IS-1 ISDN SYNCHRONISER

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IS-1 ISDN SYNCHRONISER

* USES THE RS232 AUX CHANNEL . . . . Frees Audio Channel for Stereo
* TIME CODE IN/OUT . . . . Any standard
* RS422 MACHINE CONTROL . . . . DAT or VIDEO machines
* VIDEO SYNCHRONISER . . . . Slaves Video Machine to local or remote timecode
* INTEGRAL REMOTE CONTROL . . . . With Remote Tally indication
* STAND ALONE VIDEO SYNCHRONISER . . . . Slave to timecode
* PROGRAMABLE ENCODE DECODE OFFSET . . . . To suit encode system used
* GENERAL PURPOSE PORTS . . . . User In/Out Ports

OPTIONS

* BAUD RATE . . . . 2400, 1200, 600 BAUD
* INTERNAL SPG . . . . PAL or NTSC
* PARALLEL REMOTE CONTROL . . . . ISDN or Local
* VITC READER . . . . VITC+LTC or VITC only

The CB ISDN Synchroniser is a custom version of the CB SS-2 Video Synchroniser that combines a video synchroniser with a RS232 ISDN interface, this addition enables the video to slave either to timecode in the normal way or to timecode received via the ISDN line. By using the RS232 Aux channel instead of one of the Audio channels it is now possible to send STEREO audio and timecode over ONE ISDN link. By including the RS422 machine control and synchroniser no additional hardware is required to make a full sound/video link-up over an ISDN line.

The Prefered system requires one IS-1 unit at each end of the ISDN link, this provides bi-diretional timecode and machine control. The advantage of the system is that a single trained operator can control instant high quality monitoring synchronous with picture in two locations. However a sigle unit may be used either as a stand alone synchroniser to lock the local video machine to a remote source of timecode, or to buffer the local timecode before the isdin line, this allows high speed timecode to be transmitted as bursts of play speed code.

MASTER

The master unit reads timecode and transmits both the code and the remote switch information via the ISDN line. The REMOTE tallies are driven from information received from the slave, in this way the operator at the MASTER unit knows what is happening to the slave. The master unit may also be used to slave a video machine to the timecode.

SLAVE

The slave unit genlocks its generator to the ISDN information and uses that timecode to slave a video or dat machine. The machine position and status are transmitted via the ISDN line to be used as tally information by the MASTER unit. The timecode output may be used by external equipment.

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IS-1 ISDN SYNCHRONISER

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Timecode reader microprocessor interface.

GEN

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Video reference decoder, reference selection, reference monostable.

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VITC reader analog and digital.

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ISDNFRAME

Frame drawing showing all internal cabling.

1.0 DISPLAY

In normal operation the eight digit display will show any of the following:-
    Master timecode
    Slave timecode
    Offset
    Reader timecode
    Remote ISDN timecode

1.01 Master timecode
To display the Master timecode depress **SELECT** until the **Master** LED is illuminated.

1.02 Slave timecode
To display Slave timecode depress **SELECT** until the **SLAVE** LED is illuminated.

1.03 Offset

To display current Offset depress **SELECT** until the **OFFSET** LED is illuminated.

1.04 Reader Timecode
To display Reader user bits depress **SELECT** until the **READER** LED is illuminated. Note on earlier units this is labled **DIFF**.

1.05 Remote ISDN timecode
To display the remote ISDN timecode depress **SELECT** until the **ISDN** LED is illuminated. Note on earlier designs this LED is not fitted.

1.06 FREEZE
This key has two possible functions dependent on the setting in CONFIGURATION as follows:-

Fr2 disP: Freeze the display only, when the display is frozen the **FREEZE** LED is illuminated.

Fr2 Gen: Freeze the generator, when the generator is frozen the **Freeze** LED is illuminated.

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

This key also enable's and disable's the frame display in the inserted video if this option is fitted.

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

GENERATOR STANDARD

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

Note. See the CONFIGURATION section for the method of selecting the film frame rate and 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

1.08 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.

This 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 CONFIGURATION section for the method of selecting the generator colour lock status.

Not currently available.

1.09 REF

These LED's illuminate to indicate the selected frame rate reference for the timecode generator when set to FREE RUN. 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 **CONFIGURATION** section for method of selecting generator reference.

