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A Buying Guide For Those Wishing To Purchase Civil Defense Radiological Instruments

By Nick Studer

Introduction

As long as I have had my informational web site on civil defense equipment, I've gotten questions about the relatively inexpensive surplus Civil Defense radiological survey meters, Geiger counters, and dosimeters, despite the relatively detailed page I have posted about them. I intend to go in detail for those who wish to buy these pieces of equipment.

I would like to reiterate what I have said for some time now: The new radiation meters and dosimeters are highly superior to the surplus civil defense equipment. These new meters are superior as they have radiation alarms when the rate is past scale, self-diagnostics, EMP protection, radiation alarms, simplified decontamination, longer battery lives, and the fact that they are much more accurate than the CD meters and geiger counters. Also, these new meters are also usually wide-range types, measuring not only the high ranges of radiation as the CD high-range meters do, but also low ranges that the CD high-range meters cannot detect on their most sensitive setting. To measure the low ranges like one new meter can do, you must also purchase, in addition to a high-range CD meter, a low-range CD V-700 Geiger counter. This makes purchasing CD equipment not only much more expensive than new equipment, but also much more inconvenient, as you must carry around two CD meters instead of one new meter. However, most already know new equipment is far superior, but will still purchase the CD instruments anyway. I've found it is usually because they are much more inexpensive compared to the $1000-$1200 new radiation meters and $500 dosimeters most see as their only alternative. Fortunately, this is not true in the slightest. Many of the superior new instruments are available at the same price or only slightly more expensive than the inferior CD equipment. For example, the new radiation meter I recommend is the Portable Radiological Dose Rate Meter 82, or PRDM 82 by Siemens. This meter is available for http://www.bullnet.co.uk/shops/live/geigers.htm for £69, about $111 USD. Even after getting it calibrated for about $60-$80, it is still cheaper than some places are selling the CD equipment. The new dosimeters are also more accurate, hold a charge and don't leak as much, and usually are easier to zero than the CD dosimeters. For new dosimeters, I recommend the Dosimeter Corporation DCA Model 686 dosimeter (0-600 R) and the DCA Model 909 dosimeter charger. Because many still do not recognize the threat of nuclear, biological, and chemical accidents, terrorism, and war, new high-range dosimeters such as DCA Model 686 are sold quite cheaply, in sharp contrast to their lower-range variants. Go to http://www.dosimeter.com for more information and pricing

for new dosimeters and dosimeter chargers from Dosimeter Corp. I should mention, that the Siemens PRDM 82 and Dosimeter Corporation DCA Model 686 dosimeter with DCA Model 909 dosimeter charger were recommended by Nuclear War Survival Skills (Written by Cresson H. Kearny, and is the current "bible" of nuclear survival.).

Different Types Of CD Equipment

With that said about how newer equipment is usually cheaper and much better than CD equipment, I'll move along to the CD gear, as I know some of you no matter what I say, will want Civil Defense equipment. Maybe you like their nice yellow paint color…

Before I move on, I'll assume that you have all adequately educated yourselves on the types of radiation, their effects, where they come from, and also the threats of nuclear accidents, terrorism, and war. If you have not, stop reading this guide now, and I suggest that you take FEMA's Independent Study Course IS-3 "Radiological Emergency Management online at http://www.training.fema.gov/emiweb/is3.htm. It is an excellent primer on the basics of radiation and the threats from nuclear accidents, terrorism, and war. I also suggest you read Nuclear War Survival Skills, available for reading online at http://www.oism.org/nwss. (I recommend that you also purchase a hard copy of this book for future reference, in case you cannot access it online.) NWSS is the current "bible" of nuclear survival, and an excellent reference.

Now then, there are many, many, many different makes and models of CD equipment. There are CD V-711 blast hardened, permanently mounted EOC survey meters, CD V-757 barrier shielding demonstration meters, CD V-790 low-range calibration machines, CD V-787 water standards, CD V-457 demonstration meters, CD V-781 aerial fallout meters, etc., etc., etc. Many, many different types of them exist. However, unless you are a collector of civil defense equipment (Like I am.), wish to demonstrate to large groups what thicknesses of certain materials will shield against certain amount of radiation, wish to start up your own calibration lab, monitor fallout from an airplane, etc., most of these pieces of equipment do not concern you. Others want meters to hunt for radioactive minerals or antiques. However, if you are reading this, you are interested in these meters as a method to protect yourself against the potentially dangerous levels of radiation that are caused nuclear accidents, terrorism, or war.

How these meters got onto the market is a strange one at that. When the entire Civil Defense shelter system was dismantled in 1980, everything from the radiation kits to the fallout shelter signs on the outside of the buildings were removed by the Federal Emergency Management Agency. Essentially, everything except the radiation kits were destroyed or sold off. The instruments were kept in storage, and periodically maintained, until the Clinton administration closed the Office of Civil Defense within FEMA in 1996. Those in charge of FEMA now feel that civil defense should not be provided for the people, just to themselves with their Continuity of Government (COG) program. So, all of these perfectly good pieces of radiological equipment have either been thrown out, or sold via mass auction to the public since FEMA's Office of Civil Defense was closed. (Note: The Office of Civil Defense in FEMA is much different from the Office of Civil

Defense mentioned later on in this guide. That Office of Civil Defense existed from 1961 to the early 1970s, and was within the Department of Defense.)

The only types of Civil Defense radiological equipment which concern you are medium and high-range survey meters, low-range Geiger counters, low, intermediate, and high-range dosimeters, and dosimeter chargers.

