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**GPIB-232CT-A**

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## GPIB-232CT-A IBCL EPROM Installation Guide

This guide describes how to replace the factory-installed EPROM that comes with your GPIB-232CT-A. This kit is meant to be used with the *GPIB-CT IBCL Reference Manual*.

The procedures in this guide should be performed only by qualified persons. This guide contains separate instructions for the AC and DC versions of the GPIB-232CT-A. Be sure you follow the appropriate instructions for disassembling and reassembling your GPIB-232CT-A.

### Introduction

The Interface Bus Control Language (IBCL) is a powerful, interactive language that you can use to program the GPIB-232CT-A. You can use IBCL to create custom applications that are outside the scope of the NI-488.2™ software and the firmware that comes with your GPIB-232CT-A. IBCL is intended for experienced users who require additional functionality and stand-alone capability. If you want to use IBCL, you must replace the factory-installed EPROM. The original warranty for your GPIB-232CT-A is still valid if you follow the directions in this installation guide.

### What You Need to Get Started

- ☐ One of the following boxes:
  - GPIB-232CT-A (100-120 VAC)
  - GPIB-232CT-A (220-240 VAC)
  - GPIB-232CT-A (DC)

- ☐ GPIB-232CT-A IBCL EPROM

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The following tools:

- Phillips screwdriver
- 3/16 in. nutdriver
- 1/4 in. nutdriver or pliers
- Scribe

**Caution:** *Most of the circuitry in the GPIB-232CT-A uses advanced CMOS technology and can be damaged by static electricity. Avoid touching any of the components and take any necessary CMOS handling precautions.*

## Disassembling the GPIB-232CT-A (AC Version)

This section describes the disassembly of the AC version of the GPIB-232CT-A. The disassembly instructions for the DC version are located in the next section.

**Warning:** *The GPIB-232CT-A contains circuitry which operates with hazardous voltages. Do not open the unit unless you have removed the power cord.*

Refer to Figure 1 and complete the following steps to disassemble the GPIB-232CT-A.

**Note:** *You may find that organizing the pieces as you disassemble the GPIB-232CT-A simplifies reassembly.*

1. Disconnect any GPIB cables, the serial cable, and the power cord from the GPIB-232CT-A.
2. Using a 1/4 in. nutdriver or pliers, remove the jackscrews (A), the lock washers (B), and the GPIB connector shield (C) from the GPIB connector (I).
3. Using a 3/16 in. nutdriver or pliers, remove the jackscrews (D) and the washers (E) from the 9-Pin D-Sub serial connector (L).
4. Lift the metal cover (F) from the lower assembly (M) of the GPIB-232CT-A.
5. Remove the four screws (G) that hold down the printed wiring board (H) at each corner with the screwdriver.

6. Lift the printed wiring board (H) from the lower assembly (M) and the lower assembly standoffs (N).

Figure 1 shows the location of the parts you need to disassemble the AC version of the GPIB-232CT-A.

