No STEREO SET ever sounds better than the record you play. Ultimately, the limits of fidelity are encountered in the program source. That's why there is a constant race between record makers and equipment makers. Whenever one group pulls ahead, the other must catch up. Formerly, records had a lot more sound in their grooves than

WHERE DID THEY HANG YOUR EARS?

old-fashioned sound systems were able to elicit from them in playback. Then, for a while, the equipment makers seemed ahead of the record makers. Today, they're pretty well running neck and neck, having attained levels of achievement that only two or three years ago would have seemed completely fantastic. In recording, the task of providing what might be called the "technical interpretation" of music falls to the recording engineers who, as a group, regard their trade as a vital means of musical communication. They view their microphones as the proxy ears of a vast audience existing, possibly, beyond the performer's life span,

Like strange birds craning their necks, microphones hang in a cluster at a studio of Columbia Records.





and they feel a keen responsibility to deliver to this unseen audience a plausible replica of the original performance.

So many crucial variables are involved in the recording process that the engineers become as much active participants in the final result as the musicians. Much depends on rapport between musicians and engineers. Most sessions are therefore supervised by a new type of specialist, a hybrid of musician and engineer called the recording director. His job is to act as liaison man between art and science.

The first problem facing the recording director is to decide what kind of sound best suits the particular work to be recorded. "You can't record all composers with the same setup," explains recording director Alan Silver of Connoisseur Society Records. "Beethoven, for instance, requires quite a different technique from, say, Ravel. For Beethoven's massive, blocklike scoring we put the mikes a good distance from the orchestra to a point where all the instruments blend into a solid texture of sound. But to catch the lacy quality of Ravel, we move in close to pick up all the separate strands in his scoring."

This seemingly plausible policy invites dissent. Should Beethoven really be massive? Another school of thought insists that in such thick orchestrations, the engineer should make special efforts to bring out individual instruments rather than strive for granite solidity.

Individual recording companies differ in their philosophy in these matters. Command Records, for instance, has attracted much attention by favoring extremely lucid sound textures that stress detail and transparency. Deutsche Grammophon generally takes the opposite approach: solid and heavy orchestral mass. RCA Victor and

Orchestral sections and solo pianist are placed for optimum spatial effect in this Columbia stereo recording session.



John Pfeiffer (top), RCA Victor's Audio Coordinator, inspects a new studio control console while recording engineer Edwin Begley sets the knobs.

Columbia Records occupy a middle ground, trying to maintain adequate weight while still highlighting relevant details of scoring. Some record companies even try to create an identifiable tonal "image" for their recorded sound, but no major company will deliberately sacrifice musical values for sound as such.

The recording director naturally wants to assure his unseen listeners "the best seat in the house," but this, too, leaves ample room for argument. Where, after all, is the "best" seat? Way up front? Granted, the instruments sound bright and lively there, but the strings tend to be a little harsh, and the relative lack of echo might make the over-all sound too tight and dry for some tastes. Perhaps a location first row center in the balcony: here the reflections from walls and ceilings mingle with the sounds arriving directly from the orchestra, giving the music warmth and spaciousness and



adding deep glow to the lower reaches of the cellos and basses. Fine, but some detail gets drowned in this mellow sea of sound, blurring some fast passages and obscuring the interplay of polyphonic parts. Again, compromise is the only solution. "It's all a matter of where you hang their ears," quips a Columbia technician.

Consultation with the conductor is sometimes of doubtful value, for he rarely hears music the way the listener does. For one thing, the conductor normally receives the full impact of the orchestra at point-blank range—an experience few listeners would care to endure. Moreover, with the score photographed in his mind, he is apt to thinks of music rather analytically. Hence, neither his mental nor his physical perspective of the music corresponds to that of the typical listener.

With all these variables entering into the situation, the whole concept of "concert

hall realism" appears somewhat specious. Leopold Stokowski, the first great conductor to become deeply interested in these problems, recently observed: "Concert hall sound is a completely meaningless criterion for music heard in the home. No two concert halls sound alike, anyway."

Just how much "tailoring" of musical performances is desirable or permissible is a subject of endless argument. Until a few years ago, there was a widespread vogue for spreading microphones throughout the orchestra, with separate pickups for strings, woodwinds, brass, percussion and so forth. The idea was to take the listener literally "inside" the orchestra as if he had a dozen ears spread out among the players. Delicate shadings of tone, soft glissandos of the harp, little percussive accents that were normally obscured now emerged clearly. "If any note gets covered up, we can dig it out and make it audible," boasts a stalwart adherent of this multimike method.

