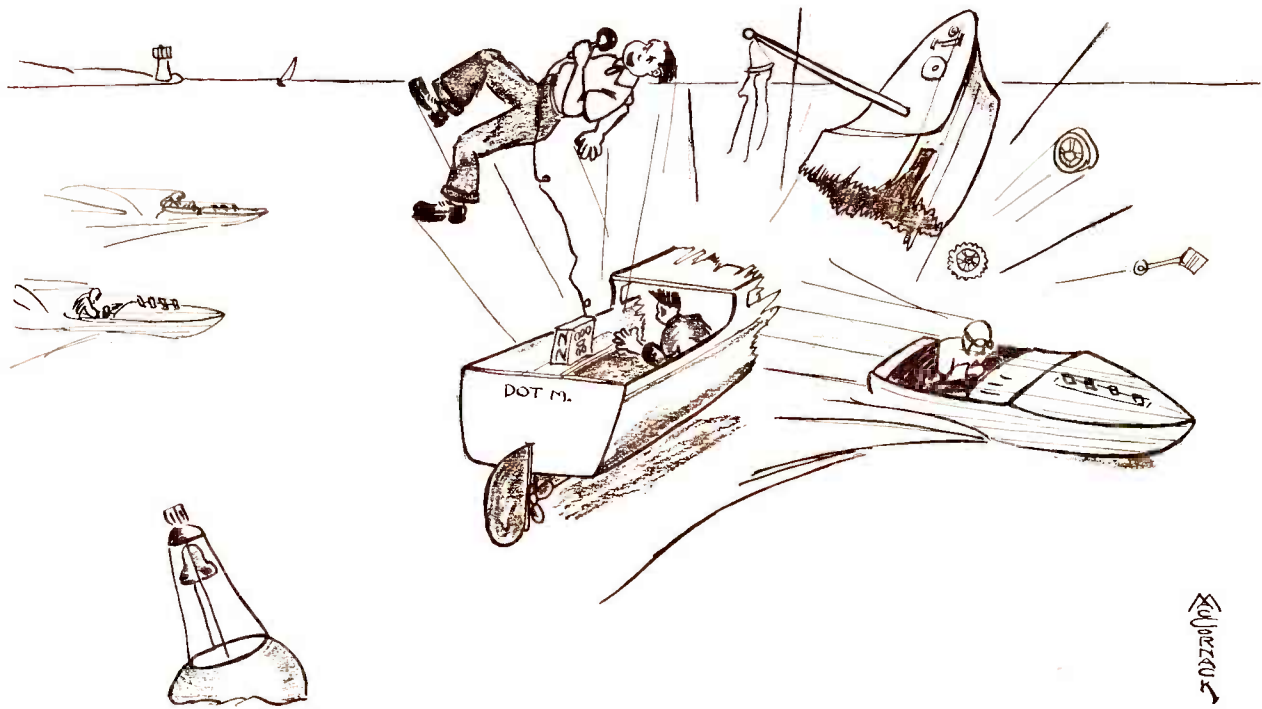




# JOURNAL

DIRECTED TO BROADCAST ENGINEERS AND EXECUTIVES



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June

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1941

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# Replacing Aluminum for Recording Discs

By C. J. LeBel

Chief Engineer, Audio Devices, Inc.

**O**UR many friends have been very generous with their suggestions on the aluminum substitute problem. We have followed up on these suggestions regularly and in addition have been pursuing the problem fairly actively ourselves since 1939. Nevertheless, when aluminum priorities were imposed at the end of February and aluminum deliveries ceased, the suddenness of the action made it difficult to provide an immediate remedy. Carloads of special material are not available from stock. Furthermore, the most recent discovery (mentioned further on) has presented unusual problems which have proven a great deal more troublesome than one might assume. Nevertheless, for the sake of the broadcasting industry it has been necessary to find a solution, for the only aluminum available today is the small quantity produced by remelting and rerolling scrap.

Before discussing the situation in detail, it would be helpful to go over the requirements for a disc base material:

1. Extreme flatness. Even so little a change of thickness as is produced by coating swirl has proven extremely annoying in the past. This means that the disc must be flat to within a few thousandths of an inch.

2. No inherent tendency to buckle or twist. This is rather troublesome because the word NO has to be taken literally. Even a few thousandths twist in a record will produce some puzzling and annoying difficulties.

3. Great stiffness. If the base is not sufficiently stiff, the difference in tension between the two sides will be enough to produce serious buckling. It is out of the question to balance the tension on both sides perfectly and this means that there is always a certain amount of residual force in one direction or another.

4. Extremely smooth surface. Any roughness or grain will reflect itself directly in a corresponding though smaller irregularity in the coating. In turn this will tend to modulate the groove, thereby increasing the noise level. Remembering that the groove itself is only two or three thousandths of an inch deep it may easily be appreciated that a minute irregularity will correspond to a sizeable proportionate change in groove.

5. Non-porous. In any really porous material it is highly desirable to apply undercoats to seal the surface before applying the coat to be recorded on. On the other hand, it has been found that using a multilayer coating produces all sorts of internal strains which manifest themselves undesirably in the completed record and the industry has worked steadily toward our standard homogeneous single layer coating.

6. Stiff during moderate baking. It is well known that AUDIO-DISCS undergo a curing operation after coating, driving out material necessary for coating but undesirable in the finished product. This has to be done at an elevated temperature in order to produce the necessary results. In

practice this means that materials must not melt at the curing temperature, nor flow so that the record collapses completely long before the curing is finished. Some have claimed that a curing period of several weeks at low temperature would be satisfactory, but on the other hand the most experienced chemists are of the opinion that such a low temperature curing would not yield a coating of permanent characteristics.

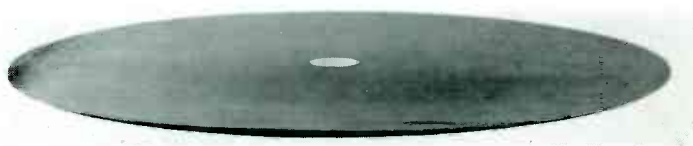
By virtue of the fact that tests on aluminum substitutes started in the spring of 1939, it has been possible to try and reject a great many things. As a matter of fact, twenty-three different types and grades of materials have been tried since then.

In the metals it has been possible to try zinc and its alloys, copper, brass and steel.

In the non-metallic substances it has been possible to try various kinds of cardboard, thermoplastic resins, thermosetting resins, glass and hard fibre. Let us examine these materials in a general sort of way and narrow the field down.

As is well known, there is a distinct shortage of zinc and it has been considered quite futile to make any attempt to use zinc or any high zinc alloys. Actually, interesting results have been secured from some of the high zinc alloys, but it has been felt that there are so many other applications where zinc is the only material available that it would be unpatriotic to even attempt to standardize on such a scarce material. Copper also is headed for scarcity.

We come now to the materials which have a serious tendency to warp (see illustration). A great many different



resins have been used and a great many different base materials impregnated with these resins. It is quite true that some materials are considered to have little tendency to warp but in practice this merely means that a 16" blank will only bow up  $\frac{1}{8}$  inch or so instead of the  $\frac{1}{2}$  inch or 1 inch bow produced in a similar material which is considered to have a "little" tendency to warp. More objectionable than that is the curious type of skewed twist which is even worse to record on than the simple bending that some materials occasionally produce. The thermosetting resins (phenolics) show this tendency. Hard fibre shows it to a very high degree. Some manufacturers believe that warping is a function of moisture absorption, but it has been found that regardless of the reason a coated disc will warp just as badly or worse than an uncoated one. Some have proposed remedying this by using

extremely thick sheets of material. A number of practical objections immediately arise. The flatness of a thick plate is perfect only after machining—prohibitive in cost. Almost no recording machines in use today will handle thick plates properly. Finally there is a serious question whether there is enough accurate factory capacity available to handle such difficult materials on the scale which would be required to keep up with broadcast demands alone.

The thermoplastic resins are quite unsuitable because of their tendency to flow when heated. This means that it would be impossible to cure properly. Likewise, such materials have some tendency to warp with age so that in any case they must be ruled out.

In considering the surface one soon discovers that resinous materials are rather grainy. Doubtless suitable polishing operations would help, but the cost and the facilities required would be so great that it would be quite impossible to keep up with commercial production. This can be seen by reflecting some light off the surface at the proper angle and the grain immediately shows up in quite serious form, particularly if the surface be dark or black.

If we consider cardboard we find that perhaps the worst characteristic is the softness of the material. The lack of stiffness is so great that any tension at all will buckle the disc up like a lady's hat. This may be overcome by softening up the coating. A coating of this sort has no thread throw, which spells trouble in many stations. The high frequency response—diameter effect is necessarily bad, as it always is in any soft coating, and therefore, while cardboard may be satisfactory for less critical home use, it certainly is not a broadcast material. Finally, no cardboard is really smooth; all have serious wrinkles.

A brief consideration will show that this narrows the choice down to two, to steel and glass.

