



Nida Corporation





# Model 110E Trainer

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User's Guide



# PRELIMINARIES

	<b>Nida Trainer</b>	<b>DOM</b>	<b>Year 20</b>	<b>1</b>	<b>1</b>	<b>Training Equipment</b>	110-130VAC 60Hz
	<input type="checkbox"/> MODEL 110E			22	22		220-240VAC 50/60Hz
	<input type="checkbox"/> MODEL 130E			33	33		<b>Serial # T000000</b> Listed X X X X X X X X
	<input type="checkbox"/> MODEL 360S			44	44		
				55	55		<b>WARNING</b>
				66	66		
				77	77		DO NOT REMOVE COVERS
				88	88		REFER SERVICE TO QUALIFIED PERSONNEL
				99	99		
	Month: 1 2 3 4 5 6 7 8 9 10 11 12						
	Mfg. By: Nida Corporation. Melbourne, FL USA						



– Electric Shock



– Hazard or Danger

**Only  
qualified service personnel  
are authorized to work on the  
Nida Model 110E Trainer.**

**The electrical protection in this equipment  
will be impaired if used in a manner not  
specified by the manufacturer.**

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## ***INTRODUCTION***

Congratulations on your selection of the ***Nida Model 110E Trainer***. We are certain that you will be satisfied with your purchase of one of the finest electronics training platforms on the market. Whether you are using a single trainer or are setting up a classroom of trainers, your satisfaction and success is important to us.

Nida Corporation has been in the technical training market for over 40 years and our products are considered top-quality. We are so committed to product quality and reliability that we offer a 5-year warranty on your new trainer. If you are a first-time purchaser of a Nida Corporation product, welcome to the family. We believe you will find that our commitment to your program success is an integral part of our business model. You will become part of the Nida Family of Users. If this is not your first purchase of a Nida product, you already know how important your student success is to our team.

We want to ensure that you and your students get the best results from the trainer and are comfortable with operating it safely. This manual contains all the information you need to safely set up, operate, and maintain your trainer. Please read this user's guide thoroughly before setting up your Nida lab for the first time and refer back to it if you need any information about the trainer.

As you read through the user's guide, be aware of these special types of information:



### **WARNING**

This information is intended to alert you to important safety information that will protect you and your students from harm.



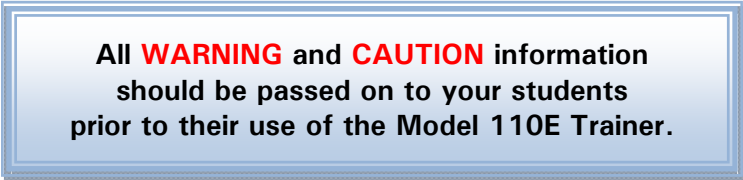
### **CAUTION**

This information is intended to help you avoid damaging the trainer, other property, or the environment.



### **NOTE**

This information provides reminders or additional explanation of a topic.



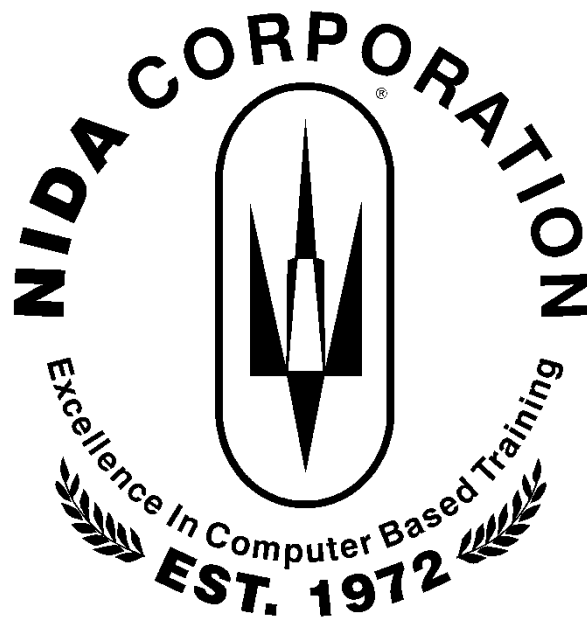
All **WARNING** and **CAUTION** information should be passed on to your students prior to their use of the Model 110E Trainer.