Unfortunately this elaborate approach, sometimes involving as many as twenty microphones and control boards that resembled the cockpit of a jet airliner, proved more attractive in theory than in practice. Too often, technical finagling with the natural proportions of music produced grotesque results. Debussy, for example, emerged in sharply etched microscopic definition rather than in suitable misty shades. True, many listeners were entranced with the novelty of "hearing everything," but esthetically the process was like magnifying the brush strokes in a painting.

Today most record companies relegate these technical tricks to the realm of pop music, where they add electronic sex appeal to the feeble groans of hopeful teenagers. In classical music recording, the current trend is toward a "hands-off" policy for engineers. "We don't want the engineer to second-guess the conductor," says RCA Victor's Richard Mohr, "and we've cut the number of microphones to a minimum."

Abstinence from knob-twirling is also the rule at Columbia Records. "Matters of orchestral balance," says John McClure of Columbia's Masterworks Division, "should be left entirely under the control of the conductor. The interpretations of music must not be usurped by engineers, recording directors or electronic devices." Mc-Clure admits that it has been a long fight to train the engineers not to meddle with the music. But to McClure, strict non-interference in artistic matters is a firm article of faith, and he pleads his cause eloquently: "Music is an established and successful art; recording, a young and developing one. It is only reasonable to insist that engineers must not reinterpret the music to compensate for imperfect or immature technology."

Stereo has lately undergone a similar evolution, with technical gimmickry giving way to emphasis on genuine musical values. In the early days of stereo, directionality was so overemphasized that listeners felt they were watching a pingpong game as the musical focus jumped between left and right speakers. "That's what the public pays for and that's what we give them," the president of a small record company proudly announced.

Not all musicians bore such abuse meekly. "I try to make the orchestra play together," stormed the late Dmitri Mitropoulos at a hapless engineer, "and you pull it apart!"

As the sheer novelty of stereo wore off, listeners and engineers both grew tired of musical ping-pong. G. A. Briggs, a famous English audio engineer, wrote in a professional journal: "I want stereo to convey the really essential dimensions of a musical performance. I don't give a damn where the players sit."

Today's stereo records can be heard without straining one's neck. They can also be heard without having to sit midway between the speakers. For the most part, they aim at creating the impression of a continuous sound field of realistic width and depth analogous to that existing in the concert hall.

Despite recent technical progress, some problems continue to vex the engineers. Foremost among these is the question of dynamic range, i.e., the range between the loudest and softest passages to be put on a disc.

The average home phonograph would simply screech and shriek under a full orchestral onslaught. Moreover, ordinary machines are so beset by hum and other noises that extremely soft passages are covered up. Neglected records that are not cleaned before each playing soon develop surface noise to mask their softer sounds. To counter these difficulties, record makers simply used to make the loud passages softer and soft passages louder. Besides, argued the recording executives, the public doesn't want to hear abrupt loudness changes. "Keep the level even-don't disturb the bridge players," was the standard motto as the engineers nonchalantly clipped the bloom off a tenor's ringing tones or

reduced Wagnerian cataclysms to teapot tempests.

The rising tide of high fidelity changed all that. Users of quality sound systems capable of a far more realistic loudness range clamored for discs suited to the potential of their equipment. As a result, the dynamic range in the classical recordings by such firms as Columbia, London, Command, Angel and others has been notably increased, and nobody worries about the bridge players any more.

RCA recently introduced a special process called "Dynagroove," designed to give an illusion of greater dynamic range while remaining considerate of the limitation inherent in ordinary phonographs. Highly promising in principle, the process evoked both praise and criticism from discerning listeners and is still being improved in accordance with those reactions.

The listener's best bet is to set the volume control so that the music in his living room strikes his ears with the same apparent loudness as it would in his usual seat at the concert hall. If his living room is anywhere near normal size, all loudness differences will then emerge fairly close to their true proportions in a "live" concert.

Ask any engineer what his biggest headache is and he'll answer without hesitation: concertos and operas. Not that he minds the added chore of having to balance the solo instrument or the singers' voices against the orchestra. That's tricky, but it can be done. The real hurdle is to convince prima donnas (of either sex) that his or her voice, fiddle or piano stands out quite sufficiently against the orchestral background and that no further highlighting is needed. That's an *impossible* job.