The choice between these two materials is not easy. Steel can be extremely flat, but unfortunately the steel industry today is operating at better than 100% capacity, and a rolling mill cannot be extremely careful; for the time simply is not available. On the other hand glass is ideal in this respect, being flat within plus or minus two thousandths of an inch. This may be appreciated more if it is realized that the human hair is 50% larger.

With respect to smoothness, again the steel industry can do a truly excellent job, but it lacks the time. The roll surfaces must be in extremely good condition to avoid roll marks, which means taking a pair of rolls (perfectly satisfactory for normal work) out of service for dressing down. The cost is very high and worse yet the time and the strain on rolling facilities are too great to permit this in many cases, so a set of rolls which are nearly right are used. Even if the mill is successful in avoiding roll marks, it very often produces a curious type of orange peel. None of these objections apply to glass, and so from the standpoint of smoothness it is the best choice.

With respect to fragility there is no doubt whatever that

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- Additions and alterations, administration and development buildings, Rocky Point
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- RCA alterations, Bush Terminal, Brooklyn, N. Y.
- Mast erection, roof of 30 Broad Street, New York
- Mast erection, roof of 65 Beaver Street, New York
- Alterations, RCA Communications Building, 66 Broad Street, New York
- Erection of NBC television antenna on dome of Empire State Building, New York
- Design and erection of television relay tower, Hauppauge, Long Island
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- American Radio News tower erection and foundations, Carlstadt, New Jersey
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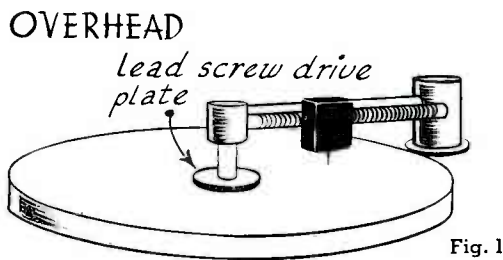


Fig. 1

steel is the better of the two. On the other hand it should be pointed out that steel can be bent and that therefore discs may easily have a slight bend, produced somewhere in the handling, too small to see at first glance and yet enough to cause trouble in recording. Lacquer coated glass discs are nowhere nearly as fragile as one might picture. The coating on either side acts as an excellent cushion and so the disc will survive considerable impact. When damaged by abuse the split produced often runs only to the center, and while the glass is cracked, it is not in two pieces, so may be played without worry and re-recorded if need be. It should be pointed out still further that glass, while it is moderately elastic, cannot be permanently bent. It is difficult to exaggerate the comforting feeling that every disc will be absolutely flat.

It is well known that tempered glass is obtainable. This material is much closer to unbreakable. On the other hand, it is not flat and its cost is completely out of the question. There is the further danger a break once started results in complete shattering rather than a mere crack.

Steel deliveries are slow and are likely to get still slower in the immediate future. Even orders placed months ahead will not always yield the superfine quality necessary for recording. On the other hand glass is available in unlimited quantities from stock and once one has mastered the many tricks involved, production is limited only by factory capacity, a condition never before obtained.

Having just hinted at the problems of production, let us be a little more explicit. In glass there are several problems, but the main ones are those of drilling a hole in the center and of cutting the circle from the large sheet as delivered. These appear rather easy; they certainly have been done in the past in the glass industry. On the other hand it should be recognized that drilling a few holes and cutting a few circles is no preparation at all for mass production. The methods used must be vastly different and particularly the accuracy expected is vastly greater than the glass industry is used to. We are expecting as high accuracy in glass as we have heretofore secured in metal, and this is no light feat. In addition to that there are other problems connected with handling the material before coating. In steel the chief problems are securing proper flatness and sufficiently smooth surface. These are problems of the steel manufacturer rather than of the disc manufacturer, and are more or less beyond the latter's control. However, they are very serious problems, as judged by the quality of material that has been received.

Comparative tests of harmonic distortion and of frequency response have been made over the entire audio range. Within the limits possible in such measurement glass and aluminum base discs are absolutely identical. On the other hand two out

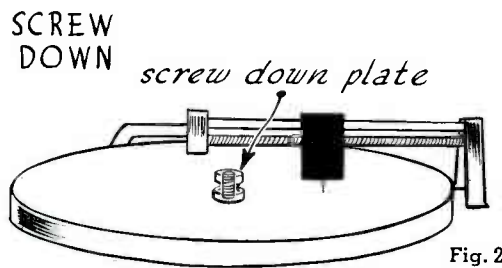


Fig. 2

of the first three sound engineers to compare glass base discs with aluminum remarked immediately that the glass base discs sounded better. The writer cannot explain this phenomenon, but it has occurred sufficiently often since, and the engineers reporting have been of such high calibre that there is no doubt whatever that there is such an effect. The writer is at a loss for an explanation, and it is hoped that our many friends in the industry can supply one, even if only tentative.

Since mass production's start in early April, many thousands of records have been shipped in standard quantity packages and the breakage has been next to nothing. When the express companies become used to handling the packages the breakage will drop to exactly zero. With regard to shipping individual discs or a few, we have devised a special cushion package and in shipping tests clear across the continent and back there has been absolutely no breakage at all. Floating or cushioned construction has achieved this.

There has been some question as to the reason for a single hole rather than the conventional two or four. The strongest factor in favor of the single hole construction has been durability. Experiments have shown that a crack is more likely to start at the drilled hole than elsewhere, and if the number of holes can be reduced to one, this factor can be reduced to a minimum. Still further there seems to be a line of weakness joining the two holes and we eliminate this trouble area if we reduce the number of holes to one.

Experiments have shown that there is no slippage difficulty. This is not surprising when we recall that smooth wax blanks were held on smooth steel plates on the old-time wax recording machine with a pressure of not over a few pounds. If we take an instantaneous disc, we find that its surface is by no means comparable to the slipperiness of the wax and therefore pressure of a pound or two is quite sufficient to make the disc grip the turntable as tightly as though glued on. The important thing is to hold the disc by rubber. The average overhead lead screw type of device (Figure 1) uses a rubber mat on the turntable and a rubber washer on the lower part of the drive pad and no changes whatever are needed. One type of lathe feed mechanism uses a very effective threaded center pin and a screw-on clamp disc, (Figure 2) so again no change whatever is necessary. Finally we come to the rather expensive and rare lathe type of machine which

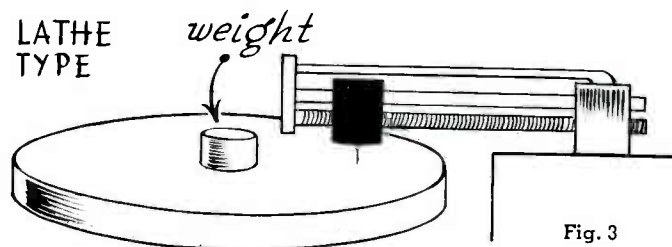


Fig. 3

has a spring drive pin but no provision for clamping (Figure 3). This presents no difficulty if one uses a weight on the center of the record, such a weight as is occasionally used with transcription turntables. Otherwise a one or two pound piece of iron several inches in diameter may be taken, faced off, and a hole drilled through the center to provide room for the pin. A layer of rubber then can be cemented to the bottom with ordinary rubber cement. This sounds a great deal harder to do than it actually is. The added load has no effect whatever on the performance of a machine of this sort, which was originally designed to carry a 12 to 15 pound wax blank if necessary. We started out with the idea that it might be necessary to use scotch tape to hold the disc from turning, but found that in no case was it necessary regardless of the type of machine used. The largest broadcasting organizations made tests with a crayon mark on the disc and another mark directly opposite it on the turntable surface. A 15 minute recording was then made and timed as recorded; at the end of the recording the two marks were still directly opposite one another. Rechecking many times has shown no slippage and so the tape idea has never come into use.

Fear about slippage has been totally absent in the large organizations which have cut thousands of discs. Recently some engineers in trying glass have worried unnecessarily. Read the instructions of the disc manufacturer and obey them. Everyone must realize that friction can have just as potent a grip as a steel pin—even trains operate by friction!

If you do have a special type of machine that doesn't fit into the ordinary classifications, write your disc manufacturer for advice—and take that advice when received, for it is based on a great deal of successful experimentation.

A final point has been the matter of thickness. Tests showed that beyond .065" there was no significant improvement in durability. On the other hand a disc thicker than this becomes so massive when coated that it will throw any recording machine head considerably out of alignment. The .065" thick base is definitely the thickest that can be used easily. Glass is somewhat flexible and when too thick, it becomes too stiff. Less give within limits seems to counter-balance any gain in strength due to the increase of thickness. Furthermore, the weight of the disc and therefore the force tending to damage it increases directly in proportion to the thickness, and so again we have another force tending to counter-balance any improvement due to strength. Perhaps an even thinner base may ultimately be adopted.

In conclusion the writer firmly believes that glass has become the broadcast stations' high quality disc material and that when the present emergency is over the stations will continue to use glass even though a return to aluminum would be then possible. Worry over the single hole clamping is bound to pass after cutting the first dozen transcriptions. The advantages of extreme accuracy and higher fidelity are so great that once enjoyed they are not easily given up. This opinion has been reinforced by our users' judgment and several months successful production of high quality glass discs.



