite a bit. Singles and doubles matches have been played in the past few weeks, but the champion has not been decided yet. There are 24 men in the singles competition and 15 teams in the doubles play. There will be medals for the winners of the leagues.

TENNIS

The tennis program has given the Rose men a chance to get a little workout as well as get in a little exercise, too. There are singles and doubles matches in this part of the intramural program also. There are 18 men participating in the program. The champion should be decided by May 16.
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FLOOD CONTROL
(Continued from page 27)
the river. The upper pool extends up the Ohio River 95.5 miles to the New Richmond Locks and Dam. There will be two locks located at Markland. The main lock will be 110 feet wide and 1200 feet long. An auxiliary lock 110 feet wide and 600 feet long is located beside the main lock. The dam has 12 gates, each 42 feet high and 100 feet long mounted from piers that are 15 feet wide. The dam is non-navigable. The gates are so designed as to accommodate the highest floods on record.

There are a total of 53 locks and dams on the Ohio River. At present there is construction going on at three locations to replace 14 of these dams. There is one very unusual fact in all of this construction. All of the construction is done by private industry and civilians. The only part played by the U.S. Army Engineer District is inspection and safety. This also holds for all construction and maintenance on the actual post of Fort Knox.

AS WE ADVANCE
(Continued from page 15)
dicates that many people have finally realized its importance. Another great factor which should enable the world to socialize successfully is the moral code taught by most of the world's great religions.

Today, socialism is said to be impractical because men are naturally greedy and lazy. This may be partially true now, but what of the future. Fortunately, society is dynamic, and we are slowly being forced to lay aside this greed and prejudice or else face extermination. It will be a great day when need replaces money in the food market. However, the centralization of government and industry necessary to accomplish this will take a united and alert people, highly educated and very rational. The materialistic gain will not be justified by the loss of freedom. But socialism appears to be the best, if perhaps the only, road to travel. So let us become better acquainted with it, that we may travel with care.

THE SPORTS CARS
(Continued from page 26)
mitted from the front wheels to your hands.

This sparkling response, coupled with the other features found on a sports car, makes for a high degree of maneuverability in heavy traffic. The sports car is ideal for lane-hopping and scooting around cars stopped to make turns. To prove this, I will challenge anyone to race through downtown Indianapolis at 5:00 p.m. from west to east. Naturally anyone caught killing a pedestrian will be immediately disqualified.

This article has attempted to acquaint you with some of the advantages of sports car ownership, even though admittedly there are certain strategic social disadvantages involved. Here's hoping that some day you'll drive a sports car with its fast, positive steering, instant acceleration, responsive brakes, superb cornering characteristics, and economy to boot.

Woodridge Motel
Member A.A.A.
and
Quality Motor Courts
ON U.S. 40 — 1 1/4 MILE

WEST OF ROSE POLY

Terre Haute, Indiana

PHONE C-1808
Fraternity Notes

(Continued from page 20)

Through the efforts of social chairman Larry Grimes and the cooperation of the entire chapter, this open house was a whopping big affair. Comments from both ATO and Chi Omega seemed to indicate that this was the best mixer either group had ever attended.

Another party was held at the house preceding the Junior Prom; here, too, everybody certainly enjoyed themselves. The upcoming events sound like more big affairs: An open house with the Delta Gamma sorority on Saturday, April 26; a dinner party before the I-F Dance on May 10; and a picnic on May 11, the Sunday after the dance.

Alpha Tau Omega opened the softball season on a fine note. Behind the superb pitching of “the old redhead,” Larry Grimes, and the fine hitting of the entire squad, ATO bowled over Lambda Chi Alpha in the opening game by an overwhelming score of 9 to 8. At any rate we won.

We intend to keep on winning too. Coach Bill Kuchar predicts, “If we can continue to score more runs than the other teams, we will go through the season undefeated.”

The pledges have been giving the active chapter a little static the past few weeks. It seems that various and sundry items have turned up missing, including silverware, trophies, silverware again, and pitchers. A few beds were torn up one night, and miscellaneous other strange things have happened. In retaliation, the pledges have put in many extra hours of work at the request of the active chapter. The pledges have been washing dishes for two weeks, and they played a few little “games” one night to the glee of the actives.

