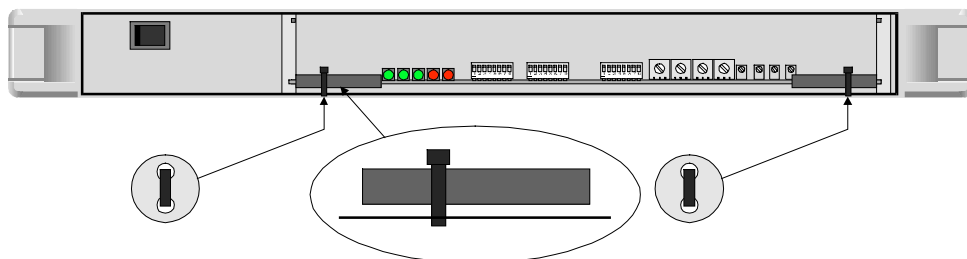


NRS50

Noise Reducer

Transit Protection-Important Notice



REMOVING THE TRANSIT TIE-WRAPS

When supplied the PCB card will be secured by 2 tie-wraps, looped around the card ejectors and through 2 holes in the base plate. Before installing the rack both of the tie-wraps should be removed by cutting off the tie-wrap knot and completely removing the tie-wrap.

REPLACING THE TRANSIT TIE-WRAPS

Before shipping, the transit tie-wraps should be replaced with the spare tie-wraps supplied (part no. RMW610). With the unit free-standing ensure that the PCB card is pushed fully home using the card ejectors. From the inside of the unit, feed the tongue of the tie-wrap behind the card ejector and through the base plate using the rear of the 2 holes. From the outside, feed the tongue back through the base plate using the other hole, past the front of the card ejector, feed through the eye of the tie-wrap, pull tight and cut off the excess.


Operator's Manual

© May 1997

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Tel: +44(0) 1730 821188. Fax: +44(0) 1730 821199.

Safety Warnings

Always ensure that the unit is properly earthed and power connections correctly made.

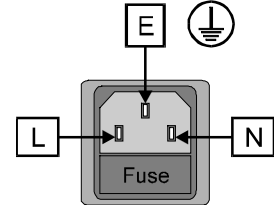
This equipment shall be supplied from a power system providing a **PROTECTIVE EARTH**  connection and having a neutral connection which can be reliably identified.

The power terminals of the IEC mains input connector on the rear panel are identified as shown below:

E = Protective Earth Conductor

N = Neutral Conductor

L = Live Conductor



Power cable supplied for countries other than the USA

The equipment is normally shipped with a power cable with a standard IEC moulded free socket on one end and a standard IEC moulded plug on the other. If you are required to remove the moulded mains supply plug, dispose of the plug immediately in a safe manner. The colour code for the lead is as follows:

GREEN/YELLOW lead connected to E (Protective Earth Conductor)

BLUE lead connected to N (Neutral Conductor)

BROWN lead connected to L (Live Conductor)

Power cable supplied for the USA

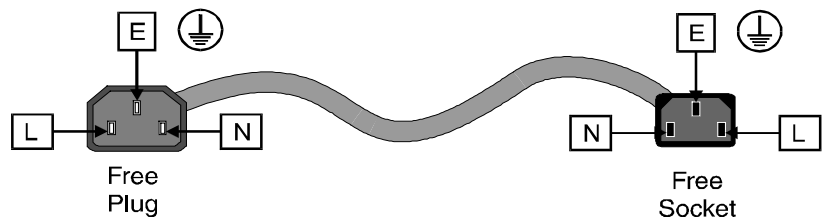
The equipment is shipped with a power cord with a standard IEC moulded free socket on one end and a standard 3-pin plug on the other. If you are required to remove the moulded mains supply plug, dispose of the plug immediately in a safe manner. The colour code for the lead is as follows:

GREEN lead connected to E (Protective Earth Conductor)

WHITE lead connected to N (Neutral Conductor)

BLACK lead connected to L (Live Conductor)

The terminals of the IEC mains supply lead are identified as shown opposite:



Note that for equipment that is not fitted with a mains power switch, to comply with BS60950 Clauses 1.7.2 and 2.6.9, the power outlet supplying power to the unit should be close to the unit and easily accessible.



Warnings

Voltages within this unit can be lethal under certain circumstances. Where power is required to be connected to the unit during servicing great care must be taken to avoid contact with these voltages.

Maintenance should only be carried out by suitably qualified personnel.

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EMC Standards



This unit conforms to the following standards:

Electromagnetic Compatibility-Generic Immunity Standard BS EN 50082-1:1992

The European Standard EN 50082-1:1992 has the status of a British Standard and is related to European Council Directive 89/336/EEC dated 3rd May 1989.

Electromagnetic Compatibility-Generic Emission Standard BS EN 50081-1:1992

The European Standard EN 50081-1:1992 has the status of a British Standard and is related to European Council Directive 89/336/EEC dated 3rd May 1989.

Safety Standards

This unit conforms to EN60065:1992 as ammended by ammendment A1(May 1993) and ammendment A2(March 1994). Specification for safety of technology equipment, including electrical business equipment.

EMC Performance of Cables and Connectors

Snell & Wilcox products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M.

D-TYPE CONNECTORS

D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having "dimples" which improve the contact between the plug and socket shells, are recommended.

Packing List

The unit is supplied in a dedicated packing carton provided by the manufacturer and should not be accepted if delivered in inferior or unauthorised materials. Carefully unpack the carton and check for any shipping damage or shortages.

Any shortages or damage should be reported to the supplier immediately.

Enclosures:

- NRS50 Noise Reducer Unit
- Power cable
- Operator's Handbook

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Description

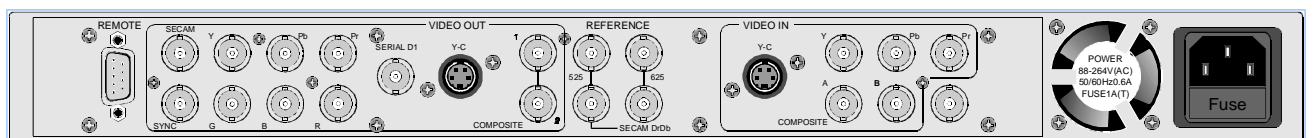
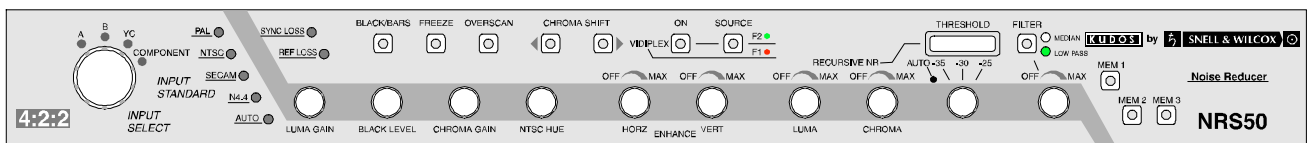
The NRS50 is a full-featured multi-standard format interchange Timebase/Synchroniser incorporating a powerful 2-stage noise reducer comprising a non-linear adaptive recursive filter followed by a unique spatial-temporal median filter. The median filter has the ability to remove noise peaks without introducing smearing artefacts and is ideally suited to the suppressing of impulse noise originating from film dirt or 'sparklies' prevalent in pictures received via satellite sources. All recursive and median noise reduction coefficients are adjustable and a bargraph display shows the calculated noise floor of the signal being processed so the adaption threshold may be accurately set.

The NRS50 is also designed to give high quality timebase correction and is part of a new range of complementary broadcast quality products from Snell & Wilcox Ltd. This completely new design utilises the very latest Digital video processing techniques and is constructed using surface mount

technology to provide the ultimate in reliability and performance while maintaining low cost. The unit will synchronise NTSC/N4.4/525 to NTSC/525 OR PAL/SECAM/625 to PAL 625 and provides a SECAM output. Input formats may be Composite, Y-C or Component YPrPb and outputs are available as Serial D1, Composite, Y-C, Component YPrPb, SECAM and RGBs. Separate horizontal and vertical aperture correction can be applied to the picture. Unique Digital processing, using independent circuitry for PAL and NTSC signals, is optimised for accurate Y-C separation.

