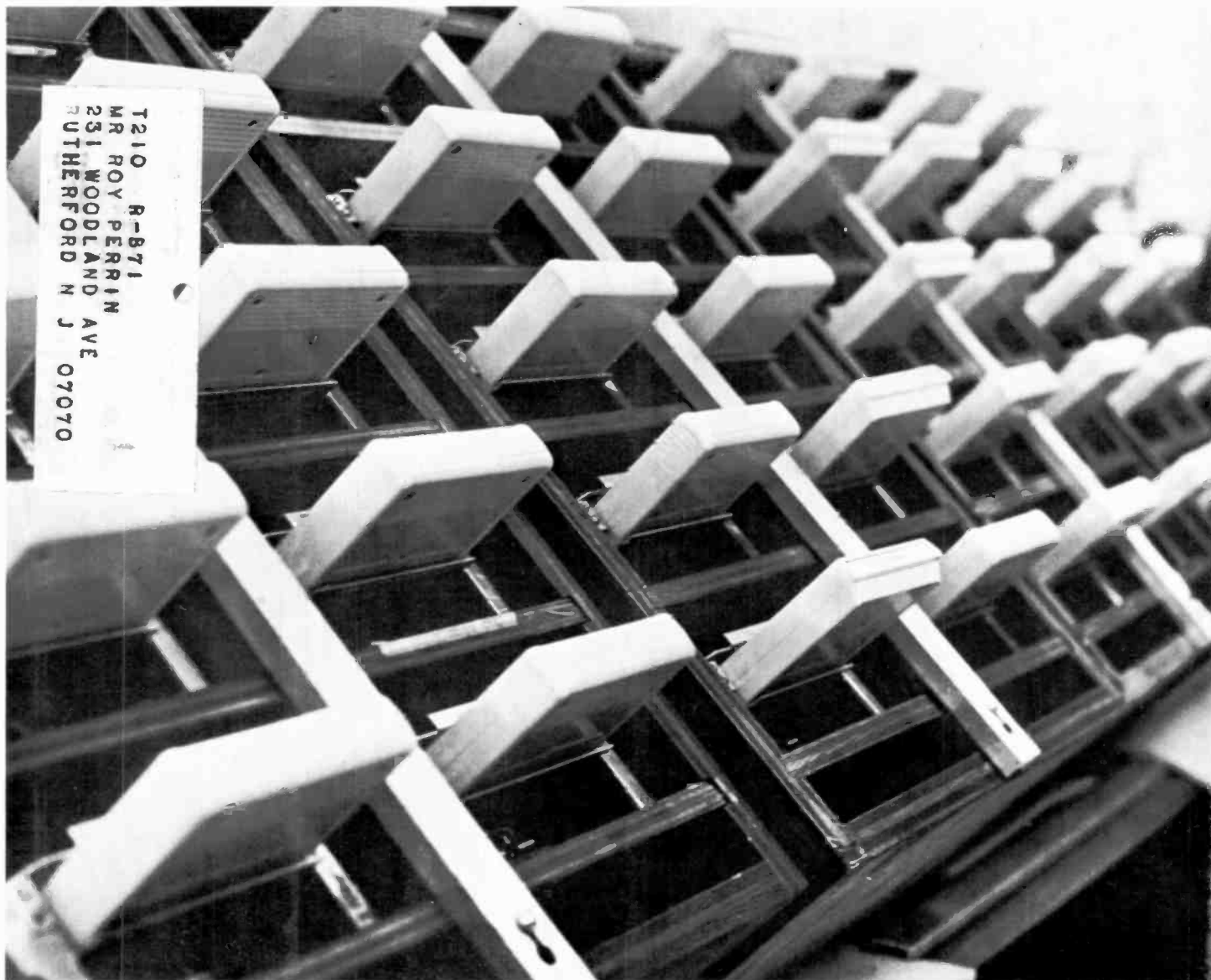


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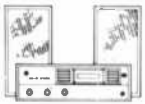
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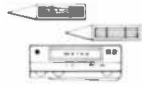
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NOTES

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Contrary to what the salesman may tell you, cassettes do jam up from time to time. This usually happens most often with the lower-cost bargain cassettes, but it can (and has) happen with the high-priced spread as well. If it happens in a cassette that's held together with screws, fine and dandy; you just remove the screws, separate the cassette halves and hope that you don't spill the guts all over the floor. Ever try to rewind 1/7-inch-wide cassette tape by hand? If you never have, you're missing one of the truly invigorating experiences of life.

Assuming you have a steady hand and don't spill the beans, you can dismantle the troubled cassette fairly easily, snip out the jammed section of tape, splice, trim, and reassemble. Sometimes the leader will come loose from its captive hub. Replace this double width in the friction slot. If you must use glue, be sure none gets anywhere but in the hub slot. Otherwise, the cassette will never be the same again.

What about the cassettes that don't have screws holding them together? Throw 'em out? Not on your life. Pry the baby open with a penknife—carefully—working the knife blade down the crack in the edge, a little at a time. When the two halves of the clam shell finally separate, they may do it with some gusto, so be on the alert to avoid tape spillage. Make the repairs as above, reassemble the cassette and stick the two halves together with ordinary Scotch tape. Just don't cover any holes with the tape and you'll be all right.

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MAY, 1969

VOLUME 16, NO. 5

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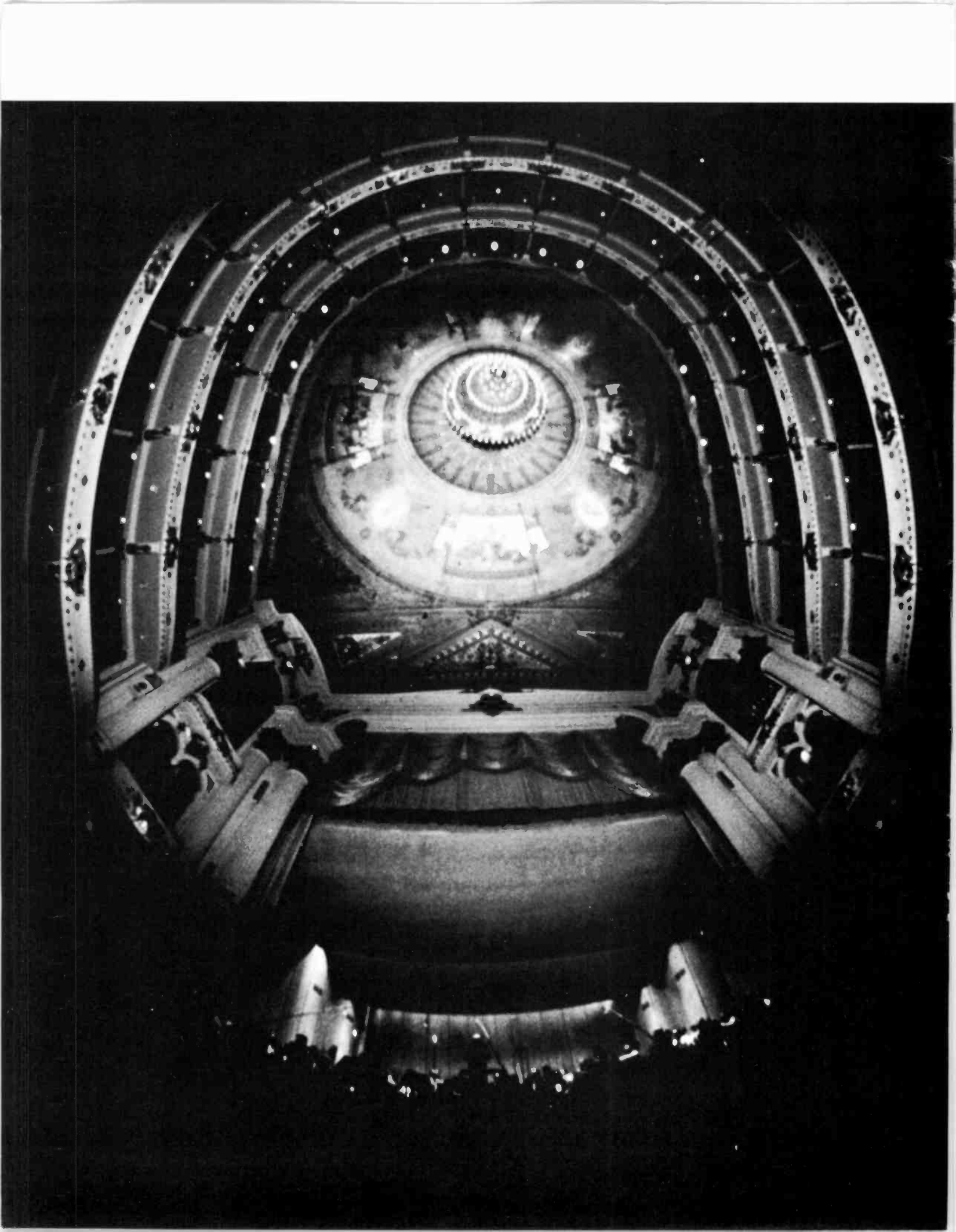
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Throughout history, the concert hall has been as much a part of music as the instruments and the conductor at the podium. Sounds that reverberate off walls, ceiling, and floor are even more crucial than direct sound in forming the blends of tones that make up an enjoyable musical performance.

A "live" (reverberant) hall imparts fullness of tone, yet, on the other hand, too much reverberation will muddle the music. If the time gap between direct sound and reverberation is small, the audience will have a sense of presence or intimacy with the orchestra. A good hall also imparts envelopment, an exotic feeling of being surrounded by the music. The stage and pit design, together with ceiling construction, are major factors in blending the music so that the sound from the various instruments seems harmonious to the audience. In short, the concert hall is an acoustical envelope for the music.

The importance of the acoustical envelope has been known since the ancient Greeks built their amphitheaters on Athenian hillsides, with a wall behind the stage to reflect the voices of the performers back into the audience. From the Middle Ages to the end of the eighteenth century, most composers deliberately shaped their music to meet acoustical requirements of performance sites, usually cathedrals, drawing rooms, or outdoors. For example, the forms used by Mozart and Haydn in their chamber and orchestra music are identical; but the counterpoint, ornamentation, layout of chords, and the rate at which harmonies change vary according to whether the piece is room music, concert music, or street music. And, it is no coincidence that Gregorian chants sound best in a hall acoustically resembling a medieval cathedral, where reverberation time is as long as 10 seconds.

The maverick was Richard Wagner, who broke with the Baroque-like opera tradition to create personalized, rich, stirring music. However, in order to achieve a good acoustical environment for his musical style, he also had to design his own opera house. The Festspielhaus in Bayreuth, Germany, which combines a relatively long reverberation time with thoroughly blended orchestra tones, today is literally a monument to Wagner's music. Most musicians claim his music sounds best there, while it is a relatively poor hall for almost all other compositions.

