

OWNER'S MANUAL

Model KD-100

KEY TAPE DISINTEGRATOR

Applies to Serial #s 02-2324 and up.

Elegant Crypto-Stroyer™ Technology

Applied Magnetics Lab

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Fast, Complete, Highest-Security

Destruction of Cryptographic Key Tape

- SECURE ● FAST ● LOW COST ● COMPACT
- SIMPLE-TO-USE ● LIGHT-WEIGHT ● SAFE
- LOW-POWER ● ENVIRONMENT-FRIENDLY
- EASY MAINTENANCE ● QUIET ● RUGGED

US and Foreign Patents Pending

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SECURITY WARNINGS

- 1. Machine DESTROYS TAPE & DATA completely.
- 2. For Key Tape ONLY-- Not for anything else.
- 3. Operator must CONTINUOUSLY MAKE SURE that the job is getting done properly!
This is why we built the top window into the KD-100.

a) Look through this window into the clear plastic residue chute during destruction.

b) VERIFY that ONLY fine powder (almost invisible) is flowing towards the Vacuum Intake.

c) If you are not getting fine powder Residue, Stop! Consult your Security Officer about what to do. See "Normal Operating Instructions" (a few pages below) for more details.

d) If you are get a buildup of Residue in the clear plastic chute, STOP! Overheat Damage is possible!

The Bag is full, or outlet to bag may be clogged!

Fix the problem before proceeding!

- 4. Do not attempt to adjust or modify this machine! You might cause the KD-100 to deviate from DOD certification specifications, and thus lose the ability to declassify Key Tape per DOD requirements!

NOTE: At the end, the last 3/8" or so of Tape does NOT get converted into dust-like chips. It contains no data.

DOD is aware of this. See p.13.

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Please refer servicing to qualified personnel.

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*Crypto-Stroyer*TM INTRODUCTION

WARNING-- PATENTS PENDING!

The KD-100 and its embodied technology are covered in pending US and Foreign Patent Applications.

The KD-100 was developed specifically for the purpose of reducing Cryptographic Key Tape to a form in which all data on or within the Tape would be absolutely unrecoverable. It achieves this objective by reducing the Key Tape to powder.

It was also desirable (among other things) that the machine be very compact, of reasonable cost, and easy to use.

Key tape is (of necessity) extremely rugged-- a blend of paper and polyester (also known as "Mylar"). Paper is almost as abrasive as dirt, and polyester is a very tough, durable plastic material. It tends to stretch, and this is why Key Tape will easily jam conventional shredders, even including conventional high-security shredders and disintegrators of top quality.

Key tape is also very thin (about the thickness of a human hair). This makes it even harder to cut, because the clearance between cutting edges must be very small. If the cutting edges are not very tight, the Tape will simply slip between cutting edges without any cutting action at all!

The KD-100 employs AML's proprietary *Crypto-Stroyer*TM technology, which has a number of security applications.

The KD-100 disintegrates Key Tape by cutting a typical 10" segment into about 200,000 tiny pieces, in about 4 seconds. The tiny cut pieces are like dust particles.

To do this, the KD-100 employs mechanisms to precisely control the feed of Tape to the Cutter, a special Cutter to rapidly chop the tape into tiny pieces, and means to assure that there is no clearance between cutting elements.

The entire machine (about 180 parts) is run by a single motor. It does 4 things using 13 gears and associated components:

1. Drive (directly) the Vacuum System to collect the Residue.

2. Drive the Pinch Roller mechanism (through a gear train) to precisely meter the Tape into the Cutting Zone at a rate precisely proportional to Cutter speed.
3. Drive the Cutter (directly, at very high speed) to disintegrate the Tape.
4. Drive another (special) mechanism, through a secondary gear train, to maintain zero cutting element clearance.

IMPORTANT! LIMITATIONS:

This machine was designed for low-volume applications! If you are doing a lot of volume (more than a few segments per day), we (and DOD) **HIGHLY RECOMMEND** that you have us convert this machine for External Vacuum Operation-- order: "KD-100-EXTVAC-R". Factory only. Details? See our web site.

Web Site Updates/Contact: We regularly update our web site with the latest information. If you are the actual user, we urge you to supply an e-mail address for important notices, and please **CHECK** at WWW.APPLIEDMAGNETICS.COM for updates.

Promises: There will be no spam or sales pitches from us!
We'll keep your e-mail address **Strictly Confidential!**

OPERATING SEQUENCE

1. The Operator feeds Key Tape into a Guide.
From this point on, operation is fully automatic.
2. A pinch roller and Capstan together capture the Tape and force it into the Cutting Zone at a precise, controlled rate.
3. Tiny teeth on the rotating Cutter engage the Tape and pull it inwards and slightly downwards, and then cut it.
4. The Cutter slices off **VERY** tiny bits of Tape (now Residue).
5. The cutter carries the Residue past the Cutting Zone.
6. The Vacuum System picks up the Residue via the Chute just past the Cutting Zone and pumps it into the Residue Bag.
The custom-designed Cutter has over 150 tiny teeth, ground into it in a helical cross-cut pattern. At 20,000 RPM it makes about 50,000 cuts **PER SECOND**.

As Key Tape is precisely advanced into the Cutter at about 2.5" per second, each inch of Tape is subjected to about 20,000 cuts. The resulting Residue is therefore powdery and dust-like.

Unlike a conventional Security Disintegrator, the cutting action is NOT random. It is controlled, specific, deliberate and predictable because of the physical design of the KD-100.



SAFETY INSTRUCTIONS

A special note:

Your safety is even more important than usual when you fire up this machine!

You are performing a critically important job in safeguarding your country's secrets.

Other people are depending on you to do that job.

You must keep yourself safe to do that job!

- GENERAL WARNING: When using any electric machine, basic safety precautions should always be followed to reduce risk of fire, electric shock, and personal injury, including the following:
- READ ALL INSTRUCTIONS
- CONSIDER WORK AREA ENVIRONMENT:
Don't expose KD-100 to rain. Don't use KD-100 in wet locations. Keep work area well lit.
- Don't use KD-100 for purposes not intended; for example, don't use for any sort of metal, credit cards, etc.
- Keep STAPLES, PAPER CLIPS, etc. OUT OF THIS MACHINE!
- DON'T ABUSE CORD. Never pull or yank the cord to disconnect from receptacle.
Keep cord away from heat, oil, and sharp edges.
- ALWAYS USE KD-100 on a stable work surface.

