Section 2 – Hardware Installation

Unpacking and Inspection

Each Jupiter Control System is tested, inspected, and found free of defects prior to shipment. Before unpacking the equipment, inspect the shipping carton for evidence of freight damage. If the contents have been damaged, notify the carrier and Thomson. Retain all shipping cartons and padding material for inspection by the carrier.

Do not return damaged merchandise to Thomson until an appropriate claim has been filed with the carrier and a material return authorization number has been received from us.

> **Quick Start tip**: If your Jupiter equipment was purchased from Thomson as a "turnkey" system, you may wish to refer to the *Jupiter Getting Started Guide*, part no. 04-045707-003. This booklet provides an abbreviated version of the information in this section.

110/230 VAC Selection

Most panels are auto sensing; otherwise, power line adjustments are normally made at the factory, based on the location of the end–user. However, verifying these settings before applying power is a good practice.

CP 3020 Control Panels

Control panel input voltage selection is made with a rotary switch on the rear panel. There are no internal adjustments. Installation of control panels continues on page 2–45.

CP 300 Series Control Panels

These panels use an external power supply. See page 2–45.

File Server

Check to see if the PC file server supplied with the system has a voltage selector switch for the power supply on the rear panel, and if so, that the proper mains voltage is set.

Installation instructions for the file server begin on page 2–38.

VM 3000 Switch Settings

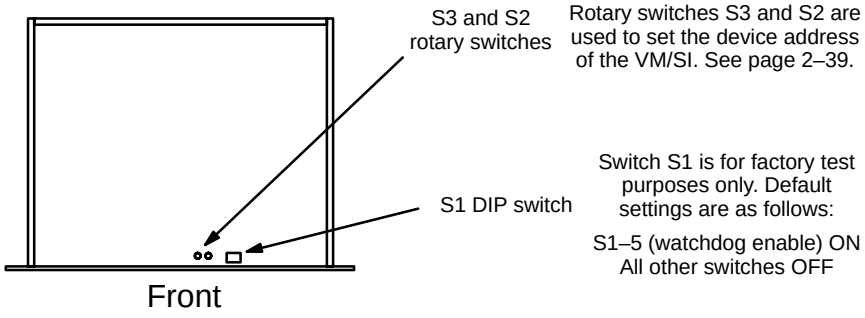


Figure 2–2. *VM/SI 3000 rotary and DIP switch locations.*

Rack Mounting

Thomson recommends that each control chassis be near most of the devices which it will control, thus reducing system cabling. The VM 3000 Control Processor should be located near the distribution switcher. Leaving ventilation space between the rack mount units is not necessary.

System diagrams are shown in the following pages.

VM 3000 Connection to Distribution Switchers

THOMSON CROSSPOINT BUS ROUTERS

The VM 3000 can be used to control Trinix, Concerto, Venus, and other routers listed in Figure 2–3.

— For conventional (square matrix) switchers (such as Trinix, Concerto, and Venus), only one VM 3000 will typically be required (or two for redundancy purposes), since a single unit is capable of controlling up to 1024 video or audio outputs in each of 96 logical levels.§ For a redundant installation, see page 2–4.

— If the switcher is of the three–stage type, multiple VM 3000s may be needed. Please refer to Appendix H after reviewing this section.

The various switchers listed below can be mixed on the same Thomson Crosspoint Bus; however, the VM 3000 drives the matrix according to “super” Crosspoint Bus rules.

Note: A majority of TVS/TAS 2000 model switchers presently in the field will require updated crosspoint board state PROMs in order to accept super Crosspoint Bus signals. Older units in the 2000 series may also require audio crosspoint board modifications in order for the correct PROMs to be installed.

The VM 3000 must be configured using the Network Description table (page 5–22) and the Switcher Description table (page 5–31).

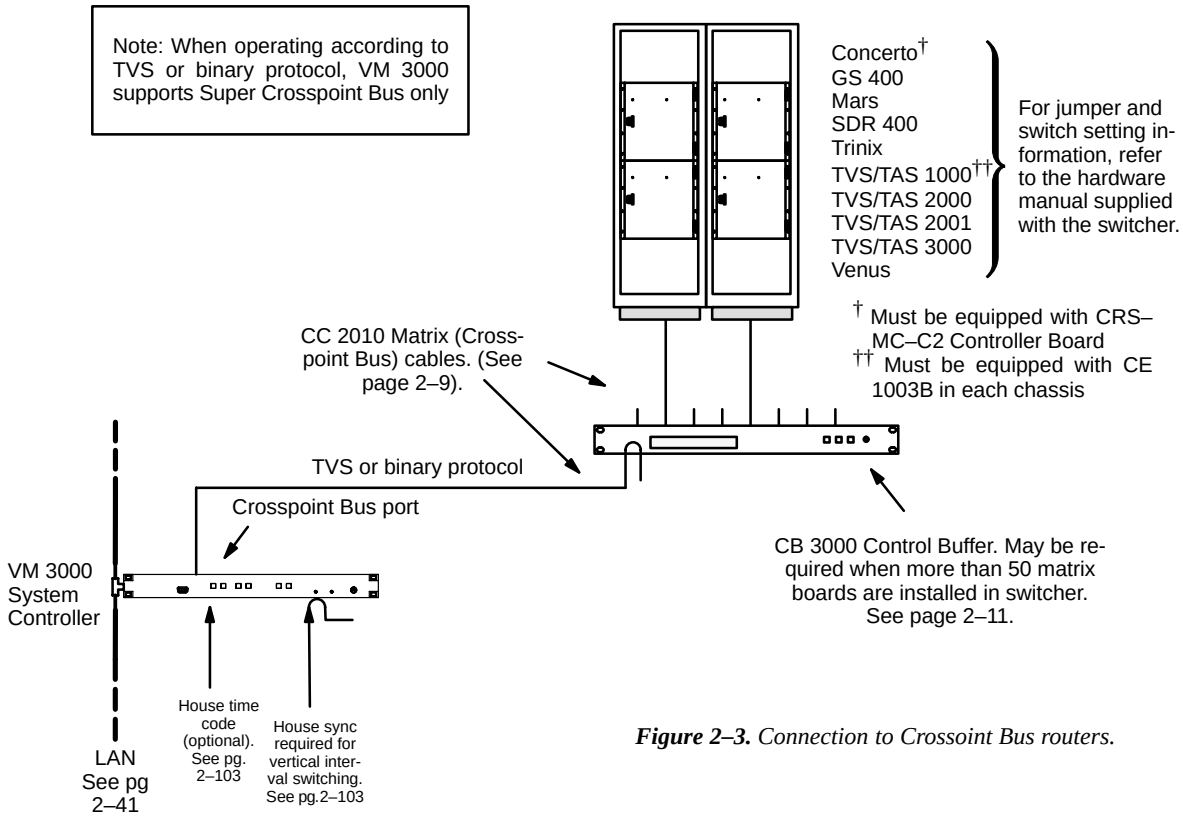


Figure 2–3. *Connection to Crossoint Bus routers.*

§ However, the practical number of levels that can be controlled depends on the total number of outputs. For more information, see page 1–16.

INSTALLING REDUNDANT VM 3000 CONTROL PROCESSOR

In a redundant installation, each VM 3000 monitors the other. If a fault is detected in the active unit, control will be switched to the other device automatically. Wiring for redundant VM 3000s is shown in Figures 2–4 and 2–5. For software configuration, see Step 4 on page 5–23.

Note 1: Only late–model VM 3000 Control Processors can be operated in redundant mode. Please contact Thomson for additional information.

Note 2: Automatic changeover is not available for the party line port or the VGA port.

Note 3: For information about manual changeover, and a maintaining a *third* unit as a replacement for a failed redundant unit, see Appendix K.

Crosspoint Bus Router with CB 3000 Control Buffer

"Crosspoint Bus routers" are listed on page 2–3.

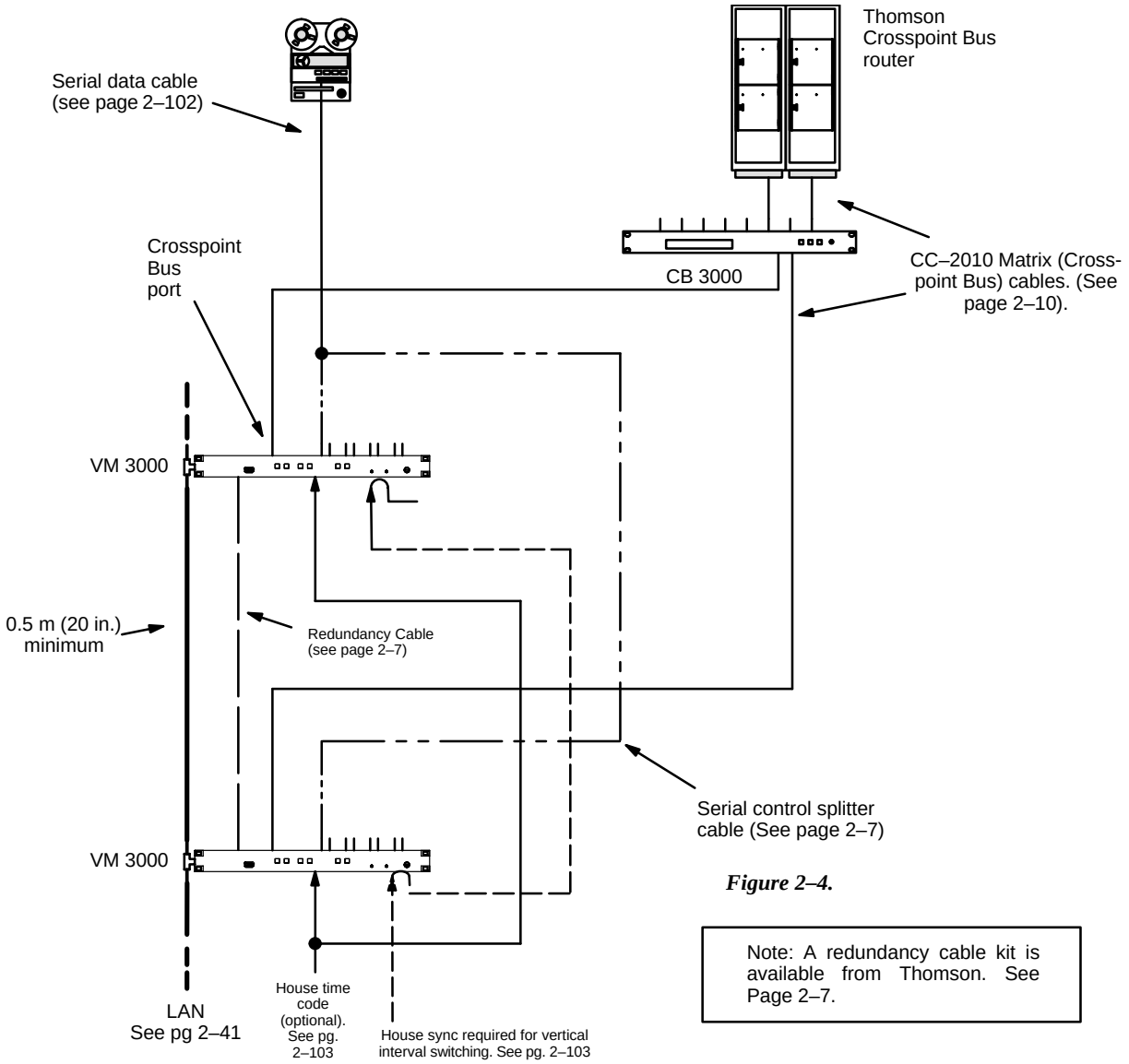


Figure 2–4.

Note: A redundancy cable kit is available from Thomson. See Page 2–7.

Crosspoint Bus Routers without CB 3000 Control Buffer

"Crosspoint Bus routers" are listed on page 2–3.

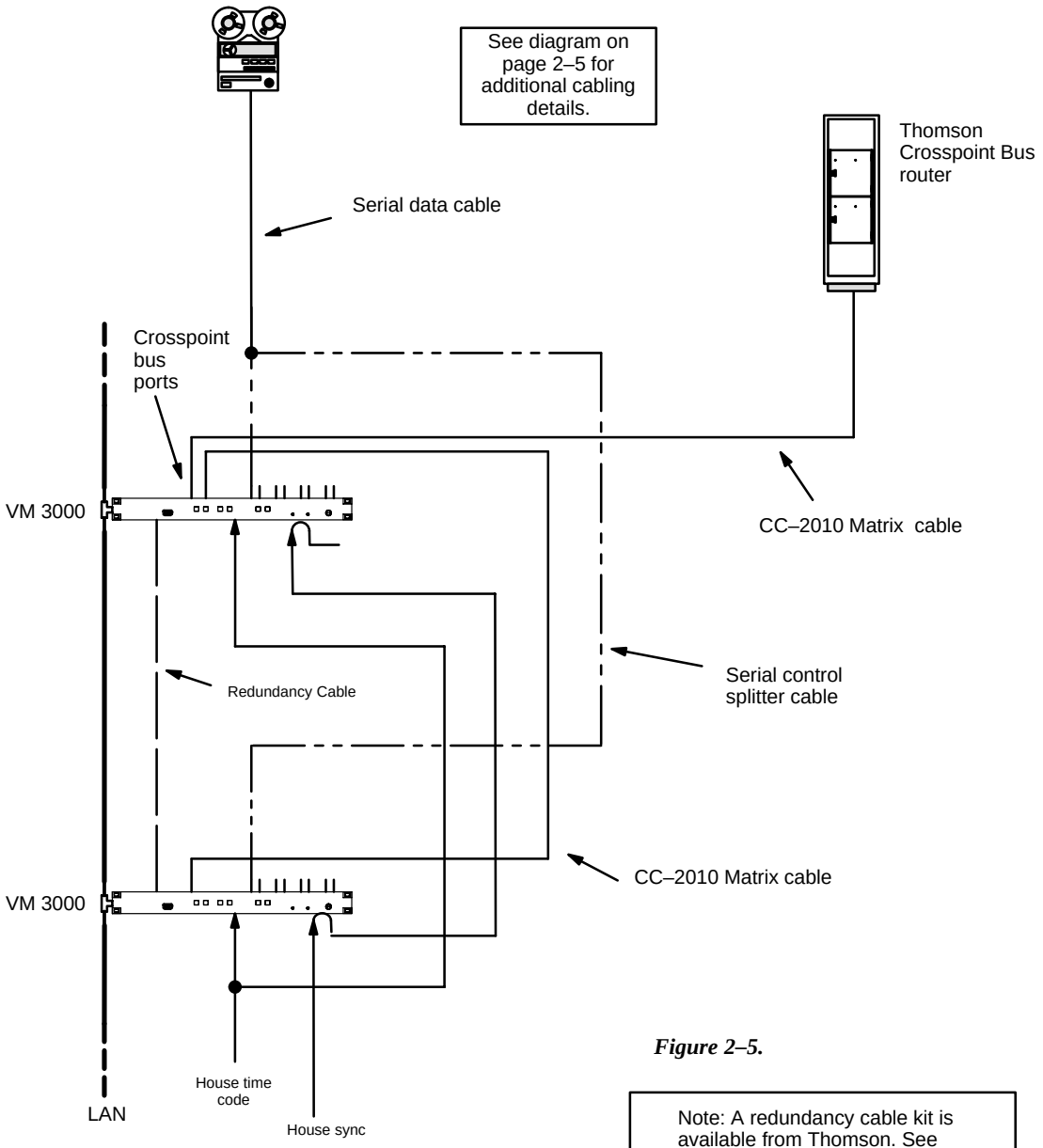


Figure 2–5.

Note: A redundancy cable kit is available from Thomson. See page 2–7.

VM 3000 REDUNDANCY KIT CABLES

Note 1: Cables are supplied with connectors installed.

Note 2: For wiring diagrams, please see pages 2–5, 2–6, and 2–8.

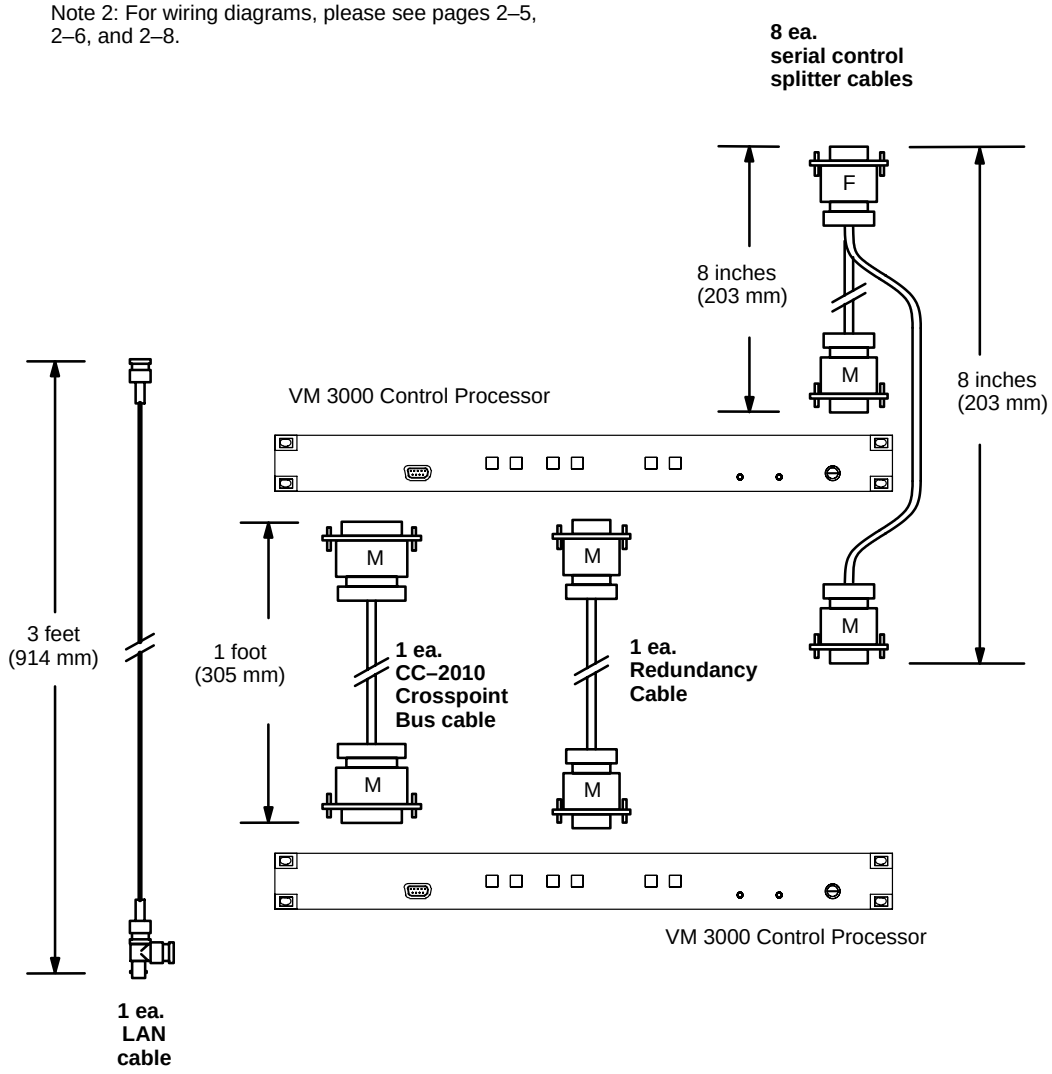


Figure 2–6. *VM 3000 redundancy kit cables. Kit part no. 44–045838–001.*

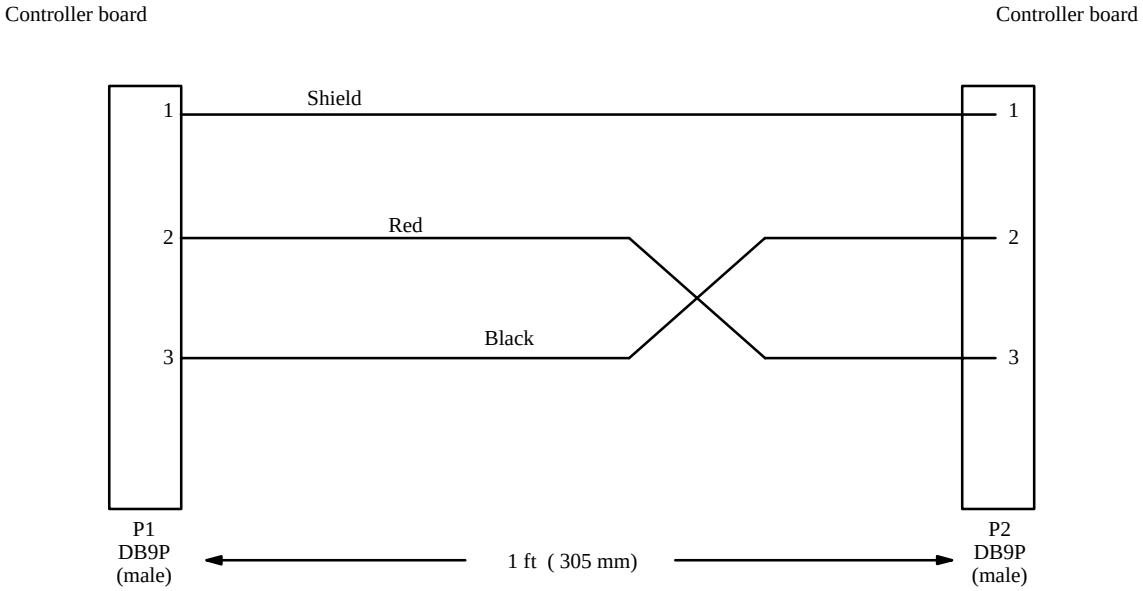


Figure 2–7. *Assembly, BCS–3000 Redundancy Cable. Ref: Thomson drawing no. 01–041340–001.*

CC 2010 MATRIX (CROSSPOINT BUS) CABLE

The CC 2010 cable is used to connect the VM 3000 Control Processor to the switcher Crosspoint Bus. Depending on the size of the switcher, this bus may require intermediate buffering through the CB 3000 Control Buffer. See Figure 2–3.

The CC 2010 is a 10–conductor (plus ground) cable. The following ready–made cables, with installed 15–pin D male connectors, are available from Thomson:

Length	Part. No.
1 foot (0.3 m)	01–048592–001
2 feet (0.6 m)	01–048592–002
3 feet (0.9 m)	01–048592–003
10 feet (3 m)	01–048592–010
25 feet (7.6 m)	01–048592–025
50 feet (15.2 m)	01–048592–050
100 feet (30 m)	01–048592–100

Figure 2–8.

All rear–panel Crosspoint Bus connectors are 15–pin D, female. For Concerto and Trinix applications, the crosspoint bus must be terminated at the point farthest from the control processor using a Crosspoint Bus Terminator, part number 01–053050–001. For other routers, no termination is required.

For specific wiring instructions concerning CC 2010 Crosspoint Bus Cables, please refer to the installation diagrams supplied with your switcher.

For those who wish to prepare their own cables, pin–outs are shown in Figure 2–9. The cable itself should be Belden 9505 or equivalent. Steps should be taken to shield the connectors, e.g., using EMI housings or ferrite cores. Details concerning ferrite cores are given in Figure 2–11.

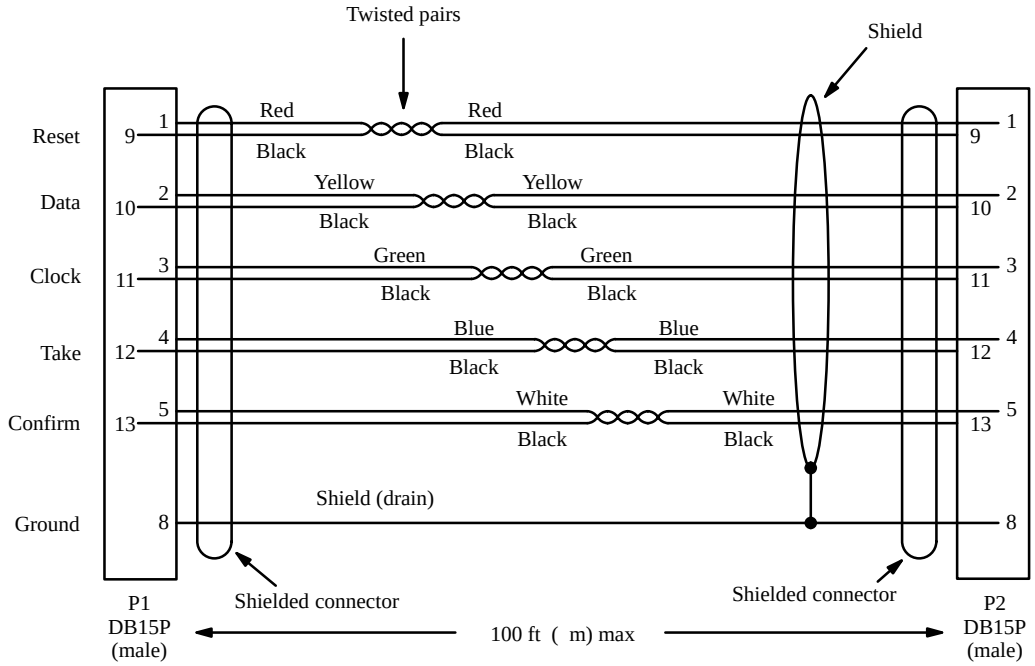


Figure 2–9. *CC 2010 wiring. Reference: "Assembly, XPT Bus Cable Shield," Thomson drawing no. 01–048592–TAB.*

CB 3000 Control Buffer

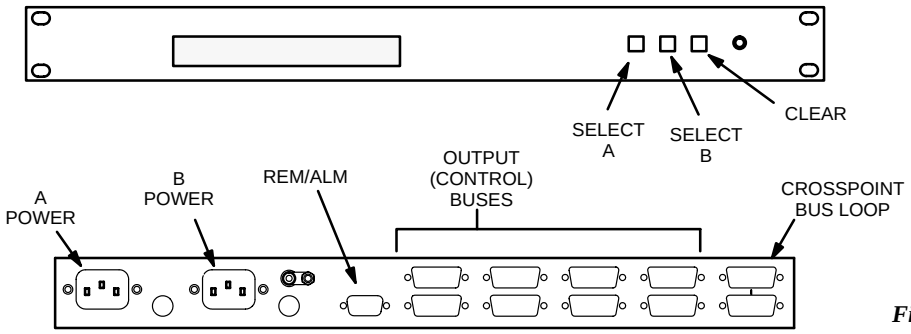


Figure 2–10. *CB 3000.*

The CB 3000 Control Buffer is required for buffering crosspoint data when more than 50 TVS/TAS 3000 or TVS/TAS 2000 matrix boards (or more than 96 Venus crosspoint boards) are installed in a switching matrix. A CB 3000 is also required if the Crosspoint Bus is sent to more than one equipment rack. Each of the eight CB 3000 outputs can drive up to 50 (TVS/TAS) or up to 96 (Venus) crosspoint boards. See page 2–3.

For Trinix requirements, please refer to the Trinix Installation Manual or Planning Guide.

Some systems may be equipped with one or more single–output CB *2000* Control Buffers rather than a CB *3000*. Please refer to the wiring information supplied with your switcher for details.

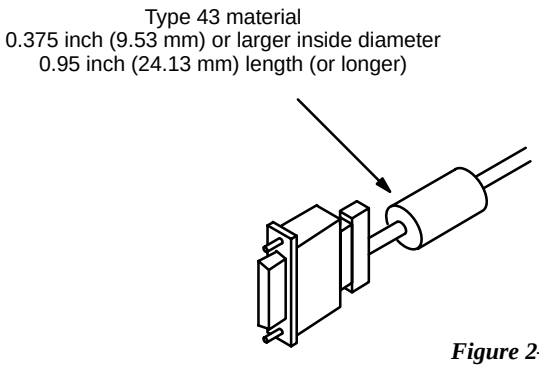
Each CB 3000 output contains two identical channels, with channel A normally used; this condition is indicated by the eight green LEDs in the display window. If a fault is detected in channel A, that output will automatically switch to channel B; in this case the green LEDs would be off and one or more red LEDs would be on. If a changeover occurs, first check to see if the unit will return to normal operation by pressing the SELECT A button:

— If the unit returns to channel A operation, but a red LED remains on, press CLEAR. If the red LED(s) go off, it can be assumed that the unit is fully operational.

— If the unit immediately returns to channel B operation, contact Thomson Technical Support.

VDE EMI/RFI Modifications to Matrix Cables

User–supplied matrix cables for VDE installations require a ferrite core over each end of the cable, adjacent to the connector.



Type 43 material sources

Fair–Rite, part no. 2643625102

Fair–Rite Products Corp., P.O. Box J, Commercial Row, Wallkill, NY 12589, USA; Tel. (914) 895–2055.

Chomerics, part no. 83–10–A637–1000

Chomerics Inc., 77 Dragon Ct., Woburn, MA 01888 USA; Tel. (617) 935–4850.

Figure 2–11. *Matrix cable VDE modifications.*

CONNECTION TO SERIAL–CONTROL ROUTERS

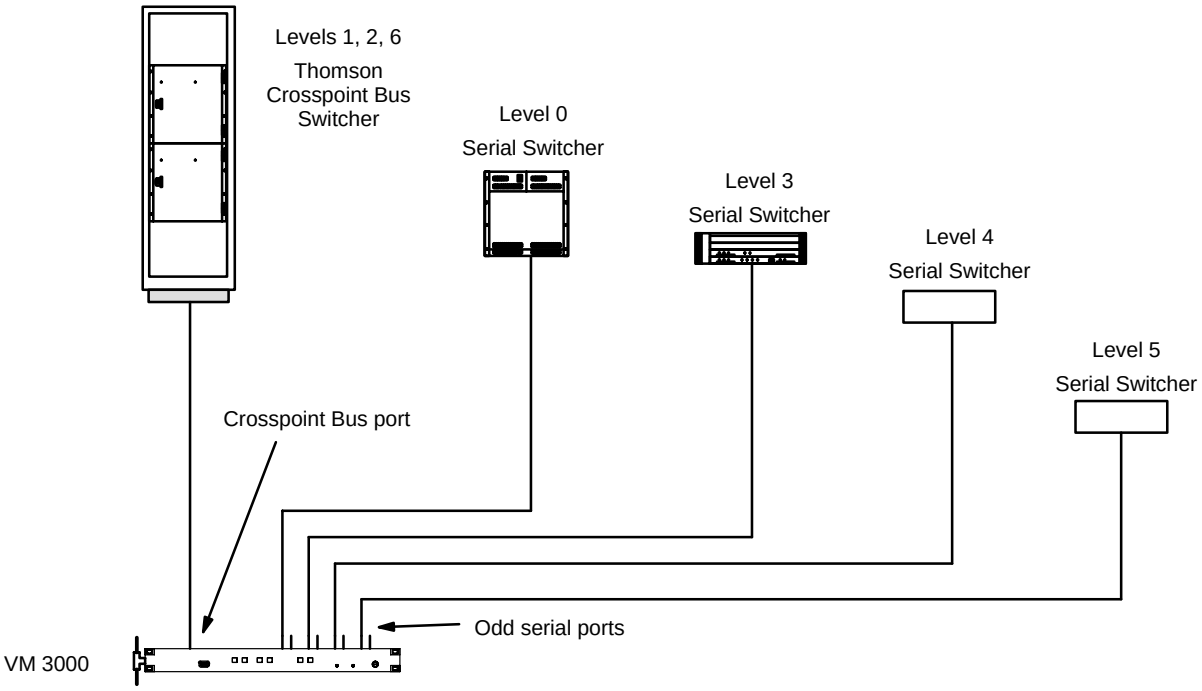


Figure 2–12. *Connection to serial control routers (example).*

The VM 3000 Control Processor can be used to control certain non–Crosspoint Bus switchers using serial interface ports (Figure 2–12). Control of some of these routers is an extra–cost option; such routers are referred to as “remote” routers.§

A single VM 3000 can be used to operate one or more switchers through the Thomson Crosspoint Bus, while operating up to four separate “serial” switchers through the serial ports.

Please note the restrictions for this application shown in Figure 2–13.

Note 1: The SI 3000 cannot be used to operate a serial–control switcher.

Note 2: Vertical interval switching of a switcher connected to a VM 3000 serial port depends on the sync system of the switcher itself. Sync connections to the VM 3000 have no effect on the operation of the serial switcher.

The VM 3000 must be configured using the Network Description table (page 5–22); Serial Protocol table (page 5–25), and Switcher Description table (page 5–31).

Please refer to the following pages for details concerning each switcher type. The manual supplied with the switcher should also be checked for port configuration instructions.

§ For more information about Jupiter options, see page 1–27.

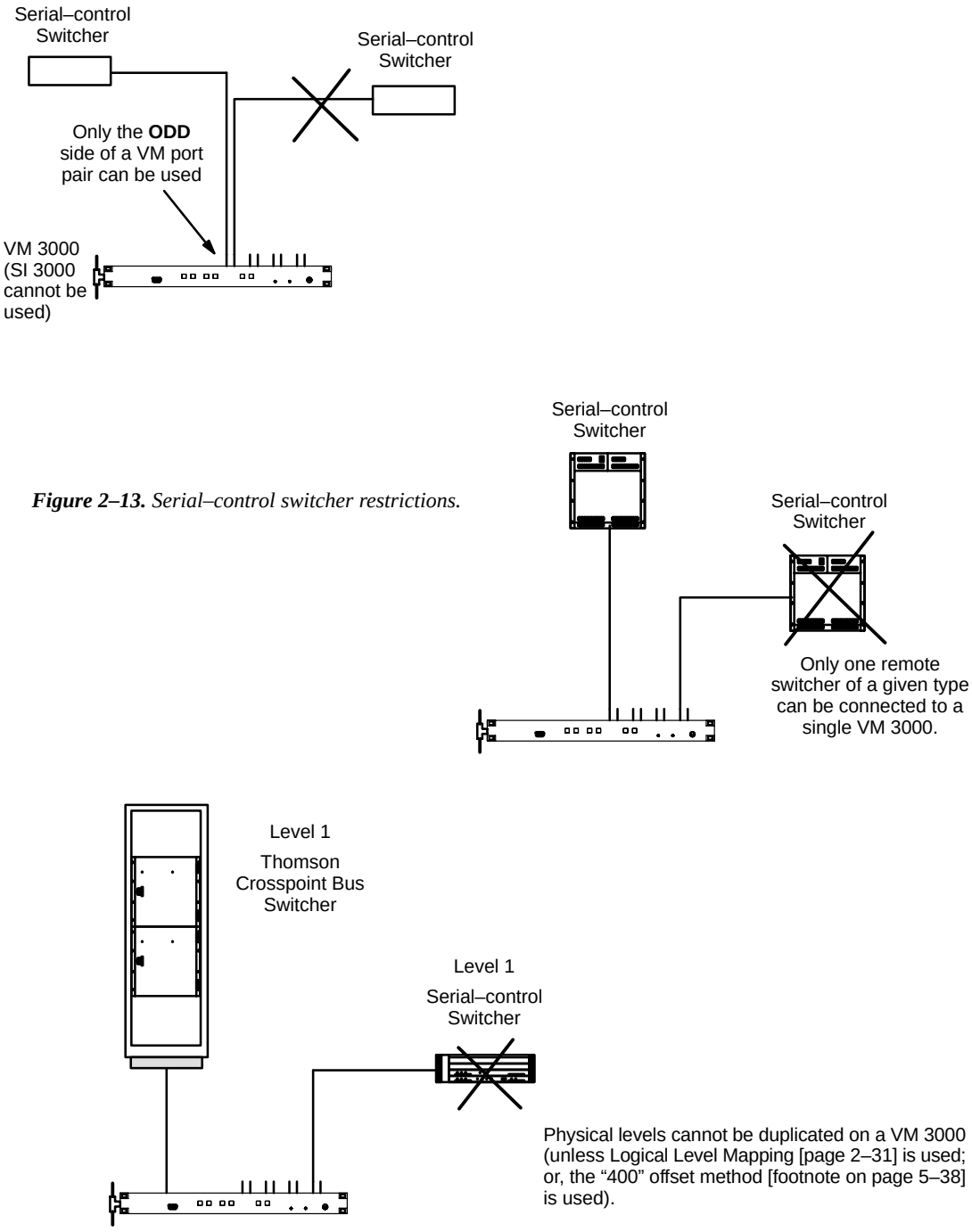


Figure 2–13. *Serial–control switcher restrictions.*

TRITON SYSTEMS

Triton routers are connected using an odd–numbered VM 3000 serial port. SI 3000 serial ports cannot be used. Multiple Triton chassis can be connected to a single VM, but *only* if all them are connected on the same MIDI bus and connected through the same single serial port. If more than one Triton MIDI bus is needed, the switchers on that bus must be connected to another VM.

The serial connector on Triton routers is a 9–pin RS–232 signal level port. Since the VM has RS–422 ports, a RS–422 to RS–232 converter must be used to ensure reliable communications. Please refer to Figure 2–14.

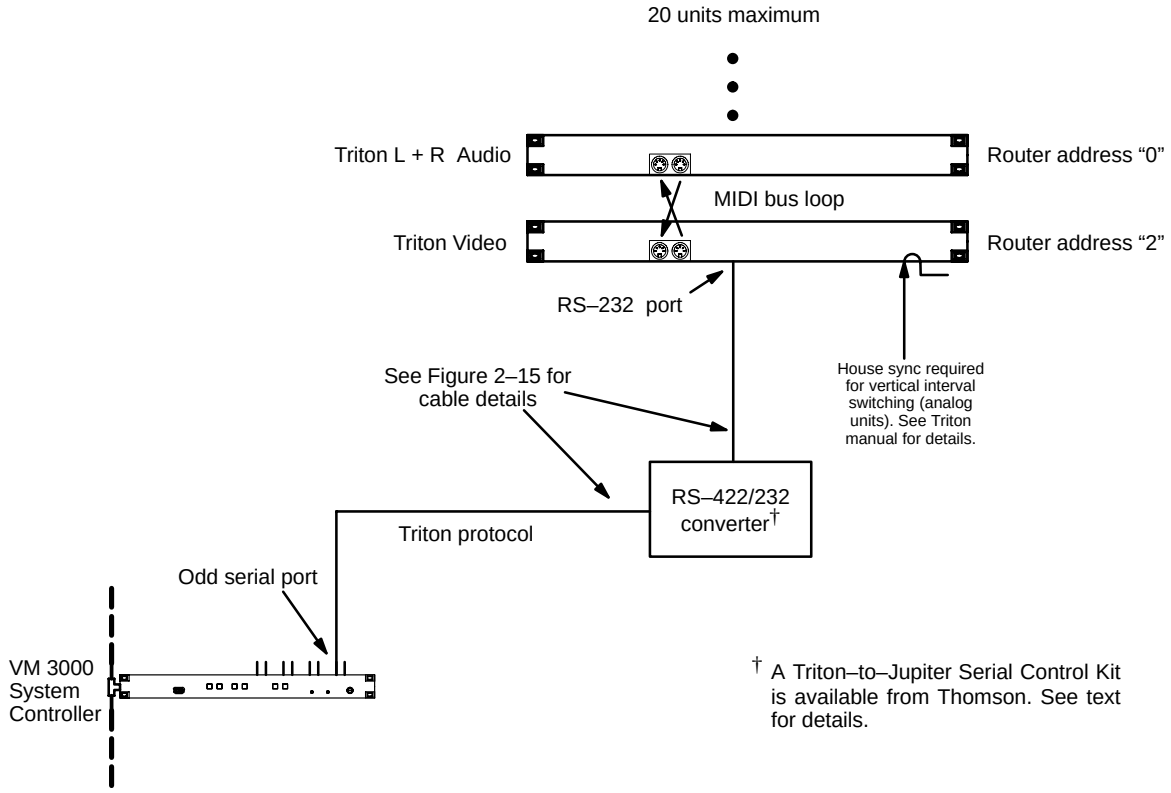


Figure 2–14. *Example of connection to Triton distribution switchers.*

A Triton–to–Jupiter Serial Control Kit, available from Thomson, includes a B&B Electronics 422COR RS–232/RS–422 Converter, a B&B Universal Power Supply, a 25 ft. (7.6 m) VM/CM to Converter Cable, and a 5 ft. (7.6 m) Converter to Triton Cable. The part number of this kit is 44-050456-001.

Multiple Triton switchers are connected with a MIDI bus loop (as detailed in the Triton manual). In a typical video/audio switching application, each chassis is set with a unique “Router Address” from 0 to 15 (DIP switches 1–4 on the rear panel). Note that split switching is possible, but only between chassis; e.g., Audio Left/Right can be split from Video, but Audio Left cannot be split from Audio Right.

In RGB or YUV applications where all three signals must always switch together, the Router Address should be set to the same value on each chassis.

Up to 20 chassis can be connected in one MIDI loop.

Note 1: some Triton switchers have front–panel controls. to be shown on Jupiter control panels. These controls will operate normally when the router is connected to a Jupiter system but Jupiter 6.0 and after software is required in order for Triton status to be indicated on Jupiter panels.

Note 2: all RS–232/422 connections should be complete and all MIDI bus loop connections should be made and terminated at the originating device before applying power to the Triton router.

In order for a Triton analog video router to switch on Vertical Interval as set in the Switcher Description Table, rear–panel DIP 7 must be DOWN and a sync reference signal must be connected to Input No. 1. The reference signal must be composite video, 1 Vpp, 300 mV sync, 75 ohms. For more information, refer to the Triton manual.

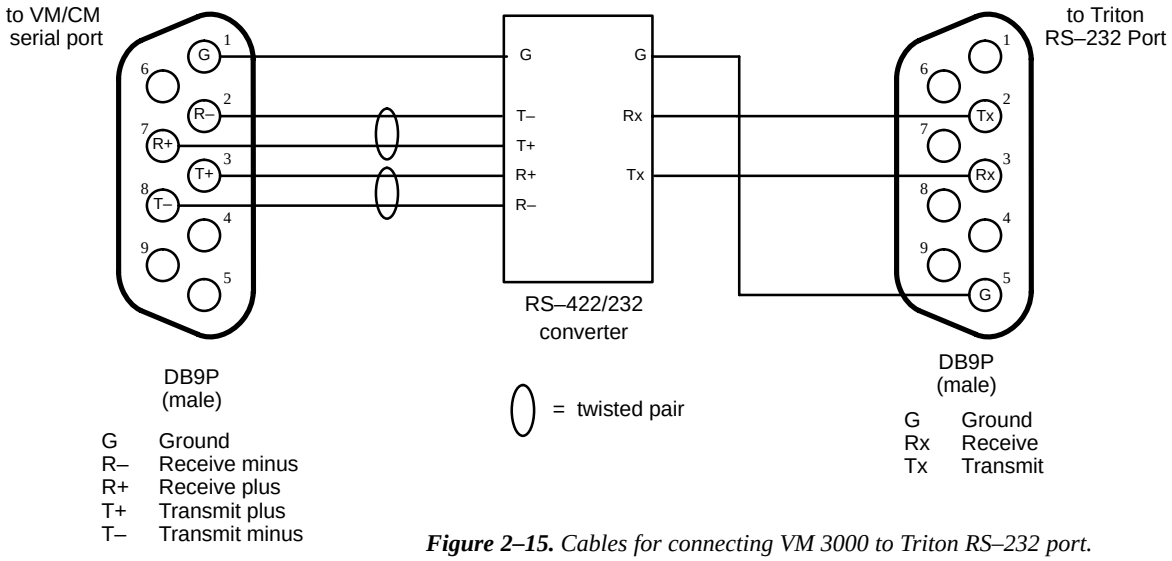


Figure 2–15. *Cables for connecting VM 3000 to Triton RS–232 port.*

Software Configuration

The VM connected to the Triton router must be configured using the Network Description table (page 5–22) and Serial Protocol table (page 5–25).

Triton configuration is similar to that for other routers, beginning with the Switcher Description table (page 5–31). From that point, switcher inputs, outputs, a CP Level Set, and CP input/Output Sets must be defined.

SMS 7000 CONNECTIONS

The VM 3000 can be connected to a Grass Valley SMS 7000 Signal Management System and router (see Figure 2–16). The protocol setting is: 38400 baud, 8 data bits, no parity, 1 stop bit.

The serial cable on the back of the SMS 7000 controller frame may be labeled RS–232, but it can and should function as RS–422 if configured in software. The VM 3000 is connected to one of the DB25 or DB9 ports on the back of the SMS 7000 controller frame. Refer to the manual supplied with the SMS 7000 for instructions on setting the port up for RS–422 and setting the serial parameters.

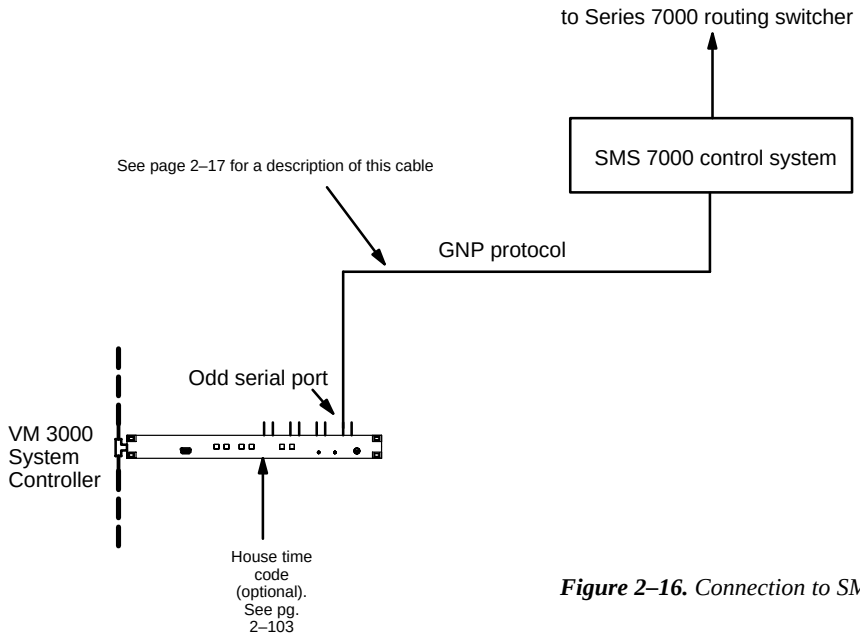


Figure 2–16. *Connection to SMS 7000 Control System.*

Software Configuration

The VM 3000 connected to the SMS 7000 must be configured using the Network Description table (page 5–22) and Serial Protocol table (page 5–25).

The router must be defined on the Switcher Description table (page 5–31). From that point, switcher inputs, outputs, a CP Level Set, and CP input/Output Sets must be defined.