1.10 VITC

This key is used to enable the VITC reader if fitted, depending on the configuration there are two modes of operation for the VITC reader:-

VItC-LtC	Auto mode the LTC reader has priority over the VITC reader. When there is no LTC the VITC reader is enabled, if LTC is found the VITC reader is disabled.
VIt ONLY	The LTC reader is disabled and only the VITC reader is operational.

Note 1.	The decimal point to the right of the frames continues to indicate the LTC status even in VIt ONLY mode.
Note 2.	When the configuration is changed it is necessary to re enable the VITC reader to change its mode of operation.

2.00 GENERATOR

2.10 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 SETUP section for method of setting the preset start time.

2.20 JAM

When the **JAM** LED is illuminated the generator is numerically locked to the reader. There are five different jam modes available, the various **JAM** modes are selected in the configuration section. The generator is always locked to the selected reference XTAL-VIDEO-EXT-LINE-READER, if it is required to lock the generator to an external code source then JAM should be enabled in the selected mode and the generator reference should be selected to READER.

2.21 JAM CONFIGURATION

Further details of the various jam options may be found in the following sections of this manual:-

4.08 JAM SOURCE	Determines the jam source: RDR-1, RDR-2, SERIAL
4.09 JAM TYPE	Determines the jam modes.
4.10 JAM OFFSET	Enable/disable jam with offset.
4.11 DROPOUT FILTER	Specifies the number frames without code before it is assumed that the code has stopped.
4.12 BURST LENGTH	Specifies length on incremental timecode burst to be used when jamming to high speed code in JAM CODE.
4.13 STATIONARY CODE	Enable/disable the output of stationary code when the generator is stopped.
4.17 GEN USER SOURCE	Enable/disable the transfer of USER bits in jam.

2.22 JAM WITH OFFSET

When it is required to jam the generator to the reader with an offset two operations must be preformed as follows:-

1) Enable the jam with offset function in Configuration.

2) Set the offset required. Two values are used to set the offset, generator reset time and Reader reset time. These are used to avoid any offset calculation. The unit will calculate the offset by subtracting the two values.

EG. If the start of picture on a tape is at 9:55:23:13 and a time of 1:00:00:00 is required for the start of picture.:-

Depress the SET key so that the SET LED is illuminated.

Depress the SELECT key repeatedly until the GEN. LED is illuminated. Use the <-, ->, INC, DEC keys until the display shows 1:00:00:00.
Depress the SELECT key twice so that the READER LED is illuminated. Set the display to 9:55:23:13.
Depress both <- and -> simultaneously to enter Configuration. Set for JAM FrEE and OFFSEt.
Depress SET to leave configuration. Enable JAM if and run the tape, G.RST may be used to stop the generator, the generator should be enabled as soon as good code is read.

If the required offset is known then for a positive offset zero the reader reset time and set the generator reset time as the offset, for a negative offset zero the generator reset time and set the reader reset time as the offset.

2.23 JAM EXAMPLES

The generated timecode is frame locked to the selected reference (1.09 REF). When regenerating timecode from an audio tape recorder the reference should be set to **READER**. When re-generating timecode from a video tape recorder the reference should be set to **VIDEO** provided that:-

1) The original timecode was referenced to video.
2) Both the video tape machine and the generator are connected to the same reference.

3.0 GENERATOR SETUP

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

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

The user may then specify the generator reset timecode value, the generator user bits and the reader timecode which is equivalent to the generator timecode when jamming with an offset. The value is modified as follows, the decimal point is used as a cursor to indicate the digit which will be modified by the numeric or **INC** and **DEC** keys. The cursor keys **<** and **>** move the cursor clockwise and anti-clockwise.

CLEAR: If both **INC** and **DEC** keys are depressed simultaneously the current displayed data will be cleared to all zero's.

To leave the setup mode depress the **SET** key.

4. UNIT / VIDEO / SERIAL CONFIGURATION

CONFIGURATION SELECTION

The configuration of the unit is selected by first depressing the **SET** key so that the **SET** LED is illuminated then depress both **<-** and **->** simultaneously to enable configuration selection. The first display allows you to select which configuration you wish to adjust **UNIt / VIdEO / SErIAL**. Make your selection and then depress **<-** and **->** simultaneously to select.

