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Getting Started

System Overview

The **Tally System Console** program provides detailed control of many remote display units from a single location.

The Tally System Console program operates in three distinct modes.

Demonstration Mode

The program demonstrates both its features and the features of IMAGE VIDEO remote display units. Actual remote display units are not required to operate the program in demonstration mode.

Message System Mode

With one or more remote display units connected, the program can control the messages appearing on the displays.

Tally System Mode

With at least one Tally System Interface unit connected, the program can configure and control the devices connected to the interface unit. The Tally System Interface unit provides stand-alone tally system operation. Once the system is configured, the Tally System Console PC need not be connected or operating with the Tally System Interface unit. The interface unit coordinates information from various devices including routing switchers, production switchers, and GPI inputs to produce tally information for remote display units and GPI outputs. To configure the Tally System Interface unit you must create a model of your signal switching system in a structured format.

The difference between the three modes of Tally System Console program operation is determined merely by the absence of equipment connected to the PC. You do not need to specify the operating mode to the program.

In the message system mode, the Tally System Console program uses the next available PC communication port to connect to one or more remote display units.

The content of each unit's display can be edited directly or a pre-defined type of content can be selected by filling in a few parameters in a dialog box. Display contents can also be loaded from multiple configuration files. If no communication port is available, remote display units cannot be connected and the program operates in the demonstration mode. Before a remote display unit can be controlled, the unit's serial number must be supplied to the program.

In the tally system mode, the program uses a port that you specify to communicate with a Tally System Interface unit. If your PC is network-ready, you can connect the PC and the Tally System Interface unit via an Ethernet link using TCP/IP. In this case, you must provide an IP address for the Tally System Interface unit. Even if you use the Ethernet link, you must still specify a communication port so that the Tally System Interface unit can be issued an IP address from the Tally System Console program.

Also in the tally system mode, the connection status of the PC and the Tally System Interface unit is continuously monitored. If a connection problem is detected, the connection indicator (the red Image Video logo near the lower left corner of the currently selected unit window) begins to flash. Once a good connection is restored, the connection indicator stops flashing. The connection indicator does not flash in the

message system mode regardless of remote display unit connection status. The connection indicator does not appear while the work offline mode is selected.

Normally, display units are installed below video monitors in a wall containing many monitors. The display units do not need to be within view of the program operator. A replica of the display unit and its current contents are depicted graphically on the screen in a window. To help locate a remote display unit in a large system, another window shows the position of all remote display units on the monitor wall.

All display unit attributes are controllable from the console including color, flashing, LED brightness, character formatting, graphic characters, and timer control.

You can place unit windows anywhere on the screen. Each unit window offers direct control of a set of remote display units. By placing several unit windows on the screen, you can quickly control a set of frequently changed remote display units.

You can place unit windows in groups. Unit window groups can be moved on the screen as one object.

You can arrange remote display units below monitors in the layout window. The entire monitor wall is scaled to fit in the layout window as the window is sized.

The messages, names, and locations of units in the remote display unit system can be saved in configuration files for recall the next time the program is started.

Remote Display Units

The Tally System Console program is designed to operate with IMAGE VIDEO model RDU-1500 series (three-color) and RDU-1600 series (single-color) remote display units. Each remote display unit can show text and graphic symbols on LED's arranged 7 dots high and up to 160 dots wide.

Unit Size

The width of each remote display unit is user-programmable. Typical unit sizes are 17", 13", and 8 ½". Other sizes can be used where the viewing area is loaded with fewer than the maximum number of LED modules. The Configure Display Units dialog box can be used to set the size of a remote display unit.

Although any size can be set, you should configure an on-screen remote display unit with the same size of LED area as the corresponding actual remote display unit. This is so the unit window can accurately depict the appearance of the real remote display unit.

Sections

The display area of any remote display unit can be partitioned into one, two, or three sections. This feature is normally used where a remote display unit is installed below one, two, or three video monitors. With the exception of LED brightness and timer functions, each display section operates as if it were an independent unit. You can change the message, color, and text formatting in a section without affecting the other sections of the display unit. See Arranging Display Unit Sections for more information.

Lines

At any time, each display unit section shows a message from one of up to three "lines". The duration of each line can be programmed so that different messages can appear sequentially. You can use lines to produce repeating effects such as flashing or color changes.

Identification

Remote display units are connected to the PC or Tally System Interface unit by a serial link. To provide individual operation, each remote display unit must be given unique identification. For this purpose, all remote display units are factory-programmed with an identification number matching their serial number.

To configure access to a specific remote display unit, select **Ctrl+F10** to open the Configure Display Units dialog box. Select the unit to be configured by its name and enter the serial number of the actual remote display unit to be accessed. Select Rename to associate the name with the serial number. Repeat these steps to configure other remote display units. Once all remote display units in your system are configured, you can access and control any unit by its name.

You can use a command to make all remote display units show their serial number simultaneously. This may help you during the initial system configuration procedure. From the keyboard, select **Ctrl+Shift+F3**. Alternately, you can use the main menu command **Display Unit;Show Serial #s**. Select the command again to remove the serial number from the displays.

Creating a System Model

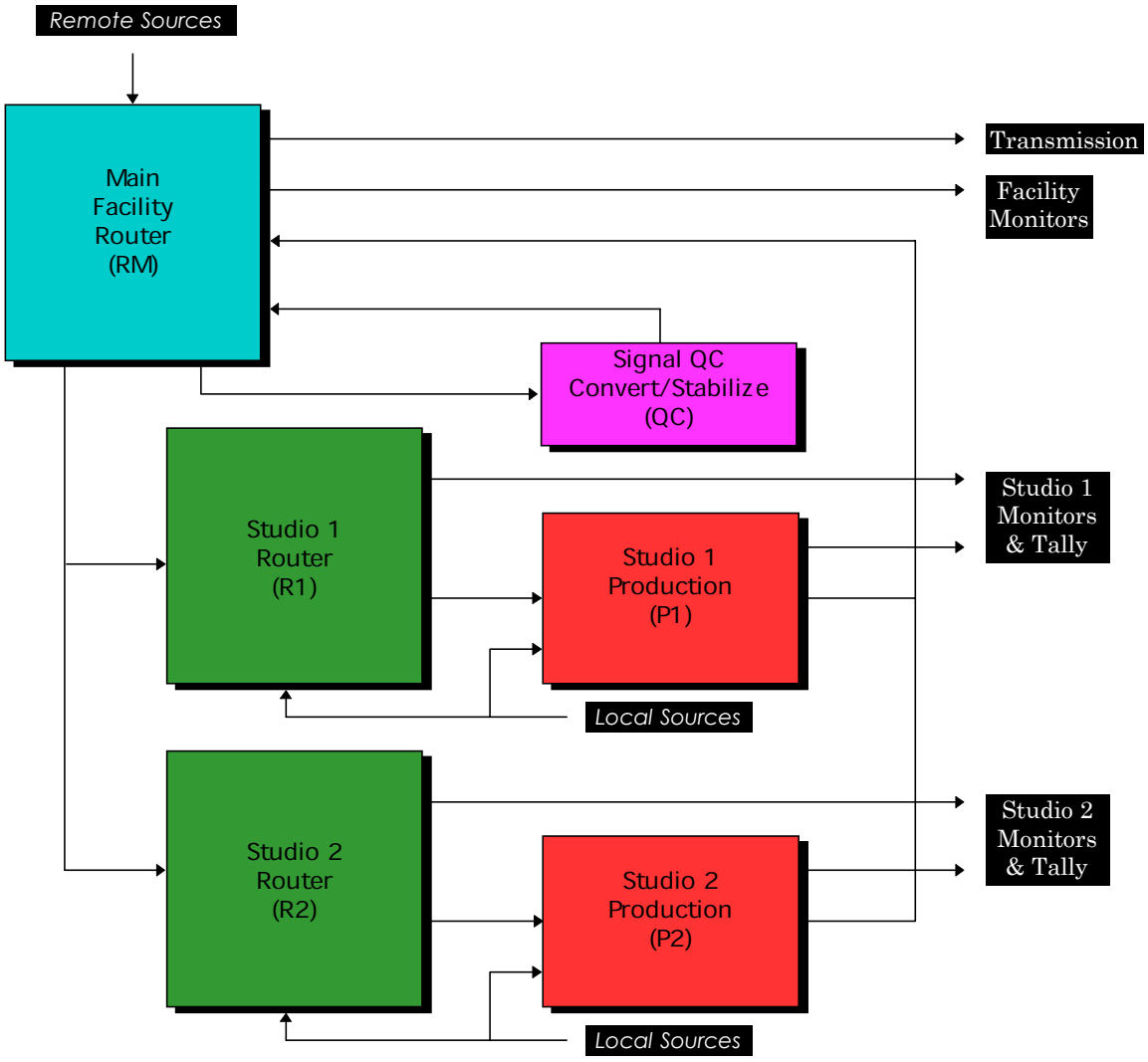
In order to track and tally signals, the tally system needs to know all the possible ways that each source signal can be carried to any destination in your signal switching system. To do this, you must "model" your system by describing its relevant components in terms that the tally system understands.

In most systems, the principle components are routing switchers and production switchers, and the signal interconnections between that equipment. In modeling the system, you must create two types of components.

- A resource device for each piece of switching equipment.
- A resource interconnection for each signal cable that carries a signal from the output of a resource device to one or more inputs of other resource devices.

Example

The following diagram shows the components of a typical system:



In this system, there are two studios producing material for transmission and a common area that both provides remote sources to the studios and selects studio outputs for transmission. Each studio has their own routing switcher and production switcher with local sources such as cameras and tape machines.

To model the system, each resource device is assigned a name (shown in parenthesis in the diagram). The studio production switchers are named P1 and P2, and the routing switchers are named R1 and R2. The main facility routing switcher is named RM. The resource device names are used by the tally system to associate devices with points of interconnection. Keep resource device names as short as possible. They are used frequently throughout the tally system configuration.

The interconnection lines between resource devices in the diagram actually represent multiple cables. For this example, assume the cables and input/output names listed in the following table are present. In each row, a resource device and output name are specified to denote the starting point of a cable and a resource device and input name are specified to denote the ending point of a cable.

Signal Origin		**Signal Termination**	
Device	**Output**	**Device**	**Input**
R1	SWR01	P1	1
R1	SWR02	P1	2
R1	PGM	RM	STU01
R2	SWR01	P2	1
R2	SWR02	P2	2
R2	PGM	RM	STU02
RM	REM01	R1	REM01
RM	REM01	R2	REM01
RM	REM02	R1	REM02
RM	REM02	R2	REM02

Notice that some cables have the same starting point. This "single start point/multiple end point" mechanism allows the tally system to not only trace and tally a signal back to its origin but also trace forward to other possible destinations for that same signal.

When specifying inputs to a resource device or outputs from a resource device to the tally system, you must use a special notation that the tally system can recognize. The notation is:

resource name :: input or output name [level name]

The double colon and square brackets are to be taken literally. For example, `R1::SWR01[1]` is the notation for output SWR01 of level 1 of resource device R1. Use this notation when specifying resource interconnections, or the control text for remote display unit sections or GPI outputs.

The level name is only required where the output or input has multiple levels (or channels) installed. If there is only one level, do not include the level name or the enclosing square brackets. Depending on the capabilities of the resource device and the port it uses to connect to the tally system, the input name, output name, or level name could actually be a number instead of a name. See Using Resource Devices for information on specific resource device capabilities.

In any tally system, you only need to specify resource devices that are considered "active switching" equipment. Active switching equipment is able to alter the path that signals take from their original source to their final destination. Active equipment includes routing switchers and production switchers. Inactive equipment may process a signal but it does not alter its path. A distribution amplifier is an example of inactive equipment. You do not need to model inactive equipment for the tally system.

In some switching systems, several pieces of switching equipment can be controlled through a single host system. In this case, the tally system can access all path information from a single communication port. In other switching systems, a separate

communication port is needed to access each piece of switching equipment. This is usually the case where equipment from different manufacturers is combined into a larger system. In general, the number of resource devices that you need to model any system is determined by the number of communication ports that are required to access resource device path information.

To specify a model to the tally system, use the Configure Resource Device dialog box to create or modify resource devices, and the Configure Resource Interconnections dialog box to create of modify resource interconnections. When specifying resource interconnections, you must describe any cables that have the same starting point as a single interconnection element. Each interconnection element can have one origin and many termination ends.

Once you have modeled the switching system, you can access any information from the tally system to appear on remote display units or control GPI outputs. Use the Configure Display Units dialog box to create or modify remote display units. Use the Configure GPIs dialog box to create of modify GPI outputs.

Using Resource Devices

Although not required, most tally systems monitor at least one resource device. In practice, there are usually several resource devices, interconnected in some manner, that make up the switching system model. In large tally systems, there could be several Tally System Interface units, each connected to separate switching equipment.

To use a resource device to monitor your equipment with the tally system:

- open the Configure Resource Device dialog box
- specify a name for the resource device and add it to the system configuration
- specify the type of equipment handled by the resource device
- select the Tally System Interface unit number of the interface unit that is actually connected to the equipment (select interface number 2 if the tally system has only one interface unit)
- supply communication port set-up information and any other device-specific information

Add a resource device for each piece of switching equipment in your system. You can have more than one resource device of the same type in the same system.

The following equipment is supported. Information on installing and using the equipment is provided for each type of device. When installing connections to external equipment, please note that all tally system communication ports with the same connector have the same pin designations. Since equipment from different manufacturers is likely to have varying pin designations, special interface cables may need to be used.

GVG / Tektronix

SMS-7000 Routing Switcher (COM port)

SMS-7000 Routing Switcher (TCP/IP port)

Horizon Router HX-GPI (COM port)

Model 4000-3 Production. Switcher (COM port)

Model 3000 Production Switcher (COM port)

M-2100 Master Control Switcher (COM port)

M-2100 Master Control Panel Assignment (COM port)

Philips

BCS-3000/Jupiter Routing Switcher (COM port)

Saturn Master Control Switcher MPK (COM port)

Pesa

PESA Lynx Routing Switcher (COM port)

Leitch

Routing Switcher (COM port)

Sony

DVS Series Routing Switcher (S-BUS port)

Utah Scientific

AVS-2 Routing Switcher (COM port)

Pro-Bel

System 3 Routing Switcher (COM port)

Datatek

D-2166 Routing Switcher (COM port)

Sigma

Sigma Series Routing Switcher (COM port)

Talia

EOS-2000 Routing Switcher (COM port)

If your switching equipment does not appear in this list, it may be supported in a later release of the tally system firmware. Please contact your vendor for more information.

All of the listed equipment connects to the tally system using either a serial communication port or an Ethernet port and TCP/IP. If your equipment is not capable of this type of interface, you may be able to connect the equipment through the use of a parallel interface. For this type of interface, add a virtual router type of resource device to represent the actual switching equipment.

Supported Resource Devices

GVG/Tektronix SMS-7000 Routing Switcher (COM port)

Specifications

Equipment port	Any available mezzanine port
Tally system port	Any of COM7 through COM12 (RS-422) or COM2 (RS-232)
Protocol	Native
Serial format	Fixed at 9600 baud, 8 data bits, no parity, 1 stop bit
Input name format	Alphanumeric
Output name format	Alphanumeric
Level format	Numeric starting from 1

Consult your equipment manuals for information on configuring the operation of its communication ports.

GVG/Tektronix SMS-7000 Routing Switcher (TCP/IP port)

Specifications

Equipment port	Ethernet
Tally system port	Ethernet, two programmable IP addresses (main and backup)
Protocol	Native, embedded in TCP/IP
Serial format	10-base T
Input name format	Alphanumeric
Output name format	Alphanumeric
Level format	Numeric starting from 1

You can program the tally system to connect with either one or both of the MCPU's in the SMS-7000 system. To connect with only one MCPU, specify only one valid IP address (set the other to 0.0.0.0). To connect with both MCPU's, specify two unique and valid IP addresses.

Warning

There is a difference in the way the main and backup MCPU's operate over the mezzanine serial port versus an Ethernet TCP/IP port. On a change-over from one MCPU to the other, the mezzanine serial port is also switched and continues to operate with the tally system through the same single connector. On the TCP/IP port, however, each MCPU has its own IP address. If the IP address of only one MCPU was programmed into the tally system, a change-over to the other MCPU would break communication with the tally system as it only has permission to communication with the original (now off-line) MCPU. For this reason, it is recommended that you program the tally system with both of the IP addresses of the SMS-7000 MCPU's.

Consult your equipment manuals for information on configuring the operation of its communication ports. Consult your network administrator to obtain valid IP addresses.

GVG/Tektronix Model 4000-3 Production Switcher (COM port)

Specifications

Equipment port	High-speed tally port, unidirectional
Tally system port	Any of COM7 through COM12
Protocol	External Tally Interface
Serial format	Fixed at RS-422, 76800 baud, 8 data bits, no parity, 1 stop bit
Input name format	Numeric starting from 1 plus a fixed name set
Output name format	Fixed name set, generated by tally system
Level format	None

This type of device uses a single-direction port (information is transmitted from the device to the tally system only). On the interface cable that connects the tally system with this equipment, do not connect the signals in the other direction (tally system to device) as this may cause improper operation of the port.

Access to information from this type of resource device is through a set of fixed names. Each input and output in the switching equipment is assigned a name from the following table. Some inputs have non-numeric names, but most inputs are identified numerically from 1 to 64. Many of the outputs are internal to the switcher and cannot be monitored externally. In a typical tally system, only the PGMOUTV, PST, and PVW outputs are of interest.

Input Name	Description
1 to 64	Standard inputs 1 to 64
FRAMEV	Frame store video
FRAMEK	Frame store key
TEST	Test signal
BLACK	Black signal
BGND1	Background 1
BGND2	Background 2
MSKBUS	Clipped mask bus
MSKSTO	Clipped mask store

Output Name	Description
PGMOUTV	Program output video
PGMOUTK	Program output key
ME1PGMV	Mix/effects 1 program video
ME1PGMK	Mix/effects 1 program key
ME2PGMV	Mix/effects 2 program video
ME2PGMK	Mix/effects 2 program key
ME3PGMV	Mix/effects 3 program video
ME3PGMK	Mix/effects 3 program key
PST	Preset output
PGMV	Program bus video
PGMK	Program bus key
PSTV	Preset bus video
PSTK	Preset bus key
DSK1V	Downstream key 1 video
DSK1K	Downstream key 1 key
DSK2V	Downstream key 2 video
DSK2K	Downstream key 2 key
ME1K1V	Mix/effects 1 key 1 video
ME1K1K	Mix/effects 1 key 1 key

Output Name	Description
ME1K2V	Mix/effects 1 key 2 video
ME1K2K	Mix/effects 1 key 2 key
ME1B1V	Mix/effects 1 background A video
ME1B1K	Mix/effects 1 background A key
ME1B2V	Mix/effects 1 background B video
ME1B2K	Mix/effects 1 background B key
ME2K1V	Mix/effects 2 key 1 video
ME2K1K	Mix/effects 2 key 1 key
ME2K2V	Mix/effects 2 key 2 video
ME2K2K	Mix/effects 2 key 2 key
ME2B1V	Mix/effects 2 background A video
ME2B1K	Mix/effects 2 background A key
ME2B2V	Mix/effects 2 background B video
ME2B2K	Mix/effects 2 background B key
ME3K1V	Mix/effects 3 key 1 video
ME3K1K	Mix/effects 3 key 1 key
ME3K2V	Mix/effects 3 key 2 video
ME3K2K	Mix/effects 3 key 2 key
ME3B1V	Mix/effects 3 background A video
ME3B1K	Mix/effects 3 background A key
ME3B2V	Mix/effects 3 background B video
ME3B2K	Mix/effects 3 background B key
PVW	Preview bus video
MASK	Mask bus
AUX1V	Auxiliary 1 video
AUX1K	Auxiliary 1 key
AUX2V	Auxiliary 2 video
AUX2K	Auxiliary 2 key
AUX3V	Auxiliary 3 video
AUX3K	Auxiliary 3 key
AUX4V	Auxiliary 4 video
AUX4K	Auxiliary 4 key
AUX5V	Auxiliary 5 video
AUX5K	Auxiliary 5 key
AUX6V	Auxiliary 6 video
AUX6K	Auxiliary 6 key
AUX7V	Auxiliary 7 video
AUX7K	Auxiliary 7 key
AUX8V	Auxiliary 8 video
AUX8K	Auxiliary 8 key
AUX9V	Auxiliary 9 video
AUX9K	Auxiliary 9 key
DVE1K	Digital video effects 1 key
DVE1V	Digital video effects 1 video
DVE2K	Digital video effects 2 key
DVE2V	Digital video effects 2 video
DVE3K	Digital video effects 3 key
DVE3V	Digital video effects 3 video
DVE4K	Digital video effects 4 key
DVE4V	Digital video effects 4 video
DVE5K	Digital video effects 5 key
DVE5V	Digital video effects 5 video
DVE6K	Digital video effects 6 key
DVE6V	Digital video effects 6 video
DVE7K	Digital video effects 7 key
DVE7V	Digital video effects 7 video
DVE8K	Digital video effects 8 key

Output Name	Description
DVE8V	Digital video effects 8 video
DVE9K	Digital video effects 9 key
DVE9V	Digital video effects 9 video
AUX1CTL	Auxiliary 1 control
AUX2CTL	Auxiliary 2 control
AUX3CTL	Auxiliary 3 control
AUX4CTL	Auxiliary 4 control
AUX1TLY	Auxiliary 1 tally
AUX2TLY	Auxiliary 2 tally
AUX3TLY	Auxiliary 3 tally
AUX4TLY	Auxiliary 4 tally
DVEA	Digital video effects channel A
DVEB	Digital video effects channel B

Consult your equipment manuals for information on configuring the operation of its communication ports.

GVG/Tektronix Model 3000 Production Switcher (COM port)

Available in future release of tally system firmware. As the communication protocol for this switcher is a subset of the Model 4000-3 switcher, you can use the Model 4000-3 resource device type to connect the tally system with this switcher.

GVG/Tektronix M-2100 Master Control Switcher (COM port)

Specifications

Equipment port	M-2100 processor expansion port
Tally system port	Any of COM7 through COM12
Protocol	M-2100 Tally Expansion
Serial format	Fixed at RS-422, 38400 baud, 8 data bits, no parity, 1 stop bit
Input name format	Numeric starting from 1 plus a fixed name set
Output name format	Fixed name set, generated by tally system
Level format	None

Access to information from this type of resource device is through a set of fixed names. Each input and output in the switching equipment is assigned a name from the following table. Some inputs have non-numeric names, but some inputs are identified numerically from 1 to 16. Many of the outputs are internal to the switcher and cannot be monitored externally. In a typical tally system, only the PGMV and PSTV outputs are of interest.

Input Name	Description
1 to 16	Physical inputs 1 to 16
SQZBACK	Squeeze back
K1 to K4	Key input 1 to 4
EMB1A1 to EMB16A1	Embedded audio 1 input 1 to 16
AES1A1 to AES16A1	AES audio 1 input 1 to 16
OVR1A1 to OVR4A1	Audio 1 over input 1 to 4
EMB1A2 to EMB16A2	Embedded audio 2 input 1 to 16
AES1A2 to AES16A2	AES audio 2 input 1 to 16
OVR1A2 to OVR4A2	Audio 2 over input 1 to 4
EMB1A3 to EMB16A3	Embedded audio 3 input 1 to 16
AES1A3 to AES16A3	AES audio 3 input 1 to 16
OVR1A3 to OVR4A3	Audio 3 over input 1 to 4
EMB1A4 to EMB16A4	Embedded audio 4 input 1 to 16
AES1A4 to AES16A4	AES audio 4 input 1 to 16
OVR1A4 to OVR4A4	Audio 4 over input 1 to 4

Output Name	Description
PGMV	Program output video
PSTV	Preset output video
PGMA1	Program output audio 1
PSTA1	Preset output audio 1
PGMA2	Program output audio 2
PSTA2	Preset output audio 2
PGMA3	Program output audio 3
PSTA3	Preset output audio 3
PGMA4	Program output audio 4
PSTA4	Preset output audio 4
PGMVBUS	Program bus video
PSTVBUS	Preset bus video
PGMA1BUS	Program bus audio 1
PSTA1BUS	Preset bus audio 1
PGMA2BUS	Program bus audio 2
PSTA2BUS	Preset bus audio 2
PGMA3BUS	Program bus audio 3
PSTA3BUS	Preset bus audio 3
PGMA4BUS	Program bus audio 4
PSTA4BUS	Preset bus audio 4

Output Name	Description
AUX1V	Auxiliary 1 bus video
AUX1A1	Auxiliary 1 bus audio 1
AUX1A2	Auxiliary 1 bus audio 2
AUX1A3	Auxiliary 1 bus audio 3
AUX1A4	Auxiliary 1 bus audio 4
AUX2V	Auxiliary 2 bus video
AUX2A1	Auxiliary 2 bus audio 1
AUX2A2	Auxiliary 2 bus audio 2
AUX2A3	Auxiliary 2 bus audio 3
AUX2A4	Auxiliary 2 bus audio 4
AUX3V	Auxiliary 3 bus video
AUX3A1	Auxiliary 3 bus audio 1
AUX3A2	Auxiliary 3 bus audio 2
AUX3A3	Auxiliary 3 bus audio 3
AUX3A4	Auxiliary 3 bus audio 4
AUX4V	Auxiliary 4 bus video
AUX4A1	Auxiliary 4 bus audio 1
AUX4A2	Auxiliary 4 bus audio 2
AUX4A3	Auxiliary 4 bus audio 3
AUX4A4	Auxiliary 4 bus audio 4

Consult your equipment manuals for information on configuring the operation of its communication ports.

GVG/Tektronix M-2100 Master Control Panel Assignment (COM port)

Specifications

Equipment port	M-2100 Master Control Panel delegation port
Tally system port	Any of COM7 through COM12
Protocol	Primary FCM Name
Serial format	Fixed at RS-422, 9600 baud, 8 data bits, no parity, 1 stop bit
Input name format	Alphanumeric, generated by M-2100
Output name format	Fixed name: SWR
Level format	None

This type of resource device has only one output named SWR. Inputs are named according to M-2100 frame control module (FCM) names. The resource device reports the name of the FCM delegated to the M-2100 Control Panel that is connected to the port. This information appears as the input selected on the output named SWR.

Consult your equipment manuals for information on configuring the operation of its communication ports.

Philips BCS-3000/Jupiter Routing Switcher (COM port)

Specifications

Equipment port	Any available serial port
Tally system port	Any of COM7 through COM12 (RS-422) or COM2 (RS-232)
Protocol	ASCII Computer Interface
Serial format	Fixed at 9600 baud, 8 data bits, no parity, 1 stop bit
Input name format	Three-digit numeric starting at 000 (leading zeros must be included)
Output name format	Three-digit numeric starting at 000 (leading zeros must be included)
Level format	Numeric starting from 1

To use this type of resource device, you must create a CP Level, Input, and Output Set using the Jupiter system. This determines the actual levels, inputs, and outputs that the tally system can access. The position in the set determines the number used in the protocol to refer to that position. For example, the first input or output of the first level in the CP sets for resource device named R1 is denoted as `R1::000[1]` in the tally system.

Consult your equipment manuals for information on configuring the operation of its communication ports.

Philips Saturn Master Control Switcher MPK (COM port)

Specifications

Equipment port	MPK port
Tally system port	Any of COM7 through COM12
Protocol	Message-per-keystroke (MPK)
Serial format	Fixed at RS-422, 38400 baud, 8 data bits, even parity, 2 stop bits
Input name format	Fixed names: A, B, K1, and K2 (main inputs), and PGM and BP (bypass inputs)
Output name format	Fixed names: PGM, PST, and BP
Level format	None

This type of resource device is intended to be used in conjunction with a routing switcher controlled by a Jupiter system. This is because the Saturn Master Control Switcher uses five outputs from another switcher to select its inputs. The Saturn switcher itself sends tally information for these five outputs to an MI-3040 interface unit. The tally system simulates the MI-3040 unit (an actual MI-3040 is not required) to extract the tally information from the Saturn switcher.

To use this type of resource device, you must create an MPK device entry for the simulated MI-3040 using the Jupiter system just as if you were connecting to an actual MI-3040 unit for purposes of providing output tallies. You must specify the same unique 32-bit device address in hexadecimal notation to both the tally system and the Jupiter system.

