Features and Controls

Overview

The primary function of the Lynx System Supervisor Unit (SSU) is to perform all real time, serial control and communications tasks needed to control multiple tape and/or film transports from one or more computerized controllers, including any serial protocol translations that may be necessary.

Typical System Configurations

The following block diagram shows a general SSU system configuration, using a Lynx Keyboard Control Unit as the primary controller with a console computer and a CCU.

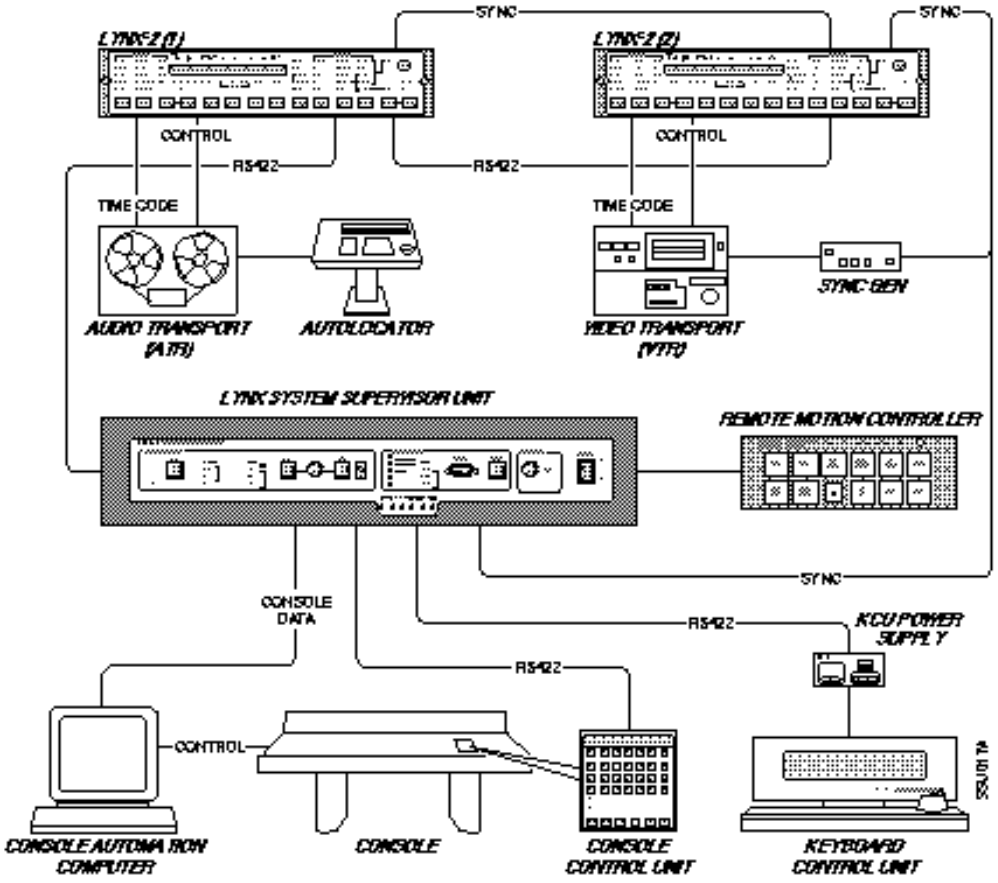

Figure 6-1. Typical System Supervisor Configuration

Keyboard/Computer Control Ports

The two Keyboard/Computer Serial Control Ports permit control of the SSU. Each port may be connected to an external control device that supports the appropriate serial protocol. The Supervisor's Control Port protocol is based on the ES-bus protocol, but incorporates certain extensions to the standard protocol to allow for control of features and functions that are specific to the Supervisor.

Most system configurations will connect a Lynx KCU or CCU to at least one of the Control Ports. The second port may be used for connection of a second keyboard to allow operation of the system from two separate operator positions, or for connection to an external control computer that supports the Supervisor protocol. (Control Port #1 must be used with a single keyboard.) Examples of such external control computers would include audio console automation systems, digital audio workstations, and computerized audio editing systems.

Electrically the Control Ports are full-duplex balanced, serial communications channels operating asynchronously at a standard transmission rate of 38.4 kilobits per second. This conforms to the electrical portion of the RS422 standard. (The Control Ports differ from the Mechanical Characteristics portion of the RS422 standard since a 25-pin D-subminiature connector is used rather than the 9-pin connector specified in the standard.)

Commands or other messages that are received on one of the Control Ports from an external controller, are communicated directly to the Supervisor's main microprocessor. The main microprocessor processes the generalized commands from the controller and outputs specific commands to the timing generator microprocessor (for actions relating to GPIs, time code generators, and MIDI) and tributary microprocessor (for actions relating to Lynx Modules and other serial devices connected to the Tributary Ports).

Tributary Ports

The four Tributary Ports are the Supervisor's method of connecting to external devices such as Lynx Modules.

