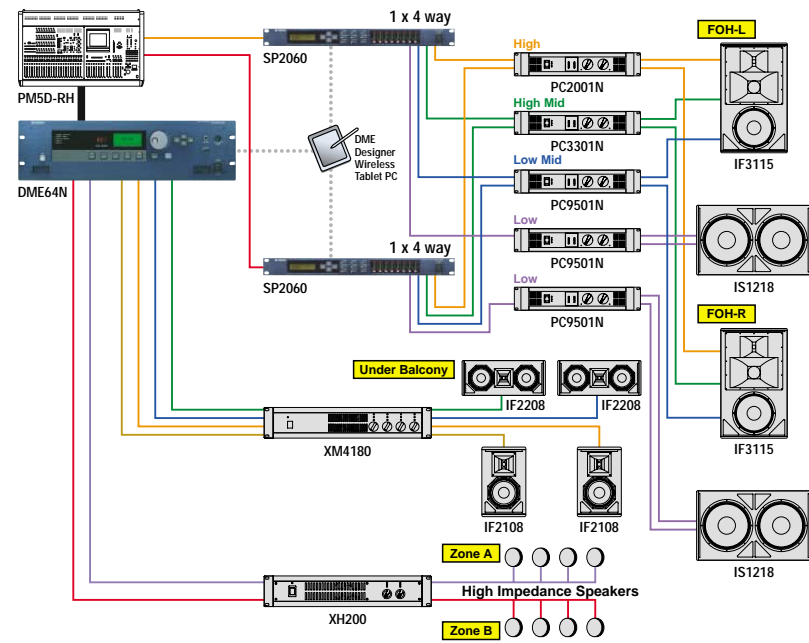## System Examples

This is an example of a simple connection setting in which the signal is distributed into three speakers. The configuration [3x2-way] installed in the SP2060 is used, and power amps are provided for each speaker. The highs and lows are driven by the two channels of each amp.

Using the configuration [2x2Way + 2Aux] built into the SP2060 and driving separate power amps for each of the high and low ranges for the main speakers provide pure high-definition sound. Also, two auxiliary lines are supplied to distribute the sound to two separate locations such as a lobby and a dressing room, and can connect the XH200 installation-use power amp to high-impedance speakers. This way, speaker processing for both main and installation use can be performed with one SP2060.

This example of speaker processing applies to concert halls and other large-scale sound systems. The wide-ranging outputs from the PM5D-RH digital mixer are routed with the DME64N digital mixing engine. The auxiliary outputs such as under-balcony, lobby and dressing room are connected directly to a power amp and speaker. For the main speaker array used as FOH, two SP2060 units are used for the left and right channels. The signal is divided into high, mid, low, and subwoofer ranges, and is driven by power amps prepared for each range.

The SP2060 is optimized for Yamaha Installation Series Speakers, promising even more precise speaker processing. And of course it can be used with all types of speakers.

YAMAHA
SPEAKER PROCESSOR SP2060

Specifications

Analog I/O Characteristics

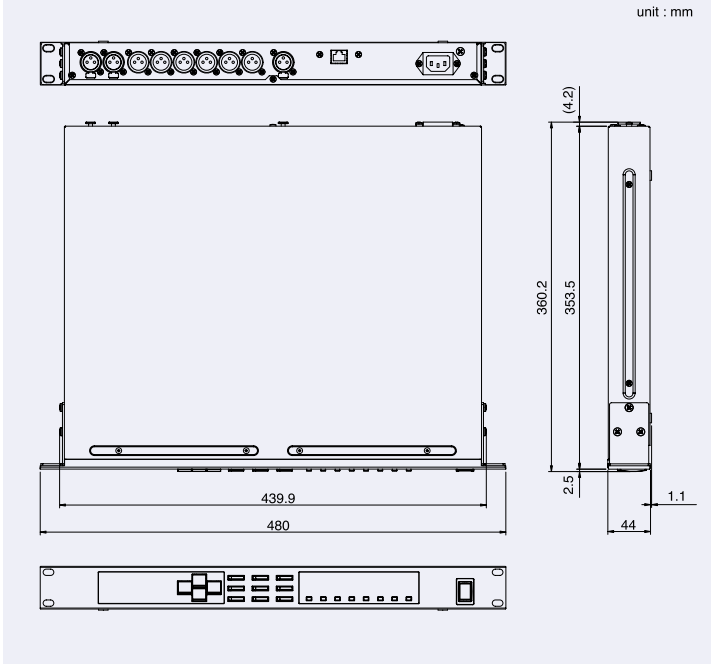| Terminals	Actual Load Impedance	For Use With Nominal	level Nominal	Max. before clip	Connector
INPUT A,B	10kΩ	600Ω Lines	+4dBu (1.23 V)	+24dBu(12.28V)	XLR-3-31 type (Balanced)
OUTPUT 1-6	75Ω	600Ω Lines	+4dBu (1.23 V)	+24dBu(12.28V)	XLR-3-32 type (Balanced)