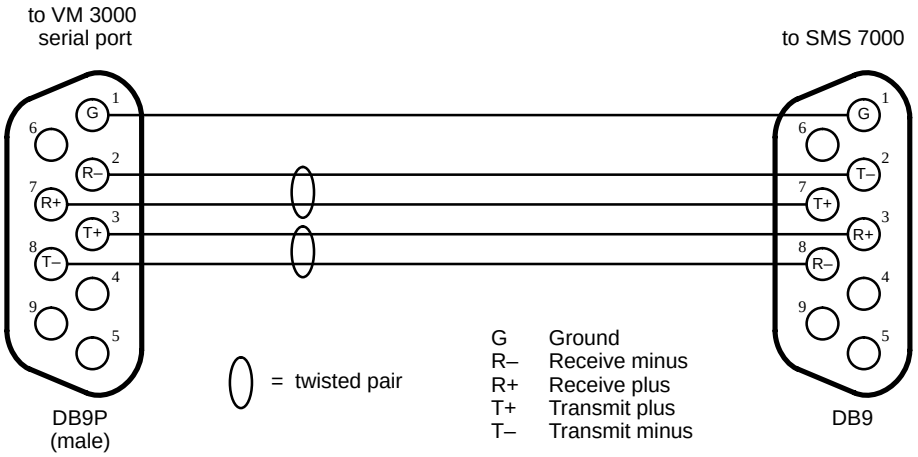


Figure 2–17. *Cable for connecting VM 3000 to SMS 7000 DB9 port.*

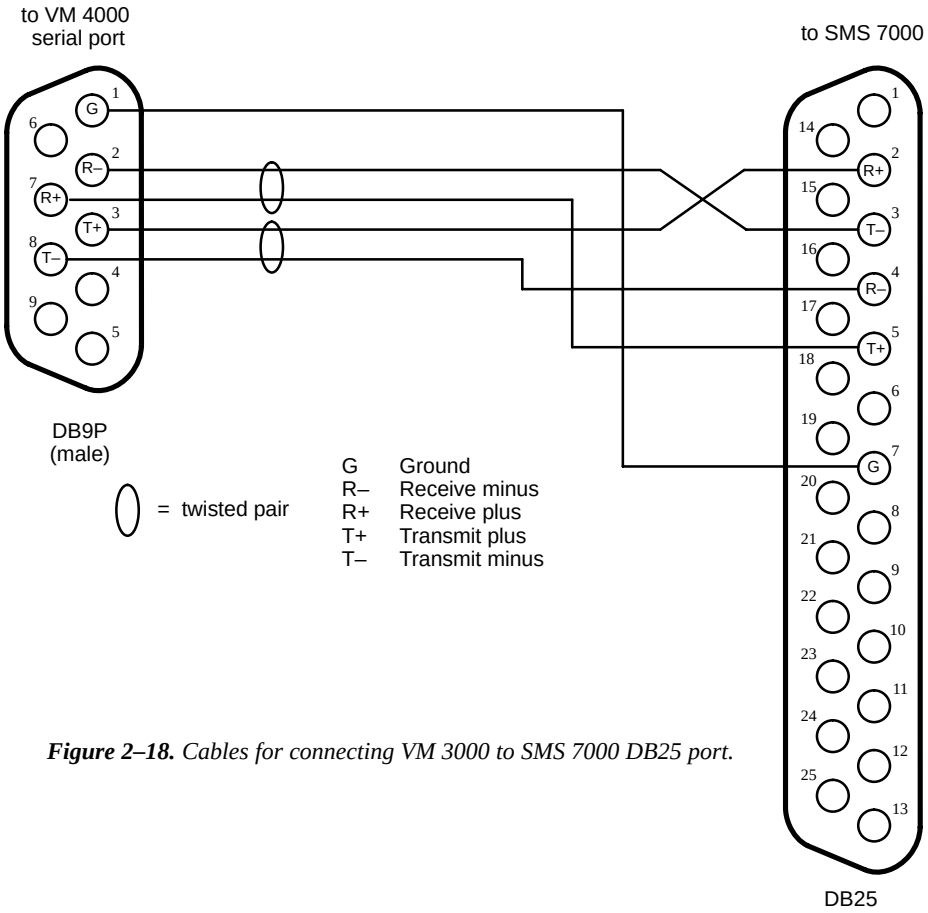


Figure 2–18. *Cables for connecting VM 3000 to SMS 7000 DB25 port.*

ENCORE CONNECTIONS

The VM 3000 can be connected to a Grass Valley Encore routing system (see Figure 2–19). The protocol setting is: 38400 baud, 8 data bits, no parity, 1 stop bit.

The serial cable on the back of the Encore controller is a RJ45, and is configured as RS–422 in software. Refer to the manual supplied with the Encore for instructions on setting the port up for RS–422 and setting the serial parameters.

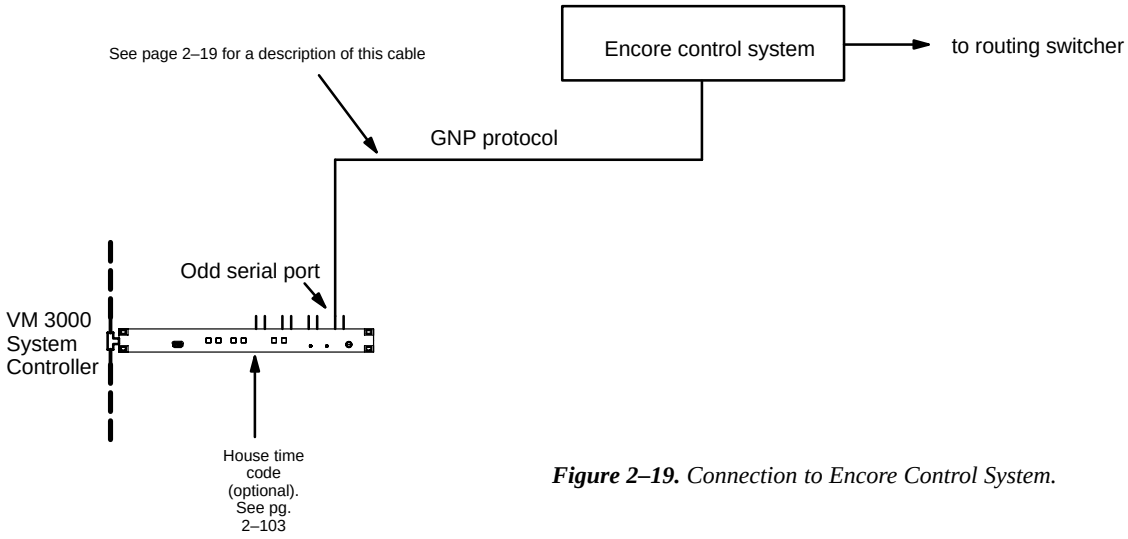


Figure 2–19. *Connection to Encore Control System.*

Software Configuration

The VM 3000 connected to the Encore must be configured using the Network Description table (page 5–22) and Serial Protocol table (page 5–25).

The router must be defined on the Switcher Description table (page 5–31). From that point, switcher inputs, outputs, a CP Level Set, and CP input/Output Sets must be defined.

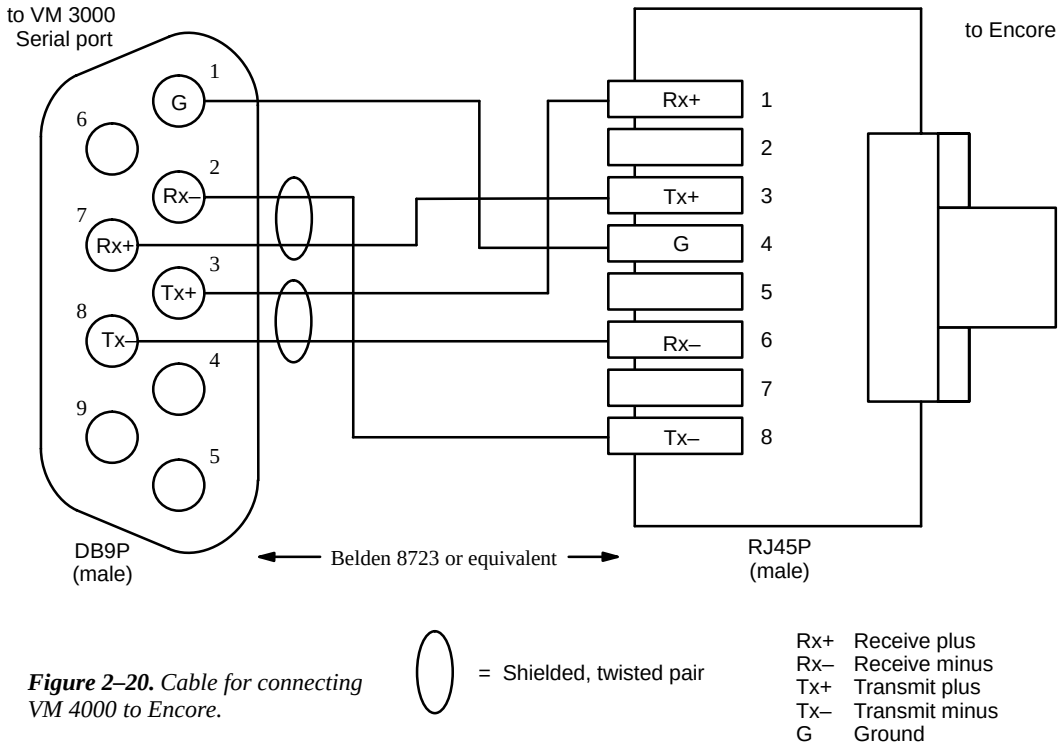


Figure 2–20. *Cable for connecting VM 4000 to Encore.*

Note: Encore controller pinouts may vary. Please refer to the documentation supplied with the Encore system.

TEN–20, 20–TEN, SERIAL INTERFACE CONNECTIONS

The VM 3000 can be connected to a Serial Interface (SERIM), which in turn is connected to a TEN–20 or 20–TEN routing switcher (see Figure 2–21). The protocol setting is: 38400 baud, 8 data bits, even parity, 1 stop bit.

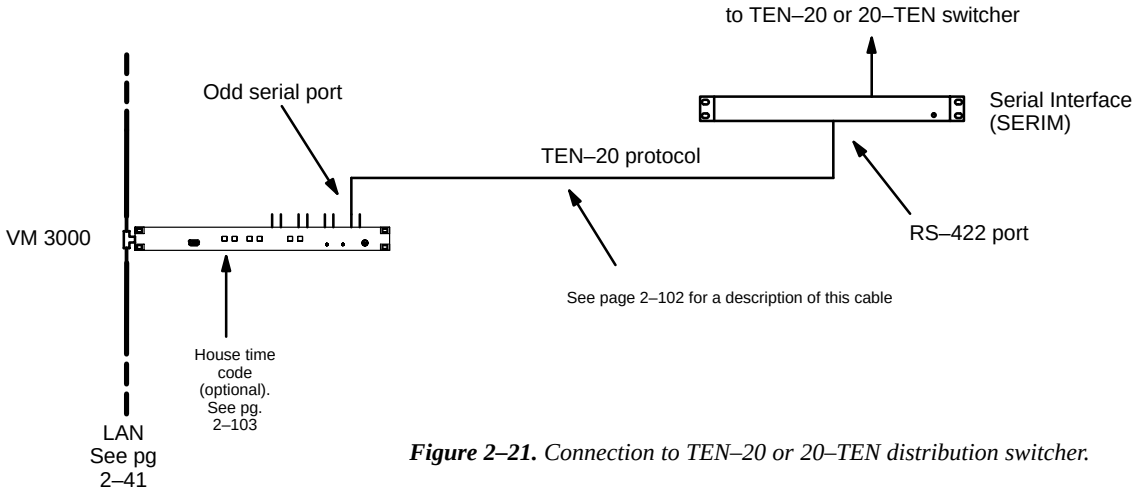


Figure 2–21. *Connection to TEN–20 or 20–TEN distribution switcher.*

HORIZON CONNECTIONS

The VM 3000 can be connected to a Horizon switcher through the General Purpose Interface with Terminal/Computer Interface software (GPI–T/CI) (see Figure 2–22). The protocol for the GPI–T/CI RS–422 port must be set at: 38400 baud, 8 data bits, even parity, and 1 stop bit (refer to the Horizon GPI–T/CI Manual for configuration instructions).

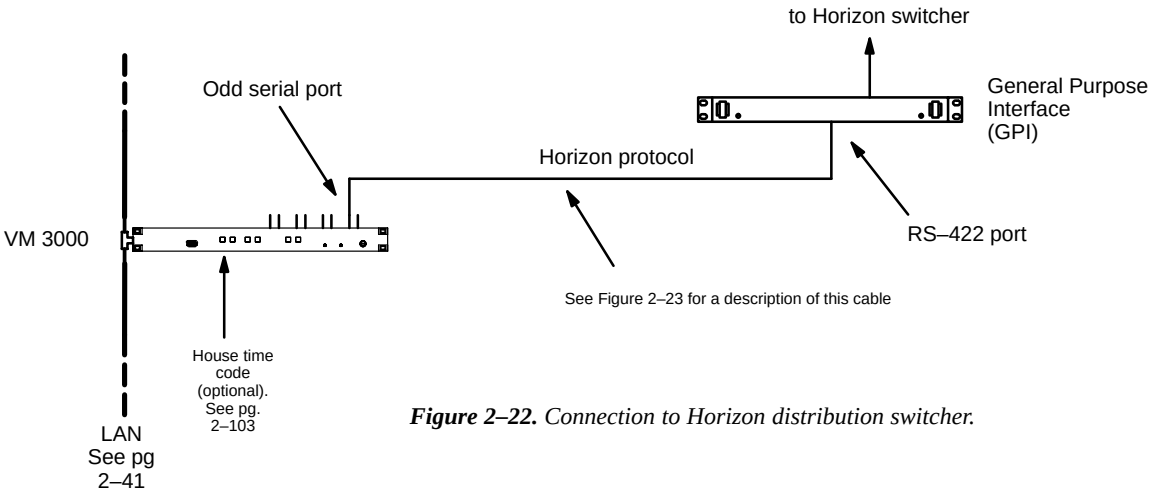


Figure 2–22. *Connection to Horizon distribution switcher.*

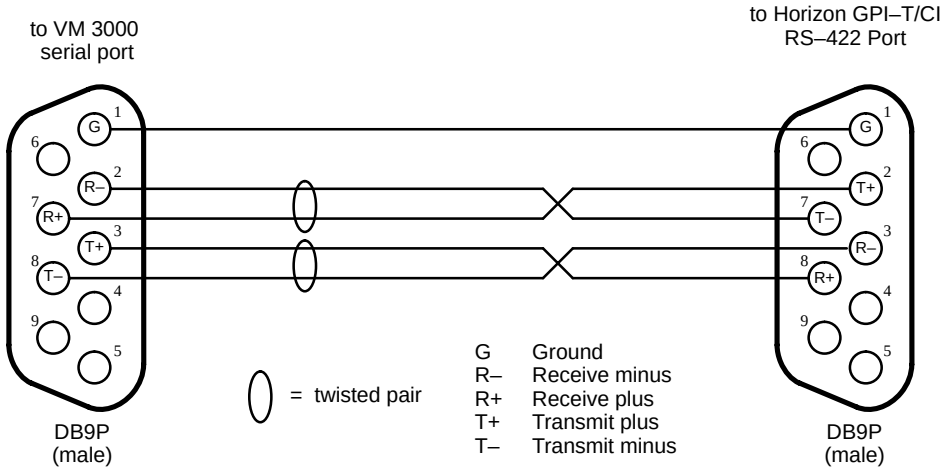


Figure 2–23. *Cable for connecting VM 3000 to Horizon switcher.*

ALPHA IMAGE A264S DISTRIBUTION SWITCHER

See Figure 2–24 for hardware connections. The protocol setting is: 38400 baud, 8 data bits, even parity, 1 stop bit.

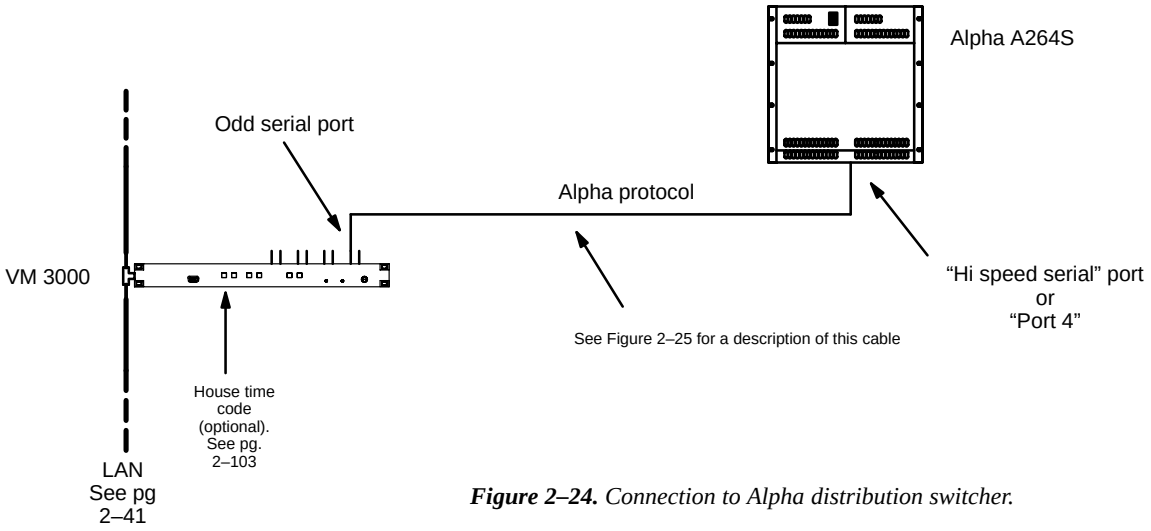


Figure 2–24. *Connection to Alpha distribution switcher.*

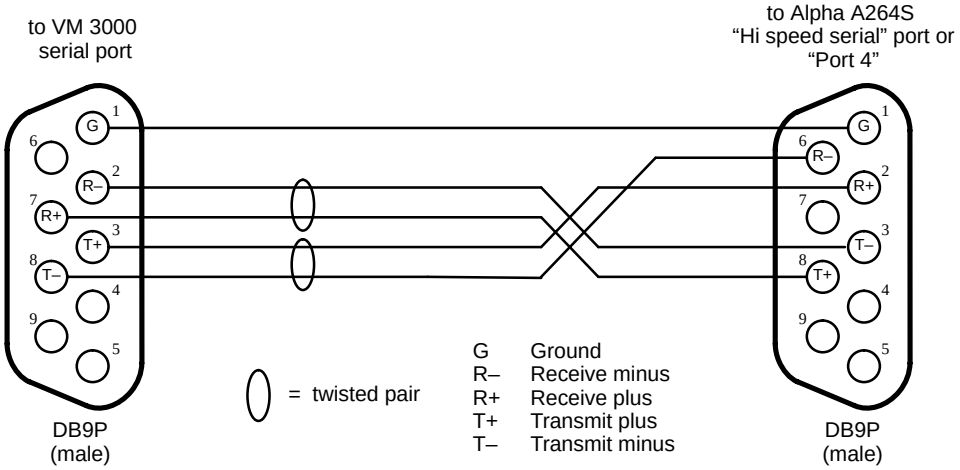


Figure 2–25. *Cable for connecting VM 3000 to Alpha Image A264S switcher.*

DATATEK D–2000/2166 CONNECTIONS

The VM 3000 can be connected to a Datatek D–2166 Buffer Control Module, which in turn is connected to a D–2000 Series routing switcher (see page 2–23). The protocol setting is: 38400 baud, 8 data bits, even parity, 1 stop bit.

Although the VM 3000 is connected to one of the D–2166 Buffer Control Module ports labelled “RS–232,” the port must be set with an internal jumper to operate according to RS–*422*. Refer to the manual supplied with the D–2166 for more information.

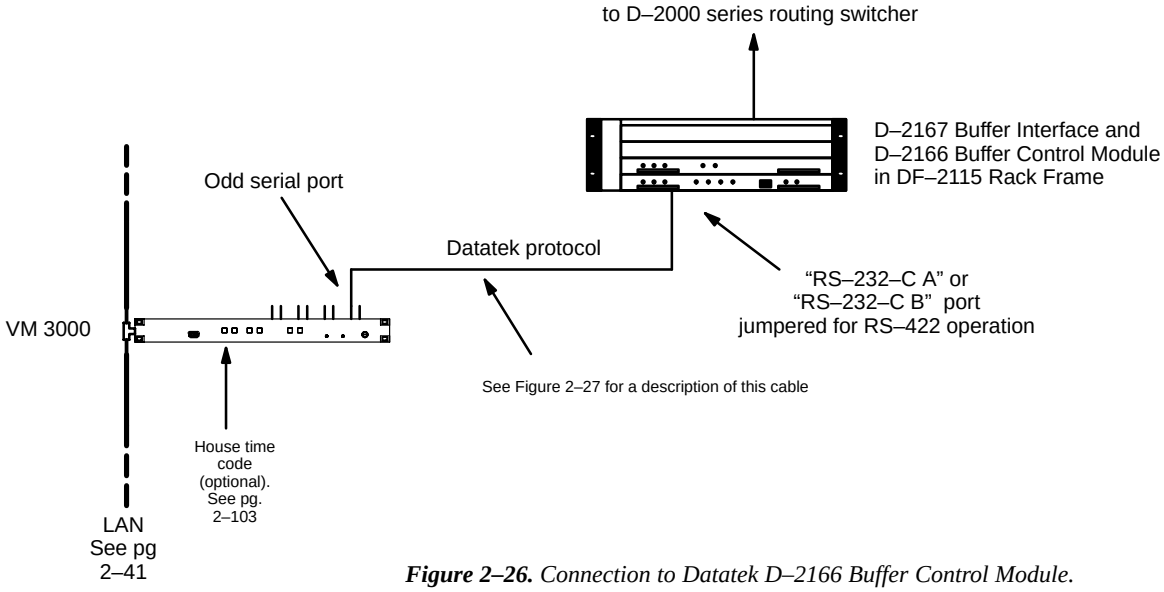
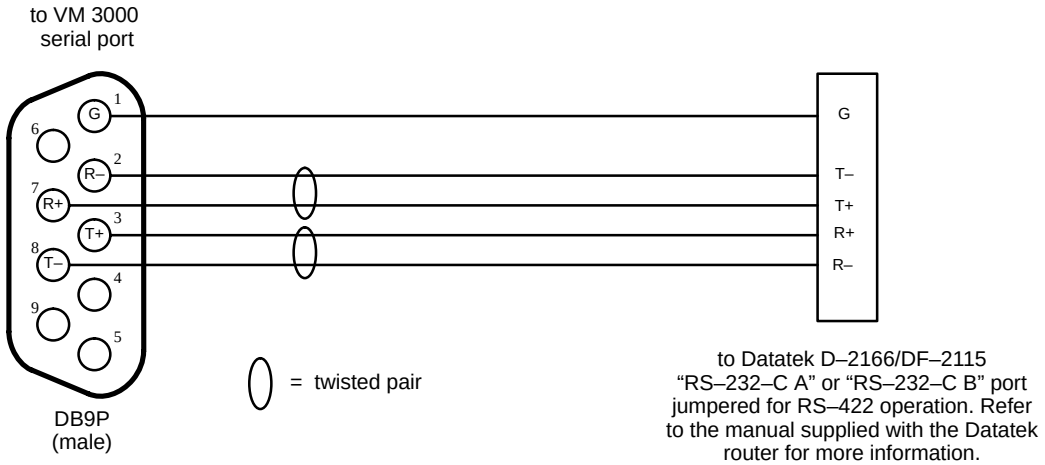


Figure 2–26. *Connection to Datatek D–2166 Buffer Control Module.*



G Ground
R– Receive minus
R+ Receive plus
T+ Transmit plus
T– Transmit minus

Figure 2–27. *Cable for connecting VM 3000 to Datatek D–2166 Buffer Control Module.*

NVISION DISTRIBUTION SWITCHER

Certain late–model NVISION switchers can be controlled using the hardware connections shown in Figure 2–28. The protocol setting is: 38400 baud, 8 data bits, odd parity, 1 stop bit.

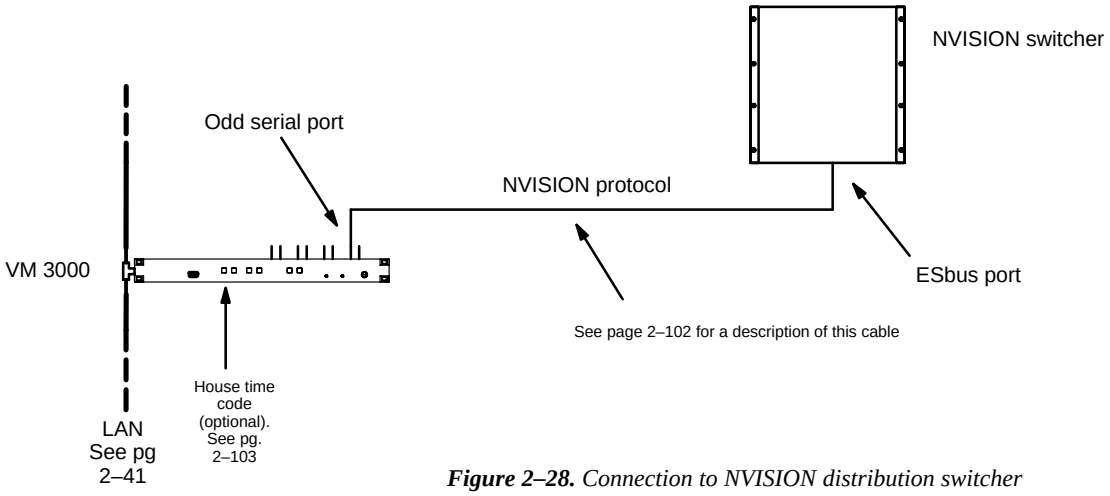


Figure 2–28. *Connection to NVISION distribution switcher*

PRO–BEL DISTRIBUTION SWITCHER

Pro–bel Eclipse (SW.P.02) switchers can be controlled using the hardware connections shown in Figure 2–29. The protocol setting is: 38400 baud, 8 data bits, odd parity, 1 stop bit.

Note: On the Serial Protocol table (page 5–25) select the “Alpha Imag.” protocol for this switcher.

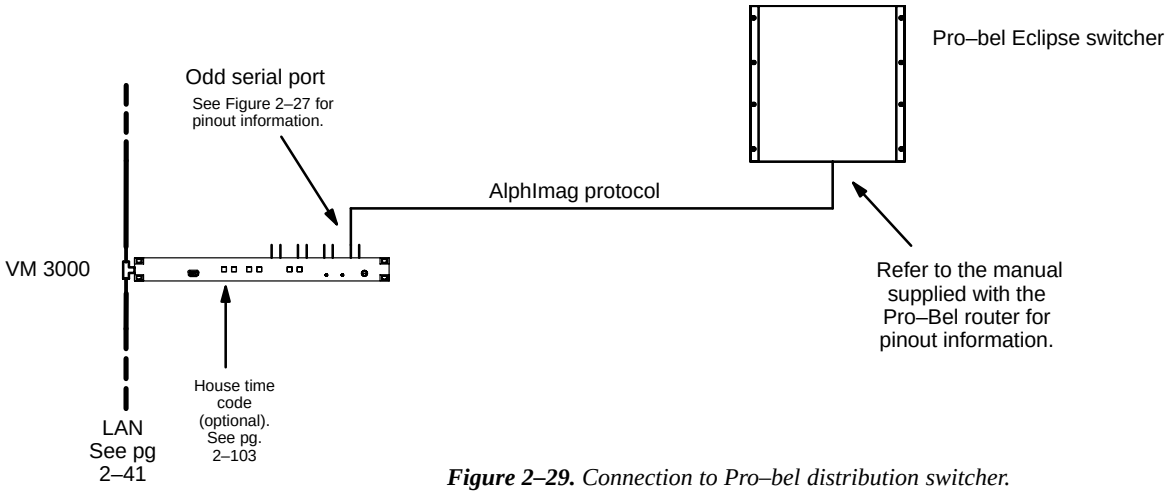


Figure 2–29. *Connection to Pro–bel distribution switcher.*

UTAH SCIENTIFIC PARTY LINE CONNECTION USING UDI–1B

The VM 3000 can be connected to a Utah Scientific Party Line through a UDI–1B Universal Data Interface (see Figure 2–30). Some UDI–1B units are equipped with a 9–pin RS–422 port; others are equipped with a 25–pin RS–232 port. Either type can be used.

The protocol for the UDI–1B port must be set at: 9600 baud, 7 data bits, even parity, and 2 stop bits. The UDI–1B must be equipped with software version 81.4 or later. The UDI–1B "AUX" rotary switch needs to be set to "E" for "PL–160 Mode" and to enable all mode commands. Refer to the UDI–1B manual for detailed procedures.

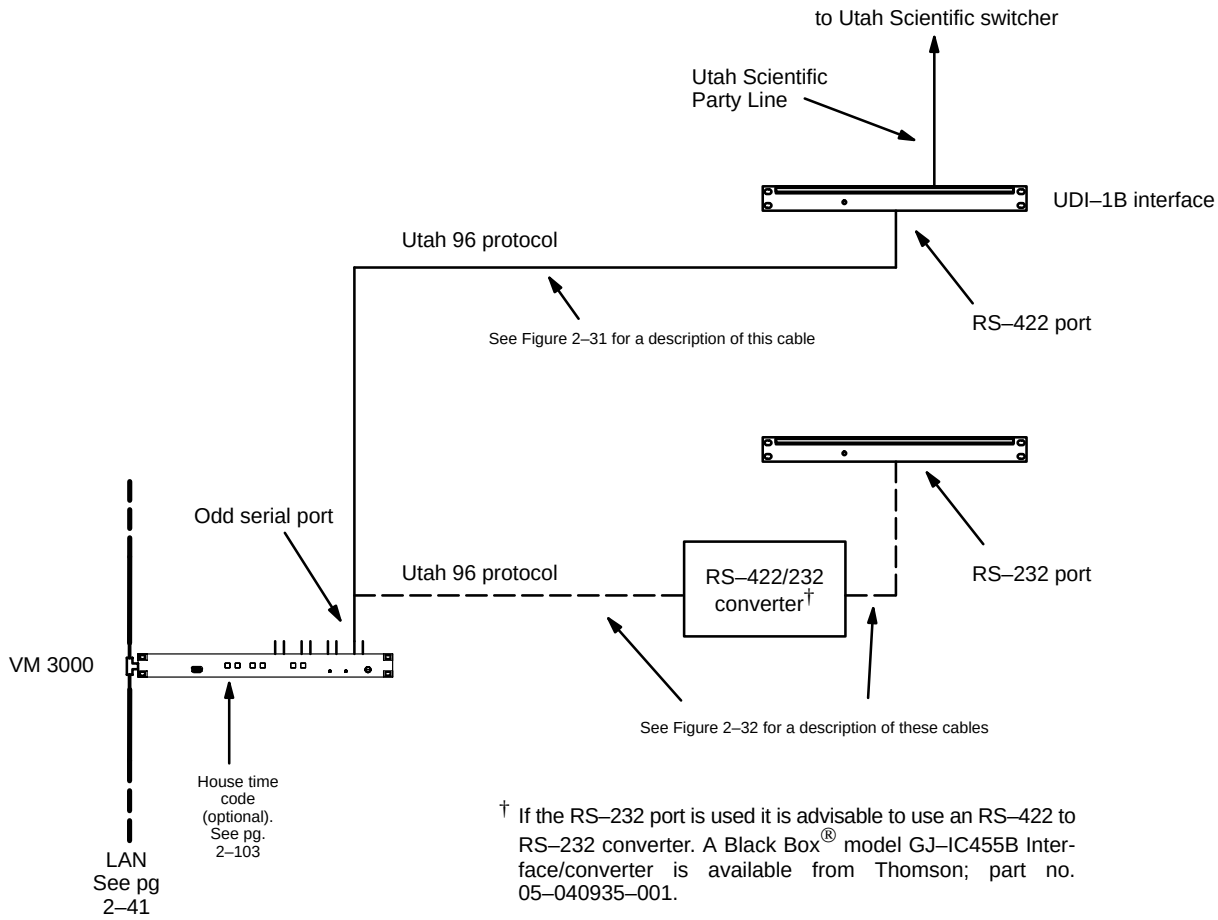


Figure 2–30. *Connection to Utah Scientific Party Line.*

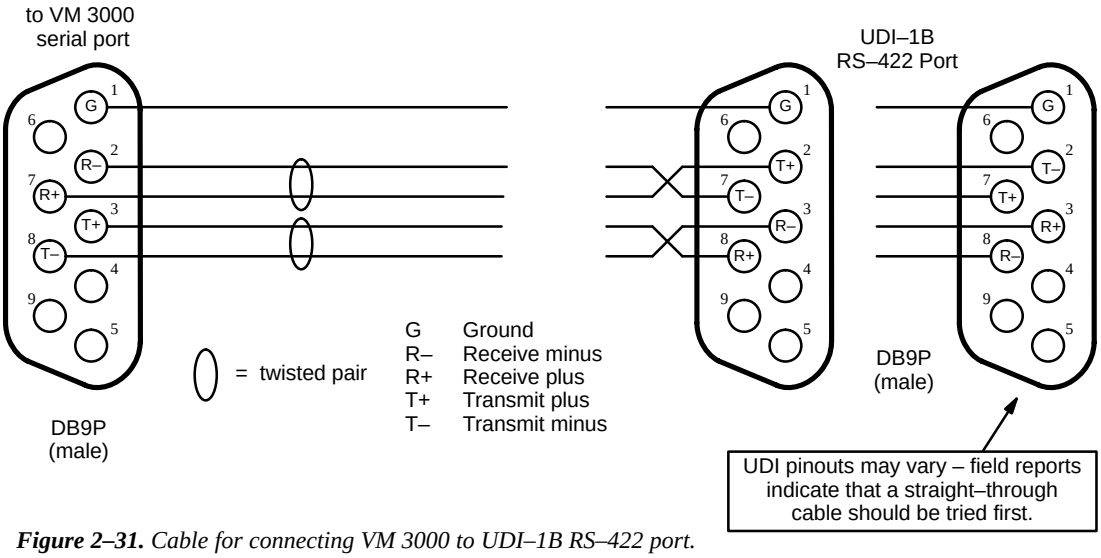


Figure 2–31. *Cable for connecting VM 3000 to UDI–1B RS–422 port.*

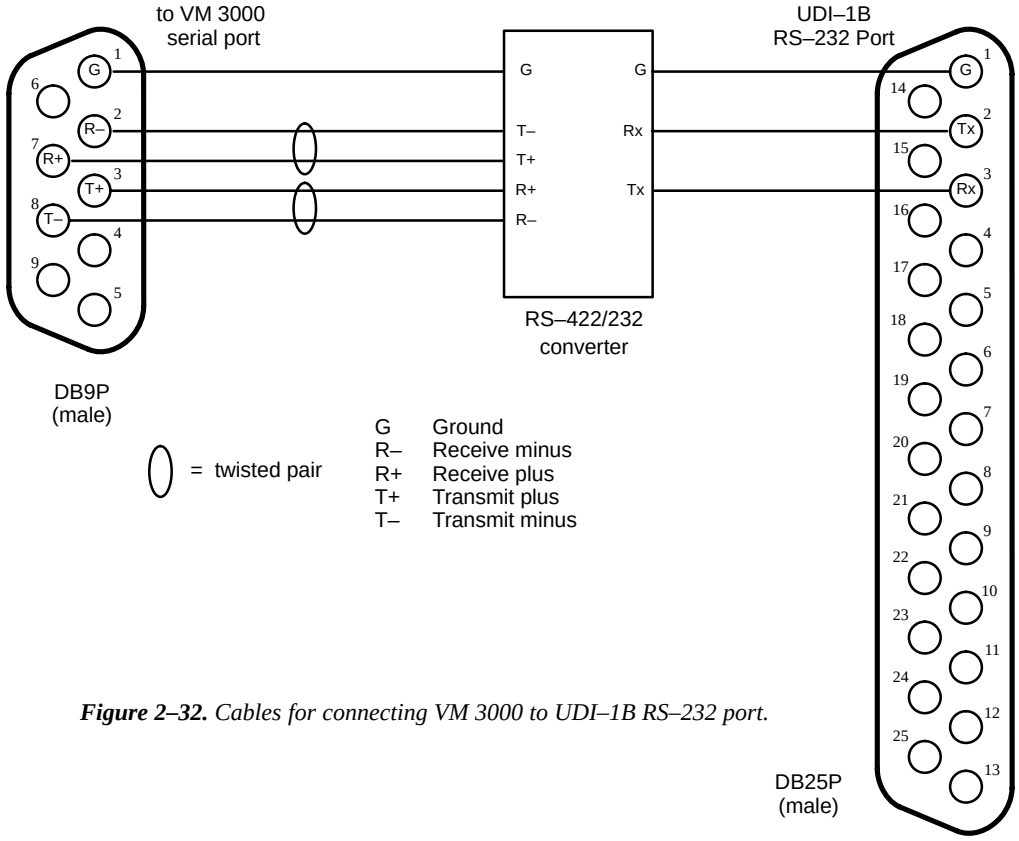


Figure 2–32. *Cables for connecting VM 3000 to UDI–1B RS–232 port.*

UTAH SCIENTIFIC AVS–1B WITH PL–320

The VM 3000 can be connected to a Utah Scientific AVS–1B through the switcher's PL–320 Control and Memory Card (see Figure 2–33). The protocol for the PL–320 RS–422 port must be set at: 1200 baud, 7 data bits, even parity, and 2 stop bits. The PL–320 must be equipped with software version 32.B or later. Refer to the PL–320 Manual for configuration instructions.

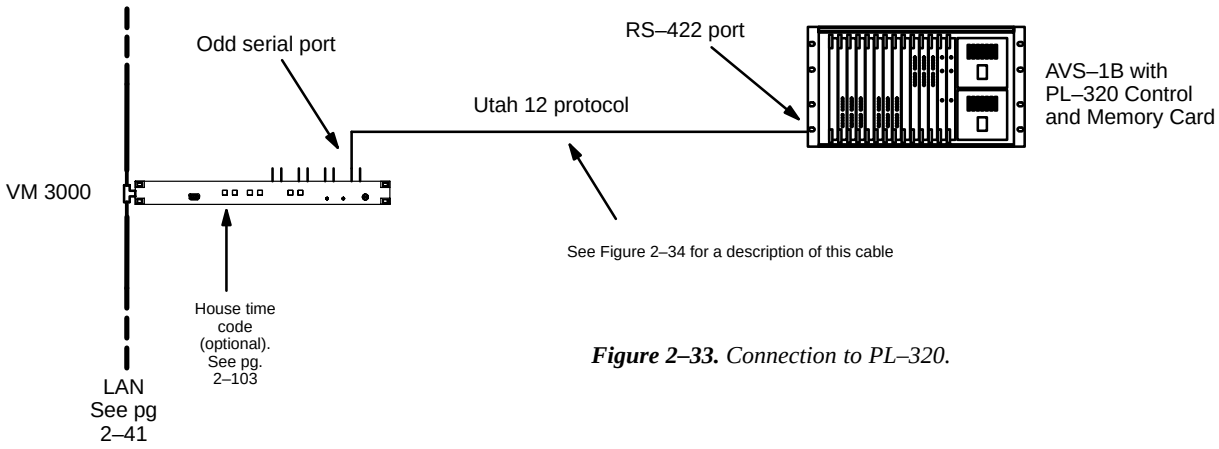


Figure 2–33. *Connection to PL–320.*

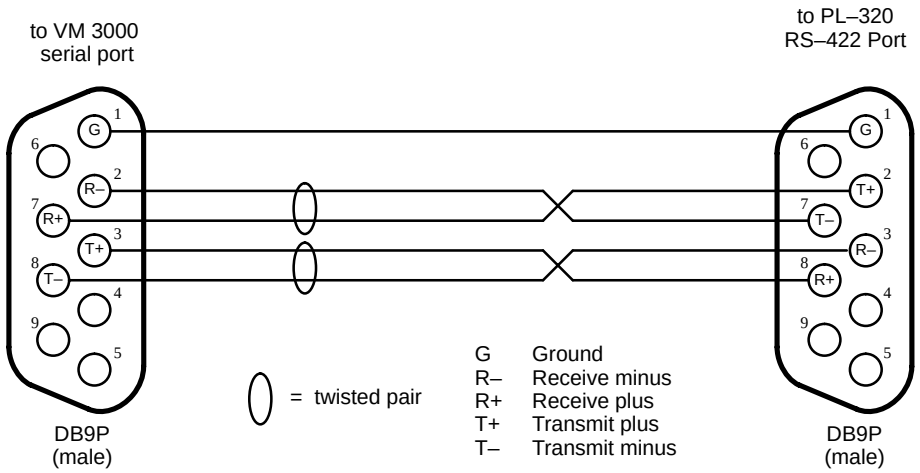


Figure 2–34. *Cable for connecting VM 3000 to PL–320.*

VISTEK ARRAY SWITCHER

See Figure 2–35 for hardware connections, which can be made to the Vistek switcher's RS–422 or RS–232 port. The protocol setting is: 9600 baud, 8 data bits, no parity, 1 stop bit. If the RS–232 port is used, using an RS–422 to RS–232 converter between the VM 3000 and the switcher is advisable.

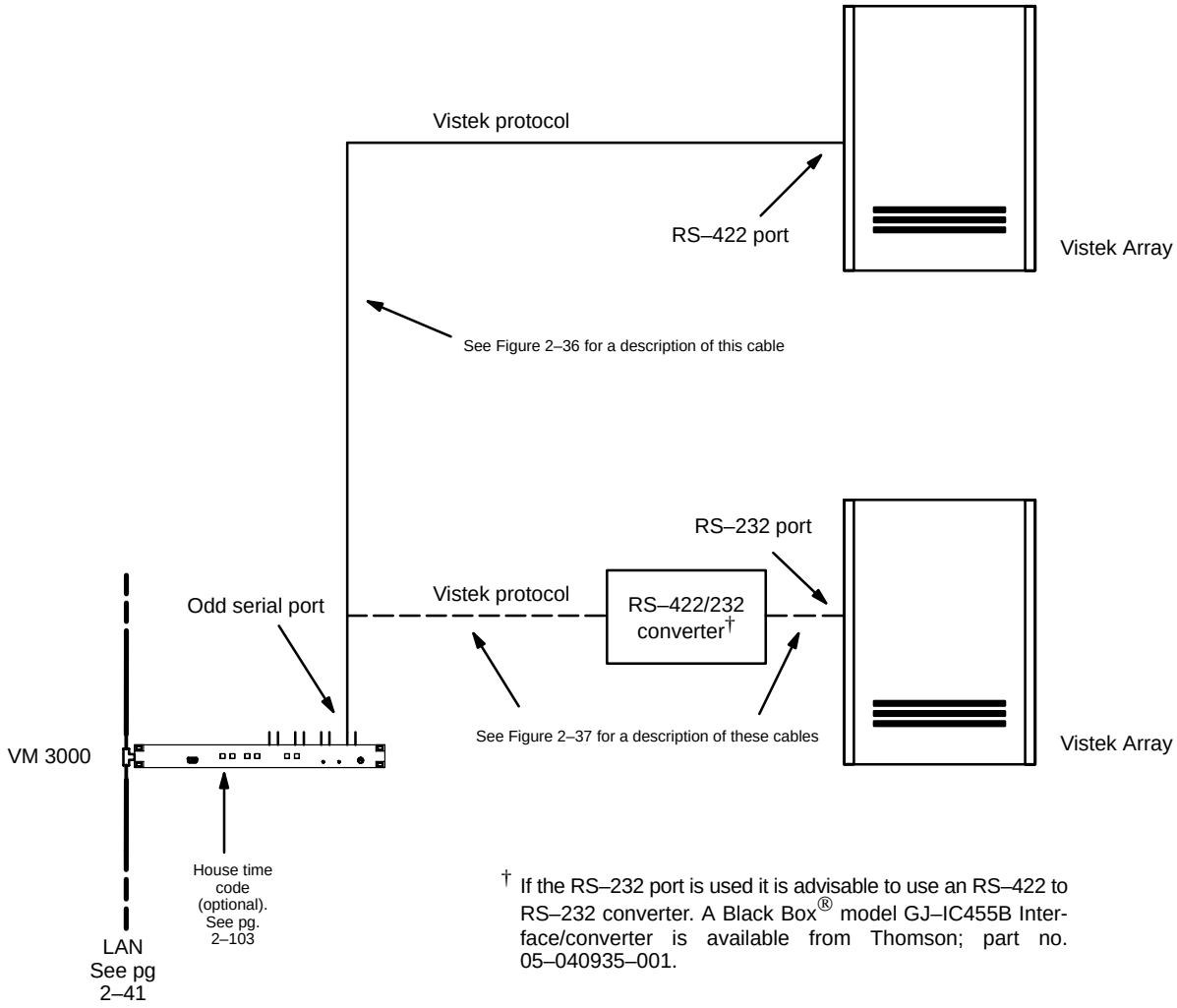


Figure 2–35. *Alternate methods for connection to Vistek Array distribution switcher.*

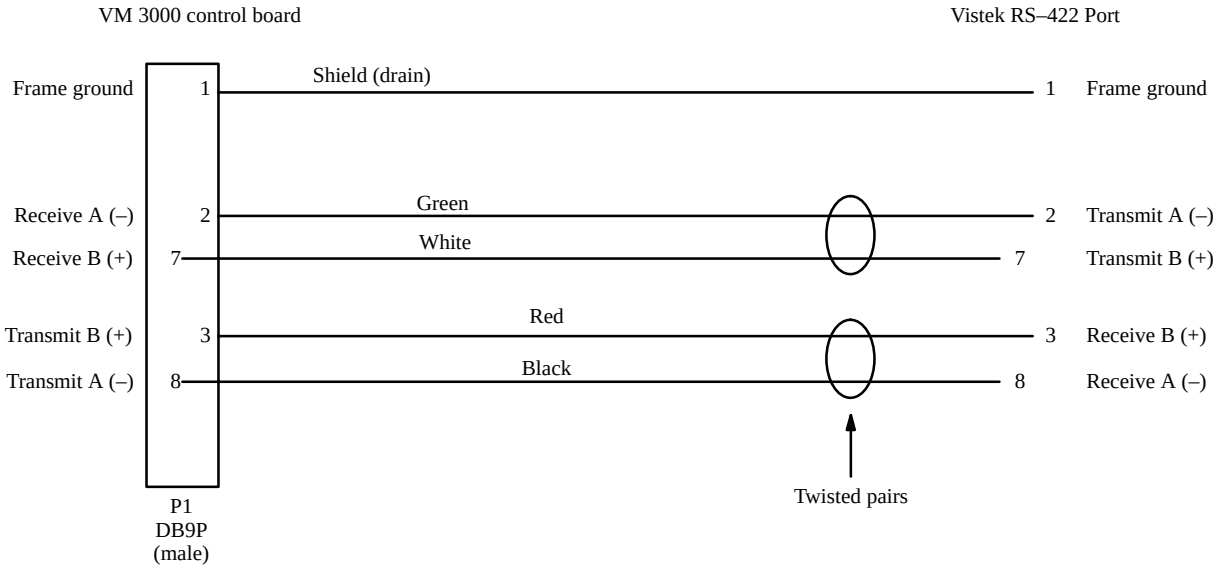


Figure 2–36. *Cable for connecting VM 3000 to Vistek RS–422 port.*

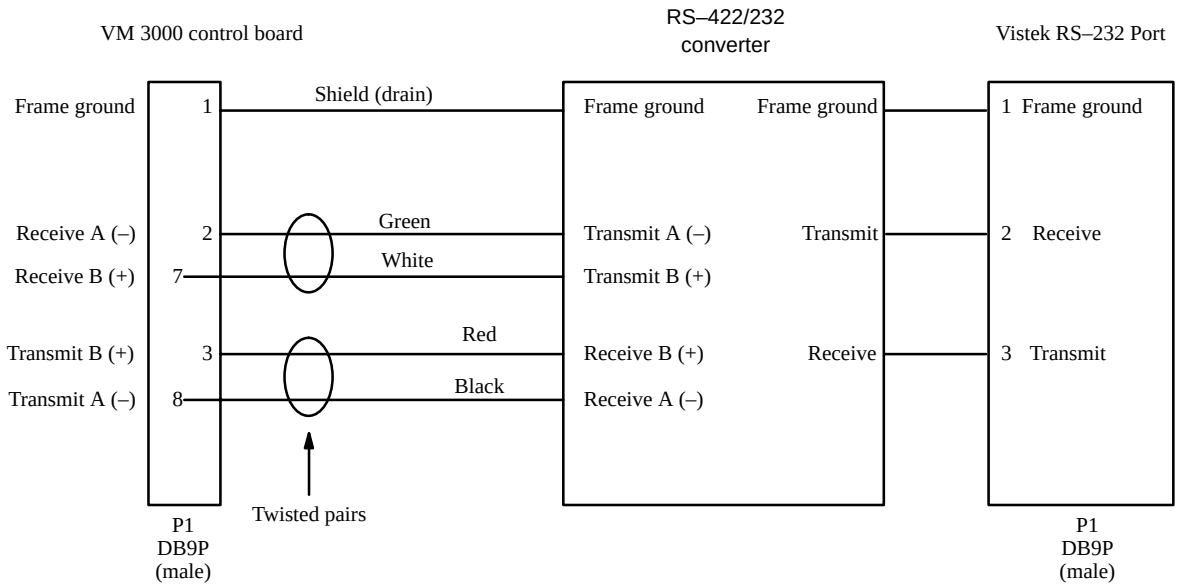


Figure 2–37. *Cables for connecting VM 3000 to Vistek RS–232 port.*

NEXUS AUDIO ROUTING SYSTEMS

Nexus and Nexus Star audio routers can be controlled using the hardware connections shown in Figure 2–38. The Nexus Star switcher requires special PROMs for this application (please contact Thomson for more information).