Tributary Port 1 is configured to control multiple (up to six) Lynx Modules. The protocol which is used to communicate with Lynx Modules is based on Ampex VPR-3 serial protocol, but incorporates certain extensions to the standard protocol as necessary to control features and functions that are specific to the Lynx system.

Tributary Ports 2 and 3 potentially can be configured to directly communicate with a variety of serially controlled devices and systems as the appropriate serial protocols are implemented in Supervisor software.

Tributary Port 4 is configured for a Neve console automation computer using Adam-Smith 2600 control protocol.

Electrically the Tributary Ports are full-duplex balanced, serial communications channels operating asynchronously at a standard transmission rate of 38.4 kilobits per second (Port 4 is 9600 bits per second). The Tributary Ports generally conform to the RS422 standard.

Audio I/O Functions

Time Code Generators

The Supervisor incorporates three multi-standard time code generators that may be controlled through the Keyboard/ Computer Control Ports. These generators run phase-locked to the system frame rate reference and may be used to drive external devices and systems that require only a time code reference. By starting and stopping a generator and specifying the frame numbers to be output by the generator, the controller can operate an external time code-referenced devices in much the same way as a tape machine, including the ability to offset the time code referenced device, relative to the system.

The SSU can generate time code to SMPTE (Drop Frame or non-Drop Frame), EBU or film standards as appropriate, locked to the selected system frame rate reference.

Each of the three generators is configured for a specific purpose. Time Code Generator #1 generates a play speed time code signal in both play and wind modes. This “virtual machine” style generator is suitable for connecting to automatic systems or time code chase devices. This generator is used to connect to the SSL Master time code input. Time code Generator #1's output includes VITC-style still-frame time code to ensure that any connected device always has accurate position information.

Time Code Generator #2 provides an alternate time code signal that may be used to drive external time code-referenced systems such as digital audio workstations and SMPTE-to-MIDI converters. This generator is used to provide the Neve Automation Computer with reference time code. Generator #2 outputs time code that is locked to Generator #1 when the system is in Play; this generator's output is suppressed at all other times.

Time Code Generator #3 is only used by the SSL Computer for time code striping purposes. The generator is controlled by the SSL shape command. By following the prompts provided by the SSL Computer, Generator #3 may set for any desired starting frame number or may be jam-synced to match the system time code (i.e., the Supervisor's Generator #1).

Beep Generator

The beep generator is a variable frequency audio oscillator circuit whose output is gated by the same logic that drives GPI Relay #8.

Logic I/O Functions

GPI Closures

The Supervisor includes eight single-pole, single-throw relays that may be used for a variety of switching tasks under external or time code control. The relay contacts are totally isolated from all Supervisor circuitry for maximum flexibility in application implementation.

Annunciator Outputs

The first four of the annunciator outputs (open collector Darlington transistor), are programmed to provide a "4-3-2-1" countdown sequence prior to each GPI relay closure. An additional output is programmed as system lock indicator.

AUX Logic Inputs

The Supervisor provides switch inputs for Master Transport control. Supported functions are Rewind, Fast Forward, Stop, Play, Rehearse, Record, Locate, Cue, Allstop, Rollback, Replay and Edit. A Remote Motion Controller (RMC) option supports these motion control switches and the annunciator outputs. These logic inputs may also be driven from switch closures, or from TTL or CMOS logic circuitry.

MIDI Functions

MIDI Out Functions

MIDI Time Code (MTC) is available on the MIDI OUT connector on the Supervisor. This MIDI Time Code follows the Supervisor's Time Code Generator.

The Supervisor's MIDI Time code generation conforms to the standards set forth in *MIDI Time Code and Cueing Detailed Specification (Supplement to MIDI 1.0).*

Diagnostics

Front Panel Diagnostic Display and Signal Access

Operation of all major system functions including GPIs, Main, Trib and Tgen Processors, Option Boards, Control Ports, Tributary Ports and System Reference Clock can be checked using the front panel LEDs and switches.

Serial Diagnostic Port

The RS232 serial port is currently dedicated to factory test diagnostic software.

SSL Data Interface Option

The SSL Data Interface Option is a dedicated hardware interface that allows a Solid State Logic, G Series system to accomplish tape machine control and synchronization, via the SSU and Lynx-2 Time Code Modules.

Master Remote Control Interface Functions

The SSL Data Interface option provides a 25-pin D-subminiature, female connector for connection to the Master Transport Remote (S29) connector on an SSL G Series console. This connector is identical in pin-out and function to the corresponding connector on an SSL Master Transport Selector unit.

The S29 MSTR REMOTE connector on the SSL Data Interface receives parallel switch-closure commands from the five MASTER REMOTE push buttons on the G Series Computer control panel; these commands are Rewind, Fast Forward, Stop, Play, and Record. When the SSL Data Interface receives one of these commands, it's microprocessor generates the corresponding command message(s) in the Supervisor's ES-bus-based protocol

and transmits the command(s) to the Supervisor's main processor. The Supervisor then handles the transmission of the message to the appropriate Lynx Module, via the Tributary Port. The Supervisor will serially address this command message to the specific Lynx Module that has been designated as the master by the SSL Computer.

