FIGURE FB-E-SY-2B-2

LIST OF CONSTANTS (VERSION 1.11 SOFTWARE)
MODEL 2600 E-SY SYNCHRONIZER

Replaces Figure FB-E-SY-1B-2, "List of Constants (Version 1.00 Software)"

SYSTEM 2600E

SYSTEM 2600 has recently undergone substantial changes and improvements. The SYSTEM 2600 chassis has been improved, the SYSTEM 2600 Power Supply module has been completely re-designed, and—most significantly—***major*** software enhancements have been added to a number of SYSTEM 2600 modules and to both the 2600 A/V Audio Editor and the 2600 CC Compact Controller. These new features supersede previous capabilities to such a dramatic extent that they constitute a new generation of SYSTEM 2600, which will be known as SYSTEM 2600***E*** (***E***nhanced).

When upgraded to the latest hardware and software revisions, the 2600 SY Synchronizer module therefore will be known as the 2600 E-SY. The initial software for the 2600 E-SY module is Version 1.11.

The following is a list of all 2600 E-SY Constants available in software Version 1.11.

KEEP THIS LIST OF CONSTANTS WITH THE 2600 SY SECTION OF YOUR SYSTEM 2600 INSTRUCTION MANUAL, FOR REFERENCE TO THE FEATURES WHICH ARE PROVIDED BY THE 2600 E-SY, SOFTWARE VERSION 1.11.

CONSTANT NUMBER	DEFAULT VALUE	DESCRIPTION AND REMARKS
00 MSD	0	PROM to NV Memory Transfer Flag. **When set to 0** and *saved* in NV memory, the first set of user-customized NV constants is loaded into RAM on power-up. **When set to 1** and *saved* in NV memory, the second set of user-customized NV constants is loaded into RAM on power-up. **When set to F** and *saved* in NV memory, the PROM default constants (which are the constants for the Otari MX-5050) are loaded into RAM on power-up. The value of Constant 00 MSD changes from F to 8 to indicate that these defaults have been loaded.
00 LSD	0	Address of Master Transport. Set to the assigned address of the master transport, from 0 through 9.

01 MSD 6 Frequency Synthesizer Octave Tap.

Used in conjunction with Constants 04 LSD and 03 MSD and LSD to select FM capstan servo output center frequency. Refer to Figure SY-7 in Section 1.6.5 of the Synchronizer manual for details.

01 LSD 6 Lock Error Criterion.

After lock has been achieved, set to the number (0 - F) of consecutive, contiguous, frames during which offset errors greater than Wide Lock Window Width (Constant 06 MSD) must occur before re-synchronizing will begin.

Setting 01 LSD to too low a value will cause unnecessary re-synchronizing when occasional bursts of corrupted time code occur which pass other tests for validity.

02 MSD 1 Lock Servo Coefficient K1.

Weights the present positional error of offset to optimize final synchronizing time. Set to the smallest value (0 - F) which does not cause slave to overshoot or to oscillate about its lock position.

02 LSD 4 Lock Servo Coefficient K2.

Weights the running sum of offset errors to optimize damping while slave is synchronizing. Set to the smallest value (0 - F) which does not cause slave transport to oscillate during final synchronization.

03 BOTH 2 Second and Third Least Significant Digits of FM Center Frequency Code.

Constants 04 LSD, 03 MSD and 03 LSD are used together to set capstan FM frequency. Refer to Figure SY-7 for values. Always set to the PROM default values when using DC capstan control.

04 MSD 0 Capstan Relay Mode Flag.

When set to 0, and with the CONTROL switch ON, the capstan relay is enabled *only* when the Synchronizer module is in the Chase mode.

NOTE

When a Synchronizer module is being controlled by *neither* a SYSTEM 2600E Controller or an external computer, and the CONTROL switch is ON, it will ***always*** be in the Chase mode when set up to control a slave transport.

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When a Synchronizer module *is* being controlled by a SYSTEM 2600E Controller or by an external computer, and the CONTROL switch is ON, it may or may not be in the Chase mode, depending upon the commands it receives.

When set to 1, the capstan relay is enabled whenever the front panel CONTROL switch is ON, irrespective of mode.

When set to 2, and with the CONTROL switch ON, the capstan relay is enabled during capstan speed control synchronizing or when the transport is playing under capstan speed control (i.e., running locked with the wide lock indicator LED lit), but not during FF and RW. In addition, when set to 2, a second Play command is issued to the transport when lock occurs.

When set to 4, and with the CONTROL switch ON, the capstan relay is enabled whenever the Tape Synchronizer is in the Chase mode and the wide lock indicator LED is *not* lit.

When set to 6, and with the CONTROL switch ON, the capstan relay is enabled as when set to 2 but lock has not been achieved (i.e. the wide lock indicator LED is *not* lit). In addition, when set to 6, a second play command is issued to the transport when lock occurs.

04 LSD 8 Most Significant Digit of FM Center Frequency Code.

See Constant 03 MSD.

05 MSD 4 Capstan Speed Control Range.

Sets the capstan speed control range around play speed in +/- 3% increments, from 0% to +/- 45% (0 - F).

05 LSD 2 Lock Servo Coefficient K3.

Sets the maximum rate of change of error correction which will be applied by the capstan speed control routine. Set to the highest value which adequately accommodates speed changes (varispeed) without incurring unacceptable overshoot.

