

Video Streamer

0.00 Quick Start Guide

0.10 Entering Cues

As the video is playing or parked

- 1: Press the Transfer key [**->**](17) to capture
- 2: Trim by moving the cursor to appropriate areas, enter correct numbers
or using [**INC**](18)+(30) and [**DEC**] (18)+(23).
- 3: Press [**STORE**](22), Timecode is now entered in cue list
- 4: Press [**DATA**](28) to remove data line
- 5: Press [**WIPE**](27) to arm streamer, This stays on during operation.

note: The timecode reader standard has to be correct **BEFORE** entering cues since they are stored as a frame count.

0.20 Update Cue List

- 1: Press [**MODE**](21)
- 2: Press [**2**] then [**2**] again
- 3: Press [**^**](30) or [**v**](23) to find cue to be cleared or updated
- 4: Press [**<-**](29), [**->**](31), or [**TAB**](24) to appropriate area's, enter corrected numbers
- 5: Press [**STORE**](22)
- 6: Press [**MODE**](21)

0.30 Clearing Cue List

- 1: Press [**MODE**](21)
- 2: Press [**5**] then [**1**] then [**1**] again
- 3: Press [**STORE**](22)
- 4: Press [**MODE**](21)

0.30 Video Streamer Setup

- 1: Press [**SET**](12)
- 2: Press [**<-**](29) and [**->**](31) together at the same time
- 3: Select the correct STANDARD, REFERENCE, and NTSC with [**<-**](29), [**^**](30), [**v**](23), [**->**](31)
- 4: Press [**STORE**](22) or [**SET**](12)
- 5: Select correct wipe speed by updating the cue list **BPM** and **BT**, see Entering cues or update cue list. When ADR mode is active ([**MODE**](21), 5, 5, 8) the wipe speed **BPM** and **BT** are global.

0.40 When Streamers do not happen

Check the following:-

- 1: That there is readable timecode at the point in the tape where it is needed.
- 2: That the **WIPE** LED is illuminated.
- 3: That there is no cue directly ahead of the cue you wish to display. The offending cue may be deleted or removed temporarily by using the **ACTIVE** key followed by **STORE**, note that the cue details will become fainter to indicate that the cue is not Active. Alternatively speed up the cues so that they will fit into a smaller time interval.
- 4: That the cue is present in the cue list.

0.50 Displaying Reader timecode as Footage

The Footage may be displayed instead of the Generator User bits.

- 1: Select menu [Mode], [7].
- 2: Select film speed [2]= 24fps, [3]= 25fps, [4]= 30fps.
- 3: Select film size (35/16mm) [7].
- 3: Enter timecode point for zero footage [8].
- 4: Exit menu [Mode].
- 5: [Select] G.User display then enable insertion [TC].



VS-1 Video Streamer

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Timecode Display with Video Cueing

- * Video Cueing..... Different sizes and styles
- * Timecode Inserter Reader, Generator, User
- * Internal Battery backed Cue Listover 500 cues stored
- * Multi-Standard PAL, NTSC, SECAM
- * Any Timecode Standard24, 25, 30, Drop
- * RS232 Serial Interface..... Cue List/EDL Download
- * VS-Link Download ProgramDOS and Widows version
- * Audio Cue Output..... Beep or optional click
- * RS422 Serial interface Interfaces with CB MR Systems
- * Timecode to Footage converter.....Video burn in of footage
- * Lock and Record indicator Video burn-in for both SR and MR Systems
- * Trigger input SR and Other systems

The VS-1 is a video replacement for traditional methods of providing cues. Traditional methods with film involve pre-listen heads and chinagraph pencil wipes punch frames etc for visual and audio cues. The VS-1 offers timecode in the picture, video wipes, countdown numbers, flashframes for visual cues and a beep or optional click output (metronome) for audio cues.

The cues may be triggered in three different ways :-

- 1)From an internal Cue List
- 2)External contact closure
- 3)External audio input

The internal cue list may be generated in different ways:-

- 1)Capture key from timecode reader
- 2)Keyboard entry on the VS-1
- 3)Audio trigger from timecode reader
- 4) Download from PC Compatible Computer using VS-Link or VS-Link2
- 5)Download from CB MR ADR system
- 6)Third party Software Black Box spotting system for DAW's

The Video Streamer has been available since 1986, the software and hardware has been kept up to date by improvements/modifications as required. Most of these are available as upgrades to all uses. The latest addition is the windows version of the VS-Link download software that is currently available in beta form.

look for details and download a trial of VS-Link2 software from www.colinbroad.com

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0.00 NEW FEATURES

0.01 VS-LINK

VS-LINK is a DOS PC program that allows the user to upload and download streamer data files. Information may be downloaded from EDL lists (Record In Time) or text files. Alternatively the existing data in the Streamer may be saved for use at a later date.

0.02 Q-STREAM

QStream is Windows program available from Keith Sherry at www.soundofvoices.com which will allow the user to generate cue files on a number of Digital Audio Workstations and download them to the Streamer.

0.03 FOOTAGE

The footage that was inserted instead of the Time Code Reader user data is now inserted in the Timecode Generator User data. This allows insertion and by using the JAM function any timecode feed may be converted to footage and timecode and used with the CB Electronics Giant Display.

The footage zero point may be set as before or by changing the time code generator reset value.

Hard Reset now sets the Generator USER Bits to be Footage @ 24 fps.

0.20 FOOTAGE

0.21 FOOTAGE INSERTION

To change the footage insert, select as follows

MODE

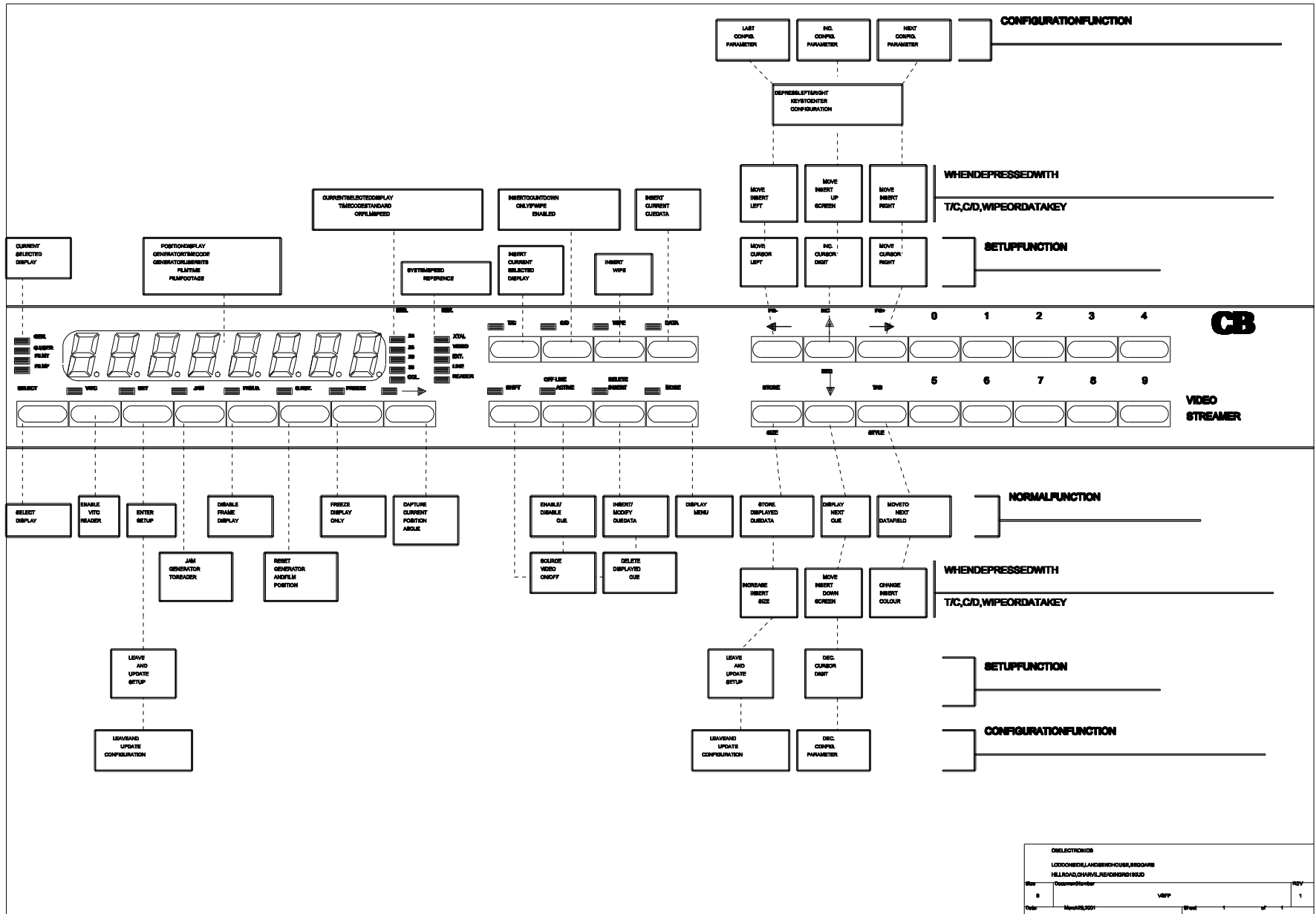
5 SYSTEM OPTIONS

7 USER or FEET+FRAMES

Select as required

To set the footage zero point, either enter from the user/feet+frames selection screen or in normal operation select **SET**, display the generator time and set using the keyboard.

0.22 ENTERING/DISPLAYING CUE POINTS AS A FOOTAGE



1.00 TIMECODE READER/GENERATOR

1.10 DISPLAY

In normal operation the eight digit display will show any of the following:-

Generator timecode
Generator user bits

Reader timecode
Reader user bits

1.11 Generator timecode

To display Generator timecode depress SELECT until the 'GEN' LED is illuminated.

1.12 Reader timecode

To display Reader timecode depress SELECT until the 'READ' LED is illuminated.

1.13 Generator USER bits

To display Generator user bits depress SELECT until the 'G.USER' LED is illuminated.

1.14 Reader USER bits

To display Reader user bits depress SELECT until the 'R.USER' LED is illuminated.

1.15 FRZ

This key may be used to Freeze the display at any time. When the display is frozen the FRZ LED is illuminated.

1.16 FRM.D

This key is used to enable or disable the display of frames. The LED is illuminated when the frame display is disabled.

This key also enable's and disable's the frame display in the inserted video.

1.17 STD

These LED's will illuminate to indicate the standard of the incoming code when either 'READ' or 'R.USER' LED's are illuminated.

These LED's will illuminate to indicate the selected standard of the timecode generator when either 'GEN' or 'G.USER' are illuminated.

Note. See the PRIMARY SETUP section for the method of selecting the generator standard.

The standards recognised are as follows:-

- 24 24 frame per second FILM timecode
- 25 25 frame per second EBU timecode
- 29 29.97 frame per second SMPTE drop frame timecode
- 30 30 frame per second SMPTE timecode

1.18 COL

This LED will illuminate to indicate that the colour bit is set in the incoming code when either 'READ' or 'R.USER' LED's are illuminated.

These LED will illuminate to indicate that the timecode generator is colour locked to an external video signal when either 'GEN' or 'G.USER' are illuminated.

Note: See the PRIMARY SETUP section for the method of selecting the generator colour lock status.

1.19 REF

These LED's illuminate to indicate the selected frame rate reference for the timecode generator. The following external references may be selected:-

XTAL	Internal crystal reference
VIDEO	External composite video input
EXT	External frame or 2*frame rate input
MAINS	Internally derived mains line
READER	Internally derived reader frame rate

When a reference other than XTAL is selected the LED will flash if the reference is not present. When the generator is locked to the external reference the LED will cease flashing.

Note: See the PRIMARY SETUP section for method of selecting the generator reference.

1.20 GENERATOR

1.21 G.RST

This key is used to stop, reset and start the generator to the preset start time.

When the "G.RST" LED is illuminated the generator is stopped and reset to the preset start time. To start the generator depress the G.RST key, the generator will start and the "G.RST" LED will be extinguished.

Note: See the PRIMARY SETUP section for method of setting the preset start time.

1.22 JAM

When the "JAM" LED is illuminated the generator is numerically locked to the reader. Whenever the reader discovers new timecode, or a timecode edit, the timecode data is transferred to the generator.

If good timecode is present when the JAM mode is activated the current timecode data is transferred on activation.

