

# Eimac News

SAN BRUNO PLANT



Tenth Anniversary Edition

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## A DECADE IS A LIFETIME IN ELECTRONICS

*Ten years! With the intense activity of those years it is hard to realize that the first decade of Eimac history is past. With pardonable pride it is safe to say these ten years have been successful.*

*In trying to determine the "formula for success" it is at once apparent that the members of Eimac, collectively, and not individually, were the dominating factor in this formula.*

*Success was not due to an inspirational leader who could emotionally stir the members of the organization to fevered activity. It wasn't the masterful decision of a genius nor the herculean task of any small group. Success was due to extreme cooperation by the entire plant in solving a common problem.*

*Collectively, undoubtedly one of the finest groups of its kind anywhere—how about individually? Surely to do the job so well must have required the services of unusual men and women. Such is not the case, because the men and women of Eimac are just good, sincere American citizens taking an honest pride in doing their job well. Thirteen of the original seventeen Eimac employees are still with the company. All now hold key positions in the organization.*

*Eimac's products are probably the most complex and difficult components of the new electronic era. And believe it or not the entire organization is "local talent." This statement is as true in Salt Lake as it is in San Bruno. Most of our key personnel in San Bruno have lived in this area all their lives. Except for a few who were sent from San Bruno, all of Salt Lake's personnel are from the Salt Lake area. All of which is to say that the distant fields are not the greenest, but rather that plenty of talent is around us all the time, if only allowed to develop.*

*Nobody will deny that Eimac's normal steady growth was accelerated by the war. The radical and efficient tubes of Eimac design were quickly adaptable by the military. It should be pointed out, however, that Eimac is definitely not a "war baby." Obviously, some reduction in production will take place after Victory is ours, but in the world of tomorrow Eimac has a very definite place. Research, formulas and manufacturing techniques developed in our laboratories and our plant, definitely assure new products which should find ready markets in the post-war field.*

BILL EITEL

JACK McCULLOUGH

Sept. 9, 1944

# The History of Eitel-McCullough, Inc.

In the depths of a depression a couple of fellows had an idea. They didn't have any money, but they had an idea.

Bill Eitel and Jack McCullough hit upon an idea for making better vacuum tubes while they were working together in the early '30's. Financial conditions kept them from going into business for themselves at that time, but they definitely had it in mind.

One night, while visiting with a friend, Brad Harrison, a San Bruno real estate man, Bill and Jack were grumbling a bit over the way things were going.

Jack remarked, "If we had \$5000 we could go into business for ourselves." The remark was half in jest, half to keep the conversation going.

However, Brad Harrison didn't think Jack was joking, and inquired into the whys and wherefores of the idea. Then he said, "I think I can get hold of \$5000 for you."

With those words, the firm of Eitel-McCullough, Inc. was on its way to being born. Harrison convinced Walter G. Preddy, a San Francisco theater owner, that the idea was a sound one and would be a logical investment.

Preddy and Harrison each put up \$2,500 to make up the needed \$5000 and Bill and Jack put up their ideas and their abilities. An agreement was made that the first profits would be shared equally by Harrison and Preddy, until they had each received \$1,250, after which time the profits were to be shared equally or held by the company. Both Harrison and Preddy got their share in the first year!

On September 4, 1934, a vacant store at 592 San Mateo Avenue, now the location of Eimac's training center and employment office, was rented by the firm. However, it was not until Sept. 13, 1934, that Eitel-McCullough, Inc., actually received its corporation charter, naming Preddy as president.

In the little shop, Bill and Jack and Carl Porter, a colleague also interested in radio, set about to produce their vacuum tube—a tube that learned radio men said was impossible, could not be efficient and wouldn't hold up.

From the opening of the shop until November 5, 1934, the three men comprising the production staff were busy setting up equipment (what little there was) and making devices for use in the production of the tubes. They knew what they wanted to build, how it was to operate and its approximate size, but they had no blueprints to go by, almost no tools and barely enough material to start on.

In order to save time, they had a sketch of the intended tube drawn, and the name Eimac appeared before the amateur radio operators in an ad featuring Eimac's first tube, the 150T. It was in the November, 1934, issue of the publication QST that it was run—before Eimac had actually produced a tube!

Manufacturing began in early November with Bill doing most of the glass work, Jack the pumping and Carl the assembly work, although each spent time on all operations.

The first five Eimac tubes ever exhibited were displayed at an amateur radio convention in Fresno in the latter part of November. The tubes, 150T's, created a great deal of favorable comment, but unknown to the gazing convention folks, each tube had a cracked filament stem.

When the trio returned from the Fresno convention, they set about to correct the cause of the stem cracking. They turned out ten or fifteen tubes, all with cracked

stems. It looked like a bottleneck for sure, but Bill kept burning his fingers and came up with the solution just before the "not worth a plugged nickel" stage had been reached.

Sale of the tubes began to boom. Orders ranged from three to five tubes a week—an enormous figure then. Two additional tubes a week was a terrific production job in those days and in order to keep up with orders, Eimac hired its second employee, Ronnie Gordon, on Dec. 1.

Steadily the call for Eimac tubes increased as word of Eimac's durable and efficient tubes circulated among the amateur operators, airlines and radio equipment firms about the country. By 1937, more than a dozen men were working to keep up with the constant orders.

In June, 1936, Eimac moved down the street to a new location in a new building, constructed specifically for the plant, with built-in offices and everything. The original plant at the present location comprised the space now occupied by the Reclamation department, extending back to the middle of the Glass department.

Eloise Wiley was the first full time woman employee to appear on the company payroll. She worked in the "up-the-street" location until February, 1936, to handle the book work and secretarial duties. When she left, Ruth Duncan, now assistant secretary of the corporation, took over the duties and, generally speaking, became Eimac's office force.

Between 1936 and 1939, events at the plant were unspectacular. The original little group of men, and the few hired during the three years, kept plugging away, turning out and developing new tube types every year.

In 1939 the tubes were still mostly hand-made. An order for forty 750T's or fifty 250T's caused the seventeen men on the production line to whistle in amazement.

In July, 1940, Eimac received a contract from Western Electric for 10,000 tubes to be used in military equipment—and, to put it mildly, hell broke loose! Seventeen employees, and the army wanted 10,000 tubes!

Words can't describe what went on in the plant then. (Converting from hand methods to mass production kept everyone working night and day for months,) sent the hiring rate skyrocketing, tossed all standard methods and routines and techniques out of the window. It was an impossible, incredible task, but somehow they did it.

By July, 1941, the original staff was ten times as large as it was on July 1, 1940, and a month later Eimac started hiring women for production work—a radical step in those days. Eighteen women were hired that first day—the first of thousands to come.

In the spring of 1941, the plant was doubled in size to accommodate the constantly growing crew which now numbered more than 150 and was still growing as fast as new men could be hired and trained.

The production demands of the Army and Navy soon made it necessary to create a plant-wide three-shift schedule, which began in September, 1941. Still the military needs were greater than the one plant could handle. In December 1941, a site in Salt Lake City was chosen for a new Eimac plant to be erected by the Defense Plant Corporation. Eimac was selected to operate the plant because of the company's reputation for low unit cost and high quality production, its efficient and uninterrupted operation through the most trying period of the war.

Construction started on the new plant in March, 1942.



A dozen San Bruno Eimackers, headed by Gordon Howes and Louie Pierri, formed a nucleus around which a crew of Salt Lake men and women was built with speed, so great that production got underway in June, and the first tube was tipped off the number one rotary pump in the new plant on August 10, 1942.

A year later the Salt Lake plant could look back on one of the most remarkable records ever made by a war plant—it had out-produced its original estimated capacity by **three times!**

The first male employee at Salt Lake, Ed Frost, was hired in May and sent to San Bruno for training. During the latter part of June, the first plant girls were hired.

By October of 1942, the Salt Lake plant had as many persons on the payroll as did the San Bruno plant, and eventually went well past the San Bruno employment peak.

To utilize all available manpower at Salt Lake, a number of blind persons were hired and performed certain jobs with equal quality and quantity as the persons they released for other duties.

From March of 1942 until August, 1943, Bill Eitel was in charge of the Salt Lake plant's construction and production. When Bill returned to San Bruno, Louie Pierri became general manager at the Salt Lake plant.

In San Bruno expansion was still going on. Offices were located in the plant proper up until the spring of 1942, when a one-story office building was constructed. The last addition to the plant building was made in the first half of 1943 and it has remained that size since.

That however, did not end the building activities for long. In January, 1943, construction of the present engineering building was begun. When the job was completed and the Laboratory moved in March, 1943, from its spot in the plant, a strategic relocation of departments got underway to facilitate the production of the much-needed tubes.

While the department relocation was underway, tubes were still pouring out in ever-increasing volume. In fact, one of the outstanding production records of the San Bruno plant was made during this period.

The production quota for one of the small types was then around 4,000 a month. Suddenly the Navy requested 12,000 for the month of March, 1943, to supply vital fighting equipment which could be operated only with this tube.

Quietly the word went around the plant, "The Navy needs a lot of those tubes, but quick." There was no fanfare, no bulletins, no drum-beating. But the contagion spread like wildfire. All over the plant production records were broken daily. Operators and supervisors and foremen and department heads worked around the clock, lunch hours and rest periods and time forgotten.

They made it, of course. When the last day of March rolled around, they had turned out 12,061 tubes of this particular type, three times the average monthly production, and at the same time doubled production of several other types just out of sheer enthusiasm.

Ample proof of the quality and quantity of Eimac products is the Army-Navy "E" pennant which flies over the guardhouse. Three stars to date have been added to that pennant, which was first awarded in August, 1942. It was the first award in the national vacuum tube field, the third in any industry in California, and the fifth on the West Coast. An award was also bestowed upon the Salt

Lake plant in August, 1943. One white star appears on the Salt Lake flag.

A cafeteria was part of the Salt Lake plant when it was built, but San Bruno had to await a new addition to the existing buildings before hot meals could be served.

When the San Bruno Cafeteria opened in 1943, however, it was worth the wait. Serving complete, balanced meals at food cost alone, the Cafeteria recently was acclaimed the finest in any western industry, by the War Foods Administration.

The Cafeteria, however, is only one expression of Eimac's advanced policies, which include a wide range of protection and benefits for all employees.

Plans are drawn now for a new medical unit to replace the present sandbagged oxygen-hydrogen manifold-ing plant (the oxy-house) when it is moved to its new location across the street. This new medical unit will permit even greater expansion of the company's health, safety and nutrition program, directed toward maintaining a staff of healthy and happy people.

There is a vast informality about Eimac, one of the features usually noted by visitors along with the air conditioning, the music and the physical features of the plant.

That informality extends all the way into corporation affairs, where it is possible because the corporation consists of only three men—Bill, Jack and Brad Harrison, who own all the stock among them, and therefore are their own board of directors.

Walter Preddy, the fourth stockholder of the pioneer period, sold his interests to the other three in 1941—for \$57,000. Bill Eitel became president, Jack McCullough vice president and treasurer, Brad Harrison secretary.

Consolidated now to two shifts at the San Bruno plant, one shift at the Salt Lake plant, Eimac looks toward the next decade with confidence that its life to date in the new world of electronics is ample preparation for the chartless future.

Every tube now in production in the Eimac plant was either designed here originally under an Eimac patent, or was developed by Eimac engineers to make production possible, or both.

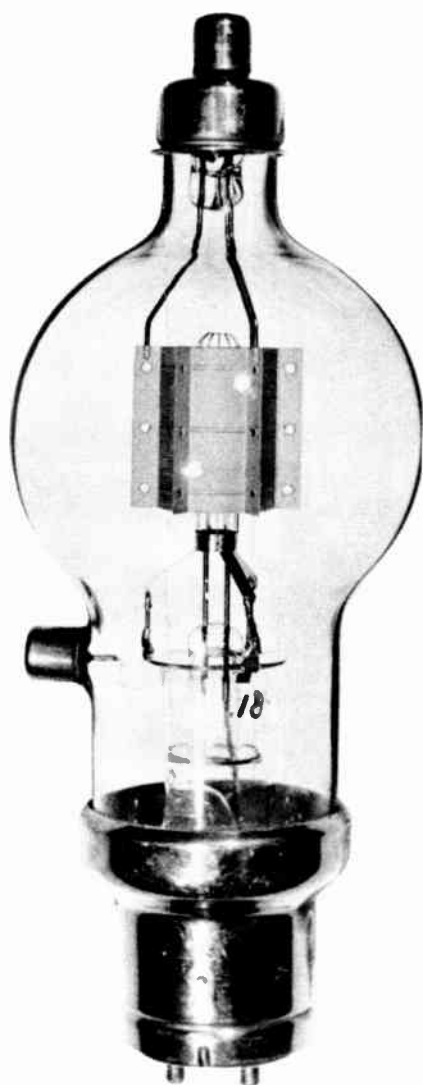
Tubes devised and developed by the Laboratory staff are brought into production by training top operators and supervisors right in the Laboratory. In turn, these men and women pass along their "know-how" to the men and women on the line.

That's how, during 1942, at least thirty-seven different types of tubes were produced; fifty-one in 1943, and fifty-five thus far in 1944, many of them radical designs which the industry had regarded as impractical or downright impossible to produce in quantity.

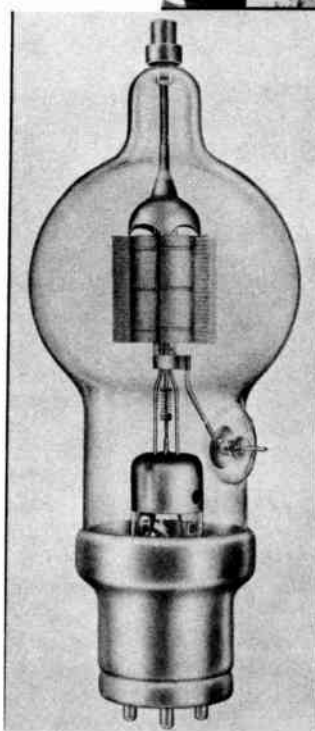
Because all Eimac patents have been made available to the Army and Navy, many other manufacturers are now producing Eimac type tubes, where in the early years of the war, Eimac was in the unenviable position of being the sole producer of many types of vital military radio and radar tubes.

In the fields of television, frequency modulation, radio frequency heating and many other industrial uses of applied electronics, Eimac is preparing for the post-war period. In the meantime, the men and women of Eimac are holding up their end of the war, fully aware that it isn't over yet and that vacuum tubes are a number one need on every fighting front.

**1934:** In the depths of the depression, a couple of fellows had an idea. They didn't have any money, but they had an idea.



1934-150T



250T  
superseded 150T



## A D e c a d e i s A L i f e t i m e I n E l e c t r o n i c s

The first tube that Bill Eitel and Jack McCullough produced under the Eimac trade mark was a 150 watt triode. A type number had to be assigned and since the rated plate dissipation was 150 watts, this gave them the idea to utilize the plate dissipation in the type numbers. The "T" denoted "Triode." Thus, the 150T became the first Eimac tube.

Bill and Jack had definite ideas in mind as to what should go into a transmitting tube. Being amateur operators ("hams") themselves, they knew they must build a tube that could really take it. In 1934, there were no tubes on the market that could handle momentary power overloads that the "hams" were inclined to demand. Bill and Jack had the skill to apply to this first tube.

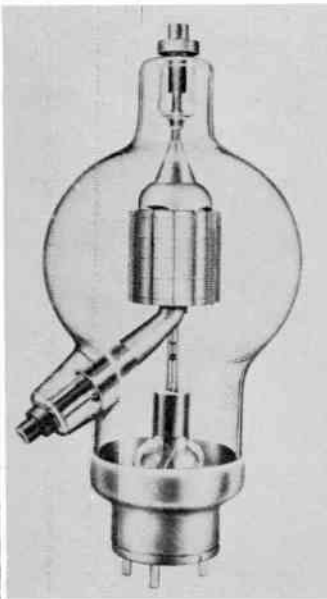
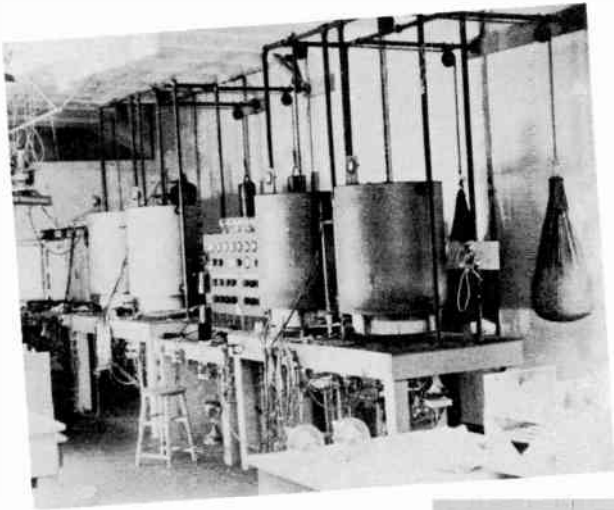
Compared to present day production methods the making of

the first few 150T tubes was accomplished by quite a crude method. Pliers and tweezers were utilized to form the seals and presses. Sealing of the tungsten leads in the glass bulbs was a job which proved one of the most difficult from the very beginning. The filament support leads that go through the base of the glass bulb were almost more than a match for their skill.

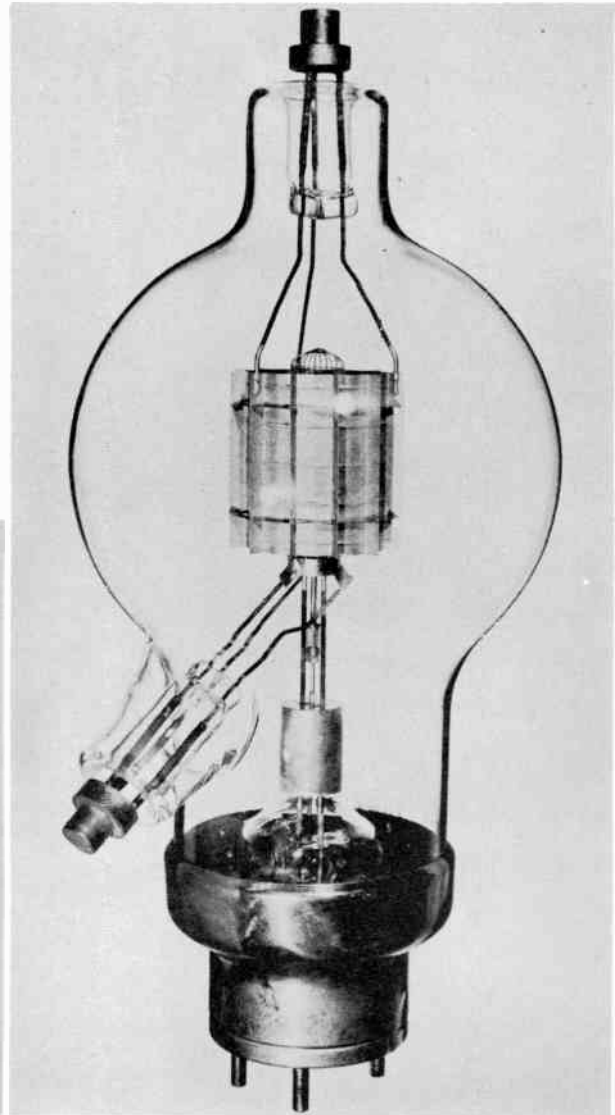
Sealing operations were accomplished by revolving the tube by hand over the oxygen gas flame, whereas now the same job is done in motor driven glass lathes. Almost two months to the day from the time they opened the doors, they brought out what they thought was the "last word" in 150 watt transmitting tubes. They had completed five tubes which they were anxious to take to a "ham" radio convention, held in November 1934. It was here they announced the first Eimac tube. The fate of these tubes is related in the "The History of Eimac."

In a vacant store (which later became a butcher shop) they started making vacuum tubes by hand methods, one at a time.

:1935



750T  
superseded 500T



1935-500T

## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

The year 1935 marked the birth of what were to be two very popular new tubes in the Eimac line—the 500T and the 300T. The 500T saw the light of day in August of 1935, while the 300T made its first appearance in December. The 300T was the forerunner of the 450T, which is one of the most popular tubes in the whole Eimac line today.

