LTC 8900 Series

BOSCH

en Installation Manual

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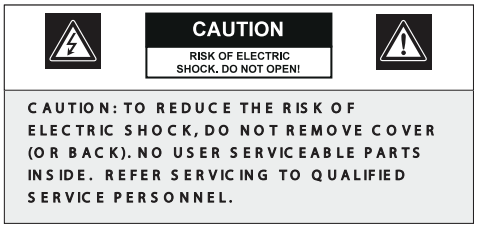
1 Safety

Safety Precautions



This symbol indicates the presence of uninsulated dangerous voltage within the product s enclosure. This may constitute a risk of electric shock.

The user should consult the operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Attention: Installation should be performed by qualified service personnel only in accordance with the National Electrical Code or applicable local codes.

Power Disconnect. Units with or without ON-OFF switches have power supplied to the unit whenever the power cord is inserted into the power source; however, the unit is operational only when the ON-OFF switch is in the ON position. The power cord is the main power disconnect for all units.

Sécurité

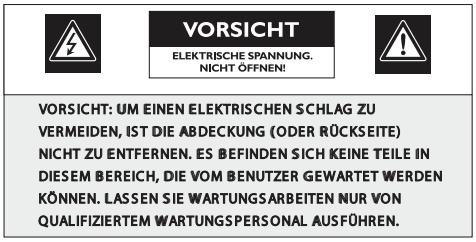
Ce symbole signale que le produit renferme une « tension potentiellement dangereuse » non isolée susceptible de provoquer une électrocution.

Ce symbole invite l'utilisat eur à consulter les instructions d'utilisation et d'entretien (dépannage) reprises dans la documentation qui accompagne l'appareil.

Attention : l'installation doit exclusivement être réalisée par du personnel qualifié, conformément au code national d'électricité américain (NEC) ou au code d'électricité local en vigueur.

Coupure de l'alimentation. Qu'ils soient pourvus ou non d'un commutateur ON/OFF, tous les appareils reçoivent de l'énergie une fois le cordon branché sur la source d'alimentation. Toutefois, l'appareil ne fonctionne réellement que lorsque le commutateur est réglé sur ON. Le débranchement du cordon d'alimentation permet de couper l'alimentation des appareils.

Sicherheitshinweise



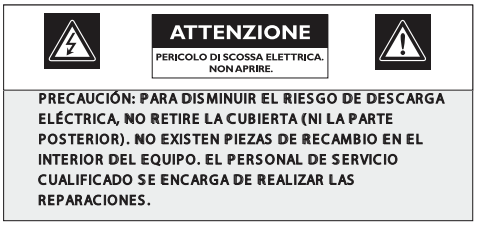
Das Symbol macht auf nicht isolierte „gefährliche Spannung" im Gehäuse aufmerksam. Dies kann zu einem elektrischen Schlag führen.

Der Benutzer sollte sich ausführlich über Anweisungen für die Bedienung und Instandhaltung (Wartung) in den begleitenden Unterlagen informieren.

Achtung! Die Installation sollte nur von qualifiziertem Kundendienstpersonal gemäß jeweils zutreffender Elektrovorschriften ausgeführt werden.

Unterbrechung des Netzanschlusses. Geräte mit oder ohne Netzschalter haben Spannung am Gerät anliegen, sobald der Netzstecker in die Steckdose gesteckt wird. Das Gerät ist jedoch nur betriebsbereit, wenn der Netzschalter (EIN/AUS) auf EIN steht. Wenn das Netzkabel aus der Steckdose gezogen wird, ist die Spannungszuführung zum Gerät vollkommen unterbrochen.

Precauciones de Seguridad



Este símbolo indica que existen puntos de tensión peligrosos sin aislamiento dentro de la cubierta de la unidad. Estos puntos pueden constituir un riesgo de descarga eléctrica.

El usuario debe consultar las instrucciones de funcionamiento y mantenimiento (reparación) en la documentación que se suministra con el aparato.

Atención: la instalación la debe realizar únicamente personal cualificado de conformidad con el National Electric Code o las normas aplicables en su país.

Desconexión de la alimentación. Las unidades con o sin interruptores de encendido/apagado reciben alimentación eléctrica siempre que el cable de alimentación esté conectado a la fuente de alimentación. Sin embargo, la unidad sólo funciona cuando el interruptor está en la posición de encendido. El cable de alimentación es la principal fuente de desconexión de todas las unidades.

Veiligheidsmaatregelen

VOORZICHTIG: OPEN DE BEHUIZING OF DE ACHTERKANT VAN HET APPARAAT NIET. ZO VERMINDERT U HET RISICO OP ELEKTRISCHE SCHOKKEN. IN HET APPARAAT BEVINDEN ZICH GEEN ONDERDELEN DIE U ZELF KUNT REPAREREN. LAAT SERVICE EN ONDERHOUD UITVOEREN DOOR GEKWALIFICEERD PERSONEEL.

Dit symbool geeft aan dat er binnen in het apparaat ongeïsoleer de, gevaarlijke spanning aanwezig is die mogelijk elektrische schokken kan veroorzaken.

De gebruiker dient de bedienings- en onderhoudsvoorschriften te raadplegen in de documentatie die werd meegeleverd met het apparaat.

Attentie: het apparaat mag alleen door gekwalificeerd personeel wor den geïnst alleerd. De installatie dient in overeenstemming met de nationale elektrische richtlijnen of de van toepassing zijnde lokale richtlijnen te worden uitgevoerd.

Spanning uitschakelen. Apparatuur met of zonder aan-uitschakelaar staat onder spanning zolang de stekker is aangesloten op de wandcontactdoos. De apparatuur is uitsluitend in werking als de aan-uitschakelaar aan staat. Het netsnoer is de "hoofdschakelaar" voor alle apparatuur.

Medidas de Segurança

CUIDADO: PARA REDUZIR O RISCO DE CHOQUE ELÉCTRICO, NÃO RETIRE A TAMPA (OU A PARTE POSTERIOR). NO INTERIOR, NÃO EXISTEM PEÇAS QUE POSSAM SER REPARADAS PELO UTILIZADOR. REMETA A ASSISTÊNCIA PARA OS TÉCNICOS QUALIFICADOS.

Este símbolo indica a presença de "tensão perigosa" não isolada dentro da estrutura do produto, o que pode constituir risco de choque eléctrico.

O utilizador deve consultar as instruções de funcionamento e manutenção (assistência) nos documentos que acompanham o aparelho.

Atenção: a instalação deve ser executada apenas por técnicos qualificados da assistência, de acordo com o código eléctrico nacional ou os códigos locais aplicáveis.

Corte de corrente. As unidades com ou sem interruptores ON-OFF (ligar/desligar) recebem corrente sempre que o fio de alimentação está introduzido na fonte de alimentação; contudo, a unidade apenas está operacional quando o interruptor ON-OFF está na posição ON. O fio de alimentação destina-se a desligar a corrente em todas as unidades.

Sicurezza

ATTENZIONE: PER RIDURRE IL RISCHIO DI SCOSSE ELETTRICHE NON RIMUOVERE LA COPERTURA (O IL PANNELLO POSTERIORE). L'UNITÀ NON CONTIENE COMPONENTI INTERNI RIPARABILI DALL'UTENTE. PER QUALSIASI INTERVENTO, RIVOLGERSI A PERSONALE TECNICO QUALIFICATO.

Questo simbolo indica la presenza di "tensione pericolosa" non isolata all'interno del contenitore del prodotto. Ciò comporta un potenziale rischio di scosse elettriche.

Si consiglia di consultare le istruzioni operative e di manutenzione (interventi tecnici) contenute nella documentazione fornita con il dispositivo.

Attenzione: l'installazione deve essere effettuata esclusivamente da personale tecnico qualificato in confor mità con il N ational Electrical Code o con le normative locali vigenti.

Scollegamento dell'alimentazione. Le unità dotate o sprovviste di interruttori ON-OFF vengono alimentate quando si inserisce il cavo nella presa dell'alimentazione. L'unità è tutta via in funzione solo quando l'interruttore ON-OFF si trova nella posizione ON. Il cavo di alimentazione costituisce il dispositivo di scollegamento dell'alimentazione principale per tutte le unità.

安全预防措施

注意：为避免受到电击，不要拆除机盖（或后盖）。用户不得擅自维修里面的部件。有关维修事项，请咨询合格的维修人员。

此符号表示产品机壳内存在未绝缘的“危险电压”。这可能导致电击。

用户应参照设备附带的操作和维护（维修）说明。

注意：安装须由合格的维修人员遵照美国国家电工标准或相关电气规则进行。

断开电源。在电源线插入电源时，配备或未配备 ON-OFF 开关的设备都已通电；但设备只有在 ON-OFF 开关处于 ON 位置时才能工作。对于所有设备，电源线是断开电源的主要方式。

1.1 About this Manual

This manual has been compiled with great care and the information it contains has been thoroughly verified. The text was complete and correct at the time of printing. Because of the ongoing development of products, the content of the manual may change without notice. Bosch Security Systems accepts no liability for damage resulting directly or indirectly from faults, incompleteness, or discrepancies between the manual and the product described.

1.2 Legal Information

Copyright

This manual is the intellectual property of Bosch Security Systems, Inc. and is protected by copyright. All rights reserved.

Trademarks

All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.

1.3 Safety Precautions

Danger!

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Warning!

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Caution!

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Notice!

Indicates a situation which, if not avoided, could result in damage to the equipment or environment, or data loss.

1.4 Important safety instructions

Read, follow, and retain for future reference all of the following safety instructions. Heed all warnings on the unit and in the operating instructions before operating the unit.

Warning!

For Indoor Use Only!

If this unit connects to outdoor equipment, ensure that the system is grounded.

1. **Cleaning -** Unplug the unit from the outlet before cleaning. Follow any instructions provided with the unit. Generally, using a dry cloth for cleaning is sufficient but a moist, fluff-free cloth or leather shammy may also be used. Do not use liquid cleaners or aerosol cleaners.
2. **Heat Sources -** Do not install the unit near any heat sources such as radiators, heaters, stoves, or other equipment (including amplifiers) that produce heat.

3. **Ventilation -** Any openings in the unit enclosure are provided for ventilation to prevent overheating and ensure reliable operation. Do not block or cover these openings. Do not place the unit in an enclosure unless proper ventilation is provided, or the manufacturer's instructions have been adhered to.
4. **Water -** Do not use this unit near water, for example near a bathtub, washbowl, sink, laundry basket, in a damp or wet basement, near a swimming pool, in an outdoor installation, or in any area classified as a wet location. To reduce the risk of fire or electrical shock, do not expose this unit to rain or moisture.
5. **Object and liquid entry -** Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electrical shock. Never spill liquid of any kind on the unit. Do not place objects filled with liquids, such as vases or cups, on the unit.
6. **Lightning -** For added protection during a lightning storm, or when leaving this unit unattended and unused for long periods, unplug the unit from the wall outlet and disconnect the cable system. This will prevent damage to the unit from lightning and power line surges.
7. **Controls adjustment -** Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may cause damage to the unit. Use of controls or adjustments, or performance of procedures other than those specified, may result in hazardous radiation exposure.
8. **Overloading -** Do not overload outlets and extension cords. This can cause fire or electrical shock.
9. **Power supply cord and plug protection -** Protect the power supply cord and plug from foot traffic, being pinched by items placed upon or against them at electrical outlets, and its exit from the unit. For units intended to operate with 230 VAC, 50 Hz, the power supply cord must comply with the latest versions of *IEC 60227*. For units intended to operate with 120 VAC, 60 Hz, the power supply cord must comply with the latest versions of *UL 62* and *CSA 22.2 No.49*.
10. **Power disconnect -** Units have power supplied to the unit whenever the power cord is inserted into the power source. The power cord plug is the main power disconnect device for switching off the voltage for all units.
11. **Power sources -** Operate the unit only from the type of power source indicated on the label. Before proceeding, be sure to disconnect the power from the cable to be installed into the unit.
    - For battery powered units, refer to the operating instructions.
    - For external power supplied units, use only the recommended or approved power supplies.
    - For limited power source units, this power source must comply with *EN60950*. Substitutions may damage the unit or cause fire or shock.
    - For 24 VAC units, voltage applied to the unit's power input should not exceed ±10%, or 28 VAC. User-supplied wiring must comply with local electrical codes (Class 2 power levels). Do not ground the supply at the terminals or at the unit's power supply terminals.
    - If unsure of the type of power supply to use, contact your dealer or local power company.
12. **Servicing -** Do not attempt to service this unit yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

13. **Damage requiring service -** Unplug the unit from the main AC power source and refer servicing to qualified service personnel when any damage to the equipment has occurred, such as:
    - the power supply cord or plug is damaged;
    - exposure to moisture, water, and/or inclement weather (rain, snow, etc.);
    - liquid has been spilled in or on the equipment;
    - an object has fallen into the unit;
    - unit has been dropped or the unit cabinet is damaged;
    - unit exhibits a distinct change in performance;
    - unit does not operate normally when the user correctly follows the operating instructions.
14. **Replacement parts -** Be sure the service technician uses replacement parts specified by the manufacturer, or that have the same characteristics as the original parts. Unauthorized substitutions may cause fire, electrical shock, or other hazards.
15. **Safety check -** Safety checks should be performed upon completion of service or repairs to the unit to ensure proper operating condition.
16. **Installation -** Install in accordance with the manufacturer's instructions and in accordance with applicable local codes.
    This unit should not be located in the vicinity of electrical lights or power circuits, or where it may contact such lights or circuits.
    U.S.A. models only – refer to the National Electrical Code *Article 820* regarding installation of CATV systems.
17. **Attachments, changes or modifications -** Only use attachments/accessories specified by the manufacturer. Any change or modification of the equipment, not expressly approved by Bosch, could void the warranty or, in the case of an authorization agreement, authority to operate the equipment.

1.5 Important notices

Accessories - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury and/or serious damage to the unit. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer. When a cart is used, use caution and care when moving the cart/apparatus combination to avoid injury from tip-over. Quick stops, excessive force, or uneven surfaces may cause the cart/unit combination to overturn. Mount the unit per the manufacturer's instructions.

All-pole power switch - Incorporate an all-pole power switch, with a contact separation of at least 3 mm in each pole, into the electrical installation of the building. If it is needed to open the housing for servicing and/or other activities, use this all-pole switch as the main disconnect device for switching off the voltage to the unit.
Battery replacement - A lithium battery is located inside the unit enclosure. To avoid danger of explosion, replace the battery as per instructions. Replace only with the same or equivalent type recommended by the manufacturer. Refer all servicing to qualified service personnel.

Notice!
Batteries must not be disposed of in household waste. Dispose of batteries only at suitable collection points and, in the case of lithium batteries, mask the poles.
For further information refer to: http://www.BoschSecurity.com/standards

Camera signal - Protect the cable with a primary protector if the camera signal is beyond 140 feet, in accordance with *NEC800 (CEC Section 60)*.

Disposal - Your Bosch product was developed and manufactured with high-quality material and components that can be recycled and reused. This symbol means that electronic and electrical appliances, which have reached the end of their working life, must be collected and disposed of separately from household waste material. Separate collecting systems are usually in place for disused electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, per *European Directive 2002/96/EC*.

Electronic Surveillance - This unit is intended for use in public areas only. U.S. federal law strictly prohibits surreptitious recording of oral communications.

Environmental statement - Bosch has a strong commitment towards the environment. This unit has been designed to respect the environment as much as possible.

Electrostatic-sensitive device - Use proper CMOS/MOS-FET handling precautions to avoid electrostatic discharge. NOTE: Wear required grounded wrist straps and observe proper ESD safety precautions when handling the electrostatic-sensitive printed circuit boards.

Fuse rating - For protection of the unit, the branch circuit protection must be secured with a maximum fuse rating of 16A. This must be in accordance with *NEC800 (CEC Section 60)*.

Grounding - For mounting the unit in potentially damp environments, ensure to ground the system using the ground connection of the power supply connector (see section: Connecting external power supply).

Coax grounding:

- Ground the cable system if connecting an outside cable system to the unit.
- Connect outdoor equipment to the unit's inputs only after this unit has had its grounding plug connected to a grounded outlet or its ground terminal is properly connected to a ground source.
- Disconnect the unit's input connectors from outdoor equipment before disconnecting the grounding plug or grounding terminal.
- Follow proper safety precautions such as grounding for any outdoor device connected to this unit.

U.S.A. models only - *Section 810* of the *National Electrical Code, ANSI/NFPA No.70*, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

Grounding and polarization - This unit may be equipped with a polarized alternating current line plug (a plug with one blade wider than the other blade). This safety feature allows the plug to fit into the power outlet in only one way. If unable to insert the plug fully into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the polarized plug.

Alternately, this unit may be equipped with a 3-pole grounding plug (a plug with a third pin for earth grounding). This safety feature allows the plug to fit into a grounded power outlet only. If unable to insert the plug into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the grounding plug.

Moving - Disconnect the power before moving the unit. Move the unit with care. Excessive force or shock may damage the unit and the hard disk drives.

Outdoor signals - The installation for outdoor signals, especially regarding clearance from power and lightning conductors and transient protection, must be in accordance with *NEC725* and *NEC800 (CEC Rule 16-224* and *CEC Section 60)*.

Permanently connected equipment - Incorporate a readily accessible disconnect device external to the equipment.

Pluggable equipment - Install the socket outlet near the equipment so it is easily accessible.

Rack-mount

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

System ground/Safety ground

System (video) ground is indicated by the symbol .

Safety (power) ground is indicated by the symbol .

The system ground is only used to comply with safety standards or installation practices in certain countries. Bosch does **not** recommend connecting system ground to safety ground unless it is explicitly required. However, if the system ground and safety ground are connected and grounding loops are causing interference in the video signal, use an isolation transformer (available separately from Bosch).

Caution!

Connecting System ground to Safety ground may result in ground loops that can disrupt the CCTV system.

Video loss - Video loss is inherent to digital video recording; therefore, Bosch Security Systems cannot be held liable for any damage that results from missing video information. To minimize the risk of lost digital information, Bosch Security Systems recommends multiple, redundant recording systems, and a procedure to back up all analog and digital information.

1.6 FCC & ICES compliance

FCC & ICES Information

(U.S.A. and Canadian Models Only)

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions:

– this device may not cause harmful interference, and
– this device must accept any interference received, including interference that may cause undesired operation.

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 and ICES-003 of Industry Canada. 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 radiates radio frequency energy and, if not installed and used in accordance with the instruction manual, 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 expense.

Intentional or unintentional modifications, not expressly approved by the party responsible for compliance, shall not be made. Any such modifications could void the user's authority to operate the equipment. If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action.

The user may find the following booklet, prepared by the Federal Communications Commission, helpful: How to Identify and Resolve Radio-TV Interference Problems. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Informations FCC et ICES

(modèles utilisés aux États-Unis et au Canada uniquement)

Ce produit est conforme aux normes FCC partie 15. la mise en service est soumises aux deux conditions suivantes :

– cet appareil ne peut pas provoquer d'interférence nuisible et
– cet appareil doit pouvoir tolérer toutes les interférences auxquelles il est soumit, y compris les interférences qui pourraient influer sur son bon fonctionnement.

AVERTISSEMENT: Suite à différents tests, cet appareil s’est révélé conforme aux exigences imposées aux appareils numériques de **Classe A** en vertu de la section 15 du règlement de la Commission fédérale des communications des États-Unis (FCC). Ces contraintes sont destinées à fournir une protection raisonnable contre les interférences nuisibles quand l'appareil est utilisé dans une **installation commerciale**. Cette appareil génère, utilise et émet de l'energie de fréquence radio, et peut, en cas d'installation ou d'utilisation non conforme aux instructions, générer des interférences nuisibles aux communications radio. L’utilisation de ce produit dans une zone résidentielle peut provoquer des interférences nuisibles. Le cas échéant, l’utilisateur devra remédier à ces interférences à ses propres frais.

Au besoin, l’utilisateur consultera son revendeur ou un technicien qualifié en radio/télévision, qui procédera à une opération corrective. La brochure suivante, publiée par la Commission fédérale des communications (FCC), peut s’avérer utile : How to Identify and Resolve Radio-TV Interference Problems (Comment identifier et résoudre les problèmes d’interférences de radio et de télévision). Cette brochure est disponible auprès du U.S. Government Printing Office, Washington, DC 20402, États-Unis, sous la référence n° 004-000-00345-4.

Notice!
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.

1.7 UL certification

UL Disclaimer
Underwriter Laboratories Inc. ("UL") has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in Standard(s) for Safety for Information Technology Equipment, UL 60950-1 . UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.
UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING-RELATED FUNCTIONS OF THIS PRODUCT.

Disclaimer
Underwriter Laboratories Inc. (“UL”) has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Closed Circuit Television Equipment, UL 2044*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.
UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING RELATED FUNCTIONS OF THIS PRODUCT.

1.8 Warranty / Limitation of Liability

The unit has a 3 year warranty.
BOSCH Security Systems warrants that its products, at the time of shipment by BOSCH Security Systems, are free from defect in material or workmanship under normal use and service for the respective warranty periods specified in the applicable Price Schedule or as otherwise published.
To assure conformance with operating limitations, Buyer should refer to the applicable data sheet.
The warranty is void (i) if the Product is not operated in conformance with installation, environmental, mechanical or electrical requirements, or within thermal stress limits, or (ii) to the extent that any malfunction is the result of misuse, abuse, vandalism, neglect, improper installation or application, alteration, accident, or negligence in use, storage, transportation, or handling or if the original identification markings on the product have been removed, defaced or altered, lightning, electricity, water, fire, environment or other hazard, or act of God, or other impact outside of normal operating guidelines.
The foregoing warranty is subject to Buyer’s (i) promptly written claim and (ii) timely provision to BOSCH Security Systems of an opportunity to inspect and test the Product claimed to be defective. Such inspection may be on Buyer’s premises and/or BOSCH Security Systems may request the return of the Product at Buyer’s expense. However, BOSCH Security Systems shall not be responsible for packing, inspection, or labor costs in connection with the return of Product. No Product shall be accepted for warranty service that is not accompanied by a Return Authorization issued by BOSCH.

The liability of BOSCH Security Systems hereunder or otherwise is solely and exclusively limited to replacement (new or refurbished Product), repair, or credit of the amortized purchase price, as BOSCH Security may elect, for any Product which is returned by Buyer during the applicable warranty period, or services for which timely notice of defect has been given by Buyer, and which are found by BOSCH Security to be subject to adjustment under this warranty.
BOSCH Security System's warranty shall not be enlarged, diminished, or affected by, and no obligation or liability shall arise or grow out of BOSCH Security's rendering or technical advice, facilities, or services in connection with Buyer's order to the products furnished hereunder.
Some non-Bosch manufactured products supplied in this kit may be factory refurbished by original equipment manufacturer. Irrespective of OEM's warranty, Bosch standard warranty still applies to all items supplied.
For more information about the warranty on this product, see the Warranty Repair section on Bosch's Customer Care web page at www.boschsecurity.us/en-us/Service/CustomerCare.

1.9 Customer Support and Service

If this unit needs service, contact the nearest Bosch Security Systems Service Center for authorization to return and shipping instructions.

Service Centers

USA

Telephone: 800-366-2283 or 585-340-4162
Fax: 800-366-1329
Email: cctv.repair@us.bosch.com

Customer Service

Telephone: 888-289-0096
Fax: 585-223-9180
Email: security.sales@us.bosch.com

Technical Support

Telephone: 800-326-1450
Fax: 585-223-3508 or 717-735-6560
Email: technical.support@us.bosch.com

Repair Center

Telephone: 585-421-4220
Fax: 585-223-9180 or 717-735-6561
Email: security.repair@us.bosch.com

Canada

Telephone: 514-738-2434
Fax: 514-738-8480

Europe, Middle East & Africa Region

Please contact your local distributor or Bosch sales office. Use this link:
http://www.boschsecurity.com/startpage/html/europe.htm

Asia Pacific Region

Please contact your local distributor or Bosch sales office. Use this link:
http://www.boschsecurity.com/startpage/html/asia_pacific.htm

More Information

For more information please contact the nearest Bosch Security Systems location or visit www.boschsecurity.com

2 Unpacking

- This equipment should be unpacked and handled with care. Check the exterior of the packaging for visible damage. If an item appears to have been damaged in shipment, notify the shipper immediately.
- Verify that all the parts listed in the Parts List below are included. If any items are missing, notify your Bosch Security Systems Sales or Customer Service Representative.
- Do not use this product if any component appears to be damaged. Please contact Bosch Security Systems in the event of damaged goods.
- The original packing carton is the safest container in which to transport the unit and must be used if returning the unit for service. Save it for possible future use.

2.1 Parts List

Part
LTC 8901 or LTC 8904 Series Unit
LTC 8902 Series and LTC 8903 Series Matrix Bays
LTC 8943/95 PC System Controller PC (Redundant Configurations Only)
LTC 8944/93, LTC 8945/93, LTC 8946/93 LAN Switches

3 Introduction

This manual covers the installation of the Allegiant® LTC 8900 Series systems. Information on system operation and information on the PC software package (if applicable) are covered in their own respective manuals. Keep these and other manuals which are supplied along with the various accessory devices available for reference during system installation and configuration.

3.1 Description

The Allegiant LTC 8900 Series is a state-of-the-art video switching and control system for indoor use only. It is the highest-capacity system in the Allegiant family. The system can switch and control up to 4096 cameras to 512 monitors. It is also compatible with all the existing accessories currently available in the Allegiant product line. Various system capacity configurations are illustratedin *, page 68* through *, page 68*.

3.2 Features

The LTC 8900 system can be purchased in either one of two design configurations: standard and redundant. The standard configuration includes the LTC 8904 Series type CPU, which contains a single CPU module and a single power supply. If maximum reliability is required, the system can be purchased to include the LTC 8901 Series CPU which contains dual CPU modules and dual power supplies. This redundant system design option includes an industrial model PC, which enables the system to provide automatic switchover in case of failure of the primary CPU module or of the CPU power supply.

The LTC 8900 Allegiant series systems can accommodate multiple operator keyboards and a computer system console. They can also accommodate 2048 alarm points. All 2048 alarm points are available through RS-232 command input; up to 1024 alarm points are available through contact closure inputs using LTC 8540/00 alarm units and LTC 8713/00 Series port expander units. In addition, the Allegiant Series have a Satellite configuration capability through which the system can communicate with up to 256 remote combinations of Allegiant Series switchers. In standard system configurations, the user can add a Windows®-based PC to simplify programming of the system using either the supplied LTC 8059 Master Control Software for Windows package or the optional LTC 8850 GUI software package. In the redundant design configuration, the system is programmed and continuously monitored using the supplied LTC 8943/95 System Controller Pentium® PC.

Using the PC-based software, user passwords can be utilized, providing an added measure of system security; various lockout tables restricting user access to cameras, monitors, keyboards, and remote camera control are easily programmed using the PC-based software package. The PC software also supports up to 128 different time-activated events, providing automated control of video sequencing, monitor message broadcasts, receiver/driver functions, sophisticated alarm control, powerful system macro capabilities, and several other functions.

Even with its sophistication, the Allegiant LTC 8900 system is designed for the novice user. The ergonomic keyboard design contains many user-friendly but powerful functions. A user can choose from up to 256 sequences that are stored in memory, select any of the cameras to view on any of the monitors, and take exclusive control of remote pan/tilt camera functions right from the keyboard. Each monitor can display a system status overlay showing alarm status, sequence conditions, time/date, and camera information.

The Allegiant LTC 8900 Series systems represent a dramatic breakthrough in CCTV switcher/controllers, and are backed by years of expertise in designing and manufacturing closed circuit video equipment.

4 System Components

4.1 LTC 8904 Series CPU Bay

This unit provides central control for the entire system. It contains all the system's configuration information such as camera tables, alarm tables, sequences, etc. It is also the connection interface to the various external Allegiant Series accessory products such as keyboards, alarm interfaces, signal distribution units, etc. One LTC 8904 Series CPU bay per system is required. An LTC 8904 Series CPU bay includes one power supply (LTC 8905), one CPU module (LTC 8910), and a relay module (LTC 8917).

4.2 LTC 8901 Series CPU Bay

(Applicable to redundant system configurations only.)
This unit is similar to the standard LTC 8904 Series CPU, except it utilizes a redundant design architecture. The LTC 8901 Series provides hot standby features with redundant power supplies and CPU boards. In conjunction with the supplied System Controller PC, the LTC 8901 Series system is capable of automatic detection of a main power supply or CPU fault and automatic switch over to the backup.
The unit also features the patented data mirroring technology, which allows the backup CPU to constantly maintain the same state as the main CPU. Downloaded tables into the primary CPU are automatically transferred to the backup CPU. Unlike competitive systems, data transfers to the backup LTC 8901 Series CPU are automatically verified to ensure accuracy. With this feature, if the main CPU fails, the backup CPU will be in the exact same state that the main CPU was in prior to failure - all appropriate video will be on the monitors, sequences will be running, alarms will be active, etc. One LTC 8901 Series CPU bay per system is required. An LTC 8901 Series CPU bay includes two power supplies (LTC 8905), two CPU modules (LTC 8910), and a relay module (LTC 8917).

4.3 LTC 8902 Series Output Bay

The LTC 8902 Series Output Bays generate the text overlays for the video monitors. Each bay accepts up to 8 LTC 8934/00 Video Output Modules providing output for up to 64 monitors. For more outputs, additional output bays can be used up to a maximum of 8 bays providing 512 monitor outputs. Each LTC 8902 Series Input Bay includes one Data Receiver module (LTC 8916) and a power supply (LTC 8906).

4.4 LTC 8903 Series Input Bay

The LTC 8903 Series Input Bays provide the video switching functions. Each bay accepts up to 16 LTC 8921/00 Video Input Modules providing up to 256 camera inputs. Because of it’s unique video bus design, the LTC 8903 Series bay is capable of switching 256 cameras to a group of 32 monitors using only 8 LTC 8921/00 Video Input modules. When 16 LTC 8921/00 modules are installed in a LTC 8803 Series bay, 256 cameras can be switched to up to 64 monitors.The Input Bay provides full matrix switching – any input can be connected to any output. Up to 4 LTC 8903 Series Input Bays can be connected directly to a LTC 8902 Series Output Bay. This configuration can handle up to 1024 camera inputs.
To handle a greater number of cameras, a second stage of LTC 8903 Series bays can be used. In this configuration, the outputs of up to 4 LTC 8903 Series Input Bays are connected to the camera inputs of another LTC 8903 Series Input Bay. The outputs of this second-stage bay are then connected to an LTC 8902 Series Output Bay. Up to 4 second-stage LTC 8903 Series Input Bays can connect to the LTC 8902 Series Output Bay, for a total capacity of 4096 camera inputs. When multiple LTC 8902 Series Output Bays are used in a system, the LTC

8903 Series Input Bay configuration must be duplicated for each output bay. The camera signals to the first input bay configuration are looped using video ribbon cables to the next group of input bays. This sequence continues for each LTC 8902 Series Output Bay in the system.Each LTC 8903 Series Input Bay includes one Data Receiver module (LTC 8918) and a power supply (LTC 8805).

4.5 LTC 8934/00 Video Output Modules

The LTC 8934/00 Video Output modules are installed into LTC 8902 Series Output Bays to provide video output to monitors and DVR/VCRs. Each output module handles 8 outputs. Up to 8 modules can be installed in each LTC 8902 Series Output Bay.

4.6 LTC 8921/00 Video Input Modules

The LTC 8921/00 Video Input modules are installed into LTC 8903 Series Input Bays to accept input from cameras and other video sources. Each input modules accepts 32 video inputs. Up to 16 modules can be installed in each LTC 8903 Series Input Bay.

4.7 LTC 8943/95 System Controller PC

(Applicable to redundant system configurations only.)
The LTC 8943/95 Series System Controller is an industrial grade PC system supplied in a rack-mountable enclosure and includes a rack-mounted monitor, a rack-mounted keyboard, Windows operating system and preloaded configuration software. The LTC 8943/95 PC is supplied only if the system is purchased in the redundant design configuration.
The PC runs the System Supervisor Software that manages the CPU data mirroring and automatic switchover functions. Since the PC is intended to configure and monitor the operation of the LTC 8900 system, Bosch strongly recommends using the PC solely for this purpose, not as an operator's workstation or for any other purpose which could interfere with its ability to provide automatic switchover functions.

4.8 LTC 8944/93 and LTC 8945/93 LAN Switches

(Applicable to redundant system configurations only.)
The LTC 8944/93 and LTC 8945/93 units are 10/100Base-T Ethernet LAN switches that provide a communication link between the LTC 8901 Series main CPU bay and the system's LTC 8902 Series and LTC 8903 Series matrix bays. In redundant system configurations, the LTC 8944/93 and LTC 8945/93 switches are factory-configured to communicate directly with the LTC 8943/95 System Controller PC.

4.9 LTC 8946/93 LAN Switches

The LTC 8946/93 is a 10/100Base-T Ethernet LAN switch that provides a communication link between the LTC 8904 Series main CPU bay and up to 11 of the system's LTC 8902 Series and LTC 8903 Series matrix bays. LTC 8946/93 switches can be cascaded together for use in large systems to provide additional LAN ports when the number of LTC 8902 Series and LTC 8903 Series matrix bays exceed a combined quantity of 11 in standard configuration systems or 18 in redundant design system configurations.

4.10 LTC 8809/00 Video Ribbon Cable

The LTC 8809/00 are 16-channel ribbon cables used to provide video connections between various system components. They are specifically designed for use with video signals and are equipped with locking keyed connectors on each end.

4.11 LTC 8808/00 Video Interconnect Panel

This patch panel contains 32 BNC connectors on its front for external video connections and two 16-contact ribbon connectors on its rear. Two LTC 8809/00 16-conductor ribbon cables are included for interfacing the patch panel to the video input or video output connectors on the LTC 8902 Series Output Bays and LTC 8903 Series Input Bays.

4.12 LAN Cables

Three types of LAN cables are supplied with the system. The first type has a length of 8 m (25 ft). The second type is 3 m (10 ft) long. The third type is 2 m (6 ft) long and contain reversed data connections. These shorter LAN cables are used exclusively for crossover connections between the LTC 8944/93, LTC 8945/93, and LTC 8946/93 LAN switches.

4.13 Security Key for PC-based Software

The Master Control Software for Windows (MCSW) or the Graphical User Interface (GUI) PC-based software programs can only be accessed when a Security Key is attached to the PC. This key is used to prevent unauthorized access to the system software, and it should be kept in a safe place if the need to remove it from the PC occurs. In redundant design system configurations, a Security Key is supplied along with the preloaded MCSW software for use on the LTC 8943/95 PC. In standard system configurations, the MCSW and its Key are included for use on a user-supplied PC.

4.14 Miscellaneous Components

The system is supplied with other miscellaneous components including power cords for both 110V and 220 V outlets. The unused cords can be discarded. Figure 31 illustrates some of these components along with other cables noted elsewhere in this manual.

5 Hardware Installation Procedure for Standard Systems Utilizing LTC 8904 Series CPU

5.1 General Installation Considerations

(Refer to *Hardware Installation Procedure for Redundant System Configuration Utilizing LTC 8901 Series CPU, page 33*, for Installation Procedure for redundant system configurations using LTC 8901 Series CPU.)

Notice!

Do Not Apply power to equipment until instructed to do so.

To facilitate system installation, it is highly recommended to install the system components using these guidelines:

1. The main system components are designed to be rack-mounted into standard 19in. EIA racks. Remove the 4 rubber bumper foot pads found on the bottoms of the bays before installing them. Four (4) holes are provided for mounting the bays in the rack. Rack-mounting screws and associated hardware are NOT included.
2. If possible, rack the LTC 8902 Series bays so they are in a central location with respect to the LTC 8903 Series bays. This is especially important in large system configurations where many LTC 8903 Series Input Bays will be feeding video to a single or a few LTC 8902 Series Output Bays.
   NOTE: Interconnecting LTC 8902 Series bays and LTC 8903 Series bays must be located close enough together that the supplied 2 m (6 ft) video interconnect cables can be used. Although it is not an absolute requirement, the matrix bay video interconnect cabling will be easier to manage if the LTC 8902 Series Bays are mounted higher up in the rack above any LTC 8903 Series Input Bays.
3. Camera and monitor video connections are NOT made directly to the LTC 8902 Series and LTC 8903 Series matrix bays. All external video connections are made to LTC 8808/00 Video Interconnect Panels. Each LTC 8808/00 panel accepts up to 32 video connections and interfaces to the various matrix bays using 2 LTC 8809/00 video ribbon cables. The LTC 8808/00 panels can be mounted wherever convenient as long as they are within 2 m (6 ft) of the matrix bay that they are being used with 2 m (6 ft) is the length of the LTC 8809/00 ribbon cable).
4. Install the LTC 8902 Series and LTC 8903Series matrix bays close enough to the systems LTC 8946/93 LAN switch(es) so that the supplied 8 m (25 ft) LAN cables can be used. If necessary due to unusual installation conditions, longer standard 10/100 Base-T LAN cables should be obtained from a local computer hardware supplier.
5. Once installed, some care is necessary to avoid damage to the connectors on the matrix bays to which the LTC 8809/00 ribbon cables are attached. The ribbon cable connectors contain locking hooks which can be damaged if too much strain is put on the ribbon cables. If necessary, support the LTC 8809/00 cables to eliminate excessive loading force on the locking hooks.

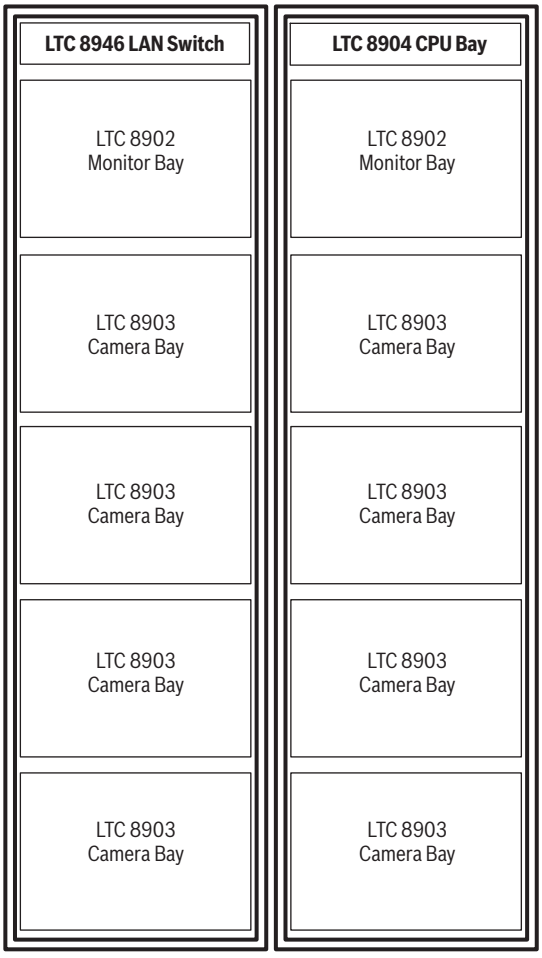


Figure 5.1: LTC 8900 1024 Camera by 128 Monitor System Installed in Two 72 in. EIA Mounting Racks

5.2 LTC 8904 Series CPU Bay Installation

The LTC 8904 Series Main CPU Bay is supplied fully assembled and requires no user adjustments. Install the CPU bay into the mounting rack.
NOTE: Rack-mounting screws and associated hardware are NOT included.

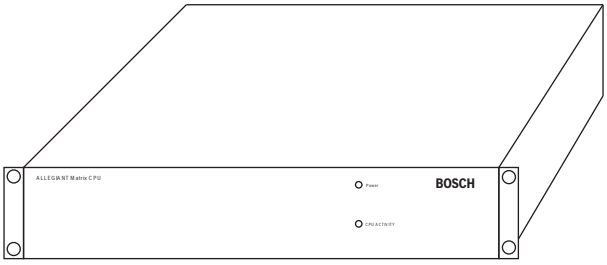


Figure 5.2: LTC 8904 Series CPU Bay

It is recommended that the CPU bay be mounted so that a 9 cm (3-1/2 in.) rack space is available either above or below the enclosure. In sites where the system can not be taken out of operation for a period of time, this will leave a mounting space available for a replacement CPU in the unlikely event that the original CPU must be removed for servicing. Do not attach line cord to AC power source until instructed to do so.

5.3 LAN Switch Installation

The LTC 8946/93 is a standard 10/100 Base-T network switch. Disregard the original manufacturers instructions supplied with the LAN switch(es). To use the switch(es) in the LTC 8900 system, follow the directions supplied in this manual ONLY.
The software supplied with the switch(es) is not used. The switch(es) for the LTC 8900 systems are used in a network dedicated to only the LTC 8900 system. **The switch(es) must not be connected to a computer network or any other network.**
All of the LAN data cables going to the switch(es) will connect to the front panel ports. The main AC linecord is connected to the rear panel of the switch. If desired, switch(es) can be mounted so that the front panel is facing into the rack. Determine which orientation is most suitable for your application, then attach the supplied racking ears to the side mounting holes accordingly.
Attach the AC line cords to the switches, but do not attach the line cord to the AC power source until instructed to do so.