4.00 UNIT CONFIGURATION

The first display in the unit configuration indicates witch of the four selectable setup's the unit is set to. The four choices **CONFIG 1** .. **CONFIG 4** may be selected simply by using the **INC, DEC, <-** or **->** keys, once you have chosen and modified the configuration use the **SET** key to exit.

CONFIGURATION MODIFICATION

To modify a parameter within a selected configuration then simultaneously depress both **<-** and **->** keys a second time to enter the configuration menu (note. a third simultaneous depression of these keys will enter the **SERIAL CONFIGURATION MENU**). Once in the CONFIGURATION MENU 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
VItC-LtC / VIt ONLY
FrZ dISP / FrZ GEN
USErGrSt / USEr SEt
JAN rdr1 / JAN rdr2 / J SErIAL
JAN FrEE / JAN CODE / rESHAPE / JAN ONCE / JAN PHAS
No OFFSt / JAN OFFS
droPO 10
bUrSt 06
SCOdE OF / SCOdE ON
SCOdE 0 / SCOdE -1
tout 50
GEnU-PSt / GU-rdr1t / GU-rdr1U / GU-SEr t / GU-SEr U

The **<** and **>** keys are used to select the parameter displayed. The **INC** and **DEC** keys are used to change the selection of the displayed parameter.

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

4.01 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.

4.02 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.

4.03 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.

4.04 VITC ENABLE: VItC-LtC / VIt ONLY

When the VITC reader is enabled using the VITC key two modes of operation are available:-
VItC-LtC   If LTC is present then the reader will read the LTC in preference to VITC, the VITC will only be read if there is no LTC.
VIt ONLY   The LTC reader is turned OFF and only VITC is read.

4.05 FREEZE DISPLAY or GENERATOR: FrZ dISP / FrZ GEN

The **FREEZE** key may be used to freeze the generator or to freeze the display only:-
FrZ dISP   When the LED is illuminated the display is frozen.
FrZ GEN   When the LED is illuminated the generator is frozen, if stationary code is not enabled the generator will output stationary code for **BURST** frames and then mute. If the key is depressed a second time the generator will start from its current value.

4.06 GENERATOR USER BIT SET: USErGrSt / USEr SEt

The generator user bits may be set either when leaving setup, or when depressing the **G.RST** key.
USErGrSt   Update the generator user bits when depressing the **G.RST** key.
USEr SEt   Update the generator user bits when leaving setup.

4.07 GENERATOR JAM SOURCE: JAN rdr1 / JAN rdr2 /J SErIAL

When the **JAM** LED is illuminated the generator is numerically jammed to one of the following sources:-

JAN rdr1   Jam from the main timecode input.
JAN rdr2   Jam from the Auxiliary timecode reader **[OPTION]**.
J SErIAL   Jam from the SERIAL port **[OPTION]**.

4.08 GENERATOR JAM TYPE: JAN FrEE / JAN CodE / rESHAPE / JAN ONCE / JAN PHAS

When the "JAM" LED is illuminated the generator is numerically jammed to selected timecode source. 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 a preset number of frames (4.10) 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.

rESHAPE: The reader input data is connected directly to the output shaping circuit. The timecode output is a buffered and reshaped input. *NOTE: This option is only available with CB8601-4 High Speed reader/Time Code Generator PCB's. U24 (CD4052) should be fitted.*

JAM ONCE When Jam is enabled the generator output is stopped, when good code is read the generator output is enabled and the code is jammed for the first 120 frames. After **TOUT** frames of good code jam is disabled.

JAN PHAS The Generator will start in **JAM** in the normal way however after **TOUT** frames of good code it will free run until it discovers **DROPO** frames without code. At this point the generator will stop at the last good timecode value and wait for new code.

JAN triG The Generator will stop on its preset value, the first timecode sync word discovered by the reader will turn off **JAM** and start the generator.

The speed of the generator will be determined by the generator reference and may be selected as described in section 4.05.

