RADIO AND TELEVISION

Sound Effects

TURNBULL

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WITH DRAWINGS BY THE AUTHOR

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RADIO AND TELEVISION SOUND EFFECTS

FRONTISPIECE. Soundmen Jack Robinson and Fred Cole all set for a terrific comedy crash used on the Red Skelton show. (Photo courtesy National Broadcasting Company.)

TO MY WIFE

Whose patience and encouragement
made this book possible

PREFACE

IN OCTOBER, 1921, station WJZ, Newark, New Jersey, broadcast the World Series. At the ball park a sports writer telephoned a play-by-play description of the game to Thomas S. Cowan at WJZ. Announcer Cowan relayed the phoned description of the game over the microphone in his own words. In order to simulate a broadcast coming directly from the playing field, Cowan stationed a group of workers outside the studio window and instructed them to cheer every time he signaled. To further the illusion, Cowan faked the sound of the bat smacking the ball by snapping matches close to the microphone. And with this simple beginning the amazingly complex and specialized field of radio sound effects was born.

It was some time, however, before the highly trained and specialized sound artist made his appearance. For years anyone who was handy and not actually performing before the microphone stepped in and assisted with what few simple effects were used. A book slammed or the lid of a piano dropped served as the closing of a door. A pistol shot was made by hitting the rim edge of a snare drum or by slapping a leather cushion with a stick of wood. A trap drummer's wire brush on a snare drum or two pieces of sandpaper rubbed together badly faked the sound of a train. No great effort was made to achieve realism. Radio was stepping out on unsteady legs.

Gradually, as the great listening audience took the new medium of entertainment to its heart, demands were made for a change of entertainment fare. Singers and orchestras began to bore the listener. Radio drama made its belated appearance. Engineers, actors, producers, and writers wrestled with the medium and gradually mastered it. As the quality of the radio drama improved, the need for "ear scenery" increased. After all, radio *is* an aural medium. By now the days of radio as merely a novelty had passed. It was no longer a hobby, but an integral part of everyday American life.

In early radio every scene, regardless of where it was laid, had a sameness about it that defied any illusion of locale changes. Then it was realized that sound effects could establish a scene as indoors or out, aboard ship, on a train, in a car, down a mine shaft, out in space, and so on. No longer could anyone handy do the effects. Sound had become too important a part of the radio drama. The time was ripe for a specific person to take charge of creating atmosphere and mood and identifying the action as it progressed. This was done through the medium of sound effects. And thus the specialized sound technician or sound-effects artist materialized.

In the past twenty years the radio sound-effects field has made tremendous advances. The highly trained soundmen comprise one of the most specialized and limited groups of men employed in the United States.

Qualified soundmen are found in a handful of key outlet stations of the major networks. Generally speaking, the majority of sound artists are found in the originating stations of four cities: New York, Chicago, San Francisco, and Hollywood. Figures as of December, 1949, show that the ten key stations of the major networks employ 121 full-time staff soundmen. It is estimated that there are twenty-seven full-time and thirty-one part-time or nonstaff members employed by the rest of the approximately two thousand AM radio stations. So with a grand total of a little less than two hundred full-time and part-time radio sound-effects artists in the United States, the reader can understand why this field is not only very limited but very specialized.

A few chapters here and there in books on production and writing cover about all that has been written on radio and television sound effects. In those instances sound effects have been discussed from the producer's or writer's side. This book is written from the soundman's viewpoint.

It is not intended to be an unabridged work on how every sound effect is done, nor is it written as a guide to other soundmen. It is written to explain just what part sound plays in the radio and television drama, how it is affected by writing and production, what are some of the problems faced by a soundman, and how a sound-effects artist does his job.

One suggestion: if and when the reader encounters an unfamiliar radio or TV word, he should check with the glossary.

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Hollywood, California
December, 1950

ROBERT B. TURNBULL

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CHAPTER ONE

Types and Uses of Sound Effects

THE PROBLEMS of the radio playwright are very different from those of the screen, stage, or literary writer. In a story the action is described. In a play or motion picture the spectator sees and hears what is taking place. But in radio drama the scene is only heard. As sound effects intensify atmosphere and mood and identify the action as it progresses, properly executed sound has become an important and integral part of radio drama.

The stage and screen playwright thinks and writes in terms of placement of furnishings and props, lighting, costumes, casting, business, and the movement and activities of the actors. These devices give action and atmosphere to the playwright's efforts.

The radio playwright concentrates on how the play "listens." He cannot point up the atmosphere, mood, or action by the above devices. His medium is strictly aural and depends upon music, dialogue, narration, and sound effects for success. The playwright's pet, pantomime, can only be implied in radio by sound or music.

Although thousands of different sound effects are heard on radio, basically, they serve but two purposes and thus may be divided into two classes: (1) those that create atmospheric background or mood—these are the "where or when sounds"; (2) those that carry the action or move the story along—these are the "how and why sounds."

ATMOSPHERIC BACKGROUND AND MOOD SOUNDS

Atmospheric background and mood sounds take the place of stage settings, costumes, scenery, and other production aids used in visual drama.

In radio drama the clicking of railroad rails, hum of an auto motor, gurgle of a stream, and similar effects are used to set a scene or provide atmospheric background. They are factual sounds that give information. These background sounds should tell where the scene is laid.

Mood sounds, such as moaning wind or specially created effects for a specific show, are not intended to stimulate the intellect. They are designed primarily to evoke an emotional response.

One of the most valuable functions of radio sound effects is changing scenes. In a matter of seconds a new time, locale, or mood may be established. A brief interval of background sound and the listener is back in Biblical times. A boat whistle and he has crossed the ocean. Generally speaking, sound effects can make transitions and set a scene more effectively than narration, dialogue, or music, and as time is precious in radio, this use of sound is of extreme value.

Time

Time here means the time of day or night. Obviously some background sounds are nonexistent at certain periods of the day. During other periods they are predominant, and at other times intermittent.

A rooster usually sets an early morning scene. An owl hooting, coyotes howling, or crickets are frequently (and too often perfunctorily) used to indicate night. Traffic sounds vary in volume according to the time of day. The soundman studies the script, determines the period of day or night, and shades his effects accordingly.

Locale and Period

These two elements have been grouped together because they are intermingled. Let us take the following example. This is a sound cue from a radio script.

SOUND: STREET NOISES IN BG

The BG means "background." The first thing that comes to mind is, what is the period? Is it contemporary, fifty years ago, late seventeenth century, or what? And the locale—hamlet, or metropolis? Let's say the scene is a gold-rush town of the Old West. Then we know that the street noises will consist of walking and trotting horses, an occasional buckboard or freight wagon, and human footsteps. A modern

FIGURE 1. *Carriage on cobblestone street used on* Sherlock Holmes. *The motor revolving the wheels is controlled by a foot-operated variac. Soundman Bill Hoffman uses hollowed wooden blocks for horse's hooves. (Courtesy of Mutual Broadcasting System.)*

story might call for the intersection of Forty-second Street and Broadway during the day, with auto horns, traffic signals, cars and buses starting and stopping. Then again the story might be *The Count of Monte Cristo* and the scene Paris, requiring sounds of horses and carriages clopping

along cobblestone streets. When possible sounds that are associated with the specific locale are chosen.

One thing the soundman must never do is let the background sound become too prominent. Usually it is the first thing the listener hears when a scene begins. Then it is decreased in volume and plays "under" the dialogue. If the scene is a long one, the sound may be completely dropped and then brought in from time to time. Background sound over a sustained period of time becomes annoying and distracting.

SOUNDS OF ACTION

The second basic function of sound effects in radio is to forward the action. The atmospheric and mood sounds take the place of the visual settings used on the stage and screen. The sounds of action replace the visual movements.

Such sounds are meant to convey a mental image of the action. Therefore they must be convincing. In many cases the effect is simulated, but it sounds authentic. For example, the sounds of stabbing, clubbing, and the like, are faked for obvious reasons.

Sounds of action include footsteps, fights, pouring a drink, shots, starting, stopping, and driving a car, and the like. They must be cued into a script very carefully, so that they match the dialogue. Usually as the actor reads the dialogue, the soundman runs the effect to match his words, and the sound is thus cued or blended to the actor by the soundman.

We have discussed briefly the *types* of sound, sounds of atmosphere or mood and sounds of action. But we can also classify sounds as to the manner in which they are used.

REALISTIC

Realistic sounds are just what the name implies. They are sounds adhering as nearly as possible to those in nature or real life. Realistic sounds form the bulk of sound effects used in radio.

SEMIREALISTIC OR SUGGESTIVE

These sounds are sufficiently realistic to give a natural feeling, yet are held below normal prominence. Semirealistic sounds merely suggest, they are not of the "hey, listen to me" type.

Suppose we have a scene that runs three minutes and takes place in

a fast-running motorcar. As we begin the scene we hear the motor purring. As soon as the dialogue starts we drop the volume of the motor a bit. After all, the important thing to hear is what's being said. Some directors want to hear the car running full volume throughout the scene, even though three minutes of a sustained sound can be very distracting. On the other hand, another director will establish, then reduce the car noise to an absolute minimum. Toward the end of the scene the car is gradually faded back in. The use of sound in this manner is semirealistic or suggestive.

SYMBOLIC

Symbolic sound is used to explain something of an abstract nature or to convey impressions by association. It is used mainly in fantasy, fairy stories, or plays of the psychological type.

For example, let us assume that a story is concerned with a specter that haunts Tweekington castle on the dismal moors of Scotland. It is evening on the day that the haunt makes its annual appearance at midnight. The assembled group sits silently watching the clock, awaiting the stroke of twelve. Suspense has been developed, and then . . . the clock begins to strike midnight! The sound is symbolic; it presages the climactic action.

Another example. When Clay Needham was six years of age, his father and mother were killed in an attack on their little homestead. Young Clay was hidden under the bunk bed while his father's enemies stormed in and did away with the adult members of the family. The whole affair remained a nightmare to Clay. From time to time he is plagued by remembrances of the screams and shots, and the sound of a pair of Mexican silver spurs clomping about the little shack. At the most inopportune times throughout the rest of the story Clay "hears" the spurs again. The use of the spurs in these mental sequences is symbolic. They signify the dread, the confusion, and the horror of his past experience.

CONVENTIONALIZED

Radio like other mediums of entertainment has developed certain conventional devices. In the theater a short drop of the curtain signifies a passage of time. This we accept without question, because we know what it is supposed to mean. Similar conventions have become established in the medium of radio. Television is in the process of developing its own.

Through long usage, certain radio sounds have come to represent or

imply specific things. For example, a character in a radio drama will say that he is leaving New York that night for the West Coast. Then we hear the sound of a train whistle, which fades out rapidly for our hero who exclaims, "Doesn't it ever stop raining in Los Angeles?" Or by the simple use of a boat whistle the listener is informed that a character is no longer in New Orleans but is now safe and sound in Rio. By the same token, crickets and owls have come to mean nighttime, and twittering birds set the time as day. The shopworn device of a clock ticking is used to denote the passage of time. These devices have become conventionalized and are readily accepted by the listener.

IMPRESSIONISTIC

Impressionism is the use of unrealistic effects to create unusual impressions or emotions in the mind of the listener. It emphasizes the abstract expression of ideas and appeals primarily to the subconscious.

For example, in a fantasy using the principal characters of "Alice in Wonderland," a sequence called for one of the characters to anger the March Hare, who kicked him so hard that he bounced several times. A conventional body-fall effect was not wanted, but a comedy effect of a man bouncing several times as if he were on a Pogo stick. The effect as finally worked out consisted of the use of a "jew's-harp" going "b-oink, b-oink, b-oink." The mental picture was very clear and was an impressionistic use of sound. A fine example of impressionism is found in Eugene O'Neill's "Emperor Jones." The beating of the tom-tom conveys the impression of Jones's heightened pulse beat.

From the foregoing, the reader can see that sound effects have many uses and serve many purposes. If a writer knows how to write for sound, a director how to use it, and of course a soundman how to create it, the possibilities of sound effects are practically unlimited.

CHAPTER TWO

The Psychology of Sound

NO ATTEMPTS will be made in this chapter to reveal hitherto unknown workings of the human mind. However, psychology has its place in the understanding and use of sound effects.

As the human mind develops, it forms definite habits of association. These associative patterns can be utilized to arouse emotional reactions in the radio listener if sounds are styled for psychological effect. A sudden emphatic sound, a continuous sound, an undulating insistent sound, an intermittent sound, or a sound that builds to a climax, when properly integrated in a script, may contribute materially to the emotional impact of the scene. A sensitive writer or director working with an imaginative soundman may, by psychological use of sound, lift a routine radio play to the level of fine dramatic entertainment.

A *steady sustained sound* gives a feeling of directness, continuous movement, formality, stability, and, if a quiet sound, one of repose and tranquility.

An *undulating* sound, varying in pitch or rhythm, expresses insistence, purposeful movement, or perseverance.

An *intermittent* sound expresses informality, indecision, disorder, and lack of purpose or leadership.

Sounds that *suddenly increase in volume* express a feeling of climax, intensity, concentration, impatience, and aggressiveness. They are the sounds of definite action.

Sounds that *gradually increase in volume* express a feeling of relentlessness, suspense, progress, patience, pursuit, gathering strength, resolution. A gradually increased volume of sound gives a very definite feeling of insistence and purpose.

Sounds that *suddenly fade* indicate a feeling of cowardice, fear, lack of purpose, loss of strength, or defeat.

Sounds that *gradually fade* express a feeling of dejection, temporary defeat, possible regrouping of forces, and suspense.

Sounds that *increase in volume and suddenly stop*, or are held to a specific volume level, give a feeling of opposition, conflict, and frustration. Suddenly cut-off sounds are very good for suspense effects.

High-pitched sounds tend to give a lighter feeling, a gayer mood, and sometimes a feeling of tension. *Low-pitched* sounds lean more to the morose and somber mood. Emphatic sounds should be crisp and definite. Less decisive sounds should lack the sharpness of emphatic sounds. The reader of course should realize that the above-given emotional characteristics of sounds are broad generalizations.

We form a mental image when confronted by known sounds, and respond emotionally when stimulated by unknown or imaginative sounds. This psychological appeal to the listener should be considered in radio writing, production, and direction. In radio drama the stage exists only in the listener's mind. It is his imagination stimulated by all the craft that goes into a radio production that ultimately makes that particular broadcast a success or failure. That is why two people may be violently opposed in their appreciation of the same radio program. One gets tremendous enjoyment through the stimulation of his fertile imagination; the other, with the imagination of a mud turtle, may find it pretty dull going.

In selecting sound effects for any radio production, the following questions should be asked. (1) What is the basic character of the show—frivolous or serious, realistic or imaginative, comical or reverent? The answer to this will determine the over-all approach to the selection of sound effects. (2) What is the mood of each scene? (3) What specific sounds will augment or supplement these moods?

The director and soundman must first study the over-all pattern of a scene. The proper procedure in selecting sound effects is to start with the abstract feeling, establish the proper mood and atmosphere, then work toward the concrete sounds needed.

Chapter I classified the types of sound effects as those of action and those of mood or atmosphere, and discussed five ways in which they could be used.

It is interesting to note that a parallel seems to exist between the principles of art composition and the use of sound effects. Here are some of the basic principles of art: unity, harmony, balance, rhythm,

FIGURE 2. *A technique used to get that feeling of being in a lost world. The sustain pedal is held down, and two feathers are used to gently stroke the strings of the piano. (Courtesy of American Broadcasting Company.)*

proportion, dominance, and variety. Notice how they apply to sound effects.

The *unity* of a sound effect may be said to be the appropriateness of the sound effect itself. Since any sound cue is subject to many different

interpretations, the effect ultimately chosen should have meaning and purpose. Does it belong? Is it in the period, time, locale? Does it do the job? Does it fit in with the pace and rhythm of the script, or does it stop the progression of the story? Is it pertinent to the scene, or is it some sound that has been dragged in, in lieu of a more appropriate effect?

If a sound effect does not stimulate the imagination or have meaning through association, if it is only a noise, then it lacks unity because it destroys the continuity of the script. Sound is an integral part of radio drama. If a sound effect misses, the whole production suffers accordingly.

Whenever two or more sounds are audible at the same time, a sound pattern is formed. The balance between the perspectives, volume, and rhythm of these sounds must be harmonious. *Harmony* is formed by the proper relationships between all parts of a production. Harmony in radio demands logical progression from scene to scene, and from sound sequence to sound sequence. Any foreign note or incongruous detail not in keeping with the other elements of a production will destroy the harmony of a radio or television production.

In art, *balance* is the relationship between the size or apparent weight of two or more elements of a composition. *Volume* and perspective are the means of achieving balance in radio. In art a larger or more colorful unit of a composition will capture attention by its mass or intensity, and in radio the loudest of two or more sounds imparts a feeling of greater size or closer proximity to the mike. That is why it is necessary at times to "cheat" a sound, that is, present it in untrue volume, in order to get it across.

A simple example is footsteps. Normally radio dialogue is heard apparently at mouth level as the actors talk directly into a mike. At that level, footsteps would scarcely be noticed. But as soon as the actors start to walk, the sound of their footsteps is picked up on a sound mike usually set about two or two and a half feet above the walking surface. The resulting balance and perspective between dialogue and footsteps is unnatural. The steps are "cheated" because it is important to know that the actors are in motion.

Balances are routinely handled in radio production, yet they offer subtle possibilities that are not realized by some practitioners in the craft. Volume is the spotlight of radio, and its judicious use in regard to balances between sounds and dialogue will determine just how much attention a sound will get, as well as place the sound in its proper relation to other sounds and dialogue.

Sound volume is generally thought of only as being light or heavy in some degree. But with imaginative use, sound volume can influence the emotional response of the listener. For example, a gun battle at a distance has some excitement, but bring that gun battle on mike and it becomes much more exciting. A distant (low-level) train whistle may bring a note of nostalgia, but the chuff-chuff of a fast-approaching train and train whistle (increasing volume level) gives an entirely different feeling. The low lap and wash of surf give a feeling of soothing quietness, a howling wind the feeling of agitation and suspense.

There are two kinds of balance, symmetrical or formal balance between two masses of even weight, and asymmetrical or informal balance between two masses of uneven weight. To repeat, volume is the principal means of balance in radio, supplemented by perspective.

An equal balance in volume between two sounds generally tends to become monotonous and, worse, confusing to the listener. Both sounds, having equal attraction, create a conflict that makes it difficult for the listener to understand either sound. For example, assume that a scene contains the sound of a fast automobile running parallel to and at the same speed as a train. If the sounds of both train and auto are played at the same volume level, the listener does not know whether the scene is supposed to be played *on* the train or *in* the auto. By allowing one sound to predominate, the listener has no doubt as to which means of transportation is on mike.

Progressively increased volume of sound, such as an approaching train or automobile, gives a feeling of *motion*. The balance of the sound is constantly changing in weight or importance and as it fades on becomes the dominant part of an asymmetrical balance. The converse, of course, is true when sound volume is diminished as in a fade.

An entire scene may be thrown out of balance by excessive sound volume. No sound should be permitted to overbalance other sounds and dialogue unless there is a specific reason for the high volume level. Informal or asymmetrical balance between a heavy and light sound is possible by proper use of perspective. By placing the heavy sound farther away from the mike (or lowering the volume) and bringing the lighter sound closer to the mike (or increasing the volume), a satisfactory balance may be obtained. However, this shift in emphasis and change in "presence" can be done only when in accord with the script content.

Rhythm in art is achieved by repetition of line, direction, color, or motif. In radio there is also rhythm, a rhythm that is part of the flow of continuity. In any dramatic performance this over-all rhythm is devel-

oped as the story progresses. Each scene also has its own peculiar rhythms that heighten the mood and action. In general, rhythmic sounds sustain interest because the listener has time to hear, interpret, and associate his experience with the sound. A change in rhythm gives variety to a sound. The rhythm of a galloping horse should be varied occasionally to indicate the differences in terrain. In a scene with a sustained BG of an auto motor, the rhythm of the motor should fluctuate as the car weaves in and out of traffic, or takes turns and goes up inclines. The proper use and variation of rhythms are particularly valuable in heightening the illusion of suspense and in the pay-off of a comedy sequence.

Pace is the physical counterpart of rhythm and is more closely identified with a dramatic production. Pace is the tempo of a scene or entire dramatic performance. As there is an over-all rhythm for an entire drama and various other rhythms for each scene, pace too varies in the over-all play and individual scene. Change of pace arouses interest and forestalls monotony. An increase in pace helps to build a climax. A sudden decrease in pace can foster the feeling of menace and suspense.

Expository scenes consisting primarily of explanation usually are slow paced to make sure that all-important information is gotten over to the listening audience. The timing of sound effects in a scene of this type must be consistent with the pacing of the scene. On the other hand, scenes of climax and action are rapidly paced because things are happening.

Unless there is variation in pace, the movement of a show becomes static. However, even if a scene calls for a very fast pace, the too rapid addition of new sounds or variation of current sounds is not good. The listener must have time to hear and understand each sound effect before the next challenges his understanding. A good sense of timing is necessary on the part of a soundman. Unless his effects are keyed to the pace of a scene, the scene may fall into the category of sheer whimsy.

In everyday living we have come to accept the fact that everything is in proper *proportion* to everything else. The width of a door is proportionate to its height. Cats are small and horses are large in proportion to each other. The blast of a stick of dynamite and the bang of a firecracker are both loud sounds, but their volumes are proportionate to each other. At the same perspective the former will always sound louder than the latter. In radio and TV the use of sound must always be kept within reasonably acceptable proportions. Sounds are sometimes cheated for emphasis, but should always be handled with a thought to natural

FIGURE 3. *Soundmen Keene Crockett, William McClintock, and Elliott Grey staging the sounds of a festive party. (Courtesy of American Broadcasting Company.)*

proportion. A massive wooden door should not be used for a small cottage. The closing of a window should not sound like the dropping of a medieval portcullis.

Proportion is based primarily on good judgment. There is an exception however. One of the basic secrets of comedy sound effects is the use of

disproportionate sounds. Fibber's closet and Benny's basement vault are excellent examples. The laughs gotten from these sound sequences are primarily based on exaggerated proportion relationships.

Dominance is as important a principle in radio as in art. An on-mike sound generally dominates sounds and dialogue at a more distant perspective. The spatial sense of three dimensions is simulated in radio by the use of two or more perspectives. On-mike sounds and dialogue give a feeling of closeness and presence. A supplementary sound held down in volume gives a more distant presence or perspective. The judicious use of on- and off-mike sounds give that third-dimensional feeling of "here" and "there." For a feeling of great distance, do not rely alone on the use of a very faint sound. For example, you may want to establish the feel of vast range country. You can simulate it by using an *on-mike* stomp and snort of a horse, the *middle distant* perspective of lowing cattle, and a *far distant* train whistle. The use of the *middle distant* cattle sounds seems to extend the sound of the train whistle, to heighten the feel of distance more than the train whistle alone.

Dominance in sound alone should be handled very carefully. The instant two sounds are used, one must be sacrificed to the other so that both do not get equal emphasis and thus create confusion. Make sure that the lesser sound is not sacrificed to the point where it is lost and that the dominant sound is not emphasized to a point where it overpowers. Avoid having too many perspectives of sound. The more perspectives, the more difficult control becomes, and the harder it is for the listener to unscramble who or what is where.

Dominance of sound effects is achieved primarily by volume emphasis, but this is by no means the only manner of control. Sound may also be made dominant by contrast to other sounds, by repetition, by duration, by change in perspective, by apparent physical movement or change in pace, by an increase in complexity or simplification, by a dramatic pause, a break in rhythm, or by some other change in the principles mentioned. A much more subtle and emphatic dominance may often be achieved by means other than an increase in volume.

Variety in choice and use of sound effects aids in overcoming a static feeling in a production. A change of pace, rhythm, or perspective, the substitution of imaginative sounds for realistic sounds, etc., all aid in giving a flow to the continuity. A feeling of commonplaceness results from overuse of routine sound effects. However, do not attempt to achieve variety by deliberate manipulations of sound cues. Variety without unity

creates a hectic confusion that is most unwelcome. Variety gives life to a production, but only when properly used.

The content of this chapter should not give the reader the idea that the creation and execution of sound effects is a mysterious art that is part black magic and part sixth sense. A soundman does not have to be a second Merlin to create sound effects, but it certainly would help! A thorough understanding of sound and its psychological effect on the listener is of considerable aid in creating sound effects.

The reader will find that reference to this chapter may be of some help when confronted by a particularly difficult sound cue. If you have approached the problem in a material way and gotten no results, try using the abstract method. Get down to the basic elements of the sound cue and its psychological import. Somewhere in this chapter may be a clue to the solution.

No matter how anyone approaches his work as a soundman, or in what manner he executes his duties, he must remember that good sound is never obvious. It is done smoothly and in such harmony with the other parts of the show that the listening audience is never conscious of a succession of sound effects.

Sound effects are not the most important part of a radio production. They are however instrumental in determining whether the production will have high artistic merit or will be just a mediocre segment of the broadcast day. Sounds are brought to life only by the soundman. He should use them selectively, artistically, and, above all, creatively.

CHAPTER THREE

Timing

WHAT MAKES a good sound-effects artist? Primarily, he must like radio, be willing to work hard, and be ready to eat, sleep, and work odd hours. In addition there are seven attributes that a soundman must have. They are: a sense of timing, imagination, inventiveness, finesse, dependability, the capacity to grasp essentials quickly, and the ability to "hear" sound by reading written sound cues. An extra pair of eyes and hands sometimes help too. Let us consider some of these qualities individually and see how they apply. This chapter will be concerned with timing.

Probably along with imagination, timing is the most necessary qualification for a successful soundman. Without a sense of timing he is lost, and so is the show.

The playwright builds and phrases his dialogue in a certain way to establish characters and develop the plot. The actor plays with the lines. He pauses, emphasizes, throws away lines and changes pace in order to get the mood and action across to the listening audience.

The soundman does exactly the same as the actor. He too changes pace, pauses, emphasizes, and so on. He matches dialogue with sound in the mood and tempo given and at the precise second it is needed. This calls for split-second timing. In a mystery story, for example, the opening of a creaky door, a blow on the head, or the tapping on a window if given too soon will ruin the suspense effect. The soundman must "feel" the suspense and help in building it by recognizing the proper instant of execution.

Proper timing can be achieved only by feeling the mood of a scene and having an accurate mental picture of the setting and action. Here is a portion of a script to show how this works.

MUSIC: BRIDGE

SOUND: RAIN IN BG—QUICK STEPS ON WALK—UP STEPS—TRY LATCH—OPEN AND CLOSE—FOOTSTEPS—BLOW ON HEAD

BILL: (GROAN)

SOUND: BODY FALL

TILDEN: (LAUGH) Well, *Mr.* Bill Halstrom, you were right on schedule. (STEPS UNDER) And now to get that envelope and . . .

SOUND: CLICK OF LIGHT SWITCH

TILDEN: (NO WAIT) . . . Then we'll see who is the guy that's going to get his *full* share of the business. (CHUCKLE)

SOUND: ROLL BODY OVER AND SEARCH POCKETS

TILDEN: Let's see . . . no . . . not there . . . Yeah, here it is! Thanks Bill, and pleasant dreams! And when you wake up, remember that *I'll* be the boss, and *I'll* be the one to give the orders! Good night, *Mr.* William Halstrom!

SOUND: FOOTSTEPS—DOOR OPEN AND CLOSE

MUSIC: BRIDGE

The first thing to do is to check and see what sounds are needed. They are: rain, footsteps, front steps, door latch, door open and close, blow on head, body fall, light switch, sound of body being rolled and searched, envelope.

From the script the soundman determined that the locale is the home of well-to-do Mr. James. This means that the door to his house is substantial and has a solid sound, and from the stock of numerous doors the soundman selects a sturdy one. Since Mr. James is a man of means, it is assumed that his walk is paved, not graveled, so a block of cement is used to walk on for the approach to the door. Now the blow on the head. There is no indication as to what kind of weapon Tilden used, but it must have been solid in order to floor Bill. For this the soundman uses a wooden mallet or a short piece of garden hose, and a small pumpkin, a tight large head of cabbage, or a tightly folded baseball glove. The other props are easily assembled and handily placed. The door, cement, and wooden walking boards are properly placed in relation to the microphone. And of course the soundman wears his hard heels so that the footsteps will be audible.

The rain is a recorded effect, played on a turntable. There is no indication of a heavy storm, so the soundman does not blend thunder and wind recordings with the rain. Of course he has them handy in case the producer wants them. A nice wet rain is "sneaked" in under the music bridge and the correct level is established as the music dies out.

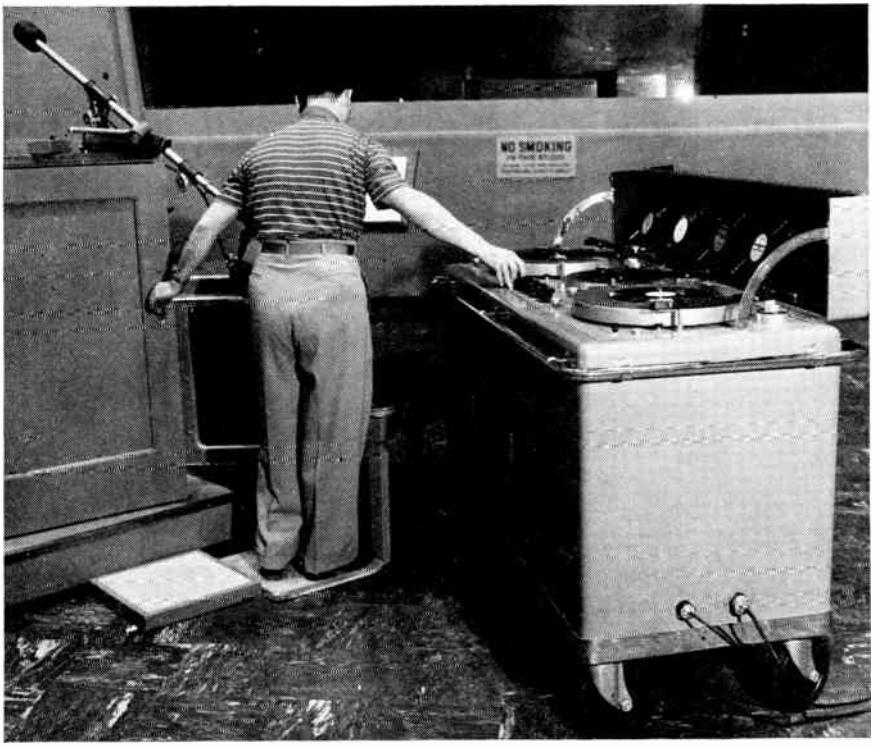


FIGURE 4. *Setup illustrating the arrangement of sound equipment discussed in scene on pages 17–21. Refer to this photograph as you read the scene. (Courtesy of Don Lee Broadcasting System.)*

The soundman waits for the director's cue to start the footsteps. On cue he quickly walks on the slab of cement. Six or eight brisk footsteps and then up the porch steps. Now he is on the porch.

You will note that the sound cue said "up steps—try latch." But the soundman really should take three or more steps on the porch before stopping, in order to get to the door.

Now if a person were going into an unlighted house on a rainy night, and were not too sure of his welcome (as brought out in the preceding portion of the script), he'd hesitate before trying the door. Consequently

the soundman pauses slightly, then gently tries the door knob. The door opens. Again a bit of hesitation, then the soundman steps in and closes the door.

Now here is definitely where the writer left out something. When the door closed the sound of the rain should be taken completely out or dropped way down in volume so that the scene will change from an *outside* to an *inside* perspective. Bill (up to now impersonated by the soundman) is now *inside* the house, and the rain is *outside.*

In all probability the house would not have cement floors, so the instant the soundman "came through" the door he changed from the cement block (walk, steps, and porch) to a walking board simulating a hardwood or carpeted floor, depending upon what the director wants.

The scene is now inside the house. It is dark. The mood is one of insecurity, so the soundman will take slow cautious steps. How many steps will depend upon the director. Slow, quiet, but definite footsteps will build suspense. Too many would be melodramatic.

In the meantime, as soon as the door is closed, the soundman gets the cabbage or pumpkin in one hand and the mallet in the other to be ready for the blow. The footsteps continue. Then on the director's cue the mallet is brought down sharply, and thousands of "whodunit" fans get a vicarious thrill!

The actor playing Bill has been watching the soundman, and on the "klunk" of the blow does a "take" or reaction, in this case a groan. The soundman does a little shuffle of his feet and then the body fall.

As soon as he has completed the body fall, the soundman quickly gets rid of the blow-on-the-head equipment and picks up the light switch, which is mounted in a block of wood.

In the middle of Tilden's first speech there is a sound cue (STEPS UNDER). So somewhere before the word "schedule," the soundman starts footsteps and continues under the speech until just before the word "and." There he pauses before snapping on the light, because he cannot walk *through* the wall. He stops, snaps the light, and then walks back to the body. The actor, though his script says (NO WAIT), will give a slight break between his "and" and "then," so the click of the light switch will be "in the clear."

The sound cue (STEPS STOP) has been omitted, but the distance from the light switch to Bill is the same as vice versa, so the soundman would stop during the words "the guy that's going" and for the rest of the speech would kneel preparatory to making the search.

After the (CHUCKLE), the soundman scuffles slightly on the floor or a riser, and lets the body relax with a slight thud. Now the search begins. This takes careful timing in working with the actor that plays Tilden. Reasonably close to the sound mike the soundman pats his chest and thighs, timing the patting with the dialogue, "Let's see . . . no . . . not there . . . Yeah, here it is!" Of course there should be slight pauses between the groups of words. As an added touch the soundman might have some loose change in one pocket and a bunch of keys in another. As these are patted they give a realistic effect of different pockets being searched. If not specifically written in or asked for by the director but offered by the soundman, this is called ad lib sound.

On the words "Yeah, here it is!" the soundman pats a pocket that has an envelope in it and pulls out the envelope with appropriate rattling of the paper so that the sound will be sure to register.

If the rest of the scene were followed as written, there would be a "hole" or "wait" between the end of Tilden's speech and the opening and closing of the door. To prevent this, "sound is moved up" and on the words "and when you wake up," the soundman starts to get up from his kneeling position and walk toward the door. Along about "give the orders" the steps stop as the door has been reached. The door is opened, then Tilden gives his last line "Good night, *Mr.* William Halstrom!" On this line the soundman snaps the light and closes the door. There is no specific reason to snap off the light other than it tidies up the scene and leaves no loose ends.

Again there is no mention of rain, but the alert soundman will see that as soon as the door is opened, the sound of rain is brought up in volume, and when the door is closed it is taken out (the listener supposedly remains in the house). As soon as the door is closed the director cues music for the bridge.

"Moving the sound up," as in the case of getting Tilden up off the floor, walking to and opening the door, all ahead of the written sound cue, is a common practice by soundmen. It makes the timing more accurate and plausible, heightens the dramatic effect, and speeds up the pace of the action.

You have read the scene as originally written, and the detailed discussion of how the scene was played. The following is the scene with all the sound cued in, both written and implied. Notice how different the script would appear if every sound effect were indicated in its proper place.

MUSIC: BRIDGE

SOUND: RAIN IN BG (recorded) QUICK STEPS ON WALK (hard heels on cement) UP STEPS (shuffle four steps on cement, *no* heels) (3 or 4 steps across porch on cement) STOP (pause) TRY LATCH (work doorknob) DOOR OPENS (open door) (pause) (couple of steps, cement to wood) CLOSE DOOR (on door close take out rain or drop down in volume) (pause) FOOTSTEPS (slow cautious footsteps on wood) (pick up pumpkin and mallet) (watch for cue for blow on head) BLOW ON HEAD (strike pumpkin with mallet)

BILL: (GROAN)

SOUND: BODY FALL (get rid of mallet and pumpkin, pick up light switch)

TILDEN: (LAUGH) Well, *Mr.* Bill Halstrom, you were right on schedule. STEPS UNDER (start footsteps on wood) and now to get that envelope (steps stop) and . . .

SOUND: CLICK OF LIGHT SWITCH (click on switch)

TILDEN: (NO WAIT) . . . then (start steps) we'll see who is the guy that's going (stop steps) (kneel under rest of speech) to get his *full* share of the business. (CHUCKLES)

SOUND: ROLL BODY OVER AND SEARCH POCKETS (scuffle feet and arms on floor or riser)

TILDEN: (pat chest) Let's see . . . (pat, pat) no . . . (pat pocket with change) not there . . . (pat pocket with keys, then pocket with envelope) yeah, there it is! (pull out envelope) Thanks, Bill, and pleasant dreams! (get up off floor) And when you wake up, (start steps) remember *I'll* be the boss, and I'll be the one to give the orders. (stop footsteps, yank open door, bring up sound of rain) Good night, *Mr.* William Halstrom! (click light switch, a step on wood and a step on cement, close door, cut rain sound on door slam)

SOUND: FOOTSTEPS—DOOR OPEN AND CLOSE

MUSIC: BRIDGE

This is actually an easy scene for the soundman, but to the layman it might seem complicated and overloaded for one man to handle. The

effects used are simple and routine. But the effectiveness of the scene depends upon the timing. Sound must anticipate, shift sound cues in order to fit the action indicated by the dialogue, and in certain instances insert effects that have been overlooked.

Here is another example of timing. In this case the situation is somewhat different and calls especially for a keen sense of *anticipation* on the part of the soundman. You will note that some of the actual sound cues are not written in and that the broken speeches directly bear on properly timed sound. The scene is in the Old West. The character of prime concern here is Rawhide, the comedy character of the show.

FINCH: Why you loud-mouthed old coot! I'll unravel yore spine and make a string o' beads outta the bones! An' this here's a starter! (SWING)

SOUND: SOCK AND BODY FALL

RAWHIDE: (OFF) Dad-blast yuh, Finch, yuh walloped me when I warn't lookin'! (COMING ON) But I'll settle yore hash! (SWING)

SOUND: SOCK AND FIGHT UNDER

RAWHIDE: (CUE) (FIGHTING) When I git through . . . OOF . . . with yuh, you'll . . . OW . . . wish yuh had a . . . AII . . . doggone yuh, stand . . . UGH . . . stand still so I can . . . EEE . . . hit *you sometimes*!

FINCH: (FIGHTING) I'll let yuh have a . . .

SLIM: (COMING ON) Never mind him Rawhide! Stop it! Hold it you two old goats!

RAWHIDE: Slim boy! You—you ain't dead?

FINCH: You! But I thought you was . . .

SOUND: FIGHT STOPS

SLIM: Yeah, I know, but your bullet just nicked my shoulder.

FINCH: Now wait! Wait a minute!

The scene is set outside the ranch house, a gravel-box is used for walking in dirt. The fight means a "sock glove" for the blows. This is a mitten-type leather glove, or a five-fingered glove will do if it is of leather and fairly thin. A punching-bag glove works quite well. The leather, if of the right thickness, gives a sharper sound than a blow struck by the bare fist and has more body to it. It also affords some measure of protection to the hand.

The body fall indicates that Rawhide is knocked down. But the device as used in the scene previously discussed cannot be used here because the fall is on dirt and not a wooden floor. So the soundman sets up a small gravel box with two canvas bags across it, one filled with sand, the other with fine pea gravel.

As the action starts, sound scuffles a bit in the gravel box, simulating two old-timers squaring off for a fight. As Finch says "An' this here's a starter!" he gives the last word with an effort in his voice, as if striking a blow. Sound watches him closely and as he starts to swing does the same and a fraction of a second *after* the word "starter" has been said strikes his bare hand sharply with the gloved hand, close to the mike. As soon as the blow is struck, sound takes a couple of staggering steps on his heels, turning away from the mike and lunging out on the sand and gravel bags set on a table or riser about three or four feet from the mike. He lands on the bags with his fists clenched, arms parallel and in front of him. Hitting hard on the sand bag with his forearms, he strikes the gravel bag with one fist and then the other to simulate the head and feet striking.

Note that Rawhide's speech immediately following the sound of the sock and fall begins (OFF), which means that the fall of his body should be a little distance from the mike (off mike). That is why sound turned after the blow and fell on the gravel and sand bags at three or four feet distant from where the blow was struck.

Somewhere in the middle of Rawhide's first line, sound scuffles his feet (getting Rawhide up off the ground) and on the sound cue (COMING ON), fades in quick steps on dirt. This brings Rawhide back to where Finch is, who remained on mike. Now the two men are together again and can start fighting as they are within reach of each other.

On Rawhide's word "hash" sound gives another blow and starts a regular fight. This is done by stamping around in the gravel box, slapping and pounding the thighs and chest to simulate an exchange of blows other than haymakers to the chin. Now comes the part that calls for very careful timing and alertness on the part of the soundman.

Throughout Rawhide's following speech, which is really a series of broken speeches, there are definite socks, though not written in. So the soundman anticipates each one in this way:

RAWHIDE: (CUE) (FIGHTING) When I git through (SOCK) OOF! . . . with yuh, you'll (SOCK) OW! . . . wish you had a (SOCK)

AII! . . . doggone yuh, stand (SOCK) UGH! . . . stand still so I can (SOCK) EEE! . . . hit *you sometimes*!

The "OOF," "OW," "AII," "UGH," "EEE," are all "takes" on the part of Rawhide. And to motivate his takes, the soundman puts in a sock just before each one. The scene plays very fast and the soundman must be very alert or the whole sequence will fall apart. As soon as sound gets into this part of the fight, he forgets the body slaps and concentrates on the definite socks, so they will be "in the clear." Up close to the mike he anticipates each blow and pounds it in hard so that the timing is exact.

Rawhide is too busy to listen to or watch sound. So he tears along, making a good comedy scene, and sound backs him up by matching action to *his* dialogue.

After the last definite sock on the "EEE," sound goes back to the body slaps and shuffle with an occasional light blow with the glove until the fight stops.

Slim's (COMING ON) means that Slim has been off mike and now approaches the two old men. Sound anticipates his footsteps on gravel and fades them in as the actor approaches the mike speaking his lines. When he has reached his place the proper distance from the mike, sound stops the steps. The actor's fade-on was matched by sound so that voice and steps at all times seemed the same distance from the microphone.

Sometimes it seems that in order to properly time his effects the soundman should be one of those multiarmed Indian gods. For example, here is a portion of a comedy script, a take-off on the popular juvenile serial, *Superman*. Here is the opening of this travesty.

JACK: SMELLOGGS PIP . . . the delicious, nutritious, breakfast food . . . presents the ADVENTURES OF STUPORMAN!!

BILL: Faster than a speeding skillet!

SOUND: VOCAL SWISH NOISE WITH QUICK CLANK & BO-ING ON TWANG BOX

JACK: More powerful than a locomotive!

SOUND: QUICK TRAIN EFFECT AND WHISTLE

BILL: Able to leap tall buildings at a single bound!

SOUND: SLOOP WHISTLE—BODY FALL—CRASH

BILL: Well, almost!

JACK: Look! Up in the air!

SOUND: QUICK BIRD TWITTER

BILL: It's a bird!

SOUND: QUICK LOUD PLANE ZOOM

JACK: It's a plane!

BILL: NO! It's STUPORMAN!!

SOUND: PLANES—BIRDS—SLOOP WHISTLE—MOTORS—TRAINS—SWISHES—THEN SUDDENLY DEAD SILENCE

JACK: (SISSY) Oh, hello!

BILL: Our story in just a moment, but first a message from old blabbermouth . . .

As this was a comedy sketch, it played very fast. Actually the portion of the scene just given was timed in exactly thirty-seven seconds! It had to go *very* fast or the comedy effect was lost.

In a case like this, in addition to fast timing and coordination, the soundman must arrange the effects so they will be available in the proper order. There is no time to watch the script, so the soundman must memorize the sound cues. Due to the limited rehearsal time, it was necessary to understand all the sound cues and memorize their proper sequence in a very short time. A person doing this capably is called a "quick study."

The few illustrations given show that a sense of timing is vital to the successful soundman. Without this quality he cannot possibly perform satisfactorily. Timing is as essential to a soundman as to an actor, because in a sense the soundman is an actor. He acts as the physical counterpart of the actor who reads the dialogue.

CHAPTER FOUR

Imagination

IMAGINATION and inventiveness have been grouped together because one predicates the other. It is in these fields that the soundman is able to make real contributions to the radio play.

The basic difficulty faced by the soundman in selecting or developing an unusual effect is that different people may interpret the effect in different ways and the soundman is caught in the middle. As an author writes a show, he pictures certain sequences sounding a certain way. Sound reads the script, tries to get a mental picture of the action and how the effect should sound, and then goes about creating that effect. After he is reasonably satisfied, he does the sound effect for the director.

This is the crucial test, because in many cases the director has an entirely different idea as to how the effect should sound. The alert soundman knows this and will have two or three secondary effects available if possible. Thus a minimum of three people have interpreted the effect and it is quite possible that they all see it in a different light.

But this is not the least of sound's difficulties in the imagination and inventiveness category. The following six types of sound present real challenges to the imagination. (1) Sounds that have actually existed but there are none now extant to copy; (2) sounds known only to a few specialists; (3) sounds of top-secret devices; (4) sounds that never existed and are purely imaginary; (5) sounds that of necessity *must* be improvised; (6) specially created sounds peculiarly apropos to a mood or effect. Let us explore these a little further.

(1) UNKNOWN SOUNDS OF THE PAST

To illustrate the first group, let's take the sound of some prehistoric animal. Obviously none has been recorded and there are none living to

FIGURE 5. *The contraption originally used for the sound of Jack Benny's Maxwell. Soundman Fred Cole is cued up to sound the old-fashioned horn. In the foreground are coconut shells used for horses' hooves. (Courtesy of American Broadcasting Company.)*

copy. Although no one actually knows how animals of this period sounded, by a process of deduction an approximation of how they probably sounded may be made.

If the script calls for a brontosaurus, it refers to a dinosaur with a

humped back, long tail and neck, small head, about sixty-five feet long and covered with heavy armorlike scales. The important thing to know is that this dinosaur was herbivorous, i.e., was a grass eater like a horse or a cow. It was, so paleontologists claim, a relatively docile animal. Accordingly, if obliged to create the call of a brontosaurus, the soundman would not create a ferocious snarl or growl, but something more like a bellow, with lots of rumble and bass tones.

Then the script might have a tyrannosaurus. You no doubt remember that this was the vicious mean-tempered creature with a long tail, very short forelegs, that ran around erect on extremely powerful hind legs. The tyrannosaurus would provoke a fight with anything that moved. It was the largest of the carnivorous dinosaurs, and without doubt the meanest. As a meat eater, and a mean-tempered one at that, probably the sound emitted by this animal was a fearsome thing, a spine-chilling roar. In that case the soundman would go through his wild animal recordings and make a blend of the nastiest sounding roars and screams that he could find.

One more example illustrating this deduction business. Let's assume that somewhere in the script there is a pterodactyle. This was a flying reptile that had no feathers, a scaly large beak, short rat tail, and batlike flying membranes. It was also a meat eater. The pterodactyle never was as large as the brontosaurus or tyrannosaurus, but was particularly repulsive looking. So in keeping with its appearance, it probably emitted a harsh squawking sound with the overtones of a harpy caught in a cement mixer!

(2) SOUNDS KNOWN ONLY TO SPECIALISTS

The second category that taxes the imagination consists of sounds known only to a comparatively few experts or specialists, for example, a cyclotron or betatron. Few people have had the opportunity to hear these devices in operation, yet from time to time such equipment is written into a show and the soundman must produce.

Here is an example of simulating a cyclotron. The dialogue running along with the sound gave the clue to the kind of effects needed, and fortunately, as this was a comedy sequence, the effect could be "corned." The sequence ran something like this. A motor was started, ran a few seconds, and then conked out. Some adjustments were made to the delicate equipment, then the motor was started again. Further fine adjustments were made while the machine was running, then everything started functioning smoothly and the atoms began to disintegrate. Eventually

one was exploded or smashed, or whatever happens to atoms in a case like this.

Remember, this is a comedy routine. The effects (mostly recorded) used included a high-pitched electric-motor whine, a hand-operated bilge pump (the clankingest, rustiest clatter imaginable), a few lusty blows with a hammer on odds and ends of metal, a recording of an old-type radio howling while being tuned, the sound of a high-speed pile driver, and finally a champagne-cork pop. A ludicrous and amusing sequence. See if you can match the résumé of action with the sound effects used.

Until fairly recently all factual information about rocket planes has been highly secret. But for some time rocket planes were being feverishly written into scripts because they were timely. Sound-effects men were slowly going mad trying to simulate a sound very few people had heard.

Here is a portion of a script concerned with the first test flight of the XS-1, one of the earliest rocket planes. At the time the program was done, practically no information about this type of plane had been released.

NARRATOR: A B-29, the mother ship, drops the XS-One as she would a block buster . . . and the experimental plane is airborne! For a moment nothing startling happens, the tiny ship rolls in a casual way—loses altitude—then—

SOUND: WHOOOOOoooooooooooosh!

NARRATOR: The pilot, "Slick" Goodlin, turns on one of the ship's rockets! The XS-One flashes forward! A streak of smoke trails behind. . . . .

SOUND: WHOOOOOoooooooooooosh!

NARRATOR: And another!

SOUND: WHOOOOOoooooooooooosh!

NARRATOR: And another!

SOUND: WHOOOOOoooooooooooosh!

NARRATOR: Later, another. The little streamlined craft splits the air like a bullet—then cuts the power and starts a gentle downward glide.

Sound imagined the rocket "whooooooosh" would have an initial impact of tremendous power and then taper off as the rocket was expended. Sound-effects records of escaping steam, compressed air, and a forced fire under draft were recorded together on a single record. To play the effect, the turntable was left turning and the pick-up arm was held just above

it. On cue the needle was placed on the record, then volume was rapidly faded. The effect was handled this way because of the desire to get the feel of a sudden tremendous force. The sound simulated a rocket exploding, then was tapered off in volume to indicate the dissipated force of the rocket.

(3) SOUNDS OF TOP SECRET DEVICES

Secret devices were the bane of all soundmen during the war. Radar, ASDIC, megnatrons, antiaircraft predicators, and other Buck Rogers devices were mandatory in action stories. But what did these super hush-hush gadgets sound like? Soundmen working on the shows could only cross their fingers and guess.

For example, did an antiaircraft predicator buzz or hum or what? How did radar sound, or did it? The latest antiaircraft guns fired how many rounds per minute? In a regular or broken rhythm? These were but a few of the problems sound faced, and there was no way of checking for accuracy.

One of the most uncomfortable days ever spent by a soundman was caused by a situation like this. It was on *The Halls of Montezuma,* the Marine Corps broadcast from the Marine Base in San Diego during the early days of the war. The guests on this particular program were members of a famous fighting Marine squadron who made an appearance and narrated some of their experiences. As background, sound simulated the action, climaxing with a re-creation of the Battle of Guadalcanal. The soundman certainly felt foolish, especially when attempting to do this on two small portable phonographs not properly equipped for the exacting needs of radio sound effects. The whole thing was a harrowing experience.

Fortunately the guests were not only officers, but gentlemen. They realized sound's predicament and gave him many valuable hints that stood him in good stead later. In that respect sound was fortunate. But can you imagine a soundman during the war calling some military or naval base and asking how a certain piece of equipment sounded, and how many rounds per minute it fired?

(4) PURELY IMAGINARY SOUNDS

The purely imaginary sound effects are in a sense the most interesting to work with as creative ability and imagination have free rein. Sounds

FIGURE 6. *Soundman Kenneth Rodney and especially designed electronic effects that highlight the* Captain Video *program. (Courtesy of Du Mont Television.)*

in this category belong primarily to the science-fiction type of story, the Buck Rogers, Space Patrol, Superman yarns so dear to the hearts of the small fry. The shows are "loaded" with robots, interplanetary travel, space ships, fourth dimension, time machines, televisors, neutron guns, natomic rays, impervium disintegrators, galacto regenerators,

mental-communication devices, hypno-paralizers, etaoin shrdlu, and heaven knows what else, used to entrance the young 'uns between 4:00 and 6:00 P.M.

The soundman is at times hard put to create an appropriate sound, because it exists only in the mind of the writer. And the sounds have to be reasonably acceptable, because there is no more critical audience in the world than the youngsters that faithfully listen to the Crispie, Popsie, or Explosie cereal serials.

On the adult side, shows like *Suspense, Inner Sanctum, The Shadow, Escape, Exploring the Unknown, The Mysterious Traveler, Dimension X, 2000 Plus,* and so on call for much creative work on the part of the soundman.

Many of the sounds in Arch Oboler's scripts, particularly his early psychological dramas, called for unusual and imaginative effects. Along about 1939 Oboler did Dalton Trumbo's "Johnny Got His Gun" with James Cagney. This story was concerned with a "basket case" of World War I, also deaf, dumb, and blind. A horrible, gruesome story superbly narrated by Cagney. A superlative use of imaginative sound was when Johnny regained consciousness in the hospital and became aware again of the outside world as he got the vibrations of the nurse walking across the floor. Not definite steps, but distorted vibrations of her steps that he could feel. The sound had an uncanny and awesome extrasensory perception feeling. I do not know how it was done.

Another Oboler effect called for the sound of a body being turned inside out. A strictly not run-of-the-mill effect. After several tries the effect was achieved, and no doubt thousands of people from coast to coast writhed in their chairs when they heard it. How was it done? A long damp rubber glove was slowly peeled off a hand close to the mike! And as an added touch, each finger was popped as the finger portion of the glove was removed!

(5) SOUNDS IMPROVISED OF NECESSITY

Many sounds must be improvised because the legitimate sound cannot be used, or because there are no manual or recorded effects available. For example, how would you go about achieving the sound cue below? A script says:

JOHN: (STRUGGLING) You Nazi swine dish it out, now it's time you start taking it!

KURT: (STRUGGLING) My arm! My arm! You're . . . breaking. . . .

JOHN: (STRUGGLING) Yeah! And this . . . oughta even up . . . the score . . . for those . . . defenceless people . . . you've kicked (EFFORT) AROUND!!

SOUND: ARM BONE SNAPPED

KURT: (SCREAM)

JOHN: (PANTING) Okay, Superman! Now let's see you slap some women and kids now!

It says right in the AFRA code that soundmen cannot do things like this to AFRA actors. Therefore, improvisation is necessary. A twig or stick snapped sounded just like a twig or stick being snapped. It had too much "presence," that is, did not have a subcutaneous sound of a bone inside the flesh of an arm. A half-inch wooden dowel rod was wrapped in several layers of tape and, on cue, snapped. It had the most beautiful compound-fracture sound imaginable!

Here is another instance where improvisation was mandatory. A script called for the sound of a den of angry rattlesnakes. Genuine snake rattles were fastened to an alarm-clock alarm hand (the bell was removed). When set off, the rattles sounded all right, but not like a whole den of rattlers. To augment the sound, several bird shot were put in each of several Dixie Cups, and the tops stapled together. These were strung along a stiff wire and vibrated by tense manipulations of the wrist. The genuine rattles were recorded close on mike to give the "presence" of the real rattles and backed up by the vibrations of the bird shot and Dixie Cups. Three platters were made, then these three records were played simultaneously and re-recorded on one platter. The result was an effect that pleased the director and gave a perfect illusion. The same effect may also be achieved by using a dried pea in a small cellophane bag.

In another instance a sound cue called for an old-fashioned hand-operated churn. Shortly after the churn was started, the scene changed to a later moment when the state of butterhood had just arrived. Butterfat has a way of taking its time, so a real churn could not be used. But the intrepid soundman came up with this. A large wooden tobacco jar partially filled with water and strips of paper toweling filled the bill. The jar was covered with a heavy cardboard top, to give a muffled sound, and a stick was manipulated through a hole in the cardboard. During the short interval of the transition-music bridge, many presoaked wads of toweling were added to give the more congealed sound of butter.

One last illustration of sounds improvised of necessity. A script called

for the buzz of thousands of hornets whose nest had been broken open. The bee box (a device for giving this sound) was not quite right. So all the men in the sound department got together in one studio and made a recording. The bee box was used for background and to give the recording "body." The soundmen "buzzed" on pocket combs covered with onionskin typewriter second sheets. The men worked on and off mike rapidly, thus giving presence and the feeling of movement by their buzzes in and out.

(6) SOUNDS OF SPECIAL MOOD OR EFFECT

The last category, creative sounds peculiarly apropos to a mood or effect, in many instances offer the greatest challenge to the imagination and inventiveness of the soundman.

Requirements of the preceding categories usually offer some basis on which to establish the general character of the sound. But in some types of shows, like CBS's *Escape* and NBC's *High Adventure*, there is occasional need for specially devised effects that are all important to the mood or plot of the story. These shows are mainly of the imaginative or fantasy type. Let's see what some of these special effects are like.

How would you create an Occultone? In *Chandu, the Magician*, Chandu has the facilities for seeking aid from his master in India at any time. Although separated by thousands of miles, through his occult powers Chandu can communicate with his teacher. In order to heighten the mysterious and occult effect, a shimmering, weird tone was used under the master's dialogue whenever he spoke. The effect as finally achieved created more shivers than there are George Washington beds in Virginia. This is the way it was done. A vibraharp (such as Lionel Hampton plays) was stroked gently with soft mallets, running from bass to treble and vice versa in a sustaining flow of sound. The sustain pedal was alternately depressed and released so that the continuous notes had an eerie undulating sound.

This was recorded and then played back on the show as needed. It was a marvelous effect. However, the point to remember is this. Someone had to be able to "hear" the sound as described in the script. That takes imagination and real creative ability.

Here is another example of a special sound that had to be created for a specific effect in a radio play. Several years ago at NBC in New York, a soundman was handed a script which had the following sound cue:

SOUND: SUNLIGHT STREAMING THROUGH A WINDOW

The whole half-hour dramatic fantasy hinged on this one effect. There was no way of faking or sloughing off the sound. It had to be done and it had to be good. What would you have done?

The soundman came up with a piece of real aural poetry. He went to the dime store and bought a Chinese wind bell. You know, small pieces

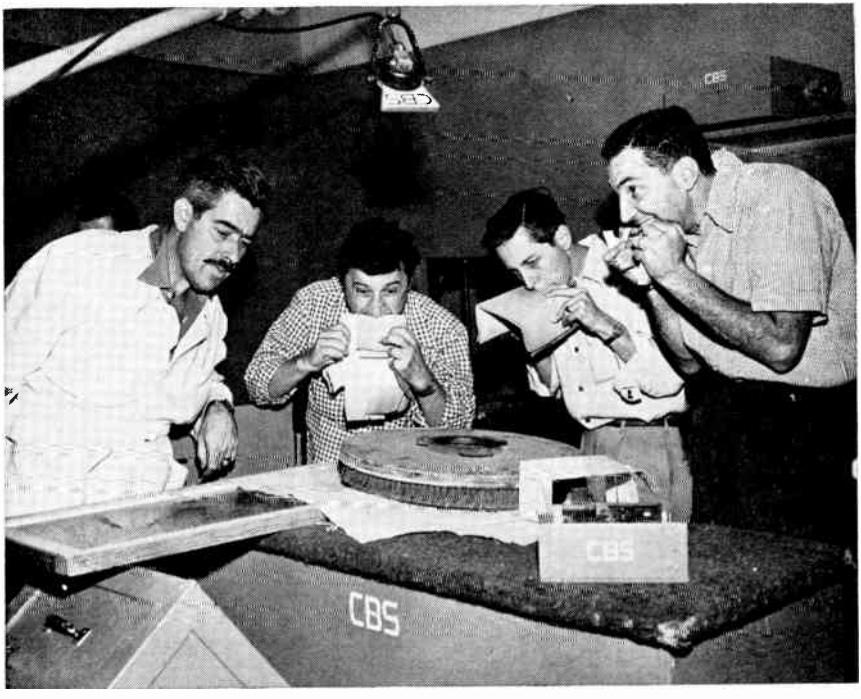


FIGURE 7. *Producer-director William N. Robson and soundmen Billy Gould, Cliff Thorsness, and Ross Murray solve the problem of gnawing rats for the* Escape *presentation of "Three Glass Keys." (Courtesy of Columbia Broadcasting System.)*

of glass suspended by short cords that tinkle in the breeze. On cue the soundman gently agitated the wind bell and one could just see and hear the sunlight streaming through the window!

Just one more instance in this category. In a psychological mystery-thriller, there was a sound cue calling for the sound of a deadly bacterial culture breeding and fomenting. The sound had to have an unreal quality that suggested some totally new and unknown menace to this world, possibly a deadly brew from another planet. The sound also had to have a tremendously active sound, yet be very low in volume. Here was a real puzzler, one of those we-don't-know-what-but-let's-make-it-

anyway sounds. Escaping steam and compressed air were too loud and identifiable. Blowing bubbles through a straw in a glass of water reminded everyone of Shep Field's Orchestra signature. Ummmm? Finally sound remembered those gay and charming days when he washed clothes in a GI helmet with a sliver of soap. Do you recall how soapsuds sound?

Well, on the show a package of soap flakes was poured into a pan of warm water. During the music bridge just before the effect was needed the soapy water was whipped into a froth with an egg beater. When the mike (very close to the foaming suds) was gradually opened, the brewing of the deadliest bacterial culture you ever imagined came through.

Later on in the same script an effect was needed to indicate the terrific potency of a solvent that would dissolve anything. To test this claim, a large diamond was dropped in a beaker of the solvent and with a quick sizzle disappeared! A cue like that is easy. Merely drop an Alka-Seltzer in a glass of water and hold the glass close to the microphone.

One of the most unusual challenges to a soundman's imagination happened on the CBS *Escape* presentation of "Three Glass Keys." The script called for a horde of starving rats to attack a lighthouse. They clawed at the windows, gnawed through a door, swarmed over the revolving beacon, and finally avalanched upon a ship. Soundmen Billy Gould and Cliff Thorsness had their hands full in creating the sounds of thousands of little feet clawing and scratching, and of the rats squealing and fighting among themselves.

None of the sounds wanted were legitimate, hence had to be improvised. To get the squeal of thousands of attacking rats, Gould and Thorsness used ten turntables and blended records of mice, pigs, birds, and monkeys. The resultant sound was terrifying. For the sound of the rats gnawing through a wooden door, peach baskets were chewed by the soundmen, and the sound of their teeth against wood was very realistic.

The sound of the rats clawing at the windows was more difficult and taxed the imagination to the utmost. Eventually the following technique was worked out. A large stiff circular brush (from the janitor's floor polisher) was pressed against a pane of glass. By twisting the brush against the glass and amplifying the scratching sound through a contact-mike pickup, a most satisfactory simulation of hundreds of tiny claws scratching against the lighthouse windows was obtained.

Of all the phases of a soundman's work, probably the fields of imagination and inventiveness do the most in determining whether the soundman is just a technician or also a creative artist.

CHAPTER FIVE

Finesse

IN THIS CHAPTER are grouped the related subjects of finesse, artistry, discrimination, and a sense of the dramatic.

One of the surest ways to check on the sensitiveness of a soundman is to determine if he uses too much or too dominant sound. Excessive or too heavy sound indicates poor taste, incompetence, or lack of dramatic sense on the part of the soundman, or the producer or director who demands it. Despite the fact that soundmen make their living by creating and executing sound patterns, they are the first to recognize that many good scripts and fine bits of acting have been badly sabotaged by "sound-happy" directors.

The top-flight directors are fine, sensitive artists and use sound sparingly. They know that the listener should not be too aware of sound effects unless they have been "pointed up" for a dramatic purpose. In a well-produced show there is a naturalness and subtle balance between sound and the rest of the production that is most convincing and effective.

To dust off an old bromide, a chain is as strong as its weakest link. A radio drama is composed of several components, music, dialogue, and sound, blended into what should be a creditable production. If any one of the ingredients is substandard to the others, the whole suffers accordingly.

All the coaching in the world by a director is ineffectual if the soundman does not have an inherent sensitivity and feel for drama. It is this dramatic sense that distinguishes a sound artist from a sound craftsman.

The very simple act of opening and closing a door calls for finesse on the part of a soundman. How is the door opened and closed? Is the person angry, happy, hurried, bold, leisurely, timid, or just matter of fact? The force with which the doorknob is grasped, the degree of effort

in turning the knob, the timing between the opening and shutting, all are done in different ways to match the mood of the action. The director may be specific about how he wants it done, but usually the soundman interprets from the dialogue. In any event, on the air it is the soundman who makes the actual sound.

A soundman must also have discrimination and good judgment. For example, in the sound departments of the large network stations there are doors of every kind: house doors, carriage doors, trap doors, stone doors; sliding, revolving, and bat-wing (saloon) doors; doors for trains, bank vaults, safes, iceboxes, cabinets, jails, barns, garages, phone booths, ships. The soundman must decide which to use.

In many cases the writer will indicate: "Safe door creaks open"; "Elevator door slams shut." But what about the sound cue written, "Door open and close"? Generally a clue can be found in the dialogue just before or after the sound cue. The door in question may be a house door, but that is not sufficient for the soundman. A bedroom or closet door has a lighter sound than a front door, especially the sound of the hardware and lock. If by any chance this is the outside door to a kitchen, what could be a nicer touch than the "screeeetch, screeeeeetch, slap" of a screen door? Unless of course it's winter.

A soundman should be familiar with the traditions, customs, and modes of living for various eras and locales. The following bit of actual script will illustrate.

CLAY: Lessee . . . that's uh . . . two dollars and fifty cents.

MARTHA: Two-fifty? Here you are.

SOUND: MONEY ON COUNTER

CLAY: Thank you, Martha! Want me to . . .

SOUND: CASH REGISTER

CLAY: (CONTINUING) . . . Help you with them bundles?

MARTHA: No thank you Clay.

This, as you can see, is a simple sound pattern. Two and a half dollars on the counter, and a cash register. From reading the script however, it is obvious that the writer has made a mistake. The scene is laid in a small midwestern general store in the very early 1900's. "Cash drawer" should have been written for the sound cue instead of "cash register," because small stores of that period would have used a cash drawer. It is a con-

trivance with wires running underneath the drawer, ending in flanges for the fingers. By manipulation of the wires by a secret combination of pressures, the drawer opens, sounding a little bell.

When this simulated effect was first used by sound on rehearsal, the director looked puzzled. He thought for a moment, smiled, and the rehearsal went on. A cash register here would have been an anachronism. A small thing, yes. But it is the careful attention to detail that makes good radio.

Here is another example of how the soundman must be aware of customs and traditions. In a Western show the writer and director had decided to identify the hero by the use of large Spanish silver spurs. They were so entranced with the idea that every time the hero moved, the spurs jingled.

Along about the middle of the show there was a dance given by the heroine at her ranch house, and the hero attended. In this particular scene, sound omitted the spurs, and the director was quite hurt by this oversight. It took some explaining to convince him that customarily a cowboy removes his spurs on social calls. Incidentally, later in the same show our hero had gone to bed in the bunkhouse. During the night he was awakened by some outside commotion and instantly dashed out to investigate. Once again the director wanted to know where the spurs were! Sound had assumed that all good cowmen, when bedded down for the night in the bunkhouse, removed their boots and spurs. Can you picture a cowboy running around with spurs lashed to his bare feet?

The rest of this chapter will consist of a few random examples of how a sound artist may contribute more than is indicated by a sound cue.

Ad lib, if not overdone, gives a spontaneity and naturalness to a script that cannot be achieved in any other way. It helps to get away from a "pat" or "set" feeling. Sometimes ad lib on the part of a soundman can do a lot more than that; it can save an awkward situation.

On one occasion, for some unaccountable reason the orchestra was not ready for the music bridge that should have tagged the scene. The script in this instance ran something like this:

JOE: So you see, Inspector, if we don't get over to Evelyn's right away, she may be murdered!

INSP. Well, what are we waiting for? Come on!

MUSIC: OMINOUS STING—THEN FURIOSO UNDER

SOUND: FAST CAR RUNNING—OCCASIONAL TIRE SKIDS

JOE: (CUE) Can't you shake this bus up a little?

INSP. She's doin' seventy now!

The inspector read his line, "Well, what are we waiting for? Come on!" and there was no music! The scene was over, yet nothing happened to tag or end it and make a transition to the following scene in the car. If something were not done, and quickly, "dead air" would become noticeable. To start the car running after complete silence would have been awkward and confusing. Cars don't materialize in an office, but the scene had not moved elsewhere.