Practice is now well under way for the Interfraternity Sing. Chuck Schrest, our song director, is well pleased with the chapter’s progress thus far; but we all know that we have a long way to go if ATO is to win our sixth consecutive song contest. The competition is going to be rough and every note will count.

An especially happy event occurred for one Tau on Saturday, April 12. Brother Bart Hartsock was wed to Miss Kathy Moore in the Sacred Heart Church, Terre Haute, on that date. Congratulations, Kathy and Bart!

The April showers are almost over, the May flowers are almost here, and the Indiana Gamma Gamma chapter of Alpha Tau Omega has seen another grand month.

Bill Perkins

THETA XI NOTES

The ranks of the Theta Xi men are sure growing! Our heartiest congratulations to Brothers Bailey and Stearley, who recently became the proud Papas of baby boys. Well, I guess that makes two sure pledges for the class of ’76, if their Daddys have any say in the matter.

A goodly portion of the brothers turned out last week to help distribute Goodwill bags in conjunction with Help Week. Most of the groups were done by 10 o’clock. However, there were several gripes about having to get up at seven on Saturday, mostly from the sophomores. But all in all, it was enjoyable, especially to the juniors, who love to see other people suffer at having to get up early on Saturday.

I hear there was a little party last week, with the sole participants being Brothers Irvin, Leavitt, and Tate. And I also hear that Brother Irvin got himself lost (at least Gary and Scary thought so). Jungles, please tell your buddies where you are going next time when you’re in that condition. They worry about you.

So far, eight of the brothers have signed up to attend the annual Founder’s Day Celebration in Indianapolis this year, including yours truly. It promises to be quite an enjoyable evening, even including the speeches.

Several activities are planned for the very near future; a picnic, the Bowery Ball, and the I-F Dance. The picnic will be in Shakamak State Park this Sunday, April the 27th. There will be lots to eat, a grudge softball game between the actives and the pledges, and maybe even time for each brother to take a quiet stroll around the Park with his date, observing all the wonders of nature.

The Bowery Ball, which this year is under the sole supervision of the pledges, will be held on May 9th, a Friday. Everyone will come dressed in his and her idea of what people wear in the bowery of a large city. And the TX Combo, which hasn’t been the same since Dick Rahn left school, will be reunited. It promises to be a very noisy, but thoroughly entertaining evening.

Practices have been held at noon hour for the past two weeks in preparation for the sing at the IF Dance. The brothers seem to be in fine voice, and are hoping to bring back the trophy.

Clara (Mom) Archer is still in the hospital at the time of this writing. Many of the brothers have been in to visit with her, and many more are planning to in the near future. I can’t think of a single TX who doesn’t love you like you were his own mother, Mom, so please hurry up and get well. We miss you.

Well, before I quit and go to bed, I’d better add something about Brothers Tate and Mathews or else they’ll shoot me on sight. Both are planning matrimony over summer, and on the same day (different girls, of course). Mel will wed Miss Pat Domasco, and Gary will wed Miss Carolyn Lawrence. Congratulations, guys, but let’s have none of that mooing around that Brother Scholl seems to do all the time over his bride. Ah, love!

Well, it’s very late, so I’d better ease my nicotine-scarred lungs and pain-wrecked body into the sack. So I’ll probably see you in the next Technic if my nerves and my trusty snow shovel hold out. Bye for now.

Eugene Amick

THE ROSE TECHNIC
The hole that couldn’t be made will be 20 miles long

THE Philadelphia Electric Company set out to build a revolutionary new power plant that would squeeze more energy out of fuel than ever before. This meant harnessing the highest combination of pressure and steam temperature ever achieved in a central station—5,000 psi and 1,200°F.

The boiler superheater tubes that carry this steel will glow red hot 24 hours a day, year in, year out. If made from the alloy steels customarily used, the tube walls would have to be so thick that no mill could pierce it. So thick that heat transfer losses would be ruinous to boiler efficiency. A super alloy steel was needed, but no one had ever succeeded in piercing such steel into tubes without developing internal flaws.

Combustion Engineering Co., designers and builders of the boiler, gave the problem to Timken Company metallurgists. The problem was to make the steel with all the alloys in just the right balance to produce piercing quality steel.