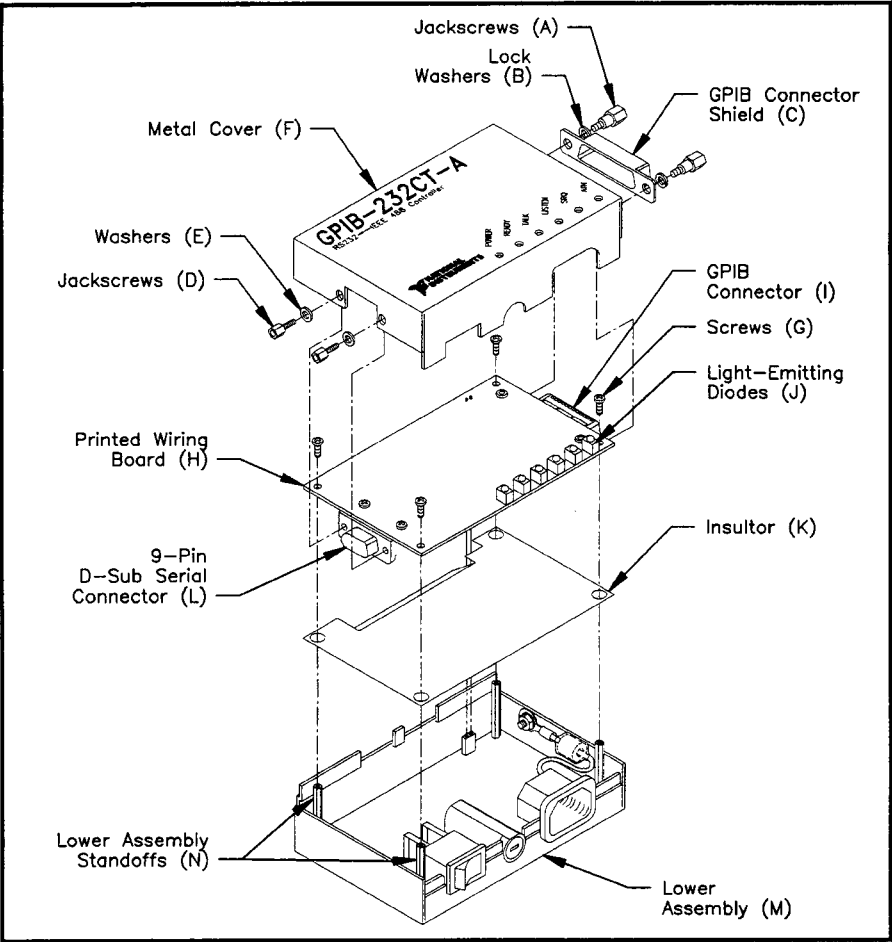


Figure 1. GPIB-232CT-A Assembly (AC Version)

## Disassembling the GPIB-232CT-A (DC Version)

This section describes the disassembly of the DC version of the GPIB-232CT-A. Refer to Figure 2 and complete the following steps to disassemble the GPIB-232CT-A.

**Note:** *You may find that organizing the pieces as you disassemble the GPIB-232CT-A simplifies reassembly.*

1. Disconnect any GPIB cables, the serial cable, and the power cord from the GPIB-232CT-A.
2. Using a 1/4 in. nutdriver or pliers, remove the jackscrews (A), the lock washers (B), and the GPIB connector shield (C) from the GPIB connector (I).
3. Using a 3/16 in. nutdriver or pliers, remove the jackscrews (D) and the washers (E) from the 9-Pin D-Sub serial connector (L).
4. Lift the metal cover (F) from the lower assembly (M) of the GPIB-232CT-A.
5. Remove the four screws (G) that hold down the printed wiring board (H) at each corner with the screwdriver.

**Warning:** *Straining the power wires that connect the printed wiring board (H) to the DC power jack (R) and the transistor (S) can damage your GPIB-232CT-A. Do not strain these wires when changing the EPROM (O). Be sure to support the printed wiring board to reduce strain on the power wires (Refer to Figure 2).*

6. Lift the printed wiring board (H) from the lower assembly (M).

Figure 2 shows the location of the parts you need to disassemble the DC version of the GPIB-232CT-A.