The built-in genlockable SPG allows the unit to accurately synchronise to an external reference signal or provide stable signals as a Master reference.

NOTE: The unit will not transcode 525 line input signals to 625 line output signals or vice-versa.



Features

- Powerful integrated noise reducer
- 3D Median filter with variable shape and size to remove impulse noise and dropouts
- Unique asymmetrical implementation of median filter for minimum process delay
- Recursive filtering to remove white noise
- Luminance and chrominance low pass spatial filtering
- Automatic noise level measurement and bargraph display
- Automatic threshold settings for hands-off operation
- SDI output for use with digital and compression systems
- Overscan to remove visible head switch disturbance

Specifications

Features

Signal Inputs

Composite	2 via BNC connectors
Separated Y/C	S-VHS/Hi-8 via 4-pin Mini DIN
Component	YPbPr EBU/SMPTE levels via BNC connectors
Reference	625/525/DrDb via BNC connectors

Signal Outputs

Composite	2 programme via BNC connectors
SECAM	1 programme via BNC connector
Separated Y/C	1 programme via 4-pin Mini DIN
Component	1 output YPbPr EBU/SMPTE levels via BNC connectors
GBRS	1 set (SOG selectable) via BNC connectors
Serial D1	1 via BNC connector

Front Panel Control Ranges

Luminance Gain	+6 dB to -4 dB min
Black Level	±100 mV
Chrominance Level	+6 dB to -4 dB min
NTSC Hue	More than 10°
Horizontal Enhance	Off, low, medium and high
Vertical Enhance	Off, low, medium and high
Input Standard	Auto Detect PAL, SECAM, NTSC and NTSC4.43
Input Select	Composite A, B, Y-C and Component
Pattern Select	Color Black or Color Bars
Freeze	On/Off
Overscan	Enable +2% vertical overscan to mask VCR head switch disturbances
Chroma Shift	±1 µs in increments of 74 ns
Vidiplex	On/Off
Vidiplex Source	Select field 1 or 2
Luminance Recursive Noise Reduce	Off, 3 dB, 6 dB or 9 dB
Recursive Chrominance Noise Reduce	Off, 5 dB, 8 dB or 12 dB
Recursive Noise Reduce Threshold	Auto, -35 dB, -30 dB and -25 dB
Median Filter Characteristics	Off, Luma 5-point 2 dimensional spatial, Luma 7-point 2 dimensional spatial, Luma 7-point 2 dimensional spatial plus 7-point Chrominance
Median Aperture	Normal or Wide
Memory	3 non-volatile memory locations for all noise reduction settings

Features

Preset Control Ranges

Horizontal Y-C Timing	-520 ns to +150 ns
Vertical Y-C Timing	-2 lines to +1 line
Pattern Select	SMPTE/EBU Color Bars, Linear Ramp, Multiburst and Black
HAC Boost Frequency	2.3 MHz or 3.4 MHz
Noise Reduction Threshold Level	Auto or set >30 dB, <30 dB, <25 dB
Genlock H-Phase (625 and 525)	±2 µs
Genlock Subcarrier Phase	>360°

Specifications

Input Standard	PAL/NTSC/SECAM/NTSC4.43
Input Line Frequency Range	±5% from nominal
Output Standard	Same as input standard
Composite Inputs	Select A or B
Separated Y/C Input	S-VHS/Hi-8
Component Input	YPbPr at EBU/SMPTE levels
Reference Inputs	625 and 525 Black Burst or Composite Video
SECAM Reference	Derives DrDb phasing from a SECAM signal at 525 ref. input
GBRS Outputs	0.7 V pk to pk + Syncs at 2 V pk to pk SOG at 0.3 V pk to pk selectable
Sampling	4:2:2 (13.5 MHz)
Y Frequency Response	Better than 5.5 MHz -3 dB
2T Pulse-Shape k-rating	Better than 2%
Composite Frequency Response (PAL and NTSC)	Better than 5.5 MHz -3 dB
Signal to Noise Ratio	Better than 60 dB (Weighted)
Tilt	<1%
Residual Jitter	<25 ns
Video Delay	2 lines to 1 frame
Return Loss: Inputs	better than 35 dB to 5.0 MHz
Output Syncs	To CCIR specifications
Subcarrier Stability	Better than 10 ppm (0 to 40° C)
GPI Remote Control	Select Input A, B, Y-C, Component. Enable Pattern/Black, Freeze, Vidiplex, Vidiplex field.
VITS Enabled: Pass Lines (Y Channel only)	17-23 & 330-335 for PAL Signals 15-20 & 278-283 for NTSC Signals

Power

Specifications

Input Voltage Range	90 V to 250 V 50/60 Hz
Consumption	60 VA maximum
Mains Fuse Rating	1 A

Mechanical

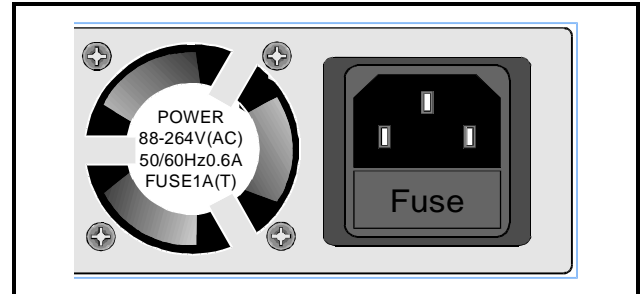
Temperature Range	0 to 40° C operating
Case Type	1U Rack Mounting
Dimensions	483 mm x 456 mm x 44.4 mm (w,d,h)
Weight	7 kg

Operation

POWER CONNECTIONS

This is the mains power connector suitable for a standard IEC type power cable and contains a 1A(T) fuse. If a plug is fitted to the cable a fuse of 5A (Fast) should be installed.

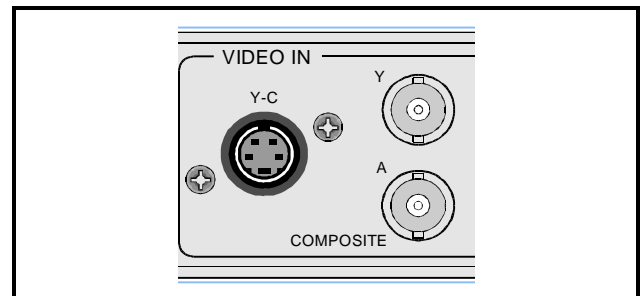
The Power On/Off switch is located behind the drop down front panel in the left hand corner.



INPUT CONNECTIONS

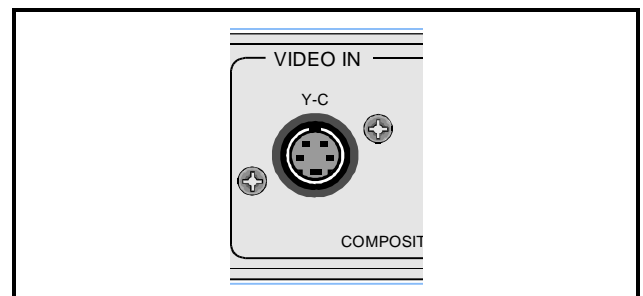
COMPOSITE INPUTS A & B

These are the Composite video inputs to the unit via BNC connectors. Nominal input level is 1V p-p terminated in 75 Ohms. A or B input may be enabled by the front panel INPUT SELECT switch.



Y-C SEPARATED INPUT

The Y-C (S-VHS/Hi-8) input signal is connected to the unit via a 4 pin Mini DIN type connector. Y input level is a nominal 1V p-p into 75 Ohms C input level is a nominal 0.3V p-p colour burst into 75 Ohms.



Operation

REFERENCE INPUTS 625 AND 525 (SECAM Dr/Db)

When suitable signals are connected to these inputs, the output of the unit will be fully synchronised to the relevant signal source. The 525/625 signal may be black burst or standard composite video and the BNC connector is terminated in 75 Ohms.