06 MSD 1 Wide Lock Window Width.

Sets the width of the "wide lock" window in increments of .05 frame, from 0 to .75 frame (0 - F).

When set to 0, Constant 06 LSD sets the width of both the "narrow lock" and "wide lock" windows, in increments of 0.001 frame, from 0 to 0.015 frame (0 - F).

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06 LSD 3 Narrow Lock Window Width.

Sets the width of the "narrow lock" window (and of the "wide lock" window if Constant 06 MSD is 0), in increments of 0.001 frame, from 0 to 0.015 frame (0 - F).

07 MSD 0 Play-to-Cue-Point.

When set to 0, Play-to-Cue-Point routines are not enabled.

When set to any numeric value 1 - 7, Play-to-Cue-Point routines are enabled.

If the transport is a master, or is a slave cueing independently, it will cue to a point which is the number of seconds entered (1 - 7) less than the cue point, stop, play to the cue point, and stop.

If a cue point pre-roll has been entered (Constant 07 LSD), a master transport, or a slave transport being cued independently, will play to the pre-roll address, and stop.

If the transport is a slave ***and*** is being cued to a parked master, it will cue to a point which is the number of seconds entered (1 - 7) less than the Smart-Start park position, stop, play to Smart-Start position, and stop.

If the transport is a slave ***and*** is being cued to a playing master, it will cue ahead of master to the number of time code seconds entered in Constant 37 MSD greater than the Smart-Start position, stop and immediately play-for-time-code, stop, and Smart-Start.

If no time code from is read from the slave transport during play-for-time-code, the slave will continue playing.

07 LSD 0 Cue Point Pre-Roll.

Numeric value of the cue point pre-roll, in seconds (0 - F).

This constant applies only to master and slave transports which are independently cueing—not to slave transports which are cueing while chasing a master transport.

08 MSD 0 Pause Flag.

When set to 0, the Synchronizer module issues a Stop command to stop the transport when it is parking after cueing, and a Play command to return the transport to play.

When set to 1, the Synchronizer module issues a Pause (instead of Stop) command to stop the transport when it is stopping from play, and a Pause (instead of Play) command to return transport to play.

When set to 2, the Synchronizer module issues a Pause (instead of Stop) command to stop transport when it is stopping from play, and Play command to return transport to play.

When set to 4, the Synchronizer module parks a slave which is cueing to a stopped master approximately N seconds ahead of the master, where N is the value of Constant 37 MSD. The Synchronizer module issues the same commands as when set to 0.

When set to A, the Synchronizer module issues Pause commands instead of Stop commands during *all* routines, including cueing, chasing, when entering FF or RW from Pause, and when entering Pause from Play (the last as when Constant is set to 2).

08 LSD 2 Cue Oscillation Stop.

The numeric value of maximum number of oscillations (0 - 7) around cue point which are permitted to occur while E-SY module is attempting to meet parking criteria, before the transport is stopped. Movements across cue point in forward direction only are counted.

When set to F, the number of oscillations around cue point is *ignored* as a criterion for stopping the transport while the E-SY module is attempting to meet parking criteria, and the Synchronizer uses only the transport's velocity and position with respect to the cue point to determine when the transport must be stopped while the Synchronizer is attempting to meet parking criteria.

09 MSD 0 Type-of-Cueing Flag.

When set to 0, permits cueing by means of alternating FF and RW commands to control tape speed (FF/RW Cueing).

When set to 1, invokes cueing by means of FM or DC capstan speed control output (Servo Cueing).

When set to 2, invokes "Constant-Speed" Cueing routine. Must be used with Play-to-Cue-Point routine (Constant 07 MSD). The value of Constant 07 MSD establishes the acceptable parking window (from the cue point to minus the value of Constant 07 MSD) within which the transport must park prior to beginning the Play-to-Cue-Point routine, as well as the "target" stopping point.

Cueing is controlled by means of FF or RW commands, depending upon tape direction required. The Cueing constant (Constant 10 LSD) must be set to a value higher than in FF/RW cueing, to inhibit the E-SY module from attempting to gradually slow down the tape (by means of alternating FF/RW commands) as the target stopping point is approached.

When projections of transport's ballistic characteristics indicate that the target stopping point (the cue point minus the value of Constant 07 MSD) will be reached by issuing a Stop command, the Synchronizer issues a Stop command.

If the Cueing constant (Constant 10 LSD) has been optimally set, and if the tape is approaching the target stopping point (which is always prior to the cue point) in FF, the tape should stop slightly beyond the target point (will stop at a slightly higher time code number than the target point) and, therefore, just inside the window. Play-to-Cue-Point can then immediately begin.

If the Cueing constant (Constant 10 LSD) has been optimally set, and if the tape is approaching the target point in Rewind, the tape should stop slightly before the target point (at a slightly lower time code number) and, therefore, just outside the window. The transport should then Fast Forward briefly and stop just inside the window, in approximately the same position as from a forward cue. Play-to-Cue-Point can then begin.

When set to 4, Modulated Cueing is invoked (See Field Bulletin SY-4B for details).

When set to 8 (*and* E-SY Constant 47 is set to the appropriate joggable transport type), Jog/Shuttle Cueing is invoked (See Field Bulletin SY-7 for details).

09 LSD 0 **Motion Sense Flag.**

When set to 0, permits the E-SY module to issue alternating FF and RW commands (FF/RW Cueing) to control tape speed, without regard for speed and direction of the tape when commands are issued.

