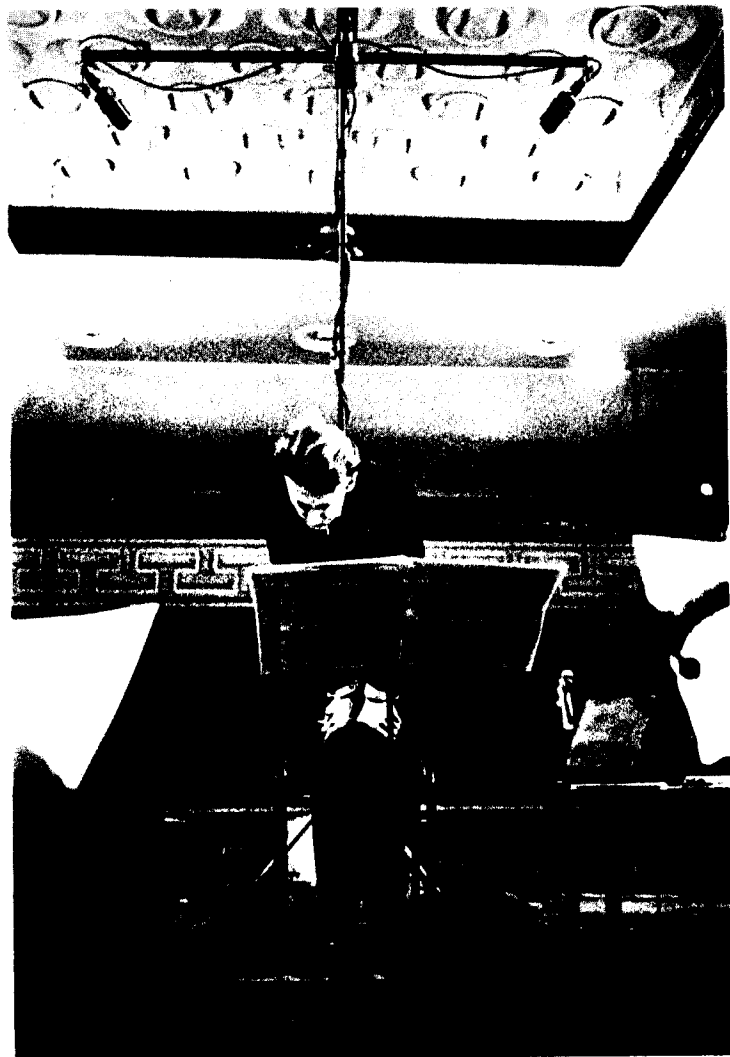


The Birth of Decca Stereo

by Michael H. Gray



The Wilkinson/Decca Tree at Walthamstow Town Hall, 1965.

By the early 1950's, multi-channel audio tape recorders had become common enough in the U.S. for pioneers like Bert Whyte, Emory Cook and Robert Blake to begin to use them to make stereo recordings of symphony orchestras. In Europe, however, early stereo was the province of big companies like EMI and Decca, which had the R&D resources to develop multi-channel techniques and extensive recording programs in which to test them. Today stereo is taken for granted as the standard for music recording; but until the late 1950's, 2-channel (or binaural, as they were often misleadingly called) recordings were almost always confined to classical music whose studios offered an ideal setting for testing new and still experimental stereo mixers and mike setups.

RCA was the first big American company to take stereo to commercial sessions when it sent Producer Jack Pfeiffer and Engineer Leslie Chase to Boston's Symphony Hall to record Berlioz's Damnation of Faust on February 21 and 22, 1954 using a modified RCA RT-11 two-channel recorder, a pair of five-channel mono mixers and two Neumann U-47 microphones. A month later, Pfeiffer and Chase were in Chicago recording Richard Strauss with the Chicago Symphony under Fritz Reiner, then back in New York taping Toscanini's last two broadcasts with the NBC Symphony and Franck's Symphony with Guido Cantelli on April 6.