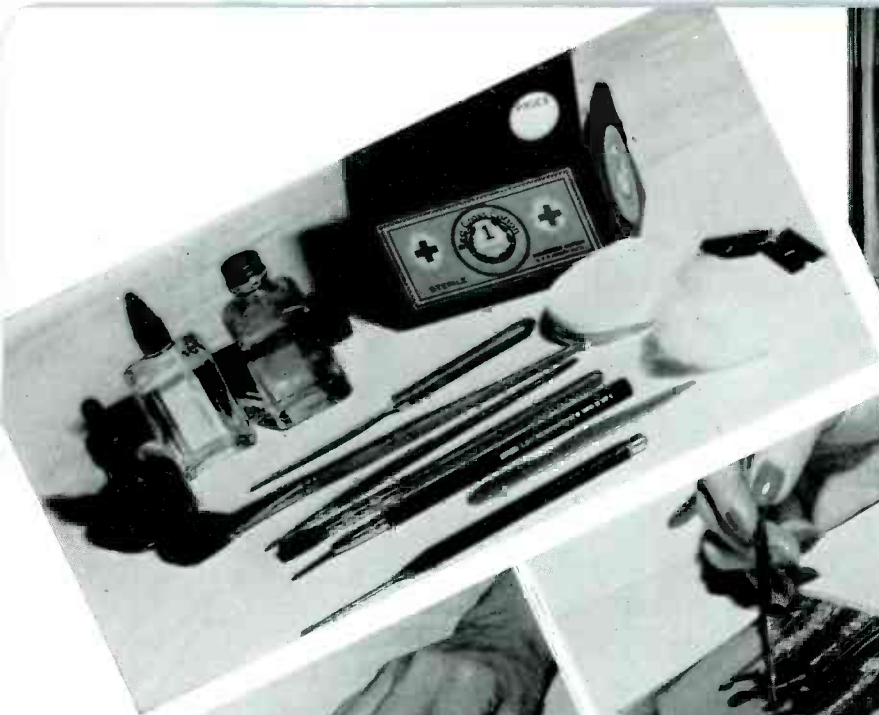
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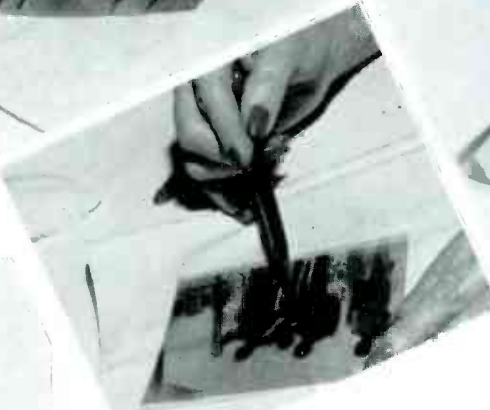
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Another Hollywood photo from the Pete Smith short "Candid Camera Maniacs", courtesy Metro-Goldwyn-Mayer



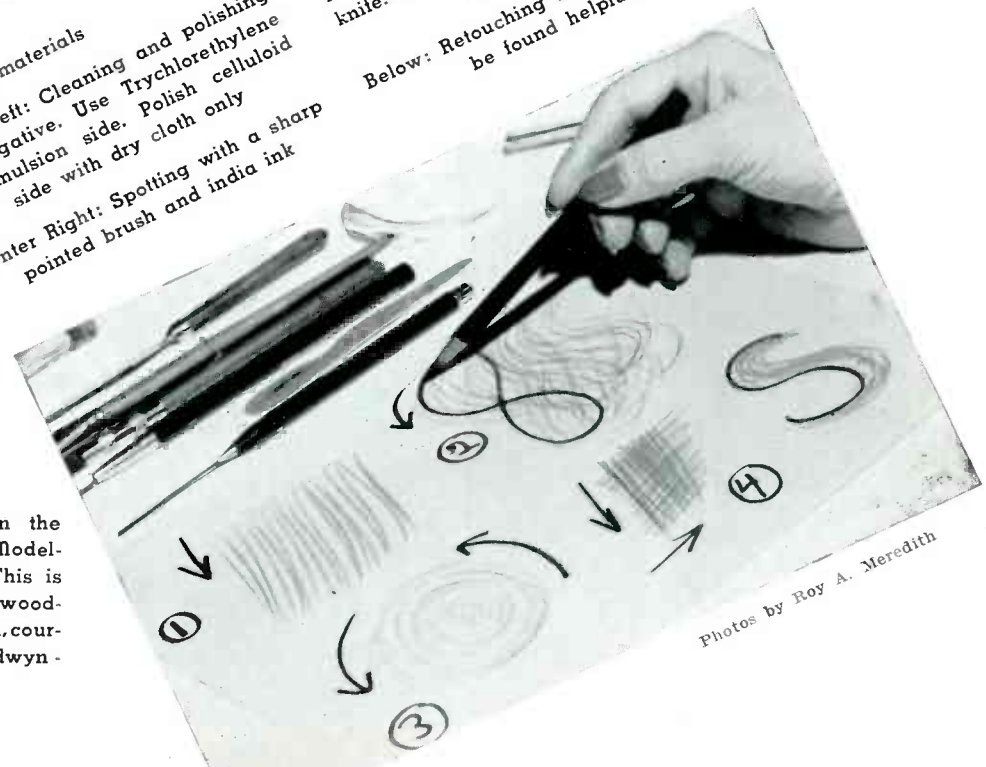
Bottom Left: Using the retouching pencil

Bottom Right: Using the etching knife. Use with a very light downward stroke

Below: Retouching strokes that will be found helpful



Dorothy Dugan in the Pete Smith short, "Modeling for Money". This is a typical Hollywood-quality photograph, courtesy Metro - Goldwyn - Mayer



Photos by Roy A. Meredith



# Retouching Photographic Negatives

By Roy A. Meredith

Staff Cameraman, National Broadcasting Company

**P**HOTO retouching falls into two major classes. The first category is strictly art work, and is employed to improve subject appearance—such as removing freckles, a bump on the nose, etc. The second class of retouching is employed to compensate for technical defects in the picture that have resulted from poor lighting, flash-bulb high-lights, or any other technical short-coming. The former type of retouching is pure artistry—and since you cannot tell a person how to be an artist in one or a dozen articles such as this, only the latter type of retouching will be discussed herein.

To the amateur photographer, photo negative retouching is somewhat of a mystery that takes years of experience and practice to learn, and probably beyond his capabilities. He therefore does not do anything about looking into the so-called mystery of the art of retouching. In the following article I will attempt to throw some light on the matter in a demonstration of a few hints that should prove practical and instructive to the average amateur photographer.

As a motion picture cameraman, my first suggestion would be to avoid the necessity of retouching by using the proper precautions in the beginning, before you take the picture. For example, if you are “shooting” a portrait, the proper make-up and lighting will leave no retouching to be done.

There is no question or doubt that the photography that comes out of Hollywood is the best in the world, and by that standard I am basing my suggestions. The pictures that accompany this article will leave no doubt in the mind as

to what I mean. There are thousands of feet of film that come out of Hollywood every year, not to mention the thousands of “stills” that accompany those pictures for publicity purposes. They are well nigh perfect as to lighting and content. The “stills” are shot at the same time and under the same lighting conditions as the movie, still and movie camera side by side. Those “stills” seldom are retouched if at all. The number of “stills” taken would make the cost prohibitive if every one of them had to be retouched, so Hollywood, and the movie industry as a whole takes the necessary precautions in advance.

However, every one doesn't have a Hollywood studio for his picture making, so there are times when retouching is a necessary evil, and hence this article.

## Equipment

The materials needed for retouching are few and inexpensive. Mostly pencil leads, not the ordinary kind, but a regular retouching holder, and leads that can be slipped into it. The leads cost about ten cents each, the holder about fifty cents. There are six degrees of hardness in leads, B, H, 3H, 4H, 2H, and 5H. As a rule, No. 3H is mostly used.

A retouching easel, that consists of a board with a ground glass opening that has a concentrated light under it. A black hood can be used to shield light from elsewhere but it is not entirely necessary. Other materials are Black India ink, absorbent cotton, retouching fluid,—two grades, medium and special (strong solution), a pointed brush for spotting, and a

(Continued on Page Eleven)

Marking the proof

Before retouching . . .

and after retouching



# Tom Gootee Says: "What Every Broadcast Engineer Needs Is a Little More Humor"

Here Are Two of His Contributions Toward That End

## You Can Be a Song-writer

THE music controversy between Radio and ASCAP has made the entire nation music conscious. New and catchy tunes are springing up almost overnight, and people who used to have difficulty even whistling a popular song have taken a new interest in music.

With all this new music kicking around the air lanes most people have been prompted to query: "Why can't I, too, write popular music?"

The answer is: You can!

And this article will tell you how to make thousands of dollars practically overnight—maybe—and with little or no actual work. This method is not only foolproof but stupendously worthless. However, it will give you an idea of just what's cooking in the music-writing business—in case you ever decide to write popular songs.