Access to information from this type of resource device is through three fixed output names; PGM (for program), PST (for preset), and BP (for bypass), with input names A (for background A), B (for background B), K1 (for key 1), and K2 (for key 2) for outputs PGM and PST, and input names PGM and BP for output BP.

The outputs named PGM and PST indicate the set of inputs that are currently connected to that output. This could be any of A, B, K1, or K2.

The output named BP indicates either PGM if the switcher is not in the bypass mode, or BP if the switcher is in the bypass mode.

For example, if output PGM has inputs A and B selected, this indicates that the background A and B inputs are reaching the Saturn switcher program output (a dissolve is in progress). Use resource interconnections to inform the tally system that outputs of one resource device are connected to inputs of another. To make the Saturn program output (named PGM) the “on-air” signal, make a resource interconnection originating from this output with “on-air” usage selected. To include the Saturn Bypass feature in tally determination, make a resource interconnection from the Saturn program output (PGM) to the Saturn program bypass input (also named PGM). Then make another resource interconnection originating from the Saturn bypass output (named BP) with “on-air” usage selected.

Consult your equipment manuals for information on configuring the operation of its communication ports.

PESA Lynx Routing Switcher (COM port)

Available in future release of tally system firmware.

Leitch Routing Switcher (COM port)

Specifications

Equipment port	Any available remote control serial port
Tally system port	Any of COM7 through COM12 (RS-422) or COM2 (RS-232)
Protocol	Pass-through protocol
Serial format	Fixed at 9600 baud, 7 data bits, no parity, 1 stop bit
Input name format	Numeric starting at 0 (leading zeros must not be included)
Output name format	Numeric starting at 0 (leading zeros must not be included)
Level format	Numeric starting from 0

Consult your equipment manuals for information on configuring the operation of its communication ports.

Sony DVS Series Routing Switcher (S-BUS port)

Specifications

Equipment port	S-BUS BNC
Tally system port	CTL1
Protocol	S-BUS
Serial format	312.5k bits/second, HDLC
Input name format	Alphanumeric
Output name format	Alphanumeric
Level format	Alphanumeric

With this type of resource device, the tally system connects directly to the S-BUS coaxial cable using a BNC "Tee" adapter. The S-BUS is a high-speed communication link that requires end-termination. Regardless of the number of routing switchers connected to the S-BUS, all of them can be monitored by the tally system using a single connection.

The IMAGE VIDEO Tally System Interface unit occupies S-BUS station number 7. Do not set the station address of other S-BUS devices to this address. Doing so may cause improper system operation.

To access information from this type of device, specify the input or output category followed by a three-digit number (leading zeros must be included), and optional level name. For example, `R1::VTR001[VID]` specifies the input or output named VTR001 on its level named VID for the resource device named R1.

Sigma Series Routing Switcher (COM port)

Available in future release of tally system firmware.

Virtual Router/Switcher

The tally system can interface to 512 general purpose interface (GPI) inputs. GPI inputs and outputs are connected to a tally system serial port (usually COM7) through an interface unit such as the Image Video Model 4211.

To use GPI inputs to control a virtual router/switcher, you must specify the control text for at least one resource output. The resource output provides the tally system with information about a resource device output that would otherwise come from an actual device through a communication port. Since the device has no such port, the information comes in the form of a set of GPI inputs that go active to indicate that a specific input is connected to a specific output.

The I2N embedded function is most commonly used for this purpose. When it appears in the control text of a virtual router/switcher resource output, the active GPI inputs it specifies are converted to a list of inputs. For example, the control text `I2N(0,16,1)` causes any active GPI input number from 0 to 15 to indicate that corresponding virtual router/switcher resource inputs from 1 to 16 are connected to that virtual router/switcher resource output.

A virtual router/switcher can have many resource outputs, and a tally system can have many virtual routers/switchers. You can even use virtual routers/switchers to model static portions of your signal switching system. This can useful when your system has source signals that are distributed to multiple locations. This allows you to attach an alternate name to an originating source in place instead of several places. To create a static output, just add a resource output to a virtual router/switcher that has fixed control text (no embedded functions are used).

Use the Resource Output Control dialog box to create or modify resource outputs. This dialog box can be opened from the Configure Resource Device dialog box.

Importing and Exporting Files

Most elements of the tally system's configuration information can be imported from files of other formats into the tally system, or exported from the tally system into files of other formats. This allows you to examine or modify tally system configuration data using applications other than the Tally System Console program.

To handle the translation of tally system configuration data into various file formats the Tally System Console program uses the ODBC facility built into Windows. This means that you can import or export files in any format for which you have a matching ODBC driver. Run the ODBC Manager from the Windows Control Panel to determine which drivers are available on your system. Most popular spreadsheet and data base applications automatically add an ODBC driver when you install the application.

Note

The ODBC Manager and drivers are usually installed when you add ODBC-ready applications to your system. If you do not have the ODBC Manager and at least one ODBC driver, you cannot use the file import or export features of the Tally System Console program.

When interacting with an ODBC driver, you must specify a data source name. When importing, the data source name is usually a file or a directory containing a set of files. When exporting, a data source name is still required even though you will be creating files. In this case, you must create an empty file or directory using the appropriate application before starting the export operation.

Regardless of the file format you choose, the Tally System Console program generates and accepts configuration data organized as a set of named tables, with each table having a fixed set of named columns and a variable number of records. The way in which this information appears when opened in other applications can vary. In a spreadsheet application, for example, one workbook file may contain each table as a separate worksheet, with each worksheet having the first row containing column names and the remaining rows containing configuration data records. Conversely, in a text file format, each table may appear in a separate file with each file having the first line containing column names and the remaining lines containing configuration data records.

To import or export a file, you must decide what type of information you wish translate. You can select any combination of the following tables:

Table Name	Description
DisplayUnit	All remote display units with name, serial number, and attributes
DisplaySection	All sections of each remote display unit with control message
GlobalMessage	All global message names and values
ResourceItem	All resource items with resource device name and attributes
ResourceOutput	All resource outputs with resource device name and control message
Interconnection	All resource interconnections with origin, multiple ends, and usage
GPIOutput	All GPI outputs with name, address, size, and control message

The column names for each table are:

Table Name	Column Name	Description
DisplayUnit	Serial	Serial number of display unit, up to 6 characters
	Name	Name of display unit, up to 26 characters
	Type	Model of display, RDU-1500, RDU-1600, etc.

	Base	Left-most dot location, 0 to 159
	Size	Total number of dots wide, 1 to 160
	Interface	Interface unit number connected to display, 1 to 16
	Port	Communication port connected to display, COM1 to 12
	Brightness	LED brightness level, 0 (maximum) to 36 (minimum)
	Layout	Name of layout containing display unit, up to 26 characters
	LayoutH	Horizontal position within layout, 0 (left side) to 49
	LayoutV	Vertical position within layout, 0 (top) to 35 (bottom)
	MonitorCount	Monitors adjacent to display, Single, Dual, Triple, or None
	MonitorUnderOver	Display unit position relative to monitors, Under or Over
DisplaySection	Serial	Serial number of display unit, up to 6 characters
	Name	Name of display unit, up to 26 characters
	Section	Section within display unit, 1, 2, or 3
	Start	Left most dot location (relative to base of display unit), 0 to 159
	Width	Total number of dots wide, 1 to 160
	Format	Type of control message, one of the following: Custom Fixed message User selected message Tally selected message Primary originating source Combined originating sources
	Lock	Changes locked out, Yes or No
	Control	Control message
GlobalMessage	Name	Name of global message, up to 26 characters
	Message	Contents of global message
ResourceItem	Resource	Name of device containing resource item, up to 26 characters
	Name	Name of resource item, up to 26 characters
	ShortName	Alternate name, up to 8 characters
	LongName	Alternate name, up to 19 characters
	Type	Type of resource item, Source, Dest, Source-Dest, or None
	StyleA	Style A, Primary, Secondary, Short, Long, or Style B
	StyleB	Style B, Primary, Secondary, Short, Long, or Style A
	Priority	Priority of resource item, 0 (highest) to 255 (lowest)
ResourceOutput	Resource	Name of device containing resource output, up to 26 characters
	Name	Name of resource output, up to 26 characters
	Control	Control message
Interconnection	Name	Name of resource interconnection, up to 26 characters
	Type	Usage of interconnection, Normal, On-air, or Next-to-air
	Origin	Resource item feeding interconnection
	Ends	Comma-separated list of resource items fed by interconnection
GPIOutput	Name	Name of GPI output, up to 26 characters
	Base	Base address, 0 to 511
	Size	Number of bits in GPI output set, 1 to 32
	Interface	Interface unit number connected to GPI interface, 1 to 16

Port	Communication port connected to GPI interface, COM1 to 12
Control	Control message

Table names, column names, and column values are case sensitive. Each must be specified exactly as shown.

When importing, tables with names not described above are ignored regardless of the name of columns within the table. Similarly, columns with names not described above are also ignored, but other columns (named above) in the same table can be imported.

Column and record order is not significant. Each record must uniquely identify an item to be imported. Only those columns that uniquely identify the item must be present. The item assumes default attributes if some column information is omitted. See Partial Import Operation below for information on the effects of missing columns.

Each imported record can cause a configuration item to be modified or created. Importing does not cause existing items to be removed. You must remove unwanted items manually either before or after the import operation. To configure the tally system from imported items only, remove all desired configuration items before starting the import operation. You can remove all configuration items at once by selecting the **File; New** menu command, or from the keyboard, select **Ctrl+Shift+F7**. Note that the tally system must consist of at least one display unit at all times.

When exporting, tables are created with exactly those column listed above. Existing tables of the same name are replaced. Tables of other names are not affected.

Import Operation

To import tally system configuration tables, select the **File; Import** menu command. The ODBC Manager opens a dialog box where you can select the type of file to import and the location of the file also known as the data source name. The data source name could be a file or a directory, depending on the type of file being imported. Close the ODBC Manager dialog box. The Select Items to Import dialog box opens. The previously selected configuration items remain checked. Check the desired configuration items to be imported. Items that are disabled cannot be checked and indicate that there are no items of that type in the file to be imported. If there is not at least one type of item in the file to be imported, an error message appears.

Export Operation

To export tally system configuration tables, select the **File; Export** menu command. The ODBC Manager opens a dialog box where you can select the type of file to export and the location of the file also known as the data source name. The data source name could be a file or a directory, depending on the type of file being exported. The data source must already exist even if you are creating new tables. If you need to create an empty file for this purpose, use the application that you intend to use to open the exported file. Close the ODBC Manager dialog box. The Select Items to Export dialog box opens. The previously selected configuration items remain checked. Check the desired configuration items to be exported. Items that are disabled cannot be checked and indicate that there are no items of that type in the current tally system configuration.

Partial Import Operation

A common use of the file import and export operations is to export to a file, make changes using another application, then import the changed file. In this case, all table columns are present when the file is imported because the export operation. Alternately, you can create a file to be imported independent of the Tally System Console program. To save time, you can leave out non-essential columns if the default value for the omitted column is acceptable. For most tables, you must supply a minimum of one column.

The effects of a partial import operation and the default value for each column is described in the following table.

Table Name	Column Name	Default Value
DisplayUnit	Serial	First unused 6-digit number with leading zeros
	Name	Display Unit *n*, where *n* would create the first unused name
	Type	RDU-1500
	Base	0
	Size	160
	Interface	2
	Port	COM3
	Brightness	0
	Layout	Untitled *n*, where *n* would create the first unused name
	LayoutH	Next available position in layout
	LayoutV	Next available position in layout
	MonitorCount	Single
	MonitorUnderOver	Under
DisplaySection	Serial	First unused 6-digit number with leading zeros
	Name	Display Unit *n*, where *n* would create the first unused name
	Section	1
	Start	0
	Width	Size of display unit
	Format	Custom
	Lock	No
	Control	Empty
GlobalMessage	Name	No default value, must be present
	Message	Empty
ResourceItem	Resource	No default value, must be present
	Name	No default value, must be present
	ShortName	Empty
	LongName	Empty
	Type	Source
	StyleA	Long
	StyleB	Style A
	Priority	0
ResourceOutput	Resource	No default value, must be present
	Name	No default value, must be present
	Control	Empty
Interconnection	Name	Connection *n*, where *n* would create the first unused name
	Type	Normal
	Origin	Empty
	Ends	Empty
GPIOutput	Name	GP Output *n*, where *n* would create the first unused name
	Base	0
	Size	1
	Interface	2
	Port	COM7
	Control	Empty

For the *DisplayUnit* and *DisplaySection* tables, both the Name and Serial columns determine whether importing the record causes another display unit to be created or an

existing display unit to be modified. The following rules apply:

If the Serial column matches the serial number of an existing display unit exactly, the other attributes of that display unit, including the name, are modified according to the remaining columns. If the Name column is omitted, the default value described in the table above is provided.

If the Name column matches the name of an existing display unit exactly, but the Serial column does not match the serial number of any existing display unit, the other attributes of the display unit, including the serial number, are modified according to the remaining columns. If the Serial column is omitted, the default value described in the table above is provided.

If both the Serial and Name columns are omitted, a new display unit is added to the tally system configuration having attributes according to the remaining columns. The new unit has a default value for its name and serial number as described in the table above.

For the *GlobalMessage*, *Interconnection*, and *GPIOutput* tables, the Name column determines whether importing the record causes another item to be created or an existing item to be modified. The following rules apply:

If the Name column matches the name of an existing item exactly, the other attributes of that item are modified according to the other columns. Attributes of the item corresponding to omitted columns are not changed.

If the Name column is not omitted, but does not match the name of any existing item, a new item is added to the tally system configuration having the given name and other attributes according to the remaining columns.

If the Name column is omitted, a new item is added to the tally system configuration having attributes according to the remaining columns. The new item has a default value for its name as described in the table above.

For the *ResourceItem* and *ResourceOutput* tables, both the Resource and Name columns must be present. These columns determine whether importing the record causes another item to be created or an existing item to be modified. The following rules apply:

If the Resource and Name columns matches the resource and name of an existing item exactly, the other attributes of that item are modified according to the other columns. Attributes of the item corresponding to omitted columns are not changed.

If the Resource column matches the name of an existing resource device exactly, but the Name column does not match the name of any existing item for that resource device, a new item is added to the tally system configuration having the given resource and name and other attributes according to the remaining columns.

If the Resource column does not match the name of any existing resource device, a new resource device and a new item for that resource device is added to the tally system configuration. The new resource device is a “virtual router” type and the new item has the given resource and name and other attributes according to the remaining columns.

Use caution when importing files that were not created by an export operation. Confirm that the intended action took place by checking the attributes of each imported item in the dialog box corresponding to the item’s type.

Unit Windows

Adding a Unit Window

There is always at least one unit window in the system. Although you can control any remote display unit from this window you may wish to have several unit windows on-screen for quick access to certain display units.

To add a unit window select **Window; New** from the main menu, or use the keyboard command **Ctrl+F2**. A new unit window appears immediately below the currently selected unit window and the new unit window is selected. Initially, a single default remote display unit is assigned to the unit window. You can now assign any other remote display unit to the new unit window.

To duplicate and existing unit window select **Window; Duplicate** from the main menu, or use the keyboard command **Ctrl+Shift+F2**. A copy of the currently selected unit window appears immediately below that window and the same set of remote display units assigned to the original unit window are also assigned to the new unit window.

Vertically arranged unit windows are considered to be part of a unit window group. You can place unit windows into groups or take a unit window from a group by moving the unit window.

Selecting a Unit Window

Of all the unit windows on the screen, one of these windows is the currently selected unit window. Most commands and operations are carried out on the selected unit window or the remote display unit assigned to the selected unit window.

The selected unit window is distinguished from other unit windows by a label box bearing the name of the remote display unit selecting in that unit window appearing near the left side of the unit window. If there is not enough space at the left side of the unit window, the label box appears at the right side instead.

To select a different unit window, click the left mouse button anywhere on the unit window to be selected. You can also use **Down** arrow to select the unit window having the next lowest screen position or **Up** arrow to select the unit window having the next highest screen position. To select the unit window nearest to the top of the screen, select **Home**. To select the unit window nearest to the bottom of the screen, select **End**.

Once a unit window is selected you can choose a remote display unit from a previously assigned set of display units, or begin modifying the contents of the remote display unit currently assigned to the unit window.

Moving Unit Windows

You can place unit windows anywhere on the screen. To move a unit window, hold down the left mouse button and drag the mouse starting from any part of the window excluding the LED display area and control set selector button area. Move the mouse to the new location and release the left button. You can also move a unit window from the keyboard by selecting **Window; Move** from the main menu.

If you place a unit window of the same size directly above or below another unit window, these windows become "grouped". Unit window groups allow several unit windows, arranged vertically, to be moved or sized as one object. Just move any one of the unit windows in the group to move the entire group.

To "break" a unit window from a group, hold down **Shift** while moving the unit window. Once the window is away from others on the screen, it can be moved and sized independently. If a unit window is taken from the middle of a group, the remaining windows in the group form two groups.

In addition to moving, each separate unit window or group can be sized differently.

Sizing Unit Windows

You can choose one of three sizes (large, medium, or small) for each unit window or group of unit windows. The small size allows many unit windows to fit on the screen. The medium size is the most common size used for general editing of remote display unit contents. The large size is designed to permit viewing of remote display unit messages from across a room.

To size a unit window or group, select the unit window or any unit window in the group and use **Ctrl++** (keypad plus) to increase the window size or **Ctrl+-** (keypad minus) to decrease the window size. You can also select the size directly using the main menu commands **Window; Large**, **Window; Medium**, and **Window; Small**. The selected unit window's current size is indicated by a check mark next to the corresponding menu item.

In addition to sizing, each separate unit window or group can be moved anywhere on the screen.

Note

When sizing a group of unit windows, the "centre point" of the sizing operation is the upper-left corner of the selected window. When increasing the size of unit window, this may cause some unit windows to be "pushed" off screen. To return these windows to the screen, select a smaller size for the group, or move one of the on-screen members of the group to make the other unit windows in the group visible again.

Remote Display Units

Adding a Display Unit

The tally system always contains at least one remote display unit. You can add other units using either of the following methods.

Open the Configure Display Unitsdialog box and select **Add**. Provide a unique name for the new unit and enter the serial number of the actual remote display unit to be controlled, then select **OK**.

or

Open the layout window and double-click the left mouse button at the desired location for the new unit, or move the highlighted area to the desired location using the arrow keys and select **Ctrl+Shift+F2** or select **New Unit** from the layout menu. The new unit has the largest monitor style that can fit at the selected location.

Once a remote display unit is added to the system, it can be selected or assigned to any unit window.

Assigning a Set of Display Units to a Unit Window

Each unit window can be assigned up to 9 frequently controlled remote display units. This provides one-button access to each display unit from a single unit window. You may wish to use this feature to avoid the screen clutter associated with having separate unit windows for each frequently controlled remote display unit.

Initially, new unit windows have one control set button labeled 1. You can assign other remote display units to the same unit window without losing the remote display unit currently assigned to the unit window.

To assign another remote display unit to the unit window, double-click the left mouse button over any control set button, or use the keyboard command **Ctrl+0** (zero) or the main menu command **Window; Add Unit**. This action adds the next higher-numbered button to the control set. A default remote display unit is initially selected for this control set member, but you can select any other remote display unit.

To remove a member of the control set, use the keyboard command **Ctrl+*** (keypad asterisk) or the main menu command **Window; Remove Unit**. Only the control set member is removed from the unit window. The remote display unit assigned to the removed control set member is not removed from the system itself, and can be assigned or selected in another unit window.

Selecting a Display Unit

To control a remote display unit you must select the display unit in one or more unit windows.

You can select a remote display unit in several ways. If the desired remote display unit is already assigned to a unit window, just select that unit window.

If the remote display unit is a member of a unit window's control set, but is not the currently selected member of the control set, select the desired member by clicking the left mouse button on the corresponding control set button in the unit window. Alternately, if the currently selected control set button is flashing (you are not editing display unit contents), you can select the next or previous member of the control set using **Right** or **Left** arrow until the desired remote display unit is selected.

To select a remote display unit by its name, hold down the left mouse button and drag the mouse from any control set button in the up or down direction until the remote display unit list appears. Release the left mouse button while the mouse points to the desired remote display unit name. You can also use **Ctrl+Down** or **Ctrl+Up** to open the remote display unit list and selected the next or previous remote display unit in the list. Release **Ctrl** when the name of the desired remote display unit is highlighted. To restore the originally selected remote display unit to the unit window, release the left mouse button while not pointing to any list item, or use **Ctrl+Up** to move the highlighted list item above the top of the list. The first item in the list is always the name of the originally selected remote display unit.

While using **Ctrl+Down** and **Ctrl+Up** to navigate the list, you can also use **Ctrl+Right** or **Ctrl+Left** to select a remote display unit from the next or previous layout in a tally system that has more than one layout. The list is titled with the layout's name. This feature only works after the remote display unit list is opened. Without the list opened these commands have functions only while editing display unit contents.

If there are many remote display units, a list of their names may not fit in a reasonably-sized box. In this case, only the most recently used remote display units appear in the list and an additional item "More.." appears at the end of the list. Select this last item to open a dialog box containing a complete list of all remote display units in the system. You can open the this dialog box at any time by choosing **Display Unit; Select** from the main menu or by using the keyboard command **F6**.

You can also select a remote display unit from the layout window. Click the left mouse button while pointing to the desired remote display unit, or use the arrow keys to move the highlighted area to the remote display unit.

Once a remote display unit is selected, you can modify its contents and perform operations specific to that unit.

Configuring a Display Unit

Remote display units assume a default configuration when added to the system. Later, you can modify any of the following remote display unit attributes:

- Name consisting of up to 25 characters
- Width of the active LED display area from 1 to 160 dots
- Serial number of up to 6 characters (usually numeric)
- Location of unit in the layout window
- Number of video monitors associated with the unit from none to three
- The position of the unit relative to its video monitors (under or over)

Other remote display unit attributes, such as LED brightness and section arrangement, are more frequently changed and are not considered part of a display unit's configuration.

To change the name, serial number, width, or monitor style of a remote display unit, use the Configure Display Units dialog box. To change the location or monitor style of a remote display unit, use the layout window and the layout menu.

Configure Display Units Dialog Box

The Configure Display Units dialog box allows you to add, rename, remove, or change attributes of any remote display unit in the system. You can also use the keyboard command **Ctrl+F10** to open this dialog box.

Each remote display unit is assigned a name of up to 25 characters and a serial number of up to 6 characters. The name is chosen arbitrarily. The serial number need not actually be numeric but must correspond to the serial number assigned to the actual remote display unit to be controlled.

Type

The type of a remote display unit provides the tally system with information on how to control each remote display unit.

To set the type of a remote display unit, select the unit by picking its name from the **Name** list box or its serial number from the **Serial #** list box, then specify the desired type in the **Type** list box. Select a type that most closely matches the model number of the remote display unit. Some units have a model number that belongs to a series (the RDU-1502 belongs to the RDU-1500 series, for example). In this case, specify the matching type for all remote display units of that model series.

Warning

If the type of a remote display unit is set incorrectly, any remote display units that use the same communication port may not operate properly.

Layout

Each remote display unit belongs to only one layout. The layout window shows the location of all remote display units of a layout. Use the **Layout** list box to move a remote display unit from one layout to another.

To change the layout of a remote display unit, select the unit by picking its name from the **Name** list box or its serial number from the **Serial #** list box, then specify the desired layout in the **Layout** list box.

When you change the layout of a remote display unit, the program attempts to maintain the original location within the new layout. It is possible that this location may be occupied by another remote display unit. In this case, a message appears when you close the dialog box to remind you of the conflict and the program automatically re-locates the remote display unit to the next available layout position.

Width

The width of one remote display unit is indicated by the **Width** box and possibly one of the **17" Unit**, **13" Unit**, or **8.5" Unit** controls. A display unit's width refers to the number of dots (LED's) found horizontally in the active display area of the unit.

To change the width setting of a remote display unit, select the unit to be changed by picking its name from the **Name** list box or its serial number from the **Serial #** list box, then specify the desired width in dots in the **Width** box. Any width from 1 to 160 dots may be specified. You can also select one of the three common display unit sizes. Select **17" Unit** for a 160 dot display area. Select **13" Unit** for a 120 dot display area. Select **8.5" Unit** for a 80 dot display area. The actual remote display unit width is not affected until the Configure Display Units dialog box is closed. On the PC screen, the appearance of a unit window does not change regardless of the width of its assigned remote display unit. The LED area of the unit window, however, does reflect the chosen width and appears centred in the unit window.

There are keyboard commands available to make width adjustments without opening the Configure Display Units dialog box. You can use **Ctrl+U** or select **Display Unit; Unit**

Size; Expand from the main menu to increase the width of a unit by one dot. You can use **Ctrl+Shift+U** or select **Display Unit; Unit Size; Contract** from the main menu to decrease the width of a unit by one dot.

Monitor

The monitor style of one remote display unit is indicated by the one of the **None**, **Single**, **Dual**, or **Triple** controls. A display unit's monitor style affects its appearance in the layout window.

To change the monitor style of a remote display unit, select the unit to be changed by picking its name from the **Name** list box or its serial number from the **Serial #** list box, then select one of the four monitor styles. Select **Single** to have a single large monitor appear above the remote display unit in the layout window. Select **Dual** to have two monitors appear over the unit. Select **Triple** for three monitors. Select **None** for a display unit that is not to be associated with a monitor. The actual remote display unit monitor style is not affected until the Configure Display Units dialog box is closed.

Section Contents

Select the type of contents for each section of the selected remote display unit. Unused sections are disabled. The following types are available:

Custom

This is the normal content type where you can edit remote display unit control text directly. The control text is completely user-defined.

Fixed message

Select this type to create a fixed message display. You can select color and text formatting options from the Fixed Message dialog box by selecting the corresponding **Details** button to the right of the **Section Contents** type box.

User selected message

Select this type to create a quickly switchable message display. In a switchable message display you can change the display from message to message using **PgUp** and **PgDn**. From the User Selected Message dialog box you can select color and text formatting options and specify a list of named messages that form the switching feature. Select the corresponding **Details** button to the right of the **Section Contents** type box to open the dialog box.

Tally selected message

Select this type to create a tally-driven switchable message display. In a tally-driven message display a set of GPI inputs determines which message is displayed at any one time. From the Tally Selected Message dialog box you can select color and text formatting options and specify a list of named messages that form the switching feature. Select the corresponding **Details** button to the right of the **Section Contents** type box to open the dialog box.

Primary originating source

Select this type to create a single source name display that indicates the name of the originating source being carried to a specific resource device destination. From the Primary Originating Source dialog box you can select color and text formatting options and specify the resource device and destination name. Select the corresponding **Details** button to the right of the **Section Contents** type box to open the dialog box.

Combined originating sources

Select this type to create a potentially multiple source name display that indicates zero or more names of originating sources being combined and carried to a specific resource device destination. From the Combined Originating Sources dialog box you can select color and text formatting options and specify the resource device and destination name. Select the corresponding **Details** button to the right of the **Section Contents** type box to open the dialog box.

Locked

Check this box to protect the control text from direct editing. Use this feature to prevent accidental changes to the control text. The control text can still be modified at a later time by un-checking the **Locked** check box, making the changes, then re-checking the **Locked**

check box. You can also lock or unlock the control text of all display unit sections at once using the **Lock All** and **Unlock All** buttons in this dialog box.

If you select any section content type other than **Custom** then select **OK** from within a details dialog box, any previously specified control text for the section is replaced with the text and embedded functions required to produce the desired type of remote display unit contents. These content types are intended to help novice users program the tally system without a working knowledge of embedded functions. If you wish to view the control text generated for any of the non-custom section content types, make sure the **Locked** check box is not checked, close the Configure Display Units dialog box, then edit the section's control text normally from its unit window.

Add

To add a new remote display unit to the system, select **Add** to open the Add Display Unit dialog box. Initially, the next likely unique name and serial number based on the name and serial number of the originally selected remote display unit appears (hold down **Shift** as you select **Add** to start with the originally selected name and serial number). You can keep this new name and serial number or specify a different name and serial number for the new unit. Select **OK** to add the unit, or **Cancel** to abandon the operation and return to the Configure Display Units dialog box. Repeat the procedure to add other display units to the system. Both the name and serial number of each new unit must be unique.