Across the Atlantic that same month, EMI began stereo experiments at its Abbey Road Studios, where over two decades before Alan Blumlein's had performed his original binaural experiments. Once again, EMI engineers aimed for Blumlein's classic XY pickup pattern, this time by mounting two figure-eight patterned Neumann M-49 mikes head-to-head in a cylindrical case and passing the signals to a specially modified staggered-head EMI tape machine. EMI called these recordings "Stereosonic", and kept them a secret until they were officially unveiled at a London press conference in April 1955. Decca, meanwhile, was also hard at work on clandestine stereo. But instead of using RCA's widely separated mikes or a coincident pickup like EMI's, Decca chose a set of condenser microphones aimed left, center and right as its primary stereo sound pickup. This trio quickly become known as the Decca "Tree", and although the Tree's mikes have changed over the years from Neumann M-49's, KM-53's and KM-56's to today's M-50's (see the chart at the end of this article), the Tree remains the "ears" of almost every stereo recording Decca makes.

The Tree, and the stereo mixer which it fed, were both designed by Roy Wallace, an engineer who was brought to Decca in 1953 to get stereo session recording operational. Within a few months, Wallace had modified a six-channel mono mixer to create a stereo one with pairs of left, center and right inputs, each with bass and treble equalization and level controls, that served until the late 1950's as Decca's only two-channel microphone mixer.

Though some experimental stereo recording had been tried at Decca's West Hampstead studios in late 1953, the first two-channel taping at regular sessions took place in May of 1954, when Arthur Haddy (then head of Decca engineering as well as its senior balance engineer) brought Wallace and the stereo gear to Geneva's Victoria Hall for sessions with the Orchestre de la Suisse Romande. Here Wallace suspended his first tree about eleven feet above and slightly behind the conductor's podium. Two of the Tree's trio of cardioid-patterned Neumann KM-56 microphones were at the left and right ends of one of the Tree's two intersecting metal bars. The signal of the third mike, located close to the orchestra at the apex of the other bar, captured woodwind sound that was split in the mixer and combined with the signals from its companions. All three Tree mikes leaned about thirty degrees towards the orchestra. From the mixer, the stereo signals were routed to an Ampex 350-2 recorder running at 15 ips, a machine Decca used almost exclusively for stereo until the early 1960's. After editing, stereo tapes were filed in Decca's Tape Library under a BN (or Binaural) prefix, a designation that belied the fact that Tree was always supposed to produce effective stereo over loudspeakers, not over headphones.

Although its function was different, the Decca stereo Tree in fact was nothing more than a copy of Decca's existing mono recording setup which placed mikes in front of the violins at the conductor's left and cellos on his right and a third above and in front of the woodwinds. Though aimed like their mono counterparts, Wallace's stereo mikes were clustered closely on the Tree to create a tight and sharply defined stereo image that excluded reflected sound from the sides and rear of the hall that Wallace did not want in the stereo picture.

For the first three years, Decca stereo tapings were mainly regarded as experiments to see if the tree and mixer would work as planned under studio conditions, and to see if improvements could be made by changing the placement or type of the Tree's mikes. Changes that were judged to sound worse than Wallace's original KM-56's, such as cardioid M-49's in baffles (tried in Paris in 1954) or omni-directional KM-53's

that briefly occupied the Tree during recording sessions in London in 1957, were soon discarded. Changes that sounded better, such as omni-directional M-50's in baffles, first tried at mono balance engineer Kenneth Wilkinson's insistence in Belgrade in 1955 (where Decca was recording Russian operas), would, as we shall see, eventually become part of Decca's standard stereo mike setup.

One engineer who shaped the early sound of Decca stereo is James Brown, who began work as a two-channel balance engineer in Vienna in 1955. Among the many handicaps that he faced was the fact that Wallace had modified just one mixer, thus assuring that stereo could be made in just one recording location at a time. It therefore took Brown and Wallace, who were at first Decca's only full-time stereo men, up to two years to learn a hall well enough to match, if not surpass, the sound their mono colleagues, who had spent years perfecting their recording setups, were already getting in the same hall.

