⊕ YAMAHA

DM 2000VCM
DIGITAL PRODUCTION CONSOLE

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The Renowned DM2000 Plus
an Extraordinary New Range of Effects and Simulations

Yamaha's top-of-the-line DM2000 Digital Production Console is already well established as a standard in the professional audio production field.
It has become the first choice of discerning audio professionals worldwide because of its unsurpassed audio quality, superior versatility, outstanding reliability, and advanced surround monitoring capabilities that made it one of the first digital consoles in the world to win THX pm3™ approval.
The new DM2000VCM is the DM2000 Version 2 plus a formidable array of state-of-the-art processing technologies that provide all-new production power.
You now have extraordinary recreations of classic compression and EQ units from the 70's, simulations of several legendary analog open-reel tape decks, a complete suite of unmatched REV-X reverb effects, a surround post-production package that is second to none, and even a selection of vintage stomp boxes to spice up your mixes. And all of this is right at your fingertips, with no need to patch in external processors.
The technology that has made all of this possible is some of the most advanced in the world, and the sound is simply superb.
In short, one of the world's most popular digital production consoles just got a lot more powerful.

■ VCM Technology

VCM technology is responsible for the classic compressor, EQ, analog tape deck, and stomp-box effect simulations in the DM2000VCM. VCM (Virtual Circuitry Modeling) technology actually models the characteristics of analog circuitry – right down to the last resistor and capacitor. VCM technology goes well beyond simply analyzing and modeling electronic components and emulating the sound of old equipment. It's capable of capturing subtleties that simple digital simulations cannot even approach, while actually creating ideal examples of sought-after vintage gear.

■ iSSP Technology

iSSP technology is the key to the DM2000VCM's incredible selection of surround post-production effects. iSSP stands for "Interactive Spatial Sound Processing," and is Yamaha's original new spatial sound effect system. Designed through extensive research and exhaustive testing, this technology offers unparalleled reality, operability and originality for surround processing applications. It delivers unprecedented sound-field positioning precision and versatility, as well as realistic sound source movement effects with simple operation that allows simulations of an almost unlimited variety of spatial environments.

■ REV-X

"REV-X" is the advanced algorithm behind Yamaha's newest generation of reverb and ambience programs, offering unprecedented reverberation depth and realism with smooth decay. REV-X technology takes full advantage of the 24-bit 96-kHz processing capability of the DM2000 for reverb and ambience effects that have the reassuring warmth and reality of natural acoustic environments.

The Team and the Technology Behind the Sound

"Modeling is a means to an end, not the final goal." Mr. Toshifumi Kunimoto, the central figure of Yamaha's physical modeling technology team, has a fine track record when it comes to meeting some very challenging goals. The division known at Yamaha as "K's Lab" ("K" for "Kunimoto") was established in 1987 to develop new modeling technology that would become the next phase in synthesizer evolution after the FM and PCM tone generators that were the mainstay of the synthesizer world at the time.
The result was the world's first physical modeling synthesizers – the VL1 and VP1 – released in 1993. Research and development has continued relentlessly ever since, and in 2001 the K's Lab team began aiming it's formidable technological capabilities at physical modeling for effects, and that's when Mr. Kunimoto's goal began to take on primary importance. The goal? In a word, "musicality."
The K's Lab team were aware that the earliest effect modeling technologies were focused more on superficial reproduction of specific characteristics and tonalities than on actually making music, and it was clear that by applying the same physical modeling technology that was used in the original VL1 and VP1 synthesizers, although in a significantly more evolved form, it would be possible to deliver truly accurate, eminently musical effects. And rather than relying on frequency response graphs and other "precision" measurements to evaluate final performance, many critical performance decisions were made using the trained ears of top-level music and sound specialists.

The Birth of VCM

It took more than two years of concentrated work, but by 2003 K's Lab had refined and re-purposed physical modeling to the point where it was ready for practical implementation … in the form of Virtual Circuit Modeling. VCM is the cornerstone of Yamaha's Add-On Effects, and achieves it's stunning sonic and musical performance by actually modeling the individual characteristics of the multitude of parts and components that contributed to the final sound of the original analog circuits: transistors, tape, tape heads, etc. Even subtle saturation effects have been painstakingly modeled to bring the warmth and richness of the original analog gear back to life in stable, easy-to-operate digital form.