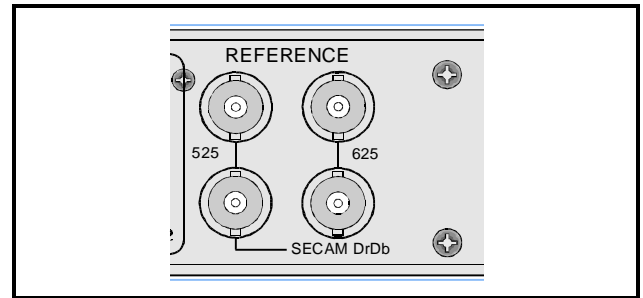
Note that by setting internal switches the 75 Ohm terminating resistor may be disconnected and the input impedance becomes high at >15K.

If no signal is present the unit will automatically revert to internal SPG operation and the red LED on the front panel will be illuminated indicating that the reference signal has been lost.

The SECAM Dr/Db reference signal should be connected to the '525' reference input socket.

The SECAM output signal will then follow the reference Dr/Db sequence, while the horizontal and vertical timing will follow the PAL reference signal connected to the '625' reference connector.

The SECAM DrDb reference must be horizontally timed close to this '625' reference (see specification). If only the SECAM output is to be used, then to reference to external Horizontal, Vertical and DrDb signals, a SECAM black signal must be connected to both the '525' and '625' reference inputs.



COMPONENT INPUT

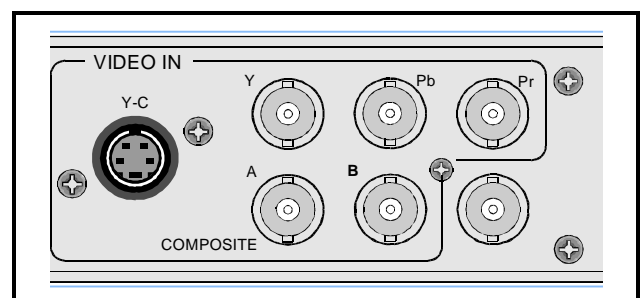
These BNC connectors accept standard EBU(625) or SMPTE(525) component signals and is enabled by setting the INPUT SELECT switch on the front panel to COMPONENT.

Nominal levels for 100% colour bars are as follows:-

Y signal 1V p-p (0.7V Video, 0.3V Sync)
 into 75 Ohms

Pb signal 0.7V p-p

Pr signal 0.7V p-p

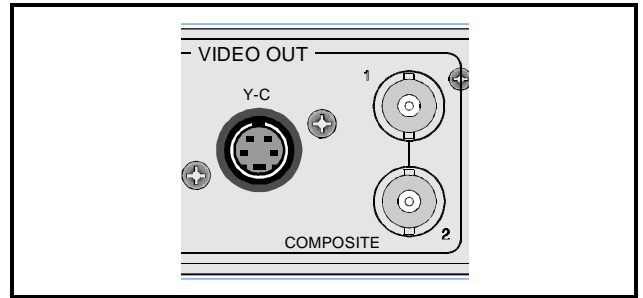


Operation

Operation

MAIN OUTPUTS 1 & 2

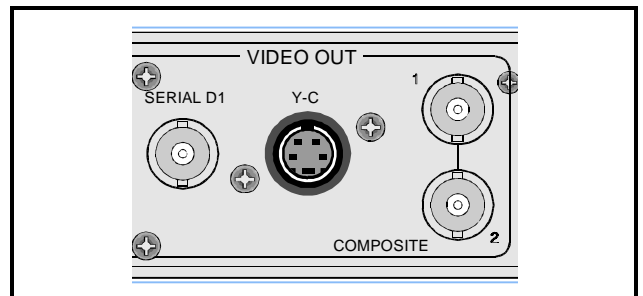
Two isolated composite outputs are available from these BNC connectors. Output level is standard 1V p-p into 75 Ohms. When power to the unit is lost, or the unit is switched Off, the unit will automatically bypass the signal on Composite A input to Composite output 1



Y-C SEPARATED OUTPUT

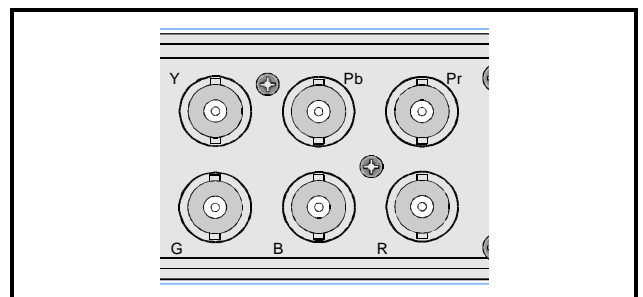
A Y-C (S-VHS/Hi-8) output signal is available from a 4 pin Mini DIN type connector.

Y output level is a nominal 1V p-p into 75 Ohms
 C output level is a nominal 0.3V p-p colour burst into 75 Ohms



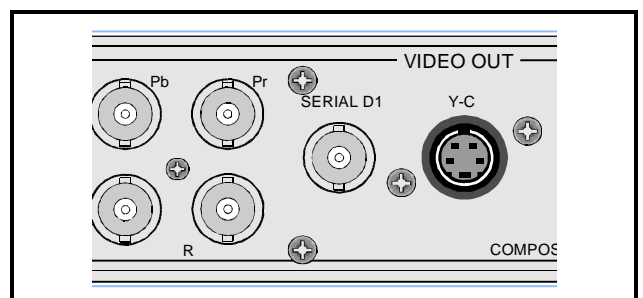
COMPONENT OUTPUT

The three BNC connectors provide standard EBU(625) or SMPTE(525) component YPbPr output signals.



SERIAL D1 OUTPUT

An output of serial D1 is available from this BNC connector



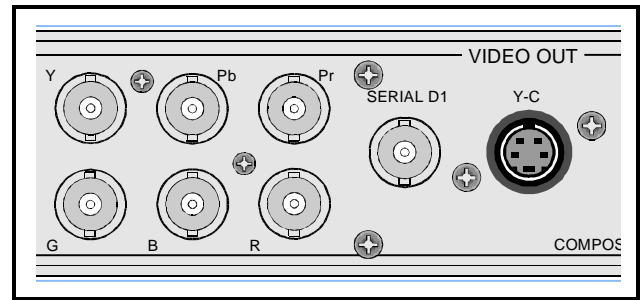
Operation

GBRS OUTPUT

The three BNC connectors provide analogue non-composite outputs of separate Red, Green, and Blue signals at 0.7V p-p plus mixed sync at 2V p-p, all into 75 Ohms.

SOG (Sync on green) at 0.3V p-p may be enabled by an internal link.

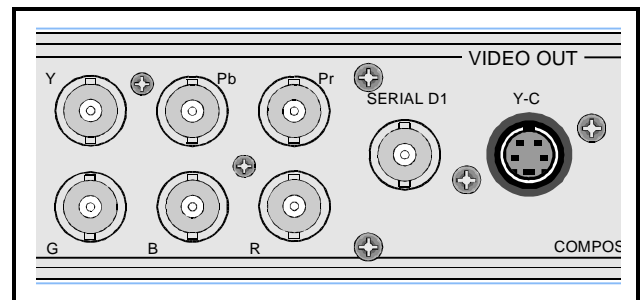
The complete PCB must be withdrawn from the unit (ensure power is turned off and PCB securing screws are removed) using the card ejectors and the 'Sync on green' link (LK 4) will be found to the rear of the lower main card.



SECAM OUTPUT

This BNC connector provides a standard SECAM signal output of 1V p-p into 75 Ohms when the output standard is set to 625.

Note that when 525 output standard is selected this output becomes monochrome only.

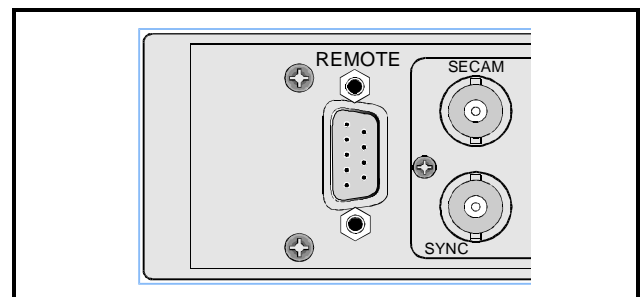


REMOTE

Remote control of certain functions is made available via this 9 pin female 'D' connector. Control signals are active when lines are taken to ground.

Control sources may be a mechanical switch, relay contact or open collector transistor.

Selection of input signals is by a 2-bit Binary code where 1 represents open and 0 represents low or grounded.



