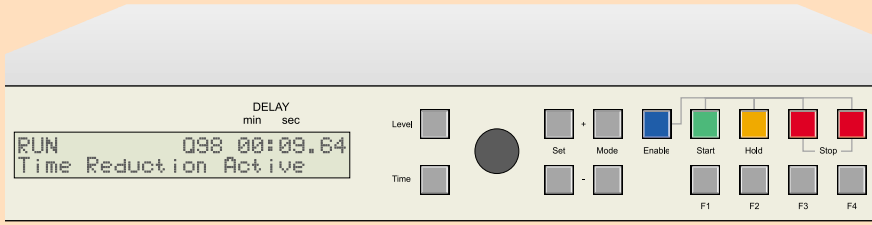
AUDIO

CASH PROGRAMME TIME REDUCTION PROCESSOR

CASH



▼ Cash display and control panel

DESCRIPTION

Cash saves you time, quite literally. Cash processes an audio signal to provide an output which is shorter in duration than the input, without audibly affecting the signal. There is no frequency shift and the processing does not introduce audio artefacts; you just get the audio you fed in.

You can use Cash to shorten a programme without having to edit the recording. You can use Cash to catch up time when a programme has overrun. You can use Cash to insert ads, promos and other content into a live programme without losing any of the action.

If you have a programme, news bulletin or traffic report syndicated to a number of stations, you can adjust the duration to fit each station's slot without editing your material. Simply tell Cash how much time to save, play out the programe to Cash and record Cash's output.

If a programme overruns, you can play out the next programme to Cash at the correct start time, and tell Cash how much time to save. The current programme will run to completion, and Cash will then play out the next programme, reducing its duration to fit the available time.

If you run an ad during a live broadcast, such as sports coverage, you can guarantee to catch all the action regardless of when the ad is aired. Tell Cash how long the ad is and when it starts, and Cash will process the programme's output to fit the schedule, without losing any audio.

How Cash Works

▼ Cash is a solid state dynamic audio store linked to an audio signal procesor, incorporating an integrated time and audio monitoring system.

Cash reduces the duration of audio material by looking for relatively long periods of silence and discarding very short amounts.

Depending upon the source material, Cash can recover time at somewhere between 4% (3 minutes in the hour) and 16% (10 minutes in the hour) undetectably. Much greater recovery rates are possible, but high rates on the wrong audio will be audible.

Cash has three parameters set by the user. The first is the Insertion Time. This is the length of the ad or clip to be inserted, or simply the amount of time by which a programme is to be reduced.

The second is the Programme Time. This is the length of the programme, during which Cash must recover the time lost during the insertion.

The third parameter is the Total Hold Time. This allows for any time during the programme when the operator may wish to suspend the reduction process.

The rate of reduction is calculated by dividing the insertion time into the programme time, having first subtracted the hold time. This is expressed on Cash's display as a quality level.

Naturally, the actual rate at which Cash can recover time is dependent upon the programme material. Speech tends to present more opportunities for recovery than music, for instance. Cash monitors its recovery rate and adjusts its processing to ensure that the programme finishes on time.

Recovery is biased towards the start of the programme and gradually reduced, to ensure that there is no sudden change of tempo as one programme ends and another starts.

▼ Cash can be equipped with over 5 minutes of memory, allowing a full news bulletin to be inserted into a live event without losing any of the action

▼ Cash monitors the rate of recovery and, if necessary, overrides any settings to ensure that the programme completes on time

Inserting an Ad

▼ Playing out ads and promos, or cutting away to a brief bulletin is always dangerous when covering something live.

Cash ensures that you and your audience don't miss the action, even if it does take place during an ad spot.

While the ad is playing out, Cash stores the live audio in memory. When the ad finishes, Cash starts playing out the material, and continues to record the current audio, rather like a tape loop.

The difference is that Cash examines the incoming audio and, as it finds relatively long periods of silence, it trims them before recording. It continues this process until the time lost while playing out the spot has been recovered.

Cash is programmed with the duration of the insert and the time in which it has to catch up. If you're playing out a 20 second ad roughly half-way through a 30 minute live program, then Cash has to recover the 20 seconds in the time remaining after the ad is played out, roughly 15 minutes, which it will achieve easily and inaudibly. Of course, you can't start saving time from the beginning of the programme, because it's a live event and you can't get ahead of that!

Cash provides four function keys, which offer one-button access to stored values for insert, programme and hold times. Regular breaks can thus be stored and recovered easily and repeatedly. And if there are several different insertions during a single programme, these presets can be used to set Cash up in advance, rather than redefining the parameters between each insert.

Trimming without Editing

▼ When you have a fixed slot and a longer programme, it's likely that the programme will have to be shortened.

The editing process requires someone to listen to the programme and decide what can be discarded without losing the meaning and flow. Such critical decisions cannot be taken on the fly.

