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Technical Reference

Tektronix

DAS 9200
Technician's Reference

070-5959-09

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 all safety summaries prior to performing service.

CE

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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.

Ground the Product

This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Do Not Operate Without Covers

To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.

Use Proper Fuse

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

Do Not Operate in Wet/Damp Conditions

To avoid electric shock, do not operate this product in wet or damp conditions.

Do Not Operate in Explosive Atmosphere

To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Avoid Exposed Circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Product Damage Precautions

Use Proper Power Source

Do not operate this product from a power source that applies more than the voltage specified.

Use Proper Voltage Setting

Before applying power, ensure that the line selector is in the proper position for the power source being used.

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 on the Product

The following symbols may appear on the product:



DANGER
High Voltage



Protective Ground
(Earth) Terminal



ATTENTION
Refer to
Manual



Double
Insulated

Certifications and Compliances

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.

Compliances

Consult the product specifications for IEC Installation Category, Pollution Degree, and Safety Class.

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.

Use Caution When Servicing the CRT

To avoid electric shock or injury, use extreme caution when handling the CRT. Only qualified personnel familiar with CRT servicing procedures and precautions should remove or install the CRT.

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

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.

To avoid electric shock, do not touch exposed connections.

X-Radiation

To avoid x-radiation exposure, do not modify or otherwise alter the high-voltage circuitry or the CRT enclosure. X-ray emissions generated within this product have been sufficiently shielded.

Preface

The Digital Analysis System (DAS) 9200 documentation package provides the information necessary to install, operate, maintain, and service the DAS. DAS documentation consists of:

- This **technician's reference manual**, which helps you isolate DAS problems to the module level, replace that module, and recheck the status of the system
- A **verification and adjustment procedures manual**, that allows a qualified technician to verify specifications of the mainframe and modules
- A **system user manual**, which includes a beginning user orientation, a discussion of DAS system-level operation, and reference information such as installation procedures, specifications, error messages, and a complete glossary of terms
- A series of **module user manuals** that cover each of the DAS acquisition, pattern generation, and optional I/O modules
- An **on-line documentation** package that includes a location-dependent system of technical notes
- A **programmatic command language user manual** that describes the set of programmatic commands available for remotely controlling the DAS
- A series of **application software user manuals** that describe the various application software packages
- A series of microprocessor-specific **microprocessor support instructions** (designed to accompany the *92A60/90 Module User Manual* and *92A96 & 92C96 Module User Manual*) that describe the various microprocessor support packages
- A series of **workbooks** that teach concepts about DAS acquisition modules and pattern generation modules

The *DAS Technician's Reference Manual* is designed for use by qualified service personnel. It contains information necessary to check, troubleshoot, and maintain the DAS mainframe and all associated modules. Troubleshooting is primarily based on internal power-up diagnostics. These diagnostics isolate problems to the board (or module) level. Once the faulty board is identified, use the instructions provided in this manual to remove and replace it. Replacing the faulty board allows a minimum of downtime for the user. The board is later repaired at the factory.

This manual contains the following sections:

- *Introduction to DAS Hardware.* Provides a basic description of the DAS system.
- *Maintenance.* Provides information on how to keep the mainframe and modules in good working condition. Line-voltage selection and lithium battery replacement procedures are also given.
- *Disassembly/Reassembly Procedures.* Gives instructions for disassembling and reassembling the mainframe and probes.
- *Troubleshooting.* Provides information on diagnostics and troubleshooting practices.
- *General Circuit Functions.* Gives an overview of circuit functions on mainframe boards and instrument modules; bus descriptions are also given.
- *Replaceable Electrical Parts.* Contains a list (including Tektronix part numbers) of replaceable electrical parts for the DAS mainframe and associated modules; some parts are only replaceable to the module/board level.
- *Replaceable Mechanical Parts.* Contains a list (including Tektronix part numbers) of replaceable mechanical parts for the DAS mainframe and associated modules.

Introduction to DAS Hardware

The Digital Analysis System (DAS) 9200 is a highly modular set of state-of-the-art digital analysis tools. It includes the following items:

- A mainframe
- A color terminal
- Acquisition and pattern-generation modules
- Application software packages
- Probes

By selecting and configuring these tools, you can customize your digital analysis system for your applications.

The DAS can be used either as a stand-alone digital analysis system or as an intelligent peripheral device connected to a host computer or controller. Figure 1–1 shows two example configurations. On the left, a DAS stand-alone system (DASXP) is connected to a terminal; on the right, a DAS sends data to a controlling host computer (DASNT).

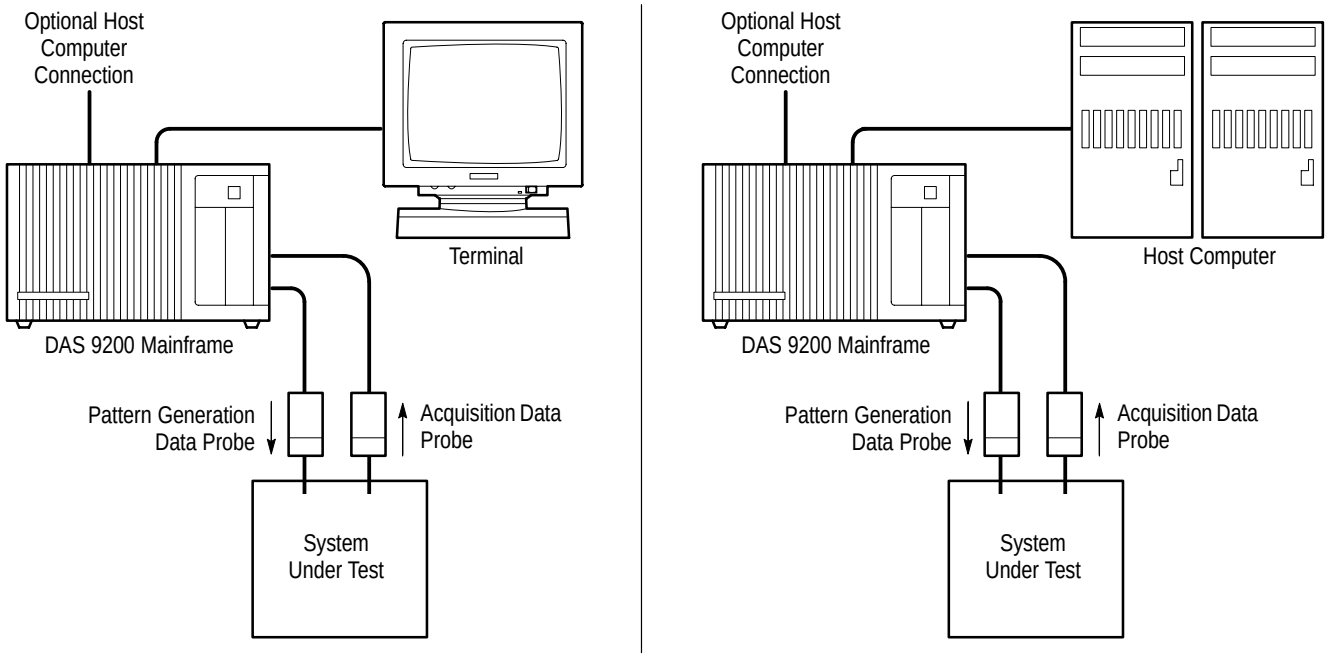


Figure 1–1: DAS Basic Configurations

As a stand-alone system, the DAS can be connected to a Tektronix color terminal, host computer, printer, or copier. The color terminal displays the interactive menus. The host computer can be used to transfer acquisition, stimulation, and instrument setup data to or from the DAS. Various types of parallel and serial printers are supported to generate non-color (monochrome) reproductions of display screens and acquisition and pattern-generation data.

Using the optional 92XTerm software (also known as DASNT systems), you can operate the DAS from a window on a workstation. The interactive menus appear in the workstation window and are controlled with the mouse and keyboard. Communication between the DAS and the workstation is over a local area network (LAN).

As a peripheral device remotely controlled by a host computer, the DAS supports a Programmatic Command Language (PCL) that is an alternative to the keyboard and menu interface. PCL commands let you start and stop acquisitions, manage files, and report status and error information. Data can be processed either by the DAS or the host computer; when the host computer processes data, the DAS is the source of raw or partially processed data.

Mainframes and Terminals

The mainframes provide computing power, input and output features, and mass storage for your modules. The mainframe provides enhanced computing power due to its larger memory and faster CPU. The mainframes exist in the following versions:

- DAS 9221 with 16 Mbyte RAM on the Controller board, 100 Mbyte (or greater) hard disk drive, and 1.4 Mbyte floppy disk drive
- DAS 9220 with 8 Mbyte RAM on the Memory board, 40 Mbyte hard disk drive, and 1.2 Mbyte floppy disk drive
- DAS 9219 with 2 Mbyte RAM on the Memory board, 20 Mbyte hard disk drive, and 400 Kbyte floppy disk drive (the DAS 9219 is no longer available)

The DAS 92E9 is an Expansion mainframe with extra slots for additional modules.

Terminals

The standard display device is a Tektronix color terminal with a detachable keyboard. Earlier versions of the DAS used a 9200T or a 9201T monitor; newer versions use an X terminal with a detachable keyboard and mouse. Interactive menus, which are manipulated from the keyboard or mouse, allow you to define the contents of the system, enter parameters and data, and control the outputs of the instrument. These menus use color-coded command fields to show the available selections.

You can power on and power off your mainframe and terminal from a 9200T or 9201T using the terminal power button. This feature is built into DAS 9221 mainframes; for DAS 9219/9220 mainframes, you must install an optional one-button power-switch adapter.

The 9201T is a direct replacement for the 9200T, so references in this manual to the 9201T also apply to the 9200T. However, references to the *4205 Service Manual* apply only to the 9201T; if you use a 9200T, refer instead to the *4105 Service Manual*.

The X terminal requires a 92LANSE LAN (local area network) module installed in the mainframe. You can use the X terminal only with the DAS/SE, DASXP, or DASNT mainframes. For service information, refer to the *TekXpress X Terminal Service Manual*.

Mainframe Hardware

The mainframe shown in Figure 1–2 consists of the following major internal components:

- Mechanical chassis
- Controller board (with 16 Mbyte RAM for the DAS 9221)
- Memory board with either 2 Mbyte or 8 Mbyte RAM (DAS 9219/9220)
- Backplane board with 8 module slots
- Hard disk drive
- 3.5 inch or 5.25 inch floppy disk drive
- Three RS-232 ports
- Power supply with a maximum output of 700 watts

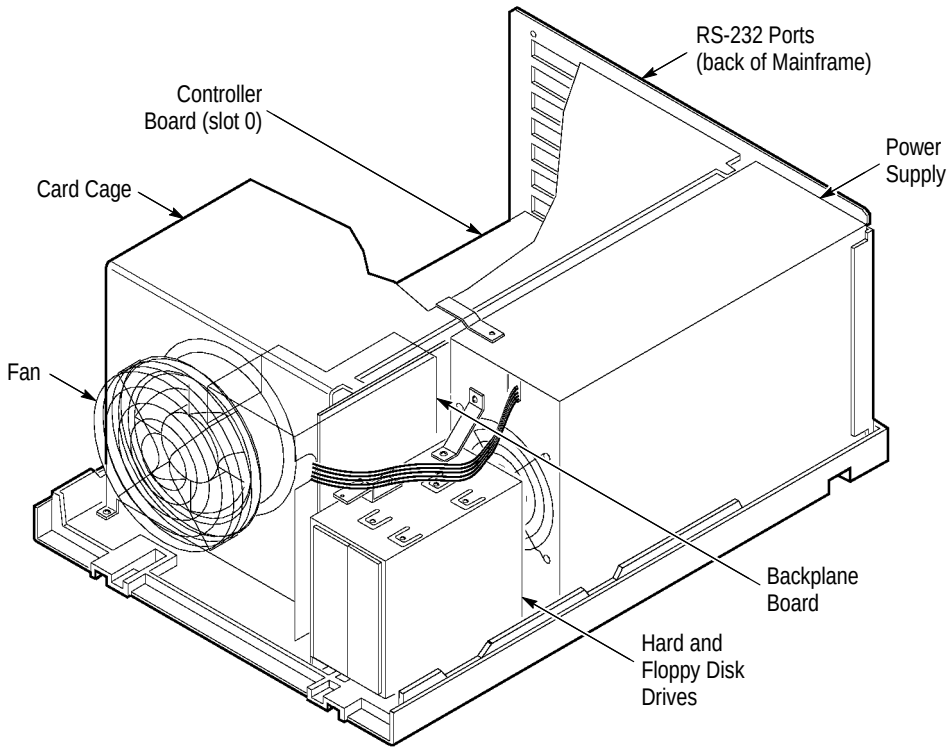


Figure 1–2: Master Mainframe Internal Components (Memory Board in Slot 1 for DAS 9219/9220)

Mechanical Chassis. The chassis provides the mechanical connection and cooling for all mainframe components and options. DAS modules reside in the card cage; probes connect to the modules through openings in the rear of the chassis.

NOTE. *To install, remove, or reposition any DAS module, you must remove the mainframe top cover and card-cage door.*

To disassemble major chassis components, refer to *Disassembly/Reassembly Procedures beginning on page 3–3*.

Controller Board. The Controller board resides in slot 0 of the Master mainframe; Expansion mainframes use an Expansion Slave board instead of a Controller board. The Controller board provides the following resources:

- DAS 9221 mainframes use a 68EC030 microprocessor with address decoding for an asynchronous bus structure (32-bit address, 32-bit data). DAS 9219/9220 mainframes use a 68010 microprocessor (24-bit address, 16-bit data).

- Nonvolatile RAM for storing interrupt routine addresses, previous shutdown conditions, and pointers to other processes
- 64 Kbytes of boot ROM in DAS 9221 (32 Kbytes in DAS 9219/9220) for power-up sequences and diagnostics
- 16 Mbytes of dynamic RAM (DAS 9221 only) with refresh circuitry
- A communication interface between circuit boards, the hard disk drive, and the floppy disk drive
- Asynchronous time bases and other circuitry supporting the expansion of up to four time-aligned mainframes
- A clock/calendar with battery backup
- Power-supply control for mainframe shutdown

Memory Board (DAS 9219 and DAS 9220). There are two different Memory boards: the 2 Mbyte dynamic RAM board is standard with the DAS 9219, and the 8 Mbyte dynamic RAM board is standard with the DAS 9220. The 8 Mbyte board is also available as a performance upgrade for the DAS 9219. Only one Memory board can be installed in the Master mainframe, and it must reside in slot 1; Expansion mainframes do not use a Memory board. (The DAS 9221 has Memory-board functions resident on the Controller board.) The Memory board provides the following resources:

- 2 Mbytes of dynamic RAM (standard with the DAS 9219) with refresh circuitry for supporting system software, post-processing of acquired data, and other calculations.
- 8 Mbytes of dynamic RAM (standard with the DAS 9220) with refresh circuitry. The lower part of RAM supports system software and post-processing of acquired data. The upper part of RAM temporarily stores configuration and data files to improve the system response time.
- Circuitry supporting the Memory Management Unit (MMU), for multiple process control.
- An interface to the Controller board, allowing access to the system RAM and to the terminal, host, and auxiliary communication ports.

Backplane Board. This board provides the mechanical and electrical connections between the Controller board, the Memory board (DAS 9219 and DAS 9220), and the eight slots used for the acquisition and pattern generation modules. Signals are carried on bus structures, some of which extend outside the Master mainframe to Expansion mainframes.

Hard and Floppy Disk Drives. The operating system software is installed on the hard disk, along with other files (such as user-generated setups and reference memories).

The DAS 9221 mainframes have been available with 100 Mbyte, 127 Mbyte, 170 Mbyte, and 270 Mbyte SCSI hard disk drives. The DAS 9220 mainframes used 40 Mbyte and 80 Mbyte hard disk drives (ST506 interface), while the DAS 9219 mainframes had 10 Mbyte and 20 Mbyte hard disk drives. To determine the size of hard disk in your mainframe, refer to the Diagnostic menu.

An optional 80 Mbyte hard disk drive is available for DAS 9219/9220 mainframes. If data security or portability is a concern, you can order your mainframe with a removable hard disk drive, so that setup and data files can be secured overnight or easily transported to another DAS. An 80 Mbyte removable drive is available for the DAS 9219/9220; a 127 Mbyte, 170 Mbyte, or 270 Mbyte removable drive is available for the DAS 9221. (Other versions of the removable hard disk drive were available for earlier versions of the mainframe.)



WARNING. *The removable drive for the DAS 9221 (SCSI drive) is not interchangeable with the removable drives for the DAS 9219/9220 (ST506 interface drives). If you install the wrong type of drive into your mainframe, you can damage the drive.*

Do not disconnect or remove the removable hard disk drive while the mainframe is powered. Doing so will damage the hard disk or corrupt the file system.

The floppy disk drives are used for loading application software from floppy disk, copying files for use on other mainframes, and making and restoring backup files. Backup procedures with on-screen instructions are available. A light on the front of the floppy disk drive indicates when a floppy disk is being accessed.

A 3.5 inch, 1.4 Mbyte floppy disk drive is standard in DAS 9221 mainframes with System Software Release 3, Version 1.40 and higher. The floppy disk drive is also available as an upgrade kit for older systems.

A 5.25 inch, 1.2 Mbyte floppy disk drive was available in earlier versions of the DAS 9220 and DAS 9221 mainframes. This disk drive is available as an option for the DAS 9219 mainframe. This drive reads floppy disks written in 360 Kbyte/400 Kbyte format; however, it cannot write to disks of this type. For write operations, use only 96 TPI (tracks per inch), double-sided, high-density floppy disks with this drive.

A 5.25 inch, 400 Kbyte floppy disk drive was standard in the DAS 9219 mainframe. This drive can read or write to floppy disks in 360 Kbyte/400 Kbyte format only. Use only 48 TPI, double-sided, double-density floppy disks with this drive; do not use 96 TPI high-density disks.

RS-232 Ports. The DAS 9219/9220 mainframes have three 25-pin DCE RS-232 ports and the DAS 9221 mainframe has three 9-pin DCE RS-232 ports. Other devices access these ports through openings on the rear panel. The three ports have the following functions:

- The terminal port connects the mainframe to a display device. Baud rates are 38400 (default), 19200, 9600, 4800, 2400, 1200, 600, 300, and 110.
- The host port connects the mainframe to a host computer system with a null-modem cable. Baud rates are 38400, 19200, 9600 (default), 4800, 2400, 1200, 600, 300, and 110.
- The auxiliary port connects the mainframe to other RS-232-compatible devices (for example, a printer). Baud rates are 38400, 19200, 9600 (default), 4800, 2400, 1200, 600, 300, and 110.

The host and auxiliary ports transmit eight data bits, no parity, and one stop bit. You can configure the terminal and host port protocol using the Communications menu.

Optional Expansion and I/O Ports. The 92C01, 92C02, and 92C03 GPIB/Expansion modules are optional interface boards for the DAS. These modules function as follows:

- The 92C01 module provides a GPIB port for the mainframe. (It was available for earlier versions of the mainframe.)
- The 92C02 module provides a GPIB port and an interface to the DAS 92E9 Expansion mainframe.
- The 92C03 module provides an interface only to the DAS 92E9 Expansion mainframe.

Master mainframes have direct memory access (DMA) capability; this feature is not available in Expansion mainframes. Therefore, 92C01/02/03 modules must be installed in slot 8 of the Master mainframe. The GPIB portion of the 92C01 and 92C02 modules does not work in the DAS 92E9 Expansion mainframe; however, the 92C03 module and the expansion portion of the 92C02 module are fully functional when installed in slot 8 of the Expansion mainframe. Therefore, you should use the 92C03 module in Expansion mainframes.

LAN Interfaces. The 92LANSE and 92LAN Modules provide a LAN (local area network) interface for the DAS mainframe. The 92LANSE module is standard in a DAS 9221 mainframe used with the X terminals. These modules were optional in other mainframes. The 92LANSE Module connects directly to the DAS 9221 Controller board and can only be used with DAS 9221 mainframes.

The 92LAN Module is no longer available. For information on the 92LAN module, refer to the *92LAN User/Installation Manual*.

Power Supply. The power supply module consists of two boards that supply power to all mainframe components. This supply can deliver up to 650 watts from either a 115 V or 230 V AC power source (see Table 1–1 for Master mainframes and Table 1–2 for Expansion mainframes).



WARNING. *To change the line-voltage input of the power supply (between 115 V and 230 V), refer to* Maintenance *beginning on page 2–1*.

Mainframe Power Requirements

The DAS mainframes support different numbers of acquisition and pattern-generation modules based on the type of power cord and power supply used with each mainframe. The standard 12 A power cord should be used for Master mainframes drawing less than 400 watts (12 A/115 V) and for Expansion mainframes drawing less than 475 watts. When the module configuration in the mainframe requires more power, a higher-current power-cord/power-supply combination must be used (refer to Tables 1–1 and 1–2). If the module configuration in the Master mainframe requires more than 575 watts (650 watts in Expansion mainframes), the DAS will automatically shut off.

NOTE. *If you install the 15 A power cord (Option 1A), put the label supplied with the power cord on the DAS back panel over the existing description that reads: 1900 VA MAX., FREQ. 48-63 Hz.*

The power source must be capable of supplying the maximum line current required for your system. A mainframe connected to a 115 V power source draws a maximum continuous current of 15 A; the one-cycle surge current is 25 A nominal. Therefore, a Master mainframe with three Expansion mainframes may require a total line current of 60 A. (A mainframe connected to a 230 V power source draws a maximum continuous current of 10 A, so a Master mainframe with three Expansion mainframes may require a total line current of 40 A.)

When the DAS is connected to a 230 V power source, you must use a 230 V power cord. The DAS draws no more than 10 A when operating at 230 V, but when the DAS is connected to a 3-phase power source, the mainframe draws no more than 8 A on any phase. The three-phase power cord is permanently attached to the power supply. To upgrade your mainframe's power supply with the three-phase option, contact your Tektronix field service center.

Table 1–1: Power for Master Mainframes

Watts	Voltage	Cord Option	Source
400 W	105 V – 127 V	Std.	115 V, 12 A
500 W	105 V – 127 V[1]	Opt. 1A	115 V, 15 A
575 W	200 V – 250 V	A1 – A5	230 V, 10 A
700 W[2]	200 V – 250 V (phase-to-phase)	Opt. 1B (3-phase)[3]	120/208 V, 8 A

1 **Operation at a low line of 90 V is possible if the card-cage load is reduced to 425 watts or less.**

2 **The 700 W 3-phase power supply option was discontinued as of serial number B061162.**

3 **The three-phase load is Y-connected. A maximum of 15 A at three times the frequency may flow into the neutral conductor. A switch or circuit breaker at the installation site is required by some international standards.**

Table 1–2: Power for Expansion Mainframes

Watts	Voltage	Cord Option	Source
475 W	105 V – 127 V	Std.	115 V, 12 A
575 W	105 V – 127 V[1]	Opt. 1A	115 V, 15 A
650 W	200 V – 250 V	A1 – A5	220 V, 10 A
750 W[2]	200 V – 250 V (phase-to-phase)	Opt. 1B (3-phase)[3]	120/208 V, 8 A

1 **Operation at a low line of 90 V is possible if the card-cage load is reduced to 425 watts or less.**

2 **The 750 W 3-phase power supply option was discontinued as of serial number B061162.**

3 **The three-phase load is Y-connected. A maximum of 15 A at three times the frequency may flow into the neutral conductor. A switch or circuit breaker at the installation site is required by some international standards.**

Refer to *Selecting the Line Voltage and Replacing the Line Fuse* beginning on page 2–6 for instructions on how to change the line voltage.

Module Power Requirements. Each combination of boards requires a different amount of power from the mainframes. Therefore, you must select a power cord, power supply, and power source that meets your system line-current demands.

To determine the power cord and power source you need, check the message displayed during power-on that shows the total wattage for the boards installed in each mainframe. (The power-up message is erased when the system menus display.) Calculate the total wattage required (from Table 1–3) and compare it with the available power (from Tables 1–1 and 1–2). If the installed boards require more power than is available from your current power cord and power source, then you must upgrade your mainframe to meet those requirements.

***NOTE**. If you reconfigured the boards in your mainframe since the last power-down or added boards to your system, check the power values in Tables 1–1, 1–2, and 1–3 to ensure that the total wattage required by the new configuration can be supplied by your current mainframe power cord and power source.*

Table 1–3 lists the power consumed for each board. Use this table to calculate the power required for your mainframe's configuration. For example, if your mainframe contains the following boards: one 92A16, two 92A16Es, one 92S16, and one 92S32, then the total power required equals: 107 W (A16) + 166 W (A16Es) + 78 W (S16) + 79 W (S32), or 430 W. Next, compare this value with the power-cord options in Tables 1–1 and 1–2. Since the standard 12 A power cord delivers a maximum of 400 watts, the Option 1A power cord must be used to supply up to 500 watts to the card cage.

Table 1–3: Power for DAS Cards (with Probes)

Card Type	Power (watts)
92A16 Master Interface	107
92A16E Expander Interface	83
92A96/SD/UD	150[1]
92A96D/XD	140
92C96/D/XD/SD	150[1]
92A60 Controller	80
92A60/D Memory	50
92A90 Controller	80
92A90/D Memory	50
92S16	78
92S32	79
92SX109	78
92SX118	79
92C01	25
92C02	30
92C03	25

Table 1–3: Power for DAS Cards (with Probes) (Cont.)

Card Type	Power (watts)
92HS8 Master Interface	20
92HS8E Standard Interface	12
92LAN	25
92V64PM Pattern Master	64
92V64PE Pattern Expander	64
92V64E Error Memory	64

1 **Acquisition Module power requirements reduced to 140 W max. effective SN B061162 and above**

The DAS software checks your configuration at power on and warns you to use the correct power source and power cord. The power supply and module cards can be damaged if you try to operate the DAS in an illegal configuration. The DAS 9221 Controller board contains a set of jumpers that identify the type of power cord and power supply in the mainframe. If you change the power cord or power supply, then you should relocate these jumpers to reflect the new configuration (refer to Jumper J8700 in Figure 4–29 on page 4–68). If the power requirements exceed safe limits, the system shuts down. For example, if you have five 92A96 Modules in one mainframe (700 W, which exceeds the power requirements), the DAS displays a warning message at power-up and then shuts down.

Power Cords. The mainframe has no main AC power switch, so the power cord serves as the main-power disconnect. The power-cord connection for the Master mainframe and Expansion mainframe is on the rear panel. The standard power cord for the mainframe is rated at 12 A; optional power cords are available for mainframe configurations requiring more power.

The mainframe uses a three-wire power cord with a three-contact plug for connection to the power source and protective ground. The plug's protective-ground connects to accessible metal parts of the mainframe.



WARNING. *To protect against electrical shock, insert the power-cord plug into a grounded power source receptacle.*

External Event Connections. The optional 92C02 and 92C03 modules provide a set of pins that support external event I/O signals. For more information, refer to *Using the External Event I/O Pins* in the *DAS System User Manual*.

The External Event In pin accepts a TTL-level signal from an external source. The received event can be monitored by (or can control) other modules. You can set this up in the Signal Definition overlay (Cluster Setup menu).

The External Event Out pin passes a TTL-level event signal from a DAS to an external component to use as an arming or triggering signal. For example, the event-out signal can trigger an oscilloscope or stop, start, or trigger a separate DAS system.

Discrete I/O Port (DAS 9221 Mainframes with 92LANSE Modules). The optional 92PORT software product allows you to monitor and send signals to a system-under-test using the 37-pin D-connector on the rear of the Master mainframe.

DAS with Option 04

An option to the DAS mainframe, Option 04, allows the mainframe to satisfy the German electromagnetic interference (EMI) requirements. Refer to *Replaceable Mechanical Parts* serial number history of Option 04 on page 7–24.

DAS Systems Prior to January 1, 1996. DAS mainframes equipped with Option 04 that were sold prior to January 1, 1996 satisfied the German electromagnetic interference (EMI) requirements VDE 0871, Class B. This VDE option applied to mainframes set for 230 V operation only; operation at 115 V exceeds component ratings. A mainframe with Option 04 includes the following items:

- Conductive elastic between the front panel and media mount
- Rear-panel probe shields
- EMI gasket material on the edges of the baseplate
- Clip for holding the power supply tightly against the inside of the rear panel
- Probe clamps for holding probes to the rear panel
- Six grounding clamps for RS-232 connectors (DAS 9219/9220 only)
- Conductive paint on the inside of the top cover and baseplate to make a connection to the EMI gasket material along the edges of the baseplate
- Screen material on the front panel and top cover
- EMI gasket material on the inside-rear edge of the top cover

Follow these precautionary guidelines when using an Option 04-equipped mainframe:

- Avoid scratching any surface coated with conductive paint.
- Avoid bending or tearing gasket material along the edges of the baseplate and snagging clothing on gasket material.
- Avoid bending or snagging the EMI gasket material when installing or removing boards from mainframe slots.

Remove only shields that correspond to probes or cables being attached, because unnecessary removal of the shields increases EMI radiation. Remove a rear-panel probe shield as follows:

1. Remove the two top screws.
2. Remove the two screws that attach the adjacent shield.
3. Remove the rear-panel probe shield.
4. Replace the screws attaching the adjacent shield.

To connect to the host port of a DAS 9219/9220 mainframe, you must remove the corresponding port connector shield.

DAS Systems After January 1, 1996. Newer DAS mainframes with Option 04 meet Directive 89/336/EEC for electromagnetic compatibility. Option 04 applies to mainframes set for 230 V operation only; operation at 115 V exceeds component ratings. A mainframe with Option 04 includes a 230 V line filter to eliminate or reduce electromagnetic interference.

DAS 92E9 Expansion Mainframe

The DAS 92E9 Expansion mainframe provides additional slot space for acquisition and pattern generation modules. Up to three Expansion mainframes can be added to the Master mainframe. A fully-expanded system (Master mainframe with three Expansion mainframes) provides a total of 28 usable slots. Expansion and Master mainframes use the same mechanical chassis, backplane, and power supply. However, the Expansion mainframe does not contain a Memory board, power switch, or disk drives. In an Expansion mainframe, an Expansion Slave board replaces the Master mainframe's Controller board.

If you have one Expansion mainframe with the Master mainframe, you can place it on top of the Master mainframe, as in Figure 1–3; the Master mainframe can support the weight of only one Expansion mainframe. When using two or three Expansion mainframes, all mainframes must be vertically rackmounted; the Master mainframe must be positioned as the lowest mainframe in the rack. For complete details on rackmounting, refer to the *Option 05: Rackmount Installation Instructions* document.

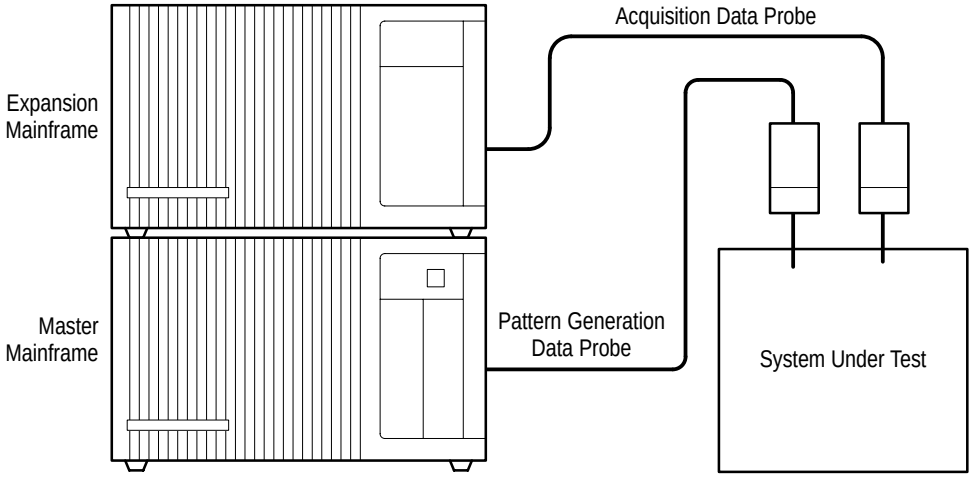


Figure 1–3: DAS Master Mainframe Connected with One Expansion Mainframe

In a fully-expanded system (see Figure 1–4), the Master mainframe and Expansion mainframes 1 and 2 require an Expansion board in slot 8 of each mainframe. The Master mainframe uses either a 92C02 GPIB/Expansion module or a 92C03 Expansion module to make the connection to the Expansion Slave board installed in the next mainframe. Expansion mainframes 1 and 2 use a 92C03 module. Refer to *Disassembly/Reassembly of the Mainframes* beginning on page 3–3 for module installation and removal instructions.

***NOTE**. The system software numbers the DAS 92E9 Expansion Mainframe slots from 9-35. You can use these slots, except the Expansion Slave board slot, for modules.*

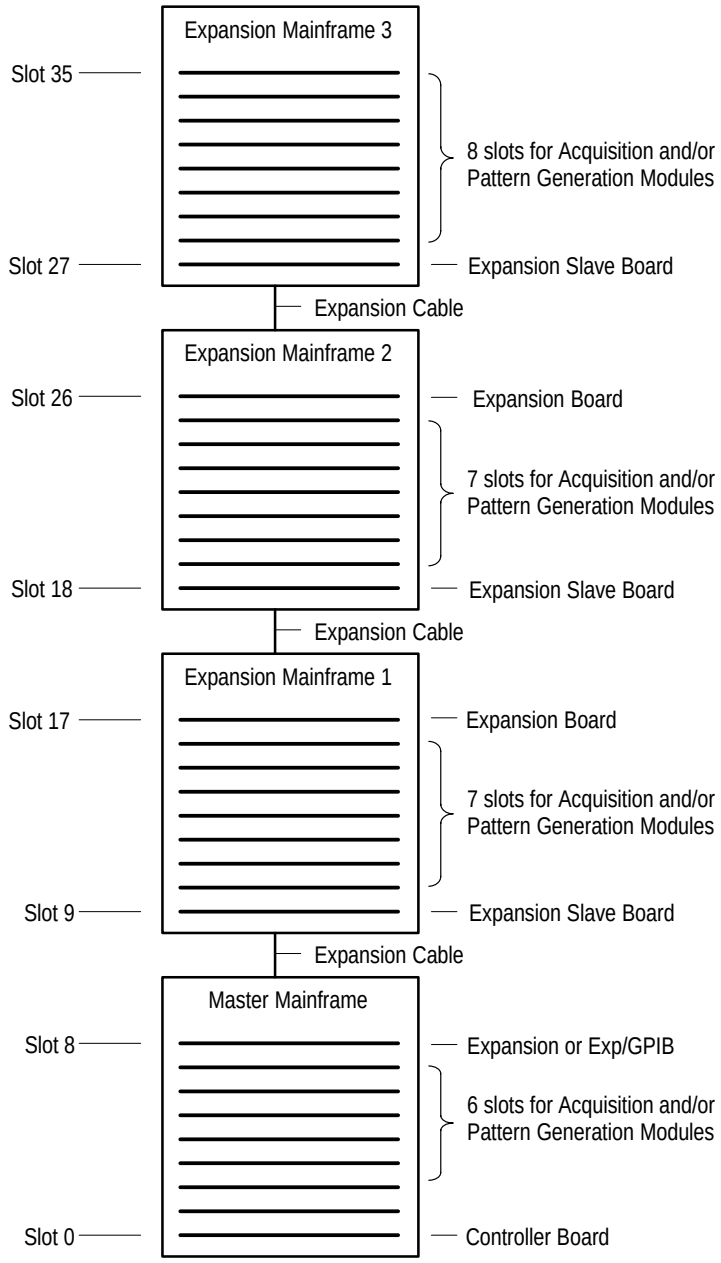


Figure 1–4: Twenty-Eight Slots Available with One Master and Three Expansion Mainframes

Acquisition and Pattern Generation Modules

Data acquisition and pattern generation modules, consisting of one or more printed-circuit boards, are the building blocks of the DAS system. These boards are installed in mainframe bus slots according to configuration guidelines in the user manual for each module. Refer to Table 1–4 for a list of available modules. Brief descriptions of these modules are included in *General Circuit Functions*. For detailed information on individual modules, including specifications and menu and field descriptions, refer to the appropriate user manual.

Table 1–4: DAS Series Acquisition and Pattern Generation Modules

Module	Purpose	Channels	Depth	Speed
92A16	acquisition	16	4K	200 MHz
92A16E	acq. expander	16	4K	200 MHz
92A60[1]	acquisition	60	32K	20 MHz
92A60D[1]	acquisition	60	128K	20 MHz
92A90[1]	acquisition	90	32K	20 MHz
92A90D[1]	acquisition	90	128K	20 MHz
92A96[2]	acquisition	96	8K	100 MHz
92A96D[2]	acquisition	96	32K	100 MHz
92A96XD[2]	acquisition	96	128K	100 MHz
92A96SD[2]	acquisition	96	512K	100 MHz
92A96UD[2]	acquisition	96	2M	100 MHz
92C96D[2]	acquisition	96	32K	100 MHz
92C96XD[2]	acquisition	96	128K	100 MHz
92C96SD[2]	acquisition	96	512K	100 MHz
92HS8[3]	acquisition	8	8K	2 GHz
92HS8E[3]	acq. expander	8	8K	2 GHz
92S16	pattern generation	16	1K	50 MHz
92S32	pattern generation	32	8K	50 MHz
92SX109	pattern generation	9	2K	100 MHz
92SX118	pattern generation	18	16K	100 MHz

1 **The 92A60/D and 92A90/D are both two-board sets; other modules consist of a single board.**

2 **The 92A96 High-Speed timing offers asynchronous support of 48 channels at 200 MHz and 24 channels at 400 MHz.**

3 **The 92HS8 has a mainframe cabinet that connects to the DAS through an interface board.**

You can combine modules functionally in menus. Combining acquisition modules adds data-channel width (for example, combining 92A16 and 92A16E boards). Combining pattern generation modules increases pattern memory depth (for example, combining 92S16 and 92S32 boards). You can also group modules to operate as an independently functioning unit (called a cluster); several clusters can run simultaneously. For more information on grouping modules and clusters, refer to the *DAS System User Manual*.

Maintenance

This chapter explains how to keep your DAS mainframe, associated modules, and terminal in good working condition. It also contains procedures on how to change the line-voltage selection (between sources of 115 V and 230 V) and replace the lithium battery on the Controller board of DAS 9219/9220 mainframes.



WARNING. *Dangerous electric-shock hazards exist inside the mainframe. Be sure to power down the mainframe and disconnect the power cord before removing the cabinet. Only qualified service personnel should disassemble the mainframe.*



CAUTION. *When powering down the mainframe, wait 60 seconds before disconnecting the power cord. This allows the mainframe to complete file-management procedures and move the hard disk head to a safe position.*

Preventive Maintenance

Preventive maintenance consists of periodic cleaning. If dust accumulates on components, it acts as an insulating blanket and prevents efficient heat dissipation. This condition can cause overheating and component breakdown. Periodic cleaning reduces instrument breakdown and increases reliability.

You should clean the DAS mainframe and terminal as needed, based on the operating environment.

Static Precautions



CAUTION. *Many components within the mainframe are extremely susceptible to static-discharge damage. Service the mainframe only in a static-free environment. Observe standard handling precautions for static-sensitive devices while servicing the instrument. Always wear a grounded wrist strap, or equivalent, while servicing the mainframe.*

Observe the following precautions to avoid damage:

- Do not handle static-sensitive components on the boards.
- Transport and store static-sensitive boards in their original containers or on conductive foam. Label any package that contains static-sensitive assemblies.
- Wear a wrist strap attached to the mainframe while handling the boards to discharge the static voltage from your body.
- If you need to temporarily set a board down, place it on the card cage to protect it from damage by static voltage.
- Do not allow anything capable of generating or holding a static charge on the work surface.
- Do not slide a board over any surface.
- Avoid handling boards in areas that have a floor or work-surface covering capable of generating a static charge.
- When not in use, store boards in a static-free (conductive) package.

Cleaning Guidelines

Use the following guidelines when cleaning the mainframe and modules:



CAUTION. *Spray-wash dirty parts with a cleaning solution (as described in Interior Cleaning, later in this section), THOROUGHLY RINSE with deionized water, and IMMEDIATELY DRY with low air pressure.*

When cleaning near unsealed electromechanical components, use as little washing as possible. This prevents removing the lubricant from the components and getting excess moisture into the contact areas of the switches. MOISTURE WILL CAUSE CORROSION, which may degrade instrument performance.

DO NOT use a freon-based cleaner on the circuit boards. Freon will damage aluminum capacitors.

DO NOT wash the Standby/On switch. Cover the switch during washing procedures.

DO NOT use fluorocarbon-based spray cleaners or silicon spray lubricants on switches or switch contacts. These sprays may damage the circuit-board material or plastic parts, and leave a dust-collecting residue. Use Tektronix Contact Lubricant and Cleaner (part number 006-0442-00) as a lubricant.

To prevent damage from electrical arcing, completely dry all circuit boards, switches, and board interface connectors. Do this by heating the board or switch in an oven at 65° C (150° F) for 15 minutes before applying power.

Mainframe

The following paragraphs describe maintenance procedures for DAS mainframes.

Exterior Cleaning. Dust the exterior surfaces of the mainframe with a dry, lint-free cloth or a soft-bristle brush. If dirt remains, use a cloth or swab dampened with a 75% isopropyl alcohol solution. A swab is also useful for cleaning in narrow spaces around the controls. Do not use abrasive compounds on any part of the instrument.



CAUTION. *To prevent getting moisture inside the instrument during external cleaning, use only enough liquid to dampen the cloth or swab.*

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

Interior Cleaning. Clean the interior every six months to keep dust from contaminating the disk drives. To access the mainframe's interior, refer to the instructions in *Disassembly/Reassembly Procedures*.

Use a dry, low-velocity stream of air to clean the interior of the mainframe. A soft-bristle brush is useful for cleaning around components. If a liquid must be used for minor internal cleaning, use a 75% isopropyl alcohol solution and rinse with deionized water.

Floppy Disk Drive. The floppy disk drive requires routine maintenance to operate at maximum efficiency. The disks may be permanently damaged if dirt and dust accumulate on the recording surfaces. To prevent damage, the disks should be stored in the envelope and box provided, where they will not be exposed to dust or dirt. In addition, the head should be cleaned periodically.

You will need the following materials for routine maintenance:

- Vacuum cleaner
- 5.25 inch floppy-disk head-cleaning kit

The routine maintenance and cleaning schedules for the floppy disk drive are as follows:

- Clean the exterior (face) of the floppy disk drive monthly with a damp cloth and a 75% isopropyl alcohol solution.



CAUTION. *Do not allow moisture to enter the disk drive. When power is applied, voltages may damage internal components.*

- Clean the head monthly. Use the instructions provided with the head-cleaning kit.
- Clean the interior every six months with a soft-bristle brush and vacuum cleaner.

If the disk drive is heavily used, or is used in a dirty environment, you should clean the drive more frequently.

Hard Disk Drive. The hard disk drive requires no periodic maintenance.

Terminal and Keyboard

The following paragraphs describe maintenance procedures for the terminal and keyboard.

Exterior Cleaning. Dust the exterior surfaces of the terminal and keyboard with a dry, lint-free cloth or a soft-bristle brush. If dirt remains, use a cloth or swab dampened with a 75% isopropyl alcohol solution. A swab is also useful for cleaning in narrow spaces around the controls. Do not use abrasive compounds on any part of these instruments.



CAUTION. *To prevent getting moisture inside the instrument during external cleaning, use only enough liquid to dampen the cloth or swab.*

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

Terminal Screen. Clean the face of the display screen using a soft cloth dampened with a solution of 75% isopropyl alcohol.

Keyboard. Use an artist's soft brush to remove any dust or foreign matter between the keypads.

Interior Cleaning. For procedures on disassembly and interior cleaning of the 9200T, refer to the *4105 Service Manual.* For procedures on disassembly and interior cleaning of the 9201T, refer to the *4205 Service Manual*. For disassembly and interior cleaning procedures for the X terminals, refer to the *TekXpress X Terminal Series Service Manual*. (These manuals are not part of the DAS documentation package; to obtain a manual, contact your local Tektronix representative.)

DAS Modules

The following paragraphs describe cleaning procedures for the DAS modules.

To clean the surface of a DAS module, use a dry, low-velocity stream of air. A soft natural-bristle brush is useful for cleaning around components. To prevent static damage to parts, use only a natural-bristle brush (a synthetic brush can generate static electricity).



CAUTION. *Do not use liquid cleaning agents when cleaning the modules.*

92HS8/8E Cabinet

The following paragraphs describe cleaning procedures for the 92HS8 cabinet.

Exterior Cleaning. Dust the exterior surfaces of the 92HS8/8E cabinet with a dry, lint-free cloth or a soft-bristle brush. If dirt remains, use a cloth or swab dampened with a 75% isopropyl alcohol solution. A swab is also useful for cleaning in narrow spaces around the controls. Do not use abrasive compounds on any part of the cabinet.



CAUTION. *To prevent getting moisture inside the cabinet during external cleaning, use only enough liquid to dampen the cloth or swab.*

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

Interior Cleaning. To access the cabinet's interior, refer to the instructions in *Disassembly/Reassembly Procedures*.

Use a dry, low-velocity stream of air to clean the interior of the instrument. A soft natural-bristle brush is useful for cleaning around components.



CAUTION. *Do not clean in areas near a 92HS8/8E hybrid IC or its associated Hypcon assembly elastomer.*

Corrective Maintenance

Corrective maintenance consists of inspecting the instrument for damage and obtaining replacement parts. Periodic inspection reduces instrument breakdown. This section also discusses procedures for changing the line-voltage selection and replacing the lithium battery on the Controller board.

Inspection

Inspect the instrument for broken connections, frayed wires, poorly seated components, leaking capacitors, damaged hardware, and heat-damaged components. Heat damaged parts usually indicate other circuit problems.

If you notice any of the above problems, inform your Tektronix field representative.

Obtaining Replacements

Obtain replaceable parts for your instrument from your local Tektronix Field Office or representative.

Mechanical. Most of the mechanical parts in this instrument are manufactured by Tektronix. Some parts are selected by Tektronix to satisfy particular requirements, or are manufactured to certain specifications for Tektronix. To determine the Tektronix part number of a mechanical part, refer to *Replaceable Mechanical Parts* beginning on page 7–1.

Electrical. Individual electrical components are not replaceable parts, except fuses and the lithium battery on the DAS 9219/9220 Controller board. Instead, whole assemblies are replaced (such as the 92A16 module, 92HS8 cabinet, or 92HS8 interface cable). The part numbers for the assemblies can be found in *Replaceable Electrical Parts*. The power supply is replaceable as a unit only. The part number can also be found in *Replaceable Electrical Parts* beginning on page 6–1.

Selecting the Line Voltage and Replacing the Line Fuse

DAS Mainframe. To change between the 115 V and 230 V line-voltage selections on the mainframe, perform the following steps.



CAUTION. *A power supply with Option 04 (VDE) should operate at 230 V only, not at 115 V. Option 04 provides a line filter.*



WARNING. *Disassembly procedures should be performed only by qualified service personnel. You may be exposed to dangerous electric-shock hazards if you remove the cover. Before removing the cover, power down the mainframe, wait 60 seconds, and then disconnect the power cord. This procedure allows the power-down sequence to complete.*

1. Perform steps 8, 9, 11, 12, and 13 of *Procedure 7: Removing the Power Supply* beginning on page 3–15.
2. Remove the three screws holding the power supply frame together, as shown in Figure 2–1.

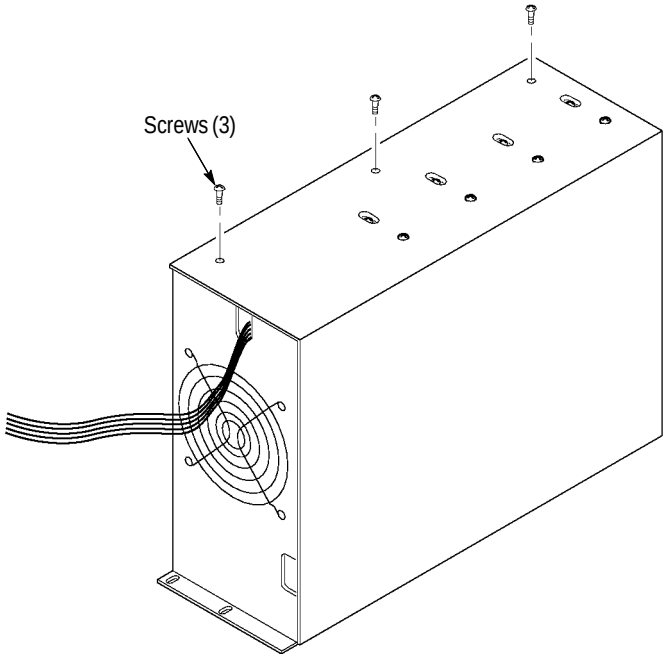


Figure 2–1: Location of Power Supply Frame Screws

3. Gently lower the side of the power supply to expose the inside of the power supply.
4. Refer to Figure 2–2 to locate the line voltage selection jacks (J134, J136, J137, J138, and J139) at the rear of the Primary board in the power supply.

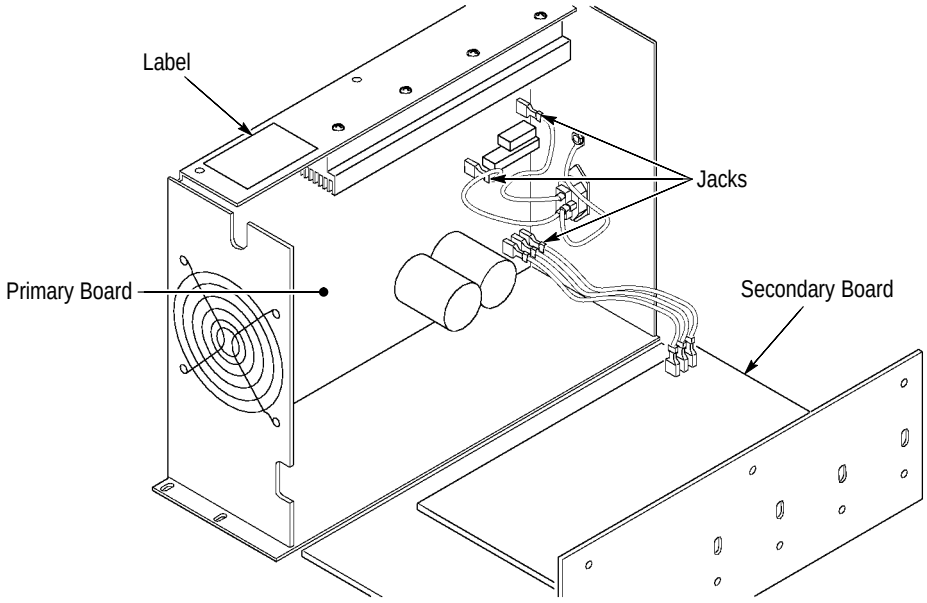


Figure 2–2: Location of Line Voltage Selection Jacks

5. Refer to Figure 2–3 to determine the current line selection.

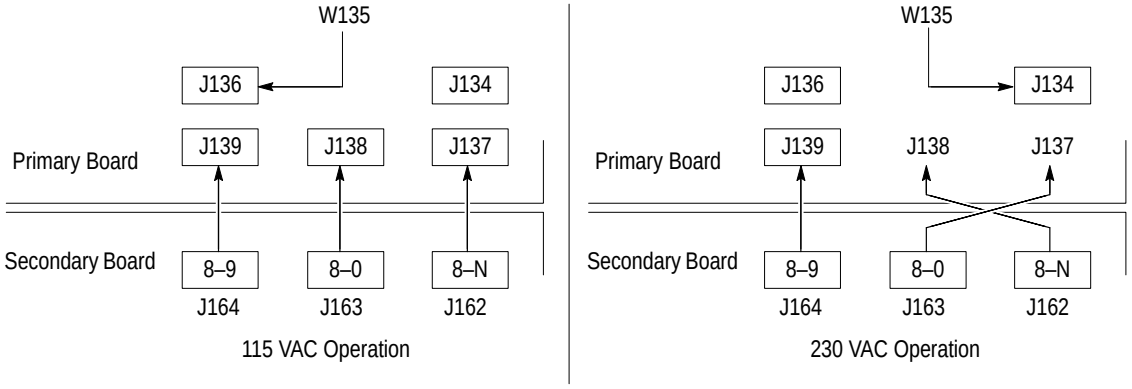


Figure 2–3: Position of Line Voltage Selection Jacks for 115 V or 230 V Operation

NOTE. *The numbers 8-9, 8-0, and 8-N in Figure 2–3 indicate the following wire-color code (resistor color code standard):*

- *Wire 8-9 is a gray wire with a white stripe.*
- *Wire 8-0 is a gray wire with a black stripe.*
- *Wire 8-N is a gray wire with no stripe.*

6. Change the selection by grasping the plastic boot of the wire with needle-nose pliers and moving the wire to the appropriate jack.

***NOTE**. When installing W135 on J136 or J134, turn W135 180° to insert it on the jack.*

7. Reassemble the power supply and replace it in the mainframe.

8. Remove the fuse from the back panel (see Figure 2–4) and replace the mainframe fuse as follows:

   - 115 V operation uses a 15 A, medium blow fuse.
   - 230 V operation uses a 10 A, slow blow fuse.

To determine the fuse part number, refer to *Replaceable Electrical Parts.*

***NOTE**. 230 V operation requires one of the power cord Options A1-A5.*

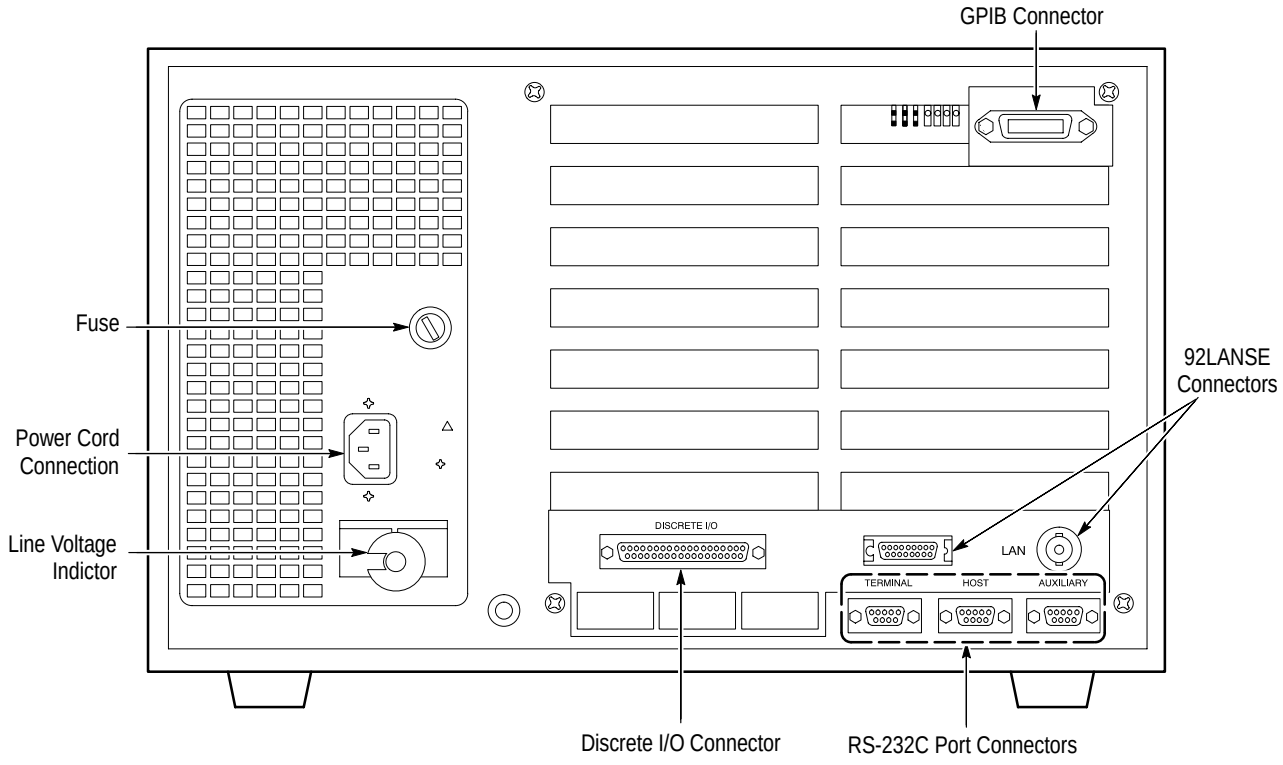


Figure 2–4: Location of DAS 9221 Back Panel Fuse and Line Voltage Indicator Knob (DAS 9219/9220 Look Similar)

9. Loosen the screw in the middle of the line-voltage indicator knob. (Refer to Figure 2–4.)

10. Turn the knob until you can see the appropriate line voltage in the recessed portion of the knob.

CAUTION. *Check that the indicator shows the correct line voltage. The instrument may be damaged if it is accidentally connected to the wrong power source.*

11. Tighten the screw to secure the line voltage indicator.

12. For the DAS 9221, change the power-supply/power-cord configuration jumper (J8700 on the Controller board) to reflect the new configuration.

13. Reassemble the mainframe.

9200T Terminal. There are two line voltage selection switches on the rear panel of the 9200T (see Figure 2–5). Before applying power to the terminal, check that the settings of both switches match the nominal voltage level of the AC power outlet that will supply power to the terminal.

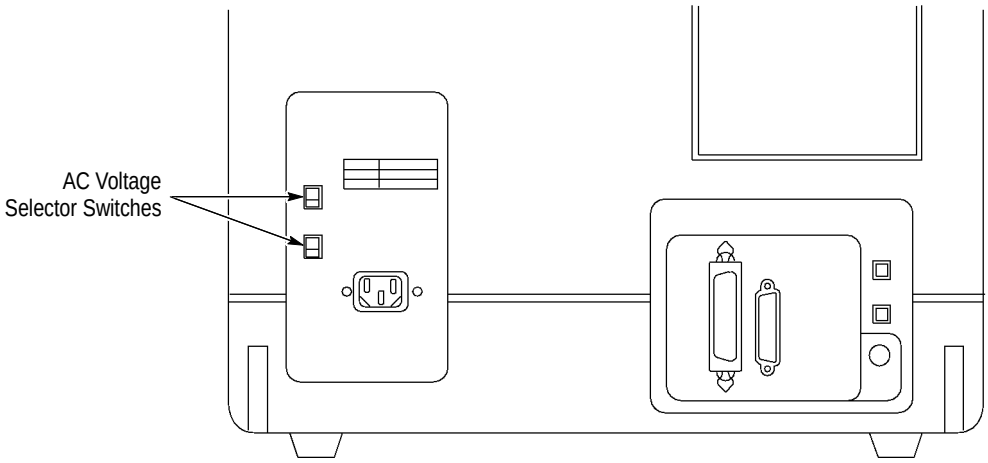


Figure 2–5: Location of AC Voltage Selector Switches on the 9200T

CAUTION. *After the 9200T is turned off, wait five seconds to discharge the capacitors before turning it on again.*

To change the line voltage selection on the 9200T, turn off the terminal and unplug the power cord. Switch the line-voltage selection switches to the desired position and plug the power cord into the appropriate outlet. (230 V operation requires one of the power cord Options A1-A5.)

9201T Terminal. There is one line voltage selection switch on the rear panel of the 9201T. Before applying power, check that the setting of this switch matches the nominal voltage level of the AC power outlet that will supply power to the terminal.

CAUTION. *After the 9201T is turned off, wait five seconds to discharge the capacitors before turning it on again.*

To change the line voltage selection on the 9201T, turn off the terminal and unplug the power cord. Switch the line voltage selection switch to the desired position and plug the power cord into the appropriate outlet. (230 V operation requires one of the power-cord Options A1-A5.)

X Terminals. There are no line voltage selection for the X terminals. The terminals automatically adjust to line voltages in the range of 90 to 260 VAC with the frequency between 48 and 66 Hz. Only use a power cable with the appropriate power source that is in good condition and complies with the local certification standards.

92HS8/8E Cabinet. The line voltage selector switch, line fuse, and AC power switch for the 92HS8 cabinet are located inside the right side panel of the cabinet (when facing the front of the cabinet). (See Figure 2–6.) The AC power switch should always be in the on position (switched towards the front of the cabinet).

The line-voltage indicator for the 92HS8 cabinet is located on the left side of the back panel (see Figure 2–7). A black hex-head screw indicates which voltage source the cabinet is set to use.

WARNING. *Changing the position of the back panel screw does not change the power supply voltage range. The position of this screw is only an indicator of the voltage setting.*

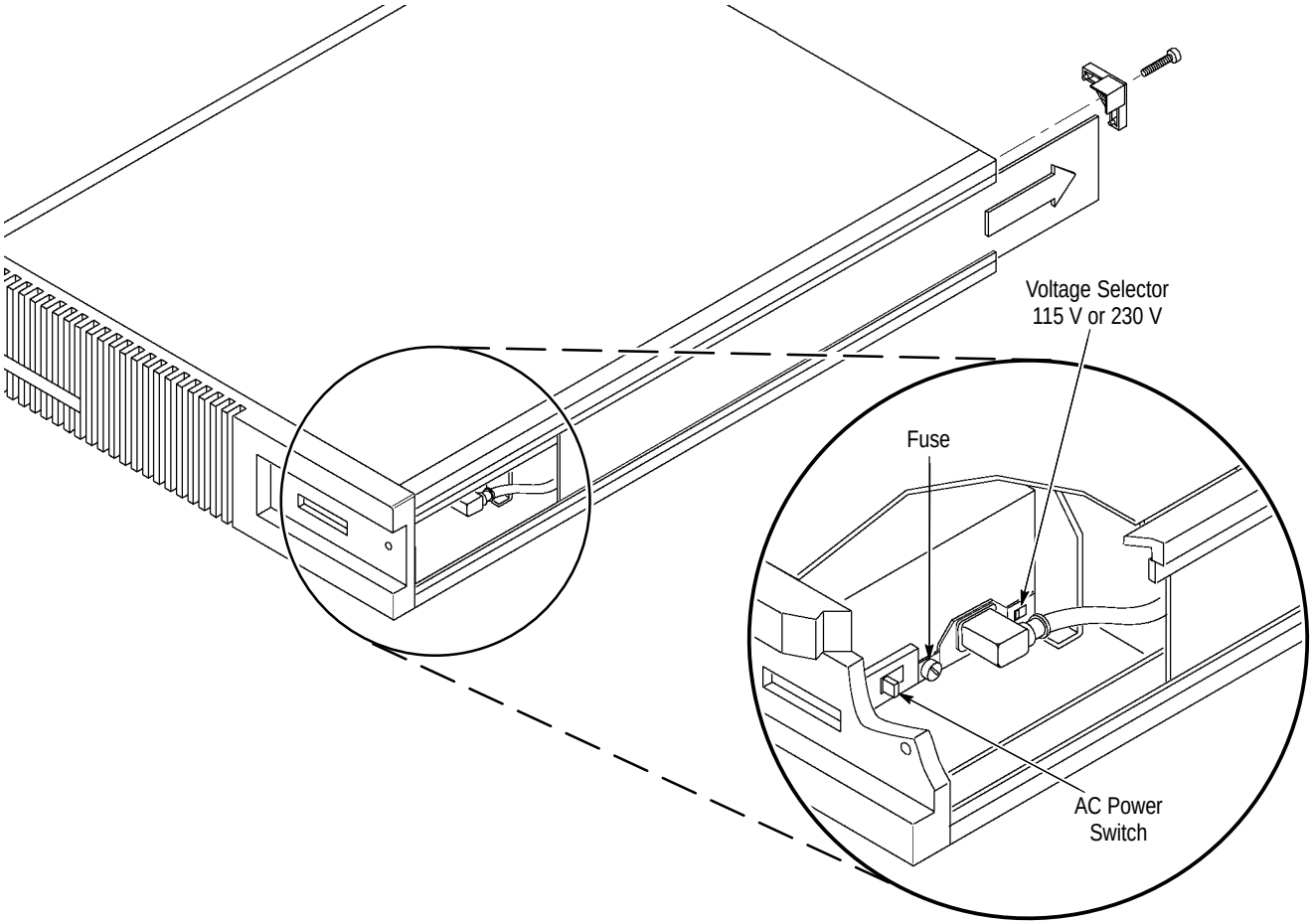


Figure 2–6: Location of the Line Voltage Selector and Line Fuse Behind the 92HS8/8E Side Panel

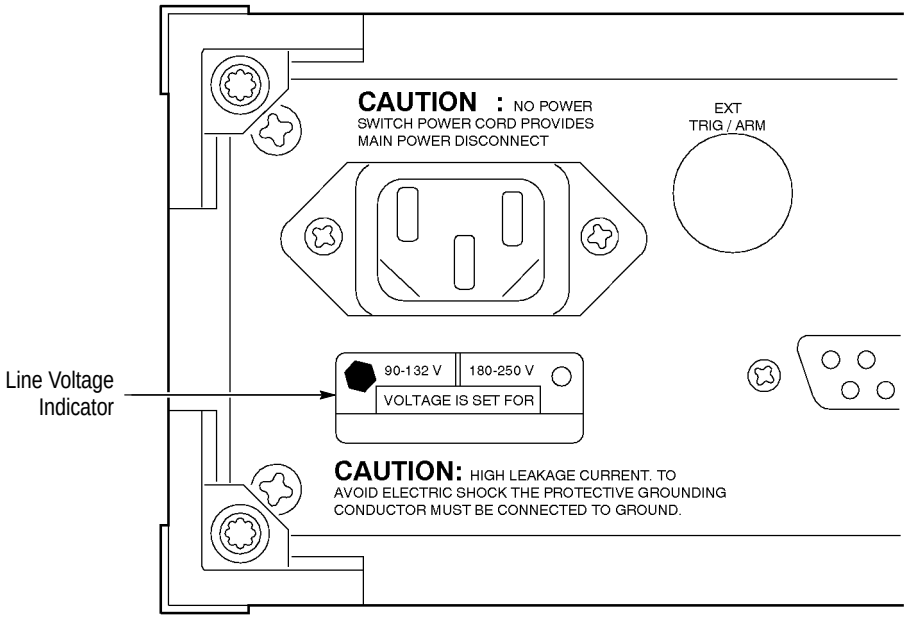


Figure 2–7: Back Panel Location of the 92HS8 Line Voltage Indicator Screw

To change the line voltage selector on the 92HS8/8E cabinet between 115 V and 230 V operation, perform the following steps.

1. Power down the DAS mainframe and 92HS8 cabinets and disconnect all power cords.
2. Facing the rear of the 92HS8 cabinet, remove the corner feet on the top and bottom of the left side of the cabinet using a TORX screwdriver.
3. Slide the cabinet side out of its holding track to expose the power supply line fuse and line-selector switch, located near the front of the instrument.
4. Change the line voltage selector, then remove the 92HS8 line fuse and replace it as follows:
   - 115 V operation requires a 5 A, fast blow fuse.
   - 230 V operation requires a 2.5 A, fast blow fuse.

***NOTE**. 230 V operation requires one of the power-cord Options A1-A5.*

To determine the part number of these fuses, refer to *Replaceable Electrical Parts.*

5. Replace the side panel and corner feet on the cabinet.

6. Remove the line-voltage indicator screw on the back panel and position it to indicate the power source being used.

Replacing the Battery on the DAS 9219/9220 Controller Board

The DAS 9219 and DAS 9220 mainframes use a lithium backup battery on the Controller board when there is no power to the mainframe (such as when the power cord is not attached). This battery also provides backup power for the clock/calendar feature displayed in the Diagnostic menu.



CAUTION. *Battery replacement should be performed by a qualified technician.*

NOTE. *The DAS 9221 battery is built into the circuitry and has a 10-year life. To replace this battery, a qualified service technician must replace a chip on the Controller board.*

If your mainframe is in constant use, you should check the battery yearly. If it is not used for long periods, you should check the battery every six months. Replace the backup battery if the voltage is near 2.6 volts, since the system information stored in RAM may be lost if the voltage drops below this value.

To determine the condition of the battery, measure the battery voltage across the battery (BT905 in Figure 2–8) with the line cord removed from the power supply. When it becomes necessary to replace the backup battery on the Controller board, use the following procedure:



CAUTION. *After powering down the mainframe, wait 60 seconds before disconnecting the power cord to allow the mainframe to lock the head in the hard disk drive and complete file-management procedures.*

1. Remove the line cord from the power supply.
2. To provide temporary power to the Controller board circuits while replacing the battery, connect an external +5 volt supply across C921 (shown in Figure 2–8).



CAUTION. *Before connecting the external power supply, observe the polarity of the supply and the capacitor. Connect the minus (–) lead of the supply to the grounded side of the capacitor.*

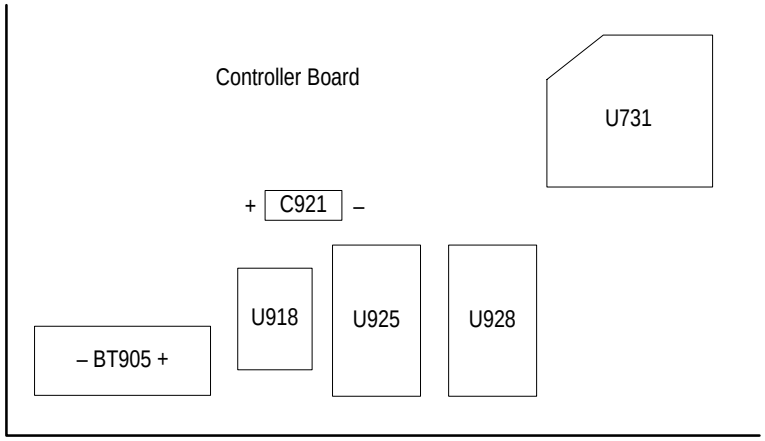


Figure 2–8: Location of C921 on Mainframe Controller Board

3. Remove the battery (BT905 in Figure 2–8) by cutting the elastic band and pulling the battery out of the holder.

WARNING. *To avoid injury, observe proper procedures for handling and disposal of lithium batteries. Improper handling may cause fire, explosion, or severe burns. Don't recharge, crush, disassemble, heat the battery above 100° C (212° F), incinerate, or expose the contents of the battery to water. Dispose of the battery in accordance with local, state, and national regulations. For further information, refer to the Lithium Battery Disposal section following this procedure.*

4. Place the new battery in position and push it into the holder, while observing the correct polarity.

5. Disconnect the external +5 volt power supply.

6. Install a new elastic band around the battery by performing the following substeps:

a. Perform steps 2, 7, and 8, of *Procedure 8: Removing the Card Cage* beginning on page 3–18 in the *Disassembly/Reassembly Procedures* chapter.

b. Gently pull the card-cage assembly up from the nylon posts.

c. Insert the elastic band into the holes provided. Pull the elastic band tightly, from the bottom, with needle-nose pliers.

d. Reinstall the card-cage assembly.

7. Check the condition of the battery by measuring the voltage across it. It should measure approximately 3 volts.

Disposing the Lithium Battery

You can safely dispose of small quantities of batteries (less than 20) with ordinary garbage in a sanitary landfill; larger quantities must be sent by surface transport to a Hazardous Waste Disposal Facility. The batteries should be individually packaged to prevent shorting and packed in a sturdy container that is clearly labeled “Lithium Batteries — DO NOT OPEN.”

Disassembly/Reassembly Procedures

This chapter describes the disassembly and reassembly procedures for the DAS mainframes, 92HS8 cabinet, and acquisition and pattern generation module probes.

In the following procedures, directional terms (top, bottom, left, right, front, and back) assume that your mainframe is in an upright position (with the bottom down), and that you are facing the front of the mainframe. Reassembly procedures are the reverse of the disassembly procedures unless otherwise noted.

Figure 3–1 shows the DAS mainframe; use this figure to locate the major components. The DAS 92E9 Expansion mainframe is very similar to the DAS. In the disassembly procedures, differences between these mainframes are noted.

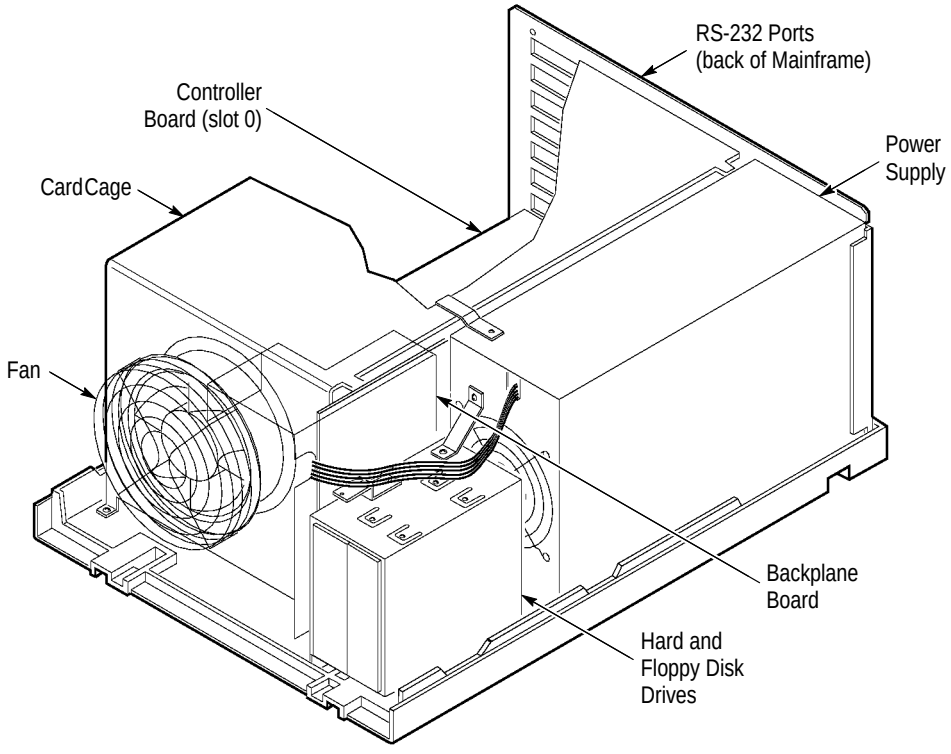


Figure 3–1: DAS Mainframe Internal Components (Memory Board in Slot 1 for DAS 9219/9220)

In addition to the illustrations in this section, refer to *Replaceable Mechanical Parts* for a detailed exploded view and parts list for the mainframes.

General Precautions

Observe the following precautions when performing any disassembly/reassembly procedures.



CAUTION. *After powering down the mainframe with the Standby/On switch, wait 60 seconds before disconnecting the power cord. This allows the mainframe to lock the head in the hard disk drive to a safe position and complete file-management procedures.*

- DO NOT attempt any disassembly procedure with the power cord connected.
- DO NOT operate a mainframe or 92HS8 cabinet with the cover removed to prevent overheating.
- DO NOT attempt mainframe disassembly procedures with probes installed or RS-232 connections in place.
- DO NOT place the mainframe on its front face. The front panel will not support the weight of the mainframe.

Tools Required

The following list identifies the tools necessary for disassembly of the DAS mainframes, 92HS8 cabinet, and probes. This is a complete list of tools; you will need only the tools for your specific disassembly needs.

- 3⁄16 inch flexible shaft nutdriver
- 1⁄4 inch nutdriver
- 11 inch (shaft length) #2 POZIDRIV screwdriver (magnetic tip)
- 1⁄8 inch flat-blade screwdriver
- #1 POZIDRIV screwdriver
- #1 Phillips screwdriver
- Torque screwdriver with the following tips:

  1⁄8 inch slotted blade tip

  1⁄4 inch nutdriver tip

  #1 Phillips tip

  TORX-type magnetic tip (T-20)

- #0 Phillips screwdriver
- Small diagonal cutters
- Two board ejector tools (located inside the mainframe front panel) (Tektronix part number 105-0985-00)

Disassembly/Reassembly of the Mainframes

The following procedures describe how to disassemble and reassemble the DAS Master mainframe and DAS 92E9 Expansion mainframe. The user may perform procedures 1 and 2. However, qualified service personnel must perform the other procedures.



CAUTION. *Only qualified service personnel should perform disassembly procedures. Dangerous electric-shock hazards may be exposed when you remove the mainframe cover. Power down the mainframe and wait 60 seconds before disconnecting the power cord, so the power-down sequence completes.*

Procedure 1: Removing the Mainframe Top Cover

To install or remove a module, you must first remove the mainframe's top cover and inner card-cage door. Use the following steps to remove the top cover.

1. Power down the mainframe.



CAUTION. *After powering down the mainframe, wait 60 seconds before disconnecting the power cord. This allows the head in the hard disk drive to lock in a safe position and the software to complete file-management procedures.*

2. Disconnect the power cord.
3. Press the plastic latches on the left and right lower-rear sides of the cover and lift the cover from the back (see Figure 3–2).

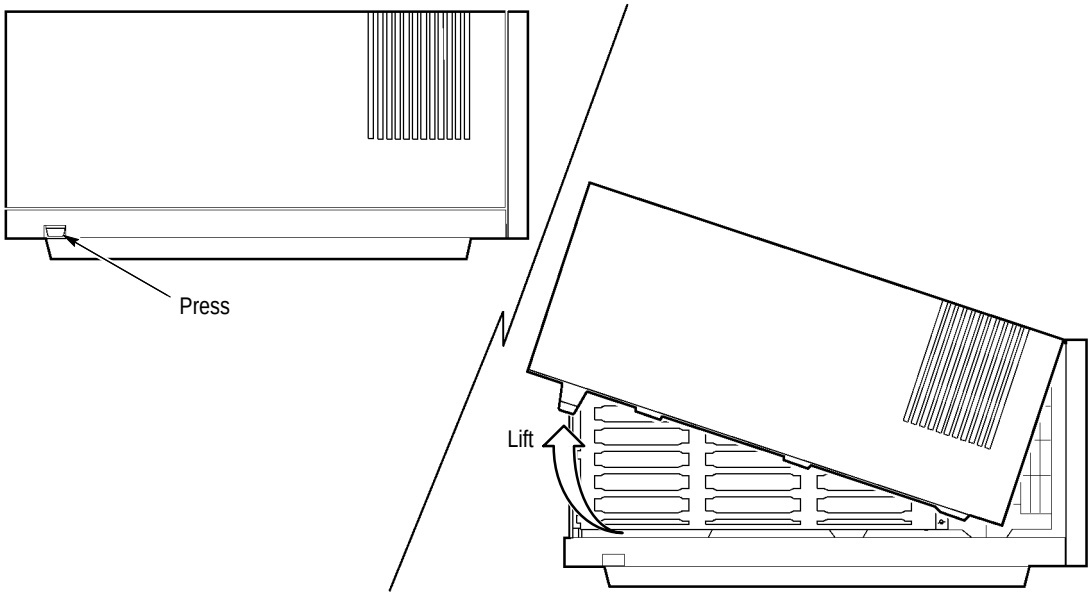


Figure 3–2: Removing the Mainframe Top Cover

4. Tilt the cover off the front of the mainframe. Set the cover aside so its inner surface will not be scratched.

Instructions for removing the card-cage door are listed in procedure 2.

Procedure 2: Removing a Module From the Card Cage

This procedure describes how to remove an acquisition or pattern generation module from the mainframe card cage. It can also be used to remove other boards (such as the Memory board in DAS 9219/9220 mainframes or GPIB/Expansion modules) that reside in reserved slots of the mainframe.



CAUTION. *Many components within the mainframe are susceptible to static-discharge damage. Follow the standard handling precautions for static-sensitive devices under* Static Precautions *beginning on page 2–1 when servicing this instrument.*

1. Perform procedure 1 on page 3–3.
2. To remove the card-cage door, unscrew (counterclockwise) the fasteners on the card-cage door (see Figure 3–3). Remove the door and set aside.

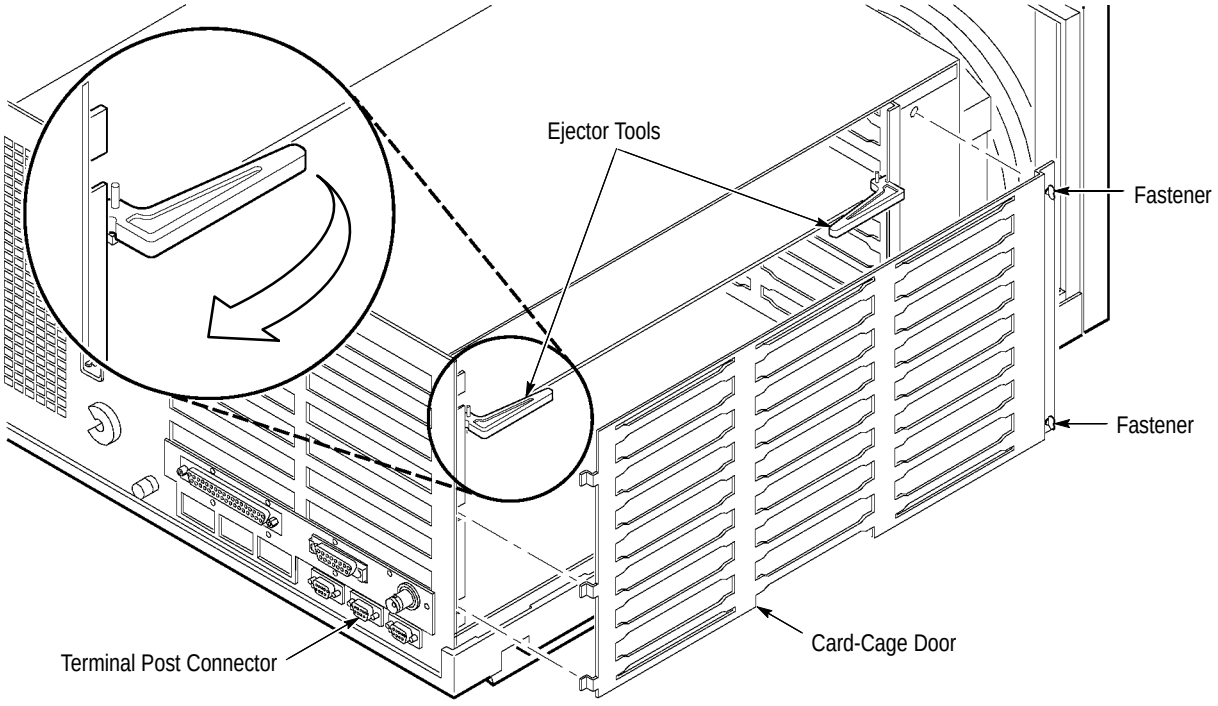


Figure 3–3: Ejector Tools and Location of Card-Cage Door Fasteners

3. Disconnect the probes, GPIB, and LAN cables from the rear of the mainframe. For DAS 9219/9220 mainframes, disconnect the RS-232 connections.
4. Remove the connectors from the GPIB and LAN modules (if installed).

NOTE. *When removing a 92A60 or 92A90 module, remove the 92A60/90 Memory board before removing the buffer probe attached to the 92A60/90 Controller board.*

5. Insert the two board-ejector tools into the board you are removing, as shown in Figure 3–3.

NOTE. *Board-ejector tools are stored inside the front panel of the mainframe on the left-hand side.*

6. Pry the board from the backplane.



CAUTION. *Pry with even force on both sides of the board to prevent bending the backplane-alignment pins.*

7. Grasp the sides of the board and pull it out of the card cage.

When installing modules, align the connection between the backplane and the module before applying pressure; this prevents connector damage.

Procedure 2a: Removing the 92LANSE Module

1. Perform procedures 1 on page 3–3 and 2 on page 3–5 to remove all other boards or modules from the mainframe.
2. Unscrew the five screws holding the 92LANSE module to the Controller board.
3. Carefully lift the 92LANSE module and remove the three cables connected to the module.

Procedure 3: Removing the Front Panel

1. Perform procedure 1 on page 3–3.
2. Note the orientation of the connector(s) at the back of the Standby/On switch and disconnect the connector(s) from the switch.
3. Place the mainframe so the bottom of the front panel hangs over the workbench.
4. Press the release latches located underneath the front panel, as shown in Figure 3–4. While pressing the latches, pull the front panel towards you.
5. Move the mainframe back onto the workbench.

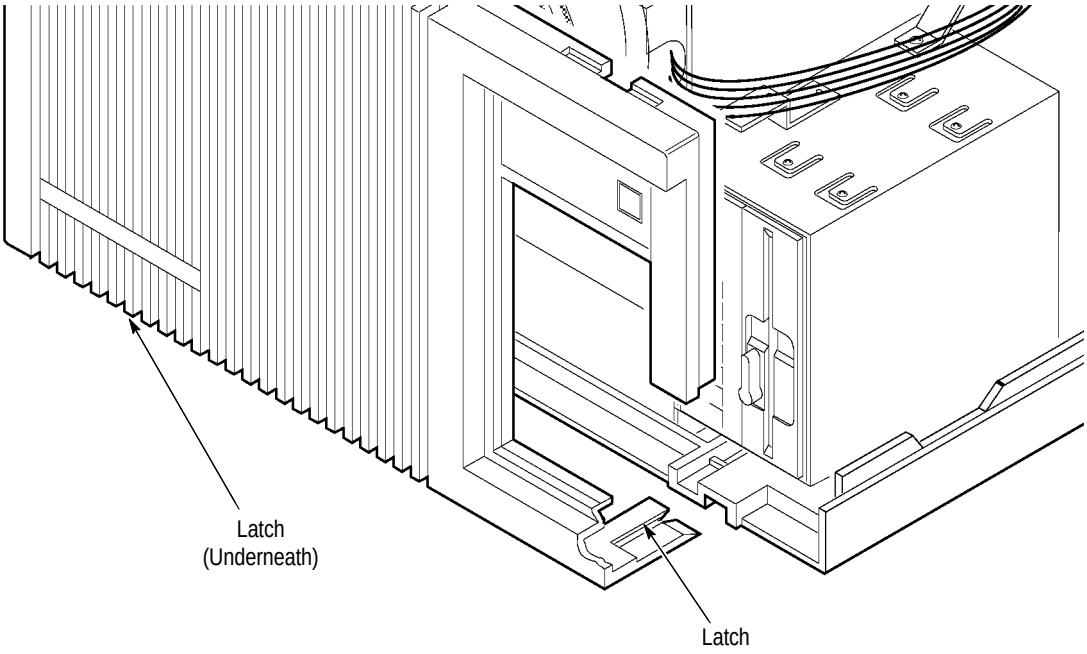


Figure 3–4: Location of Latches for Removing the Front Panel

Procedure 4: Removing the Fan

1. Perform procedures 1 on page 3–3 and 3 on page 3–6.
2. Disconnect the two-wire power cable (W865) located on top of the fan.
3. Disconnect the three-wire sense cable connector (W866) located below the power cable.
4. Remove the four screws that hold the fan to the card cage; they are located at the 4, 6, 8, and 12 o'clock positions.
5. Pull the fan and fan cage towards you and off the mainframe.

When reinstalling the fan, do not allow the ribbon cables or wires to hang in front of the fan. Torque the four screws that hold the fan to the card cage 5.0 to 6.0 inch pounds.

Procedure 5: Removing the Media Frame

This procedure describes how to remove the media frame from the DAS mainframe.



CAUTION. *If your system has a removable media hard disk drive, remove it before disassembly to prevent damage.*

1. Perform procedures 1 on page 3–3 and 3 on page 3–6.
2. Remove the ribbon cables connected to the Controller board beneath the card-cage fan. For DAS 9219 and DAS 9220 mainframes, remove the three ribbon cables (W298, W398, and W698) connected to J298, J398, and J698 on the Controller board. For DAS 9221 mainframes, remove the two ribbon cables (W3900 and W6900) connected to J3900 and J6900 on the Controller board.
3. Using care not to cut the power-supply wires, cut the plastic tie that holds the power-supply wires to the top of the media frame.
4. Remove the stabilizer bracket connecting the media frame to the power-supply frame.
5. Unscrew the four screws that hold the media frame to the mainframe baseplate (see Figure 3–5).
6. Grasp the media frame with both hands and tilt it outward, then lift up and remove. You may need to open the cable clamp located on the left side of the media frame before you can move the media frame onto the adjacent work surface.
7. Remove the ribbon cable W965 that connects the power supply to the media.

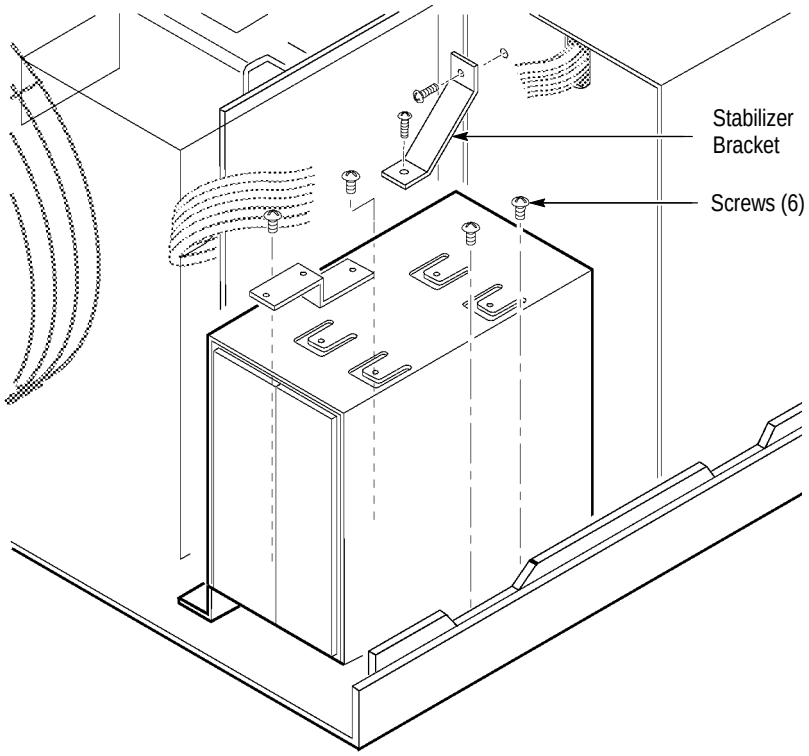


Figure 3–5: Location of Screws for Removing the Media Frame

Procedure 6: Removing the Disk Drives From the Media Frame

This procedure describes how to remove both the hard disk and floppy disk drives from your media frame. This procedure does not apply to Expansion mainframes.

1. Perform procedure 5 on page 3–8.
2. Disconnect the ribbon cable(s) from the drive being removed.
3. Remove the two screws (on top of the appropriate drive) from the media frame.
4. Gently turn the media frame on its side, to prevent damage, and remove the two bottom screws.
5. Grasp the drive from the front and pull towards you to remove it from the media frame.

Installation Hints for Floppy Disk Drives. The procedure for installing the floppy disk drive is essentially the reverse of the disassembly procedure. When installing the floppy disk drive, torque the metric screws from 5.0 to 7.0 inch pounds.

CAUTION. *Some disk drives use metric screws, identified by their gold finish. Make sure metric screws are used only into metric mounting holes to prevent damaging the threads.*

Installation Hints for Fixed-Media Hard Disk Drives. The procedure for installing the fixed-media hard disk drive is essentially the reverse of the disassembly procedure.

1. Attach the data and controller cables to the floppy disk drive and hard-disk connectors. Figures 3–6 and 3–7 show the correct connector and cable arrangements for the different mainframes.
2. Secure the ribbon cables in the self-adhesive retaining clamp.
3. Connect the power cable to both disk drives (power-cable connectors are keyed to the connectors on the disk drives). Use between 7.5 and 10.0 inch-pounds of torque to fasten the media frame.

CAUTION. *Be careful not to pinch any power or ribbon cables when installing the media frame.*

4. Reconnect the cables to the mainframe Controller board, routing the cables so they do not block the airflow from either the card-cage fan or the power-supply fan. The ribbon cables must be folded neatly, as shown in Figure 3–8 on page 3–13.
5. Secure the power-supply wires to the top of the media frame using a cable tie.

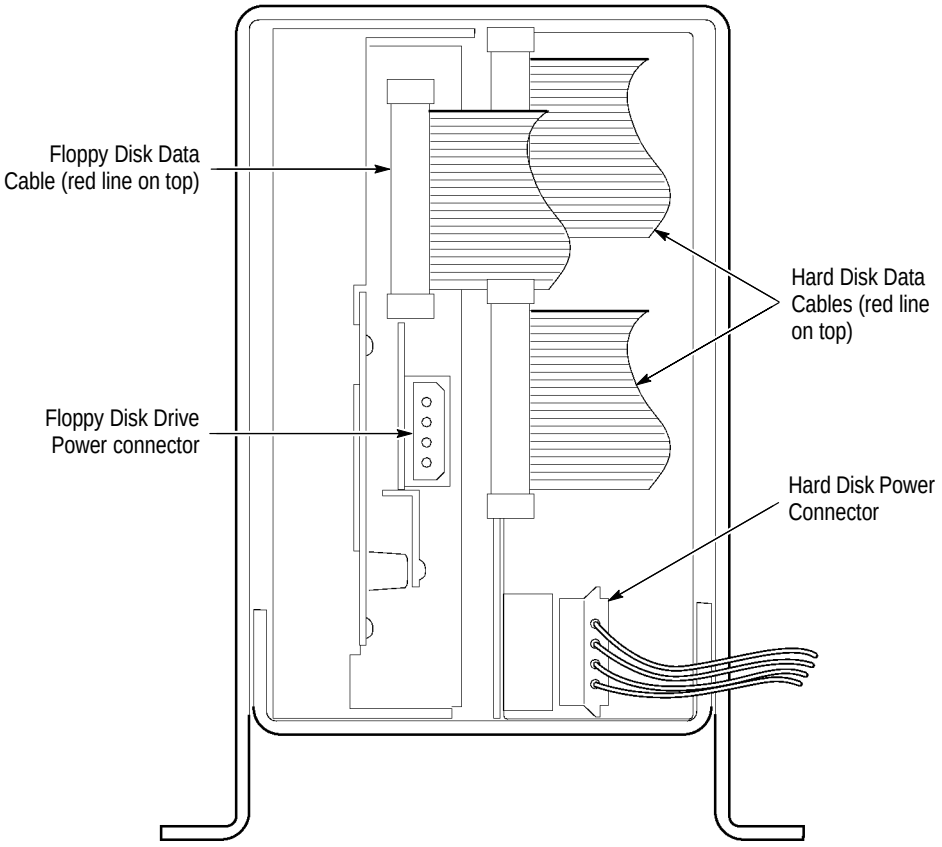


Figure 3–6: Typical Cable Connections for Fixed-Mount Hard and Floppy Disk Drives for DAS 9219 and DAS 9220 Mainframes

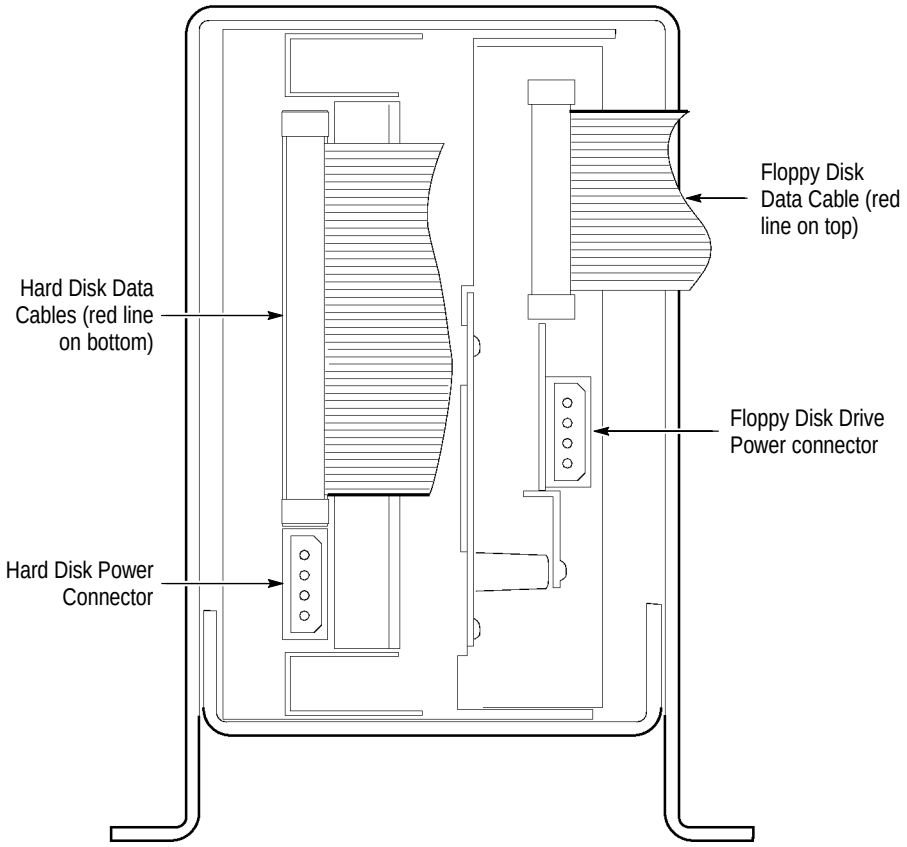


Figure 3–7: Typical Cable Connections for Fixed-Mount Hard and Floppy Disk Drives For DAS 9221 Mainframes

Installation Hints For Removable-Media Hard Disk Drives. The procedure for installing the removable-media hard disk drive is essentially the reverse of the disassembly procedure.



CAUTION. *DO NOT install a DAS 9221 removable SCSI disk drive into a DAS 9219 or DAS 9220 mainframe that uses removable ST506 drives. Installing the wrong type of drive into a system may result in damage to the hardware. Refer to Hard and Floppy Disk Drive Switch and Jumper Positions in* Troubleshooting *for descriptions of the drives.*

1. Before installing the new media frame, test the fit of the removable hard disk drive. (See Figures 3–9 on page 3–14 and 3–10 on page 3–15 for the different mainframes.) The disk drive should fit snugly into place with only a small amount of friction from the media frame.

After you are satisfied with the fit, remove the hard disk drive before installing the media frame in the DAS.

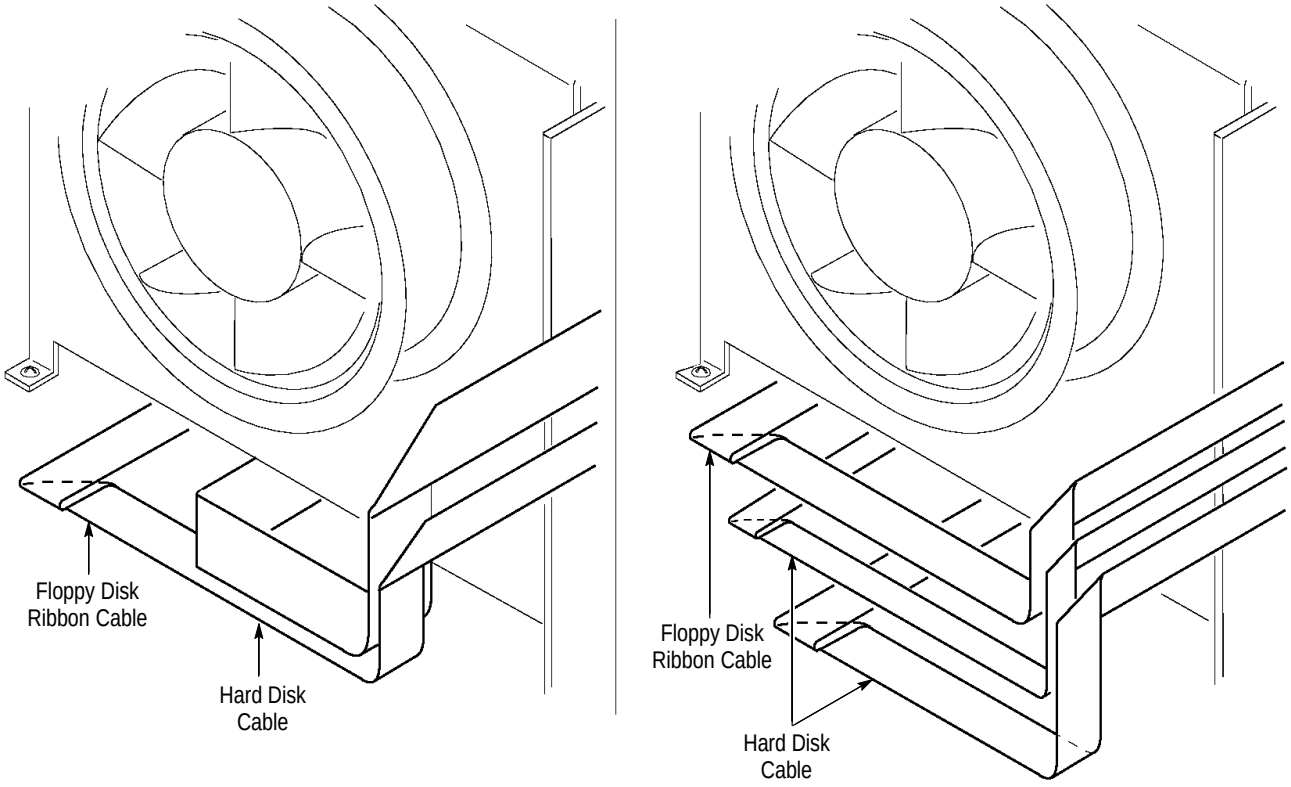


Figure 3–8: Folding the Ribbon Cables

If you have a DAS 9221 mainframe, fold the cables as shown in the left side of the illustration. If you have a DAS 9219/9220 mainframe, fold the cables as shown on the right side of the illustration.

2. Attach the data and controller cables to the floppy disk drive and hard-disk connectors. Figures 3–6 and 3–7 show the correct connector and cable arrangements for each mainframe.

3. Secure the ribbon cables in the retaining clamp.

4. Connect the power cable to both disk drives (power-cable connectors are keyed to the connectors on the disk drives). Install the media frame into the DAS, gently forcing it as far to the right as possible. Use 7.5 to 10.0 inch-pounds of torque to fasten the media frame in place.

CAUTION. *Be careful not to pinch any power or ribbon cables when installing the media frame.*

5. Reconnect the cables to the mainframe Controller board, routing the cables so that they do not block the airflow from either the card-cage fan or the power-supply fan. The ribbon cables must be folded neatly, as shown in Figure 3–8.
6. Secure the power-supply wires to the top of the media frame using a cable tie.
7. Install the stabilizer bracket that secures the media frame to the power-supply frame.
8. Install the removable media after you complete all reassembly.

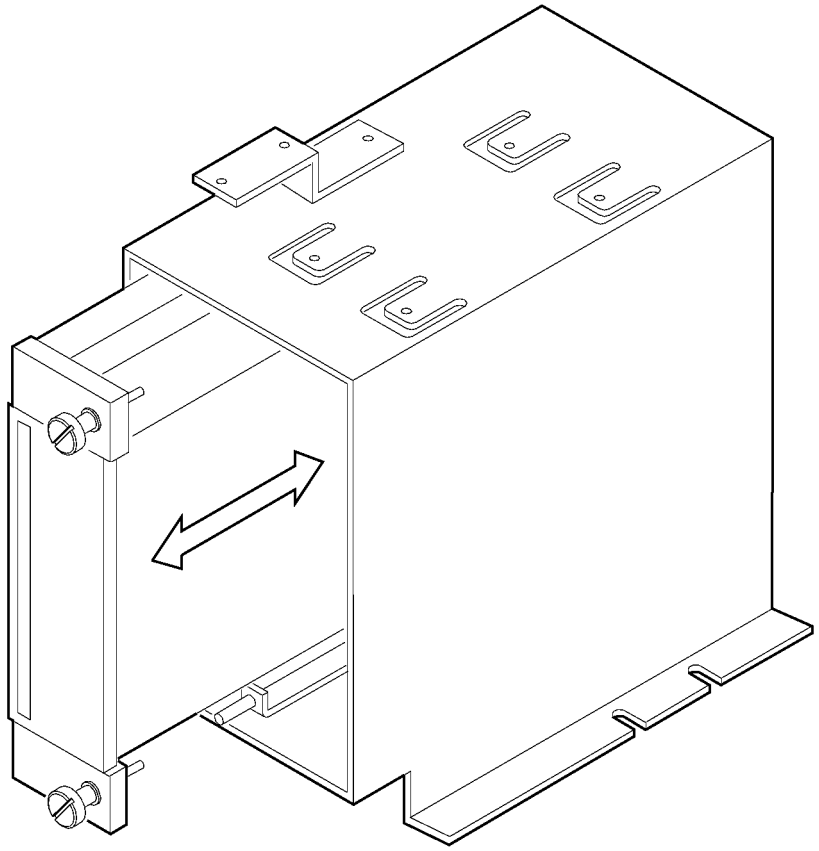


Figure 3–9: Removable 20 Mbyte Drive in DAS 9219/9220 Media Frame

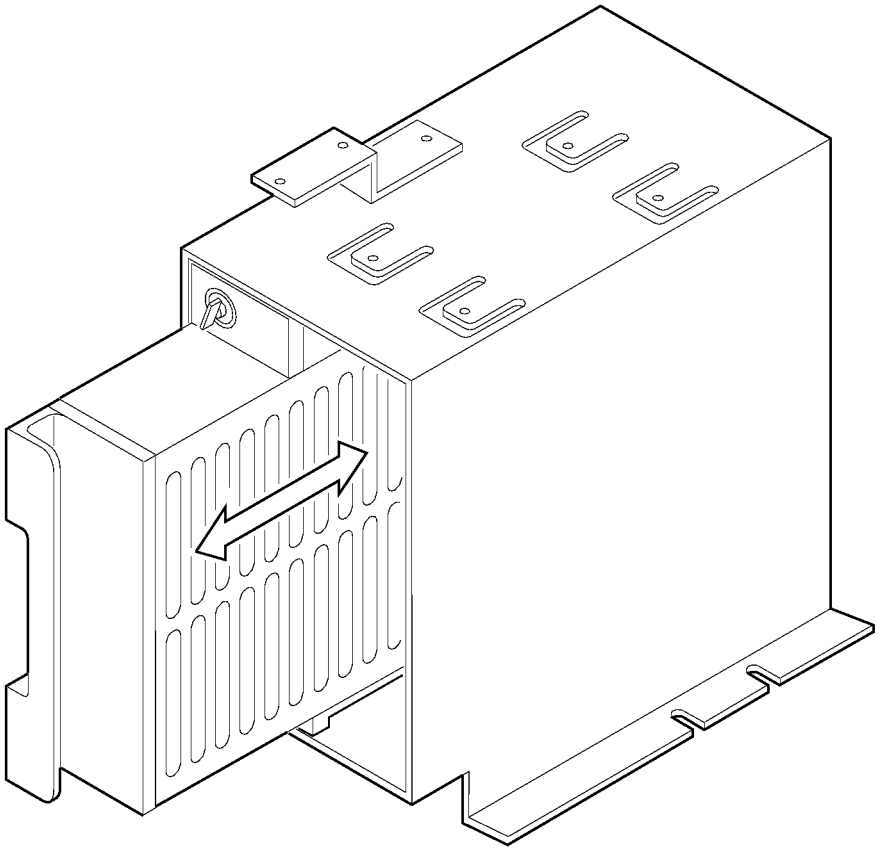


Figure 3–10: Removable Hard Disk Drive in a Media Frame

The hard disk drive is installed on the right side in a DAS 9221 mainframe.

Procedure 7: Removing the Power Supply

1. Perform procedures 1 on page 3–3 and 3 on page 3–6.
2. Trace the wires from the front of the power supply to the three front-edge connectors (J690, J590, and J390) on the Backplane board.
3. Using care not to cut the power-supply wires, cut the plastic tie that holds the power-supply wires to the media frame.
4. Unscrew and disconnect the 21 power-supply wires from the three edge connectors on the Backplane board.
5. Disconnect the ribbon cable (W290) from J290 on the Backplane board.
6. Disconnect the two-prong power cable connector (W865) and the three-prong sense cable connector (W866) from the fan.

***NOTE**. Remove the media frame before removing the power supply. It is not necessary to remove the cables connected to the media for this procedure.*

7. Unscrew the four screws that hold the media frame to the mainframe baseplate (see Figure 3–5 on page 3–9).
8. Remove the stabilizer bracket connecting the media frame to the power-supply frame.
9. Remove the bracket connecting the power-supply frame to the card cage.
10. Grasp the media frame with both hands and tilt it outward, then lift up and turn 90° to remove.
11. Remove the ribbon cable (W965) that connects the power supply to the media.
12. Unscrew the two bottom-front and two top-rear screws of the power-supply frame from the mainframe. (See Figure 3–11.)

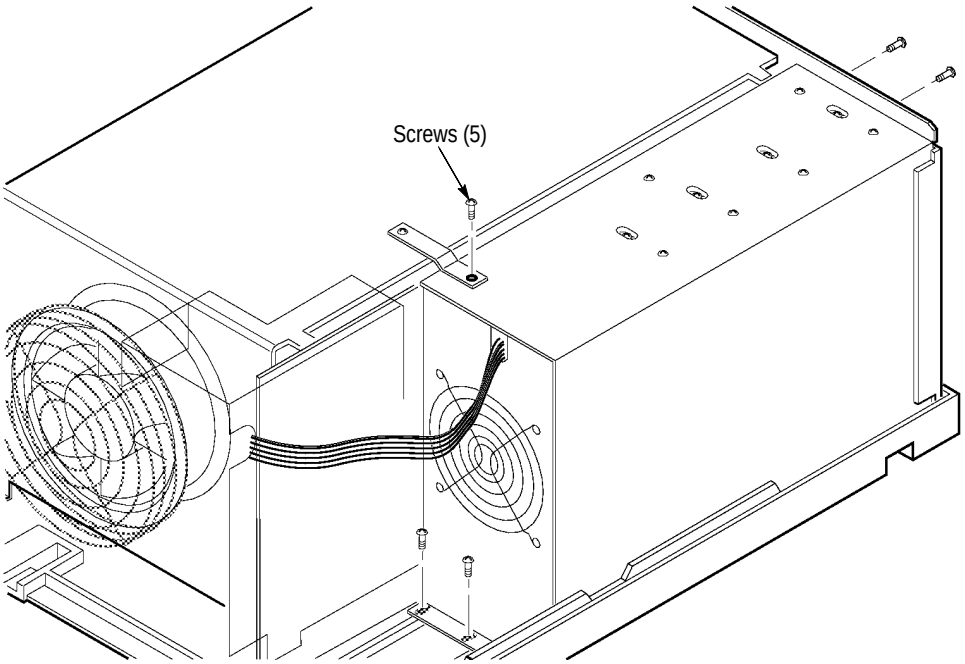


Figure 3–11: Location of Screws for Removing the Mainframe Power Supply

***CAUTION.** Do not bend the pins on the back of the Backplane board when removing or installing the power supply.*

13. Slide the power supply toward the front of the mainframe, tilt it outward, then lift the power supply out of the mainframe.