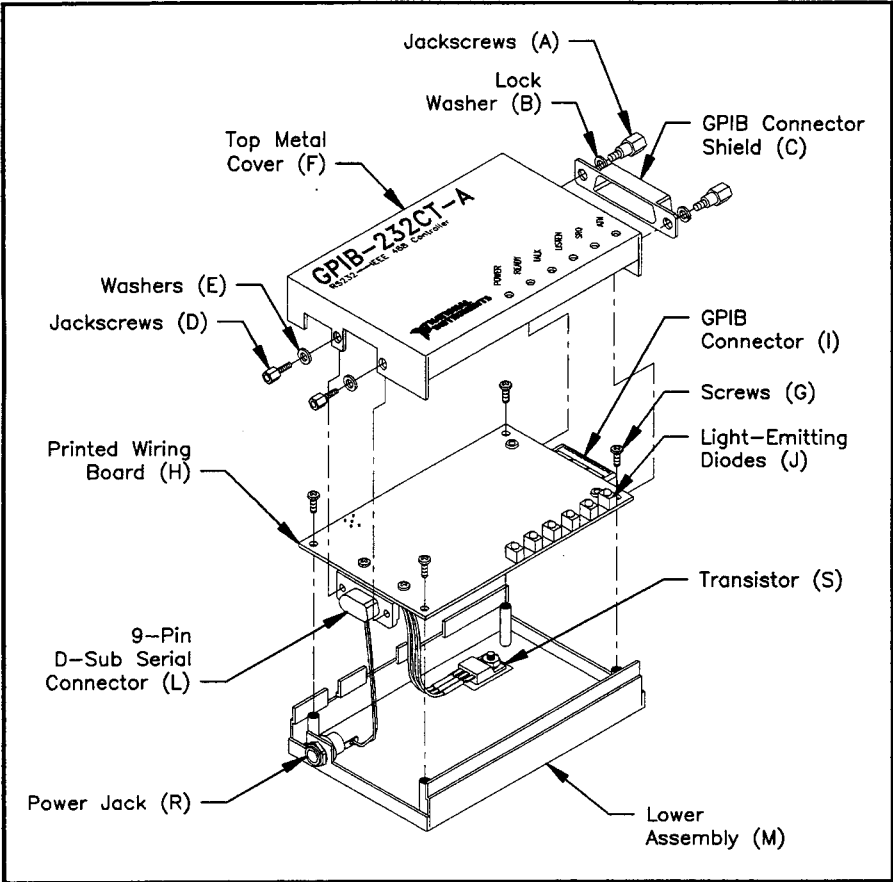


Figure 2. GPIB-232CT-A Assembly (DC Version)

## **Changing the GPIB-232CT-A EPROM (AC Version)**

Refer to Figure 3 and complete the following steps to change the GPIB-232CT-A EPROM.

1. Turn the printed wiring board (H) so that the underside is facing upwards.
2. Use the scribe to remove the old EPROM (O) by carefully prying it out of the EPROM socket (P). Be careful not to put too much force on the EPROM socket (P) which might cause it to crack.
3. Notice that the EPROM (O) and the EPROM socket (P) are each keyed in one corner so that you can only insert the EPROM (O) in one orientation. Remove the new EPROM from the antistatic bag. Align the new EPROM (O) correctly with the EPROM socket (P).
4. Press firmly to ensure that the EPROM (O) is secure in the EPROM socket (P).
5. Store the old or original EPROM in the antistatic bag for future use.

Figure 3 shows the location of the EPROM (O) and the EPROM socket (P) on the underside of the AC version of the printed wiring board (H). If you have a DC version of the GPIB-232CT-A, refer to Figure 4.