The SSL Data Interface generates mode tally signals that correspond to the five transport modes. The tally signals are returned to the SSL via the MSTR REMOTE connector where they illuminate the MASTER REMOTE push buttons. The five tally signals are synthesized by the SSL Data Interface in response to the transport status that is reported back to the Supervisor by the designated master Lynx Module. (This transport mode status is derived by the Lynx Module from the time code and/or tach and direction signals it receives from its transport except in the case of Play and Record modes where the Lynx Module receives a true tally signal from most types of transport.)

The SSL Data Interface also generates Tachometer and Direction signals, which it returns to the G Series Computer on the MSTR REMOTE connector. The G Series Computer uses these signals to update its tape position display, when it is not receiving readable master time code. These signals are synthesized in the Supervisor, based on data received from the designated master machine's Lynx Module. Because the Tachometer and Direction signals are synthesized by the Supervisor, the nominal tach frequency and direction logic polarity as seen by the SSL will be constant, regardless of what type of tape transport is actually being operated as the master. The standardized Tach frequency from the Supervisor is 30 pulses-per-second at Play speed (25 pps in EBU/PAL) and the standardized direction polarity is HIGH.

The SSU with SSL Data Interface performs the same basic function as the SSL Master Transport Selector unit in terms of routing the SSL's Master Remote commands to the appropriate machine and returning the tach, direction, and mode tally data from the appropriate machine to the SSL. Note that the SSL Master Transport Selector performs this function in hardware using multi-pole relays and is limited to selection of one of three machines as the master, while the SSU performs the function on the software level and thus allows any of five connected machines to be designated as the master.

Front Panel Features

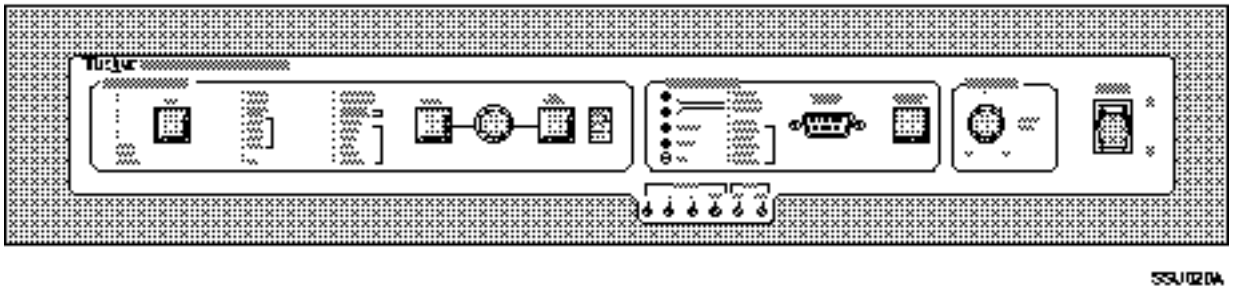

Figure 6-2. Front Panel

Most of the controls and indicators on the front panel of the SSU are used for diagnostic or testing purposes. Under normal circumstances the display acts as a status indicator for all devices connected to the SSU, with LED indicators for Computer and Controller communication, GPI event status, and System reference. After initial communication is established, all internal functions of the SSU are accessed from a KCU, CCU or external computer/editor, and the SSU becomes “transparent” to system operations.

An exception is the use of the TEST key to clear the Supervisor’s non-volatile memory. To clear the battery backed-up memory, hold the TEST key while turning on power to the Supervisor. Note that all data that is normally retained in the Supervisor, including any information stored from a CCU or KCU, will be erased and the default parameters reinstalled.

SYSTEM STATUS Block

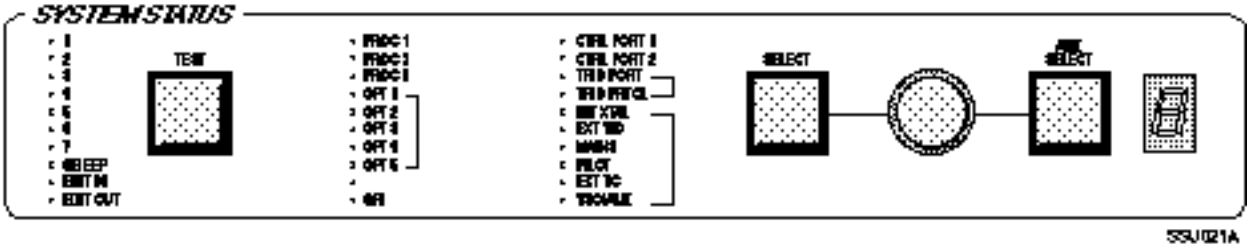

Figure 6-3. System Status Block

The System Status area of the Supervisor front panel contains three LED tally displays, three key switches, a rotary encoder, and a single-digit, 7-segment LED display. These controls and displays provide a means of selecting and displaying various system-level options and status.