5.4 LTC 8902 Series Output Bay and LTC 8903 Series Input Bay Installation

The LTC 8902 Series and LTC 8903 Series bays require insertion of the power supply, data receiver module, and the video modules.
Remove the front panel of the bay (LTC 8902 Series or LTC 8903 Series) by loosening the 4 corner fasteners.
LTC 8902 Series Video Output bays are supplied with LTC 8906 Series power supplies. LTC 8903 Series Video Input bays are supplied with LTC 8805 Series power supplies.
Install the power supply in the far right position of the bay ensuring proper alignment and seating of the supply into the rear mating connector.
Verify that the power supply ON/OFF switch is in the OFF position.

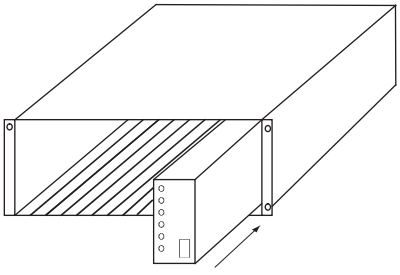


Figure 5.3: Typical Power Supply Insertion

Install four (4) supplied screws and star washers on the rear panel of the bay(s) surrounding the power supply line cord. This fastens the power supply securely in place.
Repeat this procedure for all LTC 8902 Series and LTC 8903 Series bays.

Caution!
If the LTC 8902 Series or LTC 8903 Series bays are to be transported, the main power supplies should be removed to prevent possible damage to the bays internal parts.

Install the matrix bays into the mounting rack.
Place the bays in the racks as described in General Installation Considerations within his manual.
Note that rack-mounting screws and associated hardware are NOT included.
Attach the AC line cord, but do not power up the bay until instructed.

NOTE: The LTC 8902 Series and LTC 8903 Series bays should be installed so there is at least 4.5 cm (1-3/4 in.) of clearance above and below the bay, to allow for proper cooling. Failure to provide proper clearance may cause the equipment to exceed its recommended operating temperature range.
DO NOT install the LTC 8934/00 Video Output modules or the LTC 8921/00 Video Input modules into the matrix bays at this time.

5.5 Module Insertion

A special tool is supplied with the system components, for insertion of the Data Receiver, Video Input Module, and Video Output Module boards into LTC 8902 and LTC 8903 Series equipment bays. The tool is a simple lever (an angled piece of aluminum), used as follows: Insert the board fully into the slot, ensuring proper alignment with the connectors. Insert the short end of the lever into the groove in the front of the bay so the tool is aligned with the card ejectors on the card, then push the lever to force the card into the slot.

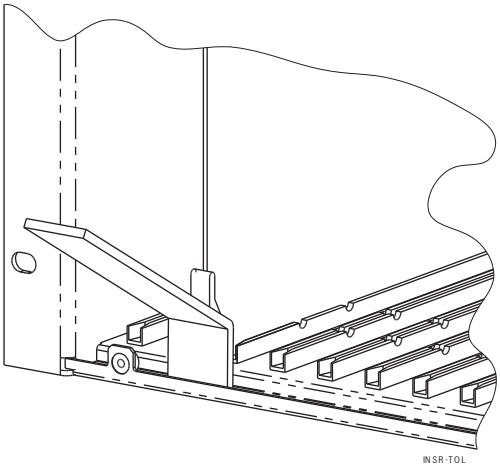


Figure 5.4: Example of Insertion Tool Use

5.6 Data Receiver Modules

LTC 8902 Series Video Output bays are supplied with LTC 8916/01 Data Receiver modules. LTC 8903 Series Video Input bays are supplied with LTC 8918/01 Data Receiver modules. Data Receiver Modules are installed into the right most slot (adjacent to the power supply) of the matrix bays as shown below:

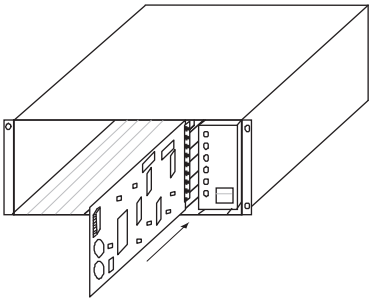


Figure 5.5: Typical Data Receiver Module Insertion

5.7 LTC 8916/01 Data Receiver Modules

The LTC 8916/01 Data Receiver modules (installed in LTC 8902 Series bays) contain three (3) 8-position dip switches.

For system configurations of up to 2048 cameras and 512 monitors, , *page 68* can be used as a guide for setting the Data Receiver DIP switches. Otherwise, follow the procedure described below.
Verify that switches located on dipswitch S1 and S3 are all OFF.On dipswitch S2 of the LTC 8916/01, verify that switches 1 to 4 are OFF. Switch 8 should be in the ON position. Switches 5 through 7 determine the monitor number range that the bay will be used for and must be set according to the table below:

5	6	7	Monitor Range
OFF	OFF	OFF	1 to 64
OFF	OFF	ON	65 to 128
OFF	ON	OFF	129 to 192
OFF	ON	ON	193 to 256
ON	OFF	OFF	257 to 320
ON	OFF	ON	321 to 384
ON	ON	OFF	385 to 448
ON	ON	ON	449 to 512

Table 5.1: LTC 8916/01 Data Receiver Module Switch Positions (used in LTC 8902 Service Bays)

5.8 LTC 8918/01 Data Receiver Modules

The LTC 8918/01 Data Receiver modules (installed in LTC 8903 Series bays) contain three (3) 8-position dip switches. For system configurations of up to 2048 cameras and 512 monitors, , *page 68* can be used as a guide for setting the Data Receiver DIP switches. Otherwise, follow the procedure described below.
Verify that switches 1 to 3 and 5 to 8 on dipswitch S1 are OFF.
If the LTC 8903 Series bay will be used as a *primary camera bay* (one that will have cameras directly connected to it), place switch 4 on S1 in the OFF position.
If the LTC 8903 Series bay will be used as a *secondary camera bay* (one that will have other LTC 8903 Series bays connected to its inputs), place switch 4 on S1 in the ON position.
If switch 4 on S1 has been set to the OFF position (for use as a *primary camera bay* as described previously), set switches 1 to 4 on S2 according to the *Primary Camera Bay Range* in , *page 25* shown below:

1	2	3	4	Camera Number Range
OFF	OFF	OFF	OFF	1 to 256
OFF	OFF	OFF	ON	257 to 512
OFF	OFF	ON	OFF	513 to 768
OFF	OFF	ON	ON	769 to 1024
OFF	ON	OFF	OFF	1025 to 1280
OFF	ON	OFF	ON	1281 to 1536
OFF	ON	ON	OFF	1537 to 1792
OFF	ON	ON	ON	1793 to 2048

1	2	3	4	Camera Number Range
ON	OFF	OFF	OFF	2049 to 2304
ON	OFF	OFF	ON	2305 to 2560
ON	OFF	ON	OFF	2561 to 2816
ON	OFF	ON	ON	2817 to 3072
ON	ON	OFF	OFF	3073 to 3328
ON	ON	OFF	ON	3329 to 3584
ON	ON	ON	OFF	3585 to 3840
ON	ON	ON	ON	3841 to 4096

Table 5.2: LTC 8918/01 Data Receiver Module (used in LTC 8903 Series bays) S2 positions 1 through 4

LTC 8903 Series Camera bays will always be providing video signals (either directly, or via a second LTC 8903 Series bay) to a specific LTC 8902 Series Monitor bay. Determine the applicable LTC 8902 Series Monitor bay, then set switches 5 through 7 on dipswitch S2 to the same settings as switches 5 through 7 on S2 of the Data Receiver module installed in the corresponding LTC 8902 Series bay. These will be the same settings as listed in the Monitor Number Range shown in *, page 24*.
On dipswitch S2 of the LTC 8918, verify that switch 8 is ON.
If switch 4 on S1 has been set to the ON position (for use as a *secondary camera bay* as described above), set switches 3 and 4 of S2 OF. Set switches 1 and 2 of S2 according to which *primary camera bays* it will be connected per *, page 25* below:

1	2	Primary Camera Bay Range
OFF	OFF	1 to 4
OFF	ON	5 to 8
ON	OFF	9 to 12
ON	ON	13 to 16

Table 5.3: LTC 8918 Data Receiver Module (used in LTC 8903 bays) S2 Positions 1 and 2

5.9 LTC 8934/00 Video Output Modules

The appropriate number of LTC 8934/00 Video Output Modules should be installed in the LTC 8902 Series main bay starting with the left most slot. Each output module handles 8 outputs. If fewer than the maximum number of Video Output Modules are installed, they should be installed from left to right, with empty spaces on the right.
In some system configurations, 8 or less LTC 8934/00 modules may be distributed between two (2) LTC 8902 Series Video Output bays. This configuration assures partial system operation in the unlikely event of an LTC 8902 Series failure. Since this creates a *gap* in the monitor number order, the optional Allegiant PC-based system software allows renumbering of the *logical* monitor numbers. For example, if the system was designed for 64 monitor outputs, four LTC 8934/00 modules (handling monitors 1 to 32) would be installed in the first LTC 8902 Series bay. Another four LTC 8934/00 modules would be installed in a second LTC 8902 Series bay.

The default monitor number range for this second module would be 65 to 96. Since this would be inconvenient to operators of the system, the *logical* numbers of the monitor numbers in the second bay can be renumbered to range from 33 to 64 using the optional Allegiant PC-based system software. *, page 37* shows an example of this type of configuration. It is also possible to number the monitors so that one bay contains the odd numbered monitors and the other bay contains even numbered monitors. This way, a viewing location containing an even mix of monitors from each bay would lose *every other one* in the unlikely event of a LTC 8902 Series bay failure.

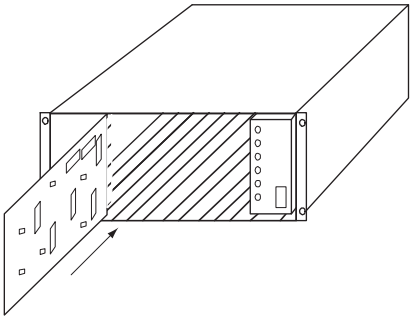


Figure 5.6: Typical Video Output Module Insertion

The LTC 8934/00 Video Output Modules contain five (5) 8-position dip switches. DIP switch S1001 is reserved and all switches should be left in the ON position.

Dip switches S1002, S1003, S1004, and S1005 are video termination switches for each of the video bus inputs. All of these switches should be set to ON (terminated). This is the factory default.

All LTC 8934/00 Video Output Modules are identical and can be swapped anywhere within the bay without changing the module.

5.10 LTC 8921/00 Video Input Modules

For the LTC 8903 Series Bays, termination switches (S1001 through S1004) on the LTC 8921/00 Video Input Modules must be set to the correct position prior to installation. Read the Termination Practices section prior to actually installing the Video Input Modules on these systems. As shipped from the factory, all terminated switches are in the ON (terminated) position.

Locate and use the diagram(s) that best fit your system configuration (*, page 68* to *, page 68* in this manual). The appropriate number of Video Input Modules (LTC 8921/00) should be installed in the LTC 8903 Series main bay, starting with the left most slot. Each input module handles 32 inputs by 32 outputs.

Since the LTC 8903 Series supplies 64 outputs, two (2) LTC 8921/00 input cards are required for each set of 32 cameras. Odd numbered slots provide video for monitors 1-32, and even numbered slots provide video for monitors 33-64. If 32 or less monitors are being served by the LTC 8903 Series bay, the Video Input Modules are not required in the even numbered slots. This concept is shown in *, page 68* and examples of system configurations are shown in *, page 68*.

Cards in even numbered slots should have all termination switches OFF. If looping is not being used, cards in odd numbered slots should have the termination switches ON. See Termination Practices for more details.

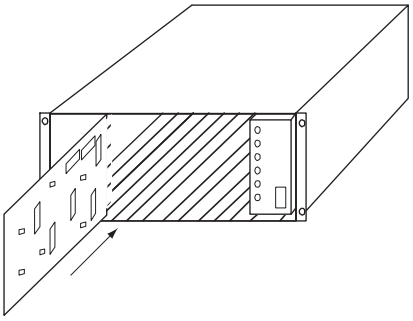


Figure 5.7: Typical Video Input Module Insertion

All LTC 8921/00 Video Input Modules are identical and can be swapped anywhere within the bay without making any changes to the module except to maintain proper termination settings.

5.11 System Video Connections

5.11.1 Camera Input Connections

Camera connections to the LTC 8903 Series Input Bays require LTC 8808/00 Video Interconnect (Patch) Panel. Each patch panel provides 32 BNCs for video input or video looping connections to the system. Patch panels are connected to the rear of the LTC 8903 Series Input Bay using the supplied LTC 8809/00 ribbon cables. Each cable can carry video for up to 16 cameras. Two cables can be attached to each patch panel to support up to 32 cameras per panel. Each ribbon cable should be attached to the appropriate VIDEO IN connector on the rear of the LTC 8903 Series bays. A rear panel diagram of the LTC 8903 Series bay is shown in *, page 68*. Refer to *, page 68* to *, page 68* to review typical system connections.

The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when connecting system components.

Although attaching a ribbon cable with reversed polarity will not cause permanent damage, it can cause all video functions within the bay to cease until corrected. Double-check ribbon cable connections to avoid this condition.

, page 68 illustrates the polarity key orientations on the LTC 8902 and LTC 8903 Series video matrix bays.

The LTC 8808/00 panels are typically installed on the rear of the mounting rack, behind the applicable matrix bay. They can be mounted elsewhere as long as the 2 m (6 ft) LTC 8809/00 ribbon cables can reach the applicable matrix bay. Note that rackmounting screws and associated hardware are NOT included.

The Video Input connectors are labeled with multiple levels. If more than 256 cameras are used in a system, multiple levels of input bays are used. These system configurations are shown in *, page 68* through *, page 68*.

5.11.2 System Connections over 1024 Cameras

If more than 1024 cameras are used, a second stage of LTC 8903 Series Video Input Bays are required. These system configurations are shown in *, page 68*, *, page 68* to *, page 68*, *, page 68* and *, page 68*. In this configuration, the VIDEO OUT connectors from the first stage LTC 8903 Series bays are connected to the VIDEO IN connectors on the second stage bays using LTC 8809/00 ribbon cables.

The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching between the bays.

The VIDEO OUT connectors are labeled A through D. These connectors must be connected to corresponding VIDEO IN connectors labeled A through D.

5.11.3 Camera Bays to Monitor Bay Video Connections

The VIDEO OUT connectors from LTC 8903 Series input bays are connected to the VIDEO BUS connectors on the LTC 8902 Series output bays using LTC 8809/00 ribbon cables. Rear panel diagrams of the LTC 8902 Series and LTC 8903 Series bays are shown in , *page 68*.

The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching between the bays.

, *page 68* shows the polarity *key* of the ribbon cable connectors on the LTC 8902 Series and LTC 8903 Series matrix bays.

The LTC 8903 Series bay s VIDEO OUT connectors are labeled A through D, and the Monitor Bay VIDEO BUS connectors are labeled **CAMERA BAY OUTPUT A through CAMERA BAY OUTPUT D**.

The input bay A-D connectors must be connected to corresponding A-D connectors on the output bay using LTC 8809/00 coax ribbon cables. , *page 68* and , *page 68* demonstrate these connections.

5.11.4 Multiple Monitor Bay Consideration

If multiple monitor bays are used in the system, the LTC 8903 Series Input Bay configuration must be duplicated for each output bay. This is illustrated in system configuration diagrams , *page 68* through , *page 68*. The video inputs from the first set of LTC 8903 Series Input Bays must be looped through to the second set of input bays using LTC 8809/00 coax ribbon cables.

The LTC 8903 Series bays provide looping connectors for these connections. The supplied ribbon cable connectors are connected from the LOOP outputs of the first set of input bays to the corresponding VIDEO IN connectors on the next set of input bays using LTC 8809/00 ribbon cables. This looping can continue as needed. The termination switches on the LTC 8921/00 Video Input Cards must be turned OFF in all LTC 8903 Series Input bays except those in the last set (assuming the system will NOT have video looping connections).

5.11.5 Monitor Output Connections

For monitor connections, the LTC 8902 Series Output Bays require the LTC 8808/00 Video Interconnect (Patch) Panel. Up to 32 monitors per panel can be connected. Each ribbon cable should be attached to the appropriate *MONITOR OUTPUT* connector on the rear of the LTC 8902 Series bays.

The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching between system components.

Refer to , *page 68* for typical system connections. The LTC 8808/00 panels are typically installed on the rear of the mounting rack behind the applicable matrix bay. They can be mounted elsewhere as long as the 2 m (6 ft) LTC 8809/00 ribbon cables can reach the applicable matrix bay.

NOTE: Rack-mounting screws and associated hardware are NOT included.

5.11.6 System Video Looping Connections

LTC 8808/00 panels are also used to provide looping video outputs from the system. Each ribbon cable should be attached to the appropriate **LOOP** connector on the rear of the last group of LTC 8903 Series bays.

The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching between system components.

5.12 Termination Practices

Video from every camera should be terminated with a 75 ohm resistance. Each video line should be terminated exactly once. If video from a camera is going to several devices, only the last piece of equipment on the video line should be terminated.
See *, page 68* through *, page 68* for proper termination practices. Allegiant LTC 8900 systems terminate their video inputs as follows:

5.12.1 LTC 8903 Series Terminations

Each LTC 8921/00 VIM card has DIP switches (S1001 through S1004) for selecting the termination of each video line. To terminate an input line, make sure that the appropriate DIP switch on the VIM card is ON. If non-terminated operation is required for looping purposes, turn the switch OFF.
Each LTC 8921/00 VIM card provides outputs for 32 monitors. The LTC 8903 Series bay provides 64 outputs, two LTC 8921/00 VIM cards for each 32 inputs (when more than 32 monitors are being served by the LTC 8903 Series bay). In this case, inputs are shared by adjacent cards. The cards in slots one and two handle inputs 1-32, the cards in slots three and four handle inputs 33-64, etc,. Since each input goes to two cards, only one of the two cards should be terminated. Although either card in a pair can be terminated, it is recommended that cards in the odd number slots are terminated (dip switches ON), and cards in even numbered slots are unterminated.
The LTC 8903 Series Input Bay provides video looping connections which use LTC 8809/00 coax type ribbon cables. Each LTC 8809/00 cable provides looping capability for up to 16 video inputs. The termination switches on the LTC 8921/00 cards should be OFF for all LTC 8903 Series Input bays except those in the last set (assuming the system will NOT have video looping connections). In the last bay, the termination switches should be set to ON in even numbered slots (as described in the preceding paragraph).
If the system will have some or all video inputs looped out, all termination switches corresponding to the looped video channels should be set to OFF in all LTC 8903 Series bays.

5.12.2 Second Level LTC 8903 Series Terminations

When more than 1024 cameras are used, two levels of LTC 8903 Series bays are required. In this case the LTC 8903 Series bays in the first level are terminated as described above. In the second level LTC 8903 Series bay, the termination switches should be turned ON on all cards. Note that in the secondary level, LTC 8903 Series cards are inserted only into slots 1, 4, 5, 8, 9, 12, 13, and 16 as depicted in *, page 68* through *, page 68*, *, page 68*, and *, page 68*.

5.12.3 LTC 8902 Series Terminators

Dip switches S1002, S1003, S1004, and S1005 on the LTC 8934/00 Video Output Module are video termination switches. All of these switches should be set to ON (terminated). This factory default correctly terminates the outputs of the LTC 8903 Series bays into a 75 ohm load.
Just like camera inputs, monitor outputs on the Allegiant system are designed to be terminated. Each monitor output from the LTC 8902 Series bay expects to be connected to a 75 ohm load. This is the load typically provided by a normal monitor. If a monitor output line is looped through several monitors or other equipment, make sure that only the last unit on the line is terminated.

5.13 System Data Connections

5.13.1 LTC 8904 Series CPU Data Connections

The LTC 8904 Series CPU connects to the LTC 8946/93 LAN switch using a supplied standard 8m (25ft) 10/100Base-T twisted pair cable. The LAN cable can be connected to any port of the LTC 8946/93 LAN switch.

5.13.2 LTC 8902 Series and LTC 8903 Series Data Connections

Data connections for LTC 8902 Series and LTC 8903 Series bays are shown in *, page 68*.
Each LTC 8902 Series bay and LTC 8903 Series bay has two LAN connectors, but either of these connectors can be used. Only one at a time should be connected. The supplied standard 8 m (25 ft) 10/100Base-T twisted pair cable is used to connect the LAN connectors on the LTC 8902 Series and LTC 8903 Series bays to any of the ports on any of the LTC 8946/93 LAN switch(es).
The number of available LAN ports can be increased by cascading multiple LTC 8946/93 LAN switches. Each LTC 8946/93 provides 10 additional ports. Additional ports are only required in large systems with more than a combined total of 11 LTC 8902 Series and LTC 8903 Series bays.

5.13.3 Multiple LTC 8946/93 LAN Switch Connections

When the combined quantity of LTC 8902 Series and LTC 8903 Series matrix bays exceeds 11, use 1 or more additional LTC 8946/93 LAN switch(s). Each additional LTC 8946/93 switch provides 10 additional ports for connection to matrix bays.
Connect the supplied 2 m (6 ft) crossover cable from any port of the second LTC 8946/93 LAN switch to any port located on the first LTC 8946/93 LAN switch. Connect any additional LTC 8946/93 LAN switches similarly. These data connections are illustrated in *, page 68*.

5.14 Main Power Connections

Install the supplied AC power cords between the various pieces of equipment and the appropriate AC power source.
Verify that the AC power switches (on applicable components) are initially set to OFF.
The order that power is supplied to the system is not critical, but the following order is recommended if unfamiliar with the equipment:
Apply power to the LTC 8946/93 LAN switch(es). The LAN switches do not have a main AC power switch, and should power up as soon as the main AC power cord is connected.
Switch on the main AC power to the video bays (LTC 8902 and LTC 8903).
Verify that the LEDs associated with the fuses are lit on all of the power supplies located in the LTC 8902 Series and LTC 8903 Series matrix bays.
Initially, the modules within the matrix bays should indicate the following conditions:

- The CPU ACT. LEDS on all Data Receiver modules (module next to power supply) installed in the various matrix bays should blink randomly green. The LAN LINK/ACT LED will blink green to indicate communication with the Allegiant CPU. The LAN DUP/COL LED illuminates yellow to indicate a full duplex network link exists with the Allegiant CPU. All other LEDs can be ignored.
- Activity LEDs should be blinking on the video input and output modules installed in the matrix bays.

Apply power to the LTC 8904 Series CPU bay. The LTC 8904 Series CPU does not have a main AC power switch, and should power up as soon as the main AC power cord is connected. The front panel power LED should be lit and the Activity LED should blink.

NOTE: Depending on activity and general size of the system, it may require several seconds to fully initialize after a power-up reset.

At this point, the system should be operational. If cameras and monitors are connected to the system, video from camera number 1 should be visible on all system monitors. The on-screen text overlay should be visible and the clock should be running (even if no video signal is present). If not, double-check video and data cable connections. If necessary, refer to the Troubleshooting Guide in this manual.

To complete the installation, proceed to *Camera Phasing and Accessory Installation, page 54*.

6 Hardware Installation Procedure for Redundant System Configuration Utilizing LTC 8901 Series CPU

Refer to for Installation Procedure for standard system configuration using LTC 8904 Series CPU.

6.1 System Redundancy Considerations

6.1.1 General Information

Redundant configurations of the LTC 8900 Allegiant System are designed so that no single point failure can disable the entire system. This is accomplished by providing redundancy for critical system components. This section provides the information required to design truly fault-tolerant systems.

The LTC 8901 Series CPU bay is the central point of control for the video switching system. In the standard nonredundant system configuration, a failure of this component would disable the entire system. To prevent this, the LTC 8901 Series was designed with redundant CPU boards and power supplies, all contained within the LTC 8901 Series bay. If one of the primary components fails, control is automatically switched to the backup units.

In a redundant LTC 8900 configuration, the PC software uses a patented Data Mirroring feature. This feature maintains the backup CPU in the same state as the primary CPU. If a switch-over to the backup CPU occurs, the system will be displaying the same cameras, running the same sequences, and otherwise replicating the state of the primary CPU prior to failure.

To perform Data Mirroring, the system monitors all data changes in the primary CPU, and sends copies of this data to the backup CPU. Data Mirroring works for configuration tables, such as camera titles, and for real time event data, such as alarm activations. The copied data is verified by appropriate hardware handshaking and data checking mechanisms, ensuring that the backup CPU contains valid data at the critical time of a switch-over.

In the redundant configuration of the LTC 8900 system, a supplied external computer is used to monitor the operating condition of the primary and backup CPUs. This computer, the LTC 8943/95 System Controller, runs the System Supervisor program to perform the system monitoring and Data Mirroring functions. Note that failure of the System Controller PC has no affect on normal operation of the LTC 8900 system. In fact, the system can be operated without the System Controller, with automatic switchover and Data Mirroring functions then unavailable.

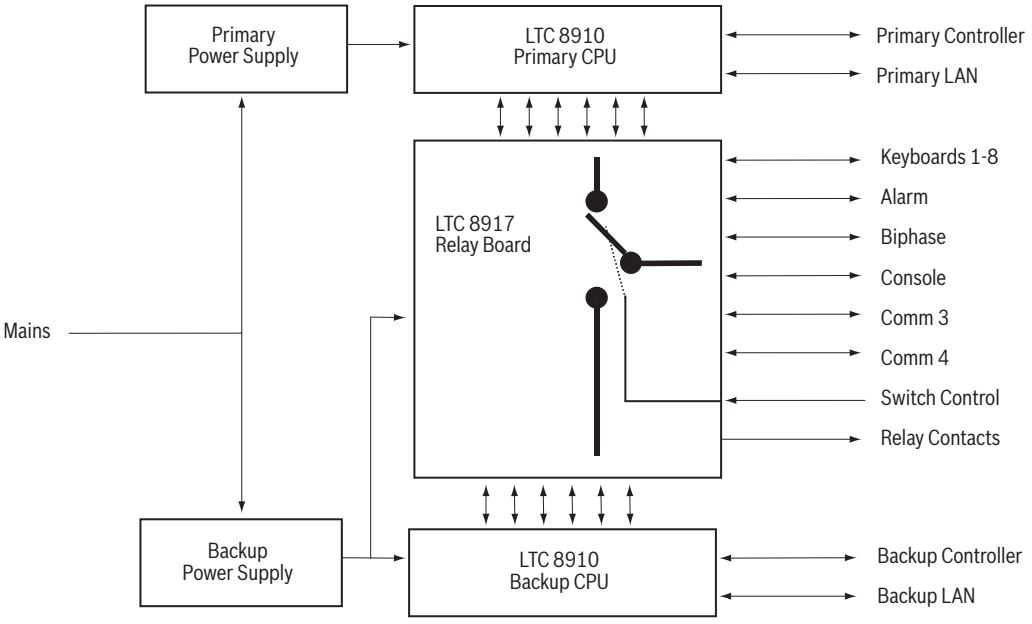


Figure 6.1: Automatic switchover and Data Mirroring functions then unavailable.

6.1.2 LTC 8901 Series CPU Design Features

The LTC 8901 CPU was designed to withstand failure of a CPU board or power supply with no loss of functionality or data. A diagram of the CPU bay is shown below.

The bay contains two identical sets of power supplies and CPU boards (primary and backup). The communication ports for external devices, such as keyboards and alarm units, can be switched to either CPU.

The LTC 8943/95 System Controller PC monitors the operation of the CPUs through the Primary Controller and Backup Controller ports. Under normal conditions, the external devices are connected to the primary CPU. If the primary CPU or power supply fails, the LTC 8943/95 System Controller PC detect this failure and switches the communication ports to the backup CPU using the Switch Control input.

6.1.3 LTC 8943/95 System Controller PC Functions

The System Controller uses a rack-mount, industrial grade PC to provide several important features in redundant LTC 8900 system configurations. The System Supervisor software that runs on this PC provides user interface and control functions for the CPU selection and Data Mirroring features. The System Controller data connections are shown in the following figure.

The System Controller uses the Primary Controller and Backup Controller ports on the LTC 8901 Series bay to communicate with the primary and backup CPUs. If a failure is detected, the System Controller sends a signal on the Switch Control port of the LTC 8901 Series to cause the switch to the backup controller. The System Controller then disables the LAN port connected to the primary CPU and enables the LAN port connected to the backup CPU.

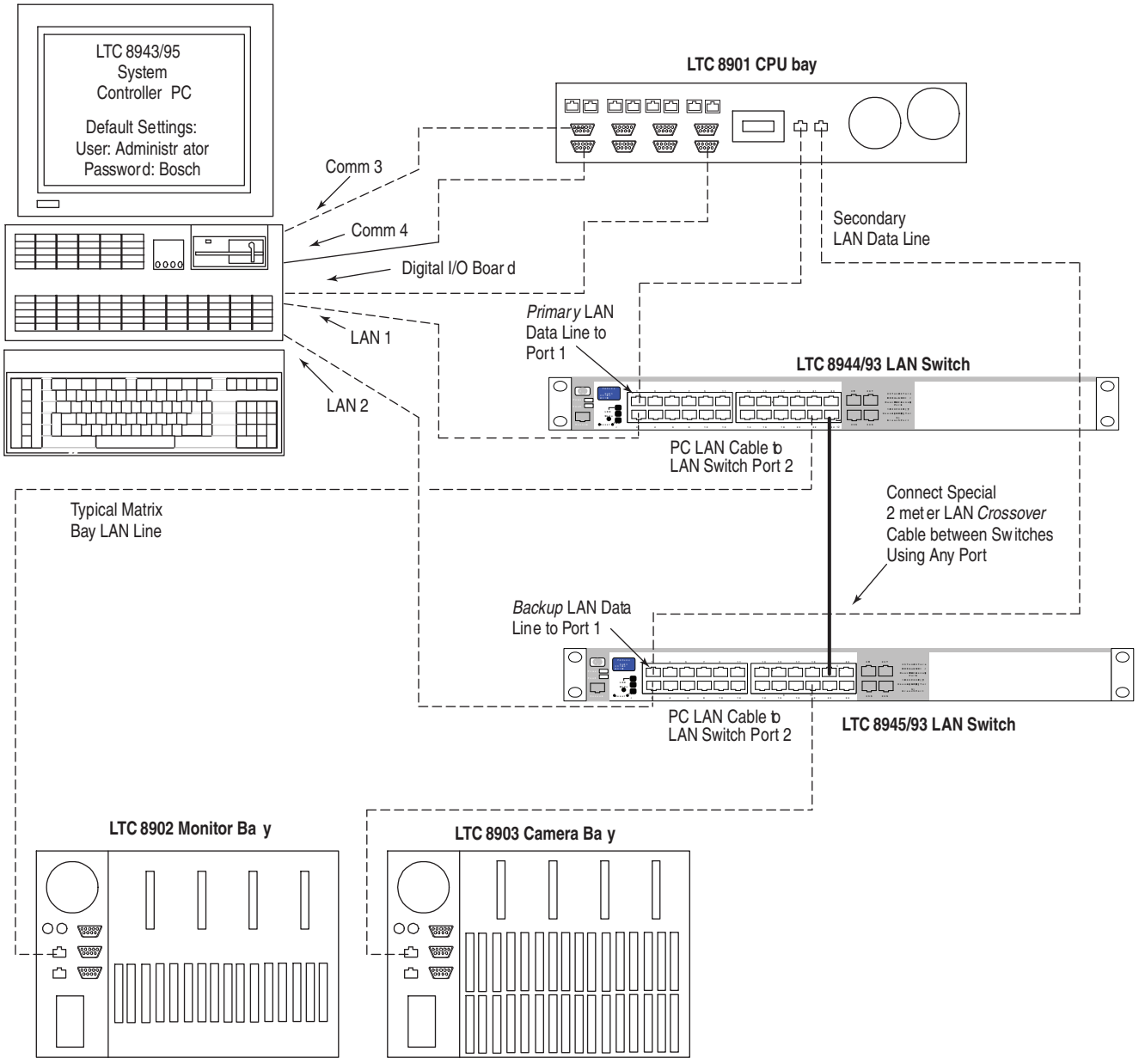


Figure 6.2: Data Connections for Redundant System Design

6.1.4 LTC 8901 Series CPU Design Features

The LAN switches provide the interbay communication for the system. Since all systemcommunication is routed through these switches, the use of only one switch would make the system vulnerable to a single point failure. The redundant configurations of the LTC 8900 system are therefore supplied with a minimum of two switches.

The LAN switches are standard 10/100Base-T ethernet switches. Data connections are made using unshielded twisted pair wire with RJ-45 modular connectors. On the LTC 8944/93 and LTC 8945/93 switches, the factory preconfigures port 1 to accept CPU communication and port 2 to accept System Controller PC communication. The switches are also factory preconfigured so that any data entering ports 3 through 12 is sent to all other ports. A special LAN cable connection (shown in , *page 34*) provides a data path between the two switches.

With this in place, data coming from the in-use CPU will go to all other ports on both switches. This allows the video bays to be connected to any port on either switch (except port 1 or 2, which is reserved for the System Controller PC).
The LAN switches are extremely reliable, but the system should be designed to minimize the impact of a switch failure. If a single port on a switch fails, only the bay connected to that port will be lost. If an entire switch fails, all bays connected to that switch will fail.
Thus, it is advisable to divide critical cameras and monitors to bays connected to different switches, ensuring that no more than half of these signals will be lost in the event of a switch failure.
The LTC 8901 Series CPU bay provides separate LAN connections for the primary CPU and backup CPU. The LTC 8900 system was designed so that each CPU board always thinks that it is controlling the system. Thus both CPUs send control data to the LAN switches. To prevent conflicts, the System Controller disables the LAN switch port 1 for the CPU that is not in use. For example, when the primary CPU is controlling the system, LTC 8945/93 LAN switch port 1 for the backup CPU is disabled.
The System Controller uses LAN connections into port 2 of the switches to control and monitor these switches. If a switch failure is detected (either a complete failure or a failure of the CPU port, i.e., port 1), automatic switch-over will occur.

6.1.5 Video Bay Redundancy Considerations

The LTC 8900 system was designed to provide redundancy for critical components. Careful system design ensures that tolerance of single point failures is maintained. For example, if a single output bay is used in the system and the data receiver board in the bay fails, the entire system will fail (this is true for the LTC 8900 system as well as the competitors systems). When fault-tolerance is critical, the system designer should always specify at least two output bays. This allows critical camera signals to be distributed between the bays.
To support this redundancy concept for smaller systems, the LTC 8901 Series configuration tables may be programmed with logical camera and monitor numbering. An example of the non-redundancy/redundancy concept is shown in the following two figures. Both figures showa 256 x 64 system.
In the first configuration, a worst case failure in either the output or input bay could disable the entire system.
In the second configuration, logical monitor numbering was used to unconfigure monitor outputs 33-64, and renumber monitor outputs 65-96 as logical monitor numbers 33-64. Logical monitor renumbering is configured using the Allegiant Server software. Refer to the software manual for details.

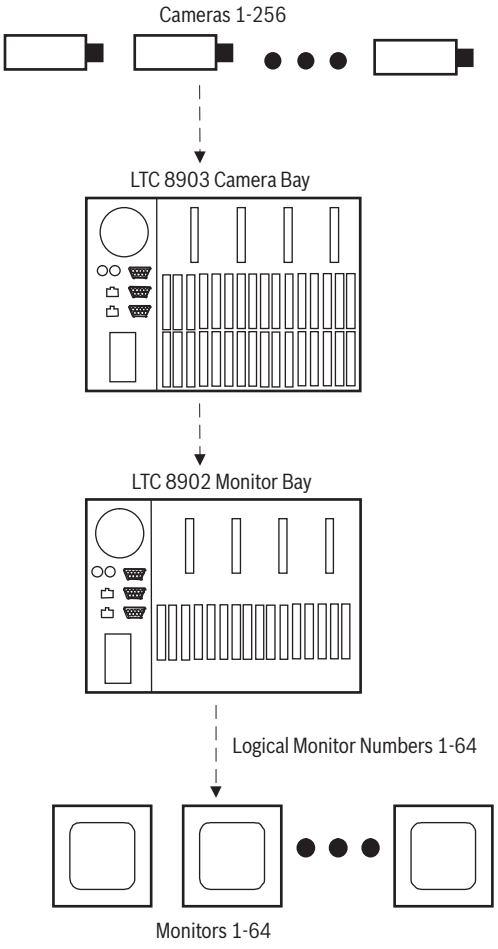


Figure 6.3: Non Fault-tolerant 256 Camera x 64 Monitor System

6.1.6 General Installation Considerations

To facilitate system installation, it is highly recommended to install system components using the following guidelines:

1. The main system components are designed to be rack-mounted into standard 19 in. EIA racks. Remove the 4 rubber bumper foot pads found on the bottoms of the bays before installing them. Four (4) holes are provided for mounting the bays in the rack. Rack-mounting screws and associated hardware are NOT included.
2. With redundant system configurations, install the LTC 8943/95 System Controller PC, monitor, and keyboard so that they are easily accessible for the system installer/ programmer.
   NOTE: The PC must be installed within 3 m (10 ft) of the main CPU bay and within 3 m (10 ft) of the LAN switches so the supplied cables can be used.

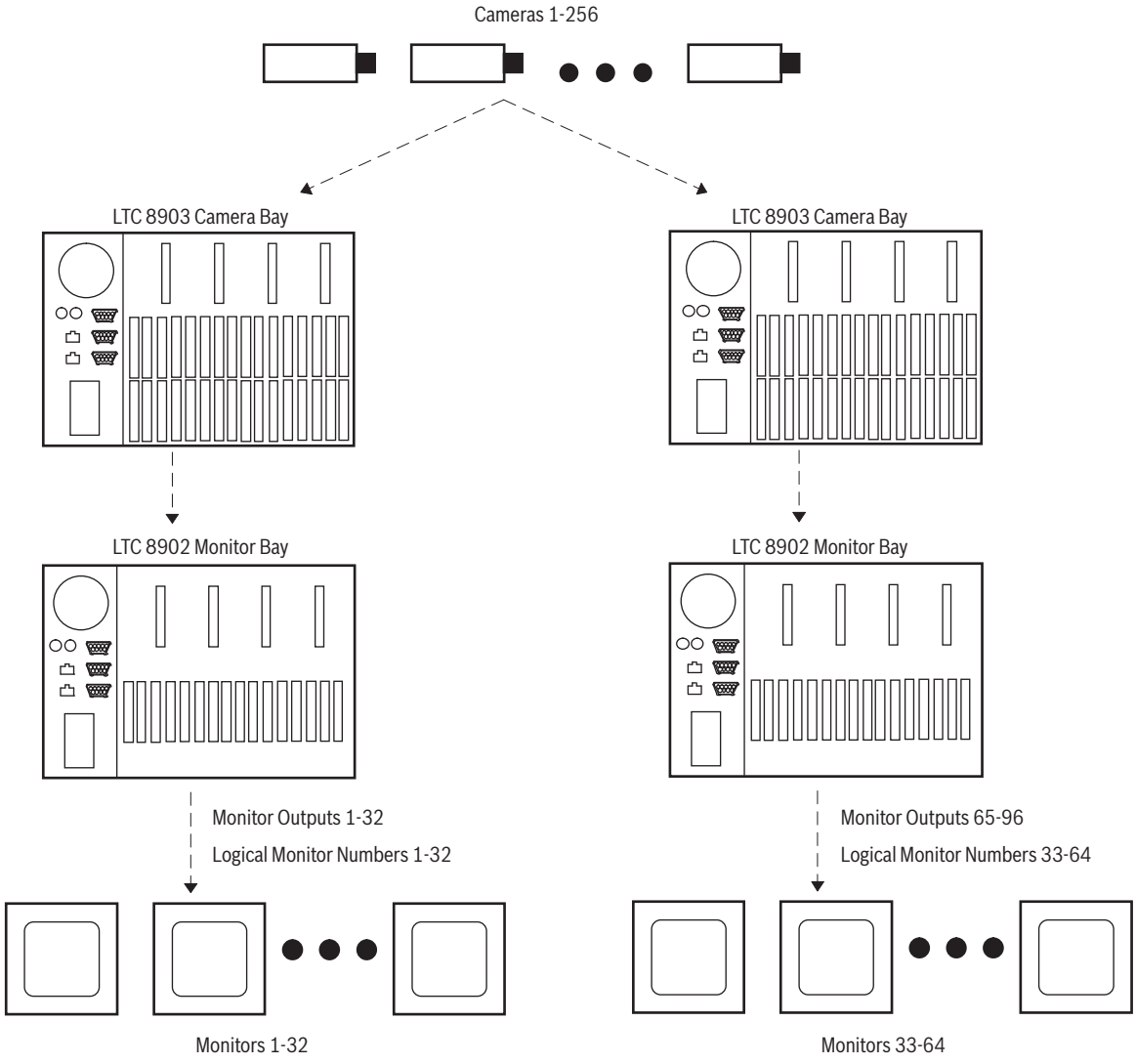


Figure 6.4: Fault-tolerant 256 Camera x 64 Monitor System

3. If possible, rack the LTC 8902 Series bays so they are in a central location with respect to the LTC 8903 Series bays. This is especially important in large system configurations where many LTC 8903 Series Input Bays will be feeding video to a single or a few LTC 8902 Series Output Bays.
   NOTE: Interconnecting LTC 8902 Series bays and LTC 8903 Series bays must be located close enough together that the supplied 2 m (6 ft) video interconnect cables can be used. Although not a requirement, the matrix bay video interconnect cabling will be easier to manage if the LTC 8902 Series Bays are mounted higher up in the rack, above any LTC 8903 Series Input Bays.
4. Camera and monitor video connections are NOT made directly to the LTC 8902 Series and LTC 8903 Series matrix bays. All external video connections are made to LTC 8808/00 Video Interconnect Panels. Each LTC 8808/00 panel accepts up to 32 video connections and interfaces to the various matrix bays using two (2) LTC 8809/00 video ribbon cables. The LTC 8808/00 panels can be mounted wherever convenient, as long as they are within 2 m (6 ft) of the matrix bay that they are being used with 2 m (6 ft) length of the LTC 8809/00 ribbon cable).

