

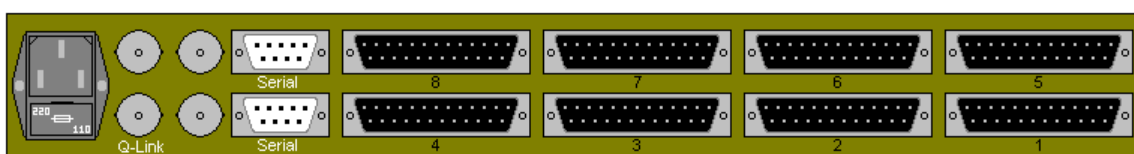
Application Note AN-0010

TR-3200 Tally Router Application Guide

Quartz routers are often used to route signals to a vision mixer that is feeding a transmission path. In this situation users need to know which sources are on air. The Quartz TR-3200A Tally Router can provide tally indication to the lights both on the cameras, called reverse tally, and on the monitors, called forward tally.

Traditionally tally routers use a matrix of relays that follow the video router and thus route the tally back to the camera. For a 16x16 router 256 relays would be needed; this is both expensive and large compared to the Quartz solution. The Quartz Tally Router has input and output interfaces only, and utilises software to process the matrix pattern, instead of a complete matrix of relays.

The TR-3200A has 64 electronic inputs that can sense the tallies from the mixer. It connects to the router by the Quartz Q-Link system to obtain router status. The unit controls 32 output relays to drive tally lamps.



TR-3200A Rear View

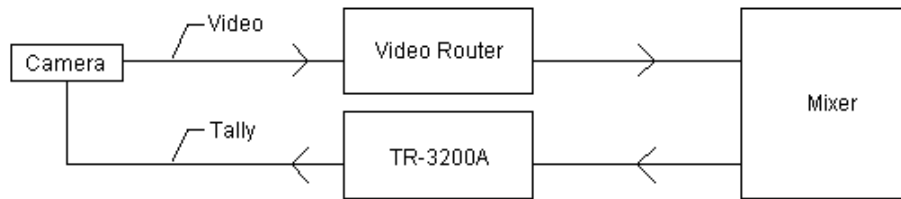
The 64 tally inputs are spread across the four lower D25 connectors with 16 input signals per connector. The 32 tally outputs are spread across the four upper D25 connectors with 8 output signals per connector. The four output tally connectors may be individually assigned to provide forward or reverse tallies. Two wires are provided for each relay to ensure full electrical isolation.

There are several different types of Tally system covered by this application note:

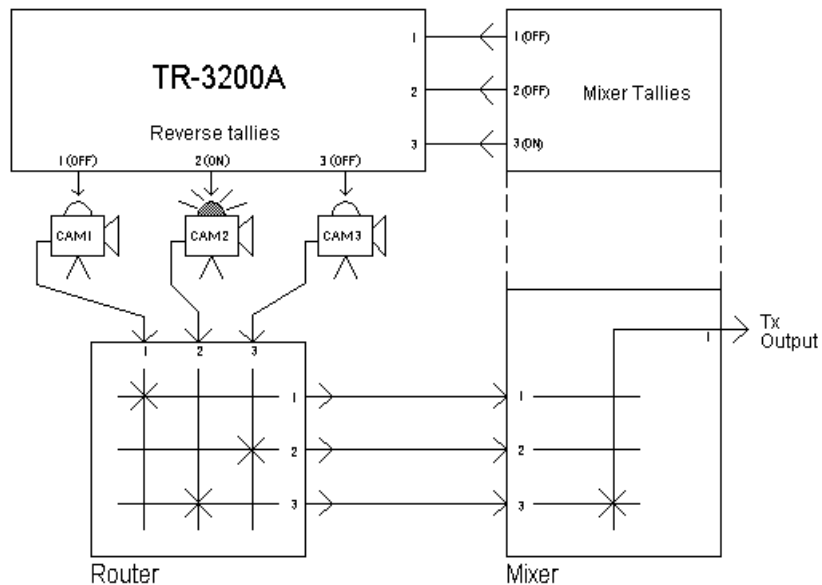
- 1) Reverse tally routing, normally camera on-air lamps.
- 2) Forward tally routing, normally monitor on-air lamps.
- 3) Red/Green tally routing, normally on-air and ISO or VTR record tally.
- 4) General tally routing, routing a tally signal from A -to-B.
- 5) Dummy tally routing, tally routing when the corresponding video is direct to the mixer.