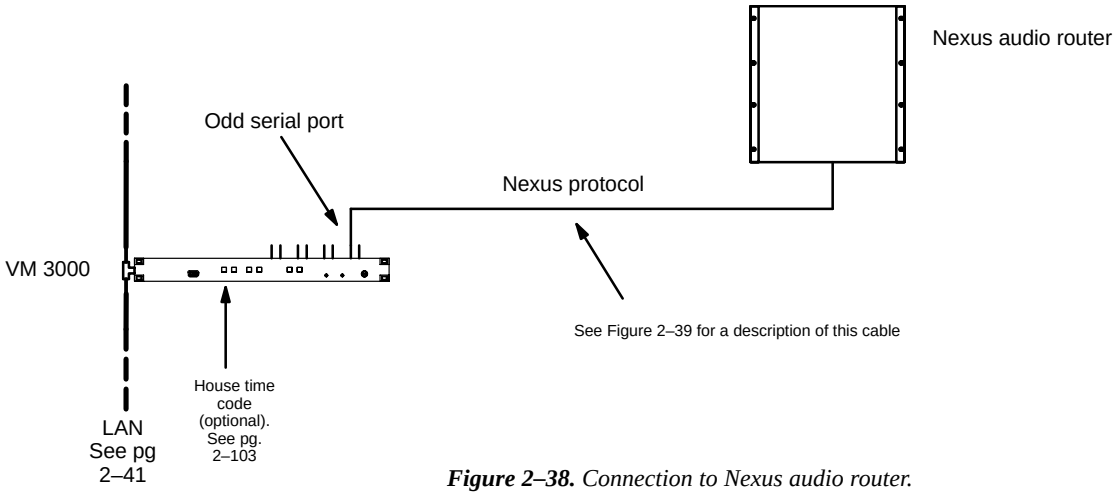


Figure 2–38. *Connection to Nexus audio router.*

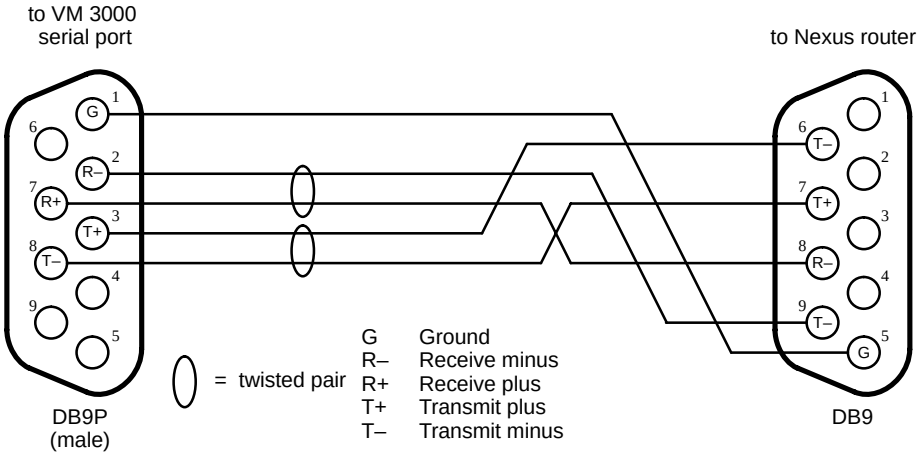


Figure 2–39. *Cable for connecting VM 3000 to Nexus audio router.*

Logical Level Mapping

In these systems, the same physical level number is used on more than one logical level. For example, a switcher could have video on level 1, left audio on level 2, and right audio **also** on level 2. In Figure 2–40, a 60 x 60 audio level is being used as two 60 x 30 switchers, i.e., with half the outputs assigned to the left channel and the other half to the right channel.

This technique can sometimes help reduce overall switcher size, but requires special entries to the Switcher Description table and the Switcher Outputs table. See Step 9(i) on page 5–37.

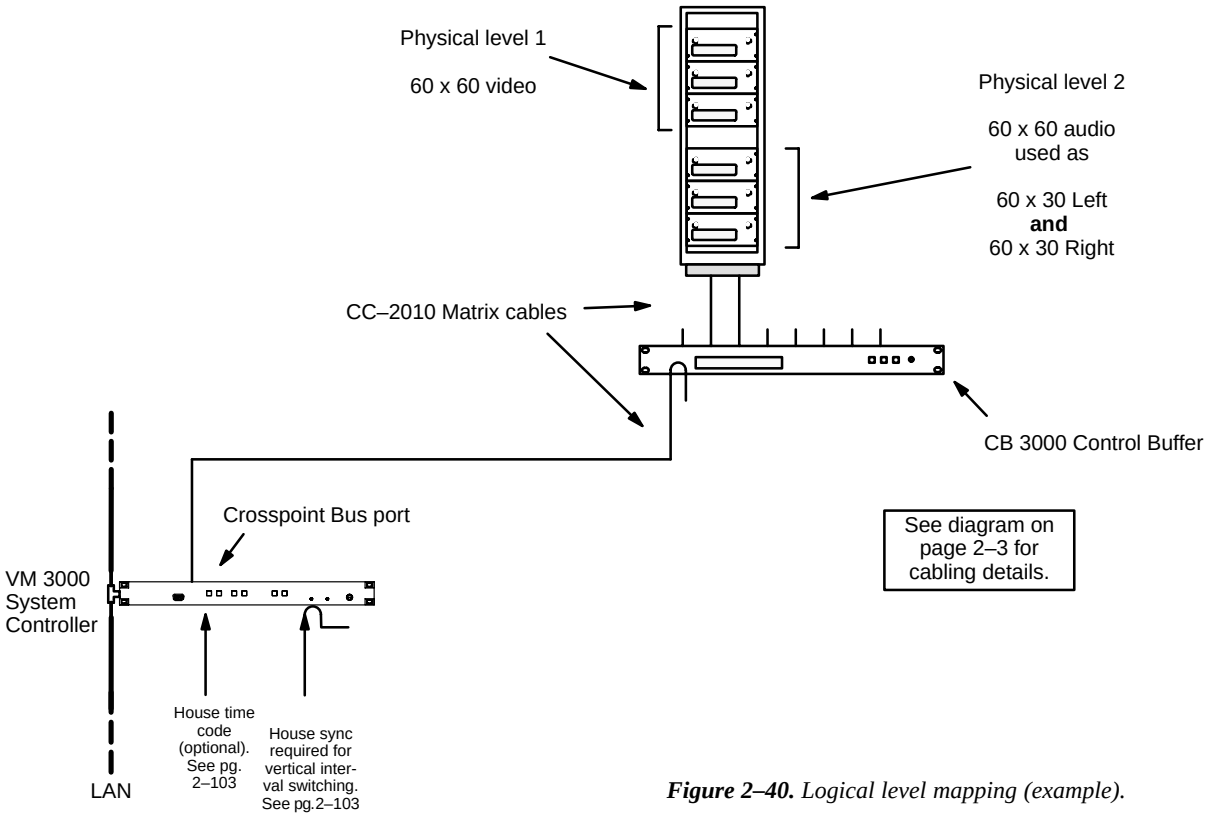


Figure 2–40. *Logical level mapping (example).*

Data Matrix Switching

The Jupiter system can be used to control RS–232, RS–422, and RS–423 data switchers. In a typical application, a Venus data matrix switcher can be used to route RS–422 machine control signals.

Older model Venus switchers equipped with DM 400 or DM 400A Data Matrix boards require crossover or Y–line cables. Newer model Venus systems are equipped with the DM 400B Data Matrix boards; these boards have software–configurable rear–panel pinout functions and do not require crossover or Y–line cables.§

Hardware Connections

For complete information regarding jumper settings and cabling, refer to the technical manual supplied with the data switcher.

Software Configuration

— For DM 400/400A Data Matrix boards, refer to Appendix L.

— For an overview of DM 400B configuration, see page 5–48. Entries are required on the Switcher Description table (page 5–31), Switcher Input table (page 5–44), Switcher Output table (page 5–51), CP Input Set (page 5–58), and CP Output Set (page 5–76).

§Type and model of switcher card is shown on front edge of printed circuit board.

Connection to Multiple Thomson Crosspoint Bus Distribution Switchers

CONNECTION USING A SINGLE VM 3000

A single VM 3000 control board can be used to control more than one Crosspoint Bus switcher; however, each physical level must have a unique number. When expanding a system in the field, this may require changing DIP switches or jumpers on the hardware. See Figure 2–41.

Note: Figure 2–41 pictures a mixture of TVS and Venus routers. This is possible *only if all* switchers are configured to operate on the same type (Super) Crosspoint Bus. For example, older TVS 2000 matrix cards are not capable of operating on Super Crosspoint Bus, but a newer State machine PROM is available which permits Super Crosspoint Bus operations (each TVS 2000 board requires the newer State Machine PROM). Later versions of TVS 2000/3000 switchers were shipped with this PROM already installed; a DIP switch setting selects between Super and Extended Crosspoint Bus.

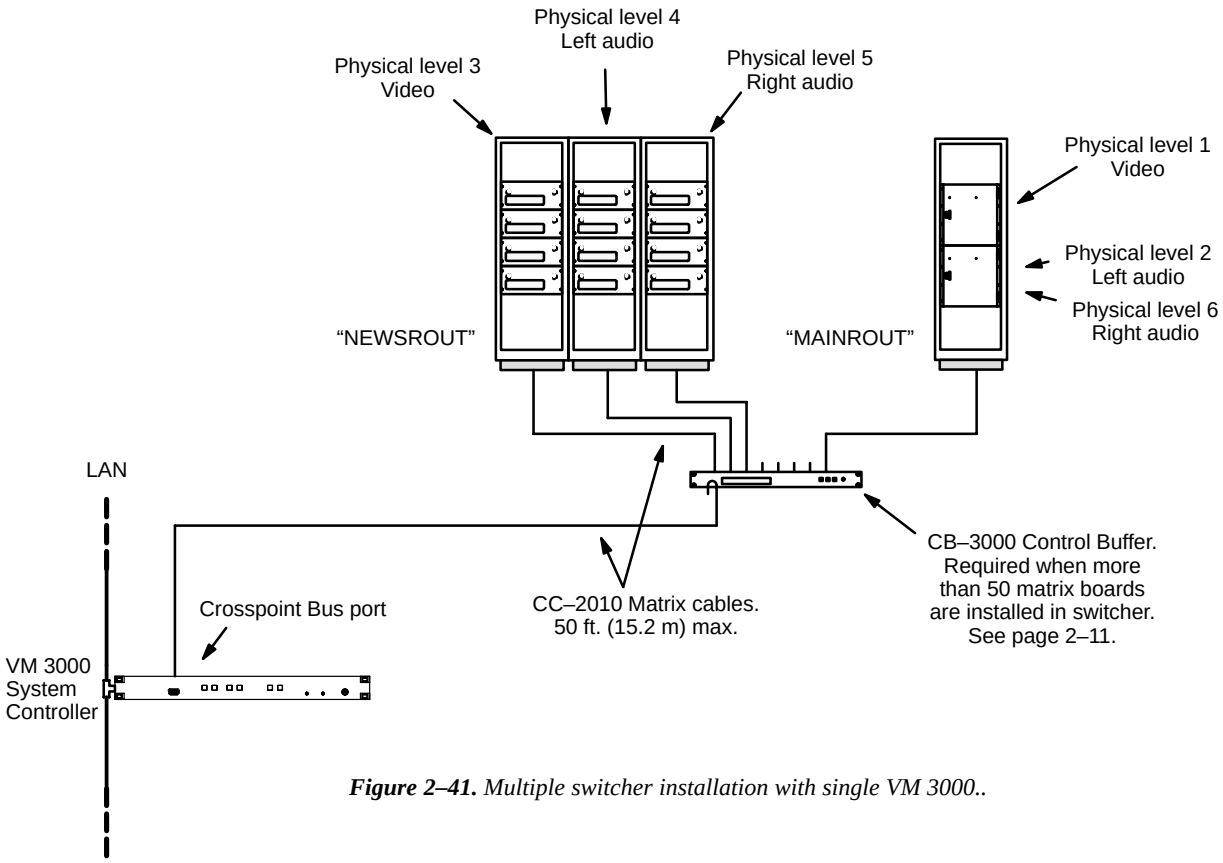


Figure 2–41. *Multiple switcher installation with single VM 3000..*

DEDICATED VM 3000 PER SWITCHER

By using separate VM 3000s, physical level numbers may be duplicated from one switcher to another. When expanding a system in the field, this will eliminate the need to change DIP switches or jumpers on the hardware. See Figure 2–42.

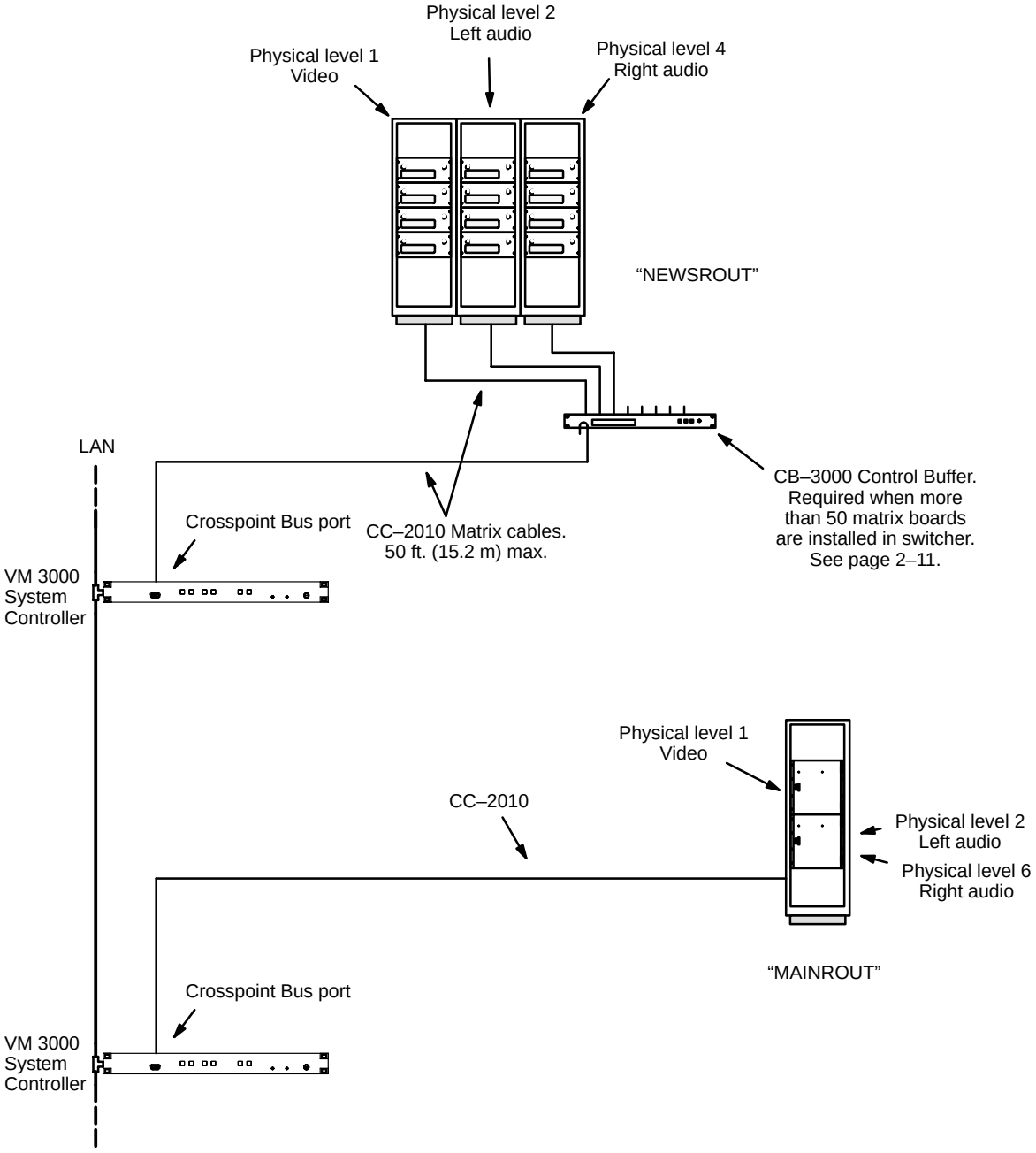


Figure 2–42. *Multiple switcher installation with dedicated VM 3000s.*

Connection to Multiple Distribution Switchers with Path Finding

Note: Data level pathfinding is not supported.

The path finding software option allows two or more Jupiter–controlled routing switchers to operate as a system, where one switcher can access the other's inputs through a number of *tie lines*. Tie lines can vary in number from one switcher to another, and from one level to another.

Two wiring schemes can be used: *sequential* wiring, where tie lines are organized in blocks (as shown on page 2–36); and *non–sequential* wiring (as shown on page 2–37). Sequential wiring requires entries to only one file server table (the "Path finding Data Table," shown on page 5–196). Non–sequential wiring requires use of an additional table (the "Non–Sequential Path finding Data Table," shown on page 5–207.)

SEQUENTIAL PATH FINDING (PATH FINDING USING SEQUENTIAL WIRING)

Connections can start with any input or output number, but thereafter must be sequential. Page 2–36 shows example connections for one level. Notice that the lowest number in an output group must be connected to the lowest number in the corresponding input group, and so on.

Due to distance limitations of the CC–2010 Matrix cable, it may necessary to install a separate VM 3000 Control Processor for each switcher.

See page 5–196 for an overview of sequential path finding and software configuration requirements.

NON–SEQUENTIAL PATH FINDING (PATH FINDING USING NON–SEQUENTIAL WIRING)

In some cases, especially when adding tie lines to an existing system, wiring new lines out of sequence may be desirable. Page 2–37 shows example connections for one level.

Due to distance limitations of the CC–2010 Matrix cable, installing a separate VM 3000 Control Processor for each switcher may be necessary.

See page 5–196 for an overview of path finding and software configuration; then refer to page 5–207 for additional non–sequential path finding requirements.

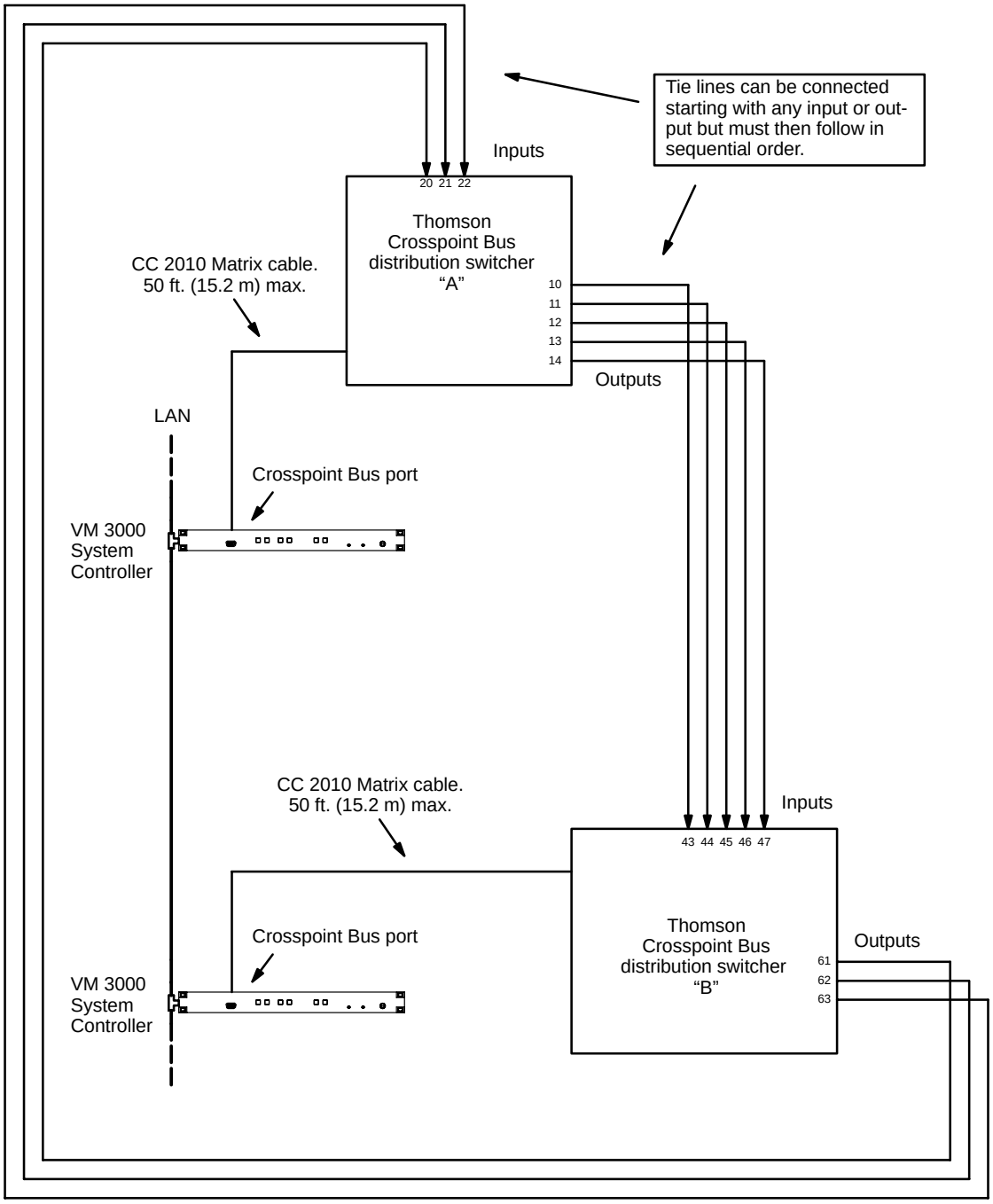


Figure 2–43. *Sequential path finding connections (example).*

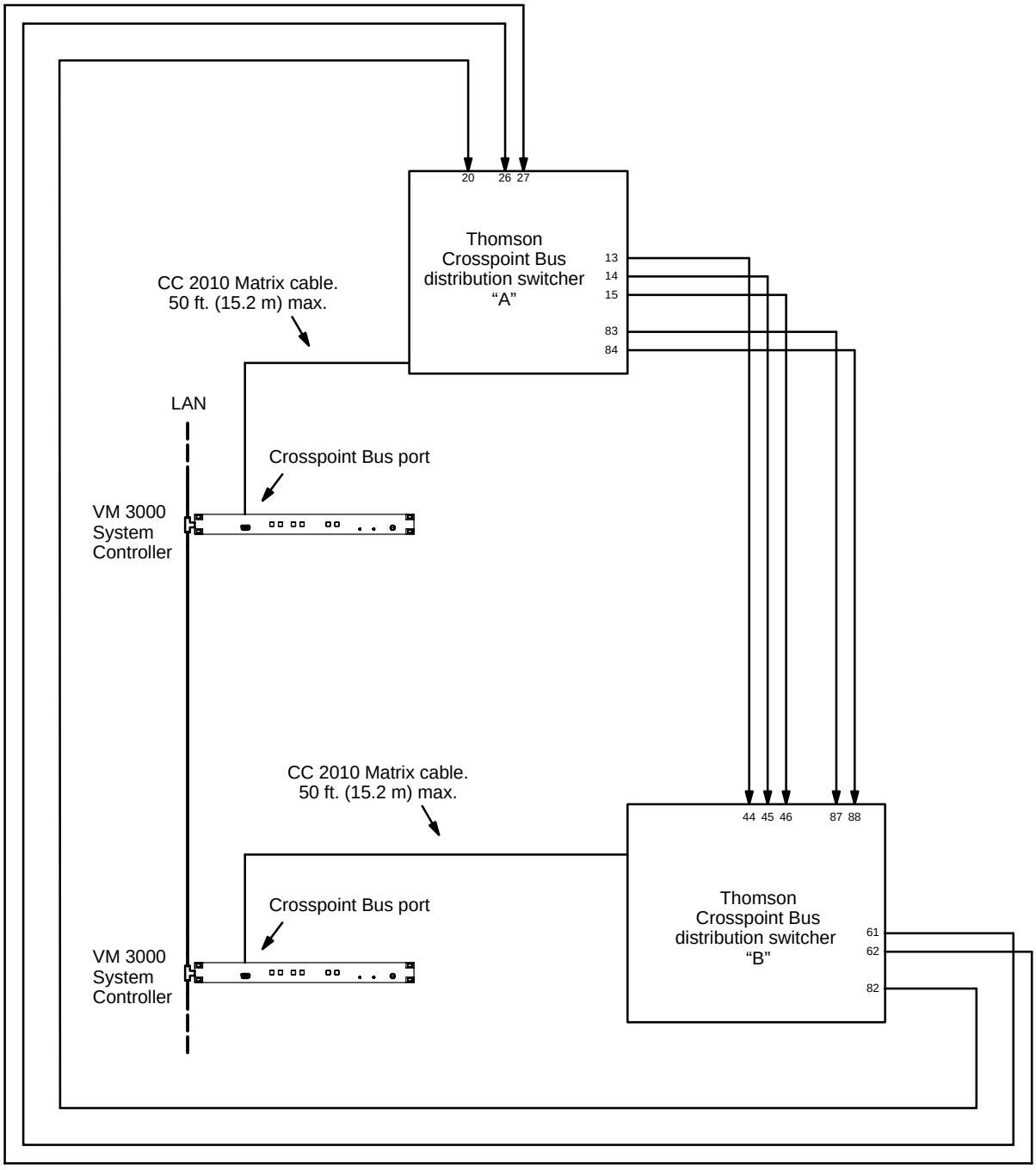


Figure 2–44. *Non–sequential path finding connections (example).*

Installing PC

Minimum hardware and software requirements have already been described (page 1–6).

Follow the instructions supplied with the file server for connection of monitor, keyboard, and mouse.

FILE SERVER PC (LAN) SYSTEM

Using a CAT 5 10/100BaseT cable, connect the file server to a media converter or hub as appropriate.

Note: Use of non–Jupiter equipment on the Jupiter LAN is not recommended and will not be supported.

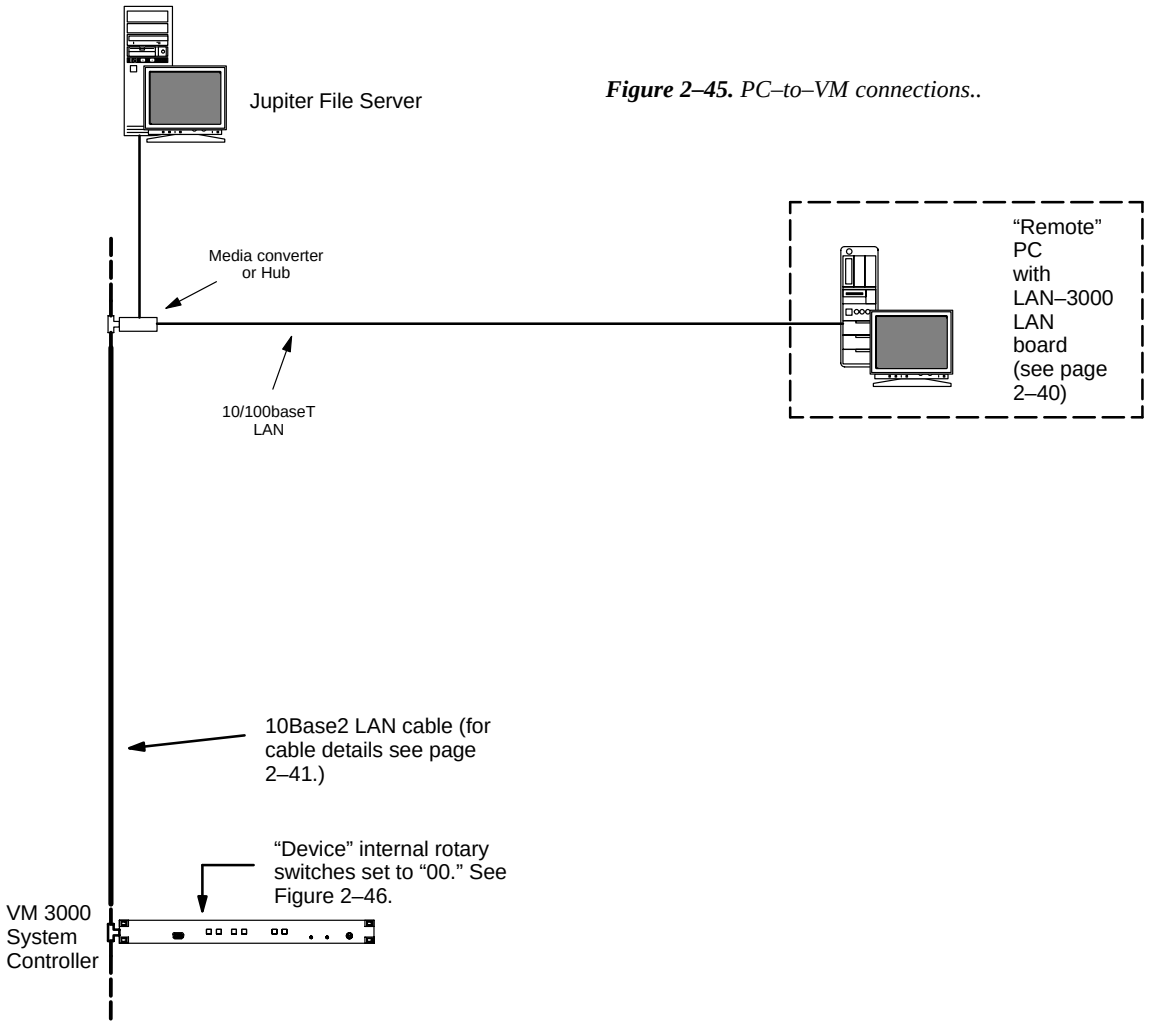


Figure 2–45. *PC–to–VM connections..*

The VM 3000 internal "Device" switches must be set to "00." See Figure 2–45.

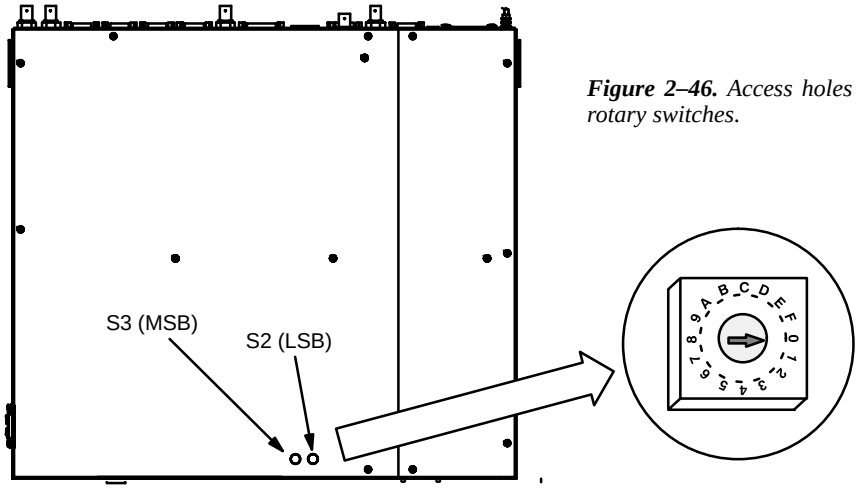


Figure 2–46. *Access holes for VM/SI 3000 "Device" rotary switches.*

	Switch S3	Switch S2
Conventional LAN operation	0	0
Beginning of user–defined addresses	0	1

End of user–defined addresses	F	E

Figure 2–47. *Rotary switch settings..*

For conventional LAN installation S2 and S3 are set at "00."

This causes the unit to use the address stored in the hardware address PROM, i.e., the address shown on the rear panel. This address must be entered on the Network Description table (page 5–22).

USER DEFINED ADDRESSES

If for some reason the VM 3000 (or an SI 3000) needs to be removed from a LAN, and replaced by another VM/SI 3000, this would normally require the address of the new unit to be entered on the Network Description table and the modified configuration set to be activated. However, it is possible to avoid changing the Network Description table and instead use S2 and S3 to set the VM/SI 3000 to the address **0080CEDEADxy**, where **x** is set with S3 and **y** is set with S2; the address "0080CEDEADxy" is entered permanently on the Network Description table. For example: address "0080CEDEAD01" could be entered on the table; thereafter each VM/SI 3000 connected to the LAN could be set with S3 at "0" and S2 at "1."

This technique can be used in redundant installations where a third VM/SI is maintained as a replacement for a failed redundant unit. For more information, see Appendix K.

PRINTER

A printer can be connected to the LPT1 port and used to print the contents of an entire Configuration Set in a 132–column format; it can also be used to print the contents of individual tables (page 5–16).

SOFTWARE INSTALLATION

Procedures for installing the Jupiter software on the file server are found in the Field Engineering Bulletin supplied with the software.

Installing "Remote" PC on LAN

A second PC can be installed on a Jupiter LAN in addition to the PC used as the file server. This "remote" PC can be used for certain Jupiter Network Suite (JNS) applications. For details concerning installation, see Appendix G.

For information about JNS see page 4–1.

Installing 10Base2 LAN Cables

The 10Base2 LAN used to connect VM/SI 3000 units is the Ethernet thin cable type, also referred to as “thin net.” LAN cabling guidelines are shown in Figures 2–48 and 2–49. Please note the following additional restrictions:

- 50–ohm, RG–58 type coaxial cable and BNC connectors must be used for the LAN cabling. *75–ohm RG–59 cable cannot be used*. Furthermore, cable crimpers designed for RG–59 cable may not do a good job with the smaller RG–58 cable. Factory–made cable is available (see below).

- A thin cable LAN cannot be used outdoors between unconnected buildings. An Ethernet thick–cable segment, connected to thin cable segments with repeaters, would be required for this purpose.

- Local building codes must be checked before LAN installation, especially with regard to grounding requirements and installation of cable in air return plenums. It is recommended that the LAN not be grounded; but if grounding is required by local code it should be grounded on one end only. Generally, the national electrical codes restrict the use of LAN cabling in air ducts and plenums. If PVC–jacketed cable is permitted in such spaces it typically must be run in metal conduit; FEP–jacketed cable is typically permitted without conduit.

- Due to possible speed loss, use of non–Jupiter equipment on the LAN is not recommended and will not be supported.

The following RG–58 thin net cables, with installed BNC connectors, are available from Thomson:

1 meter (3.3 ft)
2 meters (6.6 ft)
4 meters (13.1 ft)
8 meters (26.2 ft)
16 meters (52.5 ft)
32 meters (105 ft)

For ordering information, see page 1–23.

The jacket material for these cables is fluoropolymer (FEP).

A termination kit, consisting of a pair of 50–ohm terminators (without ground wire connections) is also available. The part number is 44–039807–001.

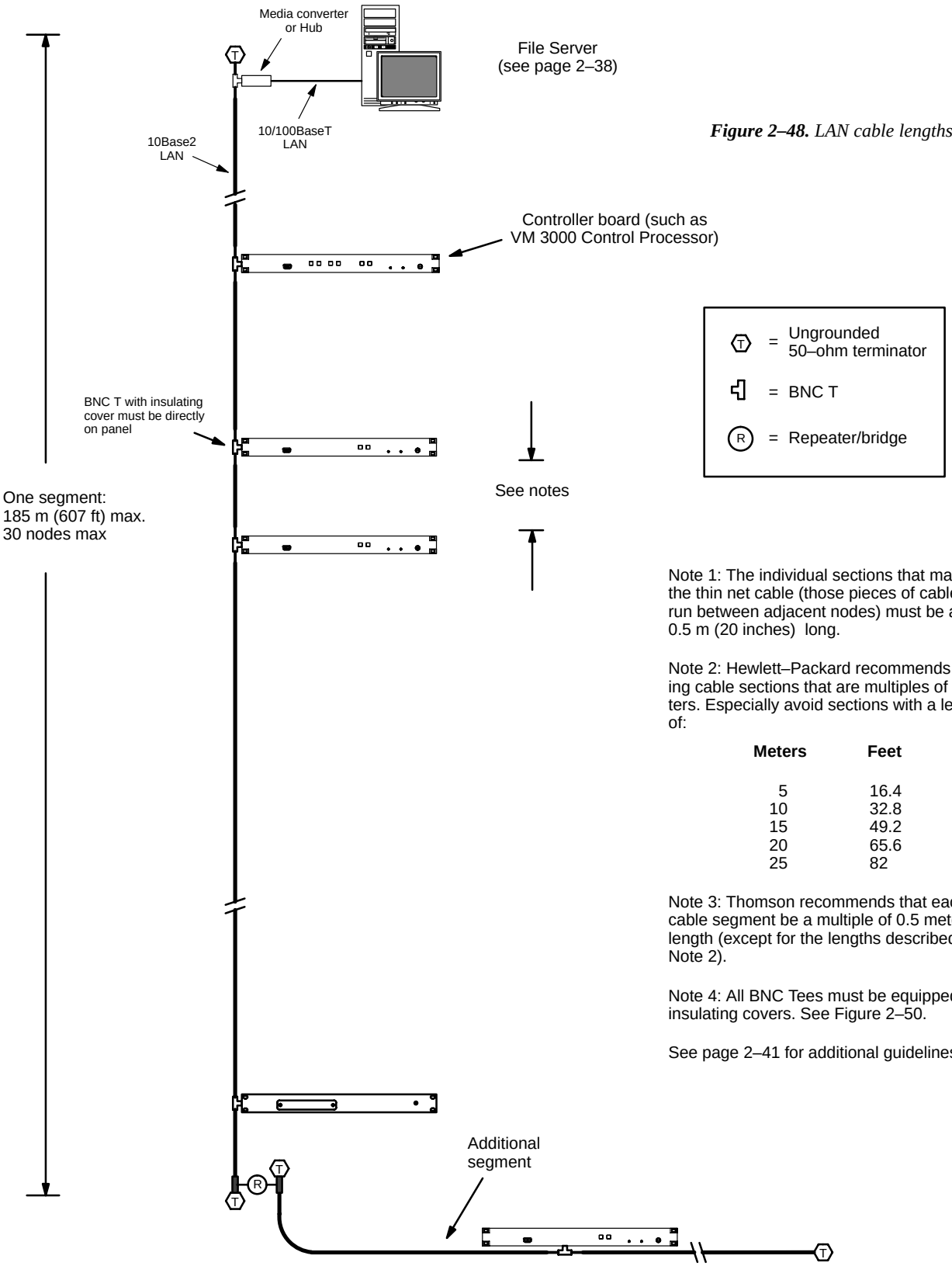


Figure 2–48. *LAN cable lengths*

Note 1: The individual sections that make up the thin net cable (those pieces of cable that run between adjacent nodes) must be at least 0.5 m (20 inches) long.

Note 2: Hewlett–Packard recommends avoiding cable sections that are multiples of 5 meters. Especially avoid sections with a length of:

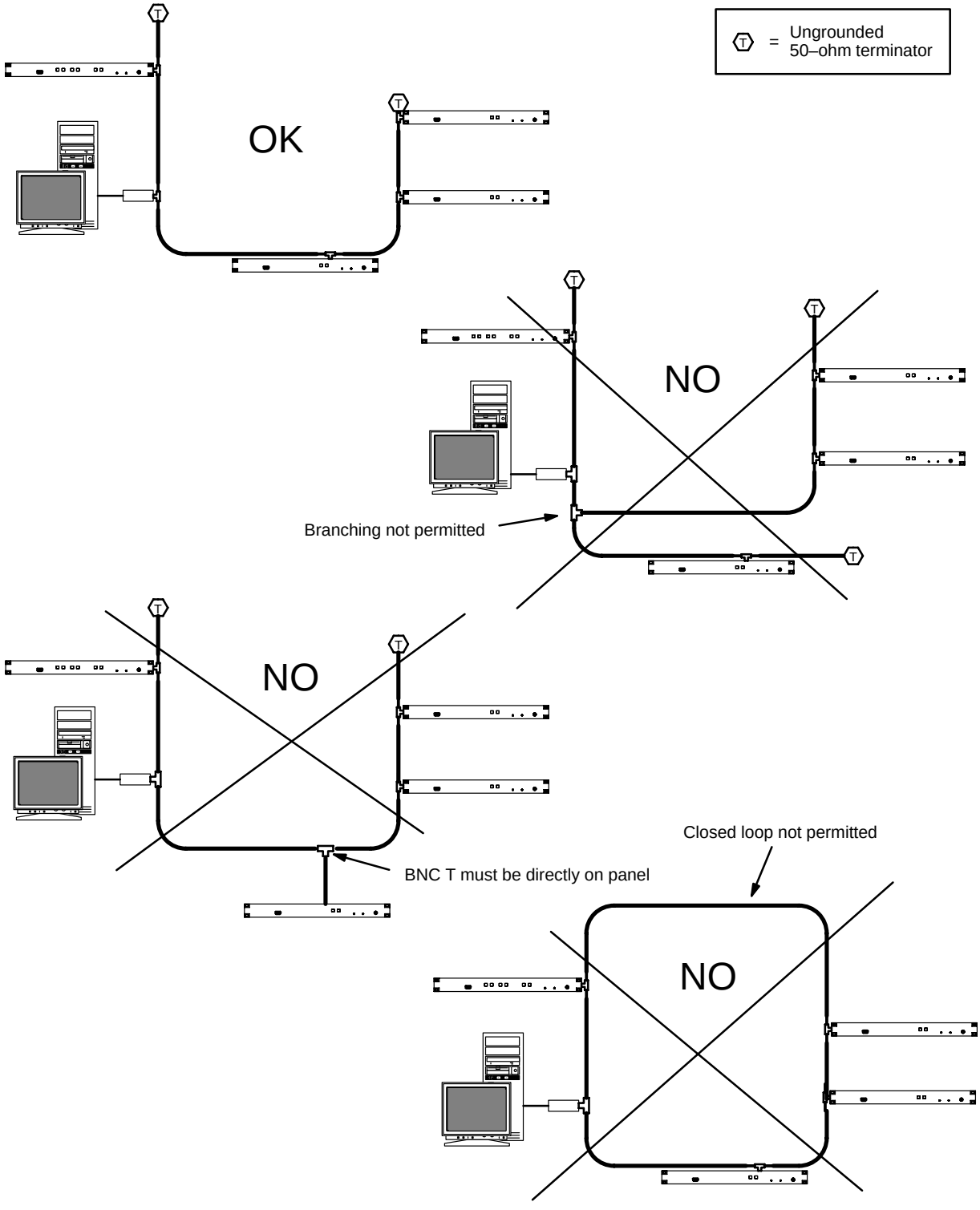
Meters	Feet
5	16.4
10	32.8
15	49.2
20	65.6
25	82

Note 3: Thomson recommends that each cable segment be a multiple of 0.5 meter in length (except for the lengths described in Note 2).

Note 4: All BNC Tees must be equipped with insulating covers. See Figure 2–50.

See page 2–41 for additional guidelines.

***Figure 2–49.10Base2** LAN cable linearity.*



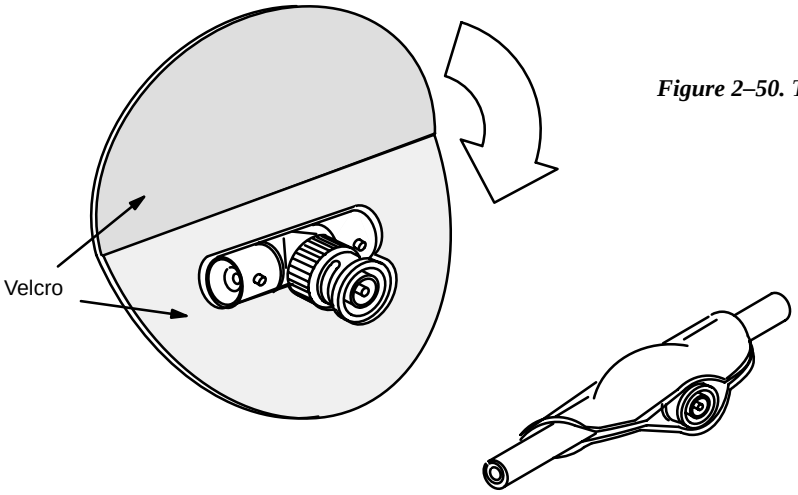


Figure 2–50. *ThinLAN insulating cover for tee connector.*

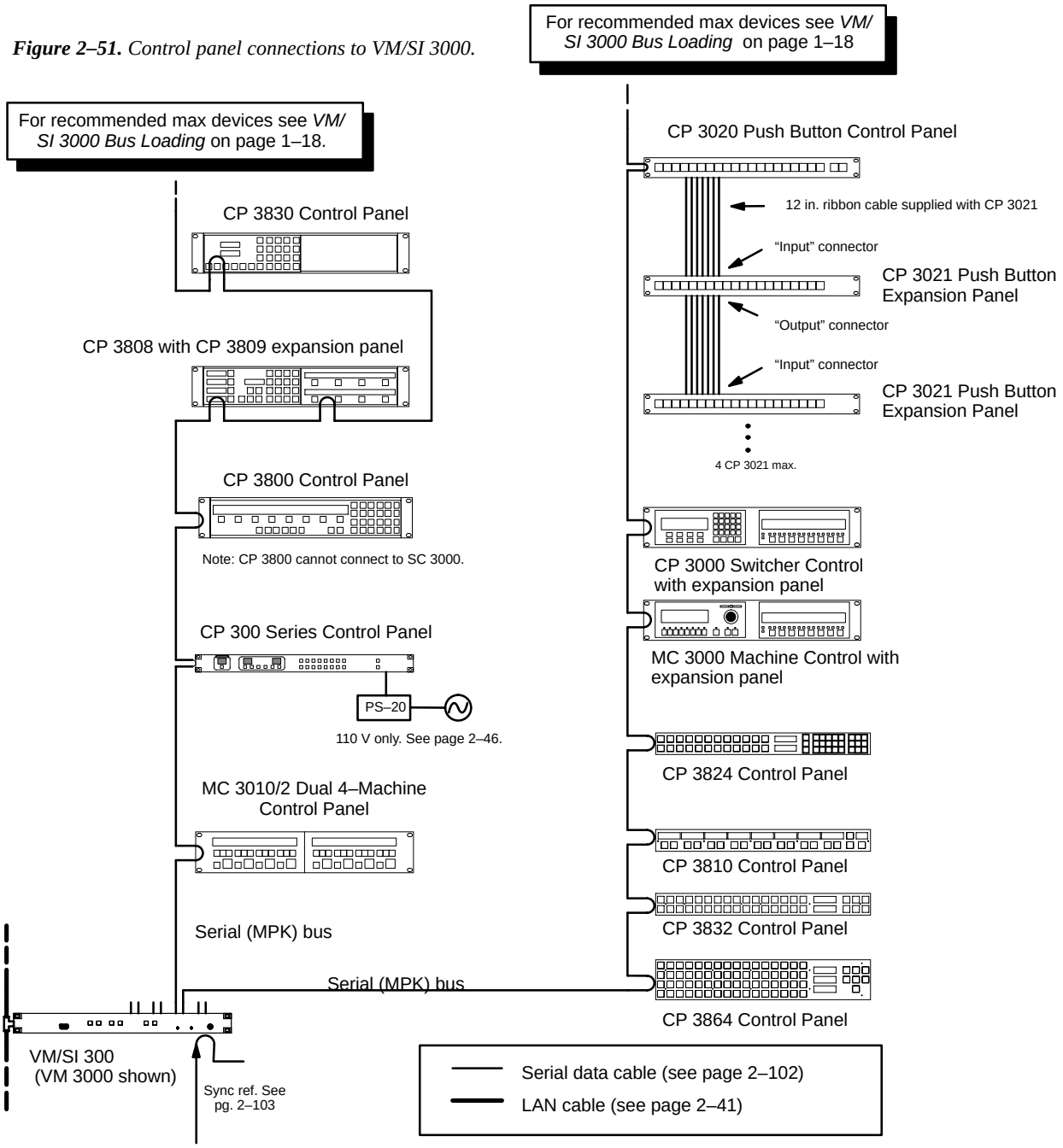
Thomson part no: 05–042549–001.
Amphenol part no: 31–5271.
HP part no: 92227R.