The era of the contemporary concert hall began some 200 years ago, perhaps with the opening of Milan's famed La Scala opera house with its much copied horseshoe design. On the whole, these early halls were built narrower than their modern counterparts, with smaller and more concentrated

ACOUSTICS IN THE CONCERT HALL

by Edward McIntyre





seating areas—less room for each seat. For example, La Scala has a present capacity of only 2,289 seats, many with obstructed views of the stage, and allows just five and a half square feet of space per person, compared to the American standard of seven and a half square feet for comfort and safety. This is a major part of the reason for the intimacy and the richness of sound that have made the Italian opera house and other old classical music halls world-renowned.

According to a leading authority, an American concert hall of the same magnitude would require a seating area of about double that of La Scala and would have to be laid out for optimum viewing as well as listening. This could be obtained only with a certain loss of richness and intimacy. An audience absorbs sound the way a thick carpet does; in proportion to the area, not the number of tufts comprising it.

Acoustical engineering for the concert hall is a complex craft in America today for both economic and architectural reasons. Major concert halls in this country must seat at least three to four thousand persons to be profitable. Since indirect sounds or reverberations become an even greater musical factor in a large auditorium, more variables face the designer. Another acoustical handicap is caused by the fact that almost all halls must serve a variety of purposes, ranging from symphonic and chamber music performances to plays and lectures. Howard Taubman, music critic of the *New York Times*, tactfully understated the problem this way. "One must feel that multi-purpose acoustics are not the ideal solution for strictly musical purposes." A reverberant hall that would be excellent for a symphony orchestra may make an articulate lecturer sound muddled.

Designing optimum acoustics into a large concert hall, even for purely musical purposes, is at best chancy. Blueprints and engineering drawings simply cannot precisely predict the acoustical qualities of a filled auditorium. For example, Philharmonic Hall in New York, heralded as the ultimate in acoustical sophistication, was criticized after its opening for being too thin in sound, lacking power, and being weak in bass tones. Major architectural alterations, at a cost of some \$2 million, have corrected these faults although not to everyone's satisfaction. In Orchestra Hall in Chicago, strange pockets of acoustical configurations make the sound of the harp overpower all other instruments in certain boxes. For half a century, this phenomenon has defied correction.



Perfect acoustics, however, is more than a matter of the projection of faint sounds from the stage to the most distant seats. "But I don't want to hear a pin drop. I want to hear an orchestra," replied Eugene Ormandy, conductor of the Philadelphia Symphony, to the manager of a world-famous concert hall who claimed that his auditorium had perfect acoustics because the entire audience could hear a pin drop on stage.

The ideal concert hall will bring a balance of tones to listeners in all parts of the auditorium. It will strike an optimum balance between richness and clarity of sound and create a feeling of intimacy. It will also give the audience an illusion of being entirely surrounded by music.

Although this dream hall probably does not exist, most auditoriums can be improved either architecturally or electronically. The traditional method has been to change the physical structure of the interior, but this is usually very expensive, partly because it is basically a trial-and-error proposition. The multimillion-dollar alteration of Philharmonic Hall is a case in point.

The original design of the Hall aimed for a combination of acoustical qualities, including a reverberation time of 2 to 2.22 seconds (considered ideal for symphonic music) and strong first reflections to create intimacy. Most experts believe that intimacy stems from having the first in a series of reflections that make up the reverberation come in strongly and quickly—within 20 to 50 thousandths of a second—after the original sound from the stage. To produce such a quick bounce, there must be a reflecting surface near every member of the audience. But many seats in Philharmonic Hall, particularly in the front and center, were too far away from the side walls. To overcome this handicap, shield-shaped "clouds" were installed below the ceiling to provide quick first reflections to all parts of the Hall. These clouds were employed, rather than simply lowering the ceiling, to allow part of the sound to go right through to the top of the Hall, thus aiding the reverberation time. This

part of the design was successful. The reverberation time was electronically measured at 2.2 seconds, ample in nearly every hall for a full, rich sound. However, the first-night audience received clarity of sound, but with dry, as opposed to rich, bass tones and no feeling of the power of the music, exactly opposite of what was expected.

Although there is still some controversy, most acousticians believe that the particular sizes and spacings of these clouds had an anti-bass focusing effect, emphasizing instead the sounds of violins and cymbals. In addition, they believe that the balance between the early reflections bouncing off the clouds and the later ones coming off the ceiling was out of line, cutting down on the power of sound.

In any case, the concept of separated clouds was drastically revised. The clouds were raised and the space between them and the ceiling was filled in. Reflecting surfaces were strengthened in some parts of the Hall, with more wood being used. (It is still debatable whether wood is the ideal reflecting surface for a concert hall.) Improvements have been noticed. Philharmonic Hall has a much warmer and deeper tone than when it opened.

The twentieth century has no monopoly on acoustical disasters. The oval-shaped, 5,000-seat Royal Albert Hall built nearly 100 years ago is so wide that the reverberation from the far walls creates strong echoes. A bitter quip of music critics some years ago was that Albert Hall was their favorite spot for music because they got two and sometimes three concerts at the same time for the price of one. In recent years, the strength of the echoes has been reduced by installing large sound-absorbing surfaces, such as fiberglass, that cut down on reflected sound. But, this does nothing to change the sensation of being miles away from the orchestra.

Recently, electronics has been playing an increasing role in the concert hall, much to the chagrin of certain musical purists. There is a widespread feeling that once sound has come through a loudspeaker it is no longer "pure"—that it is an intrusion between



musician and audience. This is understandable since many electronic systems still used on the Broadway stage and in local amphitheatres range in quality from poor to fair.

However, professional concert hall systems of today put out sound that is indistinguishable from the original. Used with sophistication, an electronic system can lift the weak elements of a hall without changing the basic "hall sound." Electronics has aided concert halls without any listener being aware of its presence.

For example, electronics adds richness to the clarity of tone at the Royal Festival Hall, which was built in London 17 years ago. The designers of the auditorium initially managed to get the clarity they were after, and the Hall had what was supposed to be an acceptable reverberation time. However, the sound was too dry and lacked resonance and power. Since the interior surfaces were made strongly reflective of sound, there was no architectural way of increasing reverberation time short of making the Hall larger. So management went to electronics for help.

Without any public announcement, a series of microphones was installed in the ceiling to pick up the reverberant sound, rather than the direct sound from the stage. These sounds were then fed into amplifiers and loud-speakers to be projected back at a higher volume level. This system gave birth to the term "assisted resonance" since its aim was simply to strengthen the natural resonances of the Hall. Critics, without knowing why, found the Hall much richer after the system got under way and only after the improvement had been noted did the management give the reason.

Electronics does nearly everything at the mammoth Palace of Congress in the Kremlin. Since the hall has 6,000 seats, top-flight musical acoustics would be out of the question by any other means. The hall was made rather sound-absorbent to avoid the echoes caused by long-traveled reverberation, and literally hundreds of speakers were installed, controlled by a skilled operator at a panel. To reate







intimacy, he can custom-feed a quick first reflection everywhere in the hall to coincide with the direct sound from the stage. He can also delay reflections with the right characteristics for a pleasing reverberation in all sections of the auditorium. In fact, the operator has such complete control over the reverberation that he can adjust it for each style of music and even for individual pieces. This versatile acoustical system has made the Kremlin hall an all-purpose auditorium. It can create an ideal acoustical envelope for a symphony orchestra or it can be adjusted for lectures or dramas that require great clarity and little reverberation. Since this system requires high musical and technical skill at the control panel, there is a school in Moscow to train operators.

In America as well as Europe, electronics has heightened the enjoyment of the musical audience. For example, it not only improves acoustical qualities at the Philadelphia Civic Auditorium, but, in addition, it gives opera performances three full dimensions. Music had previously never been heard well there for the same reason that makes any large hall risky for music: many seats were simply too far away.

John H. Volkman of RCA Laboratories studied the problem and recommended an "auditory perspective" system. This means that the microphones and speakers would be placed in locations that would convey a sense of movement to the audience.

The system uses seven channels with the microphones placed in an oval pattern covering a specific area of the stage. The seven speakers are in the ceiling in a corresponding pattern, each delivering sound to the whole Auditorium from a slightly different location. Acoustically, the system is designed to work with the natural reverberation in the hall. The combination of the spatial pattern of the speakers and the visual action on the stage gives the audience a convincing sense that the sound is coming from a particular singer at a specific location. The performers themselves are kept aware of how they sound out in the hall by means of seven subsidiary speakers trained on the stage.

The use of seven channels, rather than just two or three, allows the system to be self-adjusting to a degree. The operator is not under pressure to follow ups and downs of volume, because the singer moves from the area of one microphone to another.

The latest application of electronic aid to music is also in Philadelphia, at the Academy of Music. This auditorium had long been noted for great clarity, but it suffered from dryness. The reverberation time was simply too short for full rich sounds. Although local audiences have adjusted to the sound for live performances, it was entirely unsatisfactory for recordings.

Mr. Volkman, together with John Pfeiffer, an executive producer of RCA Red Seal records, designed an electronic system that increased reverberation time from a low of 1.4 seconds to a fine full 2.2 seconds. A recent recording session with the Philadelphia Symphony Orchestra showed the tremendous improvement in the concert hall.

The future of electronics in the concert hall is very promising. It is an economical and efficient answer to the acoustical problems that are almost inherent in giant multipurpose auditoriums of today. According to Mr. Pfeiffer, "If the direct sound from the orchestra is pleasant and not out of balance by improper stage reflectors, modern electronics makes it economically feasible to improve acoustically a concert hall of any size and quality.

by Tommy Thomas

HERE'S A MAGIC GENIE FOR

Last month we introduced you to a simple little relay device that coupled to your recorder for but a single function: the automatic control of a 35mm slide projector. Let's add greatly to its versatility by adding another relay plus a few switches and other assorted electrical paraphernalia. Now, limited mostly only by our own imagination, *we'll be able to do an almost infinite variety of automatic tasks with our tape machines.*

But first, so you can better understand a few examples of what magic can be done—and so as to get your own mind buzzing with ideas—let me briefly explain the main functions of the “Sensor Master”:

Function 1: Connector “C” goes to a SPST set of 5-amp. contacts that are *momentary-acting* . . . that is, they only stay closed as long as current is applied to the relay. This is controlled by the length of the foil sensing strips on the recording tape as well as by the speed the tape is running.

Function 2: Connector “F” goes to a SPST set of 5-amp. contacts that are *holding contacts* . . . that is, when a short pulse of current causes the contacts to close or open, they STAY closed or open even though the current to the relay stops. Each new pulse of electricity (triggered by a new foil strip on the moving tape) reverses the position of the contacts.

Function 3: Connector “H” goes to the same set of SPST *holding* contacts, but also included is a direct hookup to 110-volts a.c. Hence, anything within the 5-amp. (non-inductive) limits of the contacts will not only be controlled by these contacts, but the necessary electricity is also supplied.

NOW FOR A FEW EXAMPLES!

