When Lionel Went Nuclear

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Lionel began making nuclear toy trains beginning in 1958. In 1960, Lionel ventured into the real nuclear world.

In the Beginning

Lionel's nuclear-themed trains and accessories have been a frequent part of the company's product line since 1958. (See Lubenau and Hornor articles in the Health Physics *Newsletter*, December 1997 and March, June, and July 1998). In 1960, Lionel entered the real nuclear world when it acquired Anton Electronics Laboratories (Anton). Lionel's acquisition of Anton was part of a corporate strategy to diversify its product line.

Anton was founded in 1948 by Nicholas Anton, who was responsible for the design of many of the radiation detectors used in early US space probes. In 1960, Anton employed 316 workers consisting of 21 scientists and technical staff and 234 production workers, with the remainder being supervisors, maintenance workers, and clerical workers. It had not been profitable: net operating losses occurred in each of the years from 1956 to 1959. The losses for 1957 to 1959 totaled $162,256; the loss in 1959 alone was $86,528. Notwithstanding this dismal record, Lionel acquired Anton, renaming it Lionel Electronic Laboratories (LEL). Nicholas Anton was retained but soon left, forming a new company, EON Corporation.

Initially, LEL was featured in Lionel's annual reports but in 1963 there was no mention of LEL except in the financial section that contained this revealing footnote:

"In September 1963, Lionel closed down the operations of a subsidiary, Lionel Electronics Laboratories, Inc., at its Brooklyn, New York plant and transferred the inventories and certain fixed assets to two other plant locations. In connection with the closing down of the operations, the employment of all accounting and clerical employees at the Brooklyn plant was terminated. The subsidiary had recorded sales for 1963 of approximately $1,950,000 and it showed a gross loss of $1,050,000. While a substantial portion of the gross loss appears to have been attributable to write-downs of inventories, idle facilities and nonproductive labor, there remains a portion of the gross loss—in an amount presently undeterminable—the causes of which Lionel is presently unable to identify definitely from the subsidiary's accounting records and the knowledge of the present accounting personnel."

There was no mention of LEL in the annual report for the following year and the 1965 annual report was the last to mention LEL.

Civil Defense Equipment Made by LEL

The civil defense radiation detector most commonly seen is the CDV-700 Geiger counter. The Office of Civil Defense (OCD) purchased 453,000 of these units between 1955 and 1985. Anton was a late-entry manufacturer making the model 6. After taking over Anton, LEL continued making the model 6 under its own name before moving on to the model 6b **(Figure 1)**. The difference between the two models is the battery requirement—five D-cells in the 6 compared with two D-cells in the 6b. LEL made approximately 82,000 CDV-700s, a respectable 18% of federal government purchases. Some LEL model 6b units contained a modified GM tube to extend the units' range.

Figure 1. Lionel Electronic Laboratories (LEL) model 6b CDV-700 Geiger survey meter. This is LEL's most successful product. About 82,000 were sold to the Office of Civil Defense. Many are being retained and recycled for use by homeland security radiological emergency response teams.

The CDV 715 was designed to measure high levels of radiation encountered following an enemy nuclear attack. The 1969 cost to the government was $15.86 per unit. It came in models 1, 1A, and 1B. LEL made models 1 and 1A. Between 20,000 and 30,000 of the 657,000 CDV-715s were made by LEL.

Some LEL CDV-700 and CDV-715 units were incorporated into the CDV-777-1 Shelter Radiation Detection Kit which also included dosimeters and dosimeter chargers.

The CDV-794 was intended to calibrate civil defense radiation detectors using a 130 Ci ^{137}Cs source. Anton made three to five prototypes that became LEL's property following the takeover. However, Marlow Stangler, an OCD health physicist, discovered that the safety interlocks on the Anton prototypes could easily be jimmied. OCD sought out another manufacturer, Tech Ops, to produce an improved version. Although LEL advertised the CDV-794, there is doubt that LEL manufactured or distributed any beyond the prototypes it acquired from Anton.

Perhaps the most unusual LEL product made for the civil defense

program was a prototype combination portable radio and Geiger counter, the CDV-726DX **(Figure 2)** made sometime between 1960 and 1962. The Geiger counter operated when the radio, a General Electric eight-transistor unit, was on.

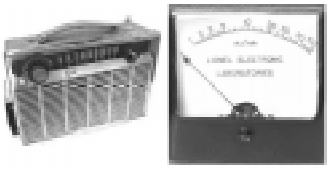

Figure 2. A one-of-a-kind prototype that never went into production, the Lionel CDV-726DX is a combination transistor radio and GM radiation detector. The detector operated when the radio was turned on.