The only solution in a case like this is a "board fade," but there must be something to be faded, either music, dialogue, or sound. There was no music, dialogue had run out, so sound took over. Fast action is indicated by the script, so sound in the tempo of the urgent "Come on!" started footsteps running to the door, yanked it open, and then ran down steps to the sidewalk. In the meantime, the director grasped what sound was doing, held the engineer "off" until the footsteps were "established," then had the engineer do a board fade. By use of the "master gain" on his control panel, the engineer faded down all microphones in the studio. The soundman, still running, switched on the turntables with the running-car and tire-skid records. On the "out" signal from the director, indicating that the studio was dead, sound stopped the running steps and started to bring up the volume of the running car. After a few seconds' pause the engineer started fading in again until proper levels were reached. The sound of the running car was established, then faded down by the soundman so that the dialogue could easily be heard. The director threw a cue to Joe who picked up with the line "Can't you shake up this bus a little?" and thus the new scene was started and the show went on without the listening audience realizing that a bad moment had transpired.

Sound's reaction to this emergency was an ad lib; he substituted an extemporaneous sound sequence for the missing musical bridge and thus provided the means for a board fade. After all, the show must go on, and within a rigidly restricted time period.

Such extensive ad-libbing is of course an exception. Fortunately such crises seldom arise. Sound, however, is frequently ad-libbed on an air show because of a change of pace that spontaneously develops. To illustrate:

MIKE: I'm telling you, Bence, if that squealer Fargo ever opens his yap again, we're dead ducks!

BENCE: Yeah! Yeah, I know! I shoulda known better. Come on, Mike, grab your heater and let's ramble on down and settle a score with a dirty weaseling rat!

MUSIC: HIT AND DOWN UNDER

The above was rehearsed quietly. Both Mike and Bence underplayed their lines, giving a feeling of quiet but deadly menace. But on the air

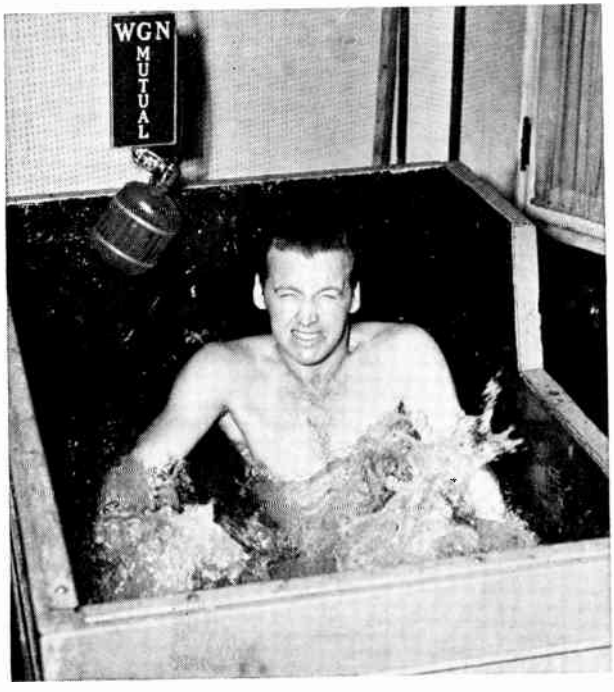


FIGURE 8. *Soundman Bob Cline realistically gets the sound of thrashing about in water while working on "Tom Mix and his Straight Shooters." (Courtesy of Mutual Broadcasting System.)*

show the whole picture changed. During this scene, both Mike and Bence picked up the tempo. Instead of quiet menace, they built up a restive anger that called for action. The whole attack on the lines had changed. So when Bence said, "Come on, Mike . . ." there was urgency in his voice that called for action then! Sound, in order to sustain the feel of the new interpretation, kicked back a chair and started hurrying footsteps toward the door, which was yanked open and timed to slam shut at the end of "weaseling rat!" This tagged the scene emphatically. And although purely

ad lib, this activity was needed to supplement the urgency of the dialogue delivery. The increased pace of Bence's speech meant *now!*

Not all ad libs are as elaborate as the instances given. Usually they consist of little intangible bits of movement that give color and naturalness to a scene. For example, here is an actual sound cue written in a script:

SOUND: AD LIB—COPS IN BG—TAKING PICTURES AND MEASUREMENTS THROUGHOUT SCENE

The writer assumed that sound knew what activity takes place during a call made by the Homicide Squad, so the background movement was left to his creative imagination.

In many cases the use of a simple sound or perhaps the omission of a sound is more eloquent in setting a mood than pages of narration or dialogue. For example, in rehearsal the director wanted to heighten the suspense in a certain scene. He could do it with an extra long pause, but an extended period of dead air is dangerous, so some other means had to be found.

The scene was at night on the grounds of a large estate. Two police officers were hidden in the bushes, waiting to trap a suspected killer. They talked in low tones for a few seconds to let the listeners know where they were and what they were doing, then quieted down to wait. A wait long enough to build real suspense would be impossible, yet the director wanted all the suspense he could get because this was the pay-off. If the young sleuth had deduced correctly, the murderer would come along this way at this time. Sound suggested a dramatic device that gave just the touch needed.

At the beginning of the scene a recording of crickets was used to establish the time as night and the locale as outdoors. When the men ceased talking, the volume of the cricket sounds was increased slightly, then a recording of a single cricket was started at higher volume. This gave a closer perspective. Then for five or six seconds there was no sound other than crickets. Suddenly the background crickets ceased chirping. The nearer cricket continued for three or more seconds and then abruptly ceased. A pause of a few seconds, then the sound of faint footsteps started a long fade-in. The device of crickets chirping, then suddenly stopping, gave a feeling that something was moving in the background. The use of the closer cricket gave a feeling of the "on" presence or the third dimension. Whatever was moving was coming closer. This imaginative

use of sound heightened the suspense, yet consumed much less time than a long, dangerous silence would have.

One of the major problems in radio broadcasting is to achieve an outdoor feeling inside a studio. This is primarily a matter of acoustics, a problem for the engineer. But acoustics sometimes do pose problems for sound, especially in exterior or outdoor effects.

For example, in one particular scene the sound pattern just did not sound right. It was laid in the Northwest logging country. The sound cue called for the sound of several axes at various perspectives, chopping down the big pine trees. Records of chopping trees were not satisfactory, and manual chopping on and off mike did not sound right either. The sound did not give an outdoors illusion.

Finally the missing element was recognized. If you have ever been in the deep woods and heard the sound of an ax, you will recall that each stroke of the ax echoed throughout the woods. Echo, that was what was needed. So the men of the sound department got together and recorded the sound of manual chopping through the echo chamber. On the show the director greeted this specially recorded effect with the remark, "That sounds so much like the great outdoors, I can feel my hay fever coming on again!"

A point to remember is this: the artistry, discrimination, and quick thinking of a soundman depend entirely on the individual. Many soundmen are good technicians. They follow a script closely, do all the things they are supposed to do, and execute their effects on cue. But they may lack one of the attributes that would stamp them as a real sound artist. For example, one soundman will perform all sword duels in the same manner, while another will distinguish between the sound of a saber duel (cut and slash) and a rapier or épée duel (fence and thrust). Or the run-of-the-mill soundman will use steam trains entering Grand Central Station and heavy traffic featuring buses and streetcars on the "Sunset Strip," while the discriminating soundman will note the fact that there are no street cars on the "Strip" and only electric trains enter Grand Central Station.

Prior to rehearsal it is up to the soundman to interpret the sound cues in the script and translate them into concrete sounds. He has to make decisions, create new effects, know his periods and locales, and have the exact authentic or simulated sound ready when the rehearsal starts. The soundman must use his initiative, and above all, must slant the effects to please the individual director.

CHAPTER SIX

Manual Effects

RADIO SOUND-EFFECTS records generally supply the sound of background, locale, and broad action. The manual effects (those done by hands, feet, or body) usually provide the sounds of specific action. In general, more manual effects are used on the radio than recorded ones.

As an experiment to tax your ingenuity, here are a few manual-effects problems with the solutions given at the end of the chapter. Before looking at the answers, see if you can simulate each of the sounds called for. The real problem is to be able to "hear" the sound so well that you can analyze it, then decide how to reproduce it. The sounds are: iced drinks, a bird flying, safe dial, elevator door, skinning a person alive, an ice jam, a freshly caught fish flopping on the wharf, and a squeaky door.

In the manual effects the acting ability of the soundman comes to the fore. Every bit of personal movement that can be seen and heard on the moving-picture screen, stage, or television screen is performed by the soundman in radio. An actor may read dialogue and imply action, but it is the soundman who manually makes the personal-action sounds. The field of manual effects is so large that there is space for only a few broad directions in this chapter.

Recorded sound effects are pretty well standardized and constant, offering little flexibility. Of course various records can be blended together to create a new sound, or the filters and speeds varied to modify the recorded sound. But manual sound is more flexible than recorded, and also more personal.

The most important factor in proper execution of manual effects is picturing the activity as it happens. Dialogue and sound cues give the clue to the sound, but it is up to the soundman to execute it in the mood and tempo given. Incidentally, a sound cue is mainly a clue as to what

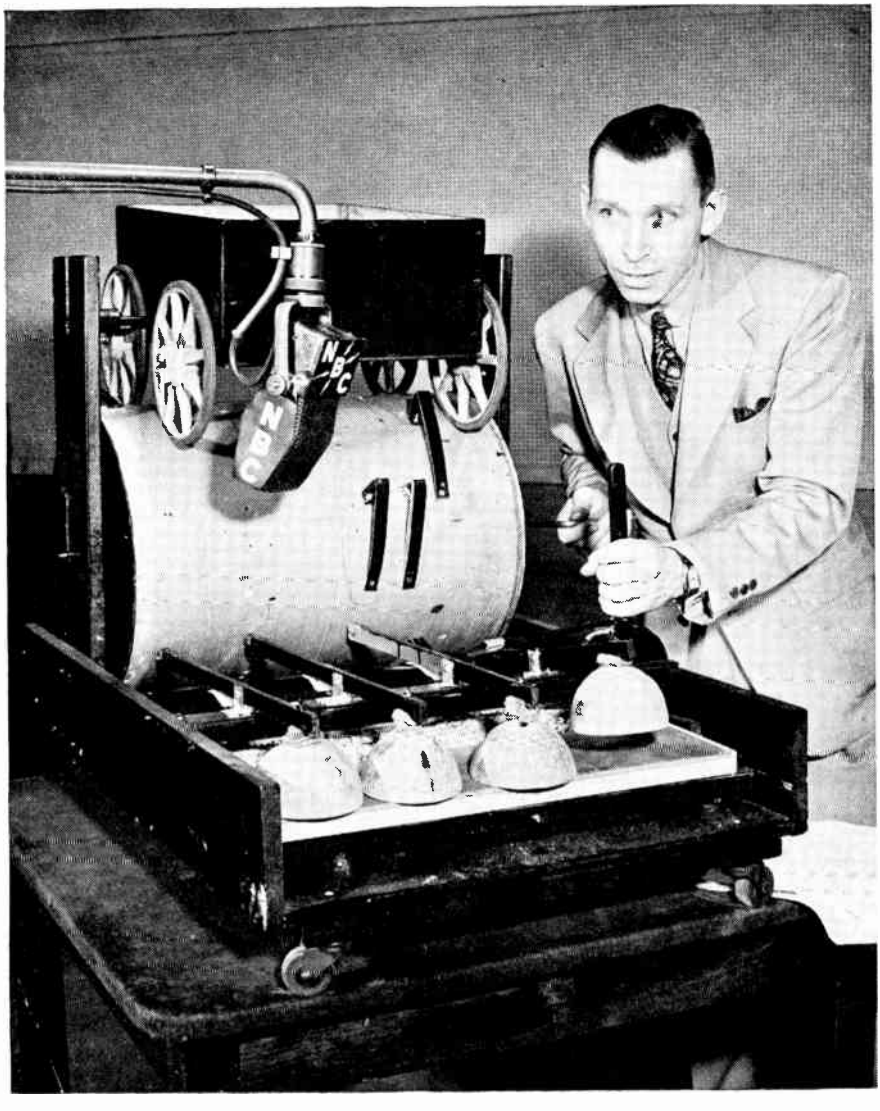


FIGURE 9. *Soundman Tommy Evans operating NBC's horse and wagon apparatus. The eccentric offsets on the revolving drum activate the hooves in proper rhythm. Surfaces under the hooves are interchangeable to simulate different terrain. (Courtesy of National Broadcasting Company.)*

activity takes place and when; its interpretation is left by the writer to the soundman. Of course if the latter has the wrong interpretation, the director straightens him out. It is absolutely essential that sound have a clear mental picture of what the dialogue and suggested or indicated

action is all about, or there cannot be proper correlation between sound and dialogue.

Take footsteps, for instance. Simple, you say? Well, yes and no. One of the most difficult things for the beginner to master is natural-sounding footsteps. In order to do them properly, it is necessary to picture the activity. In the mind's eye take apart the process of walking. Then, wearing leather heels, stand on some hard surface and walk, without leaving a space eighteen inches square. Now picture how these people would walk: a woman, a drunk, a six-foot-three two-hundred-and-twenty-pound villain, or a bow-legged cowboy.

See, there *is* a trick to it. And when you realize that most footsteps on the radio are done within a two- or three-foot area (the soundman must stay near the mike), the matter does not seem so simple. Now try running. Then simulate going up or down stairs. It can be done, in fact it is done many, many times a day and within a very restricted area.

The secret of proper-sounding footsteps is flexibility. The knees and especially the ankles must be kept flexible. After the heel strikes, bring down the ball of the foot just hard enough to register. Don't slap it down in a flat-footed manner that goes "ka-lump"; steps of this type are suited only to Red Skelton's "Clem Kaddidlehopper."

Here are a few other tips on footsteps. Remember that women take a shorter stride than men, so walk them a little faster than you would a man. Also, what you hear mostly when a woman walks is the click of the heels. When a soundman does his impersonation of a woman walking, he walks on his heels in short and fairly rapid strides, or on heels with just a suggestion of the ball of the foot.

The size of the person may be indicated in two ways. A large person naturally walks with heavier steps, and a tall person with a longer stride. In the case of the soundman who stands in one place and does not actually step out in a walk, he merely walks heavier, or increases the time interval between the steps.

Now and then barefooted steps are required. The easiest way, next to removing shoes and sox, is to extend the fingers of the hand so they are close together and curved back slightly. Then gently strike them together, heel to finger tips, in a rocking motion. The same motion may be used on a walking surface close to the mike.

Footsteps, blows, body falls may sound unsatisfactory unless the soundman has pictured the activity correctly. Let's consider body falls. In general, a body fall indicates sudden loss of consciousness by some one. He either faints or is shot, stabbed, poisoned, hit on the head, or in-

capacitated by some more novel means. In each case the manner in which the victim collapses must be consistent with the cause of collapse. A man who is shot falls in a different way than one who faints. And a victim felled with a blow to the chin folds up differently than one hit on the head.

Here are some examples. As each type of body fall is discussed, close your eyes for a moment and try to visualize it. Almost invariably a man who is shot falls forward (unless he is charging a bazooka). Usually when he receives the impact of the bullet he stumbles, staggers a couple of steps, then pitches forward. A faint is more in the nature of a slump rather than a fall and is done in a relaxed manner.

In a fight, if the victim is struck and sent sprawling, either conscious or unconscious, the impetus of the blow thrusts him backward, he loses his balance, and down he goes. Here, instead of his knees buckling, he sits down, then his shoulders hit, followed by his head, arms, and legs at about the same time.

In the case of a person who is stabbed or poisoned in radio drama, the attendant sounds are usually hammed considerably. These episodes are rich meaty bits to play with, and the actors and directors milk them for all they are worth. Generally the victim, if stabbed, does a big "take," then starts a slow waltz clog as he wrestles with the knife and stumbles about on unsteady legs. Usually it takes some time for him to get so weak that he gives up and thuds to the floor. But while his life is slowly ebbing away, he gasps out yards of the writer's deathless prose, and there is nothing for the soundman to do but lurch about in an aimless sort of way until the body-fall cue.

But poisoning, that's something else. As the soon-to-be-deceased gurgles and gags in the best *Inner Sanctum* tradition, again the soundman picks up his cue and lurches about with abandon. But here it seems that directors want to add their little "touches" to give a more vivid picture. As the actor squeezes his larynx tighter and tighter, while gasping out a confession that neatly ties up the loose ends of the plot, the soundman goes to work. He bangs over tables and chairs in his tottering about the room, and polishes off with the director's "touch," a batch of crockery smashing to the floor as the victim grabs at the table cloth and at long last collapses.

These are special effects; the usual radio body fall is done in a fairly routine manner. At the proper time the soundman faces toward a small table or riser about two or two and a half feet high. He executes the kind of footwork called for by the type of fall, then lunges toward the table holding his arms parallel and about a foot apart with the elbows slightly

bent and falls heavily upon the forearms. Then the clenched fists are struck on the surface, to simulate the head and feet striking. Of course, infinite variations can be worked from this basic maneuver.

A conscientious soundman makes a hobby of listening to sounds and collecting them. When he runs across some unusual sound, he'll stop and watch and listen. This way he learns many things that he files away in his memory. Just what does he listen for? In order to capture the distinctive attributes of a particular sound, the soundman listens for these things: Is the sound metallic or animal? What's the pitch, high or low? Does it have a rhythm? Tempo? What is the duration of the sound? Does it vary under different conditions? Is it sustained or intermittent? Is it seasonal? Can the actual effect be used, or must it be simulated?

If the object making the sound can be purchased or secured by "moonlight requisitioning," well and good. There is no problem there, except possibly cost or getting caught. If the sound must be simulated, the soundman carries the salient characteristics of the sound in his head until such time as he needs to use it. Then from his experience he assembles various bits of metal, wood, leather, glass, and so on, and sets about constructing a device that will give a creditable simulation of the desired sound.

Collecting sounds is one of the fascinations of the sound-effects business. A squeaky chair, an old carpenter's chest with rusty hinges, a discarded ice box with door, a weathered lamp, or an old chime clock are all seized upon with jubilation. Eventually they'll all be used. It is not unusual to see soundmen coming to work with a few sticks of stove wood, cellophane from bread wrappers or gifts, slabs of concrete paving, various sized glasses, bits of rope and canvas, old inner tubes, and broken toys. Many of radio's most amazing effects have been constructed from such odds and ends. The soundman is constantly on a scavenger hunt.

A soundman always tries to create effects that will operate easily. What good is a marvelous effect if it takes four men to operate it? Sounds can be coaxed more readily out of a simply constructed device than an elaborate one. And then again, the simpler the construction, the less chance of some part getting out of order.

Another factor that must be considered in the use and construction of manual effects is portability. In an elaborate sound setup on a show loaded with sound cues, no soundman wants to wrestle some overweight device on and off mike. Many times the sound mikes are surrounded by sound effects; there just isn't space to place some bulky effect where it will register properly and leave it there throughout the show. In these instances, portability is very desirable.

Compactness is another desirable feature. It makes for better placement around mikes, as well as allowing for more effects to be used without supplementary handling. And of course compactness is an aid in storage.

Many times an effect is quickly improvised and thus is of flimsy construction. Whenever possible, effects should be well and sturdily constructed. Time spent in building a piece of equipment is well spent if the equipment can be used over and over without fear of its coming apart

FIGURE 10. *Soundman Keene Crockett operating a splash tank and a metal windlass for marine effects. (Courtesy of National Broadcasting Company.)*

FIGURE 11. *A manually operated device to secure the sound of marching feet. The suspended wooden pegs are rhythmically dropped on the broom corn. (Courtesy of the National Broadcasting Company.)*

while in use. Doors, for example, get hard and continuous use. A door made of well-seasoned, kiln-dried oak and sturdily constructed will stand years of hard usage.

There have been many illustrated magazine articles showing or explaining how some radio sounds are done. By now practically any radio listener knows that crinkled cellophane makes the sound of a small fire, that halves of cocoanut shells or plumber's helpers are used for horses' hooves, and that squeezing a box of cornstarch gives the sound of footsteps on snow. Well, I would like to go one step further in this book and teach the reader how to actually do the "beat" for horses. Anyone with

a modicum of coordination and a sense of rhythm can gallop a horse, radio-wise, easily.

Sit or stand at a table or desk so that the extended fingers comfortably overlap the edge of the top surface about two inches. Keep the wrists flexible. This is important! As soon as you start to tighten up, you tire easily and, worse, lose the beat. Now you are going to learn the "four-beat." Assuming you are right-handed, lightly strike the extended fingers of the right hand on the table. Then the left, the right, and the left. You start with the right hand, alternate four taps or "beats," ending with the left hand on the fourth blow.

So far you've made four alternate taps. Now do the same thing again, only this time accent the fourth or last beat with a little heavier tap. Do this slowly. Get the rhythm first; speed comes later with practice. Now you have done something like this: da-da-da-*dum*. As you repeat the beat, say the da-da-da-*dum*, so you'll be sure and get the accent on the fourth beat. It's the same thing as the *V* in the Morse code (. . . —).

That's all there is to the beat of a horse galloping. You put the sequences of four beats together in a continuous flow, and you have a galloping horse—except for one more thing. There is a slight break after each group of four beats. The reason for the slight pause is this: when a horse gallops, the right hind foot comes down first; then the left hind foot and the right fore foot strike almost simultaneously; the left fore foot is the last to strike the ground, followed by a brief period of suspension in which all four feet are off the ground. That's the sequence. Four feet, pause, four feet, pause, etc.

The next time you see a newsreel of a race, watch the action of the horses. Incidentally, you'll notice that even the fastest horses do not run with a terrifically fast beat, but with a tremendous stride which raises a question: why is it that directors insist on blazing speed for the cowboy's horse? Of course, each horse opera has its favorite horse, which is the fastest in the world. This is proved at least once in each script, and we expect the director to take dramatic license with the effect. But the pace that the radio horses go is six or eight times faster than any sprint-record holder! It would be an amusing experiment to have an annual roundup of radio cowboy heroes to determine which has the fastest horse, Tom Mix's Tony, the Lone Ranger's Silver, Straight Arrow's Fury, the Cisco Kid's Diablo, Roy Rogers' Trigger, Red Ryder's Thunder, or Hopalong Cassidy's Topper. While the cowboy stars signed autographs the horse-opera soundmen could determine which steed has the fastest beat!

In the early days of radio the three-beat, probably stemming from the

time that the trap drummer did horses on the temple block, was used. The beat is simple; the right hand is struck twice in rapid succession, then the left, and the third beat is accented. There is a break between the groups of three beats. The sound should be, da-da-*dum*, da-da-*dum!* Try it. As you can see, the three beat sounds just like a three-legged horse. It is very good for comedy horse effects.

In executing manual effects, sound must remember at all times that his work is in the nature of a proxy for the actor. Sound uses his body and inanimate gadgets to give life and meaning to the things that the actor is saying and supposedly doing. Consequently the activities of the sound-man call for finesse, timing, and imagination, as well as a grasp of the dramatic import of the script and considerable acting ability. Throughout this book are bits of illustration concerning manual effects.

Here are the answers to the test at the beginning of this chapter. Remember, real sounds were not to be used; you were to *simulate* the effects. Iced drinks are simulated by using a couple of used photo-flash bulbs or tiny sealed dimestore perfume bottles in a glass of water. A bird flap is made by using a hoop of wire covered loosely with an old piece of silk. Leave several inches slack. An old badminton racket or trout fishing hoop is fine. Jerk the hoop in an up-and-down motion, so the slack has a chance to pop back and forth. Or why not try a large feather duster? Safe dial? A combination lock, or spin the cylinder of a pistol. An elevator door is done by running a roller skate over a piece of metal. A track of angle iron spaced apart the width of the skate is good. Don't forget a slight bump at the end, signifying that the door is fully opened or closed. To skin a person alive, pull several pieces of adhesive tape off of a leather cushion or an old leather seat.

An ice jam? Just twist and rub an inflated rubber balloon with the fingers. The flopping fish is done by flopping a folded inner tube or a hot-water bottle on a wooden surface. A good squeak, easily done, is with a paper cup from the water cooler. Press the top together, then press the center portion tightly together and twist sideways with the fingers.

Manual effects are extremely interesting, because they are personal. They are you. Try some of these things, or make up your own. Become sound conscious, listen, and try and discover what characteristics identify a particular sound. Then see if you can go about simulating that sound by some simple means. Remember, manual effects should be easily operated, compact, portable, well constructed, and above all, should sound right!

CHAPTER SEVEN

Recorded Effects

TO THE UNINITIATED, the use of recorded sound effects would seem to consist of placing a record on a turntable, starting it, and letting the sound seep out. Actually, almost every time a soundman places a pickup arm on a record, he is confronted by special problems. He must consider levels, matched quality, perspective, proper speed, and surface noises. He may have to cross-arm, double-arm, segue, slip-start or spot-cue his records. This does not mean that all recorded effects are difficult, but occasionally some sequences are very hard to handle.

The regular commercial sound disc is similar in size, material, and appearance to the 10-in. musical recorded disc played on the home phonograph. Almost without exception sound recordings are made to revolve at 78 r.p.m., the same as home recordings.

The average sound-effects record costs from $1.50 to $3.00. Depending upon the number of dramatic shows a station originates, the sound department may have an investment of from a few hundred to several thousand dollars in records alone. The originating stations for the major networks have elaborate libraries of commercially recorded sound effects as well as numerous especially recorded effects made by their own soundmen.

The major commercial firms specializing in sound recordings are, Masque, Gennett, Standard, Speedy-Q, and Major. Over fifteen thousand effects are available. The following will give the reader a faint idea of some of the unusual effects on commercial records: milking a cow, baby chicks in a brooder, seagulls feeding, fender bump in traffic, barroom fight, collapsing bridge, bacon frying, fitting and nailing a horseshoe, coffee percolating, wrecking a piano with an ax, bubbling lava, earthquake, Japanese crowd at a baseball game, turnstile click, auto flat tire

thumping, train crash, airplanes falling, shooting gallery, orchestra tuning up (both symphony and dance), pool-hall noises, blizzards, bowling alleys (one to fifty-two alleys), sawing down a tree, circus effects, forest fire, maternity ward, wire-photo machine, rock crusher, taximeter,

FIGURE 12. *About twenty years ago this heavy bell and whistle, the latter operated by steam, were set up on the roof of the Merchandise Mart in Chicago and used when such train effects were needed. Tommy Horan shows Curt Mitchell the recording now used containing the same effects. (Courtesy of National Broadcasting Company.)*

Indian dances, loading cannon, branding cattle, katydids, pile drivers, wrestling match, dam bursting, and dozens of animal, bird, train, auto, and plane effects.

The recordings are played on turntables similar to those of the home phonograph. But there the similarity ends. Radio sound turntables are

mounted on a piece of equipment generally called a "sound truck," "truck," "Jeep," or "Console." Some trucks have built-in speakers, others have separate speakers.

A "three-holer" (three turntables) should be equipped with a minimum of four heads or pickup arms, adjacent pairs of which can be placed simultaneously upon the same record. A "four-holer" should have a minimum of five pickup arms. The reason for this is that if a sequence calls for a sustained background sound, and the record runs less than the time needed, the same record can be used with one pickup head until the sound is about to run out, then the adjacent head can be swung over and the sound continued without a break. This is called "cross-arming." The sound is transferred from one pickup to the other by a "cross fade." In using the cross fade in cross-arming, it is very important that the volume control for the pickup not in use be turned off; otherwise there will be a double amount of sound. Each tone arm, pickup, or "head" is equipped with its own volume control, referred to in the vernacular as the "pot" or the "gain." The loudness or volume is measured in DBs (decibels).

In addition, each table is equipped with the familiar high and low control (filter) found on modern radios and phonographs. These are extremely important, because effects are made or broken by the use of highs and lows. For example, the sound of a recorded shot (giving the "off" perspective) and the ricochet (the "on" perspective) sound right only when the shot is sounded with the lows in and the highs are emphasized on the ricochet. Conversely, thunder sounds better if the "highs" are in for the initial impact and the "lows" featured for the tapering rumble that follows.

"Cuing-in" is a commonplace requirement for a soundman. This means that a specific effect is buried in the content of a recorded sound cut. For example, in a horse opera the villain may start to "scratch leather." But the intrepid hero beats him to the draw and shoots the gun out of the villain's hand. Here sound cues in thirteen and a half turns on the first or outside cut of Major record No. 5007A. On cue with the dialogue, a live gunshot is fired and the record is released at full volume. The sound of the live shot indicates that the hero has fired, and the ricochet signifies the metallic "whang-g-y" as the bullet strikes the villain's gun. This calls for split-second timing, as the ricochet must follow instantly on the shot but must in no case precede it!

Another example: in a scene where the detective is driving frantically to rescue a young lady, sound may use a record of a car racing at high

speed, throwing in an occasional tire skid to give the effect of sliding around turns and corners at high speed. This is a separate record and can be picked up at any time by merely opening and closing the pot. On cue, and matching the dialogue, sound brings the car to a fast stop and jumps out. This calls for a third record which matches the first one (it must be the same type of car) inset to the portion of the record where the brakes squeal, or the tires skid and the car comes to a quick stop. On cue, sound segues to the last record from the first, being sure to close the pot on the first as he does, then cuts the pot on the last record, grabs the handle of the car door, yanks it open, jumps to the ground, and merrily dashes along to the solution of the story.

Another consideration is the "level" of a recorded effect. Level is the degree of volume, the amount the pot has been opened; in other words, how loud the sound is. Naturally, any distant sound is of relatively low level. A recorded shot or explosion used at a low level indicates an "off" or distant perspective. If the shot is "on" (close to the mike), the sound has more "presence" or "on" perspective, and therefore the pot is opened up more. The closer the sound, the louder it is.

There are other considerations on levels, however. The engineer who mixes the show is harassed by the limitations of his equipment which can stand only so much gain. A sound of very high level sustained over three seconds will usually blow the station off the air. Again, levels have to be established so as to match dialogue. If a character rides up on a wagon, he fades in toward the mike with his dialogue to give the illusion of approaching from a distance. To match his approach, the sound of the wagon must fade in with the same perspective as the actor, so that he will sound as if he is riding on it, not floating in the air ahead of or behind it. As the actor works off and on mike, the soundman must match these variations in presence and level with his recorded and manual effects.

A variation of cross-arming is double-arming. In cross-arming, two pickup arms are used to extend the running time of a single recorded effect. In double-arming, two heads are used simultaneously on the same record to give twice as many sounds. For example, in a battle scene a record may be played that is heavy with the sound of guns, shell whines and explosions, zooming planes, grenades, and the like. The producer may want a bigger effect. In that case, sound does not need to put on a duplicate or supplementary record, but can double the amount of sound by using two pickup heads at the same time on the same record. As another example, a sound cue may call for a sheriff's posse. Two soundmen may gallop horses with the coconut shells which will represent

on-mike horses of the hero and his partner. Another soundman plays a recording of fifteen horses, the rest of the posse, but holds it down in volume so that it is a background sound. But this is a big posse. So the posse record is double-armed, and presto, thirty riders instead of fifteen! Remember, double-arming doubles the amount of the sound, not necessarily the loudness, while cross-arming does not increase either the volume or amount of sound, but does extend the running time of a recorded effect.

"Segues" and "sequences" are in a sense interrelated. A segue is an unnoticeable transition from one recorded sound effect to another. A sustained flow of sound may be the result of several effects, and the smooth change from one to another is a segue. For example, in a correctly executed airplane take-off, there are usually five stages to reproduce: the start and idle, taxiing to the strip, revving the engine while checking the carburetor heat and magnetos, the run down the runway and take-off, and then the air-borne flight. It is extremely rare that one record will match the written dialogue in proper sequence and the right amount of time for each sequence. The sounds of the various sequences are available on record, and to match timing and duration of sound with dialogue, the soundman will often have to use five or more separate records in a matter of seconds. The order in which the various parts of the take-off are played is the "sequence," while the blending from one recorded effect to the next is the "segue."

When a plane lands, a different set of records is needed. First sound determines if the scene is in the plane (interior or "on" perspective) or is some spot on the ground toward which the plane is approaching (exterior or "off" to "on" perspective). If the scene is in the plane, the sequence begins with the sound of a plane gliding on the approach pattern. The motor is throttled down and occasionally gunned to clear the throttle. This is a separate record from the glide. A bit of wind howling past the plane adds to the illusion, but its use will depend upon the type of plane and its landing speed. Next the plane hits the ground and rolls, losing momentum; the brakes squeal; the plane is turned off the runway and taxied to the line, jockied into position, and the motor killed with a final coughing grunt. Each different sound must be played on a different record or from different cuts on the same record. The manipulating of possibly a half-dozen records on three or more turntables must be seen to be appreciated.

Ordinarily it would take a plane a few minutes to come in on the landing pattern, land, lose speed, stop, turn around, taxi to the hangar or line, work into position, and stop. Yet due to the limited time in a

radio production, all this must be greatly compressed or cheated to a matter of thirty or forty-five seconds at most.

In a sequence like this it is not unusual to stack records three deep on each turntable and then quickly remove them as they are used. Throughout a sequence of this type, sound is segueing from one record to another, keeping the right level at all times, turning on the right pots at the right instant, cutting off the pots of records no longer needed, taking off records and cuing-up new ones, and all the time watching the director, the script, the volume indicator (VI) for predetermined levels, and selecting the exact spot on each record that he wants for insets. Yes, using sound-effects records calls for a little more than simple placement of a record on a turntable and pressing a button or pushing a lever.

At the beginning of this chapter, mention was made of an effect that was cued in, the metallic ricochet of a gun being hit by a bullet. In this instance the outside cut of this particular record was cued in thirteen and a half turns from the first groove. In order to get the sound cleanly at the exact instant wanted, the table must be turning, but not the record. If the table is not turning, it will take several turns to get up speed to 78 r.p.m. from a dead stop. Until fairly recently it was necessary to start a table turning sometime before the cue arrived, hold the record with one hand, and have the other hand on the closed pot. The table would be revolving at 78 r.p.m. and the cued-up record on it, but not turning. On cue the record was released and within a half-turn was up to speed, the pot was wiped open simultaneously, and the sound came through. Holding a record immovable on a revolving table for a cued recorded effect is called "slip-starting."

The newer sound trucks are equipped with devices that can be preset on a spot cue or inset. The table with the cued-up record is stopped and the pot is opened at the desired level. On cue the starting switch is thrown, the table starts, gets up speed within half a turn, and the sound comes through because the pot is open.

The use of highs and lows has been discussed briefly. These are controlled by the filter, and their proper use adds greatly to the dramatic value of recorded effects. Too much use of highs, however, results in a noticeable increase of surface noise, the hiss or scratch of the pickup needle as it runs in the groove of the record. This is especially true of old and worn records or ones that have been cheaply processed. Records made of Vinylite have the least surface noise, but are more expensive than the customary shellac type. The use of highs tends to thin out a sound, while the lows tend to give it more body.

Insets and spot cues are the same thing and were discussed in connection with slip-starting. When a particular portion of a sound cut is desired, the pickup arm is placed at the beginning of that portion. Let's say that the script calls for the howl of a wolf. The wolf howl cut on this particular record consists of twenty turns (complete revolutions of the record) altogether. The middle ten turns carry the sound of the howl, the first five and the last five turns of the groove having no sound on

FIGURE 13. *Fred Cole uses the "pre-set" indicator to find the exact groove on a sound record for an "inset" or "spot cue." (Courtesy of National Broadcasting Company.)*

them. The soundman would inset or spot-cue five turns from the beginning of the cut, so that when the cue came the howl would be ready to start immediately. Otherwise there would be silence while the five blank lead-in turns were playing. To be precise, sound would inset four and a half turns, not five, because he must allow a half-turn for the table to get up speed and not "wow" in. A wow occurs when a sound has been cued up too "tight" or close, and the table does not get up to normal speed before the sound is heard. If the wolf howl were cued up at five turns, the first half-turn would be below speed and the sound would start with

a low moan, then rapidly ascend in pitch until 78 r.p.m. had been gained. So *remember to allow an extra half-turn on an inset.*

In using recorded sounds it is necessary to consider the matching of records in a sequence, for example an airplane take-off sequence. It is vital that the same type of plane be used throughout, and to avoid such errors as having a dual-motor plane revving up and taxiing, and then segueing to a single-motor craft taking off. This holds true also for trains and automobiles where several component effects are used to form one continuous sound sequence.

The chief danger in making rapid segues during a complicated sequence is in inadvertently segueing to the wrong cut or record. This can easily happen, as in some instances entirely unrelated effects have been recorded on the same side of a record. For instance, Standard 202B contains two minutes of various Model T Ford sounds, and a twenty second cut of a collie dog barking! Under the pressure of fast changes it is very possible to cue up an effect, then too late discover that instead of an old-time train starting, there is a fine rendition of a diesel streamliner whizzing by with the distinctive blast of the air horn!

Proper speed is another factor that the soundman must always consider. Although commercial sound records are recorded at 78 r.p.m., probably half of the recorded effects used on the air are varied in speed. Some recordings just naturally sound better when run slower or faster.

For example a script may call for the BG sound of a train. Sound determines that the scene is laid in the interior of a streamliner running at seventy miles per hour. The rail clicks then should sound fast and a little high in key. Or again the scene may be in the coach of an old wood burner probably running at not more than thirty-five miles per hour. For this, sound may use the same rail clicks as for the fast train, but he will slow them down considerably and bring in the lows.

Or maybe the hero shouts, "faster, faster," so the running-auto record is speeded up on the variable table. Then again the script may call for an old-fashioned hand-operated printing press. For this, sound might use the Gennett recording of a hand-operated washing machine with the variable table running very slowly. If this effect is used, a few highs should be filtered in to bring up the pitch of the sound which is unnaturally lowered because of the slow speed.

Possibly the story is about Robin Hood with the scene near the huge water wheel at the mill of the Good Miller. There should be the sound of a small running brook (for the raceway), and the revolving water wheel. The latter may be simulated by a recorded hand-operated bilge

pump (Standard 307B) run at very slow speed. The illusion is good because the slow intermittent "screeeek" of the metallic bilge pump gives the slow-turning effect of the big wheel.

The few instances mentioned have shown how the speed of recorded sounds may be varied for specific effects. The important thing to remember, though, is that the soundman must be aware of the possibilities of

FIGURE 14. *General view of sound setup on* Grand Central Station. *James Rogan operates the triple turntable console at the left and Francis Mellow handles the two auxiliary turntables in the foreground. (Courtesy of Columbia Broadcasting System.)*

various recorded sounds. When he hears an effect he must also be able to recognize its secondary possibilities with changed filters and varied speeds. So you see, although the commercial sound-effects records are cut at 78 r.p.m., that does not necessarily mean that they are always run at the standard speed.

In addition to the thousands of commercial effects that may be bought, each sound department generally has many that have been recorded especially for specific programs. One of the large railroads had a show on the air for several years. This company sent a recording crew out for

several weeks to record special train effects. The crew covered thousands of miles and recorded every conceivable train effect from roundhouse noises to a train scooping up water on the run. The recordings cost several thousand dollars, but the show about the railroad sounded authentic!

Many times a sound department will make a special recording because there is none commercially available for the sound wanted. For example, a program had need for the sound of a tremendous stampede of cattle. A special recording was made in the following manner. Several soundmen got together in one of the studios and set up two sound trucks. On four of the tables were placed posse records (a recording of many horses at a gallop), and on another table the sound of an earthquake rumble. Six soundmen manipulated coconut shells for hooves. As the recordings started, two of the soundmen stomped and strolled about with the "hooves." A peaceful, tranquil scene. Suddenly the other "manual" soundmen joined in with their hooves, and the stampede started. On the sound truck two of the posse records were blended in, then another and another. After the stampede got started, the earthquake rumble was sneaked in underneath the dominant sounds and sustained. The whole thing developed into an awe-inspiring sound. For the file two other recordings were made at the same time.

In one of these the sequence was changed. First the earthquake rumble was heard very faintly. As this sound was gradually increased, the sounds of the stampede were added and the whole gradually brought up to full level, then slowly diminished. Thus was secured a different perspective of a stampede. One started on mike, and the other started off mike, faded on, then passed.

The third began with calves bawling and cows mooing. Suddenly another record and then another were added, until there was a terrific din of cattle bawling and mooing. This was recorded and signified the startled excitement of the cattle as they commenced to stampede. By using the stampede record and the cattle sounds, a cattle stampede could be simulated. The cattle noises were not recorded on the stampede record because by leaving them out that same record could be used for a stampede of buffalo or a herd of wild horses.

The sound of the cattle stampede was produced by blending two specially recorded 12-in. records which represented the efforts of seven soundmen and a combination of eight records. To get the same effect on the broadcast without the special recordings would have called for some doing!

Sometimes an effect will be recorded for convenience alone. For ex-

ample, a script may contain a long scene depicting a running fight between Indians and persons on a stagecoach. For four pages there are sounds of the rattle of harness, the hooves of six galloping horses, the roll of the wheels, bumps on the rough road, and the squeak of straining wood. In addition there are Indians yelling, sounds of shots on and off mike, and the sound of horses galloping in and out. To simplify matters, all the sounds of the stagecoach were recorded, the wheels rolling and bumping, six horses galloping, rattle of harness, and creak of wood. On the broadcast the soundman operating the truck played this single record, which he cross-armed as needed to sustain the sound. He also fired the live shots and used the recorded off shots when called for. Two other "manual" soundmen galloped horses that faded on and off mike to suit the action of the attacking Indians.

The larger radio stations that have a special-events man and a tape or wire recorder are in a position to secure some very fine effects, especially for BG sounds. The on-the-spot special-events announcer can record the sounds of a horror-stricken or terrified crowd, get the activity of a four-alarm fire, or the sounds of a fiercely burning brush fire. These are then dubbed off the tape onto acetate recordings and kept in the sound-department file until needed.

In using recorded effects, the first thing to do is to become familiar with the records themselves. The various catalogues list the effects a particular record contains, but cannot indicate what the effects sound like. A recommended procedure is to gather together at one time all the records of a particular type, say of trains, and play them all. By this means the best sounds of starting, stopping (both fast and slow starts and stops), rail clicks, running, whistles, and so on may be found. On the whistles, check to see if there is at least one with the Doppler effect. Despite the descriptions in the various catalogues, it is best to hear the records, before deciding in which to invest. The astute soundman does not limit himself to any particular brand of commercial sound records, but checks them all and then selects the ones that best suit his needs.

Many commercial effects available on records are much better done manually. Recorded effects of raising and lowering windows and shades, shuffling and dealing cards, washing dishes, mixing drinks, police whistles, typewriter, and the like sound better and are more readily controlled when done manually. Only those effects that cannot readily be done either manually or electronically should be purchased on record.

All in all, sound-effects records are both good and bad. Many poor recorded effects are being used and will continue to be used until better

recordings are made. Particularly bad are the "wet" sounds: rain, rivers, and other water sounds. Small-crowd records are poor, and most applause and laugh records have a metallic sound. Some of the sounds on commercial sound-effects records are faked, and faked badly. That's another reason why records should be listened to and not just ordered from a catalogue.

One of the most annoying things about records is surface noise, the hiss and scratch the needle makes as it runs in the groove. A badly worn

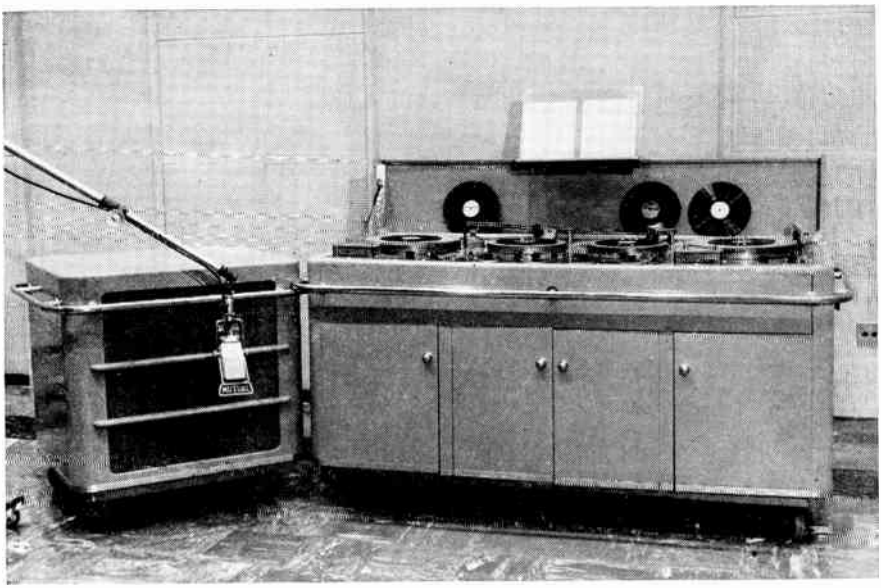


FIGURE 15. *Four-turntable sound truck. This specially designed truck has been used on* Roy Rogers, Red Ryder, The Cisco Kid, *and* Hopalong Cassidy, *all fast-moving heavy-action shows. (Courtesy of Don Lee–Mutual Broadcasting System.)*

or cheaply made record usually gives considerable surface and is quite noticeable when the level is increased. Surface noise brings up another point. A soundman, if he uses the same type of records week after week on a particular show, generally uses two complete sets of records. An old set is used for rehearsals, and a newer less-worn set on the air show.

As to the sound truck itself, space does not permit a complete and detailed layout plan, but here are some of the desirable features that should be incorporated in the construction of the sound truck.

The motors must be silent, well insulated, and mounted so as to eliminate vibration. The belt-driven type of motor is not satisfactory be-

cause the belt tends to stretch with wear causing the table to revolve at irregular speeds. The best type of motor is one in which the power is transmitted by a shaft to a rubber wheel which revolves the turntable by a constantly controlled friction. Constant-speed control is absolutely necessary, because unwanted variations tend to distort the recorded sounds.

A minimum of three turntables is desirable, at least two with preset speeds of 33⅓ and 78 r.p.m., and the third table with variable speeds from 0 to about 130 r.p.m. It is better if all tables can be variable and have strong enough motors for slip-starting. On a variable-speed turntable the speed can be varied while the table is in motion. If the sound truck is built with only one variable table, it should be placed between the other two.

Remember that speed is judged by the peripheral speed of the turntable while under full-load operating conditions. A turntable running at 78 r.p.m. must do so with the record and pickup head placed upon it. The turntables should be at least twelve inches in diameter and the top surface felt-covered.

With three turntables there should be four tone arms or pickups, arranged on swivel heads and so placed that the two center tone arms can be used on either adjacent table. This permits double-arming and cross-arming. Each pickup head should be counterbalanced and have its own amplifier and mixer or gain control. Each should also have its own tone or filter control for high and low frequencies.

Sapphire needles are more expensive than steel needles, but are cheaper in the long run because with moderate care they will last indefinitely, cause much less wear and tear on the records, and give much less needle scratch. Place the needle as near the free-swinging end of the tone arm as possible so that it can readily be seen for spot-cuing. The pickup arm should be counterbalanced to provide a needle pressure of not more than one ounce.

The controls for each tone arm should be placed for convenient handling and so that they can readily be seen. In addition there should be a master gain that can be used to fade all the tone arms simultaneously. However, all of the above attributes are of little value unless the sound truck has a good speaker with wide frequency response and no hum.

Generally speaking, recorded effects are used when manual effects are not practical in a studio, when simulated sounds are not satisfactory, or when long sustained background sounds are needed.

If the reader wishes to buy recorded effects, it is suggested that he write

to each of the sound-effects recording companies listed at the end of this chapter and request the latest catalogues. This suggestion is made because no one company has all recorded effects and it is possible that the reader using just one company's catalogue will not find the effect wanted. For example, at the present writing only Standard has recorded jet planes and helicopters; only Major has recorded the sound of an avalanche.

However, with five catalogues and thousands of effects listed, the reader is confronted by a problem. Some effects will be better than others, and it will be impossible to audition them all before choosing. Which to buy? The problem of selection has motivated writing the rest of this chapter. In the following recommendations, no one company is favored; each excels in certain recordings and the recommended records are the best of their type. In most instances several records are listed for each effect, and those preceded by an asterisk are generally considered to be the most desirable.

A word of caution. After you have located the effect in the alphabetical list that follows, check the catalogue number in the proper catalogue and carefully read the description of the effect. Possibly it will not fulfill your requirements. Another suggestion. If there seems to be no choice between two similar effects, check to see what is on the reverse of the record. It would be a waste of money to order a record and find on the back some effect that you already have. Also be sure that progressive sounds have a start and finish. Take automobiles, for example. Be sure that the record you order has the start, idle, gear shift, run, and stop. With two duplicate records you can segue back and forth between them and thus make your sound pattern fit the dialogue.

If confronted by an optional choice, select the recording that sets out the changes in sound pattern by spread grooves or spirals. This facilitates spotting specific cues quickly. Standard and Speedy-Q are especially good in this respect. As a specific example, take the automobile record by Speedy-Q No. 7906. This record is particularly good for auto effects because the B side gives the starter, then a two minute idle which is very realistic. The A side starts, shifts gears, runs for over two minutes, then stops. Each change in sound is easily picked up when wanted by placing the needle of the second tone arm in the spiral or spread groove and segueing to it. In addition, the B side offers about twelve seconds of starter grind before the motor starts. This is excellent in building suspense. If the long starter grind is not wanted, place the pickup head in the spread groove just past that part of the record, and the car starts right up. Thus on the two sides of this record, SQ-7906-A-B, you have all the

FIGURE 16. *Sound engineers Urban Johnson and Russel King recording the actual sound of a fender bump for Standard Radio. (Courtesy of Standard Super Sound Effects.)*

automobile sounds you normally need, including the added effect of a prolonged starter grind. Of course skids, crashes, horns, etc. call for supplementary records.

Again a word of caution. Be sure and read the catalogue description

of the effect before ordering. If you order blindly, possibly you'll not get what you want. Now to continue with the automobile effect. Should you order Standard 203, you'll get a Ford V-8, the same as on the Speedy-Q 7906, but on the Standard A side there is no starting or stopping of the car, and the B side consists of various auto horns. Both records have the same kind of car, and both have two minutes of running auto, but one offers start, run, and stop, and the other run only.

In ordering records, always look to the future. Get as much value out of your investment as you can. Possibly the effect you want right now is a running automobile, so you may order Standard 203. The record may serve its purpose on your current show. But later you may need a running auto with a start and stop. If so, then you have to order another running-auto record to meet these requirements, and this type of buying makes it difficult to keep within a budget.

Another thing to watch out for when ordering records: what is the perspective of the recorded effect? Is it on or off mike? Is the perspective in the car or at a stationary point toward which the car approaches, fades full on, then recedes?

In selecting your record note the length of time the effect runs. You can always fade or "clip out" of a recorded sound, but the duration of a recorded effect can be extended only by cross-arming or using a duplicate record on another turntable. In either case that will tie up a second turntable or tone arm which possibly cannot be spared.

The following is the recommended list. Entries preceded by an asterisk are used most frequently by professional soundmen. For the sake of brevity these abbreviations are used: M—Masque; MAJ—Major; ST—Standard; SQ—Speedy-Q; G—Gennett.

AIRPLANES

Battles. *MAJ-5028A (dive bombers); ST-102B and 104A (power dives); *ST-103A (air battle)

Continuous Flight. *MAJ-5050A (interior perspective); *SQ-7862B (dual-motor interior); *ST-106B (dual-motor interior); *ST-100A (mass formation overhead); *ST-110A (Aircobra); *ST-110B (Lightning); *ST-113A (C-47); *ST-112A (jet)

Fall—Crash—Burn. *M-104A (missing—glide—land); *M-206A (falls—crashes); *ST-102B (falling); ST-103B (crash and burn); ST-104A (power dive—crash); ST-204A (crash)

Jet. ST-112A (take-off—fly—land); ST-113B (take-off); ST-114A (F-80 take-off)

Maneuvers. *MAJ-5051B (stunting); *MAJ-5051B (squadron passing); ST-103A (air battle)

Multimotor Civilian. ST-102B (DC-2 idle); ST-113A (C-47); ST-116A (land—take-off); ST-117A-B (land—take-off); SQ-7861A-B (take-off); SQ-7862A-B (taxi in and out—fly); °SQ-7913A (take-off—fly—land)

Multimotor Military. °SQ-7862B (dual-motor interior); °SQ-7913A (take-off—fly—land); SQ-7926B (warm-up—take-off); SQ-7928A-B (take-off—land); ST-116A-B (land—take-off); ST-117A-B (take-off—land)

Single-Motor Civilian. SQ-7886B (Idle—take-off—pass); ST-112B (Stinson); ST-114B (Stinson)

Single-Motor Military. °M-104A (miss—glide); MAJ-5040A-B (dive bombers); SQ-7885A-B (bomber); SQ-7926A (bomber—P-38); SQ-7928A-B (take-off—land); ST-114A (take-offs)

AIRPORT BACKGROUND. ST-104B (general)

AIR RAID. SQ-7887A (planes—bombs—siren—AA); See also AIRPLANES, BATTLES; AIR-RAID SIREN

AIR-RAID SIREN. MAJ-4023A (alert—all clear); °ST-506B (British air raid—all clear); ST-909A-B (U.S. air raid); °G-1352A (British air raid)

AMUSEMENT CENTER. See also: CALLIOPE; MERRY-GO-ROUND. ST-260A (midway); SQ-7908A (roller coaster); SQ-7908B (shooting gallery)

ANGRY MOB. °M-508A (angry mob); ST-259A (French—mixed foreign—native)

ANIMALS. (See under individual animals)

APPLAUSE. M-502B (mixed audience); °ST-261A-B (applause—cheers); SQ-7856A-B (theater audience); °ST-271B (large audience)

AUTOMOBILES

Bus. SQ-7897A (start—stop—pass); SQ-7897B (running)

Horns. ST-203B (4 types); M-208B (3 types); M-209B (musical—moo); M-210B (French bulb—klaxon); MAJ-5003A (bulb—air—vibrator); °MAJ-5041A (car and horn pass very fast); SQ-7825B (6 various); SQ-7876A (air—vibrator)

Passenger. ST-202A (backing up); °SQ-7800A-B (Model-T); °SQ-7801A-B (Model-T); SQ-7802A-B (Model-A); SQ-7803A-B (old Dodge); SQ-7804B (brake squeal on stop); SQ-7825A (Chevrolet); °SQ-7906A-B (Ford V-8 and highly recommended); ST-211A ('48 Dodge); °ST-212A ('48 Dodge); °ST-213A ('48 Dodge); °ST-214A-B (hydramatic); °ST-219A-B (interior and exterior running)

Racing. °ST-205A-B (two-seater); M-206A (two-seater); SQ-7888A-B (midget); SQ-7889A-B (midget); G-1087 (dirt track); °ST-205B (in and out of pit)

Skids and Crashes. °ST-204A (skids—crashes); ST-307A (continuous skid); °SQ-7874A (skids); °SQ-7874B (crashes); SQ-7920A (blow-out—flat); ST-205B (burning)

Trucks. °M-213B (clashing gears); SQ-7877A-B (GMC 1½-ton); °ST-211B (Diesel); °ST-216B (Diesel); °ST-216A (GMC 10-ton)

AVALANCHE. °MAJ-5020A (also has earthquake rumble and lava)

BABIES. °ST-257A-B (mad—nursery); °SQ-7832A-B (one baby continuous); °ST-264A-B (various)

BELL BUOY. SQ-7841B (has harbor BG)

BELLS. (Use recordings for large bells, manual effects for small.) MAJ-4029A (church); MAJ-5005B (church); ST-900A (church); SQ-7878B (church); SQ-7912A (church); ST-927A-B (mission); SQ-7815A (mission); SQ-7865B (train); M-1006B (ship); M-1007A (ship); ST-902A-B (telephone)

BIRDS. M-701A (nightingale); M-701B (canary); M-701B (bird store); SQ-7836A (mockingbird); °SQ-7837A-B (linnets—larks—sparrows); °SQ-7870A (mourning dove, use also for owl); SQ-7814A-B (sea gulls); MAJ-4028A (screech owl); G-1337B (mockingbird); ST-164B (tropical)

BLIZZARD. °ST-552A (blizzard); SQ-7847A (howling wind)

BOATS

Bells. M-1006B (for'ard deck—bridge); M-1007A (ship's clock—deck bell)

Fishing. SQ-7814B (single cylinder); SQ-7843B (diesel)

Liner. (See also BOATS, WHISTLES) °ST-350A (ship engine room); SQ-7848B (sailing from pier); °ST-351B (bow wave, no engine, for deck scenes)

Motorboat. M-251B (large, start—run—stop); ST-351A (60-ft. diesel cruiser); ST-352B (start—run—stop); °SQ-7831A (25-ft., start—run—no stop); SQ-7872B (small, start—idle—run)

Outboard. M-251A (dingy, start—run—stop); ST-354A-B (start—run—stop, with and without muffler)

Whistles. M-253A (destroyer—steamship—tug—ferry); MAJ-4004A (all types); MAJ-5043B (9 different); ST-350B (liners—tugs); °SQ-7848A (liners—freighters)

BOOS. ST-258A (mixed crowd); ST-261B (boos and hisses)

BOWLING. MAJ-5054A (roll and strike, two alleys); ST-904B (52 alleys); °SQ-7919B (single alley)

BUGLE CALLS. M-1004A (U.S. Army); M-1005A (U.S. Army); M-1004B (British); M-1005B (U.S. Navy); °ST-400-401-402-403 (U.S. Army and Navy); °SQ-7866A (U.S. Army and Navy); °SQ-7867A-B (U.S. Army and Navy)

CALLIOPE. °MAJ-5012B (march); °MAJ-5013B (gladiators); °MAJ-5014B (waltz); °MAJ-5015B (march); °ST-411A (waltz—march); G-1201A-B (steam calliope)

CARNIVAL—MIDWAY. (See also AMUSEMENT CENTER) ST-260A (carnival and midway)

CARILLON. ST-418A-B; ST-421A-B; ST-424A-B (Various)

CAROUSEL. (See MERRY-GO-ROUND)

CATTLE. ST-157B (milking); °ST-152B (moo); MAJ-4005A (herd); ST-160B (cattle roundup); SQ-7858A (cows and calves); °SQ-7858B (range cattle); SQ-7881B (yearlings' bawl); SQ-7917B (moos)

CATS. SQ-7914A (yowl—purr); °ST-161A-B (various)

CHEERS. M-503B (large crowd, sustained); ST-251A-B (short and long bursts)

CHICKENS. °ST-152B (rooster crow); ST-157B (chicks); SQ-7840A (chickens and roosters); SQ-7915A (flock chickens); ST-164A (rooster)

CHILDREN. MAJ-4005B (playing, but hold to low level); °SQ-7869B (playground); ST-267A (in swimming pool)

CHOPPING TREE. °G-1054A (chop and tree fall); ST-924A (chop and tree fall)

CLOCKS. °M-1007B (house); °MAJ-5024A (house); SQ-7818A-B (house); ST-900A (house and cuckoo); °MAJ-5005B (Big Ben); ST-901B (Big Ben)

CONSTRUCTION

Manual. °SQ-7878A (hammer and saw—power-saw); °SQ-7931B (hammer and saw)

Mechanical. Any of the Speedy-Q or Standard effects are all right

CRASHES. °ST-453B (train); °ST-508B (bridge); °ST-204A (auto); SQ-7874B (auto); °M-206A (plane); ST-103B (plane); ST-104A (plane); °G-1054A (tree); °ST-924A (tree)

CRICKETS. MAJ-4022A (with frogs, hold to low level); SQ-7869A (with frogs); °SQ-7870B (several); SQ-7905B (one); SQ-7918B (one); SQ-7818A (one and one frog); °G-1179B (crickets and katydids)

CROWD. SQ-7806A (large); SQ-7807A (large); SQ-7807B (yells); MAJ-4005B (children); ST-263A-B (children); SQ-7869B (children); ST-259A (foreign); ST-258A (boos); °M-507A (mixed); ST-251A-B (applause and cheers); ST-262A-B (circus); ST-269A (small group women); ST-269B (mixed); M-502A (mixed social); M-503A (large sports); M-503B (cheers); °M-504A-B (mixed); M-505A-B (mixed laughs); °M-508A (angry mob); ST-252A (small conversational)

DOGS. °ST-150 (bark—growl); ST-152A (hounds); ST-157A (hounds); ST-162A (bark); °ST-202A (bark); MAJ-4027A (bark); MAJ-5026B (police dog); SQ-7834B (collie); SQ-7917A-B (barks); SQ-7905A (one dog howling and barking)

DRUMS. °SQ-7854A-B (jungle—war—ceremonial); G-1164B (African tom-toms)

EARTHQUAKE. °MAJ-5020A (also has avalanche and lava sounds)

EERIE SOUNDS. MAJ-4028A (animal cries); ST-258A-B (screams); SQ-7883A (Malayan pheasant); SQ-7901A (mournful wind); MAJ-4028A (screech owl); °MAJ-5026B (wolf howl); G-1074B (ape chatter); ST-910A-B (Hallowe'en effects)

ELECTRIC MOTORS. Any of the Standard 300 series are good

ELEPHANTS. G-1039 (has some echo); ST-163B (one—many)

ELEVATED TRAINS. °MAJ-5031B (arrive—depart)

ELEVATOR. SQ-7904B

EXPLOSIONS. °ST-500B (the best); SQ-7838B (slow .38-cal. pistol down to 33⅓); MAJ-5020A (for explosion in mine followed with avalanche)

FIRE. °MAJ-5023B (forest fire, may be used for any large fire); °SQ-7871A (building on fire)

FIRE ENGINE. M-270A-B (siren—bell—pumping—idle); M-271A-B; (passing); °SQ-7871B (arriving); SQ-7913 (arriving—leaving); °G-1109B (fire hose inside building)

FIREWORKS. °G-1084 (for firecrackers use inside cut and speed up table as fast as it will go); ST-929A-B (fireworks)

FOG HORN. SQ-7841A (has harbor background)

FROGS. SQ-7835A-B (small and bullfrogs); SQ-7869A (with crickets); SQ-7918A-B (single frog and cricket)

GONGS. M-1006A (1½-, 3-, and 5-ft. Chinese gongs)

HARBOR SOUNDS. M-253A (general confusion); °MAJ-5043A (dock sounds); °SQ-7814B (sea gulls and fishing boat); SQ-7841A and SQ-7842A (fog horns); SQ-7848B (boat sailing); SQ-7872A (general background)

HELICOPTER. ST-115A-B (various effects)

HOGS. ST-152A (with pigs); °G-1032A (with pigs)

HORSES. (If possible do manually) °ST-155B (whinny); °ST-155B (posse); °ST-159A (trotting); °ST-159B (gallop); SQ-7833A (horse and wagon); SQ-7883A (whinny); SQ-7916B (whinny and colt squeal)

HURDY-GURDY. (See STREET ORGAN)

INDIANS. °MAJ-5033A (war cries and dances); °ST-259B (chant and dance); SQ-7891B (war cries and shots)

INDUSTRIAL MACHINERY. MAJ-5044B (punch press); SQ-7931A (pneumatic-air chisel); check Standard Catalogue for other effects

JUNGLE. (See also under specific animals wanted) MAJ-4023B (birds); MAJ-5028B (drums); SQ-7909B (various animals)

LAUGHTER. MAJ-5002B (continuous, keep to low level); M-505A-B (mixed audience); °M-506A-B (mixed laughter); ST-251A (short bursts); °ST-271A (large audience)

LAVA. °MAJ-5020A (bubbling lava) (also has earthquake rumble and avalanche)

LEOPARD. SQ-7880B (snarl and roar)

LION. °MAJ-5018A (roar and snarl); °SQ-7820A-B (snarl and fight); SQ-7821A-B (roar); SQ-7880A (mountain lion or puma); SQ-7882A-B (lion and lioness roars); °ST-165A (roaring and snarling)

MACHINE GUN. MAJ-4003B (light Jap and .50-mm.); °ST-503A (in bursts); °ST-502A (French and German); SQ-7851A (.30-cal. U.S.)

MACHINERY. (See INDUSTRIAL MACHINERY)

MERRY-GO-ROUND. M-1010A (small); °MAJ-5055A (children's voices in BG); MAJ-5053A-B (check music clearance); °ST-412A-B; MAJ-5052A-B; ST-425A-B

MONKEY ORGAN. MAJ-5022A; G-1317B

MONKEYS. SQ-7880A (gibbons); G-1074B (gibbons); SQ-7883B (25 rhesus); °ST-165B (two—many)

MOTORCYCLES. SQ-7824B (with siren); SQ-7874B (with siren); °ST-207A (with and without siren)

MULES. °ST-152A (braying); SQ-7916A (braying)

MUSIC BOXES. M-1001A-B (large Swiss); °MAJ-5027A-B (small); °ST-408B (small)

NATIVES. ST-260B (African dance); ST-269A (mob); SQ-7854A-B (drums); °MAJ-5033A (Indians); °ST-259B (Indians)

NEWSPAPERS. ST-906B (office); SQ-7826A (printing press); ST-314A-B (presses); G-1168B (slow down to about 50 r.p.m.)

NIGHT NOISES. °SQ-7870A (use mourning dove for owl); ST-152B (wolf); °MAJ-5026B (wolf); MAJ-4028A (owl); °G-1182B (katydids and crickets); (see also CRICKETS)

OFFICE BACKGROUND. SQ-7879A (general confusion of machines and voices)

ORCHESTRA. ST-408A (tune-up—popular and classical)

OWL. SQ-7870A (use mourning dove); MAJ-4028A (screech owl)

PIANO. °MAJ-4029B (automatic with xylophone effect, keep to low level); °G-1192A-B (tin-pan piano)

PIPE ORGAN. °ST-415A-B; °ST-416A-B (funeral march—wedding march)

POLICE. °ST-206A-B (sirens and squad cars); SQ-7824A-B (motorcycles and squad cars); SQ-7874B (motorcycle and siren); °ST-207A (motorcycle and siren)

POOLROOM. ST-925A-B (with and without voices in BG)

PRINTING PRESSES. (See NEWSPAPERS)

RADIO. MAJ-5044A (squeal—static—shortwave); M-607A-B (code); °MAJ-5003B (code); ST-908A-B (code); °SQ-7855B (three different pitches); ST-908B (static); SQ-7895A (multiple code)

RAIN. °M-552A (steady rain); ST-553A (on pavement); ST-556A-B (on pavement)

REED ORGAN. ST-414A-B (old favorites—hymns)

RIVER. °SQ-7836B (babbling brook); °M-553A (rapids); SQ-7925A (backwash and eddy)

SAILING SHIP. Combine ST-351B (bow wave) and SQ-7847A (wind) and add wood creak manually

SAWING TREE. °G-1054B (cross-cut saw—with tree crash)

SCREAMS. °ST-258A (of terror, mixed voices); °ST-258B (woman screaming)

SEA GULLS. °SQ-7814A (feeding); SQ-7814B (fishing boat in BG); ST-158A (feeding, surf in BG)

SHEEP. SQ-7881A (large flock); ST-162B (large flock)

SHOTS. °MAJ-5007A (rifle and very good ricochets); °ST-503B (ricochets); °ST-507B (Western style); ST-508A (Western style); °SQ-7838A-B (very good continuous and cued shots)

SIREN. °ST-506B (air raid); ST-909A (air raid); MAJ-4023A (air raid); °ST-206A-B (police); °ST-207A (motorcycle); SQ-7824A (squad car); SQ-7824B (motorcycle)

STOCK-MARKET TICKER. ST-904A (continuous run)

STORM. °SQ-7847B (storm at sea); °ST-552A (blizzard); SQ-7860B and SQ-7911B (rain—wind—thunder)

STREET CARS. SQ-7808B (approach—stop—recede—pass); ST-457A-B (same)

STREET ORGAN. (hurdy-gurdy) M-1012A-B; °MAJ-5012A; °MAJ-5013A; °MAJ-5014A; °MAJ-5015A; G-1317A (see catalogues for tunes)

SUBWAY. °MAJ-5031A (express—local); to get effect of riding on subway, use MAJ-5008A rail clicks, feature the lows, and run through slight echo.