GPI Tally Indicators

The leftmost LED column displays the GPI relay closures as they occur in real time. The first eight LEDs are numbered to correspond to the eight GPI relays contained in the Supervisor. Since the logic circuitry for GPI #8 is also used for the Dialog Beep function, the eighth LED is labeled 8/BEEP. These LEDs display the GPI closures as they occur, regardless of the settings of any other switches on the Supervisor's front panel. GPI parameters are controlled from the KCU or CCU and include several options for triggering. (Please refer to the KCU or CCU Operating manual for complete information.)

Below the 8/BEEP LED indicator is the EDIT IN and EDIT OUT LEDs. These lamps light momentarily during an automated edit, at the in and out time code points.

TEST Key

The [TEST] key immediately to the right of the GPI Tallies allows manual triggering of the GPIs from the Supervisor's front panel. This allows the operator a method of testing the GPI output relays.

To trigger any of the GPIs manually, press the [SELECT] key until it lights. Then turn the selection knob until the GPI indicator lights up, (at the bottom of the second LED column). The [TEST] key will also light up and a number will appear in the display window to the right of the [AUX/SELECT] key. Pressing the [TEST] key at this point fires the selected GPI.

If you wish to manually trigger a different GPI, press the [AUX/SELECT] key; the [AUX/SELECT] key will light up and the [SELECT] key will go off. Now when you turn the selection knob, the numbers in the window scroll to select the various GPIs. Simply turn the knob until the desired GPI number is displayed in the window, and then press the [TEST] key to fire the corresponding GPI.

The [TEST] key is also used to clear the Supervisor's battery backed-up (non-volatile) memory. Holding the [TEST] key while turning on the AC mains power to the Supervisor clears all data normally retained in the Supervisor, including the entire Event List.

Selection/Status Indicators

When the [SELECT] key is lit, the two LED columns between the [TEST] and [SELECT] keys display the current selection. The knob between [SELECT] and [AUX/SELECT] scrolls through the various primary selections available and lights up the corresponding LED in the tally columns.

When the Supervisor is in Normal mode (i.e., neither the [SELECT] nor the [AUX/SELECT] key is illuminated), the two LED selection tally arrays indicate the current operating status of the system.

PROC 1, PROC 2, PROC 3 Indicators

When the Supervisor is in Normal mode, the three PROC lights indicate the Supervisor's three microprocessors are active.

Microprocessor #1 (PROC 1) is the Main processor, microprocessor #2 (PROC 2) is the Timing Generator, and microprocessor #3 (PROC 3) is the Tributary Port processor.

The PROC 1, 2 and 3 LEDs should all be lit when the Supervisor is in Normal mode. If any of these LEDs are not lit, it indicates an error condition.

OPT 1 - OPT 5 Indicators

When the Supervisor is in Normal mode, the five OPT LEDs are used to indicate the presence of activity in any of the Supervisor's five Option positions. These Option positions are hardware expansion slots inside the Supervisor, which are provided to accommodate future functional expansions or hardware-specific interfaces; such as the SSL Data Interface.

With the SSL Data Interface option installed in the Supervisor the OPT 1 through OPT 4 indicators will be lit when the Supervisor is in Normal mode.

GPI Indicator

When the Supervisor is in Select mode ([SELECT] or [AUX/SELECT] key lit) the GPI indicator will light up to indicate when the Supervisor is in the GPI Test mode. This mode allows the operator to manually trigger any of the GPI relays with the [TEST] button (which will be lit along with the GPI LED). The selection of which GPI will be triggered by the [TEST] button is made with the selection knob when the [AUX/SELECT] key is lit, and the number of the selected GPI will appear in the display window.

The GPI indicator will not light up when the Supervisor is in the non-Select mode.

CTRL PORT 1 & CTRL PORT 2 Indicators

When the Supervisor is in the Select mode ([SELECT] key lit) the CTRL PORT 1 or CTRL PORT 2 LED will light up when the [SELECT] knob is turned to select the desired port. If the selected Control Port is currently active, the LEDs in the Diagnostics block will light up to reflect the activity and status of the port and the transmitted and received serial data signals will be available on the test point terminals.

Tributary Indicators

The next two indicators in the right-hand Select/Status display column, TRIB PORT and TRIB PRTCL, relate to the Supervisor's four Tributary Ports. The Supervisor uses the Tributary Ports to communicate serially with the Lynx Modules, or other devices that it controls.

TRIB PORT Indicator

When the Supervisor is in the Select mode the TRIB PORT indicator will light up if the [SELECT] knob is turned to select TRIB PORT. The TRIB PORT indicator detects serial signals from one of the four Tributary Ports and routs them to the Diagnostics section of the Supervisor. The selection of the specific Tributary Port from among the four is made with the selection knob when the [AUX/SELECT] key is lit, and the port's number will appear in the display window.

If the selected Tributary Port is currently active, the LEDs in the Diagnostics section will light up to reflect the activity and status of the port and the transmitted and received serial data signals will be available on the test point terminals.