The generated timecode is locked to the selected reference (section 1.19). When regenerating timecode from an audio tape recorder the reference should be set to READER. When re-generation timecode from a video tape recorder the reference should be set to VIDEO provided that 1) the original timecode was referenced to timecode and 2) both the video machine and the generator are connected to the same video reference.

There are two modes of JAM available as follows:-

- 1) JAM FREE: in this mode the generator continues if the reader code stops.
- 2) JAM CODE: in this mode the generator stops if the reader code stops for more than 10 frames.

1.30 Reader

There are two time code readers, one for LTC and one for VITC. The LTC reader is always fitted and the VITC reader is an option.

The LTC reader is always active, it will read code from 1/20 to 80x play speed provided that it receives a clean input signal. When 10 frames of good LTC code are detected the LTC reader will override the VITC reader.

The VITC reader is enabled by the VITC key on the front panel. When the VITC LED is illuminated the VITC reader is enabled. The VITC reader is active on the INSERTER video signal. The VITC reader looks at ALL Video lines so that it will work in stop or wind.

1.40 SETUP

The SETUP mode is entered by depressing the "SET" key, when the setup mode is active the "SET" LED is illuminated.

1.41 GENERATOR SETUP

When the "SET" LED is illuminated the function of the "SELECT" key is modified so that only the generator timecode or user bits may be selected.

When in setup the preset start time and user bits of the generator may be set. The decimal point is used as a cursor to indicate the digit which will be modified by the numeric or "^" and "v" keys. The cursor keys "<" and ">" move the cursor clockwise and anti-clockwise.

CLEAR: If both "^" and "v" keys are depressed simultaneously then the current displayed data will be cleared to all zero's.

To leave the setup mode depress either the "SET" or "STORE" key.

1.42 PRIMARY SETUP

This may be entered from GENERATOR SETUP by depressing both "<" and ">" simultaneously. In PRIMARY SETUP the display indicates either the parameter to be modified or the various selections of a particular parameter as follows:-

GEn Std
GEn rEF
Not Col / 4 FIEld / 8 FIEld
PAL / NTSC
JAn FREE / JAn CodE
NoUPdAtE / SAVE USR / LOAD USR / LOAD FAC
Uipe 0
bEEP 0
GRL A000
RL1 A000
RL2 A000
RL3 A000
RL4 A000
RL5 A000
RL6 A000
RL7 A000
RL8 A000

The "<" and ">" keys are used to select the parameter displayed. The "^" and "v" keys are used to change the selection of the displayed parameter.

When the "SET" key is depressed both the primary setup and setup modes are exited. The parameters are then set as selected whilst in setup or primary setup.

1.421 GENERATOR STANDARD: GEN STD

The generator standard may be set to any of the following:-

24 24 frame per second FILM timecode
25 25 frame per second EBU timecode
29 SMPTE drop frame timecode
30 SMPTE timecode

When generating SMPTE time code either DROP or non drop, the frame rate will be determined by the selected reference. When XTAL is selected as the reference drop frame code will be generated at 29.97 frames per second.

1.422 GENERATOR REFERENCE:GEN REF

The generator frame rate reference may be set to any of the following:-

XTAL	Internal crystal reference.
VIDEO	External video reference.
EXT	External frame or twice frame rate square wave.
MAINS	Internal reference derived from the power input.
READER	Internal reference from the time code reader.

NOTE:When the generator is not locked to film the generator frame rate is assumed to be the same or one half of the reference frame rate.

1.423 GENERATOR COLOUR LOCK

The generator colour lock may be set as any of the following when the generator is locked to VIDEO.

Not Col	No colour frame lock, locked to frame rate only,Also known as 2 Field lock.
4 FIELd	Colour locked to 4 field sequence only.
8 FIELd	Full PAL colour lock, 8 field sequence.

The colour lock information is derived from the external video reference input. This should be setup as described in appendix C before attempting to use colour lock.

1.424 INSERTER STANDARD: PAL / NtSC

This flag sets the expected video standard for the inserter. If set to PAL the unit will operate correctly on NTSC but any insertion at the bottom of the screen will not be displayed since there are less lines per field.

1.425 GENERATOR JAM TYPE: JAN FrEE / JAN CodE

When the "JAM" LED is illuminated the generator is numerically jammed to the reader timecode. The jam type is determined by this flag as follows:-

JAN FrEE:The reader data is transferred when the JAM key is depressed to enable JAM and when new timecode is read by the reader. The generator is free running and will continue when the reader stops reading timecode.

Used when copying a tape to avoid dropouts or when extending timecode on a tape.

JAM CodE:The reader data is transferred when the JAM key is depressed to enable jam and when new timecode is read by the reader. If the reader code stops for more than 25 frames the generator will generate stationary code at the last good timecode number.

Used when regenerating timecode used in a system which is susceptible to dropouts, but where the system should stop if the master timecode stops.

The speed of the generator will be determined by the generator reference and may be selected as described in section 6.02.

1.426 EEPROM: NoUPdAtE / SAVE USR / LOAd USR / LOAD FAC

The addition of an EEPROM to the system allows the user to select between three different settings as follows:

- 1)Current: Held in battery backed RAM destroyed when Read User or Read Factory are selected or a Hard Reset command.
- 2)User: Held in EEPROM, selected by Read User or a hard reset command, updated by SAVE USR command.
- 3)Factory: Held in EPROM, Selected by Read Factory

The EEPROM section of the setup that determines the action to be taken on leaving Setup as follows

NoUPdAtE No action

SAVE USR Write current user settings from Battery backed RAM to EEPROM

LOAD USR Write saved settings from EEPROM to Battery backed RAM

LOAD FAC Write Factory Default settings to Battery backed RAM

Units shipped after December 2002 have the EEPROM fitted by default, older units can be updated by a plug in PCB and new software.

Installing EEPROM Software for the first time

When new software is installed where it is necessary to initialise user setup in the EEPROM as follows:-

- i) Enter Setup
- ii) Select **NoUPdAtE**
- iii) Change to **LOAD FAC**.
- iv) Exit setup.
- v) Enter Setup
- vi) Select **NoUPdAtE**
- vii) Change to **SAVE USR**
- viii) Exit Setup and wait until **Write EE** stops flashing

1.427 Wipe Adjust: Uipe 0

The target point of the wipe may be adjusted by +/- 5 frames to allow for video delays or other factors.

1.428 Beep Adjust: bEEP 0

The target point of the beeps may be adjusted by +/- 3 frames to allow for video delays or other factors.

1.429 GLOBAL RELAY ADVANCE: GRL A000

The Relays Global Advance parameter may be set to any value between 0 and 200 frames.

1.430 INDIVIDUAL RELAY ADVANCE: RL1 A000 .. RL8 A000

The Individual Relay Advance parameter may be set to any value between 0 and 120 frames.

Each relay may fire up to 255 frames early:

$$\text{Relay fire point} = [\text{Cue Point}] - [\text{Global Relay Advance}] - [\text{Individual Relay Advance}]$$

See sections 6.14 and 10.80 for more relay setup information

2.00 TIMECODE and USER INSERTION

This unit can simultaneously display the reader timecode, reader USER bits, Generator timecode, and generator USER bits. To adjust any of these first use the SELECT key to select one of 'GEN', 'GENU', 'READ', 'READU'. All the following parameters may then be adjusted:-

2.01 ENABLE/DISABLE

To enable/disable the insertion first select the required data with the SELECT key, then depress the T/C key, to enable/disable the insertion. The T/C LED is illuminated when the selected data insertion is enabled.

2.02 STYLE

There are four different styles of timecode insertion available for each insertion as follows-

- 1) White numerals on a dark grey background.
- 2) Black numerals on a light grey background.
- 3) White numerals with no background.
- 4) Black numerals with no background.

To change the style, select the required data, hold the T/C key depressed and depress the STYLE key. Each time the STYLE key is depressed the style will be incremented once.

2.03 SIZE

There are seven different sizes of numerals available from 10 lines by 8 pixels to 40 lines by 32 pixels.

To change the size, select the required data, hold the T/C key depressed and depress the SIZE key. Each time the SIZE key is depressed the height will be incremented by 10 lines or the width by 8 pixels, when at maximum size the next depression of the SIZE key will cause the size to revert to 10 lines by 8 pixels.

2.04 POSITION

Both the horizontal and the vertical position on the screen may be changed in increments of 8 pixels and 10 lines respectively.

To change the vertical position, select the required data, hold the T/C key depressed and depress the ^ key to move up the screen and the v key to move down

To change the horizontal position, hold the T/C key depressed and depress the < key or > key as required.

Note the screen "wraps round" in both directions, eg. to move from top of screen to bottom it is often quicker to use the ^ key.

3.00 WIPE

3.01 ENABLE/DISABLE

To enable the wipe, depress the WIPE key so that the WIPE LED is illuminated. To disable the wipe, depress the WIPE key so that the WIPE LED is extinguished.

Each cue group may be assigned to one of three different wipes. To modify each WIPE display the cursor, style, and size keys must be assigned to the selected wipe. The cursor assign menu may be accessed from the wipe option select menu, See section 10.39 WIPE: CURSOR ASSIGN for full details.

3.02 STYLE

There are six different styles of wipe available as follows:-

- 1) Dark grey box filling from left with white.
- 2) Light grey box filling from left with black.
- 3) Dark grey box with white vertical line moving from left to right.
- 4) Light grey box with black vertical line moving from left to right.
- 5) Dark grey full height target line with white full height line moving from left to right.
- 6) Light grey full height target line with black full height line moving from left to right.

To change the style, hold the WIPE key depressed and depress the STYLE key. Each time the STYLE key is depressed the style will be incremented once.

3.03 SIZE

For wipe styles 1-4 inclusive the height of the Grey box may be changed from 10 lines to 40 lines in increments of 10 lines.

To change the size, hold the WIPE key depressed and depress the SIZE key. Each time the SIZE key is depressed the height will be increment by 10 lines, when at maximum height the next depression of the SIZE key will cause the height to revert to 10 lines.

3.04 POSITION

For styles 1-4 inclusive the vertical position on the screen may be changed in increments of 10 lines.

To change the vertical position, hold the WIPE key depressed and depress the ^ key to move up the screen and the v key to move down the screen.

NOTE: The screen "wraps round" eg. to move from top of screen to bottom it is often quicker to use the ^ key.

3.10 Q-COUNT INSERTION

The "Q-COUNT" is a display showing the elapsed time since the last cue point. The format of this display is Minutes, seconds and optional frames.

3.11 ENABLE/DISABLE

To enable or disable the Q-COUNT insertion, enter mode and depress "3" for "3) WIPE 1 OPTION SELECT", then depress "4" as necessary to turn ON or OFF "4) POSITION COUNT AFTER Q-POINT". The standard format for Q-COUNT is MINS:SECS, option "5" may be used to turn a frame display ON or OFF.

To modify the Q-COUNT display the cursor, style, and size keys must be assigned to the Q-COUNT. The cursor assign menu may be accessed from the wipe option select menu. Select "4) Q-COUNT & ADVANCE WARNING", when active this line will flash. The Q-COUNT display may then be modified as described below.

3.12 STYLE

There are five different styles of Q-COUNT insertion available as follows-

- 1) White numerals on a dark grey background.
- 2) Black numerals on a light grey background.
- 3) White numerals with no background.
- 4) Black numerals with no background.

To change the style, hold the WIPE key depressed and depress the STYLE key. Each time the STYLE key is depressed the style will be incremented once.

3.13 SIZE

There are seven different sizes of numerals available from 10 lines by 8 pixels to 40 lines by 32 pixels.

To change the size, hold the WIPE key depressed and depress the SIZE key. Each time the SIZE key is depressed the height will be incremented by 10 lines or the width by 8 pixels, when at maximum size the next depression of the SIZE key will cause the size to revert to 10 lines by 8 pixels.

3.14 POSITION

Both the horizontal and the vertical position on the screen may be changed in increments of 8 pixels and 10 lines respectively.

To change the vertical position, hold the WIPE key depressed and depress the ^ key to move up the screen and the v key to move down

To change the horizontal position, hold the WIPE key depressed and depress the < key or > key as required.

NOTE: The screen "wraps round" in both directions, eg. to move from top of screen to bottom it is often quicker to use the ^ key.

4.00 COUNTDOWN and FLASH FRAME

4.01 ENABLE/DISABLE

To enable the count down and flash frame, depress the C/D key so that the C/D LED is illuminated. To disable the countdown and flash frame depress the C/D key so that the C/D LED is extinguished.

Note. The flash frame is also enabled and disabled via the mode menu. See section 10.36 for further details.

