PRESTO Deliverable
The Snell and Wilcox PRESTO Synchroniser

Historically many broadcasting organisations used UMATIC reel to reel tape machines over a period of some twenty years as the main equipment to record and play back programme material. The tape transport mechanism of these machines is somewhat suspect in that loss of synchronisation and Drop Outs occurs, particularly when playing ageing tapes recorded on other machines.

Archivists are now faced with the difficulty of capturing (preserving) the several hundred thousands of archives stored on UMATIC tapes being played through a diminishing number of obsolete UMATIC machines.

Frequent loss of synchronisation or picture drop outs are very disruptive to any attempt to efficiently transfer UMATIC masters into a long term storage format.

The role of Snell and Wilcox in the PRESTO Project is to develop a "Stand alone black box" to be positioned at the output of the UMATIC VCR. The function of this equipment is, to prevent loss of synchronisation and to detect and compensate for picture drop outs. The object is to provide a continuous output signal to enable effective transfer of archive programme material into a long term tape or disc store.

The PRESTO Synchroniser is a preservation enabler, not a restoration tool. It is designed to replace synchronising pulses and overcome drop outs but to leave the picture content unaltered. The synchroniser should therefore provide a stable replication of the master tape being transferred.

A detailed specification was agreed between the partners to provide a Synchroniser compatible with a wide range of input and output interfaces for both SECAM and PAL formats.

While principally aimed at UMATIC working (seen as the worst case) the equipment can be used in other situations where signal stability is a problem.

The synchroniser produced for the PRESTO Workshop in May 2002 is the first prototype equipment developed. This will be used by the three main partners (INA, BBC, RAI) in a working archive preservation environment to establish the range and robustness of its performance. It will never be possible to provide a stabiliser to recover every archive, as some will be damaged beyond repair.

Following the PRESTO Workshop in May and subsequent user trials, the synchroniser will be upgraded to provide optimised performance. The upgraded prototype will then be production engineered and made available as a commercial product.

Performance tests on Drop Out Detection and Compensation (DOD / DOC) will be carried out using both the upgraded PRESTO Synchroniser and the more complex equipment developed by Snell and Wilcox in the BRAVA project. The prototype PRESTO equipment uses line repetition techniques for DOC. The BRAVA equipment, designed as a sophisticated archive restoration tool, interpolates over several fields. It is expected that the PRESTO equipment will stabilise the majority of defective tapes. The performance tests will establish what additional level of performance can be gained from BRAVA .

The Synchroniser is housed in a 1U high, standard nineteen inch rack mounting chassis. The unit is equipped with Rollcall providing full remote control.

The technical description and specification is given below.

PRESTO Synchroniser Description

Short form description

The unit provides multi-standard (PAL/SECAM) decoding of composite U-matic and VHS video to SDI and also provides a frame synchroniser-TBC plus drop-out compensation and basic enhancement.

General description

The unit provides multi-standard decoding using a proprietary adaptive comb filter. – VHS / composite inputs and will recover chroma from U-Matic tape. U-Matic luminance is taken from DUB-Y.

The decoder will lock to noisy and unstable signal sources (e.g. U-matic or VHS sources without TBC, Hi/Low/SP U-matic PAL/SECAM, and seamlessly select the appropriate comb mode. Input formats are Composite, Y/C and Composite + Y.

Improved D.O.C. is via FM (RF) signal level analysis without full demodulation process.
Output format is 10-bit serial digital with EDH data packets. Included is a full frame synchroniser with horizontal and vertical phasing controls to synchronise the output to a studio reference.

Features

- Multi-standard (PAL/SECAM) decoding of composite U-matic Hi/Low/SP video
- All 10 bit data path
- Lock to noisy and unstable signal sources
- Automatic and manual setting of the colour TV standard (PAL/SECAM)
- Composite and "Dub Y" inputs
- Auxiliary RF input for advanced drop-out compensation control
- 2 x SDI outputs

An ergonomically designed front panel allows rapid access to key functions. Full RollCall remote control is available.

PRESTO Synchroniser - Specification

Features	Specifications	
Inputs		
Composite	Connector / Format	2 x BNC; PAL/SECAM
	Return Loss	better than –30dB to 6MHz
Y ("DUB" or S-video)	Connector / Format	1 x BNC
	Return Loss	better than –30dB to 6MHz
C (S-video)	Connector / Format	1 x BNC; PAL/SECAM
	Return Loss	better than –30dB to 6MHz
RF / TTL (active low)	Connector / Format	1 x BNC; U-matic RF or TTL
	Return Loss	better than –30dB to 6MHz
Video Reference	Connector / Format	BNC; Composite Video (PAL)
	Sync - Burst Level	0.3V ± 3dB
Outputs		
SDI	Connector / Format	2 x BNC; 270MBits
	Return Loss	better than –15dB to 270MHz
Control Interface		
RollCall	Connector / Format	BNC; S&W RollNet
Remote	Connector / Format	9 way D; S&W 'RollCall RS485' or RS422 @ 38KBaud
GPI (configurable I/O)	Connector / Format	2 x BNC; Closing contact inputs or open-collector outputs
Direct Controls		
Input Type Select	Composite / Composite + Ydub / Y/C (*S-video*)	
Colour Standard	PAL / SECAM / Auto	
Colour Killer	Chroma on / Chroma off / Auto	
D.O.C.	Off / RF / TTL	

Genlock	Off / On
Freeze	Off / On
Pattern / Black	Off / On
DbDr sequence	Bottles / Line / Auto
Proc. Amp. controls:	
Video Gain	± 6dB
Chroma Gain	± 6dB
Black Level	± 100mV
Picture timing:	
Y/C Timing	TBD
Picture H Position	TBD
DOC Sensitivity	Typ. 30% to 70% of average carrier level

Set Up Controls

Pattern Select	Black, 75% Bars, 100% Bars, Ramp, Multiburst
Genlock H and V Phase	± 1 line in steps of 148ns; Full frame in 1H steps
Default Output	Freeze , Black, Test Pattern
User Memories	[Store / Name] x 8
GPI function	GPI – Separate open and closed memory trigger
DOC compensation delay	[BVU800, variable ± TBD ns]
Preset Unit	Restores all factory settings

CS
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