Netra™ t 1100 Service Manual

THE NETWORK IS THE COMPUTER™

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Electromagnetic Compatibility Information – USA

System Classes

Please read all of the following information to determine the class of system you have and the environment in which it should be installed and operated.

In the United States, the Federal Communications Commission (FCC) governs the levels of electromagnetic emissions from a digital device. Electromagnetic emissions can interfere with radio and television transmission. To reduce the risk of harmful interference, the FCC has established requirements for manufacturers of digital devices.

A manufacturer of a digital device must test and label the product to inform an end-user of the maximum emission level from the product when used in accordance with its instructions. The FCC has established two classes of levels, Class A and Class B. A system that meets the FCC Class A requirements may be marketed for use in an industrial or a commercial area. A system that meets the more stringent FCC Class B requirements may be marketed for use in a residential area in addition to use in an industrial or a commercial area.

An end-user in the United States is responsible for ensuring that his system is suitable for its environment as stated in the above paragraph and bears the financial responsibility for correcting harmful interference.

For a system to be considered an FCC Class B system, all peripherals of the system (workstation, monitor, keyboard, mouse, external disk and tape drives, modem, printer, etc.) must be labeled as such. If any peripheral or the system itself is labeled as FCC Class A, the entire system becomes FCC Class A and should not be used in a residential area.

To determine if your system is FCC Class A or FCC Class B, you must check the marking on each peripheral and on your workstation. Each piece of equipment should have an FCC statement marked on the unit. The FCC statement should identify the equipment as Class A or Class B. If there is no indication of the Class in the FCC statement, consider it to be Class A unless there is a mark which states “FCC ID:” followed by alphanumeric characters. If it has this FCC ID mark, it is Class B. If any of the peripherals in your system is not marked with an FCC statement, the equipment should not be used in a home because of the greater likelihood of interference to radio and television reception. Contact the manufacturer of the peripheral if you have any questions.

Modifications

If the end-user adds single in-line memory modules (SIMMs) or internal drives or PCI cards to the system, the FCC Class of the machine could be affected. All DIMMs and internal drives offered by Sun for use in a Sun™ product have been tested and will not change the FCC Class labeled on the product if it is installed per the instructions in the Sun Netra t1100 Installation and Basic Maintenance Guide.

If memory, drives, or PCI cards are purchased from sources other than Sun, the FCC Class of the system may be adversely affected. Modifications not approved by Sun may void the authority granted by the FCC to operate the equipment.

Shielded Cables

Connections between the system and other external equipment must be made using shielded cables, earthed at both ends, in order to maintain compliance with FCC radio frequency emission limits.

FCC Class A Notice

Note – This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Sun Netra t1100 Installation and Basic Maintenance Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Although this equipment is a Class A device. it has been tested to the more stringent Class B emission limits.

EUROPEAN UNION NOTICE

Products with the CE marking comply with the protection requirements of the following EU Directives:

- EMC Directive 89/336/EEC, as amended by 93/68/EEC, by application of the following harmonised standards:

EN 55022:	1994	- Electromagnetic Interference
EN 50082-1:	1992	- Electromagnetic Immunity:

- Low Voltage Directive 73/23/EEC, as amended by 93/68/EEC, by application of the following harmonised standard:

  EN60950: 1992 AMD3, Safety of Information Technology Equipment.

TO ENSURE COMPLIANCE:

The following additional components or accessories are required:

1. Shielded cables having earthed metal shells shall be used for connection to all input/output ports.
2. Cable connectors shall be shielded type (e.g. shielded RJ45 plugs).
3. Ethernet cables shall be IEEE 802.3 compliant, and shall be of the Shielded Twisted Pair type (STP).
4. If Ethernet Micro-Transceivers are to be connected directly to the AUI ports (15-way Ethernet ports) they shall:

   a. comply with IEEE 802.3 Ethernet requirements for 10BaseT,

   b. meet the CISPR 22 Class B requirements for emissions, and

   c. be of the Shielded Twisted Pair type. (Recommended types are Milan Micro-Twist Model # MIL-10P, 3COM ISOLAN TP, or other specification equivalent types. *Always ask to see manufacturer's Certificate of Compliance or other supporting data to authenticate compliance.*)
5. Keep all doors closed while system is in operation.
6. The system must be reliably connected to earth.
7. Antistatic wrist-strap connection points are located on the front and rear lower panels of the unit.

Warning – This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

F

GARANTIE DE CONFORMITÉ:

Les composants et accessoires suivants sont requis :

1. Des câbles blindés équipés de fiches en métal doivent être utilisés pour toutes les connexions aux raccordements d'entrée/ de sortie de l'appareil.
2. Toutes les connexions câblées doivent être de type blindé (p. ex. fiches RJ45 blindées).
3. Les câbles Ethernet doivent être conformes à IEEE 802.3 et de type Twisted Pair (blindé) (STP, Shielded Twisted Pair).
4. Si des Micro-Transceivers Ethernet doivent être connectés directement aux connexions AUI (connexions Ethernet à 15 pôles), ils doivent:
   a.satisfaire aux exigences Ethernet IEEE 802.3 pour 10BaseT,

   b. satisfaire aux exigences CISPR 22 Class B concernant les émissions, et

   c. être de type Twisted Pair (blindé). (Les types recommandés sont : Milan Micro-Twist Model # MIL-10P, 3COM ISOLAN TP, ou autres types correspondant aux spécifications. *Demandez toujours à voir le certificat de conformité du fabricant ou autres données appropriées authentifiant la conformité.*)
5. Tenez toutes les portes fermées lorsque le système est en marche.
6. Le système doit être mis à la terre conformément aux prescriptions.
7. Des points de connexion de la sangle de poignet sont situés sur les parois inférieures de la façade et du dos de l'appareil.

D

SICHERSTELLEN DER KONFORMITÄT:

Die folgenden Zubehörteile und zusätzlichen Komponenten werden benötigt

1. Für alle Verbindungen zu den Anschlüssen des Gerätes sollen abgeschirmte Kabel verwendet werden, die mit Metallsteckern ausgerüstet sind.
2. Alle Kabelverbindungen sollen von abgeschirmter Bauart sein (z. B. abgeschirmte RJ45-Stecker).
3. Ethernet-Kabel sollen IEEE 802.3-konform und vom Typ Twisted Pair (abgeschirmt) (STP, Shielded Twisted Pair) sein.
4. Wenn Ethernet Micro-Transceiver direkt mit den AUI-Anschlüssen (15-polige Ethernet-Anschlüsse) verbunden werden sollen, müssen diese:
   a.den Ethernet-Anforderungen in IEEE 802.3 für 10BaseT entsprechen,

   b. den CISPR 22 Class B-Anforderungen in Bezug auf elektrische Emissionen entsprechen, und

   c. vom Typ Twisted Pair (abgeschirmt) (Shielded Twisted Pair, STP) sein (Empfohlen werden Milan Micro-Twist Model # MIL-10P, 3COM ISOLAN TP oder andere den Spezifikationen entsprechende Bauarten. *Lassen Sie sich immer die Herstellerbescheinigung über die Konformität oder andere geeignete Daten zeigen, die die Konformität belegen.*)
5. Halten Sie alle Gerätetüren geschlossen, wenn das System in Betrieb ist.
6. Das System muß stets vorschriftsmäßig geerdet sein.
7. Die Anschlüssen für das Handgelenkband befinden sich am vorderen und hinteren Paneel des Gerätes unten.

Renseignements de compatibilité électromagnetique – Canada

Communications Canada (c'est-à-dire le DOC, Ministère des Communications) règlemente les dispositifs numériques de façon analogue aux presciptions de la FCC (Commission fédérale des communications) aux Etats Unis. Chaque produit doit être étiqueté ou livré avec une documentation spécifiant sa classe. Le DOC définit, comme le fait la FCC, l'environnement dans lequel un dispositif numérique doit être utilisé. La classe A, spécifiée par le DOC, s'applique aux zones industrielles ou commerciales, alors que la classe B s'applique aux zones résidentielles, industrielles ou commerciales.

Comme il en est le cas avec la FCC, chaque périphérique d'un système doit répondre aux spécifications de la classe B définie par le DOC afin qu'un système puisse être considéré comme faisant partie de cette classe. Si un périphérique ou un poste de travail quelconque appartient à la classe A, le système appartient alors à la classe A définie par le DOC et par conséquent ne doit pas être mis en service dans une zone résidentielle.

Au Canada il revient à l'utilisateur de s'assurer que son système est approprié pour l'environnement auquel il appartient, tel que spécifié dans le paragraphe ci-dessus.

Si des unités internes ou des barrettes de mémoire SIMM sont ajoutées à un poste de travail, la classe du DOC de la machine risque d'être affectée. Toutes les unités internes et barrettes de mémoire SIMM offertes par Sun et destinées à être utilisées sur un poste de travail Sun ont été soumises à des essais. Elles ne changeront pas la classe du DOC figurant sur le poste de travail si l'installation est conformée aux instructions spécifiées dans le Guide d'installation Sun. Si l'utilisateur se procure des unités et des barrettes de mémoire ailleurs que chez Sun, la classe du poste de travail définie par le DOC risque d'être défavorablement affectée.

Avis concernant les systèmes appartenant à la classe A du DOC:

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Electromagnetic Compatibility Information – Canada

Communications Canada (i.e., the Department of Communications) regulates digital devices similar to the FCC in the United States. Every product should be labeled or provided with documentation that states the class of the product. The DOC defines the environment in which a digital device should be used as the FCC does, DOC Class A is for an industrial or a commercial area and DOC Class B is for a residential, an industrial, or a commercial area.

As it is with the FCC, every peripheral of a system must meet DOC Class B levels in order for a system to be considered DOC Class B. If any peripheral or the workstation is DOC Class A, the system is DOC Class A and should not be used in a residential area.

An end-user in Canada is responsible for ensuring that his system is suitable for its environment as stated in the above paragraph.

If single in-line memory modules (SIMMs) or internal drives are added to the workstation, the DOC Class of the machine could be affected. All SIMMs and internal drives offered by Sun for use in a Sun workstation have been tested and will not change the DOC Class labeled on the workstation if installed per the instructions in the Sun Installation Guide. If memory or drives are purchased from sources other than Sun, the DOC Class of the workstation may be adversely affected.

DOC Class A Notice

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Contents

Figures

Tables

Preface

The *Netra t 1100 System Service Manual* provides detailed procedures for the removal and replacement of field-replaceable parts in the Netra t 1100 computer system.

Who Should Use This Guide

This book is written for technicians, advanced computer system end-users with experience in replacing hardware and troubleshooting, system administrators and authorized service providers (ASPs).

How This Guide Is Organized

The guide is arranged as follows:

Chapter 1, "Product Description", provides information on system features and components.

Chapter 2, "SunVTS Overview", contains an overview of the Netra t 1100 SunVTS diagnostic tool.

Chapter 3, "Power-On Self-Test", contains procedures to initiate power-on self-test diagnostics.

Chapter 4, "Troubleshooting Procedures", describes how to troubleshoot possible problems and includes suggested corrective actions.

Chapter 5, "Tool Requirements", provides a description of the tools required.

Chapter 6, "Power On and Off", contains procedures to power on and power off the Netra t 1100.

Chapter 7, "Internal Access", contains procedures to remove the Netra t 1100's top access cover, attach the wrist strap, and replace the top access cover.

Chapter 8, "Power Subassemblies", contains procedures to remove and replace the power-related subassemblies of the Netra t 1100.

Chapter 9, "Storage Devices", contains procedures to remove and replace the storage devices.

Chapter 10, "Motherboard and Component Replacement", contains removal and replacement procedures for the motherboard and components of the motherboard.

Chapter 11, "Illustrated Parts List", lists the authorized replaceable parts for the Netra t 1100. A brief description of each listed component is also provided.

Appendix A, "Product Specifications", provides physical, electrical and environmental specifications for the Netra t 1100.

Appendix B, "Signal Descriptions", gives signal descriptions for the motherboard connectors.

Accompanying Documentation

- Netra t 1100 Installation and Basic Maintenance Guide (English / French / German) (805-1895-10)
- Netra t 1100 Installation and Basic Maintenance Guide (English / Spanish) (805-3051-10)
- Netra t 1100 Installation and Basic Maintenance Guide (English / Mandarin / Japanese) (805-3052-10)
- Netra t 1100 System Reference Guide (English Only) (805-1893-10)
- Netra t 1100 User's Guide (English Only) (805-1892-10)

Conventions used in this Guide

The following table shows the type changes and symbols used in this guide.

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Example
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `system% You have mail.`
`AaBbCc123`	What you type, as opposed to on-screen computer output	`system%` **`su`** `Password:`
AaBbCc123	Command-line placeholder: replace with a real name or value	To delete a file, type `rm` *filename*.
AaBbCc123	Book titles, new words or terms, or words to be emphasized	Read Chapter 6 in *User's Guide.* These are called *class* options. You *must* be root to do this.
`%`	UNIX C shell prompt	`system%`
`$`	UNIX Bourne and Korn shell prompt	`system$`
`#`	super-user prompt, all shells	`system#`

Symbols

The following symbols mean:

Note – A note provides information which should be considered by the reader.

Caution – Cautions accompanied by this Attention icon carry information about procedures or events which if not considered may cause damage to the data or hardware of your system.

Caution – Cautions accompanied by this Hazard icon carry information about procedures which must be followed to reduce the risk of electric shock and danger to personal health. Follow all instructions carefully.

F

Symboles

Les symboles suivants signifient:

Remarque – Une remarque fournit des informations devant être considérées par le lecteur.

Prudence – Fournit des informations sur des procédures ou événements précis dont le non-respect peut provoquer des pertes de données ou des dommages au matériel de votre système.

Prudence – Fournit des informations sur les procédures devant être suivies pour réduire les risques de choc électrique et autres dangers pour la santé du personnel. Veuillez respecter scrupuleusement toutes les instructions.

Symbole

Die Symbole haben folgende Bedeutungen:

Anmerkung – Eine Anmerkung liefert Informationen, die der Leser bedenken soll.

Vorsicht – Hier aufgeführte Informationen zu bestimmten Vorgehensweisen oder Ereignissen sind sehr wichtig. Deren Nichtbeachtung kann zu Schäden an der Hardware des Systems oder zu Datenverlust führen.

Vorsicht – Warnungen liefern Informationen zu bestimmten Vorgehensweisen, die genau befolgt werden müssen, um das Risiko eines elektrischen Schlages oder sonstiger gesundheitlicher Gefährdungen auszuschließen. Befolgen Sie alle Anweisungen genau.

Handling and Taking Care of your CD-ROM Disks

Please observe the following precautions when handling CD-ROM disks:

- DO NOT touch the data side of the disk (the side of the disk with no label).
- DO NOT apply paper labels or write on any part of the disk, data side or label side.
- If dust or fingerprints get on to the disk, wipe with a dry cloth from the center of the disk to the edge.
- DO NOT place the disk in any place where it will be subjected to direct sunlight or high temperature.

Caution – Do not use Benzene, Paint Thinner, Record Cleaner, Static Repellent or any type of CD Lens cleaner. These chemicals can damage the surface of the CD-ROM disk. In addition, these fluids will build up on the lens cleaning brush in your CD-ROM reader, reducing effectiveness.

F

Prudence – ne jamais utiliser de benzène, de diluant, de liquide de nettoyage, d'agent antistatique ou tout type de nettoyant de lentille de lecteur CD. Ces produits chimiques peuvent endommager la surface du CD-ROM. De plus, ces fluides se déposeraient sur la brosse de nettoyage de lentille de votre lecteur CD, réduisant son efficacité.

D

Vorsicht – Verwenden Sie niemals Benzol, Verdünner, Reinigungsflüssigkeiten, Antistatik-Mittel oder irgendwelche Arten von Linsenreinigern für CD-Spieler. Diese Chemikalien können die Oberfläche der CD-ROM beschädigen. Außerdem würden sich diese Flüssigkeiten auf der Linsenreinigungsbürste im CD-ROM-Lesegerät ablagern und deren Wirksamkeit beeinträchtigen.

Note – In some circumstances, if your CD-ROM disk does not have a clean data surface, your system may fail to boot.

F

Remarque – dans certaines circonstances, il est possible que votre système ne démarre pas si la surface de votre CD-ROM est encrassée.

D

Anmerkung – In einigen Fällen kann es bei verschmutzter Oberfläche der CD-ROM dazu kommen, daß das System nicht startet.

UNIX Commands

This document may not include specific software commands or procedures. Instead, it may name specific software tasks with reference to the operating system documentation and/or the handbook that was shipped with your new hardware.

The type of reference information which might be needed may include:

- Shutting down the system
- Booting the system
- Configuring devices
- Other basic software procedures.

See one or more of the following:

- *Solaris 2.x Handbook for SMCC Peripherals* contains Solaris™ 2.x software commands.
- On-line AnswerBook™ for the complete set of documentation supporting the Solaris 2.x software environment.
- Other software documentation which you received with your system.

Shell Prompts

TABLE P-2 lists the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	`machine_name%`
C shell superuser	`machine_name#`
Bourne shell and Korn shell	`$`
Bourne shell and Korn shell superuser	`#`

Safety Precautions

The following general safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the equipment. Sun Microsystems assumes no liability for the customer's failure to comply with these requirements.

The safety precautions listed below represent warnings of certain dangers of which Sun Microsystems is aware. You, as the user of the product, should note these warnings and all other safety precautions necessary for the safe operation of the equipment in your operating environment.

Safety Requirements

For protection, observe the following safety precautions when setting up the equipment:

- Follow all cautions, warnings and instructions marked on the equipment.
- Never push objects of any kind through openings in the equipment. They may touch dangerous voltage points or short components, resulting in fire or electric shock.
- Refer servicing of equipment to qualified personnel.

Ground the Instrument

Class 1 equipment:

To minimize shock hazard, the equipment enclosure must be reliably connected to an electrical ground. This DC unit is provided with an equipment grounding connection point. The equipment grounding conductor must be securely fastened to the identified ground point.

Do Not Operate in an Explosive Atmosphere

Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

Keep Away From Live Circuits

Only trained personnel may remove equipment covers for internal subassembly or component replacement or any internal adjustment. Under certain conditions, dangerous voltages may exist even with the power source removed.

Do Not Service or Adjust Alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

Do Not Substitute Parts or Modify Equipment

Because of the danger of introducing additional hazards and/or the possibility of compromising emissions compliance, do not install substitute parts or perform any unauthorized modification of the equipment. Contact your local support organization for service and repair to ensure that safety features are maintained.

Placement of a Sun Product

Caution – To ensure reliable operation of the Sun product and to protect it from overheating, openings in the equipment must not be blocked or covered.

Power Connection

Caution – The power switch of this product functions as a standby type device only. The DC power connector serves as the primary disconnect devices for the system.

Electrostatic Discharge

Caution – The boards and hard disk drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothes or work environment can destroy components.
Do not touch the components themselves or any metal parts. Wear a wrist strap when handling the drive assemblies, boards or cards.

Lithium Battery

Caution – On Sun system boards, a lithium battery is molded into the real-time clock, SDS No. M48T59Y, MK48TXXB-XX, M48T18-XXXPCZ or M48T59W-XXXPCZ.

Caution – Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer’s instructions.

Prudence – Il y a danger d’explosion s’il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d’un équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

D

Vorsicht – Explosionsgefahr bei nicht ordnungsgemãssem Einbau der Batterie. Nur mit gleichen oder vom Hersteller empohlenen Teilen zu ersetzen. Gebrauchte Batterien bitte nach Herstellerangaben entsorgen.

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Mesures de sécurité

Les mesures de sécurité générales suivantes doivent être respectées pendant toutes les phases de fonctionnement, d'entretien et de réparation de cet appareil. Le non-respect de ces mesures ou des avertissements spécifiques mentionnés à d'autres pages de ce manuel est une violation des normes de sécurité en matière de construction, de fabrication, et des conditions d'utilisation prévues de l'appareil. Sun Microsystems n'assume aucune responsabilité en cas de non-respect des exigences mentionnées de la part du client.

Les mesures de sécurité listées ci-dessous constituent des avertissements relatifs à certains dangers connus par Sun Microsystems. En tant qu'utilisateur de ce produit, vous devez prendre connaissance de ces avertissements et de toutes les mesures de sécurité nécessaires au fonctionnement de l'appareil en toute sécurité dans votre environnement d'utilisation.

