# *Appendix L*

## *Special Configuration Requirements: Venus DM 400/400A Data Matrix Switching*

Note 1: The following discussion applies only to older model Venus switchers equipped with DM 400 or DM 400A Data Matrix boards. Newer model Venus systems are equipped with the DM 400B Data Martrix boards; these boards have software–configurable rear–panel pinout functions and do not require crossover or Y–line cables.[§]

The Jupiter system can be used to control RS–232, RS–422, and RS–423 data switchers.

DM 400/400A data switchers employ a "reverse" switching technique, where one level is used to switch data from a controlling device (such as an editor) to a controlled device (such as a VTR); a second level is used to return data to the controller. The return path is switched automatically by the control system.

The following discussion applies specifically to a Venus DM 400/400A data matrix switchers in an RS–422 machine control application; however, the same concepts generally apply to other Thomson Crosspoint Bus data switchers and protocols. An important difference is that the Venus DM 400/400A data matrix switcher uses the *same physical level number* for both the forward and reverse levels; whereas the TVS/TAS series data matrix switchers use different physical level numbers.

### HARDWARE CONNECTIONS

For complete information regarding jumper settings and cabling, refer to the technical manual supplied with the switcher. An example of an RS–422 Venus system is shown on page L–2.

Note 2: As shown on page L–2, the cable used to connect the control device (e.g., editor) to the DM 400/400A switcher is a cross–over type cable.

Note 3: If you wish to use or build a cable for the editor that has the standard "straight–through" pin–outs, you may elect to use this straight–through cable with a short crossover cable or connector. The short crossover cable/connector could be attached permanently to the Venus rear panel.