Reverse Tally Routing

A reverse tally system allows all the sources contributing to the final studio output to be given an indication of their on-air status. A typical system is shown below in outline



This can be drawn in more detail to show the internal routes of a 3 camera system.

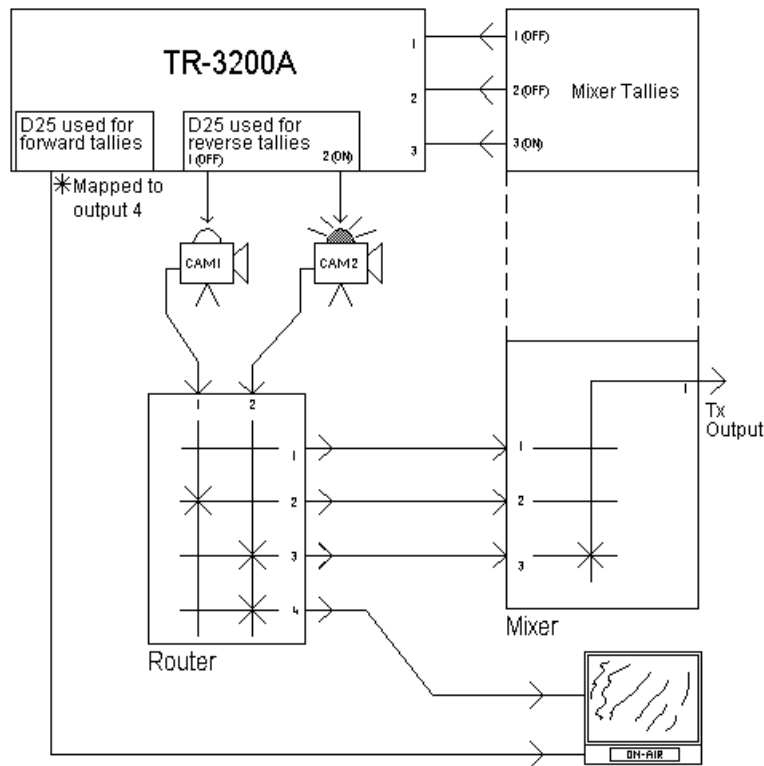


Camera 2 is routed through the router to input 3 of the mixer. The mixer is using input 3 to its output, which causes mixer tally output 3 to become active (turn on). This is sensed by the TR-3200A, which checks the router status to see which source is routed to output 3. In this case it is router input 2 so the TR-3200A activates its tally output 2. This then turns the Camera 2 tally lamp on.

If the mixer now starts a fade to input 2 then both camera 2 and 3 are contributing to the output. The TR-3200A will detect this and turn both camera tallies on.

Forward Tally Routing

Forward tally systems are used to drive the on-air lamps in monitors, and associated under monitor display (UMD) systems, viewing on-air sources.



In the above example the Forward Tally output (*) is mapped to video output 4, which is feeding the monitor. When camera 2 is routed to the monitor the TR-3200A detects the route change, checks if camera 2 has its tally light on, and if so turns on the Forward Tally output, which in turn lights the monitor tally lamp.

Red/Green Tally Routing

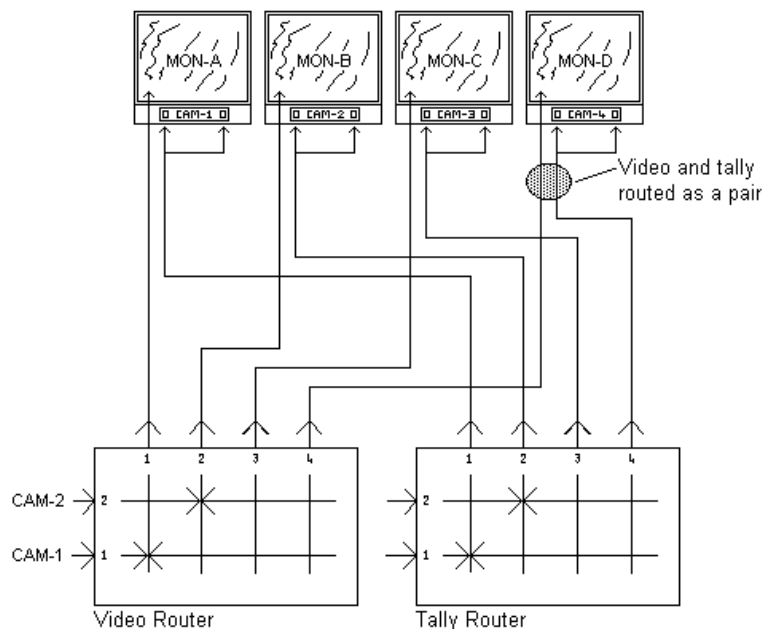
Studios or OB trucks often require two different tallies, sometimes referred to as Red and Green tallies or On Air and ISO tallies. The Red/Green tally system will often use Red for the On Air source and Green for sources currently connected to the vision mixer as these may go On Air at any time. The ISO tally usually refers to sources connected to VTRs in record mode.