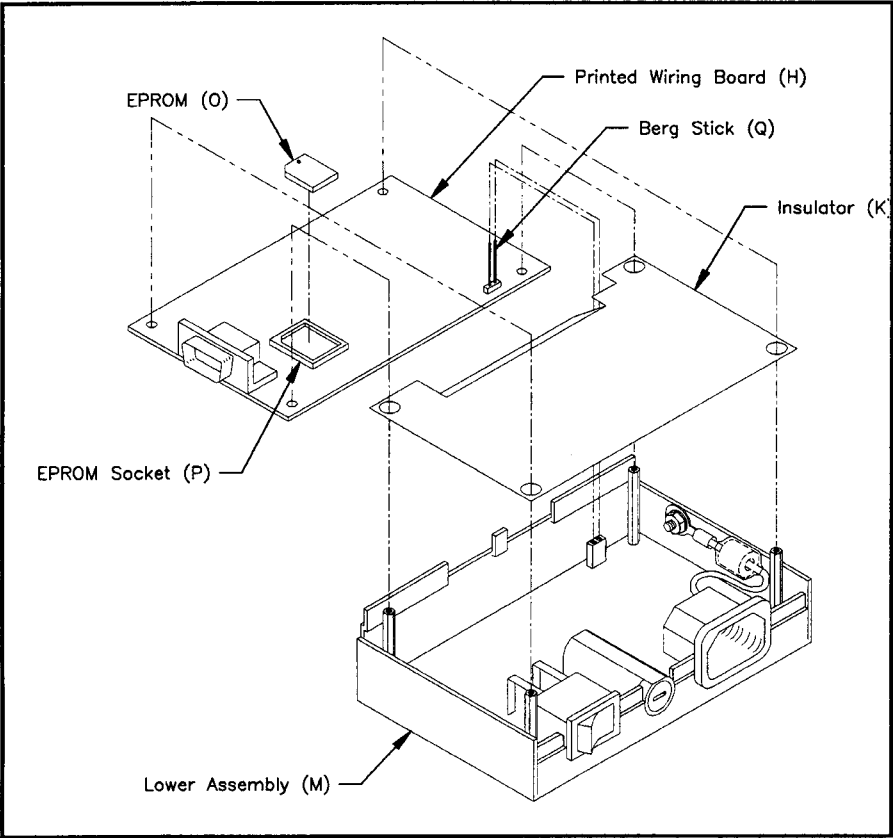


Figure 3. The GPIB-232CT-A (AC Version) Lower Assembly and Printed Wiring Board



## **Changing the GPIB-232CT-A EPROM (DC Version)**

Refer to Figure 4 and complete the following steps to change the GPIB-232CT-A EPROM.

1. Turn the printed wiring board (H) so that the underside is facing upwards.
2. Use the scribe to remove the old EPROM (O) by carefully prying it out of the EPROM socket (P). Be careful not to put too much force on the EPROM socket (P) which might cause it to crack.
3. Notice that the EPROM (O) and the EPROM socket (P) are each keyed in one corner so that you can only insert the EPROM (O) in one orientation. Remove the new EPROM from the antistatic bag. Align the new EPROM (O) correctly with the EPROM socket (P).
4. Press firmly to ensure that the EPROM (O) is secure in the EPROM socket (P).
5. Store the old or original EPROM in the antistatic bag for future use.

Figure 4 shows the location of the EPROM (O) and the EPROM socket (P) on the underside of the DC version of the printed wiring board (H). If you have an AC version of the GPIB-232CT-A, refer to Figure 3.

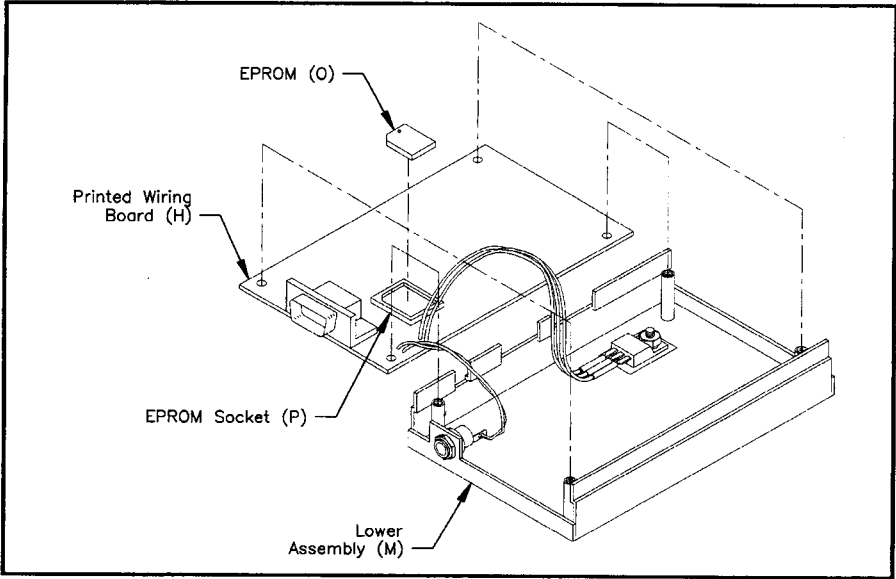


Figure 4. The GPIB-232CT-A (DC Version) Lower Assembly and Printed Wiring Board

## Reassembling the GPIB-232CT-A (AC Version)

This section describes how to reassemble the AC version of the GPIB-232CT-A. The reassembly instructions for the DC version are located in the next section.

Refer to Figure 5 and complete the following steps to reassemble the AC version of the GPIB-232CT-A.

1. Align the printed wiring board (H) on the lower assembly standoffs (N). Be certain that the berg sticks (Q) on the printed wiring board (H) line up with the socket on the lower assembly (M).
2. Insert the four screws (G) to secure the printed wiring board (H) to the lower assembly (M). Tighten the screws.
3. Gently press the metal cover (F) back onto the lower assembly (M) and ensure that the metal cover (F) is positioned so that the tops of the light-emitting diodes (J) are flush with the top of the GPIB-232CT-A.
4. Place one washer (E) on one jackscrew (D) and insert the jackscrew (D) into the mounting holes on the 9-Pin D-Sub serial connector (L) and tighten using a 3/16 in. nutdriver or pliers. Repeat with the other washer (E) and jackscrew (D).
5. Place one lock washer (B) on one jackscrew (A). Hold the GPIB connector shield (C) on the GPIB connector (I) and insert the jackscrew (A) through the GPIB connector shield (C). Tighten using a 1/4 in. nutdriver or pliers. Repeat with the other lock washer (B) and jackscrew (A).

