



ILAB America Inc.

**General Processor Design Data
Notes on Analog and Digital surround and virtual Processing modes, formats**

**January 2003
Revision 1**

Table of Contents

2/6 CHANNEL AUDIO PROCESSOR BLOCK DIAGRAM	7
6/6 CHANNEL AUDIO PROCESSOR BLOCK DIAGRAM	8
2/8 CHANNEL AUDIO PROCESSOR BLOCK DIAGRAM	9
VIRTUAL HEADPHONE/SPEAKER AUDIO PROCESSOR BLOCK DIAGRAM	10
ILAB STOCK DESIGNS.....	11
PREMIUM 6 CHANNEL PROCESSOR CORE.....	11
PREMIUM 8 CHANNEL PROCESSOR CORE.....	11
ECONOMY 6 CHANNEL PROCESSOR CORE.....	12
HEADPHONE PROCESSOR CORE.....	12
TYPICAL PROCESSING MODES VS. AUDIO SOURCE INPUT TYPE.....	13
CHANNEL INPUT CODING.....	13
<i>Dolby Digital Bitstream</i>	13
<i>DTS bitstream</i>	13
<i>SACD</i>	13
<i>DVD-A</i>	13
<i>PCM</i>	13
<i>MPEG</i>	13
INPUT SOURCE TYPE.....	14
DOLBY DIGITAL BITSTREAM LFE.....	15
BASS MANAGEMENT (BASS SUMMING AND FILTERING)	15
INPUT BITSTREAM STATUS	16
STAT FOR AC-3.....	16
SPDIF STAT FOR AC-3.....	17
SOURCE TYPE FOR AC-3.....	17
SUR_EX FLAGS.....	17
STAT FOR PCM.....	18
SPDIF STAT FOR PCM.....	18
SOURCE TYPE FOR PCM.....	19
STAT FOR MPEG.....	19
SPDIF STAT FOR MPEG.....	20
SOURCE TYPE FOR MPEG.....	20
STAT FOR DTS.....	21
SPDIF STAT FOR DTS.....	22
SOURCE TYPE FOR DTS.....	22
PROCESSING MODE DEFINITIONS	23

INPUT / OUTPUT CONNECTORS	24
<i>Color coding , option 1 : color scheme was established by Lucasfilm Ltd. for Home THX ® products.</i>	24
<i>Color coding , option 2: EIAJ color coding standard (CPX-1220)</i>	24
<i>Color coding (option 1: EIAJ color coding standard (CPX-1220))</i>	25
CHANNEL DELAYS	26
SURROUND DELAY REQUIREMENTS.....	26
CENTER DELAY REQUIREMENTS.....	26
NOISE SEQUENCING	26
AUDIO SOURCES	27
TYPICAL OUTPUT SIGNALS AVAILABLE FROM VARIOUS SOURCES.....	27
GAME CONSOLE AUDIO	28
PLAYSTATION 2 AUDIO.....	28
X BOX AUDIO.....	28
NINTENDO GAME CUBE AUDIO.....	28
PC AUDIO.....	28
USB AUDIO	29
USB 1.1.....	29
USB 2.0.....	29
USB NAMING AND PACKAGING RECOMMENDATIONS.....	29
USB LOGOS.....	31
FIREWIRE (IEEE1394)	32
DVD AUDIO	33
AUDIO SIGNAL DECODING SYSTEM	34
LPCM CODING	34
5.1 , 6.1 AND 7.1 PROCESSING	35
DECODING TECHNOLOGIES AND CORRESPONDING LOGOS	36
DOLBY SURROUND.....	36
DOLBY SURROUND PRO LOGIC.....	36
DOLBY SURROUND PRO LOGIC II.....	36
DOLBY DIGITAL.....	37
DOLBY HEADPHONE.....	37
DOLBY® VIRTUAL SPEAKER.....	37
VIRTUAL DOLBY SURROUND AND VIRTUAL DOLBY DIGITAL.....	38
THX ULTRA.....	38