4.02 STYLE

There are five different styles of countdown available as follows:-

- 1) White numerals on a dark grey background.
- 2) Black numerals on a light grey background.
- 3) White numerals with no background.
- 4) Black numerals with no background.
- 5) White numerals on large black background

To change the style, hold the C/D key depressed and depress the STYLE key. Each time the STYLE key is depressed the style will be incremented once.

4.03 SIZE

There are eight different sizes of numerals available from 10 lines by 8 pixels to 40 lines by 32 pixels, and 180 lines by 112 pixels.

To change the size, hold the C/D key depressed and depress the SIZE key. Each time the SIZE key is depressed the height will be incremented by 10 lines or the width by 8 pixels, when at maximum size the next depression of the SIZE key will cause the size to revert to 10 lines by 8 pixels.

4.04 POSITION

Both the horizontal and the vertical position on the screen may be changed in increments of 8 pixels and 10 lines respectively.

To change the vertical position, hold the C/D key depressed and depress the ^ key to move up the screen and the v key to move down

To change the horizontal position, hold the C/D key depressed and depress the < key or > key as required.

Note the screen "wraps round" in both directions, eg. to move from top of screen to bottom it is often quicker to use the ^ key.

5.00 RECORD/LOCK FLAG INSERTION

5.01 ENABLE/DISABLE

To enable or disable the RECORD/LOCK FLAG insertion, enter mode and depress "5" for "5) SYSTEM OPTIONS", then depress "5" to select "5) SYSTEM OPTION SELECT". Once the system option select menu is displayed depress 4 to switch ON or OFF "4) RECORD/PLAY INSERT".

5.02 INSERTED FLAGS

There are currently two different flags available:

Lock: Grey square

Record: Grey Square with a capital R in reverse.

5.03 FRONT PANEL SELECTION

For Demonstration purposes the display may be changed from the front panel by holding the SHIFT key depressed and depressing the DATA key between Off, Lock and Record. When finished leave in the Off position.

5.04 REMOTE SELECTION

The display may be changed by the opto isolator inputs. Opto-isolator input 4 will over-ride any current display to RECORD. The Opto-isolator inputs must be assigned as described in section 10.56,

1) CUE + MODE + LOCK + RECORD they control the display as follows:-

OPTO 1: External wipe trigger, triggers an immediate count down and wipe. The speed of the wipe is the same as defined in the first entry of the cue list.

OPTO 2: Enables the data line insertion

OPTO 3: Changes the record/lock insert to **LOCK**.

OPTO 4: Changes the record/lock insert to **RECORD**.

3) CUE + OFF-LINE + ON-LINE + RECORD

OPTO 1: External wipe trigger, triggers an immediate count down and wipe. The speed of the wipe is the same as defined in the first entry of the cue list.

OPTO 2: Switches the Output to Off-Line (Black)

OPTO 3: Switches the Output to On-Line (Video)

OPTO 4: Changes the record/play insert to **RECORD**.

notes:

- 1) If the RECORD flag is enabled then lock is assumed, it is not necessary to enable both.
- 2) The RECORD/LOCK flag is attached to and is modified with the reader timecode insertion. and may be modified as described below:-

5.05 STYLE

There are two different styles of RECORD/PLAY FLAG insertion available as follows-

1) White letters on a dark grey background.

2) Black letters on a light grey background.

To change the style, first use the **SELECT** key to display **READ** then hold the **TC** key depressed and depress the **STYLE** key. Each time the **STYLE** key is depressed the style will be incremented once.

5.06 SIZE

There are four different sizes of letters available from 10 lines by 8 pixels to 20 lines by 16 pixels.

To change the size, first use the **SELECT** key to display **READ** then hold the **TC** key depressed and depress the **SIZE** key. Each time the **SIZE** key is depressed the height will be incremented by 10 lines or the width by 8 pixels, when at maximum size the next depression of the **SIZE** key will cause the size to revert to 10 lines by 8 pixels.

note: The RECORD/LOCK flag size changes with the timecode reader insertion, as there are more sizes for the timecode insertion the RECORD/LOCK flag will remain the same size for the three larger timecode sizes.

5.07 POSITION

The RECORD/LOCK flag is attached to the left of the reader timecode insertion and moves with the Reader timecode insertion.

Both the horizontal and the vertical position on the screen may be changed in increments of 8 pixels and 10 lines respectively.

To change the vertical position, first use the **SELECT** key to display **READ** then hold the **TC** key depressed and depress the ^ key to move up the screen and the v key to move down

To change the horizontal position, hold the **DATA** key depressed and depress the < key or > key as required.

NOTE: The screen "wraps round" in both directions, eg. to move from top of screen to bottom it is often quicker to use the ^ key.

6.00 CUE POINT DATA

The cue point data may be displayed either as a single line within the video or as part of the edit list when MODE is active. For information on the cue list see the MODE section.

6.01 ENABLE/DISABLE

To enable the data line, depress the DATA key so that the DATA LED is illuminated. To disable data line depress the DATA key so that the DATA LED is extinguished.

The data line is enabled when the transfer "->" key is depressed, allowing modification after "on the fly transfers" of the current time code position.

To modify the data line display the RECORD/PLAY INSERT must be off. To disable the RECORD/PLAY insert first select 5) SYSTEM OPTIONS and then select 5) SYSTEM OPTION SELECT. The record/play insert may then be turned on and off by the 4 key.

6.02 SIZE

There are two different sizes of data line, 10 lines by 8 pixels or 20 lines by 8 pixels.

To change the size, hold the DATA key depressed and depress the SIZE key. Each time the SIZE key is depressed the height alternate between 10 and 20 lines.

6.03 POSITION

The vertical position on the screen may be changed in increments of 10 lines.

To change the vertical position, hold the DATA key depressed and depress the ^ key to move up the screen and the v key to move down

Note: The screen "wraps round" in both directions, eg. to move from top of screen to bottom it is often quicker to use the ^ key.

6.10 DATA LINE FORMAT

There are 3 different data line formats as follows:-

- 1) Wipe data 01M001 01:00:00:00 BPM=080 BT=04
- 2) MIDI data 01M001 01:00:00:00 0=NOP D=000 C=00
- 3) EVENT data 01M001 01:00:00:00 EVENT > 0000 0000

In all formats the first two data fields are identical, the information displayed in these data fields is as follows:-

CUE GROUP 1 - 16

CUE NUMBER 1 - 256

CUE POINT TIME CODE VALUE HH:MM:SS:FF

The CUE GROUP NUMBER is used to allow global changes to groups of cues. The number also changes the next letter in the display line. Cue group 1 is assigned to Music, group 2 is assigned to Effects and groups 3 - 16 to Dialogue. Current Global changes by group include, cue group enable and cue group re-number.

The Cue number may be re-numbered by a single command for all cues or by cue group, see section 10.54 for further details.

The three data formats define either 1) WIPE, 2) MIDI, 3) EVENTS. To change data field format depress "SHIFT" and ">" or "SHIFT" and "<" simultaneously.

6.11 COUNT TEMPO AND BEATS IN

The wipe data fields are as follows:-

TEMPO: Beats per Minute or 50 - 305
 Frames per beat in frames & 1/8's

BEATS IN 1 - 16

6.12 WIPE DURATION

The wipe duration may be calculated as follows:-

Wipe duration = $BT * 60/BPM$ in seconds

Thus the wipe duration may be changed by adjusting either the maximum count (BT), or the tempo (BPM or FPB).

6.14 EVENTS

The EVENT data fields are as follows:-

EVENT relays 1-4 0000 0=OFF 1=ON
EVENT relays 5-8 0000 0=OFF 1=ON

NOTE: The event data is modified in a different manner to all other data! Position the cursor on the ">" symbol to the left of the event data field, then use the 1 - 8 keys as event ON/OFF switches. A "1" indicates that the relay will be activated at the cue point.

7.00 DATA LINE EDITOR

The data line editor is identical whether editing single line display or cue list display.

7.01 EDIT MODES

There are two basic editing modes, MODIFY and INSERT, the style of edit line display indicates the current edit mode:-

MODIFY White characters on a dark grey background. This mode is used to modify existing cues.

INSERT Black characters on a light grey background. This mode is used to insert new cues.

To enter the INSERT mode either move the data line to the bottom of the data list or depress the "INSERT" key.

To leave the INSERT mode and enter MODIFY either depress DELETE (SHIFT + INSERT), "^" or "v" keys. The INSERT key may be used to toggle between INSERT and MODIFY

7.02 TAB and CURSOR

The "^" and "v" cursor keys move the edit line up and down the edit list. The "<" and ">" keys move the cursor clockwise and anti-clockwise through a data field. The "TAB" key moves the cursor from data field to data field.

7.03 MODIFY

When in modify mode the data line displayed is modified by placing the cursor over the character to be modified and entering the new data. After modifying the data the cue list is updated by depressing the STORE key.

7.031 INCREMENT & DECREMENT

The timecode data field only, may also be modified by depressing the INCREMENT ("SHIFT"+"^") and DECREMENT("SHIFT" +"v") keys, independent of the position of the cursor.

7.032 EVENT DATA FIELD MODIFICATION

The EVENT data field is modified differently, when the cursor is in the EVENT field the numeric keys are used to control the status of each event, eg. the "5" key changes EVENT 5 control data. Each time a numeric key is depressed the event or wipe control data is changed from 0 to 1 or 1 to 0, where 0 represents OFF and 1 represents ON.

The modified edit data is transferred to the cue list when either the "STORE", "^" or "v" keys are depressed. At this point the old data is deleted and the new data inserted in the cue list.

7.04 INSERT

The Insert mode is used to add new cues to the cue list. When in the insert mode the currently displayed data line is modified in the same way as the modify mode.

The new edit data is transferred to the cue list when either the "STORE", "^" or "v" keys are depressed. At this point the new data inserted in the cue list.

If the STORE key is used to enter the new data to the cue list then the editor will remain in the INSERT mode. If the "^" or "v" key is used to enter the new data to the cue list then the editor will revert to the MODIFY mode.

7.05 ACTIVE

When the edit data line is displayed the cue point may be activated or de-activated by depressing the ACTIVE key. The edit line is modified by changing the characters to indicate that the displayed cue point is inactive.

When a cue is made inactive all actions associated with that cue point are turned off as if the cue was deleted. The cue data however remains in the cue list and may be re-activated at any time.

7.06 DELETE

The DELETE key ("SHIFT"+"INSERT") if in MODIFY mode deletes the currently displayed cue point. Once a cue point has been deleted it is lost irrevocably. If in INSERT mode the delete key changes the edit mode to MODIFY and does not store the current entry.

7.07 TRANSFER

The "->" next to the eight digit display is used for 'on the fly' transfers of timecode data to the cue list. This key is not active when MODE is enabled and menu screens are displayed.

The first depression of the transfer key will enable the data line insert.

The current timecode position with the previous wipe, event and midi data are transferred to the data line and cue list, the data line may then be modified by the user.

8.00 OFF-LINE

When editing the cue list, the user may switch the unit OFF- LINE. In this mode it is not necessary to have a video signal connected to the inserter input. The unit will then generate its own video sync's.

To enable the OFF LINE mode depress SHIFT+ACTIVE, the displayed screen will then have a light grey border to indicate that it is in the OFF LINE mode. To disable the OFF- LINE mode depress SHIFT+ACTIVE.

The unit will switch out of OFF-LINE if new timecode is detected at the input. It is assumed that if the user starts the video machine than he wishes to view the video!

If it is required to use the unit without video, then option 0555 CONTINUOUS BACKGROUND should be enabled, for further data see section 10.555.

9.00 RESET

9.01 POWER UP RESET

When switched on the unit will reset, On reset the memory is not completely cleared since most settings and the cue list are battery backed. If a backup failure is detected the unit will reset the whole memory.

9.02 CPU CARD RESET

When servicing the unit it may be required to reset the unit without switching off the power. The unit will be reset is the two pins on the front of the PROCESSOR BD labels SW1. This will reset the unit in the same way as a power up reset.

9.03 SOFT RESET

A power up reset may be initiated from the front panel by a simultaneous depression of the SELECT and TRANSFER keys.

9.04 HARD RESET

If it is required to reset the battery backed memory manually a hard reset may be initiated from the front panel by simultaneous depression of the SELECT and TAB keys. This may be necessary when new software is fitted. CAUTION this will wipe the cue memory!