Conditions requises en matière de sécurité

Pour votre sécurité, veuillez respecter toutes les mesures de sécurité lors de l'installation de l'appareil:

- Respectez tous les avertissements, recommandations et instructions indiqués sur l'appareil.
- Assurez-vous que les valeurs de tension et de fréquence de l'alimentation électrique correspondent à celles indiquées sur l'appareil.
- Ne jamais introduire d'objet de quelque type que ce soit dans les ouvertures de l'appareil. Ils pourraient entrer en contact avec des éléments dangereux sous tension ou court-circuiter des composants, provoquant un incendie ou un choc électrique.
- Ne faites effectuer les travaux d'entretien que par du personnel qualifié.

Mise à la terre de l'appareil

Appareil de Classe 1:

Pour minimiser les risques de choc électrique, le boîtier de l'appareil doit être mis à la terre. Cet appareil à courant continu est fourni avec une connexion de mise à la terre. Le conducteur de mise à la terre doit être raccordé solidement à la prise de terre indiquée.

Ne pas faire fonctionner dans une atmosphère en danger d'explosion

Ne pas faire fonctionner l'appareil en présence de gaz ou de vapeurs inflammables. L'utilisation de tout équipement électrique dans un environnement de ce type présente un grave danger en matière de sécurité.

Ne vous approchez pas de circuits sous tension

Seul le personnel formé à cet effet peut retirer les couvercles de l'appareil pour procéder à des réglages internes, des échanges de composants ou autres travaux à l'intérieur de l'appareil. Dans certaines conditions, des tensions dangereuses peuvent être présentes dans l'appareil, même lorsque l'alimentation en courant est interrompue.

Ne pas procéder seul à des travaux d'entretien ou de réglage

N'essayez pas de procéder à des travaux d'entretien ou de réglage internes hors de la présence d'une personne capable, en cas de besoin, de fournir les premiers soins et de réanimer un éventuel blessé.

Ne pas remplacer de pièces ou modifier l'équipement

Considérant le risque de provoquer des dangers supplémentaires et / ou la possibilité de compromettre les dispositions de conformité, ne pas installer de pièces de valeur moindre ou effectuer de modification non autorisée sur l'appareil. Adressez-vous à une entreprise locale pour tous travaux de service et de réparation afin d'être assuré que les mesures de sécurité seront respectées.

D Sicherheitsvorkehrungen

Die folgenden, allgemeinen Sicherheitsvorkehrungen müssen bei allen Betriebs-, Wartungs- und Reparaturvorgängen dieses Gerätes beachtet werden. Die Mißachtung dieser Vorkehrungen oder anderer Warnungen und Hinweise an anderer Stelle in diesem Handbuch verletzt Sicherheitsstandards von Konstruktion und Herstellung und widerspricht den vorgesehenen Einsatzbedingungen des Gerätes. Sun Microsystems übernimmt keinerlei Verantwortung für das Versäumnis von Kunden, die genannten Anforderungen zu erfüllen.

Die im folgenden genannten Sicherheitsvorkehrungen dienen als Warnungen vor bestimmten Gefahren, die Sun Microsystems bekannt sind. Sie, als Benutzer des Produktes, sollten diese Warnungen und alle anderen Sicherheitsvorkehrungen sorgfältig beachten, da diese für den sicheren Betrieb der Geräte unter allen Einsatzbedingungen wichtig sind.

Sicherheitsanforderungen

Beachten Sie zu Ihrer eigenen Sicherheit alle genannten Sicherheitsvorkehrungen genau, wenn Sie das Gerät installieren:

- Beachten Sie alle Vorsichtsmaßnahmen, Warnungen und Anweisungen, die am Gerät angebracht sind.
- Stellen Sie sicher, daß die Spannung und Frequenz der Stromversorgung den Werten entsprechen, die auf dem Gerät angegeben sind.
- Stecken Sie niemals Gegenstände gleich welcher Art durch Öffnungen in das Gerät. Solche Gegenstände könnten mit spannungsführenden Elementen in Berührung kommen oder Komponenten kurzschließen. Dies kann zu Feuer oder zu elektrischen Schlägen führen.
- Lassen Sie alle Wartungsarbeiten an den Geräten nur durch qualifiziert Fachleute durchführen.

Erden des Gerätes

Gerät der Schutzklasse 1:

Um die Gefahr von Stromschlägen zu minimieren, muß das Gehäuse des Gerätes stets geerdet werden. Dieses DC-Gerät ist mit einem Erdungsanschluß versehen. Der Erdungsleiter muß sicher und zuverlässig mit dem angegebenen Erdungsanschluß verbunden werden.

Nicht in explosionsgefährdeter Atmosphäre betreiben

Betreiben Sie das Gerät nicht, wenn entzündliche Gase oder Dämpfe vorhanden sind. Der Betrieb von elektrischen Einrichtungen unter solchen Bedingungen stellt ein schweres Sicherheitsrisiko dar.

Halten Sie sich von spannungsführenden Stromkreisen fern

Nur entsprechend geschultes Fachpersonal darf die Abdeckungen des Systems entfernen, um interne Einstellungen oder sonstige Arbeiten am Gerät vorzunehmen, oder um Komponenten auszutauschen. Unter bestimmten Bedingungen können selbst bei unterbrochener Stromversorgung gefährliche Spannungen im Gerät vorhanden sein.

Keine Wartungs- oder Einstellungsarbeiten alleine vornehmen

Nehmen Sie keine internen Arbeiten an dem Gerät vor und führen Sie keine Einstellungen aus, wenn nicht eine zweite Person anwesend ist, die bei Bedarf Erste Hilfe leisten oder eine Wiederbelebung durchführen kann.

Ersetzen Sie keine Teile und nehmen Sie keinerlei Veränderungen an vorhandenen Einrichtungen vor

Wegen der Gefahr, zusätzliche Gefahrenstellen zu verursachen und/oder die Konformität mit Emissionsbestimmungen zu beeinträchtigen, dürfen keine minderwertigen Ersatzteile eingebaut und keinerlei unzulässige Veränderungen an den Einrichtungen vorgenommen werden. Wenden Sie sich für Service-Handlungen und Reparaturen stets ein lokales Service-Unternehmen, damit sichergestellt ist, daß alle Sicherheitsvorkehrungen unbeeinträchtigt bleiben.

CHAPTER 1

Product Description

The Netra t 1100 system is a uni-processor device that uses the family of UltraSPARC™ II processors. Enclosed within a rack-mounting enclosure, the Netra t 1100 provides the following:

- Power and cooling for high performance processors;
- Extensive IO expansion and a wide range of options;
- Modular internal design;
- High performance disk, system, memory and IO subsystem;
- High-performance peripheral component interconnect (PCI) IO expansion with comparable options to existing SBus options.

FIGURE 1-1 on page 3 and FIGURE 1-2 on page 3 show the Netra t 1100 system. The following sections provide a brief description of the Netra t 1100 IO devices and a detailed overview of the system's features.

System Unit Features

System unit components are housed in a rack-mounting enclosure. Overall enclosure dimensions (width x depth x height) are 431.8mm x 508mm x 177.8mm (17in x 20in x 7in). System unit electronics are contained on a single printed circuit board (motherboard). The motherboard contains the CPU module, memory, system control application-specific integrated circuits (ASICs) and IO ASICs.

The system unit has the following features:

- Rack-mounting enclosure with 350W power supply.
- Support for modular UltraSPARC II processor with 1Mb or 2Mb Ecache, and system operating frequencies from 250MHz to 300MHz.
- UPA coherent memory interconnect.
- Use of DIMMs, with an interleaved memory system. Each pair of DIMM slots (four rows of two pairs each) accepts 32, 64 or 128Mb DIMM modules. Populating with two pairs of identical capacity DIMMs enables the memory controller to interleave and overlap, providing optimal system performance. There are a total of 16 DIMM slots.

- Four PCI slots:
  - Three 33MHz, 64- or 32-bit, 5VDC slots
  - One 66MHz or 33MHz, 64- or 32-bit, 3.3VDC slot

  Universal PCI cards can be used in any of the four PCI slots.
- 10/100megabit per second (Mbps) Ethernet.
- 40Mb/s UltraSCSI (Fast-20).
- Two DB-25 serial ports (synchronous and asynchronous protocols).

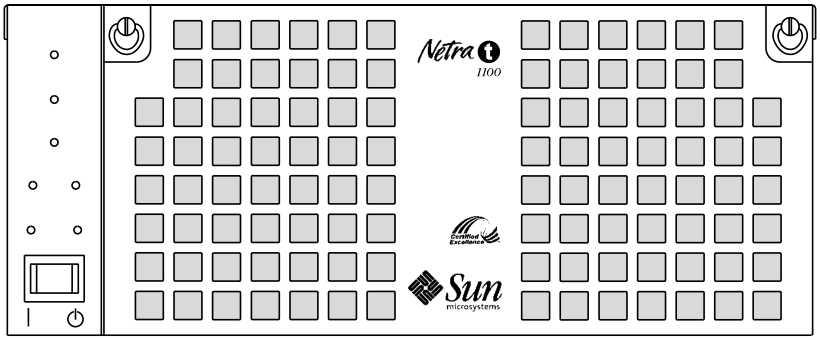

FIGURE 1-1 System Unit Front View

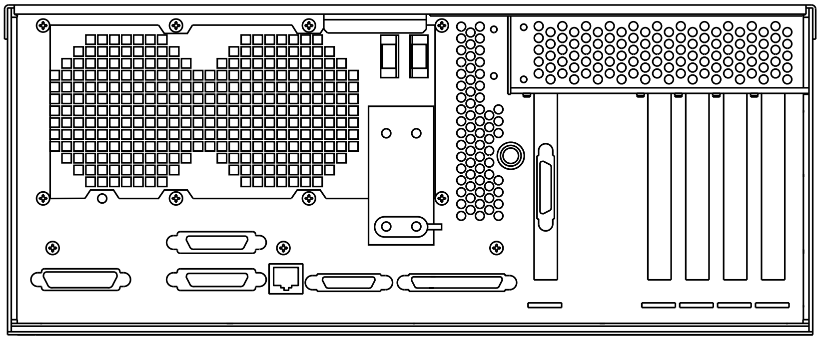

FIGURE 1-2 System Unit Rear View

System Unit Components

TABLE 11-1 on page 105 lists the system unit components by part number. A brief description of each listed component is also provided.

Note – Part numbers listed in TABLE 11-1 on page 105 are correct as of the service manual publication date but are subject to change without notice. Consult your authorized Sun sales representative or service provider to confirm a part number prior to ordering a replacement part.

CHAPTER **2**

SunVTS Overview

This chapter contains an overview of the Netra t 1100 SunVTS™ diagnostic tool. The following is the list of the SunVTS diagnostic topics presented in this chapter.

SunVTS Description

The SunVTS software executes multiple diagnostic hardware tests from a single user interface. SunVTS verifies the configuration, functionality and reliability of most hardware controllers and devices.

SunVTS Operation

TABLE 2-1 lists the documentation for the SunVTS software. These documents are available on the *Solaris on Sun Hardware AnswerBook*, which is on the *SMCC Updates CD-ROM* for the Solaris release.

TABLE 2-1 SunVTS Documentation

Title	Part Number	Description
SunVTS User's Guide	802-5331	Describes the SunVTS environment; starting and controlling various user interfaces; feature descriptions
SunVTS Test Reference Manual	802-5330	Describes each SunVTS test; provides various test options and command line arguments
SunVTS Quick Reference Card	802-5329	Provides overview of `vtsui` interface features
SunVTS 2.0.1 Test Supplement	802-7680	Adds new and enhanced test information to the SunVTS Test Reference Manual

CHAPTER **3**

Power-On Self-Test

This chapter contains procedures to initiate the Netra t 1100 system unit power-on self-test (POST) diagnostics. Procedures are also included to support pre-POST preparation, POST data interpretation and the bypassing of POST diagnostics. The following is a list of the POST diagnostic topics presented in this chapter.

POST Overview

POST can be used to determine if part of the system unit has failed and should be replaced. POST detects approximately 95 percent of system unit faults, and is located in the system board OpenBoot™ PROM (OBP). The setting of two NVRAM variables, the `diag-switch?` and `diag-level` flags, determines if POST is executed. TABLE 3-1 lists the `diag-switch?` and `diag-level` flag settings for disabling POST (`off`), enabling POST maximum (`max`), or enabling POST minimum (`min`).

TABLE 3-1 Diag-Level Switch Settings

`Diag-Level` **Setting**	**POST Initialization**	**Serial Port A IO**	**Serial Port A Error Output**	`Diag-Switch?` **Setting**
Off	No	N/A	N/A	N/A
Max	Yes (power-on)	Enabled	Enabled	True
Min	Yes (power-on)	Disabled	Enabled	True

Pre-POST Preparation

Pre-POST preparation includes:

- Setting up a `tip` connection to another workstation or terminal to view POST progress and error messages. See “To Set Up a tip Connection” below.
- Verifying baud rates between a Netra t 1100 and a terminal. See “To Verify the Baud Rate” on page 10.

To Set Up a `tip` Connection

A `tip` connection enables a remote shell window to be used as a terminal to display test data from a system being tested. Serial ports A or used to establish the `tip` connection between the system unit being tested and another Sun workstation monitor or TTY-type terminal. The `tip` connection is used in a SunOS window and provides features to help with the OBP.

1. **Connect serial port A of the system being tested to another Sun workstation serial port B using a serial null modem cable (connect cable pins 2-3, 3-2, 7-20, and 20-7).**

2. **At the other Sun workstation, check the `/etc/remote` file:**

```
hardwire:\
    :dv=/dev/term/b:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D:
```

Note – The example shows connection to serial port B, `ttyb`.

3. **To use serial port A:**

   a. **Copy and paste the following:**

```
hardwire:\
    :dv=/dev/term/b:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D:
```

   b. **Then modify as follows:**

```
hardwire:\
    :dv=/dev/term/a:br#9600:el=^C^S^Q^U^D:ie=%$:oe=^D:
```

4. **In a Shell Tool window on the Sun workstation, type `tip hardwire`. Verify the response:**

```
hostname% tip hardwire
connected
```

Note – The shell window is now a `tip` window directed to the serial port of the system unit being tested. When power is applied to the system unit being tested, POST messages will be displayed in this window.

5. **When POST is completed, disconnect the `tip` window as follows:**

   a. **Open a Shell Tool.**

   b. **Type `ps -a` to view the active `tip` line and process ID (PID) number.**

   c. **Type the following to kill the `tip` hardwire process.**

```
hostname% kill -9 PID# of tip hardwire process
```

To Verify the Baud Rate

To verify the baud rate between the system unit being tested and a terminal or another Sun workstation monitor:

1. **Open a Shell Tool.**
2. **Type `eeprom`.**
3. **Verify the following serial port default settings as follows:**

```
ttyb-mode = 9600,8,n,1
ttya-mode = 9600,8,n,1
```

Note – Ensure that the settings are consistent with TTY-type terminal or workstation monitor settings.

To Initialize POST

POST is initialized by setting `diag-switch?` to `true` and `diag-level` to `max` or `min`, followed by power cycling the system unit.

1. **At the system prompt, type:**

```
setenv diag-switch? true
```

2. **When the POST is complete, set `diag-switch?` to `false` (default setting).**

Maximum and Minimum Levels of POST

Two levels of POST are available: maximum (`max`) level and minimum (`min`) level. The system initiates the selected level of POST based on the setting of `diag-level`, an NVRAM variable.

The default setting for `diag-level` is `max`. An example of a `max` level POST output on serial port A is provided in "diag-level Variable Set to max" An example of a `min` level POST output on serial port A is provided in "diag-level Variable Set to min" on page 21.

To set `diag-level` to `min`, type:

```
ok setenv diag-level min
```

To return to the default setting:

```
ok setenv diag-level max
```

`diag-level` Variable Set to `max`

When the `diag-level` variable is set to `max`, POST enables an extended set of diagnostic-level tests. This mode requires approximately four and a half minutes to complete. CODE EXAMPLE 3-1 identifies a typical serial port A POST output with `diag-level` set to `max`.

Note – xxxx placeholders used in table entries represent numeric values which can change without notice.