Figure 5 shows the location of the parts you need to reassemble the AC version of the GPIB-232CT-A. If you have a DC version of the GPIB-232CT-A, refer to Figure 6.

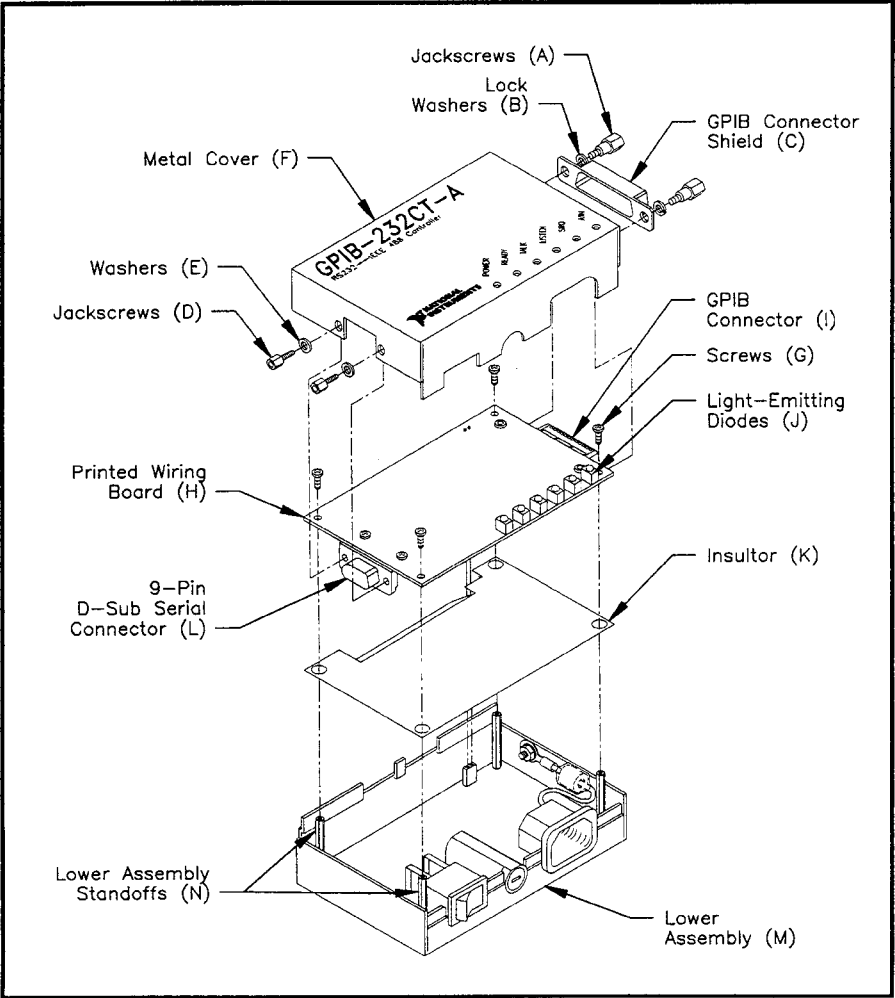


Figure 5. GPIB-232CT-A Assembly (AC Version)

## Reassembling the GPIB-232CT-A (DC Version)

This section describes how to reassemble the DC version of the GPIB-232CT-A. Refer to Figure 6 and complete the following steps to reassemble the DC version of the GPIB-232CT-A.