Both the 500T and the 300T, because of their power ratings, were beyond the scope of the average amateur station. These tubes were designed with the thought of competing with some of the water-cooled tubes which were on the market at the time.

Water-cooled tubes require quite a bit of additional mechanical equipment to maintain the required temperature for fairly efficient operation. Neither the 500T nor the 300T required any of this superfluous gear. Here were two tubes that were the answer to the design engineers' dreams in that these tubes adapted them-

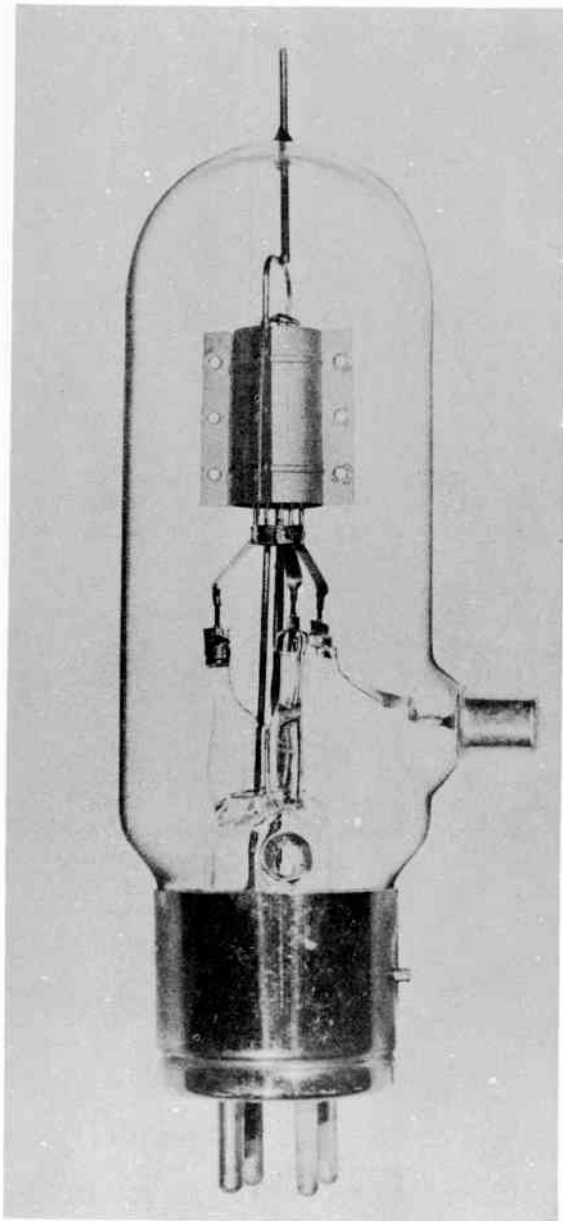
selves very nicely to broadcast stations, airline ground station transmitters, police department radio stations, etc.

There were a number of air-cooled tubes on the market having almost the same power ratings, but the physical size of those tubes made them quite easy to replace by the smaller Eimac tubes. In July, 1937, the 300T was superseded by the 450T.

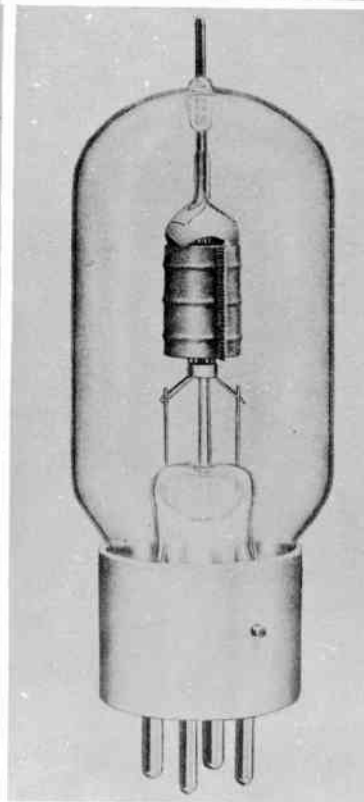
This 450T is now being used in almost every major airline ground station transmitter as well as many broadcast stations throughout the world. In addition to this there are many different electronic uses to which this tube is applied. In June, 1937, the 500T was superseded by the 750T. This tube likewise is used in a number of high powered airline ground station transmitters as well as in many Navy communication stations. The 750TL is also used in many foreign broadcast stations, especially in Latin America.



1936: It wasn't only a new business, it was a new industry, a new world, and there were more headaches than profits.



1936-35T



35T of Today



## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

The 35T, without question, was the tube of 1936. Although the tube was announced in April 1936, because of various difficulties deliveries were not made until September of that year.

By comparison to the 150T, 50T, 300T and the 500T, this tube was a midget, having 35 watts of plate dissipation. However, this tube proved to be one of the most popular tubes in the whole Eimac line for the "hams."

Here was a tube in the low cost field that would give the hams a compact transmitter with quite a bit of power output.

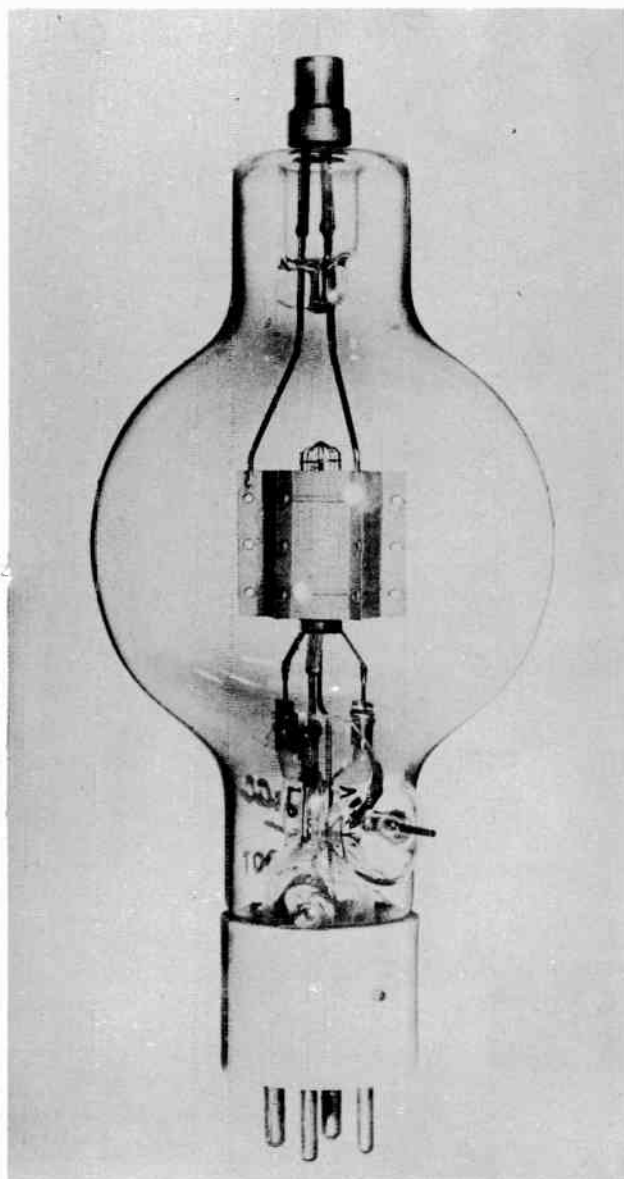
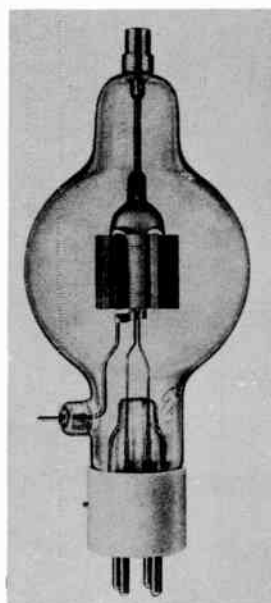
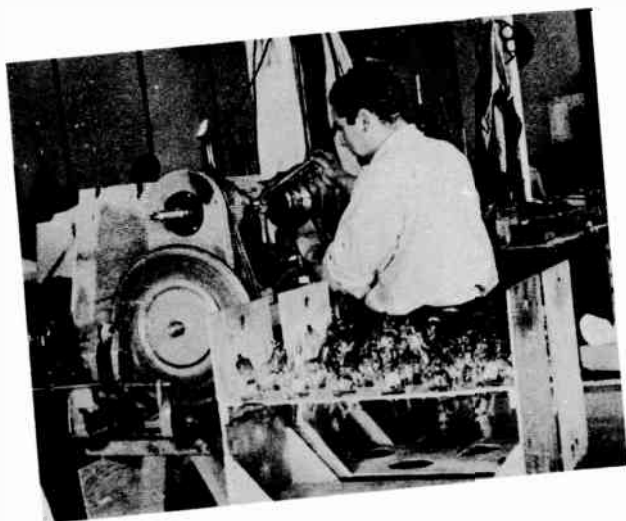
Ham radio applications are mentioned frequently because at that particular time, hams were the first to hop on to a new tube for trying it out. The 35T also became very popular with the amateurs in foreign countries. Power limitations in foreign countries were much lower than the power allowed the hams in the United States.

The diathermy manufacturers found the 35T a very good tube for their low power portable equipment. This tube at present is used in a great many military communications equipment applications.



The word Eimac began to get around among the amateur operators, and the airlines, and the trade. The word meant quality.

:1937



100T of Today

1937-100T

## A D e c a d e i s A L i f e t i m e I n E l e c t r o n i c s

In 1937 the 100T attained great popularity in the 100 watt field. This tube was actually developed in October 1936, superseding the type 50T. Here again amateur radio operators used this tube because it would give then a medium amount of power, at a comparatively low cost.

There were no tubes on the market at that time that would seriously compete with the 100T tube. The tubes that were on the market in the same price class were of obsolete and ancient design and would often fail whenever they were slightly overloaded.

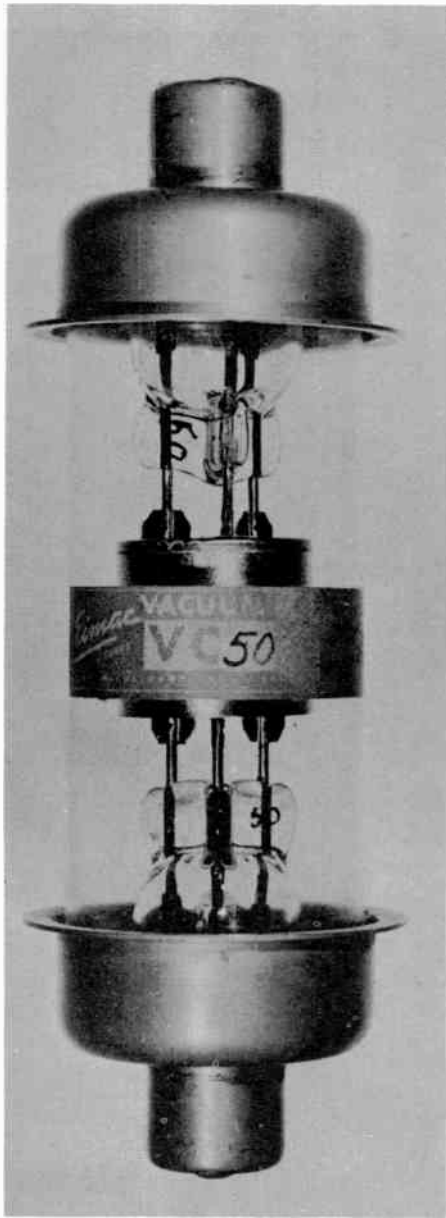
The 100T was not limited to the amateur field—many commercial manufacturers of police radio equipment, diathermy

machines, and low power broadcast stations found this tube to be the answer to many requirements.

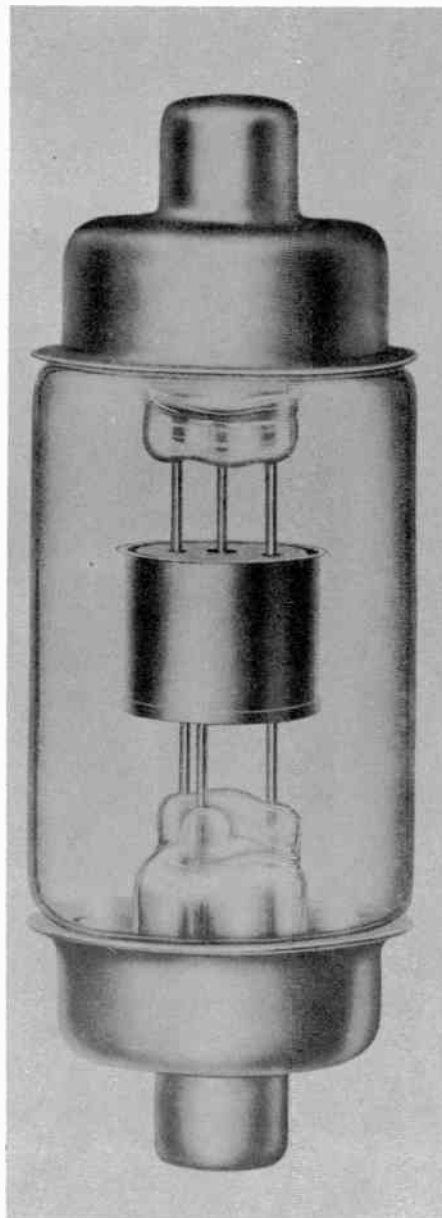
In 1937, the U. S. Navy made its first ship-borne radar equipment experiment. These radar units used the Eimac 100T type tube. Five years later during the battle of Midway the Eimac 100T proved itself by giving consistent operation.

Several other tube types were developed from the 100T technique, these tubes being used in quite a number of restricted military equipment. In addition to this, extremely large quantities are used in Signal Corps communication equipment, which can be found on every beachhead and battlefield today.

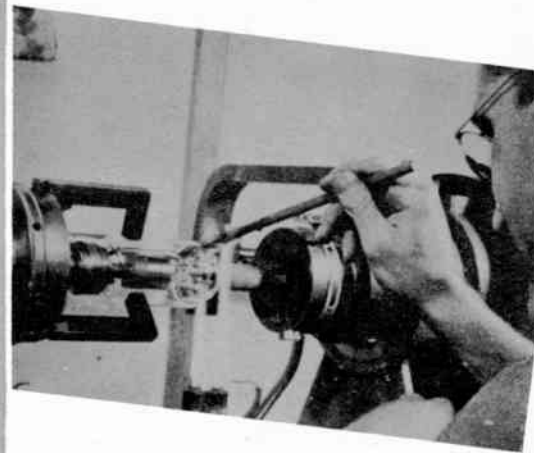
1938: It was still a very small operation, with half a dozen employees, and more hand tools than machinery.



1938-VC50



VC50 of Today



## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

The year 1938 brought about a new Eimac product. This time it was not a transmitting tube but a vacuum condenser. The first vacuum condenser had a capacity of 50 mmfd. The type number assigned was VC-50. This condenser was announced in March of 1938.

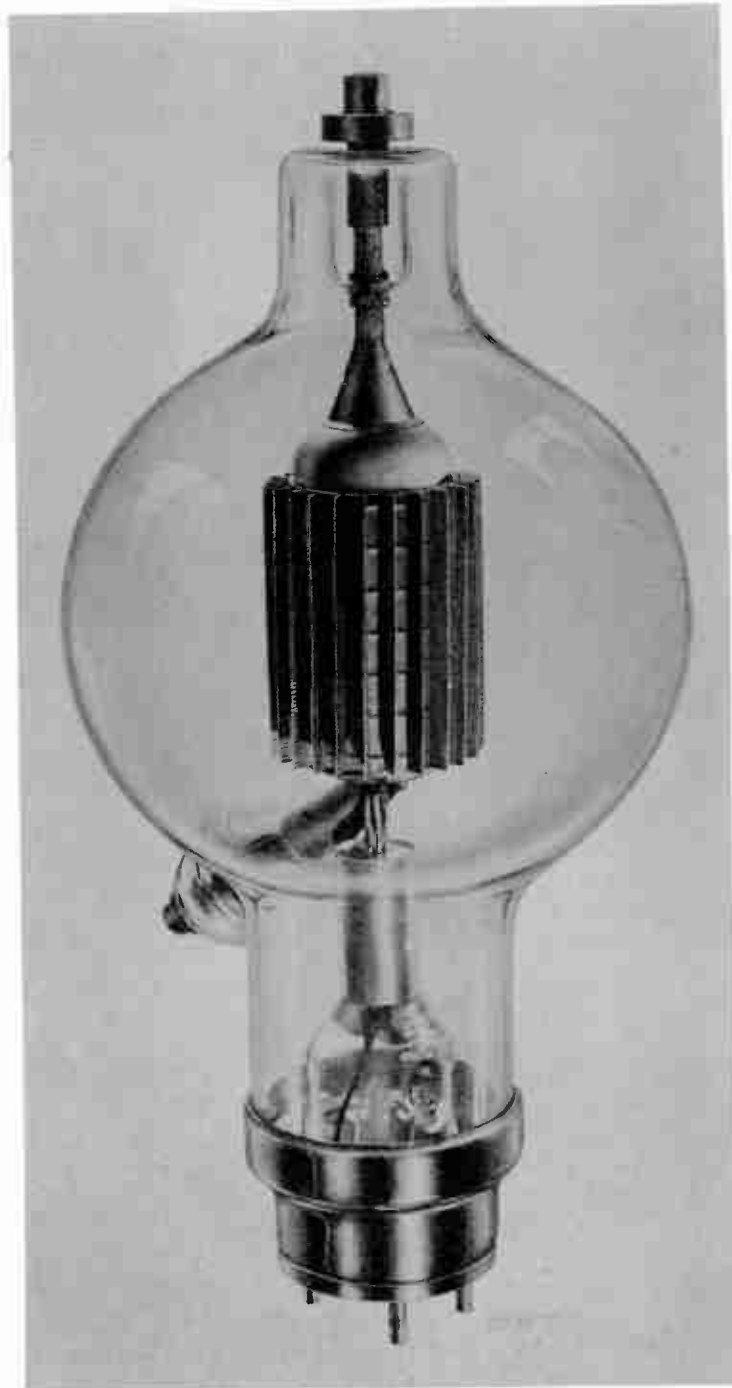
The idea of putting a condenser in a vacuum was not necessarily new, but this was the first time a condenser of this capacity was put into such a small space, and yet withstand a RF peak

voltage of 32,000 volts. This condenser allows equipment manufacturers to do away with some of the bulky variable air condensers, thus adding to the overall efficiency of the equipment.

As is the case in bringing out any new product, Bill and Jack had their headaches with the vacuum condenser due to warping plates and cracked stems. Eimac was the first company to make a condenser of this type—and today Eimac manufactures eight different types.

Over in Europe a man named Hitler, and a man named Mussolini, were introducing the world to the science of total war.

1939



1939-2000T

## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

In 1939 the largest air-cooled tube on the market was produced, the Eimac 2000T. Radio engineers did not think it possible to build an air-cooled tube having 2000 watts of plate dissipation. There were water-cooled tubes on the market, but here again bulky, intricate water-cooling systems were needed.

