TC 1210 SPATIAL EXPANDER + STEREO CHORUS/FLANGER
INSTRUCTION MANUAL

CONTENTS **PAGE**

INTRODUCTION	1
FEATURES	2
THE SOUND IMAGE OF TC 1210	2
OPERATIONAL DESCRIPTION	4
DESCRIPTION OF CONTROLS	4
HOW TO GET STARTED	6
SETTING SAMPLES	7
TECHNICAL DESCRIPTION	8
TECHNICAL SPECIFICATIONS	8
SERVICE	9
OPTIONS	10
OTHER TC PRODUCTS	10
APPENDIX, THE HAAS EFFECT	10

INTRODUCTION

Congratulations on your purchase of the TC 1210. We are sure you have made a sound investment, with which you will enjoy many sessions.

BEHIND THE TC 1210

The reasonings behind the TC 1210 have been to make the ultimate surround sounding chorus/flanger for the studio and for on-stage use, a goal we are sure, you also will realise has been reached.

Built on experiences with our TC STEREO CHORUS FLANGER pedal, with which we have enjoyed a shear stream of encouragements from practically everyone who have had the opportunity (including the utmost capable musicians in the world) the TC 1210 takes you some steps further into creating a wealth of fascinating and well sounding spatial stereo chorus sound-images.

TC Electronic is a well reputated audio-processing electronics firm started in 1976, now with more than 100 manpower-years of combined skills within high quality audio processing developments and manufacturing.

Downloaded from www.Manualslib.com manuals search engine

FEATURES

A new non-digital sounding high quality analog differential bucket principle has been developed for the TC 1210 featuring much improved performance over traditional implementations.

Advantages of the double chorus units are:

1. Totally new static and dynamic spatial stereo chorus and flanger images, by cross couplings and links between the two units.
2. Delaypanning.
3. Stereo input possibility.
4. Mono compatibility.
5. Possibility of making chorus and flanging simultaneously.
6. Even making live quad-output spatial chorus sounds are possible.
7. Possibility of using the TC 1210 as two separate chorus/flangers.

Technically it features:

1. Analog sound resolution quality with low noise and distortion figures.
2. Line input and output levels.
3. “Active transformer” balanced XLR inputs and outputs as well as
4. High input impedance instrument level jack inputs as well as low impedance jack outputs.
5. Unity-gain characteristics making it very easy to patch in or insert.

manufactured to the high standards professionals demands:

High quality components in reliable low-noise and high slewrate constructions.
Quality fibre glass doublesided pcb.
All packed in a rugged steel construction with black anodized aluminum front 19” rack mounting.
Plugable board construction and component identifications for fast service.

THE SOUND IMAGE OF TC 1210

The TC 1210 actually consists of two complete stereo chorus flangers combined with phase shifts and an advanced common circuitry to link and crossmix the units in carefully controlled modes and combinations.

The principal ideas behind these combinations take their roots in the so called “Haas effect” or “principle of first arrival”:

Sound travels through air with a speed of approx. 340 m/sec. and it is our brainwork with the sound arriving at slightly different times to each ear directly from the source and the reflections of the sound, (reverberations) arriving a little later, that enables us to tell from where the sound originated.

Downloaded from www.Manualslib.com manuals search engine

--- that is, we hear a sound source as coming from the position from where the sound source has its shortest distance, or “arrives first” ---

By introducing delays in a stereo system we can move our experience of the position of the sound sources. In some respects these delays needed, are so short, that we merely regard them as phase shifts. This is one of the basics of most so called EXITER-effects, in which a slight and static broadening of the stereo image is created (primarily in the treble range).

The careful combinations of phase shifts and delays within the TC 1210, enables a variety of STATIC SPATIAL EXPANSIONS, wide broadenings and psychoacoustic enhancements of the stereo image to be created.

By unbalancing the delays and phase shifts within the TC 1210 it is possible, with the left and right channels volumes remaining unchanged, to shift the appeared origination of the sound from left to right and vice versa. Modulating the delays introduces a dynamic shifting panning image. These effects can be heard with the TC 1210 “STATIC and DYNAMIC DELAY PANNING” effect setting samples.

