

Orchestral Recording

REVISITING AND REFINING CLASSIC
TECHNIQUES

By [Steve Jennings-x](#)

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The conceit of these sorts of periodic articles, which are designed to fill readers in on the latest recording techniques, is that there is great new information to be imparted — that changes in technology have led to some sort of reassessment of the way a particular musical style is captured for posterity. But the fact is, in the world of orchestral recording, there doesn't seem to be radical departures in the way that engineers are working, even as the ultimate media destinations have almost entirely moved from tape to digital disk storage. Traditions run deep in classical music recording, and while it isn't exactly accurate to say that there's nothing new under the sun, there is still a great reliance on tried-and-true methods that have been successful for many decades, though it isn't hard to find a few new wrinkles, too.

With that in mind, we contacted four engineers steeped in the wisdom of how to best record an orchestra, whether for a classical production, a film score or as background on a pop date. Lawrence Rock (you can call him Larry; many do) has been the audio director of the New York Philharmonic for nearly a decade, and has made countless classical recordings both in recording studios and, more often, live in concert. Long revered as an intelligent and resourceful studio owner (Ocean Way, Record One, et al), Allen Sides' greatest passion has always been engineering, and he's recorded orchestras for many pop and rock records (Goo Goo Dolls, Sheryl Crow) and film scores. These days, John Kurlander mostly engineers film scores in L.A. (*The Lord of the Rings* films, *Master and Commander*, etc.), but during his more than three-decade career, he has also cut dozens of straight classical albums and has worked with orchestras on numerous rock LPs. John Rodd, the youngster of the group, cut his orchestral recording chops in the late '80s and early '90s in his native Canada, working on classical and film scoring dates at Manta Sound in Toronto and the Banff Center for the Arts (Alberta). Later, he moved to Los Angeles and landed a job as a scoring recordist at Fox's Newman Scoring Stage and is now an

independent engineer specializing in recording orchestral film and videogame scores.

MODIFIED OLD SCHOOL

For a half-century, orchestral recording has been dominated by two techniques that emphasize minimal miking in front of and above the musicians: The Blumlein method, developed in the early 1930s, uses a single pair of bidirectional mics to create an accurate stereo image; and the more popular Decca Tree, developed by engineers for Decca Records in the mid-'50s, uses three microphones on a T-stand (the classic iteration used Neumann M-50s) to give optimal left, right and center imaging for recording. (For a detailed, cogent look at the Decca Tree, see Ron Streicher's September 2003 *Mix* article at mixonline.com.) There are still some purists who fully embrace these proven "old-school" techniques, but it has been much more common during the multitrack age for engineers to augment either the Blumlein or Decca setup (often modifying each) with spot mics over small groups of players or sections of the orchestra that can be brought into the mix later. All four of these engineers favor a modified Decca Tree with spot mics. And, not surprisingly, surround recording also considerably changes the mic equation.

[The Neumann M50 is an omnidirectional tube mic with a small diameter diaphragm. It is omni up to 2500Hz, and has a smoothly rising frequency response, from the front, above 2500Hz, rising to +5dB. It is no longer made. But almost every one of them ever made is still being used. You need \$17,000 to get a used one. -JB]

John Kurlander . Kurlander got his start at EMI (Abbey Road) Studios in London in the late '60s. After several years working his way up from "tea boy" to assistant, he got his first shot as lead engineer on a classical project in 1975. "I went up to Liverpool with instructions from one of the chief engineers who said, 'Look, just do as you're told and don't experiment. I've been doing Liverpool Philharmonic Hall for 20 years now and *this* is how you do it.' You had classical engineers and pop engineers; they were very, very separate. The EQ modules for the valve boards even said 'pop' or 'classical' on them.

"The Decca Tree was the tradition from Decca, which was about a mile down the road from us," he continues, "and the tradition for EMI Classics

was a Blumlein stereo pair, so you could get into serious trouble if you tried putting three M50s up. [Laughs] And, likewise, the Decca boys would have been in trouble if they had put up a Blumlein stereo pair. The truth is, even the guys who worked for Decca were constantly trying to second-guess [the Tree]. Even though they probably had the formula framed on the wall, they were still wondering, 'What if we tried something else on the center? What if we went a little wider?'"