A survey meter is an instrument that, using an ionization (ion) chamber, measures the rate of radiation. It is commonly compared to the speedometer of a car. Of the survey meters, the only ones you should look for is the CD V-710 medium-range survey meter, and CD V-715, CD V-717, and CD V-720 high range meters. There is only one medium-range survey meter, the CD V-710.

A Geiger-Müller, commonly known as a Geiger counter, or GM counter, can also be compared to a car's speedometer. It measures radiation rates, just like a survey meter. However, it operates on a different principle. Instead of an ion chamber, a Geiger counter uses a Geiger-Müller tube to measure the radiation rate. Usually, Geiger counters only measure low amounts of radiation, not large amounts like the survey meters do, although, there are of course exceptions. There is only one low-range Geiger counter, the CD V-700.

If a survey meter or Geiger counter is the speedometer of the car, a dosimeter is the odometer. It tracks your cumulative, or total dose. Civil defense, and most other dosimeters look like a big fat pen. Of the dosimeters, the only ones you should look for is the low-range CD V-138, intermediate-range CD V-730, and the high-range CD V-740 and CD V-742.

To reuse these dosimeters, you must have a dosimeter charger. These are simple electronic instruments that "zero" and electrically charge the dosimeters so they can be reused. Of the dosimeter charges, you should only look for the CD V-750 and CD V-750 Model 6.

There are many different manufacturers and models of each piece of equipment. This gets VERY confusing, and I hope to sort out the mystery below. For example, there is the CD V-700 6B made by Electro-Neutronics, and there is also one made by Victoreen, and also one by Lionel, there is the Model 5 by Anton, and a Model 6 by the same manufacturer. There are many others. Some versions of each piece of equipment are considered unreliable and obsolete, and should be avoided for that reason. I will include which versions should be avoided in each section below.

Survey Meters

Medium-Range:

CD V-710: These meters were purchased by the Federal Civil Defense Administration in the mid to late-1950s as it slowly began to accept the responsibility of radiological

defense. The last version, the Model 5 by Victoreen, was purchased in the late 1950s. These meters are medium-range types, as they measure from 0-0.5, 0-5 and 0-50 R/hr of gamma radiation only using their ion chamber. Many of the Jordan CD V-710 Model 4's and Victoreen CD V-710 Model 5's have been modified so they use 2 D-cell batteries instead of 1 D-cell and two special, expensive batteries. Whether or not a CD V-710 has been modified in this regard can be determined if there is a small sticker, usually on one side of the case. The sticker usually says something in the regards of "MODIFIED CD V-710."

The Office of Civil Defense disposed of this entire family of meters back in the late 1960s and early 1970s considering them obsolete and unreliable. The CD V-715 is essentially the replacement for the CD V-710. There are very few of these remaining, and even fewer working. The only reason I have included this meter as a number of these meters still will power up. So, since the possibility of using them exists, I have included it in the guide. If you come across one of these meters working, check to make sure it zeroes and circuit checks correctly. If it does, you have a good chance of getting it calibrated. It should be noted, that these meters were considered obsolete as they did not measure higher than 50 R/hr, and fallout radiation levels can go much higher.

However, many versions of the CD V-710 are considered unreliable and should be avoided. The Model 1 (SID-1) by El-Tronics; the Model 2 by Jordan; and Model 3 by Victoreen are considered obsolete and unreliable by FEMA. The Model 4 by Jordan, and Model 5 by Victoreen are also considered obsolete, but are not totally unreliable and are still acceptable for use if they can be serviced and calibrated properly. I personally recommend the Model 5 by Victoreen, as it is the most recent and improved of the series. You can determine if a meters is a Model 4 and 5's because they have a square plastic case. Looking at the nomenclature is still the best way to determine what manufacturer and model the meter is. However, I recommend you do not purchase a CD V-710 except for collector value, or as a show or conversation piece. Very few will even power up, even fewer will calibrate, and even fewer will keep their calibration and thereby be useable in an NBC environment. Also, the plastic case can become magnetized, and that can cause major problems for you in an emergency.

You should not pay more than $35-$40 for an uncalibrated CD V-710 Model 4 or 5. The only reason for this higher price is because of the collector value of the meter. For a calibrated CD V-710, you should only pay about $130-$150.

You cannot find these meters for sale anywhere but eBay, as they are so rare in comparison to the other meters, that is why I highly recommend to you a cheaper, yet superior, high-range survey meter instead.

High-Range

CD V-715: First purchased around 1960 by the Office of Civil & Defense Mobilization and later Office of Civil Defense. The last version, the Model 1B by Victoreen, was

purchased in 1964. This meter weights 3.25 pounds. They measure from 0-0.5, 0-5, 0-50, and 0-500 R/hr of gamma radiation only using their ion chamber.

These meters are the lightest and simplest of all the civil defense high-range survey meters. Therefore, many rate them highly, from best to worst, many rank these meters as follows: CD V-715, CD V-717, CD V-720. My ranking system is CD V-717, CD V-720, CD V-715. I rate the CD V-715 last, not because of any problems with it, but because of its lack of additional features. The CD V-717 has a very useful remote monitoring option, and the CD V-720 can detect beta particles from fission products.

