

TCG

Time Code Generator

Software option for the SR-112

Owner's manual

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Credits

Concept: AID, Brainstorm Electronics
Software: Gerry Lester
Manual: Bernard Frings, Gerry Lester
Technical Assistance: Jim Pace

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1. Introduction

The TCG option enables the SR-112 to generate time code, locked to an external video reference or not, for multiple applications:

- Generate new master time code, at any standard rate;
- Regenerate existing time code (eliminating drop outs and reducing jitter);
- Jam sync locked to external video;
- Delay time code up to 60 msec (useful when aligning audio to video)

2. Installation

Be sure to update your SR-112 with the latest firmware (for information, please refer to page 18 of the SR-112 User’s Manual).

Once you have registered your TCG purchase, you will receive a unique authorization key, a series of 4 numbers, separated by periods. This key is only valid for the SR-112 with the serial number used during registration.

Enter this code via Menu 98 (Feature Key - see page 6) then reboot your unit.

This authorization procedure only needs to happen once, even with subsequent firmware updates.

3. Status Pages (LCD Display)



With the TCG option installed, your SR-112 has 3 new status pages, in addition to the 5 existing ones:

- TIME CODE INPUT STATUS
- TIME CODE INPUT READER - NEW
- USER BITS IN
- GENERATOR STATUS 1 - NEW
- GENERATOR STATUS 2 - NEW
- VIDEO FORMAT
- TIME CODE/ VIDEO PHASE
- TIME CODE ERRORS

To access these different pages, press the [UP] or [DOWN] key.

- TIME CODE INPUT READER



Gives visibility to the timecode input at times when the generator takes over the 7-segment display.

- GENERATOR STATUS 1



Indicates the format and the frame rate of the generated time code. Formats available are 24, 25, 30DF and 30ND. Rates available are 23.976, 24.000, 25.000, 29.970 and 30.000.



The “XFrM” indicator comes on when the generator is creating 24 frame code locked at 23.976Hz to an NTSC video reference. This is the only cross frame mode currently supported.

- GENERATOR STATUS 2



The bottom line of this page is separated in 3 sections:
Left: Indicates the Repair Mode selected in menu 20 (Jam/Copy)
Center: Indicates the Generator Delay in milliseconds.
The “DLY=xx” segment illuminates only when a delay has been requested via the “Gen Delay” menu 12.
Right: Indicates the lock status of the regenerator (Unlk/Lock)

4. Menus Description

4.1. MENU 01: MODE



The SR-112 has 3 different operating modes:

- Reshape
- Repair
- Generate

A corresponding LED illuminates on the front panel (STATUS Section) to indicate the current selection.

Note: Menu 01 only appears when the TCG software option has been installed since, without it, Reshape is the only mode available.

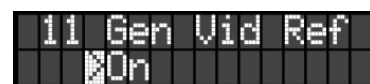
4.2. MENU 10: GENERATOR FORMAT



Select from the following options the type of time code to be generated:

- 24 at a rate of 23.976
- 24 at a rate of 24.000
- 25 at a rate of 25.000
- 30DF at a rate of 29.970
- 30ND at a rate of 29.970
- 30DF at a rate of 30.000
- 30ND at a rate of 30.000

4.3. MENUS 11: GENERATOR VIDEO REF



This selection determines if the generator is video referenced or not.

If an external video reference is connected to the rear panel, the TCG will lock to it. With 24F/S & 30F/S, this means the rate will be pulled down to 23.976 and 29.970. This is always the case, even if no video is present.

4.4. MENUS 12: GENERATOR DELAY



Menu 12 lets you enter a value in milliseconds to delay the generator output in repair mode. This value can go up to 60 milliseconds.

This function can be useful when the audio is ahead of the video.

The "Gen Delay" menu is unique in that the generator delay is dynamically adjusted as the menu value is incremented or decremented. It is not necessary to press the [ENTER] key for the new value to take effect.

When the TCG starts running and a delay has been requested, the 7-segment display indicates "Gen dly" for about 2 seconds (see page 8).

4.5. MENUS 13: GENERATOR START TIME



This is the frame number at which the TCG will start when the [GEN RUN] button is pressed.

4.6. MENUS 14: GENERATOR USER BITS



This menu lets you set the User Bits of the generated time code.

4.7. MENUS 20: REPAIR MODE



Two Repair Modes are available: COPY and JAM.

- COPY: the SR-112 continuously reads the time code input and regenerates the exact same numbers.
- JAM: a one-time copy of the input time code is transferred to the generator shortly after the input time code achieves play velocity. The generator then increments as it would in GENERATE mode.

4.8. MENUS 21: REPAIR FLYWHEEL TIME



If the source time code becomes corrupted or drops out, the TCG repairs this by flywheeling over the 'bad' area, generating good code.

Menu 21 lets you set the interval of time during which this happens. The choices are: 5 fr, 15 fr or infinity.

With INFINITY selected, use the [GEN RUN] switch to stop the generator.