CODE EXAMPLE 3-1 `diag-level` set to `max`

```
xHardware Power ONButton Power ON
SCUPP detected
Configuring SCUP for 72.0-84.0 Mhz
Blackbird >V1.0
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
@(#) Sun Ultra 30 UPA/PCI  3.9 Version 5 created 1997/04/11 10:03
Probing keyboard Done
%o0 = 0000.0000.0000.4001

Executing Power On SelfTest



@(#) Sun Ultra 30 UPA/PCI POST 1.1.1 03/04/97

CPU: UltraSPARC 2 (MHz: 248 MID: 0 Ecache Size: 1024KB)
Init System BSS
NVRAM Battery Detect Test
NVRAM Scratch Addr Test
NVRAM Scratch Data Test
M48T59 TOD Timestamp Test
M48T59 TOD Init Test
M48T59 TOD Functional Test
DMMU TLB Tag Access Test
DMMU TLB RAM Access Test
Probe Ecache
Ecache RAM Addr Test
Ecache Tag Addr Test
Invalidate Ecache Tags
Init SC Regs
SC Address Reg Test
SC Reg Index Test
SC Regs Test
Init SC Regs
Probe Memory
INFO:       0MB Bank 0
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
INFO:       0MB Bank 1
INFO:       0MB Bank 2
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
INFO:      64MB Bank 7
Interleave Mode Enable
Malloc Post Memory
Init Post Memory
Memory Addr w/ Ecache Test
Map PROM/STACK/NVRAM in DMMU
Update Master Stack/Frame Ptrs
V9 Instruction Test
CPU Tick and Tick Compare Reg Test
CPU Soft Trap Test
CPU Softint Reg and Int Test
FPU Regs Test
FPU Move Regs Test
FPU State Reg Test
FPU Functional Test
FPU Trap Test
DMMU Primary Context Reg Test
DMMU Secondary Context Reg Test
DMMU TSB Reg Test
DMMU Tag Access Reg Test
DMMU VA Watchpoint Reg Test
DMMU PA Watchpoint Reg Test
IMMU TSB Reg Test
IMMU Tag Access Reg Test
IMMU TLB RAM Access Test
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
IMMU TLB Tag Access Test
Dcache RAM Test
Dcache Tag Test
Icache RAM Test
Icache Tag Test
Icache Next Test
Icache Predecode Test
Displacement Flush Ecache
Ecache RAM Test
Ecache Tag Test
Ecache Access Test
Init Psycho
Psycho Cntl and UPA Reg Test
Psycho DMA Scoreboard Reg Test
Psycho Perf Cntl Reg Test
PIO Decoder and BCT Test
PCI Byte Enable Test
Counter/Timer Limit Regs Test
Timer Increment Test
Timer Reload Test
Timer Periodic Test
Mondo Int Map (short) Reg Test
Mondo Int Set/Clr Reg Test
Psycho IOMMU Regs Test
Psycho IOMMU RAM NTA Test
Psycho IOMMU CAM NTA Test
Psycho IOMMU RAM Address Test
Psycho IOMMU CAM Address Test
IOMMU TLB Compare Test
IOMMU TLB Flush Test
Stream Buff A Control Reg Test
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
Psycho ScacheA Page Tag Addr Test
Psycho ScacheA Line Tag Addr Test
Psycho ScacheA RAM Addr Test
Psycho ScacheA Page Tag NTA Test
Psycho ScacheA Line Tag NTA Test
Psycho ScacheA Error Status NTA Test
Psycho ScacheA RAM NTA Test
Stream Buff B Control Reg Test
Psycho ScacheB Page Tag Addr Test
Psycho ScacheB Line Tag Addr Test
Psycho ScacheB RAM Addr Test
Psycho ScacheB Page Tag NTA Test
Psycho ScacheB Line Tag NTA Test
Psycho ScacheB Error Status NTA Test
Psycho ScacheB RAM NTA Test
PBMA PCI Config Space Regs Test
PBMA Control/Status Reg Test
PBMA Diag Reg Test
PBMB PCI Config Space Regs Test
PBMB Control/Status Reg Test
PBMB Diag Reg Test
Init Memory
INFO:       0MB Bank 0
INFO:       0MB Bank 1
INFO:       0MB Bank 2
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
INFO:      64MB Bank 7
Memory RAM Test
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
INFO:       0MB Bank 0
INFO:       0MB Bank 1
INFO:       0MB Bank 2
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
INFO:      64MB Bank 7
Memory Addr w/ Ecache Test
INFO:       0MB Bank 0
INFO:       0MB Bank 1
INFO:       0MB Bank 2
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
INFO:      64MB Bank 7
Block Memory Addr Test
INFO:       0MB Bank 0
INFO:       0MB Bank 1
INFO:       0MB Bank 2
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
INFO:      64MB Bank 7
Displacement Flush Ecache Test
ECC Memory Addr Test
INFO:       0MB Bank 0
INFO:       0MB Bank 1
INFO:       0MB Bank 2
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
INFO:      64MB Bank 7
DMMU Hit/Miss Test
IMMU Hit/Miss Test
DMMU Little Endian Test
IU ASI Access Test
FPU ASI Access Test
Ecache Thrash Test
UltraSPARC-2 Prefetch Instructions Test
CPU UPA Config: 000003b8.3cc0803b
SRAM Mode: 22 Clock Mode: 3:1 ELIM: 4 PCON: 0f3 MCAP: 7
Ecache Size Limited: 1024KB
Test 0: prefetch_mr
Test 1: prefetch to non-cacheable page
Test 2: prefetch to page with dmmu misss
Test 3: prefetch miss does not check alignment
Test 4: prefetcha with asi 0x4c is noped
Test 5: prefetcha with asi 0x54 is noped
Test 6: prefetcha with asi 0x6e is noped
Test 7: prefetcha with asi 0x76 is noped
Test 8: prefetch with fcn 5
Test 9: prefetch with fcn 2
Test 10: prefetch with fcn 12
Test 11: prefetch with fcn 16 is noped
Test 12: prefetch with fcn 29 is noped
Test 13: prefetcha with asi 0x15 is noped
Test 14: prefetch with fcn 3
Test 15: prefetcha14 with fcn 2
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
Test 16: prefetcha80_mr
Test 17: prefetcha81_1r
Test 18: prefetcha10_mw
Test 19: prefetcha80_17 is noped
Test 20: prefetcha10_6: illegal instruction trap
Test 21: prefetcha11_1w
Test 22: prefetcha81_31
Test 23: prefetcha11_15: illegal instruction trap
Init Psycho
Mondo Generate Interrupt Test
Timer Interrupt Test
Timer Interrupt w/ periodic Test
Psycho Stream Buff A Flush Sync Test
Psycho Stream Buff B Flush Sync Test
Psycho Stream Buff A Flush Invalidate Test
Psycho Stream Buff B Flush Invalidate Test
Psycho Merge Buffer w/ Scache A Test
Psycho Merge Buffer w/ Scache B Test
Consist DMA Rd, IOMMU miss Ebus Test
Consist DMA Rd, IOMMU miss Lpbk Test
Consist DMA Rd, IOMMU hit Ebus Test
Consist DMA Rd, IOMMU hit Lpbk Test
Consist DMA Wr, IOMMU miss Ebus Test
Consist DMA Wr, IOMMU miss Lpbk Test
Consist DMA Wr, IOMMU hit Ebus Test
Consist DMA Wr, IOMMU hit Lpbk Test
Stream DMA Rd, IOMMU miss, Scache Miss Ebus Test
Stream DMA Rd, IOMMU miss, Scache Miss Lpbk Test
Stream DMA Rd, IOMMU hit, Scache Miss Ebus Test
Stream DMA Rd, IOMMU hit, Scache Miss Lpbk Test
Stream DMA Rd, IOMMU Miss, Scache(prev rd) Hit Ebus Test
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
Stream DMA Rd, IOMMU Miss, Scache Hit (prev rd) Lpbk Test
Stream DMA Rd, IOMMU Hit, Scache Hit Ebus Test
Stream DMA Rd, IOMMU Hit, Scache Hit (prev rd) Lpbk Test
Stream DMA Rd, IOMMU Miss, Scache Hit(prev wr) Ebus Test
Stream DMA Rd, IOMMU Miss, Scache Hit (prev wr) Lpbk Test
Stream DMA Rd, IOMMU Hit, Scache Hit(prev wr) Ebus Test
Stream DMA Rd, IOMMU Hit, Scache Hit (prev wr) Lpbk Test
Stream DMA Wr, IOMMU miss, Scache Miss Ebus Test
Stream DMA Wr, IOMMU miss, Scache Miss Lpbk Test
Stream DMA Wr, IOMMU hit, Scache Miss Ebus Test
Stream DMA Wr, IOMMU hit, Scache Miss Lpbk Test
Stream DMA Wr, IOMMU Miss, Scache(prev rd) Hit Ebus Test
Stream DMA Wr, IOMMU Miss, Scache(prev rd) Hit Lpbk Test
Stream DMA Wr, IOMMU Hit, Scache(prev rd) Hit Ebus Test
Stream DMA Wr, IOMMU Hit, Scache(prev rd) Hit Lpbk Test
Stream DMA Wr, IOMMU Miss, Scache(prev wr) Hit Ebus Test
Stream DMA Wr, IOMMU Miss, Scache(prev wr) Hit Lpbk Test
Stream DMA Wr, IOMMU Hit, Scache(prev wr) Hit Ebus Test
Stream DMA Wr, IOMMU Hit, Scache(prev wr) Hit Lpbk Test
Pass-Thru DMA Rd, Ebus device Test
Pass-Thru DMA Wr, Ebus device Test
Consist DMA Rd, IOMMU LRU Lock Ebus Test
Consist DMA Rd, IOMMU LRU Lock Lpbk Test
Stream DMA Rd, IOMMU LRU Lock, Scache LRU Lock Ebus Test
Stream DMA Rd, IOMMU LRU Lock, Scache LRU Lock Lpbk Test
Stream DMA Rd, IOMMU miss, Scache LRU Lock Ebus Test
Stream DMA Rd, IOMMU Miss, Scache LRU Lock Lpbk Test
Stream DMA Rd, IOMMU Hit, Scache LRU Lock Ebus Test
Stream DMA Rd, IOMMU Hit, Scache LRU Lock Lpbk Test
Stream DMA Rd, IOMMU LRU Lock, Scache Miss Ebus Test
Stream DMA Rd, IOMMU LRU Lock, Scache Miss Lpbk Test
```

CODE EXAMPLE 3-1 `diag-level` set to `max` *(Continued)*

```
Consist DMA Wr, IOMMU LRU Locked Ebus Test
Consist DMA Wr, IOMMU LRU Lock Lpbk Test
Stream DMA Wr, IOMMU LRU Lock, Scache LRU Lock Ebus Test
Stream DMA Wr, IOMMU LRU Lock, Scache LRU Lock Lpbk Test
Stream DMA Wr, IOMMU Miss, Scache LRU Lock Ebus Test
Stream DMA Wr, IOMMU Miss, Scache LRU Lock Lpbk Test
Stream DMA Wr, IOMMU Hit, Scache LRU Lock Ebus Test
Stream DMA Wr, IOMMU Hit, Scache LRU Lock Lpbk Test
Stream DMA Wr, IOMMU LRU Lock, Scache Miss Ebus Test
Stream DMA Wr, IOMMU LRU Lock, Scache Miss Lpbk Test
Stream DMA Wr, IOMMU LRU Lock, Scache(prev rd) Hit Ebus Test
Stream DMA Wr, IOMMU LRU Lock, Scache(prev rd) Hit Lpbk Test
CPU Addr Align Trap Test
DMMU Access Priv Page Test
DMMU Write Protected Page Test
Init Psycho
PIO Read Error, Master Abort Test
PIO Read Error, Target Abort Test
PIO Write Error, Master Abort Test
PIO Write Error, Target Abort Test
Pri CE ECC Error Test
Pri UE ECC Error Test
Pri 2 bit w/ bit hole UE ECC Err Test
Pri 3 bit UE ECC Err Test
STATUS =PASSED


Power On Selftest Completed
```

`diag-level` Variable Set to `min`

When `diag-level` is set to `min`, POST enables an abbreviated set of diagnostic-level tests. This mode requires approximately three minutes to complete. CODE EXAMPLE 3-2 identifies a serial port A POST output with `diag-level` set to `min`.

CODE EXAMPLE 3-2 `diag-level` set to `min`

```
Hardware Power ON Button Power ON
SCUPP detected
Configuring SCUP for 72.0-84.0 Mhz
Blackbird >V1.0

@(#) Sun Ultra 30 UPA/PCI  3.9 Version 5 created 1997/04/11 10:03
Probing keyboard Done
%o0 = 0000.0000.0000.2001

Executing Power On SelfTest



@(#) Sun Ultra 30 UPA/PCI POST 1.1.1 03/04/97

CPU: UltraSPARC 2 (MHz: 248 MID: 0 Ecache Size: 1024KB)
Init System BSS
NVRAM Battery Detect Test
NVRAM Scratch Addr Test
NVRAM Scratch Data Test
M48T59 TOD Timestamp Test
M48T59 TOD Init Test
M48T59 TOD Functional Test
DMMU TLB Tag Access Test
DMMU TLB RAM Access Test
Probe Ecache
```

CODE EXAMPLE 3-2 `diag-level` set to `min` *(Continued)*

```
Ecache RAM Addr Test
Ecache Tag Addr Test
Invalidate Ecache Tags
Init SC Regs
SC Address Reg Test
SC Reg Index Test
SC Regs Test
Init SC Regs
Probe Memory
INFO:       0MB Bank 0
INFO:       0MB Bank 1
INFO:       0MB Bank 2
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
INFO:      64MB Bank 7
Interleave Mode Enable
Malloc Post Memory
Init Post Memory
Memory Addr w/ Ecache Test
Map PROM/STACK/NVRAM in DMMU
Update Master Stack/Frame Ptrs
V9 Instruction Test
CPU Soft Trap Test
CPU Softint Reg and Int Test
FPU Regs Test
FPU Move Regs Test
DMMU Primary Context Reg Test
DMMU Secondary Context Reg Test
DMMU TSB Reg Test
```

CODE EXAMPLE 3-2 `diag-level` set to `min` *(Continued)*

```
DMMU Tag Access Reg Test
IMMU TSB Reg Test
IMMU Tag Access Reg Test
Dcache Tag Test
Icache Tag Test
Displacement Flush Ecache
Ecache RAM Test
Ecache Tag Test
Ecache Access Test
Init Psycho
Psycho Cntl and UPA Reg Test
Psycho DMA Scoreboard Reg Test
Counter/Timer Limit Regs Test
Mondo Int Map (short) Reg Test
Psycho IOMMU Regs Test
Psycho IOMMU RAM Address Test
Psycho IOMMU CAM Address Test
Psycho ScacheA RAM Addr Test
Psycho ScacheB RAM Addr Test
PBMA PCI Config Space Regs Test
PBMA Control/Status Reg Test
PBMB PCI Config Space Regs Test
PBMB Control/Status Reg Test
Init Memory
INFO:       0MB Bank 0
INFO:       0MB Bank 1
INFO:       0MB Bank 2
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
```

CODE EXAMPLE 3-2 `diag-level` set to `min` *(Continued)*

```
INFO:      64MB Bank 7
Memory Addr w/ Ecache Test
INFO:       0MB Bank 0
INFO:       0MB Bank 1
INFO:       0MB Bank 2
INFO:       0MB Bank 3
INFO:       0MB Bank 4
INFO:       0MB Bank 5
INFO:      64MB Bank 6
INFO:      64MB Bank 7
IU ASI Access Test
FPU ASI Access Test
Ecache Thrash Test
UltraSPARC-2 Prefetch Instructions Test
CPU UPA Config: 000003b8.3cc0803b
SRAM Mode: 22 Clock Mode: 3:1 ELIM: 4 PCON: 0f3 MCAP: 7
Ecache Size Limited: 1024KB
Test 0: prefetch_mr
Test 1: prefetch to non-cacheable page
Test 2: prefetch to page with dmmu misss
Test 3: prefetch miss does not check alignment
Test 4: prefetcha with asi 0x4c is noped
Test 5: prefetcha with asi 0x54 is noped
Test 6: prefetcha with asi 0x6e is noped
Test 7: prefetcha with asi 0x76 is noped
Test 8: prefetch with fcn 5
Test 9: prefetch with fcn 2
Test 10: prefetch with fcn 12
Test 11: prefetch with fcn 16 is noped
Test 12: prefetch with fcn 29 is noped
Test 13: prefetcha with asi 0x15 is noped
```

CODE EXAMPLE 3-2 `diag-level` set to `min` *(Continued)*

```
Test 14: prefetch with fcn 3
Test 15: prefetcha14 with fcn 2
Test 16: prefetcha80_mr
Test 17: prefetcha81_1r
Test 18: prefetcha10_mw
Test 19: prefetcha80_17 is noped
Test 20: prefetcha10_6: illegal instruction trap
Test 21: prefetcha11_1w
Test 22: prefetcha81_31
Test 23: prefetcha11_15: illegal instruction trap
Init Psycho
Mondo Generate Interrupt Test
CPU Addr Align Trap Test
DMMU Access Priv Page Test
DMMU Write Protected Page Test
Init Psycho
PIO Read Error, Master Abort Test
PIO Read Error, Target Abort Test
PIO Write Error, Master Abort Test
PIO Write Error, Target Abort Test
Pri CE ECC Error Test
Pri UE ECC Error Test
Pri 2 bit w/ bit hole UE ECC Err Test
Pri 3 bit UE ECC Err Test
STATUS =PASSED


Power On Selftest Completed
```

POST Progress and Error Reporting

While POST is initialized, POST progress indications are visible when a TTY-type terminal or a `tip` line is connected between serial port A (default port) of the system being tested and a POST monitoring system.

If an error occurs during execution, POST attempts to send a failure message to the POST monitoring system. CODE EXAMPLE 3-3 identifies the typical appearance of a failure message.

Note – The system does not automatically boot if a POST error occurs; it halts at the `ok` prompt to alert the user of a failure.

CODE EXAMPLE 3-3 Typical Error Code Failure Message

```
UltraSPARC-2 Prefetch Instructions Test
CPU UPA Config: 000006b8.3cc0803b
SRAM Mode: 22 Clock Mode: 3:1 ELIM: 4 PCON: 0f3 MCAP: 13
Ecache Size Limited: 2048KB
Test 0: prefetch_mr
STATUS =FAILED
TEST   =UltraSPARC-2 Prefetch Instructions
TTF    =0
PASSES =1
ERRORS =1
SUSPECT=CPU (Basic) U0101
MESSAGE=
Edata Mismatch(T0) Data compare error.
addr     00000000.40802000
expected 00000000
observed 22222222
xor      22222222
```

System LEDs

FIGURE 3-1 shows the location of the LEDs.

The front panel has seven LEDs:

- POWER–*Green*
  This indicator that is illuminated at all times when the system is On.
- SUPPLY A–*Green*
  Illuminated whenever DC input A is present.
- SUPPLY B–*Green*
  Illuminated whenever DC input B is present.
- SYSTEM–*Green*
  This indicator is off (or reset) during power up procedures and is illuminated whenever UNIX is running. It is reset by a hardware Watchdog timeout or, alternatively, whenever the user-defined Alarm 3 is asserted.
- ALARM 1–*Amber*
  Illuminated whenever the user-defined Alarm 1 is asserted.
- ALARM 2–*Amber*
  Illuminated whenever the user-defined Alarm 2 is asserted.
- SPARE–*Amber*
  For future enhancement.

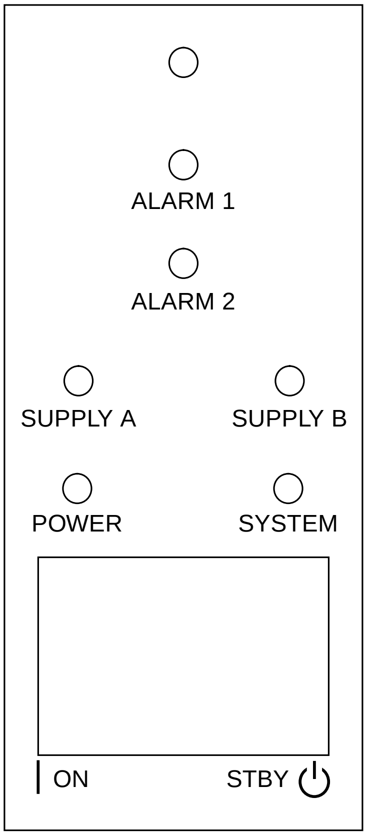

FIGURE 3-1 Netra t 1100 System LEDs

Motherboard Test

To initialize the motherboard POST:

1. **Either:**

   a. From a terminal connected to ttyA, press the <*Break*> key to enter OBP, or

   b. From a tip hardwire connection, send a break command.

2. **At the OK prompt, type:**

```
setenv diag-level max
setenv diag-switch? true
reset-all
```

The system will now reset and commence POST.

Note – Non-optional components such as four DIMMs in slots U0701, U0801, U0901, and U1001, the motherboard, the power supply and the keyboard must be installed for POST to execute properly. Removing the optional system components and retesting the system isolates the possibility that those components are the cause of the failure.

CHAPTER 4

Troubleshooting Procedures

This chapter describes how to troubleshoot possible problems with the Netra t 1100 system unit and includes suggested corrective actions. To follow these troubleshooting procedures a terminal should be connected to the Netra t 1100 system serial port A.

Power-On Failure

This section provides examples of power-on failure symptoms and suggested actions.

Symptom

The system does not power up when the power switch is pressed.

Action

Check the input power connectors are correctly fitted. Check external circuit breakers are correctly set.

Press the power switch at the front of the system unit. If the system powers on, no further action is required. If the system does not power on, the CPU module may not be properly seated. Remove the top cover and inspect the CPU module for proper seating. If the system powers on, no further action is required.

If the input DC power has been verified, the CPU module is properly seated, and the power-on key has been pressed but the system does not power up, the system power supply may be defective. See “Power Supply Test” on page 34.

Symptom

The system attempts to power up but does not boot.

Action

Press the power-on button. If the system unit still fails to boot, refer to “Motherboard Test” on page 29.

Disk Drive or Removable Media Drive Failure

This section provides disk drive and removable media drive failure symptoms and suggested actions.

Symptom

- A disk drive read, write or parity error is reported by the operating system or customer application.
- A removable media drive read error or parity error is reported by the operating system or customer application.

Action

- Replace the drive indicated by the failure message. The operating system identifies the internal drives as identified in TABLE 4-1.

TABLE 4-1 Internal Drive Identification

Operating System Address	Drive Physical Location and Target
c0t0d0s#	Lower SCSI Disk, target 0
c0t1d0s#	Upper SCSI Disk, target 1
c0t6d0s#	CD-ROM drive, target 6 (optional)
c0t5d0s#	Tape drive, target 5 (optional)

Note – The # symbol in the operating system address examples will be a numeral between 0 and 7 that describes the slice or partition on the drive.

Symptom

Disk drive or removable media drive fails to respond to commands.

Note – If POST is to be bypassed, type: `setenv diag-switch? false` at the `ok` prompt.

Action

Test the drive response to the *`probe-scsi`* command as follows:

1. **At the system `ok` prompt:**

   a. **Type** `reset-all`**.**

   b. **Type** `probe-scsi`**.**

   If the drives respond and a message is displayed, the system SCSI controller has successfully probed the devices. This indicates that the system board is operating correctly. If one drive does not respond to the SCSI controller probe but the others do, replace the unresponsive drive. If one internal disk drive is configured with the system and the `probe-scsi` test fails to show the device in the message, replace the drive. If the problem is still evident after replacing the drive, replace the SCSI backplane assembly. If replacing both the disk drive and the SCSI backplane assembly does not correct the problem, replace the motherboard.

Power Supply Test

This section describes how to test the power supply. FIGURE 4-1 and TABLE 4-2 identify power supply connector J2901. FIGURE 4-2 and TABLE 4-3 identify power supply connector J2902. FIGURE 4-3 and FIGURE 4-3 identify power supply connector J2903.

1. **Power off the system.**

   See “To Power Off the System” on page 43.

2. **Remove the top access cover.**

   See “To Remove the Top Access Cover” on page 49.

3. **Lift the power supply from the chassis and rest it on the enclosure to expose connectors J2901 through J2903.**

4. **Power on the system.**
5. **Using a digital voltage meter (DVM), check the power supply output voltages as follows:**

Note – Power supply connectors J2901 through J2903 must remain connected to the motherboard.