FEMA realized in the 1980s that many of their CD V-715's were not holding calibration correctly or their meter needles metronomed (flailed wildly). They found the high-megaohm resistors were causing the problem, and added a jumper on the back of the circuit board, and gasket on the high megaohm cover, as well as other things. This caused the CD V-715's to keep their calibration longer, and be much more reliable. After this modification was done, an "R," which means "retrofit," was either stamped or written in permanent pen by the nomenclature on the case of the meter to signify it had been modified. All the FEMA literature from the early 1980s until the present informs radiological monitors should only use CD V-715's that have undergone the retrofit. All the CD V-715's that had not yet already been retrofitted were supposed to be given the modification, or not used at all. I've seen some sellers at eBay who are selling these meters put in their item description "These units appear to be in "factory fresh" unused condition. Unlike most of the other Gamma detectors you'll see, these units are NOT stamped with an "R" on the top of the case, which indicates that they are "refurbs". These are NOT refurbs." While they try to make it seem as if a CD V-715 which has been retrofitted (Stamped or had an R written on it.) is worse than a "factory fresh" one, it is exactly the opposite. If you buy a CD V-715, do not buy it unless it is, of course, considered current and reliable by FEMA, but also has undergone the retrofit. Those that have not undergone the retrofit may do very weird things, but will also lose their calibration (And therefore their accuracy) much sooner than those retrofitted CD V-715's. Again, let me reiterate, make sure your CD V-715 has been retrofitted.

The CD V-715 Model 1 and 1A by Lionel are considered unreliable by FEMA, and should be avoided. The Model 1A by Landers, Frary, and Clark and the Model 1A by Victoreen are considered reliable and current. So is the next, more improved version, the Model 1B by Victoreen. Personally, I recommend the Model 1B by Victoreen over the 1A models. To differentiate between the different meters, you will have to look at the nomenclature on the top of the case, and read which manufacturer and model the meter is, and if it has the "R" written or stamped on the case next to the nomenclature.

You should not pay more than $15-$30 for an uncalibrated CD V-715. A calibrated CD V-715 should not really be bought for more than $150. Premier Items and RadMeters4U (KI4U, Inc.) both stock CD V-715's they have already calibrated and serviced. I recommend Premier Items as they sell their calibrated CD V-715's for $99 (Plus shipping.) while RadMeters4U sells the same quality and calibrated meters for $225

(Shipping is, however, included in the price at RadMeters4U). Really, the whole choice is whether you want to pay $225, or $99 plus shipping, save $100, and get the same thing.

CD V-717: Purchased in 1964 by the Office of Civil Defense. There was only one model purchased, the Model 1 by Victoreen. This meter weights 5.25 pounds. They measure from 0-0.5, 0-5, 0-50, and 0-500 R/hr of gamma radiation only using their ion chamber. The ion chamber is in its own detachable part of the case, and is connected to the rest of the meter by a 25' cable. When the ion chamber bottom case is not detached from the rest of the meter, it directly plugs into the rest of the meter. The cable is wound onto a spool and placed in the storage space in the bottom case.

In my opinion, this is the best civil defense meter you can buy. While it is the heaviest of the CD meters, the remote monitoring option more than makes up for its increased weight. Most of us will not have to conduct radiological response, and therefore carry around a meter all day, so the extra two pounds is not really a disadvantage in the slightest. With this meter, you could technically monitor fallout radiation levels outside your shelter without having left the safety of your permanent or expedient shelter. A huge advantage, as unlike the other three CD survey meters, you don't have to expose yourself to fallout for a period of time outside your shelter to take the reading.

Only one version of the CD V-717 was produced, and it is not considered unreliable or obsolete. None should be avoided unless it is in bad shape or broken of course.

You should not pay more than $15-$30 for an uncalibrated CD V-717. Premier Items and RadMeters4U (KI4U, Inc.) both stock CD V-717's they have already calibrated and serviced. I recommend Premier Items as they sell their calibrated CD V-717's for $99 (Plus shipping.) while RadMeters4U sells the same quality and calibrated meters for $255 (Shipping is included in the price at RadMeters4U). Really, the whole choice is whether you want to pay $255 or $99 plus shipping, save $100, and get the same thing.

CD V-720: First bought by the Federal Civil Defense Administration and later Office of Civil & Defense Mobilization. The last version, the Model 3A by Victoreen, was purchased in 1961. This meter weights 3.75 pounds. They measure from 0-5, 0-50, and 0-500 R/hr of gamma radiation only using their ion chamber. It cannot measure from 0-0.5 R/hr, as it does not have the X0.1 range. The case bottom of the CD V-720 has a sliding beta shield which retracts, revealing the bottom of the ion chamber. The ion chamber has an ultra-thin beta window, which allows the detection, but not measurement, of beta particles.

The second best, in my opinion, Civil Defense survey meter. While it does not have an X0.1 range, with the extra half-pound of weight over the CD V-715, you can detect beta particles. A very handy feature indeed. One problem though, the beta shield can easily trap dirt, so make sure you keep it clean, especially in a shelter environment.

To understand why the CD V-720 does not have the X0.1 range like the CD V-715 and CD V-717 do, we must look back at the early FCDA and OCDM CD V-777 Radiation

Detection Sets, which are/were the standard kits of instruments issued for civil defense use. The early version of the CD V-777 Radiation Detection Sets had one early CD V-700, one early CD V-720, one CD V-710, one CD V-730 medium-range dosimeter, one CD V-740 high-range dosimeter, and one early CD V-750 dosimeter charger. The CD V-710 is the companion for the CD V-720, and the other way around. The CD V-710 was purchased as a medium-range survey meter, 0-50 R/hr, and had the X0.1 scale, so it could detect levels of radiation just above the CD V-700's low-range capabilities. Fallout radiation levels can easily climb higher than 50 R/hr, so the CD V-720 was bought for that eventuality, and packaged in the same kit as the CD V-710. So, you were never supposed to have a CD V-720 without a CD V-710 within reach, and vise versa. Since the CD V-710 could already measure 0-0.5 R/hr, FCDA and for a short time, OCDM, believed they didn't need to spend the money to make the CD V-720 more sensitive, having the X0.1 range, so it too could measure from 0-0.5 R/hr. The CD V-710 and CD V-720 were later replaced by the CD V-715, which is essentially a cross between a CD V-710 and a CD V-720, minus the CD V-720's beta detection capability. The CD V-715, as you should already know, has the X0.1 range, so it can not only detect the CD V-710's 0-0.5, 0-5, and 0-50 R/hr ranges, but also the CD V-720's 0-500 R/hr range. (Note: The CD V-720 was replaced by the CD V-715, but not in all aspects. The CD V-720 still had a place as a post-attack survey meter that could detect the presence of beta particles.)