We recommend that you also read the Nida Corporation Warranty Sheet that came with your purchase. The warranty information will help you understand its coverage and your responsibilities of ownership.

If you have any questions about the trainer, software, or learning content, be sure to check the help files on your DVD. You can also access information on the Nida web site at [www.nida.com](http://www.nida.com) under the Support tab or give us a call at 1-800-327-6432.

Whether you are a first time buyer or existing customer, thanks for your purchase and let's get started!

Best Wishes  
The Employee-Owners of Nida Corporation



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### **A FEW WORDS ABOUT SAFETY**

Your safety and the safety of your students are very important to us. Using the Nida trainer safely is an important responsibility.

To help you make informed decisions about safety, we have provided operating procedures and safety information in this manual and important information on labels located on the reverse side of the trainer. The information alerts you to potential hazards that can easily be avoided by following the guidelines, labels, and/or placards.

Of course, it is not practical or possible to warn you about all the hazards associated with operating or maintaining electronic training equipment. You must always use standard safety practices and good judgment when working with and around electronics equipment.

All Nida Corporation products are designed for use in normal environmental conditions. The environment must have suitable power requirements, lighting, and ventilation to meet the specifications of this trainer. (See the TECHNICAL & CONSUMER INFORMATION section). The trainer should be supported by furniture (desks, tables, or lab benches) designed to accommodate the trainers, test equipment, computers, and support material. Other uses or support can result in injury to the operator or damage to the trainer or other property. Injuries or property damage can be prevented if you follow all the instructions in this manual. The most common hazards are discussed below, along with the best way to protect yourself and others.

#### **OPERATOR RESPONSIBILITY**

- Know how to disconnect the trainer quickly in case of emergency.
- Understand the use of all trainer controls, inputs, outputs, and connections.
- Be sure that anyone who operates the trainer receives proper instruction.

#### **ELECTRIC SHOCK HAZARDS**

- The trainer is current-limited and does not produce sufficient voltages or current to pose an electric shock hazard during proper use.
- Using the trainer in wet conditions could result in a shock hazard.
- Do not connect the trainer to an electrical outlet that has not been tested for the proper voltage output.

A rectangular warning box with a red border and a white background. The word "WARNING" is written in bold, black, uppercase letters in the center of the box.

#### **WARNING**

**Do not operate the trainer if it has been damaged, soaked, or dropped without first consulting Nida Corporation technical support.**

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**BEFORE OPERATION****UNPACKING INSTRUCTIONS**

- a. Observe the notation THIS END UP on the shipping carton.
- b. Open the top of the shipping carton and remove the power cord and USB cable.
- c. With knees bent, reach down, grasp the bottom of the trainer, and remove it from the box with both hands.
- d. Remove the foam packing from each side of the trainer.

**NOTE**

**Retain the shipping carton and foam for repacking or storage of the trainer.**

- e. Remove the trainer from the plastic bag.
- f. Place the trainer on a suitable flat horizontal surface. Ensure that the distance between the flat surface and the trainer bottom is not less than the height of the trainer feet.

**CAUTION**

**Failure to provide adequate bottom clearance will degrade speaker performance and interrupt the natural airflow through the trainer and power supply.**

**INSPECTION FOR SHIPMENT DAMAGE**

- a. Check all controls for visible damage.
- b. Check PC receptacles to ensure that none of the PC pins are damaged, bent, or broken.

**ASSEMBLY INSTRUCTIONS**

The Nida Model 110E Trainer comes fully assembled. No assembly instructions are needed.

**INSTALLATION INSTRUCTIONS****C A I INSTALLATION**

- a. Place the trainer on a flat, horizontal surface.

**CAUTION**

**The flat surface must allow unobstructed clearance at a minimum of the height of the trainer feet to ensure proper cooling and speaker operation.**

**Never remove the feet from the bottom of the trainer.**

**Ensure the back of the trainer is at least 4 inches from any vertical surface to ensure adequate ventilation and cable management.**

- b. Connect the line power cord to the AC Connector And Fuse Module located on the back of trainer.