9.05 MANUAL HARD RESET

The front panel hard reset is only possible if the front panel software is running correctly. If all else fails switch off the power, open the unit, and unplug the PROCESSOR BD. This will disconnect the memory from the backup battery. Replace the PROCESSOR BD, and power up the unit.

10.00 MODE

The mode key is used to enter and leave the menu driven section of the Video Streamer. When mode is active the selected menu is displayed in the video image, the full screen cue list may also be entered when MODE is active.

The numeric keys are used either to access the different menu screens, to select one of several options, or to turn on and off individual options. The functions of the numeric keys are dependant on the screen selected.

10.01 ROOT MENU

The root menu is displayed on entering MODE, the screen is represented by diagram SCREEN 0. The root menu may be accessed from most other screens by selecting:-

0) MODE SELECTION SCREEN

On some screens this data line is not displayed, however it is possible to access the root menu by depressing the 0 key. The only screens where this is not possible are requiring data entry (eg. SCREEN 01A, SET PROJECT NUMBER).

10.10 SAVE, LOAD OR PRINT CUE LIST

The input/output section is entered from the root menu by selecting '1) SAVE, LOAD OR PRINT CUE LIST' by depressing the '1' key.

Once the Input/Output section has been entered SCREEN 01A is displayed, When this screen is displayed the project number and revision number may be entered. Once the correct data has been entered then depress STORE to continue.

NOTE:A PROJECT NUMBER OTHER THAN 0000 MUST BE ENTERED! WHEN SAVING OR LOADING.

Once the project number and revision number have been entered SCREEN 01B is displayed. When this screen is displayed the selections as described in sections 10.11 to 10.17 may be made.

10.11 SAVE TO TAPE

On depressing the '1' key to select '1) SAVE TO TAPE' SCREEN 011 is displayed instructing the user to "PUT TAPE IN RECORD THEN G.RESET. The user should connect the timecode output to a tape recorder, put the tape recorder into RECORD and depress the G.RST key on the video streamer. The cue list data will be presented at the timecode output, this should be recorded on a spare tape track. the length of tape required is dependant on the length of the cue list.

Once the data has finished the generator will automatically stop, the G.RST LED illuminate and the screen revert to the root menu SCREEN 0.

10.12 LOAD FROM TAPE

On depressing the '2' key to select '2) LOAD FROM TAPE' SCREEN 012 is displayed. A pre-recorded cue list with the correct project and revision number should be connected to the timecode input. Once valid data has been read and verified the screen will revert to the root menu SCREEN 0.

10.13 OUTPUT TO PRINTER

On depressing the '3' key to select '3) OUTPUT TO PRINTER' SCREEN 013 will be displayed. The printer output is a serial RS232 port labelled SERIAL or SERIAL A. The data format is as follows:-

1 START BIT, 8 DATA BITS, NO PARITY, 1 STOP BIT

The baud rate may be selected from this screen by selecting 3) SET BAUD RATE. At this point SCREEN 0133 is displayed. The BAUD rate may then be selected. The selected baud rate will then flash. Depressing the STORE key, the screen will then return to SCREEN 013.

- 1) LIST ALL ACTIVE CUES will list all cues currently active.
- 2) LIST ALL CUES will list all cues in the cue list.

10.14 SAVE TO SERIAL

Not currently available.

10.15 LOAD FROM SERIAL

Not currently available.

10.20 EDIT/CONFORM CUE LIST

The EDIT/CONFORM menu is entered from the root menu by selecting '2) EDIT/CONFORM CUE LIST' by depressing the '2' key.

From this menu the user may select to edit or conform the cue list. The only difference between EDIT and CONFORM is the effect of the MODIFY command. In EDIT only one cue is modified. In CONFORM any modification to the time code value of a cue point will ripple through all other following cues.

Once the cue list has been entered the only way of exiting is to depress the MODE key. This exits both from MODE and the CUE LIST EDITOR.

CUE LIST FORMAT

Once in the cue list editor a list of either 12 or 24 cues is displayed. The number of entries is dependent on the height of the displayed characters. The height of the displayed characters is selected by the height of the displayed DATA line (section 6.02).

The current edit line is indicated by the background colour of the data line. The colour of the edit line is dependant on the edit mode, as follows:-

MODIFY White characters on a dark grey background. This mode is used to modify existing cue list entries.

INSERT Black characters on a light grey background. This mode is used to insert new cues into the cue list.

For a full description of the cue list editor see section 7.00 DATA LINE EDITOR.

10.21 EDIT ACTIVE CUES

When this mode is selected only the current active cues are displayed and available for editing. If any cue is made inactive it will disappear from the screen as soon as the cursor is moved.

10.22 EDIT ALL CUES

This is the normal edit mode, all cues are displayed and available for editing.

10.23 CONFORM ACTIVE CUES

When this mode is selected only the current active cues are displayed and available for editing. In this mode the cues for one artist or production may be changed without changing any others.

This mode should be used carefully since it is possible to modify the cues in such a way as to change the cue list from an ordered list to a disordered list. This will not effect the operation of the unit as long as the inactive cues remain inactive but will cause chaos if they are enabled at a later date!!!!

10.24 CONFORM ALL CUES

10.30 COUNTDOWN OPTION SELECT

The COUNTDOWN option select menu is entered from the root menu when '3) COUNTDOWN OPTION SELECT' is selected by depressing the '3' key.

In the option select menu individual options may be toggled ON/OFF by the numeric keys. The diagram SCREEN 03 represents this screen.

10.31 ON= COUNT UP, OFF= COUNT DOWN

When ON the visual count to cue counts up eg.
1, 2, 3, FLASH.

When OFF the visual count to cue counts down eg.
3, 2, 1, FLASH.

10.32 ADVANCE INDICATION

When ON either the data line or part of the data line are displayed 10 seconds before the cue point. This supplies cue information and advance warning to both the artist and engineer of the next cue.

10.33 FULL DATA LINE

When ON the full data line is displayed if enabled (Section 10.32), ten seconds before the next cue point. The data line information is described in section 6.00. The vertical position of the data line is determined by the vertical position of the wipe. The height of the data line (either 10 or 20 lines) is determined by the size of the wipe.

When OFF only the artist number and cue number are displayed if enabled (Section 10.32), ten seconds before the next cue point. The following is an example of the data displayed:- 01M001

The size, position and style of the displayed data are those selected for the Q-COUNT (Section 4.00).

10.34 POSITION COUNT AFTER Q-POINT

When ON a position count is displayed showing the relative time since the last cue point in minutes and seconds. See section 4.00 for description of format.

10.35 DISPLAY Q-COUNT FRAMES

When ON and when the position after cue point is displayed then the relative time since the last cue point is shown in frames as well as minutes and seconds.

10.36 FLASH FRAME

When ON a full frame cross is inserted into the picture for 2 frames at the cue point.

10.37 BLACK VIDEO BLACK

A mode commonly used in Germany, only available with CB MR systems that download both the In and Out points to the streamer. The effect is to blank the video before and after the take.

10.38 DISPLAY PROGRESS BAR

Only available with CB MR Systems, this option displays a progress bar indicating relative position when between in and out points.

10.40 WIPE : GROUP ASSIGN

The WIPE group assign menu is entered from the root menu when '4) WIPE : GROUP ASSIGN' is selected by depressing the '4' key.

In the group assign menu individual groups may be assigned to different wipes. The numeric keys increment the group wipe assigns to OFF, W=1, W=2, W=3. When off the screen wipe is disabled but the event relays and midi events are still active. The diagram SCREEN 04 represents this screen.

When entered groups 1 - 8 are displayed, to access groups 9 -16 select `9) MORE'. Groups 9 - 16 will then be displayed, to return to groups 1 - 8 select `9) MORE'.

See section 3.00 for full details of the wipe size, position and styles available. See section 10.39 for details of the wipe cursor assign.

10.50 SYSTEM OPTIONS

The SYSTEM OPTION'S menu is entered from the root menu when 5) SYSTEM OPTION'S is selected by depressing the `5' key. From this menu further menus may be accessed. The diagram SCREEN 05 represents this screen.

10.51 ERASE/RESTORE CUE LIST

The Erase/Restore menu is entered from the system options menu when the `1' key is depressed. This menu is represented by screen diagram SCREEN 051.

By depressing the `1' key the current cue list is erased, the current end of list pointer is saved and the end of list pointer reset to zero. By depressing the `2' key the current end of list pointer is swapped with the saved end of list pointer.

Note that any entries after the cue list is erased, overwrite existing entries.

10.52 SELECT TIME ENTRY MODE

The time entry menu is entered from the system option's menu when the '2' key is depressed. In the time entry menu the mode of cue point entry and display in the cue list is selected by the numeric keys. The diagram SCREEN 052 represents this screen. The selected mode is indicated by inverse video of the line selected.

10.521 TIMECODE

Cue point entry in time code values, used when entering time values from burnt in time code, on the fly, or from a cue list in this format.

10.522 FEET & FRAMES @ 24/23.97 FPS

Cue point entry in feet and frames, used when entering cue points from a cue list in feet and frames. A internal conversion is compensates for a film transfer at a film speed of 24 FPS to the current reader time code speed.

Before using this mode the timecode value for the zero feet and frames position should be set using 8) SET TIMECODE ZERO POINT.

10.523 FEET & FRAMES @ 25 FPS

Cue point entry in feet and frames, used when entering cue points from a cue list in feet and frames. A internal conversion is compensates for a film transfer at a film speed of 25 FPS to the current reader time code speed.

Before using this mode the timecode value for the zero feet and frames position should be set using 8) SET TIMECODE ZERO POINT.

10.524 FEET & FRAMES @ 30 FPS

Cue point entry in feet and frames, used when entering cue points from a cue list in feet and frames. A internal conversion is compensates for a film transfer at a film speed of 30 FPS to the current reader time code speed.

Before using this mode the timecode value for the zero feet and frames position should be set using 8) SET TIMECODE ZERO POINT.

10.525 HRS : MINS : SECS : 1/100's

Cue point entry in decimal time, used when entering time values from a stop watch generated cue list.

Before using this mode the timecode value for the zero time position should be set using 8) SET TIMECODE ZERO POINT.

10.526 RELATIVE TIMECODE

Cue point entry in timecode values relative to a time code point.

Before using this mode the timecode value for the zero time position should be set using 8) SET TIMECODE ZERO POINT.

10.527 FILM SIZE

Used to set number of frames per foot when entering and displaying cues in the feet and frames mode. When the "7" key is depressed a new menu is displayed allowing selection of 16mm or 35 mm FEET and FRAMES.

10.528 SET TIMECODE ZERO POINT

Set the time code zero offset for entry in all modes. This time code value is added to the time entry to calculate the time code value of the cue point.

The value entered is also used when inserting feet, or relative time in place of the user data. See section 10.57 for further details.

10.53 TEMPO DISPLAY SELECT

The tempo display menu is entered from the root menu when the '3' key is depressed. In the tempo display menu the standard of FPB entry may be selected by the numeric keys. The diagram SCREEN 053 represents this screen. The selected entry mode is indicated by flashing the line selected.

If 24, 25 or 30 FPS are selected then the entry is assumed to be of the standard selected. The actual number of frames per beat is then calculated as follows:-

ACTUAL FPB = ENTERED FPB*READER STANDARD / ENTRY STANDARD

Thus if a entry standard of 24FPS is selected the following conversions will be made:-

ENTRY STANDARD = 24	SPECIFIED FPB= 12F0
READER STANDARD = 24	ACTUAL FPB = 12F0
READER STANDARD = 25	ACTUAL FPB = 12F4
READER STANDARD = 30	ACTUAL FPB = 15F0

The conversion is accurate to 1/256 th of a frame.

10.534 BEATS per MIN

When this is selected the data line display will change from FPB=12F0 to BPM=125 and tempo entry in Beats per minute will be allowed. The tempo is converted internally to FPB and stored in frames and 1/8's.

Because the storage is in BPM not all FPB numbers are valid. When STORE is depressed the FPB displayed may change as the display is the converted BPM number rounded to the nearest eighth of a frame.

10.54 RE-NUMBER CUES

The cue renumber menu is accessed from the system options menu by depressing the '4' key.

From this menu the cues may be globally re-numbered, diagram SCREEN 054 represents this screen. The re-number mode selected will be indicated by the selected line flashing.

10.541 RE-NUMBER ALL CUES

When selected all cues are re-numbered sequentially starting from cue number 001. If there are more than 255 cues then the cue number will start again at 001.

10.542 RE-NUMBER BY GROUP

When selected all cues are re-numbered by group, the cues in each group are re-numbered sequentially starting from cue number 001.