The CD V-720 is as old as the CD V-710 medium-range survey meter. The early versions, the Model 1 by Chatham, and the Model 2 by Victoreen are considered obsolete and unreliable and should be avoided. The Victoreen Model 2, it should be mentioned, had a plastic case and looks much like a Victoreen CD V-710 Model 5, just larger and having the beta shield on the case bottom. The Chatham Model 1 has a rounded design, distinguishing it from all the others. More recently, the Model 3 by Landers, Frary, and Clark has been declared obsolete and unreliable by FEMA, and also should be avoided. Currently, only the Victoreen Model 3A is considered current and reliable by FEMA. The Model 3A can be determined from the handle with a finger grip (The Model 3 has a strange flat handle.), and the curves at the front bottom of the meter where the ion chamber is. Of course, looking at the nomenclature on the top of the meter's case is always the best way to determine the manufacturer and model of the meter.

You should not pay more than $15-$30 for an uncalibrated CD V-720. Premier Items and RadMeters4U (KI4U, Inc.) both stock CD V-720's they have already calibrated and serviced. I recommend Premier Items as they sell their calibrated CD V-720's for $99 (Plus shipping.) while RadMeters4U sells the same quality and calibrated meters for $240 (Shipping is included in the price at RadMeters4U). Really, the whole choice is whether you want to pay $240 or $99 plus shipping, save $100, and get the same thing.

Low-Range Geiger Counters:

CD V-700: The only low-range civil defense instrument. First purchased by the Federal Civil Defense Administration in the early 1950s, then by the Office of Civil & Defense Mobilization, and later Office of Civil Defense. The last version, the Model 6B (Made by a variety of manufacturers.) was last purchased in 1963-1964. This meter weights about 5

pounds. They measure from 0-0.5, 0-5, and 0-50 mR/hr of gamma radiation and 0-300, 0-3000, and 0-30,000 CPM of beta radiation using their Geiger-Müller (GM) tube enclosed in a "hot-dog" style probe with beta window.

The CD V-700 meters are probably the coolest of the CD meters. In fact, they have to be one of my favorite radiation meters. However, they do not have as much use as the medium and high-range survey meters. The early CD V-700's bought by the FCDA, like the Nuclear Measurements Model 1 and Victoreen Model 2, were designed for training radiological monitors to use high-range instruments, like the then-current CD V-710. The later CD V-700's that were bought by OCDM and OCD are designed for personnel monitoring (Finding contamination on personnel, and making sure decontamination was successful.) and finding low levels of contamination after a nuclear explosion or large reactor accident. They are also used for finding contamination in food, water, and other supplies. They will be of much use in the same capacity as the high-range survey meters after a dirty bomb attack or smaller reactor incident. Their feature of a removable probe, which is detachable from the handle, allows you to get the detector closer to their source of radiation.

There is a special variant of the CD V-700, the CD V-700M. The CD V-700M was initially designed to detect radioiodine (I-131), a very dangerous isotope of normal iodine, which is a fission product of nuclear explosions. This meter is simply a regular CD V-700 which has been fitted the OCD-P-108 end-window probe with a larger GM tube in it instead of the "hot-dog" probe with 6993 GM tube. They also have had their electronics slightly rewired or added on to make sure the meter works correctly with its new probe. This new probe and GM tube allows it to detect not only beta and gamma radiation more accurately, but also alpha radiation as well. However, the CD V-700M is very expensive, as very few OCD-P-108 probes, and the GM tubes designed for them, were made. Personally, I feel the regular CD V-700 with "hot-dog" probe and 6993 GM tube is just fine for regular civil defense use.

There is also a loudspeaker for the CD V-700, called the CD V-705. It is used instead of headphones when you wish to demonstrate radiation, have some other special task, or just don't want to wear headphones. However, I find headphones are just fine, and you should not waste precious batteries on a speaker, just so you don't have to wear headphones. Batteries will become very scarce after an NBC incident, and shouldn't be wasted.

As the CD V-700 was the first civil defense meter bought by FCDA, so some models of the CD V-700 are considered unreliable and obsolete by FEMA. The Model 1 (GS3-CD) by Nuclear Measurements, the Model 2 by Victoreen, Model 3 by Chatham, and Model 4 by Universal Atomics are all considered obsolete and unreliable by FEMA, and should all be avoided. Considered current and reliable by FEMA is the Model 5 by Anton, the Model 6 also by Anton, the Model 6 by Victoreen, the Model 6A also by Victoreen, the Model 6B by Electro-Neutronics, the Model 6B by Lionel, and finally, the Model 6B by Victoreen. Personally, of these all, I suggest one of the Model 6B's if you getting a CD V-700. Many rate Lionel's and Victoreen's highly, although I personally have enjoyed my Electro-Neutronics 6B the best. Make sure you get an inspected, serviced, and hopefully

calibrated Electro-Neutronics 6B if you decide on purchasing one, as some have had problems. Anyway, most of the CD V-700 family looks much, much, alike, and so you'll have to look at the nomenclature on the top of the meter's case to identify what manufacturer and model it is.