First of all, you don't need a knowledge of music. Some of the best song-writers can't even whistle a simple tune like "Jeannie, With the You-Know-What," and others don't know one key from another. The main thing is to write catchy and tuneful lyrics—therein lies the secret of success.

Therefore, you should be able to read and write, know something about lyrical poetry, and have a friend who is an executive with a music publishing company.

You can buy a good poet's dictionary at your nearest bookstore, and that is your only investment. With the aid of this little book you will be surprised to find how easy it is to write poetry and rhyming verse. For practice you can write short jingles about all your friends and enemies—poking fun at their shortcomings. Before you know it you'll be a poet—and ready at last to begin writing popular songs.

Every popular song must have a good lyric. Even if the song itself is slightly corny the words to the tune may make it an immediate hit. Lyrics may be divided into four general groups, representing four themes: (1) Love Is Wonderful! (2) Love Is Terrible! (3) Cowboy and Hillbilly Tunes, (4) Miscellaneous Subjects.

From this you will gather that a popular song will either be about love, or it won't be about love. And love songs, good or bad, are always popular with the public—for some unknown reason. The No. 1 Theme is just what its title implies—and includes about 90 per cent of all tunes published. The No. 2 Love Theme is more often referred to as a Torch Song.

Now to write your song.

First of all, you should get into the mood of the type of tune you intend to write. Have you been having trouble with the "little woman"? Has your best gal turned you down? Has your gal said: Yes? Does the moon make you yearn

for something, or somebody? Have you paid your Income Tax?

As soon as you are properly inspired, grab a few sheets of paper and a pencil—and shut yourself away from the noisy workaday world.

Suppose that you decide to write a torrid Torch Song. For example, we'll assume that the "little woman" has been beating up on you quite regularly of late, and you have become somewhat despondent. Whereupon you take your pencil and paper and go down in the cellar by yourself, or go up the street to Joe's Place—and meditate. While you're meditating—and before you doze off between beers—you whip out your Little Gem Poet's Dictionary and dash off a sultry ballad such as this:

Just one more kiss,  
One you will never miss,  
Before we say goodbye.  
Just one more dance,  
To end our great romance,  
Then I'll go out and die.

This is known as the "killer" type of Torch Ballad; where your chance of living through more than one chorus is quite remote. And still another Torch type is this:

It's hard to eat Thanksgiving dinners,  
And also Christmas dinners,  
In lonely big hotels  
Without you, dear, beside me  
Listening to New Year's bells. Or belles.

If, on the other hand, you are very happy about love and such things—like when you were first married—you may care to dash off a sparkling little song explaining your great happiness with something like this:

I may be crazy but I love you, Daisy  
I may be lazy but I love you, Daisy.  
I know I'm crazy.  
But don't let that worry you, dear;  
I'll love you anyway, I fear.

Leaving love songs for the nonce, you may care to write about topical things—such as this little ditty set to a brisk, marching tempo:

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I want to be a soldier boy,  
 And fight for Uncle Sam.  
 I want to join the army, yes,  
 And take it on the lam!  
 For I can be a soldier, too,  
 At least that's what they told me;  
 But I've been training now a year  
 And am I a lousy soldier!

Cowboy songs are mostly mournful, and sometimes referred to as "tear-jerkers." Cowboys are supposed to spend all their spare time thinking about (a) Going to heaven, (b) Going some place else, (c) Rolling prairies and fields of grain and corn—generally in bottles. But a good hill-billy ballad should be downright sad, without sparing any of the emotions; such as this lachrymose dirge: Oh, they're buryin' Uncle John today, 'Cause he is full of lead, An' they're cuttin' down the old pine tree Fer kindlin' wood.

By now you probably have not an excellent idea of just how to construct a suitable verse—patterned after some particular theme. After you have written a good verse and chorus it will be necessary to title your song.

And a good title is very important!

In fact, a good title may sell your

song. So considerable thought should be given to this important angle. A few titles that will come to your mind might be: "You're My Social Security, Dear," "When Jeanie's Light Brown Hair Was Purple," "I Met Her on the Night Boat To Albany," or "Where Was Grandpa When the Lights Went Out!" Or, after writing "I'll Bet You Won't Miss Me When I'm Drafted," you could write its sequel, "I Bet I Will Too Miss You When You're Drafted."

A few other good titles are: "Military Swing," "Between 18th and 19th at Hialeah," "Who Stole Mr. Murphy's Overalls," "Keep The Home Fires Cooking," "When Grandpa Blew His Top," "Ladies' Day at Ebets Field," "A Weekend at the County Morgue," and countless others.

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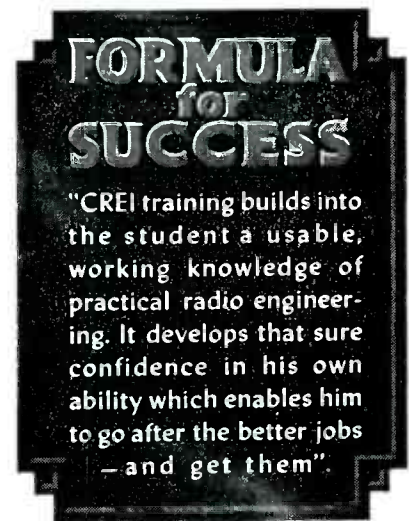
With a knowledge of Spanish you can do all this—and more, too! And what's more, learning can be very simple—providing, of course, that you don't want a vocabulary of over ten words.

First we will assume that you are planning a trip to Mexico or Guatemala

or Cuba—those being the most likely countries for a brief vacation. You will want to know just enough Spanish to (1) swear at the natives, (2) argue with the merchants over prices, (3) find your way to the nearest bar, and (4) find your way home again.

The two most important words to remember are: *yes* and *no*. They can always be used whenever you may be in doubt as to what the natives are trying to sell you. The word for *no* in Spanish is *no*; the word for *yes* is *si* or *OK*. For instance, when you go into a store and point out some article you would like to have (not counting the store-keeper's daughter) the merchant will probably start jibbering away at a terrific pace—and when he is finished you wag your head slyly and say *no*! Then he will start all over again. After repeating this routine eight or ten times he will prob-

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ably get the idea, and then hold up so many fingers indicating the price of the article. He will always ask ten or twenty times what it is worth; so never agree with his first quotations—he might not survive the shock. While he is giving out with his fire-engine delivery of rapid Spanish, you can confuse him further by arguing back in English. Finally, after several hours, when you have argued him down from five hundred pesos to three pesos, you shake your head up and down and say: OK.

You now have a vocabulary of two words; use them often. Never use the word *maybe*; make up your mind one way or the other.

At some time during your trip you will be approached and considerably bothered by enormous swarms of natives who will want to either (1) act as your guide and "show you the city," (2) sell you trinkets and souvenirs, (3) shine your shoes, (4) conduct you to the nearest "hot spot" or bar, (5) sell you a

correspondence course in boiler-making, (6) lift your pocketbook when you aren't looking, (7) sell you a life insurance policy, or (8) carry on a heated political argument, on any subject. At times these well-meaning but too enterprising natives assume some of the aspects of flies, and may become very bothersome. Whereupon you utter the magic Spanish phrase that sends them quickly on their respective ways: *No tengo dinero!* — which means, in American, "Scram, you guys, I'm flat broke!" This is also a good phrase to try on your waiter in the hotel restaurant—after you have consumed much food and wine—and will quickly prove to him that you are familiar with the customs of the country and how to wash dishes.

It is when you endeavor to determine directions that you will probably have the most difficulty in a Latin country. For instance, you may want to go from your hotel to the nearest tavern for a short beer. You saunter casually out of

the hotel and immediately run into a small army of natives—each over-anxious to show you the various and sundry sights of the village. All of these offers you pass up, and then say to the most intelligent one: *Donde esta la taberna?* In English this means: "Say, Jughead, where's the closest bar?" Whereupon the native will offer to take you there—for a modest sum—since he knows you cannot find your way around by yourself (particularly in your condition) and is only too anxious to assist you. So you pay him a trifling amount, and he leads you up two flights of stairs, through several doors, across a roof, down one flight, and through a maze of corridors—eventually arriving at your destination which, by a strange coincidence, you find was in back of the hotel all the time. So this is a very good phrase to remember.

In times of exasperation—and there may be many—you will feel inclined to say "nuts!" And since a native would probably not understand this English word you give him the translation in Spanish: *Nueces!* — which is probably meaningless to him anyway.

And that completes our vocabulary of the most important ten words in the Spanish language. Without these ten words you cannot enjoy your vacation trip—so learn them today!

In conclusion it might be added that it is always advisable to take your wife on any trip to Latin or South America—you'll find out why, after you get there. For one thing, the natives will probably be afraid of her and leave you both alone—which is a blessing. And also, she will be quick to recognize alleged "bargains" in trinkets, pottery, rugs, and other souvenirs. So be sure and take your wife along—and never wander off without her. Some of our best friends have been lost alone in the wilds of western Havana for over thirteen years!