- **MAINTAIN KD-100 WITH CARE.** Keep KD-100 clean and properly adjusted for best and safest performance.
- Follow instructions for cleaning, maintenance, and adjustment.
- Inspect KD-100 cord periodically and if damaged, have it repaired by an authorized service facility.
- Inspect extension cords periodically. Replace if damaged.
- Keep the machine free from oil and grease.
- **DISCONNECT KD-100** from outlet before any servicing, including Residue Bag replacement.
- **REMOVE ADJUSTING KEYS AND WRENCHES.** Form the habit of checking to see that keys and adjusting wrenches are removed from KD-100 before closing the cover or turning it on.
- **AVOID UNINTENTIONAL STARTING!**
Be sure the switch is off when plugging in the cord.
- **OUTDOOR-USE EXTENSION CORDS:** When KD-100 is used outdoors, use only extension cords marked for use outdoors.
- **CHECK DAMAGED PARTS.** Before further use of the KD-100, a cover or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function.
- Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect proper operation.
- A cover or switch or other part that is defective should be properly repaired or replaced by an authorized service center.
Do not use KD-100 if the power switch does not turn it on/off.
- **DO NOT OPERATE KD-100** near flammable liquids, or in gaseous or explosive atmospheres. The Motor in the KD-100 normally sparks internally, and the sparks might ignite fumes.
- If you must operate with the cover open, please:

Keep hands, hair, and clothing well clear!

Rotating parts, such as gears, can injure hands and grab hair and clothing!

- If the KD-100 is not working properly, contact an authorized service center for repair.
- **DISCONNECT PLUG FROM POWER SUPPLY** before making adjustments, or changing the cutter or Residue Bag.
- **CAUTION: USE IDENTICAL REPLACEMENT PARTS.**
- **DO NOT TOUCH CUTTER** after KD-100 has been running. It may be extremely HOT! It is SHARP, too!
- **TO STOP** the KD-100, set the SWITCH to "OFF" position.
- **SWITCH OFF & UNPLUG POWER** before opening cover.

DOUBLE INSULATION AND GROUNDING

The KD-100 is constructed throughout with two separate layers of electrical insulation, or one double thickness of insulation between you and the KD-100's electrical system.

With this insulation system, grounding is not necessary for protection from electrical shock from the KD-100's electrical system. Please note, however, that Double Insulation does NOT take the place of normal safety precautions. The insulation system is for added protection against injury resulting from a possible electrical insulation failure inside.

HOWEVER, under very dry conditions, it is possible that static electrical charges could build up internally as KD-100 runs. This is similar to what happens when we walk or rub our shoes on a carpet in very dry weather and get a small shock when we touch a doorknob or other metallic object.

To suppress possible static charge buildups, KD-100 is equipped with a 3-prong, grounding-type cord and plug. Please do not defeat its purpose. Connect to a Grounded Outlet Only.

Do not cut off the grounding pin!

Do not use an adapter to bypass grounding of 3-prong plug!

EXTENSION CORDS

Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw.

An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. The table below shows the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord.

For 120 Volts operation:

Cord length->	0-25 ft	26-100 ft	101-150ft
Wire size->	18 ga	14 ga	12 ga

For 220 Volts operation:

Cord length->	0-50 ft	51-200 ft	201-300ft
Wire size->	18 ga	14 ga	12 ga

POWER SOURCE: Be sure your power supply agrees with the specific KD-100's data-plate marking.

120 or 220 AC means that your KD-100 may be operated only with alternating current and never with direct current.

A voltage decrease of more than 10% may cause loss of power and overheating. Every KD-100 is factory tested; if this KD-100 does not operate properly, check the power supply.

INITIAL SETUP

INCLUDED with KD-100:

This Manual, one disposable vacuum Residue Bag (already installed), plus any Options ordered with the machine.

Any ordered Options are already installed when we ship the KD-100.

Carefully unpack the KD-100. Inspect for shipping damage. Try to **SAVE** the packing materials, in case it is later returned for service.

Open the lid.

Make sure that Residue Bag is properly attached to Vacuum Outlet.

Flexible rubber Bag Seal (built into each Bag) **MUST COMPLETELY** surround Vacuum Outlet.

Cardboard Bag Collar **MUST** be secured with both **CLIP** and **SPRING**.

If in any doubt, please see Bag Instructions, near end of this Manual.

Close and latch the lid, making sure that the LID does NOT PINCH the Residue Bag.

LOCATION:

Place the KD-100 on a stable surface, such as a desk or table.

POWER REQUIRED: Typically, under 3 amperes @ 115 VAC 60 Hz (under 300 watts) while running. Starting surge can be up to 6 (with 115 VAC) amperes for under 1/2 second, mostly due to the starting requirements of the cutter drive motor.

Check the data-plate (rear of machine).

Make sure that your power source matches the specified power on the data-plate. In the continental US, the required power is 110-130 VAC, 60 Hz, AC ONLY.

1. Set the front-panel rocker switch to the ("OFF") position.
2. Plug the KD-100 into a GROUNDED outlet.

NORMAL OPERATING INSTRUCTIONS

1. Switch ON (depress right side of SWITCH).
Right-hand half of the SWITCH will glow red.
Motor will start.
Timer will come on, indicating total elapsed running time.
2. Slip the end of the Key Tape into the Guide, left side of machine, and slide the Tape inwards until the KD-100's internal rubber pinch-roller grabs the tape and pulls it in.

Action is automatic from here on. Just make sure that nothing is preventing the Tape from being pulled into the machine.

If it is a long segment, keep it from being tangled or otherwise held back from feeding in. A 10" segment takes about 4 seconds to be disintegrated.

If you have difficulty,

- a) Make sure that the tape is not folded
- b) Lift the tab to make insertion easier, then let it snap back down when self-feeding begins.

IMPORTANT SECURITY INSTRUCTION:

OPERATOR: You must CONTINUOUSLY
MAKE SURE that the job is getting done properly!

This is why we built the top window into the KD-100!

3. Observe the action through the window. You will see fine dust, BARELY VISIBLE, flowing through the clear plastic chute towards the vacuum unit.

