AW2400 SPECIFICATIONS

GENERAL SPECIFICATIONS
All faders are nominal when measured. Output impedance of signal generator:150ohms

Internal Processing	32bit
Sampling Frequency	44.1, 48kHz (-6% ~ +6%) Internal Clock 44.1, 48kHz (-10% ~ +6%) External Clock
Frequency Response	0, +1/-3 dB 20Hz ~ 20kHz, ref to the nominal output level @1kHz (MIC/LINE INPUT ~ STEREO OUT) (GAIN max)
Total Harmonic Distortion Fs = 44.1kHz *Total Harmonic Distortion is measured with 20kHz LPF	Less than 0.05% @20Hz ~ 20kHz / +4dBu (MIC/LINE INPUT ~ STEREO OUT) (GAIN min)
Dynamic Range *Dynamic range is measured with IHF-A filter	115 dB typ. DA Converter (STEREO OUT) 109 dB min. DA Converter (STEREO OUT) (INPUT CH all off) 110 dB typ. AD+DA (MIC/LINE INPUT to STEREO OUT) 104 dB min. AD+DA (MIC / LINE INPUT to STEREO OUT) (GAIN min)
Crosstalk@1kHz	-70 dB
Phantom Voltage	48V
AD Converter	24 Bit Linear / 128 Times Oversampling
DA Converter	24 Bit Linear / 128 Times Oversampling
MIDI	MTC (Master / Slave), MIDI Clock (Master), MMC (Master / Slave), Program Change, Control Change
Memory	Scene Memory, EQ Library, Compressor Library, Gate Library, Effect Library, Channel Library
Fader	13 x 100mm (Motorized)
Display	320 x 240 dot GRAPHIC LCD (contrast control pot.)
Power Requirements	120V 60Hz 85W, 230V 50Hz 85W, 220-240V 50/60Hz 85W
Dimensions (W x D x H) : mm	533 x 503 x 153
Net Weight	11.5kg
Operating Temperature	5 ~ 35˚C

* 0dBu is referenced to 0.775 Vrms

MIXER

Audio Input Section	MIC/LINE INPUT	8 CH (XLR & PHONE)
	INSERT INPUT	2 CH (STEREO PHONE X 1)
	DIGITAL STEREO IN	2 CH (COAXIAL STEREO x 1)
Audio Output Section	STEREO OUT	2 CH (STEREO x 1)
	MONITOR OUT	2 CH (STEREO x 1)
	OMNI OUT	4 CH (PHONE X 4)
	INSERT OUT	2 CH (STEREO PHONE X 2)
	PHONES	2 CH (STEREO x 1)
	DIGITAL STEREO OUT	2 CH (COAXIAL STEREO x 1)
Card Slot	Mini-YGDAI CARD SLOT	1Slot, max 16 CH (for Mini-YGDAI Card)
Mixer Input Section		Total 48 CH
	MIC/LINE INPUT	16 CH
	INTERNAL EFFECT RETURN	8 CH (STEREO x 4)
	RECORDER MONITOR	24 CH
Internal Effect Section	EFFECTS	4 Units
Master Section		Total 16 Bus
	BUS	4 CH (STEREO x 2)
	AUX	4 CH
	STEREO	2 CH (STEREO x 1)
	SOLO	2 CH (STEREO x 1)
	EFFECT	4 CH

COMMUNICATION WITH EXTERNAL DEVICES

MIDI IN	5 pin DIN
MIDI OUT / THRU	5 pin DIN
FOOT SW	PHONE
USE 2.0	Type B

RECORDER

Recording Resolution		16bit / 24bit
Sampling Frequency		44.1 / 48kHz
Maximum Number of Songs		100 Songs
Maximum Number of Simultaneous Recording / Playback Tracks		16 Tracks Recording (16bit) 24 Tracks Playback (16bit) 8 Tracks Recording (24bit) 12 Tracks Playback (24bit)
Number of Tracks		208 Tracks (24 Tracks + STEREO Track) x 8 Virtual (16bit) 112 Tracks (12 Tracks + STEREO Track) x 8 Virtual (24bit)
HDD	Type Capacity	3.5" IDE 40 GB
Edit Functions	Song Edit Track Edit	OPTIMIZE, DELETE, COPY, IMPORT ERASE, DELETE, INSERT, COPY, MOVE, EXCHANGE, TIME COMP / EXPAND, PITCH CHANGE, EXPORT, CD IMPORT, WAV IMPORT
Other Functions	LOCATE PUNCH I / O PITCH FIX	Quick LOCATE RTZ, A, B, LAST REC IN, LAST REC OUT, DIRECT LOCATE 1 ~ 9 MARK 1~99 MANUAL PUNCH I / O, AUTO PUNCH I / O
CD-RW DRIVE		DATA BACKUP, CD-AUDIO MAKEUP and PLAYBACK, CD-AUDIO IMPORT, WAV FILE IMPORT

AW2400 INPUT OUTPUT CHARACTERISTICS

ANALOG INPUT CHARACTERISTICS

Input Terminals	GAIN	Actual Load Impedance	For Use With Nominal	Input Level		Connector
				Nominal	Max. before clip	
INPUT [1-8]	Min.	3kΩ	50-600Ω Mics & 600Ω Lines	+4dBu (1.23V)	+24dBu (12.28V)	XLR-3-31, Phone Jack (TRS Balanced)
	Max.			-46dBu (3.88mV)	-32dBu (38.84mV)	
INPUT [1,2]	Min.	10kΩ	600Ω Lines	0dBu (0.775V)	+20dBu (7.75V)	Stereo Phone Jack (TRS)

INPUT: XLR-3-31 type connectors are balanced. (1=GND, 2=HOT, 3=COLD)
INPUT: Phone jacks are balanced. (Tip=HOT, Ring=COLD, Sleeve=GND)
INSERT IN Stereo phone jack is unbalanced. (Tip=INSERT OUT, Ring=INSERT IN, Sleeve=GND)
In these specifications, 0dBu=0.775 Vrms.
All AD converters (INPUT1-8) are 24 bit linear, 128times oversampling.
+48V DC (phantom power) is supplied to INPUT(1-8) XLR type connectors via each INPUT1-4, INPUT5-8 switch.