When set to 1, causes the E-SY module to issue a Stop command (and confirm that the tape motion has stopped) before any new FF or RW command is issued.

When set to 2, requires that the tape stop before the E-SY module honors a control track/tach pulse direction change indication from direction tally. Commands are issued in same way as when set to 0.

When set to 3, invokes operations as described by both value 1 and value 2.

NOTE

The Synchronizer module always issues a Stop command (and confirms that tape motion has stopped) before issuing a new Play command, no matter what the value of this constant is.

10 MSD 1 Time Scale Expansion Factor.

When Servo Cueing, Modulated Cueing or Jog/Shuttle Cueing is invoked, determines the length of the slow-down profile.

10 LSD 2 Cueing Constant.

Use of this value (0 - F) depends upon the type of cueing invoked by Constant 09 MSD.

When FF/RW Cueing or Modulated Cueing is invoked, the value of this constant weights influence of tape velocity on determination of point at which opposite direction command is issued during cueing and parking. Range of values is:

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VALUE	EFFECT
C B A 9 8 7 6	High-range values assume transport can bring tape to a stop quickly, as is the case with most VCRs. The Synchronizer does not begin to slow the transport until the tape is relatively close to the cue point.
5 4 3 2 1	Middle-range values, used with most transports.
0 F E D	Low-range values assume transport requires a relatively long time to bring tape to a stop. ATRs with large-diameter reels, for example, may require low-range values. The Synchronizer module begins slowing the transport relatively far in advance of the cue point.

Set to the largest value which produces acceptably low transport overshoot during parking after cueing.

When FM Servo Cueing is invoked, value sets a scale factor to shift the FM frequency during cueing to match specific transport characteristics.

When DC Servo Cueing is invoked, constant is used as a flag (0 or 1) to determine how the transport is to receive direction commands.

When set to 0, transport direction is controlled by the Synchronizer module's FF and RW outputs and transport speed is controlled by its DC output voltage (Unipolar DC control).

When set to 1, both transport direction and speed are controlled by the Synchronizer's DC output voltage (Bipolar DC control).

11 MSD through 26 LSD

Servo Cueing, Modulated Cueing and Jog/Shuttle Cueing Slow-Down Profiles.

For use of these constants, refer to application information covering Servo Cueing, Modulated Cueing (Field Bulletin SY-4B) and Jog/Shuttle Cueing (Field Bulletin SY-7) of specific transports.

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27 BOTH 00 Slave Pilot Tone Frequency.

Set value (01 - FF) to equal the number of zero crossings of pilot tone signal per time code frame. For example, for 60 Hz, 30 frame pilot tone, set the value to 04, because a 60 Hz sine wave will cross zero four times during each frame (1/30 of a second).

For normal operation (with time code), set value to 00.

28 BOTH 00 Slave Time Code and Phase Reference Source Flags.

When set to 00, reference is taken from REF IN jack if over-the-bus time code from an associated SYSTEM 2600E time code reader (interposed between slave transport and synchronizer) is present; if over-the-bus time code is not present, phase reference is taken from the slave play-speed-only time code reader of the Synchronizer module.

When set to 01, reference is taken from REF IN jack only, no matter which way the time code is received.

When set to 02, operation is same as when set to 00, *plus* reference is broadcast on bus line 28 by the Synchronizer for use by other modules.

When set to 03, operation is the same as when set to 01, *plus* reference is broadcast on bus line 28 by the Synchronizer for use by other modules.

When set to 04, allows only play-speed-reader time code to be used as a source of slave time code, and allows source of reference to be automatically selected as when set to 00.

When set to 05, allows only over-the-bus time code to be used as a source of slave time code, and allows reference to be taken from REF IN jack only.

When set to 10, reference is taken only from the slave play-speed-only time code reader of the Synchronizer module, no matter which way the time code is received.

When set to 12, operation is same as when set to 10, plus reference is broadcast on bus line 28 by the Synchronizer for use by other modules.

29 BOTH 00 Master Pilot Tone Frequency.

Set value (01 - FF) to equal the number of zero crossings of pilot tone signal per time code frame, For example, for 60 Hz, 30 frame pilot tone, set value to 04, because a 60 Hz sine wave will cross zero four times during each frame (1/30 of a second).

For normal operation with time code, set value to 00.

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30 BOTH 00 Master Time Code and Phase Reference Source Flags.

When set to 00, reference is taken from bus line 28 if over-the-bus time code from an associated SYSTEM 2600E time code reader (interposed between master transport and synchronizer) is present; if over-the-bus time code is not present, phase reference is taken from the master play-speed-only time code reader of the Synchronizer module.

When set to 01, reference is taken only from bus line 28, no matter which way the time code is received.

When set to 20, reference is taken from the master play-speed-only time code reader of the Synchronizer module only, no matter which way the time code is received.

When set to 04, allows time code read by the master play-speed-only reader to be used as a source of master time code, *plus* allows the source of reference to automatically be selected as when set to 00.

When set to 05, allows only over-the-bus time code to be used as a source of master time code, *plus* allows reference to be taken from bus line 28 only.

31 BOTH 28 Control Track/Tach Pulse Rate.

Value (01 - FE) defines the number of pulses per second (at play speed) of the control track/tach pulse input signal.

When set to 00, the Synchronizer module uses a value equal to the number of frames (or fields if Constant 32 LSD is 2) per second of time code.

