Instruction Manual

Tektronix

Communication Pod

070-8760-02

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Warning
The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to the Safety Summary prior to performing service.

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Tektronix, Inc., P.O. Box 1000, Wilsonville, OR 97070–1000

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

Only qualified personnel should perform service procedures.

Injury Precautions

Use Proper Power Cord — To avoid fire hazard, use only the power cord specified for this product.

Avoid Electric Overload — To avoid electric shock or fire hazard, do not apply a voltage to a terminal that is outside the range specified for that terminal.

Do Not Operate Without Covers — To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.

Do Not Operate in Wet/Damp Conditions — To avoid electric shock, do not operate this product in wet or damp conditions.

Ground the Product — This product is grounded through the oscilloscope GND.

Use Proper Fuse — To avoid fire hazard, use only the fuse type and rating specified for this product.

Do Not Operate in Explosive Atmospheres — To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Product Damage Precautions

Use Proper Power Source — Do not operate this product from a power source that applies more than the voltage specified.

Provide Proper Ventilation — To prevent product overheating, provide proper ventilation.

Do Not Operate With Suspected Failures — If you suspect there is damage to this product, have it inspected by qualified service personnel.

Safety Terms and Symbols

Terms in This Manual

These terms may appear in this manual:

WARNING. *Warning statements identify conditions or practices that could result in injury or loss of life.*

CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product

These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols in This Manual

This symbol may appear in the manual:

This symbol indicates where specific cautions and warnings are found.

Symbols on the Product

These symbols may appear on the product:

DANGER
High Voltage

Protective ground
(earth) terminal

ATTENTION
Refer to
manual

Double
Insulated

Certifications

CSA Certified Power Cords

CSA Certification includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

Service Safety Summary

Only qualified personnel should perform service procedures. Read this Service Safety Summary and the General Safety Summary before performing any service procedures.

Do Not Service Alone

Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power

To avoid electric shock, disconnect the main power by means of the power cord or, if provided, the power switch.

CRTs retain hazardous voltages for long periods of time after power is turned off. Before attempting any servicing, discharge the CRT by shorting the anode to chassis ground. When discharging the CRT, connect the discharge path to ground and then the anode. Rough handling may cause the CRT to implode. Do not nick or scratch the glass or subject it to undue pressure when removing or installing it. When handling the CRT, wear safety goggles and heavy gloves for protection.

Use Care When Servicing With Power On

To avoid electric shock, do not touch exposed connections.

Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

Preface

This manual contains operation and service information for the ROMBURN software (Tektronix part number: 063-1852-XX) and the Communication Pod.

Communication Pod Background

Table i summarizes the differences between the previous and current Communication Pod versions that are supported by this manual.

Table i: Summary of Communication Pod Versions

Part Number	067-1436-00	067-1436-02	067-1436-03	067-1436-04	067-1436-05
Capability	ROMBURN Pod	ROMBURN Pod	Comm-Only Pod	ROMBURN Pod	Comm-Only Pod
PC Interfaces	GPIB and Motorola DI (serial port)	GPIB and Motorola ICD (parallel port)	GPIB only	GPIB and Motorola ICD (parallel port)	GPIB only
Products Supported	TDS 300 Series, TAS 400 Series	TDS 300 Series, TAS 400 Series, and TWD 120	TDS 300 Series and TAS 400 Series	TDS 300 Series, TAS 400 Series, TWD 120, and THS 700 Series	TDS 300 Series and TAS 400 Series
Firmware Version	5.1	5.1	5.1	5.2	5.2
Status	Obsolete, replaced by 067-1436-04	Obsolete, replaced by 067-1436-04	Obsolete, replaced by 067-1436-05	Current	Current
Upgrade Availability	Compatible with firmware version 5.2	Compatible with firmware version 5.2 Can be upgraded to support THS 700 Series	Compatible with firmware version 5.2	Not applicable	Not applicable

About This Manual

This manual is for internal use by Field/Factory Service and Manufacturing at Tektronix. It contains the following sections:

- *Getting Started* provides the product description, hardware/software configuration, and some verification tests.
- *Operating Basics* provides a functional overview of the Communication Pod.
- *Reference* describes the Main Menu and its submenus, and other applications.
- *Theory of Operation* describes the different parts of the Communication Pod, such as memory and registers.
- *Performance Verification* describes the Functional Check Procedures and the equipment required for these procedures.
- *Maintenance* describes the cleaning procedures, disassembly/assembly of the Communication Pod, and general troubleshooting.
- *Replaceable Electrical Parts* lists the electrical parts for the Communication Pod.
- *Diagrams* contains the schematics for the Communication Pod.
- *Replaceable Mechanical Parts* lists the mechanical parts for the Communication Pod.

Related Manuals

The following is a list of service manuals for the TDS-, TAS-, TWD-, and THS-series oscilloscopes:

- *TDS 300 Series Service Manual*, Tektronix part number 070-8570-XX.
- *Service Manual for the TAS 455/465*, Tektronix part number 070-8524-XX.
- *Service Manual for the TAS 475/485*, Tektronix part number 070-8878-XX.
- *Instruction Manual for the TWD 120*, Tektronix part number 070-8821-XX.
- *THS 710 and THS 720 Service Manual*, Tektronix part number 070-9246-XX.

Getting Started

This section provides a product description of the Communication Pod, hardware and software installation procedures, and a discussion on the different configurations for the different target instruments. At the end of this section, you learn how to enter the ROMBURN environment.

Product Description

There are two current versions of the Communication Pod: 067-1436-04 and 067-1436-05. This manual refers to them as the "ROMBURN Pod" and "Comm-Only Pod," respectively. Refer to Table i on page xi for a summary of previous Communication Pod versions also covered by this manual and the products they support.

Comm-Only Pod

The Comm-Only Pod is a data communication device that provides the following features for its target instrument:

- GPIB communication port
- RS-232 communication port
- Background port connector
- Additional RAM and ROM

ROMBURN Pod

The ROMBURN Pod is a Comm-Only Pod with an addition of either a Motorola DI board or Motorola ICD board installed, but not both. Both boards perform the same functions. However, the DI board uses the serial port of the PC while the ICD board uses the parallel port.

When the ROMBURN software is installed and runs on a PC, the following features become available:

- Ability to burn or upgrade ROM firmware in a target instrument
- Ability to perform low level debugging (checking memory contents, for example)
- Ability to perform instrument-specific exerciser loops and diagnostics

Installation

This section describes the installation of both the Comm-Only and ROMBURN Pods.

CAUTION. *Do not install or remove the Communication Pod when the target instrument power is on.*

Comm-Only Pod

To install the Comm-Only Pod, perform the following steps:

1. Remove the instrument cover. (See *Related Manuals* in the *Preface* section.)
2. Connect the 50-pin cable from the Comm-Only Pod to the target instrument at its processor board. Make sure that pin 1 on the cable matches the pin 1 position on the socket.

ROMBURN Pod

The following section describes the procedures for hardware and software installations for the ROMBURN Pod.

Hardware Installation. To install the hardware for the ROMBURN Pod, perform the following steps:

1. Remove the pod cover. (See *Removing Pod Cover* in the *Maintenance* section.)
2. If you are using the Motorola ICD board assembly, go to step 6. Otherwise, connect one end of the 9-pin serial cable to the ROMBURN Pod at the DB9 connector on the Motorola DI board. Figures 1–1 and 1–2 show the pin assignments of the cable.

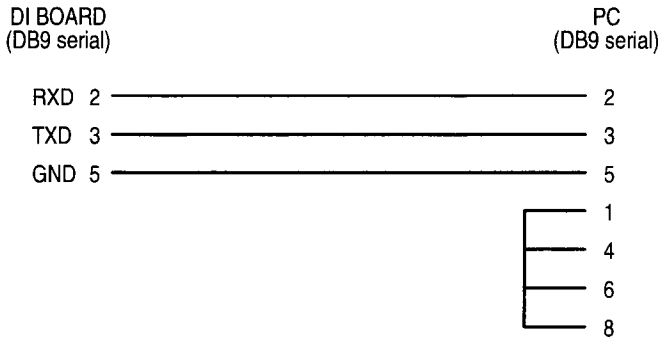


Figure 1–1: Motorola DI Board to DB9 Connector Pin Assignment

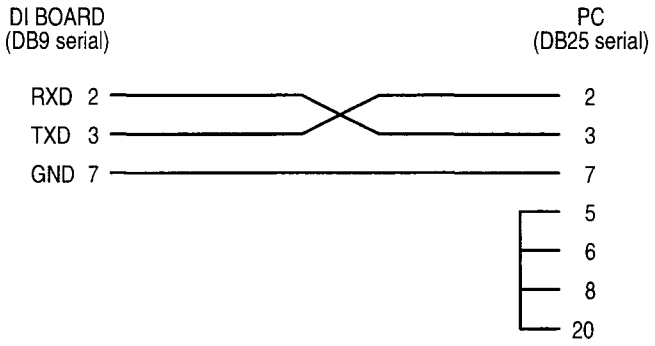


Figure 1–2: Motorola DI Board to DB25 Connector Pin Assignment

3. Replace the pod cover.
4. Connect the other end of the 9-pin serial cable to a serial port on the PC
5. Go to step 9.
6. Connect the ICD board assembly cable to the ROMBURN Pod at the J4 connector. (The ICD board assembly cable has 10 pins while the J4 connector has 8 pins. Figure 1–3 shows the connection and pin assignment between the cable and its connector.)

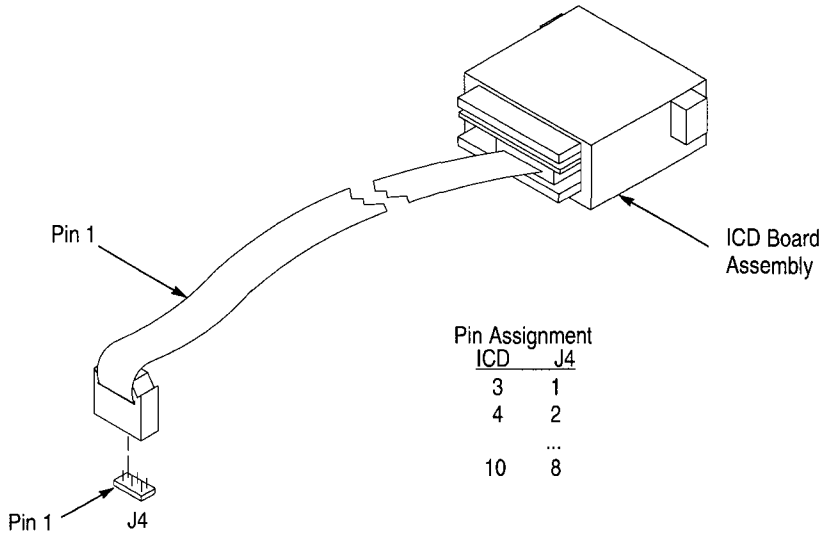


Figure 1–3: Connecting Motorola ICD Board Assembly

7. Replace the pod cover; the ICD board assembly should be outside the pod.

8. Use a parallel cable to connect the ICD board assembly to a parallel port on the PC.

9. If you are connecting the ROMBURN Pod to a THS 700-Series instrument, refer to *THS 700 Series-Specific Installation Information* on page 1–5. Otherwise, remove the instrument cover. (See *Related Manuals* on page xii of the *Preface*.)

10. Connect the 50-pin cable from the ROMBURN Pod to the target instrument at its processor board. Make sure that pin 1 on the cable matches the pin 1 position on the socket.

11. Connect a GPIB cable between the pod and the PC, and set the GPIB address according to Table 1–1.

Table 1–1: GPIB Address Setting

Instrument	Burning[1]	Normal Operation
TDS	1	Set through instrument menu
TAS	1	1[2]
TWD	1	No capacity
THS	1	No capacity

1 **Automatically set for the burning operation**

2 **Hard-wired to 1, you cannot change it**

12. Connect the power supply cord from the wall transformer to the ROMBURN Pod.

Software Installation. To install the software, perform the following steps:

1. Turn on the PC and wait for the "C:\:>" prompt to appear on the PC screen.

2. Insert Disk 1 of the installation floppy diskettes into the A: drive. Type:

```
A:
INSTALL C:\ROMBURN
```

NOTE. *Instead of ROMBURN, you can use another name for the directory to better describe the instrument that you are working with. For example, you can name the directory TDSBURN if you are using a TDS oscilloscope.*

This program creates the ROMBURN directory on the C: drive and copies its accompanying files into the directory. The *Appendix* section contains a list of these files and describes their functions.

3. Edit the file ROMBURN.CFG to correctly show the settings and parameters of the system. For example, you can change the default instrument to be a different one.

THS 700 Series-Specific Installation Information

Disregard this section if you are attaching the Communication Pod to any instrument other than a THS 700-Series instrument.

An adapter board (671-3682-XX) is required to connect either the Comm-Only Pod or the ROMBURN Pod to a THS 700-Series instrument. Follow these instructions to connect the adapter board to the THS 700-Series instrument and the Communication Pod:

1. Refer to the *THS 710 & THS 720 Service Manual* for instructions to remove the front cover and switch mat.
2. Insert a ⅛ inch flat-bladed screwdriver between the back cover and chassis at the location shown in Figure 1–4.

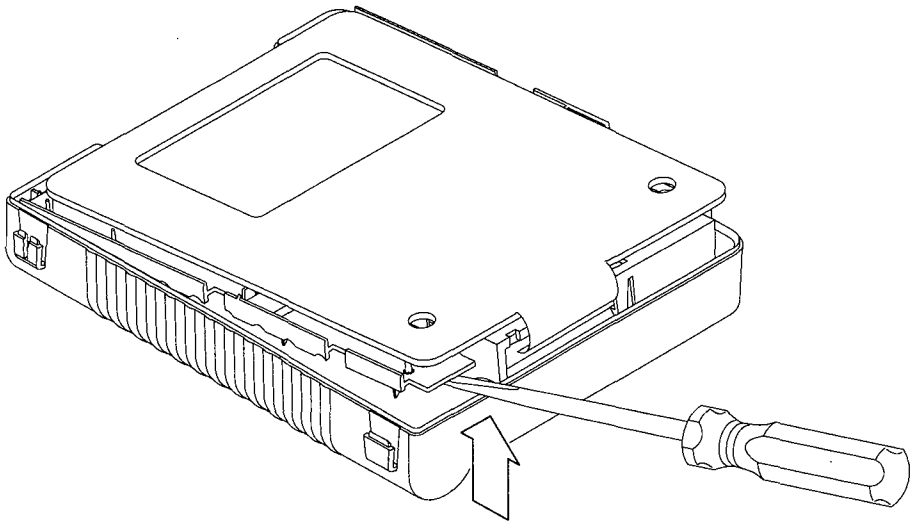


Figure 1–4: Lifting the Chassis Assembly

3. Lift the chassis assembly out of the back cover far enough that you can insert your fingers under the assembly to provide support.
4. Fold the switch flex-circuit assembly toward you to access the internal connector J1 shown in Figure 1–5.

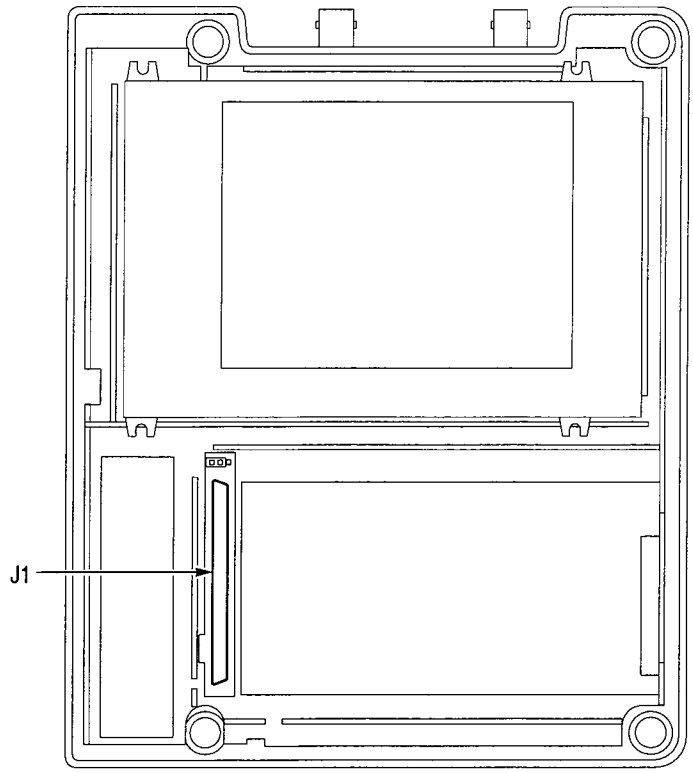


Figure 1–5: Location of Internal Connector J1

5. While supporting the circuit board from beneath with your fingers, install the adapter board (671-3682-XX) into connector J1.
6. Lower the chassis assembly back into the back cover.
7. Connect the cable from the adapter board to the cable from the Comm-Only Pod or ROMBURN Pod. Make sure that pin 1 on the two cables are correctly aligned.
8. Fold the switch flex-circuit assembly back over the adapter board.
9. Reinstall the switch mat.
10. Connect the AC adapter to the THS 700 Series instrument to supply power.
11. Press the ON/STBY button to turn instrument power on.
12. If you are installing the ROMBURN Pod, return to step 11 on page 1–4 to complete the installation.

Configuration

Configuration of the ROMBURN environment involves the basic hardware and software installations, as previously discussed in the *Installation* section, and additional steps (mostly setting switches and defining parameter values) to allow you to do the tasks at hand. For instance, setting the GPIB address is part of the configuration process to establish data communication between the PC and the target instrument. Hence configuration varies from instrument to instrument and even from task to task on the same instrument.

This section describes configuration for the TDS and TAS instruments as a group as shown in Figures 1–6 and 1–7, configuration for TWD by itself as shown in Figures 1–8 and 1–9, and configuration for THS as shown in Figures 1–10 and 1–11.

NOTE. *For a given instrument or application, only a subset of the hardware and cables shown in Figures 1–6 through 1–9 may be needed.*