- c. Connect the communications cable (if applicable) to the computer. A USB cable is provided for a USB-to-USB interface with the computer.

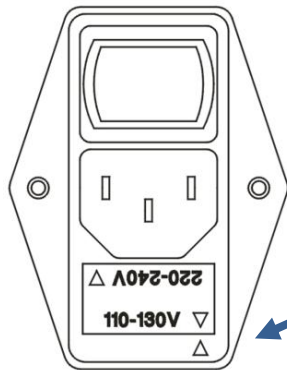
**NOTE**

**If your computer has a serial connection only, contact Nida for a serial cable adapter.**



**C A I INSTALLATION, continued**

- d. Ensure that the trainer's MAIN POWER switch is set to the OFF position.
- e. Verify that the orientation of the fuse holder matches the local voltage source, 110-130 VAC 60 Hz, or 220-240 VAC 50/60 Hz, as appropriate.



Alignment of arrows indicates voltage setting.



- f. Connect the trainer line cord into an approved AC receptacle.

**WARNING**

Always use the line cord provided with the trainer. Proper grounding of the trainer through the line cord is essential for safe operation.

Do not modify the ground pin or receptacle in any way.

Do not utilize a two-prong power connector adapter. Ensure the trainer, line cord, and receptacle ground are secure and in proper operation.

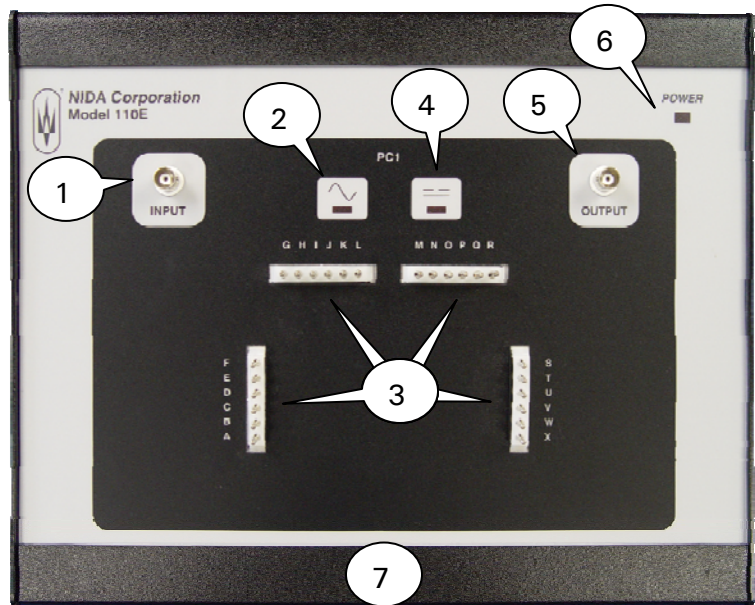
Failure to properly ground the trainer could result in a shock hazard.

**NOTE**

**See the disconnection instructions in the PREPARATION FOR SHIPPING section of this manual for details on uninstalling the trainer.**

**CONTROLS & FEATURES**

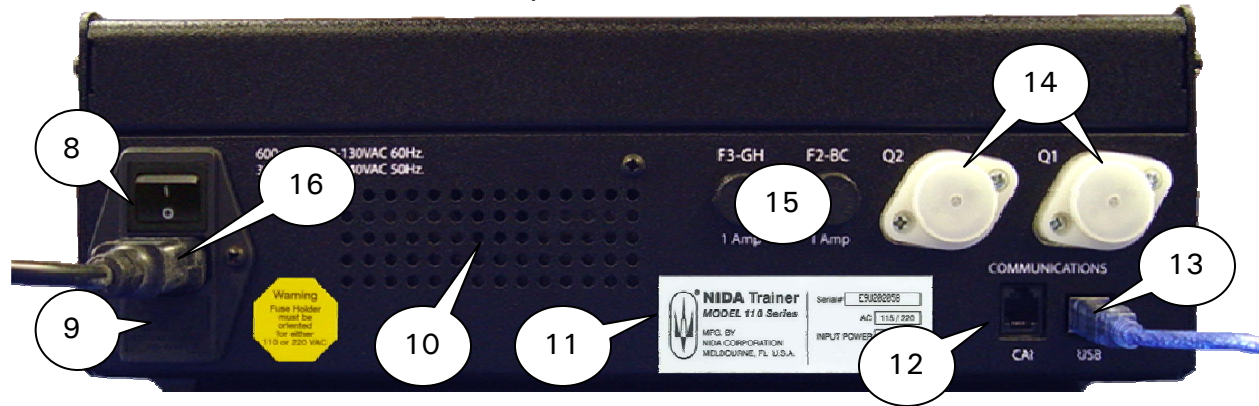
The Model 110E single-position trainer is an electronic platform that provides a prewired AC/DC power supply system, an input-output system, and an in-circuit faulting system. Experiment circuits are supported by installing a Nida Series 130 pre-wired Experiment PC cards (optional breadboard PC card is also available) onto PC connectors located on the top of the trainer. An RJ11/RS-232 serial interface or USB interface allows operation and control of the trainer from a computer. During computer-controlled operation, the Model 110E is enhanced through the use of external Computer Assisted Instruction (CAI) programs.