Refer to Table 3–1 when reconnecting the power-supply wires to the Backplane board.

Table 3–1: Power-supply Connections

Connector	Connector Slot #	Wire Color	Voltage
J690	1, 2	red	+17.5 V
J690	3, 4	violet	–17.5 V
J690	5 – 7	yellow	+3V
J590	1 – 7	any white[1]	+5V
J390	1 – 7	any black[2]	GND

1 **All white wires are +5 V; connect these wires to any slot.**

2 **All black wires are ground; connect these wires to any slot.**



CAUTION. *When reconnecting cables, align ribbon cable W290 with J290 on the Backplane board. If the connectors are offset, the power supply may be damaged.*

When reinstalling the power-supply frame into the mainframe, perform the following procedure:

1. Press the power-supply frame against the rear of the mainframe; check that there is not a gap between the two frames.

2. Screw the two bottom-front screws of the power-supply frame to the mainframe; apply between 3.5 and 4.0 inch-pounds of torque to the screws.

3. Screw the two top-rear screws of the power-supply frame to the mainframe; apply between 3.5 and 4.0 inch-pounds of torque to the screws.

4. Check that the cables do not block the fans.

These steps maximize the air flow between the power-supply frame and the media frame and reduce EMI radiation.

Procedure 8: Removing the Card Cage

***NOTE**. You must remove the card cage from the mainframe before removing the Controller board and the backplane.*

1. Perform procedure 1 on page 3–3, procedures 2 and 2a on page 3–6, and procedure 3 on page 3–6.
2. Disconnect the connectors to the GPIB, 92LAN, or 92LANSE boards. For DAS 9221 mainframes, disconnect the three internal RS-232 cables from the Controller board.
3. Remove the stabilizer bracket connecting the power-supply frame to the card cage.
4. Disconnect the power cable connector (W865) and the sense cable connector (W866) from the fan.
5. Disconnect W290 from J290 on the Backplane board.
6. Disconnect the ribbon cables located below the fan.
7. Unscrew and remove the 21 power-supply wires from the three connectors on the Backplane board.
8. Remove the four screws from the back panel, as shown in Figure 3–12.

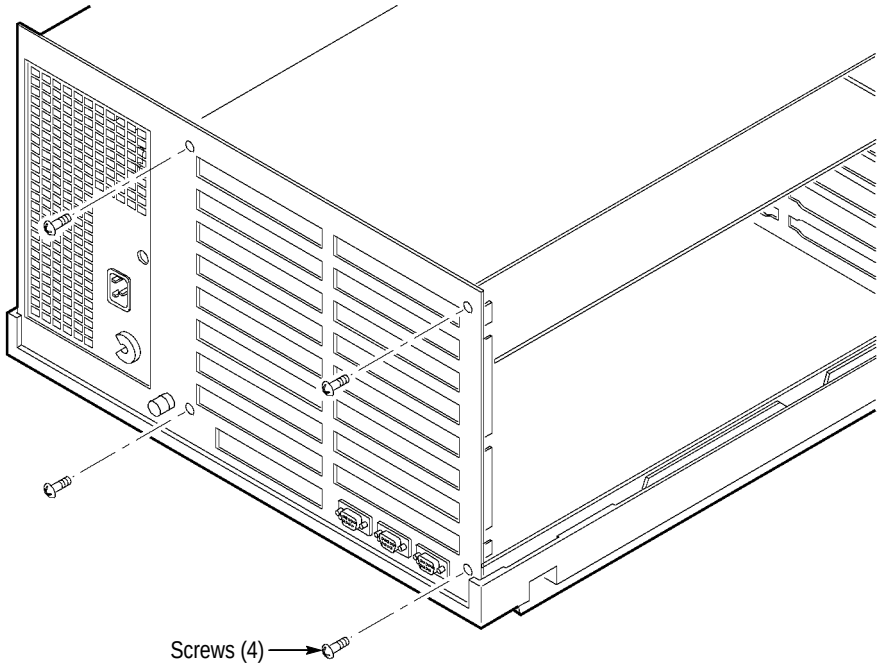


Figure 3–12: Back Panel Screw Locations for Removing the Card Cage

9. Remove the two bottom-front screws, as shown in Figure 3–13.

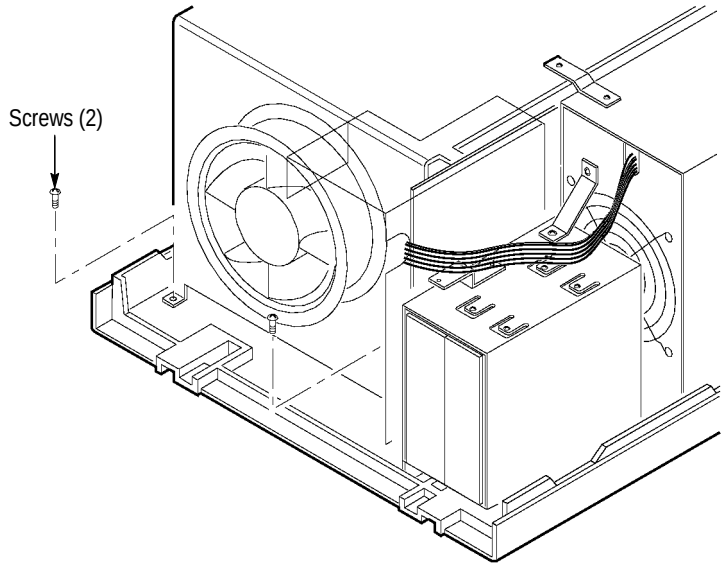


Figure 3–13: Bottom-front Screw Locations for Removing the Card Cage

10. Pull the card cage up from the nylon posts in the baseplate, then forward. Be careful not to damage the internal RS-232 cables in the DAS 9221.

NOTE. *You may need to pinch together the nylon supports on the Controller board to separate it from the baseplate of the mechanical chassis.*

When reconnecting the power-supply wires, torque the screws on the connector from 3.5 to 4.0 inch-pounds. Align each nylon support with its mounting hole before pressing the Controller board onto the baseplate.

Procedure 9: Removing the Controller Board

Preform the following procedure to remove the Controller board from the master mainframe.



CAUTION. *Many components within the mainframe are extremely susceptible to static-discharge damage. Follow the standard handling precautions for static-sensitive devices in* Maintenance *when servicing this instrument.*

1. Perform procedure 1 on page 3–3, procedure 2 on page 3–5, procedure 3 on page 3–6, and procedure 8 on page 3–18.
2. Place the card cage upside down, so the bottom of the Controller board faces up.
3. Remove the seven screws holding the Controller board to the card-cage assembly.
4. Carefully push the Controller board from the backplane connection with one hand, while holding the card cage with the other hand.

When reinstalling the Controller board, check that its connections to the backplane are fully mated. Remember to reconnect any cables that were disconnected during disassembly, such as the RS-232 cables in the DAS 9221 mainframe.

Procedure 10: Removing and Disassembling the Expansion Cable (DAS 92E9 only)

The first part of this procedure explains how to remove the expansion cable from the mainframe.

1. With the power cord disconnected, perform procedure 1 on page 3–3.
2. Using procedure 2 on page 3–5, remove the boards from slots 1 and 2 to access the Expansion Slave board.
3. Note the orientation and location of the connectors, then unplug the six cables of the expansion-cable assembly. Refer to the cabling diagram for the DAS 92E9 Expansion mainframe (Figure 5–7 on page 5–14) during reassembly.
4. At the rear of the mainframe, remove the three screws from the top of the strain-relief bracket; they hold together the two parts of the bracket for the expansion-cable assembly. Then remove the fourth screw that holds the strain-relief bracket to the mainframe back panel.
5. Note the orientation of the strain-relief bracket components, then remove them. Remove the expansion-cable assembly from the Expansion mainframe.
6. To remove the end of the expansion-cable assembly that is connected to a 92C02/03 module, remove the two screws holding the expansion-cable assembly to the DAS L-shaped retaining bracket.

The remaining steps describe how to disassemble the expansion-cable assembly.

7. Remove the three screws from the top of the expansion-cable assembly.
8. Remove the top cover to access the cables and board within the housing.
9. To remove the bottom cover, turn the housing face down and remove two screws. (For reassembly, separate these smaller-size screws from the others.)
10. To remove the expansion-cable board from the housing, turn the housing face up and remove the two screws holding the board to the bottom cover. Tip the board up on one side and remove it from the housing, being careful not to damage any cables.

Procedure 11: Removing the Expansion Slave Board (DAS 92E9 only)

The Expansion mainframes do not have a Controller board; instead, they have an Expansion Slave board. Perform the following procedure for removing the Expansion Slave board from the Expansion mainframe.



CAUTION. *Many components within the mainframe are extremely susceptible to static-discharge damage. Follow the standard handling precautions for static-sensitive devices in* Maintenance *when servicing this instrument.*

1. Perform procedure 1 on page 3–3, procedure 2 on page 3–5, procedure 3 on page 3–6, and procedure 10 on page 3–20.

NOTE*. You may need to pinch together the nylon supports on the Expansion Slave board to separate it from the bottom cover of the mechanical chassis.*

2. Perform procedure 8 on page 3–18 to remove the card cage from the mainframe. Place the card cage upside down, so the bottom of the Expansion Slave board faces up.
3. Remove the seven screws holding the Expansion Slave board to the card-cage assembly.
4. Carefully push the Expansion Slave board from the backplane connection with one hand, while holding the card cage with the other hand.

When reinstalling the Expansion Slave board, check that its connector to the backplane are fully mated. Check that all cables are connected as in the DAS 92E9 cabling diagram (see Figure 5–7 on page 5–14).

Procedure 12: Removing the Backplane

1. Perform procedure 1 on page 3–3, procedure 2 on page 3–5, procedure 3 on page 3–6, procedure 8 on page 3–18, and procedure 9 on page 3–20.
2. Place the left side of the card-cage assembly on the work surface.
3. Remove the five screws holding the Backplane board to the card cage.
4. Remove the plastic shield from the front of the Back plane board.
5. Separate the connection between the Backplane board and the Controller board and then lift the Backplane board off the card-cage assembly.

When reconnecting the power-supply wires to the Backplane board, refer to Table 3–1 on page 3–17. The screws must be torqued between 3.5 and 4.0 inch-pounds.

Disassembly/Reassembly of the 92HS8 Cabinet

The following procedures describe the partial disassembly of the 92HS8 cabinet, such as:

- Removing the 92HS8 top, bottom, and side covers
- Elevating the Memory board to access the Acquisition board
- Removing the power supply and cooling fans
- Replacing 92HS8 probes connected to the cabinet

Reassembly procedures, unless otherwise noted, are the reverse of the disassembly procedures.

The procedure for removing a 92HS8 Interface board from the DAS is similar to removing any DAS module.



WARNING. *The interior of the 92HS8 cabinet contains hazardous voltages. Before removing the covers, power down the unit and disconnect the AC power cord from the rear of the cabinet.*



CAUTION. *When reassembling the 92HS8, fold the cables to maximize the flow of cooling air over the hybrids. Restricted air flow may cause the hybrids to overheat.*

Procedure 1: Removing the 92HS8 Cabinet Covers

This procedure describes how to remove the cabinet top, bottom, and two side covers. To remove any cover, you will need a screwdriver with a TORX-type tip.

NOTE. *Operating the cabinet for extended periods without covers may cause the instrument to overheat.*

1. Disconnect the power cord from the 92HS8 cabinet.
2. Check that all cabling does not interfere with the cover being removed.
3. Remove the top cover by removing the two top corner feet at the rear of the cabinet. Then slide the top cover to the rear and remove it from the cabinet.
4. Remove the bottom cover by removing the two bottom corner feet at the rear of the cabinet and sliding the bottom cover to the rear of the cabinet.
5. Remove a side cover by removing the top and bottom corner feet from the rear of the cabinet for the side (left or right) being removed. Slide the side cover to the rear of the cabinet.

Procedure 2: Elevating the 92HS8 Memory Board

Perform this procedure to access the components under the Memory board.

1. Perform Procedure 1.
2. Remove the seven screws holding the board in place (see Figure 3–14).
3. Swing the Memory board to the upright position, since the board is secured to the cabinet by a hinge on the left side of the cabinet.

NOTE. *You may need to prop the board in the upright position.*

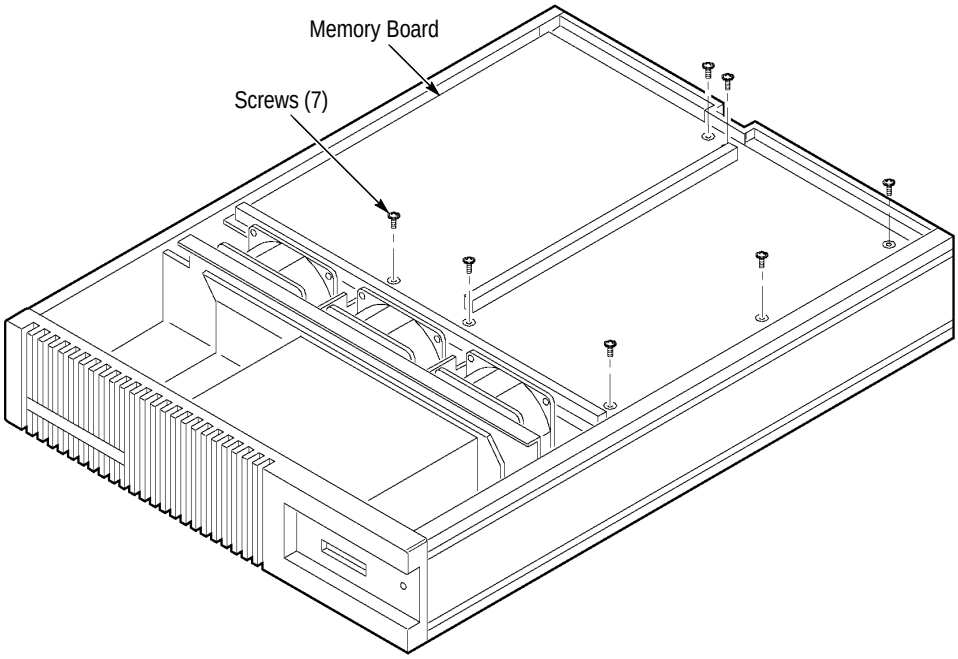


Figure 3–14: Location of Screws for Elevating the 92HS8 Memory Board

Procedure 3: Removing the 92HS8 Power Supply

1. Perform Procedures 1 and 2 on page 3–23.
2. Remove the AC power cord (inside the cabinet) from the power supply.
3. Remove the two screws from the top cover of the power supply and remove the cover.
4. Remove the six screws and the two spacer posts that secure the power supply to the cabinet (see Figure 3–15). Tip the power supply onto its side.
5. Unsolder the cables from the back of the power supply and remove it from the cabinet.

Procedure 4: Removing the 92HS8 Cooling Fans

The following procedure applies to the three fans in the 92HS8 cabinet.

1. Perform Procedures 1 and 2 on page 3–23 and steps 1-3 of procedure 3. Tip the power supply to gain access to the necessary screws. Note: Do not unsolder the wires to the power supply and remove it, unless you cannot access the screws for fan removal.
2. Disconnect the fan's power cable.
3. Remove the screws and nuts from each corner of the fan housing and remove the fan.

Procedure 5: Replacing 92HS8 Probes

Probes must be installed from the inside of the instrument and pulled through to the outside. Use the following procedure when removing and installing probes.

1. Remove the cabinet's top cover and lift the Memory board, using procedures 1 and 2 on page 3–23.
2. To remove a probe, remove the probe ground clamp and carefully disconnect the leads from the SMB and harmonica connectors on the Acquisition board. While compressing the probe's boot, pull the probe through the back panel to the inside of the cabinet.
3. Feed the replacement probe through the back panel from the inside of the cabinet. Check that the probe's strain relief is correctly seated in the back panel.
4. Dress the probe wires carefully so that the shields do not contact the chassis (probe shields are +5 volts).
5. Check that the red coax connects to the +SMB connector and the black coax connects to the -SMB connector.
6. Check that pin 1 on the three-wide harmonica connector is correctly oriented with pin 1 on the socket.
7. After probe replacement, recalibrate the 92HS8 using the deskew procedures described in the *92HS8/8E Module User Manual*.

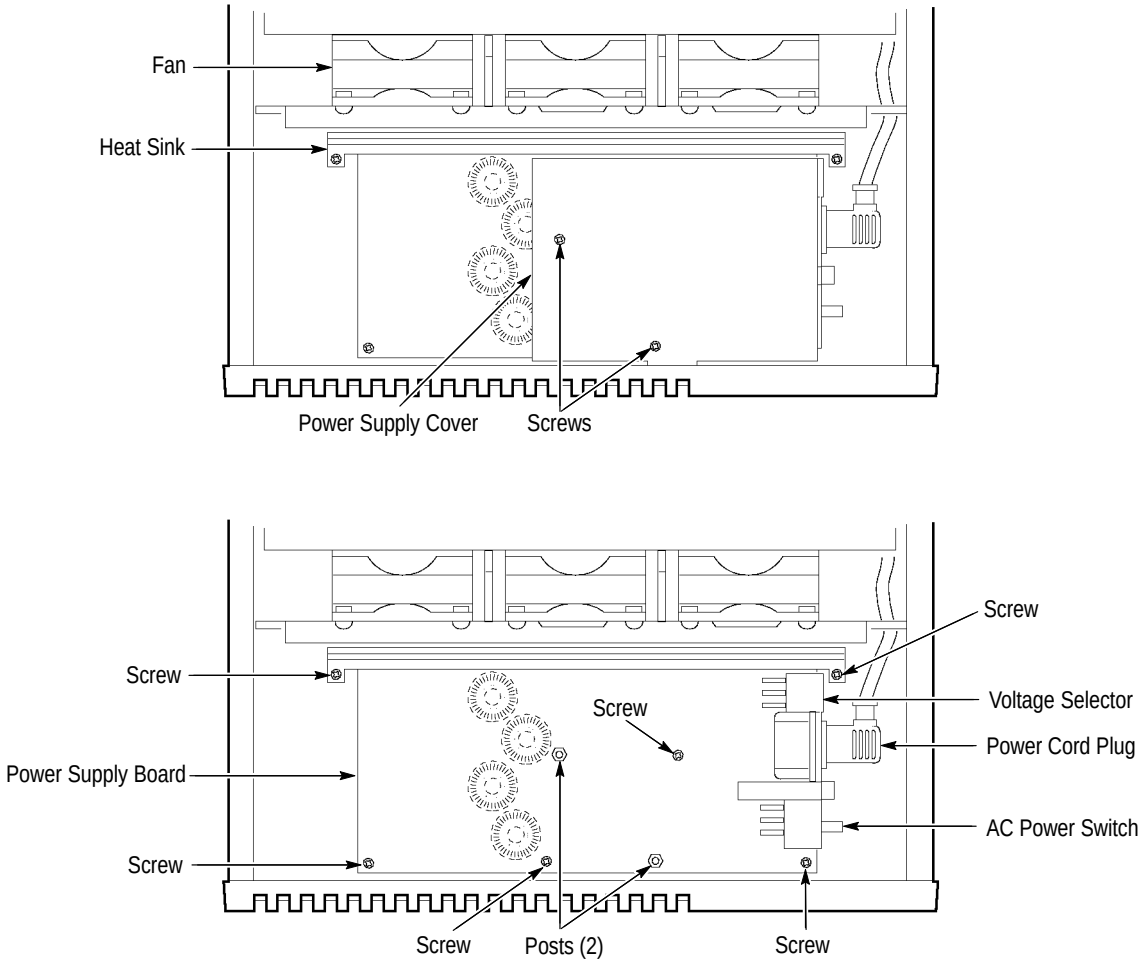


Figure 3–15: Location of Screws for Removing the 92HS8 Power Supply

Disassembly/Reassembly of Probes

The circuit-board assemblies in each DAS probe are replaceable. The following procedures describe how to disassemble and reassemble each probe, so you can replace the assemblies.

CAUTION. *Static discharge may damage the probe semiconductors. Follow the standard handling precautions for static-sensitive devices under* Static Precautions *on page 2–1 when servicing the probes.*

P6461/E Data Acquisition Probe

1. Press the latches located on the sides of the P6461 probe.
2. Grasp the top and bottom halves of the probe and pull apart.
3. Remove the static shield.
4. If you need to remove one or more of the podlets, grasp the podlet by the base, close to the pins, and pull the podlet from the sockets on the board.
5. Disconnect the cable from the board by grasping the pin connector from each side and pulling the connection apart.
6. Remove the board from the case.

Reassembly of the probe is the reverse of the disassembly procedure. When reassembling the probe, start with the labeled half of the case facing down. Then, insert the board.

P6460 Data Acquisition Probe

1. Unscrew the screws in each corner of the probe case.
2. Grasp the top and bottom halves of the probe and pull apart.
3. Lift the hybrid circuit-board assembly from the probe case.
4. Disconnect the cable from the board by grasping the pin connector from each side and pulling the connection apart.

Reassembly of the probe is the reverse of the disassembly procedure.

P6464 Pattern Generator Probe

Use the following steps to disassemble the P6464 probe.



CAUTION. *When disassembling the probe, avoid contaminating the contacts of the hybrid circuit and its socket with dust, finger oil, etc.*

1. With a flat-blade screwdriver, press the latches on the side of the P6464 probe.
2. Grasp the top and bottom halves of the probe and pull apart.
3. If you need to remove one or more of the podlets, grasp the podlet by the base, close to the pins, and pull the podlet from the socket on the board.
4. Using a POZIDRIV screwdriver, unscrew the four screws holding the heat sink to the hybrid.
5. Lift the heat sink and the plate underneath to expose the hybrid.
6. Disconnect the three-wide cable from J160 on the main board and J120 on the +3 V supply board.

Reassembly of the probe is the reverse of the disassembly procedure.

NOTE. *Main-board replacements do not contain the hybrid circuit. Retain the hybrid for use in the replacement board.*

P6465 Pattern Generator Probe

Use the following steps to disassemble the P6465 probe.

NOTE. *When disassembling the probe, avoid contaminating the contacts of the hybrid circuit and its socket with dust, finger oil, etc.*

1. With a flat-blade screwdriver, press the latches on the side of the P6465 probe.
2. Grasp the top and bottom halves of the probe and pull apart.
3. If you need to remove one or more of the podlets, grasp the podlet by the base, close to the pins, and pull the podlet from the socket on the board.
4. Using a POZIDRIV screwdriver, unscrew the three screws on the top of the plate.
5. Disconnect the two ribbon cables from the top board (Strobe board) and pull the side of the board out.
6. Unscrew the four screws in the recessed portion of the plate.
7. Lift the plate and remove it from the main board.
8. Disconnect the cable from the board by grasping the pin connector from each side and pulling the connection apart.

Reassembly of the probe is the reverse of the disassembly procedure.

P6463/A Pattern Generator Probe

Use the following steps to disassemble the P6463 or P6463A probe.

1. With a flat-blade screw driver, unlatch the latches on the side of the P6463/A probe.
2. Remove the upper half of the probe housing and set it aside.
3. To remove the ID/Logic board (the smaller board), unscrew the four mounting screws with a POZIDRIV screwdriver. Unplug the ID/Logic board from the Buffer/Driver board by gently pulling the two boards apart.



CAUTION. *The ID/Logic board is connected to the pod ID switch through a two-wire cable. Take care not to stress the cable's connections during disassembly procedures. Unnecessary strain on the cable may cause damage to the cable.*

4. If necessary, free the pod ID switch from the lower probe housing by slightly loosening the mounting nut and lifting the switch out.
5. To remove the Buffer/Driver board, gently pull up on the red and black power leads to free them from the lower probe housing. Grasp the board and lift it from the lower probe housing. To disconnect the cable assembly from the Buffer/Driver board, grasp the cable assembly plug and gently pull it straight out (note pin 1 orientation for reassembly).
6. Reassembly of the probe is the reverse of this procedure.

92A60/90 Buffer Probe

Use the following steps to disassemble the 92A60/90 Buffer Probe.



CAUTION. *Static discharge may damage the probe semiconductors. Follow the standard handling precautions for static-sensitive devices in* Maintenance *when servicing this instrument.*

1. With the DAS mainframe power OFF, disconnect the lead set or probe adapter plugged into the probe.
2. With a flat-blade screwdriver, unlatch one side of the probe. Keep that side slightly separated while unlatching the other side of the probe.
3. Grasp the top and bottom halves of the probe and pull apart.
4. Remove the flat-ribbon cables by grasping the loose tabs and pulling straight up.
5. Unscrew the two screws holding the circuit board to the bottom plastic case. They are located near the probe adapter end.
6. Pull the circuit board forward and out.

Reassembly of the probe is the reverse of the disassembly procedure.

Terminals

The disassembly/reassembly procedures and other helpful service information for the DAS terminals are found in one of the following documents:

- 9200T: 4105 Service Manual
- 9201T: 4205 Service Manual
- X Terminals: TekXpress X Terminal Series Service Manual

These manuals are not part of the DAS documentation package. Contact your Tektronix representative to order one of these manuals.

Troubleshooting

This chapter contains troubleshooting information for isolating failures in the DAS mainframe to the module or board level. This troubleshooting information includes diagnostics descriptions and troubleshooting tips for areas not tested by the diagnostics. Terminal diagnostics are also included; refer to the *4105 Service Manual* for additional information on the 9200T, the *4205 Service Manual* for additional information on the 9201T, and the *TekXpress X Terminal Service Manual* for additional information on the X terminals. (These manuals are not part of the DAS documentation package; to obtain them, contact your local Tektronix representative.)

Mainframe Troubleshooting Overview

Use the following steps as an overview of troubleshooting the mainframes.

1. Ensure that all mainframe modules are correctly and installed and that all interconnects and cables are properly connected and fully seated. Ensure that the module installation conforms with all slot location restrictions and module configuration guidelines.
2. Power up the mainframe and check that the power-supply voltages are within specification. Also check that the media power-supply voltages are at the media power connectors.
3. If the power supply does not power up, check the following:
   - Power-supply AC-line fuse
   - Line-voltage selection
   - The AC-line power-cord connection
   - Power-supply secondary wiring and control cable connections
   - Front-panel DC power switch connection and operation
4. Verify that you properly connected the terminal to the mainframe Terminal port with the recommended RS-232 cable. Check that the terminal communication parameters (such as baud rate) match the settings of the mainframe. Also check for the proper setting of the Controller board DIP switches for the Terminal port near the back of the mainframe.
5. Power up the DAS with DIP switch 1 in the up position (normal boot) and check the back-panel LED indicators to ensure that no level 0 diagnostic errors have occurred.

6. Power on the DAS to the BOOT?> prompt (DIP switch 1 in the down position) and run the System Software File System Check and Verify hard-disk maintenance utilities. These floppy-based utilities check if the drive is properly formatted and if the system software is installed and uncorrupted.

7. Check if the Expansion mainframes are properly connected to the 92C02/03 Expansion board in the top slot of the next lower mainframe.

8. Check the following for all mainframes and expansion mainframes:

   - Power cord/power supply configuration for the AC-line power being used
   - The AC-line fuses
   - Power-configuration jumper on the Controller board (for DAS 9221 mainframes)

Module Troubleshooting Overview

Use the following steps as an overview of troubleshooting the modules; detailed troubleshooting information is included later in this section.

1. Check that the module is properly installed according to the module installation instructions. The installation must meet all slot-location restrictions for the module and adjacent modules. Refer to the installation section of the module user manual for detailed installation guidelines.

2. If the module fails the power-up diagnostics, check the description for the four-digit error code from the Diagnostics menu. If the module has a functional failure, check all connections between the DAS and the system under test (SUT).

3. Check that the boards are fully seated into the backplane slot connectors. If necessary, power down the DAS, remove the module, reseat it, and power up the system. Verify that all probes and cables are fully seated.

4. If the module still fails, check if the problem is slot-related. Power down the DAS, install the failing module into a different mainframe slot, and power up the system. This will isolate mainframe slot-related problems.

5. Remove the module and inspect it for physical damage or shorted leads or components.

6. Replace the module with a known-good replacement module. Check that the replacement passes its diagnostic tests.

7. If the module still has a problem, try the following procedure:

   a. Run the file system Check and Verify utilities to check if the problem is due to corrupted system software.

   b. Remove all modules except the failing module to check if another module is interfering with the system bus. If the module no longer fails, reinstall the modules one-by-one to identify the cause of the problem.

   c. Check that the DAS power-supply voltages are within specification. Refer to *Introduction to DAS Hardware* for the allowable range of the power-supply voltages.

   d. Inspect the 540-pin connectors on the backplane for damaged, bent, or shorted pins.

   e. Replace the Controller board with a known-good board to check the controller bus interface.

   f. If the module is in an Expansion mainframe, check that the Expansion mainframe cable assembly is properly connected to the 92C02/03 Expansion board in the top slot of the next lower mainframe. Check the cable assembly for damage and ensure the individual cables are properly connected. If possible, move the module to the Master mainframe to verify the failure still occurs.

Power-On Diagnostics

The mainframe and terminal contain diagnostics that normally run when powered on. Since the terminal provides the user interface, it should be powered on and checked first (with the mainframe power off). After the terminal diagnostics complete, turn on the mainframe to execute its power on diagnostics. Refer to the section *DAS Mainframe Diagnostics* on page 4–15 for a description of these diagnostic tests.

9200T Terminal Diagnostics

Two levels of diagnostics check the 9200T; they are the Power-Up Self Test and Extended Self Test. Before powering up the terminal, connect the keyboard to the terminal.

***NOTE**. The DAS must not be powered on while the terminal diagnostics are performed, so the 9200T can control the keyboard.*

Power-Up Self Test. The Power-Up Self Test runs automatically every time you turn on the terminal or press the RESET button (see Figure 4–1). This test checks the keyboard and the display circuitry in the 9200T. The test starts when you turn on (or reset) the terminal and ends when the cursor appears; it takes less than 15 seconds to run.

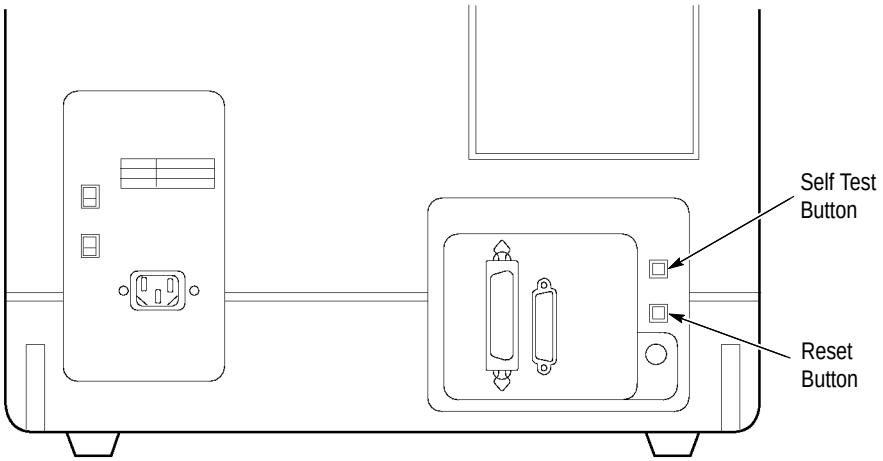


Figure 4–1: Location of SELF TEST and RESET Buttons on the 9200T Rear Panel

During the test, the light in the Caps Lock key (located in the lower-left corner of the keyboard) flashes once. If the keyboard test fails, the light stays on and the terminal beeps twice. A message may also appear on the screen.

If the display test fails, the terminal displays a message and beeps twice. If a message does not appear, adjust the BRIGHTNESS knob (located on the front of the terminal). If a message still does not appear, refer to the *4105 Service Manual.*

If the Power-up Self Test does not detect any errors, the terminal displays a blinking underscore cursor when the test completes. If the test detects an error, follow these procedures:

1. Turn the terminal off and wait 15 seconds, then turn it back on. If the test does not detect any errors, the terminal is operating normally.
2. If a Power-up Self Test error occurs on the second power-up, note the message on the screen and do the following:
   - If the message says “Keyboard Failure” or “Not Attached,” check the keyboard cable connection on the rear of the terminal.
   - If the message says “Nonvolatile Parameters Failure – Defaults Reset,” you may need to reset some operating parameters. Refer to the *4105 Service Manual*.

- If other messages appear, refer to the *4105 Service Manual*.

Extended Self Test. The Extended Self Test consists of the Power-Up Self Test and several tests of the circuitry. It may take up to four minutes to complete. Initiate the test by pressing the SELF TEST and RESET buttons (see Figure 4–1) as follows:

1. Press SELF TEST and hold it in while you press and release RESET.
2. Hold in SELF TEST for another two seconds, and then release it.

A white crosshair cursor blinks on the screen while the Extended Self Test is running. After a few seconds, the terminal beeps once and the crosshair is replaced by the following menu:

```
F6          Adjustment Procedures Menu
F7          Continue Self Test
F8          Exit Self Test

Selection:
```

Press a function key to do the following:

F6	Exits the Extended Self Test and displays the Adjustment Procedures menu. For more information, refer to the *4105 Service Manual*.
F7	Continues the Extended Self Test.
F8	Exits the Extended Self Test.

If you do not press a key within 20 seconds after the menu appears, the Extended Self Test continues. When continuing the test, the crosshair blinks intermittently on the screen. If the test does not detect any errors after approximately two minutes, the crosshair disappears and the Adjustment Procedures menu appears. Press function key F8 to return the underscore cursor to the screen.

NOTE. *The 4105 Service Manual is not part of the DAS documentation package; to obtain this manual, contact your Tektronix representative.*

9201T Terminal Diagnostics

Three levels of diagnostics check the 9201T terminal: the Power-Up Self Test, Main Self Test, and Extended Self Test. Before powering up the terminal, connect the keyboard to the terminal.

NOTE. *The DAS must not be powered on while the terminal diagnostics are performed, so the 9201T can control the keyboard.*

Power-Up Self Test. The Power-Up Self Test runs when you turn on the terminal or press the RESET button (see Figure 4–2). This test checks the keyboard and the display circuitry in the 9201T.

During the keyboard test, the light in the Caps Lock key blinks once and then stays off. If the keyboard test fails, the light stays on. A message may also appear on the screen.

If the terminal fails the test, it displays a message and beeps twice. If the terminal beeps twice and a message does not appear, adjust the BRIGHTNESS knob (located on the front panel).

If Power-up Self Test does not detect any errors, the terminal displays an underline or block cursor when the test completes. If the test detects an error, the terminal lists the error below "Self Test Error." If an error occurs, follow these procedures:

1. Press the RESET button on the front of the terminal to rerun the Power-up Self Test. If the test does not detect any errors, the terminal is operating normally.
2. If an error occurs during the second Power-Up Self Test, note the message on the screen and do the following:
   - If the message says "Keyboard Self Test failed," check the keyboard cable connection on the front of the terminal.
   - If the message says "Nonvolatile Parameters Load" and "Parameters reset to factory defaults," you may need to reset some operating parameters. Refer to the Tektronix *4205 Service Manual*. (This manual is not part of the DAS documentation package; to obtain this manual, contact your Tektronix representative.)

If the error does not affect the operation of the DAS, you can use the terminal. For example, if the copier port fails (and that port is not needed), the terminal can be used until the problem is fixed.

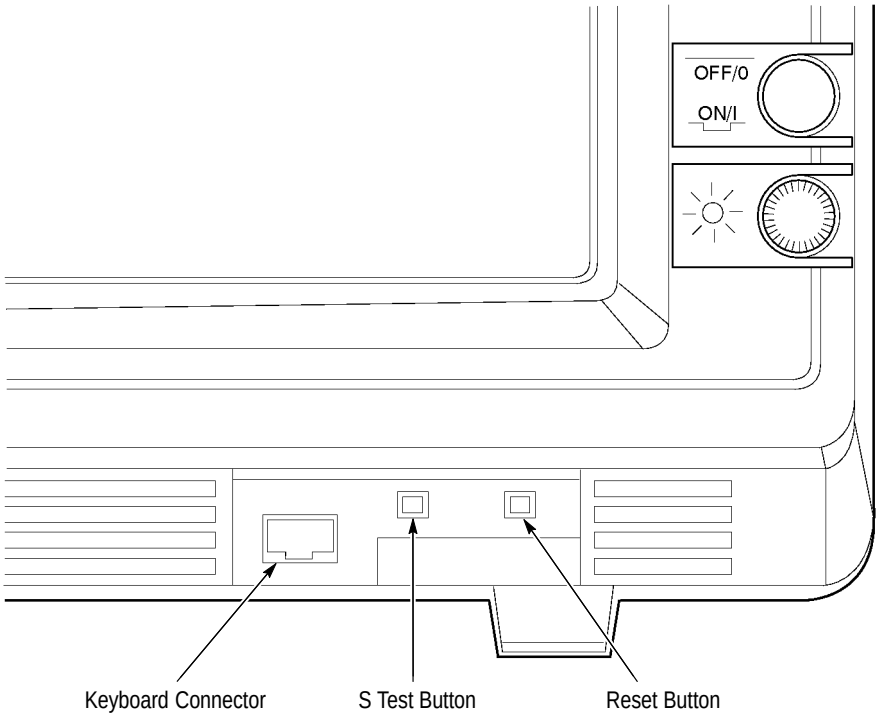


Figure 4–2: Location of S TEST and RESET Buttons on the 9201T Front Panel

Main Self Test. The Main Self Test contains several tests. To check that the terminal is functioning properly, run the following part of the test:

1. Locate the S TEST and RESET buttons on the front of the terminal. (See Figure 4–2.)
2. Press S TEST and hold it in while you press and release RESET. Continue to hold in S TEST for another two seconds, and then release it.

   After approximately seven seconds, the keyboard beeps once and the terminal displays the following menu:

```
Main Self Test Menu

F2          Self Test
F3          Continuous Self Test
F4          Self Test followed by Extended Self Test
F5          Extended Self Test Menu

Sh F1       Factory Mode Menu

F7          Redisplay Main Menu
F8          Enter Terminal Mode
```

3. Press a function key to do the following:

F2	Continues the Self Test. If the test does not detect any errors after about 12 minutes, the terminal redisplays the Main-Self Test menu. At this point, you can exit this part of the Main Self Test or continue to test the terminal.
F3	Executes the Self Test repeatedly. To exit continuous-testing mode, press the RESET button or turn the terminal off.
F4	Cycles through the part of the Extended Self Test that is used to test the terminal at the factory.
F5	Displays the Extended Self Test menu. You can test peripheral devices and terminal components from this menu.
Shift-F1	Displays the Factory Mode menu, which trained service personnel use during the manufacturing process. Refer to the Tektronix *4205 Service Manual*.
F7	Blanks the screen, then redisplays the Main Self Test menu.
F8	Exits the Main Self Test and returns the terminal to normal operation.

If you do not press a function key within 20 seconds after the menu appears, the Self Test continues.

If the test detects an error, the terminal beeps twice and displays a message. If a message does not appear, adjust the BRIGHTNESS knob (located on the front panel).

Extended Self Test. The Extended Self Test checks the terminal and the terminal's interaction with peripheral devices.

To run the Extended Self Test, you must rerun part of the Main Self Test as follows:

1. Press the S TEST button and hold it while you press and release RESET; continue to hold in S TEST for another two seconds, then release it.

2. Press F5 from the Main Self Test menu. The terminal displays the Extended Self Test menu.

```
Extended Self Test Menu

F1          Reset Nonvolatile Parameters
            (to Factory Settings)
F2          Keyboard Menu
F3          RS-232 Interface Menu
F4          Hardcopy Menu
F5          Display Pattern Menu

Sh F1       Coax Interface Test

F7          Exit Current Menu
F8          Enter Terminal Mode

Selection:
```

3. Press a function key to do the following:

F1	Resets all parameters to their factory default values. Do not press F1 if you want to discard settings saved in nonvolatile memory.
F2	Displays the Keyboard menu.
F3	Displays the RS-232 menu.
F4	Displays the Hardcopy menu.
F5	Displays the Display Pattern menu.
Shift-F1	Initiates a coax interface test for terminals with the coax option.
F7	Redisplays the Main Self Test menu.
F8	Exits the Extended Self Test and returns to normal terminal operation.

NOTE. *Some menu items adjust the terminal internally. For a discussion of these parts of the Extended Self Test, refer to the Tektronix 4205 Service Manual. (To obtain this manual, contact your Tektronix representative.)*

9202XT and 9203XT Terminal Diagnostics

Three levels of diagnostics check the 9202XT and 9203XT terminal: the Kernel Self Test, Extended Self Test, and Extended Self Test with Peripheral Tests. Before powering up the terminal, connect the keyboard to the terminal; connection information is in the *DAS System User Manual*.

Kernel Self Test. The Kernel Self Test runs automatically whenever the terminal is turned on. The Kernel Self Test is a series of programs, residing in the Boot ROM, that perform minimum hardware checks to ensure that the terminal will boot.

During the self Test programs, status and fault information is indicate by the LED indicators on the keyboard, fault messages on the display, and ringing of the bell. For further information, refer to the *TekXpress X Terminal XP10 Series Service Manual.*

Extended Self Test. The Extended Self Test are menu driven tests that reside in the Boot ROM. The tests a more extensive check of the terminal. The Extended Self Test is accessed from the Boot Monitor menu using the *selftest* command. Faults are indicated by the bell and on-screen messages.

To access the Extended Self Test, complete the following:

1. Press any key while the Kernel Self Test is in progress to access the Boot Monitor menu (The Boot Monitor menu appears after the Kernel self Test is complete.), or

   Press any key after the Kernel Self Test is complete but before the boot process is complete to access the Boot Monitor Menu.

2. At the BOOT> prompt, type *selftest* and press ENTER; the Extended Self Test Main Menu appears as shown in Figure 4–3.

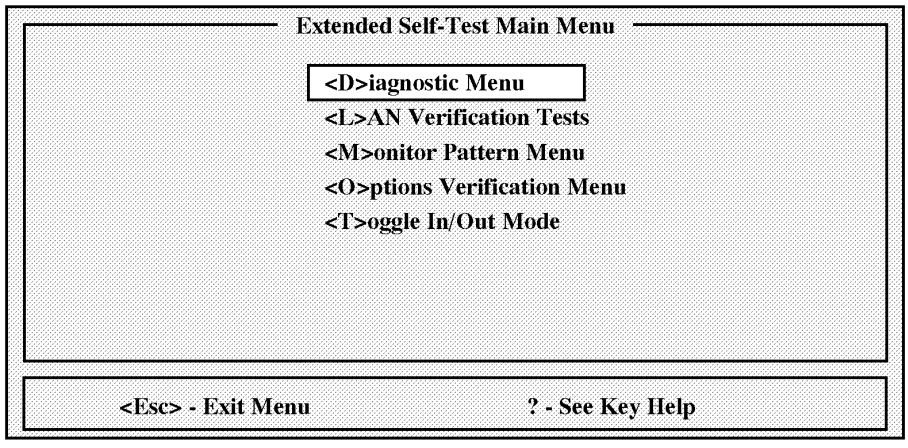


Figure 4–3: Extended Self Test Main Menu

For further information on the Extended Self Test Main Menu and the associated checks, refer to the *TekXpress X Terminal Service Manual.*

Extended Self Test with Peripheral Tests. The Extended Self Test with Peripheral Tests are menu driven tests that reside in software that is downloaded from the DAS mainframe. The tests are essentially the same as the Extended Self Tests with the added peripheral tests. The Peripheral Tests allow you to check the bell, hardware timer, keyboard, mouse, and the RS-232 port. Faults are indicated by the bell and on-screen messages.

To access the Extended Self Test with Peripheral Tests, complete the following:

1. Ensure that the terminal is properly connected to the DAS mainframe and that the DIP switch 1 (leftmost DIP switch) on the System Controller board is in the open (up) position.
2. Ensure that both the terminal and the mainframe are OFF.
3. Power on the terminal.
4. Press any key to interrupt the boot process and access the Boot Monitor menu.
5. Refer to the *DAS System User Manual* and verify that all the network setup parameters for both the 9202XT and the DAS mainframe are correct.
6. At the BOOT> prompt, enter the following:
   a. BOOT> *bpath/XP10/selftest*, and press ENTER.
   b. BOOT> *bmethod tftp*, and press ENTER.
7. Power on the DAS mainframe, and wait 2 to 3 minutes until the access lamp on the mainframe hard disk drive stops flashing.
8. When the BOOT> prompt appears, type *boot* and press ENTER.
9. After the selftest programs have transferred from the DAS mainframe, the Extended Self Test Main Menu appears (see Figure 4–4) on the terminal display. This menu is different from the menu that appears when the *selftest* command is entered from the Boot Monitor menu (see Figure 4–3) on the terminal.

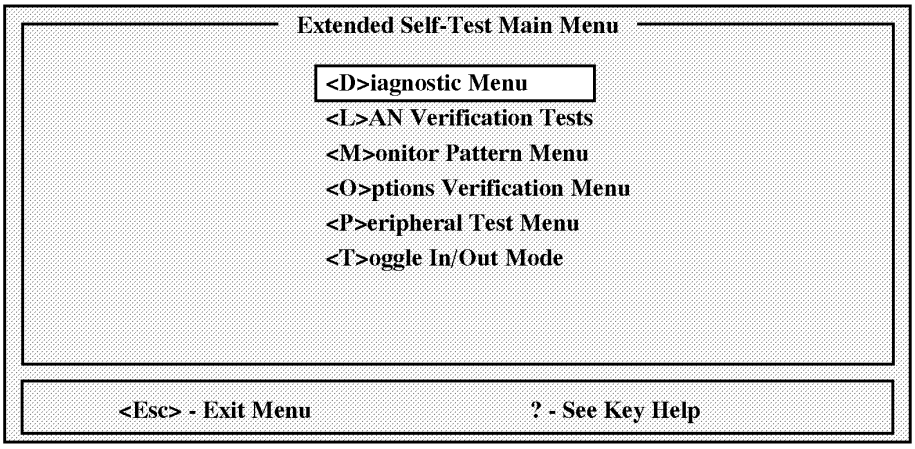


Figure 4–4: Extended Self Test Main Menu with Peripheral Tests

10. Press p, to select the Peripheral Test Menu (see Figure 4–5).

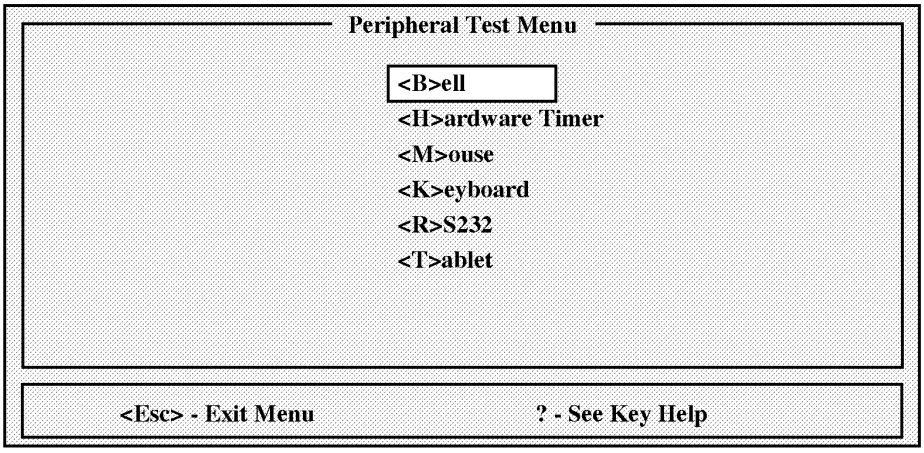


Figure 4–5: Peripheral Tests Menu

For further information, refer to the *TekXpress X Terminal Service Manual.*

9204XT, 9205XT, and 9206XT Terminal Diagnostics

The 9204XT, 9205XT, and 9206XT terminals use the following self test programs: the Kernel Self Test, Local Self Test, and Extended Self Test. Before powering up the terminal, connect the keyboard to the terminal; connection information is in the *DAS System User Manual*.

Kernel Self Test. The Kernel Self Test runs automatically whenever the terminal is turned on. The Kernel Self Test is a series of programs, residing in the Boot ROM, that perform minimum hardware checks to ensure that the terminal will boot.

During the self Test programs, status and fault information is indicate by the LED indicators on the keyboard, fault messages on the display, and ringing of the bell. For further information, refer to the *TekXpress X Terminal Series Service Manual.*

Local Self Test. The Local Self Test is a set of tests to verify field-kit installations. The tests are stored in the boot ROM and are executed from the Boot Monitor menu using the *selftest* command. Faults are indicated by on-screen messages.

To access the Local Self Test, complete the following:

1. Press any key while the Kernel Self Test is in progress to access the Boot Monitor menu (The Boot Monitor menu appears after the Kernel Self Test is complete.), or

   Press any key after the Kernel Self Test is complete but before the boot process is complete to access the Boot Monitor Menu.

2. At the BOOT> prompt, type *selftest* and press ENTER; the Self Test Menu appears as shown in Figure 4–6.

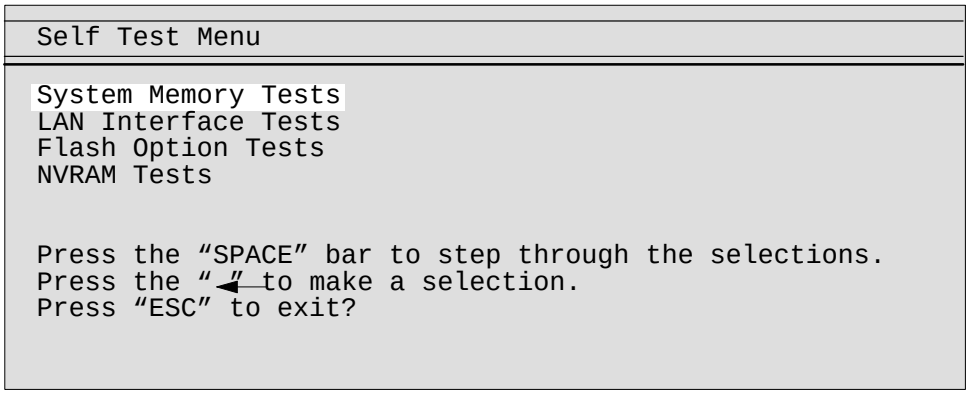


Figure 4–6: Local Self Test Menu

For further information on the Local Self Test Menu and the associated checks, refer to the *TekXpress X Terminal Service Manual.*

Extended Self Test. The Extended Self Test is a set of menu driven tests that reside in software that is downloaded from the DAS mainframe. The tests allow you to check the bell, hardware timer, keyboard, mouse, and the RS-232 port. Faults are indicated by the bell and on-screen messages.

To access the Extended Self Test with Peripheral Tests, complete the following:

1. Ensure that the terminal is properly connected to the DAS mainframe and that the DIP switch 1 (leftmost DIP switch) on the System Controller board is in the open (up) position.
2. Ensure that both the terminal and the mainframe are OFF.
3. Power on the terminal.
4. Press any key to interrupt the boot process and access the Boot Monitor menu.
5. Refer to the *DAS System User Manual* and verify that all the network setup parameters for both the terminal and the mainframe are correct.
6. At the BOOT> prompt, enter the following:
   a. BOOT> *bpath /XP300/selftest*, and press ENTER.
   b. BOOT> *bmethod tftp,* and press ENTER.
7. Power on the mainframe, and wait 2 to 3 minutes until the access lamp on the mainframe hard disk drive stops flashing.
8. When the BOOT> prompt appears, type *boot* and press ENTER.
9. After the selftest programs have transferred from the mainframe, the Extended Self Test Main Menu (see Figure 4–7) appears on the terminal.

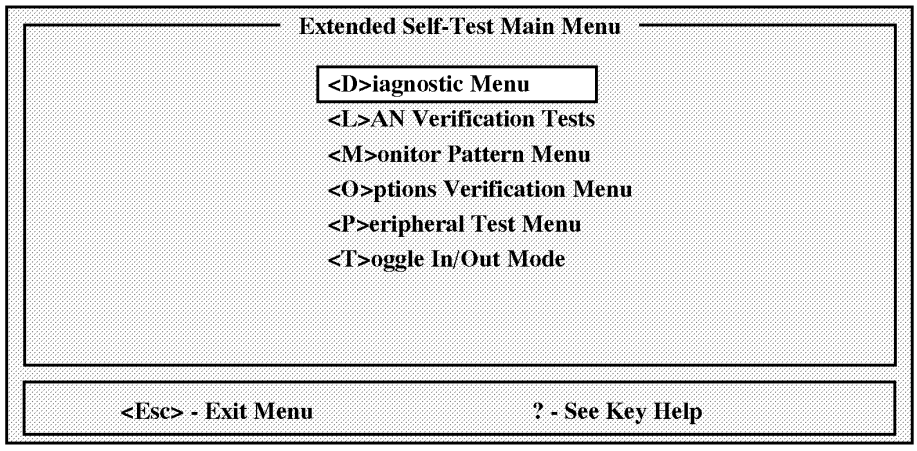


Figure 4–7: Extended Self Test Main Menu

10. Press p, to select the Peripheral Test Menu.

For further information, refer to the *TekXpress X Terminal Service Manual*.

DAS Mainframe Diagnostics

The DAS normally runs diagnostics at power on to check the major mainframe internal components, operating software, and installed modules.

Diagnostics, File System Checks, and the Boot Option Overlay. If the mainframe has System Software Release 3, Version 1.60 and higher, you can bypass the power-on diagnostics and file system checks by changing the settings in the Boot Option overlay to the Diagnostics menu. The default settings are to execute diagnostics and the file system check each time you power on the mainframe. However, you can set up the mainframe to bypass the diagnostics and file system checks for up to 14 days or up to five power-on cycles, which ever occurs first. You can also set the mainframe to only run the file system check after an abnormal power down.

There are certain conditions that require the diagnostics or file system checks to be run. If these conditions occur, they override the selections made in the Boot Option overlay. The conditions required for running diagnostics include the following:

- A module failed at the last power on.
- The module configuration of the mainframe has changed (you either removed or added a module to the mainframe).

If an abnormal power down occurs, the mainframe will always run the file system check, regardless of the settings in the Boot Option overlay.

Information under the BOOT ACTIVITY area in the Boot Option overlay summarizes the most recent diagnostics and file system check activity. It lists the last time that the diagnostics were checked and the last time the files system was checked.

NOTE. *If you run the File System Check procedure from the floppy disks, the mainframe will ignore the settings in the Boot Option overlay.*

These features let the user power on the mainframe quickly without having to wait for the power-on diagnostics or file system checks. Refer to the discussion of the Boot Option overlay in the user manual for more information on setting the boot options.

Diagnostic Overview. There are two levels of diagnostics: 0 and 1. Level 0 first calculates the power consumption and reports the results. It then checks the mainframe and attached Expansion mainframes; this takes approximately 12 seconds for the DAS 9219/9220 and 6 seconds for the DAS 9221. When the level 0 diagnostics are successfully completed, the mainframe displays the message "LEVEL 0 diagnostics – complete;" then level 1 diagnostics begin.

Level 1 checks all modules installed in the mainframes; each check takes up to 10 seconds per module for the DAS 9219/9220 and 6 seconds per module for the DAS 9221. First, level 1 diagnostics check for incorrect module configurations. When this part of level 1 completes, the mainframe displays the message "LEVEL 1 configuration test(s) complete." Level 1 then runs diagnostics for each module. If Level 1 detects errors, it reports them in the Diagnostic menu with a FAIL message and a corresponding error code. The mainframe displays the Diagnostics menu after it completes the power-up diagnostics and tests the major instrument functions.

If random characters or no characters appear when you power up the system, you may need to change the terminal's baud rate.

Level 0 Diagnostics. Level 0 diagnostics detect two types of errors: soft errors and hard errors. Usually, you can correct a soft error by reconfiguring the cards in the mainframe or by connecting a higher-rated power cord. If the error is severe enough (for example, board power requirements exceed power-supply limits), the mainframe shuts off. A hard error can usually be corrected by replacing a mainframe board, such as the Controller board.

Level 0 diagnostics displays the total power used by the modules in the mainframes, and then checks the mainframes for functionality. Refer to *Introduction to DAS Hardware* for power-cord and power-supply requirements.

If level 0 diagnostics do not detect an error, level 1 diagnostics begin. If level 0 detects an error, a message may appear on the terminal. In addition, LEDs on the rear of the Controller board report an error pattern. On power-up, the LEDs sequence to track the progress of level 0 diagnostics. These LEDs are described in the *Controller Board LEDs* section.

Tables 4–1 and 4–2 list messages that you may encounter when powering on your DAS system; the tables are mainframe specific. These tables contain only examples of diagnostic error messages; this is not a complete list of all the messages you may encounter. These tables also describe the messages and suggest corrective actions.

Table 4–1: DAS 9221 Level 0 Diagnostics Messages

Message	Description/Corrective Action
Example 1: One mainframe, no expansion mainframes.	
MAINFRAME instrument modules use 385 watts. Refer to *Introduction to DAS Hardware* of this manual to verify the correct power cord/supply requirements. For assistance contact your local Tektronix field service representative.	This is a status message; no errors are detected. This message is displayed even though the correct power cord is connected.
Example 2: One mainframe, no expansion mainframes.	
MAINFRAME instrument modules use 525 watts. Error! Shutting down. MAINFRAME has "Opt. 1A" which supplies 500 watts maximum. Refer to *Introduction to DAS Hardware* to verify the correct power cord/supply requirements. For assistance, contact your local Tektronix field service representative. ***NOTE.*** *Removing 1 or more modules may bring wattage requirements to within the limits of the power cord.*	The mainframe exceeded its maximum power limit of 500 watts and shuts down. Refer to *Introduction to DAS Hardware* for information on configuring boards so they consume less power.
Example 3: One mainframe, three expansion mainframes.	
MAINFRAME instrument modules use 137 watts. EXPANSION 1 instrument modules use 450 watts. EXPANSION 2 instrument modules use 25 watts. EXPANSION 3 instrument modules use 47 watts. Refer to *Introduction to DAS Hardware* to verify the correct power cord/supply requirements. For assistance contact your local Tektronix field service representative.	The mainframe and all expansions are within their power-consumption limits.
Example 4: One mainframe, three expansion mainframes. Expansion 1 fails.	
MAINFRAME instrument modules use 159 watts. EXPANSION 1 instrument modules use 500 watts. ERROR! Shutting down. ***NOTE.*** *Removing 1 or more modules may bring wattage requirements to within the limits of the power cord.*	Expansion 1 exceeded its power limit of 475 watts. All mainframes will power down. The mainframes will not power up until you correct the problem with expansion 1. Refer to *Introduction to DAS Hardware* for information on configuring boards so they consume less power.
Example 5: One mainframe, three expansion mainframes. Expansion 3 does not power on.	
MAINFRAME instrument modules use 137 watts. EXPANSION 1 instrument modules use 450 watts. EXPANSION 2 instrument modules use 25 watts. EXPANSION 3 is not ready. ERROR! Shutting down.	Expansion 3 did not power on. All mainframes will power down. Check Expansion 3 power plug and fuse, or check that the interconnect is properly connected. The Expansion Slave board in Expansion 3 could be faulty.

Table 4–1: DAS 9221 Level 0 Diagnostics Messages (Cont.)

Message	Description/Corrective Action
Example 6: One mainframe, three expansion mainframes. Expansion 2 has a power or fan failure.	
MAINFRAME instrument modules use 137 watts. EXPANSION 1 instrument modules use 450 watts. EXPANSION 2 instrument modules use 25 watts. EXPANSION 3 instrument modules use 47 watts. Refer to *Introduction to DAS Hardware* to verify the correct power cord/supply requirements. For assistance contact your local Tektronix field service representative. EXPANSION 2 POWER FAIL! Error! shutting down.	Diagnostics added the total power consumption in the Master mainframe and each Expansion, and determined that they are within their power limits. During testing of the Master mainframe, Expansion 2 reported a failure (either a fan or a power-supply failure). All mainframes power down. No mainframe will power up until Expansion 2 is repaired or removed from the system. To determine if the fans (mainframe fan or power-supply fan) have failed, perform the corrective actions for FAN FAIL! in Table 4–3. To determine if the power supply has failed, perform the corrective actions for POWER FAIL! in Table 4–3.

Table 4–2: DAS 9219/92200 Level 0 Diagnostics Messages

Message	Description/Corrective Action
Example 1: One mainframe, no expansion mainframes.	
MAINFRAME instrument modules use 385 watts. Refer to *Introduction to DAS Hardware* for the correct power cord/supply requirements.	This is a status message; no errors are detected. This power-cord message is displayed even though the correct power cord is connected.
Example 2: One mainframe, no expansion mainframes.	
MAINFRAME instrument modules use 425 watts. Error! Shutting down.	The mainframe exceeded its maximum power limit of 400 watts and shuts down. Refer to *Introduction to DAS Hardware* for information on configuring boards so they consume less power.
Example 3: One mainframe, three expansion mainframes.	
MAINFRAME instrument modules use 137 watts. EXPANSION 1 instrument modules use 437 watts. EXPANSION 2 instrument modules use 25 watts. EXPANSION 3 instrument modules use 47 watts. Refer to *Introduction to DAS Hardware* for the correct power cord/supply requirements.	The Master mainframe and all Expansion mainframes are within their power-consumption limits.
Example 4: One mainframe, three expansion mainframes. Expansion 1 fails.	
MAINFRAME instrument modules use 159 watts. EXPANSION 1 instrument modules use 557 watts. ERROR! Shutting down.	Expansion 1 exceeded its power limit of 475 watts. All mainframes will power down. The mainframes will not power up until you correct the problem with Expansion 1. Refer to *Introduction to DAS Hardware* for information on configuring boards so they consume less power.
Example 5: One mainframe, three expansion mainframes. Expansion 3 does not power on.	
MAINFRAME instrument modules use 137 watts. EXPANSION 1 instrument modules use 465 watts. EXPANSION 2 instrument modules use 25 watts. EXPANSION 3 is not ready. ERROR! Shutting down.	Expansion 3 did not power on. All mainframes will power down. Check Expansion 3 power plug and fuse, or check that the interconnect is properly connected. The Expansion Slave board in Expansion 3 could be faulty.

Table 4–2: DAS 9219/92200 Level 0 Diagnostics Messages (Cont.)

Message	Description/Corrective Action
Example 6: One mainframe, three expansion mainframes. Expansion 2 has a power or fan failure.	
MAINFRAME instrument modules use 137 watts. EXPANSION 1 instrument modules use 450 watts. EXPANSION 2 instrument modules use 25 watts. EXPANSION 3 instrument modules use 47 watts. Refer to *Introduction to DAS Hardware* for the correct power cord/supply requirements. EXPANSION 2 POWER FAIL! Error! shutting down.	Diagnostics added the total power consumption in the Master mainframe and each Expansion, and determined that they are within their power limits. During testing of the Master mainframe, Expansion 2 reported a failure (either a fan or a power-supply failure). All mainframes power down. No mainframe will power up until Expansion 2 is repaired or removed from the system. To determine if the fans (mainframe fan or power-supply fan) have failed, perform the corrective actions for FAN FAIL! in Table 4–3. To determine if the power supply has failed, perform the corrective actions for POWER FAIL! in Table 4–3.

Table 4–3 lists error messages and corrective actions for DAS mainframes.

Table 4–3: Error Messages for DAS Mainframes

Message	Description/Corrective Action
POWER FAIL!	Check the power cord connection and the mainframe's fuse on the back panel. Dropped cycles in the power source also cause this message. If all of these actions fail to correct the problem, replace the power supply.
FAN FAIL!	The mainframe fan or power-supply fan may have a problem, so the mainframe may overheat. Remove the top cover and check that cables are not blocking airflow from either fan. Visually check that the card-cage fan and power-supply fan is turning. Check that W866 is connected to the mainframe fan. Partially remove the W865 connector from the card-cage fan, so you can measure the voltage across it with a digital voltmeter. It should measure between 16 VDC–32 VDC. If it doesn't, replace the power supply.
Switch OFF	The On/Standby switch, located on the front panel, is in the Standby (Off) position. If the switch is ON, the power supply, power switch, or the Controller board may be faulty.
WARNING! RS-232 PORT FAILURE	Level 0 diagnostics check each RS-232 port up to the hardware drivers, but not beyond them. If the Terminal port fails, the mainframe stops the diagnostic tests. If the Host or Auxiliary ports fail, this message appears and the Controller board LEDs display a troubleshooting code for about three seconds. Refer to Tables 4–4 and 4–5 for a description of the LED error codes.
memory address=nnnnnnnn memory value =nnnnnnnn	The nnnnnnnn in the memory address field is an eight-digit hex number. For DAS 9219/9220, numbers from 0 through 1FFFFC indicate a Memory board failure and numbers from 810000 through 813FFC indicate a Controller board failure. The number in the memory value field indicates the value at the memory address.
(DAS 92E9 Only) EXPANSION X POWER FAIL! Error! shutting down.	A failure occurred in an Expansion mainframe; X indicates which Expansion mainframe failed (2, 3, or 4). Check the power supply/power source or mainframe fan. All mainframes power down. No mainframe will power up until the failed Expansion mainframe is repaired or disconnected from the system.
hard panic – unknown type of floppy interrupt	Check the floppy drive hardware.

Table 4–3: Error Messages for DAS Mainframes (Cont.)

Message	Description/Corrective Action
hard panic – floppy interrupt with no buffer queued	Check the floppy drive hardware.
soft panic – Inode overflow:	The hard or floppy disk does not have any more room for storage.
soft panic – Inode address greater than 2 exp 24	The file is too big.
clock lost count	This is not a serious error. If it happens repeatedly, check the Controller board or modules.
failure to reboot from ROM	Problems with ROM or the hard disk could cause this problem.
file descriptor ...	Usually indicates an interprocess-communication problem between the system manager and the menu you were using. Cycle power or rebuild operating-system software to recover from the problem.
Supervisor trap	RAM or a kernel from the disk is bad.
Supervisor bus error exception	RAM or hardware bus (such as the hard disk) problem.
Supervisor address error exception	RAM or hardware bus (such as the hard disk) problem.
Drive is not bad block formatted	Reformat drive, make the file system, and reinstall software. May not be able to access the drive.
Unable to read (write) bit map	Reformat drive, make the file system, and reinstall software. You may not be able to access the hard disk drive.
Hard disk error x–xx	A problem has occurred with the hard disk drive or with files on the drive. You may not be able to access the hard disk drive. Reformat drive, make the file system, and reinstall software.
OS: message SDO:	Cycle the power on the mainframe and run the file system Check and Verify.
Winchester interrupt with no buffer queued	Check the ST506 Interface controller. (DAS 9219/9220 only)
Unable to replace bad block	The hard disk does not function. There are not enough replacements for the bad blocks.

Controller Board LEDs. If level 0 diagnostics detect an error, the mainframe may pause indefinitely without displaying a message on the terminal. In this case, the set of 10 bar-graph LEDs (0–9) on the rear of the Controller board indicates the fault; you can view the LEDs through the rear of the card cage. These LEDs track the progress of level 0 diagnostics and will halt when an error occurs. The last state of these LEDs before shutdown indicates the fault.

***NOTE**. Several other surface-mounted device (SMD) LEDs are visible on the DAS 9221. These are processor-status indicators used during instrument manufacture and module repair.*

For the DAS 9219/9220, LEDs 0–7 are ordinarily OFF after successfully completing the power-up diagnostics. For the DAS 9221, LEDs 0–7 display a "scanning" pattern after successfully completing the power-up diagnostics. This scanning pattern indicates that the CPU is operating normally. The scanning pattern may be briefly interrupted based on the operating mode. Table 4–4 lists the LED error codes for the DAS 9221; Tables 4–5 and 4–6 list the codes for the DAS 9219/9220.

NOTE. *LEDs 0–7 are in hexadecimal code, with the least significant bit at the far left as you face the rear of the mainframe.*

The level 0 tests are not necessarily run sequentially. Individual codes within a set of 16s (hex) are run sequentially; however, sets are not run sequentially. For example, 33 always comes before 34; but the 70s may come before the 30s.

If the level 0 diagnostics do not detect an error, LEDs 0–9 indicate the status of the three power-supply voltages as follows:

- If any of LEDs 0–7 are lit, the +5 V supply is present
- If LED 8 is lit, the + and –17.5 V supplies are present
- If LED 9 is lit, the +3 V current-sink supply is present

NOTE. *You can verify the presence of the power-supply voltages by checking the test pads at J890 on the top-front of the Backplane board with a digital voltmeter.*

Table 4–4: LED Diagnostic Errors for DAS 9221

Error Codes †	Test Functions	Possible Failures Other than Controller Board
FF	Reset asserted	power supply
00	Level 0 diagnostics complete	
01	BOOTROM checksummed	none
1X	NVRAM	none
20	VoltAmps summation	a module in a slot
30	Enable PFail exception	power supply
31	Enable xBint2 exception	a module in a slot
33	System clock	none
34	Enable Hard/Floppy disk, I/O exception	Expansion I/O
35	Enable xBINT1 exception	a module in a slot
38 – 3B	Communication port interrupts	none

Table 4–4: LED Diagnostic Errors for DAS 9221 (Cont.)

Error Codes †	Test Functions	Possible Failures Other than Controller Board
3F	Enable xBint0 exception	a module in a slot
40 – 47	Communication port registers	none
48 – 4B	Communication port transmit	none
4C – 4F	Communication port receive	none
5X	MMU registers	none
6X ‡	DRAM	none
63	Fan fail	power supply/fan
66	Exception vector move	none
70 – 71	Floppy disk registers	floppy disk
73 – 74	8K buffer RAM/alignment	none
7A – 7D	Floppy Disk Controller IC/interrupt	none
9X	MMU operation	none
A1	Calendar access	none
A2	No clock movement	none
A3	Clock movement is wrong	none
A4	10 µs clock period	none
B0	MMU registers disable	none
B1	MMU registers address	none
CX	SCSI testing	SCSI drive
F3	Unexpected Bus Error	mainframe memory module
F7	BINTx exception	a module in a slot
F8	Spurious exception	a module in a slot
F9	Undefined exception	none
FD	Expansion Power/Fan fail exception	Expansion power supply or card cage fan power line has dropped phases 92C02/03

† **X = “Don’t Care”**

‡ **Except error codes 63 and 66**

Table 4–5: DAS 9219/9220 Controller Board LED Diagnostic Errors

Error Codes †	Test Functions	Possible Failures Other than Controller Board
FF	Reset asserted	power supply
01	Even BOOTROM checksummed	none
02	Odd BOOTROM checksummed	none
1X	NVRAM	none
20	VoltAmps summation	a module in a slot
30	Enable PFail exception	power supply
31	Enable xBint2 exception	a module in a slot
32	Clock/Calendar	none
33	System clock/Timer compare	none
34	Enable Hard/Floppy disk, I/O exception	Expansion I/O
35	Enable xBINT1 exception	a module in a slot
3F	Enable xBint0 exception	a module in a slot
63	Enable Turnoff exception	power supply
70 – 72	Hard/Floppy disk registers	hard disk
74 – 74	8K buffer RAM/alignment	none
75 – 79	Hard Disk Controller IC/interrupt	none
7A – 7D	Floppy Disk Controller IC/interrupt	none
80	Time base 500 µs chain	none
81	Time base 1 ms chain	none
82 – 83	Time base TSx	none
84 – 87	Time base TB0 – TB3	none
F3	Unexpected bus error	mainframe memory module
F7	BINTx exception	a module in a slot
F8	Spurious exception	a module in a slot
F9	Undefined exception	none
FD	Expansion Power/Fan fail exception	Expansion power supply or card cage fan power line has dropped phases 92C02/03

† **X = “Don’t Care”**

Table 4–6: DAS 9219/9220 Memory Board Diagnostic Errors

Error Codes	Test Functions	Possible Failures Other than Memory Board
38 – 3B	Communication ports' interrupts	Mainframe Controller
40 – 47	Communication ports' registers	Mainframe Controller
48 – 4B	Communication ports' transmit	Mainframe Controller
4C – 4F	Communication ports' receive	Mainframe Controller
5X	MMU registers	Mainframe Controller
6X † ‡	DRAM	Mainframe Controller
9X	MMU operation	Mainframe Controller

† **Except Controller-board error codes 63**

‡ **Error code 66 occurs if DIP switch #1 is in the down position. (Refer to the *DIP Switches on the Controller Board* on page 4–45.)**

Diagnostics menu. The Diagnostics menu lists the major system components (the master mainframe, any attached expansion mainframes, and media drives) and reports the status of each component at power-on. This menu also displays a summary and brief description of the modules installed in each mainframe, the software version currently installed, the date and time, and some general user information.

In earlier versions of the system software the Diagnostics menu was known as the Power Up menu. Some of the major features of the Diagnostics Menu include the following information:

- The name of the mainframe, such as Mainframe, Expansion 1, Expansion 2, and Expansion 3. Expansion mainframes and media drives are only listed if they are connected.
- A summary of the modules installed in each slot of the specified mainframe. The Master mainframe has slots 0, 1, and 8 reserved for specific boards (the Memory board is in slot 1 for the DAS 9219/9220); slots 2–7 accept any DAS module. Expansion mainframes provide additional slots, so the total number of slots varies with the number of Expansion mainframes. You cannot select this field; it is only for information.
- The results of diagnostic testing (done at power-on) with a PASS, FAIL, or No S/W message. FAIL messages include a four-digit error code (refer to *Diagnostics menu Error Codes*). The No S/W message indicates that the module software is not installed (refer to the Version menu for a list of the installed software). You cannot select this field; it is only for information.

- The current date and time. You may change these values in an overlay accessed by function key F5: SET TIME. (See the *DAS System User Manual* for more information on this overlay.)
- The version number of the software currently loaded on the mainframe hard disk drive. You cannot select this field; it is only for information.
- The conditions surrounding the last power-down, such as Normal, Software, Power Failure, Unexpected, and Fan Failure. (Refer to Table 4–7 for more information on these messages.) You cannot select this field.

The Previous Shutdown field in the Diagnostics menu indicates how the mainframe last powered down. Table 4–7 lists and explains these messages.

Table 4–7: Previous Shutdown Field Messages

Message	Explanation
Normal	The last system shutdown resulted from pushing the front-panel power switch to the OFF position. This is the correct way to power-down. All open files and interprocess communication channels close properly.
Hard OS Failure	The last system shutdown resulted from a fatal error detected by the operating system from a hardware or software failure. This power-down may corrupt the hard disk file system. For information on checking and rebuilding the file system refer to *Loading DAS System Software.* (Check for manual changes at the back of this manual to verify that the information has not been updated.)
Software	The last system shutdown resulted from depleted system resources, such as hard disk space or memory. This power-down may corrupt the hard disk file system. For information on checking and rebuilding the file system refer to *Loading DAS System Software.* (Check for manual changes at the back of this manual to verify that the information has not been updated.)
Power Failure	The last system shutdown resulted from loss of AC power (e.g., power cord disconnected from the power source). Files remain open, resulting in a loss of disk space. For information on checking and rebuilding the file system refer to *Loading DAS System Software.* (Check for manual changes at the back of this manual to verify that the information has not been updated.)
Unexpected	The last system shutdown resulted from unknown causes. The operating system assumes this mode at power on. This power-down may corrupt the disk file system. For information on checking and rebuilding the file system refer to *Loading DAS System Software.* (Check for manual changes at the back of this manual to verify that the information has not been updated.)
Fan Failure	The last system shutdown resulted from either a mainframe fan failure, a power-supply fan failure, or an over-temperature condition. This power-down does not corrupt the disk file system.

Level 1 Diagnostics. After the mainframe completes level 0 diagnostics, level 1 diagnostics check for incorrect module configurations. This test checks that the installed boards are in legal slots. If this test fails, the terminal displays the message "FATAL: Configuration error in slot (#)," where # indicates the first slot number with the error. Some modules display configuration errors. The test does not display additional configuration errors until you correct the first error. For information on installing modules in the mainframe, refer to the *DAS System User Manual*.

After each FATAL message, the terminal displays the message "System going down" and the mainframe powers down. When you correct the problem and the DAS is powered up again, the configuration test reruns. When this part of level 1 completes successfully, the terminal displays the message "LEVEL 1 Configuration test(s) complete."

After level 1 completes the configuration tests, it checks the Event and Correlation buses and installed modules. If the buses or modules fail, the Diagnostics menu displays a FAIL message and error code when the level 1 diagnostics finish.

Diagnostics menu Error Codes. Diagnostic provides a PASS, FAIL or No S/W message for every module in the mainframe and any attached expansion mainframes. If a FAIL message appears, a four-digit error code also appears as an index to additional information describing the failure. The first digit in the error code indicates the type of error:

1	Diagnostics were not performed on that module.
2	Module operation is still possible but specifications are no longer guaranteed.
3–7	Unused codes, so they should not be displayed.
8	The module hardware is incompatible with the module software version. (This number only appears for DAS systems with mainframe software releases prior to Release 2, Version 1.00. Number 8 is unused on newer software releases.) You cannot operate a DAS module with an error code of 8.
9	System operation is possible, but operation of the module is not possible.
C	The problem affects other parts of the system; operation of the module is not possible and the DAS shuts down. Prior to shutdown, the mainframe displays the message "FATAL: Hardware Error" along with the failed module's slot number and error code.

If "No S/W" appears in place of a PASS or FAIL message, the installed module does not have any software installed on the hard disk. Refer to the Version menu to display a list of the installed software. If you want to install the software for your module, refer to the procedures listed later in this section.

Tables 4–8 to 4–18 list error codes for mainframe and module failures. Because the 92LANSE module connects directly to the DAS 9221 Controller board, any diagnostics errors for the 92LANSE module are reported as errors for the controller board (see Table 4–10).

Table 4–8: DAS 9219/9220 Controller Board Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than Mainframe Controller Board
X00X	EVENT/CORRELATION LINES	Any card that uses the Event/Correlation lines
X000	Start Lines	
X001	Event Lines	
X002		

Table 4–9: DAS 9219/9220 8 Mbyte Memory Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than Memory Board
X00X	FAST MEMORY CHECK	Main Controller
X000	Access Memory	Main Controller
X001	Fast memory write/read	Main Controller
X002	Parity path	Main Controller

Table 4–10: DAS 9221 Controller Board Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than Mainframe Controller Board
X00X	EVENT/CORRELATION LINES	Any card that uses the Event/Correlation lines
X000	Start Lines	
X001	Event Lines	
X002	Correlation Lines	
X10X	TIMEBASE CHECKS	
X100	Time base Chain	
X101	Time base 4	
X102	Time base 1	
X103	Time base 2	
X104	Time base 3	
X20X	FAST MEMORY CHECK	
X200	Access Memory	
X201	Fast memory write/read (2–16 M)	

Table 4–10: DAS 9221 Controller Board Diagnostic Error Codes (Cont.)

Error Codes	Test Name	Possible Failures Other than Mainframe Controller Board
X202	Parity path	
X30X	92LANSE MODULE CHECKS	92LANSE Module
X300	Hardware Present	92LANSE Module
X301	Control-Status Register	92LANSE Module
X302	Discrete I/O Register	92LANSE Module
X303	ID ROM	92LANSE Module
X304	RAM	92LANSE Module
X305	Lance Chip Registers	92LANSE Module
X306	Lance Chip Initialization	92LANSE Module
X307	Internal Loopback	92LANSE Module

92A60/90 Configuration Errors. The 92A60/90 modules display additional information when configuration errors exist. Errors occur if the modules are installed in an incorrect order or if the buffer probe is connected to the Controller board incorrectly.

If a 92A60M (or 92A90M) board is not installed in the slot preceding a 92A60C (or 92A90C) board, the test displays the message “Preceding slot has card that may damage 92A60C (or 92A90C) controller card.” If a 92A60C (or 92A90C) board is not installed in the slot following a 92A60M (or 92A90M) board, the test displays the message “Next higher slot has card that may damage 92A60M (or 92A90M) memory card.”

NOTE*. The diagnostics do not display the 92A60/90 messages if the preceding or following slot is empty. Diagnostics only check for problems that could damage the 92A60/90. Since an empty slot does not damage the board, the test does not display a message. Also, when a 92A90C board is adjacent to a 92A60M board or a 92A60C board is adjacent to a 92A90M board, the test does not display these messages.*

If a buffer probe cable is incorrectly attached to a 92A60C or 92A90C Controller board, the DAS prevents the use of that module and displays the message “Buffer probe connections may damage A60 (or A90) Controller card.” Refer to the 92A60/90 *User Manual* for a description of connecting the buffer probe.

Tables 4–11 and 4–12 list the 92A60/90 error codes.

Table 4–11: 92A60/90/60D/90D Controller Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than 92A60/90 Controller
X00X	INSTRUMENT CONTROL BLOCK	
X000	Programmatic Control	
X001	Event Bus Control	Event Lines 1–4
X10X	CLOCK GENERATOR BLOCK	
X100	Jumper Position	
X101	Register Parity	
X102	Gate Array/RAM Bus Interface	
X103	RAM March	
X104	State/Login Phase Selection	
X20X	MEMORY CONTROL BLOCK	
X200	Memory Address Register †	92A60/90M, Application Bus
X201	Timestamp Counter †	92A60/90M, Application Bus
X202	Post-Trig Delay Counter †	92A60/90M, Application Bus
X30X	REAL-TIME CONTROLLER BLOCK	
X300	RTC RAM	
X301	Word Recognizer ICs	
X302	Word Recognizer 1–8 Events	
X303	State/Flag Events	92A60/90M, Application Bus
X304	Event Bus Interface	92A60/90M, Application Bus, Event Lines 1–16
X305	Counter/Timer Register	
X306	Counter Operation	
X307	Timer Operation	92A60/90M Timestamp Counter, 9200 Time bases 0–3, Application Bus
X308	Counter/Timer Event	
X40X	ACQUISITION DATA PATH BLOCK	
X400	Word Recognizer 1–8 Data Path	92A60/90M, Application Bus
X401	Word Recognizer 9–16 Data Path	92A60/90M, Application Bus
X402	Data Range Recognizer 1–2 Path	92A60/90M, Application Bus
X403	Address Range Recognizer 1–2 Path	92A60/90M, Application Bus

† **These circuits reside on the 92A60/90 Memory board.**

Table 4–12: 92A60/90/60D/90D Memory Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than 92A60/90 Memory
X00X	ACQUISITION MEMORY BLOCK	
X000	Bank Select Test	92A60/90C,
X001	RAM March	92A60/90C, Application Bus

92A96 and 92C96 Configuration Errors. The 92A96 and 92C96 Modules display additional information when errors occur. Table 4–13 lists the possible errors. Refer to the *92A96 & 92C96 Module User Manual* for more information on these errors.

Table 4–13: 92A96 and 92C96 Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than Module
X00X	ACQUISITION MEMORY	
X000	Mem Full Bit	
X001	Ripple MAR	
X002	MAR TC Carry	
X003	Bank Select	
X004	AcqRAM Banks 0 & 2	
X005	AcqRAM Banks 1 & 3	
X10X	TIMESTAMP	
X100	Gray to Binary	
X101	TStamp Rollover	
X102	TSReset/FastClk	
X20X	CSM	
X200	CSM RAM	
X201	START + Clock Paths	
X202	Async Clock Select	
X30X	RTC	
X300	RTC Array Access	
X301	State RAM	
X302	Clock Counters	
X303	Microcode	
X304	Cal. mode Acquire	

Table 4–13: 92A96 and 92C96 Diagnostic Error Codes (Cont.)

Error Codes	Test Name	Possible Failures Other than Module
X305	CRE Event	
X306	Events Out	Any DAS card
X307	Events In	Any DAS card or DAS Controller
X40X	WORD RECOGNIZERS	
X400	RTC WR Events	
X401	Address Recognizer Inputs	
X402	Data Recognizer Inputs	
X403	Control Recognizer Inputs	
X404	Address Recognizer Events	
X405	Data Recognizer Events	
X406	Control Recognizer Events	

92HS8 Configuration Errors. The 92HS8 Modules display additional information when configuration errors exist. If the 92HS8 cabinet is not receiving power when it is attached to the 92HS8 Master (or 92HS8E Expander) interface board, the test displays the message “Attached cabinet is unpowered.” If the slot adjacent (higher) to the 92HS8 Master interface contains a board other than a 92HS8E Expander board, the test displays the message “Succeeding slot has card other than 92HS8E Expander.”

Table 4–14 lists the 92HS8/8E error codes.

Table 4–14: 92HS8/8E Diagnostic Error Codes

Error Codes		Test Name	Possible Failures Other than 92HS8/8E
X00X		92HS8/8E INTERFACE	
X000		92HS8/8E Status	
X001		Event Lines	Any cards with Events
X002		Correlation Lines	Any card with Correlation
X003		CMOS RAM	
POD D	**POD C**		
X10X	X60X	SAMPLE & HOLD	
X100	X600	Login Status	Cable from cabinet to interface
X101	X601	DAC RAM	
X20X	X70X	WORD RECOGNIZERS	
X200	X700	A Word Recognizer Events	
X201	X701	B Word Recognizer Event	
X202	X702	Glitch Delay Filter	
X203	X703	Events Detector	
X204	X704	Glitch Detector	
X30X	X80X	TRIGGER SEQUENCER	
X300	X800	Start Select	
X301	X801	Trigger State	
X302	X802	Arms Select	
X303	X803	Assert Manual Arms	Any card with Events
X304	X804	Assert Event Arms	Any card with Events
X305	X805	Word Recognizer Event Path	
X306	X806	Trigger/Delay Counter Modes	
X307	X807	Run Trigger/Delay Counter	
X308	X808	92HS8/8E Time Base	
X40X	X90X	ACQUISITION MEMORY	
X400	X900	Load Address Counters	
X401	X901	Run Address Counters	
X402	X902	Bank Select Generator	
X403	X903	Select 2 GHz Mode	

Table 4–14: 92HS8/8E Diagnostic Error Codes (Cont.)

Error Codes		Test Name	Possible Failures Other than 92HS8/8E
X404	X904	Divide-By-Four Generator	
X405	X905	Memory Data Bit Independence	
X50X	XA0X	SYSTEMS	
X500	XA00	92HS8 Interface Clock Phase	External Clock Cables
X501	XA01	92HS8 Interface Time Base	External Clock Cables
X502	XA02	Attached Data Probes	Data Probes

Table 4–15: 92S16/92SX109 Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than 92S16/92SX109
X000	Clk Path – clock	9200 System time base
X100	Program Counter Load	
X101	Program Counter Increment	
X102	Stack Load	
X103	Stack Increment	
X200	S16 Memory – Bit Write	
X201	S16 Memory – Memory Address	
X202	S16 Memory – Memory Test	
X300	Reg. A – Load Mode	
X301	Reg. A – Incr. Mode	
X302	Reg. A – Decr. Mode	
X400	Reg. B – Load Mode	
X401	Reg. B – Incr. Mode	
X402	Reg. B – Decr. Mode	
X500	Instruction – Advance / Jump	
X501	Instruction – Irq	
X502	Instruction – Repeat	
X503	Instruction – If Key	
X504	Instruction – If Ext	
X600	Output Lines – Output	

Table 4–15: 92S16/92SX109 Diagnostic Error Codes (Cont.)

Error Codes	Test Name	Possible Failures Other than 92S16/92SX109
X700	Low speed Events – Event Output/ Input	Main Controller board
X701	Low speed Events – Start/Stop Control	Main Controller board
X800	Probe ID and interface	Failed, unidentified, or incorrect probe

Table 4–16: 92S32/92SX118 Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than 92S32/92SX118
X0XX	Vector Address Generator	
X1XX	Loop Counter	
X2XX	Vector RAM	
X202	Pattern Mem – Walk 1 with 20 ns clk	9200 Time Base 1 (Controller board)
X203	Pattern Mem – Walk 0 with 20 ns clk	9200 Time Base 1 (Controller board) Check 92S32 terminator jumpers
X30X	Clock Selector	9200 Time Base 0–3 (Controller board)
X40X	Start Flip Flop	9200 Event 1–4
X500	Pod A Inhibit	
X501	Pod B Inhibit	
X502	Pod C Inhibit	
X503	Pod D Inhibit	
X504	Internal Inhibit Switch	
X60X	Probe Interface	Failed Probe
X70X	Bus Interface to 92S16	92S16, 92S32s or the Application Bus (Controller board)

Table 4–17: 92A16/16E Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than 92A16/16E
X0XX	DAC Memory	
X100	Acq Memory – Address counter	
X101	Acq Memory – Delay counter	
X102	Acq Memory – “Ones”	
X103	Acq Memory – “Zeros”	
X104	Acq Memory – Data independence	
X105	Acq Memory – Address independence	
X2XX	Login Acquisition	
X300	Word Recognizers	
X301	Edge Recognizer	
X400	Glitch Recognizer	
X401	Glitch Acquisition	
X5XX †	HSC to Slow Interacts	Event lines 3–11
X6XX †	HSC to Timer/Counters	
X7XX †	HSC to Memory	
X8XX	Complete Acquisition including Clock Path	

† **The 92A16E does not use these tests.**

Table 4–18: 92C01/02/03 Diagnostic Error Codes

Error Codes	Test Name	Possible Failures Other than 92C01/02/03
X00X †	EXPANSION BUS COMMUNICATIONS (92C02/03 only)	
8000 †	expansion read/write	Expansion Slave
X10X †	EVENT/CORRELATION LINES (92C02/03 only)	
X100 †	event/correlation lines	Expansion Slave, A card in a slot of current expansion mainframe
X20X †	TIME BASES (92C02/03 only)	
X200 †	time base chains	Expansion Slave
X201 †	time base 0	Expansion Slave
X202 †	time base 1	Expansion Slave
X203 †	time base 2	Expansion Slave
X204 †	time base 3	Expansion Slave
X30X	DDMA (92C01/02 only)	
X300	DMA registers	Main Controller board
X301	DMA memory swap	
X302	DMA interrupts	Main Controller Expansion Slave
X40X	GPIB (92C01/02 only)	
X400	GPIB register	Main Controller board
X50X	SCSI (92C02 only)	
X500	SCSI register	
X60X †	ALT SCSI (92C02/03)	Expansion Slave
X600 †	alt SCSI register	

† The Diagnostics menu reports these errors against the 92E9 Expansion Slave board.

92LAN Diagnostics

92LAN has diagnostic firmware that executes at system power on. The 92LAN Module on-board ROM stores the code for these diagnostic tests. The 92LAN diagnostics tests consist of two groups of tests: the controller test and the shared memory tests.

On system power on, the 92LAN controller executes its diagnostics. As these tests execute, the 7-segment display located on the left-rear of the 92LAN board displays a series of patterns. If any tests fails, the display's decimal point lights and an F character is displayed after all tests finish. If all tests pass, a P character is displayed after all tests finish.

During a power-up sequence, 92LAN diagnostic tests are partially or fully executed several times due to occasional reset activity during level 0 and level 1 diagnostics.

NOTE. *Due to time restrictions, some 92LAN diagnostics tests do not run at power-up. For information on accessing and executing these tests, refer to the Extended Diagnostics information in this section.*

The DAS controller runs four additional tests to check the LAN board's shared-RAM interface during level 1 diagnostics.

If the power-up diagnostics do not detect errors, the 92LAN loads its RAM-based operating system. The mainframe system controller supplies this LAN Operating System (LANOS) from the hard disk drive via the shared-RAM. The 68000 reads the LANOS from shared-RAM, writes it into its own bank of support RAM, and executes LANOS.

When LANOS is running, it resets the 7-segment display to zero and uses the display as an ethernet-packet counter. This counter increments by one for each packet addressed to the 92LAN. When the 92LAN board is idle, the display shows the packet counter incrementing. This is caused by network broadcast messages, such as ARP requests, and is normal; all hosts on the network must pay attention to these.

The 92LAN board also contains a 10-segment bar-graph display. The bar nearest the 92LAN board's outside edge is segment 1. Segments are numbered sequentially through segment 10 at the opposite end. Table 4–19 describes the function of each segment.

Table 4–19: Diagnostic Bar Codes

Segment	Description
1	This segment lights during power-up diagnostics. It stays lit after the mainframe boots UNIX, only if a LAN diagnostic test fails. If all tests pass, this bar is not lit when the Diagnostics menu displays.
2 – 8	These segments are currently not used.
9	This segment is the 92LAN processor "heartbeat." It flashes about once every 1.5 seconds after the diagnostics pass and the mainframe boots UNIX.
10	This segment is the interrupt output from the LAN coprocessor. A lit bar indicates that the coprocessor is interrupting the LAN controller.

After all 92LAN and mainframe system diagnostics finish, the system runs the file-system check and starts UNIX.

To support the 92LAN ftp, rsh**,** and rcp functions, the system software contains the two daemons: ftpd and rshd. These daemons start after the file-system checks complete.

The ftpd and rshd daemons are software processes that monitor the 92LAN interface for requests and then service those requests. If any 92LAN diagnostic tests fail, these daemons do not start and the message "lanload: lan diagnostics indicate failure" displays. When the daemons start during the power-up sequence, the following power-up messages display:

```
starting daemons
ftpd daemon started
rshd daemon started
```

After the daemon messages, the terminal displays the system Diagnostics menu.

Error Codes

The system Diagnostics menu displays the 92LAN status as either PASS or FAIL followed by a four-digit error code. The 92LAN disables after any power-up diagnostic failure.

Even though the Diagnostics menu shows a PASS condition, some conditions may still prevent you from communicating via the 92LAN. For more information on these conditions, refer to the section Communications Problem Guide**.**

Table 4–20 explains the Diagnostics menu's four-digit diagnostic error codes for five controller tests. Table 4–21 shows the error codes for four shared-memory tests.

Table 4–20: Power-On LAN Controller Tests

Test Group Name	Diagnostic Error Code
Power-up Timeout	9000
92LAN Kernel	9001
92LANSRAM	9002
92LAN82586	9003
92LAN Bus or DUART	9004
92LAN DRAM	9005

Table 4–21: Shared-Memory Tests

Test Group Name	Diagnostic Error Code
Checksum	9100
Bit Independence (16 bit)	9101
Memory Test (byte)	9102
Memory Test (long word)	9103

92LAN Boot-Up Status

After the system power-up, the 92LAN Overlay of the system's Communication menu provides additional diagnostic information.

The LAN Boot field in the overlay-status section indicates the current 92LAN status. This field displays a message, such as "LAN cable not connected," indicating that the 92LAN is not connected to the network correctly. For more information on these messages, refer to *BOOT Messages* in *Disassembly/Reassembly Procedures* of the *92LAN User Installation Manual.*

The LAN Diag Word field in the overlay-status section indicates the pass/failure result of each ROM-based diagnostic test run by the 92LAN controller. The 92LAN controller transfers the contents of the diagnostic word to the system controller via the shared-RAM interface.

If a test fails, the diagnostic word field displays a hexadecimal word (consisting of 8 hexadecimal characters, 4 binary bits/character). The diagnostic word does not display any leading zeros. Bit 31 is the high-order bit and bit 0 is the low-order bit. Each bit corresponds to a specific test. If a test fails, the associated bit is set to 1.

For example, if the UART Internal Test (bit 7) fails, the diagnostic word shows a value of hexadecimal 80. If the LAN cable is not connected to the back-panel connector, causing the LAN External loopback test (bit 19) to fail, the diagnostic word contains 80000 Hexadecimal.

***NOTE**. A LAN External loopback test failure does not appear as a failure in the system Diagnostics menu.*

If all tests pass, the diagnostic word value is 0. If tests were not executed, (for example, if connector pins 1+2 or 2+3 of J155 are shorted) or all tests failed, the diagnostic word is ffffffff. (Refer to the section *Communication Problem Guide* for more information about connector J155.) Table 4–22 shows the LAN diagnostic word format.

Table 4–22: LAN Diagnostic Word

Byte 4	Byte 3	Byte 2	Byte 1
Bits 31 – 24	Bits 23 – 16	Bits 15 – 8	Bits 7 – 0
XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX

Extended 92LAN Diagnostics

The 92LAN provides additional diagnostics through the Diagnostic Terminal Port (DTP). These functions are not supported as a product feature, but are provided as an additional troubleshooting aid.

The Diagnostic Terminal Port has two distinct modes of operation: inquiry mode and ddm mode. Each mode is independent of the other.

The inquiry mode is available only when the 92LAN boots normally and is functional on the network. Inquiry mode allows you to connect a terminal to the DTP and query the 92LAN about its current address settings, list the contents of the 92LAN ARP table, and invoke a Snoopy-mode display of network transactions for the LAN node network.

The DDM mode (Diagnostic Debug Monitor) lets you select and run (or loop) the 92LAN diagnostics from the DTP terminal. This aids in capturing intermittent or temperature-related diagnostic failures.

Inquiry Mode. The inquiry mode is not a supported LAN feature. The following information is provided as supplemental information.

Use the inquiry mode as follows:

1. Connect a terminal to the 92LAN Terminal port (J145) with a DTP cable. Refer to *Cable Construction* to build a cable.
2. Apply power to the 92LAN terminal. Set the terminal communication parameters as shown below. These parameters are the defaults for the 92LAN DTP.

```
9600 BAUD      Full duplex
8 bits/char    No parity
1 stop bit
```

3. Apply power to the DAS mainframe.
4. The 92LAN terminal displays the status of the 92LAN diagnostics as they execute. These diagnostics are run partially or fully several times during a normal mainframe power-up sequence.

   Next, the 92LAN terminal displays several information strings, documenting firmware version numbers and other information.
5. After the power-up messages, the LAN terminal displays the Command? prompt indicating that the 92LAN DTP can accept inputs.
6. Table 4–23 lists the 92LAN DTP commands.

Table 4–23: 92LAN DTP Commands

Command	Description
? (or <CR>)	Displays the user commands list.
ar	Lists current ARP table entries on the DAS. This table is empty at power on. It is appended with the ethernet and protocol (internet) addresses of each network node with which the DAS has communicated since power on.
lb	Changes the 92LAN DTP BAUD rate from the default power-up value of 9600. (The terminal BAUD rate must also be changed.)
na	Lists the 92LAN ethernet address (from ROM, Hex value), 92LAN internet address (from O/S, decimal value), and the 92LAN gateway address (from O/S, decimal value).
sm	Displays the snoopy-mode status and prompts for changes. The Snoopy-mode default state is OFF. All internet addresses (decimal values) display as hexadecimal equivalents in Snoopy-mode displays. Refer to the section *Snoopy Mode for ARP and TCP/IP* for snoopy-mode display formats.

DDM Mode. DDM is not a supported 92LAN feature. The following information is provided only as supplemental information.

Use the DDM mode as follows:

1. Connect a terminal to the 92LAN Terminal port (J145) with a DTP cable. Refer to *Cable Construction* to build a cable.
2. Apply power to the 92LAN terminal. Set the terminal communication parameters as follows. These parameters are the defaults for the 92LAN DTP.

```
9600 BAUD       Full duplex
8 bits/char     No parity
1 stop bit
```

3. On the 92LAN board, short pins 2 and 3 of J155.
4. Place DIP switch #1 on the System Controller board in the down position, and apply power to the DAS mainframe.
5. When prompted by the 92LAN terminal, press the Return key twice. (If you want to change only the 92LAN Terminal port BAUD rate, press it once.)
6. Remove the jumper installed in step 3.
7. The 92LAN Controller now enters the 92LAN Firmware Diagnostics Debug Monitor (DDM) and the 92LAN DTP terminal displays the DDM selection menu.

   This menu allows you to list, select, and run all 92LAN functions and tests, and provides various loop and error-printing options. The displayed prompt line shows your selections.

Cable Construction

The DTP cable connects a terminal (or PC with terminal emulation software) to the 92LAN Diagnostic Terminal Port. The following parts list and Table 4–24 allow you to construct this build-it-yourself cable.

Parts Required:

6 each Female, 0.1 square pin contact, (Tektronix part no. 131-0707-00)

1 each 6-inch wide terminal contact holder, (Tektronix part no. 352-0164-06)

1 each 25-pin female D (DCE) connector, (Tektronix part no. 131-0569-00)

Two feet of 6-conductor ribbon cable

Table 4–24: DTP Cable Wiring

Connector J145	DCE Connector
1	2
2	3
3	4
4	5, 6
5	7
6	20

Mainframe Troubleshooting

Isolation of a problem is limited to the module level; diagnostics only perform checks on individual boards and not the entire system. Items such as probe connections, probe functionality, and card-to-card interactions cannot be tested. If the mainframe passes the diagnostics, but you still suspect a hardware problem, there are other checks you can do to find the problem. This section contains information to troubleshoot mainframe hardware and system software.

Power Supply Check

To determine if the power-supply voltages are within their tolerance, measure the voltages on the power-supply test pads (J890) on the top-front corner of the backplane. The first six test pads are labeled GND, +5 V, +3 V, +15 V, -15 V, and +12 V.

Using a digital multimeter set at 20 V/Div, probe the test pads for the voltages shown in Table 4–25.

Table 4–25: Power-Supply Voltages

Supply	Tolerance
+ 5 V	5.09 V min., 5.21 V max.
+ 3 V	–2.0 V min., –2.2 V max. (+5 V ref.)
+15 V	15 V min., 20 V max.
–15 V	–15 V min., –20 V max.
+12 V	11.4 V min., 12.6 V max.

Power Control Signals

Check the power control signals to troubleshoot the mainframe. These signals travel between the backplane and the power supply. Six test pads for the signals are located below the power-supply test pads on the top-front corner of the backplane. You can check the test pads for active TTL levels with a digital multimeter or an oscilloscope. Table 4–26 shows the name associated with the labels on the test pads and describes the functions of the signals.

Table 4–26: Test-Pad Signal Descriptions

Label	Name	Description
CL~	CURRENT LIMIT	This active-low signal travels from the backplane to the power supply and shuts down the power supply. An instrument module could draw too much current and activate this signal.
TOF	TURNOFF	This active-high signal travels from the power supply to the Controller through the backplane. The signal indicates to the Controller board that the front-panel switch is in the OFF position or that a FAN FAIL has been detected. When the Controller board receives the TOF signal, it accesses the hard disk to shutdown the operating system orderly. The Controller board then sends SD~ to the power supply.
SS	SUPPLY STABLE	This active-high signal travels from the power supply to the Controller board through the backplane. The signal indicates that the +5 V supply is stable.
PF~	POWER FAIL	This active-low signal travels from the power supply to the Controller board through the backplane. If the signal maintains a TTL high for greater than 30 μs, primary power is available. A high-to-low transition indicates that primary power is disabled. When the Controller board receives this signal, it will use NVRAM, instead of the hard disk, to perform an emergency shutdown of the operating system.

Table 4–26: Test-Pad Signal Descriptions (Cont.)

Label	Name	Description
SD~	SHUTDOWN	This active-low signal travels from the Controller through the backplane to the power supply to power down the mainframe after the TURNOFF signal is sent.
ON~	ON/STANDBY	This active-low signal traveling from the backplane to the Power Supply and the Controller board indicates the position of the front-panel switch. When ON, the front-panel switch is pushed in. When in STANDBY mode, the front-panel switch is out.

Refer to *Controller Board* beginning on page 5–5 for more information on the sequence of events for TURNOFF, POWER FAIL, and SHUTDOWN.

DIP Switches on the Controller Board

The Controller board has eight DIP switches; you access the switches through an opening on the back panel of the mainframe. Check these switches if power on is unsuccessful.

Use DIP switches 1 and 2 when loading the system software from floppy disks. You can also use DIP switches 1 and 2 to force the mainframe to loop its level 0 diagnostics; this may be helpful to isolate intermittent power-on errors.

The Communications menu contains RS-232 parameters for the Terminal, Host, and Auxiliary ports (see *DAS System User Manual*). You can override these selected parameters at power-up by using DIP switches 3–8. Refer to Table 4–27 for a summary of the DIP-switch settings. The “restore parameters” setting restores the port’s Communications menu operating parameters at power up, instead of restoring the default operating parameters. You can change the port parameters at any time by making changes in the Communications menu when the mainframe is operating.

Table 4–27: Baud Rate Dip Switches

Switch Use	Setting	Result
Boot Control	1 / 2	
	U / U	normal boot
	D / U	BOOT?> prompt
	U / D	not used
	D / D	loop on level 0 diagnostics
Terminal Port	3 / 4	
	U / U	38.4K baud default
	U / D	2400 baud
	D / U	1200 baud
	D / D	restore parameters
Host Port	5 / 6	
	U / U	9600 baud default
	U / D	2400 baud
	D / U	1200 baud
	D / D	restore parameters
Auxiliary Port	7 / 8	
	U / U	9600 baud default
	U / D	2400 baud
	D / U	1200 baud
	D / D	restore parameters

U = Up (opened) switch; D = Down (closed) switch

RS-232 Ports

Diagnostics do not test the output drivers and physical connectors of the RS-232 ports. However, you can use the following procedure to test the Terminal port if you suspect a problem.

1. Check the baud-rate DIP-switch settings (see Table 4–27) on the mainframe and the terminal (9200T or 9201T). Both devices should be set to the same baud rate, typically 38400 baud.

   a. To check the terminal baud rate, turn the mainframe off and wait for the power-down message. Power on the terminal and press the unlabeled function key (upper-left corner of the keyboard, next to the Notes key).

   b. After receiving an asterisk prompt, type STATUS BAUD. If the reply is not 38400, type BAUD 38400. Store this baud rate in nonvolatile memory by typing NVSAVE; this sets the terminal to this rate at power up.

c. To recheck the baud rate, retype STATUS BAUD.

d. Press the unlabeled function key again, and power ON the DAS mainframe.

2. If the Terminal port still has a problem, power down the mainframe and terminal.

3. Power on the terminal and run the Extended Self Test.

4. Display the Adjustment Procedures menu.

5. Run the RS-232 Interface Test. You need a RS-232 loopback connector for your terminal. (See the *4105 Service Manual* for a 9200T or the *4205 Service Manual* for a 9201T. To obtain these manuals, contact your Tektronix representative.)

6. If the test does not detect any errors, replace the RS-232 cable. For the DAS 9219/9220, you can also replace the Memory board. For DAS 9221, you can replace the Controller board or the internal 9-pin RS-232 cables.

To check the Host and Auxiliary ports, exchange the Memory board with a known good one (DAS 9219/9220 only), or use a Data Communication Analyzer (such as a Tektronix 834) to analyze the data transferred through the port.

Hard and Floppy Disk Drive Power Connector

Figure 4–8 shows the locations of the power connector pins for the hard and floppy disk drives.

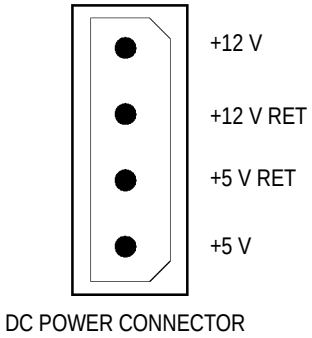


Figure 4–8: Floppy and Hard Disk Drive Power Connector.

Hard Disk Drive Switch and Jumper Positions

The hard disk drive circuit boards have several switches and jumpers that are set at the factory. You should never change these switch and jumper positions. However, if you suspect that the drives are the source of a problem, refer to Figures 4–9 to 4–16 for the correct positions of the switches and jumpers.

Hard disk drives are available in different sizes. DAS 9219/9220 mainframes use the following sizes of ST506 drives: 10 Mbyte, 20 Mbyte, 40 Mbyte, or 80 Mbyte. DAS 9221 mainframes use 100 Mbyte, 127 Mbyte, 170 Mbyte, or 1.2 Gbyte SCSI drives.

CAUTION. *Be aware of the differences between the removable hard disk drives. (The DAS 9221 uses a SCSI drive and DAS 9219/9220 mainframes use a ST506-interface type of drive.) These drives are not interchangeable. If you install the wrong type of drive into your mainframe, you may damage the drive.*

The 10 Mbyte (NEC D5124) and 20 Mbyte (Seagate ST-225) drives are no longer available. Refer to Figures 4–9 and 4–10.

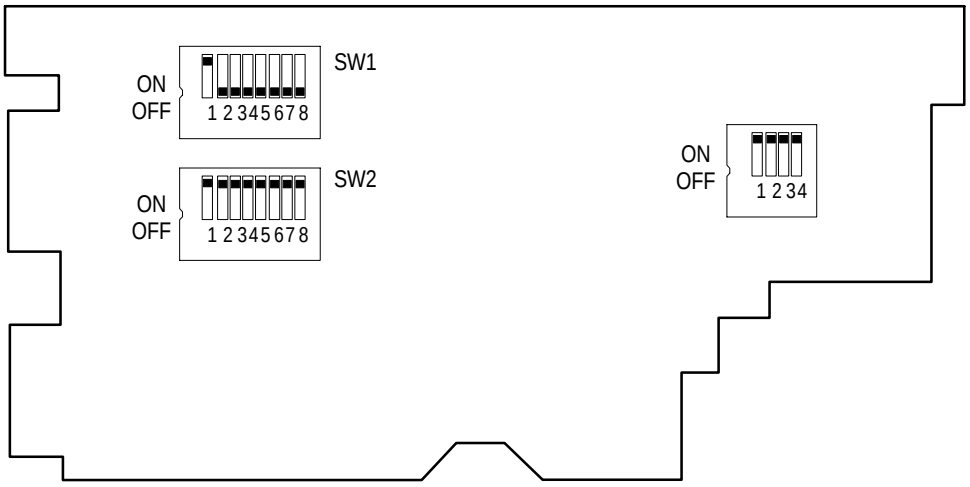


Figure 4–9: Switch Locations on the 10 Mbyte Hard Disk Drive Circuit-Board (Factory Settings Shown)

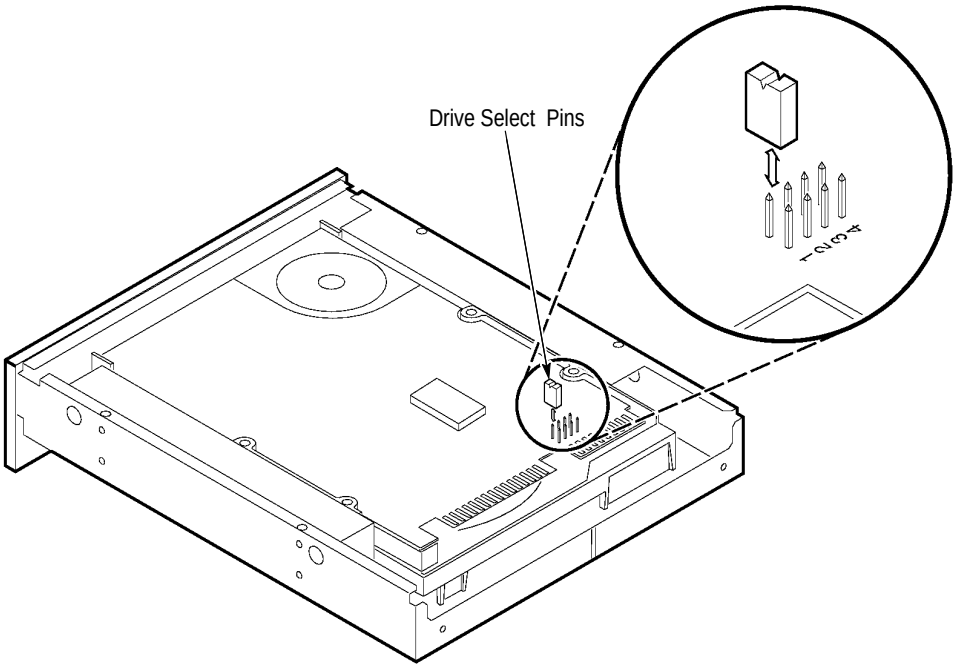


Figure 4–10: Jumper Locations on the 20 Mbyte Fixed Hard Disk Drive (Factory Settings Shown)

The 20 Mbyte removable hard drive (Miniscribe 8425) is no longer available. It is installed into a removable cartridge that installs into a media mount with two thumb screws. This media mount is different than the mount used for other removable drives. The drive-select jumpers are located on the component side of the circuit board, under the label SEL 1. You must remove the aluminum cover to access the jumpers. Refer to Figure 4–11.