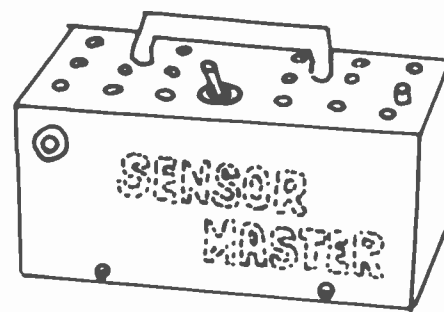
Function 1: The best use for momentary contacts was demonstrated last month, with the slide projector, but there are other uses as well. For instance, you could hook up a *Signaling Device* (with flashlight batteries and a “blinker” light) that would signal you automatically every so often . . . perhaps letting you know every five or ten minutes that that much tape was used up.

Function 2: The “On-Off” holding contacts can be used in many different ways, but perhaps the most useful is when this switching control is hooked up to the MOTOR of your recorder (Fig. 7). This way, when the motor stops the tape stops too, but the amplifier remains on, warmed and ready to go. This function would be especially useful for those of you with recorders that do not already have an automatic shut-off feature built into the machine.

Function 3: This is the most versatile function of all because so many different electrical devices can be plugged directly into the Sensor Master unit both for power and automatic control. You can plug the recorder itself in, for example. Or even *two* recorders, say, if you're copying tapes. Then, with a strip of foil on the “master” tape at the end of the selection you are copying, both machines will turn themselves off when through. You don't even have to be around to monitor the operation once you get it going.*****Or you can plug ELECTRIC LIGHTS into socket “H” instead. For fun use, for instance, especially for kids at a party, set up with all the room lights off except a table lamp that is plugged into the Sensor Unit for power (and control). Then put on a narration tape where you're telling jokes and stories to the children. When you get to a ghost story, a piece of foil on the recording tape at that point will plunge the room into scary darkness by turning off the table lamp automatically, and then turn it on again when the story is over.***** My own favorite with lights is to plug a small red lamp bulb (7 watt, 110-VAC) directly into the rear of the Sensor Unit, at “H”, and then prepare my tapes with a foil strip a few minutes away from the end (see Fig. 12). That way, the red lamp will go on *before* the end of the tape is reached, alerting me to be prepared. Etc., etc.

Now let's build this unit. Last month we worked with the transformer and the first simple relay, so we'll pick it up from there. The added relay (Fig. 3, left) is a *Guardian* Type IR-610L-A115 Latching Relay with SPST contacts. It came from Newark Electronics Corp., 223 W. Madison St., Chicago 6, Ill.,

YOUR RECORDER



and is their Stock No. 24F097, selling for \$3.80 plus postage on 4 oz. This is a 60-cycle, 110-volt AC relay that is directly controlled by the first relay. NOTE! You may be able to get many of the following parts from your local hi-fi store or electronics supply house, but just in case you're not able to, I'll list a mail order source:

PART "A": An ordinary 110-volt male plug with about five or so feet of lamp cord attached.

PART "B": A *Switchcraft* Type 3501FP Phono Jack. This phono jack may be obtained from the Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill. It's their Stock No. 41H758, for 21 cents, 3 oz. shpg. wt. You'll also need a matching Type 3501M Plug, Allied Stock No. 41H599, for 6 cents.

PART "C": A *Cinch-Jones* Type S-302-AB two-contact Socket for chassis mounting. Allied Stock No. 40H880, 27 cents, 3 oz. The matching male plug is a *Cinch-Jones* Type P-302-CCT two-contact Plug with cable clamp. Allied Stock No. 40H802, 57 cents, 3 oz.

PART "D": A heavy-duty 6-amp. DPDT Toggle Switch with bat handle, from Lafayette Radio Electronics Corp., P. O. Box 88, Syosset, L. I., New York. It's their Stock No. SW-22, 32 cents, 3 oz.

PART "E": A neon On-Off "Jiffi-Lite" Indicator Lamp, Lafayette Stock No. MS-695, 46 cents, 4 oz. So you won't leave the unit plugged in.

PART "F": Same as Part "C".

PART "G": Same as Part "D".

PART "H": A Type 2R2 molded bakelite Chassis AC Socket. Allied Stock No. 40H830, 17 cents, 2 oz.

PART "J": A Type 80541-E Momentary Contact Push Button SPST Normally-Open Switch, Newark Stock No. 23F119, 74 cents, 2 oz. This switch is used to bypass the contacts on the recorder when necessary: to test the relays, other equipment, etc.

PART "K": Same as Part "C".

PART "X": The same 18 cents .01 Mfd., 600 VDC *Sprague* Capacitor mentioned in March issue, for shunting across the relay contacts to reduce excessive arcing whenever possible.

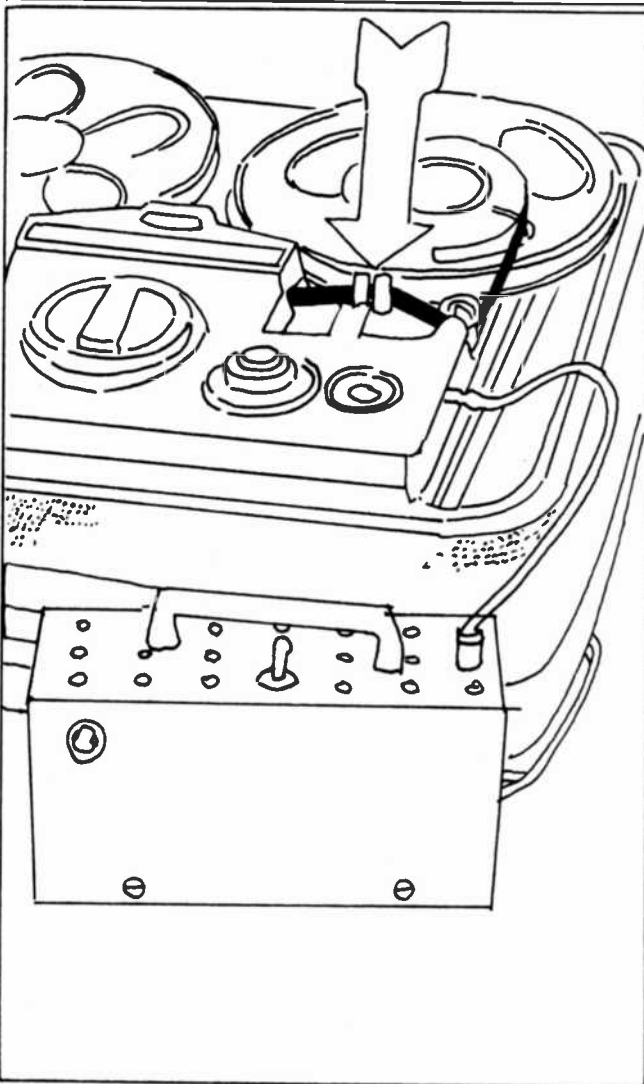
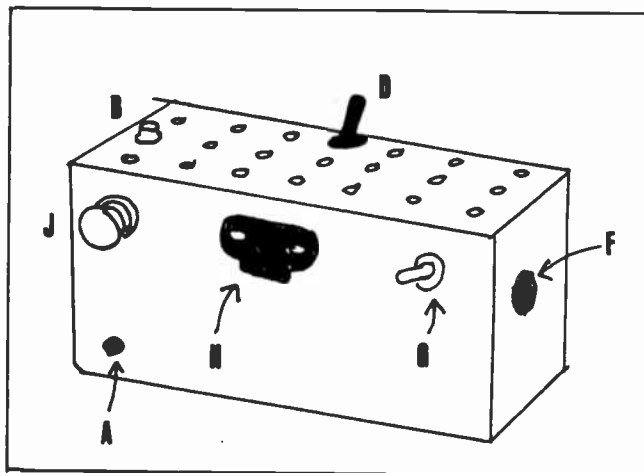
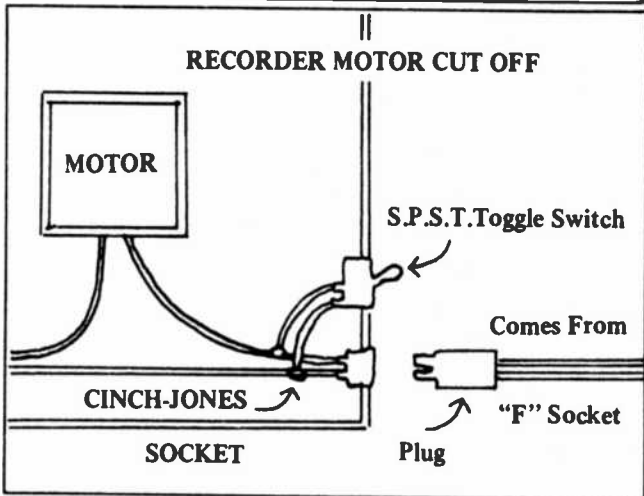
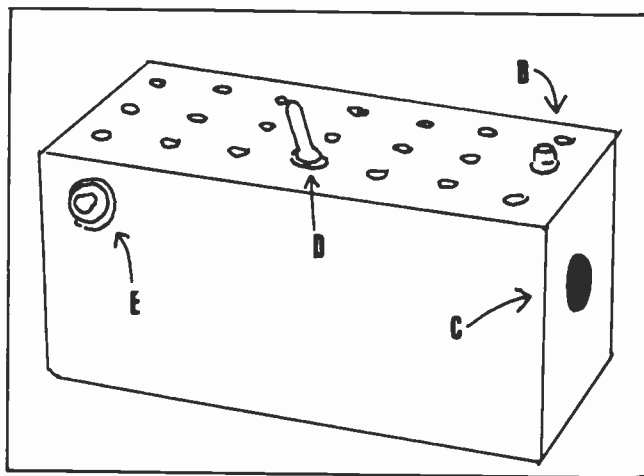
With these electronic parts, some ½"-thick wood

for the base and ¼"-thick Masonite for the housing, plus ordinary lamp cord for wiring, you should have no special trouble putting all this together as shown. Follow the wiring diagram wire by wire (wire lengths are not at all critical) and when you're through be sure to check that the wiring is correct before plugging the unit in to try it out. And of course, all joining wiring must be solidly twisted together and then soldered, and all exposed naked wires taped for insulation. Then be careful, when "stuffing" all the various wires inside the housing when putting it together finally, that none of the wires foul up the movement of the contacts on either relay.

Switches "D" and "G" control the relays and hence the functions. Switching "D" to the right disconnects the left relay completely, for auto-projector or similar usage (Function 1). With switch "D" to the left, now switch "G" controls whether you're in Function 2 or 3.