**MODEL 110E TRAINER DESCRIPTION**

NIDA MODEL 110E TRAINER CONTROL PANEL		
NO.	COMPONENT	DESCRIPTION
1	BNC INPUT CONNECTION	Provides for the connection of an external input signal to the Pin E position.
2	AC POWER INDICATOR	Illuminates when 14 VAC nominal voltage is applied to Pins B, C, G, and H.
3	EXPERIMENT CIRCUIT BOARD CONNECTORS	Provides connections to the experiment card installed on the trainer through 24 connector pins labeled A through X.
4	DC POWER INDICATOR	Illuminates when the outputs of the DC power supplies are connected to the trainer on Pins O and N.
5	BNC OUTPUT CONNECTION	Allows connection of external equipment to monitor the output at Pin T.
6	POWER LIGHT	Illuminates when AC line power is applied to the trainer and the MAIN POWER switch is in the ON position.
7	CHASSIS	Full metal chassis for durability and reliability.
	<b>WARNING</b>	Only qualified technicians are authorized to open the Nida Model 110E Trainer chassis.

**MODEL 110E TRAINER DESCRIPTION, continued**



**NIDA MODEL 110E TRAINER REAR PANEL**

NO.	COMPONENT	DESCRIPTION
8	TRAINER MAIN POWER ON-OFF SWITCH	Applies power to the trainer. This is the switch referred to when setting the “Initial Control Settings” in the learning content.
9	AC POWER CONNECTOR AND FUSE MODULE	Provides line cord connection to the Model 110E Trainer. The input voltage rating is 110-130 VAC 60 Hz, or 220-240 VAC 50/60 Hz. A 600 mA/250 V Slo-Blo fuse is required for 110-130 VAC and a 300 mA/250 V Slo-Blo fuse is required for 220-240 VAC.  <b>CAUTION</b>  <b>Only qualified technicians are authorized to open the AC power fuse modules.</b>
10	VENTILATION GRID	Provides ventilation for the trainer AC and DC power supplies.
11	IDENTIFICATION PLATE	Provides model number, serial number, and system specification data.
12	CAI COMMUNICATION PORT	Provides computer serial connection port for Computer Assisted Instruction (CAI) interface.
13	USB COMMUNICATION PORT	Provides computer USB connection port for Computer Assisted Instruction (CAI) interface.
14	POWER TRANSISTORS Q1 and Q2	Power transistors are part of the trainer’s experiment board DC power supply. No user intervention is required.
15	USER AC POWER FUSES	Fuses F2-BC and F3-GH provide AC overcurrent protection during experiments. The fuses are rated at 1A/250V. Fuse F2-BC protects pins B and C on the front panel. Fuse F2-GH protects pins G and H on the front panel.
16	POWER SUPPLY LINE CORD	Included with the trainer is a UL certified power supply line cord. Always use the provided cord or a cord that meets the specifications identified in the Model 110E Trainer TECHNICAL SPECIFICATIONS AND CONSUMER INFORMATION section of this guide.