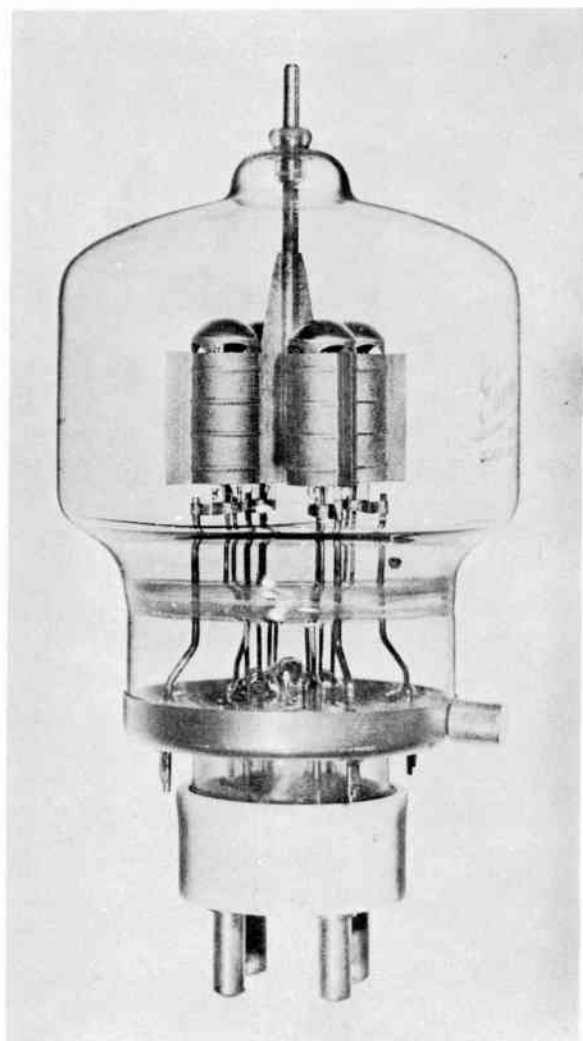
The 2000T is used in high-power communication type trans-

mitters and is operating very well for the airlines in transoceanic communication circuits. Broadcast stations also find this tube to their liking, especially in Latin America.

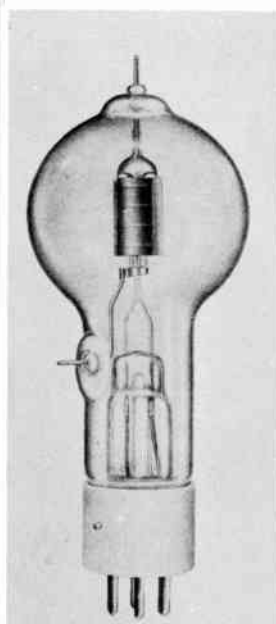
With the advent of the electronic heating equipment manufacturers, this tube again was found desirable. At present, the 2000T is the largest tube in the Eimac line.



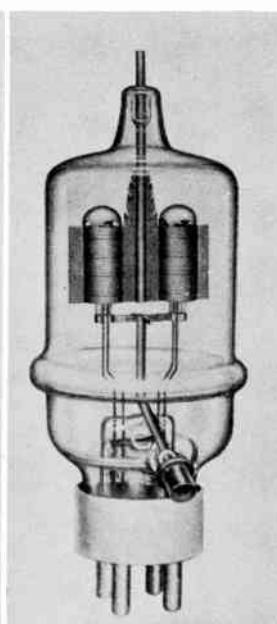
**1940:** All at once the word ELECTRONICS was being tossed around, and Eimac found itself with a contract for 10,000 tubes. How many "zeros" were added to that 10,000 in 1943 can't be told.



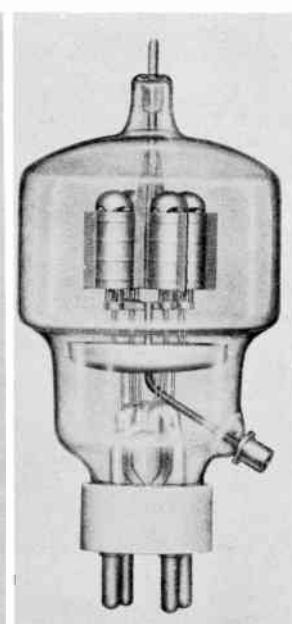
1940-304T



75T



152T



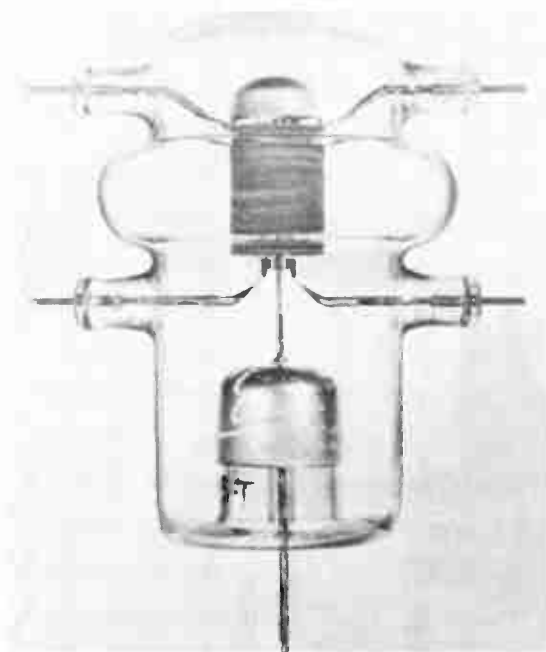
304T

## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

For the year 1940, it seems as though two tubes vie for honors, the 152T and the 304T, brought out in January and February, respectively. These two tubes were a departure from the type of construction of previous Eimac tubes. Instead of having a single set of elements (grid, filament and plate), the 152T had two sets of elements, while the 304T tube contained four sets. The type number 152 indicates 150 watt plate dissipation while the figure two denotes the number of sets of elements. Likewise the 304 indicates 300 watts of power with 4 sets of elements. It should be mentioned here that the 152T was an outgrowth of a transmitter which Bill and Jack had employing four 75T type tubes in a push-pull parallel circuit. This transmitter was used so effectively and performed so nicely in their ham radio stations that they decided to make two tubes with the same operating characteristics as the four 75T's. Thus the 152T was born, as each is equal to two 75T's in power ratings. You can no doubt guess the 304T was derived from using four 152T's in a similar circuit, a single 304T being the equivalent of two 152T's.

One advantage in the 75T, 152T and the 304T type tubes lies in that low plate voltage and high plate current may be used, and attain good operating efficiency. As mentioned before these tubes have departed from the previous Eimac technique in tubes, where practically all others attain high efficiency with the use of high plate voltage and low plate current.

The 152T and the 304T having been announced after the beginning of the European War, were never given a chance to become popular with the "hams" because of the curtailment of amateur radio by the government. The 304T was discovered by the Army and the Navy as having very desirable characteristics and consequently have been quantity produced during the past three years. Diathermy manufacturers are using the 75T and the 152T, and a number of electronic heating equipment manufacturers have seen the good points of the 304T and are using them to good advantage.



1941-VT127A  
(Varied improvements since 1941)



## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

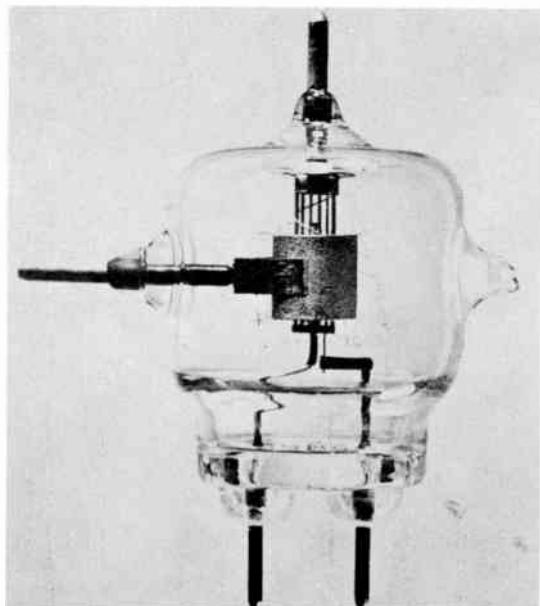
In 1941 the VT127A achieved its greatest popularity. This tube until very recently was classified as restricted by the Army and Navy, and it is still being used by them throughout the world in radar equipment.

The VT127A actually came out of the 100T type tube. As shown in the photograph it contains the internal elements similar to the 100T although the glass envelope is of an entirely different shape.

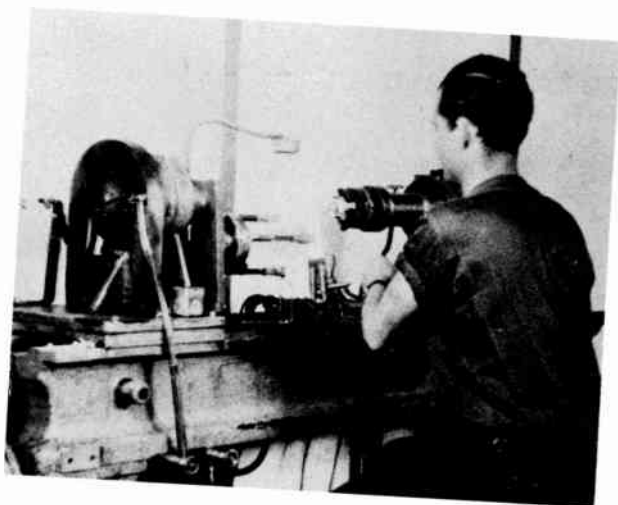
The dual tungsten plate and grid leads are brought out through each side of the envelope thus enabling short leads within the equipment itself.

This tube is rated at 100 watts plate dissipation. The VT127A probably had achieved some distinction in that Eimac has produced more of this type possibly than of any other one type during the past few years.

1942: One plant couldn't do it all—at the request of the Signal Corps, a brand new plant was opened at Salt Lake City.



1942-15E



## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

The year 1942 saw tremendous production of a real midget tube, the 15E. In fact, Eimac as well as the Navy boys call it "The Flea." The size of the flea is indicated by its 2 $\frac{3}{4}$ " overall height.

This tube, like the VT127A, was restricted until a few months ago. It was designed especially for airborne equipment. Obviously the small size was suited to lightweight equipment such as all aircraft requires.

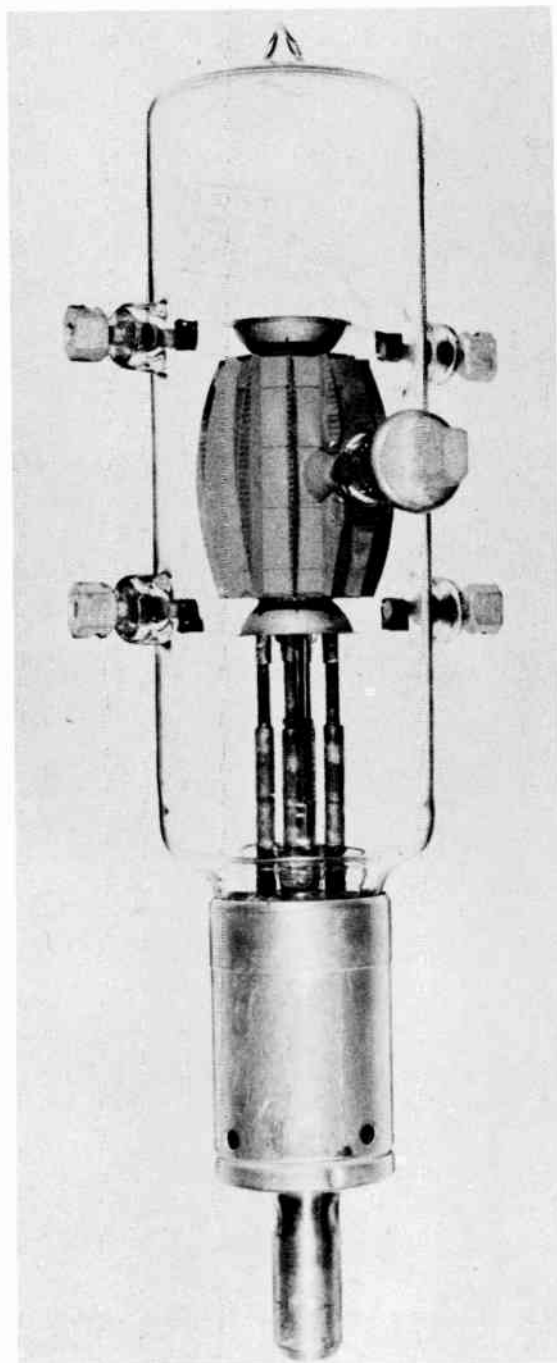
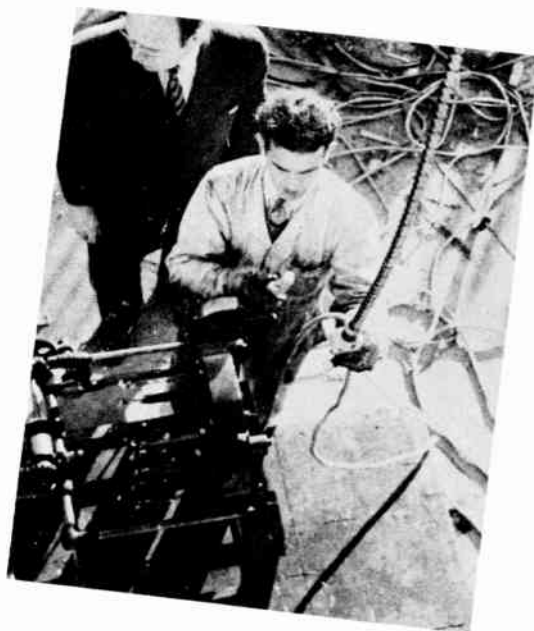
The 15E gave Eimac its greatest test for quantity production in the shortest period of time. A quota was set and after a little slow sledding at the beginning, the quota was more than achieved each month. Sometimes the daily returns of the number of tubes manufactured reminded one of the election returns.

Since this tube has been released from the restricted classification, inquiries indicate the possibility of many varied future applications.



Both plants soared to production heights many times the wildest estimates anyone could have made six months before.

:1943



1943-527

## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

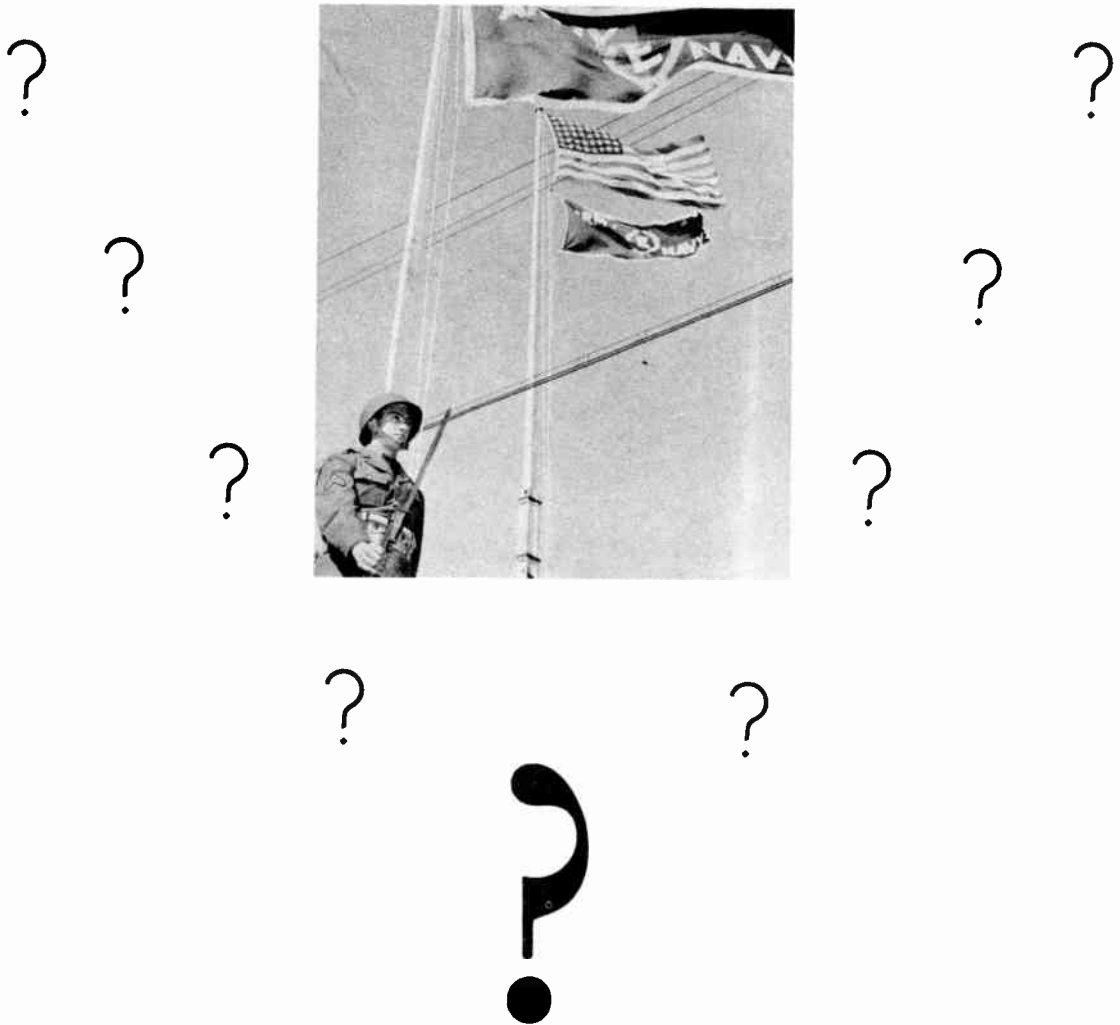
In 1943, the 527 was designed, and it was a real test of Eimac skill and ingenuity. A development contract was given Eimac by the Navy to design a piece of equipment, including tubes, to have tremendous power output.

The output demanded by the Navy was much higher than any other similar piece of equipment. With this contract went a deadline for completion of the unit. This deadline was met and the

equipment shipped to the Naval Research Laboratory for test.

There are many features used in the 527 that are not employed in any other Eimac tube. Whereas the plate dissipation is but 300 watts, the filament requires 5.5 volts at 135 amperes. For comparison the other Eimac 300 watt tube is the 304T which requires 5 volts at 26 amperes. This will indicate the rugged filament employed in the 527.

1944: Looking back over 10 years, those two fellows with the idea can well wonder what the next decade will bring forth.



## A D e c a d e I s A L i f e t i m e I n E l e c t r o n i c s

The list described in these pages does not include all the tubes in the Eimac line and a few others should be given here. For example in the year 1934, there was also the 50T which was the forerunner of the 100T.

In 1937 Eimac developed a tube with 1000 watts plate dissipation, but contained in the same size bulb as the 450T. This tube was the 1000 UHF, now known as the 1000T. This tube was primarily developed at the request of Major Armstrong for experimental work in FM broadcasting. It was a tube of high plate dissipation, yet its physical dimensions were small. It likewise could be used on higher frequencies than some of the other Eimac tubes.

Then in 1938, Eimac produced two rectifiers, the RX21 and the KY21, the latter being of a grid controlled type.

In 1940 Eimac digressed a bit to develop a switch within a vacuum. We call this vacuum switch the "VS-1". This special unit was and is used for an antenna change-over switch for aircraft communication equipment. At high altitudes, the old open air mechanical type switch gave trouble in that it would arc over between contacts. The necessity arose, when airplanes flew higher and higher, to develop a switch that would not arc over. Here again, Eimac went to work and came out with the Vacuum Switch. It is interesting to note the contacts within this tube are spaced at only .015 inches, and yet no arcing is experienced.

It will be interesting to see what the end of 1944 will bring as Eimac's most outstanding tube. At this time there are three or four tubes which will compete for honors.

# While Walking Through The Plant One Sees...

## The Pump Department

It probably ought to be called the Vacuum Exhaust department, or Electrical Processing, or something, but it's easier just to say Pump, because that's the principal function of the department—pumping out the air from inside the glass bulb of every vacuum tube and degassing the metals.

There's more than just sucking out the air, in the manner of an electric light bulb—just about every last molecule of gas, including that soaked up by the metal parts and the glass itself, has to be driven out by high voltage and high temperatures.