ANALOG OUTPUT CHARACTERISTICS

Output Terminals	Actual Source Impedance	For Use With Nominal	Output Level		Connector
			Nominal	Max. before clip	
STEREO OUT [L,R]	75Ω	600Ω Lines	+4dBu (1.23V)	+24dBu (12.28V)	Phone Jack (TRS Balanced)
MONITOR OUT [L,R]	75Ω	600Ω Lines	+4dBu (1.23V)	+24dBu (12.28V)	Phone Jack (TRS Balanced)
OMNI OUT [1-4]	150Ω	10kΩ Lines	0dBu (0.775V)	+20dBu (7.75V)	Phone Jack (Unbalanced)
INSERT OUT [L,R]	600Ω	10kΩ Lines	0dBu (0.775V)	+20dBu (7.75V)	Stereo Phone Jack (TRS)
PHONES [L,R]	100Ω	8 ~ 40Ω	6mW/8Ω 19mW/40Ω	25mW/8Ω 75mW/40Ω	Stereo Phone Jack (TRS)

STEREO OUT,MONITOR OUT phone jacks are balanced. (Tip=HOT, Ring=COLD, Sleeve=GND)
INSERT OUT Stereo phone jack is unbalanced. (Tip=INSERT OUT, Ring=INSERT IN, Sleeve=GND)
PHONES Stereo phone jack is unbalanced. (Tip=LEFT, Ring=RIGHT, Sleeve=GND)
In these specifications, 0dBu=0.775 Vrms.
All DA converters are 24bit, 128times oversampling.

DIGITAL INPUT CHARACTERISTICS

Terminal	Format	Data Length	Connector
DIGITAL STEREO IN	IEC-60958 (S/P DIF)	24bit	RCA Pin Jack

DIGITAL OUTPUT CHARACTERISTICS

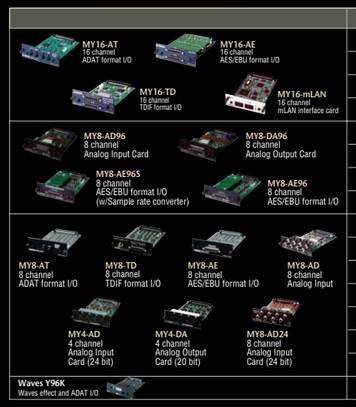
Terminal	Format	Data Length	Connector
DIGITAL STEREO OUT	IEC-60958 (S/P DIF)	24bit	RCA Pin Jack

CONTROL I / O CHARACTERISTICS

Terminal		Format	Level	Connector
(TO HOST)	USB	USB 2.0	0V - 3.3V	B type USB connector
MIDI	IN	MIDI	-	DIN Connector 5P
	OUT/THRU	MIDI	-	DIN Connector 5P

OPTIONS

Available Mini-YGDAI card specifications (for AW2400)
The AW1600 has no I/O expansion slot and cannot use optional mini-YGDAI cards.
* Guidance on the use of Mini-YGDAI cards **http://www2.yamaha.co.jp/div/webmg/pa_card/e/check.php3**



Model	Function	Input	Output*1	Format	Resolution	Frequency
MY16-AT	Digital I/O	16	16	ADAT	24 bit	44.1/48 kHz
MY16-AE	Digital I/O	16	16	AES/EBU	24 bit	44.1/48 kHz
MY16-TD	Digital I/O	16	16	TASCAM	24 bit	44.1/48 kHz
MY16-mLAN	mLAN Interface	16	16	IEEE1394	24 bit	44.1/48 kHz
MY8-AD96	ANALOG IN	8	-	-	24 bit	44.1/48/
MY8-DA96	ANALOG OUT	-	8	-	24 bit	44.1/48/
MY8-AE96S*1	Digital I/O	8	8	AES/EBU	24 bit	44.1/48/
MY8-AE96	Digital I/O	8	8	AES/EBU	24 bit	44.1/48/
MY8-AT	Digital I/O	8	8	ADAT	20 bit	44.1/48 kHz
MY8-TD	Digital I/O	8	8	TASCAM	24 bit	44.1/48 kHz
MY8-AE	Digital I/O	8	8	AES/EBU	24 bit	44.1/48 kHz
MY8-AD	ANALOG IN	8	-	-	24 bit	44.1/48 kHz
MY4-AD	ANALOG IN	4	-	-	24 bit	44.1/48 kHz
MY4-DA	ANALOG OUT	-	4	-	20 bit	44.1/48 kHz
MY8-AD24	ANALOG IN	8	-	-	24 bit	44.1/48 kHz
Y96K	Effect & I/O	8	8	ADAT	24 bit	44.1/48 kHz

Foot Switch FC5

*1. Selectable from STEREO/BUS/AUX/DIRECT OUT/INSERT OUT/CASCADE OUT (STEREO, BUS1-8, AUX1-8, SOLO). See the user's manual for further information.
*2. Sampling Rate Converter for input
• Details depend on each interface card.

For details please contact:

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YAMAHA

AW2400
PROFESSIONAL AUDIO WORKSTATION

AW1600
PROFESSIONAL AUDIO WORKSTATION

The Mobile Musician's Recording Studio

If you're a musician on the move – or with limited "studio" space – you'll want maximum audio workstation performance and functionality with minimum size, weight, and setup hassles. The AW1600 provides extraordinary 24-bit music production power in a remarkably compact, all-in-one unit that can take you all the way from inspiration to finished CD.