Cash surmounts this problem by shortening the overall length of the programme without editing out anything other than very brief periods of silence.

This automatic process can take place without any detailed preparations; in fact it can be done live to air if necessary.

To shorten a programme, tell Cash how long the programme is and by how much it must be shortened. Then, play out the programme to Cash and start the reduction process at the same time. Cash reduces and stores incoming audio, and starts playing out audio after the reduction period. Then, as the programme proceeds, Cash continues to shorten the gap between incoming and outgoing audio until, by the end of trhe programme, the two are in sync.

This process can be performed on material going to air. Simply start the programme and Cash at the time necessary for the programme to be completed on schedule. Meanwhile, current programming is going to air. At the appropriate time Cash will play out from its stored audio, and will catch up the "lost" time as the programme continues.

▼ Cash displays a dynamic quality indicator, alerting the operator to difficult material in which savings are not easily made

▼ GPI inputs and RS232 serial remote control allow Cash to be integrated into any control environment

▼ The GPI Preload facility allows Cash to be used as a fixed delay such as a profanity delay), optionally recovering the delay in the last few minutes of the programme

Recovering from Overruns

▼ If a programme overruns the schedule, it is possible to use Cash to recover the lost time during the next programme.

Cash operates by storing up a buffer of audio and gradually reducing the length of the buffer until, at the end of a programme, the buffer has been reduced to zero.

For Cash to work, It must first be programmed to record a particular buffer length (the amount of time to be recovered) and the programme length (the period in which to recover this time).

Consequently, the operator must make a decision about how long the overrun will be, and set Cash up accordingly. If the overrun is live (rather than a miscalculation) then informed guesswork will be employed to determine the length of the overrun in advance!

The recorded programme must be started at the correct time, and Cash will immediately start to reduce the length of the audio it stores. When the insertion time (here the estimated overrun) has elapsed, Cash will start to play out the next programme.

The Time Machine

▼ Cash has a sister: the Time Machine does for composite video signals what Cash does for audio.

The Time Machine takes a composite (PAL or NTSC) video signal and reduces the duration of the output. Using sophisticated television standards conversion techniques the Time Machine looks for consecutive video frames with similar content and discards ocacasional frames, keeping the audio in step by losing fragments of silence close to the discarded video frames.

CASH PROGRAMME TIME REDUCTION PROCESSOR

Using the parameters you set, Cash produces the highest audio quality with the least perceptible processing. By providing Cash with the length of the insert and the duration of the programme , Cash can calculate the optimum recovery rate and show in advance the likely quality which will be achieved. As the programme end time approaches, Cash decreases the rate of audio reduction to ensure that there are no noticable changes in tempo. Cash will recover 2-3 minutes in an hour completely inaudibly, and can recover up to 10 minutes in the hour with good results, depending upon the original material.

The front panel controls are augmented by four function keys, each of which stores the insert, hold and programme times for a chosen event, and is used to quickly recall these parameters rather than manually setting them on each use. A GPI interface provides remote start, hold, stop and function selection, plus a facility to start Cash without starting time reduction - useful as a profanity delay. The RS232 serial interface provides comprehensive setup and control of Cash, and the Start, Hold and Stop functions are compatible with BVW edit controllers.

SPECIFICATIONS

▼ FUNCTIONS

Maximum memory storage capacity	5mins 49 seconds (insertion time)
Maximum programme duration	4 hours (catch-up time)
Maximum hold time	1 hour (allows calculation of optimum recovery rate)
Insertion time accuracy	Set to within $^{1}/_{100}$th of a second
Programme time accuracy	Set to the nearest minute
Hold time accuracy	Set to the nearest 30 seconds
Optimum recovery rates	<4% (3 minutes or less in the hour)
Acceptable recovery rates	<16% (10 minutes or less in the hour)
Inset, programme and hold times	Selected and set by pushbutton and rotary index
Start, hold and stop functions	Selected by pushbutton, protected by Enable button
Audio level adjustments	Selected and set by pushbutton and rotary index

▼ AUDIO

Inputs	Balanced or unbalanced mono or stereo, XLR female
Input level	0dBm into 600Ω
Outputs	Balanced or unbalanced mono or stereo, XLR male
Output level	0dBm into 600Ω
Level adjustments	±16dBm (clips @ +20dBm)
Frequency response	20Hz to 20kHz ±0.5dB
Separation	96dB
Signal/noise	86dB (A weighted)
THD	0.04%
Processing delay	42ms ±16ms (excluding any programmed delay)

▼ REMOTE CONTROL

GPIs	Start, Hold, Stop, F1, F2, F3, F4, Preload
RS232 serial control	Start, Hold, Stop (emulates BVW commands) plus full programming and operating control and status reporting

▼ PHYSICAL

Housing	1U 19" rackframe, 280mm deep
Power requirement	110/220 V AC, 60/50Hz, switchable

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