Making Space

A new addition to Yamaha's powerful Add-On Effect arsenal is iSSP (Interactive Spatial Sound Processing). This innovative effect takes surround sound to new levels of reality and creative control. iSSP is actually a combination of two advanced modeling technologies that add up to the most realistic spatial simulation available anywhere:

• Room acoustics modeling that both predicts sound reflection patterns based on room shape, and actually models the decay of the reflections based on source directivity and room surface materials.

• Matrix sound processing that converts source position data to parameters that precisely control the output of each matrix channel, and simulates distance-related decay through delay and filter processing.

It sounds complicated, but all this powerful technology is packaged in a way that makes it easy and in intuitive to operate.

Dedicated DSP LSIs Deliver Unprecedented 24-bit, 96 kHz Performance

Unlike equipment that achieves operation in 96K mode with reduced number of tracks, the DM2000 imposes no such limitations — whether running at 44.1kHz, 48kHz, 88.2kHz or 96kHz. In the DM2000, 96kHz with 32-bit internal processing is the standard. To achieve this, no fewer than 14 newly-developed YAMAHA DSP7 LSIs are utilized in the mixer section, and eight DSP6 LSIs for effects, achieving performance that stretches the limits of the most advanced technology currently available. By way of comparison, the Yamaha 02R – the digital mixing console that almost single-handedly started the digital production revolution, and rapidly became the industry standard – uses six DSP3 chips in it's mixer section. A single DSP7 chip has more than four times the processing power of a DSP3. The DM2000 provides more than 9 times the processing power of the 02R. We're talking about 96 channels of super-clean, super-dynamic, noise-free 24-bit/ 96 kHz audio, plus all the additional effects and processing you'll ever need for most applications. At 44.1 or 48 kHz the DM2000 is barely idling.

Internal Effects Fully Support 96 kHz Processing

What's the point of having 24 bit/96 kHz audio if you have to convert down to a lower sampling rate for effect processing? The point may seem obvious, but that's exactly what's happening if you're using hardware or software processors that don't offer 24 bit/96 kHz performance anywhere in your signal chain. That's why Yamaha included a comprehensive range of 96 kHz compatible stereo effects in the DM2000 – plus several designed specifically for surround. And you can use as many as eight individual effect processors simultaneously.

Finest Mic-Preamps with Onboard 24bit/96kHz AD/DA Conversion

Taking the preceding discussion a step further, what about analog-to-digital and digital-to-analog conversion? The same applies: if you don't have all 24 bits at the full 96 kHz in top-quality converters, you're definitely going to be missing something (i.e. part of your sound). Once again, the DM2000 imposes no limitations. All onboard A/D and D/A conversion makes use of top-performance 24 bit/96 kHz converters. This is particularly important in the DM2000 because it features some of the finest analog mic preamps available in any console, anywhere. The on-board converters ensure that you get an excellent digital representation of the warm, transparent output from

these remarkable mic preamps. A new range of Mini-YGDAI digital and analog I/O cards also provide full 24 bit/96 kHz capability.
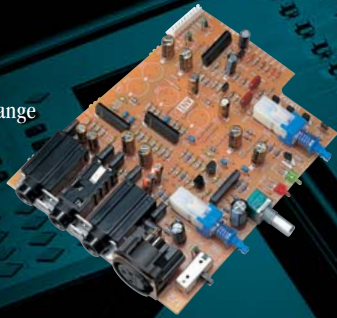
Comprehensive Automation and Scene Control

Automation and Scene Memory recall capability are essential elements of modern digital mixing consoles. With the DM2000, Yamaha takes these functions to an even higher level of precision and ease-of-use. While providing full automation of virtually all console parameters, DM2000 features smooth and quiet touch-sensitive, 100mm motorized faders that make writing and updating automated mixes faster and more intuitive than ever. And all automation data is recorded at 1/4-frame accuracy to ensure excellent precision. Global Fade Time and Global Recall Safe are in addition to independent fade time and recall safe settings for each scene, you can set global fade time and recall safe settings that apply to all scenes. This ability can dramatically reduce setup time when you will be using multiple scenes with the same settings.