When set to FF, invokes the tach pulse rate measurement routine (See Section 3.8 of Synchronizer manual).

32 MSD 0 Master/Slave Time Code Register Initialization and Direction Flag.

When set to 0, the sense of direction jumper JP6 is automatically learned for the Synchronizer module's control track/tach updating routines when either master time code (Constant 32 LSD set to 1) or slave time code (Constant 32 LSD set to 0) is read.

When set to 1, the time code address stored in the offset register will be transferred to either the master time code register (Constant 32 LSD set to 1) or the slave time code register (Constant 32 LSD set to 0) when the first control track/tach pulse is received.

When set to 2, automatic learning for direction sense of jumper JP6 is defeated.

When set to A, the Synchronizer module inverts the sense of tape direction jumper JP6 (the same effect as physically changing the jumper position).

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32 LSD 0 Pulse Update and Fractional Tach Assignment Flags.

When set to 0, assigns the control track/tach pulse input to the slave play-speed-only time code reader.

When set to 1, assigns the control track/tach pulse input to the master play-speed-only time code reader.

When set to 2 *and* E-SY Constant 31 (tach rate) is set to 0, the tach rate for the slave transport defaults to system *field* rate (60, 50 or 48 Hz) instead of system frame rate.

When set to 3 *and* E-SY Constant 31 is set to 0, same as when set to 2 *except* that tach is assigned to the master.

When set to 4, invokes slave software bi-phase decoder operation. Refer to the appropriate Interface Drawing for connections between bi-phase and E-SY module.

When set to 5, invokes master software bi-phase decoder operation. Refer to the appropriate Interface Drawing for connections between bi-phase and the **E-SY module.**

NOTE

Additionally, either the slave pilot tone frequency (Constants 27 MSD and LSD) or the master pilot tone frequency (Constants 29 MSD and LSD), as appropriate, must be set to a value equal to the number of play speed bi-phase square wave cycles per frame (play speed bi-phase frequency divided by the number of frames per second).

For example, if the play speed bi-phase frequency is 240 Hz (240 cycles per second), and the time code standard in use is 30 frames per second, then the constant should be set to 8 (240 divided by 30 = 8 cycles/frame).

When set to 8, the fractional tach mode is invoked. The value of Constant 31 (tach rate) then represents the number of tach pulses per 8 seconds.

When set to 9, operation is the same as when set to 1, *plus* the fractional tach mode is also invoked.

33 MSD 0 Splice-Trap Request Flag.

When set to 0, the Synchronizer module will hold the original offset following detection of a splice, and will attempt to chase and re-synchronize as necessary.

When set to 1, the Synchronizer will hold the new offset—both address and subframes—following detection of a splice, and will maintain lock.

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When set to A, the Synchronizer will capture subframe offsets following detection of a splice ***only after the Auto mode switchover to Freewheel has occurred.*** When the Auto mode is exited, the original fractions of offset are restored, leaving unchanged the offset that was in use before the Auto mode switchover.

When set to F, the Synchronizer will capture subframe offsets only (keeping original hours, minutes, seconds and frames offset), following detection of a splice. If hours, minutes, seconds or frames offset change is detected, the Synchronizer will attempt to chase and re-synchronize as necessary, if the Synchronizer is in Address mode.

33 LSD 0 Slow Relock Request Flag.

When set to 0, errors encountered during lock are handled by re-synchronizing the transport at the normal (audible) rate of capstan slewing.

When set to a value N from 1 to 9, errors encountered that are N frames or less are handled by re-synchronizing the transport at a slow, sub-audible rate (approximately 0.1 frames/second). Errors that are greater than N frames are handled at the normal rate.

34 BOTH 29 Lock Routine Exit Error.

The two-digit decimal number (00 - 99) determines the magnitude of the offset error, in frames, which must occur before the Synchronizer module will switch from capstan control mode to the cueing mode in order to try to correct the error.

35 MSD 6 Command Repeat.

When set to 0, command repeats are defeated, and the E-SY module will send only one command to achieve a requested transport motion.

When set to a value N from 1 to F, the E-SY module will *repeat* a transport command (FF, RW, Play, Stop) N times to achieve a desired motion by a transport. For example, if set to 2, the command will be issued a total of three times. If transport has not responded to command after last repeat, a Stop command is issued.

The Command Repeat routine is only invoked during automatic operations, such as cueing, chasing, auto-play, and cycling. Commands are not repeated automatically if a transport does not respond to a command which is not part of an automatic routine (pressing the PLAY key on a SYSTEM 2600E Controller, for instance).

35 LSD 6 Momentary Command Output Duration.

Value determines the output duration—in increments of 1/120 second, from 1 (8.3 ms) to F (125 ms)—of command outputs. Actual output duration may vary +/- 1/120 second from the desired duration.

If transport appears to be missing commands issued by the Synchronizer module, command pulse duration should be lengthened.

36 MSD 0 Event 2 (Record Out) Advance.

Numeric value (0 - F) of advance operation of the Event 2 (Record Out) output, in frames.

36 LSD 0 Event 1 (Record In) Advance.

Numeric value (0 - F) of advance operation of the Event 1 (Record In) output, in frames.

37 MSD 2 Park-Ahead to Playing Master.

Number of seconds (0 - 7) that a slave will park ahead of a playing master when slave is cueing prior to synchronizing.