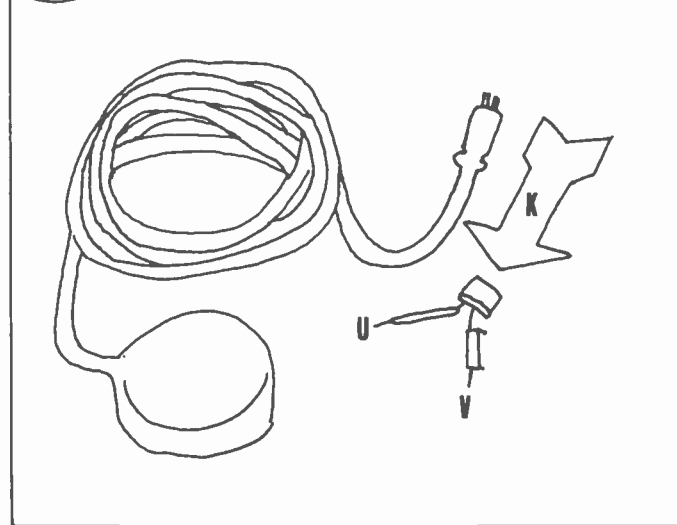
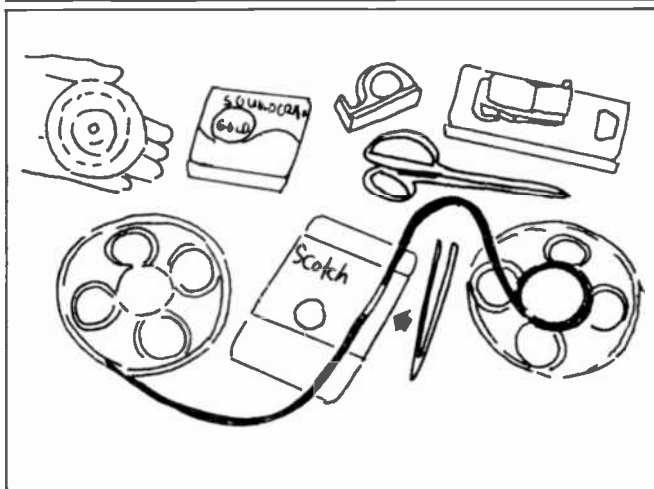
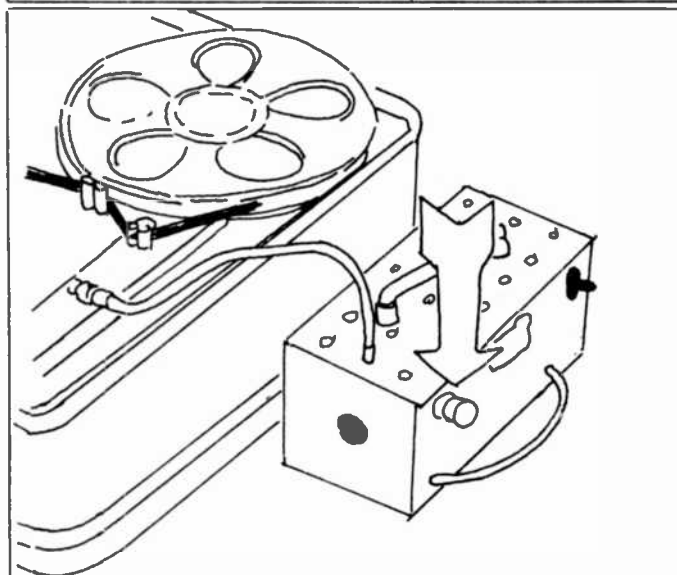
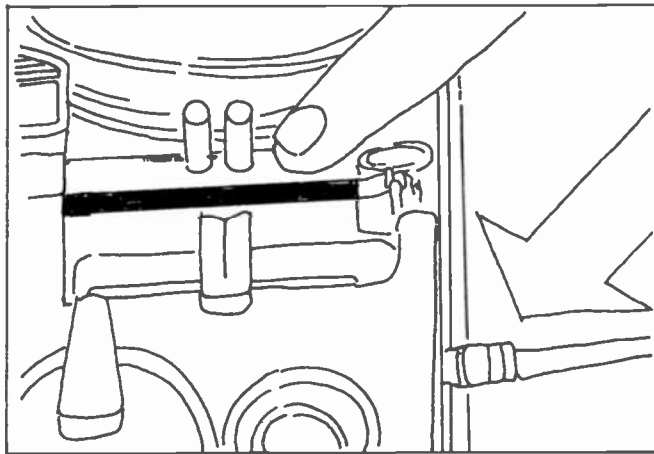
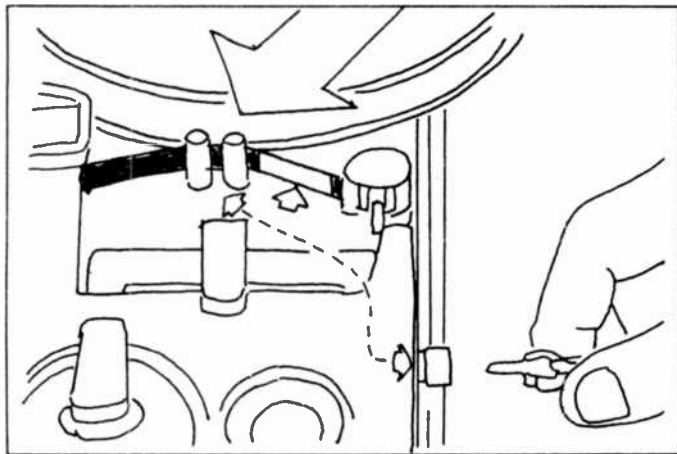
Function 4 (optional): Rather than perhaps scare people away by having my wiring seem overly complicated, I left off this extra wiring except for those of you who will have need of this very special function. The Part "K" socket parallels the "J" switch, making it possible for you to plug in a bypassing switch via a remote control cord. You can make up your own cable and switch or there's a very good *Foot Switch* available from the Burstein-Applebee Co., 1012 McGee St., Kansas City 6, Mo. It's their Stock No. 18A162, for \$1.95, and the foot switch comes complete with an 8-foot cord and an attached Type P-302-CCT *Cinch-Jones* male plug (see Fig. 11).

Some friends of mine, practicing for a Little-Theater play they were putting on, used this foot switch arrangement together with their recorder coupled to a Sensor Master unit to give them remote control over their recorded sound effects. They had the sound effects on tape, one after the other, in the exact order they needed them to appear in their play. At the end of each effect there were a few seconds of silence and a piece of sensing foil on the tape. So all they had to do during the play was to step on the



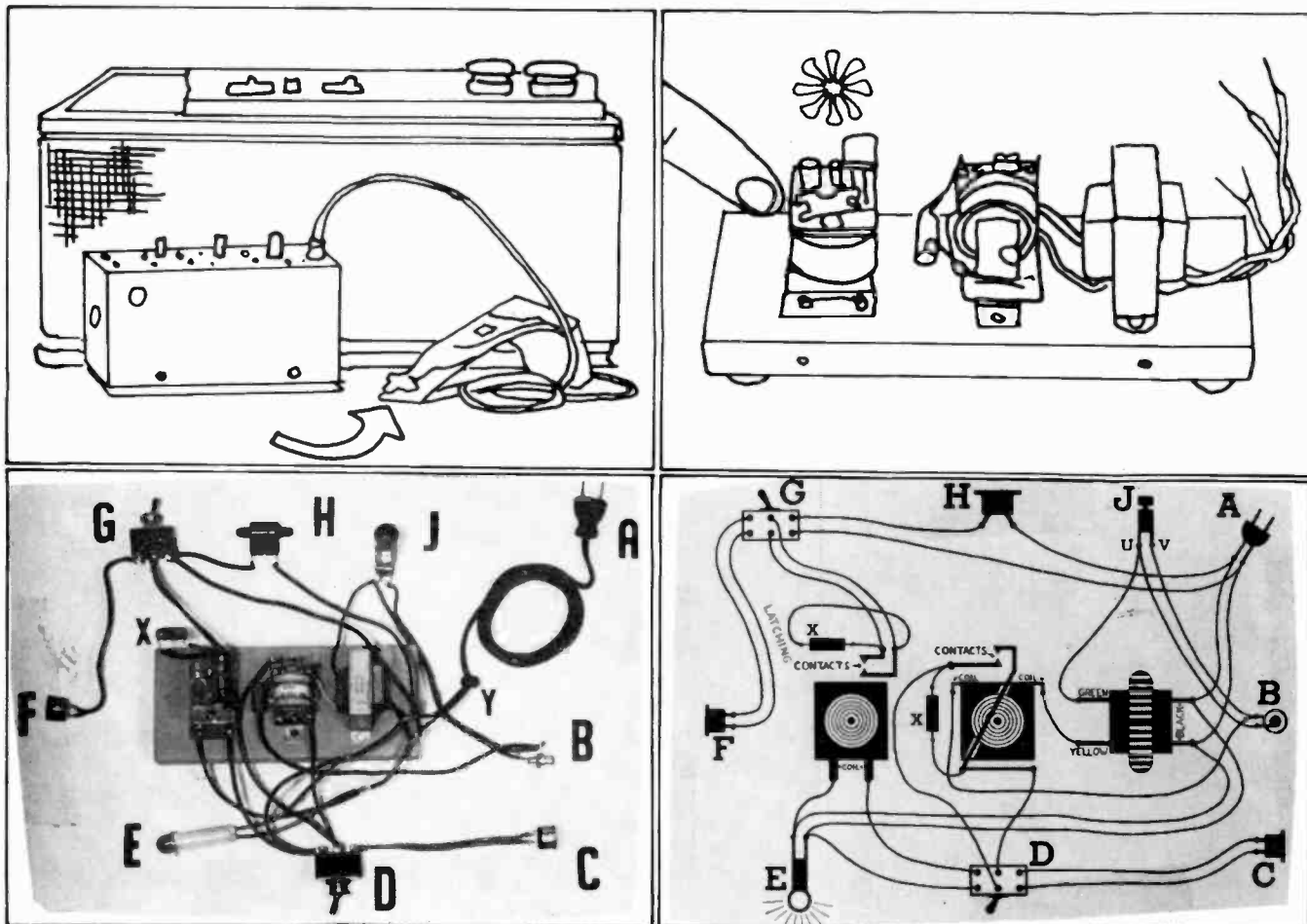
Upper left: Fig. 5—Here's a front view of the housing after being glued together, sanded smoothly and then painted. You can use metal or even plastic if you wish, but I especially recommend MASONITE (a common pressed-wood product) because it's easy to work with. Masonite PEC BOARD was used on top, to allow for ventilation of the transformer. Upper right: Fig. 6—The same housing from the rear. The exact size doesn't matter much (mine is 3½" square by 7¼" long) and the location of the various switches and sockets, etc., doesn't make any special difference. You can follow my setup as illustrated here or feel free to transfer parts around in any manner most convenient to you. Lower left: Fig. 7—To control the motor (only) of your recorder, you'll have to "break into" one of the two motor leads and attach the two ends to a female socket connector and to a parallel-connected switch. The SPST (single pole, single throw) toggle switch allows normal use of the recorder when you don't want special "auto-sensor" control.

Lower right: Fig. 8—Finding the best location for the all-important TAPE CONTACTS will most likely be your most difficult job. Very best of all is when you can make them an integral and permanent part of the tape deck. That way, you can plug in and use the "Sensor Master" unit at a moment's notice, as shown here with a Revere recorder.