Installing Control Panels

CONNECTIONS T0 VM/SI 3000

For VM/SI 3000, the protocol for the serial ports must be set in pairs. (The protocol is set at the file server, as described later in this manual.) In the example shown in Figure 2–51, port 5 is connected to MPK devices (control panels). Notice that because the port protocol is set in pairs, port 6 must also be used with MPK devices.

Figure 2–51. *Control panel connections to VM/SI 3000.*



SWITCHER CONTROL PANELS

CP 300 Series

Power supply requirements – A wall plug–in power supply is supplied with each 300 Series panel that will be used with 110 VAC 60 Hz power. Panels that are to be used in areas where 220VAC 50Hz power is the norm are not shipped with any power supply; the user in these areas must provide a source of regulated 5 VDC power to each panel. The power requirement is +5 VDC +/– 0.25 V at 600 mA. The power connector used on the 300 Series PC board is an RL11A (female) made by LZR Electronics; Thomson part no. 30–005724–007.

> Note: The PS 300 110/220 VAC Power Adaptor Kit provides all hardware needed to modify one CP 300 Series control panel for direct connection to a power line. See Appendix Q.

DIP switch settings – A DIP switch, accessible through an opening in the rear panel, must be set with switch 8 OFF when a 300 Series panel is used in a Jupiter system; the remaining seven switches are ignored. This sets the panel address to the one stored in PROM (which is stamped on the rear panel).

CP 300 24 X 1 Single Bus Control Panel

Installation is shown on page 2–45.

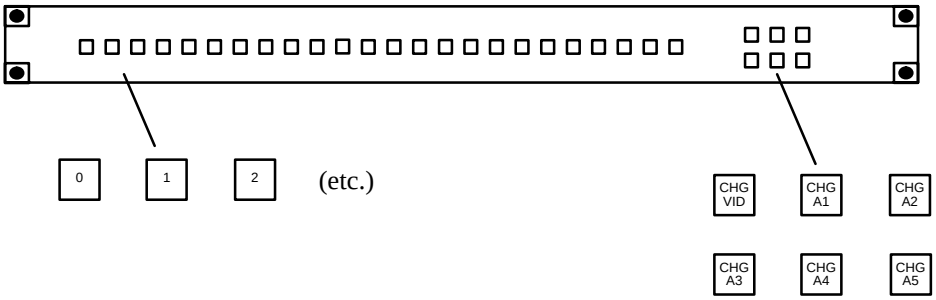


Figure 2–52. *CP 300 Control Panel (as supplied).*

The CP 300 is a single bus control panel that can select one of 24 inputs. The push buttons illuminate to indicate status and can be fitted by the user with transparent labels. The panel is shipped with input and level labels as shown in Figure 2–52—any other labels must be created by the user (please see page 2–72 for more information about installing labels).

The bus to be controlled is entered as the “Output Set” on the MPK Devices table (page 5–108). **Also entered on the MPK Device table is an Override Set for the panel; the Override Set (page 5–98) determines which button is assigned to which source.** The left–hand button of the CP 300 (the “0” button in Figure 2–52) will select the first input listed on the Override Set created and selected for this particular panel.

Six *Level* keys are provided on the right side of the panel for split (breakaway) switching and statusing.

For operating instructions, see page 6–1.

CP 310 24 X 8 Eight Bus Control Panel

Installation is shown on page 2–45.

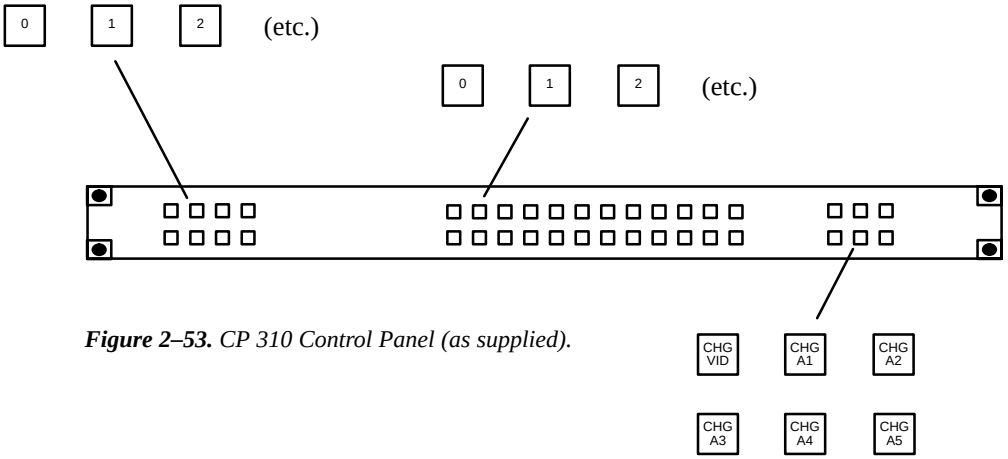


Figure 2–53. *CP 310 Control Panel (as supplied).*

The CP 310 Control Panel is very similar to the CP 300 Control Panel, except that eight buttons on the left side of the panel are used to control eight outputs. Refer to the CP 300 discussion (page 2–46) for installation instructions.

The buses to be controlled are listed in an “Output Set” (page 5–76); the name of the Output Set is entered on the MPK Devices table (page 5–108).

For operating instructions, see page 6–2.

CP 320 Push Button Control Panel

Installation of this panel is shown on page 2–45.

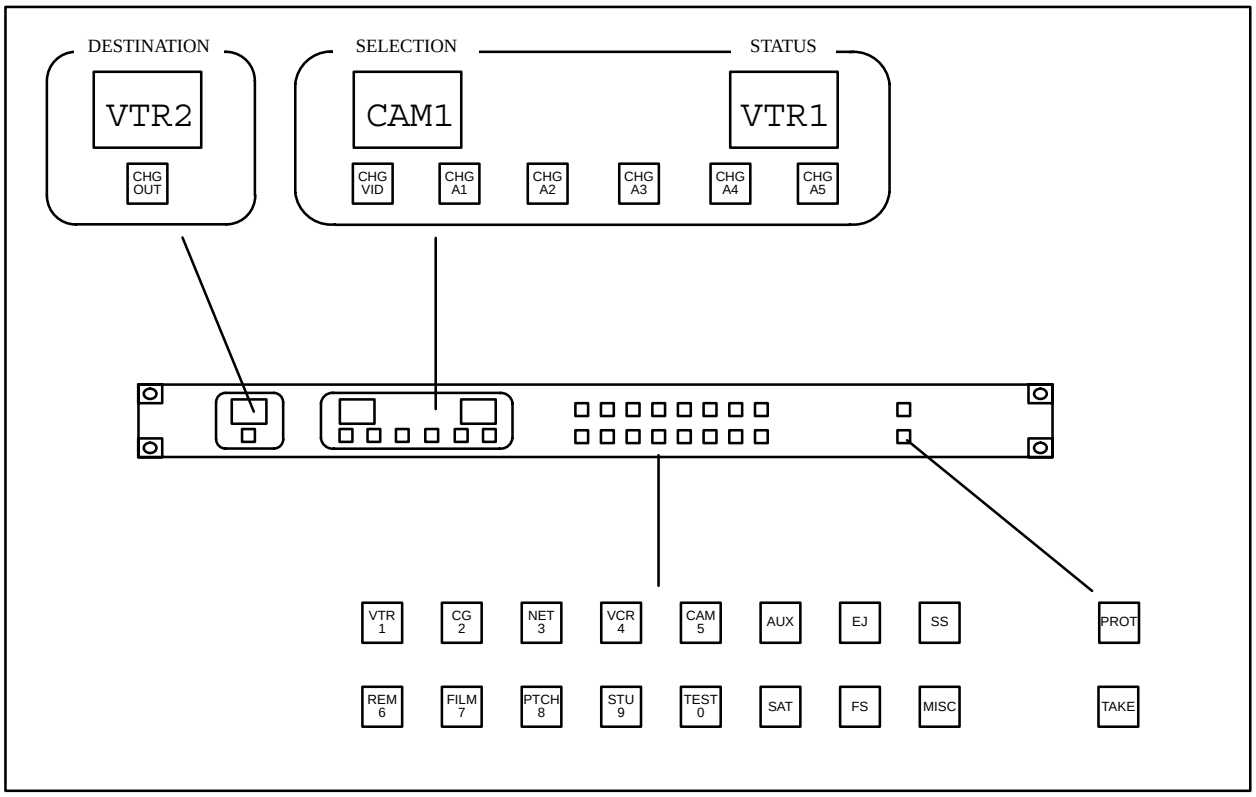


Figure 2–54. *CP 320 Push Button Control Panel (as supplied).*

The CP 320 is a full–matrix, category/number control panel. The left-most mnemonic display shows switcher destination (output being controlled), the center display shows the input category/number just selected, and the right indicates switcher status (input now switched to the destination shown).

Sixteen buttons in the center are labeled with input/output categories; this allows the first button press to designate the category and the second button press to designate the selection number. The factory–supplied categories (“VTR,” “CG,” etc.) can be changed by installing new labels (see page 2–72) and creating a custom category set (see Step 5 on page 5–62.)

Two buttons are located on the far right, the top button for protecting an input and the bottom button for performing a TAKE of the selected input/output. Buttons are also provided for changing the output to be controlled and for selection of specific levels (split switching).

The CP 320 panel is configured using the MPK Devices table (page 5–108). For operating instructions, see page 6–3.

CP 328 Push Button Control Panel

Hardware installation and operation of the CP 328 is the same as the CP 320. Software configuration is slightly different due to the eight–character display windows. See Step 10 on page 5–65.

CP 330 Control Panel

Installation of this panel is shown on page 2–45.

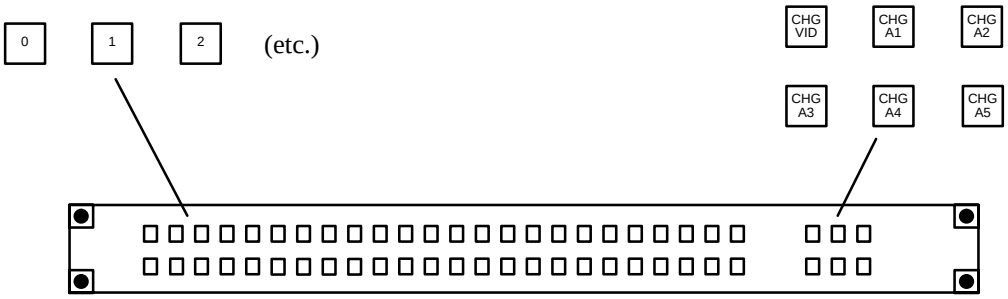


Figure 2–55. *CP–330 Control Panel (as supplied).*

The CP 330 can be configured to operate as a 48 x 1 panel, or, as a 24 x 2 panel with the top row of buttons assigned to one output and the bottom row to another.

Installation is very similar to the CP 300 (page 2–46). However, for the 24 x 2 application, on the MPK Devices table, a “Y” is entered in the Expansion Panel column, and, the entry in the Output Set column is the name of an actual Output Set. This Output Set must show the names of the two destinations.

For operating instructions, see page 6–1.

CP 330/6 48 x 6 Six Bus Control Panel

Installation of this panel is shown on page 2–45.

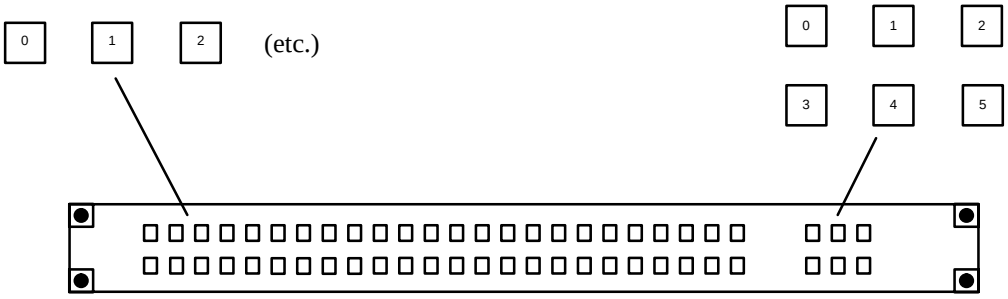


Figure 2–56. *CP–330/6 Control Panel (as supplied).*

The CP 330/6 Control Panel is very similar to the CP 300 Control Panel, except that six buttons on the right side of the panel are used to control six outputs. Refer to the CP 300 discussion (page 2–46) for installation instructions.

The buses to be controlled are listed in an “Output Set” (page 5–76); the name of the Output Set is entered on the MPK Devices table (page 5–108).

For operating instructions, see page 6–5.

CP 3000 Switcher Control Panel and CP 3010 Expansion Panel

Installation of these panels is shown on page 2–45.

The basic control panel, referred to as the CP 3000, can be configured for single–bus operation (allowing selection of a source for one destination), multi–bus operation (allowing selection of a source for several destinations), or full matrix operation (selection of a source for any destination). This panel can be arranged to select one of 20 source categories (VTR, CAM, etc.) and then, using a 10–key pad, a unit within the category. Crosspoint status is provided by the display window. Additional push buttons provide breakaway (control of individual switcher levels such as left audio, time code, etc), chop, lock, protect, and override switching. A password can be assigned to the panel if desired.

The CP 3000 can also be operated in connection with an adjacent CP 3010 expansion panel (see Figure 2–58). For multi–bus control the desired source can be selected on the CP 3000; the CP 3010 would then display the names of eight destinations, beneath which are eight corresponding TAKE keys; one of these would be pressed to complete the switch. The page of eight destinations can be scrolled to display up to 160 possible destinations. A blank panel is supplied when the CP 3000 is mounted without a CP 3010.

> Note: The original version of the CP 3000 panel can now be retrofitted in the field with re–legendable keys, using the CP 3000RBK Relegendable Button Kit, part no. 44–046025–001.

The CP 3000/3010 panels are configured using the MPK Devices table (page 5–108).

For operating instructions, see page 6–7.

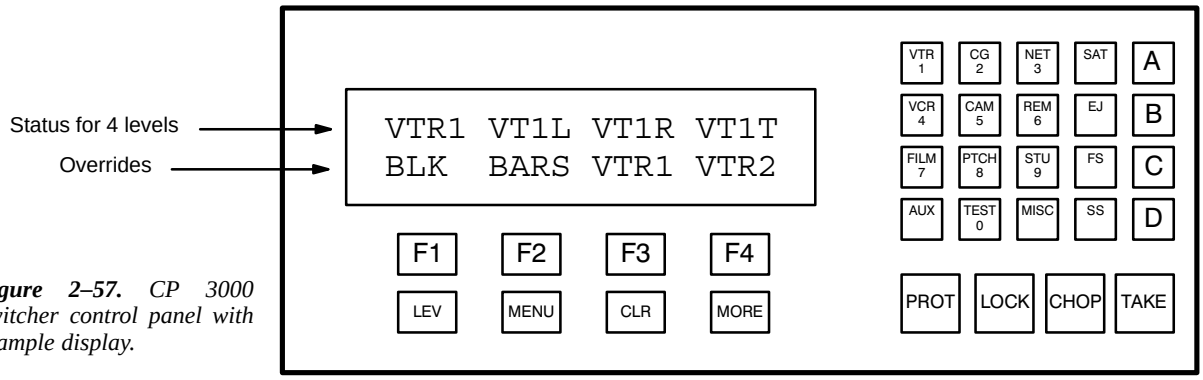


Figure 2–57. *CP 3000 Switcher control panel with example display.*

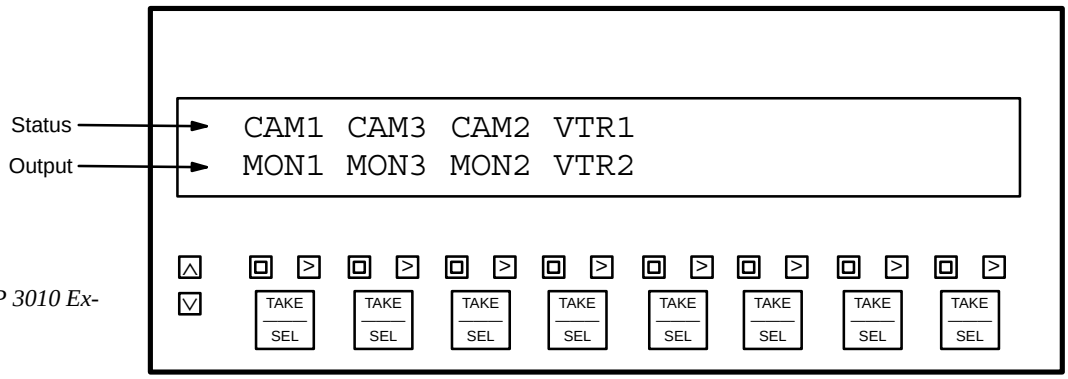


Figure 2–58. *CP 3010 Expansion panel.*

CP 3020 Push Button Control Panel

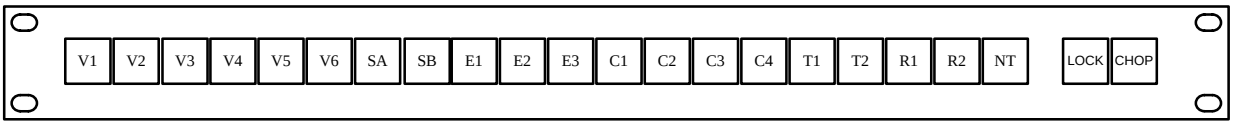


Figure 2–59. *CP 3020 Push Button Control Panel with example labels.*

Installation of this panel is shown on page 2–45.

The CP 3020 is a single–bus control panel that can select one of 20 inputs. The push buttons illuminate to indicate status and can be fitted by the user with transparent labels. The panel is shipped with "Lock" and "Chop" labels and a general purpose "0–99" label set—any other labels must be created by the user (please see page 2–72 for more information about installing labels).

The logical name of the switcher bus (output) that is to be controlled is entered in the "OutSet" column on the MPK Devices Table (page 5–108). **Also entered on the MPK Device table is an Override Set for the panel; the Override Set (page 5–98) determines which button is assigned to which source.** The left–hand button of the CP 3020 (the "V1" button in Figure 2–59) will select the first input listed on the Override Set created and selected for this particular panel.

For operating instructions, see page 6–26.

CP 3021 Push Button Expansion Panel

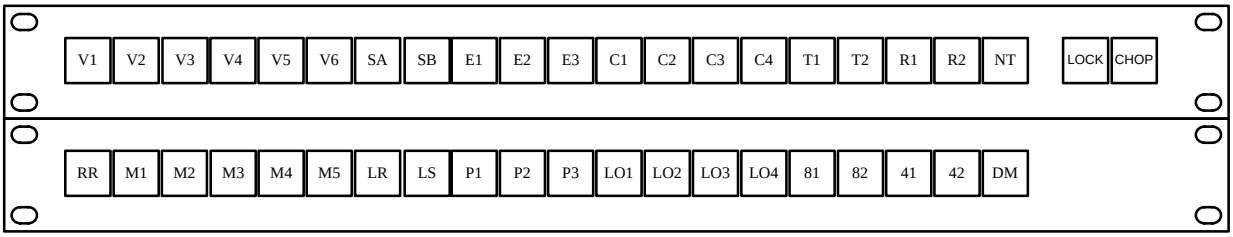


Figure 2–60. *CP 3020 Push Button Control Panel with CP 3021 Push Button Expansion Panel with example labels.*

Up to four CP 3021 Push Button Expansion panels can be added to the CP 3020, allowing button–per–input selection of up to 100 inputs. Each CP 3021 is supplied with a 12–inch (305 mm) ribbon cable with installed 37–pin connectors; the cables loop through each expansion unit.

The left–hand button of the CP 3020 (the "V1" button in Figure 2–60) will select the first input listed on the Override Set created and selected for this particular CP 3020. The left–hand button of the first CP 3021 on the ribbon wire bus (the "M1" button in this example) will select the 21st input listed, etc.

> Note: The "remote" connector of the CP 3020 **must** be connected to the "input" connector of the first CP 3021; the "output" connector of that CP 3021 must be connected to the "input" connector of the next CP 3021, etc.

CP 3800 Eight Character Control Panel

Installation of this panel is shown on page 2–45.

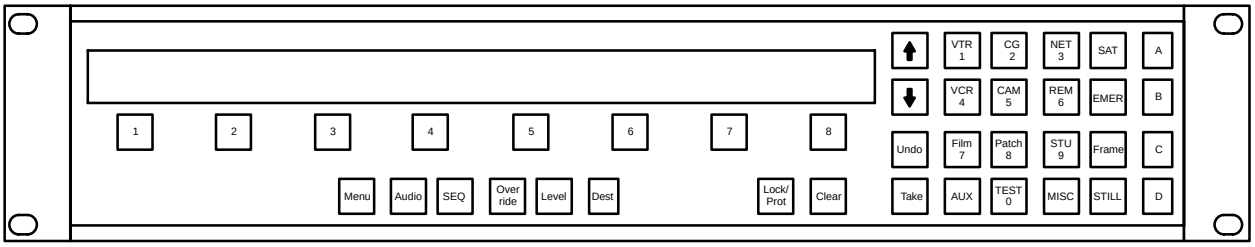


Figure 2–61.

The CP 3800 is a universal, eight–character mnemonic, switcher and machine control panel.

Note: the CP 3800 cannot be run from an SC 3000. It can only be connected to a VM/SI 3000.

This control panel uses an eight–character “CP 3800” type CP Level Set (page 5–55), CP Input Set (page 5–58) and CP Output Set (page 5–76). These sets, and others, are assigned to the panel using the MPK Devices table (page 5–108). and if used for machine control, the Machine Control Devices table (page 5–141). It can also use custom CP Category Sets (page 5–104).

For operating instructions, see page 6–27.

CP 3808 Control Panel

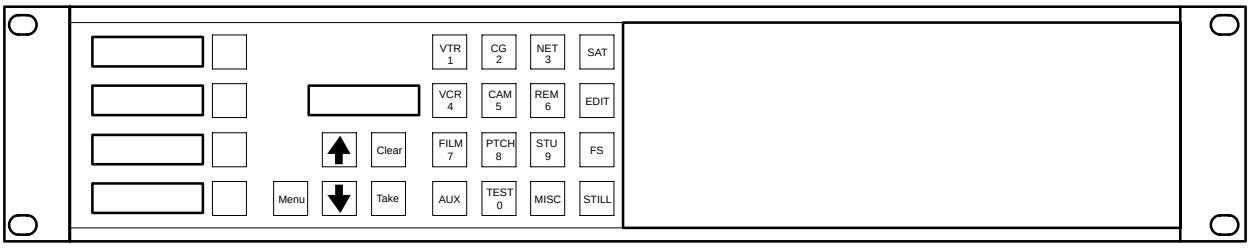


Figure 2–62. *CP 3808.*

The CP 3808 control panel is a 16–category, full–matrix,* multiple level breakaway panel capable of locking and protecting outputs. The panel features eight–character display capability and relegendable, lighted push buttons.

As an option, the CP 3808 can be operated in connection with an adjacent CP 3809 Expansion Panel (see page 2–56) or a CP 3810 Expansion Panel (see page 2–63).

Hardware installation

Installation of this panel is shown on page 2–45.

If desired, the panel hardware can be tested, and window/button brightness adjusted, without being connected to the controller board (VM/SI–3000). For more information, see Diagnostics Mode on page 6–71.

Software configuration

The CP 3808 panel can display eight–character mnemonics for inputs and outputs. To accomplish this create a CP Level Set of type “3800” (page 5–55), a CP Input Set of type “3808” (page 5–63), and a CP Output Set of type “3808” (page 5–80). These sets are among those assigned to each panel using the MPK Devices table (page 5–108).

Although the panel is capable of full–matrix operation, it can be restricted to control selected outputs, or even restricted to control of a single output if desired. Such restrictions are made using the MPK Devices table (page 5–113).

Since the keycaps are relegendable, the CP 3808’s CP Input and Output Sets can use a custom CP Category set (page 5–104).

Before the panel can be used, these sets must be compiled, and the appropriate configuration set made active using the Control Center (page 5–13).

Operation

For operating instructions, see page 6–64.

* Defined in Glossary Section

CP 3824 Control Panel

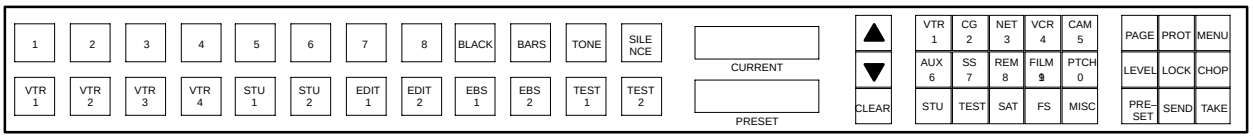


Figure 2–63. *CP 3824.*

The CP 3824 control panel is a locally–programmable, full–matrix,* multiple level breakaway panel capable of locking and protecting outputs. The panel features eight–character display capability and relegendable, lighted push buttons. The 24 button–per–source keys on the left side of the panel are initially assigned to inputs from the file server, but some or all can be re–assigned to new inputs at any time using only the panel itself. Sources can also be selected by scrolling up/down an LED display of “Preset” mnemonics or by using the Category/Number keypad.

Hardware installation

Installation of this panel is shown on page 2–45.

For information about changing keycap labels, see page 2–73.

If desired, the panel hardware can be tested, and window/button brightness adjusted, without being connected to the controller board (VM/SI 3000). For more information, see Diagnostics Mode on page 6–87.

Software configuration

The panel can display eight–character mnemonics for inputs and outputs. This is accomplished by creating a CP Level Set of type “3800” (page 5–55), a CP Input Set of type “3824” (page 5–63), and a CP Output Set of type “3824” (page 5–80). These sets are among those assigned to each panel using the MPK Devices table (page 5–108). Also entered on the MPK Device table is an Override Set for the panel (page 5–98); this set determines which of the 24 button–per–source buttons is assigned to which source. The upper left–hand button of the CP 3824 (the “1” button in Figure 2–63) will select the first input listed on the Override Set created and selected for this particular panel.

Although the panel is capable of full–matrix operation, it can be restricted to control selected outputs, or even restricted to control of a single output if desired. Such restrictions are made using the MPK Devices table (page 5–113).

Since the keycaps are relegendable, the CP 3824’s CP Input and Output Sets can use a custom CP Category set (page 5–104).

Before the panel can be used, these sets must be compiled, and the appropriate configuration set made active using the Control Center (page 5–13).

Operation

For operating instructions, see page 6–76.

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* Defined in Glossary Section

CP 3830 Control Panel

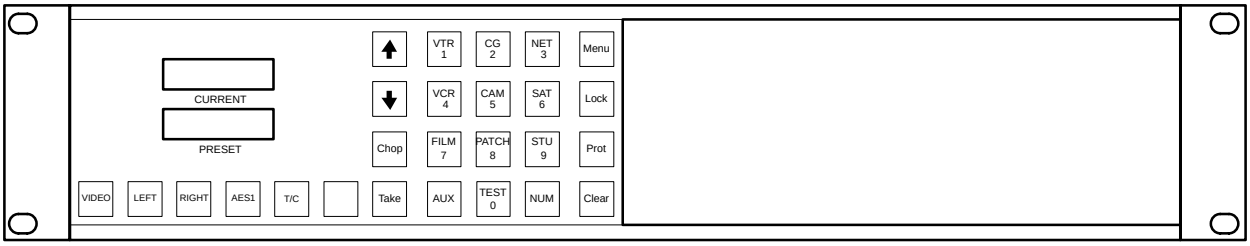

Figure 2–64. *CP 3830.*

The CP 3830 Control Panel is a 12–category, full–matrix,* multiple–level* breakaway* panel which is capable of locking,* protecting,* and chopping* outputs. The panel features eight–character display capability and relegendable, lighted push buttons.

As an option, the CP 3830 can be operated in connection with an adjacent CP 3809 Expansion Panel (see page 2–56) or a CP 3810 Expansion Panel (see page 2–63).

Dual CP 3830 panels can be configured so that one of the panels is always used for destination selection (see page 5–132). Dual output mode is also possible with two panels side by side.

Hardware installation

Installation of this panel is shown on page 2–45.

If desired, the panel hardware can be tested, and window/button brightness adjusted, without being connected to the controller board (VM/SI–3000). For more information, see Diagnostics Mode on page 6–87.

Software configuration

The panel can display eight–character mnemonics for inputs and outputs. To accomplish this, create a CP Level Set of type “3800” (page 5–55), a CP Input Set of type “3830” (page 5–63), and a CP Output Set of type “3830” (page 5–80). These sets are among those assigned to each panel using the MPK Devices table (page 5–108).

Although the panel is capable of full–matrix operation, it can be restricted to control of selected outputs, or even restricted to control a single output if desired. Such restrictions are made using the MPK Devices table (page 5–113).

Since the keycaps are relegendable, the CP 3830’s CP Input and Output Sets can use a custom CP Category set (page 5–104).

Before the panel can be used, these sets must be compiled, and the appropriate configuration set made active using the Control Center (page 5–13).

Operation

For operating instructions, see page 6–88.

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* Defined in Glossary Section

CP 3830P *(CP 3830 with automatic preview)*

The CP 3830 can be configured to control two outputs with the second output used for preview. In this mode, the panel is referred to as a "CP 3830P." To take full advantage of this capability, a video preview monitor should be located near the panel. Note: The CP 3830P cannot be operated with an expansion panel.

The CP 3830P panel uses a CP Level Set of type "3800" (page 5–55), a CP Input Set of type "3830" (page 5–63), and a CP Output Set of type "3830" (page 5–80). These sets are among those assigned to each panel using the MPK Devices table (page 5–108); where the panel is identified as a CP 3830 type "P."

For operating instructions, see page 6–88.

CP 3809 Expansion Panel

Up to five optional CP 3809 panels can be associated with a CP 3808 or CP 3830 (but not CP 3830P), providing direct switching and continuous status for up to 40 outputs.

Figure 2–65 illustrates a CP 3808 with a CP 3809 array for control of 24 outputs.

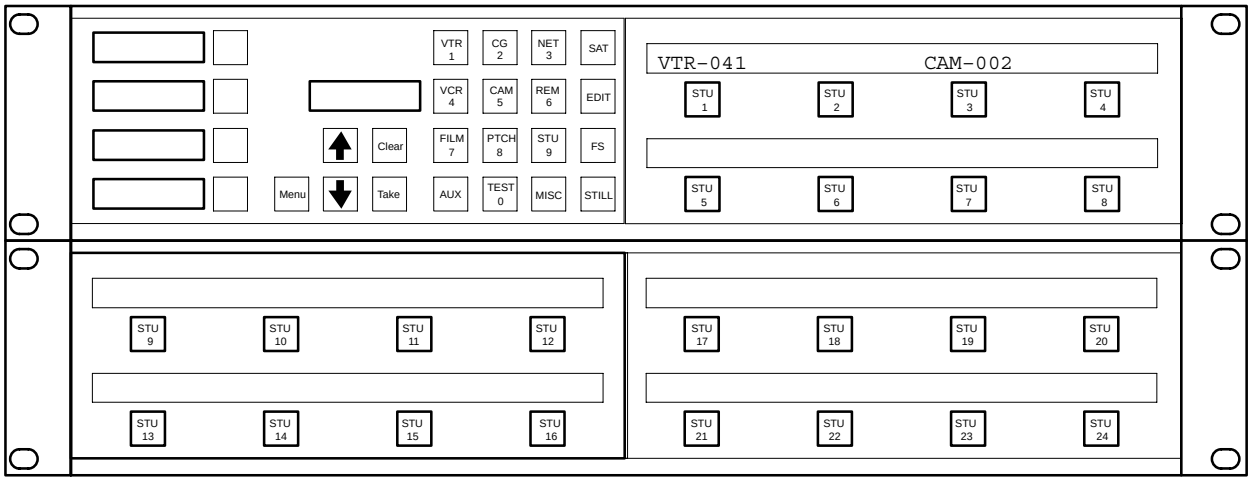


Figure 2–65. *CP 3808/E (top) with CP 3809/2 Dual Expansion Panel (below).*

Hardware installation

Installation of this panel is shown on page 2–45. Note that each CP 3809 Expansion panel requires a separate MPK connection.

If desired, the panel hardware can be tested, and window/button brightness adjusted, without being connected to the controller board (VM/SI–3000). For more information, see Diagnostics Mode on page 6–125.

Software configuration

Each CP 3809 Expansion panel requires a separate entry on the MPK Devices table. See "Out Panel" on page 5–109.

The MPK Devices table entry for the main panel (CP 3808 or CP 3830) must have a check mark in the “Expansion” box. The MPK Devices table entry for the CP 3809(s) must *not* have a check mark. See “Expansion” on page 5–110.

> Note: The MPK Devices table entry for the CP 3809 must identify the associated CP 3808 or CP 3830 in the *Out Panel* column. See page 5–112.

The CP 3809 Expansion Panel keys are assigned to outputs using the CP Output table (page 5–76). Buttons that are left unassigned can be assigned dynamically by the operator (page 6–124).

Operation

For operating instructions, see page 6–124.

CP 3832 Control Panel

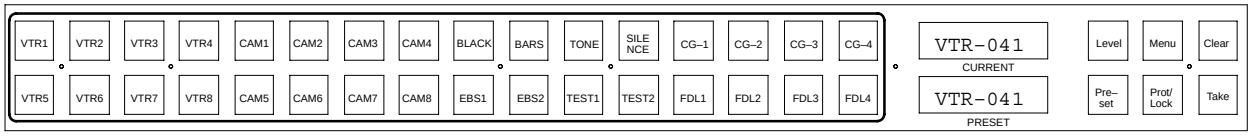


Figure 2–66. *CP 3832.*

The CP 3832 is a multiple–level* breakaway* panel which is capable of locking,* and protecting* outputs. The panel features eight–character display capability and relegendable, lighted push buttons.

The panel can be configured as a 32 x 1 single bus panel (Figure 2–67), as a 16 x 16 “balanced split” panel (Figure 2–68), or as some variation of an “unbalanced split” panel (Figure 2–69).

The panel can also be configured as a type “CP 3832L,” in which the right–hand group of six buttons are used for level selection and the panel operates in “sticky levels”* mode. In this case, the “Level” button shown in Figure 2–66 is used to access the first level in the panel’s Level Set (typically video), the “Menu” button is used for the second level (e.g., left audio), etc.

Both the CP 3832 and the CP 3832L can be configured as a 32 x 1 single bus panel (Figure 2–67), as a 16 x 16 “balanced split” panel (Figure 2–68), or as some variation of an “unbalanced split” panel (Figure 2–69).

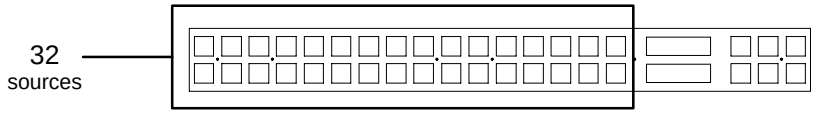


Figure 2–67. *Single–bus configuration.*

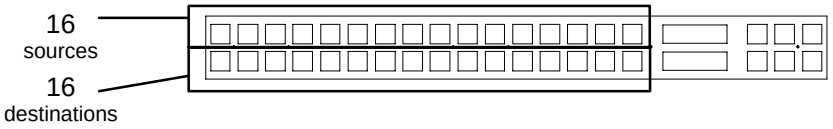


Figure 2–68. *“Balanced split” configuration.*

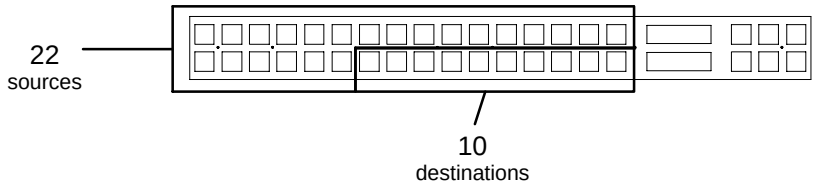


Figure 2–69. *Example of “unbalanced split” configuration (22 x 10).*

Unbalanced split panels can be configured to control from 1 to 15 outputs, with keys not used for outputs available to control inputs. For example, if 10 buttons are assigned to outputs then 22 buttons are available for inputs.

Control of additional inputs/outputs is possible using adjacent CP 3832 or CP 3864 expansion panels (page 2–62); the CP 3832 can be also be operated in connection with an adjacent CP 3810 Expansion Panel (see page 2–63).

> Note: The CP 3832/3864 **cannot be used with an expansion panel** if the panel is configured 1) in an unbalanced split configuration, or 2) in full–time Preview mode (that is, as a “CP 3832P” or “CP 3864P,”or 3) as a CP 3832L.

* Defined in Glossary Section

Hardware Installation

Installation of this panel is shown on page 2–45.

If desired, the panel hardware can be tested, and window/button brightness adjusted, without being connected to the controller board (such as a VM/SI 3000). For more information, see Diagnostics Mode on page 6–112.

Software Configuration

The panel uses an eight–character CP Level Set of type “3800” (page 5–55).

MPK table entries will depend on the application (see page 5–108).

Sources are defined in a CP Input Set of type “cp3832” (page 5–58). Destinations are defined in a CP Output Set of type “cp3832” (page 5–76).

Before the panel can be used, these sets must be compiled, and the appropriate configuration set made active using the Control Center (page 5–13).

For CP 3832 operating instructions, see page 6–100.

For CP 3832L operating instructions, see page 6–117.

CP 3864 Control Panel

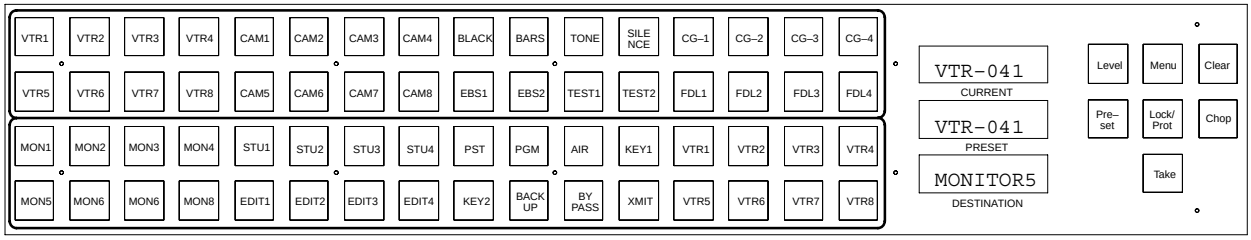


Figure 2–70. *CP 3864.*

The CP 3864 is a multiple–level* breakaway* panel which is capable of locking,* protecting,* and chopping* outputs. The panel features eight–character display capability and relegendable, lighted push buttons.

The panel can also be configured as a type “CP 3864L,” in which the upper right–hand group of six buttons are used for level selection and the panel operates in “sticky levels”* mode. In this case, the “Level” button shown in Figure 2–70 is used to access the first level in the panel’s Level Set (typically video), the “Menu” button is used for the second level (e.g., left audio), etc. The Take button is used as a Protect key.

The CP 3864 Control Panel can be configured as a 64 x 1 single bus (Figure 2–71), as a 32 x 32 “balanced split” panel (Figure 2–72), or as some variation of an “unbalanced split” panel (Figure 2–73).

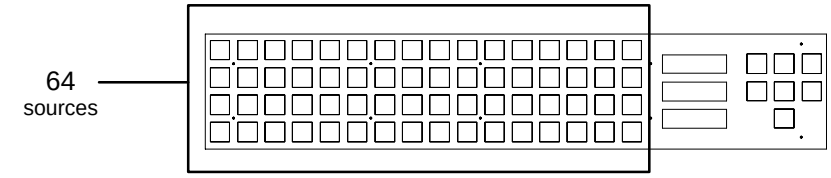


Figure 2–71. *Single–bus configuration.*

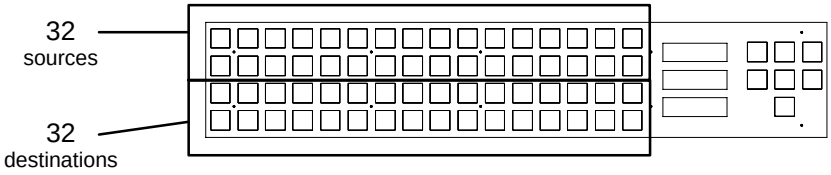


Figure 2–72. *“Balanced split” configuration.*

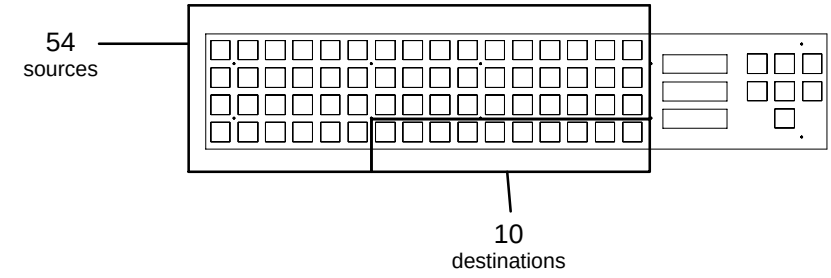


Figure 2–73. *Example of “unbalanced split” configuration (54 x 10) .*

* Defined in Glossary Section

Unbalanced split panels can be configured to control from 1 to 31 outputs, with keys not used for outputs available to control inputs. For example, if 10 buttons are assigned to outputs then 54 buttons are available for inputs.

Except for unbalanced split and CP 3864L configurations, control of additional inputs/outputs is possible using adjacent CP 3864 or CP 3832 panels (page 2–62); as another alternative, the CP 3864 can be operated in connection with an adjacent CP 3810 Expansion Panel (see page 2–63).

Hardware Installation

Installation of this panel is shown on page 2–45.

If desired, the panel hardware can be tested, and window/button brightness adjusted, without being connected to the controller board (such as a VM/SI–3000). For more information, see Diagnostics Mode on page 6–112.

Software Configuration

The panel uses an eight–character CP Level Set of type “3800” (page 5–55).

MPK table entries will depend on the application (see page 5–108).

Sources are defined in a CP Input Set of type “cp3832” (page 5–58). Destinations are defined in a CP Output Set of type “cp3832” (page 5–76).

Before the panel can be used, these sets must be compiled, and the appropriate configuration set made active using the Control Center (page 5–13).

For CP 3864 operating instructions, see page 6–26.

For CP 3864L operating instructions, see page 6–117.

Source/Destination Expansion

The CP 3832 and CP 3864 can be combined to increase the number of sources and destinations to a maximum of 128 x 128. Examples are shown in Figure 2–74.

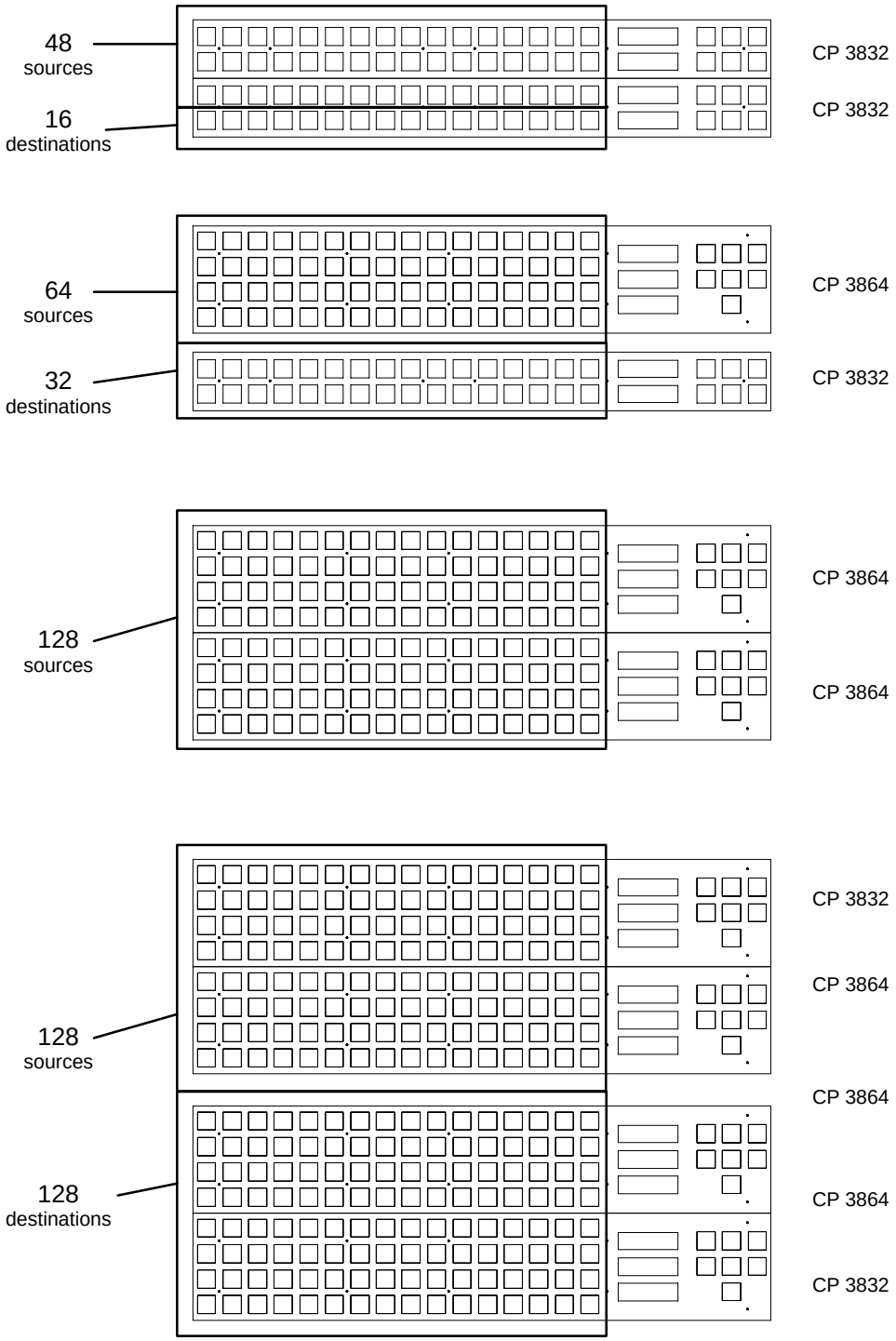


Figure 2–74.

CP 3810 Panel

The optional CP 3810 panel can be associated with a CP 3832, CP 3864, CP 3808, or CP 3830, providing control of up to 80 outputs. The CP 3810 can also be assigned to one output, providing breakaway (split) switching and/or multi–level status.

Figure 2–75 illustrates a CP 3810 with a CP 3832 panel.

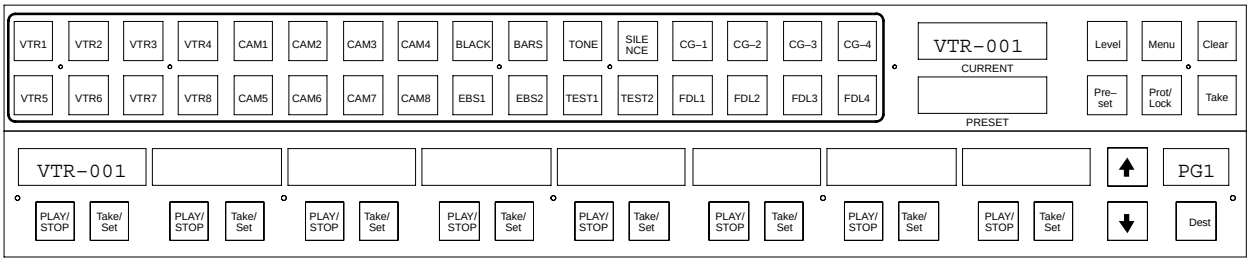


Figure 2–75. *CP 3832 (top) with CP 3810 Expansion Panel (below).*

The CP 3810 can be operated in several modes:

— For multi–bus control the destination can be selected on the CP 3810 and the desired source can be selected on the main panel (CP 3832, CP 3864, CP 3808, or CP 3830). The CP 3810 can display the names of eight destinations. The “page” of eight destinations can be scrolled to display up to 80 possible destinations.

— For single–destination applications, the panel can be configured as a “CP 3810L” and operated with a main panel or as a stand–alone unit:

- When used with a main panel, the desired destination can be selected on the main panel; the CP 3810 will display the status of eight levels. The “page” of eight levels can be scrolled to display additional levels. A breakaway switch can be set up and executed with a single Take command.