Digital Input Characteristics

Terminal	Format	Data length	Level	Connector
DIGITAL INPUT AES/EBU	AES/EBU	24bit	RS422	XLR-3-31 type(Balanced)

General Specifications

Sampling Frequency	Internal Clock	96kHz
	External Clock Normal Rate	44.0559kHz - 48.048kHz
	Double Rate	88.1118kHz - 96.096kHz
Signal Delay	761usec INPUT to Output fs=96kHz	
Frequency Response	20Hz-40kHz (TYP 0dB, MAX +0.5dB, MIN -1.0dB) fs=96kHz RL=600Ω	
Total Harmonic Distortion	0.007 % (+22dBu@1kHz) 0.05% (+4dBu@20Hz-20kHz) fs=96kHz RL=600Ω measured with 18dB/octave filter @80kHz	
Ham & Noise	TYP -82dBu MAX -79dBu fs=96kHz RL=600Ω Rs=150Ω measured with 6dB/octave filter @12.7kHz; equivalent to a 20kHz filter with infinite dB/octave attenuation.	
Dynamic Range	106dB AD+DA fs=96kHz RL=600Ω measured with 6dB/octave filter @12.7kHz: equivalent to a 20kHz filter with infinite dB/octave attenuation.	
Crosstalk@1KHz	-80dB INPUT to Output fs=96kHz measured with 18dB/octave filter @80kHz	
Dimensions(WxHxD)	480 x 360.2 x 44 mm	
Net Weight	4.2 kg	

* In these specifications, 0dBu is referenced to 0.775 Vrms.
* All AD converters are 24 bit linear, 64times oversampling.(Fs=96kHz)
* All DA converters are 24 bit linear,128times oversampling.(Fs=48kHz)/64times oversampling.(Fs=96kHz)

Dimensions

unit : mm

Yamaha, an innovator in digital mixer technology, presents its new Digital Speaker Processor that provides excellent sound quality with a wide variety of new features and PC configuration setting capability.

SP2060
SPEAKER PROCESSOR

Rear Panel

Main Features

- Digital speaker processor with a variety of built-in features and highly accurate speaker processing capability
- Equipped with two analog inputs and six analog outputs, plus two AES/EBU format digital inputs
- Provides excellent sound quality that ranks with the most-advanced Yamaha Digital Mixers, with 24bit/96kHz high resolution
- Capable of detailed programming with DME Designer PC application software
- User-friendly design includes Ethernet port enabling direct connection to a computer and an easy-to-operate front panel
- Optimized for Yamaha Installation Series Speakers, guaranteeing speaker processing with tremendous accuracy
- Compact, portable 1U size for smooth setup to meet a variety of needs, from live PA to installation use

Digital speaker processor with a variety of built-in features and highly accurate speaker processing capability

The SP2060 packs all of the features necessary for speaker processing into a compact 1U-size chassis to fully and flexibly meet a variety of speaker processing demands. Our exclusive LSI features the specialized sound processing expected from Yamaha for even higher accuracy in digital signal processing. Many built-in functions play major roles in speaker processing, including gain, delay, PEQ, comp, crossover, and limiter. The highly accurate All-Pass Filter can minutely control just the phase without changing the gain.