INPUT FADE TIME

Complete Surround Solution
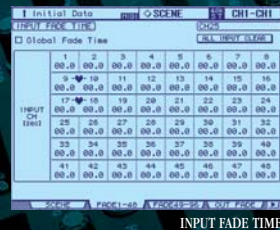
SURROUND MONITORING

The DM2000 provides everything required for a complete surround solution. All the facilities you need for surround processing, panning and monitoring — including joystick — are provided as standard equipment. The joystick is the perfect (and generally preferred) tool for smooth, continuous positioning of 5.1 or 6.1 surround sound for DVDs or other surround media. And since accurate monitoring is so essential to surround production, extra care was taken to ensure that the DM2000 offers the ideal mixing environment — it includes a downmix matrix which can deliver 3-1 (LCRS) and stereo mixes while you are burning a surround mix to DVD, bass management, and speaker alignment facilities for optimum speaker system tuning. The DM2000 will even handle multiple surround stem mixes with ease.

Intuitive Interface Designed for Maximum Productivity

Anyone who is familiar with the 02R will immediately feel comfortable with the DM2000. While the comprehensive, efficient display format of the 02R has been inherited by the DM2000, the control surface and user interface system has been greatly expanded and enhanced to allow analog-style hands-on operation with minimum need to refer to the LCD. The motto: mix with your ears, not with your eyes. 16 user-defined keys which can be assigned the functions of your choice are also provided.

96 Channels in 4 Layers

One of the advantages of working with digital is that it allows maximum power and flexibility to be packed into minimum space. The DM2000's 24 precision 100-millimeter motorized channel faders, for example, can be instantaneously layer-switched to control any of 96 channels. So you have 96 channels in the space of 24, and switching between layers with the channels right in front of you can be a lot faster and easier than trying to locate a desired channel on a massive spread-out console. More importantly, all operations can be carried out without having to move away from the monitoring "sweet spot". Encoder mode now features an assignable function, Alternative Layer, which enables you to control the channel level for all 48 channels without switching between layers.

Extraordinary Patching Flexibility

All available inputs, outputs, effects, and channel inserts can be assigned to any of the console's channels or outputs via the DM2000's remarkably versatile, easy-to-use digital patching system. For example, any of the 8 effect processors can be assigned to an auxiliary buss for send-type operation, or inserted directly into any input channel as required. A direct out function also allows the signal from any of the 96 input channels to be routed directly to any digital or analog output in the system. Further, a 22 by 8 (4-stereo) matrix mix system in the DM2000 can be used to provide cue monitor mixes, downmix monitoring for surround production, or zone level control for sound reinforcement applications. The fully flexible patching system makes 22 of DM2000's busses (eight record/subgroup busses, 12 auxiliary sends, L/R stereo buss) and four stereo matrixes — to be assigned to any available output connector.

I/O Expandability and Plug-in Capability

The DM2000's real I/O versatility comes in the form of six Mini-YGDAI expansion slots. The expansion slots are 24 bit/96 kHz compatible, so you can select I/O and processing cards to provide the input/output configuration and processing capabilities that are perfect for your needs. Whether you need digital I/O in ADAT, TASCAM, or AES/EBU format, CobraNet connectivity, or extra analog I/O capability, the appropriate Mini-YGDAI cards are available.

Channel Name and FL Display

A much-appreciated feature of Yamaha's ground-breaking PM1D digital sound reinforcement console is individual channel name displays. The DM2000 has inherited this feature so you can identify channels at a glance — a particular advantage when switching between mixing layers. In addition to the default 4-character channel name display, you can hold down the SEL key for any channel to see a long name of up to 16 characters displayed across the 8-channel section. Version 2 adds fader level and port name display functions. With graphic FL display, you can see the status of the channel at a glance.

PREFERENCES2
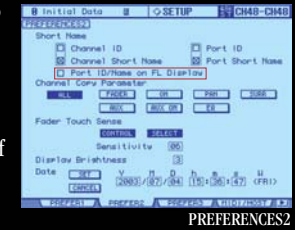
Standard Display

Long Name Display

Integrated DAW Control

Advanced Protocol DAW control

The DM2000 has been designed to integrate tightly with leading digital audio workstations to create a complete production and mixing environment. Extensive support for Digidesign's Pro Tools® system provides full control of mixing and processing parameters, as well as transport/track-arming control and access to editing functions, directly from the DM2000 control surface. The new Advanced DAW Control Protocol, initiated by Yamaha and Steinberg, enables you to control DAW software such as Nuendo® and Cubase SX® by using DM2000's SELECTED CHANNEL section. (Controllable functions vary depending on the DAW software and version you are using.)