Connections are as follows:

Pin 1	Ground	Composite		Y/C	YUV
		A	B		
2	Input Select 0 (low)	1	0	0	1
3	Input Select 1 (high)	1	0	1	0
4	Black/Pattern Enable				
5	Not Connected				
6	Freeze Enable				
7	Vidiplex Enable				
8	Vidiplex Field Select (high=field 1, low=field 2)				
9	Not Used				

Operation

FRONT PANEL CONTROLS

Note that clockwise rotation of these controls increases levels, anticlockwise rotation decreases levels.

LUMINANCE GAIN

This control allows the luminance level or contrast of the output signal to be adjusted.

The range of control is + 6dB maximum to -4dB minimum and 0dB (Unity Gain) is set at the detent 12 o'clock position.

BLACK LEVEL

The Black level or brightness of the output picture may be adjusted by $\pm 100\text{mV}$ with this control. The centre detent 12 o'clock position sets the black level at blanking level.

CHROMA GAIN

This control allows the Colour saturation of the output picture signal to adjusted.

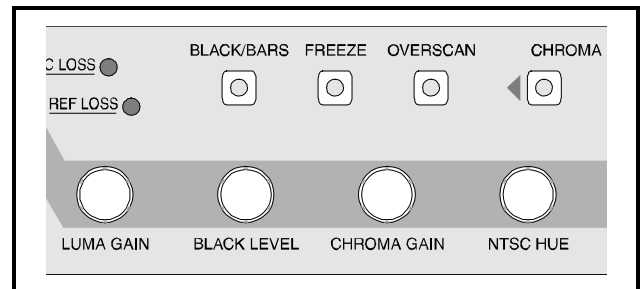
The range of control is + 6dB to -4dB minimum and 0dB (Unity Gain) is set at the detent 12 o'clock position.

NTSC HUE

The colour Hue, or specific colour tint of the picture, can be changed using this control when processing NTSC signals.

The effect can be seen on a Vectorscope as a change in the vector angle between the Burst vector and the colour vectors.

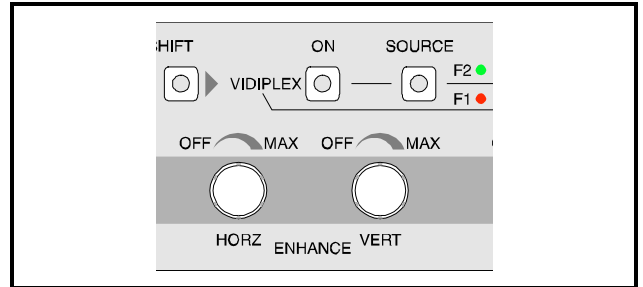
The amount of adjustment available is greater than 10° and the centre detent position represents 0°



Operation

ENHANCE HORZ

This four position switch allows various amounts of horizontal aperture correction to be applied to the signal being processed. The amount of correction that may be applied can be zero (off), low, medium and high (max) and is cored against noise and residual subcarrier. Correction is only applied in the luminance channel. The enhancement will be centred around the boost frequency set by SW2 position 2, to either 2.3MHz or 3.4MHz (See 'Preset DIP Switches')



The settings may be stored in a non-volatile memory. See 'MEMORY'

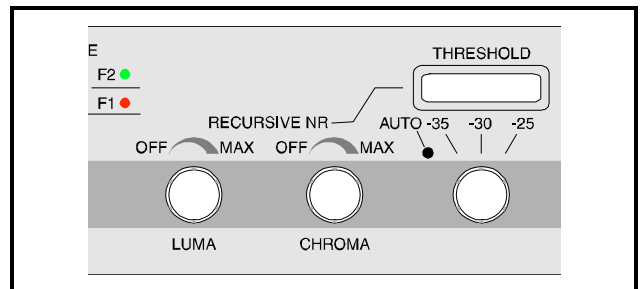
ENHANCE VERT

This four position switch allows various amounts of vertical aperture correction to be applied to the signal being processed. The amount of correction that may be applied can be zero (off), low, medium and high (max). The settings may be stored in a non-volatile memory. See 'MEMORY'

RECURSIVE NR

These four position switches allows various amounts of Luminance and Chrominance Noise Reduction to be applied to the signal being processed. The amount of correction that may be applied can be zero (off), low, medium and high (max)

The settings may be stored in a non-volatile memory. See 'MEMORY'



Operation

THRESHOLD

This 4 position switch allows the threshold level at which differentiation is made between noise and moving texture information. The four settings are at -35dB, -30dB, -25dB and automatic mode. Noise levels worse than -25dB will always be interpreted as motion and the system is not intended to operate in this region.

The AUTO position enables the adaptive noise algorithm to choose the ideal threshold for the signal being processed.

The LED bargraph display indicates the measured intensity of the noise floor. When AUTO mode is selected the display is continuous and changes in the display indicate changes in the selected noise threshold. When a manual setting is selected the display continues to show the level of measured noise but the LED representing the selected threshold flashes; indicating the manual selection.

The settings may be stored in a non-volatile memory. See 'MEMORY'

MEDIAN FILTER

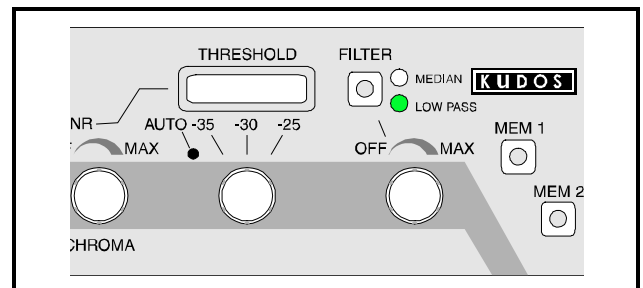
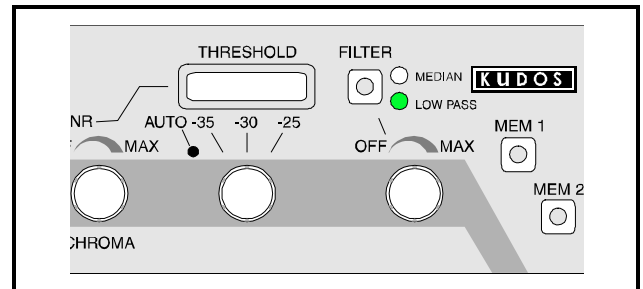
Enabling the MEDIAN filter allows further noise reduction to be achieved. For more details see the 'System Overview-Noise Reducer' section.

The Median Filter switch selects the following filter characteristics:-

- 1 Off
- 2 Luminance 5-point, 2 dimensional spatial filter
- 3 Luminance 7-point, 2 dimensional spatial filter (This setting has two configurations, SYMMETRIC and ASYMMETRIC which are selectable by a DIP switch on the noise reducer PCB. See 'Noise Reduction' section)
- 4 As position 3, plus additional 7-point filtering for the Chrominance channel.

MEDIAN WIDE

This push button allows either a normal or WIDE aperture (LED ON) to be selected. The WIDE filter mode is used for reducing noise such as coarse film grain. On normal images this causes some loss of resolution. See 'System Overview- Noise Reducer' for a more detailed description.



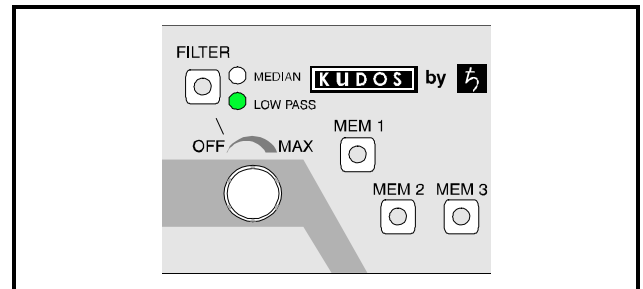
Operation

MEMORY (MEM 1, 2 & 3)

Three sets of control settings may be stored in a non-volatile memory.

