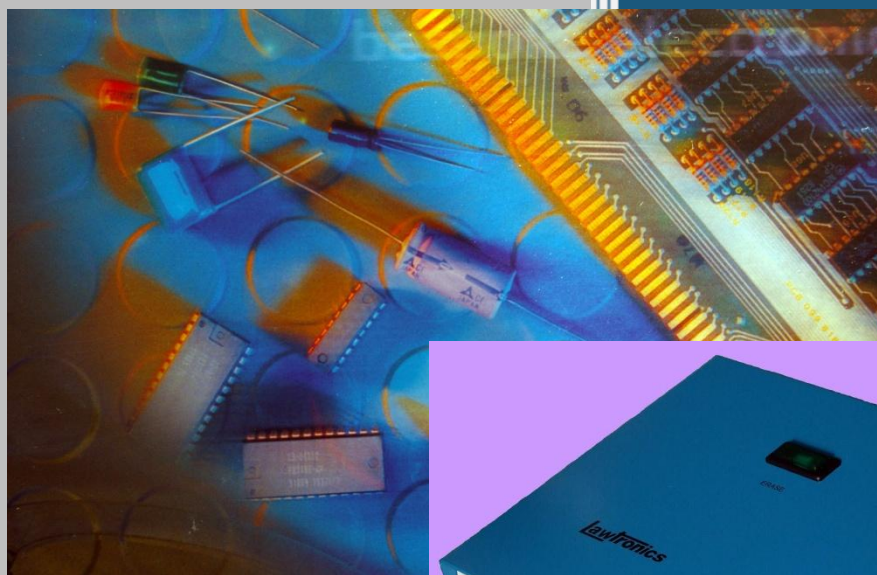


Astrosyn

Guide to Erasing Eproms



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Introduction

Each individual cell in an Eprom is programmed by injection of high energy electrons. Due to the absence of any electrical connections, each gate acts as a charged capacitor. Programming converts each addressed cell to a "0" state. The standard method of erasure is to expose the whole cell array to high intensity UV light at 253.7nm for a defined length of time. The UV radiation causes an ionising action, resulting in the charge leaking into the silicon substrate. When sufficient charge has been drawn from the cell, it is no longer programmed in the "0" state.

Neither programming, nor erasure, occurs instantaneously. Programming may require more than 100 pulses to achieve the required change of cell charge and a considerable exposure time to UV light is needed to remove the program.

Eprom manufacturers specify the desired exposure level in Ws/cm^2 . Since the light output of a new UV tube is determined by the lamp manufacturer, the end user only has control of the exposure period. One of the most common causes of failure in equipment containing MOS Eproms is improper or incomplete erasure before programming.

Correct erasure requires the use of a high quality eraser and the application of the correct UV exposure for an adequate time. The exposure time varies with the device to be erased. These variables include: previous programming or erasing history; the power of the UV source; and the cleanliness of both the Eprom window and UV lamp surface. Manufacturers specify minimum erase dosage, usually in the range 6-15 Watt-seconds/ cm^2 , but in practice this should only be used as a rough guide.

As the UV lamp ages, output intensity gradually diminishes, increasing the exposure time needed. Similarly, reduced AC voltage, increased distance from the lamp, and dirt or finger marks on the lamp and Eprom window surface also extend the erase time. For these reasons it is recommended to check the correct erase time periodically, as shown below.

Erase Time

Using the Lawtronics Model ME5E Eprom eraser, we suggest following the method below to ensure a completely blank device is ready for further programming.

1. Mount a programmed Eprom on the antistatic foam in the tray of the ME5E eraser.
2. Operate the UV source for a measured length of time, say 10 minutes.
3. Place the Eprom in a programmer and check if it is blank.
4. If it is not, repeat step 2 for a further period, say 5 minutes.
5. Repeat steps 1, 2 and 3 until the device reads blank.
6. Multiply the total time to achieve the blank state by three to determine the minimum erasure time.

7. If the erasure time becomes unacceptably long, replacement of the UV lamp will restore the optimum period.

UV Tube change in the ME5E eraser

Disconnect the mains supply, and remove eraser top by removing external screws.



Locate the internal tube support plate fitted with snap-in plastic tube holders on each side.

Remove the tube starter, and then unscrew the two tube support plate screws to give access to the UV lamp.



Reverse the procedure to fit the new lamp.

Note: Do not handle tube glass as finger marks are opaque to UV and light output will be reduced.

SAFETY WARNINGS!

Short wavelength UV is injurious to the eyes and can cause painful skin burns.

Always disconnect the mains power supply before and during lamp replacement.

Never look directly at a working UV lamp.