5. Install the LTC 8902 Series and LTC 8903 Series matrix bays close enough to the system LAN switches (LTC 8944/93, LTC 8945/93, and LTC 8946/93) so that the supplied 8 m (25 ft) LAN cables can be used.
   If necessary due to unusual installation conditions, longer standard 10/100Base-T LAN cables should be obtained from a local computer hardware supplier.
6. Once installed, exercise care to avoid damaging to the connectors on the matrix bays to which the LTC 8809/00 ribbon cables are attached. The ribbon cable connectors contain locking hooks that can be damaged if too much strain is put on the ribbon cables.
   If necessary, support the LTC 8809/00 cables to eliminate excessive loading force on the locking hooks.
7. Do not mix the different types of supplied LAN cables. The 3 m (10 ft) length is used between the CPU and LAN switches. The 8 m (25 ft) length is used between the CPU and the video matrix bays in all system configurations. The 2 m (6 ft) length has reversed data connections and can only be used between the LTC 8944/93, LTC 8945/93, and LTC 8946/93 LAN switches.

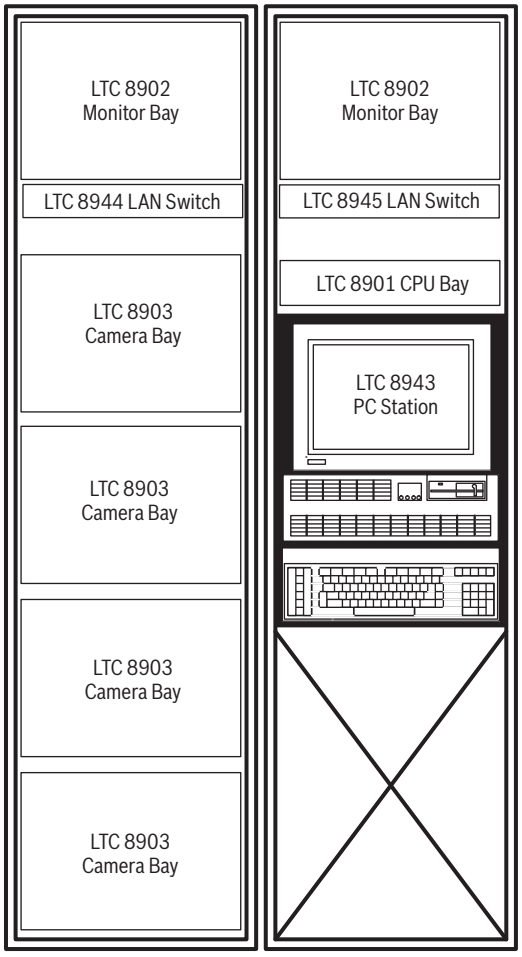


Figure 6.5: LTC 8900 512 Cameras by 128 Monitors Redundant System Configuration Installed in two (2) 72-in. EIA mounting racks

6.2 Main CPU Bay Installation

The LTC 8900 Series Main CPU Bay is supplied fully assembled and requires no user adjustments. Install CPU bay into the mounting rack. Note, rack-mounting screws and associated hardware are NOT included.

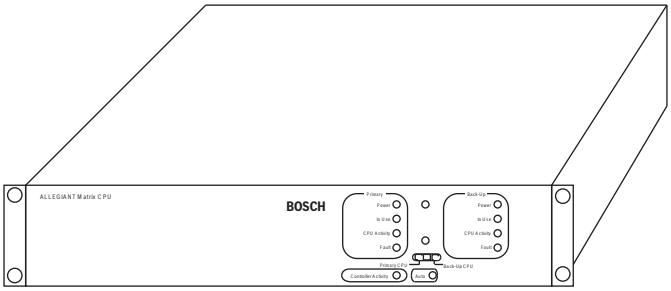


Figure 6.6: LTC 8901 Series CPU Bay

It is recommended that the CPU bay be mounted so a 9 cm (3-1/2 in.) rack space is available either above or below the enclosure. In sites where the system can not be taken out of operation for a period of time, this will leave a mounting space available for a replacement CPU in the unlikely event that the original CPU must be removed for servicing.
Verify that the front panel selector switch is set to AUTO.
Do not attach line cord to AC power source until instructed to do so.

6.3 LAN Switch Installation

The LTC 8944/93, LTC 8945/93, and LTC 8946/93 are 10/100Base-T LAN switches. The LTC 8944/93 and LTC 8945/93 LAN switches are used in redundant system configurations only. Disregard the original manufacturer s instructions supplied with the LAN switches.
All three models of LAN switches are standard 10/100Base-T network switches supplied with software (on CD-ROM) and network installation instructions by the original manufacturer. The software supplied with the switches is not used. The switches for the LTC 8900 systems are used in a network dedicated to only the LTC 8900 system. The switches must not be connected to a computer network, or any other network. To use the switches in the LTC 8900 system, follow the directions in this manual ONLY.
All data cables going to the switches connect to the front panel ports. The main AC line cord is connected to the rear panel of the switch. If desired, the switches can be mounted so that the front panel is facing into the rack. Determine which orientation is most suitable for your application, then attach the supplied racking ears to the side mounting holes accordingly. Attach AC line cords to switches, but do not attach line cord to AC power source until instructed.

6.4 LTC 8943/95 System Controller PC Installation

6.4.1 PC Installation

The LTC 8943/95 PC is supplied with all internal modules fully assembled. The rack ears can be attached or removed depending on if the unit will be installed into an EIA 19 in. rack or placed on desktop surface. Attach AC line cord but do not attach line cord to AC power source until instructed.

Caution!
Important considerations related to the LTC 8943/95 System Controller PC:
This PC contains a solid state hard drive with limited storage capacity. Please refrain from installing additional software that would reduce the remaining hard drive capacity to less than 1GB.
No anti-virus software is provided. If this PC will be connected to a network or the internet, Bosch strongly recommends that a user-supplied anti-virus software package is installed to provide protection.

In the inadvertent chance that a catastrophic problem or other unforeseen act corrupts the operating system files, a “Recovery DVD” is provided. The DVD can be used to restore the PC’s hard drive back to its original Factory default image. Complete instruction for use can be found on the DVD label.
A CD/DVD reader/writer is installed in this PC. Windows XP supports reading CD/DVDs and writing to CDs. If desired, the supplied copy of NERO CD/DVD media software can be installed an used to write to DVDs.
The latest version of Allegiant LTC 8059 Master Control Software (MCS) is installed on this PC. Older versions are included (but not installed) to support backward compatibility with older Allegiant CPU firmware. If necessary, refer to the Allegiant MCS desktop folder for additional information related to using the older MCS versions.

6.4.2 PC Monitor Installation

The monitor (UML-191-90) is a 48.3 cm (19 in.) LCD flat panel monitor that accommodates both video and PC input simultaneously. To install the monitor into an EIA 19 in. rack, attach the monitor to the monitor rack kit (UMM-LCDUB-RM) following the instructions supplied with the monitor rack kit. Connect the supplied VGA cable to the PC. If desired, an available monitor output from the Allegiant (or other composite video source) can be connected to the video input using a coax with BNC connector. Attach AC line cord but do not attach line cord to AC power source until instructed.

6.4.3 Keyboard/Mouse Rack Installation

The Keyboard/Mouse rack tray is designed to be installed into an EIA 19 in. rack, but a rack having a shallow depth may require additional work. If the tray does not match up with the rear part of the rack (too short or too long), some custom provisions at time of installation will be needed. In some cases, the back portion of the tray may protrude from the rear of the rack. Be sure to provide support for the rear portion of the tray unit.

6.4.4 Final Installation

Attach the mouse, keyboard, and software security dongle to the appropriate ports. These connection points are illustrated in , *page 68*. If desired, the USB and PS2 ports located on the front of the PC can also be used for external accessory connections.

6.5 LTC 8902 Series Output Bay and LTC 8903 Series Input Bay Installation

The LTC 8902 Series and LTC 8903 Series bays require insertion of the power supply, data receiver module, and the video modules. Remove the front panel of the bay (LTC 8902 Series or LTC 8903 Series) by loosening the four (4) corner fasteners.
LTC 8902 Series Video Output bays are supplied with LTC 8906 Series Power Supplies.
LTC 8903 Series Video Input bays are supplied with LTC 8805 Series Power Supplies.

Install the power supply in the far right position of the bay, ensuring proper alignment and seating of the supply into the rear mating connector. Verify that the power supply ON/OFF switch is in the OFF position.

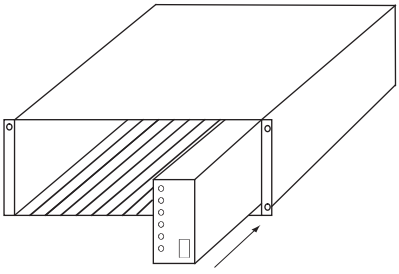


Figure 6.7: Typical Power Supply Insertion

Install 4 supplied screws and star washers on the rear panel of the bay(s) surrounding the power supply line cord. This fastens the power supply securely in place. Repeat this procedure for all LTC 8902 Series and LTC 8903 Series bays.

Caution!
If the LTC 8902 Series or LTC 8903 Series bays are to be transported, the main power supplies should be removed to prevent possible damage to the bays internal parts.

Install the matrix bays into the mounting rack. Place the bays in the racks as described in General Installation Considerations within this manual. Note, rack-mounting screws and associated hardware are NOT included. Attach AC line cord, but do not power up the bay until instructed to do so.

NOTE: The LTC 8902 Series and LTC 8903 Series bays should be installed so there is at least 4.5 cm (1-3/4 in.) of clearance above and below the bay, to allow for proper cooling. Failure to provide proper clearance may cause the equipment to exceed its recommended operating temperature range.

DO NOT install the LTC 8934/00 Video Output modules or the LTC 8921/00 Video Input modules into the matrix bays at this time.

6.6 Module Insertion

A special tool is supplied with the system components, for insertion of the Data Receiver, Video Input Module, and Video Output Module boards into LTC 8902/90 and LTC 8903/90 equipment bays. The tool is a simple lever (an angled piece of aluminum), used as follows:

Insert the board fully into the slot, ensuring proper alignment with the connectors.

Insert the short end of the lever into the groove in the front of the bay so the tool is aligned with the card ejectors on the card, then push the lever to force the card into the slot.

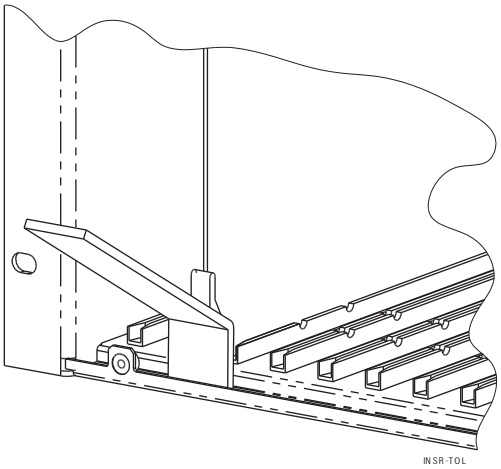


Figure 6.8: Example of Insertion Tool Use

6.7 Data Receiver Modules

LTC 8902 Series Video Output bays are supplied with LTC 8916/01 Data Receiver modules. LTC 8903 Series Video Input bays are supplied with LTC 8918/01 Data Receiver modules. Data Receiver Modules are installed into the right most slot (adjacent to the power supply) of the matrix bays as follows:

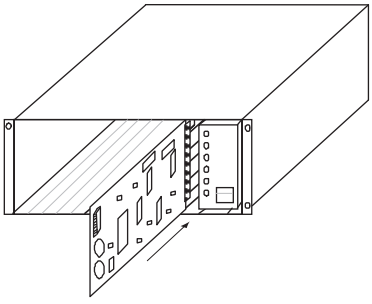


Figure 6.9: Typical Data Receiver Module Insertion

6.8 LTC 8916/01 Data Receiver Modules

The LTC 8916/01 Data Receiver modules (installed in LTC 8902 Series bays) contain three (3) 8-position dip switches.

For system configurations of up to 2048 cameras and 512 monitors, , *page 68* can be used as a guide for setting the Data Receiver DIP switches. Otherwise, follow the procedure described below.

Verify that switches located on dipswitch S1 are all OFF.

On dipswitch S2 of the LTC 8916/01, verify that switches from 1 to 4 are OFF. Switch 8 should be in the ON position. Switches 5 through 7 determine the monitor number range that the bay will be used for and must be set according to , *page 43*.

5	6	7	Monitor Range
OFF	OFF	OFF	1 to 64
OFF	OFF	ON	65 to 128
OFF	ON	OFF	129 to 192
OFF	ON	ON	193 to 256

5	6	7	Monitor Range
ON	OFF	OFF	257 to 320
ON	OFF	ON	321 to 384
ON	ON	OFF	385 to 448
ON	ON	ON	449 to 512

Table 6.1: LTC 8916/01 Data Receiver Module Switch Positions (used in LTC 8902 Service Bays)

6.9 LTC 8918/01 Data Receiver Modules

The LTC 8918/01 Data Receiver modules (installed in LTC 8903 Series bays) contain three (3) 8-position dip switches.

For system configurations of up to 2048 cameras and 512 monitors, , *page 68* can be used as a guide for setting the Data Receiver DIP switches. Otherwise, follow the procedure described below.

Verify that switches 1 to 3 and 5 to 8 on dipswitch S1 are OFF.

Switch 4 on S1 should be placed in the OFF position if the LTC 8903 Series bay will be used as a primary camera bay (one that will have cameras directly connected to it). If the LTC 8903 Series bay will be used as a secondary camera bay (one that will have other LTC 8903 Series bays connected to its inputs), place switch 4 on S1 in the ON position.

If switch 4 on S1 has been set to the OFF position (for use as a primary camera bay as described above) set switches 1 to 4 on S2 according to the Primary Camera Bay Range in the table below:

1	2	3	4	Camera Number Range
OFF	OFF	OFF	OFF	1 to 256
OFF	OFF	OFF	ON	257 to 512
OFF	OFF	ON	OFF	513 to 768
OFF	OFF	ON	ON	769 to 1024
OFF	ON	OFF	OFF	1025 to 1280
OFF	ON	OFF	ON	1281 to 1536
OFF	ON	ON	OFF	1537 to 1792
OFF	ON	ON	ON	1793 to 2048
ON	OFF	OFF	OFF	2049 to 2304
ON	OFF	OFF	ON	2305 to 2560
ON	OFF	ON	OFF	2561 to 2816
ON	OFF	ON	ON	2817 to 3072
ON	ON	OFF	OFF	3073 to 3328
ON	ON	OFF	ON	3329 to 3584

1	2	3	4	Camera Number Range
ON	ON	ON	OFF	3585 to 3840
ON	ON	ON	ON	3841 to 4096

Table 6.2: LTC 8918/01 Data Receiver Module (used in LTC 8903 Series bays) S2 positions 1 through 4

LTC 8903 Series Camera bays always provide video signals (either directly, or via a second LTC 8903 Series bay) to a specific LTC 8902 Series Monitor bay. Determine the applicable LTC 8902 Series Monitor bay, then set switches 5 through 7 on dip switch S2 to the same settings as switches 5 through 7 on S2 of the Data Receiver module installed in the corresponding LTC 8902 Series bay. These will be the same settings as listed in the Monitor Number Range shown in *, page 43*.
ON dip switch S2 of the LTC 8918, verify that switch 8 is ON.
If switch 4 on S1 has been set to the ON position (for use as a secondary camera bay as described above) set switches 3 and 4 of S2 OFF and set switches 1 and 2 of S2 according to which primary camera bays it will be connected to per *, page 44*.

1	2	Primary Camera Bay Range
OFF	OFF	1 to 4
OFF	ON	5 to 8
ON	OFF	9 to 12
ON	ON	13 to 16

Table 6.3: LTC 8918 Data Receiver Module (used in LTC 8903 bays) S2 Positions 1 and 2

6.10 LTC 8934/00 Video Output Modules

The appropriate number of LTC 8934/00 Video Output Modules should be installed in the LTC 8902 Series main bay starting with the left most slot. Each output module handles 8 outputs. If fewer than the maximum number of Video Output Modules are installed, they should be installed from left to right, with empty spaces on the right.
In some system configurations, 8 or less LTC 8934/00 modules may be distributed between two (2) LTC 8902 Series Video Output bays. This configuration assures partial system operation in the unlikely event of an LTC 8902 Series failure. Since this creates a gap in the monitor number order, the system software allows renumbering of the logical monitor numbers. For example, if the system was designed for 64 monitor outputs, four LTC 8934/00 modules (handling monitors 1 to 32) would be installed in the first LTC 8902 Series bay. Another four LTC 8934/00 modules would be installed in a second LTC 8902 Series bay. The default monitor number range for this second module would be 65 to 96. Since this would be inconvenient to operators of the system, the logical numbers of the monitor numbers in the second bay can be renumbered to range from 33 to 64 using the software on the System Supervisor PC. *, page 37* shows an example of this type of configuration. It is also possible to number the monitors so that one bay contains the odd numbered monitors and the other bay contains even numbered monitors. This way, a viewing location containing an even mix of monitors from each bay would lose every other one in the unlikely event of an LTC 8902 Series bay failure.

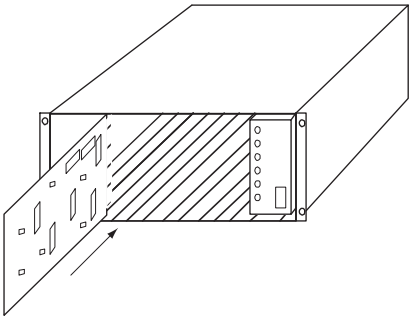


Figure 6.10: Typical Video Output Module Insertion

The LTC 8934/00 Video Output Modules contain five (5) 8-position dip switches. DIP switch S1001 is reserved and all switches should be left in the ON position.
Dip switches S1002, S1003, S1004, and S1005 are video termination switches for each of the video bus inputs. All of these switches should be set to ON (terminated), the factory default position. All LTC 8934/00 Video Output Modules are identical and can be swapped anywhere within the bay without making any changes to the module.

6.11 LTC 8921/00 Video Input Modules

For the LTC 8903 Series Bays, termination switches(S1001 through S1004) on the LTC 8921/00 Video Input Modules must be set to the correct position prior to installation. Read Termination Practices section prior to actually installing the Video Input Modules on these systems. As shipped from the factory, all terminated switches are placed in the ON (terminated) position.
It is helpful to locate and use one or more of the diagrams that best fits your system configuration among , *page 68* to , *page 68* in this manual.
The appropriate number of Video Input Modules (LTC 8921/00) should be installed in the LTC 8903 Series main bay, starting with the left most slot. Each input module handles 32 inputs by 32 outputs.
Since the LTC 8903 Series supplies 64 outputs, two (2) LTC 8921/00 input cards are required for each set of 32 cameras. Odd numbered slots provide video for monitors 1-32, and even numbered slots provide video for monitors 33-64. If 32 or fewer monitors are being served by the LTC 8903 Series bay, Video Input Modules are not required in the even numbered slots. This concept is shown in , *page 68*, and examples of system configurations are shown in , *page 68*.
Cards in even numbered slots should have all termination switches set to OFF. If looping is not being used, cards in odd numbered slots should have the termination switches set to ON (see Termination Practices for more details).

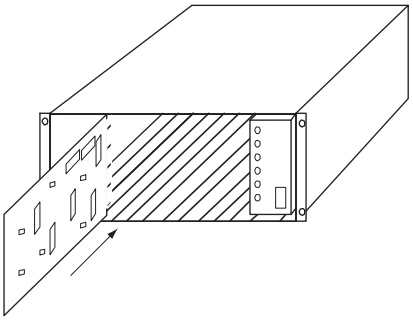


Figure 6.11: Typical Video Input Module Insertion

All LTC 8921/00 Video Input Modules are identical and can be swapped anywhere within the bay without making any changes to the module, except to maintain proper termination settings.

6.12 System Video Connections

6.12.1 Camera Input Connections

Camera connections to the LTC 8903 Series Input Bays require the LTC 8808/00 Video Interconnect (Patch) Panel. Each patch panel provides 32 BNCs for video input or video looping connections to the system. Patch panels are connected to the rear of the LTC 8903 Series Input Bay using the supplied LTC 8809/00 ribbon cables. Each cable can carry video for up to 16 cameras. Two (2) cables can be attached to each patch panel to support up to 32 cameras per panel. Each ribbon cable should be attached to the appropriate VIDEO IN connector on the rear of the LTC 8903 Series bays. A rear panel diagram of the LTC 8903 Series bay is shown in *, page 68*.

Refer to *, page 68* for typical system connections.

The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching cables between system components.

Although attaching a ribbon cable with reversed polarity will not cause any permanent damage, it can cause all video functions within the bay to cease until corrected. Double-check ribbon cable connections to avoid this condition.

, page 68 illustrates the polarity key orientations on the LTC 8902 and LTC 8903 Series video matrix bays.

The LTC 8808/00 panels are typically installed on the rear of the mounting rack behind the applicable matrix bay. They can be mounted elsewhere as long as the 2 m (6 ft) LTC 8809/00 ribbon cables can reach the applicable matrix bay. Note, rack-mounting screws and associated hardware are NOT included.

The Video Input connectors are labeled with multiple levels. If more than 256 cameras are used in a system, multiple levels of input bays are used. This type of system configuration is shown in *, page 68* through *, page 68*.

6.12.2 System Connections over 1024 Cameras

If more than 1024 cameras are used, then a second stage of LTC 8903 Series Video Input Bays are required. This type of system configurations is shown in *, page 68*, *, page 68* through *, page 68*, *, page 68*, and *, page 68*. In this configuration, the VIDEO OUT connectors from the first stage LTC 8903 Series bays are connected to the VIDEO IN connectors on the second stage bays using LTC 8809/00 ribbon cables.

The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching between the bays. The VIDEO OUT connectors are labeled A through D. These connectors must be connected to corresponding VIDEO IN connectors labeled A through D.

6.12.3 System Connections over 1024 Cameras

The VIDEO OUT connectors from LTC 8903 Series input bays are connected to the VIDEO BUSconnectors on the LTC 8902 Series output bays using LTC 8809/00 ribbon cables. Rear panel diagrams of the LTC 8902 Series and LTC 8903 Series bays are shown in *, page 68*.

The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching between the bays. See *, page 68*, showing the polarity key of the ribbon cable connectors located on the LTC 8902 Series and LTC 8903 Series matrix bays.

The LTC 8903 Series bay s VIDEO OUT connectors are labeled A through D, and the Monitor Bay VIDEO BUS connectors are labeled CAMERA BAY OUTPUT A through CAMERA BAY OUTPUT D.
The input bay A-D connectors must be connected to corresponding A-D connectors on the output bay using LTC 8809/00 coax ribbon cables. , *page 68* and , *page 68* demonstrate these connections.

6.12.4 Multiple Monitor Bay Considerations

If multiple monitor bays are used in the system, the LTC 8903 Series Input Bay configuration must be duplicated for each output bay. This is illustrated in the system configuration diagrams of , *page 68* through , *page 68*. The video inputs from the first set of LTC 8903 Series Input Bays must be looped through to the second set of input bays using LTC 8809/00 coax ribbon cables. The LTC 8903 Series bays provide looping connectors to support these connections. The supplied ribbon cable connectors are connected from the LOOP outputs of the first set of input bays to the corresponding VIDEO IN connectors on the next set of input bays using LTC 8809/00 ribbon cables. This looping can continue as needed. The termination switches on the LTC 8921/00 Video Input Cards must be turned OFF in all LTC 8903 Series Input bays except for those in the last set (assuming the system will NOT have video looping connections).

6.12.5 Monitor Output Connections

For monitor connections, the LTC 8902 Series Output Bays require the LTC 8808/00 Video Interconnect (Patch) Panel. Up to 32 monitors per panel can be connected. Each ribbon cable should be attached to the appropriate MONITOR OUTPUT connector on the rear of the LTC 8902 Series bays.
The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching between system components.
Refer to , *page 68* for typical system connections. The LTC 8808/00 panels are typically installed on the rear of the mounting rack behind the applicable matrix bay. They can be mounted elsewhere as long as the 2 m (6 ft) LTC 8809/00 ribbon cables can reach the applicable matrix bay. Note, rack-mounting screws and associated hardware are NOT included.

6.12.6 System Video Looping Connections

LTC 8808/00 panels are also used to provide looping video outputs from the system. Each ribbon cable should be attached to the appropriate LOOP connector on the rear of the last group of LTC 8903 Series bays.
The LTC 8809/00 ribbon cables have keyed connectors on each end. Maintain correct polarity when attaching between system components.

6.13 Termination Practices

Video from every camera should be terminated with a 75 ohm resistance. Each video line should be terminated exactly once. If video from a given camera is going to several different devices, only the last piece of equipment on the video line should be terminated. Various diagrams illustrating proper termination practices are shown in , *page 68* through , *page 68*. Allegiant LTC 8900 systems terminate their video inputs as follows:

6.13.1 LTC 8903 Series Terminators

Each LTC 8921/00 VIM card has DIP switches (S1001 through S1004) for selecting the termination of each video line. To terminate an input line, make sure that the appropriate DIP switch on the VIM card is ON. If non-terminated operation is required for looping purposes, turn the switch OFF. Each LTC 8921/00 VIM card provides outputs for 32 monitors. Since the

LTC 8903 Series bay provides 64 outputs, two LTC 8921/00 VIM cards are required for each 32 inputs (when more than 32 monitors are being served by the LTC 8903 Series bay). In this case, inputs are shared by adjacent cards. The cards in slots one and two handle inputs 1-32; the cards in slots three and four handle inputs 33-64, etc. Since each input goes to two cards, only one of the two cards should be terminated. Although either card in a pair can be terminated, it is recommended that cards in the odd number slots are terminated (dip switches ON) and cards in even number slots are unterminated.
The LTC 8903 Series Input Bay provides video looping connections which use LTC 8809/00 coax type ribbon cables. Each LTC 8809/00 cable provides looping capability for up to 16 video inputs. The termination switches on the LTC 8921/00 cards should be set to OFF for all LTC 8903 Series Input bays except those in the last set (assuming the system will NOT have video looping connections). In the last bay, the termination switches should be set to ON in even numbered slots (as described in the preceding paragraph).
If the system will have some or all video inputs looped out, all termination switches corresponding to the looped video channels should be set to OFF in all LTC 8903 Series bays.

6.13.2 Second Level 8903 Series Terminations

When more than 1024 cameras are used, two levels of LTC 8903 Series bays are required. In this case, the LTC 8903 Series bays in the first level are terminated as described above. In the second level LTC 8903 Series bay, the terminations switches should be turned ON on all cards.
NOTE: In the secondary level, LTC 8903 Series cards are inserted only into slots 1, 4, 5, 8, 9, 12, 13, and 16 as depicted in *, page 68* through *, page 68*, *, page 68* and *, page 68*.

6.13.3 LTC 8902 Series Terminations

Dip switches S1002, S1003, S1004, and S1005 on the LTC 8934/00 Video Output Module are video termination switches, which should be set to ON (terminated), the factory default position. This correctly terminates the outputs of the LTC 8903 Series bays into a 75 ohm load.
Like camera inputs, monitor outputs on the Allegiant system are designed to be terminated. Each monitor output from the LTC 8902 Series bay expects to be connected to a 75 ohm load. This is the load typically provided by a normal monitor. If a monitor output line is *looped* through several monitors or other equipment, ensure that only the last unit on the line is terminated.

6.14 System Data Connections

6.14.1 LTC 8901 Series CPU Data Connections

The LTC 8901 Series CPU connects to the supplied LTC 8943/95 System Controller PC using the supplied RS-232 cables and the Digital I/O connector. The PC COM3 port connects to the PRIMARY CONTROLLER jack on the LTC 8901 Series bay. The PC COM4 connects to the BACKUP CONTROLLER jack on the LTC 8901 Series bay.
The supplied Digital I/O cable connects the PC Digital I/O board (50-pin header connector on the back of the PC) to the SWITCH CONTROL jack on the LTC 8901 Series bay.
The LTC 8901 Series CPU also makes two LAN connections to the LAN switches. The PRIMARY LAN connector should be connected to PORT 1 of the LTC 8944/93 LAN switch (labeled Primary IP address) using a supplied standard 3 m (10 ft) 10/100Base-T twisted pair cable. The BACKUP LAN connector should be connected to PORT 1 of the LTC 8944/93 LAN switch (labeled Backup IP address) also using a supplied standard 3 m (10 ft) 10/100Base- T twisted pair cable.

Note that the LTC 8943/95 System Controller PC is supplied with a third LAN port. This port is available for connecting the PC to the user s Ethernet network. Only those with advanced knowledge of Windows and network installations should attempt to use this interface.
A rear panel diagram of the LTC 8901 Series CPU is shown in , *page 68*.

6.14.2 LTC 8902 Series and LTC 8903 Series Data Connections

Data connections for LTC 8902 Series and LTC 8903 Series bays are shown in , *page 68*.
Each LTC 8902 Series bay and LTC 8903 Series bay has two LAN connectors. Either of these connectors can be used, although only one should be connected at a time. The supplied standard 8 m (25 ft) 10/100Base-T twisted pair cable is used to connect from the LAN connectors on the LTC 8902 Series and LTC 8903 Series bays to any of the ports on any of the 10/100Base-T switches.
The LAN connections should be spread across LAN switch #1 and LAN switch #2 in a manner to minimize the impact of a switch failure to the system. For example, in a system with 128 monitor outputs, one LTC 8902 Series bay and all of its associated LTC 8903 Series bays can be connected to one LAN switch. The second LTC 8902 Series bay and its associated LTC 8903 Series bays should be connected to the other LAN switch. This way, half of the system (either monitors 1 to 64 OR monitors 65 to 128) will remain in operation in the unlikely event of a LAN switch failure.
The number of available LAN switches in the system can be expanded using additional LTC 8946/93 LAN switches. Each LTC 8946/93 provides 10 additional ports, which are only required in large systems having more than a combined total of 18 LTC 8902 Series and LTC 8903 Series bays.

6.14.3 LTC 8944/93 LAN Switch to LTC 8945/93 LAN Switch Connections

The LAN switches must be connected together using the supplied 2 m (6 ft) crossover LAN cable. Connect the LAN cable between any two ports on the two LAN switches.

6.14.4 LTC 8946/93 LAN Switch Connections

When the combined quantity of LTC 8902 Series and LTC 8903 Series matrix bays exceeds 18, 1 or more expansion LTC 8946/93 LAN switches are required. Each LTC 8946/93 expansion switch provides an additional 10 ports for connection to matrix bays.
Connect the supplied 2 m (6 ft) crossover cable from any port of the expansion LTC 8946/93 LAN switch to any port located on either the LTC 8944/93 or LTC 8945/93 LAN switch. Any additional LTC 8946/93 LAN switches would be connected in a similar manner to any available LTC 8944/93, LTC 8945/93, or LTC 8946/93 LAN switches. These data connections are illustrated in , *page 68*.

6.14.5 LTC 8943/95 PC to LTC 8945/93 LAN Switch Connectors

The LTC 8943/95 System Controller PC connects to the LTC 8944/93 and LTC 8945/93 LAN switches using the supplied standard 3 m (10 ft) 10/100Base-T twisted pair cables. Connect one cable from the Primary LAN interface board on the rear panel of the PC, to port 2 of the LTC 8944/93 LAN switch (switch labeled *Primary IP address*).
Connect another 3 m (10 ft) LAN cable from the Backup LAN interface board on the rear panel of the PC to port 2 of the LTC 8944/93 LAN switch (switch labeled *Backup IP address*). These data connections are illustrated in , *page 68*.

6.15 Main Power Connections

Install the supplied AC power cords between the equipment and the appropriate AC power source. Verify that the AC power switches (on applicable components) are initially set to OFF.

NOTE: Before attaching the AC line cord to the LTC 8943/95 System Controller PC, verify that the line voltage selector switch next to the AC plug is set correctly.

The order that power is supplied to the system is not critical, but the following order is recommended if unfamiliar with the equipment:

Apply power to the LTC 894x/93 LAN switches. The LAN switches do not have a main AC power switch, and should power up as soon as the main AC power cord is connected. Initially, the switch models should indicate the following conditions:

1. Power light is illuminated.
2. The *Link* port indicator LEDs corresponding to the 2 m (6 ft) *crossover* LAN cable should be illuminated.
3. *Mode* LEDs below the *Link* LEDs should blink.

Switch on the main AC power to the video bays (LTC 8902 and LTC 8903). Verify that the LEDs associated with the fuses are lit on all of the power supplies in the LTC 8902 Series and LTC 8903 Series matrix bays. Initially, the modules within the matrix bays should indicate the following conditions:

1. The CPU ACT. LEDs on all Data Receiver modules (module next to power supply) installed in the matrix bays should be blinking randomly green. The LAN LINK/ACT LED will blink green to indicate communication with the Allegiant CPU. The LAN DUP/COL LED illuminates yellow to indicate a full duplex network link exists with the Allegiant CPU. All other LEDs can be ignored.
2. Activity LEDs should be blinking on the video input and output modules installed in the matrix bays.

Turn on the main power switches to the LTC 8943 System Controller PC and its associated PC monitor. Continue to follow the power up procedure while the PC boots up.

Apply power to the LTC 8901 CPU bay. The LTC 8901 CPU does not have a main AC power switch, and should power up as soon as the main AC power cord is connected. Verify that the CPU Selector switch on the front panel is set to Auto Select mode. Initially, the front panel LEDs of the CPU bay should indicate the following conditions:

1. The power LEDs should be lit for both CPUs.
2. Activity LEDs should be blinking for both CPUs.
3. The In Use LED should be lit for the Primary CPU.
4. Both Fault LEDs should be off.
5. The Controller Activity LED should be off.
6. The Auto LED should be lit.

NOTE: Based on activity and general system, the system may require several seconds to fully initialize after a power up reset.

At this point, the system should be operational but not in its full *redundant mode*.

If cameras and monitors are connected to the system, video from camera number 1 should be visible on all system monitors. The on-screen text overlay should be visible and the clock should be running (even if no video signal is present). If not, double-check the video and data cable connections. If necessary, refer to the Troubleshooting section of this manual.

The following steps detail the initial operation of the PC-based System Supervisor software. Complete programming and operation of the supplied software can be found in the supplied LTC 8059 Master Control Software for Windows manual and the System Supervisor manual. If any difficulty is experienced, please refer to the appropriate manual.

1. If the PC was powered up in the previous section, the Windows operating system should already have begun running. Once the Begin login box appears, press Ctrl + Alt + Del as indicated.
2. When the login Information box appears, login as Administrator using the Password Bosch (only first letter is capitalized).

3. After the PC enters the Windows desktop screen, the Allegiant server program should start automatically. If the automatic feature has been disabled, find and double-click the Allegiant icon to open the Allegiant Server program.
4. When the login Information box appears, login as Installer level using the Password 1.
5. Select File, Open, and load the Default.Alg file. This default file automatically configures the communication ports to their default settings.
6. After the file has loaded, the table will appear on the screen. Click On-Online in the menu, then select Go-Online. After 20-30 seconds, the software will go on line and the System Supervisor selection box will appear.
7. Select the Primary CPU, and check the enabled data mirroring checkbox, then click OK.

The System Supervisor on-screen diagram should now indicate a fully operational system and the Controller Activity LED on the LTC 8901 CPU bay should be blinking.

NOTE: Since the LTC 8943/95 PC is intended to configure and monitor the operation of the LTC 8900 system, it is strongly recommended that the PC be used solely for this purpose. It should not be used as an operator s workstation, or for any other purpose that could interfere with its ability to provide automatic switchover functions.

6.16 LTC 8901 Series CPU Relay Outputs and Buzzers

The LTC 8901 Series main CPU bay provides five relay outputs that can be connected to devices to alert the operators if a failure is detected.

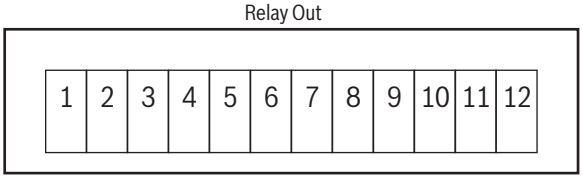


Figure 6.12: LTC 8901 CPU Rear Panel Relay Outputs

, page 52 defines the operations of the relay outputs. Dry contact relays with the following specifications are used:

Maximum load	1.0 A at 24 VAC, 40 VAC peak
Contact material	Ag (Au clad)
Minimum permissible load	10 mVDC, 10 A

The last two contacts of the Relay Out connector are actually inputs to the system. These contacts (pins 11 and 12 on the Relay Out connector) can be shorted together to disable the front panel buzzers on the LTC 8901 Series bay. If not disabled, these buzzers will sound if a LTC 8901 Series failure is detected. These contacts may be connected to a toggle switch to allow switchable disabling of the buzzers.

Connector Positions	Functions	Description
1 & 2	Relay - Primary Power Supply Fault	Normally open, closes when Primary Power Supply failure is detected
3 & 4	Relay - Primary CPU Fault	Normally open, closes when Primary CPU failure is detected
5 & 6	Relay - Backup Power Supply Fault	Normally open, closes when Back Power Supply failure is detected

Connector Positions	Functions	Description
7 & 8	Relay - Backup CPU Fault	Normal open, closes when Backup CPU failure is detected
9 & 10	Relay - Any Fault	Normally open, closes when any LTC 8901 failure is detected
11 & 12	Input - Silence Buzzer	Connect these inputs together to silence the LTC 8901 Series failure/warning buzzers

Table 6.4: CPU Relay Output Functions

6.17 LTC 8901 Series CPU Selection Switch

The Switch Control input to the LTC 8901 Series can be over ridden using the front panel switch. This switch allows manual selection of either the primary or backup CPU. This switch should be left in the AUTO position to enable the automatic switchover functions. The AUTO LED on the front panel illuminates to indicate proper switch position. If the LTC 8943/95 System Controller PC is not connected, the CPU cannot operate in a redundant mode even if its front panel switch is set to AUTO. However, the system will continue to operate in a nonredundant mode because the communication signals to the matrix bays continues to be supplied from the primary CPU.

If the CPU bay front panel switch is used to manually select a CPU, the appropriate LAN port enabling must still occur. The System Controller performs this action, even if the front panel switch is used to manually override automatic CPU selection. If the System Controller is connected and the System Supervisor software is running, the System Controller will automatically enable and disable the appropriate ports (when the System Supervisor software is running, the Controller Activity LED on the front of the LTC 8901 Series CPU bay will be blinking).

If a manual selection is made when the System Controller is not connected or the System Supervisor software is not running, the installer must manually ensure that the selected CPU LAN connection is plugged into an active port, and that the nonselected CPU LAN connection is either plugged into a disabled port or unplugged.

7 Camera Phasing and Accessory Installation

7.1 Camera Phasing Information

NOTE: All cameras should be vertically phased properly with each other. The LTC 8900 system is an analog switcher, and this is required to prevent rolling during video switching. Keyboard User Function 44 may simplify camera phasing tasks. Refer to the LTC 8900 Series user manual for complete details.