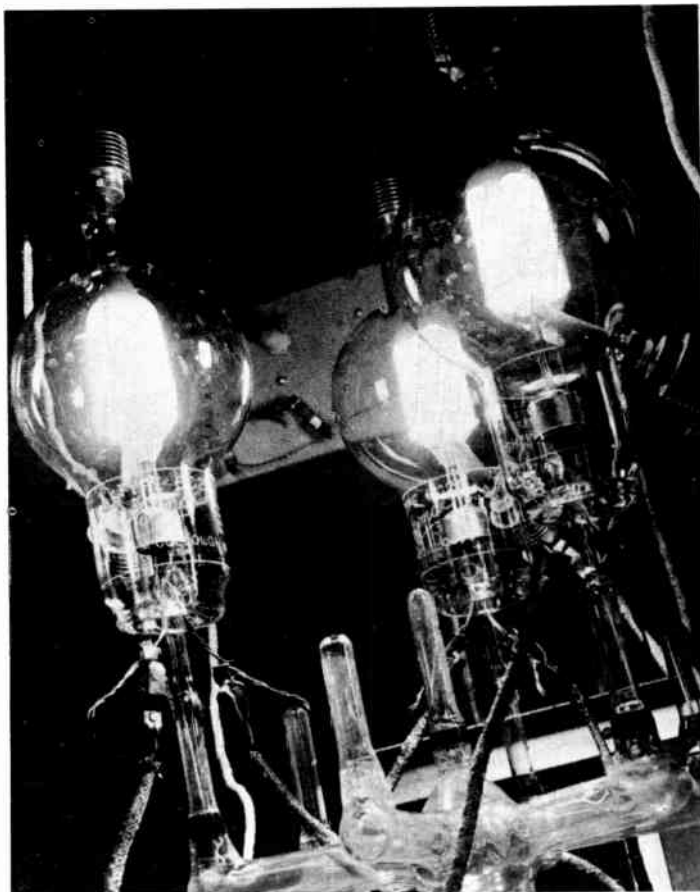
Then there's the preliminary business of carbonizing filaments, a complicated rite that does something complex to the thoriated tungsten which emits the electrons that make the tube tick. (Note to Lab: All right, then you explain it!) And the business of debarnacled, of induction heating, grinding, basing, testing—all involving rows of highly complicated instruments and apparatus designed to measure the efficiency and other characteristics of each and every tube produced by Eimac.

Pump is the last department to hang on to the graveyard shift, since processing isn't something you can just turn off like a clock when 3:30 comes, and because there just never have been enough pumps to go around.

The big rotary pumps that are the principal feature of the department are entirely and solely Eimac creations, the children of necessity. Standard pumps couldn't do the job fast enough. The Army and the Navy needed tubes faster than they could be pumped by existing methods. So the Eimac gang dreamed up a rotary, and there it was—just like that!

Not apparent now are the weeks and months of sweating and figuring and trial and error that went into those ingenious machines, and the tinkering and adjusting and changing that were required in getting them to perform consistently.

The rotary principle has since been applied to electrical testing, in the new rotary tester which recently graced the front cover of a national radio magazine.



The present department head, O. P. Taylor, is the original—he took over where Jack McCullough left off when the plant first started to grow.

Foremen are Russ Higby, Cliff Ricker and Irving Coutts, with Elliott Sigourney as quality control engineer.

## The Punch Press Department

Once upon a time those hundreds of small metal parts that make up Eimac plates and grids and filaments were made by hand, with a pair of shears, pliers and patience.

Nowadays, however, more than 200 different dies are employed in the Punch Press department for shaping, bending and drawing a variety of metals into the appropriate form required for any of half a hundred tube types.

Literally thousands of parts flow out of Punch Press every day. The department, headed by Skeets Jones, includes a row of punch presses, sandblasters, roller welders and precision shears.

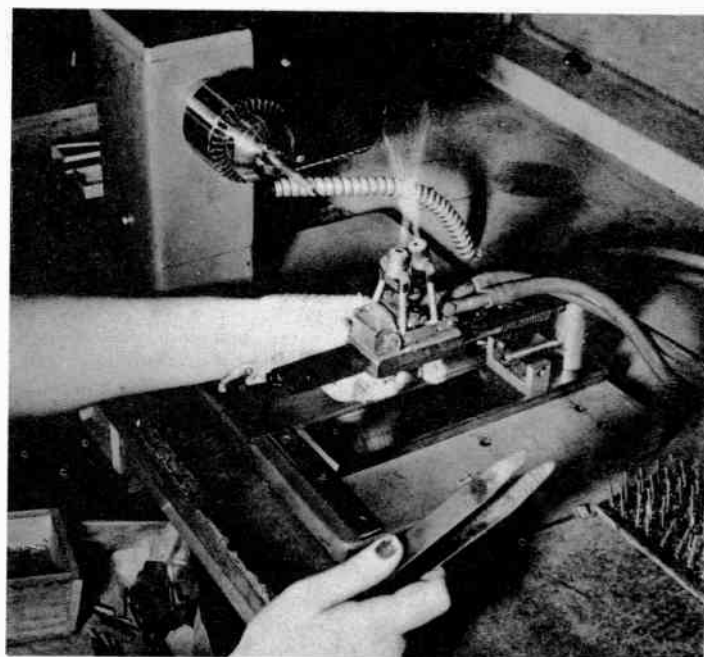
Like Grid and Plate, Punch Press split off from the old Assembly department when Jack James went into Traffic in March, 1943, and has since grown on its own. Carl Magnuson is general foreman on both shifts, with Frank Christie as day shift foreman and Fred Bjork as swing foreman.

A study of the big display board over the roller welders will reveal some of the 300-odd operations performed in this compact department, which is the starting point for the metal parts of nearly every tube made here.

Incidentally, every one of the 200 dies used in this department was designed and made in our own Machine Shop, and all of the die setting is done by the foremen. The roller welders, sandblasters and shearing machines also are Eimac products, designed to meet the unusual requirements of unique industry.







## THE GLASS DEPARTMENT

They call it the Glass department, because that's what goes there, but actually it is a whole collection of departments which combine to form the largest single department in the plant.

All glass fabrication, blank forming, sealing and annealing are handled by this big family, under the direction of Don Furgason, who is strictly an up-from-the-ranks Eimac product.

The Glass department is noted for its Horatio Alger flavor—a plant manager, a chief engineer and some other assorted brass hats having got their start twisting goopy glass here.

That's not so surprising, though, considering the wide variety of opportunity offered by the highly varied tasks and skills used in this department—from beading oxidized tungsten leads to sealing in filaments on a lathe or hunting for strains with a polariscope.

There are several sections—fleas, beading-flares-tubulation-and-glass-cracking, stems, and Glass proper, which includes sealing and miscellaneous operations like making relays. Each section is headed up by a supervisor, answering to Shift Foremen Leo Ray and Vic Hermann.

Something like 35 different kinds and styles of glass blanks, about 50 sizes and shapes of tubulation and beading glass, and three standard varieties of chemical composition (pyrex, nonex and uranium) further complicate the business of getting to know glass.

Cap that with some tanks of nitrogen, some oxy-acetylene or hydrogen flames, a blast of air pressure and a spinning chuck, and you have the Glass department, which hasn't ever been the same since Wolves' Row went to war.



## The Grid Department

That section of the plant where girls work with their eyes glued to an invisible something between the points of a spot-welder, is known as the Grid department.

The grid, a sort of electronic gate or valve, is a tiny bit of cylindrical bird-cage made of such precious metals as tungsten, nickel, tantalum and platinum in various combinations, spot-welded in amazing precision.

Few jobs in the plant arouse more interest among lay visitors than grid winding and mounting, particularly 15-E and 3C-24 types, which epitomize the precise, high-quality work that goes into every Eimac tube.

Originally a part of the old Assembly department, Grid was launched on its own in March, 1943, when Jack James became Traffic head and the department was split up into several sections with Bud Stuart heading up Grid.

The department has grown considerably since then, with numerous new tube types requiring a wider variety of Grid work. A recent acquisition is the phenomenal grid winding machine, of which there are now two, which mass produces grids of remarkable uniformity.

Bud is warming up for a sojourn in the armed services, having been gathered in by the "under 26" Selective Service rule. He has relinquished command of the department to Skeets Jones of Punch Press, who will carry on both jobs with the assistance of Dave Jackson, day foreman, and Ralph Downey, swing foreman.



## The Drafting Department

It's known briefly as the Drafting department, but actually the little group of pencil pushers occupying one end of the Lab building under the direction of A. M. Newhall includes several first class engineers who have done much to build Eimac's production to its present high peak of efficiency.

At present the department consists of three machine designers, one electrical draftsman, one mechanical draftsman, three detail draftsmen, and the department clerk who doubles in blueprinting, besides the department head who is a graduate engineer.

These people design and engineer new equipment of all kinds for the fabrication of tube parts and completed tubes, re-design existing machinery, draw plans for new jigs, tools and fixtures, make outline drawings of new tube types, prepare charts, graphs and diagrams for every other department and for customers and suppliers, and in their spare moments think up new mechanical and electrical gadgets on their own.

Perhaps the crowning achievement of the department to date is its design, in conjunction with the Laboratory and the Machine Shop, of an automatic grid winder which can mass produce grids of uniformity.

The Grid machine, and many another gadget which would put Rube Goldberg to shame, place Eimac's Drafting department high in the ranks of engineering achievement.

## The Shipping Department

"We Who See Them Last" is appropriately the name of the Eimac News column which portrays the weekly doings of the Shipping department.

Here the accumulated effort of every Eimac employee winds up in a package for shipment to all the battlefronts of the world, as carefully protected against damage as a newborn babe.

As in other departments of a new industry, most of the methods used in Shipping were devised right here, out of necessity and out of the ingenuity of Eimac employees such as Jerry Manly, originally and still the department head.

Upon learning that Eimac tubes were being bounced off lighters onto coral beaches, and even dropped in parachutes, the boys and girls rigged up a novel method of suspending tubes within their cases to prevent breakage despite any kind of rough handling.

The method put an awful strain on the girdle material supply, but it did the trick and it is still doing it.

Out of elastic and fiber and string, and wood and metal and plastics, and cotton batting and excelsior, this department can devise a packing for anything on short notice, and practically will guarantee that it will get to its destination anywhere in good order.

To date, there is no record of the department's having tried to pack and ship the aforementioned new-born babe, but such an emergency wouldn't phase the Shipping gang in the least.



SHIPPING





## The Construction Department

If it couldn't be bought, or nobody ever saw one before, Tommy Hall and his Construction gang would build it.

That was the story of Eimac's expansion in equipment and apparatus for those hectic years when the rotary pumps were a-building and spot-welders were worth their weight in P-TW.

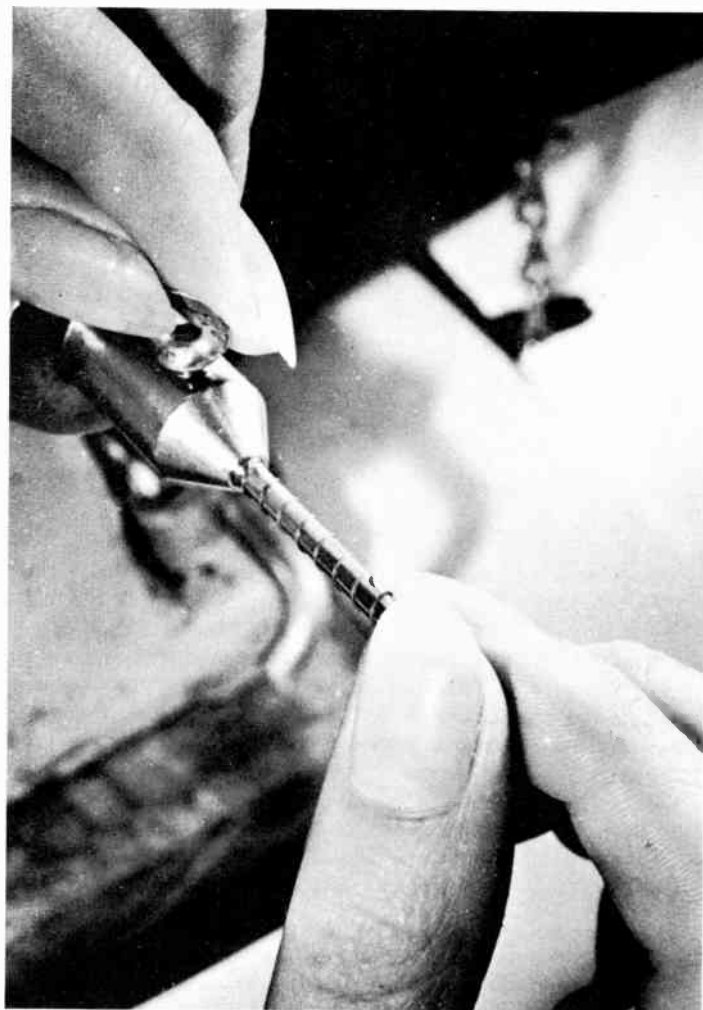
In addition to the not-so-easy job of maintaining all plant equipment, the power supplies and the pumps and the fans and the myriad of other moving parts that keep the place going, Tommy's gang has the assignment of making anything anybody wants, or needs, in the line of electrical apparatus.

Working at times under terrific pressure, the Construction department went in strong for what it called "Russian engineering," which is mostly improvising new ideas in less time than seems humanly possible.

Of late, Construction has been going in for more refined gadgets like high-frequency oscillators, fancy gear for Standards Control and Final Testing, nice shiny panels neatly engraved with cryptic characters, but the slightly wacky atmosphere prevails nonetheless.

Bill Baker heads up the electrical service division of Construction, maintaining the complicated equipment in Pump, while Stan Johnson is shop foreman, directing the work of the screwdriver pushers and wire twisters who build the tube shrinkers and electron percolators.

Besides the department head and foremen, who also work, the department now includes a squad of radio electricians, a sheet metal man, a couple of machinists, an electrical draftsman and some mechanics and maintenance men who also serve as handy men with hammer and saw on occasion.



## The Spiral Filament Department

"What do you use those little springs for?" That is a question often heard as visitors gaze upon the rows and more rows of the Spiral Filament department.

Those "springs" are not springs, however; they are spiral filaments, which serve as the heart of the smaller type tubes.

The utmost precision is the prerequisite of an operator of this department. Each coil in a spiral filament must be exactly, not pretty close, but exactly to the thousandths of an inch the same distance apart. There can be no bows or sags whatever and the filament must be mounted so that the center rod or long lead is smack dab in the center of the assembly.

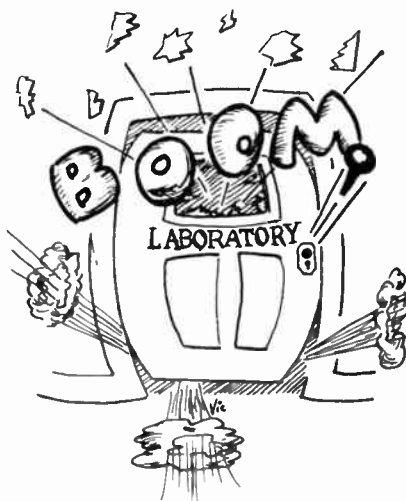
First operation in the department is that of winding the filament, followed by the mounting, straightening, (and re-straight-

ening after carbonizing on certain tube types) grid mounting, arc welding and a host of other intricate operations that require perfection through and through.

'Tis a far cry now from the days of tweezers, cut hands and "damn these little things" words which prevailed in the earlier days. Also the variety of production has increased, now to nine different type filaments. But during the ten years of operation the number of different types has probably numbered close to 30.

Art Arrigoni, oft-called "Arturo," is the department's chief, with Al Gilbert and Bill Leonard as his shift foremen.





## THE LABORATORY

All of Eimac can well be considered a laboratory-in-production, but there is one large and important corner of the place that is strictly a laboratory, meaning experimental.

Responsible for the company's principle vacuum tube developments, the Lab ranks right up in the front line of the nation's leading electronic research organizations. Not a few ideas worked out in the Lab and put into production in the plant are playing their unpublicized but vital part in winning the war on every front.

Not until after the peace is signed can all of Eimac's contributions to modern warfare be revealed, but when it is, the Lab will draw a good share of the credit.

Constantly expanding, the Lab now includes a complete Glass section, a Chemistry section, an Instrument Room, Spectrograph.

Machine Shop and a general experimental section, all under the direction of Hal Sorg.

Current experiments, like many of the past developments, are still under the secrecy label, but it can be revealed that the Lab staff is engaged in an important long-range program for the period of the war and well beyond.

The staff includes a number of electronic engineers who shudder at the title, two engineering chemists, a couple of machinists, an instrument maker, a spectrograph technician, several glass technicians, and a variety of assistants, most of whom have come from production jobs.

There is also the little man who empties the RF buckets on the Lab roof, but nobody has thought up an appropriate title for him yet.

## The Machine Shop

A sight to make any mechanically-minded man or boy drool with anticipation greets the curious investigator who pokes his nose into the lower floor of the engineering building.

Here is the last stronghold of the male war worker—the Machine Shop—which should properly be known as the Machine Tool & Die department.

Eimac's machine shop differs from most in that no production work of any kind is done there, the entire section being devoted to producing tools, dies, jigs, mandrels, fixtures and gadgets for making tube parts, and to building and repairing complicated apparatus and equipment.

Since this company went into war production in a field in which there was NO available equipment, everything had to be made here—which is where the Machine Shop came into being.

Eimac even had its own die designer in Fred Schack, who figures out those polished and precise cutting and shaping dies used in the Punch Press to make various shapes out of tantalum and tungsten and nickel and a variety of other metals.

Some of the finest precision machinery to be found in any shop in the Bay Area is kept humming in the Machine Shop, which works down to tolerances of 1/10,000th of an inch.

Aluminum, brass, copper, stainless and tool steels, tantalum, nickel, silver, copper, tungsten, molybdenum and a host of alloys are among the materials with which the shop is familiar. Jay Eitel heads up the division, with a staff of tool & die makers and precision machinists who will make anything, given a rough idea, a hunk of metal and a file.





## The Plate Department

When you think of girl welders, in ordinary terms, you think of hefty gals with hoods and masks and torches crawling around the hold of a ship.

At Eimac, it's different. Welders here sit in posture chairs at low tables under fluorescent lights in an air-conditioned room and tack little metal parts together to make something called plates.

At Eimac, plates are different, too. They aren't flat—they are cylindrical, and they're apt to grow fins like a fish, and they're made of tantalum or molybdenum.

Every tube has a plate—the receiving end of the electron stream that comes from the filament.

Plate takes up where Punch Press leaves off on most types, assembling and welding and completing the plate sections for each tube. That's a bigger job than it sounds—one type alone requires more than 800 welds in 28 different operations.

The Plate department is one of the newer ones—another of those off-shoots of the Punch Press-Plate-Grid arrangement which Jack James headed up before he went into Traffic. George Currier is the department head, assisted by Henry Rideout and Kenneth Drew as shift foremen.

## The Inspection Department

There are plenty of gags about Inspectors and their chronic inability to see anything good, but Eimac's Inspection department has pretty well overcome that prejudicial view.

With the Eimac standard of the highest possible quality constantly in mind, the Inspection department has held to a minimum rejections from the government inspectors who take the last look at the tubes before they go into Shipping.

At each stage in assembly, from raw materials to sub-assembly to completed tube, Inspection gives a close scrutiny to every tube for every conceivable kind of defect such as filament, grid and plate alignment, seal leaks, broken or damaged grids or filaments, dirt, stones, seeds and cords (they aren't what you think), misshapen seals or blanks, wrong parts, quality variations and a thousand and one other possible deviations from the accepted standard.

Raw glass is inspected in Pre-Inspection, in the warehouse up the street, raw tungsten in the Serialing section, and the various parts in the little compartments adjoining Glass, or downstairs in the new Inspection section.

Microscopes, go-no-go gauges, polariscopes and Tesla coils, magnifying glasses, and most of all, eyes and horse sense are the equipment of Eimac's versatile inspectors. Willard "Bill" Tallmon



is department head, assisted by Bob Pearl and Harry Muehlman as shift foremen, and Sig Johnson as Pre-Inspection foreman.

The department also has a quality control engineer in the person of Art Lustig, formerly a shift foreman now detached for special duty.





## The Standards Control Department

Originally set up as an adjunct to production and laboratory testing facilities, the work of Standards Control became a vital necessity with the institution of joint Army-Navy specifications for all Eimac's many tube types.