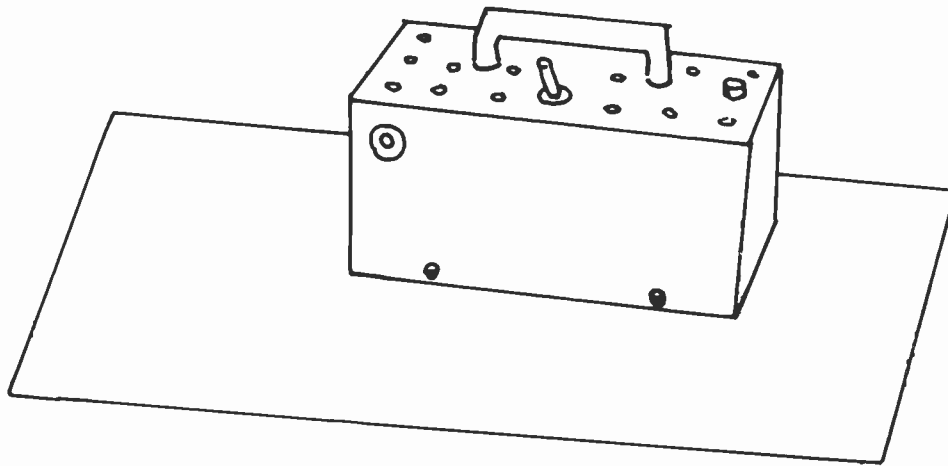


Upper left: Fig. 9—With a good setup, auxiliary Tape Guide Posts as mentioned (March issue) aren't even necessary. Here we simply used TWO BRASS POSTS about an eighth inch apart, with two wires going under the deck to the phono plug mounted conveniently nearby. Luckily the Revere deck is plastic here, so "insulating" was a minor problem. Upper

right: Fig. 10—Just disappearing "round the bend" to the right is a FOIL SENSOR STRIP (for a better, full-length view of one of these attached "triggers," see Fig. 9, hollow arrow). Especially note that the normal path of the tape is nowhere near the two brass-post contacts, so they don't get in the way at all when they aren't needed. Lower left: Fig. 11—If you want the special (optional) STOP/START automatic foot-switch-controlled function described in the text, one more 2-contact socket is necessary. A convenient location is just below the push-switch "j," since the wires "U" and "V" from socket "K" are wired in parallel with the "J" switch terminals (see Fig. 4-b). Lower right: Fig. 12—Though I use my own Sensor Master for many different purposes, the everyday use I delight in is when I have it warn me that the end of a tape is near. Second only to liking generous colored leaders on all my tapes, I want a single foil strip a new MINUTES from the end to "Red Light" warn me the end is approaching.



Upper left: Fig. 2—Of vital importance are the contacts (arrow) that go on your tape deck . . . shown here mounted in "outrigger" form as previously demonstrated. But now if at all possible, with all the many uses of this new control unit, it would be far better if the contacts were fastened and wired PERMANENTLY to the deck (see Fig. 9). Upper right: Fig. 3—A simple momentary-contact relay (center) holds its contacts closed only as long as current is applied, which of course is just perfect for auto-projector use. But when contacts must close or open AND STAY THAT WAY even after the current to the relay stops, you need add a special "latching" (holding) relay to the circuit. Lower left: Fig. 4a—Finally, to put the little transformer and the two relays to work for many different purposes, this mad scramble of added switches, sockets, wire and such are needed. You wouldn't do it this way, but wired without a housing it would look like this. Lower right: Fig. 4b—Actually, of course, this is a rather simple circuit that can easily be put together by most anyone with a wee bit of soldering experience. Use ordinary lamp cord, "zipped" apart single where necessary, and follow this diagram one wire at a time.



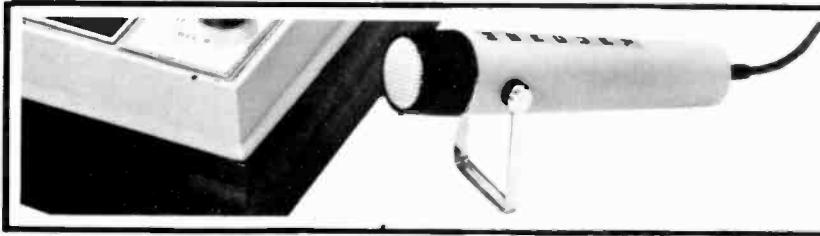
foot switch every time they needed a new sound effect. The recorder was hooked up so the amplifier stayed on but the motor only was cut off (see Function 2), hence when they stepped on the foot switch this turned the motor back on and the sound effect played over a hidden auxiliary loudspeaker. Then, at the end of the sound effect, the foil on the recording tape made automatic contact and shut the motor back off, all ready for the press of the foot switch to begin the succeeding sound effect when it was time for it. Pretty neat!

PERMANENT CONTACTS ON YOUR TAPE DECK!

The big problem here, in locating these two vital contacts, is in finding a spot on your tape deck that will keep the passing tape under constant tension even when the tape has reeled off almost down to the hub. If you own a Revere recorder you're all set (see Figs. 8 thru 11) but even if you don't *it shouldn't be too difficult to duplicate the tape-path conditions that make the Revere so ideal for this purpose.* Note, in Fig. 10, how the normal path of the tape is straight out from the capstan to a special "guide post" a few inches to the right, where the tape wraps itself around at about a 90 degree angle before going on to the pickup reel. You can guide your own tape this same way simply by fastening a single *Nortronics TG-5* Tape Guide Post (see last month) at a point on your own tape deck that more or less duplicates the Revere

setup. Either fasten the Guide from below deck with a machine screw or Epoxy it in place from above. And it needn't be insulated from the metal deck.

Now you're all set to fasten your two brass contacts as shown in Fig. 9, off-setting them enough to give a good, constant tension to the REAR of the passing tape where the foil strips will be. If you can't handle this delicate installation yourself, have an expert at a hi-fi shop do it for you, with the contacts permanently mounted and wired to a phono jack (same as Part "B"). Be sure that the two contacts are brass or some other non-ferrous metal, so there's no danger of their becoming magnetized and ruining your tapes that pass by. The contact posts should be mounted atop the deck in such a way that not only are they insulated from each other, but from the metal tape deck also, or now you run the risk of inducing hum into your recordings. And *ultra important* is that the two contacts are mounted in such a position—let me stress once more—that a fair amount of tension is constantly applied to the passing tape, no matter how much is on each reel. This is no problem if you duplicate the Revere "system" of tape travel which I highly recommend, but otherwise position the posts carefully. Make tests with both full and near-empty reels of tape before making the positions permanent. And remember, the object is to make perfect foil contact across the two posts 100% of the time. Nothing else will do!



RECORDING VOCALS WITH

There has been much written on the placement of the microphone for piano pickups, taking into consideration the characteristics and tone of the various types. Very little has been written about the problems of voice-piano pickups. If good recording results are desired, such pickups also require special attention, for the combination of the singing voice with the piano requires special treatment.

Let us assume, for the time being, that the piano set-up has been made and is satisfactory. The next step then is to locate the vocalist in relation to the microphone.

The best and quickest way to find the correct working distance is for the vocalist to take any comfortable singing position in front of the microphone and sing a selection which covers both his high and low ranges. The recorded characteristics of his voice can then be easily checked. If the volume at the two extremes seems approximately the same as that of the middle register, and the tones do not distort, the singer's position is probably correct. However, since very few voices have uniform volume over their full range, a compromise must generally be made: the

singer should take the position from which the greater part of his tonal range is recorded without distortion and with fairly uniform volume. This can be called his average or normal position at the microphone. For the remainder of his range—that portion which is either too loud or too soft—the singer will have to make adjustments while performing. The way in which he does this is called microphone technique.

More specifically, microphone technique may be defined as the best utilization of a singer's voice characteristics relative to the type of microphone and recorder used. Such complex explanation may make this technique sound like a highly difficult procedure, and perhaps this is the reason why so many professional vocalists on radio and television, and even on recordings, have disregarded it. Actually microphone technique, based upon common sense, is simple, easy to learn, and beneficial to any performance over a microphone.

In order to illustrate it let us take, as an analogy, water being forced through a hose into a bucket. When the water comes out of the hose with too much pressure or too suddenly, it spills out of the bucket.



To prevent this the pressure must be reduced. Substituting a microphone and recorder for the bucket, sound for the water, and volume for pressure, we obtain the effect in which sound, transmitted with too much volume for the microphone and recorder to handle, will actually "spill over" or distort. The size of the hose, which will affect the water pressure, may be likened to the vocal cavity of the singer which determines the volume of the various notes produced while the size or shape of the bucket may be said to correspond to the different types of microphones in use. Now microphone technique does nothing more than prevent sound from spilling out of its particular bucket by reducing its pressure on the microphone and recorder.

The way to do this is obvious: the singer backs away so that his tones reach the microphone with reduced volume. This occurs because the volume of sound decreases by its square as the distance from its source increases. For example, the volume of sound reaching the microphone from a singer six feet away will be four times less than that received when he is only three feet from the microphone. Of course the

vocalist could maintain a set position and reduce his own volume, but in singing, particularly with full voice, this is not a very easy thing to do, also especially without affecting the quality of the voice recorded. While there are a few exceptions, the majority of singers prefer to back away from the microphone on crescendos.

One additional point in our analogy: if the water pressure is too low, the water will probably not reach the bucket. Similarly tones too low in volume will not be picked up by the microphone or will come through poorly and often buried in the background noise. Microphone technique therefore also consists of boosting the tones too soft for normal recording. This means that the singer will have to move closer during pianissimo passages, when his voice volume is low.

An immediate protest will undoubtedly be raised that all this curtailment of volume variations will kill the musical expression in any selection. Were all tones levelled, this would be true, but actually microphone technique deals only with the extremes of a singer's volume range, preventing peaks from being distorted



when they are excessive, and soft passages from not being heard at all when their volume is too low. In reality the range of volume variations possible within the limits of volume handling capabilities of the microphone and recorder is sufficiently wide to cover almost all of the gamut of musical expressions.

Perhaps the most difficult thing about microphone technique is to learn not to overcontrol. When the vocalist goes back too far on a crescendo, the result is not the desired smooth swelling of tones without distortion, but a sharp fade accompanied by a change in the timbre of the voice. On the other hand, moving too close will cause the voice to boom, destroying its quality and intelligibility.

The exact distance to move in or out on very soft or loud tones depends upon both the voice and the microphone characteristics. For instance, the very low notes of a bass singer may resonate, at close range, with a portion of the microphone structure, thus causing the notes to boom through and distort. In this case the singer would have to back away, whereas with a different type of microphone, without the low frequency resonance, the same low notes might be too soft to pick up and the singer would have to move closer. A similar effect also can be caused by a difference in microphone sensitivity. For example, a soprano backing away on a crescendo of high frequency notes would lose her effect when using a microphone of reduced sensitivity because the response of the microphone to her voice would drop off faster with the increased distance than with the first microphone. Of course these results would probably occur only when first using a new or unfamiliar microphone, for with usage the characteristics of the unit will become evident and the right technique used to compensate for them. However, as a rule of thumb, it may be said that with non-operatic types of songs, a variation of two to six inches from the singer's average position should be sufficient to handle most changes in volume, while in operatic singing variations up to a foot may be required.