After returning to this country you will be quick to agree that we have here mentioned all of the really necessary Spanish words. There are others, of course, but you won't need them. Besides, most of the natives down there speak perfect English—if you'll let them!

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# Retouching Photo Negatives

(Continued from Page Seven)

set of etching knives. For this latter purpose, razor blades can be used in place of knives, but are a little awkward to handle. Some turpentine, abrasive paste, and a good magnifying glass constitute all the necessary implements.

The first results are bound to be disappointing, and I would suggest using several old negatives for practice.

Before going to work on your negative, make an 8 x 10 print; a 4 x 5 contact print will do also as a guide. Study the print carefully for spots, scratches, and other unwanted blemishes and shadows. Take a black grease pencil and underline the areas to be retouched. Match these with the negative, being careful to note their characteristics. They will be the OPPOSITE color from the print. For example, a shadow on the print will be a light area on the negative which will require shading . . . or an unusually bright highlight in the print will be a black spot in the negative and will require abrasive treatment or the etching knife in order to match toning and color. After the first treatment, make a test print to see the results obtained.

## Scratches

Negative scratches are, as a rule, a very common trouble caused by carelessness or accident in handling. Dust may collect on the negative while it is drying. If the scratch has broken the emulsion it is possible to eliminate the fault by using Trychlorethylene on a lintless cloth and carefully running it over the emulsion side of the negative. After this is done turn the negative over to the celluloid side and polish with a dry cloth. You will find when you make the test print that it has brightened up the picture, and that it does no harm to use this method on all negatives before printing if they have NOT been retouched, because this fluid will remove other retouching fluids from the film.

If the emulsion is badly scratched, and shows light thru it upon examination, there are two ways of treatment. The first is to smooth the edges of the scratch with the etching knife, being careful to use a light downward motion, and then using the retouching pencil or ink. The second method is to use the retouching (soft) pencil AFTER retouching fluid has been applied.

## Detailed Photographic Retouching

The first step is "Doping" the negative. Put some retouching fluid on a piece of absorbent cotton and apply to the area to be treated. Rub in a circular motion until dry. This prepares the negative so the leads will stick to the surface. Hold the negative up to the light. If the negative shows a ring where the fluid left off, apply a little more and rub until dry.

Take the retouching pencil, making sure the point is needle sharp and protrudes about an inch and a half from the holder. Hold the pencil flat using a very light stroke until the area is the same density as the rest of surface.

Retouching pencils H. or B. should be used to take out spots, freckles, circles under the eyes, blemishes, etc.

The different strokes to be used with the pencils are the letter (S) forms and the figure "8's" all made in a continuous motion. (See illustration.) Cross lines and dots are also used. These strokes are about the fastest strokes used for shading light areas. After the area that has needed shading has been worked over, make a test print. By so doing you will be able to see the effect of the work done.

Of course there are much more complicated forms of retouching, and I have listed only a few of the simple and most common methods of treating common faults that are to be found in every day work and are to be avoided if possible. In short, the simple expedient in retouching is to match the area in color by the use of the various methods I have listed.

Portrait retouching that deals with rounding out cheeks, chins, and lips is a little complicated and calls for more explanation than I have space for. But you will find that after you have tried your first negative and see the result you will begin to try more complicated forms on your own.

One word of warning. Do not touch the eyes or eyebrows on any negative, as the slightest slip will in most cases ruin a negative for all time. Eyes seldom if at all need retouching, and as a parting word,—no amount of retouching can fix a badly lighted negative; with the proper make-up, and a few ideas on lighting, your pictures will take on that "Hollywood" look.

Retouching a negative is like patching a tire; it can be used, but it's still patched.

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# WOR Goes to a Party at Carteret, N. J.



FALL GIRL of the afternoon was Frances Barth of the Purchasing Department



EDNA BOODY of the Sales Promotion staff was in good form at Badminton



MUTUAL's Pepsi - Cola Twins, Katherine Keeping and Florence Diulio, attracted almost as many engineers as the ball game did



MIGHTY DICK BORNER, Maintenance, scores easily to the evident irritation of catcher John Rudley, Drafting Department, while HAX Hadden, master control supervisor, gets set



BECAUSE OF HIS AGE, Shirley Davis, Engineering Maintenance Supervisor, was permitted to use the spitball. Umpire Stella Berthoff, Artists Bureau, has just watched him lick a fast one



THE WHOLE GANG ATE—and drank



OH-H-H! IT COULDN'T BE SOMETHING I ATE! Charley Singer, Transmitter Supervisor, and genial host



IT MUST HAVE BEEN INTERESTING — because J. R. Poppele, chief engineer, made sure it caught the eye of Ted Striebert, WOR vice-president

# WOR NEWS

By R. A. Schlegel

**T**HE WOR transmitter staff demonstrated their abilities as chefs, teachers and ball players on June 7 when they were hosts to nearly fifty men and women of the WOR staff at the transmitter in Carteret, New Jersey.

After Jack Poppele, chief engineer, had conducted the staff on a tour of the transmitter and explained its operation, a picnic lunch was served and the visitors then proceeded to trounce their engineering hosts in a softball game.

Frequent visits to the transmitter are a part of WOR's general policy of acquainting all employees with the operation of the station and promoting inter-departmental relations.

Recent additions to our staff are Eugene Clark, formerly with WKNY and WTRY, Kingston and Troy, New York; Walter Payne, formerly first sax player with Don Bestor's Orchestra, is now trying his hand at the opposite end of the mike. Daniel Ehrenreich, from WNYC, New York City's own station. Jimmy Gavigan, from WHAI, Greenfield, Massachusetts, and Harry Bryant, a recent graduate of RCA Institute. These additions were made necessary by putting our FM station, W71NY, on a full time and separate program basis and also to handle the additional requirements due to the station going on a twenty-four hour operating sked.

Don Hale and Ed Scatterday are taking a vacation tour of the West. Their itinerary includes such places as the Grand Canyon, Lake Louise country, Hollywood, etc. Just received a late report from the globe trotters, visiting Pike's Peak but unable to get to the top due to heavy snow drifts on the highway.

Paul Reveal now the skipper and owner of a thirty-two foot cabin cruiser on which he is spending his vacation. I have been informed by usually unreliable sources that on his first trip out with the boat, Paul ran aground on a sand bar and is spending the rest of the vacation in an effort to float the craft.

Jimmy O'Connor spent the greater part of his vacation around Kingston, New York, where he indulged in the ancient art of sitting. O'Connor has been transferred from recording back to studio work. He is replaced by Paul C. Baldwin, formerly with the U. S. Record Corporation of New York.

Francis Garufy, formerly of WNLC, New London, Conn., has replaced Charles Harrison at the Carteret transmitter.

IBEW Local 40 of Hollywood is conducting a drive to take the independent stations from the CIO. The local announced they signed KIEV, KFVD, KFAC and is negotiating with Don Lec Broadcasting System for a unit contract covering KHJ, KFRC, KBD and KGB. New contract will call for 25 to 30 per cent wage increase, three weeks' vacation with pay, ten days' sick leave per year and arbi-



A group of WOR employees gather under their banner at the party given for them by the WOR Engineering Staff on June 7th

tration. . . . West Coast IBEW announces that the IBEW Local at Boise, Idaho, has signed with KIDO providing for a base salary of \$40, which is an increase of \$10 per week. IBEW also reports signing of a new contract with KOL, Seattle, for \$210 per month for a six-month period when it will be increased to \$217 per month. The \$210 monthly scale was recently agreed to by KXA, also of Seattle.

Who snatched the buzzer on the Lowell Thomas Program of Friday the thirteenth and made the Sound Effects man whistle out "SUNOCO"?

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# Hollywood News

By Ray Ferguson

**H**'YA, GANG!

No doubt the inhabitants, a couple of minutes ago here at Santa Monica Beach, probably were surprised and bewildered at sight of four young stalwart fellows stripped to their waists in swimming trunks and dodging traffic across Roosevelt Highway. One of the chaps carried a typewriter and colored beach towel. Another, an RCA portable radio, sun tan oil, cigarettes, matches, and a book. The third man lugged a small box in one hand, Life, Time and the A.T.E. Journal in the other! The fourth guy was burdened with a clock, towels and writing paper. Thus equipped, the group crossed the highway and reached a choice spot across the way on the beach.

Yes—we are writing this column from Santa Monica Beach today. And here we are: camp set up, sun-tan oil smeared all over us and comfortably spread out on the sand in front of the beach wall protecting Doug Fairbanks' house from the elements, which might include the tides and even the sound of our typewriter.

With the sun beating down on our long, lean frame, we think we've got it all figured out on how to get two things done at the same time. What with swell summer weather

here now in earnest, and this being our day off, to combine the two and write in a pair of beach trunks. Thus making for a situation we can more than enjoy and be grateful for, while having a hand-to-hand encounter with a typewriter, sunshine and warm sand to back it all up.

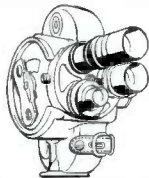
It must be mentioned that our one weakness to describe our surroundings, perhaps not well, but at least not over-looking what is going on around us, usually comes to the front when the spirit from within is in a happy mood.

