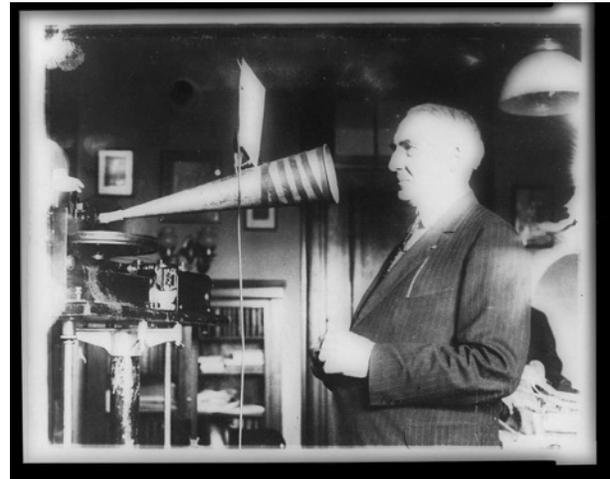


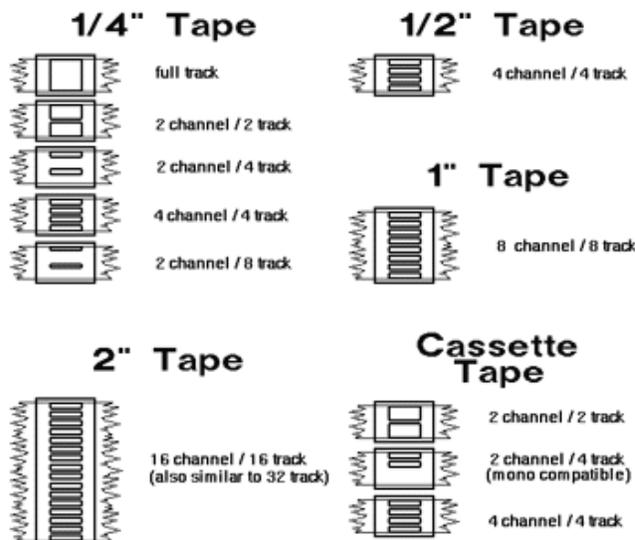
## Handout 2 - Magnetic Tape and Multitracking

Thomas Edison's phonograph, patented in 1877, launched the recording industry. The phonograph funneled sound through a large horn with a needle at its narrow end. The sound waves moved the needle which then cut grooves into a cylinder or flat wax disc. The photo to the right shows president Warren G. Harding recording a speech into a phonograph around 1921.



Guitarist and inventor Les Paul conceived of what he called "sound on sound" recording in the 1930s. Paul experimented first with recording himself through a phonograph to disc and then recording himself performing with a playback of that disc. Upon acquiring an early magnetic tape recording machine, Paul continued tinkering, outfitting it with a second recording head so it could capture two signals at once.

Inspired by Paul's recordings and ideas, singer Bing Crosby invested in the Ampex Corporation's development of a multitrack tape machine. In the early 1950s, Ampex released the first 3-track machine, and over the ensuing decades the track count increased to 4-, 8-, 16-, 24- and 32. All of these machines divided a strip of magnetic tape, either 1/4-inch, 1/2-inch, 1- or 2- inch wide, into sections, or "tracks." Each track could contain separate, autonomous sound, but all were synched together. Any one of the tracks, or all of the tracks, could be erased and then re-recorded without destroying the tape. The diagram above shows how recording heads divide various sizes of magnetic tape into tracks.



### Why all these tracks?

Think back to the clip of Duke Ellington leading his band in a phonograph recording. The musicians are positioned around a single microphone with the acoustic guitar and bass closest, so they'll be heard, and the drums in the back to prevent them from overpowering the recording, a different configuration than they would use in concert. Ellington's recording was then notched directly, and permanently, to disc. However, a magnetic recorder with four tracks allows an engineer to mix four independent audio signals to tape, either simultaneously or at separate times. Moreover, the tracks maintain this