Civil defense radiation detection equipment was designed during the cold war to be used in the event of a nuclear attack. The units are simple in design, easy to use, sturdy, and dependable. Following the end of the cold war, state and local agencies began to discard their civil defense equipment. Following 9/11 and concerns over nuclear and radiological terrorism, the remaining civil defense equipment is being recycled for use by homeland security and emergency management agencies. Florida, for example, is recycling its remaining civil defense equipment, specifically calling for the reuse of LEL's model 6b CDV-700s.

Commercial Products

In contrast to its civil defense products, surviving examples of LEL commercial nuclear products, especially the larger pieces, are infrequently found. A survivor in mint condition is a model 455 bench monitor in the Oak Ridge Associated Universities (ORAU) health physics collection **(Figure 3)**. Smaller pieces, such as detector tubes, are somewhat easier to find. A pancake (flat) Geiger tube originally made by Anton continued to be made by LEL **(Figure 4)**. Its protective metal cover is stamped with the Anton shield with "Lionel" replacing Anton's name. Another surviving Geiger tube is an end-window type, model 210H. The protective cap is unmarked but the label on the tube bears the same Lionel shield.

Figure 3. Lionel model 455 laboratory bench monitor scaler. This was first advertised in 1963, a time when decade scalers were beginning to replace the binary system used in the 455.

Although LEL product catalogs were advertised, we have been unable to locate any, making it difficult to compile a list of its products. LEL's advertisements in *Nucleonics* suggest the scope of its nuclear product line:

- Model 223 alpha beta gamma detector, *Nucleonics*, March 1964, p. 76
- Model 227 end window GM, *Nucleonics*, August 1964, p. 178
- Model 330 thermal neutron tube, *Nucleonics*, March 1963, p. 77
- Model 340 GM gamma detector, *Nucleonics*, March 1964, p. 76
- Model 455 ratemeter/scaler, *Nucleonics*, June 1963, p. 83
- Model 457 GM ratemeter, *Nucleonics*, July 1961, p. 118
- Model 475 CAM, *Nucleonics*, June 1963, p. 101
- Model 602 pancake GM, *Nucleonics*, March 1964, p. 76
- Model 794 calibrator, *Nucleonics*, June 1963, p.101
- Model 807 neutron detector tube, *Nucleonics*, March 1963, p. 77
- Model 813 neutron detector tube, *Nucleonics*, March 1963, p. 77
- Air particulate and portal monitors, *Nucleonics*, March 1962, p. 105

Figure 4. Lionel miniature pancake-type GM detector. Originally made by Anton, the cover is stamped with the Anton shield but with "Lionel" replacing "Anton."

An LEL ad also appeared in *Health Physics* in December 1961.

Collecting LEL

Are LEL products collectable? Among toy-train fanciers, any nontoy-train product bearing Lionel's name is very collectable (and expensive), examples being table electric fans and girls' toy electric stoves, both from the 1930s (the stoves definitely do not meet today's consumer product standards for children), and naval binnacles made during WWII. What is not well known in the toy-train field is that many of the LEL civil defense products are, in fact, common; for example, the number of CDV-700s that were made by LEL is 82,000. Even if only one-tenth survived, this would be a generous production quantity if the number were applied to a Lionel train engine or car. But these production numbers are not well known. So, don't be surprised by the prices you might see at a toy-train meet or an auction.

What is more important is that state and local agencies are collecting surplus LEL civil defense products for reuse in programs for responding to emergencies resulting from nuclear and radiological terrorism. LEL's history may have been short and checkered but the quality of the design and manufac-

ture of its civil defense products has withstood the test of time, finding a new use in the 21st century.

Acknowledgments

Marlow Stangler, a Health Physics Society (HPS) member, began working for the Office of Civil Defense in the 1950s and continued to do so for its successor agencies until his retirement. He generously shared his recollections of LEL's role in the civil defense program. Jan Athey, Train Collectors Association (TCA) Librarian, guided us through TCA's extensive Lionel files. Lloyd Bolling, Nuclear Regulatory Commission (NRC) health physicist, and J. Samuel Walker, the NRC historian, were very helpful. Rose Marie Pratt, New York Department of Labor, shared her personal notes on the Anton and LEL activities in Brooklyn that used radiation sources requiring a state license. Walter Cofer, a Florida health physicist, informed us about that state's recycling of surplus LEL CDV-700s. Years before 9/11, Walt traded two LEL CDV-700s to Hornor and Lubenau in exchange for a Rivigator jug, a deal still regarded with great satisfaction by all parties.

On the national level, a collaborative effort by the US Departments of Justice and Energy and the HPS is aimed at providing surplus radiation detection equipment, training, and technical support to emergency responders; see the PowerPoint presentation "Homeland Defense Equipment Reuse (HDER) Program" at http://hps.org/hsc/documents. Readers interested in learning more about civil defense equipment and history are directed to www.civildefensemuseum.com and www.southernradiation.com, both amply illustrated and informative.

Readers are cordially invited to virtually check out LEL products in the ORAU collection at www.orau.org/ptp/museumdirectory.htm.

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