Let's not forget, there are the rare CD V-700M's. The CD V-700M's put on either Electro-Neutronics or Victoreen CD V-700's are considered current and reliable by FEMA.

None of the CD V-705's are considered obsolete or unreliable. All are considered current and reliable by FEMA.

A good inexpensive modern replacement is the Victoreen 496. The Victoreen 496 is essentially a much-updated version of the CD V-700, with a built in speaker, the ability to accept new probes, and other great features not found on the CD V-700. Available inexpensively on eBay for about $25 (Without the probe, so a new one must be purchased and then calibrated with the meter.), when fitted with a new "hot dog," "end-window," or my personal recommendation, a "pancake" probe, these meters are much better than the CD V-700 in all aspects, and usually not that much more expensive. (A new probe with GM tube is about $100-$200) I suggest the Ludlums 44-9 pancake probe with alpha-beta-gamma GM detector as the best new probe for the Victoreen 496.Remember, a low-range meter is not totally necessary, and so the purchase of a Victoreen 496 should not be a priority until a PRDM 82, Dosimeter Corp. DCA Model 909 dosimeter charger and DCA Model 686 dosimeters have been purchased. It should be mentioned that many new Geiger counters exist today that would be more than acceptable for use instead of a CD V-700, like the Ludlums Model 3. However, these new Geiger counters are usually much more expensive that the already excellent Victoreen 496, so they are not recommended.

You should not pay more than $40-$100 for an uncalibrated CD V-700. Premier Items and RadMeters4U (KI4U, Inc.) both stock CD V-700's they have already calibrated and serviced. I recommend Premier Items as they sell their calibrated CD V-700's for $129 (Plus shipping.) while RadMeters4U sells the same quality and calibrated meters for $225 (If you want a Victoreen CD V-700 6A) or $325 (If you would rather have a brand new CD V-700 6B by Electro-Neutronics.) (Shipping is included in the price at RadMeters4U). Either way from RadMeters4U, you can have a CD V-700 from Premier Items for $129 calibrated, and in the same condition as the $225 Victoreen from RadMeters4U. That's $96 savings. Of course, if you want a brand new meter, you'll have to pay an extra $100 on top of that $96 to RadMeters4U, or you might try politely asking Premier Items for a better condition one if you want it for your collection or something…

The CD V-700M's I have never seen anywhere uncalibrated. They are a VERY, VERY rare item. However, RadMeters4U has them calibrated on a brand new Electro-Neutronics base for $475 is you have an urge to splurge on something not that much more useful in a nuclear emergency than the regular CD V-700.

CD V-705's are sometimes seen on eBay going for about $50. However, RadMeters4U has them for $45 delivered. I do not know if Premier Items has them for sale.

Dosimeters

Low-Range

CD V-138: A low-range dosimeter with a range of 0-200 mR. It is shorter than all of the other CD dosimeters. It has a division of 10 milli-Roentgens (mR) per each scale line. The Office of Civil & Defense Mobilization bought these in the late-1950s to the early-1960s.

This dosimeter would be of the most use in a dirty bomb or other low range nuclear incident. It is essentially the companion dosimeter for the CD V-700 just as the CD V-742 is the companion for the CD V-715 and the other high-range meters.

The CD V-138 dosimeters are excellent for low-range nuclear emergencies, but not absolutely necessary. However, if you have extra funds to allocate to low-range radiological emergencies, a good modern replacement for these dosimeters is the Dosimeter Corp. DCA Model 883 (0-500 mR) dosimeter. Low-range dosimeters are not as much a necessity as the higher-ranged PRDM 82, Dosimeter Corp. DCA Model 909 dosimeter chargers, and DCA Model 686 dosimeters, and so a greater priority should be attached to procuring these items first.

You should not pay more than $5-$10 for an untested CD V-138. Premier Items is selling electrical leak and accuracy tested CD V-138's for $39 each (Plus shipping), and will also include 10 untested CD V-138's with each order of one CD V-138. RadMeters4U does not carry them.

Intermediate-Range:

CD V-730: An intermediate, or medium-range dosimeter with a range of 0-20 Roentgens. It is about the same size as all the other dosimeters. It has a division of 1 Roentgen per each scale line. The Office of Civil & Defense Mobilization bought these in the early 1960s.

This dosimeter is essentially a cross between a CD V-138 low-range dosimeter and one of the two high-range dosimeters, the CD V-740 and CD V-742. It really only has a use in intermediate-range nuclear incidents, where a CD V-138 would be overwhelmed, and you want the smaller scale divisions of 1 R instead of the much larger scale divisions in the high-range ones. This would allow you to get your total R dose more accurately, as with a CD V-740 or CD V-742, you'll need to estimate your dose if it is between the scale division lines.

You should not pay more than $5-$10 for an untested CD V-730. I have not seen them sold anywhere but eBay, and then even there, very rarely. So, I personally recommend you purchase a CD V-740 or CD V-742 high-range dosimeter instead.

High-Range:

CD V-740: A high-range dosimeter with a range of 0-100 Roentgens. It is about the same size as all the other dosimeters. It has a division of 5 Roentgens per each scale line. The Federal Civil Defense Administration bought these in the mid-1950s.

This is the lower range of the two high-range dosimeters. It has a smaller scale division, so when you want a smaller scale division then the CD V-742's, you use these. Not many of these are available anymore, as few are passing the electrical leak and accuracy tests. The CD V-742, in later purchases by the Office of Civil Defense, essentially replaced the CD V-740, but they are still entirely usable, if they successfully pass the electrical leak and accuracy tests, of course.