SURF. °M-551A (slight tide); °M-551B (rocky shore); ST-550A (high waves); ST-551A (rocky beach); ST-550B (medium tide); °ST-555A-B (light—heavy)

TANKS. °MAJ-5047A-B (various maneuvers); ST-513A (various maneuvers)

TELEGRAPH. °MAJ-5003B (key); °MAJ-5037B (battery of tickers); SQ-7828B (sounder)

TELEPHONE. (Best to use manual phone) °ST-902A (included here because it has hard-to-get pay-phone bells)

TELETYPE. °MAJ-5037B (receiver); °ST-301A (transmitter); SQ-7919A (one receiver at 60 words per minute)

THUNDER. °MAJ-4070A (easily cued, good reverberation); °ST-554B (single and continuous); °SQ-7910A (individual crashes)

TIGER. °MAJ-5018A (roar and snarl); SQ-7880B (snarl)

TRACTOR. SQ-7892A (diesel); SQ-7909A (diesel); ST-217A-B (caterpillar)

TRAFFIC. °SQ-7809A (best average traffic); MAJ-5005A (very heavy); SQ-7875A (traffic jam); SQ-7875B (heavy); G-1313A (Trafalgar Square, has foreign horns); °ST-213B (fast highway traffic passing by); ST-215A (heavy); ST-220 (foreign—Paris)

TRAINS. °ST-453B (crash); ST-461B (various effects); ST-465B (toy train)

Diesel. SQ-7810A (Super-Chief arrives and leaves); SQ-7811B (pass by); SQ-7893A (streamliner passes—arrives—leaves); ST-458B (arrive and depart); ST-463A (fast passenger train passes by)

Locomotive. °ST-454B (interior cab perspective); °ST-456A (interior cab perspective); °ST-456B (the first cut good for old-time train); °SQ-7865A-B (idle, this is a must for steam-train effects); SQ-7914B (heavy-duty gas engine, good for comedy train); °ST-466A (idle—steady run); °ST-466B (off, freight train passes by)

Rail Clicks. °MAJ-5008A (medium speed); °ST-455B (fast); SQ-7823B (slow); G-1181A (fast); °ST-462A-B (interior perspective)

Steam. ST-455A-B (arrive—leave); SQ-7810B (arrive—leave); °SQ-7811A (arrive—leave); SQ-7822A (arrive—leave); °SQ-7865A-B (idle); SQ-7823A (fast start); SQ-7893B (stand—start—leave); SQ-7894A (approach and pass); SQ-7894B (slow up-hill is good); °ST-458A (passenger); °ST-459A-B (passenger); °ST-460A-B (passenger—freight)

Terminal. M-407A (freight terminal); ST-453A (station BG); SQ-7922A (switch engine); ST-461A (freight-yard activity)

Whistles. M-407B (4 different); °MAJ-5008A (2 different); MAJ-5020B (various); ST-461A (5 different)

TYPEWRITER. (Best done manually.) °ST-301A-B (expert—hunt-and-peck); SQ-7828A (expert—amateur)

WAGON. SQ-7833A-B (hard and soft dirt road); SQ-7903A (use for stage-coach); °G-1179A (horse and buggy); ST-500A (artillery caissons, good for freight wagons)

WARFARE

Historic. M-801A (old-time rifles and cannon); SQ-7891A (medieval battle, no guns)

Modern. (See also tanks, shots, machine gun, airplanes) ST-510B (105-mm. gun); ST-511A (battle); °ST-511B (155-mm. howitzer); ST-512B (BAR, medium and .50-cal. machine gun); ST-513A (tanks); SQ-7851A (.30-cal. machine gun); °ST-514A-B (naval gunfire); ST-515A-B (naval fire—invasion landing); M-801B (battle); °MAJ-5011A (battle); °MAJ-5024B (16-in. naval gun); °MAJ-5024B (anti-aircraft); °MAJ-5045A (cannon); °MAJ-5048B (depth bomb); °MAJ-5048B (distant gun bursts); ST-506A (artillery); ST-509A (depth charge); ST-501A-B (battle)

WATER SOUNDS. °M-552B (lap and wash); M-553B (waterfall); °ST-551B (waterfall); SQ-7836A (brook); °M-553A (rapids); SQ-7847B (storm at sea); °M-551A-B (surf, rocky shore); ST-550A (light waves); SQ-7925A (backwash and eddy); ST-267A (children in pool); °ST-267B (diving); °ST-351B (bow wave of ship)

WESTERN EFFECTS. (See horses; cattle; shots; Indians; wagon; wolf; night noises; piano, tin-pan)

WIND. ST-552B (high velocity); SQ-7847A-B (blizzard); ST-552A (blizzard); SQ-7901A (low mournful); SQ-7802A-B (high, sharp, and low pitch); M-554A (mournful); G-1163A (howling)

WIRE-PHOTO MACHINE. °MAJ-5038A

WOLF. ST-152B (repeated howls); °MAJ-5026B (howl—howl and bark)

In the foregoing list many factors were taken into consideration. Between two equally satisfactory effects, a choice was made as to which had the least surface noise, most faithful reproduction, best definition, least bass rumble, and general over-all desirability. The object of listing

several effects under each type was to offer the buyer an opportunity to check the reverse side of the record and in that way augment the record library with additional effects.

In ordering be sure that both sides of a record are not needed at the same time. To go back to the SQ-7906 automobile for a moment: if a sequence calls for the car to start, idle during five speeches, then start and run continuously, one record will not give this effect. The 7906 B

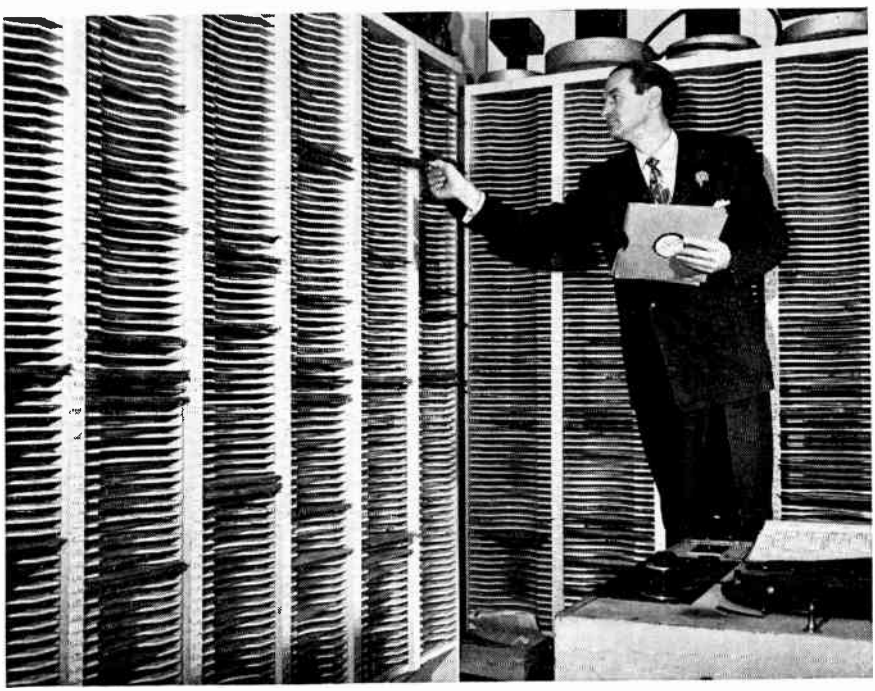


FIGURE 17. *Soundman Ed Ludes selecting records from the well-stocked sound-effects library at NBC, Hollywood. (Courtesy of National Broadcasting Company.)*

side has the start and idle, the A side has start and run, but no idle. In a case like this, two records are needed, the B side to start and idle, then a segue to a second 7906 A side for shift of gears and run.

As soon as you get a record, try it at various speeds and with various filter settings. See if you can't find some other effect on that record. A creative soundman is never limited by the labels on records.

With nominal care records will last a long time and give good service. If the record library permits, use one set of records for rehearsals, and save duplicate records for air shows. Always keep records in the dust

jackets when not in use. If it is necessary to mark an inset on a record, use a Blaisdel grease pencil or a red china-marking pencil. Never use chalk; it crumbles and the dust gets down in the grooves, causing an unpleasant gritty sound.

Although recorded sound effects lack the flexibility and personal element of manual effects, the clever and imaginative soundman can create really amazing illusions by the adroit use of filters, variable speeds, and the blending of records.

Here are the names and addresses of the leading manufacturers of commercial sound-effects records. Each maker sells a double-faced 10-in. disc at between $1.50 and $3.00. The discs are recorded at 78 r.p.m.

STANDARD SUPER SOUND EFFECTS

140 North LaBrea Avenue
Hollywood 36, California

360 North Michigan Avenue
Chicago 1, Illinois

1 East 54th Street
New York City 22, N. Y.

MAJOR RECORDS

Thomas J. Valentino, Inc.
150 West 46th Street
New York City 19, N. Y.

National Hollywood Recording
1475 El Mirador Drive
Pasadena 2, California

GENNETT ELECTRICAL TRANSCRIPTIONS

1344 So. Flower Street
Los Angeles 15, Calif.

67 West 44th Street
New York City 18, N. Y.

South 1st and B Streets
Richmond, Indiana

MASQUE SOUND AND RECORDING CORP.

331 West 51st Street
New York City 19, N. Y.

SPEEDY-Q SOUND EFFECTS

Starr Piano Company
1344 So. Flower Street
Los Angeles 15, Calif.

Charles Mickelson, Inc.
25 West 47th Street
New York City 19, N. Y.

Starr Piano Co.
South 1st and B Streets
Richmond, Indiana

CHAPTER EIGHT

Electronic and Acoustical Effects

AN ELECTRONIC SOUND is one made by an electric impulse or operating on an electrical circuit. Acoustical sounds are those whose quality or characteristics are varied by the acoustical conditions under which they are produced.

Electronic sounds include electric motors of all sizes, electrically operated horns, vibrators, bells, chimes, buzzers, telephone and telegraph keys, fans, sirens, variable audio-frequency units (filters), keyed oscillators, and thunder screens.

Of the electronic devices, the variable audio-frequency or filter is probably used the most. Simply stated, it is an electrical device used to change tone characteristics by selective elimination of frequencies, the same thing, actually, as the high- or low-pitch control on your home radio. In radio drama the filter may be used in two ways, to produce a more natural sounding effect, and, conversely, to give a sound a supernatural quality.

The filter is plugged into a mike circuit by the control-room engineer (mixer), and all sounds coming over that particular mike can then have the highs or lows eliminated to the degree desired. In the naturalistic category, filters are used to give the effect of sounds presumably coming over a radio, telephone, phonograph, police broadcast, or intercommunication system. Voices sound different over a telephone because the phone does not reproduce *all* the frequencies. By sending the voice through a filter, the high and low frequencies can be cut down and a telephone effect achieved.

In the early days of radio, the telephone, radio, and police call effects were made by muffling the speaker's voice with reversed megaphones,

pans, wash tubs, glass tumblers, and the like. At best these were poor substitutes for a telephone circuit. Eventually, as experts entered the sound field, it was discovered that the telephonic effect was not muffled, but incomplete or filtered. A microphone circuit with the highs and lows filtered out, leaving only a narrow center band, gave the illusion wanted. In consequence, an acoustical strainer or filter was developed. By the elimination and/or blending of various high and low frequencies, radio speakers, telephones, phonographs, police calls or intercommunication systems became realistic sounding. Almost invariably the operation of the electronic filter is left entirely to the control-room engineer.

FIGURE 18. *One of the first devices used to get a realistic "filtered" telephone effect. The actor spoke into the hand-held phone instead of speaking into a filtered cast mike. (Courtesy of National Broadcasting Company.)*

In the supernaturalistic use of the filter, the goal is not realism but to give the illusion of ghosts, invisible people, God, inner voices, supernatural beings, and the voice of conscience. Mainly this technique is employed for stream-of-consciousness dialogue. You have heard it many times, especially on the soap operas. The heroine is burdened down by twenty-seven assorted catastrophes, and for three pages she wrestles with her soul (on filter) while the organist plays softly in a minor key with occasional pertinent "stings." Two factors have made these "washboard weepers" possible: the sponsor, of course, and the use of the filter in exposing the inner agony of the harassed principals.

Telephones are used constantly in radio plays, and can be reproduced successfully only by—a telephone. But a telephone is a two-way proposi-

tion; a completed connection has two ends, the one where the person on mike is, and the one at the other end of the line. A regular phone is used for sound effects at "this" end, while a phone box, described below, simulates the sound at the other end. There are many kinds of phones, and the well-equipped sound department has all types. There is the old-style upright desk phone, the hand set or French phone, the pay phone, intercom's, and the old party-line hand-cranked phone. And of course there are phones with and without dials. From the script the soundman hand-cranked, may be obtained from the local telephone company on a determines which type is needed. The phones mentioned, except the memorandum receipt.

The phone box is made by some gifted craftsman in the sound department. It generally consists of a box about a foot square and contains all the sounds needed for phone effects, both on mike and over the wire. Mounted on top of the box is a hand set dial phone. A compact phone box is battery operated and so wired that it will give the following effects: on-mike bell ring; on the filtered or other end of the line, ringing signal, busy signal, and the click of the phone picked up or hung up. These sounds are controlled by small push buttons appropriately marked. For the other-end sounds, the receiver is held close to the mike because the sounds are low in volume. The rhythm and timing of the effects depend upon the imagination of the soundman. The phone box has nothing to do with the dialogue of the telephone conversation. That is supplied by actors, the one "at this end" speaking into a regular mike, the one "at the other end" talking over a filter mike.

A telephone signal is composed of two bells of slightly different tone, and may be simulated by using two different door bells. The setup may be arranged for both phone and door-bell effects. Simply line up the two bells close together so that the clapper of one bell will strike both gongs. By placing the push buttons in proper relation to the battery and the respective bells, one button will activate the single door bell, the other button will activate the clapper striking both bells, thus giving the telephone ring. It is a good idea to mount the bells on heavy felt or sponge rubber in order to avoid the heavy resonance of a wooden surface. The next time you hear a telephone ring, listen for the two tones.

Other electronic devices, such as horns, bells, chimes, buzzers, sirens, and equipment of that type, are either operated on a dry-cell battery or plugged into an a-c circuit. Small electric motors equipped with rheostats are placed close to the mike to simulate the sound of elevators, dynamos, submarine engines, and various electrical equipment. A vibra-

tor may be used for special effects; its first use in radio was for simulating airplane motors. The rubber tip was pressed against a small drum or tom-tom, and, presto! an airplane! Walter Winchell uses a battery of

FIGURE 19. *Soundman Edward Wojtal striking a thunder spring. The spring is attached to a contact mike and fed to a speaker. At the upper left is a wind machine and on the right a rain machine. (Courtesy of Columbia Broadcasting System.)*

telegraphic keys and oscillators to dramatize his news, while a "bug" is used in sending out a radio signal for Jimmy Fidler's Hollywood gossip session.

The thunder screen is an audio-frequency effect that is most realistic sounding. It consists of tightly stretched copper screening within an

upright frame of two-by-four's approximately three by five feet. A magnetic phonograph pickup is mounted on the crosspiece above the screen. One end of a piece of wire spring is soldered directly to the screen and the other end is inserted into the needle hole of the phonograph pickup. Striking the screen with a padded stick (a timpani mallet is good) causes it to vibrate. These vibrations are transmitted through the spring wire to the pickup, and the output amplified and sent into the studio by a loudspeaker, then picked up on a studio mike. The screen must be very tight and the pickup head solidly mounted. A more natural effect is achieved if the screen is struck a solid blow, then followed by several lighter taps with the timpani mallet. This gives the tapering-off effect of a thunder crash. Explosions may also be made on the thunder screen.

Another electronic device that is used most effectively in radio drama is known commercially as the Sonovox. The "Beeeeee-Ohhhhh" foghorn of the Lifebuoy soap signature, and Bromo-Seltzer's "Fight headaches three ways, Bromo-Seltzer, Bromo-Seltzer, Bromo-Seltzer" whistle and train commercial signature are produced with Sonovox. It is an amazing instrument that makes animals speak, trains talk, and machinery sing. Ordinary speech is caused by two things: the buzz or hum made in the throat by air passing through the vocal cords, and the modification of this buzz or hum in the mouth by the palate, tongue, lips, and teeth. These modifications in the mouth form the actual syllables which in turn make the words of articulate speech. The inventor of Sonovox, Gilbert Wright, took this knowledge and developed the Sonovox by replacing the human buzz in the throat with a mechanical one.

With Sonovox any sound may be transmitted through the walls of a human throat and in turn articulated into words by the operator's lips and tongue. In the case of the Lifebuoy foghorn, the recorded "voice" of the foghorn comes out of the mouth of the operator or "articulator." While the Sonovox instrument transmits the recorded sound to her throat, the articulator forms the "Beeeeeee-Ohhhhh" silently, and the mouth cavity, acting as a loudspeaker, enables the sound to be heard.

Here is an example of the use of Sonovox. In a radio drama a character has sabotaged a plane, causing it to crash. His conscience plagues him, and his feeling of guilt is dramatized by the sound of a plane motor conking out, then the whine of the falling plane. A record of a plane conking out and falling is played. The sound waves from the turntable are fed through wires to two Sonovox instruments that look like large earphones. A Sonovox articulator presses the "earphones" to her larynx. The plane sounds are then transmitted through the walls of her throat to

her mouth cavity. The articulator forms the words, "Why did you do it? Why did you do it?" or "You killed him! You killed him!" by silent lip and tongue movement. What emerges from the articulator's mouth are her words in the tones or sound of the airplane. The articulator's own voice isn't evident in the results; it is not used. A man and woman sound

FIGURE 20. *The articulator at the right is forming the words of the Bromo-Seltzer commercial with the aid of Sonovox. The source of the train sounds is on the record in the foreground. Carleton Young and Marian Shockley at left. (Courtesy of Wright-Sonovox, Inc.)*

the same on Sonovox because they merely form the words; the desired sound supplies the "voice."

Sonovox is not used so much in radio now as in motion pictures. It is obtainable by the week on a lease basis, and only trained articulators are used. These girls are trained for at least six months, most of that time being spent on proper articulation and overcoming any dialects. Sonovox can be used with a contact mike as well as recorded effects. A contact mike picks up vibrations directly from a vibrating surface, in contrast to other types of mikes that pick up vibrations through the air. If the basic sound used in a Sonovox sequence were a squeaky door, a contact

mike would be placed directly against the surface of the door, thus picking up the vibrations of the squeak.

Another electronic instrument used in radio is a device called Sono-shot, manufactured by Aeronics, Inc., of New York. The Sono-shot electronically simulates the sound of pistol shots by firing shotgun primers. The primers are fired by firing pins actuated by electric solenoids. The heart of the device is a step relay which allows the ten solenoids to be

FIGURE 21. *Aeronic's Sono-shot, an instrument that simulates live gunshots by electronically firing shotgun primers. (Courtesy of Aeronics, Inc., of New York.)*

energized in proper sequence with the use of the pistol-grip switch. A series of electromagnetic relays provides for the proper timing of the solenoid action and automatic reset of the mechanism for subsequent firing with the next pull of the trigger.

A full load consists of thirty shots which are fired in banks of ten. These may be fired as fast as the operator can pull the trigger of the pistol-handle switch. When the first bank of ten shots has been fired, the following bank of ten shots may be set in firing position in about two seconds.

The advantages of the Sono-shot is that it has thirty shots, eliminates the danger of flash burns, reduces misfires and cartridge jamming, is fast firing, and may be fired from remote locations in the studio. The latter is important because it permits the placement of the instrument in a favorable acoustical position. It is priced at $340, f.o.b. New York City.

Now for the acoustical field. As stated in the beginning of this chapter, an acoustical effect is one where the character and quality of sound is varied by the acoustic conditions under which it is produced. A sound generated in a radio studio is eventually heard by the home listener over his loudspeaker. But that sound did not travel directly from its source into a microphone; it was picked up by the microphone from several places or directions simultaneously.

Most of a broadcast sound, say a gunshot or a door slam, comes from the original source. The rest of that same sound comes from the ceiling, the side walls, and the floor of the studio in several waves or reflections from those surfaces. In a room that has hard-finished walls, ceilings, and floors, the original sound wave can reflect several times from these non-absorbent surfaces before dying out. In an especially "live" studio, a single sound may persist by reverberation for five or six seconds. This excessive reverberation makes for trouble because of the unnatural effect.

As a remedy, sound-absorbing materials are placed on the wall and ceiling surfaces of the studio. These materials in the early days of radio consisted of monk's cloth or heavy draperies and wires strung about the ceiling. The high-frequency sounds were absorbed all right, but those in the lower register were not affected and thus were grossly over-emphasized. The current trend is to build into the wall surfaces some soft fibrous vegetable or mineral composition. Another technique is to eliminate flat parallel surfaces. Studio walls are now built in a series of curved or saw-toothed planes which tend to break up the sound-wave reflections and thus cut down the reverberations. Instead of being reflected in parallel lines, the sound waves are diffused throughout the studio. A period of reverberation from 0.8 to 1.2 seconds is tolerable for a studio. If the period is greater, the studio is too live. If the period is less, the studio is dead; the sounds die out too soon. Some very careful figuring has to be done by an acoustical engineer in order to design an acoustically perfect studio.

Because of the above factors, the acoustics of a studio have an important bearing on the placement of the sound effects and the arrangement of sound mikes, and on how sounds will reproduce. Sometimes in order to vary the acoustics it is necessary for the soundman to set up a series of

large screens to achieve separation from the cast and orchestra, or to reduce reverberations, and at other times an asbestos-lined box must be used for certain gunshots because of the acoustics of the studio.

Gunshots are often an acoustical problem. For several years we did a horse opera in which of course there were a great number of gunshots. By experimentation twenty-two-caliber guns were chosen as best suited to the acoustics of the studio. Thirty-twos, thirty-eights, and even forty-fives had been tried. These twenty-twos use a special motion-picture blank that has a double charge. After moving to a new building with scientifically designed studios, the sound department received a letter. It was from an out-of-town listener who was a crank on guns; he collected them, loaded his own shells, and so on. He was glad that we had finally gotten on the ball and were now using man-sized guns; he could tell by the sound that they were forty-fours. The sound department thanked him for his interest, and said they were most happy that at last he was satisfied with the shots. Of course no mention was made of the fact that the lowly twenty-twos were still being used. The shots did sound "bigger," but only because of the different acoustics in the new studios.

The prime use of acoustics, however, is in the operation of the echo chamber. Before discussing this device, it might be wise to distinguish between reverberation and echo. Reverberation is the successive reflections or returns of a sound at intervals too short for the ear to distinguish, hence the sound seems continuous but decreasing in intensity. It is a sound that seems to "linger." Echo is the reflection or return of a sound *after a short period of silence.*

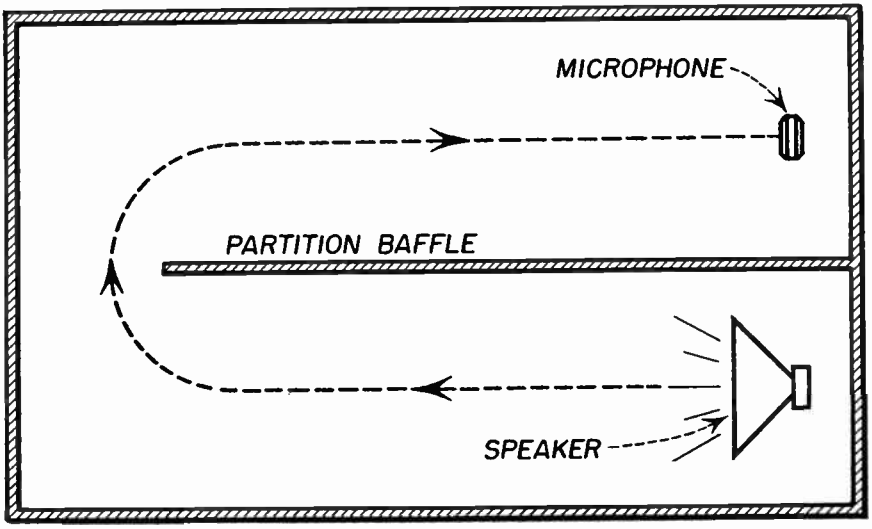
The echo chamber is used to set a scene in a specific locale such as a cave, canyon, large hall, courtroom, or any place that calls for sound in a large enclosed space.

The echo chamber can be made in several dimensions and shapes. A good echo chamber is a long narrow room, approximately three feet wide, about six feet high and thirty feet long and closed at each end. The chamber is insulated against all outside sounds and the interior walls are finished in a hard smooth surface that has a high degree of reflection. At one end is a loudspeaker, at the other a microphone.

The control room engineer plugs in lines leading to and from the echo chamber. The sound that is to be "echoed" is picked up on a studio mike, amplified, and then sent to the *speaker* in the echo chamber. The sound sent out from the loudspeaker reverberates off the hard walls of the floor, ceiling, and walls as it travels down the narrow room to the *microphone* at the other end. There it is picked up by the mike and sent back to the

engineer's control panel. The job of the echo chamber is to add reverberation and time lag to the initial sound. Part of the original sound goes directly on the air; the other part, the echo, has reverberation added to it by its trip through the chamber and goes on the air a fraction of a second later—thus a sound and its echo.

A room of limited length can be used by placing a baffle in the center running along the length of the room. The baffle is not quite as long as the room; it starts from one end wall, but does not reach the wall at the other end. The room is thus divided into two sections each having half the width of the room, and connected by an opening in the baffle at one



ECHO CHAMBER

end. The microphone is placed in one section and the speaker in the other, both at the opposite end from the opening in the baffle. The sound must then travel down one section, through the opening, and back along the other section to reach the microphone from the speaker. Thus although the room is small, it has a sound path equivalent to twice its length.

Echo may be used for different effects. Straight echo gives the sound of a large enclosed area, such as an auditorium or cave. If supported and identified by dialogue, echo may give a feeling of vast cosmic space. Echo combined with filter gives an insecure, eerie, disembodied effect. A very heavy echo has a tendency to produce a Godlike quality; the feeling of an all-enveloping presence.

In the absence of an echo chamber an echo effect may be simulated

by using a grand piano. A dynamic microphone is placed face down over the holes of the sounding board. The sustain pedal is held down, leaving the strings free. With the top of the piano half open, the voice or sound effects are directed into the piano toward the strings. The strings of the piano vibrate freely with the sound and continue for a short period afterwards, thus simulating an echo.

Echo effects can also be achieved on recordings, but it is necessary to have two pickups or tone arms, and a separate volume control for each arm. Double-arm the two pickups on one record, that is, arrange the equipment so that the two pickups can play the same record at the same time, and so that the two pickup heads are as close together as possible. Select the particular groove wherein the desired sound is located, and place the needles of both pickups in the same groove. Be sure they are in the same groove, or the time lag will be too great.

The head which will play the sound first should be set at the volume desired for the initial sound. The second pickup head will play the sound a fraction of a second later, i.e., will be the echo. If full echo is wanted, set the volume of the second pickup at almost the same level as the first. If a more distant echo is desired, set the second level a little lower.

This technique is seldom used in commercial radio. It is much simpler to use the original sound on record and feed through an echo chamber. However, the amateur or group that does not have an echo chamber may use this method to great advantage in getting echo effects on recorded sounds. For manual or vocal sounds, use the piano method.

Although a soundman uses many electronic and acoustical effects, the use of echo and filter are under the direct control of the control-room engineer and not the soundman.

CHAPTER NINE

Special Uses of Sound

IN GENERAL, sound effects are used to help create and heighten the action, mood, and atmosphere of radio drama. In addition to this general use, however, there are three ways in which sound may be used as an integral part of the drama form itself. These are: as a signature; as the dominant and unifying motif of a montage; and as a means of transition.

A *signature* is defined in the glossary as the theme song, musical phrase, sound, or catch phrase that identifies a special program. Here we are concerned only with sound signatures, such as the footsteps and foghorn at the open and close of *Bulldog Drummond*, or the racket of guns, cars, police whistles, and sirens that opens a *Gangbusters* program. There are many more. The sounds in these signatures are detached from the regular drama and are used as an aid in the positive and colorful identification of the program. Sound in signatures becomes a definite part of the format.

A *montage* consists of a succession of very short scenes that quickly cover a considerable period of time or forcibly develop plot. It is a fast-paced device that covers expository material in a rapid, concise, and dramatic manner. Montages generally use music as the unifying thread that holds the rapidly succeeding scenes together. However, here is an example of a montage using sound effects as the connecting medium. The program is concerned with the conflict between two gangster mobs. Violence is expected to break out at any moment, when suddenly:

SOUND: SPEEDING CAR: ON CUE MACHINE-GUN CHATTER

VOICE 1: (CUE) Yah, that got 'em!

VOICE 2: Come on, let's get outta here!

VOICE 1: Okay, an' just wait 'til the chief hears about this!

SOUND: SWELL CAR BRIEFLY THEN FAST CROSS FADE TO RUNNING DIRT FOOTSTEPS

MAC: (CUE) Step on it, Pete! That stuff'll go off any second!

PETE: I know! I'm running, ain't I?

MAC: When that nitro takes off. . . .

SOUND: TERRIFIC EXPLOSION SLIGHTLY OFF: AS DEBRIS FALLS CROSS-FADE TO SLOW CAUTIOUS STEPS ON CEMENT

VOICE 1: (CUE) Easy now. They're just around this corner.

VOICE 2: Yeah, keep your shirt on!

VOICE 1: When I see . . . There they are! Let 'em have it!

SOUND: HALF A DOZEN FAST LIVE SHOTS

The above montage consists of three very short scenes. Each takes place at a different time and in a different locale, not necessarily established. The sudden violence is clearly indicated to the listening audience and sets up the following scene which continues with the story line. You will note that each scene consisted of but three short lines and a sound effect. Yet all the horror and brutality packed into this forty-second montage is as much as could have been achieved by five pages of script. And besides, the montage has much more impact because of its brevity and "build."

Here is a montage consisting of sound only.

GLENN: So Carson said that, eh? Well, I swear I'll find him, if it takes me the rest of my life!

SOUND: TRAIN WHISTLE AND FAST RAIL CLICKS—CROSS-FADE TO SPEEDING CAR: SWELL BRIEFLY THEN X-FADE TO AIRPLANE IN FLIGHT: HOLD, THEN BOARD-FADE INTO GALLOPING HORSE: BRING UP, THEN X-FADE TO PADDLING CANOE: ON CUE BOARD-FADE INTO SLOW DIRT STEPS: ON CUE BRING TO SLOW STOP

GLENN: (CUE) (HARD AND COLD) It's taken a long time, Carson, but I've got you now!

The brief uses of different kinds of transportation sounds clearly indicated the search that Glenn made for Carson. Within a matter of

seconds the feeling of all the time taken in a search as extensive as this is established. It must be admitted though, that a montage is usually done with music rather than sound as the unifying element.

The third special use of sound is in *transitions*. A brief discussion here of transitions is necessary to show what they are and how they are used. There are four types: pause, narration, music, and sound.

The radio drama tells a complete story in a very brief period of time, therefore of necessity it generally consists of several relatively short scenes. To just end a scene and start the following without some means of indicating a break between would be most confusing to the listener. Hence the bridge or transition has been developed to act as a curtain between scenes, with the additional advantage of being able to set the time, locale, or mood of the following scene.

Here is an example of the pause transition.

CARL: Okay—okay, if that's the way you feel about it! But I'll bet anything you want that Jimmie will go to Mr. Jones and spill the works. (START FADE) In fact I'm pretty sure that he's probably there now . . . (OUT)

(BOARD FADE OUT)

JONES: (CUE) (FADE IN) Hmmmmmm. This is an interesting revelation, Jimmie. I'm only sorry that you didn't come to me sooner.

You will note that the setting of the new scene is established or suggested in the closing words of the old scene. A disadvantage of this type of transition is that it does not definitely curtain the preceding scene as can be done with sound or music. Dialogue has to be specially written for the fades because a good portion of the words are too low in volume (being faded in or out) to be readily heard. Thus if they are lost, the continuity is not affected. The words at the beginning of the fades are in a sense throwaway words. The advantage of a pause transition is that no unnatural elements such as music, narration, or sound are introduced. It is also much less expensive than a live musical transition.

The second type of transition is narration.

SMITH: Treat me like that, will he? I'll show him! I'll take the company car and by good hard driving I ought to be in Centerville in two days, and then we'll see who's boss!

NARR: So with murder in his heart, old Bill Smith set out for Centerville. Two days later, tired and disheveled, he walked into the Manager's office.

MGR: Smith! What in the world are you doing here?

In this type of transition, the narrator sets the scene and bridges the time gap with a few explanatory words. The narrator can act as a very fast and malleable transition device, but his intrusion during a story from time to time has a tendency to destroy the illusion of reality. The main advantage of the narration transition is speed.

The most common and generally speaking the most satisfactory transition is done with music. In a script it is indicated by the underscored words.

MUSIC: BRIDGE

MOTHER: Janet darling, I know you and Bob will be very happy!

JANET: I hope so, Mother, but I wish the wedding weren't so soon. Somehow I just don't feel too sure!

MUSIC: SNEAK UNCERTAIN FEELING THEN SEGUE TO WEDDING MARCH

MINISTER: Dearly Beloved, we are gathered here . . .

The change in locale is established by the context of the dialogue, aided by the mood of the music. The chief advantage of the music transition is that it provides a real curtain or conclusion to a scene. Properly scored music also can end a scene in the right mood, then segue to the emotional feel of the following scene. Musical transitions are especially good where the change from one scene to another is primarily in mood or emotion, rather than just locale. The unfavorable aspects of music used as a bridge are that it introduces an unnatural element and that it is the most expensive type of transition used in radio. The use of an organist or orchestra hits the budget hard.

The fourth type of transition is done with sound effects. The sounds are either cross-faded, board-faded, or studio-faded. Check the glossary for definitions of these fades.

To illustrate the use of sound in transitions here is a seven-minute sketch that was part of the Navy Day broadcast over the Mutual Broadcasting System on October 27, 1946. This portion of the Navy Day broadcast originated in Hollywood, starred Henry Fonda and Gene Kelly, and was written and directed by Larry Hayes. Please note that the shifting back and forth in time and locale has been adroitly handled by the use of sound as the medium of transition. Here is the complete Hollywood portion of the broadcast.

FIGURE 22. *General view of* The Whistler. *Soundman Berne Surrey is in the upper left-hand corner. (Courtesy of Columbia Broadcasting System.)*

NAVY DAY BROADCAST

"THE NAVY CROSS"

4:30 — 5:00 PM PST OCTOBER 27, 1946

MUTUAL BROADCASTING SYSTEM

SOUND: FOOTSTEPS ON CONCRETE, UP STEPS, ACROSS PORCH AND KNOCK ON DOOR

JERRY: (OFF MIKE) Come in.

SOUND: DOOR OPENS . . . FOOTSTEPS INTO ROOM . . . DOOR CLOSED

JERRY: (STILL OFF) Who's that?

MAC: It's me, Jerry, Bill McDowell.

JERRY: (OFF) Hiya, Captain . . . come on in, I'm in my room.

SOUND: FOOTSTEPS ON MIKE

MAC: What're you doin' in bed, Jerry?

JERRY: (FADING IN) Got the mumps . . . did ya go to the ceremony, (STEPS STOP) Mac? Did ya see Mom get Joe's Navy Cross?

MAC: Yes, Jerry, I was there. . . . Your mother home yet?

JERRY: No . . . she oughta be here soon. Gee whiz, I would have to get the mumps and miss the ceremony.

MAC: (LAUGHS)

JERRY: Mac, what does posthumously, mean?

MAC: Posthumously . . . means awarding a medal after death.

JERRY: Oh . . . Did Mom cry, Mac? Did she? She was afraid she would.

MAC: No, Jerry, she didn't cry.

JERRY: A good spud, hunh? Lots of moxy . . . she's Navy.

JOE: (ON ECHO) Navy. That kid brother of mine's got a lotta pride, Mac.

JERRY: My brother was a hero, wasn't he, Mac?

MAC: Yeah, mate, he was a hero . . . sure he was.

JOE: (ECHO) Don't tell him that, Mac, don't put any tin-god ideas in his head.

JERRY: An ace . . . he was an ace . . . flew SB2C's . . . just like this one.

JOE: (ECHO) Look at it, Mac . . . a model of a Helldiver . . . just like mine . . . shiny, no holes . . . just like mine before I . . .

MAC: Where'd you get this?

JERRY: I made it. It's just like the one in Joe's picture up there . . . that's what I'm gonna fly when I grow up.

MAC: Sure . . . sure you will.

JERRY: Mac, tell me what happened . . . that day Joe won the Navy Cross.

MAC: All right, Jerry . . . I'll tell you . . . I'll tell you . . . I'd like to tell somebody . . . everybody, about your brother, Joe.

JOE: (ECHO) Not about me, Mac . . . about the war . . . the rest of the Navy, and your Marine Corps . . . and the Army and the enemy. If you can figure out why wars are hatched up, tell him that, too . . . not about me.

JERRY: You were the Captain of the Marine Detachment on Joe's Carrier, weren't you?

JOE: (ECHO) Joe's Carrier . . . you'd think I owned the whole darn Navy to hear that kid talk.

MAC: Yeah, Jerry, he had the top bunk, I had the bottom . . . Stateroom 342. . . .

JERRY: Starboard side, just above the hanger deck!

MAC: Yeah . . . they were revving up the whole shebang, four squadrons the night before the strike when I came off watch. Joe was sittin' at the desk (FADE) when I came in. He looked up . . .

SOUND: ANTICIPATE AND HOLD UNDER: MANY PLANES STARTING AND WARMING UP OFF MIKE

JOE: (NO ECHO NOW) Hello, Mac, off watch already?

MAC: Yeah . . . til midnight. . . . What're you doin', Joe?

JOE: Writing a letter to Jerry, my kid brother. How's the weather top side?

MAC: Beautiful, full moon. . . .

JOE: Invitation to the enemy, eh?

MAC: Roger . . . the old man's pacing the bridge.

JOE: Itchy, hunh?

MAC: Like he was wearing red flannels.

JOE: Got a right to be . . . if an enemy patrol spotted us tonight, it'd throw a kink in our surprise raid tomorrow.

MAC: You going?

JOE: Wouldn't miss it. We can break their backs with this one, if we hit 'em right.

MAC: Sounds big.

JOE: It will be.

MAC: Might get a little rough.

JOE: That's for sure . . . you might have an empty bunk tomorrow night.

MAC: Empty bunk!

SOUND: TAKE PLANES DOWN FOR: STUDIO FADE AND CUT CUE BOARD FADE IN ON

MAC: (CUE) Your brother was like that, Jerry. I think he knew he was going on his last strike the next day.

JERRY: How did he know?

MAC: That's one I can't answer, Mate. When he came out of the ready room next morning, I met him at the top of the ladder.

SOUND: ANTICIPATE HUM OF ENGINES WELL B.G. . . . STEPS ON STEEL LADDER FADE IN

MAC: (CUE) Hello, Joe . . . got time for a cup of coffee?

SOUND: FOOTSTEPS . . . WALK SHORT DISTANCE . . . STOP . . . CUPS . . . POUR COFFEE . . . FOOTSTEPS TO TABLE AND SIT DOWN . . . DRINK COFFEE . . . ALL UNDER FOLLOWING DIALOGUE

MAC: How was the briefing?

JOE: It's bigger than I thought.

MAC: Yeah, like what?

JOE: Jap fleet steaming south, heavy task force, three carriers and full escort. BB's, Cruisers, Cans . . . the works.

MAC: Far?

JOE: No . . . we'll hit 'em at 0940, according to the time table . . . by the way, will you mail that letter to Jerry for me?

MAC: Oh sure, sure.

JOE: THANKS.

SOUND: BOARD FADE OUT ON ENGINES AND CUPS (STUDIO OUT) . . . FADE IN ON . . . PLANES TAKING OFF ONE AT A TIME UNDER FOLLOWING SPEECH

MAC: I went up to the flying bridge to watch the take-off . . . Joe was just dropping into the cockpit, his gunner was in and ready. Joe looked up to where I was, waved that lanky hand of his, signaled to the plane handlers . . . they pulled his chocks and he gunned her. His prop whined and he was gone.

SOUND: FADE PLANES AND CROSS FADE INTO ONE MAN'S STEPS ON STEEL LADDER

MAC: At 0940 I dropped into a chair in the communications center next to the fighter-director. (TO FIGHTER-DIRECTOR) They over the target yet? . . . He just nodded, handed me his phone and picked up another one. I put it to my ear just in time to hear . . .

SOUND: PLANE MOTOR LIGHT ON FILTER UNDER

JOE: (FILTER) Bearcat Five to Whitetail . . . Bearcat Five to Whitetail . . . over the target . . . going down.

MAC: (TO HIMSELF) Joe . . . it was Joe, going into his dive. Give it to 'em, kid!

SOUND: PLANE GOES INTO A WHINING DIVE (ON FILTER)

MAC: (CUE) Drop 'em, Joe. . . . Drop 'em and pull out!
JOE: (FILTER) Bombs away!

SOUND: PLANE PULLS OUT . . . LEVEL OFF AND KEEP PLANE ENGINES UNDER . . . OFF EXPLOSION . . . (ALL ON FILTER)

MAC: Good boy!

JOE: (FILTER) Direct hit on enemy carrier, island damaged, flight deck afire . . . Going in to strafe.

MAC: Going back in . . . the fighter-director grinned at me . . . Joe was going back down the mouth of those Jap antiaircraft guns . . . a sky full of lead . . . then I heard it!

SOUND: SMALL EXPLOSION ON FILTER

MAC: Sounded like Joe was in trouble . . . I waited for his voice. Ages . . . then . . .

JOE: (FILTER) Bearcat Five to Whitetail . . . Show's over for us. My gunner's dead . . . Instruments shot up . . . gas gauge shows empty . . .

MAC: Keep her nose up, Joe . . . keep comin' . . .

JOE: (FILTER) My legs are no good . . . motor's conkin' out . . . I've weaned her . . . losing altitude . . . goin' in . . .

SOUND: (ON FILTER) PLANE MOTOR CONKS OUT . . . HOLD WIND ON WINGS

MAC: Keep talkin', Joe . . . keep talkin' . . .

JOE: (FILTER) Goin' downhill . . . like a sleigh-ride . . . wide open . . . like a . . .

SOUND: (ON FILTER) PLANE HITS WATER THEN CUT ALL SOUND

MAC: JOE!

(PAUSE)

MAC: (CUE) That's the story, Jerry.

JERRY: The paper said . . .

MAC: Yeah, mate. I read it . . . Lt. Joe Ryan knocked down three Zeros, made a direct hit on a Jap carrier . . . extraordinary heroism while engaging the enemy. . . .

JERRY: Why did he have to . . . die, Mac?

JOE: (ECHO) There's a question for you, Mac . . . go ahead . . . tell him.

MAC: I don't know, Jerry . . . I wish Joe were here to tell you himself. He always seemed to know what to say.

JOE: (ECHO) No, Mac, you were the smart one . . . tell Jerry about right, and truth . . . and a free world.

ENGR: (FROM HERE ON TAKE ECHO OUT GRADUALLY)

JERRY: I'm goin' to be a Carrier pilot in the Navy, like Joe.

MAC: You'll be a good one, too, Jerry . . . like Joe.

JOE: (ECHO) Tell him why we died, Mac . . . tell him those simple things like live and let live . . . tell all kids Jerry's age things like that. Tell 'em why we need that Navy . . . and your Marine Corps right with it, for peace . . .

SOUND: SNEAK PLANE AND SLOWLY BUILD FOR TAG

. . . then when he learns to fly that Navy plane, he won't get holes in it . . . and he won't ever have to think of his mother coming home from a ceremony, walking up the front porch clutching all that's left of her son in the palm of her hand . . . a ribbon, and a Navy Cross.

SOUND: PEAK PLANE RAPIDLY, HOLD FOR FIVE SECONDS AND FADE FOR SWITCHOVER

ENGR: RETURN TO NEW YORK

CHAPTER TEN

Microphones

ALL THE EFFORT that goes into a radio performance, writing, directing, acting, music, sound effects, and so on, is aimed at the extension of the listener's ear, the microphone. To define a microphone simply, it is an electrical instrument which converts the energy of air-borne waves into electrical-energy waves of the same frequency characteristics. That is, a *sound wave* of 310 cycles strikes the microphone and the mike converts this into an *electrical wave* of 310 cycles.

The use of microphones is the engineer's business. But a soundman should know the properties of different type mikes so as to get the proper mike for a specific use. A soundman who knows how to set up his sound equipment properly and what mikes are most desirable in relation to it not only makes it easier for himself and the show as a whole, but may also cooperate more closely with the engineer. Mikes directly affect the success of sounds. The frequency range and pickup field or pattern have direct bearing on whether the sound patterns sound right. The soundman sets up his equipment in the general area in which the director indicates he wants sound, and so arranges it as to use as few mikes as possible. His setup is also governed by the kinds and characteristics of mikes used.

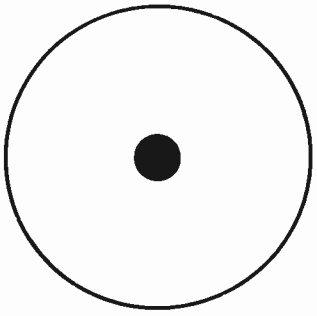
There are five main types of microphones: (1) carbon; (2) velocity or ribbon; (3) condenser; (4) Rochelle salt or crystal; (5) moving coil or dynamic. The velocity and dynamic mikes are the types principally used in radio.

Each type of mike listed has characteristics that vary with the input and output impedance, frequency response, output voltage, amplifier stages, response pattern, gain factor, and so on. In addition, each manufacturer has his own variations. A soundman does not necessarily have to concern himself with all the technical aspects of microphones, but he should know the response pattern or directional characteristics of the different types.

All mikes may be divided into three classes with regard to their sensitivity, i.e., the direction or area the mike pattern covers: nondirectional, bidirectional, and unidirectional.

NONDIRECTIONAL—BEAM IN ALL DIRECTIONS

This is the pattern of a nondirectional mike as seen from directly above.

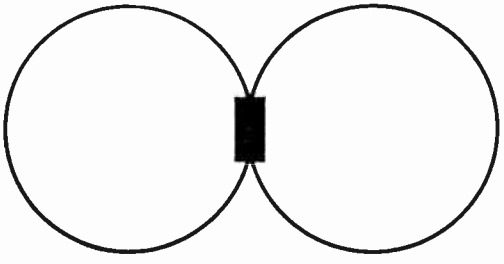


The small circle indicates the nondirectional mike. The large circle indicates the pickup pattern. Any sound given on the periphery of the large circle will have the same volume and frequency response, no matter from what direction it comes. In other words, the pickup is not limited to any specific direction; the beam is 360 degrees; there is no dead side. If used for sound, a nondirectional mike should be mounted so that the axis of the beam is parallel to the floor.

One point should be understood right here. The beam patterns as sketched are not hard and fast. That is, the line drawn is not one of absolute demarcation. The mike is sensitive beyond the indicated beam line, though the volume pickup decreases rapidly beyond that point.

BIDIRECTIONAL MIKE—TWO OPPOSING BEAMS

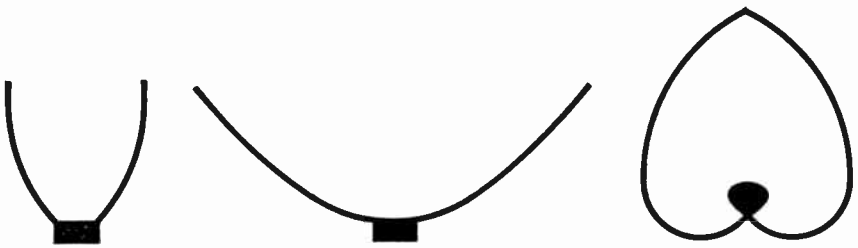
A bidirectional mike has a pattern like this.



The pickup of a bidirectional mike has a figure-eight pattern. Mikes in this class are known as ribbon or velocity mikes. Two sides of the mike are sensitive and the other two sides are dead. This mike is used a great deal as a dialogue mike because actors can face each other, it is very good for fades because of the relatively narrow beam, and it permits at least four performers to work on mike at the same time with relative ease.

UNIDIRECTIONAL MIKE—BEAM IN ONE DIRECTION ONLY

Unidirectional mikes have response patterns like this.



VELOCITY DYNAMIC CARDIOID

Generalizations are unsatisfactory because there always seem to be exceptions. However, it appears that mikes used for sound usually are unidirectional, and generally speaking the cardioid is the most satisfactory as a sound mike.

When doing sound effects in the confined area of a studio, it is desirable to eliminate extraneous sounds originating in back of the mike; particularly audience noises, room echo, and acoustic feedback. A unidirectional mike is more desirable in this respect than the other types because by proper placement those unwanted sounds can be shielded off. The cardioid when set on unidirectional has a 180-degree heart-shaped pickup pattern with the mike at the inward peak point. The 180-degree response pattern gives a wide beam, hence a large working area, and the negative 180-degree dead side aids in eliminating unwanted sounds.

By placing a cardioid on a boom angled so the axis of the mike is parallel to the floor and about two feet above it, the full advantages offered by this particular mike may be utilized. See Figure 23 for placement of a cardioid mike and observe the grouping of stationary pieces, door, truck speaker, and walking surfaces, so placed as to utilize the favorable beam of the cardioid.

The reader may wonder why a dynamic mike which is also unidirectional and has even a wider beam than a cardioid is not more desirable

as a sound mike. The answer is that the dynamic mike lacks the definition of the cardioid. Several different frequencies striking a dynamic mike simultaneously tend to cause a muddled effect. The dynamic is excellent for low registers and single frequencies, but the higher frequencies are not reproduced with fidelity. This of course makes it unsuitable for a sound mike. The dynamic mike, however, is superior when live water sounds, such as the splash tank, are used.

The velocity or ribbon mike has a good frequency range, but the pickup pattern is rather narrow, thus forcing very close grouping of sound equipment in order to get an on perspective. Another undesirable characteristic is that if a sound is initiated very close to the velocity mike, the low frequencies are overemphasized. Four feet or further away the frequency response is normal. Many sound effects (especially stationary equipment) are operated closer than four feet in order to have a true on perspective, and this does not work too satisfactorily with a velocity mike.

In order to pick up footsteps, a bidirectional ribbon mike must be placed so that the axis of the beam is parallel to the floor. With one beam directed toward the floor the footsteps will be picked up satisfactorily, but the narrow beam would not adequately or conveniently cover a truck speaker, doors, and the like. The second beam, pointing away from the floor and toward the ceiling, could be used for hand props, but what would be the superiority of this mike over a unidirectional mike with a wider beam, where hand props can be worked under the mike? If the bidirectional mike is placed in normal position, with the axis vertical, then the walking surfaces are on the dead side of the mike.

A mike not often used in sound effects but having great possibilities is a contact mike. It is a small flat microphone that picks up sounds by physical contact with the source of vibrations rather than from air-borne sound waves. It must be in direct contact with the sound-producing instrument. Many unusual effects can be achieved through the use of a contact mike.

Here is an example of the use of a contact mike for a very effective psychological sequence. One of the characters on a show was being driven crazy by the sound of an old man rocking in a chair without saying a word. Finally the "heavy" killed the old man and ran away. That is, he ran away from everything but his conscience, which was indicated by the use of the contact mike taped to a creaky rocking chair. At appropriate times throughout the rest of the script the chair was rocked. The contact mike picked up the creaks, and these were gradually amplified until they eventually drowned out all other sounds and dialogue. It was

very effective. Contact mikes are more successful when used on sustained sounds, giving the effects time to register.

A skillful soundman will arrange his equipment and use known pickup patterns of mikes so as to operate with as few mikes as possible. Every mike added to a setup means additional room noise picked up and increases the problems of the engineer.

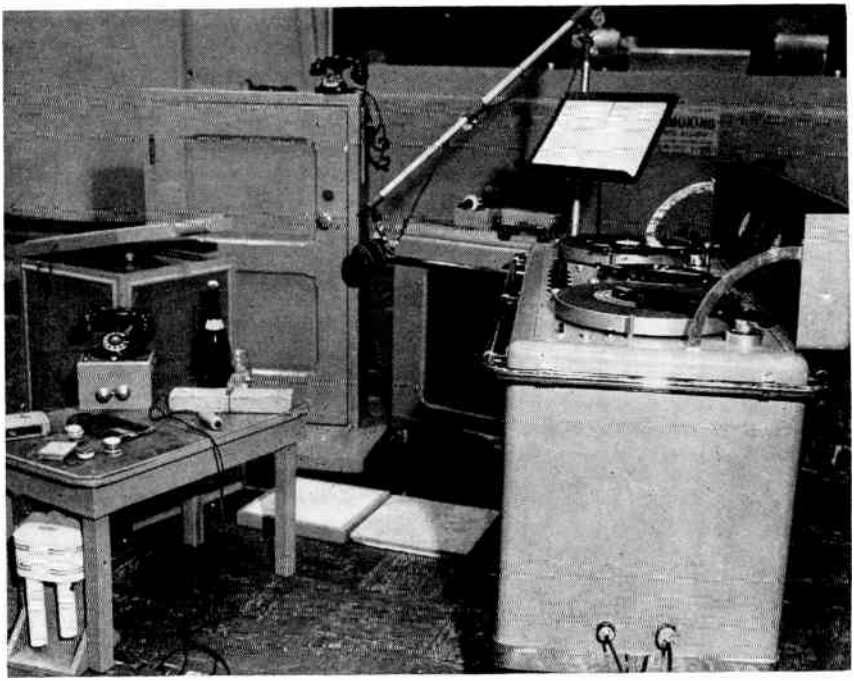


FIGURE 23. *Sound setup for one soundman showing placement of cardioid mike. (Courtesy of Don Lee Broadcasting System.)*

Now for some general considerations regarding microphones. When a sound is made close, very close, to a mike, it seems as if that sound comes from an object much larger than actually is the case. This is why peach baskets and berry boxes smashed close to a mike satisfactorily simulate heavy wooden crashes. This illusion is further heightened by the fact that sounds made very close to a mike are heard distorted—the low tones are overemphasized, thus adding body to the sound.

Actors are mobile, can work on and off mike or beam, and thus vary volume and perspective. But a sound mike is stationary, and so is the bulk of a soundman's equipment. Thus it is up to the soundman to know

how to place his equipment properly and how to utilize the beams of different mikes to advantage.

Knowledge of beam patterns can also be used in getting the effect of a loud on-mike sound. The effect may be done close to the mike but at the edge of the beam. Thus there is an on presence, yet the volume is not beyond acceptable maximum limits.

Volume is the spotlight of radio, and the loudness or level of any sound as picked up by a mike depends upon three things: (1) its distance from the mike; (2) its position relative to the sensitive face or beam of the mike; (3) the loudness of the sound itself and the direction from which it comes.

Sometimes it is necessary to build an effect to a high climax. But in radio a sound effect cannot take the form of a great increase in volume. However the feeling of a heavy-volume climax can be simulated by gradually adding new elements; increasing the complexity, rather than attempting an increase in volume which cannot be handled by the equipment. Be sure and remember that once you have established the level of a sound with the engineer, you must give him exactly the same level again.

Sounds picked up by a mike sometimes seem louder when the mike is placed in certain locations in a studio. This is caused by what is known as a "standing wave." A standing wave is the product of two or more sounds of the same frequency racing back and forth between parallel surfaces such as opposite walls, or ceiling and floor, and meeting at a point equidistant from the reflecting surfaces. When these sounds meet, they build up in intensity much the same as do ripples in a pond when they meet.

There is relatively little chance that the reader will be troubled with a standing wave. It is mentioned only so that he will know what is happening in case he sets up his equipment in a spot that happens to be the focal point of this phenomenon. This effect can be overcome in one of three ways: redesigning the studio to eliminate parallel surfaces; using sound-absorbing materials; or, more simply, by changing the position of the sound setup or moving the mike.

Study different microphones. Test them to learn their characteristics and pickup patterns or beams. By intelligent use of known mike patterns you can simplify your work and do a more creditable job.

CHAPTER ELEVEN

Directing

THE ODDS on a soundman becoming an ulcer statistic depend in great measure upon the director for whom he works. If the director is a gentleman who has insight on human nature, well and good. If, however, he is in the genius category—look out! It is the purpose of this chapter to point out the relationship between directors and soundmen as well as call attention to some pitfalls that the beginning director should avoid.

Radio is an exacting entertainment field that calls for the expenditure of considerable nervous energy. Under the duress of fighting the time element, occasional mediocre scripts, temperamental actors, and sometimes incapable soundmen, the director is at times driven to the point where he loses his composure and forgets his manners. That is point number one! Try, no matter what the provocation, always to be a gentleman! No one likes to be pushed around, to be ridiculed, humiliated, or made a fool of. As a director, watch your manner of expressing yourself. State things clearly, but always with regard to the sensibilities of your associates.

If you, as a director, are dissatisfied with a sound effect, say so, but be certain to say in what way the effect misses. Remember that the soundman has offered his conception of the sound cue, and if you do not accept it, then it is up to you to tell him what you want. Harsh dissatisfaction with a sound effect on the part of the director is an unfortunate error. It alienates the soundman, and it causes the director to lose stature in the eyes of those working on the show. Also, it serves no purpose. What the soundman wants to know is, what is wrong? If the director says, "No, that won't do, the sound must have more body," or "that should have a higher pitch," or "if you'll slow it down a bit and add more rumble, I think that'll do the trick," the soundman has some idea as to what changes should be made.

Again, if a sound effect is unsatisfactory, a director may say that it does not sound right, but he doesn't know exactly what is wrong. An admission like this is no discredit to the director. In fact, it shows that he is human. Above all, do not be afraid to correct yourself. If you have said that you want an effect done a certain way, then discover that it is not satisfactory, change it. Don't try to give the impression that you grasp all essentials at a glance and are never subject to improvement.

Don't be like some directors and lay sound on with too heavy a hand. They want to hear everything, but loud. Directors of this type demand of soundmen footsteps that sound like pile drivers, door knocks like battering rams, and to them a dropped hollow-stem wine glass must have all the delicacy of a collapsed greenhouse. Balances to them mean nothing; every sound is as loud as human muscles and amplifiers can make them. Here is an example.

A band of fifty Indians was thundering down the main street of a small western town, yelling and shooting. The hero ran out of a saloon to intercept them. With all the racket of fifty horses and fifty Indians war-whooping and firing guns, the director wanted to hear the footsteps of our hero! Yes, he wanted to hear one man's footsteps dominating the sound made by fifty war-whooping Indians, their horses, and their guns!

In order for the footsteps to register, the sounds made by the Indians had to be held down in volume. This of course made the Indians sound a half-mile away. The director protested, so these sounds were brought to almost on mike, and naturally the footsteps of our hero were again drowned out. The balance of the two sounds was so unequal that one had to be sacrificed for the other. The upshot was that the director insisted on featuring the hero's footsteps, and in consequence on the air the Indians sounded so distant that they were no menace! But the listening audience did hear those footsteps!

Some beginning directors apparently come to the conclusion that temperament is a sign of artistry or genius. Nothing is farther from the truth; and if any of the readers are guilty of this belief, get rid of it! Temper is the sign of just one thing: lack of control. Anyone can lose his temper but it takes a person with fortitude to contain himself. Tantrums only humiliate other members of the show and waste valuable rehearsal time. But primarily they degrade the would-be artiste who indulges in them.

Another thing a director should avoid is screaming at people. As the individual in command of a production, the director should speak with authority, but never raise his voice to the point where his directions con-

sist of an undecipherable cacophony of shrieks. After all, people should be able to understand what the director says.

Don't permit yourself to fall into the error of trying to get by with a pet catch phrase. If something is done that you feel is wrong, be specific. Never merely say, "I don't think you have the picture," and then sit back and wait for something to happen. What is the picture? Possibly what you have in mind is something no one else in the studio has thought of. Therefore you should state your idea of the so-called picture. Remember, the production staff and cast are not mind readers.

As a director, know your radio terminology. Unfamiliarity with radio terms is a sure tip-off to inexperience. When you say you'll use a board fade, mean a board fade and not a studio fade. If asked how the show is running, don't say "on-the-head" when you mean "on-the-nose." Never tell the cast to "stretch" when you mean "spread." Remember that "gain" and "perspective" are two different things. Say what you mean, and mean what you say.

As director you're headman, true, but be big enough to admit when you are wrong. Remember that in most cases you are working with experienced people who are specialists in their individual fields. They probably know more about certain things than you do. Give them credit for their specialized knowledge and they'll work all the harder for you. Here is an example of a director who could not bring himself to admit that he could make a mistake.

In a scene Scarface and his henchmen set fire to a warehouse. They ran a few steps to a waiting car and rapidly drove away. As the soundman started the car, he began to fade the fire because the mike was with Scarface. In other words, the scene was continued in the car pulling away from the burning warehouse.

Instantly the director stopped the rehearsal to ask why the fire was faded. Sound replied because we were in the car, rapidly leaving the fire. This was logical, but the director took exception. He had directed to make the fire a big one, and b'golly wanted the fire to increase and not fizzle out. Consequently at air time the biggest fire imaginable was riding right in the back seat of the car as it sped away from the burning warehouse!

The director knew he was wrong. The cast and production staff knew he was wrong. And the director knew that everyone knew he was wrong. But he just couldn't bring himself to admit it. So rather than dismiss a really trivial thing with a "Yes, of course that's right," he made an issue of it, and in consequence appeared ridiculous in the eyes of everyone.

Remember this: even though a director, you too are subject to human error.

Cuing is very important. Improperly thrown cues make for a poor show. In almost any script there are times when it is debatable whether the actor or sound should wait for a definite visual cue from the director or proceed without it. Then again there are times when it is mandatory

FIGURE 24. *Sound effects in action as seen from the booth. In left foreground the director, in center the mixer. (Courtesy of Columbia Broadcasting System.)*

that they wait. In any case, it is for the director to decide just how cues shall be handled, and he should make certain that everyone knows the arrangement.

In most instances the only contact a director has with those in the studio while on the air is by hand signals. Except of course the soundman and musical conductor who generally wear headphones connected to the talk-back. These hand signals should be crisp and definite. To properly throw a cue, the director should follow the script right up to a word or two before the cue, then look the recipient squarely in the eye and point at him with the index finger, almost as if accusing him. By looking directly

at the person, no one mistakes to whom the cue is given. By making the motion swift and definite, there is no question as to when the cue is given. A lot of preliminary gyrations with the hand are bound to create a feeling of uncertainty on the part of the recipient. Be emphatic on cues. They are the only way the director can keep control of the show. They are his orders. Make them orders, not "Gee, I hope he saw that" gestures!

In all probability most of the readers are familiar with the studio sign language or silent signals that are used as a means of communication while on the air. However for the benefit of those who are unfamiliar with them, here are briefly described the standard accepted hand signals used for cues and directions. Only those that relate to sound are mentioned.

STAND BY As a warning that a cue is about to be given, the arm is raised, palm out, and kept there until . . . . . .

CUE . . . . The cue is given by bringing the arm down and pointing with the index finger at the person waiting for the signal.

SPEED UP Point the index finger toward the person who is to speed up, and revolve the finger in a circular motion. The speed at which the finger is circled indicates how much more to speed up the pace.

SLOW DOWN A stretching gesture, in which the hands are moved apart with the fingers held as if they are stretching something. If moderate slow down is wanted, the hands are moved just a little apart, but if the pace is much too fast, hands are stretched wide.

ON THE NOSE When everything is on schedule, the index finger is pointed to the tip of the nose.

CUT A throat-cutting gesture with the finger or hand.

LOWER VOLUME Extend hands forward, palms down, and drop hands slowly.

INCREASE VOLUME Extend hands forward, palms up, and move hands upward.

FADE OUT Hold hand in front of face, palm out, then move hand down and away from body in a diagonal motion.

FADE IN Extend arm at shoulder level, palm inward, and move hand toward face, with a "come on" motion.

CLOSER TO MIKE Hold left hand with fingers erect and palm at right angle to face. Move right hand, held in same manner as left, toward left hand.

AWAY FROM MIKE Reverse above or hold up hand with palm out and push away from body in "back up" motion.

O.K. Use the common gesture of index finger and thumb in a circle. Also used to indicate that changes have been made satisfactorily.

QUIET OR SILENCE Bring finger to lips in "shush" gesture, then spread arms out with palms of hands pushing downward.

WATCH FOR CUE Point to eye with index finger.

TIGHTEN CUES Hold up clenched fist.

GET ON BEAM Hold up hand, fingers erect and palm at right angle to face; then point with index finger of other hand directly toward it.
SOUNDS O.K. Point to ear and nod head.

If you want to direct radio dramas, learn the medium. Direct as a radio director, not as you did in the one-act-play tournament or in Drama 112A-B. The media are vastly different and so are the techniques. Don't misunderstand. A theater background is a very valuable asset to a director of dramatic radio programs, especially in line interpretation and delivery. But if you switch over from the legitimate or amateur theater bear in mind that your new medium calls for new skills.

Don't expect to come into the new field and sweep it off its feet. People in radio are primarily concerned with getting a decent show together within the limited time and budget allowed. They are not impressed by a collection of clichés from Noel Coward, nor are they responsive to an air of artiness. Be natural. If you wish to try a new art form as a variation from your theater experience, remember that radio has certain limitations and stay within those limitations.

Do not be afraid to experiment. But if you do attempt a new approach, be familiar enough with the radio medium to know what you are doing and if it can be done. Dare to be different but do not go overboard in doing so. Radioites admire the director who has the courage to deviate from the conventional, but look askance at the director who confuses incongruity with art.

Don't become talk-back happy. Every time you push the talk-back, say something pertinent. It is a means of communication between the director and the studio during rehearsals, and with sound and the musical conductor while on the air. But at best the talk-back has an unreal, disembodied quality that can become very tiresome when used a great deal.

After dress rehearsal, come into the studio, sit down at the table, and give your cuts and changes there. Otherwise those in the studio must wait until you take your finger off the talk-back button before they can reply. If the table is some distance from the mike, those in the studio must shout or come to the mike to acknowledge your directions or to ask questions. During rehearsals and the broadcast, performers must stand at the mike; give them a chance to sit down when they can.

A director should avoid as much as possible the use of the talk-back patched into the soundman's headphone circuit when on the air. In the first place, if the soundman has to be constantly coached, rid yourself of him and get one that can do his job right! In the second place, the monitor

in the booth usually is run at a pretty high level and the director naturally shouts over the racket in the booth. When he presses the talk-back button and shouts into his desk mike, the blast that comes through the headphones is startling and can be very painful. And in the third place, everytime the talk-back is used to speak to sound, dialogue is cut off, and sound cannot hear what is going on as far as the show is concerned. This is particularly disconcerting just before a sound cue.

There is legitimate use of the talk-back connected to sound's headphones during an air show, however. For example, the show is running late and the director wants to pick up time. On the talk-back he can get the soundman's attention by quietly calling his name; then briefly stating that the show is behind and will sound please tighten up the sequence of getting out of the car, up the steps, and unlocking the door? One point, though, in this respect. If you as a director find it necessary to do something like this, be sure and do so at least several speeches ahead of the following sound cue. Remember, dialogue is cut off by the talk-back while on the air; give the soundman a chance to find his place in the script again before his cue. Above all, hold your voice down!

If you feel it necessary to call a special sound rehearsal, be sure there is a good reason for it. Do not be like one director who always held an hour sound rehearsal two days before the show. This special sound rehearsal consisted of his slowly turning the pages of the script and reading aloud the sound cues. No questions, no directions, no indications of what he wanted or expected. One wonders what it was all about.

Special sound rehearsals are in order when a show has difficult mood and atmosphere background sounds, unusual imaginative effects, or very important key sounds of action. If you call such a rehearsal, explain just what it is you want and talk it over fully. Give the soundman a chance to get the same feel and interpretation that you do. The properly handled special sound rehearsal can be a very valuable adjunct to the show. For here the director has only one problem, setting the sound patterns with the soundman. Whereas if he waited until rehearsal time, the engineer, production assistant, and cast would be forced to stand idly by while the director and soundman threshed out a difficult but important sound cue.

