ERAMCO SYSTEMS

ES 831218 ERAMCO MLDL - HARDWARE MANUAL



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POTENTIAL FOR RADIO AND TELEVISION INTERFERENCE (FOR U.S.A. ONLY)

The ERAMCO MLDL BOX "ES MLDL 1" generates and uses radio frequencies energy and, if not installed and used properly, that is, in strict accordance with the manufacture's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a class B computing device in accordance with the specifications in subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If your "ES MLDL 1" does cause interference to radio or television reception, you are encouraged to try to correct the interference by one or more of the following measures:

- * Reorientate the receiving antenna.
- * Relocate the computer with respect to the receiver.
- * move the computer and "ES MLDL 1" away from the receiver.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find the following booklet prepared by the federal Communication Commission helpful: How to Identify and Resolve Radio- TV Interference Froblems. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

INTRODUCTION

The ERAMCO SYSTEMS MLDL-Box is a thoroughly designed addition to your HP-41 system. A word of <u>warning</u> however, precedes its operating instructions. Read this manual from cover to cover before connecting the MLDL-Box to your system. The box makes extensive use of the capabilities of your HP-41 so <u>make sure to</u> <u>understand the details of this manual before using this extension.</u> A final but no less important warning: <u>Do NOT, under any</u> <u>circumstance, connect or disconnect the box unless the calculator</u> <u>is switched_OFF</u>. Irreparable damage can result.

SETTING UP INSTRUCTIONS

Your **ERAMCO SYSTEMS MLDL-Box** is delivered in a plastic enclosure. To open the box remove the bottom part after removing the fastening screws. You do not have to replace the screws if you want to open your box often, it is advisable however to keep the screws in a safe place if the need might arise to close your box a bit more permanently. Once the box is open you will see the Eprom sockets and the enabling switches. (see Fig 1.1)

Two sockets are used for one Eprom set, coming to a total box capacity of 6 Eprom sets i.e. 24 k of program! The sockets touching each other at the small edge belong together and form the space for one 4k. Eprom set. You will see one Eprom set installed if your box was ordered with the **ERAMCO MLDL Eprom**.

If you want to insert new or other Eprom's please follow the instructions for carefull insertion of new Eprom's as irreparable damage can be done to the box, the Eprom's and eventually even to the calculator.

Each Eprom set can be enabled or disabled using the corresponding Eprom switch. The Eprom's are numbered starting at the switch side from 1 up to 6. Under the Eprom sockets you will find the logical numbering ranging from 1 up to 6. To enable one set, set the switch with the corresponding number (1-6) to DN.

Do **not** switch any Eprom on yet, wait until you have read the rest of this manual.

INSTALLING NEW EFROM'S

All Eprom's have an identification indicating the pin-out, i.e. the location of pin 1. The identification can consist of a notch in the small edge of the Eprom or of a dot above pin one. This identifies pin one as the pin at the left bottom corner of the Eprom. An Eprom set consists of two Eprom's called the U2- and L8-Eprom. The U2 Eprom has the generic type number 2716 and has to be placed in the socket under the enabling switch, the LS Eprom has the generic type number 2732 and has to be placed in the adjacent socket i.e. the socket nearest to the side of the case. Insert the Eprom's so that pin one points away from the connecting cable to the calculator. (see Fig 1.1).

You will notice that the sockets also have a mark to identify the location of pin one. Should the pins of the Eprom be bent outwards (as almost always will be the case using new Eprom's), place the Eprom with the pins of one edge touching a smooth surface (e.g. a table top) and slowly and **carefully** bend them inwards. Repeat this procedure for the pins of the other edge and try to insert again. Normally this will be sufficient to make the pins fit into the socket.

It is strongly recommended to use only eproms of the NEC company or the Texas Instruments factory. Eproms of other fabricates can disrupt the working of your **ERAMCO MLDL** box due to differences in the internal operation of these eproms. Especially eproms of the Mitsubishi company should be avoided. These eproms have been proved to cause trouble when there is a set plugged in. These problems can vary from malfunctioning of the functions or programs hold by the set, up to crashing the HP-41 whenever you try to switch it on. Disabling of the set wouldn't help.