---

   a. **With the negative probe of the DVM placed on a connector ground (Gnd) pin, position the positive probe on each power pin.**

   b. **Verify voltage and signal availability as listed in TABLE 4-2 through FIGURE 4-3.**

6. **If any power pin signal is not present with the power supply active and properly connected to the motherboard, replace the power supply.**

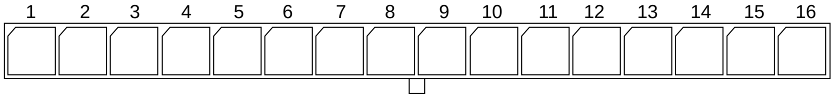

FIGURE 4-1 Power Supply Connector J2901

TABLE 4-2 Power Supply Connector J2901 Pin Description

Pin	Description	Pin	Description
1	Rtn	9	SUPPLY TRIP L
2	+3.3VDC SENSE	10	POWERON L
3	Rtn	11	–12VDC
4	+5.0VDC SENSE	12	POWER OK
5	POWER SET0 NEG	13	Rtn
6	+3.0VDC SENSE	14	+12VDC
7	POWER 0V	15	Rtn
8	POWER SET0 POS	16	+12VDC

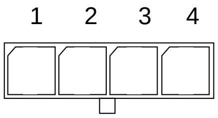

FIGURE 4-2 Power Supply Connector J2902

TABLE 4-3 Power Supply Connector J2902 Pin Description

Pin	Description	Pin	Description
1	+5.0VDC Rtn	3	+3.0VDC Rtn
2	+5.0VDC	4	+3.0VDC

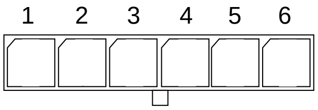

FIGURE 4-3 Power Supply Connector J2903

TABLE 4-4 Power Supply Connector J2903 Pin Description

Pin	Function	Pin	Function
1	+3.3VDC Rtn	4	+3.3VDC
2	+3.3VDC Rtn	5	+3.3VDC
3	+3.3VDC Rtn	6	+3.3VDC

DIMM Failure

At times, the operating system, diagnostic program or POST may not display a DIMM location (U number) as part of a memory error message. In this situation, the only available information is a physical memory address and failing byte (or bit). TABLE 4-5 lists physical memory addresses to locate a defective DIMM.

TABLE 4-5 DIMM Physical Memory Address

DIMM Slot	DIMM Pair (non-interleave)	DIMM Quad (interleave)
U701 U801	00000000 - 0fffffff	00000000 - 1fffffff
U901 U1001	10000000 - 1fffffff	
U702 U802	20000000 - 2fffffff	20000000 - 3fffffff
U902 U1002	30000000 - 3fffffff	
U703 U803	40000000 - 4fffffff	40000000 - 5fffffff
U903 U1003	50000000 - 5fffffff	
U704 U804	60000000 - 6fffffff	60000000 - 7fffffff
U904 U1004	70000000 - 7fffffff	

CHAPTER 5

Tool Requirements

This chapter lists the tools required to service the Netra t 1100 system:

- No.1 and No.2 Phillips-head screwdriver (magnetized tip suggested)
- Slot-head screwdriver
- Needle-nose pliers
- Antistatic wrist strap
- Digital voltage meter (DVM)
- Antistatic mat.

Place ESD-sensitive components such as system board, circuit cards, disk drives and NVRAM/TOD on an antistatic mat. The following items can be used as an antistatic mat:

- Bag used to wrap a Sun replacement part
- Shipping container used to package a Sun replacement part
- Inner side (metal part) of the system unit cover
- Sun ESD mat, part number 250-1088 (which can be purchased through your Sun sales representative)
- Disposable ESD mat; shipped with replacement parts or optional system features.

CHAPTER **6**

Power On and Off

This chapter describes how to power on and power off the Netra t 1100 system.

To Power On the System

1. **Turn on power to all connected peripherals.**

Note – Peripheral power is activated prior to system power so the system can recognize the peripherals when it is activated.

---

2. **Momentarily set the front panel ON/STBY power switch to the ON position (FIGURE 6-1).**

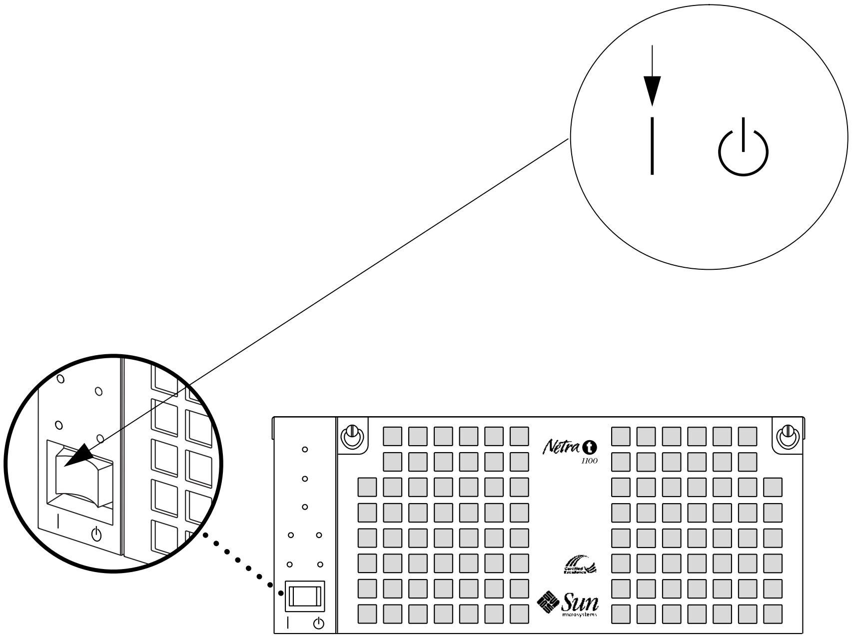

FIGURE 6-1 System Power-On (Front Panel)

To Power Off the System

Caution – Prior to turning off system power, exit from the operating system. Failure to do so may result in data loss.

---

1. **Where necessary, notify users that the system is going down.**
2. **Back up system files and data.**
3. **Halt the operating system.**
4. **Momentarily set the front panel ON/STBY power switch to the STBY ⏻ position (FIGURE 6-2) until the system powers down.**
5. **Verify that the Power LED is off.**

Caution – Regardless of the position of the ON/STBY switch, where a DC power cord remains connected to the system, DC voltage is always present within the power supply.

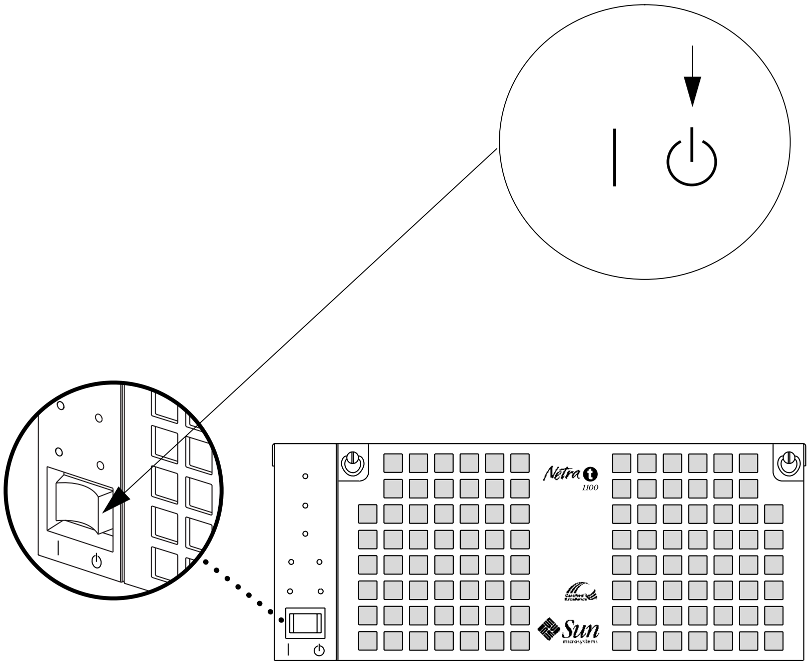

FIGURE 6-2 System Power-Off (Front Panel)

CHAPTER **7**

Internal Access

This chapter contains procedures to attach the wrist strap, remove the system top access cover and replace the system top access cover.

To Attach the Wrist Strap

Caution – Wear an antistatic wrist strap and use an ESD-protected mat when handling components. When servicing or removing system unit components, use a wrist strap with a 10mm press stud connection and attach the wrist strap to the press stud at the front or rear of the chassis. This should be performed before the top cover is removed.

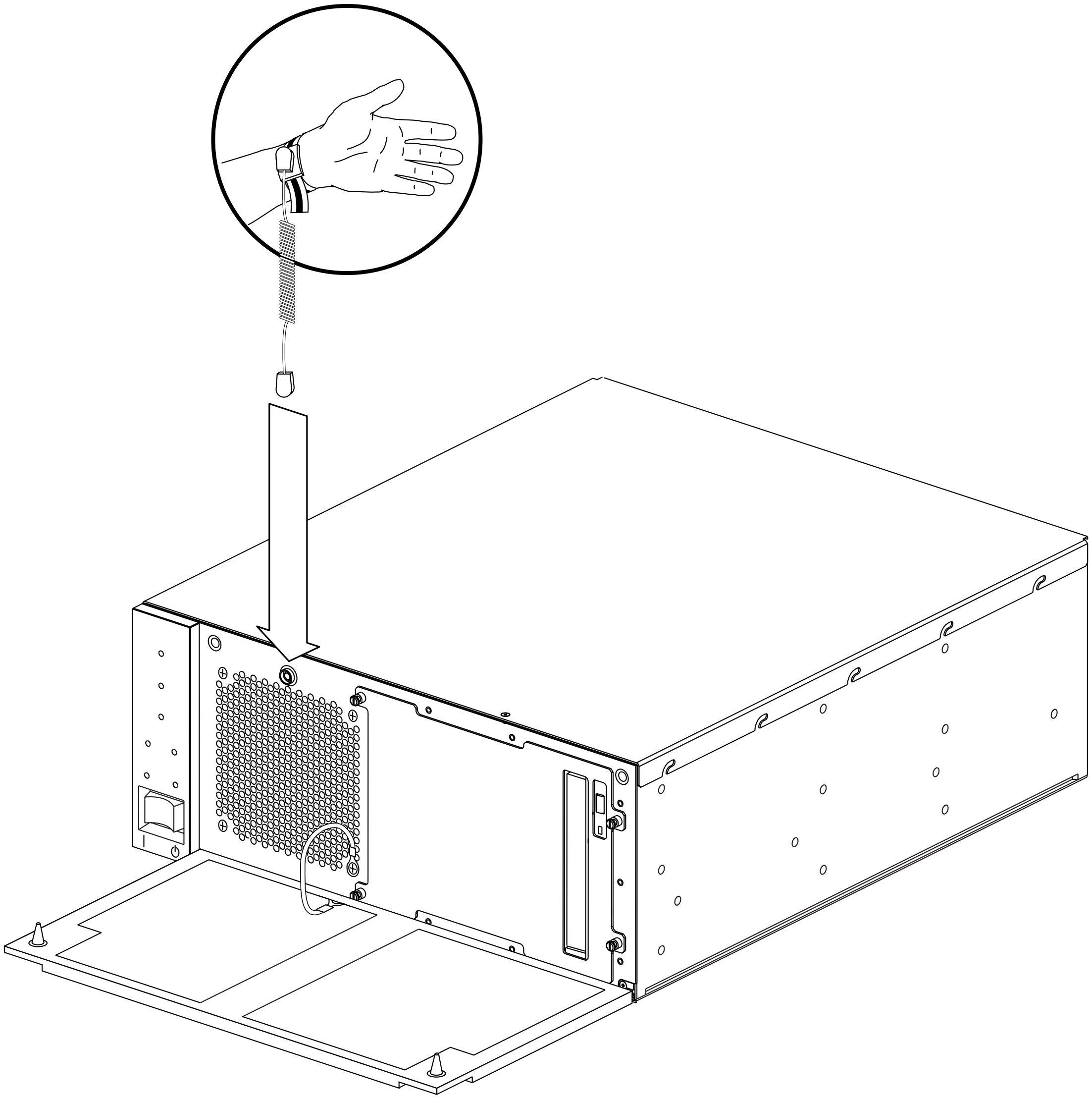

FIGURE 7-1 Attaching the Wrist Strap to the Front of the Chassis

FIGURE 7-2 Attaching the Wrist Strap to the Rear of the Chassis

To Remove the Top Access Cover

1. **Power off the system.**

   See "To Power Off the System" on page 43.

⚠ **Caution –** Wear an antistatic wrist strap and use an ESD-protected mat when handling components. When servicing or removing system unit components, an ESD Strap should be attached to the wrist, then to one of the connection points provided on the system, and then the power connectors should be removed from the system unit. Following this caution equalizes all electrical potentials with the system unit.

---

2. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

3. **Remove the rack fixing screws and withdraw the unit on its slides (if fitted). Refer to FIGURE 7-3 on page 50.**
   To remove the top access cover, the unit may need to be completely removed from the rack. If slides are fitted, disconnect the cables and release the slides. Place the system on an approved work station / position.

4. **Remove the two screws from the front of the top access cover and carefully store them away from the system unit.**

5. **Place the system so that the extended tab of the top access cover is facing you. To release the top cover, pull the tab towards you and lift the cover off.**

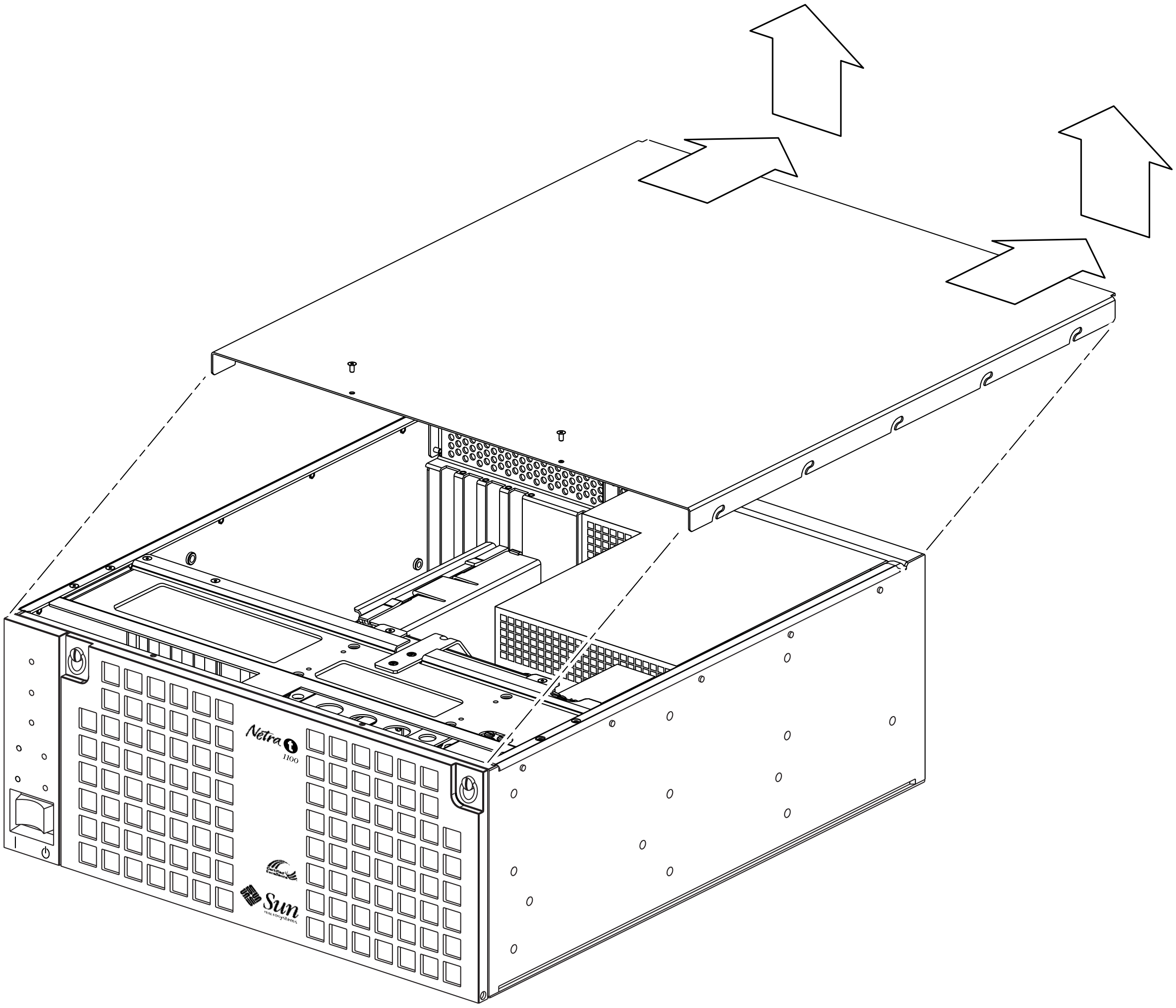

FIGURE 7-3 Removing the Top Access Cover

To Replace the Top Access Cover

Caution – Wear an antistatic wrist strap and use an ESD-protected mat when handling components. When servicing or removing system unit components, an ESD Strap should be attached to the wrist, then to one of the connection points provided on the system, and then the power connectors should be removed from the system unit.Following this caution equalizes all electrical potentials with the system unit.

1. **Attach the wrist strap.**

   See “To Attach the Wrist Strap” on page 46.

2. **Position the top access cover.**

   See FIGURE 7-4 on page 52.

3. **Engage the top access cover. Push the top cover forwards until the lugs on the sides have fully engaged in the slots.**

4. **Replace the two fixing screws.**

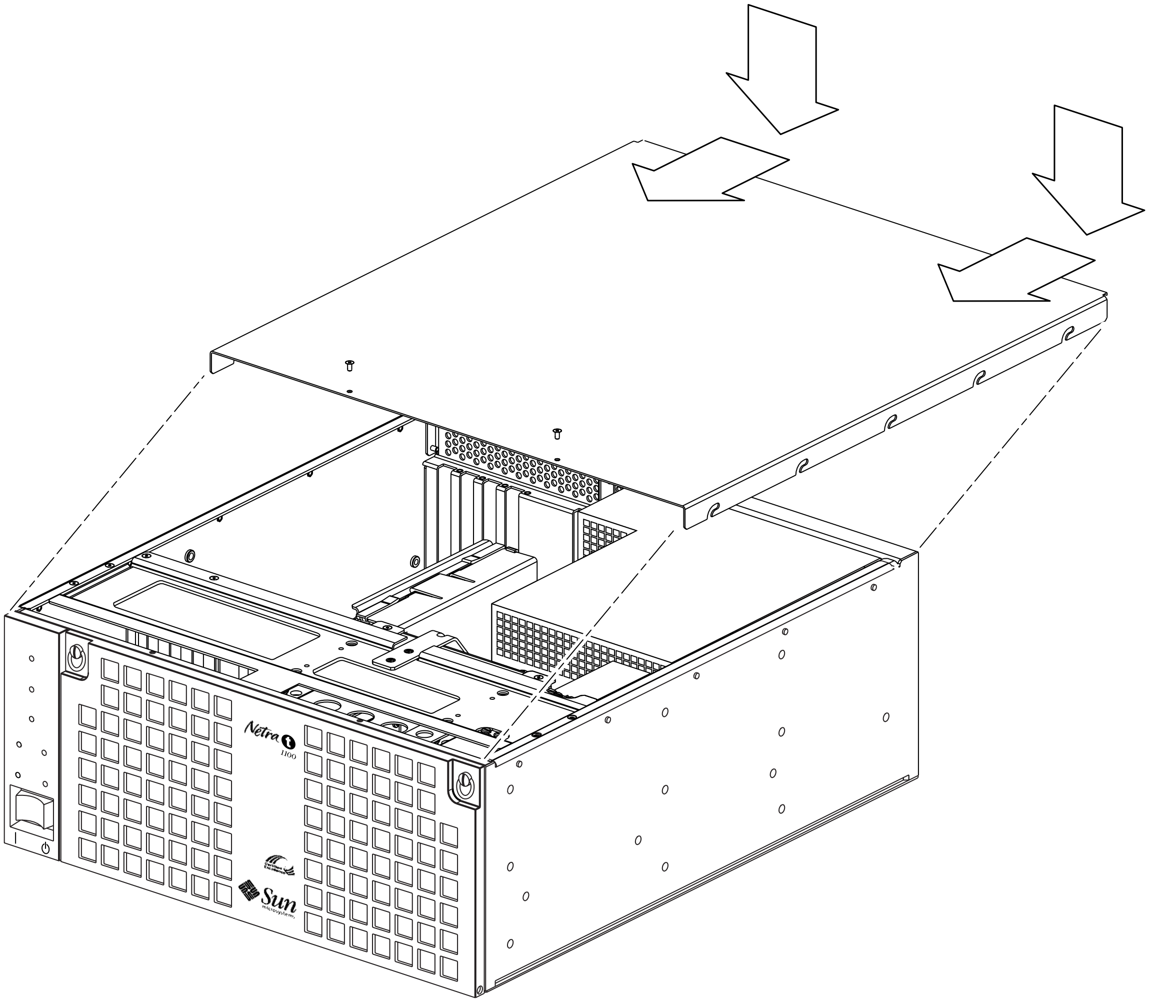

FIGURE 7-4 Replacing the Top Access Cover

CHAPTER 8

Power Subassemblies

This chapter contains procedures to remove and replace the power subassemblies of the Netra t 1100 system unit enclosure.

