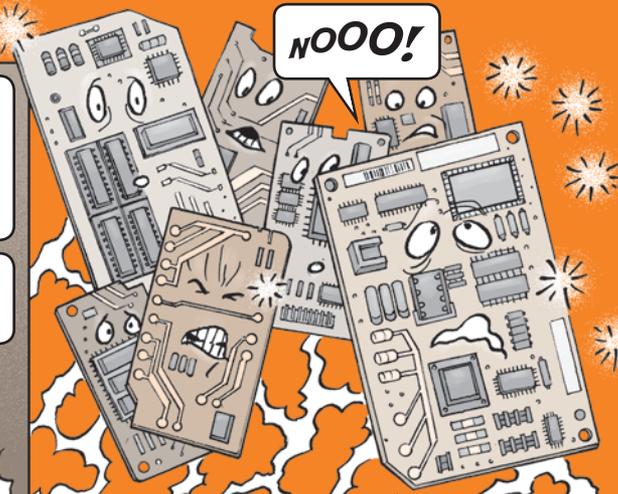


NOOO!

ELECTROSTATIC DISCHARGE (ESD), THE DISCHARGE OF STATIC ELECTRICITY, DESTROYS OR DEGRADES TRANSISTORS, RESISTORS AND INTEGRATED CIRCUITS OF CIRCUIT CARDS.

ESD CAN HAPPEN DURING PACKING, SHIPPING, HANDLING OR INSTALLATION OF CIRCUIT CARDS.



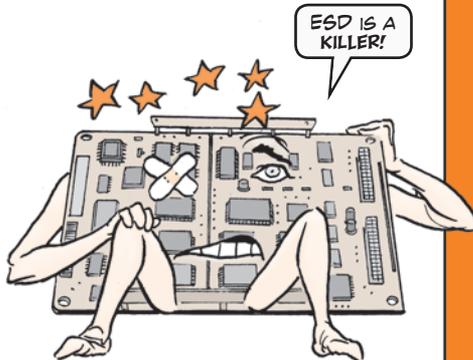
CIRCUIT CARDS CAN'T STAND THE SHOCK!

What Causes ESD?

ESD comes from electrically charged objects in your work area: Clothing, rugs, chairs, paper, ordinary packaging materials, or the work surface itself.

But the main source of ESD is you. You build up thousands of volts of static electricity by doing things like walking across the floor or combing your hair. Then, just by touching a circuit card, you'll discharge static electricity, often without realizing it.

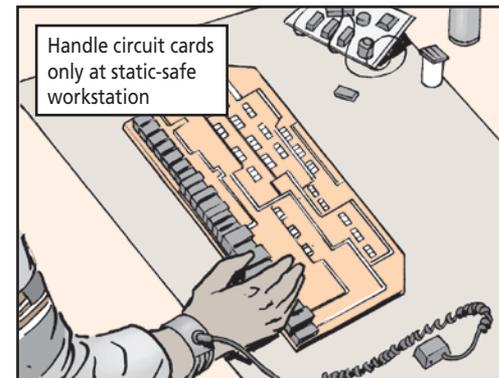
A spark as little as 30 volts ruins a sensitive electronic device. You may not feel the discharge or see the damage, but you can bet it has happened. The circuit card may fail now or be weakened enough to fail later.



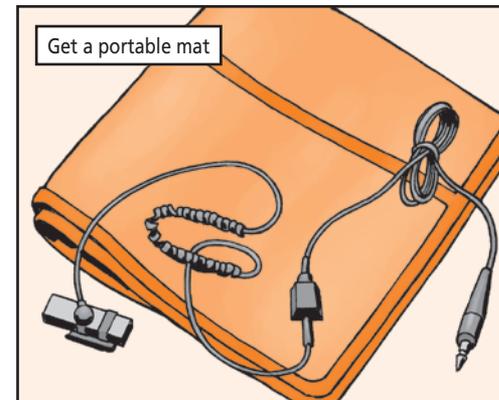
Static-safe Workstations

Protect your circuit cards from ESD. Handle them only at a static-safe workstation that includes a grounded, static-dissipative table mat, floor mat and wrist strap. They are designed to limit static buildup and carry already existing charges to ground. Here's what's generally available:

- NSN 5920-01-250-4236 will bring you a static-dissipative **table mat**, common point ground system, and an adjustable wrist strap for use in all areas other than clean rooms or laminar flow booths.
- NSN 5920-01-250-4237 gets you a **portable work surface**, common point ground system, and an adjustable wrist strap for use where other static control stations are not available.



Handle circuit cards only at static-safe workstation



Get a portable mat

- NSN 5920-01-253-5368 brings a **field service kit** that has:
 - three pouches, MIL-DTL-81997, type II, NSN 8105-01-197-7846, 12 x 10 inches
 - three barrier bags, MIL-PRF-81705, type III, NSN 8105-01-385-6281, 12 x 10 inches
 - two wrist straps, one grounding cord and a work surface mat



Use safe pouches

Instructions for a self-test and how to use the kit are printed on the work-surface mat.