It nonetheless became apparent that this advantage had a hidden liability, for while Decca's senior producers and engineers were indeed making brilliant mono records, they did so within a relationship in which creative innovation was thwarted by a rigid distinction between the purely musical role of the mono producer and the technical one of the engineer. By contrast, Decca's younger stereo crews, including engineers Brown and Wallace and producers John Culshaw and James Walker, soon developed relationships in which improvements could be proposed one day, tried the next, and kept if they were successful.

From the first it was clear that these changes were being made to clarify a composer's meaning, or to achieve a more flexible, spacious and musical sound than was possible using just the Tree itself. This latter assignment soon became the job of mikes called outriggers which, like the flanking mikes used in the mono setup, helped pick up the back string desks the Tree did not "hear" properly, and increased the breadth and spaciousness of the stereo image. How big that image was depended, as the engineers also discovered, on the mikes being used: M-50's flanking a KM-56 tree, according to Brown, produced more "air" in the stereo picture than adding 50's to a 50 tree, which already had plenty of ambient information in its pickup. Flanking a 56 tree with figure-eight patterned 56 outriggers (which was tried in London when those mikes first appeared there) captured the strings and produced a broader stereo image, but without the sense of space that materialized when the 56 outriggers were replaced by M-50's, and the 56 tree by an M-50 one.

Still, outriggers couldn't be used to balance a soloist with the orchestra, or to highlight a key part of the ensemble. These were jobs for spot reinforcement microphones. Where these were placed was naturally dictated by the piece of music being recorded, though until the late 1950's there simply weren't enough channels on the mixer to add more than just one or two of them where they were needed the most. Miking concertos normally took a single mike, usually a directional KM-56, though using a trio of 56's to feed the mixer from three perspectives near the soloist was also tried early in 1958 to record Ricci's performance of the Sibelius Violin Concerto, and for a disc of Sibelius songs taped in the same year in Kingsway Hall with Kirsten Flagstad as soloist.

Bridging mixers together could obviously provide more mike inputs, but only, Brown reports, at the expense of the overall signal-to-noise ratio, which lost about six db because there turned out to be unintended impedance mismatches between Wallace's original units. Even so, sessions for Solti's Das Rheingold in the fall of 1958, (where a KM-56 Tree captured the main orchestral sound), used Vienna's existing six-channel unit augmented by a three-input outboard mixer and a single-channel pan-potted amp, a total of just ten mikes to record what is universally recognized as a landmark achievement in stereo production.

By 1959, it was clear that FFSS was to be the future of Decca Records. The time had now come for one of its senior mono balance engineers to make his move. That man was Kenneth Wilkinson, who at the age of forty-six traded his single-channel mixing desk for a stereo one, and in so doing contributed more than any other man to the sound we know today as Decca stereo.

Wilkinson began his recording career at the Crystalate Company in 1931. In 1937, Crystalate was bought by Decca, and Wilkinson along with his colleague Arthur Haddy became the nucleus of the new Decca engineering team. Within a year, Haddy had built a moving-coil extended range disc cutter, an device that led to a secret war-time project eventually known after the War as Decca FFRR. By 1943, Decca was also getting serious about recording classical music, a new departure for a company best known for records of Vera Lynn and imports from its American partner, Jack Kapp's Decca Records. Decca's new classical studio was London's Kingsway Hall, a location whose notorious subway rumble didn't keep it from being considered by many (including Wilkinson himself) to be the best recording studio in London.

Wilkinson balanced and produced those early Kingsway sessions, a situation that three years later took a significant turn. "It was during those days," he remembers, "that Victor Olof formed the Beecham orchestra [the Royal Philharmonic] and he used to be there on the sessions, and eventually came into the control room and sort of helped out with the score. That's when he was approached to join the company as a producer. He, basically, was the first classical producer we had."