Display units can also be added using the layout window. A default name and serial number is assigned when display units are added in this way. You can use the Configure Display Units dialog box to change the name and serial number at a later time.

Rename

You can change the name or serial number assigned to an existing remote display unit.

To change the name and serial number of a remote display unit, use the following procedure. Select the unit to be renamed by picking its current name from the **Name** list box or its serial number from the **Serial #** list box. Select **Rename** to open the Rename Display Unit dialog box. The original name and serial number appear. You can keep the name and change the serial number, keep the serial number and change the name, or specify a different name and serial number for the unit. Select **OK** to rename the unit, or **Cancel** to abandon the operation and return to the Configure Display Units dialog box. Repeat the procedure to rename other display units.

Remove

To remove a remote display unit from the system, use the following procedure. Select the unit to be removed by picking its name from the **Name** list box or its serial number from the **Serial #** list box, then select **Remove**. If the removed remote display unit is assigned to any unit window another display unit is assigned to the unit window in its place.

There must be at least one remote display unit for the system to operate. The single remaining display unit cannot be removed.

Lock All

Protects the control text of all remote display unit sections from direct editing. You can also protect each remote display unit section individually using the **Locked** check box elsewhere in this dialog box.

Unlock All

Removes the protection of the control text of all remote display unit sections from direct editing. You can also remove this protection from each remote display unit section individually using the **Locked** check box elsewhere in this dialog box.

Port

Opens the Display Unit Port dialog box. You can specify the Tally System Interface unit number for the selected remote display unit (1 though 16, or None). All remote display units must have None selected as the interface if the Tally System Console program is to operate in the message system mode (no Tally System Interface unit is connected to the PC). Otherwise, select the Tally System Interface unit number which is actually

connected to the selected remote display unit. A system can consist of more than one Tally System Interface unit.

If an interface is selected (None is not selected), you can choose the specific port that the Tally System Interface unit uses to send control messages to the selected remote display unit. This setting has nothing to do with PC port selection and its setting is ignored unless an interface unit is also selected. COM1 and COM2 are 9-pin RS-232 ports. COM3, COM4, COM5, and COM6 are RJ11 connector ports. The remaining ports are 9-pin RS-422 ports. Image Video Model RDU-1500 and RDU-1600 series Remote Display Units can use any available RJ11 port.

To close the Display Unit Port dialog box, select **OK** to keep the port settings, or select **Cancel** to retain the original settings.

Close

Closes this dialog box. Any changes to display unit widths or monitor styles are put into effect at this time.

Help

Invokes the Windows Help System and shows this page.

Details Dialogs

Details Dialog Boxes

There is a details dialog box for each of the pre-defined non-custom control text types. You can use a details dialog box to generate the control text for each section of a remote display unit instead of editing the control text directly. You may prefer this method a remote display unit programming if you are not familiar with control text formats and embedded functions.

There are five details dialog boxes:

- the Fixed Message dialog box,
- the User Selected Message dialog box,
- the Tally Selected Message dialog box,
- the Primary Originating Source dialog box,
- and the Combined Originating Sources dialog box.

Each dialog box allows you to customize the remote display unit section to perform some of the more common display functions, such as source name display and user or tally-directed messaging.

To open one of the details dialog boxes, open the Configure Display Units dialog box, select the desired remote display unit, select the type of **Section Contents** for the desired section, then select the corresponding **Details** button.

Fixed Message Dialog Box

This dialog box allows you to specify the **Message**, **Character Set**, **Justify** mode, and **Color** that should appear on the remote display unit section identified by **Name**.

Specify the desired message text and attributes, then select **OK**. The required control text is automatically created. Select **Cancel** to abandon the operation and leave the control text unchanged.

The default color is dependent on a setting inside the actual remote display unit. The factory default color setting is green with no external tally asserted and red with the external tally asserted.

User Selected Message Dialog Box

This dialog box allows you to specify several named messages and the **Character Set**, **Justify** mode, and **Color** that should appear with each message on the remote display unit section identified by **Name**. Later, the Tally System Console operator will choose which one of the messages should be displayed using **PgUp** and **PgDn**.

To make a set of messages, specify a message name in the **Message Name** box. Select **Add**. Initially, the contents of a new message are ‘‘*new*’’. Replace these contents with the desired message text in the **Message** box. Repeat the procedure to add more messages as desired. Message names must be unique. If you do not specify a unique message name or you do not specify a message name at all, a beep is sounded when you select **Add**.

To remove an unwanted message, select the message in the **Message Name** box and select **Remove**.

Finally, specify the desired message character set, justify mode, and color attributes, then select **OK**. The required control text is automatically created. Select **Cancel** to abandon the operation and leave the control text unchanged.

The default color is dependent on a setting inside the actual remote display unit. The factory default color setting is green with no external tally asserted and red with the external tally asserted.

Tally Selected Message Dialog Box

This dialog box allows you to specify several named messages and the **Character Set**, **Justify** mode, and **Color** that should appear with each message on the remote display unit section identified by **Name**. The actual message chosen for the display is determined by a set of GPI inputs into the tally system. The Tally System Console program must be operating in the tally system mode to correctly use this feature.

To make a set of messages, specify a message name in the **Message Name** box. Select **Add**. Initially, the contents of a new message are and its GPI number are "*new*". Replace these contents with the desired message text in the **Message** box and the address of the actual GPI input that is to activate that message in the **Tally Address** box. Repeat the procedure to add more messages as desired. Message names must be unique. If you do not specify a unique message name or you do not specify a message name at all, a beep is sounded when you select **Add**.

To remove an unwanted message, select the message in the **Message Name** box and select **Remove**.

Finally, specify the desired message character set, justify mode, and color attributes, then select **OK**. The required control text is automatically created. Select **Cancel** to abandon the operation and leave the control text unchanged.

The default color is dependent on a setting inside the actual remote display unit. The factory default color setting is green with no external tally asserted and red with the external tally asserted.

Primary Originating Source Dialog Box

This dialog box allows you to specify a resource device destination and the **Character Set**, **Justify** mode, and **Color** that should appear with the name of the source being carried to that destination on the remote display unit section identified by **Name**. The Tally System Console program must be operating in the tally system mode to correctly use this feature.

Specify the resource device by its name in the **Device** box. Specify a destination by its name in the **Destination** box. Previously used names can be quickly selected from each drop-down list box. If the desired name is not in the list, enter it directly.

Finally, specify the desired character set, justify mode, and color attributes, then select **OK**. The required control text is automatically created. Select **Cancel** to abandon the operation and leave the control text unchanged.

Use the default color to make the source name appear red while on-air (program), amber while next-to-air (preset), and green while not on-air or next-to-air (normal). Selecting another color keeps the source name in one color regardless of its on-air or next-to-air status.

Combined Originating Sources Dialog Box

This dialog box allows you to specify a resource device destination and the **Character Set**, **Justify** mode, and **Color** that should appear with the name(s) of the sources being combined and carried to that destination on the remote display unit section identified by **Name**. The Tally System Console program must be operating in the tally system mode to correctly use this feature.

Specify the resource device by its name in the **Device** box. Specify a destination by its name in the **Destination** box. Previously used names can be quickly selected from each drop-down list box. If the desired name is not in the list, enter it directly.

Finally, specify the desired character set, justify mode, and color attributes, then select **OK**. The required control text is automatically created. Select **Cancel** to abandon the operation and leave the control text unchanged.

Use the default color to make the source name appear red while on-air (program), amber while next-to-air (preset), and green while not on-air or next-to-air (normal). Selecting another color keeps the source name in one color regardless of its on-air or next-to-air status.

This feature is normally used with resource devices such as production switchers that can construct output signals from numerous input signals simultaneously. If only one source reaches the specified destination (as is the case on a routing switcher output), this dialog box operates identically to the Primary Originating Source dialog box.

When more than one source reaches the monitored destination the source names are listed on the display using their short names until the display is filled. Resource device sources can be assigned a priority number. This number is used to determine the order in which source names appear on the display. A source name with a lower priority number appears to the left of a source name with a higher priority number.

Customizing

Control Text

Remote Display Unit Control Text

Each section of a remote display unit is assigned control text that determines the characters, color, formatting, and flashing of the section. Depending on the control text type you have selected, you can edit control text directly from a unit window or you can have the control text generated automatically after providing some information in a details dialog box.

Regardless of how it is produced, the control text is a sequence of characters containing literal characters and string expressions. Expressions can contain embedded functions and sub-expressions, possibly containing more literal characters.

To generate the final appearance of a remote display unit section, the section's control text string is "evaluated" into a final string of characters. Expressions and sub-expressions are evaluated in left to right order. Parenthesis are used to group sub-expressions and alter expression evaluation order.

Expressions can be as simple as a string of literal text or as complex as a string of many sub-expressions within sub-expressions (nesting). Expressions usually contain embedded functions which are executed given zero or more arguments in parenthesis. These arguments may also be literal text or sub-expressions. Embedded functions return a result string of zero or more characters which are then passed to higher-level embedded functions or treated as literal text for the display.

Control text that does not match an embedded function "prototype" is treated as literal text. A prototype is any valid function name, followed by zero or more space characters, followed by a left parenthesis, zero or more expression arguments separated by commas, and closing with a right parenthesis.

You may wish to specify literal text which happens to match an embedded function prototype. In this case, use matching double or single quotes to enclose text which would otherwise be interpreted as an embedded function or expression grouping. Use double quotes to enclose literal text that contains one or more single quotes. Use single quotes to enclose literal text that contains one or more double quotes.

Embedded functions are available to perform various tasks. Some embedded functions control display attributes directly, such as color and formatting. Other embedded functions provide "programming language" features such as variable assignment and referencing, math and logical functions, iteration, text manipulation, and system status information functions.

Named variables are essential to performing any higher-order operations within the control text. You can assign a string of characters to a variable with a name that you supply, then recall that variable's string contents elsewhere in the control text by referring to its name.

Named variables are synonymous with "messages". Both refer to named elements that hold zero or more characters as their "value". In the discussion of expressions, the term variable is used. This is not the same as timer/counter variables.

There are three type of variables for use in expressions. Variables with names that start with the exclamation character (!) are "temporary". Temporary variables always contain the empty string before expression evaluation begins. Typical uses of temporary variables include storage of sub-expression values for use in other parts of an expression, or iteration counters.

Variables with names that start with the asterisk character (*) are “local”. The value of these variables is retained indefinitely. These variables are also “device-specific”. This means that only this remote display unit section can use this variable. Other sections or other remote display units have their own independent local variables (even having the same name). Typical uses of local variables are for timing of special events such as the momentary flashing of a display.

Variables with names that do not start with ! or * are “global”. The value of these variables is also retained indefinitely. Typically, global variables hold some common sub-expression to be used in many remote display unit control text strings. Global variables are initialized through the Configure Messages dialog box. Although unusual, remote display unit control text can modify global variables.

Some variables have a special purpose as determined by their pre-designated names. Use of pre-designated variable names should be avoided for variables that are to function in some other manner.

The contents of graphic character groups are a set of pre-designated global variables named GG*n* where *n* is the group number from 1 to 4. The value of a graphic group variable is a sequence of hexadecimal digits representing a list of character widths and dot column maps. This format is identical to that required when downloading to the remote display units (excluding the byte count and checksum). Refer to the *Remote Display Unit Protocol* for more information.

The local variable *T is a pre-designated variable that can be used for event timing. If the variable is set to a non-zero positive numeric value, the value is automatically decremented once every thousandth of a second until it reaches zero. Once the value reaches zero, the control text is re-evaluated to perform further action. This may include setting the variable again to cause other actions to be performed at a later time. The actual variable *T does not change. It merely sets the top value to be decremented. To force continuous re-evaluation of the control text, simply set the local variable *T to a non-zero value. For example, set *T to 5000 to evaluate the control text every 5 seconds.

To allow the Tally System Console operator to easily change remote display unit messages, you can program control text for groups of switchable messages. The following pre-designated local variables make this feature possible. Message and group numbers are to be substituted for the letters in *italics*.

*#*g*#0

The value of this variable determines the number of switchable messages in group *g*. The existence of this local variable is what makes a remote display unit section operate with switchable messages. If this variable does not exist, a beep will sound when the operator attempts to switch messages or view a pop-up message list.

*$*g*

The value of this local variable is from 0 to the number of switchable messages in group *g* less 1. The control text can act on this value to display a different message or change the display in some way. The control text must not set this variable explicitly with and SV function because this would override the operator’s message choice.

*#*g*#

The value of this local variable becomes the name of message group *g*. This name appears at the top of a pop-up message list. If the variable does not exist, the name “Untitled *g*” is assumed by default.

*#*g*#*n*

The value of this local variable becomes the name of message *n* in group *g*. The name appears to the left of the message in a pop-up message list. If the variable does not exist, a numeric name is assumed by default.

See Remote Display Unit Programming for an example that uses these pre-designated variables to handle switchable messages.

Some embedded functions require numeric arguments. Use a string of decimal digits for numeric arguments. A non-decimal string is interpreted as zero.

Embedded functions that require resource device inputs or outputs as arguments expect a combination of the resource device name and the input or output name. The two elements are separated by double colon characters (::). To use double colons within a resource device name or input or output name where the colons are not to be taken as a separator, enclose the colons in double quotes ("::") or single quotes.

AC Function

Format:

AC(*exp1***)**
The value *exp1* is 4 pairs of 2-bit numbers to form 8-bit number from 0 to 255. Each bit pair is a green and red bit. The bit pair used is determined by local tally inputs T1 and T2. Set all 4 pairs the same for fixed color (color not affected by tally state).

Calculate value *exp1* by adding values from the following table:

Color	**Active Local Tallies**			
None	**T1**	**T2**	**T1 & T2**	
Blank	0	0	0	0
Red	1	4	16	64
Green	2	8	32	128
Amber	3	12	48	192

Fixed red is 85 (1 + 4 + 16 + 64)

Fixed green is 170 (2 + 8 + 32 + 128)

Fixed amber is 255 (3 + 12 + 48 + 192)

Example:

```
AC(85)RED AC(255)AMBER AC(170)GREEN
```
The result is RED AMBER GREEN in their respective colors.

Other display attributes group functions: LIN DUR AF AJ AT CH GC

AF Function

Format:

AF(*exp1***)**
The value *exp1* is a character set selector as follows:

0	fixed spacing (default)
1	large proportional spacing
2	medium proportional spacing
3	small
4	wide proportional spacing
5	block proportional spacing

Add 16 for dot reverse. Add 8 for vertical orientation. Some character sets may not be available on all remote display units.

Example:

```
AF(19)123 AF(0)LARGE
```
The result is 123 in small reversed characters and LARGE in fixed spaced characters.

Other display attributes group functions: LIN DUR AC AJ AT CH GC

AJ Function

Format:

AJ(*exp1***)**
The value of exp1 is a justify mode selector as follows:

0	left (default)
1	centre
2	right
3	full-width

Use more than one mode but always in order of left, center, and right. Full-width mode cannot be used with other modes.

Example:

```
AJ(1)CENTERAJ(2)RIGHT
```

The result is CENTER in the middle of display and RIGHT on the right side.

Other display attributes group functions: LIN DUR AC AF AT CH GC

AT Function

Format:

AT(*exp1***)**
Enables the timer/counter named *exp1* to appear in the display. Subsequent SP() functions refer to digits of the last selected timer/counter. Select up to 4 timers per display.

Example:

```
AT(T1)SP(1)SP(2):SP(3)SP(4)
```
The result is hours and minutes for timer named T1 in HH:MM format.

Other display attributes group functions: LIN DUR AC AF AJ CH GC

CH Function

Format:

CH(*exp1***)**
The result is a timer/counter digit for selector *exp1*, from 1 to 69. This function provides access to timer/counter digits regardless of the currently selected timer. Usually, this is not needed, and access to timer/counter digits is accomplished using AT and SP functions.

Example:

```
CH(1)CH(2):CH(3)CH(4)
```
The result is hours and minutes digits of first timer/counter.

Other display attributes group functions: LIN DUR AC AF AJ AT GC

DUR Function

Format:

DUR(*exp1***)**
Specifies the amount of time *exp1*, in hundredths of a second, to display the previously selected lines (use the LIN function to select lines). All displays have three separate lines that are displayed in sequence, each for their programmed duration. A line duration of zero prevents the line from appearing. If the duration of all lines are zero, the first line appears continuously.

Example:

```
LIN(1)DUR(100)ON-AIRLIN(2)DUR(50)STUDIO 1
```
Flash ON-AIR for 1 second and STUDIO 1 for one half second.

Other display attributes group functions: LIN AC AF AJ AT CH GC

GC Function

Format:

GC(*exp1***)**
The result is a graphic character for selector *exp1*, from 1 to 9. If the graphic character is not defined, the result is the empty string.

Example:

```
IF(IV(0),PLAYGC(1),STOPGC(2))
```
The result is PLAY and graphic charcter 1 if GPI input 0 is on, otherwise the result is STOP and graphic character 2.

Other display attributes group functions: LIN DUR AC AF AJ AT CH

LIN Function

Format:

LIN(*exp1***)**
Selects the lines to be affected by subsequent text and functions. All displays have three separate lines that are displayed in sequence, each for the duration specified by the DUR function.

Calculate value *exp1* by adding values from the following table:

Line	**Value**
First	1
Second	2
Third	4

To select all lines, use a value of 7 (1 + 2 + 4).

Example:

```
LIN(7)DUR(200)STATUS: LIN(1)OPENLIN(2)FROM 9 AMLIN(4)TO 5 PM
```

The result is STATUS: followed by one of OPEN, FROM 9 AM, TO 5 PM, pausing on each for 2 seconds.

Other display attributes group functions: DUR AC AF AJ AT CH GC

Remote Display Unit Programming

The information presented on a remote display unit is governed by its control text and whatever system information is referenced by embedded functions within the control text. Although you can have the Tally System Console program generate control text for you for some of the more common types of displays, the real power of the tally system is realized by customizing your own control text.

The control text of a remote display unit section is essentially a short "program". The embedded functions form a programming "language". Inputs to the program include resource device status (routing switchers, production switchers, etc.), GPI input signals, and global variables. From these inputs the program ultimately generates a string characters containing color and formatting functions, and the actual text that is to appear on the display.

A working knowledge of programming techniques would be an asset when programming the control text of a remote display unit. Some of the programming examples provided here may help you make your own custom programs.

Example 1

Suppose you have 10 remote display units. One each display you want to show the source selected on a specific routing switcher destination. You want the source names green, centred, and using the large proportional space character set.

You have configured your tally system with one routing switcher named R1. You have also configured the name of the 10 remote display units to match the name of the destination you wish to monitor on the corresponding display.

The control text of each display should contain the following:

AJ(1)AF(1)AC(170)SRC(R1::NAME(),0)
You could also supply the destination name directly for each display instead of using the NAME function. In this case, the control text for each display would not be identical, but you would not need to name the remote display units in any specific way.

If you would like the destination name on the display as well, but in amber, use this control text:

AJ(1)AF(1)AC(255)NAME() - AC(170)SRC(R1::NAME(),0)
If you want a certain source, say NET402, to always be red whenever it appears on the display (any other source still appears green), change the control text as follows:

SV(!X,SRC(R1::NAME(),0))AJ(1)AF(1)AC(255)NAME() -
IF(EQ(V(!X),NET402),AC(85),AC(170))V(!X)

The last example demonstrates the use of a temporary variable "!X" to store the result of the SRC function and avoid using that function twice.

Example 2

Suppose you want a remote display unit to show the message "STUDIO 3A" in green and add the flashing red message "ON-AIR" when GPI input number 1 is asserted. The control text would be as follows:

LIN(3)AF(1)AC(170)STUDIO 3AIF(IV(1),DUR(20)LIN(2)DUR(80)AC(85)AJ(1)ON-AIR,)
The DUR functions specify that "ON-AIR" appears for 0.8 seconds every second (80% duty cycle flash effect) while the GPI input is asserted.

Example 3

Suppose you want a remote display unit to show one of five different messages. The Tally System Console operator will choose which one of the five messages should be displayed from the keyboard using **PgUp** and **PgDn**.

For demonstration purposes, the five messages are MESSAGE 1 through 5. The actual messages can be any text. Here is the control text:

SV(*#1#0,5)ON(V(*$1),MESSAGE 1,MESSAGE 2,MESSAGE 3,MESSAGE 4,MESSAGE 5)

To make the control text affected by the operator, pre-designated variable names must be used. The value of variable "*#1#0" determines the total number of messages that can be selected by the operator in message group 1. The variable "*$1" will take on a value from 0 to the total less 1 as the operator chooses messages in group 1.

You can name each message and the message group. The message and group names appear in a pop-up list if the operator holds down the **Ctrl** key while selecting messages. For example, name the messages "Message1" through "Message5" and name the message group "Demo". The actual message and group names can be any text. Add the following control text to the above example:

SV(*#1#,Demo)SV(*#1#1,Message1)SV(*#1#2,Message2)SV(*#1#3,Message3)SV(*#1#4,Message4)SV(*#1#5,Message5)

If you do not provide message or group names, numeric message names starting with 1 are assumed by default in the pop-up list. The default message group name is "Untitled" followed by the group number.

You can program a single display to operate with several message groups. Simply repeat the control text in the example but substitute 2 and 3, etc., where the first 1 appears in each variable name.

Arranging Display Unit Sections

Each remote display unit can be partitioned into one, two, or three sections. Each section operates independently. Typically, the number of video monitors associated with a remote display unit matches the number of sections in its display.

Display sections need not be equal or evenly spaced. To arrange display sections, select a remote display unit for editing and select **Ctrl+W** or select **Section; Widths** from the main menu. The LED area of the display unit appears with one, two, or three blocked areas indicating the current section arrangement. The blocked areas are filled in with the corresponding section number, 1, 2, or 3. One section appears in red and the others in green. The red section is the "selected" section.

Sizing a Section

To change the size of a section, click the left mouse button over the left or right edge columns of the section to be sized and drag the mouse to increase or decrease the size of the section. From the keyboard, you can use **Tab** or **Shift+Tab** to select the section to be sized and **Ctrl+Right** to increase or **Ctrl+Left** to decrease the size of the section.

Moving a Section

To move a section, click the left mouse button over the interior of the section (not the left or right edge columns) to be moved and drag the mouse to the left or right. From the keyboard, you can use **Tab** or **Shift+Tab** to select the section to be moved and **Right** arrow or **Left** arrow to move the section.

Sections cannot overlap. When moving or sizing a section, the selected section has priority and adjacent sections are moved or sized if necessary to make space for the selected section.

Default Sections

The most common section arrangements have equally sized and spaced sections. To quickly arrange a single, dual, or triple section layout, select the numbers **1**, **2**, or **3**. You can then keep the arrangement or continue to make adjustments.

Removing a Section

To remove a section, just move or size remaining sections to force an unwanted section out of the LED display area. For a dual display, section three should be removed. For a single display, sections two and three should be removed.

Completing the Section Arrangement

Once you have arranged each section as desired, save the new arrangement by selecting **Enter**. If you wish to restore the original section arrangement, select **Esc** to abandon any changes made since you began arranging sections.

Modifying Display Unit Contents

Once a remote display unit is selected in a unit window, you can change the text, graphic characters, formatting, color, and flashing of each display section. You can also control timers and counters, two external tally inputs, and LED brightness.

To change the text, formatting, and color of a display section, you can edit the display's control text directly or choose one of the pre-defined types of control text. Using pre-defined types is easier, but less flexible. Editing control text directly requires a working knowledge of general programming techniques and the use of embedded functions.

To begin direct display editing, you must select a section to be edited. Click the left mouse button at the desired editing point anywhere in the display unit's LED area, or select **Enter**, **Tab**, or **Shift-Tab** to select all text in one section, then use **Right** or **Left** arrow to locate the desired edit point.

While editing a display section, the remote display unit name in the label box flashes, the currently selected control set button does not flash, and an LED block cursor flashes over one character in the section. You can select a contiguous block of characters by holding down the left mouse button and dragging the mouse to cover the desired block, or holding down the **Shift** key while using the **Right** or **Left** to move to the other end of the block. Selected text is indicated a diagonal LED pattern flashing over the text.

Display section editing is similar to most other editing operations in the Windows environment. Here is a summary of the editing features.

- **Right** arrow moves the LED cursor to the next character
- **Left** arrow moves the LED cursor to the previous character
- **Del** deletes the character under the flashing LED cursor
- **Back Space** deletes the character to the immediate left of the character under the flashing LED cursor
- **Home** moves the LED cursor to the beginning of a section
- **End** moves the LED cursor to the end of a section
- **Ctrl+Right** moves the LED cursor to the next word
- **Ctrl+Left** moves the LED cursor to the previous word
- Hold down **Shift** with the above commands to select a block.
- Double-click the left mouse button to select all the text in one word
- **Shift+Del** cuts the select text to the clipboard
- **Ctrl+Ins** copies the selected text to the clipboard
- **Shift+Ins** pastes text from the clipboard replacing the selected text
- **Tab** selects all text in the next (to the right) section of display unit
- **Shift+Tab** selects all text in the previous (to the left) section of display unit
- **Enter** stores the current control text for the section and exits from the editing mode

- **Esc** restores the previous control text for the section and exits from the editing mode

Using the **Tab** or **Shift+Tab** commands, or clicking the left mouse button in another display section, causes a different display section to be selected in multiple section remote display units. This action has the same effect as the **Enter** command. Any changes to the control text in the original display section are automatically stored.

Text is inserted before the character under the flashing LED cursor. You can specify more text than will actually fit in the LED area. Text beyond the LED area is kept and can be returned by deleting some visible characters.

Normally, a non-flashing display uses only one of a display section's three lines to show a static message. To have two or three lines flashing different messages, you must place messages in these lines and set their duration to a non-zero value using the "LIN" and "DUR" embedded functions. To facilitate editing of a section, line flashing is temporarily suspended while editing is in progress. Normal flashing resumes when you select another section or select another remote display unit.

The contents of a display section is made up of both text characters and embedded functions. Some functions have visible effects but are not themselves visible. The color attribute change function "AC", for example, changes the color of subsequent text but does not occupy space in the LED area.

Embedded function characters can be deleted just like any other text characters, alone or in a block. Special keyboard and menu commands are provided to quickly insert some of the more commonly used embedded functions. See Keyboard Commands for a list of these commands. Some of these commands may insert several embedded functions. For example, a timer command inserts eight "CH" functions. After inserting these functions, you can delete some of them as needed or insert other text between them. To format a clock display, for example, to may wish to delete the embedded functions for the seconds and frames portion of the clock and insert a colon separator between the hours and minutes.

Adjusting Display Unit LED Brightness

Once a remote display unit is selected in a unit window, you can adjust the LED brightness of all remote display units belonging to the layout of the selected remote display unit. You can also adjust the LED brightness of all remote display units in the system simultaneously. In most systems, remote display units belonging to one layout are located in the same room so it is more common to adjust the LED brightness of all units of a layout. Adjusting the LED brightness of all units in the system is usually only needed to provide a starting point (maximum LED brightness, for example) before individually adjusting the LED brightness of remote display units in each layout.

To increase the LED brightness of all remote display units of a layout only, use **Ctrl+B**.

To decrease the LED brightness of all remote display units of a layout only, use **Ctrl+Shift+B**.

To increase the LED brightness of all remote display units in the system, use **Alt+Ctrl+B**.

To decrease LED brightness of all remote display units in the system, use **Alt+Ctrl+Shift+B**.

In tally systems with only one layout, the layout-specific and system commands are equivalent.

The appearance of remote display units on the PC screen is not affected by LED brightness adjustments. Only the actual remote display units are affected.

Other Display Unit Features

Using Switchable Messages

You can program a remote display unit with several named lists, each containing pre-specified messages which can then be used to quickly switch the message on the remote display unit or change it in some desired way. To use switchable messages, you must edit the control text of the section to be affected, or select the pre-defined type *User Selected Message* from the details dialog box to create the appropriate control text for you. Only one message list can be programmed from the dialog box. For multiple message lists, you must edit the control text directly.