7.2 External Sync Information

Installations having cameras powered from an AC phase different than that of the LTC 8900 system may use the built-in EXTERNAL SYNC input or vertical PHASE ADJUST.
The EXTERNAL SYNC input accepts composite video, composite sync, or the output of a Master Sync generator. If desired, any of the system cameras may be used as a master sync source to the system using the EXTERNAL SYNC input.
To implement this feature, connect the incoming video source (using a BNC **T** connector) to both the appropriate camera BNC input and the EXTERNAL SYNC input on the rear of the LTC 8903 Series video input bay. Any of the LTC 8903 Series bays in the system can be used for this input. Multiple LTC 8903 Series bays can then be synchronized together by connecting the V SYNC output from the original bay to the EXT. SYNC input of the next bay. Continue *looping* the sync signals in this manner until all LTC 8903 Series bays are synchronized.
It is not necessary to connect a sync source to LTC 8902 video output bays. The LTC 8902 Series video output bays automatically become synchronized when a LTC 8903 Series bay is connected to it via ribbon cable to its **A1** connector. Alternatively, the PHASE ADJ on the front panel of the power supply may be adjusted on the original LTC 8903 Series bay until vertical interval switching is achieved. The PHASE ADJUST has a range of about 130 degrees.
If no external sync signal is used, the matrix bays automatically use the AC power to generate an internal sync signal.
The EXT SYNC LED on the front panel of the power supply inside a matrix bay illuminates whenever the bay is receiving an external sync signal. For LTC 8902 Series video output bays, this is whenever a ribbon cable is connected to its **A1** connector.

7.3 System Keyboard Installation

Connect a maximum of 8 system keyboards to any of the 8 keyboard ports (modular phone type jacks) on the rear of the LTC 8900 Series CPU bay. Each keyboard is supplied with a 3 m (10 ft) cable for local hookups. The LTC 8900 Series CPU bay can provide power to keyboards up to 30 m (100 ft) away using the optional LTC 8558/00 hookup cable. For distances of up to 1.5 km (5000 ft), the optional LTC 8557/x0 Hookup Kit is required, which is supplied with a remote power pack and requires user-supplied shielded twisted pair (Belden 9841 or equivalent) for communication.
Note that the system contains 64 levels of user priority which can affect operator access to various system features. These priority levels can be changed via the PC-based configuration software, but as a factory default, keyboard port number 1 is assigned the highest level. For the other keyboard default assignments, refer to the User Information section of the system s User Manual.
The system can accommodate an additional 56 system keyboards using external LTC 8714/x0 and LTC 8715/x0 keyboard port expander accessory units. Instructions for these accessories are included with the port expander units.

7.4 Signal Distribution Unit Hookup

The LTC 8900 Series CPU bay provides a single Biphase control code output which can be connected to a LTC 8568 or LTC 8768 Signal Distribution unit. The Signal Distribution units are used to provide Biphase control code outputs for communicating to remote receiver/ drivers, switcher-follower accessory units, the AutoDomefi Series of cameras, and Satellite systems. Instructions for these accessories are included with the units.

7.5 Alarm Interface Unit Hookup

The LTC 8900 Series CPU bay provides a single external alarm interface port which can be connected to a LTC 8540/00 Alarm Interface Unit or a LTC 8713/x0 Series Alarm Port Expander. Each LTC 8540/00 Alarm Interface unit accepts up to 64 dry contact closures or logic levels from remote sensing devices such as door contacts, PIRs, etc. The system can accommodate up to 1024 alarm inputs using a combination of LTC 8540/00 and LTC 8713/x0 Series accessory units. Instructions for these accessories are included with the units.

7.6 External Computer Interface Connections

The LTC 8900 Series CPU s CONSOLE port provides a single RS-232 interface port which can be connected to an external PC, an LTC 8712 Series Console Port Expander, or another computing device. This external interface port can be used to externally program and control the LTC 8900 system via a PC running the LTC 8059/00 Master Control Software, LTC 8850/00 Graphical User Interface software package, or a custom program generating Command Console Language (CCL) commands. Refer to the Allegiant Console Command Language manual for more information.

In redundant system configurations, commands and data received by the CONSOLE port are directed to the active CPU inside the LTC 8901 Series CPU bay. The system s mirroring feature automatically updates the nonactive CPU to reflect the same state.

NOTE: **The CONSOLE port does not provide a standardized pinout connection.** An interface cable is available by ordering part number LTC 8506/00. CPU port pinouts and cable pinout information can be found at the end of this manual.

The system s RS-232 communication protocols can be changed using the Allegiant PC-based configuration software package or via a system keyboard, but the factory default values are as follows:

Baud rate	115,200
Stop bits	1
Data bits	8
Parity	None
Hardware handshaking (RTS/CTS)	ON

The system can accommodate a total of 4 external devices using the LTC 8712 Series Console Port Expander accessory units. Instructions for these accessories are included with the port expander units.

7.7 Logging Printer Option Installation

NOTE: Although the installation procedure for each printer varies, the following steps are generally required. Save the printer reference manual for procedures not covered.

The LTC 8900 Series CPU does not provide a direct printer port. The CONSOLE interface port of the CPU can be configured to operate as a Printer output port. Do this by connecting a dumb terminal (or use the Windows Hyperterminal mode) to the CONSOLE port and issuing the following Command Console Language (CCL) command at the system prompt.
TC8900 > PRT2CON1
To convert back to normal Console operation, issue the same command to the port (no echo will be visible this time), but use a numeric value of zero.
Switch the main power to the printer OFF.
Install a ribbon cartridge and paper if necessary.
Set any configuration switches for your printer, to match the format provided by the LTC 8900 Series CPU. Note that the CPU communication protocol can be changed using the PC-based configuration software package, but the factory default values are as follows:

Baud rate	115,200
Stop bits	1
Data bits	8
Parity	None
Hardware handshaking (RTS/CTS)	ON

NOTE: The CONSOLE port does not provide a standardized pinout connection. An interface cable designed for a standard serial printer connection is required. Cable pinout information can be found at the end of this manual.
Attach the 9-pin male connector side of the cable to the LTC 8900 Series CPU bay connector labeled CONSOLE.
Apply power to the printer.
Verify logging printer action by loading a previously stored sequence into a monitor, activating an alarm, or performing a system reset. Any of these actions should cause a printout to occur.
The logging printer reports the following types of system status changes:
1. Incoming alarms
2. Acknowledgment of alarms by users
3. Loading of sequences
4. User logon/logoff to keyboard or console port
5. Console broadcast messages
6. Console transfer of system tables
7. Activation of time event functions
8. Power-up reset messages
9. Video loss messages

8 Satellite System Configuration Installations

A satellite system configuration is usually used for a medium to large distributed system, or to obtain extremely large matrix sizes configured more conventionally. Typically, a single Main control site can be used to view/control cameras located both locally and at various remote satellite sites. Since up to 256 satellite sites can be linked to a single Main control site, very large, distributed systems can be achieved. If the satellite systems are located at the same site as the Main system, the result is a large conventional-type system.

In a satellite configuration, the Main control site can view/control any camera in the entire system, but the remote satellite sites can only view/control cameras associated with their own site. Satellites may be configured to operate either independently or with no local viewing/control capability.

It is also possible to configure satellite systems where each site can view/control cameras from anywhere in the system. For a 2 site system, this is referred to as a dual master configuration. In the same manner, triple and quadruple master system configurations can also be configured. Cascaded satellite systems, where a Main site has a satellite which is a master to another satellite, is another available scenario. In fact, it is possible to configure systems that include a mixture of any or all of the above scenarios.

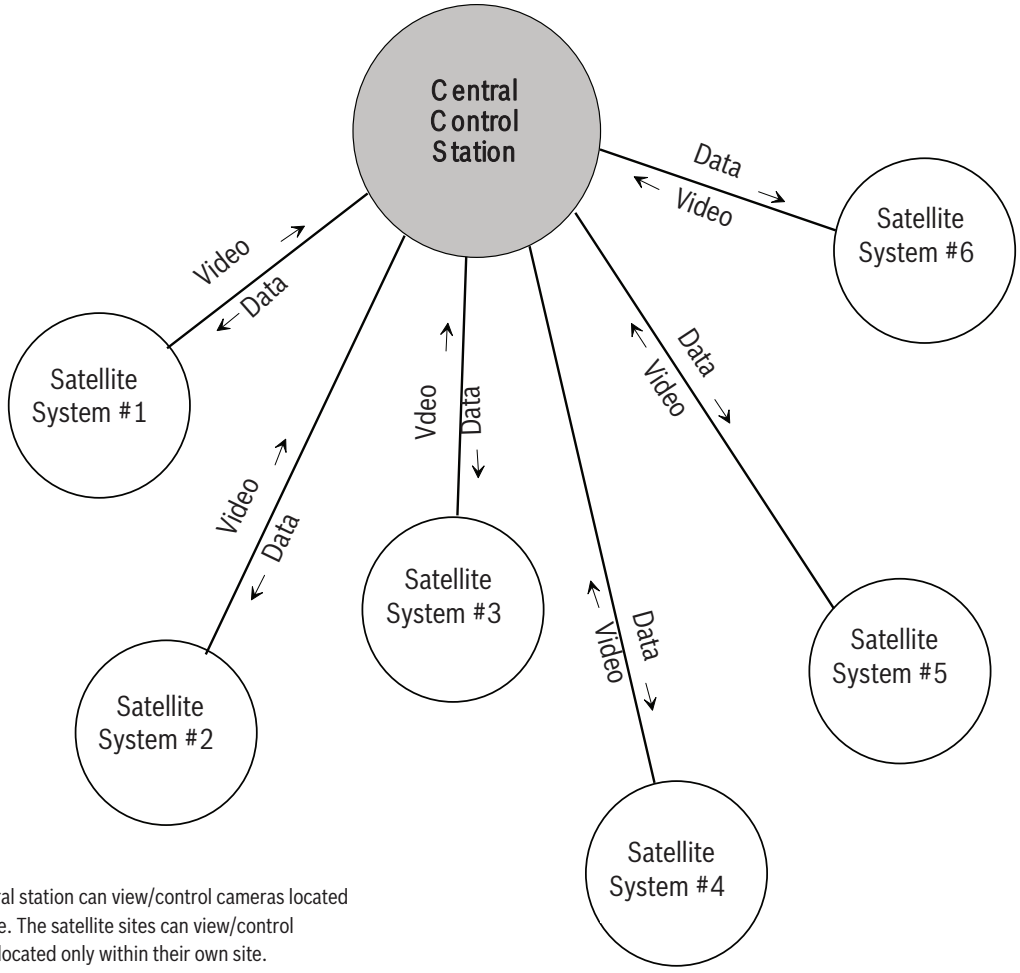


Figure 8.1: Satellite Concept Configuration

Refer to the LTC 8850/00 GUI Software manual or the LTC 8059/00 MCS package manual for additional configuration and programming information on satellite systems.

8.1 Allegiant Satellite System Configuration Installations

Any Allegiant Series switcher model (LTC 8300, LTC 8500, LTC 8600, LTC 8800, or LTC 8900) can be used as a main site or a satellite site unit. All products are standard models, and the only special requirement is to use either the optional LTC 8059/00 Master Control Software or the optional LTC 8850/00 GUI software package for initial programming of each Allegiant system.

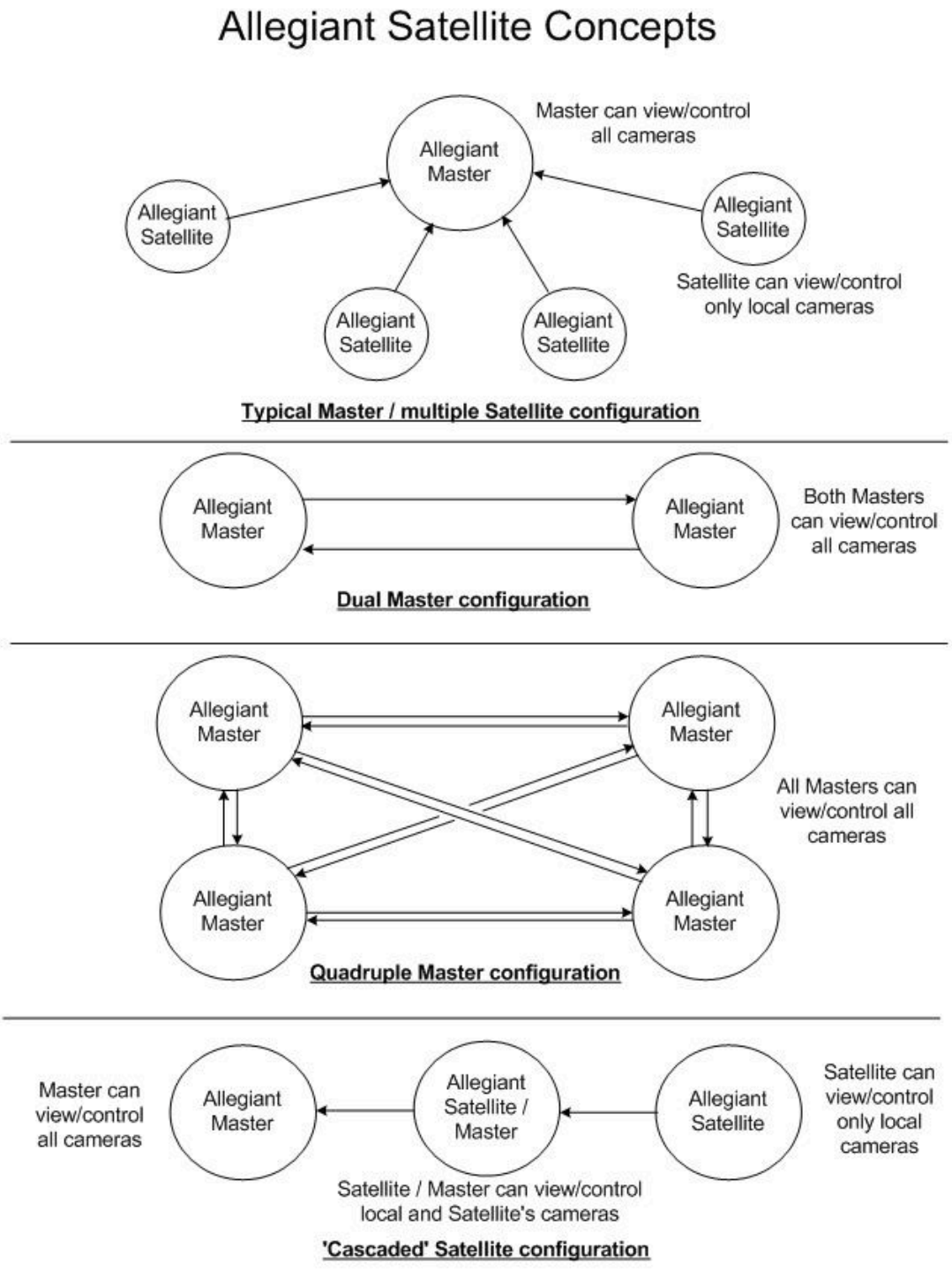


Figure 8.2: Possible Allegiant Satellite System Configurations

An Allegiant Biphase control data line from the code distribution unit at the Main site must be provided to each satellite site. This data line carries all pan/tilt/zoom control commands, in addition to the switching commands generated by the Main site switcher. The control data line should be connected to an LTC 8780 Series Data Converter to provide address decoding functions for the satellite site. If operators at the satellite site are permitted to control pan/tilt/zoom-equipped cameras, an LTC 8569 Series Code Merger must be installed at the satellite site. The Code Merger combines code generated by the main site and the satellite site, so both sites have control over pan/tilt/zoom-equipped cameras located at the satellite site. The LTC 8780 Series unit can then be connected to one of the data outputs of the LTC 8569 Series unit.

One or more monitor outputs from each satellite system are used as video trunk lines to link the remote sites to the Main site. The number of trunk lines from a satellite site determines the maximum number of cameras from that site that may be viewed simultaneously at the Main site. A satellite switcher model must be selected so that it provides the desired number of local monitor outputs plus the number of monitor outputs that will be used as trunk lines. The Main site switcher must include sufficient camera inputs for local cameras plus trunk lines. The maximum physical number of camera inputs or monitor outputs used as trunk lines cannot exceed the capacity of the system. A single Main site switcher can control multiple satellite sites up to its video input limit. If full matrix switching is required at the Main site, the number of trunk lines from each satellite site must equal the number of monitors connected to the Main site switcher. Multiple independently controlled Main site systems can be combined to provide large numbers of monitor outputs at the Main site. System capacities are listed below:

System Type	Max. Camera Inputs	Max. Monitor Outputs	Max. No. of Satellites
LTC 8300 Series	32	6	32
LTC 8500 Series	64	8	64
LTC 8600 Series	12	16	128
LTC 8800 Series	256	64	256
LTC 8900 Series	4096	512	256

Since Main site Allegiant Series switchers support access to a large quantity of remote satellite cameras, they provide additional logical camera numbers for identifying the location of the satellite camera inputs in the system. These logical camera numbers can also include titles which would appear on the Main sites monitors for any remote cameras. Since each camera (anywhere in the system) must have a unique camera number, logical camera numbers together with physical camera inputs make up the total system camera capacity. Thus, there is a trade-off between the total number of Main site cameras and the number of inputs used as trunk lines.

The more inputs used as trunk lines, the fewer there are for use as direct camera inputs.

Model No.	Maximum Number of System Cameras[1]
LTC 8300 Series	288
LTC 8500 Series	320
LTC 8600 Series	1152
LTC 8800 Series	2304

Model No.	Maximum Number of System Cameras[1]
LTC 8900 Series	6144
1. Camera inputs at all sites, plus trunk lines.	

The Main site system must be programmed via the Master Control Software LTC 8059/00 or the LTC 8850/00 GUI to identify camera trunk line inputs as well as remote satellite cameras. All systems must be configured with no duplicate camera numbers anywhere in the system. The installer should verify that the camera numbers programmed into the 'Startup Camera' field of the Monitor table are suitable for viewing by respective operators. If there are Lockouts programmed into the system, specifying a neutral camera would prevent the situation where a restricted camera could be switched to a restricted operator's monitor when their trunk line is stolen. For this feature to operate properly, the Start-up camera numbers must be locally connected cameras or a local unused input (i.e., the raster generator will be displayed when called up).

In addition, it is recommended to program Lockouts for all system keyboards so that they do not have access to unused monitor outputs. This prevents operators from inadvertently selecting a satellite camera on a non-existent monitor which will result in a trunk link becoming used up, possibly making less trunk lines available for valid selections.

Keyboard User Function 41 (see Keyboard User Function section) offers additional programming options if a multi-level cascaded Allegiant satellite system configuration is being used.

Any alarm inputs to the Main site configured to activate satellite cameras operate normally except when limited by the number of available trunk lines.

The software automatically determines trunk usage, depending on the priority level of operators currently viewing satellite cameras.

Alarm inputs applied at a satellite site will NOT activate alarm video at the Main site. If the application requires alarms located at a satellite to activate video at the Main site, the Main site s LTC 8540/00 Alarm Interface unit must be remotely located. Multiple LTC 8540/00 Alarm Interfaces may be remoted via the LTC 8713 Alarm Port expander accessory, located at the Main switcher site in LTC 8800 and LTC 8900 systems. Up to 8 LTC 8540/00 Alarm Interfaces with LTC 8713 Alarm Port Expanders can be used in a LTC 8600 system.

Two LTC 8540/00 can be used in LTC 8500 systems. Since the LTC 8300 Series contains an integral alarm interface, the remote alarm interface application does not apply. A unique time and date synchronizing feature provided in the Time Event table of the MCS or the GUI software may be programmed into the Main site switcher. This permits periodic synchronizing of the time and date to all remote switchers in the system based on the Main site s clock.

A conceptual diagram of a satellite switching system is follows:

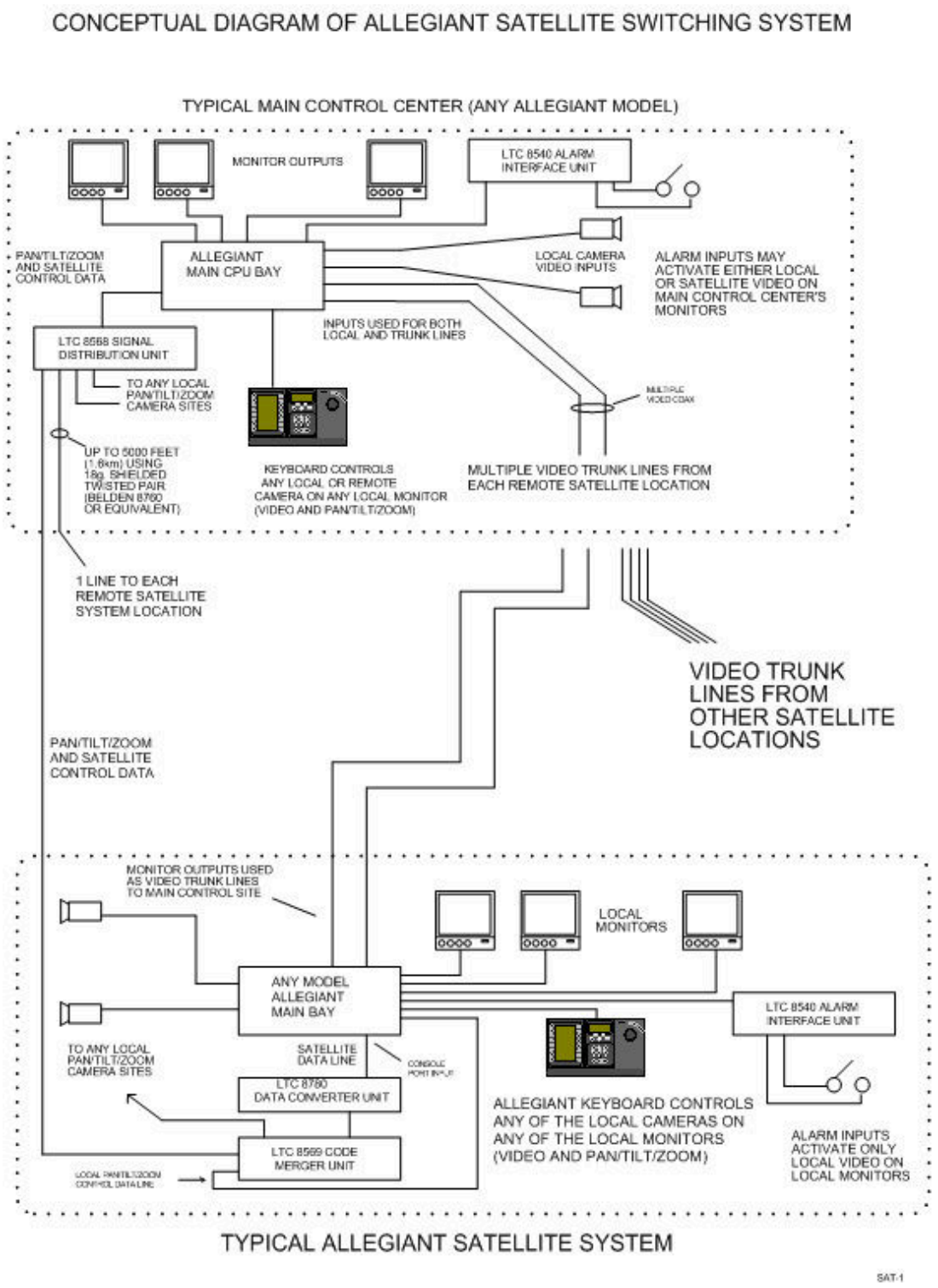


Figure 8.3: Conceptual Diagram of an Allegiant Satellite Switching System

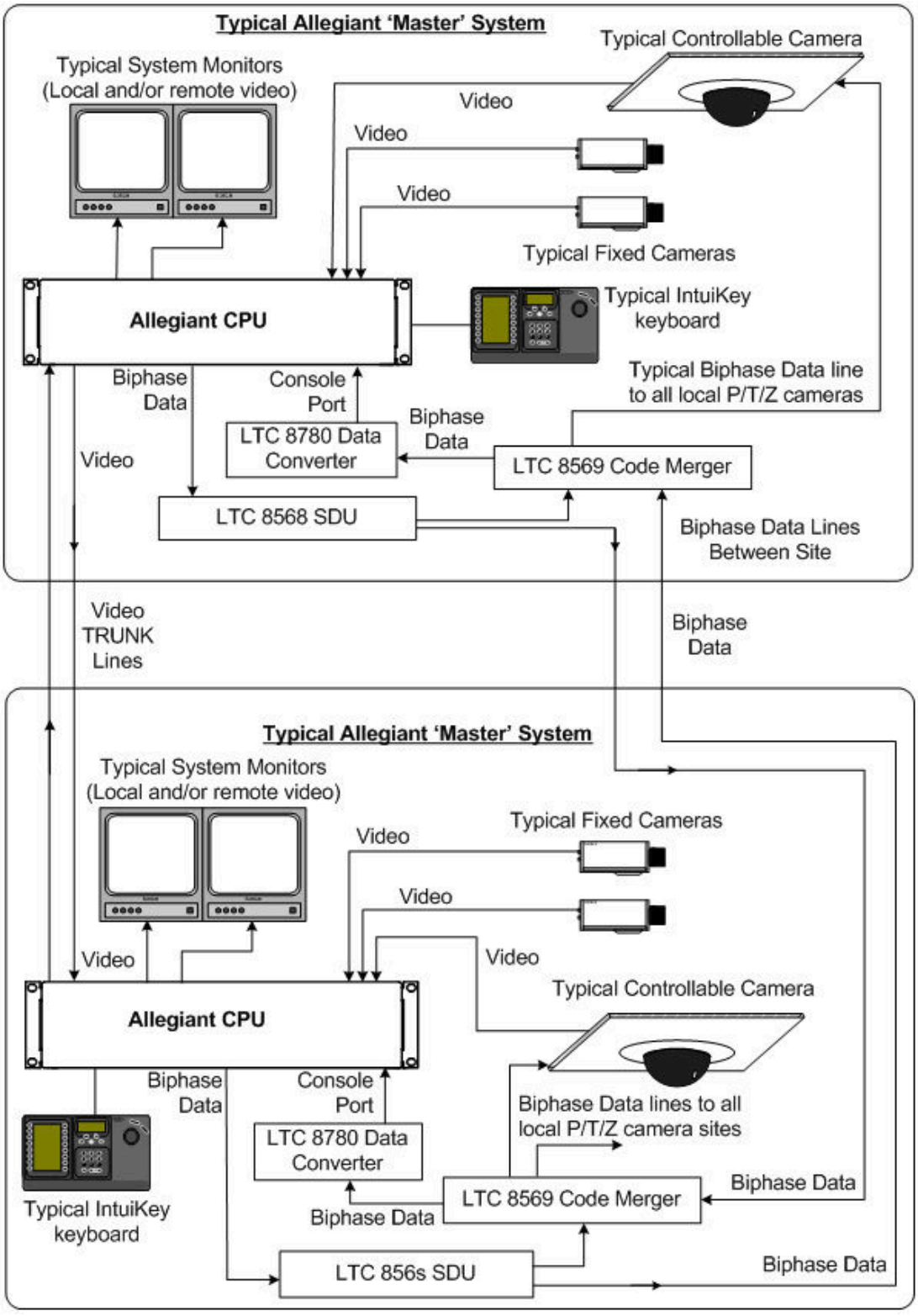


Figure 8.4: Conceptual Diagram of a Dual Master Allegiant Satellite System

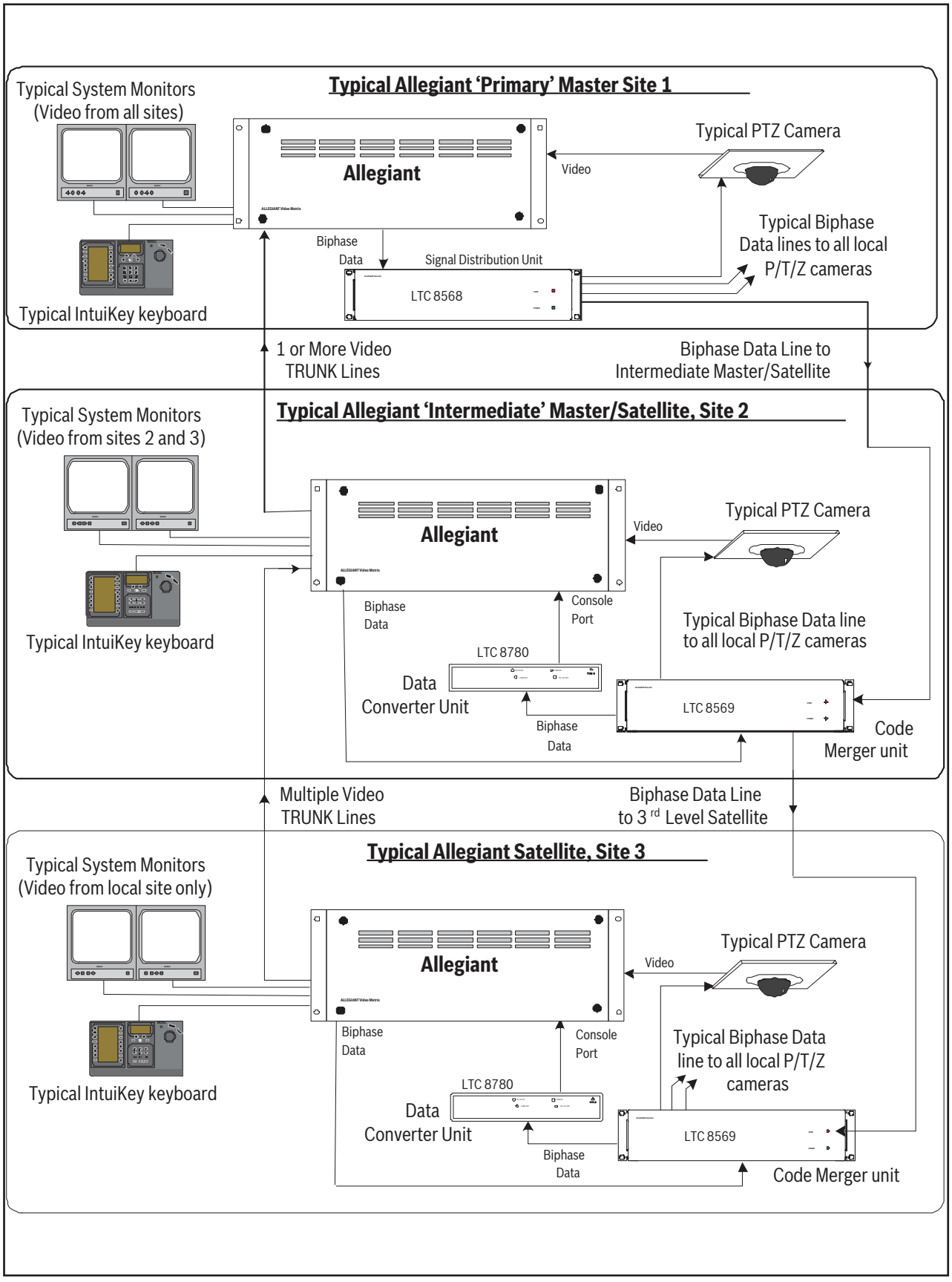


Figure 8.5: Conceptual Diagram of a Cascaded Allegiant Satellite System

8.2 Satellite Site “Trunk Line” Monitor Outputs

At each of the remote satellite sites, a desired number of monitor outputs from the switcher must be assigned as trunk lines. The number of trunk lines can range from 1 to the maximum number of monitor outputs provided by the switcher. Note that the number of trunk lines coming from a satellite site determines the maximum number of cameras from that site which may be viewed simultaneously at the main site. If operators will be stationed at the satellite site, they should be prevented from accessing the monitor outputs designated as trunk lines. This prevention can be accomplished via the Monitor Lockout Tables in either the LTC 8059/00 MCS or the LTC 8850/00 GUI Software.

8.3 Main Site “Trunk Line” Video Inputs

At the main site, video trunk line connections coming from each of the remote site(s) should be connected (and properly terminated) using an available video input at the main bay. There are no programming restrictions concerning their connections, but a sense of order can be maintained if a group of video inputs are used at the upper end of the system s designed capacity. This technique allows the main system to be more easily expanded in the future with additional local cameras or trunk lines. As an example, assume there are a total of eight (8) trunk lines coming from all satellite sites which are connected to a main site system designed for 32 inputs. Inputs 25 to 32 can be reserved for the trunk lines, leaving inputs 1 to 24 for local camera connections. If there will be no local camera inputs, the trunk lines can start at the first video input.

8.4 Control Data Lines in Satellite Systems

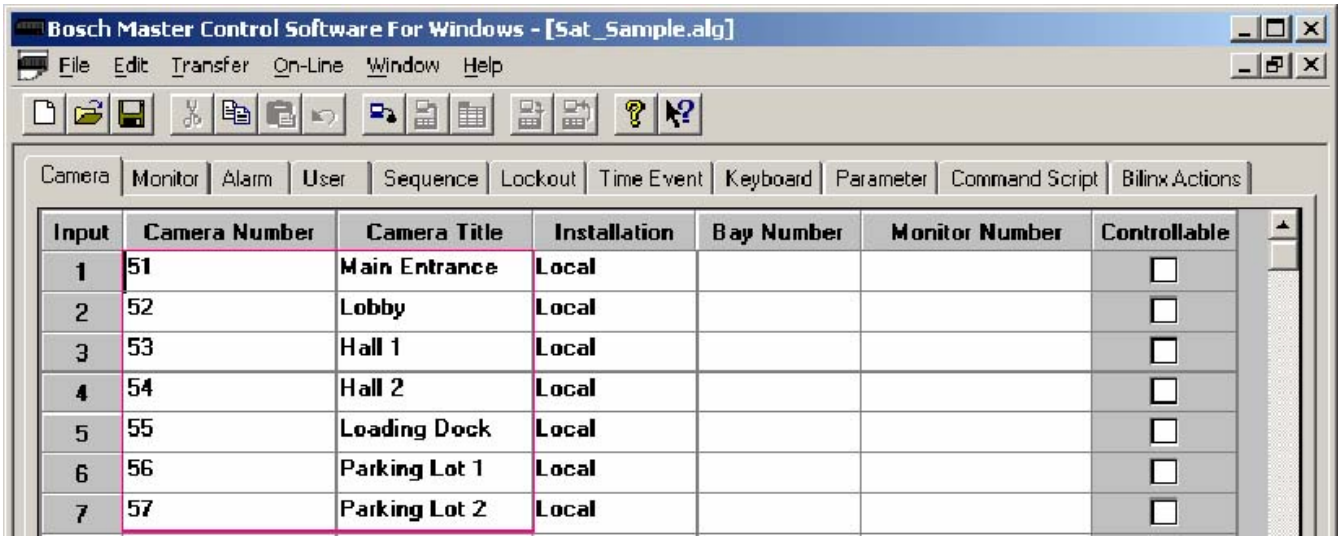
Each satellite site must be provided with an Allegiant Biphase control data line coming from the Signal Distribution located at the main site. This data line carries all pan/tilt/zoom control commands, in addition to the switching commands generated by the main site switcher. The control data line should be connected to an LTC 8780 Series Data Converter unit, which provides address decoding functions for the satellite site. An LTC 8780 Series is required for each satellite site, and must be given a unique site address number. If operators stationed at the satellite site are permitted to control pan/tilt/zoom-equipped cameras, an LTC 8569 Series Code Merger unit must be installed at the satellite site. In order for each site to have control over pan/tilt/zoom-equipped cameras, the Code Merger combines code generated by the main and satellite sites. The LTC 8780 Series can then be connected to one of the data outputs of the LTC 8569 Series unit.

8.5 Satellite Sites Programming Requirements

The optional LTC 8059/00 MCS or the optional LTC 8850/00 GUI Software is required to properly program a satellite system.

Programming the satellite sites is usually limited to designating their logical camera numbers to appropriate values via the Camera ID Table of the MCS or GUI Software. Note that no duplicate logical camera numbers are permitted anywhere in the system. Allegiant logical camera designations can be renumbered to any four-digit number on all Allegiant Series systems, except the LTC 8500 Series, which is limited to three (3) digits. Few other restrictions exist.

These camera numbers are the numbers entered at both the satellite and the main site keyboards when camera selections are made. On any AUTODOME camera or conventional pan/tilt/zoom-equipped camera, this logical number must also be entered as the receiver/driver’s site address number.



Input	Camera Number	Camera Title	Installation	Bay Number	Monitor Number	Controllable
1	51	Main Entrance	Local			☐
2	52	Lobby	Local			☐
3	53	Hall 1	Local			☐
4	54	Hall 2	Local			☐
5	55	Loading Dock	Local			☐
6	56	Parking Lot 1	Local			☐
7	57	Parking Lot 2	Local			☐

Figure 8.6: Satellite Site Sample Program Showing Logical Camera Numbers and Titles

To maintain a sense of order, it is preferable to program a satellite for a range of camera numbers. For example, in a three (3) Allegiant type satellite system, the first satellite can be programmed for camera numbers 51 to 100. Satellite two can be programmed for camera numbers 101 to 131, and satellite three can use numbers 151 to 185.

If necessary, the Keyboard-to-Monitor Lockout Table in the LTC 8059/00 MCS or the LTC 8850/00 GUI Software can be programmed in the satellite switcher to prevent any local operators from inadvertently accessing the satellite's monitor outputs being used as trunk lines.

If operators will be stationed at the satellite site, camera titles should be entered into the switcher. If desired, these titles can be selected (explained below) to appear at the main site.The only other requirement is to ensure that the console ports of all Allegiant type satellites have been set to the correct baud rate and the handshake option disabled (CTS = off). This is done via a system keyboard (see Keyboard User Function 30), the Parameters-System screen of the LTC 8059/00 MCS or the LTC 8850/00 GUI Software (make sure CPU DIP Switch 8 on Switch S2 is set to the ON position).

8.6 Main Site Programming Requirements

At the main site, the Camera ID Table must be programmed to ensure proper satellite operation. It is easiest to start with the trunk line inputs. For each trunk line, the satellite's monitor output number and its bay address must be entered (same number as the satellite's LTC 8780 address).

Camera numbers should be programmed next. No duplicate logical camera numbers are allowed anywhere in the entire system. If the system will include many local cameras, it is recommended to designate remote cameras (i.e., those located at satellite sites) using numbers above the main bay's physical video inputs (33+ on LTC 8300 Series, 65+ on LTC 8500, 129+ on LTC 8600, 257+ on LTC 8800 Series, 4097+ on LTC 8900 Series). Enter the desired camera number, (the satellite bay that it is actually connected to), and select if either a local title will be used, or if the remotely generated title will be used.

For satellite camera entries, only those numbers representing actual cameras need to be entered. For example, all 16 cameras associated with an LTC 8200 switcher do not need to be entered if only five cameras are actually connected to the switcher. If desired, a few extra

camera number lines in the table may be reserved at this time for future expansion. If a local title is specified, the camera's title can also be entered at this time. Designate any local camera numbers appropriately, and enter their corresponding titles.

