DCODE® GR-1 MASTER CLOCK _____

The GR-1 is a stand alone time code generator/reader. It can be used for logging with the internal memory and printer output, and for finding offsets and drift with its internal error display.

When the GR-1 is turned on it will go into the generate mode at the preset frame rate. The time code sets to the internal time of day and the user bits are set to the current date.

To set the time code, user bits, and frame rate: Press the "SET" key, time code will stop. A large cursor will appear over the "G". Use the up, down, left, and right keys to set the proper mode and time code value.

To set user bits scroll past the end of the display. The user screen will appear. Set the user bits as desired. The rate field will show "00". This means free UB or "MD" (indicating date mode). Once the rate and mode are set press the "SET" button. The cursor will disappear and the time code will start. Re-jam after setting the code so you are in sync. The internal clock is only used at the initial power on.

DISPLAY:
The display is a 16 digit LCD module that shows time code/user bits, mode and rate. The following list is a description of the different mode functions.

RATE FIELD DISPLAYS:
24/25	=	24/25 frames/second
29/30	=	29.97/30 frames/second
2d/3d	=	29.97/30 frames/second with drop frame

Bar graph of offset errors

THE MODE FIELD:
G	=	Generate at 24, 25, 29.97, 30 drop and non-drop code
LK	=	Lock out the set button until power is turned off
ST	=	Set the internal clock time and date. DM = day month; MD = month day.
R	=	Reads tc/ub and displays the incoming frame rate.
JC	=	Continuous jam sync to any break in code.
J	=	Jam sync to external time code one time.
SX	=	Generate start/stop code locked to an external reference.
SU	=	Generate start/stop code with playback code in the user bits.
SR	=	Generate start/stop code and read code on the input.
SS	=	Generate start/stop code triggered by an external switch.
GX	=	Generate code locked to an external reference.
GU	=	Generate with playback code in the user bits.
GR	=	Generate code and read code on the input.

MODE
(G) = The default mode at turn on. When the GR-1 is first turned on it displays the version number and copyright notice, followed by the date. The turn on sequence takes approximately 8 seconds. The internal back up crystal is set at that time. Time code feeds to the output when the display is running. All the buttons are active on the GR-1. Pushing the set button will stop the time code and allow setting of new time, user bits, and frame rate. Pushing set will offset the time code. Re-jam the slate.

(LK) = <u>Locks out use of the SET button</u>. Press the SET key. Scroll down to LK. Press the left arrow key. Press the SET key again and scroll to desired mode. When you press the SET key again, your mode will be selected and the SET key is disabled. To reset the SET key turn the GR-1 off and then back on again.

(ST) = <u>Sets the internal clock date, and date format</u>. The internal clock is used to set the time code clock at turn on. To set the date pass the end of the display and the date screen will come up. When the GR-1 is turned off the back light will blink every 4 seconds to update the internal clock. An internal backup lithium battery (BR2325) is used for the power-off clock and memory back up. The display will alert you of a dead battery. The GR-1 will still work when the BR2325 is dead. However, the internal power-off clock will not function.
LB will flash in the rate field when the main batteries are low. The time code out will still be good for a short time more, but it's time to change batteries.

(R) = <u>Read mode.</u> It displays time code, user bits, and frame rate. The input time code is re-shaped and sent to the output connector. Any time there is a stop or start in the time code, that time will be sent to the serial port as an OUT + time or IN + time. All other printer functions will be enabled.

(JC) = <u>Jam continuous.</u> This will re-jam anytime there is a break in the clock of the code. This is useful for re-stripping time code on a dub if the frame rate needs changing. An example is copying a 24 frame per second code to 30 fps. The time code is jammed on the 00 frame so the hours, minutes, and seconds are the same. Only the frame rate changes. The output port will send jam at time.