To select a message on a remote display unit programmed for switchable messages, first select the remote display unit in a unit window and select the desired section of the unit. You can then select a message according to its name or contents by holding down the left mouse button and dragging the mouse from any part of the section's LED area in the up or down direction until the message list appears. Release the left mouse button while the mouse points to the desired message. You can also use **Ctrl+PgDn** or **Ctrl+PgUp** to open the message list and selected the next or previous message in the list. Release **Ctrl** when the name and contents of the desired message unit are highlighted. To restore the originally selected message, release the left mouse button while not pointing to any list item, or use **Ctrl+PgUp** to move the highlighted list item above the top of the list. The first item in the list is always the name of the originally selected message.

If there are many messages, a list of them may not fit in a reasonably-sized box. In this case, only the most recently used messages appear in the list and an additional item "More.." appears at the end of the list. Select this last item to open a dialog box containing a complete list of message names and message groups for the remote display unit. You can also open the this dialog box at any time by choosing **Message; Select** from the main menu or by using the keyboard command **F8**.

While using **Ctrl+PgDn** or **Ctrl+PgUp** to navigate the list, you can also use **Ctrl+Right** or **Ctrl+Left** to select the next or previous message list if the remote display unit has been programmed for multiple message lists. Each list is titled with the message list's name. This feature only works after the first message list is opened. Without the list opened these commands have functions only while editing display unit contents.

Using Graphic Characters

If you require a remote display unit to show special characters that are not available in any of its built-in character sets, you can create your own graphic characters. Up to nine graphic characters can be specified.

A graphic character is placed in the control text of a remote display unit section by the embedded function "GC".

Creating a Graphic Character

While editing the contents of a display unit, you can create a new graphic character and insert its corresponding graphic code embedded function using the keyboard command **Ctrl+N** or selecting **Insert; Graphic Code; New Graphic** from the main menu. Initially, a graphic character that is six dots wide is created and all of its dots are on. The upper-left dot flashes to indicate the position of the dot cursor. To edit the graphic character, use the procedures described below.

Editing a Graphic Character

To begin editing a graphic character that was not just created, use the mouse or arrow keys to move the LED cursor until it is over or to the left of the graphic character to be edited. Select **Ctrl+E** or select **Edit; Edit Graphic** from the main menu. The upper-left dot flashes to indicate the position of the dot cursor.

Editing a graphic character is similar to using a paint program to edit images. To toggle a dot on or off, move the mouse over the desired dot and click the left button. From the keyboard, use the arrow keys and **Home** and **End** to position the dot cursor over the desired dot and press the **Space** bar.

To change a series of dots, hold down the left mouse button and drag the mouse. This action changes each dot under the mouse cursor to the opposite state of the dot where dragging started. From the keyboard, hold down **Shift** while using the arrow keys and **Home** and **End** to select a row, a column, or a rectangular block of dots and press the **Space** bar to toggle the state of all selected dots.

You may wish to make your graphic character similar to a built-in character. Just select the character while editing the graphic character and all dots are immediately set to a copy of the selected character.

Graphic characters can be from 1 to 60 dots wide. While editing a graphic character, you can change its width. Use **Ctrl+Right** to increase the width and **Ctrl+Left** to decrease the width.

If you are making a graphic character that is to appear to the left of other text characters, you should include a single column of "off" dots to separate the graphic character from other characters. All built-in characters have at least one column of off dots on their right side.

To terminate graphic character editing, select **Esc** or click the left mouse button outside of the area occupied by the graphic character.

Inserting a Previously Created Graphic Character

Once a graphic character is defined, you can place it any number of times in any display unit message. To insert a graphic character, use the mouse or arrow keys to move the LED cursor to the desired insertion point, then select **Ctrl+C** and a digit from **1** to **9** corresponding to the desired graphic character. You can also use the main menu commands **Insert; Graphic Code; Graphic Code *n***.

Removing a Graphic Character

When a graphic character is destroyed, any references to that character are displayed as a question mark "?". The graphic character definition is removed and the graphic character can no longer appear in any display. Note the difference between removing the graphic character definition and deleting a graphic code embedded function from the control text. When only the graphic code embedded function is deleted, the graphic

character can still appear elsewhere.

To remove a graphic character from a set, use the mouse or arrow keys to move the LED cursor until it is over the graphic character to be removed. Select **Ctrl+X** or select **Edit; Remove Graphic** from the main menu.

Using Timers and Counters

You can make a remote display unit show up to four "timer/counter variables". Each timer/counter variable can operate as a timer or counter and in several modes. Common modes are time of day clock with time zone adjustment, elapsed time clock, count down clock, and event counter.

Remote display units show timer/counter variables using up to eight variable code embedded functions. These functions can be mixed with other text and embedded functions to form a message for a display unit. You can choose any or all of a timer/counter's eight digits to appear in the display.

To place a timer/counter on a display, create the timer/counter and specify its operating conditions, then insert timer/counter variable code digits into the control text of a remote display unit.

Timers

A timer is a set of eight digits that count in seconds. Digits 1 through 8 correspond to tens of hours, units of hours, tens of minutes, units of minutes, tens of seconds, units of seconds, tens of frames, and units of frames, respectively. The hours digits can overflow at 23 or 99 hours. The frames digits can count in 1 to 99 frames per second. Timer variables can be programmed to follow the system's time of day clock with an optional time zone adjustment.

Counters

A counter is a set of 8 digits that counts from 0 to 99999999. You can specify embedded functions that determine the event to be counted.

Inserting a Variable Timer or Counter

To insert variable code digits for a specific timer/counter, select the desired remote display unit and begin to modify its contents. Move the LED cursor to the desired insertion point in the display area and select **Ctrl+M,** or choose **Insert; Timers/Counters** from the main menu, to open the Insert Timer/Counter dialog box. Select the desired timer/counter in the **Name** list box. Select one of the pre-defined formats in the **Format** list box. Select **OK** to insert the appropriate timer/counter selection function, variable code digits, and formatting characters. Otherwise, select **Cancel** to abandon the operation.

The **Format** list box in the Insert Timer/Counter dialog box contains some of the more common display formats. Regardless of the chosen format, you can further customize the display format by editing remote display unit contents directly.

You can also create timer/counter displays directly. You must specify at least one AT(*name*) embedded function to select the desired timer/counter by its name, followed by one or more SP(*digit*) embedded functions. The parameter *digit* must be one of the following:

Digit	Meaning
1	Tens of hours or counter digit 1
2	Units of hours or counter digit 2
3	Tens of minutes or counter digit 3
4	Units of minutes or counter digit 4
5	Tens of seconds or counter digit 5
6	Units of seconds or counter digit 6
7	Tens of frames or counter digit 7

8 Units of frames or counter digit 8

9 Tens of hours or counter digit 1, zero-blanked

10 Units of hours or counter digit 2, zero-blanked

11 Tens of minutes or counter digit 3, zero-blanked

12 Units of minutes or counter digit 4, zero-blanked

13 Tens of seconds or counter digit 5, zero-blanked

14 Units of seconds or counter digit 6, zero-blanked

15 Tens of frames or counter digit 7, zero-blanked

16 Tens of hours in 12-hour format

17 Units of hours in 12-hour format

18 A or P for AM/PM indicator

19 a or p for am/pm indicator

You can use the same digit any number of times on the same remote display unit. You can specify up to four timer/counters on each display. The SP() embedded functions produce digits associated with the timer/counter named by the nearest previous AT() embedded function.

To insert variable code digits for a non-specific timer/counter, begin editing remote display unit contents as before, and select **Ctrl+V** followed by one of **A**, **B**, **C**, **D**, **a**, **b**, **c**, or **d**. Eight timer/counter variable code embedded functions are inserted for the first, second, third, and fourth timer/counters, with or without leading zero-blanking, respectively. Similar commands are also available from the main menu under **Insert; Variable Code**. These commands allow timer/counter digits to be displayed regardless of the order that timers or counter are selected. The order of timer/counters is determined by the order of appearance of two or more AT() embedded functions.

Setting Timer/Counters

Before a timer/counter can appear on a remote display unit, you must create the timer/counter and specify some operating conditions. Select **Display Unit; Timer & Counters** from the main menu to open the Timers and Counters dialog box.

Messages

Messages

The message that appears on a remote display unit is determined by specially formatted text called the “control text”. Different control text can be assigned to each section of any remote display unit. You can edit the control text directly or select pre-defined type of control text by filling in a few parameters in the details dialog box. For most situations, the pre-defined types will suffice. For more complex displays, you must provide your own control text.

In its simplest form, the control text contains literal text to be displayed and embedded functions to change the appearance of the display text. For example, the control text:

AJ(1)MESSAGE
causes the text “MESSAGE” to appear in the centre of the display. The “AJ” function changes the justification attribute from 0 (the default setting, left justification) to 1 (centre justification).

Other embedded functions control display color and flashing. The control text can be hundreds of characters long utilizing embedded functions that assign and read variable text, make decisions, perform iteration, and respond to status changes in resource devices (switchers) and GPI inputs. The embedded functions form what could be thought of as a “programming language” for remote display units. See Remote Display Unit Programming for a examples of embedded functions and control text programming methods.

Tally System Configuration (.TSC) Files

The Tally System Console program requires one or more .TSC configuration files to define all elements of the system to the Tally System Interface unit(s). System elements such as remote display units and messages, GPI inputs and outputs, resource devices (switchers), and resource interconnnections (tie lines), are defined by configuration files.

Tally system configuration files follow the Windows Initialization File format. Some Windows programs use the .INI file type for files of this format.

Do not edit tally system configuration files directly. Doing so may cause the tally system to operate incorrectly. If you wish to modify or view tally system configuration information, select the export command in the File Menu to translate configuration information into files of other formats such as those used in common spreadsheet or data base applications. You can make changes to the exported files using another application, then select the import command in the File Menu to apply your changes to the tally system. See Importing and Exporting Files for more information.

The way in which you use tally system configuration files depends on the how you use the Tally System Console program. If the program is only to be used to initially or occasionally configure the tally system (and you have one or more Tally System Interface units), you should keep all system elements stored in one configuration file. Once the system is configured, it continues to operate as specified even after the Tally System Console program is closed or the PC is disconnected or powered off.

If the program is to be used interactively with the rest of the tally system, changing messages on-line, for example, you should keep all fixed system elements stored in one configuration file and keep sets of different messages stored in several other configuration files. In this way, you can merge messages from one of these files by selecting **Ctrl+F8** from the keyboard or selecting **File; Merge Messages** from the main menu. This command opens a dialog box from which you can choose a previously stored message file. Message file merging allows you to change the message on many remote display units at once without changing any other existing system elements.

Before the Tally System Console program is started, you can specify the default configuration files that the program will merge once it starts. This can be done in two ways. If only one configuration file is required, you can specify its name on the command line. If more than one configuration file is required, you can specify several file names on the same command line. Because file names can contain spaces, place a forward slash (/) before each file name to separate them.

Alternately, you can name your single configuration file “DEFAULT.TSC”. The program finds this file in the working directory.

Regardless of the configuration files merged as the program starts up, you can merge more files later or replace the entire system configuration by opening another file. Select the keyboard command **Ctrl+F7** or select **File; Open** from the main menu to open a configuration file.

If no configuration file is specified when the Tally System Console program is started, the default configuration file is opened instead. Each time you open or save a configuration file you are prompted to specify whether that file is to be considered the default configuration file.

If you attempt to start the Tally System Console program while the program is already running, the original program is restored (if previously minimized) and any files specified on the command line are considered message files to be merged. You are prompted to confirm merging each file into the system. This feature allows you to set-up the Windows Desktop or Program Manager with shortcuts that load a specific set of messages from a file into the system just as if you used the **File; Merge Messages** menu command and selected a message file directly from the dialog box. Refer to Windows documentation for

information on making shortcuts.

In the event you merge a configuration file specifying system elements that conflict with the existing tally system configuration, you are prompted to resolve each conflict by discarding and replacing the existing element or skipping the new element.

Layouts

Using the Layout Window

The layout window offers a view of the physical arrangement of remote display units in the system. You can position each unit on a "monitor wall" to represent the position of actual remote display units in your system. Depending on your system, using the layout window to find a specific remote display unit to be controlled may be easier than finding that unit by its name or contents.

You can create up to 10 named layouts. A remote display unit can appear on only one layout. Use the layout menu to add a new layout, rename an existing layout, or delete a layout. There must be at least one layout in any system. The name of the selected layout appears in the layout window's title bar.

To help with visual identification of a remote display unit, you can make up to three video monitors appear in the layout window above or below the remote display unit.

To open to the layout window, or select the layout window if it is already open, select **F3** or the main menu command **Window; View Layout**. To close the window, select **F3** again, or select **Esc**.

Navigating in the Layout Window

You can navigate the layout window using the keyboard or the mouse. One remote display unit or one unoccupied location is always highlighted in the layout window. This highlighted area is the layout cursor. You can use the layout cursor to add, remove, assign, modify remote display units, or create new unit windows.

Use the arrow keys and **Home** and **End** to move the layout cursor to the desired location, or move the mouse over the desired area to be highlighted and click the left mouse button once. As long as you do not resume using the keyboard to move the layout cursor, it continues to follow the mouse without holding down any mouse buttons.

As remote display units are highlighted by the mouse cursor, the same remote display unit is temporarily selected in the most recently selected unit window. This allows you to quickly scan the layout window and view the contents of any remote display unit in a larger window. To restore the original remote display unit to the unit window, move the layout cursor to an unoccupied location or select **Esc** to close the layout window.

Assigning a Display Unit to a Unit Window

To assign a remote display unit to a unit window, click the left mouse button or use the keyboard to move the highlighted area over the desired remote display unit in the layout window. Select **Enter** to keep the new assignment and close the layout window. Select **Esc** to restore the original remote display unit assignment and close the layout window.

Making a Unit Window Group

To quickly create new unit windows in a group from one or more remote display units, double-click the left mouse button over each desired remote display unit in the layout window. As you double-click each display unit, a new unit window in the small size appears. Each unit window appears below the preceding one, near the upper left or right corner of the screen, whichever area is the least occupied. You can also use the keyboard command **Ctrl+F2** or the layout menu command **New Window** to create a new unit window from the remote display unit under the layout cursor.

Sizing the Layout Window

You can size the layout window as needed. The contents of the window are automatically scaled so that all vertically arranged remote display units are always visible. As you move the layout cursor toward the bottom edge of the window, the contents of the window are scaled again after a brief pause, keeping the layout cursor visible. As you move the layout cursor laterally the layout window pans left or right to keep the layout cursor

visible.

Changing a Display Unit Location

To put a remote display unit and its associated monitors in a different location in the layout window, move the layout cursor to highlight the display unit to be re-located, then hold down the left mouse button and drag the mouse to the desired new location. Alternately, you can hold down **Shift** while using the arrow keys to move the display unit to a new location. While moving a remote display unit, the unit only appears at unoccupied locations in the layout window.

To move a remote display unit to another layout, use the Configure Display Units dialog box.

Changing the Monitor Style of a Display Unit

Use the **Monitor** commands in the layout menu to change the monitor style of a remote display unit. Select the remote display unit to be affected in the layout window and click the right mouse button to open the layout menu.

Adding a Display Unit

You can add a new remote display unit to the system by double-clicking the left mouse button over any unoccupied location in the layout window. From the keyboard, you can also move the layout cursor to the desired location using the arrow keys and select **Ctrl+Shift+F2** or select **New Unit** from the layout menu. The new unit has the largest monitor style that can fit at the selected location.

Removing a Display Unit

To remove a remote display unit from the system, select the remote display unit to be removed in the layout window, then click the right mouse button to open the layout menu and select **Remove Unit**. You can also use the keyboard command **Del**. If the removed remote display unit is assigned to any unit window another display unit is assigned to the unit window.

Menus

Main Menu

Main Menu

If the desktop has been hidden by previously selecting the **Window; Hide Desktop** menu command, the main menu appears at the top of the screen. Otherwise, you can activate the main menu by clicking the right mouse button anywhere over a unit window, or by selecting **F10**. The main menu contains the following menus.

File Menu

Window Menu

Edit Menu

Insert Menu

Section Menu

Display Unit Menu

Message Menu

Resource Menu

Help Menu

You can open any of these menus directly by holding down **Alt** and selecting the first letter of the menu name. For example, selecting **Alt+F** opens the file menu.

File Menu

New

Prompts for creation of a new system. Select **OK** to continue. All existing system configuration items are removed and a single display unit and unit window are created. Select **Cancel** to retain current system configuration items. You can also use **Ctrl+Shift+F7** to select this command.

Open

Opens a dialog box from which you can select a tally system file. Once you select a file, any existing system configuration items are removed before items from the new tally system file are created. Select **Cancel** to abandon the open file operation. You can also use **Ctrl+F7** to select this command.

Before a file is opened, you are prompted to make that file the default file to be opened the next time the Console program is started.

After the file is opened, or a new system is created with the New command, you are prompted to confirm that you want to work online or work offline. Choose to work online to configure the tally system according to the file you just opened. Choose work offline to avoid affecting the tally system at this time. You may wish to do this if you are preparing configuration files for use at a later time. Even if you choose to work offline you can still configure the tally system using the file just opened. Just uncheck the Work Offline item in the file menu.

Merge All

Opens a dialog box from which you can select a tally system file. Once you select a file, any existing system configuration items are combined with items from the new tally system file. Select **Cancel** to abandon the merge file operation.

As the new file is merged, you are prompted to resolve file conflicts by replacing an existing item or discarding a new item when a conflict is detected.

Merge Messages

Opens a dialog box from which you can select a tally system file. Once you select a file, any global messages or messages for remote display units which exist in both the current system and the new file are replaced from the new file. Select **Cancel** to abandon the merge file operation. You can also use **Ctrl+F8** to select this command.

Merge Selected Items

Opens a dialog box from which you can select the types of system configuration items to be involved in the merge operation. Check the desired items using their corresponding check boxes, then select **OK**. Another dialog box opens from which you can select a tally system file. Once you select a file, any existing system configuration items of the specified types are combined with items from the new tally system file. Select **Cancel** in either dialog box to abandon the merge file operation.

As the new file is merged, you are prompted to resolve file conflicts by replacing an existing item or discarding a new item when a conflict is detected.

Save

Prompts for confirmation to save all system configuration items to a file. Select **OK** to continue. A dialog box opens from which you can select a tally system file. Once you select a file, all system configuration items are saved in the selected tally system file. Select **Cancel** in either dialog box to abandon the save file operation. You can also use **F7** to select this command. The prompt for confirmation dialog box also appears when you have made unsaved changes and attempt to exit from the Tally System Console program.

Before a file is saved, you are prompted to make that file the default file to be opened the next time the Console program is started.

Save Messages

Prompts for confirmation to save system message items to a file. Select **OK** to continue. A dialog box opens from which you can select a tally system file. Once you select a file, any global messages or messages for remote display units saved in the new tally system file. Select **Cancel** in either dialog box to abandon the save file operation.

Save Selected Items

Opens a dialog box from which you can select the types of system configuration items to be involved in the save operation. Check the desired items using their corresponding check boxes, then select **OK**. Another dialog box opens from which you can select a tally system file. Once you select a file, only system configuration items of the specified types are saved in the new tally system file. Select **Cancel** in either dialog box to abandon the save file operation.

Import

Begins a file import operation where you specify the ODBC data source and the type of configuration items to be included in the import operation.

Export

Begins a file export operation where you specify the ODBC data source and the type of configuration items to be included in the export operation.

Work Offline

Toggles the work offline mode. A check mark appears next to the menu item while working offline.

Demo

Displays the opening screen and starts the remote display unit demo feature. The demo repeats a sequence of messages that list various remote display unit features. You can also use **F5** to select this command.

Select a key or click the left mouse button to remove the opening screen and continue the demo.

While the demo feature is running, click the left mouse button, or use **Enter** or **Space**, to pause the demo feature, or use **Esc** to terminate the demo feature.

Lock Keyboard

Prompts you to confirm activation of the keyboard lock out feature. This feature locks out most keyboard functions to prevent unintentional changes to remote display unit contents. Select **OK** to activate the lock out feature, or select **Cancel** to keep the lock out feature inactive. Some keyboard commands, such as Help, Minimize, and Exit, operate even while the lock out feature is active. You can also use **F4** to select this command.

To terminate the lock out feature, click the left or right mouse button on any unit window. You can also terminate the lock out feature by attempting to use any locked out keyboard command. A dialog box appears to confirm that the lock out feature should be terminated. Select **OK** to terminate the lock out feature, or **Cancel** to keep the lock out feature active.

Exit

Closes the Tally System Console program. You are prompted to save (select **Yes**) or discard (select **No**) any changes to unit windows, remote display units, messages, and other system configuration items to a tally system file, or cancel the exit command and continue working with program (select **Cancel**). You can also use **Alt+F4** to select this command.

Window Menu

New

Creates another unit window below the currently selected unit window. The new unit window is assigned a single default remote display unit. You can also use **Ctrl+F2** to select this command.

Duplicate

Creates another unit window below the currently selected unit window. The new unit window is assigned the same set of remote display units from the original unit window. You can also use **Ctrl+Shift+F2** to select this command.

Close

Removes the selected unit window from the screen. The remote display units which were assigned to the unit window are not removed and can be re-assigned to other unit windows. You can also use **Ctrl+F4** to select this command.

Close Group

Removes the group of unit windows, to which the selected unit window belongs, from the screen. The remote display units which were assigned to the unit windows of the group are not removed and can be re-assigned to other unit windows. You can also use **Ctrl+Shift+F4** to select this command.

Move

Allows you to move all unit windows in a group using the arrow keys or the mouse. After reaching the desired new window location, select **Enter** or the left mouse button to conclude the move operation, or select **Esc** to restore the original window location. To break a unit window away from its group, hold down **Shift** as the window is first moved. You can also move a unit window or group of unit windows by holding down the left mouse button and dragging the mouse from any part of the unit window outside of the LED viewing area.

Minimize

Hides all unit windows so that you can use the screen for other applications. You can also use **Shift+F4** to select this command.

Add Unit

Adds a display unit selector to unit window. A new remote display unit is not created. The remote display unit assigned to the selector is copied from the original selector of the unit window and the new selector becomes the current selector. If the unit window already has nine display unit selectors, this menu item is disabled. You can also use **Ctrl+0** to select this command.

Remove Unit

Removes the current display unit selector from unit window. The previous display unit selector becomes the current selector. A unit window must always have at least one display unit selector. If the unit window has only one selector, this menu item is disabled. You can also use **Ctrl+*** (keypad asterisk) to select this command.

Large

Selects the large size for the selected unit window or group of unit windows. A check mark appears next to the menu item if the large size is already selected.

Medium

Selects the medium size for the selected unit window or group of unit windows. A check mark appears next to the menu item if the medium size is already selected.

Small

Selects the small size for the selected unit window or group of unit windows. A check mark appears next to the menu item if the small size is already selected.

View Layout

Opens the layout window. You can also use **F3** to select this command.

Show Desktop

Removes the main menu from the top of the screen and makes the desktop visible. You can also use the **Restore** command from the system menu.

Hide Desktop

Places the main menu at the top of the screen and hides the desktop. You can also use the **Maximize** command from the system menu.

Edit Menu

Cut

Moves the selected text to the clipboard. The text is removed. You can also use the keyboard command **Shift+Del**.

Copy

Copies the selected text to the clipboard. You can also use the keyboard command **Ctrl+Ins**.

Paste

Copies the text from the clipboard. This menu item is disabled if the clipboard is empty. You can also use the keyboard command **Shift+Ins**.

Edit Graphic

Searches left from the cursor position for the first graphic character in the selected section and enters the graphic character editing mode. You can also use the keyboard command **Ctrl+E**.

Remove Graphic

If the character at the cursor position is a graphic character, all occurrences of this character (in all display sections) are replaced with a question mark "?" and the graphic character definition is removed. If the character at the cursor position is not a graphic character, this menu item is disabled. You can also use the keyboard command **Ctrl+X**.

Note the difference between deleting a graphic code embedded function from a message and removing the graphic character's definition. The Remove Graphic command destroys the graphic character so that it can no longer appear in any message. Deleting a graphic code embedded function from a message is similar to deleting any other character and does not affect the use of the graphic character in any other message.

Insert Menu

The insert menu and sub-menus insert an embedded function or set of embedded functions starting at the cursor position.

Color; Green

Inserts a color attribute embedded function to make subsequent text appear green. You can also use the keyboard command **Ctrl+G**.

Color; Red

Inserts a color attribute embedded function to make subsequent text appear red. You can also use the keyboard command **Ctrl+R**.

Color; Amber

Inserts a color attribute embedded function to make subsequent text appear amber. You can also use the keyboard command **Ctrl+A**.

Color; By Tally

Prepares for entry of four color selector letters to create a mixed (tally-sensitive) color attribute embedded function. On each step, select either **G** for green, **R** for red, **A** for amber, or **B** for blank. Once the fourth color is entered, the mixed color attribute embedded function is inserted. You can also use the keyboard command **Ctrl+T**.

The color produced by a mixed color attribute embedded function is dependent on the state of the remote display unit's external tally inputs. Make all four color selections the same to insert a mixed color attribute embedded function that is not sensitive to external tally inputs. For example, **Ctrl+T R R R R** has the same effect as **Ctrl+R**.

Character Set; Fixed

Inserts a character set attribute embedded function to make subsequent text appear as five dots wide with fixed spacing. You can also use the keyboard command **Ctrl+F**.

Character Set; Large Proportional

Inserts a character set attribute embedded function to make subsequent text appear as mostly five dots wide with proportional spacing. You can also use the keyboard command **Ctrl+P**.

Character Set; Medium Proportional

Inserts a character set attribute embedded function to make subsequent text appear as mostly four dots wide with proportional spacing. You can also use the keyboard command **Ctrl+Q.**

Character Set; Small

Inserts a character set attribute embedded function to make subsequent text appear as five dots high and mostly three dots wide with proportional spacing. You can also use the keyboard command **Ctrl+S**.

Character Set; Wide

Inserts a character set attribute embedded function to make subsequent text appear as mostly eight dots wide with proportional spacing (except digits 0 to 9 which use fixed spacing). You can also use the keyboard command **Ctrl+D**. This character set may not be available on some remote display units.

Character Set; Block

Inserts a character set attribute embedded function to make subsequent text appear as mostly five dots wide with a square appearance and proportional spacing (except digits 0 to 9 which use fixed spacing). You can also use the keyboard command **Ctrl+K**. This character set may not be available on some remote display units.

Reverse Text

To get reverse image text, hold down **Shift** while using one of the above commands to insert a character set attribute embedded function.

Justify

Prepares for entry of a justify code selector letter. Select either **L** for left justify, **C** for centre justify, **R** for right justify, or **F** for full justify. Once the justify letter is entered, the corresponding justify attribute embedded function is inserted. You can also use the keyboard command **Ctrl+J**.

Use care when inserting justify attribute embedded functions. Justify attributes can only be inserted in a specific order. For example, you cannot right justify text which appears to the left of text to be centred. In general, the left justify attribute (if used) must be to the left of the centre justify attribute, which in turn must be to the left of the right justify attribute, and, the full justify attribute cannot be used in the same message with any other justify attributes. Typically, only one justify attribute is used in a message. Incorrectly mixing justify attributes may cause the display to appear blank.

Variable Code

Inserts a timer/counter variable code embedded function or sequence of timer/counter variable code embedded functions from one of several menus. The menu item corresponding to each timer/counter variable code embedded function is listed in the table below. You can also use the keyboard command **Ctrl+V**. This command prepares for entry of a timer/counter variable code selector character. Enter the selector character from the table below. Once the selector character is entered, the corresponding timer/counter variable code embedded function(s) are inserted.

Variable Codes	Ctrl+V Selector	Variable Code Sub-Menu
Variable #1, 8 digits	**A**	**Timers; #1**
Variable #2, 8 digits	**B**	**Timers; #2**
Variable #3, 8 digits	**C**	**Timers; #3**
Variable #4, 8 digits	**D**	**Timers; #4**
Variable #1, 8 digits, zero blanked	**a**	**Zero Blanked Timers; #1**
Variable #2, 8 digits, zero blanked	**b**	**Zero Blanked Timers; #2**
Variable #3, 8 digits, zero blanked	**c**	**Zero Blanked Timers; #3**
Variable #4, 8 digits, zero blanked	**d**	**Zero Blanked Timers; #4**
Variable #1, 2 digits, hours in 12-hour format	**T**	**Timer #1 2-Hour; Hours**
Variable #1, A or P for AM/PM indicator	**P**	**Timer #1 2-Hour; AM/PM**
Variable #1, a or p for am/pm indicator	**p**	**Timer #1 2-Hour; am/pm**
Section ID number, 3 digits	**I**	**ID**
Section ID number, 3 digits, zero blanked	**I**	**Zero Blanked ID**

After inserting a sequence of timer/counter variable code embedded functions (up to 8 functions may be inserted), you can delete the unwanted functions (the frames digits of a timer, for example) or place intervening characters (such colon separators).