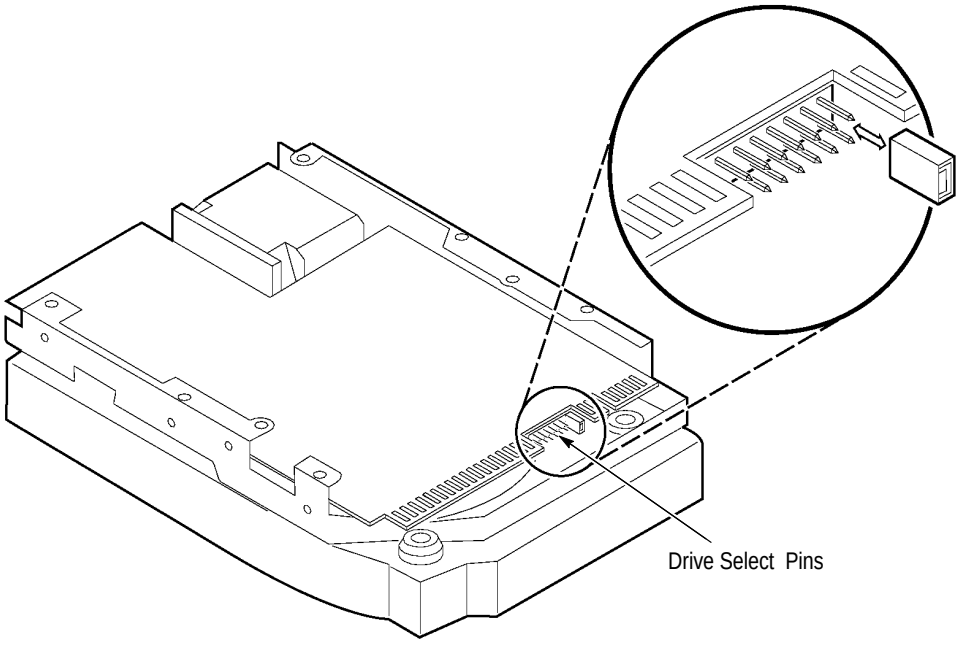


Figure 4–11: Jumper Locations on the 20 Mbyte Removable Hard Disk Drive (Factory Settings Shown)

The 40 Mbyte hard disk drive (Seagate ST-253 Wren II) was 5.25 inch (refer to Figure 4–12). The circuit board for the 5.25-inch drive attaches to the end of the mounting frame at a right angle to the main circuit board. The 40 Mbyte drive (Seagate ST-151) is now a 3.5-inch drive (refer to Figure 4–13). It has a green light on the front panel. When installed in the mainframe, its power connector is at the bottom.

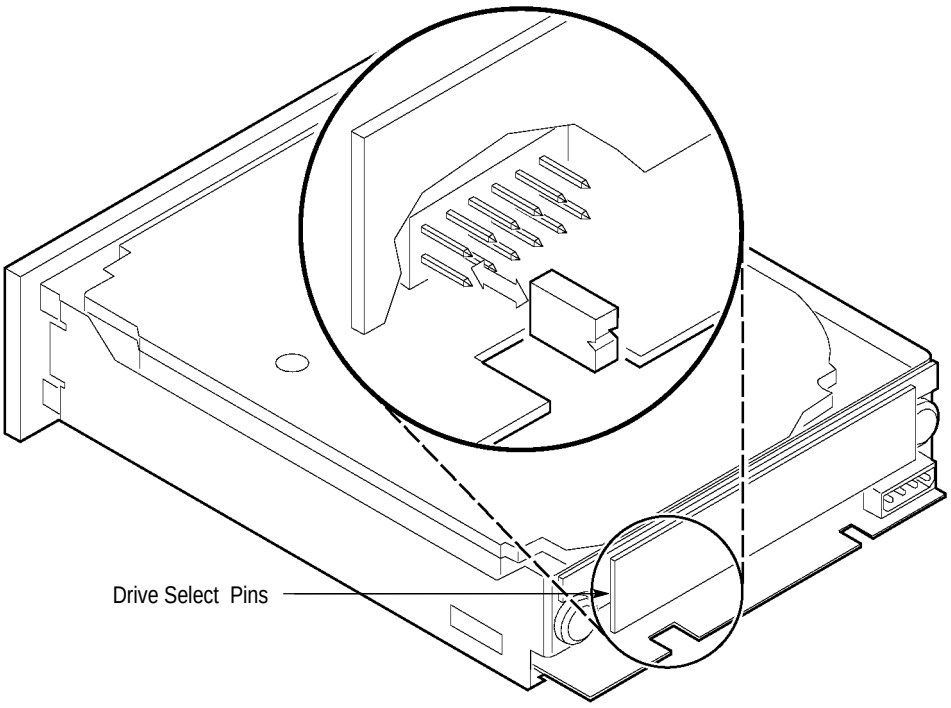


Figure 4–12: Jumper Locations on the 5.25-Inch 40 Mbyte Hard Disk Drive (Factory Settings Shown)

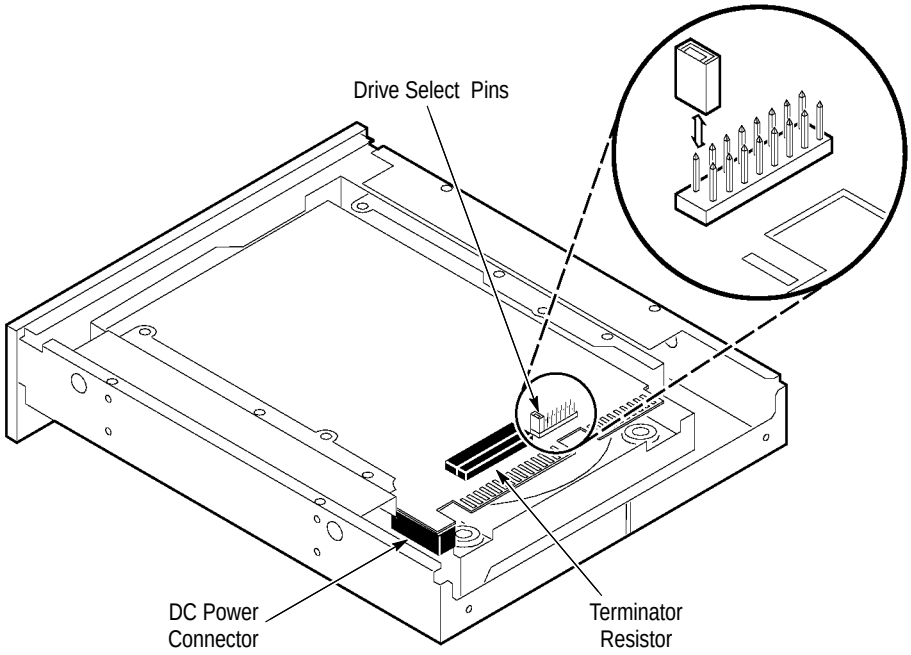


Figure 4–13: Jumper Locations on the 3.5-Inch 40 Mbyte Hard Disk Drive (Factory Settings Shown)

An 80 Mbyte hard disk drive (Seagate ST-1100 CDC Swift) is available for the DAS 9219/9220 mainframes as an option. This drive is 3.5 inches high, but it is mounted into a 5.25-inch bracket so it fits into the 5.25-inch media frame. When installed in the mainframe, this drive's power connector is at the top. The drive-select pins are located on the component side of the circuit board, near pin 1 of the 34-pin connector. The DAS supports only position 1 on the drive-select pins so the drive should have a jumper plug on the two pins closest to the edge-connector side of the board. See Figure 4–14.

The 80 Mbyte removable hard drive uses the same disk drive as the 80 Mbyte fixed hard drive. Therefore, it is a 3.5-inch ST506 drive with the same jumper positions as the 80 Mbyte fixed hard drive (see Figure 4–14). But the removable drive is installed into a removable cartridge, that is installed into a receiver frame, that is mounted into the media frame.

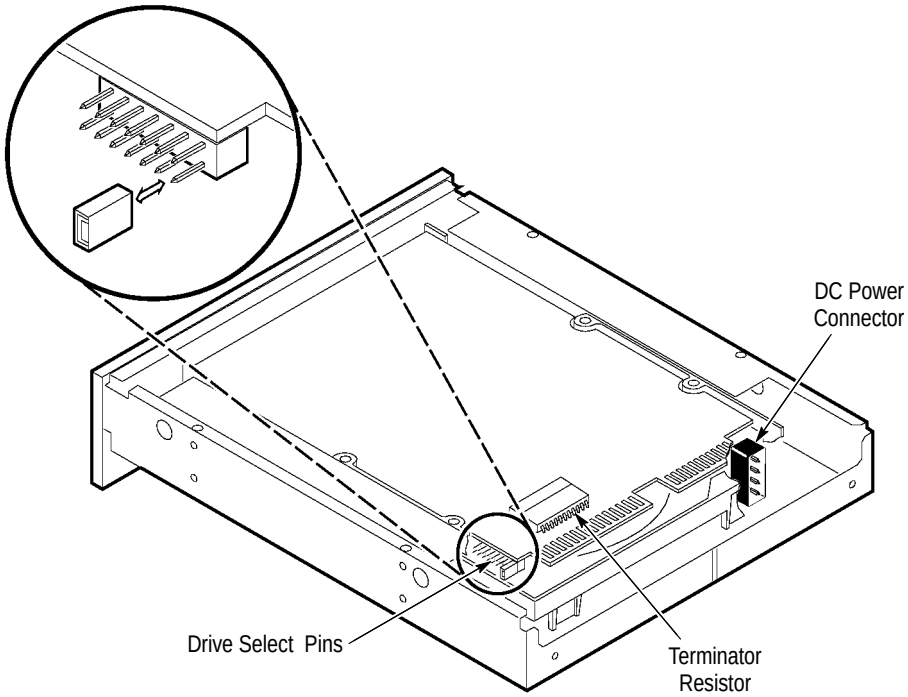


Figure 4–14: Jumper Locations on the 3.5-Inch 80 Mbyte Hard Disk Drive (Factory Settings Shown)

The 100 Mbyte hard disk drive used in the DAS 9221 mainframes is no longer available. The fixed SCSI, 3.5-inch drive is mounted in an adapter to allow installation into the 5.25-inch media frame. See Figure 4–15 for the jumper location.

The 100 Mbyte removable hard drive is no longer available as an option for DAS 9221 mainframes. It is the same SCSI, 3.5-inch drive that is used as the fixed drive. It has a tan front panel with a warning label reminding you to only use the drive in a DAS 9200/SE series mainframe. Otherwise, it looks similar to the 80 Mbyte removable drive. The jumper location is the same as the 100 Mbyte fixed hard disk; see Figure 4–15.

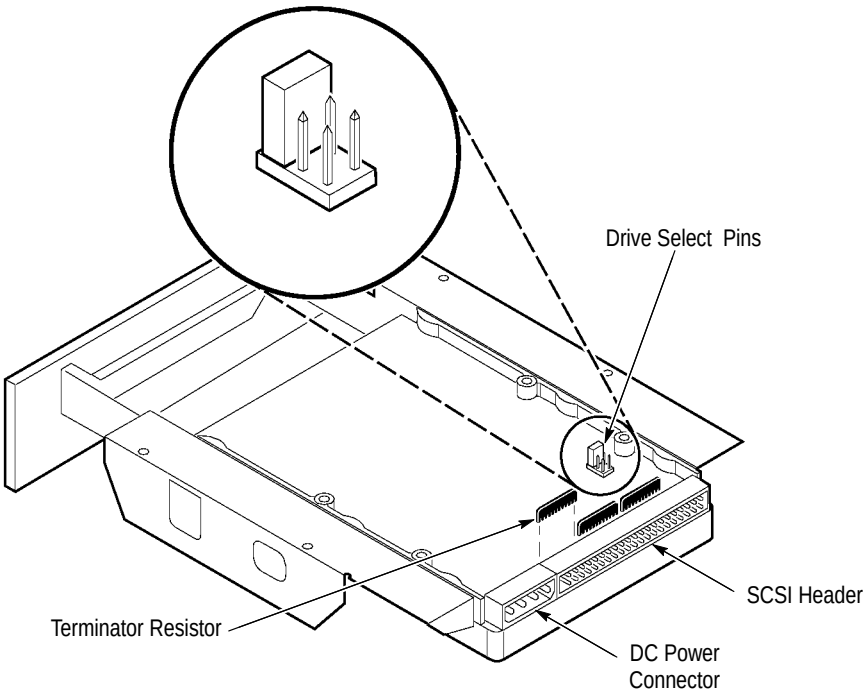


Figure 4–15: Jumper Locations on the 100 Mbyte Hard Disk Drive (Factory Settings Shown)

The 127 Mbyte hard disk drive (Figure 4–16), a fixed SCSI 3.5-inch drive, is mounted in an adapter to allow installation into the 5.25-inch media frame. The drive is shipped with no Drive Select jumpers installed.

The 170 Mbyte hard disk drive (Figure 4–16) looks similar to the 127 Mbyte hard disk drive. Locations of the Drive Select pins, termination resistors, and connections are similar. The drive is shipped with no Drive Select jumpers installed.

The 270 Mbyte hard disk drive (Figure 4–16) looks similar to the 127 Mbyte and the 170 Mbyte hard disk drives. Locations of the Drive Select pins, termination resistors, and connections are similar. The drive is shipped with no Drive Select jumpers installed.

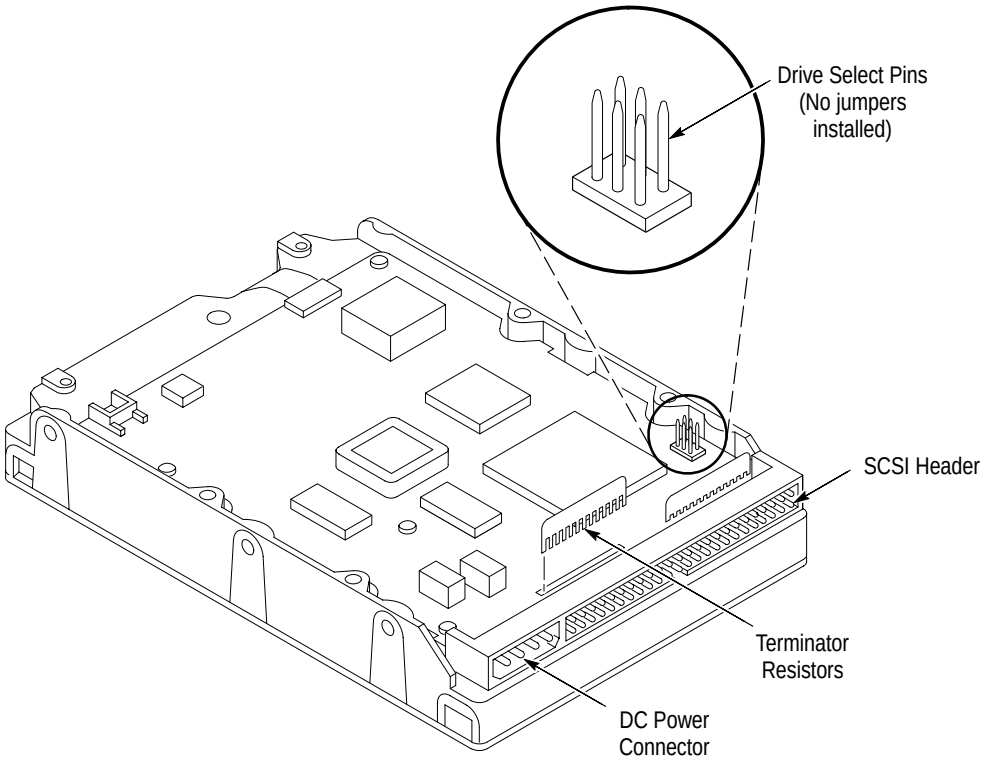


Figure 4–16: Jumper Locations on the 127, 170, and 270 Mbyte Hard Disk Drives (Factory Settings Shown)

The 1.2 Gbyte hard disk drive (Figure 4–17) looks similar to the 127 Mbyte and the 170 Mbyte hard disk drives. Locations of the Drive Select pins and connections are similar. The drive is shipped with the TE jumper installed and no Drive Select jumpers (A0-A2) installed, as shown in Figure 4–17.

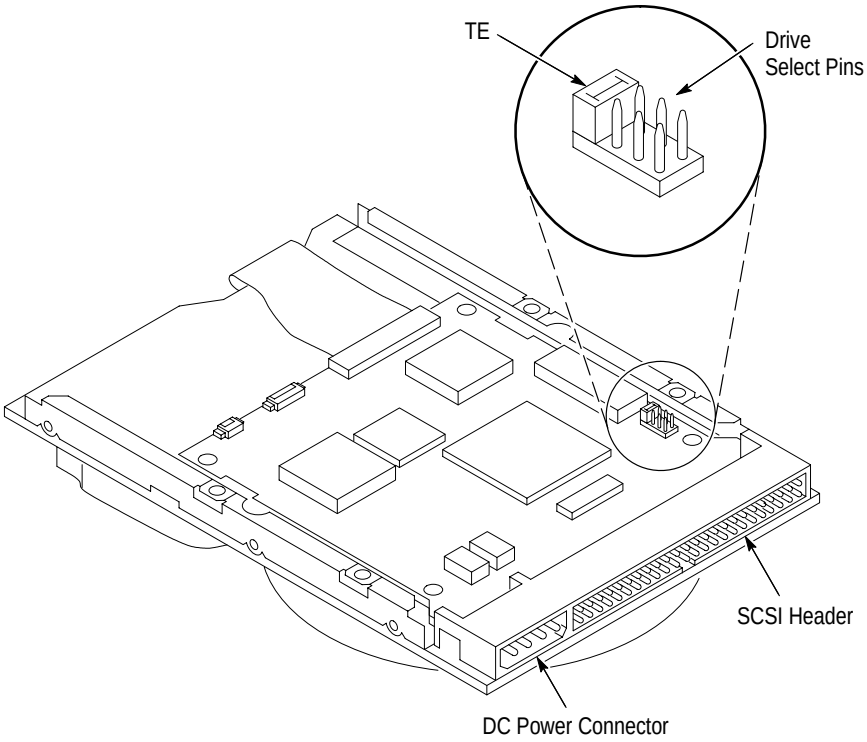


Figure 4–17: Jumper Locations on the 1.2 Gbyte Hard Disk Drive (Factory Settings Shown)

A 127 Mbyte, 170 Mbyte, or 270 Mbyte removable hard drive is available as an option for DAS 9221 mainframes. It is the same SCSI, 3.5-inch drive that is used as the fixed drive. It has a tan front panel with a warning label reminding you to only use the drive in a DAS 9200/SE series mainframe.

Floppy Disk Drive Jumper Positions

The floppy disk drive circuit boards have several jumpers that are set at the factory. You should never change these jumper positions. However, if you suspect that the drives are the source of a problem or if you replace a faulty floppy disk drive, refer to Figures 4–18 to 4–27 for the correct positions of the jumpers.

There are several types of 5.25-inch floppy disk drives: 400 Kbyte drives and 1.2 Mbyte drives. To determine which floppy disk drive is installed, check the model number on the rear of the drive. The 400 Kbyte drive's model number is

either JU455 (Panasonic) or SA455 (Shugart); the 1.2 Mbyte drive's model number is JU475.

Newer DAS mainframes are shipped with a 3.5-inch floppy disk drive. Figure 4–18 shows the jumper settings for the 3.5-inch 1.44 Mbyte Teac Model FD-235HF-3201 floppy disk drive.

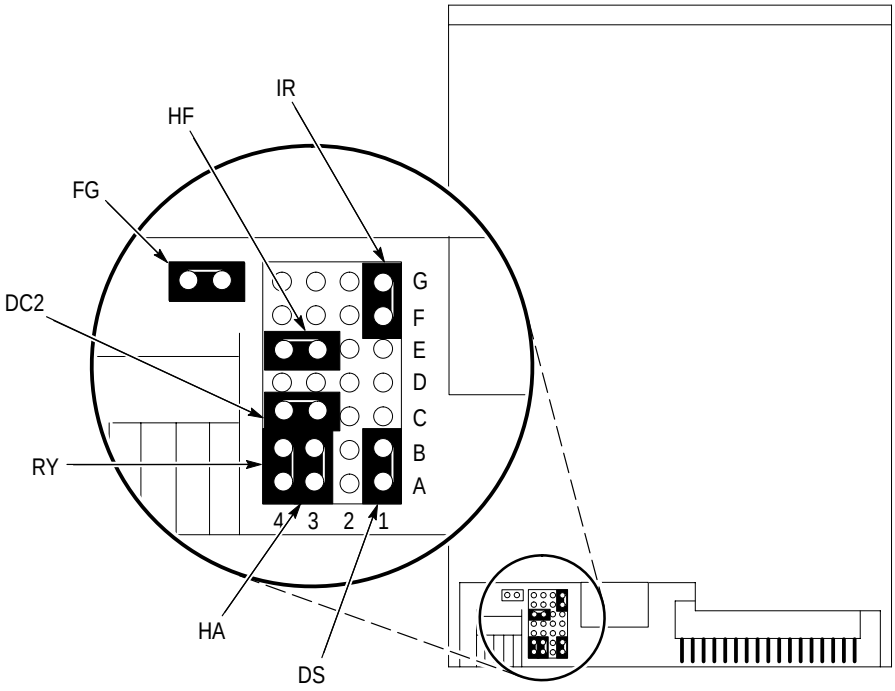


Figure 4–18: Jumper Locations on the 3.5-inch 1.44 Mbyte Teac Model FD-235HF-2301 Floppy Disk Drive (Factory Settings Shown)

Figure 4–19 shows the jumper settings for the 3.5-inch 1.44 Mbyte Teac Model FD-235HF-6529 floppy disk drive.

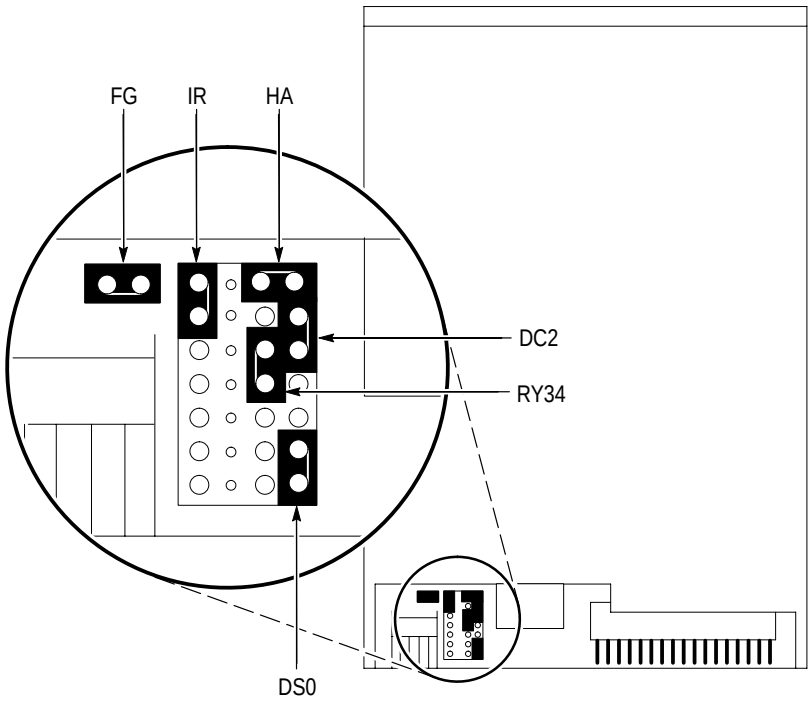


Figure 4–19: Jumper Locations on the 3.5-inch 1.44 Mbyte Teac Model FD-235HF-6529 Floppy Disk Drive (Factory Settings Shown)

Figure 4–20 shows the jumper settings for the 3.5-inch 1.44 Mbyte Teac Model FD-235HF-7529 floppy disk drive.

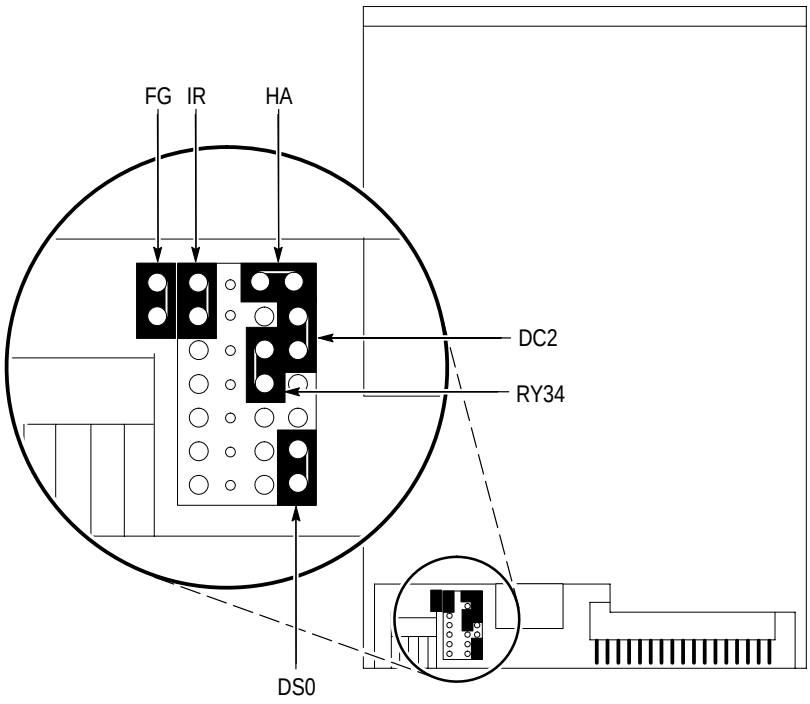


Figure 4–20: Jumper Locations on the 3.5-inch 1.44 Mbyte Teac Model FD-235HF-7529 Floppy Disk Drive (Factory Settings Shown)

Figure 4–21 shows the jumper locations for the JU455-5 400 Kbyte floppy disk drive.

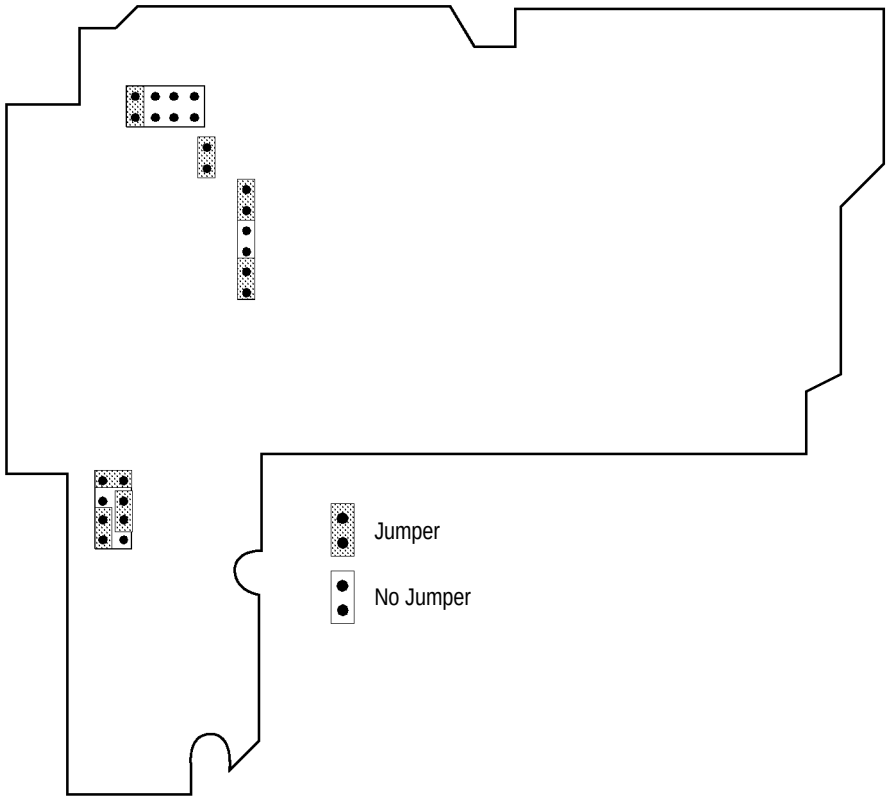


Figure 4–21: Jumper Locations on the Model JU455-5 400 Kbyte Floppy Disk Drive (Factory Settings Shown)

Figure 4–22 shows the jumper locations for the JU455-7 400 Kbyte floppy disk drive.

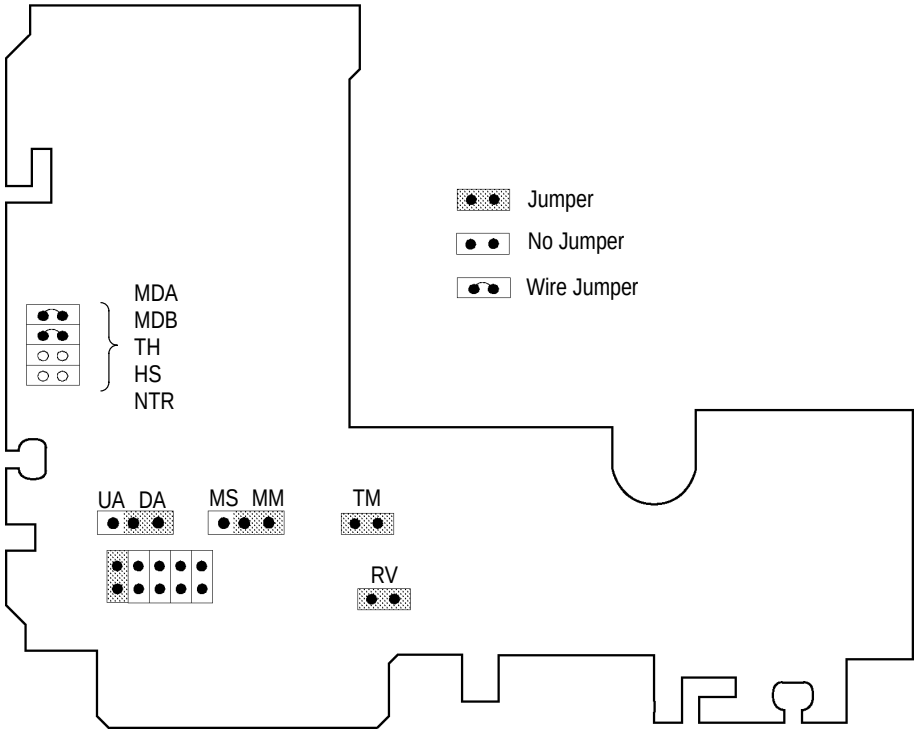


Figure 4–22: Jumper Locations on the Model JU455-7 400 Kbyte Floppy Disk Drive (Factory Settings Shown)

Figure 4–23 shows the jumper locations for the Model SA455 400 Kbyte floppy disk drive.

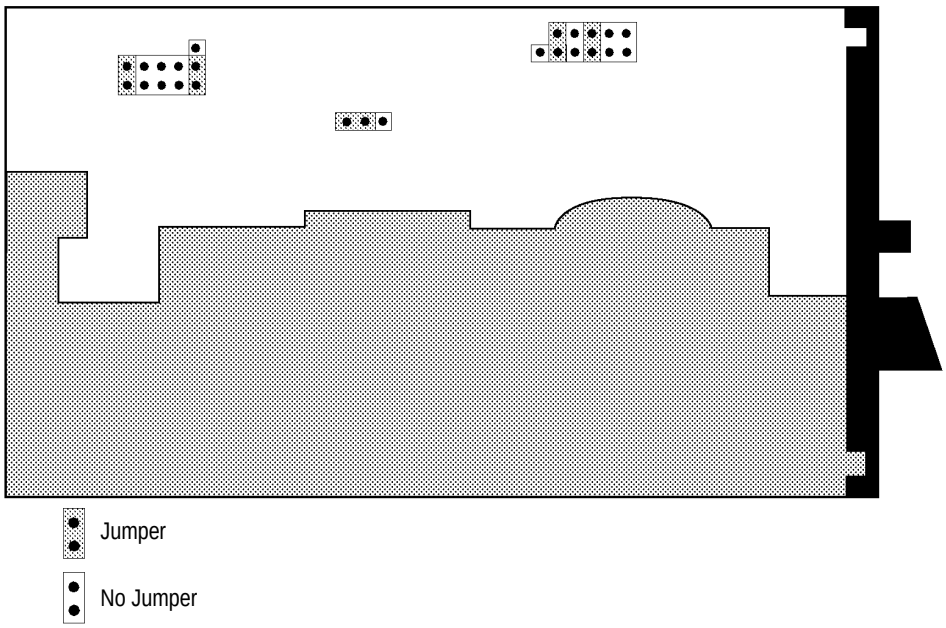


Figure 4–23: Jumper Locations on the Model SA455 400 Kbyte Floppy Disk Drive (Factory Settings Shown)

Early versions of the DAS 9221 mainframe had 1.2 Mbyte 5.25-inch floppy disk drives. The following illustrations show these floppy disk drives.

Figure 4–24 shows the factory settings of the jumpers for the Model JU475–2 1.2 Mbyte floppy disk drive. The Controller board has two jumpers (J6710 and J9700) for future options.

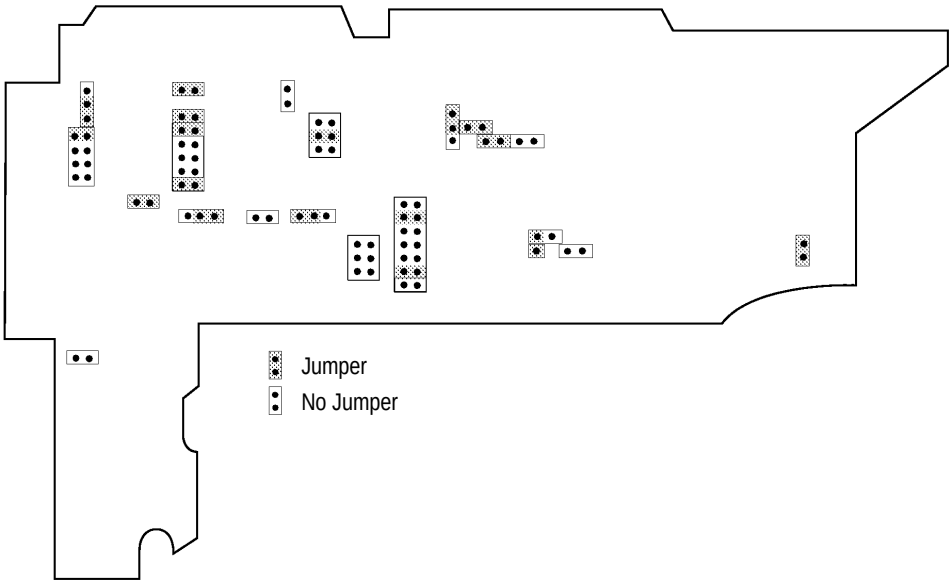


Figure 4–24: Jumper Locations on the Model JU475-2 1.2 Mbyte Floppy Disk Drive (Factory Settings Shown)

Figure 4–25 shows the jumper locations for the Model JU475–3 1.2 Mbyte floppy disk drive.

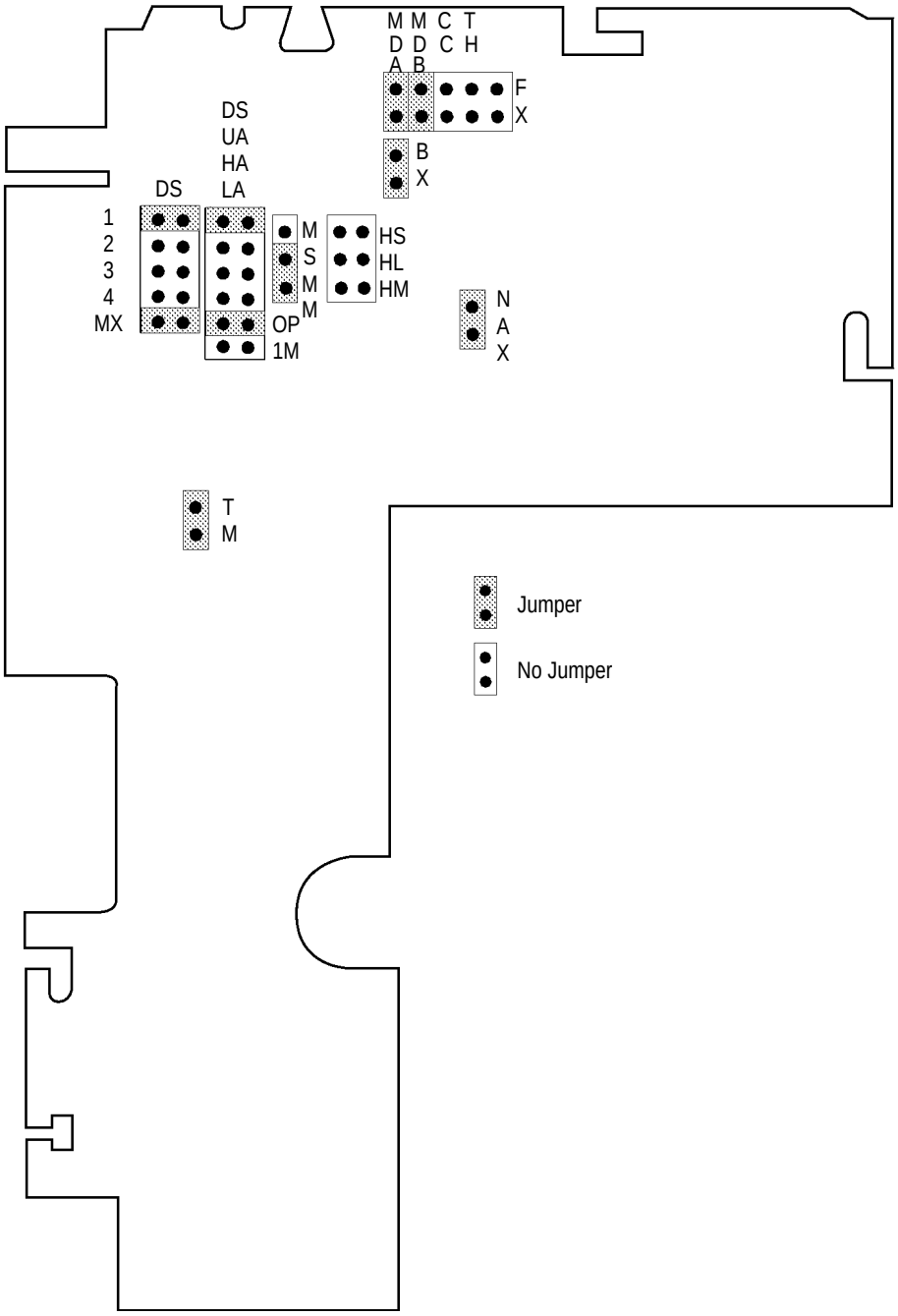


Figure 4–25: Jumper Locations on the Model JU475-3 1.2 Mbyte Floppy Disk Drive (Factory Settings Shown)

Figure 4–26 shows the jumper locations for the Model JU475-4 1.2 Mbyte floppy disk drive.

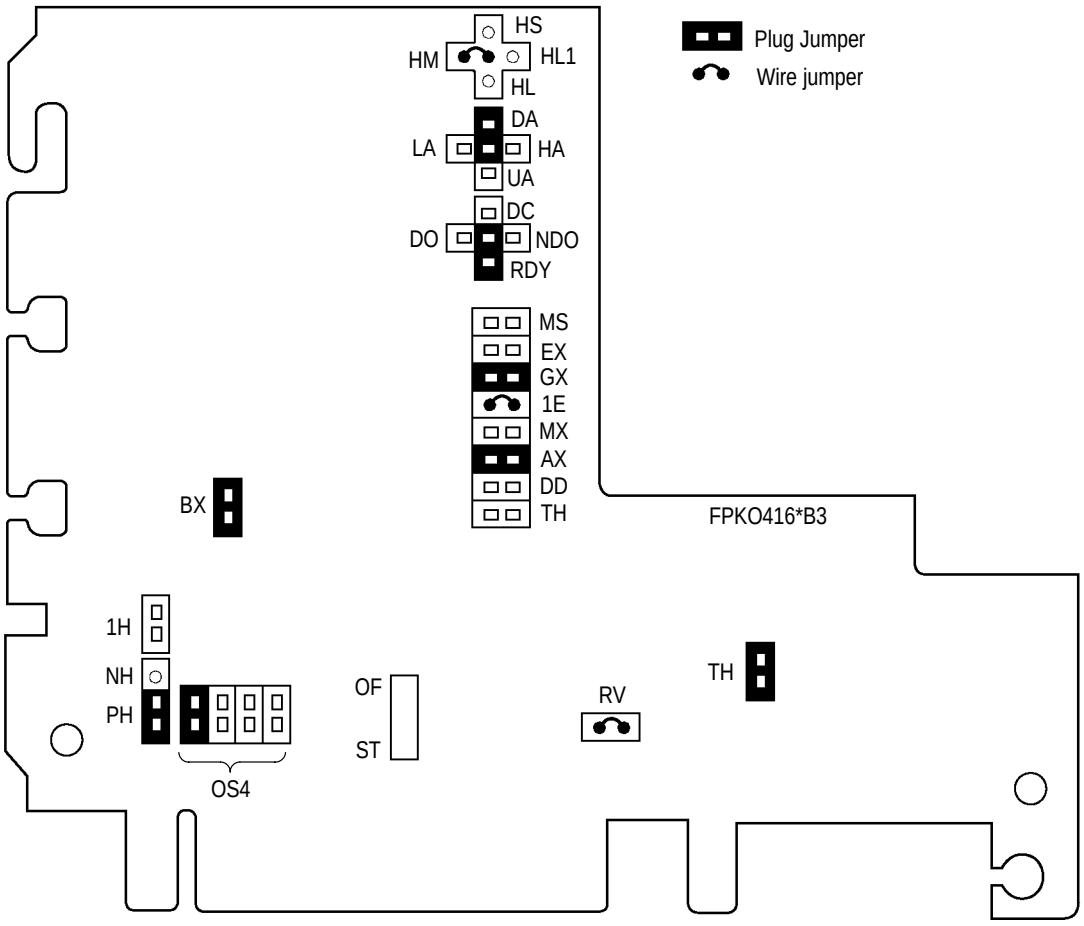


Figure 4–26: Jumper Locations on the Model JU475-4 1.2 Mbyte Floppy Disk Drive (Factory Settings Shown)

Figure 4–27 shows the jumper locations for the Model JU475-5 1.2 Mbyte floppy disk drive.

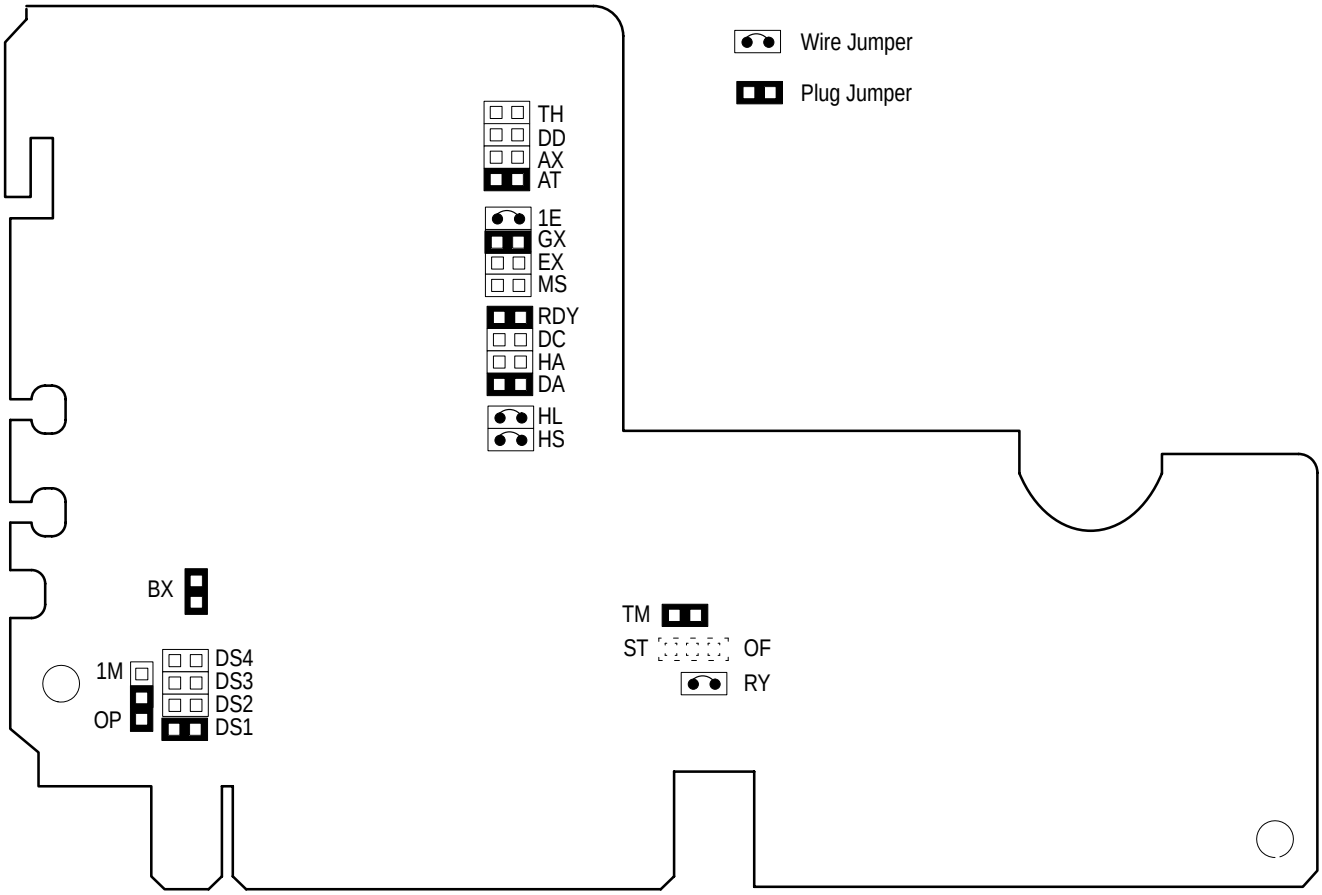


Figure 4–27: Jumper Locations on the Model JU475-5 1.2 Mbyte Floppy Disk Drive (Factory Settings Shown)

Floppy Disk Drive Strapping on the Controller Board

For DAS 9219/9220 mainframes with a 400 Kbyte floppy disk drive installed, two zero-ohm resistors (W381 and W575) must be in place on the Controller board. If the DAS 9219/9220 has a 1.2 Mbyte floppy disk drive, these resistors must be removed. Refer to Figure 4–22 for the location of these resistors.

***NOTE**. W575 is not labeled on the Controller board.*

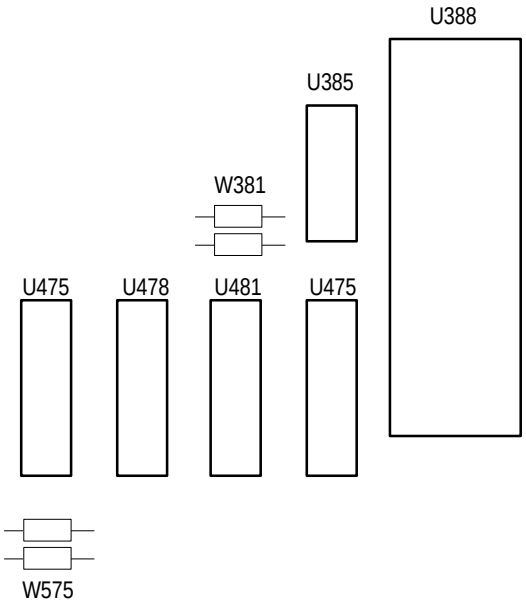


Figure 4–28: Location of 0 Ω Resistors W381 and W575 on the Controller Board

Early versions of the DAS 9221 mainframe had a 5.25-inch 1.2 Mbyte floppy disk drive. Newer versions have a 3.5-inch 1.44 Mbyte floppy disk drive. Jumper J8710 selects either the 5.25-inch floppy disk drive (pins 1 and 2 jumpered) or the 3.5-inch floppy disk drive (pins 2 and 3 jumpered). Jumper J9700 selects the density and only has pins 2 and 3 installed (pin 1 is missing). Refer to Figure 4–29 for the settings of these jumpers.

Other Controller Board Jumpers

In addition to the hard and floppy disk drive jumpers, the Controller board has other jumpers that configure the Controller board for certain operations. The position of J8700 (shown in Figure 4–29), depends on the configuration and power requirements of the mainframe (refer to *Mainframe Power Requirements* on page 1–8).

J1200 (not shown) is located on the rear of the Controller board near the Backplane board. J1200 configures the Controller board for either the TLA 510 and 520 Logic Analyzer or for the DAS. J1200 is installed for TLA 510 and 520 operation and removed for DAS operation.

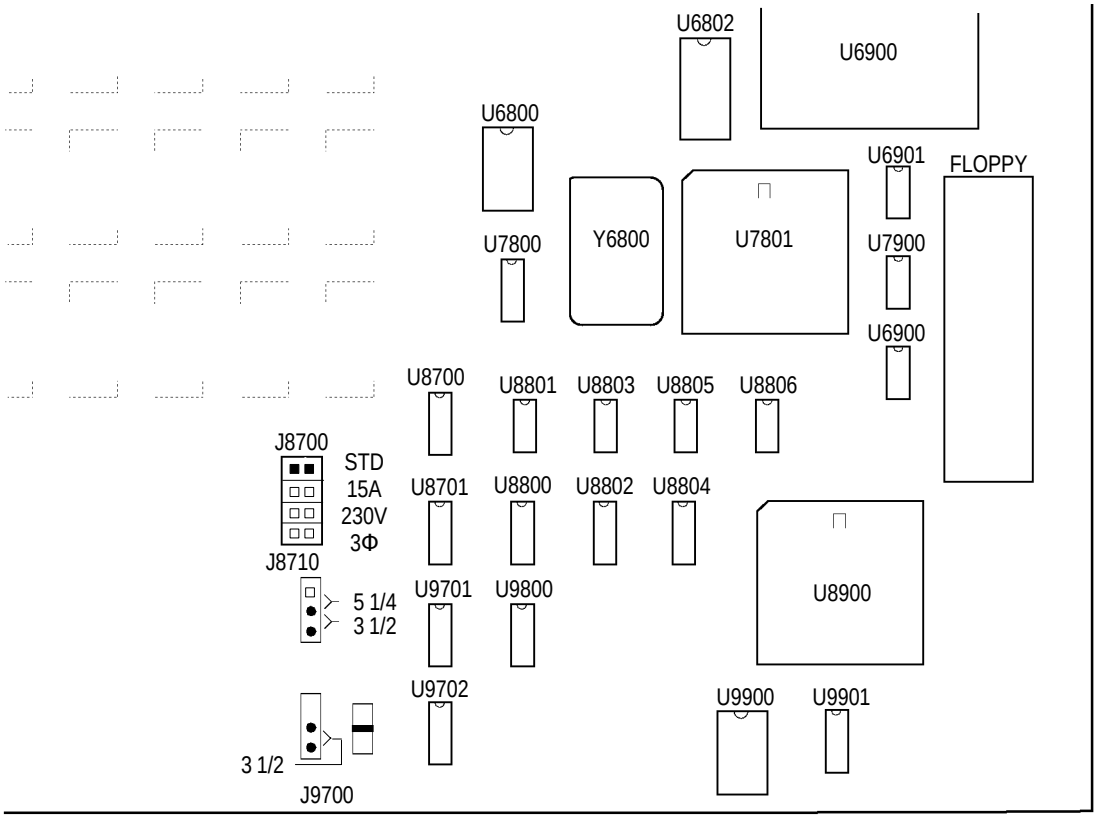


Figure 4–29: Location of Jumpers J8700, J8710, and J9700 on the Controller Board

Loading System Software

System software is loaded onto the mainframe's hard disk prior to shipment. The system software is available in the following versions:

- DASXP System Software. This software supports stand-alone DAS/XP systems with a local X terminal. This system software is also known as 9202T System Software.
- DASNT System Software. This software supports DAS/NT systems with a networked X user interface. This system software is also known as 92XTERM System Software.
- 9201T System Software. This software supported DAS systems with 9200T or 9202T RS-232 terminals.

The type of system software depends on your DAS system. However, in all cases, you need to load the system software from the supplied floppy disks only when the following conditions occur:

- You upgrade the software version of your mainframe.
- A major system-software failure damages one or more system files.
- You replace the hard disk drive.

You can load the system software onto the hard disk drive using a series of steps in this section. These steps differ from those used to copy floppy disks and load application software.

System Software consists of the following floppy disks:

- The SYSTEM UTILITIES (FORMAT, MAKE) disk. This disk contains the Hard Disk Format utility and the file system Make utility. Use the Hard Disk Format utility to format the hard disk drive or modify the swap partition size, and use the file system Make utility to create a new file system after formatting a hard disk drive. The Make utility also includes the file-system check program to check or repair the DAS file system.
- The SYSTEM UTILITIES (INSTALL) disk. This disk contains the Install Utility. Use the Install utility to install and verify the DAS Base System Software, the optional system software, and the application software. You can also use the Install utility to remove the optional system software and application software. The file-system Verify function is an option to the Install utility.
- Base System Software (volume 1 through volume n). These disks contain the essential software for the DAS. You must install all of the files from these floppy disks.

- Optional System Software. These disks contain portions of the system software for specific modules, so it is not required for all DAS systems.
- Applications Software. These disks contain special purpose software that may not be available with the Base System Software or the optional system software disks.

Hard Disk Format Utility

You must reformat your hard disk when the following occurs:

- You replace the hard disk drive with an unformatted hard disk drive.
- A serious system failure corrupts the hard disk format.
- The system cannot read block 0 of the hard disk drive.

You can also use this utility to change the size of the swap partition space; this does not require reformatting the hard disk, but requires remaking the file system using the Make utility.



CAUTION. *Reformatting the hard disk or running the file system Make utility destroys all files on the hard disk. If possible, use one of the methods described below to save user files from the hard disk.*

Formatting prepares the hard disk for data storage; it destroys all previously stored data. Use one of the following methods to save user files from the hard disk:

- Copy the files to floppy disks using the Backup/Restore utility supplied in the Disk Services menu (Release 2, version 1.XX for DAS 9219/9220 mainframes and Release 3, version 1.00 for DAS 9221 mainframes); for more information, refer to the *DAS System User Manual*.
- Transfer the files to a host computer using a 92LANSE or 92LAN (ethernet) Module.
- Transfer the files to a host computer using a 92C02 GPIB interface with the DAS Programmatic Command Language (PCL); for more information, refer to the *DAS Programmatic Command Language User Manual.*
- Transfer the files to a host computer using Kermit (an RS-232 file transfer protocol); for more information on Kermit, refer to the *DAS User Manual*.

The DAS series mainframe you have determines which hard disk format utility you will use. If your mainframe is a DAS 9221 mainframe, you must use the *SCSI Hard Disk Format Utility.* If you have a DAS 9219/9220 mainframe, you must use the *ST506 Hard Disk Format Utility.* The DAS 9221 mainframes have a label affixed to the front of the mainframe next to the power switch.

Use the following steps to load either the hard disk format utility:

1. Power down the mainframe. Face the rear of the mainframe and locate the DIP switches mounted on the Controller board (accessible through an opening on the back panel).
2. Place DIP switch 1 (the leftmost DIP switch) in the closed (down) position; this causes the DAS to bypass the normal system software when powered on. Place DIP switch 2 in the open (up) position. Leave all other DIP switches in their original positions.
3. Power up the terminal and wait for the flashing cursor to appear. Power up the mainframe and wait for the prompt BOOT?>, then insert the System Utilities disk labeled FORMAT, MAKE.
4. Type f:/format and press the Return key.

The following paragraphs discuss the menus and submenus for both Hard Disk Format utilities.

DAS 9221 SCSI Hard Disk Format Utility Menus

The main menu displays general information about the hard disk and how it is partitioned. If the hard disk has not been formatted, the main menu indicates that the hard disk has no valid partition information. Figure 4–30 shows an example of the main menu for the SCSI Hard Disk Format Utility.

Select the submenu or information you want to enter. You have four choices: enter the Format Setup Menu (for formatting the hard disk), enter the Change Swap Size Menu (for changing the swap partition space size), Show Bad Block Lists, or Exit the menu. To make a selection, enter the letter preceding the selection description. Pressing the Return key selects the default action (shown in the square brackets).

```
MAIN MENU - SCSI HARD DISK FORMATTER

Disk Description          :          /xxx/xxxx
    Capacity              :          416575 (512 byte logical block size)
    Compatibility         :          SCSI-2
    Manufacture ID        :          xxxxxxxxxxx
    Product ID            :          xxxxxxxxxxxx
    Revision NO           :          xxxx

Disk Partition List:

NUMBER        NAME       PURPOSE       LOCATION      BLOCKS     (KBYTES)
x             /xxx/xxx   ROOT          xxxxx         xxxxx      (xxxxxxxxxxxx)
x             /xxx/xxx   SWAP          xxxxx         xxxxx      (xxxxxxxxxxxx)
x             /xxx/xxx   MAP           xxxxx         xxxxx      (xxxxxxxxxxxx)
x             /xxx/xxx   ALL           xxxxx         xxxxx      (xxxxxxxxxxxx)

Selections Available:
    a. Format Setup Menu
    b. Change Swap Size Menu
    c. Show Bad Block Lists
    d. Exit

    Enter choice [default = d]
```

Figure 4–30: SCSI Hard Disk Format Utility Main Menu

Format Setup Menu. Use this menu to format your hard disk and specify the swap-space size.

```
FORMAT SETUP MENU

Current Active Options:

      Defects-Manufacturers and Grown (Recommended)

   Swap Size - 6 Meg (Recommended)

Selections Available:

   a. Initiate Format
   b. Use "Recommended" Settings
   c. Defects-Manufacturers and Grown (Recommended)
   d. Defects Manufactures Only
   e. Swap Size - 6 Meg (Recommended)
   f. Swap Size - 8 Meg
   g. Go to Main Menu

Enter choice [default = g]:
```

The selections in the Format Setup menu let you format the hard disk, change the swap size option, or return to the main menu. Option c maps out the manufacturer's bad block list and any bad blocks that may have been detected by earlier format operations. Option d maps out the manufacturer's bad block list only. To make a selection, enter the letter preceding the selection description. If you only press the Return key, the default action inside the square brackets will be selected.

Selecting Initiate Format, initiates the SCSI hard disk's internal disk format command. The format operation uses the current active swap size. This option displays the following warning message and prompt.

```
!!!WARNING:  About to format hard disk. This will destroy
             any data currently stored on the disk!!!!!!!

Swap size - 6 Meg (Recommended)

Are you sure you want to continue (y/n) [default = n]...
```



CAUTION. *Reformatting the hard disk or running the file system Make utility destroys all files on the hard disk. Before running one of these utilities, use one of the methods described earlier in this section to save the user files from the hard disk.*

If you want to continue with the format, press y. If you do not want to format your hard disk, press n or press the Return key (default is n – do not continue).

The bad block handling is done automatically by the SCSI formatting process. After successfully formatting the hard disk, the utility writes the partitioning information to the hard disk.

After formatting the hard disk, the program verifies that all blocks on the disk can be read. During the verification process, the program prints a series of "." and "+" characters showing the progress of the disk verification. If any errors are found, the program stops and prints the error; you should replace the hard disk.

Select options b or c in the Format Setup menu to change the swap-space size option accordingly; for more information on changing the swap space size, refer to *Change Swap Size Menu.*

Change Swap Size Menu. Use the Change Swap Size menu to change the swap space size of a previously formatted hard disk. You can also change the swap space size option. This option is used the next time you request the swap space size via the Make Change selection in this menu, or when you use the Initiate Format option in the Format Setup menu.

NOTE. *Changing the size of the swap partition space on your hard disk does not require reformatting the hard disk (unless the disk has never been formatted) but does require you to rebuild the file system using the Make utility. Running the Make utility destroys the data saved on the disk. Save all user files using one of the methods described earlier in this section.*

Swap space is the area reserved on the hard disk for temporarily storing program information during DAS operation. The swap space is only used when there is not enough memory available on the DAS system. The swap partition space is normally used when the following conditions occur:

- There are more than three types of modules in a DAS system
- The DAS system is using very large symbol table files

In any of these cases, you may need a swap partition space larger than the default.

When the DAS runs out of swap partition space, it cannot operate normally and displays an error message. If this happens, you should use the Change Swap Size option to increase the size of the swap partition. However, increasing the size of the swap partition also decreases the amount of hard disk space available for storing other files, such as reference memories, setups, and autorun definitions.

```
CHANGE SWAP SIZE MENU

Current Active Options:

   Swap Size - 6 Meg (Recommended)

Selections Available:

   a. Make Change
   b. Swap Size - 6 Meg (Recommended)
   c. Swap Size - 8 Meg
   d. Go to Main Menu

Enter choice [default = d]:
```

The four selections in the Change Swap Size menu let you change the swap size for the hard disk, change the swap size option to 6 Mbyte, change the swap size option to 8 Mbyte, or return to the main menu. To make a selection, enter the letter preceding the selection description. Pressing Return selects the default action (inside the square brackets).

If you select options b or c, the swap space size option changes accordingly. Selecting these options does not change the hard disk, but it is used when you select Make Change in this menu or Initiate Format in the Format Setup menu.

If you select option a, the SCSI hard disk's swap space size changes. The utility uses the current swap size option and displays the following warning message:

```
!!!WARNING:  About to change swap space size for hard disk.
             This will destroy any data currently stored on
             the disk!!!!!!!

   Swap size - 6 Meg (Recommended)

Are you sure you want to continue (y/n) [default = n]...
```



CAUTION. *Reformatting the hard disk or running the file system Make utility destroys all files on the hard disk. Use one of the methods described earlier in this section to save files from the hard disk.*

To continue, press y. If you do not want to change the swap space size of your hard disk, press n or press the Return key (default is n – do not continue).

If you try to change the swap space size of an unformatted hard disk, the utility displays an error message and cancels the change request.

If the hard disk has never been formatted, you must format it before changing the swap space size. Formatting or reformatting the hard disk creates a swap partition. The default size of the swap partition is 6 Mbyte; you can change it to 8 Mbyte.

After changing the swap space size, you should return to the BOOT?> prompt by leaving the SCSI Hard Disk Format Utility (Select the Exit option in the Main Menu). You must then run the Make Utility to build the file system and the Install Utility to reload the system software. If you do not run these two utilities, the DAS will not function properly. Both of these utilities are described later in this section.

Bad Block List Display. The SCSI Hard Disk Format Utility lets you view your hard disk's bad block list (a bad block is an area on the hard disk that contains unusable bytes).

The Bad Block List display shows all known Manufacturer's defects and Grown defects (defects developed on the hard disk after it was shipped from the factory). The lists the bad blocks by head, cylinder, and sector; it does not list the partition or file system block with the defects. It is not necessary (nor possible) to add blocks to these lists.

```
BAD BLOCK LIST DISPLAY

   LIST NAME (defect count) = head:cyl:sector,...

   Manufacturer Defects (3) = X:X:X, X:X:X, X:X:X

   Grown Defects (0) = NONE

   Press any key to return to the Main Menu:
```

If the system software detects bad blocks while the DAS is running, it automatically adds the blocks to the bad block list by the SCSI hard disk drive.

DAS 9219/9220 ST506 Hard Disk Format Utility Menus

After the DAS loads the Hard Disk Format utility, it displays the Hard Disk Drive Selection menu. This is the main menu for the Hard Disk Format utility.

```
Hard Disk Drive Selection Menu

  a)  Seagate ST-151 40-MB Drive (default)
  b)  Seagate ST-1100 Swift 80-MB Drive
  c)  Seagate ST-225 20-MB Drive
  d)  Seagate ST-253 WREN II 40-MB Drive
  e)  Miniscribe 8425 20-MB Drive (removable media)
  f)  NEC D5124 10-MB Drive
  g)  Set Disk Characteristics
  h)  Exit

  Enter choice [a]:
```

The 10, 20, 40, and 80 Mbyte hard disk drives look similar from the front of the DAS. To determine the size of the drive, remove the DAS top cover and look at the power connector on the back side of the drive. You can distinguish between the drives as follows:

- 10 Mbyte hard disk drive (NEC D5124): The power-connector pins are parallel with the main circuit board and there is no circuit board mounted on the back of the drive; this is a 5.25-inch drive with no bracket.
- 20 Mbyte hard disk drive (Seagate ST-225): The power-connector pins are at right angles to the main circuit board. This is 5.25-inch drive with no bracket.
- 40 Mbyte hard disk drive (CDC WREN II, CDC/IMPRIMIS 94205-51, or Seagate ST-253): The power-connector pins are parallel with the main circuit board and there is a circuit board mounted on the back of the drive (perpendicular to the main circuit board). This is 5.25-inch drive with no bracket.

- Standard 40 Mbyte drive (ST-151): The power-connector pins are parallel with the main circuit board and located at the bottom of the drive, and there isn't any circuit board mounted on the back; this drive is a 3.5-inch drive mounted in a 5.25 inch bracket.
- 80 Mbyte hard disk drive (Seagate ST-1100 or Swift): The power-connector pins are parallel with the main circuit board and located at the top of the drive; this drive is a 3.5-inch drive mounted in a 5 ¼-inch bracket.

The DAS 9219/9220 also have removable drives that can be distinguished from each other as follows:

- 20 Mbyte removable hard disk drive (Miniscribe 8425): Two thumb screws secure the drive in the DAS mainframe. This drive can also be mounted in the 80 Mbyte removable assembly.
- 80 Mbyte removable hard disk drive (Seagate ST-1100): A keyless latch secures the drive in the DAS mainframe.

Enter the letter that corresponds to your particular drive. (Use the Seagate ST-1100 Swift selection (b) for the 80 Mbyte removable media. Use the Seagate ST-253 WREN II selection (d) for CDC/IMPRIMIS 94205-51, CDC WREN II, and Seagate ST-253 hard disk drives.) Choice *g* allows you to format a hard disk whose parameters differ from the other choices (normally, you will not use this selection). The letter inside the square brackets is the default selection; to select it, press the Return key.

Determining Bad Block Information. Before formatting the hard disk drive, you must determine if the drive has bad blocks. (A bad block is an area on the hard disk that contains unusable bytes.) This prevents the DAS from storing data in blocks that contain bad bytes. Not all hard disks have bad blocks.

To determine the bad blocks for a hard disk drive, check the bad block list attached to the side of the hard disk drive. This list can also be on a sheet of paper in a plastic envelope attached to the side of the media frame. The bad-block information may be in a Cylinder/Head/Byte format or it may have the calculated bad blocks. If you have replaced the drive, use the bad-block list that came with the replacement drive. Store the list in the plastic envelope on the side of the media frame for future use.

To check the bad-byte list (attached to the side of the drive), you must separate the hard disk drive from the media mount that holds it; for disassembly procedures, refer to *Disassembly/Reassembly Procedures*. If there is no bad-byte information recorded, continue with the "Format Hard Disk" selection in *Hard Disk Operations Menu* shown on page 4–79.

You can enter the bad block information in either the Cylinder/Head/Byte format or the bad-block format. If you enter the information in the bad-block format, you must calculate the bad blocks from a formula before entering the information into the system; refer to *Calculating Bad Blocks*. If you enter the bad block information in the Cylinder/Head/Byte format, continue with the "Enter Bad Block Information" selection in *Hard Disk Operations Menu* shown on page 4–79.

Calculating Bad Blocks. If your DAS has a 10 Mbyte or 20 Mbyte hard disk drive, use the following formula to determine bad-block information from the bad-byte information:

Physical Block # = (Cylinder # × 36) + (9 × Head #) + (Sector # of byte)

If your DAS has a 40 Mbyte hard disk drive, use the following formula to determine bad-block information from the bad-byte information:

Physical Block # = (Cylinder # × 45) + (9 × Head #) + (Sector # of byte)

If your DAS has an 80 Mbyte hard disk drive, use the following formula to determine bad-block information from the bad-byte information:

Physical Block # = (Cylinder # × 81) + (9 × Head #) + (Sector # of byte)

In the above formulas, the Physical Block # is the bad block, Cylinder and Head information come from the bad-byte list, and Sector # of the byte is from Table 4–28.

Table 4–28: Hard Disk Byte vs. Sector

Byte #	Sector #
0 – 1132	0
1133 – 1151	0 and 1
1152 – 2237	1
2238 – 2257	1 and 2
2258 – 3342	2
3343 – 3362	2 and 3
3363 – 4442	3
4443 – 4467	3 and 4
4468 – 5552	4
5553 – 5572	4 and 5
5573 – 6657	5
6658 – 6677	5 and 6
6678 – 7762	6
7763 – 7782	6 and 7

Table 4–28: Hard Disk Byte vs. Sector (Cont.)

Byte #	Sector #
7783 – 8867	7
8868 – 8887	7 and 8
8888 – 9992	8
9993 – 10416	not used

For example, if the Cylinder/Head/Byte information describing the bad byte is 123 / 1 / 3 (byte), the formula is as follows:

Block # = (123 × 36) + (9 × 1) + 0
Block # = 4428 + 9 + 0
Block # = 4437 (this is the bad block)

If two sector numbers are listed, the formula is calculated for each sector number. For example, if the Cylinder/Head/Byte information describing the bad byte is 123 / 1 / 3344, the formulas are as follows:

Block # = (123 × 36) + (9 × 1) + 2
Block # = 4428 + (9) + 2
Block # = 4439 (this is the bad block)

Block # = (123 × 36) + (9 × 1) + 3
Block # = 4428 + (9) + 3
Block # = 4440 (this is also a bad block)

Hard Disk Operations Menu. After you select a drive, the Hard Disk Operations menu displays on the screen.

```
Hard Disk Operations Menu

  a)  Enter Bad Block Information
  b)  Format Hard Disk
  c)  Modify Existing Swap Partition Size
  d)  Exit (default)

Select (capital for verbose) [a]:
```

This menu gives you four choices: enter bad block information, format the hard disk, modify the swap partition size, or exit the menu. If you enter a lowercase letter (for example, b to format the hard disk), the program does not display diagnostic comments; if you enter an uppercase letter, the program displays diagnostic comments.

If your hard disk drive has bad block information, you must select option a to enter the bad block information before you format the hard disk.

If you try to format the hard disk without entering the bad blocks, the program retains bad block information from a previous format. However, if the disk information block is corrupted, the program assumes there are no bad blocks. While the disk is being formatted, the format program may detect additional bad blocks; these bad blocks are automatically added to the information on the disk. Since the Hard Disk Format utility verifies bad blocks, the program takes approximately one minute per megabyte.

When you select option a (Enter Bad Block Information), the format program asks you a series of questions. If the hard disk is formatted, it asks if it should retain previous bad block information. If you enter n, it erases previous bad block information. If you enter y, it checks the bad-block database for consistency. If the format program detects an error, it asks if it should add the bad block to the database, delete the bad block from the database (identifying it as a good block), or exit and erase all the bad block information. The program queries you for each error that it finds.

If your hard disk is badly corrupted, it is possible to run out of replacement blocks. If this happens, restart the format program without retaining the old bad-block data. If the hard disk drive runs out of replacement blocks a second time, you should replace the faulty drive.

When you select option b (Format Hard Disk), the program formats the hard disk drive. The program asks you to confirm the format. All files on the hard disk are destroyed.

When you select option c (Modify Existing Swap Partition Size), a selection menu lets you choose the size of swap partition that you want to use. Swap space is the area reserved on the hard disk for temporarily storing program information during DAS operation. This memory is used only when there is not enough memory available on the DAS system. Swap partition space is normally used for one of the following conditions: there is more than one type of module in a DAS system, very large symbol table files are used, or the DAS contains a 2 Mbyte memory board. In these cases, a larger swap partition space is needed.

When the DAS runs out of swap space, normal operation cannot continue. If this happens, use the modify swap partition option to increase the size of the swap partition. Increasing the size of the swap partition decreases the amount of hard disk space available for storing other files, such as reference memories, setups, and Autorun definitions.

Hard Disk Bad Block Entry Menu. If you select option a (Enter Bad Block Information), the program performs a verification process. When the program completes the verification, it displays the Hard Disk Bad Block Entry menu.

```
Hard Disk Bad Block Entry Menu

  a)  Add bad blocks in physical block number format
  b)  Add bad blocks in "cyl hd byte" format
  c)  Exit (default)

  Enter choice [c]:
```

NOTE. *The program writes bad block information to the hard disk after the format process. Therefore, if you want to map-out more bad blocks, you must reformat the hard disk.*

This menu gives you three choices: enter the bad blocks using the physical block-number format, enter the bad blocks using the Cylinder/Head/Byte format, or exit the menu. For choice a, you must know the physical block number. Otherwise, you must calculate the physical block number from the formula in the section *Calculating Bad Blocks*.

If the system software detects bad blocks while the DAS is running, it may report them as ECC errors. These errors are reported with a physical block number. You can use choice a to add these blocks (reported as ECC errors) to the bad block list. Press the Return key to exit the bad block entry program.

Choice b allows you to add the bad block information in the Cylinder/Head/Byte format. Use a space as a delimiter between values. For example, if a hard disk contains Cylinder/Head/Byte information as 123 / 1 / 3, enter the bad block as "123 1 3" and press the Return key. The program automatically calculates the physical block location and adds it to the bad block list.

After you enter the last bad block, press the Return key to exit the program. Press **c** to return to the Disk Operations menu, then press b to format the hard disk.

After the format program completes the format process, the program displays the Hard Disk Operation menu. Press d to return to the BOOT?> prompt.

Modify Swap Partition Size Menu. If you select option c (Modify Existing Swap Partition Size), the format program displays the Modify Swap Size Partition menu. (You cannot change the swap size for the 10 Mbyte hard disk drive.)

```
Modify Swap Partition Size Menu

  a)  Swap Partition Size to Small (4,068 Kbytes)
  b)  Swap Partition Size to Medium (6,840 Kbytes)
  c)  Swap Partition Size to Large (9,090 Kbytes)
  d)  Swap Partition Size to a Particular Value
  e)  Exit with no changes (default)

  Enter choice [e]:
```



CAUTION. *Modifying the swap-space size partition destroys all files on the hard disk. To save files from the hard disk, copy them onto floppy disks or transfer them to your host using a 92LAN (ethernet) Module, a 92C02 (GPIB interface) with PCL, the backup/restore utility in Disk Services, or Kermit (an RS-232 file transfer protocol). Refer to Section 3 of the DAS User Manual for information on copying files to floppy disks, backup/restore utility, or Kermit. For information on 92LAN or 92C02, refer to the user manual for those modules.*

If the hard disk has never been formatted, you must format it before changing the swap-partition size. The program creates a swap partition after formatting or reformatting the hard disk. The default size of the swap partition is based on the size of the hard disk drive. Table 4–29 shows the default swap partition sizes. If the hard disk was previously formatted, you can change the swap-partition size without reformatting the hard disk.

Table 4–29: Default Swap Partition Size

Hard Disk Size	Swap Partition Size
10 Mbyte	4,068 Kbytes
20 Mbyte	4,068 Kbytes
40 Mbyte	6,840 Kbytes
80 Mbyte	9,090 Kbytes

After changing the swap partition size, use the f:/make utility to make a file system and the f:/install utility to reload all system software. Increasing the swap-partition size reduces the amount of space available on the hard disk for user files, such as setups and reference memories.

A small swap partition uses 4 Mbyte of hard disk space (default), a medium swap partition uses 6.5 Mbyte of hard disk space, and a large swap partition uses 9 Mbyte of hard disk space. If you are using two modules, set the swap partition to a medium size. If you are using four or more modules, set the swap partition to a large size.

If none of these selections meets your needs, then you can define the swap-partition size. Selection d lets you dedicate from 4 Mbyte to 50% of the total drive capacity for the swap-partition size.

After the swap-partition size program changes the size of the swap partition, the program returns to the BOOT?> prompt. You must then run the Make utility. If you do not run the utility, the system may behave unpredictably.

File System Make Utility

The file system Make utility either creates a new, empty, file system and destroys all previously stored files on the hard disk, or it checks and repairs the existing file system. The utility prompts you to select one of the two options. Use the file-system Check option to repair file system damage resulting from an abnormal shutdown of the DAS. Before running the Make utility, use the system software Disk Services menu to save all user-created files on floppy disks. The Make utility operates the same for all DAS mainframes.

***NOTE**. If the hard disk drive is seriously corrupted, you may not be able to save files on floppy disks. Therefore, you should regularly backup your user-generated files.*

Running the File System Make Utility. If the BOOT?> prompt is displayed, proceed to step 4. If not, start with step 1.

1. Power down the mainframe. Face the rear of the mainframe and locate the DIP switches mounted on the Controller board (accessible through an opening on the back panel).
2. Place DIP switch 1 (leftmost DIP switch) in the closed (down) position. Place DIP switch 2 in the open (up) position. Leave all other DIP switches in the original positions.
3. Power ON the terminal and wait for a flashing cursor to appear. Power ON the mainframe and wait for the prompt BOOT?>, then insert the FORMAT, MAKE disk (labeled 1 of n).

4. Type f:/make. The utility displays the following menu:

```
Press "m" to run the file system Make procedure,
press "c" to run the file system Check procedure-->
```

5. Type m to create a new file system. This destroys all files on the hard disk. A warning message and prompt are displayed; type y to continue with the Make utility.

File System Check Procedure. If you type c in step 5, the file-system Check program repairs the damaged file system after a system failure. An unexpected loss of power, software failures, or hardware failures can corrupt the file system and cause the DAS to shut down in an uncontrolled fashion. When this happens, recent file-system changes may not be completely written to the hard disk and the file system may be inconsistent.

The DAS normally runs the file system Check program at power on unless you change the parameters in the Boot Option overlay to the Diagnostics menu (refer to *Diagnostics, File System Check and the Boot Option Overlay* on page 4–15 for more information on setting the boot options).

NOTE. *If you run the File System Check procedure from the floppy disks, the logic analyzer will ignore the settings in the Boot Option overlay.*

Under certain conditions, the DAS may ask you to run the file system Check program manually. The file system Check program may not completely recover from all types of damage to the file system. If system software files are corrupted or cleared, you must rebuild the file system using the file system Install utility provided with the DAS.

NOTE. *You must run the file system Check program when, if you get a message during power on indicating that the file system is damaged and cannot be automatically repaired. The DAS cannot operate with a damaged file system that it cannot repair.*

There are six phases of the file system Check program (described later in detail). During these phases, the program attempts to reconstruct the file system by deleting unreferenced files, rebuilding the free block list, and fixing any inconsistencies. It may take multiple attempts to complete the repair process. You should run the file system Check program until you no longer get errors or queries (normally no more than five times).

Once you have started the file system Check procedure, it proceeds automatically. The check goes through six phases; these are detailed in Tables 4–30 through 4–34. These tables list and explain typical messages that may be displayed during the file system Check program. (In these tables, a word in parentheses following a message indicates the actual prompt message you see on the screen.) The tables also contain recommended responses to the error messages.

When the file system Check program finds an inconsistency in the file system, it prompts you to take corrective action. There are several approaches to correcting file system problems, depending on the situation. Usually, answering y to a CLEAR? prompt or n to a RECONNECT? prompt corrects the problem without damaging any files on the hard disk. If a file has a size of 0, it can always be cleared. After clearing any files, you should run the Verify option of the Install utility to make sure that system files were not deleted. If the message EXCESSIVE BAD BLOCKS. CONTINUE? appears, enter y to continue. (A file system bad block is not the same as a bad block on the hard disk.)

NOTE. *If you receive the Excessive Bad Blocks message, you must repeat the file system Check program until it completes without errors.*

All problems may not be fixed on the first pass through the file system Check routine; you may have to rerun the program several times. If the utility completes all checks successfully, it prints the number of files, blocks, and the amount of free space and displays the following prompt:

```
Do you want to rerun the File System Check Procedure
(y/n)[n]:
```

Enter y to the prompt only if all checks did not complete successfully. If you enter n, the BOOT?> prompt is displayed.

Phase 1: Check Blocks and Sizes. This phase of the program checks the inode section of the file system; errors uncovered here usually indicate serious corruption of the file system. Table 4–30 summarizes the error messages that may be generated during Phase 1 testing. In the table, a word in parentheses following an error message indicates the actual prompt message that appears on the screen.

Table 4–30: Phase 1 File System Check Error Messages

Message	Explanation
UNKNOWN FILE TYPE I=I (CLEAR?)	The program found an unknown type of file. Type y in response to this message.
LINK COUNT TABLE OVERFLOW (CONTINUE?)	An internal error has been found. Repeat the file system Check program after completing the current pass. Type y to continue. May require several y responses.
B BAD I=I	The program has detected an illegal block number B in inode I.
EXCESSIVE BAD BLOCKS I=I (CONTINUE?)	The program has detected 10 or more bad block numbers. Type y to continue. Run the file system Check program again after completion.
B DUP I=I	The program has identified a duplicate block B in inode I.
EXCESSIVE DUP BLKS I=I (CONTINUE?)	The program has detected too many duplicate blocks in inode I. Type y to continue; when finished, run the file system Check program again.
DUP TABLE OVERFLOW (CONTINUE?)	There has been an internal table overflow. Type y to continue; when finished, run the file system Check program again.
POSSIBLE FILE SIZE ERROR I=I	A possible error in file size has been detected. After completing the file system Check procedure, run the system software Install utility, Verify option, to make sure that no files are corrupted.
DIRECTORY MISALIGNED I=I	A possible directory error has been detected. After completing the file system Check routine, run the system software Install utility, Verify option, to make sure that no files are corrupted.
PARTIALLY ALLOCATED INODE I=I (CLEAR?)	A partially allocated inode has been detected. Respond with y. After completing the file system Check procedure, run the system software Install utility, Verify option, to make sure that no files are corrupted.
PHASE 1B: RESCAN FOR MORE DUPS	This message may be displayed if the program is rescanning for additional duplicate block entries in the inode structures.

Phase 2: Check Path Names. This phase of the program removes files with corrupted inodes detected in the Phase 1 check. Table 4–31 summarizes the error messages that may be generated during Phase 2 testing. In the table, a word in parentheses following an error message indicates the actual prompt message that appears on the screen.

Table 4–31: Phase 2 File System Check Error Messages

Message	Explanation
ROOT INODE UNALLOCATED. TERMINATING	You must rebuild the file system. First, run the file system Make program. Then, use the file system Install utility to reload the System Software.
ROOT INODE NOT DIRECTORY (FIX?)	Type y in response to this message. If this generates a large number of errors, you need to rebuild the system by running the file system Make program followed by the file system Install utility to reload the System Software.
DUPS/BAD IN ROOT INODE (CONTINUE?)	Type y in response. If this generates a large number of errors, you need to rebuild the system. Do this by running the file system Make program followed by the file system Install utility to reload the System Software.
I OUT OF RANGE I=I NAME=F (REMOVE?)	The program has detected a directory entry with an out-of-range inode number I; type y in response. Run the file system Install utility, Verify option, to make sure that no files are corrupted.
UNALLOCATED I=I OWNER=O MODE=M SIZE=S MTIME=T NAME=F (REMOVE?)	The program has detected a directory entry with no allocation bits set; type y in response. Run the system file system Install utility, Verify option, to make sure that no system files have been deleted.
DUP/BAD I=I OWNER=O MODE=M SIZE=S MTIME=T DIR=F (REMOVE?)	The program has detected duplicate or bad block numbers associated with this file; type y in response. Run the file system Install utility, Verify option, to make sure that no system files have been deleted.

Phase 3: Check Connectivity. This phase of the program checks for unreferenced directories. Table 4–32 summarizes the error messages that can be generated during Phase 3 testing. In the table, a word in parentheses following an error message indicates the actual prompt message that appears on the screen.

Table 4–32: Phase 3 File System Check Error Messages

Message	Explanation
UNREF DIR I=I OWNER=O MODE=M SIZE=S MTIME=T (RECONNECT?)	The program has detected an unreferenced directory; you must clear it. Type n in response to the RECONNECT? prompt. The program then prompts you to clear the inode. Type y in response to the CLEAR? prompt. Run the file system Install utility, Verify option, to make sure that no system files have been deleted.
SORRY. NO lost+found DIRECTORY	You must rebuild your system. First, run the file system Make program, then use the file system Install utility to reload the System Software.
SORRY. NO SPACE IN lost+found DIRECTORY	You must rebuild your file system. First, run the file system Make program. Then, use the file system Install utility to reload the System Software.

Phase 4: Check Reference Counts. This phase of the program checks link count information in the file system. You will almost always get an error during this phase. As a general rule, if a file with a SIZE of 0 is unreferenced, you should clear it (do not reconnect it). Table 4–33 summarizes the error messages that can be generated during Phase 4 testing. In the table, a word in parentheses following an error message indicates the actual prompt message that appears on the screen.

Table 4–33: Phase 4 File System Check Error Messages

Message	Explanation
UNREF FILE I=I OWNER = 0 MODE=M SIZE=S MTIME=T (RECONNECT?)	An unreferenced file has been detected; always type n in response. Note the file size; if the file size is greater than 0, run the file system Install utility, Verify option, to make sure that no system files have been deleted. Most detected files are temporary; deletion of these files is harmless since the files are not usable.
(CLEAR?)	If you type n at a RECONNECT prompt, another prompt appears asking you to clear the file. You should then type y to clear.
LINK COUNT FILE I=I OWNER=O MODE=M SIZE=S MTIME=M COUNT=X SHOULD BE Y (ADJUST?)	An incorrect link count has been detected; type y in response.

Table 4–33: Phase 4 File System Check Error Messages (Cont.)

Message	Explanation
LINK COUNT DIR I=I OWNER=O MODE=M SIZE=S MTIME=M COUNT=X SHOULD BE Y (ADJUST?)	An incorrect link count has been detected; type y in response.
LINK COUNT F I=I OWNER=0 MODE=M SIZE=S MTIME=M COUNT=X SHOULD BE Y (ADJUST?)	An incorrect link count has been detected; type y in response.
UNREF FILE I=I OWNER=O MODE=M SIZE=S MTIME=M (CLEAR?)	An unreferenced file has been detected; type y in response. If the file size is greater than 0, run the file system Install utility, Verify option, to make sure that no system files have been deleted.
UNREF DIR I=I OWNER=O MODE=M SIZE=S MTIME=M (CLEAR?)	An unreferenced directory has been detected; type y in response. If the file size is greater than 0, run the file system Install utility, Verify option, to make sure that no system files have been deleted.
BAD/DUP FILE I=I OWNER=O MODE=M SIZE=S MTIME=M (CLEAR?)	A file inode containing bad blocks or duplicate blocks has been detected; type y in response. If the file size is greater than 0, run the file system Install utility, Verify option, to make sure that no system files have been deleted.
BAD/DUP DIR I=I OWNER=O MODE=M SIZE=S MTIME=M (CLEAR?)	A directory inode containing bad blocks or duplicate blocks has been detected; type y in response. If the directory size is greater than 0, run the file system Install utility, Verify option, to make sure that no system files have been deleted.
FREE INODE COUNT WRONG IN SUPERBLK (FIX?)	An inconsistency in the free inode count has been detected. The actual number of free inodes does not match the number stored in the superblock. Type y in response.

Phase 5: Check Free List. This phase of the program checks for errors in the free block list. Table 4–34 summarizes the error messages that can be generated during Phase 5 testing. In the table, a word in parentheses following an error message indicates the actual prompt message that appears on the screen.

Table 4–34: Phase 5 File System Check Error Messages

Message	Explanation
EXCESSIVE BAD BLKS IN FREE LIST (CONTINUE?)	More than 10 bad block numbers in the free block list have been detected; type y in response.
EXCESSIVE DUP BLKS IN FREE LIST (CONTINUE?)	More than 10 duplicate block numbers in the free block list have been detected; type y in response.
BAD FREEBLK COUNT	The free block count is incorrect. No action is required.
X BAD BLKS IN FREE LIST	There are X bad blocks in the free list. No action is required.
X DUP BLKS IN FREE LIST	There are X duplicate blocks in the free list. No action is required.
X BLK(S) MISSING	There were X blocks unused by the file system that were not in the free list. No action is required.
FREE BLK COUNT WRONG IN SUPERBLOCK (FIX?)	An inconsistency in the free block count has been detected. The free block count in the superblock is incorrect; type y in response.
BAD FREE LIST (SALVAGE?)	The free block list must be repaired; type y in response.

Phase 6: Salvage Free List. This phase rebuilds the file system free block list. There are no error messages generated in this phase of the file system Check procedure.

File System Install Utility

Use the file system Install utility to install and verify the Base System Software, optional system software, and application software. You can also use the Install utility to remove the optional system software and application software. The Install utility operates the same for all mainframes.

You must install the Base System Software in the following cases:

- After running the file system Make utility
- When upgrading to a new version of system software
- When repairing damage to the system software from an abnormal shutdown of the DAS

You can install the optional system software and application software when installing the Base System Software. However, you can also install the application software using the Disk Services menu at a later time.

You must install some portion of the optional system software when installing the Base System Software. You can use the Install utility at a later time to install or remove any optional system software. However, you cannot use the Install utility to remove the Base System Software.

You can use the file system Install utility to perform the following functions:

- Install the software, including the Base System Software, optional system software, and application software
- Remove optional system software or application software
- Verify that the installed software is complete and correct

Installing Base System Software. The Base System Software contains the essential software for the DAS. Use this program to add or replace Tektronix-supplied files. The program does not disturb user-generated files (such as, reference memories and system setups).

If the BOOT?> prompt is displayed, proceed to step 4. If not, begin with step 1.

1. Start with the mainframe powered off. Face the rear of the mainframe and locate the DIP switches mounted on the Controller board (accessible through an opening in the lower right corner of the back panel).
2. Place DIP switch #1 (the leftmost DIP switch) in the closed (down) position to cause the DAS to bypass the normal system software when powered on. Place DIP switch #2 in the open (up) position. Leave the other DIP switches in their original positions.
3. Power up the terminal and wait for the flashing cursor to appear. Power up the mainframe and wait for the prompt BOOT?>, then insert the INSTALL disk.

4. Type f:/install and press the Return key. The DAS displays the following menu:

```
Press "i" to Install Base System Software, Optional
     System Software, or Application Software.
Press "r" to Remove Optional System Software or
     Application Software.
Press "v" to Verify currently installed software.

Selection:
```

5. Type i to start the system software installation procedure. The following menu displays:

```
DAS File System Installation Procedure:
When the BOOT?> prompt appears, type /install
to continue with the installation process, or type /config
to adjust the LAN, GPIB, or Operating mode parameters or
save an image of the current software.
```

If you need to adjust the network parameters, type /config and refer to the *Configuration Utility* beginning on page 4–96. Otherwise, continue with the next step.

NOTE*. Do NOT remove the INSTALL disk. The program transfers several files from the floppy disk to the hard disk, then the BOOT?> prompt appears.*

---

6. Type /install and press the Return key. The system accesses the hard disk and displays the following message after a few seconds:

```
DAS File System Installation Procedure:
XXXXX Kbytes disk space remaining.
Insert next DAS system floppy disk and press Return.
(When installation is complete press "c") -->
```

7. Remove the INSTALL disk. Insert the Base System Software disk (volume 1 of volume n) and press the Return key. When the prompt appears, insert the next disk in the sequence and press the Return key. Continue loading Base System Software disks in sequence until you have installed all of them.

8. Install the optional system software disks that you need for your applications.

9. Install any application software disks. However, you can install the application software disks later using the Disk Services menu.

10. After you have installed the last disk, type c to complete the software installation procedure. The system then powers down.

11. After the DAS completes the power-down sequence, place DIP switch #1 in the open (up) position and power up the mainframe using the front-panel DC ON/OFF switch. The DAS performs the power-up diagnostics and displays the Diagnostics menu.

Installing Optional System Software. Use this program to add or replace Tektronix-supplied files only. The program does not disturb user-generated files (such as, reference memories and system setups).

NOTE*. The INSTALL disk is not required for the installation program if the Base System Software has already been installed.*

If the BOOT?> prompt is displayed, proceed to step 4. If not, begin with step 1.

1. Start with the mainframe powered off. Face the rear of the mainframe and locate the DIP switches mounted on the Controller board (accessible through an opening in the lower right corner of the back panel).
2. Place DIP switch #1 (the leftmost DIP switch) in the closed (down) position to cause the DAS to bypass the normal system software when powered on. Place DIP switch #2 in the open (up) position. Leave the other DIP switches in their original positions.
3. Power up the terminal and wait for the flashing cursor to appear. Power up the mainframe and wait for the prompt BOOT?>.
4. Type /install and press the Return key. The DAS displays the following message:

```
File System Installation Procedure:

Insert next system floppy disk and press Return.
When rebuild is complete press "c" -->
```

5. When the prompt appears, insert the first optional system software disk that you need for your applications. Continue installing the disks at each prompt until you have installed all required disks.
6. After you have installed the last disk, type **c** to complete the software installation procedure; the system then powers down.
7. Place DIP switch #1 in the open (up) position and power up the mainframe using the front-panel DC ON/OFF switch. The DAS performs the power-up diagnostics and displays the Diagnostics menu.

Installing Application Software. You can install application software using the procedure for installing optional system software. However, it may be easier to install the application software disks using the Disk Services menu.

Removing Optional System Software or Application Software. You can remove the optional system software and application software using the Install utility on disk. Removing software with this utility provides additional free space on the hard disk drive. You can also remove application software using the Disk Services menu, but you cannot remove optional system software with this menu.

If the BOOT?> prompt is already displayed, proceed to step 4. If not, begin with step 1.

1. Start with the mainframe powered off. Face the rear of the mainframe and locate the DIP switches mounted on the Controller board (accessible through an opening in the lower right corner of the back panel).
2. Place DIP switch #1 (the leftmost DIP switch) in the closed (down) position to cause the DAS to bypass the normal system software when powered on. Place DIP switch #2 in the open (up) position. Leave all other DIP switches in their original positions.
3. Power up the terminal and wait for the flashing cursor to appear. Power up the mainframe and wait for the prompt BOOT?>, then insert the INSTALL disk.

***NOTE**. When you install floppy disks in the DAS floppy disk drive, insert the disk with the label facing the center of the DAS.*

---

4. Type f:/install and press the Return key. The DAS displays the following menu:

```
Press "i" to Install Base System Software, Optional
     System Software, or Application Software.
Press "r" to Remove Optional System Software or
     Application Software.
Press "v" to Verify currently installed software.

Selection:
```

5. Type r to remove the software. A menu similar to the following appears:

```
DAS Software Removal Procedure:
XXXXX Kbytes space remaining.
The following Optional System Software and/or Application
Software is currently installed:

  1) .92A16
  2) .92A60
  3) .92A96

To remove a software package, type in the number on the
same line as the name of the package and press Return.
To exit, type in "0" and press Return, or simply press
Return with no number specified.

Which Optional System Software or Application Software
package would you like to remove?
```

The above example menu appears if you have previously installed the 92A16 Support, 92A60/90 Support, and 92A96 Optional System Software packages.

After you enter your selection, the program removes the selected package and displays the remaining list of software packages. The program prompts you for another selection.

If there are no optional system software or application software packages, the program displays an appropriate message and then displays the BOOT?> prompt.

Verifying Base, Optional and Application Software. Use the verify function of the Install utility to verify that all Tektronix-supplied software for the DAS (including the Base System Software, optional system software, and application software) is completely and correctly installed and has not been corrupted.

You will normally use the verify function of the Install utility after executing the file system Check program of the Make utility. It is not necessary to use the verify function of the Install utility after installing software, since each base, optional, and application software package is individually verified as you install it.

You can also verify all Tektronix-supplied software using the Version menu (refer to the Version menus in the *DAS System User Manual*).

If the BOOT?> prompt is already displayed, proceed to step 4. If not, begin with step 1.

1. Start with the mainframe powered off. Face the rear of the mainframe and locate the DIP switches mounted on the Controller board (accessible through an opening in the lower right corner of the back panel).

2. Place DIP switch #1 (the leftmost DIP switch) in the closed (down) position to cause the DAS to bypass the normal system software when powered on. Place DIP switch #2 in the open (up) position. Leave all other DIP switches in their original positions.

3. Power up the terminal and wait for the flashing cursor to appear. Power up the mainframe, wait for the prompt BOOT?>, and then insert the INSTALL disk.

4. Type f:/install and press the Return key. The DAS displays the following menu:

```
Press "i" to Install Base System Software, Optional
     System Software, or Application Software.
Press "r" to Remove Optional System Software or
     Application Software.
Press "v" to Verify currently installed software.

Selection:
```

5. Type v to start the software verification procedure.

Each DAS Base System Software, optional system software, and application software disk has a separate checksum list corresponding to the name of the floppy disk containing the files. Each list contains the name and the expected checksum value for each file on the disk. The verification program displays the name of each checksum list as it verifies the checksums for the files. This process takes several minutes to complete.

If any files in a checksum list do not exist or match the expected checksum, an error message displays the name of the disk and the faulty file.

After the checksums for all disks have been tested, a message is displayed. If no failures are found, the program displays: "Verify Procedure Complete, NO ERRORS." However, if one or more failures occur, the program displays: "Verify Procedure Complete, ERRORS OCCURRED." In this case, identify the disks where the errors occurred, reinstall the disks, and repeat the verify procedure.

Configuration Utility

Use the Configuration utility to check or set the various parameters for operating the DAS with an X window terminal or 92XTerm software. In most cases, you will use this tool to check or set the network addresses used to enable communications between the DAS and the host or X terminal. Use the utility to set the operating mode and save, restore, or delete system software images. You can also use the utility to check the results of the power-up diagnostics and check or set the GPIB parameters (GPIB address or whether the GPIB is on-line or off-line).

The utility loads onto the hard disk drive in the DAS mainframe when you initially install the system software. To start the utility, power up the DAS with DIP switch #1 in the down position and then type /config at the BOOT?> prompt.

User Interface. The Configuration utility is intended for use with DAS systems that use either an X window display or that may not have a user interface display. Inputs and outputs for the utility are provided through the RS-232 Terminal port at the rear of the mainframe. For more information on the RS-232 ports, refer to *DIP Switches on the Controller Board* on page 4–45.

The utility does not make use of any special characteristics of any terminal. The utility assumes that the terminal can display 80 characters per line and at least 24 lines per screen. No special character positioning or highlighting is used.

The Configuration utility is required when you operate a DAS with the 9202XT or 92XTerm software under the following conditions:

- When you change networking parameters on the DAS
- When you change the operating mode
- When you update the Flash ROM in the terminal
- When you need to check the results of the DAS power-up diagnostics and configuration (if the DAS menus do not display)

The basic utility consists on a main menu and several submenus. Each menu has a list of selections to choose from and lists the current values of the parameters. A Help selection is also available for each menu item.

Main Menu. The Main menu displays as soon as you start the utility. Figure 4–31 shows an example of the Main menu. To select an item in the Main menu, enter the character enclosed in the parenthesis following the line number of the item you are interested in, and press the Return key.

```
DAS Configuration Utility:

  1. (C) Display Hardware [C]onfiguration and Diagnostic Results.
  2. (S) [S]ave image of current system software.      Available: 9202XT
  3. (R) [R]estore saved image of system software.     Available: None
  4. (D) [D]elete saved image of system software.
  5. (T) Show Fac[t]ory Default Network Configuration.
  6. (O) Set [O]perating Mode.                          Current: 9202XT
  7. (N) Set DAS Network [N]ame.                        Current: das1
  8. (A) Set DAS Internet [A]ddress.                    Current: 123.123.125.2
  9. (M) Set Network Subnet [M]ask.                     Current: 255.255.255.0
 10. (G) Set [G]ateway Internet Address.                Current: 123.123.123.14
 11. (F) Set De[f]ault X-server Name.                   Current: eldar:0.0
 12. (X) Set Default [X]-server Internet Address.       Current: 123.21.1.0
 13. (L) Set [L]ANPCL Port Number.                      Current: 10999
 14. (P) Set GPIB [P]ort Number.                        Current: 2
 15. (E) Save changes and [E]xit to BOOT?> prompt.
 16. (U) [U]pdate 9202XT Flash ROM and Exit to BOOT?> prompt.
 17. (Q) Discard changes and [Q]uit to BOOT?> prompt.
 18. (H) [H]elp.


Please make a selection:
```

Figure 4–31: Configuration Utility Main Menu.

To display help information on any one of the selections, type the letter h, a space, the line number or letter of the item you are interested in, and press the Return key. A help message displays on the screen.

Display Hardware Configuration and Diagnostic Results. The Configuration utility allows you to check the results of the power-up diagnostics for each module installed in the Master mainframe and Expansion mainframe(s). It also lets you view the contents of each slot and the configurations of the modules in the mainframe(s). The configuration and diagnostic information is listed when you select item C in the Main menu.

Figure 4–32 shows an example of the configuration display listing. The listing looks similar to the Diagnostics menu. For each installed card or module, the diagnostic results are displayed. If a diagnostic failure exists, the resulting error code displays. The diagnostic results are those that were recorded as of the last normal power-up sequence for the system. A value of No S/W indicates that the corresponding hardware could not be tested because the Optional System Software for that hardware was not installed.

To view the hardware configuration or diagnostic results of any of the Expansion mainframes, press the Return key. Pressing any other key returns you to the Main menu.

```
CURRENT CONFIGURATION

System Software Release 3 Version 1.30
Previous Shutdown:  Normal

Slot                            Card                              Diagnostic
 0    Controller/92LANSE Network Controller                       PASS
 1                                                                - - - -
 2                                                                - - - -
 3    92A96         96 Channels/10 ns Acquisition, 8K Deep       PASS
 4    92A96XD       96 Channels/10 ns Acquisition, 128K Deep     PASS
 5                                                                - - - -
 6                                                                - - - -
 7    92S32T        32 Channels/20 ns Pattern Generation        PASS
 8                                                                - - - -

Press <CR> to see next chassis, or any other key to return to Main Menu
```

Figure 4–32: Hardware Configuration and Diagnostic Results Display

Save Image of Current System Software. Selecting item S from the Main menu lets you save a nonexecutable image of the current system software in a different location on the hard disk. This is useful when you plan to change the operating mode of the system from 9202XT to either of the 92XTerm modes or vice versa. You can save an image of the system software for the current mode of operation before installing new software. If you later decide to return to the original mode of operation, you can restore the previously saved image from the hard disk. If you plan to switch modes often, you can alternate between saved images rather than reloading software from the floppy disks.

You must have an image saved on the hard disk before you attempt to restore an image; if not, the current image will be lost. Once you save an image it becomes inactive and therefore you cannot use the image. You have to restore an image before using it.

User-created files, such as saved setups, reference memories, and trigger libraries remain in place when you save or restore an image. The files do not become part of the saved image and are not replaced when you restore an image. This means that when you convert a system from one mode of operation to another by saving then restoring or installing new system software, existing user files that were present in the original mode will still be present in the new mode. It is not necessary to save the user files separately when switching modes, (although doing a backup before such a major change is always a good idea). Likewise, saving a system software image does not make a copy of the user files and is not a substitute for a backup.

Be aware that saving an image of the current system software causes the software to be removed. Therefore, you must install new software following a Save operation before returning to normal operation. You can install new software either from the floppy disks or by restoring a previously saved image.

Saved images of system software vary in size according to the amount of optional system software and application software installed. The minimum size is approximately 14 Mbyte. If there is insufficient room on the hard disk to save the complete image, the save operation will abort, leaving the current system software intact. Saving an image takes approximately three minutes.

The Available: field at the right end of the save entry in the Main menu shows the type of system software that is currently installed and available for saving, if any. The value None signifies that the DAS system software has not been installed or has been removed as the result of either a save or operating mode change.

You will be prompted to verify your actions before the save operation occurs. If the save operation cannot be carried out, you will be returned to the Main menu.

Restore Image of Saved System Software. Selecting item R from the Main menu lets you restore a previously saved image of DAS system software. This is useful when you plan to change the operating mode. You can save an image of the system software supporting the current mode of operation before installing new software. If you later decide to return to the original mode of operation, all that is necessary is to restore the image from the hard disk.

***NOTE**. You must have an image saved on the hard disk before you attempt to restore an image; if not, the current image will be lost.*

User-created files, such as saved setups, reference memories, and trigger libraries remain in place when you save or restore an image. The files do not become part of the saved image and are not replaced when you restore an image. This means that when you convert a system from one mode of operation to another by saving then restoring or installing new system software, existing user files that were present in the original mode will still be present in the new mode. It is not necessary to save the user files separately when switching modes, (although doing a backup before such a major change is always a good idea). Likewise, saving a system software image does not make a copy of the user files and is not a substitute for a backup.

Be aware that a saved image of system software can only be restored once. After it is restored, the saved image no longer exists. Therefore, if you alternate between different versions of system software, you must resave the current system software before each restore operation. Restoring an image takes about two minutes.

The Available: field at the right of the Restore entry in the Main menu shows the type of system software that is currently saved and available to restore, if any. The value None signifies that there are no saved images present on the hard disk.

You will be prompted to verify your actions before the restore operation occurs. If the restore operation cannot be carried out, you will be returned to the Main menu.

Delete Saved Image of System Software. Selecting item D deletes saved images of the system software that you no longer need. The Available: field at the right of the Restore entry in the Main menu shows which saved images are present on the hard disk. Each image occupies approximately 14 Mbyte of hard disk space.

You will be prompted to verify your actions before the delete operation occurs. If the delete operation cannot be carried out, you will be returned to the Main menu.

Show Factory Default Network Configuration. Selecting item T lets you see or change the factory default network configuration in a single step. The proper network settings guarantee the proper configuration for stand alone operation when no other network devices are attached to the network cable that connects the DAS and terminal.

A menu similar to Figure 4–33 will be displayed. Items in the Current column are the current settings shown in the Main menu. Items listed in the Factory column show the settings that allow the DAS to operate in the stand alone mode.

If you want to use the default factory settings, enter Yes or Y at the prompt. The utility will load the default settings. If you do not want to use the default settings, enter No or N at the prompt, and you will be returned to the Main menu.

```
                Factory Default network configuration:

NETWORK OPTIONS                    Current          Factory
- - - - - - - - - - - -           - - - -          - - - -
DAS Network Name.                  das1             Tek_LA
DAS Internet Address.              123.123.125.2    10.0.0.1
Network Subnet Mask.               255.255.255.0    255.0.0.0
Gateway Internet Address           123.123.123.14   0.0.0.0
X Server Name.                     eldar:0.0        TEK_DISPLAY:0.0
X Server Internet Address          123.21.1.0       10.0.0.2

Do you want to use the Factory settings? Yes/[No]:
```

Figure 4–33: Factory Default Network Configuration Display

Set Operating Mode. Select item O to set the operating (start-up) mode for the system software.

There are different operating modes for the DAS: 9201T, 9202XT, 92XTerm Manual, or 92XTerm Automatic. The available operating modes depend on the system software. As the names imply, the 9202XT mode is for use with the DAS X terminal, while the two 92XTerm modes are for use with work station X server displays. The 9201T mode is used with older RS-232 terminals (9200T or 9201T terminals).

Table 4–35 lists the software versions and the operating modes they support.

Table 4–35: System Software vs Operating Modes

Operating Mode	9201T* System Software	DAS/XP System Software	DAS/NT System Software
9201T	X		X
9202XT		X	X
92XTerm Manual			X
92XTerm Autostart			X

*** 9201T mode was available with earlier versions of the DAS 9200 system software**

Enter a T for the 9201T operating mode, an X for the 9202XT operating mode, an M to select the 92XTerm Manual operating mode, or an A to enter the 92XTerm Autostart operating mode. To retain the current operating mode, press the Return key without entering any characters.

Set Network Name. Selecting item N from the Main menu lets you set the system (network) name for your system. Some applications refer to network devices by a name. The Internet address and name of the DAS must be entered in the appropriate tables on your host so that the system name of the DAS can be converted to the correct Internet address. The name can be up to eight alphanumeric characters long.

To set or change the name of your DAS, enter a name, and press the Return key. To retain the current name, press the Return key without entering any other characters. You will be returned to the Main menu.

Set DAS Internet Address. Selecting item A from the Main menu lets you set the Internet address for your DAS. The Internet address is the IEEE802 network address for your DAS. This Internet address must be set to an address other than 0.0.0.0 to permit communication between the DAS and other network devices. The Internet address is normally assigned by your system administrator.

Enter the new value in the format XXX.XXX.XXX.XXX (where each XXX represents a decimal number in the range of 0 to 255), and press the Return key. To retain the current address, press the Return key without entering any numbers.

Set Network Subnet Mask. Selecting item M from the Main menu lets you set the subnet mask for your DAS. The subnet mask specifies the portion of an Internet address that is common to all node addresses on a particular subnet. The subnet mask determines which other network devices the DAS may address directly and which ones it must access through a gateway. A value of 0.0.0.0 turns off subnet support. The subnet mask is normally assigned by your system administrator.

Enter the new value in the format XXX.XXX.XXX.XXX (where each XXX represents a decimal number in the range of 0 to 255), and press the Return key. To retain the current value, press the Return key without entering any numbers.

Set Gateway Internet Address. Selecting item G from the Main menu lets you set the gateway Internet address. This is the IEEE802 gateway address for the local network. The value must be set to an address other than 0.0.0.0 to permit communication between the DAS and other devices not on the same subnet. This number is normally assigned by your system administrator.

Enter the new value in the format XXX.XXX.XXX.XXX (where each XXX represents a decimal number in the range of 0 to 255), and press the Return key. To retain the current value, press the Return key without entering any numbers.