As the cutter wears out, the particles can become noticeably larger, gummier, and more like flakes than powder.

At this stage, the disintegrating action is more like mashing-between-blunt-edges than cutting-between-sharp-edges. The mashing action causes frictional heat, which tends to melt the plastic, which makes the resulting particles more gummy and flake-like. IF THIS HAPPENS, the Cutter is probably at the end of its life!

HAVE THE KD-100 SERVICED IMMEDIATELY!

4. KD-100 WILL KEEP RUNNING UNTIL YOU TURN IT OFF. You will hear the motor speed up a bit when it has finished running the Tape. NOW switch it OFF.

PLEASE NOTE: At the end of the tape, the last 3/8" or so of Tape will simply be pulled through the cutter. It does NOT get converted into dust-like chips.

REASON: It has traveled past the rubber pinch-roller, which controls and meters the tape into the disintegrating system.

DOD is aware of this, and points out that this last bit of tape contains no data.

This last bit may not be pulled into the vacuum right away. This is normal. When the machine runs again, this last bit of tape will usually get sucked into the vacuum collection system.

SECURITY NOTE: If it is a torn segment containing data, Scotch-tape it onto another segment or some 1" wide paper. Feed it in, segment-end first.

If you get a buildup of Residue in the clear plastic chute, STOP! Overheat Damage is possible!

The Bag is full, or outlet to bag may be clogged!
Fix the problem before proceeding!

The KD-100 requires smooth cooling air flow through the clear plastic chute. If Residue builds up in the chute, air flow is reduced, and the plastic component of the Key Tape will heat up and re-form into hard plastic. This may jam the cutter and damage the machine. Motor may stall. Fuse will probably blow to protect the motor!

ABOUT THE RESIDUE BAG

The Residue Bag is oversize. This is primarily to provide maximum airflow for the Vacuum System as the Bag fills. Free airflow is essential to effective Vacuum operation, which is essential to proper overall performance and service life.

Please remember that the paper filter material is really just special paper with lots of microscopic holes, small enough to stop dust, but big enough to let air through.

The Residue itself contains a large percentage of extremely fine powder particles - so fine that they will float in mid-air!

The Bag material and size were specified so as to provide maximum surface area, because some of the bag surface area will be clogged by Residue powder, thus preventing air from freely flowing through the Bag walls. Thus the Big Bag!

Please understand that even though the Residue Bag would hold a great deal more Residue than 100 segments, we recommend replacement at no more than 100 segments (7 minutes) to preserve this essential maximum airflow.

USEFUL TIPS

a) INITIAL FEED: As you become familiar with the KD-100, you will probably find that it is easier to feed the tape into the chute until it stops against the rubber roller, and then switch ON, perhaps holding slight inward pressure.

Then just let go once it starts to feed.

b) PARTLY TORN SEGMENT: It will probably feed anyway.

c) **SHORT SEGMENT or FRAGMENT:** Scotch-tape it onto another segment or some 1" wide paper. Feed it in, segment-end first.

d) **WRINKLED SEGMENT:** We have tested this. Just get it straightened out enough to start feeding. The KD-100 will tend to straighten out the rest of the tape as it feeds. The inlet chute geometry is designed for this purpose. We have crunched segments into a ball, pulled out and straightened enough to start feeding, and let the KD-100 do the rest, with no problem.

e) **FOLDED SEGMENT:** A segment folded in half will feed and run normally, but it may tend to jam in the inlet. If so, lift up the top guide and pull it back a bit, or completely out if necessary.

Notes:

1) Once the Tape is started, the top guide is only needed to help straighten out wrinkled Tape. You can feed it by hand without the top guide installed. At most, just provide gentle resistance to the feed.

2) Usually, you can simply let the KD-100 feed itself (once started) with no top guide installed at all, and without even guiding the tape by hand!

EMERGENCY OPERATIONS

If you are faced with an emergency requiring rapid destruction of a lot of tape, do some or all of this, depending on the situation:

1. Operate with the cover open. This allows maximum cooling of the interior components. **BUT: Keep hands, clothing, and hair CLEAR of interior moving parts!**
2. If the bag is filling up, and you do not have a replacement, remove it, empty it by vigorous shaking (with collar opening facing down) and re-install it.
3. If the above is too slow, tear or cut the bag at the side facing away from the vacuum unit, and let the residue spray out into the work area. This will keep the residue from fouling the machine and its motor. If you have a vacuum cleaner handy, run it with it's nozzle stuck into the open bag to pull out, control, and collect the residue.
4. Remove the top Guide, unless you need it for feeding multiple

pieces of tape. Guide the tape in by hand. This minimizes the chance of tape folding and jamming in the guide/slide area. To remove Guide, just lift the tab and pull the Guide out.

5. You may also be able to feed in a double-thickness of tape (two segments at once). This doubles your throughput. The Top guide would almost certainly have to be removed for this to work. Warning: This may overheat the machine!

CLEARING A JAM

A jam is extremely unlikely. If you get a jam, it's probably due to tape piling up beyond the rubber roller, and failing to enter the Cutting Zone. There are several methods to deal with this.

PLEASE NOTE: The "rubber roller" (below) may be either a single long roller, or two short rollers ganged together on a common Roller Shaft.

METHOD A (Cut, clear, restart)

1. Switch OFF, REMOVE top Guide, and cut or tear the tape (as short as possible) at the inlet side.
2. Switch ON. Let the pinch roller system pull through the last of the tape. It MAY pile up ahead of the rubber roller.
3. Switch OFF. Lift up the clear plastic cover's flat end (above the roller), and pull out the jammed tape. You may be able to tease it up and out with a pen or pencil or other small pointed object, and then grip it with your fingers.
4. Re-Install guide.
5. Flatten out the tape enough to re-feed it, and start up again.

METHOD B (release roller pressure, clear, restart)

1. Switch OFF, REMOVE top Guide, and cut or tear the tape (as short as possible) at the inlet side.
2. Loosen, but do not remove, the two Roller Pressure Screws, located just above the rubber roller.
3. Lift up the clear plastic cover's flat end (above the roller), and pull out jammed tape. You may be able to tease it up and out with a pen or other small pointed object, and then grip it with your fingers.