At times a soundman will say to a director that he can't do a sequence as directed. In all likelihood there is a good reason for this. It is within the director's prerogative to ask why not, and the soundman should explain what the difficulty is. If the soundman has a point, the director should then make the necessary changes, never just look at sound and mutter something uncomplimentary. Most soundmen pride themselves

in not being stumped, and it annoys them even more than a director when not able to produce.

In most cases the failure of a soundman to produce is due to some technical or physical problem that is unsolved. Although considered by some a strange mutation of the genus homo sapiens, a soundman nevertheless is equipped with only two arms and two legs. At the same time it must be admitted that some soundmen are lazy! The director then must determine whether he is being "taken in" by a lazy soundman, or whether the soundman is actually confronted by a condition beyond his capacities.

This also points up the fact that it is a good idea for a director to have a working knowledge of sound techniques. He would then be able to protect himself against being hoodwinked by a soundman, and on the other hand be able to accept with understanding any excuses offered.

If you are a director, don't come to a rehearsal without being prepared. There is no quicker way for a director to lose prestige than to walk in the booth and tell people how and what to do when obviously he has not read the script and knows nothing about the characters, plot, or sound. A puzzling question is: how can they cast a show without reading it? The secret probably is that they use the stock-company method, hiring the same performers week after week and shuffling them around until they fit the parts to a reasonable extent.

When not prepared, a director is apt to give directions that later have to be changed because of plot variations and character switches. This wastes valuable rehearsal time. Another time waster is when a director has not planned tentative cuts, in case the script is long. These should have been marked before rehearsal started.

Because of limited rehearsal time, preplanning is very important and the conscientious director does a lot of it. You beginning directors should read a script at least three times before you go to the first rehearsal. The first reading should be fairly rapid just to get the feel of the script and story line. The second reading should be moderately slow, setting the characters and catching any potential production problems. You then know the story, the characters, and your approach to production. The third reading should take quite a bit of time, for in this reading you work for cuts. This will necessitate reading back and forth so as to be sure that the cuts are logical, tie together properly, and do not affect plot. The cuts can be tentatively marked in the script. By preplanning you can go to rehearsal knowing all about the show and direct intelligently.

In all likelihood sometime you will have a show fall apart on the air.

Actors fluff, readings are changed for the worse, sound makes a bad mistake, a cue is missed—with the result that you have a great big clambake on your hands. This is a harrowing experience, but remember that you are the director and the real test of a good director is whether he can keep control and pull a show like that out of the hole. All this is leading up to one point. Keep your composure. No matter if the show is crashing down around your ears, never show your extreme agitation by waving your arms and making faces. That only disconcerts those who are depending upon you. Those working in the studio naturally tighten up when things start to go wrong. If they see that the director is proceeding with confidence, it lessens the tension and there is good likelihood that the program can get back to normal. The director should be the tower of strength on the show; be strong enough so all concerned can confidently depend upon you.

To be a respected director you must be willing to face the fact that other people working the show have intelligence and experience also. Be clever enough to accept their suggestions; possibly some very good ideas may be offered. Remember that good ideas make your show sound and play better. It is the end result that is important. As the person in command you are not obliged to utilize the suggestions offered, but at least accept them courteously, and when necessary refuse them in the same manner.

Everyone admires the individual whose personal integrity demands that he do the very best he can. But one has some misgivings about the director who becomes so engrossed in minute details that he loses sight of the over-all picture. Like the perfectionist who works over a rehearsal to the point where the performers are so exhausted that they have no life or spontaneity left for the broadcast.

A director of this type becomes so involved in many tiny bits of the script that he bears out the old saw about not being able to see the forest for the trees. There have been shows on which the perfectionist has actually spent forty-five precious minutes of the three-hour rehearsal period on a few lines of dialogue and a simple sound cue. Forty-five minutes on something like this!

SOUND: DOOR OPENS: STEPS THROUGH: DOOR CLOSES

TIM: Hello, Sheriff. It's me, Tim Monahan.

SHERIFF: (SLIGHTLY OFF) Uh? Oh hello, Tim. Glad to see you. Come in.

TIM: (STEPS START) Sheriff, I got a problem, and maybe you can help me. (STEPS STOP)

SHERIFF: (ON) That's my job, Tim, to help people. Providing it's legal. (LAUGH)

There is nothing dramatic or unusual about Tim's entrance. To all appearances it is a simple routine opening of a scene. Yet the director labored on the infinitesimal details of which was better, to open the scene with the sheriff on mike and the door and Tim off, or to play the sequence as written, waiting until the fifth line before Tim walks over to the sheriff; whether the sheriff should get up with a chair scrape on Tim's entrance, or remain seated; or whether the sheriff should get up on the words, "That's my job," or wait until the end of that speech; or maybe move the chair scrape up to the line, "Oh hello, Tim"; or should Tim close the door at the end of his first speech, or maybe it would be better to wait until the end of the sheriff's first line; ad infinitum.

The desire to do a good job is admirable, but not to the point where other portions of the script suffer from neglect. About ten pages later there was a terrific climax to the story, wherein many sounds, speeches, perspectives, levels, music, and fast cues had to be properly integrated. So much time was spent on the highly unimportant few lines and door open that an inadequate amount of time was left to rehearse the complicated and involved climax.

Another of the perfectionist's traits that is most exasperating is his seeming obliviousness to what is transpiring at any given moment. A cast, sound, music, and engineer may be working furiously on a scene on page 12, when suddenly the director cries, "Cut." Naturally everyone stops and awaits the director's comment. Then he will say to someone not even in the scene being played, "On page 4 in your second speech, change the word pistol to revolver." One wonders what's the use of rehearsing page 12 when the director's whole attention is concerned with something back on page 4!

A director may demand respect, but that does not necessarily mean he will get it. Respect is something that must be earned. Any readers that were in the armed forces will understand. Remember how we were told that it was not the individual, but the uniform we were to respect? Actually it was the individual that was liked or disliked, not his rank or uniform.

Here is a suggestion for the beginning soundman. What do you do if

a director obviously does not know his business? It is not wise to make this obvious. But you can handle him in such a way that you make him think he is reasoning things out rather than having errors pointed out to him.

If you know that the director is missing a point or is doing something wrong, don't tell him that in so many words. Instead, phrase your com-

FIGURE 25. *For the sake of realism on* This Is Your FBI, *soundmen Monte Fraser and Virgil Reimer don rubber boots and wade in water bins for the sound of horses sloshing in a shallow stream. Director Jerry Devine listens critically. (Courtesy of American Broadcasting Company.)*

FIGURE 26. *Ted Robertson and Ray Kemper, director and assistant director of Mutual's* Straight Arrow, *in search of authentic Indian lore. Here they are in Gallop, New Mexico, with a portable tape recorder getting background material. (Courtesy of Mullarky Photo Shop, Gallop, N.M.)*

ments in such a way that you are the one that does not understand and are seeking a clarification. For instance, never say, "Oh, no, Tom, what you should do is . . ." or, "But you can't do it that way because . . ." Instead, say, "I'm sorry, I don't understand," and make him explain. The idea is to have him explain to *you*. Or you can say, "Ohhhhhh, but I thought that . . ." and give the reason why you did your sound as you did. In this way you are telling him how you saw the sound sequence and are

getting across what you think should be done, yet are doing so in such a way that he cannot take offense. By using either technique the chances are that the director, in trying to explain to you, will see his error and remedy it. If he persists in doing it his way, don't argue. The director is in charge and is responsible for what goes on the air. Whatever you do, use tact. Never tell a director; always ask, or suggest.

If you are a director, stop for a moment and seriously consider the following. Your direction grows out of your training, your knowledge, your personal feelings, and interpretation. You may be absolutely right or absolutely wrong in your interpretation, but right or wrong, your direction consists of the ideas of one individual, you. The soundman has his personal interpretation too, but it is complicated by the fact that primarily he has to interpret the written sound cue and develop it in a way that he thinks will please you, the director. Possibly the soundman does not see the sound cue your way, but to the best of his knowledge he'll slant it along the lines he thinks you want.

The soundman studies individual directors, learning their production techniques and trying to anticipate what they want. Here is an example of differences in directors. Director A. always insisted on the squeal of brakes when a car stopped, be it Model A or 1951 Cadillac. Everytime sound stopped a car, he had to segue to Speedy-Q 7804B for the brake squeal. If this squeal of brakes had been used for Director B., the latter would have been very annoyed. He believed that 1951 cars do not have squeaky brakes.

So if as a director you are given a sound effect that is unsuitable, it may be because the soundman isn't familiar with your tastes. Remember, he is always in the middle between the sound cue as written and the sound cus as interpreted by the individual director. Unfortunately for the soundman, no two directors see eye-to-eye on interpretation.

The director is very important to the success of a radio program. It is his interpretation of a play that the listener hears. A script does not spontaneously blossom into a full-blown broadcast performance. The show as heard on the air is the result of hard work, in great measure coordinated and guided by the director. The director casts the show and establishes the characters and how he wants them played. He determines the pace throughout the show and how sound shall supplement or heighten certain sequences. He sets the levels and perspectives of sound effects. The director molds sound and dialogue together so that they complement each other in creating aural images. The director passes on the music and its suitability to the mood and atmosphere of the program.

He throws the starting cue and has absolute control of the show at all times. He takes all the elements of the radio drama plus the physical means of production and through his skill and experience welds them into a smooth-functioning performance.

The director has an assistant, whose title varies. Sometimes he is called the contact producer, studio manager, or production man; sometimes the assistant director. He is a member of the production staff of the radio station or network, and represents it during rehearsal and broadcast. His principal job is to assist the director in any way possible.

As a staff member, the production man is familiar with the physical layout of the studios. He should know where and how to get anything needed. He is responsible for seeing that all production details have been checked and physical equipment secured before rehearsal starts. In a sense he may be likened to the stage manager in the theater. If during rehearsal anything is needed, it is the production man's job to provide it with all possible speed. The relationship between the director and his assistant varies. In many cases they work closely together, but in some instances the director does not want comments or suggestions from the assistant director.

The production man should have some knowledge of the union rules governing soundmen, actors, engineers, and musicians. As the representative of the network or station, it is his job to call attention to an infringement. By preventing an irregularity, the employer is protected as well as the employee.

One of the assistant director's principal functions is timing the show. It is very important that he know how to use his stopwatch, how to time cuts, and above all, how to back-time, for here he can make or break a show. If he miscalculates, the show may run way long or way short. In either case, poor production is indicated, which reflects on the director although the error is the assistant director's. Timing a show is much more difficult than generally believed, and it is usually from the assistant director's timing that the broadcast is run. Another of his duties is to make out the production report. This is a complete record of rehearsal and air time, facilities utilized, members of cast, orchestra, and production staff, and any comments as to irregularities. The production report is important as it is the only complete record of the individual broadcast.

The assistant director must always be ready for emergencies. The director must stay in the booth and keep the show going. The assistant director is the man to handle necessary duties elsewhere. During the rehearsals, if new pages have to be mimeographed, it is the production

man's job to have them typed and see that mimeo runs them off with all possible dispatch. If a performer is out of the studio when cuts are given, the production man should note this and see that the actor gets the cuts when he returns. If a musical number is changed, the production man checks to make sure that it has been cleared. The production man is responsible for seeing that the interests of the station or network are protected and that the client and director are given all cooperation possible by staff personnel.

The experienced assistant director should be able to relieve the director of all details except directing the show. The position of assistant director or production man is usually the last step before attaining full directorship. In his assistant's position, he has had the opportunity to become well grounded in all phases of production. The possibilities of advancing are in great measure dependent upon how the production man conducts himself, his reliability, his interest, and how he gets along with people.

A production man can be of great help to other station employees. He works closely with the director, hence is in a position to learn his reactions and tastes. He can pass along his impressions to the engineer and soundman, giving them an opportunity to anticipate the director's wishes.

CHAPTER TWELVE

Writing

LIKE THE NOVELIST or science-fiction writer, the radio dramatist has practically no limit set on the use of his imagination. He is not restricted by limited sets as is the theater dramatist, but may shift scenes or change periods at will. His only limitation is in the use of pantomime, and even this can be described or, better yet, done by sound or music.

The radio stage exists only in the listener's mind. The radio dramatist's job is to stimulate the listener's imagination to provide the visualization. Therein lies the principal difference between radio and TV. Television's chief asset is that it offers a feeling of intimacy through the combined use of sight and hearing. But it relies less on the televiewer's imagination than does radio because scenes and characters are visible. Radio's chief asset is that it stimulates the listener's imagination, because scenes and characters are not visible and are created only in the listener's mind.

To be a competent radio dramatist a writer should have a thorough knowledge of what goes on in rehearsal and the air show. To get the greatest possible value out of his literary work he should write not only with the audience in mind, but also all those that work on the show, the actors, musicians, soundmen, engineers, and directors. The radio dramatist must write from two standpoints—one of the characters and story line, and the other of the director and production staff.

The radio playwright must think both of production technique and how his play will sound in its final form to the listening audience. Remember that a radio play must go through the production phase before it reaches the broadcast stage.

Too many writers have turned to radio from other writing fields without thoroughly grounding themselves in the mechanics of radio drama. They are "half-writers," writing solely for the aural effect on the listener, ignor-

ing the production problems and, even worse, the greater possibilities of the medium. Unfortunately not one writer in a hundred has ever taken the trouble to spend a day in a sound department. There are literally hundreds of recorded, manual, and electronic effects available that writers do not dream exist.

Good writing, be it for radio or otherwise, will have imagination, plot, a logical and interesting use of language, and an insight on human nature. This chapter will not go into those things, but discuss radio writing only as it affects the written sound cue and the problems they pose to the soundman. Properly written sound cues are not too frequent, in most cases because the writer does not know the technical problems of the medium as well as he should. In this chapter are suggestions that may aid the beginner in writing sound cues properly. Here are some examples of actual sound cues taken from network scripts.

SOUND: DOOR OPENS OFF: TIME—LATE AFTERNOON

SOUND: STEPS WALK OVER—CLOSE DOOR WITH RIGHT HAND

SOUND: LIGHT SNOW BEGINS TO FALL

SOUND: MOONLIGHT AND FAR HILLS

SOUND: THE KITTEN WALKS ACROSS PILLOW

SOUND: THEY WALK TOWARD FENCE

SOUND: GRACE RAPIDLY THREADS NEEDLE

SOUND: HE PICKS BURR OFF DOG'S JAW

SOUND: HE TRIPS OVER BUCKET OF DIRTY WATER

SOUND: DRUGSTORE NOISES—NOT SODA FOUNTAIN

SOUND: ROBIN HOOD RUNS NOISELESSLY THROUGH FOREST

SOUND: HE GENTLY PLACES HER HAT ON THE GRASS

SOUND: CAR SUDDENLY STOPS IN FRONT OF BROWN HOUSE

SOUND: SET DOWN CANS OF DYNAMITE

SOUND: PAINT ON CAR PEELS OFF DURING SANDSTORM

SOUND: RED DOG CAFÉ—SINISTER SOUNDS BG

SOUND: DOOR

Presumably the writers fondly imagined that these were sound cues. Just what did the dramatist think the soundman would do with "time—late afternoon"? As for closing the door with the right hand, how would a listener know which hand had been used? "Light snow falling" is beautiful, but also silent. "Moonlight and far hills" is a poetic picture, not a sound cue. A kitten walking across a pillow makes about as much audible sound as did Grace when she deftly slipped a thread through the eye of a needle. "They walk toward the fence"; what distinguishes "their" steps in walking toward the fence, the barn, or even the woodpile? Picking a burr off a dog has no sound unless the dog whimpers. In that case, the sound cue should have been written, "Dog whimpers as burr is pulled off." And were you ever aware that dirty water sounds different than clean water when spilled?

"Drugstore noises" usually indicates the sounds of a soda fountain. If not, what else? "Robin Hood running noiselessly" means without sound, doesn't it? Can you hear a woman's hat being placed gently on the grass? And as for stopping a car in front of a brown house, what if the soundman theoretically stopped in front of the white house instead? As a point of information, dynamite comes in stick form, packed in boxes. Blasting powder comes in cans.

Sandstorms can easily be simulated, but the fine detail of paint peeling from a car during a sandstorm is a little difficult to get over. And as to the "sinister" background sounds in the Red Dog Café, would that call for something like sharpening a few knives, or assorted groans and muffled cries of agony? The sound cue "Door" is a little gem that crops up frequently. Is it opened? Closed? On or off mike?

Adjectives or adverbs should never be used in a sound cue unless they qualify either the volume or perspective of the sound. Too many sound cues paint a visual picture, but do not tell what happens, or how it happens, or at what perspective. Sound effects can give an illusion by what can be heard, never by what can only be seen!

Writers should never forget that they are in a sense collaborators. Their scripts are not an end in themselves, but are means to an end. A radio dramatist is only one part of a team composed of the author, producer and/or director, actor, soundman, musician, technician, and audience. The collaboration of the first six members is aimed toward securing the active collaboration of the seventh member, the audience. Unfortunately some writers forget the teamwork necessary to bring their work to the listener.

If you are a beginning writer, do not become "sound happy" and hope

to stretch a mere incident to a full half-hour drama by padding with sound cues. Some neophyte writers alibi the excessive use of sound by saying that this gave the story pace and excitement. In order to achieve these, the writer should have written a script whose situation and characters created pace and excitement.

It is a fairly common tendency for beginning writers to have a sound cue for every possible movement. The script is so cluttered with assorted sounds that the listener has no chance to hear the story! Sound is steadily hammering at him with a bewildering array of assorted "listen-to-me's." A concentration of necessary sounds may make a scene dramatic and interesting, but a concentration of unnecessary sounds causes diffusion of interest. Too much sound may defeat its own purpose. Here is a very important thing to remember when writing. *A sound effect should never be used unless it clarifies a piece of business, moves the story along, or heightens mood or atmosphere.*

In contrast to the sound-happy writers, there are those who seem to lack the capacity to "hear" the physical side of their story as they write it. They handle dialogue well and develop the plot satisfactorily, but fail to write in or allow time needed for obvious and necessary sounds. For example:

SOUND: CAR RUNNING

INSP: I think the best thing to do is to make a bold approach. You know, she might not even guess why we came to see her.

TOM: Maybe, Inspector. It's at least worth a try.

INSP: In any event we have to get inside that house and try and have a look around.

SOUND: CAR PULLS TO STOP UNDER

TOM: You have your gun?

INSP: Yeah, but I don't think I'll have to use it. I hope not.

TOM: Maybe I had better go in alone. She doesn't know me.

INSP: Good idea. I'll be all set to cover you from here.

SOUND: KNOCK ON DOOR: REPEATED: DOOR OPENS

SUSAN: (SLIGHTLY OFF) Yes?

TOM: My name is Tom Burnett. May I speak with you a moment?

In the above illustration the writer was concerned with dialogue telling what was happening and where the actors were. He was so interested in getting inside the house to progress his story that he forgot to get Tom out of the car! The car stops, and the next sound heard is that of Tom knocking on the door. Tom should have opened the car door, gotten out, closed it, and walked up to the house, then knocked. An oversight as obvious as this may seem far fetched, yet it happens every day.

And there are those writers who never allow sufficient time for sound to be properly established. The capsule scenes that these writers concoct are nightmares to soundmen. Here is an example taken from a $300-a-week writer's script.

DON: My car. . . .

SOUND: CAR DOOR OPEN AND CLOSE

ELLEN: Don, you saved my life!

DON: We'll talk about that . . .

SOUND: CAR STARTS AND GETS UNDER WAY

DON: . . . at your apartment.

MUSIC: BRIDGE

The dialogue as written here allows just about three seconds between the car-door open and close and car start. Three seconds! Pause a moment and picture the scene. Even if Don were so rude as to get in first, followed by Ellen who then closed the door, he'd have to put the car key in the lock, turn it, press the starter, shift into low gear, release the brake, then start off. In three seconds! Or take a scene like this.

SOUND: DISTANT TRAIN WHISTLE: THEN START FADING IN TRAIN

MOTHER: Oh, Jim, Tommy'll soon be here. I just can't bear it!

FATHER: Patience mother. We've waited this long, a few minutes more won't . . .

MOTHER: Do you think he's changed? Will he want to stay?

FATHER: (LAUGHING) Now mother, don't get so excited. Everything will be all right!

SOUND: TRAIN PULLS IN TO STOP: IDLES: BELL RINGS IN BG

TOM: (OFF AND UP) Mother! Dad!

If you've ever waited at a depot you know that the time lapse between a distant train whistle and the train's final approach, slow down, and stop is at least five minutes! Yet this whole sequence has been compressed into a time interval of twenty to twenty-five seconds. If the distant train whistle had been dispensed with and the scene started with the train grinding to a stop, the whole sequence would have been more logical and believable.

We all realize the limitations of time in a half-hour radio drama, but sometimes the extreme speed resorted to seems as unnatural as the comedy door slam effect—you know, a door is yanked open, the "phweeeeee" of a siren, door slam, and Jerry Colonna says, "Fast, huh?"

In writing a fast-paced action script, time must be allowed for the sounds to register. Remember that radio is aural and the listener must have the opportunity not only to hear the sound but also to interpret it. If the sound is imaginative, the listener must be given time to respond emotionally. If a factual sound, he must have time to identify it. No matter how fast thinking or intelligent the listener is, there is some time lag between his reception, interpretation, and acceptance of a sound.

Before going any farther, let's stop a moment and see how sound cues should be written. In the first place, they should always be capitalized, and secondly, always underscored, like this: DOOR OPENS. Sound cues are written in caps so that they are readily seen in the script, and are underscored to distinguish them from directions.

Normally a sound cue is a clue given to a soundman as to what, when, where, and how to do a sound effect. A direction in a script is an instruction to the actor. Sometimes they may be combined. The following is a sound cue.

SOUND: A LIVE GUNSHOT

The sound cue is written in caps, is underscored, and generally is further set out by putting the word SOUND in the left-hand column of the script page. A sound cue, however, is not preceded by the word SOUND when it is buried in a speech or narration. For example, the cue for a live gunshot in that case would be written this way:

JACK: Okay, okay! If that's the way you want it, that's the way you'll get it! And believe me brother, nothing has ever given me more pleasure . . . (LIVE SHOT) . . . than this! (A BEAT) Sucker! (UP) Yeah, and all you guys are suckers if you think you can strong-arm me!

The gunshot in Jack's speech is set out by being in capital letters and underscored. Note too, that a sound cue is enclosed in parentheses when imbedded in a speech.

The (A BEAT) is a direction to the actor to take a brief pause before continuing. It is also in caps, and is enclosed in parentheses, but it is not underscored. The (UP) is a direction instructing Jack to raise his voice. A sound cue in a continued speech may be written in the usual way, however. For example:

GRACE: Sure, I shot him, and I'd do it over again if I had the chance! I hated him! Hated him more than anyone except you! So if you think . . .

SOUND: GLASS DROPS TO FLOOR AND BREAKS

GRACE: Hmmmmm, finally! I was beginning to wonder when that stuff would take effect!

The sound cue here breaks off Grace's recrimination, and must be cued in tight. If it is not, it leaves Grace hanging and creates an awkward wait. If it is important that a sound cue definitely break in or cut off a speech, write it this way:

GRACE: . . . the chance! I hated him! Hated him more than anyone except you! So if you think . . .

SOUND: (CUTS IN) GLASS DROPS TO FLOOR AND BREAKS

GRACE: Hmmmmm, finally! I was beginning to wonder when that stuff would take effect!

In many cases a sound cue and a direction can be combined. For example:

SOUND: OFF DOOR OPEN AND CLOSE

JACK: (FADING ON) Hi, fellas! Any news for me yet?

The door cue is written in the standard manner and the writer may add FOOTSTEPS FADE ON if he wishes. However he will also have to include the direction (FADING ON) in Jack's speech. It is simpler and less work to write the sound and underscored direction as shown above. By underscoring the direction to Jack, it also becomes a sound cue. There is a question of perspective here, which brings up the point of writing perspectives.

The radio writer should always visualize just where and at what per-

spectives the characters and events are taking place and should indicate these perspectives in the script. As a means of illustration, let's take a simple sound cue and see in what ways it can be written. The cue will be an automobile starting and fading.

The first thing indicated here is that there is a change in perspectives, because no matter at what distance the car starts, it fades, proceeding to a more distant point. The second thing to establish is at what perspective the car starts. Is it on mike? Half-off? Distant? If the sound cue is not written to show the perspective, how are the director and soundman to know? Unless, of course, there is a direct reference in the dialogue immediately preceding or following the sound cue.

Any sound cue written without a qualification as to perspective is generally considered to be on mike. A sound cue written CAR STARTS AND FADES will be considered an on-mike car starting and fading off. The cue written CAR STARTS HALF-OFF AND FADES is unmistakable as is DISTANT CAR STARTS AND FADES.

In keeping with the pace and action of a scene the sound cue can further be clarified by writing the cue: CAR STARTS AND FADES RAPIDLY, or SLIGHTLY-OFF CAR STARTS AND FADES SLOWLY. Whenever possible, try and qualify a sound cue as to volume or perspective. Otherwise rehearsal time must be consumed in establishing these relationships. The director, engineer, soundman, and the actors must know. If the cue is properly written there can be no question as to what, where, and how much.

Another thing some writers neglect is indicating just where a sound stops once it is started. If a continuous sound is cued to start in a scene, the soundman naturally assumes it will continue to the end of the scene unless he has some indication to the contrary. Here's an example.

BILL: (SCARED) What do you think, Mac?

MAC: (NOT TOO CONFIDENT) Well, I guess there's only one way to find out. Come on!

SOUND: CAUTIOUS FOOTSTEPS START

BILL: Doggone! I sure don't relish this prowling around in haunted houses at midnight!

MAC: Agh! There's no such thing as a . . . (BREAKS OFF) . . . Holy cats, look!

BILL: (VERY SCARED) Y-y-y-yeah! Is . . . is . . . it . . . ?

MAC: (EXCITED) It sure is! Deader'n a doornail too!

In the above there is an obvious place for the steps to stop, yet no written indication was given. Now let's play the scene over again and write in the cue where it should have been.

BILL: (SCARED) What do you think, Mac?

MAC: (NOT TOO CONFIDENT) Well, I guess there's only one way to find out. Come on!

SOUND: CAUTIOUS FOOTSTEPS START

BILL: Doggone! I sure don't relish this prowling around in haunted houses at midnight!

MAC: Agh! There's no such thing as a . . . (BREAKS OFF) . . . Holy cats, look! (STEPS STOP ABRUPTLY)

BILL: (VERY SCARED) Y-y-y-yeah! Is . . . is . . . it . . . ?

Be definite in writing sound cues. Never write them like this:

SOUND: OF DOOR OPENING

SOUND: AS OF WASHING DISHES

If you want a door to open merely write: DOOR OPEN. The "of" preceding the actual cue is too easily mistaken for "off." The "as of" in the second sound cue is superfluous, and further, it connotes a simulated sound!

It is particularly important to indicate specific perspectives when there is more than one in a sound cue. For example, do not write a sound cue this way unless all sounds are on mike.

SOUND: GUNSHOTS: RAIN: HORSE COMING TO STOP

If all three sounds are not on mike, indicate the various perspectives in this way:

SOUND: GUNSHOTS BG: RAIN: GALLOPING HORSE FADES ON AND STOPS UNDER

When written this way there is no question that the gun battle is taking place at a distance; it is raining on mike; a fast horse approaches and stops on mike.

If you wish to indicate that a sound should continue, use the words "sustain," "continue," "through," "hold," or "under."

SOUND: GRAB AND STRUGGLE UNDER

PETER: (STRUGGLING) No you don't! You're not gonna get away this time!

NICK: (STRUGGLING) That's what you think! You couldn't stop me last time, an' believe me, you can't . . .

SOUND: TWO FAST OFF SHOTS: STRUGGLE CUTS ABRUPTLY

PETER: What was that?

NICK: Shots! Dad must be in trouble! Come on!

Sometimes a sound must be sustained, but the volume cheated so that dialogue is not lost. For example, an ammunition dump blows up. There is the initial heavy explosion, followed by exploding bombs, grenades, shells, cartridges, and so on. If the latter were sustained at the initial level, dialogue would be covered. In a case like this write the cue this way:

CAP'T: Sergeant, did all the men get out?

SGT: All except Collins, sir!

CAP'T: Collins! I might have guessed he'd . . . (BREAK OFF) . . . Well, if that dump goes up, that's the end of Collins!

SGT: Yes, sir! And good riddance I'd . . .

SOUND: OFF AMMUNITION DUMP BLOWS UP: EXPLODING MUNITIONS CONTINUE DOWN UNDER AND HOLD

CAP'T: There she goes!

SGT: Doggone! Six months hard work all shot with one lucky hit!

CAP'T: Luck has nothing to do with it. This is war, Sergeant! Get the men together, we'll see what can be done!

SGT: Right away sir!

MUSIC: HIT HARD THEN MODULATE TO NARRATIVE SCORING

It is not always necessary to write a sustain word, especially for background sounds. For example, the following two sound cues are obviously sustained sounds and will be continued until the end of the scene or change of locale.

SOUND: BG OF TOY SECTION IN LARGE DEPARTMENT STORE

SOUND: CRICKETS BG

Many times it is necessary to start a sound cue at a very low level and increase to a climax. In cases like this it is usually sufficient to qualify the cue with the word "sneak" and top it with the word "build" or "swell" at the climax.

TEX: I dunno, Slim. Guess the only thing to do is go on.

SLIM: Yeah, I suppose. But I sure don't like the looks of the pass. Snow's startin' to thaw an' that could mean trouble.

SOUND: SNEAK IN AVALANCHE AND BUILD GRADUALLY

TEX: (IMPATIENTLY) Alright, so the snow's thawing! But we can't just let Doolin hole up in them hills an' do nothing about it!

SLIM: Take it easy, Tex. I know how you feel, but if we go on now, there's . . . (BREAKS OFF) . . . Tex! Hear that?

TEX: (LISTENING INTENTLY) Yeah. Yeah! Avalanche! There it is! Above us on the right! Let's get out of here! Come on Smokey! Git up, boy!

SLIM: (AD LIB GIDDAPS)

SOUND: HORSES START FAST: BUILD AVALANCHE TO FULL ON

MUSIC: IN UNDER AND TAKE OUT TO BRIDGE

Faded sounds indicate movement and a change in perspective. There are several kinds of fades, and different ways of writing them. First the fade on.

SOUND: HEAVY OFF IRON DOOR CREAKS OPEN AND CLANGS SHUT: A FEW SLOW STEPS FADE IN ON STONE AND STOP

BOILEAU: (CUE) (QUIETLY) Your Majesty, it is my most painful duty to assist you in your preparation for the guillotine.

Steps fading on without matching dialogue are usually used for a suspense effect. If the suspense element is not desired, sound may match dialogue and be written this way:

SOUND: HEAVY OFF IRON DOOR CREAKS OPEN AND CLANGS SHUT

BOILEAU: (FADING ON SLOWLY) Your Majesty, it is my most painful duty to assist you in your preparation for the guillotine.

Fades and perspectives are merely relationships to the microphone. In the above illustration, the mike is presumably with His Majesty, whom Boileau addresses. Obviously Boileau entered the cell from off mike because he entered through an off-mike door, and faded on. If the writer wishes to reverse the mike position, that is, have Boileau on mike and His Majesty off mike at the beginning of the scene, write it this way:

SOUND: HEAVY IRON DOOR CREAKS OPEN AND CLANGS SHUT: A FEW SLOW STEPS ON STONE

BOILEAU: Your Majesty, it is my most painful duty to assist you in your preparation for the guillotine.

Here the action is the same as before. Boileau enters through a large iron door and walks to His Majesty. The difference is that the mike is with Boileau; in the sound cue the words "off" and "fading on" have been omitted. Remember, it is always necessary to indicate perspective in a sound cue when it is other than on mike.

Fading off is just the reverse of fading on or fading in. However, it is not necessary to write the words "off" or "out" after "fade." The word in itself is sufficient, as it can mean only one thing. These kinds of fades are known as "studio" or "actor's" fades.

In contrast to the studio or actor's fade, there is the mechanical or board fade which is done by the engineer. This type of fade is generally used to end a scene for a pause transition. The board fade is used a good deal on *Gangbusters*, and must be written differently than the studio fade.

JIM: Faster, Mac, we gotta get there before it's too late!

MAC: Okay Jim! Hold on to your hat!

SOUND: SPEED UP AUTO AND HOLD UNTIL CUT CUE (BOARD FADE)

SOUND: FAST RAIL CLICKS: SLIGHTLY OFF TRAIN WHISTLE

JIM: (CUE) What time is it, Mac?

MAC: Another ten minutes and we'll be there!

In the board fade, sound and dialogue are held to normal level in the studio while the engineer decreases mike volumes until completely out. At that instant the director gives the cut cue, and sound then cuts the automobile and quickly brings in the train rail clicks to normal level. The engineer then fades in the studio mikes, thus gradually bringing up the sound of the rail clicks. Just as the proper level is reached, the director throws a cue for the train whistle, and as it dies out another cue to Jim, who picks up with his first speech after the board fade. Remember, in a board fade the engineer does the fading while cast and sound maintain normal levels. In studio fades cast and sound do the fades, while the engineer maintains normal levels.

A board fade indicates a change in time or locale. A studio fade may also be used in this way. For example:

HARRY: You know the place, Stan?

STAN: Yeah, yeah! Big brown two-story house at the end of the street! Relax, will yuh? It's twenty miles yet!

SOUND: SWELL FAST RUNNING AUTO: HOLD BRIEFLY: THEN FADE DOWN AND OUT: FADE BACK IN ON CAR SKIDDING TO STOP

HARRY: That the place? You sure?

STAN: Of course I'm sure! Come on!

A change in locale is usually achieved through use of a music bridge or narration. However it may be done by cross-fading sound.

SOUND: EXPERT ON TYPEWRITER

MARY: (TO SELF) . . . so you see, Jim darling, things are working out beautifully. Two more months and we should (BEGIN FADE) be able to be together for ever. Oh how I . . .

SOUND: CROSS-FADE TYPEWRITER INTO RAIL CLICKS AND TRAIN WHISTLE

JIM: (FADING ON) (READING) . . . be able to be together for ever. Oh how I look forward to that day. So with all my heart, etc.

Here the typewriter must fade with Mary, and the train sounds be pretty well established by "Oh how I." The BG train sounds are brought in as the typewriter is faded out. Jim must start reading with Mary and match her cadence and inflection as he overlaps her speech, or the effect is lost. Normally a live typewriter is best for typing sounds, but in this case a recorded typewriter is better as it is easier to cross-fade with recorded train sounds.

Never bury sound cues in dialogue or narration without indicating them in some way. Hidden sound cues indicate a lack of experience in radio playwriting.

SANDRA: I'm sorry it happened this way, Andre. I tried to tell you, but you would never listen to me. You were always so sure of me. So now I'm leaving you! I'm going away with Brad and . . . (REACTS AS SHE IS SLAPPED). (A BEAT) You shouldn't have done that, Andre. You should never have struck me. (QUIETLY) Goodbye, Andre.

SOUND: STEPS FADE: OFF DOOR OPEN AND CLOSE QUIETLY

In many cases it is impossible to indicate by a written sound cue the exact place an effect should be. The director may vary the pace of a speech in such a way that the initiation of an effect may come anywhere within a dozen words. Handle this by prefacing the written sound cue with the word "anticipate."

KREUGER: I tell yuh, them natives are on a tear; we gotta get outta here!

LOUGHLIN: (CHUCKLE) Agh, you're imagining things, Kreuger! Why those natives are scared to death of us, and our rifles! "Long stick make thunder" they call them! (LAUGH) Why, just a couple of shots over their heads and . . .

SOUND: ANTICIPATE JUNGLE DRUMS BG

KREUGER: (CUTS IN) Listen! There, I told you! The death drums!

In this case the drums probably will be started along about the words "long stick make thunder" so that they will have time to register with the listening audience and to motivate Kreuger's last speech which cuts off Loughlin's line. Here are two more examples of anticipated sound.

NARR: The well-dressed stranger parked his car, crossed over to the bank, presented his credentials, and was ushered into the president's office . . .

SOUND: (ANTICIPATE AS INDICATED ABOVE) DOOR OPEN AND CLOSE: A FEW STEPS

GREEN: I came as fast as I could, Mr. Larkin.

. . . . .

SOUND: START RUNNING STEPS

CLAY: (RUNNING) Come on, Tad, this is what we've been waiting for!

TAD: (RUNNING) You mean you're going to Copper City?

CLAY: Yep! We'll catch Braden there!

SOUND: FADE ON STANDING HORSES

TAD: Boy, you sure are crazy! That's suicide!

CLAY: May be, but I'm going! Steady boy! (MOUNT) Shake it up Tad, we haven't any time to lose! All right Blacky, out there! Stretch out, boy! Let's roll!

SOUND: (ANTICIPATE) HORSES INTO HARD GALLOP

If you as a writer cannot express in a written sound cue what you want, how can you expect the soundman and director to know? Never shirk your duty by writing a sound cue "do it" or "he does." Do what? How? At what perspective? Make your sound cues as short yet as descriptive as possible. Qualify your cues with "Massive wooden door slowly creaks open" or "(Off) jail door slams shut." Remember too, if there is no indication of interior or exterior locale in a scene, qualify footsteps with "a few steps on wood" or "several fast dirt steps, then stop," and the like. Above all, do not weasel out of a difficult imaginative sound cue as did one writer by writing:

SOUND: FRANNIS THE GEEFUS

If a sound cue is unidentified by situation or dialogue and is not important to mood, atmosphere, or plot, leave it out. Bits of pantomime are fine in a visual medium, but have no place in the aural medium of radio unless they are necessary and understood. For example, note the use of unidentified sound in the following illustration.

FIGURE 27. *Bill Nugent setting up for a show. The gadget at the left is used for a comedy pay-off on the slot machine. (Courtesy of National Broadcasting Company.)*

BEN: What about the descriptions of the clothes the girl wears? Anything we could start on?

WALT: No . . . other than the fact she wears flashy clothes.

SOUND: DOOR OPENS—CLOSES: FOOTSTEPS COMING ON

JOE: Oh, hiya, Jackson.

JACK: (OFF) Hi.

SOUND: JACKSON WALKS OVER TO LOCKER: OPENS IT: PUTS OVERCOAT INSIDE, CLOSES LOCKER AND WALKS OVER TO GROUP

WALT: Any luck?

JACK: Not much. None of the victims have a very good idea what the dame looked like. Tall, good looking, nice figure. That's all.

No mention was made in the script of weather necessitating the use of an overcoat, of the fact that Jackson had an overcoat, nor the fact that there was a locker in the room. The cue is meaningless and poses a problem to the listener. What was going on at this point? If the listener stops to puzzle out what has happened, what that off-mike unidentified sound was, he ceases to listen to the dialogue and loses his place in the story.

If the writer or director insisted on this little bit of realism, the dialogue and sound pattern should have been altered slightly, to something like this:

WALT: No . . . other than the fact she wears flashy clothes

SOUND: (OFF) DOOR OPENS—CLOSES: FOOTSTEPS BG

JOE: Oh, hiya, Jackson.

JACK: (OFF) Hi.

WALT: Any luck?

JACK: (OFF) Just a sec until I hang up my coat.

SOUND: (OFF) LOCKER OPENS AND CLOSES

JACK: (FADING ON) Not much. None of the victims, etc.

Do not write a sound cue for an effect that would not be sufficiently audible to register. For example:

BUTLER: Who is calling please?

COUNT: My card.

SOUND: PASSING CARD

BUTLER: Please be seated sir. I will announce you immediately.

Another example of a sound cue that would not register:

BETTY: It's beautiful! It's the loveliest engagement ring I've ever seen! May I see it?

ANNE: (PLEASED) Of course, dear. Here.

SOUND: HAND OVER RING

BETTY: (RAPTUROUSLY) You're such a lucky girl, Anne! Your Tom has wonderful taste!

ANNE: (SMUGLY) Yes, and the money to match it too!

These are illustrations of ridiculous sound cues. Neither the card nor the ring would make any sound. To give the feeling that they are exchanging hands, all that has to be done is to have the butler and Betty take a good beat pause, then continue with their lines.

One more suggestion. Is it necessary for the writer to make a list of sound effects for the individual script? Soundmen consider such a list a complete waste of time. Any soundman that selects his effects for a show from a list without going through the script isn't worth his salt. He should know exactly what each sound cue is, how it applies to the script, and what it should do. This he can determine only by reading the script. For example:

SOUND: A SHOT

What kind of a shot? Pistol? Rifle? Large or small caliber? A live on-mike shot or recorded off-mike shot? Or as another example:

SOUND: CROWD

What kind of a crowd? Polite social gathering? Angry mob? Football? Race-track? Men? Women? Mixed? Children? Laughing? Fifty? Five hundred? Five thousand?

No, don't bother to list effects. Let the soundman read the script. If, however, there is a most unusual effect, or some little-known historical apparatus that you have encountered in your research, have the foresight and courtesy to phone and explain it to the soundman. This consideration a soundman deeply appreciates. It gives him time to make any necessary research, opportunity to build an effect or work out a satisfactory blend of recordings. The astute writer knows that a gesture of this kind will assure the creation of a satisfactory effect by the soundman.

Write within the budget. You would not have sixteen speaking characters on a show when the budget allows for only five performers. Even if they all double, you're still short. The same holds true for soundmen. On a show using one soundman, do not write cues requiring two or three. There are times when it is physically impossible for one soundman to do several things at the same time, yet some writers fail to consider that fact.

For example, here is a scene in which the heavy, on mike, is beating up the hero. In the distance a car fades on to half off, stops, people jump out, slam the car door, run across the sidewalk to where the battle is going on, and then after an exchange of shots, the villain knocks out the hero who falls to the ground while the villain runs away. The scene has excitement, yes, but can you see what an impossible position one soundman is in trying to get the on and off perspectives, fades, working the sound truck, opening and closing off car doors, firing guns and doing body falls, while all the time simulating a big fight on mike. Believe it or not, whodunit writers will week after week write a scene of this type, and wonder why one soundman has trouble doing it!

No implication is meant that a writer should be an expert in sound effects. That's the soundman's job, as writing is the writer's job. But if the writer knows something about the soundman's and other production personnel's problems and limitations, a lot of confusion can be eliminated and a smoother show result. If drastic changes are made in a script, the writer should find out why. If the changes were caused by production problems, then the writer should learn why the change was necessary and make his future scripts more production-wise. If a choice has to be made between two writers of equal experience and ability, the writer whose scripts offer the fewer production problems will undoubtedly be the one chosen.

The progressive writer will check from time to time with sound to learn if any new equipment has been built or unusual effects purchased. He is anxious to utilize new techniques and effects to give variety to his scripts. Or a soundman who admires a writer might notify him that the sound department has just purchased a new so-and-so, and thought he'd like to know. The writer appreciates this courtesy also. Sometimes a tip like this will start a train of thought that results in an unusual script.

An ideal set-up, depending upon the individual of course, is the writer-director combination. If the writer also produces the show, he is familiar with the problems and limitations of both the script and production. Any odd problems can be quickly settled during rehearsal. Or the director and soundman can get together and iron out any potential difficulties before rehearsal starts.

In some instances sound cues are given that call for considerable research on the part of a soundman. Although the director is in charge of a show and has the final say, sound does not wait until rehearsal to get instructions. He reads the script and if he does not understand just what a particular cue means, he either checks with the writer, contacts the

director, or does research in the library or museum. Those fortunate enough to live in Hollywood usually have a contact in the research department at one of the major motion-picture studios. A phone call or visit will clear up any unusual research problem. It is up to the soundman to be all set up, script marked, and ready to go when rehearsal is called.

Occasionally a sound cue causes some real digging in order to get the facts. For instance, what sounds would re-create the loading of a Revo-

FIGURE 28. *Sound setup on the fast-moving heavy-action adventure drama* Straight Arrow. *Soundman Tom Hanley at the sound truck and the author with Fury's "hooves." (Courtesy of Don Lee–Mutual Broadcasting System.)*

lutionary War muzzle-loader musket? How many shots did the first Colt revolver fire without reloading, and how fast? What was the mechanical operation of an early Reuter's semaphore? How did it sound? What tools were used in building the pyramid of Gizeh? What were the implements used by the alchemists? These are but a very few of the challenges presented to soundmen. The soundman's job is to be ready at the start of rehearsal with the real sound, or a creditable simulation thereof.

In most cases the writer has researched before he writes the script. However some sound cues indicate that the writer is either guessing or

does not know what he is writing about. For example, a sound cue called for the metallic clink of copper ore being examined. This was pure guesswork. Copper in the ore state would sound like rock; only when refined does copper have a metallic sound. Or take the case of the writer that called for the rattle of a bit in a hackamore!

If any reader of this book intends to become a writer in the field of radio, remember these few simple rules:

Make your sound cues as concise yet explanatory as possible. A sound cue should never leave a question as to the "what," "where," "how," and "how much."

Do not load up a script with unneeded sound cues, but be sure and have them where needed.

Write within the budget. If two soundmen are assigned to the show, use them to fullest advantage, but don't demand the work of three men.

If you have some unusual or obscure sound effect in a script, don't be mysterious about it. Explain it fully. After all, it is your brain child that is placed in the hands of others. If they do not understand it, what you had in mind will not be evident in the broadcast.

Come to rehearsals and watch the mechanics of putting a show together. If you are observant, your scripts will show improvement.

If you become puzzled in writing a sound sequence, call up or visit a soundman at the studio. Spend some time with him in the sound department. You will probably learn about effects you never dreamed existed.

In any respect the radio dramatist's scripts, good or bad, continually pose challenges for the soundman. There are many fine writers in the radio field, men of integrity and personal pride who seriously try to write good scripts. And fortunately these writers have the intelligence to welcome suggestions and criticisms from those whose job it is to give life to their scripts. It is a real joy to work shows scripted by writers of this caliber. The beginning and hopeful writer can do no better than to emulate them.

CHAPTER THIRTEEN

Working A Show

IN THIS CHAPTER the reader will be taken step by step, from the time sound gets the script, through the setting up of the show, rehearsal, and the broadcast performance.

Here is a hypothetical day in the life of a soundman. His big effort for the day is on *Ace Nye, Private Eye*, which invades the air at 8:00 P.M. and calls for one soundman. The show is a whodunit written around Ace, a private investigator. His chief reason for existence seems to be to show up the police force as a group of incompetents, particularly Lieutenant Kreuger of Homicide.

About three o'clock sound picks up the script and sits down to look it over. As he rapidly flips through the pages he is primarily concerned with locating any unusual sound cues that might call for especially created effects. However, this script calls for the usual effects, so in the sound room (where the sound effects are stored), sound starts gathering the effects needed and places them in a prop truck. First he puts in his hard-heeled work shoes, and then the other manual effects. These various hand props, consisting of real and simulated effects, are wheeled into Studio Eight, then a house door and a car door are brought in.

Sound skims through the script again, this time looking for the recorded effects needed. He makes his selection from memory, consulting the sound-effects catalogues only when not too familiar with the number of some specific effect. If the script calls for some rarely used recorded effect, sound will gather up all records containing that particular effect and audition them to make a selection.

Sound has now assembled all the effects indicated in the script, and starts his setup. This may vary from show to show, depending on how many soundmen work the show and the equipment used. A show of this type usually may be set up with a single sound mike.

First he arranges the sound truck in a position that permits him to see over it toward the control booth, so that during the show he can see the director's cues readily and from time to time check with him for volume levels.

Next he determines where the single mike will be placed. In this show he has the speaker of the sound truck, a house door, and a car door that must be close enough to the mike to give an on-mike presence. The actual placement of the mike depends on the type used. In this case it is a cardioid mounted on a boom. The boom is elevated and the arm angled sharply down so that the face of the mike is about two and a half feet above and parallel to the floor.

The placement and the 180-degree pickup pattern of this particular mike will easily give the proper presence to the hardware on the two doors for on-mike work; is right for picking up recorded sounds on the speaker; and about right for the gravel, cement, and wooden walking surfaces that are arranged almost directly under the mike.

The speaker, doors, and walking surfaces are generally placed in proper perspective to the mike and left there for the entire show. On the other hand, the portable hand props are grouped conveniently on the prop truck where they may be readily reached and brought on mike as needed. Sound has now made his setup, and sits down to mark the script.

Every soundman has his own ideas on marking a script, and it is his business so long as he understands the markings. One suggestion to the beginner: keep your markings simple. The more to read, the greater chance of error. Why not just encircle the written sound cue and let it go at that?

By this time sound is ready to go on mike. The cast has been reading at the table or in the script conference room and they are ready for the first on-mike rehearsal. Their "read-around" has given them some idea of the characters and story line. The read-around has also given the director a chance to explain the general manner in which he wants the show played, with specific details to be taken up on the mike rehearsal.

It is about four o'clock now, and everyone goes on mike for the first run-through. This is the first time that all the parts of the script are brought together, the acting, sound, music, direction, and mixing. This rehearsal sounds quite different than what the broadcast will eventually sound like. There are fluffs, spots where the timing does not fit, places where sound cues should be moved, placement of actors on or off mike altered, a sentence rephrased, and so on. The first run-through is not a particularly smooth performance.

Sound usually has little difficulty on the first run-through, unless there are some very unusual or particularly difficult sound sequences. The script is routine, and having worked the show for a long time, sound knows what the director wants. Which brings up a point discussed in Chapter 11 but worth reviewing here. Many times a soundman will do an effect that he feels is wrong and would not do that way on another show. But he has learned by experience that the director wants the effect done that particular way. The smart soundman slants his work to the director's taste, rather than to his own. Thus he becomes a great artist in the eyes of the director, even though the effect may be, in the soundman's opinion, very poor.

During the first rehearsal many of the technical problems are ironed out, especially on fades, perspectives, and volume levels. As the rehearsal progresses the soundman sees where he should anticipate sooner in certain instances, or maybe move a sound cue down a couple of lines. There will be places where an actor will jump a sound cue or not wait for an effect to establish properly. Sound notes this, along with spots where he is off on his own timing. It is the director's job to watch for these things too, but if he misses, then the soundman points them out in a nice way. It would be tactless to state baldly that Wilbur made too long a fade or came in too fast, or that Sandra threw the timing off by her movement. It is not the soundman's place to comment on the actors' mike technique.

The actor is principally concerned with line interpretation and mike placement, sound with mood, atmosphere, and physical activity, the engineer with proper balances, and the director with the over-all effect. When the production staff and actors can get together in a critically constructive and friendly way, it makes for a better show. Hence sound or anyone else should feel justified in speaking up when an obvious discrepancy is noticed. Sound may ask for permission to move up a sound cue, to hold off an effect, or to anticipate something ahead of the written sound cue.

On this rehearsal the soundman may find that he has not placed the truck speaker in proper relation to the mike, or that his off door is too far off, or that the sound of the elevator door is too loud. The proper perspective and levels are established by the soundman, engineer, and director, and corrections made. On recorded effects the soundman looks to the director immediately after establishing the sound to see if the level is correct. If too loud or too light, the director will signal, and the soundman then either makes a mental note of the correct level or marks it on his script.

On a "happy show" where there is a spirit of good fellowship with gagging and practical joking, the first rehearsal is the time for any horseplay. The actors may ad-lib or change lines for a laugh, and sound may gag an effect for a chuckle. It eases the tension of rehearsal and puts everyone in a good mood. But after the first rehearsal all horseplay should cease. From then on the rehearsal is serious business.

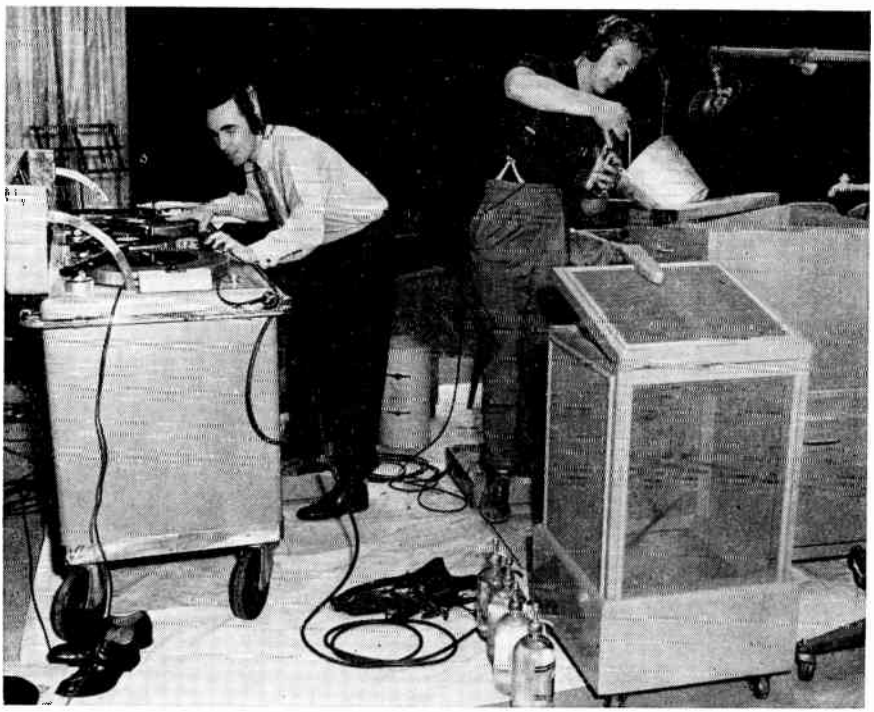


FIGURE 29. *On* Family Theater *Tom Hanley plays a lowing-cattle record while Bill James "milks" a cow. (Courtesy of Don Lee–Mutual Broadcasting System.)*

But let us return to *Ace Nye, Private Eye.* By now the script has been gone through once on mike. With stops and reworking of scenes, it is now about five o'clock. The script is gone through again to see how well some of the more difficult scenes have been improved and if the problems of levels, perspectives, and fades have been satisfactorily corrected. This is a rough dress rehearsal, that is, the entire script is done without stop so that an approximate timing may be made.

The time is now five-thirty. The director on the last rehearsal has been listening more critically to line interpretation by the actors, and between five-thirty and six works with the cast on lines. He also points out to music

and the engineer any irregularities, and of course sound comes in for corrections on unsatisfactory sound effects. The rough dress shows that the script would be two minutes and forty-seven seconds too long for a half-hour show if played at the same pace as on the dress. Two of the scenes should have been played at a faster tempo, so about thirty seconds can be picked up there. That leaves two minutes and seventeen seconds still "over." It is now six o'clock, and the cast and production crew are dismissed for the dinner hour.

During the dinner hour the director, and writer if present, make cuts in the script to approximate the time needed. Sound also gets another door because in one place the sound of an off-door close and an on-mike phone ring occur almost simultaneously. With one sound mike and one soundman that is difficult to do. Ordinarily the engineer can hold the mike down (in level) to give the door near the mike an off sound. But if he did that, the phone also would sound off. So he brings in another door and places it a little distance from the mike for the off door. At the right time it can be closed while the phone bell is rung by a remote-control button. Here is a case where sound can do off and on mike effects simultaneously and not try to be in two places at once. If the perspective of the two effects were reversed, it would not be necessary to get the extra door. The on-mike door could be used with the sound mike at normal pickup level, and the phone bell placed off mike and operated by an extension cord.

After the hour for the supper break, the cast and production staff reassemble in Studio Eight at seven o'clock. At this time the director gives the cuts and everyone marks these lines out of his script. As each cut is given, the actors read the cut lines and a timing is made by the contact producer or script girl. The accumulated timing of cuts will show how much time has been taken out of the script. When the two minutes and seventeen seconds have been reached, another twenty to thirty seconds are cut in order to allow for a little "spread."

It is now about seven-fifteen, so everyone goes on mike again for a final dress. This rehearsal is done as if it were the actual broadcast. No stops are made, and the final accurate timing that will guide the air show is made with timings noted on the script every thirty seconds. With experienced performers and staff and an average script, few problems arise in the dress. The show times out right and the production and line interpretation difficulties have been satisfactorily corrected.

It is now seven-forty-five, so the director gives everyone a ten-minute break. By five minutes of eight, everyone assembles in the studio and

prepares to go on the air. During this last five minutes, sound is very busy. He checks to see that the sound truck is warmed up, all tables turn readily, and all controls function properly. If not using sapphires, he inserts new needles in the pickup heads, changes the rehearsal records for the air show records, and cues up the first records that will be used on the show. If there is a glass crash, he sees that the glass crasher is loaded, and stand-by glass available. Two guns are loaded, and ammunition laid out where it can easily be reached. Although there are only three shots on this show, and the guns hold nine shots each, a second gun is always ready as a standby in case a gun jams.

The walking surfaces are tested to see that they will not rock and are conveniently placed. It is about one minute of air time now, and the last thing sound does is check his script to see that the pages are in consecutive order. By then "system cue" is given and in thirty seconds the show will be on the air. Sound puts on his headphones, glances quickly around to see that all the manual props are within reach, and he is ready. Just then the director throws a cue, the "on the air" sign lights up, the orchestra starts the theme, and the show is on the air!

Once on the air there is no stopping! No retakes, no talking things over, or trying something different. To the best of everyone's ability the show has been polished and the script cut to the proper time. The latter is very important because no matter what happens, there is exactly twenty-nine minutes and thirty seconds to perform the entire drama, give the commercials, sign off the show, and give system cue at 8:29:30 P.M.

The broadcast is the climax. Everyone on the show must be on the alert and do the very best he knows how. The station and the network have provided the facilities and production staff; the agency has bought the writer's script and hired the actors, as well as supplying the orchestra and director. For this twenty-nine-plus minutes the entire facilities of some one to five hundred radio stations all over the United States have been subordinated to what is happening in Studio Eight.

Sound closely watches his script, the actors, the engineer, and the director. He matches his sound to the known peculiarities of specific actors, and is always on the alert for any new ones that may develop. Even when he starts a recorded effect at the level established in rehearsal, he glances toward the booth to check with the director. Is it too high? Not enough?

As sound sees an effect coming up, he gets the proper piece of apparatus or cues up the desired record so as to be ready when the cue comes. After manual effects or records have been used and there is no need of

them again, he places them out of the way. This keeps the working area uncluttered and lessens the chance of error.

The show goes well. The proper pace has been maintained, the cuts taken in the script keep the show on the nose, and from time to time the director touches his nose to indicate that everything is on schedule. Finally at 8:29:30 the announcer says, "This is the Premier Broadcasting System," the orchestra plays for another fifteen seconds, the "on the air" lights go out at 8:29:45, and the show is over!

CHAPTER FOURTEEN

Types of Shows

RADIO ENTERTAINMENT is composed of many different types of show designed to appeal to many different types of listener. This chapter will discuss some of the more common types, and sound's relation to them. First, the dramatic shows.

Generally speaking, on a dramatic show the soundman works with literal sounds and strives for realism. The pace varies considerably depending upon the type of drama. Some plays are hard-boiled fast-paced affairs that call for very quick and concentrated cues. Other dramas are comparatively actionless and concentrate pretty much on the dialogue and plot line. Usually the suspense element is played to the limit, and this calls for careful timing. But let's take some specific types and see how sound is used in them. The following comments are of course broad generalizations.

THE UNIT DRAMA

The unit drama presents a complete story on each broadcast. It does not have the same principal characters every week, but does operate under the same program title name. The timing and pace vary according to the particular program. Sound is usually of the conventional type, that is, as realistic as possible. Generally sound is not too important on this type of drama, and is not pointed up for any special emphasis. Programs of this kind are *Lux Radio Theater*, *Favorite Story*, *First Nighter*, and *Gang-Busters.*

THE EPISODIC DRAMA

The episodic drama is practically the same as the unit drama, with one exception: the same central characters are used on every program. A

complete story is told on each broadcast. Sounds are usually conventional except that some research is necessary on period episodic dramas like *Sherlock Holmes, The Count of Monte Cristo,* and *Straight Arrow.* Usually the tempo is faster and more dramatic than on the unit drama. Other programs in this category are *Big Town, Mr. District Attorney, The Lone Ranger, The Thin Man,* and *The Mayor of the Town.*

THE BIOGRAPHICAL DRAMA

The biographical drama is usually historical. Realistic effects are called for, with the added problem of much research on the part of the soundman. Pace varies with the individual script. The soundman working this type of show must be especially alert about details of various periods and in many cases of foreign locales. An outstanding example of the historical biographical drama is *Mr. President* with Edward Arnold.

THE SERIAL DRAMA

The soap opera is our most familiar example of a radio serial. The story line is stretched over an interminable period of time. The chief incidents of the plot are spread out in a series of episodes that may last as long as two or three months. The pace is very slow, the plot barely progressing because the author conserves his material as much as possible. The basic format of the serial drama is a great deal of dialogue and very little action. In this type of drama stress is laid on setting characters and talking about the things that are happening, but doing little about them. Hence sound is relegated to a minor place and is generally used sparingly. Presumably the detergent dramas offer a certain comfort to women who listen to them; real life couldn't possibly be as grim as depicted in the soap opera.

An exception to the general serial drama was Jimmy Scribner's *Johnson Family.* Although this was primarily a comedy show, it had a continued story line and was given in five 15-minute episodes a week.

THE DRAMATIC NARRATIVE

The dramatic narrative is a combination of narration and dramatic scenes, presenting a complete drama in each broadcast. The unifying thread of the story is supplied by the narrator, connecting short dramatic

highlight scenes. Usually more ground is covered than could successfully be handled in any other way within the time limitations. The pace of the show varies with the story being told. Research on sound effects varies also according to whether the drama is period or contemporary. There are usually some difficult spots for sound because of the frequent use of

FIGURE 30. *Ronald Colman surrounded by soundmen Parker Cornell, Virgil Reimer, Bob Conlon, Fred Cole, Tiny Lamb, and Floyd Caton on the* Screen Director's Playhouse *production of "The Prisoner of Zenda." (Courtesy of National Broadcasting Company.)*

montages. This calls for rapid and accurate work on the part of the soundman. *The Whistler* and *The Mysterious Traveler* are of the contemporary type, while *You Are There* and *The Cavalcade of America* are period shows.

THE DOCUMENTARY

The documentary is a dramatized information program similar to the dramatic narrative show in format. The old *March of Time* is an example.

During the war many shows of this kind were on the air. In peacetime the documentary is used primarily on special public-service programs: army recruiting, accident prevention, campaigns for medical research and disease prevention—any program carrying a special message. The documentary is recognized as the most palatable way in which to present factual material. Sound on these shows varies, depending on how the program is written. One of the finest examples of the documentary program was True Boardman's "And Sudden Death."

THE FANTASY

The fantasy program may be in the format of any of the above-mentioned types of show. Its distinctive characteristic is that it makes no pretense of being liberal or realistic, and therefore offers an especial challenge to the soundman. The literal sounds used on routine programs are seldom adaptable to a fantasy, which usually requires especially created effects. In general they are highly imaginative and call for a sensitive feel for the mood and locale of the show. Above all, the soundman must very carefully watch his timing and volume levels. A fine example of this type of program is *Let's Pretend.*

THE ADVENTURE DRAMA

The adventure drama is typically a slam-bang, hard-boiled, fast-paced show. There is a lot of action, and consequently the show is loaded with sound effects. After all, sound is the action of a program. Generally the tempo is fairly rapid, and sounds are of the literal or realistic type. The kid serials are a type of adventure drama. *Sky-King, Terry and the Pirates, Superman,* and similar shows are full of sound effects. The action is fast and the suspense angle played up. An episode generally ends with a "cliff hanger." No matter what sounds are used on these programs, they must be loud and easily distinguishable. Adult adventure dramas are *Straight Arrow, Lone Ranger, Red Ryder,* and one of the finest shows of this type, now no longer on the air, *The Voyage of the Scarlet Queen.*

COMEDY SHOWS

As far as sound is concerned, a comedy show is handled quite differently than a dramatic show. In the first place, there are two types of comedy shows, the situation comedy, and the gag comedy.

The situation comedy

The situation comedy is generally a half-hour program built around a specific incident, told in its complete form within the time limit. Shows in this category are *The Adventures of Ozzie and Harriet, The Phil Harris-*

FIGURE 31. *Soundman Bud Tollefson on the verge of opening Fibber McGee's closet. (Courtesy of National Broadcasting Company.)*

Alice Faye Show, Fibber McGee and Molly, A Day in the Life of Dennis Day, The Jack Benny Show, Our Miss Brooks, and the like.

A situation is set up at the beginning of the program and worked to a conclusion or pay-off, with plenty of laughs along the way. The situation may be about a trip across country taken by Phil Harris, Alice Faye, and their children, with all the troubles they encounter. Or Ozzie may decide

to go to night school, and Harriet and the children plague him about it. Possibly Fibber decides to take up painting as a hobby, with Molly as the chief scoffer, aided and abetted by other principal members of the cast.

The sounds on these shows are in the main realistic. Yet the soundman must use a great deal of ingenuity because many of the legitimate sounds are varied or gagged to give a comedy effect. In many instances the writer will give a clue as to what kind of sound he wants, then leave it up to the imagination of the soundman. Probably two of radio's most famous sound routines, other than *Inner Sanctum's* creaking door, are Jack Benny's Maxwell (originally done by an especially built contraption and now done vocally by Mel Blanc), and the avalanche that results when Fibber opens his closet door.

The gag comedy

The gag comedy show differs from the situation comedy show in that there is no specific plot outline to hold the program together. Bing Crosby, Fred Allen, Milton Berle, and others give monologue routines or use other performers to feed them lines. Sometimes short sketches are used with a guest star or regular members of the cast. In any event the pace is very fast. Things move swiftly, and the comedy sound effects used generally get laughs because they are completely ridiculous or greatly exaggerated. On the gag show the soundman must have an entirely different approach to interpretation of sound than on any other type of show. Each effect is worked out with one idea in mind: will it get a laugh? Or will it in some manner aid in building a gag so as to get a bigger laugh?

One of the greatest laughs ever gotten in radio was caused by a very simple effect. It was a keen sense of the ridiculous that made the gag so funny. On a Durante-Moore show, Jimmy came to Moore's house. Moore made some remark about the California rain, which Durante loyally brushed aside with the comment that it was just a little mist. He then proceeded to take off a pair of rubber boots, and gallons of water gushed out! This of course got a big laugh. But the soundman topped that as the laugh started to die out by making the sound of a single frog croaking! This double snapper, perfectly timed, got a good forty-five-second laugh! Imagination and perfect timing made the pay-off so great. Which brings up the point of timing on a comedy show.

It is a cardinal sin in show business to "step on a laugh." The whole object of a comedy show is to get laughs. If an actor or soundman starts his following line or cue before a laugh has almost died out, he has

stepped on it and defeated the whole purpose of the show. This calls for a fine sense of timing by the cast and sound. Usually certain routines are expected to get laughs, and the performers wait hopefully at these points. But there are always unexpected laughs also, and the soundman must watch out for these.

Sound effects on a comedy show are also affected by whether or not it is an audience show. If there is an audience, many of the sound gags can be played up for the visual element. The listening audience gets a terrific kick out of the racket made when Fibber opens his closet door. But the studio audience has the real show when the soundman opens the door, then goes to work on the enormous pile of stuff that has been carefully arranged for the sustained crash. On audience shows the soundman becomes a visual actor too. He will milk "sight gags" for all they are worth, playing to the studio audience. At times, according to the effect, the soundman hams a great deal, or will play a gag dead pan to get more laughs. An uninhibited soundman will knock himself out (literally) on a comedy show and work for his laughs as hard as any star. The top-flight comedy shows use sound a great deal for laughs. If a soundman comes up with a particularly funny sound sequence, that sequence is played up for all the laughs it can get.

Most comedy sounds are based on legitimate sounds, but are given a novel twist or comic interpolation that catches the listener off guard. A soundman with a good sense of dramatic values plus an outsized sense of humor is a rare person and of incalculable value to a comedy show. Fantasy, along with comedy, are the two most difficult types of shows for sound. Both call for much creative work, unusual effects, and a great deal of imagination. In addition, a sensitive feel for timing is a must in working comedy shows.

The purpose of this chapter is mainly to point out that a soundman must be adaptable to various types of shows. The pace and interpretation of effects vary according to the kind of program being done. Thus a soundman must never permit himself to get into a rut by doing his work in the same manner all the time. He must remain malleable and understand the techniques of the different types of dramatic and comedy shows.