The settings that may be stored are:-

- LUMA Recursive noise reduction level
- CHROMA Recursive noise reduction level
- THRESHOLD selections
- MEDIAN aperture type
- MEDIAN filter setting
- HORIZONTAL & VERTICAL Enhancement settings



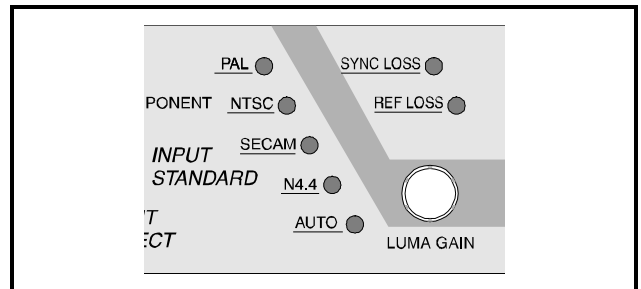
To store the settings a memory key should be pressed whilst the required features are selected, the key held down until the memory LED's are extinguished (this takes about 3-4 seconds) and then released. To recall a memory setting the relevant memory button should be pressed momentarily and it will be illuminated.

NOTE:- When a memory setting has been enabled, the relevant front panel controls will become non-operational. To regain operation from the front panel controls the memory selection must be cancelled by momentarily pressing the relevant memory button.

Operation

INPUT STANDARD

LED's automatically indicate the INPUT STANDARD of the signal connected to the appropriate input connector. The colour standards that may be processed by the unit are PAL, NTSC, SECAM and NTSC 4.4. The AUTO selection will be confirmed by the illumination of the green LED and the colour standard of the input signal will be indicated by the illumination of a red LED.



Note that if it is anticipated that a noisy or discontinuous signal may be connected to the unit, the Force Input Standard function should be used (DIP switch SW3 on card edge); the AUTO position should not be used.

This precaution is advisable as this unit always provides an output signal in the same standard as the input; the input standard information (and hence the output standard) is derived from the input signal. In the AUTO mode and processing a poor PAL, SECAM or 625 line input signal, it is possible for the unit to output a 525 line output due to the operation of the automatic line standard detection circuitry defaulting to 525 line standard.

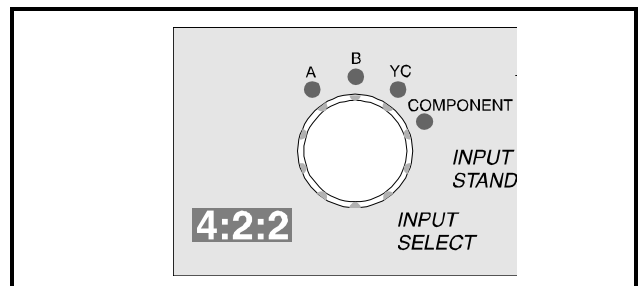
Disabling the automatic line standard detection circuitry using SW3 to force the input standard to either PAL or SECAM, ensures the unit always outputs a 625 line signal under these conditions. When processing a poor 525 line signal it is not necessary to use the Force Input Standard function.

Note also that the LED's are disabled when the component input is selected and the 525 or 625 mode is automatically set. (Only if SW3 is in AUTO position, or Force NTSC or N4.4)

INPUT SELECT

This switch selects the input signal to be processed from the various input connectors on the rear panel of the unit.

Selection may be as follows:-
 Composite Input A, Composite Input B, Y-C Separated (S-VHS/Hi-8) 358 or 443 and Component YPbPr.



Operation

BLACK/BARS

This illuminated toggle push button allows an internally generated test pattern (selected by card edge switch) to appear at all outputs of the unit. If colour black is selected then it will enable the unit to cut to black.

FREEZE

When activated this button will be illuminated and the output picture will be frozen. The picture will be an interpolated frozen field giving correct interlace. If vidiplex is ON the picture will be a freeze field 1 or 2, with the correct interlace sequence generated to prevent line flicker

OVERSCAN

When this function is enabled (confirmed by an illuminated LED) the unit will expand the picture height by 2% so that the head switch disturbance from VCR's, that would normally be seen at the bottom of the picture, disappears.

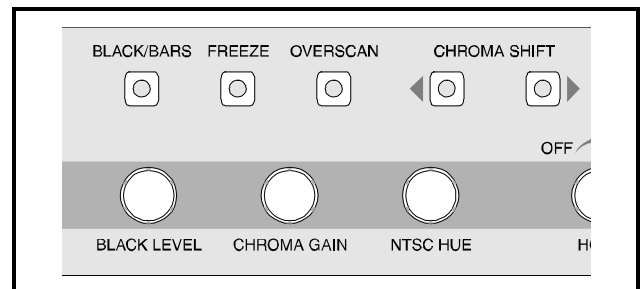
CHROMA SHIFT

These buttons allow the horizontal position of chrominance signal relative to the luminance signal to be changed.

This function is also known as Y/C delay adjustment. Each time the button is pressed a fixed amount of correction is applied. There are 16 steps in each direction.

The left hand button moves chroma to the left (greater Chroma delay) and the right button moves chroma to the right (less Chroma delay) Overall range is 1 microsecond.

On power up the Chroma Shift will default to the amount set by the internal preset DIP switches (see Preset DIP switches SW1)



Operation

VIDIPILEX

Vidiplex is a method of multiplexing two separate TV pictures onto one video signal line.

One picture is put onto one field of the picture frame and the other picture is put onto the next field of the frame using the odd/even field structure of the signal.

The Vidiplex function of the unit is enabled by pressing the Vidiplex ON button (operation confirmed by the LED illumination).

The unit will now decode the vidiplex signal and the individual field of the picture may be displayed by pressing the SOURCE button.

The LED in this button will glow red for field 1 and glow green for field 2.

The input fields are fully interpolated to produce a spatially correct interlaced output frame.

SYNC LOSS

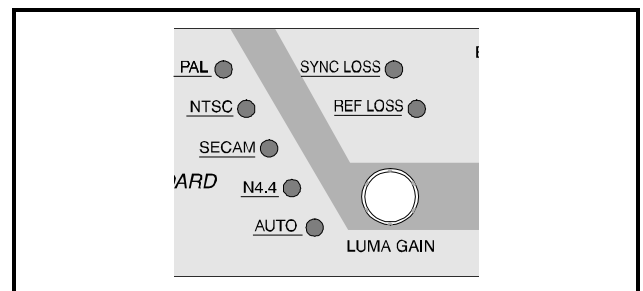
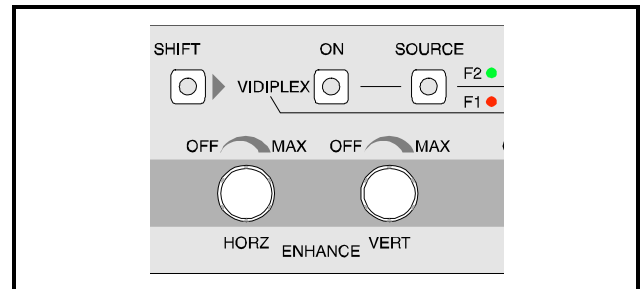
In the event of input sync loss this red LED will be illuminated.

The output picture will field freeze on the last good field and, if desired, may be made to cut to black after approximately 0.5 seconds.

(Internal link selection LK7, located in the front right hand corner of the main PCB)

REF LOSS

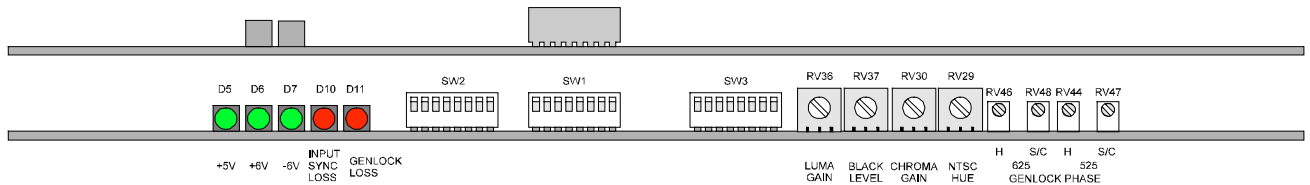
If the reference signal related to the output (see above 'Reference Inputs') is lost, this red LED will become illuminated.



Operation

PRESET CONTROL FUNCTIONS

These presets are located on the front edge of the plug-in PCB and are accessible by pulling forward and lowering the metal front panel.