Set Default X Server Name. Selecting item F from the Main menu lets you specify the system name of the X server that will display the DAS window in the 9202XT or 92XTerm Autostart operating mode. In this mode, the DAS automatically initiates an X window display on the Default X Server when the DAS is powered up. Most X servers have only one display and one screen, so server_name:0.0 is the most common entry.

Enter the new value in the format server_name:d.s, where server_name is the system name of the X server device, d is the single digit number of the display on that device, and s is the single digit number of the screen on that display. The display number is required; however, the screen value will default to .0 if not specified. To retain the current name, press the Return key without entering any numbers.

This name is only for informational purposes, unless the default X server address parameter is set to Use Name. In this case, there must be an entry in the DAS /etc/hosts table that associates this name with an X server address.

If the operating mode is set to something other than 9202XT or 92XTerm Autostart, this parameter has no affect. Your system administrator should provide you with the correct name for your default X server.

Set Default X Server Address. Selecting item X from the Main menu lets you specify the default X server address. The default X server address specifies the Internet address of the X server that displays the DAS window in the 9202XT or 92XTerm Autostart operating modes. In this mode, the DAS automatically initiates an X window display on the default X server when the DAS is powered up. If this parameter is set to the special value of Use Name, then the default X server name is used instead of the address. In this case, the default X server name and address must be entered in the DAS /etc/hosts file.

If the operating mode is set to something other than 9202XT or 92XTerm Autostart, this parameter has no affect. Your system administrator should provide you with the correct Internet address for your default X Server.

Enter the new value in the format XXX.XXX.XXX.XXX (where each XXX represents a decimal number in the range of 0 to 255), or enter –1 to select the Use Name option, and press the Return key. To retain the current address, press the Return key without entering any numbers.

Set LANPCL Port Number. Selecting item L from the Main menu lets you set the service number assigned to the DAS LAN PCL (LANP) service. This number is used by host software requesting LAN PCL services from the DAS. The legal range of values for this entry is 1025 to 65535. Host software provided by Tektronix assumes that this service is assigned the value 10999. If you specify a different value, you must also change the host-based software.

Enter a new value in the range of 1025 to 65535, or press the Return key without entering number to retain the current value.

Set GPIB Port Number. Selecting item P from the Main menu lets you set the GPIB port address assigned to the DAS when it is used in a GPIB network. Legal values are Off line and addresses 0 through 30. When the value is set to Off line, the DAS is prevented from responding to any GPIB activity. There are no secondary GPIB addresses for the DAS.

Enter a new value in the range of 0 to 30 or –1 for Off Line. Press the Return key to retain the current value.

Update Flash ROM. If you have a 9202XT, 9203XT, 9204XT, or 9205XT terminal, you can use the Configuration utility to update the internal Flash ROM. Updating the Flash ROM is only necessary when the terminal software or fonts require updating with a new version. You may also need to update the Flash ROM as a result of any service work done to the terminal. If you desire to update the Flash ROM, you first must set the network configuration parameters.

NOTE. *You do not need to update the Flash ROM in the 9202XT terminal to change the Internet address. Use the other selections in the Configuration Utility Main menu to update the internet information for the DAS. Update the 9202XT internet information in the 9202XT Boot Monitor. Internet addresses and other networking parameters are normally assigned by your system administrator.*

After setting the parameters, select item U in the Configuration Utility Main menu to begin the Flash ROM update process. You are asked to confirm your actions before starting the operation. Enter y to confirm your actions.

A series of messages are displayed. When the operation is ready to load the X terminal software, information appears on the screen. Follow the steps listed below and the displayed instructions to update the Flash ROM. The following steps assume that you have a 9202XT; the procedure is similar for other TekXpress X terminals.

Read the entire Flash ROM procedure on the terminal screen before continuing. To return to the start of the procedure, press the Return key.



CAUTION. *If your terminal is not a 9202XT or 9203XT Terminal (XP17 or XP18), skip to Step 2.*

1. Before starting the Flash Update procedure, information regarding the software compression is displayed. Follow the instructions on the screen to make the appropriate selections for your Flash ROM configuration.
2. Information about step 1 of the Flash ROM procedure is displayed. Read the information carefully before proceeding.
3. The configuration parameters that you specified are displayed on the terminal. Write these parameters down; you need to enter the parameters in the Boot Monitor (the parameters will not be visible after you reset the terminal). Do not continue with the instructions on the terminal screen until you have completed the steps 4 through 15 of the instructions listed below.

   The boot path information is case sensitive (upper or lower case). Be sure to copy the boot path exactly as displayed. The terminal will not boot properly if the boot path is wrong.
4. Reset the terminal by pressing the Control, Alt, and Delete keys simultaneously. When the Boot Monitor appears on the screen, press the space bar to stop the boot process. This prevents the terminal from completing the boot process before the parameters are set.

NOTE. *Some NVRAM parameters cannot be set at the Boot Monitor. If you experience problems with the Flash procedure, try restoring the terminal factory settings by issuing the NVFACTORY command and then returning to this procedure.*

5. Enter the Internet address for the terminal. For example:

```
IADDR 123.21.1.0
```

6. Enter the Internet address for the DAS. For example:

```
IHOST 123.123.125.2
```

7. Enter the Network Subnet Mask. For example:

```
IMASK 255.255.255.0
```

8. Enter the Gateway Internet address (if required). For example:

```
IGATE 123.123.125.14
```

9. Enter the boot path name of the boot file. For example, if you have a 9204XT or 9205XT Terminal, enter:

```
BPATH /XP300/os
```

If you have a 9202XT or 9203XT Terminal, enter:

```
BPATH /XP10/os
```

10. Enter the boot method parameter that the X terminal will use after the Flash ROM update is complete by typing:

```
BMETHOD ROM
```

11. Save the entries in the nonvolatile memory of the terminal by typing:

```
NVSAVE
```

12. Enter the BOOT command to use for the Flash ROM update process by typing:

```
BOOT TFTP
```

NOTE. *Do not continue with the following steps until the terminal has rebooted. The boot process is complete when the Serial window appears (the word Connected will appear in the window).*

13. After the Serial window appears, press the Return key. Disregard the following messages that appear on the screen, and continue to step 14.

```
Answering NO to this question will return you to STEP 1.

Terminate the Flash procedure and return to the DAS boot
prompt? Yes/[No].
```

14. Press the Return key until the following text appears:

```
Are you ready to continue to STEP #2?
```

15. Enter y in response to the prompt. The text for Step 2 will display.

When you start the Flash Update process, the X terminal writes the parameters to the Flash ROM. The process takes approximately 10 minutes. When the terminal boots, the Flash ROM monitor displays the following message: FLASH UPDATE IN PROGRESS. If the message does not appear, the Flash Update process failed. Follow the suggestions on the screen to identify any problems.

16. When you are ready to start the Flash Update process, enter y in response to the prompt on the screen. Verify that the Flash Update in Progress message is displayed.



CAUTION. *Disturbing the terminal or the mainframe can cause the Flash Update process to fail. Do not move terminal or the mainframe or press any keys unless instructed to do so. If the screen blanks out or goes dark, you can move the mouse or press one of the Shift keys to reactivate the display without disturbing the update process.*

17. If the Flash Operation Completed message is displayed, enter y in response to the next prompt on the screen. The text to Step 3 of the Flash Update procedure is displayed; carefully read this information. Entering n at the prompt returns you to Step 1 of the Flash Update procedure to restart the entire process.

18. Press the Control, Alt, and Delete keys simultaneously to reset (boot) the terminal from the Flash ROM. Verify that the Serial window appears after the boot process is complete.

19. If the Serial window does not appear, restart the Flash Update procedure again from the Configuration Utility Main menu.

20. If the Serial window appears, boot the DAS normally, and verify that the DAS window displays on the terminal.

Typing the final command will exit the Configuration utility and you will be returned to the BOOT?> prompt.

Leaving the Utility. There are two ways to leave the Configuration utility: by saving the changes, or by discarding the changes. Either way, you will be returned to the BOOT?> prompt.

Select item E to save any changes and exit to the BOOT?> prompt. This would be the normal way to leave the utility. All changes will be saved and will take affect when the DAS returns to normal operation.

Select item Q to discard the parameter modifications (except the operating mode changes). Major operating mode changes, such as converting from 9202XT mode to 92XTerm mode, will remain in effect. System changes resulting from the save, restore, or delete options will also remain. If you performed the restore operation, you should use the Exit option to save the current parameter values in place of the values that were part of the restored image.

After quitting the Configuration utility, you will return to the BOOT?> prompt, from which you can enter /install to install new software, or reset the DIP switch, restart the mainframe, and return to normal operation.

Optional System Software

Optional system software disks contain parts of the system software which are not required for all DAS systems. This software is optional, so you can free up space on your DAS hard disk drive by installing only software that is required for your system. Each optional software disk label shows the approximate size of the software to help you decide which optional software to install. It is possible for this number to be larger than the capacity of the floppy disks.

The Base System Software and all optional system software is installed on all systems shipped from the factory. You can remove unnecessary optional system software or application software by using the remove option of the Install utility. You can install or exclude optional system software and application software at your discretion when you upgrade your mainframe to new software versions. When upgrading the software, remove any optional system software that you do not want to replace with a newer version; if you are unsure of the software versions, run the Verify function to check that all of the software on the hard disk is the current version.

There are different optional software packages. Some of these relate directly to the instrument module families available, and the others contain the software necessary for remote operation. Each optional software package for the instrument modules can support multiple modules of that type, so needs to be installed only once. The optional software packages are briefly described below:

- 92A16 Support. This package provides the necessary software to operate the 92A16 and 92A16E Data Acquisition Modules. You can remove or exclude this software in systems that do not contain 92A16 Modules.

- 92A96 Support. This package provides the necessary software to operate the 92A96 or 92C96 Data Acquisition Modules. You can remove or exclude this software in systems that do not contain 92A96 or 92C96 Modules.
- 92A60 Support. This package provides the necessary software to operate the 92A60/90 Data Acquisition Modules. You can remove or exclude this software in systems that do not contain 92A60/90 Modules.
- 92HS8 Support. This package provides the necessary software to operate the 92HS8 Data Acquisition Modules. You can remove or exclude this software in systems that do not contain 92HS8 Modules.
- 92S16 Support. This package provides the necessary software to operate the 92S16/32 and 92SX109/118 Pattern Generation Modules. You can remove or exclude this software in systems that do not contain 92S16/32 or 92SX109/118 Modules.
- Remote Operation Support. This package provides the necessary software to operate the DAS remotely using the Programmatic Command Language (PCL). You can remove or exclude this software in systems that do not operate remotely with PCL.
- 9202XT Support, XP17 Supplement. This package provides the necessary software to update the Flash ROM in the 9202XT or 9203XT terminals. It also provides additional software to service the terminal.
- 9204XT Support, XP100 and XP200 Supplement. This package provides the necessary software to update the Flash ROM in the 9204XT, 9205XT, or 9206XT terminals. It also provides additional software to service the terminals.

Application Software

Application software disks contain special purpose software that provides additional capability not present in the Base System Software or optional system software. Application software (available as separate products) includes microprocessor support and device verification packages.

You can install or remove application software using the Disk Services menu (refer to the Disk Services menu in the *DAS System User Manual*). However, you can also install or remove the application software using the Install utility when you install the Base System Software or optional system software.

Operator's Checkout Procedure

These procedures consist of power-up diagnostic tests on the mainframe and terminal; the tests check the operating status of the system.

The mainframe and terminal contain diagnostics that run automatically when powered up. Since the terminal provides the user interface, it should be powered up and checked first (with the mainframe power off). After the terminal diagnostics are completed, power up the mainframe to execute its power-up diagnostics.

The *DAS 9200 Verification and Adjustment Procedures* document contains procedures for testing specifications; these procedures should only be performed by a qualified service technician.

9200T or 9201T Terminal Power-Up Diagnostics

The terminal can be checked by two or more levels of diagnostics. Before powering up the terminal, ensure that the keyboard is connected to the terminal.

NOTE. *Unless specified, do not connect the terminal to the mainframe when performing the following tests. This allows the function keys to be under the control of the terminal.*

Power-Up Self-Test

The Power-Up Self-Test runs automatically every time you turn on the terminal or push the RESET button. This test checks the keyboard, then the terminal's display circuitry. The LED in the Caps Lock key (located in the lower-left corner of the keyboard) briefly flashes when the test is running. This self-test runs between turning on (or resetting) the terminal and the first appearance of the cursor; it takes less than 15 seconds to run.

If an error is found during the keyboard portion of the Power-Up Self-Test, the Caps Lock light stays on and the terminal beeps twice. A message may also appear on the screen.

If a problem is found during the display check, the terminal displays a message on the screen and beeps twice. If a message does not appear, adjust the BRIGHTNESS knob on the terminal. If a message still does not appear, refer to *Power-Up Diagnostics* in this section.

If the Power-Up Self-Test does not detect errors, the terminal displays a blinking underscore cursor.

If the Power-Up Self-Test detects an error when you turn on the terminal, proceed as follows:

1. Turn the terminal off (wait 15 seconds) and then turn it back on. If the terminal powers up without detecting a Power-Up Self-Test error, it is operating normally.

2. If an error occurs during the Power-Up Self-Test on the second power-up, note the message on the screen, and follow this procedure.

   a. If the message includes the words “Keyboard Failure” or “Not Attached,” check the keyboard-cable connection on the rear of the terminal.

   b. If the message includes the words “Nonvolatile Parameters Failure – Defaults Reset”, reset some operating parameters.

To perform the Extended Self-Tests (9200T terminal) or the Main Self-Test (9201T terminal) refer to the terminal diagnostics earlier in this section.

X Terminal Power-Up Diagnostics

The X terminal is tested by a Kernel Self-Test, an Extended Self-Test, and an Extended Self-Test with Peripheral Test. The Kernel Self-Test performs the minimum hardware checks to ensure that the terminal will boot. The Extended Self-Test performs additional checks on the terminal and resides in the terminal ROM. The Extended Self-Test with Peripheral Tests is the same as the Extended Self-Test with the addition of the terminal peripheral tests, such as the bell, keyboard, and mouse. This tests resides in software on the DAS mainframe and must be downloaded to the terminal. For more information on the 9202XT or 9203XT terminals, refer to the *TekXpress X Terminal XP10 Series Service Manual*. For more information on the 9204XT or 9205XT terminals, refer to the *TekXpress Family of X Terminals Service Manual*.

Mainframe Power-Up Diagnostics

The mainframe runs diagnostics at power-up to functionally check the mainframe components, operating software, and installed modules. When the power-up diagnostics are successfully completed, most instrument functions are verified.

***NOTE**. Do not press any keys during the power-up sequence; this may cause a diagnostic error.*

Power-up diagnostics take approximately 10 seconds for each card installed in the mainframe (or expansion mainframe). After completing the tests, the mainframe displays the Diagnostics menu. This menu reports the diagnostic results with a PASS, FAIL, or No S/W message. If a diagnostic error is found, the DAS displays a four-digit error code next to the faulty board/module in the Diagnostics menu. If a failure occurs, record the displayed error information and refer to the diagnostics earlier in this section or contact your local Tektronix service center.

Troubleshooting the DAS Modules

The following paragraphs provide troubleshooting information for the DAS Modules; refer also to the module troubleshooting guidelines at the beginning of this section.

92A16/16E Troubleshooting

Diagnostic tests check major portions of the circuitry on the 92A16/16E Data Acquisition Module. If diagnostics pass, but you still suspect a problem, you can use other methods to isolate the problem. First, try operating the module in a different slot and see if the problem still exists. If it does, replace the module with a known-good module. If you suspect the P6461/E probe of being faulty, connect the probe to a known-good 92A16/16E Module. Check if the probe is acquiring data by performing the manual deskew procedures in the *92A16/16E Module User Manual.*

92A16/16E Fuses. If the P6461 probe has a short or the ±15 V circuitry on the 92A16 Module has problems, the 92A16 has two fuse runs (–15 V and +15 V) that protect the module. These runs are located on the lower left-hand side of the board, with the 540-pin connector facing you and the component side down. They are both labeled FUSE RUN. One or both of these runs may open if a failure occurs.

The 92A16E Module has two fuses (A11F983 and A11F984), instead of fuse runs, that protect the board if the P6461E has a short. A11F983 and A11F984 are located on the component side of the 92A16E board in the bottom right-hand corner, with the 540-pin connector facing you. One or both of these fuses may open if a failure occurs.



CAUTION. *Connecting P6464 or P6465 Pattern Generation Probes to the 92A16/16E Data Acquisition Modules may damage the probes permanently.*

Connecting a Pattern Generation Probe to the 92A16/16E Module may also cause the runs to open or the fuses to blow.

To determine if the problem is the board or the probe, perform the following procedure.



CAUTION. *Before replacing a module suspected of being faulty with a known-good module, perform the following probe test. If the probe is the cause of an open fuse run on the 92A16 Module or a blown fuse on the 92A16E Module, replacing the module will result in another blown fuse on the replacement module.*

1. Power down the mainframe and remove the suspected P6461/E probe from the module pod connector.

2. Check the resistance of the probe at the pod connector with the negative lead on pin 1 (ground) and the positive lead on pin 32 (+15V). (Refer to Figure 4–34.) A reading of approximately 1 kΩ or more indicates the probe is not the source of the problem.



CAUTION. *Gently touch the meter leads to the contacts of the pod connector. Pressing the tips of your meter leads into the contacts may damage the contacts, causing intermittent connections.*

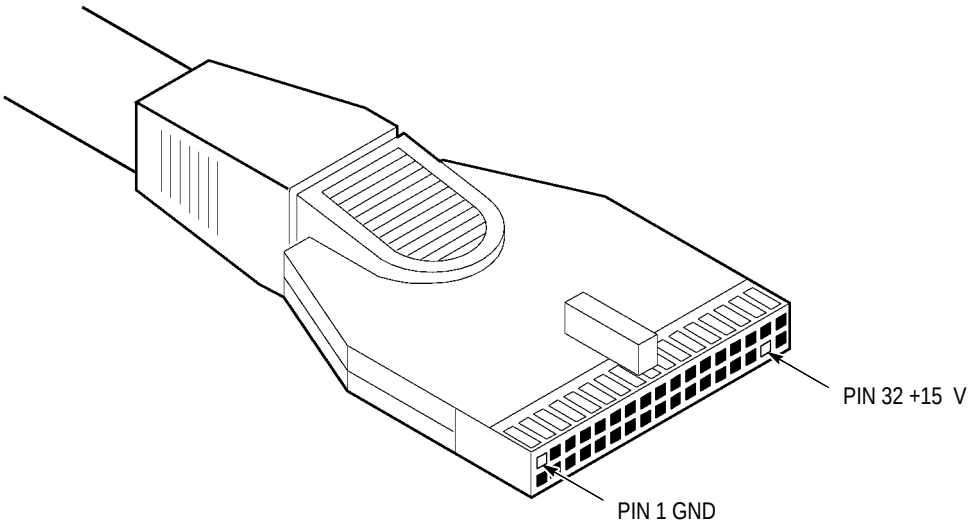


Figure 4–34: Pod Connector of the P6461/E Probe

3. If the reading indicates the probe is good, replace the module. If the reading indicates the probe is bad, replace the probe and the fuse on the module.

NOTE*. Replace the fuse run with a fuse mounted on the non-component side of the board. Refer to the component numbers in the Replaceable Electrical Parts for the part number for the fuse. Solder the replacement fuse to the pads at each end of the open fuse run.*

92A60/90 Troubleshooting

Diagnostic tests check major portions of the circuitry on the 92A60/90 Data Acquisition Module. If diagnostics pass, but you still suspect a problem, you can use other methods to isolate the problem. First, try operating the module in a different pair of slots to see if the problem persists. If it does, replace one or both of the cards for the 92A60/90 Module with a known-good module. If you suspect the buffer probe of being faulty, connect the probe to a known-good 92A60/90 Module. Check to see that the probe is acquiring data by performing the external deskew procedures in the *92A60/90 Module User Manual*.

The 92A60/90 components are defined as the Controller board (92A60/90C), Memory board (92A60/90M), and the buffer probe. If either the controller or memory is a 92A60 Module component, the DAS system recognizes it as a 92A60 Module. For example, if the user installs a 92A90C and 92A60M, the DAS recognizes that combination as a 92A60 Module. If a 92A90 Module uses a 92A60 Buffer Probe, or if a 92A60 Module uses a 92A90 Buffer Probe, the Configuration menu indicates unusable channels.

92A96 and 92C96 Troubleshooting

Troubleshooting for the 92A96 and 92C96 modules include replacing fuses and heat sinks and repairing coaxial cables.

- Fusible Runs. The 92A96/D/XD/SD (A27, A28, and A29)and 92C96 (A32) Modules have two fusible runs (F116 & F117) that require replacement fuse cartridges. The 92A96UD Module (A33) has actual fuses. The fuses and fusible runs protect the +5 V circuitry on the module and to the probe power connector at J200. Replace the fuses for all versions 92A96 and 92C96 Modules with the proper fuse. Refer to the *Replaceable Electrical Parts* for their part numbers.
- Heat Sinks. When replacing heat sinks for the eight comparator ICs (A27U215, A27U315, A27U415, A27U515, A27U610, A27U615, A27U715, and A27U815), affix them with a thermal-conductive adhesive such as Loctite Thermal Conductive Adhesive-Repairable, Item No. 00241. Make sure the heat sink and IC orientation are the same.
- Coaxial Cable Repair. You can order the optional coaxial probe cables and individual replacement coaxial conductors for the module as replacement parts. Refer to *Replaceable Mechanical Parts* for the appropriate part numbers. The replacement procedure is described below.

Equipment and Material Required. The following equipment and material are necessary to complete the replacement procedure:

Replacement coaxial wire

Replacement color-coded probe labels

Cable assembly header latch release tool

Masking tape

Screwdriver, #1 POZIDRIV

Coaxial-Wire Replacement Procedure. Use the following procedure to replace a single coaxial wire in a coaxial-type probe assembly.

1. Identify the faulty channel by functional testing.
2. Swap the suspected faulty cable with another coaxial cable to ensure that the module, podlets, and interface housing are functioning properly.
3. Find the pin number of the faulty channel in Table 4–36. If necessary, refer to the *92A96 and* 92C96 *Module User Manual* to identify the probes and sections.
4. Locate the faulty coaxial wire by using the pin-number location illustration of the coaxial-cable assembly header (see Figure 4–35).
5. At each end of the cable assembly, remove the color-coded label from the side of the cable-header housings opposite the key to access the screws. Remove the screws from the header housings and the upper housing covers.
6. Lift the coaxial wires from the channels in the lower half of the housing. Note the orientation of these wires for later reinstallation.
7. Slide the black cable header forward in the lower housing half and remove it from the housing. Repeat this step for the other end of the assembly.
8. Use the header latch release tool to unlatch both contacts of the faulty coaxial wire from the header at each end of the assembly (refer to Figure 4–36). Do not lift the latches farther than necessary to unlatch the contacts of the coaxial wire to prevent damage to the latches (causing intermittent operation of the coaxial cable assembly). Extract the coaxial wire completely before releasing the latch.
9. Compress the mesh sleeving to increase its inside diameter as much as possible.

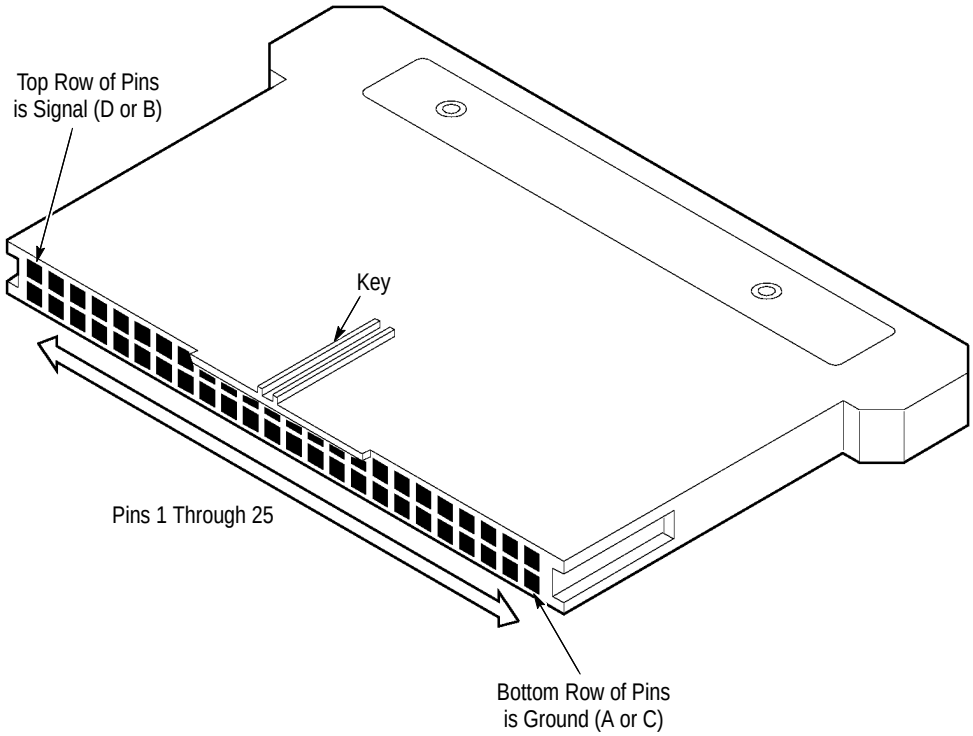


Figure 4–35: Coaxial Probe Cable Header Pin Orientation

Table 4–36: Probe-Cable Pin to Display-Channel Mapping

	Probe			
Pin Number	**A**	**B**	**C**	**D**
1	Clock_0	Clock_1	Clock_2	Clock_3
2	C0_7	C1_7	C2_7	C3_7
3	C0_6	C1_6	C2_6	C3_6
4	C0_5	C1_5	C2_5	C3_5
5	C0_4	C1_4	C2_4	C3_4
6	C0_3	C1_3	C2_3	C3_3
7	C0_2	C1_2	C2_2	C3_2
8	C0_1	C1_1	C2_1	C3_1
9	C0_0	C1_0	C2_0	C3_0
10	A1_7	A3_7	D1_7	D3_7
11	A1_6	A3_6	D1_6	D3_6
12	A1_5	A3_5	D1_5	D3_5

Table 4–36: Probe-Cable Pin to Display-Channel Mapping (Cont.)

	Probe			
Pin Number	**A**	**B**	**C**	**D**
13	A1_4	A3_4	D1_4	D3_4
14	A1_3	A3_3	D1_3	D3_3
15	A1_2	A3_2	D1_2	D3_2
16	A1_1	A3_1	D1_1	D3_1
17	A1_0	A3_0	D1_0	D3_0
18	A0_7	A2_7	D0_7	D2_7
19	A0_6	A2_6	D0_6	D2_6
20	A0_5	A2_5	D0_5	D2_5
21	A0_4	A2_4	D0_4	D2_4
22	A0_3	A2_3	D0_3	D2_3
23	A0_2	A2_2	D0_2	D2_2
24	A0_1	A2_1	D0_1	D2_1
25	A0_0	A2_0	D0_0	D2_0

10. Attach one end of the replacement coaxial conductor to an end of the faulty coaxial conductor in the following manner:

a. Lay the two coaxial wires end-to-end with a 4-inch to 6-inch overlap.

b. Wrap the overlapping portion of the two coaxial wires tightly with masking tape to temporarily splice them together.

11. Pull the faulty coaxial wire through the compressed mesh sleeve, so the replacement coaxial wire is drawn into and through the mesh sleeve. Stop when the replacement conductor is located in the proper position in the cable-wire bundle.

12. Unwrap and remove the masking tape from the splice of the two coaxial wires and discard the faulty wire.

13. At each end of the replacement coaxial wire, insert and latch the female contacts for both the signal (limp conductor) and the shield (rigid conductor) conductors into the cable header.

14. Reinsert the cable header into the lower half of the header housings. The cable header should be oriented so the signal-conductor side of the header is towards the key of the housing half.

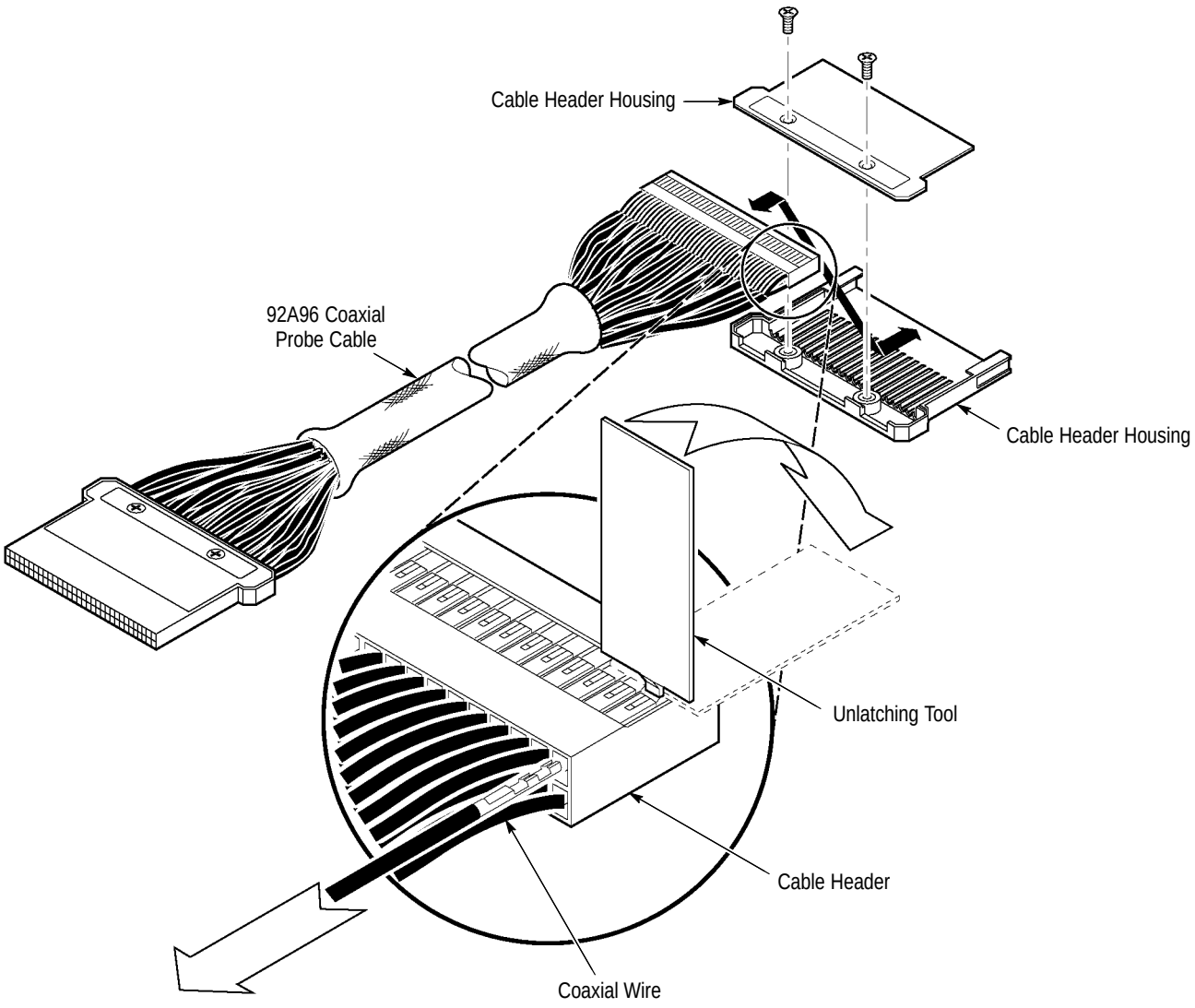


Figure 4–36: Removing a Coaxial Conductor (Wire)

15. Carefully relocate each coaxial wire into the channels of the lower housing half.
16. Replace the upper housing cover and reinstall the screws at each end of the cable assembly.
17. Stretch the mesh sleeving to its full length.
18. Replace the color-coded labels removed in step 5 with the appropriate colored label.
19. This completes the coaxial cable assembly repair. Test the cable assembly to ensure that the installation is successful.

92HS8 Troubleshooting

Diagnostic tests check major portions of the circuitry for the attached 92HS8 cabinet and interface board. If the diagnostics pass, but you still suspect a problem, you can use other methods to isolate the problem. Before assuming a problem exists, recheck the hardware connections and operating guidelines to ensure that you are using the 92HS8 Module correctly.

If you suspect there is a power-related problem, check the following:

- Ensure that the mainframe is powered on.
- Ensure that the 92HS8 cabinet is properly connected to the power source; check the front-panel LED to verify that the cabinet is receiving power.
- Check the connections of the interface cable between the interface board in the mainframe and the 92HS8 cabinet.
- Check the 92HS8 Module's three fuses. The 92HS8 Master interface board has two fuses; the 92HS8E Standard (or Expander) interface does not have fuses. The 92HS8's cabinet line fuse is located inside the right-hand side panel (see *Maintenance* for information on accessing fuses).

If you suspect a problem with the 92HS8/8E interface card, move the card to a different slot in the mainframe. For 8-channel modules, ensure that you are connected to pod D on the interface card; this connection is not required for diagnostic testing. Pod connections for 16-, 24-, and 32-channel modules are described later in this section.

The following faults and diagnostic error codes indicate possible problems with the 92HS8 Master or 92HS8E Standard interface card (refer to Table 4–15 for a description of 92HS8 diagnostic error codes):

- A bus error that prevents the DAS from recognizing and testing an installed board. The result is a diagnostic error code with a digit displayed in the MSB position followed by three zeros (for example, 1000). The displayed digit indicates the slot number of the untested board.
- A bus error that generates a diagnostic message in the following format: SLOT X FUNCTION Y TEST Z BUS ERROR 9Y0Z (where X is the mainframe slot, Y is the function number of the test, and Z is the test number of the failed function).
- An interface-board diagnostic failure that generates any of the following diagnostic error codes: X000, X001, X002, X003.
- A problem with sending/receiving signal events that generates any of the following diagnostic error codes: X001, X303, X304, X803, X804.
- A problem with data correlation that causes diagnostic error code X002.

- Time base problems; for 8-channel systems, diagnostic error codes X308 and X808 and for multichannel systems, diagnostic error codes X500, X501, XA00, and XA01.

The following faults and diagnostic error codes indicate possible problems with the 92HS8 cabinet (refer to Table 4–14 for a description of 92HS8 diagnostic error codes):

- Diagnostic error codes from X10X through XA0X.
- Clock problems that generate diagnostic error codes X200 through X502 and error codes X700 through XA02.
- Threshold problems that generate diagnostic error codes X101 and X601.
- Triggering problems that generate diagnostic error codes X300 through X307 and error codes X800 through X807.
- Probe problems that generate diagnostic error codes X502 and XA02.

If you suspect a problem with an individual 92HS8 probe, check that you have a proper signal source. If necessary, swap the probe's ±SMB leads (inside the cabinet) with another probe. If you replace the probe, you must recalibrate the 92HS8 Module using the deskew procedure (refer to the *92HS8/8E Module User Manual.*).

If the 92HS8 Module operates in the external asynchronous mode and you suspect problems, check the clock probe. If your configuration has more than eight channels, ensure that you are following these guidelines:

- If you use two, three, or four cabinets in the system, they must have clock cables properly connected to the master interface card for that module (red is the positive connection and black is the negative connection). For details on cable connections, refer to the *92HS8/8E Module User Manual.*
- The Master interface must be adjacent to the Standard interface board; the master must always reside in the lower-numbered slot when using 16-, 24-, or 32-channel modules. If no Standard interface board is used, the slot above the Master must be vacant.
- For 16-channel modules, connect to pods C and D of the Master interface board. For 24-channel modules, connect to pods C and D on the Master, and pod D of the Expander interface board. For 32-channel modules, connect to both pods C and D of the Master and Expander interface boards.

92S16/32 Troubleshooting

Diagnostic tests check major portions of the circuitry on the 92S32 Pattern Generation Module. If diagnostics pass, but you still suspect a problem, you can use other methods to isolate the problem. First, operate the module in a different slot and see if the problem still exists. If it does, replace the module with a known-good module. If you suspect the P6464/65 probe of being faulty, connect the probe to a known-good 92S32 module. Check that the probe is outputting data by connecting an oscilloscope to the output channels of the probe when the 92S16/32 Module is outputting an alternating data pattern. (The probe podlets must be powered from an external power supply on the VH and VL probe leads; see the *92S16/32 Module User Manual*.)

92S32 Terminator. Each 92S32 circuit board contains a set of 40 high-speed terminator blocks arranged in six groups near the backplane connector. When in the open position, signal lines that pass information between pattern generator cards are allowed to pass through to each other. A 92S32 with these jumpers in the closed position is displayed as a 92S32T in the Diagnostics menu. For more information and location of the terminators refer to the *92S16/32 Module User Manual*.

P6464 and P6465 Probe Fuses. Each pattern generation probe contains three replaceable fuses. Physically, the fuses consist of one incandescent lamp and two can-type fuses. (Later versions of these probes contain a self-resetting thermal fuse.) The lamp is used for ground sensing. A glowing lamp (visible through the air vents on the side of the probe case) indicates a large difference in ground potential between the system-under-test and the DAS. (A difference in ground potential negatively affects output data.) If the lamp is not glowing, either the ground potential is correct or the lamp is burned out.

The two remaining can-type fuses are for podlets VEE (–) and VCC (+). If the fuse for VEE (–) blows, the threshold reference for output data changes in the positive direction. If the fuse for VCC (+) blows, the threshold reference for output data changes in the negative direction. Both fuses are socketed, but the lamp is soldered to the board. For instructions on accessing the fuses, refer to *Disassembly/Reassembly Procedures* in this manual; part numbers are found in *Replaceable Electrical Parts*.

92SX109/118 Troubleshooting

Troubleshooting for the 92SX109/118 Pattern Generation Modules is the same as troubleshooting for the 92S16/32 modules. Also, refer to the *92SX109/118 Module User Manual* for multiplexer adjustment procedures.

92C01/02 Troubleshooting

There are four light-emitting diodes (LEDs) mounted on one end of the 92C01/02 circuit boards. Three of the LEDs indicate the state of the handshake protocol between the DAS and the GPIB, and the fourth LED indicates if the DAS is requesting service.

The LED indicators are visible through the mainframe's back panel when a 92C01 or 92C02 module is installed; they are located to the left of the GPIB port connector. From left to right, the LEDs represent the following GPIB lines:

- NDAC (Not Data Accepted) — When lit, indicates that one or more listeners have not yet accepted the current data byte.
- NRFD (Not Ready For Data) — When lit, indicates that one or more listeners are not ready to accept a new data byte (for example, the input buffer is already full).
- DAV (Data Valid) — When lit, indicates that the talker is outputting a valid data byte on the bus.
- SRQ (Service Request) — When lit, indicates that the DAS is requesting service from the controller.

The SRQ indicator is always controlled by the DAS, therefore always reflects the mainframe's state. The three handshake indicators, however, have different meanings when the DAS is the talker versus the listener. When the DAS is a listener, the DAV indicator reflects the state of the bus, and the NRFD, NDAC, and SRQ indicators reflect the state of the DAS (not the state of other listeners on the bus). Alternatively, when the DAS is the talker, the DAV and SRQ indicators reflect the state of the DAS, and the NRFD and NDAC indicators reflect the state of the bus.

It can be difficult to determine which instruments are listeners and talkers on the GPIB. When operation is normal and there is bus traffic, the LEDs usually blink rapidly. If the bus appears to be hung, however, the LEDs are in steady state and may indicate if the DAS is responsible. When the bus is hung, the LEDs represent the state of the 92C01/02's bus driver and receiver circuitry, rather than the state of the bus itself.

DAS LAN Troubleshooting

This section discusses problems that could cause the 92LAN or the 92LANSE Modules to lose or prevent communications with your host or X terminal (92LANSE only).

X Terminal Traits

When performing LAN troubleshooting, there are traits of the X Terminals you need to remember. These traits include the following items:

- The terminal sense the network cable type (thinnet or thicknet) when the terminal is powered on (9204XT and 9205XT only).
- The three rear panel network connections (thinnet, thicknet, and twisted pairs) can only be connected one at a time. Multiple connections will prevent the terminal from operating properly.

- If you change the cable type you must recycle the power in order for the terminal to recognized the cable type (9204XT and 9205XT only).
- If you change the network connection to a different rear panel connector, check (and change if necessary) the position of the jumper on the LAN Interface board inside the X terminal (9202XT and 9203XT only).

DAS Stand-Alone LAN Troubleshooting

This section discusses problems that may cause the 92LANSE Module to lose or prevent communications with the X Terminal. This section also provides suggestions that can help you determine where the problem might be. This section is divided into the following parts:

- LAN Hardware
- X Terminal Software
- Mainframe Software

LAN Hardware Troubleshooting. To verify that the hardware of the mainframe and X Terminal are functioning properly, perform the following steps:

1. Check that the power cords for the terminal and the mainframe are plugged into an appropriate socket.
2. Check that the fuses on the terminal and the mainframe are good.
3. Check that all cabling between the mainframe and the terminal are correct.
4. Check that the jumper of the 92LANSE board is in the correct position (Thicknet or Thinnet) for the current cabling setup.
5. Check the connections of the cables from the 92LANSE board to the rear panel of the mainframe.
6. Power on the X Terminal and check for LED error codes on the keyboard.
7. Run the complete X Terminal Diagnostics.
8. Power on the mainframe and check the LEDs on the back of the Controller board if the Level 0 diagnostics halt.
9. Run the Configuration utility and check the results of the diagnostics (Level 1).

X Terminal Software Troubleshooting. To verify that the software of the X Terminal and and mainframe are functioning properly, perform the following steps. The first steps are for the X terminal, followed by the mainframe steps.

1. Power off the mainframe and the X Terminal.
2. Power on the X Terminal and press the space bar until the terminal Boot Monitor appears.
3. Check the terminal default boot parameters as shown in Table 4–37.

Table 4–37: Terminal Factory Default Boot Parameters

Parameter	Default Value	Parameter	Default Value
IADDR	10.0.0.2	DNODE	0.0
IHOST	10.0.0.1	BMETHOD	ROM
IMASK	255.0.0.0	BDISPLAY	DISABLED
IGATE	0.0.0.0	BAFROM	NVRAM
BPATH	os*		

*** On initial power-on, the default value is /XP300/os (for 9204XT or 9205XT terminals or /XP10/os for 9202XT or 9203XT terminals) and then changes to os.**

4. Power off the terminal and then on again to boot from the X Terminal flash ROM.
5. Verify that the serial window appears with the word “connected” inside.

NOTE*. If the serial window does not appear, you may need to reflash the X Terminal Flash ROM. Refer to* Update Terminal Flash ROM *on page 4–104. You can also try the tftp boot process to boot the X Terminal. Refer to* tftp Boot Process *described after these procedures.*

If the serial window does not appear on the screen, you may need a separate RS-232 terminal to run the Configuration Utility.

Mainframe Software Troubleshooting. To determine that the software of the mainframe is functioning properly, perform the following steps:

1. Power on the mainframe with DIP switch number 1 down and number 2 up. The terminal will display the prompt BOOT?>.
2. Enter /config to display the Configuration Utility menu.

3. Verify that the proper network parameters are set. Refer to Figure 4–33 on page 4–101 for the factory default network parameters for the mainframe.
4. Verify the mainframe software by running the file system check procedure and the verify function of the Install utility. Refer to *File System Check Procedure* on page 4–84 and *Verifying Base, Optional, and Application Software* on page 4–95. If necessary correct any errors.
5. Power off the terminal and mainframe, and set the DIP switches of the mainframe to the normal boot position (switches 1 and 2 up).
6. Power on the terminal and mainframe. Wait two minutes for the maionframe to complete its boot process and then verify communications by attempting to Ping the mainframe from the terminal using the following procedure:
   a. After the X terminal has booted and the Serial window displays, press the Setup Key on the keyboard and enter the Setup window on the X Terminal. On some terminals it may be necessary to press Shift-Setup.
   b. Select Network Utilities from the Network Tables and Utilities pull-down menu.
   c. Enter the Internet address of the mainframe then press Enter. (You can get this address from the Configuration Utility menu.)
   d. Perform the Ping test to verify that there is communication between the X Terminal and the mainframe.
7. Perform the tftp Boot Process, as described next, if the Ping test was successful but the DAS window does not appear when the mainframe is booted normally.

The tftp Boot Process. Use this procedure if you cannot boot the mainframe from the terminals internal flash ROM. The serial window can be used to verify or modify the Configuration Utility settings:

1. Boot the X Terminal and immediately press the space bar until the prompt BOOT?> appears.
2. Set the DIP switches on the mainframe (located on the rear of the Controller board) to the normal operation position (all up).
3. Wait approximately two minutes for the following sequences to complete:
   - Power on diagnostics
   - LEDs at the rear of the Controller board begin to perform a continuous swirling pattern
   - The hard disk activity light no longer glows

4. Verify the proper internet parameters is set in the X Terminal monitor. Refer to Table 4–37.

5. Check that the BPATH is /XP300/os (/XP10/os for 9202XT or 9203XT terminals).

NOTE. *Case sensitivity does apply.*

6. Type boot tftp at the X Terminal boot prompt and then press Enter.

7. Verify that the boot progress indicator bar staedily progresses from 0% to 100%. This should take approximately one minute. Once 100% is reached the Serial window followed by the DAS window appear.

LAN Network Troubleshooting

This section discusses problems that could cause the 92LANSE or 92LAN Modules to lose or prevent communications with your host. This section is divided into two parts:

- Problem Isolation
- Communications

Equipment Required. You need the following equipment to perform these tests. (The number in parenthesis identifies the Tektronix Part Number.)

- One ethernet stinger-to-BNC adapter (103-0278-00)
- One BNC-T connector (103-0030-00)
- Two 50-ohm BNC terminators (011-0123-00)

Problem Isolation. This section consists of the following parts:

- Checking the 92LAN or 92LANSE Module off the net
- Network hardware setup
- Network software setup

Checking the Module Off the Net (92LAN Only). This procedure tests the 92LAN Module functions independently of the network environment. For THICKNET networks, use the following procedure:

1. Connect the transceiver (AUI) cable between the LAN back-panel connector and the transceiver.

2. Disconnect the transceiver from the tapping block.

3. Connect an ethernet stinger-to-BNC adapter to the transceiver's tapping block connector. Then connect a BNC-T connector to the adapter and a 50-ohm BNC terminator to each open end of the BNC-T connector.

   This isolates the 92LAN Module from the network and creates a proper termination environment for the ethernet transceiver.

4. Power up the mainframe to automatically execute the external loopback test. If the Module is operational, the external loopback test passes.

5. Check that the external loopback test has passed by verifying the following:

   - The LAN Boot Status in the LAN overlay indicates the system is up.
   - The servers available in the LAN overlay are listening.
   - The value of the diagnostic word is zero.

   You can also run the external loopback for the 92LAN Module test in DDM mode, as described in *Using DDM Mode*. DDM mode loops the test to check for intermittent connections.

For a THINNET network, use the following procedure:

1. Disconnect the 92LAN Module from the network cable at the LAN back-panel BNC connector. Do not break other network cable connections or the network becomes non-functional.

2. Attach a BNC-T connector to the the LAN back-panel BNC connector. Connect a 50-ohm BNC terminator to each of the BNC-T connector's open ends.

   This isolates the 92LAN Module from the network and creates a proper termination environment for the thinnet transceiver, which is part of the module.

3. For the 92LAN Module, power up the mainframe to automatically execute the external loopback test. If the Module is operational, the external loopback test passes.

4. Check that the external loopback test has passed by verifying the following:

   - The LAN Boot Status in the LAN overlay indicates the system is up.
   - The servers available in the LAN overlay are listening.
   - The value of the diagnostic word is zero.

   You can also run the external loopback for the 92LAN Module test in DDM mode, as described in *Using DDM Mode*. DDM mode loops the test to check for intermittent connections.

Network Hardware Setup. The following steps check the network and 92LAN or 92LANSE hardware. Each step first asks you a question, then points to an area of possible trouble.

1. For the 92LAN Module, does the LAN overlay LAN Boot Status message indicate that the system is up? If the system is not up, refer to *Boot Messages* in this section.

2. For the 92LAN Module, does the DAS Diagnostics menu indicate a PASS for the 92LAN board, but the LAN overlay LAN Boot message states that the LAN cable is not connected? Check that the Thicknet/Thinnet jumper block on the 92LAN board is in the proper position and that the board is properly connected to the network. Also, refer to Step 6.

3. For both LAN modules, is the status for the servers shown as Listening? If their status is Connected, the LAN is being used by another user or is hung. Determine if other users are connected.

4. Is the THICK/THIN jumper block (J686 on the 92LANSE Module or J315 on the 92LAN Module) in the proper position for the LAN cabling used?

5. Are all connections to the network correct? Is the network properly terminated? If the network uses thinnet cable, is the thinnet T-connector attached directly to the LAN back-panel BNC connector (on the DAS) without 50-ohm extension cables?

   Check that no metal part of the LAN cabling is grounded to earth ground. Insulated covers are available for insulating metallic parts of the network cable. Contact site network administrator for assistance.

6. Can other hosts on the network communicate with one another? Can they communicate with the DAS? For example, try the UNIX command string "/etc/ping hostname" (substitute the name of your host for "hostname") to test network operation.

7. Network hardware problems may cause the 92LAN Module to fail its external loopback test for a variety of reasons, such as a shorted or incorrectly terminated network cable. (This is possible for either a thinnet or thicknet network.)

   With a thicknet cable, tapping block connections to the ethernet cable center conductor may be open, intermittent, or noisy. First, determine if the problem is caused by the connection/termination or the thicknet transceiver. It may be helpful to isolate the 92LAN or 92LANSE Module from the network.

8. Check the LAN back-panel connector for continuity between the connector and the network interface.

Network Software Setup. The following steps check the network and the DAS LAN software. Each step asks a question, then points to an area of possible trouble.

1. Have you assigned a unique DAS hostname and internet address and entered them in the /etc/hosts file, or its equivalent, on your host computer?

   Use the cat or more UNIX command to view the entries in the /etc/hosts file.

***NOTE**. The system or network administrator should modify this file.*

2. Does your host use ARP to resolve internet-to-ethernet address correspondence? Use the /etc/arp –a UNIX command, or its equivalent, to view the current contents of the hosts ARP table. If the 92LAN or 92LANSE Module has been exchanged, the entry in this table must be modified or cleared before the host can initiate communication with the new board.

***NOTE**. In most UNIX-like operating systems, unused entries are automatically cleared periodically if communication with the host has not taken place.*

   For example, use the UNIX command string "/etc/ping hostname" to test network operation; substitute the DAS internet address for *hostname* to test communication to the DAS via LAN.

3. For the 92LAN Module, is the optional 92LAN Module Support Software loaded onto the DAS mainframe's hard drive and is it not corrupted? Use the Version menu to determine the presence of 92LAN Support Software and run the Verify Software Utility.

4. Does the LAN overlay contain the correct hostname, internet address, gateway address, and subnet mask? If not, enter the correct information and reboot the LAN.

5. Did you reboot the LAN after entering or modifying the DAS hostname, internet, gateway address, or subnet mask? Rebooting is necessary for the new values to be used.

6. For the 92LAN Module, use the DTP terminal to check 92LAN ARP table entries and use Snoopy mode to determine if any packets are addressed to the 92LAN.

7. Does ftp report an error when the host issues a command? Refer to *Using ftp* in the *92LAN User/Installation Manual* or in the *92LANSE Instruction Manual* for error messages.

8. If the host runs the DEC VMS Operating System, has a third-party TCP/IP-compatible FTP software package been properly installed and set up on the host? If not, contact your system administrator or Tektronix sales engineer.

LAN Communications

The DAS LAN can interface and communicate with a variety of host computers running various operating systems.

Host computers communicate with the DAS using either the ftp (file transfer protocol), rsh (remote shell), or rcp (remote copy) commands.

Refer to the *92LAN User/Installation Manual* or *92LANSE Instruction Manual* if you use ftp. The rsh and rcp commands are not discussed in the *92LAN Users/Installation* Manual or *92LANSE Instruction Manual*, but they function because the LAN Support Software contains a rshd daemon. You can execute the ftp, rsh, and rcp commands from only a host computer terminal.

You can use either the assigned *hostname* or the DAS internet address with these commands. The actual hostname or internet address should be substituted for the *hostname* or the *internet address* shown in the example.

The following examples show the ftp, rsh, and rcp command syntax. Each example is followed by a brief description.

- "ftp hostname" initiates an ftp session with the computer called *hostname*.
- "ftp 8.1.75.128" initiates an ftp session with the host located at internet address 8.1.75.128.
- "rsh hostname date" causes the host called *hostname* to execute the date command and return the output from the command to the requesting host.
- "rsh 8.1.75.128 /bin/sh –i" causes the host at internet address 8.1.75.128 to invoke an interactive shell process. This is similar to a remote login (rlogin) to the host. Use Control-d to end this shell. Be careful when logged into the DAS, since you could damage the software on the hard disk drive.
- "rcp hostname:/la_files/Setup/lan_test lan_test.local" copies the file lan_test from the directory /la_files/Setup on the computer called *hostname* to a file called lan_test_local in the current directory of the host initiating the command.

Boot Messages (92LAN Module Only). The LAN Boot Status field may contain one the following messages:

- System is up — the LAN system is up and running.
- Memory interface failure — the 92LAN Module and the mainframe shared memory and their interface has a problem.
- LAN diagnostic failure — the on-board 92LAN diagnostics display this message if an error occurs during power-up. A hex-formatted word displays in the diagnostic-word (92LAN only) field. For an explanation of these error codes, refer to *LAN Diagnostics*.

- LAN not connected — the Thicknet or Thinnet cable is not attached to the cable assembly on the back panel of the mainframe. Reboot the LAN subsystem after reconnecting the cable.
- LAN boot failure — this message displays the first time the LAN system is powered up without the internet address entered.

Diagnostic Word Error Messages (92LAN Module Only). The LAN Diagnostic Word in the 92LAN overlay consists of a 32-bit hexadecimal word containing the 92LAN diagnostics error codes for all LAN tests. Each bit indicates a separate test. If a test fails, the associated bit is set to a logical one. The diagnostic word is zero if the 92LAN diagnostics do not find any problems. Table 4–38 relates the bits and tests.

Table 4–38: 92LAN Module Diagnostics

Bit	Test
0 (LSB)	DRAM refresh circuitry
1	DRAM address bus
2	DRAM data bus
3	Bus-error circuitry
4	I/O bus eight-bit I/0 bus
5	UART CLOCKINT interrupt circuitry
6	UART PORTINT interrupt circuitry
7	UART internal tests
8	SRAM address bus
9	SRAM data bus
10	SRAM devices
11	Interface interrupt circuitry between the 92LAN card and the mainframe
12	LAN PROM checksum. Ethernet address PROM is corrupted.
13	LAN data bus
14	LAN interrupt circuitry between the 68000 and the 82586 LAN coprocessor on the circuit board.
15	LAN co-processor component has failed.
16	LAN address setup component will not accept an address.
17	LAN internal loopback component failed.
18	LAN Serial Interface Adapter (SIA) failed.
19	LAN external loopback cannot send and receive packet from network. The cable may not be connected to the back panel.

Table 4–38: 92LAN Module Diagnostics (Cont.)

Bit	Test
20–24	No test
25	CPU test
26	EPROM checksum kernel test
27	Even EPROM checksum
28	Kernel testing in progress.
30	Unexpected interrupt occurred
31 (MSB)	Unexpected bus error occurred.

Snoopy Mode for ARP and TCP/IP

The sm command activates and deactivates the "Snoopy mode," which monitors address resolution, transport control and Internet protocols.

The Snoopy mode helps locate problems when a 92LAN is connected to the network. In Snoopy mode, the local terminal displays TCP/IP messages addressed directly to the 92LAN and messages for the network originating at the 92LAN.

***NOTE**. Snoopy mode runs better at faster local terminal baud rates. Snoopy mode may affect 92LAN performance during communication-intensive operations.*

Snoopy mode checks for opened and closed network connections by monitoring the Internet protocol (IP). Snoopy mode also monitors ARP (Address Resolution Protocol) messages to check if the correct Internet address is being searched for and if the 92LAN is being addressed. Addresses in ARP messages are preceded with Q for a query or R for a reply.

The Snoopy mode is off by default. After it has been activated, the Snoopy mode may be in either condition. In response to the Snoopy mode prompt, enter Y Return to turn the Snoopy mode on, or N Return) to turn the Snoopy mode off. If you do not want to change the Snoopy mode condition, press Return without a response.

Because of the Snoopy mode's limited resources (it can buffer up to 100 messages), Snoopy messages may be dropped during a heavy load. The local terminal shows when a message has been dropped. This does not mean that the 92LAN has missed messages.

Output Formats. The Snoopy mode displays the ARP messages in the following format:

```
ARP /QR/ SSSSSSSSSSSS ssssssss DDDDDDDDDDDD dddddddd
```

The Snoopy mode displays the TCP messages in the following format:

```
SSSSSSSS:ssss DDDDDDDD:dddd qqqqqqqq aaaaaaaa wwww
UAPRSFllll[RW][0123456789ABCDEF]
```

The fields for the above formats are defined as follows:

- `SSSSSSSSSSSS ssssssss` are unformatted hexadecimal ethernet and internet addresses.

NOTE*. Internet addresses are usually displayed in the format x.x.x.x, where x is a decimal number between 0 and 255. The sm command displays the value in hexadecimal to fit all of the data onto one line.*

- `DDDDDDDDDDDD dddddddd` is the destination ethernet and internet addresses in hexadecimal, unformatted.
- `SSSSSSS` is the source address from the IP header.
- `ssss` is the source port from the TCP header.
- `DDDDDDDD` is the destination address from the IP header.
- `dddd` is the destination port from the TCP header.
- `qqqqqqqq` is the sequence number from the TCP header.
- `aaaaaaaa` is the acknowledgment number from the TCP header.
- `wwww` is the window from the TCP header.
- `llll` is the TCP data length.
- `R` or `W` displays if the 92LAN is reading (`R`) or writing (`W`) this message.
- `0123456789ABCDEF` is partial data. A maximum of eight bytes are displayed. This field is blank if there isn't any data.
- `ARP` marks an address resolution protocol packet. Lines without an ARP are transport control and Internet controls.
- `UAPRSF` is the flag field. When a flag is not true, the appropriate flag bit shows an underline. If the flag is true, the field contains one of the following letters: U for urgent, A for acknowledge**,** P for push, R for reset, S for synchronize, and F for finish or no more data from sender.

Examples. In the following example, the sm command activates the Snoopy mode and displays the 92LAN current Internet network protocol and ARP messages.

```
Command? sm
Current Snoopy mode: OFF
Available modes are: A-ARP, T-TCP/IP, Y-All, N-Off
or a combination of them, such as AI for aarp and ICMP
? (Press RETURN for no change)

New Snoopy Mode: ARP only
```

Then the Snoopy mode displays the network protocol and ARP messages.

Figures 4–37 through 4–40 show examples of displays with descriptions. Figures 4–37 and 4–38 show typical ARP request and response messages.

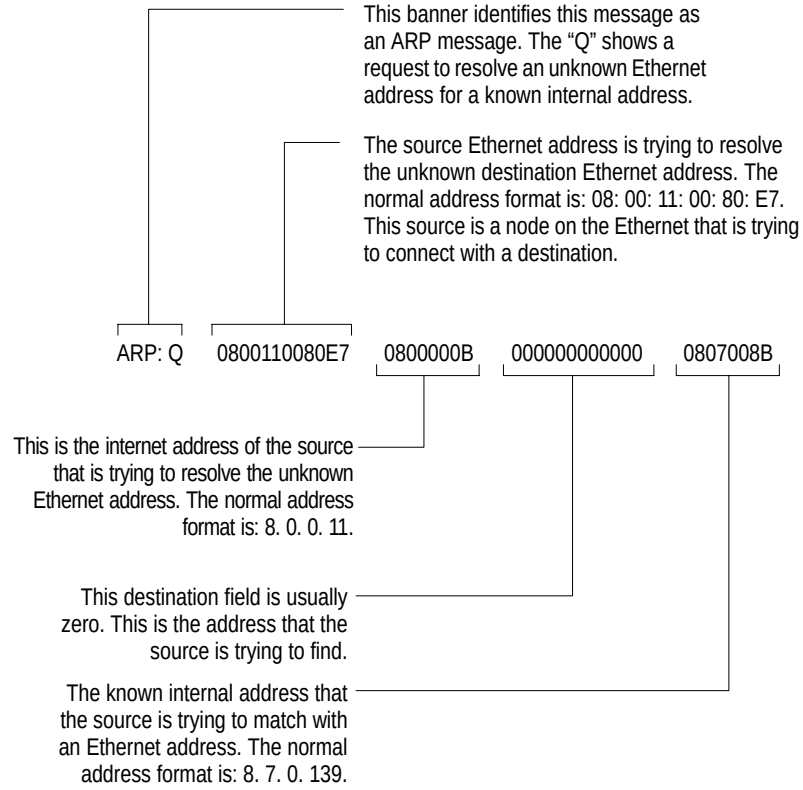


Figure 4–37: Snoopy Mode Example Request ARP Message

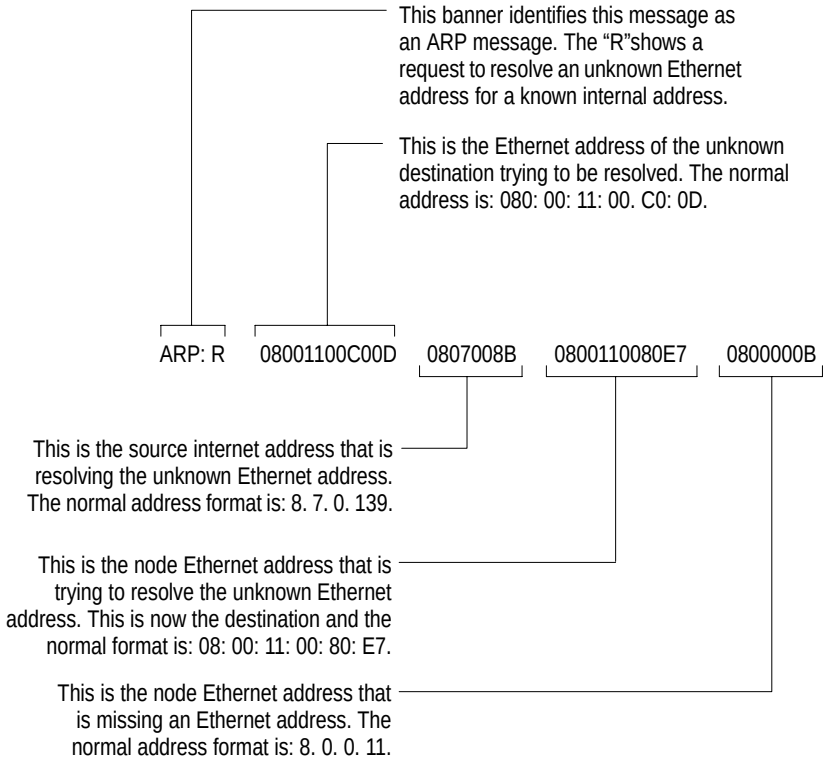


Figure 4–38: Snoopy Mode Example Response ARP Message TCP/IP Message

TCP/IP messages do not have the ARP label. A TCP/IP message has eleven fields. (Refer to Figure 4–39.)

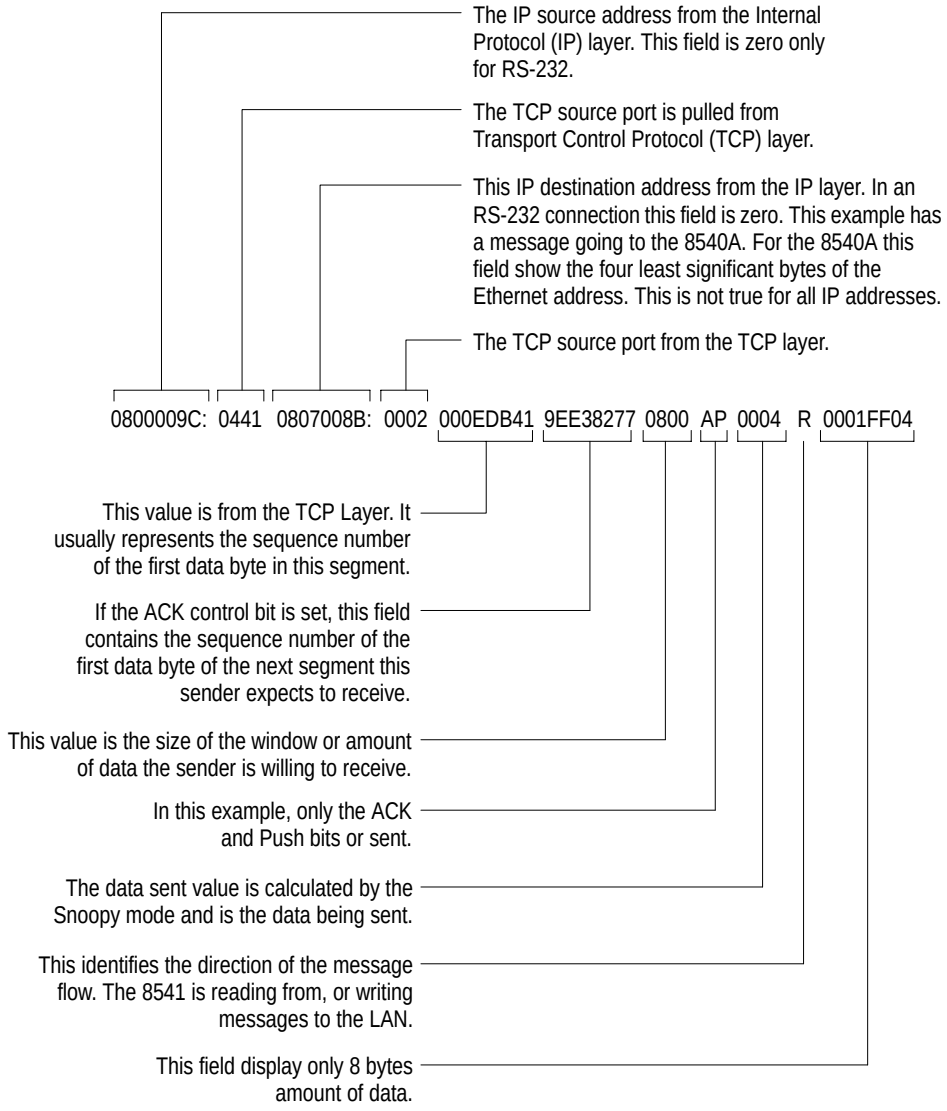


Figure 4–39: Snoopy Mode Example Response TCP/IP Message

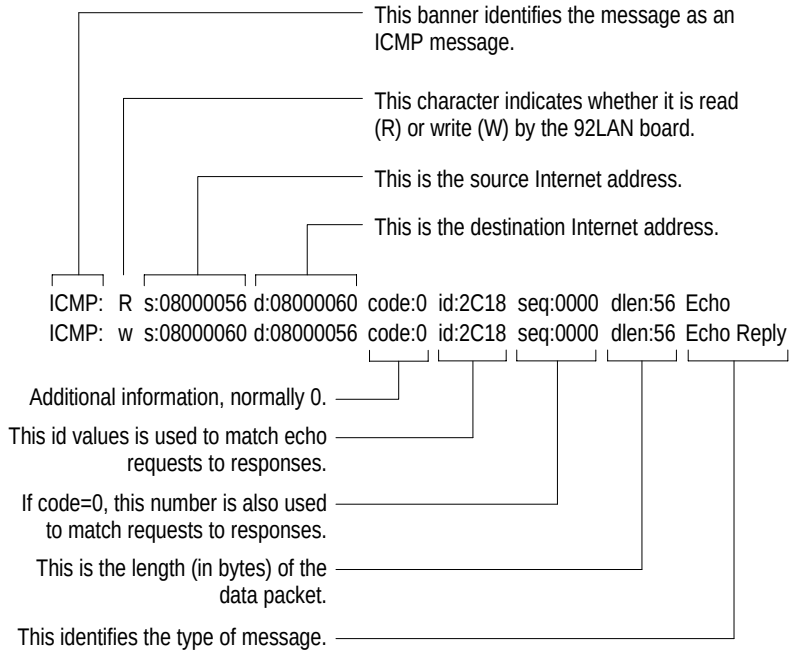


Figure 4–40: 92LAN Snoopy Mode ICMP Example Message

General Circuit Functions

This chapter describes the general functions of the circuitry on DAS major components. System components include the DAS mainframes (including the DAS 92E9 Expansion Mainframe), acquisition and pattern generation modules, probes, communication modules, and terminal. This manual does not discuss the circuit functions of the terminal; refer to the *4105 Service Manual* (9200T), the *4205 Service Manual* (9201T), or the *TekXpress X Terminal Service Manual* (9202XT, 9203XT, 9204XT, or 9205XT) for this information. (The terminal service manuals are not part of the DAS documentation package; contact your local Tektronix representative for ordering information.)

DAS Mainframe

The DAS mechanical chassis houses all mainframe components and options. A card cage within this chassis holds modules; probes connect to the modules through openings in the rear of the chassis. The major mainframe components consist of the following items:

- Backplane board
- Controller board
- Memory board (for DAS 9219/9220 only)
- Hard and Floppy Disk Drives
- Power Supply

These components communicate with each other and with any installed modules via the backplane and mainframe cables. Refer to Figure 5–1 for a cable diagram of the DAS 9219/9220 and Figure 5–2 for a cable diagram of the DAS 9221.

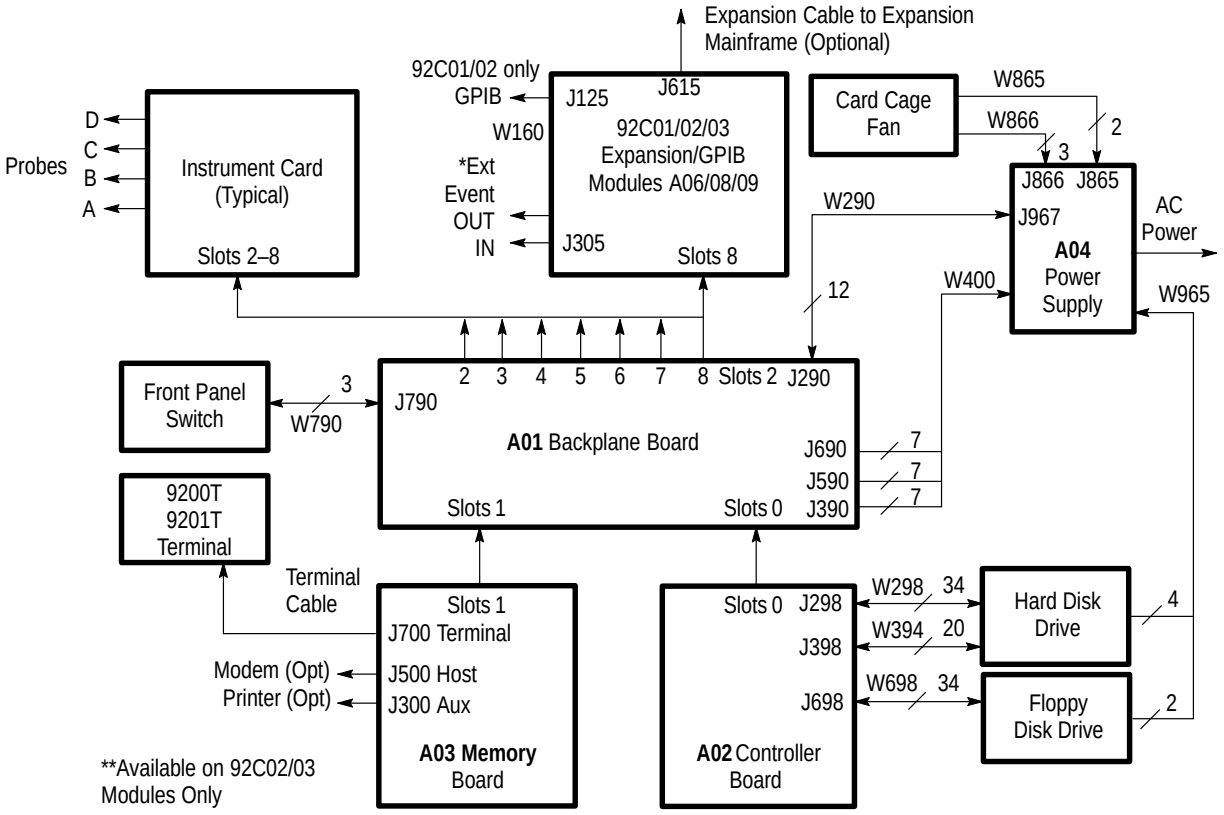


Figure 5–1: DAS 9219/9220 Mainframe Cable Diagram

Backplane Board

This board provides the mechanical and electrical connection between the Controller board, Memory board (for DAS 9219/9220 mainframes), and slots that accept DAS modules. The backplane provides the bus structures for inter-mainframe communications. The modules access the buses within a mainframe through seven 540-pin connector slots mounted on the backplane. The four basic bus structures on the backplane include the following:

- Control bus
- Instrument bus
- Application bus
- Power-supply bus

Some of these buses extend outside the Master mainframe to Expansion mainframes. These buses provide the communication link between the Master mainframe and up to three Expansion mainframes, as shown in Figure 5–3. This figure may also be helpful when troubleshooting system-level failures.

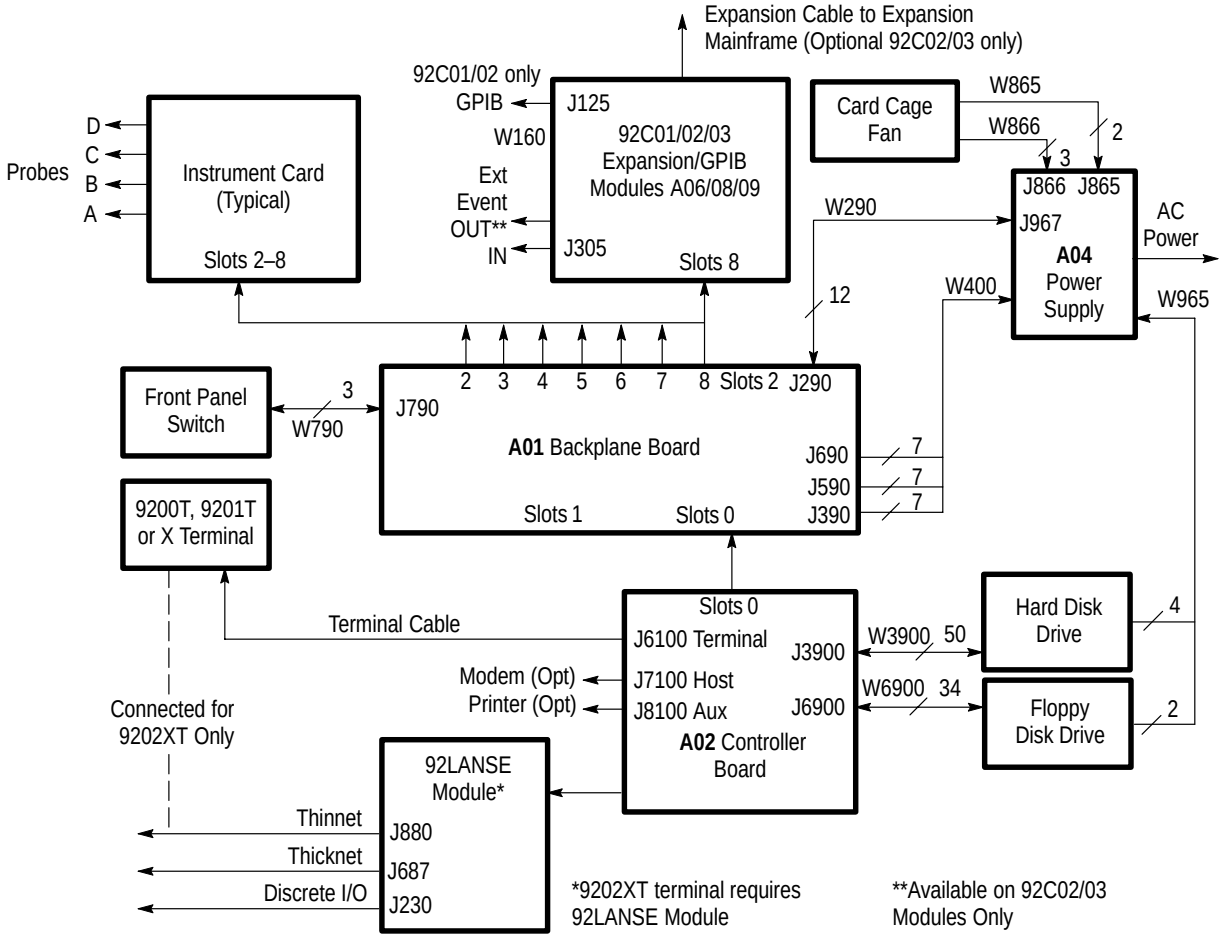


Figure 5–2: DAS 9221 Mainframe Cable Diagram

Control Bus. The Control bus provides buffered address, data, and control lines for the DAS. These lines support the transfer of data, setup, and status information between the Controller board and other mainframe components. This information is not used during real-time interactions with the device-under-test. The primary functions of the Control bus are as follows:

- Provide setup information to the modules
- Provide test vectors to pattern generation modules or programming information to generate test vectors
- Retrieve data from the acquisition module for display or processing by a host computer
- Retrieve status information from modules for display

The Control bus is asynchronous; this allows a wide range of module responses and the ability to extend to Expansion mainframes.

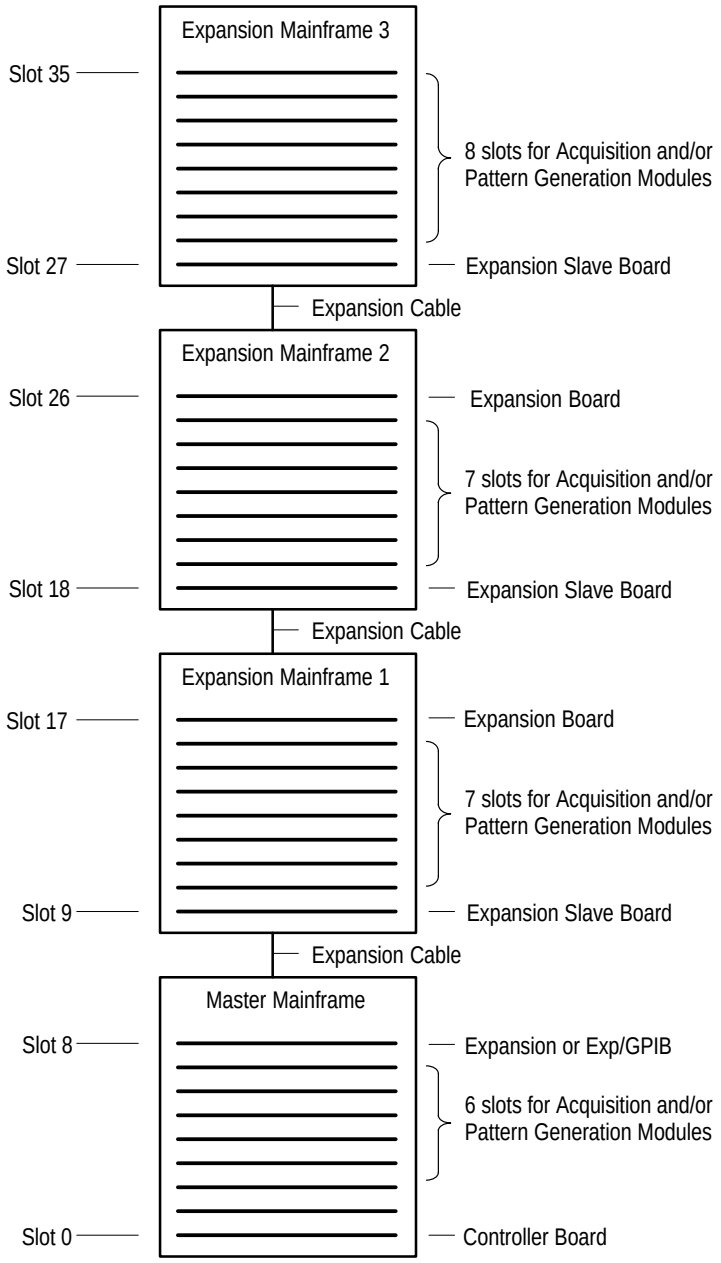


Figure 5–3: DAS System Bus Diagram

Instrument Bus. The Instrument bus consists of three buses: the Event bus, Time Base bus, and Correlation bus.

The Event bus allows modules to pass real-time, low-speed events (≥40 ns) between each other at TTL levels. Sixteen general-purpose event lines allow Boolean combinations of events between modules, including sequential arms, trigger, qualification, and start/stop functions. A differential ECL signal (TSYNC) is a synchronizing clock used to clock events on and off the Instrument bus. TSYNC runs at periods of 40, 80, 160, and 160 ns for one, two, three, and four mainframe systems, respectively. The Controller selects the TSYNC rate to track the reduced speed of events caused by additional Expansion mainframes.

The Time Base bus provides four programmable time bases for asynchronous acquisition and timestamp (for example, a type of correlation). The four time bases are programmable by the Controller from 1 ms to 20 ns, plus 40 ns, in increments of 1, 2, and 5. The time bases, developed from the differential ECL signal MCLK, do not extend to Expansion mainframes. The master mainframe synchronizes Expansion-mainframe time bases with a 10 ns clock signal (ECLK).

The Correlation bus passes signals needed for time alignment of data from acquisition modules. The data may have been acquired at different rates. There are eight correlation signal lines available on the backplane; these signals are buffered at each Expansion mainframe interface. The maximum clock rate is 25 MHz; all correlation signals are open-collector TTL. For a complete description of correlation, refer to the user's manuals for the module.

Application Bus. The Application bus consists of differential pairs of ECL signal lines. It provides fast communication (250 MHz or 800 picosecond edge speeds) between modules installed in adjacent mainframe slots. This allows modules that are grouped into clusters to operate independently. This bus does not extend across mainframe boundaries, except for eight pairs of differential ECL lines that send high-speed events between mainframes.

Power-Supply Bus. The Power-supply bus distributes voltages to all instrument slots on the backplane; other mainframe components receive power through cabling (see Figures 5–1 and 5–2). This bus also carries power-control signals between the Controller board and the power supply; these signals control the powering up/down of the Master mainframe and attached Expansion mainframes.

Controller Board

The Controller board consists of several interrelated circuits that provide the DAS with computing resources and the means for setting up hardware for the mainframe and its modules. Expansion mainframes contain an Expansion Slave board, instead of a Controller board.

DAS 9221 Controller. Figure 5–4 contains circuit blocks with alphabetical indexes to the following descriptions for DAS 9221 Controller boards.

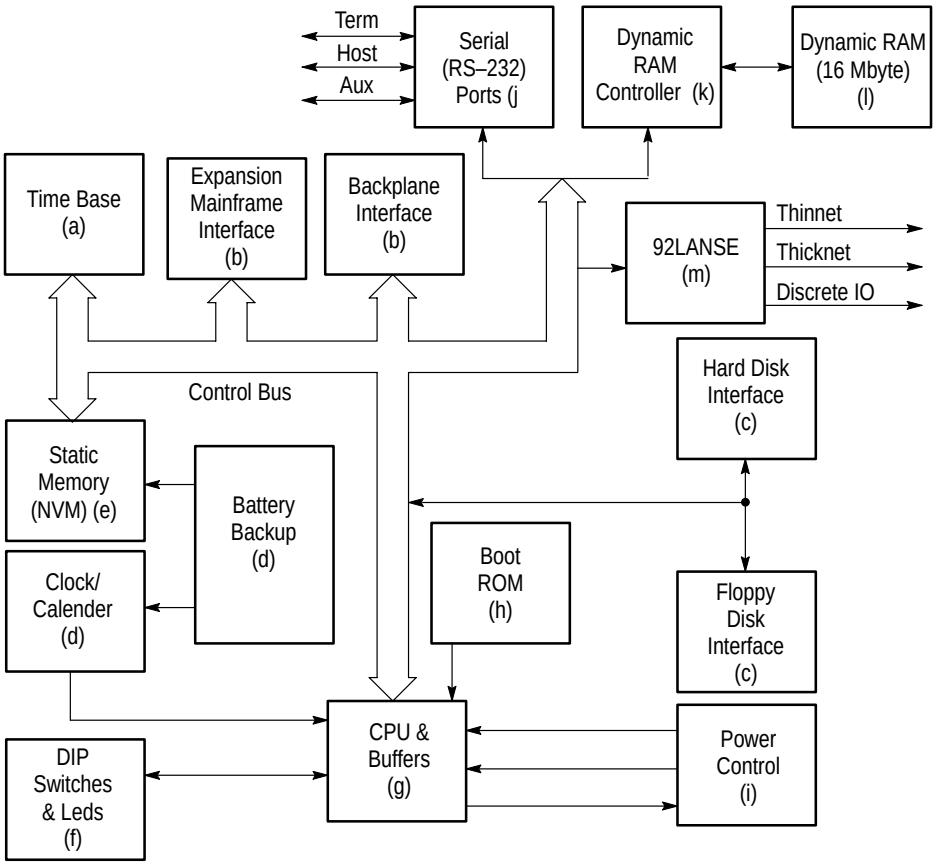


Figure 5–4: DAS 9221 Controller Board Block Diagram

(a) Four asynchronous ECL TIME BASES reside on (and are programmed by) the Controller board. Asynchronous acquisitions and timestamp operations use these time bases. For more information on the time bases, refer to *Instrument Bus* beggining on page 5–4.

(b) The Controller board has interface circuitry for Expansion mainframes and the backplane. The EXPANSION MAINFRAME INTERFACE links the Control and Instrument buses between the Controller and the time-aligned expansion mainframes. The BACKPLANE INTERFACE provides the connection for address, data, and control lines between the controller's CPU and the module slots.

(c) The SCSI HARD DISK INTERFACE and the FLOPPY DISK INTERFACE link the control lines from the CPU to the hard and floppy disk drives. The floppy disk interface uses a CACHE MEMORY; this is a high-speed intermediate buffer that talks directly to the CPU using the Control bus. The SCSI interface uses DMA to access memory directly.

(d) The Controller board contains a single part that contains BATTERY BACKUP, CLOCK/CALENDAR, and STATIC MEMORY (NVM). The battery powers the other features when the mainframe loses power (such as when you disconnect the power cord or power down the mainframe).

(e) The STATIC MEMORY contains approximately 32 Kbytes of nonvolatile RAM for storing interrupt routine addresses, previous shutdown conditions, and pointers to other processes.

(f) LEDs monitor the state of the power supplies and activity of the CPU during level 0 power-up diagnostics. DIP SWITCHES override the baud rates (set in the Communications menu) for the RS-232C ports. Refer to *Controller Board LEDS* on page 4–20 for more information on the LEDs.

(g) The CPU is a 68EC030 microprocessor operating at 40 MHz; it uses an asynchronous bus structure and decoding circuitry to transfer 32 address bits and 32 data bits. The BUFFERS link the address, data, and control lines from the CPU to outside circuitry. These buffers can be tri-stated when other controllers (for example, a GPIB DMA controller) use these lines.

(h) The BOOT ROM contains 64 Kbytes of ROM space used to store power-up sequences and level 0 diagnostic.

(i) POWER CONTROL issues the TURNOFF request signal to the CPU for a normal power-down sequence (power switch OFF). The CPU performs file-management procedures and sends a SHUTDOWN signal to the power supply, causing the power supply to shut down.

If an unexpected power loss occurs (for example, power cord pulled), the power supply issues the POWER FAIL signal to the CPU. The CPU does not access the disk drives to store data, instead STATIC MEMORY stores the data. The next time you power ON the mainframe, the Previous Shutdown field in the Power Up menu contains the message “Power Failure” instead of “Normal.” Refer to Table 4–7 on page 4–25 for more information on the messages in the Previous Shutdown field.

(j) The SERIAL (RS-232) PORTS provide support for Terminal, Host, and Auxiliary communications.

(k) The DYNAMIC RAM CONTROLLER consists of RAM read/write accessing and refresh circuitry for the DYNAMIC RAM.

(l) The DYNAMIC RAM contains 16 Mbytes of storage. Most of the DYNAMIC RAM stores system software and post-processes acquired data. The upper quarter of DYNAMIC RAM temporarily stores configuration and data files to improve the system response time.

(m) The 92LANSE Module is an I/O adapter that connects directly to the Controller board. The module provides an Ethernet communication medium for host and 9202XT terminal interfacing. The 92LANSE module also provides limited remote control and monitoring capabilities. The module is optional with the 9200T or 9201T terminal, but required for the 9202XT terminal.

You can power up/down the DAS 9221 using two pins on the Controller board (J5000 labeled REMOTE). The pins are at the rear of the Controller board and are accessible through the card cage. Shorting the pins together causes the mainframe and all expansion mainframes to power up. To power down the mainframes, remove the short.

Also, you can power up and power down your DAS 9221 mainframe and terminal using the terminal power button. To use this option, install a jumper wire between J6110-1 (labeled REM) and J8101-3 (labeled RTS) on the Controller board. When you turn on the terminal (with the mainframe power switch in the OFF position), power is applied to the mainframe after the terminal power-up diagnostics complete. The jumper is not installed when the DAS is shipped.

NOTE. *If the terminal fails its power-up diagnostics with the jumper wire installed, the terminal may not display information from the mainframe.*

DAS 9219/9220 Controller. Figure 5–5 contains circuit blocks with alphabetical indexes to the following descriptions for DAS 9219/9220 Controller boards.

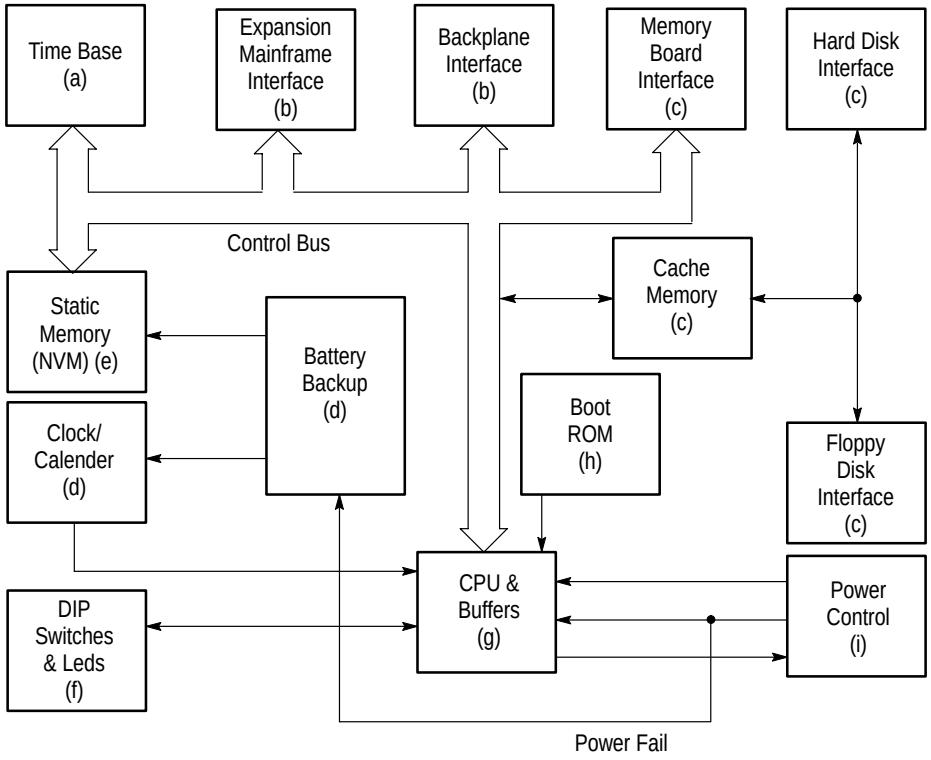


Figure 5–5: DAS 9219/9220 Controller Board Block Diagram

(a) Four asynchronous ECL time bases reside on (and are programmed by) the Controller board. Asynchronous acquisitions and timestamp operations use these time bases. For more information on the time bases, refer to *Instrument Bus* beginning on page 5–4.

(b) The Controller board has interface circuitry for expansion mainframes, the backplane, and the Memory board. The EXPANSION MAINFRAME INTERFACE links the Control and Instrument buses between the Controller and the time-aligned Expansion mainframes. The BACKPLANE INTERFACE provides the connection for address, data, and control lines between the controller's CPU and the module slots. The MEMORY BOARD INTERFACE links the controller's CPU to the memory's dynamic RAM controller and RS-232C ports.

(c) The HARD DISK INTERFACE and the FLOPPY DISK INTERFACE link the control lines from the CPU to the hard and floppy disk drives. Both interfaces share a CACHE MEMORY; this is a high-speed intermediate buffer that talks directly to the CPU using the Control bus.

(d) The Controller board contains a BATTERY BACKUP circuit that powers the CLOCK/CALENDAR circuit and STATIC MEMORY (NVM) when power is removed from the mainframe (for example, when the power cord is pulled).

(e) The STATIC MEMORY contains 16 Kbytes of nonvolatile RAM for storing interrupt routine addresses, previous-shutdown conditions, and pointers to other processes.

(f) LEDs monitor the status of the power supplies and activity of the CPU during level 0 power-up diagnostics. DIP SWITCHES override the baud rates (set in the Communications menu) for the RS-232C ports on the Memory board. Refer to *Controller Board LEDs* on page 4–20 for more information on the LEDs.

(g) The CPU is a 68010 microprocessor operating at 10 MHz; it uses an asynchronous bus structure and decoding circuitry to transfer 24 address bits and 16 data bits. The BUFFERS link the address, data, and control lines from the CPU to outside circuitry. These buffers can be tri-stated when other controllers (for example, a GPIB DMA controller) use these lines.

(h) The BOOT ROM contains 32 Kbytes of ROM space to store power-up sequences and level 0 diagnostic routines.

(i) POWER CONTROL issues the TURNOFF request signal to the CPU for a normal power-down sequence (power switch OFF). The CPU performs file-management procedures and sends a SHUTDOWN signal to the power supply, causing the power supply to shut down.

    If an unexpected power loss occurs (for example, power cord pulled), the power supply issues the POWER FAIL signal to the CPU and BATTERY BACKUP. The CPU does not access the disk drives to store data, instead STATIC MEMORY stores the data. The next time you power ON the mainframe, the Previous Shutdown field in the Power Up menu contains the message “Power Failure” instead of “Normal.” Refer to Table 4–7 on page 4–25 for more information on the messages in the Previous Shutdown field.

You can power up/down the DAS 9219/9220 using two pins on the Controller board (J605). These pins are located at the rear of the Controller board and are accessible through an opening at the rear of the mainframe. Shorting the two pins together causes the Master mainframe and all Expansion mainframes to power up. To power down the mainframes, remove the short.

Also, you can install an optional one-button power-switch adaptor to power up and power down your DAS 9219/9220 mainframe and terminal using the terminal power button. To use this optional accessory, connect the adapter in series with the terminal’s RS-232 cable near the back of the mainframe. Connect the adapter’s two-pin jumper wire to the two pins of J604 on the Controller board. When you turn on the terminal (with the mainframe power switch in the OFF position), power is applied to the mainframe after the terminal power-up diagnostics complete.

Memory Board (DAS 9219/9220 Only)

The Memory board consists of circuit blocks that provide the DAS 9219/9220 with dynamic RAM space and serial ports for RS-232 communications. The Memory board must reside in slot 1 of the Master mainframe card cage; Expansion mainframes do not contain a Memory board. The main differences between the 2 Mbyte and 8 Mbyte Memory boards are the amount of RAM and the RAM circuitry; the other circuit blocks are identical on both boards. Figure 5–6 contains circuit blocks with alphabetical indexes to the following descriptions.

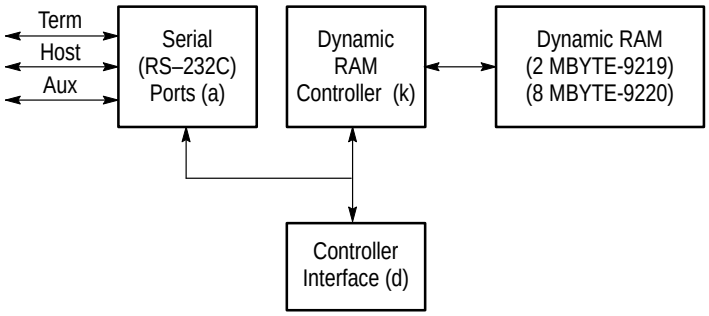


Figure 5–6: DAS 9219/9220 Memory Board Block Diagram

(a) The SERIAL (RS-232) PORTS support Terminal, Host, and Auxiliary communications.

(b) The DYNAMIC RAM CONTROLLER consists of RAM read/write accessing and refresh circuitry for the DYNAMIC RAM.

(c) On the 2 Mbyte Memory board, the DYNAMIC RAM contains 2 Mbyte of storage for supporting system software and for post-processing of acquired data and other calculations.

On the 8 Mbyte Memory board, the DYNAMIC RAM contains 8 Mbyte of storage. The lower half of the DYNAMIC RAM stores system software and post-processes acquired data. The upper half of DYNAMIC RAM temporarily stores configuration and data files to improve the system response time.

(d) The CONTROLLER INTERFACE links the memory's DYNAMIC RAM CONTROLLER and SERIAL RS-232C PORTS to the controller's CPU.

Hard and Floppy Disk Drives

A media frame inside the Master mainframe houses the hard disk and floppy disk drives; Expansion mainframes do not have disk drives. These drives interface with the Controller board via ribbon cables. Cables from the power supply power the drives (see Figure 5–1 and 5–2 on pages 5–2 and 5–3).

The storage capacity for the standard hard disk drive in DAS mainframes is as follows:

- 127 Mbyte for DAS 9221 (earlier versions contained a 100 Mbyte drive)
- 40 Mbyte for DAS 9220 (no longer available)
- 10 Mbyte or 20 Mbyte for DAS 9219 (no longer available)

An 80 Mbyte hard disk drive is available for the DAS 9219/9220 as an option. Removable-media hard disk drives are also available as options; an 80 Mbyte drive is available for the DAS 9219/9220 and an 127 Mbyte drive is available for the DAS 9221 (The 20 Mbyte (DAS 9219/9220) and the 100 Mbytes (DAS 9221) are no longer available).

When you power down the mainframe by pressing the ON/OFF switch, a power-down sequence locks the head in the hard disk drive into a safe position and completes file-management procedures.

Use the floppy disk drives for the following purposes:

- Loading application software from floppy disk
- Copying files for use on other DAS mainframes
- Making and restoring backup files
- Storing instrument setups, reference data, and acquisition data from the modules

A light on the front of the floppy-disk drive indicates when the mainframe is accessing a floppy disk. This light glows slightly when the system is powered up, but the drive is not in use.

A 5.25-inch 400 Kbyte floppy disk drive was standard in the DAS 9219 mainframe, and was available as an option for the DAS 9220. This drive reads or writes to floppy disks in 360 Kbyte or 400 Kbyte format only. Use only 48 TPI (tracks-per-inch), double-sided, double-density floppy disks with this drive; do not use 96 TPI disks.

A 5.25-inch 1.2 Mbyte floppy disk drive was standard in the DAS 9220 and DAS 9221 mainframes, and was available as an option for the DAS 9221 mainframe. This drive reads or writes to floppy disks in 1.2 Mbyte format. This drive also reads floppy disks written in 400 Kbyte format (for example, 92SS Backup System Software); however, it should not be used to write to disks of this type. Use only 96 TPI, double-sided, high-density floppy disks to store and retrieve data with this drive.

A 3.5-inch 1.44 Mbyte floppy disk drive is available with DAS 9221 mainframes with system software Release 3, Version 1.40 and higher. The disk drive has 512 byte sectors, 18 sectors per track, two tracks per cylinder, and 80 cylinders per disk. The drive is low-level PC format compatible.

Power Supply

The power supply is located in a separate housing within the mainframe. A series of 21 wires attached to the backplane transfers power from the power supply to the modules, Memory board (in DAS 9219/9220 mainframes), and Controller Board. The system controller controls the power supply via a ribbon cable which attaches to the backplane. The media power cable supplies power to the DAS mainframe media. The 2-wire fan power cable supplies power to the card-cage fan. The power supply senses proper operation of the fan through the 3-wire fan performance sense cable. The power supply provides the following functions:

- +3, +5 and ±17.5 volt supplies for the mainframe components (refer to Figures 5–1 and 5–2 on pages 5–2 and 5–3)
- Power to the power-supply fan and card-cage fan. A temperature sensor in the power supply controls the fan voltage. The voltage varies from 16 V to 32 V to provide higher fan speeds when more cooling is needed.
- Power to the instrument modules plugged into each slot of the backplane. Each module has different power requirements (refer to *Power Cords* on page 1–11).
- Keep-alive power to the Controller board for use in the power-control circuitry
- Temperature sensors to detect over-temperature conditions in the mainframe, so the mainframe powers down
- Line-voltage circuitry for operation with a 115 V or 230 VAC power source (refer to *Selecting the Line Voltage and Replacing the Line Fuse* beginning on page 2–6)
- A fuse, located on the back panel, to protect from current surges. 115 V operation uses a 15 A fuse; 230 V operation uses a 10 A fuse.

DAS 92E9 Expansion Mainframe

The DAS 92E9 Expansion mainframe provides additional slot space for acquisition and pattern generation modules in the DAS system. The Expansion mainframe connects to a Master mainframe (or another Expansion mainframe) through an expansion cable assembly. One end of this cable assembly plugs into the 96-pin connector of a 92C02/03 module installed in slot 8 of the previous mainframe (Master or Expansion). The other ends of the cable assembly attach to six connectors on the Expansion Slave board in slot 0 of the next Expansion mainframe in the system. This extends the DAS system bus structure to the Expansion mainframe. This allows a Master mainframe to control a system containing as many as three Expansion mainframes.

The DAS 92E9 Expansion mainframe uses the same basic mechanical chassis as other DAS mainframes. (Refer to Figure 5–7 for an internal cabling diagram.)

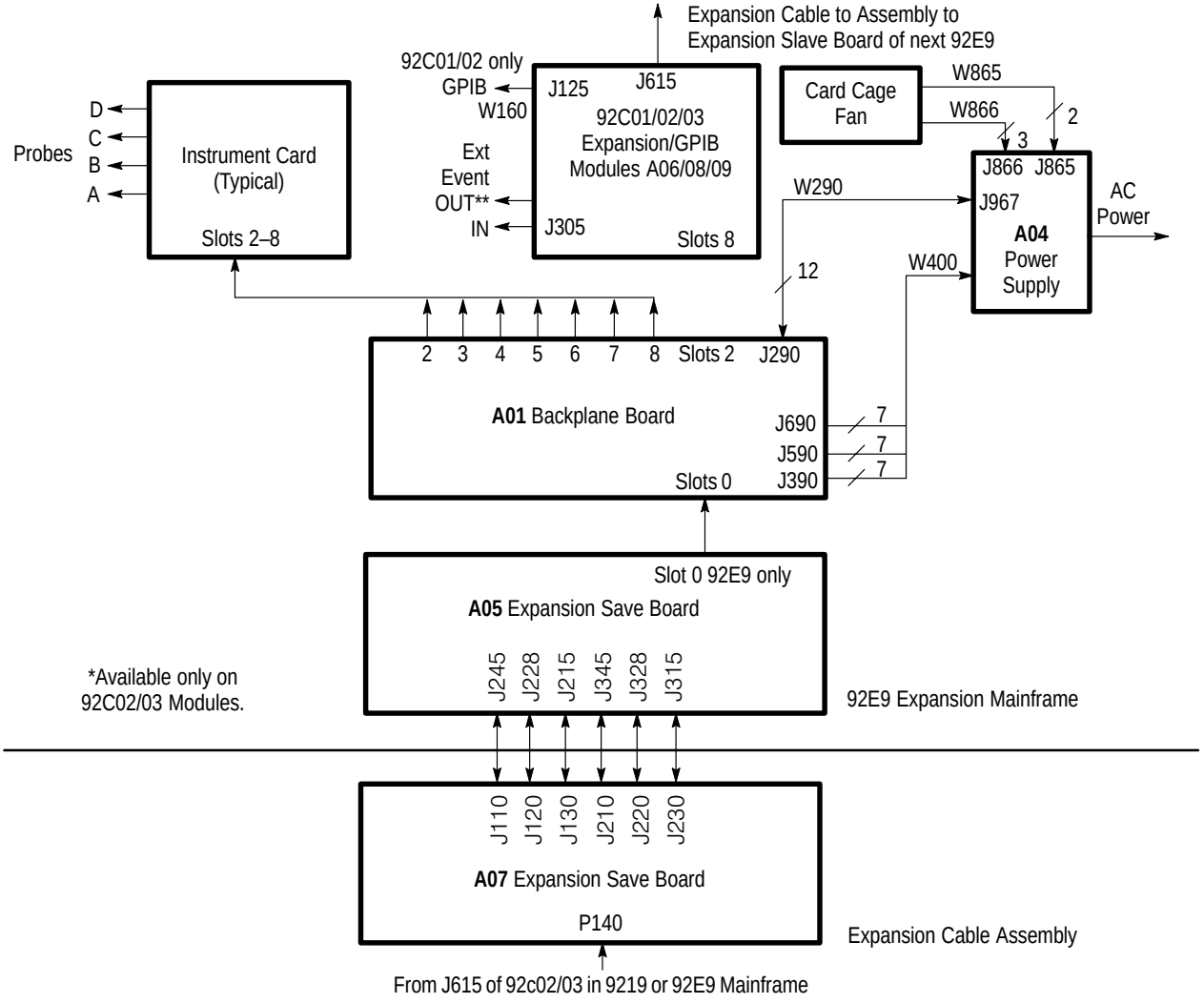


Figure 5–7: DAS 92E9 Expansion Mainframe Cable Diagram

Some of the same major components in the Master mainframe are also part of the DAS 92E9 Expansion mainframe; these components include the Backplane board, the Card cage, and the Power supply.

The DAS 92E9 Expansion mainframe does not contain hard or floppy disk drives, Memory board, Controller board, or front-panel power DC switch. Power control is provided by the Master mainframe through the expansion cable assembly.

Major components unique to the Expansion mainframe include the Expansion Slave board and the Expansion cable assembly.

Expansion Slave Board

The Expansion Slave board occupies the same physical slot in the Expansion mainframe as the Controller board occupies in the Master mainframe (slot 0). The Expansion Slave board uses a Backplane board for electrical connections to DAS modules. Some of the buses on the Master mainframe's backplane are also available to Expansion mainframes through the expansion cable assembly. The expansion cable assembly that connects a Master mainframe (or Expansion mainframe) to another mainframe is composed of a six cables that attach to an Expansion Cable board mounted inside a housing. The Expansion Cable board does not contain active circuitry.

The four basic bus structures carried on the backplane are as follows:

- Control bus
- Instrument bus
- Application bus
- Power-supply bus

Refer to Figure 5–3 for an illustration of the bus structures. Also, refer to *Backplane Board* for a detailed description of these buses.

The Expansion Slave board contains interface circuitry for communicating with the Master mainframe's Controller board and modules. Four programmable time bases for asynchronous acquisition and timestamp operations reside on the Expansion Slave board. The Master mainframe's Controller board programs these time bases. Time bases do not extend beyond the Expansion mainframe; each set of time bases operates independently of the other mainframes.

Since the Expansion mainframe does not have a power switch, the Controller board provides the power control. When a condition requiring power-down occurs in an Expansion mainframe (such as fan failure), the Expansion mainframe issues an interrupt to the Master mainframe's Controller board for power-down.

92A16/16E Data Acquisition Module

The 92A16 Module is a 16-channel data acquisition module suited for general-purpose, medium-speed hardware timing analysis and for high-speed state analysis. The 92A16E expands the number of channels to 32. Up to five 92A16Es can be added for a total acquisition memory width of 96 channels in a single mainframe. The maximum word recognition width for an expansion word set is 64 channels. The 92A16 is composed of circuit blocks that provide the following functions:

- 200 MHz acquisition clock generation for the master 92A16 and all Expander 92A16Es.
- An interface to the CPU on the Controller board of the mainframe. CPU control of the module is accomplished through this circuitry.
- Circuitry to deskew the data input channels; this minimizes the time delay between signals on the module.
- A probe interface that determines probe I.D. status and contains a digital-to-analog converter for generating acquisition thresholds. Incoming acquisition data is compared against this threshold to determine its logical state (high or low).
- Login registers for glitch and edge detection. The registers receive incoming data from the probe interface and send it to the high-speed controller.
- A high-speed controller that contains timer, counter circuits, and trigger state control circuitry; the Event bus passes the resulting information to other modules for their use (as in start/stop triggering). The high-speed controller stops the acquisition process when the trigger condition is satisfied.
- Four parallel word recognizers that recognize binary words up to 16 bits. Before word recognition can occur, these words must be preloaded into a comparison RAM through the CPU interface. Incoming acquisition data is compared against the preloaded words until a match is found.
- A memory multiplexer system that uses a latched pipeline with a 4-phase clock to multiplex the data into a high-speed ECL RAM. This allows the RAM to capture data at 200 MHz.
- Storage qualification for incoming acquisition data and 4 Kbytes of acquisition memory (2 Kbytes with glitches enabled).
- A PROM to supply identification information to the Controller board.

The 92A16E module is functionally the same as the 92A16 except that it does not have a high-speed controller circuit.

P6461/E Data Acquisition Probe

Two P6461/E Data Acquisition Probes are standard with the 92A16/16E Data Acquisition Modules. The P6461 contains eight data channels, one clock channel, and one qualifier channel; this probe has an input threshold range of –5 V to +5 V with low input capacitance (≤ 2.5 pF). A pod I.D. circuit informs the mainframe of the probe type and connection location. The P6461 contains deskew circuitry to ensure that the 92A16 simultaneously receives signals that occur simultaneously at the probe tips. You can replace the circuit boards and podlets for the P6461/E probes; refer to *Replaceable Electrical Parts*.

The P6461E probe has the same features, but does not have the clock channel, qualifier channel, or deskew circuitry.

P6460 Data Acquisition Probe

The P6460 is an optional data acquisition probe that the 92A16 Data Acquisition Module can use as a lower-cost alternative to the P6461/E probes. The P6460 provides eight data channels, a qualifier and a clock channel operating at 100 MHz. The probe is also used with the 92S16 Pattern Generator as an external control probe. The probe contains an input threshold circuit with a range of –5 V to +5 V and has a pod I.D. circuit. For more information, refer to the *P6460 Data Acquisition Probe Instructions* sheet.