4.09 GENERATOR OFFSET: No OFFSt / JAN OFFS

When JAM is selected the generator may be jammed to the reader with an offset. No OFFSt disables this function, JAN OFFS enables jam with offset

4.10 JAM DROPOUT FILTER: droPO 10

When JAM is enabled this parameter sets the minimum length of dropout accepted before it is assumed that the input code has stopped. This parameter may be set between 1 and 50 frames.

If JAM FREE is selected if there is no code then the generator will continue free running until new code arrives. If new code arrives in less than 'dropout' frames then there will be no change in the generator output even if the code has changed. If new code arrives after 'dropout' frames have passed then the generator will re-jam to the new code.

If JAM CODE is selected, a dropout longer than specified will result in the generator stopping with the numbers jammed to the last known good reader timecode. When new code arrives the generator starts up and re-jams to the new code.

This parameter is also used by the Edit Decision List software to decide when to update the EDL list when no timecode is present

4.11 BURST LENGTH: bUrSt 06

When **JAM CODE** is enabled and the generator is jammed to high speed code it is not possible to follow frame by frame because the generator runs at play speed only. The output of the generator jumps in value to follow the input code. Most readers require several sequential frames of code before they will read. **BURST** sets the number of sequential frames output. **BURST** may be set between 1 and 30.

4.12 STATIONARY CODE ENABLE: SCOdE OF / SCOdE ON

If JAM CODE is enabled the generator will stop incrementing if the input timecode stops. In this case there are two options available:-

SCOdE OF Stationary code is output for BURST frames after which the generator output is muted.

SCOdE ON Stationary code is output.

4.13 STATIONARY CODE OFFSET: SCODE 0 / SCODE -1

When jamming to VITC or stationary LTC timecode this flag enables the generated code to be offset by -1 frame when generating stationary code. This is for use with some synchronisers which add one when reading stationary code (Adams Smith). To enable a one frame negative offset when stationary code is generated set to **SCODE -1**. *Note. for this to operate the following options must be set 1) **SCODE ON**, 2) **JAM CODE**.*

4.14 TIMEOUT: tout 50

4.15 GENERATOR USER BIT SOURCE: GEnU-PSt / GU-rdr1t / GU-rdr1U / GU-SEr t/ GU-SEr U / GU-rdr2t / GU-rdr2U

The source for the generator user bits may be selected to the following:-

GEnU-PSt As preset by the user in **SETUP**.
GU-rdr1t Timecode reader 1 time
GU-rdr1U Timecode reader 1 User bits
GU-Ser t Serial timecode **[OPTION]**.
GU-Ser U Serial USER data **[OPTION]**.
GU-rdr2t Timecode reader 1 time **[OPTION]**.
GU-rdr2U Timecode reader 1 User bits **[OPTION]**.

4.20 ISDN: SERIAL-A CONFIGURATION

In SERIAL CONFIGURATION the display indicates either the parameter to be modified or the various selections of a particular parameter in the same way as in CONFIGURATION. The first three selections are as follows:-

9600bAud / 300 bAud / 1200bAud / 2400bAud / 19200 bd
NO   PAr / EVEN PAr /Odd PAr
1 StOP / 2 StOP
OFSt1 ??
OFSt2 ??
Snd Rdr1 / Snd S9 / Snd GEN

The **<** and **>** keys are used to select the parameter displayed. The **INC** and **DEC** keys are used to change the selection of the displayed parameter.

When the **SET** key is depressed the SERIAL CONFIGURATION, CONFIGURATION and SETUP modes are exited. The parameters are then set as selected whilst in setup, CONFIGURATION or SERIAL CONFIGURATION.

4.21 BAUD RATE:

9600bAud / 300 bAud / 1200bAud / 2400bAud / 19200 bd

The BAUD rate is user selectable to any one of the above standard baud rates. After a hard reset the unit will select 9600 BAUD.

4.22 PARITY

NO   PAr / EVEN PAr / Odd PAr

The type of data parity bit is user selectable. After a hard reset the unit will select **NO   Par** as its default mode.

4.23 STOP BITS

1 StOP / 2 StOP

The number off stop bits is user selectable, the default setting is 1 stop bit.

4.24 ONE-WAY ISDN OFFSET

OFSt1 ??