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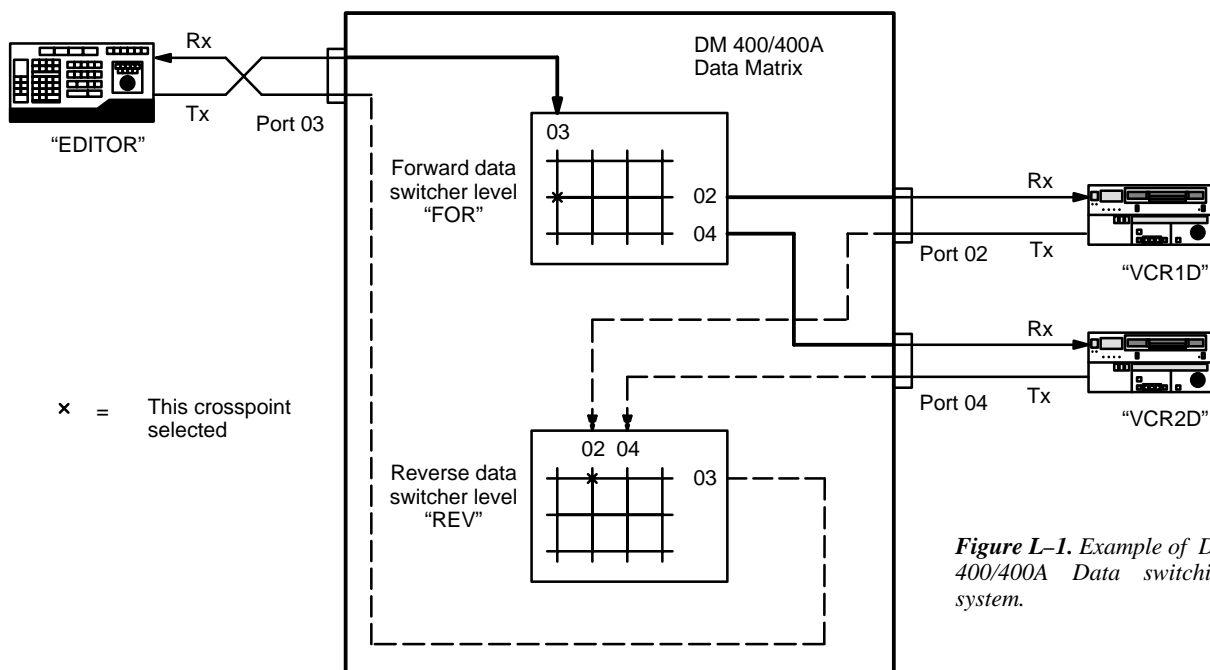[§] Type and model of switcher card is shown on front edge of printed circuit board.
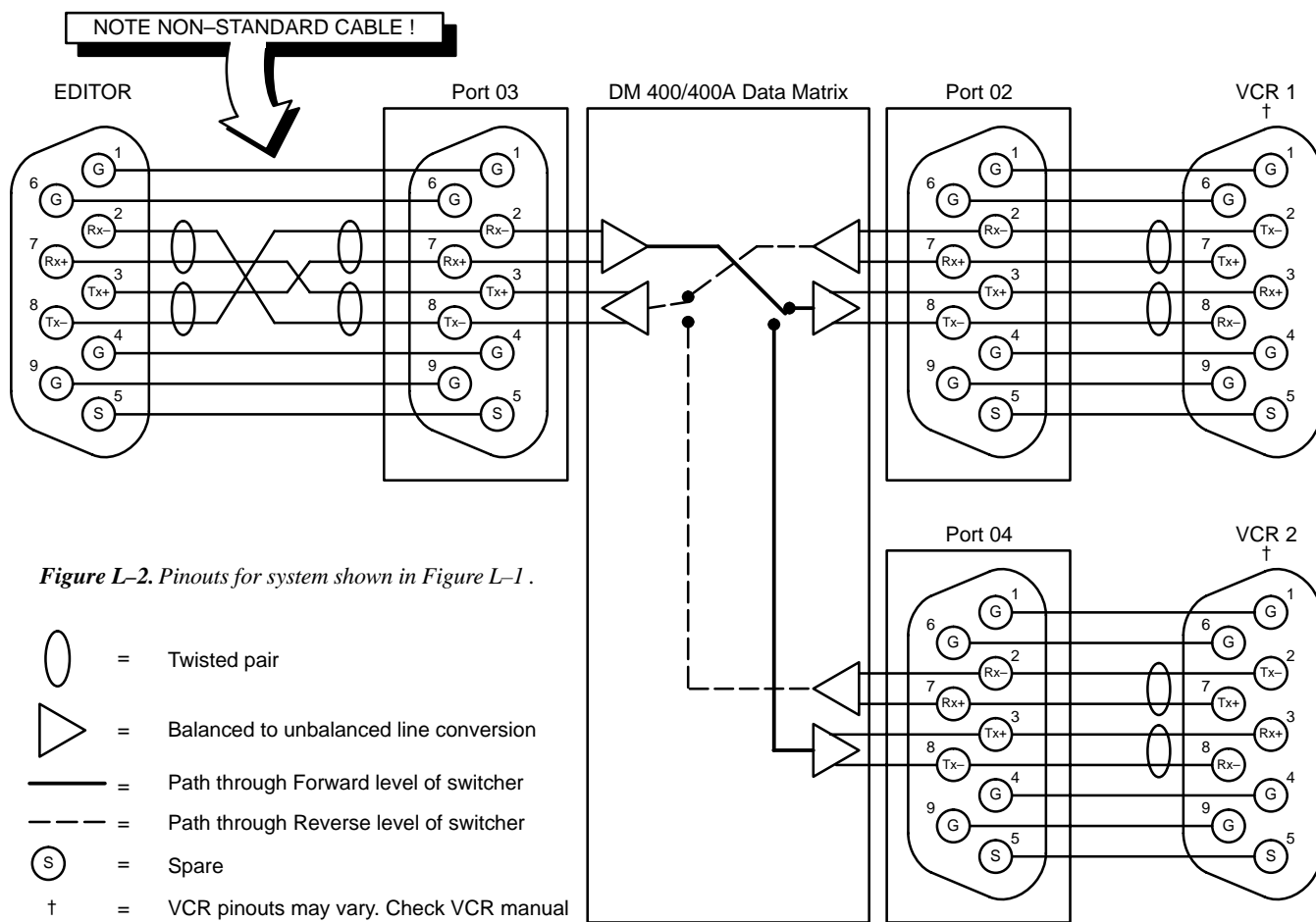
*Figure L–1. Example of DM 400/400A Data switching system.*

NOTE NON–STANDARD CABLE !

*Figure L–2. Pinouts for system shown in Figure L–1 .*

= Twisted pair

= Balanced to unbalanced line conversion

= Path through Forward level of switcher

= Path through Reverse level of switcher

S = Spare

† = VCR pinouts may vary. Check VCR manual

## SWITCHER DESCRIPTION TABLE

An example of a Switcher Description table for a DM 400/400A data matrix switcher is shown in Figure L–3. This table corresponds to the system shown in Figures L–1 and L–2.

