Cold War Atomic Radiation Radio

By Bart Lee, K6VK, CHRS and AWA Fellow

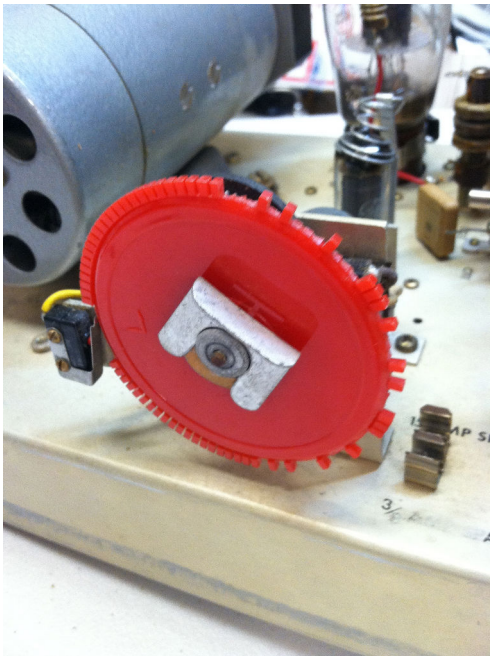
John Staples, Ph.D., W6BM, steadies an ancient transmitter…

With Vlad-The-Impaler Putin threatening atomic warfare, a retrospective look at radiation safety may be appropriate. The idea back in the 1950s was that infantry units had to know where they could go and where they should avoid after a nearby tactical atomic bomb complicated their lives. They were issued "Radiac" radiation meters (ion chambers) for this purpose. But that was a hard system to test, without actually setting off an appropriate bomb. So too, it was hard to calibrate the Radiacs for field conditions without widespread radiation. So it would be hard to drill on the Radiac system as well. What to do?

USN LM-108 Radiation Simulator c. 1957

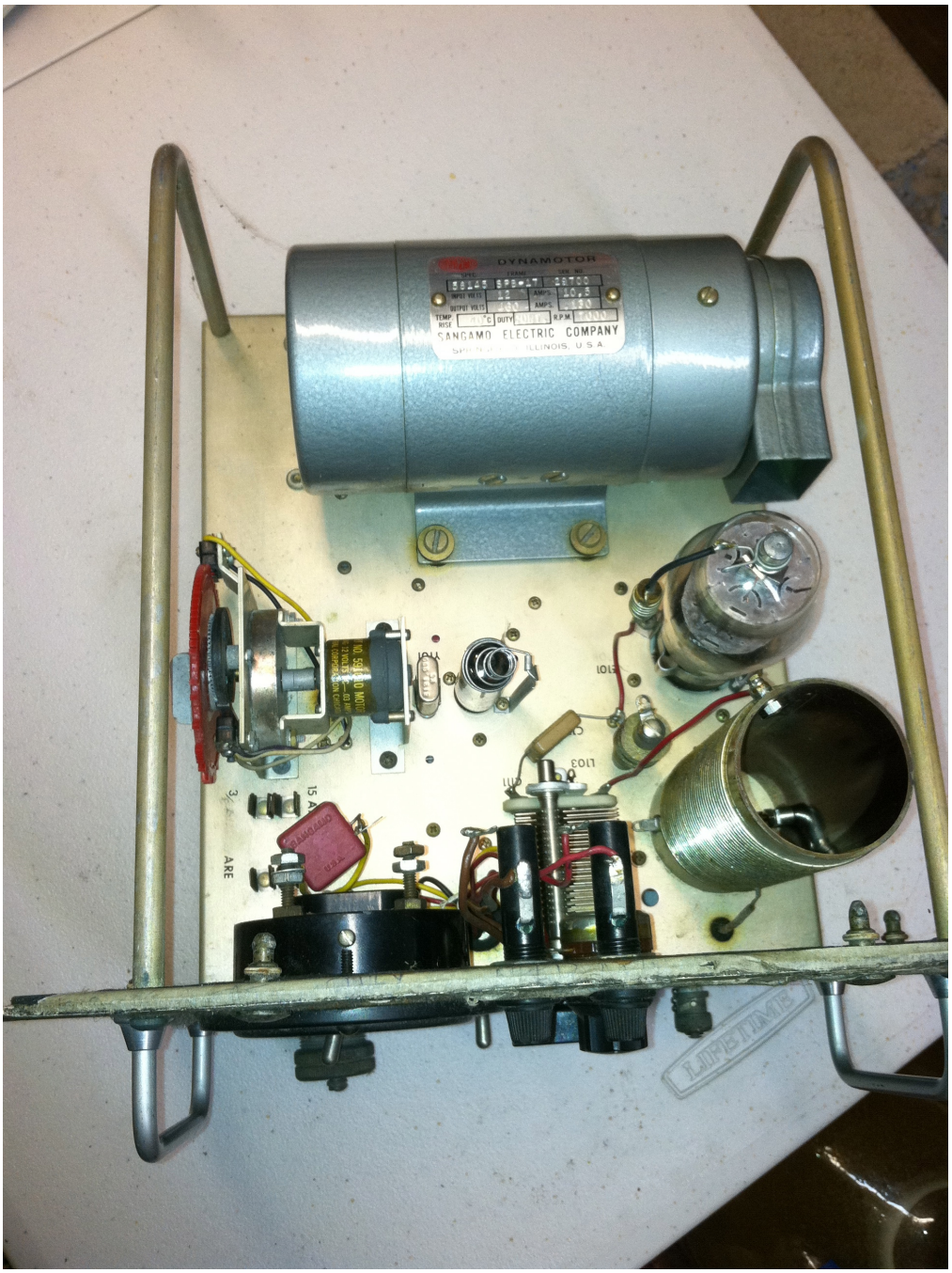
Appropriate experts could assume or determine that terrain and its features would in effect modulate the spread of radioactive particles from a tactical atomic detonation. Terrain and its features similarly would modulate any direct or indirect radiation after the blast, *e.g.*, from accumulations of radioactive debris. A further assumption seems good: HF radio waves at certain frequencies would similarly be "modulated" by terrain etc. That is, one would find less intensity behind a hill relative to the blast site than on the facing side of the hill (*Duh*… and this was tested).

So small a radio receiver, as of 1957 a new-fangled transistor type, could take the place of real Radiacs. A small transmitter at the notional blast site provided the radio frequency energy. That was what this "RADIACMETER IM-108 PD SIMULATED (TRANSMITTER)" did, at about 3 MHz. (I think it was AM modulated CW). The code wheel sent out a unique interrupted CW (not Morse code, but it could be). Wheels could be easily changed. Maybe more than one such transmitter could be used in a field exercise to simulate say, two or more blasts.

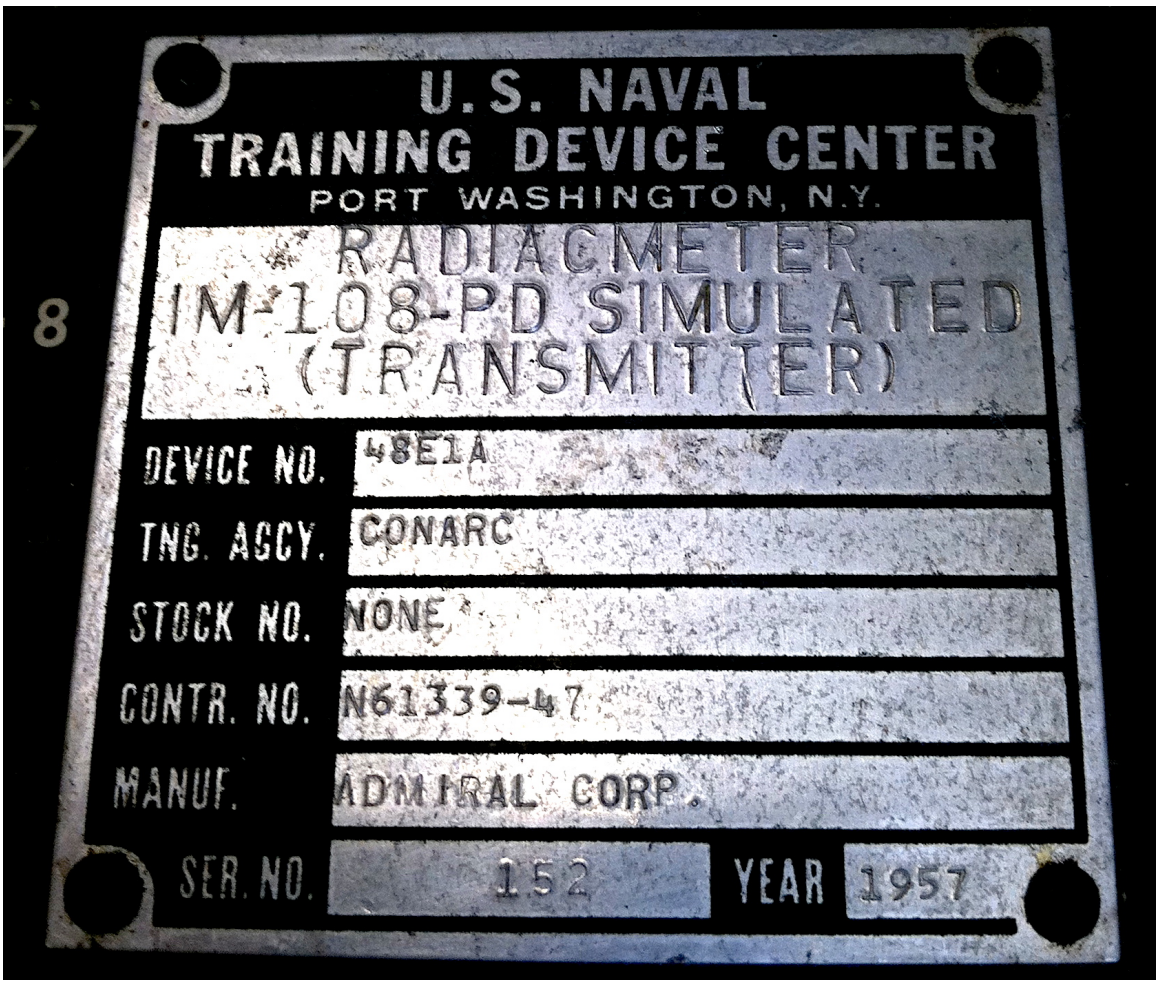


The Code Wheel in the Transmitter

The transmitter is small, light and portable by hand or jeep and runs off 24 volts with a big dynamotor. It is a self contained and pretty well sealed metal box with a power-in socket and an antenna-out connector.



The transmitter and its dynamotor



The survey teams each used transistorized radio receivers. That was advanced for 1957. Maybe they could have used tuned passive "crystal" receiver as well, listening for coded dynamotor whine if not modulated AM code.

"Infantry Magazine," for April June, 1958 described the system:

"A new device which should greatly improve training is the Radiation Survey Training Set Device 48EIA. This is a radio transmitter which emits its signal to 10 radio receivers. The receivers are constructed to look like the ion chamber. With this device the unit commander can establish a

simulated radiation field and train his survey teams without the hazards associated with exposure to nuclear radiation. Details of this training set are contained in DA Pamphlet 310-5, 1 May 1956. These sets should be available in the near future through Army training aid subcenters."

Electronics magazine, September 1, 1957 (page 8) set out some of the detail of the system (unable to resist an atomic pun):

TRAINING DEVICE FAKES FALLOUT -- Transmitter Simulates Gamma Radiation, Receivers Are Calibrated In Roentgens.

ELECTRONIC EQUIPMENT for faking fallouts may mushroom into a substantial business by winter.

