

Engineer's Mini-Studio-Logbook

Simple Cassette mastering with Tascam 2488MKII

Ever questioned 'Can you put this cassette on CD? This is a description of a way to refurbish and create a master from old cassette tape audio. The purpose of the document is to provide some simple hints. This document is under construction.

All kind of constructive remarks are welcomed at
cassette_mastering(at)openbronportaal.nl

Publisher: © OpenBronPortaal (all rights reserved)

Table of Contents

| | |
|---|---|
| Engineer's Mini-Studio-Logbook..... | 1 |
| Simple Cassette mastering with Tascam 2488MKII..... | 1 |
| That good old damned demo..... | 2 |
| Do not expect miracles..... | 2 |
| Have a 'good old' cassette-recorder..... | 2 |
| Calibration..... | 3 |
| Audio level Chart..... | 3 |
| First listening..... | 3 |
| Copy clean Cassette..... | 4 |
| Squeeze out the Mother-Master..... | 4 |
| The One-Click Wonder..... | 4 |
| Useful tools..... | 5 |
| Real Time Analyzer – Samson D-1500..... | 5 |
| Tascam 2488MKii..... | 5 |
| Sum/Delta convertor..... | 5 |
| Scope..... | 6 |
| Finally..... | 6 |
| Reflect..... | 7 |
| Attachment..... | 8 |
| my 'Engineer's Mini-Studio-Logbook'..... | 8 |

That good old damned demo

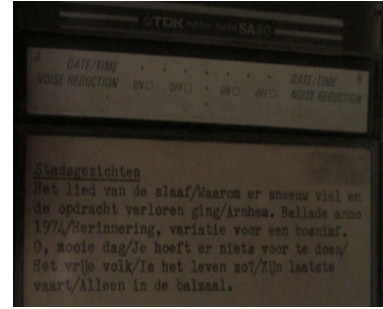
Normally your friend speaks...

'Can you put this Cassette on CD?'

'It's that good old damned demo,

no master available,

Can you ?'



'Stadsgezichten', 1974,
Early Nederpop.

The audio-craze recordist answer will be *'Well, I can try to refurbish the audio and create a new CD master, this will take some(?) time, but you're my friend..., and I am wizard, you know...'*

Do not expect miracles

You will never get more from a tape than it's content, But you can try some backwards mastering ?, First. make a clean copy of the audio, squeeze this out in several parts, then remix..., each action properly tuned and processed?

Have a 'good old' cassette-recorder

Even with a high quality cassette-deck, audio quality is not conform studio quality. Domestic decks, cassette's and tape have their shortcomings. It's noise, distortion, satiation, flutter, staggering amplitudo's...

Rethink, you have an old painting to fix in a modern canvas.

Find the deck with minimal flutter and clean the tape transport and replay heads. Do an smooth rewind of the tape. Get audio from it's line outputs via balanced line transformers to isolate a lot of metal noise and avoid earth loops,

Calibration tapes are safely guarded precision tools; you want recorded flutter and none of reproduced.

Calibration

Audio level Chart

| dBrfs | dBm/dBu | dBV | VU | Vrms | Remarks |
|-------|---------|------|-------|-------|----------------|
| 0 | 20 | 17.8 | 16 | 7.75 | Red Book limit |
| -16 | 4 | 1.8 | 0 | 1.238 | dBrfs headroom |
| -18.8 | 2.2 | 0 | -1.8 | 1 | 1 Volt |
| -12 | 0 | -2.2 | -4 | 0.775 | 1mW/600 Ω |
| -4.2 | -7.8 | -10 | -11.8 | 0.316 | Domestic |
| -14.2 | -17.8 | -20 | -21.8 | 0.1 | 100 mV |

Domestic tape cassette-recorder nominal line output level is -10 dBV at 10k. 11.8 dB gain is needed in main channel strip to move the audio level from 0 VU to -16 dBrfs.