By the late '70s, Kurlander found himself working increasingly on hybrid pop/classical projects. "You know that joke in *This Is Spinal Tap* where they say they want to do some of their acoustic numbers with the London Symphony Orchestra? Well, that joke was based on what actually happened! Every rock band worth its salt wanted to overdub the London Symphony."

Kurlander says that unlike in straight classical recording, when the orchestra's natural dynamic range is maintained, an ensemble being layered over a rock track requires different mic treatment. "I would typically mike it up from three different perspectives: a close, a medium and a distant. Then I started compressing those three layers. In those days, I would probably have six or eight mics close, then a medium [pair] over the conductor and then a really distant [pair]. A lot of times, I wouldn't be mixing it. The engineer who had recorded the [pop] tracks would come along and I'd give them very specific guidelines on how to mix my tracks. By using the multi-perspective technique, you'd actually come out with something that was relatively squashed up but gave the illusion of being dynamic and natural."

Today, Kurlander says, the modified Decca Tree has become a standard for film scoring. "I use the [Neumann] 150s [a modern update of the M-50] simply because they're new and they're matched and they're reliable, and reliable is really important. So I'll do that and then do a round of closer mics, depending on what the score is, because you never really know what you're going to need [in the mix].

"I'll put my initial Tree at 10 to 12 feet. Then I'll have a circuit of close mics in the sections, and that would depend on the size and the writing and where we're recording — how close they're going

to be. It could be as few as five or six mics or up to as many as 18 or 20. I use a lot of [Neumann KM] 84s or derivatives of 84s — the 184s. And if I have to go closer than about 12 to 18 inches, I prefer not to go that close with a modern condenser and I'll use a ribbon. And if I'm going to go for violin solo or a cello solo, I'll use a ribbon, as well. For surround, I'll have a pair of very high omnis, and sometimes I'll add in some of the Tree's left and right into the rears."

LIVE CHALLENGES

Lawrence Rock Most of what Rock records for the New York Philharmonic are live concerts for either broadcast or CD release, putting him in a different position from the other engineers. Not only does he have to deal with a live audience, he usually doesn't have the opportunity to switch miking schemes between musical pieces at a given performance, even if there are significant changes in style or instrument configuration. And if he's working a broadcast, he also has to consider the dynamic limitations of radio compression.

"When you're recording live, you're dealing with an audience and the noise they make, and any concert hall is going to become less reverberant when people are in it. As a result, I have to use digital reverb; in fact, I've often said that I've built my career on the judicious use of digital reverb," he says with a chuckle.

Rock says he has mostly used Lexicon reverbs during the years. "The 300 has been my workhorse because the digital interface is so straightforward. Of course, I go back to the era of the 200 and the 224, which didn't even have digital interfaces."

When asked about the newer generation of reverbs that actually emulate some of the classical halls in which he records, he says he doesn't like the "known room" approach, "because in my mind, what you're really creating is an idealized version; what we're creating is an illusion. Microphones don't hear the way ears do — you don't have the brain to sort it all out until you're listening on the other end, and then you're listening to speakers or headphones. So you're really creating a whole sound that's certainly related to the source, but it's hardly an exact replication. So you use whatever you have at your disposal in terms of types of microphones and the

placement and whatever processing you need. That said, in the classical world, we try to minimize processing — choosing the microphone that has the kind of sound you're going for and then *not* adding equalization to it because, be it analog or digital, you're still introducing a form of distortion, technically speaking."

Rock says that growing up in Chicago, he was well aware of the Decca Tree approach. "During the [music director Sir Georg] Solti era, they always had the Decca Tree and they applied that approach no matter what hall they were recording in, and I think the results were variable. Sometimes they would have seven of the modified M-50s — a Tree and two outriggers on each side — and it was too much of the same mic sound; it got a little muddy and a little brittle."

Rock likes to mix mics, avoiding the buildup of the coloration of any given mic. "What I generally use is a combination of the Neumann KM-130s, which are the omnis — in fact, I use them with the little [sound defraction] spheres that make them, as I call them, the poor man's M-50 — in the center, and then I use the Schoeps MK2S, which is an omni capsule that has a little bit of high-end rise, as does the Neumann 130. In a place like Avery Fisher Hall here [in N.Y.], and really, working in any hall with an audience present, the first thing to go is the high-frequency return — the kind of reflections and so on that would support high frequency. So those mics are both good for that."