Thru metallurgical research, they achieved the proper balance of alloy elements that made it possible to pierce 20 miles of seamless superheater tubes of the size shown above. It’s another example of how Timken Company metallurgists solve tough steel problems.

WANT TO LEARN MORE ABOUT STEEL OR JOB OPPORTUNITIES?

For information about fine steel, send for “The Story of Timken Alloy Steel Quality”. And for help in planning your future, write for “BETTER-ness and Your Career at the Timken Company”. Just drop a card to The Timken Roller Bearing Company, Canton 6, Ohio.
D. M.: “I’m glad to have a good sense of humor. Every time I see something funny, I laugh and laugh.”
J. D.: “I’ll bet you have a hell of a time shaving.”

Students are like steamboats—they toot the loudest when they are in a fog.

Every amusing story must of necessity, be unkind, untrue or immoral.

Engineer: “Going around with women a lot keeps you young.”
Secnd Engineer: “How Come?”
Engineer: “I started going around with women when I was a freshman two years ago, and I’m still a freshman.”

Famous last words: “Hell, he won’t ask us for that.”

When Eloise returned from a ride, her mother noticed that one of her shoes was muddy.

“Why is your right shoe muddy and not your left?” she asked.

“I changed my mind,” Eloise answered.

A foreign delegate to the U. N. motored through New England and was reported to have been shocked by the “open display of sex mindedness in that part of the country.”

When asked what he meant specifically, He said:

“Well, as I drove along the highway, it confronted me again and again. First it was “soft shoulders,” then “dangerous curves,” “Five Gals. for one dollar,” “Try Ethyl” and finally, “Watch out for Children.”

And the old Maid said: “Don’t put ‘Miss’ on my tombstone when I’m gone, for I haven’t missed as much as you think I have.”

College Student: “I have a splinter in my finger.”

Engineer: “Been scratching your head?”

Wife: “Darling, tell me how did you ever get Junior to eat olives?”

Ch.E.: “Simple, I started him with Martinis.”

The president of a company that specializes in roofing tells about a tin roof of a Kansas store that was torn off and rolled into a neat bundle by a cyclone. Having a sense of humor, the owner wrapped a few strands of bailing wire around the ruin and shipped it to Henry Ford. In due time came a communication saying; “It will cost you $49.00 to have your car repaired. For Heaven’s sake tell us what hit you.”

Senior Engineer: We’re coming to a tunnel. Are you afraid?

Co-ed: Not if you take that cigar out of your mouth.

The best way to drive a baby buggy is to tickle his little feet.

Policeman: “How did you knock him down?”

Motorist: “I didn’t! I pulled up to let him go across—and he fainted.”

In God we trust, the rest pay cash!

Learned in Mechanics: Every couple has a moment.

A certain absent minded professor was unpacking some glassware he had received from the factory. Seeing that one jar was turned upside down, he explained, “How absurd, this jar has no mouth.” Turning it over he was once more astonished: “Why the bottom’s gone, too,” he exclaimed.

Customer: “Have you any four volt, two watt bulbs?”

Clerk: “For what?”

Customer: “No two.”

Clerk: “Two what?”

Customer: “Yeah!”

Two movie producers decided to take up golf. They purchased clubs, bag, shoes, etc., and checked in at the course.

“I’m sorry,” the starter told them, “but you can’t play today. There are no caddies.”

The producers looked at each other for a moment and then one said: “So who cares? For one day we’ll take a Buick!”

THE ROSE TECHNIC
The Army's first operational rotor-tip propelled jet helicopter—built by Hiller.

The camera has caught the fuel spray pattern within the rear end of the ram-jet engine even though passing by at about 450 miles per hour.

Project:

**Inspect rotor tip jets for a whirlybird**

Hiller Helicopters wanted facts on the fuel spray pattern of a ram-jet engine whirling at speeds up to 700 feet per second. Photography got the job.

When Hiller Helicopters of Palo Alto, Cal.—a pioneer in vertical take-off aircraft—developed a rotor-tip ram-jet engine, they knew the fuel spray would be subject to high air velocity and centrifugal force up to 1200 G's. Would the fuel spray be deflected outward and cause the jet to lose thrust? They wanted to know. So they set up the camera with its fast eye to catch what otherwise couldn't be seen. And they learned the right angle of air intake and nozzle to obtain the greatest power.