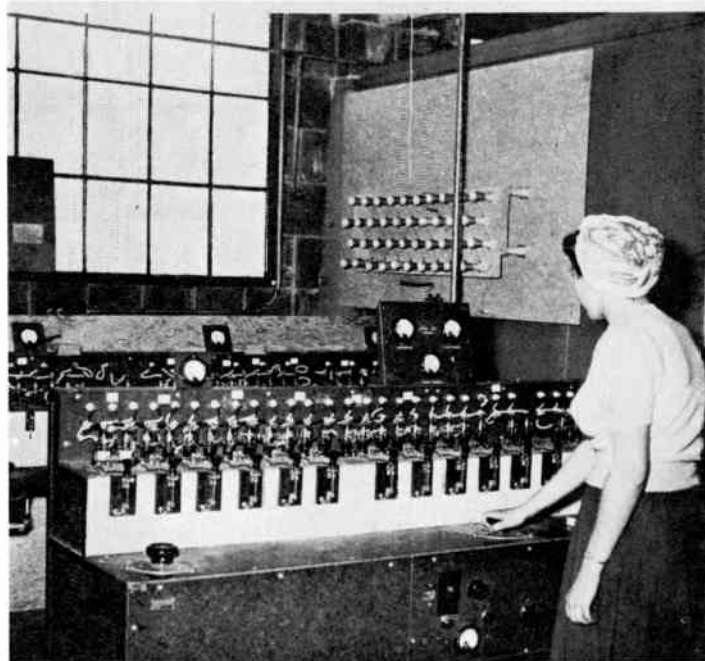
Standards Control took over the warehouse formerly occupied by Pre-Inspection, and under the direction of Erwis Isgitt, who was brought from Salt Lake City for the purpose, it became a separate department in the fall of 1943.

Standards Control, sampling completed tubes at random from the production line, provides a barometer of production quality by making highly critical measurements of characteristics.

In addition, life tests are made of a percentage of tubes, running them in transmitters with dummy loads until they give up the ghost from old age—which is a matter of many thousands of hours, providing much valuable information on performance and trends.

The department has an astonishing variety of complex equipment and testing apparatus, most of which grew out of Eimac equipment and was built for its specific purpose by Eimac's laboratory and construction men.

Jay Patterson and Bob Davis serve as shift foremen and assist in the operation of all the department's apparatus, besides assisting in setting up new equipment as required.



## The Receiving Department

As most department names are apt to become in an organization as large as this one, "Receiving" isn't entirely the title for that section of Jack James' Traffic department which is headed by John Dunstan.

The Receiving department checks in all materials, supplies and other goods that comes in through Eimac's gates, recording the receipt and invoice numbers and routing the material to its proper department.

Such materials may be anything from darts for the noon-hour baseball game to a ton of cement, or a small fortune in platinum, or some highly breakable glassware, or a stack of government forms, or a pair of glasses.

In addition, however, the department wraps, weighs and ships all outgoing goods except for completed tubes, assists in loading and unloading the trucks that back up to its door and does such odd chores as moving furniture for the office help when occasion demands.

The strange lingo of way bills and bills of lading and invoice and purchase order is familiar language to this department, which didn't even bat an eyelash the other day when a sewing machine arrived in the same truck with half a dozen voltage regulators.

## The Straight Filament Department

In all this talk about electronic warfare and the new science of electronics, it is easy to overlook the fact that the electrons in question have to originate somewhere.

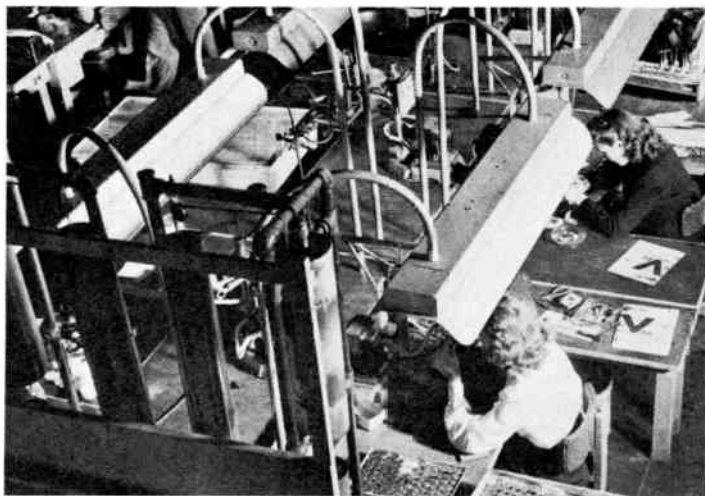
In the case of all Eimac's larger tube types, they originate in the Straight Filament department, or at least in the thoriated tungsten wire that makes up these filaments.

Of course, there's more than just a hunk of wire. Also included are such items as a nickel shield can, a nickel U-piece, a bottom spring cup, the bottom filament supports, a pusher spring, a top spring cup, a pusher, filament hairpins (the wire!) and a cross-tab.

All these parts, many of them exceedingly small, have to be fabricated, shaped and mounted on the center and side rods, the completed filaments "squished" in hydrogen, straightened meticulously, then given a final inspection.

Originally this work was done by hand, but the present array of welders has done away with many of the hand operations, although fingers and eyes still play the major part in this department.

Fran Migge has headed the department since Rad Leonard left the job to move up the line. The department boasts of the only woman shift foreman in the plant (at present), Edith Thylin, a veteran Eimacker.







## RECLAMATION



## The Reclamation Department

While most of the rest of the plant is busy putting tubes together, there's one department that spends part of its time taking them apart. In fact, it's the only place in the plant where it's legal to bust a blank with a hammer.

However, it's all to the good. There have been times in the past, during periods of critical shortage of certain materials, that the Reclamation department virtually kept the place on the air, supplying critical material, salvaged from rejected and damaged tubes.

It used to be called Salvage, a sort of step-child of Glass, and it had a cubby hole in the basement to start with.

But as the plant mushroomed, Salvage became Reclamation, and it graduated to the main floor and acquired a lot of special machinery for cracking glass, grinding tungsten, beveling, deburring, polishing, inspecting, cutting, burning—you'd be surprised at what all goes there.

Salvaged parts are sorted into bins, worked over and carefully checked for possible return to the assembly line, or bundled up for shipment back to the factory where the raw material originates. Everything except glass, porcelain and cement is salvaged in this department, which is headed by Vern Vincent, with Rudy Uribe as general foreman, assisted by Bill Gust and Bob Nourse.

## The Stockroom

Eimac's Stockroom could easily be called the Materials Disbursements department and thereby give a clearer description of the duties carried out there.

The Stockroom is an important division of the Traffic department, which is the control center of materials flowing through the plant.

Most important activity of the Stockroom is the keeping of inventories and delivering of materials to the departments. From the inventories the Traffic department is able to make up reports by which the departments schedule their work for each day. The Purchasing department also uses the inventories as gauge for material needs.

The Stockroom also, is an aid in the cost accounting set-up. Records kept on parts passing through the departments may be applied to the specific tube types and allow the Accounting department to reach an exact figure. Practically every tube part is now routed through Stock and not from department to department as was the case not so long ago.

The Stockroom was originally set up in June, 1941. It has expanded to large proportions during the three years of its existence and has also taken on more and more duties with the passing of each month.

Under Traffic Department Head Jack James, George Parks is in charge of Tube Materials Stock. Don McMillan and Dan Daniels are the foremen on day and swing shifts, respectively. Frank Novello runs the Construction stockroom, Vernon Lee the Machine Shop stockroom, Gene Gallagher the Miscellaneous stockroom, all parts of Traffic.





## The Chemical Department

There's one department of the plant that has seen everything.

The Chemical department, officially known as Chemical Cleaning, at one time or another gets its highly antiseptic hands on every part of every tube that goes through production.

Since a fingerprint inside a bulb, or a stray bit of copper on a plate, or a speck of dust or some chewing gum could easily destroy the value of any tube, Chemical Cleaning has become a highly essential activity in the list of Eimac's varied performances.

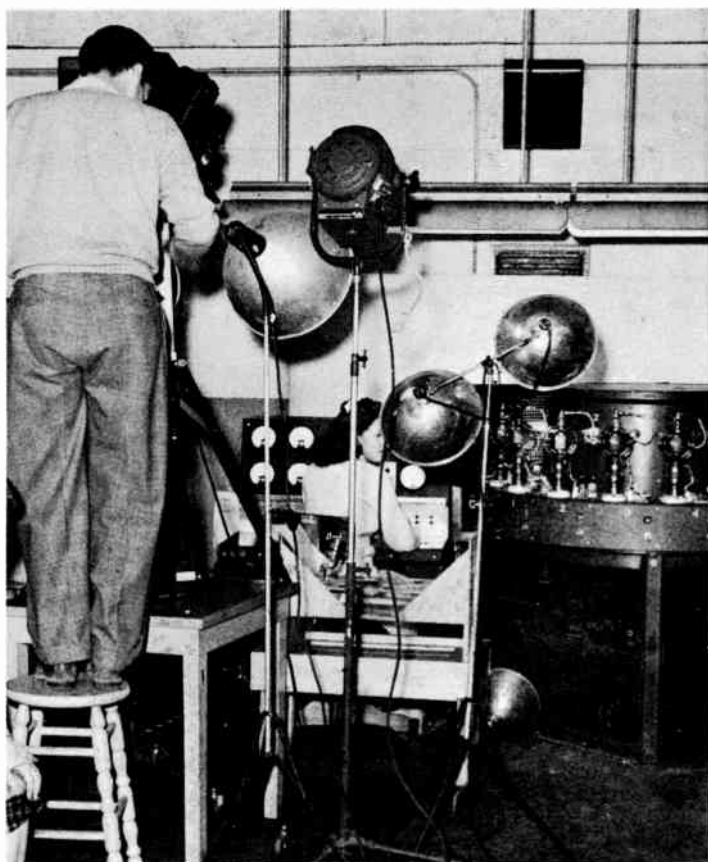
Under Vern Vincent's zealous direction, the department now includes a large staff working in several sections, including nitriting, acid boiling, tube washing, degreasing, spraying and some miscellaneous chores involving some 25 different kinds of acid solutions and liquids.

Prior to the advent of air conditioning, Chem was apt to be a bit on the fragrant side at times, despite fans and blowers. Nowadays, it is a clean and orderly place where as many as 32 operations, for example, are performed on one tube type alone.

Leads are nitrited, stems cleaned, blanks washed, parts degreased, filaments and plates sprayed interminably in this section, a sort of cross-roads of production.

Originally the department was scattered all over the plant, under the general supervision of two or three men, but in recent years under Vern it has been consolidated and expanded into quite a large department.

Foreman Ed Wilkes runs the day shift, with Bill Walsh as swing foreman.



## THE PHOTOGRAPHY DEPARTMENT

Photography has gone a long way at Eimac in a brief space of time, a long way in technique, equipment and the quality and quantity of photographic production.

Under the direction of Bryant "Buck" Rogers, photography activities now include everything from laboratory photomicrographs to advertising spreads, from 16 mm color movies to electron microscope records.

Training films for the Personnel department, news photos for the Eimac News, advertising and publicity shots for the Sales department, documentary records for the files, type approval and equipment records for production, copy work and hand-books

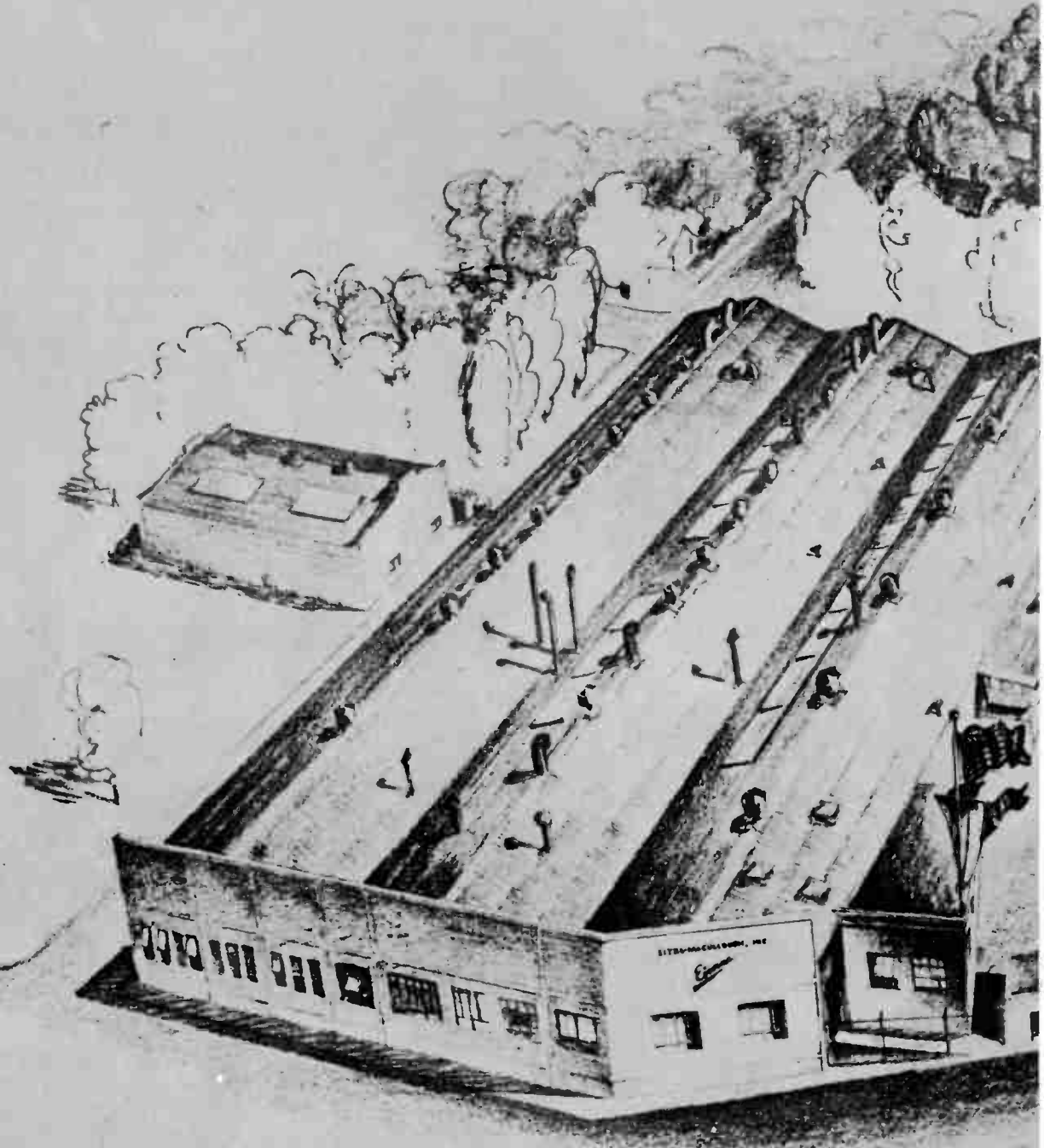
and photostats for nearly every department in the plant are on the daily routine of this little department.

The department includes a surprising amount of equipment, part of it purchased, and part of it adapted or just plain invented for the purpose by Buck Rogers with the assistance of the Lab gang, many of whom are amateur photographers in their own right.

The department now has a complete file of negatives on persons and tubes and parts and materials covering almost everything and everyone in the plant, and is rapidly building a library of full color photos, Buck's personal specialty.

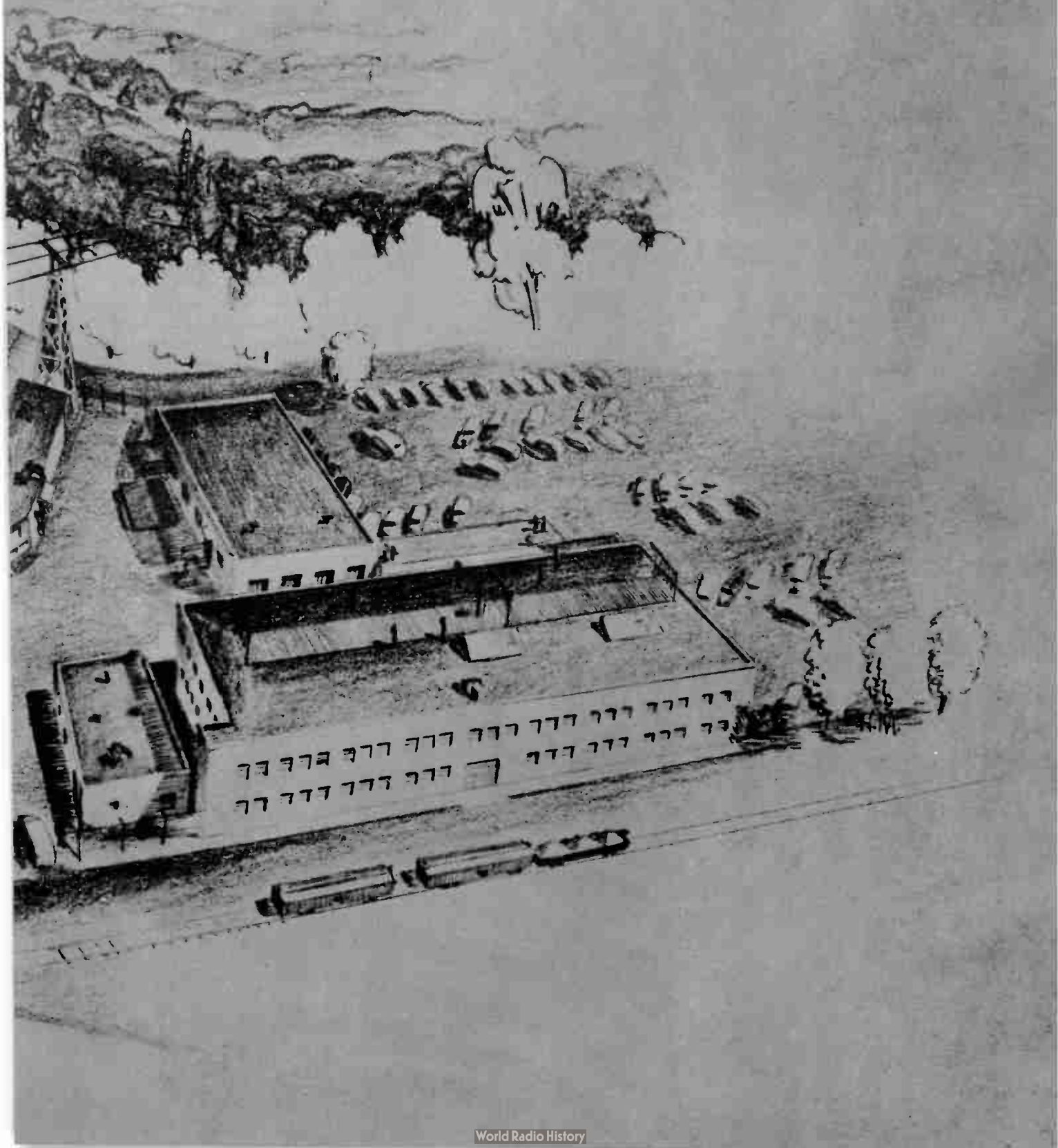
News photos are handled by Charlie Dole, who assists Buck with technical work in his spare moments.







# INO PLANT





## THEN, OF COURSE, THERE'S THE OFFICE

Eimac's office staff differs from that of most other industries in two chief respects: there isn't a name on a door anywhere, and few wear neckties unless they are going somewhere.

Knocking on doors also is a seldom-observed custom, arising mainly from the fact that you seldom find a door closed anyhow.

The Eimac office workers sit at desks, and others dash around at an acute angle (the Wunderlich slant) with papers clutched in fist, but all are usually up to their ears in words and numbers.

You have to work in an office to appreciate the incredible amount of paper work it takes to run a war industry, or any other industry, for that matter.

Whether it's in Accounting, or Purchasing, or Personnel, or Production, or Traffic, the volume of paper that is handled every day belies the current reports of an acute national paper shortage.

The Office, of course, isn't a department of itself. It consists of several departments and generally includes everyone who works on a monthly salary, except for the Lab men, engineers and draftsmen, and the department heads and their office clerks who generally are considered part of the plant because that's where they spend their time and beat out their brains.

The main office building contains the Controller's office, the Accounting department which includes payroll, timekeeping, billing,

etc.; and Cost Accounting, Purchasing, Materials Control, Personnel and a couple of subdivisions of Personnel—selective service, wage stabilization, job analysis and records.