The preset controls for VIDEO GAIN, BLACK LEVEL, CHROMA GAIN and HUE are used to calibrate the front panel controls centre detent position. e.g. The Video Gain Preset will allow the front panel Luminance Gain control centre detent position to be set for unity gain.

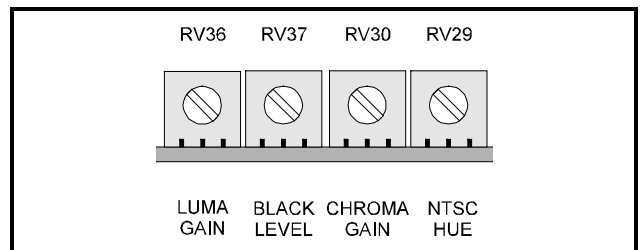
NOTE:- For accurate settings a Waveform Monitor and Vectorscope would be required.

LUMA GAIN

This control adjusts the overall Video gain of the module. The gain is factory preset to unity and can be adjusted from +6dB to -4dB using this control. The preset position is factory set to correct the variation of Y level between NTSC and PAL systems.

Clockwise rotation increases the Gain, anticlockwise rotation reduces the gain.

colour vectors. The amount of adjustment available is 10° and is factory set to zero



BLACK LEVEL

The Black Level (pedestal) of the output signal is adjustable by ±100mV with this control.

This control is factory set to remove the NTSC 7.5 IRE Units pedestal present on the input. True Black Level on the PAL output coincides with Blanking level.

Clockwise rotation increases the black level, anticlockwise rotation reduces the black level.

CHROMA GAIN

This control allows the colour saturation of the picture to be adjusted.

The range of adjustment is from +6dB to -4dB and is factory set to 0dB. Clockwise rotation increases colour saturation, anticlockwise rotation reduces saturation.

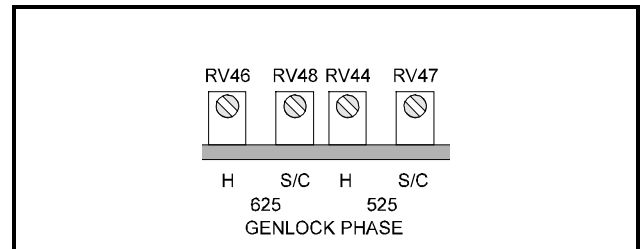
NTSC HUE

The colour Hue, or specific colour tint of the picture, can be changed using this control. The effect can be seen on a Vectorscope as a change in the vector angle between the Burst vector and the

Operation

625 H PHASE

This control allows the timing between the 625 reference sync input and the output syncs to be adjusted. Adjustment requires the use of a dual channel oscilloscope so that coincidence occurs between the ref. syncs and output syncs. The range of control is ± 2 microseconds.



625 S/C PHASE

This control adjusts the relative phase of the Subcarrier at the video output to that of the Subcarrier of the 625 reference signal. To adjust correctly the ref. signal and the video output signal should be displayed on a dual channel vectorscope and burst vectors aligned for minimum overlap. Control range is greater than 360°

525 H PHASE

This control allows the timing between the 525 reference sync input and the output syncs to be adjusted. Adjustment requires the use of a dual channel oscilloscope so that coincidence occurs between the ref. syncs and output syncs. The range of control is ± 2 microseconds.

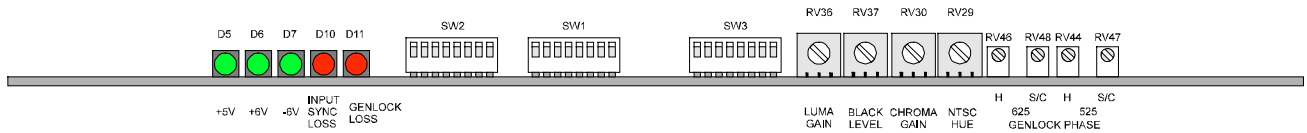
525 S/C PHASE

This control adjusts the relative phase of the Subcarrier at the video output to that of the Subcarrier of the 525 reference signal. To adjust correctly the ref. signal and the video output signal should be displayed on a dual channel vectorscope and burst vectors aligned for minimum overlap. Control range is greater than 360°

Operation

PRESET DIP SWITCHES

These three banks of switches are provided to enable various modes and corrections to be preset. They may be used to operate the unit when supplied without a front control panel.



FUNCTION SELECT	SW2 SETTINGS							
	1	2	3	4	5	6	7	8
Enable Black/Pattern*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pattern Black	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pattern Colour Bars	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pattern Multiburst	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pattern Linear Ramp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enable HAC (Medium Level)*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HAC Frequency Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HAC Frequency High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enable VAC (Medium Level)*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overscan Enable*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

* Note that these selections are duplicated by front panel controls; when such front panel controls are fitted the DIP switches must be set to the UP position.

Operation

FUNCTION SELECT	SW1 SETTINGS							
	1	2	3	4	5	6	7	8
Enable Vidiplex Field 1*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enable Vidiplex Field 2*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Preset Horizontal Y/C Delay								
0 ns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
+ 75 ns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
+ 150 ns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- 75 ns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- 150 ns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- 300 ns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- 370 ns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- 520 ns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Preset Vertical Y/C Delay								
0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
+ 1 line	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- 1 line	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- 2 lines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Freeze Enable*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

* Note that these selections are duplicated by front panel controls; when such front panel controls are fitted the DIP switches must be set to the UP position.

Operation

FUNCTION SELECT	SW3 SETTINGS							
	1	2	3	4	5	6	7	8
Select Input A*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Select Input B*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Select Input Y/C*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Select Input YPbPr*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VITS Blanked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VITS Pass-thru Mode Enabled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Auto Select Input Standard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Force Input Standard PAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Force Input Standard SECAM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Force Input Standard NTSC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Force Input Standard N4.4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VITS Pass Mode Notes

1. Only lines 17 to 23 and 330 to 335 (PAL), 15 to 20 and 278 to 283 (NTSC) are allowed to pass through the unit un-decoded and un-processed
2. Card edge switch SW3 position 4 enables this function when in the ON position (down)
3. These VITS lines are passed only through the Y (Luminance) channel of the unit which has a bandwidth of 5.5MHz.
4. These VITS lines should not contain encoded colour information as the output colour burst will not be related to any encoded colour information contained on these lines

* Note that these selections are duplicated by front panel controls; when such front panel controls are fitted the DIP switches must be set to the UP position.

Operation

SECAM ENCODER

A composite SECAM output is available from this unit.

A major advantage of this encoder is the inclusion of a Carrier Dispersal System which prevents tilt on decoded highly saturated colour. This feature overcomes the familiar problem of hue errors following Chrominance transients exhibited by conventional SECAM encoders.

PEAK LUMINANCE LEVEL ADJUSTMENT

This is set by means of a preset potentiometer RV2 on the Encoder daughter PCB. Clockwise rotation reduces the peak luminance level at 4.28MHz.

SECAM IDENTIFICATION SIGNAL

The Encoder may be configured to generate Dr/Db ident "bottles" and can be enabled or disabled by means of a link (LK 2) on the Encoder daughter PCB (upper PCB).

To change the configuration the main PCB retaining screws should be removed and the complete PCB withdrawn.

LK 2 is located at the rear of the daughter PCB.

To enable "bottles" the link should be fitted towards the Power Supply side of the unit and away from the Power Supply side to disable the "bottles".

FEATURES

- Broadcast/Industrial specification
- High precision analogue encoding to SECAM
- Unique Luminance processing for maximum bandwidth
- Accurate 2T Pulse to Bar response
- Carrier Dispersal System
- External Dr/Db Phasing via SECAM reference Black Burst
- No external controls

PERFORMANCE

Peak Luminance level	Set to 10% @ 4.28MHz Adjustable 5-20% at 4.28MHz (see below)
----------------------	--

Tilt	<1%
------	-----

K Rating	1% Max.
----------	---------

Chrominance Bandwidth	1MHz
-----------------------	------

Permissible Sync to Dr/Db reference Delay	±4 µs
--	-------

Operation

NOISE REDUCTION

This is a powerful frame recursive noise reduction system with separate processing and controls for the Luminance and Chrominance channels.

The noise reduction system may be enabled and controlled by setting the card edge DIP switches or by the front panel rotary switches.