- When used as a stand–alone status panel, the desired destination is permanently entered on the MPK table (see Software Configuration below). The CP 3810 will display the status of eight levels. The “page” of eight levels can be scrolled to display additional levels.

— The CP 3810 can also be used as a limited–function machine control panel, providing Play and Stop commands for VTRs.

— Alternatively, it can be configured as a “CP 3810S,” meaning that the selected outputs will remain selected until explicitly changed by the operator.

Hardware Installation

Installation of this panel is shown on page 2–45. Note that each CP 3810 panel requires a separate MPK connection.

If desired, the panel hardware can be tested, and window/button brightness adjusted, without being connected to the controller board (VM/SI–3000). For more information, see Diagnostics Mode on page 6–130.

Software Configuration

Each CP 3810 panel requires a separate entry on the MPK Devices table. See page 5–108.

For multi–bus control, the CP 3810 Expansion Panel keys are assigned to outputs using the CP Output table (page 5–76).

When used as a machine control panel, the CP 3810 will require entry on the Machine Control table (page 5–141).

Operation

For operating instructions, see page 6–126.

INSTALLING MACHINE CONTROL PANELS

MC 3000 Machine Control Panel and CP 3010 Expansion Panel

Installation of these panels is shown on page 2–45.

The MC 3000 machine control panel includes a series of push buttons for motion control (PLAY, STOP, etc.). A variable speed knob, with a color–coded direction/speed indicator, is also included.

The machine to be operated can be selected using the adjacent CP 3010 expansion panel (Figure 2–77), which can display the names of eight machines over a row of selection buttons. Additional pages of eight machines can be called up for display in the window as required. The method by which machines are assigned to the CP 3010 is described in detail later in this manual (see *Assigning Machines to Control Panels* on page 5–151). The CP 3010 can also be used as a limited–function machine control panel, providing Start and Stop commands for VTRs.

The panels must be entered on the Machine Control Devices table (page 5–141) and the MPK Devices table (page 5–108). For operating instructions, please see page 6–132.

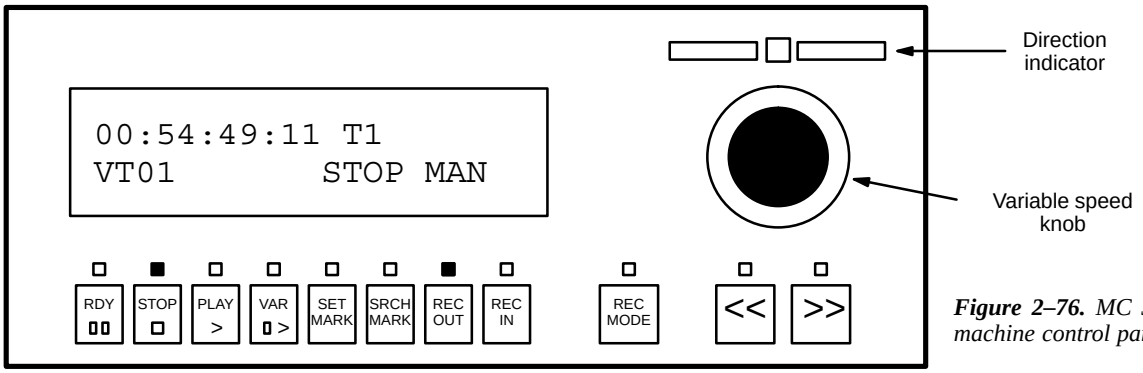


Figure 2–76. *MC 3000 machine control panel.*

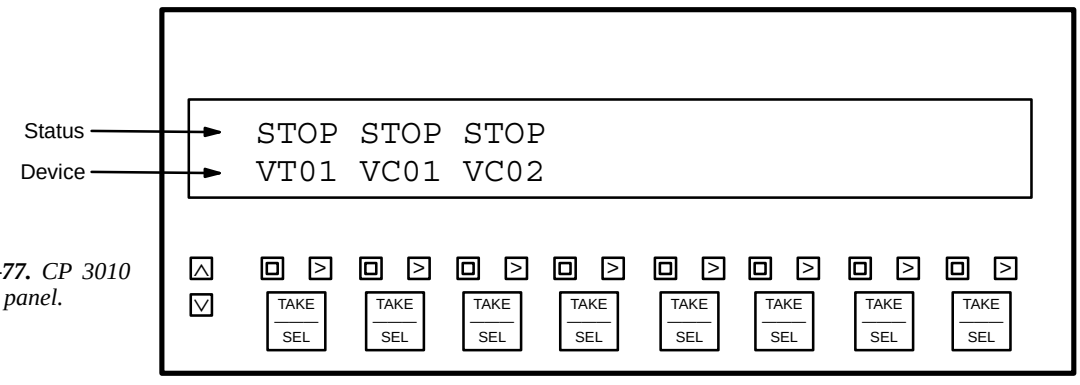


Figure 2–77. *CP 3010 expansion panel.*

MC 3010 Machine Control Panel

The MC 3010/2 version of this panel is shown in Figure 2–78; installation is shown on page 2–45.

The MC 3010 is used to control four (MC 3010/1 version) or eight (MC 3010/2 version) tape machines. The display window shows the name of the machine presently linked to the button group immediately below. Lighted, re–legendable push buttons are provided for motion control and status.

A special feature of the panel is the GANG START key, which allows a command to be sent to multiple machines simultaneously.

The method by which machines are assigned to the MC 3010 is described in detail later in this manual (see *Assigning Machines to Control Panels* on page 5–151).

The panel must be entered on the Machine Control Devices table (page 5–141) and the MPK Devices table (page 5–108). For operating instructions, please see page 6–135.

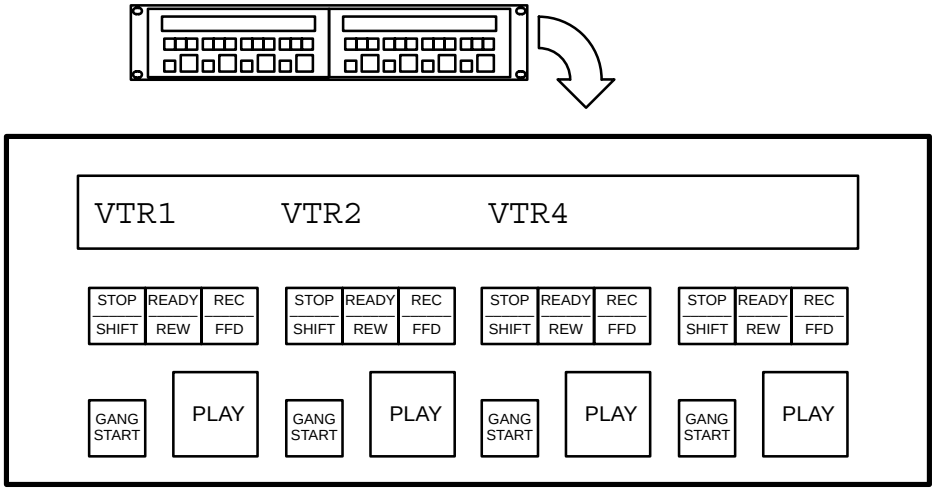


Figure 2–78. *MC 3010/2 Dual 4–Machine Control Panel.*

MC 3020L Linkage Panel

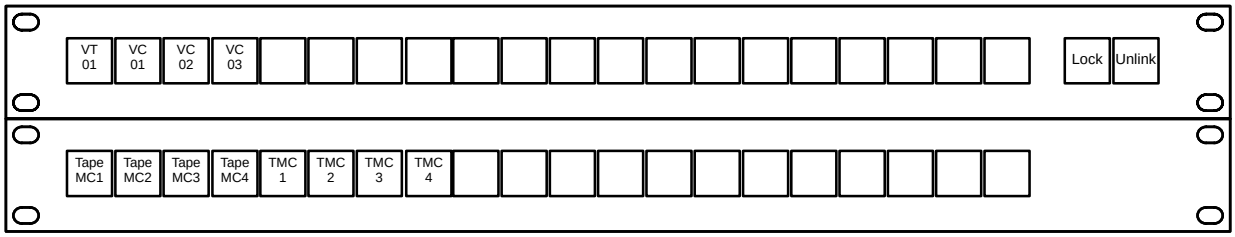


Figure 2–79. *MC 3020L Linkage Panel with CP 3021 Expansion Panel (example labels).*

The MC 3020L Linkage panel can be used to manually assign control of a particular machine to a button group of a particular control panel.

The push buttons illuminate when pressed and can be fitted by the user with transparent labels. The panel is shipped with “Lock” and “Unlink” labels and a general purpose “0–20” label set—any other labels must be created by the user (please see page 2–72 for more information about installing labels).

An installation example is shown on page 2–68; for configuration instructions, please see page 5–118.

For operating instructions, please see page 6–138.

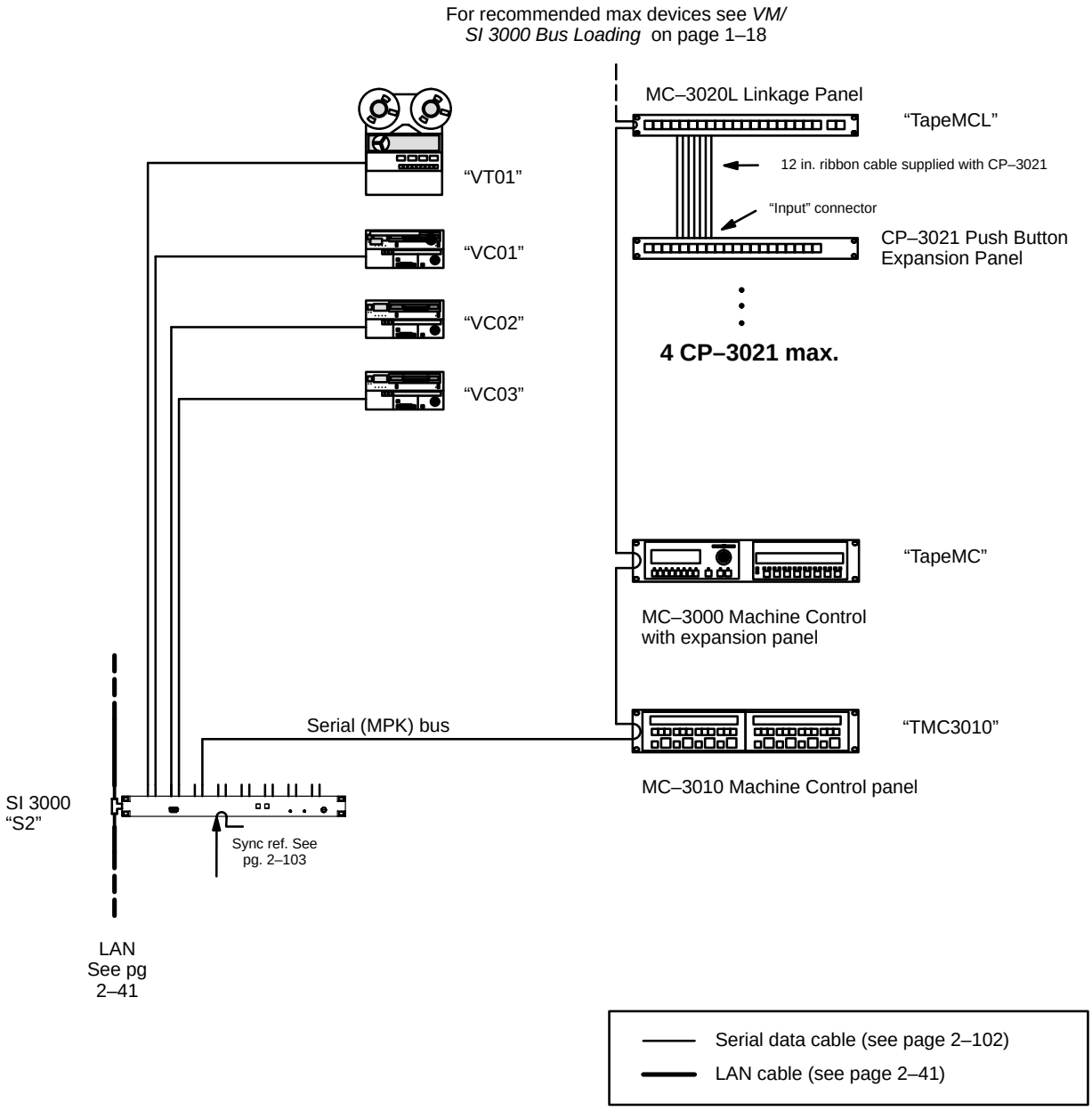


Figure 2–80. *MC–3020L Linkage Panel installation..*

MC 3020D Delegate Panel

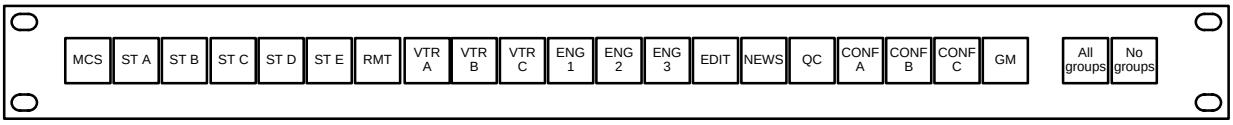


Figure 2–81. *MC 3020D Delegate Panel with example labels.*

The optional MC 3020D is used to delegate control of a machine to a single remote panel, a group of panels, multiple groups, or to all remote panels. The MC 3020D does not actually connect a control panel to a machine; rather, it ***allows*** the connection to be made to specific panels using the normal machine linkage procedures described on page 5–151. The advantage of the panel is that it prevents control of a machine being lost due to inadvertent linkage to another control panel. For example, once control of a VTR has been delegated to the Master Control room panel, it would not be possible for a panel in Studio A to take control.

The push buttons illuminate when pressed and can be fitted by the user with transparent labels. The panel is shipped with "All Groups / No Groups" labels and a general purpose "0–20" label set—any other labels must be created by the user (please see page 2–72 for more information about installing labels).

The MC 3020D can be installed in a panel–per–machine arrangement, with one panel dedicated to each machine; or, in a central control location. The central control arrangement requires the addition of one or more CP 3021 Expansion Panels.

Panel–per–machine arrangement

In this scheme, each MC 3020D is associated with a particular device to be controlled, such as a VTR. An installation example is shown in Figure 2–82. For configuration instructions, please see page 5–161.

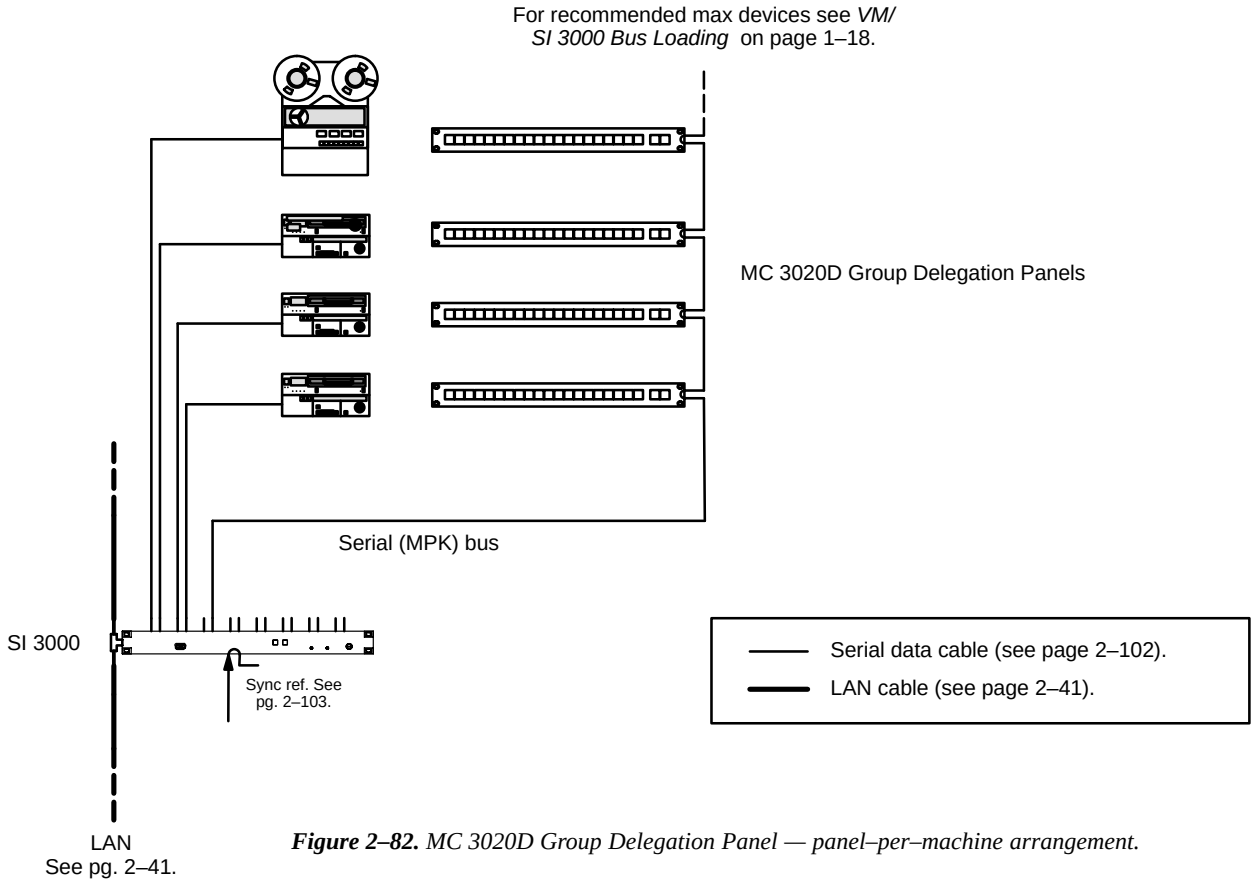


Figure 2–82. *MC 3020D Group Delegation Panel — panel–per–machine arrangement.*

MC 3020D Central Control Arrangement

In this scheme, a single MC 3020D is mounted next to one or more CP 3021 Expansion Panels. The operator first selects a delegation group (or groups), then a machine (or machines). With four expansion panels, up to 80 machines can be accommodated. An installation example is shown in Figure 2–84. For configuration instructions, please see page 5–161.

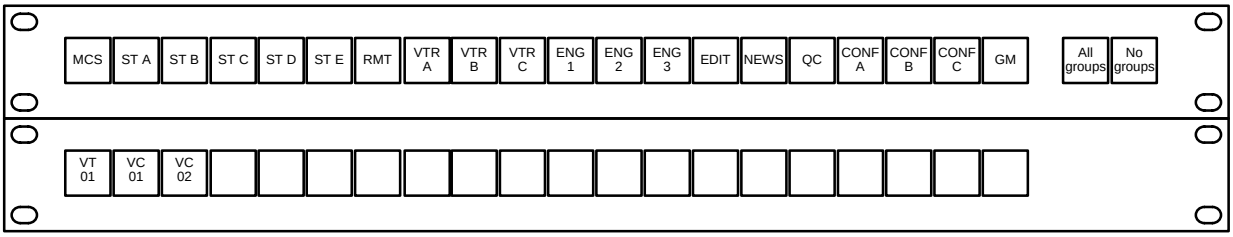


Figure 2–83. *MC 3020D Delegate Panel with CP 3021 Expansion Panel.*

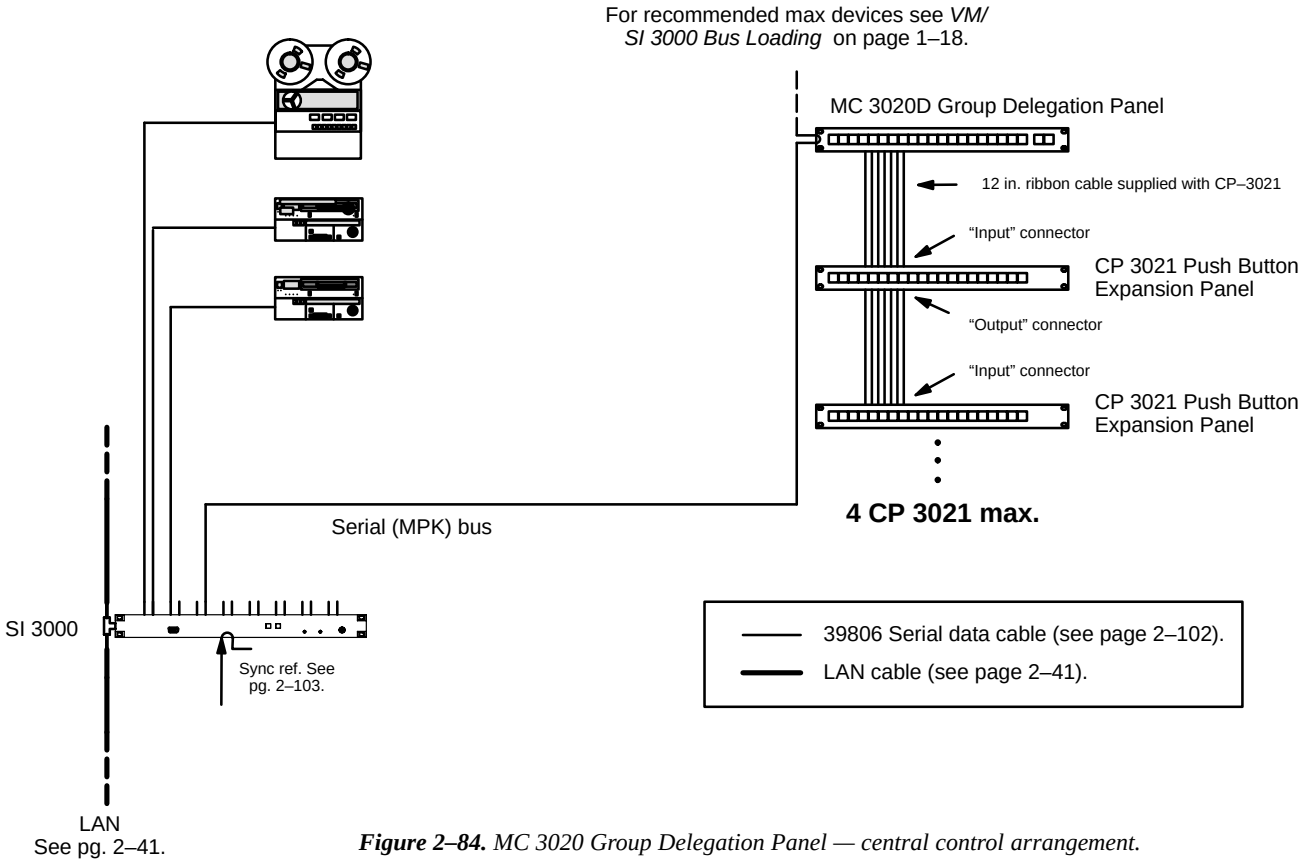


Figure 2–84. *MC 3020 Group Delegation Panel — central control arrangement.*

PREPARING AND INSTALLING BUTTON LABELS

CP 3020/1
MC 3020D/L
VC 3020

Button caps are removed using a small screwdriver (or a fingernail). Use the small slot between the clear cap and the black portion of the button; the slot can be found along the top or bottom of the button housing.

> Note: A good technique is to use a corner of the tip of the screwdriver and a fingernail in the same slot. Be prepared for the cap to come off suddenly!

The diffusing screen inside can be used as a size guide when creating the labels. For best results, the labels should be prepared as photographic transparencies (this service is available at any printing company using lithographic equipment). As an alternative, a photocopy machine that will make copies on transparent material can be used. Due to its opacity, bond paper for the labels is not recommended.

Replacing Button Bulbs

After removing the cap and diffuser, the bulb (which is an incandescent type) can be pulled straight out.

> **Important:** Use extreme care when removing bulbs so that they do not break in the socket. The recommended tool is a piece of heat shrink or other plastic tubing that will fit snugly on the bulb.

The Thomson part numbers for the bulbs are:

Button size	Thomson part no.	Manufacturer	Manufacturer part no.
0.7–inch	65–028985–005	Oshino Electric	OL–685BPE
0.45–inch	65–028985–007	Siemens	LY K380

When re–installing the cap, notice that the small slots used during removal must be on the top and bottom of the button or the cap will not snap into place properly.

CP 300 Series Control Panels

These panels are supplied with general purpose labels already installed. A sheet with additional labels is also provided, and with care, these labels can be substituted for those already installed. The button caps are most easily removed by pulling them straight off with needle nose pliers. Using needle–nose pliers will insure that only the transparent cap is removed. *Do not* pry off the entire button top assembly by using a screwdriver or similar tool; this will not provide access to the label. The existing label is held in place with adhesive; scrape off the label and replace it with the new one.

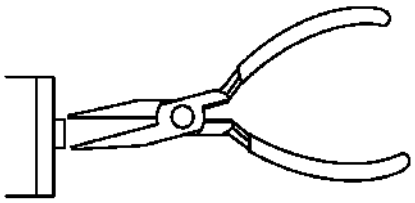


Figure 2–85.

CP 3800 Series Control Panels

These panels are supplied with general purpose labels already installed. A sheet with additional labels is also provided, and with care these labels can be substituted for those already installed. The button caps are most easily removed by pulling back the top edge with the finger tip (see Figure 2–86). For the black-edged buttons on the right side of the CP 3824, use a technique similar to that described above for the CP 3020.

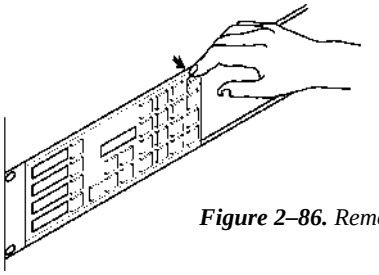


Figure 2–86. *Removing CP 3800 series keycaps.*

Testing Bulbs

CP/MC/VC 3020

To test the bulbs without sending any commands to the switcher or machines, use the pair of buttons on the right side of the main panel:

1. Press and hold the right–hand button of the pair, then press the left hand button of the pair.

   Both buttons will flash, showing that the panel is in test mode.

2. Press any other button to test the bulb.

   Bulbs on expansion panels can also be tested.

3. To exit the test mode, repeat step 1.

   The panel will return to its previous condition.

MC 3010

For MC 3010 diagnostics, please see page 6–137.

CP 300 / 3800 Series Panels

For lamp test information, please refer to Section 4 and the description of diagnostics for the particular panel.

ESBUS CONTROL PANELS

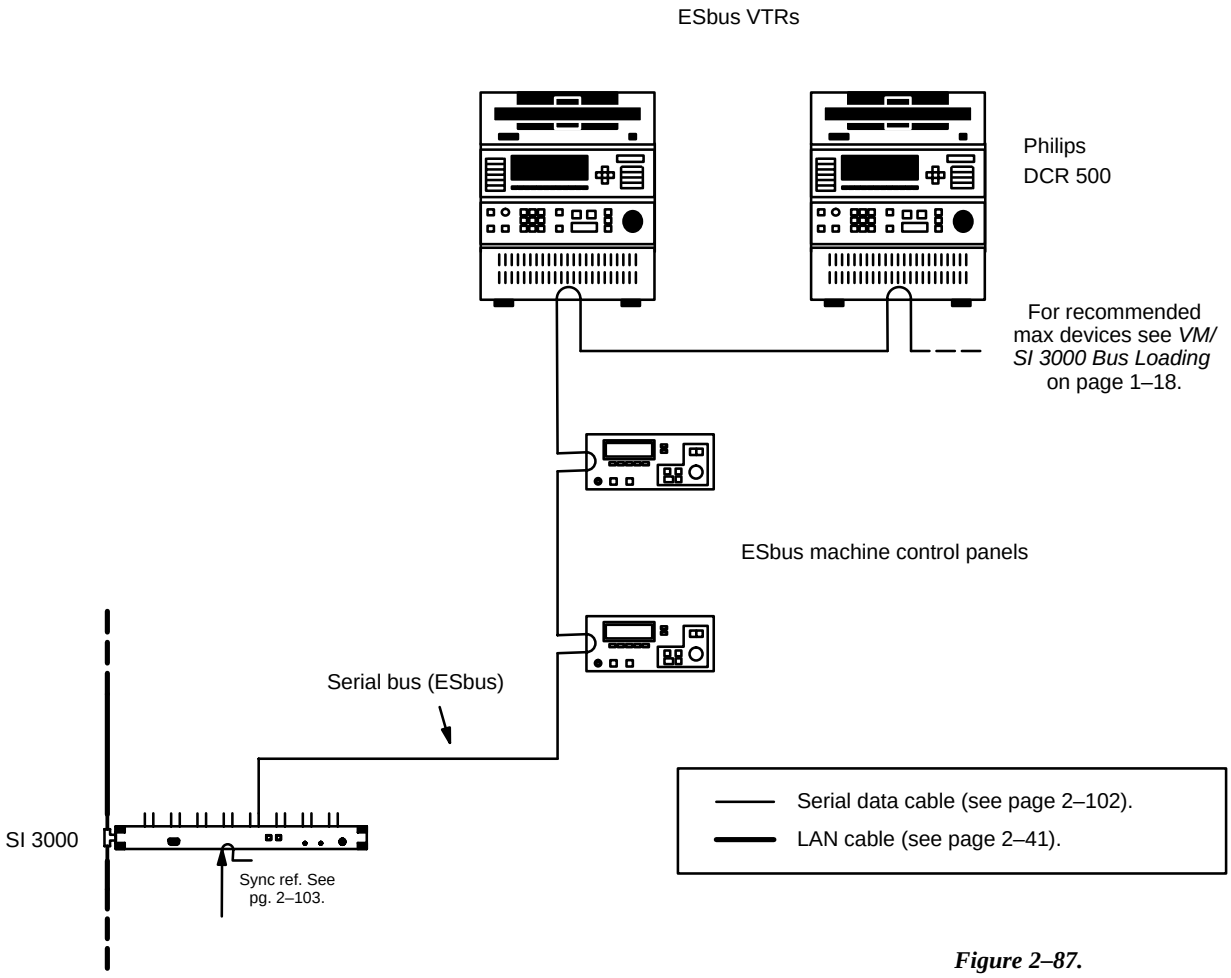


Figure 2–87.

CONNECTION TO THOMSON DD SERIES (“DIAMOND”)

An example of hardware connections are shown in Figure 2–88.

- The “Diamond protocol” cable to one of the DD serial ports is required for display of routing switcher status on the DD console. For cable pin–outs, see page 2–102.

- The “ASCII bus protocol” cable to the DD XBAR port is required if switch commands will be sent from the DD to Jupiter; for example, when a Venus router is used to provide additional AUX outputs for the DD, or used to provide Pre–Routing. For cable pin–outs, see Figure 2–89.

- If desired, an MPK control panel could be used for DD Pre–Routing. For cable pin–outs, see page 2–102.

“Diamond” and “ASCII” protocols are set on the Serial Protocol table (page 5–25); and the switcher is identified on the MPK Devices table (page 5–129).

Installation of MPK panels was discussed on page 2–46.

Refer to the DD installation manual for information about the Diamond serial ports and operating instructions.

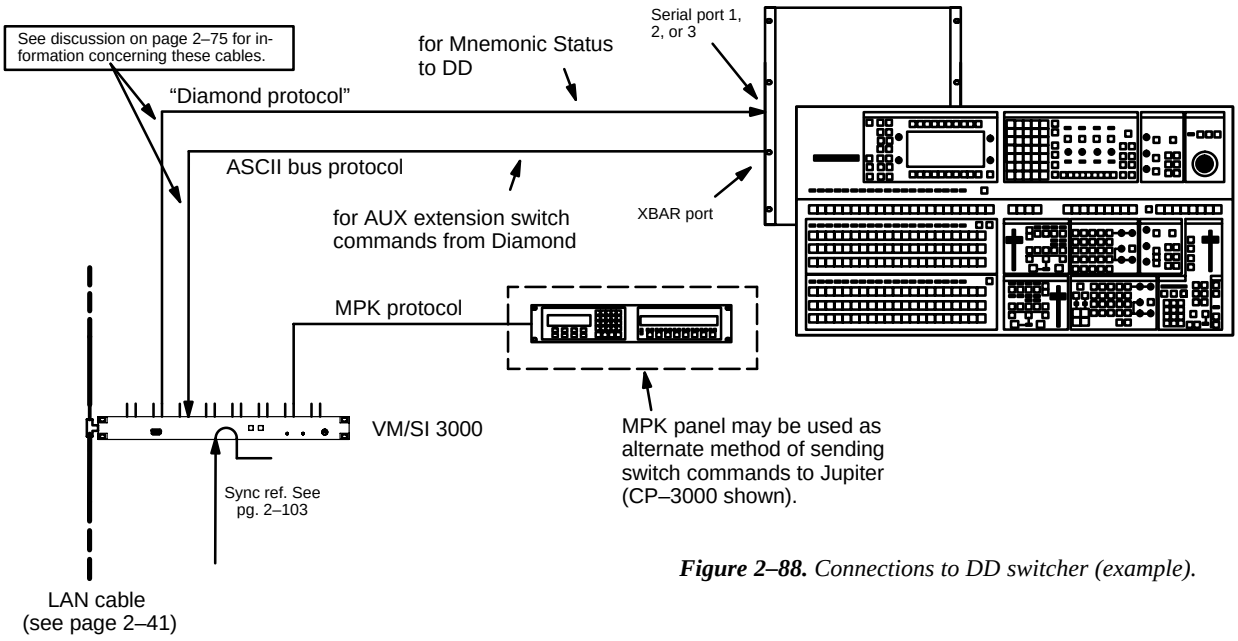
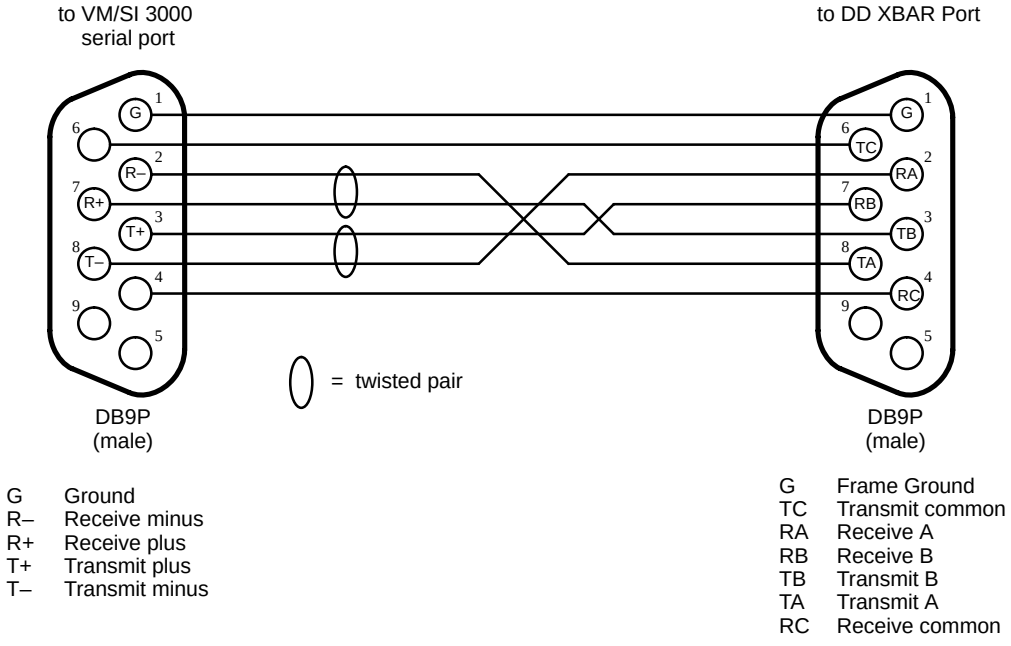


Figure 2–88. *Connections to DD switcher (example).*



G Ground
R– Receive minus
R+ Receive plus
T+ Transmit plus
T– Transmit minus

G Frame Ground
TC Transmit common
RA Receive A
RB Receive B
TB Transmit B
TA Transmit A
RC Receive common

Figure 2–89. *Cable for connecting VM/SI 3000 to Thomson DD XBAR Port.*

CONNECTION TO EXTERNAL SWITCHER CONTROL DEVICES

Thomson Broadcast Automation Systems

Note: This discussion applies to router control only. For information about connections to a Saturn Master Control switcher, please refer to the Saturn Installation and Operating manual.

Hardware connections are shown in Figure 2–90.

A ready–made cable, with installed 9–pin D and RJ45 male connectors, is available from Thomson. For those who wish to prepare their own cable, the pin–outs are shown on page 2–78. The cable itself should be Belden 8723 or equivalent.

Within the Thomson Automation MSL 4000 Server, the IFS 4 interface board will require a “BV” type PROM installed for the port that is connected to the VM/SI. For more information, refer to the installation instructions supplied with the MSL 4000.

For the VM/SI 3000, “ESswitch” protocol must be set on the Serial Protocol table (page 5–25). The baud rate must be set to match that being used by the IFS 4 port of the MSL 4000 (usually 9600).

The MSL 4000 Remote Program Controller is identified on the MPK Devices table (page 5–130). The MSL 4000 can use the same CP Level Set (type “CP3000”) that all the control panels use as long as the levels the Automation system needs to control are defined. CP Level Sets are discussed in detail starting on page 5–55. The MSL 4000 uses a “Serial” type CP Input Set (page 5–58) and a “Serial” type CP Output Set (page 5–76).

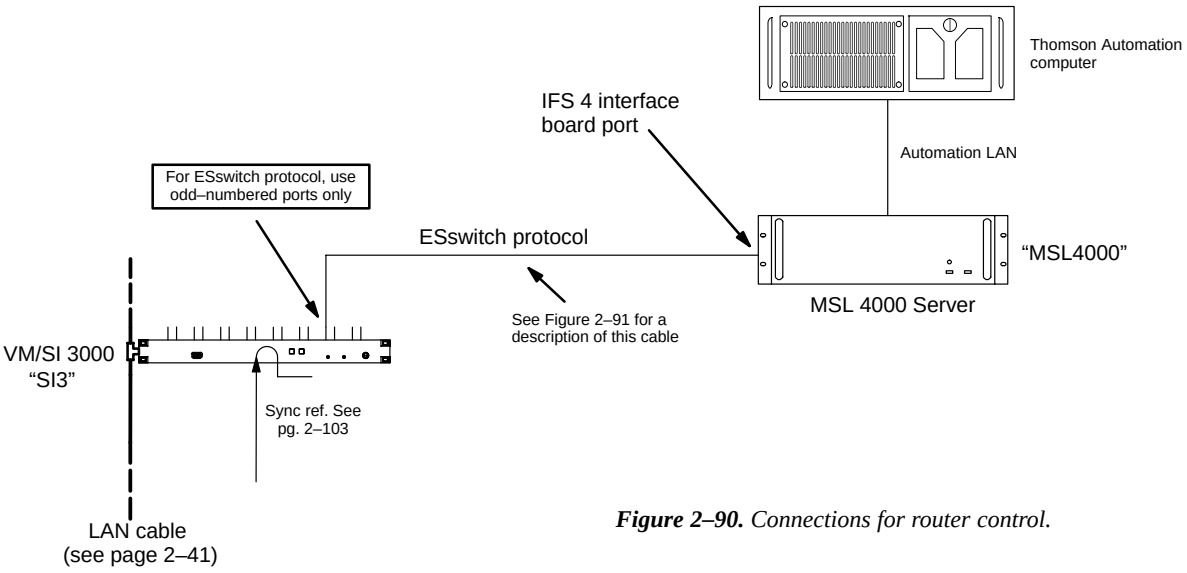


Figure 2–90. *Connections for router control.*

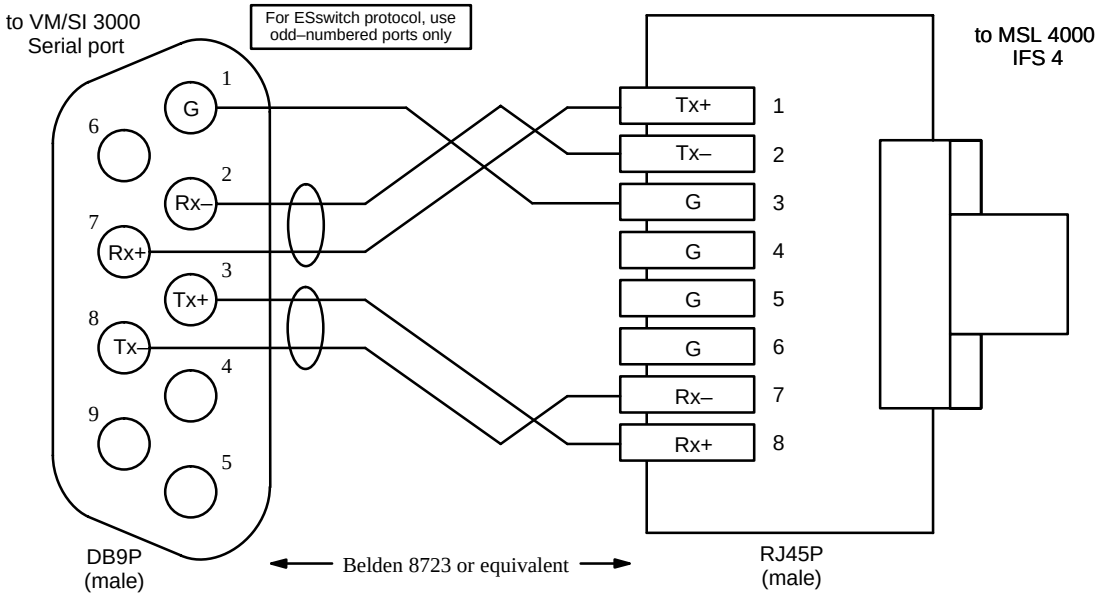


Figure 2–91. *Cable for connecting VM/SI 3000 to MSL 4000.*

Other Control Devices Using "ESswitch" Proposed ESbus Routing Switcher Dialect

Hardware connections are shown in Figure 2–92; "ESswitch" protocol is set on the Serial Protocol table (page 5–25); and the control computer is identified on the MPK Devices table (page 5–129). A technical description of the proposed dialect is available; please contact Thomson for more information.

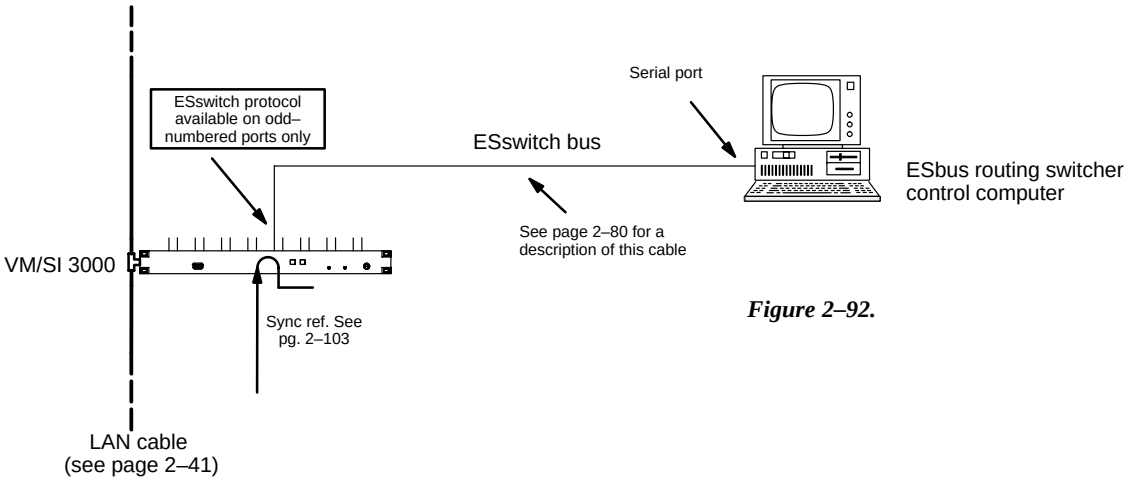


Figure 2–92.

Using Thomson ASCII Computer Interface Protocol

Hardware connections are shown in Figure 2–93; "ASCII" protocol is set on the Serial Protocol table (page 5–25); and the control computer is identified on the MPK Devices table (page 5–129). A technical description of the Thomson ASCII computer interface protocol is presented in Appendix N.

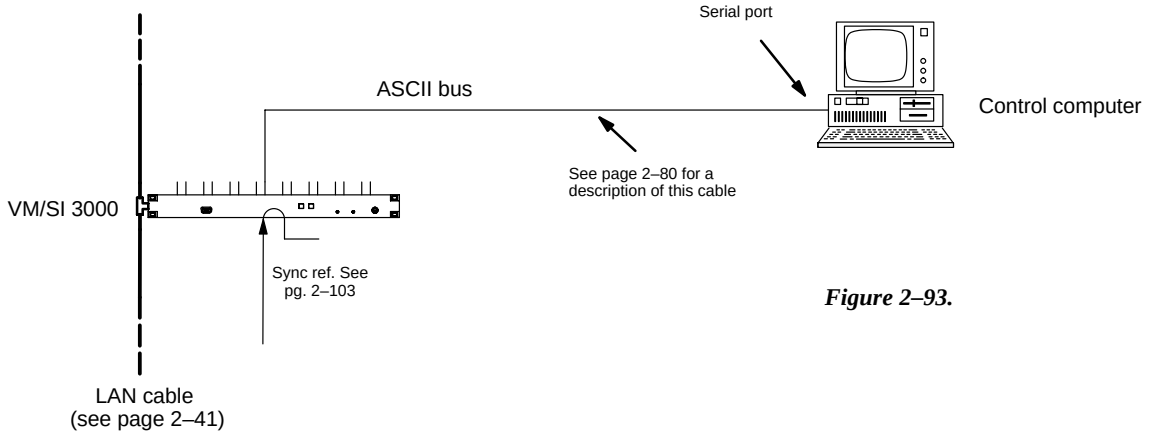


Figure 2–93.