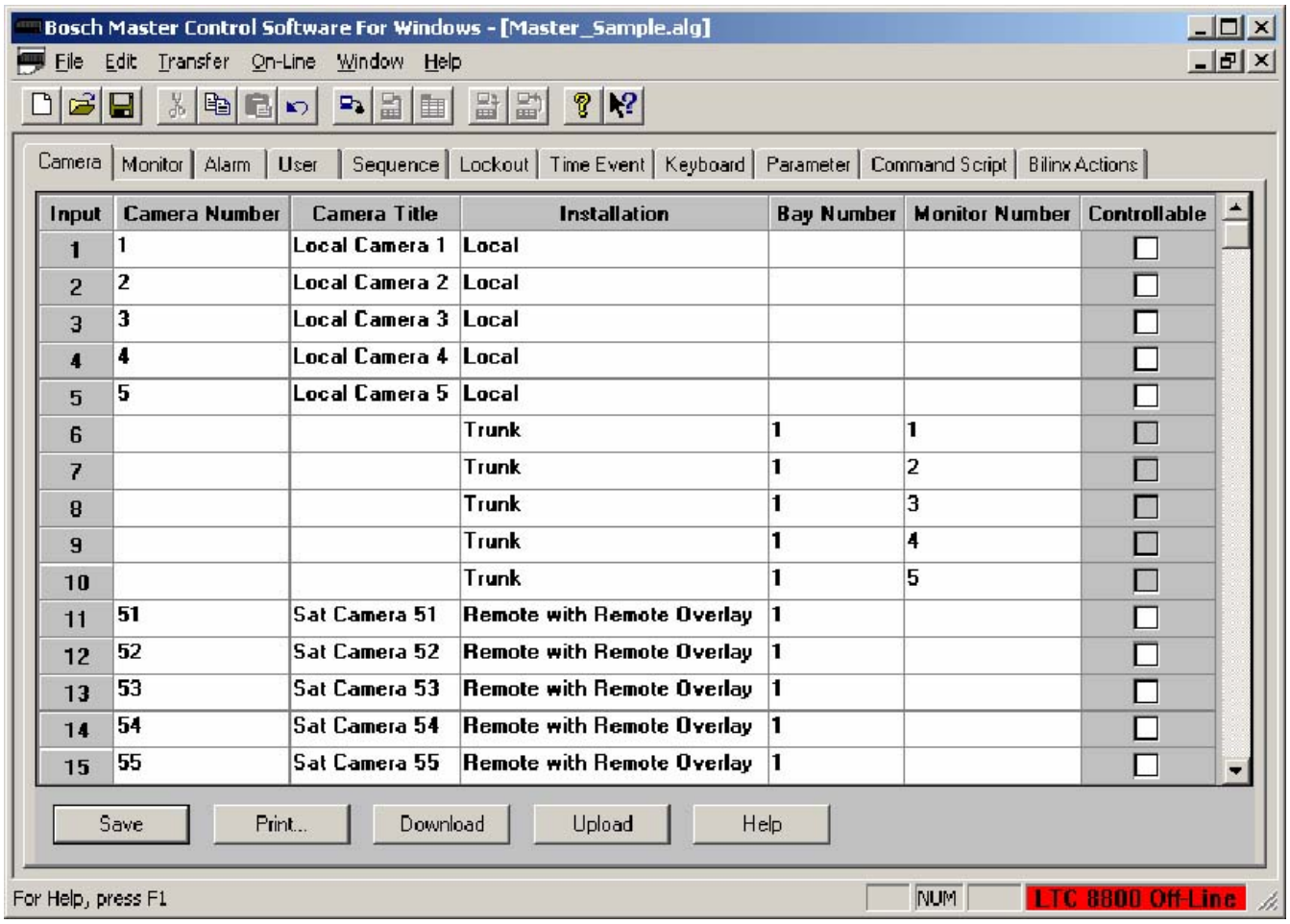
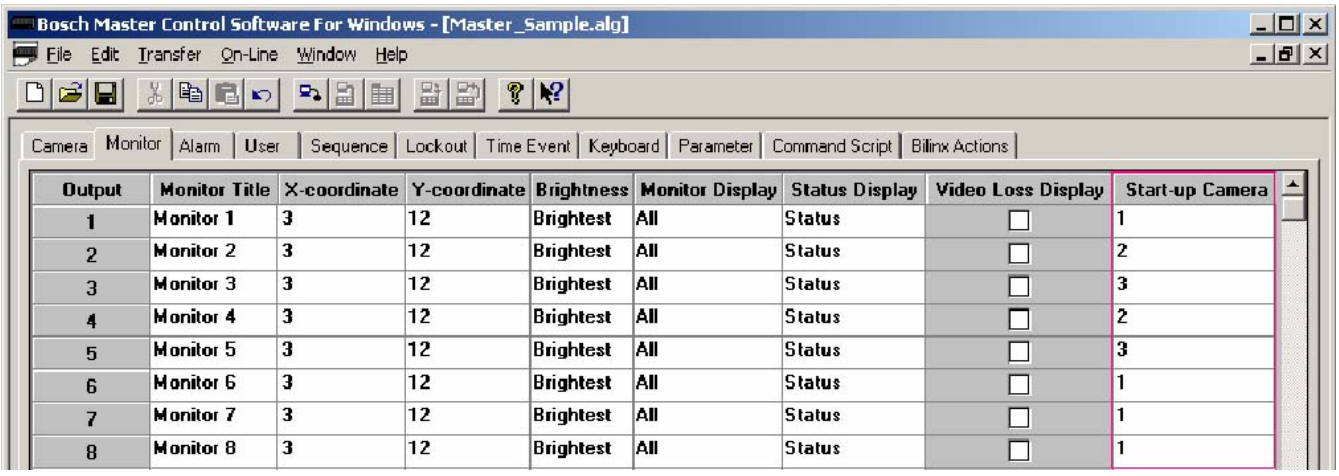


Figure 8.7: Main Site Sample Program Showing Local Cameras, Trunk Lines and Remote Cameras

NOTE: Either a local camera, or a remote camera programmed with a local title, will need to be selected to view certain on-screen prompts or data during programming of the main site via a system keyboard.

Once the system is programmed and configured, any unused monitor outputs located at the main site should be selected to display a local camera via the system keyboard. This prevents unused monitor outputs from using up trunk lines which may result in some confusing operational responses.

The "Start-up" camera numbers listed in the Monitor Table of the LTC 8059/00 software should be programmed to specify locally connected cameras or a local unused input (i.e., the raster generator will be displayed when called up). This table defines the camera numbers that will automatically be switched to an operator's monitor in the event the trunk line being used to display their original satellite camera is 'stolen' by an operator with a higher priority.



Output	Monitor Title	X-coordinate	Y-coordinate	Brightness	Monitor Display	Status Display	Video Loss Display	Start-up Camera
1	Monitor 1	3	12	Brightest	All	Status	☐	1
2	Monitor 2	3	12	Brightest	All	Status	☐	2
3	Monitor 3	3	12	Brightest	All	Status	☐	3
4	Monitor 4	3	12	Brightest	All	Status	☐	2
5	Monitor 5	3	12	Brightest	All	Status	☐	3
6	Monitor 6	3	12	Brightest	All	Status	☐	1
7	Monitor 7	3	12	Brightest	All	Status	☐	1
8	Monitor 8	3	12	Brightest	All	Status	☐	1

Figure 8.8: Main Site Sample Program Showing Monitor Start-Up Camera Numbers

8.7 Special Programming for “Cascaded” Satellite System Configurations

In a 3-tier cascaded satellite system, it is highly recommended for the system design to have more trunks lines between the intermediate master/satellite system and the 3rd level satellite system than there are between the top level master system and the intermediate system. In systems where this is not the case, it is likely that operators at top level master and the intermediate master/satellite will end up fighting for trunk lines coming from the 3rd level satellite system.

There are two user configuration options available (starting in CPU firmware version 8.70) to eliminate or at least significantly reduce conflicts between operators when this type of system is being used.

Option 1: Using Factory default settings, previously selected satellite cameras remain on trunk lines even after the operator switches back to a local camera view. Although this mode of operation is more desirable in standard systems because it minimizes delays when previous satellite cameras are reselected, it is not advantageous to use in cascaded systems. In cascaded systems, all available trunk lines coming from the 3rd level satellite system may become used up, making them unavailable to the operators at the intermediate system.

In this situation, keyboard User Function 41 should be set to the NO REM CAM CACHE option at the master site location. In this mode, after the top level operator selects a locally connected camera, the trunk line between the top level and the intermediate level system will immediately be reset to its Start-up camera (as defined in the Monitor Table of the LTC 8059/00 MCS). This action frees the trunk line between the intermediate level system and the 3rd level system so it will be available if needed by an operator at the intermediate level system.

For the monitors being used as trunk lines in the intermediate system, it is important for the “Start-up” camera numbers listed in the Monitor Table of the LTC 8059/00 software to be programmed to specify cameras connected locally or a local unused input (i.e., the raster generator will be displayed when called up). This action ensures that no trunk line is used when a monitor switches to the Start-up camera.

Option 2: If the top level master system and intermediate level system in a cascade configuration can or will be set to operate as “Dual Master” systems, a priority based satellite camera feature can be configured.

In default cascaded satellite system configurations, satellite switching commands are not associated with a user priority level. When a switching command sent from a master site is received by a satellite, the switch selection can immediately be overridden by operators at the satellite location who have any priority level.
This situation is more likely to be encountered in 3-tier Satellite systems that do not have a good distribution of trunk lines (i.e., more between the top level system and the intermediate level system than there are between the intermediate system and the 3rd tier satellite).
Since dual master configurations support bi-directional communications, it is possible to set keyboard User Function 41 to use the SAT nnn PRIORITY option for both the top level and intermediate level master systems. The satellite number assigned to the system that is currently being programmed must be specified here. This feature will enable use of the operators user priority to determine if access to a desired satellite camera is provided or not. For instance, if no trunk lines are available and an operator requesting a satellite camera has a higher priority than at least 1 of the existing operators, the requested camera will be switched. If the operator does not have sufficient priority, they will receive an error message (i.e., error 81) via the satellite communication path, and their camera will switch to the Start-up camera specified in the Monitor Table.

8.8 Alarm Inputs in Satellite Systems

Any alarm inputs to the main site, which have been programmed to activate cameras located at satellites, will operate normally except when limited by the number of trunk lines available. The software automatically determines trunk usage depending on the priority level of operators currently viewing satellite cameras. Alarm inputs applied at a satellite site will not activate the alarm video at the main site.
If the application requires alarms located at a satellite to activate video at the main site, the remote alarms must be brought back to the main site. If necessary, the main site's LTC 8540/00 Alarm Interface unit can be remotely located via an RS-232 link. Since the Alarm Interface capability is an integral part of the LTC 8300 Series, this is not possible if an LTC 8300 Series system is being used as the main site system. If more than one satellite site contains alarms, multiple LTC 8540/00 Alarm Interfaces can be remotely located. The number of alarm interfaces which can be remote is limited only by the capacity of the main site system to support this capability.

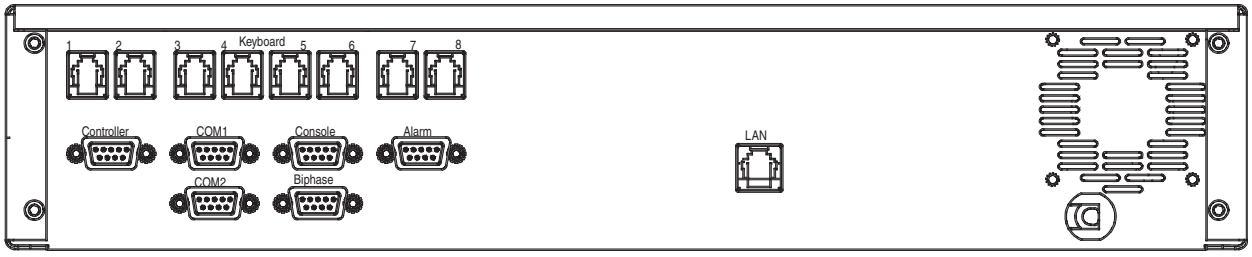


Figure 8.9: Rear Panel View of LTC 8904 Series CPU Bay

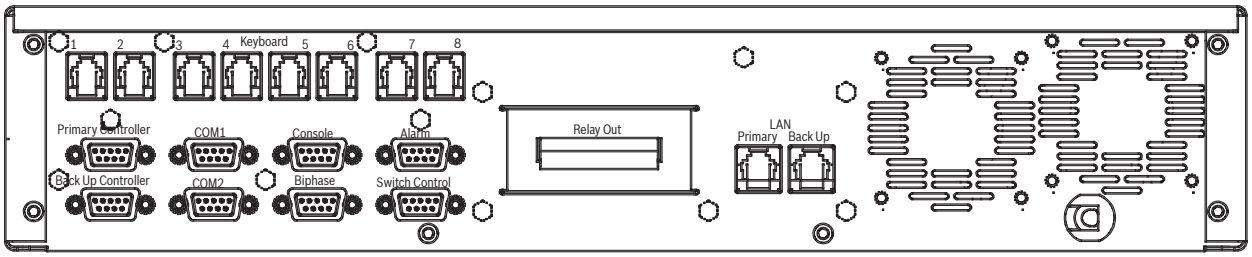


Figure 8.10: Rear Panel View of LTC 8901 Series CPU Bay

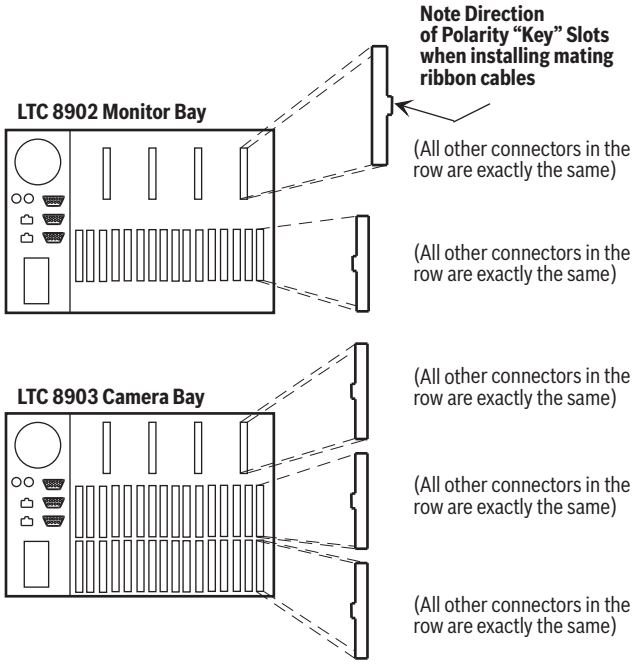


Figure 8.11: Ribbon Connector Key Polarity Diagram for Matrix Bays

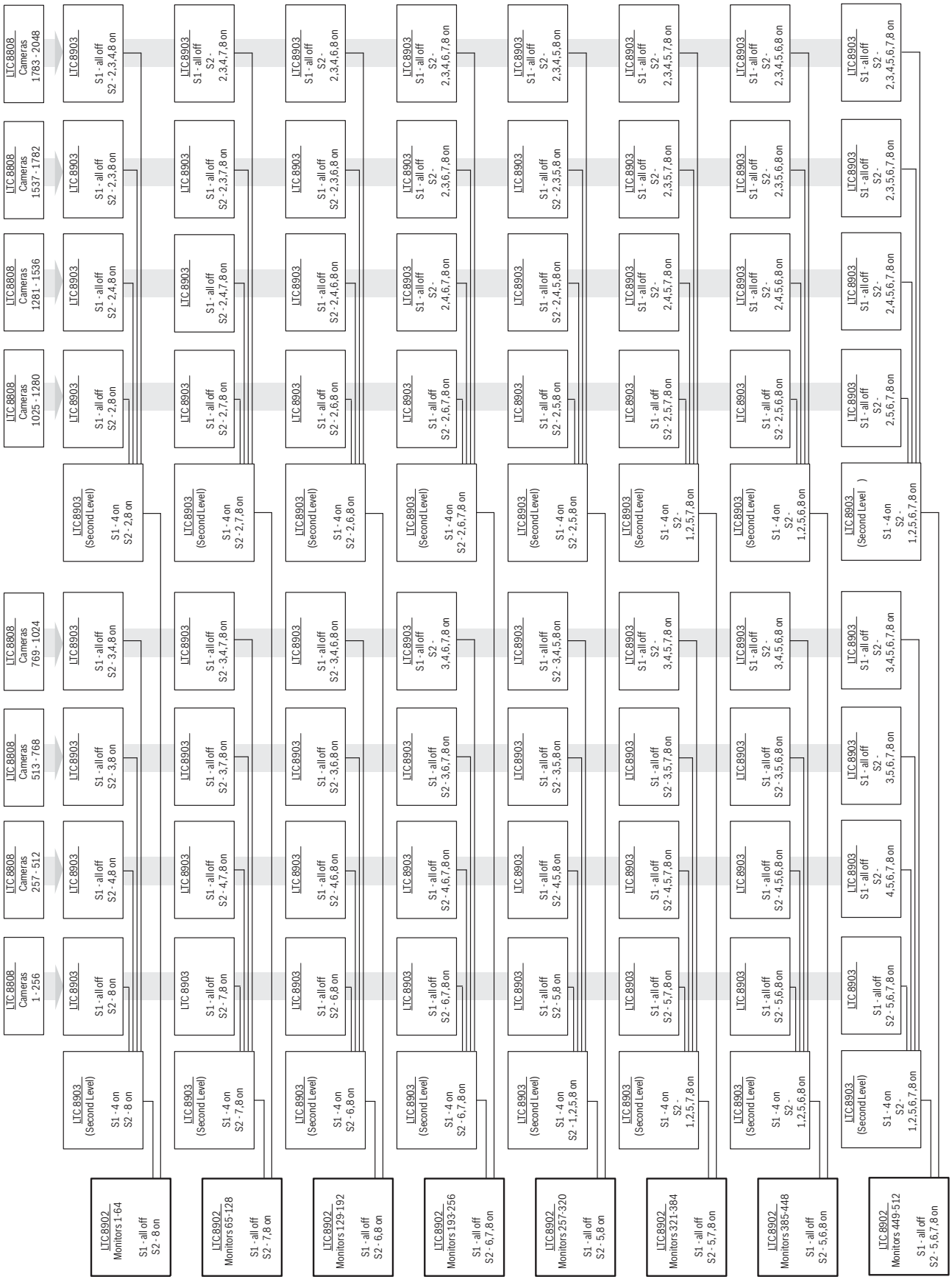


Figure 8.12: Graphical Summary of Data Receiver DIP Switch Settings for Systems Up to 2048 Cameras by 512 Monitors

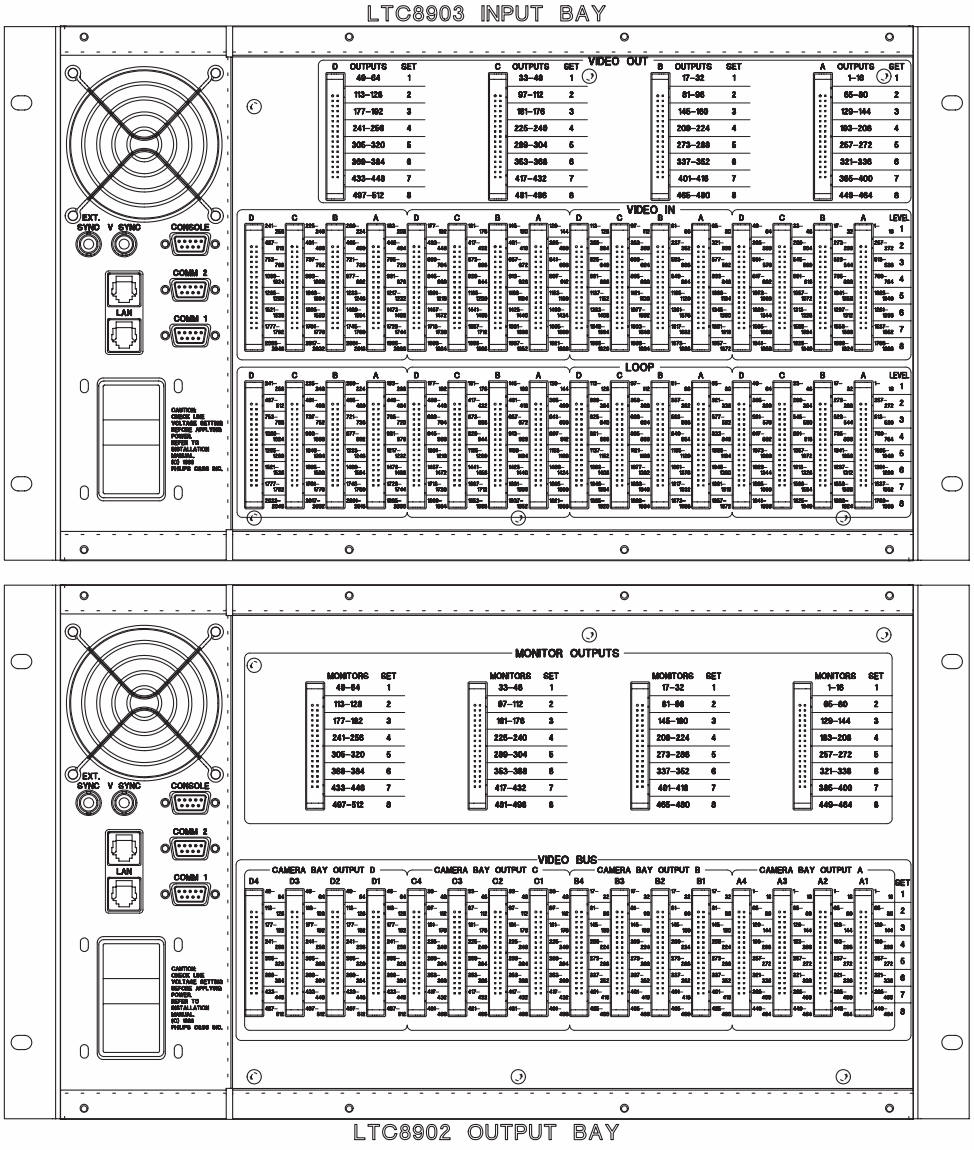


Figure 8.13: Rear Panel View of LTC 8902 Series and LTC 8903 Series Video Matrix Bays

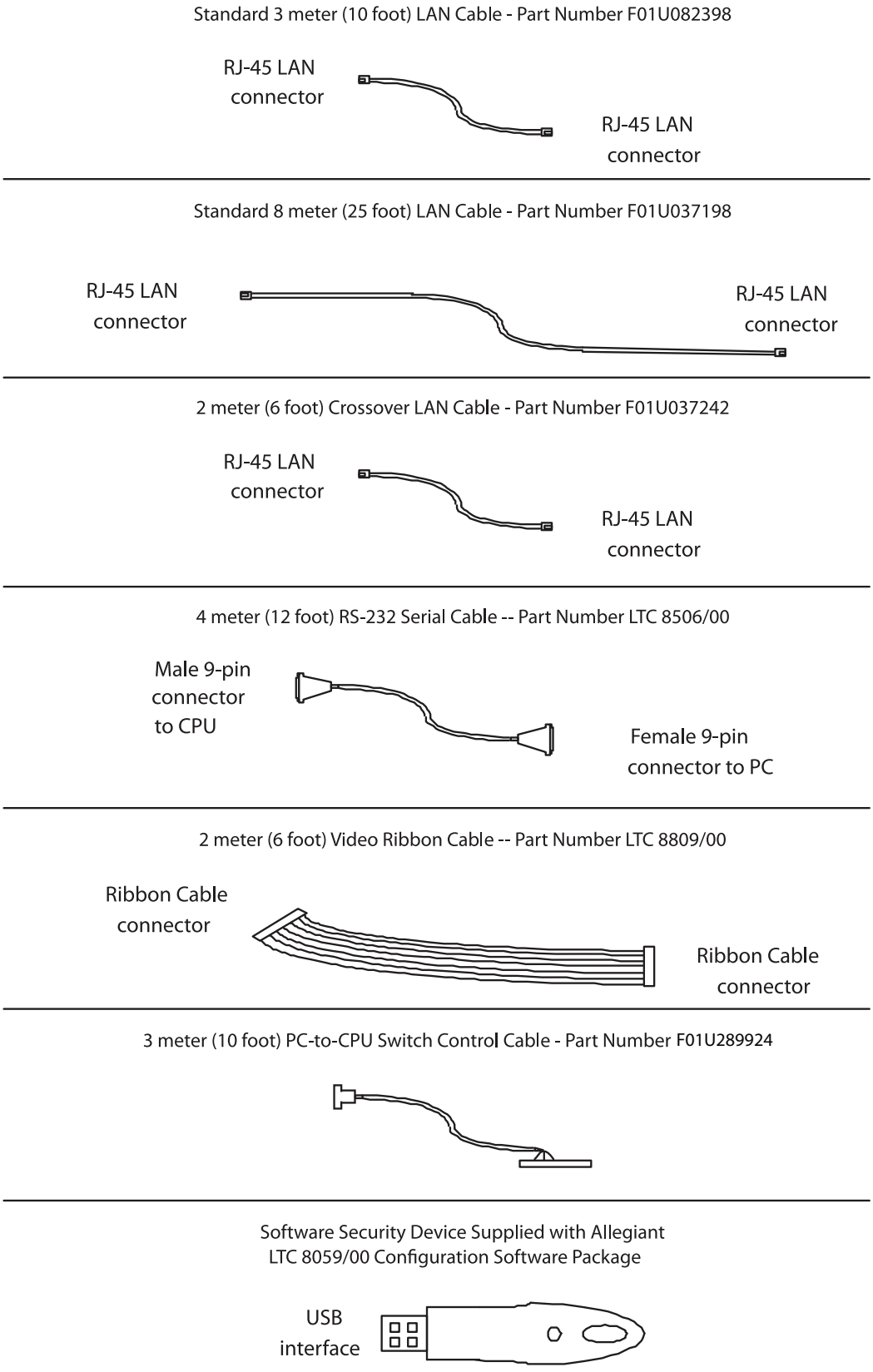


Figure 8.14: Cable and Accessory Diagrams

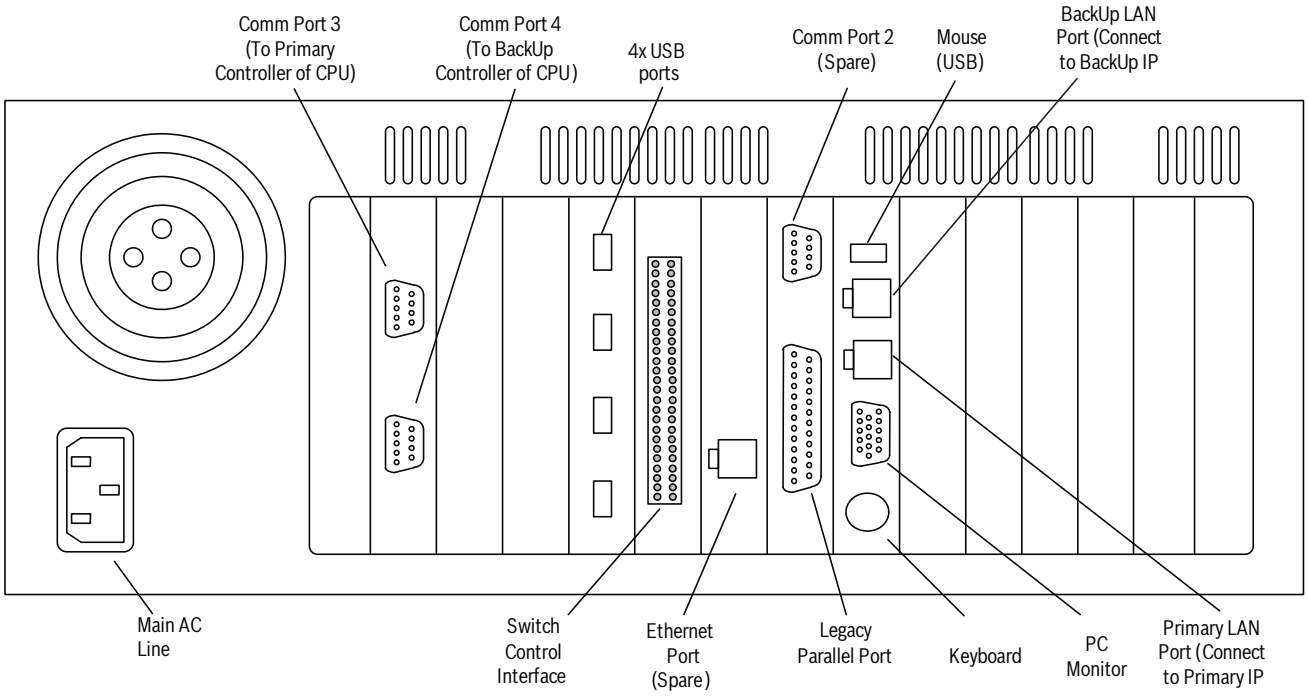


Figure 8.15: Typical LTC 8943/95 System Controller PC Rear Panels (Applies to Redundant Systems Configurations Only)

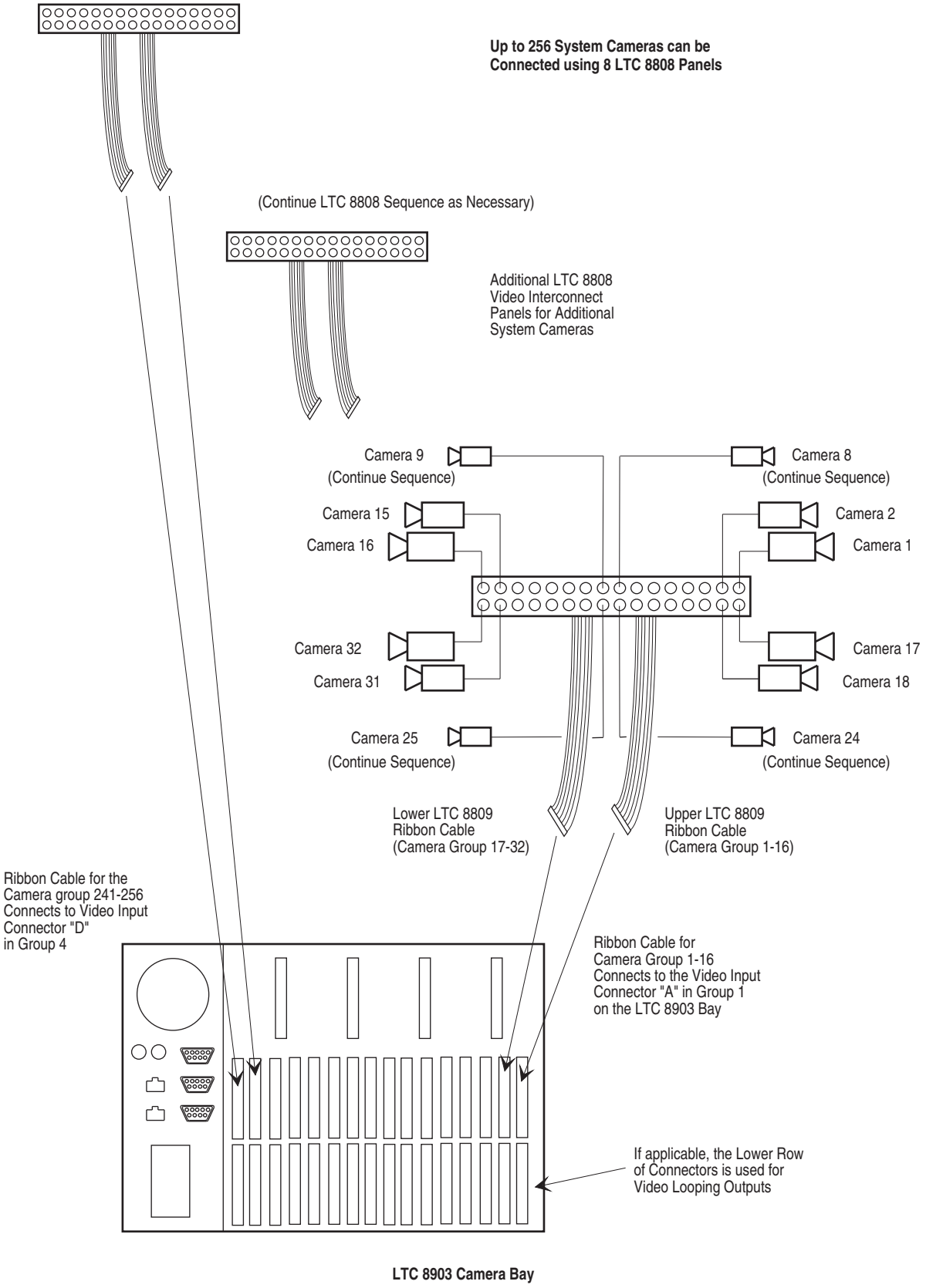


Figure 8.16: System Camera Connection Concept

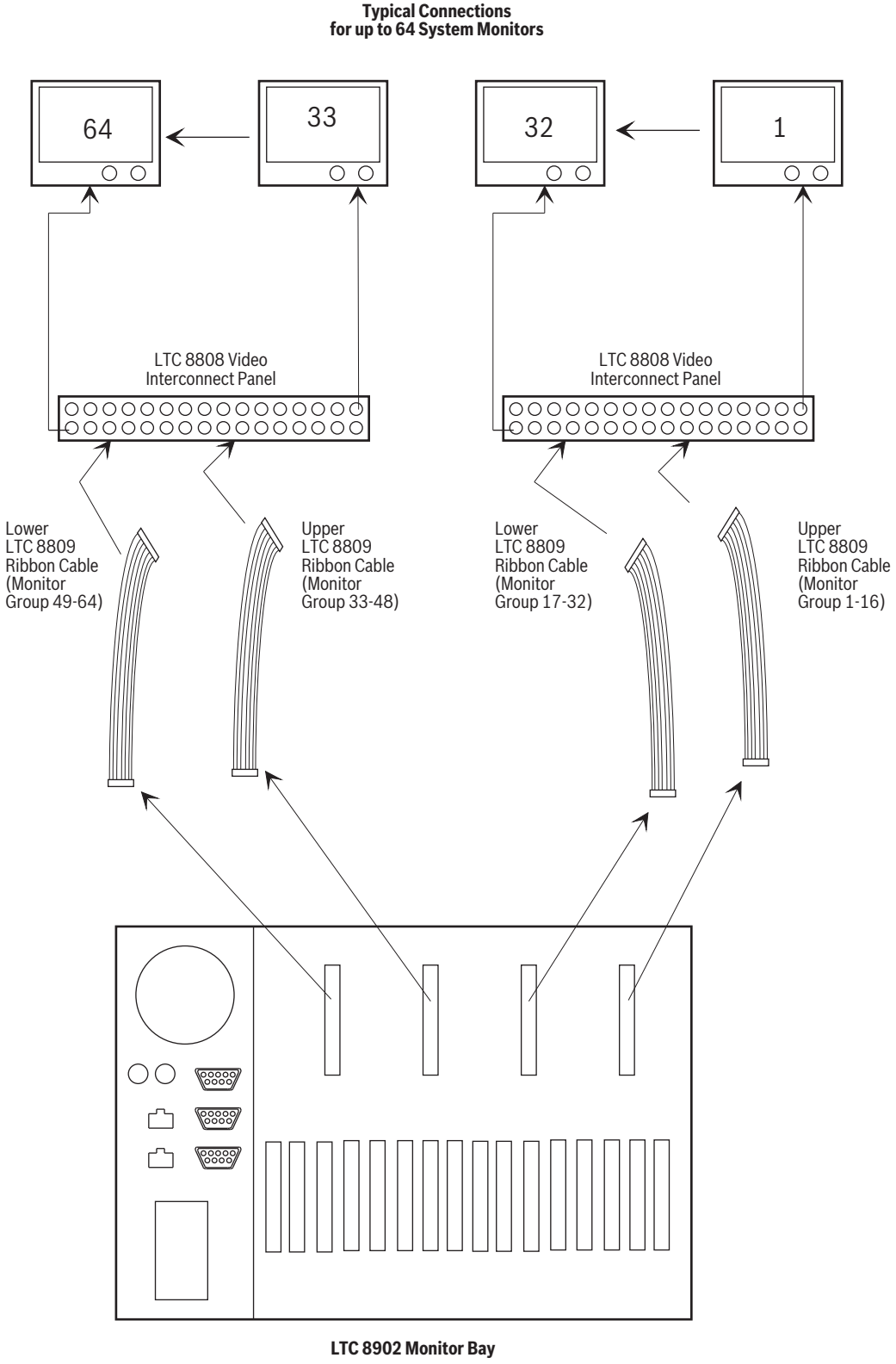


Figure 8.17: System Monitor Connection Concept

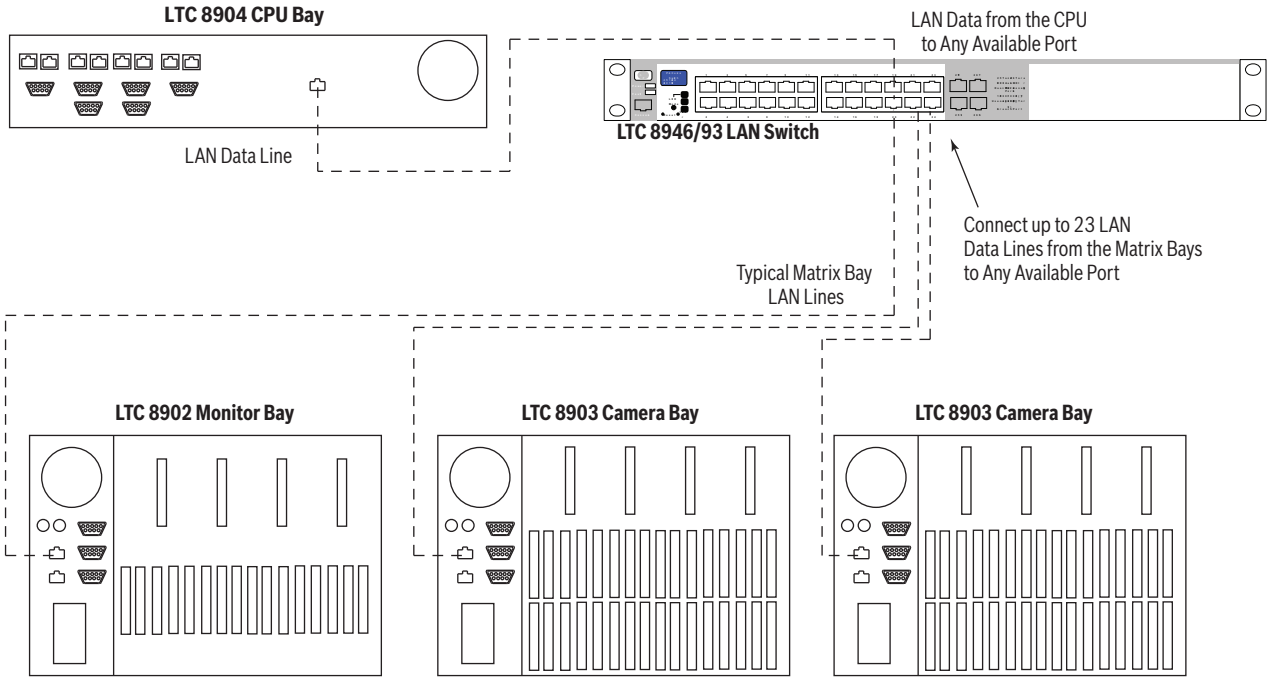
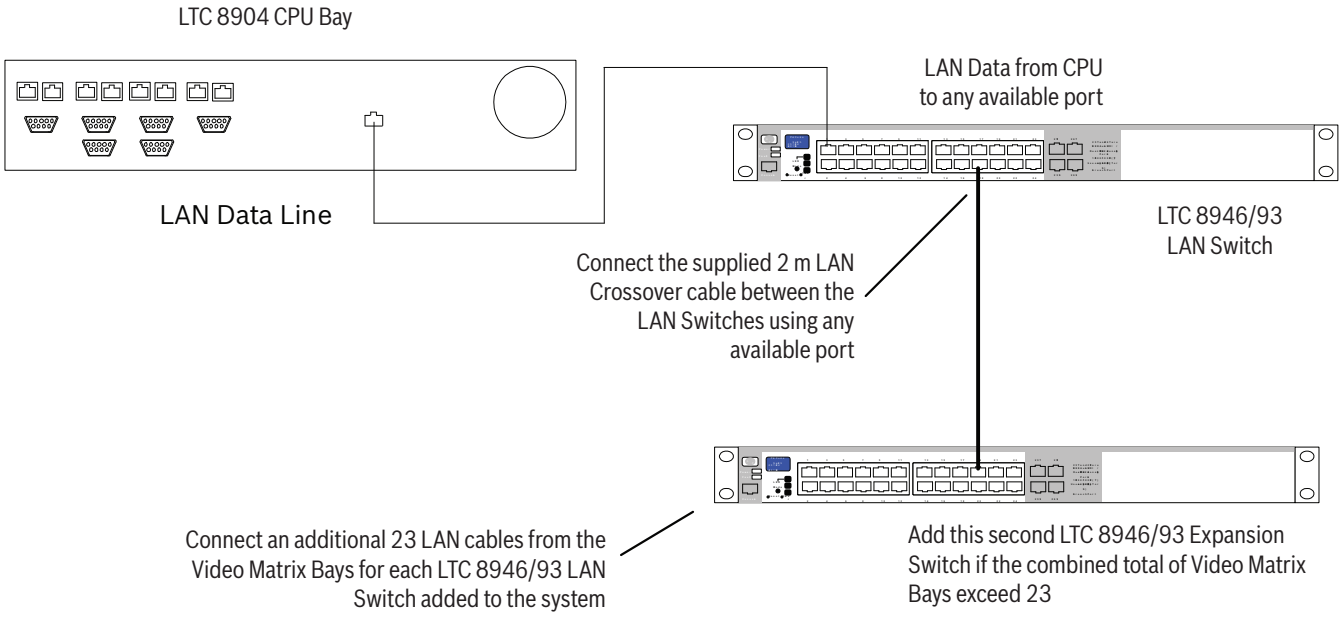