This the coding offset for the system used, in one-way mode this offset is added to the current timecode before it is transmitted to the ISDN encoder. This offset is only active in play so that it has no effect on stationary timecode.

4.25 TWO-WAY ISDN OFFSET

OFSt2 ??

This the combined transmission delay and coding offset for the system used, in two-way mode this offset is added to the current timecode before it is transmitted to the ISDN encoder. This offset is only active in play so that it has no effect on stationary timecode.

4.26 ISDN SEND TIMECODE SOURCE

Snd Rdr1 / Snd S9 / Snd GEN

This parameter selects the timecode data send to the ISDN line as follows:-

Snd Rdr1   Reader-1 timecode data, this is normally used by the MASTER unit.

Snd S9   Timecode data read from the 9 pin slave machine, this is normally used by the SLAVE unit.

Snd GEN   The internal timecode generator data, this is normally used for test only.

4.** USER CONFIGURATION TABLE

When installing new software or after a **HARD RESET** it is important that the configuration of the unit remains the same. This sheet is provided for that purpose, please write down the current configuration so as to be able to reset the unit correctly. Remember that the next engineer to use the unit may not be a fully understand why it has been set up in this way!

GENERATOR SETUP

The user may then specify the generator reset timecode value, the generator user bits and the reader timecode which is equivalent to the generator timecode when jamming with an offset. The value is modified as follows, the decimal point is used as a cursor to indicate the digit which will be modified by the numeric or **INC** and **DEC** keys. The cursor keys **<** and **>** move the cursor clockwise and anti-clockwise.

CLEAR: If both **INC** and **DEC** keys are depressed simultaneously the current displayed data will be cleared to all zero's.

To leave the setup mode depress the **SET** key.

Setting	Nominal	SELECT	
_____	10:00:00:00	GEN T.	Generator Reset Time
_____	00:00:00:00	GEN U.	Generator Reset USER
_____	00:00:00:00	READ T.	Generator Reset OFFSET

CONFIGURATION

Setting	Nominal	Options
_____	CONFIG 1	CONFIG 1 / CONFIG 2 / CONFIG 3 / CONFIG 4
_____	25	GEn Std 24, 25, 29, 30
_____	Video	GEn rEF XTAL, Video, Line, External, Reader
_____	Not Col	Not Col / 4 Field / 8 Field
_____	VItC-LtC	VItC-LtC / VIt ONLY
_____	FrZ dISP	FrZ dISP / FrZ GEN
_____	USErGrSt	USErGrSt / USEr SEt
_____	JAN rdr1	JAN rdr1 / JAN rdr2 / J SErIAL
_____	JAN FrEE	JAN FrEE / JAN CODE / rESHAPE / JAN ONCE / JAN PHASE / JAN triG
_____	No OFFSt	No OFFSt / JAN OFFS
_____	droPO 10	droPO 1-30
_____	bUrSt 06	bUrSt 06
_____	SCOdE OF	SCOdE OF / SCOdE ON
_____	SCOdE 0	SCOdE 0 / SCOdE -1
_____	TOUT 50	TOUT 1-100
_____	GEnU-PSt	GEnU-PSt / GU-RDR1t / GU-RDR1U / GU-SEr U / GU-rdr2t / GU-rdr2U

6.00 RESET

6.01 POWER UP RESET

When switched on the unit will reset, On reset the memory is not completely cleared since the current film position, timecode offset, and configuration are battery backed. If a memory backup failure is detected the unit will reset the whole memory. During the power up sequence the LED Display will show the following:-

LEd Good	This indicates that the CPU, ROM, LED display, and driver are working correctly.
Ran Good	This indicates that the RAM has been checked and is good.
RAn BAd	This indicates that the RAM has been found to be bad.
bC12	This is the revision code of the software
HArd rSt	This indicated that an error was found in the configuration ram and that the memory backed ram has been reset.

6.02 CPU CARD RESET

When servicing the unit it may be required to reset the unit without switching off the power. To do this short 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.

6.03 SOFT RESET

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

6.04 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 **FREEZE** keys. This may be necessary when new software is fitted. CAUTION this will wipe the Configuration memory! If the front panel software is not working correctly the unit will only reset if the **SELECT** and **FREEZE** keys are depressed during the power up sequence.

6.05 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.