10.543 RE-NUMBER ALL CUES FROM CURSOR

When selected all cues, starting from the current cursor position are re-numbered sequentially starting at the current cue number.

10.544 RE-NUMBER GROUP FROM CURSOR

When selected all cues in the cursor group, starting from the current cursor position are re-numbered sequentially starting at the current cue number

10.55 SYSTEM OPTION SELECT

The system option select menu is entered from the system option's menu when '5) SYSTEM OPTION SELECT' is selected by depressing the '5' key.

In the option select menu individual options may be toggled ON/OFF by the numeric keys. The diagram SCREEN 055 represents this screen.

10.551 CONTINUOUS CLICK OUTPUT

When on the metronome output is continuous and does not stop when the cue is reached. The metronome output starts for the first cue as normal and then continues until the input timecode stops.

When a new cue is found the tempo of the metronome is changed at the cue point and not for the COUNT-IN.

10.552 OFF-LINE > SYNC I/P

When switching to Black background using the OFF-Line switch or the Black-Video-Black option the system can blank out the video in one of two ways as follows

Off Use sync from the incoming picture, This is always possible when the picture is always stable.

On Use Syncs from the video reference input, necessary when sourcing picture from VHS or U-matic without time base correction.

10.553 AUTO-INCREMENT CUE NUMBER

When ON the cue number is incremented whenever a new cue point is inserted, either by the TRANSFER key or when in INSERT EDIT.

10.554 RECORD/PLAY INSERT

When ON a flag is inserted into the video, this flag may be switched to insert 'EDIT', 'PLAY', or 'RECORD'. For further information see section 5.00 RECORD/PLAY FLAG INSERTION, and section 10.561 1) WIPE + MARK + LOCK + RECORD.

10.555 CONTINUOUS BACKGROUND

When ON the unit may be used without video as a audio only cue unit. In this mode the unit will remain OFF-LINE unless switched ON-line. When OFF, the unit will which from OFF- LINE to ON-LINE whenever new code is present.

When OFF-LINE the unit produces its on video black with a white border. To switch the unit ON or OFF LINE depress SHIFT and ACTIVE simultaneously.

10.556 KEYBOARD MARK

When ON the keyboard may be used to trigger relay cue points. The mark mode is active when enabled and when the data line is not displayed.

When the mark mode is enabled depressing one of the numeric keys 1 - 8 will pulse the selected relay and enter a cue point into the cue list. The cue point will be entered as firing the selected relay and in cue group 16. Thus a relay may be fired on the fly and if the sound effect is in the correct position may be recorded on the first pass. If early or late the cue point may be adjusted and fired by the timecode on the next pass.

Numeric key '0' in this mode will set the current timecode value as the TIMECODE ZERO POINT, and insert a cue in group 1 at this point.

10.557 BEEP AND C/D ONCE ONLY

When On the BEEP and Countdown are output only on the first cue after entering play.
When OFF the BEEP and Countdown are output for every cue.

10.558 ADR MODE

When **ON** all the **TEMPO** and **COUNT** will be set the same as the first cue in the list for all cues.

10.56 OPTO-INPUT ASSIGN

The opto-input assign menu is entered from the system option's menu when '6) OPTO-INPUT ASSIGN' is selected by depressing the '6' key.

In the opto-input assign menu the four opto inputs may be assigned to different functions by the numeric keys. The selected function is indicated by the flashing line. The diagram SCREEN 056 represents this screen.

10.561 WIPE + MARK + LOCK + RECORD

When selected the opto's are assigned to control the record play insert and to trigger an immediate wipe. Further details on the record play flag may be found in section 4.00. The opto's are assigned as follows:-

OPTO 1:External wipe trigger, triggers an immediate count down and wipe. The speed of the wipe is the same as defined in the first entry of the cue list.

OPTO 2:Transfer current timecode position to cue list.

OPTO 3:Enables the LOCK INDICATOR.

OPTO 4:Enables the RECORD INDICATOR.

10.562 MARK EVENT RELAY 1-4

When selected the opto-input's are assigned as remote TRANSFER keys. The opto's are assigned to insert an entry in the cue list at the current time code value when depressed. Each opto corresponds to an individual Relay.

10.563 BLACK VIDEO BLACK : CUE + OFF-LINE + ON-LINE + RECORD

Used in Germany, the screen can be blanked using opto 1 and displayed using Opto 2

OPTO 1:External wipe trigger, triggers an immediate count down and wipe. The speed of the wipe is the same as defined in the first entry of the cue list.

OPTO 2:OFF-LINE Blank incoming video

OPTO 3:ON-LINE Enables incoming video

OPTO 4:Enables the RECORD INDICATOR.

10.57 GENERATOR USER

The Generator user menu is entered from the system option's menu when '7) USER or FEET+FRAMES' is selected by depressing the '7' key.

This menu is used to select the source and format of the generator user bits, the selection is made by the numeric keys. The selected format is indicated by the flashing line. The diagram SCREEN 057 represents this screen.

10.571 USER BITS

When selected the current preset user bit information.

10.572 FILM SPEED 24/23.97

When selected the timecode zero point is subtracted from the current time code position. The result is then converted to a feet and frame number assuming a film speed of 24 frames per second.

10.573 FILM SPEED 25

When selected the timecode zero point is subtracted from the current time code position. The result is then converted to a feet and frame number assuming a film speed of 25 frames per second.

10.574 FILM SPEED 30/29.97

When selected the timecode zero point is subtracted from the current time code position. The result is then converted to a feet and frame number assuming a film speed of 30 frames per second.

10.575 HRS : MINS : SECS : 1/10'S

When selected the timecode zero point is subtracted from the current time code position. The frame part of the result is converted to 1/10 seconds.

10.576 RELATIVE TIMECODE

When selected the timecode zero point is subtracted from the current time code position. The result is then displayed.

10.579 FILM SIZE

When selected the film size menu is accessed, this menu is used to set the number of frames per foot used in the FEET/ FRAMES calculations. The current selection is indicated by the flashing line. This menu is represented by menu diagram SCREEN 0759.

10.5791 35mm

When selected the number of frames per foot is set to 16.

10.5792 16mm

When selected the number of frames per foot is set to 40.

10.70 CUE GROUP ENABLE

The cue group enable menu is entered from the root menu when the `7' key is depressed. This menu is represented by menu diagram SCREEN 07.

The function of this menu is to enable and disable whole groups of cues. For example it may be required to enter the cues for music, effects, and four different vocal overdubs. By changing the reel number/artist number at the beginning of the data line each set of cues may be given individual numbers (eg.: 01M, 02E, 03D, 04D, 05D, 06D). This screen then enables whole groups of cues as required so that confusing cues are not enabled.

By depressing the `9' key SCREEN 079 is displayed to access cues 09D to 16D.

When editing the cue list the ACTIVE key will change any individual cue which has been set by the cue group enable screen.

10.80 EVENT RELAY SETUP

The event relay setup menu is entered from the root menu by depressing the `8' key. This menu is represented by menu diagram SCREEN 08.

This menu enables individual relays 2-7 to be made continuous or momentary.

Relay 1 may be switched from momentary event relay to a continuous cue fired relay.

Relay 1 (K8) (Pins 14 & 33): Active at first cue point.

Relay 8 may be switched from a momentary event relay to a continuous good timecode relay.

Relay 8 (K7) (Pins 13 & 32): Active when the reader timecode is good.

Each relay may fire up to 255 frames earley, the relay's fire at
[Cue Point] - [Global Relay Advance] - [Individual Relay Advance]

See sections 1.429 and 1.430 for details on setting Global and Individual Relay advance.

See section 6.14 for information on enabling/disabling relays

Momentary relays are disabled 1 frame after the cue point

Continuous relays are disabled when timecode stops, or if another cue arrives with the relay turned off

The relays are only fired from the event list and not by external events except for the good code and cue fired relay.

10.90 WIPE : CURSOR ASSIGN

The WIPE cursor assign menu is selected from the wipe option select screen by depressing the '9' key.

In the cursor assign menu the position, style, and size adjustments may be assigned. The diagram SCREEN 039 represents this screen. The current selection is shown by the selected line flashing.

10.391 WIPE 1

When this line is active the cursor, style and size keys when used with the wipe key modify WIPE 1.

10.392 WIPE 2

When this line is active the cursor, style and size keys when used with the wipe key modify WIPE 2.

10.393 WIPE 3

When this line is active the cursor, style and size keys when used with the wipe key modify WIPE 3.

10.394 Q-COUNT & ADVANCE WARNING

When this line is active the cursor, style and size keys when used with the wipe key modify the Q-COUNT and Advance warning displays.

11.00 MENU DIAGRAMS

The following screen diagrams show the different menu screens which may be accessed when MODE is active. The screen numbers represent the way in which each screen is accessed. SCREEN 0133 is accessed as follows:-

- 0 ROOT MENU
- 1 1) SAVE, LOAD or PRINT CUE LIST
- 3 3) OUTPUT TO PRINTER
- 3 3) SET BAUD RATE

SCREEN 0

- 0) MODE SELECTION SCREEN

 - 1) SAVE, LOAD OR PRINT CUE LIST
 - 2) EDIT CUE LIST
 - 3) COUNTDOWN : OPTION SELECT
 - 4) WIPE : GROUP ASSIGN
 - 5) SYSTEM OPTIONS
 - 6) CUE GROUP DELETE
 - 7) CUE GROUP ENABLE
 - 8) EVENT RELAY SETUP
 - 8) RELAY SETUP
 - 9) WIPE: CURSOR ASSIGN
- ENTER SELECTION ?

SCREEN 01A

1) SAVE, LOAD OR PRINT CUE LIST

SET PROJECT No.0000 Rev. No.00

STORE TO CONTINUE, MODE TO ABORT

SCREEN 01B

1) SAVE, LOAD OR PRINT CUE LIST

0) MODE SELECTION SCREEN

1) SAVE TO TAPE

2) LOAD FROM TAPE

3) OUTPUT TO PRINTER

4) SAVE TO SERIAL

5) LOAD FROM SERIAL

ENTER SELECTION ?

SCREEN 013

3) OUTPUT TO PRINTER

0) MODE SELECTION SCREEN

1) LIST ALL ACTIVE CUES

2) LIST ALL CUES

3) SET BAUD RATE

ENTER SELECTION ?

SCREEN 0133

3) SET BAUD RATE

0) MODE SELECTION SCREEN

1) 1200 BAUD

2) 2400 BAUD

3) 4800 BAUD

4) 9600 BAUD

ENTER SELECTION ?

STORE TO CONTINUE, MODE TO ABORT

SCREEN 011

1) SAVE TO TAPE

PUT TAPE IN RECORD THEN G.RESET

SCREEN 012

2) LOAD FROM TAPE

PLAY TAPE WHEN READY

SCREEN 03

3) COUNTDOWN OPTION SELECT

0) MODE SELECTION SCREEN

OFF 1) ON = COUNT UP, OFF = COUNT DOWN

OFF 2) ADVANCE INDICATION

OFF 3) FULL DATA LINE

OFF 4) POSITION COUNT AFTER Q-POINT

OFF 5) DISPLAY Q-COUNT FRAMES

OFF 6) FLASH FRAME

OFF 7) BLACK VIDEO BLACK

OFF 8) DISPLAY PROGRESS BAR

9) COUNTDOWN : CURSOR ASSIGN

ENTER SELECTION ?

SCREEN 04

4) WIPE : GROUP ASSIGN

0) MODE SELECTION SCREEN

W=1 1) CUE GROUP 01M

W=2 2) CUE GROUP 02E

W=3 3) CUE GROUP 03D

OFF 4) CUE GROUP 04D

OFF 5) CUE GROUP 05D

OFF 6) CUE GROUP 06D

OFF 7) CUE GROUP 07D

OFF 8) CUE GROUP 08D

9) MORE

ENTER SELECTION ?

SCREEN 049

4) WIPE : GROUP ASSIGN

0) MODE SELECTION SCREEN

OFF 1) CUE GROUP 09D

OFF 2) CUE GROUP 10D

OFF 3) CUE GROUP 11D

OFF 4) CUE GROUP 12D

OFF 5) CUE GROUP 13D

OFF 6) CUE GROUP 14D

OFF 7) CUE GROUP 15D

OFF 8) CUE GROUP 16D

9) MORE

ENTER SELECTION ?