### MODEL 110E PC POSITION PIN FUNCTION DESCRIPTION

The printed circuit (PC) card pins on the face of the Model 110E trainer supports and interconnects with the learning content experiment circuit cards. The position is labeled PC1. The PC position provides 24 connector pins for mounting the Model 130 Series experiment PC boards. The connector pins provide the function shown in the PC Connector Pin Functions table.

**PC Connector Pin Functions**

A	Common ground
B, C	14 VAC (PC1)
D, E, F	Inputs (i.e., signals)
G, H	14 VAC (PC1)
I, J, K, L, M	To fault relays
N	Negative DC voltage
O	Positive DC voltage
P, Q	To fault relays
R	Reserved
S, T, U	Outputs (i.e., signals)
V, W, X	To fault relays

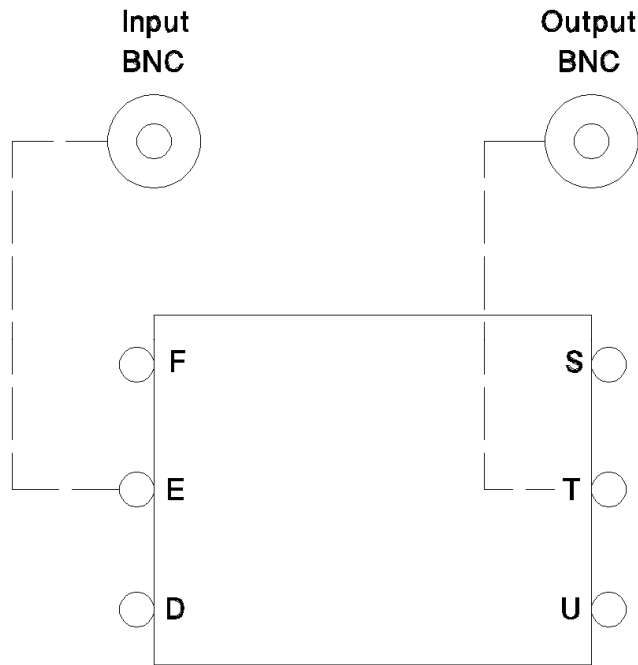
The 110E Trainer is grounded through the ground pin on the line cord.

**WARNING**

Always use the line cord provided with the trainer. Proper grounding of the trainer through the line cord is essential for safe operation. Do not modify the ground pin or receptacle in any way. Do not utilize a two-prong power connector adapter. Ensure the trainer, line cord, and receptacle ground are secure and in proper operation or a shock hazard could result.

**MODEL 110E PC POSITION INTERCONNECTIONS**

The PC position on the Model 110E Trainer operates by means of BNC inputs, BNC outputs, and internal connections, as shown below.



**PC Position Internal Connections**

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## OPERATION

### START-UP FOR NORMAL OPERATION

Perform the following start-up steps for normal operation:

- a. Perform daily use inspection, as described on page 12 of this manual.
- b. Place the trainer Main Power switch to ON. Ensure that the Power indicator illuminates.

### INITIAL CONTROL SETTING

Upon power-up, the Nida 110E Trainer will be in its initial control setting. That is, system power is applied, but all user functions are deactivated. The trainer will perform a self-test followed by an audible “chirp”. The chirp indicates that the trainer is ready for use.

### NORMAL OPERATION

The trainer is ready for use after the initial control setting has been performed. Specific operation instructions for power applications, card applications, and circuit measurements are contained in each lesson/experiment module of the Nida Series 130 Lab/Text Manuals or CAI lesson content. The Nida 110E Trainer operates in CAI Mode; meaning that the trainer must be interfaced to a computer that is running a Nida lesson for proper operation. The CAI lesson will provide all inputs for voltage selection, experiment card power application, setting of faults, and removal of faults. There are no trainer interface actions required of the user outside of the Nida CAI lesson except for turning the trainer on.

### NORMAL SHUTDOWN

Perform the following steps to shut down the Nida Model 110E Trainer:

- a. If in a Nida CAI lesson, exit the lesson.
- b. Set the trainer Main Power switch to OFF. The Power indicator should extinguish.
- c. Remove experiment cards and test equipment from the PC position.
- d. Unplug the power cord from the AC power source (as required).