Red/Green tallies around a vision mixer require two TR-3200A systems. The first is connected for reverse and forward tallies, as discussed above. The second unit has all its input pins that are associated with the vision mixer (inputs that represent router outputs connected to the mixer inputs) wired to 0V. This second unit will then tally any source that is routed to the mixer.

ISO tallies again use two TR-3200A systems with the first, On Air unit, connected normally to the vision mixer for reverse and forward tallies as before. The second unit would have its input pins connected to the VTRs GPI outputs, with these GPI's programmed to activate when the VTR is in record mode.

General Tally Routing

In some applications it is necessary to simply route the tally signals. The most common situation is with monitor walls where different users require a specific monitor wall layout. This is a job traditionally performed with pin patch panels.



In the example above the tally router is a standard TR-3200 configured in a different mode where it follows the video router. When CAM-1 is routed to MON-A the corresponding tally is also routed. This allows very quick reconfiguration of the monitor wall, and by using router salvos, allows an existing setup to be recalled. The same effect could be achieved using a standard relay router (Q1600-RR-1608 etc) but the above method is lower cost and gives electrical isolation between the TR-3200 inputs and outputs.

Dummy Tally Routing

In some installations mixer inputs will be connected directly to equipment, and not connected via the routing system. The tally system can still be used for these sources by following these few simple steps.

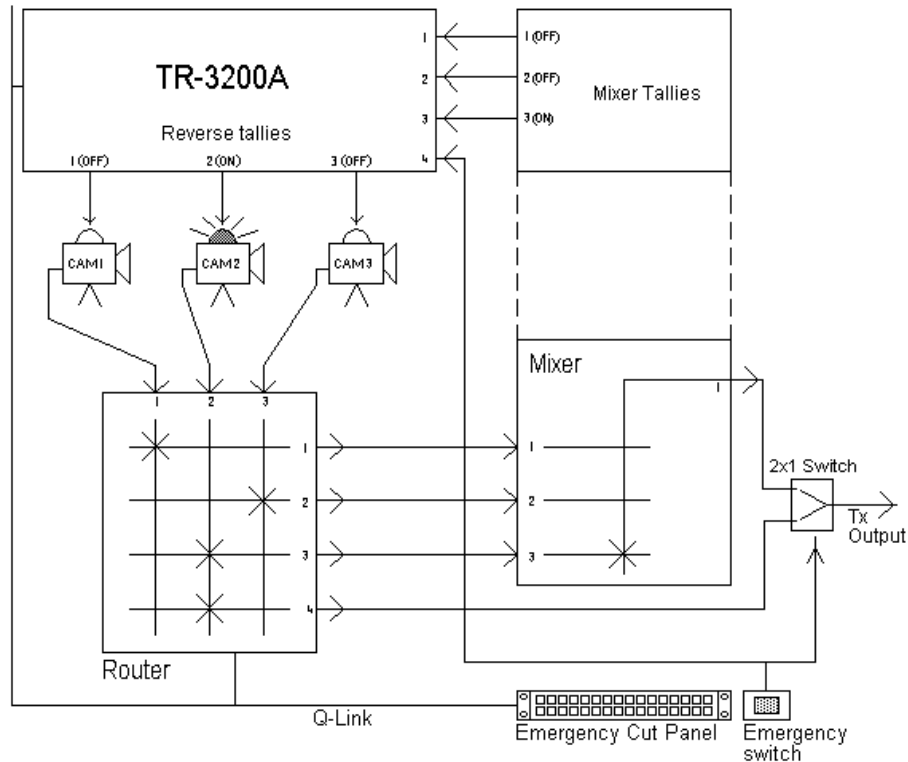
- 1) Create a destination in the router setup that represents an imaginary connection from the router to the mixer.
- 2) Create a source in the router setup that represents the source (if it is not already connected to the router).
- 3) Download the setup to the router.
- 4) Use the WinSetup Engineering Panel to route the source to imaginary/dummy destination.