Power Supply

To Remove the Power Supply

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

Caution – When removing the power supply, attach the copper end of the wrist strap to the system unit chassis, not to the power supply.

3. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

4. **If necessary, disconnect the two DC power connectors from the system.**

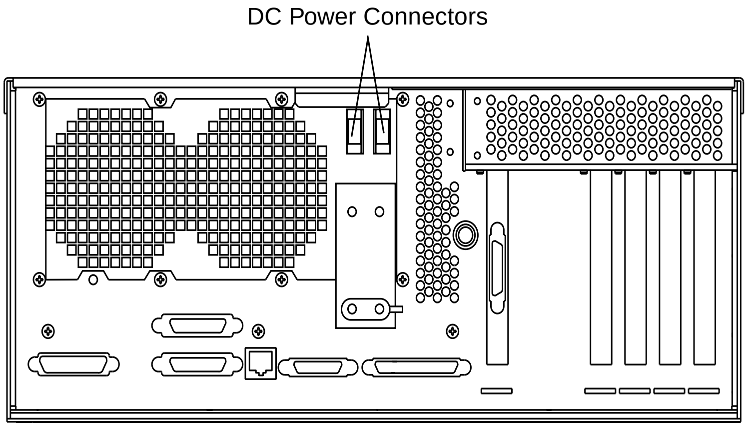

FIGURE 8-1 DC Power Connectors

5. **Using an 8mm wrench, remove the primary earth connection by removing the M5 nut and washers.**

6. **Using a No.2 Phillips-head screwdriver, loosen the eight external and two internal captive screws securing the power supply to the chassis. (See FIGURE 8-2and 8-3.)**

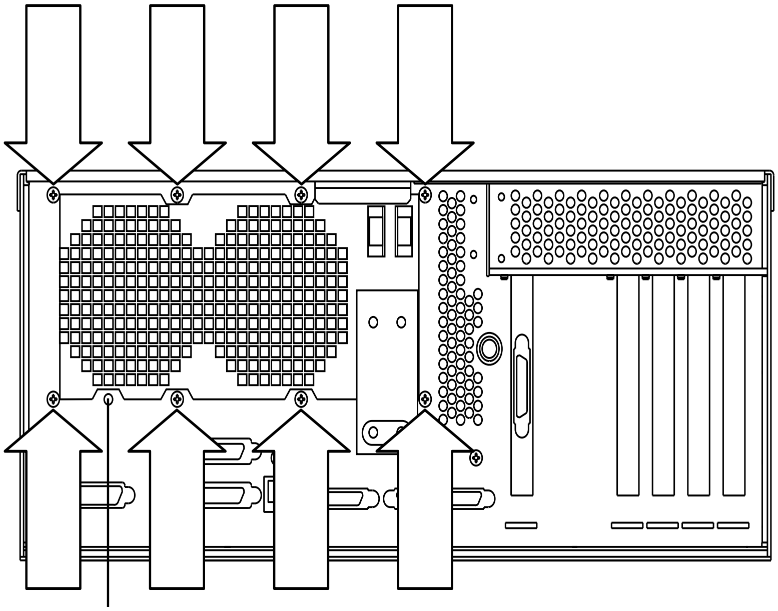

FIGURE 8-2 Removing the Power Supply

7. **Push the power supply forwards slightly to clear the earth grounding stud.**

8. **Lift the power supply from the chassis until it is restrained by the power supply cables. Rest the power supply on the front crossmember of the enclosure.**

9. **Remove the cables from the clip retaining them to the processor mounting plate.**

10. **Disconnect the two cables from the alarms card. (To perform this it may be necessary to remove the alarms card and any PCI cards from the chassis.)**

11. **Disconnect the power supply cables from the motherboard.**

12. **Disconnect the power supply cable from the removable drive assembly.**

13. **Disconnect the power supply cable from the hard disk drive assembly.**

14. **Disconnect the power supply cable from the main fan unit.**

15. **Remove the power supply from the chassis.**

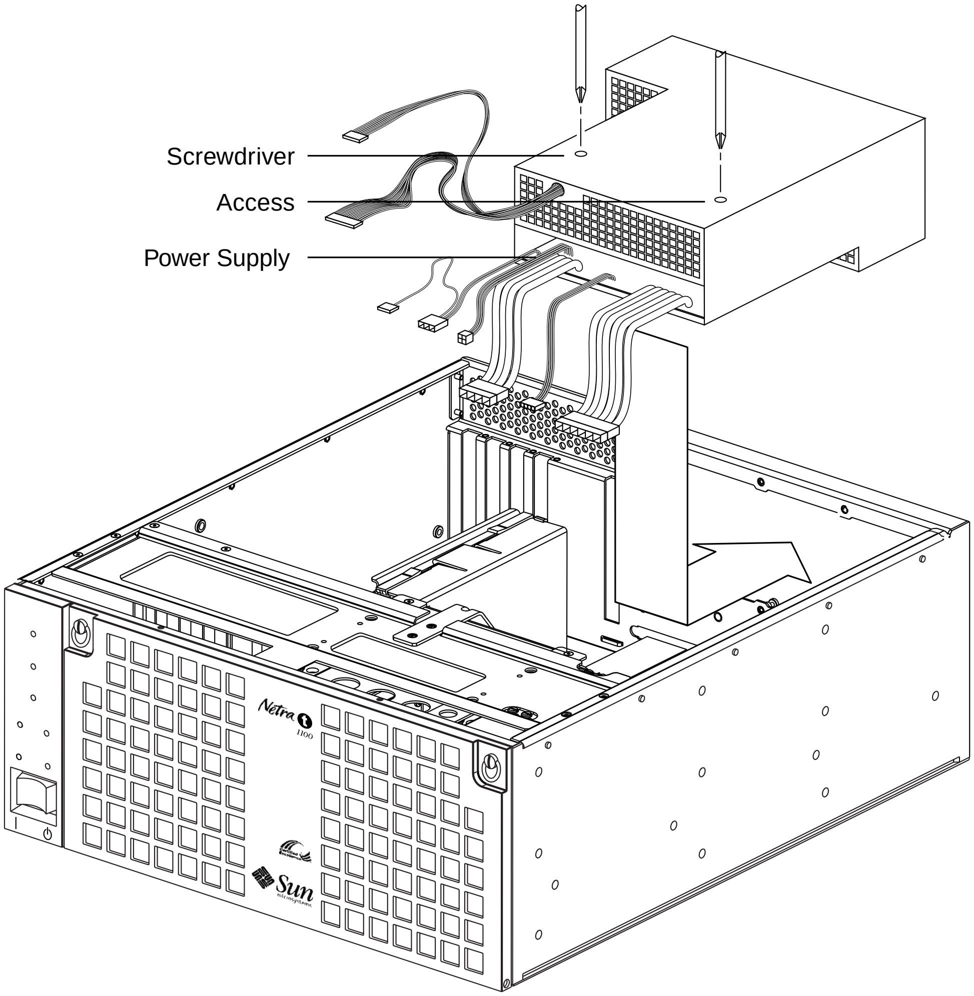

FIGURE 8-3 Removing the Power Supply (Part 2)

To Replace the Power Supply

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Position the power supply above the chassis. Rest it, upside-down, on the front crossmember of the enclosure.**
3. **Connect the power cable to the removeable media drive assembly (if fitted).**
4. **Connect the three main power supply cables to the motherboard.**
5. **Connect the power cable to the SCSI backplane assembly.**
6. **Connect the power cable to the main fan assembly.**
7. **Connect the cable connector to the alarms card.**
8. **Position the power supply toward the rear of the chassis until the power supply rear panel is flush with the chassis.**
9. **Using a No.2 Phillips-head screwdriver, tighten the eight captive screws securing the power supply to the rear of the chassis.**
10. **Using a No.2 Phillips-head screwdriver, tighten the two internal captive screws at the front of the supply.**
11. **Replace the top access cover.**

    See "To Remove the Top Access Cover" on page 49.

12. **Detach the wrist strap.**
13. **Power on the system.**

    See "To Power On the System" on page 42.

DC Switch Assembly

To Remove the DC Switch Assembly

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

3. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

4. **Disconnect the DC power connector from the back of the LED board.**

5. **Grasp both sides of the switch while pushing it towards the front of the system. Once free, the switch can be removed completely.**

6. **Remove the DC switch assembly from the chassis front. See FIGURE 8-4 on page 59.**

DC Switch Assembly

FIGURE 8-4 Removing and Replacing the DC Switch Assembly

To Replace the DC Switch Assembly

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Feed the DC switch assembly power connector through the chassis front.**
3. **Position the DC switch assembly into the chassis housing and snap it into place.**
4. **Connect the DC power connector to the LED card.**
5. **Replace the top access cover.**

   See "To Replace the Top Access Cover" on page 51.

6. **Detach the wrist strap.**

CHAPTER **9**

Storage Devices

This chapter contains procedures to remove and replace the Netra t 1100 system unit storage devices.

Hard Disk Drive

To Remove a Hard Disk Drive

See FIGURE 9-1 on page 63.

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

3. **Open the front access cover.**
4. **Remove the front ESD screen, using a No.1 Phillips-head screwdriver to undo the four captive screws.**
5. **Push the handle latch to the right to open the drive handle.**
6. **Extend the drive handle to disconnect the drive from the system.**
7. **Holding the drive handle, remove the drive from the drive bay.**
8. **The hard disk drive rear connector is disconnected when the drive is ejected.**
9. **Place the drive on an antistatic mat.**

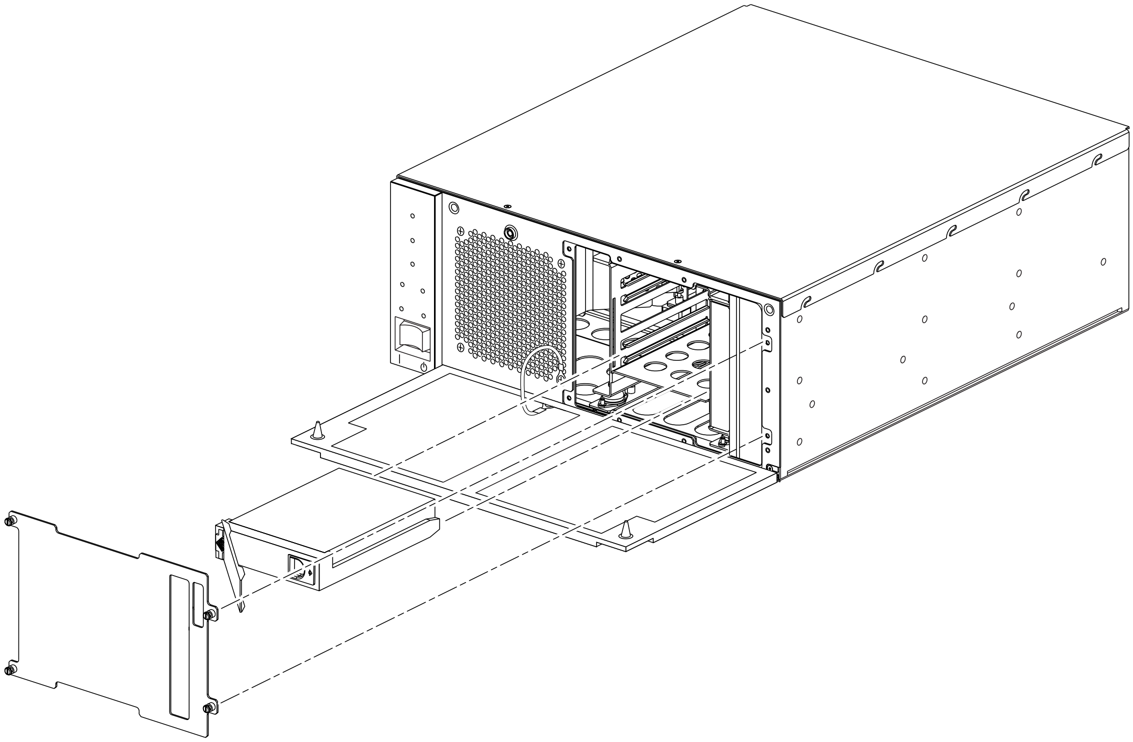

FIGURE 9-1 Removing and Replacing a Hard Disk Drive

To Install a Hard Disk Drive

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Holding the drive handle, insert the drive into the drive bay.**
3. **Push the front of the drive to connect it to the SCSI bus.**
4. **Close the drive handle to lock the drive into the system.**
5. **Replace the front ESD screen using a No.1 Phillips-head screwdriver.**
6. **Replace the front access cover.**
7. **Detach the wrist strap.**
8. **Power-on the system.**

   See "To Power On the System" on page 42.

To Remove a Removable Media Drive

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Remove the top cover.**

   See "To Remove the Top Access Cover" on page 49.

3. **Remove the ESD plate.**

   See "To Remove a Hard Disk Drive" on page 62.

4. **Undo the four captive screws on top of the removable media drive assembly using a No.1 Phillips-head screwdriver.**

5. **Partially remove the CD-ROM/tape drive from the assembly.**

6. **Disconnect the SCSI and power connectors from the rear of the drive.**

7. **Remove the drive from the chassis and place it on an antistatic mat.**

Note – The drive is an close fit and will require a certain amount of force to remove.

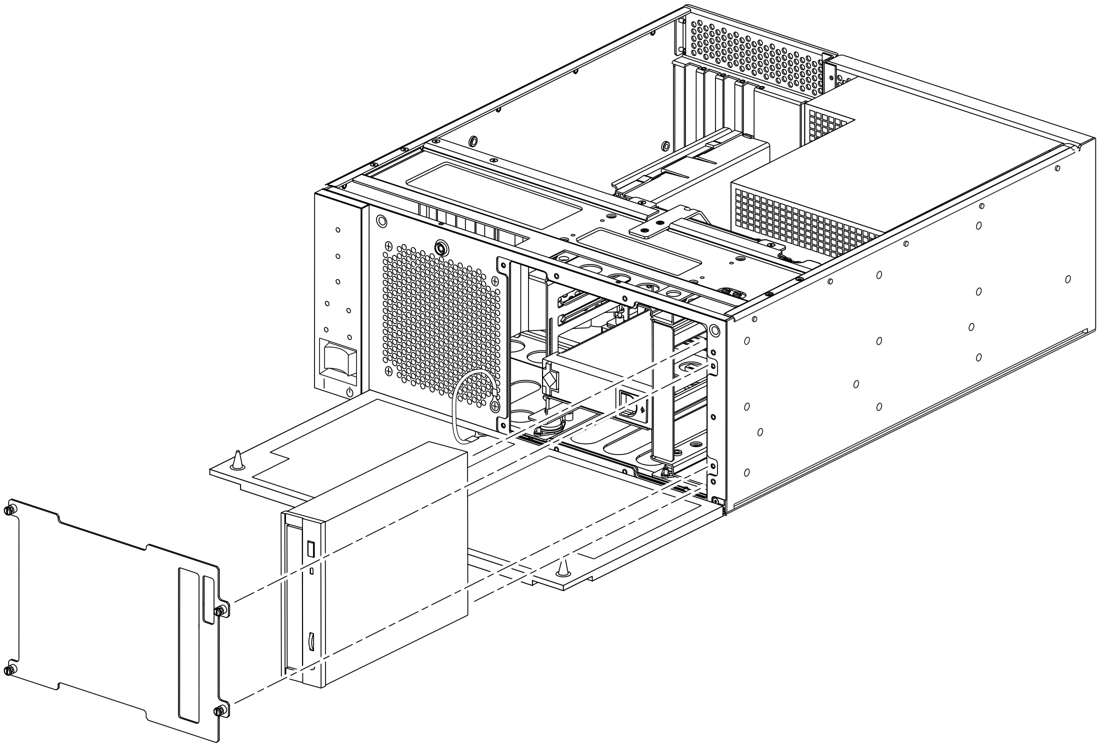

FIGURE 9-2 Removing and Replacing the CD-ROM or Tape Drive

To Install a Removable Media Drive

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See “To Attach the Wrist Strap” on page 46.

2. **Remove the top cover.**

   See “To Remove the Top Access Cover” on page 49.

3. **Lower the front cover.**

4. **Remove the ESD plate.**

   See "To Remove a Hard Disk Drive" on page 62.

5. **Partially insert the drive with the release button at the top right hand side.**
6. **Connect the SCSI and power cables to the rear of the drive.**
7. **Push the drive fully into the drive assembly (FIGURE 9-2 on page 66).**

Note – The drive is an close fit and will require a certain amount of force to insert.

---

8. **Using a No.1 Phillips-head screwdriver, replace the four captive screws securing the drive to the drive assembly.**
9. **Replace the ESD plate.**
10. **Replace the top cover.**

    See "Replacing the Top Access Cover" on page 52.

11. **Remove the wrist strap.**
12. **Replace the front cover.**

To Remove the SCSI Backplane

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Remove the top cover.**

   See "To Remove the Top Access Cover" on page 49.

3. **Remove the power supply.**

   See "To Remove the Power Supply" on page 54.