### EMERGENCY SHUTDOWN

If any function of the trainer is suspected of incorrect operation, shut down and unplug the trainer immediately. No further emergency operation procedures are needed.

**WARNING**

Ensure that a qualified technician authorized to work on Nida trainers completes a performance verification check, as described in the Model 110E single-position Trainer technical manual prior to subsequent use.

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## **MAINTAINING YOUR TRAINER**

### **CLEANING**

For best performance, the Model 110E Trainer should be cleaned periodically to remove dust, dirt, and grease.

- a. Ensure the trainer power is off.
- b. Remove dust from the trainer with a soft brush.
- c. Remove heavier dirt by wiping down the trainer with a mild cleaning agent applied to a soft cloth.



**Do not spray cleaning agent  
directly on the Model 110E Trainer.**

### **INSPECTION**

The trainer requires no schedule of periodic inspections. Daily use inspections, however, should be carried out by performing the following steps:

- a. Check the general condition of the trainer for bent or broken pins or switches.
- b. Check the power cord for damage such as cut wires, dents, nicks, and bent, loose, or broken prongs.



**Never use a power cord that is damaged or missing the ground pin.  
Proper grounding of the trainer through the line cord is essential for  
safe operation.**

**Do not modify the ground pin or receptacle in any way.  
Do not utilize a two-prong power connector adapter.  
Ensure the trainer, line cord, and receptacle ground are secure and  
in proper operation or a shock hazard could result.**

**PERFORMANCE VERIFICATION**

Your Model 110E Trainer provides maintenance free performance. If the trainer is suspected of malfunctioning or operating out of tolerance, perform a normal start up procedure and allow the trainer to complete the self-diagnosis test. If the trainer continues to perform poorly after the normal start up, a performance verification should be conducted.

A red rectangular box with a white border containing the word "WARNING" in white capital letters.**WARNING**

Performance verifications should only be attempted by a qualified technician in accordance with the Model 110E technical manual.

There are no performance verifications that can be accomplished by the user.

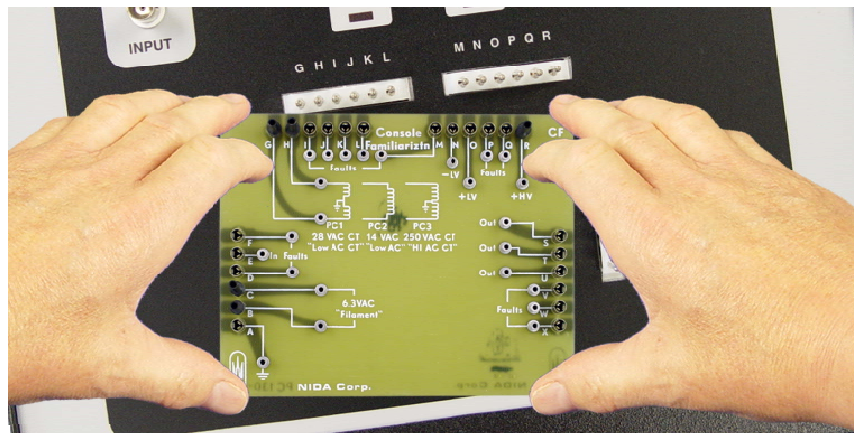


### **TRAINER FAMILIARIZATION**

To familiarize yourself with the Model 110E Trainer, you will need an experiment circuit card. Any card will suffice; however, if you have the DC Card Set, select the PC130-CF card.

#### **INSTALLING A PC CARD ON THE TRAINER**

- a. Select a PC card and pick it up by the four corners.