The basics of a chorus-sound is the mixing of a signal with a modulated, delayed part of the same signal.
The modulation of the delay brings with it a slight shifting pitch, the added delay part of the signal gives the imagination that more than one voice is sounding - hence the name “chorus”. Furthermore the mixing of the two parts produces a “comb-filter”-like frequency response.
Arranged in the right proportions this brings with it a nice broadening of the sound. - TC 1210 contains not only one, but two such units.

Two chorus/flanger units brings the possibilities of creating chorus and flangings simultaneously as well as creating some even more exiting chorus effects, some of them with the nice features of the single chorus unit enhanced, some of them with a totally new stereo image.

Combined with the spatial image creation circuitry within the TC 1210, you create a variety of dynamically moving SPATIAL CHORUS and FLANGER images. Spatial excitations bound to be heard to image.

Downloaded from www.Manualslib.com manuals search engine

OPERATIONAL DESCRIPTION

The TC 1210 has two general modes of operation:

1. Normal mode (stereo or mono input - stereo output)

2. Separate mode (2 separate channels each: mono input - stereo output)

1. In normal mode the TC 1210 is a two preset unit where the two presets can be used singly or combined.

2. In separate mode the TC 1210 is divided into two independent chorus/flangers. It is possible to link the LFO's and the bypass of the two channels, thereby enabling the TC 1210 to synchronize the effects used on different tracks or instruments.

DESCRIPTION OF CONTROLS

FRONT PANEL CONTROLS:

BYPASS:	Switches the effects in and out.
INPUT SENS.:	Controls the headrooms of the channels. Adjusts the input and the output level simultaneously, automatically giving the TC 1210 an 1:1 input/output gain ratio.
PPM METER:	Shows the headrooms of the channels.
INTENSITY:	effect MODE 1: Controls the amount of direct (clean) signal. effect MODE 2: Controls the amount of effect signal. effect MODE 3: Controls the amount of signal regenerated. effect MODE 4: Controls the amount of inversed signal re-generated.
SPEED:	Controls the rate of sweep from one sweep every ten seconds to ten sweeps every second.
WIDTH:	Controls the depth of the delay modulation from o to 100%,
DELAY:	Controls the length of the delay time from approx. 0.65 to 12 mS.

Downloaded from www.Manualslib.com manuals search engine

INPUT MODE SWITCHES:

STEREO INPUT: Disables the mix of inputs 1&2 to allow stereo or separate input signals.

SEPARATE INPUT: Divides TC 1210 into two separate mono in/stereo out chorus/flangers.

LINK MODE SWITCHES:

CROSS OFF:

1. IN NORMAL MODE:
   Switches off the cross mixings of the channels.

2. IN SEPARATE MODE:
   Disables the bypass link of the two channels.

SWEEP SYNC.:

1. IN NORMAL MODE:
   Synchronizes the two LFO delay modulators in-phase.

2. IN SEPARATE MODE (and both channels on):
   Mixes the LFO delay modulators of the two channels.

REAR PANEL CONTROLS & CONNECTIONS:

IN 1: XLR balanced left (mono) input.

IN 2: XLR balanced right input.

OUT 1: XLR balanced left output.

OUT 2: XLR balanced right output.

INPUT 2:

1. IN NORMAL MODE:
   Right Input.

2. IN SEPARATE MODE:
   Channel 1 input.

INPUT 1:

1. IN NORMAL MODE:
   Left input.

2. IN SEPARATE MODE:
   Channel 2 input.

OUTPUTS 2:

1. IN NORMAL MODE:
   Right output.

Downloaded from www.Manualslib.com manuals search engine

2. IN SEPARATE MODE:
Channel 2 left & right outputs.
Stereo jack wiring: LEFT OUTPUT = TIP, RIGHT OUTPUT = RING.

OUTPUTS 1: 1. IN NORMAL MODE:
Left output.

2. IN SEPARATE MODE:
Channel 1 left & right outputs.
Stereo jack wiring: LEFT OUTPUT = TIP; RIGHT OUTPUT = RING.

DIRECT MUTE: Switch that mutes the direct part signal of the unit.

EX. SPEED: Stereo jack to short the LFO sweep range 5 times.