By the end of 1946, Wilkinson had also made his first records in Walthamstow Town Hall, a venue he quickly found when a series of sessions with Charles Munch couldn't be booked into Kingsway Hall. Wilkinson is too modest to take credit for the sound of his discovery, though it has been the site for some of his best records, including many produced by Charles Gerhardt, a man Wilkinson regards as one of the most talented and musical he has ever worked with.

During the next decade, Wilkinson became one of Decca's most travelled balance engineers, moving from London to Amsterdam, Paris, Rome, Copenhagen, Bayreuth and elsewhere accompanying Victor Olof and later his younger colleague, John Culshaw. Many of those early sessions were made with just three English-made RK-2 omni-directional condensers; but as new Neumann mikes became available after the War, Decca's RK-2's were soon replaced, first by Neumann M-49's or M-50's on the flanking mikes, and then by Neumann's for the center wind pickup.

Wilkinson's microphones were always means to an end, for his objective, in his own words, was to achieve "as natural a sound as possible" with the "quality" that was "more important than anything on a recording." This was especially true after the arrival of stereo, for Wilkinson, sooner, perhaps, than other Decca balance engineers, concluded that cardioid mikes, such as KM-56's, were not the way to get the best possible sound. "The 56 naturally gave a good stereo effect", he notes, "but I was never happy with the quality of the sound. I don't think a directional mike gives you a good sound from an orchestra anyway. It's very good on solos and solo work, but I don't think it is for orchestral."

The mike that Wilkinson did think would give a better sound was the Neumann M-50, with which he began to experiment on his Tree soon after arriving on the stereo side. At first, Wilkinson put his 50's in baffles, for, like his colleagues, he continued to believe that omni-directional mikes needed to be isolated from one another "to separate the sound coming from the left, the center and the

right so that you didn't pick up the cellos from the back of the mike facing the first violins." Wilkinson eventually discovered, however, that 50's without baffles not only retained their stereo effect, but also achieved better sound because there was now more hall resonance in the stereo picture.

It was from these experiments that Wilkinson devised the orchestral mike setup that served as the framework for his basic stereo balance. He describes it this way: "You set up the tree just slightly in front of the orchestra. The two outriggers, again, one in front of the first violins, that's facing the whole orchestra, and one over the cellos. We used to have two mikes on the woodwind section--they were directional mikes, 56's in the early days. You'd see a mike on the tympani, just to give it that little bit of clarity, and one behind the horns. If we had a harp, we'd have a mike trained on the harp. Basically, we never used too many microphones. I think they're using too many these days."

Beginning with a rough equality in the mix between the Tree and the outriggers, Wilkinson added his spot mikes. "The spot mikes you don't use so much of because you do get the balance through the tree and the outriggers from the whole orchestra. It's only to give just that little bit more definition on the tympani, the horns and the woodwinds that we use these spot mikes. We didn't rely on those for the whole sound. You basically get it through the front mikes. I think that woodwinds should not be brought forward because they are behind the orchestra, more or less, so therefore they should sound a little bit distant. You need the clarity, naturally, to hear what they're doing."

Clarity, and quality, were what it came down to. "That's the whole reason", he said, "to get the sound as natural as you can. You're trying to made a record sound as you hear the orchestra in the hall." All the effort in the world, nonetheless, could never make a good record of a bad tape. Decca's balance engineers were always aware that many variables, including added mike equalization, the placement of the orchestra in the hall, and the type and bias of the tape being used, helped shape how a session sounded. To control these factors, Decca engineers kept a record of session mike setups and added frequency runs to each reel of session tape so that music from sessions several days apart could be smoothly edited together. Careful preparation nevertheless didn't keep identical setups with the same orchestra in the same location from producing mysteriously different results, a situation producer Charles Gerhardt says he faced more than once during his long career.