This value is also used as the stopped-master park-ahead time in the parking routines invoked by Constant 08 MSD.

37 LSD 0 Smart-Start Defeat Flag.

When set to 0, the Smart-Start routine is enabled, and ongoing adjustments to Smart-Start are done ***only after true master and slave time codes have been read***.

When set to 1, the Smart-Start routine is defeated. The Synchronizer module starts the slave as soon as the master starts and attempts to synchronize the slave to the master, using capstan speed control, as long as the initial offset error does not exceed the lock routine exit value (Constant 34 BOTH).

When set to 2, updating of the Smart-Start parking position is suspended, but Smart-Start is still done using the last known parking position.

When set to 4, adjustments to the Smart-Start parking position are done without waiting for true master time code to appear.

NOTE

When a master is operating in pseudo-address mode, all slaves which are following that master and are using true time code ***MUST*** have Constant 37 LSD set to 4.

When set to 8, Smart-Start parking position adjustments are done without waiting for true slave time code to appear.

When set to C, Smart-Start parking position adjustments are done without waiting for true time code to appear from either the master or slave.

38 MSD 0 Resolved-Play Flag.

When set to 0, the Synchronizer interprets any Play command issued to it via an external controller (including SYSTEM 2600E Controllers) as a standard (non-resolved) Play command.

When set to 1, the Synchronizer interprets any Play command issued to it via an external controller (including SYSTEM 2600E Controllers) as a Resolved-Play command, causing the slave to be freewheel-locked to the reference signal appearing on bus line 28 (AUXV) of the SYSTEM 2600E Module Data Bus. If this reference disappears, the Synchronizer issues a Stop command to the transport.

When set to 3, same as 1 except that if the AUXV reference disappears, the Synchronizer allows the transport to continue playing.

When set to 4 ***and*** Auto mode is invoked, the Synchronizer module will first address-lock the slave to the master's time code; then, after the Auto mode switches over to freewheel, the slave will ignore both master time code ***and master motion***, but will continue resolving to the AUXV reference. This is useful in a code-only situation where the master transport has only a short leader of time code at the head of its tape, and it is desired to have the slave continue to play resolved to "house sync" after having synchronized to that short segment of master time code.

When set to 6, same as 4 except that if the AUXV reference disappears, the Synchronizer module allows the transport to continue playing.

When set to 8 ***and*** Auto mode is invoked (Constant 38 LSD is set to a non-zero value). The Synchronizer will first address-lock the slave to the master's time code; then, after the Auto mode switches over to freewheel, the capstan relay turns OFF, allowing the slave transport to "self-resolve". Any integer ***or fractional*** offset errors which may subsequently occur between the master and the slave are ignored.

38 LSD 0 Auto Mode Enable.

Number of seconds of delay (1 - 9) before a slave Synchronizer module switches from Address mode to Freewheel mode, after lock occurs.

When value is 0, Auto mode is not invoked and the slave Synchronizer does not automatically switch to Freewheel.

When value is F, the slave synchronizer switches from Address mode to Freewheel mode without delay, after lock occurs.

39 MSD 1 All-Slaves-Parked Flag Address.

Value (0 - 9) indicates to E-SY module the address it should look to for an All-Transports-Parked status flag. This constant is used by a Synchronizer module when it is set up to control a transport as a master.

This constant should normally be set to the value of the ***lowest synchronizer address*** on the System 2600E Module Data Bus.

39 LSD 0 Event Time Code Flag.

When set to 0, the Synchronizer uses slave (self) time code for event capturing and comparing.

When set to 1, the Synchronizer uses master time code for event capturing and comparing.

40 MSD 0 Maximum Bi-Phase FF/RW Speed.

Value determines the maximum wind speed, as a multiple of play speed, from 1 to F.

Set to 0 if the Bi-phase Option (BPO) card is not installed in the Synchronizer module.

40 LSD 0 Bi-Phase Speed Ramping Rate.

Value determines the rate of speed change (ramping rate) when the transport is accelerating and decelerating between Stop, Play, FF and RW, from 1 to F. Higher numbers produce faster ramping rates.

Use Figure SY-13, Computation of Bi-Phase Ramping Constant Values, to determine the value of the constant.

Set to 0 if the Bi-phase Option (BPO) card is not installed in the Synchronizer module.

41 BOTH 29 Slave Transport Park-after-Chase Window Width.

Decimal value determines the Park-after-Chase window width, from 00 to 99 frames, in increments of 1 frame.

If a slave transport does not park within the programmed window when parking after chasing a master, it will re-cue and re-park, in attempting to park within the window, until the number of oscillations around the cue point (as set in Constant 08 LSD) have occurred.

42 MSD 0 Event 3 (Rehearse) Output Flag.

When set to 0, the Event 3 output is allowed to operate only when the Synchronizer module has determined that the transport is in Play.

When set to 1, the Event 3 output is allowed to operate regardless of transport motion, allowing the output to be used as an independent utility.

42 LSD 0 Subframe Event Operation Flag.

When set to 0, the standard routine for loading frame-accurate event addresses is invoked. This mode may be used with either subframe-accurate (S3,B3 ON) or frame-accurate (S3,B3 OFF) event operation. If subframe-accurate operation is in use (S3,B3 ON), events will occur at the start of the frame edge, minus frame and subframe advances (refer to E-SY Constants 36, 43, and 44 for Record advances, and to E-SY Constants 54, 55 and 56 for Rehearse advances).