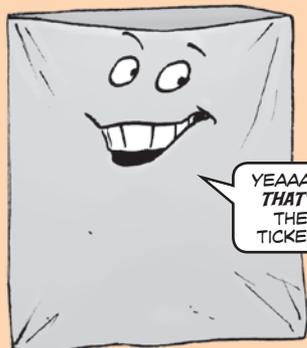
IF YOU'RE GOING TO BE PACKAGING ESD SENSITIVE (ESDS) CIRCUIT CARDS, HERE ARE A COUPLE OF WAYS TO PROTECT THEM...



FIRST, WRAP THE CARDS IN ANTISTATIC BUBBLE WRAP. NSN 8135-01-234-6649 BRINGS A 500-FT ROLL.

THEN MAKE A BAG FROM STATIC-SHIELDING BARRIER MATERIAL, NSN 8135-01-185-6816.

HEAT SEAL THE BAG WITH A HANDHELD SEALER, NSN 3540-01-456-4286.

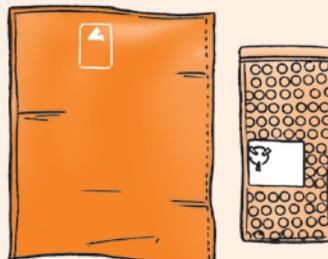


YEAHH. THAT'S THE TICKET!

YOU'LL NEED TO ORDER IT ON A DD FORM 1348-6 FROM RIC GSA AND PUT "NSN NOT ON AMDF" IN THE REMARKS BLOCK.

IF THE PIECE OF ELECTRONIC EQUIPMENT IS SMALL ENOUGH, PUT IT INTO ONE OF THESE ESD-FREE FLEXIBLE CUSHION POUCHES...

Use flexible cushion pouches



Pouch Size (inches)	NSN 8105-01-
12x12	197-2965
11x15	215-4752
10x10	197-2966
10x12	197-7846
8x8	215-0462



Whichever way you go, finish the job with a fast pack. NSN 8115-01-019-4084 brings you an ESD fast pack that measures 12 x 18 x 3 1/2 inches. NSN 8115-01-057-1244 brings you an ESD fast pack that measures 10 x 10 x 3 1/2 inches.

There's much more to know about packaging, and you can get the word from LOGSAP 746-1, *Packaging—The Basics*.

To get your copy, write to:

LOGSA PSCC
ATTN: AMXLS-AT-P
11 Hap Arnold Blvd
Tobyhanna, PA 18466-5097

Or call DSN 795-7763, (570) 615-7763, or email:

toby.pt@us.army.mil

You can also download a copy from the LOGSA website:

<https://www.logsa.army.mil/index.cfm>

From the home page, expand the Publications link on the banner across the top of the screen. The link to Packaging—The Basics is at the bottom.

IT'S ALSO A GOOD IDEA TO CHECK WITH YOUR COMMAND FOR THE NAME OF AN ESD POC.

IF YOUR COMMAND DOESN'T HAVE ONE, YOUR ELECTRONIC REPAIR DEPOT WILL.



AN ESD POC CAN ADVISE YOU ON THE BEST METHODS AND EQUIPMENT TO PROTECT YOUR CIRCUIT CARDS.

High Charge

The slow discharge path of a static-safe workstation can protect your circuit card from discharging conductors such as metal or your body. Unfortunately, a workstation can't protect against common, highly charged, non-conducting items. Candy wrappers, folders, paper, foam cups, cigarette packs, plastic and masking tape, plastics, vinyl, heat guns with blowers and common packing material can have a high static charge. Keep them away from the work site.

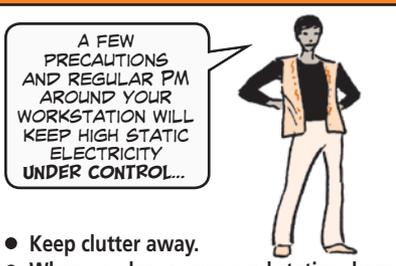
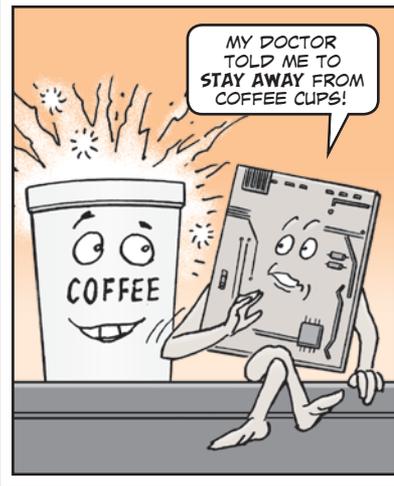


THESE HAVE HIGH STATIC CHARGE.