Studio Manager Version 2 Software Supplied

Control from a personal computer? Of course! And Yamaha even supplies the software. The DM2000 comes with the Studio manager application for both Macintosh® and Windows® platforms, allowing total control and management of all DM2000 parameters via a comprehensive graphic interface. Studio Manager Version 2 offers even more advanced networking potential than the original version, functioning as a complete central management system for digital mixing.
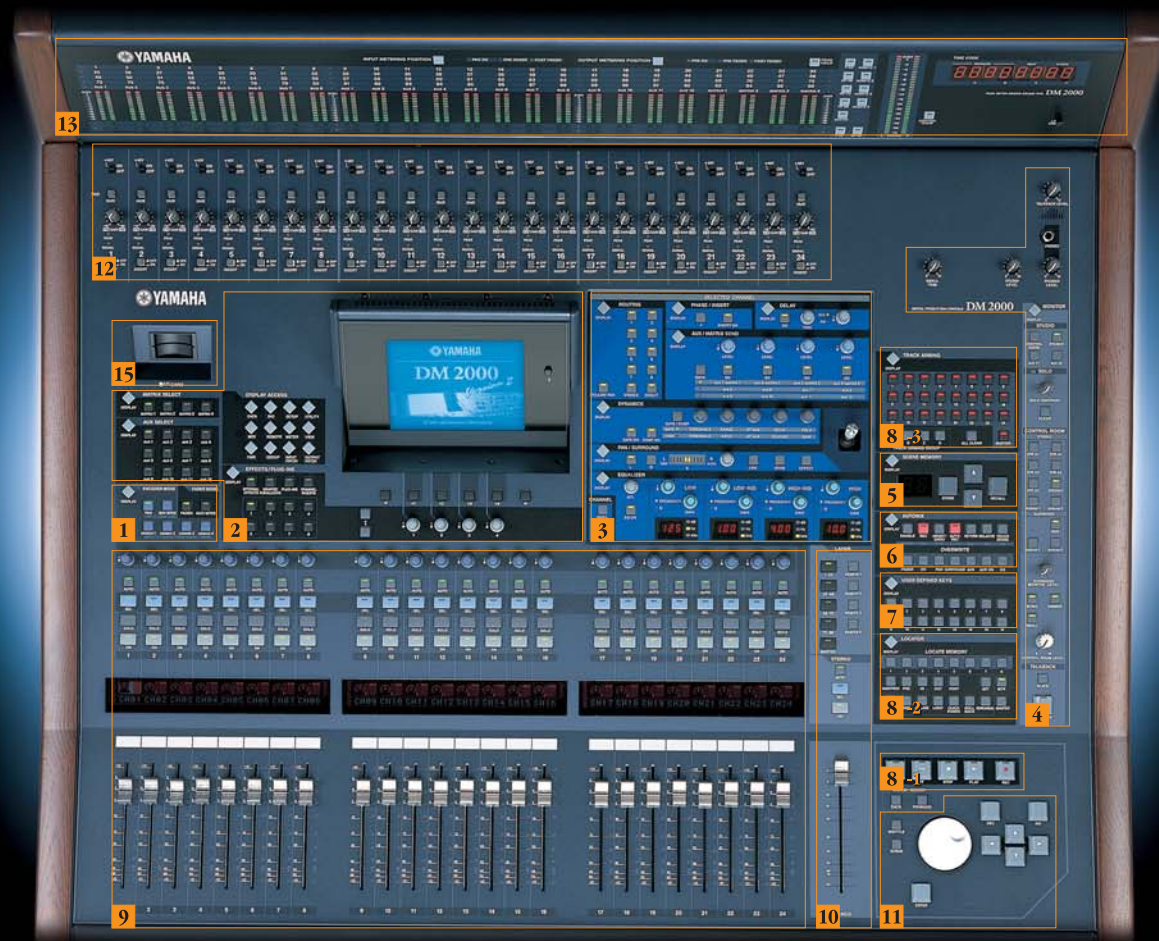
DM 2000

Extraordinary Power & Flexibility In an Intuitive Interface

Advanced features and functions are only of real value if they are easily accessible, easy to use, and make sense within the context of the production process. The Yamaha DM2000 has been designed on the strength of past successes plus invaluable feedback from leading engineers and artists worldwide. It is the latest step in an ongoing evolution that makes more production power, creative potential, and operational efficiency available than ever before. Version 2 further builds on experience gained from the original DM2000, taking takes interface ease-of-use and versatility to unprecedented levels.