1. Align the printed wiring board (H) on the lower assembly standoffs (N). Check that the wires that connect the printed wiring board (H) to the DC power jack (R) and the transistor (S) are inside the box and are not being pinched.
2. Insert the four screws (G) to secure the printed wiring board (H) to the lower assembly (M). Tighten the screws.
3. Gently press the metal cover (F) back onto the lower assembly (M) and ensure that the metal cover (F) is positioned so that the tops of the light-emitting diodes (J) are flush with the top of the GPIB-232CT-A.
4. Place one washer (E) on one jackscrew (D) and insert the jackscrew (D) into the mounting holes on the 9-Pin D-Sub serial connector (L) and tighten using a 3/16 in. nutdriver or pliers. Repeat with the other washer (E) and jackscrew (D).
5. Place one lock washer (B) on one jackscrew (A). Hold the GPIB connector shield (C) on the GPIB connector (I) and insert the jackscrew (A) through the GPIB connector shield (C). Tighten using a 1/4 in. nutdriver or pliers. Repeat with the other lock washer (B) and jackscrew (A).

Figure 6 shows the location of the parts you need to reassemble the DC version of the GPIB-232CT-A. If you have an AC version of the GPIB-232CT-A, refer to Figure 5.

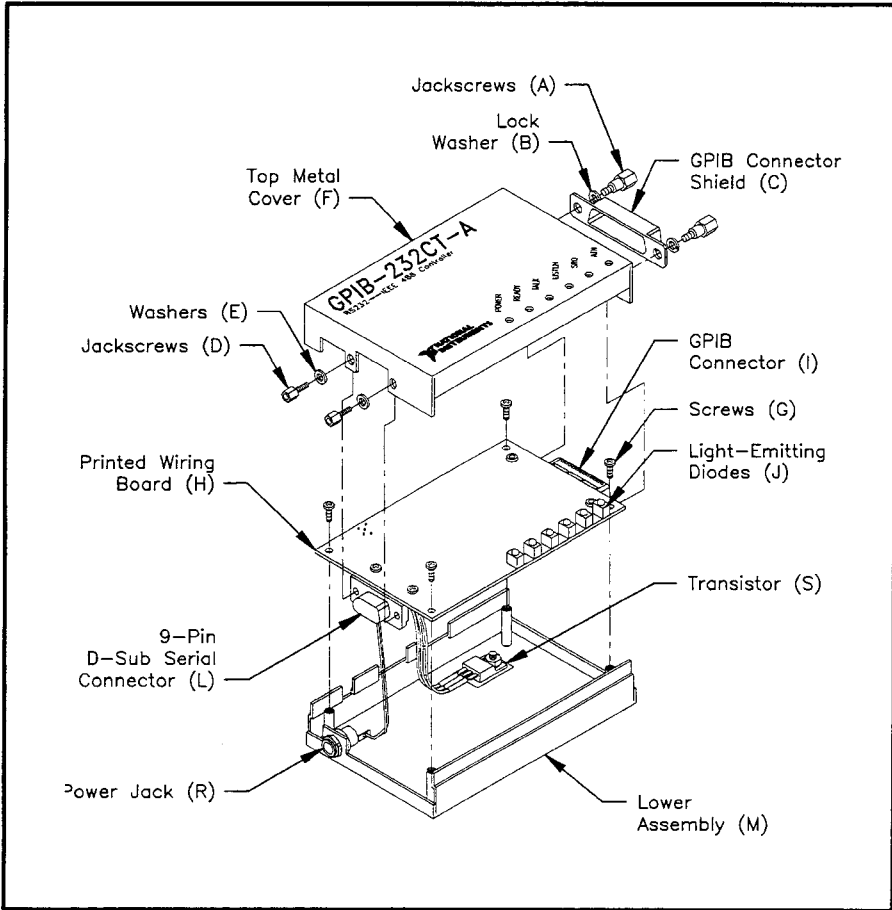


Figure 6. GPIB-232CT-A Assembly (DC Version)

## Verifying the EPROM Installation

To verify that you have properly installed the EPROM, plug in the unit and power on your GPIB-232CT-A. The **POWER** indicator should come on immediately. The **READY** indicator should come on after the GPIB-232CT-A has passed its power-on self test, indicating the unit is ready for operation. If the **READY** indicator does not come on within seven seconds after the unit is powered on, recheck the assembly and retry the power-on sequence. If the **READY** indicator still does not come on, carefully fill out the forms in Appendix G, *Customer Communication*, of the *GPIB-CT IBCL Reference Manual*, and call National Instruments.

You are now ready to start using the GPIB-232CT-A. Attach your GPIB cables. Refer to the *GPIB-CT IBCL Reference Manual* for information on programming.