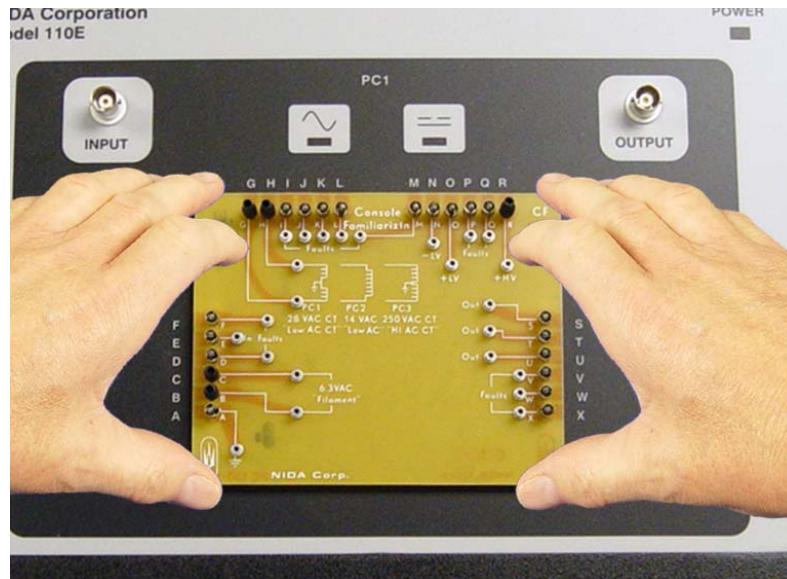
- b. With the component side up, align the PC card over the pins in the PC1 position.
- c. Gently press the card down on the pins until it stops.

#### **NOTE**

**The PC-to-board connections are designed to self-clean with each insertion and removal of the card.**

**REMOVING A PC CARD FROM A TRAINER**

- a. Grasp the PC card by its four corners.



- b. Gently rock the card while pulling up on all four corners simultaneously.

**PREPARATION FOR RESHIPMENT****DISCONNECTION INSTRUCTIONS**

- a. Position the trainer to allow access to the rear of the trainer.
- b. Remove the power cord from the power receptacle.
- c. Remove the communications cable from the back of the trainer.
- d. Remove the power cord from the back of the trainer.

**REPACKING INSTRUCTIONS**

- a. Place the trainer in the plastic bag.
- b. Place the foam packing on each side of the trainer.
- c. Pick up the trainer from the bottom, with both hands, and carefully place it into the shipping carton.
- d. Place the User's Guide, Technical Manual and other accessories provided on top of the trainer in the shipping carton.
- e. Seal the top of the carton. Ensure the notation **THIS SIDE UP** is readable and visible.

**STORAGE**

The Nida Model 110E Trainer should be repacked in its shipping carton before being placed in storage for any extended length of time. (See Preparation for Reshipment). The packaged trainer should then be stored indoors, at a room temperature of 10° to 40° C or 50° to 104° F (ambient).

For daily storage after use, cover the trainer with the dust cover and store in a dry place where no chance of physical damage, such as being bumped or jostled, exists.

**TECHNICAL AND CONSUMER INFORMATION****TECHNICAL SPECIFICATIONS**

The following technical specifications apply to your Model 110E Trainer.

- Primary Power: 110-130 VAC 60 Hz (0.6 A max), or
- 220-240 VAC 50/60 Hz (0.3 A max)
- Detachable Power Supply Cord (115 VAC applications):
  - Approvals: UL E84516 or equivalent
  - Standards: IEC 60320
  - Flame Rating: FT2
  - Power Rating: 10A/125V
- DC Power Sources:
  - 0 to -24 VDC with selectable voltages and current up to 1 A
  - 0 to +24 VDC with selectable voltages and current up to 1 A
  - Total DC power across both power supplies not to exceed 39 VDC
- AC Power Source:
  - 14 VAC at 1 A maximum
- Communications Link: USB or Serial (9600 baud rate with stop bit and parity check)
- Operating temperature: 5°C to 40°C ambient
- Dimensions:
  - Width – 33.02 cm / 13 in
  - Height – 11.43 cm / 4.5 in
  - Depth – 25.4 cm / 10 in
- Weight: 3.8 kg (8.3 lbs)
- Construction: Sheet metal covered by flat panel matte finish
- Internal Function Speaker Output - Maximum: 48 dB at 1 foot

**CONSUMER INFORMATION**

Normal environmental conditions apply to equipment designed to be safe at a minimum under the following conditions.

- Indoor use
- Altitude up to 2000 m (6,600 feet)
- Ambient temperatures between 5° C to 40°C
- Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
- Main supply voltage fluctuations up to ±10% of the nominal voltage
- Transient over-voltages typically present on the main power supply
- Applicable rated pollution degree