7.00 ISDN SYNCHRONISER

7.10 ISDN OFFSET
The ISDN offset switches control and adjust the timecode data send to the ISDN line.

7.11 TWO-WAY
This selects between ONE-WAY and TWO-WAY offset. These offsets may be set separately ind the SERIAL-A configuration menu.

7.12 TRIM-
This subtracts one frame from the currently selected ISDN offset.

7.13 TRIM+
This adds one frame to the currently selected ISDN offset.

7.14 AUTO CALCULATE
Not yet fitted

7.20 LOCAL OFFSET
The Local offset is used to slave the local video machine. The value in the offset register is added to the selected jam source and displayed as the MASTER timecode.

7.21 MARK
This sets the local offset so current relative position of master and slave are maintained.

7.22 TRIM-
This subtracts one frame from the current local offset.

7.23 TRIM+
This adds one frame to the current local offset.

7.24 CLEAR OFFSET
Depressing **TRIM-** and **TRIM+** simultaneously will reset the local offset to ZERO.

7.30 MASTER
The controlled machine is always slaved to an internal generator. The generator may be jammed to either the time code reader (T/C) or the remote ISDN data (ISDN). When neither T/C or ISDN is selected the generator is free running.

7.31 READER
Config 2 Selected:-
> Jam ON
> Generator Numerically Jammed to timecode Reader 1.
> Generator Speed Reference:- Video

7.32 ISDN
Config 3 Selected:-
> Jam ON
> Generator Jammed to ISDN information: **JAN SEeA**
> Generator speed reference:- Video

7.33 READER & ISDN OFF
Config 1 Selected:-
> Jam OFF
> Generator speed reference:- Video

7.40 MACHINE CONTROL

The machine control keys act as a remote control for either the local (NEAR) or distant (FAR) video machine. The NEAR control is via SERIAL-B directly to the 9-pin port of the machine. The FAR control sends commands via the ISDN line to control the distant machine.

If the controlled machine is not remote enabled the motion control LED's will be switched OFF.

7.31 PLAY, STOP, <<, >>

Remote controls for ATR/VTR, check the NEAR and FAR LED's to decide whether the controlled machine is local or via the ISDN link.

7.32 RECORD

This sends an insert record command to the controlled machine. The channels are selected in the machine setup.

7.33 CHASE

This key Enables the chase mode on the slave machine. Chase is disabled when any other command is sent eg. STOP. The record key does not change the chase status. SERIAL B configuration determins allows the user to select the machine's internal chase command when this key is depressed.

7.34 NEAR

This key selects control of the machine directly connected to the IS-1 via Serial-B.

7.35 FAR

This key selects control of the machine at the far end of the ISDN link. All commands are sent via the ISDN link.

8.00 SLAVING A VTR USING SONY PROTOCOL

Note: This should be read with section 4.00 which discusses the serial setup.

To slave a VTR the following must be carried out.

    1)   The SYNCHRONISER should be setup as required with the VTR timecode output **if used** connected to **AUX-B** and the serial control to **SERIAL-B**.

    2)   The unit timecode output at the sync point should be the same as the timecode at the video start mark. One way this may be achieved easily is described in section **1.1 MARK SYNC** below.

    3)   The Generator timecode standard and frame rate should be the same as the timecode and frame rate of the video machine.

    4) The VTR should be selected to **SERIAL REMOTE CONTROL**

    5)   The synchroniser should be enabled as described below.

If all the above are carried out and the VTR timecode is within 2 hours of the current timecode the VTR will then locate to the current **GENERATOR TIMECODE** position (**GEN**).

If a VO9800 or VO9850 is used and you expect to use timecode on track 1 or 2 as well as the dedicated timecode track then it is recommended that the modification as detailed in our application note are carried out. The machine modification as designed by our Italian agents (Audio International) allows the use of time code from any of the tracks by a simple switch behind the front panel.

8.1 ENABLE
The IS-1 may be synchronised either to timecode from the timecode READER, or timecode from the ISDN serial input.

    1) Select the MASTER using the READER or ISDN switch.

    2)   Enable the synchroniser via MACHINE CONTROL using the CHASE switch.