About a hundred feet away the blue Pacific rolls up to the beach with long, sprakling lines of waves rushing up with a deep, satisfying boom. Here and there, either alone or in groups, people sprawl along the sand. To our left a volley ball court is in constant use. Fellows from many walks of life cross their paths there. From Douglas Aircraft, the two universities—USC and UCLA—the movies, and, of course, NBC, come men and women to relax and swim here along the great expanse of this fine beach. It is always a thrill when we see a Douglas A20A attack ship hurtle through the sky. The big aircraft plant is only a few miles from here and it is with great anticipation that we await the day soon when the famous B19 will actually be flying.

Along this particular stretch of beach we think it interesting, not only for the swell body-surfing to be had, but for the movie names as well.

To our left a white-washed brick wall begins and extends several hundred feet behind us. Behind the wall are two homes we know of right offhand. Norma Shearer's lovely place and the other the beautiful beach house of the late Douglas Fairbanks. While further on down are more good-looking places picture people have built here. Among them are Joel McCrea, Darryl Zanuck, head man at Fox; Bill Goetz, Fox executive, and others we are not familiar with. Outstanding for its size and Colonial architecture, the great white mansion of Marion Davies looms up at the far end of this strip of sand. Her place is protected from the sea with a sea-wall that goes down twenty-seven feet into the beach. Behind the wall are tennis courts, small guest houses and a swimming pool. Something we have never been quite able to figure out is why people living along the beach should have swimming pools when the ocean is literally right in their front yards. Another thing we still wonder about is why haven't we seen Marion Davies on the beach. It isn't that we expect her to pop out at a moment's notice. We simply think how nice it would be to just see her come strolling along some fine, sunny day. It must be possible because one morning not so long ago, when we were absorbing the sun next to the beach door at Miss Shearer's place, the door suddenly opened and, to our great delight, Norma Shearer walked out. We felt her appearance had a lot to do with making the rest of the day one of happiness and song. Sometimes we do things somewhat differently as a means to an end. At any rate, even though we were born under

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a star which, according to the charts, show us as being at times rather extreme, there was the time when body-surfing that a wave took a hold of us and drove us thirty m.p.h., nose along the bottom, toward the beach. We were literally driven up on the sand like a nail with quite a loss of skin along the upper part of the nose. Not so funny then as now in recalling the incident when we came up screaming, "My God, boys, is it broken?"

And now, with people along the beach wall here casting curious glances in our direction from time to time, we can't help but wonder whatinhell is wrong with packing a typewriter down and propping it up on an empty spud box so we can get our home work done.

## San Francisco News

By Lee Kolm

**O**N May 21st the famous Bal Tabarin was the scene of the SF Chapter's annual Ladies' Night. All of the NABET members and their wives, who were able to attend, plus Mr. and Mrs. Al Nelson, Curtis Peck, Joe Arnone, A. E. "Shorty" Evans, Joe Baker, and Mr. Tommy Phelan gathered around one long table on the first terrace.

After dinner Sophie Tucker, featured at the Bal, was introduced to each couple by Mr. Al Nelson and many wives took the opportunity to have their menus autographed by the star. Although many of the boys had morning watches the dancing continued until 2 A. M. One group consisting of the Mitchells, the Parkhursts, the Barrons, the Sanders, and the Kolms stayed on till closing time and then left for other night spots to end the party at 5 A. M.



Photo shows  
George Greaves,  
Field Supervisor,  
with two fish caught off  
SF Municipal Pier.  
The bass are a  
23 and a 25 pounder.  
Joe Arnone was along  
on the fishing excursion,  
but failed to get results  
with his gear.

**NAMES MAKE NEWS** . . . The Dick Parks and the Henry Duntons of KGO visited Yosemite National Park during May. Bicycling occupied the time of the Parks who

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found this means of transportation ideal for reaching the park's many scenic spots . . . The Harold Platts, SE, are readying a nursery for an expected arrival in August . . . Richard O'Brien, KPO, will receive his EE from Stanford this June and television is his thesis topic . . . Making the usual excuses about the old car using oil, etc., Bev Palmer, CS, purchased a new De Soto sedan. With his well furnish-ing lots of water for the garden he figures to pay for the car with the saving he'll make on the water bill . . . Jimmy Ball, KGO, makes the old car do another year simply by having the buggy repainted . . . With headquarters in the Mark Twain Hotel, Warren Andresen, SE, is photographing the progress of our new building. Using a wide angle lens on his Cine Special, Andy should turn out a swell job . . . Joe Baker, Commodore of KPO, entered his yacht "Trade Winds" in the Golden Gate regatta May 18th. His boat finished fifth in Division 13 . . . Most of Aubrey Fisher's spare time is spent on the Golf course, but we haven't heard if he can equal Dick Parks' recent 88 . . . Although he returned from the Santa Clara Valley moderately successful, Mort Brewer still feels that the steelhead has yet to equal the fight of the High Sierra trout. Mort, the present KPO vacationist, plans to visit Death Valley before continuing on south into Mexico . . . Guy Cassidy, SE, reports his house going up rapidly, but overtime work in the studios occasionally hinders the progress . . . Walt Kellogg, KPO, sports a new Packard club coupe.

# RIDING GAIN



# ON THE AIRIALTO WITH TOM GOOTÉE

**T**HE wettest show on the networks—literally speaking—is the Jack Armstrong serial, now nearing its 2,000th episode. It is strictly an “action” show, with much use of water sound-effects. Story sequences call for boat rides so many times sound man Harry Bubeck finally had to rig up a special water-tank for the show. Since nothing sounds so much like water as water, Harry often spends hours every afternoon splashing away for all he’s worth in the tank. After almost every broadcast the actors make a bee-line for the nearest clothes presser. And a corps of janitors, armed with mops, move in to dry up the studio for the next show. Harold Jackson—engineer on the show—opines that fully a gallon of water is lost every day, and several mops worn out every week.

\* \* \*

With the new theater of war shifting into the Near East, developments in that region will shortly be forthcoming—and listeners with good short-wave sets and a little patience can pick up broadcasts direct from many of those small countries. The Turkish station at Ankara: TAP (on 9.465 mc) and TAQ (on 15.195) is the principal remaining “neutral” station at this time. TAP, incidentally, is the regular contact station in the Near East for the Alka-Seltzer “News of the World” program, nightly on NBC.

\* \* \*

American International broadcasters have been slow to realize the tremendous importance of long-distance, international broadcasting—for both educational and propaganda purposes. However, by summer this branch of the radio industry should be completely organized with a view toward more concerted effort—rather than individual operation. There are a number of high-powered, modern stations now on the air in this country—and more to come. NBC operates two fifty kilowatt international stations: WNBI and WRCA. Columbia has two new, similarly powered stations being completed at Brentwood, New Jersey. In San Francisco GE is building new 50 kw. equipment for KGEI. And among the older international stations are: WLWO in Cincinnati, WCAB in Philadelphia, and WCBX in New York. Spanish and Portuguese lead all other languages, but listeners in European-occupied countries are not entirely forgotten. American International Broadcasting—like America itself—is the last stronghold of uncensored democracy.

Happy Jack Turner—veteran piano solo act, now on the Red network every morning—plays the piano entirely “by ear.” And practically every piece in the same key: G flat. Jack says he likes the black keys better than the white ones—because there aren’t so many of them. He further admits that he took two piano lessons once. But he didn’t learn anything, he says, so he quit!

\* \* \*

Josh Higgins of Finchville—the imaginary rustic philosopher created by Joe Du Mond—is no longer on the networks. After managing and working in radio stations for some assorted fifteen years, Joe Du Mond now manages a new station of his own: KBUR, in Burlington, Iowa—and he promises to make the 250 watter “really go places in a big way.” Joe is a native of Iowa, but he got his start in radio with WEFW in New York back in 1927. He later managed WMT in Waterloo, Iowa—and came to NBC in 1936, when he created his famous character: Josh Higgins of Finchville. Joe’s popularity was so great in the middle west that a state park in Iowa was named for and dedicated to his radio personality: Josh Higgins.

\* \* \*

One of the most easily rehearsed shows on the networks is Al Pierce’s Gang, over CBS—a boon to engineers, producers and actors alike. Each skit is rehearsed separately, off mike, as are the musical numbers. Then each part of the show is clocked from the control room—and the show goes on the air. There never has been a complete dress rehearsal for the Gang, and m.c. Al Pierce claims his formula to be as good as any, at least for his show.

\* \* \*

Johnnie Johnston—formerly of Chicago’s NBC, now in Hollywood—will be doing a little singing in the forthcoming movie: “They’re in the Navy.” It was his voice, incidentally, that was dubbed in “The Penny Serenade,” starring Irene Dunne and Cary Grant.

\* \* \*

The Court of Missing Heirs program has actually restored over \$500,000 to rightful claimants—“lost” heirs—during the 18 months the show has been on the air. Which ain’t hay.