92A60/90 Data Acquisition Module

The 92A60/90 Data Acquisition Module consists of two cards and a buffer probe that provide 60 channels (with the 92A60) or 90 channels (with the 92A90) of data acquisition. The two cards are the Controller board (92A60C and 92A90C) and the Memory board (92A60M and 92A90M). The DAS Backplane's Application bus provides inter-card communication. Communication is possible only when the two cards occupy adjacent slots of the mainframe. The Memory board must occupy a lower-numbered slot than the Controller board. 92A60/90 Modules cannot be combined.

The 92A60/90 standard Memory board provides a maximum memory depth of 32,768 data samples. An optional deep Memory board extends the maximum memory depth to 131,072 data samples; this is version 92A60D/90D. A 92A60/90 Module may be field upgraded to a 92A60D/90D by installing a 92F20/21 Memory board upgrade kit.

92A60/90 Controller Board

The 92A60/90 Controller board eliminates unwanted data and performs user-defined operations on the remaining data. The user defines operations in the 92A60/90 menus. Circuit blocks compose the 92A60/90 Controller board and provide the following features and functions:

- An asynchronous 20 MHz clock, developed from the Time Base bus, for asynchronous acquisition. For synchronous acquisition, the Controller board develops a clock by using eight clock/qualifier lines received through the buffer probe from the system under test. Clock lines are edge-sensitive and qualifier lines are level-sensitive.
- 32 Kbytes of acquisition memory.
- An interface for the Buffer Probe.
- Trigger circuitry that detects a valid trigger condition, then passes the Trigger Event to the Memory board for further processing. (See discussions of trigger position and memory addressing in *92A60/90 Memory Board*.)
- 16 states for a trigger-specification program. Only one state (or step) is active at any one time. States are not necessarily performed in sequence.
- A choice of store qualifiers: Store Event, Store By State, and Store/Don't Store Actions. Store Event and Store by State can be combined.
- 16 word recognizers that capture binary words on acquired data up to 60 bits wide for the 92A60 and 90 bits wide for the 92A90.
- Four range recognizers that show when events fell into each range. Two range recognizers are usually used for address and two for data. The address-range recognizers are 32 bits wide for both the 92A60 and the 92A90. The data-range recognizers are 32 bits wide on the 92A90, and 16 bits wide on the 92A60.
- Three counter/timers that are 24 bits wide for both the 92A60 and the 92A90. Each of the three counter/timers is used as either a counter or a timer. They cannot be used as three individual counters plus three individual timers.
- Three Signals In/Out which are used for communication with other modules in the DAS system. These signals travel on the backplane's Event bus.
- Two Flags, which are signals that hold a status indication until reset by the user. Each flag must be used independently.
- A Sync Out TTL-level signal which the user connects into the system for use as an interrupt. An SMB connector mounted on the rear of the Controller board provides the connection for the Sync Out cable. Sync Out is also used with the deskew adapter.

- A Start/Stop function for starting and stopping either the 92A60/90's acquisition or a cluster's acquisition.
- A PROM to supply identification information to the Controller board.

92A60/90 Memory Board

The 92A60/90 Memory board's provides memory addressing and an acquisition memory. The memory is 32 Kbits deep and 60 channels wide (92A60), or 90 channels wide (92A90).

The 92A60/90 Memory board is composed of circuit blocks that provide the following features and functions:

- Trigger-position circuitry that controls the amount of data stored before and after the trigger. You can select from nine trigger positions, or a specific amount of time delay.
- Two storage modes, Normal and Paged. In Normal mode, new data overwrites old data when memory is filled. In Paged mode, a memory page is stored each time a trigger occurs. This allows you to see the data multiple times (depending on the size of the page) around a trigger point. Half of a page is stored before and after each trigger.
- Timestamp operation to correlate data from other 92A60/90 modules. Every sample has a time value stored with a data value. This allows you to view the amount of time that has elapsed between samples.
- Correlation activity with other acquisition modules (92A16 and 92HS8). This circuitry, in conjunction with timestamp operation, communicates with other modules using the Correlation bus.
- A PROM to supply identification information to the Controller board.

92A60/90 Buffer Probe

The 92A60/90 uses the 92A60/90 Buffer Probe. This probe consists of two halves: the buffer probe and the flying lead set. The flying lead set can be pulled away from the buffer probe and replaced with a microprocessor-specific probe adapter (for example, 92DM27 for the 68000 and 68010 Microprocessors). The buffer half contains input buffers, cable drivers, circuitry for electrostatic discharge protection, and a probe ID button. The probe adapters contain circuitry that provides channel assignments to the 92A60C or 92A90C and physical connection to your system.

The 92A60/90 Buffer Probe has three 40-pin probe cables that attach to the 92A90 Controller board. When used with the 92A60, the probe has only two cables. Refer to the *92A60/90 Data Acquisition Module User Manual* for information on connecting the buffer probe to the 92A60/90 Controller board.

92A96 and 92C96 Data Acquisition Modules

The 92A96 and 92C96 Modules are 100 MHz, 96-channel data acquisition modules for general-purpose, medium-speed hardware analysis, 32-bit microprocessor support, and up to 400 megasamples of high-speed time analysis. You can expand the modules to 288 channels of acquisition at speeds of 100 MHz (synchronous) and 72 channels at speeds of up to 400 MHz (asynchronous). The module comes with 8-channel probes and single-channel clock probes, or with an optional 90-channel microprocessor interface.

The modules are available in the following versions:

- 92A96 with an 8K memory (standard)
- 92A96D with a 32K memory
- 92A96XD with a 128K memory
- 92A96SD with a 512K memory
- 92A96UD with a 2M memory
- 92C96D with a 32K memory
- 92C96XD with 128K memory
- 92C96SD with a 512K memory

The 92C96 Modules function identically to the 92A96 Modules. The memory depth of the 92C96 Modules is determined by an ID ROM. Memory upgrade kits are available for the 92C96 Modules. Contact your local Tektronix sales representative for information on the memory upgrade kits.

In addition to stand-alone operation, you can time-correlate the 92A96 or 92C96 Modules with the 92A16, 92A60/90, or other 92A96 Modules to provide multiple time bases.

The circuit blocks of the 92A96 and 92C96 Modules include the following features and functions (refer to Figure 5–8):

- The Processor Interface Subsystem enables the DAS system controller to set up each of the other subsystems using the backplane.
- The Signal Conditioning Subsystem prepares the system-under-test (SUT) data by improving its signal-to-noise ratio before it is sampled. It also selects the synchronous clock source for the Timing Subsystem.
- The Timing Subsystem provides the pipeline timing clocks for the Acquisition and Qualification Subsystems. This circuitry clocks the data from acquisition through storage.

- The Acquisition Subsystem samples the desired SUT data and presents it for qualification and possible storage in memory.
- The Qualification Subsystem examines the sampled data to determine which part of it to store in memory.
- The Memory Subsystem stores the qualified data.
- The Timestamp Subsystem provides a time reference to be stored with each sample.

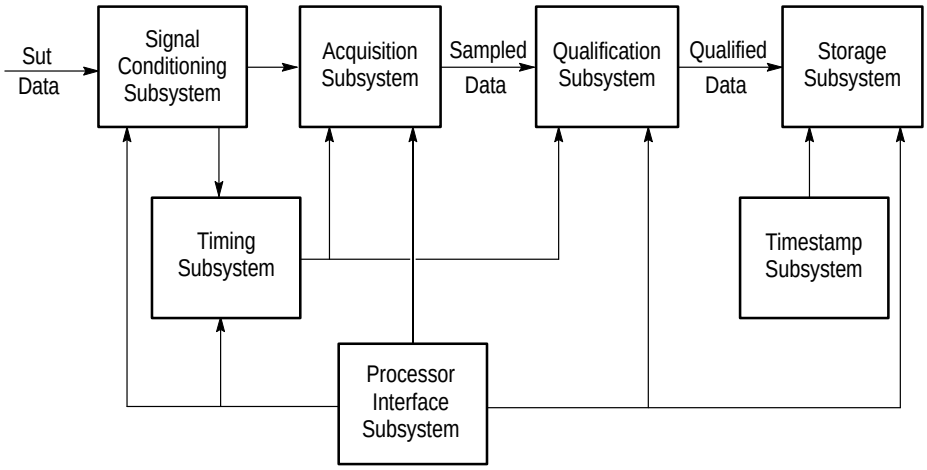


Figure 5–8: 92A96 and 92C96 Module Functional Block Diagram

92HS8/8E High-Speed Data Acquisition Module

The 92HS8 Module consists of an interface board (92HS8 Master or 92HS8E Expander) installed in the DAS, interface cable, and 92HS8 high-speed cabinet. A 92HS8 Module with a single cabinet attached provides eight channels that are capable of sampling rates up to 2 GHz, an 8K memory, two word recognizers, and two levels of triggering. You an expand the 92HS8 to a 16-, 24-, or 32-channel module using interface boards, clock cables, and cabinets (refer to the *92HS8/8E Module User Manual* for details). When forming a module with more than eight channels, clock cables connect each high-speed cabinet to the Master interface board.

The 92HS8 Master interface board and 92HS8E Expander interface board provide the following circuitry:

- An interface to the DAS CPU, through the Backplane's Control bus, for programming control of the 92HS8 cabinet and interface board.
- Static RAM to provide a sequential image of the acquisition memory.

- Circuitry to support one signal event in/out for communication with other DAS modules on the Event bus.
- Circuitry to support correlation (mark) activity with other DAS modules on the Correlation bus.
- A common time base and clock source (500 MHz to 200 Hz) for each cabinet in a 16-, 24-, or 32-channel module (92HS8 Master Interface only).
- Stop-Store signal output from the 92HS8 circuitry that generates a trigger. This signal is ORed on the Master interface card in a 16-32 channel module. If the Stop-Store signal originates from the cabinet attached to the 92HS8E interface card, it is passed to the 92HS8 Master interface card on one line of the Application bus.
- A card ID PROM to provide identification to the DAS Controller board.

The major components in a 92HS8 high-speed cabinet include an Acquisition board, Memory board, power supply, Calibrator board, and three cooling fans. Each cabinet has nine probes (eight data-channel and one trigger/arm probe) that are permanently attached to the cabinet. The 92HS8 cabinet provides the following functions:

- Time base circuitry that generates clock rates from 500 MHz to 200 MHz in a 5-2-1 sequence for asynchronous acquisitions. (Note: This is used only with 8-channel modules and during deskew procedures.)
- High-bandwidth differential probes with adjustable threshold for each channel.
- Four-phase login path that allows 500 ps sampling with a 2 ns clock. Deskewing elements are provided in the login clock path for aligning data sample points across all eight channels.
- A four-bank memory system multiplexed by a factor of eight (16 ns minimum cycle time) to provide 8K of acquisition memory.
- Two 8-bit word recognizers capable of being programmed independently to detect both data and glitches in edge or level modes. Data from the login outputs is compared against a programmed mask and the result (true or false) is sent to the trigger machine.
- A trigger-state machine (minimum clock rate 4 ns) that monitors the two word-recognizer outputs and provides two levels of triggering. There are five possible states (Start, Armed, Ready, Triggered, and Stop), depending on the programmed menu selections and word-recognizer events. A Stop status condition shuts down the 92HS8 system clock at the end of an acquisition if trigger conditions are satisfied.

- Probe threshold and deskewing control circuits. Analog voltages are stored in sample and hold circuits generated by a RAM-driven digital-to-analog converter (DAC). These analog voltages are set to the desired probe-threshold values based on user selections and deskew elements as determined by the deskew procedure.
- Address and data paths to support communication/programming with the DAS CPU through the interface board installed in the mainframe and the interface cable between the mainframe and the cabinet.
- External Arms probe input to provide an enable to the trigger machine based on an external event.
- An External Asynchronous clock probe that provides an input for an external time base for the 92HS8 system clock. A single 8-channel module can be run synchronously using an external clock source if the clock source is periodic and symmetrical. You can select to clock from the rising edge of the external clock (up to 350 MHz) or from both the rising and falling edges (700 MHz).

92S16 Pattern Generation Module

The 92S16 algorithmic pattern generator provides up to 18 channels of output pattern vectors and two clock channels. An SMB connector, located on the back of the module, supplies a TTL-level output trigger signal. The 92S16 can use either the P6464 or P6465 Pattern Generator Probes. You can group a 92S16 with up to seven 92S32 cards to form a wider, deeper pattern-generator module. In this configuration, the 92S16 maintains the circuit interactions and test and branch features. You can include only one 92S16 in any pattern generation module. The circuit blocks of the 92S16 provide the following features and functions:

- A memory depth of 1 Kbyte of RAM.
- Clock outputs (up to a maximum rate of 50 MHz) for the pattern generation probes. You can select various pattern-generator clock rates to use either internal or external clock signals.
- A controller interface and ROMs that allow communication with the DAS Controller board. These ROMs store the module identification.
- A probe interface establishing a serial communications link for the probes and the status-readback circuitry. This allows the Controller board to read the vector being delivered by the pattern-generator probe and identifies the probe attached to each connector (pod). The probe interface also sets the threshold voltage for the P6460 probes.
- Status readback circuits that take data from the microcode memory, program counter, and first latch, and perform logic operations. The information is divided into 8-bit words for transfer to the controller.

- Probe receivers that convert differential ECL outputs from acquisition and pattern-generator probes to TTL levels.
- Vector and microcode memories. The vector memory is a 1K × 16 bit RAM and contains the output pattern. The microcode memory (micro-instruction memory) is a 1K × 28-bit RAM. The output of the microcode memory controls the pattern generation.
- A program counter control multiplexer. This multiplexer interprets codes from the program counter to determine the next address for the vector memory output and the microcode memory.
- An instruction multiplexer that applies appropriate reset signals to the external signal latches and generates a signal to control the 92S32 operating in Follows mode.
- A program counter that takes the output of the instruction multiplexer and applies the address to the vector memory and the microcode memory.
- An interrupt logic circuit that accepts the external interrupt signal from the P6460 or a DAS Event. The signal is clocked through a register that causes the interrupt address to be put onto the bus and the return address to be pushed on the stack.
- A 92S32 address driver. The driver provides a clock and control logic for 92S32s operating in the Follows mode with a 92S16 controller.
- A pattern selector that determines the next output pattern. It selects the output pattern from any of three sources: the vector memory, the internal register, or the first latch before the clock (repeat previous vector).
- A pod clock that may be delayed in 5 ns steps, over a range of –5 to +5 ns, referenced to the master clock.
- Two clock lines. Each clock line contains the delay components to make the 92S16 and 92S32s operate synchronously.
- An inhibit control circuitry that selects either the programmed internal inhibit signal stored in the microcode memory or the external inhibit signal received from the P6460 probe. It can also perform appropriate logic operations between the internal inhibit and the external inhibit signals.
- A PROM to supply identification information to the Controller board.

92S32 Pattern Generation Module

The 92S32 provides up to 36 pattern generator channels featuring sequential pattern generation. Up to seven 92S32 cards can be grouped with a single 92S16 to form a wider pattern-generation module. In this configuration, the 92S16 can use its algorithmic test and branch capabilities to control the 92S32s.

The circuit blocks of the 92S32 provide features and functions:

- 8 Kbytes of output pattern memory.
- Clock outputs (up to a maximum rate of 50 MHz) for the pattern generation probes.
- An interface to the CPU on the Controller board of the mainframe. This circuitry provides CPU control of the module.
- A clock-selector circuit that distributes an internal clock or an externally supplied clock to other circuits on this module and attached pattern-generator probes.
- An address counter that generates an internal vector address and increments this address each time a clock transition occurs (low to high).
- An address selector that takes the result of the address counter and applies it to the output pattern memory.
- An output latch that receives data from the pattern memory and sends it to the pattern-generator probe through four probe-interface circuits.
- 62-ohm terminators that terminate the Application bus for the last card in a module set. The terminated module is designated in the Power Up menu as 92S32T. Refer to *Appendix C* of the *92S16/32 User's Module Manual* for more information on these terminators.
- A PROM to supply identification information to the Controller board.

P6464 and P6465 Pattern Generation Probes

The P6464 Pattern Generation Probe is used with the 92S16/32 Pattern Generation Module. This probe generates nine DNRZ (Delayed Non-Return to Zero) channels of data (50 MHz) and one clock for either TTL or ECL logic systems. The P6464 contains:

- A programming circuit that allows the 92S32 to write to or read from the probe. Only two pieces of information can be read: the probe ID number and the status of the IDENT switch.
- A delay IC for delaying the pod clock relative to the master clock.
- Inhibit drivers that output signals used to drive the inhibit lines of each podlet.

- A +3 V Power Supply board (reference to +5 V).

The P6465 Pattern Generation Probe (used with 92S16/32 Pattern Generation Modules) provides eight DNRZ data channels, one R1/RZ (Return to One/Return to Zero) data channel, and one clock channel. The R1/RZ channel can be programmed to have a pulse width from 5 to 100 ns and a delay from 5 to 100 ns relative to the pod clock. The circuitry within this probe provides the same basic functions as the P6464 probe.

The boards and fuses in both probes are replaceable; refer to *P6464 and P6465 Probe Fuses* on page 4–121 for more information on the fuses.

P6463A Pattern Generation Probe

The P6463A Pattern Generation Probe is used with the 92S16/32 Pattern Generation Modules and can be configured to operate in either the 9-Channel 50 MHz operating mode or the 16-Channel 25 MHz operating mode. When used in the 9-channel mode, the probe is programmed the P6464 probe. The operating mode is selected by positioning two jumpers inside the probe housing and by programming a latch bit in the Program menu.

The probe can generate either 9 or 16 DNRZ channels of data and one clock signal. Data and clock channels can be set for either TTL or CMOS output drive levels by installing different ICs on the Buffer/Driver board. Power for the output driver is provided by the system-under-test or by an external power supply through the red (V_{HI}) or black (V_{LO}) leads. The P6463A probe contains the following circuit boards:

- ID/Logic Board. This board contains the programming circuitry, inhibit drivers, and remote inhibit circuitry.
- Buffer/Driver Board. This board contains ECL input drivers, ECL-to-TTL conversion circuitry, line-driver ICs that drive the output signals, and termination resistor arrays.

Refer to the *P6463A Pattern Generation Probe Instruction Manual* for more information on the probe.

92SX109/118 Pattern Generation Module

The 92SX109/118 Modules provide high-speed 100 MHz pattern generation. The 92SX109 Module is based on an enhanced 92S16 Pattern Generation Module. It is a 9-channel stimulus system that features algorithmic pattern generation. The total memory is 2 Kbytes for each channel for vector patterns and 1 Kbyte for instructions.

The 92SX118 Module is based on an enhanced 92S32 Pattern Generator Module. It is an 18-channel, sequential stimulus system. The total memory is 16 Kbytes for each channel.

One (92SX109) or two (92SX118) multiplexer devices are added to the enhanced 92S16 or enhanced 92S32 Module. Each multiplexer attaches to two of the pattern generator probe pod connectors of the pattern-generator modules. The other side of each multiplexer attaches to a single pattern-generator probe.

These modules can use the P6464 or P6465 probes. A 92SX109 or 92SX118 constitutes a module or you can combine a 92SX109 with up to seven 92SX118s to increase the channel width.

Other than the increased data rate and memory depth, the features of the 92SX109/118 Modules are the same as the 92S16/32 Modules. The configuration, timing, and vector generation operate the same, except that the 92SX109/118 probe outputs two data vectors for every sequence number in the program menu. For more information on other features of the 92SX109/118 Modules, refer to *92S16 Pattern Generation Module,* and *92S32 Pattern Generation Module,* and to the *92SX109/118 Module User Manual*.

92C01/02/03 GPIB and Expansion Modules

The 92C01 Module provides an optional high-speed General Purpose Interface Bus (GPIB) port for the DAS. The GPIB port allows the DAS to be a talker or a listener on the GPIB.

The 92C01 Module consists of a circuit board that must be installed in slot 8 of the mainframe card cage and a cable to a GPIB port connector that attaches to the mainframe back panel. The 92C01's primary address on the GPIB is assigned in the DAS Communications menu (Utility menu group).

The 92C02 Module provides a GPIB port and an interface to the DAS 92E9 Expansion mainframe. The 92C03 module provides only an Expansion mainframe interface. The 92C02's GPIB-port interface is identical to the interface for the 92C01 module. The 92C02/03's Expansion mainframe interface allows up to three Expansion mainframes to be connected in series with a DAS Master mainframe, providing additional slots for DAS modules. A multiwire cable and housing connects the 92C02/03 installed in slot 8 of the Master mainframe to an Expansion Slave board that is installed in slot 0 of the Expansion mainframe. If you have two Expansion mainframes, another 92C02/03 would be installed in slot 8 of the first Expansion mainframe. This 92C02/03 connects to an Expansion Slave board in slot 0 of the second Expansion mainframe. This type of connection scheme would also connect the third mainframe to the system.

Menus in the DAS System Software control the functionality of a multiple-mainframe system. When additional mainframes and modules are added to the system, the DAS automatically lists these additional components in the menus. The DAS Utility menus list the additional mainframes and their contents, allowing you to control the operation and interaction of the modules.

The 92C02/03 modules also provide a set of square pins at the DAS back panel for external event in/out signals and a BTSYNC signal. These signals are used for synchronizing external test equipment to the DAS. Refer to the *DAS System User Manual* for information on the use of these signals.

The 92C01/02 GPIB circuitry provides the following functions and features:

- A Direct Memory Access (DMA) controller that transfers data between the GPIB port and DAS system RAM, or between the GPIB port and any instrument card.
- A GPIB controller to interface from the GPIB port to the CPU on the DAS Controller board.
- A programmable ROM (PROM) to supply identification (ID) information to the DAS Controller board.
- Four light-emitting diodes (LEDs) mounted on one end of the circuit board that are visible through the mainframe's back panel when the module is installed. Three of the LEDs indicate the state of the handshake protocol between the DAS and the GPIB. The fourth indicates a service request from the DAS Controller. Refer to *Troubleshooting* for more information on the LEDs.

The 92C02/03 expansion circuitry, in conjunction with the Expansion Slave board, provides the following features:

- A buffered version of the DAS's Microprocessor bus to the instrument cards installed in the Expansion mainframe. The Strobe lines are re-synchronized to guarantee setup and hold times.
- Eight lines of the Correlation bus that are bidirectionally buffered across the mainframe interface. The direction is programmatically controlled by software. Lines that are not programmed remain unused between mainframes. Refer to *Correlation Bus* earlier in this section.
- Synchronous Event lines that are bidirectionally buffered between mainframes. At power-up, all Event bus lines are enabled and TSYNC's period is decreased from 40 ns to 80 ns. When the Event travels across more than two mainframes, TSYNC's period is decreased from 80 ns to 160 ns. Refer to *Instrument Bus* earlier in this section.

92LAN Module

The 92LAN Module is a communication option for the DAS. The 92LAN Module allows file transfer between the DAS and your host computer.

The 92LAN Module consists of a circuit board with connections for Thicknet/ Thinnet cables, and software support for Transport Control Protocol and Internet Protocol (TCP/IP) with FTP (File Transfer Protocol). The module is compatible with networks complying with the IEEE 802.3 10BASE5 (Thicknet) and 10BASE2 (Thinnet) interface standards. The network type is selected with a 92LAN board jumper block.

TCP/IP networking protocols allow the 92LAN to communicate with operating systems such as UNIX, DEC Ultrix-32, DEC VMS, and DOS. To transfer files to and from a DAS, the host computer must have TCP/IP capability.

A Communications menu overlay controls the 92LAN. Before using the 92LAN, you must add some system information to the overlay. Obtain this information from your system administrator. This information is needed by both, the 92LAN and your host. For a complete 92LAN-overlay description, refer to the *92LAN Installation* manual.

The 92LAN FTP is a listening-only device, allowing the 92LAN to respond only to commands issued from your host. You cannot issue commands from a 92LAN to your host.

The 92LAN board installs into slot 2 of a DAS mainframe, insuring the highest interrupt priority from the DAS system controller. Note that the 92LAN Module does not operate in Expansion mainframes.

After you install a 92LAN board, you have access to the LAN cable connections at the DAS mainframe's back panel. Connections to your network are made from the boards connectors protruding through the mainframe back panel.

The 92LAN board's main components are: the 92LAN board controller, a 68000 microprocessor with supporting ROM and RAM, a 82586 LAN coprocessor, a DUART (Dual Universal Asynchronous Receiver/Transmitter), a thinnet transceiver circuit, and its required support logic.

The 92LAN board's 68000 controller executes independently of the system controller board's 68010. These two processors interface via a bank of shared static RAM on the 92LAN board and an interrupt path to the system controller. The 82586 LAN coprocessor controls the 92LAN network interface. The LAN coprocessor shares a 512 Kbyte block of dynamic RAM with the 68000. It is through this memory that all handshaking and data transfer between these processors occurs.

The 92LAN board's ROM contains power-up diagnostics for the 92LAN and a loader that loads the 92LAN operating system into a block of dynamic RAM it shares with the 92LAN coprocessor. The DAS hard disk drive stores the 92LAN operating system and loads into the 92LAN when the DAS is powered up.

The DUART controls the two 92LAN board RS-232C ports. One port is used as a Diagnostic Terminal port and the other port is not used.

The 92LAN board thinnet transceiver eliminates the need for an external transceiver, as required by a thicknet network. The thinnet transceiver, however, is active only when selected by an on-board jumper.

The 92LAN software supports FTP server functions as well as: **r**emote shell (rsh), remote copy (rcp), and the echo/echo-reply BSD UNIX ping functions of the ICMP (Internet Control Message Protocol).

An optional 92LANP software product is available to enable the DAS to be operated remotely from a host computer via LAN.

92LANSE Module

The 92LANSE Module is an Ethernet communication option for the DAS 9221 (DAS 9200/SE) mainframe.

The 92LANSE Module consists of a circuit board with connections for Thicknet/ Thinnet cables, and software support for Transport Control Protocol and Internet Protocol (TCP/IP) with FTP (File Transfer Protocol). The module is compatible with networks complying with the IEEE 802.3 10BASE5 (Thicknet) and 10BASE2 (Thinnet) interface standards. The network type is selected with a 92LANSE board jumper block.

TCP/IP networking protocols allow the 92LANSE Module to communicate with operating systems such as UNIX, DEC Ultrix-32, DEC VMS, and DOS. To transfer files to and from a DAS, the host computer must have TCP/IP capability.

Current network parameters for the 92LANSE Module can be displayed in an overlay to the Communications menu. You can use the Configuration utility (/config) to set or modify the 92LANSE network parameters. Before using the 92LANSE Module, it may be necessary to check or modify the Configuration utility settings. If the 92LANSE Module is used on a larger network (instead of a stand-alone DAS X terminal), you must obtain this information from your system administrator. This information is needed by both the DAS and your host. For a information on the LAN overlay and the Configuration utility, refer to the DAS *System User Manual*. The Configuration utility is also discussed in chapter 4 of this manual beginning on page 4–96.

The 92LANSE FTP is a listening-only device, allowing the DAS to respond only to commands issued from your host. You cannot issue commands from a DAS to your host.

The 92LANSE Module connects directly to the DAS 9221 Controller board. The 92LANSE Module does not operate in Expansion mainframes.

After you install a 92LANSE Module, you have access to the LAN cable connections at the DAS mainframe's back panel. Connections to your network are made from the connectors protruding through the mainframe back panel.

The 92LANSE Module's control/status register maintains independent control and status of the module's chip set. The chip set consists of an AM7990 Ethernet Controller, an AM7992B Serial Interface Adapter (SIA), and a Thinnet transceiver. The Ethernet controller uses an external memory buffer that also provides access to the DAS Contoller's CPU to transfer data to and from the network.

Because the 92LANSE Module connects directly to the Controller board, the diagnostics for the 92LANSE Module are run at the same time as the diagnostics for the Controller board. Diagnostic errors are reported as errors to Slot 0 in the Power Up menu. The Version menu reports the hardware version of the 92LANSE Module and the Controller board on the same line for Slot 0.

Jumper J790 (Heart Beat Enable jumper) enables the Heart Beat feature used during a Signal Quality Error (SQE) test as described by the IEEE 802.3 definition. The Heart Beat Enable is only effective when J685 (THICK/THIN) is in the "THIN" (2-3) position. The Heart Beat Enable jumper is shipped in the 1-2 position.

The software supports FTP server functions as well as: remote shell (rsh), remote copy (rcp), and the echo/echo-reply BSD UNIX ping functions of the ICMP (Internet Control Message Protocol).

An optional 92LANP software product is available to enable the DAS to be operated remotely from a host computer via LAN.

Replaceable Electrical Parts

This section contains a list of the electrical components for the DAS 9200 System. 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.

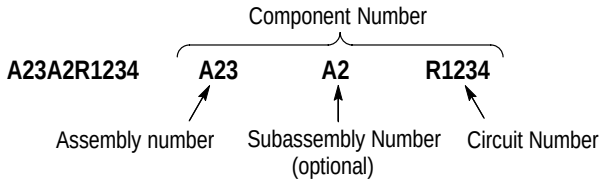
Parts List Column Descriptions

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
S3774	OSHINO ELECTRIC LAMP WORKS LTD	5 2 MINAMI SHINAGAWA 2 CHORE SHINAGAWA KU	TOKYO JAPAN
TK1333	COMPUTER CRAFT CORP	57 THOMAS RD PO BOX 264	HAWTHORNE NJ 07507
TK2469	UNITREK CORPORATION	3000 LEWIS & CLARK WAY SUITE #2	VANCOUVER WA 98601
01963	CHERRY ELECTRICAL PRODUCTS CORP	3600 SUNSET AVE	WAUKEGAN IL 60087–3214
1Y013	ACACIA/DEANCO	3101 SW 153RD DRIVE	BEAVERTON OR 97006
15605	EATON CORP OPERATIONS AND TECHNICAL CTR	4201 N 27TH ST	MILWAUKEE WI 53216–1807
2W944	PAPST MECHATRONIC CORP	AQUIDNECK INDUSTRIAL PK	NEWPORT RI 02840
61058	MATSUSHITA ELECTRIC CORP OF AMERICA PANASONIC INDUSTRIAL CO DIV	TWO PANASONIC WAY	SECAUCUS NJ 07094
61857	SAN–0 INDUSTRIAL CORP	91–3 COLIN DRIVE	HOLBROOK NY 11741
71400	BUSSMANN DIV OF COOPER INDUSTRIES INC	114 OLD STATE RD PO BOX 14460	ST LOUIS MO 63178
74594	COMPONENT RESOURCES INC (DIST) DIV OF CPI INTERNATIONAL CORP	14525 SW WALKER ROAD	BEAVERTON OR 97006
75915	LITTELFUSE INC SUB TRACOR INC	800 E NORTHWEST HWY	DES PLAINES IL 60016–3049
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
95146	ALCO ELECTRONIC PRODUCTS INC	1551 OSGOOD ST	NORTH ANDOVER MA 01845–1014

Replaceable Electrical Parts List

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
				DAS 9200 MAINFRAME & MODULE CIRCUIT BOARDS		
A01	670–8729–00	B010100	B010629	CIRCUIT BD ASSY:BACKPLANE	80009	670872900
A01	670–8729–01	B010630		CIRCUIT BD ASSY:BACKPLANE (DAS 9200 & 92E9 MAINFRAMES)	80009	670872901
A02	670–8725–00	B010100	B010185	CIRCUIT BD ASSY:CONTROLLER	80009	670872500
A02	670–8725–01	B010186	B010260	CIRCUIT BD ASSY:CONTROLLER	80009	670872501
A02	670–8725–02	B010261	B010468	CIRCUIT BD ASSY:CONTROLLER	80009	670872502
A02	670–8725–03	B010469	B010647	CIRCUIT BD ASSY:CONTROLLER	80009	670872503
A02	670–8725–04	B010648	B011285	CIRCUIT BD ASSY:CONTROLLER	80009	670872504
A02	670–8725–05	B011286	B011375	CIRCUIT BD ASSY:CONTROLLER	80009	670872505
A02	670–8725–06	B011376		CIRCUIT BD ASSY:CONTROLLER	80009	670872506
A02BT905	146–0050–00			BATTERY,DRY:3V,1200MA,2/3A LITHIUM, (DAS 9200 MAINFRAMES ONLY)	61058	BR–2/3A
A02U565	160–3948–00			MICROCKT,DGTL:4096 X 8 EPROM,PRGM2732A–3	80009	160394800
A03	670–9514–00			CIRCUIT BD ASSY:MEMORY (STANDARD FOR DAS 9219 & 9220 ALSO SEE A14)	80009	670951400
A04	650–1807–10			POWER SUPPLY ASSY:STANDARD 115V (DAS 9200 MF)	80009	650180710
A04	650–1807–10			POWER SUPPLY ASSY:STANDARD 115V (DAS 92E9)	80009	650180710
A04	650–1877–08			POWER SUPPLY ASSY:OPT 04 (DAS 9200 MF)	80009	650187708
A04	650–1877–08			POWER SUPPLY ASSY:OPT 04 (DAS 92E9)	80009	650187708
A04	650–1931–10			POWER SUPPLY ASSY:OPT A1–A5 (DAS 9200 MF)	80009	650193110
A04	650–1931–10			POWER SUPPLY ASSY:OPT A1–A5 (DAS 92E9)	80009	650193110
A04	650–1973–09			POWER SUPPLY ASSY:OPT 1B 3 PHASE (DAS 9200 MF)	80009	650197309
A04	650–1973–09			POWER SUPPLY ASSY:OPT 1B 3 PHASE (DAS 92E9)	80009	650197309
A04F120	159–0057–00			FUSE,CARTRIDGE:CERAMIC;0.01A,250V,3AB,TIME–DELAY,CSA (230V OPERATION, OPTIONS A1–A5 & 04)	71400	MDA–1/100
A04F120	159–0256–00			FUSE,CARTRIDGE:15A,250V,FAST (115V OPERATION, STD MAINFRAME)	75915	314015
A04W290	175–9776–00			LEAD ASSY,ELEC:STRD,22 AWG,300V,18.0 L (A04J967 TO A01J290)	1Y013	61921
A04W865	161–0214–00			CABLE ASSY,PWR,:2,16 AWG,300V,26.0 L, (A04J865 TO CARD CAGE FAN)	TK1333	CC23385
A04W866	174–0267–00			CA ASSY,SP,ELEC:3,22 AWG,22.0 L (A04J866 TO CARD CAGE FAN)	TK2469	174–0267–00
A04W965	175–9777–00			LEAD ASSY,ELEC:3,20 AWG,5.0 L, (A04J965 TO J1 FLOPPY DISK DRIVE)	TK2469	175–9777–00

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A05	670–8726–00	B010100	B010128	CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872600
A05	670–8726–01	B010129	B010154	CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872601
A05	670–8726–02	B010155	B010262	CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872602
A05	670–8726–03	B010263	B010330	CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872603
A05	670–8726–04	B010331		CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872604
A06	670–8728–00	B010100	B019999	CIRCUIT BD ASSY:GPIB	80009	670872800
A06	670–8728–01	B020000	B030099	CIRCUIT BD ASSY:GPIB	80009	670872801
A06	670–8728–02	B030100		CIRCUIT BD ASSY:GPIB (92C01 ONLY)	80009	670872802
A07	671–0011–00			CIRCUIT BD ASSY:EXPANSION CABLE (92E9 ONLY)	80009	671001100
A08	670–8730–00	B010100	B019999	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873000
A08	670–8730–01	B020000	B020137	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873001
A08	670–8730–02	B030100	B030144	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873002
A08	670–8730–03	B030145	B030228	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873003
A08	670–8730–04	B030229	B030384	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873004
A08	670–8730–05	B030385	B030862	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873005
A08	670–8730–06	B030863		CIRCUIT BD ASSY:EXPANSION/GPIB (92C02 ONLY)	80009	670873006
A09	670–8727–00	B010100	B019999	CIRCUIT BD ASSY:EXPANSION	80009	670872700
A09	670–8727–01	B020000	B020137	CIRCUIT BD ASSY:EXPANSION	80009	670872701
A09	670–8727–02	B020138	B020153	CIRCUIT BD ASSY:EXPANSION	80009	670872702
A09	670–8727–03	B020154	B020173	CIRCUIT BD ASSY:EXPANSION	80009	670872703
A09	670–8727–04	B020174		CIRCUIT BD ASSY:EXPANSION (92C03 ONLY)	80009	670872704
A10	670–9478–00	B010100	B019999	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947800
A10	670–9478–01	B020100	B029999	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947801
A10	670–9478–02	B030100	B039999	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947802
A10	670–9478–03	B040100	B040327	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947803
A10	670–9478–04	B040328	B040389	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947804
A10	670–9478–05	B040390	B040498	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947805
A10	670–9478–06	B040499	B040987	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947806
A11	670–9500–00	B010100	B019999	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670950000
A11	670–9500–01	B020100	B020420	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670950001
A11	670–9500–02	B020421	B029999	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670950002

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A11	670–9500–03	B030100	B030249	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670950003
A11	670–9500–04	B030250	B039999	CIRCUIT BD ASSY:DATA ACQUISTION	80009	670950004
A11	671–0609–00	B040100		CIRCUIT BD ASSY:DATA ACQUISITION (92A16E ONLY REPLACED WITH A17)	80009	671060900
A11F983	159–0114–00			FUSE,WIRE LEAD:1A,125V,AXIAL LEADS,	61857	SP1–1A
A11F984	159–0114–00			FUSE,WIRE LEAD:1A,125V,AXIAL LEADS, (92A16E ONLY)	61857	SP1–1A
A12	670–8502–01	B010100	B019999	CIRCUIT BD ASSY:MAIN	80009	670850201
A12	670–8502–02	B020000	B029999	CIRCUIT BD ASSY:MAIN	80009	670850202
A12	670–8502–03	B030000		CIRCUIT BOARD:MAIN (P6461 ONLY)	80009	670850203
A12DS108	150–0057–01			LAMP,INCAND:5V,0.115A,WIRE LD,AGED & SEL	S3774	OL7153AS15TPL
A12J104	165–2040–10	B010100	B021046	MICROCKT,LINEAR:500MHZ COMPARATOR PROBE PODLET	80009	165204001
A12J104	165–2040–11	B021407		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A12J105	165–2040–10	B010100	B021046	MICROCKT,LINEAR:500MHZ COMPARATOR PROBE PODLET	80009	165204001
A12J105	165–2040–11	B010100	B020147	MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A12J106	165–2040–10	B010100	B021046	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A12J106	165–2040–11	B021047		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A12J204	165–2040–10	B010100	B020147	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A12J204	165–2040–11	B021047		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRUIT BOARD)	80009	165204011
A12J205	165–2040–10	B010100	B021046	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A12J205	165–2040–11	B021047		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRUIT BOARD)	80009	165204011
A12J206	165–2040–10	B010100		MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A12J206	165–2040–11	B021047		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040	80009	165204011
A12J207	165–2040–10	B010100	B021046	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A12J207	165–2040–11	B021047		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A12J304	165–2040–10	B010100	B021046	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A12J304	165–2040–11	B021047		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A13	670–8501–01	B010100	B019999	CIRCUIT BD ASSY:EXPANDER MAIN	80009	670850101
A13	670–8501–02	B020000	B029999	CIRCUIT BD ASSY:EXPANDER MAIN	80009	670850102
A13	670–8501–03	B030000		CIRCUIT BOARD:EXTENDER MAIN (P6461E ONLY)	80009	670850103
A13DS108	150–0057–01			LAMP,INCAND:5V,0.115A,WIRE LD,AGED & SEL (P6461E ONLY)	S3774	OL7153AS15TPL
A13J104	165–2040–10	B010100	B020740	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A13J104	165–2040–11	B020741		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A13J105	165–2040–10	B010100	B020740	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A13J105	165–2040–11	B020741		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A13J106	165–2040–10	B010100	B020740	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204010
A13J106	165–2040–11	B020741		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A13J204	165–2040–10	B010100	B020740	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A13J204	165–2040–11	B020741		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A13J205	165–2040–10	B010100	B020740	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A13J205	165–2040–11	B020741		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A13J206	165–2040–10	B010100	B020740	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A13J206	165–2040–11	B020741		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A13J207	165–2040–10	B010100	B020740	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
A13J207	165–2040–11	B020741		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204011
A13J304	165–2040–10	B010100	B020740	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A13J304	165–2040–11	B020741		MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (NOT INCLUDED WITH CIRCUIT BOARD) (P6461E ONLY)	80009	165204011
A14	670–9514–00	B010100	B019999	CIRCUIT BD ASSY:MEMORY	80009	670951400
A14	671–0470–00	B020100	B049999	CIRCUIT BD ASSY:MEMORY (DAS 9200 MAINFRAME ONLY)	80009	671047000
A15	671–0760–00	B010100	B010505	CIRCUIT BD ASSY:LAN INTERFACE	80009	671076000
A15	671–0760–01	B0100506		CIRCUIT BD ASSY:LAN INTERFACE;	80009	671076001
A16	671–0610–00	B050100	B050249	CIRCUIT BD ASSY:DATA ACQUISITION	80009	671061000
A16	671–0610–01	B050250	B050327	CIRCUIT BD ASSY:DATA ACQUISITION	80009	671061001
A16	671–0610–02	B050328	B051041	CIRCUIT BD ASSY:DATA ACQUISITION	80009	671061002
A16	671–0610–03	B051042		CIRCUIT BD ASSY:DATA ACQUISITION; (92A016 ONLY)	80009	671061003
A17	671–0609–00	B040100	B040817	CIRCUIT BD ASSY:DATA ACQUISITION	80009	671060900
A17	671–0609–01	B040818		CIRCUIT BD ASSY:DATA ACQUISITION; (92A016E ONLY)	80009	671060901
A18	671–0777–00	B010100	B010138	CIRCUIT BD ASSY:INTERFACE MEDIA	80009	671077700
A18	671–0777–01	B010139		CIRCUIT BD ASSY:INTERFACE MEDIA, (DAS 9200 OPTION 14 ONLY)	80009	671077701
A19	671–0778–00			CIRCUIT BD ASSY:INSTR INTERFACE 92F14 (DAS 9200 OPTION 14 ONLY)	80009	671077800
A20	670–9501–00	B010100	B019999	CIRCUIT BD ASSY:CONTROLLER	80009	670950100
A20	670–9501–01	B010100	B029999	CIRCUIT BD ASSY:CONTROLLER	80009	670950101
A20	670–9501–02	B030100	B049999	CIRCUIT BD ASSY:CONTROLLER	80009	670950102
A20	670–9501–03	B050100	B069999	CIRCUIT BD ASSY:CONTROLLER	80009	670950103
A20	670–9501–04	B070100	B070157	CIRCUIT BD ASSY:CONTROLLER	80009	670950104
A20	670–9501–05	B070158	B070192	CIRCUIT BD ASSY:CONTROLLER	80009	670950105
A20	670–9501–06	B070193		CIRCUIT BD ASSY:CONTROLLER; (92A60 ONLY)	80009	670950106
A20	670–9501–04	B010100	B020118	CIRCUIT BD ASSY:CONTROLLER	80009	670950104
A20	670–9501–05	B020119	B020142	CIRCUIT BD ASSY:CONTROLLER	80009	670950105
A20	670–9501–06	B020143		CIRCUIT BD ASSY:CONTROLLER; (92A60D ONLY)	80009	670950106
A21	670–9678–00	B010100	B039999	CIRCUIT BD ASSY:CONTROLLER	80009	670967800

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A21	670–9678–01	B020100	B029999	CIRCUIT BD ASSY:CONTROLLER	80009	670967801
A21	670–9678–02	B040100	B049999	CIRCUIT BD ASSY:CONTROLLER	80009	670967802
A21	670–9678–03	B050100	B069999	CIRCUIT BD ASSY:CONTROLLER	80009	670967803
A21	670–9678–04	B070100	B070502	CIRCUIT BD ASSY:CONTROLLER	80009	670967804
A21	670–9678–05	B070503	B070799	CIRCUIT BD ASSY:CONTROLLER	80009	670967805
A21	670–9678–06	B070800		CIRCUIT BD ASSY:CONTROLLER (92A90D OLY)	80009	670967806
A21	670–9678–04	B010100	B020309	CIRCUIT BD ASSY:CONTROLLER	80009	670967804
A21	670–9678–05	B020310	B020691	CIRCUIT BD ASSY:CONTROLLER	80009	670967805
A21	670–9678–06	B020692		CIRCUIT BD ASSY:CONTROLLER (92A90 ONLY)	80009	670967806
A22	670–9489–00	B010100	B019999	CIRCUIT BD ASSY:MEMORY	80009	670948900
A22	670–9489–01	B010100	B019999	CIRCUIT BD ASSY:MEMORY	80009	670948901
A22	670–9489–02	B020000	B039999	CIRCUIT BD ASSY:MEMORY	80009	670948902
A22	670–9489–03	B040000	B059999	CIRCUIT BD ASSY:MEMORY	80009	670948903
A22	670–9489–04	B060000	B069999	CIRCUIT BD ASSY:MEMORY	80009	670948904
A22	670–9489–05	B070100		CIRCUIT BD ASSY:MEMORY (92A60 ONLY)	80009	670948905
A22	671–0772–00	B060100	B069999	CIRCUIT BD ASSY:92A60 SHALLOW MEMORY	80009	671077200
A22	671–0772–01	B070100	B070164	CIRCUIT BD ASSY:92A60 SHALLOW MEMORY	80009	671077201
A22	671–0772–02	B070165		CIRCUIT BD ASSY:92A60 SHALLOW MEMORY (92A60 ONLY)	80009	671077202
A23	670–9677–00	B010100	B019999	CIRCUIT BD ASSY:MEMORY	80009	670967700
A23	670–9677–01	B010100	B019999	CIRCUIT BD ASSY:MEMORY	80009	670967701
A23	670–9677–02	B020000	B029999	CIRCUIT BD ASSY:MEMORY	80009	670967702
A23	670–9677–03	B030000	B059999	CIRCUIT BD ASSY:MEMORY	80009	670967703
A23	670–9677–04	B060100	B070103	CIRCUIT BD ASSY:MEMORY	80009	670967704
A23	670–9677–05	B070104		CIRCUIT BD ASSY:MEMORY (92A90 ONLY)	80009	670967705
A23	671–0773–00	B060100	B069999	CIRCUIT BD ASSY:92A90 SHALLOW MEMORY	80009	671077300
A23	671–0773–01	B070100	B070507	CIRCUIT BD ASSY:92A90 SHALLOW MEMORY	80009	671077301
A23	671–0773–02	B070508		CIRCUIT BD ASSY:92A90 SHALLOW MEMORY (92A90 ONLY)	80009	671077302
A24	670–9624–00			CIRCUIT BD ASSY:BUFFER PROBE (92A60/60D/90/90D ONLY)	80009	670962400
A24S100	260–2314–00			SWITCH,PUSH:SPST,0.4 VA MAX,20VDC	95146	TPD11CG–PC0

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A25	671–0712–00	B010100	B019999	CIRCUIT BD ASSY:60 CH DEEP MEMORY	80009	671071200
A25	671–0712–01	B020000	B020113	CIRCUIT BD ASSY:60 CH DEEP MEMORY	80009	671071201
A25	671–0712–02	B020114	B020116	CIRCUIT BD ASSY:60 CH DEEP MEMORY	80009	671071202
A25	671–0712–03	B020117		CIRCUIT BD ASSY:60 CH DEEP MEMORY (92A60D ONLY)	80009	671071203
A26	671–0713–00	B010100	B0201002	CIRCUIT BD ASSY:90 CH DEEP MEMORY	80009	671071300
A26	671–0713–01	B020103	B020271	CIRCUIT BD ASSY:90 CH DEEP MEMORY	80009	671071301
A26	671–0713–02	B020272	B020297	CIRCUIT BD ASSY:90 CH DEEP MEMORY	80009	671071302
A26	671–0713–03	B020298		CIRCUIT BD ASSY:90 CH DEEP MEMORY (92A90D ONLY)	80009	671071303
A27	671–1578–00	B010100	B010121	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157800
A27	671–1578–01	B010122	B029999	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157801
A27	671–1578–02	B030100	B030175	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157802
A27	671–1578–03	B030176	B030185	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157803
A27	671–1578–04	B030186	B039999	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157804
A27	671–1578–05	B040100	B040170	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157805
A27	671–1578–06	B040171	B060757	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY (92A96 ONLY)	80009	671157806
A27F116	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A27F117	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A28	671–1579–00	B010100	B010158	CIRCUIT BD ASSY:DATA ACQUISTION 32K MEMORY	80009	671157900
A28	671–1579–01	B010159	B010232	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY	80009	671157901
A28	671–1579–02	B010233	B010533	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY	80009	671157902
A28	671–1579–03	B010534	B010550	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY	80009	671157903
A28	671–1579–04	B010551	B010864	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY	80009	671157904
A28	671–1579–05	B010865	B060757	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY (92A96D ONLY)	80009	671157905
A28F116	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A28F117	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A29	671–1580–00	B010100	B010107	CIRCUIT BD ASSY:DATA ACQUISTION 128K MEMORY	80009	671158000
A29	671–1580–01	B010108	B010111	CIRCUIT BD ASSY:DATA ACQUISITION 128K MEMORY	80009	671158001
A29	671–1580–02	B010112	B010336	CIRCUIT BD ASSY:DATA ACQUISITION 128K MEMORY	80009	671158002
A29	671–1580–03	B010337	B010722	CIRCUIT BD ASSY:DATA ACQUISITION 128K MEMORY	80009	671158003
A29	671–1580–04	B010723	B060757	CIRCUIT BD ASSY:DATA ACQUISITION 128K MEMORY (92A96XD ONLY)	80009	671158004
A29F116	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A29F117	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A30	671–1806–00			CIRCUIT BD ASSY:90 CHANNEL INTERFACE (92A96 OPTION 01 ONLY)	80009	671180600
A30	671–0274–00	B010100	B010159	CIRCUIT BD ASSY:BUFFER/DRIVER	80009	671027400
A30	671–0274–01	B010160	B010354	CIRCUIT BD ASSY:BUFFER/DRIVER	80009	671027401
A30	671–0274–02	B010355		CIRCUIT BD ASSY:BUFFER/DRIVER (P6463 ONLY)	80009	671027402
A30	671–1793–00			CIRCUIT BD ASSY:P6463A BUFFER/DRIVER (P6463A ONLY)	80009	671179300
A31	671–0273–00	B010100	B010159	CIRCUIT BD ASSY:D/LOGIC	80009	671027300
A31	671–0273–01	B010160	B010354	CIRCUIT BD ASSY:ID/LOGIC	80009	671027301
A31	671–0273–02	B010355		CIRCUIT BD ASSY:ID/LOGIC (P6463/P6463A ONLY)	80009	671027302
A32	671–2674–00	B010100	B010292	CIRCUIT BD ASSY:DATA ACQUISITION 512K	80009	671267400
A32	671–2674–01	B010293	B060757	CIRCUIT BD ASSY:DATA ACQUISITION 512K (92A96SD ONLY)	80009	671267401
A32	671–3254–00	B060758		CIRCUIT BD ASSY:DATA ACQUISITION 512K (92C96 ONLY)	80009	671325400
A32	671–3255–00	B060758		CIRCUIT BD ASSY:DATA ACQUISITION 512K (92C96D ONLY)	80009	671325500
A32	671–3256–00	B060758		CIRCUIT BD ASSY:DATA ACQUISITION 512K (92C96XD ONLY)	80009	671325600
A32	671–3257–00	B060758		CIRCUIT BD ASSY:DATA ACQUISITION 512K (92C96SD ONLY)	80009	671325700
A32F116	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A32F117	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A33	671–3463–00			CIRCUIT BD ASSY:DATA ACQUISITION 2M (92A96UD ONLY)	80009	671346300
A33F116	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A33F117	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A33F118	159–0116–00			FUSE CARTRIDGE 1A,125V,0.4SEC0.17	TK0946	SM4–1A
A36	670–8742–00	B010100	B010673	CIRCUIT BD ASSY:MAIN	80009	670874200
A36	670–8742–01	B010674	B020402	CIRCUIT BD ASSY:MAIN	80009	670874201
A36	670–8742–02	B020403	B029999	CIRCUIT BD ASSY:MAIN	80009	670874202
A36	670–8742–03	B030000	B039999	CIRCUIT BD ASSY:MAIN	80009	670874203
A36	670–8742–04	B040000	B040938	CIRCUIT BD ASSY:MAIN	80009	670874204
A36	670–8742–05	B040939	B049999	CIRCUIT BD ASSY:MAIN	80009	670874205
A36	670–8742–06	B050000		CIRCUIT BD ASSY:MAIN (P6464 ONLY)	80009	670874206
A36F120	159–0124–00			FUSE,PLUG IN:3A,125V,0.05 SEC,RADIAL LEADS,	75915	272003
A36F170	159–0124–00			FUSE,PLUG IN:3A,125V,0.05 SEC,RADIAL LEADS,	75915	272003
A36H340	165–2051–00			MICROCKT,DGTL:DESKEW IC HYBRID	80009	165205100
A36J100	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204810
A36J100	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A36J100	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J100	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J200	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204810
A36J200	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J200	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J200	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J206	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,	80009	165204810
A36J206	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J206	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J206	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J300	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,	80009	165204810
A36J300	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J300	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J300	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J306	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,	80009	165204810
A36J306	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J306	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J306	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J400	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,	80009	165204810
A36J400	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J400	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J400	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J406	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,	80009	165204810
A36J406	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J406	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J406	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J500	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,	80009	165204810
A36J500	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J500	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812

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Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A36J500	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J506	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,	80009	165204810
A36J506	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J506	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J506	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A36J600	165–2048–10	B010100	B019999	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204810
A36J600	165–2048–11	B020000	B032447	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
A36J600	165–2048–12	B032448	B039999	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
A36J600	165–2048–13	B040000		MICROCKT,DGTL:LET 2048 W/INSUL SLVG (NOT INCLUDED WITH CIRCUIT BOARD)	80009	165204813
A37	670–8808–00			CIRCUIT BD ASSY:3V POWERSUPPLY (P6464 ONLY)	80009	670880800
A40	670–9593–10			CIRCUIT BD ASSY:PATTERN GENERATOR MDL	80009	670959310
A40	670–9593–11			CIRCUIT BD ASSY:PATTERN GENERATOR MDL	80009	670959311
A40	670–9593–12			CIRCUIT BD ASSY:PATTERN GENERATOR MDL; (DAS 92S16 ONLY)	80009	670959312
A41	671–1244–00			CIRCUIT BD ASSY:MAX MUX (010–6403–XX ONLY)	80009	671124400
A45	670–9594–10	300001	300478	CIRCUIT BD ASSY:PATTERN GENERATOR MDL	80009	670959410
A45	670–9594–11	300479	300623	CIRCUIT BD ASSY:PATTERN GENERATOR MDL	80009	670959411
A45	670–9594–12	300624		CIRCUIT BD ASSYPATTERN GENERATOR MDL (DAS 92S32 ONLY)	80009	670959412
A46	670–9603–00	B010100	B011242	CIRCUIT BD ASSY:MAIN (P6465)	80009	670960300
A46	670–9603–01	B011243	B020721	CIRCUIT BD ASSY:MAIN (P6465)	80009	670960301
A46	670–9603–02	B030722	B039999	CIRCUIT BD ASSY:MAIN (P6465)	80009	670960302
A46	670–9603–03	B040100	B040341	CIRCUIT BD ASSY:MAIN (P6465)	80009	670960303
A46	670–9603–04	B040342		CIRCUIT BD ASSY:MAIN (P6465)	80009	670960304
A46F120	159–0124–00	B010100	B030722	FUSE,PLUG IN:3A,125V,0.05 SEC,RADIAL LEADS,	75915	272003
A46F170	307–1543–00	B030723		RES,THERMAL:1.85 AMP,20 DEG C,LEADED	06090	RXE185
A47	670–9602–00	B010100	B010452	CIRCUIT BD ASSY:STROBE	80009	670960200
A47	670–9602–01	B010453	B011242	CIRCUIT BD ASSY:STROBE	80009	670960201
A47	670–9602–02	B011243	B019999	CIRCUIT BD ASSY:STROBE	80009	670960202

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A47	670–9602–03	B020100		CIRCUIT BD ASSY:STROBE (P6465 ONLY)	80009	670960203
A56	670–9767–00			CIRCUIT BD ASSY:MASTER INTERFACE (92HS8 ONLY)	80009	670976700
A56F989	159–0159–00			FUSE,WIRE LEAD:1.5A,125V,5 SEC, (92HS8 ONLY)	75915	25101.5
A57	670–9768–00			CIRCUIT BD ASSY:INTERFACE (SLAVE) (92HS8E ONLY)	80009	670976800
A58	650–1987–00	B010100	B010305	MAINTENANCE KIT:MAINFRAME (92HS8 CABINET ONLY)	80009	650198700
A58	650–1987–01	B010306	B010318	MAINTENANCE KIT:MAINFRAME (92HS8 CABINET ONLY)	80009	650198701
A58	650–1987–02	B010319	B010337	MAINTENANCE KIT:MAINFRAME (92HS8 CABINET ONLY)	80009	650198702
A58	650–1987–03	B010338		MAINTENANCE KIT:MAINFRAME (92HS8 CABINET ONLY)	80009	650198703
A58B134	119–1790–01	B010100	B010305	FAN,TUBEAXIAL:12VDC,3W,,3450 RPM,36 CFM	2W944	8112G–10
A58B134	119–1790–02	B010306		FAN,TUBEAXIAL:12VDC,3W,3450 RPM,36. CFM,80MM, ,	2W944	8112K–10
A58F201	159–0014–00			FUSE,CARTRIDGE:3AG,5A,250V,0.8SEC, (STANDARD ONLY, 115V)	61857	SS2–5A
A58F201	159–0126–00			FUSE,CARTRIDGE:3AG,2.5A,250V,0.65SEC, (OPTIONS A1,A2,A3,A4,& A5 ONLY, 230V)	71400	AGC–2 1/2
A58A1	010–0431–10			PROBE,BUFFER:REPLACEABLE (92HS8, 92HS8E ONLY)	80009	010043110
A70	672–1119–02			CIRCUIT BD ASSY:672–1119–01,WITHOUT 175–6807–00 CABLE (P6460 ONLY)	80009	672111902
A70	671–2324–01	B050100	B050102	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232401
A70	671–2324–02	B050103	B050465	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232402
A70	671–2324–03	B050466	B050564	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232403
A70	671–2324–04	B050565	B050611	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232404
A70	671–2324–05	B050612	B050717	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232405
A70	671–2324–06	B050718		CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232406
A70	671–2324–07			CIRCUIT BD ASSY:DAS9221 CONTROLLER; (DAS 9221 ONLY)	80009	671232407
A70	671–2324–01	B050100	B050102	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232401
A70	671–2324–02	B050103	B050450	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232402
A70	671–2324–03	B050451	B050549	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232403
A70	671–2324–04	B050550	B050564	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232404
A70	671–2324–05	B050565	B050717	CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232405

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A70	671–2324–06	B050718		CIRCUIT BD ASSY:DAS9221 CONTROLLER;	80009	671232406
A70	671–2324–07			CIRCUIT BD ASSY:DAS9221 CONTROLLER; (DAS 9229 ONLY)	80009	671232407
A70U3301	160–8821–00			IG,DIGITAL:CMOS,PLDEEPLD,22V10,PRGM 156–5924–00, 25NS,130MA	80009	160882100
A70U3301	160–8821–00			IG,DIGITAL:CMOS,PLDEEPLD,22V10,PRGM 156–5924–00, 25NS,130MA	80009	160882100
A70U3303	160–8826–00			IC,DIGITAL:CMOS,PLDEEPLD	80009	160882600
A70U3503	160–8810–00			IG,DIGITAL:CMOS,PLDEEPLD	80009	160881000
A70U4300	160–8815–00			IG,DIGITAL:STTL,PLD;PAL.20R8,PRGM 156–6360–00, 125MHZ,210MA	80009	160881500
A70U5300	160–8814–00			IG,DIGITAL:STTL,PLD;PAL.20R8,PRGM 156–6360–00, 125MHZ,210MA	80009	160881400
A70U5301	160–8827–00			IC,DIGITAL:STTL,PLD;PAL,20R8,PRGM 156–6360–00,5NS, 125MHZ,210MA	80009	160882700
A70U6300	160–8817–00			IG,DIGITAL:STTL,PLD;PAL 20R6–5 PLCC28,PRGM156–6381–00	80009	160881700
A70U6301	160–8828–00			IC,DIGITAL:STTL,PLD;PAL 20R8–5,PRGM 156–6360–00,PLCC28	80009	160882800
A70U6900	160–8825–01			IC,DIGITAL:CMOS,PLD;EPLD	80009	160882501
A70U7102	160–8811–00			IG,DIGITAL:STTL,PLD PAL20R6,156–6381–00, 124MHZ,210MA, 20R6–5,PLCC28,TUBE	80009	160881100
A70U7103	160–8816–00			IG,DIGITAL:STTL,PLD;PAL.20L8,PRGM 156–6258–00 ,125MHZ,210MA	80009	160881600
A70U7200	160–8818–00			IG,DIGITAL:CMOS,PLD;OTP,22V10,PRGM 156–5912–00,15NS,90MA	80009	160881800
A70U7201	160–8820–00			IG,DIGITAL:CMOS,PLD;EEPLD,22V10,PRGM 156–5924–00, 25NS,130MA	80009	160882000
A70U8102	160–8813–00			IG,DIGITAL:STTL,PLD;PAL.20R8,PRGM 156–6360–00,125MHZ,210MA	80009	160881300
A70U8200	160–8819–00			IG,DIGITAL:CMOS,PLD;OTP,22V10,PRGM 156–5912–00, 15NS,90MA	80009	160881900
A70U8202	160–8812–00			IG,DIGITAL:STTL,PLD;PAL20R6,156–6381–00		
A70U8900	160–8823–00			IC,DIGITAL:CMOS,PLD;OTP,5064,64 MACROCELL,30NS,PRGM 156–6229–00	80009	160882300
A70U9100	160–8935–01			IC,MEMORY:CMOS,64K X 8,PRGM 156–3381–00, 27C 512, DIP28.6 (DAS 9221 ONLY)	80009	160893501
A70U2900	160–8822–00			IC,MEMORY:CMOS,PLD;OPT,PRGM 156–6229–00, 64MACROCELL,30NS	80009	160882200
A71	671–2452–00	B010100	B010340	CIRCUIT BD ASSY:LAN IO ADAPTER;	80009	671245200
A71	671–2452–01	B010341	B010933	CIRCUIT BD ASSY:LAN IO ADAPTER;	80009	671245201
A71	671–2452–02	B010934		CIRCUIT BD ASSY:LAN IO ADAPTER; (DAS 92LANSE ONLY)	80009	671245202
A71F120	159–0153–00			FUSE,WIRE LEAD:1.5A,125V,FAST BLOW,	61857	SP5–1.5A DI

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
A71F170	159–0235–00			FUSE,WIRE LEAD:0.75A,125V,FAST	71400	TR/MCR 3/4
A71F640	159–0153–00			FUSE,WIRE LEAD:1.5A,125V,FAST BLOW,	61857	SP5–1.5A DI
A71U810	160–5647–01			IC,DIGITAL:STTL,PROM;32 X 8,3 STATE OUT,PRGM, 74S288, DIP16,CER (92LANSE ONLY)	80009	160564701
				CHASSIS PARTS		
S1	260–2305–00	B010100	B011637	SWITCH,PUSH:SPST,0.1A	15605	220K21920MXXA
S1	260–2355–00	B011638		SWITCH,PUSH:SPDT,LIGHTED (DAS9220 & DAS 9229)	74594	IDC–4–01–4554
S1	260–2305–00	B040100	B040327	SWITCH,PUSH:SPST,0.1A	15605	220K21920MXXA
S1	260–2355–00	B040328		SWITCH,PUSH:SPDT,LIGHTED (DAS9220)	74594	IDC–4–01–4554
W298	174–0025–00			CA ASSY,SP,ELEC:34,26 AWG,24.0 L (A02J298 TO J2 HARD DISK DRIVE)	1Y013	61934
W298	174–1313–00			CA ASSY,SP,ELEC:20,28 AWG,19.0 L,RIBBON (OPTION 14 ONLY)	1Y013	64148
W398	174–0024–00			CA ASSY,SP,ELEC:20,26 AWG,24.0 L (A02J398 TO J1 HARD DISK DRIVE)	1Y013	61933
W398	174–1312–00	B010100	B059999	CA ASSY,SP,ELEC:34,28 AWG,16.0 L,RIBBON	1Y013	ORDER BY DESC
W398	174–2063–01	B060100		CA ASSY,SP,ELEC RIBBON,FLOPPY:IDC,24,28 AWG,FOLDED, 2X17,0.1 CTR,RCPT,MIL PLZ 29.0 L X 2X17,RCPT X 8.5 L,RCPT, W/PULL TAB (OPTION 14 ONLY)		
W698	174–0105–00	B010100	B059999	CA ASSY,SP,ELEC:34,28 AWG,17.0 L,RIBBON (A02J698 TO J2 FLOPPY DISK DRIVE)	1Y013	61935
W698	174–0105–00	B010100	B060741	CA ASSY,SP,ELEC:34,28 AWG,17.0 L,RIBBON (A02J698 TO J2 FLOPPY DISK DRIVE)	1Y013	61935
W790	174–0026–00	B010100	B011637	CA ASSY,SP,ELEC:3,26 AWG,8.0 L	80009	174002600
W790	174–1838–00	B011638		CA ASSY,SP,ELEC:5,26 AWG,9.5 L (LV500:A01J790 TO FRONT PANEL SW)	TK2469	174–1838–00
W790	174–0026–00	B010100	B040327	CA ASSY,SP,ELEC:3,26 AWG,8.0 L	80009	174002600
W790	174–1838–00	B040328		CA ASSY,SP,ELEC:5,26 AWG,9.5 L (DAS 9219 & 9228:A02J790 TO FRONT PANEL SW)	TK2469	174–1838–00
W790	174–0026–00	B010100	B010129	CA ASSY,SP,ELEC:3,26 AWG,8.0 L	80009	174002600
W790	174–1838–00	B010128		CA ASSY,SP,ELEC:5,26 AWG,9.5 L (DAS 9220:A01J790 TO FRONT PANEL SW)	TK2469	174–1838–00
W965	426–2511–00			BRKT, CHASSIS:3.5 IN TO 5.25 IN CONVERSION, ENABLES 3.5 IN FLOPPY TO FIT INTO 5.25 IN MECH OPENING (INCLUDES POWER ADAPTER FOR 3.5 IN DRIVE)	80009	174086000
W3900	174–2695–00			CA ASSY,SP:RIBBON,SCSI;IDC,50,28 AWG,18.5 L, 2X25,0.1 CTR, RCPT,CTR PLZ BOTH ENDS, OPPOSITE SIDES	1Y013	67930

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
W6900	174–0105–00	B010100	B059999	CA ASSY,SP,ELEC:34,28 AWG,17.0 L,RIBBON (SAS 9221–5.25 FLOPPY DISK DRIVE)	1Y013	61935
W6900	174–2063–01	B060100		CA ASSY,SP,ELEC RIBBON,FLOPPY:IDC,24,28 AWG,FOLDED, 2X17,0.1 CTR,RCPT,MIL PLZ 29.0 L X 2X17,RCPT X 8.5 L,RCPT, W/PULL TAB (DAS9221 3.5 FLOPPY DISK DRIVE)	80009	ORDER BY

Replaceable Electrical Parts List

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
				TERMINALS		
				9200T		
A1	670–7936–41			CIRCUIT BD ASSY:TERMINAL CONTROL	80009	670–7936–41
A1U80	160–3946–00			MICROCKT,DGTL:32K X 8 EPROM, PRGM	80009	160–3946–00
A1U90	160–3944–00			MICROCKT,DGTL:32K X 8 EPROM, PRGM	80009	160–3944–00
A1U180	160–3947–00			MICROCKT,DGTL:32K X 8 EPROM, PRGM	80009	160–3947–00
A1U190	160–3945–00			MICROCKT,DGTL:32K X 8 EPROM, PRGM	80009	160–3945–00
A2	670–7935–16			CIRCUIT BD ASSY:DISPLAY CONTROL	80009	670–7935–41
A2U565	160–3948–00			MICROCKT,DIGTL:32K X 8 EPROM,PRGM	80009	160–3948–00
A3	119–2374–01			KEYBOARD ASSY: (9200T ONLY)	01963	KXNZ–8754
A3	119–2493–03			KEYBOARD ASSY:9201TD,VT–100,SQ CONN WITH ENCLOSURE (INCLUDES 9200 KEYCAP SET,PN 366–0364–00)	80009	119–2493–00
A4	118–5459–01			CABLE ASSEMBLY:COILED W/RD 5 PIN DIN CONN	80009	118–5459–00
				(FOR MORE COMPLETE INFORMATION, REFER TO 070–4525–XX & 0705877–XX)		
				9201T		
A1	670–8903–45			CIRCUIT BD ASSY:MAIN LOGIC	80009	670–8903–45
A1U831	020–1461–03			COMPONENT KIT:9201T FIRMWARE	80009	020–1461–03
A1U835	020–1461–03			COMPONENT KIT:9201T FIRMWARE	80009	020–1461–03
A1U845	020–1461–03			COMPONENT KIT:9201T FIRMWARE	80009	020–1461–03
A1U1031	020–1461–03			COMPONENT KIT:9201T FIRMWARE	80009	020–1461–03
A1U1035	020–1461–03			COMPONENT KIT:9201T FIRMWARE	80009	020–1461–03
A1U1045	020–1461–03			COMPONENT KIT:9201T FIRMWARE (REPLACEABLE AS A SET)	80009	020–1461–03
A3	119–2493–03			KEYBOARD ASSY:9201TD,VT–100,SQ CONN WITH ENCLOSURE (INCLUDES 9200 KEYCAP SET,PN 366–0364–00)	80009	119–2493–00
A4	118–4998–00			CABLE ASSEMBLY:COILED	80009	118–4998–00
				(FOR MORE COMPLETE INFORMATION, REFER TO 070–5874–XX & 0705877–XX)		

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
				9202XT		
	671–2482–06			CIRCUIT BD ASSY:MAIN LOGIC,4 BIT PLANE	80009	ORDER BY DESC
	671–2765–00			CIRCUIT BD ASSY:FLASH OPT 4 MEG (9202XT)		ORDER BY DESC
	671–3224–00			CIRCUIT BD ASSY:NEW FLASH ROM XP35X,OPT 1B (9202XT)	80009	ORDER BY DESC
	119–4254–01			KEYBOARD, ASSY:IBM101,NORTH AMERICAN ACCOM XP PRODUCTS (9202XT & 9203XT)	80009	ORDER BY DESC
	671–2757–00			CIRCUIT BD ADD:LAN	80009	ORDER BY DESC
	671–2769–00			CIRCUIT BD ASSY:FLASH ROM/RS232 (9202XT & 9203XT)	80009	ORDER BY DESC
				9203XT		
	671–2521–06			CIRCUIT BD ASSY:MAIN LOGIC,HIGH RES	80009	ORDER BY DESC
	671–2885–00			CIRCUIT BD ASSY:4 MEG SIMM FLASH	80009	ORDER BY DESC
	671–3224–00			CIRCUIT BD ASSY:NEW FLASH ROM XP35X,OPT 1B	80009	ORDER BY DESC
	671–2769–00			CIRCUIT BD ASSY:FLASH ROM/RS232 (9202XT & 9203XT)	80009	ORDER BY DESC
	119–4254–01			KEYBOARD, ASSY:IBM101,NORTH AMERICAN ACCOM XP PRODUCTS (9202XT & 9203XT)	80009	ORDER BY DESC
				9204XT		
	671–2996–00			CIRCUIT BD ASSY:MAIN LOGIC LUNAR TECO COLOR	80009	ORDER BY DESC
	671–3225–00			CIRCUIT BD ASSY:2MB FLASH BD	80009	ORDER BY DESC
	671–3225–00			CIRCUIT BD ASSY:NEW FLASH ROM XP35X,OPT 1A	80009	ORDER BY DESC
	156–4382–00			IC,MEMORY:CMOS,DRAM;1MEG X 32,70NS,MODULE,WITH WORD WIDE MONOLITHIC DEVICES 421000AEW,SIMM72	80009	ORDER BY DESC
	119–4254–01	B010100	B060805	KEYBOARD, ASSY:IBM101,NORTH AMERICAN ACCOM XP PRODUCTS	80009	ORDER BY DESC
	119–4899–01			KEYBOARD:KEYBOARD,101+ NORTH AM W/PS/2 CABLE	80009	ORDER BY DESC

(FOR MORE COMPLETE INFORMATION, REFER TO 070–5874–XX & 070–5877–XX)

Replaceable Electrical Parts List (Cont.)

Component Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Name & Description	Mfr. Code	Mfr. Part Number
				9205XT		
	671–2998–00			CIRCUIT BD ASSY:MAIN LOGIC LUNAR MODULAR COLOR	80009	ORDER BY DESC
	671–2977–00			CIRCUIT BD ASSY:2MB FLASH BD	80009	ORDER BY DESC
	671–3225–00			CIRCUIT BD ASSY:NEW FLASH ROM XP35X,OPT 1A	80009	ORDER BY DESC
	119–5030–02			POWER SUPPLY:40W;5V 4A,12V 1A,45 MIL SQ PIN;90–265 VAC,47 TO 63HZ,45MIL SQ PIN;3 X 5 X 1.45, UL CSA TUV	80009	ORDER BY DESC
	119–5030–04			POWER SUPPLY:40W;5V 4A,12V 1A,90–264 VAC,47– 63HZ,0.045 SQ PIN,3 X 5 X 1.45, UL,CS,TUV	80009	ORDER BY DESC
	156–4382–00			IC,MEMORY:CMOS,DRAM;I MEG X 32,70NS,MODULE,WITH WORD WIDE MONOLITHIC DEVICES 42100A32,SIMM72	80009	ORDER BY DESC
	119–4254–01	B010100	B060805	KEYBOARD, ASSY:IBM101,NORTH AMERICAN ACCOM XP PRODUCTS	80009	ORDER BY DESC
	119–4899–01			KEYBOARD:KEYBOARD,101+ NORTH AM W/PS/2 CABLE	80009	ORDER BY DESC
				9206XT & 9206XT OPTION 4X		
	671–3311–01			CRT BD ASSY:MAIN LOGICCOLOR	80009	ORDER BY DESC
	671–3225–00			CIRCUIT BD ASSY:NEW FLASH ROM XP35X,OPT 1A	80009	ORDER BY DESC
	156–4382–00			IC,MEMORY:CMOS,DRAM;1 MEG X 32,7ONS,MODULE, WITH WORD WIDE MONOLITHIC DEVICES 421000A32,SIMM72	80009	ORDER BY DESC

Replaceable Mechanical Parts

This section contains a list of the replaceable mechanical components for the DAS 9200 System. 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 products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order.

- Part number (see Part Number Revision Level below)
- 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.

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
S3109	FELLER	72 VERONICA AVE UNIT 4	SUMMERSET NJ 08873
S3774	OSHINO ELECTRIC LAMP WORKS LTD	5 2 MINAMI SHINAGAWA 2 CHORE SHINAGAWA KU	TOKYO JAPAN
TK0AJ	ELMEC CO LTD	621–41 OHAZA–SHIMOSHINDEN TSURUGASHIMA–CHO IRUMA–GUN	SAITAMA JAPAN
TK0198	HAMILTON HALLMARK	9750 SW NIMBUS AVE	BEAVERTON OR 97005
TK0303	FAB TEK INC	17 SUGAR HOLLOW RD	DANBURY CT 06810
TK0392	NORTHWEST FASTENER SALES INC	7923 SW CIRRUS DRIVE	BEAVERTON OR 97005–6448
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609–3320
TK0588	UNIVERSAL PRECISION PRODUCTS	1775 NW 216TH	HILLSBORO OR 97123
TK0623	GENERAL TOOL AND SUPPLY CO (DIST)	407 NW 17TH	PORTLAND OR 97209–2214
TK0860	LABEL GRAPHICS	6700 SW BRADBURY CT	PORTLAND OR 97224
TK1112	NOBLE FORM INC	111 RAILROAD AVE	SELAH WA 98942
TK1113	MODCOM INC	555 SW SECOND AVE	CANBY OR 97013
TK1163	POLYCAST INC	9898 SW TIGARD ST	TIGARD OR 97223
TK1179	PANEL COMPONENTS CORP	1360 N DUTTON AVE PO BOX 6626	SANTA ROSA CA 95406
TK1337	NATIONAL ELECTRIC CABLE DIV NATIONAL ELECTRIC CONTROL CO	1730 ELMHURST RD	ELK GROVE VILLAGE IL 60007–5909
TK1375	ESAM		
TK1386	PYRAMID ELECTRONICS SUPPLY INC	9757 JUANITA DRIVE NE	KIRKLAND WA 98034
TK1415	CABOT CORP E A R DIV	7911 ZIONSVILLE RD	INDIANAPOLIS IN 46268
TK1465	BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124–6629
TK1471	PHOENIX CONTACT INC	1900 GREENWOOD ST	HARRISBURG PA 17104
TK1499	AMLAN INC	97 THORNWOOD RD	STAMFORD CT 06903–2617
TK1506	HUGHES R S CO INC	2238 NE COLUMBIA BLVD	PORTLAND OR 97211–0068
TK1742	WJ WILD MANUFACTURING CO	PO BOX 103 FLOODGATE STREET	BIRMINGHAM B5 5SJ ENGLAND
TK1875	CENTRAL FASTENER INC	160 EMERAL ST PO BOX 1089	KEENE NH 03431
TK1915	HIRSCHMANN CO	PO BOX 229	RIVERDALE NJ 07457
TK1943	NEILSEN MANUFACTURING INC	3501 PORTLAND ROAD NE	SALEM OR 97303
TK1951	XYTEC PLASTICS INC	9350 47TH AVE SW BLDG 10 PO BOX 99057	TACOMA WA 98499–3904
TK2076	PACKAGING RESOURCES DIV OF COLUMBIA CORRUGATED BOX CO	12555 SW TUALATIN SHERWOOD RD	TUALATIN OR 97062–8051
TK2122	INDUSTRIAL GASKET INC	1623 SE 6TH AVE	PORTLAND OR 97214–3502
TK2208	NORTHWEST RUBBER EXTRUDERS INC	16748 SW 77TH AVE	PORTLAND OR 97223
TK2354	UNITRACK INDUSTRIES INC	1372 ENTERPRISE PO BOX 1927	WEST CHESTER PA 19380
TK2383	PANASONIC INDUSTRIAL CO	1600 MC CANDLASS DRIVE	MILPATAS CA 95035

Manufacturers Cross Index (Cont.)

Mfr. Code	Manufacturer	Address	City, State, Zip Code
TK2435	MEC IMEX INCORPORATED	6TH FLOOR 162 CHANG AN E ROAD SEC 2	TAIPEI, TAIWAN ROC
TK2469	UNITREK CORPORATION	3000 LEWIS & CLARK WAY SUITE #2	VANCOUVER WA 98601
TK2541	AMERICOR ELECTRONICS LTD	2682 W COYLE AVENUE	ELK GROVE VILLAGE IL 60007
TK2548	XEROX BUSINESS SERVICES DIV OF XEROX CORPORATION	14181 SW MILLIKAN WAY	BEAVERTON OR 97077
TK6027	APTRONICS CORP	9450 PINENEEDLE DR	MENTOR OH 44061–0270
0AMX4	TCL INC	47621 WESTINGHOUSE DRIVE	FREMONT CA 94539
0ANT4	DIAGRAPH OF THE NORTHWEST	6701 SW MC EWAN	LAKE OSWEGO OR 97035
0B445	ELECTRI–CORD MFG CO INC	312 EAST MAIN ST	WESTFIELD PA 16950
0GZV8	HUBER AND SUHNER INC	ONE ALLEN MARTIN DRIVE	EXXEX VT 05451
0JE80	CONNECTOR RESOURCES UNLIMITED	1005 AMES AVENUE	MILPITAS CA 95035
0JR05	TRIQUEST CORP	3000 LEWIS AND CLARK HWY	VANCOUVER WA 98661–2999
0J260	COMTEK MANUFACTURING OF OREGON (METALS)	PO BOX 4200	BEAVERTON OR 97076–4200
0KBZ5	MORELLIS Q & D PLASTICS	1812 16TH AVE	FOREST GROVE OR 97116
0KBZ8	SHELLEY–RAGON INC (DIST)	919 SW 150TH	SEATTLE WA 98166–1829
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
0KB05	NORTH STAR NAMEPLATE	1281–S NE 25TH	HILLSBORO OR 97124
0MS63	QUALITY TECHNOLOGIES CORP	610 N MARY AVENUE	SUNNYVALE CA 94086
00141	PIC DESIGN CORP	BENSON RD PO BOX 1004	MIDDLEBURY CT 06762
00613	USM CORP SUB OF EMHART INDUSTRIES INC MOLLY FASTENER DIV	504 MT LAUREL AVE	TEMPLE PA 19560–1410
00779	AMP INC	2800 FULLING MILL PO BOX 3608	HARRISBURG PA 17105
01963	CHERRY ELECTRICAL PRODUCTS CORP	3600 SUNSET AVE	WAUKEGAN IL 60087–3214
05469	BEARINGS INC	3634 EUCLID P O BOX 6925	CLEVELAND OH 44101
05820	EG AND G WAKEFIELD ENGINEERING	60 AUDUBON RD	WAKEFIELD MA 01880–1203
06090	RAYCHEM CORP	300 CONSTITUTION DRIVE	MENLO PARK CA 94025–1111
06383	PANDUIT CORP	17301 RIDGELAND	TINLEY PARK IL 60477–3048
06915	RICHCO PLASTIC CO	5825 N TRIPP AVE	CHICAGO IL 60646–6013
07416	NELSON NAME PLATE CO	3191 CASITAS	LOS ANGELES CA 90039–2410
08530	RELIANCE MICA CORP	341–39TH ST	BROOKLYN NY 11212–2903
09922	BURNDY CORP	RICHARDS AVE	NORWALK CT 06852
1Y013	ACACIA/DEANCO	3101 SW 153RD DRIVE	BEAVERTON OR 97006
11897	PLASTIGLIDE MFG CORP	2701 W EL SEGUNDO BLVD	HAWTHORNE CA 90250–3318
12327	FREEWAY CORP	9301 ALLEN DR	CLEVELAND OH 44125–4632

Manufacturers Cross Index (Cont.)

Mfr. Code	Manufacturer	Address	City, State, Zip Code
13103	THERMALLOY CO INC	2021 W VALLEY VIEW LN PO BOX 810839	DALLAS TX 75381
15920	CONTROL DATA CORP ROSEVILLE OPERATIONS TERMINALS AND SMALL SYSTEMS	2401 N FAIRVIEW AVE	ST PAUL MN 55113–2707
17217	GORE W L AND ASSOCIATES INC	555 PAPER MILL ROAD PO BOX 9329	NEWARK DE 19711–7598
23633	RICHEY ELECTRONICS INC	7441 LINCOLN WAY	GARDEN GROVE, CA 92641
2J927	AMERICAN PRECISION INDUSTRIES INC	5455A SE ALEXANDER HILLSBORO OR	97123
2K262	BOYD CORP	6136 NE 87th AVE PO BOX 20038	PORTLAND OR 97220
22526	BERG ELECTRONICS INC (DUPONT)	857 OLD TRAIL RD	ETTERS PA 17319
22670	G M NAMEPLATE INC	2040 15TH AVE WEST	SEATTLE WA 98119–2728
24546	DALE ELECTRONICS A VISHAY INTERTECHNOLOGY INC CO	550 HIGH ST	BRADFORD PA 16701–3737
24931	SPECIALTY CONNECTOR CO INC	2100 EARLYWOOD DR PO BOX 547	FRANKLIN IN 46131
26742	METHODE ELECTRONICS INC	7447 W WILSON AVE	CHICAGO IL 60656–4548
27264	MOLEX INC	2222 WELLINGTON COURT	LISLE IL 60532–1613
3M099	PORTLAND SCREW CO	6520 N BASIN ST	PORTLAND OR 97217–3920
30161	AAVID ENGINEERING INC	ONE KOOL PATH PO BOX 400	LACONIA NH 03247
30817	INSTRUMENT SPECIALTIES CO INC	EXIT 53 RT 80 BOX A	DELAWARE WATER GAP PA 18327
39766	MERRILL MFG CORP	236 S GENESEE ST PO BOX 566	MERRILL WI 54452–3314
5Y400	TRIAX METAL PRODUCTS INC DIV OF BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124–6629
50434	HEWLETT–PACKARD CO OPTOELECTRONICS DIV	370 W TRIMBLE RD	SAN JOSE CA 95131–1008
52152	MINNESOTA MINING AND MFG CO INDUSTRIAL SPECIALTIES DIV	3M CENTER	ST PAUL MN 55144–0001
52814	TECH–ETCH INC	45 ALDRIN RD	PLYMOUTH MA 02360
52961	NORTHWEST STAMPING	86365 COLLEGE VIEW RD	EUGENE OR 97405–9631
53217	TECHNICAL WIRE PRODUCTS INC DBA TECKNIT INC	320 N NOPAL ST	SANTA BARBARA CA 93103–3225
53387	MINNESOTA MINING MFG CO	PO BOX 2963	AUSTIN TX 78769–2963
53718	GRACE W R AND CO POLYFIBRON DIV/AIRMOLD/	BECKER FARMS INDUSTRIAL PK P O BOX 610	ROANOKE RAPIDS NC 27870
54491			
54583	TDK ELECTRONICS CORP	12 HARBOR PARK DR	PORT WASHINGTON NY 11550
58050	TEKA PRODUCTS INC	45 SALEM ST	PROVIDENCE RI 02907
6D224	CONTEX TRI–TEK ENGINEERING CORP	14500 SOUTH BROADWAY	GARDENA CA 90248

Manufacturers Cross Index (Cont.)

Mfr. Code	Manufacturer	Address	City, State, Zip Code
60381	PRECISION INTERCONNECT	16640 SW 72ND AVE	PORTLAND OR 97224
61058	MATSUSHITA ELECTRIC CORP OF AMERICA PANASONIC INDUSTRIAL CO DIV	TWO PANASONIC WAY	SECAUCUS NJ 07094
61935	SCHURTER INC	1016 CLEGG COURT	PETALUMA CA 94952–1152
62803	NEC INFORMATION SYSTEMS INC	1414 MASSACHUSETTS AVE	BOXBOROUGH MA 01719–2205
63058	MCKENZIE TECHNOLOGY	910 PAGE AVENUE	FREMONT CA 94538
63227	EG AND G ROTRON		
63852	QUANTUM CORPORATION	500 MC CARTHY BLVD	MILPITAS CA 95035
64537	KDI ELECTRONICS INC SUBSIDIARY OF KDI CORP	31 FARINELLA DR	EAST HANOVER NJ 07936
65249	BOGEN COMMUNICATIONS INC	50 SPRING STREET PO BOX 575	RAMSEY NJ 07446
65867	SEAGATE TECHNOLOGY	920 DISC DRIVE	SCOTTS VALLEY CA 95066–4544
72228	AMCA INTERNATIONAL CORP CONTINENTAL SCREW CO DIV	459 MT PLEASANT	NEW BEDFORD MA 02742
73743	FISCHER SPECIAL MFG CO	111 INDUSTRIAL RD	COLD SPRING KY 41076–9749
74868	AMPHENOL CORP R F CONNECTORS (OPNS)	1 KENNEDY AVE	DANBURY CT 06810–5803
75915	LITTELFUSE INC SUB TRACOR INC	800 E NORTHWEST HWY	DES PLAINES IL 60016–3049
77132	DOT DIV A UNITED–CARR DIV OF TRW INC	250 KNOTTER RD P O BOX 767	CHESHIRE CT 06410
78189	ILLINOIS TOOL WORKS INC SHAKEPROOF DIV	ST CHARLES ROAD	ELGIN IL 60120
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001
81073	GRAYHILL INC	561 HILLGROVE AVE PO BOX 10373	LA GRANGE IL 60525–5914
82389	SWITCHCRAFT INC SUB OF RAYTHEON CO	5555 N ELSTRON AVE	CHICAGO IL 60630–1314
83385	MICRODOT MFG INC GREER–CENTRAL DIV	3221 W BIG BEAVER RD	TROY MI 48098
83486	ELCO INDUSTRIES INC	1101 SAMUELSON RD	ROCKFORD IL 61101
85471	BOYD CORP	13885 RAMOMA AVE	CHINO CA 91710
85480	BRADY W H CO CORP H Q INDUSTRIAL PRODUCTS DIV	2221 W CAMDEN RD PO BOX 2131	MILWAUKEE WI 53209
9M860	ELECTRONIC SUB ASSEMBLY MFG CORP (ESAM)	930 SE M STREET PO BOX 376	GRANTS PASS OR 97526–3248

Manufacturers Cross Index (Cont.)

Mfr. Code	Manufacturer	Address	City, State, Zip Code
91500	ASHEVILLE–SCHOONMAKER MICA CO	910 JEFFERSON AVE P O BOX 318	NEWPORT NEWS VA 23607–6120
94222	SOUTHCO INC	210 N BRINTON LAKE RD	CONCORDVILLE PA 19331
95146	ALCO ELECTRONIC PRODUCTS INC	1551 OSGOOD ST	NORTH ANDOVER MA 01845–1014
98159	RUBBER TECK INC	19115 HAMILTON AVE PO BOX 389	GARDENA CA 90247
98978	INTERNATIONAL ELECTRONIC RESEARCH CORP	135 W MAGNOLIA BLVD PO BOX 7704	BURBANK CA 91502

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
					DAS 9219/20/21		
1–1	437–0363–00			1	CABINET ASSY:8541/DAS9200 SERIES,	0JR05	437–0363–00
–2	334–6310–00			1	MARKER,IDENT:MKD TEKTRONIX DAS9200 DIGITAL ANALYSIS SYSTEM,	22670	ORDER BY DESC
–3	386–5365–00			1	PANEL,SW MTG:DAS9229, (DAS9221 ONLY)	TK1951	386–5365–00
–4	334–8327–00			1	MARKER,IDENT:MARKED DAS SE	0KB05	ORDER BY DESC
	334–8740–00			1	MARKER,IDENT MARKED DAS XP,92FXSE	0KB05	ORDER BY DESC
	334–8739–00			1	MARKER,IDENT MARKED DAS NT,92FXNET	0KB05	ORDER BY DESC
–5	331–0497–00			1	MASK,FACADE:BLACK,LEXAN W/ADHESIVE	07416	ORDER BY DESC
–6	407–3498–00			1	BRKT,EJECTOR:DAS9229	TK1943	ORDER BY DESC
–7	212–0023–00	B010100	B011831	2	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		2	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–8	105–0985–00			2	EJECTOR,CKT BD:NYLON	TK1163	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					DAS 9219/20 CHASSIS		
2–1	200–3208–00			1	GUARD,FAN:CARD CAGE,	39766	ORDER BY DESC
–2	212–0093–00			4	SCREW,MACHINE:8–32 X 2.625,HEX HD,STL	83385	OBD
–3	119–2058–00			1	FAN,TUBEAXIAL:24VDC,24W,3350 RPM,240 CFM	63227	PD24B2QNN/03228
–4	386–5241–00	B010100	B030334	1	STIF,CIRCUIT BD:EDGE CARD,ALUMINUM	80009	386524100
	386–5341–01	B010506		1	STIF,CIRCUIT BD:EDGE CARD,ALUMINUM (SEE A03 & A14 REPL)	5Y40	ORDER BY DESC
–5	670–9514–00			1	CIRCUIT BD ASSY:MEMORY (A03 DAS9219 & 9220 STANDARD)	80009	670951400
	671–0760–00	B010100	B010505	1	CIRCUIT BD ASSY:LAN INTERFACE	80009	671076000
	671–0760–01	B010506		1	CIRCUIT BD ASSY:LAN INTERFACE; (A14 DAS 9220 STANDARD,DAS9219 & 9229	80009	671076001
–6	361–1350–00			3	SPACER,CONN:2.1 X 0.7,ABS	TK1163	ORDER BY DESC
–7	131–0812–01			3	CONN,DSUB:PCB/PNL,;FEMALE,RTANG,25 POS, 0.112 CTR, 454 MLG X 0.225 TAIL,4–40 SCREW,30 GOLD	00779	747420–4
–8	211–0376–00			6	SCREW,MACHINE:4–40 X 0.438 L,PNH SST,POZIDRIVE	80009	211037600
–9	220–0438–00			6	NUT,PLAIN,HEX:4–40 X 0.25 HEX,SST	TK0435	11527–436
–10	131–0890–00			6	CONN,HARDWARE:DSUB,JACK SCREW;4–40 X 0.312L HEX HD,STL CD PL,W/2 FLAT WASHERS,1 LOCKWASHER,4–40 NUT	0KB01	131–0890–00
–11	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–12	211–0381–00	B010100	B010192	4	SCREW,MACHINE:2–56 X 0.312 L,PNH,SST,POZI	3M099	ORDER BY DESC
	211–0405–00	B010193		4	SCREW,MACHINE:2–56 X 0.375,TRH, SST POZIDRIVE	TK0392	ORDER BY DESC
–13	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–14	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–15	136–0757–00			2	SOCKET,DIP:PCB,;FEMALE,STR,2 X 20,40 POS,0. 1 X 0.6 CTR,0.175 H X 0.130 TAIL,BECU,TIN,A CCOM 0.008–0.015 X 0.014–0.022 IC	09922	DILB40P–108
–16	333–3279–00	B010100	B011831	1	PANEL,REAR:DAS9229,	0J260	ORDER BY DESC
	333–3279–01	B011832		1	PANEL,REAR:DAS9229,	5Y400	333–3279–01
–17	212–0023–00	B010100	B011831	9	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		9	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–18	129–0103–00			1	POST,BDG,ELEC:ASSEMBLY	TK0588	ORDER BY DESC
–19	210–0455–00			2	NUT,PLAIN,HEX:0.25–28 X 0.375,BRS NP	73743	3089–402
–20	441–1733–00	B010100	B010307	2	CHAS,CARD CAGE:ALUMINUM,	5Y400	ORDER BY DESC
	441–1733–01	B010308	B011578	1	CHAS,CARD CAGE:ALUMINUM,	5Y400	ORDER BY DESC
	441–1733–02	B011579		1	CHAS,CARD CAGE:ALUMINUM,	5Y400	441–1733–02

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
2–21	212–0023–00	B010100	B011831	2	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		2	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–22	214–3839–00			4	FASTENER,BLIND:0.56 L,8–32 THRU	00613	USM C8–32
–23	670–8729–00	B010100	B010629	1	CIRCUIT BD ASSY:BACKPLANE	80009	670872900
	670–8729–01	B010630		1	CIRCUIT BD ASSY:BACKPLANE (SEE REPL A01)	80009	670872901
–24	131–3715–00			8	CONN,HDI:PCB,MALE,STR,4 X 135,540 POS,0.1 CTR,0.46 H X 0.177 TAIL,30 GOLD,W/DUAL GUIDEPINS	22526	50017–1540A
–25	351–0778–00	B010100	B010192	16	GUIDE,PIN:	22526	77268–002
	351–0778–00	B010193	B010675	8	GUIDE,PIN:	22526	77268–002
	351–0778–01	B010676		16	GUIDE,PIN:0.585 X 0.080,2–56,SST	22526	77031–102
–26	211–0404–00	B010193		16	SCREW,MACHINE:2–56 X O.375,PNH,SST POZIDRIVE	TK0392	ORDER BY DESC
–27	220–0032–00	B010193	B010675	16	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
	220–0032–00	B010676		32	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–28	131–1343–00	B011639		1	CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230 MLG X 0.195 TAIL,30 GOLD	58050	082–3643–SS02
–29	131–3480–00			3	TERMINAL BLOCK:7 PIN,	TK1471	MKDSF 3/7 5.08
–30	131–3712–00	B010100	B011179	1	CONN,HDI:PCB,;FEMALE,RTANG,368 POS,4 X 92,0.1 CTR, 0.190 TAIL,W/CTR GUIDE PIN	22526	67883–342
	131–3712–01	B011180		1	CONN,HDI:PCB,;FEMALE,RTANG,3 X 92,368 POS,0.1 CTR, 0.48 MLG X 0.145 TAIL,30 GOLD, W/CTRGUIDE PIN	22526	50004–1368F
–31	211–0381–00	B010100	B010192	3	SCREW,MACHINE:2–56 X 0.312 L,PNH,SST,POZI	3M099	ORDER BY DESC
	211–0405–00	B010193		3	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–32	220–0032–00			3	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–33	131–2230–00			1	CONN,HDR:FEEDTHRU/PCB,;MALE,STR,2 X 8,0.1 CTR,0.230 MLG X 0.230 MLG,30 GOLD	58050	082–0843–SD08
–34	378–0271–00			1	BAFFLE,AIR:CARDCAGE,	5Y400	378–0271–00
–35	211–0244–00			2	SCR,ASSEM WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ,MACHINE	TK0435	7772–312
–36	386–5486–00			1	SUPPORT,CKT BD:LOCKING,0.188,NYLON	06915	LCBS–2–3R
–37	670–8725–00	B010100	B010185	1	CIRCUIT BD ASSY:CONTROLLER	80009	670872500
	670–8725–01	B010186	B010260	1	CIRCUIT BD ASSY:CONTROLLER	80009	670872501
	670–8725–02	B010261	B010468	1	CIRCUIT BD ASSY:CONTROLLER	80009	670872502
	670–8725–03	B010469	B010647	1	CIRCUIT BD ASSY:CONTROLLER	80009	670872503
	670–8725–04	B010648	B011285	1	CIRCUIT BD ASSY:CONTROLLER	80009	670872504
	670–8725–05	B011286	B011375	1	CIRCUIT BD ASSY:CONTROLLER	80009	670872505
	670–8725–06	B011376		1	CIRCUIT BOARD:CONTROLLER (SEE REPL A02)	80009	670872506
–38	211–0244–00			2	SCR,ASSEM WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ,MACHINE	TK0435	7772–312
–39	131–0608–00			7	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
2–40	136–0757–00			2	SOCKET,DIP:PCB,;FEMALE,STR,2 X 20,40 POS,0.1 X 0.6 CTR,0.175 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014–0.022 IC	09922	DILB40P–108
–41	136–0755–00			2	SOCKET,DIP:PCB,;FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR,0.175 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
–42	131–1789–00			1	CONN,HDR::PCB,;MALE,RTANG,2 X 10,0.1 CTR,0.380 H X 0.090 TAIL,SHRD/4 SIDES,CTR PLZ,30GOLD,REAR SHRD, END PLZ	22526	65268–008
–43	131–2567–00			2	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.3 90 H, 0.230 MLG X 0.1 TAIL,PLZ WALL,CTR PLZ, 30 GOLD,0.15 PCB TO SQ PIN	22526	65461–006
–44	136–0849–00			1	SOCKET,PGA:PCB,MOT 68000;68 POS,10 X 10,0.1 X 0.1 CTR,0.250 H X 0.110 TAIL,TIN, SYMMETRICAL,PAT 1006, LIF,GOLD	00779	916220–2
–45	346–0032–00			1	STRAP,RETAINING:0.075 DIA X 4.0 L,MLD RBR	98159	2829–75–4
–46	352–0742–00			1	HOLDER,BATTERY:2/3A LITHIUM,94V–O POLYEST	65249	BH2/3A
–47	131–3713–00			1	CONN,HDI:PCB,;MALE,STR,4 X 92,368 POS,0.01 CTR,0.460 H X 0.120 TAIL,30 GOLD,W/CTR GUIDE PIN	22526	50016–1368J
–48	211–0381–00	B010100	B010192	2	SCREW,MACHINE:2–56 X 0.312 L,PNH,SST,POZI	3M099	ORDER BY DESC
	211–0404–00	B010193		2	SCREW,MACHINE:2–56 X O.375,PNH,SST POZIDRIVE	TK0392	ORDER BY DESC
–49	220–0032–00	B010100	B010192	2	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
	220–0032–00	B010193	B010675	2	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
	220–0032–00	B010676		3	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–50	211–0375–00	B010100	B010192	1	SCREW,MACHINE:2–56 X 0.438 L,PNH,SST POZIDRIVE	80009	211037500
	351–0778–00	B010193	B010675	1	GUIDE,PIN:	22526	77268–002
	351–0778–01	B010676		1	GUIDE,PIN:0.585 X 0.080,2–56,SST (SET OF 2)	22526	77031–102
–51	386–5323–00			5	SUPPORT,CKT BD:NYLON	06915	BHC–3–01
–52	119–2224–00	B010100	B010527	1	HARD DISK DRIVE:10 MEGABYTE,NEC 5124 WINCHESTER	62803	5124
	119–2225–00	B010528		1	HARD DISK DRIVE:20 MEGABYTE,SEAGATE (STD FOR DAS9219/9229, OPT12 FOR DAS9220)	TK0198	ST225
	119–2225–00	B010100	B010527	1	HARD DISK DRIVE:20 MEGABYTE,SEAGATE	TK0198	ST225
	119–3290–00	B010100	B011762	1	HARD DISK DRIVE: WINCHESTER, 5.25 INCH;40MB ,24MS,ST412/(DAS 9219)	15920	94205–51
	119–3705–00	B011763			HARD DISK DRIVE:WINCHESTER, 3.5;80MB ,24MS,ST412/ (OPT 13 DAS9219/9229, STD DAS9220)	65867	ST1100
	426–2389–00	B040620			BRKT,CHASSIS: 3.5 TO 5.25HARD/FLOPPY DRIVE (DAS 9220)	15920	94205–51
	426–2444–00	B040798		1	BRKT,CHASSIS: 3.5 TO 5.25HARD/FLOPPY DRIVE (DAS 9220)	65867	54459–014
	426–2449–00	B010100	B050573		BRKT,CHASSIS: 3.5 TO 5.25HARD/FLOPPY DRIVE	15920	426244900
	426–2449–01	B050574		1	BRKT,CHASSIS: 3.5 TO 5.25HARD/FLOPPY DRIVE (DAS 9221)	15920	426244901
	441–1998–00			1	CHASSIS,DISK DR:FRAME & CARTRIDGE	OJE80	ST–450–5

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
2–52	119–3290–00	B010100	B040119	1	HARD DISK DRIVE:40 MB,5.25 INCH (OPT 13 DAS9219/9229, STD DAS9220)	15920	94205–51
	119–4317–00	B040120		1	HARD DISK DRIVEWINCHESTER:3.5:40MB,W/BRACKET (DAS9220/29)	65867	ST151903001–029
	426–2444–00	B040120		1	FR,SECT,MTG HARD DISK,3.5 TO 5.25 HALFHEIGHT (DAS9220/29)	65867	54459–014
	426–2389–00	B040620		1	FR,SECT,NTG HARD DISK,3.5 TO 5.25 HALFHEIGHT	5920	54459–010
–53	211–0507–00			4	SCREW,MACHINE:6–32 X 0.312,PNH,STL	TK0435	ORDER BY DESC
–54	119–1636–00			1	FLOPPY DISK DR:5.25,DBL–DENS,2–SIDED,0.5MB (STD FOR DAS9219/9229 OPT 15 9220)	61058	JU–455–5
	119–2400–00	B010100	B011795	1	FLOPPY DISK DR:5.25 MINI FLOPPY,1.2MB,1/2H	61058	JU–4753–AEG
	119–2400–03	B011796		1	FLOPPY DISK DR:5.25 MINI FLOPPY,1.6MB,HALF HIGH (OPT 10 FOR DAS9219/9229 STD FOR 9220)	TK2383	JU475–4AEG
–55	211–0383–00			4	SCREW,MACHINE:3MM–8MM,PNH,PHILLIPS	0KB01	211–0383–00
–56	407–3415–00	B010100	B010611	4	BRACKET ASSY:MEDIA	80009	407341500
	407–3415–01	B010612	B011831	1	BRACKET ASSY:MEDIA	5Y400	407–3415–01
	407–3415–02	B011832		1	BRACKET ASSY:MEDIA	5Y400	ORDER BY DESC
–57	212–0023–00	B010100	B011831	4	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	210–0001–00	B011832		4	WASHER,LOCK:#2 INTL,0.013 THK,STL	78189	1202–00–00–0541
–58	006–6698–00	B010217		1	ENVELOPE,POLY:4.5 X 5.5,POLYETHYLENE, PRESSURE SENSITIVE	0ANT4	4.5 X 5.5 POLY
–59	343–1280–00			1	CLAMP,CABLE:FCM MOUNT	06383	FCM3–A–14
–60	407–3503–00			1	BRACKET,SUPPORT:STAB MEDIA TO POWERSPLY	TK1943	ORDER BY DESC
–61	212–0023–00	B010100	B011832	1	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		1	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–62	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–63	407–3504–00			1	BRACKET,SUPPORT:STAB MEDIA TO CARD CAGE	TK1943	ORDER BY DESC
–64	212–0023–00	B010100	B011831	1	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		1	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–65	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–66	650–1807–00	B010100	B010185	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180700
	650–1807–01	B010186	B010447	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180701
	650–1807–02	B010448	B010623	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180702
	650–1807–03	B010624	B010993	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180703
	650–1807–04	B010994	B011301	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180704
	650–1807–05	B011302	B011689	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180705
	650–1807–06	B011690	B011759	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180706
	650–1807–07	B011760	B011824	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180707
	650–1807–08	B011825	B049999	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180708
	650–1807–09	B050100	B051063	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180709
	650–1807–10	B061064		1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180710

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
2–66	650–1877–00	B010100	B010447	1	POWER SUPPLY ASSY:DAS9219 OPT 4	80009	650187700
	650–1877–01	B010448	B011021	1	POWER SUPPLY ASSY:DAS9219 OPT 04	80009	650187701
	650–1877–02	B011022	B011314	1	POWER SUPPLY ASSY:DAS9219 OPT 04	80009	650187702
	650–1877–03	B011315	B011711	1	POWER SUPPLY ASSY:DAS9219 OPT 04	80009	650187703
	650–1877–04	B011712	B011757	1	POWER SUPPLY ASSY:DAS9219 OPT 04	80009	650187704
	650–1877–05	B011758	B011864	1	POWER SUPPLY ASSY:DAS9219 OPT 04	80009	650187705
	650–1877–06	B011865	B049999	1	POWER SUPPLY ASSY:DAS9219 OPT 04	80009	650187706
	650–1877–07	B050100	B051063	1	POWER SUPPLY ASSY:DAS9219 OPT 04	80009	650187707
	650–1877–08	B061064		1	POWER SUPPLY ASSY:DAS9219 OPT 04	80009	650187708
–66	650–1931–00	B010100	B010185	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193100
	650–1931–01	B010186	B010447	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193101
	650–1931–02	B010448	B010645	1	POWER SUPPLY ASSY:OPT A1 –A5	80009	650193102
	650–1931–03	B010646	B011083	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193103
	650–1931–04	B011084	B011264	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193104
	650–1931–05	B011265	B011693	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193105
	650–1931–06	B011694	B011737	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193106
	650–1931–07	B011738	B011825	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193107
	650–1931–08	B011826	B049999	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193108
	650–1931–09	B050100	B051063	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193109
	650–1931–10	B061064		1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193110
	650–1973–00	B010100	B010447	1	POWER SUPPLY ASSY:OPT 1B 3 PHASE	80009	650197300
	650–1973–01	B010448	B010628	1	POWER SUPPLY ASSY:OPT 1B 3 PHASE	80009	650197301
	650–1973–02	B010629	B011106	1	POWER SUPPLY ASSY:OPT 1B,3 PHASE	80009	650197302
	650–1973–03	B011107	B011227	1	POWER SUPPLY ASSY:OPT 1B 3 PHASE	80009	650197303
	650–1973–04	B011228	B011327	1	POWER SUPPLY ASSY:OPT 1B,3 PHASE	80009	650197304
	650–1973–05	B011328	B011511	1	POWER SUPPLY ASSY:OPT 1B,3 PHASE	80009	650197305
	650–1973–06	B011512	B011824	1	POWER SUPPLY ASSY:OPT 1B,3 PHASE	80009	650197306
	650–1973–07	B011825	B049999	1	POWER SUPPLY ASSY:OPT 1B,3 PHASE	80009	650197307
	650–1973–08	B050100	B061031	1	POWER SUPPLY ASSY:OPT 1B,3 PHASE	80009	650197308
	650–1973–09	B061032	B061162	1	POWER SUPPLY ASSY:OPT 1B,3 PHASE	80009	650197309
–67	212–0023–00	B010100	B011831	2	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		2	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–68	343–0149–00			2	STRAP,TIEDOWN,E:6.75 L,PLASTIC	06383	ORDER BY DESC
–69	348–0149–00			1	GROMMET,PLASTIC:BLACK,U–SHAPE,0.88 ID	0KBZ5	N/A
–70	255–0334–00			1	PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYLON	11897	122–NN–2500–060
	334–4645–00	B010624		1	MARKER,IDENT:MKD TEKTRONIX	TK0860	ORDER BY DESC
–71	352–0795–00			1	FUSEHOLDER:20A,250V,GRAY,	75915	345–101–010
–72	200–3253–00			1	CAP,FUSEHOLDER:U/W 3AG FUSE	75915	345–101–020
–73	366–1522–00			1	KNOB:YEL,0.156 ID X 1.0 OD X 0.25 H,	80009	366152200
–74	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–75	437–0363–00			1	CABINET ASSY:8541/DAS9200 SERIES, (SUBPART OF CAB ASSY, SEE FIG 1)	0JR05	437–0363–00
–76	348–0845–00			1	FOOT,CABINET:SMOKE TAN,LEXAN, (INCLUDED AS PART OF 437–0363–00)	TK1951	ORDER BY DESC
–77	348–1061–00	B011096	B011264	4	FOOT,CABINET:PU POLYMER	52152	SJ–5012 BLACK
	348–1061–00	B011265		4	FOOT,CABINET:PU POLYMER	52152	SJ–5012 BLACK
–78	212–0082–00	B011265		4	SCREW,MACHINE:8–32 X 1.25,PNH,STL	TK0435	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
–79	131–0566–00			2	BUS,CONDUCTOR:DUMMY RES,0.094 OD X 0.225L (USED WITH 400K FLOPPY DRIVE)	24546	OMA0207
–80	334–4935–00			1	MARKER,IDENT:MKD U.L.	07416	334–4935–00
–81	334–5954–00			1	MARKER,IDENT:MKD CSA CERTIFIED FRENCH	22670	ORDER BY DESC
–82	334–8608–00			1	MARKER,IDENT:IVORY GRAY, MARKED CE	0KB05	334–8608–00
					STANDARD ACCESSORIES		
	P6041	B010100	B010171	2	PROBE PASSIVE:1X,3.5 FEET	80009	P6041
	016–0870–00	B010100	B010375	1	CASE,ACCESSORY:FLOPPY DISK,1–10	54491	513334
	334–6832–00	B010376		1	LABEL:MKD DAS9200	07416	334–6832–00
	334–6832–01			1	LABEL:MARKED DAS9200	07416	334–6832–01
	105–0985–00	B010965		2	EJECTOR,CKT BD:NYLON	TK1163	ORDER BY DESC
	012–1253–00			1	CABLE,INTCON:SHLD,RS232;15 COND,144 L,DB25MALE/ DB25 FEMALE (MAINFRAME–TO–TERMINALCONNECTION)	6D224	901781
	671–0957–00			1	CIRCUIT BD ASSY:TRAINING AID	80009	671095700
	062–8939–09			1	MANUAL,TECH:USERS,DAS9200 SERIES,SYS PKG	80009	062893909
	070–5957–06			1	MANUAL,TECH:USERS,DAS9219 SERIES SYS	80009	070595706
	063–0174–02			1	REMOTE OPERATION PACKAGE	80009	063017402
	070–5960–06			1	MANUAL,TECH:USERS,DAS9200 SERIES PROGRAMMATIC COMMAND LANGUAGE	80009	070596006
	070–5958–03			1	MANUAL,TECH:REF GUIDE,DAS9200 SERIES, COMMAND LANGUAGE PROGRAMMATIC	80009	070595803
	070–7483–01			1	MANUAL,TECH:USERS,DAS9200 SERIES, ACQUISITION & PATTERN GENERATION	80009	070748301
					OPTIONAL ACCESSORIES		
	012–0689–02			1	CABLE,INTCON:192.0 L,021–0188–00 TO MODEM	80009	012068902
	012–0153–00			1	CABLE ASSY,RF:TELEQUIPMENT	80009	012015300
	012–1233–00			1	CABLE,INTCON:3 METER 4693D TO HOST	80009	012123300
	344–0399–00		B061008		CLIP,GROUND:CU BE	5Y400	344–0399–00
	062–8941–00			1	MANUAL,TECH:SERVICE,DAS9200SERVICE INFORMATION	80009	062894100
	070–5959–08			1	MANUAL,TECH:REF,DAS9200 SERIES MAINFRAME	80009	070595908
	012–0911–00			1	CABLE,INTCON:SHLD CMPST,RS232;MLD,15,24 AWG,10 FT, DUAL SHLD,25 POS,MALE,DSUB, DB25M X 25 POS,FEMALE, DSUB,DB25F,15 POS LOAD	TK2435	ORDER BY DESC
	016–0845–00			1	ADPTR,RACKMOUNT:OPT 05	80009	016084500
	070–5961–02			1	MANUAL,TECH:DAS9200	80009	070596102
	016–1080–00	B011809		1	ACCESSORY PKG:RS232 POWER SWITCH ADAPTER	1Y013	ASI 65416