Graphic Code; New Graphic

Creates a new graphic character, inserts its graphic code embedded function, and enters the graphic character editing mode. You can also use the keyboard command **Ctrl+N**.

Graphic Code; Graphic Code *n*

Inserts the graphic code embedded function for graphic character *n*, 1 through 9. You can also use the keyboard command **Ctrl+C**. This command prepares for entry of a graphic code selector character. Enter the selector character **1** through **9**. Once the selector character is entered, the corresponding graphic code embedded function is inserted. Only defined graphic characters have corresponding menu items. If no graphic characters are defined, these menu items do not exist.

Other Functions

This menu shows embedded functions organized into the following categories: **Text**, **Decision**, **Logical**, **Math**, **Date & Time**, **Message Variables**, **System & Resource**, and **Section**. Each category lists related embedded functions by name and description. While editing remote display unit control text, novice users may find these menu items helpful to

insert a template of an embedded function instead of typing the embedded function name directly. Regardless of how the embedded function name is entered, most require additional arguments before operating properly.

Section Menu

Next Section

Moves the cursor to the next section of the display unit (if any) and selects all text in that section. Any unsaved control text from the original section is saved before the next section is selected. You can also use the keyboard command **Tab**.

Previous Section

Moves the cursor to the previous section of the display unit (if any) and selects all text in that section. Any unsaved control text from the original section is saved before the previous section is selected. You can also use the keyboard command **Shift+Tab**.

Widths

Enters the section width arranging mode where you can size and position each of a display unit's three sections. You can also use the keyboard command **Ctrl+W**. Select **Enter** or **Esc** to terminate this mode. See Arranging Display Unit Sections for information on this command.

Display Unit Menu

Select

Opens a dialog box to select a remote display unit by name. If desired, first select a layout by name from the **Layout** list box. This limits the contents of the **Name** list box to the names of remote display units that belong only to the selected layout. Check **Show All** to view the names of remote display units from all layouts. Choose a unit from the **Name** list box then select **OK** to assign that unit to the currently selected unit window, or select **Cancel** to restore the originally assigned unit to the window. You can also use the keyboard command **F6** to open the dialog box.

Tally 1
Tally 2
(Available in demonstration mode only)

Controls one of the external tally inputs of the remote display unit in the selected unit window from a menu. The menu item corresponding to each tally function is listed in the table below. You can also use the keyboard commands **Ctrl+1** for tally number 1 and **Ctrl+2** for tally number 2. These command prepare for entry of a tally function selector letter. Enter the selector letter from the table below. Once the selector letter is entered, the corresponding tally function is performed.

External Tally Input Function	Selector	Tally 1/Tally 2 Menu Item
Set tally to a low level	**L**	**Low**
Set tally to a high level	**H**	**High**
Toggle the tally to the opposite level	**T**	**Toggle**
Pulse the tally to the opposite level for a ¼ of a second, then return to the original level	**P**	**Pulse**

A check mark appears next to the Low or High menu items to indicate the current level of the corresponding external tally input.

Timer *n* Control; Mode
(Available in demonstration mode only)

Sets the operating mode of timer *n*, from 1 to 4. The control a timer, you must position the cursor over any one of its timer/counter variable code digits, otherwise, items in this menu are disabled.

To use the timer to count an event, select the **8 Digit** menu item.

To use the timer to time an event, select the **100 Hour** menu item.

To use the timer as a time of day clock, select the **24 Hour** menu item.

To use the timer as a static number, select the **Stop** menu item.

A check mark appears next to one of these menu items to indicate the current timer format.

To make the timer increase as it advances, select the **Incrementing** menu item.

To make the timer decrease as it advances, select the **Decrementing** menu item.

A check mark appears next to one of these menu items to indicate the current timer

direction. If the 24 hour format is selected, these menu items are disabled.

To specify the timer's frame rate as 25 frames per second, select the **25 fps** menu item.

To specify the timer's frame rate as 30 frames per second, select the **30 fps** menu item.

A check mark appears next to one of these menu items to indicate the current frame rate. If the 8 digit format is selected, these menu items are disabled and the timer operates with 100 frames per second.

To enable or disable timer overflow or underflow, select the **Over/Underflow** menu item.

A check mark appears next to the menu item to indicate that timer overflow or underflow are permitted. If the 24 hour format is selected, this menu item is disabled.

Timer *n* Control; Tally 1 Action
Timer *n* Control; Tally 2 Action
(Available in demonstration mode only)

Sets the effect of external tally inputs on timer *n*, from 1 to 4. The control the tally action of a timer, you must position the cursor over any one of its timer/counter variable code digits, otherwise, items in these menus are disabled.

To prevent a tally from affecting the timer, select the **None** menu item.

To make the tally advance the timer each time the tally changes to its active level, select the **Clock** menu item.

To make the timer only advance while the tally is at its active level, select the **Gate** function.

To reset the timer to its lowest value (or highest value if it is a decrementing timer) each time the tally changes to its active level, select the **Reset** menu item.

To hold the timer at its lowest value (or highest value if it is a decrementing timer) while the tally is at its active level, select the **Hold** menu item.

To set the tally to its active level while the timer is at its terminal value, select the **Output Level** menu item.

To pulse the tally to its active level for ¼ of a second when the timer reaches its terminal value, select the **Output Pulse** menu item.

A check mark appears next to one of these menu items to indicate the current tally action mode.

Normally, the active level of an external tally input is the low level. To set the opposite active level, select the **Invert** menu item.

A check mark appears next to the menu item to indicate that tally action is inverted (the active level is the high level).

Timers & Counters
Opens the Timers and Counters dialog box. You can also use the keyboard command **Ctrl+M**.

Increase Brightness
Increases the LED brightness of all remote display units belonging to the layout of the selected remote display unit. The appearance of the LED's on the PC screen is not affected. You can also use the keyboard command **Ctrl+B**. To alter the LED brightness of all remote display units in the system hold down **Alt** as you select the brightness command.

Decrease Brightness

Decreases the LED brightness of all remote display units belonging to the layout of the selected remote display unit. The appearance of the LED's on the PC screen is not affected. You can also use the keyboard command **Ctrl+Shift+B**. To alter the LED brightness of all remote display units in the system hold down **Alt** as you select the brightness command.

Line Synchronize

Immediately coordinate the flashing of messages on all remote display units which have been programmed to flash (a non-zero duration has been specified for two or more lines of a display unit section). Flash timing is only relevant between remote display units which flash messages of identical durations. You can also use the keyboard command **F9**.

Remote Menu

Accesses the built in menu system of the remote display unit in the selected unit window. The LED area of the PC screen display blanks while the remote menu is active and any characters entered at the keyboard are sent directly to the remote display unit. Select this command again to de-activate the remote menu. A check mark appears next to this menu item while the remote menu is active. You can also use the keyboard command **Ctrl+F3**.

Normally, using the remote display unit's built-in menu is not necessary as the Tally System Console program provides all the necessary set-up and control functions. You may, however, use this command to explore some of the remote display unit's built-in features for stand-alone operation.

Note that while the remote menu is active on one remote display unit, the Tally System Console program cannot send control commands to any other remote display units. You must de-activate the remote menu before control of other remote display units can resume.

In remote display units with a small or partially loaded LED area the built-in menu system has been disabled at the factory. In this case, the remote menu does not appear when you select the remote menu command. Select the command again to return to the previous operation.

Show Serial #s

Make all remote display units in the system display their assigned serial numbers. Select this command again to restore normal operation. A check mark appears next to the menu item while remote display units are showing their serial numbers. The same serial number appears in each section of remote display units that have more than one section. You can also use the keyboard command **Ctrl+Shift+F3**.

Test

Activates an LED test for the remote display unit in the selected unit window. During the test, the display alternates between all red or all green dots on. Select this command again, or select another remote display unit or another unit window, to restore normal operation. A check mark appears next to the menu item while the remote display unit test is active. You can also use the keyboard command **Alt+F3**.

Initialize Unit

Send all necessary set-up and control commands to the remote display unit in the selected unit window. You can also use the keyboard command **F2**.

Although the initialize function is normally handled by the Tally System Console program (system operating in the message system mode), or the Tally System Interface unit (system operating in the tally system mode), the Initialize Unit command may be useful to initialize a remote display unit that was just connected to the system. This is because the serial link to the remote display units is one-way. The remote display units cannot request information from the system. They can only receive commands from the system. To keep the contents of each remote display unit current, the system periodically sends commands to refresh the information in each display. In a large system, it may take some time to refresh a specific display. The Initialize Unit command is provided to update a

remote display unit immediately.

Reset Unit
(Available in demonstration mode only)

Send a command to the remote display unit in the selected unit window to make the unit reset and operate as if it was just powered on. This command can be used to test the stand-alone operation of a unit after saving messages into the unit with the Save to Unit command (described below). You can also use the keyboard command **Shift+F2**.

Save To Unit
(Available in demonstration mode only)

Send commands to the remote display unit in the selected unit window to save the current messages and section arrangement in the unit permanently. Use this command to prepare a remote display unit for stand-alone operation. You can also use the keyboard command **Shift+F7**. It is unnecessary to permanently save messages or section arrangement in a remote display unit if the unit is to be used with the tally system (not used for stand-alone operation). This is because the tally system overrides the messages and section arrangement originally programmed into each remote display unit by periodically sending the control information according to the configuration of the tally system.

Configure
Opens the Configure Display Units dialog box. You can also use the keyboard command **Ctrl+F10**.

Unit Size; Expand
Increase the overall size of the remote display unit in the selected unit window by one dot. The size of each display unit section is adjusted to share the new size. You can also use the keyboard command **Ctrl+U**.

Unit Size; Contract
Decrease the overall size of the remote display unit in the selected unit window by one dot. The size of each display unit section is adjusted to share the new size. You can also use the keyboard command **Ctrl+Shift+U**.

Unit Size; 17" Unit
Set the size of the remote display unit in the selected unit window to that of a standard 17" remote display unit (160 dots). The size of each display unit section is adjusted to share the new size.

Unit Size; 13" Unit
Set the size of the remote display unit in the selected unit window to that of a standard 13" remote display unit (120 dots). The size of each display unit section is adjusted to share the new size.

Unit Size; 8.5" Unit
Set the size of the remote display unit in the selected unit window to that of a standard 8 ½" remote display unit (80 dots). The size of each display unit section is adjusted to share the new size.

Message Menu

Except for the **Configure** menu item, these menu items are disabled if the selected remote display unit section is not programmed to use switchable messages. A beep sounds if you use any of the keyboard commands corresponding to these menu items.

Next

Selects the next message from the message list of the most recently used message group. You can also use the keyboard command **PgDn**.

Previous

Selects the previous message from the message list of the most recently used message group. You can also use the keyboard command **PgUp**.

First

Selects the first message from the message list. You can also use the keyboard command **Shift+PgUp**.

Last

Selects the last message from the message list of the most recently used message group. You can also use the keyboard command **Shift+PgDn**.

Select

Opens a dialog box to select a message by name. Chose a message group if the remote display unit section is programmed for multiple message groups. Choose a message then choose **OK** to select that message in the currently selected remote display unit section, or select **Cancel** to restore the original message to the remote display unit. You can also use the keyboard command **F8**.

Configure

Opens the Configure Messages dialog box. You can also use the keyboard command **Ctrl+Shift+F8**.

Resource Menu

Devices

Opens the Configure Resource Device dialog box. You can also use the keyboard command **Ctrl+F9**.

Source Item

Opens a dialog box where you can alter the long name or short name of a source item associated with resource. The current contents of the selected remote display unit determines the source item to be altered. Specify a new short name, long name, or both, then select OK. To abandon the changes, select Cancel.

If no source item is associated with the selected remote display unit, a beep sounds and the dialog box does not open.

Use this command to quickly change the alternate name of a source. You can also use the keyboard command **Shift+F9**. To change other attributes of a source item, or to change the attributes of destination items, use the Configure Resource Device dialog box.

Interconnect

Opens the Configure Resource Interconnections dialog box. You can also use the keyboard command **Ctrl+Shift+F9**.

GPIs

Opens the Configure GPIs dialog box. You can also use the keyboard command **Ctrl+Shift+F10**.

System Interface

Opens the Configure System Interface dialog box.

Help Menu

Contents

Invokes the Windows Help System and shows the main table of contents. You can also use **F1** to select this command.

Index

Invokes the Windows Help System and shows the program's help index. Other information can be located from the index by selecting related topics.

Commands

Invokes the Windows Help System and shows a summary of keyboard commands. You may find these commands more useful than their mouse or menu equivalents once you are more familiar with the program. You can also use **Ctrl+F1** to select this command.

About

Displays a dialog box declaring version information about the program.

Enable Function Assistant

Enables or disables the Function Assistant window. If enabled, the window pops up as you edit the control text of remote display units, GPI outputs, resource outputs, or named messages. The Function Assistant window shows information about embedded function, including formats, parameter values, and examples of their use. A check mark appears next to this item in the help menu if the function assistant is enabled to appear.

Layout Menu

Layout Menu

You can activate the layout menu by clicking the right mouse button anywhere over the layout window, or by selecting **F10** while the layout window's caption bar is highlighted (indicating it is the active window).

Layout; Hide
Closes the layout window. You can also use **F3** to select this command.

Layout; New
Prompts you to specify the name of a new layout. Initially, the name is "Untitled" followed by a number. Use this name or specify another name. Select **OK** the create the new layout. The new layout becomes the selected layout. Select **Cancel** to abandon the operation. Layout names must be unique.

Layout; Rename
Prompts you to specify a new name for the selected layout a new layout. Specify the new name and select **OK** to rename the layout. Select **Cancel** to abandon the operation. Layout names must be unique.

Layout; Delete Layout
Removes the selected layout. If there are remote display units located within the layout (the layout is not empty), the remote display units must also be removed (they cannot be orphaned). You are prompted for confirmation before remote display units are removed. Select **Yes** to remove the layout and all its remote display units. Select **No** to abandon the operation. The prompt for confirmation does not appear when deleting an empty layout. This menu item is disabled if there is only one layout (the last layout cannot be removed).

Layout; *Layout Name*
Choose this menu item to make *Layout Name* the selected layout. There is one menu item for each layout. The currently selected layout is indicated with a check mark next to the item. The menu items are listed in the order that the corresponding layouts were most recently selected.

New Window
Creates a new unit window in the upper left or right corner of the screen, below other unit windows in that area, and assigns the remote display unit currently selected in the layout window. You can also use **Ctrl+F2** to select this command. This command does not appear in the menu while an unoccupied location is currently selected in the layout window.

New Unit
Creates a new remote display unit at the currently selected location in the layout window. You can also use **Ctrl+Shift+F2** to select this command. This command does not appear in the menu while an occupied location is currently selected in the layout window.

Monitor; None
Monitor; Single
Monitor; Dual
Monitor; Triple
Changes the monitor style of the remote display unit currently selected in the layout window. A check mark appears next to the menu item corresponding to the monitor style of the selected remote display unit. These menu items are disabled while an unoccupied location is currently selected in the layout window. The menu items corresponding to each monitor style may also be disabled where that monitor style would not fit in the layout window due to the position of adjacent remote display units.

Monitor; Under
Monitor; Over

Changes the monitor location relative to the remote display unit currently selected in the layout window. Select Under to place the remote display unit below its monitors. Select Over to place the remote display unit above its monitors. A check mark appears next to the menu item that is currently applied to the selected remote display unit. These menu items are disabled while an unoccupied location is currently selected in the layout window. These menu items are also disabled if the monitor style "none" is selected.

Configure

Opens the Configure Display Units dialog box. You can also use the keyboard command **Ctrl+F10**.

Remove Unit

Prompts for confirmation to remove the remote display unit(s) currently selected in the layout window from the system. You can also use the keyboard command **Del**.

Keyboard Shortcuts

Keyboard Command Summary

You can use the mouse and menus to perform may program functions which can also be performed by keyboard commands. More experienced program users tend to use keyboard commands for quicker program operation. Here is a summary of all the keyboard commands and shortcuts. Some commands required more than one keystroke to be completed.

Command	Menu or Mouse Equivalent	Description
Program Control		
F10	Click right mouse button in unit window	Open main menu
Alt+F4	Exit	Prompt to save the configuration file, then close all unit windows and exit from the program
Unit Window Control		
Shift+F4	**Window; Minimize**	Temporarily hide all unit windows
Ctrl+F2	**Window; New**	Create a new unit window below the selected unit window and assign the single default unit
Ctrl+Shift+F2	**Window; Duplicate**	Create a new unit window below selected unit window and assign the same set units from the original window
Ctrl+F4	**Window; Close**	Removes the selected unit window from the screen (no remote display units are removed from the system)
Ctrl+Shift+F4	**Window; Close Group**	Removes the group of unit windows, to which to selected unit window belongs, from the screen (no remote display units are removed from the system)
Ctrl+0	**Window; Add Unit**	
	Double-click a control set button	Add a unit to the selected unit

		window's control set (no remote display unit is added to the system)
Ctrl+* (keypad asterisk)	**Window; Remove Unit**	Remove the current unit from the selected unit window's control set (no remote display units are removed from the system)
Ctrl++ (keypad plus)		Select the next larger of the three unit window sizes for the selected unit window group
Ctrl+- (keypad minus)		Select the next smaller of the three unit window sizes for the selected unit window group
F3	**Window; View Layout**	Open or select the layout window
Layout Window Control		
F10	Click right mouse button in layout window	Open the layout menu
F3	**Hide Layout**	Close the layout window
Ctrl+F2	**New; Window** Double-click over unit in the layout window	Create a new unit window in the upper left or right corner of the screen, below other unit windows in that area, and assign the remote display unit currently selected in the layout window
Ctrl+Shift+F2	**New; Unit** Double-click over any free layout location	Create a new remote display unit at the currently selected location in the layout window
Del	**Remove Unit**	Remove the remote display unit(s) currently selected in the layout window from the system
Clipboard (while editing display unit control text)		
Shift+Del	**Edit; Cut**	Cut selected text to

		clipboard
Ctrl+Ins	**Edit; Copy**	Copy selected text to clipboard
Shift+Ins	**Edit; Paste**	Paste text from clipboard replacing selected text
Color		
Ctrl+G	**Insert; Color; Green**	Insert green color embedded function
Ctrl+R	**Insert; Color; Red**	Insert red color embedded function
Ctrl+A	**Insert; Color; Amber**	Insert amber color embedded function
Ctrl+T	**Insert; Color; By Tally**	Begin entry of tally-sensitive color embedded function
Character Set		
Ctrl+F	**Insert; Character Set; Fixed**	Insert fixed spacing character set embedded function
Ctrl+P	**Insert; Character Set; Large**	Insert large proportional spacing character set embedded function
Ctrl+Q	**Insert; Character Set; Medium**	Insert medium proportional spacing character set embedded function
Ctrl+S	**Insert; Character Set; Small**	Insert small character set code
Ctrl+D	**Insert; Character Set; Wide**	Insert wide character set code
Ctrl+K	**Insert; Character Set; Block**	Insert block character set code
Justification		
Ctrl+J L	**Insert; Justify; Left**	Insert left justify embedded function
Ctrl+J C	**Insert; Justify; Centre**	Insert centre justify embedded function
Ctrl+J R	**Insert; Justify; Right**	Insert right justify embedded function
Ctrl+J F	**Insert; Justify; Full**	Insert full justify embedded function
Timer/Counter Variables		
Ctrl+V A	**Insert; Variable Code; Timers; #1**	Insert 8 variable code embedded functions for timer 1 digits
Ctrl+V B	**Insert; Variable Code; Timers; #2**	Insert 8 variable code embedded functions for timer 2 digits

Ctrl+V C	**Insert; Variable Code; Timers; #3**	Insert 8 variable code embedded functions for timer 3 digits
Ctrl+V D	**Insert; Variable Code; Timers; #4**	Insert 8 variable code embedded functions for timer 4 digits
Ctrl+V a	**Insert; Variable Code; Zero Blanked Timers; #1**	Insert 8 variable code embedded functions for timer 1 digits with zero blanking
Ctrl+V b	**Insert; Variable Code; Zero Blanked Timers; #2**	Insert 8 variable code embedded functions for timer 2 digits with zero blanking
Ctrl+V c	**Insert; Variable Code; Zero Blanked Timers; #3**	Insert 8 variable code embedded functions for timer 3 digits with zero blanking
Ctrl+V d	**Insert; Variable Code; Zero Blanked Timers; #4**	Insert 8 variable code embedded functions for timer 4 digits with zero blanking
Ctrl+V T	**Insert; Variable Code; Timer 1 12-hour; Hours**	Insert 2 variable code embedded functions for timer 1 upper 2 digits in 12-hour format
Ctrl+V P	**Insert; Variable Code; Timer 1 12-hour; AM/PM**	Insert 1 variable code embedded function for timer 1 A or P (AM/PM indicator)
Ctrl+V p	**Insert; Variable Code; Timer 1 12-hour; am/pm**	Insert 1 variable code embedded function for timer 1 a or p (am/pm indicator)
Ctrl_V I	**Insert; Variable Code; ID**	Insert 3 variable code embedded functions for section ID digits
Ctrl_V i	**Insert; Variable Code; Zero Blanked ID**	Insert 3 variable code embedded functions for section ID digits width zero blanking
Ctrl+M	**Insert; Timers/Counters**	Opens the Timers and Counters dialog box.

Graphics

Ctrl+E	**Edit; Edit Graphic**	Search for next graphic character and begin editing
Ctrl+X	**Edit; Remove Graphic**	Remove graphic character definition from all display units
Ctrl+N	**Insert; Graphic Code; New Graphic**	Create a new graphic character and insert its graphic code embedded function
Ctrl+C 1	**Insert; Graphic Code; Graphic Code 1**	Insert embedded function for graphic character 1
Ctrl+C 2	**Insert; Graphic Code; Graphic Code 2**	Insert embedded function for graphic character 2
Ctrl+C 3	**Insert; Graphic Code; Graphic Code 3**	Insert embedded function for graphic character 3
Ctrl+C 4	**Insert; Graphic Code; Graphic Code 4**	Insert embedded function for graphic character 4
Ctrl+C 5	**Insert; Graphic Code; Graphic Code 5**	Insert embedded function for graphic character 5
Ctrl+C 6	**Insert; Graphic Code; Graphic Code 6**	Insert embedded function for graphic character 6
Ctrl+C 7	**Insert; Graphic Code; Graphic Code 7**	Insert embedded function for graphic character 7
Ctrl+C 8	**Insert; Graphic Code; Graphic Code 8**	Insert embedded function for graphic character 8
Ctrl+C 9	**Insert; Graphic Code; Graphic Code 9**	Insert embedded function for graphic character 9
Section Control		
Tab	**Section; Next Section**	Select all text in next section of display unit
Shift+Tab	**Section; Previous Section**	Select all text in previous section of display unit
Ctrl+W	**Section; Widths**	Enter section sizing and positioning mode
F9	**Display Unit; Line Synchronize**	Synchronize flashing of all sections of all remote display units
Unit Window Navigation		

Up		Select unit window in next-highest screen position
Down		Select unit window in next-lowest screen position
Home		Select unit window in highest screen position or move caret to beginning while editing control text
End		Select unit window in lowest screen position or move caret to end while editing control text

Select Remote Display Unit in Unit Window

F6	**Display Unit; Select**	Open the Select Display Unit dialog box
Ctrl+Up	Left-drag control set button up	Open or navigate quick list of remote display unit names to change assignment of selected unit window (list opens up if possible)
Ctrl+Down	Left-drag control set button down	Open or navigate quick list of remote display unit names to change assignment of selected unit window (list opens down if possible)
Ctrl+Home		Select first unit in quick list of remote display unit names to change assignment of selected unit window (list must already be open)
Ctrl+End		Select last unit in quick list of remote display unit names to change assignment of selected unit window (list must already be open)
Ctrl+Right		Select quick list of remote display unit names from next layout to change

		assignment of selected unit window (list must already be open and another layout must exist)
Ctrl+Left		Select quick list of remote display unit names from previous layout to change assignment of selected unit window (list must already be open and another layout must exist)

External Tally Input Control

(Available in demonstration mode only)

Ctrl+1 L	**Display Unit; Tally 1; Low**	Set external tally input 1 to a low level
Ctrl+1 H	**Display Unit; Tally 1; High**	Set external tally input 1 to a high level
Ctrl+1 T	**Display Unit; Tally 1; Toggle**	Set external tally input 1 to its opposite level
Ctrl+1 P	**Display Unit; Tally 1; Pulse**	Set external tally input 1 to its opposite level for ¼ of a second, then return to its original level
Ctrl+2 L	**Display Unit; Tally 2; Low**	Set external tally input 2 to a low level
Ctrl+2 H	**Display Unit; Tally 2; High**	Set external tally input 2 to a high level
Ctrl+2 T	**Display Unit; Tally 2; Toggle**	Set external tally input 2 to its opposite level
Ctrl+2 P	**Display Unit; Tally 2; Pulse**	Set external tally input 2 to its opposite level for ¼ of a second, then return to its original level

LED Brightness

Ctrl+B	**Display Unit; Increase Brightness**	Increase LED brightness of all remote display units in a layout
Ctrl+Shift+B	**Display Unit; Decrease Brightness**	Decrease LED brightness of all

		remote display units in a layout
Alt+Ctrl+B		Increase LED brightness of all remote display units in the system
Alt+Ctrl+Shift+B		Decrease LED brightness of all remote display units in the system
System Functions		
Ctrl+F3	**Display Unit; Remote Menu**	Activate or de-activate the built-in menu system of the remote display unit of the selected unit window
Ctrl+Shift+F3	**Display Unit; Show Serial #s**	Show or hide serial numbers on all remote display units
Alt+F3	**Display Unit; Test**	Activate or deactivate the LED test on the remote display unit of the selected unit window
F2	**Display Unit; Initialize Unit**	Immediately refresh remote display unit of the selected unit window with the necessary control messages
Shift+F2	**Display Unit; Reset Unit**	Reset remote display unit of the selected unit window
Shift+F7	**Display Unit; Save to Unit**	Save start-up messages permanently in remote display unit of the selected unit window (prepares unit for stand-alone operation)
Ctrl+F10	**Display Unit; Configure** Double-click outside unit window LED area	Open the Configure Display Units dialog box
Remote Display Unit Size		
Ctrl+U	**Display Unit; Unit Size; Expand**	Increase the overall size of the remote

		display unit of the selected unit window by one dot
Ctrl+Shift+U	**Display Unit; Unit Size; Contract**	Decrease the overall size of the remote display unit of the selected unit window by one dot
Message Control		
PgDn	**Message; Next**	Select the next message from all available messages
PgUp	**Message; Previous**	Select the previous message from all available messages
Shift+PgUp	**Message; First**	Select the first of all available messages
Shift+PgDn	**Message; Last**	Select the last of all available messages
Ctrl+PgUp	Left-drag up from unit window LED area	Open or navigate quick list of available messages and names to change message in current line of selected unit window (list opens up if possible)
Ctrl+PgDn	Left-drag down from unit window LED area	Open or navigate quick list of available messages and names to change message in current line of selected unit window (list opens down if possible)
Ctrl+Right		Select quick list of available messages from next message group (list must already be open and another message group must exist)
Ctrl+Left		Select quick list of available messages from previous message group (list must already be open and another message group must exist)
F8	**Message; Select**	Open the Select Message dialog box
Ctrl+Shift+F8	**Message; Configure**	Open the Configure

		Messages dialog box
File Operations		
Ctrl+Shift+F7	**File; New**	Prompts for confirmation to remove all system configuration items and create a new system with one remote display unit
Ctrl+F7	**File; Open**	Open dialog box to specify tally system file where all system configuration items are to be recalled
F7	**File; Save**	Open dialog box to specify tally system file where all system configuration items are to be saved
Ctrl+F8	**File; Merge Messages**	Open dialog box to specify tally system file where remote display unit messages are to be merged with current messages
Configuration Operations		
Ctrl+F10	**Display Unit; Configure** Double-click outside unit window LED area	Open the Configure Display Units dialog box
Ctrl+Shift+F10	**Resource; GPIs**	Open the Configure GPIs dialog box
Ctrl+F9	**Resource; Devices**	Open the Configure Display Units dialog box
Shift+F9	**Resource; Source Item**	Open the Configure Source Item dialog box
Ctrl+Shift+F9	**Resource; Interconnect**	Open the Configure Resource Interconnections dialog box
Ctrl+Shift+F8	**Message; Configure**	Open the Configure Messages dialog box
Feature Demonstration		
F5	**Demo**	Start or restart the demo feature on the

		remote display unit of the selected unit window
Space	Left-click in unit window	Pause demo feature if running, or resume demo feature if paused
Enter	Left-click in unit window	Pause demo feature if running, or perform next step if demo feature paused
Esc		Terminate demo feature if running or paused
Help		
F1	**Help; Contents**	Invoke the Windows Help System and show help contents information
Ctrl+F1	**Help; Commands**	Invoke the Windows Help System and show command information (this page)

Clipboard

The clipboard is a temporary storage area which can be used to transfer information between windows in one or more applications.