Figure 8.18: Standard System Data Connection Details



* If required, add additional LTC 8946/93 LAN Switches in a similar fashion

Figure 8.19: Data Connections for Standard Systems Having More than 1 LAN Switch

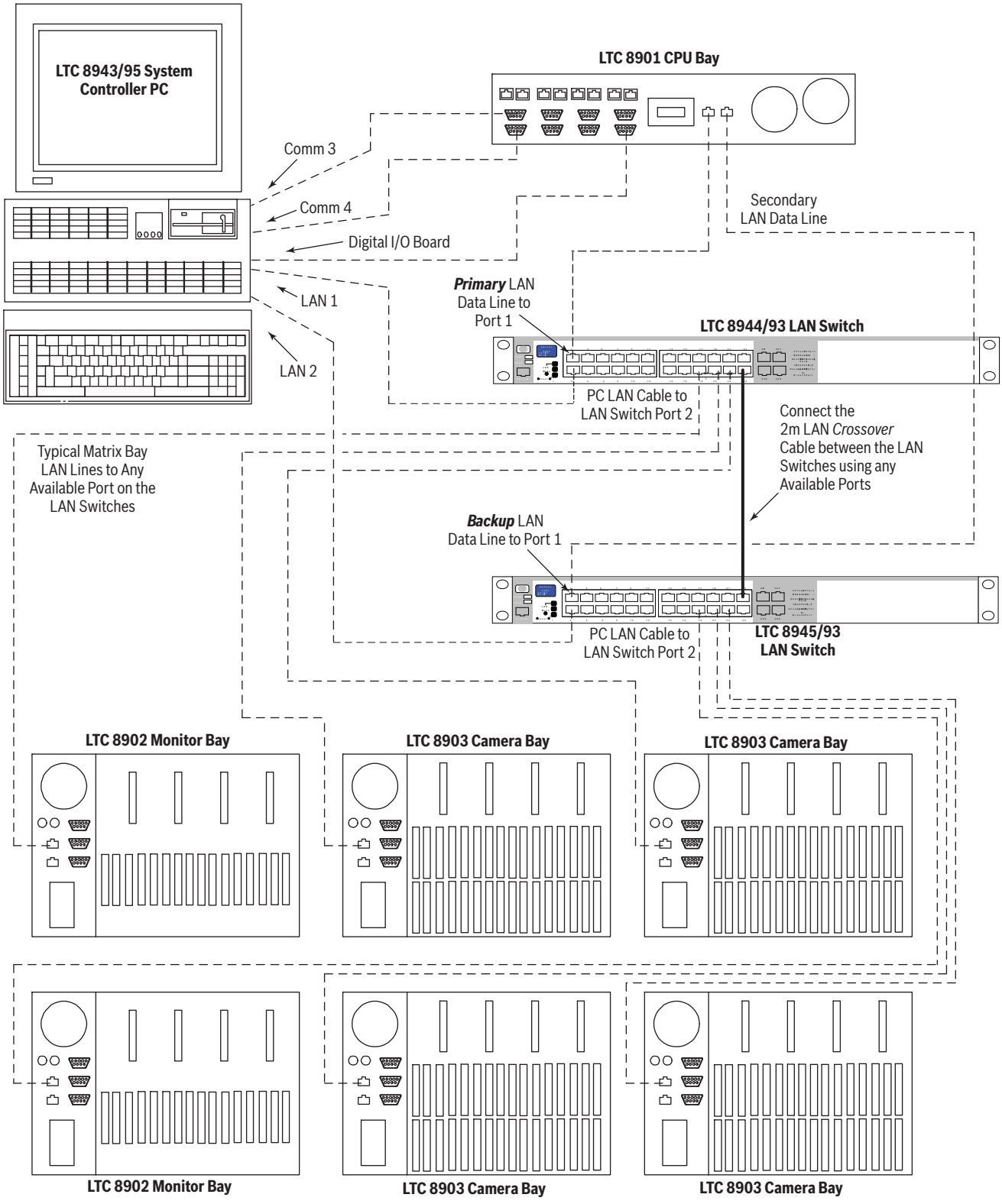
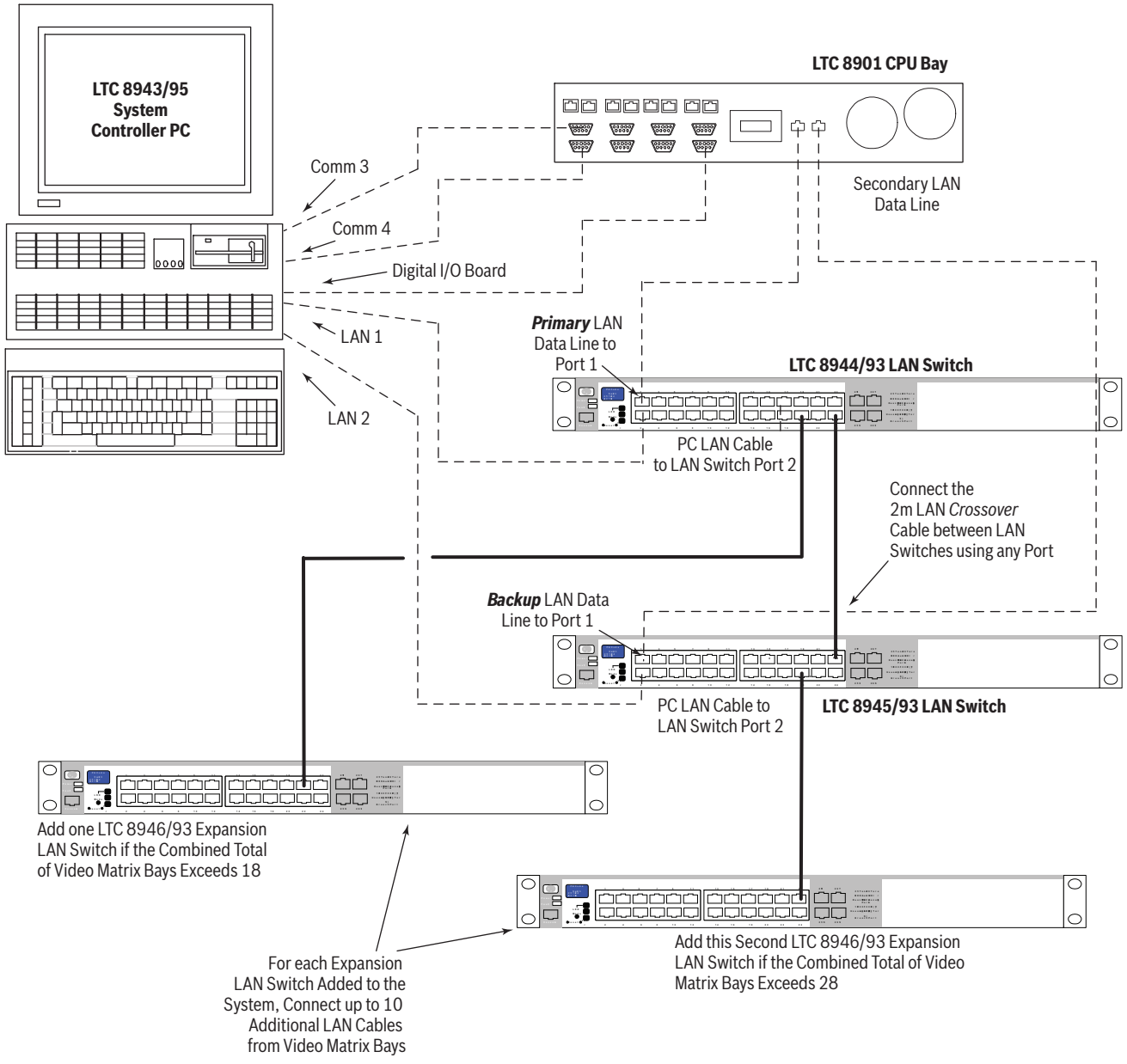


Figure 8.20: Redundant System Configurations Data Connections Details



***If required, Add Additional LTC 8946/92 LAN Switches Similarly**

Figure 8.21: Data Connections for Redundant System Configurations Having More than 2 LAN Switches

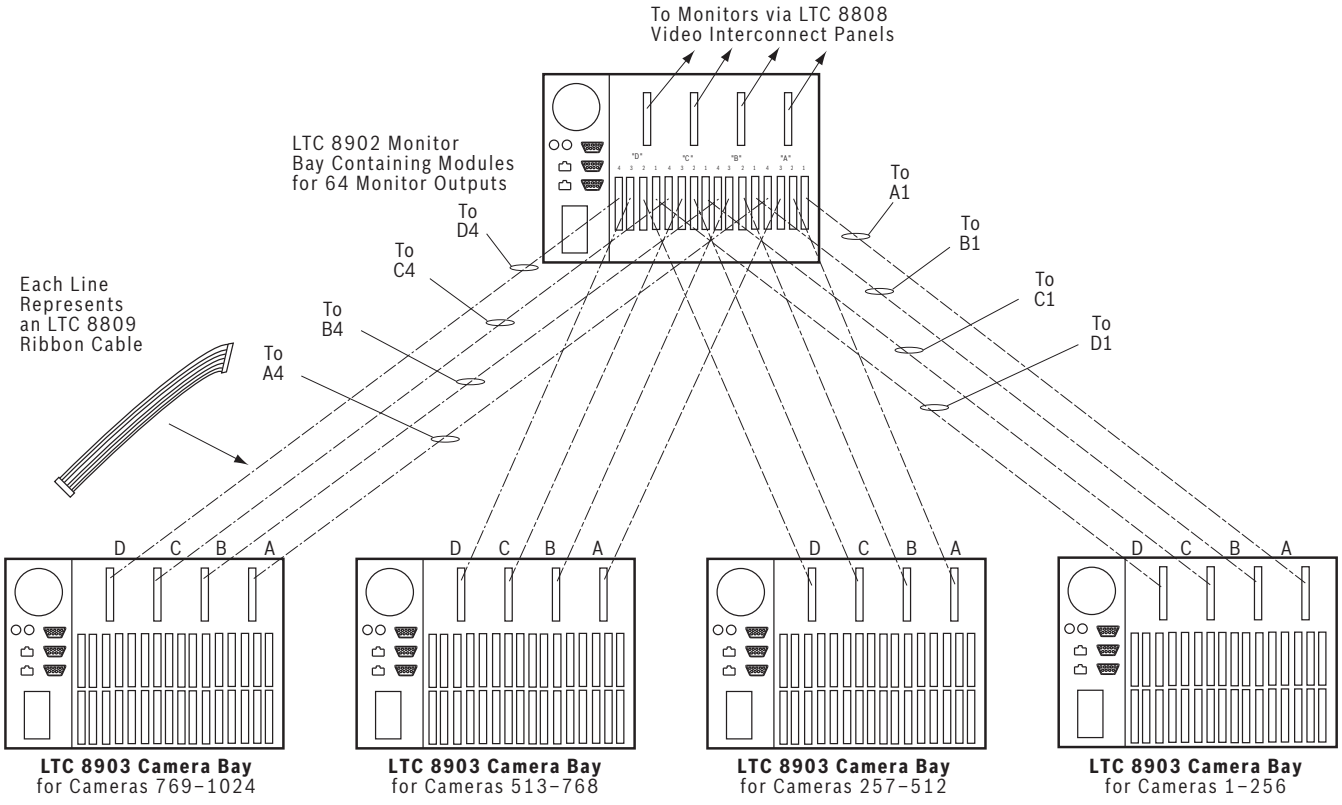


Figure 8.22: Video Interconnect Concept for Systems Having 1024 Cameras

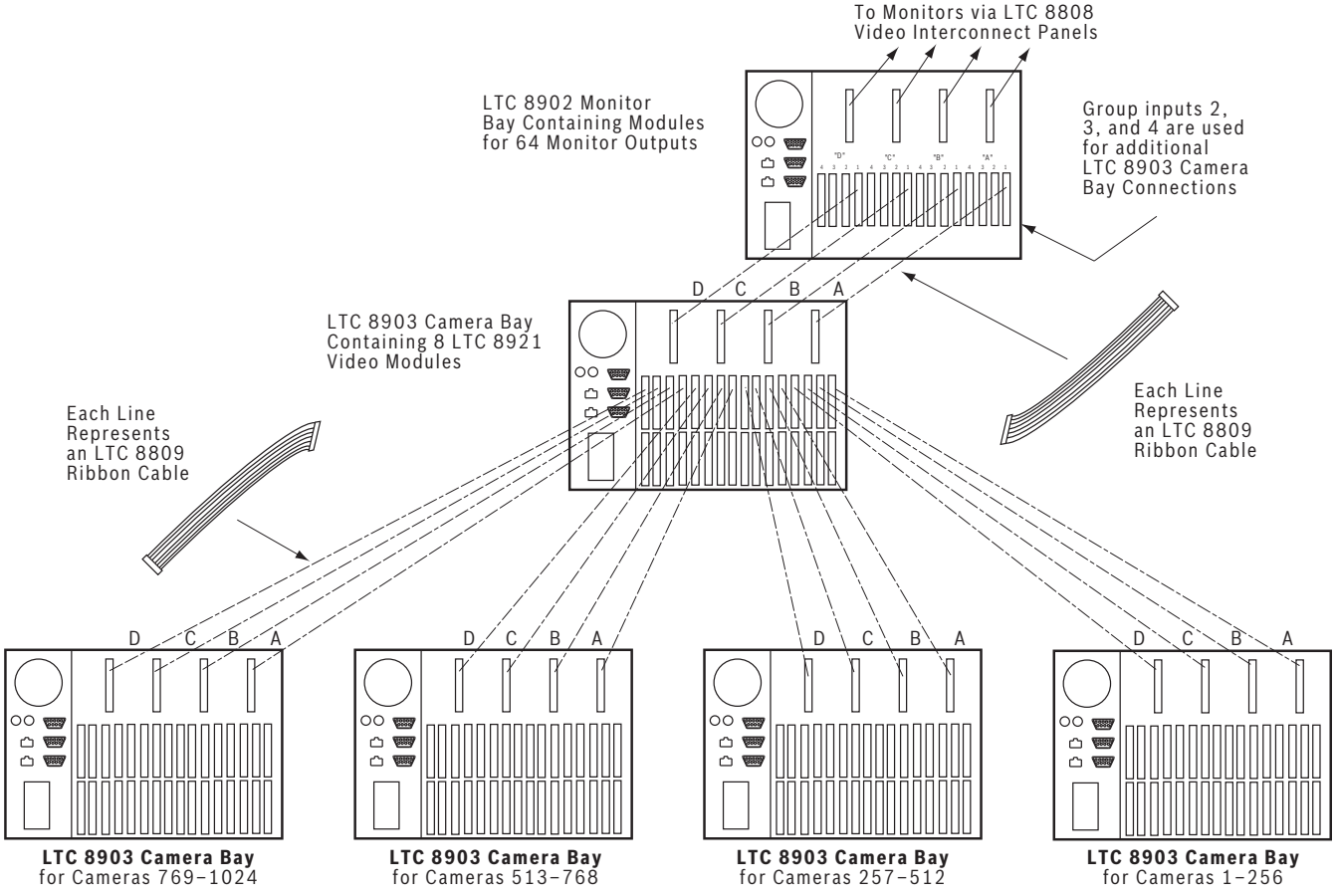


Figure 8.23: Video Interconnect Concept in Systems Having Greater than 1024 Cameras

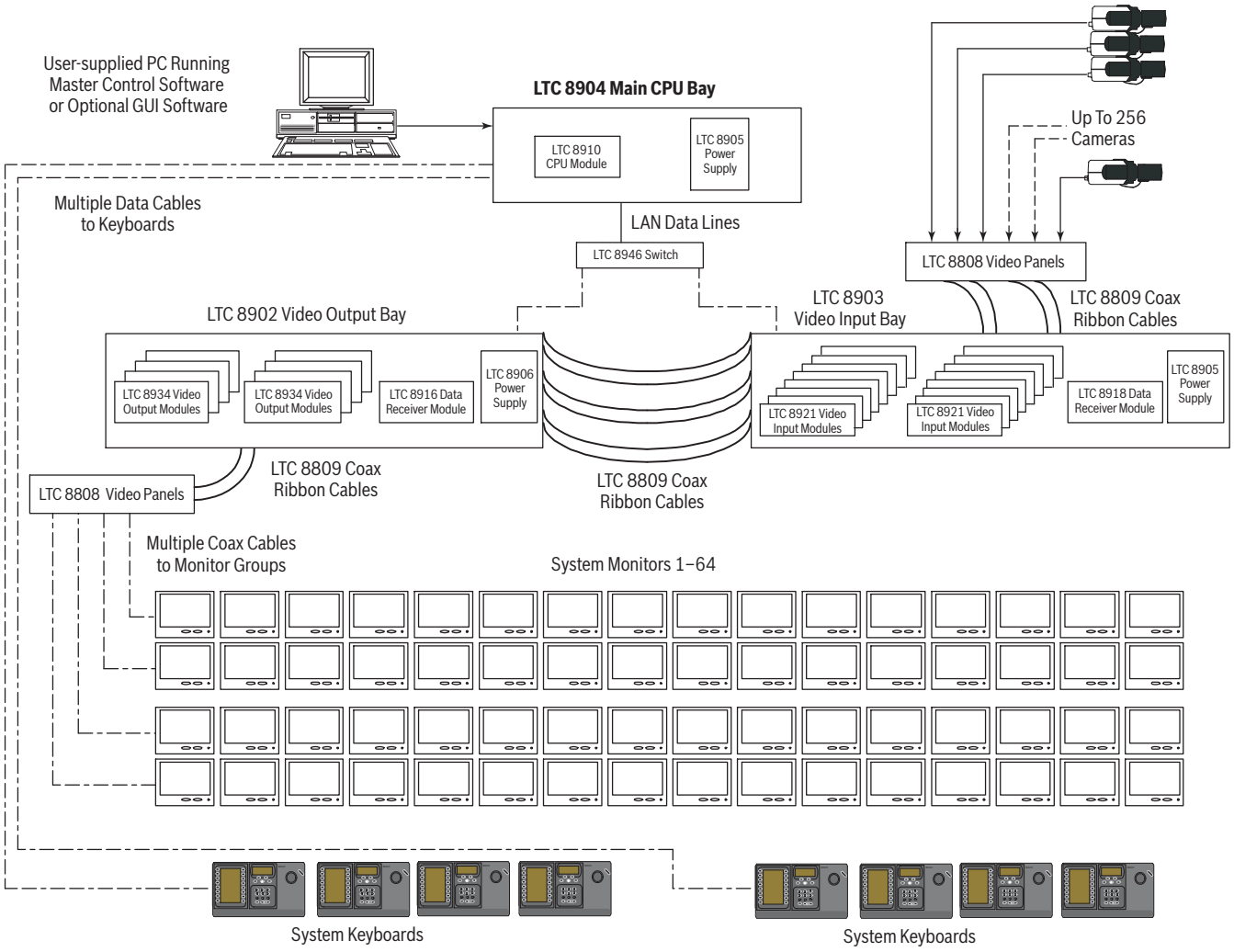


Figure 8.24: Typical Diagram for Standard System Configuration of 256 Cameras and 64 Monitors

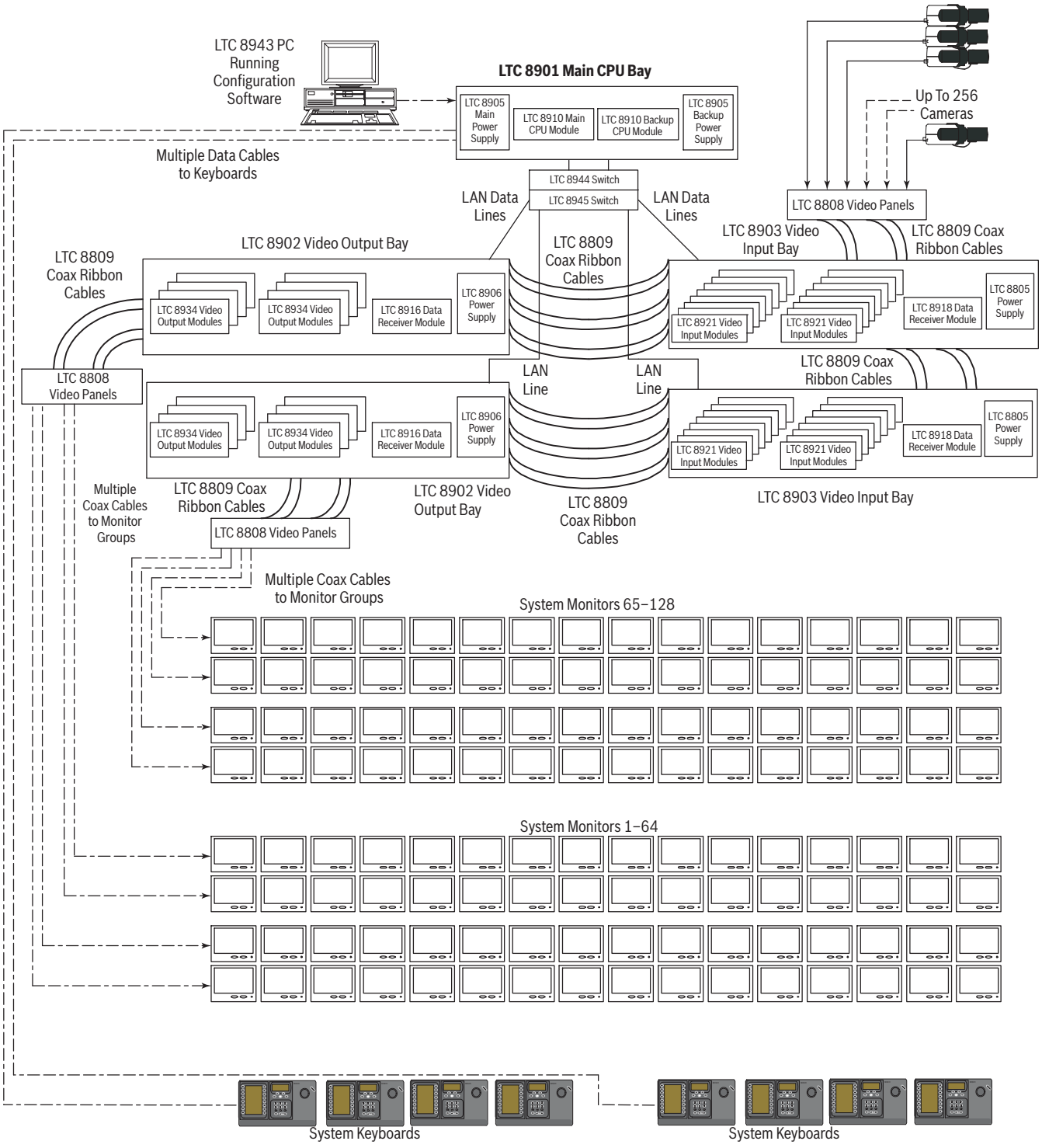


Figure 8.25: Typical Diagram of Redundant System Configuration for 256 Cameras by 128 Monitors

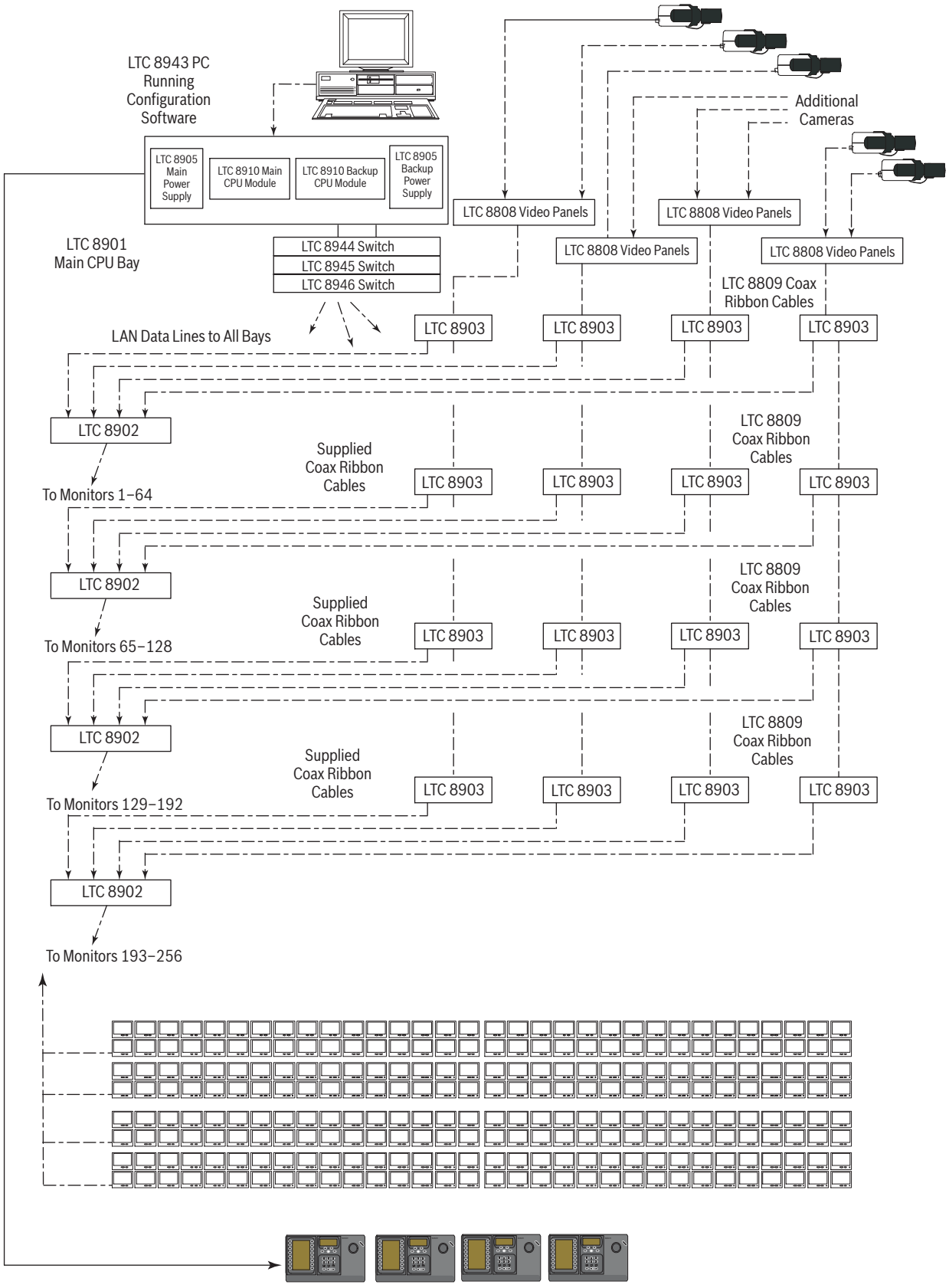


Figure 8.26: Typical Diagram of Redundant System Configuration for 1024 Cameras by 256 Monitors

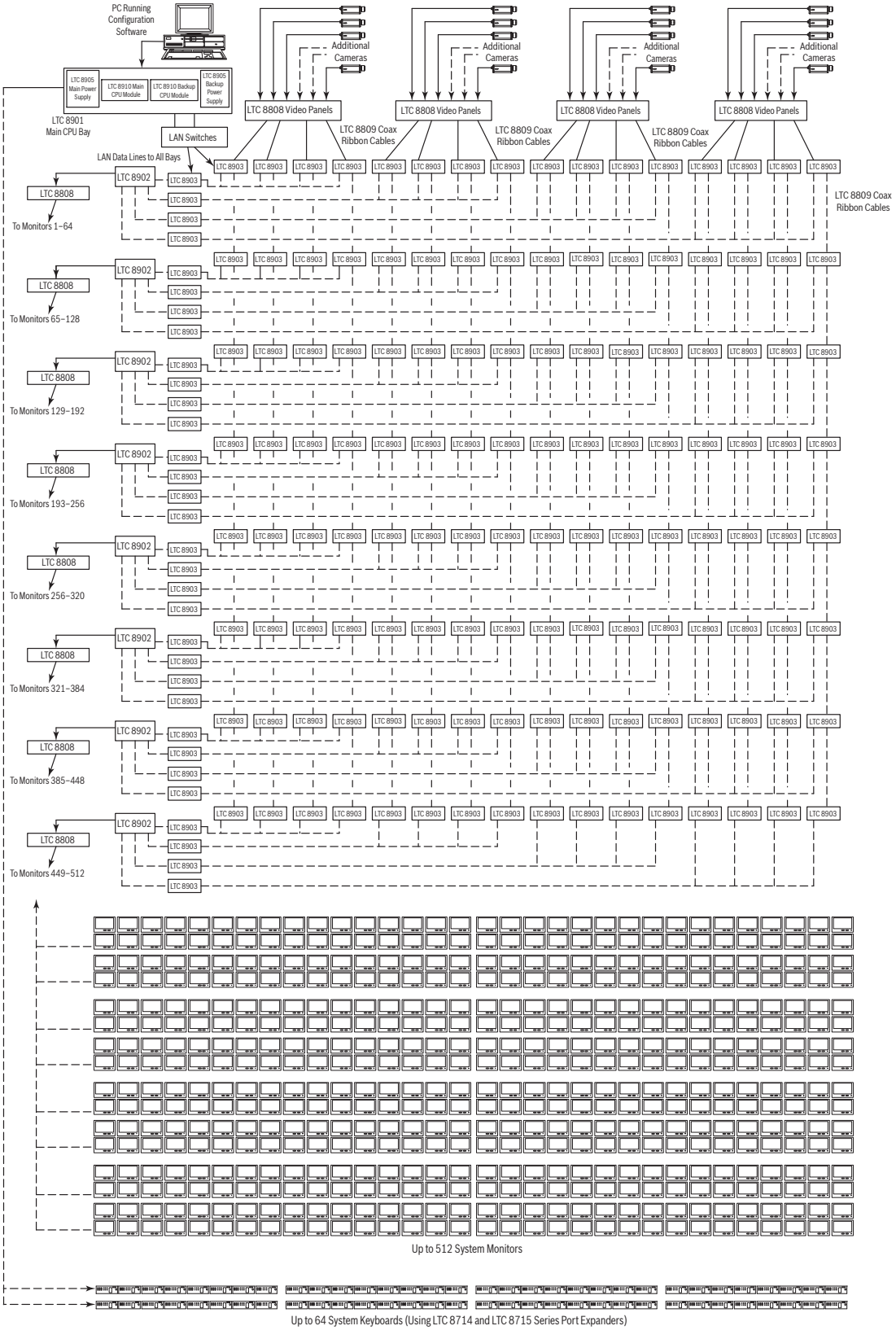


Figure 8.27: Typical Diagram of Redundant System Configuration for 4096 Cameras by 512 Monitors

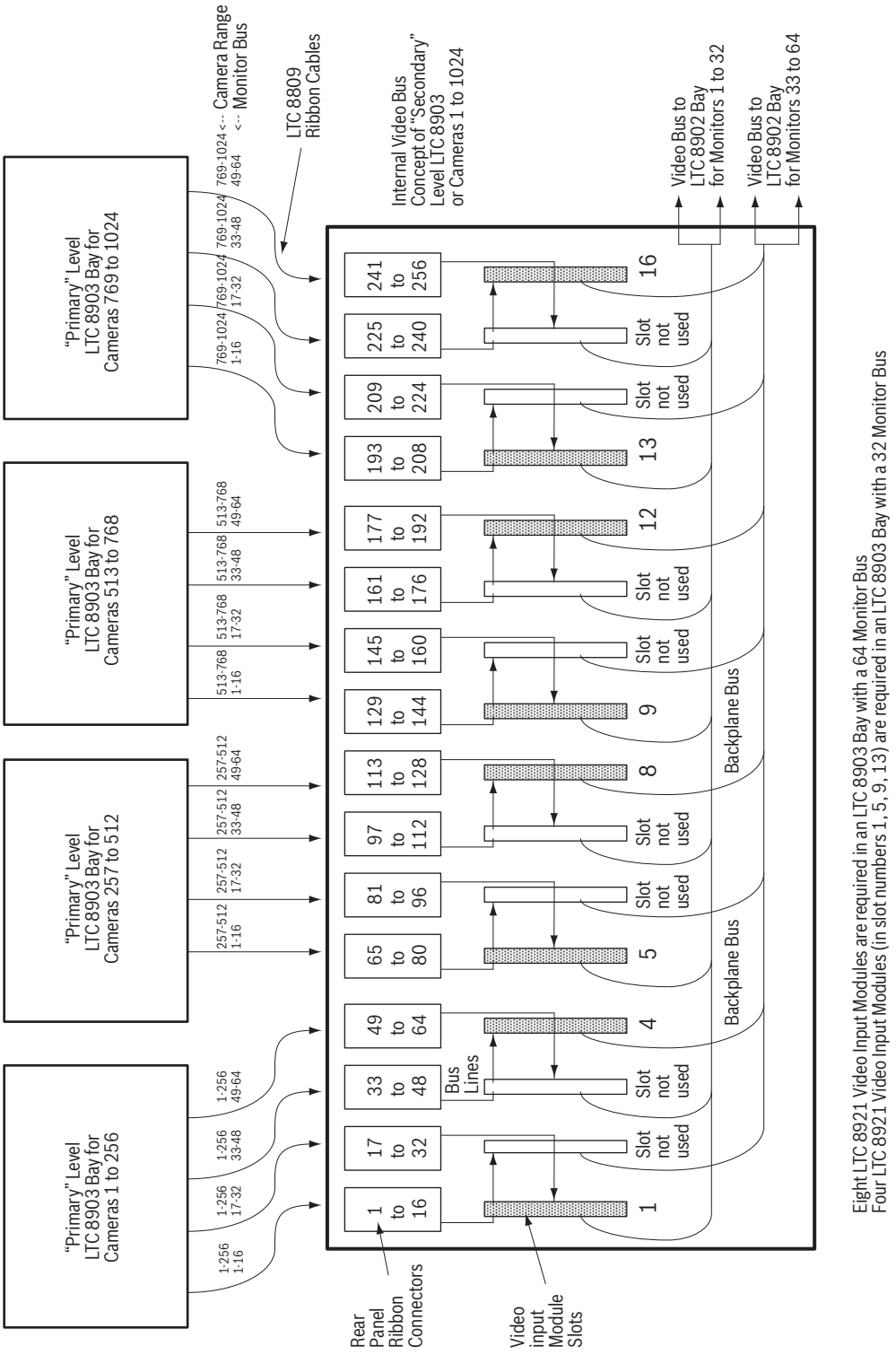


Figure 8.28: Video Bus Concept Diagram

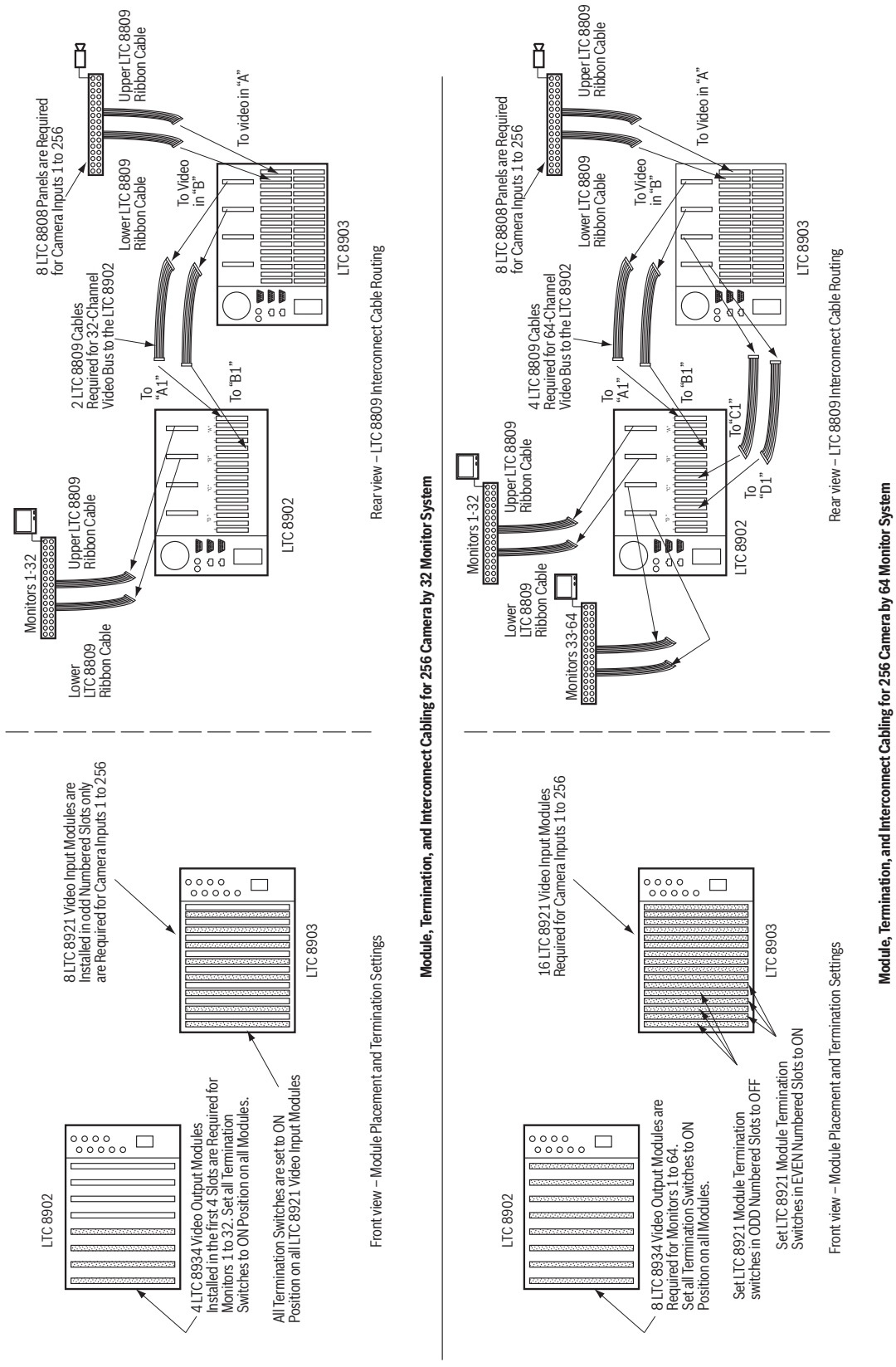


Figure 8.29: Module, Termination, and Interconnect Cabling for 256 Cameras by 32 or 64 Monitor Systems