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					9219/20/21/E9/POWER CORD OPTIONS		
3–1	161–0213–00			1	CABLE ASSY,PWR,:3,16 AWG,2.5 METER,SJT, GREY,105 DEG C,MCA–3T X BME–3S,13A/250V, NORTH AMERICAN; (STANDARD ONLY)	0B445	ECM–161–0213–00
–2	161–0209–00			1	CABLE ASSY,PWR,:3,1.0MM SQ,220V,2.5 METERS EUROPEAN, (OPTION A1 EUROPEAN ONLY)	TK1179	8680030802
–3	161–0210–00			1	CABLE ASSY,PWR,:3,1.0MM SQ,240V,2.5 METERS UNITED KINGDOM, (OPTION A2 UNITED KINGDOM ONLY)	S3109	209–03
–4	161–0211–00			1	CABLE ASSY,PWR,:3,1.0MM SQ 240V,2.5 METERS AUSTRALIAN, (OPTION A3 AUSTRALIAN ONLY)	S3109	SAA/3–OD3RRFC3X
–5	161–0208–00			1	CABLE ASSY,PWR,:3,16 AWG,2.5 METER,SJT, GREY,105 DEG C,NORTH AMERICIAN,13A/250V, US 220V (OPTION A4 NORTH AMERICAN ONLY)	0B445	ECM 161–0208–00
–6	161–0212–00			1	CABLE ASSY,PWR,:3,1.0MM SQ,220V,2.5 METERS (OPTION A5 SWISS ONLY)	TK1179	86542000
–7	161–0218–00			1	CABLE ASSY,PWR,:3,14 AWG,100 L,SJT,BLK,60 DEG C,5–20P X BME–3S,15A/125V; (OPTION 1A ONLY)	0B445	ECM–161–0218–00

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					DAS 9200 OPTION 14		
4–0	020–1677–00			1	ACCESSORY KIT:REMOVABLE HARD DISK ASSY92F14	80009	020167700
–1	426–2296–00			1	FRAME SECTION:TOP,PLASTIC	0J260	426–2296–00
–2	211–0210–00			2	SCREW,MACHINE:4–40 X 0.531,SPL HD,SST,SLOT	00141	4314
–3	213–1026–00			1	THUMBSCREW:6–32,1.0 L,SST	0J260	213–1026–00
–4	407–3773–00			1	BRACKET,MEDIA:ALUMINUM	5Y400	407–3773–00
–5	211–0541–00			4	SCREW,MACHINE:6–32 X 0.25,FLH,100 DEG,STL	TK0435	ORDER BY DESC
–6	671–0777–00	B010101	B010138	1	CIRCUIT BD ASSY:INTERFACE MEDIA	80009	671077700
	671–0777–01	B010139		1	CIRCUIT BD ASSY:INTERFACE MEDIA (A18)	80009	671077701
–7	211–0313–00			4	SCR,ASSEM WSHR:4–40 X 0.5,PNH,STL CD PL,POZ	TK0435	ORDER BY DESC
–8	166–0031–00			2	SPACER,SLEEVE:0.25 L X 0.18 ID,AL	80009	166003100
–9	214–4156–00			2	PIN,GUIDE:4–40 X 1.450,AL	0J260	214–4156–00
–10	131–4458–00			1	CONN,RIBBON:PCB,;MALE,STR,50 POS,0.085 CTR,0.412 H X 0.125 TAIL,INTEGRAL STAND OFF,0.125 DIA THRU MTG, PLASTIC SHELL	00779	552116–1
–11	211–0430–00			2	SCREW,MACHINE:2–56 X 0.625 PNH,POZ,CD PL	0KB01	211–0430–00
–12	210–1008–00			4	WASHER,FLAT:0.09 ID X 0.188 OD X 0.02,BRS	12327	ORDER BY DESC
–13	210–0053–00			2	WASHER,LOCK:#2 SPLIT,0.02 THK STL	TK0392	ORDER BY DESC
–14	210–0405–00			2	NUT,PLAIN,HEX:2–56 X 0.188,BRS CD PL	73743	12157–50
–15	174–1311–00			1	CA ASSY,SP,ELEC:4,18 AWG,3.0 L,	1Y013	ORDER BY DESC
–16	131–4455–00			1	CONN,EDGECARD::PCB,;FEMALE,STR,2 X 17,0.1 CTR,0.610 H X 0.170 TAIL,0.2 X 0.1 PCB,0.225 CARD DEPTH,30 GOLD	00779	1–583485–8
–17	131–4456–00			1	CONN,EDGECARD::PCB,;FEMALE,STR,2 X 10,0.1 CTR,0.610 H X 0.135 TAIL,0.2 X 0.1 PCB,0.225 CARD DEPTH,30 GOLD	00779	1–583485–2
–18	119–3289–00			1	HARD DISK DRIVE:3.5 IN,20MEG,W/FT FACADE	TK0198	8425F
–19	118–7817–00			1	FRONT PLATE:92F14 REMOVABLE MEDIA 119–3289–00	80009	118781700
–20	211–0007–00			2	SCREW,MACHINE:4–40 X 0.188,PNH,STL	TK0435	ORDER BY DESC
–21	150–1070–00			1	LT EMITTING DIO:RED,635NM,35MA MAX	0MS63	MV57124A
–22	426–2295–00			1	FRAME SECTION:BOTTOM,PLASTIC	0J260	426–2295–00
–23	211–0510–00			2	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–24	213–1026–00			1	THUMBSCREW:6–32,1.0 L,SST	0J260	213–1026–00
–25	407–3772–00			1	BRACKET,MTG AS:ALUMINUM	0J260	407–3772–00 REV

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
4–26	343–1280–00			1	CLAMP,CABLE:FCM MOUNT	06383	FCM3–A–14
–27	343–0149–00			1	STRAP,TIEDOWN,E:6.75 L,PLASTIC	06383	ORDER BY DESC
–28	671–0778–00			1	CIRCUIT BD ASSY:INSTR INTERFACE 92F14	80009	671077800
–29	211–0313–00			4	SCR,ASSEM WSHR:4–40 X 0.5,PNH,STL CD PL,POZ	TK0435	ORDER BY DESC
–30	131–4496–00			2	TERMINAL LUG:0.02 X 0.3,MALE,QIK DISC,21 DEG BEND,CU	TK2469	131–4496–00
–31	131–4457–00			1	CONN,RIBBON:PCB,;FEMALE,STR,50 POS,0.085 CTR,0.412 H X 0.125 TAIL,0.125 DIA THRU MTG, INTEGRAL STANDOFF PLASTIC SHELL	00779	552118–1
–32	211–0081–00			2	SCREW,MACHINE:2–56 X 0.562,PNH,STL	TK0435	ORDER BY DESC
–33	210–1008–00			4	WASHER,FLAT:0.09 ID X 0.188 OD X 0.02,BRS	12327	ORDER BY DESC
–34	210–0053–00			2	WASHER,LOCK:#2 SPLIT,0.02 THK STL	TK0392	ORDER BY DESC
–35	210–0405–00			2	NUT,PLAIN,HEX:2–56 X 0.188,BRS CD PL	73743	12157–50
–36	131–4461–00			1	CONN,HDR PWR::PCB,;MALE,STR,1 X 4,0.200 CTR,0.400 H X 0.150 TAIL,TIN,DUAL PLZ,0.084 DIA PIN,10 AMP	27264	15–24–4049
–37	131–1343–00	B011639		2	CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230 MLG X 0.195 TAIL,30 GOLD (J2 REQUIRES 34 PINS:J3 REQUIRES 20 PINS)	58050	082–3643–SS02
–38	174–1312–00			1	CA ASSY,SP,ELEC:34,28 AWG,16.0 L,RIBBON (REPLACES W398 IN DAS)	1Y013	ORDER BY DESC
–39	174–1313–00			1	CA ASSY,SP,ELEC:20,28 AWG,19.0 L,RIBBON (REPLACES W298 IN DAS)	1Y013	64148
					STANDARD ACCESSORIES		
–40	004–3463–00			1	CUSH MATL,PKG:11.375 X 7.0 X 2.25 INSERT2.1 TO 2.3 LB/ CU FT ANTISTATIC POLYETHYLENE FOAM	TK2076	ORDER BY DESC
–41	202–0206–00			1	CASE,CRYG,PROBE:12.25 X 8.0 X 3.875,PLASTIC, BLUE	53718	RQ3–7/8
	343–0149–00			1	STRAP,TIEDOWN,E:6.75 L,PLASTIC (NOT ILLUSTRATED)	06383	ORDER BY DESC
	070–7120–00			1	MANUAL,TECH:INSTL INSTR,92F14	80009	070712000

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					DAS 9219/9220 OPTION 18		
5–0	020–1934–00			1	COMPONENT KIT:REMOVABLE MEDIA ASSEMBLY	80009	020193400
–1	441–1998–00			1	CHASSIS,DISK DR:FRAME & CARTRIDGE	0JE80	ST–450–5
	426–2440–00			1	FRAME,SECTION:92F18,80 MEG REMOVABLE MEDIAFRAME	0JE80	BT–450–3
	426–2441–00			1	SECTION:CARTRIDGE,92F18 80 MEG REMOVABLE MEDIA	0JE80	AT–450–1
–2	119–3705–00			1	DISK DRIVE:WINCHESTER,HARD;80 MEG 3.5 IN X HAR506 MFM	65867	ST1100
–3	211–0614–00			4	SCR,ASSEM WSHR:6–32 X 0.250,PNH,STL,CD PL POZ,W/ EXT LK WSHR	83385	ORDER BY DESC
–4	004–3463–00			1	CUSH MATL,PKG:11.375 X 7.0 X 2.25 INSERT 2.1 TO 2.3 LB/ CU FT ANTISTATIC POLYETHYLENE FOAM	TK2076	ORDER BY DESC
–5	004–3961–00			1	CUSH MATL PKG:11.25 X 6.75 X 11.125 0.5 2 PIECES,ANTI STATIC,URETHANEFOAM	TK2076	004–3961–00
–6	202–0206–00			1	CASE,CRYG,PROBE:12.25 X 8.0 X 3.875,PLASTIC, BLUE	53718	RQ3–7/8
	343–0149–00			1	STRAP,TIEDOWN,E:6.75 L,PLASTIC (NOT SHOWN)	06383	ORDER BY DESC
	020–1935–00			1	COMPONENT KIT:REMOVABLE HARD DISK, MECHANICAL COMPATIBILITY KIT (NOT SHOWN)	80009	020193500
	070–8306–00			1	MANUAL,TECH:INSTRUCTION,92F18,80 MBYTE REMOV–ABLE HARD DISK DRIVE INSTALLATION INSTRUCTIONS	80009	070830600
					DAS 9221 OPTION 18		
	020–2003–00			1	COMPONENT KIT:REMOVEABLE 105MB HARD DISKDRIVE W/CARTRIDGE	80009	020200300
–7	441–2018–00			1	CHASSIS,DISK DR:FRAME & CARTRIDGE, DAS9221	0JE80	9000–900–03
–8	119–4359–00	B050100	B050450	1	DISK,DRIVE:WINCHESTER,3.5;105MB	63852	LPS105S
	119–4588–00	B050451	B050695	1	DISK,DRIVE:WINDCHESTER,3.5,127MB	63852	ELS127S
	119–4787–00	B050696	B060898	1	DISK,DRIVE:WINCHESTER,3.5,170MB	63852	ELS170S
	119–5089–00	B060899	B061104	1	DISK,DRIVE:WINCHESTER,3.5,270MB	63852	QM30270MV/F
	119–5491–00	B061105		1	DISK,DRIVE:WINCHESTER,3.5,1.2 GB	63852	QM31280FBS
–9	211–0614–00			4	SCR,ASSEM WSHR:6–32 X 0.250,PNH,STL,CD PL POZ,W/ EXT LK WSHR	83385	ORDER BY DESC
–10	004–3463–00			1	CUSH MATL,PKG:11.375 X 7.0 X 2.25 INSERT2.1 TO 2.3 LB/ CU FT ANTISTATIC POLYETHYLENE FOAM	TK2076	ORDER BY DESC
–11	004–3961–00			1	CUSH MATL PKG:11.25 X 6.75 X 11.125 0.5 2 PIECES, ANTI STATIC,URETHANE FOAM	TK2076	004–3961–00
–12	202–0206–00			1	CASE,CRYG,PROBE:12.25 X 8.0 X 3.875,PLASTIC, BLUE	53718	RQ3–7/8
	343–0149–00			1	STRAP,TIEDOWN,E:6.75 L,PLASTIC (NOT SHOWN)	06383	ORDER BY DESC
	070–8480–00			1	MANUAL,TECH:INSTRUCTION,92F221 MAINFRAME UPGRADE	TK2548	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					DAS 9221 CHASSIS		
6–1	200–3208–00			1	GUARD,FAN:CARDCAGE,	39766	ORDER BY DESC
–2	212–0093–00			4	SCREW,MACHINE:8–32 X 2.625,HEX HD,STL	83385	OBD
–3	119–2058–00			1	FAN,TUBEAXIAL:24VDC,24W,3350 RPM,240 CFM	63227	PD24B2QNN/03228
–4	386–5341–01			1	STIF,CIRCUIT BD:EDGE CARD,ALUMINUM	5Y400	ORDER BY DESC
–5	333–4007–00			1	PANEL,REAR:DAS9221,	5Y400	ORDER BY DESC
–6	212–0001–00			9	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–7	129–0103–00			1	POST,BDG,ELEC:ASSEMBLY	TK0588	ORDER BY DESC
–8	210–0455–00			2	NUT,PLAIN,HEX:0.25–28 X 0.375,BRS NP	73743	3089–402
–9	174–2665–00			3	CA ASSY,SP,ELEC:3.25 L,DB9 TO 10 PIN HDR, DAS9221	1Y013	67931
–10	131–0890–00			3	CONN,HARDWARE:DSUB,JACK SCREW;4–40 X 0.312L HEX HD,STL CD PL,W/2 FLAT WASHERS,1 LOCKWASHER,4–40 NUT (INCLUDES HARDWARE)	0KB01	131–0890–00
–11	441–1733–02			1	CHAS,CARD CAGE:ALUMINUM,	5Y400	441–1733–02
–12	212–0001–00			1	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–13	214–3839–00			4	FASTENER,BLIND:0.56 L,8–32 THRU	00613	USM C8–32
–14	670–8729–01			1	CIRCUIT BD ASSY:BACKPLANE (A01)	80009	670872901
–15	131–3715–00			8	CONN,HDI:PCB,MALE,STR,4 X 135,540 POS,0.1 CTR, 0.46 H X 0.177 TAIL,30 GOLD,W/DUAL GUIDE PINS	22526	50017–1540A
–16	351–0778–01			16	GUIDE,PIN:0.585 X 0.080,2–56,SST (SET OF 2 EA PINS W/WASHERS & NUTS)	22526	77031–102
–17	—— ——				(NOT REQUIRED)		
–18	—— ——				(NOT REQUIRED)		
–19	211–0404–00			16	SCREW,MACHINE:2–56 X O.375,PNH, SST POZIDRIVE	TK0392	ORDER BY DESC
–20	220–0032–00			32	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–21	131–1343–00			1	CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230 MLG X 0.195 TAIL,30 GOLD	58050	082–3643–SS02
–22	131–3480–00			3	TERMINAL BLOCK:7 PIN,	TK1471	MKDSF 3/7 5.08
–23	131–3712–01			1	CONN,HDI:PCB,;FEMALE,RTANG,3 X 92,368 POS,0.1 CTR, 0.48 MLG X 0.145 TAIL,30 GOLD, W/CTRGUIDE PIN	22526	50004–1368F
–24	211–0405–00			3	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–25	220–0032–00			3	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
6–26	131–2230–00			1	CONN,HDR:FEEDTHRU/PCB,;MALE,STR,2 X 8,0.1 CTR,0.230 MLG X 0.230 MLG,30 GOLD	58050	082–0843–SD08
–27	378–0271–00			1	BAFFLE,AIR:CARDCAGE,	5Y400	378–0271–00
–28	255–0334–00			1	PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYLON	11897	122–NN–2500–060
–29	211–0244–00			2	SCR,ASSEM WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ	TK0435	7772–312
–30	386–5486–00			1	SUPPORT,CKT BD:LOCKING,0.188,NYLON	06915	LCBS–2–3R
–31	671–2324–01	B050100	B050102	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232401
	671–2324–02	B050103	B050465	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232402
	671–2324–03	B050466	B050564	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232403
	671–2324–04	B050565	B050611	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232404
	671–2324–05	B050612	B050717	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232405
	671–2324–06	B050718	B050736	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232406
	671–2324–07	B050737	B060989	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232407
	671–2324–08	B060990		1	CIRCUIT BD ASSY:DAS CONTROLLER; (A70 DAS9221 ONLY)	80009	671232408
	671–2324–01	B050100	B050102	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232401
	671–2324–02	B050103	B050450	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232402
	671–2324–03	B050451	B050549	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232403
	671–2324–04	B050550	B050610	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232404
	671–2324–05	B050612	B050717	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232405
	671–2324–06	B050718	B050736	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232406
	671–2324–07	B050737	B060989	1	CIRCUIT BD ASSY:DAS CONTROLLER;	80009	671232407
	671–2324–08	B060990		1	CIRCUIT BD ASSY:DAS CONTROLLER; (A70 DAS 9229 ONLY)	80009	671232408
–32	211–0244–00			2	SCR,ASSEM WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ	TK0435	7772–312
–33	129–1423–00			5	SPACER,POST:0.44 L,4–40 THRU INT EXCEPT 0.07 TOP, 0.312 DIA	5Y400	ORDER BY DESC
–34	210–0004–00			5	WASHER,LOCK:#4 INTL,0.015 THK,STL	78189	1204–00–00–0541
–35	211–0661–00			5	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ	TK0435	ORDER BY DESC
–36	131–5428–00			1	CONN,HDR:PCB,;MALE,STR,2 X 50,0.050 CTR,0.480 H X 0.100 TAIL,SHRD/4 SIDES, END PLZ, PRESS–IN MTG POST, 30 GOLD,0.012 SQ	22526	87434–150
–37	131–0993–00			4	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR,0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–38	131–1857–00			1	CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230MLG X 0.100 TAIL,GOLD	58050	082–3644–SS10
–39	386–5323–00			5	SUPPORT,CKT BD:NYLON	06915	BHC–3–01
–40	136–0755–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 14,28 POS, 0.1 X 0.6 CTR, 0.175 H X 0.130 TAIL,BECU,TIN, ACCOM 0.008–0.0015 X 0.014–0.022	09922	DILB28P–108
–41	131–5438–00			4	CONN,HDR:PCB,;MALE,STR,2 X 5,0.100 CTR, 0.0365 H X 0.105 TAIL,SHRD/4 SIDES,CTR PLZ,0.025 DIA,GXT	22526	66506–066
–42	131–5267–00			2	CONN,HDR:PCB,;MALE,STR,2 X 40,0.1 CTR, 0.235MLG X 0.110 TAIL,30GOLD	53387	N–2480–6122–TB

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
–43	131–3766–00			1	CONN,HDR:PCB,;MALE,RTANG,1 X 2,0.1 CTR,0.235 MLG X 0.110 TAIL,30 GOLD,0.025 SQ	00779	87232–2
6–44	260–2285–00			1	SWITCH,ROCKER:SPST;DIP,8 POSITION,SIDE ACTUATED, 0.1 OHM CONTACT RES,5A,2PF, 0.980"L,0.281"H,0.380" W,SEALED	81073	76PSB08S
–45	150–1083–00			1	DIODE,OPTO:,LED;RED,655NM,10 ELEMENT BAR GRAPH ARRAY	50434	HDSP–4820
–46	386–1635–00			1	SUPPORT,CKT BD:CHASSIS MT,ACETAL	80009	386163500
–47	131–3713–00			1	CONN,HDI:PCB,;MALE,STR,4 X 92,368 POS,0.01 CTR,0.460 H X 0.120 TAIL,30 GOLD,W/CTR GUIDE PIN	22526	50016–1368J
–48	351–0778–01			1	GUIDE,PIN:0.585 X 0.080,2–56,SST (SET OF 2, 1 REQUIRED)	22526	77031–102
–49	211–0404–00			2	SCREW,MACHINE:2–56 X O.375,PNH,SST POZIDRIVE	TK0392	ORDER BY DESC
–50	220–0032–00			3	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–51	131–3182–00			2	CONN,HDR:PCB,;MALE,RTANG,2 X 25,0.1 CTR, 0.390 MLG X 0.112 TAIL,0.33 H,SHRD/4 SIDES,CTR PLZ,30 GOLD,HIGH TEMP	22526	75867–008
–52	131–2567–00			1	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.390 H, 0.230 MLG X 0.1 TAIL,PLZ WALL,CTR PLZ, 30 GOLD,0.15 PCB TO SQ PIN	22526	65461–006
–53	386–5323–00			5	SUPPORT,CKT BD:NYLON	06915	BHC–3–01
–54	119–4398–10	B050100	B059999	1	FLOPPY DISK DR 5.25 MINI FLOPPY,1.2MB (DAS MAINFRAMES B010100 TO B059999)	80009	119439801
–55	211–0507–00			4	SCREW,MACHINE:6–32 X 0.312,PNH,STL	TK0435	ORDER BY DESC
–56	426–2389–00			1	FR SECT,MTG:HARD DISK,3.5 TO 5.25 HALFHT	15920	54459–010
	426–2444–00	B040120		1	FR SECT,MTG:HARD DISK,3.5 TO 5.25 HALFHT	80009	ORDER BY DESC
	426–2449–00	B050100	B050573	1	BRKT CHASSIS:3.5 TO 5.25 HARD/FLOPPY DRIVE	15920	426244900
	426–2449–01	B050574	B060898	1	BRKT CHASSIS:3.5 TO 5.25 HARD/FLOPPY DRIVE	15920	426244901
	426–2530–00	B060899		1	BRKT CHASSIS:3.5 TO 5.25 HARD/FLOPPY DRIVE	15920	426253000
–57	119–4359–00	B050100	B050450	1	DISK DRIVE:WINCHESTER,3.5;105MB	63852	LPS105S
	119–4588–00	B050451	B050695	1	DISK DRIVE:WINDCHESTER,3.5,127MB	63852	ELS127S
	119–4787–00	B050696	B060898	1	DISK,DRIVE:WINCHESTER,3.5,170MB	63852	ELS170S
	119–5089–00	B060899	B061104	1	DISK,DRIVE:WINCHESTER,3.5,270MB	63852	QM30270MV/F
	119–5491–00	B061105		1	DISK,DRIVE:WINCHESTER,3.5,1.2 GB	63852	QM31280FBS

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
6–58	211–0383–00			4	SCREW,MACHINE:3MM–8MM,PNH,PHILLIPS	0KB01	211–0383–00
–59	407–3415–02			1	BRACKET ASSY:MEDIA	5Y400	ORDER BY DESC
–60	212–0001–00			4	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–61	343–1280–00			1	CLAMP,CABLE:FCM MOUNT	06383	FCM3–A–14
–62	407–3503–00			1	BRACKET,SUPPORT:STAB MEDIA TO POWERSPLY	TK1943	ORDER BY DESC
–63	212–0001–00			1	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–64	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–65	407–3504–00			1	BRACKET,SUPPORT:STAB MEDIA TO CARD CAGE	TK1943	ORDER BY DESC
–66	212–0001–00			1	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–67	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–68	650–1807–09	B050100		1	POWERSUPPLY ASSY:STANDARD 115V (A04;DAS 9200 MAINFRAMES ONLY)	80009	650180709
	650–1877–07			1	POWERSUPPLY ASSY:DAS9221 OPT 04 (A04:DAS 9200 OPTION 04 ONLY)	80009	650187707
	650–1931–09			1	POWERSUPPLY ASSY:DAS9221 OPT A1/A5 (A04;DAS 9200 OPTIONS A1–A5 ONLY)	80009	650193109
	650–1973–08			1	POWERSUPPLY ASSY:DAS9221 OPT 1B,3 PHASE (A01;DAS 9200 OPTION 1B ONLY)	80009	650197308
–69	212–0001–00			1	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–70	343–0149–00			2	STRAP,TIEDOWN,E:6.75 L,PLASTIC	06383	ORDER BY DESC
–71	348–0149–00			1	GROMMET,PLASTIC:BLACK,U–SHAPE,0.88 ID	0KBZ5	ORDER BY DESC
–72	255–0334–00			1	PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYLON MARKER,	11897	122–NN–2500–060
	334–4645–00			1	IDENT:MKD TEKTRONIX	TK0860	ORDER BY DESC
–73	352–0795–00			1	FUSEHOLDER:20A,250V,GRAY,	75915	345–101–010
–74	200–3253–00			1	CAP,FUSEHOLDER:U/W 3AG FUSE	75915	345–101–020
–75	366–1522–00			1	KNOB:YEL,0.156 ID X 1.0 OD X 0.25 H,	80009	366152200
–76	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–77	437–0363–00			1	CABINET ASSY:8541/DAS9200 SERIES, (SUBPART OF CAB ASSY,SEE FIG 1 ITEM 1)	0JR05	437–0363–00
–78	348–0845–00			2	FOOT,CABINET:SMOKE TAN,LEXAN, (INCLUDED AS PART OF 437–0363–XX)	TK1951	ORDER BY DESC
–79	348–0001–00			4	FOOT,CABINET:BLACK RUBBER	TK2208	ORDER BY DESC
–80	212–0082–00			4	SCREW,MACHINE:8–32 X 1.25,PNH,STL	TK0435	ORDER BY DESC
–81	426–2511–00	B060100		1	BRACKET CHASSIS, 3.5 IN TO 5.25 IN CONVERSION, ENABLES 3.5 FLOPPY TO FIT INTO A 5.25 MECH OPENING (INCLUDES HARDWARE)	80009	ORDER BY DESC
–82	119–4758–00	B060100		1	FLOPPY DISK DR,3.5 INCH;1.44MB,1 INCH,TWO SIDED, DOUBLE DENSITY,IBM (DAS MAINFRAMES B060100 & ABOVE. ASSY INCLUDED CABLEASSY)	80009	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					STANDARD ACCESSORIES		
	P6041			1	PROBE PASSIVE: 1X,3.5 FT	80009	P6041
	105–0985–00			2	EJECTOR,CKT BD:NYLON	TK1163	ORDER BY DESC
	012–1398–00			1	CA ASSY,INTCON:SHLD CMPST,;MLD,8,26 AWG, 121.0 L	6D224	ORDER BY DESC
	070–8485–07			1	MANUAL,TECH:USERS,DAS9200 SYSTEM SERIES	TK2548	ORDER BY DESC
	070–5960–06			1	MANUAL,TECH:USERS,DAS9200 SERIES PROGRAMMATIC COMMAND LANGUAGE	TK2548	ORDER BY DESC
	070–5958–03			1	MANUAL,TECH:REF GUIDE,DAS9200 SERIES, COMMAND LANGUAGE PROGRAMMATIC	TK2548	ORDER BY DESC
	070–7483–01			1	MANUAL,TECH:USERS,DAS9200 SERIES, ACQUISITION & PATTERN GENERATION FILES	TK2548	ORDER BY DESC
	671–0957–00			1	CIRCUIT BD ASSY:TRAINING AID	80009	671095700
					OPTIONAL ACCESSORIES		
	012–1233–00			1	CABLE,INTCON:3 METER 4693D TO HOST	80009	012123300
	012–0153–00			1	CABLE ASSY,RF:TELEQUIPMENT	80009	012015300
	012–1398–00			1	CA ASSY,INTCON:SHLD CMPST,;MLD,8,26 AWG, 121.0 L, DSUB,25 POS,FEMALE,DB25 X DSUB,9 POS,MALE,DB9, ALUMINIZED MYLAR,W/BRAID	6D224	ORDER BY DESC
	070–5959–08			1	MANUAL,TECH:REF,DAS9200 SERIES MAINFRAME	TK2548	ORDER BY DESC
	012–0689–02			1	CABLE,INTCON:192.0 L,021–0188–00 TO MODEM	80009	012068902
	012–1399–00			1	CABLE,INTCON:8.0 L,9 PIN TO 25 PIN ADAPTER,92F221,	6D224	ORDER BY DESC
	174–2695–00			1	CABLE ASSEM :CABLE INTCON;18.5 L	80009	174269500
	062–8941–03			1	MANUAL, TECH: SERVICE,DAS9200 SERIES SERVICE	80009	062894103
	070–5961–02			1	MANUAL,TECH:DAS9200	80009	070596102
	334–6672–00			1	MARKER,IDENT:MKD POWER CORD 15A MAX,	07416	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					DAS 9219/20/21 OPTION 04		
7–1	437–0363–10			1	CABINET ASSY:VDE EMI SHILDING	80009	437036310
–2	253–0396–00	B010100	B061008	AR	TAPE,PRESS SENS:ALUMINUM W/PRESS SENS ADH1 INCH WIDE	TK1506	1170 1 INCH X 5
–3	337–3372–00	B010100	B061008	1	SHIELD,ELEC:EMI	53217	81–90049
–4	131–3852–00	B010100	B061008	1	SHLD GSKT,ELEK:EMI,FINGER TYPE;0.004 THICK,CLIP ON, 0.06 PITCH,BECU,TIN,10.0 L	52814	60–RC W/ADHESIV
–5	343–1312–00	B010100	B061008	1	SHIELD,ELEC:GROUNDING,ALUMINUM,	5Y400	ORDER BY DESC
–6	211–0510–00	B010100	B061008	1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–7	346–0233–00	B010100	B061008	2	STRAP,GROUND:1.375 L,ALUMINUM	5Y400	ORDER BY DESC
–8	211–0097–00	B010100	B061008	32	SCREW,MACHINE:4–40 X 0.312,PNH,STL	TK0435	ORDER BY DESC
–9	348–0917–00	B010100	B061008	14	SHLD GSKT,ELEK:4.15 X 1.375,AL,NOTCHED	5Y400	348–0917–00
–10	344–0399–00	B010100	B010578	1	CLIP,GROUND:CU BE	5Y400	344–0399–00
	344–0399–00	B010579	B061008	6	CLIP,GROUND:CU BE (9200 MAINFRAMES ONLY)	5Y400	344–0399–00
	344–0399–00	B010100	B010174	1	CLIP,GROUND:CU BE	5Y400	344–0399–00
	344–0399–00	B010175	B061008	6	CLIP,GROUND:CU BE (92E9 MAINFRAME ONLY)	5Y400	344–0399–00

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					DAS 92E9 MAINFRAME (CABINET)		
8–1	437–0363–00			1	CABINET ASSY:8541/DAS9200 SERIES,	0JR05	437–0363–00
–2	334–6310–00			1	MARKER,IDENT:MKD TEKTRONIX DAS9200 DIGITALANALYSIS SYSTEM,	22670	ORDER BY DESC
–3	200–3080–00			1	COVER,DECORATIVE:FRONT,POLYCARBONATE,	TK1951	200–3080–00
–4	386–5487–00			1	PANEL,BLANK:SWITCH,	TK1951	ORDER BY DESC
–5	407–3498–00			1	BRKT,EJECTOR:DAS9229	TK1943	ORDER BY DESC
–6	212–0023–00	B010100	B011831	2	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		2	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–7	105–0985–00			2	EJECTOR,CKT BD:NYLON	TK1163	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					DAS 92E9 MAINFRAME (CHASSIS)		
9–1	200–3208–00			1	GUARD,FAN:CARDCAGE,	39766	ORDER BY DESC
–2	212–0093–00			4	SCREW,MACHINE:8–32 X 2.625,HEX HD,STL	83385	OBD
–3	119–2058–00			1	FAN,TUBEAXIAL:24VDC,24W,3350 RPM,240 CFM	63227	PD24B2QNN/03228
–4	214–3839–00			4	FASTENER,BLIND:0.56 L,8–32 THRU	00613	USM C8–32
–5	386–5341–00	B010100	B010108	1	STIF,CIRCUIT BD:EDGE CARD,ALUMINUM,	5Y400	ORDER BY DESC
	386–5341–01	B010109		1	STIF,CIRCUIT BD:EDGE CARD,ALUMINUM,	5Y400	ORDER BY DESC
–6	441–1733–01	B010100	B010262	1	CHAS,CARD CAGE:ALUMINUM,	5Y400	ORDER BY DESC
	441–1733–02	B010263		1	CHAS,CARD CAGE:ALUMINUM,	5Y400	441–1733–02
–7	212–0023–00	B010100	B011831	4	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		2	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–8	670–8726–00	B010100	B010128	1	CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872600
	670–8726–01	B010129	B010154	1	CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872601
	670–8726–02	B010155	B010261	1	CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872602
	670–8726–03	B010162	B010330	1	CIRCUIT BD ASSY:EXPANSION SLAVE	80009	670872603
	670–8726–04	B010331			CIRCUIT BD ASSY:EXPANSION SLAVE (A05 REPL)	80009	670872604
–9	211–0244–00			12	SCR,ASSEM WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ	TK0435	7772–312
–10	131–3182–00			1	CONN,HDR:PCB,;MALE,RTANG,2 X 25,0.1 CTR. 0.390 MLG X 0.112 TAIL,0.33 H,SHRD/4 SIDES, CTR PLZ,30 GOLD,HIGH TEMP	22526	75867–008
–11	131–3713–00			1	CONN,HDI:PCB,;MALE,STR,4 X 92,368 POS,0.01 CTR,0.460 H X 0.120 TAIL,30 GOLD,W/CTR GUIDE PIN	22526	50016–1368J
–12	211–0404–00			2	SCREW,MACHINE:2–56 X O.375,PNH,SST POZIDRIVE	TK0392	ORDER BY DESC
–13	220–0032–00	B010100	B010148	2	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
	220–0032–00	B010149		3	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–14	351–0778–00	B010100	B010148	1	GUIDE,PIN:	22526	77268–002
	351–0778–01	B010149		1	GUIDE,PIN:0.585 X 0.080,2–56,SST	22526	77031–102
	136–0657–00	B010100	B010129	1	SOCKET,DIP:PCB,;24 POS,2 X 12,0.1 X 0.3 CTR ,0.210 H X 0.120 TAIL,BECU,BD RETENTION,TIN ,ACCOM 0.008–0.014 LEADS	00779	2–641933–1
	136–0657–00	B010130		2	SOCKET,DIP:PCB,;24 POS,2 X 12,0.1 X 0.3 CTR 0.210 H X 0.120 TAIL,BECU,BD RETENTION,TIN,ACCOM 0.008–0.014 LEADS	00779	2–641933–1
–15	670–8729–00	B010100	B010128	1	CIRCUIT BD ASSY:BACKPLANE	80009	670872900
	670–8729–01	B010129		1	CIRCUIT BD ASSY:BACKPLANE	80009	670872901
–16	131–3115–00			8	FITTING,CABLE:6–32 X 0.038 ID X 7.0 L X 1.038 OD,BRASS	80009	131311500

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
9–17	351–0778–00	B010100	B010148	8	GUIDE,PIN:0.585 X 0.080,2–56,SST	22526	77268–002
	351–0778–00	B010149		16	GUIDE,PIN:0.585 X 0.080,2–56,SST (SET OF 2 EA PINS W/WASHERS & NUTS)	22526	77031–102
–18	211–0404–00			16	SCREW MACHINE:2056 X 0.375, PNH, SST POSIDRIV	TK0392	ORDER BY DESC
–19	220–0032–00	B010100	B010148	16	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
	220–0032–00	B010149		32	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–20	131–1343–00	B011639		1	CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230 MLG X 0.195 TAIL,30 GOLD	58050	082–3643–SS02
–21	131–3480–00			3	TERMINAL BLOCK:7 PIN,	TK1471	MKDSF 3/7 5.08
–22	131–3712–00	B010100	B011179	1	CONN,HDI:PCB,;FEMALE,RTANG,368 POS,4 X 92,0.1 CTR, 0.190 TAIL,W/CTR GUIDE PIN	22526	67883–342
–23	211–0405–00			3	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–24	220–0032–00			3	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–25	131–2230–00			1	CONN,HDR:FEEDTHRU/PCB,;MALE,STR,2 X 8,0.1 CTR,0.230 MLG X 0.230 MLG,30 GOLD	58050	082–0843–SD08
–26	378–0271–00			1	BAFFLE,AIR:CARDCAGE,	5Y400	378–0271–00
–27	211–0244–00			2	SCR,ASSEM WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ	TK0435	7772–312
–28	386–5486–00			1	SUPPORT,CKT BD:LOCKING,0.188,NYLON	06915	LCBS–2–3R
–29	386–5323–00			5	SUPPORT,CKT BD:NYLON	06915	BHC–3–01
–30	407–3415–01	B010100	B010394	1	BRACKET ASSY:MEDIA	5Y400	407–3415–01
	407–3415–02	B010395		1	BRACKET ASSY:MEDIA	5Y400	ORDER BY DESC
–31	212–0023–00	B010100	B011831	4	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		4	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–32	343–0154–00			1	CLAMP,RIM CLENC:1.125 X 0.66 X 0.178	80009	343015400
–33	343–0149–00			1	STRAP,TIEDOWN,E:6.75 L,PLASTIC	06383	ORDER BY DESC
–34	407–3503–00			1	BRACKET,SUPPORT:STAB MEDIA TO POWERSPLY	TK1943	ORDER BY DESC
–35	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0023–00	B010100	B011831	1	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B010832		1	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–36	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–37	407–3504–00			1	BRACKET,SUPPORT:STAB MEDIA TO CARD CAGE	TK1943	ORDER BY DESC
–38	212–0023–00	B010100	B011831	1	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B010832		1	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–39	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
9–40	650–1807–01	B010100	B010121	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180701
	650–1807–02	B010122	B010142	1	POWER SUPPLY ASSYSTANDARD 115V	80009	650180702
	650–1807–03	B010143	B010181	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180703
	650–1807–04	B010182	B010230	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180704
	650–1807–05	B010231	B010309	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180705
	650–1807–06	B010310	B010330	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180706
	650–1807–07	B010331	B010379	1	POWER SUPPLY ASSYSTANDARD 115V	80009	650180707
	650–1807–08	B010380	B041176	1	POWER SUPPLY ASSY:STANDARD 115V	80009	650180708
	650–1807–09	B041177		1	POWER SUPPLY ASSY:STANDARD 115V (A04 DAS 9200 MAINFRAMES ONLY)	80009	650180709
	650–1877–01	B010100	B010121	1	POWER SUPPLY ASSY:OPT 04,VDE	80009	650187701
	650–1877–02	B010122	B010183	1	POWER SUPPLY ASSY:OPT 04,VDE	80009	650187702
	650–1877–03	B010184	B010310	1	POWER SUPPLY ASSY:OPT 04,VDE	80009	650187703
	650–1877–04	B010311	B011757	1	POWER SUPPLY ASSY:OPT 04,VDE	80009	650187704
	650–1877–05	B011758	B011864	1	POWER SUPPLY ASSY:OPT 04,VDE	80009	650187705
	650–1877–06	B011865	B041176	1	POWER SUPPLY ASSY:OPT 04,VDE	80009	650187706
	650–1877–07	B041177		1	POWER SUPPLY ASSY:OPT 04,VDE (A04 DAS 9200 OPTION 04 ONLY)	80009	650187707
	650–1931–01	B010100	B010121	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193101
	650–1931–02	B010122	B010173	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193102
	650–1931–03	B010174	B010195	1	POWER SUPPLY ASSYOPT A1–A5	80009	650193103
	650–1931–04	B010196	B010232	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193104
	650–1931–05	B010233	B010309	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193105
	650–1931–06	B010310	B010346	1	POWER SUPPLY ASSY:OPT A1–A5	80009	650193106
	650–1931–07	B010347	B010373	1	POWER SUPPLY ASSY:OPT A1–A5	80009	350193107
	650–1931–08	B010374	B041176	1	POWER SUPPLY ASSY:OPT A1–A5 (A04 DAS 9200 OPTIONS A1–A5 ONLY)	80009	350193108
	650–1973–00	B010100	B010447	1	POWER SPLY ASSY:OPT 1B,3 PHASE	80009	650197300
	650–1973–01	B010448	B011628	1	POWER SPLY ASSY:OPT 1B,3 PHASE	80009	650197301
	650–1973–02	B011629	B011106	1	POWER SPLY ASSY:OPT 1B,3 PHASE	80009	650197302
	650–1973–03	B011107	B011227	1	POWER SPLY ASSY:OPT 1B,3 PHASE	80009	650197303
	650–1973–04	B011228	B011327	1	POWER SPLY ASSY:OPT 1B,3 PHASE	80009	650197304
	650–1973–05	B011328	B011511	1	POWER SPLY ASSY:OPT 1B,3 PHASE	80009	650197305
	650–1973–06	B011512	B011824	1	POWER SPLY ASSY:OPT 1B,3 PHASE	80009	650197306
	650–1973–08	B011825	B041176	1	POWER SPLY ASSY:OPT 1B,3 PHASE	80009	650197308
	650–1973–09	B041177		1	POWER SPLY ASSY:OPT 1B,3 PHASE (A04 DAS 9200 OPTION 1B ONLY)	80009	650197309
–41	212–0023–00	B010100	B011831	2	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		2	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–42	348–0149–00			1	GROMMET,PLASTIC:BLACK,U–SHAPE,0.88 ID	0KBZ5	N/A
–43	255–0334–00			1	PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYLON	11897	122–NN–2500–060
–44	352–0795–00			1	FUSEHOLDER:20A,250V,GRAY,	75915	345–101–010
–45	200–3253–00			1	CAP,FUSEHOLDER:U/W 3AG FUSE	75915	345–101–020
–46	366–1522–00			1	KNOB:YEL,0.156 ID X 1.0 OD X 0.25 H,	80009	366152200
–47	211–0510–00			1	SCREW,MACHINE:6–32 X 0.375,PNH,STL MARKER,IDENT:	TK0435	ORDER BY DESC
	334–4645–00	B010143		1	MKD TEKTRONIX	TK0860	ORDER BY DESC
–48	437–0363–00			1	CABINET ASSY:8541/DAS9200 SERIES, (SUB PART OF CAB ASSY, SEE FIG 17,INDEX 1)	0JR05	437–0363–00
–49	348–0845–00			2	FOOT,CABINET:SMOKE TAN,LEXAN, (INCLUDED W/CAB ASSY, 437–0363–XX)	TK1951	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
9–50	348–1060–00	B010196	B010213	4	GASKET,SW CPLG:OPTICAL,1.85 X 0.85 X 0.045	80009	348106000
	348–0001–00	B010214		4	FOOT,CABINET:BLACK RUBBER	TK2208	ORDER BY DESC
–51	212–0082–00	B010214		4	SCREW,MACHINE:8–32 X 1.25,PNH,STL	TK0435	ORDER BY DESC
–52	333–3279–00	B010100	B011831	1	PANEL,REAR:DAS9229,	0J260	ORDER BY DESC
–53	212–0023–00	B010100	B011831	9	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
	212–0001–00	B011832		9	SCREW,MACHINE:8–32 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–54	334–6798–00			1	MKR SET,IDENT:MKD CHANNEL NOMENCLATURE	07416	ORDER BY DESC
–55	129–0103–00			1	POST,BDG,ELEC:ASSEMBLY	TK0588	ORDER BY DESC
–56	210–0455–00			2	NUT,PLAIN,HEX:0.25–28 X 0.375,BRS NP	73743	3089–402
–57	174–0708–00			1	CA ASSY,SP,ELEC:34,AWG,5.5 L,W/TERMINAL	1Y013	62759
–58	407–3592–00	B010100	B010270	1	BRKT,STRAIN RLF:ALUMINUM	80009	407359200
	407–3592–01	B010271		1	BRKT,STRAIN RLF:ALUMINUM	0J260	407–3592–01
–59	212–0091–00			1	SCREW,MACHINE:8–32 X 0.625,FILH,STL	TK0435	ORDER BY DESC
–60	211–0008–00			1	SCREW,MACHINE:4–40 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–61	211–0503–00			2	SCREW,MACHINE:6–32 X 0.188,PNH,STL	TK0435	ORDER BY DESC
	012–1208–00			1	CABLE ASSEMBLY:EXPANSION	80009	012120800
–62	361–1416–00			2	SPACER,EXP:3.8 X 1.4,SILICON RUBBER	2K262	361–1416–00
–63	380–0838–00			1	HOUSING,CABLE:ALUMINUM	5Y400	ORDER BY DESC
–64	211–0060–00			2	SCREW,MACHINE:2–56 X 0.438,FLH,82 DEG,STL	0KB01	211–0060–00
–65	211–0080–00			3	SCREW,MACHINE:0.25–20 X 0.469,KNURLED	80009	211008000
–66	361–1416–00			2	SPACER,EXP:3.8 X 1.4,SILICON RUBBER	2K262	361–1416–00
–67	671–0011–00			1	CIRCUIT BD ASSY:EXPANSION CABLE (SEE A07 REPL)	80009	671001100
–68	211–0661–00			3	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ	TK0435	ORDER BY DESC
–69	129–0442–00			1	SPACER,POST:0.125 L,4–40 THRU,PLSTC,0.25 OD	TK1465	ORDER BY DESC
–70	174–0679–00			1	CA ASSY,SP,ELEC:20,26 AWG,21.0 L,RIBBON	1Y013	62741
–71	174–0680–00			1	CA ASSY,SP,ELEC:20,26 AWG,22.5 L,RIBBON	53387	98–0300–3560–8
–72	174–0681–00			1	CA ASSY,SP,ELEC:20,26 AWG,25.0 L,RIBBON	53387	98–0300–3561–6
–73	174–0682–00			1	CA ASSY,SP,ELEC:50,26 AWG,21.0 L,RIBBON	23633	62742
–74	174–0683–00			1	CA ASSY,SP,ELEC:50,26 AWG,22.5 L,RIBBON	1Y013	62743
–75	174–0684–00			1	CA ASSY,SP,ELEC:50,26 AWG,25.0 L,RIBBON	1Y013	62744
–76	407–3593–00			1	BRACKET,RTNG:ALUMINUM	5Y400	407–3593–00
–77	211–0008–00			4	SCREW,MACHINE:4–40 X 0.25,PNH,STL	93907	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					STANDARD ACCESSORIES		
	105–0985–00			2	EJECTOR,CKT BD:NYLON	TK1163	ORDER BY DESC
	334–6798–00			1	MKR SET,IDENT:MKD CHANNEL NOMENCLATURE (SLOT NUMBER SHEET)	07416	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92A16		
10–1	670–9478–00	B010100	B019999	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947800
	670–9478–01	B020100	B029999	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947801
	670–9478–02	B030100	B039999	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947802
	670–9478–03	B040100	B040327	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947803
	670–9478–04	B040328	B040389	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947804
	670–9478–05	B040390	B040498	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947805
	670–9478–06	B040499	B040497	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670947806
	670–9478–07	B040498	B049999	1	CIRCUIT BD ASSY:DATA ACQUISITION (A10)	80009	670947807
	671–0610–00	B050000	B050249	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	671061000
	671–0610–01	B050250	B050327	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	671061001
	671–0610–02	B050328		1	CIRCUIT BD ASSY:DATA ACQUISITION (A16)	80009	671061002
–2	136–0813–00			11	SKT,PL–IN ELEK:CHIP CARRIER,68 CONTACTS	53387	2–0068–05400–00
–3	214–3868–00			11	HEATSINK,SEMIC:IC,LCC68;ALUMINUM, TEXTOOL SOCKET	30161	510368B00000
–4	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS,0.1X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB16P–108T
–5	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–6	211–0381–00	B010100	B020170	4	SCREW,MACHINE:2–56 X 0.312 L,PNH,SST, POZI	3M099	ORDER BY DESC
	211–0405–00	B020171		4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–7	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–8	214–0579–00			2	TERM,TEST POINT:PCB,TEST POINT;EYELET 0.05 ID,0.4 L X 0.052 WIDE X 0.032 THK,TIN PL,W/0.045TIP CHAMFER	0J260	ORDER BY DESC
–9	136–0881–00	B010100	B011609	1	SOCKET,PGA:PCB,133 POS,14 X 14,0.1 CTR, 0.165 H X 0.125 TAIL,CLOSED CTR,NON SYMMETRICAL,PAT 141	63058	PGA 133M STGTV(
–10	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–11	131–0608–00			6	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR, 0.025 SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
–12	131–0993–00			2	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR, 0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–13	334–4050–00			1	MARKER,IDENT:MKD FACTORY SET	07416	ORDER BY DESC
–14	131–3087–00			2	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.420 H X 0.140 TAIL,SHRD/4 SIDES,CTR PLZ	22526	67950–001
–15	131–0265–00			1	CONN,RF PLUG:SMB,;PCB,MALE,RTANG,50 OHM,0.381 H X 0.15 TAIL,0.043 DIA CTR COND, 0.040 SQ TAIL	0GZV8	85SMB–50–0–1

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					STANDARD ACCESSORIES		
	P6461			2	8 CHAN,200MHZ ACQ PROBE INC LEADSET & CLIPS	80009	P6461
	196–3047–00	B010100	B010536	10	LEAD SET,ELEC:PODLET,2.1 L	80009	196304700
	196–3047–01	B010537		10	LEAD SET,ELEC:PODLET,2.1 L	1Y013	61490
	206–0364–00			22	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	020–1484–01		B061008	1	ACCESSORY KIT:DAS9219/29,E9 PKG OF 4 PROBE RETAINER 343–1292–01	80009	020148401
	070–5948–04			1	MANUAL,TECH:USERS,92A16 DATA ACQUISITION MDL	80009	070594804
	334–6093–00			11	LABEL:MKD P6464	07416	ORDER BY DESC
					OPTIONAL ACCESSORIES		
	P6041			2	PROBE,PASSIVE: 1 X 3.5 FT	80009	P6041

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92A16E		
11–1	670–9500–00	B010100	B019999	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670950000
	670–9500–01	B020100	B010420	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670950001
	670–9500–02	B020421	B029999	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670950002
	670–9500–03	B030000	B030249	1	CIRCUIT BD ASSY:DATA ACQUISITION	80009	670950003
	670–9500–04	B030250	B039999	1	CIRCUIT BD ASSY:DATA ACQUISTION	80009	670950004
	671–0609–00	B040000		1	CIRCUIT BD ASSY:DATA ACQUISITION (A11)	80009	671060900
–2	136–0813–00			11	SKT,PL–IN ELEK:CHIP CARRIER,68 CONTACTS	53387	2–0068–05400–00
–3	214–3868–00			11	HEAT SINK,SEMIC:IC,LCC68;ALUMINUM,TEXTOOL SOCKET LID,ROOF STYLE	30161	510368B00000
–4	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS,0.1 X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB16P–108T
–5	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–6	211–0405–00			4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–7	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–8	214–0579–00			2	TERM,TEST POINT:PCB,TEST POINT;EYELET 0.055 ID,0.4 L X 0.052 WIDE X 0.032 THK,TIN PL,W/0.045 TIP CHAMFER	0J260	ORDER BY DESC
–9	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–10	131–0608–00			6	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR, 0.025 SQ, 0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
–11	131–0993–00			2	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR, 0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–12	334–4050–00			1	MARKER,IDENT:MKD FACTORY SET	07416	ORDER BY DESC
–13	131–3087–00			2	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.420 H X 0.140 TAIL,SHRD/4 SIDES,CTR PLZ	22526	67950–001
					STANDARD ACCESSORIES		
	P6461E			2	ACQ PROBE:8CHAN,200MHZ EXP ACQ PROBE INC	80009	P6461E
	196–3047–00	B010100	B010259		LEAD SET,ELEC:PODLET,2.1 L	80009	196304700
	196–3047–01	B010260		8	LEAD SET,ELEC:PODLET,2.1 L	1Y013	61490
	206–0364–00			1	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	020–1484–01		B061008	1	ACCESSORY KIT:DAS9219/29,E9 PKG OF 4 PROBE RETAINER 343–1292–01	80009	020148401
	334–6093–00			1	LABEL:MKD P6464	07416	ORDER BY DESC
	062–9142–00			1	SHEET,TECHNICAL:92A16E INFORMATION	80009	062914200

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					OPTIONAL ACCESSORIES		
	P6460			1	PROBE,DATA ACQ	80009	P6460
	P6041			2	PROVE,PASSIVE: 1 X 3/5 FT	80009	P6041

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					P6461/P6461E		
12–0	010–6461–01			1	PROBE KIT:ASSEMBLY (P6461 ONLY)	80009	010646101
	010–6461–21			1	PROBE KIT:ASSEMBLY (P6461E)	80009	010646121
–1	334–6148–00			1	MARKER,IDENT:MKD P6461 (P6461 ONLY)	07416	ORDER BY DESC
	334–6147–00			1	MARKER,IDENT:MKD P6461E (P6461E ONLY)	07416	ORDER BY DESC
–2	380–0759–00			1	HSG HALF,UPPER:P6461	TK1113	ORDER BY DESC
–3	165–2040–10			10	MICROCKT,LINEAR:P6461 REPLACEABLE PODLET	80009	165204010
	165–2040–11			10	MICROCKT,LINEAR:500MHZ COMPARATOR PRODE PODLET,H2040 (P6461)	80009	165204011
–4	175–9771–00	B010100	B010430	1	CA ASSY,SP,ELEC:11 TR PR,32 AWG,4,28 AWG,80.0 L	60381	175977100
	175–9771–01	B010431	B010510	1	CA ASSY,SP,ELEC:11 TW PR,32 AWG,4,28 AWG,80.0 L	80009	175977101
	175–9771–02	B010511		1	CA ASSY,SP,ELEC:11 TW PR,32 AWG,4,28 AWG,80.0 L (P6461 ONLY)	60381	175977102
	175–9771–00	B010100	B010194	1	CA ASSY,SP,ELEC:11 TR PR,32 AWG,4,28 AWG,80.0 L	60381	175977100
	175–9771–01	B010195	B010159	1	CA ASSY,SP,ELEC:11 TW PR,32 AWG,4,28 AWG,80.0 L	80009	175977101
	175–9771–02	B010260		1	CA ASSY,SP,ELEC:11 TW PR,32 AWG,4,28 AWG,80.0 L (P6461E ONLY)	60381	175977102
–5	175–9699–00	B010100	B010462	1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L	80009	175969900
	175–9699–01	B010463		1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L (P6461)	80009	175969901
	175–9699–00	B010100	B010183	1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L	80009	175969900
	175–9699–01	B010184		1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L (P6461E)	80009	175969901
–6	670–8502–01	B010100	B019999	1	CIRCUIT BD ASSY:MAIN	80009	670850201
	670–8502–02	B020000	B029999	1	CIRCUIT BD ASSY:MAIN	80009	670850202
	670–8502–03	B030000		1	CIRCUIT BD ASSY:MAIN (A12 P6461 ONLY)	80009	670850203
	670–8501–01	B010100	B019999	1	CIRCUIT BD ASSY:EXPANDER MAIN	80009	670850101
	670–8501–02	B020000	B029999	1	CIRCUIT BD ASSY:EXPANDER MAIN	80009	670850102
	670–8502–03	B030000		1	CIRCUIT BD ASSY:EXPANDER MAIN (A13 P6461E ONLY)	80009	670850203
–7	131–2615–00			1	CONN,HDR::PCB,;MALE,RTANG,2 X 17,0.1 CTR,0.230 MLG X 0.090 TAIL,0.240 H,30 GOLD,MATING PIN 0.15 FROM PCB	22526	65820–005
–8	136–0252–07			70	SOCKET,PIN TERM:SINGLE,PCB,T/G,0.030 H,0.05 4 PCB,0.012–0.22 PIN SIZE,W/O DIMPLE	22526	75060–012
–9	131–0608–00			20	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR, 0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE (P6461 ONLY)	22526	48283–018
–10	346–0032–00			1	STRAP,RETAINING:0.075 DIA X 4.0 L,MLD RBR	98159	2829–75–4

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
12–11	150–0057–01			1	LAMP,INCAND:5V,0.115A,WIRE LD,AGED & SEL	S3774	OL7153AS15TPL
–12	175–9770–00			1	CA ASSY,SP,ELEC:2,26 AWG,13.750 L	1Y013	61692
–13	337–3357–00			1	SHIELD,ELEC:3.8 X 2.174,POLYCARBONATE	2K262	ORDER BY DESC
–14	380–0760–00			1	HSG HALF,LOWER:P6461	TK1113	ORDER BY DESC
					STANDARD ACCESSORIES		
–15	206–0364–00			21	TIP,PROBE:MICROCKT TEST,0.05 CTR (P6461 ONLY)	80009	206–0364–00
	206–0364–00			17	TIP,PROBE:MICROCKT TEST,0.05 CTR (P6461E ONLY)	80009	206–0364–00
	013–0225–00			1	GRABBER,IC LEAD:YELLOW,2.047 L,GRIPS LEAD TO 0.137 DIA MAX	TK1915	973649103
–16	196–3047–00	B010100	B010536	10	LEAD SET,ELEC:PODLET,2.1 L	80009	196304700
	196–3047–01	B010537		10	LEAD SET,ELEC:PODLET,2.1 L (P6461 ONLY)	1Y013	61490
	196–3047–00	B010100	B010259	8	LEAD SET,ELEC:PODLET,2.1 L	80009	196304700
	196–3047–01	B010260		8	LEAD SET,ELEC:PODLET,2.1 L	1Y013	61490
	334–6093–00			1	LABEL:MKD P6464	07416	ORDER BY DESC
–17	348–1073–00			1	PAD,CUSHION:0.35 X 1.95,POLYURENTHANE GRAY,W/ ADHESIVE BACK	85471	348–1073–00
					OPTIONAL ACCESSORIES		
	020–1386–00	B010100	B030664	1	ACCESSORY KIT:PACKAGE OF 12(013–0217–00)	80009	020138600
	020–1386–01	B030665		1	ACCESSORY KIT:PACKAGE OF 12(206–0364–00) (P6461 ONLY)	80009	020138601
	020–1386–00	B010100	B030465	1	ACCESSORY KIT:PACKAGE OF 12(013–0217–00)	80009	020138600
	020–1386–01	B030466		1	ACCESSORY KIT:PACKAGE OF 12(206–0364–00) (P6461E ONLY)	80009	020138601
	020–1442–00			1	ACCESSORY OPT:P6461	80009	020144200
	020–1484–01	B010100	B061008	1	ACCESSORY KIT:DAS9219/29,E9 PKG OF 4 PROBE RETAINER 343–1292–01 (P6461 ONLY)	80009	020148401
	020–1484–01	B010100	B061008	1	ACCESSORY KIT:DAS9219/29,E9 PKG OF 4 PROBE RETAINER 343–1292–01	80009	020148401

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					P6460		
13–1	334–4855–00			1	MARKER,IDENT:MKD DIAGNOSTIC	07416	ORDER BY DESC
–2	380–0711–00			1	HOUSING,PROBE:UPPER,PC	TK1163	380–0711–00
–3	211–0086–00			4	SCREW,MACHINE:4–40 X 0.75,FLH,100 DEG,STL	TK0435	ORDER BY DESC
–4	210–0406–00			4	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–5	358–0674–00			1	STRAIN RLF,CA:LOWER	TK1163	ORDER BY DESC
–6	358–0675–00			1	STRAIN RLF,CA:UPPER	TK1163	358–0675–00
–7	175–6807–00	B010100	B036539	1	CA ASSY,PROBE:2 METERS	6D224	ORDER BY DESC
	175–9843–00	B036540	B052755	1	CA ASSY,SP,ELEC:22,28 AWG,76.0 L	6D224	ORDER BY DESC
	175–9843–01	B052756		1	CA ASSY,SP,ELEC:22,28 AWG,76.0 L	6D224	901951
–8	200–2731–00	B010100	B061398	2	COVER,HOLE:POLYCARBONATE,GRAY	80009	200273100
	200–2731–00	B061399		3	COVER,HOLE:POLYCARBONATE,GRAY	80009	200273100
–9	348–0782–00			2	CUSHION,HYBRID:SILCON SPONGE	85471	348–0782–00 REV
–10	672–1119–02			1	CIRCUIT BD ASSY:672–1119–01,WITHOUT CABLE (A70 SEE FIGURE 13)	80009	672111902
–11	131–1811–00			1	CONN,HDR:PCB,;MALE,RTANG,1 X 10,0.15 CTR, 0.230 MLG X 0.120 TAIL,30 GOLD	22526	65595–110
–12	131–1812–00			1	CONN,HDR:PCB,;MALE,RTANG,1 X 10,0.15 CTR, 0.230 MLG X 0.270 TAIL,30 GOLD	22526	65603–110
–13	361–0758–01			1	SPACER,PROBE:ACETAL SLATE GRAY	80009	361075801
–14	131–2615–00			1	CONN,HDR::PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.230 MLG X 0.090 TAIL,0.240 H,30 GOLD,MATING PIN 0.15 FROM PCB	22526	65820–005
–15	260–0735–01			1	SWITCH,PUSH:T,NO CONTACT,BLACK BTN	81073	39–3
–16	358–0660–00			1	BUSHING,SW MTG:AL	80009	358066000
–17	210–0008–00			1	WASHER,LOCK:#8 INTL,0.02 THK,STL	0KB01	ORDER BY DESC
–18	346–0120–00			2	STRAP,TIEDOWN,E:5.5 L MIN,PLASTIC,WHITE	06383	SST1.5M
–19	343–1095–00			1	CLAMP,HYB CKT:0.295 ID,ALUMINUM	5Y400	ORDER BY DESC
–20	426–1985–00			1	FRAME,WINDOW:010–6460–00	0KBZ5	ORDER BY DESC
–21	386–5017–00			1	PLATE,PRESSURE:POLYCARBONATE	0KBZ5	386–5017–00
–22	343–1094–00			1	RETAINER,CONN:SILICONE FOAM	0KBZ5	ORDER BY DESC
–23	196–0797–00			1	FLEX CIRCUIT:36 CONDUCTOR,COPPER	80009	196079700
–24	348–0390–00			1	CUSHION,PROBE:1.5 X 2.0 X 0.125	TK1415	ORDER BY DESC
–25	380–0710–00			1	HOUSING,PROBE:LOWER,PC	TK1163	380–0710–00
–26	334–4856–00			1	MARKER,IDENT:MKD P6460 ACQUISITION PROBE (92A16/E ONLY)	22670	ORDER BY DESC
	334–6157–00			1	MARKER,IDENT:MKD P6460 EXT CONT PROBE 92S16 PATTERN GENERATOR	07416	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					STANDARD ACCESSORIES		
	012–0987–00			1	LEAD SET,ELEC:10 WIDE,5.0 L	1Y013	61502
	020–1386–01			1	ACCESSORY KIT:PACKAGE OF 12 (206–0364–00)	80009	020138601
	012–0989–00			1	LEAD SET,ELEC:GROUND OR VL SENSE LEAD 4.0 L,BLACK W/PAMONA CLIP	1Y013	61503
	344–0046–00			1	CLIP,ELECTRICAL:ALLIGATOR,1.56 LSTL BRT DIPPED	80009	344004600
	070–4345–00			1	SHEET,TECHNICAL:INSTR,010–6460–00	80009	ORDER BY DESC
					OPTIONAL ACCESSORIES		
	012–0747–00			1	LEAD SET,ELEC:10 WIDE,25 CML	1Y013	61501
	012–0800–00			1	LEAD SET,ELEC:10.WIDE,9.843 L	80009	012080000
	020–1041–00			1	ACCESSORY PKG:40 PIN UNIVERSAL PROBE INTERFACE	80009	020104100
	012–0556–00			1	LEADSET,ELEC:DIAGNOSTIC LEADSET,ELEC:12 WIDE,10.0L	1Y013	61507
	012–1000–00			1	LEAD SET,ELEC:GROUND OR VL SENSE LEAD 4.0 L ,BLACK	1Y013	012098901
	012–0989–01			1	W/PAMONA CLIP (PKG OF 10)		
	103–0209–00			1	ADAPTER,CONN:GPIB TO PROBE CLIP,TEST:16 PIN TEST	80009	103020900
	003–0709–00			1	CLIP,AP1 #923700 OR POMONA 3916	80009	003070900
	015–0330–00			1	ADPTR,TEST CLIP:16 DIP	80009	015033000
	015–0339–00			1	ADPTR,TEST CLIP:40 DIP	80009	015033900
	015–0339–02			1	ADPTR,TEST CLIP:40 DIP	80009	015033902
	380–0560–05			1	HOUSING,TERM:MALE ADAPTER	80009	380056005

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92A60, 92A60D, 92A90 & 92A90D MEMORY BOARD		
14–1	670–9489–00	B010100	B019999	1	CIRCUIT BD ASSY:MEMORY	80009	670948900
	670–9489–01	B020100	B029999	1	CIRCUIT BD ASSY:MEMORY	80009	670978901
	670–9489–02	B030100	B039999	1	CIRCUIT BD ASSY:MEMORY	80009	670948902
	670–9489–03	B040100	B059999	1	CIRCUIT BD ASSY:MEMORY	80009	670948903
	670–9489–04	B060100	B069999	1	CIRCUIT BD ASSY:MEMORY	80009	670948904
	670–9489–05	B070100		1	CIRCUIT BD ASSY:MEMORY	80009	670948905
	671–0772–00	B060100	B069999		CIRCUIT BD ASSY:92A60 SHALLOW MEMORY	80009	671077200
	671–0772–01	B070100	B070164	1	CIRCUIT BD ASSY:92A60 SHALLOW MEMORY	80009	671077201
	671–0772–02	B070165		1	CIRCUIT BD ASSY:92A60 SHALLOW MEMORY (A22 92A60 ONLY)	80009	671077102
	670–9677–00	B010100	B019999		CIRCUIT BD ASSY:MEMORY	80009	670967700
	670–9677–02	B020100	B029999	1	CIRCUIT BD ASSY:MEMORY	80009	670967702
	670–9677–03	B030100	B059999	1	CIRCUIT BD ASSY:MEMORY	80009	670967703
	670–9677–04	B060100	B070103	1	CIRCUIT BD ASSY:MEMORY	80009	670967704
	670–9677–05	B070104		1	CIRCUIT BD ASSY:MEMORY	80009	670967705
	671–0773–00	B060100	B069999	1	CIRCUIT BD ASSY:92A90 SHALLOW MEMORY	80009	671077300
	671–0773–01	B070100	B070507	1	CIRCUIT BD ASSY:92A90 SHALLOW MEMORY	80009	671077301
	671–0773–02	B070508		1 1	CIRCUIT BD ASSY:92A90 SHALLOW MEMORY (A23 92A90 ONLY)	80009	671077302
	671–0712–00	B010100	B019999		CIRCUIT BD ASSY:60 CH DEEP MEMORY	80009	671071200
	671–0712–01	B020100	B020113	1	CIRCUIT BD ASSY:60 CH DEEP MEMORY	80009	671071201
	671–0712–02	B020114	B020116	1	CIRCUIT BD ASSY:60 CH DEEP MEMORY	80009	671071202
	671–0712–03	B020117		1 1	CIRCUIT BD ASSY:60 CH DEEP MEMORY (A25 92A60D)	80009	671071203
	671–0713–00	B010100	B020102		CIRCUIT BD ASSY:90 CH DEEP MEMORY	80009	671071300
	671–0713–01	B020103	B020271	1	CIRCUIT BD ASSY:90 CH DEEP MEMORY	80009	671071301
	671–0713–02	B020272	B020297	1	CIRCUIT BD ASSY:90 CH DEEP MEMORY	80009	671071302
	671–0713–03	B020298		1 1	CIRCUIT BD ASSY:90 CH DEEP MEMORY (A26 92A90D)	80009	671071303
–2	131–0608–00			13	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.05SQ.0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ, W/FERRULE	22526	48283–018
–3	136–0752–00			2	SOCKET,DIP:PCB,;STR,2 X 10,20 POS,0.1 X 0.3 CTR,0.175 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014–0.022 LEADS	09922	DILB20P–108
–4	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS,0.1 X 0.3 CTR,0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB16P–108T
–5	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–6	211–0405–00			4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–7	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–8	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–9	131–1425–00			1	CONN,HDR:PCB,;MALE,RTANG,1 X 36,0.1 CTR, 0.230 MLG X 0.090 TAIL,30 GOLD,STACKABLE	22526	65521–136

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92A60, 92A60D, 92A90 & 92A90D CONTROLLER BOARD		
15–1	670–9501–00	B010100	B029999	1	CIRCUIT BD ASSY:CONTROLLER	80009	670950100
	670–9501–01	B010100	B029999	1	CIRCUIT BD ASSY:CONTROLLER	80009	670950101
	670–9501–02	B030100	B049999	1	CIRCUIT BD ASSY:CONTROLLER	80009	670950102
	670–9501–03	B050100	B069999	1	CIRCUIT BD ASSY:CONTROLLER	80009	670950103
	670–9501–04	B070100	B070157	1	CIRCUIT BD ASSY:CONTROLLER	80009	670950104
	670–9501–05	B070158	B070192	1	CIRCUIT BD ASSY:CONTROLLER	80009	670950105
	670–9501–06	B070193			CIRCUIT BD ASSY:CONTROLLER (A20 92A60 ONLY)	80009	670950106
	670–9501–04	B010100	B020118	1	CIRCUIT BD ASSY:CONTROLLER	80009	670950104
	670–9501–05	B020119	B020142	1	CIRCUIT BD ASSY:CONTROLLER	80009	670950105
	670–9501–06	B020143			CIRCUIT BD ASSY:CONTROLLER (A20 92A60D ONLY)	80009	670950106
	670–9678–00	B010100	B039999	1	CIRCUIT BD ASSY:CONTROLLER	80009	670967800
	670–9678–01	B010100	B039999	1	CIRCUIT BD ASSY:CONTROLLER	80009	670967801
	670–9678–02	B040100	B049999	1	CIRCUIT BD ASSY:CONTROLLER	80009	670967802
	670–9678–03	B050100	B069999	1	CIRCUIT BD ASSY:CONTROLLER	80009	670967803
	670–9678–04	B070100	B070502	1	CIRCUIT BD ASSY:CONTROLLER	80009	670967804
	670–9678–05	B070503	B070799	1	CIRCUIT BD ASSY:CONTROLLER	80009	670967805
	670–9678–06	B070800		1	CIRCUIT BD ASSY:CONTROLLER (A21 92A90 ONLY)	80009	670967806
	670–9678–04	B010100	B020309	1	CIRCUIT BD ASSY:CONTROLLER	80009	670967804
	670–9678–05	B020310	B020691	1	CIRCUIT BD ASSY:CONTROLLER	80009	670967805
	670–9678–06	B020692		1	CIRCUIT BD ASSY:CONTROLLER (A21 92A90D ONLY)	80009	670967806
–2	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS,0.1 X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB16P–108T
–3	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–4	211–0405–00			4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–5	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–6	131–0608–00			9	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025 SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
–7	131–0993–00			1	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR, 0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–8	136–0899–00			1	SOCKET,PGA::PCB,;149 POS,15 X 15,0.1 X 0.1 CTR, 0.250 H X 0.125 TAIL,TIN,NON–SYMET– RICAL, LIF,PAT 1518	00779	55275–3
–9	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–10	214–3172–00			6	KEY,POLARIZING:,;KEY FOR 3M HEADER	0KBZ8	ORDER BY DESC
–11	131–3323–00			3	CONN,HDR:PCB,;MALE,STR,2 X 20,0.1 CTR,0.365 H X 0.112 TAIL,SHRD/4 SIDES,CTR PLZ,30 GOLD	22526	66506–025
–12	131–0265–00			1	CONN,RF PLUG:SMB,;PCB,MALE,RTANG,50 OHM,0.381 H X 0.15 TAIL,0.043 DIA CTR COND,0.040 SQ TAIL	0GZV8	85SMB–50–0–1

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					010-6470-00 & 010-6471-00		
16–0	010–6470–00			1	PROBE,BUFFER:RETARGETABLE,MICROPRCR SPRT	80009	010647000
	010–6471–00			1	PROBE,BUFFER:RETARGETABLE,MICROPRCR SPRT (92A90/92A90D ONLY)	80009	010647100
–1	334–6416–00			1	MARKER,IDENT:MKD BUFFER PROBE (010–6470–00 ONLY)	07416	334–6416–00
–2	380–0768–00			1	HOUSING HALF:UPPER PROBE	TK1163	380–0768–00
–3	175–4066–02			2	CA ASSY,SP,ELEC:108,33 AWG,72.0 L,RIBBON (010–6470–00 ONLY)	53387	98–0300–0041–2
	175–4066–02			3	CA ASSY,SP,ELEC:108,33 AWG,72.0 L,RIBBON (010–6471–00 ONLY)	53387	98–0300–0041–2
–4	343–1048–00			2	CLAMP,CABLE:2.24 L,NYLON	06383	FCM2–A–14
–5	670–9624–00			1	CIRCUIT BD ASSY:BUFFER PROBE (A24 SEE REPL)	80009	670962400
–6	211–0259–00			2	SCR,ASSEM WSHR:2–56 X 0.437,PNH,STL,POZ	TK0435	18560
–7	131–3151–00			1	CONN,DIN:PCB,;MALE,RTANG,3 X 32,0.1 CTR,0.437 H X 0.104 TAIL,30 GOLD	00779	650473–5
–8	260–2314–00			1	SWITCH,PUSH:SPST,0.4 VA MAX,20VDC (SEE 24A100 REPL)	95146	TPD11CG–PC0
–9	380–0769–00			1	HOUSING HALF:LOWER PROBE	TK1163	380–0769–00
–10	348–0910–00			3	FOOT,CKT BD HSG:92A60	52152	SJ5007
–11	334–6779–00			1	MARKER,IDENT:BLANK	85480	ORDER BY DESC
					STANDARD ACCESSORIES		
–12	407–3417–00			1	BRACKET,MTG:UPPER CABLE	0J260	ORDER BY DESC
–13	211–0121–00			2	SCR,ASSEM WSHR:4–40 X 0.438,PNH, BRS,NP,POZ	TK0435	ORDER BY DESC
–14	012–1165–00			1	LEAD SET,ELEC:12 WIDE,10.0 L	1Y013	62665
–15	010–0456–00			1	ADAPTER,PROBE:DESKEW	80009	010045600
	070–5949–00			1	MANUAL,TECH:USERS 92A60/90DATA ACQ MODULE	80009	070594900
					OPTIONAL ACCESSORIES		
	P6041			1	PROBE,PASSIVE:1 X,3.5 FT		P6041
	020–1386–01			1	ACCESSORY KIT:PACKAGE OF 12 (206–0364–00)		020138601

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92A96 , 92A96D, 92A96XD, 92A96SD, 92C96 92C96D, 92C96XD, 92C96SD & 92F22/OPTION 02		
17–1	671–1578–00	B010100	B010121	1	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157800
	671–1578–01	B010122	B029999	1	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157801
	671–1578–02	B030100	B030175	1	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157802
	671–1578–03	B030176	B030185	1	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157803
	671–1578–04	B030186	B039999	1	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157804
	671–1578–05	B040100	B040170	1	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY	80009	671157805
	671–1578–06	B040171	B060757	1	CIRCUIT BD ASSY:DATA ACQUISTION 8K MEMORY (A27 92A96 ONLY)	80009	671157806
	671–1579–00	B010100	B010158	1	CIRCUIT BD ASSY:DATA ACQUISTION 32K MEMORY,	80009	671157900
	671–1579–01	B010159	B010232	1	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY	80009	671157901
	671–1579–02	B010233	B010533	1	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY	80009	671157902
	671–1579–03	B010534	B010550	1	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY	80009	671157903
	671–1579–04	B010551	B010864	1	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY	80009	671157904
	671–1579–05	B010865	B060757	1	CIRCUIT BD ASSY:DATA ACQUISITION 32K MEMORY (A28 92A96D ONLY)	80009	671157905
	671–1580–00	B010100	B010107	1	CIRCUIT BD ASSY:DATA ACQUISTION 128K MEMORY	80009	671158000
	671–1580–01	B010108	B010111	1	CIRCUIT BD ASSY:DATA ACQUISITION 128K MEMORY	80009	671158001
	671–1580–02	B010112	B010336	1	CIRCUIT BD ASSY:DATA ACQUISITION 128K MEMORY	80009	671158002
	671–1580–03	B010337	B010722	1	CIRCUIT BD ASSY:DATA ACQUISITION 128K MEMORY	80009	671158003
	671–1580–04	B010723	B060757	1	CIRCUIT BD ASSY:DATA ACQUISITION 128K MEMORY (A29 92A96XD ONLY)	80009	671158004
	671–2674–00	B010100	B010292	1	CIRCUIT BD ASSY512K DEEP ACQUISITION MODULE	80009	671267400
	671–2674–01	B010932	B060757	1	CIRCUIT BD ASSY512K DEEP ACQUISITION MODULE	80009	671267401
	671–2674–02	B060758		1	CIRCUIT BD ASSY512K DEEP ACQUISITION MODULE (A32 92A96SD ONLY)	80009	671267402
	671–3254–00			1	CKT BD ASSY 8K POWERFLEX ACQUISITION MODULE (A32 92C96 ONLY)	80009	671325400
	671–3255–00			1	CKT BD ASSY 32KPOWERFLEX ACQUISITION MODULE (A32 92C96D)	80009	671325500
	671–3256–00			1	CKT BD ASSY 128K POWERFLEX ACQUISITIONMODULE (A32 92C96XD)	80009	671325600
	671–3257–00			1	CKT BD ASSY 512K POWERFLEX ACQUSITION MODULE (A32 92C96SD)	80009	671325700
	671–3463–00			1	CKT BD ASSY:DATA ACQUISITION 2M MEMORY (A33 92A96UD)	80009	671346300
–2	131–4945–00			1	CONN,HDR PWR::PCB,;MALE,RTANG,2 X 2,0.165 CTR,0.394 H X 0.138 TAIL,SHRD/4 SIDES,PLZ, LATCHING,TIN,94V–2,9A	27264	39–29–1048
–3	131–4955–00			2	CONN,HDR::PCB,;MALE,RTANG,4 X 25 0.1 CTR,0.640 H X 0.155 TAIL,SHRD/4 SIDES,CTR PLZ,30GOLD,(2)2 X 25,W/O LATCH	TK1465	131–4955–00
–4	131–1343–00			1	CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR,0.230 MLG X 0.195 TAIL,30 GOLD	58050	082–3643–SS02
–5	131–0265–00			1	CONN,RF PLUG:SMB,;PCB,MALE,RTANG,50 OHM,0.381 H X 0.15 TAIL,0.043 DIA CTR COND,0.040 SQ TAIL	0GZV8	85SMB–50–0–1

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
17–6	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–7	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS,0.1 X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB16P–108T
–8	131–3714–01			1	CONN,HDI:PCB,;FEMALE,RTANG,4 X 135,540 POS,0.1 CTR, 0.480 MLG X 0.120 TAIL,30 GOLD,W/DUAL GUIDE PINS	22526	50005–1540E
–9	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–10	211–0405–00			4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–11	407–4096–00	B010100	B060757	2	BRACKET,CABLE:ALUMINUM	5Y400	407–4096–00
	407–4096–01	B060758		2	BRACKET,CABLE:ALUMINUM	5Y400	407–4096–01
–12	211–0244–00			4	SCR,ASSEM WSHR:4–40 X 0.312,PNH,STL,CD PL,POZ	TK0435	7772–312
–13	334–8244–00			4	MARKER,IDENT:92A96/D/XD CABLE LABEL,BLUE	07416	ORDER BY DESC
–13	334–8245–00			4	MARKER,IDENT:92A96/D/XD CABLE LABEL,GREEN	07416	ORDER BY DESC
–13	334–8246–00			4	MARKER,IDENT:92A96/D/XD CABLE LABEL,GRAY	07416	ORDER BY DESC
–13	334–8247–00			4	MARKER,IDENT:92A96/D/XD CABLE LABEL,ORANGE	07416	ORDER BY DESC
–13	334–8029–00			1	MARKER,IDENT:MKD 92A96 (SLOT NUMBERS 1–32) (NOT SHOWN)	07416	334–8029–00
–14	334–8248–00			1	MARKER,IDENT:92A96/D/XD CHANNEL GROUPING BLUE	07416	ORDER BY DESC
	334–8249–00			1	MARKER,IDENT:92A96/D/XD CHANNEL GROUPING GREEN	07416	ORDER BY DESC
	334–8250–00			1	MARKER,IDENT:92A96/D/XD CHANNEL GROUPING GRAY	07416	ORDER BY DESC
	334–8251–00			1	MARKER,IDENT:92A96/D/XD CHANNEL GROUPING ORANGE	07416	ORDER BY DESC
–15	174–2117–00	B010100	B019999	1	CA ASSY,SP,ELEC:25 W/GNDS,60.0 L,RIBBON	80009	174211700
	174–2117–01	B020100		4	CA ASSP,SP,ELEC:25 W/GNDS,60.0 L,RIBBON (92A96 ONLY)	53387	98–0300–5385–8
	010–0492–00			1	PROBE SET:100 PODLETS,W/HOUSINGS & HOLDERS	53387	98–0300–3905–5
–16	380–0964–00			4	HOUSING,INTERFA:2 X 25 W/LATCHING FEATURE	53387	98–0300–3903–0
–17	010–0493–00			12	PODLET CA ASSY:12.0 L,BLACK	80009	010049300
	010–0493–01			12	PODLET CA,ASSY:12.0 L,BROWN	80009	010049301
	010–0493–02			12	PODLET CA,ASSY:12.0 L,RED	80009	010049302
	010–0493–03			12	PODLET CA,ASSY:12.0 L,ORANGE	80009	010049303
	010–0493–04			12	PODLET CA,ASSY:12.0 L,YELLOW	80009	010049304
	010–0493–05			12	PODLET CA,ASSY:12.0 L,GREEN	80009	010049305
	010–0493–06			12	PODLET CA,ASSY:12.0 L,BLUE	80009	010049306
	010–0493–07			12	PODLET CA,ASSY:12.0 L,PURPLE	80009	010049307
	010–0493–08			4	PODLET CA,ASSY:13.0 L	80009	010049308
–18	352–0939–00			16	HOLDER,PODLET:POLYCARBONATE	53387	98–0300–5581–2
–19	196–3347–00			12	LEAD SET,ELEC:PODLET,3.0 L	1Y013	66314
–20	174–2527–00	B010100	B040140	12	CA ASSY,SP,ELEC:10,22 AWG,4.75 L	1Y013	66179
	012–1424–00	B040141		12	LEADSET, ELEC 8 CH LEADSET (92A96)	80009	012142400
	174–2527–00	B010100	B010726	12	CA ASSY,SP,ELEC:10,22 AWG,4.75 L	1Y013	66179
	012–1424–00	B010727		12	LEADSET, ELEC 8 CH LEADSET (92A96D)	80009	012142400
	174–2527–00	B010100	B010511	12	CA ASSY,SP,ELEC:10,22 AWG,4.75 L	1Y013	66179
	012–1424–00	B010512		12	LEADSET, ELEC 8 CH LEADSET (92A96XD)	80009	012142400
	174–2527–00	B010100	B010190	12	CA ASSY,SP,ELEC:10,22 AWG,4.75 L	1Y013	66179

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
17–20	012–1424–00	B010191		12	LEADSET, ELEC 8 CH LEADSET (92A96SD)	80009	012142400
–21	206–0364–00			144	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
–22	196–3353–00			1	LEAD,ELECTRICAL:9 AWG,72.0 L,BRAID	1Y013	196–3353–00
–23	334–8030–00			1	MARKER,IDENT:MKD 92A96,PROBE LOCATION	07416	334–8030–00
					STANDARD ACCESSORIES		
	010–0492–01			1	PROBE SET:100 PODLETS,W/HOUSINGS & HOLDERS (TESTED AND LABELED)	53387	98–0300–3905–5
	174–2117–01			4	CA ASSP,SP,ELEC:25 W/GNDS,60.0 L,RIBBON	53387	98–0300–5385–8
	196–3347–00			12	LEAD SET,ELEC:PODLET,3.0 L	1Y013	66314
	174–2527–00	B010100	B040140	12	CA ASSY,SP,ELEC:10,22 AWG,4.75 L	1Y013	66179
	012–1424–00	B040141		12	LEADSET, ELEC 8 CH LEADSET (92A96)	80009	012142400
	174–2527–00	B010100	B010726	12	CA ASSY,SP,ELEC:10,22 AWG,4.75 L	1Y013	66179
	012–1424–00	B010727		12	LEADSET, ELEC 8 CH LEADSET (92A96D)	80009	012142400
	174–2527–00	B010100	B010511	12	CA ASSY,SP,ELEC:10,22 AWG,4.75 L	1Y013	66179
	012–1424–00	B010512		12	LEADSET, ELEC 8 CH LEADSET (92A96XD)	80009	012142400
	174–2527–00	B010100	B010190	12	CA ASSY,SP,ELEC:10,22 AWG,4.75 L	1Y013	66179
	012–1424–00	B010191		12	LEADSET, ELEC 8 CH LEADSET (92A96SD)	80009	012142400
	407–4096–00			2	BRACKET,CABLE:ALUMINUM	5Y400	407–4096–00
	196–3353–00			1	LEAD,ELECTRICAL:9 AWG,72.0 L,BRAID	1Y013	196–3353–00
	206–0364–00			144	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	334–8030–00			1	MARKER,IDENT:MKD 92A96,PROBE LOCATION	07416	334–8030–00
	334–8244–00			1	MARKER,IDENT:92A96/D/XD CABLE LABELBLUE	07416	ORDER BY DESC
	334–8245–00			1	MARKER,IDENT:92A96/D/XD CABLE LABEL, GREEN	07416	ORDER BY DESC
	334–8246–00			1	MARKER,IDENT:92A96/D/XD CABLE LABEL, GRAY	07416	ORDER BY DESC
	334–8247–00			1	MARKER,IDENT:92A96/D/XD CABLE LABEL, ORANGE	07416	ORDER BY DESC
	334–8248–00			1	MARKER,IDENT:92A96/D/XD CHANNEL GROUPING BLUE	07416	ORDER BY DESC
	334–8249–00			1	MARKER,IDENT:92A96/D/XD CHANNEL GROUPING GREEN	07416	ORDER BY DESC
	334–8250–00			1	MARKER,IDENT:92A96/D/XD CHANNEL GROUPING GRAY	07416	ORDER BY DESC
	334–8251–00			1	MARKER,IDENT:92A96/D/XD CHANNEL GROUPING ORANGE	07416	ORDER BY DESC
	070–7832–02			1	MANUAL,TECH:USER,DAS9200 92A96/D/XD,	80009	070783202
	070–9185–01			1	MANUAL,TECH:USER,DAS9200 92A96 & 92C96	80009	070918501
					OPTIONAL ACCESSORIES		
	020–1888–00			1	ACCESSORIES KIT:25 Y CABLES	TK2548	020188800
	020–1890–00	B010100	B030250	1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS	80009	020189001
	020–1386–01			1	ACCESSORY KIT:PACKAGE OF 12 (206–0364–00) GRABBERS	TK2565	020138601
	020–1890–01	B030251	B040140	1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS	80009	020189001

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
	020–1890–02	B040140		1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS (92A96)	80009	020189001
	020–1890–01	B010100	B010726	1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS	80009	020189001
	020–1890–02	B010727		1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS (92A96D)	80009	020189001
	020–1890–01	B010100	B010511	1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS	80009	020189001
	020–1890–02	B010412		1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS (92A96XD)	80009	020189001
	020–1890–01	B010100	B010190	1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS	80009	020189001
	020–1890–02	B010191		1	ACCESSORIES KIT:25 CHANNEL PROBE SET W/LEADSETS AND GRABBERS (92A96SD)	80009	020189001
	020–1919–00	B010100	B040140	1	ACCESSORY KIT:8 CHANNEL LEADSET,PKG OF12	80009	020191900
	020–1919–01	B040141		1	ACCESSORY KIT:8 CHANNEL LEADSET,PKG OF12 (92A96)	80009	020191901
	020–1919–00	B010100	B0101726	1	ACCESSORY KIT:8 CHANNEL LEADSET,PKG OF12	80009	020191900
	020–1919–01	B010727		1	ACCESSORY KIT:8 CHANNEL LEADSET,PKG OF12 (92A96D)	80009	020191901
	020–1919–00	B010100	B010511	1	ACCESSORY KIT:8 CHANNEL LEADSET,PKG OF12	80009	020191900
	020–1919–01	B010512		1	ACCESSORY KIT:8 CHANNEL LEADSET,PKG OF12 (92A96SD)	80009	020191901
	020–1919–00	B010100	B010190	1	ACCESSORY KIT:8 CHANNEL LEADSET,PKG OF12	80009	020191900
	020–1919–01	B010191		1	ACCESSORY KIT:8 CHANNEL LEADSET,PKG OF12 (92A96XD)	80009	020191901
	020–1939–00			1	ACCESSORIES KIT:92A96 ANTI STATIC APPLICATION KIT,	TK0623	GTS TECH ESD KI
	070–8247–01			1	MANUAL,TECH:SERVICE,92A96 MODULE	80009	070824701
	010–0508–00			1	MICRO P INTFC:90 CHANNEL INTERFACE	80009	010050800
	020–2107–00			1	ACCESSORY KIT:8 CHANNEL LEADSETS,PKG OF 6	80009	020–2107–00
	020–2108–00			1	ACCESSORY KIT:(6) 8–CHANNEL LEAD SETS,(12) Y CABLES,(72) KLIPCHIPS	80009	020–2108–00
	020–2109–00			1	ACCESSORY KIT:50 CHANNEL PROBE SET, 50 PODLETS; (6) 8-CHANNEL LEADSETS,KLIPCLIPS, (12) Y CABLES,(72) KLIPCHIPS, (2) RIBBON CABLES & LABELS	80009	020–2109–00

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92A96 OPTION 01		
18–0	010–0508–00			1	MICRO P INTFC:90 CHANNEL INTERFACE (92A96 OPTION 01 ONLY)	80009	010050800
–1	380–0994–00			1	HOUSING,ADAPTER:UPPER,INTERFACE,LEXAN,	TK1163	380–0994–00
–2	334–8011–00			1	MARKER,IDENT:MKD 90 CHANNEL,	07416	334–8011–00
–3	334–8031–00			1	MARKER,IDENT:MKD 92A96,90 CH I/F	07416	334–8031–00
–4	211–0661–00			4	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ	TK0435	ORDER BY DESC
–5	671–1806–00			1	CIRCUIT BD ASSY:90 CHANNEL INTERFACE (A30)	80009	671180600
–6	131–4955–00			2	CONN,HDR:PCB,MALE,RTANG,4 X 25 0.1 CTR,0.640 H X 0.155 TAIL,SHRD/4 SIDES,CTR PLZ,30GOLD,(2)2 X 25,W/O LATCH	TK1465	131–4955–00
–7	131–4945–00			1	CONN,HDR PWR::PCB,;MALE,RTANG,2 X 2,0.165 CTR,0.394 H X 0.138 TAIL,SHRD/4 SIDES,PLZ,LATCHING,TIN,94V–2,9 A	27264	39–29–1048
–8	260–2314–00			1	SWITCH,PUSH:SPST,0.4 VA MAX,20VDC	95146	TPD11CG–PC0
–9	131–3151–00			1	CONN,DIN:PCB,;MALE,RTANG,3 X 32,0.1 CTR, 0.437 H X 0.104 TAIL,30 GOLD	00779	650473–5
–10	214–0668–00			1	HEATSINK,SEMIC:TRANSISTOR,TO–5/TO–39;TWO PIECE, 0.625"DIA,50C/W@1W,ALUMINUM, BLACK ANODIZE (USED WITH A30U1707)	13103	2211B
–11	386–1130–00			1	INSULATOR,DISK:TRANSISTOR,NYLON (USED WITH A30U1701)	13103	7717–15N
–12	380–0995–00			1	HOUSING,ADAPTER:LOWER,INTERFACE,LEXAN,	TK1163	380–0995–00
–13	348–0910–00			4	FOOT,CKT BD HSG:92A60	52152	SJ5007
–14	105–1034–00			4	LATCH,PROBE:RIGHT ANGLE	TK1163	105–134–00
–15	174–2348–00			1	CA ASSY,SP,ELEC:4,22 AWG,72.0 L	1Y013	ASI 65861

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92A96 OPTION 02		
19–0	198–5761–50			1	WIRE SET,ELEC:60.0 L,SET OF 4,92A96 (OPTION 02 & 4S)	TK2354	ORDER BY DESC
–1	174–2571–00			4	CA ASSY,RF:25 CONDUCTOR,60.0L	TK2354	ORDER BY DESC
–2	174–2622–00			25	CA ASSY,RF:2,39 OHM COAX,26 AWG WIRE,MINI PVC,BOTH ENDS,59.0 L	TK2469	ORDER BY DESC
–3	334–8244–00			4	MARKER,IDENT:92A96/D/XD CABLE LABEL,BLUE	07416	ORDER BY DESC
	334–8245–00			4	MARKER,IDENT:92A96/D/XD CABLE LABEL, GREEN	07416	ORDER BY DESC
	334–8246–00			4	MARKER,IDENT:92A96/D/XD CABLE LABEL,GRAY	07416	ORDER BY DESC
	334–8247–00			4	MARKER,IDENT:92A96/D/XD CABLE LABEL, ORANGE	07416	ORDER BY DESC
–4	211–0105–00			4	SCREW,MACHINE:4–40 X 0.188,FLH,100 DEG,STL	TK0435	MACHINE SCREW:

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92HS8/92HS8 CABINET		
20–0	650–1987–00	B010100	B010305	1	MAINTENANCE KIT:MAINFRAME	80009	650198700
	650–1987–01	B010306	B010318	1	MAINTENANCE KIT:MAINFRAME	80009	650198701
	650–1987–02	B010319	B010337	1	MAINTENANCE KIT:MAINFRAME	80009	650198702
	650–1987–03	B010338		1	MAINTENANCE KIT:MAINFRAME	80009	650198703
–1	390–0975–00			1	CABINET TOP:FULL RACK X 22.131,	5Y400	390–0975–00
–2	334–6484–00			1	MARKER,IDENT:MKD TEKTRONIX	22670	334–6484–00 REV
–3	101–0105–00			1	TRIM,DECORATIVE:91HS8,	TK1163	ORDER BY DESC
–4	211–0504–00			4	SCREW,MACHINE:6–32 X 0.250,PNH,STL	TK0435	ORDER BY DESC
–5	343–0775–00			1	CABLE,CLAMP:RIBBON,;1.0 X 1.0,GRAY,POLY VINYL,W/ URETHANE FOAM TAPE BACKING, RETAINS 6 RIBBON CABLES,UL94V–0	52152	80610029243/348
–6	407–3298–00			1	BRACKET,CKT BD:LEFT,ALUMINUM,	5Y400	ORDER BY DESC
–7	211–0504–00			8	SCREW,MACHINE:6–32 X 0.250,PNH,STL	TK0435	ORDER BY DESC
–8	211–0507–00			2	SCREW,MACHINE:6–32 X 0.312,PNH,STL	TK0435	ORDER BY DESC
–9	348–0907–00			1	SHLD GSKT,ELEK:FINGER TYPE,8.088 L	30817	493–38
–10	348–0906–00			1	SHLD GSKT,ELEK:FINGER TYPE,3.74,L	30817	493–37
–11	343–0775–00			1	CABLE,CLAMP:RIBBON,;1.0 X 1.0,GRAY,POLY VINYL,W/ URETHANE FOAM TAPE BACKING, RETAINS 6 RIBBON CABLES,UL94V–0	52152	80610029243/348
–12	119–1987–01	B010100	B010305	3	FAN,TUBEAXIAL:120VDC.3W.3450RPM.36CFM	80009	119198701
	119–1987–02	B010306		3	FAN,TUBEAXIAL:120VDC.3W.3450RPM.36CFM (USED FOR A58B134,B152,B160)	80009	119198702
–13	211–0510–00			12	SCREW,MACHINE:6–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–14	210–0457–00			12	NUT,PL,ASSEM WA:6–32 X 0.312,STL CD PL	TK0435	ORDER BY DESC
–15	407–3402–00			1	BRACKET,CKT BD:FRONT,LEFT	5Y400	ORDER BY DESC
–16	211–0504–00			2	SCREW,MACHINE:6–32 X 0.250,PNH,STL	TK0435	ORDER BY DESC
–17	337–3250–00			2	SHIELD,STATIC:CAL BOARD	2J927	ORDER BY DESC
–18	211–0007–00			2	SCREW,MACHINE:4–40 X 0.188,PNH,STL	TK0435	ORDER BY DESC
–19	210–0551–00			2	NUT,PLAIN,HEX:4–40 X 0.25,ST CD PL	TK0435	ORDER BY DESC
–20	407–3404–00			1	BRACKET,CKT BD:FRONT,RIGHT	5Y400	ORDER BY DESC
–21	211–0504–00			2	SCREW,MACHINE:6–32 X 0.250,PNH,STL	TK0435	ORDER BY DESC
–22	255–0334–00			1	PLASTIC CHANNEL:12.75 X 0.175 X 0.155,NYLON	11897	122–NN–2500–060
–23	334–6311–00			1	MARKER,IDENT:MKD CAUTION,	07416	334–6311–00
–24	407–3301–00			1	BRACKET,CKT BD:RIGHT,ALUMINUM,	5Y400	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
20–25	211–0507–00			8	SCREW,MACHINE:6–32 X 0.312,PNH,STL	TK0435	ORDER BY DESC
–26	211–0504–00			2	SCREW,MACHINE:6–32 X 0.250,PNH,STL	TK0435	ORDER BY DESC
–27	426–2059–00			4	FRAME SECT,CAB.:91HS8,	80009	426205900
–28	213–0760–00			4	SCREW,TPG,TF:8–32 X 0.875,SPCL TAPTITE, FILH,STL	72228	ORDER BY DESC
–29	124–0401–03			2	STRIP,TRIM:CORNER W/STEP TOP,PVC, EARTHBROWN	TK1112	ORDER BY DESC
–30	124–0402–03			2	STRIP,TRIM:COR W/STEP BOT,PVC,EARTH BRN	TK1112	ORDER BY DESC
–31	348–0829–00			4	SHLD GSKT,ELEK:RIGHT,CORNER	52961	ORDER BY DESC
–32	348–0830–00			4	SHLD GSKT,ELEK:LEFT,CORNER	52961	ORDER BY DESC
–33	343–0985–00			8	RTNR,ELEK SHLD:LEFT & RIGHT	80009	343098500
–34	348–0617–04			4	FOOT,CABINET:BOT,EARTH BROWN,POLY CARBONATES	0JR05	ORDER BY DESC
–35	348–0596–00			4	PAD,CAB.FOOT:0.69 X 0.255 X 0.06,PU	TK2122	348–0596–00
–36	390–0935–00			2	CABINET SIDE:3.5 X 22.131 EARTH BROWNDRW C–1155,	80009	390093500
–37	346–0120–00			1	STRAP,TIEDOWN,E:5.5 L MIN,PLASTIC,WHITE	06383	SST1.5M
–38	441–1593–00			1	CHAS,POWERSUPPLY:91HS8,	5Y400	ORDER BY DESC
–39	407–3405–00			1	BRACKET,CKT BD:TOP	5Y400	ORDER BY DESC
–40	212–0106–00			2	SCREW,MACHINE:8–32 X 0.875,FLH,100 DEG,STL	3M099	ORDER BY DESC
–41	220–0555–00			2	NUT,PLAIN,HEX:8–32 X 0.25 HEX,STL CD PL	0KB01	ORDER BY DESC
–42	407–3403–00			1	BRACKET,CKT BD:BOTTOM	5Y400	ORDER BY DESC
–43	212–0106–00			2	SCREW,MACHINE:8–32 X 0.875,FLH,100 DEG,STL	3M099	ORDER BY DESC
–44	220–0555–00			2	NUT,PLAIN,HEX:8–32 X 0.25 HEX,STL CD PL	0KB01	ORDER BY DESC
–45	426–2093–00			1	FRAME,CABINET:REAR,FINISHED,3.5 X FULL RACK	5Y400	ORDER BY DESC
–46	213–0760–00			4	SCREW,TPG,TF:8–32 X 0.875,SPCL TAPTITE, FILH,STL	72228	ORDER BY DESC
–47	010–0431–00			9	PROBE,BUFFER:1GHZ HIGH SPEED,DATA (A58A1)	80009	010043100
–48	220–0413–00			9	NUT,SLEEVE:4–40 X 0.562 HEX,BRS CD PL	80009	220041300
–49	334–1275–00			1	CLIP,CABLE MKR:BLACK,PLASTIC	0JR05	ORDER BY DESC
	334–1275–01			1	CLIP,CABLE MKR:BROWN,PLASTIC	0JR05	ORDER BY DESC
	334–1275–02			1	CLIP,CABLE MKR:RED,PLASTIC	0JR05	ORDER BY DESC
	334–1275–03			1	CLIP,CABLE MKR:ORANGE,PLASTIC	0JR05	ORDER BY DESC
	334–1275–04			1	CLIP,CABLE MKR:YELLOW,PLASTIC	0JR05	ORDER BY DESC
	334–1275–05			1	CLIP,CABLE MKR:GREEN,PLASTIC	0JR05	ORDER BY DESC
	334–1275–06			1	CLIP,CABLE MKR:BLUE,PLASTIC	0JR05	ORDER BY DESC
	334–1275–07			1	CLIP,CABLE MKR:VIOLET,PLASTIC	0JR05	ORDER BY DESC
	334–1275–08			1	CLIP,CABLE MKR:GRAY,PLASTIC	80009	334127508
	334–1275–09			1	CLIP,CABLE MKR:WHITE,PLASTIC	0JR05	ORDER BY DESC
–50	134–0138–00			1	BUTTON,PLUG:0.625 HOLE,STL CRPL,	77132	SS48172
–51	391–0183–00			2	BLOCK,LATCHING:ZINC	TK1465	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
20–52	211–0173–00			2	SCREW,MACHINE:4–40 X 0.375,FILH,STL	TK0435	ORDER BY DESC
–53	348–0883–00			1	GASKET,RFI:2.73 X 0.8,BRASS	00779	745777–3
–54	119–2046–00			1	FILTER,RFI:6 AMP,	54583	ZUB 2206–00
–55	211–0008–00			2	SCREW,MACHINE:4–40 X 0.25,PNH,STL	TK0435	ORDER BY DESC
	162–0531–00			1	INSUL SLVG,ELEC:HT SHRINK,0.165	06090	VERSAFIT
	162–0532–00			1	INSUL SLVG,ELEC:HT SHRINK,0.375	06090	VERSAFIT
–56	161–0202–00			1	CABLE ASSY,PWR,:3,18 AWG,60 L,SVT,GREY,60 DEG C, STRIP X RTANG,BME,10A/125V	S3109	ORDER BY DESC
–57	348–0544–05			4	RTNR,CAB.COVER:CORNER EARTH BROWN,PC,	0JR05	ORDER BY DESC
–58	213–0760–00			4	SCREW,TPG,TF:8–32 X 0.875,SPCL TAPTITE, FILH,STL	72228	ORDER BY DESC
–59	211–0219–00			1	SCREW,CAP:4–40 X 0.125,SCH,STL,BK OXD	TK0392	ORDER BY DESC
–60	333–3245–00			1	PANEL,REAR:91HS8,	5Y400	ORDER BY DESC
–61	213–0801–00			8	SCREW,TPG,TF:8–32 X 0.312,TAPTITE,PNH,STL	83486	ORDER BY DESC
–62	390–0976–00			1	CABINET BOTTOM:FULL RACK X 22.131 W/HOLES	5Y400	390–0976–00

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92HS8/92HS8 POWER SUPPLY		
21–0	650–1987–00	B010100	B010305	1	MAINTENANCE KIT:MAINFRAME	80009	650198700
	650–1987–01	B010306	B010318	1	MAINTENANCE KIT:MAINFRAME	80009	650198701
	650–1987–02	B010319	B010337	1	MAINTENANCE KIT:MAINFRAME	80009	650198702
	650–1987–03	B010338		1	MAINTENANCE KIT:MAINFRAME	80009	650198703
–1	334–6260–00			1	MARKER,IDENT:MKD POWER SUPPLY SHIELD	07416	ORDER BY DESC
–2	337–3249–00			1	SHIELD,ELEC:POWER SUPPLY	5Y400	ORDER BY DESC
–3	211–0008–00			2	SCREW,MACHINE:4–40 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–4	129–1076–00			2	SPACER,POST:2.515 L,4–40 INT/ EXT,AL0.25 HEX	0J260	ORDER BY DESC
–5	——— ———			1	CIRCUIT BD ASSY: POWER SUPPLY		
–6	211–0661–00			2	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ	TK0435	ORDER BY DESC
–7	——— ———			1	MICROCIRCUIT,LI: (NOT REPLACEABLE)		
–8	210–0406–00			1	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–9	——— ———			1	WASHER,SHLDR:		
–10	——— ———			1	MICROCIRCUIT,LI (NOT REPLACEABLE)		
–11	210–0406–00			1	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–12	——— ———			1	WASHER SHLDR:		
–13	——— ———			1	MICROCIRCUIT,LI (NOT REPLACEABLE)		
–14	210–0406–00			1	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–15	——— ———			1	WASHER SHLDR:		
–16	——— ———			1	TRANSISTOR: (NOT REPLACEABLE)		
–17	210–0406–00			1	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–18	——— ———			1	WASHER SHLDR:		
–19	——— ———			1	SEMICOND DVC,DI (NOT REPLACEABLE)		
–20	210–0406–00			1	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–21	——— ———			1	WASHER,SHDR		
–22	——— ———			1	TRANSISTOR: (NOT REPLACEABLE)		
–23	210–0406–00			1	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–24	——— ———			1	WASHER SHLDR:		

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
21–25	342–0613–00			1	INSULATOR,FILM:TRANSISTORS,MICA	2K262	ORDER BY DESC
–26	342–0202–00			1	INSULATOR,PLATE:TRANSISTOR,MICA,	91500	10–21–023–106
–27	——— ———			1	SEMICOND DVC,DI: (NOT REPLACEABLE)		
–28	210–0406–00			2	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–29	210–0022–00			2	WASHER,LOCK:#6 EXT,STL CD PL	80009	210002200
–30	342–0449–01			1	INSULATOR,PLATE:TRANSISTOR,ALUMINA,	80009	342044901
–31	211–0511–00			2	SCREW,MACHINE:6–32 X 0.5,PNH,STL	TK0435	ORDER BY DESC
–32	342–0458–00			1	INSULATOR,PLATE:TRANSISTOR,MICA,	08530	1339X1–2MC
–33	200–2269–00			1	COVER,XSTR:GMA125,	0JR05	ORDER BY DESC
–34	196–1157–01			1	LEAD,ELECTRICAL:18 AWG,5.5 L,5–4,	TK1386	ORDER BY DESC
–35	210–0457–00			1	NUT,PL,ASSEM WA:6–32 X 0.312,STL CD PL	TK0435	ORDER BY DESC
–36	334–3379–05			1	MARKER,IDENT:MKD GROUND SYMBOL	80009	334337905
–37	214–3709–00			1	HEAT SINK,XSTR:(6)TO–220,(2)TO–3P,ALUMINUM	5Y400	214–3709–00
–38	211–0661–00			2	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ	TK0435	ORDER BY DESC
–39	131–0993–00			1	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR,0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–40	131–0589–00			1	TERMINAL,PIN:PRESSFIT/PCB,;MALE,STR,0.025 SQ,0.343 MLG X 0.122 TAIL,0.465 L,50 GOLD,W/FERRULE	22526	48283–087
–41	214–0579–00			13	TERM,TEST POINT:PCB,TEST POINT;EYELET 0.055ID,0.4 L X 0.052 WIDE X 0.032 THK,TIN PL,W/0.045 TIP CHAMFER	0J260	ORDER BY DESC
–42	175–9795–00			1	CA ASSY,SP,ELEC:9,22 AWG,17.0 L,RIBBON	TK2469	175–9795–00
–43	175–9793–00			1	CA ASSY,SP,ELEC:10,22 AWG,24.0 L,RIBBON	TK2469	175–9793–00
–44	175–9687–00			1	CA ASSY,SP,ELEC:3,22 AWG,19.0 L,RIBBON	TK2469	175–9687–00
–45	175–9688–00			1	CA ASSY,SP,ELEC:10,22 AWG,22.0 L,RIBBON	TK2469	175–9688–00
–46	253–0135–01			1	PLASTIC STRIP:VINYL FOAM,0.062 X 0.5 X 1296.0,DOUBLE SIDED,0.05 FT253–0135–00	80009	253013501
–47	——— ———			1	TRANSISTRO,RF: (NOT REPLACEABLE)		
–48	211–0020–00			1	SCREW,MACHINE:4–40 X 1.125,PNH,STL	TK0435	ORDER BY DESC
–49	210–0586–00			1	NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
–50	352–0725–00			1	HOLDER,TOROID:PLASTIC	0JR05	ORDER BY DESC
–51	——— ———			4	COIL,RF: (NOT REPLACEABLE)		