AW1600 Main Features

- 8-input/16-track system records top-quality uncompressed 16-bit or 24-bit audio at 44.1 kHz.
- 8 virtual tracks per physical track (18 x 8 in 16-bit mode) provide plenty of capacity for alternate takes.
- Substantial 40-gigabyte high-speed 3.5" hard disk provides plenty of internal storage as well as fast, reliable recording and playback performance.
- Built-in CD-RW drive lets you burn original audio CDs that can be played on any standard CD player, as well as make reliable CD data backups. Copyright permitting, copy CD data to the internal hard drive.
- High-performance 24-bit A/D and D/A converters guarantee outstanding audio quality.
- 4-band EQ and versatile dynamics processing on all mixer inputs and recorder tracks.
- Eight combo XLR/TRS microphone/line inputs, with switchable phantom power for all connectors
- Hi-Z mono phone jack on input 8 for direct guitar input.
- Quick loop sampler with preset rhythm phrases makes it easy to create rhythm tracks.
- Sound Clip function makes it simple to record short audio samples or memos.
- Two high-performance assignable effect processors provide a range of ambience, modulation, mastering, and even guitar effects.
- Pitch Fix function allows precise vocal pitch correction.
- Scene memory allows up to 99 mix setups to be memorized for each song.
- USB 2.0 interface provides fast data transfer between the AW1600 and a computer for effective data management.
- Data compatibility with the Yamaha AW2400, AW4416, AW2816, and AW16G audio workstations.

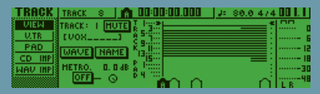
Up To 8 Inputs, 16 Tracks

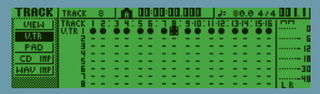
The AW1600 mixer supports up to 8 simultaneous inputs. Eight balanced mic/line XLR type connectors as well as eight balanced or unbalanced TRS phone jacks are provided in "combo connectors" on the rear panel for direct input. You can even record 8 tracks simultaneously for convenient one-take ensemble recording.

Simultaneously Recording / Playback tracks (16bit)			
Mode	Recording	Playback	STEREO Tr
NORMAL	8	16	—
STEREO Tr REC	—	16	2 REC
STEREO Tr PB	—	—	2 PB

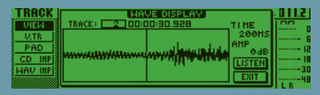
Simultaneously Recording / Playback tracks (24bit)			
Mode	Recording	Playback	STEREO Tr
NORMAL	8	8	—
STEREO Tr REC	—	8	2 REC
STEREO Tr PB	—	—	2 PB

For 16-bit recording and playback the AW1600 recorder section offers a total of 16 tracks, or 8 tracks for 24-bit recording and playback. You also have 8 virtual tracks per physical track – that's 18 (16 + stereo) x 8 in 16-bit mode or 10 (8 + stereo) x 8 in 24-bit mode) – that provide plenty of capacity for alternate takes or arrangements. Any of the mixer's inputs can be easily patched to any of the recorder's tracks for maximum recording flexibility.


TRACK - VIEW


TRACK - VTR

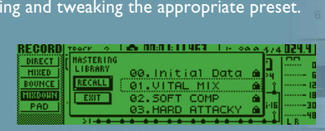

VIEW - MATER


WAVE DISPLAY

Acclaimed Yamaha Effects for Recording, Mixing and Mastering

You'll find Yamaha digital signal processing gear in most of the best studios around the world … and you'll find it in the AW1600. There's no need for external effects processors when you have a stunning range of top-class effects built right in! In fact there are two independent effect processors with corresponding sends and returns so you'll have enough processing power on hand for just about any situation. In addition to a large selection of reverb, delay, modulation, and pitch type effects, the AW1600 include an outstanding range of effects designed specifically for instruments and vocals. There are amp-simulator based guitar effects complete with speaker simulation that let you get great guitar sound without having to actually mic a guitar amplifier. Acoustic guitar hasn't been forgotten, either. You also have effects designed specifically to give you superior bass and vocal sound by simply recalling and tweaking the appropriate preset.

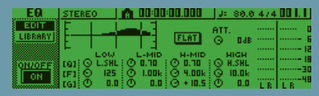
The AW2400 also includes a range of Mastering Effects that provide compression and limiting presets that can help to bring the sound of your overall mix up to professional level prior to burning your tracks to CD.


MASTERING LIBRARY


EFFECT LIBRARY

4-band EQ & Dynamics On Every Input & Track

Even with the advanced functionality of today's integrated audio workstations, compression and gating facilities on every channel is still somewhat of a luxury. Even channel EQ tends to be rather limited in some cases. The AW1600 makes no compromises when it comes to equalization or dynamics processing: in addition to extremely versatile 4-band equalization, you have independent compression and gating capability on every single input channel and recorder track for total dynamics control over your mixes.


EQ - EDIT


TRACK - VIEW


TRACK - VIEW


TRACK - VIEW

Easy-to-use Interface with Yamaha Selected Channel Concept

A thoughtful interface built around a 240 x 64 dot backlit LCD display panel makes recording and mixing with the AW1600 a smooth, efficient operation. Quick navigation keys take you to the functions and displays you need immediately, and a comprehensive complement of control keys and encoders gives you the immediacy of hands-on control where you need it most. The same Selected Channel concept that is at heart of Yamaha's industry-leading digital live mixers and production consoles makes the AW1600 easy to learn and intuitive to use.

The interface also includes large transport keys for sure transport operation, and a data entry section that includes a jog/data dial for fast, efficient data entry.


Easy Rec Routing

From Song to CD In One Unit

When you're ready to release your musical masterpieces to the world at large you can burn them directly to CD right in the AW1600. The AW1600 features a built-in high-performance CD-RW drive that can be used to create audio CDs that will play on any standard CD player, or you can use it to make CD data backups of your song data so that it can be reloaded and remixed or edited at any time.

CD - SETTING

CD - PLAY

CD - WRITE

CD - BACK UP

CD IMPORT

Pitch Fix for Pitch-perfect Vocal Tracks

If a song has vocals, the vocals are the song. You'll undoubtedly want the vocal track to sound as good as it can possibly be. The AW1600 Pitch Fix function means that the occasional off note won't mean you'll have to discard an otherwise excellent track. Pitch Fix can effectively "repair" notes that are a bit sharp or flat without adding any telltale digital artifacts.