In this example, a special entry in the "Switcher" column ("DATA") is used for the data router levels; this forces the Jupiter software to create Switcher Input and Switcher Output tables that are separate from those used for other switcher levels (Figure L–6).

> Note 1: A limitation in the present software requires that the entries in the "Switcher" column for the data router levels must be the **same** as, or come **alphabetically before**, all other names used in the Switcher column. In Figure L–3, this rule is satisfied because the letter "D" in "DATA" comes alphabetically before the letter "M" in "MAINROUT," and before the letter "O" in "OLDROUT." This does **not** mean that the entries must be in alphabetical **order** within the table itself.

For DM 400/400A applications, the forward and reverse levels have the same physical level number ("16"). Reverse switching is enabled for the reverse level ("R"); and, the reverse level is made to *follow* the forward level ("DATA" and "FOR"). The "Option" entry (normally "E") is described starting on page 5–41.

> Note 2: For DM 400/400A data switchers, the entry for "#In" must be "193." This is true regardless of the actual size of the switcher. [†]

The Switcher Description table is described in more detail starting on page 5–31.

**Switcher Description**

| | Switcher | Level | VI | RV | MC | Board | #In | #Out | PLvL | Follow Level | Driver | 3 LI | 3 LO | Option | Audio | DM 400 Off Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MAINROUT ▼ | VIDEO | ☑ | ☐ | ☑ | M1 ▼ | 64 | 64 | 1 | ▼ | Binary ▼ | | | ▼ | None ▼ | |
| 2 | MAINROUT ▼ | LEFT | ☐ | ☐ | ☐ | M1 ▼ | 64 | 64 | 2 | ▼ | Binary ▼ | | | ▼ | Left ▼ | |
| 3 | MAINROUT ▼ | RIGHT | ☐ | ☐ | ☐ | M1 ▼ | 64 | 64 | 8 | ▼ | Binary ▼ | | | ▼ | Right ▼ | |
| 4 | MAINROUT ▼ | TC | ☐ | ☐ | ☐ | M1 ▼ | 32 | 32 | 4 | ▼ | Binary ▼ | | | ▼ | None ▼ | |
| 5 | DATA ▼ | FOR | ☐ | ☐ | ☐ | M1 ▼ | 193 | 32 | 16 | ▼ | Binary ▼ | | | E ▼ | ▼ | |
| 6 | DATA ▼ | REV | ☐ | ☑ | ☐ | M1 ▼ | 193 | 32 | 16 | FOR (DATA) ▼ | Binary ▼ | | | E ▼ | ▼ | |
| 7 | OLDROUT ▼ | VIDEO | ☐ | ☐ | ☐ | M1 ▼ | 10 | 10 | 3 | ▼ | TVS Prot ▼ | | | ▼ | ▼ | |

Name chosen for data router must sort alphabetically **before** names used for other switchers (e.g., "D" comes in the alphabet before "M" and "O.")

*Figure L–3.*

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[†] This is because the "#In" must always be one greater than the largest number used in the CP Input table. The largest number used in the CP Input table will always be "192" (for the "safe" input, as described on page 5–25).

As an alternative scheme, it is possible to use the same entry in the "Switcher" column (for example, "MAINROUT") for all levels, including the data levels (Figure L–4). In this case, the Switcher Input and Switcher Output tables will have columns for all switcher levels.