THX SELECT	38
DTS DIGITAL SURROUND (5.1).....	39
DTS DIGITAL SURROUND (2CH)	39
DTS ES EXTENDED SURROUND	39
DTS NEO6	39
DTS 96/24	39
DTS ES 96/24	40
DTS PASSTHROUGH	40
DTS INTERACTIVE	40
DTS VIRTUAL.....	40
QSURROUND FOR HEADPHONES	41
QSURROUND FOR VIRTUAL SPEAKERS	41
Q3D.....	41
QEM.....	41
QMSS.....	41
DOLBY HEADPHONE.....	42
MODES AND FEATURES	42
PROCESSING REQUIREMENTS	42
DOLBY CERTIFICATION	42
DOLBY HEADPHONE STEREO.....	42
DOLBY® VIRTUAL SPEAKER.....	43
DIFFERENCE BETWEEN PRO LOGIC®, PRO LOGIC II, AND DOLBY® DIGITAL 5.1.....	48
DIFFERENCE BETWEEN DOLBY DIGITAL AND DTS	48
DOLBY DIGITAL SURROUND EX	48
DOLBY DIGITAL - GENERAL	52
FLOWCHART FOR DOLBY DIGITAL IMPLEMENTATIONS	53
DOLBY LICENSING AND CERTIFICATION	53
DOLBY TRADEMARK AND LOGOTYPE	54
PRODUCTS WITH SURROUND DECODERS	54
LASER DISC PLAYERS	55
PRODUCTS WITH DOLBY HEADPHONE.....	56
DISPLAY AND INDICATOR MARKINGS	57
THX.....	58
BASS MANAGEMENT ELECTRONIC CROSSOVER.....	59
RE-EQUALIZATION	60
TIMBRE MATCHING.....	60
ADAPTIVE DECORRELATION	61

BASS PEAK LEVEL MANAGER	61
LOUDSPEAKER POSITION TIME SYNCHRONIZATION	62
THX LICENSING AND CERTIFICATION	62
DTS.....	63
DTS-ES (EXTENDED SURROUND)	65
DTS NEO:6	65
DTS 96/24	65
DESCRIPTION OF DTS BITSTREAMS	65
DTS LICENSING AND CERTIFICATION	66
DTS LICENSING PROCESS	67
DTS PRODUCT TRADEMARK NOTICE.....	68
<i>DTS Digital Surround® systems (5.1 ch)</i>	68
OWNER’S MANUAL NOTICES	68
SALES LITERATURE AND ADVERTISEMENT NOTICES	68
<i>DTS Digital Surround® systems (2 ch)</i>	68
<i>Owner’s manual notices</i>	69
<i>Sales literature and advertisement notices</i>	69
DTS-ES EXTENDED SURROUND™	69
<i>Owner’s manual notices</i>	69
<i>Sales literature and advertisement notices</i>	69
DTS “ES-COMPATIBLE”	70
<i>Owner’s manual notices</i>	70
<i>Sales literature and advertisement notices</i>	70
DTS VIRTUAL 5.1™	70
<i>Owner’s manual notices</i>	70
<i>Sales literature and advertisement notices</i>	70
QSOUND.....	71
MONO	71
STEREO	71
SURROUND.....	71
MONO TO 3D.....	71
STEREO TO 3D.....	72
SURROUND TO 3D	72
Q3D	72
QXPANDER	72
QSURROUND.....	72
QSOUND AND SURROUND TECHNOLOGIES	73
QSURROUND RENDERS SURROUND ON 2-SPEAKER SYSTEMS.....	73
QSURROUND ADAPTS SURROUND FORMATS TO HEADPHONES.....	75
DOLBY DIGITAL, MPEG, DTS AND QSURROUND	76
QMSS: QSOUND MULTI-SPEAKER SYSTEM	76
QSURROUND IMPLEMENTATIONS	76
QSOUND LICENSING AND CERTIFICATION	77
QSOUND TRADEMARKS AND LOGOS	77