Making Records

It's still a long way from master tapes in the studio to sound consumers can hear at home. This was especially so at Decca, whose stereo experiments were kept secret from its artists long after RCA and EMI had started issuing two-track stereo tapes to consumers who had the gear to play them. Decca, of course, had no intention of issuing stereo on tape, but was instead waiting for the record industry to adopt a standard for stereo discs. It had, in fact, been at work on single-groove two-channel recording since 1950, first using a complex carrier technique (Culshaw's Ted Heath on one channel and Beethoven's Fifth on the other) which, because of excessive cross-talk problems and the need for expensive playback cartridges with a 35-KHz bandwidth, was soon scrapped in favor of a vertical/lateral system devised by Horst Redlich and Hans Klemp from Decca's German partner, Teldec. (See Donald Aldous, "Stereophony: the Prospects", Gramophone Record Review (December 1957), p. 123) By the mid-1950's, Decca was in hot competition with Westrex's 45/45 stereo disc cutter, and when Westrex won the industry standard, Decca quickly fell into line. Teldec's experimental head was immediately modified for 45/45 work and cutting engineer Cyril Windebank was set to work making sixteen hours of discs a day to build the new two-channel catalog.

With routines already well-established for making single-channel discs, making stereo ones came up to speed quickly. Like their mono companions, stereo records were always mastered from original session tapes and not from copies or work tapes. Tape matrix numbers (which identified sides of an LP) were the same in each format, differing only in prefix, ARL for mono (A for Classical, R for Record and L for London, in whose release sequence the matrices are stored in the Decca Tape Library), and now ZAL for stereo. Stereo mastering engineers continued to add their own identifying letter suffixes (A, F, L, and so on) to the number of each newly cut lacquer so that the Decca record factory could refer problems that might arise when masters were processed, since the same engineer was usually assigned to cut a particular matrix during its mastering history.

Some important procedures were different. All stereo discs cut between 1957 and 1967 were half-speed mastered, including ones from Dolby master tapes using specially modified Dolby replay machines. Half-speed cutting helped control high-frequency distortion by moving the 8 KHz peak of the early Teldec head (and those of some later Neumann models) to a point around sixteen KHz. With improvements in

high-frequency behavior there unfortunately came linearity and distortion problems at the low end, a factor which along with a thirty-Hertz "Kingsway filter" to eliminate that venue's subway rumble may account for the absence of really deep bass on many early Decca stereo discs.

By 1968, Decca was using a new Neumann SX-68 cutting head. With the installation of a Neumann SX-74 cutting head in 1974 that was joined in 1981 by a VMS-80 cutting lathe, a system was created that was at last able to pass the full frequency and dynamic range of Decca's master tapes. Even with top-class cutters, however, Decca did not remain immune from the inconsistencies of vinyl disc production, so that a single well-cut lacquer could through plating and pressing create copies different enough to make statements about which pressings are good and which are not almost impossible to make. (See David Praekel, "All records are made equal: but some are more equalized than others", Hi-Fi News & Record Review (July 1983), pp. 30-31)

Decca tapes are turned into records not only by Decca itself, but also by its many worldwide affiliates. Many of these records are made from copy tapes whose quality on disc often depends on the "house style" of the country in question. Decca tapes marketed in France, for instance, are cut to LP mastering standards set by French Polygram, which manufacturers Decca's LP product there. German Teldec, which until two years ago cut its Decca LP's from analog copy tapes, has switched to Direct Metal Mastering using digital copy tapes (and cutting instructions) supplied by the Decca Recording Centre in London. From detailed comparisons of these international mastering styles, it's clear that French Decca's of the past few year tend to be brighter and shallower and German Teldec's warmer but less firm and substantial than English pressings of the identical performances.

