



**VC-422C
VTR CONTROL ROUTER**

version 1.0

Lance Design
27 Fairview Avenue
Ridgefield, CT 06877
Tel: 203-894-8206 / Fax: 203-894-8207

www.lancedesign.com

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WARRANTY

This equipment is warranted to be free of defects in materials and manufacture for a period of two years from date of delivery. Any necessary repairs resulting from defects in materials or manufacture will be made free of charge provided that the equipment has not been subjected to mechanical or electrical abuse, as determined by Lance Design, and also provided that the equipment is returned to Lance Design with prior authorization.

No liability whatsoever is assumed for consequential damages or loss resulting from use or failure of this equipment. There are no other warranties expressed or implied.

VC-422 VTR CONTROL ROUTER GENERAL INFORMATION



VC-422 FRONT PANEL

The VC-422 is a unit designed to handle the RS-422 (9-pin) control signals for VTR's and disk recorders. It can function as a "router" in that it can bi-directionally connect pairs of machines for editing, or can connect an external controller, such as an edit controller to VTR's.

The controller can also function as a "Gang Roll" control panel for up to 24 VTR's, with control coming from either a VTR, an external controller, or the VC-422's front-panel transport controls. No protocol conversion is done within the unit, so all connected devices must speak Sony protocol.

There are 24 ports on the controller, each of which may serve as a controlling device, referred to as a MASTER, a controlled device with bi-directional communications with the master - a SMART SLAVE, or a controlled device which listens only to commands from the master, but cannot talk back to the master - a DUMB SLAVE. Each port will be configured as one of these three functions, or will be INACTIVE, in which case the input and output terminals will be isolated, high-impedance.

There are 8 GROUPS available in the controller. Each group represents a set of related machines. A port may be assigned to only one group at a time, and if, for example a port is assigned to Group 1, and is selected to be assigned to Group 2, it will be deleted from Group 1 automatically. Each group must have a master and at least 1 slave to do anything useful. If no master is assigned, the front panel transport controls become the master, and their LED's are enabled. As soon as an external master is assigned, the front panel controls are disabled. A port assigned as the master is indicated by a flashing LED.

The first slave assigned to a group will be made a SMART SLAVE, and will be permitted to have full dialog with the master. Any additional slaves assigned will be made DUMB SLAVES, and will be able only to listen.

SPECIFICATIONS: VC-422C

SIZE: 3.5"H X 19"W X 14"D excluding connectors. (2 rack units)

PORT CONNECTORS: 24 D9-F, pinout matches SMPTE RS-422 specs.

DATA FORMAT: RS-422, 38.4K, 8-bit, Odd Parity (Sony Protocol)

POWER INPUT: IEC Connector, 100-240 volts, 50-60 Hz, 15 watts

FUSE: Internal to OEM Power Supply

COOLING: Forced, through sides of cabinet

MAXIMUM NUMBER OF CONTROLLED VTR'S: 24

MAXIMUM NUMBER OF CONTROL GROUPS: 8

LOCAL CONTROLS PROVIDED: READY ON/OFF, STOP, PLAY, RECORD,
REVERSE 1X PLAY (TAIL CHECK)

TALLY OUTPUTS: 24, one for each port. DB25-F connector on rear panel



VC-422B REAR PANEL

(VC-422C INCLUDES DB25-F FOR TALLY OUTPUTS)

2) - OPERATION

1) SELECTING A GROUP

Simply press the GROUP SELECT button corresponding to the desired control group. The GROUP SELECT led will light, as well as the LED's of any ports enabled for that group.

2) CLEARING A GROUP

The selected group may be cleared of all assigned slaves and master by pressing the CLEAR button. All port LED's will go out, and the clear led will light. This indicates that there are no ports assigned to the current group.

3) ASSIGNING A MASTER

A port may be assigned to be the group master by holding down the GROUP SELECT button and pressing the desired VTR/PORT ASSIGN button. The led in the port button will begin flashing to indicate that it is the master for this group. To change the master to a different port, simply repeat the sequence for the new port. The blinking led will change to the new port. To remove a master, again hold down the group button and press the port button. The port will be made inactive, and the led will go out. Alternatively you can press the port button by itself, and the master will become a slave. If no port is assigned as a master, the LOCAL CONTROLS will automatically become the group master, and their LED's will be enabled. Tally outputs are also active with local control.

4) ASSIGNING THE SLAVE(S)

Slaves (controlled VTR's) are assigned by pressing the VTR/PORT ASSIGN buttons by themselves. They will toggle on and off, with the LED's indicating status. THE FIRST SLAVE ASSIGNED WILL BE MADE A SMART (BIDIREX) SLAVE. All subsequent slaves will be made dumb (listen only) slaves. These dumb slaves will stay dumb, even if the smart slave is made inactive. The only way to change the smart slave is to delete all slaves and assign the desired smart slave first. The slave status may be displayed by holding down the group button. The dumb slave LED's will be turned off leaving only the smart slave and the master (blinking) if present.