4. **Remove the two screws securing the power supply retaining bracket using a No. 2 Phillips-head screwdriver.**
5. **Remove the SCSI connector from the removable media drive.**

6. **Using a No. 2 Phillips-head screwdriver, remove the four screws securing the SCSI backplane. (In order to perform this it may be necessary to remove some DIMMS; for information refer to "To Remove a DIMM" on page 83.)**
7. **Disconnect the cable from the motherboard and feed the connector under the drive bay. Remove the SCSI backplane board from the chassis and place it on an antistatic mat.**

To Replace the SCSI Backplane

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.
2. **Remove the top cover.**

   See "To Remove the Top Access Cover" on page 49.
3. **Remove the power supply.**

   See "To Remove the Power Supply" on page 54.
4. **Feed the connector cable to the motherboard under the drive bay.**
5. **Using a No. 2 Phillips-head screwdriver, replace the four screws securing the SCSI backplane.**
6. **Replace the power supply retaining bracket by using a No. 2 Phillips-head screwdriver to secure the two screws.**
7. **Replace any DIMMS which may have been removed.**
8. **Replace the power supply.**

   See "To Replace the Power Supply" on page 57.
9. **Replace the top cover.**

   See "To Replace the Top Access Cover" on page 51.
10. **Remove the wrist strap.**
11. **Replace the front cover.**

CHAPTER **10**

Motherboard and Component Replacement

This chapter contains removal and replacement procedures for the Netra t 1100 motherboard and components of the motherboard. The following is a list of topics described:

CPU Module

To Remove the CPU Module

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

3. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

4. **Using both thumbs, simultaneously lift the two levers on the CPU module upward and to the side at an angle of approximately 135 degrees. See FIGURE 10-1.**

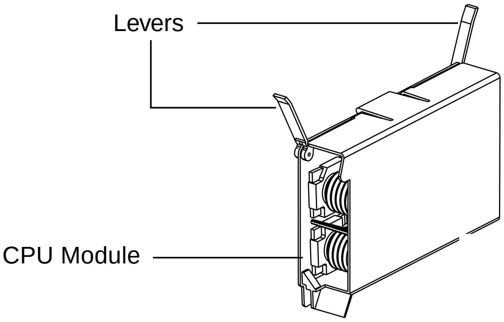

FIGURE 10-1 CPU Module Levers

5. Using the two levers, lift the CPU module upwards until it clears the system chassis.

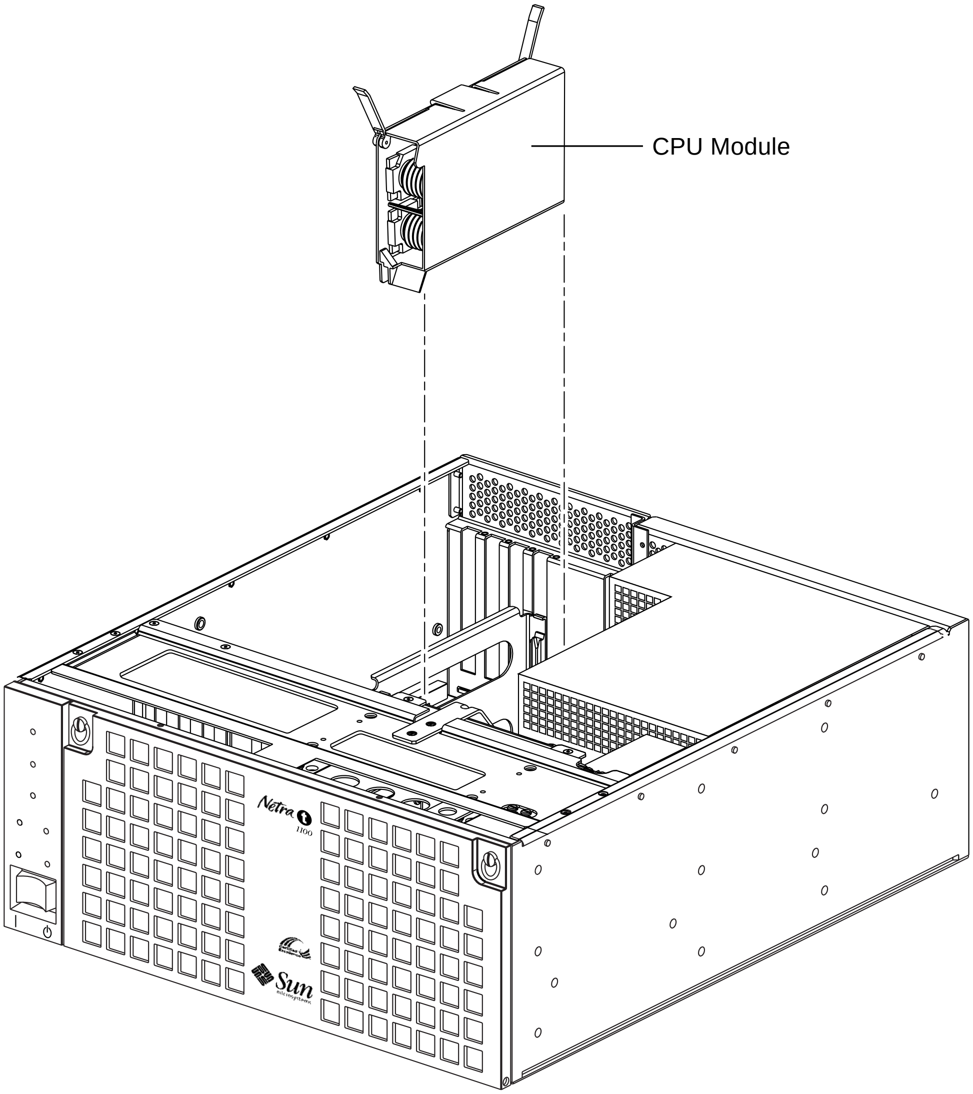

FIGURE 10-2 Removing and Replacing the CPU Module

6. Place the CPU module on an antistatic mat.

To Replace the CPU Module

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **On the antistatic mat, hold the CPU module in an upright position with the plastic surface facing you.**

3. **Move the levers on the CPU module to the 135-degree position.**

4. **Lower the CPU module along the vertical plastic guides until the module touches the motherboard slot socket. Ensure connectors are aligned. See (FIGURE 10-2 on page 71). With both hands, simultaneously turn and press the levers downward to the fully horizontal position.**

5. **Firmly press the module downward into the socket until it is fully seated and the levers are fully locked.**

6. **Replace the top access cover.**

   See "To Replace the Top Access Cover" on page 51.

7. **Detach the wrist strap.**

8. **Power on the system.**

   See "To Power On the System" on page 42.

System Fan Assembly

To Remove the System Fan Assembly

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

3. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

4. **Disconnect the fan assembly power cable from the power supply.**

5. **Using a No.2 Phillips-head screwdriver, undo the four screws and carefully remove the fan assembly from the chassis.**

Note – One of these screws also retains an earth bonding strap.

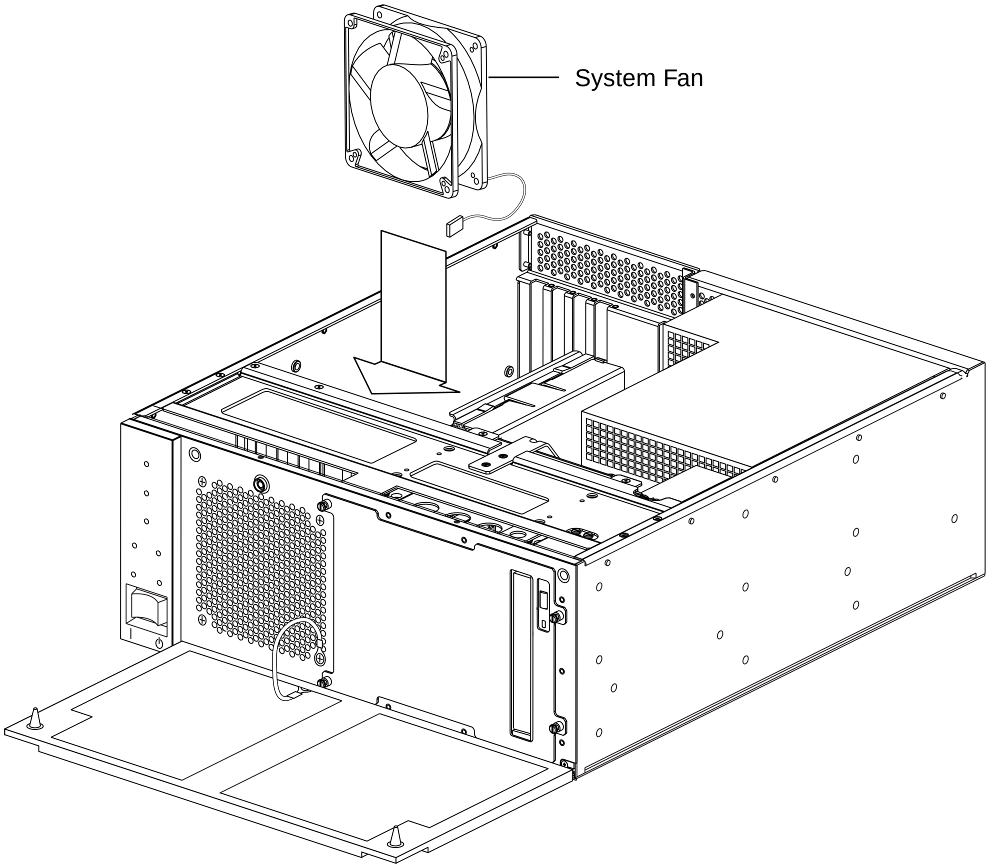

FIGURE 10-3 Removing and Replacing the System Fan Assembly

To Replace the System Fan Assembly

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Carefully position the fan assembly to the chassis and, using a No.2 Phillips-head screwdriver, secure with four screws.**

   Note – One of these screws also retains an earth bonding strap.

3. **Connect the fan assembly power cable to the power supply.**

4. **Replace the top access cover.**

   See "To Replace the Top Access Cover" on page 51.

5. **Detach the wrist strap.**

6. **Power on the system.**

   See "To Power On the System" on page 42.

NVRAM / TOD

Note – The NVRAM / TOD contains the system host identification (ID) and Ethernet address. If the same ID and Ethernet address are to be used on the replacement motherboard, remove the NVRAM / TOD from the motherboard and install the same NVRAM / TOD on the replacement motherboard after installation.

To Remove the NVRAM / TOD

1. **Power off the system.**

   See "To Power Off the System" on page 43.

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

2. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

3. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

4. **Remove the power supply from the system (without disconnecting the cables) and rest it on the enclosure.**

   See "To Remove the Power Supply" on page 54.

5. **Locate the NVRAM/TOD and carrier on the motherboard.**

6. **Grasp the NVRAM/TOD carrier at each end and pull straight up.**

Note – Gently rock the NVRAM / TOD from side to side as necessary.

7. **Place the NVRAM/TOD and carrier on an antistatic mat.**

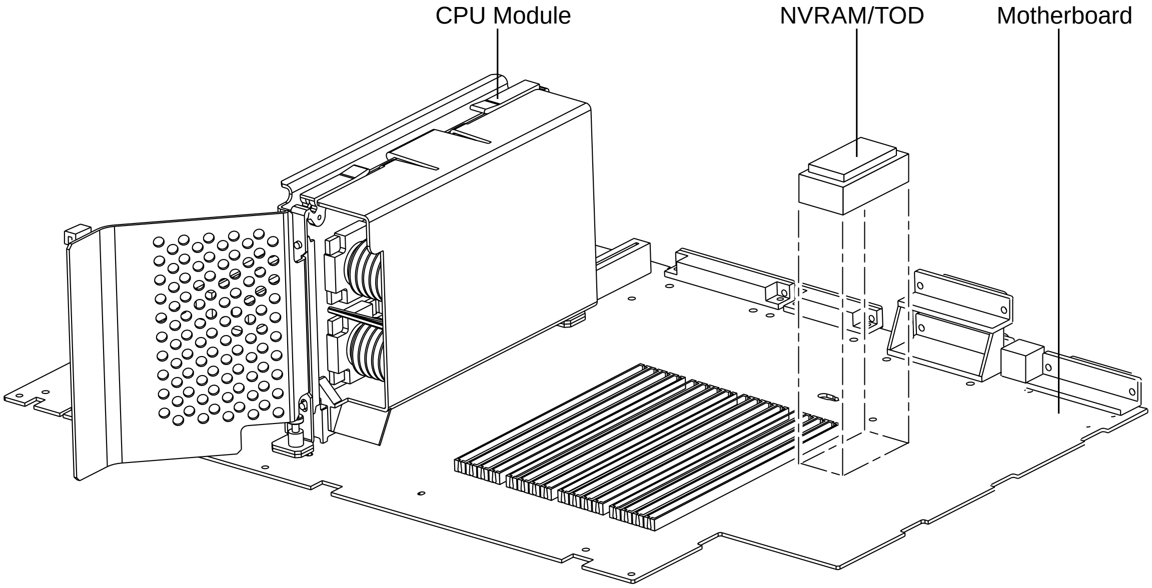

FIGURE 10-4 Removing and Replacing the NVRAM/TOD

To Replace a NVRAM / TOD

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Position the NVRAM/TOD and carrier on the motherboard.**

3. **Carefully insert the NVRAM/TOD and carrier into the socket.**

Note – The carrier is keyed so the NVRAM / TOD can only be installed one round.

---

4. **Push the NVRAM/TOD into the carrier until properly seated.**

5. **Replace the power supply.**

   See "To Replace the Power Supply" on page 57.

6. **Replace the top access cover.**

   See "To Replace the Top Access Cover" on page 51.

7. **Detach the wrist strap.**

8. **Power on the system.**

   See "To Power On the System" on page 42.

PCI Card

To Remove a PCI Card

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

3. **Disconnect the cables from the PCI card to be removed.**

4. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

5. **Using a No.2 Phillips-head screwdriver, remove the screw securing the PCI card bracket tab to the system chassis.**

Caution – Avoid applying force to one end or one side of the board as this can damage the connector.

---

6. **Pull the PCI card straight upwards from the slot.**

7. **Place the PCI card on an antistatic mat.**

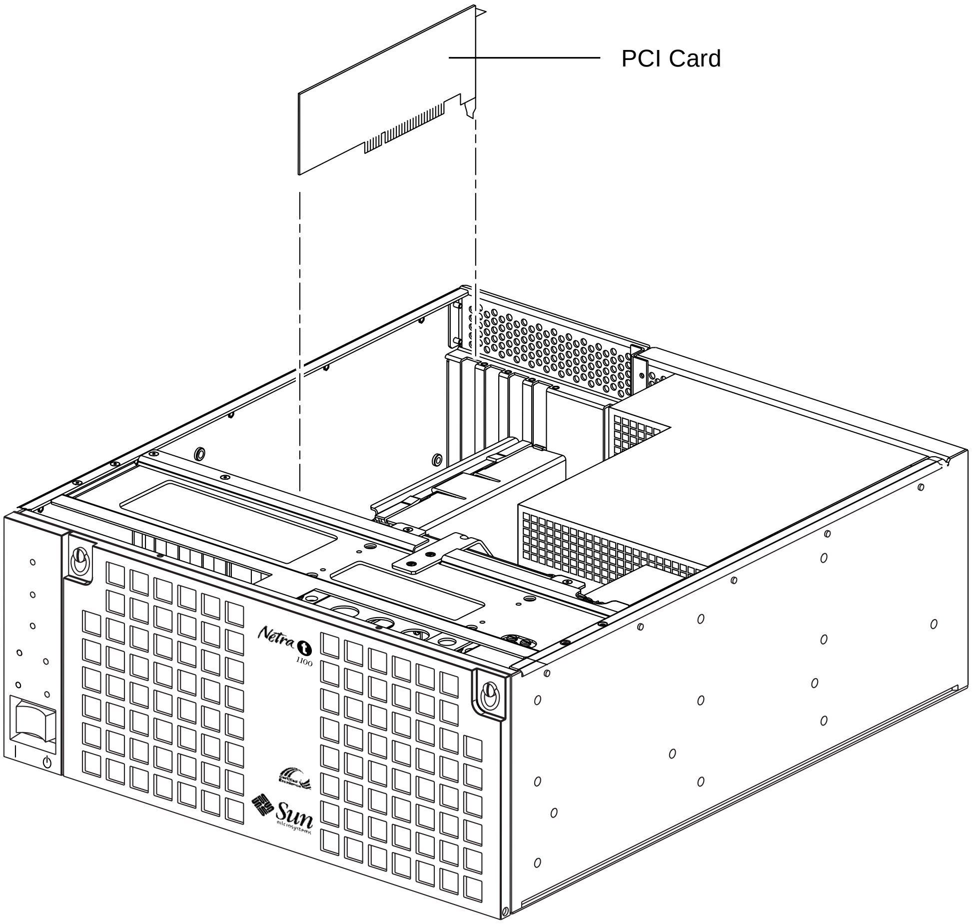

FIGURE 10-5 Removing and Replacing a PCI Card

To Replace a PCI Card

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

3. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

Note – Read the PCI card product guide for information about jumper or switch settings, slot requirements and required tools.

---

4. **Lower the PCI card so that it touches its associated slot on the motherboard.**
5. **From the two upper corners of the card, push the card straight downwards into the slot until it is fully seated.**
6. **Using a No.2 Phillips-headed screwdriver, insert and tighten the screw securing the card bracket tab to the system chassis.**
7. **Replace the top access cover.**

   See "To Replace the Top Access Cover" on page 51.

8. **Connect the cables to the PCI card.**
9. **Detach the wrist strap.**
10. **Power on the system.**

    See "To Power On the System" on page 42.

DIMM

Caution – DIMMs consist of electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or work environment can destroy the DIMM.

Caution – When removing a DIMM, an identical replacement is required. The replacement DIMM must be inserted into the same socket as the removed DIMM.

Caution – Each DIMM bank must contain at least two DIMMs of equal density (for example: two 32Mb DIMMs) to function properly. Do not mix DIMM densities in any bank.

Note – The system unit *must* have at least two identical DIMMs installed in paired sockets of any DIMM bank. For best system performance, install four identical DIMMs. TABLE 10-1 identifies DIMM installation locations.

TABLE 10-1 DIMM Bank and Slot Pairs

Bank	Slot Pairs (marked on motherboard)
0	U0701 and U0801
0	U0901 and U1001
1	U0702 and U0802
1	U0902 and U1002
2	U0703 and U0803
2	U0903 and U1003
3	U0704 and U0804
3	U0904 and U1004

To Remove a DIMM

Caution – Handle DIMMs only by the edges. Do not touch the DIMM components or metal parts. Always wear a grounding strap when handling a DIMM.

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See “To Attach the Wrist Strap” on page 46.

2. **Power off the system.**

   See “To Power Off the System” on page 43.

3. **Remove the top access cover.**

   See “To Remove the Top Access Cover” on page 49.

4. **Remove the power supply but do not disconnect any restraining power supply cables.**

   See “To Remove the Power Supply” on page 54.

5. **Rest the power supply on the side of the system enclosure.**

6. **Locate the DIMM to be removed.**

7. **Push the lever away from the DIMM (see FIGURE 10-6 on page 84) to be removed.**

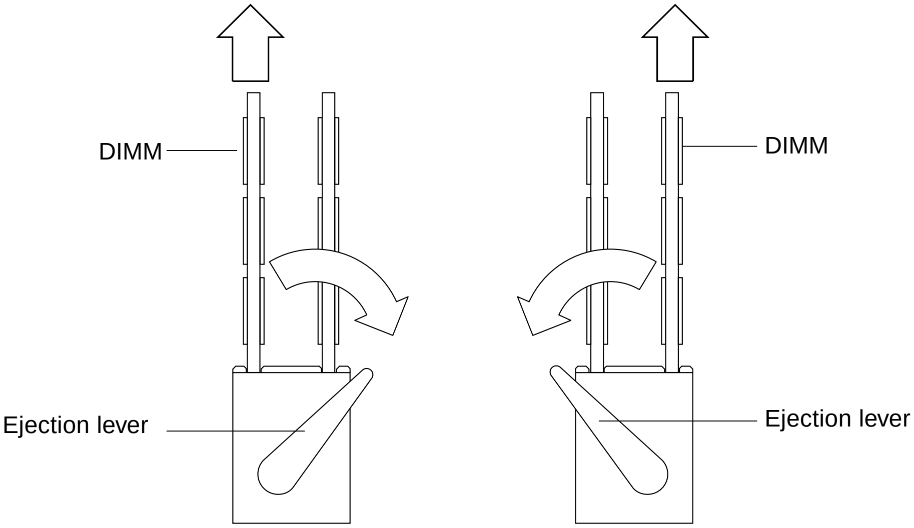

FIGURE 10-6 DIMM Ejection Lever

8. **Remove the DIMM from the socket (see FIGURE 10-7 on page 85).**
9. **Place the DIMM on an antistatic mat.**

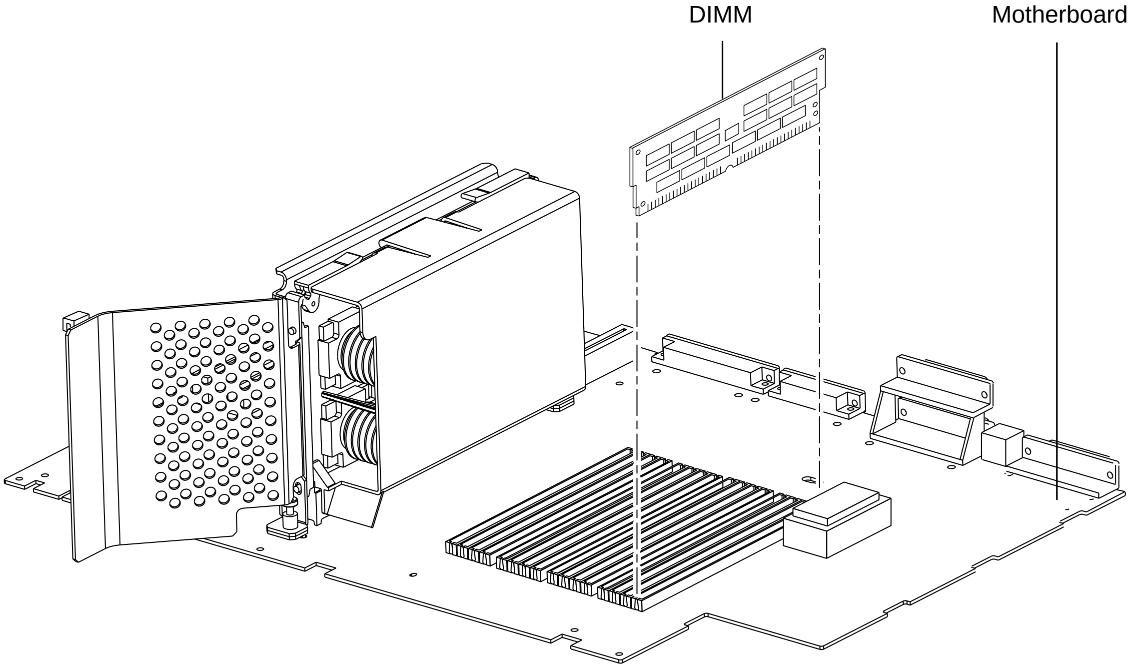

FIGURE 10-7 Removing and Replacing a DIMM

To Replace a DIMM

Caution – DIMMs are made of electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or work environment can destroy the DIMM.