Above 0 VU tape saturation starts, it's maximum level +3 VU will never reach digital maximum, but mind peaks, This area is typical tape related compressed harmonic sound. Can be used to mask



First listening

Somehow I choosed to always disable all content-controlled processors etcetera's to avoid level staggering. Choose, if possible, the correct species of tape used. And rewind smooth to it's start.

You are lucky when the audio tape track is consistent, have equally tempered sound shapes and levels of different songs somehow normalized. Estimate the quality of the tape, it's frequency range, are there any disturbances? Are acoustics comparible?, is the stereo mid?, preferred frequencies?, silences to clean?, etc.

Decide the way to work. Maybe you can do a first refurbisch in a one-time run of the tape, For instance limiting glitching disturbances or limiting noise by threshold switches.

After this reflection you will want to refurbish song by song.

Copy clean Cassette

Adjust to the calibrated headroom setting, We are dynamicly limited at the bottom, down under, get the noise floor level. Take an overall RTA image, do not change relic tone settings, try to clean-up, i.e use fast limiter.

Record - And we call this new stereo-track Mother-Master.

Squeeze out the Mother-Master

Record sepearte stereo-tracks from the Mother-Master each with a different purpose, record for instance sepearte frequency ranges i.e low-pass, mid-range, high pass, and adjust these ranges. Record a Sum/Delta pair of tracks to have the possibility to optimize stereo image. Use compression in the low tracks, determine and adjust center settings. Use de-essing on the high part but take less high than supplied ! Lot of possibilities here... you can even smuggle in some 'atmosphere' here!

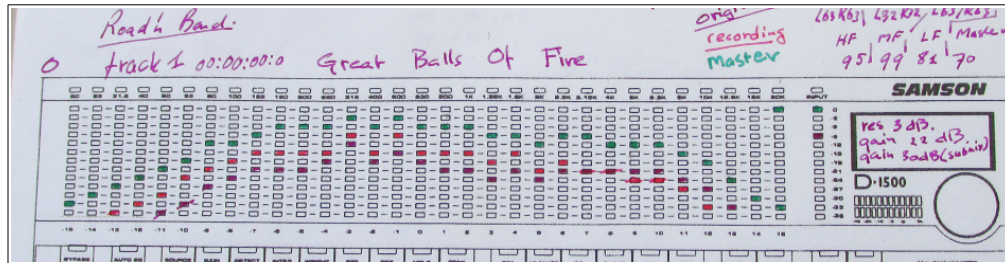
And record these all, again with optimum level settings and special attention to the low bottom center.

The One-Click Wonder

Now you can master, refurbish, and even mask some unwanted dissonances, Always start bottom-up to keep an eye on the centering of the lower range, nail the center. Sweet it to your taste, but remain consistency in all aspects during the whole song. The optimum leveling and more exact centering will always be experienced as an improvement,

Useful tools

Real Time Analyzer – Samson D-1500



RTA-sheet

This RTA-log shows properties of a song as original (purple), recording (red) and master (green), levels and parametric equalizer optimized. Frequency range is 20..20000 Hz, upper limit is digital maximum. See the masters level changed upwards with the mid less pronounced (green).

Tascam 2488MKii

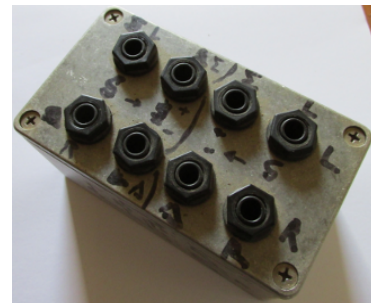
The provided parametric equalizer function is sufficient for generating tracks with different frequency ranges, besides level, no other functions were used.



Sum/Delta convertor

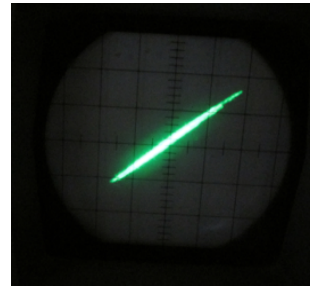
Simple block with 4 high grade audio transformers, 2 stereo channels, It's a simple 2 transformer circuit. Stereo in, Σ Δ out.