Requested by the Army for training personnel how to operate in contaminated area, a Radiation Survey Training Set was created by the Naval Training Device Center, Port Washington, N. Y. to stimulate radioactive contamination and the radiometers (IM 108) troops will use to detect it. Admiral Radio was awarded the contract for development and production and will deliver a development model to the Center this month. First 225 complete units will go to Army.

[The device will send] out harmless radio propagation in elliptical patterns similar to those created by wind spreading fallout material. Field strength of this radio transmission varies in relation to distance from receiver to source just as radioactive propagation. Terrain irregularities, first thought to be a problem, actually distort radio propagation just as they do movement of radioactive material.

Ten trainees, scattered within the ten-mile range of the transmitter, will check their portable transistorized receivers

for field strength of the radio transmission. Receiver meters (device 48E1A) will look and operate like real radiacmeters (IM 108) with field strength calibrated in roentgens.

Special hot spots will be simulated by oscillators, miniature transmitters that emit signals on the same frequency."

Another Army article suggests that, after a nearby atomic blast, a soldier in a foxhole gets one tenth of the ambient radiation of one standing up. So this system seems like a reasonable, but likely futile system.
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The Flea Market of the California Historical Radio Society some time ago bestowed upon me this "RADIACMETER IM-108 PD SIMULATED (TRANSMITTER)" (Navy, *circa* 1957). This curious device turns out to be a 3 MHz crystal controlled transmitter with an 807 output tube ~~ and, as above, it is keyed by a code wheel. So, we're looking for code wheels, maybe even the same type as the IFF sets of World War Two. (Did they have to re-invent the wheel? Probably.) It has great potential as beacon or test transmitter for at least the 80-meter ham band for the Radio Central amateur radio station W6CF.

(24 II '23, v4, de K6VK) ##