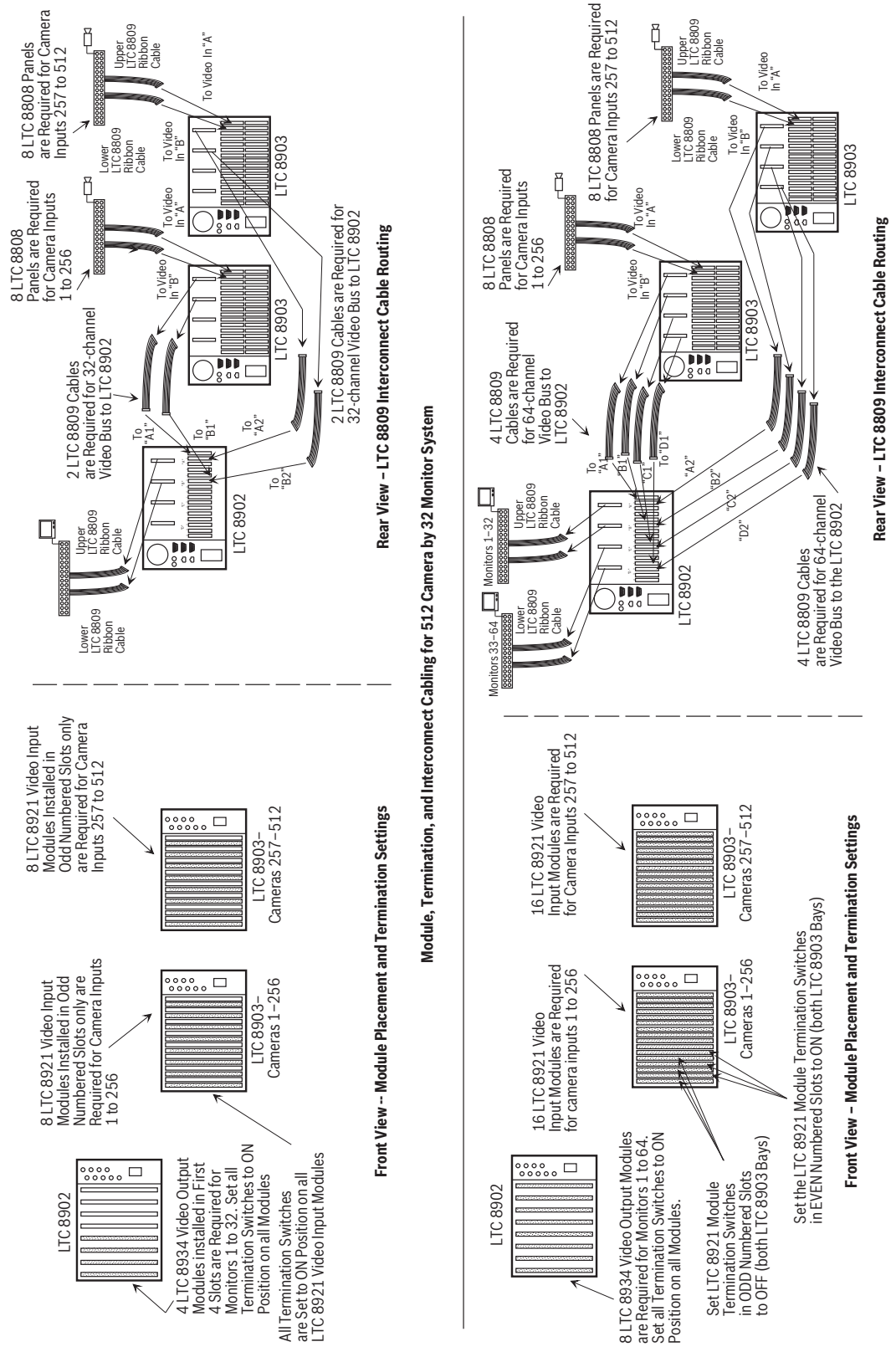
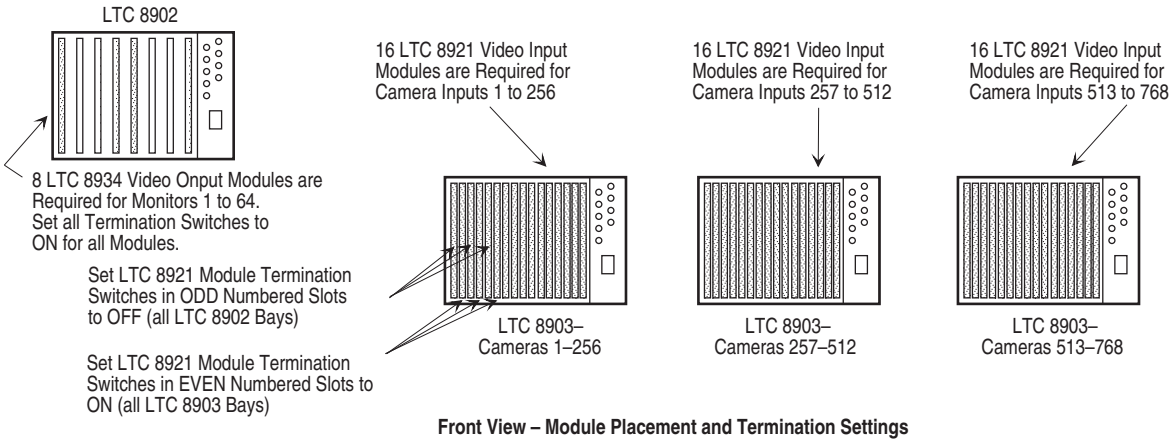
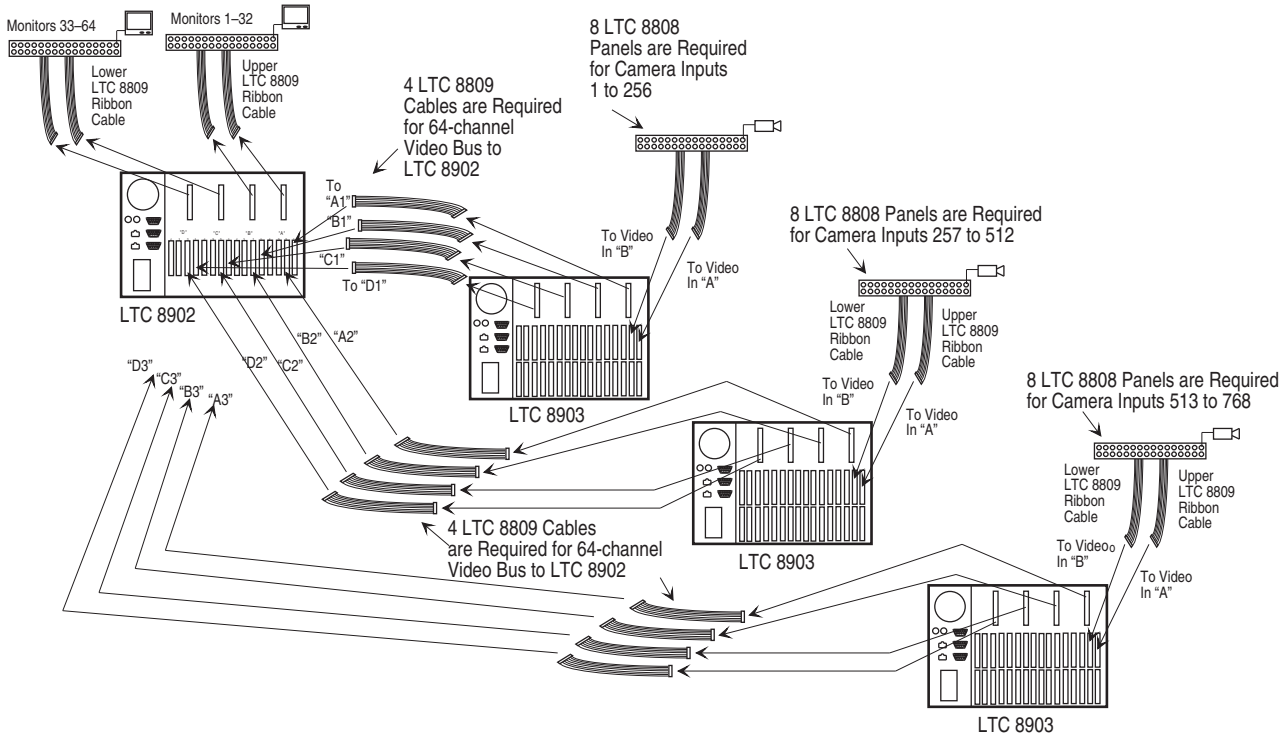


Figure 8.30: Module, Termination, and Interconnect Cabling for 512 Camera by 32 or 64 Monitor System

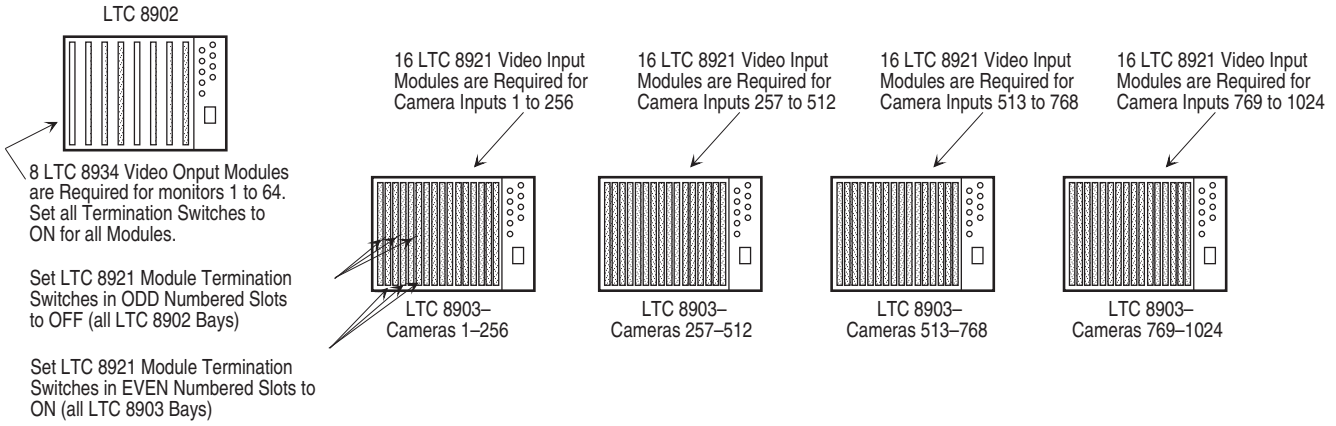


Front View – Module Placement and Termination Settings

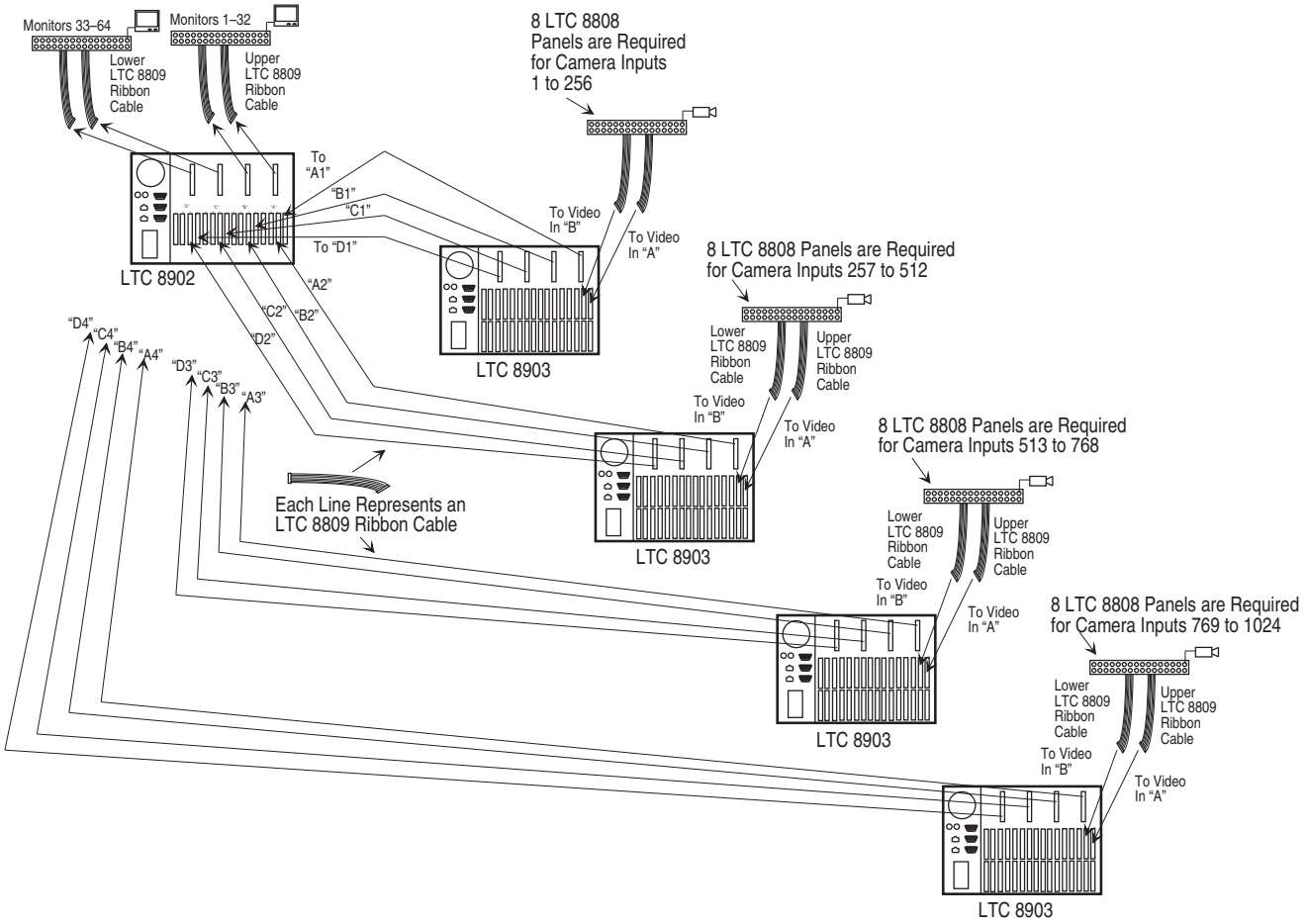


Rear View – LTC 8809 Interconnect Cable Routing

Figure 8.31: Module, Termination, and Interconnect Cabling for 768 Cameras by 64 Monitors

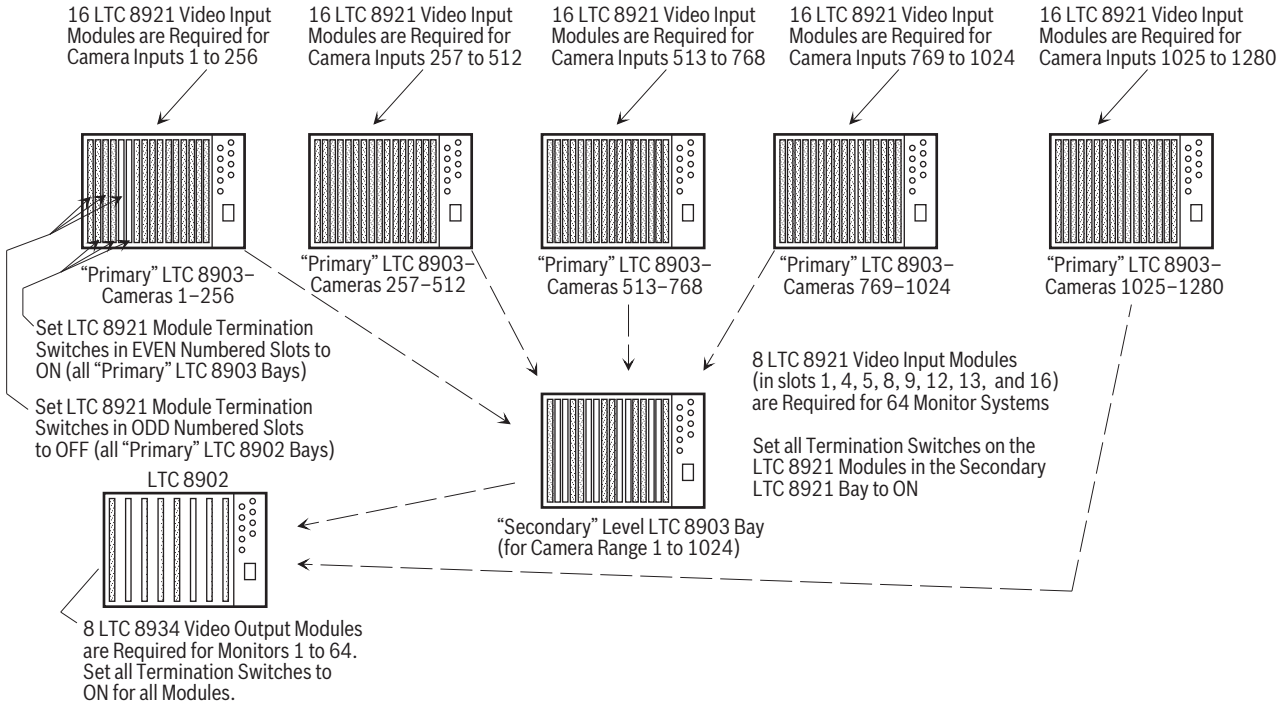


Front View – Module Placement and Termination Settings

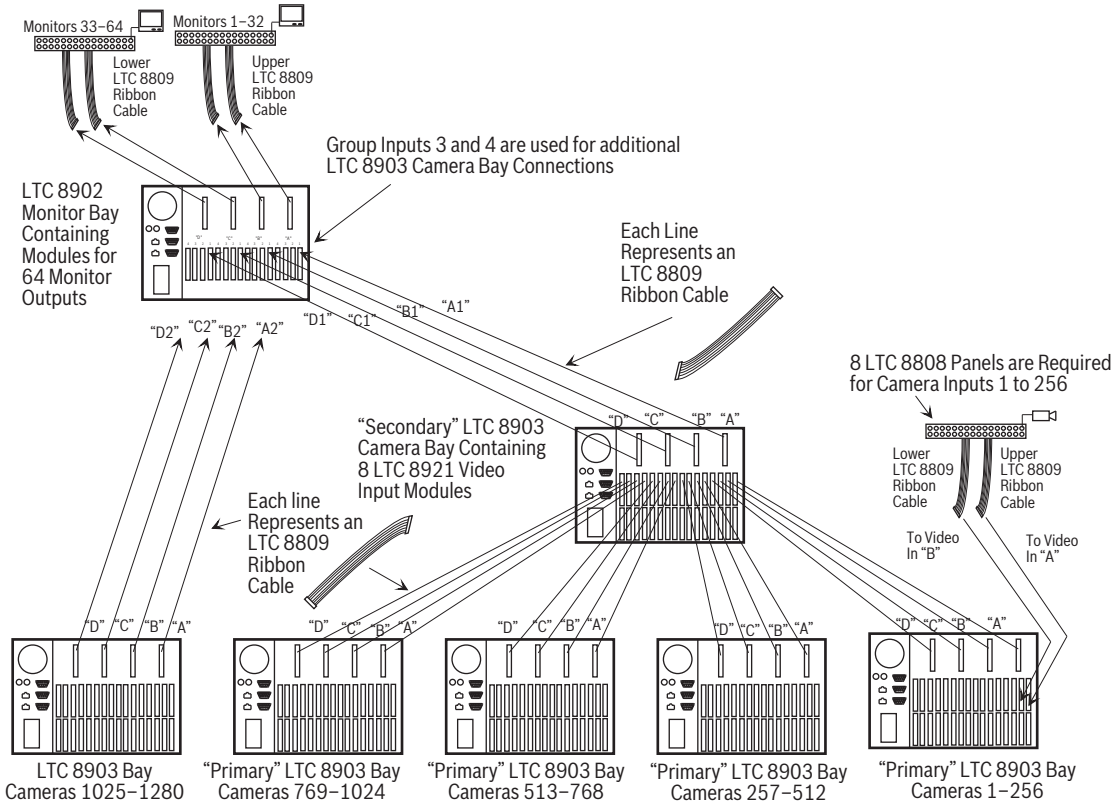


Rear View – LTC 8809 Interconnect Cable Routing

Figure 8.32: Module, Termination, and Interconnect Cabling for 1024 Camera by 64 Monitor System

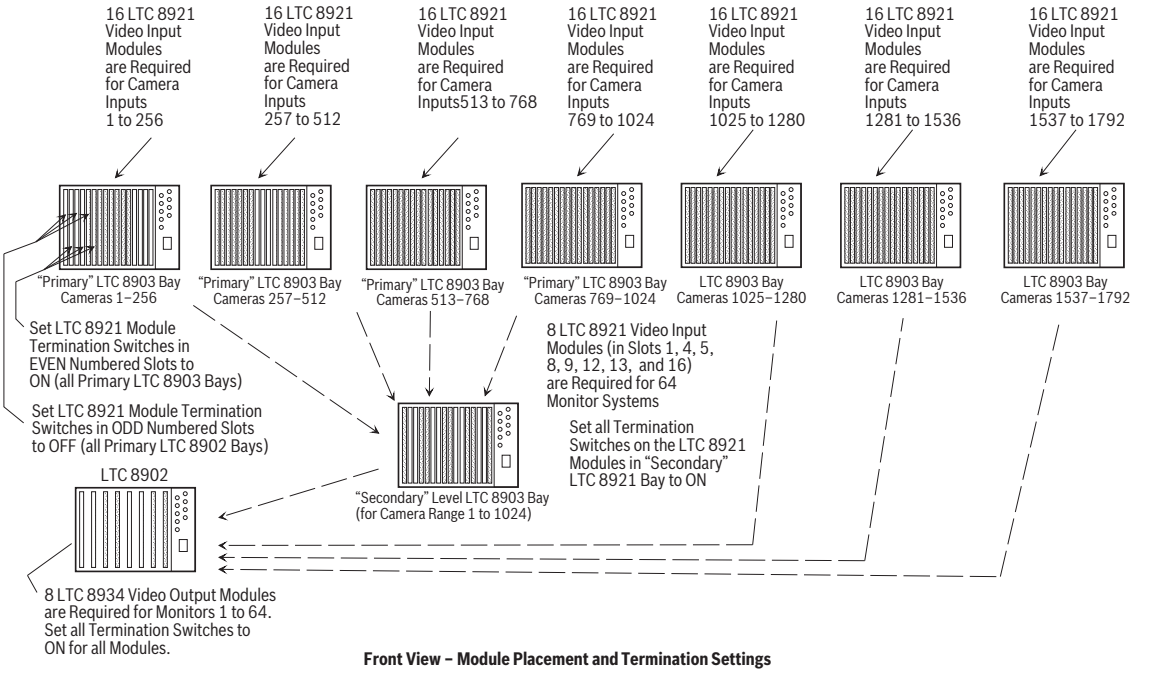


Front View – Module Placement and Termination Settings

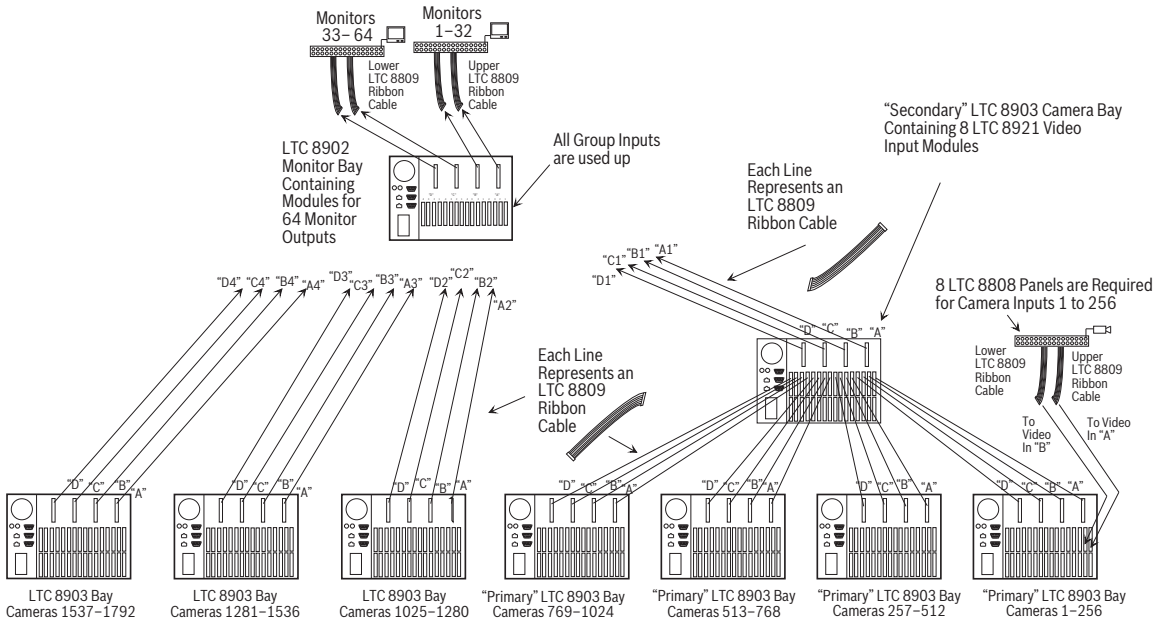


Rear View – LTC 8809 Interconnect Cable Routing

Figure 8.33: Module, Termination, and Interconnect Cabling for 1280 by 64 Monitor System

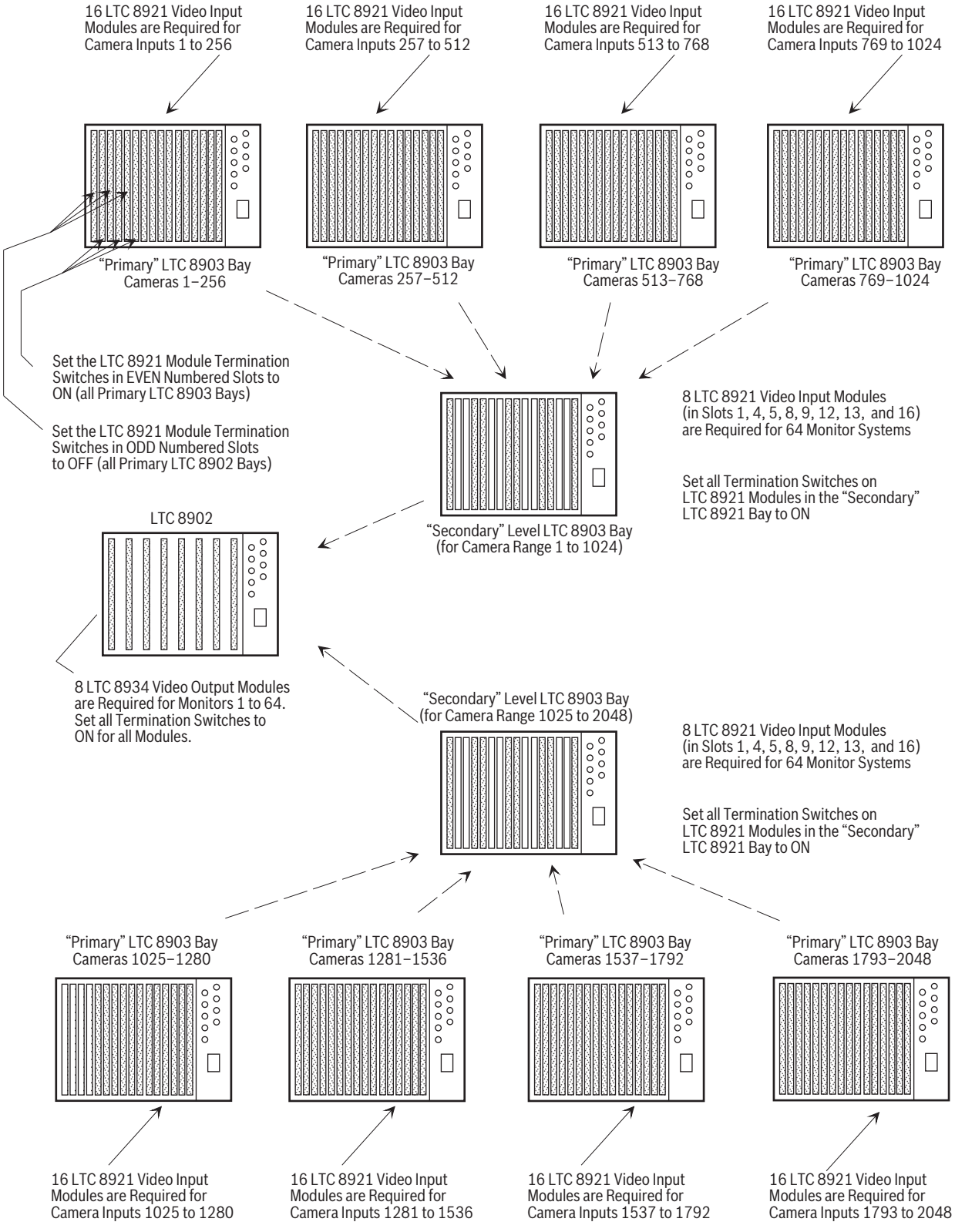


Front View – Module Placement and Termination Settings



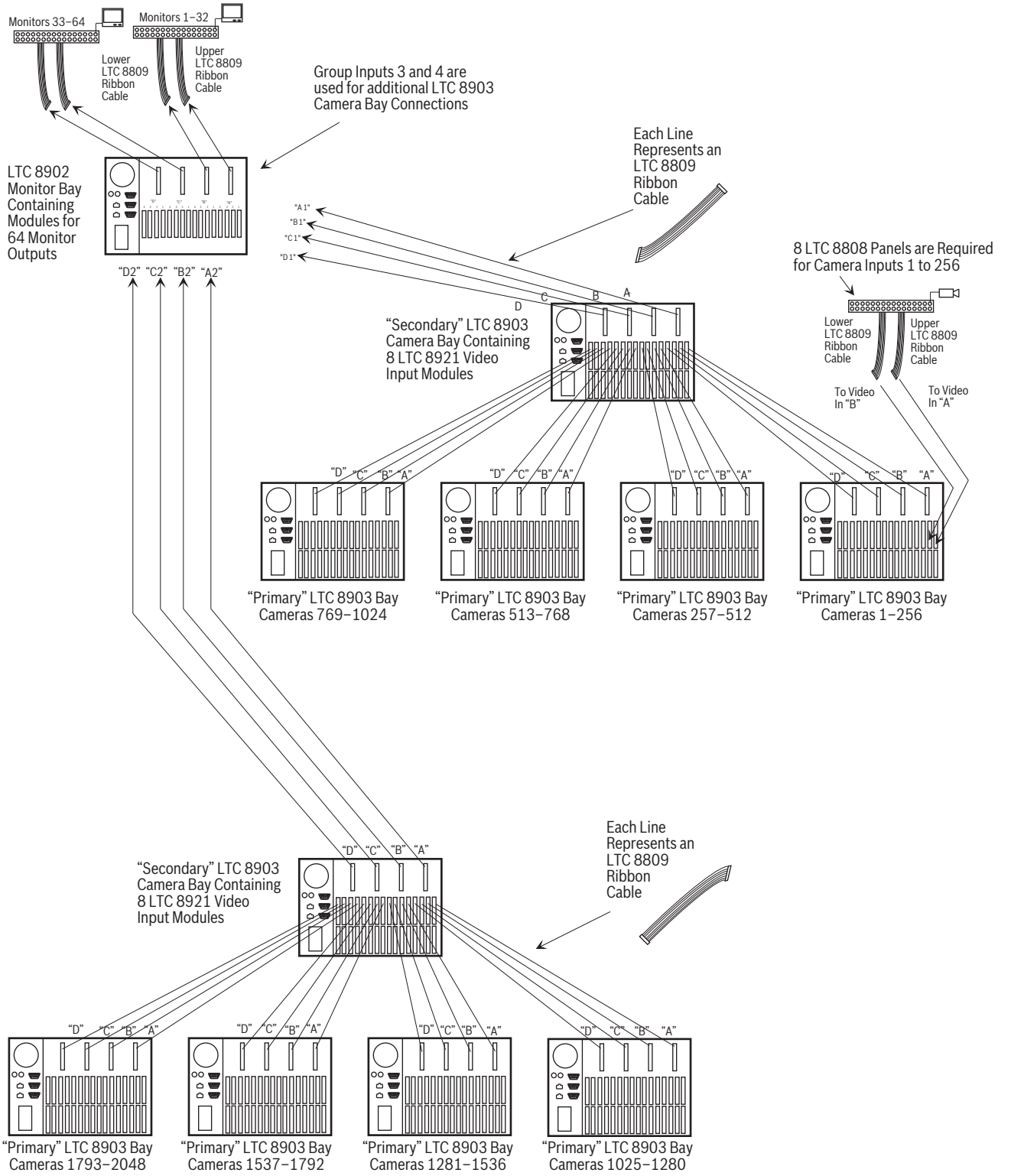
Rear View – LTC 8809 Interconnect Cable Routing

Figure 8.34: Module, Termination, and Interconnect Cabling for 1792 Camera by 64 Monitor System



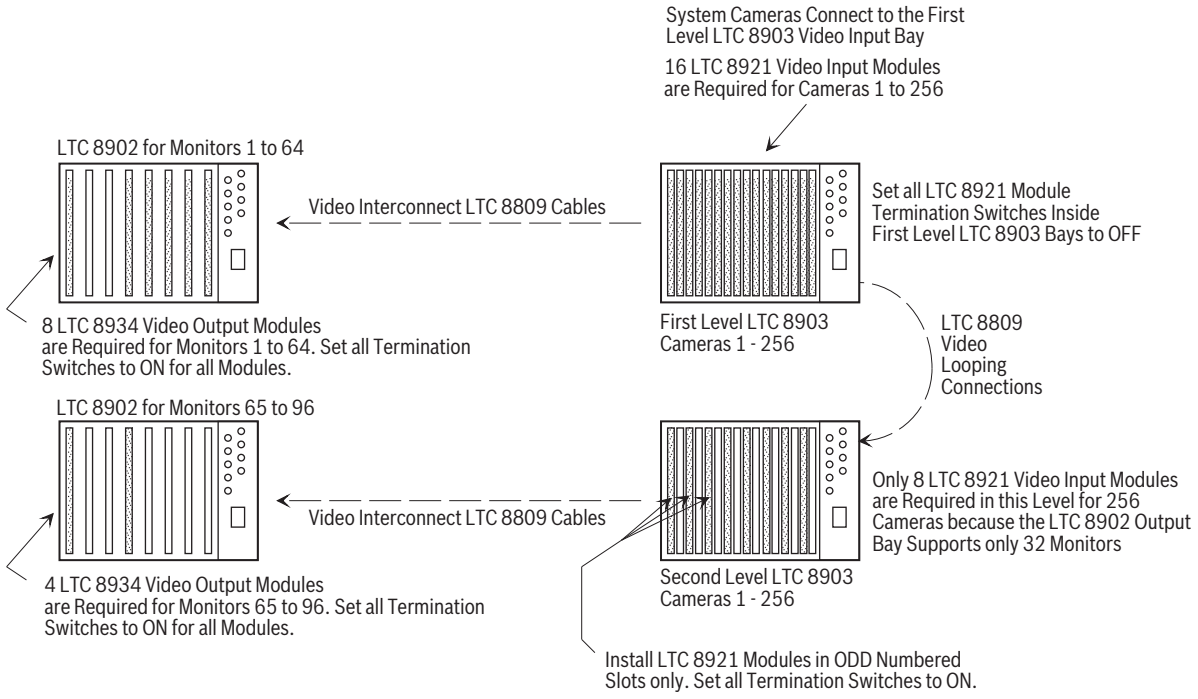
Front View – Module Placement and Termination Settings

Figure 8.35: Module, Replacement, and Termination Configuration for 2048 Camera by 64 Monitor System

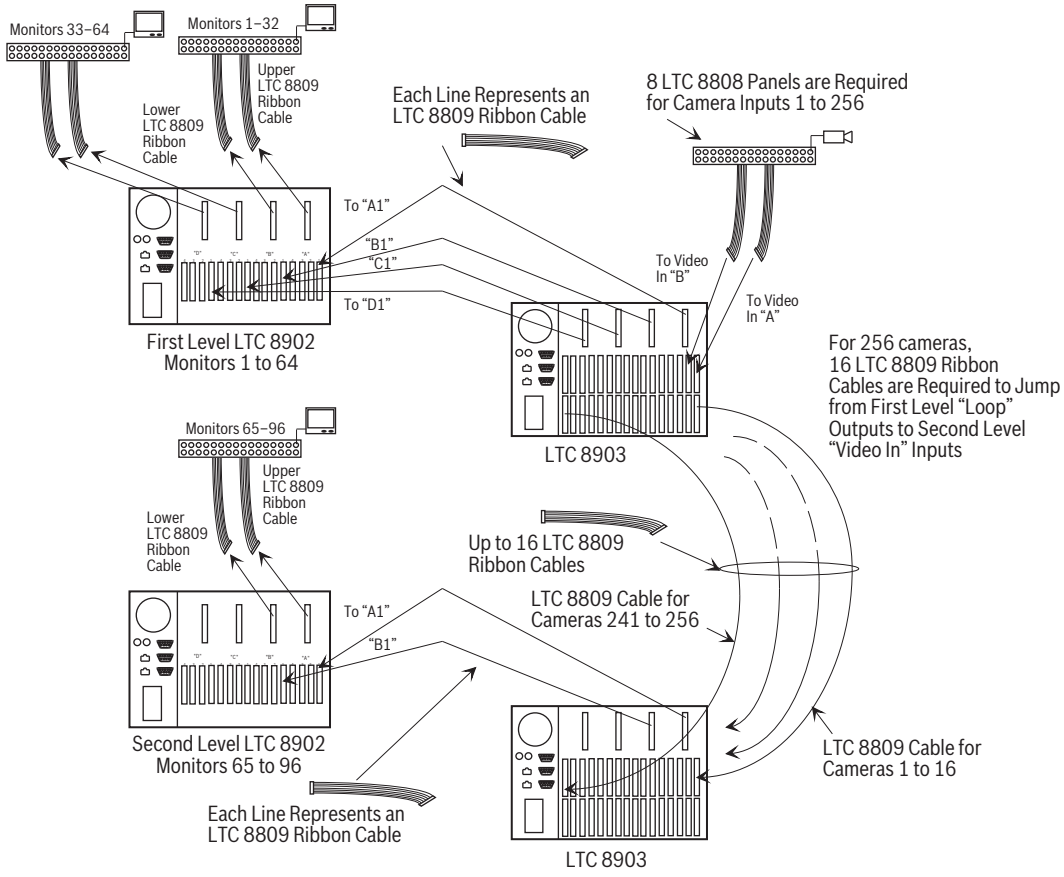


Rear View – LTC 8809 Interconnect Cable Routing

Figure 8.36: Interconnect Cabling for 2048 Camera by 64 Monitor System

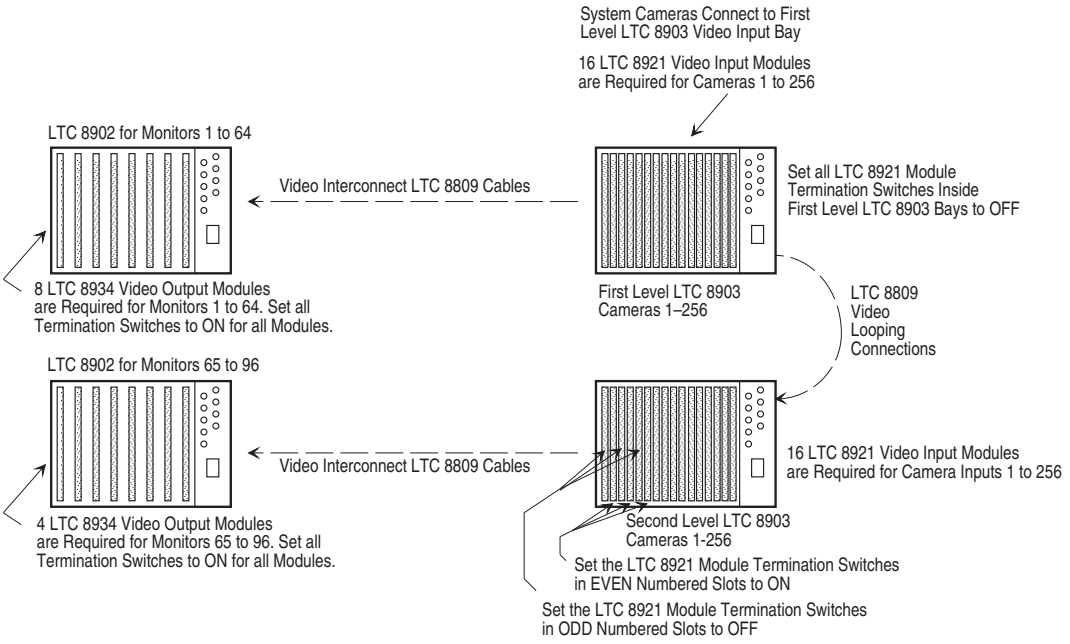


Front View – Module Placement and Termination Settings

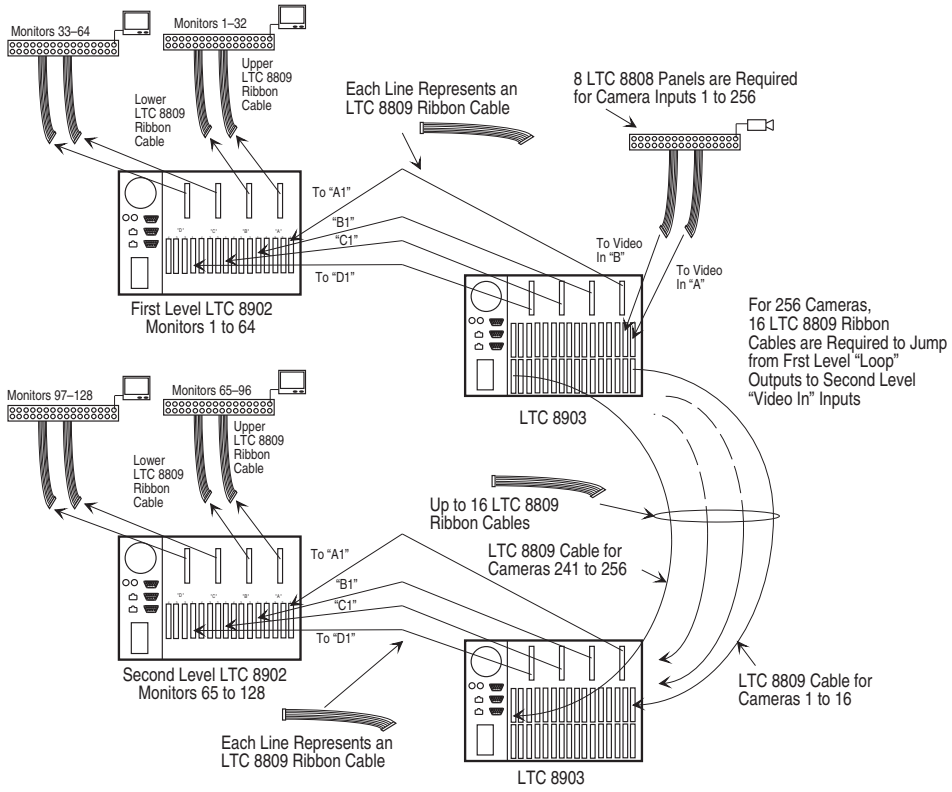


Rear View – LTC 8809 Interconnect Cable Routing

Figure 8.37: Module, Termination, and Interconnect Cabling for 256 Camera by 96 Monitor System