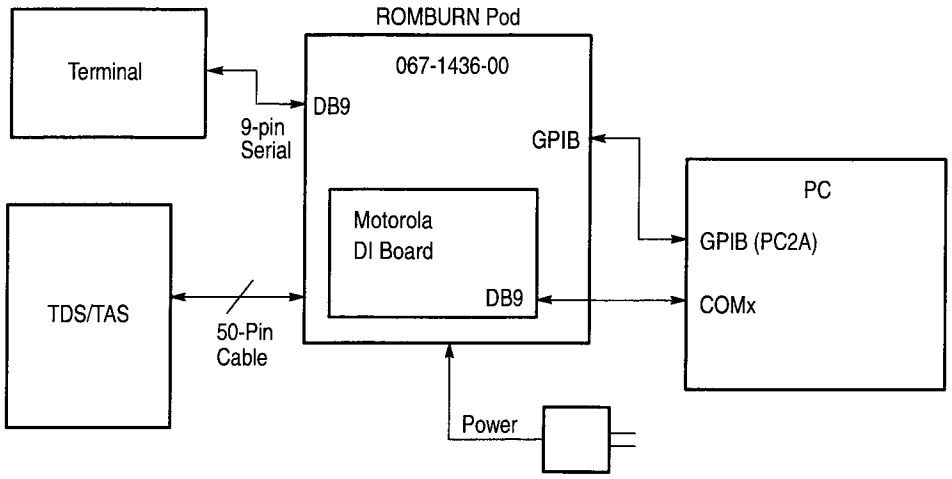


Figure 1–6: Hardware Connection with TDS & TAS for DI Board

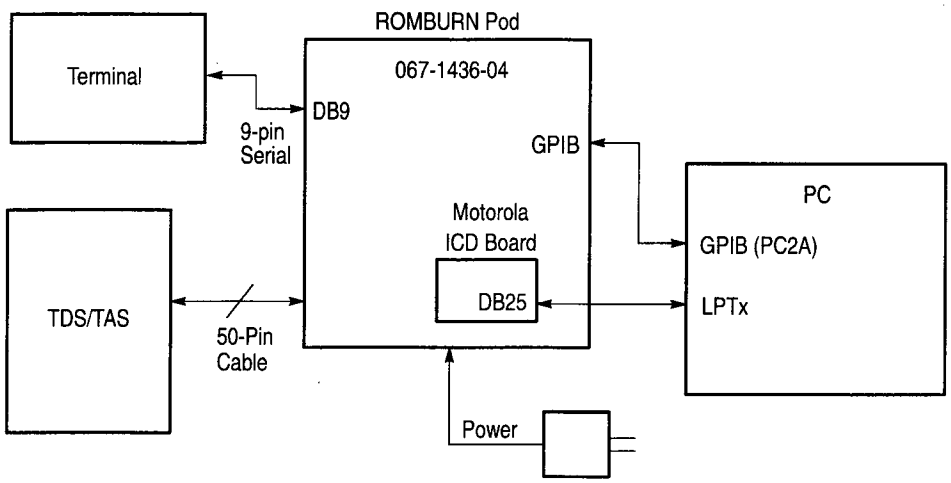


Figure 1–7: Hardware Connection with TDS & TAS for ICD Board

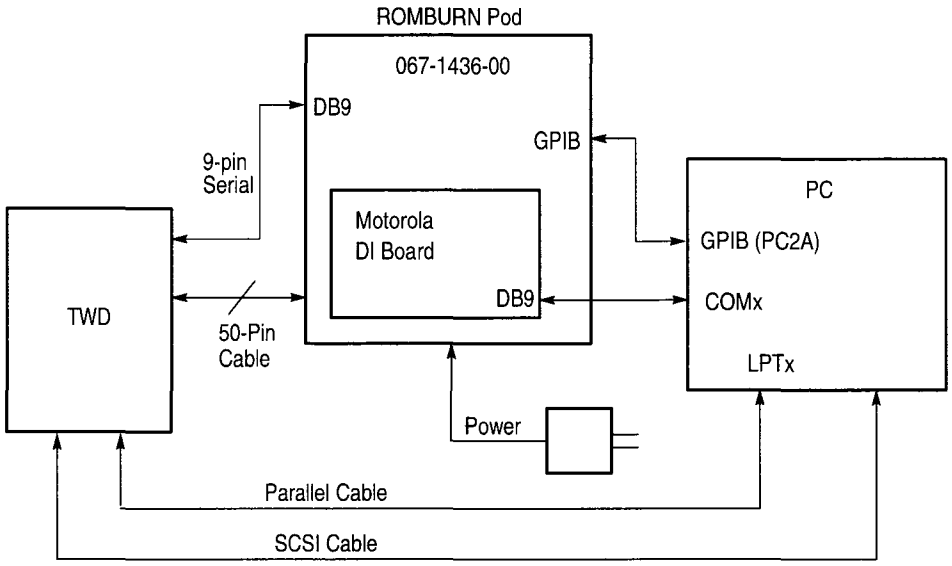


Figure 1–8: Hardware Connection with TWD for DI Board

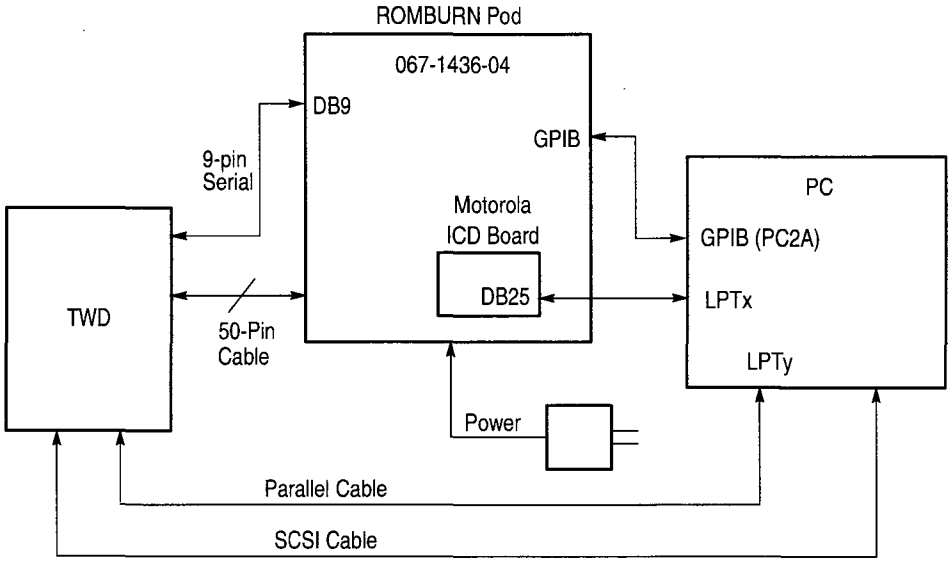


Figure 1–9: Hardware Connection with TWD for ICD Board

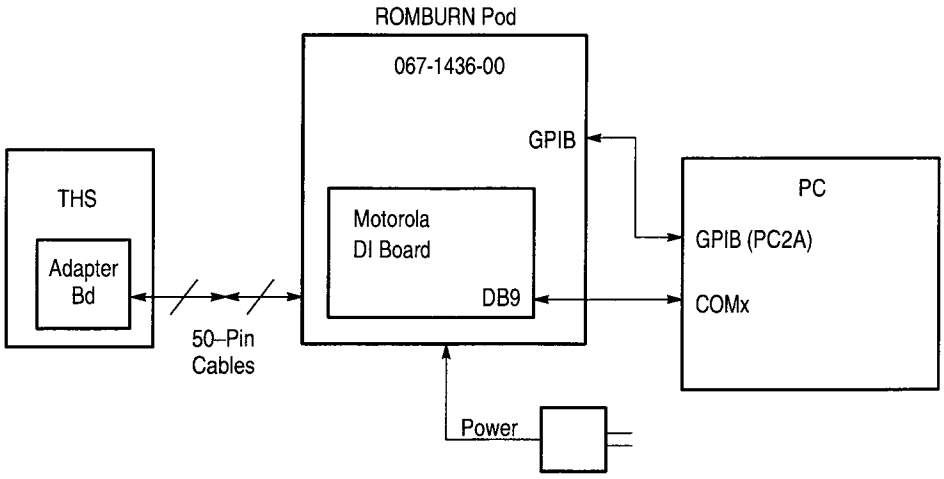


Figure 1–10: Hardware Connection with THS for DI Board

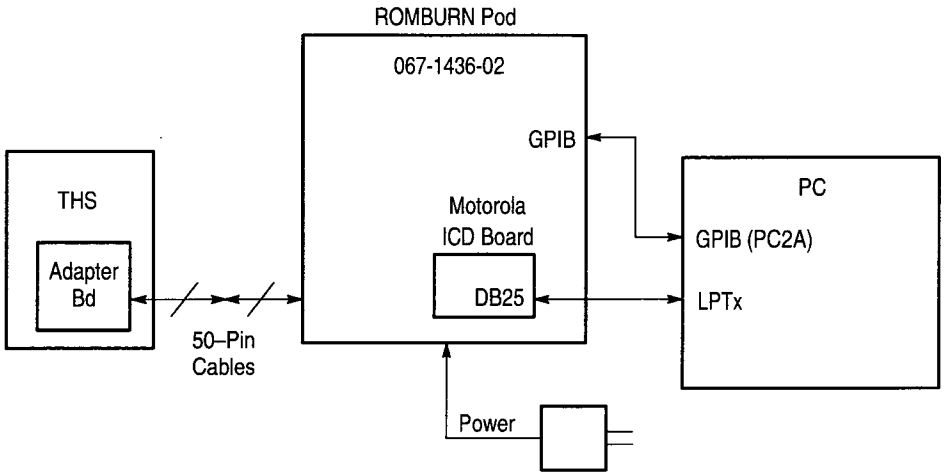


Figure 1–11: Hardware Connection with THS for ICD Board

Once you have completed the hardware and software installation, perform the following procedure to configure the ROMBURN Pod:

1. If the target instrument is a TDS and TAS and you want to monitor the system messages on a terminal, perform the following steps:
   a. Connect a 9-pin cable between the ROMBURN Pod and a terminal. (See Figures 1–6/1–7 and 1–12.)
   b. Set the terminal baud rate to match that of the target instrument.
   c. Set the jumpers according to *Setting Jumpers and DIP Switches* later in this section.
2. If you want to conduct the Port Test for the TWD 120, perform the following steps:
   a. Connect a 9-pin cable between the DB9 connector on the pod and the serial port on the instrument. (See Figure 1–8/1–9.)
   b. Connect a SCSI cable between the PC and the instrument.
   c. Connect a parallel cable between the PC and the instrument.
   d. Make sure that you set the *PARALLEL_TEST_PORT parameter in the ROMBURN.CFG file correctly. See Table 3–1 for detail.
3. For TAS, set the communication jumpers J7 and J8 to PROC; otherwise, set them to DUART for TDS and the TWD 120. (See *Jumpers and DIP Switches* on page1–14.)
4. Connect the ROMBURN Pod to a power source.
5. Connect the PC to a power source. If you are using a terminal, connect it to a power source.

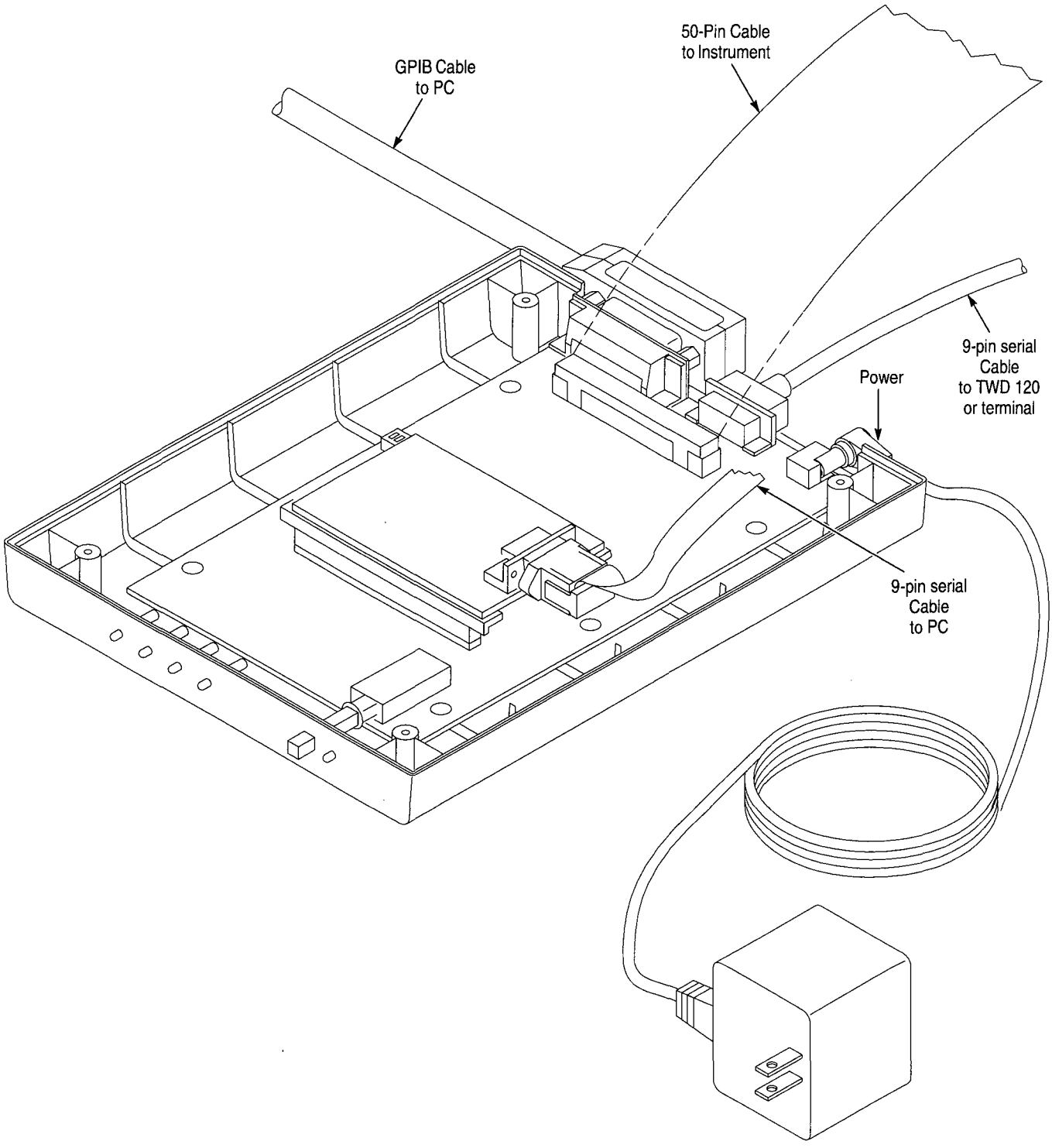


Figure 1–12: Cable Connections for the ROMBURN Pod with DI Board

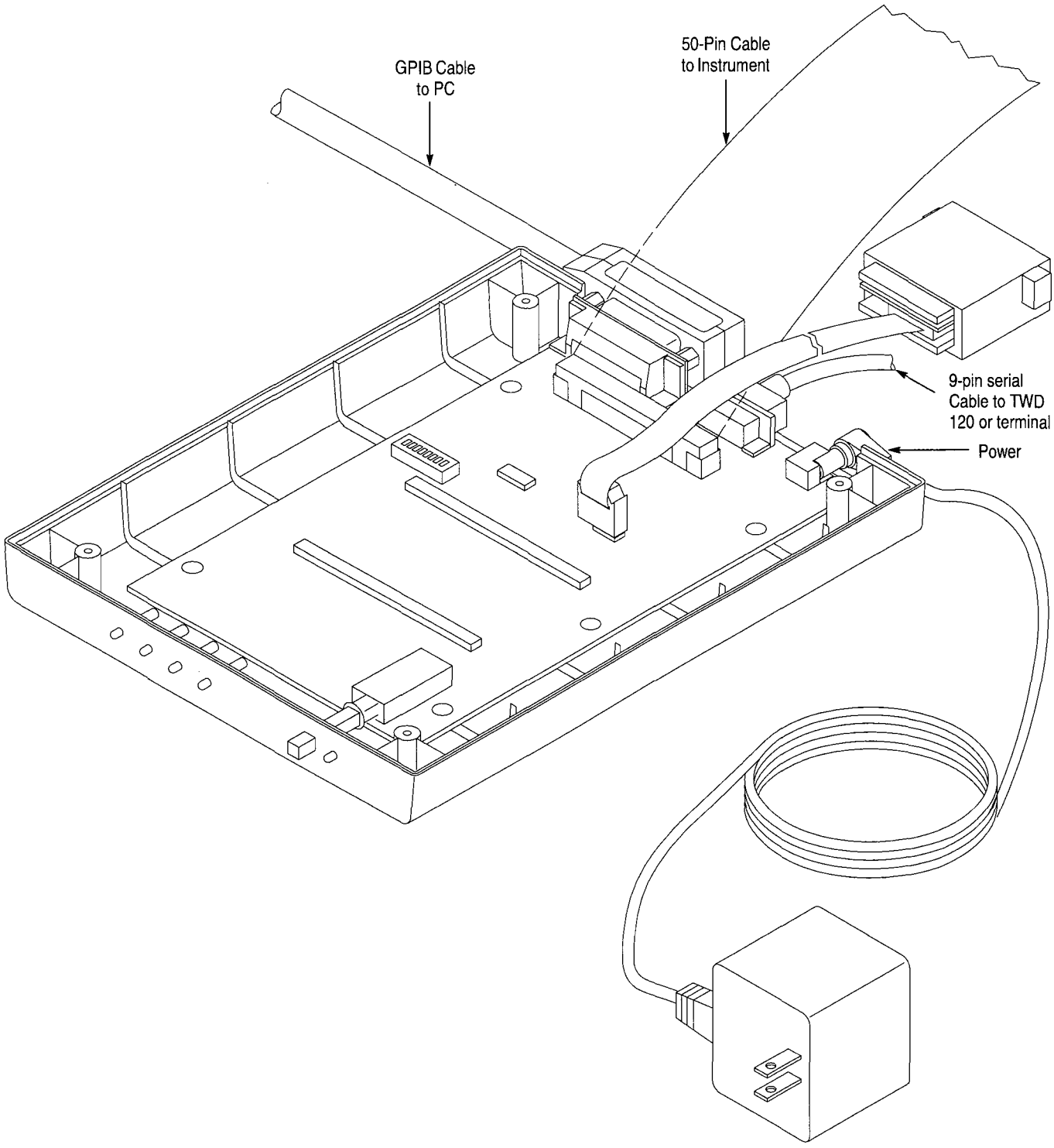


Figure 1–13: Cable Connections for the ROMBURN Pod with ICD Board

Jumpers and DIP Switches

Refer to Figure 1–14 for the locations of the jumpers and DIP switches. Use the following procedures to set up the power supply jumper, the communication jumpers, and the DIP switches. You must open up the Communication Pod before you can proceed.

Power Supply Jumper. Set the power supply jumper, J14, to AUTO. This setting allows the instrument processor to control the 12 V programming supply. If you set the jumper to MANUAL, it allows the switch on the front of the Communication Pod to control the programming voltage.

Communication Jumpers. Set the communication jumpers, J7 and J8, to either PROC or DUART. These jumpers control the source of the monitor port information. Different target instruments use different sources. If you are connecting to a TAS, set the jumpers to PROC. If you are connecting to a TDS or TWD 120, set the jumpers to DUART.

DIP Switches. These switches are not used.

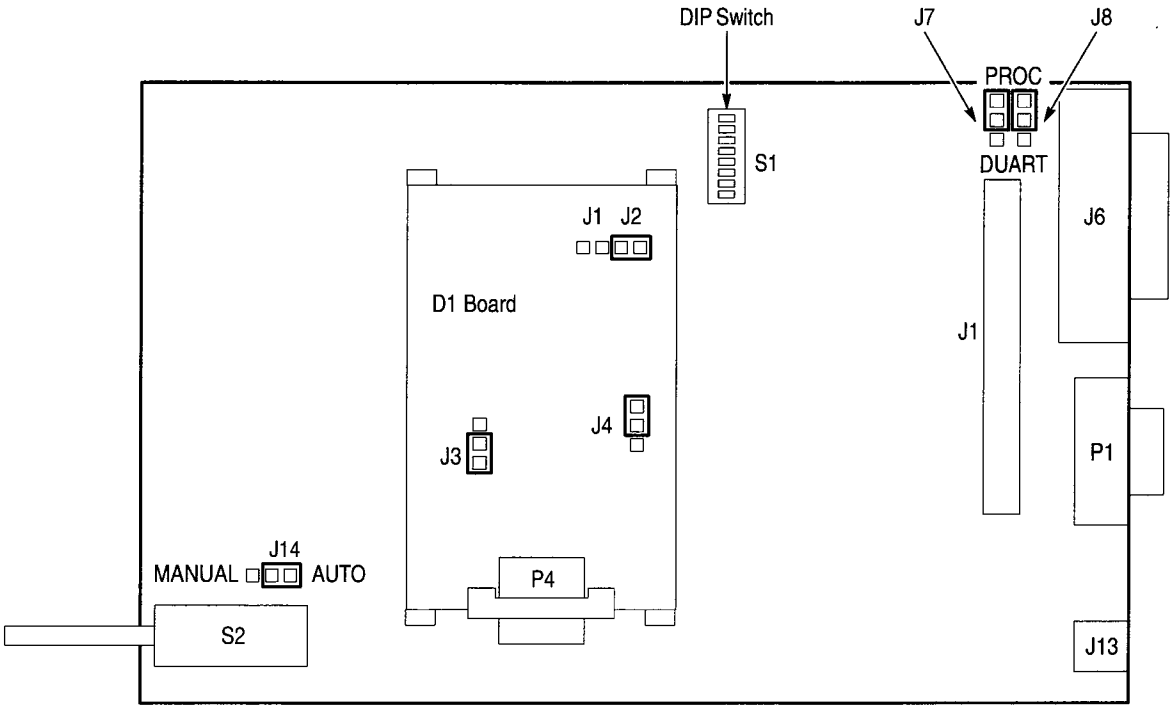


Figure 1–14: Locations of Jumpers and DIP Switches with DI Board

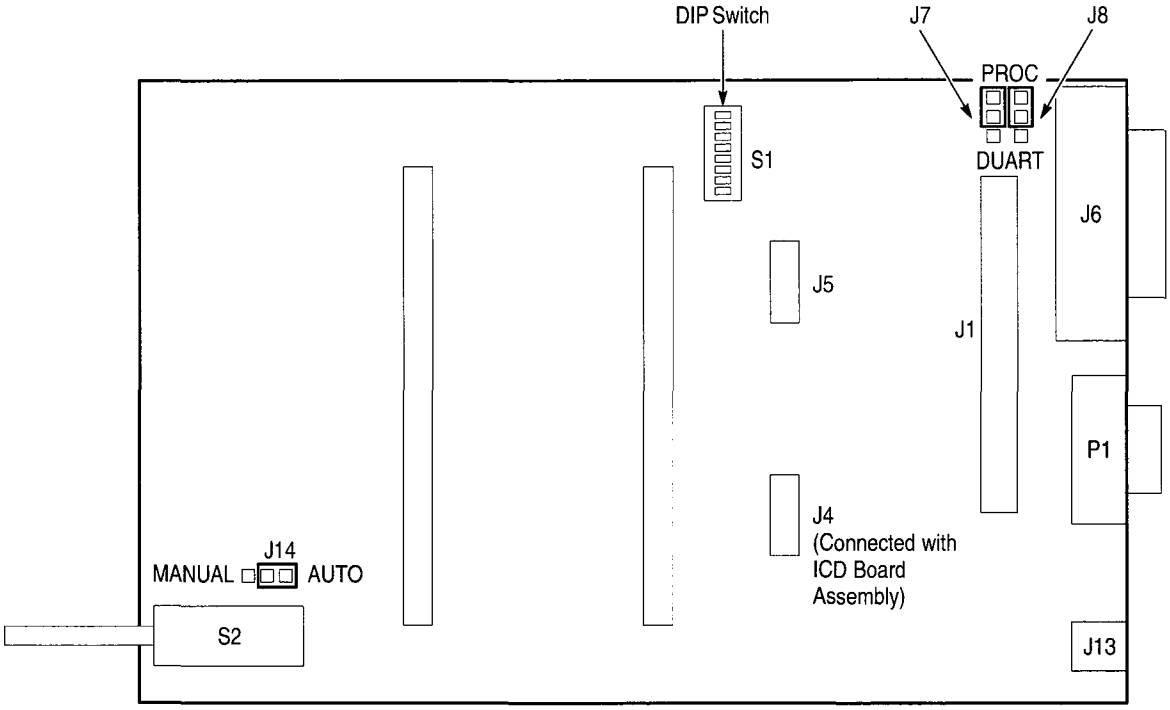


Figure 1–15: Locations of Jumpers and DIP Switches with ICD Board

Entering ROMBURN Environment

Once you have configured the ROMBURN Pod with the target instrument, you can enter the ROMBURN environment by typing at the DOS prompt "C:\>" the following DOS commands:

```
CD \ROMBURN   (or another directory you have set up)
ROMBURN
```

The Main Menu then appears on the PC screen and you can proceed with your work by making selections from the menu. See the *Reference* section for more detail on the Main Menu.

Operating Basics

This section gives an overview of the tasks that you can do with the Comm-Only Pod and the ROMBURN Pod. For the ROMBURN Pod, you learn the meanings of External/Pod ROM and Instrument ROMs, which are important in understanding many of the menu selections.

Comm-Only Pod Overview

This section provides a description of how the Comm-Only Pod works with the target instruments.

TDS 300 Series. The Comm-Only Pod provides GPIB hardware and RS-232 hardware to nonoptioned instruments.

TAS 400 Series. The Comm-Only Pod provides GPIB hardware to a TAS instrument for manufacturing and calibration/performance verification purposes. In addition, the internal jumpers, when set to PROC, allow serial communication via the processor serial port.

TWD 120. Although the Comm-Only Pod provides GPIB hardware, there is no firmware support for its use with a TWD 120.