PITCH FIX

Quick Loop Sampler

The AW1600 has a built-in pad-type sampler that delivers the same high audio quality as the recorder section. You can assign sixteen stereo waveforms to the four pads using the sample banks, or load audio tracks from the hard disk or WAV files from a CD-ROM. The timing at which each pad is played can be recorded on a dedicated "pad track," and later edited for fine control. The AW1600 comes with a library of over 250 megabytes of pre-recorded drum phrases and sound effects that can be assigned to pads – a fast, easy way to create rhythm and backing tracks for practice or as a basis for original arrangements.

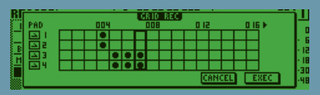
The Quick Loop Sampler also features an improved grid-record interface for fast, easy step recording.

SAMPLE - MEMORY

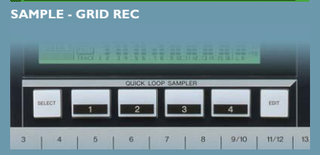
SAMPLE - LIBRARY

SAMPLE - SET UP

SAMPLE - WAV IMP



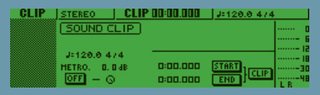
SAMPLE - GRID REC



QUICK LOOP SAMPLER

Quick Sound Clips

Whenever musical inspiration strikes you can quickly record musical "memos" or samples for later use using the AW1600 Sound Clip function. Sound clips are an ideal way to quickly capture ideas for a song or arrangement, or to create simple accompaniment parts for practice.



SOUND CLIP

The Computer Connection

Standard WAV files can be rapidly and reliably transferred back and forth between the AW1600 and a USB-equipped personal computer using the AW1600's fast USB 2.0 interface. You can back up audio data from the AW1600 directly to computer and import audio files into the AW1600 from the computer. In addition to the advanced file management capabilities that this provides you could, for example, move files to the computer for processing in a computer-based audio application and then move them back to the AW1600 for final mastering.

USB STORAGE

Versatile I/O

While many integrated audio workstations still only provide XLR input connectors on two or four inputs, the AW1600 provides a full complement of eight balanced XLR connectors for microphone or line input, as well as eight TRS phone jacks for either balanced or unbalanced line input. The XLR and TRS phone jack inputs are provided in the form of compact "combo connectors."

Switchable phantom power is provided for the XLR inputs so you can use studio-grade phantom-powered condenser microphones in order to capture superior sound right from the source. A Hi-Z mono phone plug input lets guitarists plug directly into the AW1600 in order to record directly via the superb amp simulator effects provided. Direct digital stereo input and output capability is provided via coaxial S/P DIF input and output connectors. Independent monitor and phones output are also provided in addition to the main stereo outs.

Scene Memory

With the AW1600 you can easily set up multiple mixes for each song and recall them as required. Up to 99 "scenes" containing all mix, effect, and other parameters for all channels can be stored for each song. Stored scenes can be recalled at any time via the panel controls or MIDI program change commands.

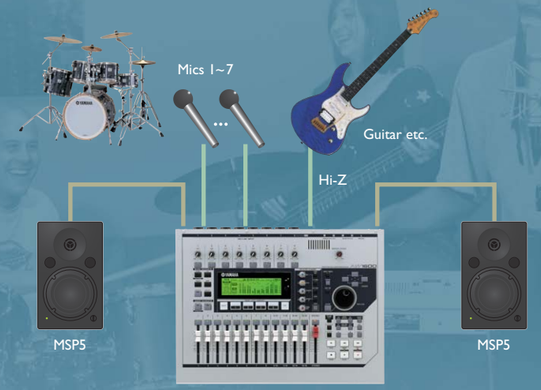
MIDI Remote Control

The AW1600 integrates easily with MIDI gear, too. It allows full parameter control via MIDI commands, so you can record scene changes as well as control changes from the AW1600 to a MIDI sequencer, for example, and then reproduce the recorded operations precisely when the sequence is played back. If you'll be using the AW1600 with MIDI gear such as a Yamaha MOTIF ES series synthesizer, the AW1600 includes a number of control "templates" that instantly set it up for convenient remote controls from the synthesizer's keys and encoders.

System Examples

Streamlined AW1600 System

The AW1600 is designed for ease and portability. And since it features eight XLR/TRS combo inputs you can connect multiple microphone and instrument sources to handle a wide variety of recording situations. There's even a Hi-Z input for direct input of a guitar or bass.



The Complete Musician's Recording Studio

The AW2400 proves that an audio workstation that's easy to use can also offer professional-class features and performance for music production. Once you've learned the basics you can efficiently go from concept to CD while concentrating on the music rather than the technical details.

AW2400 Main Features

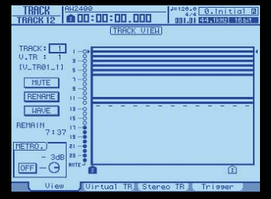
- 16-input/24-track system records top-quality uncompressed 16-bit or 24-bit audio at 44.1 or 48 kHz (12 tracks when recording 24 bit audio).
- 8 virtual tracks per physical track (26 x 8 in 16-bit mode) provide plenty of capacity for alternate takes.
- Substantial 40-gigabyte high-speed 3.5" hard disk provides plenty of internal storage as well as fast, reliable recording and playback performance.
- Built-in CD-RW drive lets you burn original audio CDs that can be played on any standard CD player, as well as make reliable CD data backups. Copyright permitting, copy CD data to the internal hard drive.
- High-performance 24-bit A/D and D/A converters guarantee outstanding audio quality.
- 4-band EQ with a choice of Type I and Type II EQ modes and versatile dynamics processing on all mixer inputs and recorder tracks.
- Full-length 100-millimeter motor faders facilitate precise mixing and mix automation.
- Eight XLR and TRS microphone/line inputs, with switchable phantom power for all XLR connectors and insert patch points on inputs 1 and 2.
- A Mini-YGDAI expansion slot on the rear panel accepts a range of high-performance I/O expansion cards.
- Sound Clip function makes it simple to record short audio samples or memos.
- Four high-performance assignable effect processors provide a range of ambience, modulation, and mastering effects.
- Pitch Fix function allows precise vocal pitch correction.
- Scene memory allows up to 99 mix setups to be memorized for each song.
- USB 2.0 interface provides fast data transfer between the AW2400 and a computer for effective data management.
- Data compatibility with the Yamaha AW1600, AW4416, AW2816, and AW16G audio workstations.