4. **Re-tighten BOTH screws FIRMLY, but not too tight!**
Screws are hollow, and can shear if over-tightened!

CAUTION! If you fail to do this and start up, the Key Tape will not be controlled. The Pressure Roller system feeds in the Tape at a controlled rate, but it ALSO keeps the tape from getting pulled into the cutter too fast! It might get pulled in and tightly wrapped around the Cutter, instead of being disintegrated by it.

RESULTS:

a) Motor will stall. Shut off immediately to prevent overheat damage!

b) Machine **MAY** have to be removed from the case to clear it.

This is because the Cutter will have to be manually rotated **BACKWARDS** (clockwise when viewed from the front of the KD-100) to "un-wind" the Key Tape wrapped around it.

There is a screwdriver slot on the end of the Cutter for this purpose. As the Key Tape is "un-wound", it must be pulled clear of the Cutter.

c) It **MAY** be possible to manually "un-wind" the Tape from around the Cutter without removing the machine. To do this:

c1. **MAKE SURE KD-100 is UN-PLUGGED** from power.

c2. Insert a **FLAT-blade screwdriver (1/4" maximum width)** into **HOLE** on front panel, to engage **SLOT** in end of Cutter. This **SLOT** is just barely visible through the **HOLE**.

c3. Rotate Cutter **CLOCKWISE** (opposite of usual rotation).

c4. As you Rotate the Cutter, pull out the jammed tape. You may be able to tease it up and out with a pen, pencil, tweezers, needle-nose pliers, or other small object, and then grip it with your fingers.

5. **Tighten Pressure Screws FIRMLY, but not too tight!**
Screws are hollow, and can shear if over-tightened!
Now, please Re-Install Guide.

6. Flatten out the tape enough to re-feed it, and start up again.

METHOD C (remove roller, clear, restart)

1. Switch **OFF**, **REMOVE** top Guide, and cut or tear the tape (as short as possible) at the inlet side.

2. REMOVE the two Roller Pressure Screws and washers (if any) located immediately above the rubber roller.

NOTE: These HOLLOW screws MAY have washers, and ALWAYS have SPRINGS riding in their holes, which press on the Roller Shaft to squeeze the Tape between the Roller and Capstan. Save the washers (if any) and the two SPRINGS.

3. Remove the two small SPRINGS which fit into the ends of the Pressure Screws, if they did not come out with the screws.

4. While gently lifting the Roller up, use a bent paper clip or similar item to push the Roller Shaft out towards the Motor.

There are holes in the side plates for this purpose, located just below the black Pressure Screws you just removed. You can slide the roller shaft all the way out, and then remove the rubber Roller.

5. Clear any tape jamming this area.

6. Holding the rubber roller in position, gently feed the Roller Shaft back into position through the roller. The roller will drop down when the Shaft is all the way in.

7. Re-install both small Pressure Springs, Pressure Screws, and Washers (if any). Tighten firmly but not too tight. Screws are hollow!

8. Re-Install guide.

9. Flatten out the tape enough to re-feed it, and start up again.

MAINTENANCE, LUBRICATION, ADJUSTMENTS

INTERIOR CLEANING:

SWITCH OFF! UNPLUG AC CORD!

Inspect interior whenever you change Residue Bag, or at any other time you open the cover. Remove any Residue or dust with an ordinary vacuum cleaner equipped with a small nozzle.

Small nozzles and adapters for ordinary vacuum cleaners are available at hardware stores, and "box" stores like Wal-Mart, Home Depot, etc.

If you are replacing a Residue Bag, remove the Bag first, then clean the interior, and then replace the Bag.

EXTERIOR CLEANING:

Wipe the fiberglass exterior of the KD-100 with a damp cloth. Do NOT use solvents. Mild detergent, such as for use on windows or countertops works very well, and will not harm the exterior surface.

INTERIOR ADJUSTMENTS - SECURITY WARNING:

Do not attempt to adjust or modify this machine! You might cause the KD-100 to deviate from Defense Dept. certification specifications, and lose ability to properly destroy Key Tape!

Please refer servicing to qualified personnel.

SERVICE and REPAIRS:

a) In general, service and repairs are performed by AML in Baltimore, MD. Please consult your own organization for more detail. Your organization may have set up a service depot, or made special service arrangements.

b) To expedite return of a unit to service AML may, at its option, exchange an incoming unit for a brand new or factory-refurbished unit.

LUBRICATION when Changing Residue Bag:

Residue Bags are supplied with a small quantity of special GREASE (Mobil XHP222 SPECIAL) and some "Q-Tip"-style applicators. Whenever you change Residue Bag:

Lubricate the TEETH of the BRONZE WORM GEAR with a thin coating of GREASE, and ALSO lay a thin line of GREASE around the TOP of this gear, just above the TEETH.

LUBRICATION using External Vacuum:

Lubricate as above, every 30 minutes, same grease.
(Extra cooling from External Vacuum relaxes the lube requirement.)

This bronze gear works hard, and greasing it as above will protect it!

MACHINE SERVICING INTERVALS

CUTTER LIFE:

9999.99 Minutes (Timer's Maximum Reading) works out to about 150,000 segments (at 4 seconds per segment).

This is about 24 MILES of Tape!

We assume that a KD-100 will have had Factory or Depot service, including a Timer resetting, before this much use would accumulate.

New Cutters, February, 2004:

New long-life "Futura" cutter for the KD-100!

Made of a new, long-wearing steel base material, with new "Futura" coating. Black in color.

(The "old" 2.6-hour cutter was gold-colored).

This new cutter has a life of around 10 hours!

With a typical "Futura" **CUTTER** life of 9500 segments, this means replacement at about 600 minutes, or about 10 hours, of actual use.

Please bear in mind that in reducing a single 10" segment of Key Tape to dust, about 205,000 individual cuts are made. 9500 segments (600 minutes of cutting time) works out to about 2 BILLION cuts through a paper/polyester/paper material, which is quite tough and abrasive.

Thus, the 9500-segment Cutter life is very impressive!

To assure continued performance, fresh high-precision Cutter Bearings are also included with each new Cutter.

BED BLADE LIFE

The Bed Blade is the "other" cutting surface, located below the Cutter. It is not visible unless the Cutter is removed.

The Bed Blade should last at least 15 hours, but is replaced with each new Cutter at about 10 hours.