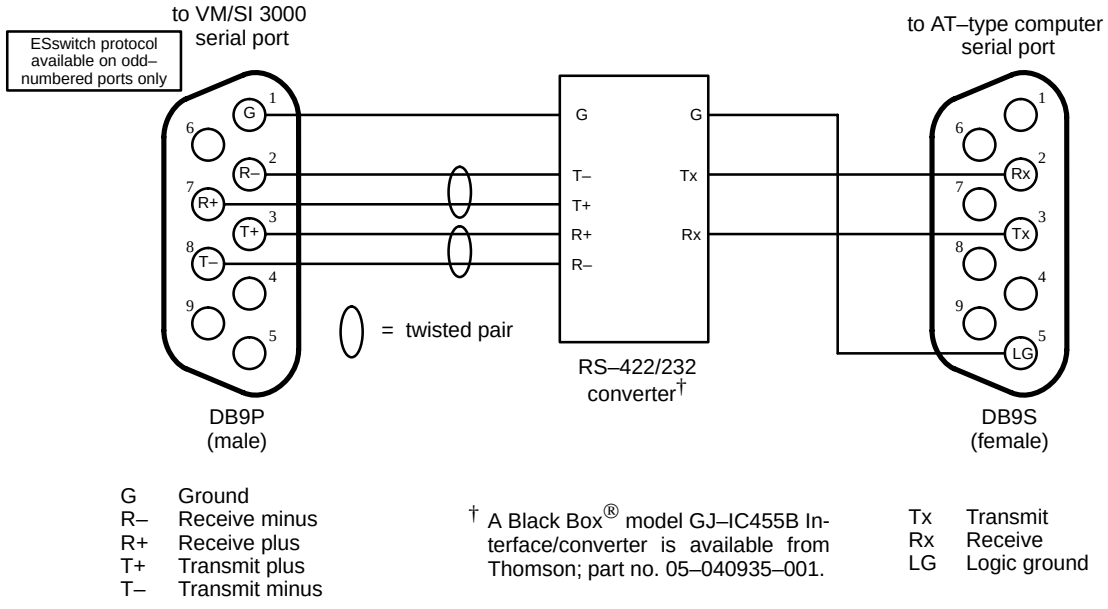


Figure 2–94. *Cable for connecting VM/SI 3000 to AT–type computer..*

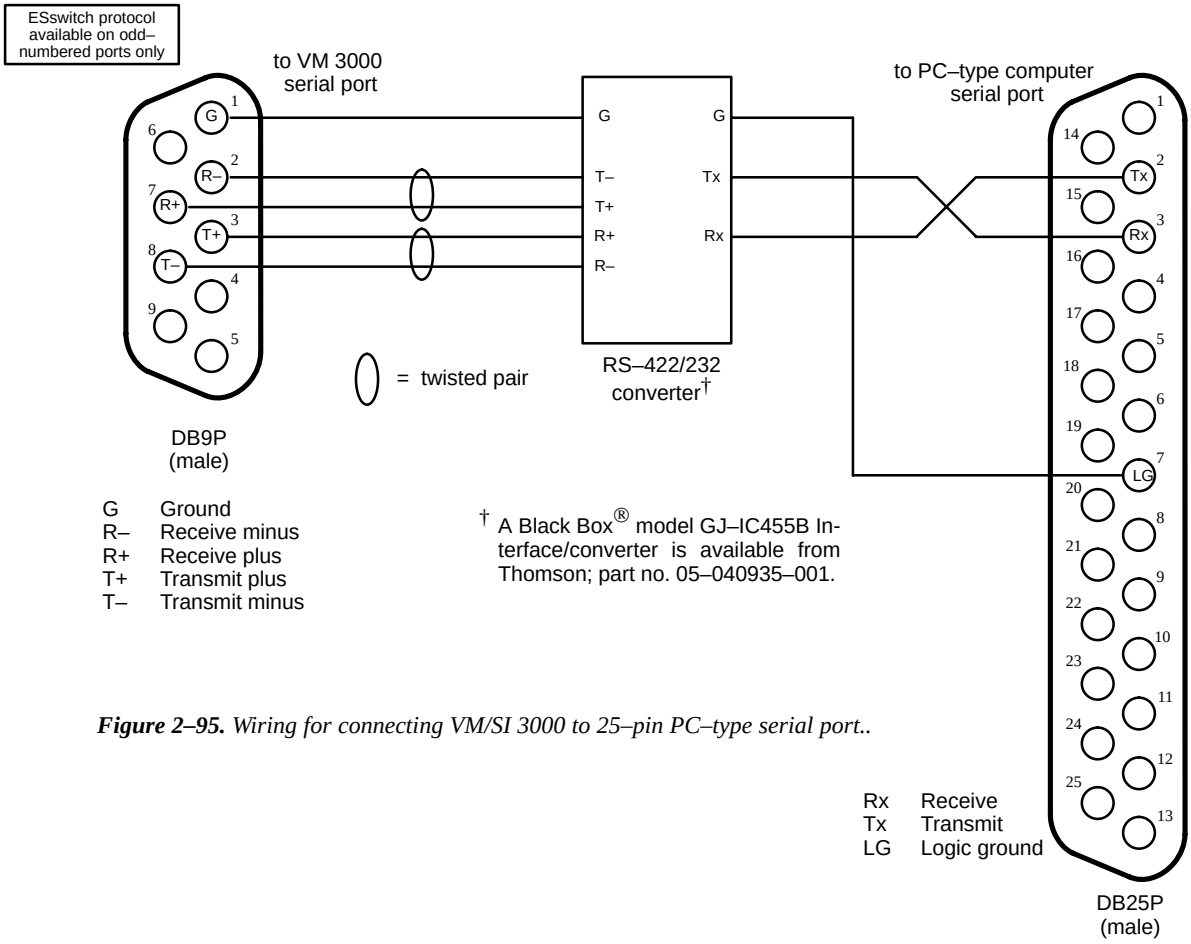


Figure 2–95. *Wiring for connecting VM/SI 3000 to 25–pin PC–type serial port..*

Model 200 production switcher with E–MEM Effects Memory

In systems where a Jupiter–controlled router is used to provide sources for a Model 200 switcher, the Jupiter control system can be used to select sources for the Model 200 and instructed to remember those sources. Later, a single E–MEM command can be used to restore the sources to the production switcher.

In this application, the Model 200 controls the routing switcher as a "peripheral device," using the Dual Serial Adapter Port 1 connected to a VM/SI/SC 3000. The serial connection is referred to in Model 200 documentation as the Peripheral Bus and by Jupiter as a GVG200 bus:

> With the STREAMLINE option, the Model 200 switcher can be set to address a particular peripheral, such as a character generator [or routing switcher], during E–MEM Effects Memory learns and recalls. When a [production] switcher effect is learned into an E–MEM register, the Model 200 sends a command over the peripheral bus to the peripheral device [VM/SI 3000] telling it to learn its current status [routing switcher status] into a memory register of its own. Later, when the same Model 200 E–MEM register is recalled, the 200 will send a command over the peripheral bus to instruct the peripheral device to recall the effect [routing switcher status] that it had previously stored in its own memory.†

For hardware installation, see Figure 2–96.

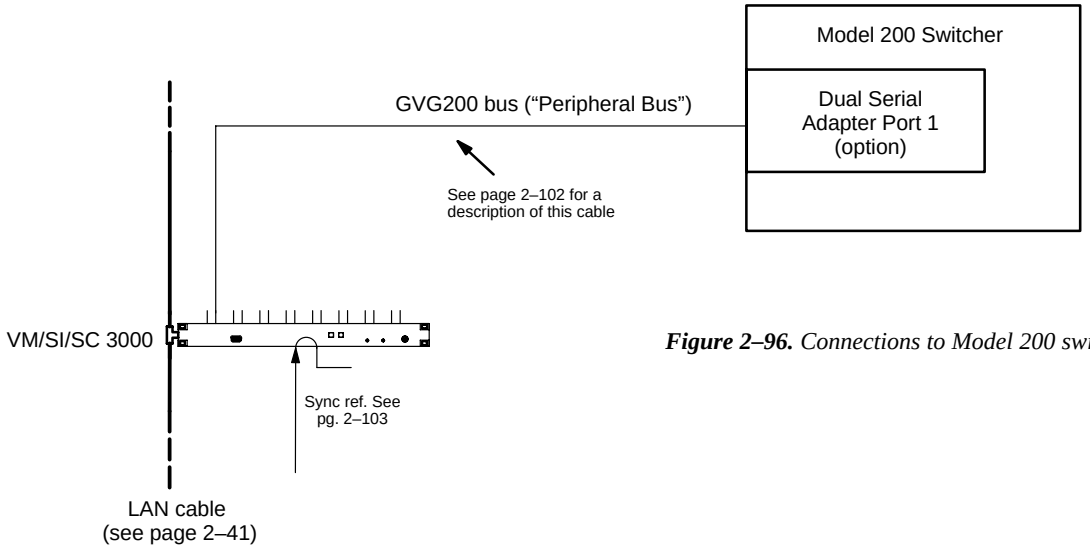


Figure 2–96. *Connections to Model 200 switcher.*

Software Configuration

For the VM/SI/SC 3000 port being used, "GVG200" protocol is set on the Serial Protocol table (see page 5–29). The production switcher is identified as a control device on the MPK Devices table, and special CP Input and Output Sets must be created (see page 5–131).

† *Model 200 Peripheral Interface II Protocol and Dialect* (Grass Valley Group Manual Number TP0424–00, June 1988), p. 1–2.

Connection to VTRs and Other Machines

INTERFACE SELECTION GUIDE

Use this chart as a starting point for installation of VTRs and other machines which are to be controlled by the Jupiter system.

VTR		Interface required	Alternate interface
Ampex	AVR–3	VM/SI 3000 with MI–3040. See page 2–93.	VM/SI 3000 with MI–1003.† See page 2–89.
	VPR–2	VM/SI 3000 with MI–3040.§ See page 2–93.	VM/SI 3000 with MI–1002.† See page 2–89.
	VPR–3 VPR–6 VPR–80 VPR–300 series ...and other late–model serial control machines	VM/SI 3000. See Figure 2–98.	None
Philips	BCB–35 BCB–60/65/70/75 DCR–10/18/20/28 DCR–34/35 DCR–100/300/500 PCB–2600/2650/2800	VM/SI 3000. See Figure 2–98.	None
Sony	Betacart	VM/SI 3000 with MI–3040 and Sony IF–10. See page 2–93.	VM/SI 3000 with MI–8B† and Sony IF–10. See Fig. 2–102 on pg. 2–90. *OR* VM/SI 3000 with MI–24B† and Sony IF–10. See Fig. 2–102 on pg 2–90. *OR* VM/SI 3000 with BBC–2300. See Fig. 2–103 on pg. 2–90.
	BVH–1000 BVH–1100	VM/SI 3000 with MI–3040.§ See page 2–93.	VM/SI 3000 with MI–2003.† See page 2–89.
	BVH–2000 BVH–2500 BVW–10 BVW–40 BVU–800 ...and other late–model serial control machines	VM/SI 3000 See Figure 2–98.	None
	LMS	VM/SI 3000 with MI–3040 and Sony IF–10. See page 2–93.	None
Other parallel control VTR, audio cart, etc.		VM/SI 3000 with MI–3040. See page 2–93.	VM/SI 3000 with MI–8B.† See page 2–89.

† Discontinued item—no longer manufactured by Thomson.

§ No speed control using MI–3040 with this VTR.

Figure 2–97.

CONNECTION TO LATE–MODEL SERIAL AND ESBUS VTRS

VTRs are connected to the LAN through a VM/SI 3000 system controller board. The protocol for these ports must be set in pairs. (The protocol is set at the file server, as described later in this manual.) In the example shown in Figure 2–98, ports 1 through 4 are configured for Sony serial machines, ports 7 and 8 for Ampex serial VTRs, and 9 and 10 for ESbus devices (such as Philips DCR Series VTRs). Notice that because the port protocol is set in pairs port 4 must be reserved for use with a Sony serial VTR.

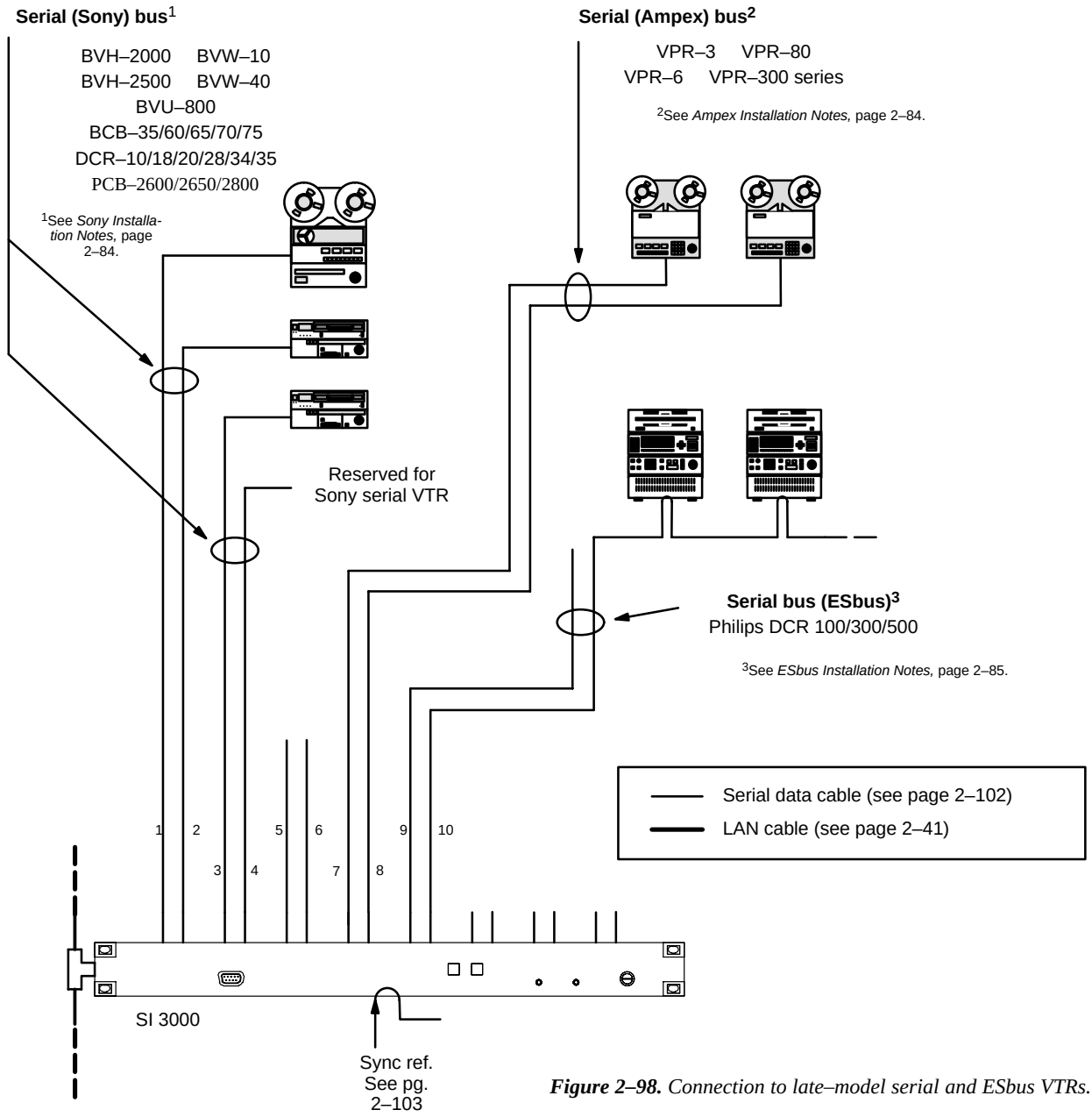


Figure 2–98. *Connection to late–model serial and ESbus VTRs.*

Sony Installation Notes

Only one Sony VTR can be connected per port.

Late model Sony machines use a remote control protocol referred to as *Sony serial*, and these can be connected directly to individual ports of a VM/SI 3000 board. Sony serial machines include the BVH–2000, BVH–2500, BVU–800, BVW–10, and BVW–40.

Older models require connection through parallel or semi–parallel interfaces. See page 2–82.

Ampex Installation Notes

Only one Ampex VTR can be connected per port.

Late model Ampex machines use a remote control protocol referred to as *Ampex serial*, and these can be connected directly to a VM/SI 3000 board. Ampex serial machines include the VPR–3, VPR–6, and VPR–80. See Figure 2–98.

Note 1: Protocol for these serial machines is similar to ESbus and includes a device addressing scheme. The address of each Ampex VTR must therefore be entered on the Machine Control Devices table (page 5–141); this is true even when only one VTR is on the bus. The machines are usually shipped with an address of 80A2 hex.

a. VPR–6 and VPR–80 Address Setup

(1) Enter setup mode 13 (setup–1–3–enter).

(2) Enter a “1” to set an address of 80A2; or enter a “2” for address 80A4. (CMX editors may expect the 80A4 address.) If the number “0” is entered, the VTR will not respond to any address.

b. VPR–3 Address Setup

(1) Remove PWA #20 (the Control PWA).

(2) Set rotary switches S4, S5, and S6 to “0.”

(3) Set rotary switch S3 to “1” for an address of 80A2. If the switches are all set to “0,” the VTR will not respond to any address.

(4) Reinsert PWA #20 into the card cage.

Older models require connection through parallel or semi–parallel interfaces. See page 2–82.

ESbus Installation Notes

ESbus VTRs can be connected in loop–through fashion to a single port of a VM/SI 3000 (ESbus multipoint scheme), or, to individual ports of the VM/SI 3000 (ESbus point–to–point scheme). As stated in the ESbus specification:

> The point–to–point configuration has the advantage of speed since the dedicated buses provide access to all tributaries [control panels and machines] simultaneously. The multipoint configuration has the advantage of reduced cabling costs and complexity but has the main disadvantage that messages to different tributaries must queue up and be sent serially on the bus. These configurations are therefore slower in response time than point–to–point systems.
>
> The optimum configuration for any local network, and the number of tributaries which it can serve, will depend critically on the types of equipment controlled, typical message lengths and the required response time. In general the number of tributaries would probably be in single figures.

If single–frame accuracy is required for ESbus VTRs, Thomson recommends setting aside an individual port on the VM/SI 3000 for each machine.

Other VTRs

Some VTRs not described above use the Sony Serial protocol; still others can be connected to the Jupiter system through a parallel interface such as the MI–3040. Please contact Thomson for additional information.

INSTALLING REDUNDANT SI 3000 CONTROL SYSTEM

In a redundant installation, each SI 3000 monitors the other. If a fault is detected in the active unit, control will be switched to the other device automatically. For information about *manual* changeover, and maintaining a *third* unit as a replacement for a failed redundant unit, see Appendix K. Wiring for redundant SI 3000s is shown in Figure 2–99. For software configuration, see Step 4 on page 5–23.

> Note: Only late–model SI 3000 Control Processors can be operated in redundant mode. Please contact Thomson for additional information.

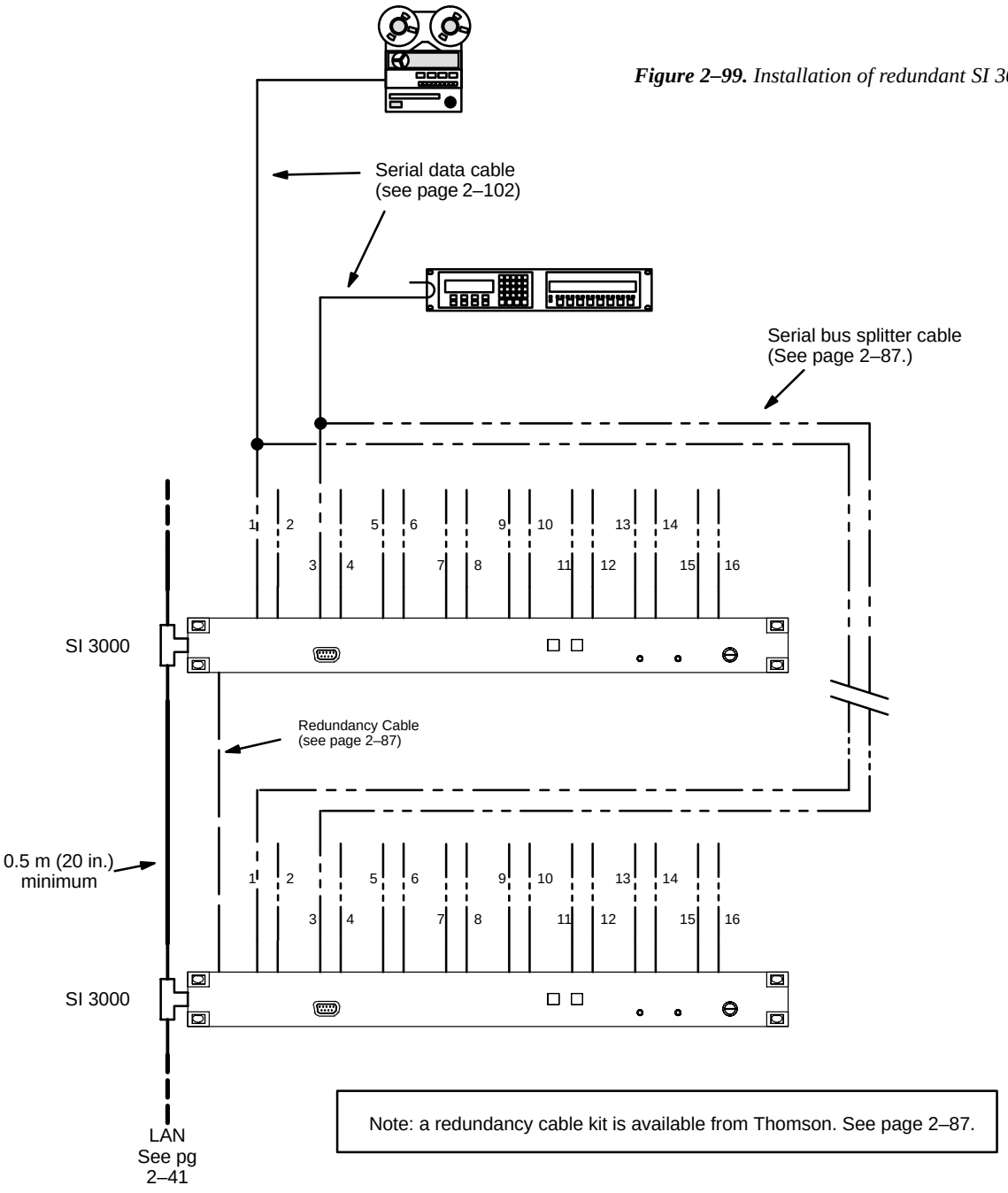


Figure 2–99. *Installation of redundant SI 3000s.*

SI 3000 Redundancy Kit Cables

Note 1: cables are supplied with connectors installed.

Note 2: for wiring, please see pages 2–86 and 2–8.

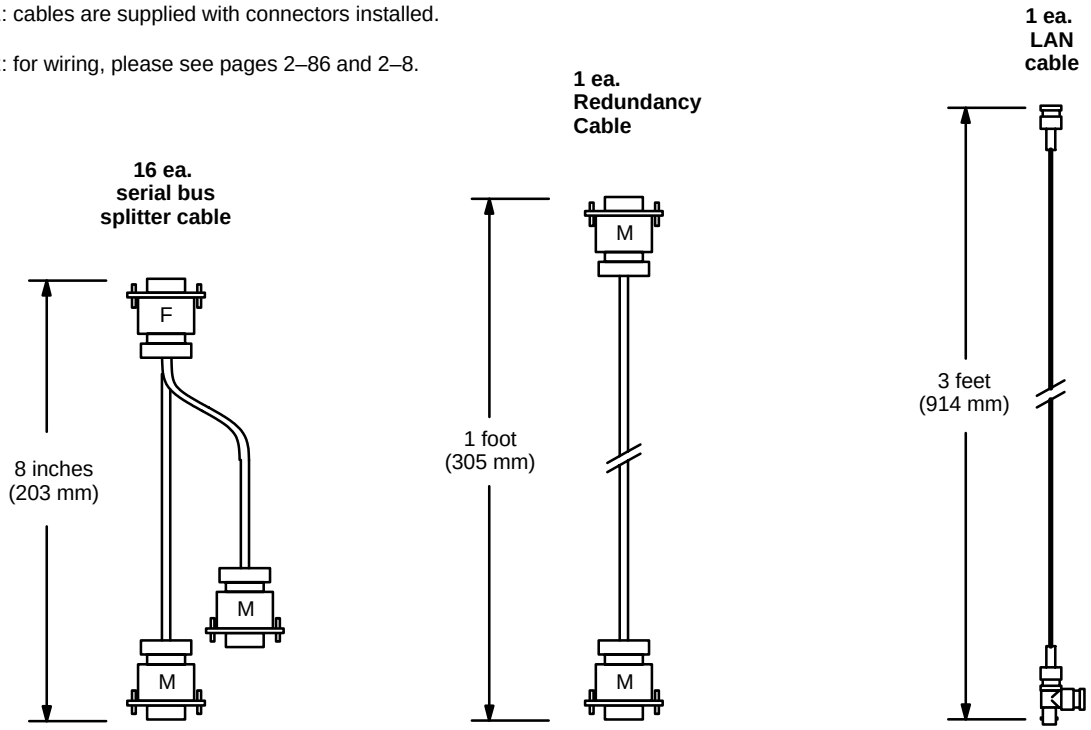


Figure 2–100. *SI 3000 redundancy kit cables. Kit part no. 44–045839–001.*

TCS 1 INTERFACES AND CONTROL PANELS

Although Thomson no longer manufactures TCS 1 Machine Control System components, existing TCS 1 modules such as the MI–2003, and/or TCS 1 control panels, such as the MC–12/3 and MC–24A, can be interfaced to the Jupiter Facility Control System (as shown in Figure 2–101); however, this may require programming and installation of new PROMs in the control panels, or the TCS 1 interfaces, or both. The protocol for busses leading to TCS 1 devices, as entered on the Serial Protocol table (page 5–25) is "TCS." See also page 5–29.

Note: For the purpose of machine control, the MCS–2000 Master Control Switcher should use the "TC2" protocol.

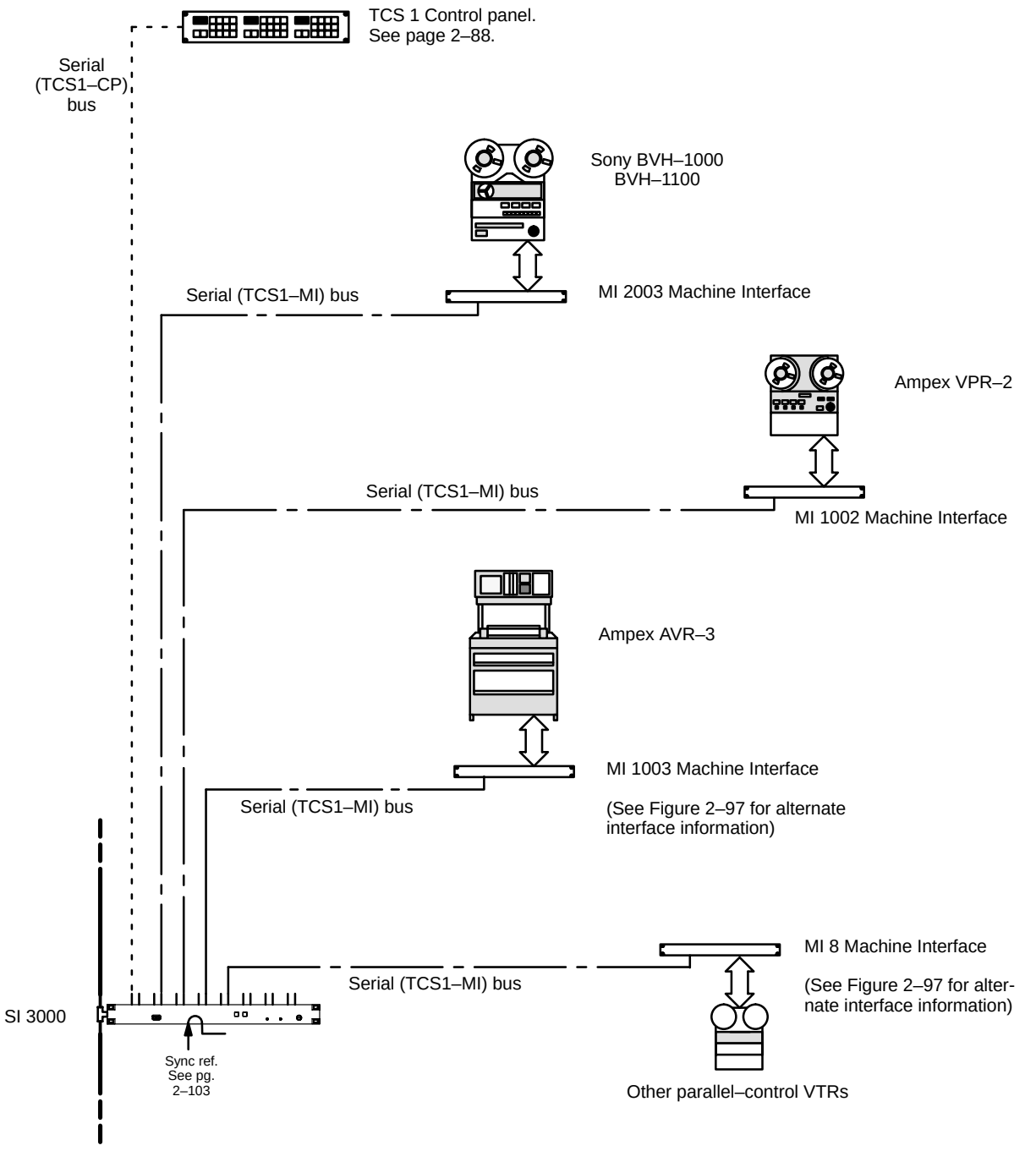
Machine Interfaces

The address of each TCS interface is set with an internal DIP switch; this setting is entered *in hexidecimal* on the Protocol Dependent Devices table (page 5–144), with a Device Type of "TCS1–MI." The device name on this table is cross–referenced to the TCS 1 Device Codes table (page 5–168), and this latter table in turn links the device name to the thumbwheel selections used by TCS 1 control panels to address particular machines.

Control Panels

TCS 1 control panels also require an entry on the Protocol Dependent Devices table; the Device Type is "TCS1–CP." No address would be required, since all TCS 1 controls are treated as one logical device. Even if more than one TCS 1 control panel is on a bus, there would be only one entry on the table.

The cable between a VM/SI 3000 and a TCS 1 control panel will vary according to the control panel type. Please contact Thomson for additional information.



Note 1: Only odd numbered ports of VM/SI 3000 can be used for connection to TCS 1 controls.

Note 2: Only even numbered ports of VM/SI 3000 can be used for connection to MI interfaces.

Note 3: MI buses can be extended to additional interfaces if desired, up to a recommended maximum of eight.

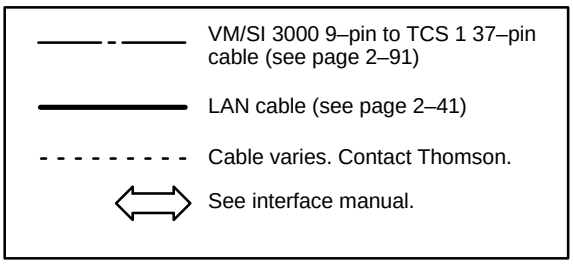


Figure 2–101. *Connection to older–model VTRs through TCS 1 interfaces.*

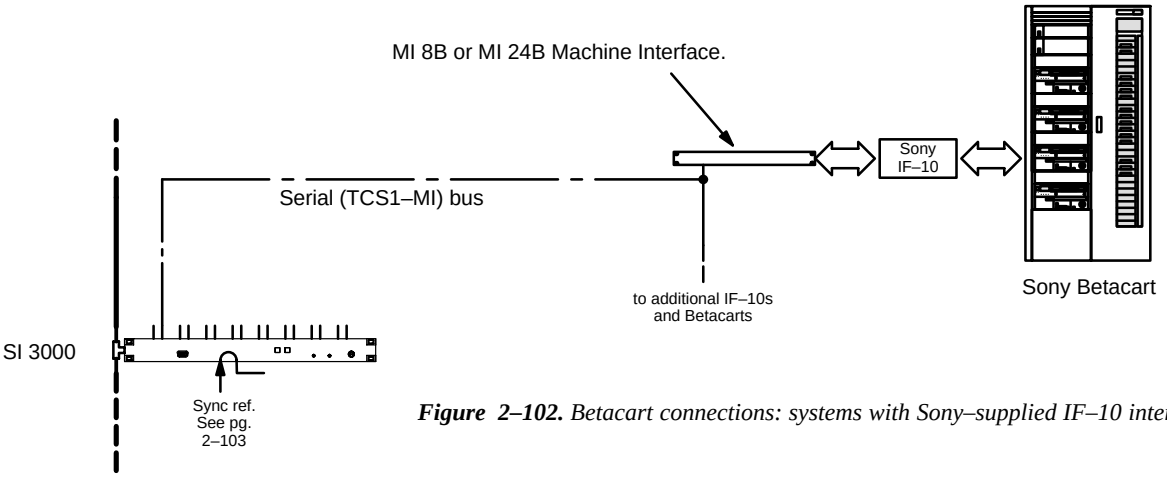


Figure 2–102. *Betacart connections: systems with Sony–supplied IF–10 interface.*

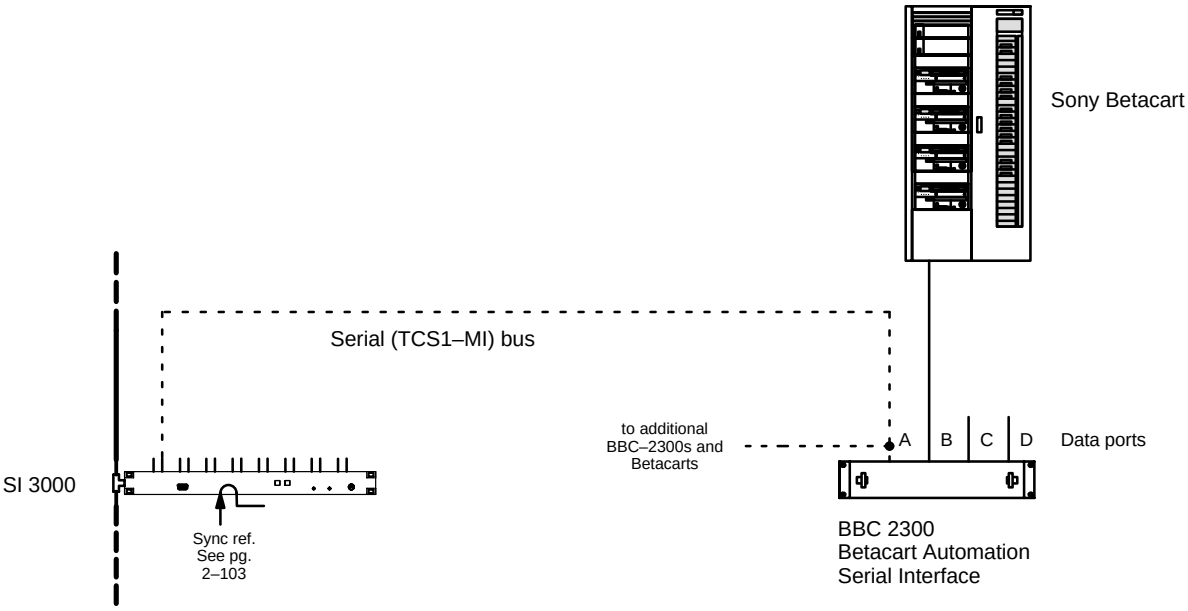
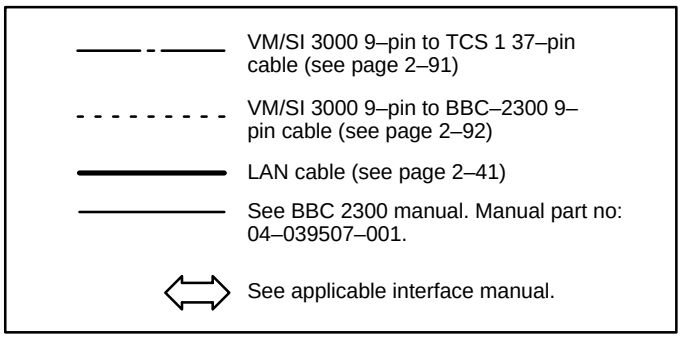


Figure 2–103. *Betacart connections: systems with Thomson BBC 2300 interface.*

For VM/SI 3000 notes see Figure 2–101.



VM/SI 3000 9–PIN TO TCS 1 37–PIN CABLE

The RS–422 cables used to connect VM/SI 3000 controller boards to TCS 1 machine interfaces (as shown in Figure 2–101) are not supplied by Thomson.

The pin–outs for this cable are shown in Figure 2–104.

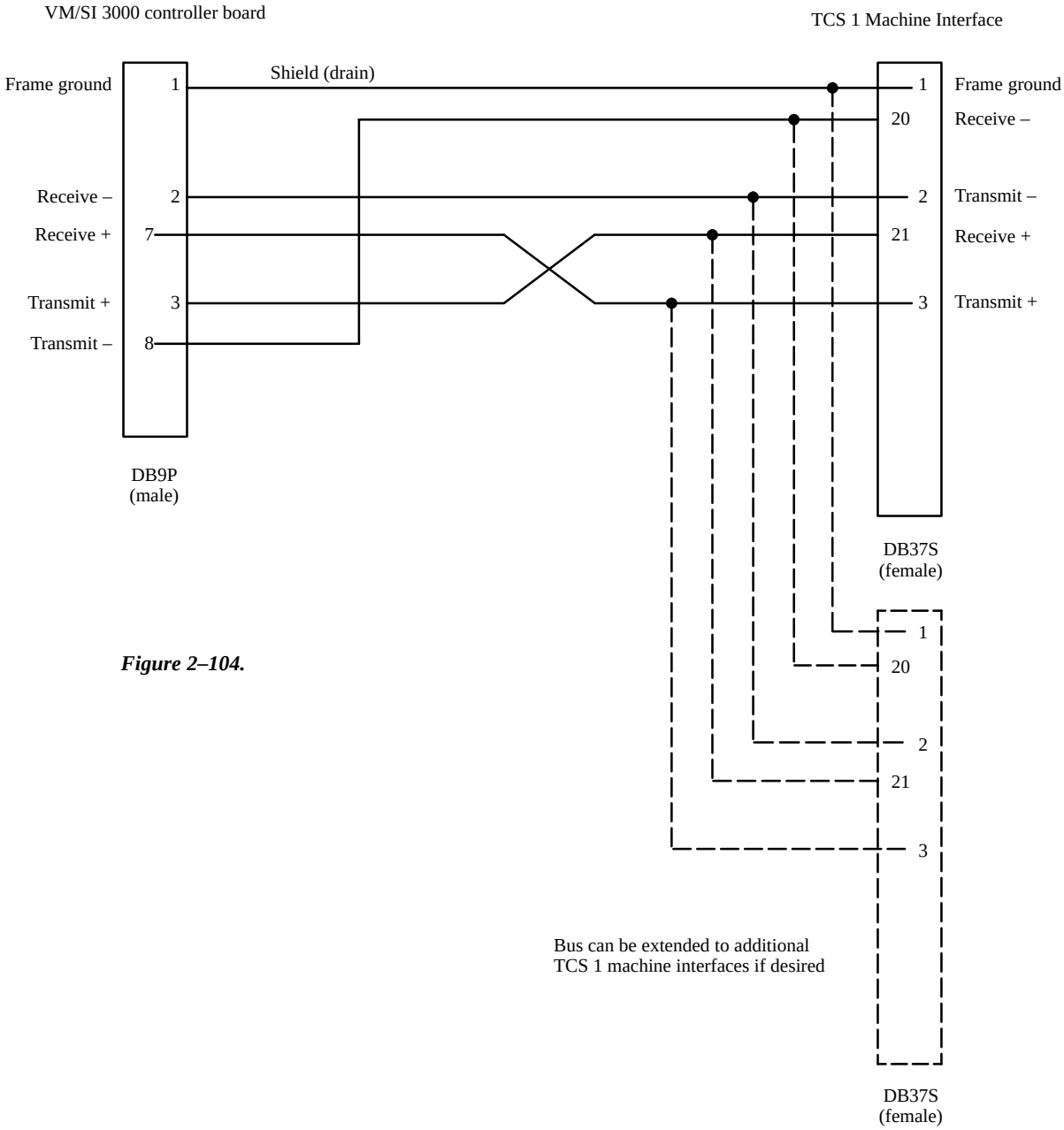


Figure 2–104.

VM/SI 3000 9–PIN TO BBC 2300 9–PIN CABLE

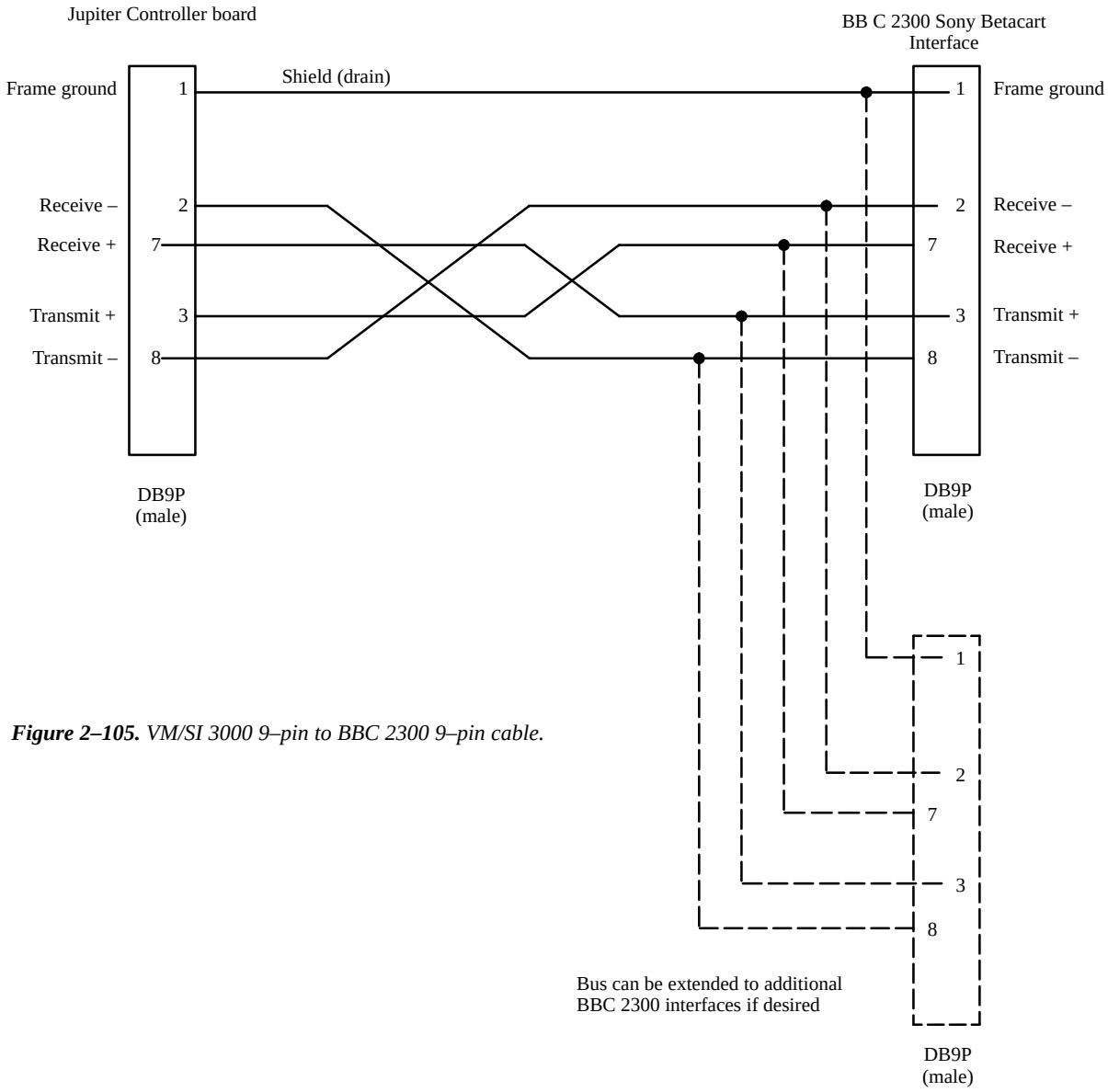


Figure 2–105. *VM/SI 3000 9–pin to BBC 2300 9–pin cable.*

CONNECTION TO PARALLEL–CONTROL MACHINES USING MI 3040

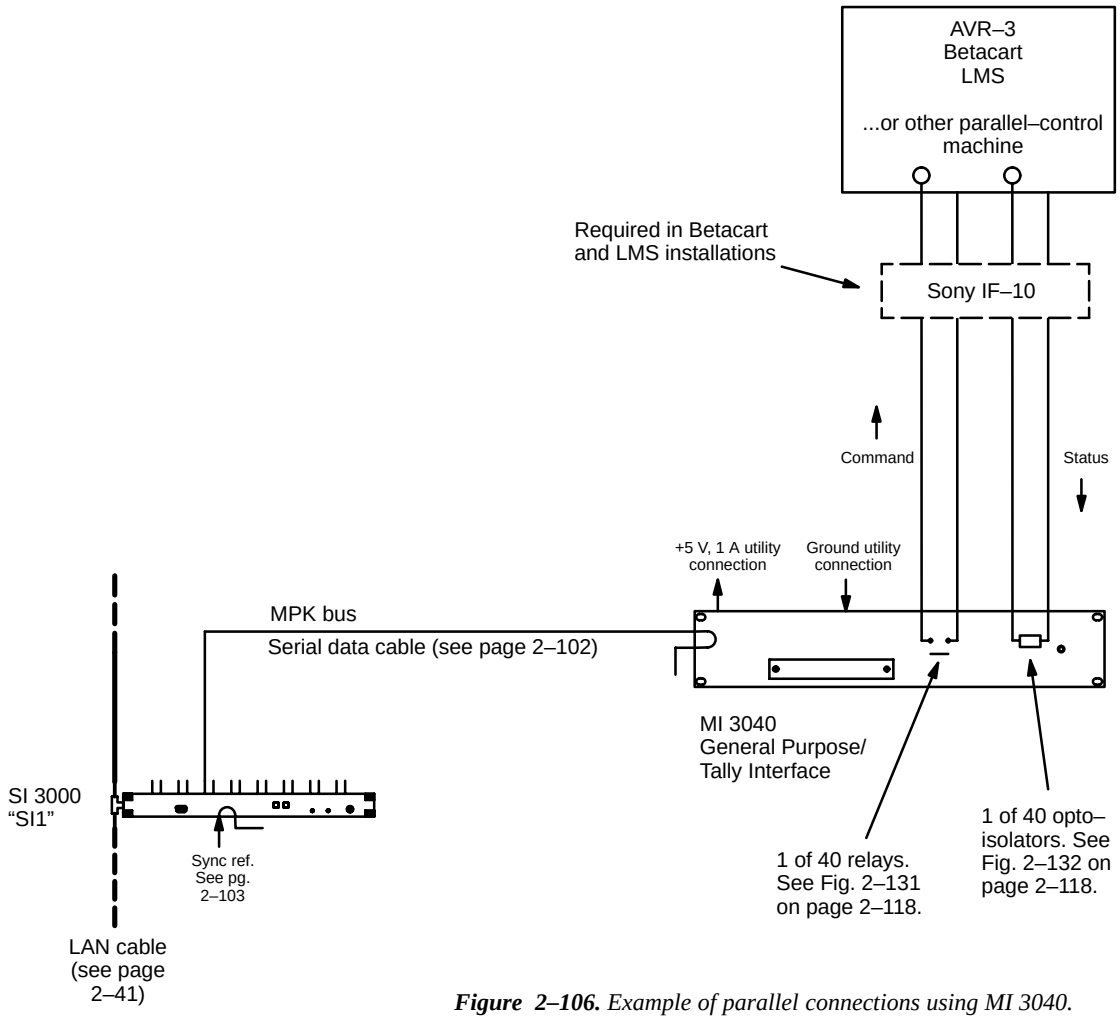


Figure 2–106. *Example of parallel connections using MI 3040.*

The MI 3040, which connects directly to a VM/SI 3000 serial port using MPK protocol, provides 40 electrically isolated output connections for general purpose control of parallel machines and 40 electrically isolated input connections for return of status information.

The unit uses solid–state relays that are suitable for low–voltage (<100 V), low–current (<300 milliamps) applications. Each relay may be configured by slide switch for normally–open or normally–closed operation. The software is designed to actuate the target relay for approximately 0.5 second before returning it to the normal position. For hardware details, please see page 2–117.

The 40 output connections can be used to control various numbers of machines and functions, depending on how the system software is configured by the user. The three possible configurations are shown in Figure 2–107; the back–panel connections for these configurations are shown in Figure 2–108.

Note 1: While the user can select any one of the configurations, the particular transport functions within each configuration, and the order in which they appear on the MI–3040 back panel, cannot be changed by the user.

An example of the connections for a unit configured as an MI 3040/2 is shown on page 2–96.

The MI 3040 can be used for parallel control of systems such as Sony Betacart and LMS. The unit can also be used with older model VTRs and audio cart machines—see the *Interface Selection Guide* on page 2–82. For an illustration of audio cart connections, see page NO TAG.

Note 2: Due to its current limit (300 mA) , the MI 3040 is not suitable for use in controlling older model projectors and optical multiplexers used in film chains.

Note 3: If the MI 3040 is used to interface to a Betacart, the Sony–supplied IF–10 interface will still be required.

The configuration of the MI 3040 is determined by entries to the MPK Devices table (page 5–116) and the Machine Control table (page 5–159).