You should not pay more than $5-$10 for an untested CD V-740. Premier Items has them for sale at $39 each (Plus shipping). However, you will need to contact Premier Items directly, as these are special order, and not on the order form. They are the same price as the other dosimeters for sale there though. RadMeters4U does not carry them.

CD V-742: A high-range dosimeter with a range of 0-200 Roentgens. It is about the same size as all the other dosimeters. It has a division of 10 Roentgens per each scale line. The Office of Civil Defense bought these in the early-1960s.

This is the highest range of the CD dosimeters. It is the most commonly used dosimeter, used in cases of high fallout radiation levels that would be encountered after a nuclear war or somewhat near a single nuclear detonation. These are the most useful, and most common of all CD dosimeters as well.

You should not pay more than $5-$10 for an untested CD V-742. Premier Items is selling electrical leak and accuracy tested CD V-138's for $39 each (Plus shipping.), they will also include 10 untested CD V-742's with each order of one tested CD V-742. RadMeters4U sells the same quality and tested dosimeters for $45 each (Shipping is included in the price at RadMeters4U), but does not include 10 untested dosimeters with each tested CD V-742 you order from them. In this case, it wouldn't really matter who you ordered from if you were looking at the price on its own, except for the fact that you get 10 untested dosimeters with every one you buy at Premier Items. This means you get a much better value for your money at Premier Items than at RadMeters4U.

Dosimeter Chargers:

CD V-750: A battery-powered dosimeter charger. The charger weighs 1.5 pounds. You take the cover off the charging contact, and then press and hold the dosimeter onto the charging contact, while looking through the eyepiece. You are then able to, by moving the knob to the right of the dosimeter, the hairline to zero, so the dosimeter can be used again, starting at the zero mark. These chargers were first purchased by the Federal Civil Defense Administration in the mid-1950s, then by the Office of Civil & Defense Mobilization, and finally the Office of Civil Defense.

An indispensable and essential purchase if you are buying any CD dosimeters. Without it, your dosimeters cannot have the hairline brought back to the zero mark. So, once it has been exposed full scale, the dosimeter cannot be used again, until you get a charger and zero it, of course.

Several models of the CD V-750 are considered obsolete and unreliable by FEMA. The Model 1 (643) by Bendix, Model 2 (FCDA) by Jordan, and the Model 3 by Universal Atomics are all considered obsolete and unreliable by FEMA. The Model 5 by Bendix, Model 5 by Jordan, Model 5A also by Jordan, Model 5B by Bendix, Model 5B by Industrial Electronic Hardware Corporation, and the Model 5B by Jordan are all considered current and reliable by FEMA. I personally suggest the Model 5B by Industrial Electronic Hardware Corporation if you are getting a CD V-750.

You should not pay more than $15-$20 for an untested CD V-750. Premier Items has tested ones for sale at $29 (Plus shipping.), while RadMeters4U sells the same quality and tested dosimeter chargers for $65 each (Shipping is included in the price at RadMeters4U). Really, the whole choice is whether you want to pay $65 or $29 plus shipping, save $36, and get the same thing.

CD V-750 Model 6: An electrostatic dosimeter charger. The charger weighs 1.5 pounds. It creates its own charge, without batteries, to charge the dosimeters. (The hairline on the scale moves to zero as the dosimeter is charged.) A black lever charges the dosimeter (It moves the hairline downscale.) and a small black button above the lever discharges the dosimeter (It moves the hairline upscale.). The dosimeter is charged by working the lever until the hairline moves down scale past zero, then the hairline moves upscale slowly as the black button is depressed. The button is released when the hairline reaches zero, therefore charging and zeroing the dosimeter, just as with the battery powered CD V-750's. These were purchased by the Federal Emergency Management Agency in the mid to late-1980s, as the next version of the CD V-750 dosimeter charger. However, as the Model 6 is so radically different from the earlier CD V-750's, I have decided it will have its own section in this guide.

I have not seen very many of these for sale. However, a dosimeter charger is an indispensable and essential purchase if you are buying any CD dosimeters. Without it, your dosimeters cannot have the fiber brought back to the zero mark. So, once it has been exposed full scale, it cannot be used again, until you get a charger and zero it, of course. You are very lucky if you find one of these for sale, but the truth is, you'll probably just be getting a regular CD V-750, which is just fine.

The only model of CD V-750 Model 6 is the Model 6 by S.E. International. It is considered reliable and current by FEMA.

I have not seen any of these for sale, not even on eBay. However, if one is ever offered for auction, you probably should only pay $40-$50 for one. But, I do suggest you avoid it, as a lot of civil defense collectors would really want it for their collection, and will

probably be willing to bid very high amounts. A regular CD V-750 is just fine, in my opinion.

Radiation Detection Kits

The Civil Defense agencies have always placed their instruments in kits, for radiological monitors to have easy access to all the instruments they need. It is also so that when a radiological monitor was to go into a shelter and begin work, all he would have to do is open the kit of instruments, and all that he required, such as dosimeters, dosimeter charger, survey meter, Geiger counter, manuals, headphones, would all be in there, and he wouldn't be missing some crucial instrument. Most civil defense instruments were taken out of the individual factory box they came in, and then placed in the kits for use. That's why you usually will see for sale on eBay mostly kits of instruments for sale. Prices fluctuate wildly on these kits, as it depends on what instruments are in the kit (For example, a CD V-777 kit with a Lionel CD V-700 6B in it will usually sell for more than another kit with a Anton CD V-700 Model 6, which isn't as sought for as the Lionel.), so really there is no set price for what you should pay for each kit.