This way, we never have to worry about wearing out the Bed Blade--it's always almost new, even if the KD-100 has been run "dry" (without cutting tape) quite a bit.

This is critical to KD-100 operation, because the Cutter is useless unless it engages the Key Tape against the Bed Blade, which provides a zero-clearance cutting surface.

MOTOR LIFE:

The Motor should run at least 300 hours without service, if the machine has been kept clean and allowed to cool itself properly (airflow not blocked, run in moderate temperatures).

The motor should be serviced or replaced "on-condition"--such as if it makes a lot of noise, overheats, sparks, or no longer runs the machine properly.

MACHINE LIFE:

This is indefinite, as all wear-prone parts are easily replaced.

KD-100 SPECIFICATIONS

INTENDED USE:

Terminal Destruction of *PMP and PLASTIC KEY TAPE*, to United States D. O. D. Specifications.

Authority: Letter of Approval, 20 March 2002.

For verification, please call DOD at (301) 688-6816 or (410) 854-6851.

PERFORMANCE:

ONE SEGMENT (10.2") disintegrated in **4 SECONDS**.
Equivalent Throughput: 13 Ft/Min = 4 meters/min

Emergency High-Volume Operation Procedure:

See Emergency Operation Procedures, page 14.

Resume normal procedures immediately thereafter.

SIZE: 8 x 10 x 6-1/2(h) inches = 205 x 255 x 65 mm

NET WEIGHT: 9.1 lbs. = 4.1 kg

ENCLOSURE: Rugged NEMA 4X Fiberglass sculptured, gasketed enclosure

POWER: 300 watts, 100-130 VAC, 50-60 Hz. Euro (200-240v) version available. Practical to use with our low-cost optional back-up battery system.

SOUND LEVEL: 75 dBA, measured at operator's ear.
Suitable for office environment.

CUTTER LIFE: 8,100 Feet of Key Tape, or about 9500 segments, or about 10 hours of actual disintegrating time.

CONTROLS and INSTRUMENTATION : On-Off Switch; Power ON indicator built into Power Switch; Time Totalizer Meter (LCD Display), with non-volatile memory. Used like a car's odometer.

PROTECTION: Slow-Blow Fuse, rear panel.

RESIDUE COLLECTION: Disposable paper vacuum filter bag.

COOLING: Forced Air (Vacuum System, plus Motor's fan which pumps exhaust air directly out of the Enclosure)

TIMER SPECIFICATIONS:

This is a miniature, all solid-state timer, custom made for the KD-100. The timer runs whenever the KD100 motor runs. No moving parts.

ELAPSED-TIME STORAGE: CMOS EEPROM non-volatile ROM keeps track of the elapsed run time without power, and without the need for a keep-alive battery, for up to 10 years.

DISPLAY: 6 digit LCD, reading to 9999.99 minutes maximum (166.6 hours). **DIGITS:** 7-segment, 5mm (.2") numeral height

TIMEBASE: Quartz crystal. **ACCURACY:** .01% or better

OPERATING TEMPERATURE: -40 to +85 degrees C

HUMIDITY: 95% RH @ +32C for 2 hours

SHOCK RESISTANCE: SAEJ137853G

VIBRATION RESISTANCE: Withstands 10 to 75 Hz @ 1 to 8 G's

RESET: Only by a special procedure, using special tools.

ROLLOVER (Automatic Recycle):

Rolls over to 0000.00 if run past 9999.99.

POWER REQUIRED: under 0.1 watts

FORMAT: MMMM.MM

This format and scaling were specified to make good real-world maintenance judgments and record-keeping easy.

The readout directly in minutes also makes checking and evaluating machine performance simple and straightforward.

INCLUDED with each KD-100

- a) Total Accumulated Use Timer
- b) User instructions
- c) Padded cardboard shipping box
- d) Standard power cord (120v for USA, 220v for Euro)
- e) Residue Bag, Installed
- f) Delivery to any APO/FPO or physical address within cont'l USA
- g) Standard AML 1 Year Warranty (see below)

OPTIONAL EQUIPMENT & SUPPLIES

1. TRANSPORT CASE OPTION (KD-100-CASE) description:

Color: All black. No reflective materials visible.

Smooth, serious, high quality appearance and finish.

Material: Heavy-web, injection-molded ABS.

WATERPROOF to 30 feet.

HANDLE: Folding, comfortable, injection-molded.

Prsssure-Relief VALVE.

Very STRONG ribbed construction - will support 3,000 lbs.

Includes FOAM inserts to nest and cushion the KD-100

DIMENSIONS (Maximum outside): 7 x 12 x 14"

WEIGHT (including foam inserts): 4.7 lbs.

STORAGE SPACE: Space available in the Transit Case for some tools and spare parts. This can be done simply by cutting some pockets into the foam Case inserts.

2. KD-100-12VCONV Emergency DC Converter Accessory (12-volt vehicle battery operation): You can disintegrate approximately 2,000 segments on a fully charged 75 ampere-hour vehicle battery. Special Order only. Contact us!

Please note that almost all vehicles (including armored vehicles, tanks, trucks, jeeps, etc.) have 12-volt batteries installed, even though they may have 24 volt (such as in HUMVEE) or higher voltage electrical systems (up to 96 volts in certain tanks).

These vehicles get their higher system voltages by stringing basic 12-volt batteries together in series to add up to the vehicle system voltage. Just connect the Emergency DC Converter Accessory across ONE of the 12-volt batteries in the string. Please be very careful to observe correct polarity when connecting the Converter to the battery.