| | Switcher | | Level | VI | RV | MC | Board | | #In | #Out | PLvL | Follow Level | | Driver | | 3 LI | 3 LO | Option | | Audio | | DM 400 Off Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Switcher Description** | | | | | | | | | | | | | | | | | | | | | | |
| 1 | MAINROUT | ▼ | VIDEO | ☑ | ☐ | ☑ | M1 | ▼ | 64 | 64 | 1 | | ▼ | Binary | ▼ | | | | ▼ | None | ▼ | |
| 2 | MAINROUT | ▼ | LEFT | ☐ | ☐ | ☐ | M1 | ▼ | 64 | 64 | 2 | | ▼ | Binary | ▼ | | | | ▼ | Left | ▼ | |
| 3 | MAINROUT | ▼ | RIGHT | ☐ | ☐ | ☐ | M1 | ▼ | 64 | 64 | 8 | | ▼ | Binary | ▼ | | | | ▼ | Right | ▼ | |
| 4 | MAINROUT | ▼ | TC | ☐ | ☐ | ☐ | M1 | ▼ | 32 | 32 | 4 | | ▼ | Binary | ▼ | | | | ▼ | None | ▼ | |
| 5 | MAINROUT | ▼ | FOR | ☐ | ☐ | ☐ | M1 | ▼ | 193 | 32 | 16 | | ▼ | Binary | ▼ | | E | | ▼ | | ▼ | |
| 6 | MAINROUT | ▼ | REV | ☐ | ☑ | ☐ | M1 | ▼ | 193 | 32 | 16 | FOR (MAINROUT) | ▼ | Binary | ▼ | | E | | ▼ | | ▼ | |
| 7 | OLDROUT | ▼ | VIDEO | ☐ | ☐ | ☐ | M1 | ▼ | 10 | 10 | 3 | | ▼ | TVS Prot | ▼ | | | | ▼ | | ▼ | |

> Name chosen for data router must sort alphabetically **before** names used for other switchers (e.g., "M" comes in the alphabet before "O.")

*Figure L–4.*

Note: A limitation in the present software requires that the entries in the "Switcher" column for the data router levels must be the **same** as or come **alphabetically before** all other names used in the Switcher column. In Figure L–4 this rule is satisfied because the entry "MAINROUT" in rows 5 and 6 is the same as the entry in rows 1 through 4, and because the letter "M" in "MAINROUT" comes alphabetically before the letter "O" in "OLDROUT." This does **not** mean that the entries must be in alphabetical **order** within the table itself.

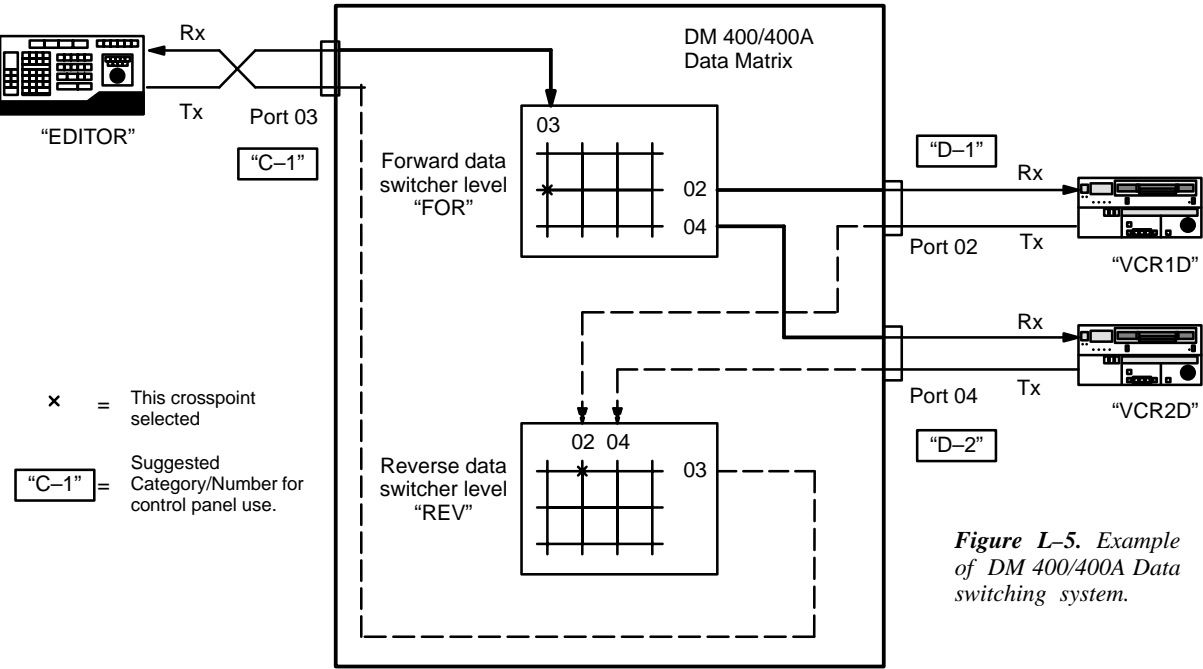For a discussion of the "DM 400 Off Time" entry, see page 5–43.



