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## **Destruction of Data in Non-Volatile Memory in the Keithley Models 2700 and 2750**

The Keithley Model 2700 and 2750 contains memory devices to hold firmware code that is executed by an internal microprocessor to operate the product and memory to save setup information. The following sections describe how the data stored in the memory devices may be cleared or destroyed.

The architecture of the 2700 and 2750 are very similar. This report covers the 2700 and any differences in the 2750 are listed in parentheses.

**Warning: Some of the procedures in this document may expose hazardous voltage and the risk of electric shock or death. Only trained, qualified, technical persons experienced with the risks and precautions of working with electrical instruments should perform these procedures.**

### **Description of memory devices and their use:**

1. One of MC68306 (MC68332 in the Model 2750) microprocessor - contains some RAM for internal use and all information is lost when the unit is powered down.
2. One of 16k bit EE PROM - non-volatile memory to store user setups and calibration constants.
3. Two (four in the Model 2750) of 512k by 8 bit CMOS RAM - stores scan setups and buffered data (battery backed up).
4. Two of 524k by 8 bit CMOS Flash memory – stores the operating code for the instrument.

### **Procedure for clearing memory content:**

Note: If the Model 2700 / 2750 starts and operates properly when powered on, it is very unlikely that the Flash memory was compromised. The microprocessor does a self test including a checksum of the memory. Any difference in the contents from the original programming will usually cause a checksum error or the unit will not function.

**Warning: Follow all instructions, including safety warnings, in the service sections of the Model 2700 / 2750 manual when performing the following steps.**

1. Microprocessor – Power down and unplug the unit for one minute.
2. One of 16k bit EE PROM –
  - a. Recall the factory setup
    - i. Press SHIFT then SETUP to display the restore menu.
    - ii. Use the right arrow to select the factory setup (FACT)
    - iii. Press ENTER.
  - b. Save the setup to overwrite any user setup information
    - i. Press SHIFT then SAVE to access the save setup menu.
    - ii. Use right arrow to select the first user memory location (SAV0).
    - iii. Press ENTER.
  - c. Repeat for the remaining two user locations using the up and down arrows to select SAV1 and SAV2.

3. Two (four in the Model 2750) of 512k by 8 bit CMOS RAM:
  - a. Reset the buffered measurement data: Press STORE then AUTO then ENTER.
  - b. Reset the scan configuration: Press SHIFT then CONFIG. Use the up and down arrow keys to display "INT:RESET". Press ENTER.
  
4. Two of 524k by 8 bit CMOS Flash memory –  
This procedure overwrites the content of the Flash memory with the 2700 / 2750 operating firmware (Step 4.1) or completely and permanently destroys the ROMs and their content (step 4.2)

The operating system resides in Flash ROM. It is reprogrammable to allow field firmware updates. The reprogramming of this memory requires a software program, called the Flash Wizard, provided by Keithley Instruments Inc. If data (other than the 2700 / 2750 operating system) was loaded into these memory devices, the 2700 / 2750 would be non-functional.

Step 4.1 - To overwrite any suspect content in these memory devices, follow the instructions with the Keithley Flash Wizard and reload the operating firmware, using the original revision that came with the product when new, or a compatible upgrade version. The Flash Wizard first clears all content in these memory devices then overwrites them with the new the firmware. Note: the firmware that is used for the upload must be known to be valid and kept secure to prevent tampering.

Step 4.2 - We do not currently offer a program to just erase this code. Complete destruction of firmware requires physical removal of integrated circuits and destruction of the integrated circuits. Note: this action renders the unit unusable.

If you have any further questions or comments, please feel free to contact my office at anytime.

Regards,



William Pelster  
Director of Quality