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
21–52	211–0020–00			3	SCREW,MACHINE:4–40 X 1.125,PNH,STL	TK0435	ORDER BY DESC
	211–0021–00			1	SCREW,MACHINE:4–40 X 1.25,PNH,STL	TK0435	ORDER BY DESC
–53	210–0586–00			4	NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
–54	352–0725–00			7	HOLDER,TOROID:PLASTIC	0JR05	ORDER BY DESC
–55	352–0086–00			1	HOLDER,TOROID:0.5 DIA,DELRIN	80009	352008600
–56	343–0549–00			4	STRAP,TIEDOWN,E:0.098 W X 4.0 L,ZYTEL	TK1499	HW–047
–57	204–0906–00			1	BODY,FUSEHOLDER:3AG & 5 X 20MM FUSES	61935	TYPE FAU 031.35
–58	200–2264–00			1	CAP,FUSEHOLDER:3AG FUSES,	61935	FEK 031 1666
–59	131–2663–00			1	CONN,RCPT,ELEC:PWR,3 MALE,250VAC,10A,	82389	EAC 333
–60	211–0661–00			2	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ	TK0435	ORDER BY DESC
–61	210–0586–00			2	NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
–62	——— ——			1	CIRCUIT BD ASSY:CAL (NOT REPLACEABLE ORDER 650–1987–XX)		
–63	211–0661–00			3	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ	TK0435	ORDER BY DESC
–64	131–0608–00			19	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR, 0.025SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
–65	175–9791–00			1	CA ASSY,SP,ELEC:3 CONDUCTOR,RIBBON W/CONN	1Y013	62142

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92HS8/92HS8 CIRCUIT BOARDS		
22–0	650–1987–00	B010100	B010305	1	MAINTENANCE KIT:MAINFRAME	80009	650198700
	650–1987–01	B010306	B010318	1	MAINTENANCE KIT:MAINFRAME	80009	650198701
	650–1987–02	B010319	B010337	1	MAINTENANCE KIT:MAINFRAME	80009	650198702
	650–1987–03	B010338		1	MAINTENANCE KIT:MAINFRAME	80009	650198703
–1	214–3773–00			2	HINGE,DOOR:ADJUSTABLE	94222	E6–10–301–20
–2	212–0023–00	B010100	B011831	4	SCREW,MACHINE:8–32 X 0.375,PNH,STL	TK0435	ORDER BY DESC
–3	210–0458–00			4	NUT,PL,ASSEM WA:8–32 X 0.344,STL CD PL	0KB01	210–0458–00
–4	——— ———			1	CIRCUIT BOARD ASSY:MEMORY (NOT REPLACEABLE,ORDER 650–1987–XX)		
–5	211–0658–00		B061008	9	SCR,ASSEM WSHR:6–32 X 0.312,PNH,STL,POZ	TK0435	17691–300
–6	131–1343–00	B011639		5	CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230MLG X 0.195 TAIL,30 GOLD	58050	082–3643–SS02
–7	386–5240–00			1	STIF,CIRCUIT BD:15.0	5Y400	ORDER BY DESC
–8	211–0658–00		B061008	5	SCR,ASSEM WSHR:6–32 X 0.312,PNH,STL,POZ	TK0435	17691–300
–9	386–5238–00			1	PLATE,STAB:POLYCARBONATE	80009	386523800
–10	211–0658–00		B061008	4	SCR,ASSEM WSHR:6–32 X 0.312,PNH,STL,POZ	TK0435	17691–300
–11	136–0813–01			16	SKT,PL–IN ELEK:CHIP CARRIER,68 CONTACT	53387	2–0068–05400–07
–12	214–3775–00			16	HT SK,MICROCKT:CHIP CARRIER,ALUMINUM	05820	MODEL 665
–13	——— ———			1	CIRCUIT BOARD ASSY:ACQUISTION (NOT REPLACEABLE,ORDER 650–1987–XX)		
–14	211–0658–00		B061008	10	SCR,ASSEM WSHR:6–32 X 0.312,PNH,STL,POZ	TK0435	17691–300
–15	131–0391–00			20	CONN,RF JACK:SMB,;50 OHM,STR,PCB,GOLD /GOLD,0.293 H X 0.155 TAIL,3/0.045 SQ TAIL 0.038 DIA CTR COND,0.2 SQ PCB,0.312 HEX	24931	32JR105–1
–16	136–0813–01			2	SKT,PL–IN ELEK:CHIP CARRIER,68 CONTACT	53387	2–0068–05400–07
–17	214–3775–00			2	HT SK,MICROCKT:CHIP CARRIER,ALUMINUM	05820	MODEL 665
–18	131–0993–00			1	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR, 0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–19	131–1343–00	B011639		6	CONN,HDR:PCB,;MALE,STR,1 X 36,0.1 CTR, 0.230MLG X 0.195 TAIL,30 GOLD	58050	082–3643–SS02
–20	426–1434–00	B010100	B030214	5	FRAME,MICROCKT:R7612D	80009	426143400
–21	211–0034–00			20	SCREW,MACHINE:2–56 X 0.5,PNH,STL	TK0435	ORDER BY DESC
–22	131–2052–00	B010100	B030214	5	CONTACT,ELEC:MICROCKT 1.4 X 1.4 HYPCON	80009	131205200
–23	361–1306–00			5	SPACER,PLATE:0.003 THK,1.395 SQ BRASS	80009	361130600

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
22–24	131–3372–00			1	CONN,DSUB:PCB/PNL,;FEMALE,RTANG,37 POS, 0.112 CTR,0.545 MLG X 0.155 TAIL,4–40 THD, 0.025 SQ TAIL	00779	745115–2
–25	386–5239–00			1	STIF,CIRCUIT BD:11.5	5Y400	ORDER BY DESC
–26	211–0658–00		B061008	4	SCR,ASSEM WSHR:6–32 X 0.312,PNH,STL,POZ	TK0435	17691–300
–27	214–3711–00			5	HEAT SINK,ELEC:HYBRID CIRCUIT	5Y400	214–3711–00
–28	214–2518–00			2	HEAT SINK,XSTR:TO–220 OR TO–202	TK0303	332–612
	136–0751–00			1	SOCKET,DIP:PCB,;STR,2 X 12,24 POS,0.1 X 0.6 CTR,0.175 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014–0.022 LEADS	09922	DILB24P108
	136–0756–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 9,18 POS,0.1 X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB18P–108
	174–0268–00	B030000		1	CA ASSY,SP,ELEC:SHLD TW PR	60381	500–0935–00
–29	175–9796–00			2	CA ASSY,SP,ELEC:2,26 AWG,16.0 L,RIBBON	17217	HTN1167B
–30	175–9686–00			1	CA ASSY,SP,ELEC:26,28,AWG,22.25 L,RIBBON	1Y013	61636
	175–9794–00			1	CA ASSY,SP,ELEC:2,33 AWG,10.0 L,RIBBON	17217	HTN 1167 B
–32	346–0120–00			9	STRAP,TIEDOWN,E:5.5 L MIN,PLASTIC,WHITE	06383	SST1.5M
–33	174–0762–00			1	CABLE ASSY,RF:2,50 OHM COAX,80.0 L,	TK1337	500–1001–00
–34	—— ——			1	CIRCUIT BOARD ASSY:MASTER INTERFACE (NOT REPLACEABLE, ORDER 650–1987–XX)		
–35	131–3087–00			2	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.420 H X 0.140 TAIL,SHRD/4 SIDES,CTR PLZ	22526	67950–001
–36	131–0265–00			8	CONN,RF PLUG:SMB,;PCB,MALE,RTANG,50 OHM,0.381 H X 0.15 TAIL,0.043 DIA CTR COND,0.040 SQ TAIL	0GZV8	85SMB–50–0–1
–37	426–1434–00	B010100	B030214	1	FRAME,MICROCKT:R7612D	80009	426143400
–38	211–0034–00			4	SCREW,MACHINE:2–56 X 0.5,PNH,STL	TK0435	ORDER BY DESC
–39	131–2052–00	B010100	B030214	1	CONTACT,ELEC:MICROCKT 1.4 X 1.4 HYPCON	80009	131205200
–40	361–1306–00	B010100	B010246	1	SPACER,PLATE:0.003 THK,1.395 SQ BRASS	80009	361130600
	361–1306–01	B010247		1	SPACER,PLATE:0.003 THK,1.395 SQ,BRASS	0J260	361–1306–01
–41	214–3711–00			1	HEAT SINK,ELEC:HYBRID CIRCUIT	5Y400	214–3711–00
–42	136–0756–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 9,18 POS, 0.1X 0.3 CTR,0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB18P–108
–43	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS ,0.1X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB16P–108T
–44	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–45	211–0405–00			4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–46	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
22–47	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	80009	386533901
–48	——— ———			1	CIRCUIT BOARD ASSY:STANDARD INTERFACE		
–49	131–3087–00			2	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.420 H X 0.140 TAIL,SHRD/4 SIDES,CTR PLZ	22526	67950–001
–50	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS, 0.1X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB16P–108T
–51	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–52	214–1337–00			1	PIN,SPRING:0.25 L X 0.103 OD,STL CD PL	0KB01	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92HS8/92HS8 STANDARD ACCESSORIES		
23–1	206–0364–00			20	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
–2	161–0118–00			1	CABLE ASSY,PWR,:3,18 AWG,90.0 L,10A/125V,SJT, NORTH AMERICAN,BME X IEC–320 RTANG RECPT, GRAY (STANDARD ONLY)	0B445	ECM–161–0118–00
–3	161–0066–09			1	CA ASSY,PWR:3,0.75MM SQ,250V/10A,99 INCH,STR,IEC320, RCPT,EUROPEAN, (OPTION A1 EUROPEAN ONLY	S3109	86511000
–4	161–0066–10			1	CA ASSY,PWR:3,0.1MM SQ,250V/10A,2.5 METER,STR, IEC320 RCPT X 13A,FUSED UK PLUG (13AFUSE)UNITED KINGDOM (OPTION A2 UNITED KINGDOM ONLY)	S3109	BS/13–H05VVF3G0
–5	161–0066–11			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,STR, IEC320,RCPT,AUSTR (OPTION A3 AUSTRALIAN ONLY)	S3109	198–000
–6	161–0066–12			1	CA ASSY,PWR:3,18 AWG,250V/10A,98 INCH,STR,IEC320, RCPT X NEMA 6–15P,US (OPTION A4 NORTH AMERICAN ONLY)	TK2541	13E68,25–1E–250
–7	161–0154–00			1	CA ASSY,PWR:3,1.0MM SQ,250V/10A,2.5 METER,STR,IEC 320,RCPT,SWISS (OPTION A5 SWISS ONLY)	S3109	12–H05VVF3G 00–
–8	196–3047–01			9	LEAD SET,ELEC:PODLET,2.1 L	1Y013	61490
–9	198–5594–00			1	WIRE SET,ELEC:4.5 FT (CABLE MATCHED TO INSTRUMENT)	80009	198559400
	198–5595–00			1	WIRE SET,ELEC:4.0 FT (CABLE MATCHED TO INSTRUMENT)	80009	198559500
	198–5596–00			1	WIRE SET,ELEC:5.0 FT (CABLE MATCHED TO INSTRUMENT)	80009	198889600
	220–0143–00			1	NUT,PRESSMOUNT:M3,SST,NUT SELF LOCKING	80009	220014300
–10	407–3626–00			1	BRKT,STRAIN RLF:92HS8	80009	407362600
	174–0762–00			1	CABLE ASSY,RF:2,50 OHM COAX,80.0 L,	TK1337	500–1001–00
	070–5951–03			1	MANUAL,TECH:USERS,92HS8 DATA ACQUISITION MDL	80009	070595103
					OPTIONAL ACCESSORIES		
	016–0884–00			1	ACCESSORY KIT:92HS8 RACK MOUNT	80009	016088400
	020–1609–00			1	ACCESSORY PKG:92HS8 VARIABLE DELAY LINE KIT	80009	020160900
	020–1610–00			1	ACCESSORY PKG:92HS8 CLOCK PROBE KIT	80009	020161000
	070–5959–08			1	MANUAL,TECH:REF,DAS9200 SERIES MAINFRAME	TK2548	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92S16/92SX109		
24–1	670–9593–10			1	CIRCUIT BD ASSY:PATTERN GENERATOR MDL	80009	670959310
	670–9593–11			1	CIRCUIT BD ASSY:PATTERN GENERATOR MDL	80009	670959311
	670–9593–12			1	CIRCUIT BD ASSY:PATTERN GENERATOR MDL (A40)	80009	670959312
–2	156–1207–02			1	MICROCKT,LINEAR:VOLTAGE RGLTR,–12V, TO=92	80009	156120702
–3	210–0406–00			1	NUT,PLAIN,HEX:4–40 X 0.188,BRS CD PL	73743	12161–50
–4	342–0163–01			1	INSULATOR,PLATE:TRANSISTOR,SILICON RUBBER SONY TEK	80009	342016301
–5	136–0260–04			1	SKT,PL–IN ELEK:MICROCIRCUIT,16 DIP	80009	136026004
–6	136–0634–01			3	SKT,PL–IN ELEK:MICROCKT,20 DIP,LOW PF MACHINED CONTACT	80009	136063401
–7	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–8	211–0381–00			4	SCREW,MACHINE:2–56 X 0.312 L,PNH,SST,POZI	3M099	ORDER BY DESC
–9	210–0405–00			4	NUT,PLAIN,HEX:2–56 X 0.188,BRS CD PL	73743	12157–50
–10	214–0579–00			11	TERM,TEST POINT:PCB,TEST POINT;EYELET 0.055ID,0.4 L X 0.052 WIDE X 0.032 THK,TIN PL,W/0.045 TIP CHAMFER	0J260	ORDER BY DESC
–11	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–12	131–0993–00			1	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR, 0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–13	131–0590–03			36	TERMINAL,PIN:0.38 L X 0.025 SQ,NO FERRULE	80009	131059003
–14	131–3087–00			3	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.420 H X 0.140 TAIL,SHRD/4 SIDES,CTR PLZ	22526	67950–001
–15	131–3617–00			1	CONN,RCPT,ELEC:CKT BD,RTANG	80009	131361700
					92S16 STANDARD ACCESSORIES		
	010–6464–00			2	PROBE,PATT GEN:50MHZ	80009	010–6464–00
	196–2963–00			1	LEAD SET,ELEC:2,23 AWG,3.156 LEACHES (2LEADS)	M860	ORDER BY DESC
	206–0364–00			1	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	334–6093–00			1	LABEL:MKD P6464	07416	ORDER BY DESC
	070–5475–00			1	MANUAL,TECH:P6464	TK2548	ORDER BY DESC
	334–6157–00			1	MARKER,IDENT:MKD P6464 EXT CONT PROBE 92S16	07416	ORDER BY DESC
	070–5950–02			1	MANUAL,TECH:USERS,92S16 PATTERN GENERATOR MDL	TK2548	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92S16 OPTIONAL ACCESSORIES		
	P6460			1	PROBE,DATA ACQ 100MHZ:	80009	P6460
	003–1134–00			1	ALIGN TOOL,ELEK:18–0603	TK0AJ	32–1902–00
	020–1392–01			1	ACCESSORY KIT:OPTIONAL	80009	020139201
	020–1484–01		J301294	1	ACCESSORY KIT PKG OF 4 PROBE RETAINER	80009	020148401
					92SX109 STANDARD ACCESSORIES		
	P6403			1	PROBE ASSEMBLY:50MHZ TO 100MHZ PATTERN GEN	80009	P6403
	196–2963–00			1	LEAD SET,ELEC:2,23 AWG,3.156 LEACHES (2LEADS)	9M860	ORDER BY DESC
	206–0364–00			1	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	334–6093–00			1	LABEL:MKD P6464	07416	ORDER BY DESC
	334–6230–00			1	MARKER,IDENT:MKD 91S16 CHANNEL SELECTOR	80009	334623000
	003–1134–00			1	ALIGN TOOL,ELEK:18–0603	TK0AJ	32–1902–00
	343–1292–01			1	RETAINER,PROBE:ALUMINUM	5Y400	343–1292–01
	343–1438–00			1	RETAINER,CABLE:ALUMINUM	5Y400	343–1438–00
	070–7562–01			1	MANUAL,TECH:USERS & INSTALLATION, 92SX109/118	80009	ORDER BY DESC
	070–5950–02			1	MANUAL,TECH:USERS,92S16PATTERN GENERATOR MDL	TK2548	ORDER BY DESC
					92SX109 OPTIONAL ACCESSORIES		
	P6460			1	PROBE,DATA ACQ 100MHZ	80009	P6460
	P6041			1	PROBE,PASSIVE: 1X,3.5 FT	80009	P6041

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92S32/92SX1118		
25–1	670–9594–10	B030001	B300478	1	CIRCUIT BD ASSY:PATTERN GENERATOR MDL	80009	670959410
	670–9594–11	B030479	B300624	1	CIRCUIT BD ASSY:PATTERN GENERATOR MDL	80009	670959411
	670–9594–12	B300624		1	CIRCUIT BD ASSY:PATTERN GENERATOR MDL (SEE A45)	80009	670959412
–2	131–3400–00			6	TERMINAL,PIN:0.46 L X 0.025 SQ	80009	131340000
–3	214–0579–00			9	TERM,TEST POINT:PCB,TEST POINT;EYELET 0.055 ID,0.4 L X 0.052 WIDE X 0.032 THK,TIN PL,W/0.045 TIP CHAMFER	0J260	ORDER BY DESC
–4	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS, 0.1X 0.3 CTR, 0.175 H X 0.130 TAIL	09922	DILB16P–108T
–5	131–3266–00			1	CONN,RCPT,ELEC:CKT BD,RTANG,4 X 135,0.1 SP	00779	532840–2
–6	211–0381–00			4	SCREW,MACHINE:2–56 X 0.312 L,PNH,SST,POZI	3M099	ORDER BY DESC
–7	220–0032–00	B300101	B300208	4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
	210–0405–00	B300209		4	NUT,PLAIN,HEX:2–56 X 0.188,BRS CD PL	73743	12157–50
–8	131–0590–03			134	TERMINAL,PIN:0.38 L X 0.025 SQ,NO FERRULE	80009	131059003
–9	131–0993–00			40	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR,0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–10	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–11	131–3087–00			4	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.420 H X 0.140 TAIL,SHRD/4 SIDES,CTR PLZ	22526	67950–001
–12	131–3617–00			1	CONN,RCPT,ELEC:CKT BD,RTANG	80009	131361700
					92S32 STANDARD ACCESSORIES		
	010–6464–00			2	PROBE,PATT GEN:50MHZ	80009	010646400
	196–2963–00			1	LEAD SET,ELEC:2,23 AWG,3.156 LEACHES (2LEADS)	9M860	ORDER BY DESC
	206–0364–00			1	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	334–6093–00			1	LABEL:MKD P6464	07416	ORDER BY DESC
	334–6157–00			1	MARKER,IDENT:MKD P6460 EXT CONT PROBE 92S16 PATTERN GENERATOR	07416	ORDER BY DESC
					92S32 OPTIONAL ACCESSORIES		
	P6041			1	PROBE,PASSIVE:1X,3.5 FT	80009	P6041
	003–1134–00			1	ALIGN TOOL,ELEK:18–0603	TK0AJ	32–1902–00
	020–1392–01			1	ACCESSORY KIT:OPTIONAL	80009	020139201
	020–1484–01		J301663	1	ACCESSORY KIT:DAS9219/29,E9 PKG OF 4 PROBE RETAINER 343–1292–01	80009	020148401

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92SX118 STANDARD ACCESSORIES		
	P6403			2	PROBE,ASSEMBLY:50MHZ TO 100MHZ PATTERN GEN	80009	P6403
	196–2963–00			1	LEAD SET,ELEC:2,23 AWG,3.156 LEACHES (2LEADS)	9M860	ORDER BY DESC
	206–0364–00			1	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	334–6093–00			1	LABEL:MKD P6464	07416	ORDER BY DESC
	003–1134–00			1	ALIGN TOOL,ELEK:18–0603	TK0AJ	32–1902–00
	343–1292–01			2	RETAINER,PROBE:ALUMINUM	5Y400	343–1292–01
	343–1438–00			2	RETAINER,CABLE:ALUMINUM	5Y400	343–1438–00
	070–5950–01			1	MANUAL,TECH:USERS,DAS9200 SERIES	80009	ORDER BY DESC
	070–7562–01			1	MANUAL,TECH:USERS & INSTALLATION, 92SX109/118	80009	ORDER BY DESC
	070–5950–02			1	MANUAL,TECH:USERS,92S16PATTERN GENERATOR MDL	TK2548	ORDER BY DESC
	070–5475–00			1	MANUAL,TECH:P6464	TK2548	ORDER BY DESC
					92SX118 OPTIONAL ACCESSORIES		
	P6041			1	PROBE,PASSIVE:1X,3.5 FT	80009	P6041

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					010–6403–00 **PATTERN GENERATOR MUTIPLEXER**		
26–0	010–6403–00			1	PROBE ASSEMBLY:50MHZ TO 100MHZ PATTERN 92SX109,GENERATOR MULTIPLEXER	80009	010640300
–1	380–0798–00			1	HOUSING,BOTTOM:ALUMINUM	5Y400	380–0798–00
–2	671–1244–00			1	CIRCUIT BD ASSY:MAX MUX (A41)	80009	671124400
–3	131–0608–00			13	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.05SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ, W/FERRULE	22526	48283–018
–4	131–4356–00			2	CONN,SHUNT:SHUNT/SHORTING,;FEMALE,1 X 2,0.1 CTR, 0.630 H,BLK,W/HANDLE,JUMPER	26742	9618–302–50
–5	131–3087–00			1	CONN,HDR:PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.420 H X 0.140 TAIL,SHRD/4 SIDES,CTR PLZ	22526	67950–001
–6	131–2615–00			2	CONN,HDR::PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.230 MLG X 0.090 TAIL,0.240 H,30 GOLD,MATING PIN 0.15 FROM PCB	22526	65820–005
–7	211–0661–00			4	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CD PL,POZ	TK0435	ORDER BY DESC
–8	174–1712–00			2	CA ASSY,SP,ELEC:11 SGL,11 TW PR,28 AWG, 13.0L	6D224	902200
–9	343–1438–00			1	RETAINER,CABLE:ALUMINUM	5Y400	343–1438–00
–10	211–0119–00			2	SCREW,MACHINE:4–40 X 0.25,FLH,100 DEG,STL	TK0435	ORDER BY DESC
–11	380–0797–00			1	HOUSING,TOP:ALUMINUM	5Y400	380–0797–00
–12	211–0541–00			4	SCREW,MACHINE:6–32 X 0.25,FLH,100 DEG,STL	TK0435	ORDER BY DESC
					STANDARD ACCESSORIES		
	003–1134–00			1	ALIGN TOOL,ELEK:18–0603	TK0AJ	32–1902–00
	070–5950–01			1	MANUAL,TECH:USERS,DAS9200 SERIES	80009	ORDER BY DESC
	070–7562–01			1	MANUAL,TECH:USERS & INSTALLATION, 92SX109/118	80009	ORDER BY DESC
	343–1292–01			2	RETAINER,PROBE:ALUMINUM (92SX109)	5Y400	343–1292–01
	343–1437–00			1	RETAINER,CABLE:ALUMINUM (92SX109)	5Y400	343–1437–00
	343–1292–01			4	RETAINER,PROBE:ALUMINUM (92SX118)	5Y400	343–1292–01
	343–1437–00			2	RETAINER,CABLE:ALUMINUM (92SX118)	5Y400	343–1438–00

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					P6464		
27–0	010–6464–00	B010100	B049999	1	PROBE,PATT GEN:50MHZ	80009	010646400
	010–6464–01	B010100	B049999	1	PROBE,PATT GEN:50MHZ	80009	010646401
	010–6464–02	B050100		1	PROBE,PAT GEN:9 CHAN,50MHZ	80009	010646402
	010–6464–03	B050100		1	PROBE,PAT GEN:9 CHAN,50MHZ	80009	010646403
					PROBE INCLUDES:		
–1	334–5957–00	B010100	B011069	2	MARKER,IDENT:MKD P6464	80009	334595700
	334–5957–00	B011070	B031109	1	MARKER,IDENT:MKD P6464	80009	334595700
	334–5957–01	B031110		1	MARKER,IDENT:MARKED P6464	22670	ORDER BY DESC
–2	334–5987–00			1	LABEL:MKD CLK STB	80009	334598700
–3	380–0735–00			1	HOUSING HALF:UPPER,	TK1163	ORDER BY DESC
–4	214–3672–00			1	HEAT SINK,ELEC:68 PIN HYBRID,ALUMINUM	5Y400	ORDER BY DESC
–5	211–0001–00	B010100	B010673	4	SCREW,MACHINE:2–56 X 0.25,PNH,STL	TK0435	ORDER BY DESC
	211–0374–00	B010674		4	SCREW,MACHINE:2–56 X 0.219 L,PNH,STL,CD PL,POZI	TK0435	ORDER BY DESC
–6	670–8808–00			1	CIRCUIT BD ASSY:3V POWERSPLY	80009	670880800
–7	211–0007–00			2	SCREW,MACHINE:4–40 X 0.188,PNH,STL	TK0435	ORDER BY DESC
–8	131–0608–00			3	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.05SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
–9	175–2911–00			1	CA ASSY,SP,ELEC:3,26 AWG,3.5 L,RIBBON (FROM A36J160 TO A37J210)	80009	175291100
–10	175–9677–00			1	CA ASSY,SP,ELEC:8,28 AWG,80.0 L,RIBBON	6D224	ORDER BY DESC
	165–2048–10	B010100	B019999	10	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,TESTED PKG	80009	65204810
–11	165–2048–10	B010100	B019999	1	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG,TESTED PKG MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204810
	165–2048–12	B032448	B039999	10	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
	165–2048–13	B040000		10		80009	165204813
–12	670–8742–00	B010100	B010673	1	CIRCUIT BD ASSY:MAIN	80009	670874200
	670–8742–01	B010674	B020402	1	CIRCUIT BD ASSY:MAIN	80009	670874201
	670–8742–02	B020403	B029999	1	CIRCUIT BD ASSY:MAIN	80009	670874202
	670–8742–03	B030000	B039999	1	CIRCUIT BD ASSY:MAIN	80009	670874203
	670–8742–04	B040000	B040938	1	CIRCUIT BD ASSY:MAIN	80009	670874204
	670–8742–05	B040939	B049999	1	CIRCUIT BD ASSY:MAIN	80009	670874205
	670–8742–06	B050000		1	CIRCUIT BD ASSY:MAIN (A36)	80009	670874206
–13	136–0252–07			70	SOCKET,PIN TERM:SINGLE,PCB,T/G,0.030 H,0.054 PCB, 0.012–0.22 PIN SIZE,W/O DIMPLE,	22526	75060–012
–14	——— ———			1	SKT,PL–IN,ELEK:CHIP CARRIER,68 CONTACT (NOT REPLACEABLE ORDER 670–8742–XX)		
–15	131–0608–00			3	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.025 SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
27–16	131–2615–00			1	CONN,HDR::PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.230 MLG X 0.090 TAIL,0.240 H,30 GOLD, MATING PIN 0.15 FROM PCB	22526	65820–005
–17	175–9699–00	B010100	B030545	1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L	80009	175969900
	175–9699–01	B030546		1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L	80009	175969901
–18	175–9702–00			1	CA ASSY,SP,ELEC:3,22 AWG,23.0 L	TK1375	ORDER BY DESC
–19	346–0032–00			1	STRAP,RETAINING:0.075 DIA X 4.0 L,MLD RBR	98159	2829–75–4
–20	361–1323–00			1	SPACER,PLATE:0.01 X 0.945 X 0.945,BRS,NP	80009	361132300
–21	380–0736–00			1	HOUSING HALF:LOWER,	TK1163	ORDER BY DESC
	346–0032–00			1	STRAP,RETAINING:0.075 DIA X 4.0 L,MLD RBR	98159	2829–75–4
	136–0893–00	B030000	B040938	4	SOCKET,SPRING:0.138 L X 0.05 DIA,TIN PL	00779	2–331272–7
					STANDARD ACCESSORIES		
	206–0364–00			23	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	070–5475–00			1	MANUAL,TECH:P6464	TK2548	ORDER BY DESC
	196–2963–00			10	LEAD SET,ELEC:2,23 AWG,3.156 LEACHES (2 LEADS)	9M860	ORDER BY DESC
	334–6093–00			1	LABEL:MKD P6464	07416	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					P6465		
28–0	010–6465–00	B010100	B039999	1	PROBE,PAT GEN:9 CHAN,50MHZ	80009	010646500
	010–6465–03	B040100		1	PROBE,PAT GEN:9 CHAN,50MHZ	80009	010646503
–1	334–6651–00			1	LABEL:3.050 X 0.325	07416	ORDER BY DESC
–2	334–6635–00	B010100	B010482	1	MARKER,IDENT:MKD TEKTRONIX P6465	80009	334663500
	334–6635–01	B010483		1	MARKER,IDENT:MARKED TEKTRONIX P6465	07416	ORDER BY DESC
–3	380–0735–00			1	HOUSING HALF:UPPER,	TK1163	ORDER BY DESC
–4	214–3904–00			1	HEAT SINK,ELEC:ALUMINUM	5Y400	ORDER BY DESC
–5	211–0374–00			4	SCREW,MACHINE:2–56 X 0.219 L,PNH,STL,CD	TK0435	ORDER BY DESC
–6	211–0007–00			3	SCREW,MACHINE:4–40 X 0.188,PNH,STL	TK0435	ORDER BY DESC
–7	174–0390–00			1	CA ASSY SP:RIBBON,;CPR,8,26 AWG,2.75 L,1X 8,0.1 CTR, BOTH ENDS	TK1375	174–0390–00
–8	175–4568–00			1	CA ASSY,SP,ELEC:8,26 AWG,4.5 L,RIBBON	1Y013	62310
–9	165–2048–11	B010100	B020179	1	MICROCKT,LINEAR:LET 2048 W/INSUL SLVG	80009	165204811
	165–2048–12	B020180	B020180	1	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204812
	165–2048–13	B030100		1	MICROCKT,DGTL:LET 2048 W/INSUL SLVG	80009	165204813
–10	334–6653–00			10	MARKER,IDENT:MKD PODLET	80009	334665300
–11	670–9602–00	B010100	B010452	1	CIRCUIT BD ASSY:STROBE	80009	670960200
	670–9602–01	B010453	B011242	1	CIRCUIT BD ASSY:STROBE	80009	670960201
	670–9602–02	B011243	B019999	1	CIRCUIT BD ASSY:STROBE	80009	670960202
	670–9602–03	B020100		1	CIRCUIT BD ASSY:STROBE (A47)	80009	670960203
–12	131–0787–00			16	TERMINAL,PIN:PCB/PRESSFIT,;MALE,STR,0.025 SQ,0.448 MLG X 0.137 TAIL,0.600 L,PHOS BRZ,50 GOLD	22526	47359–001
–13	670–9603–00	B010100	B011242	1	CIRCUIT BD ASSY:MAIN	80009	670960300
	670–9603–01	B011243	B030721	1	CIRCUIT BD ASSY:MAIN	80009	670960301
	670–9603–02	B030722	B039999	1	CIRCUIT BD ASSY:MAIN	80009	670960302
	670–9603–03	B040100	B040341	1	CIRCUIT BD ASSY:MAIN	80009	670960303
	670–9603–04	B040342		1	CIRCUIT BD ASSY:MAIN; (A46)	80009	670960304
–14	136–0993–00	B010100	B030721	4	SOCKET,PGA::PCB,;181 POS,17 X 17,0.1 CTR, 0.170 H X 0.180 TAIL,CLOSED CTR,NON SYMMETRICAL,PAT 1741	63058	PGA 181H101B1–1
–15	136–0252–07			70	SOCKET,PIN TERM:SINGLE,PCB,T/G,0.030 H, 0.054 PCB, 0.012–0.22 PIN SIZE,W/O DIMPLE	22526	75060–012
–16	175–9702–00			1	CA ASSY,SP,ELEC:3,22 AWG,23.0 L	TK1375	ORDER BY DESC
–17	346–0032–00			1	STRAP,RETAINING:0.075 DIA X 4.0 L,MLD RBR	98159	2829–75–4
–18	150–0057–00			1	LAMP,INCAND:5V,0.115A,7153AS15,WIRE LD	80009	150005700

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
28–19	131–0608–00			16	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.05 SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ, W/FERRULE (USED FOR A46J140 & J580)	22526	48283–018
–20	131–2615–00			1	CONN,HDR::PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.230 MLG X 0.090 TAIL,0.240 H,30 GOLD, MATING PIN 0.15 FROM PCB (USED FOR A46J360)	22526	65820–005
–21	——— ———			1	SKT,PLIN,ELEK:CHIP CARRIER 69,CONTACT (NOT REPLACEABLE, ORDER 670–9703–XX) (USED FOR A46J360)		
–22	361–1323–00			1	SPACER,PLATE:0.01 X 0.945 X 0.945,BRS,NP	80009	361132300
–23	175–9677–01			1	CA ASSY,SP,ELEC:11 SGL,11 TW PR,28 AWG, 80.0L	6D224	901950
–24	346–0120–00			1	STRAP,TIEDOWN,E:5.5 L MIN,PLASTIC,WHITE	06383	SST1.5M
–25	175–9699–00	B010100	B010331	1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L	80009	175969900
	175–9699–01	B010332		1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L	80009	175969901
–26	380–0736–00			1	HOUSING HALF:LOWER	TK1163	ORDER BY DESC
					STANDARD ACCESSORIES		
–27	206–0364–00			23	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206–0364–00
	020–1484–01		B061008	1	ACCESSORY PKG:DAS9219/29,E9 PKG OF 4 PROBE RETAINER 343–1292–00	80009	020148401
–28	196–2963–00			10	LEAD SET,ELEC:2,23 AWG,3.156 LEACHES (2LEADS)	9M860	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					P6463		
29–0	010–6463–00			1	PATTERN GEN:CHANNEL DOUBLER	80009	010646300
–1	334–7039–00			1	MARKER,IDENT:MARKED P6463,	07416	334–7039–00
–2	334–7038–00			1	MARKER,IDENT:MARKED P6463	07416	334–7038–00
–3	380–0735–00			1	HOUSING HALF:UPPER,	TK1163	ORDER BY DESC
–4	——— ———			1	CIRCUIT BD ASSY:ID/LOGIC (SEE A31 REPL)		
–5	211–0661–00			4	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CDPL, POZ,MACHINE	TK0435	ORDER BY DESC
–6	——— ———			1	SKT,PL–IN ELEK (SEE A31J200 REPL)		
–7	——— ———			1	CA ASSY,SP,ELEK: (SEE A31S300 REPL)		
–8	——— ———			1	CKT BD ASSYBUFFER/DRIVER: (SEE A30 REPL)		
–9	211–0661–00			4	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CDPL, POZ,MACHINE	TK0435	ORDER BY DESC
–10	210–0906–00			4	WASHER,FLAT:0.125 OD X 0.2 OD X 0.035,FBR	TK1742	1/8" X 13/64" O
–11	136–0728–00			5	SOCKET,DIP:PCB,;FEMALE,STR,2 X 7,14 POS,0.1 X 0.3 CTR,0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB14P–108
–12	136–0756–00			2	SOCKET,DIP:PCB,;FEMALE,STR,2 X 9,18 POS,0.1 X 0.3 CTR,0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB18P–108
–13	129–0198–00			4	SPACER,POST:0.75 L,4–40 EA END,BRS,0.188 HEX	TK0588	ORDER BY DESC
–14	——— ———			1	CONNECTOR: (SEE A30J360)		
–15	175–9677–01			1	CA ASSY,SP,ELEC:11 SGL,11 TW PR,28 AWG, 80.0L	6D224	901950
–16	380–0873–00			1	HOUSING,HALF:LOWER,PLASTIC	TK1163	380–0873–00
					STANDARD ACCESSORIES		
	070–6204–01			1	MANUAL,TECH:INSTR,P6463	80009	ORDER BY DESC
					OPTIONAL ACCESSORIES		
	012–1236–00			1	LEAD SET,ELEC:FLYING,34 COND,8.0 L	1Y013	3342
	012–1012–01			1	CABLE,INTCON:DAS9100 SERIES TO PROBE	80009	012101201
	020–1386–00	B010100	B010502	3	ACCESSORY KIT:PACKAGE OF 12 (013–0217–00)	80009	020138600
	020–1386–01	B010503		3	ACCESSORY KIT:PACKAGE OF 12 (206–0364–00)	80009	020138601
	020–1587–00			1	COMPONENT KIT:P6463 OPTIONAL ACCESS	80009	020158700
	175–9290–00			1	CA ASSY,SP,ELEC:34,28 AWG,59.0 L,RIBBON LEAD	22526	81325–002
	196–2963–00			17	SET,ELEC:2,23 AWG,3.156 LEACHES (2LEADS)	9M860	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					P6463A		
30–0	010–0501–00			1	PROBE,PAT GEN:9/16 CHANNEL MUXED,50MHZ/25MHZ W/ACC	80009	010050100
–1	334–7938–00			1	MARKER,IDENT:MARKED P6463A,	07416	334–7938–00
–2	334–7038–00			1	MARKER,IDENT:MARKED P6463	07416	334–7038–00
–3	380–0735–00			1	HOUSING HALF:UPPER,	TK1163	ORDER BY DESC
–4	671–0273–02			1	CIRCUIT BD ASSY:ID/LOGIC	80009	671027302
–5	211–0661–00			4	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CDPL, POZ	TK0435	ORDER BY DESC
–6	136–0939–00			1	SKT,PL–IN ELEK:CKT BD MY,2 X 11,0.1 SPACING	TK6027	929852–01–11–30
–7	175–9699–01			1	CA ASSY,SP,ELEC:2,26 AWG,6.0 L	80009	175969901
–8	671–1793–00			1	CIRCUIT BD ASSY:P6463A BUFFER/DRIVER	80009	671179300
–9	211–0661–00			4	SCR,ASSEM WSHR:4–40 X 0.25,PNH,STL,CDPL, POZ,	TK0435	ORDER BY DESC
–10	210–0906–00			4	WASHER,FLAT:0.125 OD X 0.2 OD X 0.035,FBR	TK1742	1/8" X 13/64" O
–11	129–0198–00			4	SPACER,POST:0.75 L,4–40 EA END,BRS,0.188 HEX	TK0588	ORDER BY DESC
–12	136–0728–00			5	SOCKET,DIP:PCB,;FEMALE,STR,2 X 7,14 POS,0.1X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB14P–108
–13	136–0756–00			2	SOCKET,DIP:PCB,;FEMALE,STR,2 X 9,18 POS,0.1 X 0.3 CTR, 0.175 H X 0.130 TAIL,BECU,TIN	09922	DILB18P–108
–14	131–4226–00			1	CONN,HDR::PCB,;MALE,RTANG,2 X 17,0.1 CTR, 0.280 MLG X 0.150 TAIL,0.240 H,30 GOLD	22526	65820–035
–15	131–0993–00			2	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR, 0.385 H,30 GOLD,BLACK,JUMPER	22526	65474–006
–16	380–0873–00			1	HOUSING,HALF:LOWER,PLASTIC	TK1163	380–0873–00
–17	175–9677–01			1	CA ASSY,SP,ELEC:11 SGL,11 TW PR,28 AWG, 80.0L	6D224	901950
–18	211–0097–00		B061008	1	SCREW,MACHINE:4–40 X 0.312,PNH,STL	TK0435	ORDER BY DESC
–19	343–1292–01			1	RETAINER,PROBE:ALUMINUM	5Y400	343–1292–01
					STANDARD ACCESSORIES		
	012–1236–10			1	LEAD SET,ELEC:FLYING,34 COND,12.0 L	1Y013	65133
	070–7971–00			1	MANUAL,TECH:INSTR,P6463A,DAS 9/16 CHANNEL PATTERN GENERATION PROBE	TK2548	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					OPTIONAL ACCESSORIES		
	012–1012–01			1	CABLE,INTCON:DAS9100 SERIES TO PROBE	80009	012101201
	012–1236–00			1	LEAD SET,ELEC:FLYING,34 COND,8.0 L	1Y013	63342
	012–1236–20			1	LEAD SET,ELEC:FLYING,34 COND,14.0 L ACCESSORY	1Y013	65084
	020–1386–01			3	KIT:PACKAGE OF 12 (206–0364–00)	80009	020138601
	020–1587–00			3	COMPONENT KIT:P6463 OPTIONAL ACCESS	80009	020158700
	175–9290–00			1	CA ASSY,SP,ELEC:34,28 AWG,59.0 L,RIBBON	22526	81325–002
	196–2963–00			17	LEAD SET,ELEC:2,23 AWG,3.156 LEACHES (2 LEADS)	9M860	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92C01		
31–1	670–8728–00	B010100	B019999	1	CIRCUIT BD ASSY:GPIB	80009	670872800
	670–8728–01	B020000	B030099	1	CIRCUIT BD ASSY:GPIB	80009	670872801
	670–8728–02	B030100		1	CIRCUIT BD ASSY:GPIB	80009	670872802
	670–8728–03			1	CIRCUIT BD ASSY:GPIB (A06)	80009	670872803
–2	136–0849–00			1	SOCKET,PGA:PCB,MOT 68000;68 POS,10 X 10,0.1 X 0.1 CTR, 0.250 H X 0.110 TAIL,TIN, SYMMETRICAL,PAT 1006,LIF,GOLD	00779	916220–2
–3	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–4	211–0405–00			4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–5	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–6	131–0608–00			24	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.05 SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
–7	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–8	136–0757–00			1	SOCKET,DIP:PCB;FEMALE,STR,2 X 20,40 POS,0.1 X 0.6 CTR, 0.175 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014 –0.022 IC	09922	DILB40P–108
–9	136–0754–00			1	SOCKET,DIP:PCB,FEMALE,STR,2 X 11,22 POS,0.1 X 0.4 CTR, 0.175 H X0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014 –0.022 IC	09922	DILB22P–108
–10	136–0752–00			1	SOCKET,DIP:PCB,;STR,2 X 10,20 POS,0.1 X 0.3 CTR,0.175 H X 0.130 TAIL,BECU,TIN,ACCOM 0.008–0.015 X 0.014–0.022 LEADS	09922	DILB20P–108
					STANDARD ACCESSORIES		
–11	012–1188–00			1	CABLE,INTCON:6.0 L (GPIB BACKPANEL CABLE ASSEMBLY)	1Y013	62598
–12	211–0148–00			2	SCREW,MACHINE:4–40 X 0.312,PNH,SST	TK1875	ORDER BY DESC
	012–0630–03			1	CABLE,INTCON:2.0M L	74868	C156327–B
	070–5962–00			1	MANUAL,TECH:USERS,92C01/02/03	80009	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92C02		
32–1	670–8730–00	B010100	B019999	1	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873000
	670–8730–01	B020000	B030099	1	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873001
	670–8730–02	B030100	B030228	1	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873002
	670–8730–04	B030229	B030384	1	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873004
	670–8730–05	B030385	B030862	1	CIRCUIT BD ASSY:EXPANSION/GPIB	80009	670873005
	670–8730–06	B030863		1	CIRCUIT BD ASSY:EXPANSION/GPIB, (A08)	80009	670873006
–2	136–0849–00			1	SOCKET,PGA:PCB,MOT 68000;68 POS,10 X 10,0.1 X 0.1 CTR, 0.250 H X 0.110 TAIL	00779	916220–2
–3	131–3049–00			2	CONN,HDR:PCB,;MALE,STR,2 X 8,0.1 CTR,0.230 MLG X 0.095 TAIL,30 G0LD	22526	65610–116
–4	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–5	211–0405–00			4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–6	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–7	131–0608–00			31	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR, 0.05 SQ,0.248 MLG X 0.137 TAIL,50 GOLD,PHZ BRZ,W/FERRULE	22526	48283–018
–8	131–3182–00			1	CONN,HDR:PCB,;MALE,RTANG,2 X 25,0.1 CTR, 0.390 MLG X 0.112 TAIL,0.33 H	22526	75867–008
–9	386–5339–00	B030100	B030650	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B030651		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–10	136–0757–00			1	SOCKET,DIP:PCB;FEMALE,STR,2 X 20,40 POS,0.1 X 0.6 CTR, 0.175 H X 0.130 TAIL	09922	DILB40P–108
–11	136–0754–00			1	SOCKET,DIP:PCB,FEMALE,STR,2 X 11,22 POS,0.1 X 0.4 CTR, 0.175 H X0.130 TAIL,BECU,TIN,	09922	DILB22P–108
–12	136–0752–00			1	SOCKET,DIP:PCB,;STR,2 X 10,20 POS,0.1 X 0.3 CTR,0.175 H X 0.130 TAIL	09922	DILB20P–108
–13	131–3892–00			1	CONN,HDI:PCB,;FEMALE,RTANG,4 X 35,140 POS, 0.1 CTR,0 .580 H X 0.180 TAIL,30 GOLD	00779	533444–4
–14	131–3961–00			1	CONN,HDR::PCB,;MALE,RTANG,2 X 6,0.1 CTR, 0.230 MLG X 0.195 TAIL,30 GOLD	22526	68025–106
	136–0657–00			1	SOCKET,DIP:PCB,;24 POS,2 X 12,0.1 X 0.3 CTR, 0.210 H X 0.120 TAIL	00779	2–641933–1
					STANDARD ACCESSORIES		
–15	012–1188–00			1	CABLE,INTCON:6.0 L (GPIB BACK PANEL CABLE ASSEMBLY)	1Y013	62598
–16	211–0148–00			2	SCREW,MACHINE:4–40 X 0.312,PNH,SST	TK1875	ORDER BY DESC
	012–0630–03			1	CABLE,INTCON:2.0M L	74868	C156327–B
	070–5962–00	B020100	B020165	1	MANUAL,TECH:USERS,92C01/02/03	80009	070596200
	070–5962–00	B020166	B020165	1	MANUAL,TECH:USERS,92C01/02/03	80009	070596200
	070–7460–00	B020166		1	MANUAL,TECH:INSTR SHEET,92C02/03MODULE	TK2548	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92C03		
33–1	670–8727–00	B010100	B019999	1	CIRCUIT BD ASSY:EXPANSION	80009	670872700
	670–8727–01	B020000	B020137	1	CIRCUIT BD ASSY:EXPANSION	80009	670872701
	670–8727–02	B020138	B020153	1	CIRCUIT BD ASSY:EXPANSION	80009	670872702
	670–8727–03	B020154	B020173	1	CIRCUIT BD ASSY:EXPANSION	80009	670872703
	670–8727–04	B020174	B020173	1	CIRCUIT BD ASSY:EXPANSION	80009	670872704
–2	131–3049–00			2	CONN,HDR:PCB,;MALE,STR,2 X 8,0.1 CTR, 0.230MLG X 0.095 TAIL,30 G0LD	22526	65610–116
–3	131–3714–00			1	CONN,RCPT,ELEC:FEMALE,540 PIN	22526	67884–004
–4	211–0405–00			4	SCREW,MACHINE:2–56 X 0.375,TRH,SST POZIDRIVE	TK0392	ORDER BY DESC
–5	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–6	131–0608–00			5	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR, 0.05 SQ,0.248 MLG X 0.137 TAIL	22526	48283–018
–7	386–5339–00	B010100	B011609	1	STIF,CIRCUIT BD:BRASS	80009	386533900
	386–5339–01	B011610		1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–8	131–3892–00			1	CONN,HDI:PCB,;FEMALE,RTANG,4 X 35,140 POS,0.1 CTR,0.580 H X 0.180 TAIL,30 GOLD	00779	533444–4
–9	131–3961–00			1	CONN,HDR::PCB,;MALE,RTANG,2 X 6,0.1 CTR, 0.230 MLG X 0.195 TAIL,30 GOLD	22526	68025–106
					STANDARD ACCESSORIES		
	070–5962–00			1	MANUAL,TECH:USERS,92C01/02/03	80009	070596200
	070–7460–00			1	MANUAL,TECH:INSTR SHEET,92C02/03MODULE	TK2548	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92LAN		
34–1	671–0760–00			1	CIRCUIT BD ASSY:LAN INTERFACE (A15)	80009	671076000
–2	131–3714–01			1	CONN,HDI:PCB,;FEMALE,RTANG,4 X 135, 540POS,0.1 CTR,0.480 MLG X 0.120 TAIL	22526	50005–1540E
–3	220–0032–00			4	NUT:2–56 X 0.188 X 0.062 THK,SST	0KB01	ORDER BY DESC
–4	211–0008–00			4	SCREW,MACHINE:4–40 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–5	136–0751–00			2	SOCKET,DIP:PCB,STR,2 X 12,24 POS,0.1 X 0.6 CTR,0.175 H X 0.130 TAIL	09922	DILB24P108
–6	131–4550–00			1	CONN,BOX::SHUNT,;FEMALE,STR,2 X 7,0.1 CTR,0.2 H	22526	69145–214
–7	131–0265–00			1	CONN,RF PLUG:SMB,;PCB,MALE,RTANG,50 OHM,0.381 H X 0.15 TAIL	0GZV8	85SMB–50–0–1
–8	131–3152–00			1	CONN,HDR:PCB,;MALE,STR,2 X 8,0.1 CTR,0.365 H X 0.112	53387	2516–6002UB
–9	136–0757–00			1	SOCKET,DIP:PCB,FEMALE,STR,2 X 20,40 POS,0.1 X 0.6 CTR, 0.175 H X 0.130 TAIL	09922	DILB40P–108
–10	131–1425–00			1	CONN,HDR:PCB,;MALE,RTANG,1 X 36,0.1 CTR, 0.230 MLG X 0.090 TAIL,30 GOLD,STACKABLE	22526	65521–136
–11	386–5339–01			1	STIF,CIRCUIT BD:BRASS	5Y400	386–5339–01
–12	131–0608–00			26	CONN,TERMINAL:PRESSFIT/PCB,;MALE,STR,0.0 5 SQ,0.248 MLG X 0.137 TAIL	22526	48283–018
–13	136–0755–00			2	SOCKET,DIP:PCB,FEMALE,STR,2 X 14,28 POS,0.1 X 0.6 CTR, 0.175 H X 0.130 TAIL	09922	DILB28P–108
–14	136–0716–00			1	SOCKET,DIP:PCB,;2 X 32,64 POS,0.1 X 0.9 CTR, 0.210 H X 0.128 TAIL	00779	643575–2
–15	214–3036–00			1	HEATSINK,SEMIC:TRANSISTOR,TO–220; ALUMINUM,BLACK ANODIZE	98978	7–363–BA
–16	210–0586–00			1	NUT,PL,ASSEM WA:4–40 X 0.25,STL CD PL	TK0435	ORDER BY DESC
–17	211–0012–00			1	SCREW,MACHINE:4–40 X 0.375,PNH,STL	TK0435	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					STANDARD ACCESSORIES		
34–18	012–1289–00			1	CABLE,INTCON:5.375 L,92LAN TO DAS9200	TK2469	012–1289–00
–19	211–0008–00			4	SCREW,MACHINE:4–40 X 0.25,PNH,STL	TK0435	ORDER BY DESC
–20	342–0884–00			16	INSULATOR,SHLD:BNC,PLASTIC	00779	221586–1
–21	103–0030–00			2	ADAPTER,CONN:BNC T MALE TO 2 FEMALE	00779	221 543–2
–22	011–0123–00			2	TERMN,COAXIAL:50 OHM,BNC,VSWR DC–4GHZ 1.15	64537	T190CS
–23	012–1290–00			1	CABLE,INTCON:50 OHM COAX,180.0 L DAS9200 TO HOST COMPUTER	TK2469	012–1290–00
	070–7245–00			1	MANUAL,TECH:USERS/INSTL,92LANCOMM MODULE FOR DAS9200	80009	ORDER BY DESC
					OPTIONAL ACCESSORIES		
	012–1126–00			1	CABLE,INTCON:50 OHM COAX,ETHERNET, 120.0FT,N–PLUG X N–PLUG, THICK PVC,60KN01	0AMX4	012–1126–00
	012–1101–00			1	CABLE,INTCON:50 OHM COAX,ETHERNET, 30FT,N–PLUG X N–PLUG, THICK PVC, ECS WORKSTATION TP	80009	012110100
	012–1127–00			1	TRANSCIEVER CABLE,INTCON:50 OHM COAX, ETHERNET,50 FT,N–P	80009	012112700
	003–1287–00			1	LUG X N–PLUG,THICK PVC, 60KN01	80009	003128700
	119–2032–00			1	TOOL KIT:TAPPING TRANSCEIVER:ETHERNET COMPATIBLE	0AMX4	2010–IS

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					92LANSE		
35–1	671–2452–00	B010100	B010340	1	CIRCUIT BD ASSY:LAN IO ADAPTER	80009	671245200
	671–2452–01	B010341	B010933	1	CIRCUIT BD ASSY:LAN IO ADAPTER	80009	671245201
	671–2452–02	B010934		1	CIRCUIT BD ASSY:LAN IO ADAPTER	80009	671245202
–2	——— ———			1	CONN,HDR PCB,;MALE,RTANG,2 X 20.0.1CTR (SEE A71 REPL J230)		
–3	——— ———			1	CONN,HDR:PCB,;MALE,RTANG,2 X 20.0.1 CTR (SEEA71 REPL J687)		
–4	——— ———			1	CONN,HDR:PCB,:MALE,STR,1 X 36,0.1 CTR,0.2 (SEE A71REPL J680,J681,J682,J683,J684,J685,J686,J790,TP640,TP641)		
–5	131–4550–00			1	CONN,BOX::SHUNT,;FEMALE,STR,2 X 7,0.1 CTR, 0.2 H,30 GOLD,JUMPER (SEE A71 REPL J680,J681,J682,J683,J684,J684,J685,J686)	22526	69145–214
–6	——— ———			1	CONN,BOX.PCB,;FEMALE,STR,2 X50,0.50 CTR (SEE A71 REPL J970)		
–7	131–0993–00			1	CONN,BOX:SHUNT,;FEMALE,STR,1 X 2,0.1 CTR,0.385 H,30 GOLD,BLACK,JUMPER (P790)	22526	65474–006
–8	——— ———			1	CONN,RF PLUG:SMB,PCB,MAKE,RTANG,50 OHM (SEE A71 REPL J880)		
–9	136–0729–00			1	SOCKET,DIP:PCB,;FEMALE,STR,2 X 8,16 POS,0.1 X 0.3 CTR, 0.175 H (U810)	09922	DILB16P–108T
–10	354–0393–00			5	RING,RETAINING:EXT GRIP,U/O 0.156 DIA SFT	05469	5555–15MD
–11	213–1076–00			5	THUMBSCREW:4–40 X 0.215,0.250 OD, STAINLESS STEEL,SLOT	TK1465	ORDER BY DESC
–12	012–1431–00	B010100	B010288	1	CABLE,INTCON:92LANSE	80009	012143100
	012–1431–01	B010289	B010993	1	CABLE,INTCON:92LANSE	80009	012143101
	012–1431–02	B010994		1	CABLE,INTCON:92LANSE	80009	012143102
					STANDARD ACCESSORIES		
	070–8652–00			1	MANUAL,TECH:USERS,92LANSE,	TK2548	ORDER BY DESC
	103–0030–00			1	ADAPTER,CONN:BNC T MALE TO 2 FEMALE	00779	221 543–2
	011–0123–00	B010100	B010294	2	TERMN,COAXIAL:50 OHM,BNC,VSWR DC–4GHZ 1.15	64537	T190CS
	012–1290–00	B010100	B010294	2	CABLE,INTCON:50 OHM COAX,180.0 LDAS9200 TO HOST COMPUTER	TK2469	012–1290–00
	012–0205–00	B010295		1	CA ASSY,INTCON:COAXIAL,;RFD,(1)50 OHM,108 L,BNC, MALE, BOTH ENDS	TK2469	012–0205–00
	061–3649–02			1	SHEET,TECHNICAL:USERS GUIDE,NATIONAL SUPPORT CENTER	80009	061364902

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					9200T		
36–1	334–6710–00			1	MARKER,IDENT:MKD 9200T	80009	334671000
–2	334–5204–00			1	MARKER,IDENT:MKD CAUTION	80009	334520400
–3	334–6270–00			1	PLATE,IDENT:MKD POWER ON/OFF,BRIGHTNESS	80009	334627000
–4	670–7935–16			1	CIRCUIT BD ASSY:DISPLAY CONTROL (A2)	80009	670793516
–5	670–7936–41			1	CIRCUIT BD ASSY:TERMINAL CONTROL (A1)	80009	670793641
–6	119–2374–01			1	KEYBOARD ASSY:9200T	01963	KXNZ–8754
	119–2493–03			1	KEYBOARD ASSY:9201TD,VT–100,SQ CONN (A3 9200T ONLY)	80009	119249303
	118–6271–00			1	KEYBOARD ASSY:W/O ENCLOSURE (INCLUDES 9200 KEYCAP SET)	80009	118627100
–7	366–0634–00			1	PUSH BUTTON SET:9200T LEG ENDS	80009	366063400
–8	118–5459–01			1	CABLE ASSEMBLY:COILED W/RD 5 PIN DIN CONN (A4)	80009	118545901
–9	161–0066–00			1	CA ASSY,PWR:3,18 AWG,250V/10A,98 INCH,STR, IEC320,RCPT X NEMA 5–15P,US	0B445	ECM–161–0066–00
–10	012–0911–00			1	CABLE,INTCON:SHLD CMPST,RS232;MLD,15,24 AWG,10 FT, DUAL SHLD,25 POS,MALE,DSUB,DB25M X 25 POS,FEMALE, DSUB,DB25F,15 POS LOAD	TK2435	ORDER BY DESC

(FOR MORE COMPLETE INFORMATION, REFER TO 070–4225–XX & 070–5877–XX)

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					9201T		
37–1	334–6709–00			1	MARKER,IDENT:MKD 9201T	80009	334670900
–2	334–6720–00			1	MARKER,IDENT:BLANK	80009	334672000
–3	670–8903–45			1	CIRCUIT BD ASSY:MAIN LOGIC W/O FIRMWARE (A1)	80009	670890345
–4	119–2493–03			1	KEYBOARD ASSY:9201TD,VT–100,SQ CONN	80009	119249303
	118–6271–00			1	KEYBOARD ASSY:W/O ENCLOSURE (A5 INCLUDES DAS9200 KEYCAP SET)	80009	118627100
–5	118–4998–00			1	CABLE ASSEMBLY:COILED (INCLUDES DAS9200 KEYCAP SET)	80009	118499800
–6	366–0634–00			1	PUSH BUTTON SET:9200T LEG ENDS	80009	366063400
–7	161–0066–00	B010100	B020603	1	CA ASSY,PWR:3,18 AWG,250V/10A,98 INCH,STR, IEC320, RCPT X NEMA 5–15P,US	0B445	ECM–161–0066–00
	161–0213–00	B020604		1	CABLE ASSY,PWR,:3,16 AWG,2.5METER, SJT, GREY,105 DEG C,MCA–3T X BME–3S,13A/250V, NORTH AMERICAN	0B445	ECM–161–0213–00
–8	012–0911–00	B010100	B020603	1	CABLE,INTCON:SHLD CMPST,RS232;MLD,15,24 AWG,10 FT, DUAL SHLD,25POS,MALE,DSUB, DB25M X 25 POS,FEMALE, DSUB,DB25F,15 POS	TK2435	ORDER BY DESC
	012–1253–00	B020604		1	CABLE,INTCON:SHLD,RS232;15 COND,144 L, DB25 MALE/ DB25 FEMALE	6D224	901781
–9	334–8327–00			1	MARKER,IDENT:MARKED DAS SE	0KB05	ORDER BY DESC
–10	012–1398–00			1	CA ASSY,INTCON:SHLD CMPST,;MLD,8,26 AWG,121.0 L, DSUB,25 POS,FEMALE,DB25 X DSUB,9 POS,MALE,DB9, ALUMINIZED MYLAR,W/BRAID	6D224	ORDER BY DESC
					(FOR MORE COMPLETE INFORMATION, REFER TO 070–5874–XX & 070–5877–XX)		

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
					9202XT & 9204XT		
38–1	119–4273–00	B050482	B059999	1	14 INCH COLOR X/TERMINAL40 (9202XT DAS9221 & DAS9229)	80009	119427300
	119–4273–01	B060100	B060859	1	COLOR MONITOR:TECO 14 INCH 1024 X 768 COLOW/W.NEW REAR PANEL (9204XT DAS9221 & DAS9229)	80009	119427301
–2	119–4254–01	B010100	B060805	1	KEYBOARD,ASSY:101 NORTH AMERICAN MEMBRANE (101 KEY W/SETUP)	80009	119425401
	119–4899–01				KEYBOARD:101 + NORTH AMERICAN 1/PS/2 CABLE (9204XT ONLY)	80009	119489901
–3	119–4330–00			1	POINTER ASSY:MOUSE FOR BEETLE	80009	119433000
–4	161–0213–00			1	CABLE ASSY,PWR,:3,16 AWG,2.5METER, SJT, GREY,105 DEG C,MCA–3T XBME–3S,13A/250V, NORTH AMERICAN (9202XT ONLY)	0B445	ECM–161–0213–00
	161–0066–00			1	CA ASSY,PWR,:3,18 AWG,250V/10A,98 INCH, STR, IEC320,RCPT X NEMA 5–15P,US (9204XT)	80009	161006600
–5	012–1445–00			1	CA ASSY,INTCON:SHLD CMPST,MLD,7,26 AWG,10 FT,9 POS, MALE,DSUB,DB9M X 9 POS,FEMALE, DSUB,DB9F,W/JACK SCREWS,DUAL SHLD	80009	012144500
	012–1288–00			1	CABLE,INTCON:9-PIN VGA TO 3-PIN BNC,SHLD CMPST,RGB,MOLDED,3,75OHM,72 IN, DB9 MALE X 3 MALE BNC,SILVER GRAY,		
–6	012–0205–00			1	CA ASSY,INTCON:COAXIAL,;RFD,(1)50 OHM,108 L ,BNC, MALE,BOTH ENDS	TK2469	012020500
–7	103–0030–00			2	ADAPTER,CONN:BNC T MALE TO 2 FEMALE	00779	221– 543–2
–8	011–0123–00			2	TERMN,COAXIAL:50 OHM,BNC,VSWR DC–4GHZ 1.15	64537	T190CS

(FOR MORE COMPLETE INFORMATION, REFER TO 070–8431–97 & 070–8860–98)

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					9203XT/9205XT TERMINAL		
39–1	119–4278–00				COLORMONITOR:17 INCH PANASONIC (9203XT MONITOR ONLY)	80009	ORDER BY DESC
	119–4625–00	B060100	B060859	1	COLOR MONITOR:17 INCH COLOR MONITOR DIGITAL CONTROLLER MULTI–SCAN TYPE (9205XT MONITOR ONLY)	80009	ORDER BY DESC
–2	437–0442–01			1	CABINET ASSY:ESLIPSE/TOKENRING/LUNAR (9205XT MONITOR ONLY)	80009	ORDER BY DESC
	200–4109–00			1	COVER,TOP ASSY:SHIELD/COVER TOP ASSEMBLY	80009	ORDER BY DESC
	200–4113–00			1	COVER,BOTTOM:BOTTOM CHASSIS ASSEMBLY	80009	ORDER BY DESC
	200–4110–00			1	COVER,REAR:PLASTIC	80009	ORDER BY DESC
	200–4111–00			1	COVER,PWR SPLY:POWER SUPPLY ASSEMBLY (9203XT MONITOR ONLY)	80009	ORDER BY DESC
–3	012–0205–00			1	CA ASSY,INTCON:COAXIAL,;RFD,(1)50 OHM,108L,BNC, MALE,BOTH ENDS	TK2469	012–0205–00
–4	119–4330–00			1	POINTER ASSY:MOUSE FOR BEETLE	80009	119433000
–5	161–0066–00			1	CA ASSY,PWR,:3,18 AWG,250V/10A,98 INCH, STR, IEC320, RCPT X NEMA 5–15P,US	80009	161006600
–6	012–1445–00			1	CA ASSY,INTCON:SHLD CMPST,;MLD,7,26 AWG, 10FT,9 POS,MALE,DSUB,DB9M X9 POS,FEMALE, DSUB,DB9F, W/JACK SCREWS,DUAL SHLD	80009	012144500
–7	011–0123–00	B010100	B060835	2	TERMN,COAXIAL:50OHM,BNC,VSWRDC –4GHZ 1.15	64537	T190CS
	011–0168–00	B060836		2	TERMINATOR:BNC,;MALE,STR,50 OHN,1 WATT,1.5 L,GRAY PLASTIC	80009	011016800
–8	103–0030–00			2	ADAPTER,CONN:BNC T MALE TO 2 FEMALE	00779	221 543–2
–9	119–4254–01	B010100	B060805	1	IBM101 KEYBOARD (INCLUDED WITH TERMINAL)	80009	ORDER BY DESC
	119–4899–01				KEYBOARD:101 + NORTH AMERICAN 1/PS/2 CABLE (9205XT ONLY)	80009	119489901
	119–5030–01			1	POWER SUPPY:90–265 VAC 47 TO 63 HZ, INPUT POWER 40W, OUTPUT 5V AT 4A,12V AT 2A,3 X 5 X 1.4 (9203XT ONLY NOT SHOWN)	TK2578	TO–39/10–0892B
	119–5030–02			1	POWER SUPPLY:40W;5V 4A,12V 1A,45 MIL SQ PIN;90–265 VAC,47 TO 63HZ,45 MIL SQ PIN;3 X 5 X1.45,US,CSA,TUV (9205XT ONLY NOT SHOWN)	TK2435	PSA–4032T
–10	012–1457–00			1	CABLE,INTCON SHLD CMPST,VGA;MCD,30INCH,3,75 OHM DUAL SHLD COAX,15PS,HIGH DENSITY,DSUB,MALE BOTH ENDS (9205XT ONLY)	80009	ORDER BY DESC
	012–1442–00			1	CA ASSY INTCON:SHLD CMPST,RGB/VGA;MLD,3,75 OHM, DUAL SHLD, 36 L, 15 POS, HIGH DENSISTY DSUB, MALE, X 3,BNC,MAKE,STR, SILVER GRAY	80009	ORDER BY DESC

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					(FOR MORE COMPLETE INFORMATION, REFER TO 070–8431–97 & 070–8860–98)		

Replaceable Mechanical Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
					9206XT & 9206XT OPTION 4X		
40–1	119–5434–00	B060860		1	MONITOR,COLOR:15 INCH,0.28 DOT PITCH, PC TYPE,90/264 VAC (92O6XT ONLY)	80009	119477500
	119–4847–00	B060860		1	MONITOR:17 INCH COLOR,MULTISCAN TYPE, 30–65KHZ HORI SCAN RANGE (92O6XT OPTION 4X ONLY)	80009	119484700
–2	437–0452–00			1	MECH ASSY:LOGIC CABINET ASSEMBLY	80009	ORDER BY DESC
–3	119–4900–00			1	POWER SUPPLY:19W;5.1V 2.5A,12V 0.5A,87–264VAC 47–63HZ,IEC INPUT CONNECTOR, 183CN OUTPUT CABLE W/MINIDIN; UL, CSA,TUV, IEC	80009	119490000
–4	012–0205–00			1	CA ASSY,INTCON:COAXIAL,;RFD,(1)50 OHM,108L,BNC, MALE,BOTH ENDS	TK2469	012–0205–00
–5	012–1445–00			1	CA ASSY,INTCON:SHLD CMPST,;MLD,7,26 AWG, 10FT,9POS, MALE,DSUB,DB9M X9 POS,FEMALE, DSUB,DB9F, W/JACK SCREWS,DUAL SHLD	80009	012144500
–6	161–0066–00			1	CA ASSY,PWR,:3,18 AWG,250V/10A,98 INCH, STR, IEC320, RCPT X NEMA 5–15P,US	80009	161006600
–7	012–1457–00			1	CABLE,INTCON:SHLD COMPST,VGA;MCD,30 INCH,3.75OHM DUAL SHLD COAX,15 POS,DUB,MALE–MALE,(9206XT)	80009	ORDER BY DESC
	012–1486–00			1	CABLE,VGA,SAMSUNG MONITOR,9 PIN TO 15 PIN (HIGH DENSITY)	80009	012–1486–00
	012–1442–00			1	CA ASST INTCON:SHLD COMPST, RGB/VGA;MLD,3.75 OHM, DUAL SHLD,36 L,15 POS,HIGH DENSITY DSUB,MAKE, X3, BNC,MALE,STR,SILVER GRAY (9206XT OPTION 4X)	80009	012144200
–8	103–0030–00			2	ADAPTER,CONN:BNC T MALE TO 2 FEMALE	00779	221 543–2
–9	011–0168–00			1	TERMINATOR BNC,;MALE,STR,50 OHM,1 WATT,1.5;, GRAY, PLASTIC	80009	ORDER BY DESC
–10	119–4330–00			1	POINTER ASSY:MOUSE FOR BEETLE	80009	119433000
–11	119–4899–00			1	KEYBOARD:KEYBOARD,101+NORTH AM W/PS/ECABLE	80009	119489900
–11	119–4899–01			1	KEYBOARD:KEYBOARD,101+NORTH AM W/PS/ECABLE	80009	119489901

(FOR MORE COMPLETE INFORMATION, REFER TO 070–9169–99)

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Figure 37. 9201T Terminal
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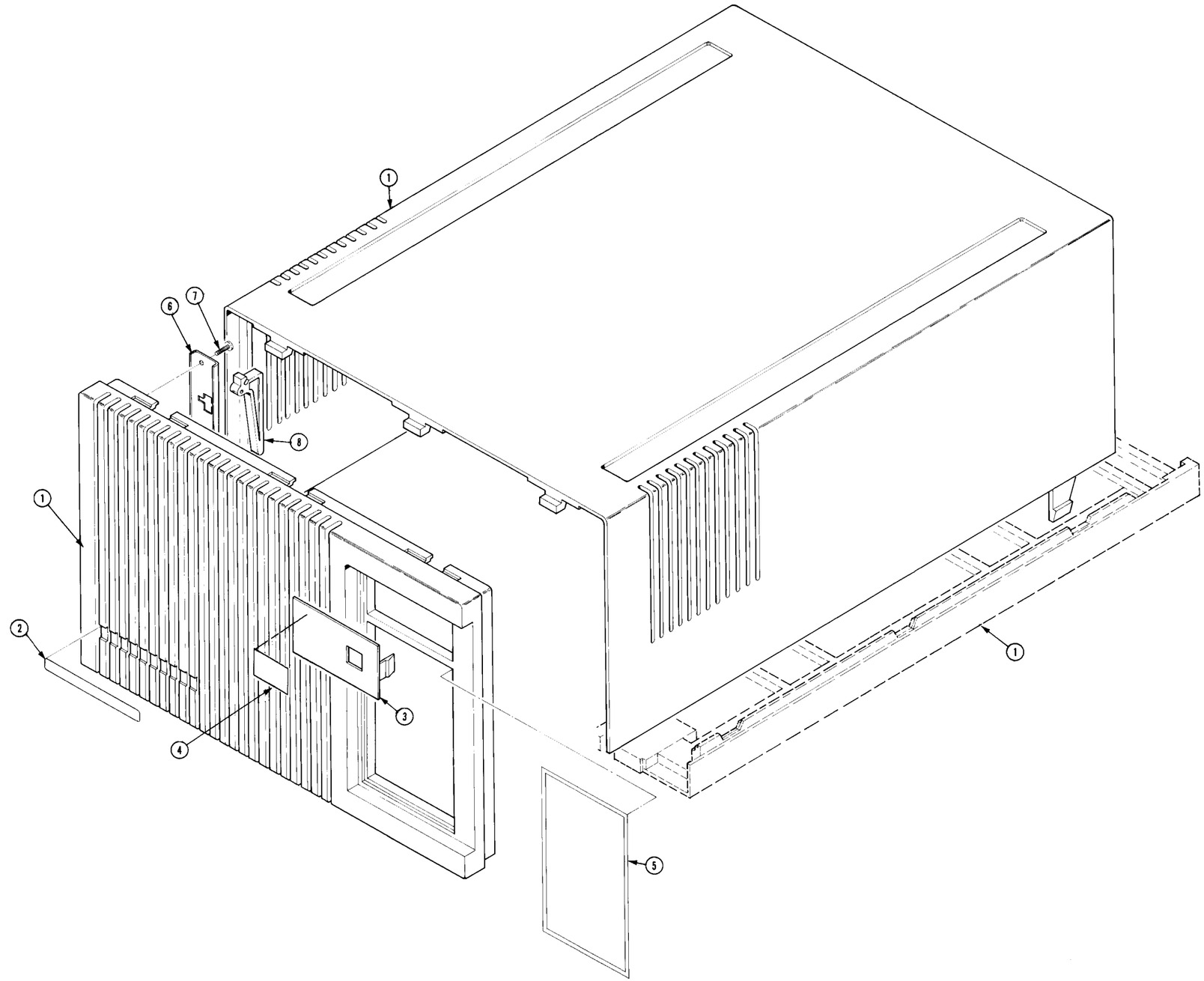


Figure 1. 9219/20/21 Cabinet

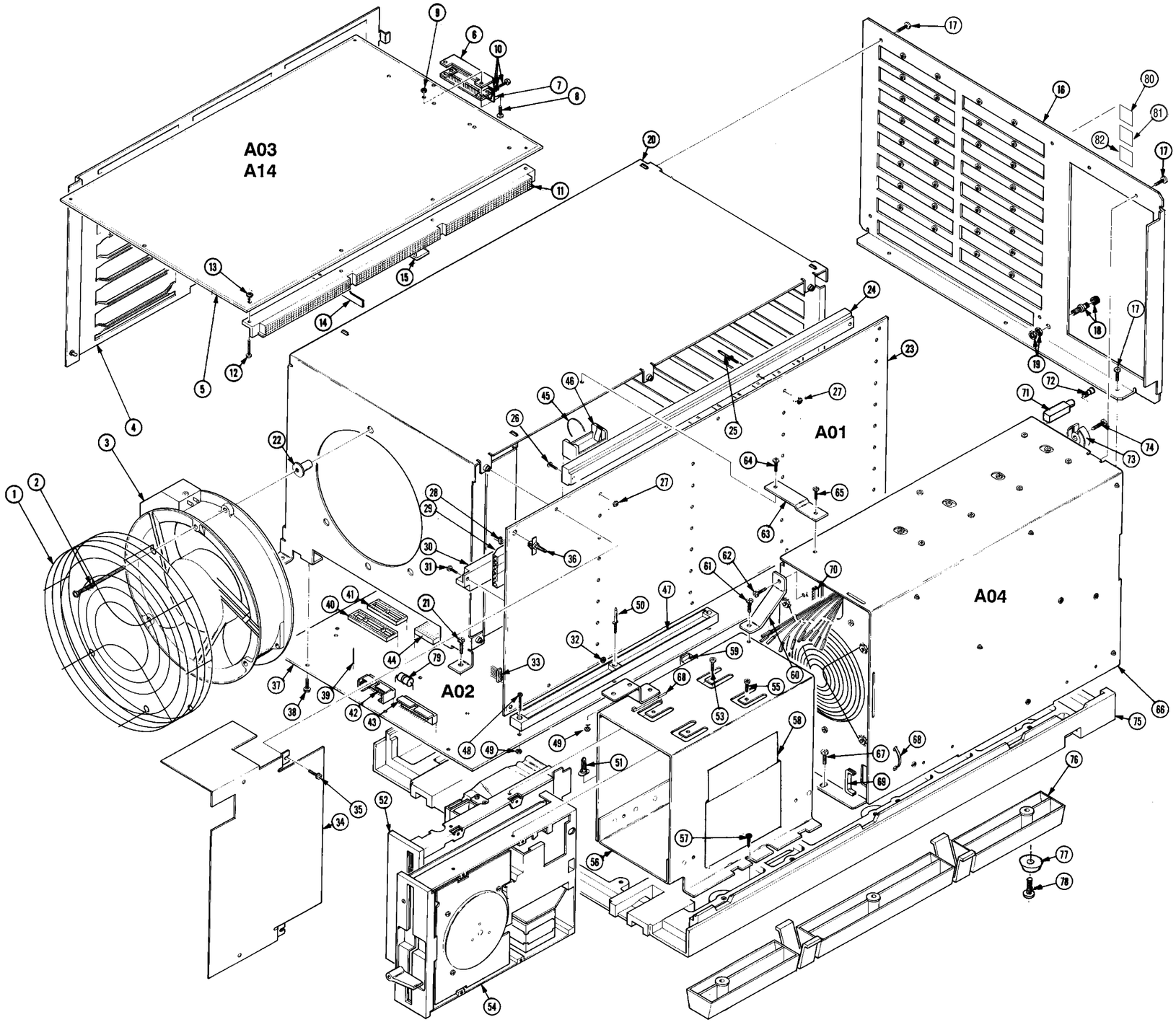
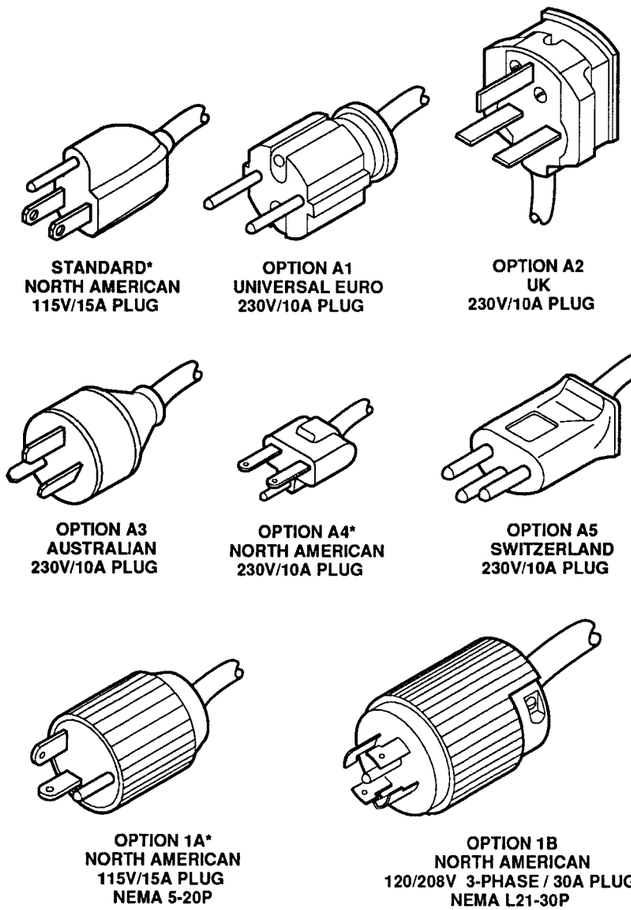


Figure 2. 9219/20



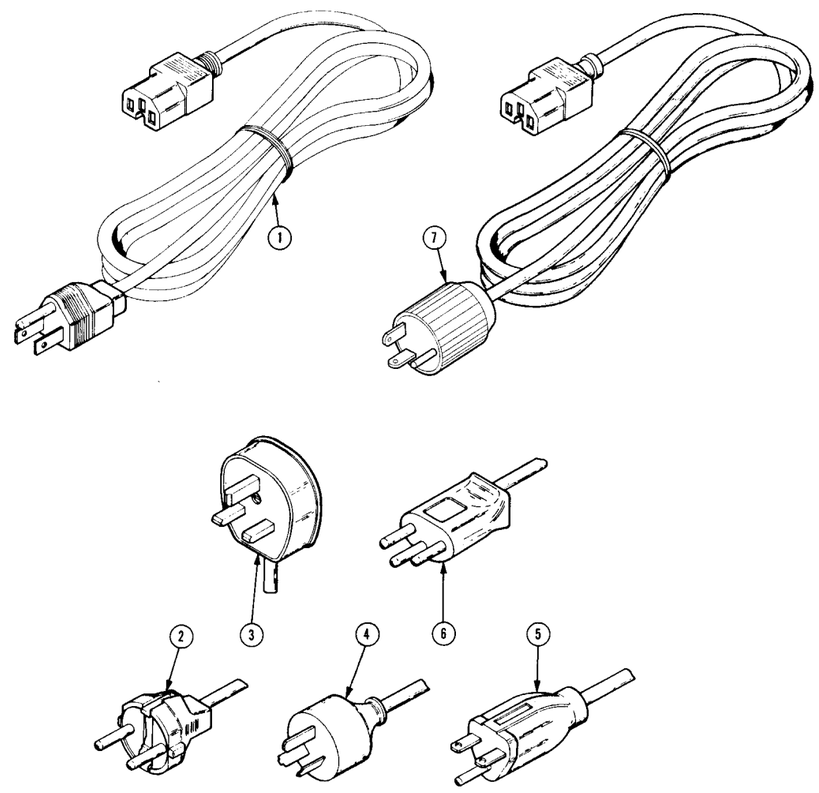


Figure 3. Power Cord Options

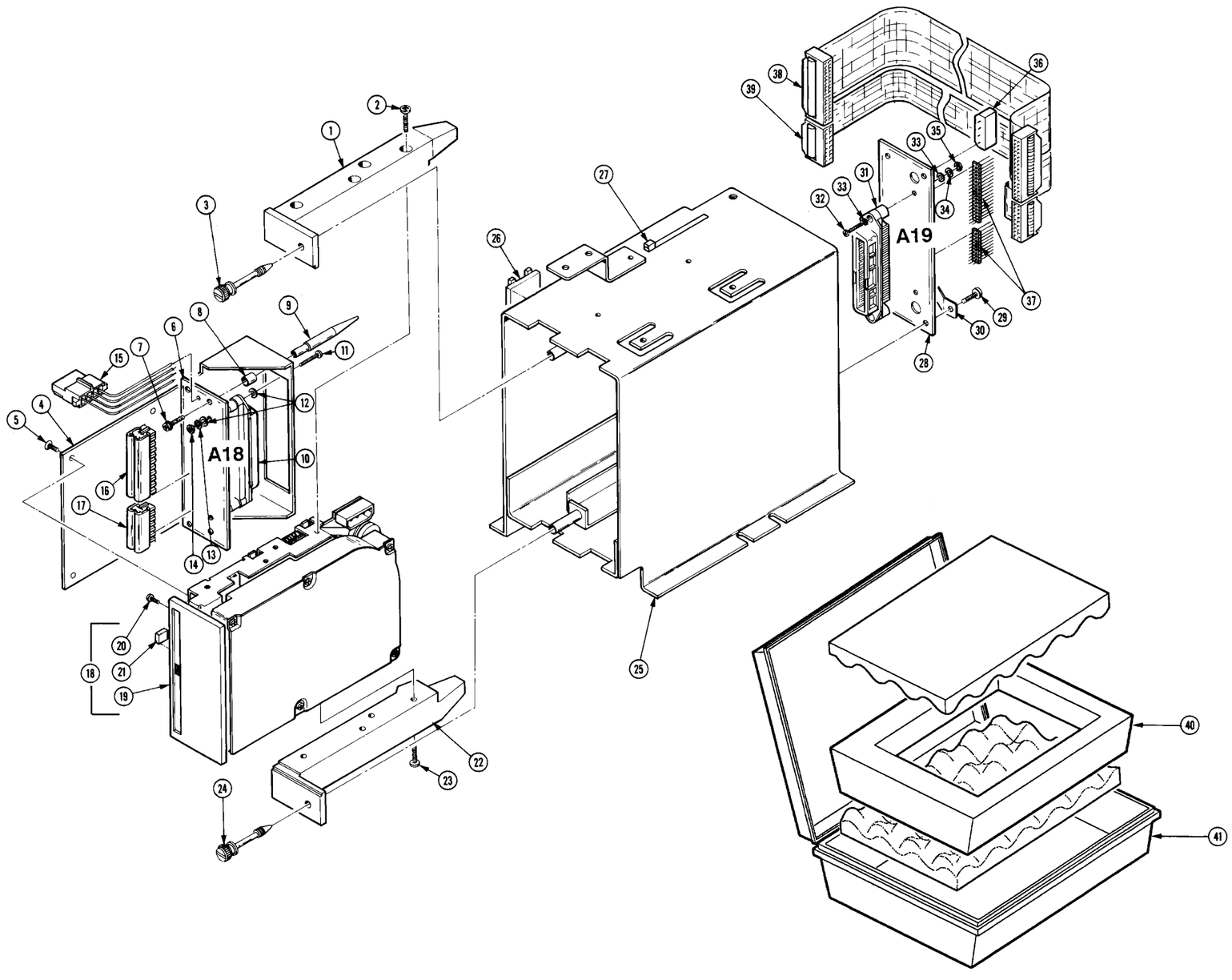
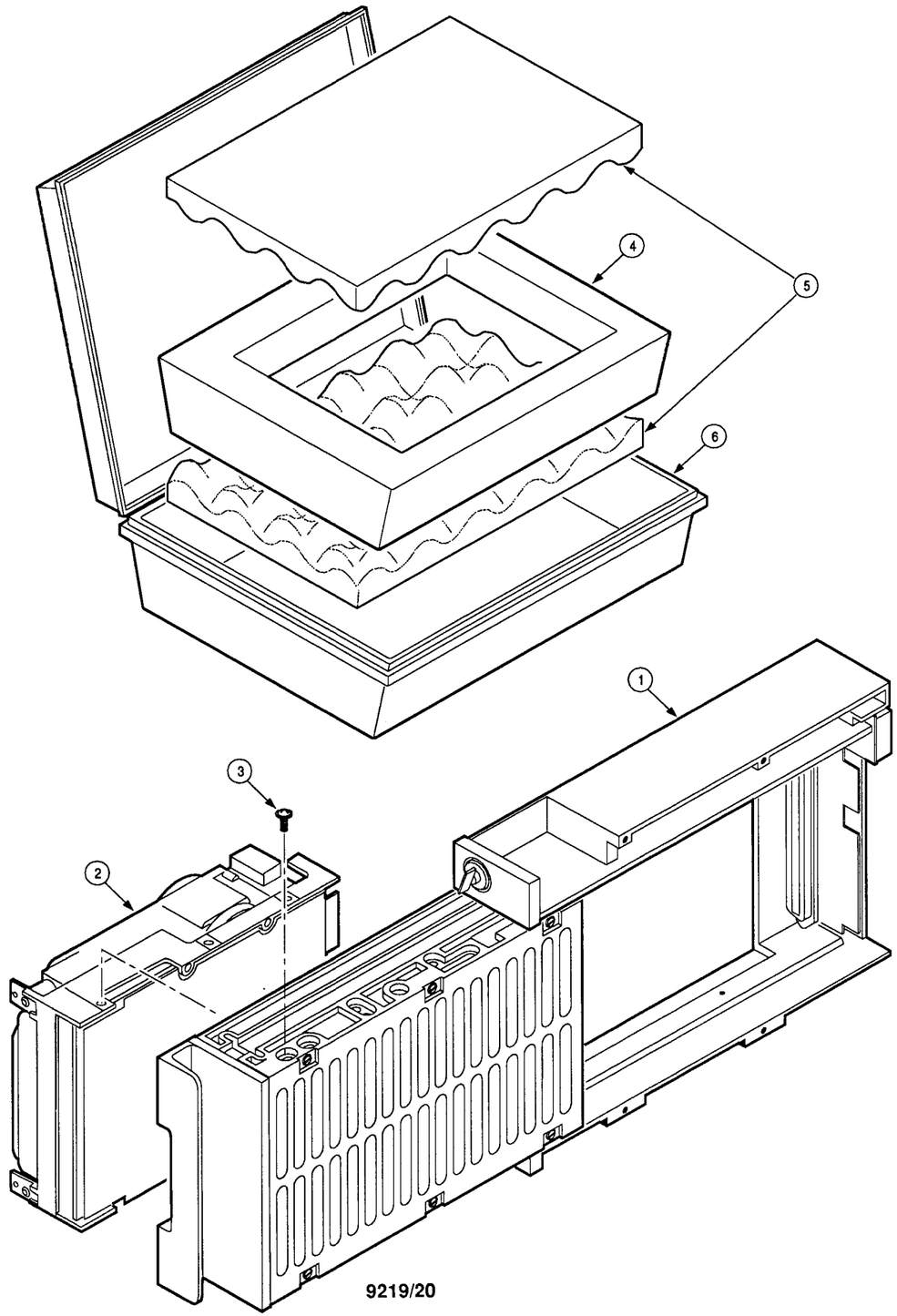