The level of noise reduction may be set to zero (off), low, medium and high.

This noise reducer incorporates a sophisticated noise measurement system that provides fully automatic adjustment of the threshold level at which noise reduction is enabled.

Manual adjustment of the threshold level is also possible.

Optimum performance is achieved when dealing with noise levels at -25dB or better.

FEATURES

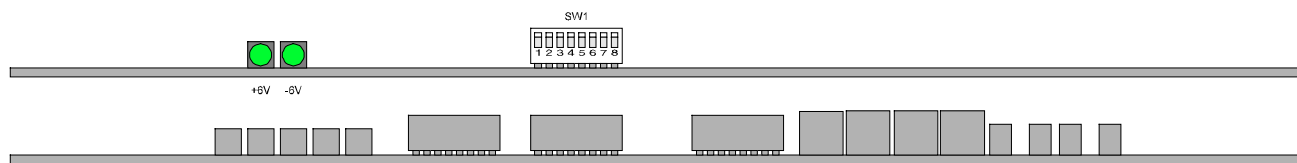
- Frame Recursive Processing
- Separate control circuitry and motion detection for Y and C Signals
- Automatic Noise Energy Measurement
- Does not introduce any Additional time delay

DIP SWITCH SETTINGS

* Note that these selections are duplicated by front panel controls; when such front panel controls are fitted the DIP switches must be set to the UP position.

FUNCTION SELECT		NOISE REDUCTION SETTINGS							
		1	2	3	4	5	6	7	8
Noise Reduction Threshold Level	Automatic	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
> 35 dB	Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
> 30 dB	Medium	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
> 25 dB	High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Luminance Noise Reduction Level	Off*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Low*	~3 dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Medium*	~6 dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High*	~9 dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Chrominance Noise Reduction Level	Off*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low*	~5 dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medium*	~8 dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
High*	~12 dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Operation



1st LINE MAINTENANCE

In the unlikely event of this unit failing to operate correctly no attempt should be made to repair the unit unless all the necessary test equipment, service manuals and technical expertise is available and permission has been granted in writing by SNELL and WILCOX Ltd. or their official agents, for such repairs to be attempted.

Failure to comply with these conditions will void the warranty.

First line maintenance should be confined to the replacement of the plug-in card, the power supply module, the fan and the backplane assembly

CLEANING

It is important that the ventilation slots in the bottom of the front panel and the holes in the sides of the unit do not become obstructed or blocked in any way including the build-up of dust etc. as this will interfere with the ventilation and cooling of the unit.

A reduction of air flow through the unit may result in overheating and the power supply over-temperature cut-out may operate and shut down the unit.

The front panel slots, side panel holes and the cooling fan should be regularly inspected and cleaned if necessary.

TO REMOVE THE PCB CARD

IMPORTANT WARNING

Before attempting to remove the PCB card the two PCB retaining screws located on the bottom panel of the unit must be removed . The card may then be safely removed by means of the card ejectors.

TO REMOVE THE POWER SUPPLY MODULE

1. Disconnect power to the unit by removing the IEC power connector
2. Allow two minutes for capacitors to discharge
3. Remove the top cover of the unit (8 screws)
4. Pull off the insulating sheet covering the power supply module
5. Pull off the white plug-in connectors
6. Remove the four black M4 nuts securing the module
7. Withdraw the module

Operation

TO REMOVE THE COOLING FAN

1. Remove the top cover of the unit
2. Remove the two PCB retaining screws located in the bottom panel
3. Remove the PCB using the card ejectors
4. Unplug the fan connector cable
5. Remove the four M4 nuts and bolts securing the fan
6. Withdraw the fan unit

NOTE:-

When refitting the fan ensure that it is fitted such that the airflow is from inside the unit to the outside. i.e. air is sucked out of the unit.

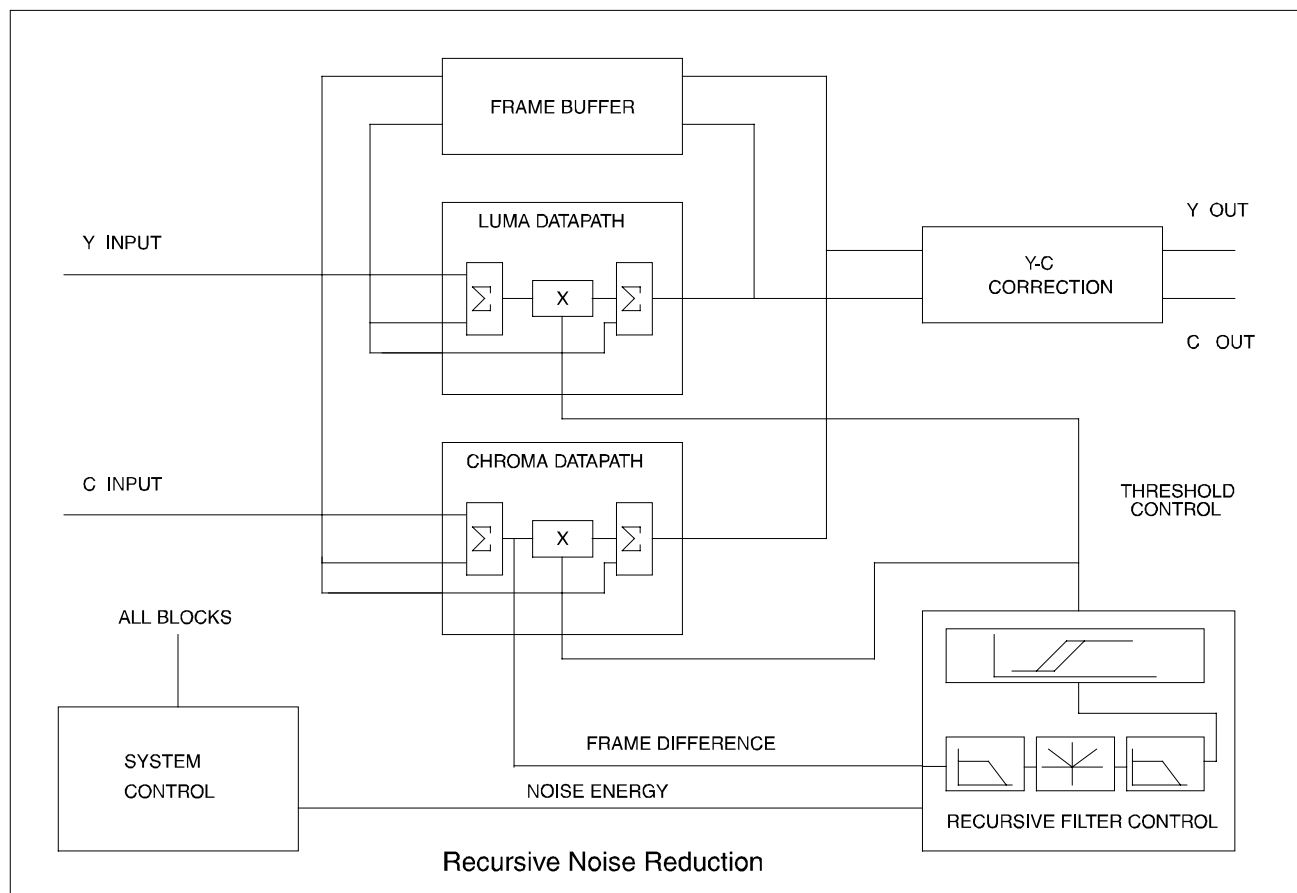
TO REMOVE THE REAR BACKPLANE ASSEMBLY

1. Remove the fan assembly as detailed above
2. Unplug the white Power Supply Module connector
3. Remove the external backplane fixing screws (5 pieces M2.5)
4. Remove the righthand rear white plastic PCB runner. (Use a flat metal tool e.g. screwdriver, to lever off the runner. The runner is fixed to the metalwork by 2 lugs.)
5. The complete backplane assembly may now be withdrawn from the unit.