Equipped with two analog inputs and six analog outputs, plus two AES/EBU format digital inputs

The rear panel is outfitted with two analog inputs and six analog outputs. Plus, two AES/EBU format digital audio inputs are included, allowing direct input from digital devices. It accepts up to 96kHz digital audio signals without the need for additional hardware, providing great compatibility with digital mixers and other devices. All terminals use XLR type connectors.

Provides excellent sound quality that ranks with the most-advanced Yamaha Digital Mixers, with 24bit/96kHz high resolution

The internal workings utilize audio processing LSI that boasts a superb processing powered mixer, and provides the fantastic sound quality of a tremendous dynamic range with an SN ratio of over 110dB. Also, for the inputs, outputs, internal circuitry, and other aspects of the analog audio stage, we have included technology achieved through our experience in high-end analog mixing console design, such as the professionally lauded PM5000, to maximize sound quality. The SP2060 further contributes to the Yamaha Professional Audio name by providing top-notch sound.

Capable of detailed programming with DME Designer PC application software

With the SP2060, detailed programming on a PC is enabled with the DME Designer software used for programming Yamaha's top-of-the-line digital audio devices, the Digital Mixing Engine DME64N and DME24N, which can be used for a wide variety of applications. By loading data programmed with DME Designer into the main unit, detailed settings can be assigned instantly with a computer, enabling more efficient editing. Also, the method of data processing can be changed even more flexibly to meet the user's needs. This allows programming of large-scale sound systems that use multiple devices such as SP2060, DME64N, and DME24N, and provides the advantage of being able to integrate and collectively manage outputs.

User-friendly design includes Ethernet port enabling direct connection to a computer and an easy-to-operate front panel

SP2060 is equipped with an Ethernet port, which enables direct connection with a PC and allows users to directly load data created with DME Designer. Using wireless LAN, programs and parameters can be set while listening to the sound as heard from the audience's receiving points with a tablet computer or other device. Plus, the main unit's front panel features six output LED meters for excellent operability and visibility, making it user-friendly even if not used in conjunction with a PC.

Optimized for Yamaha Installation Series Speakers, guaranteeing speaker processing with tremendous accuracy

Data for Yamaha Installation Series Speakers, with a great lineup variety and top-notch sound quality, comes preset in the SP2060. This allows highly accurate settings with just a few easy steps, providing the best speaker processing with the least amount of effort.

Compact, portable 1U size for smooth setup to meet a variety of needs, from live PA to installation use

The compact 1U size of the SP2060 gives it tremendous installability and portability as well as superior cost performance. It is ideal for a wide range of applications, from installation in halls and theaters to live sound reinforcement. The bold dark blue color of the front panel also offers a new level of class for professional audio devices.

DME Designer

3 x 2 way

2 x (2 way + Sub)

5 way + AUX

Multi Zone

Speaker Processor_2way

Routing

Input Delay

Input Module

Input EQ

Configuration

#	
1	3x2way
2	3x2way Link
3	2x(2way+Sub)
4	2x(2way+Sub) Link
5	2x2way+2xAux
6	2x2way+2xAux Link
7	2x3way
8	2x3way Link
9	4way+2xAux
10	5way+Aux
11	6way
12	MultiZone

Processing List

Input Select	Digital / Analog, Stereo / Mono
Input Level	+10dB – -∞
Input PEQ	8 band, Stereo Link, Bypass L.SHELF, H.SHELF, 6, 12dB /Oct
Input Delay	1300msec, Stereo Link, Bypass
Crossover	6dB /Oct AdjustGc : 12,18,24,36 or 48dB /Oct Bessel : 12,18,24,36 or 48dB /Oct Butrwrth : 12,18,24,36 or 48dB /Oct Linkwitz : 12, 24, or 48dB /Oct
Output Polarity	Normal / Inverted
Output Delay	500msec, Bypass
Output PEQ	6band, Bypass APF (All Pass Filter) 1st, 2nd Horn EQ
Output Level	+10dB – -∞
Output Limitter	Threshold -54 dB to ±0 dB, Bypass