The plant office group includes Production control, Personnel services, publications, safety, counseling and group insurance; Sales and such office space as the president, vice-president, chief engineer and plant superintendent can grab onto when nobody else is looking.

That's what makes Eimac's office different from most—the bigger your job, the smaller your office, and when you get to the top, you don't rate any office at all.

There are also offices in the Laboratory, Construction and Machine Shop, and a good deal of Stock and Shipping is concerned with office procedures, while in Traffic (which includes Receiving and all the stock rooms) a highly complex office organization keeps track of materials and parts and assemblies and their flow through the plant.

Outside the plant there are more offices—at Standards Control and at the Employment Center, the latter a branch of Personnel, which includes the plant Training Center.

Altogether, the entire Office group numbers about 10 per cent of the total employment—which is a surprisingly low percentage as industries go in war-time.





## Guards, Matrons And Janitors

"Guards, Janitors, Matrons" is the heading over one of the department sections in the records, a terse way of describing the efforts of a little group of people who play no small part in keeping Eimac on the air.

From the time Guard Captain Ben Truax checks your badge (and you'd better have one!) in through the guardhouse in the morning, until you have "borrowed" the last buttonhole from Head Matron Annette Conley, you have unconsciously been assisted in a thousand little ways by this corps of service workers.

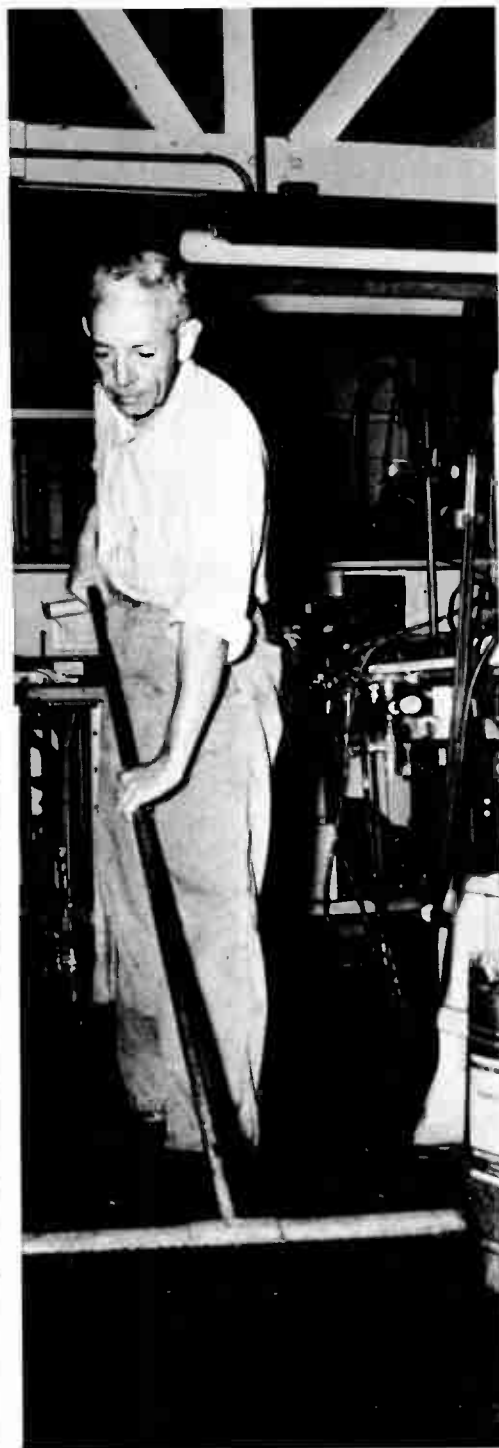
Guards check in workers and visitors and check them out again, check in trucks and suppliers and delivery men and check them

out again, patrol the outside facilities, attend to the problems of the oxy house, perform a number of other miscellaneous jobs.

The janitors keep the place clean and safe and assist in keeping fire hazards at a minimum, help with the constant shifting of equipment and stores, keep the aisles cleared to assure safe movement of materials about the plant.

The matrons are principally concerned with keeping the girls' rest rooms and personnel offices clean and pleasant.

Their many thankless tasks such as providing needle and thread, hand lotion, brushes, and other countless requests mark theirs an important job.







## THE MEDICAL DEPARTMENT

It is no coincidence that Eimac enjoys one of the best industrial records on the coast for low frequency and severity of accidents.

Prompt and efficient first aid attention to every cut, burn and abrasion has held time-losing infections to a **minimum**.

But Eimac's medical program doesn't stop with patching up punctures. There's the matter of health and physical welfare to consider, under a broad program which might be called preventive medicine.

Under this category falls the Eimac program of health education, physical examinations and re-examinations, chest X-ray and cold vaccine, inoculations, allergy treatments and recommendations for special attention to particular ills.

The objective is simply one of keeping everyone as healthy, and therefore as happy, as is humanly possible under present conditions.

Dr. Edward S. Schulze is plant medical director, with Dr. Minola Stallings as consulting allergist. Roberta McMahan heads the staff of registered nurses who are on duty at all hours to attend to any and every ailment from a burned knuckle to a headache.

The medical department and first aid room are unusually well equipped for a plant this size, including a respirator, an autoclave and sterilizer, a serum refrigerator, operating table and instruments enough to handle a major emergency.

The department works closely with the employee's own family physician in cases involving serious disorders or home treatments, and with various public health agencies.

Right: Photo shows Eimac employee having X-ray of chest taken—a recent project in the Medical department's health program





## The Cafeteria

"Good food, well cooked and economically served in clean and pleasant surroundings." These were the only requirements that Bill Eitel and Jack McCullough made of the proposed Cafeteria which was under discussion during the first six months of 1943.

And that's just what Lee Woods, Director of the Cafeteria, and her crew of experienced cooks, counter women and cafeteria workers set out to do.

Since July 8, 1943, the day the doors first swung open for business, the Cafeteria's able corps of cooks and helpers under the direction of Head Chef Louis Bruggisser, has been preparing and serving entrees which are a delight to the palate. Roast beef, just the way you like it; grilled fish that would make Fisherman's Wharf restaurateurs green with envy; desserts that melt in your mouth; and a variety of green salads daily—these are only a few of the feats of culinary art for which John Gastori, day shift cook; Joe Barrios, swing shift cook; Emil Grosso, graveyard shift, can be justly proud. Charles McBride, relief cook is ready, willing and able to pitch in on any shift where needed. Since the Cafeteria has

run on a twenty four hour basis, since its beginning, it has been necessary to schedule the serving of food with practically split-second precision.

In addition to the regular "three-a-day" schedule, Eimac employees throughout the plant and office are refreshed and relaxed at regular intervals during the day by the coffee, milk, fruit juices, doughnuts and cookies which are dispensed free at the food-carts. These units have become as much a part of Eimac as the guard house.

Lee Woods' extensive experience and background in the field of nutrition and dietetics, has found outlet in a broad program of education and information in those subjects, calculated to inform and advise the people of Eimac through posters, movies, articles and the like on aids to better health through good eating habits. Free vitamin tablets are supplied to all employees at meal time to supplement the daily foods. Close cooperation is maintained with the medical department in providing special diets to employees upon doctor's orders.





# The Training Center And Employment Office

As far back as the summer of 1943, plans were afoot for a training and induction center for Eimac where new employees could be classified according to their ability to do various types of work. These plans were crystallized in October of that year with the addition of Durant Moseley to the staff of the Personnel department as Training Director.

An extensive series of mental and mechanical tests were drawn up by "Dee" and his staff in order to learn first of all for what job the applicant's abilities seemed to fit him and then to prepare him through lectures and by actually working with the various tools, machines, materials and equipment used in the fabrication, assembling, processing and testing of vacuum tubes.

With Dave Jackson as Training Supervisor, conducting classes and assisted by supervisors from the various production departments, training and induction sessions went forward apace throughout the winter and spring of 1944.

Glass lathes, spot-welding machines, nitriding pots, pump manifolds and numerous other types of tube manufacturing equipment were transferred to the Training Center where inductees were given an opportunity to familiarize themselves with the intricacies of vacuum tube construction and processing in order to prepare them with a working knowledge of the job they were to do and the general plant routine.

In addition to the training end, the center was also set up as an employment office with Fran Purtell as interviewer, which position she has held since April of 1943.

At this point the Training Center as such is in a somewhat dormant state due to the fact that no people are being hired in the production departments at present. Rather extensive plans are being made however for the utilization of its facilities in the near future and in the meantime Fran and Wilma Nichols hold forth "up the street," interviewing the folks who come in search of work.

By coincidence, the Center is located in the same store that housed Bill and Jack's first vacuum tube plant when they set up business in 1934. It later became a butcher shop, but was available for the Center establishment because it was one of the few vacant buildings in town of sufficient size for the purposes of the Center.

Inset is  
Durant "Dee" Moseley,  
former director of the training  
center. Top is Fran Purcell  
interviewing prospective  
employee







Jack McCullough

His title, or titles, indicates that J. A. McCullough is a busy man as he is Eimac's vice-president and treasurer, rolled into one.

Jack was born in San Francisco and has spent practically all his life in this locality. Radio became part of his life in the "roaring twenties" while Jack was attending Lick-Wilmerding high school in S. F. During his high school summer vacations, and also while going to San Mateo junior college, he spent his time servicing radio sets for a well-known S. F. radio and musical firm.

Jack first went into business for himself after graduation from J. C.—not radio, but an automobile sales partnership with his brother.

Radio later became his full time occupation and it was during the early thirties that he and Bill Eitel, whom he met while working with radio, got together on some tube ideas, which resulted in the formation of Eitel-McCullough, Inc., in 1934.

Jack had dreamed for some time of finding an ideal location for his amateur radio station, W6CHE, so in 1941 he and his wife, and their two youngsters, moved into a new home high atop the Millbrae hills where his radio station is now located.

Since wartime restrictions do not permit amateur radio to be "on the air," Jack hasn't had a chance to use his rig since it has been relocated.

Hobbies in the life of J. A. M. consist of operating amateur radio station W6CHE (topping the list, of course), skiing in the winter and following the ups and downs of the Stanford university football teams.

Bill Eitel

If the teachers had ever taken a vote on it, they probably would have elected Bill Eitel as the boy least likely to succeed in the Los Gatos high school class of '26.

That was because Bill, while he was supposed to be attending classes, was attending a 10-meter transmitter in a shack up on a hill back of town.

He was still a high school kid when he set a record as the very first radio operator to contact Europe, and to span the Pacific, on the 10-meter band, the UHF of the time.

Bill was "fooling around" with radio, and crystals ground from quartz found in a Sierra creek bottom, and with high frequencies, at a time when most kids of his age were happy to own a pair of headphones and a peanut tube.

Except for delivering milk at 4 a.m., and for a minimum necessary attendance at school, Bill spent all of his waking hours in his radio shack. His station, W6ZAT, was not long in becoming widely known.

It was natural, then, for Bill to go to work in radio when his school days ended. It was through radio that Bill and Jack McCullough met, and later they got together and dreamed up their revolutionary ideas about vacuum tube design, the ideas that led them in 1934 to start out for themselves. The rest, as they say in novels, is history.

Except for the time he spent in Salt Lake City, Bill has lived all his life in Northern California. His time is now more than fully occupied, between his family, Eimac, and his 8-acre woodland "farm" back of Woodside, not to mention business trips every now and then.

# EIMAC'S OLD TIMERS

(Meaning They've Been Here Longer Than Anyone Else)



Fred Schack

In a nook by a window of Eimac's Machine Shop, Fred Schack, another of Eimac's old timers, can be found diligently applying his knowledge to the production of dies for Eimac's various departments. He is the plant's one and only full time die designer and a first class die maker in the bargain.

Upon graduating from high school he began working on the production line of the Western Electric Company located in Emeryville and has been connected with electrical manufacturing concerns ever since.

He is another Eimacker who has spent a great deal of time working in the radio business in one way or another. He had 16 years experience as a die maker behind him when he came to Eimac in 1939 to constitute half of the Machine Shop, with George Callwell comprising the other half.

In 1939 Fred came to Eimac to constitute half of the Machine Shop, with George Callwell comprising the other half.

He designs the dies used in the plant and if he doesn't actually make the die, his great knowledge of the secrets of good die-making plays a major part in their production.

Although Fred Schack is not now an owner of an amateur radio outfit, he was one of the earlier operators, operating from his home in Oakland with call letters W6UM and W6QF.

As an amateur horticulturist, Fred specializes in the growing of rare cactus plants in his greenhouse. Hunting and fishing are sidelines.



George Callwell

In 1915 some of the Los Angeles Chamber of Commerce literature was smuggled into Oregon, and George Callwell was lured to "sunny California" eventually to become one of the first Eitel-McCullough employees.

George was employed at H & K in 1924 and during his nine years of employment there, learned about vacuum tube manufacturing equipment which later laid the foundation for his own machine shop. He opened his shop in San Bruno in 1933 and supplied a great deal of such equipment for peninsula firms.

The first large enterprise at his own shop was the manufacture of a portable gas engine generator that delivered 300 watts. This generator weighed only 19 pounds and was superior to anything on the market, but was too difficult to turn out in large quantities.

In 1934 when Eimac began, George was called on by the Eimac partners to make the necessary equipment for tube manufacture. As Eimac grew, so did George's orders for equipment, until finally in 1938 he was put on the regular company payroll and moved to the Eimac plant. Much of the valuable equipment now being used in war production is the product of the agile mind and fingers of one George Callwell of the Eitel-McCullough Machine Shop.

While in his early teens and twenties, the machine shop whiz was quite an athlete. He bowled, played tennis and made quite a record for himself as a track man . . . 10 seconds is good time for the 100 yard dash on any track team.



## Don Furgason

As the tenth employee of a firm that now numbers well over a thousand, in two plants, Donald LaVon Furgason has been active in the Glass department from its inception.

He became an employee on October 4, 1937 at the age of 20 when he "didn't know a vacuum tube from a milk bottle," and had an abiding interest in aircraft. Somehow Eimac looked a bit more alive than even an aircraft factory where Don was going to apply for a position. His was a wise choice, for the aircraft factory folded two weeks later.

Don went to work learning how to handle glassware and learned it so thoroughly that he later became head of the Glass department, now the largest department in the plant.

He is responsible not only for the intricate operations of his department, but is responsible for the maintenance of complicated technical equipment. Like others of the original group of employees of Eimac, he has had and still has, a direct part in the originating and perfecting of the specialized apparatus and equipment used exclusively by the firm in vacuum tube manufacture.

Don was born in LaGrande, Oregon, about sixty miles from the famous Snake River with its Hell's Canyon, which rivals the Colorado for precipitous grandeur. He is still interested in flying, but has put the thought in cold storage for the duration. He goes fishing and hunting now and then, but spends most of his time worrying about glass.

Then, of course, there's Don's two year old son, David, who's a chip-off-the-old-block, and rightfully demands some attention from his dad.



## Rad Leonard

W6RRR signifies Radford Leonard, Eimac plant superintendent, who has had about as long and varied an experience as anyone with Eimac. He was, in fact, the sixth employee of Bill Eitel and Jack McCullough in their little tube shop back in 1936.

Born in Oakland, Rad was educated in San Francisco and San Mateo schools where he achieved considerable fame as a baseball player and where he also picked up the knowledge of amateur radio that led him into the vacuum tube business.

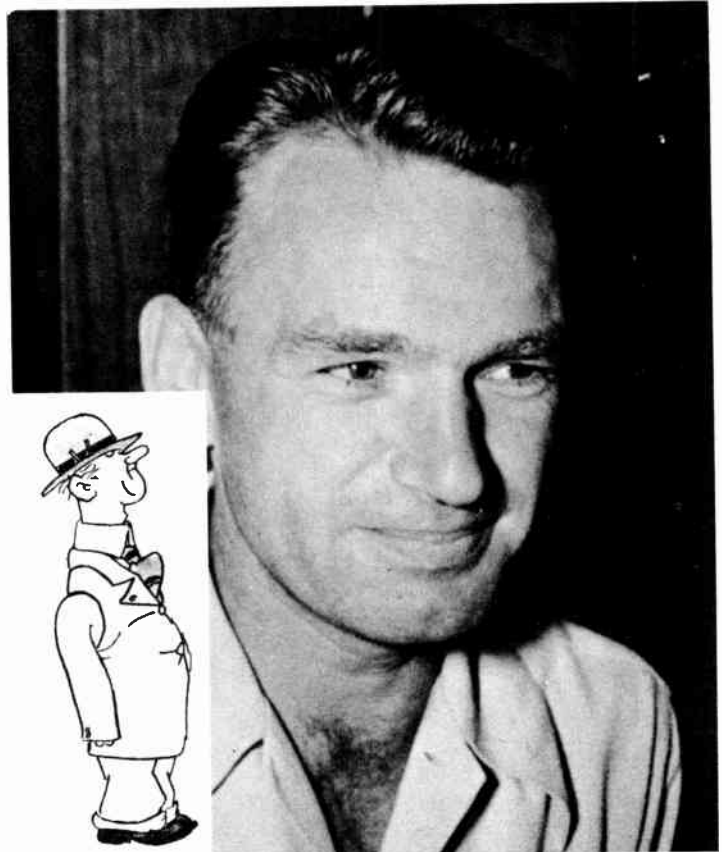
Having started here with the original handful of employees, Rad has been all the way through the mill in the tube making business, holding from time to time such titles as: assistant production manager, Straight Filament foreman and Condenser department foreman. He also handled the job of expediting new equipment to the Salt Lake plant.

As plant superintendent, Rad, who is an ardent fisherman and teller of fish stories, has a whale of a job to do.

As a brief synopsis of his innumerable jobs, he carries full authority over all departments, works in collaboration with the personnel director in determining plant policies relating to production and personnel and is a member of the joint labor-management suggestions committee.

Rad was a 1943 member of the plant softball champs, the Fleas, and is still following his all-time favorite, golf.

In 1939 he married Catherine Hunt of Burlingame. They are now the proud parents of three-and-a-half year old Leland Ross. Little Leland and his dad are both masters of an English Springer Spaniel, which Rad claims as his hunting companion.





## Jack James

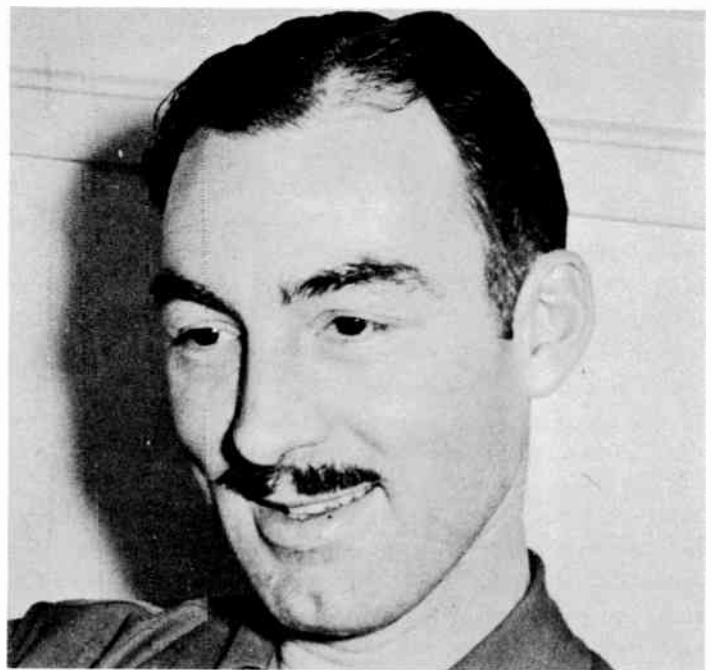
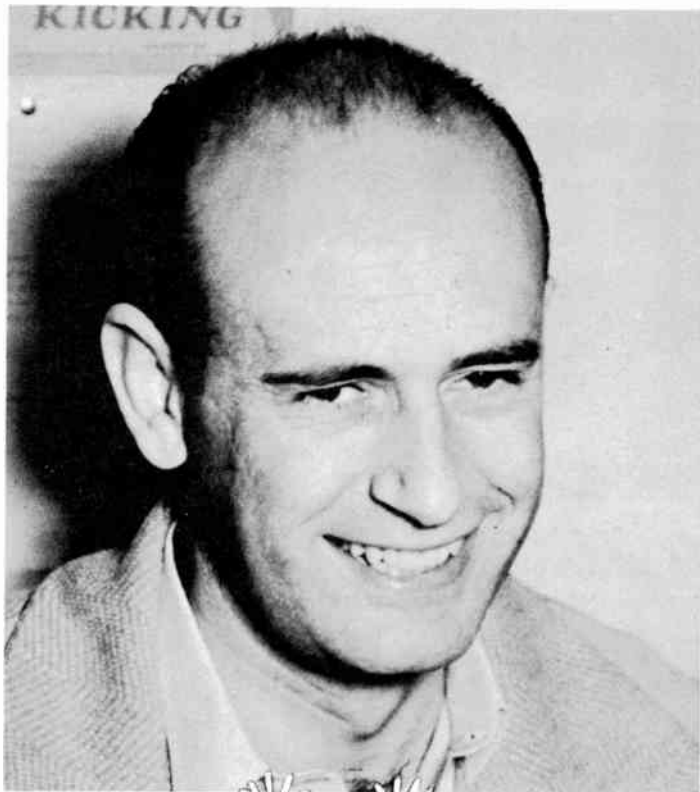
Jack James, Traffic department head, was the ninth employee hired by Eitel-McCullough in the early days of its establishment. To be exact, he began work May 14, 1936.