EX. BYPASS: Stereo jack to connect external bypass control.

FUSE

110/220VAC MAINS VOLTAGE SELECTOR.

3 PIN IEC MAINS PLUG.

HOW TO GET STARTED

1. Before connecting power cord to the mains, check that the voltage selector on pack panel is set at the appropriate range.

2. Connect input signal source(s) and select INPUT MODE:

   If mono signal sources use any of (or more to mix) the inputs.

   If stereo signal source use IN1 for left and IN2 for right and press STEREO to separate the left and right channels.

   If two separate sources use IN1 for source 1, IN2 for source 2, press Stereo to separate the left and right channels, and press SEPARATE and CROSS OFF to make TC 1210 function as two independent chorus flangers.

3. Connect outputs to a stereo- or two separate power amps:

   If using the TC 1210 as one (mono/stereo in & stereo out) unit:
   OUT1 = left, OUT2 = right

   If using the TC 1210 as two separate (mono in - stereo out) effects, the jackoutputs are used with the left outputs on the tips and the right outputs on the rings.

Downloaded from www.Manualslib.com manuals search engine

4. Adjust both the INPUT SENS gain controls so that the (yellow) odB PPM led flashes as input signal is provided, the red +3dB led should flash only on high peaks of the input.

5. Set the desired sounds:

   Start with the setting samples and build your own sounds from them. Effect 1 and 2 are indicated on with their LFO LED's flashing red/green.

SETTING SAMPLES

1. SPATIAL EXPANDER
2. CHORUS I
3. CHORUS II
4. DOUBLER
5. FLANGER I
6. FLANGER II
7. DELAY PANNING

SOUND	1	2	3	4	5	6	7
CONTROL SETTINGS:							
BYPASS	ON	ON	ON	ON	ON	ON	ON
INTENSITY	3	6	6	3	5	3	6
MODE	1	2	2	1	3	4	1
SPEED	-	,5	,2	,5	,1	,2	,5
WIDTH	0	3	5	3	1,5	6	1
DELAY	6	4	6	6	4	6	6
STEREO	(ON if input signals in stereo, OFF if in mono)						
SEPARATE	(used only when using 1210 as two independent choruses)						
CROSS OFF					ON		ON
SWEEP SYNC					ON		
BYPASS	ON	OFF	OFF	OFF	OFF	OFF	OFF
INTENSITY	6						
MODE	1						
SPEED	-						
WIDTH	0						
DELAY	5						

Downloaded from www.Manualslib.com manuals search engine

TECHNICAL DESCRIPTION

The TC 1210 contains two complete chorus flangers along with special linking and spatial enhancement circuitry to obtain the effects described.
Active transformer balanced XLR inputs and outputs are provided along with singleended jack in and outs.
Separate channel PPM (headroom) indicators and “unitygain” levelmatching circuitry to accommodate a wide range of input signals.
Provisions for the mixing and link of the two units are provided, as well as ex. bypass and speed controls.
In the signal path only high slewrate and low noise circuitry constructions are used.
Separate supply lines for signal path and controlling circuitry.
For low noise and endurable long life all switching is done electronically, controlled by mechanical switches and a common logic circuitry.
Double sided fibre glass boards with printed component identification on main board for easier service-identifications.

TECHNICAL SPECIFICATIONS

Dynamic range		100 dB (110 dB Bypass)
Frequency response	(bypass)	10 Hz to 100 KHz (+0,-1 dB)
- -	-	5 Hz to 150 KHz (+0,-3 dB)
- -	(effect on)	20 Hz to 20 KHz
THD 0 dBm, 1 KHz	(bypass)	typ. 0.001%
0 dBm, 1 KHz	(effect on)	typ. 0.03%

Input connections, high level, balanced

Termination IEC standard, pin 2:+, pin 3:-	XLR w. lock
Input impedance, differential	20 KOhm balanced or unbalanced
Input impedance, common mode	20 KOhm
Common mode rejection ratio (50-100Hz)	typ 50 dB
Max. input signal 1 KHz	+22 dBm

Input connections, low level, unbalanced

Termination	Jack (phone-plug) unbalanced
Input impedance	1 MOhm//100pF
Max. input signal 1 KHz	+16 dBm

