

**THE BALLROOM OF TOWN HALL**, Philadelphia, is normally a quiet place, and its name has never appeared in even the most obscure military history. Yet on a recent wintry morning the spirits of Napoleon, the Duke of Wellington and Czar Alexander-I were almost palpably present, as seven stories above the busy traffic et Broad and Race streets the two most famous battles in musical history were about to be reenacted. The forces gathered were formidable: 106 members of the Philadelphia Orchestra, 120 members of the Temple University Choirs and 24 members of the Philadelphia Brass Bands, all under the generalship of Eugene Ormandy. The rules were drawn from a more courtly era of military encounter, for all had agreed that the first shot would not be fired until 11 A.M. But after that, it was war!

The campaign plans of RCA were hardly less detailed than those of Tchaikovsky and Beethoven. For weeks engineer Paul Goodman and I had worked on the details of our musical and technical approach, and the equipment we assembled to capture the vast dynamic range of these battleworks was nearly as formidable as the forces described above: eighteen Neumann U-67 microphones, two 3M 8-track tape recorders, sixteen Dolby A-301 noise-reduction units, an 18-channel, 8-track RCA console with four McIntosh 100-watt monitor amplifiers driving four KLH Model Five loudspeakers over which we monitored the six direct and two ambient sound tracks. The control room was acoustically dampened to permit us to hear the sound as it came from the hall without additional coloring.

Eleven o'clock finally arrived, and *Wellington's Victory* began to resound from the hall. After a half hour of microphone-placement experiments and music-level tests we achieved a precisely balanced and fully stereophonic microphone setup for each section of the orchestra and chorus. Tape levels were precisely set to prevent any overload (with its resulting compression and distortion) in the loudest passages. We thus gained the full advantage of the extra 10 dB of dynamic range in the quiet passages made possible by the Dolby units. The final result was an open, naturally balanced sound, which met with Maestro Ormandy's enthusiastic approval.

Recording began, and we were able to maintain the full dynamic range made possible by our state-of-the-art equipment with no more than the subtle musical monitoring necessary to control sectional balances. Several hours later the smoke and noise of battle finally subsided, and RCA was the proud possessor of the fruits of the struggle.

We returned to New York studios with the tapes approved by Maestro Ormandy and made a precisely controlled Dolby transfer from the 8-track original to a final 2-track master tape. No equalization, filtering or compression of the original dynamic range occurred during this mastering. The undeniably sensational but musically unnatural heightening of string and percussion effects in the finale of the *1812 Overture* heard in many recordings was avoided. The excitement and grandeur of this finale can be reproduced without "conducting" aid from a recording producer, and the natural balances are ultimately the most exciting of all. .

The cannon shots provided a great post-session challenge. Actual recordings of cannon fired outdoors are disappointingly flat and anemic because they lack reverberant Characteristics. Cannon fired indoors are, alas, highly destructive to buildings and eardrums. The electronic cannon heard in this recording provide an ideal solution. We analyzed the frequency spectrum of several cannon recordings, and re-created, by electronic synthesis, the complex frequency components of the sound. We then recorded our "cannon shots" in a reverberant acoustical surrounding and synchronized them with the music tracks. With such technical control we were able to precisely orchestrate the 16 cannon shots in the *1812 • Overture* and the 188 called for in *Wellington's Victory*. In this case we feel science has provided us with the cannon we could previously hear only in our imaginations.