Combining Serial Tally Information

No information available.

Mixer Bypass and Failure Protection

Some provision may be made to allow mixer bypass or to protect the system in the event of a mixer failure, particularly in a transmission or OB truck environment. Bypass mode is sometimes used in an OB truck to allow a VTR to connect directly to the Tx output, via the router, during a long playback. This then free's the mixer for other editing work, thus maximising resource use.

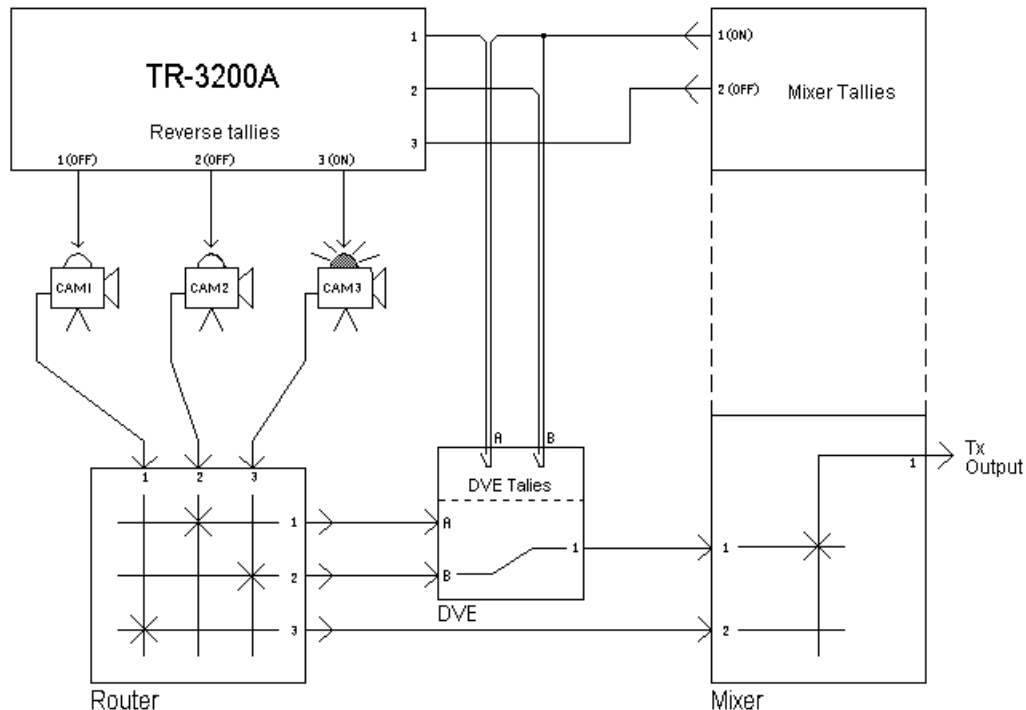


One router output is normally used with an emergency cut panel to provide limited control. If a problem occurs with the mixer the emergency switch is activated which transfers the Tx Output from the mixer to the router, normally using a 2-by-1 switcher or relay. The emergency switch also connects to the TR-3200A tally input, informing the system that the emergency cut panel is now in use. All reverse (camera) and forward (UMD) tallies work as before. In the emergency or by-pass mode the TR-3200A ignores all other mixer tally inputs.

As an option the router can 'listen' to the mixer using a serial protocol to allow the emergency cut panel to follow the mixer prior to the emergency override. In this way the emergency cut panel will be showing the same source as the mixer output.

Cascaded Tally Systems

Many transmission systems are more complex than the simple camera-to-router-to-mixer systems described so far. The following diagram shows a system that includes a DVE on the input side of the presentation mixer.



The example assumes that the DVE tallies are isolated relay contacts allowing wire ANDing to be used. As shown, mixer input 1 is fed from the DVE so mixer input 1 tally has been wired through both the DVE tallies and then on to the TR-3200A inputs. In this instance CAM-3 is routed through matrix output 2 to input B of the DVE. The current DVE effect is using input B which is in turn used by the mixers final output. The mixer will tally this by activating its input 1 tally. With the wire AND shown, the mixer input 1 tally AND the DVE 'B' tally have to be on to activate the TR-3200A input 2. As the TR-3200A knows the router status (output 2 is using input 3), it is able to activate output tally 3.