CHAPTER FIFTEEN

Sound in Television

THE MEANING of television is shown by a breakdown of its name: "tele" (far) "vision" (seeing). Television is not a new art medium, but a new means of communication, and potentially is the greatest medium for mass education, information, culture, and entertainment ever created. As TV still is in a highly elastic and formative stage, it is permissible to give here only some very broad generalizations as to sound effects and their place in TV.

In one respect or another TV resembles each of the other major mediums of entertainment: stage, radio, and motion pictures. Its technique most closely approximates that of the movies in that the major means of dissemination is through the use of a camera (the video) supplemented by sound (the audio). TV, however, draws upon both stage and motion pictures in its writing technique, with obvious variations. Radio writing has contributed little to TV writing because the former is one-dimensional or aural only, while the latter is two-dimensional, aural and visual.

The major contribution of radio to TV has been in sound effects. Radio was forced to develop its own techniques in improvising sound. These in turn were drawn upon by the theater and sound motion pictures, and ultimately by television.

The relationship of soundman to actor varies in radio, motion pictures, and television. In radio, all sound effects are done by the soundmen. In motion pictures, sound is in part created by the actor and in part dubbed in by the movie soundman. In live TV, sound is in part created by the actor and in part done by the sound-effects technician. In radio and TV, sound effects are done simultaneously with the action. In motion pictures the sounds are usually done by the soundman after the action has been filmed.

In Chapter 1 it was stated that the radio playwright's medium is strictly aural, depending upon music, narration, dialogue, and sound effects for success. There also was given a summation of the scope and limitations of the stage and screen playwright. The TV writer, however, is confronted by a different set of conditions.

In the first place, the TV writer has much more latitude in his medium than the radio playwright because he can appeal to two senses, hearing

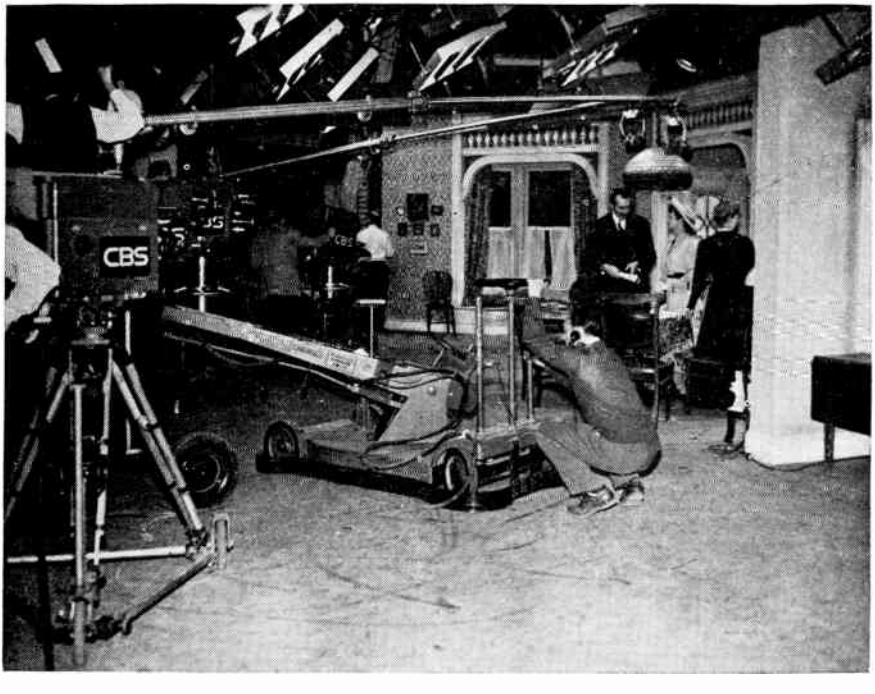


FIGURE 32. *Scene from CBS's* Ford Theater. *Four cameras and two boom mikes are visible. Onstage are Raymond Massey, Eva Le Gallienne, and Patricia Kirkland. (Courtesy of Columbia Broadcasting System.)*

and sight! Besides music, sound effects, narration, and dialogue, he can use facial expressions, gestures, costumes, scenery, stage properties, lighting effects, make-up, business (movement of actors), and trick photographic effects to dramatize his story.

We acquire our experience and learning through the stimulation of the five senses, in just what proportion is not exactly known, but without question the most informative of the senses is vision. This fact immeasurably aids the TV playwright; he has the advantage of appealing to this

most important perceptive sense, supplemented by a second important perceptive sense, hearing.

However, due to the mechanical and physical setup of TV, the television writer is confronted by limitations peculiar to the medium. Probably the greatest and most difficult problem in TV is to maintain the continuity in live dramatic shows that have time lapses and scene changes. This is no problem in motion pictures, and in radio is easily handled by use of the transition (see Chapter 9). In the theater, tradition permits continuity to be broken by intermissions for costume and scene changes, or the lowering of the curtain is accepted by the audience as indicating a time lapse. A similar device or the use of a music or sound bridge as in radio cannot be used in TV because there must never be a time when the viewer at home stares at a blank screen.

In TV if there is a time lapse or a change in locale, there must be some visual evidence of such. The use of a train whistle will not satisfactorily indicate the crossing of the continent as it does in radio; something must be seen to indicate a train trip. The simplest way to handle a situation like this is to insert a strip of sound film showing a train in motion for a few seconds, then fading back into the live scene that follows.

In TV the cuing of sound effects in transitions must be critically sharp. In radio most transitions are achieved by sound or music and are generally faded in and out of a scene. But in TV the case is different because of the many very abrupt transitions, cutting from one camera to another to get a change of angle or scene. At the exact instant of this kind of change, sound must either be initiated or cut, depending on whether the sound is going into or coming out of a scene. TV transitions are, therefore, a problem to both playwright and soundman.

A second major problem in TV is that the camera is severely limited as to depth of focus. The plane of sharp focus is very narrow, and when a TV camera is focused on an object or person, the foreground and background in relation to the focal point tend to become fuzzy or out of focus. Because of this, it can readily be seen that background sounds must be handled very carefully. If there is movement in the background that cannot be distinctly seen and understood, sound effects relating to that movement should be eliminated because they tend to confuse and conflict with what is transpiring at the point where the camera is focused.

This is the second difference as to the use of sound in TV and radio. In TV hold the background sound to a minimum unless there is a specific reason to feature BG sounds, and only then when they are easily identified.

One of the most useful attributes of sound effects in radio is that it aids in progressing action. By action is meant the implied physical movement of an actor. However, as TV is primarily visual, the televiewer at home can see the action; therefore sounds to imply action are unnecessary. This is the third difference between sound in radio and in television.

In a radio script an actor may say that he has some new tobacco he would like his guest to try. With a voice fade matched by a sound fade of footsteps, and dialogue indicating what he is doing, we hear the actor walk to the mantel of the fireplace, pick up a humidor of tobacco, and fade back to the mike. In TV, we see the actor go to the mantel and return with the tobacco. Footsteps here by a soundman to indicate action would be superfluous.

Another example. In a live telecast a close-up might show an actor picking up the phone and dialing a number. In all probability the sound heard will be that of the actor actually dialing the phone, because this ensures the viewer seeing the action and hearing the sound in perfect synchronization. It would be pointless for a performer to light a cigarette while a soundman off screen (out of camera range) struck a match close to a sound-effects mike. By picking up the actual sound of the match strike on the actor's mike, the timing is perfect, and equally as important, the perspective of the match strike is correct.

This brings up an interesting point in regard to the problem of perspectives in TV. In radio the feeling of the third dimension is achieved primarily through the proper use of sound perspectives. It is the radio soundman's job to be aware at all times of the relative position of a sound to the mike, the mike representing the listener's ear.

Sound in TV is naturally also concerned with perspectives, but here the soundman must gear his effects not only to the proper perspectives in relation to the microphone, but also to the visual position and activity of the actor. In this case all distances are in relation to the camera, representing the listener's ears and eyes, and the camera distance may be constantly shifting. Many incongruous sounds have crept out of a TV loudspeaker because a radio soundman has suddenly been thrust into a television show.

Another way in which radio and TV sounds vary is in setting a scene. In TV the scene is visual; it may be a painted backdrop, a constructed set, a space stage, but in any case, it is actually something seen. Therefore the use of sound effects in establishing locale will be supplementary only. For example, a rustic scene may be shown, supplemented by the soundman's use of recorded bird effects, lowing cattle, roosters crowing,

and so on. Sound alone, as used in radio, will not suffice. There must be some visual evidence of the scene or locale.

The visible elements of television do much toward creating mood and atmosphere, but sound also plays an important part. The clanking of chains, howl of wind, thunder, shots, animal noises, lash of surf, all the sound devices used to build suspense, terror, suspicion, and the illusion

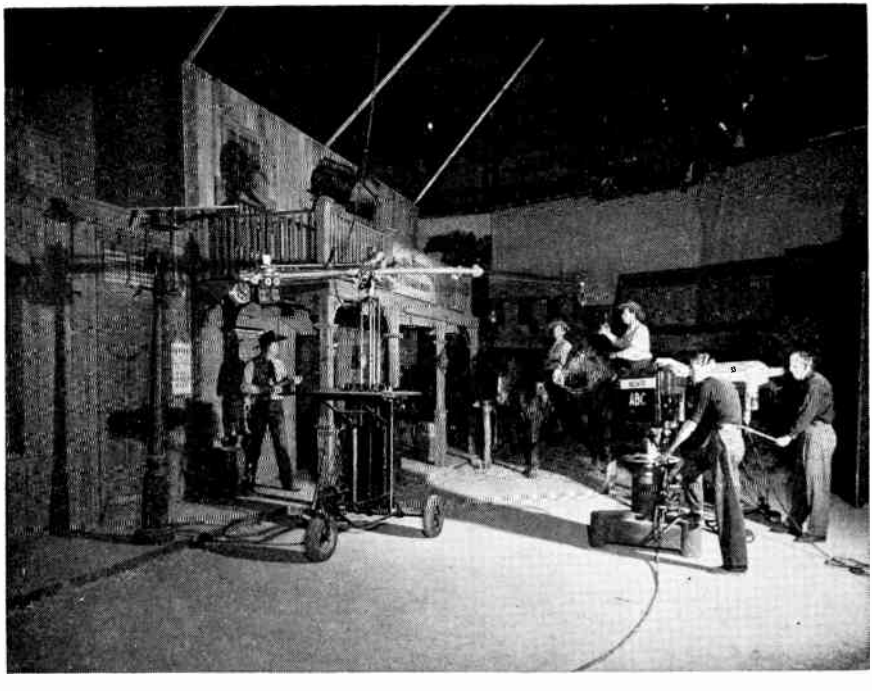


FIGURE 33. *TV set of "The Marshal of Gunsight Pass." The use of live horses eliminates the need of a soundman using coconut shells or recorded horse effects. (Courtesy of American Broadcasting Company.)*

of the supernatural or fantastic help immeasurably in creating and heightening atmosphere. A bedraggled and terror-striken pair of actors lighted by low-key illumination can project their fright to the viewer much more readily when plagued by assorted eerie and unusual sound effects. In this field sound becomes an important adjunct to TV.

Less helpful in TV is the use of sound effects in achieving or intensifying a climax. However, in background sounds where the action cannot be seen, the use of sound effects is effective. An actor may stand by a window and describe a cataclysm heard off stage. To create a great climactic

pay-off in a TV studio is almost impossible unless film or miniatures are used, supplemented by sound effects.

The use of sound effects in the establishment of time is pretty much the same in television as in radio because these are primarily BG sounds and the source does not necessarily have to be shown.

One of the chief uses of sound in radio is as an indication of entrances and exits. In TV unless these are off-stage entrances and exits, it is not likely that a soundman will need to create these sounds. As we see an actor come through a door and approach the camera, we know where he is and what he is doing. Therefore it is unnecessary to supplement his movement with footsteps or door slams.

There are great possibilities for clever use of sound in theme signatures or trademarks of programs. A title card opening a show and backed by appropriate sound effects or music can do much to establish a mood or set the general tone of the play to follow. For example, a title card bearing the legend, "Haunted House," and depicting an old tumbledown and weather-beaten house perched precariously on a cliff overlooking a pounding sea will very dramatically set the general mood of a show if it is backed by the sound of howling wind and a heavy pounding surf. Sound effects used in conjunction with a theme signature or trademark in TV offer almost unlimited possibilities.

In radio drama much of the action is suggested by dialogue or simulated by sound. In a television production the televiewer sees the action, therefore less dialogue and sound effects are needed. As a test to prove this to yourself, sit and listen with your eyes closed to a dramatic radio program for five minutes. You will note that there is an uninterrupted flow of music, sound, and dialogue; you are constantly hearing something. The next time you go to a movie, stand in the lobby for five minutes and listen to the sound track without seeing the picture. You'll be amazed at the long intervals where there is no sound or dialogue. You'll hear the audience gasp, laugh, and react in other ways, yet as far as you can hear there has been nothing to motivate these reactions. But something has been motivating them—visual action. The same holds true for a properly written and produced TV program which bears out the axiom, "Actions speak louder than words." Visible action when properly motivated is necessary and vital to a TV production. The eye becomes tired and bored when forced to watch a sustained scene that lacks movement. Movement on the tele-screen holds attention and moves the story along.

In radio, sound effects are used liberally on the action shows, the whodunits, adventure shows, horse operas, and afternoon kid serials. But

most shows of this type cannot be done successfully in a TV studio. That old radio standby, the horse opera, will have to be done on film for the TV telecast. This is the only way of providing the rapid action and changing locale of this type of show. It is a simple matter to stampede a herd of buffalo through a radio studio by means of a recording, or to effect a head-on collision of trains, but such goings on must be seen in a TV show, yet cannot be done live in the studio. The one answer is film especially edited for telecast.

However, this does not mean that some action shows cannot be done live in TV. Adventure and mystery stories are successfully being done in the television studio, but with a subtle difference. What normally would be violent action in movies or radio is toned down somewhat in the physical movement, and emphasis achieved by concentration of the action. To clarify that a bit, here is an example.

A "private eye" is in his office when two gangsters burst through the door and attack him. If the action were done in the Hollywood tradition, banging over tables and chairs, heaving furniture, and slamming about from wall to wall, the result would be unsatisfactory from a technical standpoint. In the first place, all action in TV must be confined within a rigid and set camera range. Secondly, if the action moves about so quickly that the camera is forced to move rapidly back and forth in order to follow it, the viewed results are confusing and are poor production. Thirdly, the shallow depth of field of the TV camera further confines the upstage and downstage movement of the action in regard to the position of the camera.

In a sequence of this type, the TV technique is to try to make up by concentration or intensity what it lacks in mobility. Meanwhile the soundman performs off screen the same as he would in radio—creating the sound of the blows. After all, the actors cannot really beat the faces off each other! However, here the timing must be as perfect as humanly possible because the televiewer at home sees what appears to be blows struck, and the sound must match exactly.

Sound effects serve two of the same principal purposes in TV as in radio: providing factual or action sounds, and establishing mood and atmosphere. The pickup problems, however, more closely relate to motion pictures than to radio.

In radio the performers work around a fixed mike and the problem of control is relatively simple. In TV the performers are in motion and this, coupled with the changes of visual settings, makes the dictates of camera requirements much more exacting than those of the radio microphone.

Camera or video considerations are paramount in TV, relegating the audio to a secondary or supplementary position.

As visual scenes change or performers move about the set, the camera must follow them and the microphone must do likewise. Since the mike must not be visible in the picture, it becomes difficult at times to get a satisfactory audio pickup that will match the video pickup. Suspending or concealing stationary mikes throughout the set has proven unsatisfactory because there are fluctuations in sound volume, quality, and presence as the actors move to and from the various concealed stationary mikes.

Sounds made by an actor are generally picked up on a TV set by a boom mike which is suspended on the end of a long telescoping arm mounted on a high moveable pedestal. The operator of the boom mike can extend or retract the boom, swing it in a wide horizontal arc, raise or lower it, and so spot the mike at any given point within a large area. By use of a boom mike the primary microphone of a TV production can be brought to any pickup point within its considerable radius.

Although the mike boom and its mount is big and bulky, it is relatively easy to roll the whole apparatus about, extending the radius of effective pickup. However, when the boom mount is moved there is always the problem of getting over camera and light cables and avoiding casting shadows as it moves past the many lights focused on the set. These are very real problems too.

The boom mike is used primarily for dialogue pickup; however most sounds of movement made by the actors are also picked up by this dialogue mike. These sounds of action shown by the camera and simultaneously picked up by the microphone are called natural, synchronous, or sync sounds. Any sounds whose source is not seen on the video are called off-screen or nonsync sounds. For the sake of clarity, here is an example of each.

If a close-up shows a hand working the dial of a safe and the fall of the tumblers is audible, that is a natural or sync sound because the hand shown is actually activating the sound. On the other hand, if a car is heard stopping, but is not seen, that is an off-screen or nonsync sound. It is primarily in nonsync sounds that the TV soundman comes to the fore. This is his realm, be it factual sounds or sounds of mood and atmosphere.

In radio the perspectives of sounds are in relation to a stationary microphone. In TV sound perspectives are in relation to (1) a mobile camera; (2) changes in camera angle; (3) shift in shooting distances of camera.

A moment's reflection will show that sound should also be varied in presence and volume to conform to the movements of the camera, which may include: the tilt shot in which the vertical axis of the camera is shifted to make the camera point up or down; the pan shot in which the camera turns on a horizontal plane as if scanning a scene; the whip shot, a very fast pan for dramatic shift of interest or startling change of locale; the boom shot in which the camera first tilts down, then is bodily raised

FIGURE 34. *Scene from* Colgate TV Theater. *The use of the telescoping mike boom on which dialogue and sync sound are picked up considerably reduces the need for a soundman. (Courtesy of NBC–TV.)*

to gain a bird's-eye view; the dolly shot in which the camera is dollied or rolled in for a closer look or dollied back for a more encompassing view; the travel shot in which the camera moves by stationary people or objects; and the follow shot in which a camera moves about the set following the action.

In each of the camera movements above there is a change of presence with attendant change in volume. Sometimes these are slight, as in a tilt shot where the camera is not moved from position, but merely changes the vertical axis. Sometimes the movement is considerable, as in a dolly

shot or a travel shot. However, in each instance there should be some change in sound volume or presence so that the audio-video relationship remains logical. Camera movements are in a sense elaborations of the radio fade.

Sound must also match camera angles. A change in angle is usually made for emphasis or psychological import. Normal camera angle is at eye level. For emphasis of weakness, raise the camera and tilt it down so that the subject viewed is below eye level; this gives the viewer a feeling of dominance over the subject. Sounds related to the subject should also be held down so as to conform to the feeling of weakness. Reverse the camera angle and an entirely different feeling results. For example, let us assume there is a Frankenstein type of character on the show. By keeping the camera low and shooting up, the subject appears much larger and dominates because of his commanding position. Here sound volumes should be increased to be in keeping with this dominating character.

A most effective combination of camera angles worked together is the angle and reverse angle combination. As an example, let us assume that the principal character of a show is on trial. An angle shot shooting from in back and over the jury shows the principal sitting dejectedly while the D.A. argues off screen. This shot establishes a feeling of hopelessness; the jury from its dominant position looks down on the accused. To change viewpoint and accent this feeling, a cut is made from the first to the second camera, which is at reverse angle, shooting from below and in back of the accused and still showing the jury in a commanding position. The unfortunate position of the accused is established in the first angle shot and is further emphasized by switching to the reverse-angle shot. Sustained nonsync sounds used with angle and reverse-angle shots pose some very interesting problems in balances as the viewpoint is shifted back and forth. Unless perspectives and volumes of sounds are carefully handled, the attempted accent of dominant and subordinate positions may not seem logical.

Shooting distances or picture fields also necessitates accurate presence and volume control of sound. In a CU (close-up), the audience should feel as well as hear the presence or nearness of sound. In a MCU (medium close-up) and LS (long shot), the sound must be farther away because the perspectives have been extended. There are several shooting-distance shots in TV, with variations of each. The basic shots are: LS (long shot)—showing the full figure of a person whether sitting or standing; MS (medium shot)—covering head to hips; CU (close-up)—head and

shoulders; BCU (big close-up)—face filling the screen; MCU (medium close-up)—head and half the torso; full shot (not abbreviated)—the entire set or a broad general view. In addition there is the one shot, or close-up of one person, and the two shot, showing two people in a close-up. Each of these shots when used in juxtaposition with another calls for sensitive and accurate changes in sound volume and perspective.

Another shot commonly used in TV is the establishing shot. It is a combination shot and is used primarily at the beginning of a scene. Camera No. 1 opens the scene with an LS, which tells the audience the locale of the scene. Then the camera starts to dolly in toward the focal point of action or interest. As an MS distance is approached, camera No. 1 dissolves into camera No. 2 which has been set up on a CU. The scene has been established, and the story goes on from the close-up.

No matter what angle, camera movement, or distance shot is used, the illusion of sound perspective must be very accurate in order to sustain the feeling of realism. The audience must always get the feel of spatial depth although the TV screen offers but two dimensions. If a sound source in the video appears to be twenty feet into the picture, the sound in the audio must sound like it comes from twenty feet in the picture! As the telecast progresses with constantly changing camera angles, shots, and movements, sound must exactly match in perspective and volume each change with his nonsync sound effects.

In Chapter 9, Special Uses of Sound, transitions in radio and how sound may be used in them was discussed at some length. Transitions in TV are considerably different, more nearly approaching the technique used in motion pictures. The soundman must be particularly alert during TV transitions. As the various types of TV transitions are mentioned, try and imagine the problems presented sound in each instance.

In a dissolve, one scene is faded out while the following scene is simultaneously faded in. This is a common technique in motion pictures and may be likened to a radio cross fade. If there are any sounds in the two scenes, they must overlap, yet must be handled so that they do not conflict with each other.

A lap dissolve is slightly different. One image or scene is faded in over another, both are held briefly, then the first scene is faded out while the second remains. The problem here again is not to let the overlapping sounds conflict. To avoid confusion, the preceding sound is usually reduced sharply in volume, permitting the following sound to establish.

A matched dissolve consists of exactly matching the placement of two similar or identical subjects, each on a separate camera, so when the

dissolve is made a metamorphosis has apparently taken place. An example would be the transformation of Dr. Jekyll into Mr. Hyde. There is no counterpart in radio, but the possibilities of imaginative sound effects in a TV matched dissolve are many.

A superimposure is an extended lap dissolve. In effect it consists of a double exposure. A scene may be shown on camera Number One. On cue a second scene is faded in on camera Number Two, and both scenes are

FIGURE 35. *Television shows such as WABD's* Captain Video *call for considerable imaginative sound effects. (Courtesy of DuMont TV Network.)*

seen simultaneously for as long as desired. Then camera Number Two scene is faded out, leaving the camera Number One scene. Note that this is not a transition. It is used for ghosts, apparitions, and conscience effects, which in radio would be handled through the use of a filter or echo chamber. The visual element when supplemented by imaginative sound effects can be very effective in TV.

A cut is an instantaneous switch from one camera to another. It is a very abrupt transition and can become most disconcerting when used too often. For impact and emphasis, however, a cut is most effective. It speeds up the pace and is excellent for comparisons or contrast. Many times a

specific sound cue motivates a cut. For example the video may show a young mother sewing in the living room. Off screen there is a sudden loud crash. The camera cuts from the mother to her little boy in the kitchen sheepishly staring at a big pile of broken dishes.

Intercutting is made up of very short scenes or quick flashes. It is the montage of TV. If there is considerable nonsync sound, the soundman will be very busy, and must be very accurate in timing and perspectives.

Fades in TV are primarily on the video, matched by the audio. In most cases the audio engineer will match the fade done by the video engineer.

There is another transition technique used in TV that has been borrowed from motion pictures, and offers many interesting possibilities in the use of sound effects. This is defocusing. It is a variation of the dissolve and should only be used for very special effects. It is done by throwing one camera out of focus until the image is unrecognizable, switching to the next camera, also out of focus, then bringing the second camera into focus until the new image is distinct. This transition device is most effective in fantasy and psychological drama. The possibilities of using distorted sounds to match the out-of-focus phases are fascinating.

There are two other devices used in TV not suitable to radio that offer many imaginative possibilities. The first is the process screen used for backgrounds, a technique also borrowed from the movies. A large translucent screen is placed in back of the live TV action. In back of the screen by means of a motion picture projector scenes may be projected on the screen. The TV camera in front picks up the live action performed in front of the screen. Many "location" shots are done this way. By means of the process screen and an adequate film library, any filmed locale in the world may be brought right into the TV studio. The reader no doubt has seen process shots many times but probably has not been aware of it. In motion pictures, when moving traffic is shown in the background through the rear window of an automobile, the traffic shown is by a process shot.

Another device is the use of distortion. Through manipulating camera focus, uneven or unconventional lighting of the set, overemphasizing size and shape of objects and people, exaggerated camera angles, unusual movement of cameras, use of unrealistic sounds, or any other deliberate deviation from normal TV production procedure, imaginative and attention-getting results may be obtained.

Rehearsals for a telecast and for a radio broadcast are two entirely different experiences. In radio the cast usually first reads through to get the story line and some conception of characters. Then they go on mike

for the run through in which the show is polished and all production problems are ironed out. This is followed by a dress in which the timing is made, cuts are determined, and the final flaws are eliminated.

There are so many more people and problems in a TV production that much more rehearsing is needed. The first rehearsal is the dry rehearsal. This is without cameras or mikes. It goes on and on until the cast has learned business and is reasonably sure in their memorized lines. It takes much more time than the first read through in radio. The production staff is not present in the TV dry rehearsal.

The dry rehearsal is followed by the technical rehearsal. Here the cast further refines the business and polishes lines. This rehearsal affords the production staff the opportunity to work out the mechanics of production. The cameramen, boom man, video engineer, audio engineer, floor manager, stage crew, dolly men, electricians, projectionist, producer, production manager, soundmen, narrator, and announcer all work toward a common goal, solving the production problems. This is similar to the on-mike run through in radio.

After the technical problems have been worked out satisfactorily, the camera rehearsal starts. Here the all-important camera angles and movements are determined. Lighting is improved; transitions, scene changes, key positions of performers, costumes, make-up, methods of cuing are changed or altered as needed to assure a good video pickup. To guarantee a satisfactory audio pickup, mikes may be moved, sounds rebalanced, and any other necessary changes made.

This is followed by a dress rehearsal. On the dress the entire cast and production staff take part. This rehearsal is as nearly like the actual telecast as possible; the production is run off without interruption or stops for corrections. The prime purpose of the dress is to determine if the production is ready for telecast and if it times out properly.

The system of cuing in TV is somewhat different than in radio. In the latter field the performers and soundmen take their cues directly from the director in the booth. In TV this is not practical because the director is too busy watching the various monitors in the booth and calling out the cameras, microphones, and instructing the stage manager. The latter, incidentally, is the only person who has direct contact with those performing on the set.

Instead of taking cues from the director, the soundman and others receive their cues from the floor or stage manager. He wears headphones and is in constant touch with the director. Through him are relayed any instructions and all cues. However the soundman may have a viewing

monitor whereby he can see exactly what is being transmitted at any given moment. This actually is a television set showing just what is on the line going to the transmitter to be telecast.

Then again the soundman may take his cues from the various cameras. TV cameras are usually equipped with red and green signal lights. When a camera's red light is on it means that that camera is on the air. Another

FIGURE 36. *A television control room showing the audio and video engineers monitoring a show. In a radio production there would be just one engineer, monitoring the audio. (Courtesy of National Broadcasting Company.)*

camera showing a green light signifies that it is the next to be used. When the red light goes out and the green light changes to red, a shift from the first camera to the second has been made. The alert soundman will watch these changes in lights and govern his sound accordingly. This takes considerable strain off the floor manager who has his hands full in cuing actors and others. If the soundman takes his cues from the stage manager, however, the same visual hand signals used in radio are generally used.

Working a half-hour dramatic TV show is much more exhausting than

the same length program in radio. Usually the rehearsal time is much longer, the production staff is much larger, and the problems of balance, pickup, and coordination are more complicated than in a radio broadcast. Working in any capacity on a television show is a grueling experience.

To generalize, it can safely be stated that at the present writing sound effects as such are not used nearly as much in TV as in radio. The difference in the media should make the reason clear. Radio is purely aural, while television is primarily visual. Atmosphere, mood, and background sounds are equally useful in TV and radio, but there is a vast difference in the use of action sounds. In radio the soundman creates all sounds of action. In TV he initiates very little sound of this type because he is no longer the physical counterpart of the actor.

At the end of Chapter 17 is a list of ten ways in which sound effects are useful in radio. The following will show how these ten uses of sound in radio apply to television.

(1) Sound is not nearly so important in progressing action in TV as in radio, because in TV most of the action is seen.

(2) In radio, sound is of material aid in setting a scene. In TV a scene is set visually, and only supplemented by sound effects.

(3) The use of sound in establishing the time element in TV is about as important as in radio.

(4) In TV, sound is only supplementary in establishing a locale.

(5) The proper use of sound effects in creating mood or atmosphere in TV can be of as great help as in radio.

(6) As a transition device between scenes, sound serves admirably in radio, but is of little value in TV unless coupled with some visual element.

(7) Sound effects are of great importance in radio in indicating entrances and exits. In TV the importance is negligible, unless they are off stage or unseen.

(8) In aiding to achieve a climax, sound in TV is relegated to a much less important position than in radio.

(9) In regard to the use of sound in a TV montage effect, there are definite possibilities, but these depend upon the individual script, imagination of the writer and director, and the skillful blending of film and live operation.

(10) The possibilities of sound in a theme signature or trademark are considerable.

There is no question that all of the qualifications and attributes of a radio soundman apply to TV. However, it must be remembered that

radio and its techniques are well established while television is still in the formative stage. Television is advancing much more rapidly than did radio, possibly because it has had the opportunity to profit by the experiences of the stage, radio, and sound motion pictures. Radio in its infancy had only certain phases of the legitimate theater to draw upon, and learned largely by its own mistakes.

In comparing radio and television it is important to remember that radio is one-dimensional, appealing to one sense only, hearing. The missing picture is supplied by the listener's imagination, stimulated by dialogue, sound effects, and music. There is no missing picture in television as it is a two-dimensional medium. The video supplies the visual picture, which is augmented by the audio sound.

CHAPTER SIXTEEN

Evolution of Sound in Radio Drama

THIS CHAPTER on the beginning and evolution of sound effects has purposely been left until the reader has some familiarity with the uses and techniques of sound. Our main interest will be the evolution of radio drama.

Radio (voice) broadcasting as distinct from wireless (code) communication began in a serious way about 1919–20. The pioneer broadcasters were primarily engineers and manufacturers of radio apparatus. The latter's interest centered in the technical and mechanical improvement of receivers and transmitters. The thought of entertainment or public service did not occur to them.

The father of present-day radio broadcasting was Dr. Frank Conrad. In 1912 he became interested in radio and after the close of World War I in 1918 was made chief assistant engineer at Westinghouse in Pittsburgh. His primary job was to check and perfect transmitting equipment. For this purpose he established over a hundred listening posts and began broadcasting from his garage. Fellow radio enthusiasts listened and reported to Dr. Conrad and from their bits of technical information he made further refinements on the transmitting equipment. In 1919 the government released the war-security ban on amateur wireless and radio. As a consequence, hundreds of "hams" began operating again, and many listened to the broadcasts emanating from Dr. Conrad's garage.

To relieve himself of the burden of hours of talking over the air, Dr. Conrad substituted phonograph records and thus began the first actual radio entertainment. To his surprise this brought considerable mail from unknown listeners and requests for certain records. In self-defense Dr.

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Air Concert
"Picked Up"
By Radio Here

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Air Concert "Picked Up" By Radio Here

Victrola music, played into the air over a wireless telephone, was "picked up" by listeners on the wireless receiving station which was recently installed here for patrons interested in wireless experiments. The concert was heard Thursday night about 10 o'clock, and continued 20 minutes. Two orchestra numbers, a soprano solo—which rang particularly high and clear through the air—and a juvenile "talking piece" constituted the program.

The music was from a Victrola pulled up close to the transmitter of a wireless telephone in the home of Frank Conrad, Penn and Peebles avenues, Wilkinsburg. Mr. Conrad is a wireless enthusiast and "puts on" the wireless concerts periodically for the entertainment of the many people in this district who have wireless sets.

Amateur Wireless Sets, made by the maker of the Set which is in operation in our store, are on sale here $10.00 up.

—West Basement

FIGURE 37. *The famous advertisement which appeared in the* Pittsburgh Sun *and started a train of events which led to the establishment of station KDKA and radio broadcasting. (Courtesy of Westinghouse.)*

Conrad announced that he would broadcast requested records, if available, every Wednesday and Saturday night between 7:30 and 9:30. This was the beginning of a scheduled program. As yet there were no licensed professional radio stations in the country.

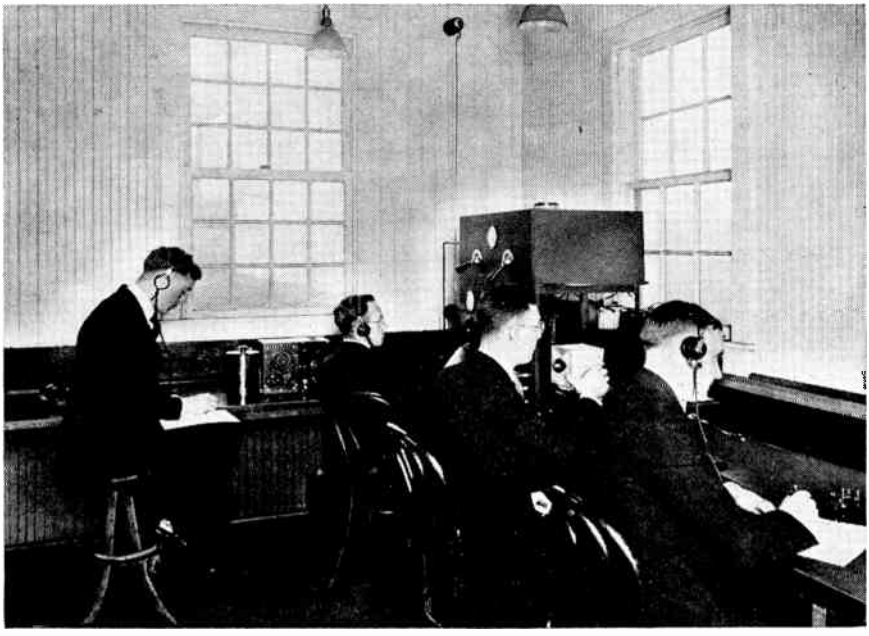
By the spring of 1920 so many amateur radio fans and their families were listening to and talking about Dr. Conrad's broadcasts that a Pittsburgh department store placed an advertisement in the *Pittsburgh Sun* on September 20. The ad stated that the store had moderately priced radio receivers that would enable the users to pick up Dr. Conrad's popular broadcasts.

The placement of this ad changed the whole concept of radio. Dr. Conrad and other engineers had been working on the theory that in some way radio could supplement the telephone for personal calls. In fact the American Telephone and Telegraph Company continued along this line until 1926. However it became evident when the department-store ad appeared that anyone with a receiver could listen in, hence there would be no privacy assured to a radio-telephone conversation. At that moment the radio-telephone idea received a mortal blow and the radio of today got its real start.

The unexpected appearance of this advertisement had a definite effect upon the officials at Westinghouse. They changed their broadcasting from a means of equipment check to a form of public service, with an eye to income derived from the sale of receivers and parts to listeners. The idea of selling air time or commercializing service had not yet been conceived.

In keeping with the decision to program radio broadcasts, Westinghouse officials moved the transmitter from Dr. Conrad's garage to a little shanty atop the company's factory in East Pittsburgh. On the night of November 2, 1920, the first licensed and prescheduled radio broadcast in the United States was made from this little room with the airing of the Harding-Cox presidential-election returns to an estimated audience of five hundred listeners. The call letters assigned by Secretary of Commerce Herbert Hoover were KDKA. Twelve years later seventeen million owners of home radio sets heard the news of Franklin D. Roosevelt's election!

The idea behind the creation of KDKA caught on; the listening audience demanded more, and in consequence program schedules began to appear in dozens of newspapers within broadcast range of KDKA. For the first few months the program material consisted primarily of phonograph records aired every evening between eight-thirty and nine-thirty. However it soon became apparent that other program fare was necessary, and KDKA answered that need by establishing a number of firsts. On January 2, 1921, KDKA broadcast the first "Church of the Air" from Pittsburgh's Calvary Episcopal Church. Two weeks later Secretary of



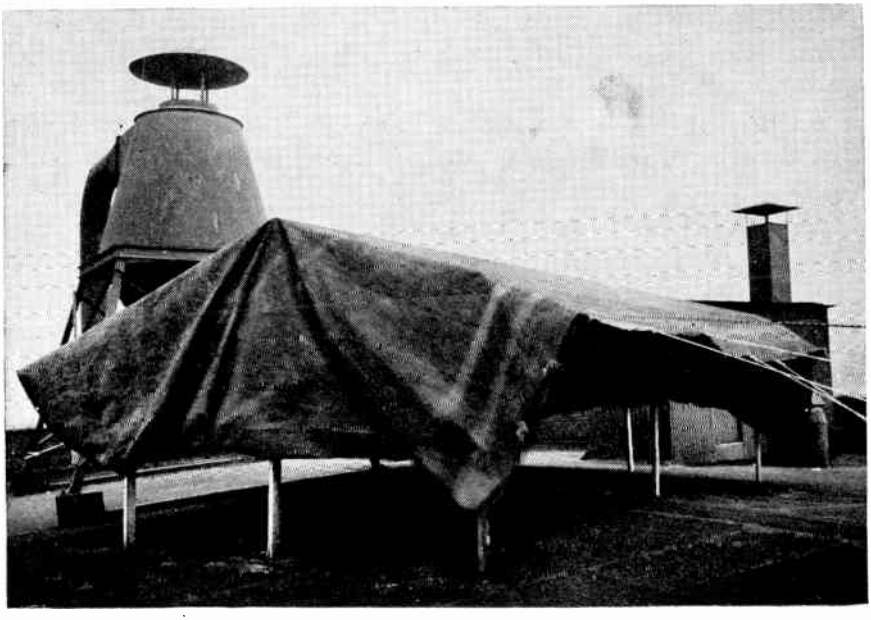


FIGURE 38. (Above) *The first licensed and prescheduled radio broadcast, KDKA, November 2, 1920, consisting of reports of the Harding-Cox presidential election returns.* (Below) *The first "studio" at KDKA was this makeshift tent erected on the top of an eight-story building at the Westinghouse Works in East Pittsburgh and used in the summer of 1921. (Courtesy of Westinghouse.)*

Commerce Hoover made an appeal over KDKA for the starving Europeans, and over $25,000 was contributed. On May 9 the first dramatic program was broadcast by remote control from the stage of the Davis Theater. In the summer of 1921 the Department of Agriculture made available to the station government market reports, thus laying the groundwork for invaluable public service to the farmer. By this time KDKA also was broadcasting time signals, sports scores, and news.

In the spring of 1921 the very fine Westinghouse employees' band was put on the air. Until this time all broadcasting had been done from the shanty, but the band could not fit into this tiny room, so it was placed in an auditorium. There one of the bugaboos that was to plague radio for years, room resonance, reared its ugly head. The band was moved outdoors and broadcast successfully from there. That summer a tent was pitched on the roof of the Westinghouse building (affording protection from the sun), and the band, now called the KDKA Little Symphony Orchestra, played inside the tent. This was the first attempt to control acoustics, and the tent was actually the first radio studio.

The reception of the orchestra was enthusiastic. Then on a very windy night that fall, the tent blew away! In order to continue the symphony concerts the orchestra was moved inside, and again room resonance became a problem. This was solved after a fashion by setting up a tent in the auditorium and placing the orchestra inside the tent! Eventually burlap was used to line the walls and ceiling of the room, and the tent was discarded. Today the acoustics problem is carefully controlled by constructing studios with polycylindrical or nonparallel walls of nonresonant material.

There were no paid artists at this time, all live program material being purely voluntary. Such professional talent as did appear before the mikes did so because of curiosity or for publicity. When short of program material, announcers would read poems, newspapers, and magazine articles, or interview practically anyone on any subject. And of course there were always the old standbys, the automatic piano and phonograph.

On July 2, 1921, the first serious competition to KDKA appeared. Station WJZ, Newark, New Jersey, broadcast the Dempsey-Carpentier fight (three months before the station officially opened). Three men at ringside gave a blow-by-blow account of the fight into telephone transmitters. This was relayed by air to nearly a hundred points throughout the country for rebroadcast, and well over a hundred thousand people heard the fight. This broadcast was a famous first and offered worthy competition to the well-established KDKA.

On October 1, 1921, WJZ officially went on the air with a broadcast of the World Series. At the ball park a sports writer telephoned a play-by-play description of the game to Thomas S. Cowan at WJZ. Announcer Cowan relayed the phoned description of the game over the microphone in his own words. In order to simulate a broadcast coming direct from the playing field, Cowan stationed a group of workers outside the studio window and instructed them to cheer every time he signaled. To further the illusion, Cowan faked the sound of the bat smacking the ball by snap-

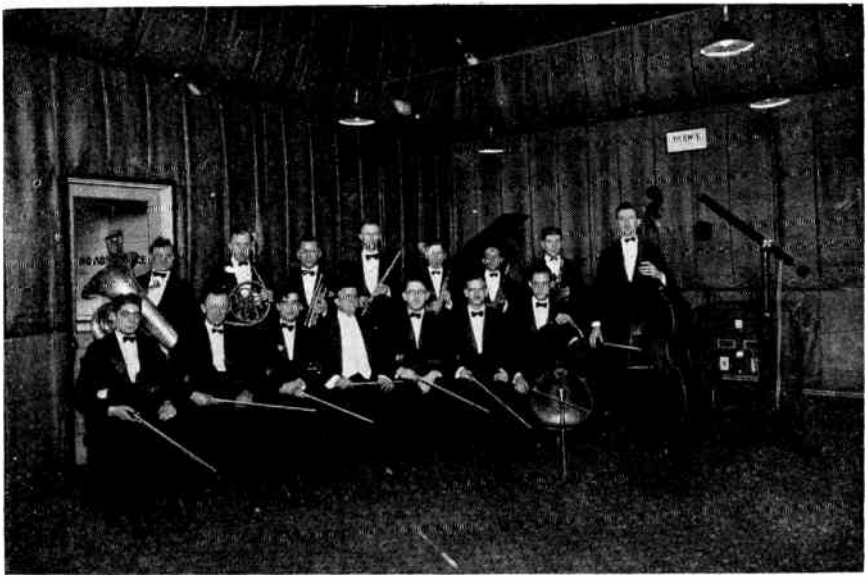


FIGURE 39. *The first orchestra developed for exclusive radio work was the KDKA Little Symphony Orchestra, Victor Saudek, conductor, in 1922. (Courtesy of Westinghouse.)*

ping matches close to the microphone. This simple simulated effect was the first actual sound effect heard on the air!

On February 22, 1922, station WGY, Schenectady, went on the air. This station is important in the annals of radio drama because on August 3 of the year WGY presented the first full length (two and a half hours) melodrama, "The Wolf," from the studio, not a stage. The WGY Players were the first group of radio actors to broadcast regularly from a studio. The presentation of "The Wolf" laid the foundation for several years of radio drama that followed from that station. Some of the earliest sound effects on the air were made by the WGY Players.

In 1922 literally hundreds of radio stations began operation. Among them were KPO, now KNBC in San Francisco; KHJ, Hollywood, now the key station of the world's largest regional network, the Don Lee Broadcasting System; and WLW, Cincinnati, now the world's most powerful commercial station with 500,000 watts of power. Also in 1922, on August 16, WEAF, New York, began transmitting. This date is important because less than two weeks later, on August 28, the first commercially sponsored program was broadcast over WEAF. The Queensborough Corporation, a Long Island real-estate firm, bought ten minutes of air time to make a sales talk promoting some apartment dwellings in Jackson Heights. The new advertising medium proved successful and by March of 1923 WEAF had twenty-five sponsors! Radio had finally gone commercial and the way was paved for better or shall we say bigger things.

On January 4, 1923, the first simultaneous broadcast was made by telephone wire—connecting WEAF and WNAC (Boston) in a three and a quarter hour broadcast. This experiment was the forerunner of the vast network operations of today. On July 1 WEAF and WMAF, Round Hill, Massachusetts, were permanently wire-connected. By March, 1923 there were 556 stations on the air.

Dramatic programs began to make their appearance about this time. In April, 1923 the first installment of *The Waddington Cipher*, a whodunit, was broadcast over WJZ, and a week later WLZ broadcast *As You Like It* from the Forty-fourth Street Theater. That same summer *Potash and Perlmutter*, a popular Broadway success, was broadcast from the stage of the theater, and two dramatic stock companies were engaged to give a short play every week.

Unfortunately these dramatic presentations were not too well received, because the technique used was that of the legitimate theater, which is unsuitable for radio broadcast. The specialized field of the radio dramatist and director had not yet been developed.

In 1923 WJZ pioneered the all-day station, and by the summer of that year there were almost a thousand stations on the air, with the resultant scramble for program material. Most appearances on the radio at this time were still on a voluntary basis, *i.e.*, no payment for talent. On October 14, 1923, the first commercial network was established, consisting of WEAF (now WNBC) and WJAR, Providence, Rhode Island.

By now the battery set was replacing the crystal set. In order to promote the sale of its B batteries, the Eveready Battery Company started the first big commercial program, *The Eveready Hour*, over WEAF on

December 4. The program consisted of both concert and popular music and a one-act play, "The Bungalow." This program was the first to pay the artists who appeared on the broadcast. By the end of 1923 the sale of advertising time became recognized as the method by which broadcasting was to be financed.

In 1924 new stations joined the already crowded field. Among them were KGO, San Francisco, and KOA, Denver. Also about this time radio

FIGURE 40. *The first "designed" studio at KDKA was installed in 1922 after the tent studio on the roof had blown away in a heavy wind. The draped ceiling and walls cut down room resonance. (Courtesy of Westinghouse.)*

artists whose names were to become household words first made their appearance. Among them were Graham MacNamee, Milton Cross, Vaughn de Leath (the first radio blues singer), and Jones and Hare, the "Happiness Boys," who came to radio after establishing a remarkable following as phonograph-recording artists. Incidentally Jones and Hare also innovated the radio-studio audience.

The year 1924 was important in radio. On February 8 the first coast-to-coast hookup was made as an experiment to test the possibilities of transcontinental radio transmission. On February 12 the first network

commercial program, originated in the studios of WEAF, was sponsored by the National Carbon Company. The program consisted of a reading of Ida M. Tarbell's "He Knew Lincoln."

The culmination of several forces gave radio a sudden emphatic boost in the year 1925. In the first place radio had gone commercial; broadcasters could now see their way clear to staying in business. The nonmanufacturing broadcasters were not concerned with the sale of

FIGURE 41. *Studio of KPO (now KNBC), San Francisco, in 1922. Note heavy drapes to deaden acoustics. (Courtesy of KNBC, San Francisco.)*

receivers and parts. They were "selling air time." Also important was the introduction of the battery set which led to the use of the loudspeaker, making it possible for an entire family to listen to a broadcast in comfort, rather than grudgingly sharing a pair of earphones.

An increasing audience was awaiting whatever fare was broadcast, and to hold these listeners genuine entertainment was assiduously sought for the now highly competitive business. By this year the American Telephone and Telegraph Company, which had clung to the hope of making radio an adjunct to the telephone, had a chain of twenty-six stations reaching from the Atlantic Coast as far west as Kansas City.

The vast improvement made in the five years from 1920 in receivers, transmitters, and the development of the dynamic microphone made it possible to receive a program over the air with better quality than could be gotten from records played on the home phonograph. In consequence the artists who had been under contract to the phonograph-recording companies became impatient to go into the new medium with its tremendous audience possibilities.

So in the year 1925 real professional talent began to be heard on the radio. Ted Husing started as an announcer at WJZ. André Kostelanetz made his first appearance, and various people from the theater appeared in dramatic sketches or complete plays. Opera stars explored the potentialities of the new medium. With the improved dynamic microphone, reasonably good balance could be obtained for orchestral broadcasts, and live music began to take a dominant place on the radio scene.

During the first five years of broadcasting, 1920–1925, radio drama consisted primarily of plays broadcast direct from the stage of a legitimate theater, or of short dramatic vignettes presented by amateurs in a radio studio. When plays were broadcast direct from the stage, there were long silent periods on the air. The onstage pantomime was excellent for the theater audience but most exasperating for the listener at home; he did not know what was going on. To remedy this, an announcer stationed in the wings would break in during these verbal lulls and explain in a whisper to the listening audience what was transpiring. This effort to make the traditions of the theater fit within the limitations of radio was a most futile one. The potentialities of radio drama were still unexplored and the crop of writers who understood the medium had not yet appeared.

In the spring of 1925 a man-and-wife vaudeville team played various engagements around Chicago. They were persuaded to appear in a series of skits over WENR in a program known as *The Smith Family*. Although the program was not too well received, it did offer something new to radio, a continued story presented in daily sequences; thus this program is the forerunner of all serial dramas. The series was dropped, but later the couple, Marian and Jim Jordan, reappeared in new characterizations, and as Fibber McGee and Molly have been a continuous success.

In that same year the blackface team of Sam 'n' Henry came into being over WGN. They were well received and followed the precedent set by *The Smith Family*, using the format of a daily continued story. In March, 1928 they went to WMAQ as Amos and Andy, and in August, 1929 started broadcasting over NBC for Pepsodent as one of the first coast-to-coast sponsored shows.

In 1926 the American Telephone and Telegraph Company finally gave up the idea of the radio-telephone and sold out their chain of stations to NBC, an incorporated subsidiary of RCA. The Red Network, formed by A.T. and T., was added to the NBC Blue Network, and thus by the end of 1926 NBC had coverage over the entire United States. The first NBC full-network broadcast was made on the evening of November 15, 1926. The following month NBC issued rate cards for full-network broadcasts. Big-time commercial network radio was now a reality.

Also in 1926 Walter Damrosch joined NBC, John McCormack broadcast over WJZ, and Paderewski played for the first time on the air. In a little over five years from the original radio broadcast, the finest professional artists in the world were making themselves available to radio, for a fee, and the rush of talent to get on the air has continued ever since.

In 1927 the Columbia Broadcasting System was formed with sixteen stations, gained twelve more the following year, and has been expanding ever since. NBC increased from forty-eight stations in 1927 to 138 within ten years. Regional networks such as the Colonial Network on the East Coast and Don Lee on the West Coast were formed to give regional coverage.

In 1926 and 1927 complete operas were aired, and more Broadway plays were broadcast. With the networks established and offering nationwide coverage, potential sponsors realized they could now afford higher prices for good talent. Radio had also made great technical advances. The signals sent out were clear and dependable, the superheterodyne receiver worked well, the dynamic loudspeaker easily serviced a roomful of listeners, and now there were many millions of entertainment-hungry listeners just waiting to be "sold."

Until about 1925–27 no one thought of sound-effects technicians as such. Any individual who happened to be in the studio at the moment and was not performing on mike did what few and simple sound effects were needed. Practically every sound used during this period was simulated. The very idea of firing a real gun loaded with blanks gave engineers the horrors when they thought what effect it would have on their sensitive microphones. At this time gunshots generally were simulated by striking a flat leather cushion with a small wooden stick. A boat whistle was sometimes simulated by blowing across the mouth of a bottle partially filled with water. Door slams were faked by slamming a book down on a table, or dropping the lid of a grand piano. These sounds were not realistic; dialogue was the important thing, and sound effects incidental.

Effects such as trains and horses had been imitated by drummers in

FIGURE 42. *Radio entertainment in 1923. Scene in studio of WJZ, Newark, New Jersey. Studios at this time were still heavily draped. Note "dish-pan" mike. (Courtesy of Westinghouse.)*

FIGURE 43. *A formal studio, with cloth hangings, created by KDKA in 1924. The microphone still had weights on the bar for adjusting it to the height of the artist. (Courtesy of Westinghouse.)*

theater orchestras and these men, who had highlighted the action moments of silent movies and vaudeville acts with their improvised sounds, were called in to aid the rapidly expanding radio drama. It was logical to believe that the theater-orchestra drummers were the men to do the job, for they had given realism to climactic scenes of the old movies with their collection of drums, cymbals, bells, whistles, and noise-makers.

Consequently many of the first radio soundmen were former drummers. These first purveyors of radio "ear scenery" had one special advantage. Their musical training had developed an excellent sense of timing and rhythm. Not only that, they had had to invent various contraptions to simulate sounds and thus were a group of men who were especially aware of sound as such.

In many instances the first radio sound effects were carry-overs from the theater and had been in use before the time of the microphone. Unfortunately many of these were not satisfactory and modifications had to be made. In the first place, sounds that had been used in the theater were very loud as they had been done backstage or in the orchestra pit without benefit of amplifying equipment. The drummer's trick of revolving a can of buckshot to simulate rain sounded like a hundred Niagaras when held close to the sensitive mike. A thunder sheet shaken or a train whistle blown in the studio sometimes overloaded the equipment to a point beyond the engineer's control. So the soundman ran to the window and blew the whistle or shook the thunder sheet out on the fire escape.

Studios of this period generally had been converted from office or storage space with no consideration of acoustics. In fact, little was known about this very important field. Various sound-deadening devices, monk's cloth, floor-to-ceiling draperies, numerous piano wires strung about the ceiling, were experimented with in the hope that the acoustics of the studio might be altered enough to give a satisfactory pickup.

These were the days of real pioneering. The problems of getting satisfactory sound effects were many. The soundmen had no precedents to guide them, they had practically no budget to buy equipment, microphones did not pick up with fidelity, and the acoustics of the studios were atrocious. Yes, this was a period of trial and tribulation, and the imaginative and creative soundman was literally worth his weight in gold. The pioneers spent hours in experimentation, seeking effects that are now routine.

For example, at this time it was found that in some cases the ringing of a door- or telephone bell could not be produced by merely ringing a

battery-wired bell. The early microphones were not true in pitch and picked up the "beat" of the bell rather than the jingle. As microphones improved, soundmen found that they could use real doorbells and telephone bells, but had to discard other effects that had been satisfactory up to then. Each soundman solved the problems that he faced in his own way. It was mostly a case of try something and use it if it worked; if it didn't, try something else. As a result each soundman had his own jealously guarded trade secrets—special apparatus he had devised for imitating particular sounds.

The vast commercially recorded sound-effects libraries had not yet been developed and the bulk of sound effects were done manually. In a sequence that called for the sound of a speeding train, four or five soundmen would be required to simulate the sound manually: one to ring the bell, one to supply the click of the wheels, one to rub a brush across a drum head for the chuff of the engine, and another to work the whistle and hiss of steam with an air tank and hose. This same effect can now be done by one soundman with recordings.

For years gunshots plagued soundmen. Slapping a leather cushion with a flat stick was one way of simulating the sound. Another was to use a fiber box instead of the cushion, giving resonance and depth to the sound. This same box and a pair of drumsticks were used for the staccato fire of a machine gun. When live guns were first used, it was believed that the concussion from blank cartridges would damage the diaphragm of the mike. To prevent this, some soundmen placed the blanks in a specially constructed metal frame and struck the firing pins with a hammer. The shot was heard but the concussion was absorbed in a baffle underneath the frame.

Another improvised device of this period was an automobile effect, such as that built by Urban Johnson of WBBM, Chicago. A chamois skin was stretched over a length of rain spout and placed so that rubber slappers driven by a small electric motor struck the chamois. The four or six slappers (depending upon the number of car cylinders) were varied in speed by a rheostat to give the effect of an auto running in various gears. The rain spout gave resonance and depth to the "motor" (Figure 48). A longer and larger rain spout was used for an airplane. Nails driven in a board and scraped over a metal plate were used for the sound of squealing brakes.

Then, as now, the sound of rain posed a real problem, and various rain-effect devices were tried. First, of course, was the buckshot-filled can that had been used in the theater. This was too loud and identifiable, so wax

cylinders containing rice were tried, but did not sound right either. Experiments with salt, bran, oats, wheat, and a half-dozen breakfast foods were also made. Then someone struck upon the idea of birdseed. A large hopper of birdseed was so arranged that a fine stream of seed struck two suspended ping-pong balls. The seed, scattered by the ping-pong balls, fell on taughtly stretched cellophane panels mounted at an angle of forty-five degrees, then slid off into a container below and was used again (Figure 47).

A refinement of this rain machine was developed later. Birdseed was dropped on a revolving turntable and a stationary arm swept the seed onto cellophane panels below. The variable-speed turntable gave better control of the flow of the birdseed (Figure 49). A still later development of the rain machine was more realistic because actual water was used. Several shower heads were mounted over a large water container. A sound-proofed electric motor pumped water through the shower heads. The water fell in a fine spray into the container, drained into a storage tank below, and was repumped through the shower heads. Satisfactory rain sounds are now available on commercial recordings.

With the fidelity of recorded effects much improved by this time, sound departments began to record sounds from life. In most instances these were more realistic than the conventional simulated manual sounds. Further, the use of recorded effects reduced the number of soundmen needed on a show. Economy-minded production departments seized upon this point, recorded sounds from life with great enthusiasm, and inadvertently improved sound on their productions. The advances since made in recorded sound effects have been most heartening.

No one can ever fully evaluate the contributions made by the soundmen of the early period. They explored a new field, capitalized on their mistakes, improvised with skill, discovered the principles, and developed the theories upon which modern sound is based. To them radio owes an eternal expression of appreciation.

In 1928 *The American Forum of the Air* began; KGFJ, Los Angeles, became the first twenty-four-hour station; H. V. Kaltenborn joined the CBS news staff; and late that year a-c sets were introduced, making the battery sets obsolete.

Also in 1928 *True Story Hour* made a valuable contribution to radio drama. The writers of this show were among the first to recognize that radio had to develop a technique of its own. They experimented with new ideas and methods instead of copying the legitimate theater. One *True Story Hour* innovation was the use of a first-person narrator to set

the story. Another program, *English Coronets*, written by Kay Van Riper and released over KFWB, Hollywood, had an air of greatness about it because Miss Van Riper was one of the first radio writers to realize the potentialities of the medium and wrote accordingly. Those who remem-

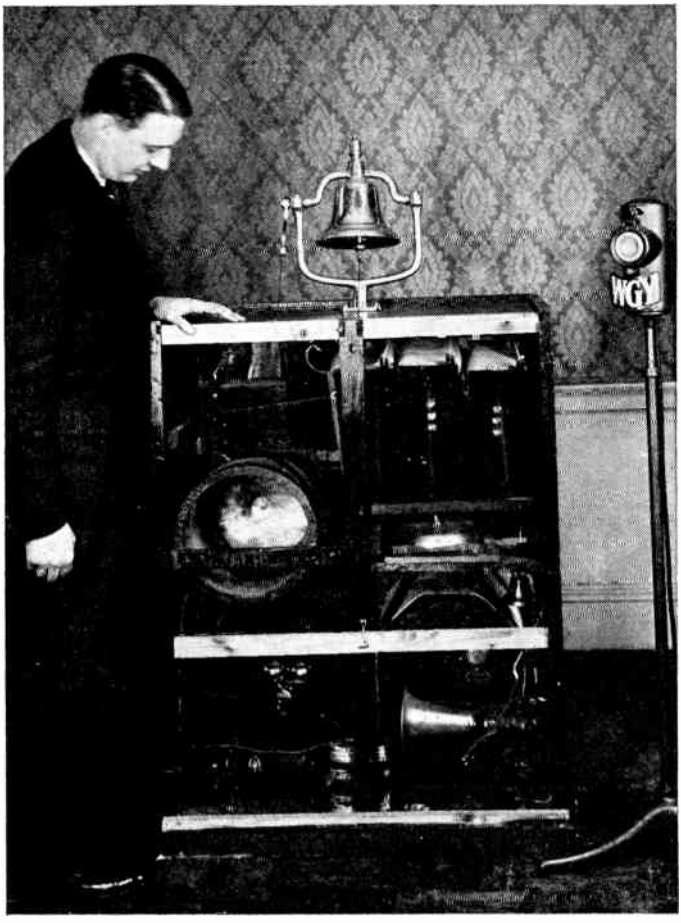


FIGURE 44. *James Wallington examining a "sound-effects machine," vintage 1924. (Courtesy of National Broadcasting Company.)*

ber this West Coast production still refer to it as one of the finest dramatic shows ever to go on the air.

Between the appearance of the successful network serial, *Amos 'n' Andy,* and the year 1932, a dozen Chicago writers capitalized on the proven fact that Americans liked a continued story on the air. The device of hold-over interest from day to day assured a steady listening audience, and in

consequence many daily serials were started. Among these were *Just Plain Bill* (the oldest continuous serial on the air at this writing), *Myrt and Marge, Ma Perkins, Road of Life, Step Mother, Romance of Helen Trent, Vic and Sade, Skippy, Women in White, Right to Happiness,* and *The Guiding Light.* Ten years later there were seventy-seven daytime serials on the air!

Among the most successful serial writers of this period were Mrs. Gertrude Berg, Irna Phillips, Mrs. Elaine Carrington, Paul Rymer, Frank Hummert, and Robert Andrews. The writers of the serial drama ground out millions of words, all based on a sure-fire formula. But Gertrude Berg brought something new to radio drama and sound effects. She insisted on realism; if the script indicated that someone was making a pot of coffee, an actual pot of coffee was brewed, or real eggs were fried by the soundman when called for. The novelty of Mrs. Berg's approach to sound effects intrigued other writers and directors and suddenly there was a demand for all kinds of realistic sounds.

By 1929 the average radio set had developed into a bulky and expensive affair about the size and weight of the old-fashioned phonograph. However the 1929 Wall Street crash had a direct effect on the receiving set, and indirectly on radio itself. In order to stay in business, radio manufacturers developed cheaper and more portable sets, and these made ownership possible for millions of new listeners. And the average person, now with little spending money, stayed home evenings and listened to the radio. The small portable also was purchased as a second set and found its way into the kitchen. There the housewives relieved their hours of tedium by listening to the serial dramas, and a large new daytime audience was brought to radio.

In October, 1929 Rudy Vallee started an hour-long variety show known as *The Fleischman Hour.* This program introduced newcomers to the air, and many of the radio stars of today owe their start to this program. Vallee also brought established stars of the theater such as Helen Hayes, Ethel Barrymore, Eva Le Gallienne, and Walter Huston to the microphone. These stars did not appear in scenes from stage plays, but in short dramas written especially for radio. The sketches paid well and several of today's top radio writers received their first recognition on this program.

The following year brought a flood of new shows, among them *First Nighter* which set a format that has been closely followed by other shows of this type ever since, and Nila Mack's *Let's Pretend.* The average children's program has been of poor quality despite the tremendous actual and potential audience, for most are written by adults from the

adult viewpoint. *Let's Pretend* is indeed an unusual program, a well-written show for children. Miss Mack's dramatizations never vary from the age level for which they are written and have the rare quality of imagination and naturalness so needed in a children's program. The sensitive and imaginative use of sound on *Let's Pretend* has been outstanding for the past twenty years.

In 1931 Kate Smith made her debut on May 1. In that same year NBC began broadcasting the Saturday matinee performance of the Metropoli-

FIGURE 45. *WGY Players of 1925. The sound effects are unidentifiable by present standards. (Courtesy of National Broadcasting Company.)*

tan Opera and CBS offered the Sunday afternoon New York Philharmonic Symphony concert. The networks were beginning to fulfill their public-service duty by presenting these outstanding musical organizations. There were technical improvements too. Receiving sets with automatic volume and tone control and the midget set were introduced.

On March 6, 1931, *The March of Time* began. This fine program presented newsworthy and accurate information in a most striking manner. Production by William Geer was outstanding and his use of sound was of the highest order. Many new effects were developed for this program by sound-effects technicians Ronald Fitzgerald, Edward Fenton, and Mrs.

Ora Nichols. Incidentally Mrs. Nichols was the only woman ever to receive senior sound status on network broadcasts.

In 1932 Fred Allen made his radio debut in a short-lived program called *The Bath Club.* Mr. Allen changed his format, gathered about him a stock company of top performers, "The Mighty Allen Art Players," and re-entered radio with *Town Hall Tonight.*

On April 23 of that year *One Man's Family,* written and directed by Carleton E. Morse, began on KGO in San Francisco. A year later it moved to NBC and was the first West Coast serial to have national sponsorship. The success of this family drama started a trend toward the origination of network shows from the West Coast.

By this time the daily serials had a firm hold on their listening audience and Lever Brothers and Proctor and Gamble, soap manufacturers, began sponsorship. The serial dramas had now become "soap operas."

In 1933 there was one important event as far as radio drama was concerned; in November of that year Arch Oboler's first radio play was broadcast. It was entitled "Futuristics" and was a satire on the habits and culture of the present as seen in the light of the future. From this, for which he received $50, Oboler went on to better things. Oboler holds a most interesting place in radio drama. He was one of the first writers who dared to deviate from the stock "boy-meets-girl" formula, or from all formulas, for that matter. He introduced fantasy and the stream-of-consciousness technique and with his imaginative writing brought imaginative sound effects to radio. As a result his programs always had tremendous listener appeal.

Any reader who remembers his *Lights Out* series, which he took over from Wyllis Cooper, will never forget it. Oboler was given free rein after scaring the nation half to death with his first effort, "Burial Service." In this series he used dialogue and sound effects in a subtle intimacy that is good radio. Although he followed the fine pattern set by Wyllis Cooper, Oboler further explored the possibilities of radio drama on his own.

Oboler was, and still is, one of the few writers in radio who understand the subtle nuances, the potentialities, and the emotional use of sound effects. He uses sound realistically as well as impressionistically for emotional impact.

The Oboler experimental plays for NBC, "The Ugliest Man in the World," "The Ivory Tower," "This Lonely Heart," "Johnny Got His Gun" (adapted from Dalton Trumbo's book and a milestone in the imaginative use of the radio medium), "The Flying Yorkshireman" (adapted from Eric Knight's delightful fantasy), and others were unique in that they

provoked the listener into giving of himself as he listened. Oboler's subtle and imaginative use of dialogue, music, and sound effects found the true radio stage, the listener's mind.

To go back to the year 1933, *Grand Hotel* starring Don Ameche and Ann Seymour started, and the first *Lone Ranger* program was broadcast on January 30. Six and a half years later, on June 30, 1939, the one-thousandth episode of *The Lone Ranger* was aired!

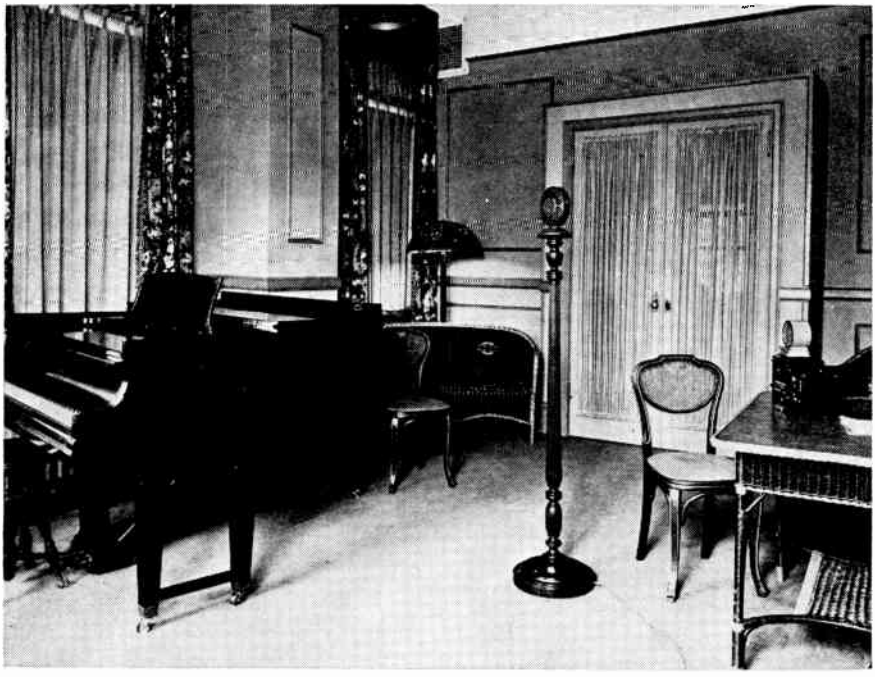


FIGURE 46. *Studio of about 1930. The heavy drapes had disappeared because microphones had been improved and the studios were better designed acoustically. (Courtesy of National Broadcasting Company.)*

In 1934 Jack Benny was sponsored by Jello, and *Hollywood Hotel* went on the air. The latter was the first important network show to originate from Hollywood. Up until this time all top-flight shows originated in Chicago or New York. In September, 1934 the third major network, Mutual, began operation with four stations. In 1936 the Colonial Network with thirteen stations and Don Lee's ten California stations joined Mutual, and thus the third coast-to-coast net was formed. Five years later Mutual had 107 cooperating stations; it now has over 500.