3. KD-100-BAGPK 10-pack, Disposable Paper Residue Bag. Made of filter paper, specific to KD-100.

4. KD-100-CUTHSS Replacement Cutter, New (Feb '04) Long -Life Alloy, with "Futura" coating. Black-colored. (Old 160-minute Cutter was gold-colored.) Same price! Also includes:

2 precision ball bearings (fitted to the specific Cutter)

1 Bed Blade

These items added on to original list, at no extra cost:

1 Coupling Setscrew (must replace whenever removed)

1 Capstan Screw (6-32 x 1/2", Nylon self-locking)

- 1 Hex ("Allen") key wrench for #6-32 Capstan Set Screw
- 1 Hex ("Allen") key wrench for #8-32 Coupling Set Screw
- 1 Hex ("Allen") key wrench for #8-32 Socket Hd Brg Retainer Screw
- 1 Hex ("Allen") key wrench for 1/4-20 Bearing Screws
- 1 tube (.02 fl. Oz.) LocTite #271 (for Coupling Screws)

5. KD-100-SM Complete Service Manual for KD-100.
NOTE! This is now included in Service Kits below!

6. KD-100-SKL Service Kit - Local. Includes:
- 1 Long-Life Replacement Cutter, "Futura" Coated
 - 2 precision ball bearings (fitted to the specific Cutter)
 - 1 Bed Blade
 - 1 Pressure Roller (may be one long single or 2 short rollers)
 - 10-pack of Residue Bags ("KD-100-BAGPK")
 - 1 Drive Shaft/Worm Assembly (For damage due to failure to change bag)
 - 2 Spare Fuses

These items added on to original list, at no extra cost:

- 1 Coupling Setscrew (must replace whenever removed)
- 1 Hex ("Allen") key wrench for #6-32 Capstan Set Screw
- 1 Hex ("Allen") key wrench for #8-32 Coupling Set Screw
- 1 Hex ("Allen") key wrench for #8-32 Socket Hd Brg Retainer Screw
- 1 Hex ("Allen") key wrench for 1/4-20 Bearing Screws
- 1 tube (.02 fl. Oz.) LocTite #271 (for Coupling Screws)
- 1 KD-100-SM Complete Service Manual for KD-100

7. KD-100-SKD Service Kit - Depot. Includes:
- 10 each, # KD-100-BAGPK (10-packs=100 total)
 - 10 Replacement Cutters
 - 20 cutter bearings (2 fitted to each Cutter)
 - 10 Bed Blades
 - 5 Pressure Roller (one long single or 2 short rollers)
 - 5 each, Drive Shaft/Worm Assembly (For damage due to failure to change bag)
 - 1 Enclosure (main box)
 - 5 Each, Small Bevel Gear 5 Each, Large Bevel Gear
 - 2 each bronze worm gear 2 each Residue chute
 - 2 each MOTOR/VACUUM Assembly.
 - 5 gear cotter pins 5 Switches
 - 5 fuses (120 V) 5 fuses (220 V)
 - 2 Power cord (120 V)
 - 2 Power cord (220 V)

These items added on to original list, at no extra cost:

- 20 Coupling Setscrews (replace whenever removed)
- 2 Hex ("Allen") key wrench for #6-32 Capstan Set Screw
- 2 Hex ("Allen") key wrench for #8-32 Coupling Set Screw
- 2 Hex ("Allen") key wrench for #8-32 Socket Hd Brg Retainer Screw
- 2 Hex ("Allen") key wrench for 1/4-20 Bearing Screws
- 1 Vial (.34 fl. Oz.) LocTite #271 (for Coupling Screws)
- 1 KD-100-SM - Complete Service Manual for KD-100

8a. KD-100-EXTVAC External Residue Collection Option.

An adapter and/or modifications to the KD-100 to allow the KD-100 to use an external vacuum, such as a "shop vac" or even a domestic-use vacuum cleaner for high-volume, uninterrupted operation. Available now! See our web site for details.

8b. KD-100-EXTVAC-R Factory Retro-Fitting of KD-100-120 or KD-100-220 for use with External Vacuum. Sorry, this can only be done at the Factory. NOTE: After this, KD-100 CANNOT be used WITHOUT an External Vacuum!

8c. KD-100-VACUNIT Commercial "Shop-Vac"-type vacuum. Wired for 120 VAC ONLY. Tested by AML with KD-100. Includes hose, fittings. Not really special. You can buy your own locally.

9. KD-100-SP 1-Year Service Policy

We will repair or replace the KD-100 for any reason:

EXCEPT for willful neglect, damage, shipping damage, or physical abuse.

INCLUDES Normal wear-and-tear items, such as cutters, blades, rollers.

INCLUDES Extension of the initial 1-year Warranty, if placed in effect after the initial 1-year Warranty.

Thus the initial warranty will be extended to remain in effect through the expiration date of the Service Policy.

To expedite return of a unit to service AML may, at its option, exchange an incoming unit for a brand new or factory-refurbished unit. Customer pays shipping to us; we pay return shipping within the continental USA.

However, if a customer requests that the returned unit be repaired, rather than exchanged, we will certainly honor that request, provided

that the customer is willing to accept a possible delay for repairs to his specific machine.

10. KD-100-EW Extends Standard 1-Year Warranty (below) for one additional year.

AML STANDARD WARRANTY

This Key Tape Disintegrator is warranted for one calendar year from the date of shipment. We will repair or replace any defective component or defect in materials or workmanship free of charge during the warranty period, subject to the following conditions:

A. To expedite return of a unit to service:

1) AML may, at its option, exchange an incoming unit for a brand new or factory-refurbished unit.

2) However, if a customer requests that the returned unit be repaired, rather than exchanged, we will certainly honor that request, provided that the customer is willing to accept a possible delay for repairs to his specific machine.

B. SHIPPING COSTS (Warranty Repairs): Customer pays shipping to us; we pay return shipping within the continental USA.

C. Warranty EXCLUDES:

1) Willful neglect, damage, shipping damage, and physical abuse;

2) Damage due to excessive AC line voltage applied;

3) The following (consumable, normal wear-and-tear items):
Cutter, Cutter Bearings, Bed Blade, Residue Bag, rubber rollers;

4) Damage due to failure to replace the Residue Bag.

(This can cause overheating and/or destruction of gears due to jamming with residue);

5) Introduction of foreign or improper materials into the unit, such as paper clips, staples, metal objects...anything other than Key Tape;

6) Overheat damage due to blocked (cooling) air inlet.

D. This Warranty is VOID if in our opinion, the unit has been improperly repaired, adjusted, or altered.

E. To the extent permitted by applicable law, Applied Magnetics Laboratory, Inc. limits the duration of any implied warranty of merchantability or fitness for a particular purpose to one year and excludes incidental or consequential damages for breach of any warranty on this product.

RESIDUE BAG REPLACEMENT

REPLACEMENT INTERVAL:

*100 segments or 7 minutes
of actual Tape Destruction Time!*

We've significantly improved the KD-100 Residue Bags, and how they're installed, since early versions of the KD-100.