5) **LOCAL CONTROLS**

The local transport controls are enabled when no master is assigned to the current group. The controls should function just like the transport controls on the decks, PLAY and RECORD together to go into record. Note that since status is not returned from the VTR's, the button lights simply indicate that the command was sent, not that it was obeyed.

By holding down STOP, and pressing PLAY, a 1x reverse play command is sent. This is useful for checking the tails of recordings when in a gang-roll record situation.

EXAMPLES OF TYPICAL OPERATION

1) **MACHINE-TO-MACHINE EDITING (TWO VTR'S)**

Select a group by pressing one of the GROUP pushbuttons. Clear the group if necessary by pressing CLEAR. Assign your record VTR as a master by holding the GROUP button down and pressing the VTR/PORT button for the record VTR. It will begin flashing, indicating that it is the master. Release the group button and select the play VTR by pressing its VTR/PORT button. It will light steadily. The machines will operate just as if they were connected with a standard 9-pin remote cable. Note that the play VTR must be in remote, as always.

To select a different PLAY VTR, first deselect the present one (by pushing the VTR/PORT button), and then enable the new one. *If the new port is selected before the old one is disabled it will be configured as a dumb (listen only) slave, and will not have full communication with the record machine.* To select a different RECORD VTR, hold the group button down, and turn off the old one first, then turn on the new one.

2) **MACHINE-TO-MACHINE EDITING (MULTIPLE PLAY VTRS)**

Additional playback machines may be added to the above situation. Suppose your main (smart slave) playback had the background video, but you needed to also roll two other vtrs, one with music and one with animation. These additional playback VTR's can be rolled automatically by assigning them as additional slaves. Once you have the record (master) and main playback (smart slave) assigned as described above, add the additional playbacks (dumb slaves) by simply pressing their PORT/VTR buttons. They do not have to be in the parallel run mode, only in remote. *An important note:* because the record VTR

can only listen to one play VTR, it can't know the status of the dumb slaves. This means that it won't wait for them to cue, for example before starting an edit. You must hit preroll first and wait for them all to park before going into auto edit. Also, all of the playback VTR's will see the same commands, so in-points will have to be edited directly on the individual control panels; if you tried to enter from the record vtr's panel, all machines would have the same in-point.

3) **SYNC ROLL OF SEVERAL VTRS**

You can roll any number of VTR's in sync from one machine's control panel. Select and clear a group as above. Hold the group button down and press the port button for the controlling machine. It will begin flashing. Release the group button, and press the port buttons of the other (slave) vtr's. Set the controlling vtr to PARALLEL-RUN mode. This allows the control panel commands to be sent out of the serial port when not in the edit mode. Put all of the slave vtr's in remote. All of the control panel functions from the master will be received by all of the slaves. (This works extremely well if you enable the IN-POINT SYNCHRONIZE in the menus of all vtrs. The sync roll will be frame-accurate every time).

4) **"GANG-ROLL" CONTROL USING THE CONTROLLER PANEL CONTROLS**

Select a group and clear it. Assign all vtr/ports that you want to control by simply pressing their buttons. They will all light steadily. Don't assign any master. When no vtr is assigned as a master, the front panel controls automatically become enabled. Put all machines in remote. Note that they do NOT have to be in parallel-run mode. The panel controls will now control all assigned vtr's. VTR's may be assigned in several groups; for example all ISO's in a group; all off-line vtr's in a group; whatever makes sense. The front panel controls will operate the vtr's assigned in the currently-selected group.

5) **CONNECTING EXTERNAL CONTROL DEVICES LIKE SLO-MO CONTROLLERS**

External devices (slo-mo controllers, edit controllers) may be connected to ports just like vtr's. They should always be assigned as masters, and the vtr's that you want them to control should be assigned as smart slaves. You would typically have one controller (or editor port) and one vtr per group. The controller is the master (blinking led) and the vtr is the smart slave (led steadily on). Note that if you change the slave (vtr) you must first delete the old one, and then assign the new. Otherwise the new slave will be assigned as a dumb slave, and will not be able to talk back to the controller.