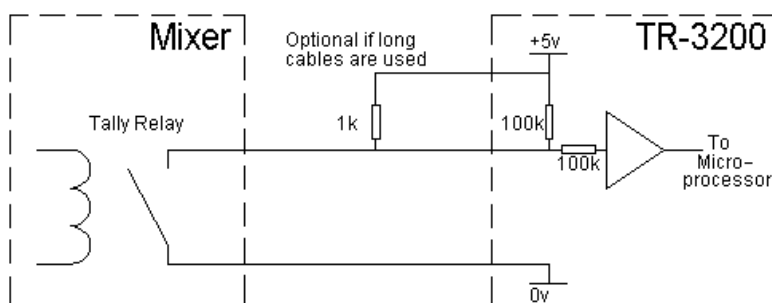
If the DVE now changes its effect to use the A input, the TR-3200A input 1 will become active (and input 2 inactive), and from the router status (output 1 is using input 2), it is able to activate output tally 2. If both the DVE A and B inputs are used at the same time then both tally relays will be on, so TR-3200A inputs 1 and 2 would be active. From the router status the TR-3200A would activate reverse tallies to CAM-2 and CAM-3.

Mirror I/P

No information yet.

Mixer to TR-3200 Connection

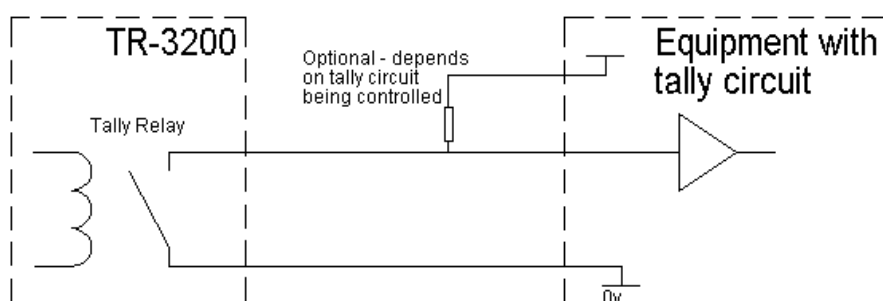
Most mixers will have isolated relay contacts for their tally outputs. These are connected to the TR-3200A as shown below.



The 100K input pull-up resistor built into the TR-3200A is usually sufficient to prevent false triggering of the TR-3200A, but if very long cables are used it may be necessary to fit an external pull-up resistor of 1K.

TR-3200 to Tally Equipment Connection

The equipment driven by the TR-3200A tally outputs will vary. A typical electronic input stage is shown below.



TR-3200A to tally equipment

If the TR-3200A is used to drive lamps directly then the relay current should not be allowed to exceed 100mA. For higher loads the TR-3200A internal relay would be used to control a larger external relay.

Normally the current that flows through the relay contacts is provided by an external power supply, but if electrical isolation is not required the internally generated +24Vdc supply may be used to provide a total of 500mA to drive the lamps.

Connector Pin-Outs

The TR-3200A input (D1-D4) and output (D5-D8) connectors use the following pin out.

Tally Input Connectors

Pin	Signal Name
1	Mixer tally 1
2	Mixer tally 2
3	Mixer tally 3
4	Mixer tally 4
5	Mixer tally 5
6	Mixer tally 6
7	Mixer tally 7
8	Mixer tally 8
9	Mixer tally 9
10	Mixer tally 10
11	Mixer tally 11
12	Mixer tally 12
13	Mixer tally 13
14	Mixer tally 14
15	Mixer tally 15
16	Mixer tally 16
17	n/c
18	n/c

Tally Output Connectors

Pin	Signal Name
1	Tally 1
2	Tally 1
3	Tally 2
4	Tally 2
5	Tally 3
6	Tally 3
7	Tally 4
8	Tally 4
9	Tally 5
10	Tally 5
11	Tally 6
12	Tally 6
13	Tally 7
14	Tally 7
15	Tally 8
16	Tally 8
17	n/c
18	n/c

19	n/c
20	n/c
21	n/c
22	+5V
23	+24V
24	0V
25	Gnd

19	n/c
20	n/c
21	n/c
22	+5V
23	+24V
24	0V
25	Gnd

Caution!

Take care to ensure that pin 23 (24V) and pin 22 (5V) are not connected together as this will damage the internal circuitry of the TR-3200A.

Appendix A: Older Product

The TR-3200 was replaced by a new design, TR-3200A, that was phased in during January 2000. The original design used the processor module PU-0002 with the NEC processor. The rear view of the unit is shown below.