Figure 4. 9219/20 Option 14



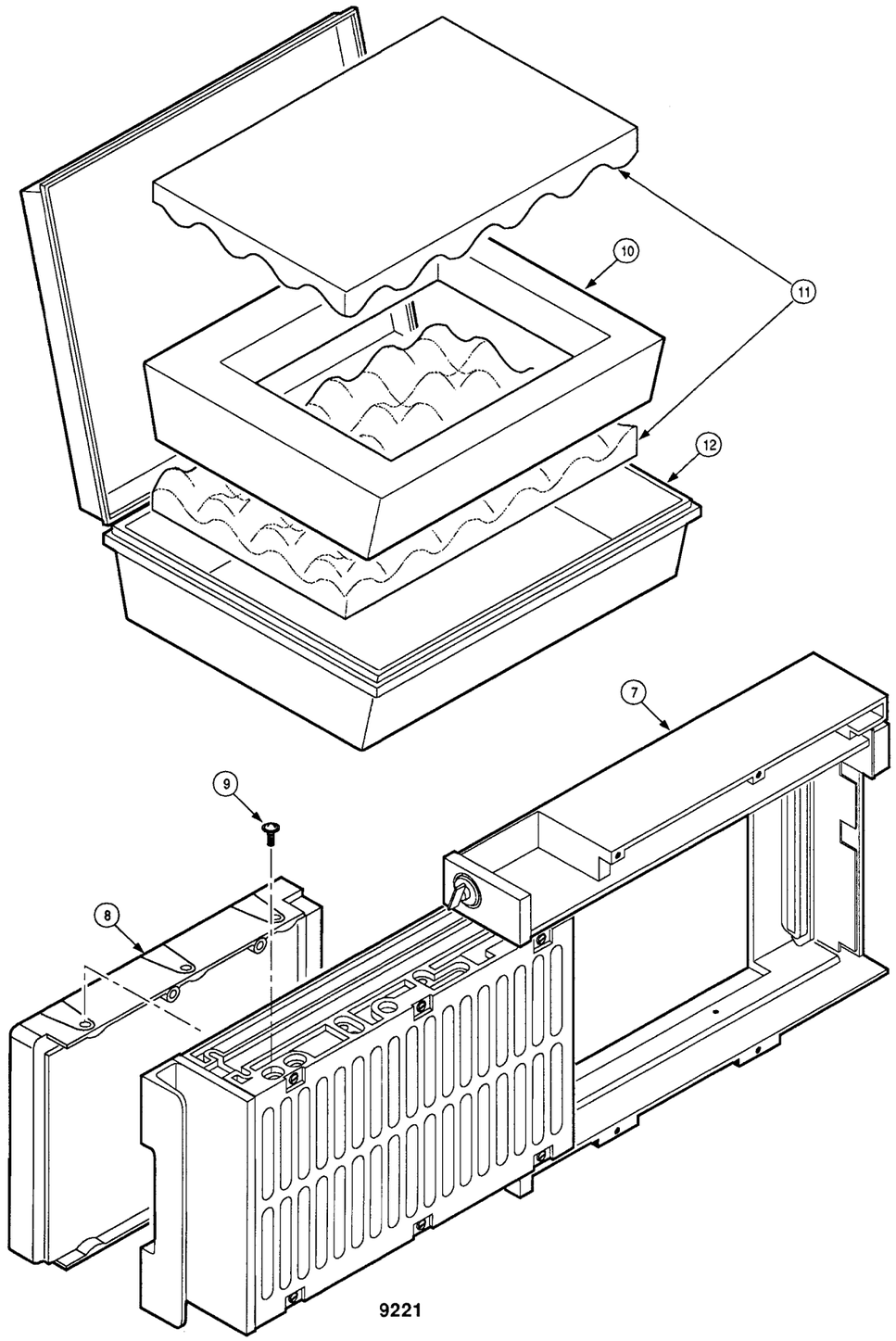


Figure 5. 9219/20 and 21 Option 18

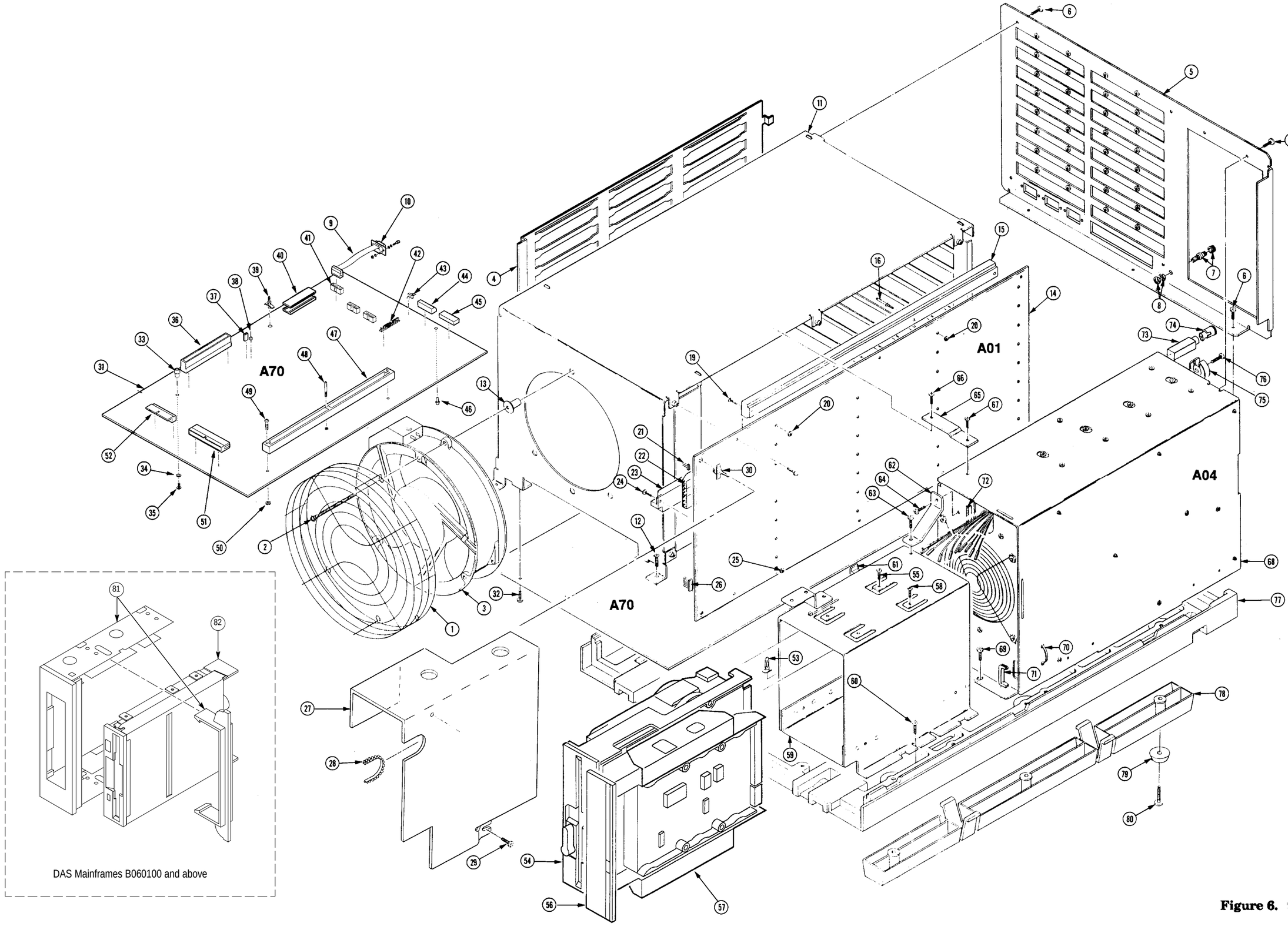


Figure 6. 9221 Chassis

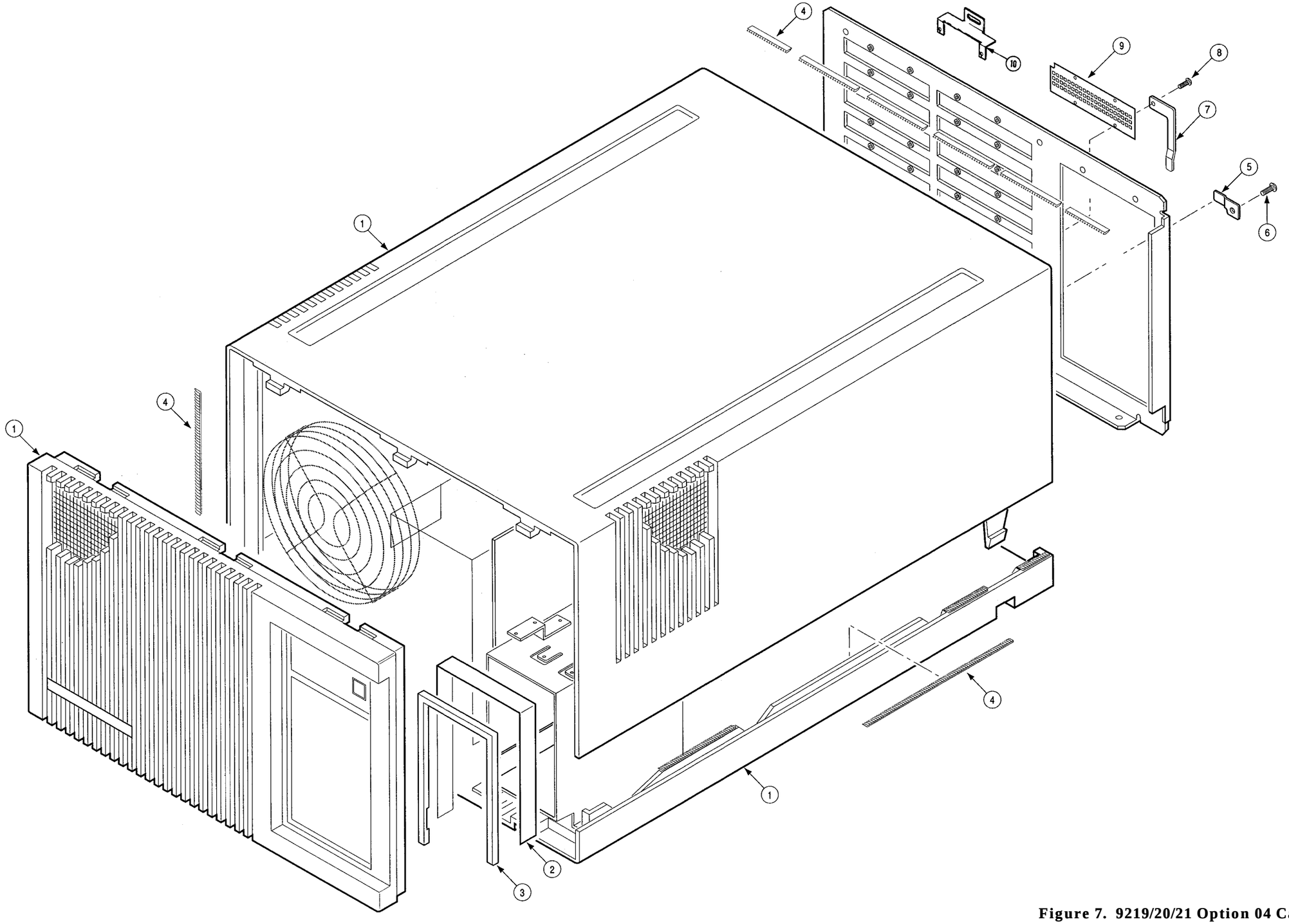


Figure 7. 9219/20/21 Option 04 Cabinet

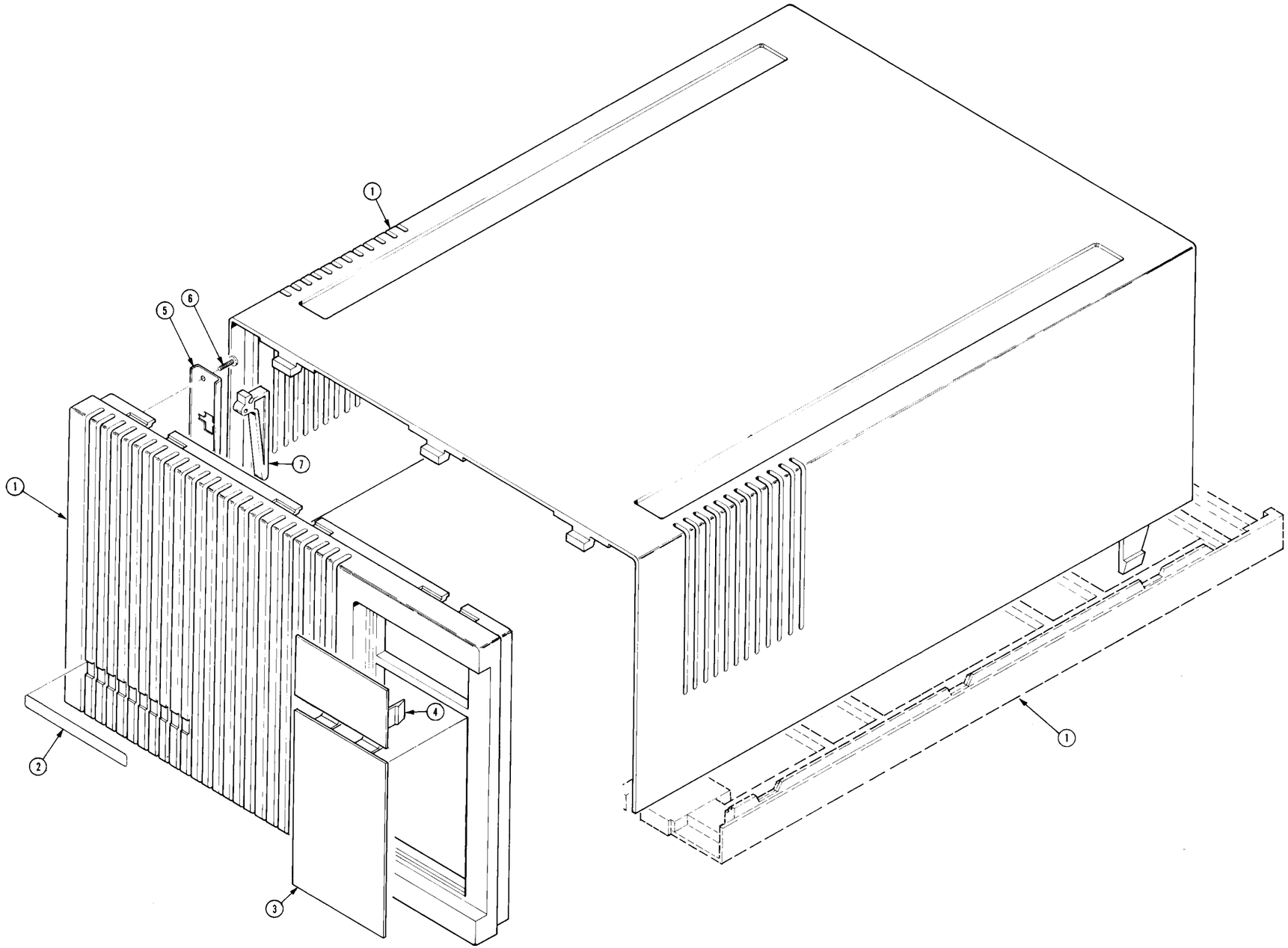


Figure 8. 92E9 Cabinet

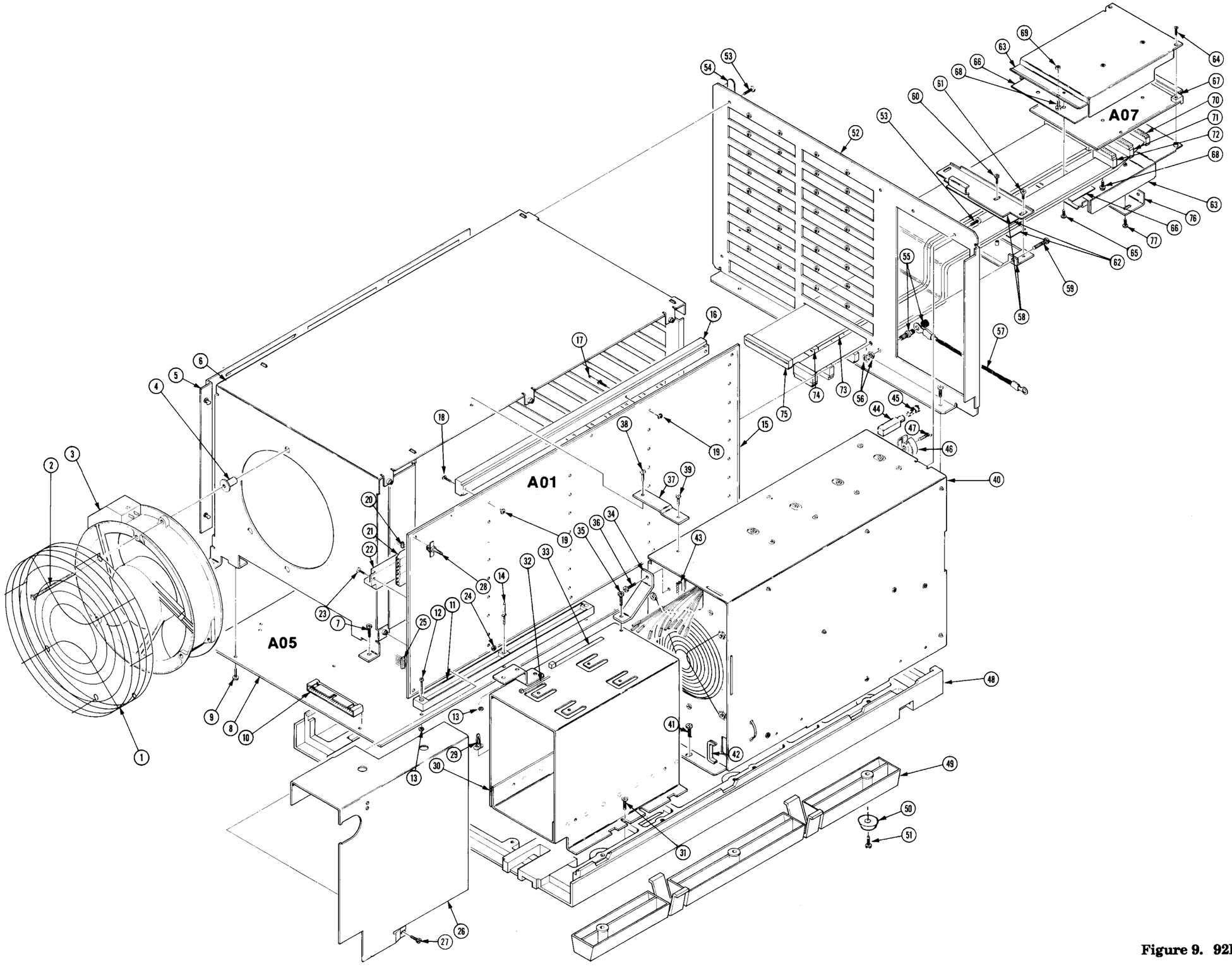


Figure 9. 92E9 Chassis

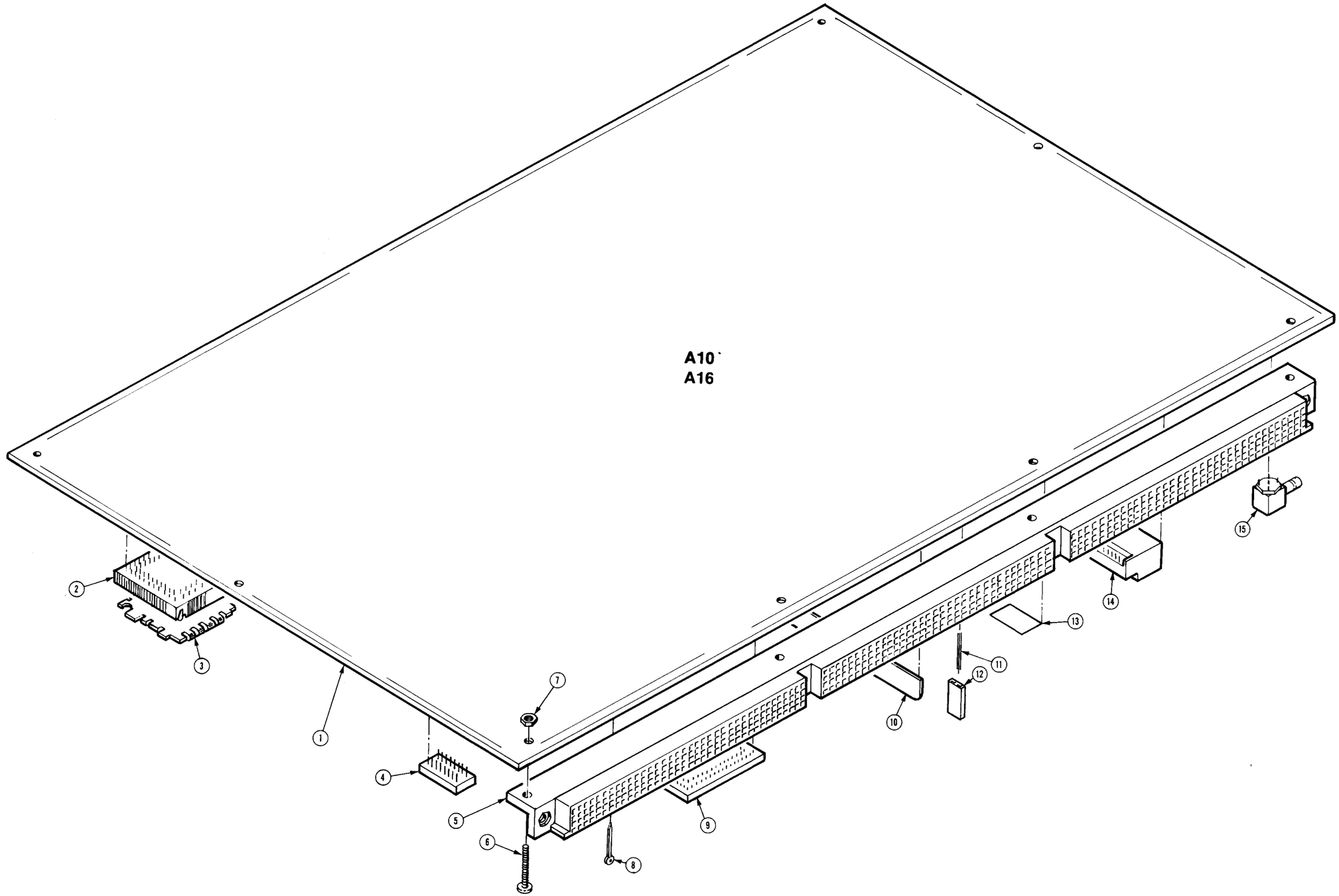


Figure 10. 92A16 Board

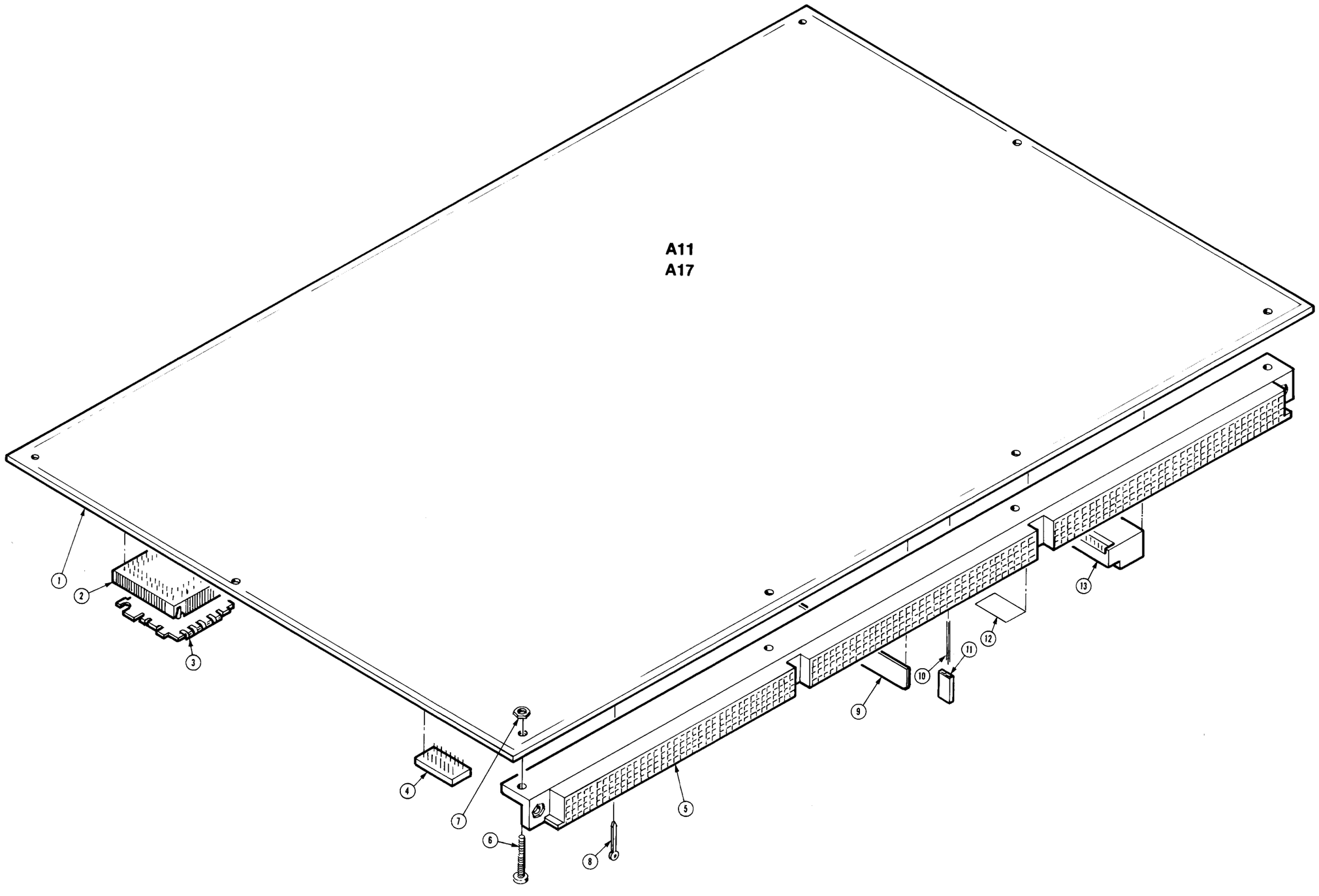


Figure 11. 92A16E Board

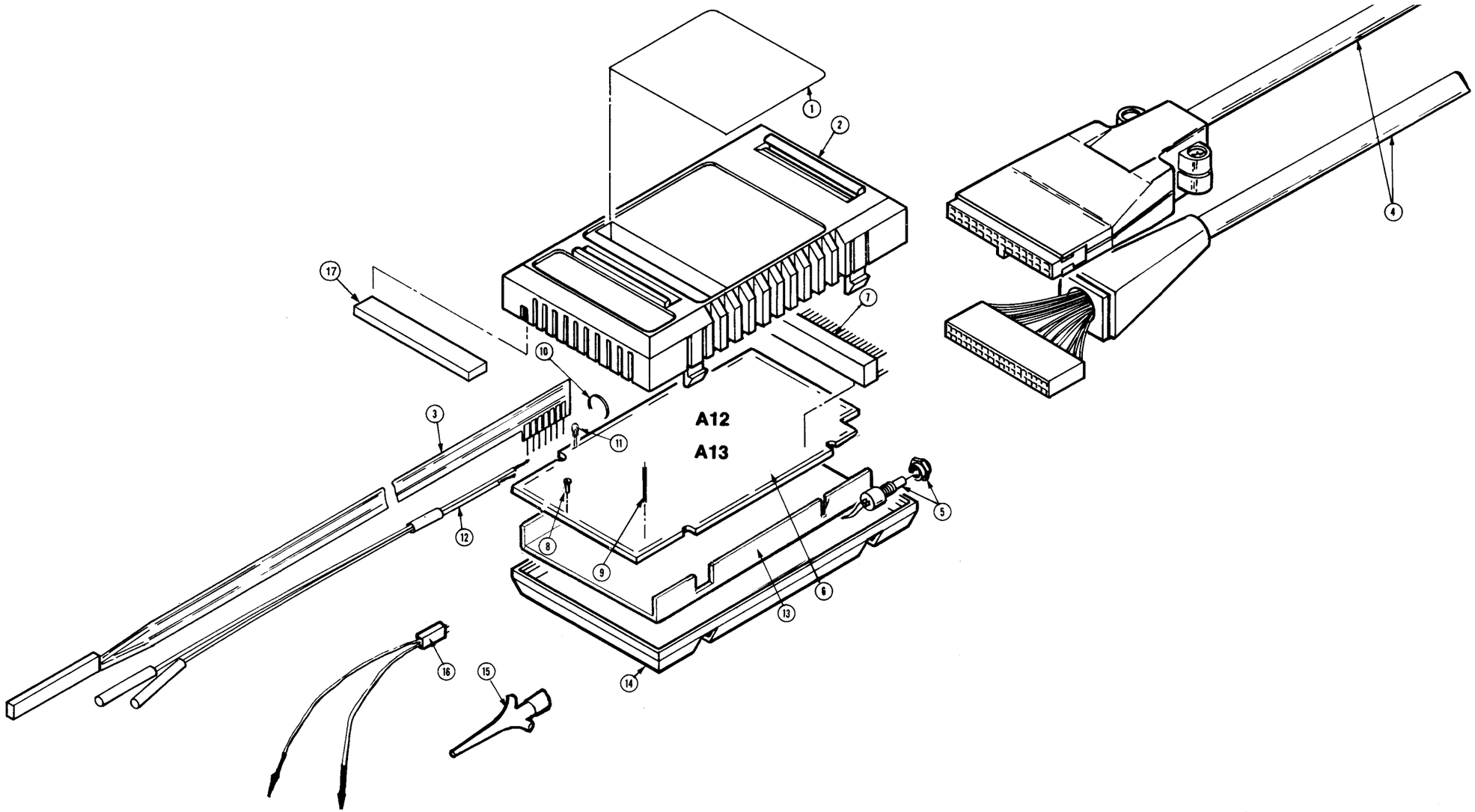


Figure 12. P6461/E

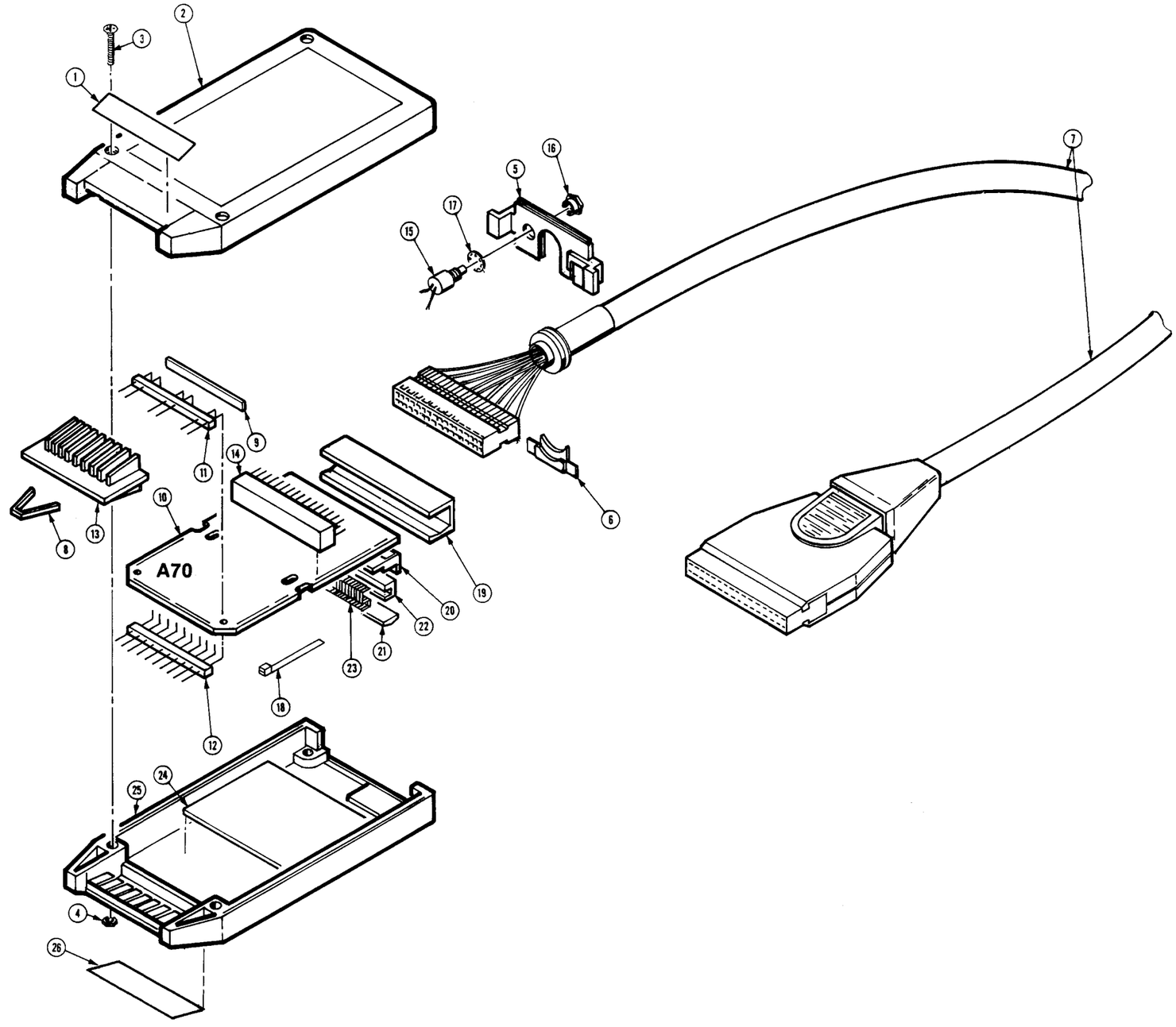


Figure 13. P6460

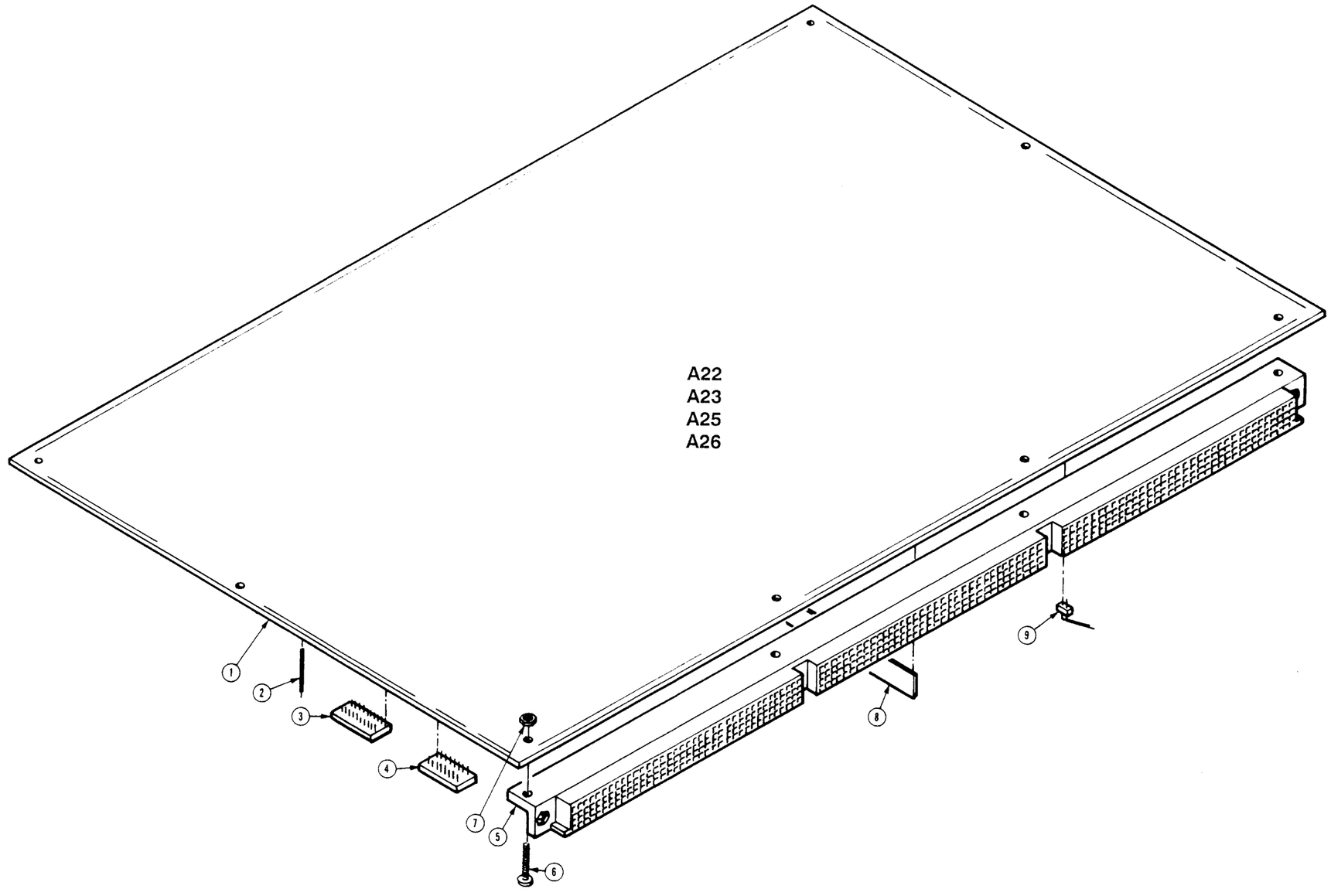


Figure 14. 92A60/90 and 60D/90D Memory Board

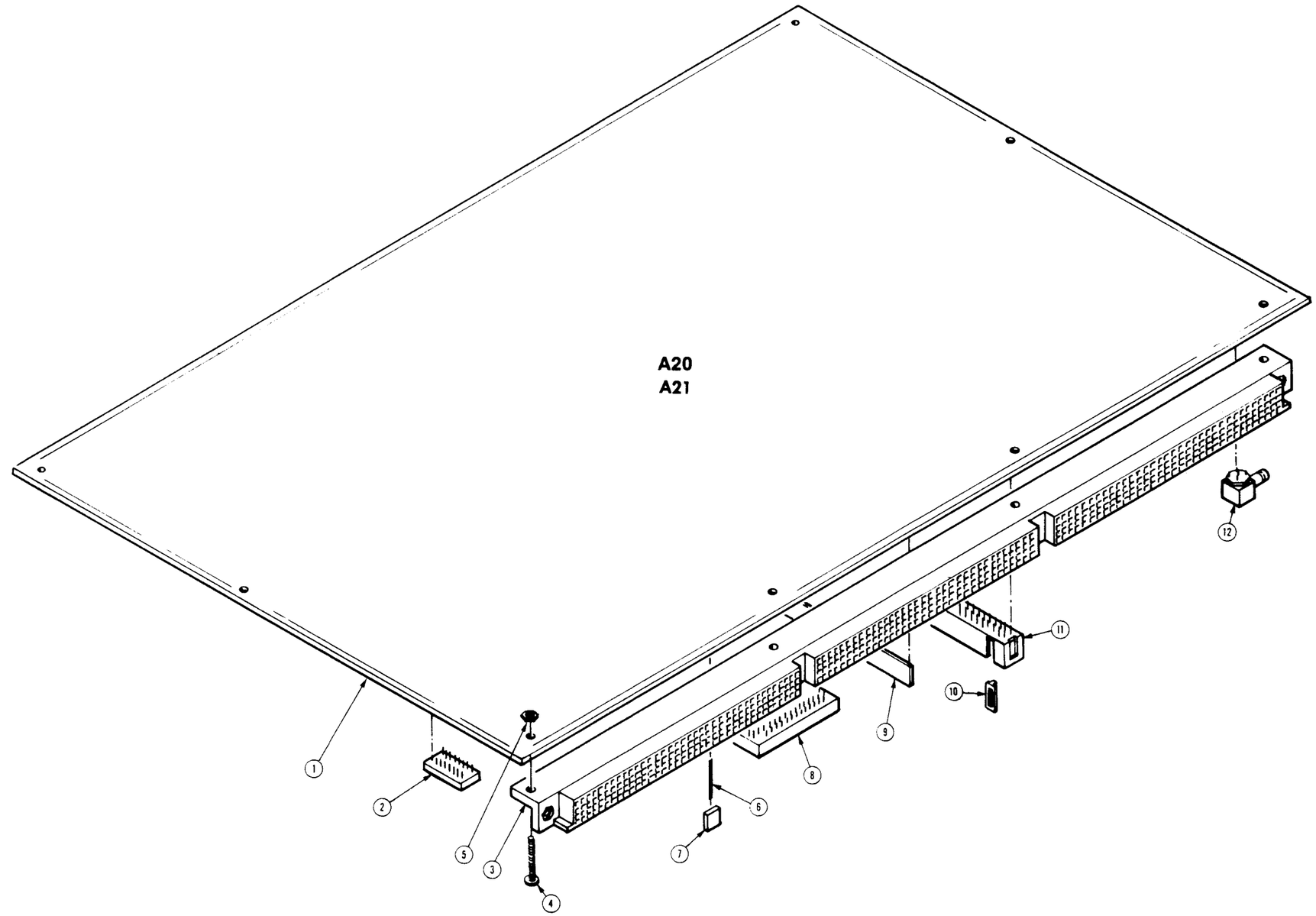


Figure 15. 92A60/90 and 60D/90D Controller Board

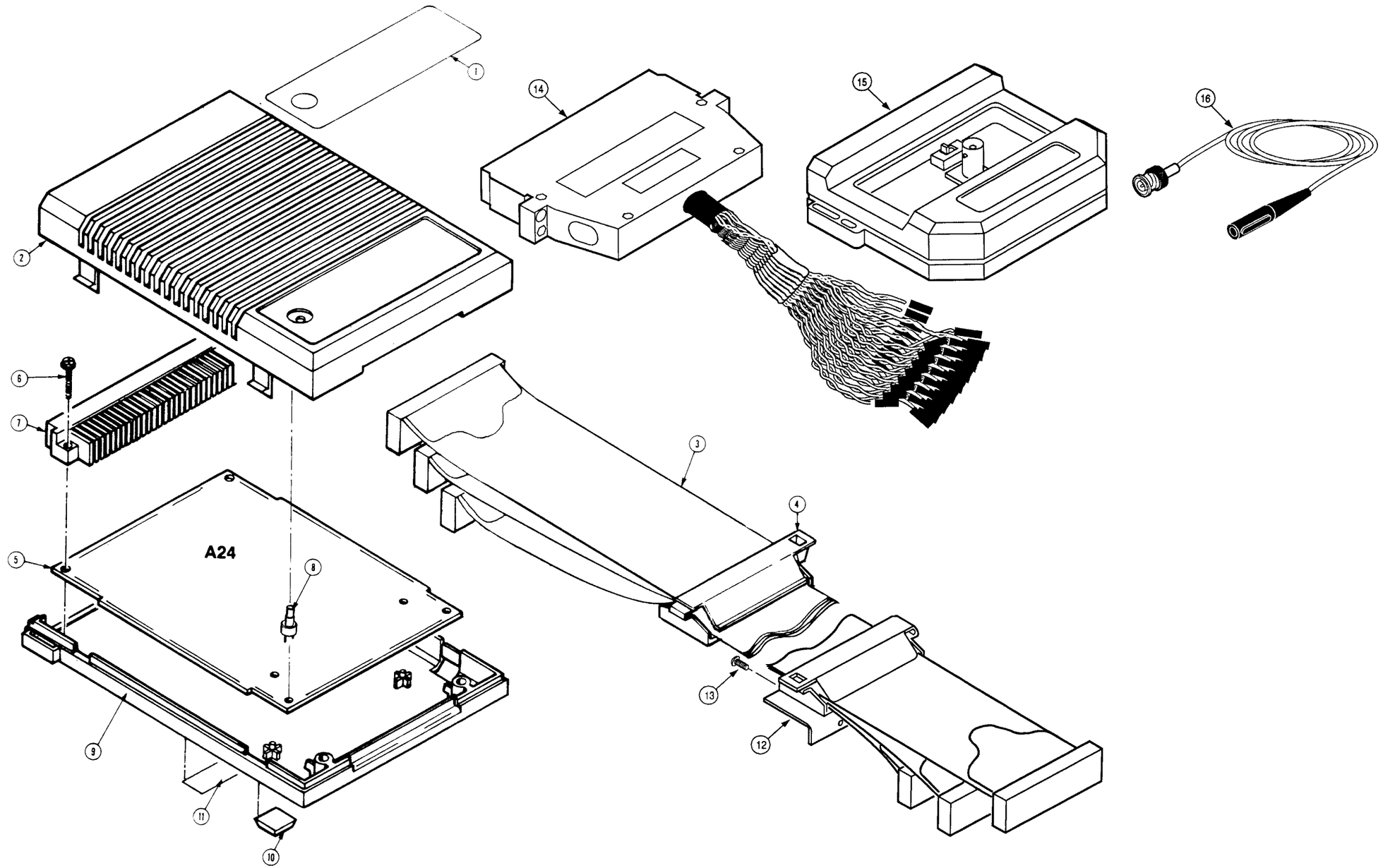


Figure 16. 010-6470-00 and 010-6471-00

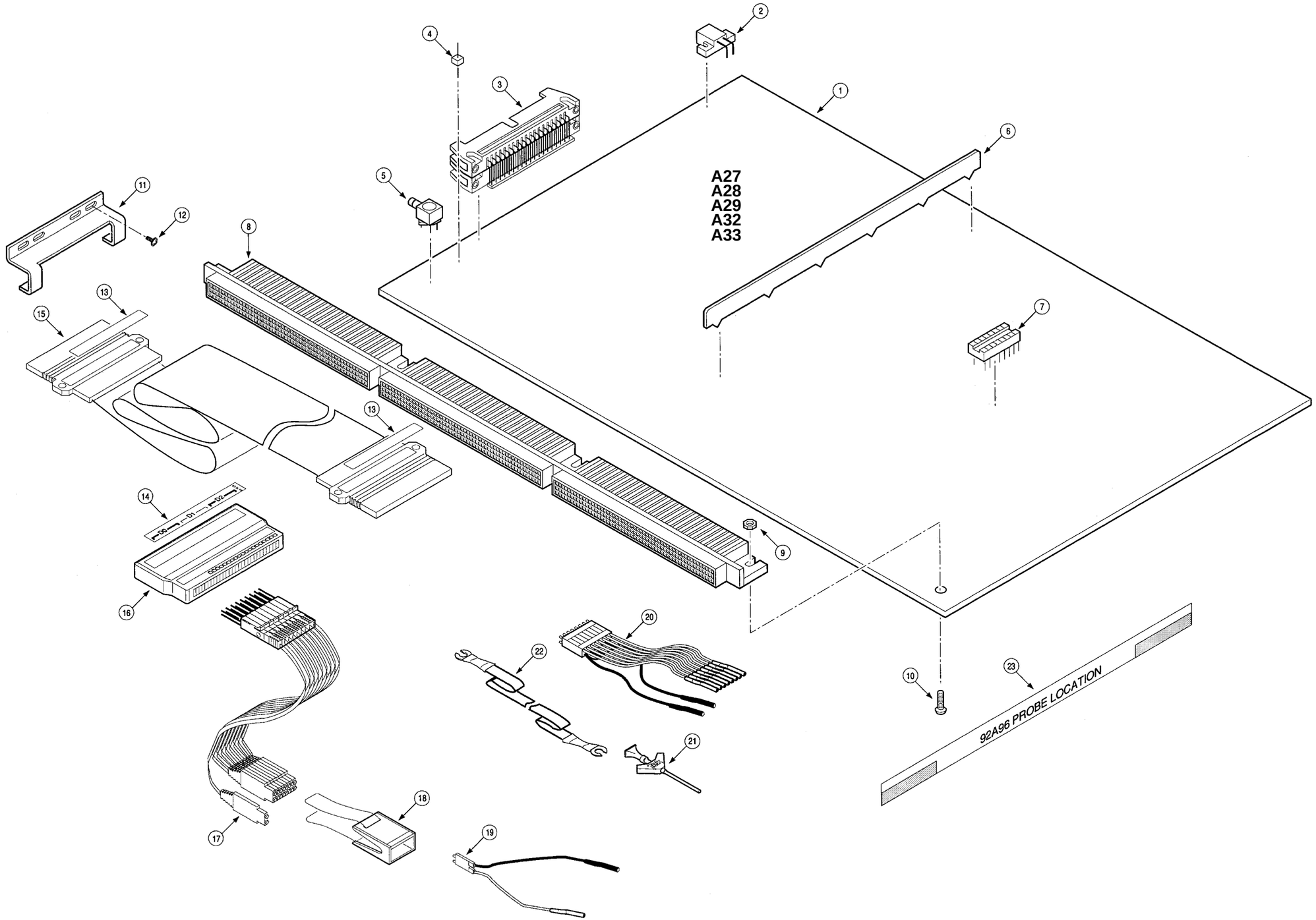


Figure 17. 92A96/D/XD/SD/UD and 92C96/D/XD/SD

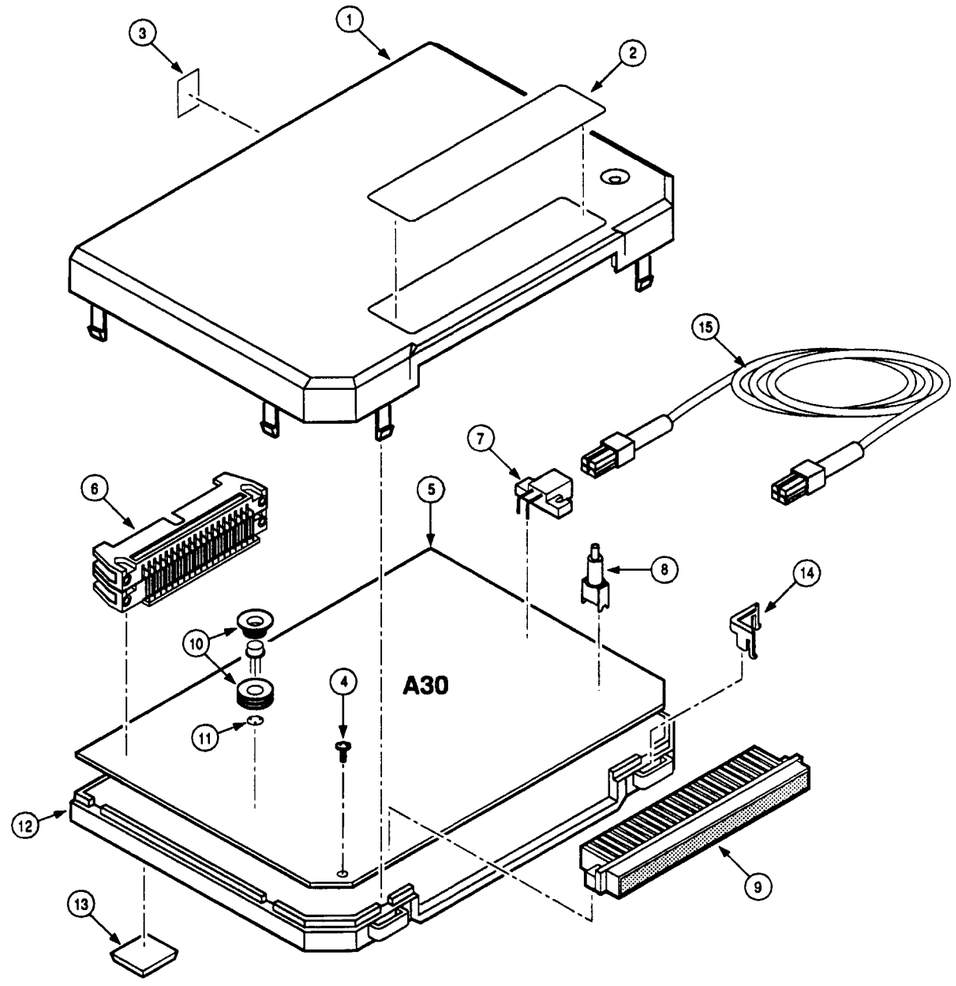


Figure 18. 92A96 Option 01

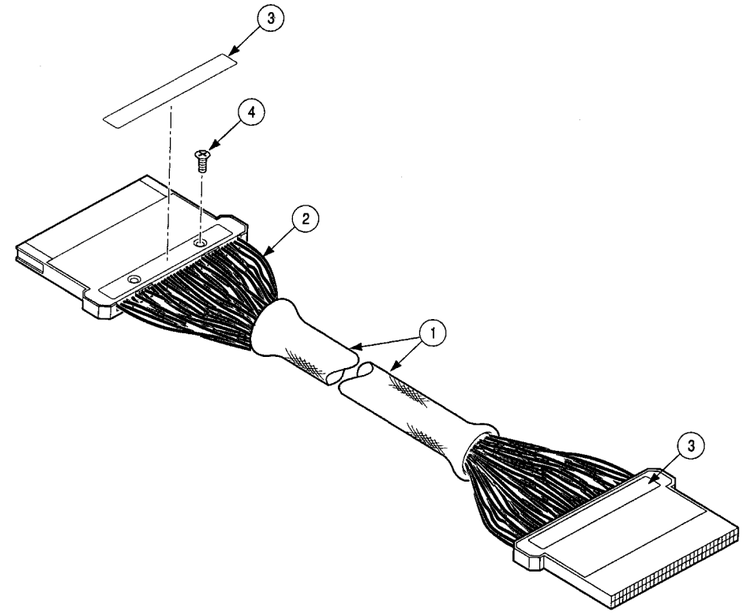


Figure 19. 92A96 Option 02

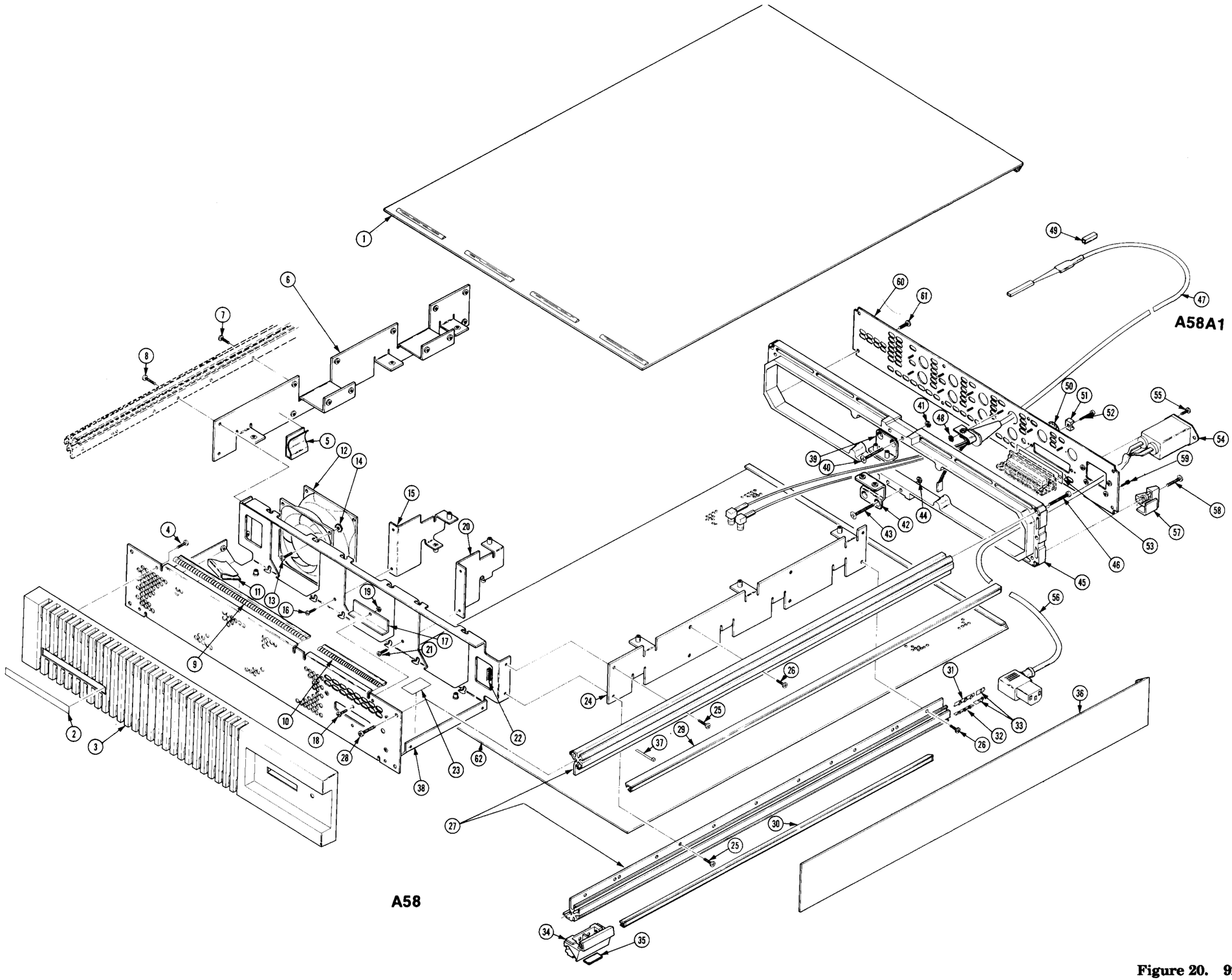


Figure 20. 92HS8 Cabinet

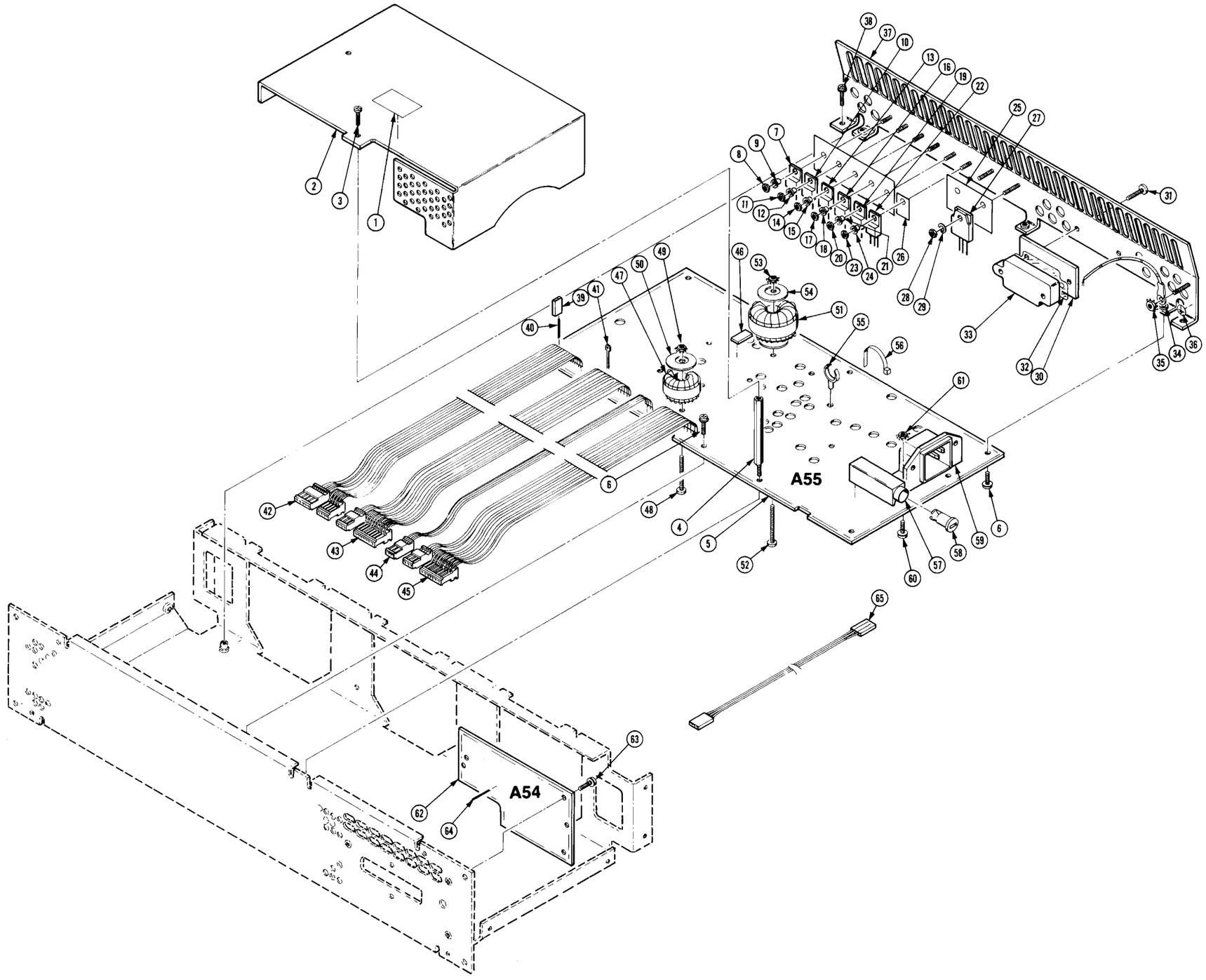


Figure 21. 92HS8/E Power Supply

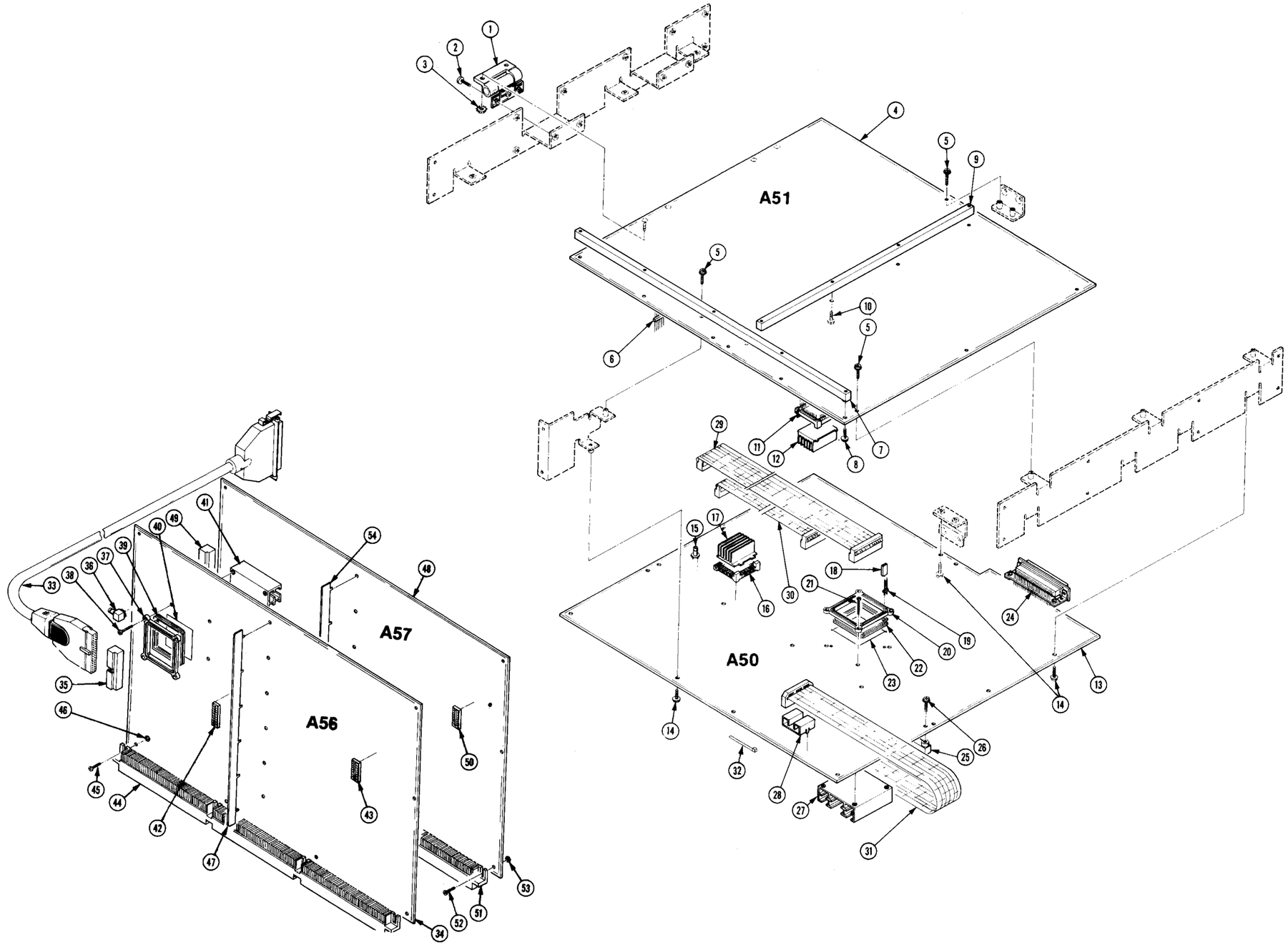


Figure 22. 92HS8/E Boards

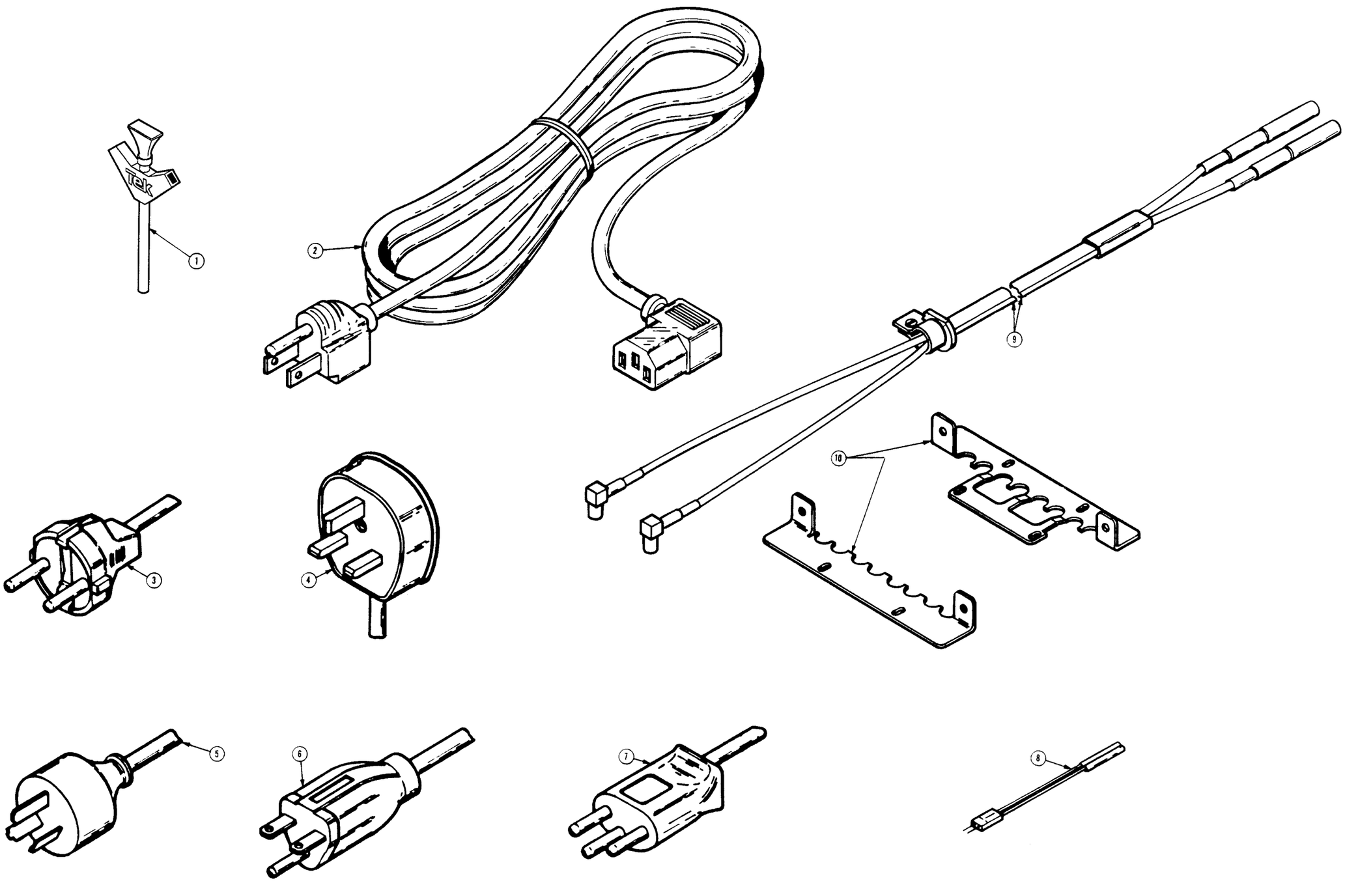


Figure 23. 92HS8/E Accessories

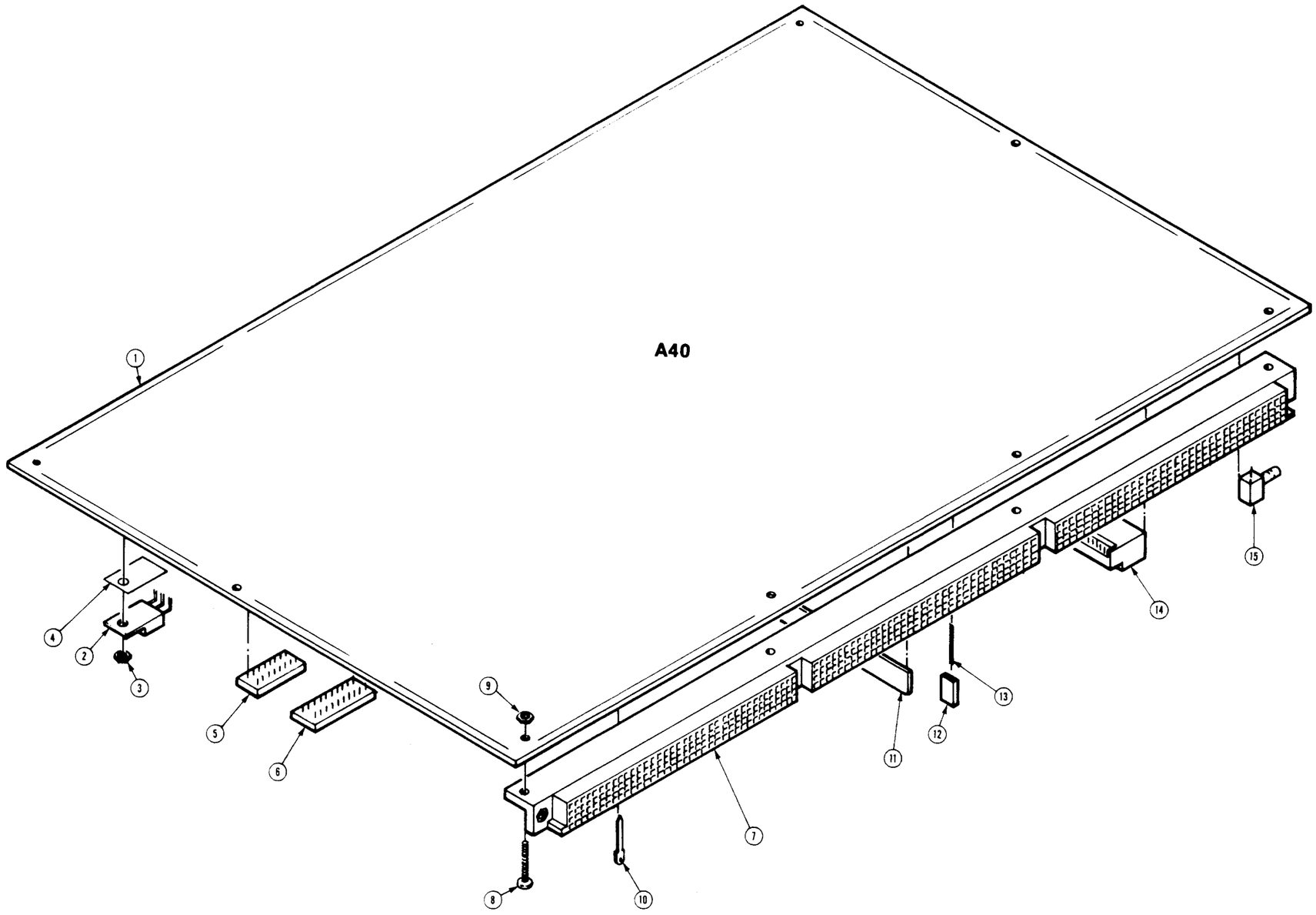


Figure 24. 92S16/92SX109 Board

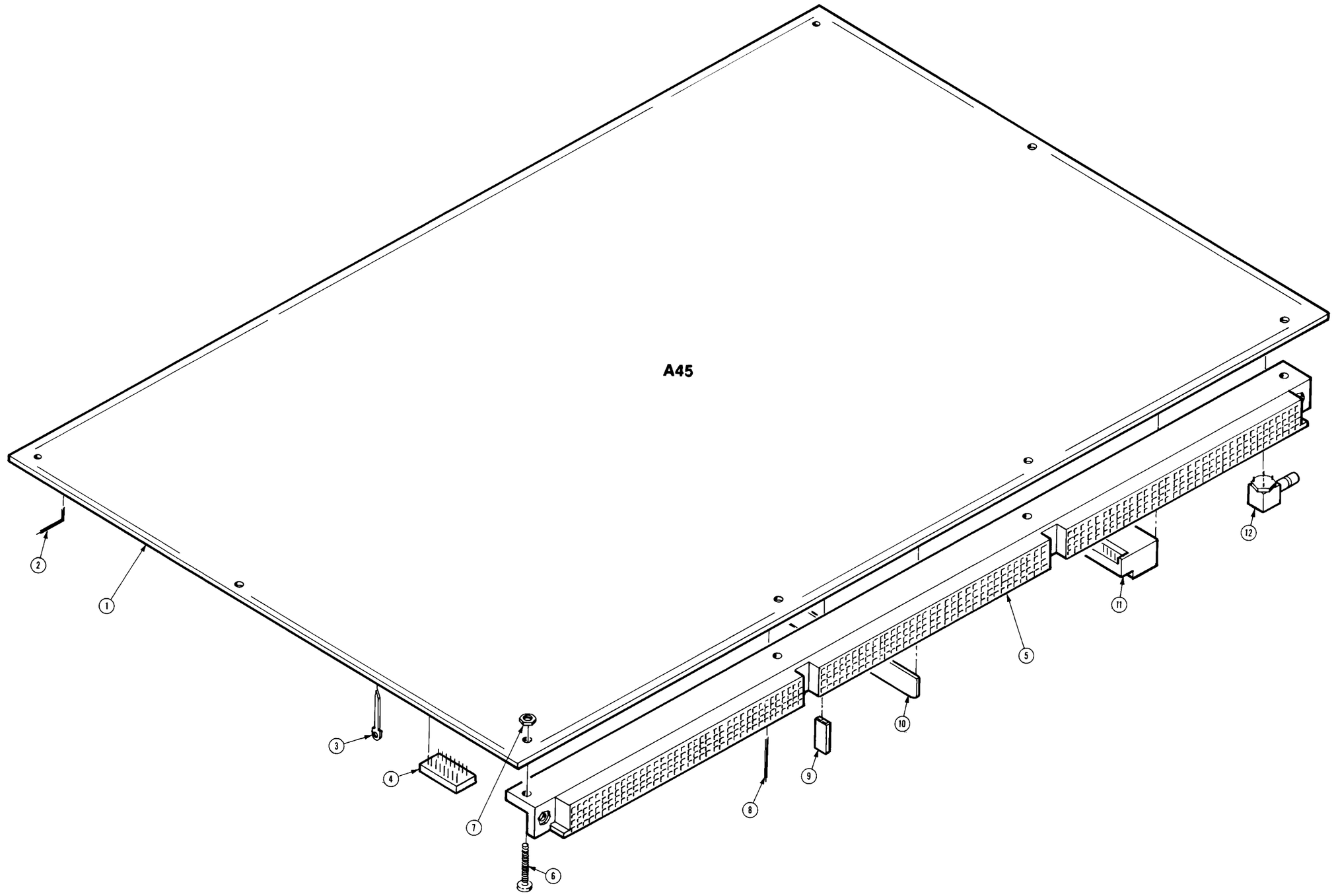


Figure 25. 92S32/92SX118 Board

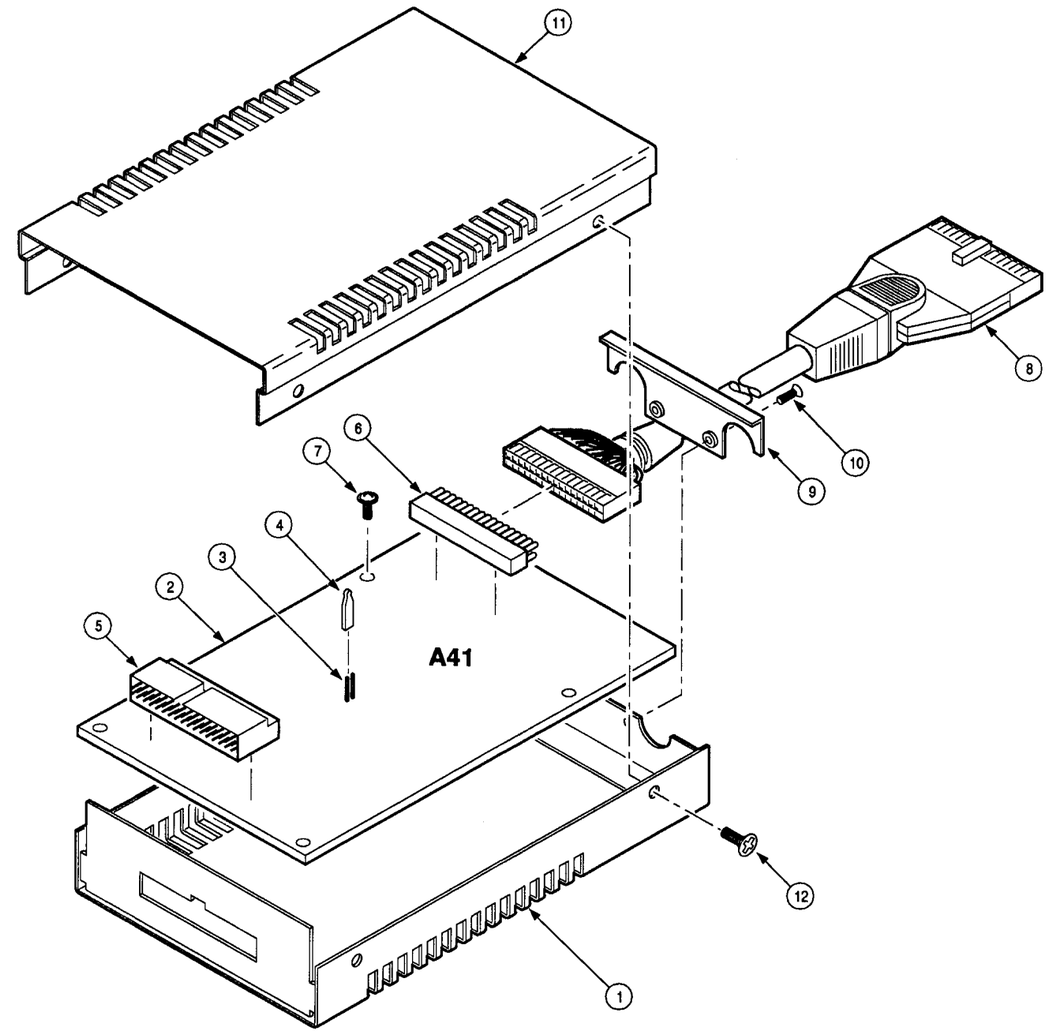


Figure 26. 92SX109/118 Multiplexer

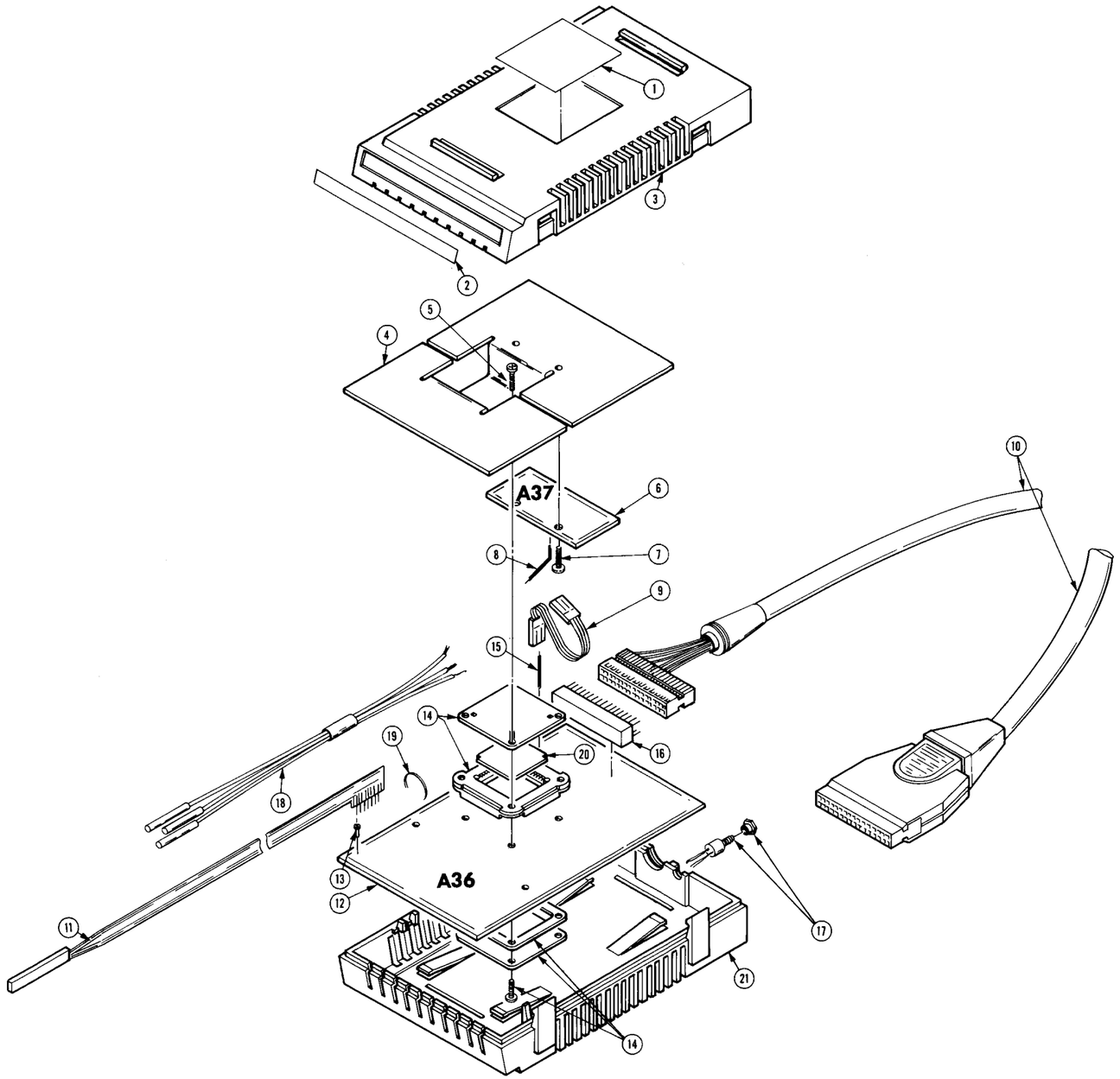


Figure 27. P6464

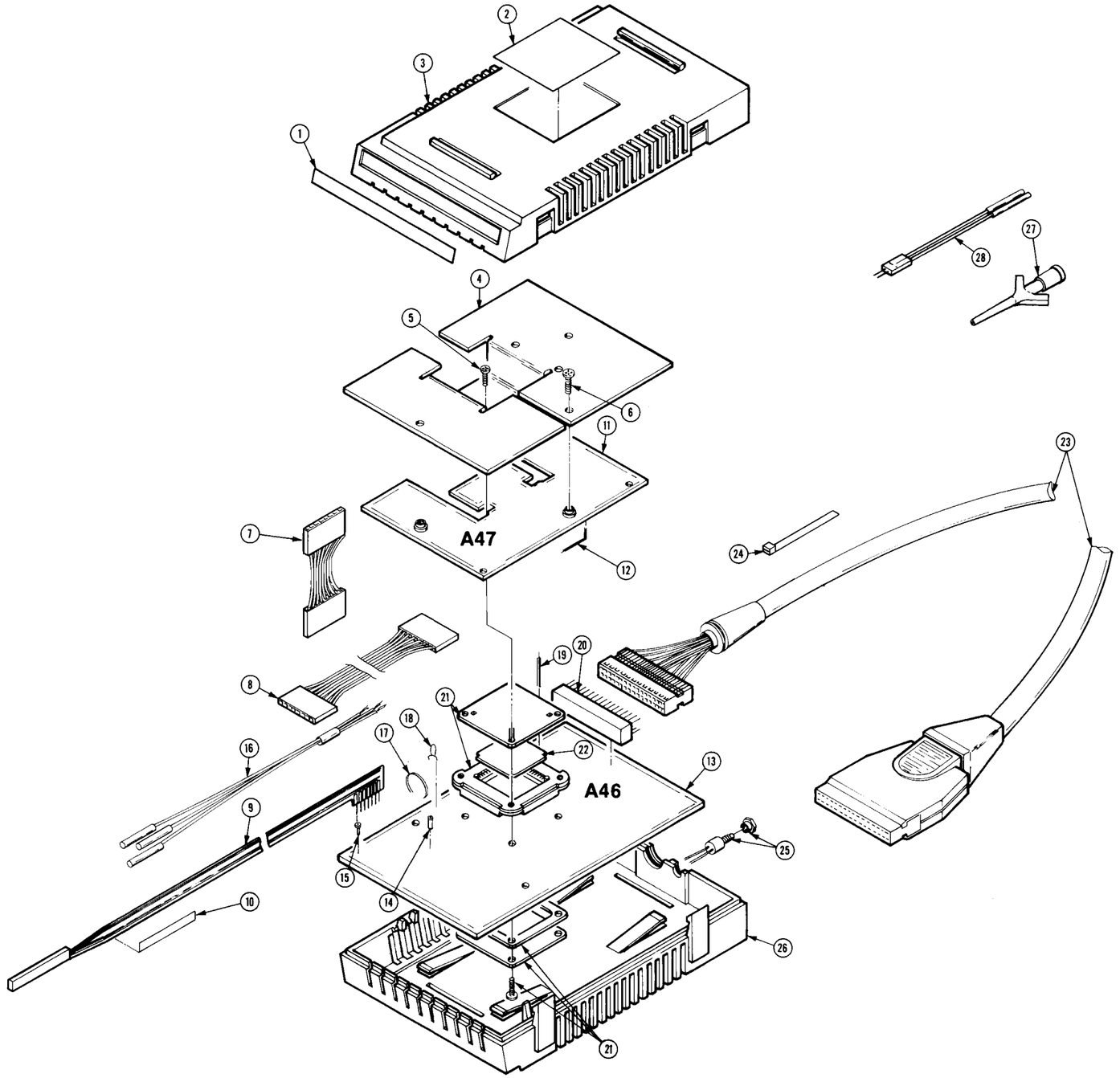


Figure 28. P6465

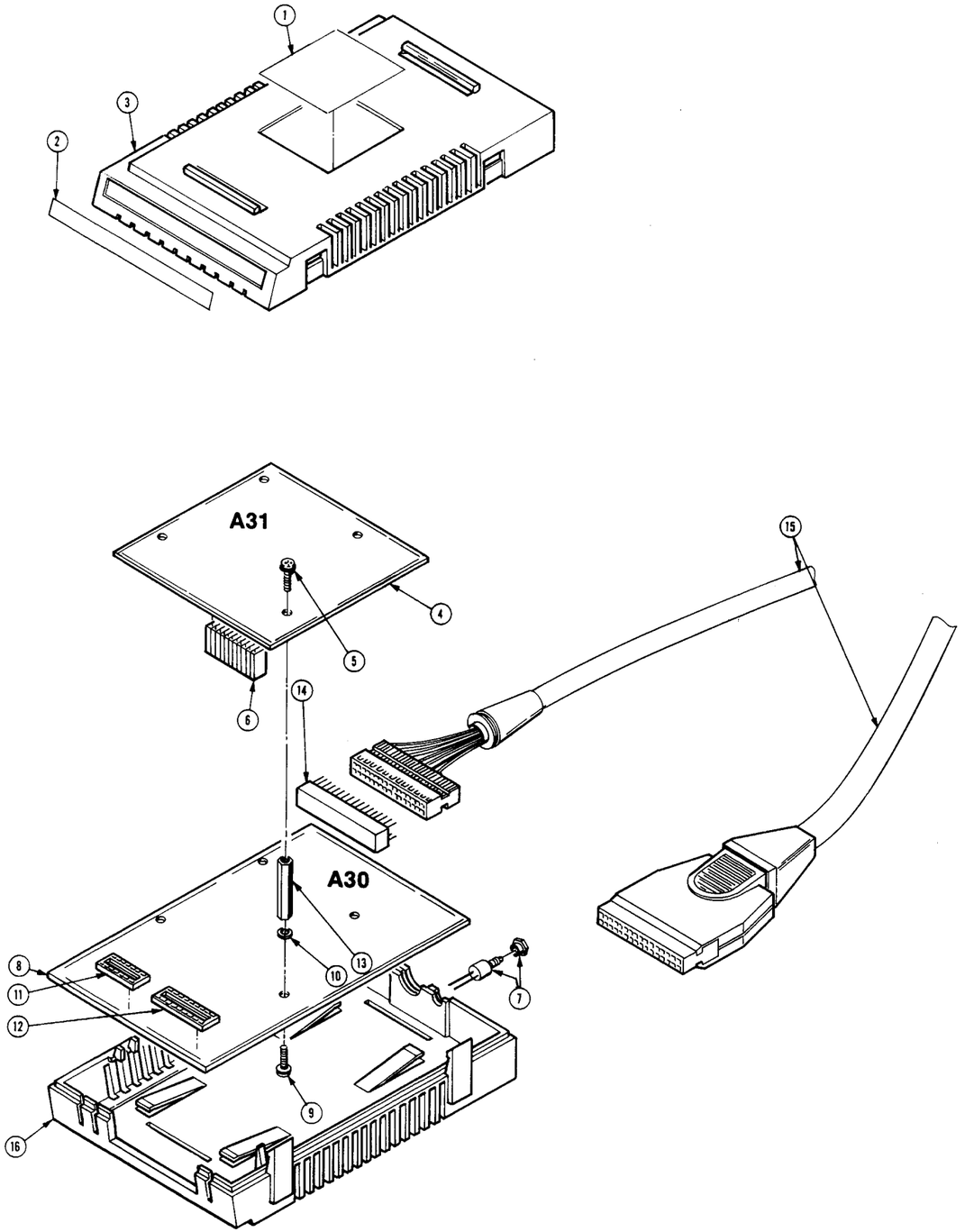


Figure 29. P6463

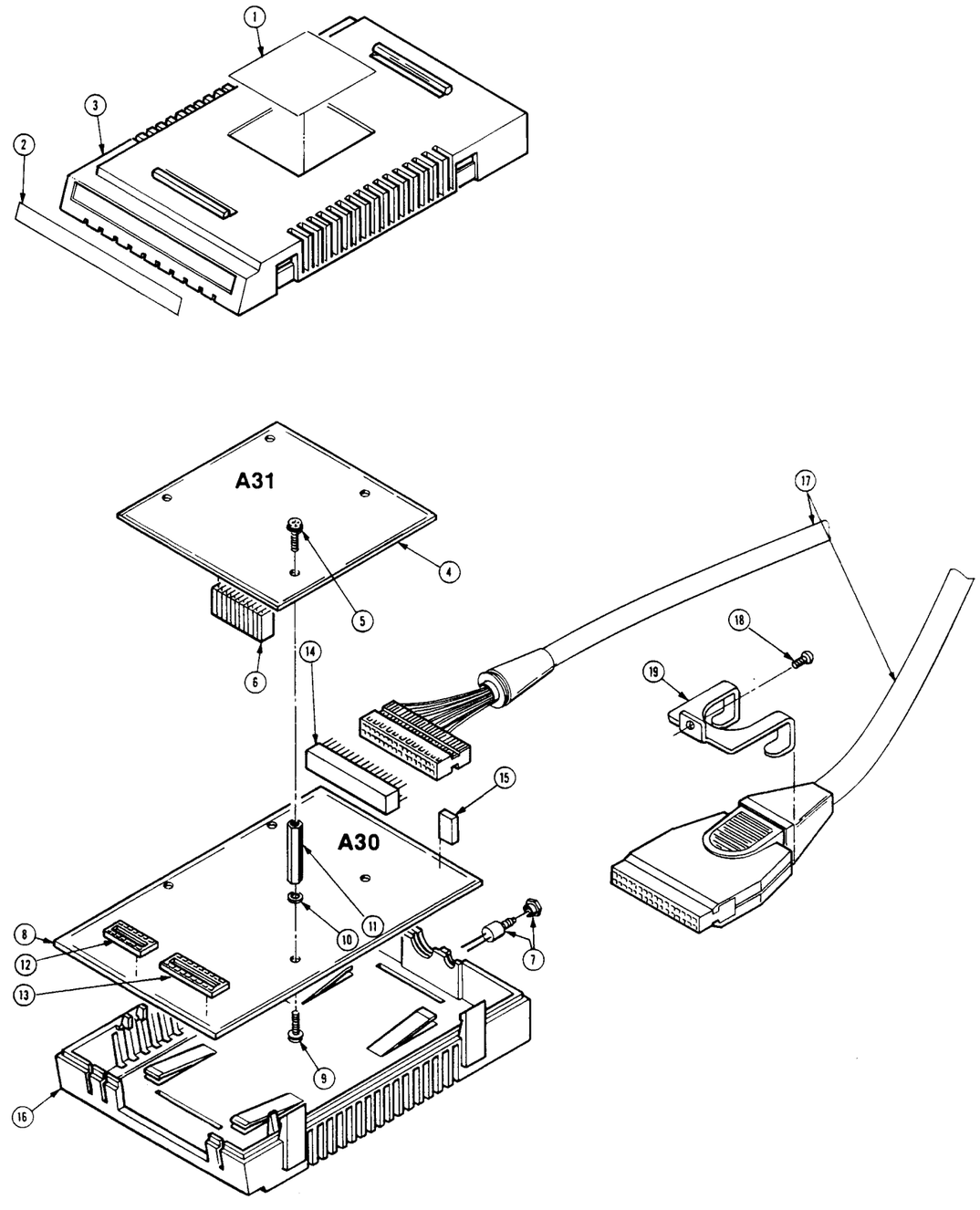


Figure 30. P6463A

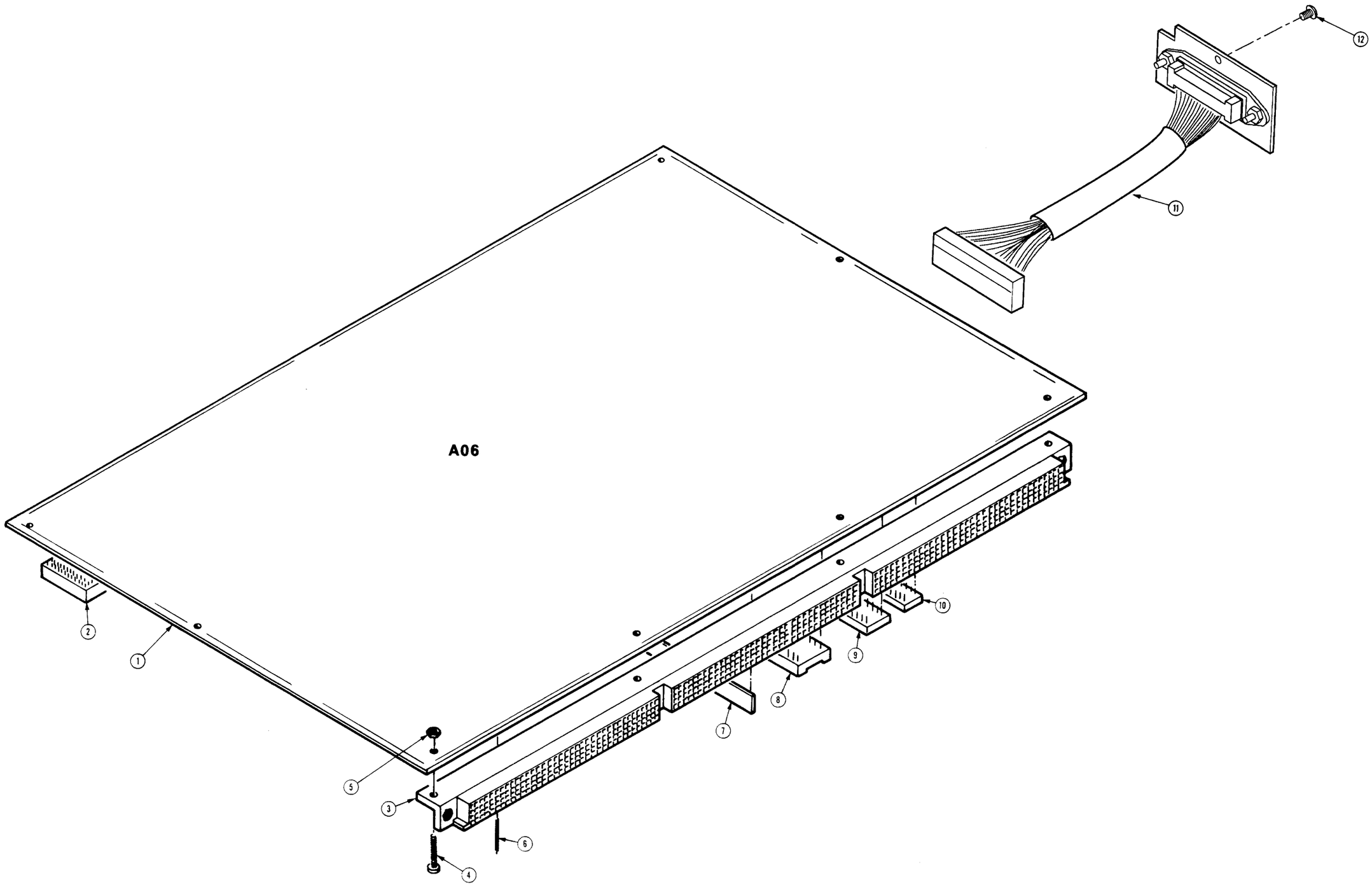


Figure 31. 92C01 Board

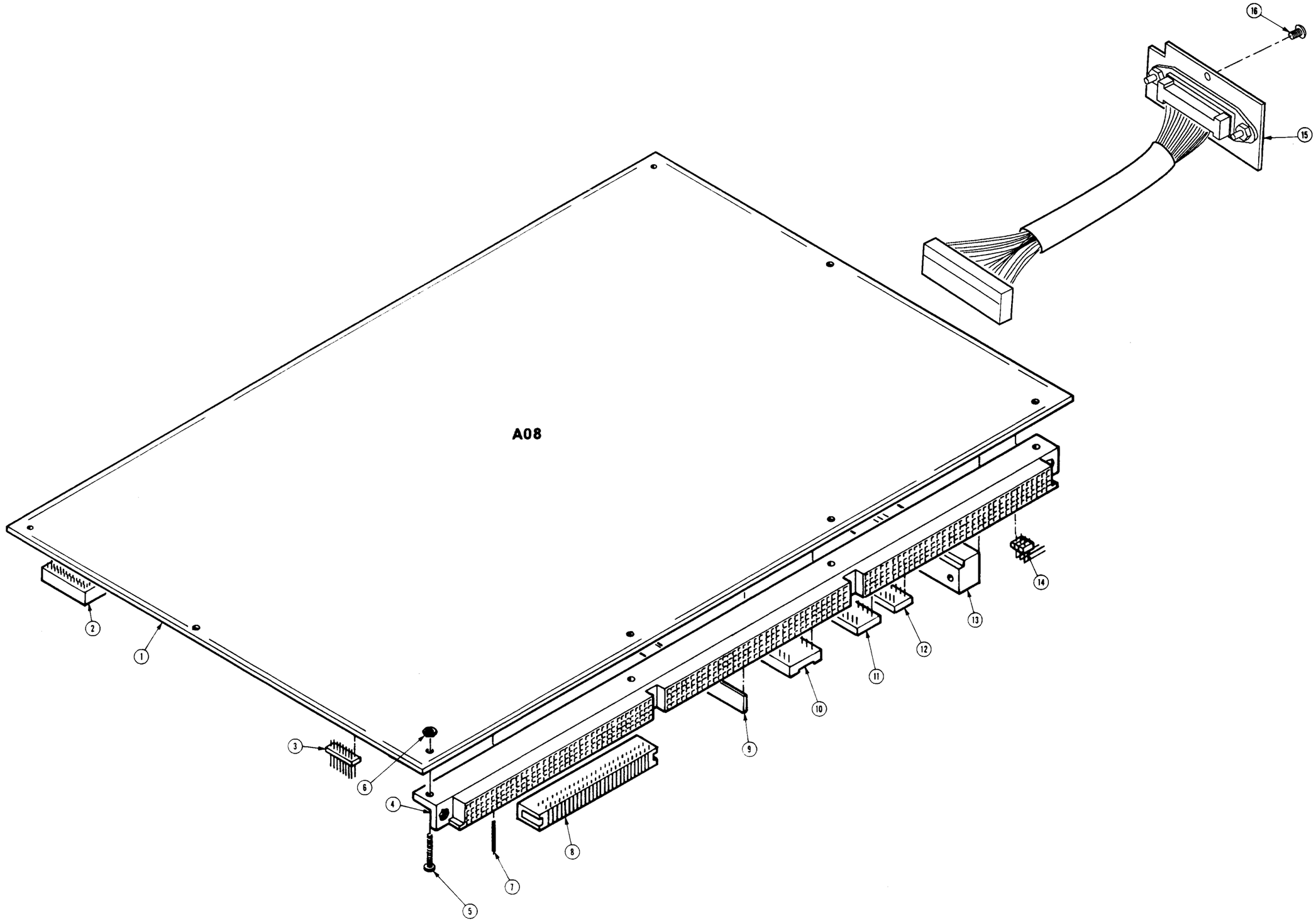


Figure 32. 92C02 Board

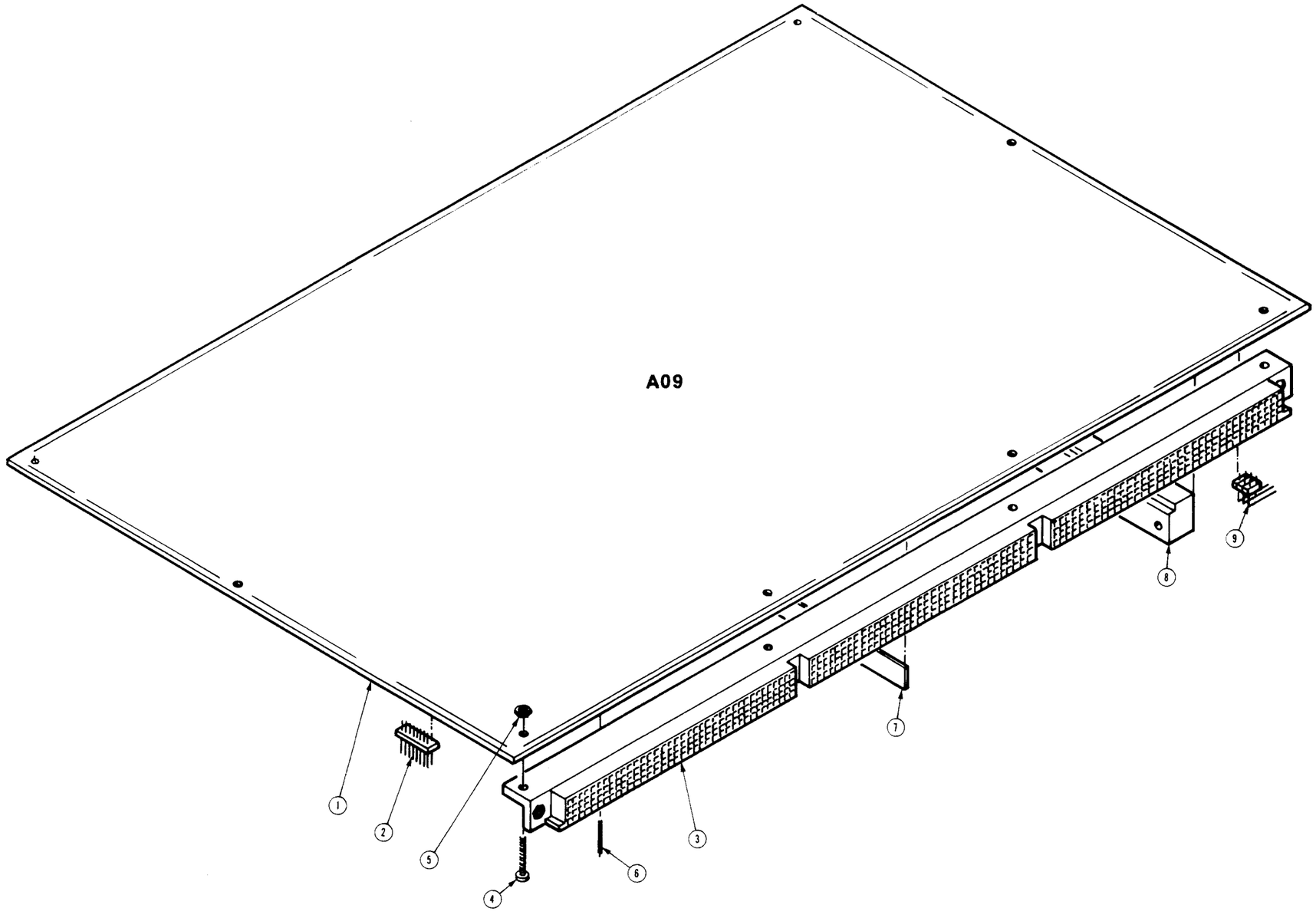


Figure 33. 92C03 Board

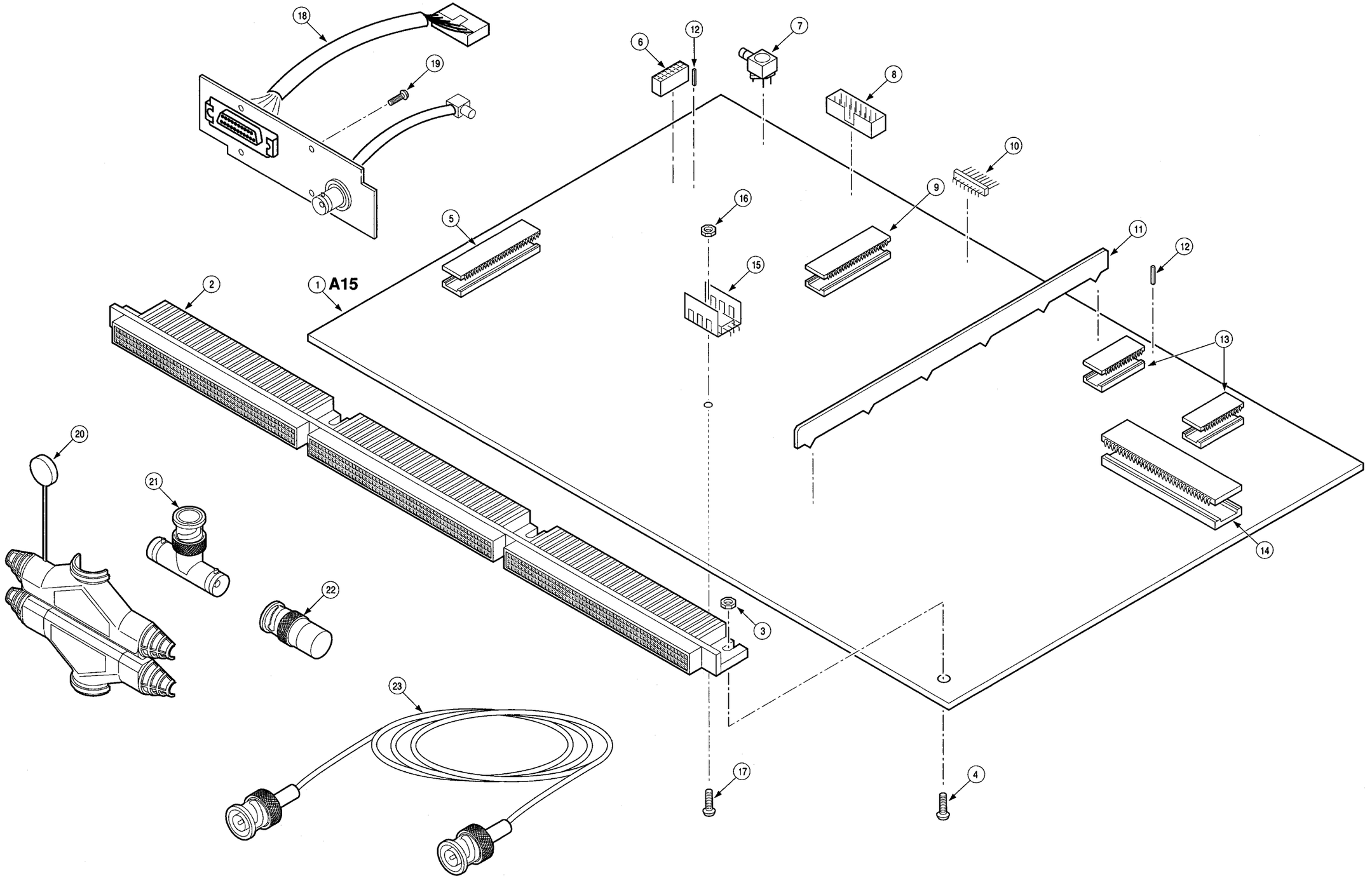


Figure 34. 92LAN Board

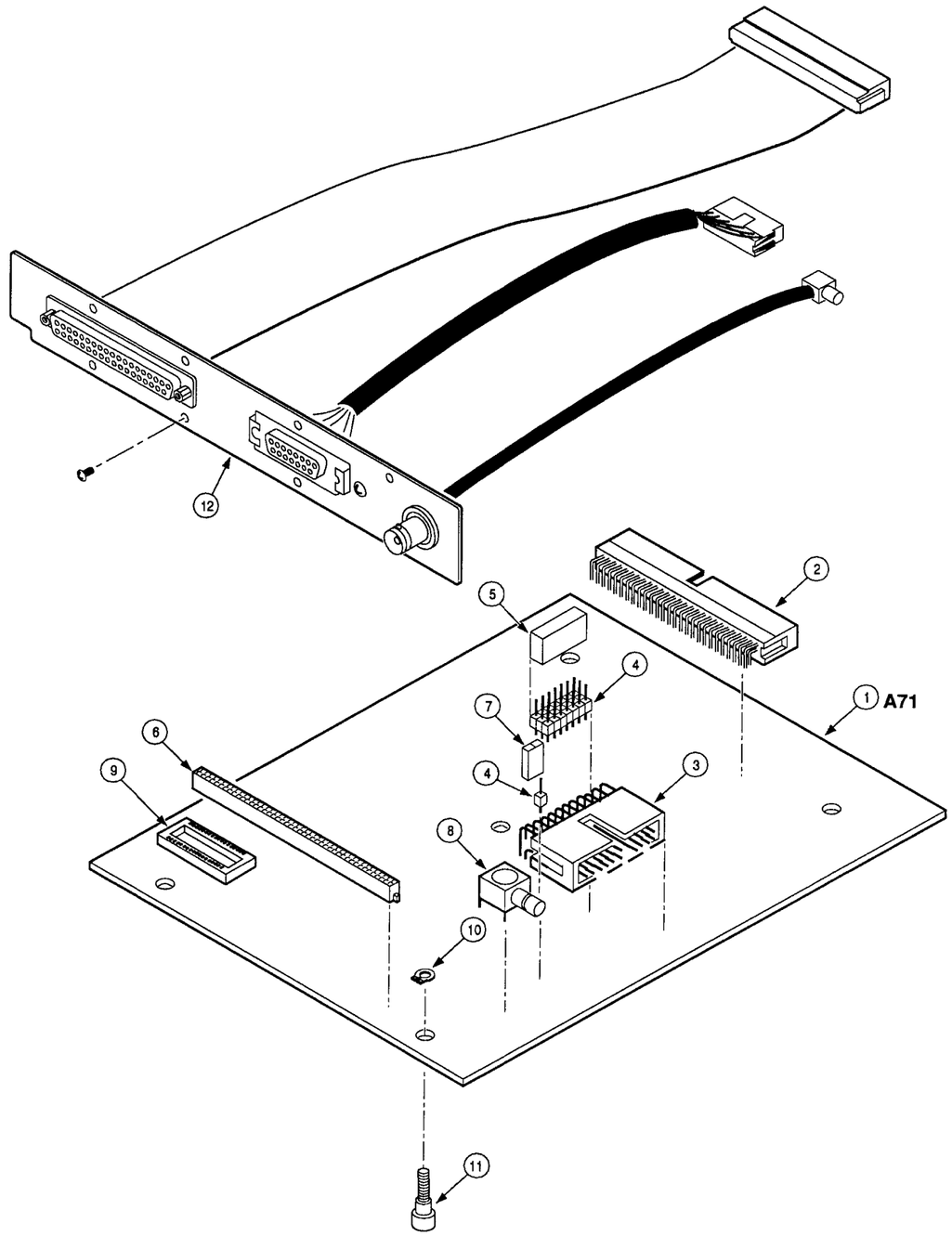


Figure 35. 92LANSE Board

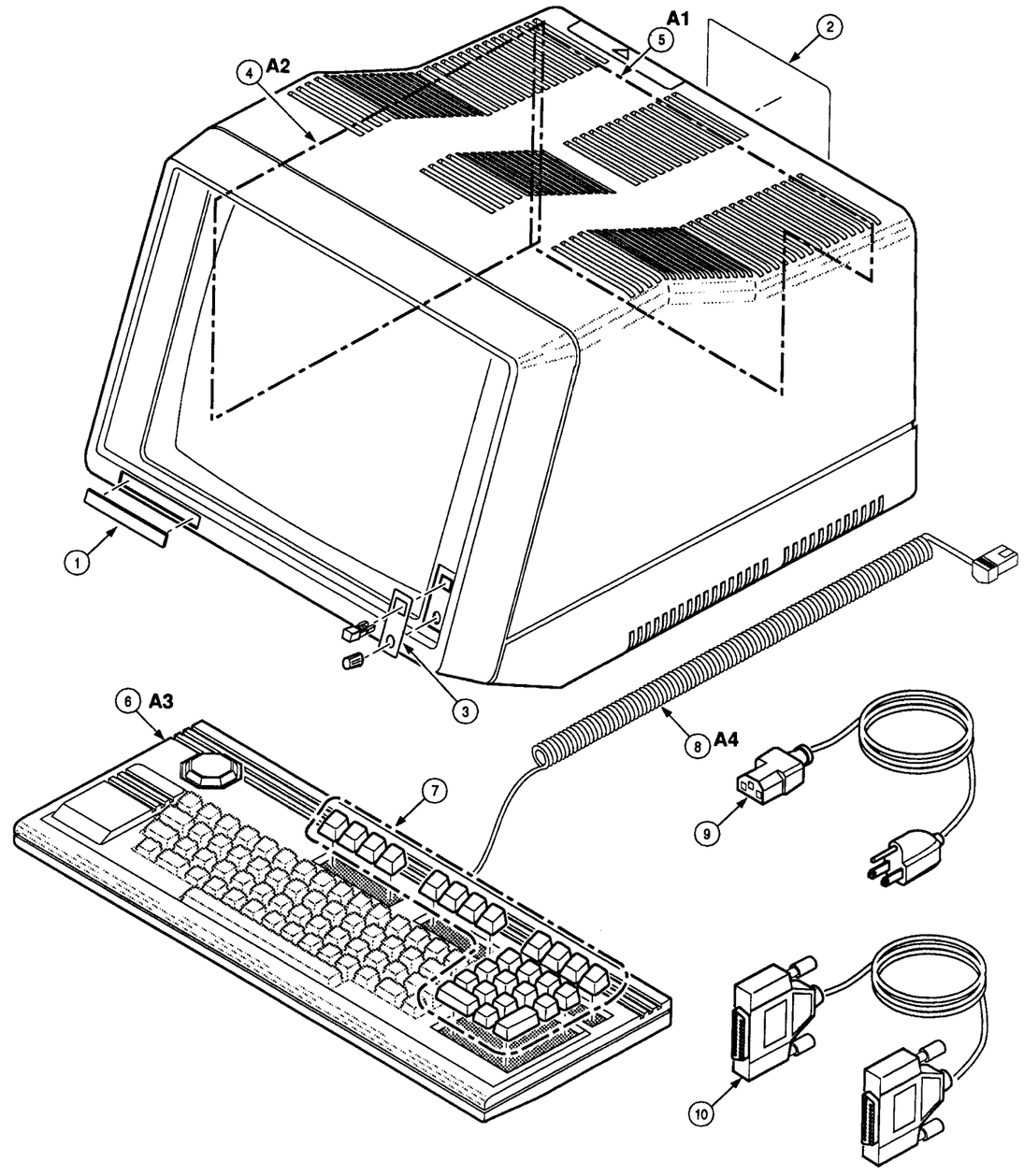


Figure 36. 9200T Terminal

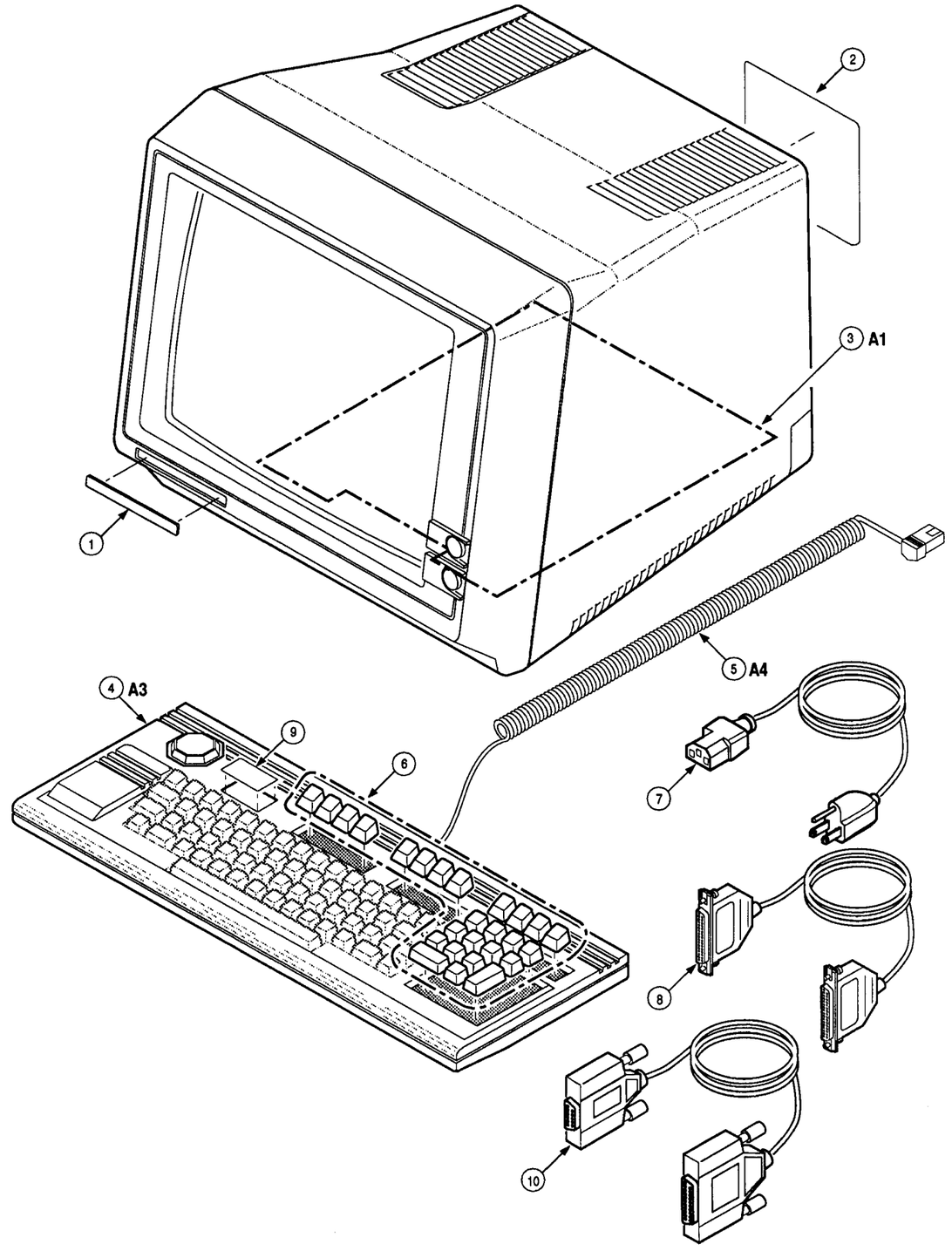


Figure 37. 9201T Terminal

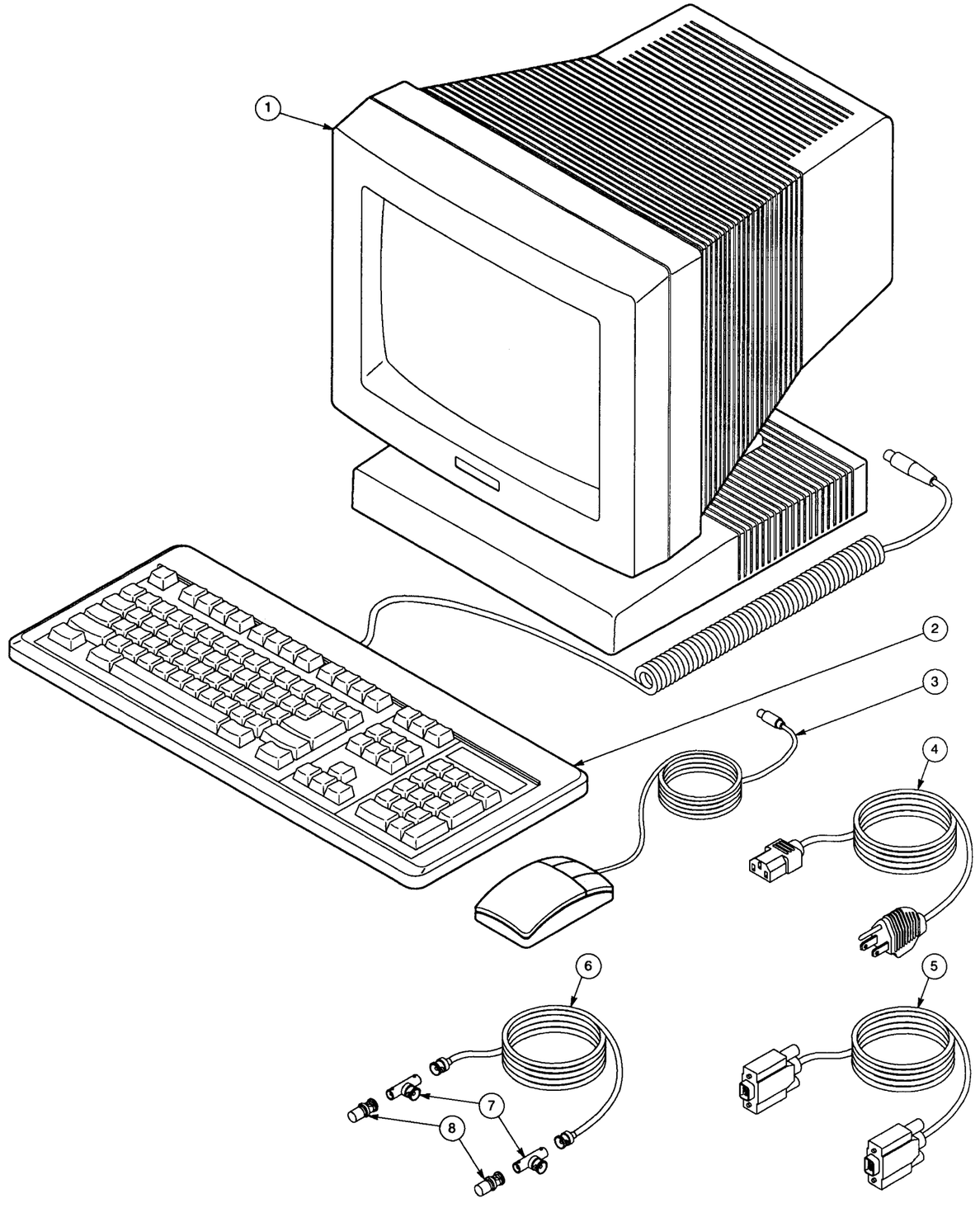


Figure 38. 9202XT/9204XT Terminal

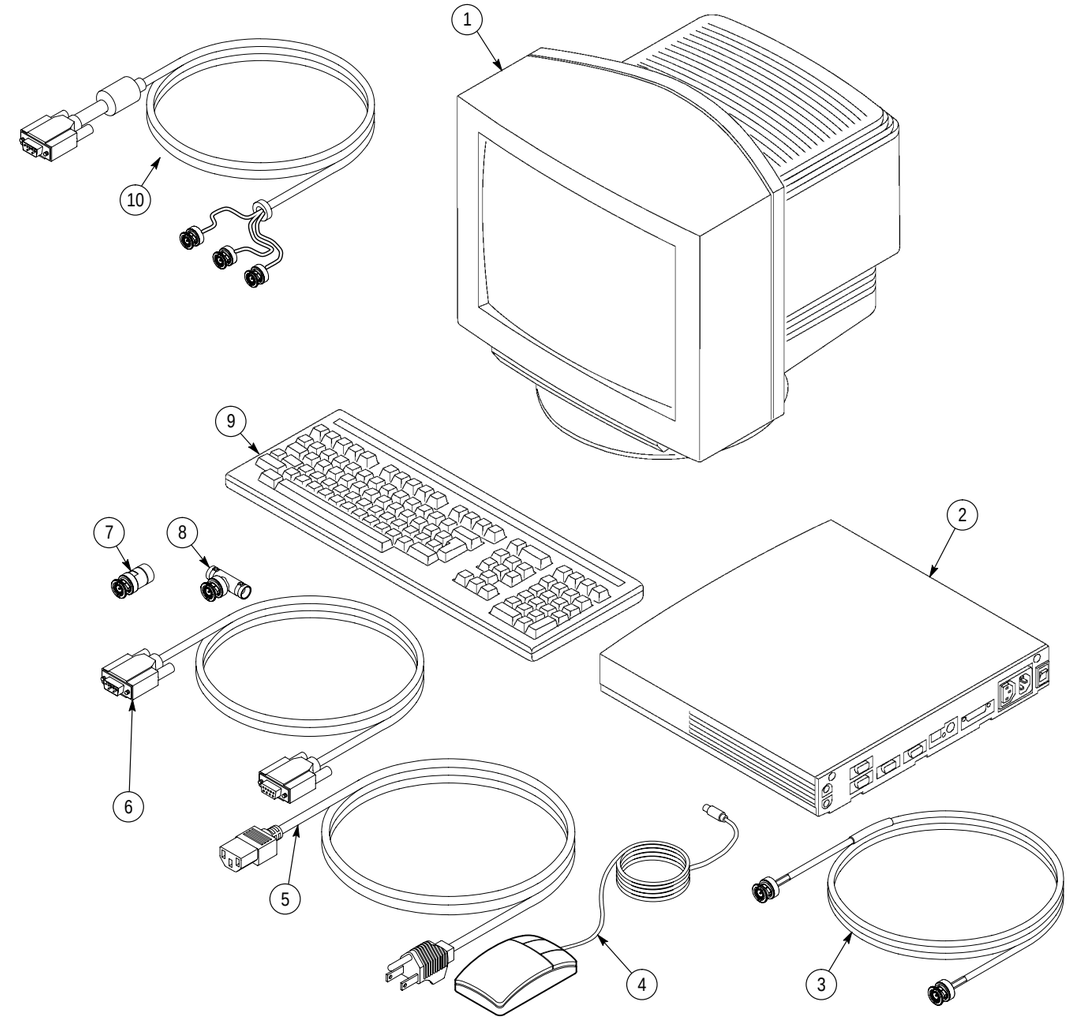


Figure 39. 9203XT/9205XT Terminal

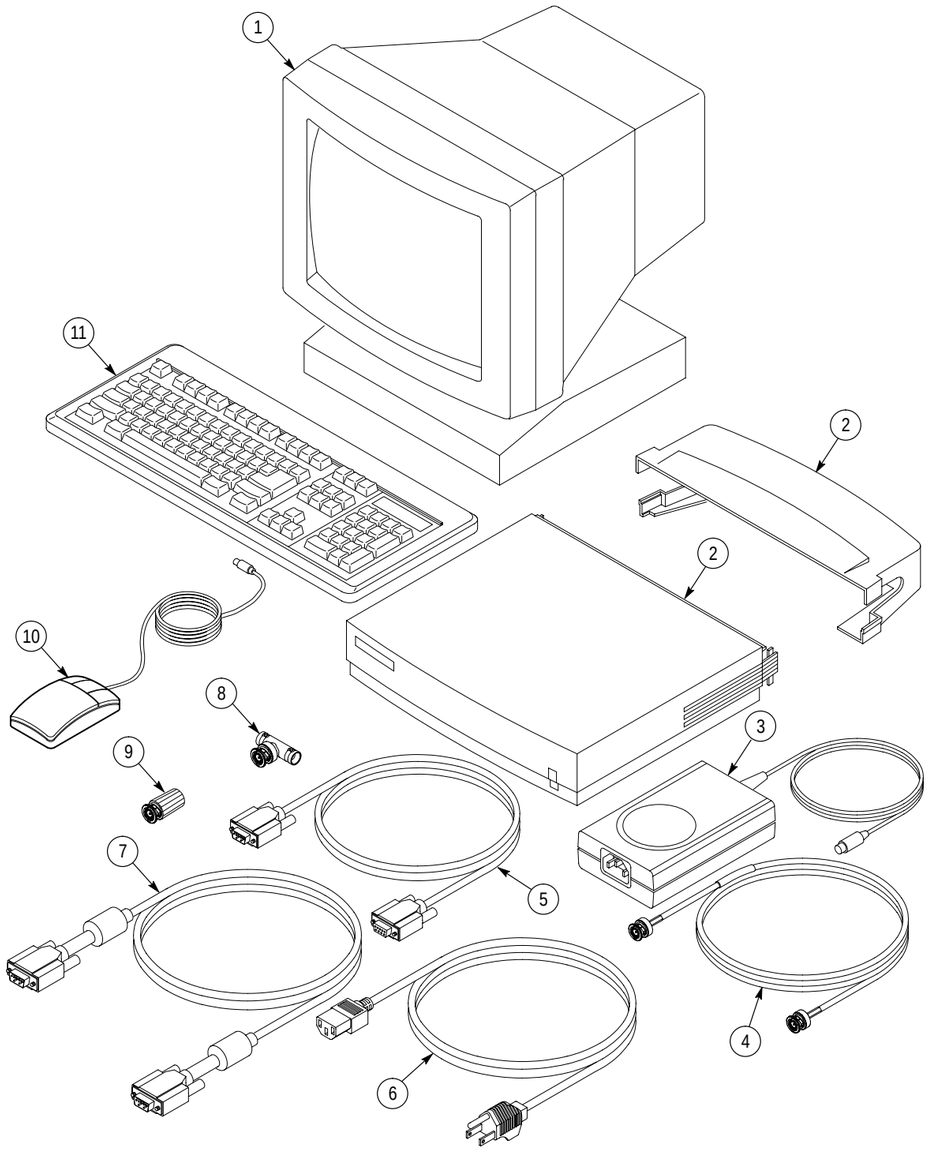


Figure 40. 9206XT Terminal

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