8.2 TIMECODE MASTER
The master timecode is read from the READER 1 input. The slave is synchronised to the Generator timecode jammed to the reader timecode. The following configuration is set when **READER** is selected as master:-

    GEN REF   VIDEO
    JAM SOURCE READER 1
    JAM TYPE   JAM CODE
    JAM OFFSET JAM OFFS

8.3 ISDN MASTER
The master timecode is fed to SERIAL-A input. The slave is synchronised to the Generator timecode jammed to SERIAL-A. The following configuration is set when **ISDN** is selected as master:-

    GEN REF   VIDEO
    JAM SOURCE Serial-A
    JAM TYPE   JAM CODE
    JAM OFFSET JAM OFFS

8.4 MARK SYNC
The quickest way of setting the generator timecode the same as the slave time code is to mark sync. this may be achieved as follows:-

    1)   Disable the synchroniser.
    2)   Position both the master and slave on a known sync point.
    3) Depress the **MARK** key.

8.5 INCREMENT / DECREMENT OFFSET

To fine tune the synchronisation the offset may be adjusted whilst synchronised.

INCREMENT OFFSET:- **TRIM+**

DECREMENT OFFSET:- **TRIM-**

8.6 USING LTC INSTEAD OF RS422 TIMECODE

When using a machine without a timecode reader or a tape with timecode on one of the Audio tracks it is necessary to use the LTC reader option. The CB controller will update the tach counter on the machine with the current LTC timecode at the start of each new timecode read.

To enable this option:-

1) Enter the configuration on the CB unit, select Serial B and set

tAch-LtC instead of Ser CodE

POS tin1 instead of POS LtC

2) On the Machine select to display CTL instead of TC.

The machine should then be put into play from the front panel and switched to Remote. On IS-1 units it may also be put into play when in remote by the IS-1.

9.00 REAR PANEL CONNECTIONS

9.01 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.

9.02 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 unbalanced source of timecode the connection should be made as follows:-

INPUT	SOURCE
Pin 1	Chassis
Pin 2	Signal
Pin 3	Signal Ground

9.03 OUTPUT XLR

The 3 pin XLR OUTPUT plug is a balanced output from the Time Code 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

9.04 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.

9.05 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

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9.06 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 telecine.

9.07 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.

9.08 SERIAL 'A'

SERIAL 'A' plug is connected to a RS232 port on the encoder/decoder units. A male 9 pin 'D' connector is mounted on the rear panel with screw lock. The pin connections are as follows:-

SERIAL-A (To Encoder/Decoder)				
CB: 9 pin Female 'D'	Dolby 9 pin Male	CCS 2000 9 pin Female	CDQ Prinma	**CB** Function
1				Internal
2	3	3	2	Tx Data A-
3	2	2	3	Rx Data B-
4	5	5	5	Gnd.
5				+5v
6				Gnd.
7				Internal
8				Internal
9				Gnd

Dolby AC-2

The Dolby AC-2 uses 1200 Baud only. The lead supplied should be connected to the RS232 connections on both the encode and decode units.

CCS CDQ2000

The CCS CDQ2000 is switchable the rear dip switches should be set as follows for 1200 Baud:-
Down   1 2 - 4
Up   - - 3 -

9.09 SERIAL 'B'

The SERIAL B socket is connected to the RS422 port on the slave machine. the connections are as follows:-

SERIAL-B (To Machine)		
9 pin 'D'	Cable Colour	Function
1		Internal
2	Brown	Rx Data A-
3	Red	Tx Data B+
4	Screen	Gnd.
5		+5v
6		Gnd.
7	Green	Rx Data B+
8	White	Tx data A-
9		Gnd

9.10 AUX-B INPUT XLR (OPTION)

The 3 pin XLR INPUT socket is a second balanced timecode input. This may be used to read the slave machine timecode. The input is connected as follows:-

Pin 1   Chassis
Pin 2   Positive Input
Pin 3   Negative input

When connected to an unbalanced source of timecode the connection should be made as follows:-

INPUT   **SOURCE**
Pin 1   Chassis
Pin 2   Signal
Pin 3   Signal Ground

APPENDIX: HARDWARE SETUP

A.00 VIDEO CARD

A.10 Inserter

A.11 Input termination

The input of the inserter is terminated by R29(75ohm), 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 labled 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.