When set to 1, invokes the enhanced routine, allowing the subframe event addresses to be entered. ***Note that subframe operation is only invoked when Dipswitch S3,B3 is ON.***

43 BOTH 00 Event 1 (Record In) Subframe Advance.

The decimal value (00 - 99) for advancing the Event 1 (Record In) operating time by hundredths of a frame. This value, as well as the value in Constant 36 LSD, is subtracted from the Event 1 (Record In) address entered by the user. It is used only if subframe event operation is invoked (by setting Dipswitch S3,B3).

44 BOTH 00 Event 2 (Record Out) Subframe Advance.

The decimal value (00 - 99) used for advancing the Event 2 (Record Out) operation time by hundredths of a frame. This value, as well as the value in Constant 36 MSD, is subtracted from the Event 2 (Record Out) address entered by the user. It is used only if subframe event operation is invoked (by setting Dipswitch S3,B3).

45 MSD 0 Speed-Up/Slow-Down Flags.

Constant 45 MSD provides the same function as, and overrides, Dipswitch S3, B2, ***If S3, B2 is set to OFF.*** If S3, B2 is set to ON, however, Speed-Up/Slow-Down commands are invoked and assigned to FF/RW continuous outputs, respectively, and Constant 45 MSD will ***not*** have any effect on Speed-Up/Slow-Down command modes.

When set to 0, Speed-Up/Slow-Down commands are not invoked.

When set to 1, Speed-Up/Slow-Down commands are invoked and assigned to the FF/RW *momentary* outputs, respectively.

When set to 2, Speed-Up/Slow-Down commands are invoked and assigned to the FF/RW *continuous* outputs, respectively.

45 LSD 0 Lock Output Flag.

When set to 0, the lock output turns ON when the transport has achieved lock, and remains OFF for all other conditions.

When set to 1, the lock output turns ON while the transport is cueing, shuttling (FF or RW) or synchronizing (but *not* locked), and remains OFF for all other conditions.

When set to 2, the lock output pulses once (for the duration defined by E-SY Constant 35 LSD) when the transport has achieved lock.

When set to 3, the lock output turns ON while the transport is cueing or jogging, and remains OFF for all other conditions.

When set to 4, same as 1 except that the lock output also turns ON while the transport is jogging.

When set to A, the lock output turns ON when the All-Transports-Parked status is true, and remains OFF for all other conditions.

When set to C, the lock output follows whatever state the capstan output is in (see Constant 04 MSD, Capstan Relay Mode Flag).

When set to E, the lock output follows the Synchronizer module's Record arming state. It turns ON when the Synchronizer's Event 1 and Event 2 relay outputs are armed to trigger at the edit In and Out addresses, respectively. The lock output turns OFF when Record arming is disabled.

When set to F, the lock output remains OFF under all conditions.

46 MSD 0 DC Polarity Flag.

Constant 46 MSD provides the same function as, and overrides, Dipswitch S3, B8, ***If S3, B8 is set to OFF***. If S3, B8 is set to ON, however, DC capstan control is inverted, and Constant 46 MSD will ***not*** have any effect on polarity.

When set to 0, the control sense for DC-controlled capstans is assumed to be normal; that is, increasing the control voltage ***increases*** the capstan speed.

When set to 8, the control sense for DC-controlled capstans is assumed to be inverted; that is, increasing the control voltage ***decreases*** the capstan speed.

46 LSD 9 Out-of-Phase MTC Correction Criterion.

When set to 0, the Synchronizer's Out-of-Phase MTC correction routine is defeated.

When set to a value N from 1 to F, master time code readings that are improperly phased with respect to the master frame edge signal are corrected in the Synchronizer's lock routine.

The value N represents the maximum number (1-15) of ***contiguous***, misphased MTC readings that will be corrected before lock is achieved.

47 BOTH 00 Type-of-Jog Flag.

When set to 00, the Synchronizer module ignores all jog commands sent to it.

When set to one of the following transport-specific values, the Synchronizer module will convert jog commands sent to it into the nearest equivalent jog motion that the transport can achieve:

VALUE	TRANSPORT TYPE
01	RS-422 (2600 SCO installed in E-SY module)
02	Sony VO-5800/5850/9600/9800/9850, VP-7000/9000/9600 (2600 SSO in E-SY module)
03	JVC CR-850 (parallel), CR-5550/6650/8250
04	Panasonic AG-6300/6500/7300/7500, NV-8500
05	JVC DS-DT900 DAT (parallel)
06	Sony PCM-7030 DAT (parallel)
0A	Albrecht (50 Hz bi-phase)
0B	240/250 Hz bi-phase

If Constant 47 is set to 03 (JVC 6650/8250), then the Synchronizer module's transport cable must conform to SYSTEM 2600E Interface Drawing No. C8809-003, Rev. 2; and the E-SY module's DC1 output must be set up as per Figure 1, "DC-1 Set-Up for JVC CR-5550/6650/8250", in Field Bulletin SY-7.

If Constant 47 is set to 02, be sure that Jumper JP-4 on the E-SY module's Synchronizer PCB is set to the .3 position (see Application Bulletin 8-B, or Interface Drawing No. C8809-002, Rev. 3).

48 BOTH 43 Transport ID (Least Significant Digits).

This Constant has no effect on synchronizing parameters, but serves only to specify which factory-programmed set of transport Constants is to be loaded into RAM from the Transport Library.