System Reference Indicators

The bottom six LEDs in the right-hand Select/Status column always indicate the currently selected source for the Supervisor's frame rate reference. This speed reference is transmitted to the Lynx-2 Modules via the Tributary Ports. Each Lynx-2 module resolves the speed of its transport to this reference.

INT XTAL Indicator

The INT XTL LED will be lit when the Supervisor's frame rate reference is derived from its internal crystal. The Supervisor's crystal may be divided down to provide 30, 29.97, 25, or 24 frames-per-second frame rates.

EXT VID Indicator

The EXT VID LED will be lit when the Supervisor's frame rate reference is derived from the external video reference signal connected to the VID REF input connectors on the back panel of the Supervisor. This external video reference signal may be composite sync, black burst, color bars, or any stable composite video signal of either NTSC or PAL/SECAM standards. The EXT VID LED will flash when video is selected as the system frame rate, but a source of video is not present.

MAINS Indicator

The MAINS LED will be lit when the Supervisor's frame rate reference is derived from the Supervisor's AC mains input. AC mains reference should only be selected when the time code frame rate directly relates to the mains frequency (i.e., 30 frame time code and 60 Hz AC mains or 25 frame time code and 50 Hz AC mains).

PILOT Indicator

The PILOT LED will be lit when the Supervisor's frame rate reference is derived from the frequency of an external pilot (sync tone) signal connected to the Supervisor's AUDIO I/O connector. This external pilot source should be a line-level, sine- or square-wave audio signal at twice the time code frame rate (e.g., 59.97 Hz pilot for 29.97 fps time code, or 50 Hz for 25 frame time code).

EXT TC Indicator

The EXT TC LED will be lit when the Supervisor's frame rate reference is derived from an external reference time code signal connected to the Supervisor's AUDIO I/O connector. Note that this capability requires the installation of an optional time code reader circuit board in the Supervisor.

(External Time code reference is not supported in the current system software.)

VSO/AUX Indicator

The VSO/AUX LED will be lit when the Supervisor is in VSO (Variable Speed Override) mode or when its frame rate reference is being received from an auxiliary source. Typically this auxiliary timing source will be the Frame Clock signal, which the Supervisor receives from the Lynx Modules via the RS422 serial bus.

The VSO/AUX LED will flash if the Supervisor's timing circuitry is not properly phase-locked to the auxiliary clock signal.

SELECT Key

The [SELECT] key determines whether the Supervisor is in the Select mode. This mode allows the user to choose various system-level indicators, which include the selection of the system reference source (Internal Crystal, External Video, etc.), and what signal or communications system is fed to the Diagnostics section of the Supervisor. Once the Select mode has been entered by pressing the [SELECT] key and lighting the keycap, the selection knob is used to scroll among the available options.

Selection Knob

The selection knob is used by the operator in either the Select mode or the Aux Select mode to scroll through the available options.

When the [SELECT] key is lit, the knob scrolls through the primary selection items. (These selection items include OPT 1, CTRL PORT 1, CTRL PORT 2, TRIB PORT, System Reference, and GPI.)

When the [AUX/SELECT] key is lit and a number appears in the window to the right of the [AUX/SELECT] key, the knob scrolls through the secondary selection items in numerical order. These secondary items include the selection of one of the eight GPIs in the GPI Test mode, and selection of one Tributary Port when the TRIB PORT light is lit in Select mode.

AUX/SELECT Key

The [AUX/SELECT] key allows the operator to select from among secondary-level options with the selection knob.

The existence of secondary-level options is indicated by a digit appearing in the window to the right of the [AUX/SELECT] key when the [SELECT] key is lit. If a number appears in this window when the [SELECT] key is lit, pressing the [AUX/SELECT] key turns off the [SELECT] key, lights up the [AUX/SELECT] key and allows you to scroll through the available choices using the selection knob. If the window to the right of the Aux Select window is dark when the [SELECT] key is lit, pressing the [AUX/SELECT] key has no effect.

Example: Press the [SELECT] key, the [SELECT] key lamp illuminates. Turn the [SELECT] knob until the GPI LED lights. Press the [AUX/SELECT] key, the [AUX/SELECT] key illuminates and the [SELECT] key goes off. A numeric indication will show in the AUX/SELECT LED window. Turn the [SELECT] knob to the desired GPI number (1-8).

Aux Select Display Window

During normal operation, the SSU will indicate Master machine status in the AUX/SELECT display window. The following designations apply: S=Stop, P=Play, R=record, r=Rehearse. The display will show a circular rotating line in the clockwise direction for Fast Forward, and counter-clockwise for Rewind.

In Select mode, the Aux Select display window indicates the number of the secondary-level selection that is active. If secondary-level options don't exist for the current selection there will be no number displayed in this window when the [SELECT] key is lit. If a number is displayed in the window while the [SELECT] key is lit, there are secondary-level options which may be selected by pressing the [AUX/SELECT] key and turning the selection knob.