Caution – Do not remove any DIMM from the antistatic container until ready to install it on the motherboard. Handle DIMMs only by their edges. Do not touch DIMM components or metal parts. Always wear a grounding strap when handling DIMMs.

Caution – Each DIMM bank must contain two DIMMs of equal density (for example two 32Mb DIMMs) to function properly. Do not mix DIMM density in any bank.

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Locate the appropriate DIMM slot(s) on the motherboard.**

Note – The system unit *must* have at least two identical DIMMs installed in paired sockets of any DIMM bank. For best system performance, install four identical DIMMs. TABLE 10-1 identifies DIMM installation locations.

Caution – Hold DIMMs only by the edges.

---

3. **Remove the DIMM from the antistatic container.**

4. **Position the DIMM in the socket, ensuring that the notch is on the same side as the lever.**

5. **Using your thumbs, press firmly on the top of the DIMM until it is properly seated.**

Note – Proper DIMM seating is verified by a clicking sound. Ensure the DIMM is properly seated.

---

6. **Replace the power supply.**

   See "To Replace the Power Supply" on page 57.

7. **Replace the top access cover.**

   See "To Replace the Top Access Cover" on page 51.

8. **Detach the wrist strap.**

9. **Power on the system.**

   See "To Power On the System" on page 42.

Alarms Card

To Remove the Alarms Card

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

3. **Disconnect the connector from the alarms card.**

4. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

5. **Using a No.2 Phillips-head screwdriver, remove the screw securing the alarms card bracket tab to the system chassis.**

Caution – Avoid damaging the connector. Apply equal force to both ends or sides of the board.

---

6. **At the two upper corners of the alarms card, pull the card straight upward from the slot. See FIGURE 10-8 on page 89.**

7. **Remove the alarms card.**

8. **Disconnect the cables from the alarms card.**

9. **Place the alarms card on an antistatic mat.**

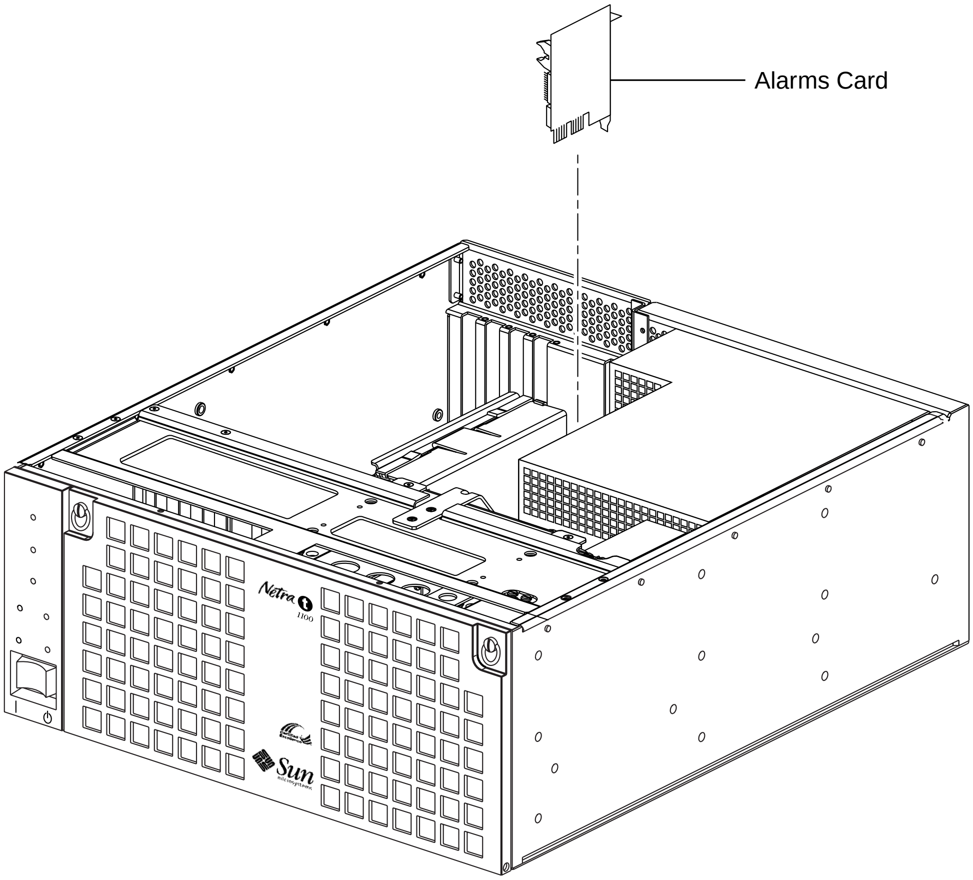

FIGURE 10-8 Removing and Replacing the Alarms Card

To Replace the Alarms Card

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Position the alarms card into the chassis.**
3. **Lower the alarms card so that it touches the appropriate slot on the motherboard.**
4. **At the two upper corners of the card, push the card straight downwards into the slot until it is fully seated.**
5. **Using a No.2 Phillips-head screwdriver, replace the screw securing the alarms card to the system chassis.**
6. **Reconnect the cables to the alarms card.**
7. **Replace the top access cover.**

   See "To Replace the Top Access Cover" on page 51.

8. **Detach the wrist strap.**
9. **Power on the system.**

   See "To Power On the System" on page 42.

LED Card

To Remove the LED Card

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Power off the system.**

   See "To Power Off the System" on page 43.

3. **Remove the top access cover.**

   See "To Remove the Top Access Cover" on page 49.

4. **Remove the 10-way IDC cable from the alarms card.**
5. **Remove the 4-way molex connector from the rear of the LED card.**
6. **Use tool Part No. 250-1357-01 (provided with the replacement LED card) to manœuvre the LED card from the standoffs. See FIGURE 10-9 on page 92.**
7. **Place the LED card on an antistatic mat.**

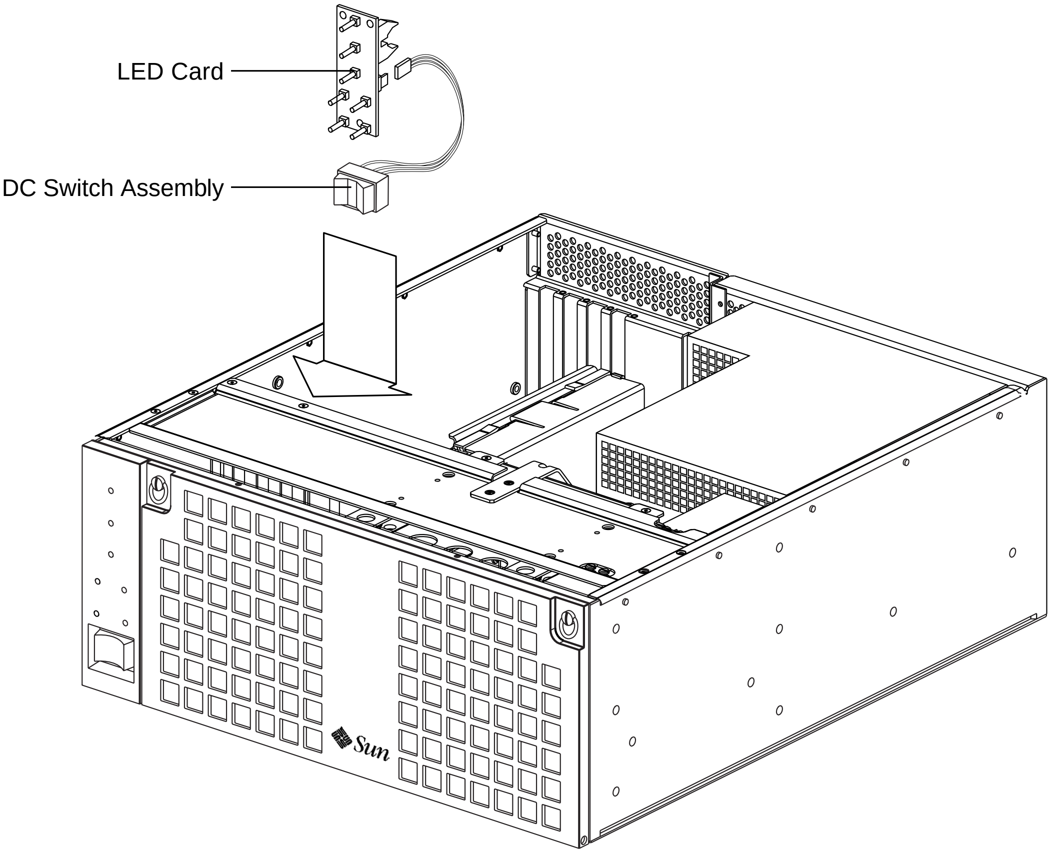

FIGURE 10-9 Removing and Replacing the LED Card.

To Replace the LED Card

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

---

1. **Attach the wrist strap.**

   See "To Attach the Wrist Strap" on page 46.

2. **Position the LED card in the chassis.**
3. **Carefully ensure all light pipes are aligned with the corresponding holes in the front panel.**
4. **Carefully push home the LED card until all the standoffs are fully engaged.**
5. **Reconnect the 10-way IDC cable to the alarms card.**
6. **Reconnect the 4-way power switch connector to the LED card.**
7. **Replace the top access cover.**

   See "To Replace the Top Access Cover" on page 51.

8. **Detach the wrist strap.**

Motherboard

Caution – Use an antistatic mat when working with the motherboard. An antistatic mat contains the cushioning needed to protect the underside components, to prevent motherboard flexing, and to provide antistatic protection.

Note – If the motherboard is being replaced, remove all DIMMs, PCI card(s), alarms card, and CPU module prior to removing the motherboard. Note the chassis slot location for each DIMM and PCI card prior to removal.

Note – The NVRAM/TOD contains the system host identification (ID) and Ethernet address. If the same ID and Ethernet address are to be used on the replacement motherboard, remove the NVRAM/TOD from the motherboard and install the same NVRAM/TOD on the replacement motherboard after installation.

To Remove the Motherboard

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

1. **Attach a wrist strap to the rear of the chassis.**

   See “To Attach the Wrist Strap” on page 46

2. **Power off the system.**

   See “To Power Off the System” on page 43.

3. **Remove the top access cover.**

   See “To Remove the Top Access Cover” on page 49.

4. **Remove the power supply.**

   See “To Remove the Power Supply” on page 54.

5. **Depopulate the motherboard by removing the following:**
    1. **CPU module.**

       See “To Remove the CPU Module” on page 70.
    2. **NVRAM/TOD with carrier.**

       See “To Remove the NVRAM/TOD” on page 76.
    3. **Alarms card.**

       See “To Remove the Alarms Card” on page 88.
    4. **PCI card(s).**

       See “To Remove a PCI Card” on page 79.
    5. **DIMMs.**

       See “Removing and Replacing a DIMM” on page 85.
6. **Remove the PSU bracket.**
7. **Disconnect the SCSI cable.**
8. **Disconnect the external cables.**
9. **Disconnect the internal SCSI cable assembly.**
10. **Release the screw securing the CPU bracket to the PCI bracket.**
11. **Using a No.2 Phillips-head screwdriver, undo the two captive screws and remove the CPU bracket from the system.**

12. **Using a No.2 Phillips-head screwdriver, undo the three captive screws securing the motherboard to the rear chassis panel.**

.

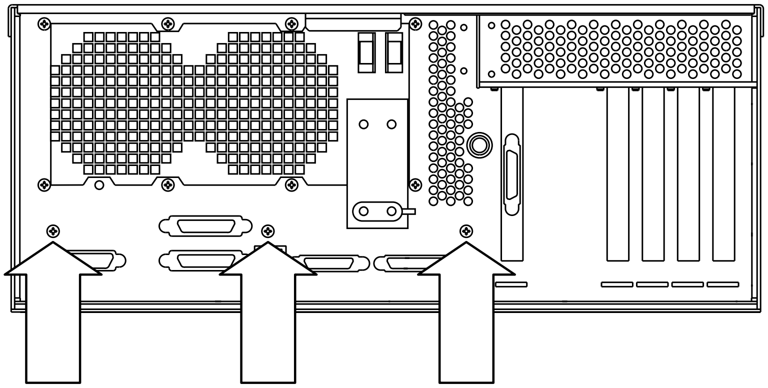

FIGURE 10-10 Removing and Replacing the Motherboard (Part 1 of 2)

13. **Remove the motherboard by sliding it towards the front of the chassis slightly, then raising the left-hand-side (viewed from the front of system).**

Caution – Handle the motherboard by the handle, back panel, or the edges only.

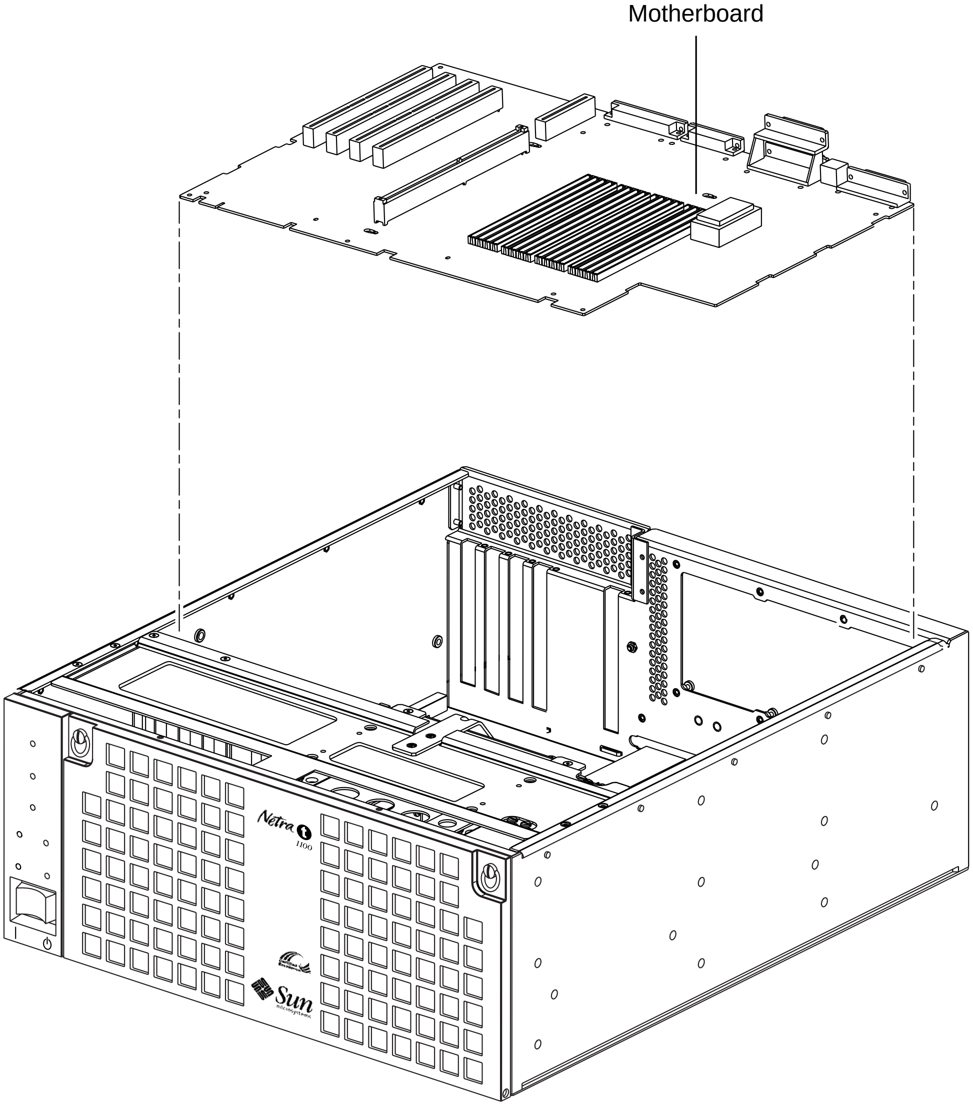

FIGURE 10-11 Removing and Replacing the Motherboard (Part 2 of 2)

14. **Place the motherboard on an antistatic mat.**

To Replace the Motherboard

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

1. **Attach a wrist strap to the rear of the chassis.**

   See "To Attach the Wrist Strap" on page 46

Caution – Handle the motherboard by the handle, back panel, or the edges only.

2. **Grasp the handle and the rear connector panel and slide the motherboard into the chassis (See FIGURE 10-11 on page 97).**
3. **Using long-nose pliers, set the motherboard serial port jumpers J2604 and J2605 (TABLE 10-2 and FIGURE 10-12).**

TABLE 10-2 Serial Port Jumper Settings

Port	Jumper	Pins 1 + 2 Select	Pins 2 + 3 Select	Default Shunt on Pins
ttya	J2604	RS232	RS423	2 + 3
ttyb	J2605	RS232	RS423	2 + 3

Note – Jumpers J2604 and J2605 can be set to either RS423 or RS232 serial interface. The jumpers are preset for RS423. RS232 is required for digital telecommunication within the European Community.

4. **Using a No.2 Phillips-head screwdriver, tighten the three captive screws that secure the motherboard to the rear of the chassis panel (See FIGURE 10-10 on page 96) starting with the centre screw.**
5. **Refit the CPU bracket and, using a No.2 Phillips screwdriver, secure the two captive screws.**
6. **Using a No.2 Phillips-head screwdriver, secure the CPU bracket to the PCI bracket.**
7. **Connect the internal SCSI cable assembly.**
8. **Refit the CPU module carrier.**

9. **Connect the external cables.**

10. **Populate the motherboard by replacing the following:**

    a. **DIMMs.**
    See “To Replace a DIMM” on page 86.

    b. **PCI card(s).**

    See “To Replace a PCI Card” on page 81.

    c. **Alarms card.**

    See “To Replace the Alarms Card” on page 90.

    d. **NVRAM/TOD with carrier.**

    See “To Replace a NVRAM/TOD” on page 78.

    e. **CPU module.**

    See “To Replace the CPU Module” on page 72.

11. **Fit the PSU bracket.**

12. **Replace the power supply.**

    See “To Replace the Power Supply” on page 57.

13. **Replace the top access cover.**

    See “To Replace the Top Access Cover” on page 51.

14. **Detach the wrist strap.**

15. **Reset the `#power-cycles` NVRAM variable to zero as follows:**

    a. **Set system power to on.**

    See “To Power On the System” on page 42.

    b. **Press the keyboard <*Break*> key after the system banner appears on the monitor.**

    c. **At the `ok` prompt, type:**

```
ok setenv #power-cycles 0
```

    d. **Verify that the `#power-cycles` NVRAM variable increments each time the system is power cycled.**

Note – The Solaris operating environment Power Management software uses the `#power-cycles` NVRAM variable to control the frequency of automatic system shutdown, if it is enabled.