In Japan, the Decca catalog has been split since 1982 between Decca's old licensee, King Records, and London Records, which is part of the Japanese Polydor group. Until recently, London digital discs were being pressed in Japan from English metal parts. With the world-wide demand for LP records continuing to fall, these home-grown discs have been replaced by ones imported from the Netherlands as Polygram moves to centralize black disc production for all its world-wide markets. King's increasingly scarce reissues of old Decca tapes are usually excellent, a tribute to quality of its LP mastering that's earned the praise of Decca's London headquarters, a factor that makes them the most desirable way (short of English mastering) to hear fifties stereo in something like its true sound.

True sound is something that we cannot expect from today's Stereo Treasury pressings (or, for that matter, from the cassettes that now dominate the London STS catalog), neither of which are equal to the records American London stopped importing here in 1978, or in most cases current Japanese, German or even French pressings of the same material. Decca tapes cut and pressed for issue in the U.S. as a rule were always supposed to sound the same as their English counterparts, a policy Decca deviated from only once in the 1960's, when Phase-Four discs made for the American market were cut (over the objections of some Decca mastering staff) between four and five decibels hotter to satisfy the presumed taste of the American "Hi-Fi" buyer.

Since 1979, Decca's LP's have been mastered in London but pressed by Philips in Holland, a fact that greatly reduced its control over how its recordings sound. Decca nonetheless continues to run its own recording sessions where Decca-made consoles, digital recorders and editing machines show that the company still retains its "invented here" technical tradition. One aspect of that tradition is Decca's ADRM, or Analogue Digital Remastering program, which will be used to process at least two thousand of the "best" of its old stereo recordings for Compact Discs, a number that still won't encompass many outstanding recordings from the 1950's and early 1960's. Hearing these tapes means scrambling for a shrinking number of black discs from France, Japan, or England, or exploring the flourishing market for original FFSS stereo discs whose prices continue to increase as collectors learn how good they sound. As one of the pioneers of early stereo sound recording, Decca FFSS LP's are well worth the effort to acquire, even if their performances are often less striking than their sound.

October 1956

Honegger: Le Roi David STS-15115/6

April 1957

Stravinsky: Le Sacre du Printemps CS-6031
Rimsky-Korsakov: Christmas Eve Suite; CS-6036
Sadko; Dubinushka; "
Flight of the Bumble Bee "
Debussy: Printemps CS-6079

October-November 1957

Debussy: La Mer CS-6024
Stravinsky: Petroushka CS-6009
Debussy: Nocturnes CS-6023
Ravel: Mother Goose Suite "

Paris Recordings, 1954-1956 (In the Salon de la Mutualité with the Paris Conservatory Orchestra; conductors are noted at each entry)

September 1954

(Unless noted otherwise under Ansermet)

20th Dukas: La Peri No stereo traced
21st Dukas: Sorcerer's Apprentice Tape BN-20
Ravel: Bolero "
22nd Honegger: Pacific 231 Tape BN-21
Rimsky-Korsakov: Scheherazade STS-15126
23rd-26th Rachmaninoff: Isle of the Dead No stereo traced
27th Liszt: Hamlet (Munchinger) No stereo traced
28th Liszt: Mazeppa (Munchinger) No stereo traced
29th Auber: Overtures (Wolff) Dec. ECS-695
30th Liszt: Hungarian Rhapsody No. 2 (Munchinger) No stereo traced

June 1955

4th, 8-9th Tchaikovsky: Suite No. 3 (Boult) STS-15034

9th Prokofiev: Lt. Kije Suite (Boult) Dec. SPA-229
10th-14th Liszt: Faust Symphony (Argenta) Tape BN-78
15th-17th Honegger: Symphonie Liturgique No stereo traced
Honegger: Chant de Joie (Denzler)
20th-21st Berlioz: Overtures (Wolff) Dec. ECS-537
22nd-23rd Massenet: Scenes pittoresques STS-15033
Massenet: Scenes alsaciennes (Wolff) "

May 1956

7th-8th Strauss: Tod und Verklärung; Tape BN-263
Don Juan (Knappertsbusch)
7th-11th Glazounov: The Seasons (Wolff) STS-15108
14th-16th Chausson: Symphony (Denzler) STS-15145
17th Franck: Chasseur Maudit; Dec. ECS-772
Redemption (Wolff)
22nd-23rd Tchaikovsky: Symphony No. 2 (Solti) STS-15120
22nd-26th Tchaikovsky: Symphony No. 5 (Solti) STS-15060
30th Charpentier: Impressions d'Italie (Wolff) STS-15117
31st Lalo: Scherzo; Rhapsody (Wolff) Dec. ECS-772

October-November 1956

22nd-23rd/ Adam: Giselle (Wolff) Dec. ECS-677
6th Nov.