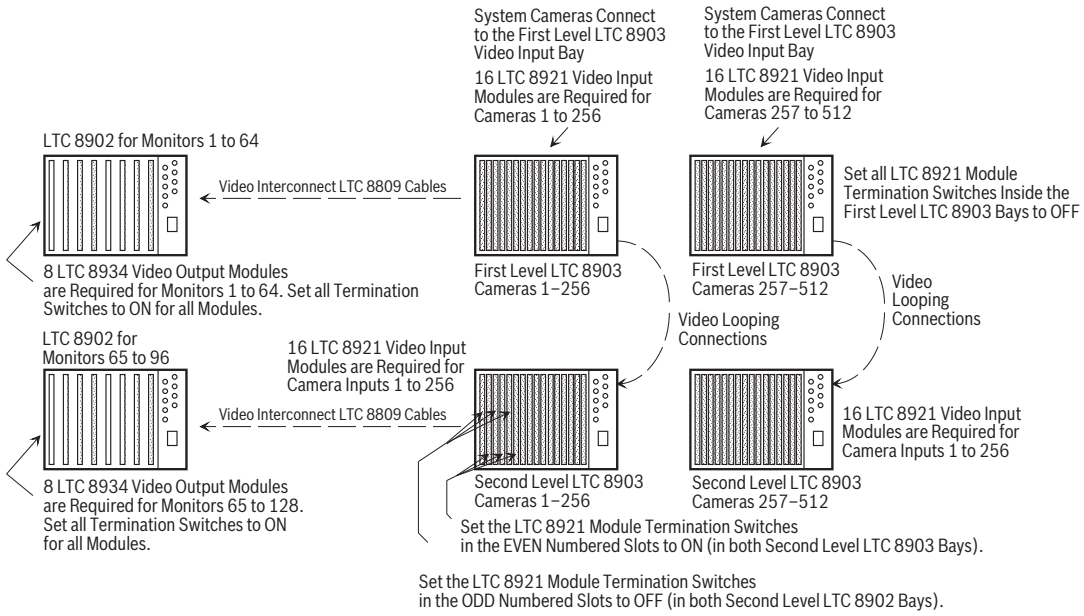


Front View – Module Placement and Termination Settings

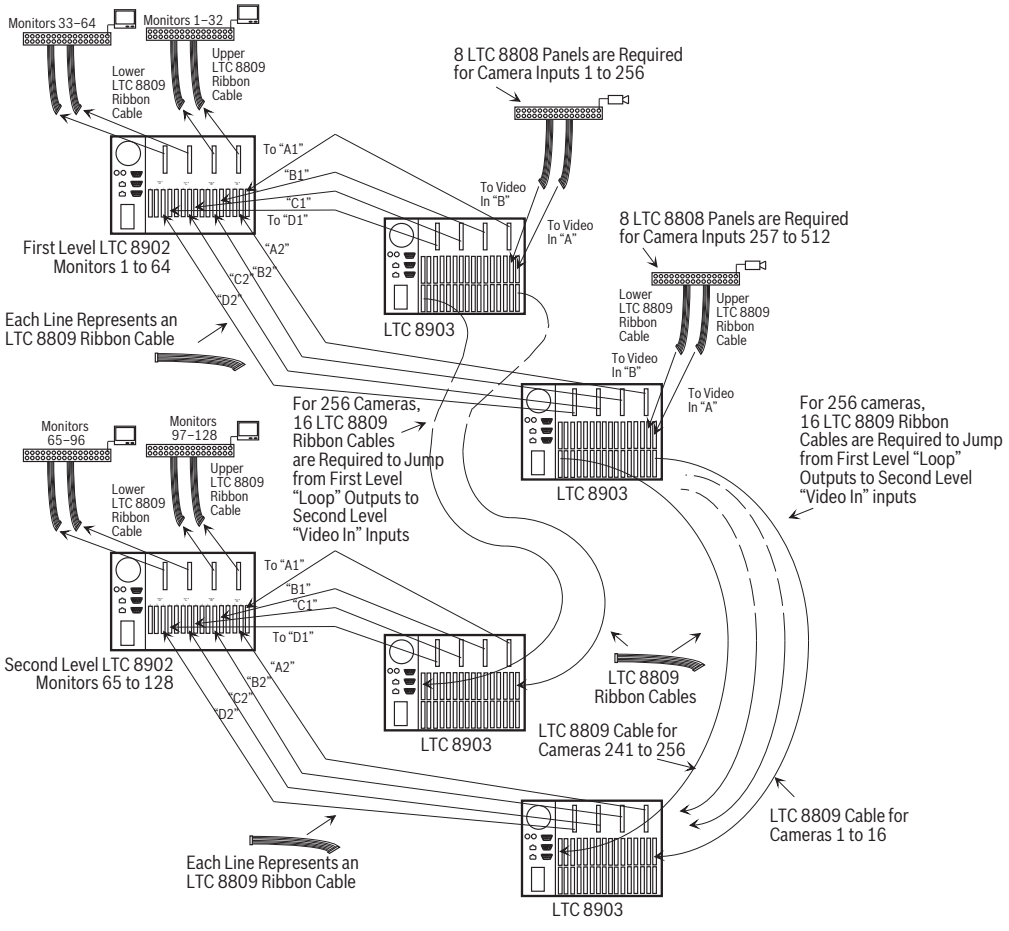


Rear View – LTC 8809 Interconnect Cable Routing

Figure 8.38: Module, Termination, and Interconnect Cabling for 256 Camera by 128 Monitor System



Front View – Module Placement and Termination Settings



Rear View – LTC 8809 Interconnect Cable Routing

Figure 8.39: Module, Termination, and Interconnect Cabling for 512 Camera by 128 Monitor System

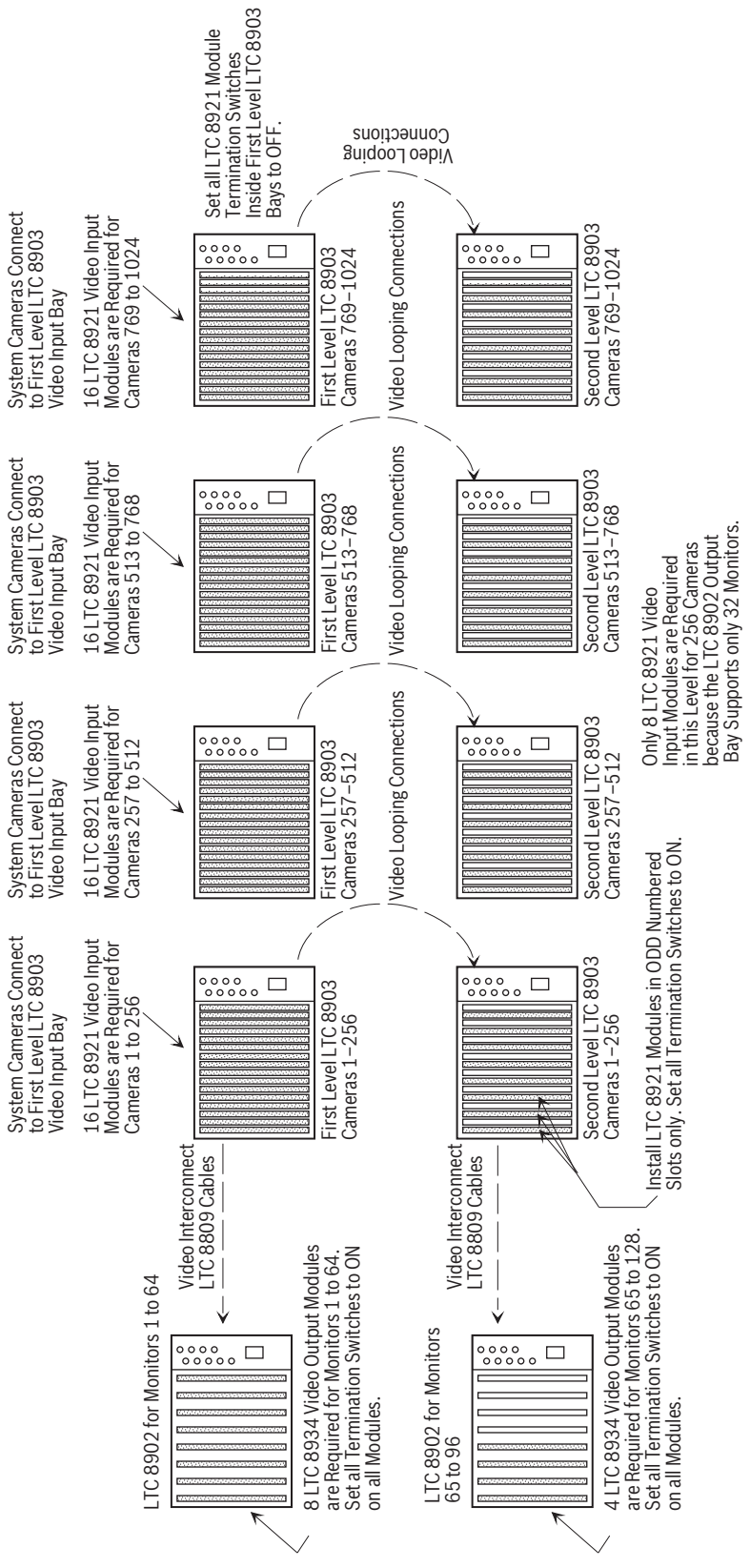


Figure 8.40: Front View, Module Placement and Termination Settings, 1024 Camera by 96 Monitor System

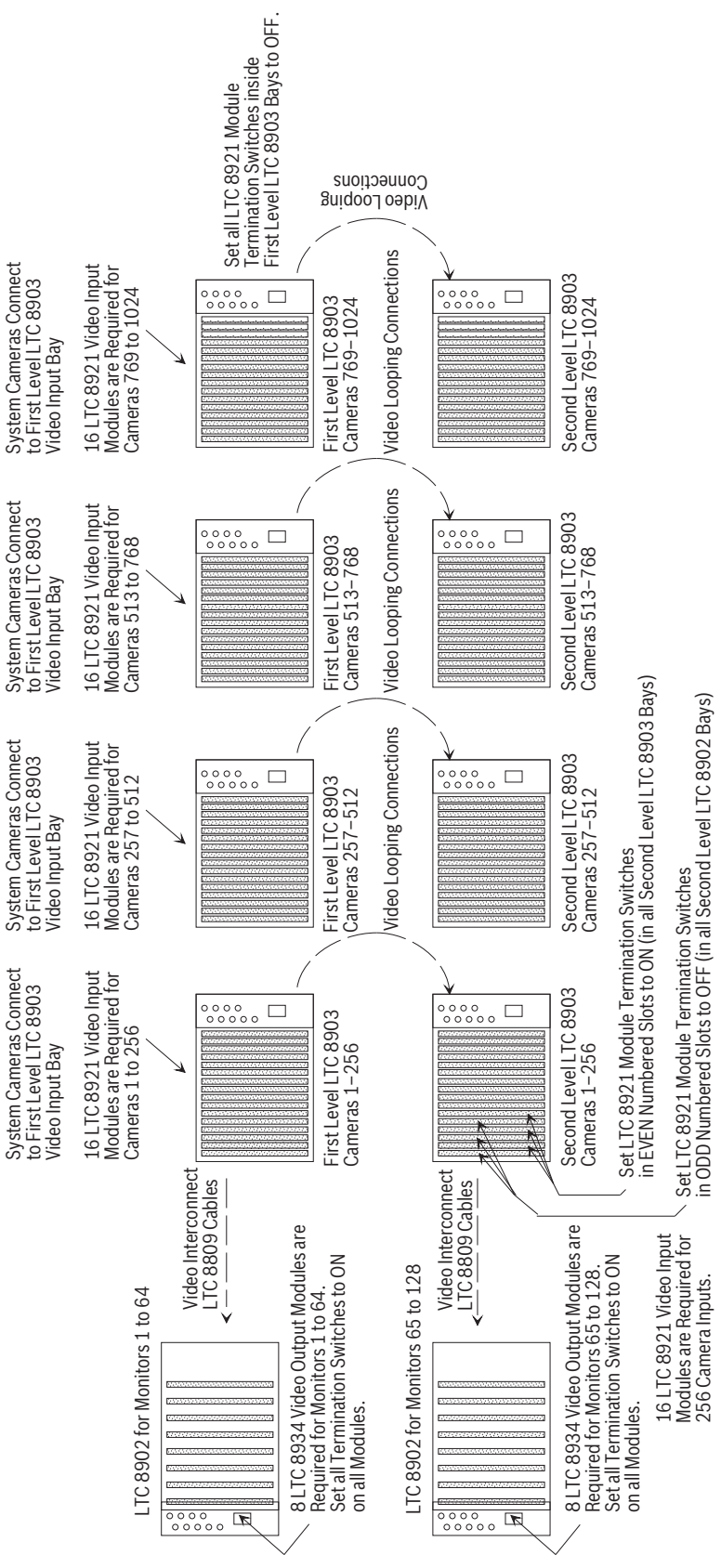


Figure 8.41: Front View, Module Placement and Termination Settings, 1024 Camera by 128 Monitor System

System Cameras Connect to "Primary" First Level LTC 8903 Bays

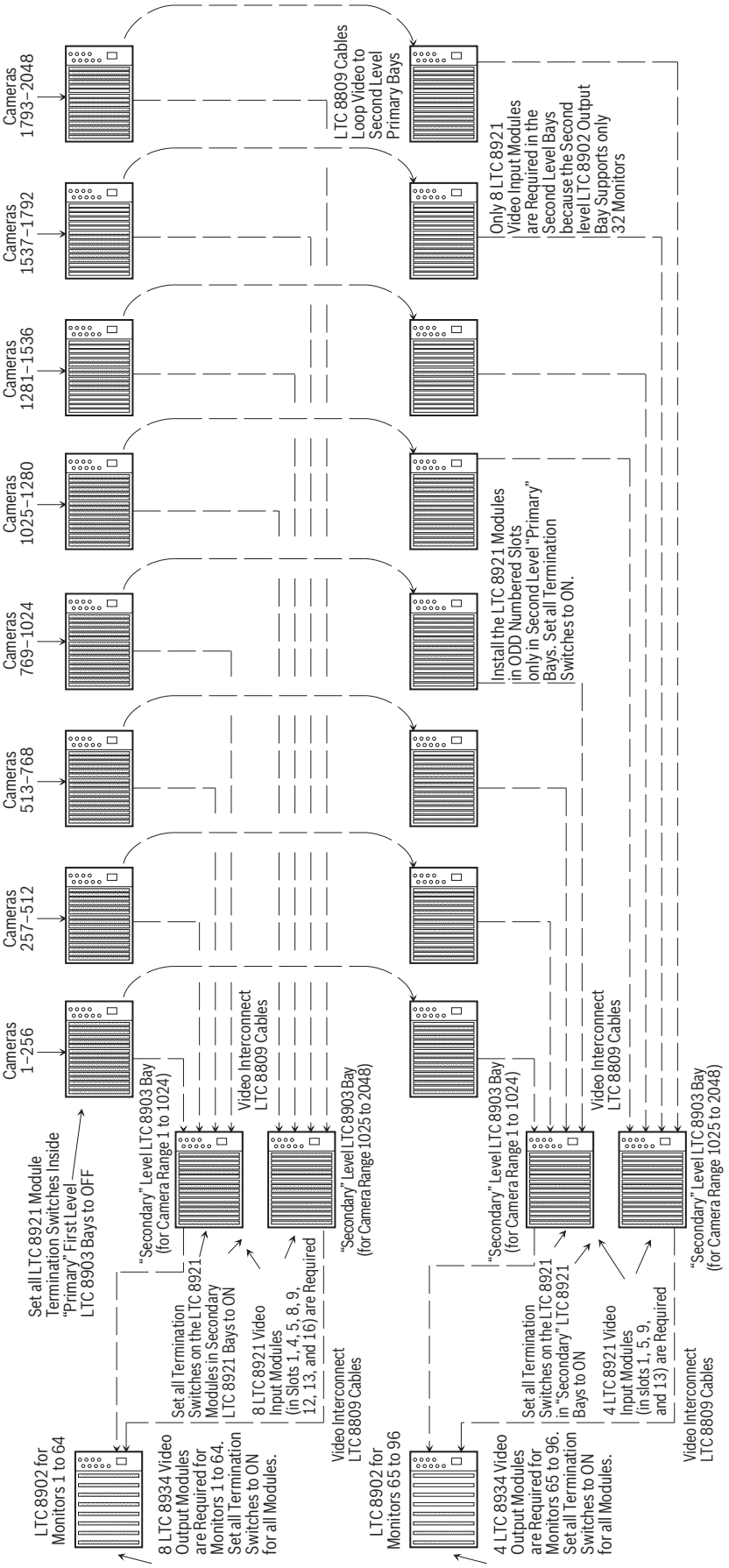


Figure 8.42: Front View, Module Placement and Termination Settings, 2048 Camera by 96 Monitor System

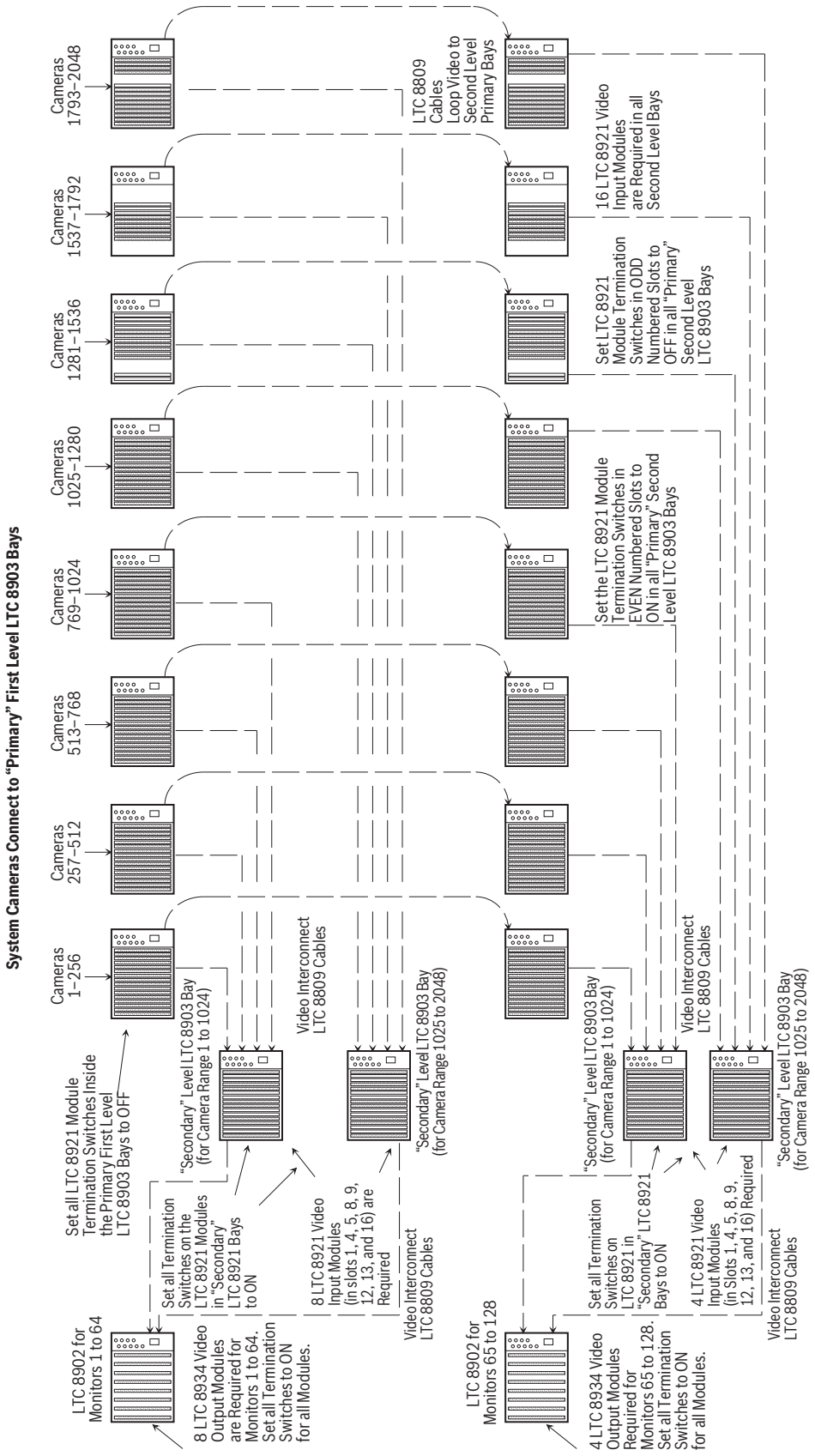


Figure 8.43: Front View, Module Placement and Termination Settings, 2048 Camera by 128 Monitor System

9 Troubleshooting Guide

The LTC 8900 Allegiant system was designed to provide very high reliability. However, if a failure does occur, the effects of the failure depend on system design and the location of the failure.

For example, in a standard nonredundant system, an LTC 8904 Series CPU bay failure could disable the entire system, while a monitor bay failure would disable only the monitors connected to the failed bay.

, page 100 (below) lists the worst-case impact resulting from failure of the LTC 8900 system components. If system troubleshooting becomes necessary, follow these guidelines:

Matrix Bay Checkout	
Indication	**Resolution**
Main power switch is ON, but the Power LED indicator is not lit	Check the main line fuse on the rear of the main bay. Refer to the *Maintenance Information, page 103* for replacement instructions.
Any of the green LED indicators on the front of the matrix bay power supply are not illuminated	Replace the blown fuses associated with any unit fuse indicators.
Intermittent video output or system operation	Verify that all circuit card modules are properly seated in their respective rack connectors.
Power Supply LEDs are lit, but there is no power indication on modules or accessory devices	Verify proper seating of the power supply within card cage. Verify that the supplied retaining screws are installed.
Keyboard Checkout	
There are no keyboard display indicators	Check the interconnect cable for cut or broken wires between the keyboard and the main CPU bay. Replace the cable if necessary. Relocate the keyboard connector on the main CPU bay to another keyboard input port. Replace the keyboard.
Keyboard indicators are lit but the keyboard is inoperative	Verify that the keyboard is logged-on to the system (if log-on feature has been enabled). Check the interconnect cable for cut or broken wires between the keyboard and the main CPU bay. Replace the cable if necessary. Relocate the keyboard connector on the main CPU bay to another keyboard input port. Replace the keyboard.

Limited keyboard functions	If possible, perform a local keyboard test to verify operation of all keys. If a local test cannot be performed, replace the keyboard. The installer or system administrator should review the PC-based configuration software package s lockout tables to determine if the problem is related to user restriction tables. If the table settings are verified, and no discrepancies are found, replace the keyboard.
Allegiant keyboard joystick is not centered	If the analog joystick of the keyboard becomes uncentered due to normal wear, it can be recalibrated. If using Intuikey Series Keyboards, calibration is done via the Keyboard Control menu. If using LTC 8555 Series Keyboards, activate the *Keyboard User Function 1* keyboard test. Refer to the Operator s Manual for more information.

Table 9.1: Troubleshooting Guidelines

Component Configuration	**Worst-case Effect of Failure Standard System Configuration**	**Worst-case Effect of Failure Redundant System**
System Controller PC	Not Applicable	Hot-switch and Data Mirroring functions are unavailable. The System is completely operational.
CPU or CPU Power Supply	Complete loss of all system operations and functions	Automatic hot-switch to backup. System completely operational. LTC 8901 Series buzzers sound, fault LEDs illuminate, and appropriate fault relays close. The System Supervisor software flashes and beeps to alert the operator.
LAN Switch, CPU Port	Not Applicable	Automatic hot-switch to backup occurs. The System is completely operational. System Supervisor software flashes and beeps to alert operator.
LAN Switch, Video Bay Port	Loss of video connected to bay; the remainder of the system is operational.	Loss of video connected to bay; the remainder of the system is operational.
LAN Switch, Entire Switch	Loss of video associated with all matrix bays connected to the switch; if the system contains multiple switches, the remainder of the system is unaffected.	Automatic hot-switch to backup occurs. There is loss of video on all bays connected to defective LAN Switch. The System Supervisor software flashes and beeps to alert the operator.
Output Bay	Loss of video connected to the bay; the remainder of the system is operational.	Loss of video connected to bay; the remainder of the system is operational.
Input Bay	Loss of video connected to the bay; the remainder of the system is operational.	Loss of video connected to bay; the remainder of the system is operational.

Table 9.2: Trouble Modes

CPU and Data Receiver LED Indicators:			
PCB ID	**PCB Label**	**Color**	**Function**
D1000	RESET	Red	Lit during reset condition
D0908	CPU ACT.	Green	Flashes to indicate processor activity
D0909	BATT LOW	Red	Lit when battery is low
D1001	Temp CRIT	Green	Lit when temperature is critical
D0800	LAN LINK/ACT	Green	Lit indicates network condition; Flashing at packet rate indicates activity
D0801	LAN 100BASET	Red	Lit indicates 100BaseT connection
D0802	LAN DUP/COL	Yellow	Lit indicates duplex mode; Flashing at paced rate indicates collisions
D0500	SDU ACT	Green	Flashes at Biphase data packet rate
D0701	CONSOLE	Green	Lit when RS-232 connection exists
D0702	PRINTER	Green	Lit when RS-232 connection exists
D0700	ALARM	Green	Lit when RS-232 connection exists
D0900	LED1	Red	Lit when flash memory is getting updates
D0901	LED2	Green	No function
D0902	LED3	Yellow	No function
D0903	LED4	Red	No function
D0904	LED5	Green	No function
D0905	LED6	Yellow	No function
D0906	LED7	Red	No function
D0907	LED8	Green	Flashing indicates keyboard polling activity

Table 9.3: LED Indicators

10 Maintenance Information

NOTE: The LTC 8900 Allegiant system has been designed to perform for long periods of time with little or no maintenance. Cleaning the keyboard or replacing a fuse may be necessary occasionally. See instructions below.

10.1 Cleaning System Keyboard(s)

The keyboard may be cleaned whenever necessary by temporarily removing it from the system and wiping it with a damp cloth. If a conventional spray cleaner is required, spray the cloth first, then wipe the surfaces. Do not use petroleum-based cleaners, or cleaners containing benzene, triclorethylene, ammonia, or acetone; these cleaners could damage the plastic surfaces.

10.2 Matrix Bay AC Line Voltage Input Selection

The AC line voltage input selector is located on the rear of the equipment bay, inside the line cord connector housing. The present input voltage selection is shown in the window of the connector housing. Remove the AC line cord if the setting is incorrect. To change the setting, insert a flat blade screwdriver into the slot at one end of the connector housing, as indicated in the drawing, and rotate the screwdriver until the door to the housing opens.
Remove the voltage selector wheel from the connector housing and rotate until the desired voltage is visible, as in *, page 103*.

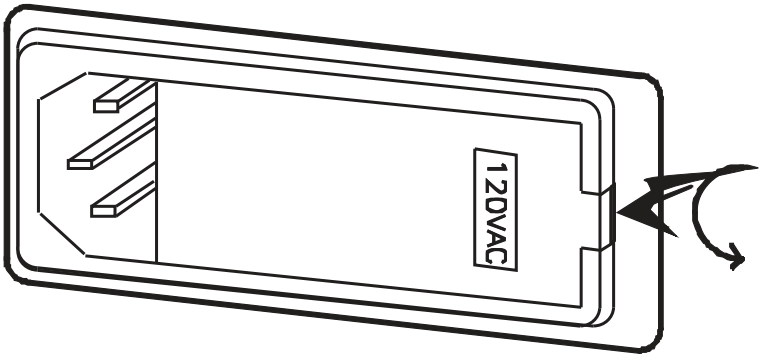


Figure 10.1: Voltage Selector

Reinsert the wheel into the connector housing so that the selected voltage is facing out. Snap the door closed, and verify that the correct voltage selection is visible through the window. Reattach the AC line cord.

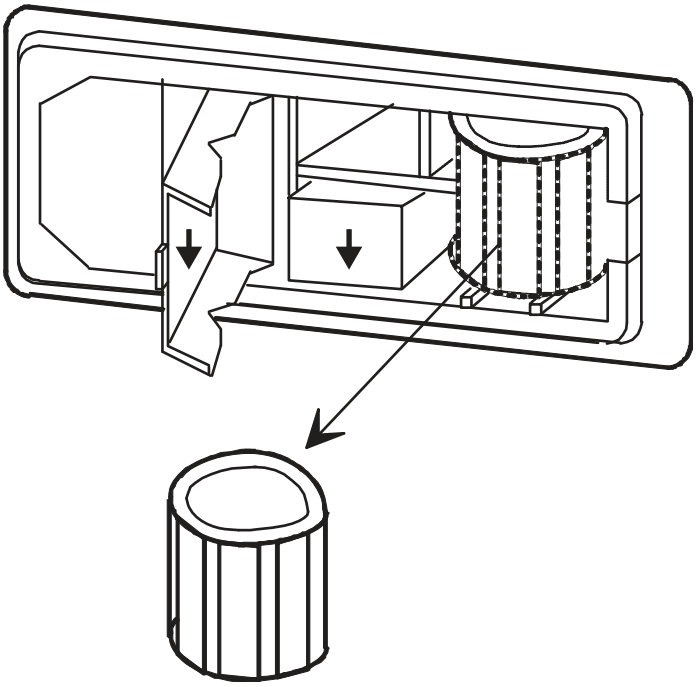


Figure 10.2: Line Voltage Selector Removal

10.3 Matrix Bay AC Line Fuse Replacement

The AC line fuse on LTC 8805/60 and LTC 8906/60 Power Supply models is located on the rear of the equipment bay, near the line cord connector. LTC 8805/50 and LTC 8906/50 Power Supply models (220-240VAC input versions) contain a circuit breaker equipped power switch that can be reset from the front. If the line fuse must be replaced in an LTC 8805/60 or LTC 8906/60 model, remove the line cord from the system. Insert a flat blade screwdriver into the slot at one end of the connector housing, and rotate the screwdriver until the door to the housing opens. Remove the fuse holder from the housing as shown below.

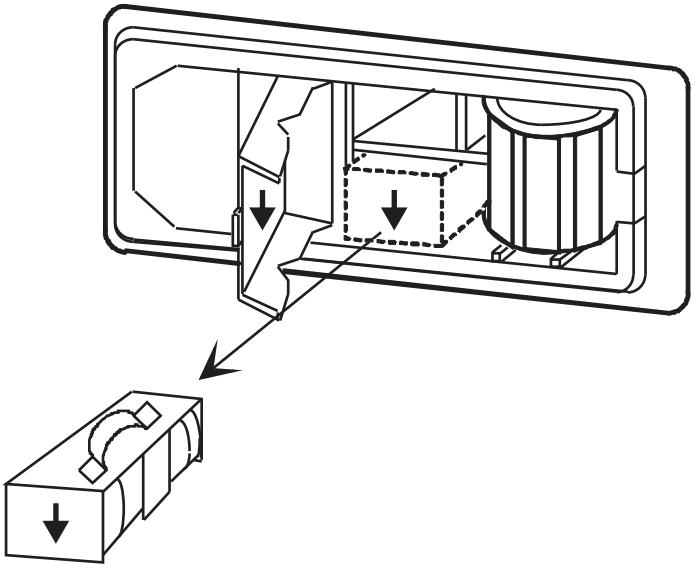


Figure 10.3: Fuse Removal

Remove the fuse from the holder (as in *, page 104*), and replace it with a fuse of the same rating (1.6 A, 250 V) for continued protection. Reinstall the fuse holder into the connector housing in the same orientation as indicated by the arrow on the door cover. Snap the door closed. After replacing the fuse, verify system start-up and operation.

10.4 Matrix Bay Power Supply Fuse Replacement

The main power supply is located in the far righthandside of the equipment bay. Remove the front panel of the bay by loosening the four (4) fasteners. Locate the fuse to be replaced by observing the green LED indicators. Note which LED indicators are not lit, then turn off the main power switch on the power supply. Replace the fuses associated with the LEDs that were not lit. Switch on the main power switch and verify that all LEDs are now illuminated. Replace the front panel.

Fuse Value/Size	**Power Supply Model**	
	LTC 8805 (8903 Bays)	LTC 8906 (8902 Bays)
100 mA / 250v 5 mm	Yes	Yes
500 mA / 250v 5 mm	Yes	Yes
1.0 A / 250v 5 mm	Yes	Yes
2.0 A / 250v 5 mm	Yes	Yes
3.15 A / 250v 5 mm	Yes	Yes
6.3 A / 250v 5 mm	Yes	Not Used

10.5 Replacing LTC 8901 or LTC 8904 Series CPU Parts

Replacement CPU boards (LTC 8910/00) and power supplies (LTC 8905/90) can be purchased to repair failed components. For minimum downtime however, the entire LTC 8901 or LTC 8904 Series bay can be swapped out.

In redundant system configurations, the unique Data Mirroring functions of the System Supervisor PC software can be used to automatically configure the new LTC 8901 Series CPU bay, making the replacement almost transparent to the system.

For example, if the primary CPU has failed in the LTC 8901 Series CPU bay, the system will have automatically switched to the backup CPU, and continues normal operation. To replace the LTC 8901 Series CPU bay, proceed as follows:

1. Install the new LTC 8901 Series CPU bay adjacent to the old LTC 8901 Series CPU bay.
2. Move the console cable, connected to the failed CPU Controller input on the old LTC 8901 Series CPU bay, to the corresponding input on the new LTC 8901 Series CPU bay. In this example, the cable would be moved from the Primary Controller connector on the old bay to the Primary Controller connector on the new bay.
3. Move the LAN cable, connected to the failed CPU LAN input on the old LTC 8901 Series CPU bay, to the corresponding input on the new LTC 8901 Series CPU bay. In this example, the cable would be moved from the Primary LAN connector on the old bay to the Primary LAN connector on the new bay.
4. Apply power to the new LTC 8901 Series CPU bay.
5. From the System Supervisor software, enable Data Mirroring. This causes the configuration data in the old LTC 8901 Series CPU bay to be copied to the new LTC 8901 Series CPU bay.

6. Wait for the System Supervisor to indicate that the Data Mirroring process has completed. This step takes a few minutes.
7. From the System Supervisor software, change the In Use CPU to the Primary CPU. This moves control to the new LTC 8901 Series CPU bay.
8. Starting with the keyboard cables, move the remaining cables from the old CPU bay to the new CPU bay.

This procedure allows the faulty LTC 8901 Series CPU bay to be replaced, with zero down time. Operator control is momentarily disabled during Steps 5 and 6.
An alternate approach is to move several of the keyboard connections to the new bay prior to executing Step 5. These keyboards will gain system control as soon as Step 5 has executed. PTZ control is regained once the SDU cable is moved from the old unit to the new unit.

10.6 LTC 8943/95 System Controller PC

Periodically inspect front panel chassis air filter. Clean or replace if necessary.

10.7 Replacement of Memory Backup Batteries

General operational notes

- Low battery conditions are indicated by LED on CPU and on-screen flashing “?? ?? ??” of time/date fields.
- Battery status can be check by keyboard operator using Keyboard User Function 43.
- Batteries are checked by CPU once per day at midnight, upon power up, and after system reset.
- If batteries are replaced without power off/on (of at least 10 seconds) or reset of CPU, LED and on-screen indicators will not display normal until next midnight is reached.

Caution!
Lithium batteries should be replaced by qualified service personnel only.

The memory backup batteries are located on the CPU card(s) inside the LTC 8900 CPU bay. The batteries provide RAM memory backup for a period of at least one year. They are only active when main AC power to the system has been lost. The RAM memory is used to store system operational data which is frequently changing, including time/date and system crosspoint data (i.e., which camera is currently being displayed on which monitor). More vital system data such as camera titles, alarm settings, user information and passwords, etc. is stored in non-volatile memory that is not affected by the condition of the batteries or the main AC power.
Replacement of the batteries begins with at least partial removal of the LTC 8900 CPU bay from the rack mount unit. If applicable, temporarily close any programs running on PC attached to CPU unit. Remove AC power and any other interface cables from CPU as necessary to allow the main bay to be pulled forward until the front sides of the main bay can be accessed. Remove the 4 screws at the rear of the main bay holding the enclosure top cover.
Slide the cover back a short distance off the enclosure to allow access to the front sides of the unit. Remove 2 screws from both sides near front to remove front panel. Support the front panel as necessary to minimize any stress on the electrical interface ribbon cable.
The right side of the unit will contain 2 PCB modules. The top module is the Primary CPU. In redundant LTC 8901 series bays, the bottom module is the Backup CPU. The middle board is the relay module.

The two batteries are mounted on the front edge of the CPU card and are about 25 mm (1 in.) in diameter. Insert a small flat blade screwdriver into the slot on one of the battery holder sockets and gently pry the battery from the holder until it can be removed by your fingers. Insert new battery by lifting the retaining clip up while inserting the battery into the socket. Insure that the negative side of the battery contacts the socket by seating the battery until it is somewhat flush with the level of the battery holder. Repeat procedure for other battery (plus 2 on other CPU if LTC 8901 Redundant CPU bay is in use). Reattach front cover, lid, and re-install into rack mount unit. Re-attach power and other interface cables.
Verification of the system's time and date and sequence programming should be made to insure no information was lost. Refer to the appropriate section of the instruction manual if any reprogramming is required.

11 Pinouts

B.1 LTC 8900 Series CPU Bay Rear Panel Connector Pinouts

B.1.1 Console Port RS-232 Pinouts

Pin #	Designation
1	GND
2	Rx
3	Tx
4	CTS
5	RTS
6	GND
7	GND
8	GND
9	GND

B.1.2 Alarm Port RS-232 Pinouts

Pin #	Designation
1	RTS
2	Tx
3	GND
4	GND
5	GND
6	Rx
7	CTS
8	+12 VDC
9	GND

B.1.3 Keyboard RS-485 Ports

Pin #	Designation
1	GND
2	GND
3	DATA
4	+DATA
5	GND
6	+12 VDC

B.1.4 Primary and Backup Controller Port RS-232 Pinouts

Pin #	Designation
1	GND
2	Rx
3	Tx
4	CTS
5	RTS
6	GND
7	GND
8	GND
9	GND

B.1.5 Biphase Port Pinouts

Pin #	Designation
1	+DATA
2	DATA
3	GND
4	GND
5	GND
6	No Connection
7	No Connection
8	GND
9	+12 VDC

B.1.6 COMM PORT 1 and COMM PORT 2

Pin #	Designation
1	NC
2	+TXD
3	TXD
4	+RXD
5	RXD
6	GND
7	NC
8	NC
9	NC

B.1.7 Primary and Backup LAN Ports

Pin #	Designation
1	+TD
2	TD
3	+RD
4	No Connection
5	No Connection
6	RD
7	No Connection
8	No Connection

B.1.8 Relay Connector (LTC 8901 only)

1 & 2	Relay - Primary Power Supply Fault
3 & 4	Relay - Primary CPU Fault
5 & 6	Relay - Backup Power Supply Fault
7 & 8	Relay - Backup CPU Fault
9 & 10	Relay - Any Fault
11 & 12	Input - Silence Buzzer

B.1.9 Console Cable

The LTC 8506/00 cable that connects the Allegiant s CPU CONSOLE Port to an external PC uses the following pinouts:

9-pin Male (CONSOLE)	Allegiant Designation	9-pin Female (PC Side)
1	GN	None
2	Receive Dat	3
3	Transmit Dat	2
4	CTS	1
5	RTS	8
6	GND	None
7	GND	5
8	GND	None
9	GND	None
		(Pins 4 & 6 jumpered)
		(Pins 1 & 7 jumpered)

A.1.10 Printer Cable

The cable that connects the Allegiant s CPU CONSOLE port to a standard serial printer uses the following pinouts:

9-pin Male (CONSOLE)	**Allegiant Designation**	**25-pin Female (Printer Side)**
1	GND	1
2	Receive Data	2
3	Transmit Data	3
4	CTS	4, 8
5	RTS	5
6	GND	None
7	GND	7
8	GND	None
9	GND	None
		(Pins 6 & 20 jumpered)