How far up does he hang the mics? "Just under 10 feet; nine-feet-11 to be exact," he says with a laugh. "You get this sweet spot. These four mics hang in a line in front of the orchestra, spread horizontally. The center ones are 18 inches apart; the outriggers are another 12 feet out on either side. One of the things that does is give me flexibility in changing the balance between the inner pair and outer pair. The Schoeps tend to be a little warmer-sounding and the Neumanns are a little more brilliant and have a little more reach. A program might have a wide variety of pieces, and I can't go down there and change mics and change positions in the middle of a concert. But I *can* change the balance, and if I need a warmer sound, I can bring the Schoeps up, and if I need a clearer sound, I can bring the Neumanns up." When it comes to spots, "I'll use some of the KM-140 cardioids over woodwinds and some string spots. I also like the MK21, which is the sub-cardioid

Schoeps. Generally, I go from the omni to the more directional as I go upstage."

CAPTURING SMALLER ENSEMBLES

Allen Sides of Capitol Records. A conversation with Sides centered on his involvement with the most recent Crow album, *Wildflower*, which features sumptuous orchestral accompaniment (by veteran pop arranger David Campbell) on nearly every song. While Sides certainly has experience working with larger orchestras, for this pop date, he recorded a smaller ensemble. The sessions took place at Ocean Way B in Los Angeles.

"The way I record [strings for a pop album] is not that different than what I do for a motion picture," Sides says. "The big live rooms we have sound so good that with the right section and the right setup and a pair of M-50s and the right spot mics, it sounds pretty amazing without having to work all that hard. It's one of those things where simplicity is really the way to go."

"With the smaller sections," he continues, "I set it up a little differently than with a larger orchestra. Typically, with David [Campbell], it will be like 12 violins, three cellos and three violas, so I end up making three rows of six: six violins, six violins and then the three violas and three celli in the last row."

"One of the challenges of recording a section like that is if you have your overall mics aimed at the first row of players, it ends up sounding like a few violins playing. With M-50s, which are actually fairly directional mics above 1k, if you aim past the front of the section, you end up getting a more unified sound. If what you're looking for is a more impressionistic sound, where you don't actually hear any one individual string but you really hear it as a group, I'll aim the M-50s more toward the last row. Then, what I'll usually do in a small section like that, I'll have three KM-54s for the L/C/R violins. If it's going to be 5.1, I'll put up a center M-50, plus I'll put up a couple of Schoeps omnis, sometimes left-right distant front, also left-right rear, depending on what perspective I want with the 5.1."

With the front M-50s, "Depending on the room, I'm usually about 12 feet in the air and sometimes as much as 15 feet — depending on the size of the section," Sides continues. "The bigger section I might split up in a more conventional fashion —

say, four, four, four and four violins on the left; then four and two celli and four and two violas on the right; and the bass is in the center in the back. The other thing I do a lot of is if we're recording two basses, I usually record them in stereo with a couple of [Neumann] U47s because it sounds impressive in pop and they're also centered in the section, so if I have it six, six and six [as in the Crow date], the two basses are dead center in basically a fourth row, so they're also being picked up evenly by the M-50s."

For spot mics, "I'll put a couple of 54s or omni 67s on the violas, and then I use a couple of 54s on the celli. The reason I use a 54 is because they have an incredibly smooth off-axis response. Usually, I'd put one per two celli; if it were four, I'd have two; if it were three, I'd have a left and right and have the mics a little farther apart and a little closer to the outside, because if they combine to mono, the center guy will be too loud."

When it comes time to mix, Sides says, "If it's a wide-open track with lots of space, I'll probably use much more of the overalls. Usually, I'll add a little viola, a little celli and not necessarily any of the close violin mics. But if it's a very dense track with multiple doubled guitar parts and lots going on, I'll probably need a little more of the close mics to fill in the distance. It always depends on what the track needs."