THS 700 Series. Although the Comm-Only Pod provides GPIB hardware, there is no firmware support for its use with a THS.

The pod also provides a background port connector to all instruments. Each instrument's processor opcodes (instructions) are shifted in through this serial port instead of being fetched from ROM, as is normally the case.

GPIB Setup The GPIB address for TAS is always set to 1. For TDS, you can use the GPIB functions provided by the instrument to set up the GPIB address.

RS-232 Setup The baud rate for TAS is 9600. For TDS and THS, you can use the RS-232 functions provided by the instrument to set up the RS-232 parameters such as baud rate, parity, stop bit, and data bits. TWD 120 does not use a serial port, except for the port tester, which is auto-configured at both ends.

ROMBURN Pod Overview

This section first explains the terms External/Pod ROM and Instrument ROMs. Following that is a diagram which shows the commands the ROMBURN environment provides. These commands are listed under the following headings:

- Burning ROMs Commands
- Erasing ROMs Commands
- Verifying ROMs Commands
- Data Files Commands
- Diagnostics Commands
- Control Commands
- Instrument Commands
- Miscellaneous Commands

External/Pod ROM & Instrument ROMs

Many of the commands involve working with ROMs, so understanding what External/Pod ROM and Instrument ROMs mean is essential. Figures 2–1, 2–2, and 2–3 illustrate what they are.

TDS. Figure 2–1 shows the locations of both the External/Pod ROM and Instrument ROMs for the TDS 300 series.

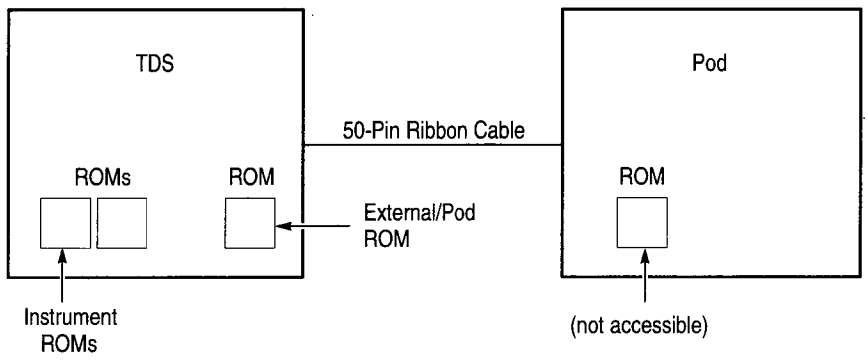


Figure 2–1: External/Pod ROM & Instrument ROMs for TDS

TAS and TWD. Figure 2–2 shows the locations of both the External/Pod ROM and Instrument ROMs for the TAS 400 and TWD 120 series.

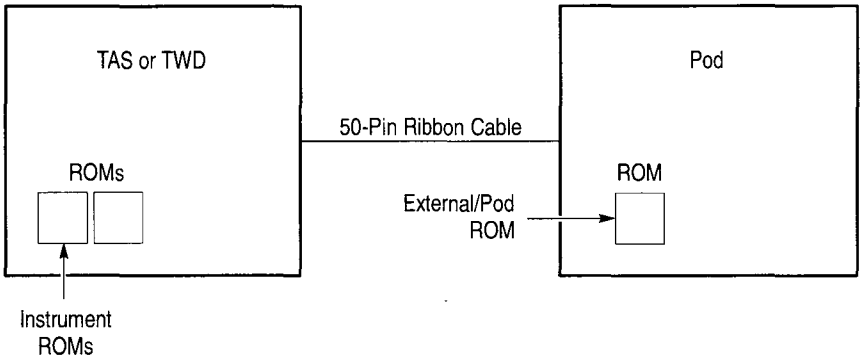


Figure 2–2: External/Pod ROM & Instrument ROMs for TAS and TWD

THS. Figure 2–3 shows the locations of both the External/Pod ROM and Instrument ROM for the THS 700 series.

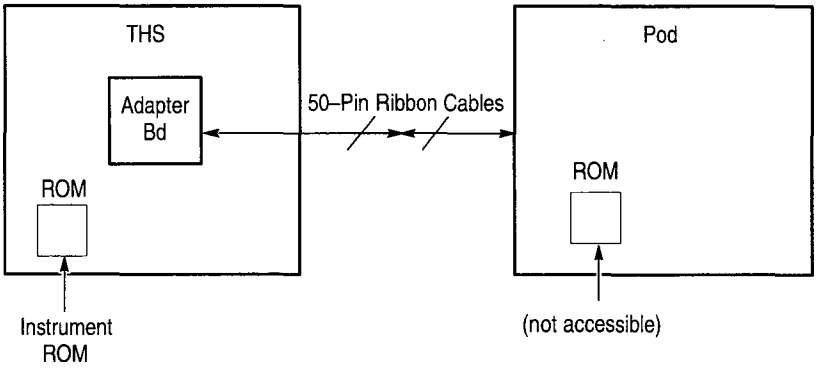


Figure 2–3: External/Pod ROM & Instrument ROM for THS

Commands Diagram

Figure 2–4 shows all the commands that are available in the ROMBURN environment, grouped by function. For detailed information on individual commands, refer to the *Reference* section.

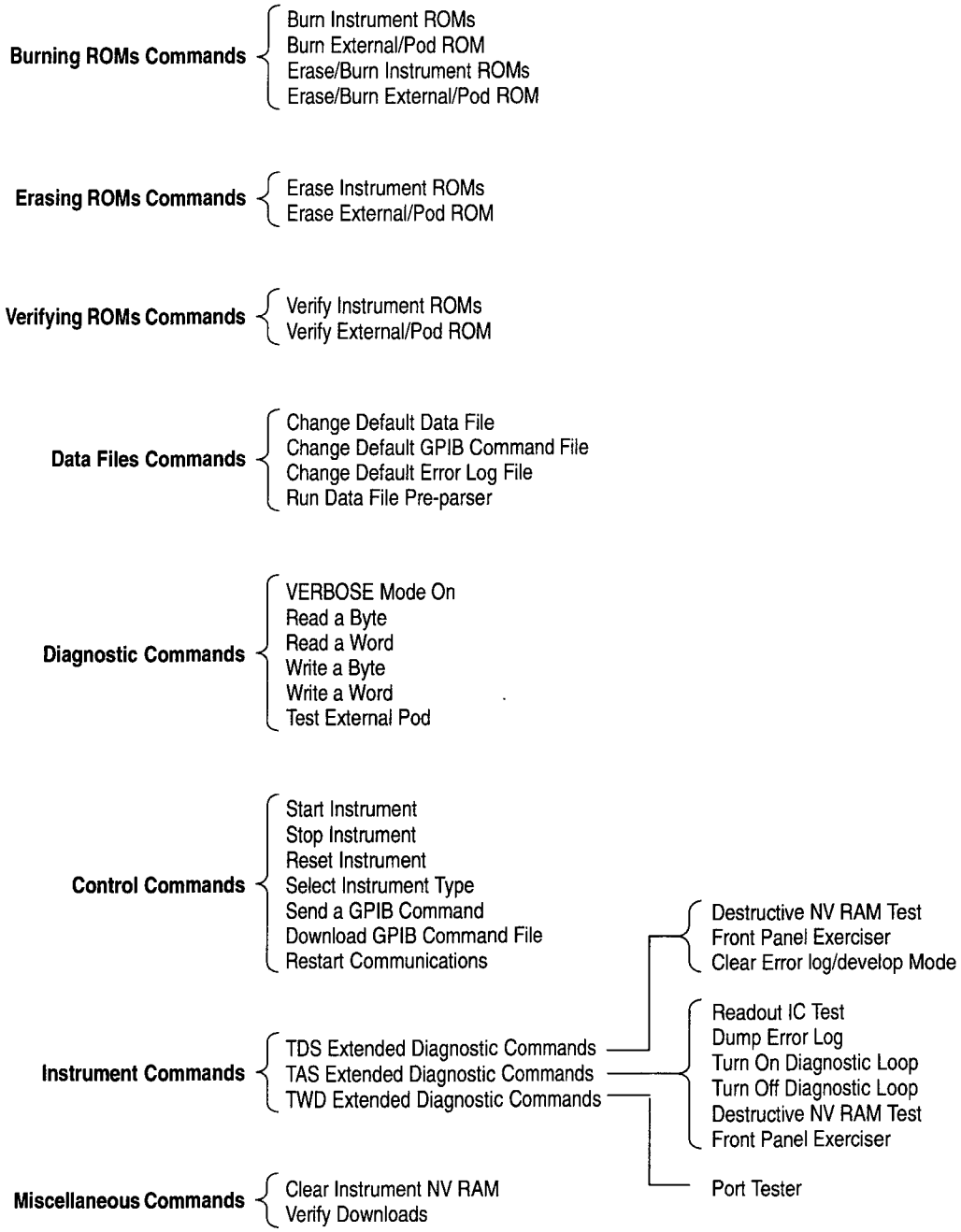


Figure 2–4: ROMBURN Commands by Function

Reference

The ROMBURN environment uses a menu-driven user interface. You can accomplish a task by making a sequence of selections from the menus and sub-menus that the ROMBURN environment provides. This section describes these menus and sub-menus and the selections they contain. This section also describes some advanced applications such as Command Line Options.

There are two ways of making a selection from the PC screen. If the mouse is turned on, you can move the arrow-head cursor over the item of interest and then click the left button on the mouse. Or, you can enter a menu item number on the keyboard.

As soon as you enter the ROMBURN environment, and if menus are enabled, the Main Menu appears on the PC screen. Figure 3–1 shows the layout of the Main Menu.

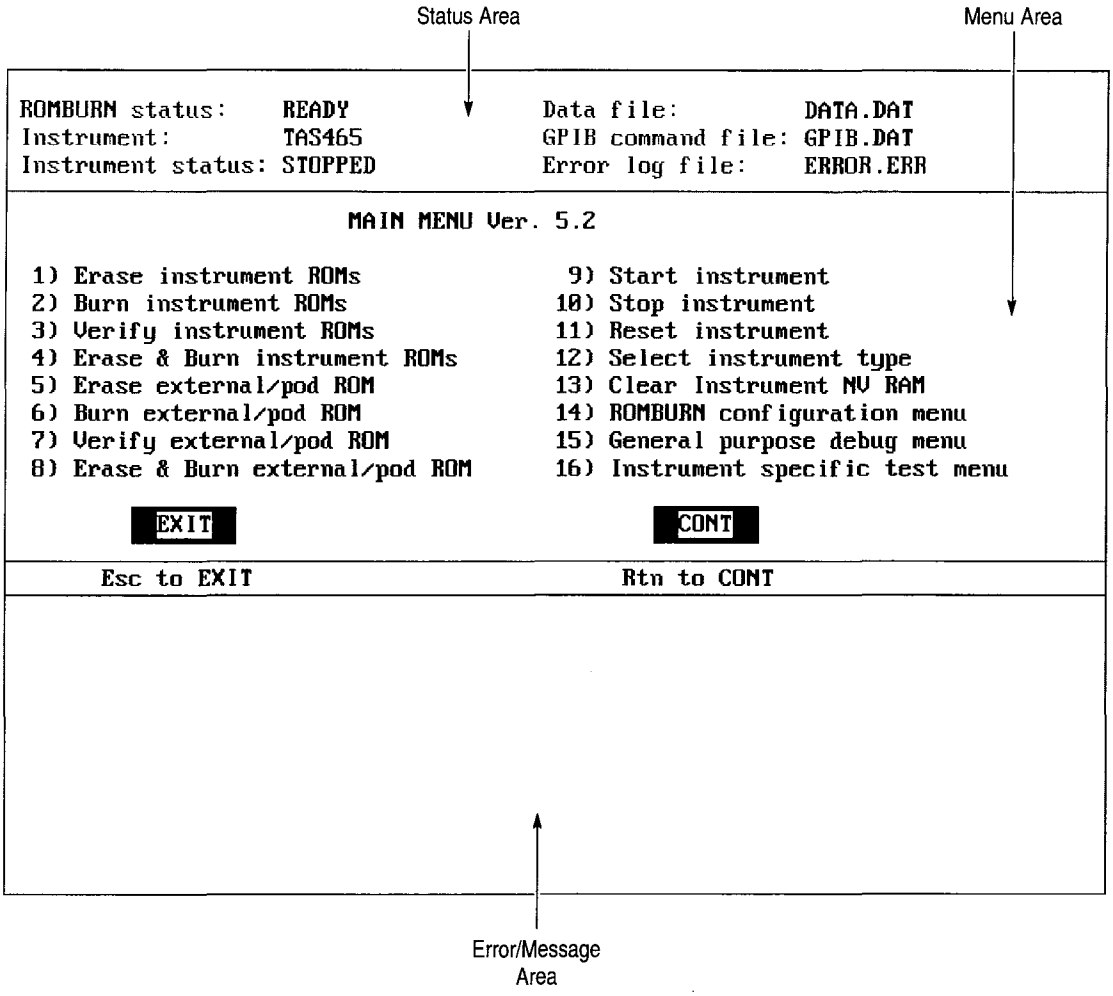


Figure 3–1: ROMBURN Main Menu

ROMBURN Main Menu

The top part of the Main Menu provides information on the ROMBURN environment:

ROMBURN Status The status can be one of the following:

- BUSY
- CHECKSUMMING
- CLEARING
- DOWNLOADING
- INITIALIZING
- PAUSED
- READY
- TESTING
- VERIFYING ROM
- VERIFYING ROMs
- VERIFYING RAM

Instrument The type of target instrument being used.

Instrument Status It is either STOPPED or RUNNING.

Data File The name of the file containing the data you want to burn into the ROMs, or the data you use to verify against those already existing in the ROMs.

GPIB Command File The name of the ASCII file containing the GPIB commands that you want to send. (Not valid for TWD 120.)

Error Log File The name of the file in which you want to store the error messages from the diagnostic error log. (Valid for TAS only.)

Main Menu Functions

This section describes each menu function in the order as they appear in the menu:

Erase Instrument ROMs This function erases the target instrument ROMs. This is only necessary if you want to reprogram the ROMs. When you program the ROMs for the first time, they are already erased.

Burn Instrument ROMs This function takes the new firmware data from the data file and burns it into the target instrument ROMs.

Verify Instrument ROMs This function compares the contents of the target instrument ROMs to the current data file and reports any discrepancies.

Erase/Burn Instrument ROMs This function performs "Erase Instrument ROMs" and "Burn Instrument ROMs" as one step.

Burn External/Pod ROM This function takes the new firmware data and burns it into the External/Pod ROM.

Erase External/Pod ROM This function erases the External/Pod ROM.

Verify External/Pod ROM This function compares the contents of the current data file to the External/Pod ROM.

Erase/Burn External/Pod ROM This function performs "Erase external/Pod ROM" and "Burn external/Pod ROM" as one step.

Start Instrument This function starts the firmware in the target instrument.

Stop Instrument This function stops the firmware in the target instrument.

Reset Instrument This function does a hardware reset on the target instrument.

Select Instrument Type This function displays a list of target instruments that are supported by the ROMBURN environment. Figure 3–2 shows a sample instrument list. Specific ROMBURN installations may have more or less instruments supported.

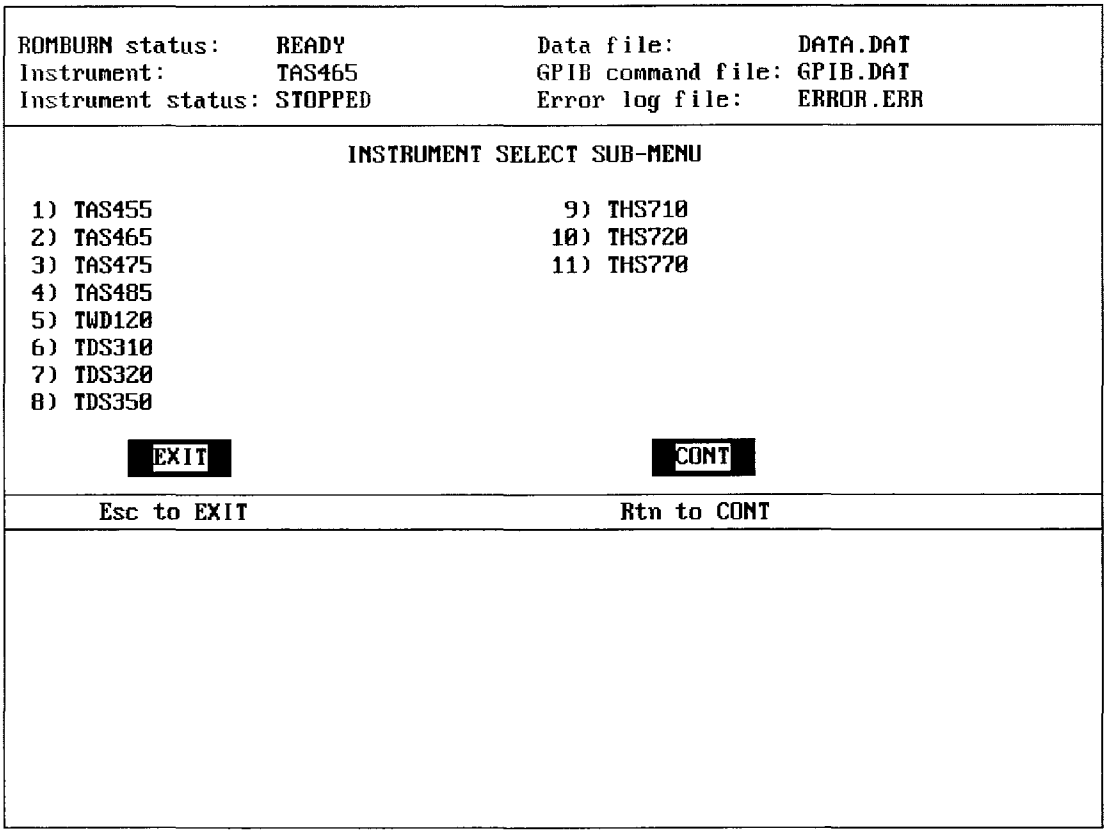


Figure 3–2: Select Instrument Type Menu

NOTE. *It is important to select the proper target instrument before you perform any function to avoid erroneous results.*

Clear Instrument NV RAM This function clears the NV RAM in the target instrument by setting every bit of the NV RAM to zero.

ROMBURN Configuration Menu This function calls out a sub-menu with selections that are capable of changing some of the configuration (environmental) parameters. See the *ROMBURN Configuration Menu* section later on.

General Purpose Debug Menu This function calls out a sub-menu with selections that perform general purpose debugging tasks such as reading or writing a byte. See the *General Purpose Debug Menu* section later on.

Instrument Specific Test Menu

This function calls out a sub-menu with selections that perform tests specific to the target instrument. See the *Instrument Specific Test Menu* section later on.

ROMBURN Configuration Menu

This sub-menu contains selections that enable you to make changes to the ROMBURN environment (configuration). Figure 3–3 shows the full selections of the sub-menu.

```
ROMBURN status:    READY              Data file:          DATA.DAT
Instrument:        TAS465             GPIB command file:  GPIB.DAT
Instrument status: STOPPED            Error log file:     ERROR.ERR

                    CONFIG MENU Ver. 5.2

 1) Verify downloads (TRUE/FALSE)
 2) Change default data file
 3) Change default GPIB command file
 4) Change default error log file
 5) VERBOSE mode on (TRUE/FALSE)
 6) Run data file pre-parser
 7) Restart communications

       EXIT                                CONT

     Esc to EXIT                        Rtn to CONT
```

Figure 3–3: ROMBURN Configuration Menu

The following descriptions explain the selections of the ROMBURN Configuration Menu:

Verify Downloads (TRUE/FALSE)

This selection toggles between TRUE and FALSE. When you select TRUE, ROMBURN performs a verification check on the download modules each time download occurs. Consequently, it takes much longer to download when you select TRUE.

Change Default Data File

This selection lets you name a different data file if you want to use a different set of data. You may add a path here for your data file, otherwise it defaults to the DATA subdirectory.

Change Default GPIB Command File

This selection lets you name a different GPIB command file if you want to send a different set of GPIB commands to the target instrument. You may add a path here for your command file, otherwise it defaults to the main ROMBURN directory.

Change Default Error Log File

This selection lets you name a different error log file if you want to store system error messages to a different file. You may add a path here for your error log file, otherwise it defaults to the DATA subdirectory.

VERBOSE Mode On (TRUE/FALSE)

This selection toggles between TRUE and FALSE. When you select TRUE, the bottom part of the screen displays a running dialog of events so that you know what is happening. You see messages such as "Checking keyboard."

Run Data File Pre-parser

This selection allows you to pre-parse an input (Motorola S-record) file into an output file for use with the ROMBURN environment. Pre-parsing an S-record file allows quicker burning into the target instrument ROMs (up to two to three times faster). You can specify the names of both the input and output files.

Restart Communications

This selection allows you to restart background communication with an instrument if the instrument has been shut off or replaced without leaving ROMBURN.

General Purpose Debug Menu

This sub-menu contains selections that allow you to perform a number of general purpose debugging tasks. Figure 3–4 shows the full selections of the sub-menu.