In 1935 *Lux Theater* began on NBC, and Eddie Cantor instituted the

idea of a pretested, or preview show. In July Phillips H. Lord offered *G-Men*. This ran for thirteen weeks, then was changed to *Gang-Busters*. Many new and startling sound effects have been developed on this program.

This brings us to the Golden Year of radio drama and sound effects, for on July 18, 1936, the Columbia Workshop started with an adaptation of Percival Wilde's one-act play, "The Finger of God." The Columbia

FIGURE 47. *Sound effects used in the thirties on* Myrt and Marge. *Urban Johnson at left operates rain machine and Lou Woehr at right with thunder drum. At mike is Donna Damerel who portrayed Marge. (Courtesy of Mrs. Urban Johnson.)*

Workshop was an experimental radio theater established and operated by the Columbia Broadcasting System. Its prime objective was to develop acting, writing, musical, and production talent, and to experiment with new ideas and techniques in radio drama. Here was an instrument that was deliberately fashioned to explore the medium of radio.

Any writer, director, musician, or actor who had the spark of creativeness was encouraged to present his work. The Workshop was an occasional program until 1938, when it became a regular sustaining feature

until the early days of World War II. During the war it was dropped, then briefly revived in 1946–47. Its importance cannot be expressed in words, because the Workshop did so much to develop good drama within the medium of radio, and such things cannot be measured.

The second Workshop offering, Leopold Proser's original, "Broadway Evening," was an impressionistic experiment signaling the fact that new ideas and techniques could be and were being developed. Other Workshop writers were Irving Reis, William N. Robson, Vic Knight, Charles Tazewell, Douglas Coulter, Milton Geiger, Pauline Gibson, and David Redstone.

Others who also had a chance to experiment and express themselves on Workshop were, Archibald MacLeish, Max Wylie (whose *Radio and Television Writing* is a must), Orson Welles, Nila Mack, and Norman Corwin. In the field of music, outstanding and original work was done by Fred Steiner, Bernard Herrmann, Lyn Murray, Charles Paul, and Alexander Semmler.

Besides developing writers and directors, Workshop offered new techniques in production, especially the dramatic use of filter and echo effects by Irving Reis. Sound reached a peak on Workshop because it was used intelligently and imaginatively to express thought and emotion subjectively rather than objectively as had been the custom. Good writing, good production, and sound used with discrimination made its impression on the radio world. A thorough discussion of Workshop plays and innovations would be a book in itself.

One of the outstanding contributors to and directors of Workshop was Norman Corwin. Corwin is essentially a poet whose work reached its true stature in radio because his expression needs an aural medium. He has given substance to poetry, and dramatically says twice as much in half the words as can be done with prose.

Corwin's work is not commercial because it does not conform to established formats or formulas. His plays have no plot, nor are his characters individual human beings. Instead, his characters symbolize groups and classes of people and through them he minutely examines small but vital details of social forces. In a detached way he philosophizes about social justice, or injustice, using a reflective approach. Mr. Corwin's forte is the documentary, fantasy, or dramatized essay. And although his productions sometimes tax the intellect because they demand such intense concentration, his endowment to radio has been considerable. Mr. Corwin probably could not write a whodunit or horse opera, but he can dramatize the moods and hopes of people in such a manner that the listener is com-

pelled to listen, and to think. His poetry, inventiveness, and unusual understanding and use of sound has done much for radio drama.

Also in 1936 *We the People*, a new type of show, went on the air, and *Great Plays* began. The latter consisted of some excellent hour-long

FIGURE 48. *Urban Johnson and assistant operating 1932 automobile effects. (Courtesy of Mrs. Urban Johnson.)*

adaptations of stage plays from Greek drama to contemporary Broadway hits. For the first time legitimate drama of all periods was made available to the nation on the air.

A year later *Silver Theater* opened with "First Love," an original written by Grover Jones and adapted by True Boardman. "First Love" was presented in episode form and ran for four consecutive Sunday afternoons. Presenting a show of this type in more than one episode was a definite departure from conventional programming. Following its initial airing, *Silver Theater* continued to use as many broadcasts as needed to tell a story.

Also in 1937 the audience-participation show began; the *Major Bowes' Amateur Hour* started; programs featuring motion-picture talent originated in Hollywood; Shakespearian cycles were begun by CBS and NBC; and Fanny Brice fascinated the radio world with her "Baby Snooks."

During the summer of 1938 CBS presented Orson Welles's *Mercury Theater*. On the October 30 broadcast of H. G. Wells's novel, *The War of the Worlds*, Welles used a technique of news flashes, commentaries, and eye-witness accounts to gain stark realism. The panic he caused graphically illustrated the hold that radio had on the listener's credulity. Orson Welles brought a certain flamboyance to radio, which had its day, then gave way to productions less obvious or sensational.

By 1939 the problem serial drama had become firmly entrenched with its daytime listeners. But in September of that year a new type daytime serial made its appearance. It was *Against the Storm* written by Sandra Michael. Miss Michael's approach was regarded as heresy in the field of the "washboard weepers" because her characters were not "stock"; the listeners could not guess or predict their reactions to any given situation as could be done in the average serial. Miss Michael wrote an episodic radio novel that concerned itself with the contemporary world and its social, political, and economic effect on her characters. The characters of *Against the Storm*, though fictional, lived normal lives in the everyday world rather than abnormal (or subnormal) lives in an artificial world. *Against the Storm* won the Peabody Award in 1942 as radio's most distinguished dramatic program.

Many of the dramatic programs offered on the air up to this time had been adaptations of novels and plays. The increase in the number of dramatic programs, the embarrassing duplication of adaptations, and network competition brought about an important change in radio drama and programing in 1938–39. More and more original radio dramas were used and fewer adaptations were made. Writers who had been selling an occasional original sketch or play were now given a chance to incorporate their own ideas in their work rather than being restricted to adaptations of some long dead novelist or playwright.

In 1940 Helen Hayes took to the air in a new dramatic series, Katharine Cornell made her radio debut, and the nighttime family situation-comedy-dramas, such as *One Man's Family*, *The Aldrich Family*, and *Vic and Sade*, reached new popularity. The Quiz programs, *Information Please*, *Quiz Kids*, *Dr. I. Q.*, *Take It or Leave It*, and *Kay Kyser's Kollege of Musical Knowledge* became favorites.

Sponsors seized upon the cheaper audience-participation program with

the result that entertainment was sacrificed for economy. Various manufacturers received free "plugs" for their give-away prizes while the sponsor got a cheap show and listeners were subjected to an unrehearsed, unprepared, ad-libbed spectacle of contestants willingly making fools of

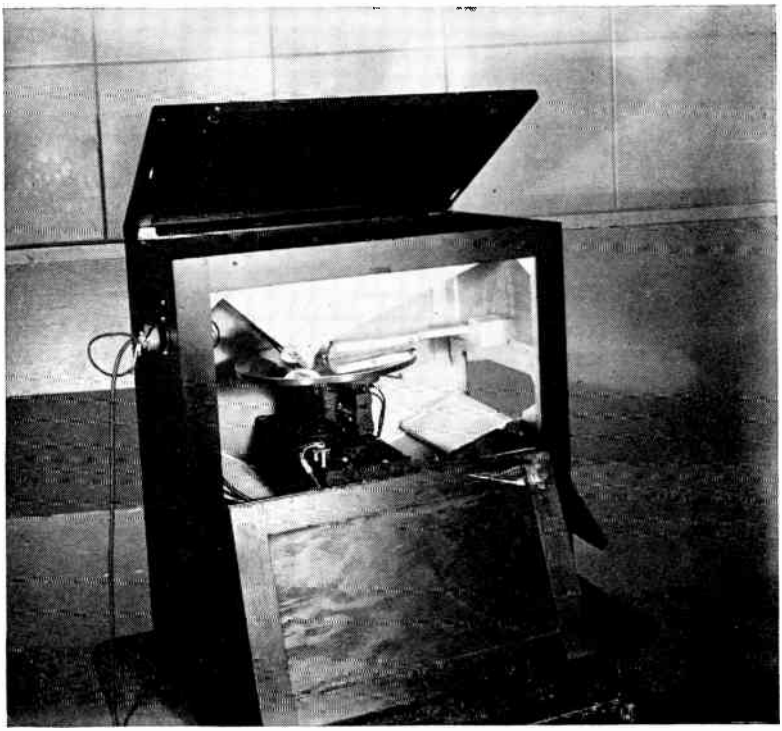


FIGURE 49. *Later refinement of rain machine as shown in Figure 47. Birdseed from hopper dropped on revolving turntable. Stationary arm swept off birdseed onto cellophane panels as the table revolved. (Courtesy of Columbia Broadcasting System.)*

themselves. Talent, other than a glib-tongued M.C., cost the sponsor nothing.

In keeping with the economy trend, the full-hour dramatic shows were reduced in number and the expensive, but entertaining, variety shows began to find themselves without options being picked up.

In September, 1941 Harold Peary, who had developed the character of "Gildersleeve" on *Fibber McGee and Molly*, began his own program, and on July 1 of that year television officially arrived when commercial operation was authorized by the Federal Communications Commission.

Pearl Harbor gave radio an opportunity to demonstrate its power to reach people and mold opinion. During the war radio became a powerful force in disseminating information and bolstering flagging hopes. One week to the day after the "day of infamy," Norman Corwin's "We Hold These Truths" was broadcast simultaneously over the four major networks and reached an estimated sixty million listeners, the greatest audience of any playwright at a single hearing.

During the war radio programing became a hectic problem. Great demands were made on radio for war-effort public service, and manufacturers shifted to war production, leaving the sponsors with little to sell or advertise. Many name brands were kept alive by name mention only, with no sales talk. New-type programs were initiated, with the documentary hammering home the duties of Americans and the dangers threatened by our enemies. Other war-inspired shows were *This is War,* produced by Corwin, and a series of dramatized stories, *The Man behind the Gun.* With the advent of war, soundmen were suddenly confronted with a whole new crop of sound-effects cues. Every conceivable military, naval, and aviation sound became a must.

Between 1942 and 1946 Groucho Marx and Jimmy Durante, who had "guested" many times, started their own shows; the melodrama *Suspense* started; *Sherlock Holmes* was revived; *Theater Guild on the Air, This Is Your FBI, Queen for a Day, Ladies Be Seated, Mystery Theater,* and other new shows made their appearance. Danny Kaye appeared briefly and proved that visual comedy is not funny in an aural medium, and escape comedy-dramas such as *Mr. and Mrs. North* increased in number.

During the war documentaries reached full flower, news and commentary broadcasts increased many-fold, and "Ah yes, there's good news tonight" became more frequent as the Allies' struggle against totalitarianism progressed favorably. The soap operas sent their men to war, and in some cases the women followed. Even *Ma Perkins* captured Nazi spies after exposing herself to incredible danger!

In 1946 the radio industry completed its first year of reconversion from wartime to peacetime service. The scramble for air time began again, and the tough-talking, much-battered, allergic-to-female *Private Eye* made his appearance with *Rogue's Gallery, Pat Novak,* and *Sam Spade.*

Since V-J Day special peacetime documentary units have been developed to produce programs dealing with social problems and major domestic and international issues; disc jockeys reached national status; Bing Crosby "taped" his show and lost not one whit of his popularity; the hour-long *Ford Theater* and *Studio One* began; and various assorted

adventure, dramatic, and comedy shows have been tried and in most cases found wanting.

Radio drama of today is written pretty much to formula. The writer develops a style or format that pleases the agency or client, then sticks to it. One cannot blame the writer because on the average he is paid (and not too well) for his quantity production and not for creative work. Advertisers footing the bills seem loath to take a chance on new approaches or an unproven idea.

FIGURE 50. *1950 studio. At left above is client's booth, below is the control room. Note polycylindrical walls and ceiling. (Courtesy of Don Lee Broadcasting System.)*

In 1950 a new trend began with the appearance of science-fiction shows. The first regular half-hour nighttime "program of the future" was Mutual's *Two Thousand Plus* followed by NBC's *Dimension X*. Others of this type are certain to follow. The fact that science-fiction programs are appearing does not necessarily mean that this will be the predominant fare of the immediate future. But they are a healthy sign that efforts are being made to supplement many of the time-tattered and shop-worn program ideas that are current.

With the cycle of science-fiction stories started, sound faces new challenges. The conventional sounds of the whodunit, comedy-drama, and

adventure yarn will not suffice. New and imaginative effects are in the offing, and the problem of creating sounds consistent with imagined space travel, thinking machines, and distant planetary civilizations opens a whole new frontier of radio sound effects.

The threat of rapidly improving television has given the radio industry a much-needed jolt. The competition offered by motion pictures and the theater in the past was little because of the ease in which radio entered the home. But now TV also enters the home and with it brings the competitive movie and theater! Radio is fast losing its former major advantage.

Healthy competition is good for any industry and the prospects and future of radio appear to be favorable. They are favorable if the powers-that-be will roll up their sleeves and meet the TV competition by offering better written, better produced programs. Incompetent and complacent writing and direction will be the kiss of death to radio in light of the fierce TV competition that is rapidly shaping up. Who knows, maybe TV is actually the salvation of radio?

CHAPTER SEVENTEEN

Improvised Sounds

THROUGHOUT THIS BOOK sound effects have been discussed on the professional level. Some readers considering the elaborate and costly equipment used in a commercial broadcast may get the feeling that good sound effects are beyond the means of the small station or classroom. This is not completely true. The high-school or college radio and television class will lack many of the expensive items that are used in the commercial field; nevertheless, many of the sounds heard every day on the radio are obtainable by simple means. These have been developed and created by soundmen who have used their imagination and sensitive "ear" and improvised on a moment's notice.

Here are a few suggestions for the nonprofessional. Please note that each effect is *simulated*. Although the following sound effects are improvisations and in most cases are not used in professional radio, they are presented to familiarize the reader with some of the simple ways in which they can be produced.

If the reader's imagination is stimulated to the point where he can go on from here in improvising and creating sounds from simple equipment, then the purpose of this chapter has been served.

AIRPLANE MOTOR (1) Press the soft rubber attachment of an electric vibrator against the membrane surface of a small tom-tom, or a tambourine with the metal jingles on the side damped or removed. By varying the pressure of the vibrator, various airplane-motor effects may be achieved. (2) Fold a heavy piece of paper and hold it so that the blades of an electric fan strike the folded paper. Try various sizes and weights of paper until a satisfactory sound is secured.

ANIMALS

CAT Easily done vocally. Listen and try to imitate.

COW Done vocally, or a small bellows-type toy may be procured at a joke shop for about a quarter.

DOG Do vocally. It really is simple, if you practice a little.

HORSE For the action of horse's hooves, see HORSES. To simulate the snuffle of a horse, take a deep breath, close the lips lightly, and as you force the air out of the lungs, relax the lips and allow to vibrate freely.

MONKEY Dampen the cork from a smooth-sided bottle and rub the side of the bottle with the cork in hard, fast, short strokes.

ARROW IN FLIGHT This sound is made by a swish stick. This is a long thin piece of wood. A $\frac{1}{4}$-in. dowel rod about 2 ft. long is fine. Hold at one end and sharply sweep down past the mike at a distance of about 6 in. For a shrill high swish, use a piece of umbrella rib with the open side facing the direction of the thrust.

ARROW STRIKING (1) To strike wood, use a bayonet or heavy knife with a sharp point, and plunge sharply into a large block of soft wood. (2) To strike flesh, use method described under STABBING.

AUTOMOBILE

BRAKE SQUEAL Drive 3 tenpenny nails through a piece of $1 \times 4 \times 4$ wood. The nails should form a triangle and slant slightly toward the point of the triangle. Place the nail points on a piece of glass which is resting on a couple of small blocks of wood. Push the block with the nails across the glass. Try this technique on various flat pieces of metal for other squeals.

HORN Use old auto horn purchased from wrecking yard and hook up to a wet battery. Hold some distance from the mike as the horn usually has a very high volume level.

MOTOR Experiment with the vibrator and tom-tom. For a comic effect use an egg beater in a metal bucket or a short piece of iron pipe banged in a rotary motion inside a square metal box, such as a fuse box.

BASEBALL HIT WITH BAT Strike a large piece of bamboo with a short piece of rubber garden hose or a small mallet.

BAT WINGS See BIRD WINGS.

BELLS

CHURCH, FIGHT, FIRE, SCHOOL, BELL These can all be made on an old automobile brake drum. Set the drum on a piece of wood so that the flange is facing up and is free to vibrate. Try striking with various wooden and metal strikers for different tones, also in various rhythms to get the effect of various bells.

DINNER BELL and EMERGENCY BELL These are usually rung much faster than the other bells. In order to get the speed necessary, suspend by a cord a piece of strap iron or small diameter pipe bent into a U shape. With

a small piece of metal rapidly strike back and forth *inside* the inverted horseshoe.

ELECTRIC BELLS These may be purchased inexpensively and should be mounted on wood for greater resonance. The dry-cell setup is handy, but the batteries eventually run down. An a-c setup is good, but calls for an a-c cord to an outlet.

OLD-FASHIONED ROTARY DOOR BELL The old-time door bell that was set in the door and twisted may be simulated by using a bicycle bell.

BIRD WINGS (1) Make a hoop about a foot in diameter of stiff wire, and shape a wire handle. To this hoop sew a piece of old silk or satin, or even a large linen handkerchief. Allow plenty of slack. With a sharp jerking motion pop the slack material back and forth. The rhythm and tempo will vary with the bird being simulated. Bats may be done by this method. (2) Use a large feather duster. Hold in one hand and gently slap the feathers against the other. Don't do bats this way though, because bats do not have feathers.

BLOOD-PRESSURE SPHYGMOMANOMETER The gadget that is strapped on the arm to take blood pressure is easily simulated by placing a finger over the nozzle end of an atomizer, then rapidly squeezing the bulb. Work close to the mike on this.

BLOWS

ON THE HEAD (1) Strike a pumpkin with a mallet. (2) Strike a large melon with a wooden mallet or a short length of garden hose. (3) Strike a baseball glove with a short piece of garden hose.

ON THE CHIN (1) Lightly dampen a large powder puff and slap on the wrist close to the mike. (2) Hold a piece of sponge rubber in one hand and strike with the fist. (3) Slip on a thin leather glove and strike the bare hand with the gloved fist.

BODY FALLS (1) See Chapter 6, Manual Effects. (2) For gory falls indicating a long drop, drop a large ripe melon or empty a bucket of wet rags on a slab of cement.

BOILING WATER Blow slowly through a straw into a glass of water.

BONES RATTLING (1) Suspend several pieces of dowel rod of different lengths and sizes on various lengths of string. Let the dowel rods swing and bump together. (2) Do the same with strings of small wooden spools.

BOTTLE OPEN (1) For an ordinary bottle, use a wine bottle with a tight-fitting cork. Be sure the cork is wet, then twist and remove rapidly in one motion. (2) For champagne bottle, prick a small balloon or pop an inflated paper bag.

BRAKE SQUEAL See AUTOMOBILE.

BREAKING BONES (1) Chew Life Savers close to the mike. (2) Twist and crunch berry boxes or small peach baskets. (3) Snap small-diameter dowel rods wrapped in soft paper. (4) Snap small pieces of hardened isinglass.

BREAKING EGGS Take a 6-in. square of very coarse sandpaper and fold the corners in toward the center, the rough side up. Lay in the palm of the hand and suddenly squeeze.

BREEZE Fold two sections of a newspaper in half and cut the sections into narrow parallel strips. Sway the strips together gently, close to the mike.

BURGLAR ALARM A very large alarm clock has the insistent steady beat of a burglar alarm.

BUSHES Rattle and twist a dried palm-tree branch or twist a broom close to the mike. Try squeezing a handful of excelsior.

CAMERA CLICK (1) Snap the switch on a flashlight. (2) See PHOTO FLASH.

CHAMPAGNE POP See BOTTLE OPEN.

CHATTERING MONKEY See MONKEY under ANIMALS.

CHIMES Suspend various lengths of pipe by leather or fiber strings, not wire, and strike with a wooden mallet. Be sure the pipes hang free and do not touch anything. The same may be done with thin glass jars that are filled to various depths with water.

CHURCH BELLS See BELLS.

CLOCKS (1) Use various clocks. (2) Use a metronome for a steady beat. (3) Collect striker mechanisms for variety of tones. (4) A cuckoo-clock effect produced by a whistle or a small bellows mechanism may be purchased in a toy department or music store. (5) Strike suspended and undamped steel spring with a padded mallet.

COCKTAIL SHAKER (1) Shake some bits of broken glass in a small amount of water in a closed coffee can. (2) Agitate sleigh bells wrapped in adhesive tape in a can. (3) Shake used photo-flash bulbs in a can with a little water.

COINS Only larger coins will register properly. Pennies and dimes have too thin a sound to pick up well. Try some medium-sized metal washers. They work very well.

COW MOO See ANIMALS.

CRASHES (1) Metallic crashes may be done by piling a collection of tin and metal scraps into a large tub and dumping. To get a sustained crash, shake and rattle the tub until cue for the pay-off crash. (2) Wooden crashes

can be done by smashing large peach baskets close to the mike. (3) Door crashes are usually done by hitting a door with the shoulder and simultaneously smashing a peach basket close to the mike. The impact must come before the crash.

CREAKS (1) Twist and squeeze a Dixie cup close to the mike. (2) Mount a rusty hinge between two blocks of wood. Twist so that the hinge binds, then slowly open or close the hinge. (3) See CREAKER and NAIL PULLER in following chapter. (4) For creak of ship rubbing against wharf, rub inflated rubber balloon close to mike.

CRICKETS Run the fingernail along the fine teeth of a pocket comb. Remember, the sound should alternate, loud, then soft.

CURTAINS Principal sound of drawn curtains is the sound of rings sliding on rod, not the fabric. String several washers or wooden or metal rings on a 2-ft. length of dowel or metal rod. Space rings evenly apart, then sweep them together from one end to the other.

DIGGING AND SHOVELING Fill a small wooden box with several inches of dirt and add several small rocks for realism. Use small GI shovel or fireplace ash scoop. Force the shovel into the dirt with slanting motion. The bottom of the box (inside) should be covered with an old piece of carpet to cut down wood resonance.

DINNER TRIANGLE See DINNER BELL under BELLS.

DISH BREAK Use castoff dishes or *unfired* pottery rejects. To be sure and get the sound of the break, place several prebroken pieces of dishes in a whole dish, then drop. The whole dish may not break, but it will give the impact, and the broken pieces will scatter, giving the sound of scattering fragments.

DOG SHAKING HIMSELF The sound of a dog shaking himself after a bath may be simulated by cutting a 2-ft. length of inner tube into inch-wide strips and holding in the fist, then violently shaking.

DOORS The principal sound heard on a door close or open comes from the lock and jamb. Half-size doors may be built, paying particular attention to the hardware for different types.

ELEVATOR DOOR Run a roller skate over a long flat piece of metal.

JAIL DOOR The characteristic sound of an iron door is the noise when it clangs shut. For this, clang two flat pieces of metal together, then let one slide along the other for a moment, signifying the bar sliding into place.

SCREEN DOOR The distinctive sound comes from the spring and the rattle of the screen on the slam. Secure an old spring, slap it against a piece of wood, then rattle a window screen.

STONE DOORS Slide a large block of cement on a large flat slab of cement. At the end of the slide, tip the block to one side and then let it fall back. This signifies the close of the door.

SWINGING-DOORS These can be simulated by swinging a real door back and forth between the hands. Let the free edge strike the heels of the hands. Watch the timing.

DRAWERS Slide two pieces of wood together. Put a small cross-piece on one so that the other will hit it at the end of the slide indicating the close. See DRAWER in following chapter.

ECHO EFFECTS See the end of Chapter 8, Electronic and Acoustical Effects.

ELECTRIC MOTORS (1) Remove bag from a vacuum cleaner and run the motor. (2) Use an electric mixer or juicer. (3) Sometimes a hair dryer sounds satisfactory.

ELECTRIC SPARK Rub two blocks of sandpaper-covered wood together in one long fast stroke.

ELEVATOR DOOR See DOORS. See also ELEVATOR DOOR in following chapter.

EXPLOSIONS (1) Put a ½-doz. BB shot inside a stem-type basketball bladder. Blow bladder up until taut, then tie the stem to prevent air leakage. Hold bladder in hands and snap sharply in an upward direction. This must be done very close to the mike. (2) See THUNDER SCREEN in the following chapter.

FALLING INTO WATER The important thing here is to get the *impact* of the hit on the surface of the water. To simulate this effect, however, *reverse* the procedure this way. Secure a large wash tub or wooden tub. Fill it about three-quarters full of water. Get a very large can (no. 10) or a bucket. Sink the bucket until it is full of water, then turn it over, but keep it submerged. With the bottom side up, yank sharply out of the tub. If it is necessary to keep the hands dry, get a 3-ft. length of pipe and at one end fasten a round disc of wood about a foot in diameter. Place the end with the wood on the bottom of the tub, then yank sharply upward. For a more elaborate piece of equipment, see SPLASH TANK in following chapter.

FIGHTS Use any one of the devices mentioned under BLOWS. However, to give realism to a *sustained* fight, slow down the pace a little and vary the actual blows by slaps of the hands on the chest and thighs.

FIGHT BELL See under BELLS.

FILE CABINET Use 3×5 card-index file close to the mike.

FIRE (1) Gently twist a piece of cellophane close to the mike. (2) To make a larger fire, add to the cellophane the frequent snap of crackling pieces of

berry box. (3) To get the sudden flare of flames, like the igniting of gasoline-soaked wood, snap open an umbrella, then bring in the crackle of cellophane.

FIRE ENGINE BELL Use the device described for DINNER BELL under BELLS.

FIRE STATION GONG Use the brake drum as described under BELLS. Remember that the tempo is slow and usually done in a code.

FISHING (1) To indicate fishing, use the occasional "sing" of the reel. Clamp the reel to some surface near the mike, then take the string and rapidly run it out as needed. (2) To indicate a caught fish, flop about an empty hot-water bottle or folded inner tube.

FOG-HORN Fasten a 5-ft. cardboard mailing tube to a 10-ft. piece of pipe. Blow hard through the pipe end.

FOOTSTEPS This has been discussed in Chapter 6, Manual Effects. However here are a few additional suggestions.

BAREFOOT Wear rubbers over shoes. Or use method described in Chapter 6.

LEAVES Stir corn flakes in a small cardboard box with the fingers. Watch the rhythm of walking.

MUD In a large wash pan place several crumpled and shredded newspapers. Paper towels work fine. Leave very little water in the pan. Simulate walking by using the palm of the hand for footsteps.

SLUSH Use the same technique as used in walking in mud, but add a little more water in the pan. Then use one hand for the pan, and the other to squeeze a box or bag of cornstarch. These must be done simultaneously and close to the mike.

SNOW Squeeze a box of cornstarch with the fingers in the proper rhythm. Better yet, put the cornstarch in a chamois bag.

STAIRS Use just the ball of the foot in a forward sliding motion. Do not use the heel. See also one-step under WALKING SURFACES in the following chapter.

FREIGHT TRAIN See LOCOMOTIVES.

GALLOPING HORSE See Chapter 6, Manual Effects.

GAMBLING SOUNDS (1) Use cards and chips. (2) For crap table, roll dice inside open violin case. (3) See ROULETTE WHEEL.

GEARS OF MACHINERY Turn hand-operated siren backwards.

GEIGER COUNTER Twist the knob of a heavy spring lock.

GLACIER BREAKING UP Twist and squeeze a small inflated rubber balloon.

GLASS CRASHES (1) Place an accumulation of broken glass and crockery in a flour sack. Drop on floor and then shake. (2) See GLASS CRASHER in following chapter.

GOLD DUST Fill a tobacco sack with BB shot or sand.

GOLD NUGGETS May be simulated by small lead fish sinkers.

GOLF BALL STRUCK Use a swish stick (see ARROW IN FLIGHT). When at the end of the swish, strike a small piece of two-by-four or temple block with a wooden mallet.

GUN COCK Why not use a real gun? (Unloaded, of course!) However, the sound may be simulated.

RIFLE The significant sound is the sliding bolt. Mount a small sliding metal latch on block of wood and practice opening and closing the latch. Don't forget the snap at the end.

PISTOL Use a spring latch. Twist and release knob quickly.

GUNSHOTS (1) Strike edge of a snare drum with a drumstick. (2) Strike a pile of alternate layers of heavy duck canvas and heavy wrapping paper with a thin flat wooden stick. The stick should be about two inches wide and not over a $\frac{1}{4}$-in. thick. (3) Strike a leather cushion with a thin flat stick. (4) Prick an inflated rubber balloon with a pin. (5) Strike the membrane of a tambourine with a drumstick. Be sure the metal rings are removed first.

GASOLINE PUMP This sound is usually heard at a slightly off-mike perspective. All you need to do is to slightly "damp" a hand-punch bell with a finger, and at intervals tap the plunger of the bell. Be careful not to do this too fast.

HAIL See WEATHER EFFECTS.

HANDCUFFS The two distinctive sounds of handcuffs are the serrated edges that click as the cuffs are opened or closed, and the snap of the lock. For the serrated edge use a long-shanked bicycle padlock. The locking sound may be made by crisply turning the key. Toy handcuffs sometimes work all right.

HAND PRESS A small hand-operated printing press may be simulated by holding a wooden folding chair by the back and rhythmically opening and closing the seat of the chair. An old rattly chair works best. This same effect may be used for a hand loom.

HARNESS RATTLE Fasten a small length of chain to a piece of stiff leather and rattle as needed.

HEART BEAT (1) Thump a drum or tom-tom with the fingers. (2) Place the needle of a record player on several thicknesses of heavy felt or sponge

rubber. Turn the volume full on, then tap the felt or rubber with the index finger in the tempo desired.

HINGES Various kinds of hinges may be mounted individually on two small blocks of wood. Only hinges that are rusty or bind when twisted will make any noise. A smooth-working or well-oiled hinge is useless. Squeaky swivel chairs work well. See HINGES in following chapter.

HIT IN THE FACE See BLOWS. To get the comedy effect of a person being slapped in face with a ripe tomato, soft pie, melon, etc., use a wash basin and rags. In a tin wash basin put a little water, then several layers of crumpled paper towels or rags. Let these soak up the water. Next prepare a wad of rags so they may be easily held in the hand. Soak the bundle of rags also. On cue, slap the wad of rags hard onto the soaked rags in the pan. This must be done very close to the mike.

HORNS (1) Various toy horns work well for specific effects. (2) Auto horns purchased from an auto wrecking yard may be hooked up to a wet-plate battery. Keep some distance from the mike though, as the blast is usually pretty loud.

HORSES (1) Hooves are made from halves of cocoanut shells or a pair of plumber's helpers. (2) For a horse snuffle, see HORSE under ANIMALS. (3) The "beat" of a horse is discussed fully in Chapter 6, Manual Effects.

ICE CRACKLING The tendency of ice to melt makes it impractical to use. For crackling ice, crumple the protective cartons or jackets that come on light bulbs, close to the mike.

ICE JAM The crushing and rending sound of an ice jam may be done by squeezing and twisting an inflated rubber balloon. Let the finger tips slip along the extended balloon.

ICED DRINKS Put a couple of small expended photo-flash bulbs in half a glass of water or a pitcher. Tiny 10-cent sample bottles of perfume that are corked and sealed with wax work well too.

KNIVES See STABBING.

KNIFE THROW The sound of a knife being thrown and hitting the wall a couple of inches from the hero is done in three parts: (1) The flight through the air is done by a swish stick (see ARROW IN FLIGHT). (2) The thud of the knife hitting is done by sharply stabbing a bayonet or large heavy knife into a block of *soft* wood. (3) The quiver of the knife after it hits is made by placing a flexible table knife on a flat wooden surface or table so that about 2 in. of the blade rests on the table, the rest of the blade and handle extending over the edge. Press the table end of the knife firmly against the table, then sharply hit the free end so that it will vibrate. Practice will

determine the right pressure on the blade and the amount of overlap on the table. The three sequences must be done very rapidly.

KNUCKLE CRACK Believe it or not, the sound of a person cracking his knuckles crops up now and then in a script. Get a rubber bone used as a pacifier for dogs, hold in the hands, and then sharply bend back and forth very close to the mike.

LAVA Heat a small pan of thin mud or heavy soup stock, then place on an electric plate and suspend a mike very close to the surface of the bubbling liquid. It will be necessary to amplify the sound considerably.

LAWN MOWER The trick here is to have control of the mower. Obviously the mower must be stationary, so place it on a table with one wheel projecting over the side, lash a stick across the free wheel to use as a handle, and turn the wheel.

LIGHT SWITCH (1) All kinds of switches that may be purchased in the hardware store should be mounted in blocks of two-by-fours, so as to give the resonance needed. Note: *in,* not *on* the wood. (2) Snap the switch on a flashlight. (3) See SWITCHES in following chapter.

LIGHTING A MATCH There are two distinct sounds in lighting a match, the scratch, and the flare of the flame. Use large wooden matches and scratch on a piece of sandpaper about 6 in. from the mike and directly on the beam. As soon as the match flames, move as close to the mike as feasible. In this way the flare comes over. Otherwise scratching a burnt match on a surface would suffice. The sound of the flare is needed.

LOCKS Door locks should be mounted *in* small pieces of two-by-four. (See LOCK AND KEY in following chapter.) When locked or unlocked, this block should be placed against a table or door so as to give body to the sound. Otherwise the sound of the action is thin and detached. Mark on the block of wood the direction in which the key turns. This will save possible embarrassment on the air.

LOCOMOTIVES (1) A simple technique is to cover one side of two pieces of two-by-four with heavy sandpaper. Rub the two sandpaper sides together. (2) The beat or rhythm differs between a freight and passenger train. The freight-engine rhythm is *chuff* chuff, *chuff* chuff. Every other beat is accented. (3) The passenger train sounds like this: *chuff* chuff chuff chuff, *chuff* chuff chuff chuff. The accent is on the first of every four beats.

LOOM For a hand-operated weaving loom, use the technique described under HAND PRESS.

MACHINE GUN (1) The characteristic sound of a machine gun is its staccato effect. A creditable simulation may be made by striking a tubular cereal

carton with two thin wooden sticks. (2) A better effect is achieved by striking the rim edge of a snare drum with a wooden drumstick.

MACHINERY (1) A small electric motor operated close to the mike is adequate for electric motors. (2) Whirl an egg beater inside a tin pan for a comedy effect. (3) Revolve a caster-mounted desk chair on a large flat piece of metal.

MATCH STRIKE See LIGHTING A MATCH.

MILKING A COW (1) Squirt a seltzer bottle into a bucket. Don't forget the proper rhythm. (2) Use two hand syringes. As you squirt the water out of one syringe, lower the nozzle of the empty syringe into the water and fill it. Alternate. To get the sound of foam on the milk, add a little soap powder to the water.

MONEY (1) See COINS. (2) For packages of currency, slip a rubber band around a half-deck of cards.

MONKEY See MONKEY under ANIMALS.

OAR LOCKS Rhythmically turn a doorknob close to the mike. Try different doorknobs until you get a reasonably close sound.

OXYGEN MASK Half inflate two football or basketball bladders and fasten the stems together. Press the air back and forth through the stems from bladder to bladder.

PASSENGER TRAIN See LOCOMOTIVES.

PHONE-BOOTH DOOR Unfold and fold the leg of a card table.

PHOTO FLASH Jerk the chain on a chain light switch close to the mike.

PICKS AND SHOVELS (1) See DIGGING. (2) For a pick, use a small pipe and strike sharply in a dirt box. Hit an occasional rock.

POURING A DRINK (1) Always touch the edge of the glass with the bottle to establish the sound. (2) For a comedy effect use the long glass tube that covers the paper cups on a water cooler. A pitcher of water used with this tube will give a terrifically *big* drink.

PULLEY To get the sustained sound of a pulley, place a loop of rope about 3 ft. long on a mounted pulley wheel. Thus the sound can be continued indefinitely.

PULLING NAILS See NAIL PULLER in the following chapter.

RAIN See WEATHER EFFECTS. See also RAIN MACHINE in the following chapter.

RATCHET SOUNDS (1) Turn the brace of a brace and bit. (2) Run a nail across a metal washboard. (3) Run a small metal pipe across teeth of an old tire jack.

RATTLESNAKE (1) Place several bird shot in the cellophane wrapper from a pack of cigarettes. Fasten to the clapper arm of an electric doorbell. Remove the bell, then press the button to let the buzzer vibrate. An alarm clock may be used instead of a doorbell. (2) Put a ½-doz. bird shot in a Dixie Cup. Staple the top of the cup together and suspend from a stiff wire. Hold the wire in the hand and vibrate by a stiff manipulation of the wrist.

RIPS AND TEARS Rip a piece of window shade or unbleached muslin.

ROBOT For robot walking use a 3-×-5 metal file case. Hold in vertical position with open end up, and bang against walking surface in slow definite rhythm. Leave the drawer in the case.

ROCKING CHAIR Squeeze the top edges of a Dixie Cup together, then rhythmically press the center together and twist back and forth with the fingers, close to the mike.

ROULETTE WHEEL (1) A toy or party roulette wheel works very well. (2) To improvise, cut a circular piece the size of a biscuit cutter out of the bottom of a large wooden salad bowl. Insert a tin biscuit cutter open side up in the hole. Place a marble in the wooden bowl and rotate briskly. On cue slow down the speed of the rotation and allow the marble to drop into the biscuit cutter.

SADDLE SQUEAK (1) Twist a leather wallet close to the mike. (2) Bind several short lengths of rubber-covered wire together, take in both hands, and twist back and forth.

SAFE DIAL (1) Revolve the chamber of a revolver close to the mike. (2) Twist the dial of a combination padlock.

SHOTS See GUNSHOTS.

SIZZLE To get the sound of a sizzle as of someone backing into a hot stove, put a heated electric iron into a very shallow pan of water. The same may be done with a soldering iron.

SKELETON (1) See BONES RATTLING. (2) Crush isinglass in the hands. The more brittle the isinglass, the better the effect.

SKIING Rub a small block of two-by-four in a circular motion over a taut piece of heavy duck canvas.

SLOT MACHINE Pour a handful of metal washers into a large tin funnel.

SNOW See FOOTSTEPS.

SOCKS See BLOWS.

SPEAKER TUBE The sound of a whistle and speaker tube in an apartment house may be done by blowing a police whistle (with the small pea removed) in the long glass tube from a Dixie Cup holder.

SPLASHES See FALLING INTO WATER. See also SPLASH TANK in following chapter.

SQUEAKS (1) See CREAKER in following chapter. (2) Twist a leather wallet close to the mike. (3) Use a squeaky swivel office chair. (4) Twist a Dixie Cup in a sideways motion. (5) Draw a violin bow across the edge of a berry box. (6) Twist a dampened tight-fitting cork in a bottle.

SQUEAL The dominant sound of a squeal is caused by friction. (1) See BRAKE SQUEAL under AUTOMOBILE. (2) Twist a metal cup (like top of thermos jug) on an *unglazed* pottery plate. (3) Twist and scrape various bits of metal against metal.

STABBING Plunge a knife into a grapefruit, cabbage, or large melon.

SURF (1) Rub a stiff scrubbing brush with a rotary motion over a drum head or timpani. Watch the rhythm. (2) Gently rotate several buckshot or dried peas inside an inflated football or basketball bladder. (3) Roll a few dried peas on a window screen.

SWIMMING See SPLASH TANK in the following chapter.

SWITCHES See LIGHT SWITCH.

SWORDS If using real swords, remember that the rapier, saber, scimitar, broadsword, cutlass, foil, épée, etc., all sound different and are handled differently. Some are used for slashing, others for thrusting. If real swords are not available, try: (1) Clashing two carving knives together. (2) Clashing a carving knife and the sharpener together.

TEARS See RIPS AND TEARS.

TELEPHONE BELL See Chapter 8, Electronic and Acoustical Effects. See also TELEPHONE CIRCUIT in the following chapter.

TELETYPE MACHINE The key to the sound here is rhythm and timing. Use a typewriter, striking the keys in a steady and constant rhythm. Do not break the rhythm even when resetting the platten. Use the space bar in the same rhythm as the typing. When no message is coming over the teletype, tap the space bar in the same steady rhythm.

THUNDER (1) See Chapter 8, Electronic and Acoustical Effects. (2) Strike a timpani a solid blow, then several lighter blows in diminishing taps. (3) Use

same technique as described under EXPLOSIONS, but sustain a little longer. (4) See THUNDER SCREEN and THUNDER SHEET in following chapter.

TRAINS (1) See LOCOMOTIVES. (2) For a toy-train whistle, use a bosun whistle.

TWANG BOX See BOING BOX and TWANG BOX in the following chapter.

TYPEWRITER Use a typewriter.

WAGON See WAGON WHEEL in the following chapter.

WATER SOUNDS Water sounds are difficult to fake realistically. Real water used whenever possible sounds much better.

BOILING WATER See BOILING WATER.

FALLING INTO WATER See FALLING INTO WATER.

RAIN See WEATHER EFFECTS.

SWIMMING See SPLASH TANK in following chapter.

WAVES See SURF.

WAVES See SURF.

WEATHER EFFECTS

BREEZE See BREEZE.

HAIL Slowly pour rice on a slanted board or piece of glass. The surface is slanted so that the rice will not pile up and deaden the sound.

RAIN (1) Roll several dried peas or quantity of rice around in a flat tin pan. (2) Fasten a large piece of tissue paper so that it is taut and slanted at a 45-deg. angle. Then slowly pour rice on it. (3) A garden hose and sprinkler sounds fine, but the problem is how to drain off the water.

SNOW See SNOW under FOOTSTEPS.

THUNDER See THUNDER in Chapters 8 and 18.

WIND (1) Remove the blades from an electric fan and substitute in their place four thin dowel rods about 1½ ft. long. (2) See WIND MACHINE in the following chapter.

WHIP CRACK (1) See WHIP CRACK in the following chapter. (2) Sharply slap two thin boards together.

WIND MACHINE See WIND MACHINE in the following chapter.

WINDOW (1) Slide one block of wood on another. (2) See WINDOW in the following chapter.

WOOD CRASHES See CRASHES.

WRITING SOUNDS Use coarse twilled paper and scratch with an unbent paper clip, fingernail, or even a pen point.

Remember, the effects given in this chapter are improvised or simulated and in most instances are not used in commercial radio. They are given here to give the reader some idea how to *listen to sounds.* Practice on some of these improvised sounds, then go about improvising your own. As you start to improvise a sound, analyze its characteristics by asking these questions: Is it metallic or wooden? What's the pitch, high or low? Resonance? Does it have a rhythm or distinctive tempo? What is its duration? Is it sustained or intermittent? What is the main quality that characterizes it from all other sounds? Listen to sounds, learn to take them apart. If you do so, then you are on your way to improvising your own sounds in a satisfactory and logical manner.

CHAPTER EIGHTEEN

Constructing Sound-Effects Equipment

IN THIS CHAPTER there are over thirty line drawings, complete with dimensions, which show how to construct sound-effects equipment. The construction of the equipment has been kept as simple as possible.

If the reader wishes to build equipment, he should construct basic effects first, the things needed and used the most. These would include a bell and buzzer box, house door, car door, wooden creaker, walking surfaces, light switch, lock and key, splash tank, telephone bell. Effects such as thunder, wind, and rain may be obtained more easily from records than from elaborate equipment that has to be built. They have been included, however, because many times they are useful in a combination drama and radio class.

In constructing equipment, use the best materials available or that the budget will allow. A well-built door of properly seasoned oak will give years of service. Do not scrimp on the materials or time taken for construction. This is false economy.

Many effects or elaborate variations of effects have been purposely left out of this section. Those given here are workable, simple to make, and will give satisfactory results. Most of the drawings are in perspective in order to better show the construction.

Possibly the reader has had the opportunity to go through a sound-effects department of some large radio station. In that case he may notice that some of the effects looked somewhat different than the drawings here. Actually each sound department has its own idea of design and construction of sound-effects equipment, but the basic principles are the same. Remember, there is no place to buy such equipment. Each sound department must design and build its own.

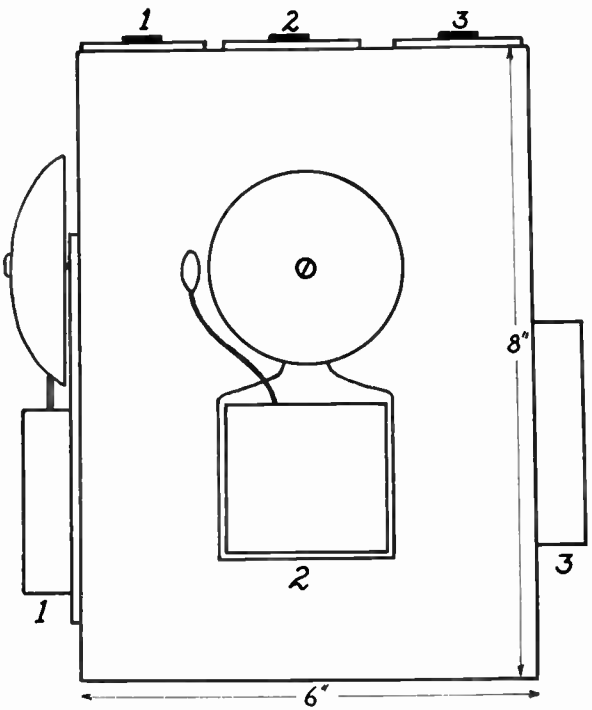
BELL AND BUZZER BOX

Build a wooden box of ⅜-in. stock 8 in. high and 6 in. square. Mount on each of the four sides a different sounding bell or buzzer and connect to two dry-cell batteries placed inside the box.

Hook up each bell or buzzer to a corresponding push button on top of the box.

This simple piece of equipment is very useful. It is compact, yet gives the sound of four different bells or buzzers as selected by the builder.

To lessen chance of error, number each push button and mark that number in your script so the wrong bell or buzzer will not be used. Push button number 1 sounds bell number 1, button number 2 sounds bell number 2, and so on.



BOING BOX

The boing box is similar in sound to the TWANG BOX, but its construction and operation are different. The boing box gives the comedy sound "Booooooiiiiinnnnnnnnggggggg!"

The chief components of the boing box are the resonating body, steel wire, and flexible neck.

Construct the box to the dimensions given using well-seasoned $\frac{1}{2}$-in. wood, except the face which should be made of $\frac{1}{4}$-in. three-ply. The box should be accurately cut and fitted, and fastened together with countersunk flat-head screws.

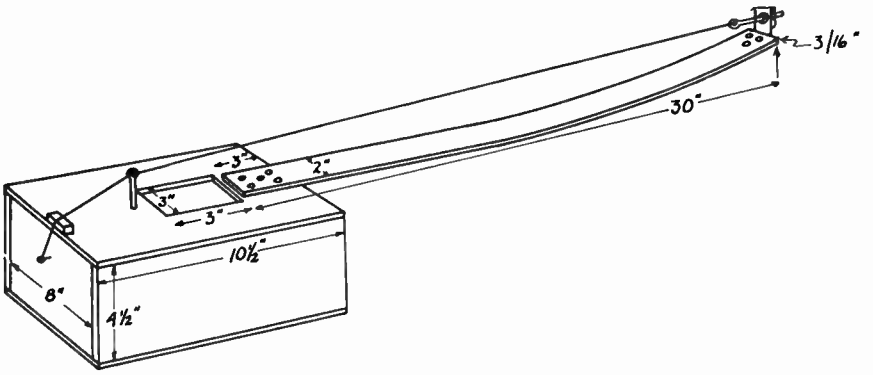
Cut a 3-in. square hole in the top surface of the box. The upright screw eye (bridge) should be about $2\frac{1}{2}$ or 3 in. long and solidly screwed into the top about an inch from the sounding hole.

The 30-in. flexible neck should be made of $\frac{3}{16}$-in. plywood, 2 in. wide, or of the same dimension flexible metal. Securely bolt one end of the neck to the sounding box.

At the other end of the neck bolt a 2-in. right-angle bracket. Pass an eye bolt through the projecting part of the angle iron, and secure at the outside with a lock washer and wing nut.

The wire should be 10-gauge .024-in.-diameter tinned music wire. The Johnson Steel and Wire Company manufactures a satisfactory wire in 25-ft. lengths that sell for thirty cents which may be obtained in most hardware stores. Attach the wire to the screw eye on the side of the box, run up over the top edge of the box, through the upright screw eye, and fasten to the eye bolt. Tighten the wing nut until the tension on the wire definitely bows the neck of the instrument.

To get the "boing," pluck the tautened wire and shake the box vigorously so that the neck vibrates. A little practice will show how tight to draw the wire and how rapidly to vibrate the box.

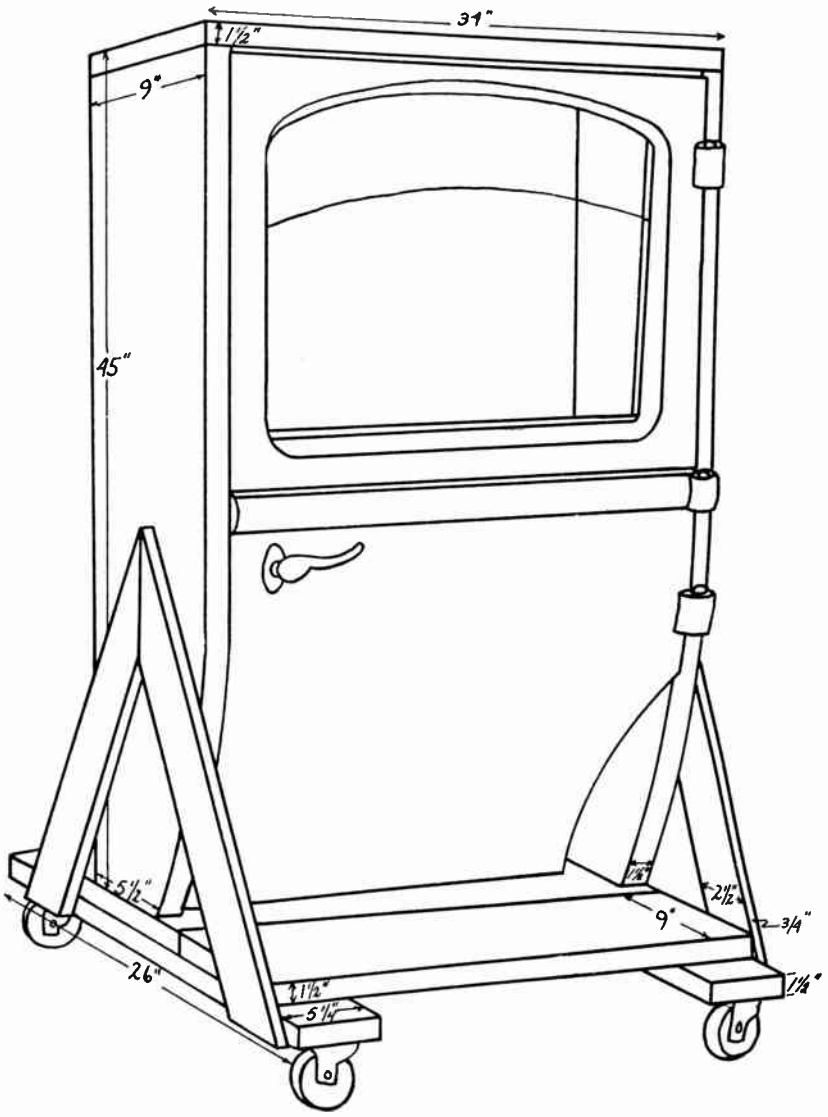


CAR DOOR

The sketch and dimensions given in the drawing show how to mount a car door. However, the dimensions may be varied to fit a door of different size and shape.

It is important that the door be solidly mounted, not top heavy, and properly hung so that it will open and close readily.

Be certain to get a door in which the window rolls easily up and down. Mount the whole piece of apparatus on heavy rubber casters.



CLOCK TICK

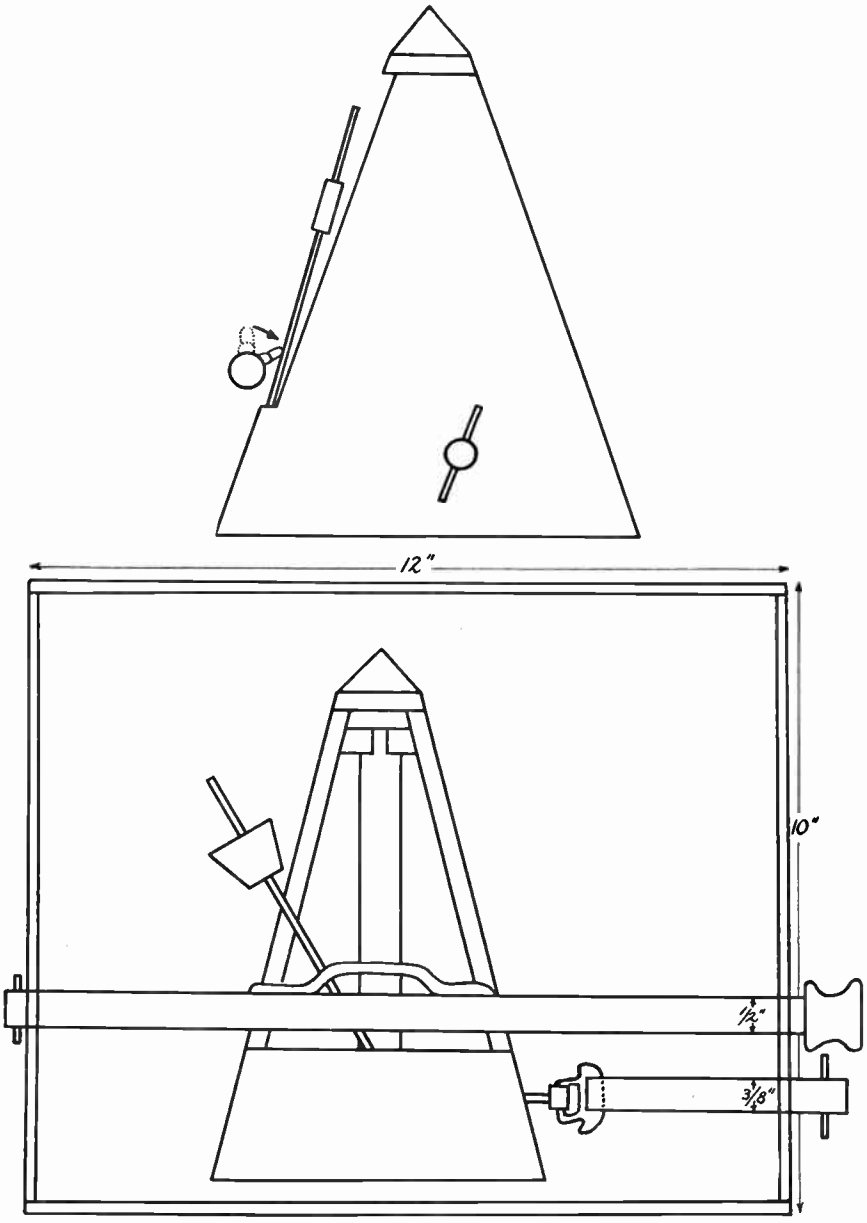
If a clock with the desired sound is not available, a metronome may be used. House the metronome in a wooden box 12 in. long, 10 in. high, and 8 in. wide. Secure the metronome securely to the base.

The illustration here is a cutaway drawing. A $\frac{1}{2}$-in. dowel rod extends the full length of the box. On the top side of the rod is fastened a small strip of stiff leather or rubber-covered telephone wire. Note the flat U shape in which the wire is bent.

To the winding mechanism fit a $\frac{3}{8}$-in. dowel and extend it to the outside of the box for ease in winding.

To use, fully wind the metronome and on cue turn the large dowel rod to the left so that the bent wire disengages from the pendulum, thus allowing it to swing freely. To stop, turn the rod in the direction of the arrow as shown in the side-view drawing. The bent wire then touches the pendulum and stops it.

Fit a hinged lid to the top of the box. When closed the muffled sound is more authentic because in reality a clock mechanism is enclosed. For very pointed use of a clock tick, open the top.

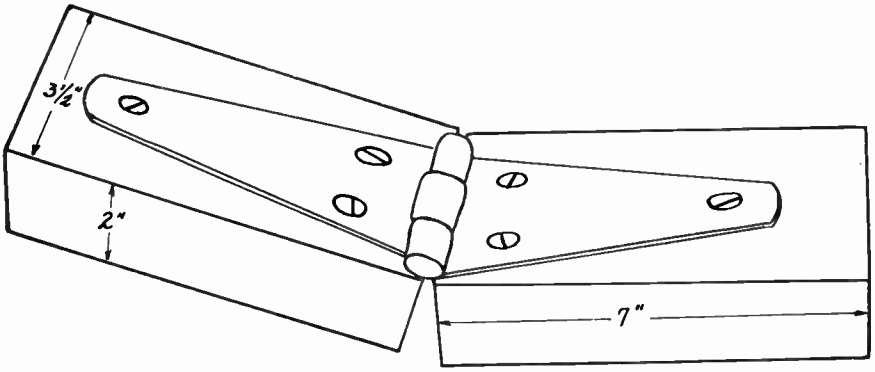


CREAKER (METAL)

The principle of the metal creaker is that there must be friction or "bind." A search must be made for a large metal hinge that is rusty or has a definite creak when moved.

Mount on two blocks of wood as shown in the drawing. To use, grasp an end in each hand, twist slightly (to bind), and slowly open or close.

Be sure and get a hinge that squeaks to start with.



CREAKER (SPRING)

This creaker is different in principle in that the sound comes primarily from a spring.

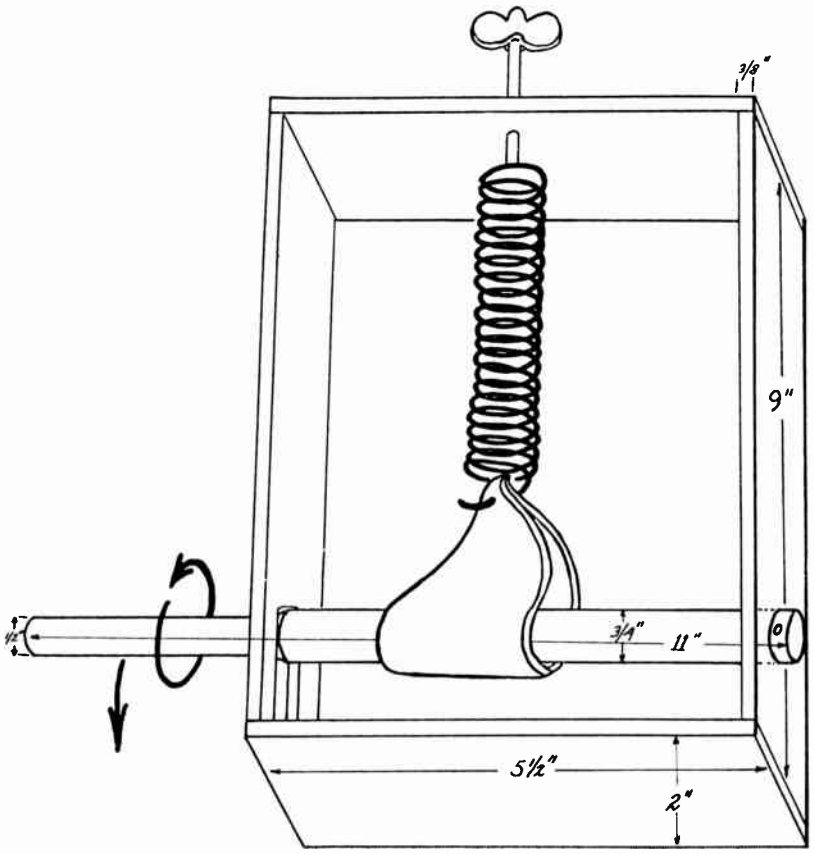
Build an open-face box of ⅜-in. wood 2 in. high, 5½ in. wide, and 9 in. long. Through one end run a ¾-in. dowel rod as shown. It should be anchored by pins on both sides of the right side wall so that it cannot slip out. The dowel rod must be able to turn freely.

Shave down the dowel rod a little to form a handle and slip through an opening cut in the left side as shown.

Shape a 6-in. piece of medium-thickness leather as shown and hook on to the end of a ¾- to 1-in. spring. The spring should have a long-shanked wing bolt fastened to the other end and extending out through the end of the box.

Tighten the wing bolt so that the leather is pulled taut around the dowel rod. To use, hold the box in one hand and the projecting handle of the dowel rod in the other. Pull the handle in the direction of the short arrow to increase tension, then twist the handle in the direction of the circular arrow.

The rosinated leather binds and jerks on the rod causing the spring to stretch and vibrate. The squeak may be varied by lessening and increasing the tension on the handle.



CREAKER (WOOD)

This wooden creaker is not difficult to make, but does call for careful measurements and accurate fitting.

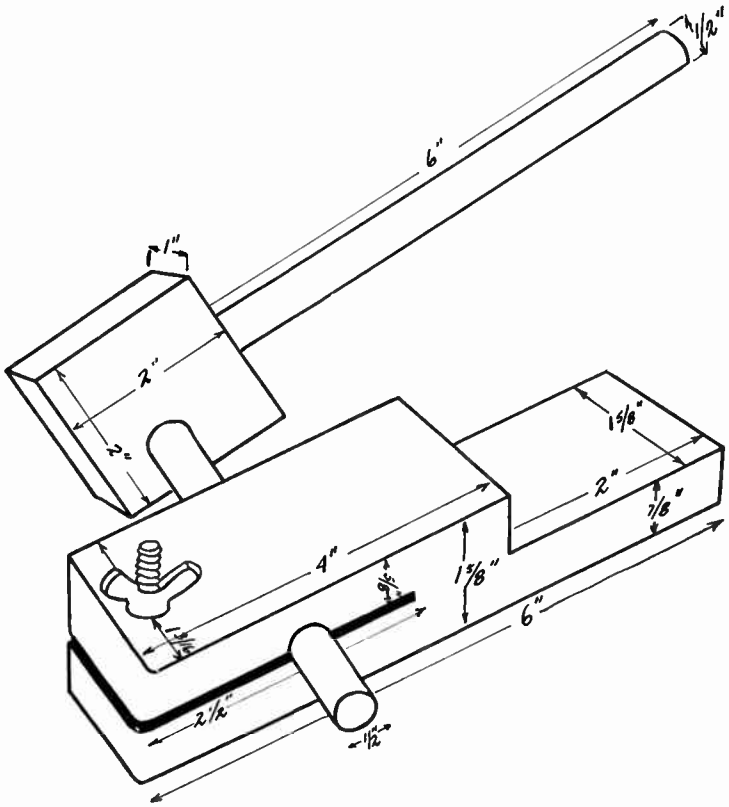
Cut a square $1\frac{3}{8}$-in. block of wood to a length of 6 in. Follow the dimensions as shown in the drawing. The heavy black area indicates a cut made by a ripsaw. (A cut the width of the saw teeth is ample.) Securely fasten the two dowel rods into the smaller adjoining square-shaped piece of wood.

Where the dowel rod runs through the large block, bore a hole $\frac{1}{2}$ in. in diameter, using the ripsaw cut as the center. Insert the dowel rod, then tighten the wing nut until there is a slight bind.

Place the base of the creaker against a doorjamb or a table surface and manipulate the handle up or down. This will have to be tried several times until just the right tension is determined.

If the creaker refuses to squeak (after long usage when the dowel rod becomes very smooth), sprinkle a little powdered rosin on the rod and try again.

The cut-down area on the larger block is to facilitate the use of a carpenter's C-clamp. Creakers have much better resonance when clamped or pressed hard against a doorjamb or table. The use of a C-clamp also leaves one hand free to do other things.



CREAKER (WOOD)

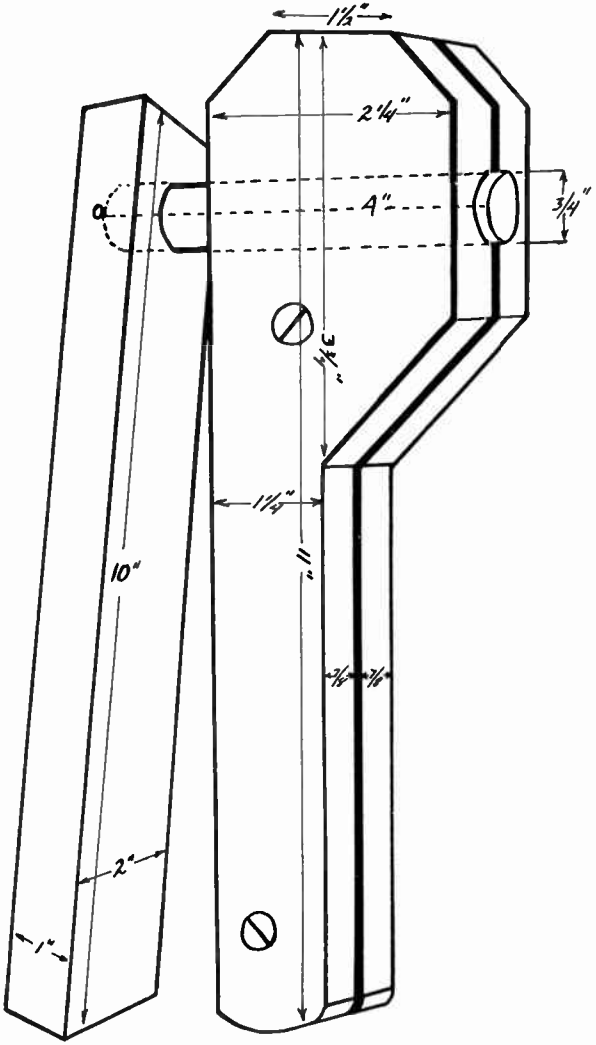
Here is a different type of wood creaker. The rectangular piece on the left is the handle.

The main body of the creaker is composed of two pieces exactly alike. The heavy black line down the center represents the separation point between the two duplicate pieces.

Anchor a ¾-in. dowel rod in the handle so it will not turn. Through the body of the creaker bore a ¾-in. hole as indicated by the dotted lines in the drawing. When the two halves are put together, the hole should be in the exact center.

To get the bind necessary, clamp the two halves of the main portion of the creaker together with bolts and wing nuts. Tighten, then hold the handle in one hand, the narrow shank of the creaker in the other hand, and turn the handle.

Practice will determine the degree of tightness necessary. Remember, if the creaker does not squeak, sprinkle powdered rosin on the dowel rod.



CURTAINS

The principal sound heard when curtains are drawn is the scrape and rattle of the curtain rings.

Build a piece of equipment as illustrated at the top of the accompanying page.

On the $\frac{3}{8}$-in. dowel rod string several large metal washers. The washers should have an opening of at least $\frac{1}{2}$ in. and be spaced evenly apart. With the fingers of one hand start at one end and push the washers to the other end of the rod.