SCREEN 05

- 5) SYSTEM OPTIONS

 - 0) MODE SELECTION SCREEN
 - 1) ERASE/RESTORE CUE LIST
 - 2) POSITION DISPLAY FORMAT
 - 3) TEMPO DISPLAY SELECT
 - 4) RE-NUMBER CUES
 - 5) SYSTEM OPTION SELECT
 - 6) OPTO-INPUT ASSIGN
 - 7) USER or FEET+FRAMES
 - 8) SET READER STANDARDS
 - 9) MORE
- ENTER SELECTION ?

SCREEN 051

- 6) ERASE/RESTORE CUE LIST

 - 0) MODE SELECTION SCREEN
 - 1) ERASE CUE LIST
 - 2) RESTORE CUE LIST
- ENTER SELECTION ?

SCREEN 052

- 2) POSITION DISPLAY FORMAT

- 0) MODE SELECTION SCREEN
- 1) TIMECODE
- 2) FEET & FRAMES @ 24/23.97 FPS
- 3) FEET & FRAMES @ 25 FPS
- 4) FEET & FRAMES @ 30/29.97 FPS
- 5) HRS : MINS : SECS :1/100'S
- 6) RELATIVE TIMECODE
- 7) FILM SIZE
- 8) SET TIMECODE ZERO POINT

ENTER SELECTION ?

SCREEN 053

- 3) TEMPO DISPLAY SELECT

- 0) MODE SELECTION SCREEN
- 1) FRAMES & 1/8'S @ 24 FPS
- 2) FRAMES & 1/8'S @ 25 FPS
- 3) FRAMES & 1/8'S @ 30 FPS
- 4) BEATS per MIN

ENTER SELECTION ?

SCREEN 054

- 4) RE-NUMBER CUES

- 0) MODE SELECTION SCREEN
- 1) RE-NUMBER ALL CUES
- 2) RE-NUMBER BY GROUP
- 3) RE-NUMBER ALL CUES FROM CURSOR
- 4) RE-NUMBER GROUP FROM CURSOR

ENTER SELECTION ?

SCREEN 055

- 1) SYSTEM OPTION SELECT

- 0) MODE SELECTION SCREEN
- OFF 1) CONTINUOUS CLICK OUTPUT
- OFF 2) OFF-LINE > SYNC I/P
- OFF 3) AUTO-INCREMENT CUE NUMBER
- OFF 4) RECORD/PLAY INSERT
- OFF 5) CONTINUOUS BACKGROUND
- OFF 6) KEYBOARD MARK
- OFF 7) BEEP AND C/D ONCE ONLY
- OFF 8) ADR MODE

ENTER SELECTION ?

SCREEN 056

- 6) OPTO INPUT ASSIGN

- 0) MODE SELECTION SCREEN
- 1) CUE + MARK + LOCK + RECORD
- 2) MARK EVENT RELAY 1-4
- 3) CUE + OFF-LINE + ON-LINE + RECORD

ENTER SELECTION ?

SCREEN 057

- 7) USER or FEET+FRAMES

- 0) MODE SELECTION SCREEN

 - 1) USER BITS
 - 2) FILM SPEED 24/23.97
 - 3) FILM SPEED 25
 - 4) FILM SPEED 30/29.97
 - 5) HRS : MINS : SECS : 1/10's
 - 6) RELATIVE TIMECODE
 - 7) FILM SIZE
 - 8) ENTER TIMECODE ZERO POINT

ENTER SELECTION ?

SCREEN 0579

- 9) FILM SIZE

- 0) MODE SELECTION SCREEN

 - 1) 35 mm
 - 2) 16 mm

ENTER SELECTION ?

SCREEN 058

- 8) SET READER STANDARD

- 0) MODE SELECTION SCREEN

 - 1) 25 FPS
 - 2) 30 FPS
 - 3) 24 FPS
 - 4) DROP FRAME

ENTER SELECTION ?

SCREEN 059

- 5) SYSTEM OPTIONS
- 0) MODE SELECTION SCREEN
- 1) SET REACTION TIME
- 2) SET AUDIO TRIGGER MASK

ENTER SELECTION ?

SCREEN 0591

SCREEN 0592

SCREEN 07

7) CUE GROUP ENABLE

0) MODE SELECTION SCREEN

ON 1) CUE GROUP 01M

ON 2) CUE GROUP 02E

OFF 3) CUE GROUP 03D

OFF 4) CUE GROUP 04D

OFF 5) CUE GROUP 05D

OFF 6) CUE GROUP 06D

OFF 7) CUE GROUP 07D

OFF 8) CUE GROUP 08D

9) MORE

ENTER SELECTION ?

SCREEN 079

7) CUE GROUP ENABLE

0) MODE SELECTION SCREEN

OFF 1) CUE GROUP 09D

OFF 2) CUE GROUP 10D

OFF 3) CUE GROUP 11D

OFF 4) CUE GROUP 12D

OFF 5) CUE GROUP 13D

OFF 6) CUE GROUP 14D

OFF 7) CUE GROUP 15D

OFF 8) CUE GROUP 16D

9) MORE

ENTER SELECTION ?

SCREEN 08

8) EVENT RELAY SETUP

0) MODE SELECTION SCREEN

OFF 1) RELAY 1 CUE FIRED

OFF 2) RELAY 2 CONTINUOUS

OFF 3) RELAY 3 CONTINUOUS

OFF 4) RELAY 4 CONTINUOUS

OFF 5) RELAY 5 CONTINUOUS

OFF 6) RELAY 6 CONTINUOUS

OFF 7) RELAY 7 CONTINUOUS

OFF 8) RELAY 8 GOOD TIMECODE

ENTER SELECTION ?

SCREEN 09

9) WIPE1: CURSOR ASSIGN

0) MODE SELECTION SCREEN

1) WIPE 1

2) WIPE 2

3) WIPE 3

4) Q-COUNT & ADVANCE WARNING

ENTER SELECTION ?

12.00 REAR PANEL CONNECTIONS

12.01 POWER INPUT

The unit is supplied for either 220-250v A.C. or 110v-125v A.C. operation. The mains IEC input socket contains an integral power line filter and mains switch. The mains lead supplied should be connected as follows:-

Brown	Live
Blue	Neutral
Green/Yellow	Earth

Later units are supplied with a voltage selector switch.

12.02 INPUT XLR

The 3 pin XLR INPUT socket is a balanced input to the Timecode reader. The input is connected as follows:-

Pin 1	Chassis
Pin 2	Positive input
Pin 3	Negative input

When connected to an un-balanced source of time code they should be connected as follows:-

INPUT SOURCE

Pin 1	Chassis
Pin 2	Signal
Pin 3	Signal Ground

12.03 OUTPUT XLR

The 3 pin XLR OUTPUT plug is a balanced output from the TimeCode Generator. The output is connected as follows:-

Pin 1	Analog Ground
Pin 2	Positive output
Pin 3	Negative output

When connected to an unbalanced load the connections should be made as follows:-

OUTPUT LOAD

Pin 1	Ground
Pin 2	Signal
Pin 3	Leave open

12.04 AUX XLR

The 3 pin XLR AUX plug is a balanced floating output from the metronome. The output is connected as follows:-

Pin 1	Analog Ground
Pin 2	Positive output
Pin 3	Negative output

When connected to an un-balanced load the connections should be made as follows:-

AUX	LOAD
Pin 1	Chassis or leave open
Pin 2	Signal
Pin 3	Ground

12.05 EXT. REF. BNC

The EXT REF BNC is connected to the reference input of the time code generator. This input when selected should be fed with either frame rate or twice frame rate signal. The preferred input is a 5 volt square wave, but a 5v sine wave is also acceptable.

12.06 VIDEO REF. BNC's

The two VIDEO REF BNC's are connected in parallel and routed to the reference input of the time code generator. This input when selected should be fed with a nominal 1 volt composite or black and burst video signal. The input has an impedance of approximately 100K.

The video input will normally be fed from station sync's in parallel with the video recorder's. In an audio studio there is normally a Sony F1 or equivalent which may be used as a source of station sync's.

12.07 INSERT I/P BNC

The INSERT I/P BNC is connected to the video inserter input. The inserter input has an input impedance of 75 ohms, see section A.11 for further information on input termination.

This input will normally be connected to the output of the video playback source.

12.08 INSERT O/P BNC's

The INSERT O/P BNC's are connected to the video inserter output. Each output has a source impedance of 75 ohms, and is resistively isolated.

The output's will normally be connected to a video monitor and the input of the video work-copy recorder.

12.09 SERIAL 'D'

The SERIAL 'D' plug is connected to a RS232/RS422 port on the CPU board. Older units use a different CPU board with a RS232 port only. The connection to a IBM is made as follows:-

RS232 Interface cable:-

CB Video Streamer				IBM PC		
	Connector On Cable				Connector On Cable	
	9 pin 'D' Male	9 pin 'D' Female	9 pin 'D' Female		9 pin 'D' Female	25 pin 'D' Female
Function	Bus (RS422) Micro-D	New Micro-D	Old Micro-A	Function	COM-1	COM-2
Tx Data-	2	2	2	Rx Data-	2	3
Rx Data-	8	3	3	Tx Data-	3	2
Ground	4	4	7	Ground.	5	7

Note: Change in ground pin between Old and New Video Streamers

12.10

12.11 PARALLEL 'D'

The 37 way PARALLEL 'D' plug provides the following functions:-

- 1) Event relay outputs
- 2) OPTO Isolator inputs
- 3) Audio trigger input

The pin connections are as follows:-

Pin 1	Trig input (-)	Pin 20	Analog ground
Pin 2	Trig input (+)	Pin 21	Analog Ground
Pin 3	Trig pot	Pin 22	Trigger pot wiper
Pin 4	OPTO1 (-)	Pin 23	+5v
Pin 5	OPTO2 (-)	Pin 24	OPTO (+) common
Pin 6	OPTO4 (-)	Pin 25	OPTO3 (-)
Pin 7		Pin 26	Relay 7 NO
Pin 8	Relay 6 C	Pin 27	Relay 7 C
Pin 9		Pin 28	Relay 6 NO
Pin 10		Pin 29	RELAY 5 NO
Pin 11	RELAY 4 C	Pin 30	RELAY 5 C
Pin 12		Pin 31	RELAY 4 NO
Pin 13	RELAY 8 NO	Pin 32	RELAY 8 C
Pin 14	RELAY 1 C	Pin 33	RELAY 1 NO
Pin 15		Pin 34	RELAY 3 NO
Pin 16	RELAY 2 C	Pin 35	RELAY 3 C
Pin 17		Pin 36	RELAY 2 NO
Pin 18		Pin 37	
Pin 19			

12.12 EVENT RELAY OUTPUTS

The specifications of the event relay contacts are as follows:-

Relays 1 to 8 single pole make

10 watts, 0.5 amp switch current, 1 amp carry current
200 volt max switching voltage, 0.2 ohm contact resistance

These ratings are maximum and MUST not be exceeded!

12.13 OPTO ISOLATOR INPUTS

The opto trigger inputs may be used to trigger wipes directly or to enter trigger points into the cue list see section 10.56.

The opto isolator inputs have internal 1Kohm current limit resistors, The Common input (pin 24) has a maximum input voltage of 24 volts and minimum of 4 volts, if higher voltages are used then external series resistors should be fitted. The opto + common (pin 24) should be connected to the external positive reference voltage or to the internal +5v (Link pins 23 and 24). The Trigger input (pins 4, 5, 6, 25) should be connected to ground via the trigger switch/relay, where the internal +5 volts is used they should be connected to pin 20.

12.14 AUDIO TRIGGER INPUT

The audio trigger input may be used to trigger wipes directly or to enter trigger points into the cue list see section 10.56.

This input is to be found on the 37 pin 'D', it is electronic balanced with an input impedance of 20 Kohm. When connected to an unbalanced source it should be connected as follows:-

UNBALANCED SOURCE Trigger input

Signal	+ input (pin 1)
Ground	- input (pin 2)

BALANCE SOURCE Trigger input

Signal +	+ Input (pin 1)
Signal -	- Input (pin 2)
Ground	Analog Ground (pin 20)

The Input threshold is set by VR4 on the video board, if required a external threshold control may be fitted to pins 3, 21, 22 and VR4 removed.

APPENDIX : HARDWARE SET UP

A.00 VIDEO CARD

The Video card in the upper card to the left when viewed from the front of the unit.

A.10 Inserter

A.11 Input termination

The input of the inserter is terminated by R29 (75 ohm), This resistor is mounted on saddle pins to facilitate user modification if required.

A.12 Video Gain

The video Gain may be adjusted from 0dB to +8dB by adjusting VR2.