*Figure L–5. Example of DM 400/400A Data switching system.*

## SWITCHER INPUT AND OUTPUT TABLES

> Note: Since the software depends on logical numbers, which are actually **row** numbers on these tables, editing one of the the tables can easily break the logical connection between them. For example, if new inputs are added to the top of the Switcher Input table, all following rows will be pushed down and assume new row (logical) numbers. To minimize this difficulty, Thomson recommends that all **NEW** entries be made at the **end** of the tables.

In a reverse switching scheme, a device feeding the "forward" level must use a *logical* input number on the forward level that is the same as its *logical* output number on the "reverse" level. In other words, the row numbers must match. See Figures L–5 and L–6.
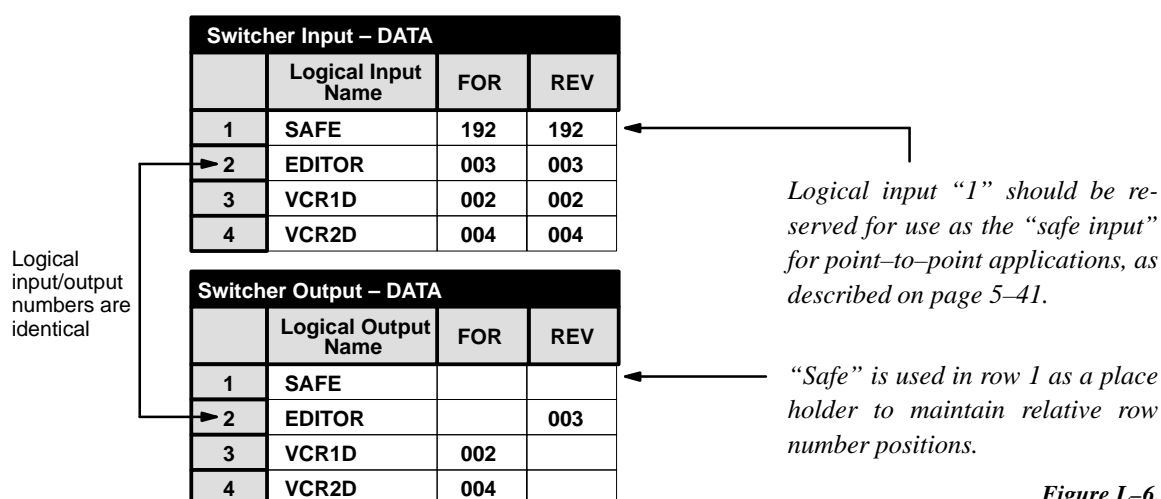
**Switcher Input – DATA**

| | Logical Input Name | FOR | REV |
|---|---|---|---|
| 1 | SAFE | 192 | 192 |
| 2 | EDITOR | 003 | 003 |
| 3 | VCR1D | 002 | 002 |
| 4 | VCR2D | 004 | 004 |

Logical input/output numbers are identical

**Switcher Output – DATA**

| | Logical Output Name | FOR | REV |
|---|---|---|---|
| 1 | SAFE | | |
| 2 | EDITOR | | 003 |
| 3 | VCR1D | 002 | |
| 4 | VCR2D | 004 | |

*Logical input "1" should be reserved for use as the "safe input" for point–to–point applications, as described on page 5–41.*

*"Safe" is used in row 1 as a place holder to maintain relative row number positions.*

***Figure L–6.***

Conversely, a device feeding the "reverse" level must use a *logical* input number on the reverse level that is the same as its *logical* output number on the forward level. See Figures L–5 and L–7.
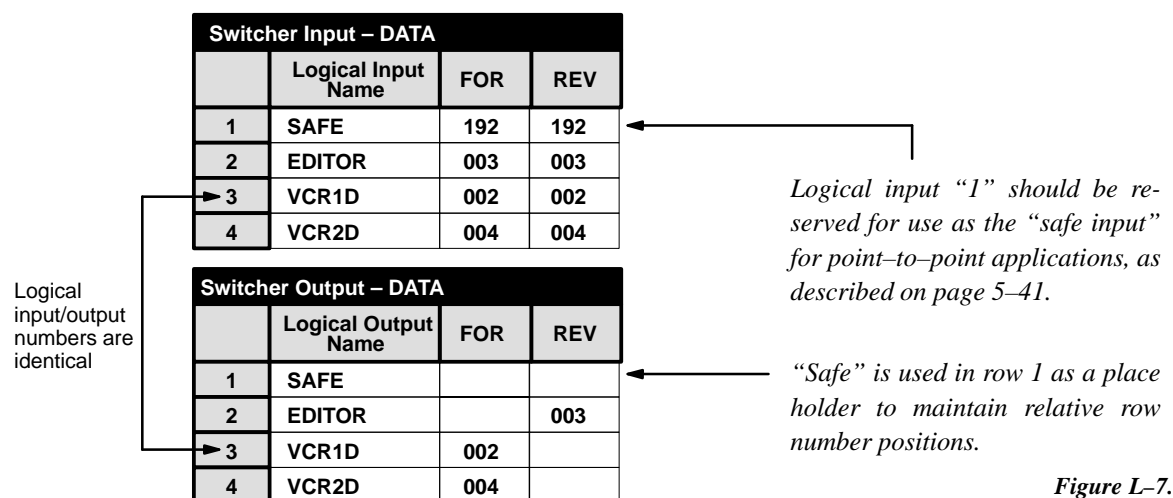
**Switcher Input – DATA**