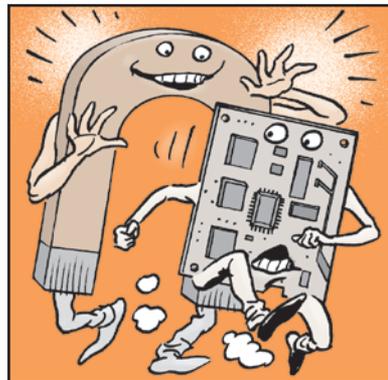
PS MORE



- Direct contact between the circuit card and the charged item triggers a discharge. A sudden flow of electric current rushes from the charged item and through the card's circuitry.
- A circuit card is placed near a charged item—a foam cup, for example. The cup could have a static charge of up to 20,000 volts. And that charge creates an electrostatic field. If the circuit card lies within the field, it takes on a charge. The damage comes later, when an unsuspecting technician reconnects (grounds) the card. BAM! The card is zapped by its own discharge as surely as if it were touched directly by the charged foam cup.



- Keep clutter away.
- When you leave your workstation, keep the circuit card protected, even if you're coming right back. Put it in an ESD-free pouch or wrap it in static-shielding barrier material.
- If you must have technical manuals and paperwork at the workstation, store them in anti-static bags. Put an ESD-safe rubber band or conductive ESD-safe tape around the bag. Never use ordinary tape or ordinary rubber bands to fasten it. The tape and rubber hold static electricity.
- Magnets, radios and telephones can create an electromagnetic field. Keep them clear of the workstation.



- If you must package an item in stretchwrap or shrinkwrap, do it away from your workstation. Packaging an item with these materials generates static electricity.

Clean Means Safe

Dirt and dust on the table and floor mats act as insulators, making it harder for the mats to carry electrical charges to ground. Clean the mats with a soft cloth, or brush them with a whisk broom.

Use only brushes made with natural bristles, such as horse hair. Brushes made with nylon or other synthetic bristles will generate static electricity.

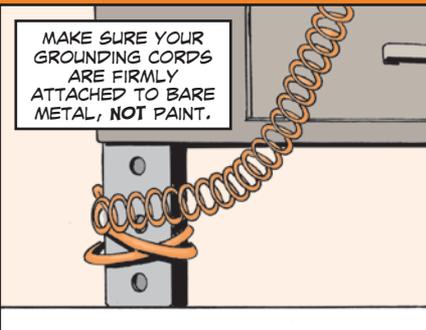
Never wax or polish the table or floor mats. That leaves a residue that insulates the mats.



Grounding

CONNECT TABLE AND FLOOR MAT GROUNDING CORDS DIRECTLY TO SHOP GROUND. GROUND EACH WORKSTATION INDIVIDUALLY.

NEVER CONNECT WORKSTATIONS IN A SERIES TO GROUND THEM.

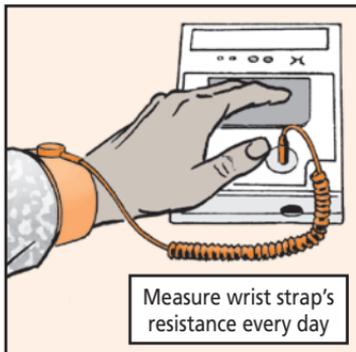


Resistance Checks

Follow the manufacturer's instructions for measuring the resistance of your workstation components. That's the only way to be sure your workstation's doing its job of carrying static charges to ground.

Measure the mat's resistance with a test kit for static control surfaces. Get the kit from the GSA Advantage website: <https://www.gsaadvantage.gov/> From the home page, do a search on the test kit's part numbers: **701C**.

Kit for static control surfaces checks mat's resistance



Measure wrist strap's resistance every day

Measuring resistance in the wrist strap is especially important. The strap takes more wear and tear than any other part of your workstation. Measure it at least daily. Get a wrist strap tester with NSN 4940-01-388-1693. Order it on a DD Form 1348-6 from RIC SMS and put "NSN not on AMDF" in the REMARKS block.

The wrist strap has a resistor to protect you against high-voltage shocks. If the resistance is too low, the strap can't protect you. Too much resistance means the strap can't draw static electricity away from your body. Either way, you'll need to replace it.

Have your workstation tested for resistance from the surface of the table or floor mats to ground. That takes special testing equipment and special support. Contact your local TMDE support folks or a CECOM LCMC LAR for help.

For more information on ESD protection, see these publications:

- MIL-HDBK-773A, *Electrostatic Discharge Protective Packaging*
- MIL-HDBK-263B, *Electrostatic Discharge Control Handbook*
- MIL-STD-1686C, *Electrostatic Discharge Control Program*

Discharge Control Program

IF YOU **CAN'T** FIND COPIES LOCALLY, THEY'RE AVAILABLE ON THE DEFENSE LOGISTICS AGENCY (DLA) DOCUMENT SERVICES ASSIST QUICK SEARCH WEBSITE:

<https://assist.daps.dla.mil/quicksearch/>

THE DLA ASSIST WEBSITE ALLOWS YOU TO DOWNLOAD AND PRINT THESE PUBLICATIONS. UPDATES AND NEW MATERIAL CAN BE FOUND THERE, TOO.