The civil defense kits are called CD V-777 kits. There are several variations of these kits. All of them contain some combination of the instruments described above. Each kit will be described below.

CD V-777 Operational Set: This kit contains two (2) CD V-715 high-range survey meters, one (1) CD V-700 low-range Geiger counter, six (6) CD V-742 high-range dosimeters, and one (1) CD V-750 dosimeter charger, all contained in a sturdy cardboard box marked "CD V-777 Radiation Detection Set."

This kit is the basic kit for civil defense use. However, for normal use by a family for protection, it is a little too much. This kit was designed for local civil defense offices and large fallout shelters, so they would have enough instruments for monitoring. That's why there are two CD V-715's and extra dosimeters.

CD V-777A RADEF Monitoring Support Set: This kit contains one (1) CD V-715 high-range survey meter, one (1) CD V-717 high-range survey meter with remote monitoring capability, one (1) CD V-700 low-range Geiger counter, six (6) CD V-742 high-range dosimeters, and one (1) CD V-750 dosimeter charger, all contained in a sturdy cardboard box marked "CD V-777A Radiation Detection Set."

This kit is essentially a CD V-777 kit, except for one modification. Instead of one CD V-715, there is a CD V-717 in its place. The CD V-777A kit was issued to radiological monitoring stations, which were fallout shelters with a protection factor (PF) of at least 200. These stations were where the civil defense was going to get the fallout radiation reading for the area, and so continued monitoring of the outside fallout radiation levels were necessary. So, the CD V-717 was purchased so that the radiological monitor did not need to go outside to take a reading, (As he would with the CD V-715 survey meter.), and therefore reduced his exposure. This is one of the best kits for family use.

CD V-777-1 Shelter Radiation Detection Kit: This kit contains one (1) CD V-715 high-range survey meter, one (1) CD V-700 low-range Geiger counter, six (6) CD V-742 high-range dosimeters, and one (1) CD V-750 dosimeter charger, all contained in a sturdy cardboard box marked "CD V-777-1 Shelter Radiation Detection Kit." Although, some CD V-777-1 kits are marked with just "CD V-777-1 Radiation Detection Set."
This kit is the same as the CD V-777 kits, except with one less CD V-715 high-range survey meter. It was designed for use by emergency service organizations like the police and fire departments. These are probably the most appropriate kits for family use.

CD V-777-2 Radiation Detection Kit: This kit contains one (1) CD V-715 high-range survey meter, six (6), but sometimes two (2), CD V-742 high-range dosimeters, and one (1) CD V-750 dosimeter charger, all contained in a sturdy cardboard box marked "CD V-777-2 Radiation Detection Kit."

This kit is the most basic of all the CD V-777 kits. It is designed for regular public fallout shelters, and does not contain a CD V-700 low-range Geiger counter. This kit is essentially the bare minimum amount of instruments needed for family use.

A few notes on these kits: I recommend highly against purchasing kits of instruments off of eBay, although they are usually plentiful there. It gives you no control over what make or model of instruments you get, what condition they're in, etc. Many sellers I have noticed take one picture of a kit, and then sell all of their kits with the same picture. I recommend getting each instrument individually, so you can pick and choose between the different makes and models, and the condition of the instrument. It also allows you to tailor what instruments you buy to what you need, not what came in the kit. It usually turns out cheaper this way anyway.

Also, some sellers are creating their own kits of instruments. One has come up with different kits he's called Radiation Detection Kit A, B, C, D, etc. These kits are usually not sufficient for real use, as most of these "handmade" kits usually only have a large number of dosimeters, with no survey meters, or just survey meters, and no dosimeters. Others have created their own types of CD V-777 kits. Others for some reason are calling an official kit something else, possibly to get more attention drawn to it. For example, one seller is calling a standard CD V-777A kit a "CD V-777C" kit for some reason.

My advice is to only buy the CD V-777 kits from Premier Items. They are the only ones I've seen actually offering all of the official CD V-777 kits of instruments calibrated when you buy them. KI4U's calibrated kit, "The Package," is roughly compatible to a CD V-777-2 kit, except it also has some extras like their personal key chain radiation monitor, KFM kit, and KI.

A Few Tips For Buyers

I'm certain some of you have already purchased instruments, and you have gotten one of the obsolete and expired instruments. Two words of advice: DON'T PANIC. If these

meters are serviced and calibrated properly, the meter might function correctly. However, most will lose their calibration fairly quickly, or have some other problem. FEMA declared them obsolete and unreliable for a reason you know. I personally suggest, that if you already have an obsolete and unreliable meter, to sell it. You may be able to get it to work, but it will probably cost more to get it ready for calibration than it is to get a new, current meter, and get that calibrated. I suggest you either sell it, or relegate it to conversation or collection piece.