A.13 Video Frequency Response

The video frequency response may be adjusted via VC1.

A.14 Inserter White Level

After the video gain has been set the peak inserter white level may be set by enabling the timecode insert, and then adjusting VR1.

A.15 Inserter Stability

U17, R10, R11, C16 and VR3 (VR3 is labelled X2 on older designs) form the Oscillator for the video character generator. VR3 adjusts the frequency of the oscillator. The frequency of this oscillator determines the stability and horizontal character size of the inserter. VR3 is a long 20mm multi-turn preset on the front left of the video board.

Note 1. This preset should only be set after the unit has been allowed to reach its operating temperature.

Note 2. VIDEO STREAMER only, check the stability of your monitor when the unit is switched to OFF LINE. It may be necessary to adjust VR3 if the video image is not stable.

Note 3. If U17 is replaced it may be necessary to change the value of R11 to provide adequate range on VR3.

B.00 TIME CODE CARD

B.01 TIME CODE INPUT

There are two timecode input paths selected by L5:-

- 1) L5 Fitted : Via a limiter for low level inputs.
- 2) L5 Omitted : By-passing the limiter for high speed code.

In most cases input path 2) should be selected and L5 omitted.

B.02 TIME CODE OUTPUT

The time code output clock is generated by a phase lock loop U22, the reference for the PLL is generated from the crystal reference by U23. The crystal frame rate signal is locked by software to the selected external reference. The stability of the PLL may be adjusted by VR3 (STB).

The shape of the time code output may be adjusted by VR2 (SHP), this preset adjusts both the rise time of the signal and the 'sharpness of the corners'. Slow rise times and rounded corners reduce any cross- talk between timecode and audio.

The time code output level is adjusted by VR1 (LEV). The timecode output is balanced with a source impedance of 330 ohms on each leg (R24 and R26).

To adjust the generator presets remove the base cover, this facilitates access to the 3 presets. The presets are labelled on the track side of the board! To access the presets from the top, switch of power, remove video board, and switch on power. The unit will function as a reader/generator without the video board.

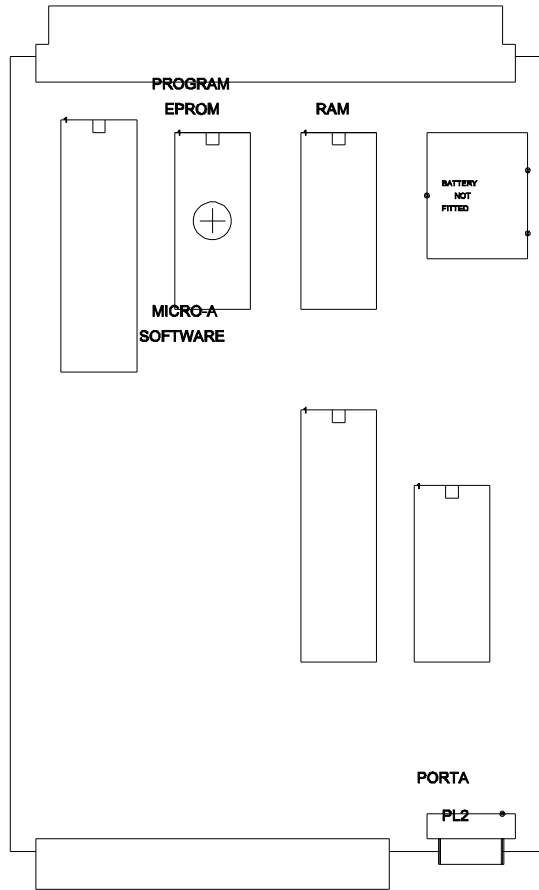
C.00 PSU Board

C.01 Colour Frame detection

VR1 is used to set up the colour frame detection circuit in PAL mode. VR2 is used to set up the colour frame detection circuit in NTSC mode.

To set the colour frame detection, connect a SPG with a colour frame reference output to the video reference input. set the unit for video reference, 8 field colour lock, and PAL or NTSC. Connect one channel of an oscilloscope to the colour field flag output on the SPG, connect pin of U23 on the TCR pcb to the second channel of the oscilloscope. Then adjust VR1(PAL) or VR2(NTSC) so that the two signals are in phase.

PROCESSOR CARDS ARE FITTED IN THE CENTRE LOWER POSITION OF ANY CB UNIT

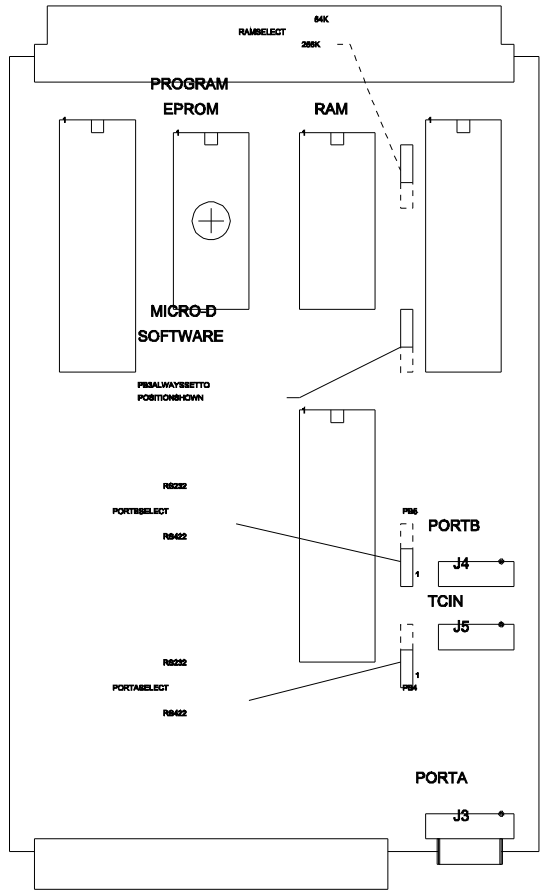


EARLIER PROCESSORS

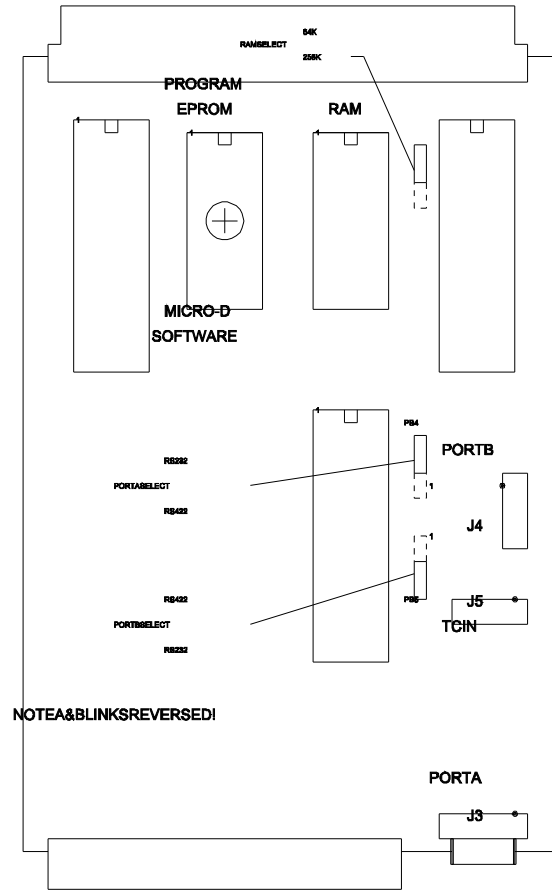
RS232 ONLY

IN GENERAL RS422 PORTS ARE RECONNECTED TO 9 WAY FEMALE D CONNECTORS

RS232 PORTS CONNECTED TO 9 WAY MALE D CONNECTORS



DTYPE PROCESSOR VER1



DTYPE PROCESSOR VER2

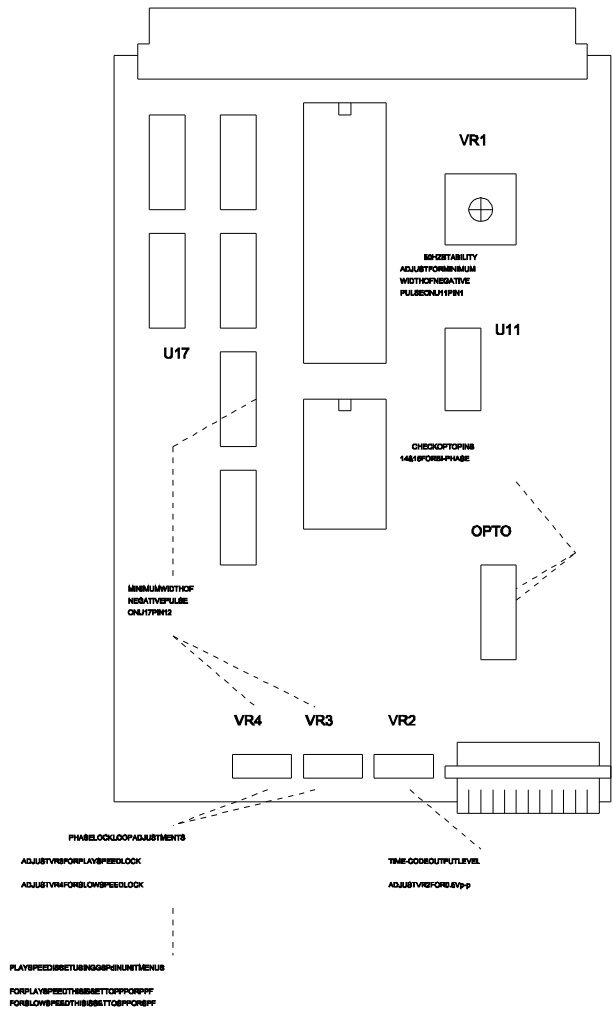
IMPROVED TO BENEFIT

(S9 MACHINES)

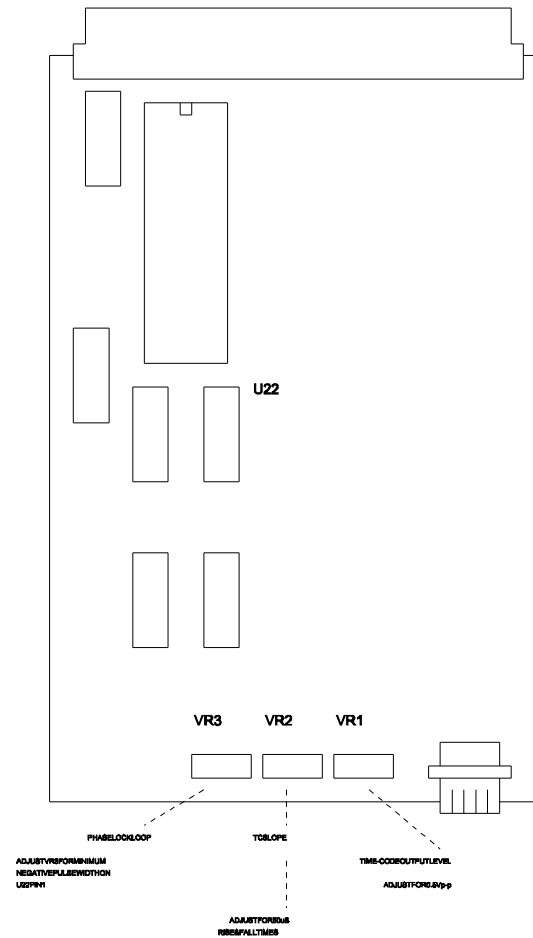
(PC USE)

