

MR. DAVE PANSEN
TRANSISTOR MUSEUM DONATION
March 2015



Size: Approx 1 3/16" L X 7/16" OD
Date Code: 7603 on box
Date Code: 369 stamped on device

**Western Electric
Type 3A**

TYPE

Germanium Point Contact Phototransistor

USAGE

4A Crossbar National Phone Call Routing System

DATE INTRODUCED

March 30, 1950

AVAILABILITY

Rare (Limited Production)

DONATION COMMENTS

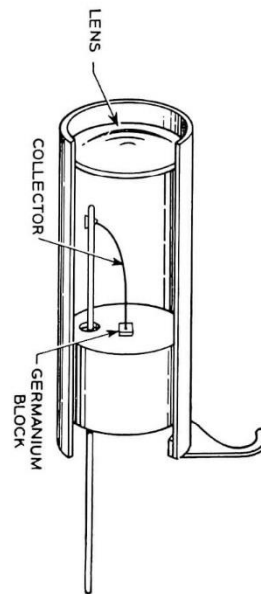
"Hello Jack, I acquired several WE NOS 3A photocell transistors recently and if you have an interest and do not already have this item in your collection I can donate one of them to the transistor museum. Attached are photos and a few historical reference points in the form of Bell Labs 1950s ads from Scientific American magazine (August, 1956). In the eight years or so I have been collecting I have only in come across 3As one time so I think they are quite rare."

HISTORIC NOTES

The invention of the transistor at Bell Labs in December 1947 was the first of many important semiconductor device developments that quickly followed this initial technology. For example, on April 6, 1949, John Shive of Bell Labs filed patent 2,560,606 describing a new transistor type that was soon to be known as a "phototransistor". Western Electric formally announced the availability of this new transistor type on March 30, 1950. The production version of the Western Electric phototransistor was designated as the Type 3A. This device type was used extensively in Western Electric/AT&T phone network switching systems, beginning with the long-lived 4A Toll Crossbar Switching System developed in 1953 ([See this reference](#)). Western Electric continued to manufacture the Type 3A into the 1970s as replacement parts for the large number of installed network systems. The Western Electric Type 3A phototransistor is a truly historic device and represents a unique technology from the early days of transistor history.

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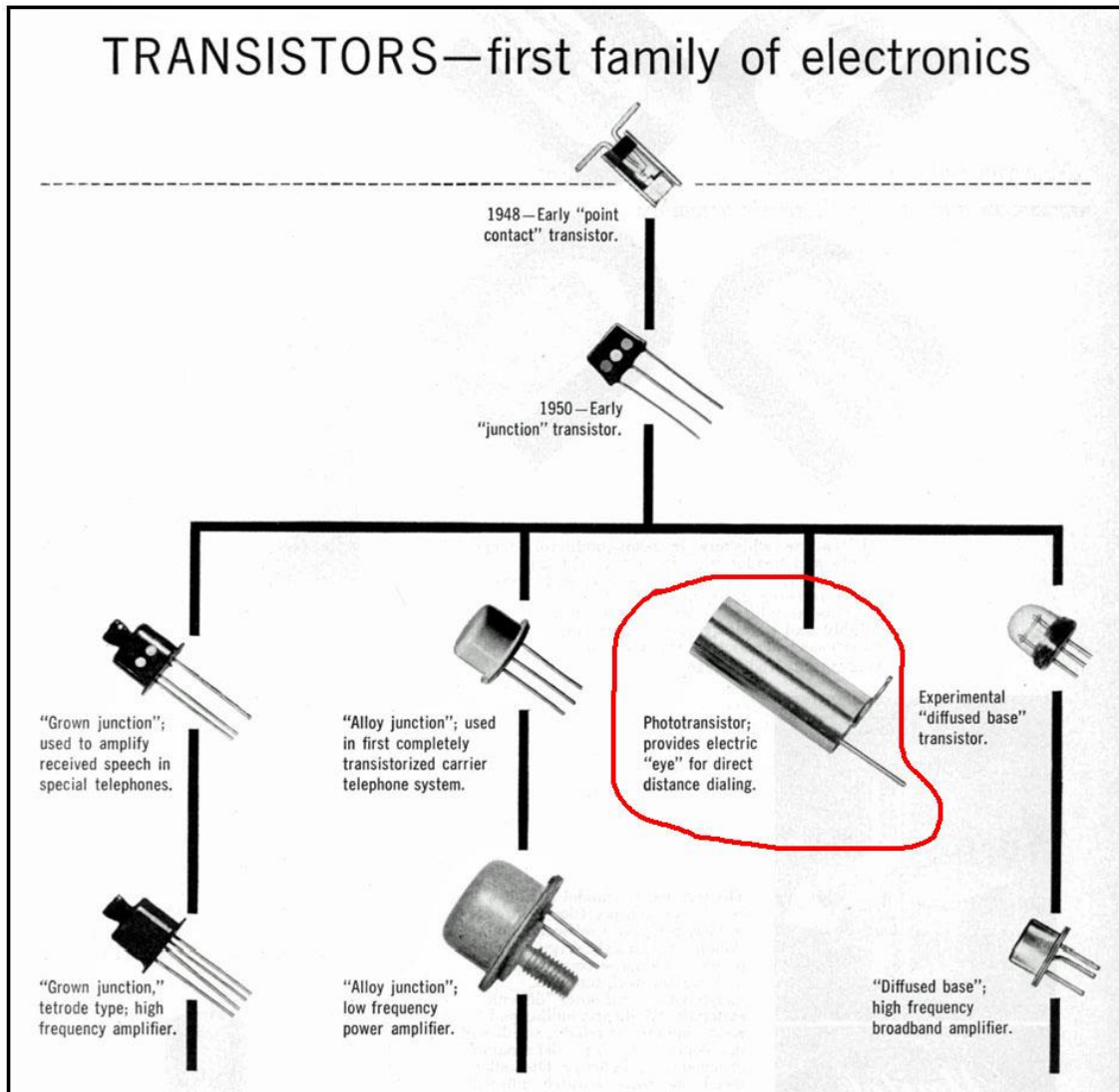
Western Electric Type 3A
Germanium Point Contact Phototransistor



As further documentation of Type 3A phototransistors donation to the Transistor Museum, Dave Pansen also provided the three photographs shown above. The diagram is excerpted from the article ["The Card Translator for Nationwide Dialing"](#) in the September 1953 Bell System Technical Journal. The Type 3A is a germanium point contact transistor, which was the first transistor technology developed at Bell Labs, but also utilizes the physical property of certain semiconductors to emit electrons in the presence of a light beam. Note the unusual construction of the phototransistor, with an optical lens to focus the light source directly onto the germanium point contact area.

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Western Electric Type 3A
Germanium Point Contact Phototransistor



The above is a section of a 1956 ad by Western Electric which illustrates the major transistor technology achievements by Bell Labs in the few years following the June 1948 announcement of the first transistor. The Type 3A is shown above circled in red. It is interesting to note that the Type 3A was developed using point contact technology, which was obsolete by the mid-1950s and replaced by the later technologies shown above (grown junction, alloy junction and diffused base). All Western Electric transistor types shown in this ad are historic and collectable, and this is particularly true for the Type 3A because of the unique technology and development history.