DIAGNOSTICS Block

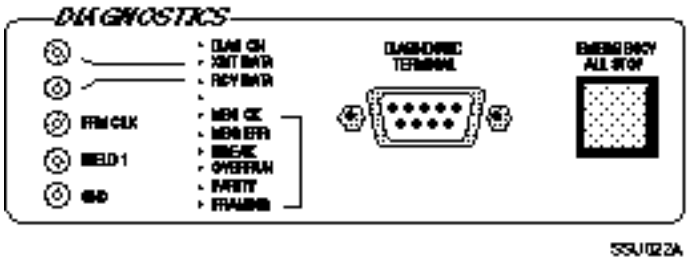

Figure 6-4. Diagnostics Block

The Diagnostics section of the Supervisor contains five test point terminals for access to diagnostic signals, an LED tally display, a 9-pin D-subminiature for connection to a diagnostic computer terminal, and the [EMERGENCY ALL STOP] key.

Diagnostics Test Points

Four of the five test points in the Diagnostics block provide access to the signals that appear on the Supervisor's various serial communications ports; the fifth, bottom test point, labeled "GND", is connected to chassis ground. All test point signals are buffered signals at a nominal 5 volt peak level, which are referenced to the GND test point.

XMT DATA (Transmit Data)

The top test point in the column of five provides access to the serial data stream being transmitted by the Supervisor on the selected serial port. There will only be a signal on the XMT DATA test point if an active serial communications port has been selected with the [SELECT] key and selection knob.

RCV DATA (Receive Data)

The second test point provides access to the serial data stream being received by the Supervisor on the selected serial port. There will only be a signal on the RCV DATA test point if an active serial communications port has been selected with the [SELECT] key and selection knob.

FRM CLK (Frame Clock)

The third test point provides access to the Frame Clock signal that is carried on Pin 5 of the Tributary Port serial bus. The signal on the FRM CLK test point is a resynthesized version of the master clock signal that is transmitted to all devices in the system. The Frame Clock signal is always present on this test point regardless of whether there is a serial port selected to the Diagnostics section.

FIELD 1

The fourth test point provides access to a clock signal that is derived from the Frame Clock and that runs at 1/4 of the current Frame Clock rate. In NTSC systems, this Field 1 signal runs at approximately 7.4925 Hz, and in PAL systems it runs at approximately 6.25 Hz. The Field 1 signal is present on this test point whenever the Supervisor is operating.

Diagnostics LED indicators

The column of LEDs next to the Diagnostics test points are used to indicate certain types of activity on the processor and/or serial busses. Each LED is driven through a buffer directly from the specified signal, so that the illumination of the LED reflects the relative duty cycle of the signal.

When an inactive processor or serial port is selected to the Diagnostics section, only the DIAG ON indicator will be lit since there will be no meaningful activity to display.

DIAGNOSTIC TERMINAL Connector

This 9-pin D-subminiature provides a serial data connection for use with an external diagnostic computer or terminal. The pin-out of this connector is given in the Appendix.

EMERGENCY ALL STOP Key

The [EMERGENCY ALL STOP] key function as a “panic button” to immediately stop all transports and other Supervisor functions.

CAPTURE Block

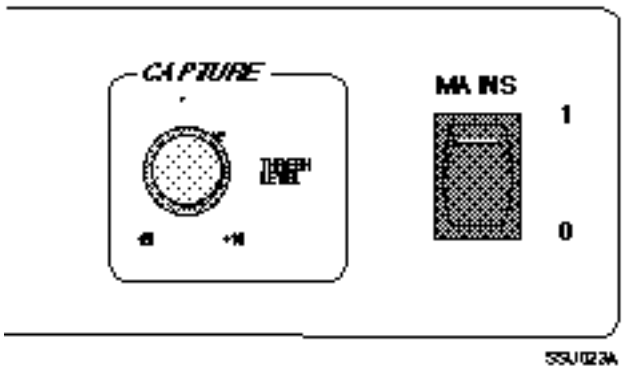

Figure 6-5. Capture Block

The CAPTURE block contains a Threshold Level control knob and a trigger indicator LED, which will permit the reference time code number corresponding to an audio event to be captured directly by triggering from the audio level of the signal.

(The Capture feature is not implemented in the current Supervisor software.)

MAINS Switch

The MAINS switch is the main power switch for the SSU. The '1' position of the switch represents power On and the '0' position is power Off.

Each time the Supervisor is powered up it executes an indicator test that lights all four green keycaps, all LED indicators except the XMT DATA and RCV DATA lights, and all seven segments of the numerical display next to the AUX SELECT key.

The Supervisor retains in battery backed-up (non-volatile) memory its current operating/display mode and GPI Events programmed in the List Mode when the power is switched off. When the power is turned on, the Supervisor automatically restores itself to the same status as when power was turned off.

To clear the operating mode and Event List data and reinitialize the Supervisor, hold the [TEST] key as you turn the MAINS switch on.