Very usefull tool to adjust stereo images by level mixing.



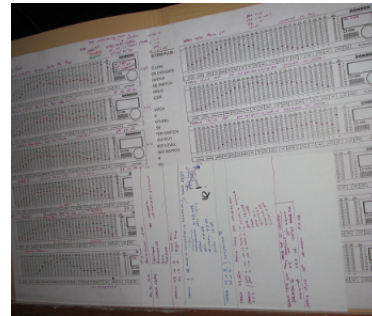
Scope

Invaluable tool to continuously monitor stereo images, centering, my audio eye catcher.



Finally

Well, it took a month and was fertile. Actions and RTA's logged and the CD was very welcomed by these older hippies... 'Stadsgezichten'.



Reflect

I know. A lot of roads are leading to Rome, It all can be digitally done, probably in a single algebra formula. But all day sitting with computer and pizza-coffee pep is not my style, I like these hardware knobs, twiggling, i.e. adjusting real time parameters of the optic compressor of a hot Twintrack channel strip burning my ears...

I found a bag of Tascam 234 Syncaset audio and later the friend found the original master, an 2-track 15"/s Scotch reel, More of those early made masters are available in this historic format. So my next refurbishment project must be dedicated to optimize that Revox A77-CS recorder, checking and re-adjusting. An summer electronic affair, thus with high priority. The transport of the machine is in smoothless condition and I can hardly wait to hear this 'old good time music' again.

Maybe you now realize what it is to be questioned with
'Can you put this cassette on CD?'

Attachment

I'm an aged rookie from a prairy part 'Calluna' of the Netherlands. Over 50 years span as engineer, as musician with audio recording craze. Once started with a Revox A77-CS (2-track 38cm/s) and now a satisfied user of the Tascam 2488MKII in a small home studio, supernatural called 'CallunaSoundExtravaganz'.

My main front-end is analog, use hardly ever digital editing, just imagine, 'old craft' with digital mastery as output, all inspired by a chaotic Extravaganz brain.

A/D only by 2488MKii, microphones are AKG Acoustics, Samson Condensors, main channel is a FocusRite Twintrack Pro. Guitar channel is fed by Marshall JMP-1 and JFX-1. or miscellanious stuff... My monitor is a Samson D-1500 Real Time Analyzer and Hameg HM307 scope, Denon amp and in seventies build Philips Studio Monitor Loudspeakers (from lab). All calibrated with DMM B&K Precision 5491B,

Gibson,Fender,Gretsch,Rickenbacker guitar's, steel, squareneck, guitarbanjo (borrowed), lots of effects, amps, Lesley, new Novation Bass Station II and oldies RA-50, DR-5 synths, own built transformer interfaces,

Lot of headroom here ! I hate singular sounds, Extravaganz airs space, in an inspiring home...so read 'Mixing Secrets' from Mike Senior, yes, class A, only harmonic content...analog is walhalla holy !!!agree ?, no need anyhow...

Sweet Tracks To Taste,

we all do...

my 'Engineer's Mini-Studio-Logbook'

Annotations, logging actions...the essential log file, the desk's help, communicator, when memory have faded earlier tricks or actions. Each project filed, with sheets, sheets, sheets,...

Some pages became coffee-blurred, rubbed and pencil'd again, most wanted items...Use spare time to re-edit these scratches into pimped-up pdf, Unconscious of creating thus my own 'Engineers MINI-Studio-Logbook',

Now, I'm like a publisher of first stuff and invite you to review my first document, 'Simple Cassette mastering with Teac 2488MKii'. All constructive remarks are sencire appreciated.

Engineer's Mini-Studio-Logbook

This is a list of scratches to include in my 'Engineer's Mini-Studio-Logbook' ,

Reviving a Revox A77 – CS Tape recorder

Tascam 2488MKII Master Automation with Rosegarden

Reading Titles from Tascam 2488MKII backup files.

CallunaSoundExtravaganz Studio Set Up

Maybe of interest?

E-Mail:

cassette_mastering(at)openbronportaal.nl