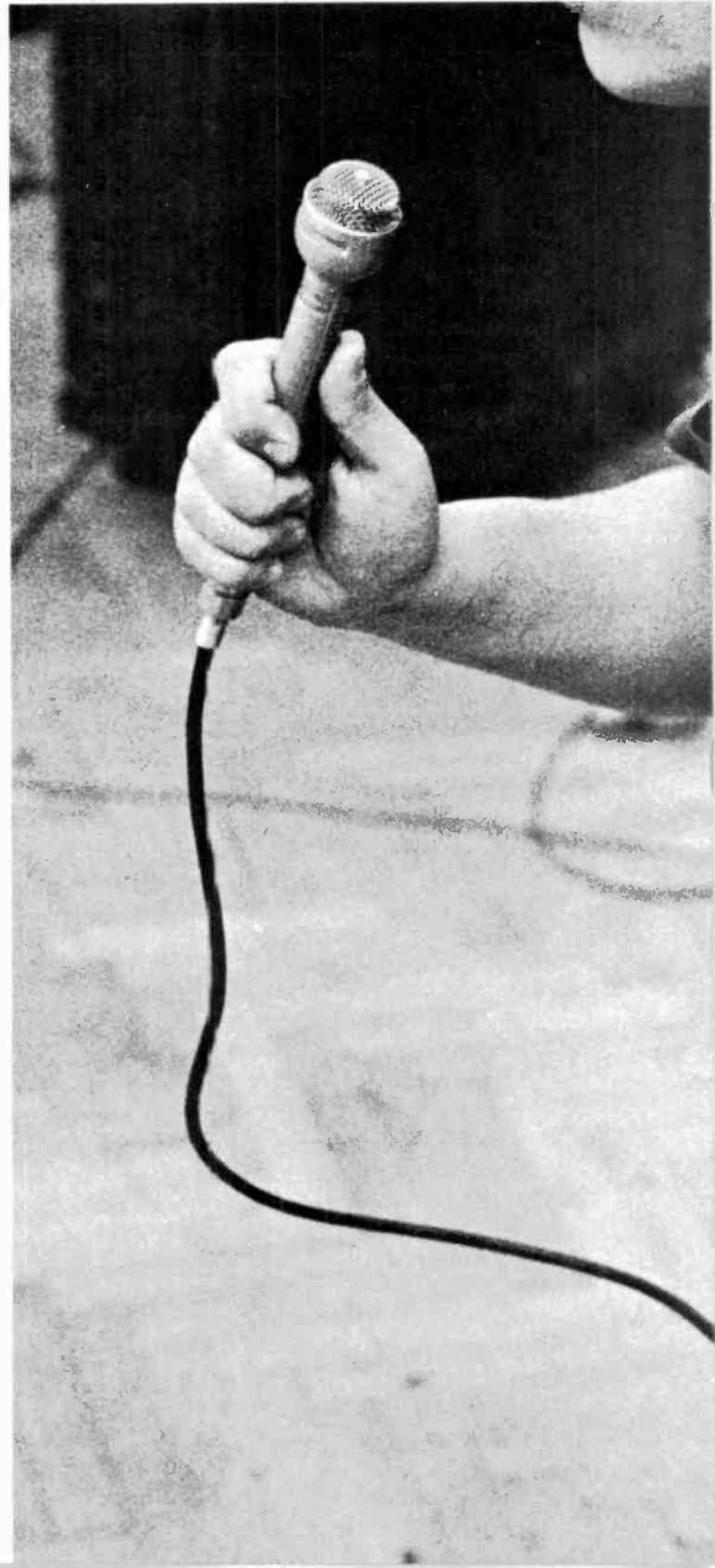
Some vocalists have been instructed to turn their head sideways on crescendos. While this may work very well on a microphone with a wide pick-up angle, the effect becomes objectionable when using a microphone with a fairly narrow beam, such as the ribbon

type. With the latter the voice volume will drop very rapidly as the singer turns away, but his tones will also lose their fullness and quality. It is therefore advisable to go straight back from the face of the microphone, thus precluding any possibility of moving away from the center of the pick-up beam.

At this time it should be pointed out that very few singers, with the possible exception of some basses, have excessive volume on their low notes. In many performances, when the passage with the low notes is reached, the listener will notice a decided drop in volume. This can easily be avoided by leaning forward slightly when singing the low tones. A movement of no more than two or three inches is generally sufficient to provide the necessary reinforcement in volume.

In all these movements toward or away from the microphone, the final check of the technique must naturally be the recording. For this reason a test run should always be made with the vocalist singing his selection and using the same microphone technique which will later be utilized during the actual performance. In this way such faults as "blasting"—caused by singing staccato passages too close to the microphone, booming on low notes, excessive changes in either the volume or quality of the voice: essentially all defects introduced by moving in too close or backing too far away, can be noted and remedied.

In some instances a singer will observe all the rules and still fail to obtain good recording results. This is frequently caused by unusual characteristics of his voice. One such type is the singer whose tones sound very harsh and breathy. Using normal technique the effect is very noticeable and objectionable; nevertheless it can be reduced and sometimes entirely eliminated simply by making the vocalist sing at an angle of approximately forty-five degrees from the face of the microphone. This deflects the full blast of his breath away from the diaphragm or sound pick-up element, thus reducing the breathy effect as well as decreasing the harshness of the tones. Slight fuzziness sometimes present in the voice, like sibilance, usually can also be remedied by this method. The angle used will undoubtedly vary with each type of voice, the amount of defect, and the kind of microphone





utilized for the pick-up, but again the exact angle can be determined very quickly by checking the results on a recording.

Another type of voice presenting a pick-up problem is that of the contralto or bass with low volume. A singer with that kind of a voice cannot come in too close because the bass response of the microphone will cause most of the tones to boom; and when he or she stands at the minimum working distance, the voice is too weak to be picked up correctly. The best way to remedy this condition is for the vocalist to take a position on the "dead" side of the microphone, that is, completely outside its pick-up beam, and then sing directly across the face of the microphone from a distance of about two inches. This will bring the source of sound very close in and thus produce increased volume without introducing the booming effect caused by the low frequency tones hitting the microphone directly.

A few words of caution should be added. Since various movements are required for microphone technique to handle extremes of volume, some vocalists have deduced that they must always move around a great deal while singing. Nor is this movement restricted to forward and back variations, for some artists have been known to weave sideways as

much as a foot. Somehow they seem to think that this will put more feeling into their performance. Now this may very well be true of the visual portion of their act, but for sound recording, the effect of any such extreme and repeated variations is more like that of a person jumping in and out of a spotlight. This is opposite to the levelling tendency previously decried, but just as objectionable. The recording will sound "spotty," with the sound volume increasing and decreasing abruptly during passages when the level should remain the same, while the quality and intelligibility of the voice will be greatly impaired.

Movement then, while singing over a microphone, must not be indiscriminate, but very much as in acting, must be motivated. And to repeat: the main reason for any motions while performing is to counteract excesses in volume caused either by very soft or very loud tones. In the singer's normal range very little movement is advisable. If expression is needed, it should be introduced by voice control, and not by abuse of microphone technique.

The above comments on motion while singing bring up a bad habit which many vocalists acquire quite innocently. You have undoubtedly seen the singer who, particularly while using a sound system in a hall or night club, will frequently raise his microphone up or lower it, will move it about, lean on it, and generally handle the unit roughly. Now disregarding the damage caused to the sensitive elements of the microphone—this will vary with the ruggedness of the unit—his singing is generally punctuated by loud crashes and other types of noise which are definitely detrimental to his performance. Sometimes, when the vocalist has walked over a thick rug, grasping the microphone will cause a spark of static electricity to jump from his fingers to the microphone stand. In such cases the audible crackle is reinforced by an electrical noise which can mar any recording. To prevent any such defects it is best not to handle or even touch the microphone during a performance; but if handling cannot be avoided, then it should be done slowly and carefully in order to keep any resultant noise down to a minimum.

Thus far the discussion has dealt with the position that a singer must assume and the microphone technique he must use in order to display his normal voice to best advantage. But the question sometimes arises: what is the singer's normal voice for recording?

Should he sing in a soft voice or with full volume? The answer of course depends entirely upon the singer's type of voice and the kind of performance he wishes to give; yet there is not always a choice. A person with a weak voice cannot sing in the manner of the operatic star who uses full voice. Neither can the same operatic star sound good nor use his voice to full effect in crooning. These two examples are extremes but they indicate how a person must be guided by the characteristics of his voice in choosing the kind of singing he will do. In a few instances a singer can work equally well with either a soft or full voice and cannot decide which type to select. He should then record a selection using first one method and the other. By comparing the results on the playback he should be able to judge their relative qualities and decide which type he prefers.

Now that the question of voice pick-ups has been explored, there still remains the problem of picking up the voice and the piano together so that they are blended properly. Whether the singing is picked up over a separate microphone or on the same unit that picks up the piano is unimportant. It is true that with a separate microphone a greater control is obtained over the volume of both the voice and instrument and in this way the balancing of the two sound levels is slightly easier, but with a bit of care equally good results can be attained with each set-up.

In each case a recording must be made of the selection in which the voice and piano accompaniment appear. When the voice is picked up over a separate microphone, its volume can be adjusted by varying the setting of the mixer control until the desired balance, in relation to the volume of the piano, is obtained. Roughly, the voice level is adjusted so that it is about twice as loud as the piano. When the singing is done over the piano microphone, then the singer must either set the volume of his own voice or, more practically, he must fix his position so that he obtains the desired volume. This is simple for all he needs to do is turn his head slightly, thus varying the amount of sound which will reach the microphone. However, should this action affect the quality of his voice, then he will either have to move straight back from the microphone or, if this makes playing the piano too awkward, the whole setup will have to be changed to obtain the required volume balance of voice and piano.

But balancing sound levels is not enough to produce a good pick-up. Sound perspective, one of the basic and probably most ignored principles of microphone technique, must also be considered.

Sound perspective is quite similar to visual perspective. As a person sees an object close by or far away, so a sound can appear to originate from a close or distant source. By listening intently to a selection whether on a recording or over the radio, and trying to visualize from the sound heard the positions of the persons and instruments, it is usually quite easy to differentiate the close from the distant sounds, very much as a person can tell in darkness whether a sound is close to him or distant.

Now when a vocalist sings fairly close to the microphone and also sounds through the loudspeaker as though he were standing close to you, he is said to be in an intimate or "on mike" position. If he sounds far away, then he is in a distant or "off mike" position. When considering a double pick-up, such as a voice and a piano, the important thing is that these two sources of sound should seem to originate from the same point; that is, they should have the same perspective. Then and only then can it be said that the voice and piano are truly balanced.

There are some people who will say that this is really going to extremes, that most listeners cannot tell nor care about perspective balance. Perhaps not everyone can detect such defect, just as in a painting the average person may not be able to point out an error in perspective; still most people will feel that something is wrong and this sense of disharmony, small as it might be, may be enough to mar a good artistic rendition.

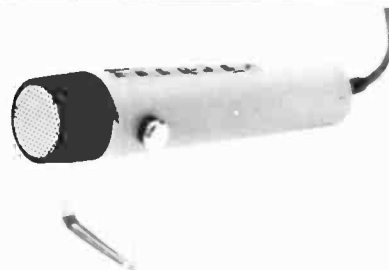
On the other hand, extremes of perspective unbalance can be not only glaring but irritating. Pick-ups that produce a close-up of the singer while maintaining a distant perspective on the piano definitely show poor microphone technique. The vocalist is prominent, but the accompaniment, instead of acting as solid support for the singer, seems disassociated from him and is often lost, particularly during vocal fortissimo passages. When the opposite situation occurs—the piano is "on mike" and the singer is heard in a distant pick-up—there is again a severe distortion of the musical picture. The voice appears to come from somewhere behind the piano and very often will be drowned out completely by the heavy notes of the



instrument. It seems reasonable, therefore, that, in order to obtain good recording results, perspective balance should be sought and maintained as much as possible.

Thus if the piano has been set up for a distant pick-up, the singer should take a distant position; if

the piano has been set for a close pick-up, then the singer must perform "on mike." Of course, you can always start out with the singer, fixing his position either close or distant and then moving the piano to maintain the same perspective. It is really not important which one determines the pick-up position,



the loudspeaker, about four to five feet away from the cone. Close your eyes or turn them away from the source of sound. By listening intently to the sound of the voice and instrument you should be able to tell very quickly whether the volume of one or the other is incorrect; and as indicated before, by using your imagination to visualize the singer and the piano, you can check whether their separate tones seem to originate from the same relative distance.

From all the factors mentioned, microphone technique may truly appear to be difficult to master, but progress can really be made quickly by keeping the following points in mind:

1. Find the correct working distance on the microphone for your particular type of voice.
2. Move the correct amount forward or backward, to compensate for soft or loud passages; and check the results on a recording to make sure that you do not over- or under-control.
3. Do not weave or make abrupt and unnecessary changes in your position while singing into the microphone.
4. Do not handle the microphone roughly during your performance, or at any time for that matter.
5. Choose the type of singing which will present your voice to best advantage.
6. Check the recording of your selection for the desired volume balance between voice and piano; then make the necessary corrections.
7. Make sure that the voice and piano perspectives are the same.

Remember that the above suggestions will not teach you how to sing; they only summarize the factors which you must observe when singing with piano accompaniment in order to keep your performance free from preventable defects. At first such defects may be numerous, but as you become more and more familiar with the inherent characteristics of your voice and its effects upon the particular microphone and recorder you are using, you will discover that your microphone technique will improve rapidly and the results obtained in your recordings will become more and more professional in nature. Here again practice is the way to perfection.

provided that they are both the same.

Once the pick-up and the recording have been made the most accurate way to check both volume and perspective balances is to play back the selection with the recorder loudspeaker adjusted for normal volume. Then take a position in the direct beam of

“COMETH

by Harold Gluck, Ph.D.

When the first portable tape recorder appeared on the market, I had visions of being able to help make remarkable changes in our educational system. My background had been in the famous experimental school run by the late Angelo Patri. So when I asked permission from my superiors to experiment with all the possibilities involved in the use of a tape recorder in our school, I was given the green light.

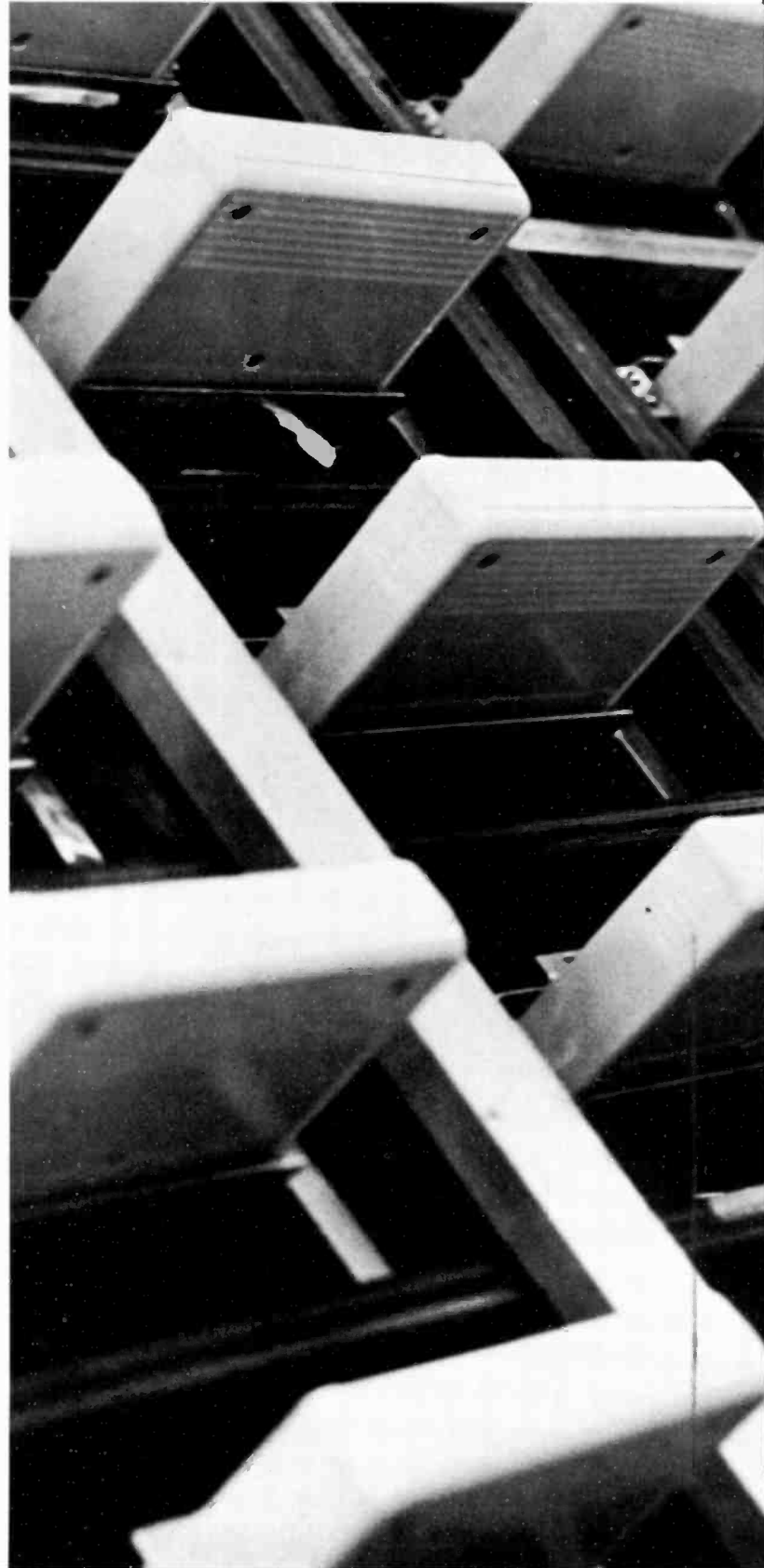
Up to that time we had one difficulty in assigning certain desired radio programs to our students: They often broadcasted at inconvenient hours. I obtained permission to tape certain lectures. Some of them were then replayed in the classroom. But when it came to trying to figure out how to get the students to use those tapes at home we immediately ran into difficulties.

Not many had recorders. And my own “portable” one at that time weighed more than thirty pounds. Alas, when I did lend the tape, it often came back torn, patched, and with sections missing. We even had a student project, where several students would go to the home of one of them and prepare a special lesson on tape. But my biggest dream of all was to help the student who was absent from class. With a taping of the day’s lesson, that student could actually make-up the work missed in class.

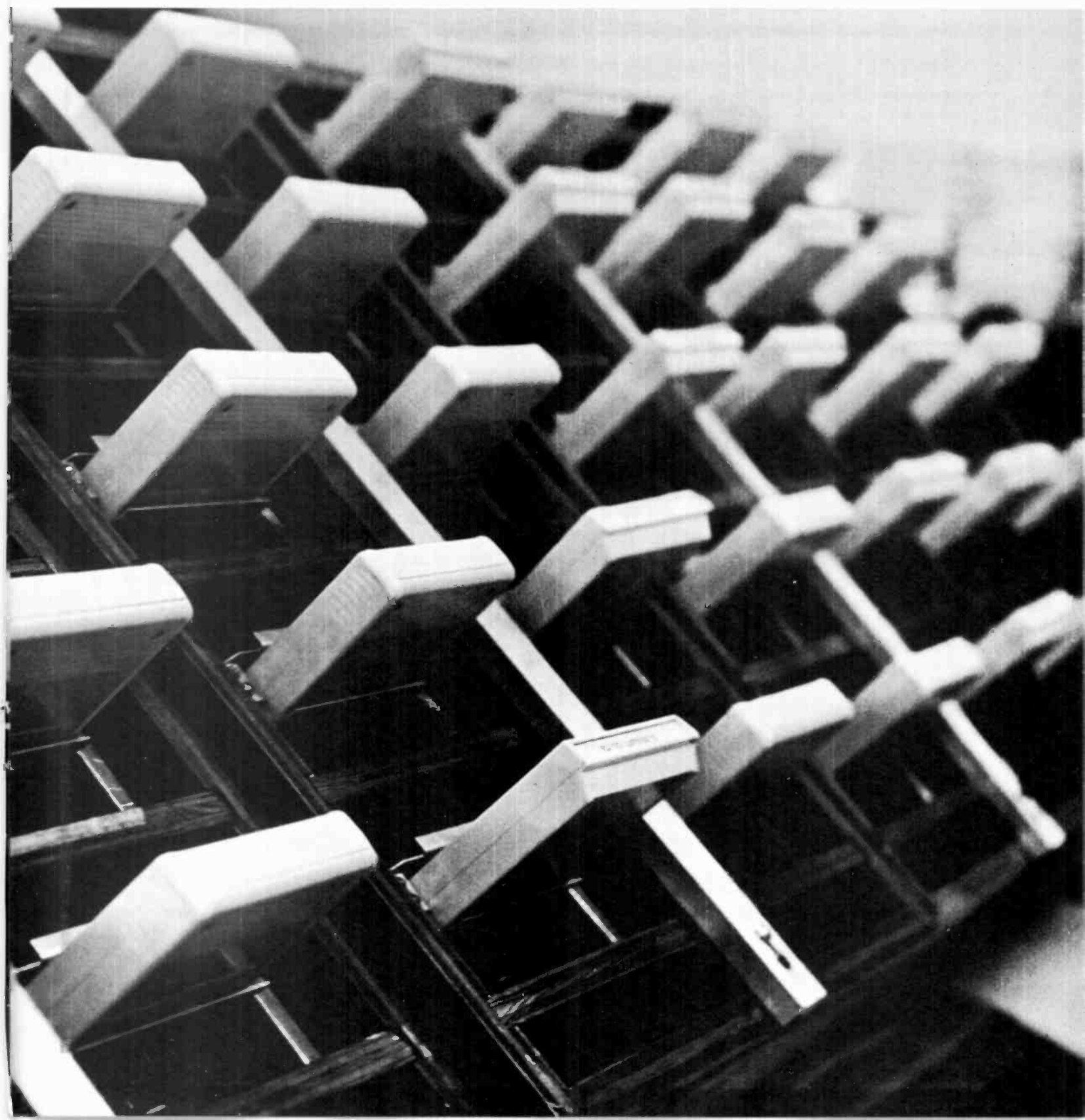
After two years of experimentation, I quit. With a very depressed feeling. The theory on which I was working was sound. The obstacle was in the material we were using. We needed something any student could use without any difficulty or problem arising from the mechanical nature of the material itself. Since we had record players why couldn’t we have just a low price tape player? I sighed. Some inventor would have to come along and produce it. The basis for it already had been invented. Actually it would be only one half of the tape recorder-player.