THE_MLDL_BOX_PORT_USAGE

It is important to know something more about your calculator and its internal mechanics to avoid potential problems. This additional knowledge concerns the user ports (1-4) and their addressing scheme (see Fig 1.2). Each user port covers two pages of 4 k. bytes length. These pages are called the lower (even numbered) page and the upper (odd numbered) page. Almost all plug in Rom's delivered by Hewlett-Packard occupy only the This lower page of a port, leaving the upper page unoccupied. fact enables the user to use plug-in Rom's and the MLDL-Box simultaneously due to the design of the ERAMCO SYSTEMS MLDL-Box. In tabel 1.3 you can find which Eprom set is addressed where and how this places the Eprom image in your user ports.

EPROM #	Address	Port	
1	8/A	1/2-L	
2	C/E	3/4-L	
3	9	1-U	
4	В	2-U	
5	D	3-0	
6	F	4–U	

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As you can see, two lower port pages are left unused. With the two switches to the right of the Eprom enabling switches you can choose which port will be left free. The leftone switch controls the setting of eprom socket number 1. When this switch is set in the on position (on in this case means pushing the switch toward the connector cable with the HP-41) Eprom socket number 1 is set to page 8. When it is switched off Eprom socket 1 is set to page A.

This also aplies for Eprom socket 2. This socket is controlled by the rightmost switch. If this one is set to the on position, the Eprom socket is set to page C. When this switch is in the off position, Eprom socket 2 is set to page E. (see Fig 1.3)

The user can use this ports for a plug-in module and for the Card Reader. A few plug-in's have a special address placing their image outside the user ports. These plug-in's are Time-module, Printer (non IL and IL), IL-module, X-Memory module, Single Memory module and Quad Memory module. These modules can be plugged into each user port, occupying only physical space, no port-address space is used however. All other plug-in Rom's however occupy physical and address space. Should a plug-in Rom use the same address space as an Eprom set, **the plug-in Rom will be given preference** above the Eprom set, resulting in an apparent disabling of the Eprom set.

If you encounter this problem, switch the Eprom off or plug the plug-in module in another port. Normally no damage will be done to the module by this double addressing but it is recommended to avoid these situations. After having adapted the configuration of the Eprom section of the MLDL-Box to your needs, make sure all unused Eprom sockets are disabled by switching the corresponding switch OFF. This enables you to use this address space for other plug-in's or for your Erom pages.

THE_BURNING_OF_EPROM'S

In order to use your own personalized software at any moment without having to use your card-reader, wand or IL-mass storage device, you can order an Eprom set containing the routines you have written. This burning service is offered amongst others by **Eramco Systems.** Should you have problems, concerning bug's or duplicate labels / X-Rom numbers an Eprom revision service is also available at reduced rates. To use this service send your software and sofware verification data on magnetic medium (cards or cassette) or in barcode to **ERAMCO SYSTEMS** or one of the others. M-Code routines and User code routines can be mixed at will. If a complete Eprom set has to be burned, and is delivered in the standard ROM>REG, SAVEROM format, reduced burning costs will be charged in certain cases.

THE_MLDL - BOX_EROM_PAGES

About in the middle of the printed circuit board at the top you will see two rotary switches. To the left of these switches you find two enabling switches. These are the Erom addressing switches and their enabling switches. Erom stands for Erasable Read Only Memory i.e. the part of the MLDL-Box into which you can write your own data using the special MLDL-ROM instructions. To the calculator these pages have the appearance of a plug-in module (ROM).

The rotary switch selects the page at which your Erom is placed, the enabling switch permits you to use this page i.e. to read the contents of this page. Remember, the enabling switch is a read_enable switch, writing into this page will <u>not</u> be inhibited by disabling the page! As pages 0, 1, 2 and 4 are used for the HP-41 C(V) operating system it is recommended not to place the switches in the position corresponding to these addresses (In case of the HP-41 CX page 3 is also used).

As no two pages can occupy the same page a preference scheme also applies to the two Erom pages. Erom (2) (the right page and enabling switch) will be disabled automatically if Erom (1) (the left page and enabling switch) is placed on the same page as Erom (2). (See Fig 1.3). Make sure that the pages of Erom contain valid data, especially the <u>last 16 Erom words</u>, before switching on-line any Erom page. Use CLBL or switch the page to address 3 and use RAMWR.

Close your box. Make sure your calculator is turned <u>OFF</u> and connect the box to the system. After switching your calculator ON you have your Eprom sets and the Erom pages at your fingertips. Should this not be the case, check the enabling switches, check your user ports for forgotten modules and check the Erom addressing and enabling switches. See set up instructions for addressing conflicts. See also In Case Of Problems.