4.9. MENUS 22: REPAIR RAMP UP TIME



During the "Ramp Up" period the generator is inactive, and input code is switched to the outputs as it would be in RESHAPE mode. Only at the end of the "Ramp Up" period does the generator start to actively seek an opportunity to begin jamming input time code into the generator stream.

Default "Ramp Up" is "None" and can be adjusted from "None" to 9.5 sec with 0.5 sec increments.

4.10. MENUS 23: REPAIR INPUT PERSISTENCY



The “Persistency” is the number of consecutive frames that the input time code must be seen to be incrementing normally before the generator jams the input time code into the generator stream.

The default value is 5 frames. It can be adjusted from None to 99 frames.

If the generator is on “Copy” mode, then the generator jams the input time code as long as the input time code continues to increment.



There are two special “Persist” settings:

- “None” means that there is no requirement for the input time code to be incrementing at all, and that the generator will use any valid number that it receives.
- “None:No Comp” is the same as “None”, but the usual methods of incrementing time code to compensate for internal reader and generator delays is discarded. The input time code is transferred unaltered to the generator stream and in that way, as long as input time code remains valid, every input frame will be accounted for in the output stream.

The disadvantage of this mode is that there is a two (2) frame delay between the input time code and the output generator code.

4.11. MENUS 24: REPAIR TIME CODE JAM WINDOW



The repair “Window” setting is used only while the generator is locked to a video reference and while it is copying or jamming from input time code. It specifies, as a percentage of a frame, the size of the “window” on either side of the video frame edge within which the input time code frame edge must fall before the input code will be recognized by the generator.

The default 25% should be perfectly adequate to accommodate time code which is not quite correctly in phase with the video reference. If however, for example, the input time code is locked to the wrong video field, then it may be necessary to open up this “window” to 50% or higher.

4.12. MENUS 98: FEATURE KEY



Menu 98 lets you enter a unique key to authorize certain features on your SR-112, such as the TCG. See ‘Installation’ page 2.

IMPORTANT NOTE ON MENU OPERATION: Remember to always press the [ENTER] key to save your settings prior to exiting a menu or to exiting the SET UP mode. No change will take place until the [ENTER] key is pressed.

5. Generator Switches and LED’s

The front panel switches and LED’s have different functions depending on the SR-112 mode of operation (Reshape / Repair / Generate). Here is a description of each under the 3 different modes. Brackets are added to indicate that operation is identical in REPAIR and GENERATE (GEN RUN LED and VIDEO REF LED).

5.1. GENERATOR RUN SWITCH

- RESHP: Ignored
- REPAIR: Stops Generator when in Flywheel mode
- GEN: Starts / stops generator



5.2. VIDEO REF LED

- RESHP: Off
- REPAIR: Off Generator is not video referenced
- /GEN: On: Generator is video referenced

5.3. GENERATOR RUN LED

- RESHP: Off
- REPAIR: Off (generator not running)
- /GEN: On: Generator is running, and generator code has been switched to the outputs
- Blink: Generator is running as above, but has entered the infinite flywheel state.
- to stop the generator press the [GEN RUN] key. (Note that if the input code has started running again prior to pressing [GENRUN], then the generator will at that time re-sync and re-jam.)

5.4. RESHAPE LED

- RESHP: On
- REPAIR: Normally off
- GEN: Off
- But blinks when generator is bypassed and input code is active (typically during jam/copy ramp up)



5.5. REPAIR LED

- RESHP: Off
- REPAIR: On
- GEN: Off

5.6. GENERATE LED

- RESHP: Off
- REPAIR: Normally off
- GEN: On
- but illuminated solidly when either:
 - (a) generator has entered flywheel mode (source stopped)
 - or (b) generator is in jam mode and past the jam point

6. Non-Volatile Storage

The SR-112 has non-volatile memory holding the current settings, including all the TCG settings. This memory is continuously updated so that, when the unit is turned on, it is in the same condition as it was when powered down.

NOTE: You should wait approximately 10 seconds after a change was entered before powering down, to allow for the flash memory to be updated.

7. Error Messages - 7-Segment Display

7.1. GENERATOR DELAY



This message (informational, not an error) is displayed when generator starts running and a delay has been requested (Repair, or Generate to Vid Ref only)

7.2. CODE - VIDEO



This message is displayed in Repair mode, Video referenced, if the input timecode type cannot be matched up with the video rate.

7.3. GENERATOR SYNC



This message is displayed in case of a Generator Sync Error (very unlikely).

7.4. GENERATOR FAILURE



This message is displayed in case of a Generator Internal Failure (even more unlikely).

8. Error Messages - Other

The following time code input errors will not be shown on the 7-segment display while the Generator is running. They will however still be added to the error report listing.

- | | |
|------------|------------|
| “CODE ERR” | “DF CHG “ |
| “CODESTOP” | “DROP OUT” |
| “CF CHG “ | “TYPE CHG” |
| “DF ERR “ | “INVALID “ |
| “DISCONT “ | “REPEAT “ |