November 1956

21st-22nd Stravinsky: Firebird Suite; STS-15197
Petroushka (Monteux) "

Vienna Recordings, 1955-1957 (In the Sofiensaal with the Vienna Philharmonic, unless otherwise noted; as before, conductors are noted on each entry)

May-June 1955 - Musikverinssaal, Konzerthaus and Redoutonsaal

16th-22nd Mozart: Così fan Tutte (Böhm) Rich. S-63508
May
30th-31st Mozart: Piano Concerto K. 595 STS-15062
May Mozart: Piano Sonata K. 331 "
(Backhaus; Böhm)

2nd-10th Mozart: Don Giovanni (Krips) OSA-1401
 June
 13th-21st Mozart: Le Nozze di Figaro OSA-1402
 June (Kleiber)

November-December

Strauss: Die Frau ohne Schatten Rich. S-64503
 (Böhm)
 12th-13th Mozart: Divertimento K. 113 STS-15119
 December Divertimento K. 205 "
 Minuets K. 463 "
 (Mozarteum Orchestra)

March 1956

Brahms: Symphony No. 4 STS-15001/4
 (Kubelik)
 Smetana: Ma Vlast (Kubelik) STS-15096/7

June 1956

Bruckner: Symphony No. 5 STS-15121/2
 Wagner: Götterdämmerung "
 excerpts
 (Knappertsbusch)
 Mozart: Symphony No. 35 Rich. 29062
 Schubert: Symphony No. 8 "
 (Schuricht)
 Wagner: Wesendonck Lieder OS-25101
 (Flagstad; Knappertsbusch)

September 1956

6th-9th Strauss: Songs (Gueden/Gulda) Dec. ECS-630
 10th-11th Schumann: Piano Concerto STS-15026
 (Backhaus; Andreae)
 14th Strauss: Till Eulenspiegel; ECS-674
Tod und Verklärung
 (Reiner)

October 1956

1st-2nd Dvorak: Symphony No. 7 (Kubelik) STS-15125
 3rd-4th Dvorak: Symphony No. 9 (Kubelik) STS-15007
 7th-8th Brahms: Symphony No. 1 (Krips) STS-15144

February-March 1957

28th Feb./ Brahms: Symphony No. 2 (Kubelik) STS-15001/4
 5 March

May 1957

Haydn: Symphony No. 96 CS-6080
 Symphony No. 104 "
 (Munchinger)
 Wagner: Die Walküre, OSA-1203
 Act III
 (Solti)
 17th-23rd Mahler: Kindertotenlieder; OS-25039
 Lieder
 (Flagstad; Boult)

June 1957

Beethoven: Piano Concerto No. 5 CS-6019
 (Curzon; Knappertsbusch)
 Strauss: Arabella (Solti) Rich. S-63522
 Brahms: Haydn Variations; STS-15027
 Academic Festival "
 Overture; Tragic Overture "
 (Knappertsbusch)

September 1957

9th-14th Haydn: Symphony No. 94 STS-15025
 Symphony No. 99 "
 (Krips)
 " Strauss: Waltzes (Krips) STS-15012
 " Vienna Holiday (Knappertsbusch) STS-15264

October 1957

Wagner: Die Walküre, Act I OSA-1204
 (Knappertsbusch)
 Brahms: Piano Concerto No. 2 Dec. ECS-751
 (Curzon; Knappertsbusch)