3) - FUNCTIONAL DESCRIPTION

1) GENERAL

The unit consists of 5 circuit boards and a power supply module. The boards are:

- 1) Front Panel PCB
- 2) MPU PCB
- 3) Matrix and I/O - Ports 1-8
- 4) Matrix and I/O - Ports 9-16
- 5) Matrix and I/O - Ports 17-24

The Front Panel board contains the switches and LED's, the latches to drive the LED's, and the data transceivers to place the switch data on the bus. The MPU Board is mounted parallel to the Front Panel PCB and connects via a 20-pin header. The three Matrix and I/O boards are identical, and are mounted to the rear panel with aluminum brackets. There is a small jumper on each board to establish the range of its port numbers. These boards connect to each other and to the MPU board via a 50-conductor ribbon cable. This cable contains the MPU data and address lines, the two bi-directional group data busses, and power and ground conductors. Multiple conductors are used for low-impedance power and ground paths.

The MPU continually reads and analyzes the front panel switch data and stores the proper port configuration data in the matrix and I/O control latches, and the panel led latches. There is an 8-bit control latch per port which stores the group data and port configuration data for that port. Also there are 5 8-bit latches on the front panel that directly drive the LED's.

The power supply is a 5 volt, 5 amp OEM switching mode supply, which is mounted on the left side panel of the unit. The power is delivered to the MPU board, from where it is distributed to the other boards. The supply also powers the 5 volt DC fan in the left side of the unit.

The VC-422C requires 100-240 Volts, 50-60 Hz for operation.

2) TALLY OUTPUTS

The VC-422C includes 24 tally light outputs, one for each port, terminated on the rear panel in a DB-25 female connector.

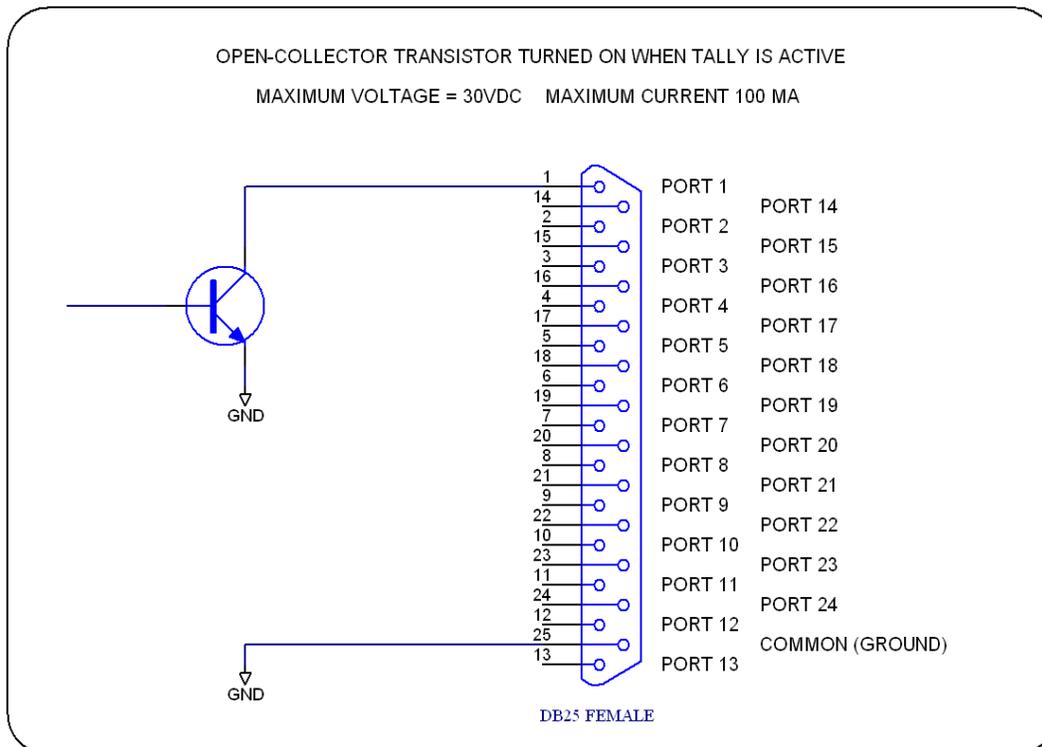
These tally outputs are activated when the corresponding port is assigned to any group without an external master and when the attached machine is in record and the servo is locked.

The ports may be assigned in the currently-displayed group, or any other group. Any groups for which tallys are desired must be using the front panel transport controls, and not an external controller as the master. (If an external controller is the master, the VC-422 does not have communication with the machine, and can't determine record/servo status.)

If a machine is in record but the servo is not locked as indicated by the 'servo lock' bit in the Sony protocol the tally will be flashing.

The tally outputs are open-collector NPN transistors which are suitable for sinking current to ground. If they are being used to drive a logic input which does not have a pull-up resistor on it, then a pull-up resistor to the appropriate voltage should be added.

The output transistors are capable of handling up to +30 volts DC, and up to 100 ma of current.



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