A new flexible rubber seal is built into each bag. This makes sealing much more secure, and it's now much easier to install the bag properly.

These new bags also have more capacity, but PLEASE still replace them EVERY 7 MINUTES of run time, for top performance and to prevent messes!

If the Bag gets too full, Residue packs in and makes it harder to remove the full Bag.

If the Bag gets too full, Residue can build up in the Clear Plastic Chute, causing overheating and conversion of the Tape into hard plastic. This can jam the Cutter system and cause a damaging overheat, machine shutdown, and blown Fuse.

REMOVING FULL BAG

Un-plug the KD-100 from AC power source!

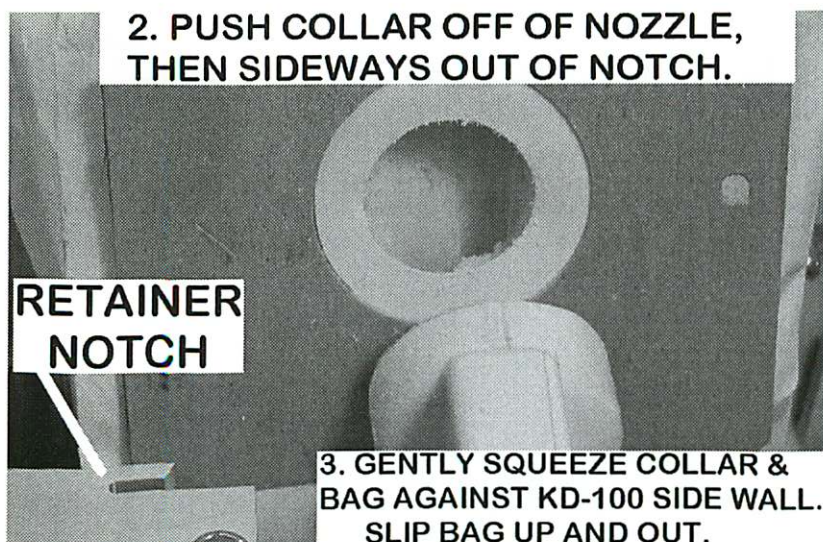
Release the two cover latches.

Open Lid fully. (See HINT, below illustration)



HINT: The Top-Window Cover is rubber-gasketed, and thus under some tension. You can unlatch it more easily by pressing down on the cover near the latches to relieve the gasket pressure.

ALSO: You can later latch it closed more easily by pressing Cover down near the latches during latching.



Caution: Do not squeeze the bag hard!

It will pump powder out through the bag collar and into your work space and make a dusty mess!

Gently shake the Bag near Vacuum Outlet to help shake Residue away from Outlet.

NOTE: If you lift and tilt the machine towards the bag a bit during this, there is less chance of spilling the Residue powder into the interior of the KD-100 when you remove the bag.

Discard the Bag and Residue.
Do not re-use the bag except in an emergency!

4. CLEAN ANY SPILLED RESIDUE from interior of KD-100.

Pay special attention to the plastic gears. If the gears are coated with Residue, use compressed air to blow them clean.

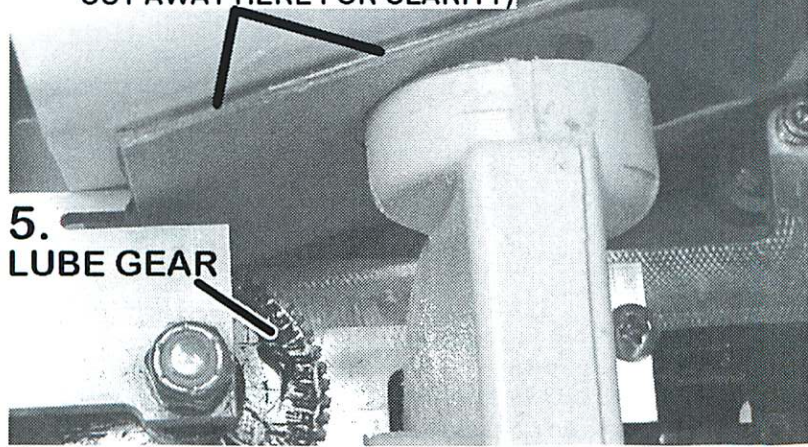
Residue collecting in them will get mashed between their teeth.
This hurts performance and can damage the gears.

INSTALLING NEW BAG

5. LUBE TEETH and TOP EDGE of Bronze Worm Gear.
Use GREASE & "Q-TIPS" supplied with pack of Bags.

6. POSITION BAG, LONG END STICKING UP.
SLIP COLLAR EDGE INTO NOTCH AS YOU PULL COLLAR ONTO NOZZLE.

(TOP HINGED PART OF COLLAR
CUT AWAY HERE FOR CLARITY)



IMPORTANT NOTES:

This Manual is shipped with machines set up for the new-style bags. But sometimes manuals do not stay with the machines!

A. If your KD-100 does NOT HAVE a BAG RETAINER or SPRING, see instructions in the BAG CONVERSION KIT (KD-100-BAGCONV), available from AML at no charge.