Up To 16 Inputs, 24 Tracks

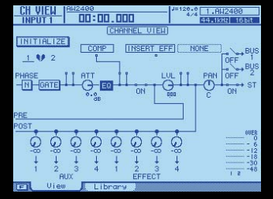
The AW2400 mixer supports up to 16 simultaneous inputs in two layers: eight of the 12 100-millimeter motor faders provided on the AW2400 panel can be instantly switched to control inputs 1~8 or 9~16. Eight balanced mic/line XLR type connectors as well as eight balanced or unbalanced TRS phone jacks are provided on the rear panel for direct input, and an additional eight analog or digital inputs can be provided via an optional Mini-YGDAI expansion card plugged into the AW2400 expansion slot. With all 16 inputs available you can even record 16 tracks simultaneously when recording in 16-bit mode, or you can record up to 8 tracks simultaneously in 24-bit mode.

Simultaneously Recording / Playback tracks (16bit)			
Mode	Recording	Playback	STEREO Tr
16Tr REC	16	8	—
NORMAL	4	24	—
STEREO Tr REC	—	24	2 REC
STEREO Tr PB	—	—	2 PB

Simultaneously Recording / Playback tracks (24bit)			
Mode	Recording	Playback	STEREO Tr
8Tr REC	8	4	—
NORMAL	2	12	—
STEREO Tr REC	—	12	2 REC
STEREO Tr PB	—	—	2 PB



TRACK VIEW

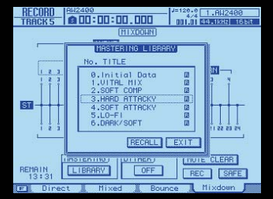


CHANNEL VIEW

For 16-bit recording and playback the AW2400 recorder section offers a total of 24 tracks, or 12 tracks for 24-bit recording and playback. You also have 8 virtual tracks per physical track – that's 26 (24 + stereo) x 8 in 16-bit mode or 14 (12 + stereo) x 8 in 24-bit mode) – that provide plenty of capacity for alternate takes or arrangements. Any of the mixer's inputs can be easily patched to any of the recorder's tracks for maximum recording flexibility. When the TRACK 1~12 or 13~16 mix layer is selected the faders adjust playback level from recorder tracks 1~12 or 13~16, respectively.

Acclaimed Yamaha Effects for Recording, Mixing and Mastering

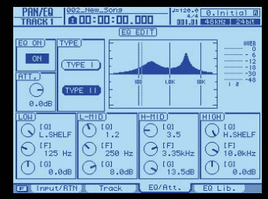
It's no secret that Yamaha makes some of the finest signal processing gear available, and with the AW2400 you get a stunning range of top-class effects built right in! You have four independent effect processors with corresponding sends and returns so you'll have enough processing power on hand for just about any situation. In addition to a large selection of reverb, delay, modulation, and pitch type effects, the AW2400 includes a range of Mastering Effects that provide compression and limiting presets that can help to bring the sound of your overall mix up to professional level prior to burning your tracks to CD.



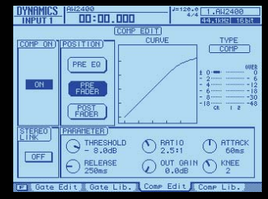
MASTERING LIBRARY

4-band EQ & Dynamics On Every Input & Track

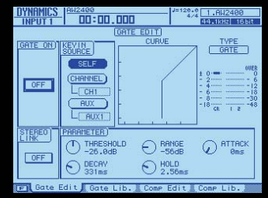
Although some level of EQ capability on every track has come to be expected, there was a time – not so long ago – when not even large mixing consoles in multi-million-dollar recording studios offered compression and gating on every channel. With the AW2400 you have just that: in addition to extremely versatile 4-band equalization, you have independent compression and gating capability on every single input channel and recorder track for total dynamics control over your mixes.



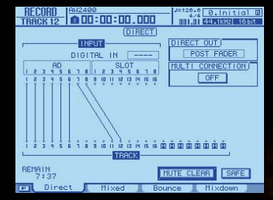
EQ EDIT



COMP EDIT



GATE EDIT

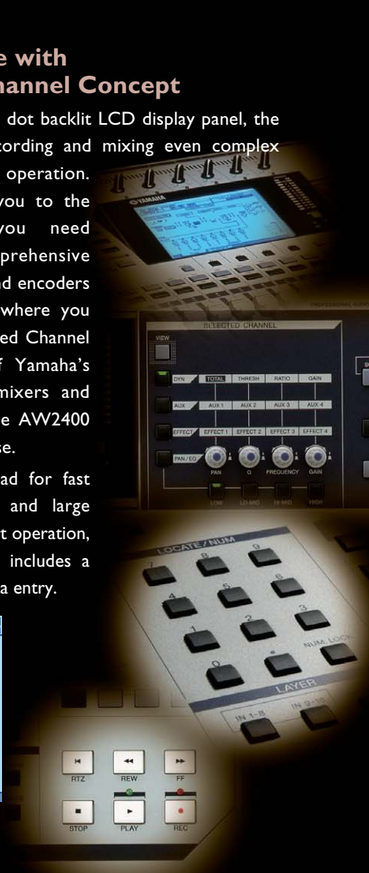


RECORD DIRECT

Easy-to-use Interface with Yamaha Selected Channel Concept

Built around a large 320 x 240 dot backlit LCD display panel, the AW2400 interface makes recording and mixing even complex projects a smooth, efficient operation. Quick navigation keys take you to the functions and displays you need immediately, and a comprehensive complement of control keys and encoders gives you hands-on intimacy where you need it most. The same Selected Channel concept that is at heart of Yamaha's industry-leading digital live mixers and production consoles makes the AW2400 easy to learn and intuitive to use.

There's even a numeric keypad for fast numeric entry and location, and large transport keys for sure transport operation, and a data entry section that includes a jog/data dial for fast, efficient data entry.



From Song to CD In One Unit

Once you've recorded, mixed and mastered your musical creations you can burn them directly to CD right in the AW2400. The AW2400 features a built-in high-performance CD-RW drive that can be used to create audio CDs that will play on any standard CD player, or you can use it to make CD data backups of your song data so that it can be reloaded and remixed or edited at any time.

CD SETTING

CD WRITE

CD PLAY

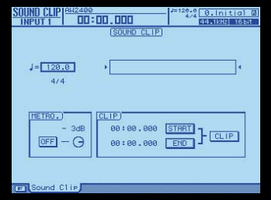
Scene Memory

The AW2400 makes it easy to setup multiple mixes for each song and recall them as required. Up to 99 "scenes" containing all mix, effect, and other parameters for all channels can be stored for each song. Stored scenes can be recalled at any time via the AW2400 panel controls, MIDI program change commands, or Automix events.

SCENE LIBRARY

Quick Sound Clips

Whenever you need to quickly record a musical "memo" or sample for later use, the AW2400 Sound Clip function is ready to roll. Sound clips are an ideal way to quickly capture ideas for a song or arrangement, or to create simple accompaniment parts for practice.



CD WRITE

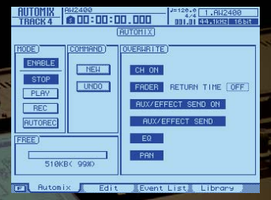
Pitch Fix for Pitch-perfect Vocal Tracks

PITCH FIX

If a song has vocals, you'll undoubtedly want the vocal track to sound as good as you can possibly make it. Since singers are human the occasional off note is to be expected, but with the AW2400 Pitch Fix function they won't mean you'll have to discard an otherwise excellent track. Pitch Fix can effectively "repair" notes that are a bit sharp or flat without adding any telltale digital artifacts.

Advanced Automix Capability

Complex mixes can require more fader moves, channel switching and other operations than one pair of hands can handle. The AW2400 Automix function provides a powerful solution. Automix allows fader, channel switch, pan, EQ, AUX send, effect send, and scene/library recall operations to be recorded and played back in real time. You can even record operations one at a time, "overdub" style. With this advanced feature complex mix and bounce operations can be accurately reproduced as many times as necessary. And Automix data can be edited in detail for no-compromise control precision.



AUTMIX

Serious I/O

Unlike many all-in-one audio workstations the AW2400 provides a full complement of eight balanced XLR connectors for microphone or line input, as well as eight TRS phone jacks for either balanced or unbalanced line input.

Switchable phantom power is provided for the XLR inputs so you can use studio-grade phantom-powered condenser microphones in order to capture superior sound right from the source. Insert patch points on inputs 1 and 2 allow insertion of external processing gear. Direct digital stereo input and output capability is provided via coaxial S/P DIF input and output connectors.

In addition to the main stereo and monitor outputs, the AW2400 also features four OMNI OUT connectors that can be assigned to output signals from just about anywhere in the system for additional signal feeds wherever they might be required. When you need more inputs and/or outputs – analog or digital – you have an excellent range of Yamaha Mini-YGDAI expansion cards from which to choose.

OUTPUT PATCH

The Computer Connection

The AW2400 features a fast USB 2.0 interface that can be connected to a USB-equipped personal computer to allow standard WAV files to be transferred back and forth. You can back up audio data from the AW2400 directly to computer and import audio files into the AW2400 from the computer. In addition to providing advanced file management capabilities this means you could, for example, move files to the computer for processing in a computer-based audio application and then move them back to the AW2400 for final mastering.

USB STORAGE

MIDI Remote Control

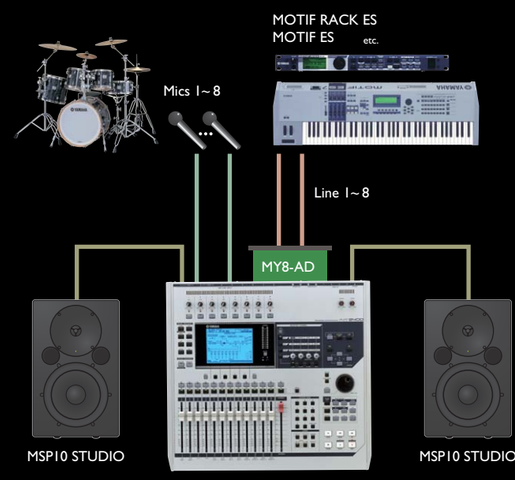
The AW2400 allows full parameter control via MIDI commands, so you can record scene changes as well as control changes from the AW2400 to a MIDI sequencer, for example, and then reproduce the recorded operations precisely when the sequence is played back. If you'll be using the AW2400 with MIDI gear such as a Yamaha MOTIF ES series synthesizer, the AW2400 includes a number of control "templates" that instantly set it up for convenient remote controls from the synth's keys and encoders.

REMOTE I

System Examples

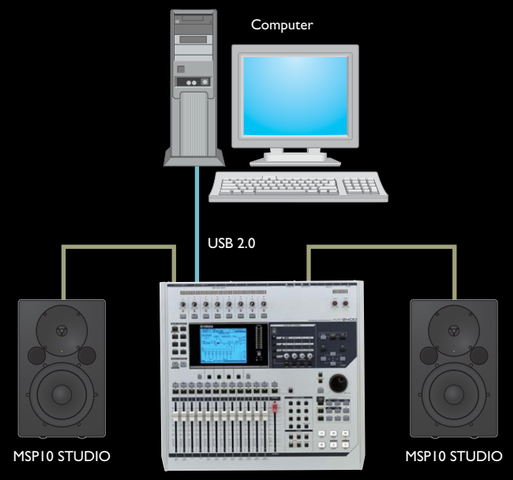
Band Recording

Since the AW2400 allows simultaneous recording of up to 16 tracks with an optional mini-YGDAI I/O card installed, it is an ideal choice for making one-take band recordings. And once the band is recorded, you can use it's advanced mixing capabilities and effects to mix, master, and burn directly to CD!