Second, no CD meter is okay to have uncalibrated. eBay is packed with uncalibrated dosimeters, survey meters, Geiger counters, and dosimeter chargers. Literally packed. However, I'm certain many people are buying the meters, and then putting them away just in case. This is NOT all right. A CD meter is useless if it is not calibrated. Just because the meter needle moves on a CD meter or dosimeter does not mean it is working correctly. It must be calibrated to be accurate and in full working order. Many will read much lower than what the true dose rate, or dose, is, and will therefore mislead you into thinking your dose will be much lower than it is. In an NBC environment, a false low reading on a radiation meter or dosimeter could lead to serious radiation sickness, even death. Therefore, if you buy an uncalibrated meter, zero it by bringing the needle all the way from the bottom of the scale to the top, and then to zero. Do the circuit check. If it does this all correctly, send it to be calibrated. KI4U, Inc. at http://www.radmeters4u.com is the best place I have found to have these pieces of equipment calibrated. They have the CD V-790 and CD V-794 calibration machines built specifically for these meters, and can also repair and service these meters. By the way, on the CD V-700's, the manual describes calibration using the check source on the side. Some people seem to believe this is how you can accurately calibrate the meter. However, in actuality, a CD V-700 calibrated using the side check source can be hugely inaccurate, especially on the highest scale setting. You must have the CD V-700's calibrated as well. Calibration must be redone every 4 years at the latest if a meter is shelf-bound. There is a shorter span between when you should calibrations if you are carrying around the meter in the back of a car, or subjecting it to other rough handling.

Third, learn how to use these instruments. FEMA no longer has any training courses available to teach the average citizen how to use these instruments. These courses disappeared along with FEMA's OCD. However, a reprint of FEMA's "Radiation Safety in Shelters" book is available from RadMeters4U for $18. This book will teach you how to effectively use the CD V-715, CD V-742 dosimeters, and CD V-750 charger.

Getting a Kearny Fallout Meter (KFM) kit as a backup for your "good" meter might not be a bad idea. In case you drop or otherwise damage your "good" meter to the point at which you feel it is inaccurate, you can simply build your KFM using the kit, and not have to worry about whether or not you're getting an accurate reading from the meter you dropped. The KFM kit is available from RadMeters4U for $35, and their pre-assembled KFM is $55.

Another important note on eBay. I like eBay VERY much. It allows me to get rare pieces of civil defense equipment for my collection I could never find anywhere near me.

However, it is not your best bet when buying for your personal protection. Premier Items is selling calibrated CD instruments for not all that much more than it would cost to get the same model of meter from eBay uncalibrated and untested. There's a chance that once you spend your money on a meter from eBay, it won't calibrate, or otherwise will not work. Then, you'll have to do it over again until you get a working one. I feel just eliminate the guesswork, spend about the same amount of money (The meter or dosimeter price, plus calibration costs, is actually about how much Premier Items is selling their already calibrated and serviced equipment.), and get one that has been calibrated and known to be working order in the first place. However, if you do order from eBay, I personally recommend cdvseller. This person sells working meters that I have never had a problem getting calibrated. The starting price for his auctions are very reasonable, as well as meters he directly sells. Many other sellers are just dumping meters onto eBay, and using the same picture for each auction. The picture usually shows meters in perfect, new, condition, and yet you receive bashed up, scratched, and dented ones if you win the auction. Be very wary of these hecklers on eBay.

Sources for Civil Defense Radiological Instruments:

eBay: The cheapest place for uncalibrated meters. Sometimes, someone will even sell CD meters WAY cheaper than they are worth, mainly because they don't know what they have. Don't forget to get the meter calibrated once you receive it! http://www.ebay.com

Premier Items: The best, and most inexpensive source for civil defense radiological instruments calibrated and in good condition. This is your one-stop-shop for all CD radiological equipment. http://www.premieritems.com

RadMeters4U: KI4U, Inc.'s radiation meter division. A little overpriced, but sell most of the same things Premier Items does. I personally would not buy meters from here because you can get the same meters, in the same condition and with the same quality calibration for about $100 cheaper at Premier Items. However, RadMeters4U seems to be the only people I've seen offering service and calibration for CD meters you have already purchased. Also, they do sell the KFM (Kearny Fallout Meter) kits, and just recently they came out with this handy little key-chain mounted radiation-warning meter of their own design. Both items are not sold at Premier Items. http://www.RadMeters4U.com

I've seen many, many places on the Internet selling these same radiation meters and dosimeters. However, they are always untested and uncalibrated, and in some cases not working at all in the first place. However, the companies still sell them for very high prices. One place was selling uncalibrated and untested CD V-717's for $100, plus shipping, when uncalibrated CD V-717's were being sold on eBay for less than $15 in the same condition. These are all "Johnny-come-lately"-type sites. They have seen Premier Items and RadMeters4U easily sell many, many instruments (Especially after the dirty bomb scare a few months back.), and they just want to get in the action. Unfortunately, none really understand these meters, what they require to be considered fully functional and accurate, and what these meters are really worth in their untested and uncalibrated state. Avoid these places at all cost, you WILL get burned.

Conclusion:

Civil Defense Radiological Survey Meters, Dosimeters, Geiger counters, and dosimeter chargers, are perfectly suited for real self-help civil defense use. They are usually quite accurate, and because of their design, very resistant to EMP, even without built in EMP protection. They can be acquired very inexpensively from Premier Items, and calibration, service and even repair for uncalibrated and untested equipment is available at RadMeters4U. However, new meters and dosimeters still easily trump them, such as the NWSS recommended Siemens PRDM 82 radiation meter and Dosimeter Corporation DCA Model 686 dosimeters and DCA Model 909 dosimeter charger. These same new meters and dosimeters usually either cost the same, or are only slightly more expensive than the CD meters and dosimeters, and are still much, much better than the CD equipment.

In any event, you MUST get some type of radiological instruments. Without radiological instruments, you will not be able to know if potentially dangerous amounts of radiation are present, and where to seek shelter. You also will not know how much radiation you have been exposed to, or when you can come out of your shelter without said instruments.

Good luck in protecting yourself and/or your family from nuclear, biological, and chemical accidents, terrorism, and war. You are truly making an intelligent, smart, and moral decision by protecting yourself and your family.