When the Menu-Select mode is invoked from either the E-SY module's front panel or the 2600 E-CC Compact Controller, the value of this Constant appears in the FRAMES positions of the E-SY module's or Compact Controller's display.

49 MSD 0 Reserved.

49 LSD 0 Menu ID (Most Significant Digit).

This Constant has no effect on synchronizing parameters, but serves only to specify which factory-programmed set of transport Constants is to be loaded into RAM from the Transport Library.

When the Menu-Select mode is invoked from either the E-SY module's front panel or the 2600 E-CC Compact Controller, the value of this Constant appears in the SECONDS position of the E-SY module's or Compact Controller's display.

—Continued—

50 MSD 0 Master Time Code Standard.

When set to 0, a ***slave*** Synchronizer module takes as the standard of master time code the standard (30, 25 or 24 fps) of the time code broadcast on the SYSTEM 2600E Module Data Bus by the SYSTEM 2600E module assigned as the master for that slave Synchronizer (i.e., the SYSTEM 2600E module whose bus address has been entered in Constant 00 LSD of all Synchronizer modules on the Data Bus). However, a ***master*** Synchronizer module (a Synchronizer module whose bus address—as set by its red rotary switch S2—matches the value set into its Constant 00 LSD) takes the ***system*** time code standard (defined by the module at Bus Address 0) as the master time code standard.

For example, if on a Module Data Bus there are a 2600 E-LG LTC Generator at Bus Address 0, a master 2600 E-SY module at Bus Address 1, and slave Synchronizer modules at Bus Addresses 2 and 3:

-- Constant 00 LSD on ***all*** the Synchronizer modules will be set to 1;

-- The slave Synchronizers at Bus Positions 2 and 3 will take as the time code standard the standard of the time code broadcast on the data bus by the master Synchronizer at Position 1; and

-- The master Synchronizer at Position 1 will take as the time code standard the time code standard defined by the 2600 E-LG at Position 0.

When set to 1, the master time code standard is assumed to be 24 fps.

When set to 2, the master time code standard is assumed to be 25 fps.

When set to 3, the master time code standard is assumed to be 30 fps.

50 LSD 0 Slave's ("Self") Time Code Standard.

When set to 0, the slave's time code standard (or "self" time code standard if the Synchronizer module has been assigned as master) is assumed to be governed by Dipswitches S3,B4 and B5 on the E-SY module (see Section 1.5.2 in the Synchronizer manual).

When set to 1, the slave's (self) time code standard is assumed to be 24 fps.

When set to 2, the slave's (self) time code standard is assumed to be 25 fps.

When set to 3, the slave's (self) time code standard is assumed to be 30 fps.

51 MSD 0 Reserved.

51 LSD 0 NTSC Video Speed Correction Flag.

When set to 0, no speed correction is applied to the slave while running locked to the master.

When set to 1, causes the slave to run 0.1% ***slower*** than the master during lock.

When set to 2, causes the slave to run 0.1% ***faster*** than the master during lock.

The value of 0.1% represents the proportional difference between the ***NTSC video-derived*** frame rate of 29.97 fps and the ***mains- or internally-derived*** frame rate of 30 fps.

Set this constant to 1 when:

a) the slave transport has had its time code and program material recorded while running locked to an ***NTSC video*** reference, ***AND***

b) the master transport has had its time code and program material recorded while running locked to a ***mains or internal*** reference.

Set this constant to 2 when:

a) the slave transport has had its time code and program material recorded while running locked to a ***mains or internal*** reference, ***AND***

b) the master transport has had its time code and program material recorded while running locked to an ***NTSC video*** reference.

The NTSC speed correction may also be invoked while Cross-Locking† (slave time code rate not the same as master time code rate).

52 MSD 1 Park-Ahead to Stopped Master.

The value (0 to F) defines the ***minimum*** number of frames-multiplied-by-5 that the slave must position itself ahead of the parked master in order to insure that Smart Start can be accomplished when the master goes into play.

This value represents an ***initially-entered*** value of the internally-retained Park-Ahead value used by the Synchronizer's Smart Start routines.

The Synchronizer module, after going through several cue-park-lock cycles, may optimize this internally-kept Park-Ahead value to one which is different from the start-up value set by this constant (which remains unchanged).

52 LSD 1 Park-to-Play Compensation.

The value (0 to F) defines the number of frames-multiplied-by-5 that the Synchronizer must compensate for the transport's start-up delay (the time from when the Synchronizer issues a Play command to when the transport has actually achieved play speed).

This value represents an ***initially-entered*** value of the internally-retained Park-to-Play compensation used by the synchronizer's Smart Start routines.

The Synchronizer module, after going through several cue-park-lock cycles, may optimize its internally-kept Park-to-Play compensation to one which is different from the start-up value set by this constant (which remains unchanged).

53 MSD 0 Record Tally Flag.

When set to 0 ***and*** Dipswitch S3,B6 of the E-SY module is OFF, the Synchronizer assumes that no record tally output is connected to pin 20 of the E-SY's 50-pin transport connector and will not broadcast the logical state of pin 20 over the data bus.

The Synchronizer module's internally-kept, software Record tally is *not* enabled. *All* Record punch-in and punch-out requests sent to the Synchronizer are executed, even if the same Record punch-in or punch-out request has been repeated several times in a row.