\* \* \*

Charles Lyon—veteran NBC Chicago announcer—now feels he is something of a qualified radio actor. It all came

about during a mix-up of production and engineering signals on a recent "Road of Life" broadcast. Charlie—busy in another studio—suddenly was handed a script and told to run to a nearby studio, there to do the commercial "tie-in" for the "Road of Life" serial. With a scant two minutes to go he dashed down the Mart hallway, bowled over two page boys, banged through several doors, looked at his script for the first time, took a deep breath—and then nearly exploded. The commercial called for *five* actors to assist him in the "plug"—and the studio was entirely bare, empty and deserted. Too late then to make other arrangements, Charlie picked up the program channels, swallowed hard and launched into the commercial—taking *all* the parts: three male voices, a girl, and a telephone operator supposedly on a filter mike—all in addition to his own part in the script. Yet despite these difficulties he staggered through line after line, contorting and changing his voice for every part. A routine transcription of the show, however, sounded much better than Charlie had ever hoped for—and now he's casting glances toward the remote possibility of becoming an actor, but *no more of doubling parts!*

\* \* \*

Clarence Hartzell—the "Uncle Fletcher" of the Vic and Sade show—seems destined for bigger and better things of his own. Present NBC plans call for a new show of his own, soon—and you can expect to hear more of the mild-mannered Clarence who overnight made the expression "Fine! Fine!" a household word among radio listeners.

\* \* \*

One radio actress who doesn't mind being called a "ham" is Lenore Kingston, W2NAZ, of New York—who really takes her amateur radio operating seriously. So much so, in fact, that she has little desire to spend her time acting in radio—preferring the operating angle "behind the mike." She first became interested in ham radio two years ago in Chicago, and spent her spare time studying the Ole Ham Handbook. In July of 1939 she was assigned her first call: W9CHD. And in just a year she had increased her code speed from a faltering 10 words per minute to a brisk 35 w.p.m.—even holding a code speed proficiency certificate from the A.R.R.L. Her transmitter rig—properly housed in a neat, gray crackle cabinet—operates with CW on 80, 40, and 20 meters, using a 616 oscillator and some 150 watts of power screaming into an 812 final amplifier. Lenore is strictly a code operator, but confesses she occasionally uses fones on 10 meters to satisfy curious guests. Her greatest ambition is to become a high-speed operator, and she gets a bigger kick out of handling traffic messages than acting in front of a broadcast mike. And as if all this wasn't enough to keep her busy, she is now teaching the code to a class of young ladies in New York—thus spreading amateur radio good-will among the fairer sex.

\* \* \*

There certainly was some hot necking the other night



Lenore Kingston

in Chicago's studio B, when Uncle Ezra got too near the gas with his celluloid collar on!

\* \* \*

**Ten Years Ago in Broadcasting.** There were three very popular singers in New York in 1931, each on a different station and with his own style—but all new-comers to radio. Russ Columbo was one of these. A young man named Bing Crosby was selling Cremo cigars over CBS—opposite the Amos 'n' Andy show on NBC. And Arthur Tracy, the "Street Singer," was breaking into radio with his own show, after several years of night club and theater appearances. Out in Chicago, the first University of Chicago Round Table was making its debut over WMAQ—with a discussion, by three professors, of the then very topical subject: Prohibition. The first superheterodyne receivers were coming into more general use by the summer of 1931, and such trade names as "Grebe," "Freed-Eisenman," "Peerless," "Stettner," "Pilot," "Fada," and "Roemer" were very familiar to the general public. And the first portable radio sets—weighing between thirty and forty pounds—were selling for about \$75 apiece.

\* \* \*

**Twenty Years Ago in Radio.** The Westinghouse Electric Company had applied to the Department of Commerce for permission to erect and operate a radio broadcast station at Newark, New Jersey—and such a license was granted in June of 1921 for a station to operate on 300 meters, using the call: WJZ. Construction of the new station was begun immediately, and completed a short time later—*just two decades ago!*

# Cleveland News

By J. D. Disbrow

**A** VERY tired-looking, bewhiskered, mussed-up individual dragged himself in to see us the other morning quite early and dropped into the nearest chair with a plop. "Just what first-class hay stack did you climb out of this morning and, if so, why?" says we. "It isn't funny, so cut the ribs," says he. "Boy, am I a wreck? Do I need sleep? Gosh, I'm tired!" "Well, cut the delay, dump the stuff. What's the reason for this dejected, worried lash-up?" says we. "It's a boy," says he; "eight pounds eight ounces, and did I have a time." Needless to say father Everett (TE) was no help to anyone at the transmitter that evening.

A little short guy with bundles stacked up to his ears blustered into the Control Room today and, after depositing the numerous articles, we discovered it was Jimmy Hackett, very sunburned. Just returned from his vacation, Jim spent most of his time in New Jersey this year.

All gassed up and ready to go was Frankie Whittam, who takes off today for Superior, Wisconsin, to track down those big fish that missed his hook last season. Confiden-

tially they have been missing his hook several seasons, but Frankie always come up with the same gags.

Just the opposite of the above two vacationists is "Red Hot" Horace Clark, who slipped away on his vacation without a peep as to direction, wind velocity or temperature.

The cameras are out of the closet now, come spring, and between Everett, Stewart, Butler and Russell we should get a couple of snazzy shots for the Journal soon. How about it, boys? Do you play golf? Do you raise your head when making a shot? Does it make you mad? Well, here is a new remedy that was shown to us the other day, guaranteed 100% effective. Obtain a length of string about 5 feet long and make a slip noose in one end. Put this noose around your head with the rest of the string hanging down in front. Now tie a good-sized fish-hook on the end of the string and tuck the hook down the inside of your pants leg. Go ahead! Lift your head.

Harry Caskey and Announcer Harry Burge tell us the bass were running at the mouth of the Rocky River and both caught their limit in a few hours recently.

"Barney" Pruitt finally got his tractor going, climbed aboard and started down the garden patch, only to tip over at the first knoll. Better put a big wheel on the downhill side, "Barney."

Congratulations to our old side kick Ross Plaisted for the swell cartoon on the cover of the May issue of the Journal. Let's have some more, Ross. After working around the new Memovox machines for a while, step into the recording room and start cutting a platter at 33 1/3. You'll swear the table is going 78.

S. E. Leonard recently saw a chance to better himself in the housing problem. Eddie's new place is "just what he's been looking for."

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Prompt Service at No Extra Cost

## Best Safety Device

The best safety device in NBC is a "seeing, thinking engineer." While we must give full credit to mechanical and electrical devices which compensate for human limitations, recognition must be given to the careful engineer who is conscious of his responsibilities to himself—and to others. He just doesn't have any accidents, there are no post mortems, and no famous last words—"I'll look in the barrel and see if it's loaded."

During the last week in May, a New York radio engineer went out during an electrical storm to make adjustments on a radio tower on a station in the metropolitan area. His pliers received the accumulated charge from the tower—and he has been in the hospital since.

TAKE TIME AND BE CAREFUL  
THINK IT OVER

—George McElrath.

# A New High in Ham Receiver Values

**O**CCASIONALLY in these discourses on modern receivers for amateur applications emphasis has been placed on the special consideration being given by designers to equipment to satisfy the limitations of the not-too-well-lined pocketbook—or the well-lined one on which various hobby demands are such as to require spreading its contents rather thin. Every ham would like to possess one of the higher priced communications receivers, but many simply cannot justify it.

For such hams some of the newer receivers offer more encouraging possibilities than ever before. This is particularly true of one receiver just introduced which, selling at fifty dollars, provides a combination of operating features heretofore seldom obtainable at much under twice the price.

The manufacturers of this Echophone "Commercial," Model EC-3, do not claim that this new receiver will in all respects equal the performance of the highest priced com-



munications receivers; but the man who buys a Ford doesn't expect Cadillac performance! The important thing is that it will provide good, dependable service, and operating features and refinements heretofore not even hoped for in a receiver of its price class.

A crystal filter is one of these features, for instance—complete with panel phasing control for true single-signal c.w. reception and maximum reduction of heterodyne interference. Another is the 4-position selectivity switch which provides two degrees of crystal selectivity and two degrees of i.f. selectivity. Others which can logically be considered outstanding are: ac/dc line operation, tuned preselector on all bands, two high-gain i.f. stages, automatic noise limiter, headphone-speaker switch on front panel with headphones working out of an isolated winding and therefore completely insulated from the power circuit, external speaker in matching cabinet, electrical bandspread for spreading any part of the entire tuning range and with

bandspread dial directly calibrated for four ham bands, continuous coverage from 540 kc. to 30.5 mc., etc.

As though all this were not enough, the design engineers have gone so far as to include facilities for monitoring one's own c.w. transmissions. This is accomplished, not by simply throttling down the sensitivity to avoid overloading, but by inclusion of a special circuit arrangement which provides highly effective monitoring and yet requires no tuning and none of the tricky adjustments so common in ordinary monitors. In the "Monitor" position of the standby switch the r.f. and i.f. stages are inoperative. The h.f.o. is converted to function as an audio oscillator with its plate voltage supplied by the signal itself which is rectified by one section of the detector diode. Thus the audio oscillator functions only when the transmitter key is pressed.