Configuration of MI 3040	Max. number of machines	Functions per machine	Names of functions	Notes
MI 3040/2	20	2	Play Stop	
MI 3040/4	10	4	Play Stop Ready Record	
MI 3040/8	5	8	Play Stop Ready Record Fast forward Rewind Set mark Cue	 (shuttle with positive velocity) (shuttle with negative velocity) (search)

Figure 2–107. *MI 3040 configurations.*

MI 3040 back–panel connector	MI 3040/2 configuration		MI 3040/4 configuration		MI 3040/8 configuration	
	Machine	Function	Machine	Function	Machine	Function
0	1	Play	1	Play	1	Play
1	1	Stop	1	Stop	1	Stop
2	2	Play	1	Ready	1	Ready
3	2	Stop	1	Record	1	Record
4	3	Play	2	Play	1	Fast forward
5	3	Stop	2	Stop	1	Rewind
6	4	Play	2	Ready	1	Set mark
7	4	Stop	2	Record	1	Cue
8	5	Play	3	Play	2	Play
9	5	Stop	3	Stop	2	Stop
10	6	Play	3	Ready	2	Ready
11	6	Stop	3	Record	2	Record
12	7	Play	4	Play	2	Fast forward
13	7	Stop	4	Stop	2	Rewind
14	8	Play	4	Ready	2	Set mark
15	8	Stop	4	Record	2	Cue
16	9	Play	5	Play	3	Play
17	9	Stop	5	Stop	3	Stop
18	10	Play	5	Ready	3	Ready
19	10	Stop	5	Record	3	Record
20	11	Play	6	Play	3	Fast forward
21	11	Stop	6	Stop	3	Rewind
22	12	Play	6	Ready	3	Set mark
23	12	Stop	6	Record	3	Cue
24	13	Play	7	Play	4	Play
25	13	Stop	7	Stop	4	Stop
26	14	Play	7	Ready	4	Ready
27	14	Stop	7	Record	4	Record
28	15	Play	8	Play	4	Fast forward
29	15	Stop	8	Stop	4	Rewind
30	16	Play	8	Ready	4	Set mark
31	16	Stop	8	Record	4	Cue
32	17	Play	9	Play	5	Play
33	17	Stop	9	Stop	5	Stop
34	18	Play	9	Ready	5	Ready
35	18	Stop	9	Record	5	Record
36	19	Play	10	Play	5	Fast forward
37	19	Stop	10	Stop	5	Rewind
38	20	Play	10	Ready	5	Set mark
39	20	Stop	10	Record	5	Cue

Figure 2–108. *MI 3040 back–panel Relay Contacts / Status In connections. For a drawing of the MI 3040 rear panel, see page 2–120.*

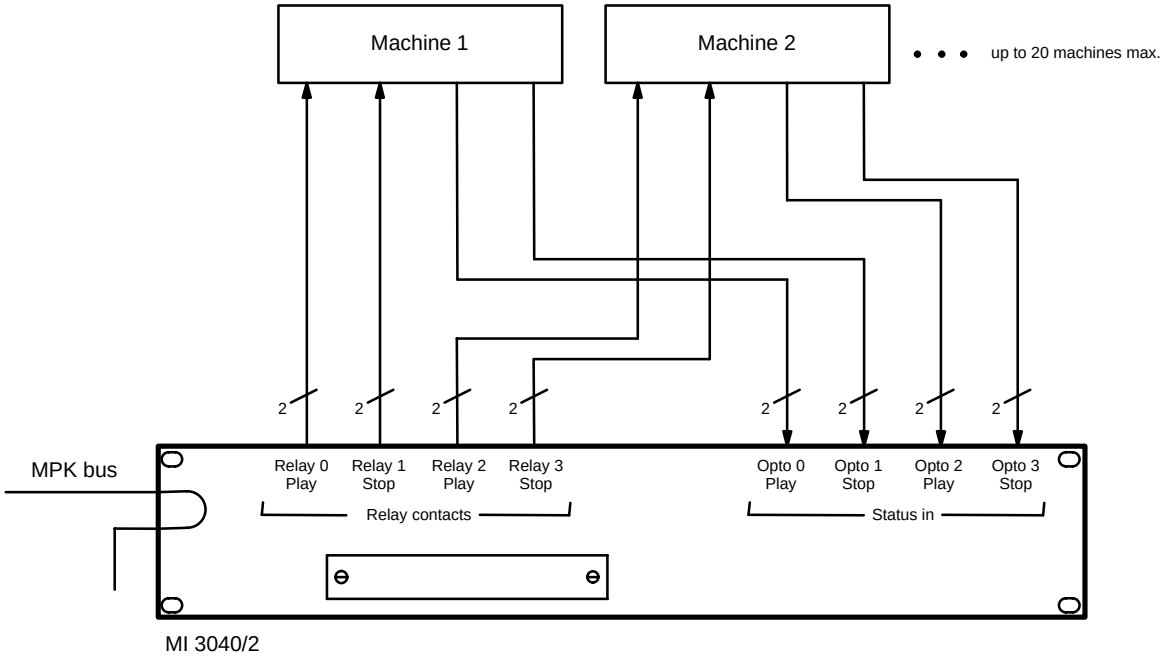


Figure 2–109. *Example of MI 3040/2 connections.*

CONNECTION TO NON–JUPITER MACHINE CONTROL PANEL OR COMPUTER

MI 3040 (“MC 3040”) Installation

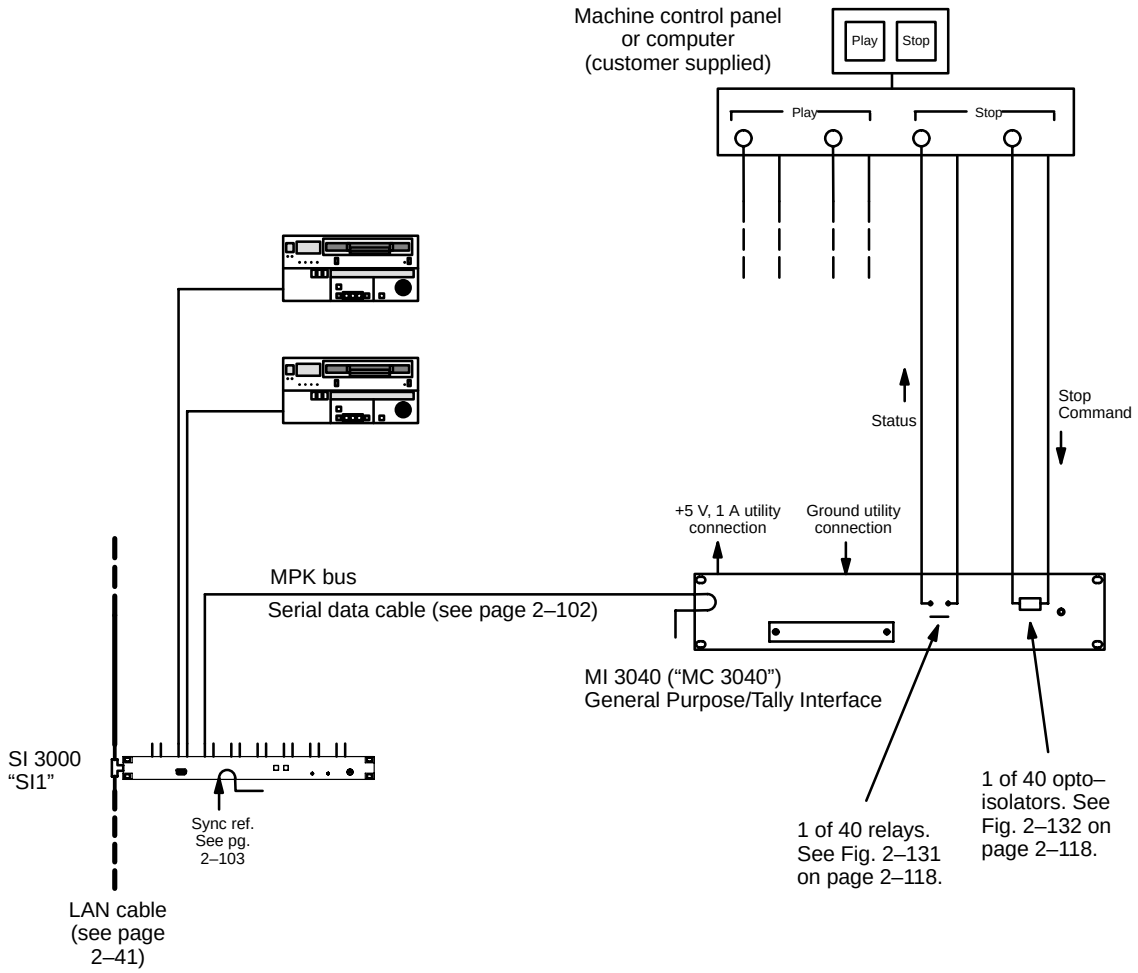


Figure 2–110. *External machine control using MI 3040 (“MC 3040”).*

With the MI 3040 General Purpose / Tally Interface, a customer–supplied external machine control panel or device can use the Jupiter system to transmit commands to, and receive status from, a VTR or similar machine. In this application, the MI 3040 is configured in software as an “MC 3040.” **It will be referred to as such for the balance of this discussion.** The MC 3040 and MI 3040 hardware is identical.

Commands such as “start“ and “stop” are sent from the external machine control device to the opto–coupler inputs; these respond to a differential voltage between the two input pins. Status information is returned from the machine to the MC 3040 relays, which are suitable for low–voltage (<100 V), low–current (<300 milliamps) applications. Each relay may be configured by slide switch for normally–open or normally–closed operation. For hardware details, please see page 2–117.

The 40 output connections can be used with various numbers of control panels and functions, depending on how the system software is configured by the user. The three possible configurations are shown in Figure 2–111; the back–panel connections for these configurations are shown in Figure 2–112.

Configuration of MC 3040	Max. number of control panels	Functions per panel	Names of functions	Notes
MC 3040/2	20	2	Play Stop	
MC 3040/4	10	4	Play Stop Ready Cue	
MC 3040/8	5	8	Play Stop Ready Cue Fast forward Rewind Set mark Record	(shuttle with positive velocity) (shuttle with negative velocity)

Figure 2–111. *MC 3040 configurations.*

Important: MC 3040 function number four (“Cue”) and function number eight (“Record”) are **reversed** from their positions in the original MI 3040. This difference can be seen by comparing Figure 2–111 with Figure 2–107 on page 2–94.

Note: While the user can select any one of the configurations, the particular transport functions within each configuration, and the order in which they appear on the MC–3040 back panel, cannot be changed by the user.

An example of the connections for a unit configured as an MC 3040/2 is shown in Figure 2–113.

Important:: Because the MC 3040 hardware is the same as the MI 3040, the rear–panel labelling is misleading. The “Status In” connectors are actually used to receive commands from the control device, while the “Relay Contacts” connectors are used to provide status.

The configuration of the MC 3040 is determined by entries to the MPK devices table (page 5–117) and the Machine Control Devices table (page 5–159) .

MC 3040 back–panel connector	MC 3040/2 configuration		MC 3040/4 configuration		MC 3040/8 configuration	
	Control panel	Function	Control panel	Function	Control panel	Function
0	1	Play	1	Play	1	Play
1	1	Stop	1	Stop	1	Stop
2	2	Play	1	Ready	1	Ready
3	2	Stop	1	Cue	1	Cue
4	3	Play	2	Play	1	Fast forward
5	3	Stop	2	Stop	1	Rewind
6	4	Play	2	Ready	1	Set mark
7	4	Stop	2	Cue	1	Record
8	5	Play	3	Play	2	Play
9	5	Stop	3	Stop	2	Stop
10	6	Play	3	Ready	2	Ready
11	6	Stop	3	Cue	2	Cue
12	7	Play	4	Play	2	Fast forward
13	7	Stop	4	Stop	2	Rewind
14	8	Play	4	Ready	2	Set mark
15	8	Stop	4	Cue	2	Record
16	9	Play	5	Play	3	Play
17	9	Stop	5	Stop	3	Stop
18	10	Play	5	Ready	3	Ready
19	10	Stop	5	Cue	3	Cue
20	11	Play	6	Play	3	Fast forward
21	11	Stop	6	Stop	3	Rewind
22	12	Play	6	Ready	3	Set mark
23	12	Stop	6	Cue	3	Record
24	13	Play	7	Play	4	Play
25	13	Stop	7	Stop	4	Stop
26	14	Play	7	Ready	4	Ready
27	14	Stop	7	Cue	4	Cue
28	15	Play	8	Play	4	Fast forward
29	15	Stop	8	Stop	4	Rewind
30	16	Play	8	Ready	4	Set mark
31	16	Stop	8	Cue	4	Record
32	17	Play	9	Play	5	Play
33	17	Stop	9	Stop	5	Stop
34	18	Play	9	Ready	5	Ready
35	18	Stop	9	Cue	5	Cue
36	19	Play	10	Play	5	Fast forward
37	19	Stop	10	Stop	5	Rewind
38	20	Play	10	Ready	5	Set mark
39	20	Stop	10	Cue	5	Record

Figure 2–112. *MC 3040 back–panel connections. For a drawing of the MC 3040 rear panel, see page 2–120.*

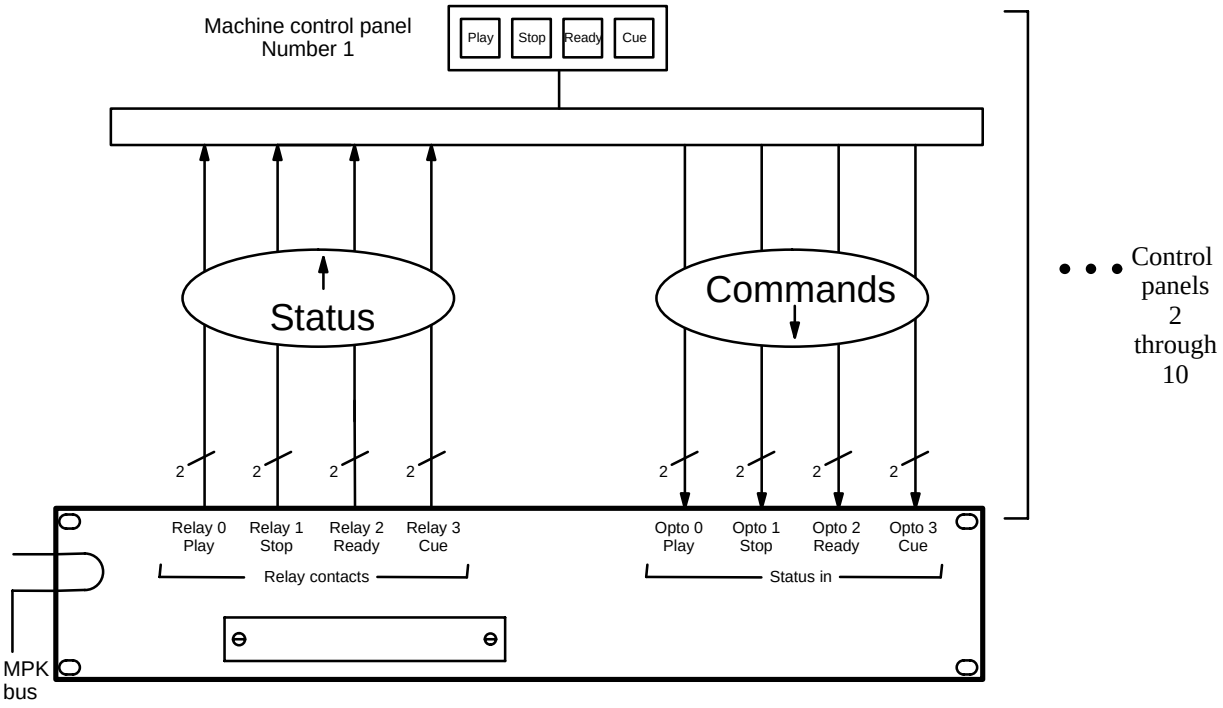


Figure 2–113. *Example of MC 3040/4 connections.*

REMOTE CONTROL VIA MODEM

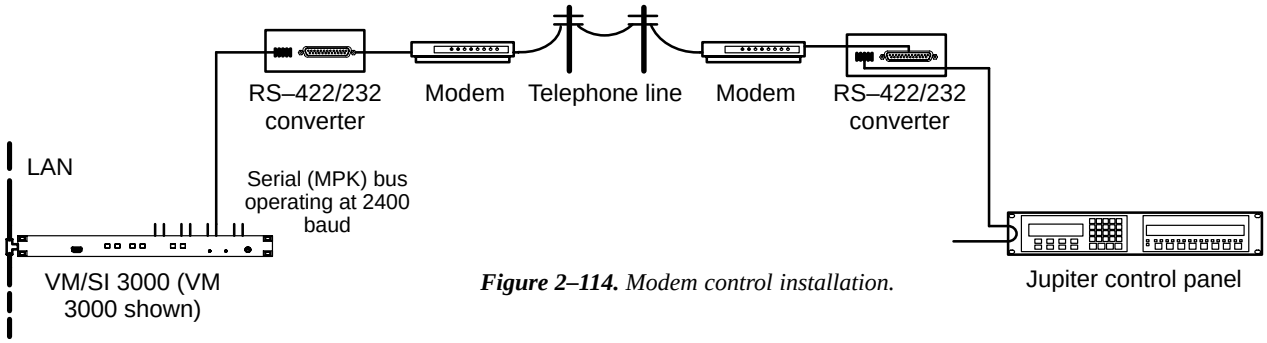


Figure 2–114. *Modem control installation.*

The Jupiter system can be controlled through a modem connection using:

- A CP 3000 control panel equipped with a 1200/2400 baud PROM (FCS–3306/1/2, part no. 45–043114–01A/B). These products are described in separate documents, part no. 04-883306-001 (1200 baud version) and 04-883306-002 (2400 baud version).

- An MPK control panel that allows baud rate selection on the front panel (e.g., CP 3800A, CP 3830, CP 3808, CP 3832, CP 3864 etc.). These products are described later in this manual.

The modems used in such a system should be connected to the Jupiter hardware through RS–232/422 converters. See Figures 2–114 and 2–115. The only modem supported for this application is the Motorola V.3229, which is available from Black Box Corp. or NetLink Technology, Inc. Two RS–232/422 Converters are recommended: 1), the Black Box IC107A RS–232 > RS–422 Converter, and 2) the Integrity Instruments 422–25I with external power supply. For instructions that apply specifically to these third–party items, please refer to Thomson Field Engineering Bulletin 04-047604-081.

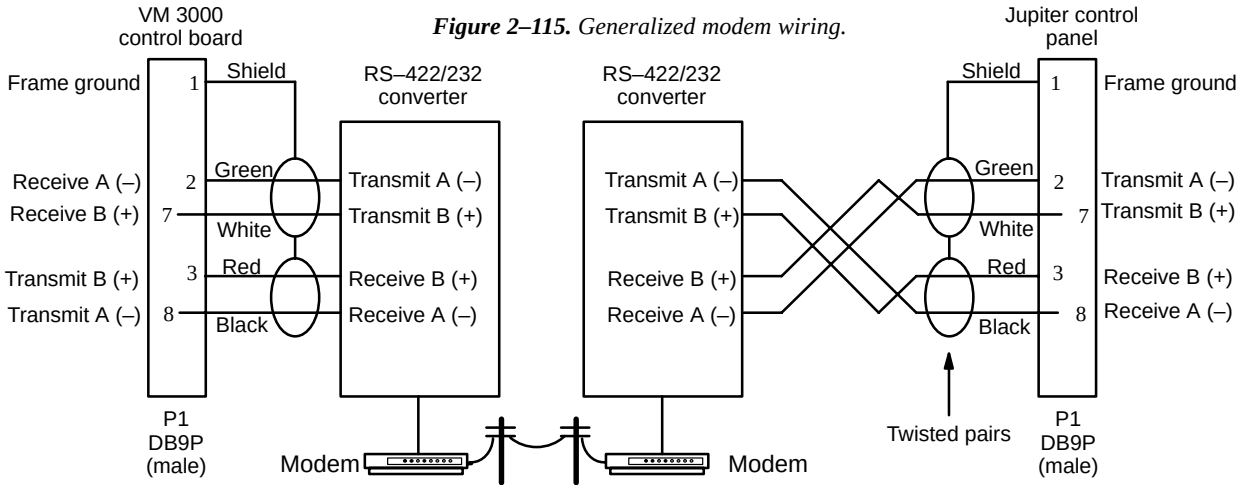


Figure 2–115. *Generalized modem wiring.*

Jupiter Configuration

Using the Serial Protocol table, change to the appropriate baud rate for the port that is connected to the modem. Only one control panel can be defined on a port that is connected to a modem. For more information, see page 5–25.

Installing VM 3000 VGA Status Display

Please refer to Appendix A for installation instructions.

Serial Data Cables

The RS–422 cables used to connect VM/SI 3000 controllers, VTRs, and control panels may be known by various names depending on the devices to which they are connected. Thus a particular serial bus might be called the “Sony bus,” the “MPK bus,” etc. In spite of the different terminology, each of these buses consist of a 4–conductor (plus ground) cable.

Maximum length per bus is 1220 meters (4003 ft).

The rear panel serial data cable connectors on the VM/SI 3000, CP 3000, MC 3000, and MI 3040 are 9–pin D, female. The CP, MC, and MI connectors are arranged for loop–through wiring. No termination is required. While these connectors are ESbus compatible, it should be noted that the Thomson serial data cables use only 5 of the 9 pins described in the ESbus specification (Appendix F).

The following ready–made cables, with installed 9–pin D male connectors, are available from Thomson (VDE* cables include ferrite cores):

1 meter (3.3 ft)	8 meters (26.2 ft)
2 meters (6.6 ft)	16 meters (52.5 ft)
4 meters (13.1 ft)	32 meters (105 ft)

For ordering information, see page 1–23.

For those who wish to prepare their own cables, the pin–outs are shown in Figure 2–116. The cable itself should be Belden 1422 or equivalent. Details concerning ferrite cores are given in Figure 2–117.

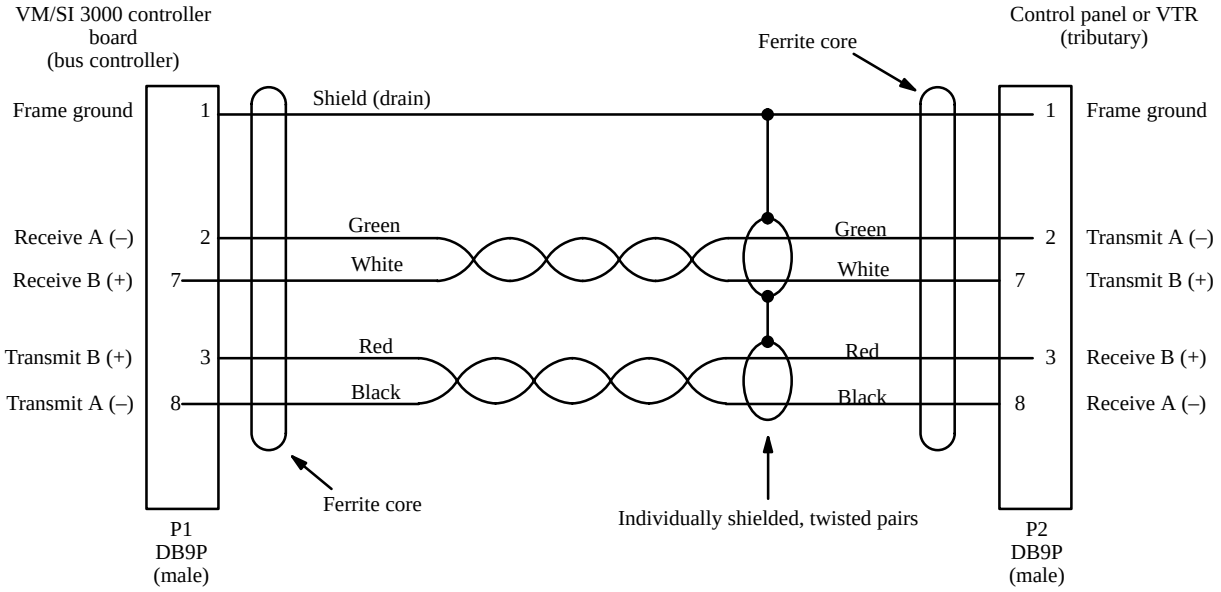
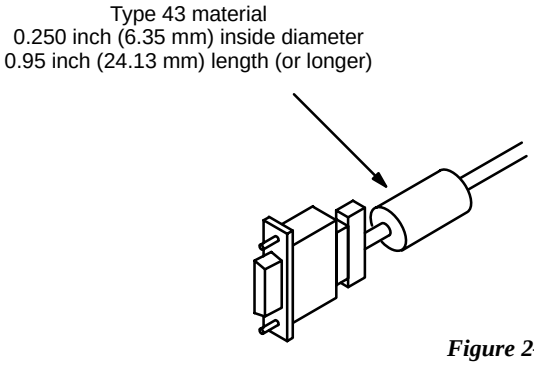


Figure 2–116. *Serial data cable wiring. Reference: “Assembly, BCS–3000 Serial Data Cable,” Thomson drawing no. 01–041600–TAB.*

*see Glossary.

VDE EMI/RFI Modifications to Serial Data Cables

User–supplied serial data cables for VDE installations require a ferrite core over each end of the cable, adjacent to the connector.



Type 43 material sources

Fair–Rite, part no. 2643480002

Fair–Rite Products Corp., P.O. Box J, Commercial Row, Wallkill, NY 12589, USA; Tel. (914) 895–2055.

Chomerics, part no. 83–10–A636–1000

Chomerics Inc., 77 Dragon Ct., Woburn, MA 01888 USA; Tel. (617) 935–4850.

Figure 2–117. *Serial data cable VDE modifications.*

Sync Reference Cables

A video reference (sync) signal should be connected to each Jupiter controller board (including the VM 3000 Control Processor, SI 3000 Control Processor, and VG 3000 Video Display / Status Generator).

This signal may be color black or composite sync with an amplitude between 1 V P–P and 4 V P–P.

The VM 3000 Matrix Controller must have a sync reference in order for a Thomson Crosspoint Bus router to switch during the house vertical interval. Crosspoint Bus routers are listed on page 2–3.

Time Code Connections

Time code can be connected to a VM 3000, in which case the VM 3000 clock and the file server clock will automatically synchronize to the time code source.

Connection to Saturn Master Control Switcher

The Jupiter control system can be used as part of a Saturn Master Control Switcher installation, as shown in Figure 2–119. §

Jupiter and Saturn software programs are presently supplied on a multi–disk set, and running the “Install” program loads both Jupiter and Saturn code.

Saturn software is accessed using the “Saturn” pull down menu. See Figure 2–118.

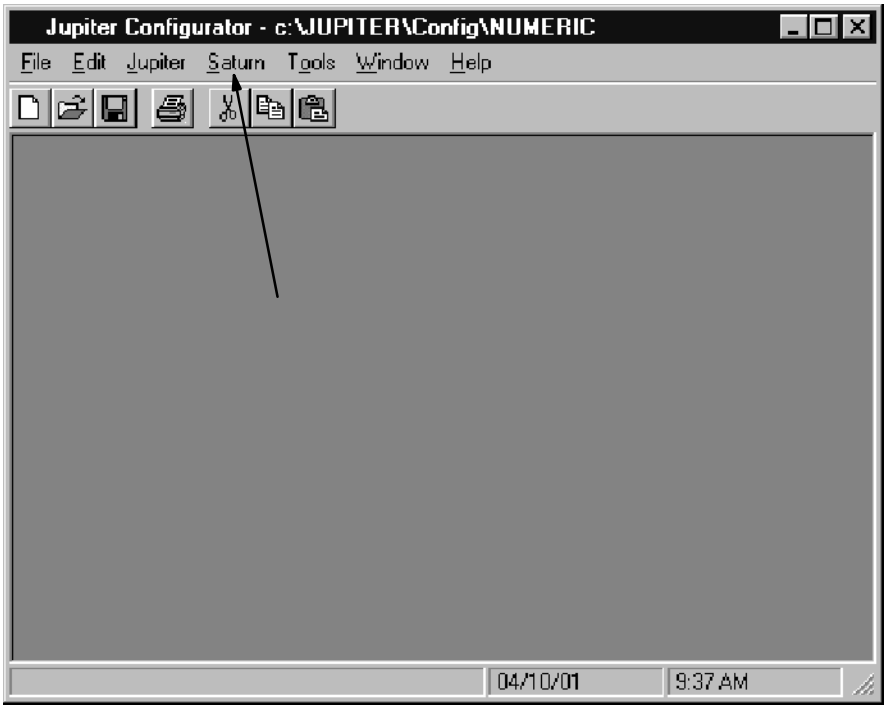


Figure 2–118. *Jupiter/Saturn Configuration menu.*

Before attempting to connect and configure the Saturn Master Control Switcher, the Jupiter Facility Control System should first be installed and checked out.

For Saturn installation instructions, including hardware connections and entries to Jupiter configuration tables, please refer to the *Saturn Master Control Switcher Installation and Operation Manual,* Thomson part no. 04–046654–010.

The **Saturn Tally** system, which operates only with the Saturn internal matrix option, is described in the Saturn installation/operating manual. For **Jupiter Tally** applications, where signals are followed through routers or production switchers, refer to page 2–107 of this manual.

For **Under Monitor Display** installation instructions, see page 2–121.

For **parallel control** of machines (such as audio carts), using the MI–3040T General Purpose / Tally Interface, refer to page 2–93.

§ Some of the functions described in this section may be extra–cost options. For more information, see page 1–27.

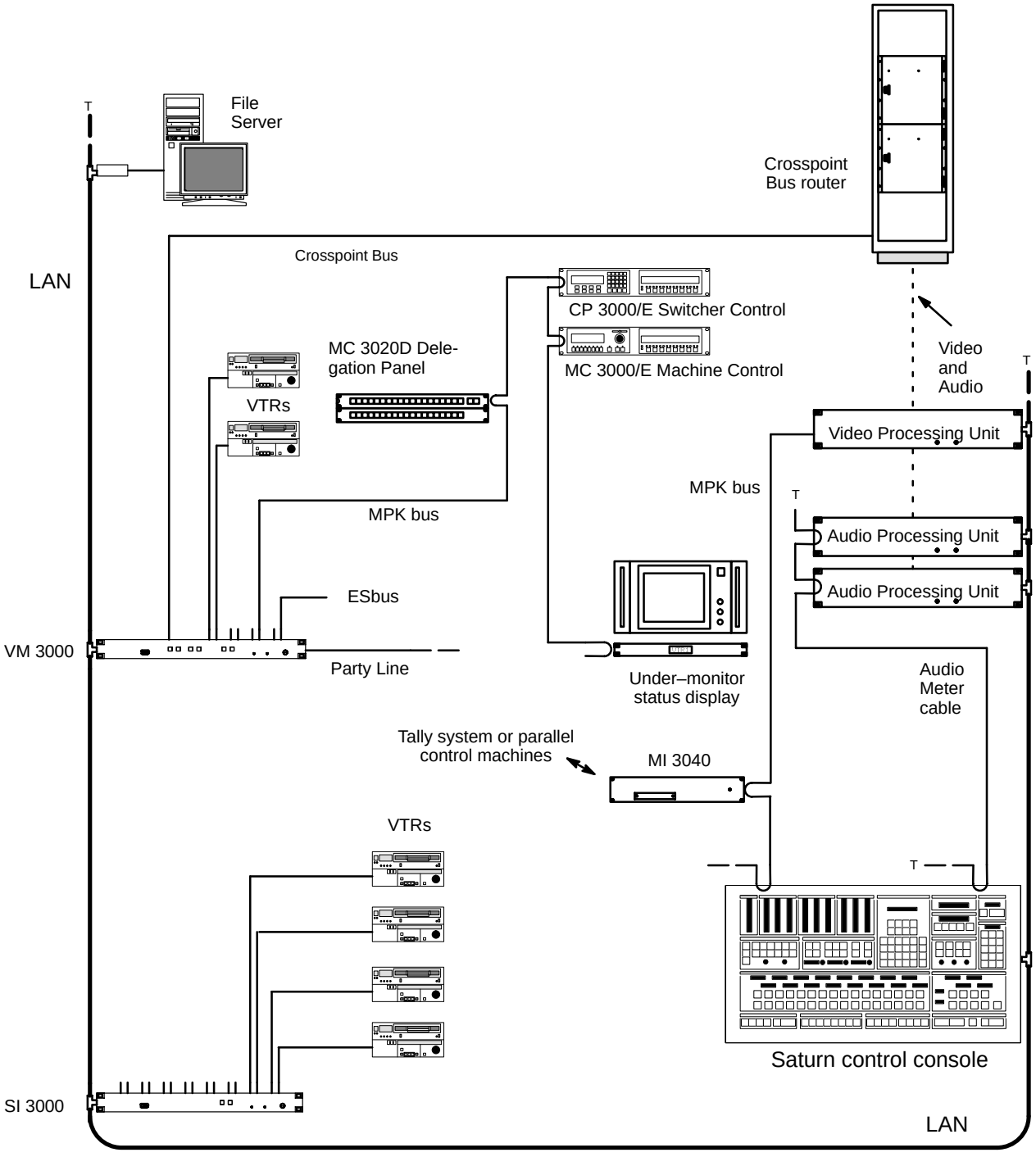


Figure 2–119. *Example of Saturn MCS with Crosspoint Bus router and Jupiter control system. For Saturn instructions, see Saturn Master Control Switcher Installation and Operating Manual.*

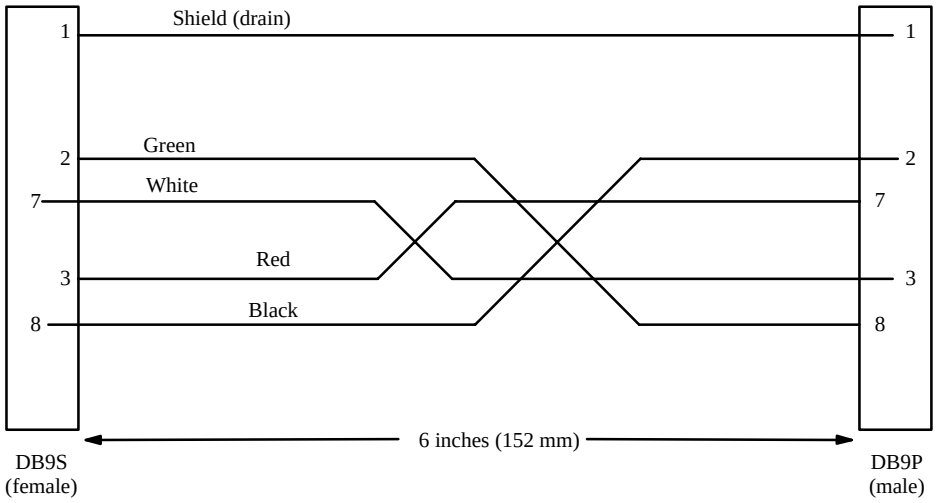


Figure 2–120. *01–041420–001 Adapter cable.*

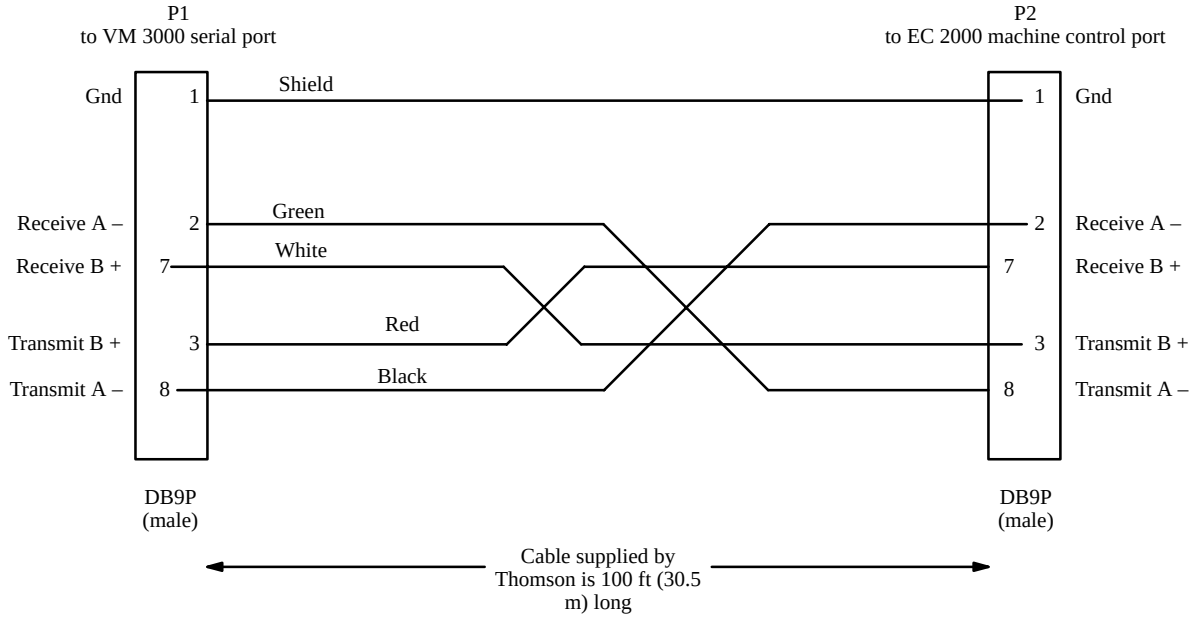


Figure 2–121. *Assembly, MCS 2000 automation cable. Ref: Thomson drawing no. 01–036373–001.*

MI 3040 Tally Installation

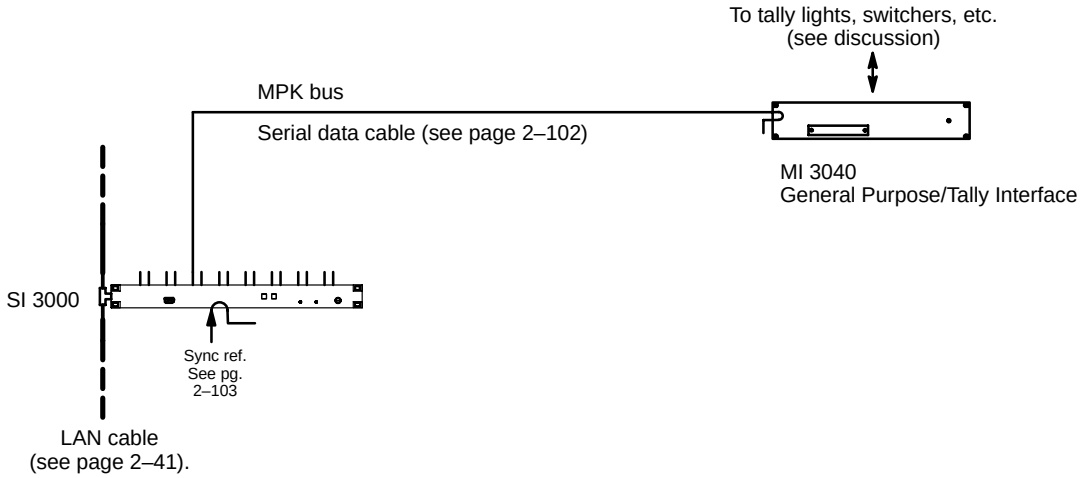


Figure 2–122. *MPK connections to MI 3040.*

TALLY SYSTEMS

Thomson offers the following software packages for operating tally systems:

- **Jupiter Tally**. The Jupiter Tally system can follow a source, such as a camera or VTR, through as many as five switchers and turn on the tally light next to the source when it is switched to the "Air" destination. Switchers that are on–air can also be tallied. Multiple sources will be tallied simultaneously during keys, special effects, etc.†

- **Saturn Tally**. "Saturn Tally" supports tally in entry level stand–alone applications where one channel of Saturn is installed and switching is performed by an internal matrix. Saturn Tally will tally up to 40 sources, switched on its own internal matrix. It will tally all sources on all levels that are on air, including audio/video inserts. See page 2–109. Also refer to "Saturn Tally" in the Saturn Installation and Operating Manual.

  Note: Only the Saturn Tally application will tally sources that are wired directly to a Saturn internal matrix.

- **Andromeda** – logical signal processing system developed by the Thomson Systems group in Griesheim, Germany. Functions include evaluation of GPIs, tally light control, evaluation of contact closure failure indications from devices such as master control switchers and video servers, and automatic, emergency switching. For more information, please refer to the Andromeda User Manual or contact Thomson.

All of these packages uses the MI 3040 General Purpose / Tally Interface either to monitor the status of switching equipment, or to provide a voltage source for tally lamps, or both.

† In certain systems, special configuration techniques will allow Jupiter to tally outputs and operate multi–level (air+preview+iso) tally systems. For more information, see Thomson technical paper "Advanced Tally Techniques for Studios with Jupiter Control and DD-35 Series Production Switchers."

MI 3040 HARDWARE OVERVIEW

Relay Outputs

The MI 3040 provides 40 electrically isolated output connections for operating tally lights, using solid–state switches which are suitable for low–voltage (<100 V), low–current (<300 milliamps) applications.

> Note 1: The Jupiter Tally system can only operate tally lights for sources that are connected directly to the Jupiter–controlled router as inputs. If a source is instead connected to a production switcher, or to a non–Saturn, non–MCS 2000 master control switcher, then the tally light for that source must be operated by that switcher's tally relay system—not by the MI 3040.

> Note 2: When the master control switcher feeds the transmitter indirectly (by re–entry through the routing switcher), a relay number must be entered on system configuration tables (as described in detail later) for a tally light assigned to the master control switcher. Relay numbers must also be entered on system tables for tally lights mounted next to production switchers. However, physical installation of these lights is optional. Whether these lights are installed or not, the sources upstream of the switcher(s) will still be tallied.

Status Inputs (Opto–isolators)

40 opto–isolated inputs are provided on the MI 3040 to receive tally data from production switchers and/or non–Saturn, non–MCS master control switchers, allowing the Jupiter system to determine what source has been selected by such switchers. This information is used along with Jupiter–controlled router status data to illuminate the appropriate tally light(s).

MPK Bus Connections

The MI 3040 connects directly to a VM/SI 3000 serial port using MPK protocol (Figure 2–122). Multiple MI 3040s can be installed as needed. Since information is shared among all units, tally lights can be operated by one MI 3040 based on switcher data received at another.

For a Saturn stand–alone system, where no VM/SI is available, the Saturn video processor (either digital or analog) is used as the source of the MPK bus.

Current Sources

In many cases current sources will need to be found to operate the tally lamps and energize the opto–isolators. Although +5 V and ground utility connections are available on the back panel of the MI 3040, this supply may not be sufficient for the particular installation. Before attempting these connections, please refer to the hardware overview starting on page 2–117.

Connecting production switchers and/or non–Saturn, non–MCS master control switchers to the MI 3040 opto–isolators will require an understanding of the switcher's tally relay hardware. Please refer to the installation manual supplied with the switcher for more information.

EXAMPLE OF SATURN TALLY SYSTEM

The following diagram shows an example of a Saturn Tally system. For detailed information, refer to “Saturn Tally” in the Saturn Installation and Operating Manual.

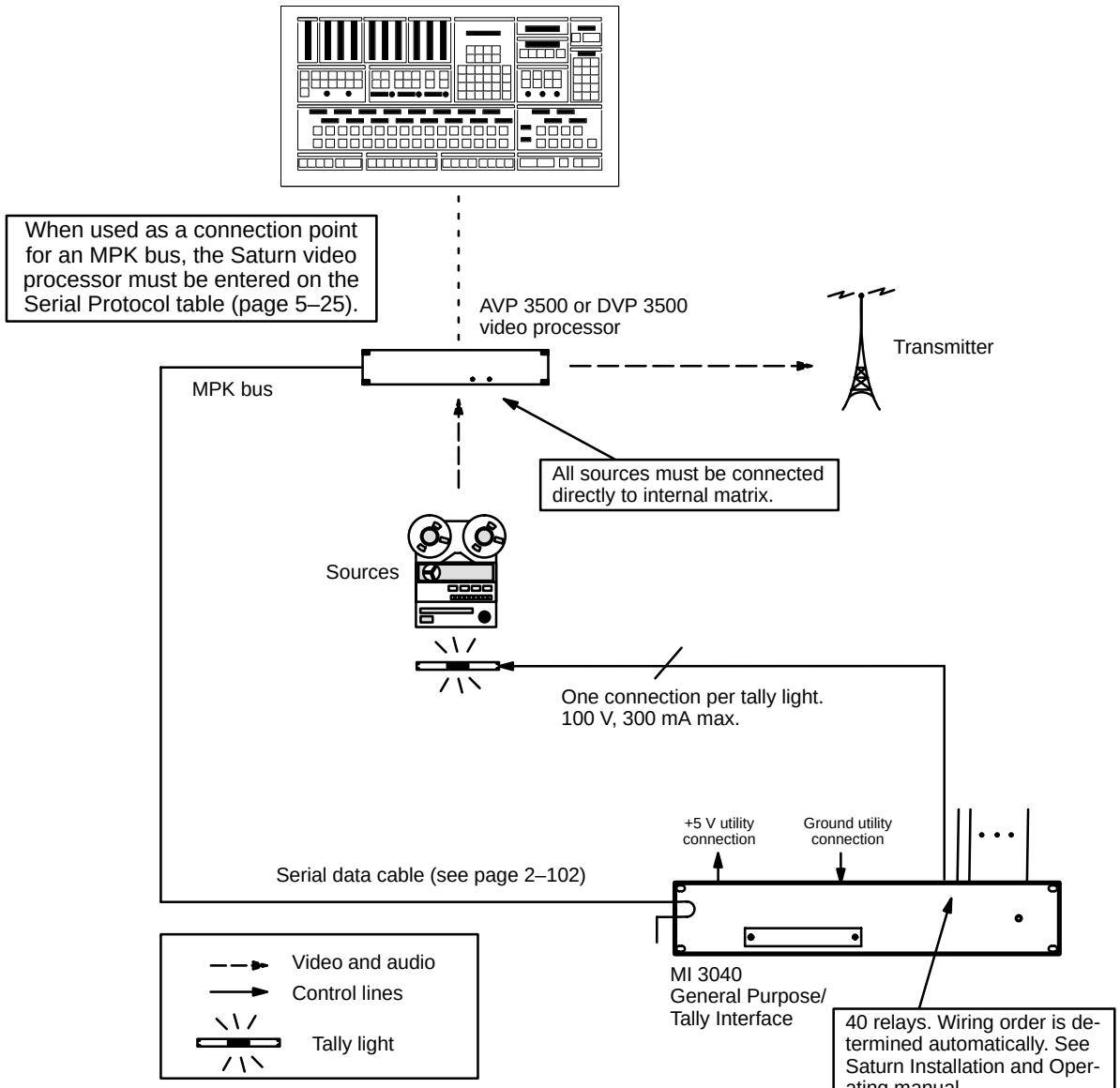


Figure 2–123. *Saturn Tally system.*

EXAMPLES OF JUPITER TALLY SYSTEMS

The diagrams on the following pages show systems that can be controlled by the Jupiter Standard Tally application.

Connection to Systems with Saturn / MCS 2000 Master Control Switcher

A Saturn/MCS master control switcher can feed the transmitter directly (page 2–111) or indirectly by re–entering the routing switcher (page 2–112). The main difference between these two systems is the tally light next to the master control switcher.

Each tally light that is to be controlled by the Jupiter system requires one relay connection, as shown.

Systems can include one or more production switchers (page 2–113 and following). For each feed from the Jupiter–controlled router to the production switcher(s), there must be a connection to one of the 40 opto–isolators of the MI 3040.

No connections from the Saturn/MCS master control switcher to the MI 3040 opto–isolators are needed; tally data is transmitted through the MPK bus.

Connection to Systems with Non–Saturn, Non–MCS Master Control Switcher

The master control switcher can feed the transmitter directly (Figure 2–128) or indirectly by re–entering the routing switcher (Figure 2–129). The main difference between these two systems is the tally light next to the master control switcher. For each feed from the Jupiter–controlled router to the master control switcher, there must be a connection to one of the 40 opto–isolators of the MI 3040. Each tally light that is to be controlled by the Jupiter system requires one relay connection, as shown.

Systems can also include one or more production switchers. For each feed from the Jupiter–controlled router to the production switcher(s), there must be a connection to one of the 40 opto–isolators of the MI 3040.

SOFTWARE CONFIGURATION

The MI 3040 must be established as an MPK device for tally use, after which it is referred to as a “MI 3040/T” (page 5–116). The Tally Relay and Tally Dependency tables must also be filled in, as described starting on page 5–174.

When used as a connection point for an MPK bus, the Saturn video processor must be entered on the Serial Protocol table (page 5–25).