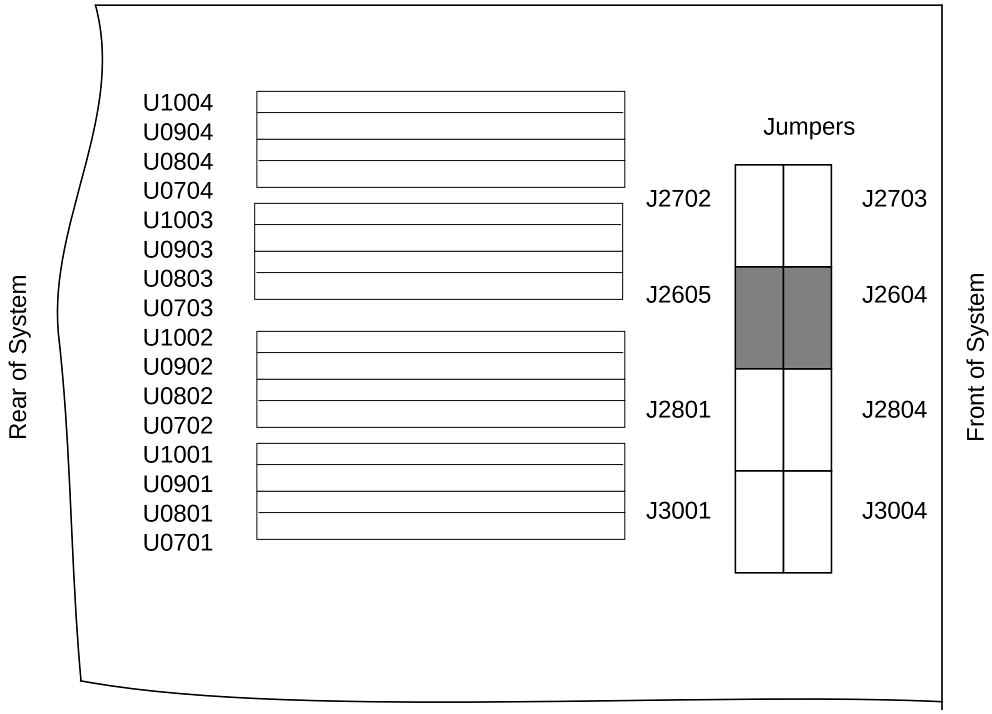

FIGURE 10-12 Location of the Motherboard Serial Port Jumpers

Note – Motherboard jumpers are identified with location numbers. Jumper pins are located immediately adjacent to the location number. Pin 1 is marked with an asterisk in any of the positions shown (FIGURE 10-13). Ensure that the serial port jumpers are set correctly.

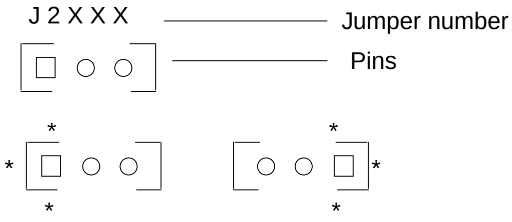

FIGURE 10-13 Identifying Jumper Pins

CHAPTER **11**

Illustrated Parts List

This chapter lists the authorized replaceable parts for the Netra t 1100 system unit. FIGURE 11-1 on page 104 illustrates an exploded view of the system unit. TABLE 11-1 on page 105 lists the system unit replaceable components. A brief description of each listed component is also provided.

The part numbers listed in TABLE 11-1 are correct as of the service manual publication date but are subject to change without notice. Numerical references illustrated in FIGURE 11-1 correlate to the numerical references listed in TABLE 11-1. Consult your authorized Sun sales representative or service provider to confirm a part number prior to ordering a replacement part.

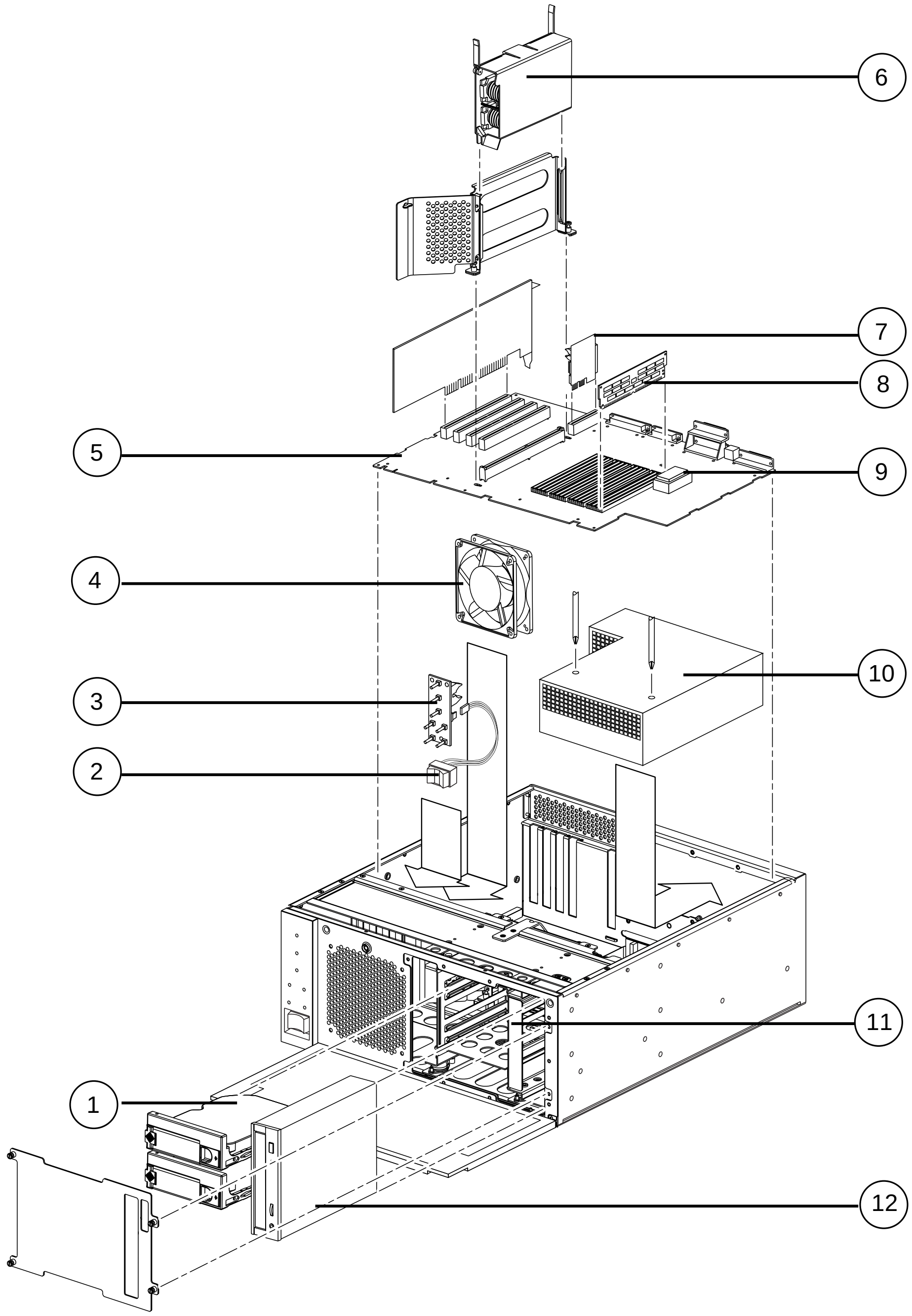

FIGURE 11-1 System Unit Exploded View

TABLE 11-1 System Unit Replaceable Components

Numerical Reference	Component	Part Number	Description
1	2.1Gb SCSI assembly	540-2936	Hard disk drive
1	4.2Gb SCSI assembly	540-2938	Hard disk drive
1	9.1Gb SCSI assembly	540-2951	Hard disk drive
2	DC power switch	530-2514	On/Standby power switch
3	LED card	501-4670	LED card
4	Main fan assembly	540-3514	Main fan
5	Motherboard	501-3139	300MHz system board
6	CPU module	501-4278	250MHz, 1Mb external cache
6	CPU module	501-4196	300MHz, 2Mb external cache
7	Alarms module	501-4669	Alarms applications
8	32Mb DIMM	501-2622	60ns, 32Mb DSIMM
8	64Mb DIMM	501-2480	60ns, 64Mb DSIMM
8	128Mb DIMM	501-3136	60ns, 128Mb DSIMM
9	NVRAM/TOD	525-1430	Time of day, 48T59, with carrier
10	Power supply	300-1355	Power supply, 350W
11	SCSI Backplane	530-2473	SCSI Backplane and QCD
12	CD-ROM drive	370-2817	12x CD-ROM drive, 1.6 inches
12	2.5Gb QIC tape drive 4.0Gb tape drive	370-2018 370-5280	2.5Gb QIC tape drive, light gray 4.0Gb SLR-5 tape drive, dark gray
12	4mm tape drive	370-2176	4Gb/8Gb, 4mm tape drive, DDS-2, light gray
12	4mm tape drive	370-2376	12Gb/24Gb, 4mm tape drive, DDS-3, dark gray

TABLE 11-1 System Unit Replaceable Components *(Continued)*

Numerical Reference	Component	Part Number	Description
12	8mm tape drive	370-2822	14Gb, 8mm tape drive, dark gray
Not illustrated	Peripheral cable	530-2345	Peripheral cable
Not illustrated	Filler panel	330-2187	CD-ROM drive filler panel
Not illustrated	SCSI cable	530-2384	68-pin external SCSI cable (2m)
Not illustrated	SCSI cable	530-2383	68-pin external SCSI cable (0.8m)
Not illustrated	Air Filter	385-491	Air Filters (QTY 10)

APPENDIX **A**

Product Specifications

This appendix provides product specifications for the Netra t 1100 system unit and is divided into three parts:

- Physical specifications
- Electrical specifications
- Environmental requirements.

Physical Specifications

Specification	**Imperial**	**Metric**
Width	17.0in.	43.20cm
Height	7.0in.	17.78cm
Depth	20.00in.	50.80cm
Weight (approximate, system unit equipped with four DIMMs, two hard disk drives and one CD-ROM drive)	51lb	23Kg

Electrical Specifications

Parameter	**Value**
DC input	–40 to –75VDC, –48VDC and 60VDC nominal
DC output	350W (maximum)
Output 1	+3.3VDC, 50A
Output 2	+5.0VDC, 35A
Output 3	+12.0VDC, 6.0A
Output 4	–12.0VDC, 1.0A
Output 5	–Prog 2.5V 28A

Environmental Requirements

Environmental	Operating	Non-operating
Temperature	5° to 40°C	–40° to 70°C
Temperature variation	30°C / hr maximum	30°C / hr maximum
Short term temperature (short term is defined as a maximum of 96 consecutive hours.)	–5° to 55°C (at a maximum of 1800m) Error-free operation of the tape streamer is from 0°C to 40°C.	
Humidity	5 to 85% (non-condensing)[1] (5 to 90% for a maximum 96 hours.)	10 to 95% non-condensing at 104°F (40°C)[1]
Elevation	–300 to +3000m	–300 to +12000m
Acoustic Noise	Less than 60dBA at a distance of 600mm and a height of 1500mm, measured at 25°C.	

[1] Subject to a maximum absolute humidity of 0.024kg of water / kg of dry air.

APPENDIX **B**

Signal Descriptions

This appendix provides signal descriptions for the Netra t 1100 system unit motherboard connectors. TABLE B-1 through TABLE B-5 list connector pin assignments and signal descriptions. An illustration of each connector is also provided.

Serial Ports A and B

Serial Ports A and B (RS423/RS232) Connector

The serial port A and B connectors are DB-25 connectors located on the system board back panel. FIGURE B-1 illustrates the serial port A and serial port B connector configuration and TABLE B-1 through to TABLE B-5 lists the connector pin assignments.

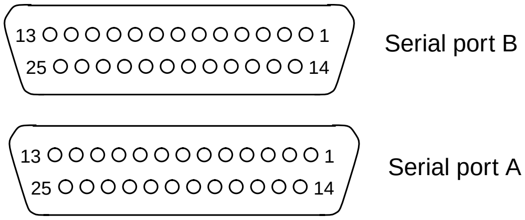

FIGURE B-1 Serial Ports A and B Connector Pin Configuration

TABLE B-1 Serial Ports A and B Connector Pin Assignments

Pin	Mnemonic	Signal Name	Description
1		Not connected	None
2	TxD	Transmit Data	Used by the data terminal equipment (DTE) to transmit data to the data circuit terminating equipment (DCE). Except when control data is being sent, RTS, CTS, SYNC and DCD must be ON for this line to be active.
3	RxD	Receive Data	Used by the DCE in response to received data from the DTE.
4	RTS	Ready To Send	Used by the DTE to condition the DCE for data transmission. The transition to ON directs the DCE to go into transmit mode. The transition to OFF directs the DCE to complete the transmission.

Pin	Mnemonic	Signal Name	Description
5	CTS	Clear To Send	Used by the DCE to indicate if it is ready to receive data from the DTE. When CTS, DSR, RTS and DTR are ON, the DCE is ready to transmit data received from the DTE across the communications channel. When only CTS is ON, the DCE is ready to accept dialing or control signals only. When CTS is OFF, the DTE should not transfer data across TxD.
6	DSR	Data Set Ready	Used by the DCE to indicate if it is ready to operate. When DSR is ON, the DCE is connected to the line and ready to exchange further control signals to start data transfer.
7	Gnd	Signal Ground	
8	DCD	Data Carrier Detect	Used by the DCE to indicate it is receiving a suitable signal from the communications channel.
9		Not connected	None.
10		Not connected	None.
11		Not connected	None.
12		Not connected	None.
13		Not connected	None.
14		Not connected	None.
15	TRxC	Transmit Clock	Used by the DCE to provide timing information to the DTE. The DTE provides data on TxD in which the transition of the bit corresponds to the rising edge of the clock.
16		Not connected	None.
17	RTxC	Receive Clock	Used by the DCE to provide timing information to the DTE. The falling edge of the clock corresponds to the center of the data bit received on RxD.
18		Not connected	None.
19		Not connected	None.
20	DTR	Data Terminal Ready	Used to control switching of the DCE to the communication channel. Once disabled, DTR cannot be enabled until SYNC is turned off.

Pin	Mnemonic	Signal Name	Description
21		Not connected	None.
22		Not connected	None.
23		Not connected	None.
24	TxC	Terminal Clock	Generated by the DTE to provide timing information to the DCE. Used only in synchronous mode and only when the driver requests a locally generated clock. Otherwise, TxC echoes the modem-generated clock. The falling edge of the clock corresponds to the center of the data bit transmitted on TxD.
25		Not connected	None.

Twisted-Pair Ethernet Connector

The twisted-pair Ethernet (TPE) connector is a RJ45 type connector located on the system board back panel. TABLE B-2 illustrates the TPE connector configuration and TABLE B-2 lists the connector pin assignments.

Caution – Connect only a TPE cable into TPE connector.

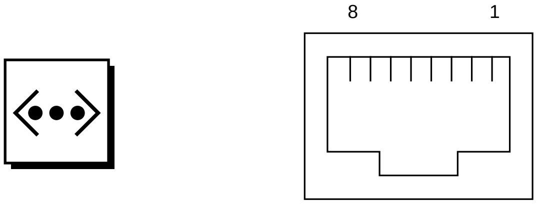

FIGURE B-2 TPE Connector Pin Configuration

TABLE B-2 TPE Connector Pin Assignments

Pin	Signal Name	Description
1	tpe0	Transmit data +
2	tpe1	Transmit data –
3	tpe2	Receive data +
4	Common mode termination	Termination
5	Common mode termination	Termination
6	tpe3	Receive data –
7	Common mode termination	Termination
8	Common mode termination	Termination

Wide SCSI Connector

The wide small computer system interface (SCSI) connector is located on the system board back panel. FIGURE B-3 illustrates the wide SCSI connector configuration and FIGURE B-3 lists the connector pin assignments.

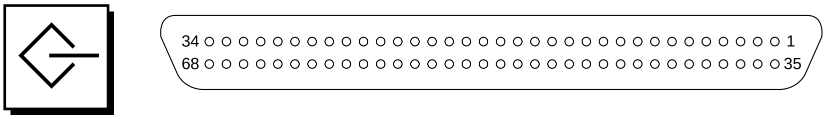

FIGURE B-3 Wide SCSI Connector Pin Configuration

TABLE B-3 Wide SCSI Connector Pin Assignments

Pin	Signal Name	Description
1	Gnd	Ground
2	Gnd	Ground
3	Gnd	Ground
4	Gnd	Ground
5	Gnd	Ground
6	Gnd	Ground
7	Gnd	Ground
8	Gnd	Ground
9	Gnd	Ground
10	Gnd	Ground
11	Gnd	Ground
12	Gnd	Ground

Pin	Signal Name	Description
13	Gnd	Ground
14	Gnd	Ground
15	Gnd	Ground
16	Gnd	Ground
17	Termpower	Termpower
18	Termpower	Termpower
19	Not used	Undefined
20	Gnd	Ground
21	Gnd	Ground
22	Gnd	Ground
23	Gnd	Ground
24	Gnd	Ground
25	Gnd	Ground
26	Gnd	Ground
27	Gnd	Ground
28	Gnd	Ground
29	Gnd	Ground
30	Gnd	Ground
31	Gnd	Ground
32	Gnd	Ground
33	Gnd	Ground
34	Gnd	Ground
35	Dat<12>_	Data 12
36	Dat<13>_	Data 13

Pin	Signal Name	Description
37	Dat<14>_	Data 14
38	Dat<15>_	Data 15
39	Par1 l_	Parity 1
40	Dat<0>_	Data 0
41	Dat<1>_	Data 1
42	Dat<2>_	Data 2
43	Dat<3>_	Data 3
44	Dat<4>_	Data 4
45	Dat<5>_	Data 5
46	Dat<6>_	Data 6
47	Dat<7>_	Data 7
48	Par0 l_	Parity 0
49	Gnd	Ground
50	Term_dis_	Term disable
51	Termpower	Termpower
52	Termpower	Termpower
53	Not used	Undefined
54	Gnd	Ground
55	Atn_	Attention
56	Gnd	Ground
57	Bsy_	Busy
58	Ack_	Acknowledge
59	Rst_	Reset
60	Msg_	Message

Pin	Signal Name	Description
61	Sel_	Select
62	Cd_	Command
63	Req_	Request
64	IO_	In/Out
65	Dat<8>_	Data 8
66	Dat<9>_	Data 9
67	Dat<10>_	Data 10
68	Dat<11>_	Data 11

Note: _ (underscore) signifies active low

Alarm Connector

The alarm connector is located on the alarm card. This connector is a male DB-15 and TABLE B-4 lists each connector line assignment.

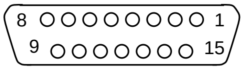

FIGURE B-4 Alarms Connector Configuration

TABLE B-4 Alarm Connector Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	RESET+	9	ALARM1 COM
2	RESET–	10	ALARM1 NC
3	Not connected	11	ALARM2 NO
4	Not connected	12	ALARM2 COM
5	ALARM3 COM	13	ALARM2 NC
6	ALARM3 NO	14	Not connected
7	ALARM3 NC	15	Not connected
8	ALARM1 NO		

Media-Independent Interface Connector

The media-independent interface (MII) connector is located on the system board back panel. FIGURE B-5 illustrates the MII connector configuration and TABLE B-5 lists the connector pin assignments.

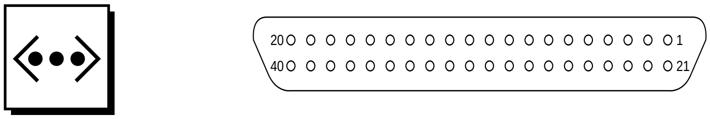

FIGURE B-5 MII Connector Pin Configuration

TABLE B-5 MII Connector Pin Assignments

Pin	Signal Name	Description
1	Pwr	Power
2	Mdio	Management data IO
3	Mdc	Management data clock
4	Rxd3	Receive data 3
5	Rxd2	Receive data 2
6	Rxd1	Receive data 1
7	Rxd0	Receive data 0
8	Rx dv	Receive data valid
9	Rx clk	Receive clock
10	Rx er	Receive error
11	Tx er	Transmit error
12	Tx clk	Transmit clock

Pin	Signal Name	Description
13	Tx en	Transmit data enable
14	Txd0	Transmit data 0
15	Txd1	Transmit data 1
16	Txd2	Transmit data 2
17	Txd3	Transmit data 3
18	Col	Collision detected
19	Crs	Carrier sense
20	Pwr	Power
21	Pwr	Power
22	Gnd	Ground
23	Gnd	Ground
24	Gnd	Ground
25	Gnd	Ground
26	Gnd	Ground
27	Gnd	Ground
28	Gnd	Ground
29	Gnd	Ground
30	Gnd	Ground
31	Gnd	Ground
32	Gnd	Ground
33	Gnd	Ground
34	Gnd	Ground
35	Gnd	Ground
36	Gnd	Ground

Pin	Signal Name	Description
37	Gnd	Ground
38	Gnd	Ground
39	Gnd	Ground
40	Pwr	Power