GEN LEVEL Trimmers

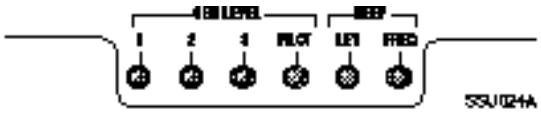

Figure 6-6. GEN Level Trimmers

The four trimmers labeled GEN LEVEL, adjust the output level of the three Time Code Generator outputs and the Pilot (sync tone) output that are available on the Supervisor's AUDIO I/O connector.

The nominal output level of each time code generator and of the pilot generator is 1.38 volts peak-to-peak (= 0.69 volts RMS or -1.0 dBu) into a balanced, bridging load. This level produces a reading of approximately -5 VU in most systems. The trimmers provide an adjustment range of approximately 16 dB, from roughly -14 to +2 VU.

BEEP Trimmers

The two trimmers labeled BEEP adjust the output level and frequency of the ADR Beep signal that appears on both the LOGIC I/O and AUDIO I/O connectors on the back panel of the Supervisor. The beep output is controlled by the GPI 8 logic in ADR Beep mode and is intended for cueing talent in dialog rerecording applications.

Rear Panel Features

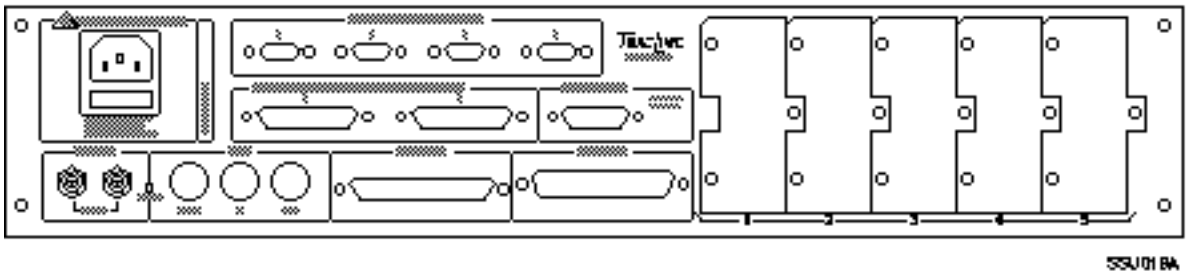

Figure 6-7. Rear Panel

AC Mains Input

The AC mains input socket accepts a standard, 3-wire, IEC-type plug.

The switching power supply in the SSU operates properly on any 50 Hz or 60 Hz AC mains supply between 90 and 265 volts AC so that there is no operator selection of operating voltage. The correct value for the AC line fuse is dependent on the mains operating voltage.

Fuse Types

The proper fuse rating for the SSU depends on the AC mains voltage. The correct fuse types and ratings are:

100-120 volt AC mains 1.5 amp, 250 volt, type GDC (Time Lag)
200-240 volt AC mains 1 amp, 250 volt, type GDC (Time Lag)

The fuse is located in the IEC plug, below the socket and can be accessed by prying the cover off with a small screwdriver.

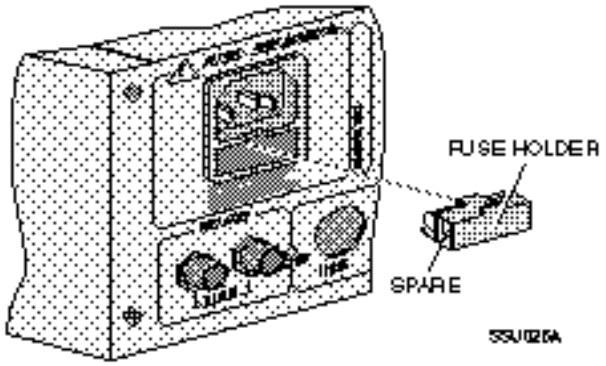

Figure 6-8. Fuse Box

VID REF LOOP Connectors

The BNC-type VID REF connectors are used for connection of an external video reference signal such as “house sync”. The Supervisor will accept composite sync, black burst, color bars, or any other stable composite video signal as its reference input. Normal, terminated video signal voltages are expected.

The two connectors are wired in parallel to facilitate loop-through connection of the video reference signal. Additionally, the Supervisor’s video reference input is a bridging amplifier to avoid any loading and termination problems. Note that the video reference signal loop should normally be resistively terminated in a 75 ohm load at one and only one point, usually at the last device in the loop.

MIDI Connectors

MIDI THRU Connector

As per the *MIDI 1.0 Detailed Specification*, the MIDI THRU connector provides a buffered direct copy of the data received on the MIDI IN connector.

The complete pin-out for the MIDI THRU connector is given in the Appendix.

MIDI IN Connector

The MIDI IN connector is an optoisolated input for serial MIDI data as per the MIDI 1.0 Detailed Specification.

(The receipt of MIDI Time Code or other MIDI data is not implemented in the current Supervisor software.)

The complete pin-out for the MIDI IN connector is given in the Appendix.

MIDI OUT Connector

The MIDI OUT connector provides access to MIDI Time Code and/or MIDI Event data generated by the SSU as per the *MIDI 1.0 Detailed Specification*.

MIDI time code out is a function of the SSU time code generation and follows the time code generator output.