(J) = <u>Jam.</u> Jam once when the set button is pushed. The jam is on the 00 frame so cross jamming of different rates can be accomplished. The input is active after the GR-1 is jammed. Sync between external code can be compared to the already jammed code. For example, jam the GR-1 from a Syncbox. Next, take the Syncbox out of sync and feed it into the GR-1. The equal, plus or minus sign will appear in between the time code and the mode field. Press and hold the left arrow button. You will see the error in time down to the 10th of a frame with the remainder in bits in the bar graph. When the code drifts off, but is still within a 10th of a frame, a not equal sign will show. A plus or minus will appear as soon as you drift beyond a 10th of a frame. A plus (+) tells you that the code being fed to the input is ahead of the jammed code. Pressing the left key will show you the error down to the bit.

(SS) (SX) = <u>Start / Stop code.</u> In this mode the time code will only run when the hold pin of the remote plug is held low. Pulling this pin low will also trigger the print take output and increment the take counter.

(GX) (SX) = <u>Generate code locked to either a 30Hz or 60Hz reference on the input plug.</u> The equal sign will appear when the GR-1 is locked. Pressing the error button will show you field (60Hz) or frame (30Hz) lock. The bar graph indicates that you are pulling your code. The code will go back to the selected frame rate if sync is lost.

(GU) (SU) = <u>Can be used for live action recording with playback.</u> Time code is generated in the time portion of the time code. The play back code is fed into the input. The time of that time code is transferred into the user bits of the new time code. There is a 1 to 2 frame delay in the play back code on the new time code.

(GR) (SR) = <u>Splits up the function of the GR-1 into a generator and a reader.</u> The time code output is unaffected, but you can now read a different code in the display. If you want to read what is coming out of the generator just loop the output into the input. The equal sign will appear if the code is in sync. A plus or minus displayed indicates any offset. Time code and user bits can be displayed with the TC UB key. When user bits are selected a "U" is displayed in the mode field. A "00" in the rate field tells you that you are in the free user bit mode. Free user bits are in memory when the power is turned off and are re-loaded at power on. "MD" in the rate field tells you that you are in the date mode. In the date mode the internal clock date loads into the time code generator user bits.

ER OR LEFT ARROW

An equals, plus, or minus sign between the time code and mode field indicate that there is a difference between the generated code and the incoming code. To view the difference press the ER button. The offset displays with a remainder in tenths of frames, and a bar graph of the bit error.

HOLD MEMORY

Pressing HOLD stores the time code value in memory and displays H- 0. Pressing HOLD again releases hold. To view previous hold points, push the up or down key and M- 0 appears. Push down again and M- 1 will display the previous hold point. Pressing hold while in the memory mode places the new time code value on top of the stack and displays M- 0. The previous point is pushed down into the memory. The memory can hold 99 tc/ub points. To exit the memory mode press XT key and running time code will be displayed.

PRINTER

The printer output drives any serial printer at 1200 baud, 8 bits, No parity. When the XT key is pushed a header is sent out the serial port and the take number is reset to #01. Every time the time code is held a take number and time code/user bits values are printed. The start of a start/stop or external hold also triggers a take.

SCENE:	MODE G	RATE 30
TAKE	TIME CODE	USER BITS
#01	00:00:00:00	00:00:00:00
#02	00:00:00:00	00:00:00:00

The printer will also print time code in and out times when in the READ and JC modes. Any break in code is printed with an IN+TC/UB, or OUT+TC/UB.

When the takes can not be printed, such as in documentary filming, the headers takes and time code numbers are stored in memory and can be printed out at the end of the day. A separate long buffer, that is not lost with power loss, stores these takes. To print memory, hold down the left arrow key and turn on the power. Continue to hold the button until printing begins.

To clear the memory buffer, hold down the right arrow key and turn the power switch on. Hold the right key until the code begins to run. To accomplish system reset hold the set key down while turning on the power. All memory locations reset, including the time and date. The time code rate will default at 30fps. The date will default to the MD mode and display the software date.

LAMP

The lamp button turns on and off the backlight. The backlight times out after 10 minutes if no buttons are pushed. Double clicking the lamp button when the lamp is off will continuously turn on the back light.

BATTERY

The GR-1 uses six "AA" alkaline batteries, or external power up to 18v. This power is also used to update the power off clock. The memory battery (BR2325) is used to retain memory and trigger the clock. Low "AA" batteries are indicated by a flashing LB in the rate field. When the internal lithium battery is dead the display will show "BR2325 is dead".