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

Note 2. If U17 is replaced it may be necessary to change the value of R11.

B.00 TIMECODE CARD

B.01 TIMECODE 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 TIMECODE OUTPUT
The timecode 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 VR#(STB).

The shape of the timecode 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 crosstalk 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 labled 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 setup 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.

D.00 CONNECTIONS

D.01 SONY RS422

Cable

Sony RS422	CB IS-1 Serial B	Cable
9 pin 'D' Male	9 pin 'D' Male	Connections
2	2	Red
3	3	White
7	7	Black
8	8	Brown
4	4	Green + Screen

D.02 DOLBY DP501 AC-2 ENCODER, DP502 AC2 DECODER

RS232 9 pin Female on unit
    2   Tx Data (Decoder Only) (Labled Rx in Dolby Manual)
    3   Rx Data (Encoder Only) (Labled Tx in Dolby Manual)
    5   Ground

Data Format:-
    1200 BAUD 1 START, 8 DATA, 1 STOP, NO PARITY

Cable

Dolby DP501 Encode	Dolby DP502 Decode	CB IS-1 Serial-A	Cable
9 pin 'D' Male	9 pin 'D' Male	9 pin 'D' Female	Connector
2	2	3	Red
3	3	2	Black
5	5	4	Screen

D.03 CCS CDQ2000

RS232 9 pin male on unit

- 2 Tx Data (Decoder Only)
- 3 Rx Data (Encoder Only)
- 5 Ground

CCS Encode	CCS Decode	CB IS-1 Serial-A	Cable
9 pin 'D' Female	9 pin 'D' Female	9 pin 'D' Female	Connector
2	2	3	Red
3	3	2	Black
5	5	4	Screen

Data Format:-
   1 start, 8 data, 1 stop, No Parity

D.03 CCS PRIMA

RS232 9 pin male on unit

- 3 Tx Data (Decoder Only)
- 2 Rx Data (Encoder Only)
- 5 Ground

CCS PRIMA Encode	CCS PRIMA Decode	CB IS-1 Serial-A	Cable
9 pin 'D' Female	9 pin 'D' Female	9 pin 'D' Female	Connector
3	3	3	Red
2	2	2	Black
5	5	4	Screen

Data Format:-
    1 start, 8 data, 1 stop, No Parity
    The baud rate should be set to 1200 using the menu

CHECKING THE ISDN SERIAL COMMUNICATIONS

To check the serial communications on the IS-1 only
     1) Hard Reset the IS-1 (**SELECT + FREEZE**)
     2) Insert a test plug in the **SERIAL-A** socket (A 9 pin 'D' female with Pins 2 & 3 linked)
     3) Feed timecode to the **INPUT** of the IS-1, Select **MASTER ISDN** on IS-1
         If the system is working then you should see the same timecode when selecting **DISPLAY, ISDN**
         and **GEN**

If this does not occur then there is a problem with the IS-1 check the position of Link PB4 on the centre board of the IS-2 is set for RS232 operation.

To check the serial communications using the Encoder/Decoder in local loop mode
     4) Remove the test plug from the **SERIAL-A** socket
     5) Connect **SERIAL-A** to the Encoder/Decoder
     6) Check BAUD rate on IS-1, Encoder and Decoder
     7) Check Parity Setting on IS-1, Encoder and Decoder
     8) Switch the Encoder/Decoder to loop mode
     9) Feed timecode to the **INPUT** of the IS-1, Select **MASTER ISDN** on IS-1
         If the system is working then you should see the same timecode when selecting **DISPLAY, ISDN**
         and **GEN**

If this does not occur then there is either a problem with the cable
     1) Simple cable fault   Check cable with buzzer
     2) Rx & Tx Reversed   Reverse pins 2 & 3 on the IS-1 connection.
     3) Incorrect BAUD Rate
     4) Incorrect Parity
     5) Incorrect ground Pin 4 on IS-1, pin 5? on Encoder/Decoder

Use a oscilloscope to look at the Tx data (**SERIAL-A** pin 2) and the Rx data (**SERIAL-A** pin 3)

If you cannot find a cable fault then suspect the Encoder/Decoder