ROOM, ROOM, ROOM

John Rodd - whose credits include DreamWorks' *The Madagascar Penguins in a Christmas Caper*, has also seen a lot of variations on the Decca Tree in the film scoring world. "Sometimes, you might see five microphones across the front, as well as spot mics. Every engineer has his own favorite way of doing it," he says. "In a good-sounding room, I'd say the room is probably going to be about 80 percent of the sound and the spot mics are more for presence than volume. On the Newman stage, for instance, depending on the score, the woodwinds often speak so clearly that you need minimal spot-miking. They're there for some presence and articulation." Rodd's favorite main mics are the Sennheiser MKH 800s, "and I've also been pleased with the Neumann 149s.

"Awhile back," Rodd relates, "I was recording a feature film score in a room that was more live than I would have liked, and the string section was proportionally a little bit small for the brass

section. The players were all in one room, so I had to drop the spot mics a little bit closer than I might ordinarily, especially on the strings. I was aware of this going into it, so I was careful in terms of using the rejection side of the spot microphones in my favor and using a little bit of baffling, but still trying to use as few mics as possible. I guess I approached that session more like a TV date. In TV, you don't rely on room mics as much. With a smaller ensemble, in terms of speed and flexibility, it's more about putting all the sections together and making sure that you can move quickly and balance things and not be reliant on the room sounding balanced.

"There are so many variables to consider before you start recording. Is there a huge dynamic range [in the music]? Are there featured soloists? Is there any musical element that's more important than anything else? Is it a lush pastoral score or more aggressive and edgy? Sometimes you have to pick which mics and mic placements are going to work for what the composer likes: Do they like an aggressive sound or a more lush sound overall?"

For an animated project called *Smile*, with music by Cody Westheimer, Rodd found himself recording a 45-piece orchestra at Capitol Studios A and B. "I put the strings and woodwinds in Studio A and then I put in the glass wall that divides A and B, and had the French horns, trumpets, trombones and tuba in Studio B. I put the conductor with his back to the glass wall that divided the two rooms," he says. "Depending on the writing of the music, the brass and so forth can overcome the smaller string section if they're all in one room. So the way I set it up, as it was a loud score, the brass could play as loud as they wanted and I could still have a refined string sound because the spot mics could be a little farther away from the instruments. It also really helped with editing because we could edit the brass differently than the strings as we had total isolation. Don't get me wrong — I'm a big proponent of having everyone in the same room at the same time, but with that particular size of an orchestra, that's a good way to work if you are at a studio like Capitol."

Blair Jackson is Mix's senior editor.

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Jack Renner - co-founder of Telarc Records

"Before the orchestra arrives, I will have treated the room for overt reflections, noise sources and so forth. You can judge the acoustics of a room by clapping your hands and listening for first reflections, standing waves, flutter echo and so on. If I am unsure, I will ask some musicians to come in and play for a while.

In my opinion, mid-band decay is very important, as is uniform decay over all bands. A minimum of 2-second mid-band decay is desirable for pleasing ambience. Newer halls tend to be 1.7 seconds or less in the mids, which can make for a dry recording. In some halls, the low-band decay is longer than the higher-band decay times, causing muddiness.

To improve reflectivity, we sometimes place sheets of plywood over plush seats. To reduce uneven decays, we've use drapes, carpet, RPG diffusers and other such methods. We avoid stage shells whenever possible. One thing we listen for is a musical ensemble cohesiveness without losing the tactile presence of individual instruments. Frequently, the room has much more to do with this than the microphone technique.

While we're adjusting the room, we'll also be determining microphone technique. We like to use the smallest number of microphones required for a fine recording.. On a smaller orchestra, say for a Mozart work, we can often use just two microphones. This preserves imaging very nicely and, by nature, injects no multi-mic blurriness.

On large orchestras, we'll generally open three or four front mics. And if the room is really dry, we'll place a pair of ambience mics out in the hall. A typical mic array starts with a pair of Neumann M50s on a 24" stereo bar a few feet behind the conductor. We begin at 10' high, pointing the mics at the front row of winds, and angled at 90 degrees to each other. The center mics are panned about 4 and 8 o'clock *[does 10 and 2 o'clock make more sense? -JB]* The flanks panned hard left and right.