You can cut or copy text into the clipboard from the control text of one display unit and paste it into the control text of another display unit.

You can also use the clipboard with other Windows applications that can handle textual information through the clipboard.

System Resources

Configure Resource Device Dialog Box

The Configure Resource Device dialog box allows you to add, rename, remove, or change attributes of the system's resource devices. You can also specify source and destination items associated with each resource device. You can also use the keyboard command **Ctrl+F9** to open this dialog box.

Each resource device is assigned a name of up to 25 characters. Although the name is chosen arbitrarily, short names are recommended. Resource device names are used with various embedded functions and shorter names result in more efficient control text evaluation.

Type

The tally system must know how to communicate with each resource device. The **Type** list box indicates the type of the resource device selected in the **Name** list box. You cannot select a different resource device type from the **Type** list box while working online; you must first select the work offline mode. You can, however, change the type of a resource device from the Resource Device Port Setup dialog box. Select the **Port Setup** button to open that dialog box. See below for more information.

Add

To add a new resource device to the system, specify a name for the resource device in the **Name** box, then select **Add** to add the device. Select the desired resource device type from the **Type** list box.

Repeat the procedure to add other resource devices to the system. Resource device names must be unique.

Resource devices can also be added if you make references to them using various embedded functions while editing remote display unit control text. Resource devices created in this way assume the "virtual router" type. You can use the Configure Resource Device dialog box to change the name and type at a later time.

Rename

You can change the name of an existing resource device.

To change the name of a resource device, select the resource device to be renamed by picking its current name from the **Name** list box, then select **Rename**. A dialog box appears where you can specify a new name for the resource device. Select **OK** to rename the resource device, or select **Cancel** to abandon to operation. The new name of a resource device is reflected in any resource interconnections associated with that resource device.

Remove

To remove a resource device from the system, select the resource device to be removed by picking its name from the **Name** list box, then select **Remove**. A dialog box appears to confirm removal of the resource device. Select **OK** to remove the resource device, or select **Cancel** to abandon to operation. Removing a resource device from the system also removes any source or destination items associated with that resource device.

Source and Destination Items: Name

Selects the source or destination item to viewed, modified, or removed. The other boxes and controls in the **Source and Destination Items** group are immediately changed to reflect the selected item. The item name is the name of a source or destination (or both) that matches exactly the name that the resource device uses when communicating with the tally system. Depending on the type of resource device, the item name could be a type and number (e.g. VTR203), some unique description, or the actual physical input or output number on the resource device.

Source and Destination Items: Short Name

Specifies a different name to appear on the remote display units instead of the item name. Short names are typically used on displays where more than one source contributes to a monitored signal, such as a program signal generated by a production switcher.

Source and Destination Items: Long Name

Specifies a different name to appear on the remote display units instead of the item name. Long names are typically used on displays where only one source feeds a monitored signal, such as an output from a routing switcher.

Source and Destination Items: Style A and Style B

Specifies which of a source or destination item's names are to appear on the remote display units where style A or style B is specifically requested. Each source and destination item can have a primary name, secondary name, short name, and long name. Depending on the type of resource device, the primary name may be numeric or even non-existent. The Tally System Console operator has control over short and long names only. The resource device system operator may have control over secondary names. The **Style A** and **Style B** list boxes allow you to change the way a source appears on many remote display units simultaneously.

Source and Destination Items: Priority

Specifies a priority number from 0 to 255 that affects the order in which source or destination names appear on some remote display units. Priority is applied where more than one resource item name must appear on the same remote display unit (such as on a production switcher output monitor). A priority of zero designates a resource item that should appear first. A priority of 255 designates a resource item that should appear last. The priority setting does not affect displays where only one resource item can appear (such as a routing switcher output monitor).

Source and Destination Items: Source

Check this box to identify a resource item that is used as a source (input) to the resource device.

Source and Destination Items: Destination

Check this box to identify a resource item that is used as a destination (output) from the resource device.

Add Item

To add a new resource item for the selected resource device, select **Add Item** to open the Add Resource Item dialog box. Initially, the next likely unique name based on the name of the originally selected resource item appears (hold down **Shift** as you select **Add Item** to start with the originally selected item name). You can keep this new name or specify a different name for the new resource item. Select **OK** to add the item, or **Cancel** to abandon the operation and return to the Configure Resource Device dialog box.

Repeat the procedure to add other resource items for the selected resource device. For a given resource device, the name of each item must be unique.

Rename Item

You can change the name of an existing resource item and retain its other properties.

To rename an existing resource item for the selected resource device, select **Rename Item** to open the Rename Resource Item dialog box. Specify a different name for the resource item. Select **OK** to rename the item, or **Cancel** to abandon the operation and return to the Configure Resource Device dialog box.

Remove Item

To remove a resource item from the system, select the resource item to be removed by picking its name from the **Name** list box, then select **Remove Item**. Removing a resource item from the system does not actually affect the associated resource device; it simply prevents the alternate names, styles, and priority from affecting the appearance of that resource source or destination on a remote display unit. When no resource item is

associated with a given resource's source or destination, the source or destination appears in its original (resource device-dependent) form.

Output Ctrl

Opens the Resource Output Control dialog box.

Port Setup

Opens the Resource Device Port Setup dialog box where you can specify how the resource device communicates with the tally system. The name and type of resource device appears in the dialog box. The type of resource device determines what other boxes appear in the dialog box.

In the **Type** list box, select the description that identifies the resource device that you are connecting to the tally system. Only those resource device types supported by the Tally System Interface unit appear in the list box. Note that some resource devices are supported with more than one type to accommodate different communication methods, such as COM and TCP/IP. Support for additional resource device types may be available through a Tally System Interface unit firmware upgrade. Consult your vendor for more information.

In the **Interface** list box, you must specify the Tally System Interface unit number (1 though 16) which is actually connected to the resource device. A system can consist of more than one Tally System Interface unit, but only one of these units communicates directly with the resource device.

Many types of resource devices connect to the tally system through a Tally System Interface unit serial port. Choose the specific port in the **Port** list box. This setting refers to connectors with corresponding labels on the rear of the Tally System Interface unit, and has nothing to do with PC port selection. COM1 and COM2 are 9-pin RS-232 ports. COM3, COM4, COM5, and COM6 are RJ11 connector ports. The remaining ports are 9-pin RS-422 ports.

For a resource device that uses asynchronous serial communication, choose the communication format in the **Format** list box. Note that some resource devices do not have multiple format capabilities. In this case, the **Format** list box setting is not relevant.

For a resource device that uses Ethernet and TCP/IP communication, specify the IP addresses of one or two resource device Ethernet ports in the **IP Addr. 1** or **IP Addr. 2** boxes. The dual addressing scheme is intended to accommodate a resource device with a built-in backup interface. The Tally System Interface unit will attempt to connect to only one of these IP addresses at a time. Initially, it attempts to communicate with the resource device using IP address 1. If the resource device does not have a built-in backup interface, simply leave either one of the IP addresses set to all zeros.

To close the Resource Device Port Setup dialog box, select **OK** to keep the port settings, or select **Cancel** to retain the original settings.

Close

Closes the Configure Resource Device dialog box.

Help

Invokes the Windows Help System and shows this page.

Configure Resource Interconnections Dialog Box

The Configure Resource Interconnections dialog box allows you to add, rename, remove, or change the attributes of the system's resource interconnections.

Name

Selects the desired resource interconnection. The other boxes and controls in the dialog box change to reflect the attributes of the selected resource interconnection.

Add

To add a new resource interconnection to the system, specify a name for the resource interconnection in the **Name** box, then select **Add** to add the resource interconnection.

Repeat the procedure to add other resource interconnections to the system. Resource interconnection names must be unique.

Rename

To change the name of a resource interconnection, select the resource interconnection to be renamed by picking its current name from the **Name** list box, then select **Rename** to open the Rename Resource Interconnection dialog box. Specify a new name for the resource interconnection. Select **OK** to rename the resource interconnection, or **Cancel** to abandon the operation and return to the Configure Resource Interconnections dialog box.

Remove

To remove a resource interconnection from the system, select the resource interconnection to be removed by picking its name from the **Name** list box, then select **Remove**.

Origin

Specifies the resource interconnection's starting point. Use the form *resource device name* :: *resource output name* (separate the device and output names with two colons).

Usage

Specifies the purpose of the signal carried by the selected resource interconnection. Check **On-air** for program signals. Check **Next-to-air** for preset signals. Otherwise, check **Normal** for all other signals. A typical tally system has one or more program and preset signals. Remote display units are usually configured so that names of sources that reach any on-air or next-to-air signal appear in red or amber, respectively, instead of green. Other custom remote display units affects can also be applied.

Ends

Lists the resource interconnection's ending points. Use the form *resource device name* :: *resource input name* (separate the device and input names with two colons).

Add End

To add a new ending point for the selected resource interconnection, specify the end point in the form *resource device name* :: *resource input name* (separate the device and input names with two colons) in the **Ends** box, then select **Add End** to add the end point.

Repeat the procedure to add other ending points.

Replace End

To change an ending point for the selected resource interconnection, select the ending point to be changed from the **Ends** list box, then select **Replace End** to open the Replace Resource End dialog box. Specify a new end point for in the form *resource device name* :: *resource input name* (separate the device and input names with two colons). Select **OK** to replace the end point, or **Cancel** to abandon the operation and return to the Configure Resource Interconnections dialog box.

Remove End

To remove an ending point for the selected resource interconnection, select the ending point to be removed from the **Ends** list box, then select **Remove End**.

Close

Closes the Configure Resource Interconnections dialog box.

Help

Invokes the Windows Help System and shows this page.

Timers and Counters Dialog Box

The Timers and Counters dialog box allows you to add, rename, remove, or change the attributes of the system's timer/counters.

Name

Selects the desired timer/counter. The other boxes and controls in the dialog box change to reflect the attributes of the selected timer/counter.

Add

To add a new timer/counter to the system, specify a name for the timer/counter in the **Name** box, then select **Add** to add the timer/counter.

Repeat the procedure to add other timer/counters to the system. Timer/counter names must be unique.

Rename

To change the name of a timer/counter, select the timer/counter to be renamed by picking its current name from the **Name** list box, then select **Rename** to open the Rename Timer/Counter dialog box. Specify a new name for the timer/counter. Select **OK** to rename the timer/counter, or **Cancel** to abandon the operation and return to the Timers and Counters dialog box.

Remove

To remove a timer/counter from the system, select the timer/counter to be removed by picking its name from the **Name** list box, then select **Remove**.

Mode

Determines how the timer/counter advances. Select **24-Hour** to have the timer/counter advance from 23:59:59 to 0:00:00. Select **100-Hour** to have the timer/counter advance from 99:59:59 to 0:00:00. Select **Counter** to have the timer/counter advance from 999999 to 0.

Direction

Determines the direction that the timer/counter advances. Select **Up** to increment when advanced. Select **Down** to decrement when advanced.

Timing Source

Selects the source that determines when the timer/counter advances. Select **Internal** for an independent timer that advances in seconds. Select **Local Time** for force the timer to follow the local system clock. Select **Clock Control** to have the timer/counter advance as directed by the contents of the **Clock Control** edit box.

Frames per second

Selects the number of frames that equal one second. You can select from 1 to 100 frames per second. If the timing source selected is **Local Time**, the number of frames per second can differ from that of the timing source.

Overflow

Check this box to have an up counting timer/counter advance past the highest count to the lowest count, or to have a down counting timer/counter advance past the lowest count to the highest count.

Time Zone Adjustment

If the timing source **Local Time** is selected, specify the number of hours, minutes, seconds, and frames to offset the selected timer from the local time. You can select from 0:00:00 to 23:59:59. Select **Ahead of Local Time** to make the timer later than the local time. Select **Behind of Local Time** to make the timer earlier than the local time.

Set

If a timing source other than **Local Time** is selected, specify the current number of hours, minutes, seconds, and frames for the timer/counter.

Set Now

After you specify the hours, minutes, seconds, and frames for a timer/counter, select **Set Now** to apply the new settings to the timer/counter.

Reset Control

Specifies the embedded functions that, once evaluated, determines when the timer/counter is to be reset. You only need to specify the reset control information once. The tally system automatically re-evaluates the embedded functions as various system conditions change. If the embedded functions evaluate to a non-zero value, the timer/counter is held in a reset state where it does not advance.

Clock Control

Specifies the embedded functions that, once evaluated, determines when the timer/counter is to be advanced. You only need to specify the clock control information once. The tally system automatically re-evaluates the embedded functions as various system conditions change. If the embedded functions evaluate from a zero value to a non-zero value on successive evaluations, the timer/counter is advanced by one frame.

Close

Closes the Timers and Counters dialog box.

Help

Invokes the Windows Help System and shows this page.

Configure System Interface Dialog Box

Use this dialog box to specify the details of how the PC running the Tally System Console program communicates with one or more Tally System Interface units.

Console

Port

Specifies the serial communication port on the PC that is connected to a Tally System Interface Unit. If you select a port that is in use by some other application running on the PC, an error message appears when you attempt to close the dialog box.

IP Address

If the PC is network-ready, this box shows the IP address of the PC's Ethernet TCP/IP interface. You cannot change this setting from within the Tally System Console program. Consult your network system administrator for more information.

/~Each of the Tally System Interface units appears in a list. The interface number and IP address associated with each unit is shown. At the end of the list is an extra entry with an interface number and IP address of zero.

Each Tally System Interface unit in the system must have a unique interface number as a means of identification. An exception is made for Tally System Interface units that are connected to the system through a Switch-over Unit. The Switch-over Unit combines two Tally System Interface units that have the same interface number. The Switch-over Unit ensures that only one Tally System Interface is active at a time.

If your tally system has only one Tally System Interface unit, and you not wish to connect its Ethernet port to the PC or other equipment, you do not need to specify an entry for the unit in the list.

If there is to be more than one Tally System Interface unit in your tally system, or you wish to use an Ethernet network to communicate between the PC or other equipment and the tally system, you must specify the interface number and IP address of each Tally System Interface unit. For each unit to be modified or added to the system, select the IP address of the existing unit from the list, or select the last list entry if the existing unit does not appear in the list, then select **Change**.

Change

After selecting an entry from the list, select this command to open the Change System Interface dialog box. Enter the interface number and IP address of the Tally System Interface unit to be modified or added. Initially, the current interface number and IP address appear in the dialog box. You can change either one or both of these items. You must specify a valid interface number from 1 to 16. Select **OK** to accept the changes and close the dialog box. Select **Cancel** to abandon the changes and close the dialog box.

To remove a Tally System Interface unit from the list, select the list entry and open the Change System Interface dialog box. Specify interface number 0, then select **OK**.

In tally systems with only one Tally System Interface unit, you may wish to change the interface number only. The factory default interface number is 2. A Tally System Interface unit that has never been assigned an new interface number operates as interface 2.

To change the interface number of a Tally System Interface unit regardless of its IP address, specify the new interface number and the IP address 0.0.0.0. In this case, you must have the PC connected directly to the Tally System Interface unit (only one unit can be assigned at a time). A prompt appears for confirmation to assign the Tally System Interface unit currently connected to the PC. Do not use this command while more than one Tally System Interface

unit is connected to the PC. Use this command once to install new Tally System Interface units to an existing system.

If the network is used by other equipment beyond the scope of the tally system, use caution when assigning IP addresses. Consult your network system administrator for more information.

Close

Closes the Configure System Interface dialog box.

Help

Invokes the Windows Help System and shows this page.

GPI Outputs

GPI Output Control Text

Each GPI output set is assigned control text that determines the state of each of its individual outputs. The control text is a sequence of characters containing literal characters and string expressions. Expressions can contain embedded functions and sub-expressions, possibly containing more literal characters.

To generate the active or inactive state of a GPI output, the GPI output's control text string is "evaluated" into a final string of characters. Expressions and sub-expressions are evaluated in left to right order. Parenthesis are used to group sub-expressions and alter expression evaluation order.

Expressions can be as simple as a string of single number or as complex as a string of many sub-expressions within sub-expressions (nesting). Expressions usually contain embedded functions which are executed given zero or more arguments in parenthesis. These arguments may also be literal text or sub-expressions. Embedded functions return a result string of zero or more characters which are then passed to higher-level embedded functions or treated as a literal numeric value to control the GPI output. If the result is 1 the GPI output is activated. If the result is zero or some non-numeric value, the GPI output is de-activated.

Individual GPI outputs can be grouped in consecutive sets of up to 32 outputs to be controlled simultaneously as directed by its control text. In this case, the resulting numeric value is transferred directly to the outputs. In an eight-output set, for example, the numeric result of control text evaluation from 0 to 255 would afford the full range operation. The GPI output with the lowest address is controlled by the least significant bit of the result. A value of 255 activates all eight outputs. A value of zero de-activates all eight outputs.

Control text that does not match an embedded function "prototype" is treated as literal text. A prototype is any valid function name, followed by zero or more space characters, followed by a left parenthesis, zero or more expression arguments separated by commas, and closing with a right parenthesis.

You may wish to specify literal text which happens to match an embedded function prototype. In this case, use matching double or single quotes to enclose text which would otherwise be interpreted as an embedded function or expression grouping. Use double quotes to enclose literal text that contains one or more single quotes. Use single quotes to enclose literal text that contains one or more double quotes.

Embedded functions are available to perform various tasks. They provide "programming language" features such as variable assignment and referencing, math and logical functions, iteration, text manipulation, and system status information functions.

Named variables are essential to performing any higher-order operations within the control text. You can assign a string of characters to a variable with a name that you supply, then recall that variable's string contents elsewhere in the control text by referring to its name.

Named variables are synonymous with "messages". Both refer to named elements that hold zero or more characters as their "value". In the discussion of expressions, the term variable is used. This is not the same as timer/counter variables.

There are three type of variables for use in expressions. Variables with names that start with the exclamation character (!) are "temporary". Temporary variables always contain the empty string before expression evaluation begins. Typical uses of temporary variables include storage of sub-expression values for use in other parts of an

expression, or iteration counters.

Variables with names that start with the asterisk character (*) are “local”. The value of these variables is retained indefinitely. These variables are also “device-specific”. This means that only this GPI output can use this variable. Other GPI outputs have their own independent local variables (even having the same name). Typical uses of local variables are for timing of special events such as the momentary action of a GPI output.

Variables with names that do not start with ! or * are “global”. The value of these variables is also retained indefinitely. Typically, global variables hold some common sub-expression to be used in many GPI output control text strings. Global variables are initialized through the Configure Messages dialog box. Although unusual, GPI output control text can modify global variables.

Some variables have a special purpose as determined by their pre-designated names. Use of pre-designated variable names should be avoided for variables that are to function in some other manner.

The local variable *T is a pre-designated variable that can be used for event timing. If the variable is set to a non-zero positive numeric value, the value is automatically decremented once every hundredth of a second until it reaches zero. Once the value reaches zero, the control text is re-evaluated to perform further action. This may include setting the variable again to cause other actions to be performed at a later time. The actual variable *T does not change. It merely sets the top value to be decremented.

Some embedded functions require numeric arguments. Use a string of decimal digits for numeric arguments. A non-decimal string is interpreted as zero.

Embedded functions that require resource device inputs or outputs as arguments expect a combination of the resource device name and the input or output name. The two elements are separated by double colon characters (::). To use double colons within a resource device name or input or output name where the colons are not to be taken as a separator, enclose the colons in double quotes (“::”) or single quotes.

Embedded Functions

Configure GPIs Dialog Box

The Configure GPIs dialog box allows you to add, rename, remove, or change the attributes of the system's general purpose interface outputs. You can also specify the location and base address of the system's GPI inputs. GPI inputs and outputs are connected to a tally system serial port through an interface unit such as the Image Video Model 4211.

You can control GPI outputs individually or as a set of up to 32 related outputs. As with remote display units, the same embedded functions can appear in the control text the governs the operation of each set of GPI outputs. Instead of being used to control display contents, the control text for set of a GPI outputs is evaluated to produce numeric text value that directly controls the state of the GPI outputs. A set of four GPI outputs, for example, requires control text that evaluates to produce a number from 0 (all four GPI outputs off) to 15 (all four GPI outputs on). To control these outputs simultaneously, but in a mutually exclusive manner, use the values 1, 2, 4, and 8. To control a single GPI output, use the values 0 (GPI output off) and 1 (GPI output on).

By custom programming a GPI output's control text, you can have a GPI output re-act to changes on any GPI inputs or resource device outputs.

Name

Selects the desired GPI output. The other boxes and controls in the dialog box change to reflect the attributes of the selected GPI output.

Add

To add a new GPI output to the system, specify a name for the GPI output in the **Name** box, then select **Add** to add the GPI output.

Repeat the procedure to add other GPI outputs to the system. GPI output names must be unique.

Rename

To change the name of a GPI output, select the GPI output to be renamed by picking its current name from the **Name** list box, then select **Rename** to open the Rename GPI Output dialog box. Specify a new name for the GPI output. Select **OK** to rename the GPI output, or **Cancel** to abandon the operation and return to the Configure GPIs dialog box.

Remove

To remove a GPI output from the system, select the GPI output to be removed by picking its name from the **Name** list box, then select **Remove**.

GPI Outputs

Interface

Specifies the Tally System Interface unit number (1 though 16) which is actually connected to the GPI interface unit. A system can consist of more than one Tally System Interface unit, but only one of these units communicates directly with the GPI interface unit.

Port

Specifies the serial communication port that is connected to the GPI interface unit. Select the item from the list box that corresponds with the connector labels on the rear of the Tally System Interface unit. This setting has nothing to do with PC port selection. COM1 and COM2 are 9-pin RS-232 ports. COM3, COM4, COM5, and COM6 are RJ11 connector ports. The remaining ports are 9-pin RS-422 ports. Image Video Model 4211 units can use any available RS-422 port.

Address

Specifies the lowest of the set of GPI output addresses. There can be up to 512 GPI outputs on each port. Valid address range from 0 to 511. Sets of GPI outputs must have consecutive addresses.

Size

Specifies the number of GPI outputs in the set.

Control

Specifies the embedded functions that, once evaluated, determine the state of the set of GPI outputs. You only need to specify the control text once. The tally system automatically re-evaluates the control text as GPI inputs or other system conditions change.

GPI Inputs

Use these boxes to have Tally System Interface units activate GPI interface ports. This is unnecessary if the same ports are already active due to configuration of at least one GPI output the same port.

Interface

Specifies the Tally System Interface unit number (1 though 16) which is actually connected to the GPI interface unit. A system can consist of more than one Tally System Interface unit, but only one of these units communicates directly with the GPI interface unit.

Port

Specifies the serial communication port that is connected to the GPI interface unit. Select the item from the list box that corresponds with the connector labels on the rear of the Tally System Interface unit. This setting has nothing to do with PC port selection. COM1 and COM2 are 9-pin RS-232 ports. COM3, COM4, COM5, and COM6 are RJ11 connector ports. The remaining ports are 9-pin RS-422 ports. Image Video Model 4211 units can use any available RS-422 port.

Base Address

Specifies the lowest of the GPI input addresses on the selected port. There can be a base address associated with each potential GPI interface port. Other GPI input addresses are in ascending order from the this base address. There can be up to 512 GPI inputs on each port.

Close

Closes the Configure GPIs dialog box.

Help

Invokes the Windows Help System and shows this page.

Resource Outputs

Resource Output Control Text

In modeling your signal switching system for the tally system, you may create some resource devices that do not directly communicate with the tally system. These resources devices (must be provided with one or more resource outputs. Each resource output is assigned control text that determines the inputs that are considered to be selected on that resource output. The control text is a sequence of characters containing literal characters and string expressions. Expressions can contain embedded functions and sub-expressions, possibly containing more literal characters.

To generate the selected inputs for the resource output, the control text string is "evaluated" into a final string of characters. Expressions and sub-expressions are evaluated in left to right order. Parenthesis are used to group sub-expressions and alter expression evaluation order.

Expressions can be as simple as a string of single number or as complex as a string of many sub-expressions within sub-expressions (nesting). Expressions usually contain embedded functions which are executed given zero or more arguments in parenthesis. These arguments may also be literal text or sub-expressions. Embedded functions return a result string of zero or more characters which are then passed to higher-level embedded functions or treated as literal input names associated with the resource output. Ultimately, a list of zero or more input names separated by spaces is generated.

Once the control text of a resource output has been evaluated, the result can be used to control the operation of remote display units or GPI outputs just like any other non-virtual resource device output.

Warning

Although there are embedded functions that can extract the input list of a resource output, avoid using this method to make resource outputs inter-dependent on each other. Doing so lengthens the control text evaluation process causing the tally system to respond to changing system conditions more slowly. Especially avoid making a circular inter-independence between two or more resource outputs. The tally system recognizes this situation and stops re-evaluating the offending control text. If this happens, the resource outputs involved are likely to hold an improper or empty input list. The remaining elements of the tally system continue to operate normally.

Control text that does not match an embedded function "prototype" is treated as literal text. A prototype is any valid function name, followed by zero or more space characters, followed by a left parenthesis, zero or more expression arguments separated by commas, and closing with a right parenthesis.

You may wish to specify literal text which happens to match an embedded function prototype. In this case, use matching double or single quotes to enclose text which would otherwise be interpreted as an embedded function or expression grouping. Use double quotes to enclose literal text that contains one or more single quotes. Use single quotes to enclose literal text that contains one or more double quotes.

Embedded functions are available to perform various tasks. They provide "programming language" features such as variable assignment and referencing, math and logical functions, iteration, text manipulation, and system status information functions.

Named variables are essential to performing any higher-order operations within the control text. You can assign a string of characters to a variable with a name that you supply, then recall that variable's string contents elsewhere in the control text by referring

to its name.

Named variables are synonymous with ‘‘messages’’. Both refer to named elements that hold zero or more characters as their ‘‘value’’. In the discussion of expressions, the term variable is used. This is not the same as timer/counter variables.

There are three type of variables for use in expressions. Variables with names that start with the exclamation character (!) are ‘‘temporary’’. Temporary variables always contain the empty string before expression evaluation begins. Typical uses of temporary variables include storage of sub-expression values for use in other parts of an expression, or iteration counters.

Variables with names that start with the asterisk character (*) are “local”. The value of these variables is retained indefinitely. These variables are also “device-specific”. This means that only this resource output can use this variable. Other resource outputs have their own independent local variables (even having the same name).

Variables with names that do not start with ! or * are “global”. The value of these variables is also retained indefinitely. Typically, global variables hold some common sub-expression to be used in many resource output control text strings. Global variables are initialized through the Configure Messages dialog box. Although unusual, resource output control text can modify global variables.

Some variables have a special purpose as determined by their pre-designated names. Use of pre-designated variable names should be avoided for variables that are to function in some other manner.

The local variable *T is a pre-designated variable that can be used for event timing. If the variable is set to a non-zero positive numeric value, the value is automatically decremented once every hundredth of a second until it reaches zero. Once the value reaches zero, the control text is re-evaluated to perform further action. This may include setting the variable again to cause other actions to be performed at a later time. The actual variable *T does not change. It merely sets the top value to be decremented.