When set to 1 ***and*** dipswitch B5,S3 of the E-SY module is OFF, the Synchronizer assumes that no Record tally output is connected to Pin 20 of the E-SY's 50-pin transport connector, and will *not* broadcast the logical state of Pin 20 over the data bus.

The Synchronizer module's internally-kept, software Record tally *is* enabled, preventing accidental punch-in or punch-out of Record as a result of issuing the same Record punch-in or punch-out request several times in a row to a transport which handles the Record function as a *toggle*.

When set to 2 ***or*** Dipswitch S3,B6 of the E-SY module is ON, the Synchronizer assumes that an ***active-low*** record tally output (one whose output goes to logical "0" when the transport enters Record) is connected to pin 20 of the E-SY's 50-pin transport connector. The E-SY module broadcasts the tally status over the data bus for use by an external controller such as the 2600 E-A/V Audio Editor or 2600 E-CC Compact Controller.

The Synchronizer module's internally-kept, software Record tally is *not* enabled. *All* Record punch-in and punch-out requests sent to the Synchronizer are executed, even if the same Record punch-in or punch-out request has been repeated several times in a row.

When set to 3, the Synchronizer module assumes that an *active-low* Record tally output (one whose output goes to logical "0" when the transport enters Record) is connected to Pin 20 of the E-SY's 50-pin transport connector. the Synchronizer module broadcasts the tally status over the Module Data Bus for us by an external controller such as the 2600 E-A/V Audio Editor or the 2600 E-CC Compact Controller

The Synchronizer module's internally-kept, software Record tally *is* enabled, preventing accidental punch-in or punch-out of Record as a result of issuing the same Record punch-in or punch-out request several times in a row to a transport which handles the Record function as a *toggle*.

When set to A, the Synchronizer assumes an ***active-high*** record tally output (one whose output goes to logical "1" when the transport enters Record) is connected to pin 20 of the E-SY's 50-pin transport connector. The E-SY module broadcasts the tally status over the data bus for use by an external controller such as the 2600 E-A/V Audio Editor or 2600 E-CC Compact Controller.

When set to B, the Synchronizer module assumes an *active-high* Record tally output (one whose output goes to logical "1" when the transport enters Record) is connected to Pin 20 of the E-SY's 50-pin transport connector. The E-SY module broadcasts the tally status over the data bus for use by an external controller such as the A/V Audio Editor or the 2600 E-CC Compact Controller.

The Synchronizer module's internally-kept, software Record tally *is* enabled, preventing accidental punch-in or punch-out of Record as a result of issuing the same Record punch-in or punch-out request several times in a row to a transport which handles the Record function as a *toggle*.

53 LSD 0 Rehearse Mode Flag.

When set to 0, the Synchronizer module's Event 3 output operates as a ***continuous*** output during rehearse, switching ON at the Rehearse In point and Switching OFF at the Rehearse Out point. Events 1 and 2 are not used during Rehearse.

When set to 1, the Synchronizer module's Event 3 output operates as a *pulsed* output during Rehearse, pulsing once at the Rehearse In point and once at the Rehearse Out point. Events 1 and 2 are not used during Rehearse.

When set to 2, the Synchronizer module's ***Event 3*** output pulses once at the **Rehearse In point, and its *Event 2* output pulses once at the Rehearse Out point. Event 1 is not used during Rehearse.**

When set to 3, the Synchronizer module's *Event 3* output switches ON during Rehearse, its *Event 1* output then pulses once at the Rehearse In point, and its *Event 2* output pulses once at the Rehearse Out point. *Event 3* switches OFF when a Record edit or a Replay is performed.

When set to 4, the Synchronizer module's *Event 3* switches OFF during a Rehearse, its *Event 1* output pulses once at the Rehearse In point, and its *Event 2* output pulses once at the Rehearse Out point. *Event 3* switches ON when a Record edit is performed and switches OFF when a Replay is performed.

NOTE

When set to 1, 2, 3 or 4, the pulse duration is defined by the value set in that Synchronizer module's Constant 35 LSD.

54 MSD 0 **Rehearse Out Advance.**

Numeric value (0 - F, hex), in frames, that the Rehearse Output (as defined by Synchronizer Constant 53 LSD) will operate in advance of the edit Out address.

54 LSD 0 **Rehearse In Advance.**

Numeric value (0 - F, hex) in frames, that the Rehearse Output (as defined by Synchronizer Constant 53 LSD) will operate in advance of the edit In address.

—Continued—

55 BOTH 00 Rehearse In Subframe Advance.

The decimal value (00 - 99) for advancing the Rehearse Output (as defined by Synchronizer Constant 53 LSD) trigger address by hundredths of a frame. This value, as well as the value in Constant 54 LSD, is subtracted from the edit In point entered, captured or marked in by the user. It is used only if subframe event operation is invoked (by setting Dipswitch S3,B3, on the Synchronizer module's Processor PCB, to ON).

56 BOTH 00 Rehearse Out Subframe Advance.

The decimal value (00 - 99) for advancing the Rehearse Output (as defined by Synchronizer Constant 53 LSD) trigger address by hundredths of a frame. This value, as well as the value in Constant 54 LSD, is subtracted from the edit Out point entered, captured or marked in by the user. It is used only if subframe event operation is invoked (by setting Dipswitch S3,B3, on the Synchronizer module's Processor PCB, to ON).

—End—