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them ever made is still being used. You need \$17,000 to get a used one. -JB]

The flanking microphones are typically Schoeps MK-2, spaced anywhere from 10' to 15' on each side of the center, with identical points as the main pair and leveled 2 to 3dB down from the mains. Microphone selection is also dependent on the humidity of the room. Humidity plays a major role in the sound and decay characteristics of any room.

In our experience, we've found that a dryer climate dulls the sound and lowers decay time. In a humid region, decay is increased, and the sound becomes brighter. We've found that relative humidity in the 50-60% region is ideal for balanced room acoustics. We bring a hygrometer to every session and make adjustments based in part on humidity readings."

Since Renner avoids opening additional microphones whenever possible, I ask about his disposition toward spot miking. "The only spots I use with any regularity are on the woodwinds, although it is the exception - not the rule. I like sub-cardioids here, such as Schoeps MK-21, spread about 3 or 4' and pointed off-axis from the front winds. In rare situations, we might also spot the basses, harps or other instruments that require an uncommon highlight.

[Sub-cardioid is sometimes called "wide-cardioid" and is nearer to omni-directional, but not quite - resulting in a natural, open sound suitable for performances with low stage volume where a more organic sound is desirable. Schoeps MK 21 is a small diameter condenser capsule that is wide cardioid. -JB]

On soloists, I try to orient the player or singer so that the main pickup is from the main microphone array, using additional soloist mics for focus. On smaller ensemble sessions, we've even placed soloists, including piano and vocals, directly in the center of the orchestra. If needed, I'll typically use cardioids or sub-cardioids on a stereo bar for additional coverage of soloists. I don't like mono mics on soloists, or, in general, on any orchestral recording. Mono mics start to sound like the talent is in a tunnel.

For choirs behind the orchestra, I'll generally place four MK-21s across the front of the choir.

The pattern allows for broader pickup while maintaining rejection from the back.."

Renner summarizes his philosophy of orchestral recording: "Telarc as a commitment we keep on all sessions and subsequent CD releases. We believe it's our responsibility to re-create as close to reality as possible in the intent of the conductor and performers. We don't intrude on the performance; rather, we're there to accurately re-create it."

Jack Vad

As recording engineer for the San Francisco Symphony, Vad's recordings are heard on more than 400 radio stations each week. Working with a live orchestra, Vad often deals with different rules than those followed by closed-session recordists. From Davies Symphony Hall in San Francisco, he shares his experience with us.

"There are inherent recording compromises made to accommodate an audience. Room noise is a constant headache. Audience comfort requires major HVAC. Live performances require lots of lighting, with its potential for hum. Alarm watches and pagers always seem to blurt out during delicate passages. And besides, the live noise, an audience is like a large absorptive carpet - unless of course you have an audience full of bald guys! The effects of the audience are carefully considered during rehearsals, so much so that Davies Hall uses wall banners - essentially long strips of carpet - which are lowered during rehearsals to emulate audience absorption.

So I start with a minimally reverberant, noisy environment and work from there - listening to the room absorption and its effect on the music. In addition to audience absorption, a packed Davies Hall has a peculiar phenomenon: at around 300 to 600 cycles, things sort of dip. There's also a large flying reflective canopy directly over the stage. The canopy reflections are brutal: exacerbating intermodulation distortion problems, reducing the sense of natural space in the recording. The canopy turns the stage into a gun barrel shooting acoustic energy, which is fine for the audience but torment on microphones.

In a formal recording environment, musicians can be placed to suit the recording. In a live environment, placement decisions are based on visual considerations and performance balance to the seats.

[So] we use very little stage miking, as it begins to look like sound reinforcement. Most mics are hung from above and aligned during rehearsals. I've experimented for years on various techniques and, mostly due to live noise, I've focused on direct, near-field techniques with omnidirectional mics limited to the main array.

Because the program may range from Haydn to Mahler on any given evening, mics are chosen and arrayed for best coverage on all pieces; sort of a zone defense. It's sometimes a trade-off, but we know our limits and will often place certain mics that are opened on one piece only.

"...a concern of any symphony-recording engineer should be the development of artistic priority. There are many successful approaches to recording orchestras, all offering different musical pictures. Developing this personal sense of musical and artistic accuracy is crucial. Technical decisions should lead to a consistent goal.