The EC-3 utilizes eight tubes, plus a ballast tube. The receiver is inclosed in a crackle-finished metal cabinet. A large central dial, dual illuminated, carries a rotary pointer moving over semi-circular calibration ranges for the main tuning and beneath this the slide-rule type bandspread calibrations and vertical indicator arm. In addition to this, the front of the receiver mounts twelve controls, providing the utmost operating flexibility.

All in all it is a receiver which will effectively meet the requirement of average ham operations, providing far greater operating convenience and effectiveness than is normally expected from a receiver in its price range.

## FM and RFD

No matter where you are, or what your needs, your radio requirements reach you quickly and exactly as you order them—if you buy at Terminal! Two conveniently located stores carry complete stocks of everything in radio.

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# Washington News

By D. A. Ullman

**W**MAL — NBC's newest transmitter had its first taste of Washington summer during the past week. The maximum temperature in the operating room was 85 — it hit 97 outside. If it never gets any worse than that, we can take it. "Twenty degrees cooler inside." Eddie Burg is on vacation now doing a bit of surf fishing at Ocean City, Md. Station Engineer Wadsworth has bought a new Dodge — back to his old standby after a high-priced experiment with a Buick. WMAL's transmitter engineers have formed a luncheon club — take turns at the cooking — then they toss up and the loser washes dishes. Bob Chapman is looking at a new house, halfway between WRC and WMAL — he divides his time between those stations. Incidentally, Bob tells a yarn about hearing a noise on WMAL's front porch. On looking out, he saw a Shetland pony peering in. When he opened the door to chase him away, the pony tried to walk past Bob and come in in defiance of the No-Visitors order. Bob had to boot him out. Anniversary chimes and commendations are in order for A. R. McGonegal. Mac completed his tenth year with NBC on June the first.

WRC Transmitter . . . Sammy Newman is back from a trip to Florida, via Merchant's and Miners' S.S. Line. Just can't stay away from the sea. Wally English has his new boat about ready to launch. It's a seventeen-foot mahogany speed-boat, built in Wally's garage. Chapman has agreed to buy the necessary fluids for the christening, beer is his preference. Wally is still holding out for champagne.

STUDIOS — One of the home-lovengest married men we know is the butt of a cruel prank of Fate. Not long ago, Frank Fugazzi was enjoying the average abnormality of expectant fatherhood. Each day he shuttled hastily from the office to the hospital and then home to four-year-old daughter, Joan. Came the eventful day on May the sixteenth when Frank and Juliet were blessed with a six-pound blue-eyed baby girl. Hardly had Frank jubilantly announced the new arrival, however, when a pesky germ sneaked up on little Joan and isolated her with whooping cough. Now the doctor, with calendar in hand, sternly umpires while baby Ann and Mrs. Fugazzi live at her mother's house and Frank with convalescing Joan anxiously conspire to drive the retreating germ from the Fugazzi home.

Clarence Allen will become Washington Engineering's first father-in-law on June the seventh when Miss Helen Jane Allen is wed to Mr. Gordon Andrew Novicke at St. Martin's Church.

New car of the month is Walter Godwin's Windsor model Chrysler. Dorson Ullman unexpectedly beat the deadline with a new Plymouth.

Mr. Lawrence Scully of Bridgeport found time between defense production schedules to drop down and install new

Scully recorder drive-belts and make improved bearing adjustments.

Mr. A. E. Johnson has just returned to his office favoring a recently infected foot.

We hear that English women have taken over their male compatriots' duties as studio and recording engineers at BBC. This might well be used as a strong argument toward creation of an auxiliary organization.

Sammy Newman reports that he was unable to escape Washington traffic even at Miami Beach. Innocently jay-walking one bright vacation day he was rudely trapped while crossing a thoroughfare — and discovered the offending motorist with good brakes to be fellow vacationer, Clyde Clark. Al Powley is currently sunning at the same resort.

## Early Radio Recording

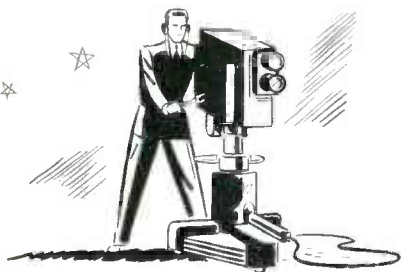
By Bob Callan

**I**N Raymond Guy's recent A.T.E. Journal article on International broadcasting, he mentioned the first broadcasts received from England and re-broadcast by WJZ and WRC. Now when such broadcasts are daily occurrences the mention of "the good old days" of broadcasting should arouse exciting memories for those engaged in the pioneer years of network broadcasting. When these first S.W. re-broadcasts were being attempted the writer was in New York, engaged in the recording of Brunswick phonograph records by means of "the new improved electrical method." At that time N.B.C. had no Radio City: not even a 711 Fifth Avenue, so studio facilities were augmented by using Brunswick's recording studios. On that particular history-making afternoon, O. B. Hanson phoned to ask us to record a portion of a s.w. broadcast then coming in on our N.B.C. line. The recordings were later played for Mr. Sarnoff and others concerned who were unable to listen to the broadcast at the time it occurred. This was no doubt by far the first delayed rebroadcast made by N.B.C.

Another early recording of an historically important broadcast was that of the Dempsey-Tunney (long count) fight in Chicago. Technically the recording setup was perfect: three minutes per round per 10-inch record with one minute between rounds to change waxes. By playing the recording of that much-disputed ninth round it was revealed, much to the satisfaction of Dempsey's backers, that twenty-three seconds elapsed from the time Tunney was knocked down until the referee's count of nine occurred. It was originally proposed to sell the series of recordings, but the intervention of the boxing commission and the interstate commerce commission made it necessary to dispose of the original metal masters. However, I believe there is still a set of records on file in the New York offices of the program department.

# MULTI-PURPOSE "ELECTRO-SHEET" COPPER

## *Stars in Television Role*

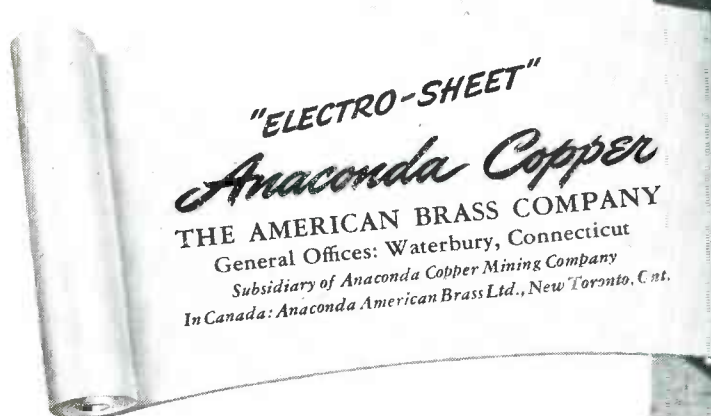


**22,600 feet of it protect television cameras from electrostatic disturbances at the new home of station W6XAO**

Early in 1941, television station W6XAO in Hollywood observed its 10th Anniversary; and fittingly, too, for at the time the station's new enlarged quarters were nearing completion.

Copper-Armored Sisalkraft ("Electro-Sheet" copper bonded to Sisalkraft building paper) was employed to shield the entire structure against electrostatic disturbances which might otherwise interfere with camera operation.

Anaconda "Electro-Sheet" is pure copper, produced in thicknesses of .0013", .0027" and .004" —in widths up to 60". It is widely used in building as a strong, non-porous sheathing... impervious to air and moisture. When combined with building papers, fabrics or asphaltic compounds, it is extremely flexible and easy to install. *Samples and names of manufacturers gladly sent on request.* 41107



Station owner Thomas S. Lee illustrates how easily "Electro-Sheet" bonded to paper can be handled. It's simple to install because it's as flexible as paper yet highly resistant to kinking, breaking or tearing. His interested companion is Miss Betty Jane Rhodes, otherwise known as the "First Lady of Television".



## ***It all started in a tent...***

AGAINST the horizon of "the spires of Princeton," the world's largest radio research laboratories are to be built by the Radio Corporation of America at Princeton, New Jersey.

The new RCA Laboratories, to be completed before the year-end, are planned to promote the growth of radio as an art and industry, and to meet the expanding demands of national defense. Several

hundred research experts and engineers will coordinate their efforts to create new products and services, and improve existing ones, in all fields of radio and electronics.

The march of progress which has led to Princeton started back in 1919 when the first RCA laboratory was located in a tent, later to be augmented by a shack 15 feet square at Riverhead, L. I. From

that humble beginning, with public service as the watchword, RCA has pioneered in radio manufacturing, international communications, marine radio, broadcasting, sound reproduction and television. Through continuous research it has discovered keys that have unlocked new doors of radio science, and has extended the usefulness of radio into many realms of public service.

Now, RCA research experts on a united front at Princeton are to take another historic step to enhance America's preeminence in radio, and to increase the services of radio to the Government, to the people of the United States and to industry.



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