Jack came to Eimac directly from junior college, where he was training for engineering, and has literally grown up with the plant. At first, all of his work was with chemical cleaning, then changed to plate and grid fabrication and assembly. He directed the activities of a large number of men and women in the Assembly department until his promotion on April, 1943 when he stepped into the job he now has as head of the Traffic department. He is in charge of the flow and timing of materials to and from Eimac's warehouses and stock rooms into and through the various departments.

The story of Jack's twenty-nine years is not an unusual one. He was born in Bakersfield, California, has lived in a number of California towns before settling in San Bruno, was married on June 16, 1939, to Florence Drew of San Bruno and has experienced much of the incidents peculiar to other Californians. Florence and Jack have a two and a half year old off-spring whom they call "Louise" and whose picture has a prominent place on Jack's desk.

An interesting feature of the James' home is Jack's darkroom, which J. J. uses more than frequently. He is definitely a camera fiend and, incidentally, was the first photographer on the Eimac News staff.

Photography often gives way to bowling and badminton for Jack is a top notch pin "knocker-downer" and one of Eimac's top ranking badminton artists.



Elliot Sigourney

Already thoroughly schooled in radio transmission technique, Elliott Sigourney came to work for Eitel-McCullough in 1936 as one of the first dozen employees of the concern. He has had an active part in the development of production technique attending Eimac's expansion during the last eight years.

Educated at Tamalpais, Lowell and Polytechnic high schools, he has been an amateur radio operator since 1926 (call letters W6OS) has held a second class radio telegraph license for six years and a first class radio telephone license for a similar period.

Prior to his employment at Eimac, he spent two years as a radio parts salesman, two years in radio construction work, and six years as a commercial radio operator monitor.

Since 'way back in 1920, Tom Hall, Eimac's Construction department head, and Sig. have fooled around with radio together—they're still doing it.

When Elliott became employee number 11, he took over the operation of pumping and carbonizing, along with his aforementioned cohort, Tom Hall. As did the other departments, the Pump department increased with time, and in March, 1941, Elliott became day shift foreman of the department.

In May of this year, he was appointed one of the three quality control engineers, responsible for the methods of controlling all quality deviations.

Adding to his list of abilities are: his skill in glass blowing and his complete knowledge of the operations connected with the processing and testing of vacuum tubes.

Sig is a man who knows electronics and who will stay with it for a long time to come.

## O. P. Taylor

Shortly after Elliott Sigourney joined the Pump department, another man, by the name of O. P. Taylor, came along to help him. That was on May 3, 1937.

When O. P. was a lad in knickerbockers he inherited an enthusiasm from his brother and the next door neighbor for amateur radio. From 1926, when he acquired his station license W6BAX, until the war subjected amateur radio to storage, O. P. has specialized in long distance communication and has contacts with 140 foreign nations to his credit.

"Opie" found his way to San Bruno by way of Fresno, San Jose, Sunnyvale and Cupertino in Santa Clara Valley. As a pre-engineering student at San Jose State, he nurtured the desire to



become a radio engineer but that desire was curtailed by the death of his father. The following year, 1930, he was working at the Federal Telegraph company pumping 20 kilowatt water-cooled tubes, his first paying job in radio. Between that occupation and one at H & K in 1933, O. P. Taylor and the depression had their meeting and O. P. existed by cutting sandwiches at a sandwich shop in San Francisco from 11 a.m. 'til 12 midnight for \$2.00 a day.

His break was made in '33 when he was employed at H & K pumping tubes, making grids . . . every process that is essential to tube production.

Through an association with Bill Eitel, the man-from-Pump was brought to Eimac to run the stem machine. After a number of shifts, O. P. was placed in charge of the Pump department in 1938, which position has been carried on ever since.

O. P. has played a lot of softball in the local bush leagues and is at present displaying his skill in left field with the Eimac Fleas.

## Carl Porter

Though he hasn't been on the Eimac payroll since he surrendered Badge No. 1 to Ronnie Gordon in 1936, Carl Porter has been intimately associated with the company since its inception—in fact, since some time before that date.

Carl worked with Bill and Jack from 1933 until Eimac was started, became their first employee in the little shop up the street. He left a year and a half later to return to the contracting business with his father, but continued to do electrical contracting work for Eimac up to the present time.

He went to Salt Lake to open up a branch of the Porter Electric company, and has established his temporary home there with his wife, Peggy, and their two children.



Carl was born in 1907 in Fondulac, Wisconsin, a place with a name that means "foot of the lake," where he left at the age of four when his family moved to Canada. Carl followed his family to California in 1913, and followed his father into the electrical game.

Besides being addicted to funny books of a gruesome nature, Carl is an inveterate bowler and pheasant hunter. He has been a bit dubious about deer hunting, however, since Gordon Howes and another man induced him to carry a third of a deer carcass out of one of the most inaccessible (and steep) sections of the highest mountain in the Wasatch range.

Carl visits back and forth occasionally between the two plants, where he is recognizable by his good looks among an array of grim characters.



## Gordon Howes

Like most of the other boys connected with Eimac, Gordon Howes, Eimac's chief engineer, chose amateur radio as his hobby. As a student at San Jose elementary and high schools, Gordon was far more interested in amateur radio than academic subjects. He can't remember when he first began radio work but he knows he was issued his call letters W6CEO in 1929.

While still attending high school, Gordon went to work for George Wunderlich, now Eimac's production manager, who was in business in San Jose at that time. Later, upon graduation from high school he accepted a full time position with Wunderlich's Radio Specialties Co.

Gordon started at Eimac in 1935 as a glass lathe operator, did a bit of everything as the plant grew, became plant superintendent before he was dispatched to Salt Lake to lay out the new plant.

When the need arose for a pilot tungsten plant to safeguard Eimac production in case of critical tungsten shortage, Gordon chose his staff, proceeded to plan and study the means of tungsten production, supervised the building of the equipment and soon Eimac was turning out its own tungsten. He has since successfully tackled several other technical problems in production at both Eimac plants.

Gordon's job as chief engineer, places him in a liaison position between the laboratories and the plant production lines in both Eimac plants. He supervises the installation of new equipment to put special products and designs into production and acts as a trouble shooter for engineering problems peculiar to the manufacture of Eimac tubes.

He is a hunter of no small repute and has been an ardent skier since the time Bill Eitel talked him into going on his first ski trip.

## Tom Hall



When Tom Hall came to Eimac on January 6, 1936, he had eleven years of experience in radio with tube and sound equipment manufacturing companies, an amateur radio operator's license and a knack for inventing practical devices useable in construction of tubes.

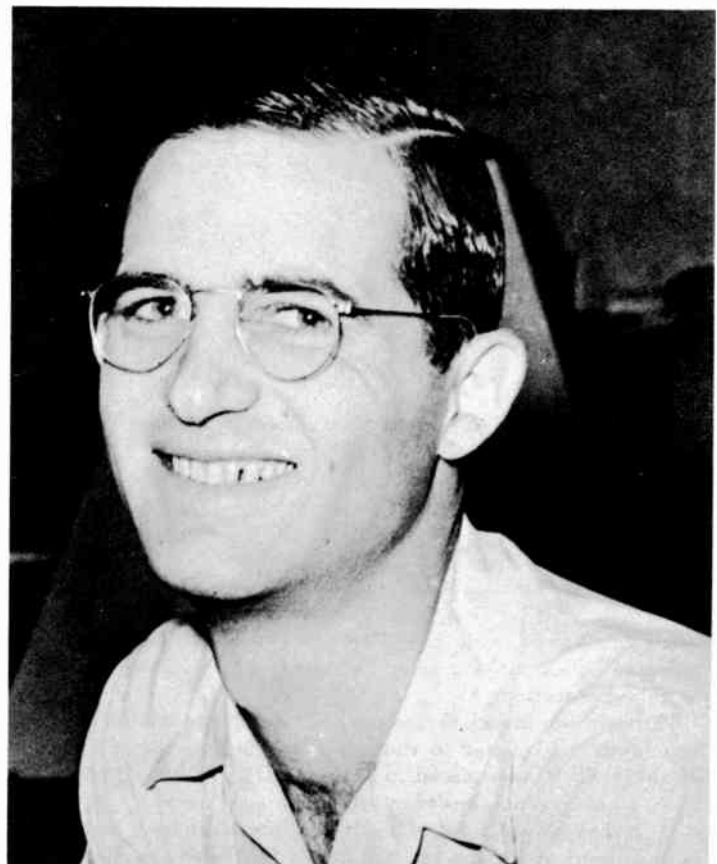
As employee number five, Tom took over Jack McCullough's job on the pump and when the business increased, Tom built more pumps. He lived very close to his work, so close in fact that he frequently got tangled in high voltage wires. Showing the pumps who was boss, he conquered their electrifying antics.

In such demand were his construction ideas that a Construction department was established in 1942 with the ingenious Mr. Hall at its head.

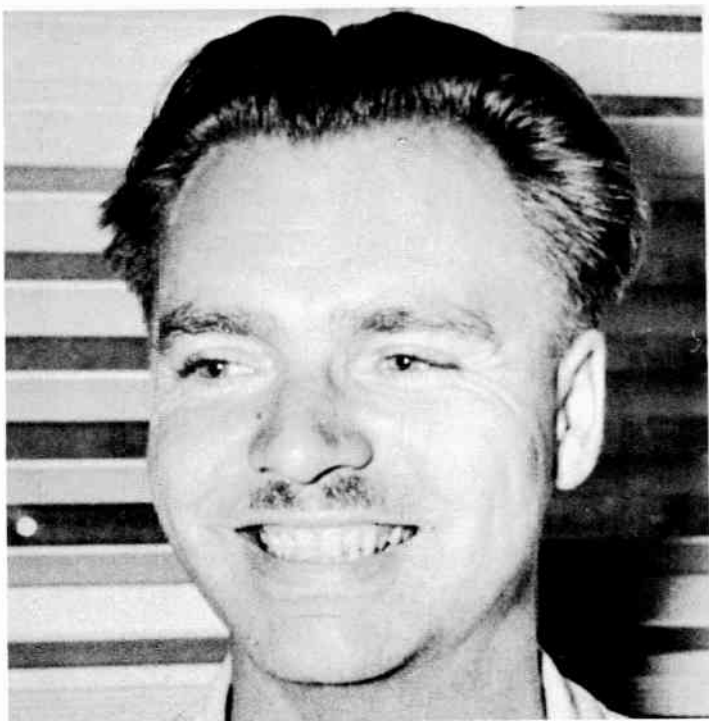
Tom was born in Cleveland, Ohio, attended grammar schools in ten different states before landing in Alameda and Gallileo high school for secondary education.

After high school, Tom's first job in radio was an incentive for gaining his radio license W6SC. In turn his amateur radio experience was incentive to explore the radio field for broader experience. That search brought Tom to Eimac where his construction of unique gadgets has helped to make Eimac tubes the best on the market.

When it's time for Tommy to relax, if you can call it relaxing, he seeks out his Rod and Gun club comrades for a hunting or fishing excursion.







Ronnie Gordon

Son of a San Jose photographer, Ronnie Gordon was one of the youngest amateur operators in the country when he went on the air in 1927 at the age of 15.

He was only 22 when he came to Eimac as employee number two on December 1, 1934, but he had already hung up a record or two for short-wave transmission. While he was still in high school he did some pioneer development work in the five-meter field, and in those days five-meter work was in the fantastic realm. Folks weren't so sure it wasn't apt to be fatal.

Ronnie spent a couple of years at San Jose State college specializing in physics, worked at H & K for six months where he met Jack and Bill and came to Eimac when the company was in the embryo stage. He made the first glass vac pumps and continued to do so until he transferred to the Production department.

At Eimac this electronics engineer made the first 60 vac relays, worked out specifications and tests, did most of the original work on the vac condensers in the old shop and continued the developments on the pumps until 1940. His experimentation with vac condensers, which is at present one of his major projects, has led to startling improvements and discoveries. He has done everything with glass, has perfected a lot of the glass techniques which have made Eimac tubes what they are, and he is still plugging away at the stuff in the Laboratory glass room.

Ronnie Gordon lives in San Carlos with his growing family, raises vegetables according to the book, and is particularly proud of his home-made food locker which keeps surplus chickens, vegetables and fruits at zero temperature for winter consumption.



Jerry Manly

Jerry Manly, Shipping department head, never really did apply for a job at Eimac. Through the mutual acquaintanceship of George Callwell, Bill Eitel learned of Jerry Manly, stopped by the Manly homestead one

morning in September, 1935, while Jerry was shining windows and asked him to join the Eimac staff.

On the afternoon of the same day, Jerry was added to the Eimac payroll as employee number six, and set to the task of unpacking glass hampers. As were the duties of all Eimackers at that time, Jerry's were varied. He worked for Ronnie Gordon cracking tubing, doing some basing, testing and ageing tubes and worked in the Assembly department for three months making grids and plates.

At this stage of the game, the Pump and Shipping Departments were consolidated. In 1937, the production of tubes had increased to an extent where an individual Shipping department was a necessity. Jerry Manly was the department head, the employee and the department.

When he left San Mateo high school in his sophomore year to "punch" cattle on a ranch in Lassen County, he had little desire for the schools of knowledge. After three years and at the age of 18, he had a change of heart. He decided to store up a little cash to pay for an education in civil engineering. It was at that time that Eimac came into his life, dismissing the engineering ambitions for awhile.

Devoting his time and thought to the development of improved packing methods, he has come up with some ideas that have hit the jackpot both in practicality and serviceability. He uses in his inventions everything from scrap iron to girdle material.

For diversion, G. M. is a fiend for golf having entered Eimac's latest tournament and being runner-up for the plant title last year.





## Adolph Schwartz

Through a letter written to Bill and Jack, Adolph Schwartz became Eimac's first representative on September 15, 1936.

As a student in New York elementary and secondary schools, Adolph Schwartz is familiar with the Eastern territory where he is a field engineer for Eimac. His territory includes: New York, New Jersey, Pennsylvania, Maryland, Delaware, Washington, D. C., Maine, New Hampshire, Connecticut, Massachusetts and Rhode Island.

In 1916, A. S. received his amateur radio operator's license and call letters W2CN. A year later he obtained his commercial radio operator's license and a position as a wireless operator in the Merchant Marine where he stayed until 1921.

Gimble Brothers department store secured the services of Mr. Schwartz in 1921 as an assistant radio buyer. As most men have a desire to do, Schwartz went into the radio business for himself as a retail salesman . . . this he did until 1936 and Eimac.

To fill in the gap caused when the war curtailed his amateur radio, Adolph has improvised a darkroom in his Teaneck, New Jersey home, where he experiments with all phases of photography.

The Schwartz household numbers five—he has two daughters and an Irish Setter, "Suzy Junior" who is a relative of the McCulloughs' and Wunderlichs' pet pooches.



## Ruth Duncan

When Ruth Duncan, Executive Secretary, came to Eimac in 1936, the office consisted only of the president and vice-president of the company.

Her initiative and ability proved to be just what the doctor ordered, for her adeptness in handling many difficult business situations has relieved Jack and Bill no end. Over a period of eight years she has accumulated a vast knowledge of the inner workings of Eitel-McCullough, making her invaluable.

A Hoosier, Ruth was born in a little town in Indiana, and it was there she got her primary schooling. After her graduation from the State Teachers college at Terre Haute, she taught school for two years, then decided that teaching wasn't exactly what she wanted and went to work for an insurance company. Her work there as bookkeeper, inspired her with the idea of going to business college. She waded through this in a few weeks, then jumped right into an A-1 position as secretary for an investment house in Indianapolis.

With a yen for California sunshine, Ruth hopped a train bound for Los Angeles. While in Los Angeles, she secured a secretarial job in a metallurgical engineer's office where she worked for a year.

Prior to her coming to Eimac in February 1936, Ruth filled in for the Chief Clerk at the Port Captain's office in Balboa, Canal Zone, for four months.

Upon her return from the Canal Zone, Mrs. Duncan heard of Eimac, spoke to John Grieder who was then "doing the books," and was hired with duties as purchasing agent, secretary, bookkeeper and "complaint man."

As the secretary and assistant treasurer of the corporation, secretary to Bill and Jack, supervisor of the feminine office personnel, a member of the Office bowling team and a housewife, Ruth Duncan has a full-time job.



## Louie Pierri

Like many another employee at Eimac, Louie Pierri first met Jack and Bill through amateur radio, and when Louie heard about the new plant, he put in his bid for a job.

Pierri's first job was as a glass lathe operator where he made the sparks fly for three years until he became day shift foreman of that department in 1940. Having learned the technicalities of glass operations, Louie proved his skill and a year later was made head of the Glass department. In the spring of '42, he was sent to the newborn Salt Lake plant to serve as the plant superintendent. A year later in June, 1943, he made another step upward to become general manager of the Salt Lake plant.

When he was in high school he played football and baseball. For a time he played semi-pro baseball.

When he left school, he immediately went into radio. He has been an amateur radio operator since he was 13 years old and has been active in amateur radio ever since. His call letters are W6DL.

In July, 1931, Lou married Florence Conti. Florence and Louie became proud parents in April, 1942, when little Robert Louis Pierri was born.

As far as anyone knows, Louie has two hobbies: flying and leg-erdemain. He got the biggest kick of his life out of answering his first S.O.S. and making his first solo flight. Flying isn't restricted in Salt Lake, so Pierri makes the most of his opportunity with two or three local flights a week.



## Len Hart

The Navy—and a broken leg suffered in a recent accident—occupy Len Hart's attentions these days, but he is well remembered at San Bruno and Salt Lake City alike as one of the originals.

Len came to work for Eimac on January 4, 1937, at the age of 23, after some earlier experience in San Jose with a radio sales outfit that folded up, through no fault of Len's, of course.

One of those never-say-die boys, Len distinguished himself at Salt Lake, where

he was one of the first department heads to arrive, by working right around the clock on occasion. His first job was setting up the Plate and Grid departments, his next was the hiring of production personnel. He was busy at both before production materials arrived.

Len went into the Navy as a first class seaman on April 15, 1944, and was sent to Chicago to train as a radio technician. Latest report is that he broke his leg in an accident, but to date there have been no details on the mishap.



## Hans Thaysen

The war has really changed things around a bit for Eimac's twelfth employee, Hans Thaysen, formerly foreman and assistant department head in the Spiral Filament department. Last March 4, Hans adopted a new title, sailor in the United States Navy, and boarded a train for the Great Lakes Naval Training Station where he continued to pursue work in radio.

He has been an amateur radio operator and experimenter for ten years, the last seven of which he spent with Eimac.

Four years of training at Campbell high school, located a few miles out of San Jose, included scientific courses, which he followed by three years at San Jose State Teachers College, majoring in radio and related subjects. Upon completion of his studies he worked for three months for a radio service shop in the southern part of the state.

In 1937, Hans learned of Eimac and migrated north to become Eimac's twelfth employee on April 27, of that year.