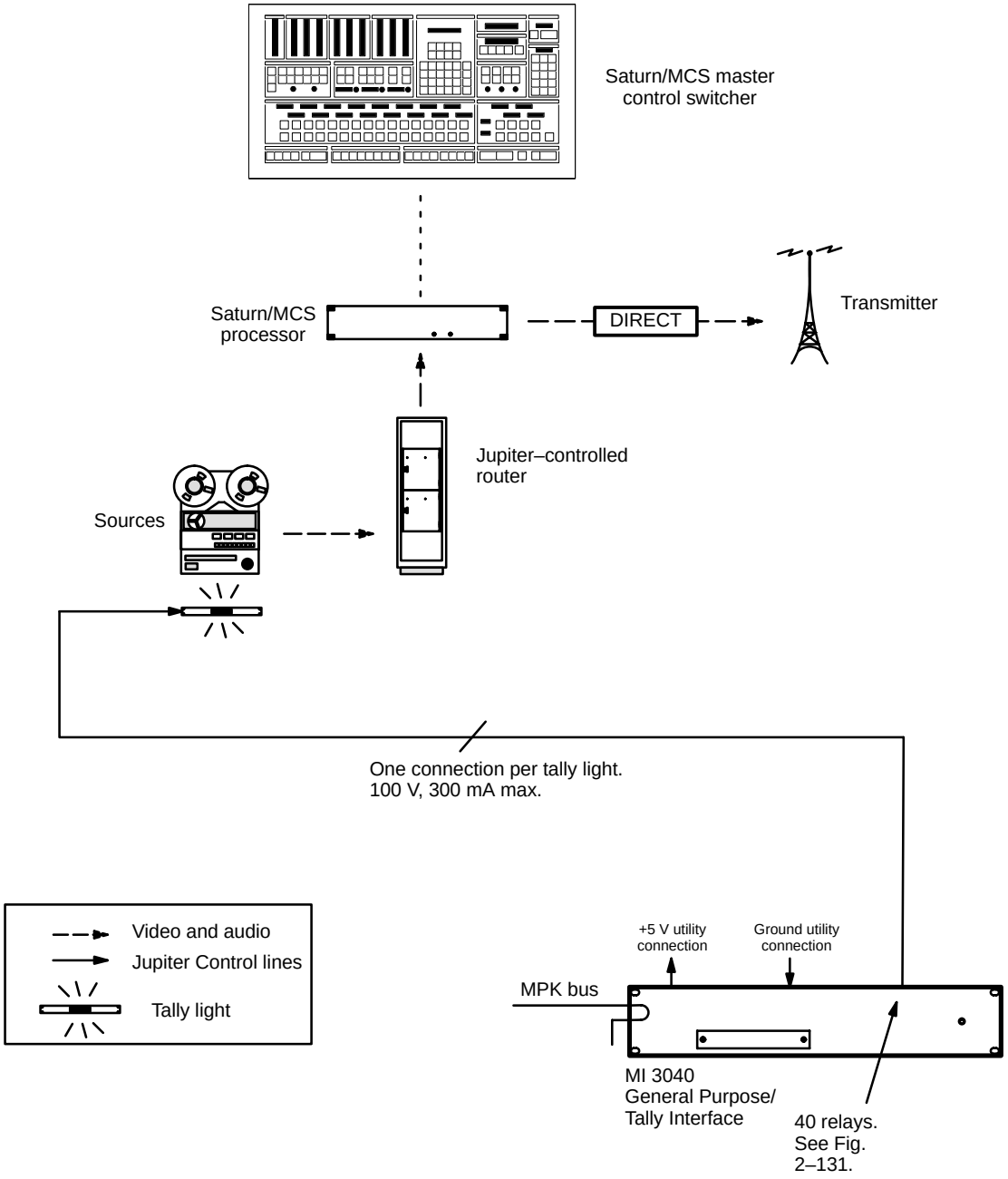


Figure 2–124. *Tally system with Jupiter–controlled router, Saturn/MCS master control, and direct feed to transmitter.*

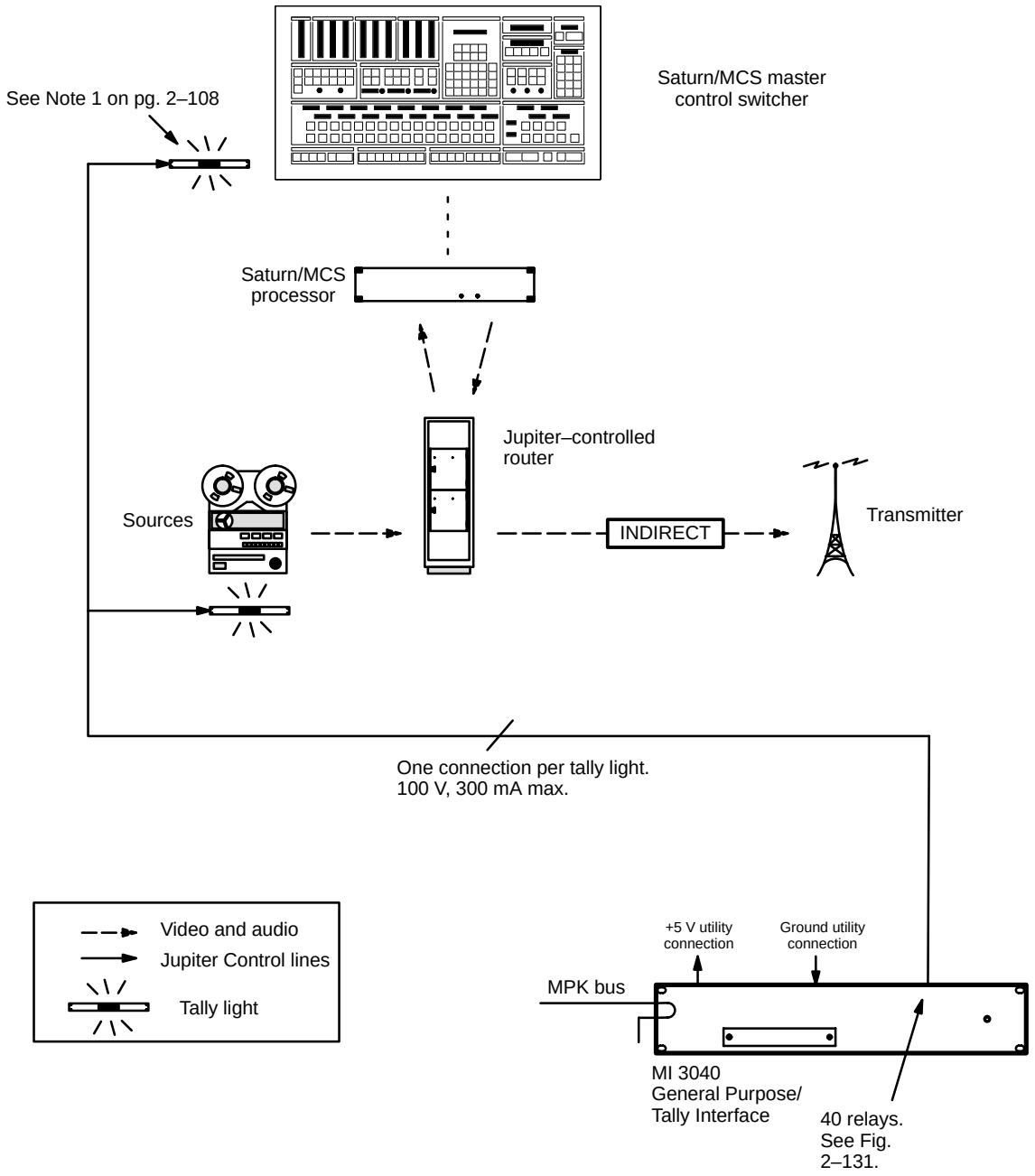


Figure 2–125. *Tally system with Thomson/MCS master control, Jupiter–controlled router, and indirect feed to transmitter.*

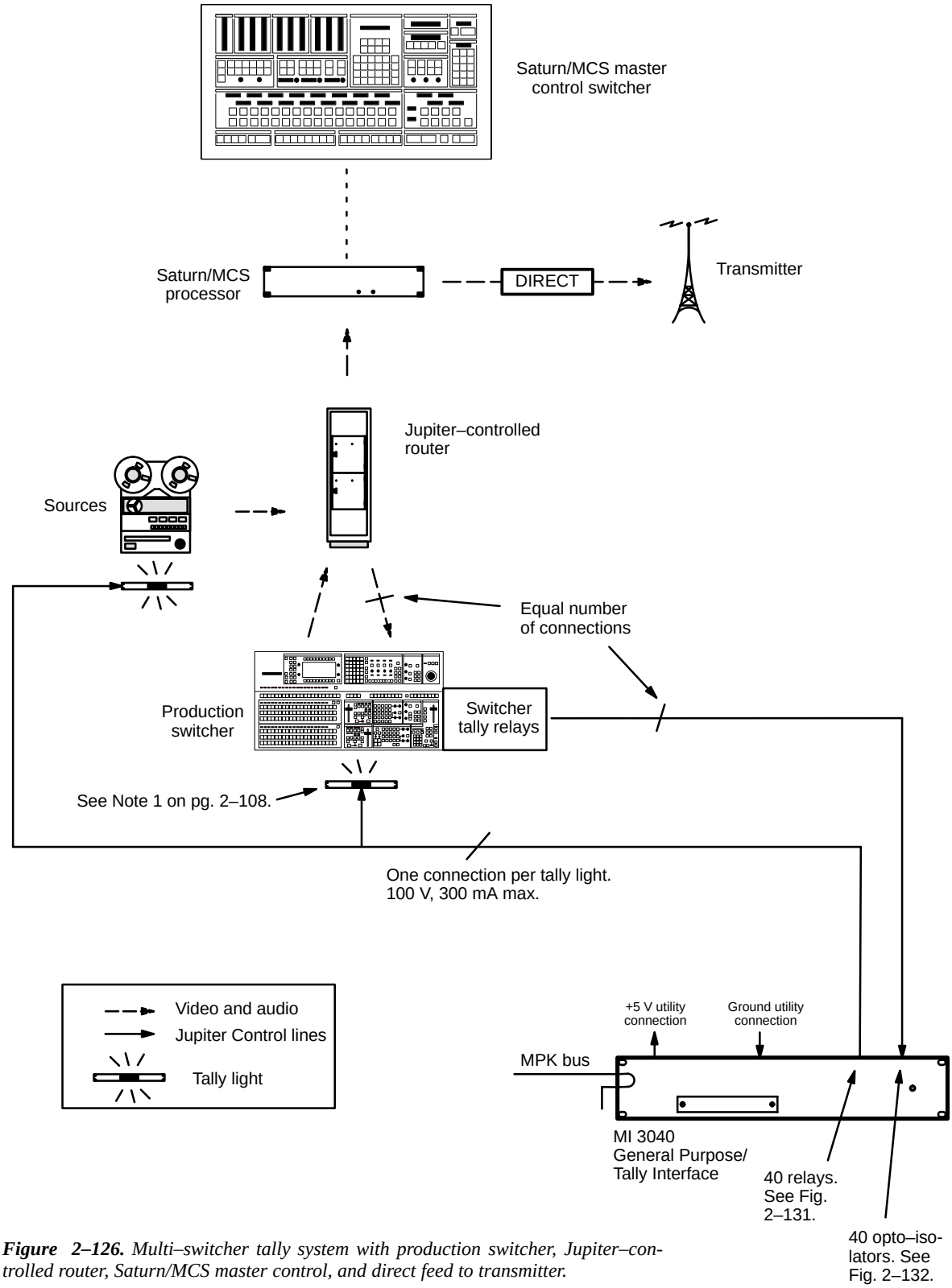


Figure 2–126. *Multi–switcher tally system with production switcher, Jupiter–controlled router, Saturn/MCS master control, and direct feed to transmitter.*

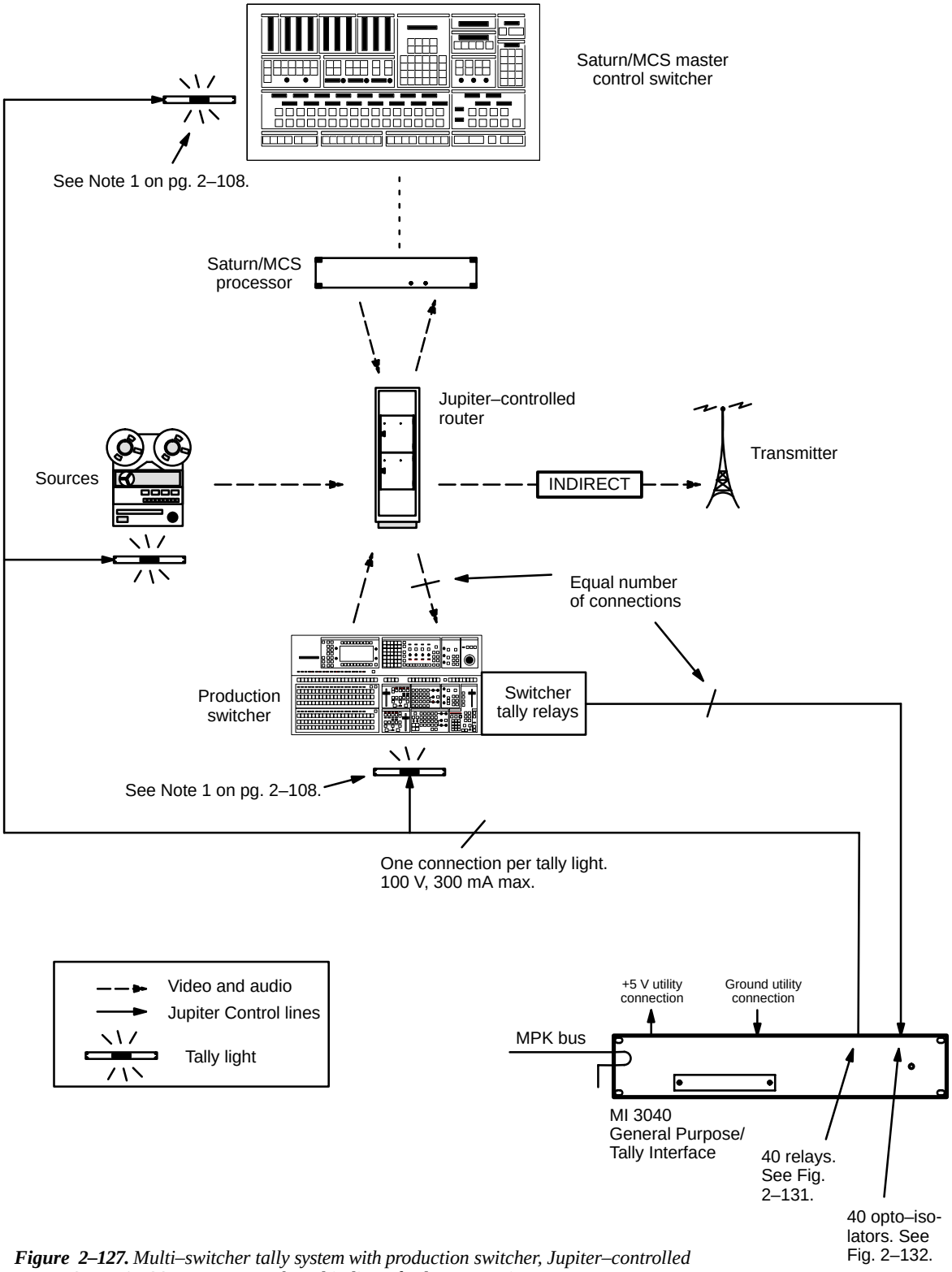


Figure 2–127. *Multi–switcher tally system with production switcher, Jupiter–controlled router, Saturn/MCS master control, and indirect feed to transmitter.*

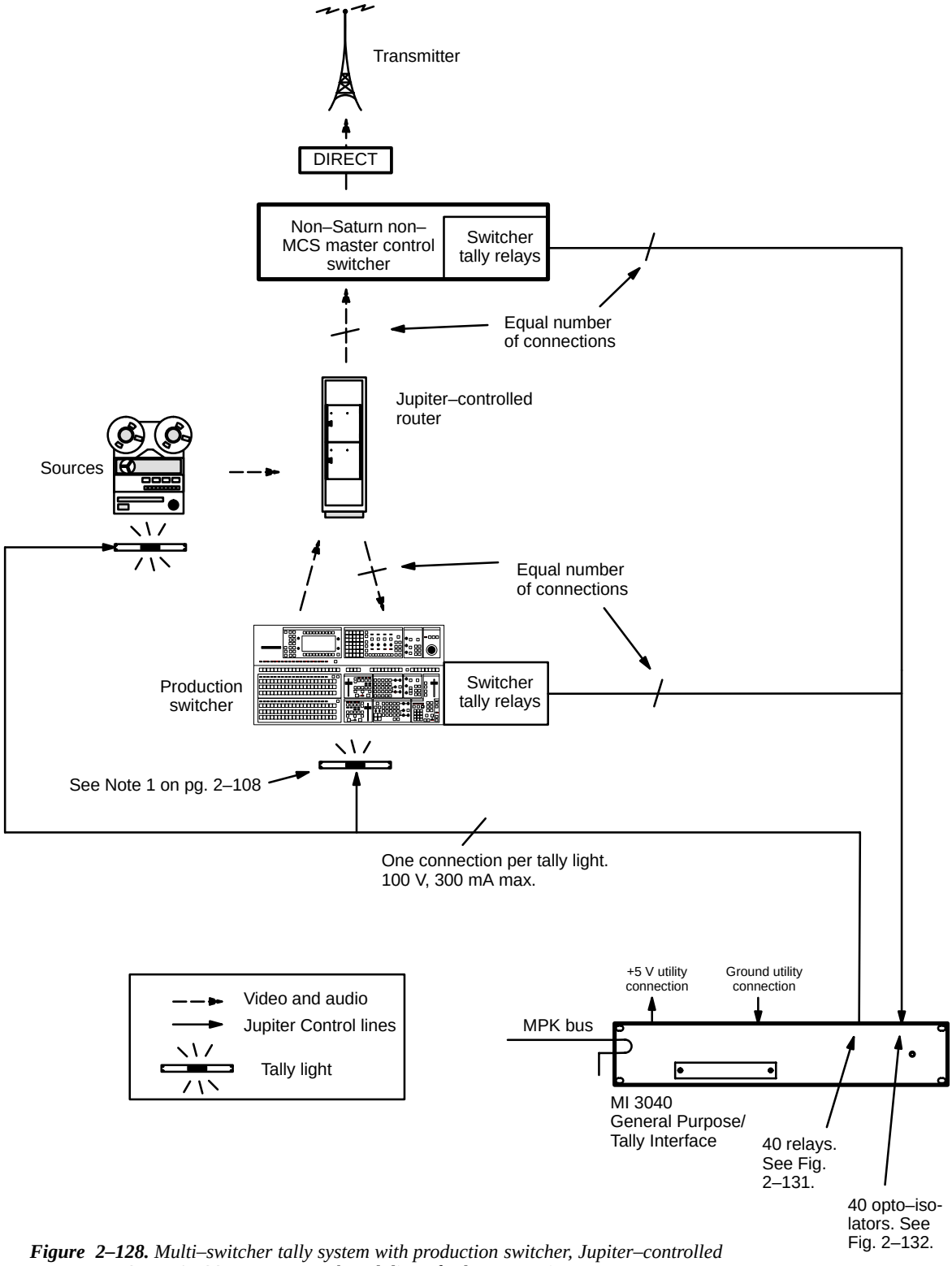


Figure 2–128. *Multi–switcher tally system with production switcher, Jupiter–controlled router, non–Saturn/MCS master control, and direct feed to transmitter.*

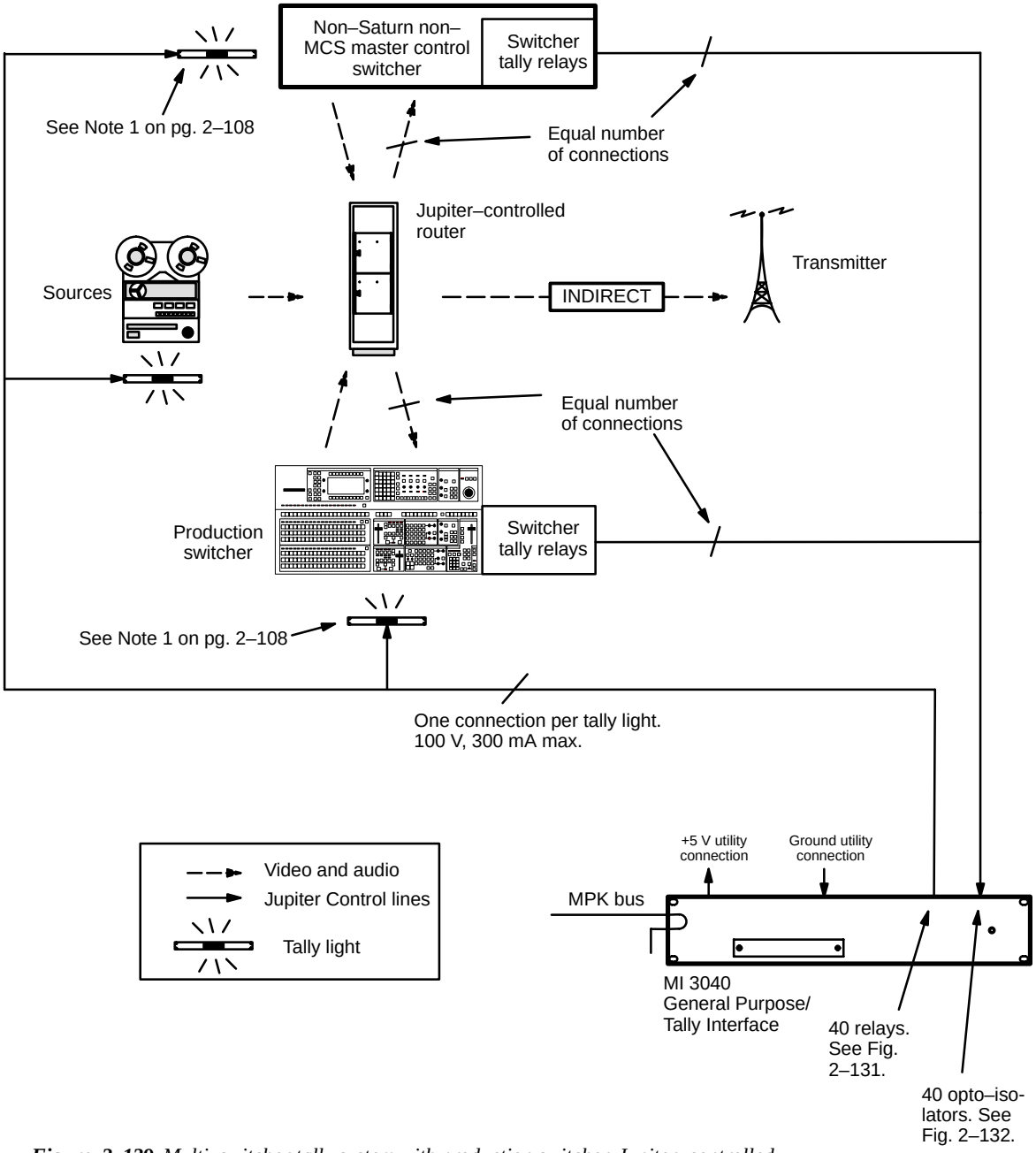


Figure 2–129. *Multi–switcher tally system with production switcher, Jupiter–controlled router, non–Saturn non–MCS master control, and indirect feed to transmitter.*

MI/MC 3040 Hardware Overview

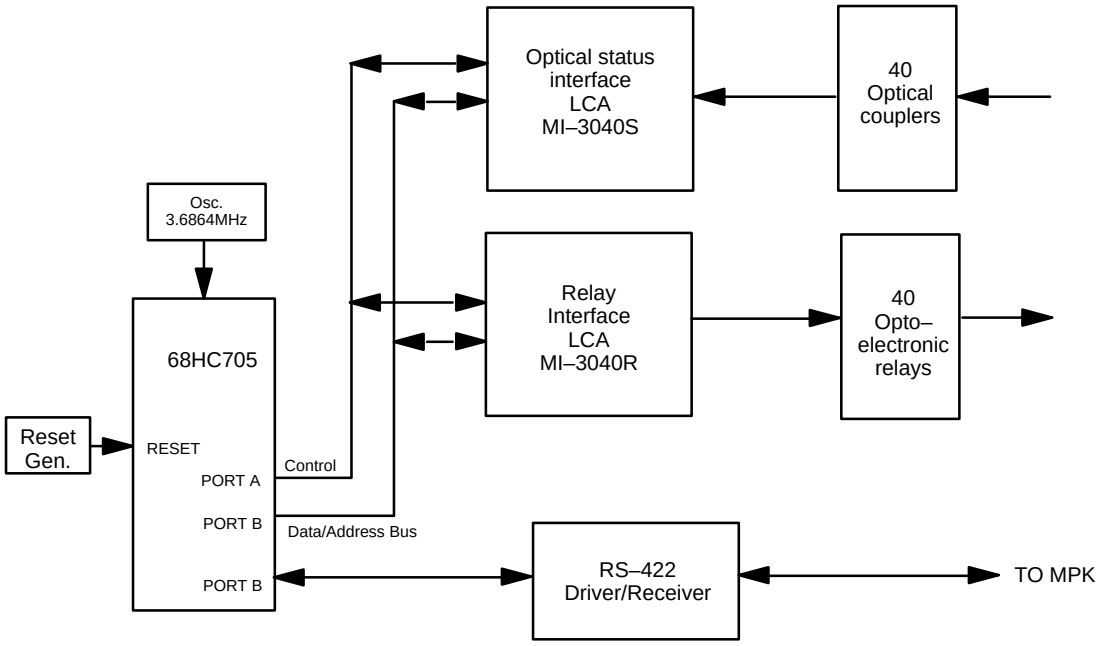


Figure 2–130. *MI/MC 3040 interface block diagram.*

The MI/MC 3040 interface provides 40 switch closures, monitors 40 isolated status inputs, and interfaces with a VM/SI 3000 using MPK protocol.

Optoelectronic Relays

(Reference: Fig. 2–131.) The relay selected for this design is an optically–coupled solid–state relay (PVD1352 by International Rectifier) capable of switching from 0 to 100 volts (AC or DC) at up to 300 mA. Each relay may be configured by slide switch for normally–open or normally–closed operation.

Relay Control

Each relay drive signal passes through a two–input exclusive–OR gate. The second input to each gate is tied to a DIP switch to ground and pull–up. When a switch is in the OPEN or OFF position, the corresponding relay is considered normally open; a high level on the relay drive line (inverted to a low level) will consequently close the relay. Conversely, when a switch is in the CLOSED or ON position, the corresponding relay is considered normally closed; a high level on the relay control line will cause this relay to open.

Optical Couplers

(Reference: Fig. 2–132.) The optical coupler inputs respond to a differential voltage between the two input pins. The optical couplers selected for this design are a bipolar type (PC314 by Sharp, for example) to eliminate the need for external steering diodes. The signal leg contains a series current–limiting resistor selected to provide between 1.75 and 13.6 milliamps of LED drive current at voltages of 5 to 28 volts (AC or DC).

Utility Connections

+5 V and ground utility connections are provided on the back panel. There are two +5 V connectors, each of which is equipped with a PCB–mounted 1 amp fuse. The fuse is designed to reset itself automatically.

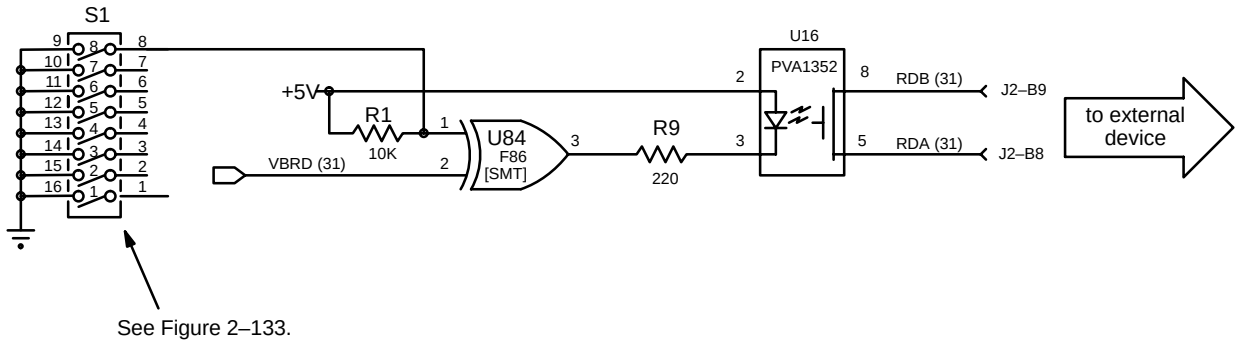


Figure 2–131. *MI/MC 3040 optoelectronic relay circuit (example). For discussion, see page 2–117.*

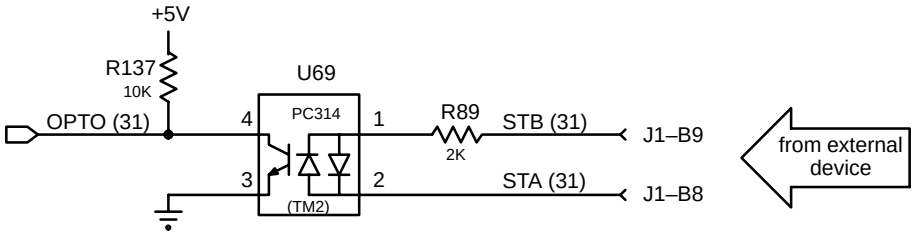


Figure 2–132. *MI/MC–3040 optical coupler status circuit (example). For discussion, see page 2–117.*

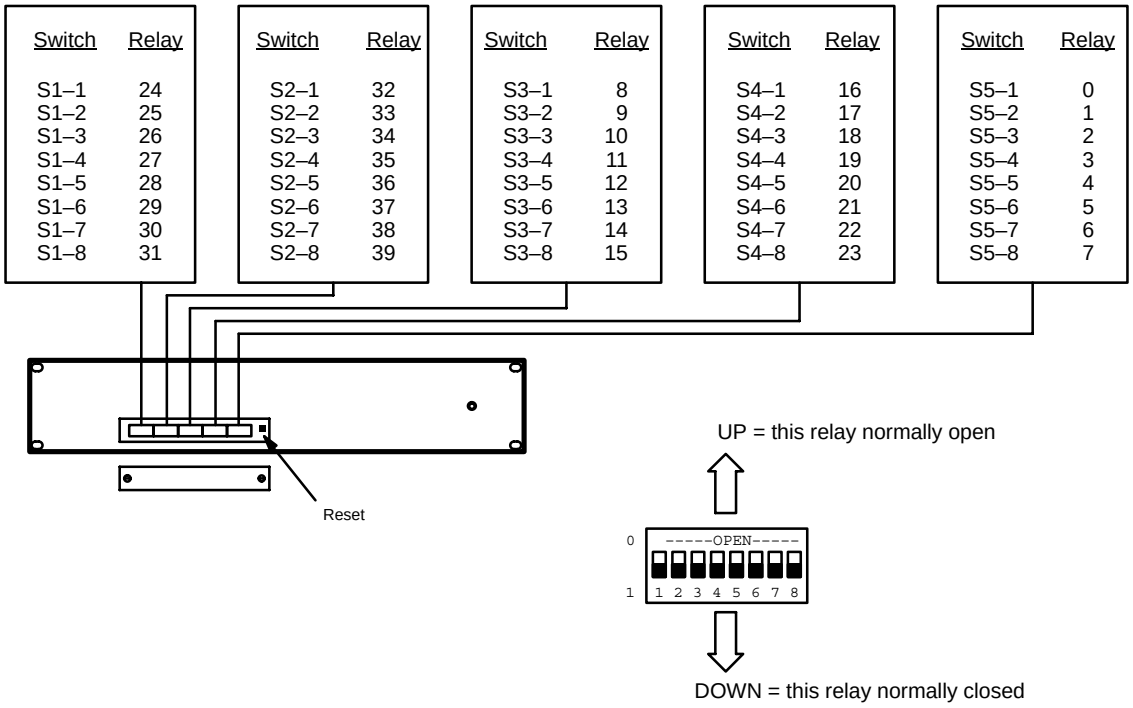


Figure 2–133. *MI/MC 3040 normally open/closed relay DIP switches.*

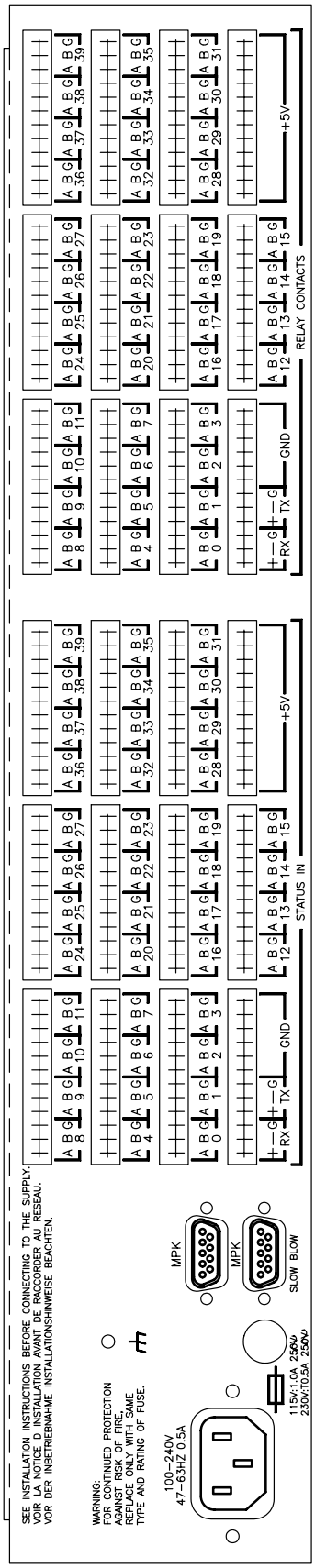


Figure 2–134. *MI/MC 3040 back panel.*

Under Monitor Displays

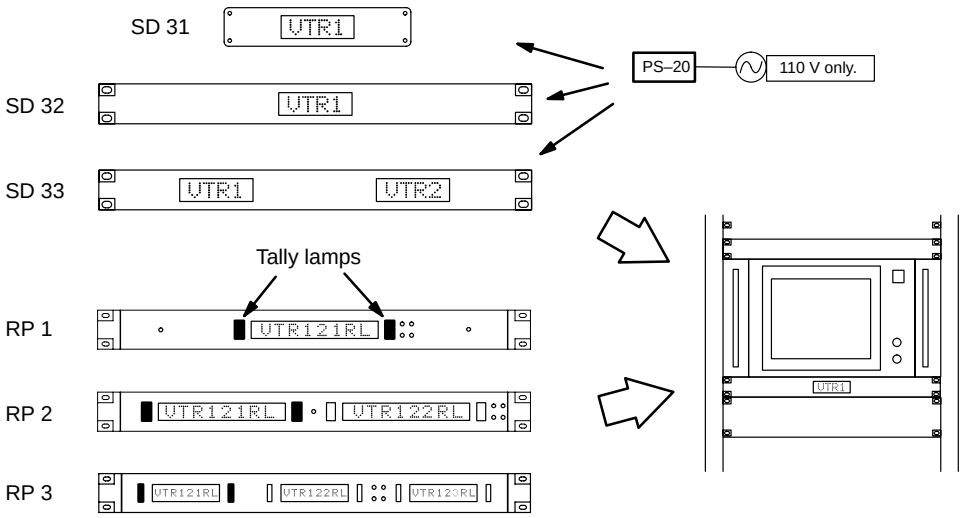


Figure 2–135. *Under Monitor Status Displays.*

Note 1: for information about TSL UMDs, see Appendix V.

Using the SD 3x and RP 1/2/3 UMD Status Displays, the Jupiter system can display the name of a source (camera, VTR, etc.) when it is switched though a Jupiter–controlled router to a particular monitor. In multi–switcher applications, the system can follow a source through as many as five switchers, including production switchers and Saturn/MCS master control switchers. Also available is a fixed mode of operation, during which the desired source name is displayed permanently. The RP 1/2/3 UMDs include a pair of red tally lights to the left and right of each display; these lights can be configured to illuminate when the source shown is switched to a particular destination (e.g., on–air).

Installation of the SD 3x Status Displays is shown below. Installation of the RP 1/2/3 Under Monitor Displays is similar.

The various SD 3x models can be mixed or matched on any MPK bus. The various RP models can also be mixed or matched on the same MPK bus; however, SD 3x models cannot be mixed with RP models on the same MPK bus.

Multiple VM/SI 3000 controllers can be used if desired.

Note 2: The DIP switches on the rear panel of SD 3x displays are not used in Jupiter installations.

Note 3: The Jupiter system can only operate status displays for sources that are connected directly to the Jupiter–controlled router as inputs (i.e., sources that go through the router to reach the master control or production switcher). The system cannot status sources that are wired *only* to the master control or production switcher. In particular, the methods described here cannot be used to status sources that are connected to a Saturn internal matrix; this requires an entirely different procedure as described in the Saturn manual.

SD 3x Power Supply Requirements

A wall plug–in power supply, Model PS 20, is supplied with each status display that will be used with 110 VAC 60 Hz power. Status displays that are to be used in areas where 220 VAC 50 Hz power is the norm are not shipped with any power supply. The user in these areas must provide a source of regulated 5 VDC power to each display. The status display requirement is +5 VDC +/– 0.25 V at an average current of 375 mA per display. Because of the internal scanning of the LEDs in the readouts, the power supply must be capable of supplying 1 Amp peaks of current. The power connector used on the SD–3x PC board is an RL11A (female) made by LZR Electronics; Thomson part no. 30–005724–007.

CONNECTION TO SYSTEMS WITH JUPITER–CONTROLLED ROUTER ONLY

Up to 16 UMDs can be connected per VM/SI port. See Figure 2–136.

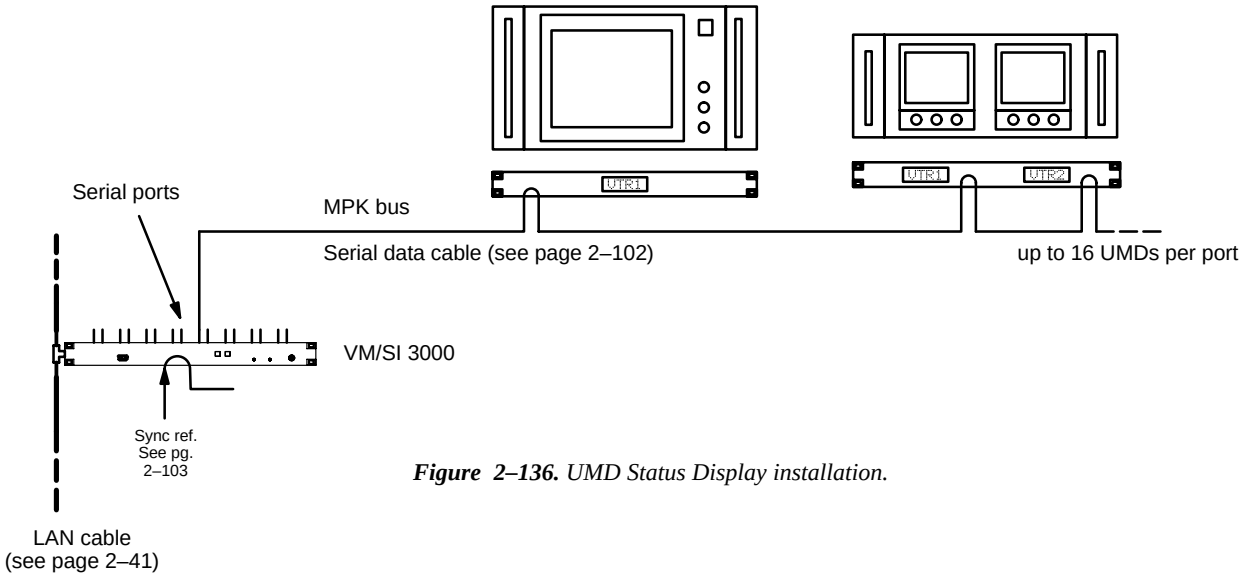


Figure 2–136. *UMD Status Display installation.*

CONNECTION TO SYSTEMS WITH SATURN/MCS MASTER CONTROL SWITCHER

A master control room application is shown in Figure 2–137. No additional connections to the master control switcher itself is required, since all status data is transmitted on the LAN (Saturn, page 2–104) or party line connections (MCS 2000, page NO TAG).

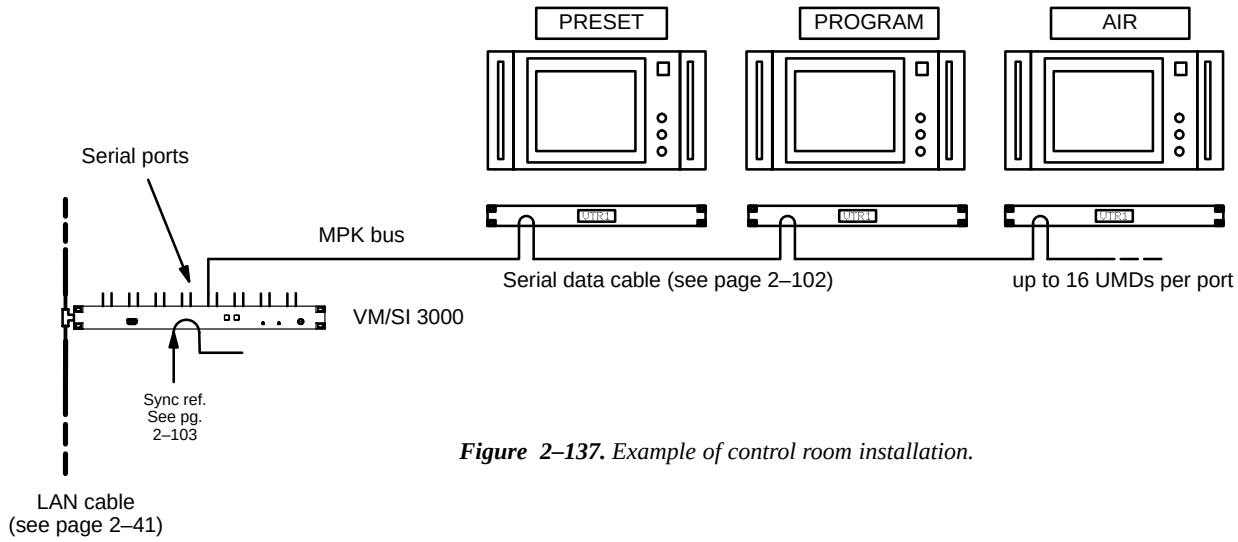


Figure 2–137. *Example of control room installation.*

In this application, the UMDs will provide correct status for inputs connected to a Saturn MCS through a Jupiter–controlled router; they will also provide correct status for inputs connected directly to a Saturn internal matrix.

CONNECTION TO SYSTEMS WITH NON–SATURN/MCS MASTER CONTROL OR WITH PRODUCTION SWITCHER

Systems can include production switchers or master control switchers other than Saturn/MCS, but since such switchers do not use the Thomson LAN or party line an MI 3040 General Purpose / Tally Interface must be used to obtain switcher status (see Figure 2–138). For each feed from the Jupiter–controlled router to the switcher(s), there must be a connection from a switcher tally relay to one of the 40 opto–isolators of the MI 3040. This allows the Jupiter to determine what source has been selected by such switchers. This information is used along with routing switcher status data to display the appropriate mnemonic.

The MI 3040 connects directly to a VM/SI 3000 serial port using MPK protocol. Since information is shared among all units, status displays can be operated by one VM/SI 3000 based on MI 3040 data received at another.

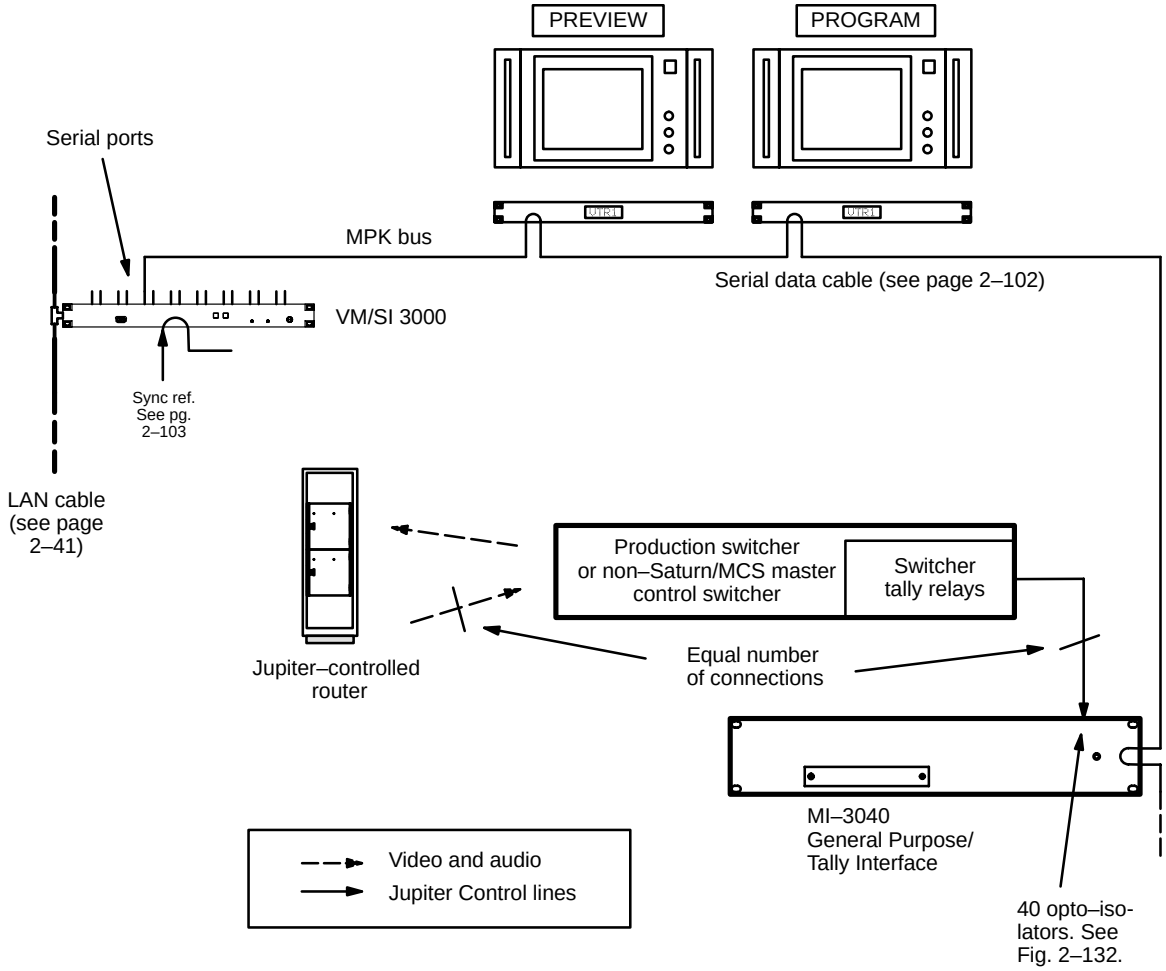


Figure 2–138. *Use of MI–3040 with production switcher / non–Saturn non–MCS master control switcher.*

Note: In this application, the Jupiter can only operate status displays for sources that are connected directly to the Jupiter–controlled router as inputs (i.e., sources that go through the router to reach the master control or production switcher). The system cannot track sources that are wired only to a non–Saturn/MCS master control or production switcher.

Connecting production switchers and/or non–Saturn/MCS master control switchers to the MI 3040 opto–isolators will require an understanding of the switcher's tally relay hardware. Please refer to the installation manual supplied with the production switcher for more information. (The MI 3040 hardware is discussed on page 2–117.)

SOFTWARE CONFIGURATION

The under monitor status displays must be entered as MPK devices. See page 5–118.

In systems which include master control or production switchers, entries to special CP Output Set tables and entries to the Tally Dependencies table will be required (see page 5–122). In some cases, entries to the Tally Relay Description table will also be needed (see page 5–125).

If RP 1/2/3 **tally light** operation is needed, additional configuration will be needed:

- For the Jupiter Standard Tally application, there must be an MPK table entry for an "MI 3040/T" whether it is physically present or not (see page 5–121). Entries to the Tally Relay and Tally Dependency tables will also be needed (see pages 5–174 and 5–180).