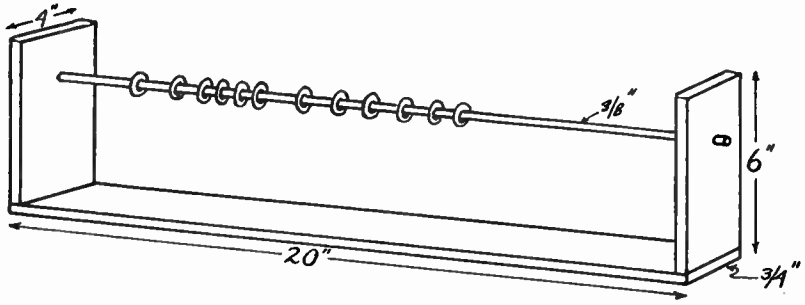
DRAWER

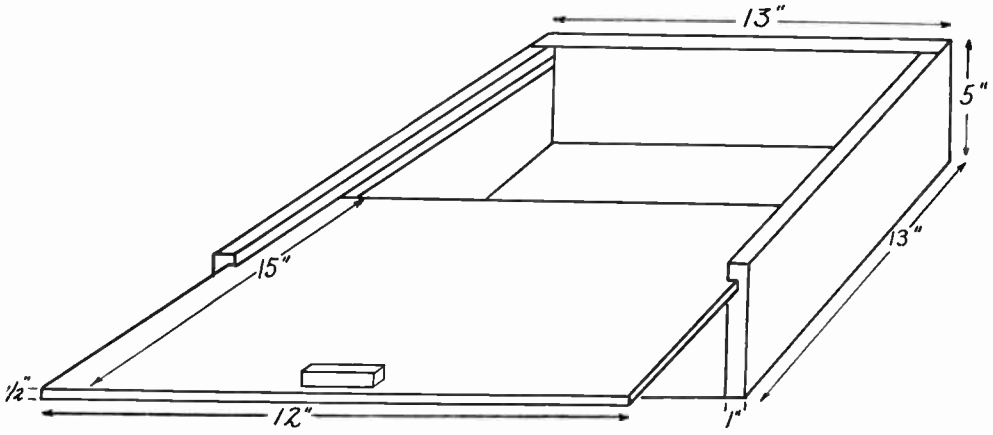
You will notice that this is not actually a drawer. The drawer effect consists of an open-faced box with a *sliding lid.*

Build a box 13 in. square, with sides 1 in. thick, 5 in. high, and a bottom of $\frac{1}{2}$-in. three-ply. The front side should be 1 in. thick, 13 in. long, and $3\frac{1}{2}$ in. high, so that the lid will just clear it.

At 1 in. from the top cut a groove $\frac{3}{8}$ in. wide and $\frac{1}{2}$ in. deep. This groove is cut in two parallel sides. Slide into this groove a 12-in. square lid of $\frac{1}{2}$-in three-ply. For convenience, nail on a short piece of 1-in. stock for a handle.

This type of drawer is most convenient because it allows rapid use, objects will not rattle while the drawer is opened, it is not top heavy, and things may be placed in it or taken out with ease.



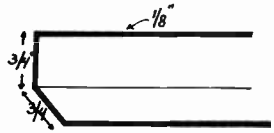


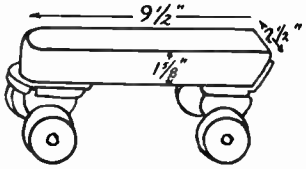
ELEVATOR DOOR

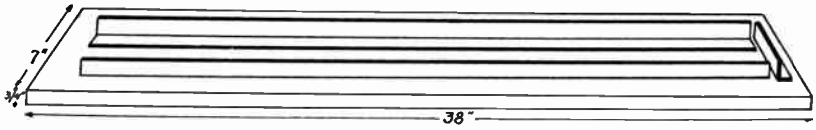
Cut a ¾-in. board 7 in. wide and 38 in. long. A shorter length may be used, but the longer the board, the less limitations as to size of door simulated.

On the board fasten two ⅛-in. angle irons, ¾ in. wide and ¾ in. high, so that the open sides face toward each other. At one end place another piece of angle iron to act as a stop. The parallel angle irons should be spaced apart just slightly farther than the width of a roller skate.

To facilitate handling, mount a block of wood on the roller skate. Place the skate in the track formed by the parallel angle irons and roll from the open end toward the closed end. A slight bump at the closed end of the track will indicate the closing of the door. To open, just reverse the direction of the roller skate.







GLASS CRASHER

A glass crasher serves two purposes. It gives the sound of *breaking glass* and the sound of *falling glass.*

Study the drawing and build to the dimensions given, or simplify to suit your needs, but use the same principles of construction.

Basically a glass crasher is a screen-enclosed upright framework with a device for holding a horizontal pane of glass, a striking mechanism, baffles to scatter and sustain the fall of the glass, and a box or drawer to catch the broken glass.

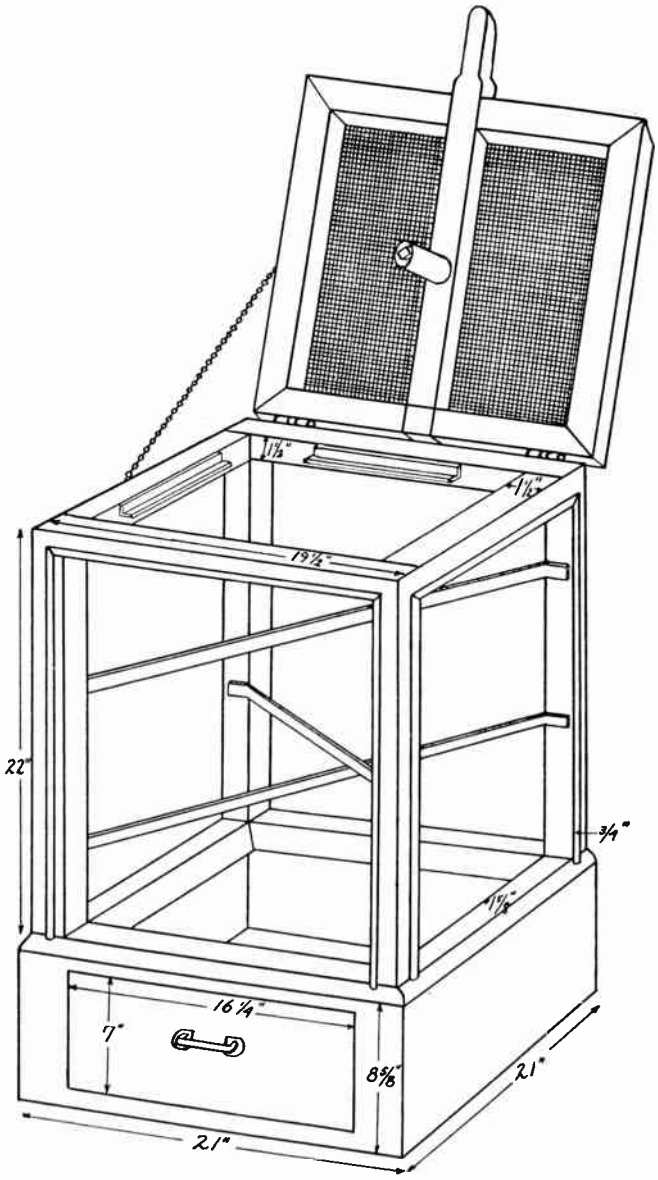
Just inside the top of the crasher note the angle irons. There are four of them, one on each side. These are $\frac{1}{8} \times \frac{1}{2} \times 12$ in. A pane of glass (in this case 12×16 in.) is supported crosswise on these angle irons. The projecting arm on the hinged top of the crasher (studded with a heavy iron bolt) is brought down hard on the glass, which breaks and falls over the three diagonal baffles and into the drawer at the bottom.

The crasher's *sides* are covered with two sets of screen held in place with $\frac{3}{4}$-in. molding. The screen has not been drawn in order to show the construction more clearly.

The inside layer of screen is $\frac{1}{4}$-in. wire mesh and outside of that is a layer of fine window screen. This does not muffle the sound as does wood and it affords protection against flying slivers of glass. The top is also covered with screen, as shown in the drawing.

Single standard panes of glass are available at any building supply firm in dimensions desired.

Mount the glass crasher on rubber-tired casters.



HOUSE DOOR

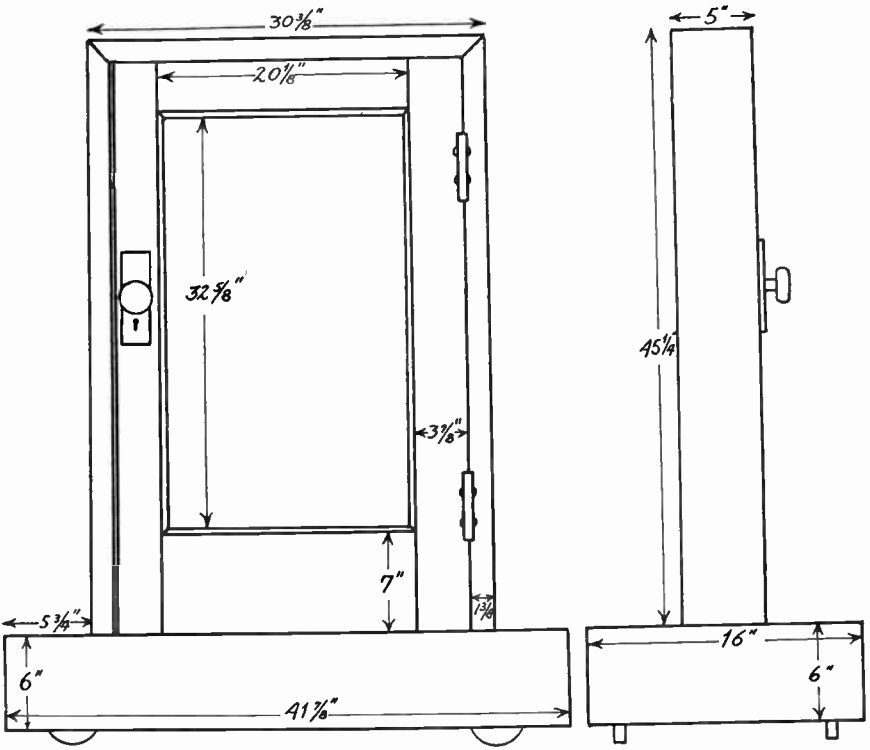
Actually a house door (for radio) may be built in various sizes and shapes. The illustration on the opposite page is merely a guide. The reader may use his own dimensions.

The important thing is to build the door solidly and of good material so that it will not rattle or warp. Kiln-dried oak serves very well.

Do not economize on the hardware. Sturdy hinges and a good doorknob and lock are essential. Mount the door in the framework as shown and be sure that the door swings freely. Be careful that the base is heavy enough that the door is not top heavy. Mount on rubber-tired casters for ease in moving.

A regular house door (purchased from a house-wrecking company) will serve, and this may be cut down in size. There is no need to use an actual full size 6-ft. 6-in. door.

Cover the back side of the door frame with three-ply or heavy sheeting. Cut an air trap on the back side as shown on page 239.



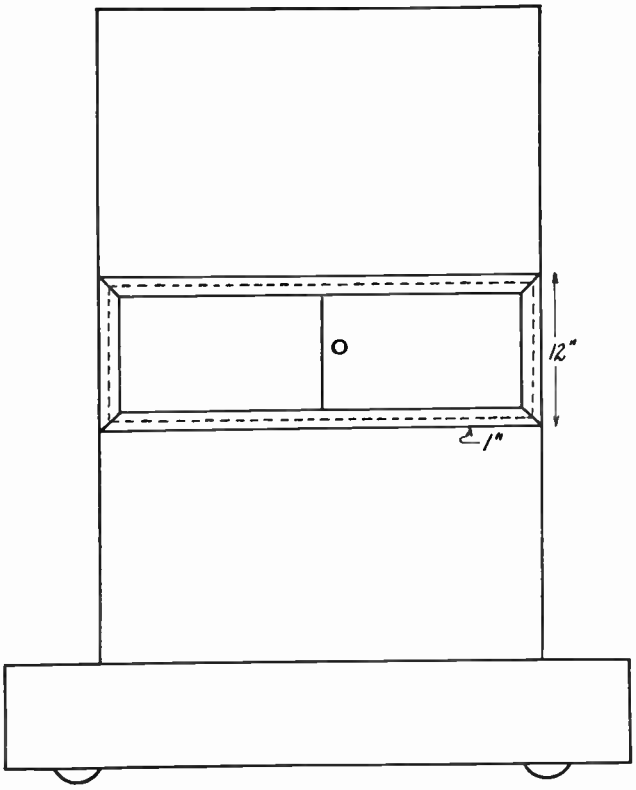
HOUSE DOOR (BACK SIDE)

This is the back view of the house door on the preceding page. Shown here is an air vent that is needed on all solid-front doors. If the door and the back side are both solid, air pressure is built up when the door is slammed making it difficult to close. Ever try to close a car door when all the windows are up?

The vent is simple to construct. In the back, approximately at the middle, cut out a section of the backing not larger than 12 in. long and 11 in. high. This cutout area should be at the extreme right or left side.

Build a frame of ½-in. strips as indicated by the dotted lines. The dotted line represents the *inner* edge of the ½-in. strips and the solid outside line is the *outer* edge of the strips. Over this place 1-in. strips as shown by the parallel solid lines. The placement of the ½-in. and 1-in. strips forms a track in which the small trap door slides.

To use, open the door part way, exposing the cutout area, thus permitting the air to escape when the door on the opposite side is closed.



IRON DOOR

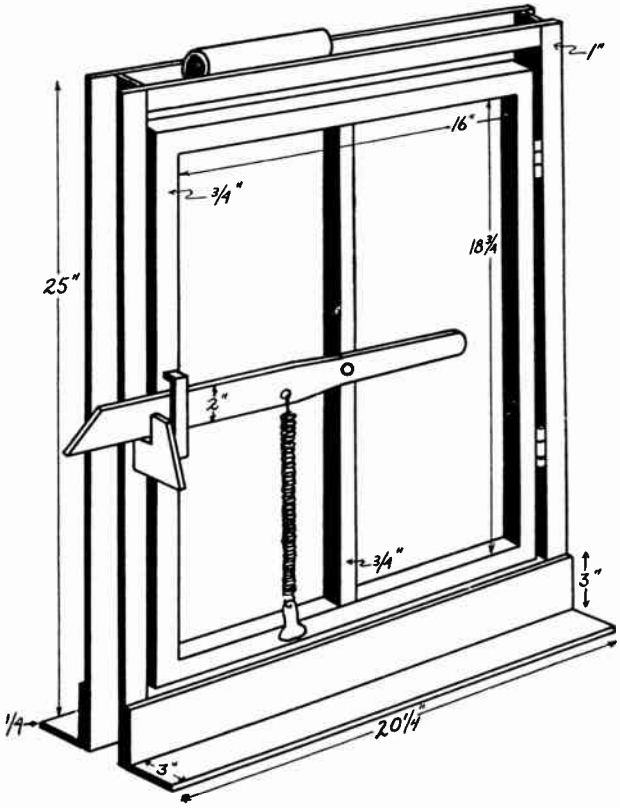
This is a simple iron door that serves for a jail door, dungeon door, mine door, or any door that is composed primarily of heavy metal.

A full-sized jail door with bars and locks may be made, but the door in the illustration will serve as well.

Be sure that the door is solidly made (all metal) and is welded at all joints so there will be no rattle or "thin" sound when used. Use heavy metal hinges. The primary purpose of a simulated jail door is to get a good heavy metallic clang when it shuts.

To open, push the handle down and pull the door away from the frame. To close, slam the door, allowing the bar to strike the projecting keeper. The bar will slide up over the slanted keeper and when fully shut the spring will pull the bar down into its retaining slot with a good loud clang.

On top (in the trough formed by the sides of the doorjamb), place a heavy iron pipe about a foot long. The pipe should slide freely. This is slid in the metal trough to indicate the placement of the heavy iron retaining bars of the lock.

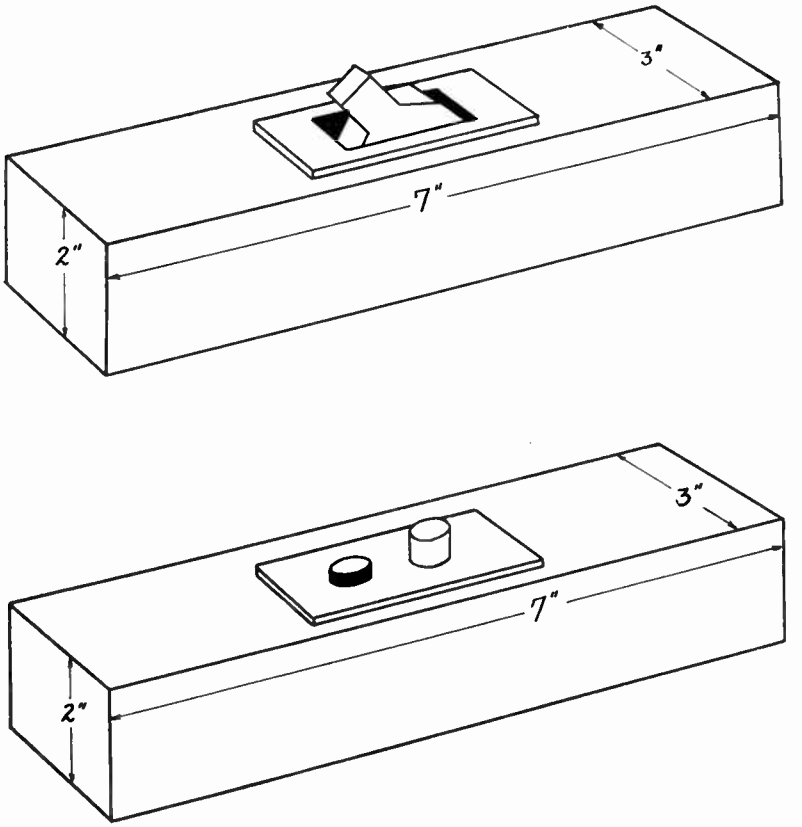


LIGHT SWITCHES

Opposite are two examples of how light switches may be mounted. Switches are mounted in wood to get the resonated sound needed.

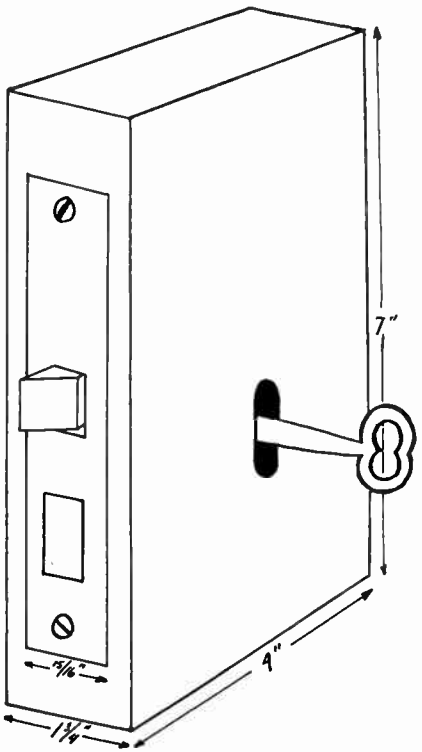
Select the type of switches desired. Basic dimensions of the wooden blocks are given, but these may be varied in order to conform to the size and shape of various switches.

Cut out a portion of the wood so that the mechanism of the switch fits easily into the hollowed-out space. Mount the switch, fasten it in, and that's all there is to it.



LOCK AND KEY

A lock and key effect is simple to make. Shape a block of wood to $1\frac{3}{4} \times 4 \times 7$ in. From the edge bore out an area that will just hold a lock mechanism. From the side bore a hole that will allow the key to be inserted. Insert the lock, bolt the face plate on, and that's all there is to it. All locks should be mounted in wooden blocks to get the resonance needed. It is not a bad idea to mount a small screw eye on the block some place and fasten the key to it with a piece of string.



NAIL PULLER

This is another wood creaker, but it is especially good for the sound of pulling nails or of rusty hinges. For nail pulling, tighten the wing nut very tight, place it on the floor and stand on it with one foot, then jerk the handle. For rusty hinges, loosen the wing nut.

The construction is simple. Mount two $\frac{1}{2} \times 2 \times 8$-in. crosspieces on the bottom. Securely fasten two $1 \times 2 \times 3$-in. uprights to the baseboard as shown. Firmly anchor the $\frac{1}{2}$-in. dowel rod in the upright shown at the top of the drawing.

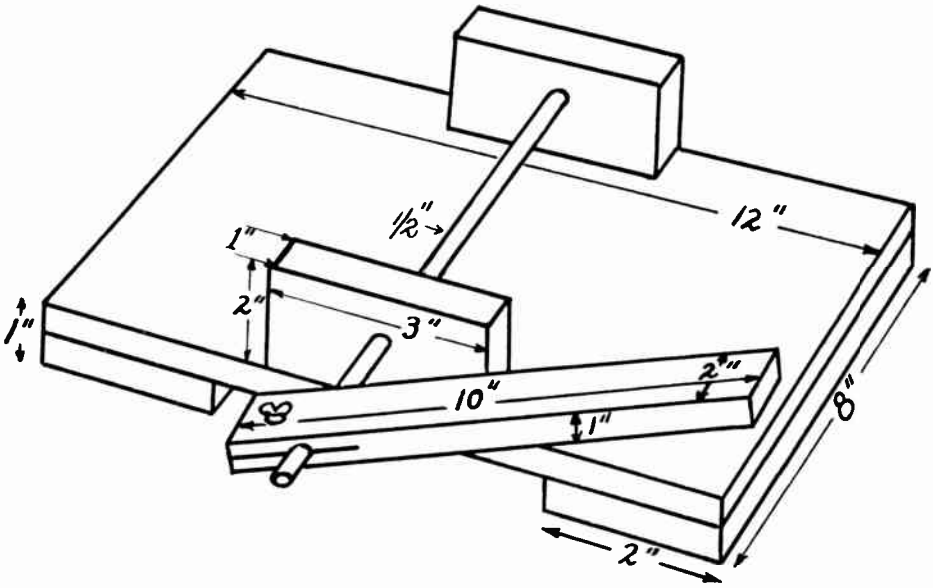
Bore a $\frac{3}{8}$-in. hole through the lower upright. Insert the $\frac{1}{2}$-in. dowel and let it extend past the hole about 4 or 5 in.

Through the side of the 10-in. handle and about 2 in. from the end bore a $\frac{1}{2}$-in. hole. At the same end make a saw cut to and past the hole about an inch.

Drill a $\frac{3}{16}$-in. hole through the handle halfway between the $\frac{1}{2}$-in. hole and the end with the saw cut. Pass a machine screw through the $\frac{3}{16}$-in. hole and fit a lock washer and wing nut to the end.

To use, slip the projecting end of the dowel rod through the hole in the handle, tighten the wing nut to get a "bind," and turn the handle.

If the apparatus does not sound satisfactory, dust some powdered rosin in the hole in the handle and on the projecting portion of the dowel rod.



RAIN MACHINE

Cut out two circular wooden disks, 30 in. in diameter and at least 1 in. thick.

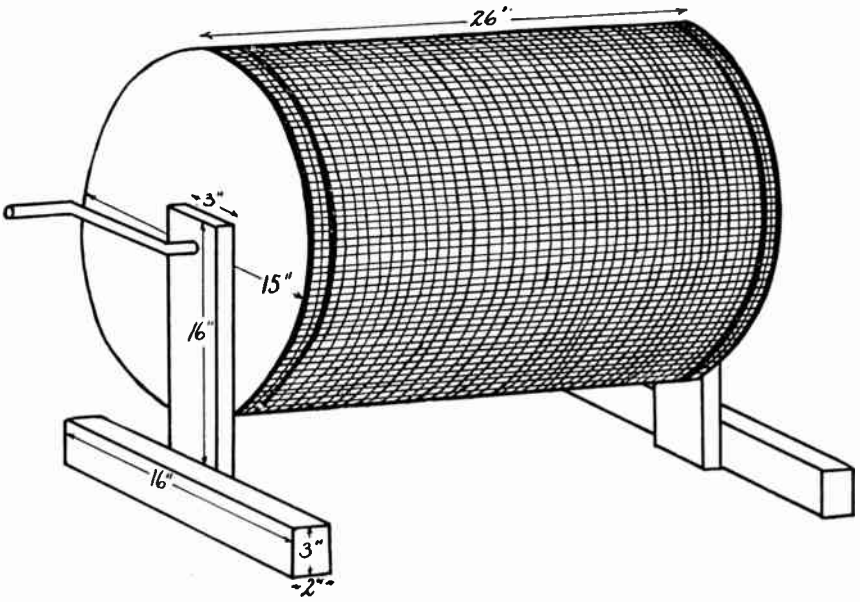
Run an axle through both disks and fasten with metal flanges so that the disks will revolve when the axle is rotated. Insert the axle through holes in the upright supports and attach handle.

Connect the two disks, forming a slatted barrel, with inch-square slats, 4 to 6 in. apart and about 26 in. long. Be sure that the outer edge of the slats are flush with the periphery of the disks. Cover the drum with window screen tacked around the edges and to the slats. Before closing the screening, pour in three or four handfuls of dried peas or beans.

See that the edges of the screen meet at a slat and are nailed down tight so that the peas or beans will not fall out when the drum is revolved.

The rain sound results when the handle is turned and the peas or beans tumble inside the screen. The speed and rhythm of the turning handle governs the force of the rain.

Actually a recorded rain effect is much simpler to use. This drawing is given primarily for use in a combination drama and radio class.

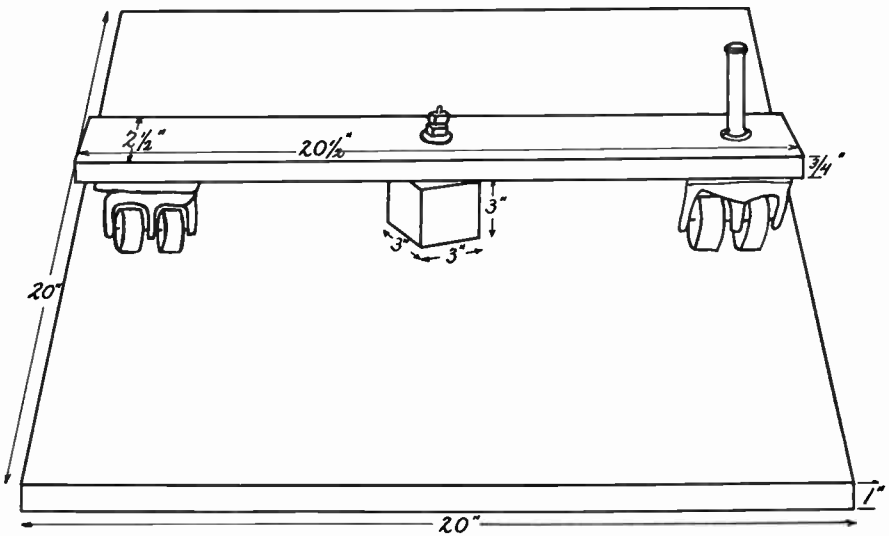


SLIDING DOOR

Make a 20×20-in. square of five-ply and face with masonite, rough side up.

In the center of the baseboard anchor a block of wood 3 in. in each dimension. Through this run a bolt. Place a cross arm as shown in the drawing of a $\frac{3}{4}\times 2\frac{1}{2}\times 20\frac{1}{2}$-in. piece of wood. Bore a hole in the center large enough that the crosspiece will revolve easily around the bolt. On the underside of the cross arm attach one-half of a roller skate at each end so that the rollers may swivel and roll easily.

On one end of the cross arm fasten a handle. To get the sound of a sliding door, revolve the cross arm by means of the handle.



SPLASH TANK (WITH PLUNGER)

The splash tank is used for the sounds of objects falling into water, swimming, wading, etc.

Construct a wooden box as shown in the drawing. Cut and fit it accurately, and put together with screws. Remember, this will contain water.

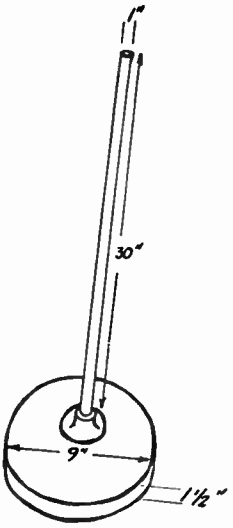
Fill in the corners with wedge-shaped blocks so as to cut down the confined sound of water slapping in the corners. Line with zinc to prevent leakage.

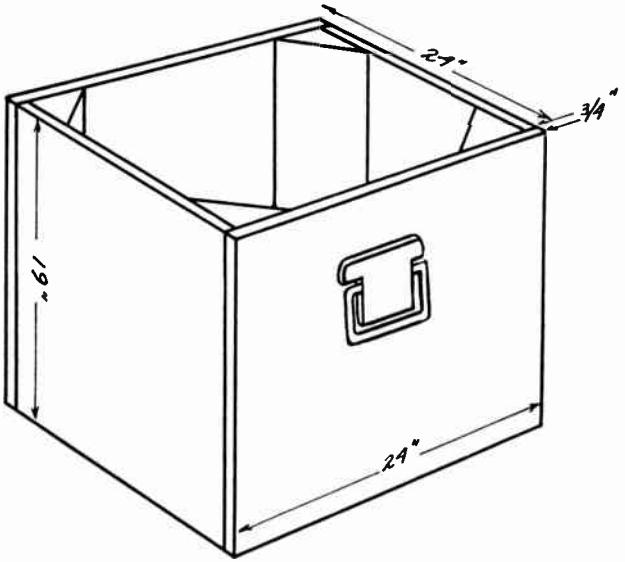
The inside should be covered with a fine waterproof duck open-mouthed bag that fits over the edge and is fastened to a series of hooks on the outside. This prevents a metallic sound and also gives the effect of unconfined water. The canvas is not shown here in order to make the drawing clearer.

For splashes, build a paddle as shown above the tank. The round disk is of wood and securely fastened to it by a metal flange is a 30-in. metal pipe handle.

For a body falling into water, put 7 or 8 in. of water in the tank, place the wooden disk on the bottom, and grasp the handle firmly. On cue, jerk the paddle sharply up and out of the water. A very good splash results. A microphone must be suspended directly above about level with the top of the tank.

See the following illustration for additional use of the splash tank.





SPLASH TANK (WITH PADDLE)

This is the same splash tank as shown in the preceding drawing. However the corner wedges have been left out and the proportions cheated a little in order to show the working mechanism better. The dimensions are correct.

Here we have a paddle that is utilized for swimming and wading effects, or for rowing a boat, or the gentle lap and wash of water.

The three sections of the paddle device are removable so that the plunger may be used for splashes.

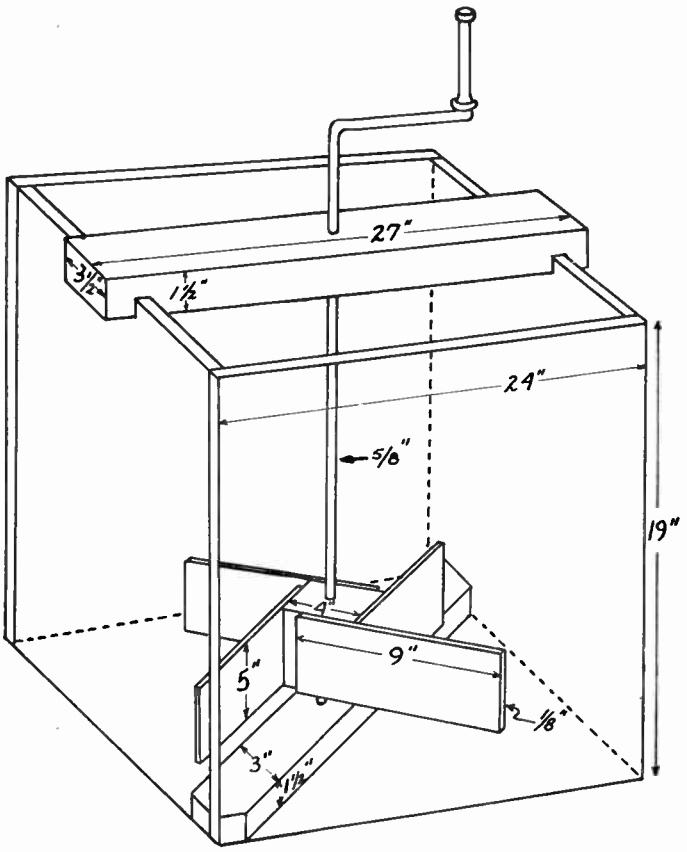
Cut a piece of $1\frac{1}{2} \times 3$-in. wood so that it will fit snugly *diagonally* across the bottom of the tank. Don't fit it too tight as it must be easily removed. Bore a $\frac{3}{4}$-in. hole exactly in the center of the crosspiece. The vertical axle to which the paddles are attached fits into this hole, making this crosspiece the lower support and guide.

Near the lower end of the axle (but high enough to clear the crosspiece), securely fasten a 4-in.-square block of wood. To this screw four $\frac{1}{8}$-in. paddles of aluminum or sheet metal. These should be 5 in. high and 9 in. long.

The axle extends up through the top crosspiece and ends in a handle. It must be able to revolve easily through the hole in the upper crosspiece.

The upper crosspiece has slots cut on the under side that permit it to fit snugly over the top edge of the tank, so the paddle is firmly anchored.

To use, put water in the tank so that it comes to about an inch below the top of the paddles. Grasp the handle and turn *back and forth* in a short arc for swimming. For wading, turn the handle in the *same* direction with short jerks. For rowing a boat, use the same technique as in wading but with more force at the beginning of the stroke. Also slow down the rhythm and add the sound of oar locks.

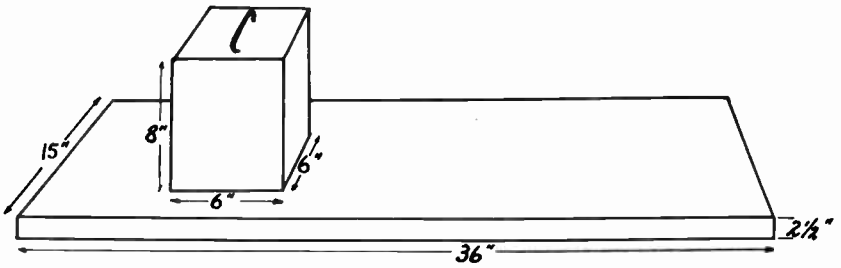


STONE DOOR

Build a form 2½ in. high, 36 in. long, and 15 in. wide. Leave the top side open, but be sure there is a bottom. Fill this with cement and level off the top. Allow to harden, then remove from the form.

Now form a cement block 6×6×8 in. Before the cement sets, insert a metal handle in one end for ease in handling.

To use, drag the cement block along the length of the cement slab. To signify a close, tip over the block at the end of the drag and allow the block to thump on the cement slab.



TELEPHONE—DOORBELL—BUZZER

A simple telephone bell, doorbell, and buzzer box can be made with two dry-cell batteries, two push buttons, and two ordinary house doorbells of *different pitch.*

Telephone

Mount and wire the equipment as shown in the accompanying cutaway drawing. By pressing push button *C*, bell *A* will be activated, the clapper striking both gongs (*A* and *B*), giving a telephone ring. Remember, a phone bell consists of *two bells of different tone.*

Doorbell

(1) Pressing push button *D* will activate bell *B*. The clapper here strikes only one bell, *B*, thus the sound of a doorbell.

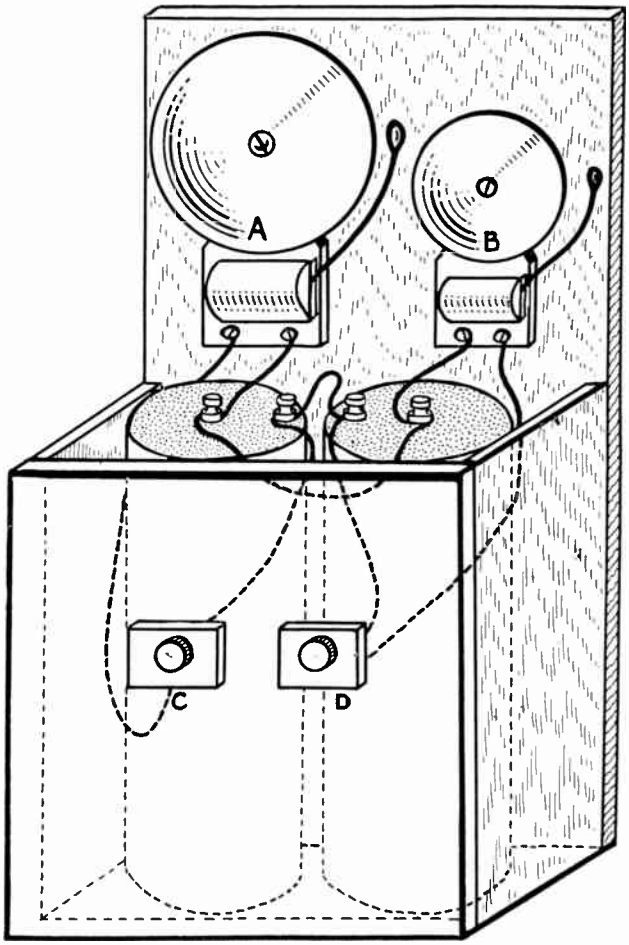
(2) Unscrew and remove gong *B* and press button *C*. This will give the sound of the single gong *A*, which is of different tone than gong *B*.

Buzzer

(1) By unscrewing and removing gong *B*, the magneto coil when activated by push button *D* will give the sound of a buzzer.

(2) A different buzzer may be secured by removing both gongs *A* and *B*, and then pressing button *C*.

Dimensions have not been given because of variations in size of batteries and bells.



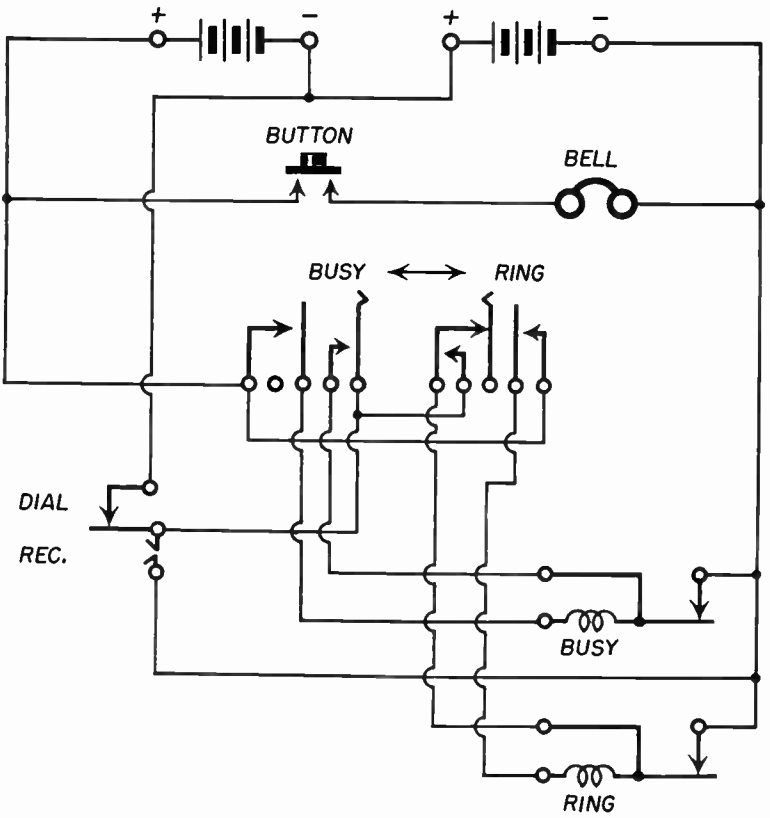
TELEPHONE CIRCUIT

The accompanying sketch is not actually a construction drawing of a telephone, but a wiring diagram for the phone shown on the prop table in Figure 23.

For this effect it is necessary to secure a regular handset phone to give the extended perspective of "the other end of the line," i.e., the filter ring and busy signal. The inner workings of the phone must be intact.

The phone is mounted on a box containing dry-cell batteries. A two-way switch may be hooked up to operate the filter ring when pushed one way, and the busy signal when pushed the other. A separate push button operates the on-mike bell ring.

Two bells of slightly different tone should be used for the on-mike bell ring.



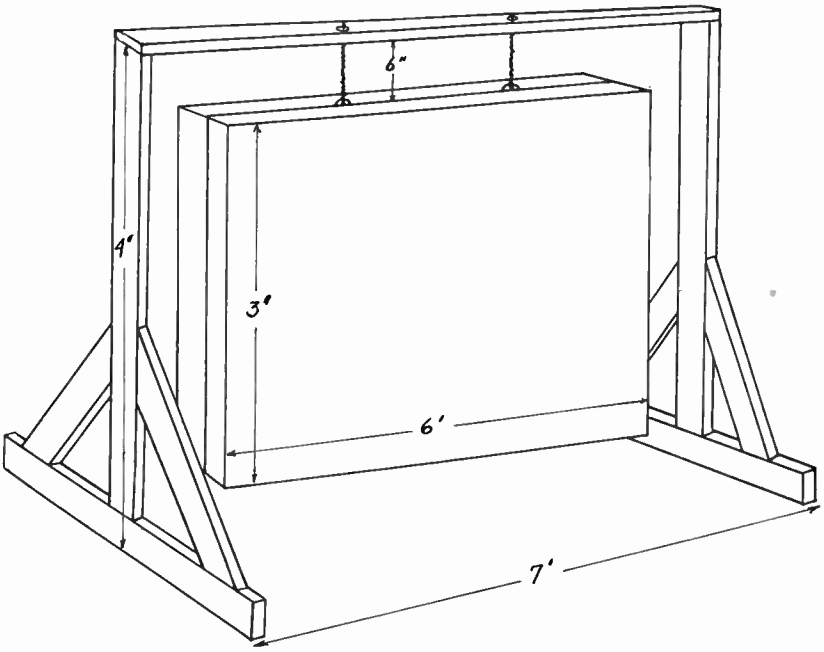
THUNDER DRUM

This is a more elaborate piece of equipment to build but is included here because the thunder effect is excellent. However the initial cost of the calfskin may be too much for the budget.

Build a frame 3×6 ft. of 2×4's. Stretch tight and cover *one side* with calfskin. This forms the drum. Suspend this drum so it hangs freely in a rack as shown in the drawing.

Place a fairly high voltage lamp inside the drum but be sure that it does not touch the calfskin or remain too close to it. The heat from the lamp will dry and tighten the hide, giving the drum a full, loud tone.

To use, strike with a heavy padded timpani mallet.



THUNDER SCREEN

Excellent thunder and explosion effects are secured from a thunder screen.

The dimensions in the drawing may be followed or a smaller screen built, but the larger the screen, the more body to the sound.

Build a frame of 1¼-in. lumber with the inside dimensions 30½ × 56½ in. To one side tack tightly stretched copper screening. Over the screen bolt or screw a duplicate frame, forming a double frame with the screen between.

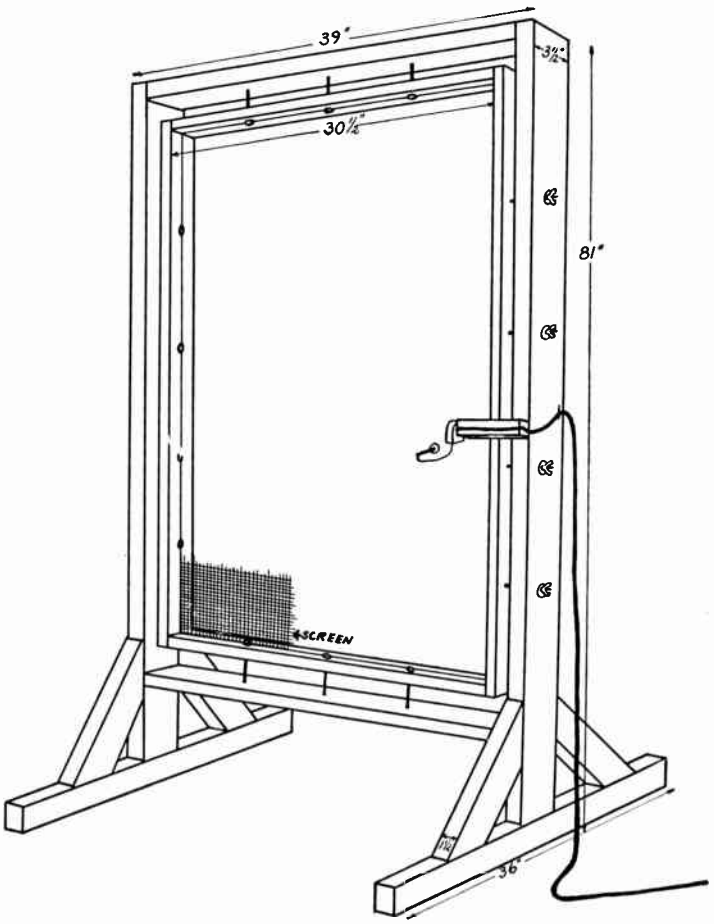
Suspend (by lug bolts) the framed screen inside the larger outside frame. Tighten by turning the wing nuts on the ends of the lug bolts.

Mount a magnetic phonograph pickup head on a block of wood that is fastened solidly to the edge of the outer frame.

Solder a copper bolt directly to the screen and to this solder a piece of spring wire whose other end is inserted in the needle hole of the pickup. With wire connect the pickup to a loud speaker. The sound-truck speaker will do.

Striking the screen with a padded timpani stick causes the screen to vibrate. These vibrations are transmitted through the copper bolt and spring wire to the pickup. The output of the pickup is amplified and fed into a studio loudspeaker.

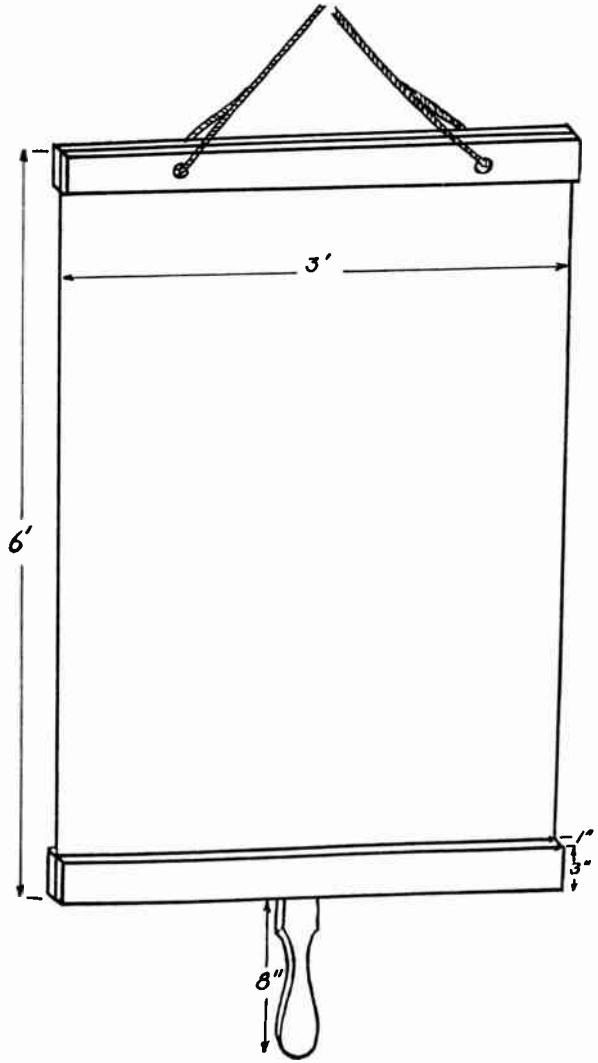
It is very important that the screen is tight, and that the copper bolt and wire spring are well soldered and rigidly mounted.



THUNDER SHEET

One way of making the sound of thunder manually is by use of the thunder sheet. It is made of a piece of 16- to 24-gauge sheet iron at least 3 ft. wide and 6 ft. long or longer. At the top and bottom of the sheet sandwich the metal between two 1×3-in. pieces of wood. Be sure the strips of wood are very tight or a tinny effect will be produced. Wing nuts and lock washers will take care of this.

Bore two holes at the top of the sheet, pass a rope through the holes, and suspend the sheet so that it hangs freely and will not be damped. Grasp the handle at the bottom edge and shake vigorously. The best technique is to give a hard sharp crack for the initial impact, then taper off the thunder roll by less vigorous shaking of the sheet.



TWANG BOX

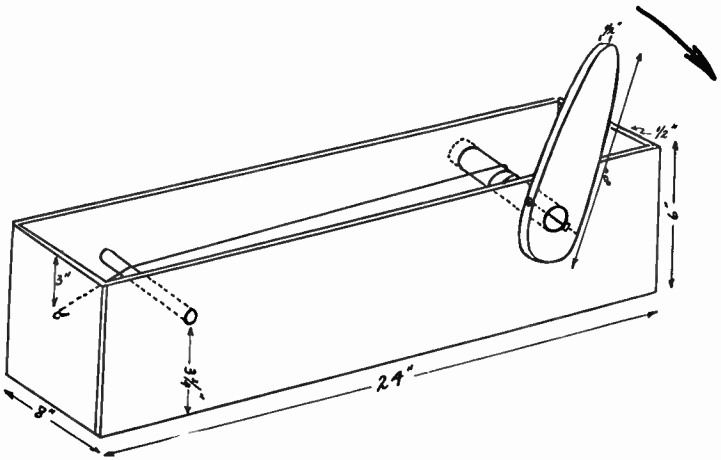
This is the device that makes the comedy sound, "Twaaaannngggg." (See BOING BOX.)

Build a wooden box to the dimensions given. At one end insert a $\frac{1}{2}$- to $\frac{3}{4}$-in. piece of pipe and anchor it firmly to the sides of the box. At the other end use a piece of 1-in. wooden dowel rod. Fasten a wooden handle to the rod as shown in the drawing. This rod must be able to rotate freely. At the end of the box the farthest distance from the rod and handle, attach a piece of 10-gauge 0.024-in.-diameter tinned music wire so that it is anchored slightly below the metal rod that runs across the box. Run the wire to the 1-in. dowel (with handle) and wrap it a couple of turns around the rod, then fasten that end of the wire securely to the dowel rod.

To use, pull the handle in the direction of the heavy arrow just enough to take up the slack in the wire. With the free hand pluck the wire, then instantly jerk the handle back and forth so as to alternately release and tighten the tension on the wire.

A little practice will show just how much tension on the wire and how much pull on the handle will give the desired effect. The boing box gives a similar effect except that usually the tone of the sound is higher and the instrument can be worked faster.

The top of the twang box is open, there being no cover on it.



WAGON WHEEL

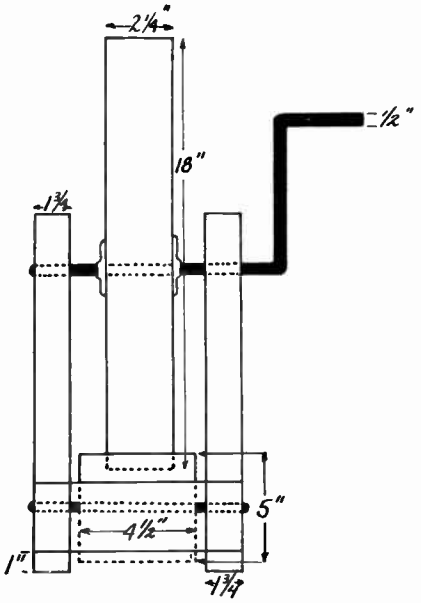
A wagon wheel may be made as shown in the accompanying drawing. The wheel itself is of wood, 2¼ in. thick, and with a radius of 9 in.

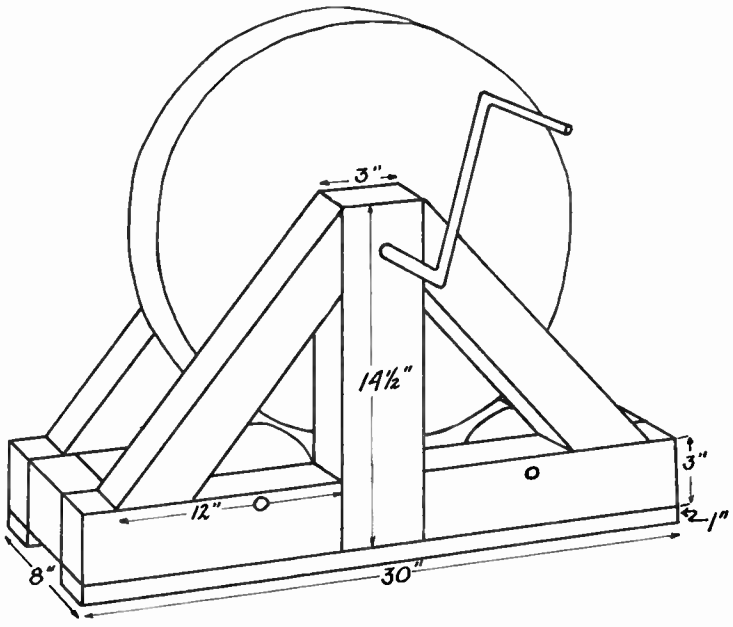
The supporting frame is made of 1¾-in. lumber. Two rollers 4½ in. wide and 5 in. in diameter are suspended freely on ½-in. axles which are mounted in the base of the frame. The large wheel is so arranged that it rests on the two rollers and all three revolve when the handle is turned.

A piece of coarse sandpaper should be glued or tacked to the surface edge of the large wheel.

A more elaborate setup may be devised by removing the bolts from the two 5-in. wheels, slipping the wheels out from the bottom, and substituting wheels of material other than wood.

The sketch as shown here is of a simple piece of equipment. The reader may use it as a basic idea and then make what modifications or improvements he sees fit.





WALKING SURFACES

Here are four types of walking surface that are used constantly in radio sound effects and should be basic equipment. Simple ways to construct them are shown.

Cement: Used for footsteps on sidewalks, palace halls, dungeons, or any rock, marble, or cement floor. Build a small wooden frame, 18×18 in. and 2 in. high.

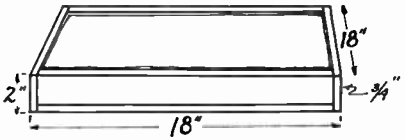
Nail a piece of three-ply on the bottom (to cut down warping). Fill flush with fine cement and let dry thoroughly. The wooden bottom protects the studio floor. Flat pieces of marble or slate work well also.

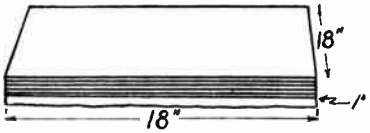
Wood: For a wooden walking surface use five-ply cut to 18×18 in. dimension. On the bottom nail a 1-in. slab of Ozolite. The latter cuts down the resonance that would be picked up off the floor of the studio.

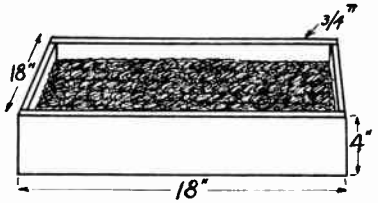
Gravel: The middle drawing shows a small gravel walking box for outdoor footsteps. Sand or dirt does not pick up well enough, so the box, built to the dimensions given, is filled with fine pea gravel. A little sand mixed in helps. Do not use large concrete aggregate, but fine pea gravel.

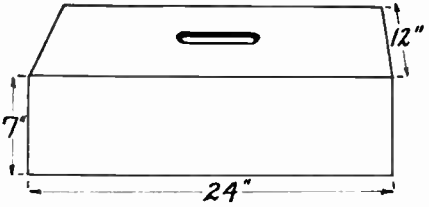
Steps: The lower sketch shows a "one-step." It is a wooden box (with no bottom) built to the specifications given. A slot is cut in the top for quick and easy handling on a show. By shuffling with the balls of the feet in a sliding motion on the one-step, the sound of walking on stairs is easily simulated.

All the walking surfaces shown here are designed for use by one man.







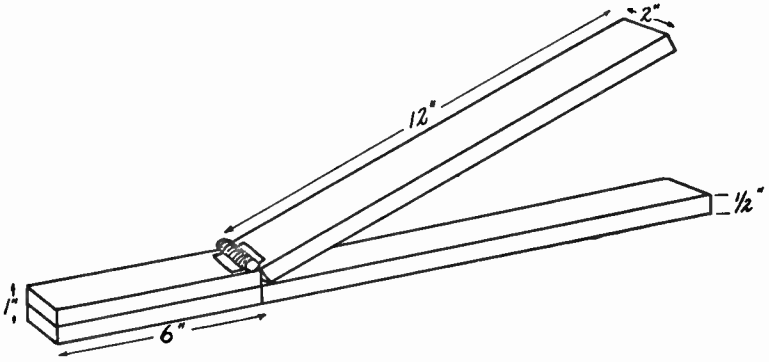


WHIP CRACK

The sound of a whip crack is made by sharply striking two pieces of wood together.

Secure two pieces of hardwood $\frac{1}{2} \times 2 \times 18$ in. Cut 6 in. off of one of the 18-in. pieces and nail to the end of the remaining piece. Take the 12-in. remnant and attach to the 6-in. piece with a spring hinge.

Hold by the double-thickness end, with the hinge side up. Raise the arm high, then bring down sharply and stop suddenly. The hinged piece will slap against the 18-in. piece with a sharp crack.

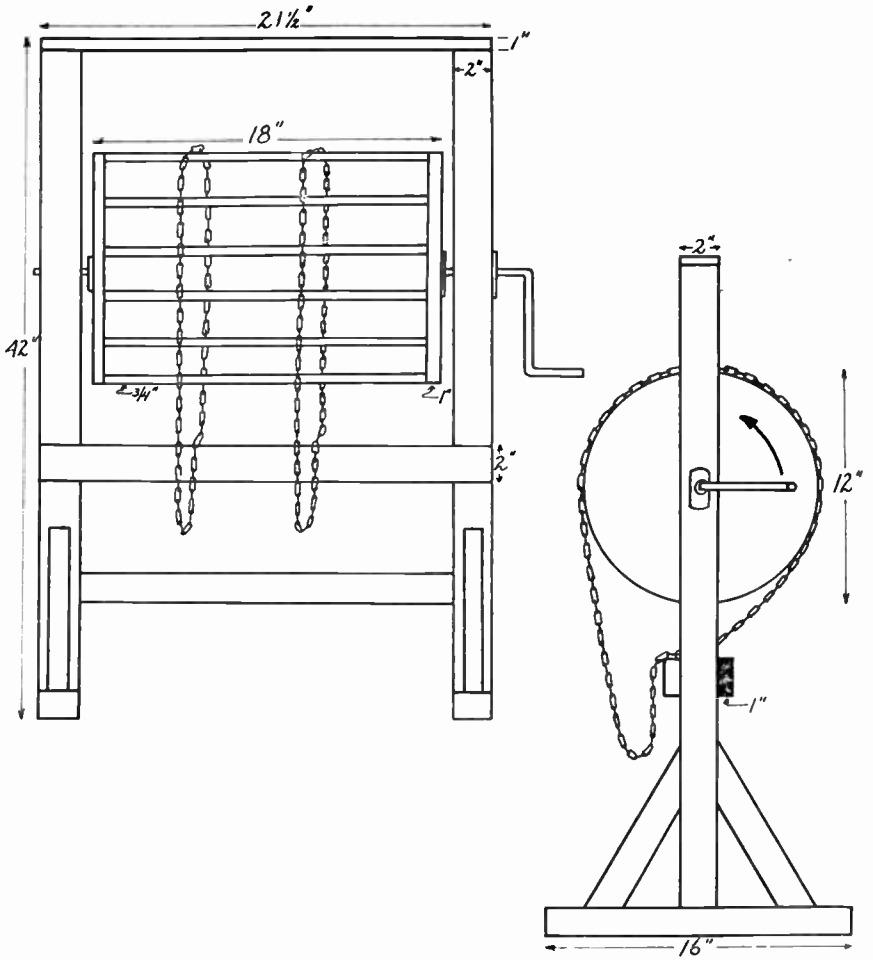


WINDLASS

The drawing shows the construction of the windlass. The barrel, 12 in. in diameter and 18 in. long, is formed by two circular end pieces connected by wooden slats set flush with the edge of the circular ends. The slats of 1-in. stock should be spaced about 3 in. apart.

Two different sounds may be secured from this windlass. If the handle is turned in the direction of the arrow, the chains will fall as shown and drag over the wooden crosspiece (shown as the small white rectangle). This will give a *wooden* sound.

If the direction of the handle is reversed, the chain goes the other way and will scrape across the crosspiece surfaced on the edge with angle iron (shown as the solid black rectangle). This will give a *metallic* sound.



WIND MACHINE (ELECTRONIC)

A powerful and flexible wind machine can be made from an electric fan, ½-hp. variable-speed motor, hair-dryer motor, sewing-machine motor, or any electric motor with a projecting shaft.

For the sake of illustration, let's use a fan. Remove the blades of the fan and to the shaft fasten two plywood discs whose diameter is the same as the housing of the fan motor. The discs must be cut in as nearly perfect a circle as possible and the center hole centered as accurately as possible.

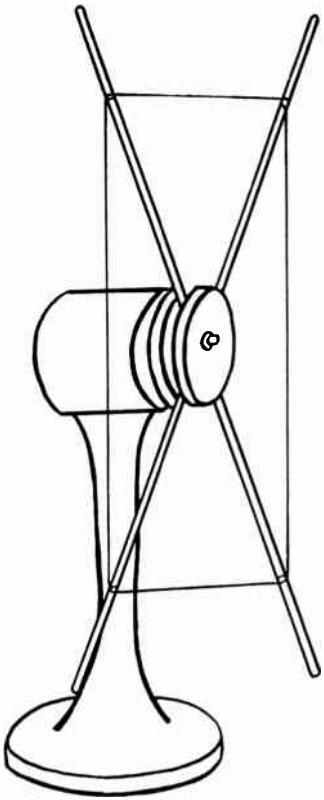
Between the two discs sandwich four ¼-in. dowel rods whose lengths are determined by the clearance of the end of a rod (in a vertical position) from the surface on which the fan is placed. Space the rods evenly apart and bolt firmly to the discs.

The rods must be of exactly the same length in order to balance. Improper balance caused by irregularly cut circles, off-center holes, or uneven lengths of dowel rod will cause serious vibration and eventual disintegration.

Reinforce and connect the four rods by a fine copper wire a few inches from the ends of the rods.

If the fan is an oscillating type, remove the oscillating device. To use, vary the speed of the motor so that the wind sound rises and falls. If the fan is not of the variable-speed type, hook it up to the foot control of a sewing machine.

Remember, the dowel rods will be turning at high speed, therefore it is absolutely essential that the blade assembly be perfectly balanced and centered.



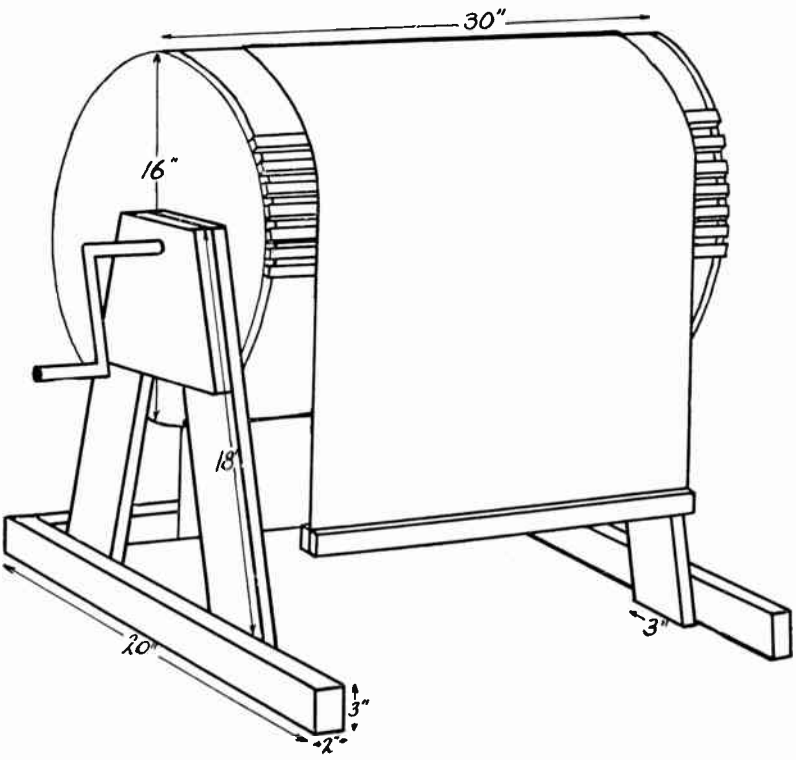
WIND MACHINE (MANUAL)

The barrel construction of the manually operated wind machine is similar to that of the rain machine, except that the slats are fastened *outside* the edge of the wooden disks and are placed about an *inch apart all the way around the barrel.* (In the drawing only a portion of the slats have been drawn.)

Over the barrel is draped a piece of canvas which is weighted at the free end by a piece of wood, and fastened permanently at the other end with nails to a connecting board running between the two base legs.

The wind effect is made by turning the handle, which revolves the drum, causing the slats to rub against the canvas. The velocity of the wind depends upon the speed of the revolutions, and the pitch of the wind on the tautness of the canvas.

Here again, as with rain, the sound is more easily obtained by use of a record. However this drawing has been included because it can be used in a dramatics class.



WINDOW

The important thing here is the sound of the window sliding up or down.

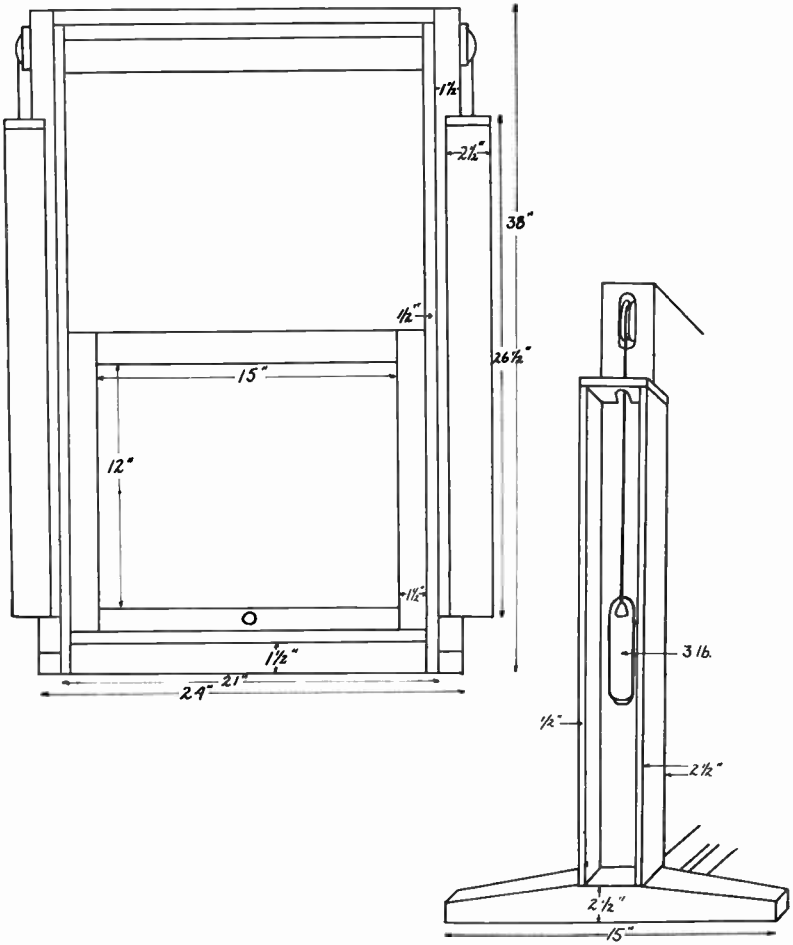
A window may be built to any convenient dimensions. Those given here are merely a guide, with a glass pane 12×15 in.

It is important that the right-sized sash weight be used. In the window shown, 3-lb. weights are just right.

Notice that the boxes containing the sash weights are placed so that they are accessible. This is done to facilitate the replacing of broken sash cords.

The view on the right has the face cover removed in order to show the arrangement of the sash weight.

Be sure that the base is wide enough that the window will stand upright and not be top heavy.