Some embedded functions require numeric arguments. Use a string of decimal digits for numeric arguments. A non-decimal string is interpreted as zero.

Embedded functions that require resource device inputs or outputs as arguments expect a combination of the resource device name and the input or output name. The two elements are separated by double colon characters (::). To use double colons within a resource device name or input or output name where the colons are not to be taken as a separator, enclose the colons in double quotes (“::”) or single quotes.

Embedded Functions

Embedded Functions

Embedded functions can appear in the control text of a remote display unit section, GPI output, resource output, or global message to perform various tasks. Embedded functions control display attributes, such as color and formatting, they provide "programming language" features such as variable assignment and referencing, math and logical functions, iteration, text manipulation, and system status information functions.

Most functions "return" a string of characters as a result of evaluating the function. The return string can be used as literal text or supplied to another higher-level function (the higher-level function used another function as one of its arguments). Some functions return an empty string (zero characters) because they have other side-effects such as variable assignment.

Some embedded functions return a string of characters identifying some element of system status. Examples would be a source name for a routing switcher crosspoint or the state of a GPI input signal. If the Tally System Console program is not operating in the tally system mode (a Tally System Interface unit is not connected to the PC), the information to be returned by the embedded function is not available. In this case, the embedded function returns a single question mark (?). If a Tally System Interface unit is connected later, the embedded function will return the appropriate information at that time.

Function names are not case sensitive. Function arguments are enclosed with left and right parenthesis characters and separated with a comma character. Enclose a comma or left or right parenthesis character in double or single quotes to specify the character literally.

Related functions are list in groups below. A prototype and description is provided for each function. Click the function name for more detailed descriptions and examples.

Decision Group

IF(exp1,exp2,exp3)

If *exp1* is non-zero, return *exp2*, otherwise return *exp3.*

ON(exp1,exp2,exp3,exp4,...)

If *exp1* is 0, return *exp2*, if *exp1* is 1, return *exp3*, if *exp1* is 2 return *exp4*, ... otherwise return empty string.

DO(exp1,exp2)

Execute *exp2* while *exp1* is non-zero, to a maximum of 100 iterations.

Logical Group

EQ(exp1,exp2,exp3,exp4,...)

Return 1 if *exp1* is identical to *exp2*, return 2 if *exp1* is identical to *exp3*, return 3 if *exp1* is identical to *exp4*, ... otherwise return 0.

LE(exp1,exp2)

Return 1 if *exp1* is less than or equal to *exp2*, otherwise return 0.

GE(exp1,exp2)

Return 1 if *exp1* is greater than or equal to *exp2*, otherwise return 0.

LT(exp1,exp2)

Return 1 if *exp1* is less than *exp2*, otherwise return 0.

GT(exp1,exp2)

Return 1 if *exp1* is greater than *exp2*, otherwise return 0.

NOT(exp1)

Return 1 if *exp1* is zero, otherwise return 0.

AND(exp1,exp2)

Return 1 if *exp1* and *exp2* are non-zero, otherwise return 0.

OR(exp1,exp2)

Return 1 if *exp1* or *exp2* is non-zero, otherwise return 0.

XOR(exp1,exp2)

Return 1 if *exp1* is non-zero and *exp2* is zero, or if *exp1* is zero and *exp2* is non-zero, otherwise return 0.

BN(*exp1*)

Return bit-wise complement of *exp1.*

BA(exp1,exp2)

Return bit-wise result of *exp1* and *exp2.*

BO(exp1,exp2)

Return bit-wise result of *exp1* or *exp2.*

BX(exp1,exp2)

Return bit-wise result of *exp1* exclusive-ored with *exp2.*

Text Manipulation Group

CHR(*exp1*)

Return character with numeric ASCII code *exp1.*

VAL(*exp1*)

Return numeric ASCII code value for first character of *exp1.*

LEN(*exp1*)

Return length of *exp1* in characters.

POS(exp1,exp2,exp3)

If *exp3* is positive, return position of *exp1* in *exp2* starting at *exp3*, otherwise return position of anything but *exp1* in *exp2* starting at absolute value of *exp3*. The first position is 1.

SS(exp1,exp2,exp3)

Return sub-string of *exp1*, starting at position *exp2*, containing up to *exp3* characters. The first position is 1.

UC(*exp1*)

Return upper case version of *exp1.*

LC(*exp1*)

Return lower case version of *exp1.*

TL(*exp1*)

Return *exp1* with leading spaces removed (left trim).

TR(*exp1*)

Return *exp1* with trailing spaces removed (right trim).

Mathematical Group

ADD(exp1,exp2)

Return sum of *exp1* and *exp2.*

SUB(exp1,exp2)

Return difference of *exp1* and *exp2.*

MUL(exp1,exp2)

Return product of *exp1* and *exp2.*

DIV(exp1,exp2)

Return quotient of *exp1* and *exp2.* Divide by 0 yields 0.

MOD(exp1,exp2)

Return modulus of *exp1* and *exp2*. Result is from 0 to *exp2* less 1. Modulus by 0 yields 0.

Date and Time Group

DATE(*exp1*)

Returns a sampling of the year, month, day, and day of week in YYYYMMDDW format, adjusted for the timer named *exp1*. If *exp1* is omitted, the local date (unadjusted) is returned. W is 0 (Sunday) to 6 (Saturday), ex. 199712313 is Wednesday, December 31, 1997.

TIME(*exp1*)

Returns a sampling of the hours, minutes, seconds, and fractions of seconds elapsed in the current day in HHMMSSFF format, adjusted for the timer named *exp1*. If exp1 is omitted, the local time (unadjusted) is returned.

TICK()

Returns a sampling of the number of hundredths of a second elapsed since the tally system was powered on (overflows to zero after 214,748,364).

Display Attributes Group

LIN(*exp1*)

Set enabled lines to *exp1* (0 to 7, a 3 bit map), return empty string. Bit 0 is 1 for line 1. Bit 1 is one for line 2. Bit 2 is 1 for line 3.

DUR(*exp1*)

Set enabled line durations to *exp1* in hundredths of a second, return empty string.

AC(*exp1*)

Set color attribute *exp1* (0 to 255, an 8 bit map, or omitted), return empty string. Bit 0 is 1 for red. Bit 1 is 1 for green. Bits 0 and 1 are 1 for amber. Remaining bits are red and green enables for external tally-sensitive color control (four tally states).

AF(*exp1*)

Set character set (font) attribute *exp1* (0 to 255 or omitted), return empty string. Bits 0 to 2 select character set; 0 for large fixed space font, 1 for large proportional space font, 2 for medium proportional space font, 3 for small font, 4 for wide font, and 5 for block font. Bit 3 is for vertical character orientation. Bit 4 is 1 for dot reversal. Some characters sets may not be available all remote display units.

AJ(*exp1*)

Set justification attribute *exp1* (0 to 3 for left, centre, right, and full justify, respectively), return empty string.

AT(*exp1*)

Select timer/counter named *exp1*, return empty string.

CH(*exp1*)

Return timer/counter variable code character for selector *exp1* (1 to 69).

GC(*exp1*)

Return graphic character number *exp1* (1 to 9).

Variable Group
SV(exp1,exp2)

Set *exp2* as the value of the variable identified by *exp1*, return empty string.

V(exp1)

Return value of variable identified by *exp1.*

FN(*exp1*)

Execute expression stored in variable identified by *exp1.*

System Parameter Group (Timers and Counters)
SPM(exp1,exp2)

Set system parameter value and mode to *exp2* for the system parameter identified by *exp1*, return empty string.

GPV(*exp1*)

Return system parameter value of the system parameter identified by *exp1.*

GPM(*exp1*)

Return system parameter mode of the system parameter identified by *exp1.*

SP(*exp1*)

Return the single variable digit selected by *exp1* (1 to 19) for the most recently selected timer/counter.

System Information Group
NAME()

Return name of remote display unit.

ID()

Return serial identification number with appended section number (1, 2, or 3) of remote display unit section.

US()

Return remote display unit section size in dots.

S(exp1,exp2)

Return the styled name for the input or output with name *exp1* and style *exp2.*

SRC(exp1,exp2)

Return name of one originating source for the output with name *exp1*, *exp2* is 0 for highest priority originating source, 1 for next highest, etc., return empty string if there are fewer than *exp2* + 1 originating sources.

SL(exp1,exp2,exp3,exp4,exp5,exp6)

Return a list of unique originating source names for the output with name *exp1* using style *exp2*. Each source name in the returned text is prefixed with *exp3* if that source is feeding any program-type destination (on-air), *exp4* if that source is feeding any preset-type destination (next-to-air), or *exp5* if neither of those two conditions apply. For a typical three-color display, *exp3*, *exp4*, and *exp5* are set to the color attribute functions for red, amber, and green, or AC(85), AC(255), and AC(170), respectively.

SID(exp1,exp2,exp3,exp4,...)

Return 1 if the input with name *exp1* reaches the output with name *exp2*, return 2 if input *exp1* reaches output *exp3*, return 3 if input *exp1* reaches output *exp4*, ... otherwise return 0.

TSX(exp1,exp2,exp3,exp4,exp5)

Return tally and styled name of one originating source for the output with name *exp1* using style exp2. The returned text is prefixed with *exp3* if the source is feeding any program-type destination (on-air), *exp4* if the source is feeding any preset-type destination (next-to-air), or *exp5* if neither of those two conditions apply. For a typical three-color display, *exp3*, *exp4*, and *exp5* are set to the color attribute functions for red, amber, and green, or AC(85), AC(255), and AC(170), respectively.

TSS(exp1,exp2,exp3,exp4,exp5)

Return tally and styled name of the input with name *exp1* using style exp2. The returned text is prefixed with *exp3* if the input is feeding any program-type destination (on-air), *exp4* if the input is feeding any preset-type destination (next-to-air), or *exp5* if neither of those two conditions apply. For a typical three-color display, *exp3*, *exp4*, and *exp5* are set to the color attribute functions for red, amber, and green, or AC(85), AC(255), and AC(170), respectively.

TSD(exp1,exp2,exp3,exp4,exp5)

Return tally and styled name for the output with name *exp1* using style exp2. The returned text is prefixed with *exp3* if the output is feeding any program-type destination (on-air), *exp4* if the output is feeding any preset-type destination (next-to-air), or *exp5* if neither of those two conditions apply. For a typical three-color display, *exp3*, *exp4*, and *exp5* are set to the color attribute functions for red, amber, and green, or AC(85), AC(255), and AC(170), respectively.

SINP(*exp1*)

Return name of signal feeding input with name *exp1*, return empty string if input is an originating signal (it is not fed by another device within the tally system).

SOUT(*exp1*)

Return name of signal fed by output with name *exp1*, return empty string if output is a terminating signal (it does not feed another device within the tally system).

XPT(*exp1*)

Return name of input selected on output with name *exp1.*

INUM(*exp1*)

Return input number of input with name *exp1*, return empty string if input number not known.

ONUM(*exp1*)

Return output number of output with name *exp1*, return empty string if output number not known.

PGM(*exp1*)

Return 1 if the input with name *exp1* is feeding any program-type destination (on-air), otherwise return 0.

PST(*exp1*)

Return 1 if the input with name *exp1* is feeding any preset-type destination (next-to-air), otherwise return 0.

PGD(exp1,exp2)

Return name of one program-type destination (on-air) that is reached by the source with name *exp1*, *exp2* is 0 for highest priority destination, 1 for next highest, etc., return empty string if there are fewer than *exp2* + 1 program-type destinations reached by the source.

PSD(exp1,exp2)

Return name of one preset-type destination (next-to-air) that is reached by the source with name *exp1*, *exp2* is 0 for highest priority destination, 1 for next highest, etc., return empty string if there are fewer than *exp2* + 1 preset-type destinations reached by the source.

IV(*exp1*)

Return numeric value indicating the state of parallel input with identification number *exp1.* The state of an active parallel input is 1. The state of an inactive parallel input is 0.

I2N(exp1,exp2,exp3)

Return list of numeric values *exp3*, *exp3* + 1, *exp3* + 2,... *exp3* + *exp2* - 1, separated by spaces, corresponding to the parallel inputs with identification numbers *exp1, exp1* + 1, *exp1* + 2, ... *exp1* + *exp2* - 1 that are in the active state.

ADD Function

Format:

ADD(*exp1,exp2****)***

The result is the sum of the numeric value *exp1* and *exp2*.

Example:

```
SV(!X,ADD(V(!X),1))
```

Increment the value of temporary variable X by 1.

Other math group functions: SUB MUL DIV MOD

AND Function

Format:

AND(*exp1,exp2****)***

If both *exp1* and *exp2* are not zero the result is 1, otherwise the result is zero.

Example:

```
SV(!Z,AND(V(!X),V(!Y)))
```

If the temporary variable X is not zero and the temporary variable Y is not zero, set the value of temporary variable Z to 1, otherwise set the value of temporary variable Z to zero.

Other logical group functions: EQ LE GE LT GT NOT OR XOR BN BA BO BX

BA Function

Format:

BA(*exp1,exp2****)***

Each bit within the result value is 1 if the corresponding bits in the numeric values *exp1* and *exp2* are both 1, otherwise that result bit is zero. The result bits are combined to produce the result value.

Example:

```
SV(!X,BA(V(!Y),15))
```

The value of the temporary variable X is set to the least significant four bits of temporary variable Y.

Other logical group functions: EQ LE GE LT GT NOT AND OR XOR BN BO BX

BN Function

Format:

BN(*exp1***)**
Each bit within the result value is the inversion of the corresponding bit in the value *exp1* (one's complement).

Example:

```
SV(!X,BN(V(!X))
```
Invert the value of the temporary variable X.

Other logical group functions: EQ LE GE LT GT NOT AND OR XOR BA BO BX

BO Function

Format:

BO(*exp1,exp2****)***

Each bit within the result value is 1 if either of the corresponding bits in the numeric values *exp1* and *exp2* are 1, otherwise that result bit is zero. The result bits are combined to produce the result value.

Example:

```
SV(!X,BO(V(!X),1))
```

The value of the temporary variable X is set to nearest odd value.

Other logical group functions: EQ LE GE LT GT NOT AND OR XOR BN BA BX

BX Function

Format:

BX(*exp1,exp2****)***

Each bit within the result value is 1 if the corresponding bits in the numeric values *exp1* and *exp2* are different, otherwise that result bit is zero. The result bits are combined to produce the result value.

Example:

```
SV(!X,BX(V(!X),255))
```

The least significant eight bits of the value of the temporary variable X are inverted.

Other logical group functions: EQ LE GE LT GT NOT AND OR XOR BN BA BO

CHR Function

Format:

CHR(*exp1***)**
The result is a single character having the ASCII value *exp1*.

Example:

```
SV(!X,CHR(61)CHR(62)CHR(63))
```
The temporary variable X is set to ABC.

Other text manipulation group functions: VAL LEN POS SS UC LC TL TR

DATE Function

Format:

DATE(*exp1***)**
The result is a sample of the day, month, year, and day of week adjusted for the timer named *exp1*, or the local date (unadjusted) if *exp1* is omitted.

Example:

```
SV(!D,SS(DATE(),1,4))
```
The temporary variable D is set to the local year.

Other date and time group functions: TIME TICK

DIV Function

Format:

DIV(*exp1,exp2****)***

The result is the division of the numeric value *exp1* and *exp2*. The remainder is discarded. If *exp2* is zero, the result is also zero.

Example:

```
SV(!X,DIV(V(!X),10))
```

The temporary variable X is divided by 10.

Other math group functions: ADD SUB MUL MOD

DO Function

Format:

DO(*exp1,exp2****)***

Repeatedly return the result of evaluating *exp2* until *exp1* is zero or a maximum of 100 iterations is reached. For effective use, evaluating *exp2* must cause *exp1* to eventually change to zero.

Example:

```
SV(!X,0)DO(LT(V(!X),5),SV(!X,ADD(V(!X),1))V(!X)" ")
```

The result is the numbers from 1 to 5 separated by spaces.

Other decision group functions: IF ON

EQ Function

Format:

EQ(*exp1,exp2,exp3,exp4,...****)***

The result is 1, 2, 3, ... if exp1 is equal to *exp2*, exp3, exp4, ..., respectively. The result is zero if *exp1* is not equal to any of *exp2*, *exp3*, *exp4*, ...

Example:

```
EQ(V(!X),JOHN,BOB,JIM,DAVE)
```

The result is 1, 2, 3, or 4, for values JOHN, BOB, JIM, or DAVE of temporary variable X.

Other logical group functions: LE GE LT GT NOT AND OR XOR BN BA BO BX

FN Function

Format:

FN(*exp1***)**
The value of the variable named *exp1* is inserted and evaluated as if it appears in place of the FN function. Use this function to apply common portions of control text to many displays at once. Create a global message containing the common text fragment as its value and re-use the fragment where needed using the FN function with the name of the global message.

Example:

SV(!Y,"SV(!X,ADD(V(!X),1))")SV(!X,0)FN(!Y)V(!X) FN(!Y)V(!X) FN(!Y)V(!X)

The result is 1 2 3.

Other variable group functions: SV V

GE Function

Format:

GE(*exp1,exp2****)***

If *exp1* is greater than or equal to *exp2* the result is 1, otherwise the result is zero. If either of *exp1* or *exp2* are non-numeric, the strings are compared lexically in ASCII order (“ACC” is greater than “ABC”).

Example:

IF(GE(V(!X),10) ,”ALARM OVERFLOW”,V(!X)” ALARMS”)
If the temporary variable X has a value of 10 or more the IF function evaluates to the text “ALARM OVERFLOW”, otherwise the IF function evaluates to the text “*n* ALARMS”, where *n* is the value of temporary variable X.

Other logical group functions: EQ LE LT GT NOT AND OR XOR BN BA BO BX

GPM Function

Format:

GPM(*exp1***)**
Gets the system parameter mode of the timer/counter named *exp1*.

Example:

```
ON(EQ(SS(GPM(T1),6,2),24,29),OTHER,PAL,NTSC)
```
The result is PAL, NTSC, or OTHER if the timer named T1 counts in 25, 30, or some other number of frames per second.

Other system parameter group functions: SPM GPV SP

GPV Function

Format:

GPV(*exp1***)**
Gets the system parameter value of the timer/counter named *exp1*.

Example:

```
SV(!X,SS(GPV(T1),1,2))
```
Set the temporary variable X to the current hour of the timer named T1.

Other system parameter group functions: SPM GPM SP

GT Function

Format:

GT(*exp1,exp2****)***

If *exp1* is greater than *exp2* the result is 1, otherwise the result is zero. If either of *exp1* or *exp2* are non-numeric, the strings are compared lexically in ASCII order (“ACC” is greater than “ABC”).

Example:

```
IF(GT(V(!X),10) ,”ALARM OVERFLOW”,V(!X)” ALARMS”)
```

If the temporary variable X has a value more than 10 the IF function evaluates to the text “ALARM OVERFLOW”, otherwise the IF function evaluates to the text “*n* ALARMS”, where *n* is the value of temporary variable X.

Other logical group functions: EQ LE GE LT NOT AND OR XOR BN BA BO BX

I2N Function

Format:

I2N(*exp1,exp2,exp3****)***

Converts a set of active GPI inputs to a list of numbers. Value *exp1* is the first GPI input number. Value *exp2* is the number of consecutive GPI inputs. Value *exp3* is the first number of a sequence that corresponds with the first GPI input. This function is commonly used to implement a multiple source output of a resource device. The I2N function is specified in the control text of one of the resource outputs of the device.

Example:

```
I2N(40, 20, 1)
```

The result is the numbers from 1 to 20 separated by spaces that correspond to active GPI inputs from 40 to 59.

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV

ID Function

Format:

ID()
The result is the serial number of up to 6 characters followed by the section number 1, 2, or 3 of the display section that is accessing this function.

Example:

```
ON(SS(ID(),LEN(ID()),1),,LEFT,CENTRE,RIGHT)
```
The result is LEFT, CENTRE, or RIGHT depending on the display section.

Other system information group functions: NAME US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

IF Function

Format:

IF(*exp1,exp2,exp3****)***

If *exp1* is not zero, the result is *exp2*, otherwise the result is *exp3*.

Example:

```
IF(IV(0),"ALARM 1","NO ALARMS")
```

If GPI input number 0 has is active, the IF function evaluates to the text "ALARM 1". If GPI input number 0 is not active, the IF functions evaluates to the text "NO ALARMS".

Other decision group functions: ON DO

INUM Function

Format:

INUM(*exp1***)**
Not available.

Example:

```
INUM(R1::CAM1)
```

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT ONUM PGM PST PGD PSD IV I2N

IV Function

Format:

IV(*exp1***)**
The result is 1 if GPI input *exp1* is active, otherwise the result is zero. Value exp1 must be numeric from 0 to 511.

Example:

```
SV(!X,EQ(IV(0)IV(1)IV(2),100,110,111))
```
Sets temporary variable X to 1 if GPI input 0 is on and inputs 1 and 2 are off. Sets temporary variable X to 2 if GPI inputs 0 and 1 are on and input 2 is off. Sets temporary variable X to 3 if GPI inputs 0, 1, and 2 are on. For any other conditions of GPI inputs 0, 1, and 2, set temporary variable X to 0.

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD I2N

LC Function

Format:

LC(*exp1***)**
Any upper case letters in *exp1* are converted to lower case in the result.

Example:

```
UC(SS(V(!X),1,1))LC(SS(V(!X),2,50))
```
Modifies the temporary variable X to have the first character in upper case and the remaining characters in lower case.

Other text manipulation group functions: CHR VAL LEN POS SS UC TL TR

LE Function

Format:

LE(*exp1,exp2****)***

If *exp1* is less than or equal to *exp2* the result is 1, otherwise the result is zero. If either of *exp1* or *exp2* are non-numeric, the strings are compared lexically in ASCII order (“ABC” is less than “ACC”).

Example:

```
IF(LE(V(!X),10),”IN RANGE”,”OUT OF RANGE”)
```

If the temporary variable X has a value of more than 10 the IF function evaluates to the text “OUT OF RANGE”, otherwise the IF function evaluates to the text “IN RANGE”.

Other logical group functions: EQ GE LT GT NOT AND OR XOR BN BA BO BX

LEN Function

Format:

LEN(*exp1***)**
The result is the number of characters in *exp1*.

Example:

```
SS("          ",1,DIV(SUB(20,LEN(V(!X))),2))V(!X)
```

The result is the contents of temporary variable X centered in a 20-character display area.

Other text manipulation group functions: CHR VAL POS SS UC LC TL TR

LT Function

Format:

LT(*exp1,exp2****)***

If *exp1* is less than *exp2* the result is 1, otherwise the result is zero. If either of *exp1* or *exp2* are non-numeric, the strings are compared lexically in ASCII order (“ABC” is less than “ACC”).

Example:

```
IF(LT(V(!X),10),”BELOW TEN”,”TEN OR MORE”)
```

If the temporary variable X has a value of 10 or more the IF function evaluates to the text “TEN OR MORE”, otherwise the IF function evaluates to the text “BELOW TEN”.

Other logical group functions: EQ LE GE GT NOT AND OR XOR BN BA BO BX

MOD Function

Format:

MOD(*exp1,exp2****)***

The result is the remainder of the division of the numeric value *exp1* and *exp2*. The dividend is discarded. If *exp2* is zero, the result is also zero.

Example:

```
SV(!X,MOD(V(!X),10))
```

Sets the temporary variable X to a modulo-10 value.

Other math group functions: ADD SUB MUL DIV

MUL Function

Format:

MUL*(exp1,exp2)*

The result is the product of the numeric value *exp1* and *exp2*.

Example:

```
SV(!X,MUL(V(!X),2))
```

Doubles the value of the temporary variable X.

Other math group functions: ADD SUB DIV MOD

NAME Function

Format:

NAME()
The result is the name of up to 26 characters of the display that is accessing this function.

Example:

```
SS(NAME(),SUB(LEN(NAME()),2),3))
```
The result is the last three characters from the name of the display.

Other system information group functions: ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

NOT Function

Format:

NOT(*exp1***)**
If *exp1* is not zero the result is 1, otherwise the result is zero.

Example:

```
SV(!Y,NOT(EQ(V(!X),5)))
```
If the temporary variable X is 5, set the value of temporary variable Y to zero, otherwise set the value of temporary variable Y to 1.

Other logical group functions: EQ LE GE LT GT AND OR XOR BN BA BO BX

ON Function

Format:

ON*(exp1,exp2,exp3,exp4,...)*

The result is *exp2*, *exp3*, *exp4*, ... if *exp1* is 0, 1, 2, ..., respectively. If *exp1* is too large, the result is the empty string.

Example:

```
ON(V(!X),ZERO,ONE,TWO,THREE,FOUR)
```

The result is ZERO, ONE, TWO, THREE, or FOUR for values 0, 1, 2, 3, 4 of temporary variable X, respectively.

Other decision group functions: IF DO

ONUM Function

Format:

ONUM(*exp1***)**
Not available.

Example:

```
ONUM(R1::VTR02)
```

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM PGM PST PGD PSD IV I2N

OR Function

Format:

OR(*exp1,exp2****)***

If either *exp1* or *exp2* are not zero the result is 1, otherwise the result is zero.

Example:

```
SV(!Z,OR(V(!X),V(!Y)))
```

If the temporary variable X is not zero or the temporary variable Y is not zero, set the value of temporary variable Z to 1, otherwise set the value of temporary variable Z to zero.

Other logical group functions: EQ LE GE LT GT NOT AND XOR BN BA BO BX

PGD Function

Format:

PGD(*exp1,exp2****)***

The result is the name of one of the on-air destinations currently reached by the source named *exp1*. The numeric value *exp2* is zero to get highest priority destination, 1 for next highest, and so on. If the result is the empty string, there are no more on-air destinations reached by that source. The format of *exp1* is `R::N[L]`, where `R` is the resource device name, `N` is the source name, and `L` is the optional level indicator. `N` and `L` are dependent on the type of resource device.

Example:

```
S(PGD(R1::VTR002,0),A)
```

The result is the style A name of the first on-air destination connected to source VTR002 of resource R1.

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PSD IV I2N

PGM Function

Format:

PGM(*exp1***)**
The result is 1 if source *exp1* is currently on-air, otherwise the result is zero. The source format is `R::N[L]`, where `R` is the resource device name, `N` is the source name, and `L` is the optional level indicator. `N` and `L` are dependent on the type of resource device.

Example:

```
IF(PGM(R1::CAM001),AC(85),AC(170))CAM 1
```
The result is CAM 1 in red if the source CAM001 of resource R1 is used on-air, otherwise the result is CAM 1 in green.

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PST IV I2N

POS Function

Format:

POS(*exp1,exp2,exp3****)***

If the value *exp3* is positive, the result is the position of string *exp2* in string *exp1* starting at position *exp3* of string *exp1*. The first position is 1. If the value *exp3* is negative (it starts with a minus sign), the result is the position of anything but string *exp2* in string *exp1* starting at position *exp3* (its absolute value).

Example:

CAM 3 IF(POS(R2::CAM3,XPT(R2::ISO1)" "XPT(R2::ISO2)" "XPT(R2::ISO3,1)),ISO,IDLE)

The result is CAM 3 ISO if the source CAM3 is selected on destination ISO1, ISO2, or ISO3 of resource R2, otherwise the result is CAM 3 IDLE.

Other text manipulation group functions: CHR VAL LEN SS UC LC TL TR

PSD Function

Format:

PSD(*exp1,exp2****)***

The result is the name of one of the next-to-air destinations currently reached by the source named *exp1*. The numeric value *exp2* is zero to get highest priority destination, 1 for next highest, and so on. If the result is the empty string, there are no more next-to-air destinations reached by that source. The format of *exp1* is `R::N[L]`, where `R` is the resource device name, `N` is the source name, and `L` is the optional level indicator. `N` and `L` are dependent on the type of resource device.

Example:

```
S(PSD(R1::CAM003,0),A)
```

The result is the style A name of the first next-to-air destination connected to source CAM003 of resource R1.

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD IV I2N

PST Function

Format:

PST(*exp1***)**
The result is 1 if source *exp1* is currently next-to-air, otherwise the result is zero. The source format is `R::N[L]`, where `R` is the resource device name, `N` is the source name, and `L` is the optional level indicator. `N` and `L` are dependent on the type of resource device.