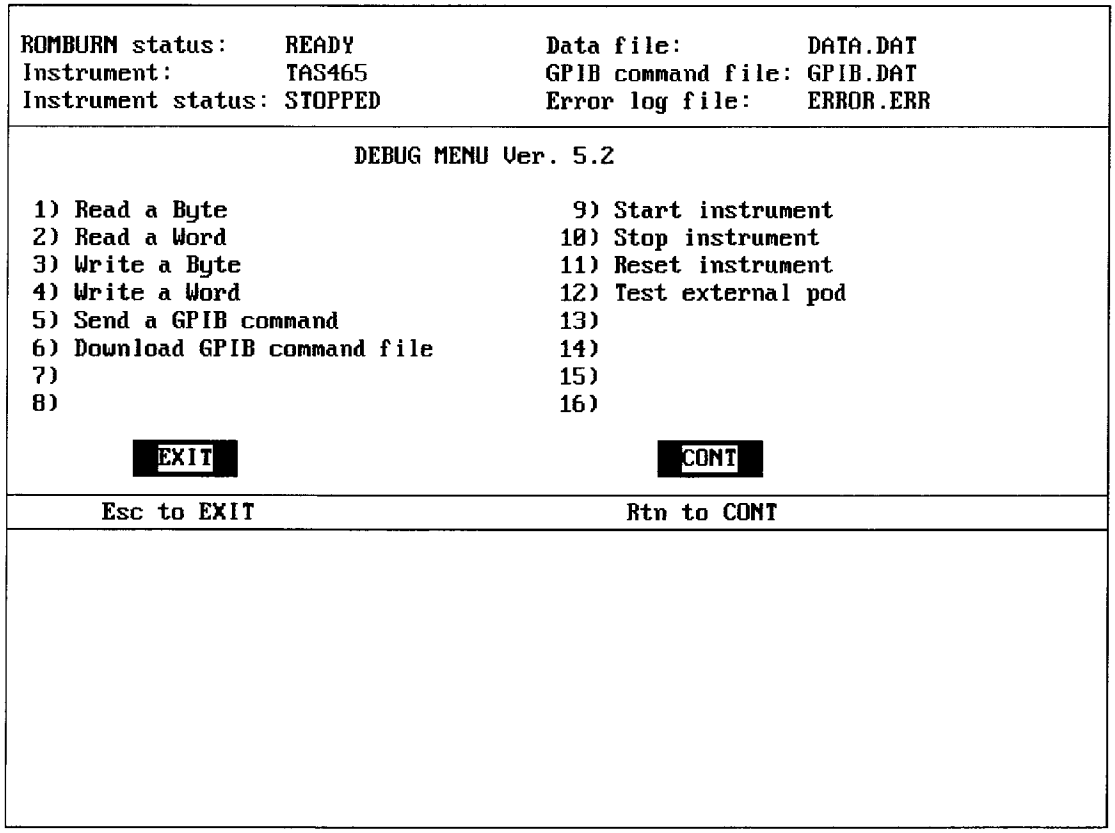


Figure 3–4: General Purpose Debug Menu

The following descriptions explain the selections of the General Purpose Debug Menu:

NOTE. *For the READ and WRITE selections to function properly, make sure the target instrument is not running. If it is, you can stop the instrument by selecting 10, Stop Instrument, from the menu.*

Read a Byte When you select Read a Byte and specify a byte address, the target instrument returns the content of the byte.

Read a Word When you select Read a Word and specify an even word address, the target instrument returns the content of the word.

Write a Byte When you select Write a Byte and specify a byte address, you can write to the byte of the target instrument.

Write a Word When you select Write a Word and specify an even word address, you can write to the word of the target instrument.

Send a GPIB Command This selection allows you to send a GPIB command to the target instrument. To do that, you need to perform the following steps (not valid for TWD 120):

1. Make sure that firmware is loaded in the target instrument.
2. Make sure that the target instrument is running. If it is not running, you can start it by selecting 9, Start Instrument, from the menu.
3. Set the GPIB address to 1. Make sure that no two instruments on the GPIB bus have the same address.
4. Once you have made this selection and waited for the instrument to finish booting, enter a GPIB command. The target instrument carries out the command or gives you a response if the command is a query.

Download GPIB Command File This selection is similar to the last selection, Send a GPIB Command, except that the commands in the GPIB command file, specified in the Main Menu, are sent to the target instrument sequentially. (Not valid for TWD 120.)

Start Instrument This selection starts the target instrument. It may take the instrument up to 30 seconds to get going. Watch for the Instrument Status to change to RUNNING. The length of time to wait is controlled by a line in the file ROMBURN.CFG or by the –SW switch on the command lines (See *Command Line Options* later on in this section.)

Stop Instrument This selection stops the target instrument. Watch for the Instrument Status to change to STOPPED.

Reset Instrument This selection causes the target instrument to perform a hardware reset.

Test External Pod This selection causes ROMBURN to automatically verify in succession, all the LEDs (one red and four green) on the front panel of the Communication Pod. You need to take note which LED is not working. The test also checks the GPIB, Duart, RAM, and ROM on the pod.

Instrument Specific Test Menu

Under the Instrument Specific Test Menu, there is a dedicated "Extended Diagnostic Sub-Menu" for each supported instrument. This section describes each of these menus.

TDS Extended Diagnostic Sub-Menu

Figure 3–5 shows a list of the diagnostic commands available for the TDS320 instrument.

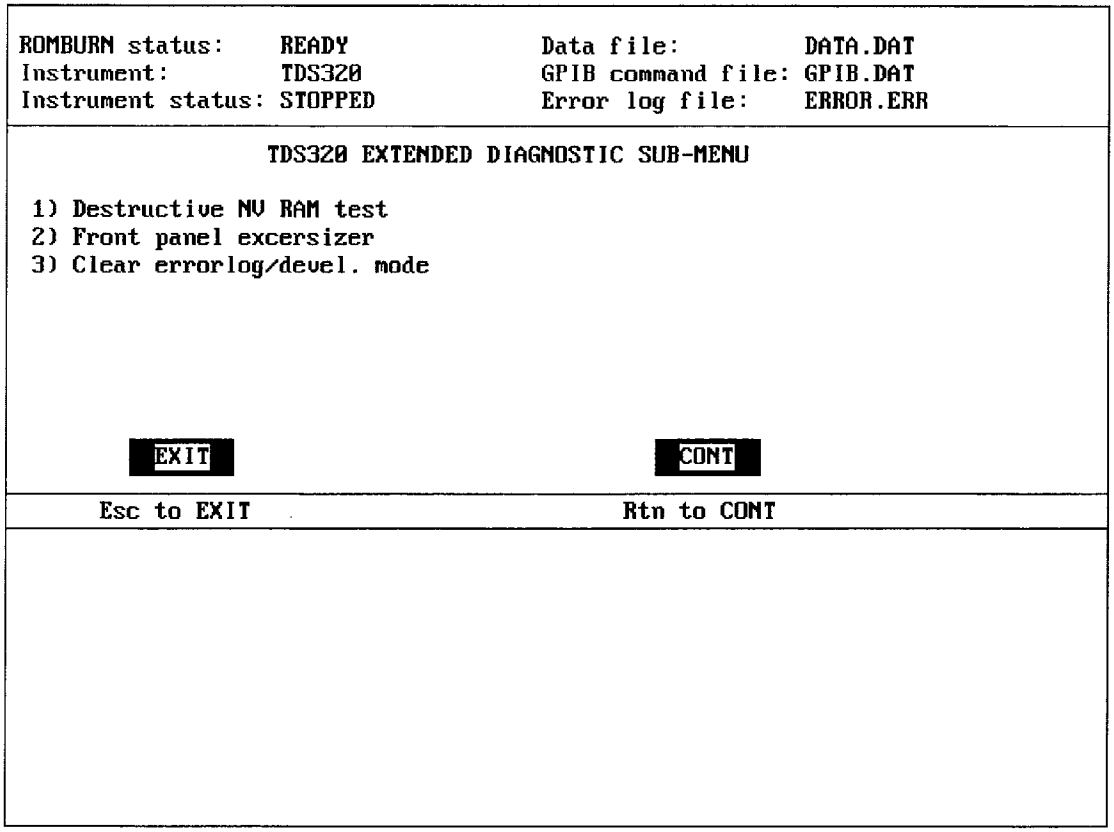


Figure 3–5: TDS Extended Diagnostic Sub-Menu

Destructive NV RAM Test. This command runs a destructive test on the nonvolatile RAM in the TDS.

CAUTION. *Since this test destroys all calibration constants, saved setups, and diagnostic error messages, you must be very careful when you use it.*

Front Panel Exerciser. This test runs an exerciser for the front panel to allow you to push any button or turn any knob on the front panel while the exerciser reports which button was pushed. After all buttons and knobs have been activated, the exerciser reports that the front panel is working properly. If you do not exercise a button or knob, there is no way to determine whether that particular button or knob works properly.

Clear Error log/devel. Mode. This command clears the instrument diagnostic error log and turns off the development mode.

TAS Extended Diagnostic Sub-Menu

Figure 3–6 shows a list of the diagnostic commands available for the TAS instruments.

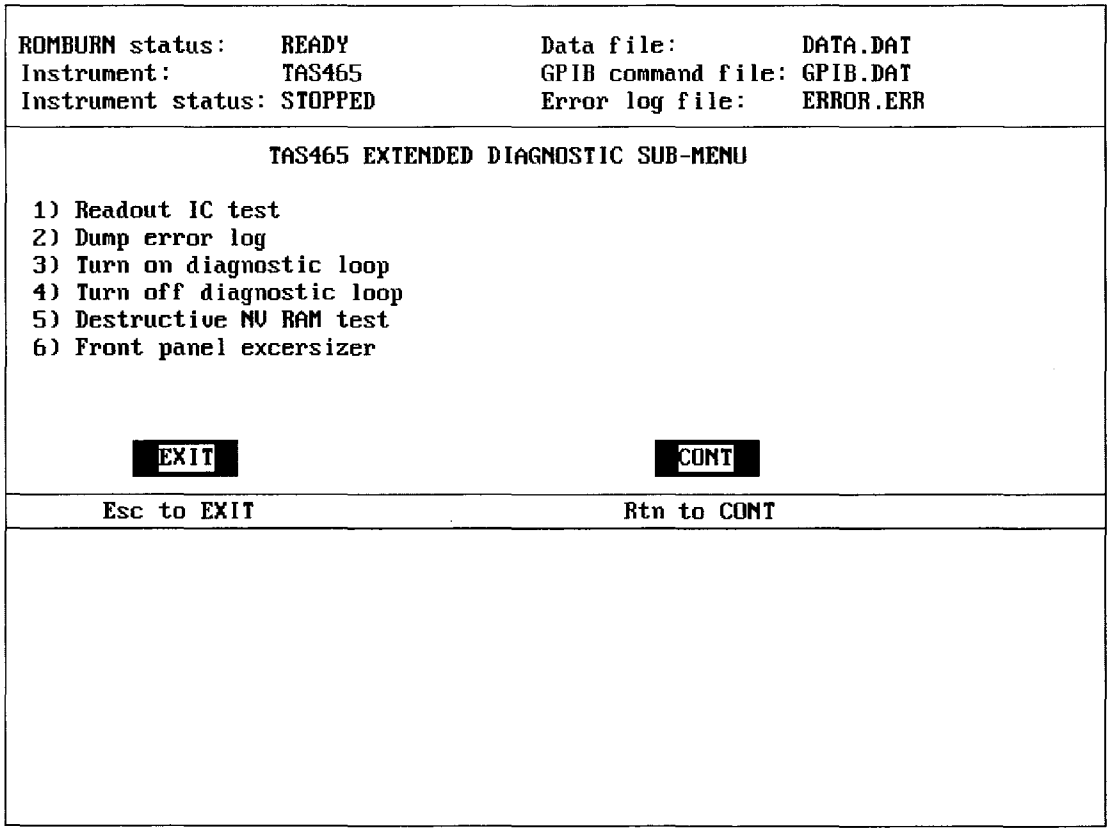


Figure 3–6: TAS Extended Diagnostic Sub-Menu

Readout IC Test. This command tests the TAS readout IC for faults.

Dump Error Log. This command allows you to take any diagnostic errors that have been saved in the TAS memory from the diagnostics and write them to the error log file.

Turn On Diagnostic Loop. This command allows you to turn on the TAS diagnostic looping mode. In this mode, the power-up diagnostics continuously loop and any errors are saved in the TAS memory. When you turn on the diagnostic looping mode, it clears any previous errors from memory.

Turn Off Diagnostic Loop. This command disables the diagnostic looping mode.

Destructive NV RAM Test. This command runs a destructive test on the nonvolatile RAM in the TAS.

CAUTION. *Since this test destroys all calibration constants, saved setups, and diagnostic error messages, you must be very careful when you use it.*

Front Panel Exerciser. This test runs an exerciser for the front panel to allow you to push any button or turn any knob (except focus and scale illum) on the front panel while the exerciser reports which button was pushed. After all buttons and knobs have been activated, the exerciser reports that the front panel is working properly. If you do not exercise a button or knob, there is no way to determine whether that particular button or knob works properly.

TWD Extended Diagnostic Sub-Menu

Figure 3–7 shows a list of the diagnostic commands available for the TWD instruments.

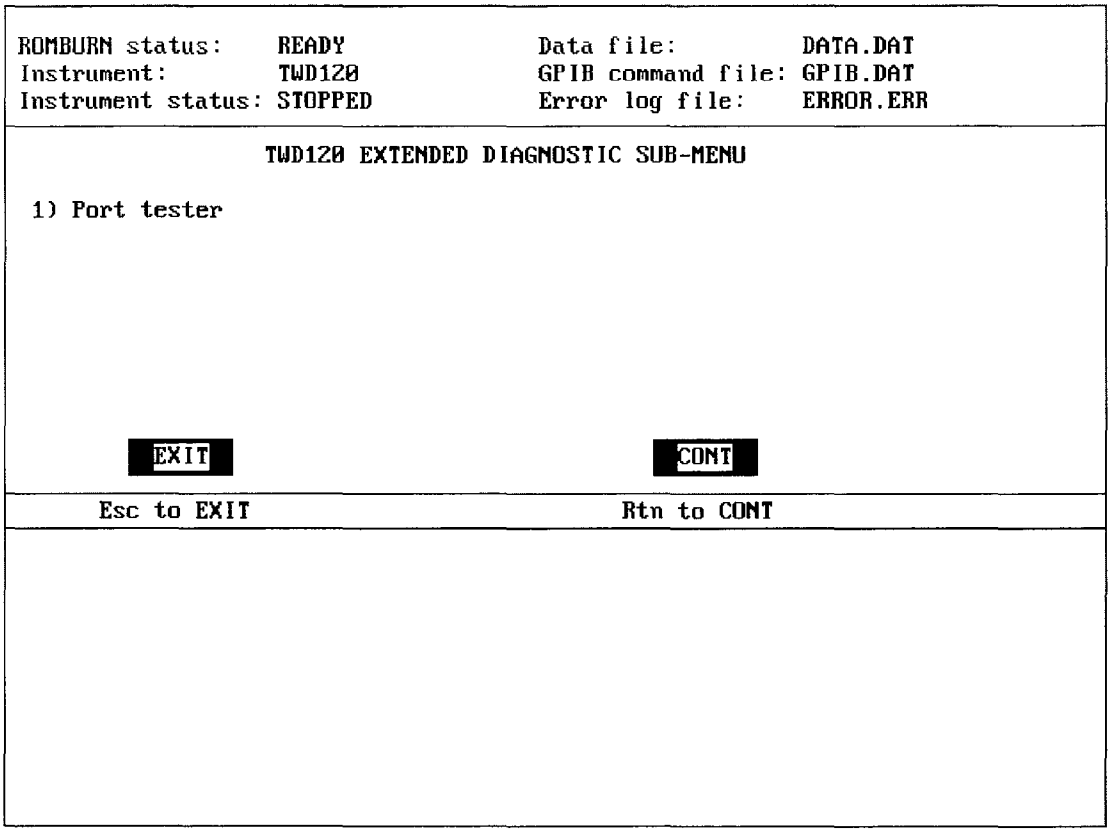


Figure 3–7: TWD Extended Diagnostic Sub-Menu

Port Tester. This command tests all communication ports on the TWD 120. It requires a SCSI board in the PC and SCSI, parallel, and serial cables as shown in Figures 1–8 and 1–9.

THS Extended Diagnostic Sub-Menu

Figure 3–8 shows that there are no diagnostic commands available for the THS 720 instrument.

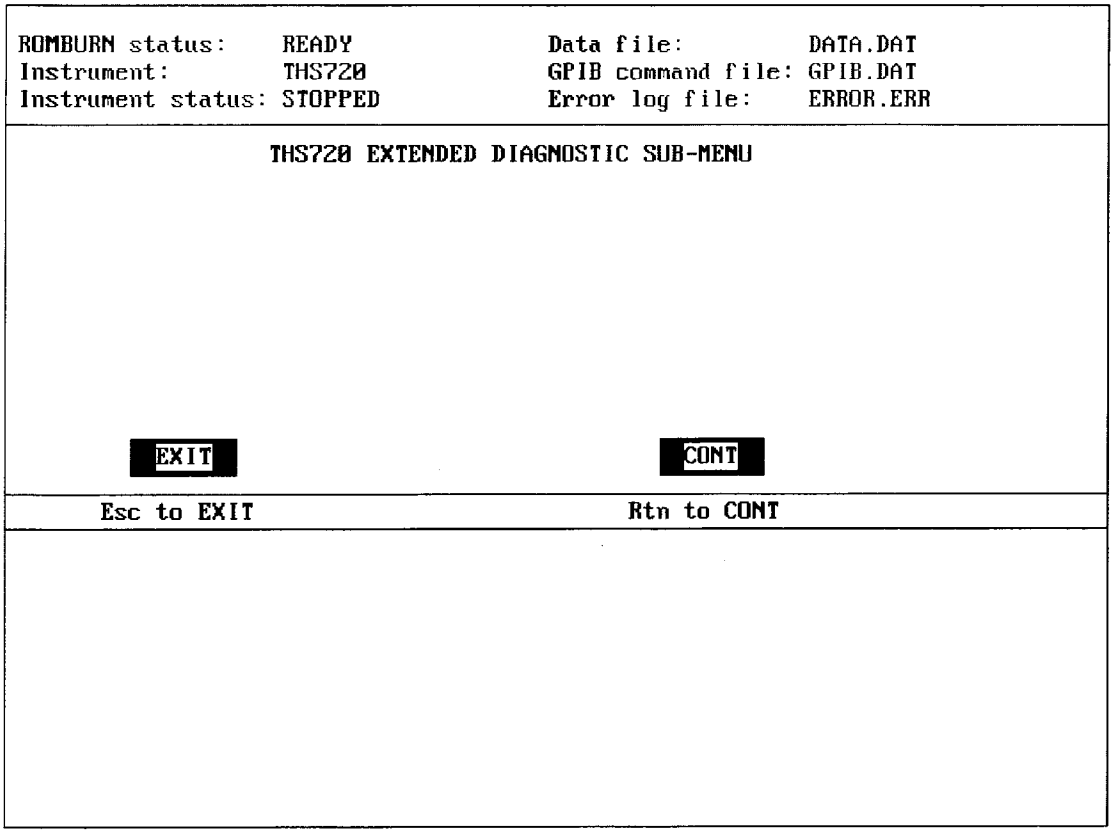


Figure 3–8: THS Extended Diagnostic Sub-Menu

Advanced Applications

The ROMBURN environment provides a menu–driven user interface. Although the menus are convenient, you are limited by the choices that these menus present. Also, when you use menus to do a task, sometimes you have to travel a few layers deep before you can accomplish it.

ROMBURN does provide you with ways (advanced applications) that you can do your tasks more efficiently without having to go through the menus or do the tasks that cannot be done using the menus only. Customizing the Extended Diagnostic Menu is such an example. In this section, you learn three advanced applications:

- Configuration File
- Command Line Options

- Extended Diagnostic File

Configuration File

Certain configuration information for the ROMBURN environment is stored in a configuration file called ROMBURN.CFG. This file tells you which communication port to use with the Motorola DI board or ICD board, the default name of the file to use when writing the TAS series diagnostic error log (TAS Extended Diagnostic Menu Selection 5), and the default target instrument type at power on (TAS, THS, TWD, or TDS). You can modify ROMBURN.CFG with any standard ASCII editor to make sure that you have the proper values for the environment parameters, such as which serial port on the PC you want to connect the pod to. Table 3–1 is an example of the ROMBURN.CFG file.

Table 3–1: ROMBURN.CFG Configuration File

Parameter	Example Value	Comment[1]
*DEFAULT_INSTRUMENT	TWD120	
*BKGND_COM_METHOD	PARALLEL	SERIAL or DI for use with Motorola DI board PARALLEL or ICD for use with Motorola ICD board
*DATA_FILE	[path]TWD120.PSD	[path] indicates an optional path; default is DATA subdirectory
*GPIB_FILE	[path]GPIB.DAT	[path] indicates an optional path; default is ROMBURN directory
*ERROR_FILE	[path]ERROR.DAT	[path] indicates an optional path; default is ROMBURN subdirectory
*SERIAL_COM_PORT	0	0 for COM1, 1 for COM2, ...
*PARALLEL_COM_PORT	0	0 for LPT1, 1 for LPT2, ...
*PARALLEL_TEST_PORT	0	for TWD 120 port test; 0 for LPT1, 1 for LPT2, ...
*GPIB_BOARD	0	Board number 0 or 1
*VERIFY	FALSE	Controls default state of verify downloads
*MOUSE_ON	TRUE	Mouse activated or not
*STARTUP_WAIT	30	Specifies, in seconds, the amount of time ROMBURN waits for instrument to boot after executing Option 9 of the Main Menu.
*DISPLAY_STATUS	FALSE	TRUE enables ROMBURN Status line to be displayed even when ROMBURN menu is turned off
*STATUS_LOCATOR	2401	Defines row and column positions of the ROMBURN Status line when *DISPLAY_STATUS is set TRUE. In this example, 2401 means row 24 and column 1 (near upper left corner of screen)
*TEMPORARY_FILESPEC	C:\RBTEMP.DAT	Specifies the path and name of a temporary (write and read) file used in conjunction with extended diagnostic tests.

[1] **In an actual ROMBURN.CFG file, there is no "Comment" column.**

Command Line Options

ROMBURN.EXE is a DOS program. When you type ROMBURN without any option at a DOS prompt, you immediately enter the "menu-driven" environment. However, if you only want to do a quick task and do not want to go through the different menus, you can just type ROMBURN with a valid option, and the task will be done immediately. The combination of the ROMBURN command and an option is called a Command Line. The general syntax for a command line is as follows:

```
ROMBURN option value
```

Option and value in the command line are not case-sensitive. The following is an example:

```
ROMBURN -E wrong
```

specifies "wrong" to be the default error log file. Table 3–2 shows all the available command line options.