System Overview-Noise Reducer

NOISE REDUCER SYSTEM

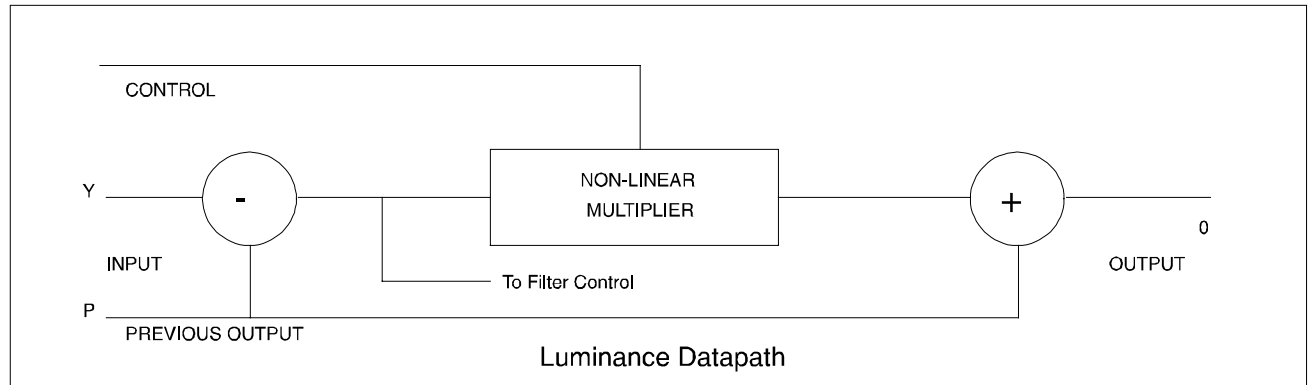
A detailed outline of the adaptive recursive noise reduction circuitry is shown below in Figure 1. The functionality of the system is implemented by the respective datapaths and the filter control algorithm described in the following sections.



System Overview-Noise Reducer

Luminance and Chrominance Datapaths

The architecture of each of the luminance and chrominance datapaths is essentially the same, but for clarity of some minor differences, each will be described separately. The luminance datapath incorporates a classical recursive implementation with additional non-linear features. An outline is given below in Figure 2.



The initial subtractor provides a signal representing the difference between the current frame (Y) and the previous output from the previous frame (P). This signal is passed directly to the multiplier and to the filter control block; providing a reference for the filter control algorithm. Under external control the multiplier scales the input by a value (k), which may vary from 0.35 to 1.0. The output from the multiplier is then added to the previous output (P) to give the final output (O). The complete process may be defined thus:

$$O = P + k (Y - P)$$

which may be rearranged:

$$O = k Y + (1 - k) P$$

The variable k therefore defines how much of the original signal is passed unaffected and how much is fed back from the previous output. The input is passed unaffected when k = 1.0 and the lowest value (k = 0.35) implies the highest level (9.1dB) of improvement possible for luminance signal to noise ratio using recursive filtering.

The multiplier also includes a non-linear mapping which allows high levels of difference to be passed directly. This difference information, which clearly represents motion, is therefore passed through the system unaffected. This provides an instantaneous response to high velocity motion. The transition region from multiplier coefficient to unity for high levels is continuous and smooth, so no visible transition is apparent. The chrominance datapath is identical in all but two respects to the luminance datapath. First, there is no direct coupling of the chrominance difference information to the control circuitry. Secondly, the depth of the highest noise reduction level is greater. The lowest value for k is 0.25, giving a highest level of signal to noise improvement of 12dB for chrominance.

System Overview-Noise Reducer

The front panel controls marked 'Noise Reduce' - 'Luma' and 'Chroma' control the minimum value of k and therefore indicate the maximum applied noise reduction. The values of k and noise reduction corresponding to the switch settings are shown in Table 1 below. These options are also available as switch settings on the PCB which must be disabled for the front panel to operate.

Switch Setting	Luminance Minimum k	Luminance Maximum Noise Reduction	Chrominance Minimum k	Chrominance Maximum Noise Reduction
OFF	1	0dB	1	0dB
LOW	0.7	-3dB	0.6	-4dB
MEDIUM	0.5	-6dB	0.4	-8dB
HIGH	0.35	-9dB	0.25	-12dB

Table 1 Luminance and Chrominance Recursive Noise Reduction Settings

Recursive Filter Control

The non-linear mapping included in the multiplier circuitry is intended to differentiate between high velocity motion and noise. This task is relatively straightforward and is completed without external control. A more serious problem, however, is the differentiation between low velocity motion (like moving texture) and noise. Indeed, it is the failure to make this distinction which gives rise to the 'pasty' features common to classical recursive noise reduction systems.

The recursive filter control is designed to analyse the difference information and improve the distinction between moving texture and noise. To do this a threshold must be defined, upon which the system bases its analysis of the difference information. This threshold may be defined by the user or automatically by the adaptive noise level algorithm; this is described in the next section.

Within the recursive filter control, four main functions are implemented:

First, the input difference signal is low pass filtered. This reduces the effect of high frequency noise and thus makes it easier to detect motion. It is important that this filter contains no nulls; as this would allow certain spatial frequencies to pass without detection; for this reason an Infinite Impulse Response (IIR) digital filter is used at this stage.

Secondly, the filtered information is rectified. This converts the noise and motion amplitude to an energy level. The output of this stage is accumulated over a complete frame and passed to the adaptive noise level algorithm.

Next, the rectified signal is again low pass filtered. This process removes any harmonics introduced by the rectifier and provides a composite signal, representing motion added to a background noise. The effect of both filters and the rectifier is to provide an output representing background noise level plus motion.

Finally, a mapping is used to apply the predefined threshold to the signal. Ideally this threshold should be chosen to lie just above the level of the background noise, such that any motion of texture may be readily detected. As the noise level is not truly constant in the time domain, it is not generally possible to make a correct decision in all cases. For this reason a non-linear mapping is used in place of a fixed threshold; this provides a continuous function across the threshold, thereby giving a grey area of distinction between noise and moving texture. The result of this is a smooth transition between applied noise reduction and unaffected

System Overview-Noise Reducer

motion, improving performance by removing much of the 'pasty' effect typical of recursive noise reduction filters.

Adaptive Noise Level Algorithm

As described in the previous section, dynamic control of the recursive filter is dependent on the choice of a threshold region to allow differentiation between noise and moving texture. This level may be set by the user using the threshold control switch. Four settings are provided; settings two, three, and four provide thresholds in the region of -35dB, -30dB, and -25dB respectively. Clearly noise levels greater than -25dB will always be interpreted as motion and the system is not intended to operate in this region. The first setting, however, selects the automatic mode when the adaptive noise level algorithm is used to choose the ideal threshold for a given piece of material.

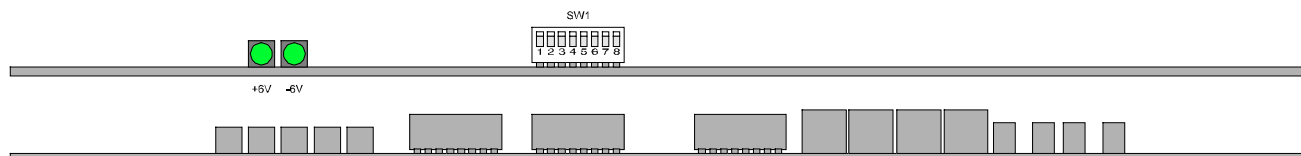
The algorithm operates on an accumulated measurement of the rectifier output over a complete frame, and is implemented within the on-board microsystem described earlier. This information is processed frame by frame providing a threshold level also calculated on a frame by frame basis. The algorithm uses a two stage non-linear filter to extract the background noise level (the noise floor) from the accumulated noise and motion energy. Two stages are required as the filter has different characteristics over long and short time intervals. This is necessary as typical material often contains very fast (short term) motion such as cuts, and longer term motion due to panning or action.

System Overview-Noise Reducer

APPENDIX

Switch settings (SW2) on upper PCB.

N.B.Note that switches 5,6,7 & 8 must all be OFF (0) for the front panel noise reducer controls to function correctly



SELECTION DE FONCTION		REGLARGES SW2							
		1	2	3	4	5	6	7	8
Récuratif Luminance	HORS SERVICE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	BAS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	MOYEN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HAUT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Récuratif Chrominance	HORS SERVICE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	BAS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	MOYEN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HAUT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sélection de Seuil	AUTO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	BAS -35dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	MOYEN -30dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HAUT -25dB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>