Using photography in research is an old story with Hiller—just as familiar as using it for improving public relations. It's an example of the way photography plays many important roles in modern-day industry.

In whatever work you do you will find that photography will play a part in improving products, aiding quality control and increasing sales.

This is all the human eye could have seen of the whirling ram-jet engine as camera takes its picture.

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**CAREERS WITH KODAK**

With photography and photographic processes becoming increasingly important in the business and industry of tomorrow, there are new and challenging opportunities at Kodak in research, engineering, electronics, design and production. If you are looking for such an interesting opportunity, write for information about careers with Kodak. Address: Business and Technical Personnel Dept., Eastman Kodak Company, Rochester 4, N.Y.
Interview with General Electric's
W. Scott Hill
Manager—Engineering Recruiting

Qualities I Look For
When Recruiting Engineers

Q. Mr. Hill, what can I do to get the most out of my job interviews?
A. You know, we have the same question. I would recommend that you have some information on what the company does and why you believe you have a contribution to make. Looking over company information in your placement office is helpful. Have in mind some of the things you would like to ask and try to anticipate questions that may refer to your specific interests.

Q. What information do you try to get during your interviews?
A. This is where we must fill in between the lines of the personnel forms. I try to find out why particular study programs have been followed, in order to learn basic motivations. I also try to find particular abilities in fields of science, or mathematics, or alternatively in the more practical courses, since these might not be apparent from personnel records. Throughout the interview we try to judge clarity of thinking since this also gives us some indication of ability and ultimate progress. One good way to judge a person, I find, is to ask myself: Would he be easy to work with and would I like to have him as my close associate?

Q. What part do first impressions play in your evaluation of people?
A. I think we all form a first impression when we meet anyone. Therefore, if a generally neat appearance is presented, I think it helps. It would indicate that you considered this important to yourself and had some pride in the way the interviewer might size you up.

Q. With only academic training as a background, how long will it be before I'll be handling responsible work?
A. Not long at all. If a man joins a training program, or is placed directly on an operating job, he gets assignments which let him work up to more responsible jobs. We are hiring people with definite consideration for their potential in either technical work or the management field, but their initial jobs will be important and responsible.

Q. How will the fact that I've had to work hard in my engineering studies, with no time for a lot of outside activities, affect my employment possibilities?
A. You're concerned, I'd guess, with all the talk of the quest for "well-rounded men." We do look for this characteristic, but being president of the student council isn't the only indication of this trait. Through talking with your professors, for example, we can determine who takes the active role in group projects and gets along well with other students in the class. This can be equally important in our judgment.

Q. How important are high scholastic grades in your decision to hire a man?
A. At G.E. we must have men who are technically competent. Your grades give us a pretty good indication of this and are also a measure of the way you have applied yourself. When we find someone whose grades are lower than might be expected from his other characteristics, we look into it to find out if there are circumstances which may have contributed.

Q. What consideration do you give work experience gained prior to graduation?
A. Often a man with summer work experience in his chosen academic field has a much better idea of what he wants to do. This helps us decide where he would be most likely to succeed or where he should start his career. Many students have had to work hard during college or summers, to support themselves. These men obviously have a motivating desire to become engineers that we find highly desirable.

Q. Do you feel that a man must know exactly what he wants to do when he is being interviewed?
A. No, I don't. It is helpful if he has thought enough about his interests to be able to discuss some general directions he is considering. For example, he might know whether he wants product engineering work, or the marketing of technical products, or the engineering associated with manufacturing. On G-E training programs, rotating assignments are designed to help men find out more about their true interests before they make their final choice.

Q. How do military commitments affect your recruiting?
A. Many young men today have military commitments when they graduate. We feel it is to their advantage and ours to accept employment after graduation and then fulfill their obligations. We have a limited number of copies of a Department of Defense booklet describing, in detail, the many ways in which the latter can be done. Just write to Engineering Personnel, Bldg. 36, 5th Floor, General Electric Company, Schenectady 5, N. Y. 999-8

*LOOK FOR other interviews discussing: Advancement in Large Companies • Salary • Personal Development.