The complete pin-out for the MIDI OUT connector is given in the Appendix.

KEYBOARD/COMPUTER CONTROL PORT Connectors

The two, 25-pin control ports are the primary control connections for the Supervisor. The two connectors access independent serial ports for connection of either one or two external control computers. The Supervisor may be operated from a controller connected to either or both control ports.

Typically, a Lynx Keyboard Control Unit is connected to one KEYBOARD/COMPUTER CONTROL PORT connector. The second controller may be a second Lynx KCU, a Console Control Unit (CCU), or some other external computerized control device such as an audio console automation system.

The complete pin-out for both KEYBOARD/COMPUTER CONTROL PORT connectors is given in the Appendix.

RS422 TRIBUTARY PORT Connectors

The four RS422 TRIBUTARY PORTS provide the Supervisor's primary means of controlling external devices such as tape transports.

The Supervisor is capable of supporting a different serial protocol on each Tributary Port as the Supervisor's software is developed further. At least one of the four Tributary Ports will always be configured to drive Lynx Modules, and each such Lynx Module port is capable of handling real time communications with up to six modules connected in a daisy chain configuration.

Only TRIBUTARY PORT #1 is activated as a machine control port in the current Supervisor software. This Tributary Port is configured to drive Lynx V type software (V500, V600, V700) for Lynx, Lynx Film, Lynx-2 Time Code and Lynx-2 Film modules. The complete pin-out for the RS422 TRIBUTARY PORT connectors is given in the Appendix.

TRIBUTARY PORT #2 is reserved for future use. TRIBUTARY PORT #3 is currently used for serial time code and status. TRIBUTARY PORT #4 is used to interface to the Neve Flying Faders system, an unbalanced RS232 port.

AUDIO I/O Connector

The 37-pin AUDIO I/O connector provides access to a variety of audio signal inputs and outputs including the following signals:

- Time Code Generator 1 Out
- Time Code Generator 2 Out
- Time Code Generator 3 Out
- Generator Pilot Out

- ADR Beep Out
- Pilot In
- Audio Trigger In

All five output signals (three Time Code Generators, Pilot, and ADR Beep) are active-balanced, low-impedance outputs. Nominal signal level is 1.38 volts peak-to-peak (= 0.69 volts RMS or -1.0 dBu) although front panel level trimmers provide an adjustment range of approximately 20 dB. The output impedance of each side of the balanced output amplifier is 330.

The two signal inputs (Pilot In and Audio Trigger In) are electronically balanced (differential) inputs.

The AUDIO I/O connector also provides input and output connections for the optional time code reader circuit board. The time code reader input is a differential input. Reshaped time code and reader-derived pilot (sync tone) outputs are provided from this optional circuit board; both are active-balanced, low-impedance outputs.

The complete pin-out of the AUDIO I/O connector is given in the Appendix.

LOGIC I/O Connector

The 50-pin LOGIC I/O connector provides access to a variety of logic inputs and outputs including the following:

- 8 GPI Relay Closures
- 5 Annunciator Outputs (countdown and lock)
- ADR Beep Out
- Frame Clock Out
- Record Command Out
- Rehearse Command Out
- 8 Auxiliary Logic Inputs, used for motion control switches
- Serial data system tally output

The eight GPI Relay Closures are single-pole, normally-open contacts rated at 2 Amperes for low-voltage DC applications (up to 30 VDC) or 600 mA for higher voltage AC or DC usage. Both contacts of each relay are totally isolated from all Supervisor circuitry for maximum flexibility in system implementation.

The five Annunciator Outputs are open-collector outputs from a transistor array IC with a common emitter connection to Supervisor Ground. Four of the Annunciator outputs are programmed to operate as a “4-3-2-1” countdown sequence in advance of each GPI relay closure. The fifth annunciator is a Group Lock Tally.

The ADR Beep output is an active-balanced, low-impedance output as described in the preceding section.

The Frame Clock output is a TTL pulse at system reference frame rate.

The Record and Rehearse command outputs are driven from Darlington opto-isolators. Both the collector and emitter of each opto-isolator is brought out to the I/O connector. These parallel outputs are activated simultaneously with the normal Record and Rehearse commands that the Supervisor transmits serially to the Lynx-2 Modules in the system.

The complete pin-out of the LOGIC I/O connector is given in the Appendix.

POWER OUT Connector

The 15-pin POWER OUT connector provides access to the Supervisor's +5 volt and ±12 volt power supply rails. These connections may be used to supply a reasonable amount of current to external devices or systems. External current usage should be limited to 100 mA per side for the bipolar 12 volt supply and 2 Amps for the +5 volt supply. Note that these DC power outputs are not internally fused.

The complete pin-out for the POWER OUT connector is given in the Appendix.

Expansion Slot Connector Positions

Five connector positions are provided for use with hardware mounted in the Supervisor's internal expansion slots.

When the optional SSL G-Series Console Data Interface is installed in the SSU, connector positions one through four are occupied by the connectors for this interface. Otherwise, all five connector positions are normally covered with blank panels.