But how about the other element—the tape itself on that clumsy reel? The answer came from a man at the shooting range. We were talking about the development of firearms. From the days when you loaded a rifle with a loose charge of powder, used a separate lead ball, then a patch, shoved it down with a ramrod, primed the pan, cocked the hammer, and the sparks did the rest. What a change with the modern cartridge. Cartridge? Somehow that clicked in my mind. Some genius would produce a tape cartridge. In fact, it was inevitable.

And so “cometh the cartridge.” Those teachers, who like myself, were discouraged by the problems involved in the use of the old recorder and reels of



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tape, now can go ahead with all of their educational dreams. And since many of the boys and girls already have cartridge players to use with their favorite musical recordings, we have part of the financial situation already solved. And there are good cartridge players that can be purchased for very little money.

Briefly here are the suggested used in the classroom for the cartridge player:

1. After the attendance is taken, the teacher has a basis to decide whether or not to record the day's lesson. If all the students are present, the recording can be skipped. But if there are absentees, then the recording is made. Later the teacher prepares certain questions on the lesson. The absentee student, upon return to school, is then loaned a cartridge player and the cartridge of that "missed lesson." Also given the sheet of questions to be answered. The student then takes the material home and has two days in which to make up the missed lesson. When returned this is then given to the additional student who was absent.

What about the student who is ill and has to be home for a period of two or three weeks? Or perhaps confined to a hospital room? And in either situation, capable and willing to continue school work. We do have a telephone connection system whereby the student can listen in to the class work. But this is much more efficient. And the biggest two advantages are: First the low comparative cost, and second, the student can listen to the lesson at his or her convenience.

2. The student who is going to give an oral report in the first period class can now give it to every other similar class subject—without having to be present. No need of sending a note to another subject teacher asking to excuse the student to make the report in person. And what is even better, the student makes the taped report at home. Listens to it and then if necessary makes corrections. And I have found that the parents get interested in this kind of learning and are more than willing to cooperate.

3. A library consisting of these cartridges can be built up by the subject department for use by any teacher or students. Special radio programs can be put on cartridges for use later in the classroom or for the students to take out with a special "library cartridge card."

4. Each specialized subject has certain problems that can be met by the use of these tapes. Let me just refer to two subjects:

a. In the shorthand class, the cartridge can be a blessing. The teacher prepares her timed dictation ahead on a cartridge. If she wishes to dictate at the rate of 40 words a minute, she carefully times herself and then prepares this lesson on the cartridge. When played in the classroom for "dictation" it then permits the teacher to be able to go up and down the aisles and check carefully on the work done by the students. What about the slow student who needs more practice? A cartridge and player are loaned to this student over the weekend. And the student can practice. In addition, where the student who takes dictation should get used to a variety of voices, students themselves can help to prepare the dictation cartridges. Need I point out, that using one cartridge as the "master," good duplicates can be made from it.

b. In the language class, the cartridge can be used in many ways. I have a short wave radio with a set-up to my tape recorder. We will use Spanish as an illustration, because I speak that language. The teacher can take off from the short wave radio onto the cartridges talks in Spanish. And thus be able to show regional differences in words and even pronunciation in different Spanish-speaking countries. And in teaching the beginning class, the cartridge can be used very efficiently. Thus in trying to get across certain sounds in a given series of words, different time patterns can be placed upon the cartridge. Starting slowly and then speeding it up. Repetition—repetition—until it becomes automatic on the part of the student.

When guest speakers are invited to a foreign language club, with their permission, a cartridge is made. And then replayed later in the classroom for those who missed the talk. And the students themselves will prepare some lectures and readings. It often comes as a definite surprise—and even a shocker—for a student to hear himself or herself speaking the foreign language. And thus with the aid of the teacher or foreign language tutor pick out the mistakes and correct them.

The cartridge, the cartridge player, and the recorder itself can do much to make teaching more efficient and even more pleasant.

tape

REVIEWS

Eddy Arnold

The Warmth of Eddy. Including: I Started A Joke, You Don't Need Me Anymore, My Way, San Francisco Is A Lonely Town, Yesterday, When I was Young, You Fool, Cycles, Band of Gold, What Have I Done For Her Lately?, To Sleep With You, Then I'll Be Over You. RCA

Music	***
Performance	***
Recording	***

Country love songs are the subject of this latest from Eddy. There are a share of contemporary popular ones also. It's just marvelous how he can make any song his and the best examples are Aznavour's Yesterday, When I Was Young, Paul Anka's My Way, and last season's big hit for Sinatra, Cycles. There are no bad touches in any Eddy Arnold effort. He is still top salesman of this type of material. —F.R.

The A&I University Singers

Down Home. Including: Son-Of-A-Preacher-Man, Crazy, Walkin' In The Sunshine, Night Life, Busted, King Of The Road, Green Green Grass Of Home, Funny How Time Slips Away, Don't Touch Me, Skip A Rope, Make The World Go Away, Forever. Dot.

Music	***
Performance	***
Recording	***

The A&I University Singers are a group new to recording. And their step-off package reeks with distinction. Each tune is simple with added measures of soul and

country seasoning. All big songs and all performed perfectly. If you wish something different, highly pleasing, something to bring the world around you into perspective, give these clean cut young adults a chance. You'll be taken off guard by them. —F.R.

Baja Marimba Band

Fresh Air. Julius Wechter and The Baja Marimba Band. Included: Cielito Lindo, Wave, I'll Marimba You, I Don't Want To Walk Without You, Fresh Air, Eleanor Rigby, The Windmills Of Your Mind, Samba Nuevo, Here, Madagascar. A&M.

Music	***
Performance	***
Recording	***

Another in a long line of enjoyable efforts by the Baja boys. A vocal or two is added to enhance an already perfect blending of marimbas and brass. The smash hit I Don't Want To Walk Without You with vocal by Julius himself is included as well as the everpresent "Water Commissioner" on the cover. Get this one and you won't regret it for a moment. —F.R.

Quincy Jones

Walking In Space. Including: Dead End, Walking In Space, Love And Peace, I Never Told You, Killer Joe, Oh Happy Day. A&M.

Music	***
Performance	***
Recording	***

There is nothing this multi-talented musician can't do. Aided by Ray Brown, Grady Tate, Jimmy Cleveland, Toots Thielemans and others, Quincy takes us on a trip lasting thirty-two minutes, fort

seconds. But it seems like only a few moments. This carefully constructed package could very well be a companion piece to the many contemporary film scorings of which Mr. Jones has given us of late. In these turbulent times some beauty can be reflected and this outing is a prime example. —F.R.

Floyd Cramer

More Country Classics. Included are: Wilwood Flower, I Really Don't Want To Know, Danny Boy, Worried Mind, Daddy Sang Bass, Everlasting Love, Born To Lose, With Pen In Hand, Heartaches By The Number, Send Me The Pillow You Dream On. RCA.

Music	***
Performance	***
Recording	***

Cramer's latest ivory-tinkling almost reads like the liner on a Dean Martin package. Such contemporary efforts as I Really Don't Want To Know and Born To Lose are etched with the skill with which he has become legendary in his own time. The tasty country backings of Bill McElhiney add untold joys. And I believe I detect the nimble fingers of Chet Atkins atop his equally famous guitar. A ready made market awaits this one. —F.R.

Alice Faye

Alice Faye in Hollywood. Included are: Nasty Man, Here's The Key To My Heart, Yes To You, According To The Moonlight, Speaking Confidentially, I've Got My Fingers Crossed, Spreadin' Rhythm Around,

spontaneous contemporary, zippy arrangements. Dean excels with the beautiful Little Green Apples. Don't miss this one and file a copy away in that special library of fun. -F.R.

Me, Natalie

Me, Natalie (Original Sound Track) with Henry Mancini's Orchestra. Natalie (Rod McKuen), Free, Sequence for Uncle Harold, A Groovy Mood, Off-Ramp To Nowhere (Alan Braunstein), Theme For Losers, We (Rod McKuen), W. A. Mozart, I Love You, In And Out Of Love Montage, Bench Warmer, Dear David (Patty Duke). Columbia.

Music	***
Performance	***
Recording	***

Believe it or not this is only the second actual soundtrack recording by Henry Mancini. (The other being Touch Of Evil.) Mr. Mancini believes in re-recording for records all his film scores. This soundtrack is fresh and most listenable with added joys to be found in a vocal by master poet Rod McKuen, and a dialogue reading by Miss

Duke. A ready made market awaits this outing. It could prove to be a big seller.

-F.R.

The Mills Brothers & Count Basie

The Board of Directors Annual Report. Includes: Cherry, Sunny, Blue and Sentimental, Glow Worm, Gentle On My Mind, I'll Be Around, Cielito Lindo, Every Day, Sent For You Yesterday, You Never Miss The Water Till The Well Runs Dry. Dot M85888, 8-track cartridge.

Music	***
Performance	***
Recording	***

It is not to be believed after listening to this cartridge, that people were spinning Mills Brothers platters more than 40 years ago. And equally so Count Basie since 1935, when he took over the reins of the late Benny Moten's band. The dynamic Basie backs the swinging Mills Brothers on a set of current and late standards. Each and everyone comes across as sheer greatness. This tape is the second meeting for these youngsters and I certainly hope The Board of Directors reconvene again next year. -F.R.

Paint Your Wagon

Paint Your Wagon (Original Cast Motion Picture Soundtrack). Included are: Main Title (I'm On My Way), I Still See Elisa, The First Thing You Know, Hand Me Down That Can O'Beans, A Million Miles Away, They Call The Wind Maria, There's A Coach Comin' In, Whoop-Ti-Ay!, I Talk To The Trees, The Gospel Of No Name City, Best Things, Wand'rin' Star, Gold Fever, Finale. Paramount.

Music	***
Performance	**
Recording	***

Paint Your Wagon is a big lusty old friend. For what some of the vocals of Lew Marvin and Clint Eastwood lack, is made up ten score in charm. The best of the Alan Jay Lerner, Frederick Loewe score is in tact and some added pieces by Andre Previn round out a fine package. The big voice singing They Call The Wind Maria belongs to Harve Presnell, a fine young actor. With Eastwood's countless fans stocking this one, and Lee Marvin riding the charts with Wand'rin' Star click single distilled from the package, how can this package help but be a best seller. It's all in good fun. -F.R.



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