He was thoroughly acquainted with the operations and techniques of his own department. In his seven years of employment at Eimac, he has devised and developed a number of improvements in production methods, facilitating higher quality tubes and greater production.

Treasure Island was Hans' last known location before his departure overseas as a radio operator.





## Eimac Awarded Six Army-Navy E's

The three white stars that decorate the big Army-Navy "E" flag flying over the guardhouse represent no less than two years of top-notch war production on the part of Eimac's small army of men and women.

It is always a matter of personal pride to everyone at Eimac to be reminded periodically that in matters of production quantity and quality, in personnel relations and low unit cost, Eimac is among the very top war producers of the nation.

In fact, very, very few war plants in any industry can boast a record to equal Eimac's four consecutive awards for the San Bruno plant and two for the Salt Lake plant, the most possible for the time elapsed.

The Eimac initial award, on September 4, 1942, was the first in the national vacuum tube field, the third in California, the fifth on the West Coast.

The formal award, made on the Company's eighth birthday, was an occasion that surpassed anything San Bruno had ever seen before.

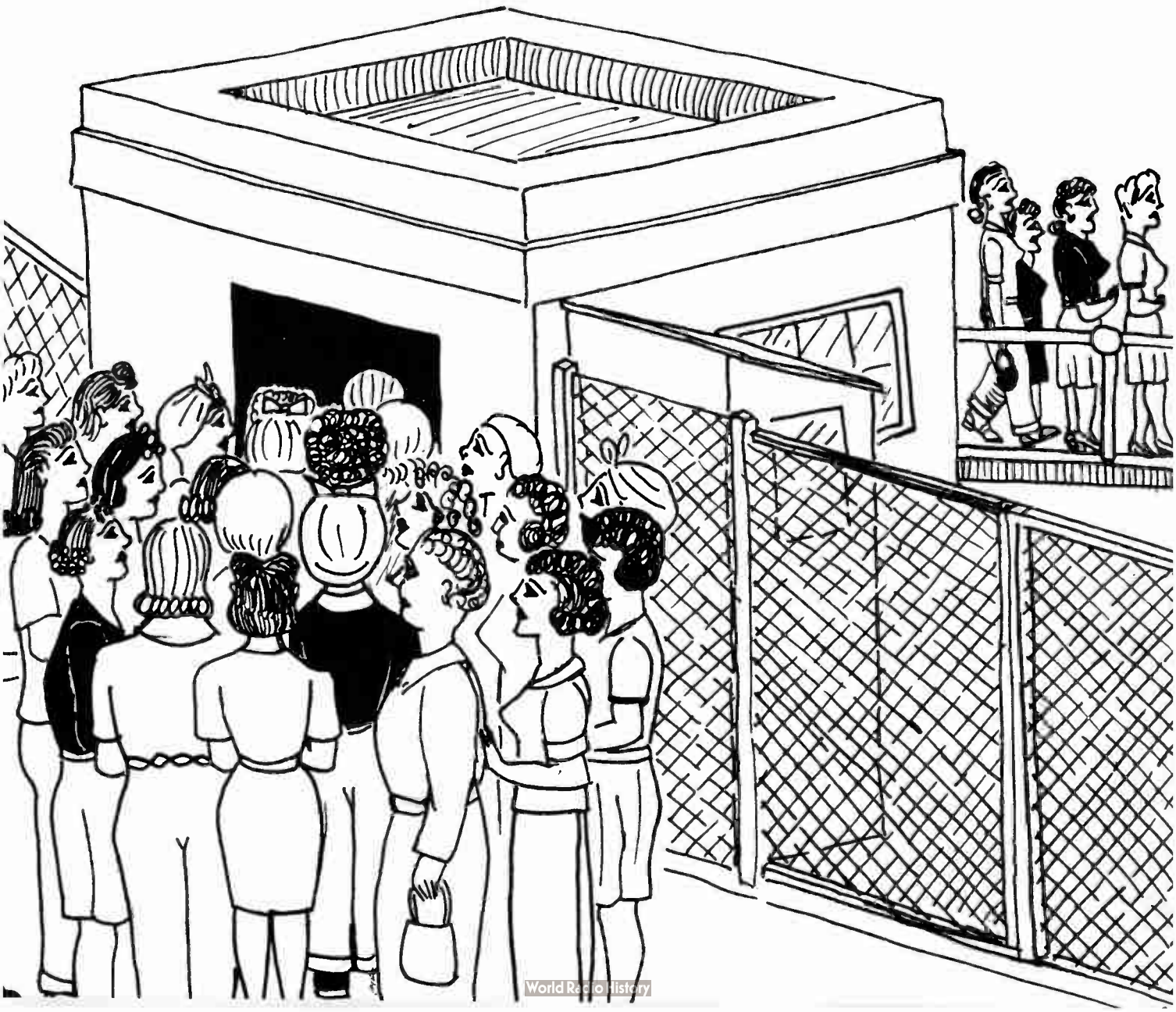
Army and Navy dignitaries, federal, state and city and county officials, visitors from other industries and the general public joined with the plant personnel in celebrating the event. Congratulatory letters and telegrams poured in from all quarters, and from such high personages as Cordell Hull, Major General Roger B. Colton and Commander Jennings B. Dow, and Major Edwin Armstrong.

No less a celebration was the formal award of the Salt Lake City's first "E" in August, 1943, when a celebration of state-wide significance was held.

Subsequent awards at six-month intervals at both plants have, by custom and at the specific request of the Army and Navy, been made without celebration or fanfare, but they have nonetheless been occasion for rejoicing on the part of the Eimac people who have made each one possible.



# AND THEN CAME THE WOMEN...





## ... And Then Came The Women



To a casual visitor today, Eimac has the appearance of a largely feminine organization, at least so far as the production departments are concerned, but it wasn't so long ago that women's place was in the office and nowhere else.

It was only three years ago that the first women production workers were hired—on August 18, 1941, to be exact. Prior to that time women's rights were defended by the little handful of office workers directed by Ruth Duncan who succeeded Eloise Wiley, the first woman office employee.

Ruth, who is now Executive Secretary and a corporation officer, heard about Eimac through a friend who mentioned an opening for a steno-bookkeeper at "some radio place" in San Bruno. Ruth started her career at Eimac as an "all-around flunky," as she puts it.

In 1940, after keeping books and sweeping out the office all by herself, increased plant operations made the addition of an assistant necessary. The assistant was Lola Greer.

Need for a rest from the trials of teaching caused Lola to leave Oklahoma for a visit at her sister's home in San Bruno. The California climate was, according to Lola, "just what I was looking for," so she adopted the state as her home. Believing a complete change was in order, she also decided to desert teaching and up turned another of those oft-mentioned but unnamed friends who suggested a possible opening at Eimac.

As the second girl in the office, Lola Greer also did a little of everything. But when Evelyn Gutzmer and a flood of new employees began to arrive, her duties were eventually specialized into her present billing job.

Of the first group hired in the office, one of the few remaining is Agnes Unterein, ninth feminine Eimacker. Agnes can be found in the Personnel office as Hank Brown's secretary, where she arrived on the first day of 1942. Prior to Eimac, Agnes worked for the Army Air Corps as a stenographer at Moffett Field. With the advent of our entry into the war, Agnes left this position because she didn't want to be transferred south with the base. Placed first in the Purchasing office as Hank's secretary, she followed him to the Personnel department.

Of the several girls hired for the plant on August 18, 1941, three are still at Eimac. Badges numbered 1000, 1001 and 1002 were issued to Juanita Redmond, Vera Satterlee and Florence Schoenwald, respectively.



Ruth Duncan



Evelyn Gutzmer



Lola Greer

Juanita Redmond, supervisor of Beading on swing, began as a beader, and after a year assumed her present duties. Vera Satterlee, possessor of badge 1001, now works in Pump on the rotaries. Starting in Spiral Filament as the first girl to mount stems, she transferred some months later to her present job. Vera was going to school when another of those omnipresent friends gave her name to George Wunderlich as a person who might be interested in working at Eimac. Florence Schoenwald, third of the trio remaining, works in the Beading department on day shift.

On the second day of the parade of the plant's feminine contingent, Edith Thylin brought a woman's touch to a purely masculine group in the Straight Filament department. Still "just one of the girls," she is presently the only woman foreman at Eimac.

The third day, August 20, brought Pearl Chambers to the Eimac fold. Although possessing badge number 1010 she has the unique distinction of having filed the first application. Four months before the building was completed, while the foundations were still being poured, Pearl Chambers marched into the office and said she wanted a job, much to Ruth Duncan's surprise. It seems that no one at the plant knew what to do about her. It was suggested, however, that she leave an application and if there was an opening she would be called. Now in the Grid department, Pearl started in Glass Cracking and some months later was transferred to the Flea department.

The other half of a sister team at Eimac is Kaye Anderson, formerly Kaye Satterlee. She arrived on the heels of her younger sister—two weeks later to be exact. On September 21, 1941, Kaye was standing in the depot waiting for a train when she decided to fill that few minutes by making an application. She never caught that train, for, much to her surprise, Kaye started to work that very same day. After two and a half years in the Grid department, she married her foreman, Ray Anderson, and in compliance with company policy she was transferred to Pump. Some months later Ray was inducted into the Army and Kaye resumed her original job.

Familiar figure to most day shifters and many swingsters

Edith Thylin



Florence Schoenwald

is Leona Moser, who types for Vern Vincent. September 22, 1941, was the memorable day on which "Mo," as she is so often called, was signed on the payroll. Previously helping Judge Rapsey of San Bruno with his office work, she came to Eimac and the Chemical department to get away from clerical tasks. She succeeded for awhile, but her talk of being able to pound the keys of a typewriter got her into another office. When Vern decided he needed an office clerk, he showed Leona a desk and told her to prove she could type. Sandwiched in with her job as Chemical clerk, "Mo" was also Safety typist-clerk while her boss was safety director.

The voice answering the Shipping 'phone on day shift probably will belong to Lee Prendergast, supervising clerk. The first girl to invade this masculine domain, Lee learned to pack tubes from Jerry Manly and the other fellows down there. If Lee hadn't been the kind of a person to take up a dare, Shipping would never have seen her. After several years of being a housewife and homebody she doubted if she could

Pearl Chambers







Agnes Unterein

go back to a regular job. A dare was the result of her misgivings, and Lee decided to show them. After six months of packing tubes she took over the clerical duties, which were made necessary by increased production and ship-ping.



Juanita Redmond



Vera Satterlee





Kaye Anderson



Leona Moser



Lee Prendergast







## Social Life Increase

A two-day ski trip to Bill and Jack's cabin at Echo Lake in the spring of '37 by the first few Eimac employees constituted Eitel-McCullough's original social enterprise. That was still in the days of the meat-market legend. The first plant event was in June, 1936, when the Eimac gang moved up the street to christen a completed but vacant building—the first to be constructed on the site the San Bruno plant now occupies.

It was a two-fold occasion—half ludicrous, half solemn—a "Hard Times" party and a christening of the new building. Times were so "hard" that Hank Brown, who wielded the bottle, used beer instead of champagne as the christening agent.

From 1936 until 1942, the social activities happened somehow; there was no system, but with the increase in personnel in the 1940's a half dozen employees, under the guidance of Waldo Hunt, took the first step in January, 1942, toward organized social functions. It was that same committee that reported and edited the first few issues of the Eimac News, then in mimeographed form.

As improvements and enlargements were being made throughout the Eimac establishment, changes were made in the social organization, too. At a hotel dance in San Francisco's Fairmont hotel, Sandy Sanderson was installed as chairman of a more formal social committee composed of 32 committeemen elected by and representing every department in the plant. Since then, plant-wide interest and "say-so" in festivities has been reflected

through this organization which discusses and draws-up plans for entertainment enjoyable to every employee, and uses the profit from their half-dozen coke machines, located throughout the plant, as its financial basis.

Because the effectiveness of a single committee was greatly hampered, two month's after Sandy's appointment the committee added new members and branched off into three parts, representing day, swing and graveyard shifts. Peggy Hanley, Betty Burley and Barry Kedall, of day, swing and graveyard, respectively, served as committee chairmen with Sandy as general chairman.

Many a barn dance, barbecue, picnic, dance and bond drawing were engineered by the committees with the swing committee earning the distinction of being the first to introduce and sponsor "something new in entertainment." The swing social senators have consistently continued to hold their "swing first" pennant.

'Twas late 1942, that Charlie "Tex" Carson, a member of the social committee and a man with a propensity for athletics, succeeded in putting across his idea that sports activities were of no small importance. His suggestion that a regular sports schedule be established struck a note with Jack McCullough. So with the help of Jack and the Personnel department, Tex made arrangements for the use of the Jefferson high school gymnasium.

By February, 1943, more complete gym accommodations had to be secured and the Burlingame high school facilities were chosen.



## With Personnel

With this venture into athletics, the social program expanded to include organized affairs in roller skating, horseback riding, swimming, hayrides and a Sports Carnival, arranged and sponsored by the day shift social committee, featuring everything from swimming relays to inter-departmental volleyball contests.

Another step was made on March 22, 1943, to further organize the plant's social and athletic functions when Bud Young was made Activities Director and was authorized to give the company's endorsement on employee projects and to aid the social committees with the details of their dances, picnics, etc.

In September, 1943, the plant day-off schedule was altered, and made it possible for all three shifts to combine for Saturday night frivolity. The first of such tri-shift affairs was the Ninth Anniversary dance on September 11, 1943, high atop historic Nob Hill in the Fairmont hotel where two tiered birthday cakes rigged with miniature radio towers were cut by Jack and Bill.

About that time arrangements were made for choruses, collection of presents for the Christmas Ship and dancing lessons—the three newer additions to the social calendar.

Two choruses, under the leadership of Lorraine Dean, held regular meetings, made records, secured a piano (which now stands in the Cafeteria for rest-period music dabblers) and gave several Christmas programs in the Cafe for swing and graveyard shifts.

"Arthur Murray taught me dancing in a hurry" became Eimackers' theme song while two teachers from Murray's School of Dancing were called into service by the day shift social committee.

Lessons were given to more than 100 day and graveyard terpsichore enthusiasts.

In October of last year, the combined social committees elected a new chairman in Jack Williams, who has been active with the social committee from its inception. Joanne Stumbaugh was elected as the committees' first secretary-treasurer.


It should be added here that, although the social committees had nothing to do with it, 40 hams from Eimac convened at the Crystal Springs Country club for a ham fest. It was the first ham fest held since the United States entered the war.

Consolidation of the graveyard shift in late June of this year, brought about a new swing social committee with an election of new departmental representatives. Lee Stockton became the swing chairman. That wasn't the only change—John Preston became chairman of the combined committee upon Jack Williams' resignation. Leona Moser was chosen secretary-treasurer.

The social committee has become a prime institution with Eimac. The success of the company's social festivities is attributed to the people on those committees who give of their free-time unsparingly, knowing that where there's laughter and gaiety, there also are friends.



# SPORTS ACTIVITIES THRU THE YEARS



The amazing growth of Eitel-McCullough in its 10-year span has not been limited to production alone, for with the increase in personnel, athletic activities, too, have expanded to great proportions.

The present well-organized, widely diversified field of athletic activities is a far cry from the days of Eimac's infancy when the boys used to play touch-tackle football during their lunch hour.

It was 'way back in 1937 that Eimac's athletic activities began when Jack James, Rad Leonard, Elliott Sigourney, O. P. Taylor, Louie Pierri, Don Furgason, Hans Thaysen and Jerry Manly all chipped in for a football and held touch-tackle games on Second avenue every lunch hour. Each day they chose sides and the "fair-haired boy" seemed to be Jack James, for he was the best passer and everybody wanted to be on his side.

Four years later, the staff had grown considerably and Eddie Edises organized the first softball team. The club played on Sunday in the San Bruno league, but even then, the boys were better at making tubes than hits, though they did win a few games.


By '42 the plant had grown up and activities began to pop up with vigor.

Near the end of that year, Fran Migge organized the first basketball team which was called the Blues. Interest ran so high that another five called the Golds was outfitted under the leadership of Ed Wilkes. The latter team didn't do very well in league competition, but Migge's gang got into the championship playoff, thanks to Ross Leonard, Dave Jackson, George Giusti, Pat Warrington, Leo Mahoney and Fran himself.

After a four-year dormancy, softball again came into the picture, and last year Jack Perry organized and managed the "Fleas," who have carried on in the '44 season and appear to have made the 10-man sport a permanent pastime.

From this point on, sports mushroomed to prominence and the field became so wide there was an activity for everyone.

Bowling has caught the fancy of the greatest number of employees and now has a very large following. More than 200 kegglers now represent Eimac at the Burlingame Bowl on bowling nights.



During the summer months of last year, golf attracted quite a number of fans and a tournament climaxed the season with Carl Magnuson being declared the plant champion. Another tourney is now being planned.

Two nights and one afternoon each week, Eimackers have access to the Burlingame high school swimming pool and gymnasium facilities where they enjoy the added sports of basketball, badminton, volleyball and boxing.

As an outgrowth of men's softball, the girls got up their own team in 1943 and this season they are performing in an organized league . . . uniforms and all. Swing shift has a girls' team which plays along with daylighters of both the plant and office.

Another widely played sport, though little publicized, is shuffleboard. Each day from 11 o'clock through the lunch periods of everyone in the plant and office, the cries of these enthusiasts can be heard, "Ha, ha . . . ten off!" To enliven the competition, a tournament is now in progress.

Most recent addition to the entertainment of Eimac's recreationally inclined is dart throwing, but thus far the Glass department seems to have a monopoly on the fun.

Another newcomer is tennis. The Eimac Racquet Club is now at little more than the embryo stage, but it is gaining new members with amazing rapidity, and soon a tournament will be underway.

Horseshoe tossing was inaugurated by the Construction gang and the Machine Shop in the latter part of '43. Play was temporarily suspended when the parking lot was being laid out and paved, but now that the new pits have been dug, the game has an even greater following.

With such a wide field to choose from, any sports-minded person in the employ of Eitel-McCullough can keep, or try to keep, in trim. A rough estimate shows approximately 500 members of the Eimac family to be enjoying their favorite sports through Eimac recreational facilities or arrangements.

It is a far cry from the old noon-time touch-tackle days.

# EIMAC NEWS

Published every Saturday by the employees of  
EITEL-McCULLOUGH, INC., SAN BRUNO, CALIF.

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Modesty forbids that the staff of The Eimac News should lay any claim to superlative quality, but if there is a better industrial employee's publication in the country, the staff would like to see a copy.

The Eimac News is one of those accidents-on-purpose that can happen only where the spirit is willing and the cooperation constant.

From the beginning, The Eimac News has belonged to the gang, and about the only time a brass hat gets a look in is when he is getting the razzberry in some form or another, or when his wife has a baby, or when he shows up wearing a necktie.

Waldo Hunt deservedly gets the credit for starting the publication, back in the spring of '42. Waldo, now in Uncle Sam's infantry, was then a foreman in Chem, and he knew about as much about newspapering as he did about infantrying.

But he rounded up a gang of willing workers nonetheless and got out a little mimeographed sheet which quickly graduated to a four-page printed newspaper, miniature tabloid size.

When the Salt Lake plant started up in August, a Salt Lake section was added and the paper enlarged to full tabloid. Later the Salt Lake section became a separate edition, and finally publication was undertaken at Salt Lake.

The San Bruno Eimac meanwhile continued to expand, acquired a full-time photographer, blossomed into its present magazine dress in 20 to 24 pages in March of 1943. The three-column format with sunken rules was adopted in August, 1943, to permit better picture display.

The Eimac News now appears every six months in bound volumes for the edification of those who like to reminisce about things back when.

Servicemen all over the globe are receiving copies and asking for more, while the list of technical men who holler if they miss an issue is astonishing. Since the mag runs neither cheesecake nor scandal, the appeal for outsiders is rather mystifying, though flattering.

The masthead lists 50-odd names of staff members, but only two of them—Editor John Nelin and Secretary Glenna McQuiston—are paid employees. All the rest of the work, with the exception of photography, is volunteer. The magazine is printed by offset process from photolith plates at the Enterprise Press in South San Francisco, and appears in the plant every Friday night on swing shift.