AW + Computer Production

All you need to connect to a personal computer is a single USB cable. Once connected you can use the computer to manage and back up your audio files and projects, and even use computer-based audio editors for additional production control. You can even control the AW2400 remotely from the computer.



AW1600 SPECIFICATIONS

GENERAL SPECIFICATIONS All faders are nominal when measured. Output impedance of signal generator:150ohms

Internal Processing	32bit	
Sampling Frequency	44.1kHz (-6% ~ +6%) 44.1kHz (-10% ~ +6%)	Internal Clock External Clock
Frequency Response	0, +1 / -3 dB, 20Hz - 20kHz,ref to the nominal output level @1kHz (MIC / LINE INPUT – STEREO / AUX OUT, GAIN min)	
Total Harmonic Distortion Fs = 44.1kHz *Total Harmonic Distortion is measured with 20kHz LPF	Less than 0.03% @1kHz / -10dBV (MIC / LINE INPUT – STEREO / AUX OUT, GAIN min)	
Dynamic Range *Dynamic range is measured with IHF-A filter	109 dB typ. DA Converter (STEREO / AUX OUT), 103 dB min. DA Converter (STEREO / AUX OUT), (INPUT CH all off) 103 dB typ. AD+DA (MIC / LINE INPUT to STEREO / AUX OUT) 97 dB min. AD+DA (MIC / LINE INPUT to STEREO / AUX OUT), (GAIN min)	
Crosstalk@1kHz	-70 dB	
Phantom Voltage	48V	
AD Converter	24 Bit Linear / 64 Times Oversampling	
DA Converter	24 Bit Linear / 128 Times Oversampling	
MIDI	MTC (Master / Slave), MIDI Clock (Master), MMC (Master / Slave), Program Change, Control Change	
Memory	Scene Memory, EQ Library, Dynamics Library, Effect Library	
Fader	13 x 60mm	
Display	240 x 64 dot GRAPHIC LCD (contrast control pot.)	
AC Adaptor	PA-300	
Dimensions (W x D x H) : mm	455 x 349 x 107	
Net Weight	6.2kg	
Operating Temperature	5~35°C	

MIXER

Audio Input Section	MIC / LINE INPUT DIGITAL STEREO IN	8 CH (COMBO XLR+PHONE) 2 CH (COAXIAL STEREO x 1)
Audio Output Section	MONITOR OUT PHONES STEREO / AUX OUT DIGITAL STEREO OUT	2 CH (STEREO x 1) 2 CH (STEREO x 1) 2 CH (STEREO x 1) 2 CH (COAXIAL STEREO x 1)
Mixer Input Section		Total 36 CH
	MIC / LINE INPUT INTERNAL EEEFECT RETURN RECORDER MONITOR QUICK LOOP SAMPLER	8 CH 4 CH (STEREO x 2) 16 CH 8 CH (STEREO x 4)
Internal Effect Section	EFFECTS	2Units
Master Section		Total 8 Bus
	BUS AUX STEREO EFFECT	2 CH (STEREO x 1) 2 CH 2 CH (STEREO x 1) 2 CH

RECORDER

Recording Resolution		16bit / 24bit	
Sampling Frequency		44.1kHz	
Maximum Number of Songs		100 Songs	
Maximum Number of Simultaneous Recording / Playback Tracks		8 Tracks Recording (16bit) 8 Tracks Recording (24bit)	16 Tracks Playback (16bit) 8 Tracks Playback (24bit)
Number of Tracks		144 Tracks (16 Tracks + STEREO Track) x 8 Virtual	
HDD	Type Capacity	3.5"IDE 40 GB	
Edit Functions	Song Edit Track Edit	OPTIMIZE, DELETE, COPY, IMPORT ERASE, DELETE, INSERT, COPY, MOVE, EXCHANGE, TIME COMP / EXPAND, PITCH CHANGE, EXPORT, CD IMPORT, WAV IMPORT	
Other Functions	LOCATE PUNCH I / O PITCH FIX	Quick LOCATE MARK MANUAL PUNCH I / O, AUTO PUNCH I / O	RTZ, A, B, LAST REC IN, LAST REC OUT 1~99
CD-RW DRIVE		DATA BACKUP, CD-AUDIO MAKEUP and PLAYBACK, CD-AUDIO IMPORT, WAV FILE IMPORT	

QUICK LOOP SAMPLER

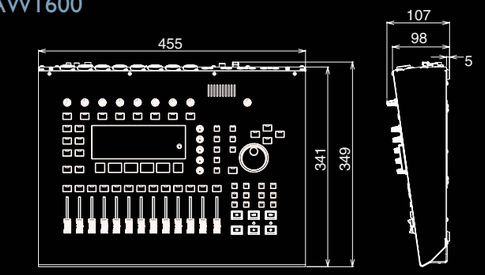
POLYPHONY	4 VOICES (STEREO)
RECORDABLE TIME	Total 47 seconds (STEREO sound) (16bit) Total 29 seconds (STEREO sound) (24bit)
Edit Functions	NAME, TRIM, PLAYBACK MODE, ERASE, EXTRACT, CD IMPORT, TRACK IMPORT, WAV IMPORT

COMMUNICATION WITH EXTERNAL DEVICES

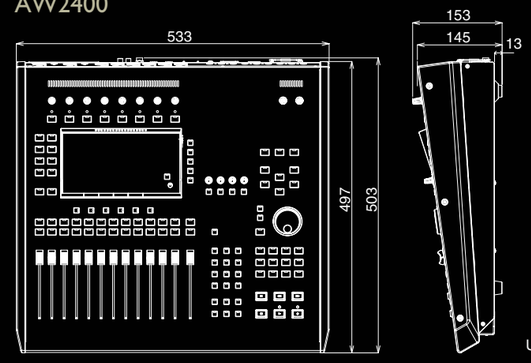
MIDI IN	5 pin DIN
MIDI OUT / THRU	5 pin DIN
FOOT SW	PHONE
USB 2.0	Btype