Our most important mics are in the front of the orchestra. We're currently using an equally spaced array of four Neumann KM-100s, with free-field equalized capsules. The outside pair is panned hard left and right. Front mics are on 6 foot spacing centers, about 5 feet away from the orchestra front, 10' high and angled down at 30 degrees with the inner pair attenuated about 3 dB and gently curved off at 30 Hz.

[The Neumann MK-100 is a very small pencil mic system with interchangeable capsules.]

In my experience, if the strings are right, everything else tends to follow nicely. The strings should sound like a developed section, not just a few players on stage front. We've tried dozens of fine mics up front, but the Neumanns offer a manageable soft image of the strings and the shell reflections, whereas brighter mics have gotten beamy and timbrally out of control.

On the woodwind spots, I like MK-21, AK-40, or AK-43 capsules. In fact, for a majority of spot applications, these are three of my favorites. Occasionally, I'll place two mics over the tympani, about 3 feet above the split between the drums for broadest coverage."

[AK-40 is cardioid, AK-43 is wide-cardioid.]

For guest soloists, including pianists, I've been using the Neumann GFM flat on the stage near the talent, though vocalists sometimes get a Neumann KM-150 on a stand about 6' away. Choirs with orchestra are miked with an array of B&K cardioids.

French horn spots are always a puzzle in a live Davies recording. In formal sessions, horns can be maneuvered around for best sonics. For a live date, we don't have that liberty. Our solution, albeit less desirable, is to place KM-140s [SDC cardioids] on goosenecks just behind the horns, at horn level, used very sparingly.

Other instruments or sections that could get spotted include the harp, piano, percussion, tuba and so forth. Trumpets and trombones, however, speak for themselves. Our spot mics in general contribute very little to the overall mix. They slightly accent the instrument's presence without sounding like there's an additional microphone.

John Eargle. A former Audio Engineering Society president with a recording career spanning more than three decades, John Eargle has been keeping busy engineering classical recording for Delos Records. To date [1994] Delos has released nearly 50 symphonic recordings engineered by the Grammy-nominated Eargle.

"The first thing I listen for in an unknown venue are early reflections from the shell and canopy. Fast, focused reflections can be devastating to a symphonic recording. In such cases, I'll either move the orchestra out farther into the hall or deaden the shell, or both. Some halls have add-on stage extensions for this purpose.

A larger stage is desired for a wider audio image, assuming the players can still hear each other. I like to arrange the orchestra a little differently than you normally see in a live concert. Moving the horns left of center often helps with spatial counterpoint on loudspeakers. The Seattle Symphony recordings are always arrayed in the 19th century European style with the first violins stereo left and the second violins stereo right."

After Eargle is satisfied with the orchestral placement and hall modifications necessary for recording, he then begins to make microphone and audio path decisions. "I really prefer four microphones across the front of the stage. My main pair are near-ORTF cardioids a few feet behind the conductor and between 9 and 12' high. [ORTF

uses closely spaced capsules - 17 cm apart with each pointing 55 degrees off axis.] The second pair are flanking mics, usually omnis. I place flanking mics near the 1/3 points of the orchestra's front (side to side) dimension. The flanks are generally gained 6dB lower than the main pair.

These four mics are sometimes sufficient for an entire orchestral recording," says Eargle, though most of the time he finds it advantageous to place spot mics in various sections of the orchestra. Concerning spot mics, he warns novice recordists: "Don't jump into spot miking hastily. There are many potential pitfalls, and it's better to move slowly. Experiment with simple spot techniques and consider alternatives before opening up a stage full of microphones. For instance the conductor can simply ask a player or section to play louder or move closer to the main mics.

I rarely spot the percussion, though some of the more traditional highlights include the harp and concerto soloists. An ORTF pair about 10' high can often be used successfully in spotting the woodwinds. Another common spot is a single mic close to the front row of double basses. This helps deliver articulation without building up much. Ultimately, spot miking should be used for focus, not loudness.