| | Logical Input Name | FOR | REV |
|---|---|---|---|
| 1 | SAFE | 192 | 192 |
| 2 | EDITOR | 003 | 003 |
| 3 | VCR1D | 002 | 002 |
| 4 | VCR2D | 004 | 004 |

Logical input/output numbers are identical

**Switcher Output – DATA**

| | Logical Output Name | FOR | REV |
|---|---|---|---|
| 1 | SAFE | | |
| 2 | EDITOR | | 003 |
| 3 | VCR1D | 002 | |
| 4 | VCR2D | 004 | |

*Logical input "1" should be reserved for use as the "safe input" for point–to–point applications, as described on page 5–41.*

*"Safe" is used in row 1 as a place holder to maintain relative row number positions.*

***Figure L–7.***

## CP LEVEL SET

In data router applications, the reverse level should be entered on the CP Level Set(s), but should **not** be set to Switch, i.e., an "N" should be entered in the "Switch" column.

## CP INPUT AND OUTPUT SETS

The input and output names in the previous tables must be assigned to Category/Entry selections. In the following examples, intended for use with a CP 3000–type panel, the "C" (for "controller") category button will be used to select the Editor and the "D" (for "destination") category button will be used to select the VCRs .

| | Category | | Entry | Auto Mnem | Mnemonic | Input |
|---|---|---|---|---|---|---|
| 1 | Test | ▼ | 1 | ☑ | BARS | BARS |
| 2 | Test | ▼ | 2 | ☑ | TONE | TONE |
| 3 | Test | ▼ | 3 | ☐ | TC | TC |
| 4 | VTR | ▼ | 1 | ☑ | VT01 | VT01 |
| 5 | VTR | ▼ | 2 | ☑ | VT02 | VT02 |
| 6 | VTR | ▼ | 3 | ☑ | VT03 | VT03 |
| 7 | VTR | ▼ | 4 | ☑ | VT04 | VT04 |
| 8 | VTR | ▼ | 5 | ☑ | VT05 | VT05 |
| n | C | ▼ | 1 | ☑ | EDITOR | EDITOR |

Input Set — KXYZ–INP

*Figure L–8.*

| | Category | | Entry | Auto Mnem | Mnemnonic | Logical Output | | Level Set | Button |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EJ | ▼ | 1 | ☑ | NEW1 | NEW1 | ▼ | ▼ | |
| 2 | EJ | ▼ | 2 | ☑ | NEW2 | NEW2 | ▼ | ▼ | |
| 3 | EJ | ▼ | 3 | ☑ | NEW3 | NEW3 | ▼ | ▼ | |
| n | D | ▼ | 1 | ☑ | VCR1 | VCR1D | ▼ | ▼ | |
| n | D | ▼ | 2 | ☑ | VCR2 | VCR2D | ▼ | ▼ | |

Output Set — KXYZ–OUT

*Figure L–9.*

## OPERATION

In this example, the operator would select a destination such as "B–1" (VCR 1); then a source such as "C–1" (the editor). When TAKE is pressed the switch is made in the forward level; *and*, VCR 1 is automatically switched back to the editor in the reverse level.

## POINT–TO–POINT DATA SWITCHING OPTIONS

**("Normal/Advise/Enforce")**

In most reverse data switching applications, one of the point–to–point Options ("Advise" or "Enforce") should be selected for the "controller level." The controller level is defined as the level receiving data from the editor or other control device. For more information, see page 5–41.

