

## The Western Electric No. 60 Selector - First Designed for Railroad Communication

Many of us know of the Strowger Switch, invented by Almon Brown Strowger in 1888, to connect automatically multiple telephone lines together. It made dial telephoning possible. In the early 1900s the railroads wanted to move from telegraph to telephone communication, but their calling and connection problem was unique. Instead of needing to connect multiple lines together, they needed to connect any one of the many locations along a single telegraph line with any other location; Strowger Switches couldn't connect these. While engaged in other duties the railroad telegraph operators sub-consciously heard their call sign amid all the clicks and clacks. However, monitoring a gigantic party line telephone circuit meant agents had to use a headphone, and it and the constant voice chatter, hindered their other duties. Western Electric, the main telephone equipment supplier at the time, needed something new to solve the railroads' problem and make sales to them possible.

The solution came in the form of the Western Electric No. 60 selector invented by WE employee Joseph C. Field. The No. 60 US Patent was number 1,343,256, filed on May 18, 1916 and issued on June 15, 1920. It allowed selective calling of a single railroad agent's telephone over an old telegraph line. When the proper three-digit code was received, it activated a bell circuit so constant monitoring of the line wasn't required.

As first used by the railroads, the device was operated by a 120V (minimum), 3.5 HZ alternating line voltage; it was a strictly electro-mechanical system. In addition to signaling a single telephone, all-call and several group calls were possible. The device's codes were set by pins set in a small wheel, which rotated in response to the line voltage alternations. Any code, which did not stop the wheel on a code pin, would reset the wheel to its home position. The total of the digits in each code had to equal 17. Though it seems inconceivable in today's digital world, the three digit codes for that original device included numbers 11, 12 and 13 – example: 13-2-2 equals 17. Western Electric literature lists the 78 codes available on this original device, but this soon proved to be insufficient. To generate the codes Western Electric sold the railroads several versions of encoders.



Figure 1 – Used on AT&T Long-Lines

Over the years, Western Electric introduced several variations of the No. 60 with greater code capacities, one of them having 241 three digit codes; this version required that numbers as high as 20 be sent – example: 20-5-2 equals the target of 27 for this later version. Other improvements or variations included versions with up to four circuit activations and different ways of connecting to mating equipment. Internet searches turned up photos for models identified as 60AP, 60BP, 60C, 60E and 66A. All similar to Figure 1.

In the 1940s, the No. 60 was modified by eliminating the screw terminals on top of the base and substituting a connector block on the bottom, which connected to a mating block in 1940s-50s Western Electric mobile telephones. Some identify this as the No. 60E and others as No. 66A. The 600 Hz – 1500Hz tone signaling used with the No. 60s on AT&T long-distance order wires was also used in those early WE mobile phones; they became the standard mobile telephone signaling tones for many years. My 60E (or 66A) has a five-digit code of 3-2-4-6-8, equaling the target of 23 for this version.

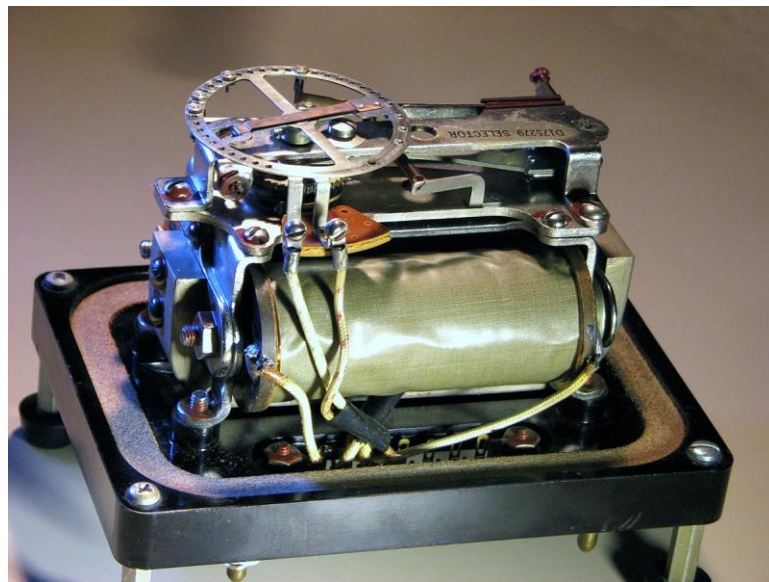


Figure 2 – My WE 60E – From a WE Mobile Telephone

However, these later No. 60 devices with a greater number of codes have a big deficiency, the four digits 5-4-6-8, or the three digits 9-6-8, also equal 23 and would also activate my device. Thus, mis-dials could produce wrong numbers, undesirable in any telephone system.

All these devices had a cover to help keep them clean. This cover was glass for the early units and clear plastic for later ones.