CHAPTER NINETEEN

In Closing

THIS CLOSING CHAPTER is in the nature of a catchall to answer some questions that the reader probably would like answered. And in all likelihood the first question is: How does one become a soundman?

That's a hard one to answer for this reason. It's the same old problem of being able to get work after having gained experience, but how can one gain experience unless one first gets work? In most cases the established soundmen started as parking-lot attendants, mail boys, ushers, aspiring actors, or in some cases just happened to be the nephew or son of a radio-station executive!

By showing an interest, watching shows, and helping whenever possible, the would-be soundman picked up a smattering of the technique and eventually, when the station or network expanded, stepped into the sound department. In many instances the same procedure still holds true. Anyone interested in becoming a soundman must be willing to start at some menial task and at a low salary. He must be willing to work, and of course a friendly manner is a great help.

I have met several young women who have set their hearts on doing sound. I do not like to discourage any of this book's feminine readers, but I can honestly say that the chances are very slim. Not because of any antipathy toward women in the field, but because they do not have the stamina to work a heavy show, and primarily because women cannot realistically do the fights and body falls, or throw themselves about with the abandon that is necessary at times. In addition, considerable technical equipment is used in sound effects which usually is beyond the experience of the average woman. No doubt they have the sensitivity and imagination necessary, but the fact that women tend to be more

practical-minded than technical-minded considerably limits them in this field. The only successful soundwoman was CBS's Mrs. Ora Nichols.

As far as I know, every soundman in commercial radio belongs to some union. Originally they all belonged to AFRA. However in November, 1946 there was a bitter battle over wage increases and some network sound groups pulled out of AFRA and joined IBEW and NABET. Soundmen work under union shop rules, forty hours a week, with a guaranteed minimum wage. Of course the working conditions vary with the different union contracts.

The pay scales vary also, running from about $45 a week for beginners to $135 a week for the old-timers. The soundman makes a reasonable living wage from his staff job, and he may supplement this by various kinds of outside work.

In July, 1949 the United States Labor Department's Bureau of Labor Statistics in co-operation with AFRA released the following information, result of a nationwide survey covering 3,742 radio artists in fifteen metropolitan cities. The average income by categories was:

Actors	$4,000
Staff Announcers	4,700
Singers	4,800
Sound Effects Artists	5,200
Free-lance Announcers	9,600

Every recorded spot announcement heard on the air that contains a sound effect has been made by some soundman. This is done for an agency at some recording company and pays anywhere from $10 to $25 for an hour's work or less. Sometimes a soundman on his day off will have a call to work several hours making spot announcements, and this certainly adds up.

Another field in which the soundman picks up extra money is the transcribed dramas that are recorded by outside companies. These are usually package shows, fifteen-minute or half-hour dramas. There the soundman works on an hourly rate, the scale depending upon whether or not he furnishes any effects.

Some of the large advertising agencies that have large-budget shows will send a regular fee to the soundman. This is in addition to his staff salary and is freely given because the agency likes the work done by the soundman. However, this is the exception rather than the rule and depends strictly upon the agency and its policies.

Usually at Christmas the director, star of the show, and many times the

agency will give gifts to the mixer, assistant director, and soundman. On the large-budget programs with the big stars, the gifts are sometimes very elaborate. The finest outright gift made at Christmas that I know of was when Red Skelton gave each member of his show's production staff an installed television set!

Some of the readers might wonder about free-lance soundmen. The problem there is two-fold. First, to be able to work any type of show and have the proper effects the soundman would have to invest thousands of dollars in equipment; various doors, windows, walking surfaces, glass crashers, electronic equipment, and many, many records at from two to three dollars apiece. He would also need a properly built sound truck, and that is a very expensive item. Where would he store his equipment, and what means of transportation would he use in hauling the bulky manual effects and sound truck? Secondly, he would only be able to work shows other than those performed at radio stations, where staff soundmen and equipment are available.

Many times I have been asked what was my most difficult sound cue. Well, I have had some hard physical sound sequences to do, have done shows that called for fast and closely grouped sound cues, and have been faced with some very difficult effects that had to be improvised. But the one sound cue that I recall with the greatest distaste is the time that I had to file my fingernails while the gal on the show was presumably getting ready for a heavy date. Unfortunately the director was a perfectionist. By the time we rehearsed, re-rehearsed, and dressed the show, I was running out of fingernails and almost driven to the point of removing my shoes and socks!

Let me repeat to the beginning director: insist on the best possible sound within the limits of equipment available and the experience of the soundman, but be reasonable. Do not demand the impossible. Remember that beginning directors tend to demand too much sound and overemphasize its importance. On the other hand, some directors of long standing fall into a tired approach to their production and lapse into accepting conventional effects because they have begun to take sound for granted.

To the neophyte writer, write only necessary sound cues; be sure they are identifiable, understandable, and simply written. Visualize the action and allow time for the action to logically develop. Remember, every written sound cue should be qualified to tell where, when, how, how much, and at what perspective. It is a real challenge to a writer to get all these qualifications into a cue of very few words.

As to the various comments made about certain kinds of directors and writers, the instances cited actually happened and were mentioned only to point out that there are mediocre directors and writers in radio just as there are mediocre workmen in any professional field. The student should profit by avoiding their mistakes.

Throughout this book I have so concentrated on sound that the reader might get the impression that I feel it the most important part of the radio drama. This of course is not true. However, sound is an integral part of a well-balanced dramatic program.

Remember that sound can do any or all of these things:

1. Carry the action.
2. Set a scene.
3. Establish time.
4. Establish locale.
5. Create mood or atmosphere.
6. Serve as a transition device between scenes.
7. Indicate entrances and exits.
8. Aid in achieving or intensifying a climax.
9. Contribute to a montage effect.
10. Be a theme signature or trademark.

And also remember this: every time that a soundman makes a sound, by electronic, vocal, manual, or recorded means, he must control the use of that sound by proper pitch, quality, perspective, volume level, duration, authenticity, acoustical relationship, balance, timing, and suitability to the particular program. It isn't easy!

Glossary

All television words are identified by the letters TV in parentheses immediately following the word.

ACCENT To stress or emphasize a sound effect, word, or musical phrase so as to "point it up" or emphasize the meaning.

ACCOUNT A commercial firm or anyone who buys radio time. In some cases the SPONSOR.

ACETATE A disc, usually of aluminum, coated with lacquer and used for instantaneous recordings. Good for immediate PLAYBACK but not durable enough for continuous use because of the soft surface material.

ACROSS-MIKE Projecting a sound from a position parallel to the face of the microphone, or at right angles to the BEAM. Also called cross-mike.

ACROSS THE BOARD A term used to describe the scheduling of a program five or more times a week at the same time period, usually Monday through Friday. Soap operas fall into this category. (See STRIP SHOW.)

ACTION (1) The course of events or "what happens" in a radio drama. (2) The specific physical activity of actors as indicated by the dialogue or sound effects.

AD LIB From the Latin "ad libitum," meaning "at pleasure." Any extemporary words, sound effects, or music.

ADVERTISER The client or SPONSOR.

ADVERTISING AGENCY An organization whose clients are the sponsors of a show. The agency buys "air time" on a station or network and is responsible for the script, production, and direction of the program. Also writes the commercials and usually collects a fee of 15 per cent of the gross cost.

AFFILIATE An independent radio station associated with or forming part of a radio NETWORK.

AFM American Federation of Musicians.

AFRA American Federation of Radio Artists, an AFL union. Comprises the actors, announcers, singers, and some soundmen.

AGENCY Abbreviation for ADVERTISING AGENCY.

AM Amplitude modulation: the method generally used in transmission of radio signals through the air. Most radio sets are AM receivers. (See FM.)

ANGLE SHOT (TV) A camera shot from a position other than normal eye-level pickup. (See REVERSE ANGLE.)

ANTICIPATE In sound to foresee and initiate an effect before the written sound cue is reached so as to properly synchronize the sound effect with the dialogue. Anticipation is one of the chief factors in proper TIMING.

ASCAP The American Society of Composers, Authors, and Publishers. This is the song writers', music composers', and music publishers' association. Licenses public performances of music of its members and collects the royalties. (See BMI.)

ASSISTANT DIRECTOR See CONTACT PRODUCER.

ATMOSPHERE The element of narration, sound effects, or music that establishes the locale or sets the mood of a drama.

AUDIO (adjective) Pertaining to the electronic transmission of sound.

AUDIO (TV) (noun) From the Latin "I hear"; this is the sound or audible portion of television. (See VIDEO.)

AUDIO ENGINEER (TV) The engineer in the booth who monitors sound portions of telecast. (See VIDEO ENGINEER.)

AUDIO FREQUENCY An electrical device that changes tone characteristics of a sound by selective elimination of frequencies.

AUDITION (1) A tryout performance of a singer, actor, announcer, or musician. (2) A recording made of a complete radio show. Played for various prospective clients in the hope they will buy the show.

BACKGROUND Sound effects or music used to heighten atmosphere or mood, and running under dialogue or narration in a secondary perspective to some foreground sound. The sound of crickets would be called a background sound. Also called BG.

BACKGROUND PROJECTION (TV) The projection of film on a translucent screen. Used as background for a studio set.

BACK-TIME Timing of a script backwards from the end to the beginning. Allowances are made for cuts and STRETCH, and the running time indicated every 15 or 30 sec. on the script. Back-timing gives the "must" or IDEAL TIME that keeps the show ON THE NOSE so that it will get off the air ON THE HEAD.

BALANCE The proper volume relationships between the elements of dialogue, music, and sound effects. The correct blending of the relative volumes of these elements gives the balance or best tonal and acoustical effects.

BCU (TV) Abbreviation of big close up in which the face of a performer fills the television screen.

BEAM The angle of sensitivity from the face of the microphone at which the instrument receives sound most efficiently. This is the live side of the mike.

BEAT A written direction in the script to take a one-count pause.

BEND THE NEEDLE An unforeseen or sudden excessive volume of sound through a mike that causes the needle of the VI (VOLUME INDICATOR) to move violently up to and beyond the danger point.

BG An abbreviation for BACKGROUND.

BIDIRECTIONAL MIKE A microphone with two live faces or pickup areas. Sound waves may be picked up from either face of the mike, or both simultaneously. Used primarily as a cast or dialogue mike.

BILLBOARD An announcement at the beginning of a program giving the name of the sponsor or listing the stars of the program.

BILLING The naming of the performers on the air. Usually the leads or stars are named at the beginning of the program, and the complete supporting cast at the end.

BIT A very small part played by an actor in a radio drama.

BITE IT OFF Cutting off music cleanly and sharply.

BLACK SCREEN (TV) When nothing is visible on the television viewing screen.

BLASTING Distortion of sounds due to more increase of volume than can be handled by the equipment. Usually caused by a too sudden deviation from a preestablished level.

BLEND (1) Same as balance; the proper mixture in volume and presence (see PERSPECTIVE) of sound, music, and dialogue. The combination of sounds from two or more mikes. (2) A combination of voices or sound effects for a special effect. Considerably used in recorded sound effects.

BLOCK Group of successive time periods; the same time span on several days.

BLOW To completely lose control of one's self. A FLUFF that winds up in complete loss of place in the script, meaning of lines, or what's going on. See BREAK UP; FLUFF.)

BMI Broadcast Music Incorporated. A rival organization to ASCAP.

BOARD The engineer's or mixer's control panel in the control booth through which all microphones, filters, and echo effects are controlled.

BOARD FADE (1) A transition technique controlled by the studio engineer on his control panel. The mikes are gradually faded down and out, then faded back in to indicate a passage of time or change in locale. (2) The mechanical fading by the engineer of an actor's voice, rather than the actor fading from the microphone. (See FADE.)

BODY FALL See Chapter 6, Manual Effects.

BOING BOX Sometimes called twang box. An instrument with a long flexible neck that looks something like an angular guitar. Has a single steel string which is plucked, then the flexible neck is rapidly vibrated to give the comedy sound, "Bo-iiiiiiiinnnnnnnggggggg!" (See page 218.)

BOOM A stand to which a mike is attached in order to elevate or extend placement of the microphone.

BOOM (TV) A telescoping arm from which a mike is suspended permitting the mike to be moved vertically or horizontally while in use.

BOOM DOLLY (TV) A movable carriage on which the camera boom is mounted. Makes it possible to raise camera, turn it completely around in a circle, as well as move freely about the set.

BOOM MIKE (TV) Principal mike used in TV. Suspended on end of MIKE BOOM.

BOOM-MIKE DOLLY (TV) Mobile platform on which boom mike is mounted.

BOOM SHOT (TV) A moving camera shot in which the camera is physically moved up or down, right or left.

BOOTH See CONTROL ROOM.

BREAK (1) Radio's most welcome time: a short rest period during rehearsal called by the director or producer. (2) An unintentional interruption during a broadcast. (3) The announcing of the station CALL LETTERS over the air at specified times.

BREAK UP When a performer is confronted with a sudden situation that causes him to break into uncontrollable laughter. (See BLOW; FLUFF.)

BRIDGE A transition from one scene to another by one of various devices. Usually done by a few phrases of music that start in the mood of the concluding scene and end in the mood of the following scene. (See TRANSITION.)

BRING IT UP To increase the volume level of speech, sound, or music.

BROADCAST A complete radio program released for public reception. Also called show.

BROADCASTING Transmission of radio signals intended for general reception by the public.

BUGS (1) Hidden or hard-to-locate defects in equipment. (2) Telegraph or radio code sending key.

BUILD The increase of emotional excitement by acceleration of the tempo, intensity, or volume level of actors, sound, or music in an approach to a climax.

BUSINESS A stage and TV term meaning all physical action and movement by performers. In radio mostly simulated by sound effects.

CA Abbreviation for COURTESY ANNOUNCEMENT.

CALL (1) The offer of a job on a show received by an actor, singer, or musician. (2) The time that a rehearsal starts.

CALL LETTERS The identifying letters assigned to individual radio stations, such as WOR, KHJ, KNBC, etc.

CAMERA (TV) The instrument that picks up the video portion of a telecast.

CAMERA BOOM (TV) A revolving and elevating pedestal on which TV camera is mounted.

CAMERA CABLE (TV) The wire that carries the picture from the camera to the control room.

CAMERA FIELD (TV) The area covered by a camera on any individual shot.

CAMERA LIGHT (TV) Small red and green lights on TV camera. Red light indicates ON-THE-AIR; green light, next to go on air.

CAMERA REHEARSAL (TV) Last rehearsal before DRESS REHEARSAL in which camera requirements are established. See DRY REHEARSAL; TECHNICAL REHEARSAL.

CANNED MUSIC Recorded or transcribed music.

CANS A slang term for headphones.

CARBON MIKE A carbon microphone, the earliest used in radio. Now seldom used as it has a tendency to "hiss."

CARDIOID A unidirectional microphone that has a pickup pattern of 180 deg. Used considerably as a sound mike.

CAST (noun) The group of performers that make up the personnel of a radio show. (verb) To select and employ actors according to their ability to perform specific types of roles.

CBS The Columbia Broadcasting System.

CENSORSHIP The FCC has certain regulations, and policies have been established by individual stations and networks. There is little real censorship, other than voluntary censorship governed largely by good taste.

CHAIN A national network.

CHAIN BREAK A commercial inserted during the station identification interval by a network or chain station.

CHAIN STATION A member station of a NETWORK.

CHARACTER A casting term meaning that a specific part calls for studied characterization.

CHARACTER ACTORS Actors who interpret roles that are younger or older than themselves, or in a dialect other than their own.

CHARACTERIZATION (1) The delineation of a role in a script by the author. (2) The portrayal of the role on the air by an actor.

CLAMBAKE A rehearsal or broadcast that falls apart because of obvious errors and weird incongruities. Usually caused by many BLOWS, FLUFFS, and BREAK-UPS.

CLEAN IT UP (1) To make necessary corrections or changes during rehearsal in order to assure a satisfactory air show. (2) Removing objectionable material from a script.

CLIENT An advertiser or SPONSOR.

CLIENTITIS An occupational headache caused by a sponsor's unwelcome interference.

CLIFF HANGER (1) A radio-serial adventure-thriller, played with a fast pace and a lot of suspense. (2) Ending an episode of a serial on a note of suspense.

CLIMAX The high point of emotional intensity in a play toward which everything that has happened before has been building. The climax is the PAY-OFF.

CLOSE UP (TV) A camera pickup showing head and shoulders of the subject. Usually abbreviated to CU.

COLD (1) Opening a radio program without theme music, sound, or preliminary build-up or introduction. (2) To perform without rehearsal or preparation.

COMING IN Approaching microphone. Same as FADE IN.

COMING ON The same as coming in.

COMING UP (1) Warning cue that the broadcast is ready to start in ten seconds. (2) Approaching the mike. Same as FADE IN or coming on.

COMMENTATOR A newscaster who slants the news by interjecting his personal views and reactions. (See NEWS ANALYST.)

COMMERCIAL (1) A sponsored program. Opposite of SUSTAINING. (2) The sales talk given on a commercial program.

COMMERCIAL CREDITS A high-sounding term meaning the specific mention of the sponsor's name or product.

COMPETITION Programs on the air from rival stations at the same time a program is being broadcast.

CONDENSER Two sets of metal plates separated by an insulator or dielectric.

FIXED CONDENSER A condenser whose plates are fixed so that its electric value is not changeable.

VARIABLE CONDENSER A condenser whose plates can be moved so that its electric value can be changed when desired.

CONDENSER MIKE A microphone using a diaphragm and having directional characteristics.

CONFLICT The unhappy situation that results when a person has two assignments or CALLS for the same time period.

CONTACT MIKE A small microphone that picks up sound by vibrations rather than sound waves. It must be in direct contact with the sound-producing instrument.

CONTACT PRODUCER An assistant producer furnished by the radio station to assist the director of a show. During the rehearsal and air show he represents the station or network. His chief job is to time the show for the director. Also called production man and assistant director. (See page 117.)

CONTINUITY Generally speaking, any written radio script.

CONTINUITY (TV) The flow of scenes forming a continuous picture. The continuity is the manner in which the individual scenes or camera shots are put together.

CONTROL ROOM A room adjoining the radio or TV studio, usually with one glass wall, from which the director controls the program. Also houses the equipment with which the engineer monitors and controls the program. Also called control-booth, or booth.

CORN Anything in a program that is amateurish or obviously unsophisticated. Usually the result of outdated jokes, dialogue, or performance.

COURTESY ANNOUNCEMENT An announcement crediting the advertiser whose time has been taken by the broadcaster for a special program. Usually abbreviated to CA.

COW CATCHER An isolated commercial at the beginning of a program advertising a secondary product of the sponsor that is not mentioned in the program itself. (See HITCH HIKE.)

CRANK GAIN Increase the volume.

CREDIT The advertising agency's message about the sponsored product. Also called plug.

CREDITS That brief portion at the end of the program in which the announcer thanks the guest star, names the director, orchestra leader, writer, actors, and everyone but the soundmen!

CROSS-ARM A technique used in recorded sound effects. While a record is being played, a second pickup arm is swung over on the same record, and the sound is transferred from the first pickup to the second. It is used when the recorded effect is not as long as required and must be continued with no break in sound.

CROSS FADE The simultaneous fading out of one portion of a program and the fading in of another. Used primarily as a transition device to indicate a change of time or locale. (See TRANSITION.)

CU (TV) Abbreviation for CLOSE UP.

CUE (1) A specific line of dialogue or sound effects indicating to the following performer to go ahead. (2) A hand signal from the director to proceed. (3) A system cue is the last line spoken at the end of a program by the announcer. It identifies the network, such as, "This is the Mutual Broadcasting System," or, "This is CBS, the Columbia Broadcasting System."

CUE IN To set the tone pickup arm of a turntable on a preselected spot of a sound record.

CUE LIGHT (TV) See CAMERA LIGHT.

CUE UP See CUE IN.

CURTAIN A definite musical ending, indicating the end of an act or program. Also called a tag.

CUSHION A flexible safety factor used near the end of a program in case the program runs less than its allotted time. Consists of theme music or an announcement that can be lengthened or shortened at will. Permits the fill of the unused portion of air time on a program. Same as padding or fill.

CUT (1) (noun) A deletion of material, musical, oral, or sound, in order to make the program fit within the allotted time. (2) (noun) Refers to a set of tracks or grooves on a sound recording, i.e., the second cut, inside cut, outside cut, etc. (3) (verb) An expression used to stop a rehearsal. (4) (verb) To make a recording. To cut an audition is to record it.

CUT (TV) Direct switch from one camera to another with no time lapse or break in picture.

CUT IN (1) Interruption of a program by an announcer at some point other than the originating studio—usually for a local commercial. (2) An actor speaking his lines before the preceding actor has finished speaking.

CUT OFF (1) A device used primarily by newscasters and commentators. They press a button in the studio that shuts off the mike, permitting them to clear their throats without being heard on the air. (2) To inadvertently take a program off the air before its completion.

DAMPEN (1) To cut down reverberation in a studio by use of sound-absorbing materials. (2) To deaden the sound of chimes, gongs, cymbals, and the like by not permitting them to vibrate freely. Usually done by touching the edge lightly with the fingers.

DB Short for DECIBEL.

DEAD AIR That period during a broadcast when nothing is heard, usually the result of someone's error.

DEAD MIKE A microphone that is not connected, out of order, or not turned on. In other words, the mike will not pick up any sound.

DEAD SIDE That portion of the microphone that is insensitive, *i.e.*, does not pick up sound. It is the area that the pickup pattern does not cover.

DEAD SPOT (1) Same as DEAD AIR. (2) That portion of a record that has no sound on it.

DECIBEL As related to sound, it is an electrical and acoustical unit of measure. The calibrations in DB's on a POT indicate the ratio between actual volume being used and the potential volume available.

DEFINITION Clean-cut or accurate identification of any specific sound.

DEFOCUSING (TV) Variation of a dissolve. A transition achieved by throwing one camera out of focus until the image is unrecognizable, then "cutting" to the next camera, equally out of focus, and bringing it into focus to reveal the new image. (See FOCUS.)

DIRECTIONAL The area that a microphone pickup pattern covers.

DIRECTOR The director is the man responsible for getting as good a performance as possible. He casts the actors and directs them, sound, and musicians in interpretation, pace, position, and so on during the rehearsal and air show. He throws all cues and in general is the supreme boss of a radio broadcast.

DISC Another name for record, transcription or platter. Also spelled disk.

DISSOLVE (TV) The momentary overlapping of an image by one camera with that of another and the gradual elimination of the first image. It is a slower transition than a CUT (TV), and is used primarily to indicate a time lapse. (See LAP DISSOLVE; MATCHED DISSOLVE.)

DISTORTION EFFECTS (TV) The exaggeration or deliberate deviation from normal TV production procedure to secure unusual visual effects.

DOLLY (TV) (noun) A mobile platform on which the TV camera is mounted. Used to quickly and smoothly move camera to a new position on the set. (verb) The act of moving camera by means of the dolly.

DOLLY IN (TV) Move camera in closer to subject.

DOLLY BACK (TV) Reverse process of dolly in.

DOLLYMAN (TV) Member of stage crew who maneuvers a dolly.

DOLLY SHOT (TV) A camera pickup made while in motion. Also called trucking or sometimes a travel shot. A dolly shot gives a feeling of movement and third dimension as it moves about the set.

DOPPLER EFFECT The pitch of a sound depends on the number of waves that strike the ear in a second. The oftener they come, the higher the sound. A locomotive whistle gives a steady note, but when a train is approaching, each vibration starts a little nearer to the listener so that the waves are, in effect, packed closer together. Thus the note of a whistle sounds a little higher than it really is. Then when the locomotive has passed, each vibration of the whistle starts farther away and takes longer to reach the listener, so that the waves are spread apart a bit. As a result the sound seems to drop suddenly as the engine passes. This sudden drop is known as the Doppler effect. Listen to Major Record No. 5041, inside cut, for a good example of this effect.

DOUBLE-ARM Using two different pickup heads on one recording so as to double the sound picked up off one record. Does not necessarily increase the volume of the sound, but does increase the quantity.

DOUBLING An actor or actress playing two or more parts in the same script.

DRAMATIC LICENSE An unnatural emphasis of a speech, sound, or situation for dramatic effect. Usually an obvious liberty taken by the writer or director.

DRESS Abbreviation of DRESS REHEARSAL.

DRESS REHEARSAL The final complete rehearsal of a show, played exactly as if it were the broadcast performance. It primarily determines the running time of the show and if CUTS or STRETCH are necessary. Usually called dress.

DRY REHEARSAL (TV) The first rehearsal in TV. Primarily for performers' benefit. No scenery, equipment, or production staff used. See also CAMERA REHEARSAL; TECHNICAL REHEARSAL.

DRY UP The unfortunate condition of a writer running out of ideas.

DUBBING The transferring of recorded dialogue or sound to a new record. A re-recording in part or whole of a record. The dubbing of music is rigidly controlled by the AFM.

DYNAMIC MIKE A moving-coil type of microphone with a 180-degree beam or pickup pattern.

EARPHONES Headphones. In the vernacular called cans. Worn by engineers and soundmen when extraneous noises or loud sounds interfere with hearing the dialogue.

ECHO (1) Abbreviation for ECHO CHAMBER. (2) The reflection or return of a sound after a short period of silence. (See REVERBERATION.)

ECHO CHAMBER A highly reverberant room with sound-reflecting walls, used to give an excess of reverberation, hence an echo effect. Fully discussed in Chapter 8, Electronic and Acoustical Effects.

EFFECT In relation to sound effects, refers to any specific sound. A gunshot is an effect, a train whistle is an effect, etc.

EIGHT-BALL A nondirectional dynamic microphone with a beam or pickup pattern of 360 deg.

ELECTRICAL TRANSCRIPTION A term generally restricted to recordings made specifically for radio-broadcast purposes. Most transcriptions are recorded

at 33⅓ r.p.m., while commercial recordings revolve at 78 r.p.m. The slower speed of the transcription makes it possible to record a complete 15-min. show on one 16-in. disc. Another advantage of the transcription is that surface noise is very low and quality high. The average 10-in. commercial recording (phonograph) runs between three and four minutes. The term electrical transcription is generally condensed to ET. Also called transcription.

ELECTRONIC An electronic sound is any sound made by equipment operated by an electronic impulse or around an electrical circuit. (See Chapter 8, Electronic and Acoustical Effects.)

ENGINEER A radio technician. Those who engineer a radio show are called MIXERS. They are mighty important to the industry.

ESTABLISH A technique used to indicate the atmosphere, mood, or locale of a scene. Crickets establish nighttime, a running-auto sound establishes the locale in an automobile, and so on. Usually a sustained sound is established, then dropped in volume.

ESTABLISHING SHOT (TV) A combination of camera shots that shows location of a scene by a LONG SHOT, then DOLLIES IN to a MEDIUM SHOT, and DISSOLVES into a CLOSE UP on a second camera.

ET An abbreviation of ELECTRICAL TRANSCRIPTION.

EXTEMPORE An impromptu performance, without benefit of written script or preparation. Also called ad-lib.

FADE A gradual increase or decrease in volume. There are three kinds of fades:

BOARD OR MECHANICAL FADE Done by the engineer in the booth. There he mechanically decreases the volume of the mikes until they are completely dead, then slowly returns them to normal level. Used for ending a scene or in a PAUSE TRANSITION.

STUDIO OR ACTOR'S FADE Done by the actor who backs away from the mike. Used to indicate that a performer is leaving or approaching the on-mike scene. (See CROSS FADE.)

FADE (TV) Decrease in brilliance and visibility of a TV picture.

FADE IN A sound or actor approaching the microphone, thus indicating closer PERSPECTIVE.

FADE IN (TV) The gradual appearance of a picture from total darkness to full visibility.

FADE ON Same as fade in.

FADE OUT The opposite of fade in. Also called fade off.

FADE OUT (TV) The gradual disappearance of the picture image from full visibility and brilliance to total darkness.

FADER A device used to increase or decrease volume of sounds. Also called pot.

FAKE To improvise a sound effect or simulate a sound because the real sound cannot be used.

FANTASY An imaginative play not restricted by realistic conventions. Usually one dealing with mythology or the supernatural.

FARCE A comedy designed strictly for laughs and not concerned with plausible characters or probabilities of plot.

FAT To be fat is to have sure-fire jokes, easy lines to deliver, or simple sound effects.

FCC The Federal Communications Commission, which controls the issuing and renewal of broadcasting licenses.

FIDELITY The exactness with which a television- or radio-transmission system reproduces sound or picture on the receiver.

FILL (1) The playing of a STAND-BY program to fill the unused portion of a designated program period. (2) To add program material, usually music, to complete the time of an assigned program period. Similar to padding or CUSHION.

FILTER A device used to change voice or sound quality by separating and eliminating either lower or upper frequencies. (See Chapter 8, Electronic and Acoustical Effects.)

FLOOR MANAGER (TV) Also called stage manager. Member of the production staff who relays cues and directions from the director in the booth to performers and staff working on the set.

FLUFF To misread a line or transpose syllables. Example: A nurse rushes in and breathlessly says, "Doctor, here is the hypodeemic nerdle!" (See BLOW; BREAK UP.)

FM Short for FREQUENCY MODULATION.

FOCUS (TV) A control for bringing the picture into the sharpest definition possible. (See DEFOCUSING.)

FOLLOW SHOT (TV) A SHOT made while camera is DOLLIED about the set following physical movement of performer.

FORMAT The particular style or pattern around which a show is written.

FREE-LANCE A person not on the staff of a radio station, network, or advertising agency, but who works for them by special assignment.

FREQUENCY The number of complete cycles of a periodic variation occurring during a specified time. For a sound wave, or its equivalent electrical wave, frequency is normally stated in cycles per second. The higher the frequency of a sound, the higher its pitch (neglecting any effect of amplitude or pitch).

FREQUENCY MODULATION A method of applying intelligence (sound waves, etc.) to a transmitted radio wave; also refers to system in which such waves are broadcast and received. This system provides relatively static-free and interference-free reception compared to the original amplitude modulation system (standard broadcast). Frequency modulation also provides the opportunity for greater fidelity in reception; its reliable broadcast range is as good as, if not better than, that realized with amplitude modulation broadcast.

FROGS The accumulation of phlegm in an announcer's or actor's throat that causes him to speak indistinctly. This is the time to use the CUT-OFF.

FRYING The hissing or crackling sound caused by defective equipment or worn-out recordings. Even new records fry if they are cheaply processed.

FULL NET Using the facilities of all stations belonging to a network in a simultaneous operation.

FULL ON On mike at full volume.

GAG A slang term generally referring to some obvious bit of comedy.

GAIN The increase of volume through amplification.

GENNETT A recording company that makes commercial sound-effects recordings. Pronounced Gen-ay'.

GET UP SPEED Anticipating the start of a record by letting the turntable revolve so that it will be turning at the proper speed or r.p.m. before the sound on the record is heard. This prevents wows.

GHOST To announce a program from a radio station in such a way as to give the impression that the announcer is on the spot at the REMOTE. Done mostly on dance remotes.

GIMMICK A new or different twist or angle that puts over a radio show. The gimmick used on CBS's *You Are There* is in creating the illusion that the re-created historical events are transpiring at the very moment of the broadcast.

GLASS CRASHER A device used for giving the sound of breaking or falling glass. (See GLASS CRASHER in Chapter 19, Constructing Sound-Effects Equipment.)

GOOSE-NECK A microphone stand with a flexible neck.

GO OUT To recede from the microphone, or decrease in volume. See FADE.

GRAVEL BOX Low open-top boxes of various sizes containing crushed rock or pea gravel. Used to walk in to simulate the sound of steps on dirt.

HIATUS The summer vacation from the air taken by the major shows. Their time spot is taken by the summer REPLACEMENTS.

HALF ON At a slight distance from the mike, or half off.

HAM (noun) An actor who is bad, corny, or tends to overact. (verb) To overact or clown.

HARD HEELS Leather heels worn on soundmen's shoes because rubber heels do not pick up sufficiently to register footsteps.

HEAVY A professional casting term meaning the villain.

HIGHS The high frequencies or vibrations of sound in contrast to the lower register. On recorded effects the highs and lows are controlled by the use of FILTERS.

HIT A sudden and emphatic attack by music. (See STING.)

HITCH HIKE An isolated commercial announcement at the end of a program advertising a secondary product of the sponsor not mentioned in the program itself. (See COW CATCHER.)

HOG The tendency of an actor to crowd in close to the mike, disregarding the rights of other performers. Similar to "upstage" in theater parlance.

HOLD OFF (1) In sound, to keep a sound effect at a distant perspective or low level. (2) To cause music, dialogue, or sound to wait until a direct cue is given by the director.

HOLD IT DOWN To decrease volume, or sustain volume at a low level.

HOOK (1) A term in script writer's parlance meaning to give a surprise ending. (2) The suspense ending that concludes an episode of a serial.

HOOK-UP A radio network comprising several stations.

HOOPER A research organization that conducts one of the surveys on radio listening. Services advertising agencies, networks, and sponsors. Research is

conducted by telephone direct to listener. Although subscribers place great stress on the Hooper rating, its value is questionable because it samples by telephone and thus reflects the listening habits of the higher-income bracket of listeners. No true cross section of radio listening can be sampled by telephone alone.

HORSE OPERA A western adventure show primarily composed of gunshots, fights, chases, and occasionally a plot. Also called oat opus or oater.

HOT MIKE A microphone that is turned on and in operation. Opposite of cold or DEAD MIKE.

HOUSE SHOW A radio show owned, written, and directed by a radio station or network. In contrast to an agency show, which is owned by an advertising agency.

IBEW The International Brotherhood of Electrical Workers. Radio engineers and some soundmen belong to this union.

ICONOSCOPE (TV) A type of TV camera tube.

IDEAL TIME A timing on a radio script that is obtained by BACK-TIMING and indicates the desired pace of the broadcast.

IMAGE ORTHICON (TV) A very sensitive TV camera tube.

INSET (1) (noun) A short scene contained within a longer one. (2) (noun) A desired sound buried in the content of a sound record. (3) (verb) The act of cuing in the pickup arm of a turntable at the desired spot on a sound record.

INSTITUTIONAL A type of advertising designed to promote the firm or institution sponsoring the program rather than its specific products. The brief talk given on the United States Steel program is an example.

INTENSITY A term used to denote the amount of energy per second per unit area of a sound. Sound diminishes in intensity as the distance from its source increases. In other words, intensity varies inversely as the square of the distance, i.e., a sound heard twenty feet away from the source, will be only a quarter as intense at forty feet (twice the distance).

INTERCUTTING (TV) Similar to a radio MONTAGE. Consists of a succession of very short scenes or flashes of the same scene from different angles.

INTERIOR DIALOGUE A modern name for both soliloquy and the aside. It is a "stream-of-consciousness" technique given great impetus by Eugene O'Neill's *Strange Interlude*. Very common in SOAP OPERAS.

IN THE CLEAR A sound effect, bit of dialogue, or music heard without any other sound to detract from it.

JUMP CUE Anticipation of a cue, when an actor, sound, or music performs before the proper time.

JURY The audience that attends the first performance of a new show. Usually a very critical group, like a first-night theater audience.

JUVENILE A player of youthful parts.

KEY The "tone" of a play or scene, high or low. A high-keyed scene is usually played with a fast pace and in an excited manner. Low key is usually done in a slower pace and is more subdued.

KILL (1) To stop rehearsal for instructions. (2) To eliminate a portion of a program by cutting. (3) To cancel a scheduled program.

KILL MIKE To turn off a microphone.

KINESCOPE (TV) A type of TV viewing tube.

LAP DISSOLVE (TV) A transition technique used in TV. Fading in one scene over another, holding briefly, then fading out the first scene and continuing with the second. (See DISSOLVE; MATCHED DISSOLVE.)

LEAD (1) The principal role in a play. (2) The actor or actress who plays the lead role.

LEAD-IN The words spoken by the announcer or narrator at the beginning of most programs. Usually performs a scene-setting or recapitulation function.

LEAD SHEET The cues or leads to guide the musical director.

LEVEL The volume level audibly noted; electrically measured by the VI (VOLUME INDICATOR) or calibrated in DB's (DECIBELS) on a POT. The level is "how loud."

LINES The words or speeches of dialogue in a play.

LIVE An actual performance, as contrasted to a recorded or transcribed show.

LIVE MIKE A microphone that is open and functioning. Same as a hot mike.

LIVE STUDIO (1) A studio that is ON THE AIR. (2) A studio that is acoustically reverberant.

LOADED (1) A show or script having an overwhelming amount of hard work. (2) A script containing excessive or difficult sound cues.

LOCALE The region or place wherein the play or scene is laid.

LOCAL PROGRAM A program broadcast by only one station, as contrasted to a network release. Local programs usually have a smaller budget and lesser facilities than network shows, but have the advantage of being tailored to meet local interests.

LOCAL STATION Any radio station that is located within one's vicinity and is easily heard may be considered a local station.

LONG SHOT (TV) A camera pickup taken from a distance sufficient to include a general view of a scene. Usually abbreviated LS.

LOOP A radio network or portion thereof.

LOUDNESS A subjective indication of sound intensity. It is the degree of sensation dependent on the intensity of the sound and the sensitiveness of the ear under particular conditions. (See INTENSITY.)

LOWS The low frequencies of sound. (See FREQUENCY; HIGHS.)

LS (TV) An abbreviation of LONG SHOT.

MAGNETIC RECORDER A recording machine that records magnetically on tape or wire.

MAJOR Major Records, a recording company that makes recorded sound effects for radio and theatrical use.

MAKE LOCAL To identify a local station by announcing its call letters.

MAKE SYSTEM To announce the name of a network at the conclusion of a network program.

MANUAL Those sound effects other than RECORDED, VOCAL, or ELECTRONIC. Usually done by the soundman's hands and feet.

MANUSCRIPT The written play. Usually mimeographed for production use. Generally abbreviated to script.

MASQUE Masque Sound and Recording Company, a firm manufacturing recorded sound effects.

MASTER (1) A FADER or GAIN control. The master controls all VOLUME CONTROLS on a given piece of equipment. If a SOUND TRUCK has three TURNTABLES,

each with a separate volume control, all three tables may be FADED simultaneously in or out by the master control. (2) The negative mold from which PRESSINGS are made.

MASTER CONTROL An engineering control room through which all studio programs are fed for release to the transmitter or network lines.

MATCHED DISSOLVE (TV) Exactly matching the position of two similar or identical shapes, each on a different camera, then dissolving from one to the other, creating an apparent metamorphosis. (See DISSOLVE; LAP DISSOLVE.)

MBS The Mutual Broadcasting System.

MC (1) The master of ceremonies. Sometimes written emcee. (2) The abbreviation of MASTER CONTROL.

MCU (TV) Abbreviation of medium close up. A camera distance halfway between a MEDIUM SHOT and a CLOSE UP.

MECHANICAL FADE See FADE.

MEDIUM SHOT (TV) A camera position middle distant between a CLOSE UP and a LONG SHOT. Generally abbreviated to MS.

MEDIUM LONG SHOT (TV) A camera pickup between a LONG SHOT and a MEDIUM SHOT. Generally abbreviated MLS.

MELODRAMA An exaggerated, romantic, exciting, and improbable type of drama. Characters are usually overdrawn, and stress is laid on action or situation. Most radio adventure dramas are of this type.

MICROPHONE A device used to convert sound waves into electrical waves, which are eventually transmitted through the air to the home receiver.

MIKE Abbreviation for MICROPHONE.

MIKE BOOM See BOOM.

MIKE BOOM (TV) A long telescoping arm on the end of which is the mike. The arm may be extended or retracted, swung in a wide horizontal arc, and raised or lowered. It is mounted on a mobile platform that facilitates its movement about the SET.

MIKE HOG See HOG.

MIKE TECHNIQUE A performer's experience and ability at the mike as indicated by results. (See MIKE-WISE.)

MIKE-WISE Any performer who understands mike technique, i.e., proper placement, voice levels, fades, etc., is mike-wise.

MILK To exhaust or extract every possible bit of humor or pathos out of a line of dialogue or situation. To "play to the gallery."

MIX To blend sounds from two or more microphones. The engineer who does the blending is called a MIXER.

MIXER (1) The engineer who monitors, controls, and blends all sounds from a radio studio. (2) Another name for control PANEL.

MLS (TV) Abbreviation of MEDIUM LONG SHOT.

MONITOR (noun) A loudspeaker in the CONTROL ROOM used to listen to a program while it is being performed in the studio. (verb) Listening to a program during its broadcast to check its content and quality. In the CONTROL ROOM the engineer monitors the show, that is, he listens to the blend of the various mikes going through the mixing PANEL and controls the LEVELS of sounds so that they go out over the air properly BALANCED. Good monitoring is vital to a good production.

MONITOR (TV) A viewing set that shows the picture picked up by the individual camera.

MONTAGE A succession of very short scenes, sound effects, or narration, used for rapid presentation of a series of events. Usually used to cover a considerable period of time, or to forcibly develop a plot situation. Generally these scenes are overlapped or held together by background music with a swell in the music between scenes.

MOOD MUSIC Phrases of music used to establish mood or atmosphere, or to set the locale of a scene.

MOTHER A positive recording produced directly from the master record.

MOVE DOWN To perform a sound effect after a written sound cue so as to achieve more accurate timing.

MOVE UP To perform a sound effect ahead of the written sound cue in order to achieve more accurate timing.

MOVING MIKE A misleading term implying that the microphone is moved. This is not true. The mike is stationary but the performers by their dialogue and through use of sound effects give the feeling of motion. An actor who seemingly walks out of a house, gets into his car, and starts to drive (being on mike all the time) has created the effect of a moving mike.

MS (TV) Abbreviation of MEDIUM SHOT.

MUSIC BRIDGE The use of music as a transition device between scenes. (See BRIDGE; TRANSITION.)

NABET The National Association of Broadcast Engineers and Technicians. Some soundmen belong to NABET.

NBC The National Broadcasting Company.

NATURAL SOUND (TV) Sounds of action whose source is shown in the picture with sight and sound simultaneous. Also called synchronous or sync sound. Opposite of NONSYNC or off-screen sound.

NARRATOR An announcer or actor who usually leads in to the story by summarizing the situation, and briefly relates the action of the play that is not dramatized. Also through narration he bridges the breaks in the time elements of the drama.

NEMO (1) A program originating outside of a radio station. A REMOTE. (2) Portable control panel used on REMOTE broadcasts.

NET Abbreviation for NETWORK.

NETWORK At the present writing there are four coast-to-coast networks: Mutual, ABC, NBC, and CBS. There are also several REGIONAL networks covering certain portions of the nation. Don Lee blankets the West Coast with over fifty stations, the Yankee Network covers the New England states, etc. The regional networks generally form large blocks of the national nets. The national networks own but a few of their stations, the setup being in the nature of a cooperative. A network sells national airtime to the sponsor at one rate and reimburses the local outlet station at a lower rate. Advantage to the local station is the use of sustaining programs at no cost, and the prestige of the large, expensive major shows that originate in New York, Chicago, and Hollywood. The nets do not own the lines that carry the programs from station to station. These are leased from the American Telephone and Telegraph Company.

NETWORK SHOW A program broadcast simultaneously over two or more stations.

NEWS ANALYST A person who interprets the significance or meaning of the news. (See COMMENTATOR.)

NEILSON RADIO INDEX A reporting service that gives the trends, ratings, and listening habits of radio listeners. (See HOOPER.)

NOISE Any undesired sound.

NONDIRECTIONAL A microphone that is not limited to picking up sound from any specific direction. It has a pickup pattern of 360 deg.

NONSYNC SOUND (TV) Any sound whose source is not seen on the video. Also called off-screen sound. Opposite of NATURAL, synchronous, or sync sound.

NUT The nut is the cost of producing a radio or television program.

OATER Another name for a HORSE OPERA. Also called oat opus.

OFF Short for OFF MIKE.

OFF MIKE At a distance from the mike, giving an "away" presence. The opposite of ON MIKE.

OFF-SCREEN SOUND (TV) The same as NONSYNC sound.

O. HENRY The climax speech of a dramatic sequence, usually consisting of a surprise or twist ending. Sometimes called a tag line.

ONE-SHOT A script complete in one installment. Generally a single program and not part of a regularly scheduled series. Shows like "The March of Dimes," "The Cancer Show," "National Safety Week," are one-shots.

ONE-SHOT (TV) A close up of one person filling the screen with head and shoulders.

ON Short for ON MIKE.

ON MIKE At the microphone and on the BEAM at the normal pickup distance. Also called at mike. Opposite of off mike.

ON THE AIR The period that a radio program is actually being broadcast.

ON THE BUTTON Same as ON THE HEAD.

ON THE HEAD A program that concludes exactly on time. Usually a program that ran ON THE NOSE throughout its allotted time.

ON THE LINE (TV) The picture going to the transmitter for telecasting.

ON THE NOSE A program that is running exactly on the predetermined schedule.

OPEN COLD To begin a show without music, sound, or preliminary introduction.

OPEN END A transcribed program recorded with the commercial spots left blank. These are filled in with commercials given by the local announcer. The *Cisco Kid* is an open-end transcription.

ORIGINATE To do a broadcast from a specific location.

OSCILLATOR An electrical device that produces current which periodically reverses in direction. The output frequency of oscillation is determined by a rheostat controlling HIGHS and LOWS.

OUTLET A radio station that releases a program on the air. Usually refers to the individual station releasing a network program.

OVER (1) A program that runs longer than its allotted time. In other words, it did not run ON THE NOSE and did not end ON THE HEAD. (2) A level or volume of sound too intense for the equipment to handle.

OVERBOARD (1) A program that runs over its prescribed time. (2) Any excess in performance, sound, or music. To HAM. (3) The solution of a plot by a writer that is improbable or more convenient than logical.

OVERLOADED Same as LOADED, only more so.

P.A. (1) Public-address system. The loudspeaker setup used in stadiums, large convention halls, and so on. (2) Personal appearance by a star.

PACE A term meaning the rate of speed in delivery of lines and action on a radio program. Pace is to radio drama what tempo is to music.

PACKAGE A ready-to-broadcast program. The sponsor buys a ready prepared show which has all components included.

PADDING Same as CUSHION or FILL.

PAN (TV) Short for panning, from "panorama." Rotating a television camera in either a vertical or horizontal plane or both, so as to keep a moving subject within camera field, or to scan a scene larger than the camera field.

PANEL An instrument control board with various controls by which the studio engineer MIXES the show. Also called board.

PARTICIPATING PROGRAM A program having more than one sponsor.

PAT (1) A static or uninspired performance. (2) Any obviously contrived or purely mechanical interpretation or reaction that lacks naturalness or spontaneity.

PAUSE TRANSITION A BOARD fade out—pause—then BOARD fade in. A technique used to indicate a change in time or locale. (See TRANSITION.)

PAY-OFF The solution to the plot of a drama, or SNAPPER of a comedy gag.

PEAK The high point in the variation of sound levels. When the indicator of the VI jumps to or beyond the safety area, the engineer moans, "You're peaking me!" (See VOLUME INDICATOR.)

PERSPECTIVE The placement of a sound effect or actor in relation to distance from the mike. May be ON MIKE, HALF ON, or OFF MIKE, with infinite variations of distance.

PICK IT UP To increase the speed or PACE of a program.

PICK UP CUES (1) A direction to actors, sound or music to respond more quickly when their cue comes. (2) To perform when a specific cue has been given.

PICKUP (1) Point where broadcast originates. (2) Device for picking up sounds from moving records or transcriptions and converting them into electrical impulses. Similar to the tone arm on a phonograph. Also called head. (3) Quality of radio transmission. (4) The location of mikes in relation to sound, cast, and orchestra.

PIPE To transmit a program over telephone lines from one point to another.

PITCH The predominant frequency of vibration per second of a given sound, giving that sound its specific quality that distinguishes it from any other sound of different vibration.

PLATTER Phonograph record, sound recording, or transcription.

PLAY BACK (1) The playing of a recorded show for audition purposes immediately after it has ben recorded. (2) The repeat of a show by means of a recording. Jack Benny broadcasts LIVE to the East in the afternoon. A recording is made of the show, and it is played back at a later hour to the West Coast. (See REBROADCAST.)

PLAY BROADLY Overplay, HAM, or perform in a comic manner.

PLAY DOWN Holding the voice, music, or sound effects to a low volume level.

PLAY STRAIGHT To play a role in a legitimate manner without obvious interpretation or characterization. Opposite of PLAY BROADLY.

PLOT The planned action of "what happens" in a radio show. Some radio dramas seem to have everything else but.

PLUG (1) The advertiser's blurb about the sponsor's product. (2) A mechanical device for connecting electrical circuits.

POINT IT UP To accent or emphasize a sound effect or line of dialogue in order to make it more meaningful.

POT A slang word for VOLUME-CONTROL dial or FADER, usually calibrated in DECIBELS.

PRACTICAL (TV) Any constructed scenery that can be used in a normal way. A practical door is one that may be opened and closed.

PRE-EMPTION The taking of a regularly scheduled time period or program for some special broadcast. When the President speaks, he pre-empts the program regularly scheduled at that time.

PRESENCE See PERSPECTIVE.

PRESSING A permanent record made from a matrix or MASTER.

PREVIEW A performance, sometimes a DRESS REHEARSAL, performed before an invited audience and used to get audience reactions. Many of the top comedy programs use this device to test their gags. A preview is not released on the air.

PRINCIPALS The leading characters of a drama. Also called leads.

PROCESS SCREEN (TV) A large translucent screen on which motion pictures are projected from the rear. It is used in a PROCESS SHOT.

PROCESS SHOT (TV) A scene projected by film on the rear of a translucent PROCESS SCREEN. In front of the screen the camera picks up live action. Used primarily for BACKGROUNDS.

PRODUCER His duties are pretty much the same as a director's, with one exception. A director may work under the supervision of a producer, but in any instance a producer is always the top man in the production phase of a program.

PRODUCTION DIRECTOR The person who is responsible for every portion of a program. He is in charge and on him rests the complete responsibility for the success of the program.

PRODUCTION MAN See CONTACT PRODUCER.

PROGRAM

COMMERCIAL One paid for by the SPONSOR.

SUSTAINING A noncommercial program offered by a network or station for listener entertainment, usually in the hope that some sponsor will become interested. *Duffy's Tavern* started in this way.

PROGRAM DIRECTOR The individual in charge of all programing at a radio station or network.

PROJECTING To increase the volume of the voice so as to be distinctly heard at a distance. An actor off mike projects in order to be heard.

PROP TRUCK A portable cabinet in which the smaller sound effects are wheeled to and from a studio.

PROTECTION RECORD A second recording usually made simultaneously with the original, to be used in case the original is damaged.

PROVISIONAL CUT A CUT in a script tentatively made to be used in case of emergency.

PUNCH To deliver a line with extra force.

PUT A BUTTON ON IT A direction to give a clean decisive ending, usually to music.

PUT A WATCH ON IT To take a TIMING.

QUALITY The attribute of a recording, transcription, or pickup that determines whether or not it is acceptable.

QUE See CUE.

QUICK STUDY A person who has the faculty of quickly grasping the essentials of a situation, story line, or changes in a script. A successful soundman must be a quick study.

RDG Radio Director's Guild.

REACH (1) A writer is said to have reached if he wrote an obviously contrived solution to a plot. (2) The act of the MIXER in deliberately increasing volume level of a microphone in order to amplify a weak sound signal.

READER A derogatory term given to an actor who merely reads words rather than giving them life through interpretation.

READ AROUND Same as READ THROUGH.

READ THROUGH The first reading of the script by the cast, usually before going ON MIKE.

REBROADCAST A repeat of a show done LIVE. (See PLAY BACK.)

RECORDED Sounds permanently preserved on film, tape, wire, or record.

REGIONAL A network covering a specific area less than transcontinental in size. Don Lee is a regional network covering the West Coast.

REHEARSAL The period during which a program is prepared for public presentation.

REHEARSAL (TV) See CAMERA REHEARSAL; DRY REHEARSAL; TECHNICAL REHEARSAL.

REMOTE A broadcast originating from a place other than a radio station. Football broadcasts are remotes.

REPEAT A show that is repeated by PLAYBACK or REBROADCAST.

REPEAT GROOVE A flaw in a recording or transcription that causes the pickup needle to stay in the same groove, thus repeating the same few words or sounds over and over.

REPLACEMENT A program that substitutes for a regular program which is on a summer HIATUS.

RESEARCH The checking by writers or soundmen through source material to authenticate their efforts on a program.

RESONANCE (1) The audible result when two different freely vibrating bodies have the same frequency of vibration. (2) The body or fullness added to a sound to make it solid or full sounding.

REVERBERATION The successive reflection or return of a sound at intervals too short for the ear to distinguish. The sound seems continuous but dies out in intensity. (See ECHO.)

REVERSE ANGLE (TV) Worked in conjunction with an ANGLE SHOT. Same subject seen from opposing angle by means of cutting back and forth between two or more cameras. Used for emphasis and changed viewpoint.

REVIEW The comments made by a professional critic about a particular performance.

RHEOSTAT A variable resistor. POTS, FADERS, and VOLUME CONTROLS are rheostats.

RHYTHM A periodic, regular, harmonious beat or cadence. Time, as contrasted to rhythm, usually has an irregular beat or cadence.

RIBBON A velocity microphone with a bidirectional pickup pattern. Used a great deal as cast (actor's) mikes.

RIDE GAIN Controlling the volume of sound from microphones or turntable pickups to assure correct level for proper transmission.

RISER (1) Small platforms used to elevate sections of an orchestra so as to secure proper balance. (2) A raised platform on which body falls are done.

R.P.M. Revolutions per minute. A phonograph record revolves at 78 r.p.m., a transcription at $33\frac{1}{3}$ r.p.m.

RUNNING TIME Refers to the timing of a script page by page. Usually marked every 30 sec. (See BACK-TIME; IDEAL TIME.)

RUN OVER (1) When a program goes past the scheduled time for ending. (2) To review or re-rehearse a portion of a program.

RUN THROUGH The first rehearsal by cast, sound, and music on mike. (See READ THROUGH)

RWG Radio Writers' Guild.

SCENE (1) The setting for the action of a play or drama. The scene is the "where." (2) A division of an act or play.

SCENE SHIFTING Various techniques used in changing locales or time elements of a play. (See FADE; TRANSITION.)

SCHEDULE A radio station timetable. All station operations are governed by the schedule.

SCHMALTZ A highly sentimental performance; a "hearts and flowers" type of thing.

SCRIPT Short for manuscript. The text of a written play. Sometimes called continuity.

SEGUE Pronounced seg-way. A term peculiar to radio and used in three different senses. (1) A musical direction to proceed to a new theme or from one musical number to another without obvious break. (2) In sound a technique used in recorded effects. Two separate but related sounds are blended together in proper sequence without appreciable pause or wait. (3) Segues are used on the playbacks of transcribed dramatic or musical programs that run longer than 15 min. A half-hour playback will consist of two 16-in. disks, each running 15 min. The engineer segues from the first to the second disk without noticeable break in the continuity. This calls for a high degree of skill on the part of the engineer. However, as half hour programs may be recorded without interruption on tape, a tape playback eliminates the need for a segue.

SEQUENCE Events, sound patterns, or musical notes that follow one another in a prescribed order.

SEQUENCE (TV) A complete scene in a TV production.

SERIAL A program given in installments and telling a continuous story.

SET (1) To set a level is to determine just how loud or at what perspective (in relation to the mike) an actor or sound effect should be heard. (2) See PAT.

SET (TV) The physical setting viewed by a TV camera.

SETUP The arrangement of the orchestra, cast, sound effects and announcer in relation to their respective mikes and to each other. The setup is the placement of equipment and personnel for the best PICKUP.

SHOT (TV) An individual scene as shown by a TV camera.

SHOT PAD Used in the early days of radio to simulate the sound of a pistol shot. Consisted of a leather cushion which was struck by a thin flat stick.

SHOW The complete broadcast program.

SIGNATURE The theme song, music, sound, or catch phrase that identifies a specific program. (See THEME.)

SITUATION Synonymous with PLOT. The problem to be solved in a drama by characters and their reactions to the situation.

SLIDE WHISTLE A comedy effect used to indicate comedy falls or jumps. Has an ascending or descending continuous note. Also called a sloop whistle.

SNAPPER The pay-off of a script, or the final line of a comedy routine.

SNEAK Very gradual fades whose beginnings or endings are barely perceptible.

SOAP OPERA An undignified name for the daytime serials about life, liberty, and the pursuit of misery. Most of these programs are sponsored by the large soap manufacturing concerns, hence soap opera.

SONO SHOT An electronic device to simulate the sound of pistol shots. (See Chapter 8, Electronic and Acoustical Effects.)

SOTTO Short for sotto voce. A direction to speak softly.

SOUND Any audible vibration. Besides PITCH, sounds have two related attributes, INTENSITY and LOUDNESS. Intensity is a physical term used to denote the amount of energy in a sound. Loudness refers to the sensation evoked by a given sound intensity. That intensity and loudness are not synonymous is due to the fact that the ear is not uniformly sensitive throughout the entire range of audible frequencies.

SOUND Sound in this book is an over-all term referring to a soundman, the sound department, or a sound effect.

SOUND-ARTIST Another name for SOUNDMAN.

SOUND EFFECTS Sounds produced by records, vocally, manually, or electronically to give action, mood, and atmosphere to a radio play.

SOUNDMAN The technician (or artist) who creates, produces, and controls sound effects.

SOUND TABLE Same as SOUND TRUCK.

SOUND TRUCK A movable cabinet containing electrically operated turntables, with various modifying controls, that reproduces recorded sound effects through an attached speaker. Also called a jeep or console.

SOUR Any sound that is off pitch or fails to come up to expectations.

SPEAKER Short for loudspeaker. A device for converting electrical energy into sound energy, the strength of the sound produced being sufficient to be audible at a distance. A speaker reverses the action of a MICROPHONE.

SPEED The proper r.p.m. for a record. To get up speed is to have the record revolving at the proper r.p.m. before using.

SPEEDY-Q The trade name of a commercial sound-effects record manufacturing company.

SPIEL The COMMERCIAL.

SPLASH TANK A specially designed water container used for such effects as bodies falling into water, swimming, wading in water, and the like.

SPONSOR The advertiser who pays the bills for a commercial show. You may not like his COMMERCIALS, but remember, he is the person who brings you Bob Hope, Fibber McGee, The Lone Ranger, Hopalong, Jack Benny, etc.

SPONSORED SHOW A COMMERCIAL show. Opposite of a SUSTAINING show.

SPOT A commercial announcement, usually isolated from any particular show, and generally given at the STATION BREAK.

SPOT CUE To place the pickup arm of a turntable in the exact groove of a recording so as to get a specific sound.

SPREAD An elastic period of time that allows for any increase in the PACE of a performance. Say a 29-min. 30-sec. show timed 29:10 on the DRESS REHEARSAL. The twenty seconds' difference is the spread.

STAGE MANAGER (TV) See FLOOR MANAGER.

STANDARD The trade name of a firm manufacturing commercial sound-effects records.

STAND BY (verb) The warning given to those in a studio that they are about to go on the air. Usually given about ten or fifteen seconds before air time.

STAND-BY (noun) A substitute program ready to take the air in case of an emergency.

STATION BREAK Station identification by giving the CALL LETTERS. Usually done between programs. SPOT announcements generally are also given at this time.

STATION IDENTIFICATION Same as STATION BREAK.

STAY WITH A direction term meaning that the actor or sound continues on mike, although they are apparently in movement. In other words there is no change in PERSPECTIVE.

STEP IT UP Increase the VOLUME. Note the difference from PICK IT UP, or increase in TEMPO.

STET A proof-reading term meaning to let stand as originally written. To stet a CUT is to return it to the SCRIPT.

STING A sharp and emphatic music cue with a sforzando effect.

STOCK Routine sound effects or conventional characterization.

STOP THE SHOW Applause or laughter so prolonged that the performance is obliged to halt momentarily.

STRANGE INTERLUDE DEVICE Characters "speaking" their thoughts. A combination of the old soliloquy and aside; used a great deal in psychological dramas and soap operas. Generally indicated by use of the FILTER.

STRETCH Slowing down the PACE of a program so as to consume time. Stretch is used when the show is running ahead of the IDEAL TIME.

STRIKE Clear the studio of equipment after a performance has been completed.

STRIP SHOW A serial program, usually five times a week at the same hour. A strip runs ACROSS THE BOARD. Soap operas come under the strip show classification.

STUDIO A room especially designed and constructed for the production of radio programs.

STUDIO FADE Sometimes called an actor's fade. This is a FADE wherein the actor moves away from the microphone. It is different than a BOARD FADE, which is done mechanically by the engineer.

SUPERIMPOSURE (TV) A double exposure. It is an extended LAP DISSOLVE effect in which two different scenes are shown at the same time, the output of two cameras put ON THE LINE simultaneously.

SURFACE Hissing or scratching noises caused by the pickup needle in the groove of a worn-out or imperfect record. Also called FRYING.

SUSTAIN To continue a sound effect.

SUSTAINING An unsponsored show, or one that has not been purchased by a commercial firm. Serves two purposes: (1) A radio station must stay on the air so many hours a day in order to retain its license. The unsold portions of time are filled with sustaining shows. (2) Used to develop new program ideas and talent.

SWELL A direction term to sound or music to momentarily increase volume.

SYNC SOUND (TV) Short for synchronous sound. (See NATURAL SOUND.)

SYNCHRONOUS SOUND See NATURAL SOUND.

SYSTEM CUE Identification of a network by mention of the network's name. Given at the conclusion of a network program. "This is CBS, the Columbia Broadcasting System" is a system cue.

TABLE Short for TURNTABLE.

TAG The conclusive ending to a scene, usually done by music.

TAG LINE Same as a SNAPPER.

TAKE (1) A reaction or sudden obvious realization by an actor. (2) An actor supposedly struck during a fight will do takes to the blows.

TAKE IT AWAY (1) CUE to begin the program. (2) Music or sound suddenly swells to a climax, overshadowing whatever has been going on previously.

TAKE IT DOWN A direction to decrease the VOLUME.

T.C. Short for transcontinental. Means a network show that reaches from coast to coast.

TECHNICAL REHEARSAL (TV) Rehearsal of cast and production staff except camera crew. (See CAMERA REHEARSAL; DRY REHEARSAL.)

TELECAST (TV) The television broadcast.

TELEVIEWER (TV) An individual member of the TV audience.

TELEVISION (TV) From *tele* (far) *vision* (seeing). The instantaneous transmission of visual and aural images to a distance for pickup by an unlimited number of receivers.

TEMPO The relative speed or PACE of a performance.

THEME Usually consists of an especially composed or particularly apropos bit of music that identifies a specific program. Bob Hope's theme is "Thanks for the Memory." The theme for the Lone Ranger is the *William Tell Overture*. (See SIGNATURE.)

THROW A CUE The director's visual hand signal to proceed.

THROW IT AWAY To give a line in a casual and offhand manner. To speak without obvious emphasis or expression.

THUNDER SCREEN A piece of audio-frequency equipment used to simulate the sound of thunder or explosions. (See Chapter 8, Electronic and Acoustical Effects.)

TIGHT (1) A program that barely fits within the time limits or is slightly too long. A tight show is liable to RUN OVER unless CUTS are made or the PACE picked up. Whenever you hear a star say "We're a little late folks, goodnight!" the show was tight. (2) When applied to recorded sound effects, means that two sounds on a record are so close together it is very difficult to pick up the desired sound without getting the second or unwanted sound.

TILT SHOT (TV) A change in vertical view of a camera.

TIME The period available on the air for a given program.

TIMING (1) In sound, the sensitive and accurate synchronization of a soundman's activities to the direct or inferred action in a script. (2) In production, the time intervals on a script indicating where the performance should be in relation to the allotted or elapsed time of the program. (See IDEAL TIME; BACK-TIME.)

TONE The timbre of a specific sound depending on its frequency vibration.

TONE ARM See PICKUP. Also called head.

TONE CONTROL On sound-reproducing units, the controls that vary the HIGHS and LOWS. Also called filters.

TOP IT See BUILD.

TRANSCRIBED Recorded for specific use on radio broadcasting, usually at 33⅓ r.p.m.

TRANSCRIPTION Short for electrical transcription. A mechanical means of recording and reproducing any sound at will.

TRANSITION The changing or moving from one scene to another by one of four methods: music, sound, pause, or narration. (See Chapter 9, Special Uses of Sound.)

TRAVELING MIKE See MOVING MIKE.

TRAVEL SHOT (TV) The same as a DOLLY SHOT.

TRUCKING (TV) See DOLLY SHOT.

TRY OUT See AUDITION.

TURKEY A show that despite an elaborate outlay of time, money, and talent just doesn't jell.

TURNTABLE A revolving platform on which records are rotated at specified speed. The sounds on the records are picked up by the attached tone arm.

TWANG BOX See BOING BOX.

TWIST An unusual or surprise ending to a story. O. Henry stories have a twist ending.

TWO-SHOT (TV) Close-up of two people.

TWX Pronounced "twix" and means a teletype.

TYPE (noun) An actor's voice suited to a specific kind of part. (verb) To limit an actor to one kind of role.

UNDER (1) A program that does not fill the allotted time. A program that runs short and calls for the use of padding, FILL, or CUSHION. (2) To sustain and subordinate one facet of the drama under another. For example, music may be running under the dialogue, or the sound of a motorcar may be held under the dialogue. (3) To decrease or sustain at a lower volume level than normally.

UNDERPLAY An actor performing in a very restrained manner.

UNIDIRECTIONAL A microphone whose pickup pattern works only in one direction. (See BIDIRECTIONAL; NONDIRECTIONAL.)

VELOCITY MIKE A RIBBON type of microphone.

VI Abbreviation of VOLUME INDICATOR.

VIDEO (TV) From the Latin, "I see." The visual portion of a TELECAST. Contrasted to the AUDIO, which is the aural portion.

VIDEO ENGINEER (TV) The engineer who controls picture quality and makes switches from one camera to another as well as producing visual effects such as FADES, DISSOLVES, SUPERIMPOSURES, etc. The video engineer monitors the visual portion of a TELECAST. (See AUDIO ENGINEER.)

VISUAL GAG A sound effect or comedy routine produced for laughs on an audience show. It has to be seen rather than just heard.

VISUAL SHOW A radio program presented before an audience. A LIVE show.

VOCAL A sound effect done orally. Contrasted to MANUAL, RECORDED, and ELECTRONIC effects.

VOLUME The fullness or quantity of a sound.

VOLUME CONTROL A variable resistor that controls the volume or degree of loudness of a sound.

VOLUME INDICATOR A very sensitive meter on a control PANEL by which the engineer gauges the amount of VOLUME being sent out. From the needle indicator on the gauge the engineer can see the amount of sound, rather than judge by ear alone. Usually abbreviated to VI.

WALLA WALLA AD LIBS by a cast to simulate the sounds of a crowd.

WALKING BOARD Small wooden surface used by soundmen to give the sound of walking on wood.

WALK-THROUGH REHEARSAL (TV) Same as DRY REHEARSAL.

WAITS (1) An unwanted pause caused by a performer missing his PICKUP CUES. (2) An actor, sound, or music deliberately holding off on their CUE, in order not to smother a laugh on an audience comedy show. (3) Any hole or silent spot on a program where there should have been something said or done.

WAX (noun) A RECORDING or PLATTER. (verb) To wax a show is to record it.

WEB A NETWORK or segment thereof.

WHIP SHOT (TV) A very fast PAN shot that blurs the scene by the speed of turning the camera. Used for a dramatic shift of interest or startling change of locale.

WIND IT UP (1) To increase TEMPO or PACE. (2) To bring to a climax or finish.

WHODUNIT A mystery thriller.

WOODSHED (1) A hard, tiring rehearsal. (2) The extra individual rehearsal by a conscientious actor.

WOW (1) A distortion of sound on a transcription or record. (2) A record, transcription, or sound recording audibly released before speed has been attained, with a resultant unpleasant sound. (3) An undulating change in PITCH caused by the uneven revolutions of a TURNTABLE.

YAK (1) A lot of talk. (2) Unnecessary talk.

YUK Slang term for a big laugh.

ZERO The uppermost normal operation limit of the VOLUME INDICATOR.

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(See also listing of recorded effects, pages 67–74, and Glossary)

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