## Y LINE TABLE – VTR CONTROLLER/TRIBUTARY SELECTION

Note: These instructions assume that the installer has read "Data Matrix Installation" in Section 3 of the *Venus Routing Switcher System Technical Manual.*

Some VTRs can act as controllers *or* tributaries. These can be connected with a "Y" cable to two Venus ports— one for use when the VTR is a controller, the other when the VTR is used as a tributary (see Figure L–14). If the VTR is operated *only* as a controller, or *only* as a tributary, then a "Y" cable will *not* be needed; the cable can instead be one of those shown on page L–4.

The following tables correspond to the system shown in Figure L–14. The basic rules for these tables have already been described (starting on page L–3).

**Switcher Description**

| | Switcher | Level | VI | RV | MC | Board | #In | #Out | PLvL | Follow Level | Driver | 3 LI | 3 LO | Option | Audio | DM 400 Off Time |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DATA ▼ | FOR | ☐ | ☐ | ☐ | VM1 ▼ | 193 | 32 | 16 | ▼ | Binary ▼ | | | E ▼ | ▼ | |
| 2 | DATA ▼ | REV | ☐ | ☑ | ☐ | VM1 ▼ | 193 | 32 | 16 | FOR (DATA) ▼ | Binary ▼ | | | E ▼ | ▼ | |

*Figure L–10.*

*Figure L–11.*

**Switcher Input – DATA**

| | Logical Input Name | FOR | REV |
|---|---|---|---|
| 1 | SAFE | 192 | 192 |
| 2 | VR1–S | 000 | 000 |
| 3 | VR1–M | 001 | 001 |
| 4 | VR2–S | 002 | 002 |
| 5 | VR2–M | 003 | 003 |

*Figure L–12.*

**Switcher Output – DATA**

| | Logical Input Name | Security | S–T | Pass word | FOR | REV |
|---|---|---|---|---|---|---|
| 1 | SAFE | | – | | 016 | |
| 2 | VR1–S | | – | | 000 | |
| 3 | VR1–M | | – | | | 001 |
| 4 | VR2–S | | – | | 002 | |
| 5 | VR2–M | | – | | | 003 |

The Y Line table informs the matrix board (VM 3000 Control Processor) of a level, input, and output that have a Y line installed. Notice that each Y line requires two entries, and that the "crossover" ports (the "M" ports) are listed as *inputs* on the forward level and *outputs* on the reverse level:

**Y Line Table**

| | Level | Logical Input | Logical Output |
|---|---|---|---|
| 1 | FOR (DATA) ▼ | VR1–M ▼ | VR1–S ▼ |
| 2 | REV (DATA) ▼ | VR1–S ▼ | VR1–M ▼ |
| 3 | FOR (DATA) ▼ | VR2–M ▼ | VR2–S ▼ |
| 4 | REV (DATA) ▼ | VR2–S ▼ | VR2–M ▼ |

*Figure L–13.*

Drop–down menu shows "Switchers" and "Names" from Switcher Description table (Figure L–10). Select appropriate data switcher.