Output connections, balanced

Termination IEC standard,	+ pin 2, - pin 3, ground pin 3, XLR
Zout, differential	50 Ohm
Zout, common mode	10K Ohm//100 pF
Max. output signal, R1=10 KOhm	+27dBm (50Vpp)
R1=600 Ohm	+21dBm (25Vpp)

Downloaded from www.Manualslib.com manuals search engine

Output connections, low level, unbalanced

Termination	Jack (phone-plug) unbalanced
Output impedance	100 Ohm
Max. output signal, R1=10 KOhm	+21dBm (25Vpp)
Channel seperation (at 1KHz, typ.)	70 dB
Differential delay	0.66 to 22 mS
Sweep range	30 times
Crossmix cancellations	typ. 40 dB
LFO speed range	0.1 to 10 Hz
	10 sec. to 0.1 sec.
(with EX. SPEED shorted)	50 sec. to 0.5 sec.

External speed control

Termination: (tip channel 1, ring channel 2) jack stereo plug for down shift of LFO frequency by pedal control

or voltage control	0 to 10V
with a sensitivity of	-2.13 volts/octave (no shift at 5V)

External bypass control

Termination: (tip channel 1, ring channel 2) jack stereo plug for control by shorting to ground (=bypass, open circuit = effect on) or by logic control (0V=bypass, open circuit or 10 to 20V = effect on)

Mains voltage VAC	200 to 240 or 100 to 120, selectable	
power consumption		18W
Mains fuse,	110V	125 mA (T)
	220V	63 mA (T)
Dimensions (WxHxD)		482x44x185 mm (19x1.75x7.3")
Weight		3,5 Kgs.

SERVICE

Service schematics and adjustment procedures are available from our distributors provided a signed "for service only" request is made on your studio/shop letterhead paper.
The two delay cards are interchangeable and are available as service-cards only (due to special trim-equipment needed to optimize performance).
Please contact your dealer for service instructions.

Downloaded from www.Manualslib.com manuals search engine

OPTIONS

Handles
TC DUAL REMOTE SWITCH, remote switch w. 2 foot switches and LED-indications.

OTHER TC PRODUCTS

TC ELECTRONIC produces a wide range of effects pedals and a number of RACK-mountable units, including a line of PARAMETRIC EQUALIZERS.
Please contact your dealer for further information.

APPENDIX 1, THE HAAS EFFECT

The principal ideas behind these combinations take their roots in the so called “Haas effect” or “principal of first arrival”:
Thankfully, most of us are born with the gift of being able to hear quite easily from where in a circular sphere around us a given sound originates.

Try fix your eyes on a point right in front of you, then close your eyes, and notice the position of a sound source near you, then turn around and stop where you hear the same sound image again, open your eyes and see - the fixpoint is right in front of you. - From this we can conclude that you can tell quite precisely from where a sound comes - No matter that wherever you were in your circular movement the sound source still sounded with unchanged volume.

Sound travels through air with a speed of approx. 340 m/sec. and it is our brainwork with the sound arriving at slightly different times to each ear directly from the source and the reflections of the sound, (reverberations) arriving a little later, that enables us to tell from where the sound originated.

--- Thus is, we hear a sound source as coming from the position from where the sound source has its shortest distance, or “arrives first” ---
This is even true with later arrivals of the sounds being higher volume than the originals.

Speaking in terms of a stereo image it is possible to give the imagination that a sound comes from the right hand speaker even if the volume of the left hand speaker is higher, provided that the left hand signal arrives a little later.

This effect can be heard in the TC 1210 “DELAY PANNING” effect, in which it is possible to alternate the origination of the sound with the volume remaining unchanged.

In some respects the delays needed to move our experience of the position of sound sources are so short, that it is more correct to speak about phase shifts instead of delays. This is the basics of most so called exiters, which are capable of producing some static stereo images.

With the TC 1210 you play on the astonishing capabilities of our ears distinguishing quite easily the origination of a sound.
TC 1210 combines delays and phase shifts with two powerful chorus/flangers creating a variety of dynamically moving images.

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine