Block Diagram

mLAN8P

mLAN8E

Specifications

mLAN8E

mLAN IEEE 1394 High Performance Serial Bus	Data Rate	S200
		Isochronous Resource Manager capable, Bus Manager capable, Connection Manager
All three models conform to IEC61883-6 Audio and Music Protocol		Digital Audio; 8 in/8 out, MIDI; 1 in/1 out
Sampling Frequency	44.1kHz	
Functions	Direct Mode	Input: 2 (max), Output: 8 (max)
	Mixer Mode	Input: 16 (max) Link SW, Gain, ATT, Phase, EQ (4Band)**, Dynamics**, AUX Send 1 - 6, Pre/Post SW 1 - 6, Channel on/off SW, Meter, Pan, Fader
		Output: 8 (max) Level, Balance, AUX Link SW, AUX Master 1 - 6
Connectors	mLAN (IEEE 1394 S200)	6 pin x 3
	SERIAL I/O	Mini DIN 8 pin x 1
Display	LED x 5	1394 connector 1, 2, 3 (Indicate the status of the devices connected to 1394 connectors 1, 2, and 3.) RT (Root)/ERR (Error): Green/Red Active: Blue
Dimensions/Weight	200 (W) x 86 (D) x 34 (H)mm/430g	
Power Consumption	4W	
Accessories	mLAN Tools CD-ROM (Macintosh, Windows) x 1	mLAN Patchbay, mLAN Mixer, mLAN driver (OMS, ASIO suppport)
	Manual set x 1	
	IEEE 1394 Cable (4.5m) x 1	

CD8-mLAN

mLAN IEEE 1394 High Performance Serial Bus	Data Rate	S200
		Isochronous Resource Manager capable, Bus Manager capable, Connection Manager
All three models conform to IEC61883-6 Audio and Music Protocol		Digital Audio; 8 in/8 out, MIDI; 1 in/1 out.
Sampling Frequency	44.1kHz, 48kHz	
Display	LED x 4	1394 connector 1, 2 (Indicate the status of the devices connected to 1394 connectors 1 and 2.) RT(Root)/ERR (Error): Green/Red ACTIVE: Blue
Connectors	Front	mLAN (IEEE 1394 S200): 6 pin x 2, SERIAL I/O: Mini DIN 8 pin x 1
	Rear	YGDAI
DIP Switch	ON/OFF	SERIAL I/O, MODEL 02R/03D,
Dimensions/Weight	132 (W) x 36.8 (H) x 328.5 (D)mm/220g	
Power Consumption	2.75W (550mA/+5V)	
Accessories	mLAN Tools CD-ROM (Macintosh, Windows) x 1	mLAN Patchbay, mLAN Mixer, mLAN driver (OMS, ASIO support)
	Manual set x 1	
	IEEE 1394 Cable (4.5m) x 1	

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mLAN8P

mLAN IEEE 1394 High Performance Serial Bus	Data Rate	S200
		Isochronous Resource Manager capable, Bus Manager capable, Connection Manager
All three models conform to IEC61883-6 Audio and Music Protocol		Digital Audio; 8 in/8 out, MIDI; 2 in/1 out
Sampling Frequency	44.1kHz, 48kHz	
Functions	Mixer	Input (x12) Link SW*, ATT, Gain*, Phase; Delay**; EQ (4Band)**, Dynamics**, AUX Send 1, 2*, Pre/Post SW 1, 2, Channel on/off SW*, Meter*, Pan*, Fader*
	Output	Effect Return (level, pan, mute), AUX Master 1, 2*, AUX Link SW*, Level*, Balance*
	Effect	Effect type/parameter
Controllers	Phones Volume, Input Volume, Rotary Encoder (Value Dial)	
Panel Switches	Mode; x 3 (Mixer 1, Mixer 2, MIDI/UTILITY) (with LED), Page; x 2 (<,>) Data; x 2 (-1/EXIT, +1/ENTER), Channel; x 8 (1, 2, 3, 4, 5, 6, 7, 8) (with LED)	
Display	Rear	LED x 5 1394 connector 1, 2, 3 (Indicate the status of the devices connected to 1394 connectors 1, 2, and 3.) RT (Root)/ERR (Error); Green/Red ACTIVE; Blue
	Front	LED x 4 LOCK (SYT PLL, DIR PLL), DATA, RT/ERR; Red/Green
		LCD 24 Characters x 2 + 7 Segments x 2 digit
Connectors	Rear	mLAN (IEEE 1394 S200); 6 pin x 3, ANALOG IN 1/L, ANALOG IN 2/R; Phone (mono) x 2, ANALOG OUT 1/L, ANALOG OUT 2/R; Phone (mono) x 2, DIGITAL IN; Optical x 1/Coaxial x 1, DIGITAL OUT; Optical x 1/Coaxial x 1, DC IN, MIDI IN/OUT-A/OUT-B; DIN 5 pin x 3, SERIAL I/O; Mini DIN 8 pin x 1
	Front	PHONES; Stereo Phone
Analog I/O	Analog In (24bit A/D Converter)	Frequency Response 5Hz-20KHz (fs=44.1KHz), 5Hz-21KHz (fs=48KHz)
	Analog Out (24bit D/A Converter)	Frequency Response 5Hz-20KHz (fs=44.1KHz), 5Hz-21KHz (fs=48KHz)
	Dynamic Range	95dB (JIS-C)
	THD	Less than 0.003% (0dBm)
Maximum Output	+3dBV (+5dBm)	
Dimensions/Weight	220 (W) x 206.2 (D) x 70.5 (H)mm/2.0 kg	
Power Consumption	17W	
Accessories	mLAN Tools CD-ROM (Macintosh, Windows) x 1	mLAN Patchbay, mLAN Mixer, mLAN driver (OMS, ASIO support)
	Manual set x 1	
	IEEE 1394 Cable (2.0m) x 1, AC adapter PA-5C x 1	

System Requirements
G3/300 B/W or later FireWire port equipped computer.
Current Powerbook models (as of September 2000) are not compatible. See our web site for up-to-date information.

Compatible Sequencers
Cubase, Logic, Performer, Vision, or other ASIO/OMS compatible application.

* Settings available via the mLAN8P.
** Applies to up to 8 of the 16 available channels.
Specifications and appearance subject to change without notice.

YAMAHA mLAN Products

mLAN Expansion Board
mLAN8E

mLAN Interface Card
CD8-mLAN

mLAN Audio/MIDI Processor
mLAN8P

Simple, Powerful Networking For Music Systems

# Simple, Powerful Networking For Music Systems

One of the reasons for the complexity and inflexibility of many of today's music production systems and studios is the sheer number of connections involved. MIDI and audio signals are routed separately, and each MIDI cable can handle up to 16 channels of data while audio usually requires a separate cable — whether analog or digital — for each channel of audio. The situation is further complicated by numerous connector types and line level standards, as well as the care that must be taken to ensure that outputs are properly connected to inputs. Yamaha's innovative mLAN networking system neatly overcomes all these problems by allowing many channels of digital audio and MIDI music data to be transferred via a single 1394-standard cable. Extremely powerful music systems can be quickly and easily configured using mLAN-compatible musical instruments, computer components and interface devices. Adding devices to or removing devices from an mLAN system is easy too, with none of the frustration and down time incurred when re-configuring conventional systems.

The Main Benefits of mLAN

High-speed, High-volume Data Transfer

Based on the industry-standard IEEE 1394 high-performance serial bus, mLAN transfers music and audio data at speeds of up to 200 Mbps. Up to approximately 100 channels of digital audio data or up to 256 ports of MIDI data (16 channels x 256 connections) can be transferred via a single cable. Just imagine the bundle of cables you'd need to transfer that volume of data with conventional connections.

IEEE 1394 Cable Conceptual Diagram

Approximately 100 conventional cables

256 MIDI cables

Other cables (digital video signals, etc.)
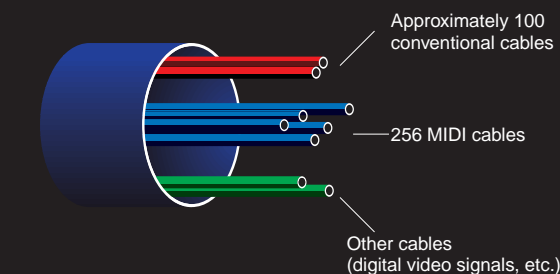
Simple, Streamlined Cabling

Where conventional systems require separate, multiple cables for MIDI, audio, and serial data connections, in an mLAN system all of these functions can be handled by a single cable between each device in the network. You don't need to worry about the order you connect the devices in, and mLAN ports are "hot pluggable" so you can unplug and plug in devices without having to power-down or reset the system.

Flexible Computer-based Patching

Using the software patchbay application provided with all Yamaha mLAN products, you can easily reconfigure your system – connecting and disconnecting devices as required – without having to physically plug, unplug, or re-route any cables at all.

Software Mixer Supplied

Both the mLAN8E Expansion Board and mLAN8P Audio/MIDI Processor come with a software mixing application that allows versatile mix control of up to 12 audio channels on the mLAN8P and up to 16 channels on the mLAN8E.

• Mixing capability is not provided on the CD8-mLAN Interface Card.

Computer Optional

Although computer control can be an advantage in mLAN networks, mLAN allows music and audio devices to be networked without a computer — an ideal way to set up systems for live performances.

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mLAN Networking Products

mLAN8E Expansion Board

Connects compatible Yamaha digital musical instruments to an mLAN network.

The mLAN8E is an expansion board for compatible Yamaha digital musical instruments. It provides the interface hardware and connectors required to connect the instrument in which it is installed to an mLAN network. In addition to mLAN networking, the mLAN8E features a built-in 16-channel mixer which can be used as a sub-mixer for connected MIDI instruments. The mixer includes channel EQ, channel dynamics, and other parameters which can be controlled from the supplied mixer application software. It also allows direct connection to computers which have IEEE 1394 ports, and a serial port is provided to allow mLAN devices to be selected from Windows-based computers. The mLAN8E comes complete with patching and mixing application software, and OMS/ASIO drivers for Macintosh computers.

Currently supported devices: Yamaha CS6x, CS6R, and S80 synthesizers. Yamaha A4000 and A5000 samplers.
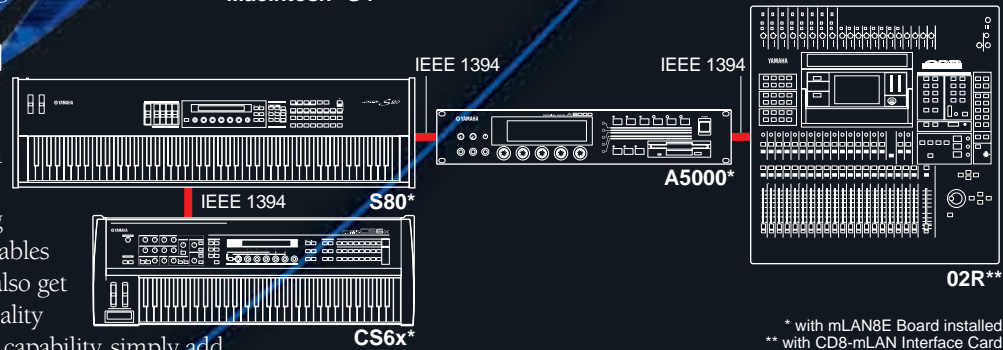
CS6x CS6R S80 A5000 A4000

System Examples

[G4/CS6x/A4000]

Here's a recording system that is extremely flexible and powerful, but requires only two 1394 cables for all audio and MIDI signal routing.

Apple Power Macintosh G4   IEEE 1394   IEEE 1394   A4000*   CS6x*

[S80/CS6x/A5000/02R]

This system would be convenient to set up for live applications. The entire system can be connected with 1394 cables so problems with wrong connections and mismatched cables are effectively eliminated. You also get the benefit of all-digital, top-quality sound. If you need re-patching capability, simply add a 1394-compatible computer — a laptop type will do nicely if you need portability — and use the supplied patching application software.

IEEE 1394   S80*   A5000*   02R**   CS6x*

* with mLAN8E Board installed
** with CD8-mLAN Interface Card

Contact your nearest Yamaha representative for mLAN8E installation.

CD8-mLAN Interface Card

Connects compatible Yamaha digital mixers to an mLAN network.

This interface card installs in a YGDAI slot on compatible Yamaha digital mixers, allowing the mixer to be directly connected to an mLAN network. The CD8-mLAN also allows direct connection to computers which have IEEE 1394 ports, and a serial port is provided to allow MIDI transmission and reception, and mLAN devices to be selected from Windows-based computers.

To receive and transmit MIDI messages via a CD8-mLAN installed in an O2R you will need an external device equipped with TO HOST and MIDI connectors (an MU-series tone generator, for example; sold separately).


Currently supported devices: Yamaha 02R and 03D Digital Mixers.

02R 03D

System Example

[G4/02R/S80/MIC]

In this setup — a hard-disk multitrack live recording system based on the O2R — the computer, O2R Digital Mixer and S80 synthesizer are interconnected using only 1394 cables. The only conventional connections are the analog lines from the microphones to the mixer. Note that the computer can be directly connected to the network without the need for any extra PCI cards or interface hardware.

IEEE 1394   Audio · Audio · Audio · Audio · Audio   G4   IEEE 1394   02R**   MIC   S80*
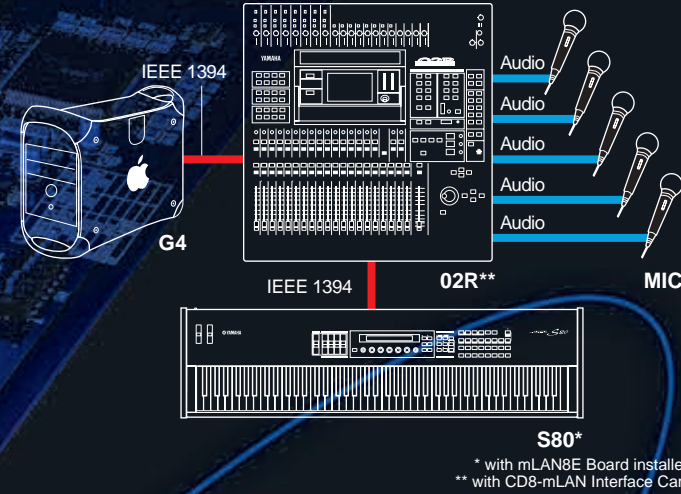
* with mLAN8E Board installed
*** with CD8-mLAN Interface Card*

mLAN8P Audio/MIDI Processor

Connects conventional MIDI and audio devices to an mLAN network.

Chances are that you'll want to connect existing audio and MIDI gear to your mLAN network, too. That's why we've provided the mLAN8P Audio/MIDI Processor: an interface unit which allows up to 8 channels of digital audio and 2 MIDI ports (16 channels x 2) to be integrated into an mLAN network. The mLAN8P features a built-in 12-channel mixer which can be controlled from the supplied software or via the unit's panel controls. Top-quality effects processing is ensured by a built-in DSP based on the one employed in the acclaimed Yamaha 03D Digital Mixer. The mLAN8P also allows direct connection to computers which have IEEE 1394 ports, and a serial port is provided to allow mLAN devices to be selected from Windows-based computers. The mLAN8P comes complete with patching and mixing application software, and OMS/ASIO drivers for Macintosh computers.
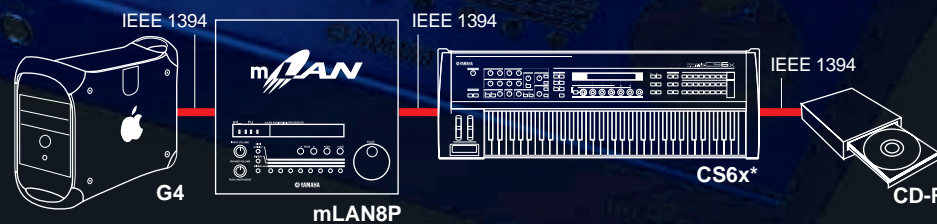
System Examples

[G4/mLAN8P/A5000/CD player]

With only the mLAN8P and a computer you have a surprisingly powerful hard disk recording system. The mLAN8P connects to the computer via a single 1394 cable, and your sources and monitor system can be connected to the mLAN8P as required. Since the mLAN8P offers a range of top-quality effects built-in, minimum load is placed on the computer's CPU.

IEEE 1394   IEEE 1394   A5000*   Audio   G4   mLAN8P   CD player
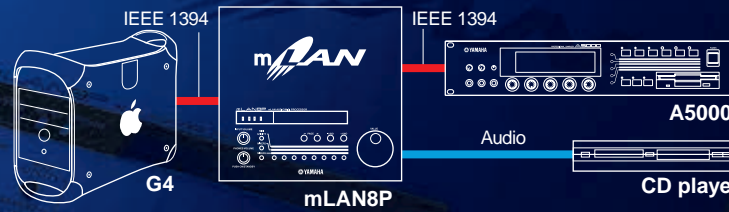
[G4/mLAN8P/CS6x/CD-R]

1394-compatible devices can be connected in just about any configuration to create systems that precisely match your needs, and re-patching can be accomplished quickly and easily via software. As shown in this hard disk recording system, A 1394-compatible CD-R recorder such as the Yamaha 8824 can be connected into the network without the need for SCSI connections.

Sequencer and other data can be written to the CD-R recorder using appropriate CD burning software (MIDI and audio data cannot be directly written to CD-R via the network).

IEEE 1394   IEEE 1394   IEEE 1394   G4   mLAN8P   CS6x*   CD-R

* with mLAN8E Board installed

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mLAN8P Effect Types

Reverb-type Effects

#	Type	Description
01	Reverb Hall	Reverb simulating a large space such as a concert hall.
02	Reverb Room	Reverb simulating the acoustics of a smaller space (room) than REVERB HALL.
03	Reverb Stage	Reverb designed with vocals in mind.
04	Reverb Plate	Simulation of a metal-plate reverb unit, producing a feeling of hard-edged reverberation.
05	Early Ref.	An effect which isolates only the early reflection (ER) component from reverberation. A flashier effect than reverb is produced.
06	Gate Reverb	A type of ER designed for use as gated reverb.
07	Reverse Gate	A reverse-playback type ER.

Delays

#	Type	Description
08	Mono Delay	Mono delay with simple operation.
09	Stereo	Use when you don't need to use complex parameter settings.
10	Mod.delay	Stereo delay with independent left and right.
11	Delay LCR	Mono delay with modulation. Three-tap delay (L, C, R).
12	Echo	Stereo delay with additional parameters for more detailed control. The signal can be fed back from left to right, and right to left.

Modulation-type Effects

#	Type	Description
13	Chorus	Three-phase stereo chorus.
14	Flange	The well-known flanging effect.
15	Symphonic	A Yamaha proprietary effect that produces a richer and more complex modulation than chorus.
16	Phaser	Stereo phaser with 2–16 stages of phase shift.
17	Auto Pan	An effect which cyclically moves the sound between left and right.
18	Tremolo	Tremolo
19	Dual Pitch	Stereo pitch shift with left and right pitches set independently.
20	Rotary	Simulation of a rotary speaker.
21	Ring Mod.	An effect that modifies the pitch by applying amplitude modulation to the frequency of the input. Even the modulation frequency can be con-trolled by modulation.
22	Mod.Filter	An effect which uses an LFO to modu-late the frequency of the filter.

Guitar Effects

#	Type	Description
23	Distortion	Distortion
24	Amp Simulate	Guitar Amp Simulator

Dynamic Effects

#	Type	Description
25	Dyna.Filter	Dynamically controlled filter.
26	Dyna.Flange	Dynamically controlled flanger.
27	Dyna.Phaser	Dynamically controlled phase shifter.

Combined Effects

#	Type	Description
28	Rev+Chorus	Reverb and chorus in parallel
29	Rev->Chorus	Reverb and chorus in series
30	Rev+Flange	Reverb and flanger in parallel
31	Rev->Flange	Reverb and flanger in series
32	Rev+Sympho.	Reverb and symphonic in parallel
33	Rev->Sympho.	Reverb and symphonic in series
34	Rev->Pan	Reverb and auto-pan in parallel
35	Delay+ER.	Delay and early reflections in parallel
36	Delay->ER.	Delay and early reflections in series
37	Delay+Rev	Delay and reverb in parallel
38	Delay->Rev	Delay and reverb in series
39	Dist->Delay	Distortion and delay in series

mLAN8P/8E EQ Library

#	Title	Description
01	Bass Drum 1	Emphasizes the low range of a bass drum and the attack created by the beater.
02	Bass Drum 2	Creates a peak around 80Hz, producing a tight, stiff sound.
03	Snare Drum 1	Emphasizes snapping and rimshot sounds.
04	Snare Drum 2	Emphasizes the ranges of that classic rock snare drum sound.
05	Tom-tom 1	Emphasizes the attack of tom-toms, and creates a long, "leathery" decay.
06	Cymbal	Emphasizes the attack of crash cymbals, extending the "sparkling" decay.
07	High Hat	Use on a tight high-hat, emphasizing the mid to high range.
08	Percussion	Emphasizes the attack and clarifies the high-range of instruments, such as shakers, cabasas, and congas.
09	E.Bass 1	Makes a tight electric-bass sound by cutting very low frequencies.
10	E.Bass 2	Unlike program 9, this program emphasizes the low range of an electric bass.
11	Syn.Bass 1	Use on a synth bass with emphasized low range.
12	Syn.Bass 2	Emphasizes the attack that is peculiar to a synth bass.
13	Piano 1	This is used to make a piano sound brighter.
14	Piano 2	Used in conjunction with a compressor, this program emphasizes the attack and low range of a piano sound.
15	E.G.Clean	Use for line-recording an electric guitar or semi-acoustic guitar to get a slightly hard sound.
16	E.G.Crunch 1	Adjusts the tonal quality of a slightly distorted guitar sound.
17	E.G.Crunch 2	A variation on program 16.
18	E.G.Dist. 1	Makes a heavily distorted guitar sound clearer.
19	E.G.Dist. 2	A variation on program 18.
20	A.G.Stroke 1	Emphasizes the bright tones of an acoustic guitar.
22	A.G.Arpeg. 1	Corrects arpeggio technique of an acoustic guitar.
23	A.G.Arpeg. 2	A variation on program 22.
24	Brass Sec.	Use with trumpets, trombones, or sax. With one instrument, adjust the HIGH or H-MID frequency.
25	Male Vocal 1	Use as a template for male vocal. Adjust the HIGH or H-MID setting according to the voice quality.
26	Male Vocal 2	A variation on program 25.
27	Female Vo. 1	Use as a template for female vocal. Adjust the HIGH or H-MID setting according to the voice quality.
28	Female Vo. 2	A variation on program 27.
29	Chorus&Harmo	Use as a template for a chorus. It makes the entire chorus much brighter.
30	Total EQ 1	Use on a stereo mix during mixdown. Sounds even better when used with a compressor.
31	Total EQ 2	A variation on program 30.
32	Total EQ 3	A variation on program 30. Can also be used with stereo inputs or external effect returns.
33	Bass Drum 3	A variation on program 1. The low and mid range is removed.
34	Snare Drum 3	A variation on program 3. It creates a thick sound.
35	Tom-tom 2	A variation on program 5. Emphasizes the mid and high range.
36	Piano 3	A variation on program 13.
37	Piano Low	Use for the low range of a piano sound recorded in stereo.
38	Piano High	Use for the high range of a piano sound recorded in stereo.
39	Fine-EQ Cass	Use when recording to or from cassette tape to make the sound clearer.
40	Narrator	Use when recording narration.

mLAN8P/8E Dynamics Library

#	Title	Type	Description
01	Comp	COMP	Compressor intended to reduce the overall volume level. Use it on the stereo output during mixdown. It can also be used with the stereo input.
02	Gate	GATE	Gate template.
03	Expand	EXPAND	Expander template.
04	Ducking	DUCKING	Ducking template.
05	Compander(H)	COMPAND-H	Hard-knee compressor template.
06	Compander(S)	COMPAND-S	Soft-knee compressor template.
07	A.Dr.BD	COMP	Compressor program for use with acoustic kit's bass drum.
08	A.Dr.BD	GATE	Gate program for use with acoustic kit's bass drum.
09	A.Dr.BD	COMPAND-H	COMPAND-H program for use with acoustic kit's bass drum.
10	A.Dr.SN	COMP	Compressor program for use with acoustic kit's snare drum.
11	A.Dr.SN	EXPAND	Expander program for use with acoustic kit's snare drum.
12	A.Dr.SN	GATE	Gate program for use with acoustic kit's snare drum.
13	A.Dr.SN	COMPAND-H	COMPAND-H program for use with acoustic kit's snare drum.
14	A.Dr.Tom	EXPAND	Expander program for use with acoustic kit's tom toms, which automatically reduces the volume when the tom toms are not played, helping to differentiate the bass and snare drums clearly.
15	A.Dr.OverTop	COMPAND-S	Soft-knees compander program to emphasize the attack and ambience of cymbals recorded with overhead microphones. It automatically reduces the volume when the cymbals are not played, helping to differentiate the bass and snare drums clearly.
16	E.B.Finger	COMP	Compressor program to level the attack and volume level of a finger-picked electric bass guitar.
17	E.B.Slap	COMP	Compressor program to level the attack and volume level of a slap electric bass guitar.
18	Syn.Bass	COMP	Compressor program to control or emphasize the level of a synth bass.
19	Piano1	COMP	Compressor program to brighten the tonal color of a piano.
20	Piano2	COMP	A variation on program 19, using a deep threshold to change the entire attack and level.
21	E.Guitar	COMP	Compressor program for electric guitar cutting and arpeggio-style backing perfor-mance. The sound color can be varied using different playing styles.
22	A.Guitar	COMP	Compressor program for acoustic guitar stroke and arpeggio-style backing performance.
23	Strings1	COMP	Compressor program for strings.
24	Strings2	COMP	A variation on program 23, intended for violas or cellos.
25	Strings3	COMP	A variation on program 23, intended for string instruments with a very low range, such as cellos or contrabass.
26	BrassSection	COMP	Compressor program intended for brass sounds with a fast and strong attack.
27	Syn.Pad	COMP	Compressor program for synth pad, intended to prevent diffusion of the sound.
28	SamplingPerc	COMPAND-S	Compressor program for sampled sounds, making them as powerful as real acoustic drums. This program is for percussion sounds.
29	Sampling BD	COMP	A variation on program 28, intended for sampled bass drum sounds.
30	Sampling SN	COMP	A variation on program 28, intended for sampled snare drum sounds.
31	Hip Comp	COMPAND-S	A variation on program 28, intended for sampled sound loops.
32	Solo Vocal1	COMP	Compressor program suited for use with solo vocals.
33	Solo Vocal2	COMP	A variation on program 32.
34	Chorus	COMP	A variation on program 32, intended for chorus vocals.
35	Click Erase	EXPAND	Expander program to remove click track sounds that may bleed out of the musicians monitor headphones.
36	Announcer	COMPAND-H	Hard compander program to reduce the music level when the announcer speaks, making the voice clearer.
37	Limiter1	COMPAND-S	A soft-knee compander program with a slow release.
38	Limiter2	COMP	Compressor program using the peak-stop style.
39	Total Comp1	COMP	Compressor intended to reduce the overall volume level. Use it on the stereo output during mixdown. It can also be used with the stereo input.
40	Total Comp2	COMP	A variation on program 39 with greater compression.