Table 3–2: ROMBURN Command Line Options

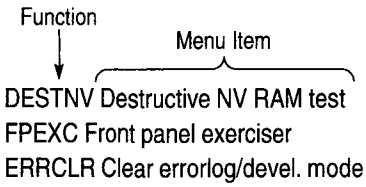
Option	Value	Description
–AE	true, false	Controls auto-exit after command line options
–BC	parallel, ICD	Specifies to use Motorola ICD board
	serial, DI	Specifies to use Motorola DI board
–C	1..16	Executes a ROMBURN configuration menu option
–D	datafile	Specifies instrument firmware data file and optional path
–E	errorfile	Specifies default error log file and optional path
–GB	0..1	Specifies GPIB board to use
–GF	gpibfile	Specifies GPIB command file and optional path
–GP	1..16	Executes a general purpose debug menu option
–H		Displays help information
–I	instrument	Specifies default instrument
–ID		Displays version number
–M	true, false	Controls the display of all menus
–MS	true, false	Controls the use of the mouse
–O	1..11,13	Executes a main menu option
–PP	0..X	Specifies which parallel port to use
–RB	0..X	Specifies the number of beeps that sound after the command line options execute
–SP	0..X	Specifies which serial port to use
–SW	0..X sec	Specifies wait time after booting instrument
–TF	filename	Specifies path and name of temporary file for diagnostic tests
–VB	true, false	Controls verbose mode
–VF	true, false	Controls verify download mode
–X	1..16	Executes an extended diagnostic menu option

Extended Diagnostic File

For each of the supported instruments, there is a instrument-specific Extended Diagnostic Sub-Menu. The list of functions on an Extended Diagnostic Sub-Menu is user configurable, so you can change it to add, remove, or reorder the functions. To make such changes, you perform the following steps:

1. Select from the ROMBURN\INSTR directory a file with filename in the form of xED.DAT, where x is the name of the instrument of your interest.
2. Use an ASCII editor to edit the file to be the way you want it.

The following is an example of a TDS350ED.DAT file. The first part of each line in the file specifies the function available, and the rest of the line will be displayed in the Extended Diagnostic Sub-Menu as a menu item.



WARNING

The following servicing instructions are for use only by qualified personnel. To avoid injury, do not perform any servicing other than that stated in the operating instructions unless you are qualified to do so. Refer to all Safety Summaries before performing any service.

Theory of Operation

This section discusses the theory of operation for the Communication Pod.

Circuit Description

Below is a technical circuit description of the following:

- Data Bus Buffering
- Clock Generation
- Memory Addressing
- LED Activation
- Chip Decoding
- RS-232 and GPIB Communication
- Eight Bit Read Register Addressing
- Twelve Volt Power Supply Configuration
- Motorola DI Board Mounting
- Motorola ICD Board Mounting

Data Bus Buffering

The data bus, upon entering the Communication Pod, is buffered by a 74HCT245 octal transceiver, to both reduce the capacitive loading and fanout requirements of the host instrument as well as to resolve potential timing problems. The transceiver is enabled by the chip select signal $\overline{\text{OPTION\_CS}}$ and the direction is controlled by R/$\overline{\text{W}}$.

Clock Generation

The Communication Pod has a surface mount 3.6864 MHz TTL level clock generator to provide a clock signal to the RS-232 and GPIB communication devices.

Memory Addressing

The pod has 128 Kbytes of flash ROM that is directly accessible by the host instrument's processor. This ROM resides at location 00000H + $\overline{\text{OPTION\_CS}}$ offset and is programmable by the processor. The pod also contains 32 Kbytes of RAM that is accessible from the processor; this RAM begins at location 20000H + $\overline{\text{OPTION\_CS}}$ offset.

LED Activation

There are four general purpose green LEDs for use by software as GPIB status lights, and other indicators. These LEDs are controlled by the parallel output port on the RS-232 communication device and are buffered by a 74LS125. They are active low, that is, the appropriate output pin on the RS-232 communication device must be at a logic zero to turn on the LED.

Chip Decoding

The four main devices, ROM, RAM, RS-232, and GPIB, are decoded using a 74F139 2-4 decoder, which is enabled with chip select signal $\overline{\text{OPTION\_CS}}$ and the appropriate device is selected with address lines ADDRESS17 and ADDRESS18. A 00 selects the ROM, 01 selects the RAM, and 11 selects either the GPIB communication device, RS-232 communication device, future centronics port, or the address register, depending on the states of ADDRESS15 and ADDRESS16.

RS-232 & GPIB Communication

RS-232 communication is controlled with a Motorola 68681. This chip has the necessary hardware for RS-232 communication as well as an auxiliary parallel output port. Level translation of the RS-232 signals is accomplished with a MAX238 level shifter. The level shifter is surface mounted to conserve space and requires only a 5 V supply. It has the capability to level shift four signals in each direction, only three in each direction are used with the 68681. The other level shifters are used to level shift the serial transmit and receive lines from the host instrument's processor, these signals may be gated to the DB9 connector by appropriate setting of the jumpers provided. External capacitors are required to generate the levels required for RS-232 communication; they are also surface mounted to conserve space. The base address of the 68681 is 68000H + $\overline{\text{OPTION\_CS}}$ offset. The GPIB communication is handled by a TI 9914 GPIB communication chip along with TI 75160 and TI 75161 data buffers. It is designed to not have parallel poll capability; that is, the output buffers are configured as totem-pole drivers for high speed communication. The 9914 TR signal is routed back to the processor via the signal OPTION_STAT for future use. The base address of the TI 9914 is 60000H + $\overline{\text{OPTION\_CS}}$ offset.

Eight Bit Read Register Addressing

The eight-bit read-only address register is located at 78000H + $\overline{\text{OPTION\_CS}}$ offset. A read from this address will enable the 74244 octal buffer and data programmed by the eight position DIP switch will be placed on the data bus. The eight bits may be used as general purpose programming bits. Each bit consists of a grounding DIP switch and a 10 kΩ pull-up resistor.

Twelve Volt Power Supply Configuration

A 12 V power supply is available for use in burning the flash ROMs. It uses a surface mount 12 V regulator that is capable of delivering 100 mA of current. This supply is configurable for either external switch or software control. If you select the external switch control via a jumper, the 12 V supply is controlled by a switch mounted on the front of the pod. If you select to use software control, the 12 V supply is controlled with an output bit from the RS-232 communication device. This is active low, which means the output pin of the 68681 must be low to turn on the 12 V supply. There is also a red LED that indicates if the 12 V supply is active. The power source is a plug-in wall transformer.

Motorola DI Board Mounting

If your ROMBURN pod comes with the Motorola DI board, you can mount Motorola's development board (BCCDI) to the GPIB pod via the connectors. This provides protection for the DI board in the manufacturing environment and provides a background connection to the processor board. In addition, address lines ADDRESS0 – ADDRESS18, BERR, $\overline{\text{OPTION\_CS}}$, R/$\overline{\text{W}}$, $\overline{\text{DS}}$, GND, and +5 V are also connected directly to the DI board. On the Communication Pod, there are two other background port connectors.

Motorola ICD Board Mounting

If your ROMBURN pod comes with the Motorola ICD board assembly, you can use it as a background communication port. This board is intended as a replacement for the obsolete DI board.

Refer to Figures 1–3 for the connection and pin assignment between the ICD board assembly cable and the J4 connector.

Performance Verification

This section describes the equipment that you need to do the Performance Verification to ensure that the Communication Pod is functioning properly with a TDS, TAS, or TWD instrument and provides the Performance Verification Procedure. You cannot verify performance of the Communication Pod using the THS.

Equipment Required

Figure 5–1 and 5–2 show the equipment that you need if you use a TDS or TAS oscilloscope with the ROMBURN pod having the Motorola DI or ICD board.

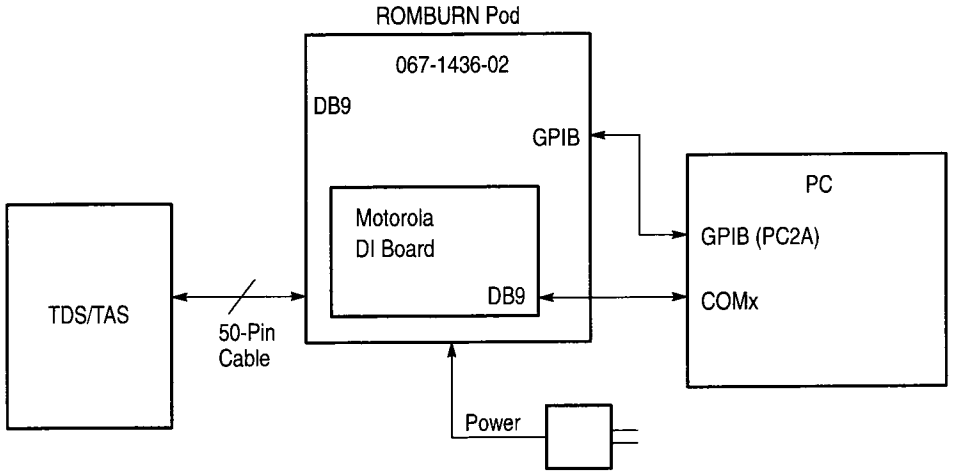


Figure 5–1: Performance Verification Configuration with TDS or TAS for ROMBURN Pod with DI Board

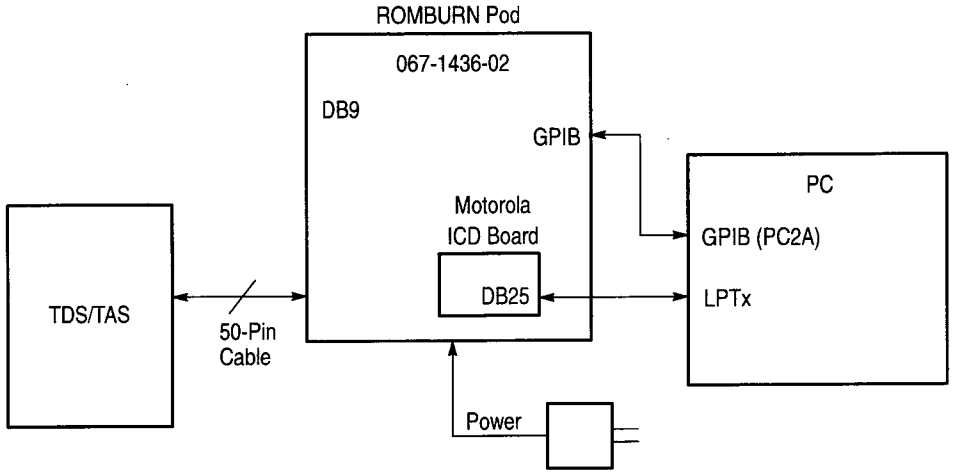


Figure 5–2: Performance Verification Configuration with TDS or TAS for ROMBURN Pod with ICD Board

Figure 5–3 and 5–4 show the equipment needed if you use a TWD oscilloscope with the ROMBURN pod having the Motorola DI or ICD board.

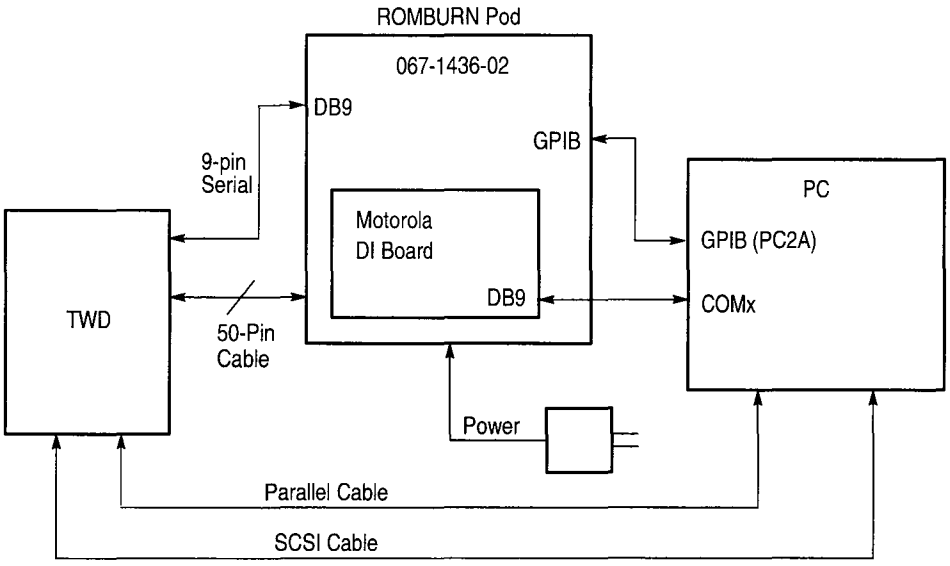


Figure 5–3: Performance Verification Configuration with TWD for ROMBURN Pod with DI Board

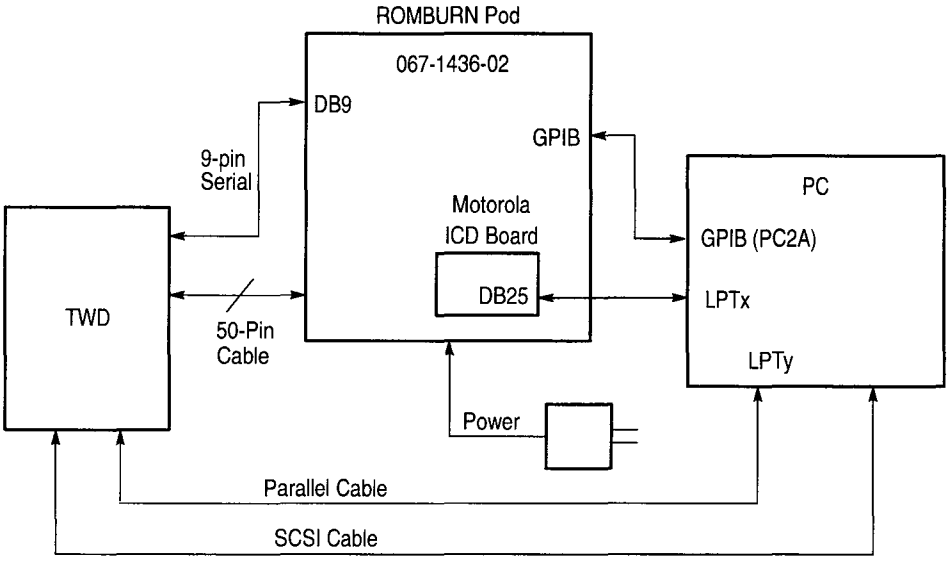


Figure 5–4: Performance Verification Configuration with TWD for ROMBURN Pod with ICD Board

Performance Verification Procedure

The following is the Performance Verification Procedure:

1. Set up the ROMBURN system as depicted in one of Figures 5–1 through 5–4 (see the *Getting Started* section for more detail) and apply power to all the equipment.
2. At the DOS prompt "C:\>", type:

   ```
   CD\ROMBURN
   ROMBURN
   ```

   The ROMBURN Main Menu appears on the PC screen.
3. Select item 12, **Select Instrument Type**, from the Main Menu; the Instrument Select Sub-Menu appears.
4. Choose the correct target instrument from the Instrument Select Sub-Menu.
5. Select **EXIT** to return to the Main Menu.
6. Select item 15, **General Purpose Debug Menu**, from the Main Menu; the Debug Sub-Menu appears.
7. Select item 12, **Test External Pod**, from the Debug Sub-Menu.
8. Follow the instructions on the screen, or hit <return> or **CONT** to receive the next instruction.

CAUTION. *ROM Test is the last step in the verification process and is destructive. Make sure that information in the ROM is not important. (ROM Test is not available for TDS.)*

9. Select **EXIT** and return to the Main Menu.

This completes the performance verification procedure.

Maintenance

This section contains the following information:

- procedures for inspecting and cleaning the Communication Pod
- instructions for removal and replacement of internal modules
- troubleshooting tree
- other information useful in maintenance and repair service of the pod

The service strategy for the Communication Pod is through Module Exchange. Any part that is listed in the *Replaceable Mechanical Parts* section is orderable from the factory.

Preparation

This manual is for qualified service personnel only. Before you proceed servicing the Communication Pod, you should familiarize yourself with it first by reading the *Operating Basics* section.

While installing or servicing the Communication Pod, follow the safety precautions as outlined in the *General Safety Summary* and *Service Safety Summary* sections.

Inspection and Cleaning

Accumulation of dust on components acts as an insulating blanket and prevents efficient heat dissipation. This condition can cause overheating and component breakdown. Periodic inspection and cleaning reduces instrument breakdown and increases instrument reliability.

CAUTION. *Spray-wash dirty parts with a cleaning solution listed under Interior Cleaning, then use deionized water to thoroughly wash all parts. Immediately dry all parts with a low-speed air blower.*

DO NOT use fluorocarbon-based spray cleaners, or chlorinated hydrocarbon cleaners; they may damage the circuit board material or plastic parts, and they may leave a dust-collecting residue.

To prevent damage from electrical arcing, ensure that all circuit board connectors are completely dry. Do this by heating the board in an oven at 75° C (176° F) for 15 minutes before installing into the Communication Pod and applying power.

Exterior Cleaning

Dust the exterior surfaces with a dry, lint-free cloth or a soft-bristle brush. If hard dirt remains, use a cloth or swab dampened with 50% mild detergent and warm water solution. The swab is also useful for cleaning in narrow spaces around controls and keys. Use the detergent solution for cleaning the display screen also. Do not use abrasive compounds on any part of the Communication Pod.

CAUTION. *To prevent damage to the equipment from water getting inside during external cleaning, use only enough water to dampen the cloth or swab.*

DO NOT use chemical cleaning agents as they may damage the plastics used in the Communication Pods. In particular, avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Interior Cleaning

Internal cleaning should be done with a clean, dry, low-velocity stream of air; however, take care not to aim the air stream directly at any other electrical part of the instrumentation. A soft-bristle brush is useful for cleaning around components. If a liquid must be used for minor cleaning, use isopropyl alcohol, denatured ethyl alcohol, or a solution of 1% mild detergent and 99% deionized water.

Inspection

Inspect internal modules for broken connections, poorly seated components, leaking capacitors, damaged hardware, and heat-damaged components.

Repair any obvious problems. However, take particular care if you find any heat-damaged parts. Overheating usually indicates other circuit problems. To prevent recurrence of the damage, find and correct the cause of the overheating. Note that replacement of electrical components may necessitate readjustment of circuitry. Refer to the *Replaceable Mechanical Parts* section for part and component descriptions.

Removal/Replacement Instructions

This section lists the tools needed for maintenance of the Communication Pod and describes the Removal and Replacement procedures for the major modules of the ROMBURN Pod.

Maintenance Tools List

The tools that are most often needed when servicing the Communication Pod are as follows:

- Soldering iron (18 W)
- Rosin core solder (60/40)
- Lint-free cloth
- Soft-bristle brush
- IC extractor
- Desoldering tool
- Solder wick
- Slotted screwdriver
- Magnetic screwdriver ($^1/_4$ inch drive)
- Torx-drive bits, T-15, for magnetic screwdriver

In the following procedures, directional terms (top, bottom, left, right, etc.) are based on the assumption that your instrument is in a normal, upright position and that you are facing the front of the instrument.

Installation or reassemble procedures are the reverse of the disassembly procedures unless otherwise noted. In some cases, installation hints are provided to aid in assembly procedures.

Removing Pod Cover

To remove the cover:

1. Disconnect all external cables to the Communication Pod.
2. Turn the pod upside down (see Figure 6–1).
3. Remove the four T-15 Torx-drive screws at the corners.
4. Remove the bottom (which is now on top) of the pod.

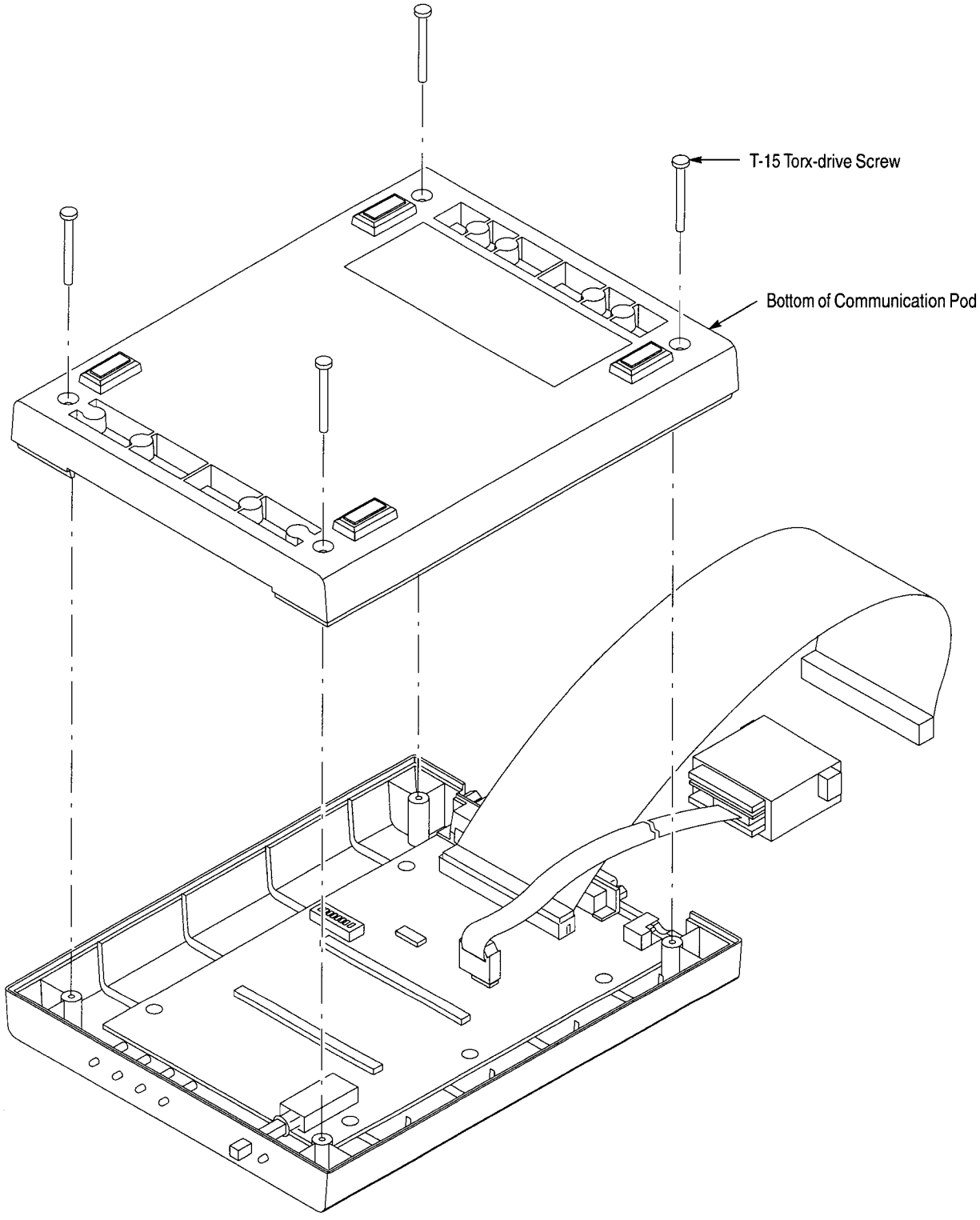


Figure 6–1: Removing Pod Cover

Removing ICD Board Assembly

CAUTION. *The ICD board is very sensitive to static, you must take the proper precautions to prevent damages due to static.*

The Motorola ICD board assembly is connected to a parallel port, such as LPT1 or LPT2, on the PC. To remove the ICD board assembly, perform the following steps:

1. Detach the parallel cable from the ICD board assembly.
2. Remove the pod cover as described on page 6–3.
3. Disconnect the ICD board assembly cable from connector J4.

Removing DI Board

CAUTION. *The DI board is very sensitive to static, you must take the proper precautions to prevent damages due to static.*

The Motorola DI board is located at the center of the pod and mounted on the main board. To remove the DI board, perform the following steps:

1. Detach the cable from the side of the DI board.
2. Pull the DI board apart from the main board.

Removing Main Board

To remove the Main board, perform the following steps:

1. Remove the switch cover from the front of the pod.
2. Detach the five LEDs from the board.
3. Detach all cables at the back of the pod.
4. Remove the six T-15 Torx-drive screws from the board.

Troubleshooting Procedures

Before you begin troubleshooting, read through this section to familiarize yourself with its contents. This section covers three topics, Troubleshooting Equipment, Troubleshooting Precautions, and General Troubleshooting Information.

Troubleshooting Equipment

Tools required to service these instruments are those commonly found in an electronic technician's tool kit.

Troubleshooting Precautions

The Communication Pod is a very static sensitive device. You must adhere to the cautionary guidelines and practices in static prevention when handling it.

Troubleshooting Tree

The following flow-chart provides general troubleshooting guidelines for circuitry and modules not supported with diagnostics firmware/software.

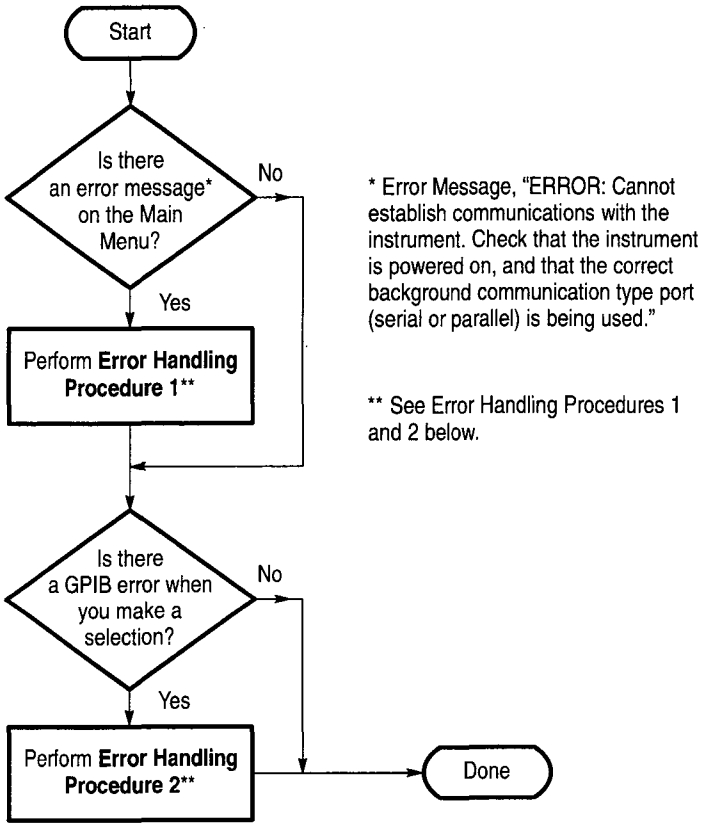


Figure 6–2: Troubleshooting Procedure for ROMBURN System Software

Error Handling Procedure 1. Perform this procedure if there is an error message on the ROMBURN Main Menu:

1. Verify that instrument is turned on.
2. Verify that pod is correctly plugged into the instrument, with pin 1 on the 50 pin connector matching pin 1 on the instrument's circuit board connector. Refer to the *Getting Started* section.
3. If you are using the Motorola ICD board assembly, go to step 8. Otherwise, verify that the Motorola DI board is installed correctly in the Communication Pod.
4. Verify that the RS-232 cable between the DI board (inside the pod) and the PC is constructed correctly. (See Figures 1–1 and 1–2.)
5. Verify that the *SERIAL_COM_PORT line in the ROMBURN.CFG file is set to match the serial port being used:

   *SERIAL_COM_PORT 0 (com 1)
   *SERIAL_COM_PORT 1 (com 2)
   . . .

6. Verify that the *BKGND_COM_METHOD parameter in the ROMBURN.CFG file is set to either SERIAL or DI.
7. Stop if you are using the Motorola DI board.
8. Verify that the Motorola ICD board is installed correctly in the Communication Pod.
9. Verify that the *PARALLEL_COM_PORT line in the ROMBURN.CFG file is set to match the parallel port being used:

   *PARALLEL_COM_PORT 0 (LPT1)
   *PARALLEL_COM_PORT 1 (LPT2)
   . . .

10. Verify that the *BKGND_COM_METHOD parameter in the ROMBURN.CFG file is set to either PARALLEL or ICD.

Error Handling Procedure 2. Perform this procedure if you receive a GPIB error:

1. Verify that a GPIB cable is connected between the PC and the Communication Pod.
2. Verify that the GPIB board being used is a National Instruments PC2/2A board with an assembly number that begins with "180" or "181".
3. Verify that the number of the board being used matches the *GPIB_BOARD setting in the ROMBURN.CFG file.
4. Verify that the correct version of GPIB.COM is installed for the GPIB board in use. When in doubt, use version C.13 or version 2.1.1 or later.

Replaceable Electrical Parts

This section contains a list of the electrical components for the Communication Pod. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest circuit improvements. Therefore, when ordering parts, it is important to include the following information in your order.

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

Using the Replaceable Electrical Parts List

The tabular information in the Replaceable Electrical Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes each column of the electrical parts list.

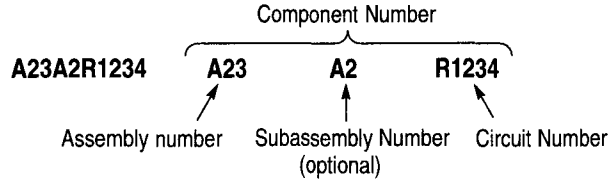
Parts List Column Descriptions

Column	Column Name	Description
1	Component Number	The component number appears on diagrams and circuit board illustrations, located in the diagrams section. Assembly numbers are clearly marked on each diagram and circuit board illustration in the *Diagrams* section, and on the mechanical exploded views in the *Replaceable Mechanical Parts* list section. The component number is obtained by adding the assembly number prefix to the circuit number (see Component Number illustration following this table). The electrical parts list is arranged by assemblies in numerical sequence (A1, with its subassemblies and parts, precedes A2, with its subassemblies and parts). Chassis-mounted parts have no assembly number prefix, and they are located at the end of the electrical parts list.
2	Tektronix Part Number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial Number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entry indicates the part is good for all serial numbers.
5	Name & Description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
6	Mfr. Code	This indicates the code number of the actual manufacturer of the part.
7	Mfr. Part Number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations

Abbreviations conform to American National Standard ANSI Y1.1–1972.

Component Number



Read: Resistor 1234 (of Subassembly 2) of Assembly 23

List of Assemblies

A list of assemblies is located at the beginning of the electrical parts list. The assemblies are listed in numerical order. When a part's complete component number is known, this list will identify the assembly in which the part is located.

Chassis Parts

Chassis-mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts List.

Mfr. Code to Manufacturer Cross Index

The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers Cross Index

Mfr. Code	Manufacturer	Address	City, State, Zip Code
TK0AY	JAPAN SOLDERLESS TERMINAL MFG CO LTD	1–4–1 HIGASH I–MACHI SHINSENRI TOYONAKA–CITY	OSAKA JAPAN
TK1146	MITSUBISHI ELECTRONICS	1050 E ARQUES AVENUE	SUNNYVALE CA 94086
TK2236	INTERNATIONAL IMPORTERS INC	5221 S MILLARD AVE	CHICAGO IL 60632
TK2520	NEC WORLD PRODUCTS	19654 8TH STREET PO BOX 517	SONOMA CA 95476
0H1N5	MARCON AMERICA CORP	998 FIRST EDGE DRIVE	VERNON HILLS IL 60061
0JR04	TOSHIBA AMERICA INC ELECTRONICS COMPONENTS DIV	9775 TOLEDO WAY	IRVINE CA 92718
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPY PO BOX 655303	DALLAS TX 75262–5303
04222	AVX CERAMICS DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR	5005 E MCDOWELL RD	PHOENIX AZ 85008–4229
09353	C AND K COMPONENTS INC	15 RIVERDALE AVE	NEWTON MA 02158–1057
1CH66	PHILIPS SEMICONDUCTORS	811 E ARQUES AVENUE PO BOX 3409	SUNNYVALE CA 94088–3409
1ES66	MAXIM INTEGRATED PRODUCTS INC	120 SAN GABRIEL DRIVE	SUNNYVALE CA 94086
14936	GENERAL INSTRUMENT CORP POWER SEMICONDUCTOR DIV	600 W JOHN ST	HICKSVILLE NY 11802–0709
27014	NATIONAL SEMICONDUCTOR CORP	2900 SEMICONDUCTOR DR	SANTA CLARA CA 95051–0606
31918	ITT SCHADOW INC	8081 WALLACE RD	EDEN PRAIRIE MN 55344–2224
34335	ADVANCED MICRO DEVICES	901 THOMPSON PL PO BOX 3453	SUNNYVALE CA 94086–3413
50139	ALLEN–BRADLEY CO ELECTRONIC COMPONENTS	1414 ALLEN BRADLEY DR	EL PASO TX 79936
53387	MINNESOTA MINING MFG CO	PO BOX 2963	AUSTIN TX 78769–2963
55680	NICHICON /AMERICA/ CORP	927 E STATE PKY	SCHAUMBURG IL 60195–4526
58050	TEKA PRODUCTS INC	45 SALEM ST	PROVIDENCE RI 02907
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
91637	DALE ELECTRONICS INC	2064 12TH AVE PO BOX 609	COLUMBUS NE 68601–3632

Replaceable Electrical Parts List

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A8	671–2554–00			CIRCUIT BD ASSY:COMMUNICATION	80009	671255400
A10	118–8980–00			CIRCUIT BD ASSY:DEVELOPMENT INTERFACE (NO REPLACEABLE PARTS–ORDER AS ASSEMBLY)	80009	118898000
A10	118–9223–00			CIRCUIT BD ASSY: ICD (NO REPLACEABLE PARTS–ORDER AS ASSEMBLY)	80009	118922300

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A8	671-2554-00			CIRCUIT BD ASSY:COMMUNICATION	80009	671255400
A8C1	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C2	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C3	290-5017-00			CAP,FXD,TANT:4.7UF,20%,20V,6.0MM X 3.2MM;6032,SMD	04222	TAJC475M020R
A8C4	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C5	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C6	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C7	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C8	290-5017-00			CAP,FXD,TANT:4.7UF,20%,20V,6.0MM X 3.2MM;6032,SMD	04222	TAJC475M020R
A8C9	290-5017-00			CAP,FXD,TANT:4.7UF,20%,20V,6.0MM X 3.2MM;6032,SMD	04222	TAJC475M020R
A8C10	290-5002-00			CAP,FXD,TANT:DRY;10UF,20%,20V,TANT OXIDE,0.287X0.170	0H1N5	20MC106MDTER
A8C11	290-5002-00			CAP,FXD,TANT:DRY;10UF,20%,20V,TANT OXIDE,0.287X0.170	0H1N5	20MC106MDTER
A8C12	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C13	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C14	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C15	290-0845-00			CAP,FXD,ELCTLT:330UF,+50-10%,25V	55680	UVX1H331MPA
A8C16	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C17	283-5004-00			CAP,FXD,CERAMIC:MLC;0.1UF,10%,25V,X7R,1206	04222	12063C104KAT3A
A8C18	290-5017-00			CAP,FXD,TANT:4.7UF,20%,20V,6.0MM X 3.2MM;6032,SMD	04222	TAJC475M020R
A8CR1	152-0585-00			DIODE,RECT:,;BRIDGE,200V,1A,50A IFSM,1.0VFAT 1A	14936	W02G-1
A8CR2	152-5047-00			DIODE,SIG:,ULTRA FAST;100V,0.74VF,4NS,2.0PF,COM-CATH	27014	MMBD1204
A8J2	131-5267-00			CONN,HDR:PCB,;MALE,STR,2 X 40,0.1 CTR,0.235	00779	104326-4
A8J3	131-5267-00			CONN,HDR:PCB,;MALE,STR,2 X 40,0.1 CTR,0.235	00779	104326-4
A8J4	131-2401-00			CONN,HDR:PCB,;MALE,STR,2 X 25,0.1 CTR,0.230	58050	082-2544-SD10
A8J5	131-3147-00			CONN,HDR:PCB,;MALE,STR,2 X 25,0.1 CTR,0.365D	53387	2550-6002UB
A8J6	131-3985-00			CONN,RIBBON:PCB/PNL,;FEMALE,RTANG,24 POS,0.085CTR	00779	553811-1
A8J7	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230	58050	082-3644-SS10
A8J8	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230	58050	082-3644-SS10
A8J9	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230	58050	082-3644-SS10
A8J10	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230	58050	082-3644-SS10
A8J11	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230	58050	082-3644-SS10
A8J12	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230	58050	082-3644-SS10
A8J13	131-4368-00			JACK,POWER DC:PCB,;MALE,RTANG,2MM PIN,8.5MM	TK2236	DC12-2.0
A8J14	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230	58050	082-3644-SS10
A8J15	131-1857-00			CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230	58050	082-3644-SS10
A8K1	148-1023-00			RELAY,ARM:2 FORM C;5VDC COIL,1A SWITCHING,50M OHM	TK2520	EB2-5NUL

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A8P1	131-3925-00			CONN,DSUB:PCB,;FEMALE,RTANG,9 POS,0.112 CTR	TK0AY	JEY-9S-1A3F-14
A8Q1	151-5000-00			TRANSISTOR,SIG:BIPOLAR,PNP;40V,200MA,250MHZ,AMP	04713	MMBT3906LT1
A8R1	321-5008-00			RES,FXD:THICK FILM;150 OHM,1%,0.125W	50139	BCK1500FT
A8R2	321-5008-00			RES,FXD:THICK FILM;150 OHM,1%,0.125W	50139	BCK1500FT
A8R3	321-5008-00			RES,FXD:THICK FILM;150 OHM,1%,0.125W	50139	BCK1500FT
A8R4	321-5008-00			RES,FXD:THICK FILM;150 OHM,1%,0.125W	50139	BCK1500FT
A8R5	307-5020-01			RES NTWK,FXD,FI:10K X 8,1%,0.25W,SOMC-1603-1002F	91637	SOMC-1603-1002F
A8R6	321-5281-00			RES,FXD:THICK FILM;2K OHM,1%,0.125W	91637	CRCW1206-2001FT
A8R7	321-5014-00			RES,FXD:THICK FILM;475 OHM,1%,0.125W	50139	BCK4750FT
A8R8	321-5281-00			RES,FXD:THICK FILM;2K OHM,1%,0.125W	91637	CRCW1206-2001FT
A8R9	321-5030-00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W	50139	BCK1002FT
A8R10	321-5030-00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W	50139	BCK1002FT
A8R11	321-5030-00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W	50139	BCK1002FT
A8R12	321-5030-00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W	50139	BCK1002FT
A8R13	321-5030-00			RES,FXD:THICK FILM;10.0K OHM,1%,0.125W	50139	BCK1002FT
A8S1	260-5000-00			SWITCH,SLIDE:SPST;8 POSITION,GOLD OVER NICKEL	09353	LD08HOSK1
A8S2	260-2443-00			SWITCH,PWR:DPDT;PUSH PUSH ALT ACT,PC PINS,6A	31918	NE18-00-EE-N-47
A8U1	156-5071-01			IC,DIGITAL:HCTCMOS,TRANSCEIVER;OCTAL,3-STATE	0JR04	TC74HCT245AFWE
A8U2	156-5191-01			IC,DIGITAL:FTTL,DEMUX/DECODER;DUAL 1-OF-4	04713	MC74F139DR2
A8U3	156-5020-00			IC,DIGITAL:CMOS,GATE;HEX INV	1CH66	HEF4069UBTD
A8U4	156-6085-01			IC,MEMORY:CMOS,EPROM;128K X 8,200NS,FLASH	34335	AM28F010A-200JC
A8U5	156-5266-01			IC,MEMORY:CMOS,SRAM;32K X 8,100NS,OE	TK1146	M5M5256BFP-10L
A8U6	156-6031-01			IC,PROCESSOR:NMOS,PERIPHERAL;DUAL ASYNCH	04713	MC68681FNR2
A8U7	156-6423-00			IC,MISC:CMOS,INTERFACE;QUAD RS-232 LINE DRIV/REC	1ES66	MAX238CWGC7036
A8U8	156-6223-00			IC,PROCESSOR:NMOS,PERIPHERAL;GPIB CONTROLLER	01295	TMS9914AFNL
A8U9	156-5580-01			IC,DIGITAL:TTL,OCTAL GPIB TRANSCEIVER,DATABUS	01295	SN75160BDWR
A8U10	156-5581-01			IC,DIGITAL:TTL,BUS TRANSCEIVER,OCTAL GPIB,BUS MNG	01295	SN75161BDWR
A8U11	156-5034-00			IC,DIGITAL:LSTTL,BUFFER;NONINV, OCTAL, LINE	01295	SN74LS244D
A8U12	156-5079-00			IC,DIGITAL:LSTTL,BUFFER;QUAD BUS, 3-STATE	01295	SN74LS125AD
A8U13	156-6035-00			IC,LINEAR:BIPOLAR,VOLT REG;POSI,+12V,100MA,4%	01295	UA78L12ACD

Diagrams

Table 8–1 describes the wiring of the 671-3682-XX adapter board used to connect the Communication Pod to the THS instrument. Schematic diagrams for the Communication Pod follow this table.

Table 8–1: Adapter Board Wiring

Pins of 80-Pin Connector (Connects to THS) *	Pins of 50-Pin Connector (Connects to Communication Pod)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27

Table 8–1: Adapter Board Wiring (Cont.)

Pins of 80-Pin Connector (Connects to THS) *	Pins of 50-Pin Connector (Connects to Communication Pod)
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	NC
49	NC
50	NC
51	NC
52	NC
53	NC
54	NC
55	NC
56	NC
57	NC
58	NC
59	NC
60	NC

Table 8–1: Adapter Board Wiring (Cont.)

Pins of 80-Pin Connector (Connects to THS) *	Pins of 50-Pin Connector (Connects to Communication Pod)
61	NC
62	NC
63	NC
64	NC
65	NC
66	NC
67	NC
68	NC
69	NC
70	NC
71	NC
72	NC
73	NC
74	NC
75	NC
76	NC
77	NC
78	NC
79	NC
80	NC

* **One end of bypass capacitors connects to pins 5 and 43; the other end connects to pins 11, 17, 23, 28, 33 and 38.**

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATION

SYMBOLS

Graphic symbol and class designation letters are based on ANSI Y32.14, 1973 in terms of positive logic. logic symbols are depicted according to the manufacturer's data book information (not according to function).

Letter symbols for quantities used in electrical science and electrical engineering are based on ANSI Y10.5, 1968.

Drafting practices, line conventions, and lettering conform to ANSI Y14.12, 1966 and ANSI Y14.2, 1973.

Abbreviations are based on ANSI Y1.1, 1972.

You can inquire about these ANSI standards by contacting:

American National Standard Institute
1430 Broadway
New York, New York 10018

COMPONENT VALUES

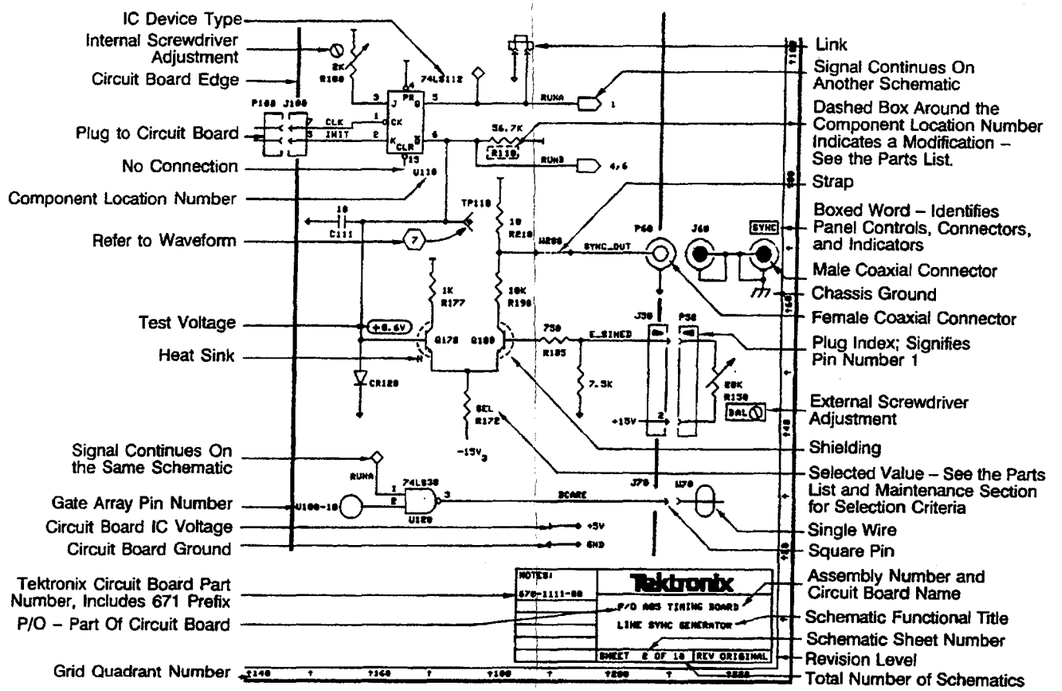
Electrical components shown on the diagram are in the following units unless noted otherwise:

Capacitors = Values one or greater are in picofarads (pF)
Values less than one are in microfarads (μF)

Resistors = Ohms (Ω)

ACTIVE–LOW SIGNAL INDICTORS

A common convention used for indicating an active–low signal (a signal performing its intended function when it is in a low state) is an overbar, as shown in the signal name $\overline{\text{RESET}}$. The overbar may be used in this manual whenever a reference is given to an active–low signal. However, the same active–low signal is indicated on the schematic with a tilde (~), or a slash (*) following the signal name (e.g., RESET ‘ or RESET*).



The information and special symbols below may appear in this manual.

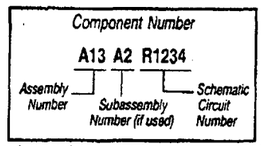
ASSEMBLY NUMBERS

Each assembly in the instrument is assigned as assembly number e.g., A5). The assembly number appears in the title of each:

- schematic diagram (lower right corner)
- circuit board component location look up table (when shown).
- schematic or circuit board component location look up table (when shown).

The Replaceable Electrical Parts list is arranged by assemblies in numerical order. The components are listed alphabetically by component location numbers. Look at the following example to see how to construct a component number.

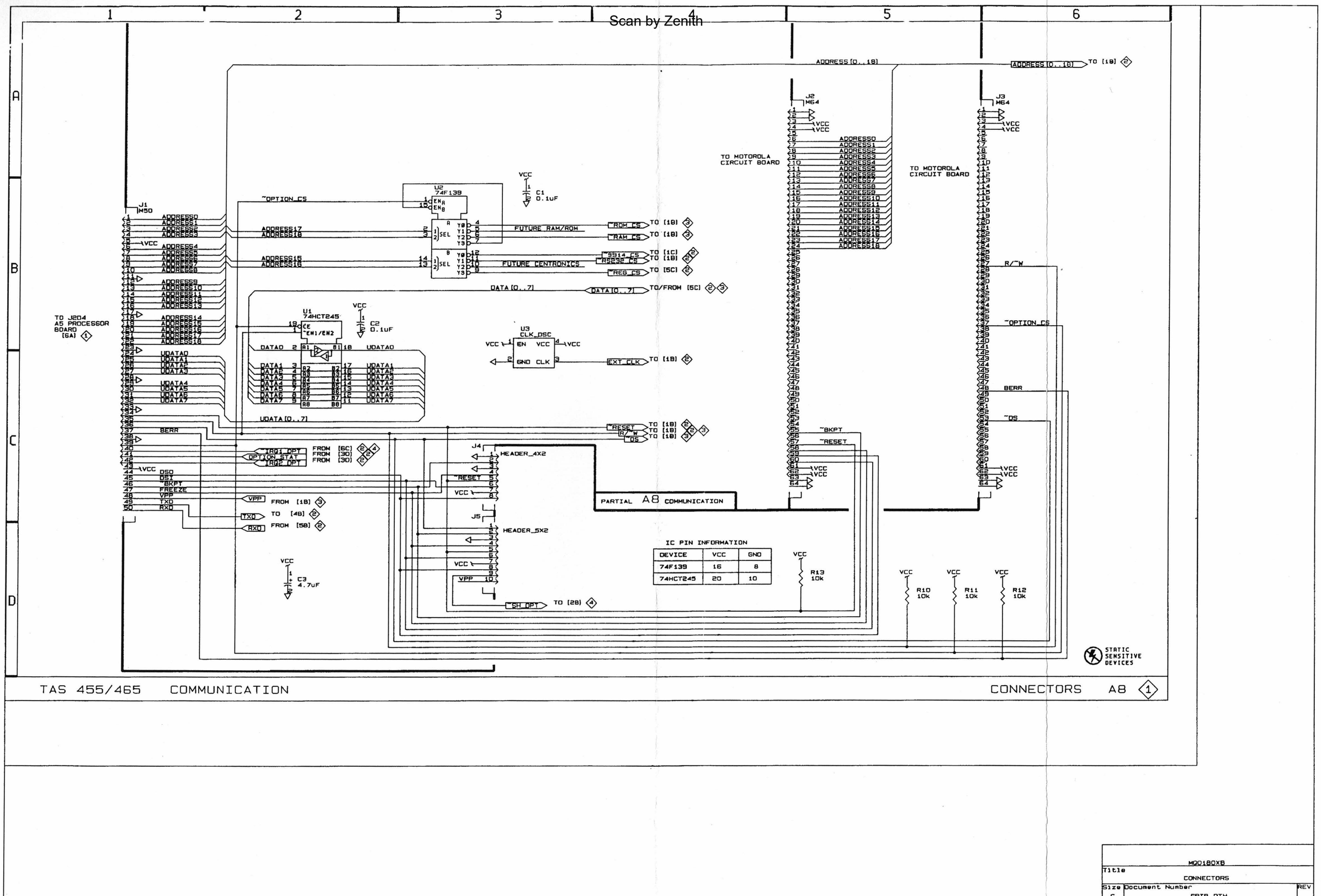
COMPONENT NUMBER EXAMPLE



Chassis mounted components have no Assembly Number prefix – see end of Replaceable Parts List.

GRID COORDINATES

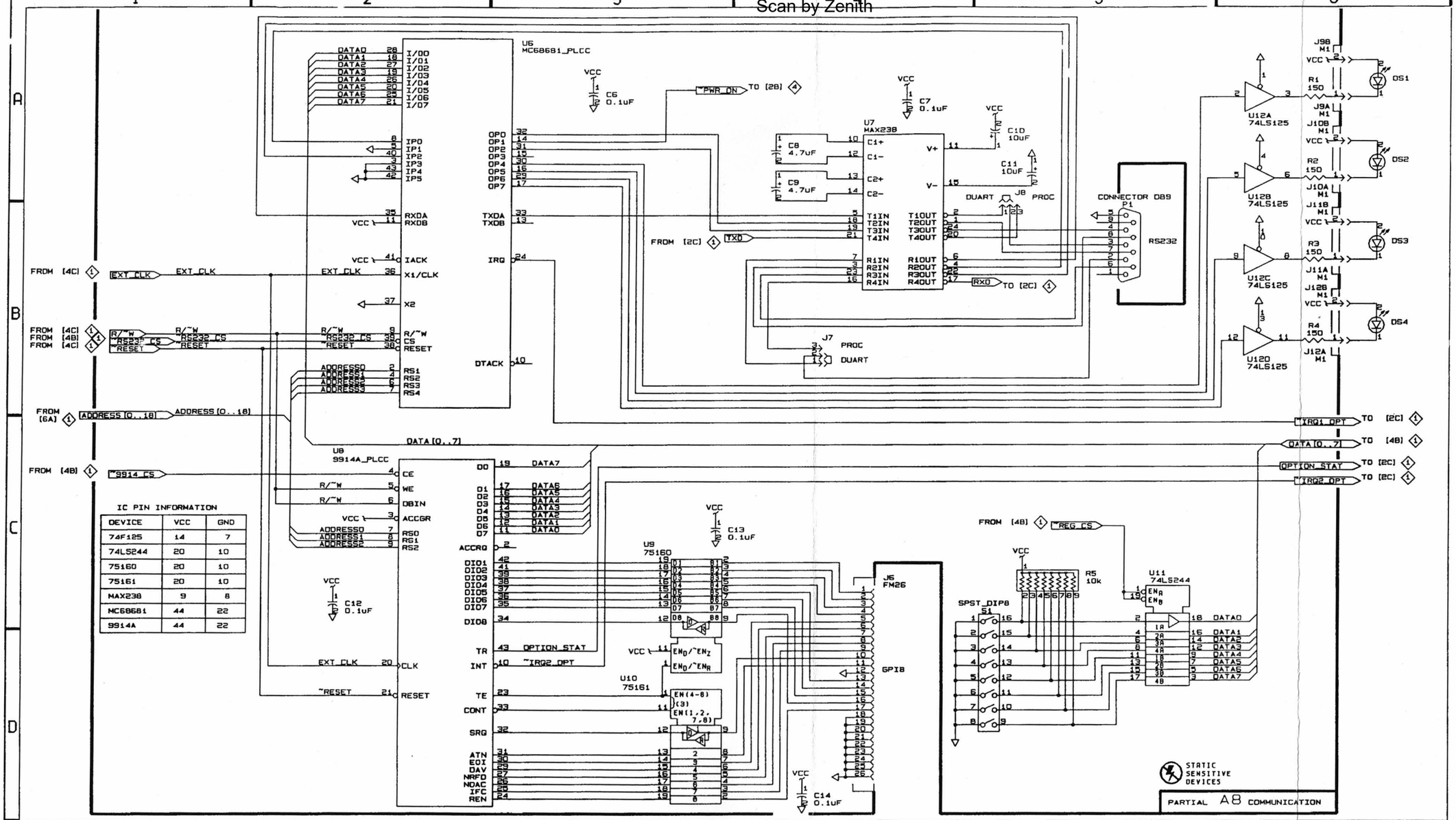
The schematic diagram(s) and circuit board component location illustration both have grids. A look up table (when shown) provides grid coordinates for ease of locating components. There may be two tables for each assembly: one for the circuit board component location illustration and one for the schematic diagram(s).



TAS 455/465 COMMUNICATION

CONNECTORS A8 1

	MQ0180XB	
Title	CONNECTORS	
Size C	Document Number GPIB_DTH	REV
Date: May 19, 1992	Sheet 1 of 5	



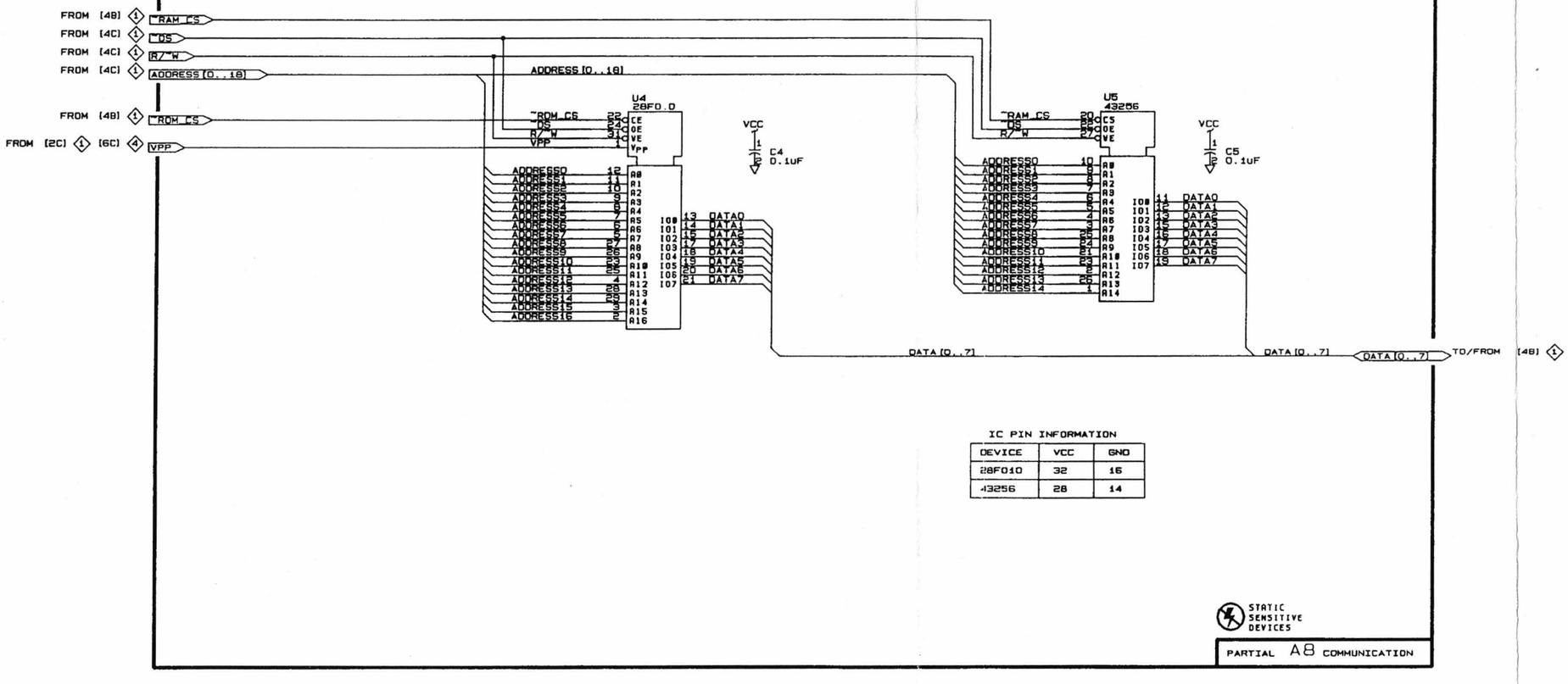
IC PIN INFORMATION

DEVICE	VCC	GND
74F125	14	7
74LS244	20	10
75160	20	10
75161	20	10
MAX238	9	8
MC68681	44	22
9914A	44	22

TAS 455/465 COMMUNICATION

RS232 & GPIB INTERFACE A8

MQ0180XB		
Title: RS232 & GPIB INTERFACE		
Size: C	Document Number: GPIB_IO	REV
Date: May 5, 1992	Sheet 2 of 5	

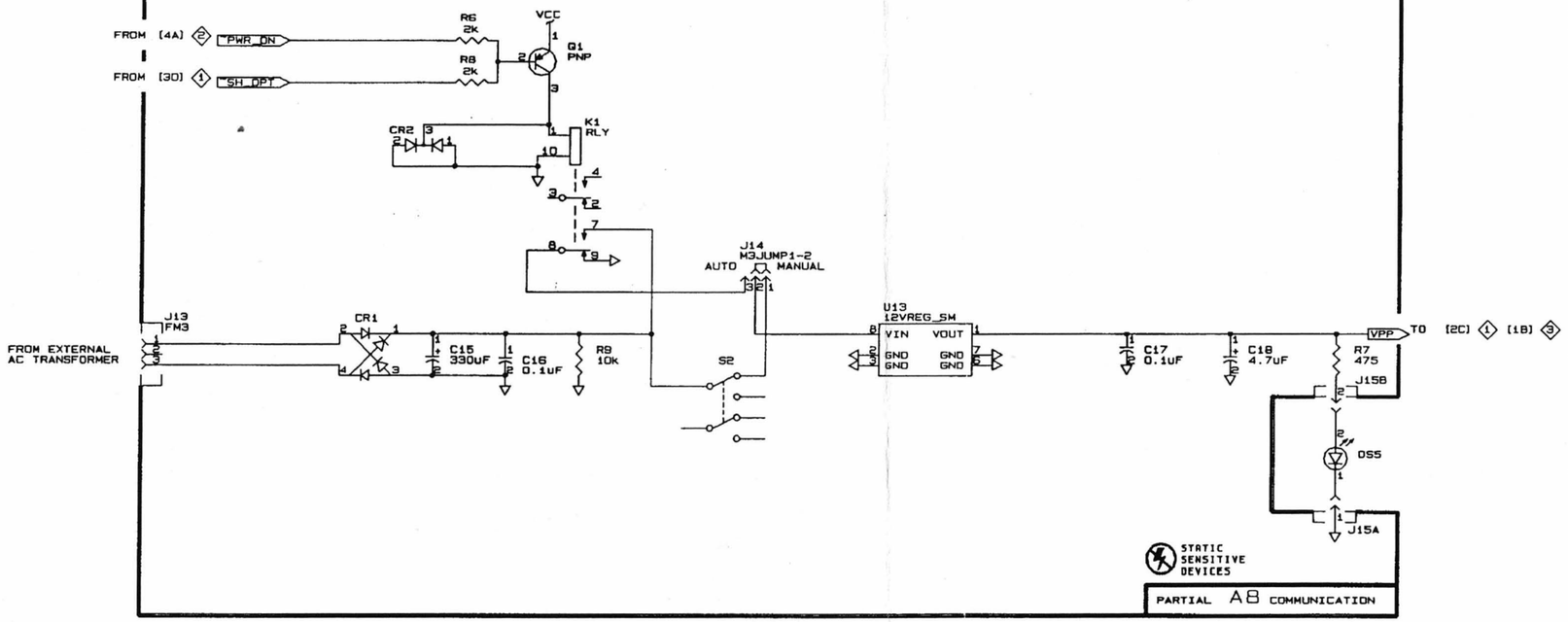


IC PIN INFORMATION

DEVICE	VCC	GND
28F010	32	16
43256	28	14

TAS 455/465 COMMUNICATION ROM & RAM A8 3

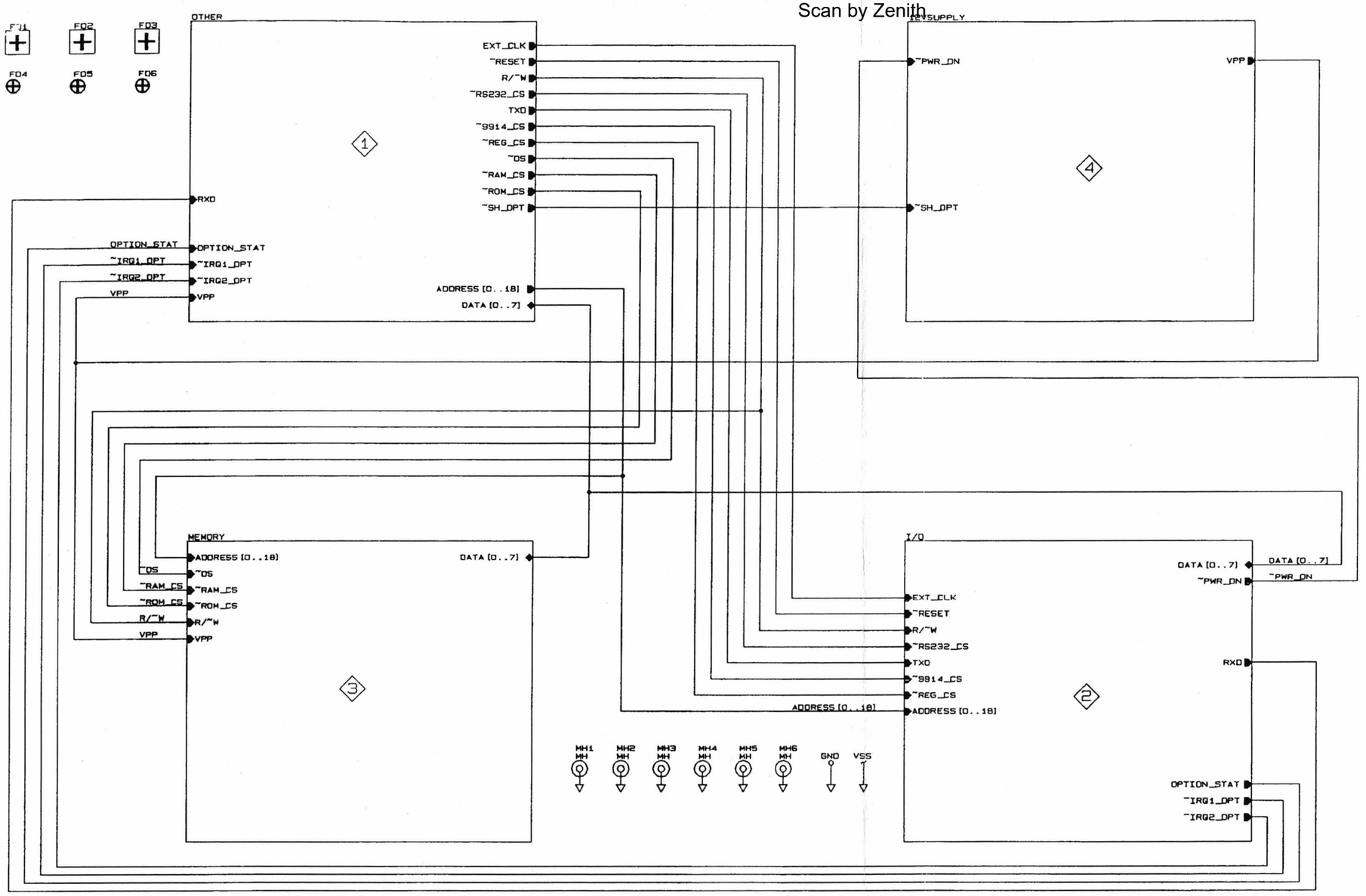
Title	MQ0180XB	
	ROM & RAM	
Size C	Document Number GPIB_MEM	REV
Date: January 31, 1992	Sheet 3 of 5	



TAS 455/465 COMMUNICATION

POWER SUPPLY A8 4

	MQ0180XB	
Title	POWER SUPPLY	
Size C	Document Number GPIB_12V	REV
Date: May 9, 1992	Sheet 4 of 5	



TAS 455/465 COMMUNICATION

MQ0180X8
ROOT SHEET A8 5

	Doug Huard	
Title	Q1 GPIB CARD	
Size C	Document Number MQ0180X8	REV X8
Date: May 8, 1992	Sheet 5 of 5	

Replaceable Mechanical Parts

This section contains a list of the replaceable mechanical components for the Communication Pod. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest circuit improvements. Therefore, when ordering parts, it is important to include the following information in your order.

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

Using the Replaceable Mechanical Parts List

The tabular information in the Replaceable Mechanical Parts List is arranged for quick retrieval. Understanding the structure and features of the list will help you find all of the information you need for ordering replacement parts. The following table describes the content of each column in the parts list.

Parts List Column Descriptions

Column	Column Name	Description
1	Figure & Index Number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix Part Number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial Number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entries indicates the part is good for all serial numbers.
5	Qty	This indicates the quantity of parts used.
6	Name & Description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6–1 for further item name identification.
7	Mfr. Code	This indicates the code of the actual manufacturer of the part.
8	Mfr. Part Number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations Abbreviations conform to American National Standard ANSI Y1.1–1972.

Chassis Parts Chassis–mounted parts and cable assemblies are located at the end of the Replaceable Electrical Parts List.

Mfr. Code to Manufacturer Cross Index The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

Manufacturers Cross Index

Mfr. Code	Manufacturer	Address	City, State, Zip Code
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
01536	TEXTRON INC CAMCAR DIV SEMS PRODUCTS UNIT	1818 CHRISTINA ST	ROCKFORD IL 61108
14310	AULT INC	7300 BOONE AVENUE NORTH	MINNEAPOLIS MN 55428
22526	BERG ELECTRONICS INC (DUPONT)	857 OLD TRAIL RD	ETTERS PA 17319
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001

Replaceable Mechanical Parts List

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
	067–1436–00				**COMMUNICATION POD WITH DI BOARD**		
9–1–1	211–0712–XX			4	SCREW,ASSEM WSHR:6–32 X 1.250,PNH,STL,CDPL,T–15	0KB01	ORDER BY DESC
–2	380–0688–XX			1	HOUSING,BOTTOM:	80009	380–0688–XX
–4	174–3035–XX			1	CA ASSY,SP:RIBBON,;IDC,50,28 AWG,12.0 L,2X25,0.1 CTR	80009	174–3035–XX
–6	380–0687–XX			1	HOUSING,TOP:	80009	380–0687–XX
–7	366–1512–XX			1	PUSH BUTTON:SIL GY,0.18 SQ X 0.83	80009	366–1512–XX
–8	131–0993–XX			6	CONN,BOX:SHUNT,FEMALE,STR1X2,0.385H,BLACK JUMPER	22526	65474–006
–9	————			1	CIRCUIT BD ASSY:DEVELOPEMENT INTERFACE (SEE A10 REPL)		
–10	————			1	CIRCUIT BD ASSY:COMMUNICATION (SEE A8 REPL)		
–11	211–0722–XX			6	SCREW,MACHINE:6–32 X 0.250,PNH,STL,CDPL,T–15	01536	ORDER BY DESC
					STANDARD ACCESSORIES		
–3	671–3682–XX			1	ADAPTER BOARD FOR THS INSTRUMENTS	80009	671–3682–XX
–5	120–1807–XX			1	TRANSFORMER,PWR:POWER SUPPLY,WALL MOUNT	14310	3281059001
	070–8760–XX			1	MANUAL, INSTRUCTION	80009	070–8760–XX
	063–1852–XX			1	ROMBURN SOFTWARE	80009	063–1852–XX

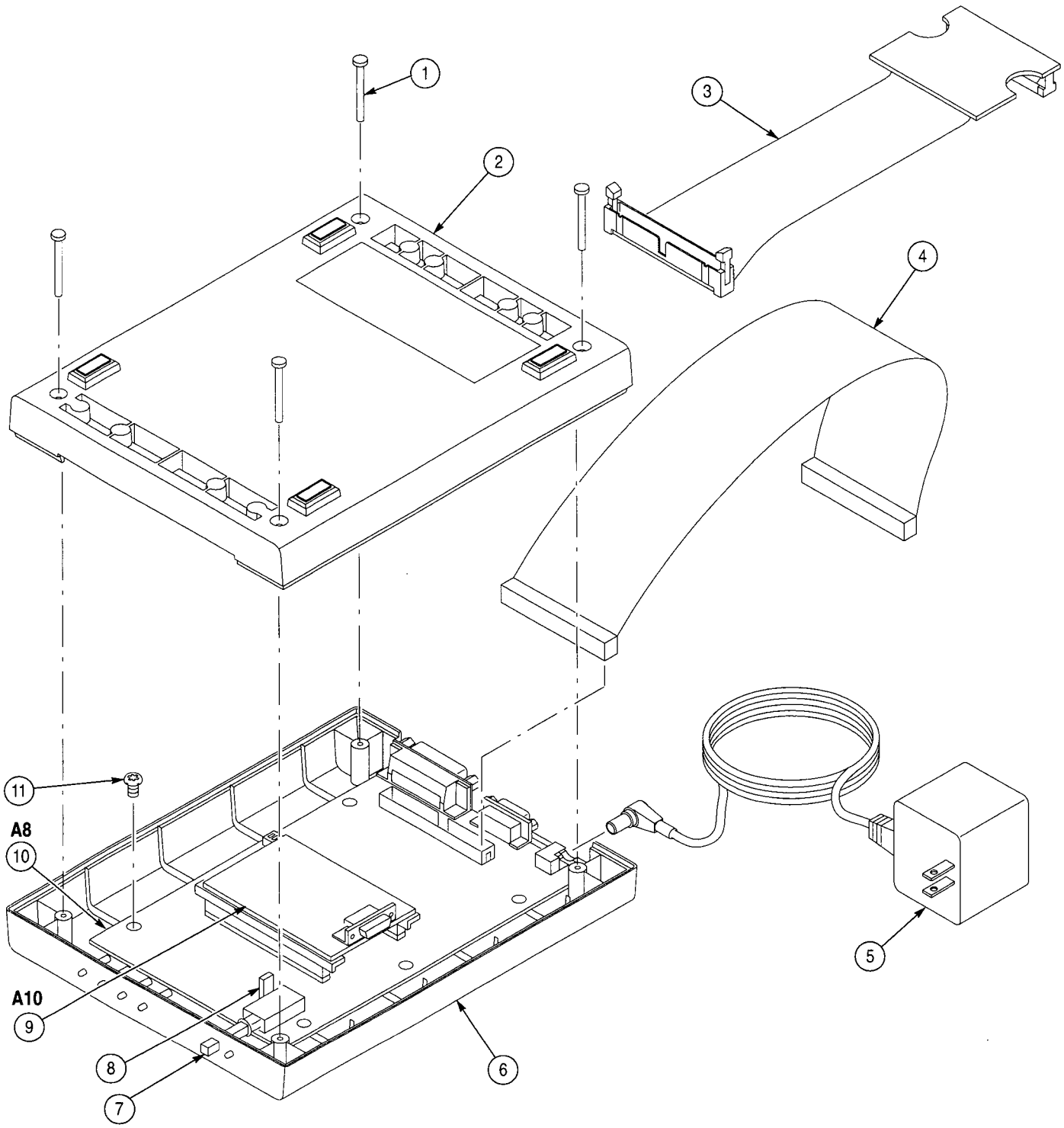


Figure 9–1: Exploded View of Communication Pod with DI Board

Replaceable Mechanical Parts List

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
	067-1436-04				**COMMUNICATION POD WITH ICD BOARD**		
9-1-1	211-0712-XX			4	SCREW,ASSEM WSHR:6-32 X 1.250,PNH,STL,CDPL,T-15	0KB01	ORDER BY DESC
-2	380-0688-XX			1	HOUSING,BOTTOM:	80009	380-0688-XX
-4	174-3035-XX			1	CA ASSY,SP:RIBBON,;IDC,50,28 AWG,12.0 L,2X25,0.1 CTR	80009	174-3035-XX
-5	————			1	CIRCUIT BD ASSY:DEVELOPEMENT INTERFACE (SEE A10 REPL)		
-7	380-0687-XX			1	HOUSING,TOP:	80009	380-0687-XX
-8	366-1512-XX			1	PUSH BUTTON:SIL GY,0.18 SQ X 0.83	80009	366-1512-XX
-9	131-0993-XX			6	CONN,BOX:SHUNT,FEMALE,STR1X2,0.385H,BLACK JUMPER	22526	65474-006
-10	————			1	CIRCUIT BD ASSY:COMMUNICATION (SEE A8 REPL)		
-11	211-0722-XX			6	SCREW,MACHINE:6-32 X 0.250,PNH,STL,CDPL,T-15	01536	ORDER BY DESC
					STANDARD ACCESSORIES		
-3	671-3682-XX			1	ADAPTER BOARD FOR THS INSTRUMENTS	80009	671-3682-XX
-6	120-1807-XX			1	TRANSFORMER,PWR:POWER SUPPLY,WALL MOUNT	14310	3281059001
	070-8760-XX			1	MANUAL, INSTRUCTION	80009	070-8760-XX
	063-1852-XX			1	ROMBURN SOFTWARE	80009	063-1852-XX

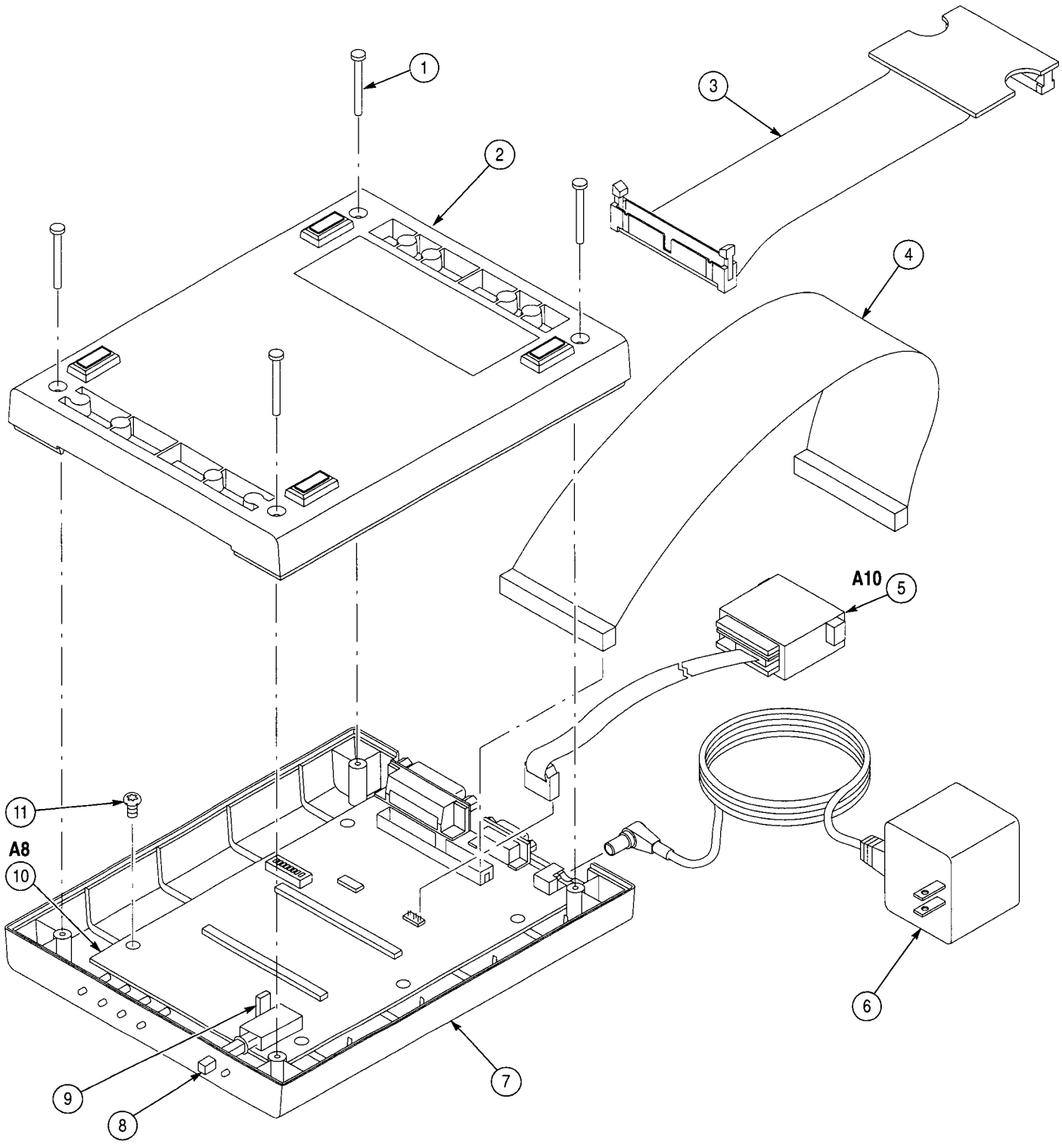


Figure 9–2: Exploded View of Communication Pod with ICD Board

Appendix A: ROMBURN System Files

Table A–1 shows a list of the system files that come with the ROMBURN environment. It is assumed that when you install the ROMBURN software, you use "ROMBURN" as the name for the main directory. Except for files with the "EXE" extension, you can use a standard ASCII editor to modify a file to ensure information regarding the ROMBURN environment (configuration) is accurate.

Table A–1: ROMBURN System Files

File Name	Description
MAIN LEVEL FILES (in the directory where ROMBURN is installed):	
ROMBURN.EXE	Main executable program.
ROMBURN.CFG	Configuration file for ROMBURN.EXE, specifies conditions at ROMBURN invocation.
INSTALL.EXE	Executable program which installs ROMBURN.
PORTTEST.EXE	Executable program to test the communications ports on a TWD120 instrument. This program should only be invoked from the instrument specific menu of ROMBURN.
TURNON.EXE	Executable program to turn on the diagnostic looping feature of TAS 4X5 instruments. This program should only be invoked from the instrument specific menu of ROMBURN.
DESTNV.EXE	Executable program to destructively test NV RAM in TAS4X5, TDS3XX, and TWD120 target instruments. This program should only be invoked from the instrument specific menu of ROM-BURN.
ERRCLR.EXE	Executable program to clear error log and to turn off the development mode for the TDS300 instruments.
TURNOFF.EXE	Executable program to turn off the diagnostic looping feature of TAS 4X5 instruments. This program should only be invoked from the instrument specific menu of ROMBURN.
FPEXC.EXE	Executable program which performs the TDS3XX and TAS4X5 front panel test. This program should only be invoked from the instrument specific menu of ROMBURN.
DUMPERR.EXE	Executable program which reads error log information from a TAS4X5 instrument and writes this information to a disk file. This program should only be invoked from the instrument specific menu of ROMBURN.
READOUT.EXE	Executable program which performs the readout IC test on a TAS4X5. This program should only be invoked from the instrument specific menu of ROMBURN.

Table A–1: ROMBURN System Files (Cont.)

File Name	Description
INSTRUMENT LEVEL FILES (in the INSTR subdirectory):	
TAS4X5.CSD	These four files (TAS455.CSD, TAS465.CSD, TAS475.CSD, TAS485.CSD) specify the chip select programming information for the target TAS4X5 instrument.
TDS3XX.CSD	These three files (TDS310.CSD, TDS320.CSD, TDS350.CSD) specify the chip select programming information for the target TDS3XX instrument.
TWD120.CSD	This file specifies the chip select programming information for the target TWD120 instrument.
TAS4X5.MOD	These four files (TAS455.MOD, TAS465.MOD, TAS475.MOD, TAS485.MOD) specify the base of instrument RAM and download module names for the target TAS4X5 instrument. The base of RAM specified in this file must correspond to the base of the RAM chip select(s) specified in the TAS4X5.CSD file. The download files, as named in this file, should exist in the MODULES subdirectory.
TDS3XX.MOD	These three files (TDS310.MOD, TDS320.MOD, TDS350.MOD) specify the base of instrument RAM and download module names for the target TDS3XX instrument. The base of RAM specified in this file must correspond to the base of the RAM chip select(s) specified in the TDS3XX.CSD file. The download files, as named in this file, should exist in the MODULES subdirectory.
TWD120.MOD	This file specifies the base of instrument RAM and download module names for the target TWD120 instrument. The base of RAM specified in this file must correspond to the base of the RAM chip select(s) specified in the TWD120.CSD file. The download files, as named in this file, should exist in the MODULES subdirectory.
TAS4X5ED.DAT	These four files (TAS455ED.DAT, TAS465ED.DAT, TAS475ED.DAT, TAS485ED.DAT) specify the instrument specific menu options and associated executable routines for the target TAS4X5 instrument. The executable routines, as named in this file, should exist in the ROMBURN directory.
TDS3XXED.DAT	These three files (TDS310ED.DAT, TDS320ED.DAT, TDS350ED.DAT) specify the instrument specific menu options and associated executable routines for the target TDS3XX instrument. The executable routines, as named in this file, should exist in the ROMBURN directory.
TWD120ED.DAT	This file specifies the instrument specific menu options and associated executable routines for the target TWD120 instrument. The executable routines, as named in this file, should exist in the ROMBURN directory.

Table A–1: ROMBURN System Files (Cont.)

File Name	Description
INSTR.DAT	This file specifies the menu options for the instrument selection sub-menu. Each instrument specified in this file should have an associated instrument.CSD file, an instrument.MOD file, and an instrumentED.DAT file, where "instrument" is replaced by the instrument name.
DATA LEVEL FILES (in the DATA subdirectory):	
PREPARSE.EXE	This executable program pre-parses a Motorola S-record firmware file into a binary format. Pre-parsing a firmware file will decrease the time it takes to update the firmware in the target instrument.
firmware files	These files contain the target instrument firmware data files in either a Motorola S-record format or a pre-parsed format.
MODULES LEVEL FILES (in the MODULES subdirectory):	
QPCHKSUM.HEX	This Motorola S-record file is a download module that checksums the target instrument's ROMs. Its base is 100,000H. Use it for TAS4X5 and TWD120 target instruments.
QCERASE.HEX	This file is a download module which erases the communication pod ROMs. Its base is 100,000H. Use it for TAS4X5 and TWD120 target instruments.
SPERASE.HEX	This Motorola S-record file is a download module which erases the target instrument's ROMs. Its base is 280,000H. Use it for TDS3XX target instruments.
SCLEARNV.HEX	This Motorola S-record file is a download module that clears the NV RAM to all zeros. Its base is 280,000H. Use it for TDS3XX target instruments.
QCLEARNV.HEX	This Motorola S-record file is a download module that clears the NV RAM to all zeros. Its base is 100,000H. Use it for TAS4X5 target instruments.
QCVERIFY.HEX	This Motorola S-record file is a download module that verifies the contents of the communication pod ROM against a specified disk file. Its base is 100,000H. Use it for TAS4X5 and TWD120 target instruments.
SCERASE.HEX	This Motorola S-record file is a download module that erases the byte-wide ROM on TDS3XX instruments. Its base is 280,000H. Use it for TDS3XX target instruments.
QPODTEST.HEX	This Motorola S-record file is a download module that tests the communication pod. Its base is 100,000H. Use it for TAS4X5 and TWD120 target instruments.
QPERASE.HEX	This Motorola S-record file is a download module which erases the target instrument's ROMs. Its base is 100,000H. Use it for TAS4X5 and TWD120 target instruments.

Table A–1: ROMBURN System Files (Cont.)

File Name	Description
PORTTEST.HEX	This Motorola S-record file is a download module which tests the TWD120 communication ports. Its base is 100,000H. Use it for TWD120 target instruments in conjunction with PORTTEST.EXE
QFPTEST.HEX	This Motorola S-record file is a download module which tests the TAS4X5 front panel. Its base is 100,000H. Use it for TAS4X5 target instruments in conjunction with FPEXC.EXE.
SCBURN.HEX	This Motorola S-record file is a download module which loads data (firmware) into the byte-wide ROM on TDS3XX instruments. Its base is 280,000H. Use it for TDS3XX target instruments.
SPODTEST.HEX	This Motorola S-record file is a download module which tests the communication pod. Its base is 280,000H. Use it for TDS3XX target instruments.
QPBURN.HEX	This Motorola S-record file is a download module which loads data (firmware) into the ROMs on TAS4X5 and TWD120 instruments. Its base is 100,000H.
PCLEARNV.HEX	This Motorola S-record file is a download module that clears the NV RAM to all zeros. Its base is 100,000H. Use it for TWD120 target instruments.
SFPTEST.HEX	This Motorola S-record file is a download module which tests the TDS3XX front panel. Its base is 280,000H. Use it for TDS3XX target instruments in conjunction with FPEXC.EXE.
SPVERIFY.HEX	This Motorola S-record file is a download module that verifies the contents of the target instrument's ROMs against a specified disk file. Its base is 280,000H. Use it for TDS3XX target instruments.
READOUT.HEX	This Motorola S-record file is a download module that tests the readout IC in TAS4X5 instruments. Its base is 100,000H. Use it in conjunction with READOUT.EXE.
QPVERIFY.HEX	This Motorola S-record file is a download module that verifies the contents of the target instrument's ROMs against a specified disk file. Its base is 100,000H. Use it for TAS4X5 and TWD120 target instruments.
QCBURN.HEX	This Motorola S-record file is a download module which loads data (firmware) into the communication pod ROM on TAS4X5 and TWD120 instruments. Its base is 100,000H.
SPBURN.HEX	This Motorola S-record file is a download module which loads data (firmware) into the target instrument's ROMs. It's base is 280,000H. Use it for TDS3XX instruments.
SCVERIFY.HEX	This Motorola S-record file is a download module that verifies the contents of the byte-wide ROM in TDS3XX instruments against a specified disk file. Its base is 280,000H.
QDNVTEST.HEX	This Motorola S-record file is a download module that destructively tests the NV RAM in a TAS4X5 instrument. Its base is 100,000H. Use it in conjunction with DESTNV.EXE.

Table A–1: ROMBURN System Files (Cont.)

File Name	Description
SDNVTEST.HEX	This Motorola S-record file is a download module that destructively tests the NV RAM in a TDS3XX instrument. Its base is 280,000H. Use it in conjunction with DESTNV.EXE.
PDNVTEST.HEX	This Motorola S-record file is a download module that destructively tests the NV RAM in a TWD120 instrument. Its base is 100,000H. Use it in conjunction with DESTNV.EXE.

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