Example:

```
IF(PST(R1::CAM002),AC(255),AC(170))CAM 2
```
The result is CAM 2 in amber if source CAM002 of resource R1 is next-to-air, otherwise the result is CAM 2 in green.

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PGD PSD IV I2N

S Function

Format:

S(exp1,exp2**)**

Gets the "styled" name of the source or destination named *exp1* using the style selector *exp2*. The format of *exp1* is `R::N[L]`, where `R` is the resource device name, `N` is the source or destination name, and `L` is the optional level indicator. `N` and `L` are dependent on the type of resource device. Style *exp2* is as follows:

Selector	Style
0	primary name
1	secondary name
2	short name
3	long name
A	style A
B	style B

Styles A and B refer to one of the other styles independently for each source and destination. Primary and secondary names refer to the native name within the resource device, which could be a number. Long and short names are user-specified aliases.

Example:

```
S(SRC(R1::AUX002,0),3)
```

The result is the long name of the originating source at destination AUX002 of resource R1.

Other system information group functions: NAME ID US SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

SID Function

Format:

SID(*exp1,exp2,exp3,exp4,...****)***

The result is 1, 2, 3, ... if the source named *exp1* reaches the destination named *exp2*, *exp3*, *exp4*, ..., otherwise the result is zero. The format of *exp1*, *exp2*, exp3, *exp4*, ... is `R::N[L]`, where `R` is the resource device name, `N` is the source or destination name, and `L` is the optional level indicator. `N` and `L` are dependent on the type of resource device.

Example:

```
CAM 3 IF(SID(R2::CAM3,R2::ISO1,R2::ISO2,R2::ISO3),ISO,IDLE)
```

The result is CAM 3 ISO if the source CAM3 is selected on any of the destinations ISO1, ISO2, or ISO3 of resource R2, otherwise the result is CAM3 IDLE.

Other system information group functions: NAME ID US S SRC SL TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

SINP Function

Format:

SINP(*exp1***)**
Not available.

Example:

```
SINP(FEED2)
```

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

SL Function

Format:

SL(*exp1,exp2,exp3,exp4,exp5,exp6****)***

The result is a list of zero or more styled names of sources currently reaching the destination named *exp1* using the style selector *exp2*, with each source name preceded by one of string *exp4*, *exp5*, or *exp6*, depending on the on-air, next-to-air, or normal usage of the source, respectively. The function limits the total length of source names (including space separators) to the numeric value of *exp3* in characters (partial source names are not listed). The format of *exp1* and *exp2* is described with S function.

Example:

```
SL(S1::PGMOUTV,A,26,AC(85),AC(255),AC(170))
```

The result is a list, in 26 characters or less, of style A source names for sources reaching destination PGMOUTV of resource S1. Each on-air, next-to-air, and other sources appear red, amber, and green, respectively.

Other system information group functions: NAME ID US S SRC SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

SOUT Function

Format:

SOUT(*exp1***)**
Not available.

Example:

```
SOUT(FEED1)
```

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP XPT INUM ONUM PGM PST PGD PSD IV I2N

SP Function

Format:

SP(*exp1***)**
The result is a timer/counter digit selected by *exp1* for the timer/counter selected by most recent AT function. If none were selected, the result is the empty string. You can use any digit more than once in the same display. The numeric value *exp1* selects digits as follows:

Selector	Digit
1	tens of hours
2	units of hours
3	tens of minutes
4	units of minutes
5	tens of seconds
6	units of seconds
7	tens of frames
8	units of frames
9	tens of hours (zero-blanking)
10	units of hours (zero-blanking)
11	tens of minutes (zero-blanking)
12	units of minutes (zero-blanking)
13	tens of seconds (zero-blanking)
14	units of seconds (zero-blanking)
15	tens of frames (zero-blanking)
16	tens of hours (12-hour format)
17	units of hours (12-hour format)
18	upper-case A or P for AM/PM indicator
19	lower-case a or p for am/pm indicator

Use this function to format your own timer/counter displays. Alternately, you can insert all the necessary functions at once from a dialog box. The dialog box list several common clock formats. Select **Ctrl+M,** or choose **Insert; Timers/Counters** from the main menu, to open this dialog box.

Example:

```
AT(T2)SP(1)SP(2):SP(3)SP(4):SP(5)SP(6).SP(7)SP(8)
```
The result is the hours, minutes, seconds, and frames for the timer named T2 in HH:MM:SS.FF format.

Other system parameter group functions: SPM GPV GPM

SPM Function

Format:

SPM(*exp1,exp2****)***

Sets the system parameter mode and value of the timer/counter named *exp1* to *exp2*.

Example:

```
SPM(T1,0215000010100--)
```

Sets the timer named T1 to follow 2 hours and 15 minutes ahead of local time.

Other system parameter group functions: GPV GPM SP

SRC Function

Format:

SRC(*exp1,exp2****)***

The result is the name of one of the originating sources currently reaching the destination named *exp1*. The numeric value *exp2* is zero to get highest priority source, 1 for next highest, and so on. If the result is the empty string, there are no more sources reaching that destination. The format of *exp1* is `R::N[L]`, where `R` is the resource device name, `N` is the destination name, and `L` is the optional level indicator. `N` and `L` are dependent on the type of resource device.

Example:

```
S(SRC(R1::VTR001,0),A)
```

The result is the style A name of the originating source at the destination VTR001 of resource R1.

Other system information group functions: NAME ID US S SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

SS Function

Format:

SS(*exp1,exp2,exp3****)***

The result is the part of string *exp1* starting from position *exp2* and containing up to *exp3* characters. The first position is 1.

Example:

```
SV(!X,SS(ADD(V(!X),1000),2,3))
```

The temporary variable X is padded with leading zeros to make it at least 3 characters long.

Other text manipulation group functions: CHR VAL LEN POS UC LC TL TR

SUB Function

Format:

SUB(*exp1,exp2****)***

The result is the remainder of the subtraction of the numeric value *exp2* from *exp1*.

Example:

```
SV(!Y,EQ(LEN(SUB(V(!X),1)),LEN(V(!X))))
```

Set the temporary variable Y to zero if the temporary variable X is a power of 10, otherwise set the temporary variable Y to 1.

Other math group functions: ADD MUL DIV MOD

SV Function

Format:

SV(*exp1,exp2****)***

If the variable named *exp1* already exists, the result of this function is to replace its value with *exp2*, otherwise the function creates a variable named *exp1* and gives it the initial value of *exp2*. The result is always the empty string.

The first character of *exp1* determines the type of variable being set.

If *exp1* starts with an exclamation point ! the variable is considered temporary. Its value lasts only until the end of the control text in which it appears.

If *exp1* start with an asterisk * the variable is considered private to the display section in which it appears. Its value is not available to other displays.

If *exp1* starts with any other character, the variable is considered global to all displays. Do not create or modify global variables within the control text of any display section if its value is to be used by other display sections. Instead, use the Configure Messages dialog box to create or change the value of a global variable.

Example:

```
SV(!X,"SV(!Y,MUL(V(!Y),10))V(!Y)")SV(!Y,1)FN(!X) FN(!X) FN(!X)
```

The result is 10 100 1000 by using the temporary variable X to repeat a set of operations on the temporary variable Y.

Other variable group functions: V FN

TICK Function

Format:

TICK()
The result is a sample of the number of hundredths of seconds that have elapsed since the tally system was powered on. This number overflows to zero approximately every 24.8 days.

Example:

SV(X,IF(LEN(V(X)),V(X),TICK()))IF(LT(TICK(),ADD(V(X),500)),WAIT,DONE)

The result is WORKING if less than 5 seconds has past, otherwise the result is DONE.

Other date and time group functions: DATE TIME

TIME Function

Format:

TIME(*exp1***)**
The result is a sample of the hour, minute, second, and frame adjusted for the timer named *exp1*, or the local time (unadjusted) if *exp1* is omitted.

Example:

```
SV(!T,SS(TIME(),1,2))
```
Sets the temporary variable T to the local hour.

Other date and time group functions: DATE TICK

TL Function

Format:

TL(*exp1***)**
The result is the string *exp1* with any leading spaces removed.

Example:

```
TL(IF(IV(1),” 1”,)IF(IV(2),” 2”,)IF(IV(3),” 3”,))
```
The result is a list of only the active GPI inputs 1, 2 and 3, removing first space separator.

Other text manipulation group functions: CHR VAL LEN POS SS UC LC TR

TR Function

Format:

TR(*exp1***)**
The result is the string *exp1* with any trailing spaces removed.

Example:

```
TR(IF(IV(1),"1 ",)IF(IV(2),"2 ",)IF(IV(3),"3 ",))
```

The result is a list of only the active GPI inputs 1, 2 and 3, removing last space separator.

Other text manipulation group functions: CHR VAL LEN POS SS UC LC TL

TSD Function

Format:

TSD(*exp1,exp2,exp3,exp4,exp5****)***

The result is the styled name of the destination named *exp1* using the style selector *exp2*, preceded by one of string *exp3*, *exp4*, or *exp5*, depending on the on-air, next-to-air, or normal usage of that destination, respectively. The format of *exp1* and *exp2* is described with S function.

Example:

```
TSD(R1::AUX001[1],3,AC(85),AC(255),AC(0))
```

The result is the long name for the destination AUX001, level 1, of resource R1. The name appears red, amber, or blank if the destination is on-air, next-to-air, or neither, respectively.

Other system information group functions: NAME ID US S SRC SL SID TSX TSS SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

TSS Function

Format:

TSS(*exp1,exp2,exp3,exp4,exp5****)***

The result is the styled name of the source named *exp1* using the style selector *exp2*, preceded by one of string *exp3*, *exp4*, or *exp5*, depending on the on-air, next-to-air, or normal usage of that source, respectively. The format of *exp1* and *exp2* is described with S function.

Example:

```
TSS(R1::CAM5,A,AC(85),AC(255),AC(170))
```

The result is the style A name for the source CAM5 of resource R1. The name appears red, amber, or green if the source is on-air, next-to-air, or neither, respectively.

Other system information group functions: NAME ID US S SRC SL SID TSX TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

TSX Function

Format:

TSX(*exp1,exp2,exp3,exp4,exp5****)***

The result is the styled name of the source currently reaching the destination named *exp1* using the style selector *exp2*, preceded by one of string *exp3*, *exp4*, or *exp5*, depending on the on-air, next-to-air, or normal usage of that source, respectively. The format of *exp1* and *exp2* is described with S function.

Example:

```
TSX(R2::004[2],A,AC(85),AC(255),AC(170))
```

The result is the style A name for the source 004, level 2, of resource R2. The name appears red, amber, or green if the source is on-air, next-to-air, or neither, respectively.

Other system information group functions: NAME ID US S SRC SL SID TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

UC Function

Format:

UC(*exp1***)**
Any lower case letters in *exp1* are converted to upper case in the result.

Example:

```
UC(SS(V(!X),1,1))LC(SS(V(!X),2,50))
```
Modifies the temporary variable X to have the first character in upper case and the remaining characters in lower case.

Other text manipulation group functions: CHR VAL LEN POS SS LC TL TR

US Function

Format:

US()
The result is the number of dots there are in the width of the display section that is accessing this function.

Example:

```
SV(!X,DIV(US(),6))
```
Sets the temporary variable X to the number of fixed spacing characters that fit in the display section.

Other system information group functions: NAME ID S SRC SL SID TSX TSS TSD SINP SOUT XPT INUM ONUM PGM PST PGD PSD IV I2N

V Function

Format:

V(*exp1***)**
The result is the contents of the variable named *exp1*. The contents are not re-evaluated. Use the FN function to evaluate the contents of a variable. If the variable does not exist, the result is the empty string.

The first character of *exp1* determines the type of variable. Variable types are described with the SV function.

Example:

```
SV(!X,:)AT(T1)SP(1)SP(2)V(!X)SP(3)SP(4)V(!X)SP(5)SP(6)
```

Using the temporary variable X to specify the separator as a colon, the result is the hours, minutes, seconds for the timer named T1 in HH:MM:SS format.

Other variable group functions: SV FN

VAL Function

Format:

VAL(*exp1***)**
The result is the numeric ASCII value of the first character of the string *exp1*.

Example:

```
IF(LT(VAL(UC(V(!X))),VAL(N)),A-M,N-Z)
```
The result is A-M if the first character of temporary variable X has a value less than that of the letter N, otherwise the result is N-Z.

Other text manipulation group functions: CHR LEN POS SS UC LC TL TR

XOR Function

Format:

XOR*(exp1,exp2)*

If both *exp1* and *exp2* are not zero, or both *exp1* and *exp2* are zero, the result is zero, otherwise the result is 1.

Example:

```
SV(!Z,XOR(V(!X),V(!Y)))
```

If the temporary variable X is not zero and the temporary variable Y is zero, or the temporary variable X is zero and the temporary variable Y is not zero, set the value of temporary variable Z to 1, otherwise set the value of temporary variable Z to zero.

Other logical group functions: EQ LE GE LT GT NOT AND OR BN BA BO BX

XPT Function

Format:

XPT(*exp1***)**
The result is the name of the source currently reaching the destination *exp1*. The format of *exp1* is `R::N[L]`, where `R` is the resource device name, `N` is the destination name, and `L` is the optional level indicator. `N` and `L` are dependent on the type of resource device.

Use this function instead of the SRC function when you are interested in the closest but not necessarily originating source for a destination.

Example:

```
S(XPT(R1::VTR001),2)
```
The result is the short name for the source reaching the destination VTR001 of resource R1.

Other system information group functions: NAME ID US S SRC SL SID TSX TSS TSD SINP SOUT INUM ONUM PGM PST PGD PSD IV I2N

Configure Resource Output Dialog Box

The Configure Resource Output dialog box allows you to add, remove, or change the control text of the system's resource outputs.

Use this dialog box to specify how a resource device's output determines the resource device's inputs that it carries. This is only required for resource devices of the "virtual router" type. Other "non-virtual" resource devices obtain input to output routing information directly from a "real router" over a specific communication port.

Some virtual router type resource devices may not physically exist so their behavior must be synthesized. Other virtual router resource type devices exist, but they have no serial communication port. An example of this would be a production switcher that does not appear in the list of supported types of resource devices. In this case, a set of GPI signals must be generated by the resource device and connected to GPI inputs within the tally system to provide the necessary routing information.

To way in which a resource device output reacts to GPI inputs is determined by its associated control text. The Resource Output Control dialog box allows you to specify this control text for each resource output in the system.

The same embedded functions used in remote display unit control text evaluation can also be applied to resource output control. Instead of being used to control display contents, the control text for a resource output is evaluated to produce a list of source names that represent the actual inputs currently carried to that output. This generally involves testing several GPI input states (using the IV() embedded function) and choosing the corresponding source from among a list of source names.

To specify control text for a resource output, select the desired resource device, add the output, then enter its control text. Repeat the procedure for other outputs and resource devices as needed.

Resource

Selects the resource device to be associated with the output. The **Output** list box shows only those outputs previously created for the selected resource device.

Output

Selects the output so you can examine or modify its control text.

Control

Specifies the embedded functions that, once evaluated, determine the inputs that the output carries. You only need to specify the control text once. The tally system automatically re-evaluates the control text as GPI inputs or other system conditions change.

Add

To add a new resource output for the selected resource device, select **Add** to open the Add Resource Output dialog box. Initially, the next likely unique output name based on the name of the originally selected output appears (hold down **Shift** as you select **Add** to start with the originally selected output name). You can keep this new name or specify a different name for the new output. Select **OK** to add the output, or **Cancel** to abandon the operation and return to the Configure Resource Output dialog box.

Repeat the procedure to add other resource outputs for the selected resource device. For a given resource device, the name of each output must be unique.

Remove

To remove a resource output from the system, select the resource output to be removed by picking its name from the **Output** list box, then select **Remove**.

Close

Closes the Configure Resource Output dialog box.

Help

Invokes the Windows Help System and shows this page.

Global Messages

Control Text

Much of the tally system's programmable features are handled by interpreting a pre-programmed variable-length sequence of characters referred to as "control text". This text contains combinations of fixed information and embedded functions. The embedded functions are evaluated by the tally system as system conditions change to produce a resulting sequence of characters. This result is then applied to affect the element that has been programmed with that control text.

Embedded functions form a very powerful "programming language". Their use in control text can be quite simple or complex. The full functionality of the tally system is only realized when control text is customized to suite specific applications. For the novice user, programming control text can be avoided by using a set of details dialog boxes.

In the tally system, control text is used to:

- control the information appearing on each section of the remote display units,
- control the state (active or inactive) of GPI outputs,
- consolidate information in the form of global messages for use within the control text of many remote display units or GPI outputs,
- determine what inputs are currently selected on resource outputs that form virtual routers/switchers (a special type of resource device).

Although you can specify any embedded function in the control text of any of these elements, some functions inherently do not apply to some elements. For example, an embedded function that controls display color is not useful in the control text of a GPI output or resource output.

Global Message Control Text

The most common use of a global message is to shorten the control text of remote display units or GPI outputs. This is done by replacing common sequences of text that would appear in the control text of many remote display units or GPI outputs with a short reference to a named global message (using the embedded function FN). When the control text is evaluated, this reference is replaced with the global message control text, thereby re-constructing the original un-shortened control text.

This method has an advantage in that a modification to the global message control text causes all tally system elements that refer to it to be immediately affected. Without this mechanism, the control text of each element would have to be change individually to produce the same effect.

Using the Configure Messages dialog box, each global message can be assigned control text that determines its current value. The control text is a sequence of characters containing literal characters and string expressions. Expressions can contain embedded functions and sub-expressions, possibly containing more literal characters. The control text string is "evaluated" into a final string of characters. Expressions and sub-expressions are evaluated in left to right order. Parenthesis are used to group sub-expressions and alter expression evaluation order.

Expressions can be as simple as a string of single number or as complex as a string of many sub-expressions within sub-expressions (nesting). Expressions usually contain embedded functions which are executed given zero or more arguments in parenthesis. These arguments may also be literal text or sub-expressions. Embedded functions return a result string of zero or more characters which are then passed to higher-level embedded functions or treated as literal text.

Once the control text of a global message has been evaluated, the result can be used to control the operation of remote display units or GPI outputs using the embedded function V.

Warning

Avoid global messages inter-dependent on each other. Doing so lengthens the control text evaluation process causing the tally system to respond to changing system conditions more slowly. Especially avoid making a circular inter-independence between two or more global messages. The tally system recognizes this situation and stops re-evaluating the offending control text. If this happens, the global messages involved are likely to hold unpredictable information. The remaining elements of the tally system continue to operate normally.

Control text that does not match an embedded function "prototype" is treated as literal text. A prototype is any valid function name, followed by zero or more space characters, followed by a left parenthesis, zero or more expression arguments separated by commas, and closing with a right parenthesis.

You may wish to specify literal text which happens to match an embedded function prototype. In this case, use matching double or single quotes to enclose text which would otherwise be interpreted as an embedded function or expression grouping. Use double quotes to enclose literal text that contains one or more single quotes. Use single quotes to enclose literal text that contains one or more double quotes.

Embedded functions are available to perform various tasks. They provide "programming language" features such as variable assignment and referencing, math and logical functions, iteration, text manipulation, and system status information functions.

Named variables are essential to performing any higher-order operations within the control text. You can assign a string of characters to a variable with a name that you supply, then recall that variable's string contents elsewhere in the control text by referring

to its name.

Named variables are synonymous with ‘‘messages’’. Both refer to named elements that hold zero or more characters as their ‘‘value’’. In the discussion of expressions, the term variable is used. This is not the same as timer/counter variables.

There are three type of variables for use in expressions. Variables with names that start with the exclamation character (!) are ‘‘temporary”. Temporary variables can be used to pass information into a global message from the control text that refers to the global message. Other typical uses of temporary variables include storage of sub-expression values for use in other parts of an expression, or iteration counters.

Variables with names that start with the asterisk character (*) are “local”. The value of these variables is retained indefinitely. These variables are also “device-specific”. This means that using a local variable within the control text of a global message would refer to the local variable that belongs to the device (remote display unit, GPI output, or resource output) that is using this global variable in its control text.

Variables with names that do not start with ! or * are “global”. The value of these variables is also retained indefinitely.

Configure Messages Dialog Box

The Configure Messages dialog box allows you to add, rename, remove, or modify global messages or messages associated with a specific remote display unit section. You can also use the keyboard command **Ctrl+Shift+F8** to open this dialog box.

Messages are just named strings of text. Messages can contain literal text, embedded functions, and even references to other messages. Messages can be also created, modified, and destroyed by embedded functions within the control text of a remote display unit.

There are three types of messages; global; local; and temporary. You can use this dialog box to modify global and local messages only. Global messages are available to all remote display units. Local messages are specific to a single section of a remote display unit. Temporary messages can only be changed by embedded functions within the control text of a remote display unit.

You can assign a name of up to 25 characters to each message. The name is chosen arbitrarily but must be unique among all message names for a given remote display unit. Global message names must be unique among all global messages. There is a different set of local messages for each remote display unit. Two or more local messages with the same name but associated with different remote display units are considered to be completely different messages and can have different contents.

Some messages have special functions because they have pre-designated names. A message with a name having the form *#g#n*, for example, provides the user-switchable message feature with the name for list item *n* in list group *g*. See Remote Display Unit Programming for an example that uses these pre-designated variables to handle switchable messages.

Initially, the name and contents of all messages associated with the selected remote display unit appears in the dialog box. One message is the currently selected message. Message contents appear as they would if assigned to the remote display unit in the selected unit window.

Unit

To examine or modify local messages, select the associated remote display unit.

Section

Select the desired section, 1, 2, or 3, of the remote display unit. Each section can be associated with a different set of messages. Unused sections numbers are disabled.

Global Messages

Place a check mark in this box to examine or modify the global message set. Remove the check mark to examine or modify local messages associated with a specific remote display unit section.

Name

Select the specific message, by its name, to examine or modify. The message's content and appearance is shown.

Contents

Specify the contents of the select message. Any literal text and embedded functions can be entered.

Message

Select the specific message, by its appearance, to examine or modify. The message's content and name is shown. The appearance of a message is a reflection of how it may look if it were to replace the control text in the currently selected remote display unit section. Since messages can be embedded within other messages or control text, the actual appearance or affect of a message on a remote display unit section cannot be predicted.

Add

To add a new message to the global or local set, specify a name for the new message at the top of the **Name** list box, then select **Add**. The content of the new message is initially empty.

Rename

To change the name of a message, use the following procedure. Select the message to be renamed by picking its current name from the **Name** list box or the message appearance from the **Message** list box. Specify a new name for the message at the top of the **Name** list box and select **Rename**.

Remove

To remove a message from the global or local message set, use the following procedure. Select the message to be removed by picking its name from the **Name** list box or its appearance from the **Message** list box, then select **Remove**.

Close

Closes this dialog box.

Help

Invokes the Windows Help System and shows this page.

Tally System Console Index

GVG/Tektronix Horizon Routing Switcher HX-GPI (COM port)

Available in future release of tally system firmware.

Utah Scientific AVS-2 Routing Switcher (COM port)

Specifications

Equipment port	Any available external control serial port
Tally system port	Any of COM7 through COM12
Protocol	External Computer Control
Serial format	Fixed at RS-422, 9600 baud, 8 data bits, no parity, 1 stop bit
Input name format	Three-digit numeric starting at 001 (leading zeros must be included)
Output name format	Three-digit numeric starting at 001 (leading zeros must be included)
Level format	Numeric starting from 1

Consult your equipment manuals for information on configuring the operation of its communication ports.

Pro-Bel System 3 Routing Switcher (COM port)

Available in future release of tally system firmware.

Datatek D-2166 Routing Switcher (COM port)

Available in future release of tally system firmware.

Talia EOS-2000 Routing Switcher (COM port)

Specifications

Equipment port	EOS-2000 PC port or PC expander port
Tally system port	COM2
Protocol	EOS-2000 CPU to PC protocol
Serial format	Fixed at RS-232, 57600 baud, 8 data bits, no parity, 1 stop bit
Input name format	Alphanumeric
Output name format	Alphanumeric
Level format	Numeric starting from 1

With this type of resource device, the tally system can connect directly to the EOS-2000, or indirectly through a PC port expander. The later allows another PC and the tally system to be connected simultaneously.

The IMAGE VIDEO Tally System Interface unit must be provided with a user-programmed device address. Do not set this address to the same address of other devices connected the port expander. Doing so may cause improper system operation. In most systems, you can use the device address 1.

To access information from this type of device, specify the input or output category (also called a mnemonic), an optional number, and optional level name. For example, `R1::VTR 1[1]` specifies the input or output named VTR1 on level 1 for the resource device named R1.

When specifying an input name, you must separate the category and number with exactly one space character. If there is no number associated with the category, do not specify a space character at the end of the category. Space characters within a category are permitted and must be specified exactly as programmed into the routing switcher system.

When specifying an output name, however, you can use several variations to refer to the same output. For example, the output names:

```
R1::VTR2[1]
R1::VTR 2[1]
```

R1::VTR 2[1]

```
R1::VTR002[1]
R1::VTR 00002[1]
```

all refer to the same output. Although these outputs are considered independent of each other by the tally system, the input connected to them appears to follow on each output since they actually follow a single output from the routing switcher system. There is no good reason to use different output name formats in the same tally system. Use only one of the above formats to specify output names.

Unit Window

A window depicting the appearance of any one of the system's remote display units. Unit windows appear in one of three sizes.

Layout Window

A window depicting the arrangement of some or all of the system's remote display units on a monitor wall. There can be up to 10 named layouts. Only one of these layouts can appear in the layout window at a time. This is the selected layout and its name appears in the layout window's title bar.

Monitor Style

The number and position of video monitors associated with a remote display unit. Up to three monitors can be located above or below the display unit.

Serial Number

A number of up to 6 digits that uniquely identifies a single remote display unit. The Tally System Console program uses serial numbers to target control of individual display units. Select **Ctrl+Shift+F3** to show the serial number assigned to each display.

Control Set

A set of up to 9 remote display units frequently controlled from single unit window. A button for each control set member appears in the upper-left area of a unit window. Click the button to quickly select the remote display unit assigned to the corresponding control set member. One button is always flashing or steadily "illuminated". A flashing button indicates that you can select other control set members or other unit windows using the arrow keys. A steady button indicates that display unit contents are currently being edited and the arrow keys have editing functions.

Command Line

Windows applications are supplied with a command line; a string of text that the application can use to alter the default way in which the application starts up. Consult Windows help for information on setting commands lines.

Working Directory

Windows applications assume a file directory where files that do not have fully qualified path names are stored or recalled. Consult Windows help for information on setting working directories.

Resource Device

Equipment that carries, routes, combines, or otherwise affects signals within the scope of the tally system is considered a resource device. Routing switchers, production switchers, master control switchers, and frame stores are all examples of resource devices. To use a resource device, you must specify how the tally system communicates with the resource device and declare any signal interconnections between it and other devices in the system. Although the use of resource devices is optional, a typical tally system consists of at least one resource device.

Resource Item

Each resource device can be associated with many source and destination items that allow you to override the normal appearance of that item on a remote display unit.

Resource Output

Resource devices of the “virtual router” type must specify how each resource output determines the resource inputs that it will carry. Each output in these types of resource devices must be associated with control text that directs the tally system to sample a set of GPI inputs and report the name of the corresponding source(s). This allows other parts of the tally system to re-act to changes on a resource device output just as if the output belonged to a non-virtual type of resource device.

Work Offline

Select the work offline mode to modify tally system configuration items or open other files without affecting tally system operation. This action is equivalent to disconnecting the PC from the tally system. De-select the work offline mode to configure the tally system according to the configuration items from the currently open file. Remember to open the original configuration file before de-selecting the work offline mode to avoid affecting the tally system. When opening a file you are prompted to confirm that you want to work online.

Resource Interconnection

A signal that travels between two resource devices forms a resource interconnection. Each resource interconnection is defined with a single point of origin (a resource device output) and zero or more points of termination (resource device inputs). Resource interconnections allow the tally system to trace the originating source of a signal through multiple resource devices.

ODBC

Open Data Base Connectivity. A Windows facility that allows common data formats used by popular data base and spreadsheet programs to transfer data to and from other programs. The ODBC Manager can be accessed from the Windows Control Panel.

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