B. There MAY BE a BAG CONVERSION KIT in your package of Bags (KD-100-BAGPK)!

C. If your KD-100 already has the BAG RETAINER & SPRING, just discard the kit.

7.
**BEND COLLAR FULLY DOWN AT HINGE.
PULL COLLAR FULLY ONTO NOZZLE.**

**HOOK SPRING (ONTO COLLAR ONLY)
FROM OUTSIDE, HOOKING INTO HOLE.
DON'T PUNCTURE BAG WITH SPRING!**

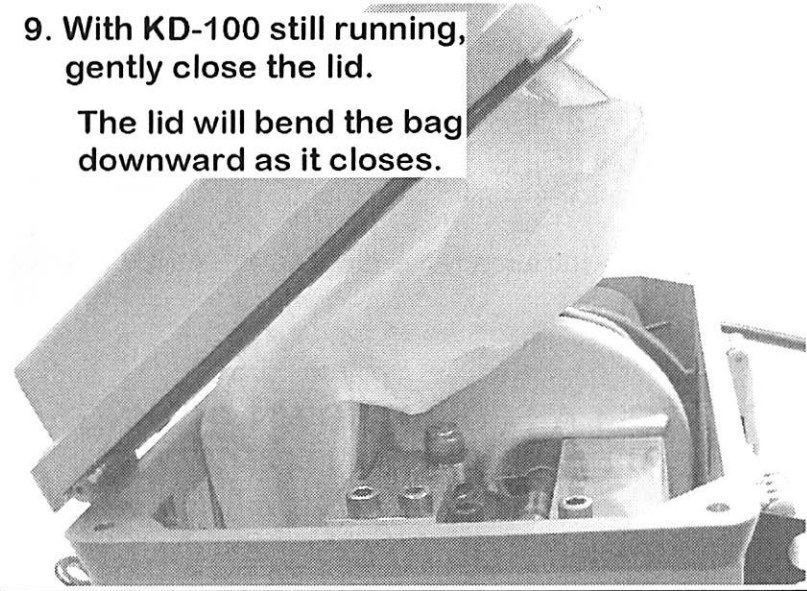
**8. SWITCH UNIT ON - INFLATE BAG.
IT WILL STAND STRAIGHT UP.
PULL OUT GUSSET FOLD,
THIS SIDE ONLY==>
FOR MAX. BAG CAPACITY**

<=SPRING

***CAUTION! Stay clear of bronze gear & other parts!
Keep hair, clothing, and hands well clear
of interior of the KD-100 when power is on!***

9. With KD-100 still running, gently close the lid.

The lid will bend the bag downward as it closes.



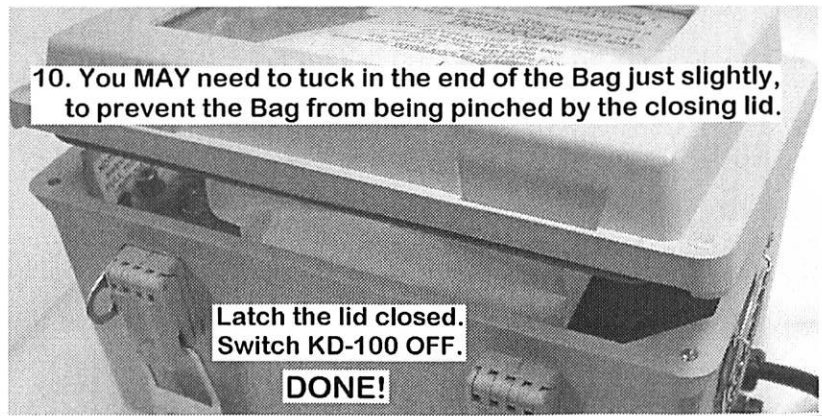
CAUTION!

*Stay clear of bronze gear & other parts!
Keep hair, clothing, and hands well clear
of interior of the KD-100 when power is on!*

10. You MAY need to tuck in the end of the Bag just slightly, to prevent the Bag from being pinched by the closing lid.

Latch the lid closed.
Switch KD-100 OFF.

DONE!



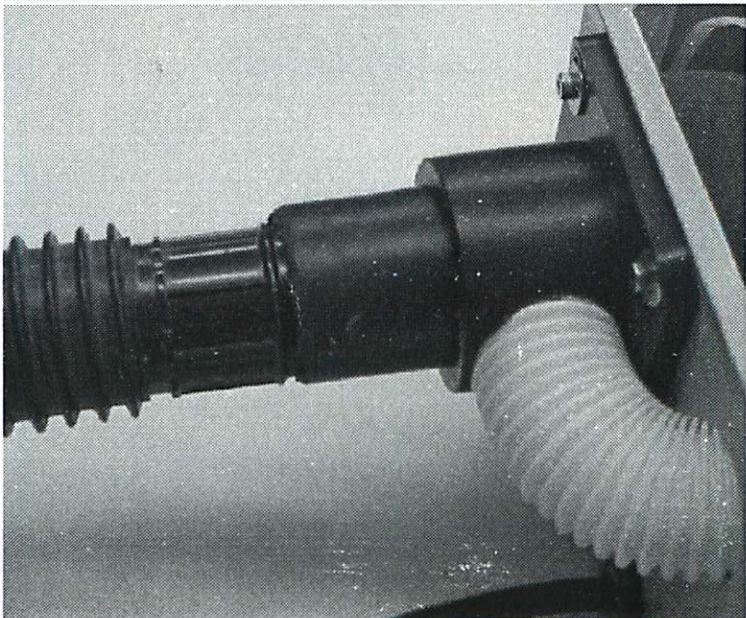
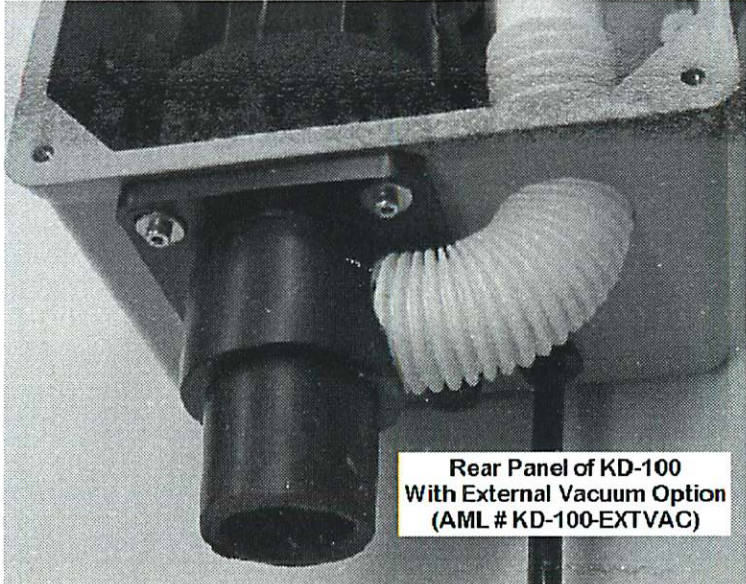


External Vacuum Configuration Option

For high volume destruction (more than a few segments per day), this Configuration is **HIGHLY RECOMMENDED** (by DOD and us)...

It can be retrofitted (at factory only) to your KD-100.

Use your own "Shop-Vac" -- or one supplied by AML.



Please see www.appliedmagnetics.com for details.