If your selection of used ports was carefull enough you will hardly ever have to switch any Eprom / Erom off. If you have to, refer to the instructions for how to disable the conflicting Eprom / Erom. Do not remove or install Eprom's too often as this will wear out your Eprom sockets. Use the Erom pages for less used software. An IL-cassette and the functions SAVEROM and GETROM provide you with this facility.

IN_CASE_OF_PROBLEMS

As can be seen in tabel 1.3 only Eprom's 1 & 2 can cause direct problems. These problems occur if a plug-in module is placed in one of the ports and Eprom's 1 or 2 are inserted. Non problem causing plug-in's are Printer, HP-IL module, Time module, Single and Quad Memory and Extended Memory module.

Indirect problems can occur with 8k. plug-in modules. These are (apart from 8k. custom Rom's) :

Navigation Rom, Real Estate Rom, Structural Analysis, Data Logger Rom, HP-IL Development Rom, Plotter Rom, Petroleum Rom, PPC Rom and a special case is the Autostart/Duplication Rom. All these Rom's have a size of 8k., except for the Auto/Dup Rom, and there fore occupy the lower as well as the upper page of a port. A port thus used <u>can not</u> be used also in the Eprom Box. Switch off the Eprom's corresponding to that port or remove the 8k. module, which ever seems needed. In the special case of the Auto/Dup Rom we have a 4k rom that uses an upper page in a port. Place this Rom in one of the ports 1 or 3 to get maximum addressing capability. Do not forget to switch off switches 3 or 5, depending on the port used.

Another problem often encountered, is the use of the same label by more than one Rom. Do a CAT 2 to find duplicate labels in Rom. there are any, please insert the wanted Eprom or Rom at the If lowest possible address or disable / unplug the offending one. Should you want to use both at the same time it would be advisable to change the label name in the Eprom to a unique one. (See burning of Eprom's). A problem less often encountered but harder to detect is the use of the same X-Rom number by two Eprom's / Rom's. Check the Rom / Eprom user manual for the used X-Rom numbers. Your HP-41 C(V)(X) will always use the first Rom / Eprom with the desired X-Rom number, disregarding all the others.

E.G. Aviation Rom and Clinical Rom both have X-Rom 19 as identifying number. These modules, using the same X-Rom number are identified by the addition 'X' to the module name on the module case.

The Erom pages can cause software crashes if not properly Erom initialized. Make sure you have cleared or initialized the page before switching it on-line. Should the system crash, switch the Erom off. Try to wake up your calculator now. Unplug the box if necessary. Reinitialize the page or remove the defective routines in Erom or Eprom(s)

These software crashes can be caused by a nearly empty battery. Because the battery is nearly empty data retention is not quaranteed anymore. This causes a partial data loss. Aspecially in case this loss occurs at the last addresses of the Erom pages, a crash is most likely. These are the so called entry points. (we refer to appendix F of your **ERAMCO SYSTEMS** operating rom)

This problem is easy to handle. To replace the batterys you have to remove the two screws holding the printed circuit board. Now gently lift the package with the three boards out of it's case. The batterys are hold in a special battery case. This case is hold in place with a few pieces of doublesided adhesive tape. (see Fig 1.4)

To be able to remove and replace the batterys you have to get the battery case out of the box. Now you can replace the batterys. Fitt the battery case with some doublesided adhesive tape in its original place and assemble the whole unit again.

With normal usage this is something you have to do once in two years. However it its advisable to replace the batterys once every year to avoid leakage of the batterys.

If all the possible causes have been checked, and you are still left in doubt as to the proper functioning of your system unplug the MLDL-Box and check your HP-41 C(V)(X) for problems. If the MLDL-Box is suspected of causing the trouble send it in for service.

L1IMITED 180 DAYS WARRANTY

ERAMCO SYSTEMS warrants their MLDL-Boxes against defects in materials and workmanship for 180 days from the date of original purchase. If the unit is sold or transferred to other persons or institutions ownership warranty is automatically transferred to the new legal owner. During the warranty period **ERAMCO SYSTEMS** will repair or, at their option, replace at no charge a product that proves to be defective, provided the product is returned, shipping prepaid, to **ERAMCO SYSTEMS** or their official service representative.

WHAT IS NOT COVERED

This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by other than **ERAMCO SYSTEMS** or their official service representative.

No other express warranty is given. Any other implied warranty of merchantability or fitness is limited to the 180 days period of this written warranty. In no event shall **ERAMCO SYSTEMS** be liable for consequential damages. This liability shall in no way exceed the catalog price of the product at the moment of sale.

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Figure 1.1

MLDL HARDWARE MANUAL



Figure 1.2



Figure 1.3