CB ELECTRONICS
10000 NSIDE, LAND BEND HOUSE, BEEGARS

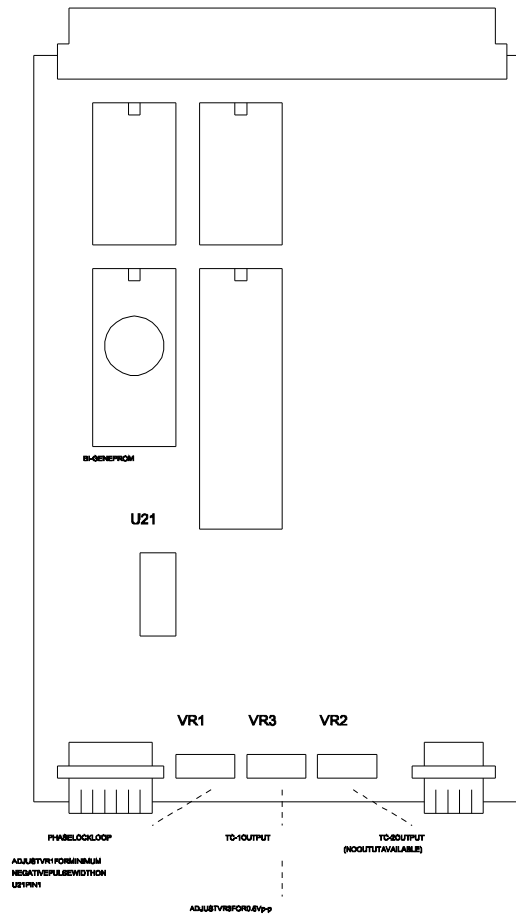
FILMCODERCARD



READERGENERATOR

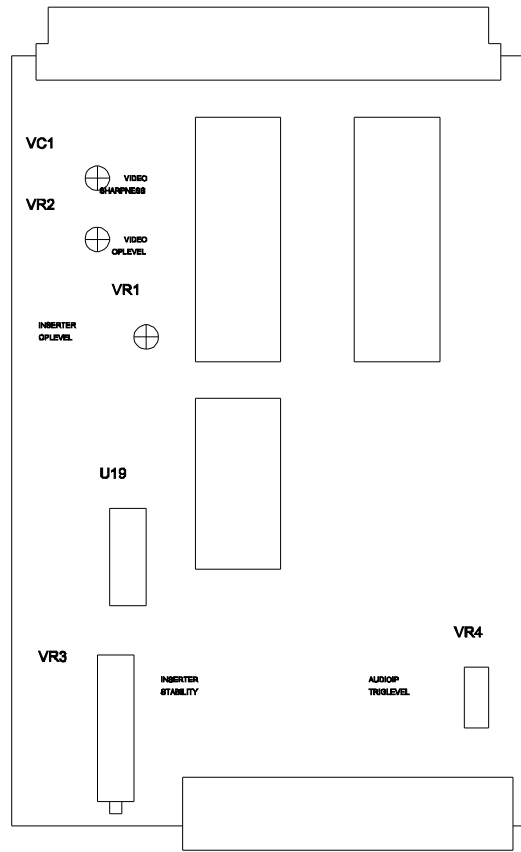


BI-PHASE GENERATOR



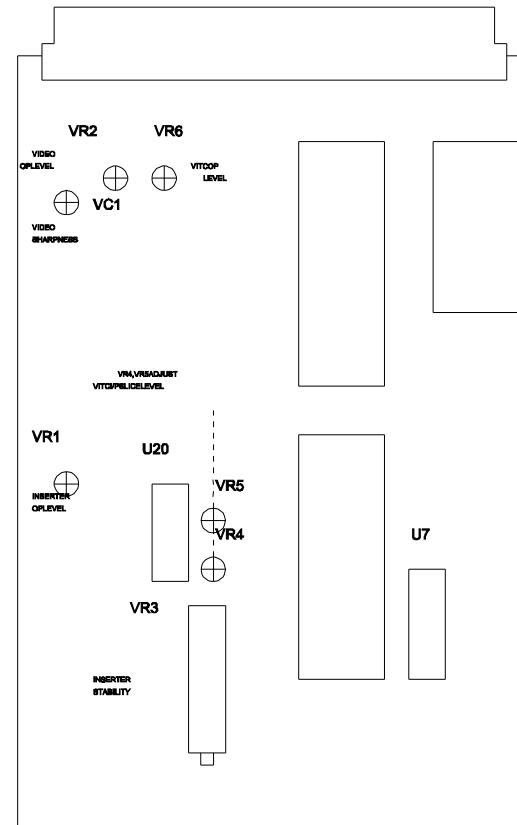
©ELECTRONICS
 LOCKSMITH LANE BIRCH CLIFFS BIRCHDALE
 HILL RD, CHRYSLER, BIRCH CLIFFS

ALWAYS FITTED AS TOP LEFT CARD WHEN VIEWED FROM FRONT



VS-1
VIDEOINSERTER
AUDIO TRIGGER
+RELAY

NOTE: IF HORIZONTAL SYNC IS NOT PRESENT, THE CHARACTER GENERATOR WILL
GENERATE A BLACK SCREEN. IF THE CHARACTER GENERATOR IS NOT PRESENT,
THE CHARACTER GENERATOR WILL GENERATE A BLACK SCREEN.



TC-2,FC-2,ED-2
VITCREADER/GENERATOR
+VIDEOINSERTER

NOTE: IF HORIZONTAL SYNC IS NOT PRESENT, THE CHARACTER GENERATOR WILL
GENERATE A BLACK SCREEN. IF THE CHARACTER GENERATOR IS NOT PRESENT,
THE CHARACTER GENERATOR WILL GENERATE A BLACK SCREEN.

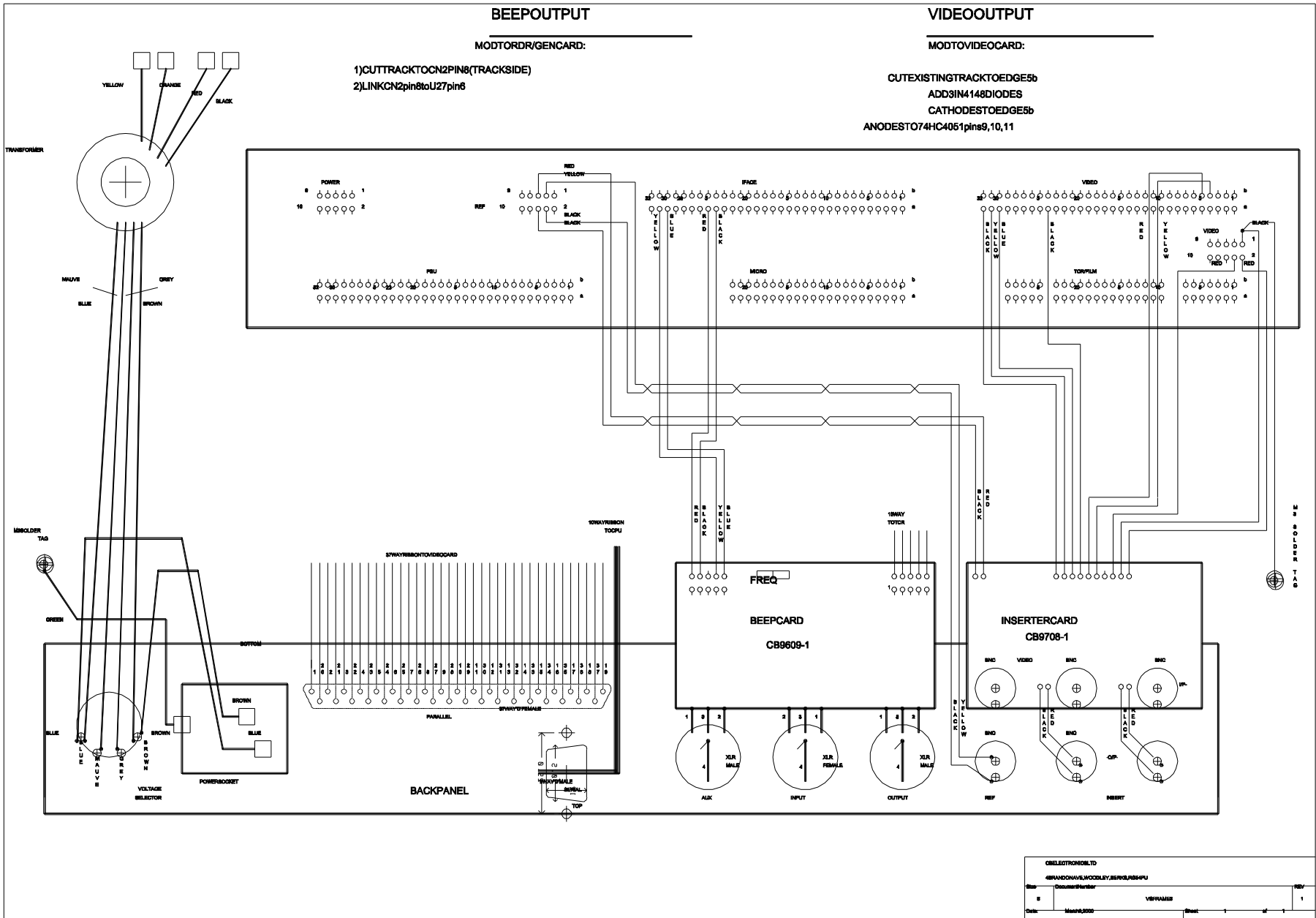
IF THE VITCOP LEVEL IS NOT PRESENT, THE CHARACTER GENERATOR WILL
GENERATE A BLACK SCREEN. IF THE VITCOP LEVEL IS NOT PRESENT, THE
CHARACTER GENERATOR WILL GENERATE A BLACK SCREEN.

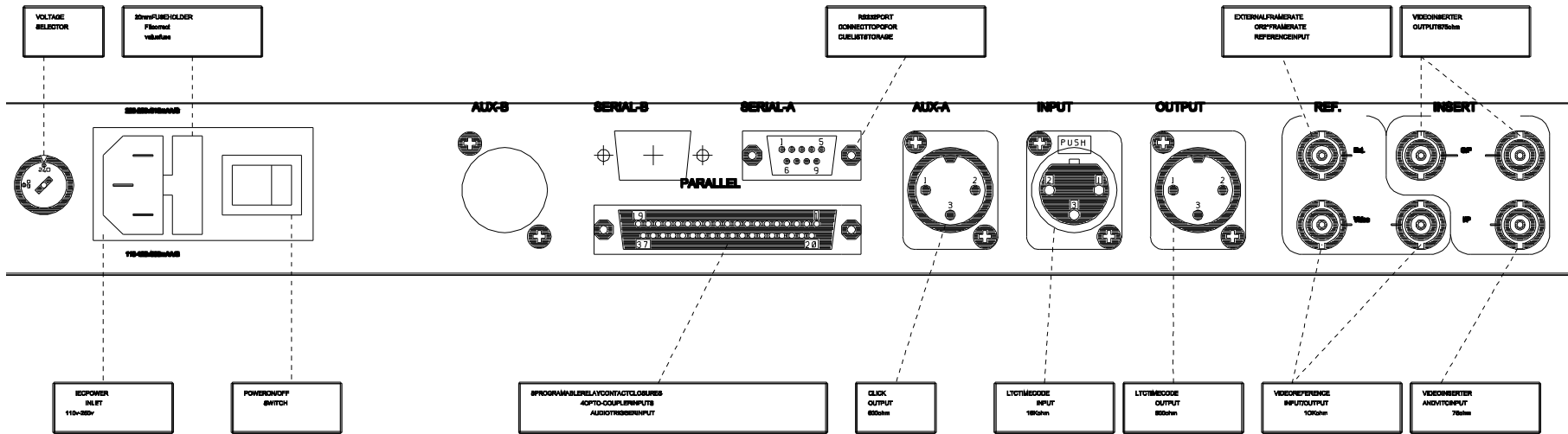
OR BOTH VITCOP

OR BOTH VITCOP

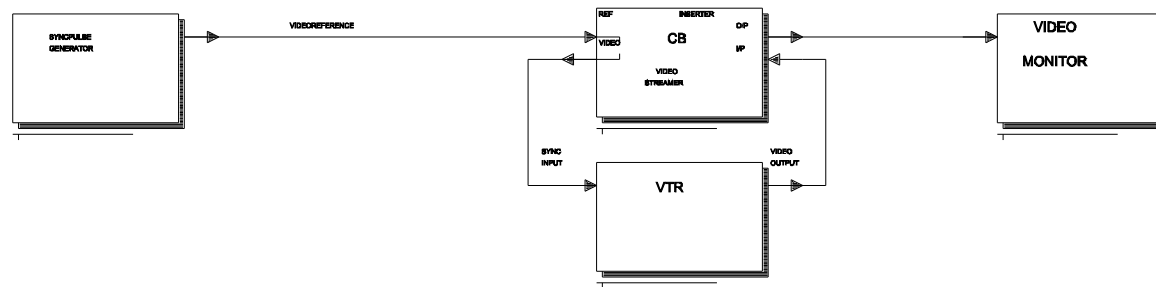
OR BOTH VITCOP

OR BOTH VITCOP





TYPICAL VIDEO CONNECTION



CB ELECTRONICS LTD
 48 RANDONAVE, WOODLEY, BERKSHIRE, UK
 Design Number: VS-2
 Date: July 1991