Select the appropriate name from those already entered on the Input (Figure L–11) or Output (Figure L–12) table.
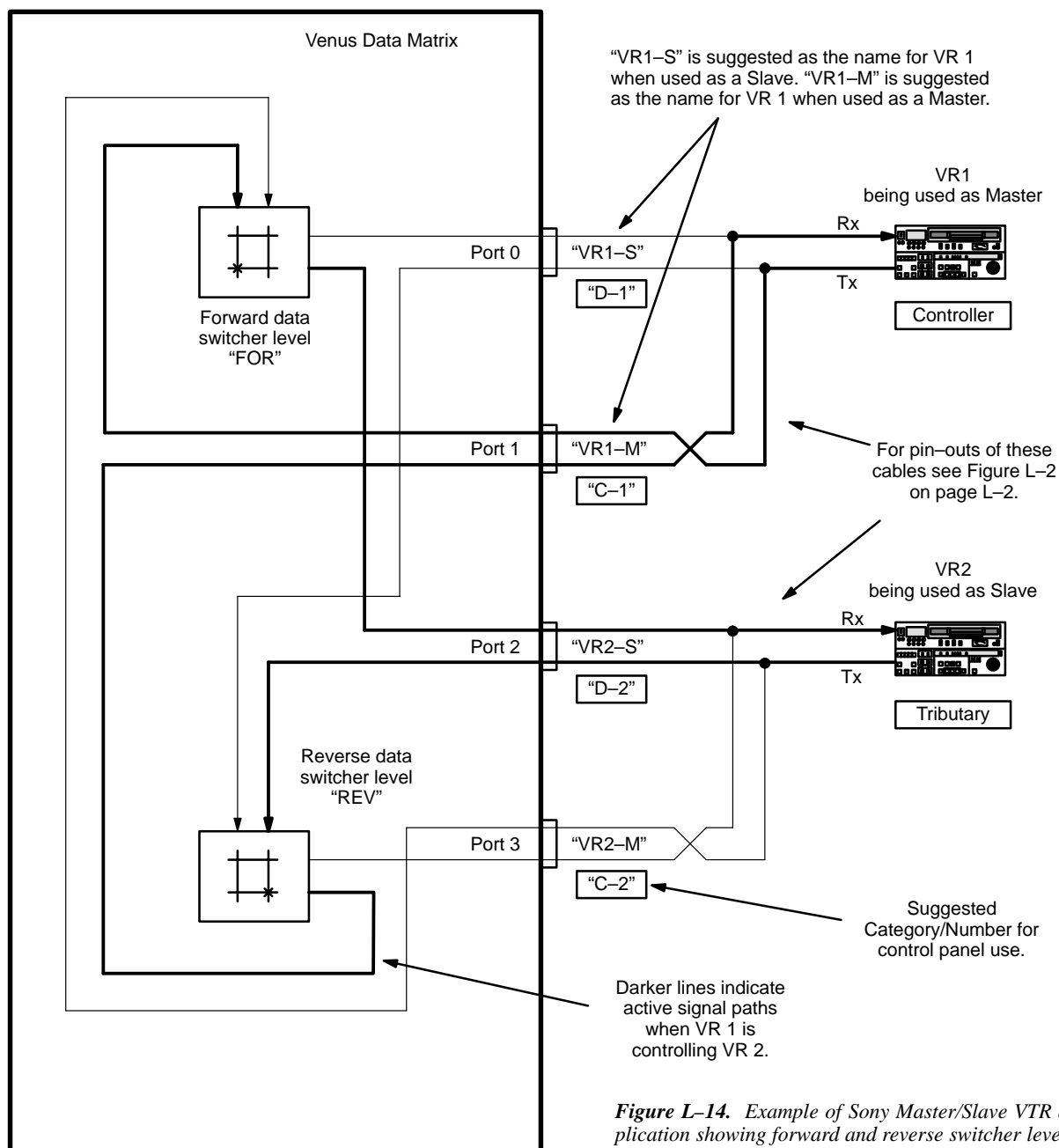
*Figure L–14.* *Example of Sony Master/Slave VTR application showing forward and reverse switcher levels.*

*CP Input and Output Sets*

The input and output names in the previous tables must be assigned to Category/Entry selections. In the following examples, intended for use with a CP–3000–type panel, the "C" (for "controller") category button will be used to select the master VCR and the "D" (for "destination") category button will be used to select the slave VCR.

| Input Set — KXYZ–INP | | | | | |
|---|---|---|---|---|---|
| | **Category** | **Entry** | **Auto Mnem** | **Mnemonic** | **Logical Input** |
| **1** | C ▼ | 1 | ☑ | VR1M | VR1–M ▼ |
| **2** | C ▼ | 2 | ☑ | VR2M | VR2–M ▼ |

| Output Set — KXYZ –OUT | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Category** | **Entry** | **Auto Mnem** | **Mnemnonic** | **Logical Output** | **Level Set** | **Button** |
| **1** | D ▼ | 1 | ☑ | VR1S | VR1–S ▼ | ▼ | |
| **2** | D ▼ | 2 | ☑ | VR2S | VR2–S ▼ | ▼ | |

*Figure L–15.*

*Operation*

In this example, the operator might select a slave VCR destination such as "D–2" (VR 2); then select a master VCR source (i.e., a controller) such as "C–1" (VR 1). When TAKE is pressed, the VR 1 transmit (Tx) signal is switched through the cross-over cable to VR2; *and*, the VR 2 Tx signal is automatically switched back to VR 1. VR 1 is therefore the master and VR 2 the slave. If the operator selected input "C–2" and output "D–1," then VR 2 would be the master and VR 1 the slave.