When recording a soloist, such as a piano or violin, with an orchestra, I'll place the talent in front of the conductor for good eye contact. Soloists will generally be miked with a pair of microphones, usually ORTF on piano. Be prepared to ride gain when close-miking a soloist. Things can get out of hand if you're not careful. A little artificial reverb may also be necessary help to match the close-miked soloist's sound with the natural room ambience on the orchestral microphones. By the way, I never use artificial reverb on the main microphones unless the hall is just unbearably dry."

Often, Eargle is asked to record the orchestra with a large choir. He says, "a choir can be tricky. Sometimes, the entire choir will be asked to move into different parts of the hall for tests. On most of my choir work, they end up behind the orchestra. However, there have been instances where we actually placed the choir in the main seating area, around rows four to ten, facing the orchestra, with excellent results. We may use as many as 15

microphones during a complex work for orchestra, choir and soloists.

I generally use very little EQ, perhaps a little room rumble filtering or a gentle lowpass filter knee on strings. Once all the microphones are set and balanced through the mixer, I usually record direct to 2-track."

Final words of wisdom? "Work closely with the conductor, know the score, know the hall and let your imagination be on hand at all times."

Bruce John Leek

Anyone familiar with vinyl mastering knows Bruce Leek as one of the most prolific disc cutters in recent history - 20,000 platters mastered. And while Bruce continues to master fine audiophile vinyl his main interest is recording the symphonic wind orchestra, otherwise known as the concert band.

Though less popular than the customary symphony orchestra, symphonic winds remain prominent in schools and military institutions, as well as sharing a stage on many well-known concert halls worldwide. In Japan, for instance, the symphonic concert band has become mainstream, drawing capacity crowds and spawning a long list of new recorded works. Having engineered more than 1,000 concert band recordings to date, Leek is arguably the world's most prolific engineer in this milieu.

"A large symphonic wind ensemble generates a tremendous amount of acoustic energy. It's a remarkable experience to be in a 500-seat hall with 300 musicians playing fortissimo. This happened a few years back, at Texas A&M. Often the marching band will use a row of long-bell herald trumpets. They're quite loud, and it often poses a balance problem for the engineer. Imagine also the sound of 15 tubas in unison. We blew the roof off the place, and the recording turned out to be exceptionally powerful.

In general, however, the concert bands I record are around the same size as a conventional symphony or chamber orchestra, usually ranging from 40 to 100 players. Instead of the first and second violins, we'll have a section of clarinets. Instead of bass, cello and viola sections, we'll have wind sections in various ranges.

Save for strings, the rest of the orchestra remains pretty much the same: flutes and other

woodwinds in the middle, percussion in the back and sides, and brass in back stretched left to right."

Many of Leek's recordings are major classical works transcribed for the concert band. "Highly percussive pieces, such as the Rite of Spring, require a dryer hall for winds to develop and balance with the percussion. A Mozart wind piece, by contrast, seems to record better in a smaller hall that has substantial reverberation. Two of the greatest concert band halls are Royce Hall at UCLA, and Ogden Hall at Hampton University in Virginia.

If the band is polished and tight, I like to capture a closer, more direct sound. On the other hand, if the band has a few weak players, I'll generally back up and focus on a wash of direct and reflected image. It's interesting how a microphone movement can change the apparent quality of a concert band. Besides, I'm asked to make the band sound good. I must be doing something right because most of my work is repeat business.

I usually start with an array of four MKH-20s across the front. The inside mics are 3 to 6' apart 6' to 8' high, angled down between 10 and 30 degrees and pointing about 30 degrees off-center, and placed inside the conductor. All measurements vary and depend on arrangement highlights and ensemble size. The outside mics are spaced about 10 to 20 feet apart, lifted a bit higher, and with a steeper point angle. I like a pair of ambient mics on the hall, as well; usually AT4049 omnis.

It's usually not necessary to spot mike a concert band, though sometimes a celeste or harp does get covered up. In such cases I'll place a stereo pair for spot - MKH40s. The spots are not prominent in the mix. In fact, if you can tell I've used a spot mic, then I haven't done my job. Occasionally, I'll add a bit of reverb to the spot to blend it with the main mics, especially when the mains are pulled back.

[MKH 40 is a SDC Sennheiser cardioid. MKH 20 is an omni.]