DIMENSIONS

AW1600



AW2400



Unit: mm

AW1600 INPUT OUTPUT CHARACTERISTICS

ANALOG INPUT CHARACTERISTICS

Input Terminals	GAIN	Actual Load Impedance	For Use With Nominal	Input level		Connector
				Nominal	Max. before clip	
INPUT [1-8]	Min.	3kΩ	50-600Ω Mics & 600Ω Lines	+4dBu (1.23V)	+18dBu (6.16V)	Combo type (XLR+PHONE)
	Max.			-46dBu (3.88mV)	-32dBu (19.47mV)	
INPUT 8 HI-Z	Min.	500kΩ		+46dBu (1.23V)	+18dBu (6.16V)	Phone Jack
	Max.			-46dBu (3.88mV)	-32dBu (19.47mV)	

Combo type connectors are balanced. (1 / Sleeve=GND, 2 / Tip=HOT, 3 / Ring=COLD)
In these specifications, when dBu represents specific voltage, 0dBu is referenced to 0.775 Vrms.
All AD converters (INPUT1-8) are 24 bit linear, 64times oversampling.
+48V DC (phantom power) is supplied to INPUT (1-8) XLR type connectors via 1-4CH, 5-8CH switch.

ANALOG OUTPUT CHARACTERISTICS

Output Terminals	Actual Source Impedance	For Use With Nominal	Output Level		Connector
			Nominal	Max. before clip	
STEREO OUT / AUX OUT	150Ω	10kΩ Lines	-10dBV (0.316V)	+4dBV (1.58V)	Phone Jack
MONITOR OUT [L,R]	150Ω	10kΩ Lines	-10dBV (0.316V)	+4dBV (1.58V)	Phone Jack
PHONES [L,R]	28Ω	8~40Ω	6mW / 8Ω 9mW / 40Ω	25mW / 8Ω 35mW / 40Ω	Stereo Phone Jack (TRS)

Phone jacks are unbalanced.
PHONES: stereo phone jack is unbalanced. (Tip=LEFT, Ring=RIGHT, Sleeve=GND)
In these specifications, when dBV represents specific voltage, 0dBV is referenced to 1.00 Vrms.
All DA convertors are 24bit, 128times oversampling.

DIGITAL INPUT CHARACTERISTICS

Terminal	Format	Data length	Connector
DIGITAL STEREO IN	IEC-60958 (S/P DIF)	24bit	RCA Pin Jack

DIGITAL OUTPUT CHARACTERISTICS

Terminal	Format	Data length	Connector
DIGITAL STEREO OUT	IEC-60958 (S/P DIF)	24bit	RCA Pin Jack

CONTROL I / O CHARACTERISTICS

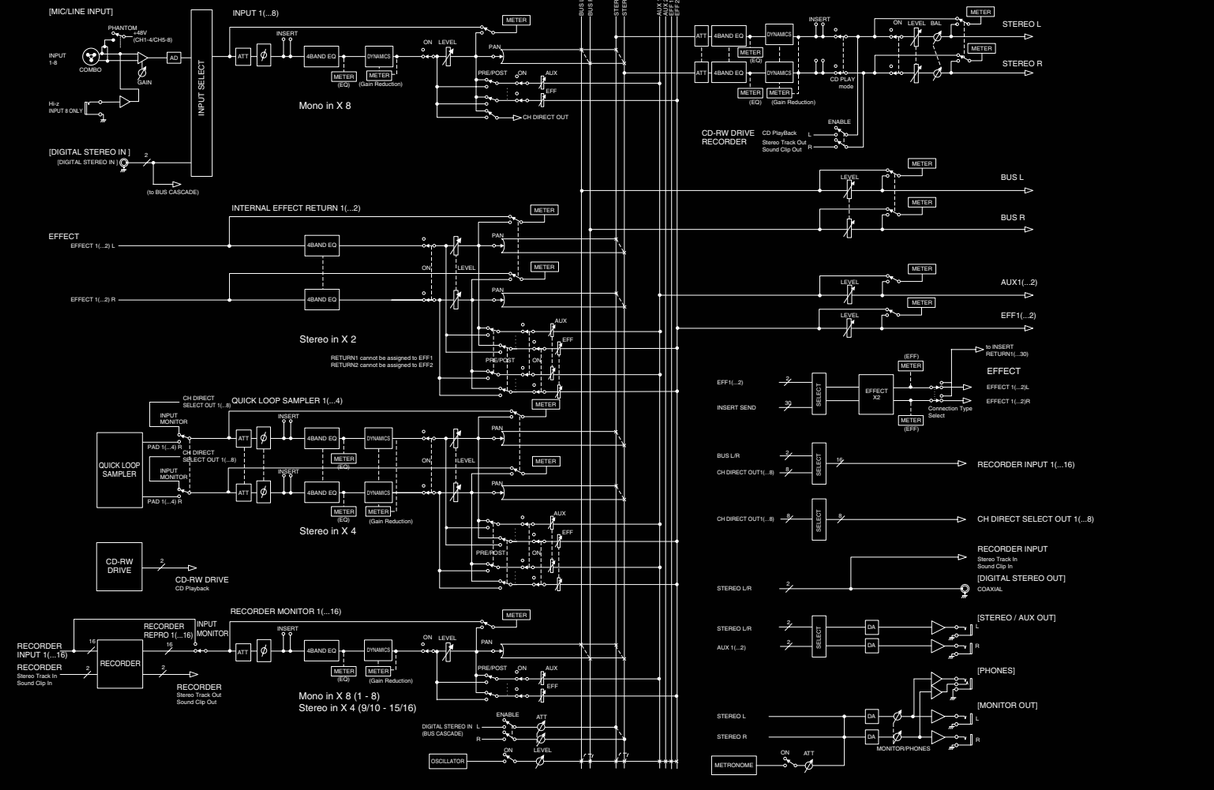
Terminal		Format	Level	Connector
(TO HOST)	USB	USB 2.0	0V - 3.3V	B type USB connector
MIDI	IN	MIDI	-	DIN Connector 5P
	OUT/THRU	MIDI	-	DIN Connector 5P

REAR PANEL

AW1600

AW2400

AW1600 BLOCK DIAGRAM



AW2400 BLOCK DIAGRAM