* Rear panel shown with optional expansion boards installed.

1. Fader & Encoder Mode

The FADER MODE keys allow the DM2000's faders to be instantaneously switched between fader and auxiliary/matrix level control, while the ENCODER MODE keys assign the console's rotary encoders for pan, send level, and other assignable control functions. This flexible system lets you set up the controls for the most efficient operation according to the signal flow and mixing task at hand. Version 2 additionally includes a fader touch-sense function that allows automix parameter punch in/out operations to be carried with unprecedented speed and efficiency. Of particular interest to broadcast engineers will be the new fader solo release and pre-fader with pan functions included in Version 2. Fader solo release allows instant, automatic switchover from solo source monitoring to mixing. Pre-fader with pan also provides a post-pan monitoring option. Also, Version 2 features a group master function that allows group control of specified faders. By assigning the input and output fader masters to the console's user-assignable layer you have the operational equivalent of a large analog console equipped with 12 VCA faders.

TOUCH SENSE FUNCTION

INPUT FADER GROUP

INPUT FADER MASTER

OUTPUT FADER GROUP

OUTPUT FADER MASTER
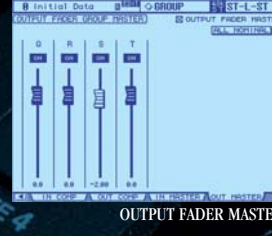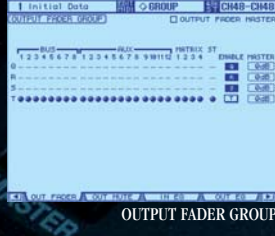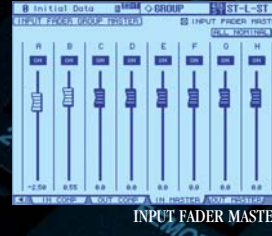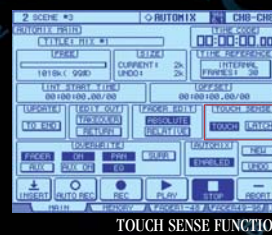
2. Display Control

The DISPLAY ACCESS keys determine which type of data will be shown on the DM2000's LCD panel: digital inputs and outputs, channel parameters, utility functions ... a total of 12 selectable categories are provided here, in addition to the DISPLAY keys provided for each of the DM2000's control sections. This approach minimizes the need to scroll through on-screen lists when you need access to a particular type of data. Below the display access keys are a group of EFFECTS/PLUG-IN keys that can be used to instantly bring the parameters for any of the eight simultaneously-assignable effects to the display.

Editing and selection of on-screen parameters is easy, too, via encoders located immediately below the display.

3. Selected Channel Section

The SELECTED CHANNEL controls form the largest single control group on the DM2000 panel — and with good reason. Here's where you're likely to be spending most of your time, setting up channel EQ, dynamics, panning or surround positioning, matrix send levels, and more. The SELECTED CHANNEL controls are, as the name implies, the hands on channel controls for the currently selected input and output channel, with analog-style buttons and knobs for direct, easy access to every single parameter. Need to adjust the highmid frequency a little? Just grab the HIGH-MID encoder and turn. And while we're on the subject of EQ, note that individual numeric displays are provided for each of the four EQ bands, displaying precise frequency and dB values immediately below the encoders so you don't have to refer to the LCD display. The SELECTED CHANNEL section also offers a number of extra functions — such as the ability to copy and paste settings from one channel to another — to make life in the digital domain easier than ever. All of the sub-sections within the SELECTED CHANNEL section also feature DISPLAY keys that instantly bring the corresponding parameters up on the LCD display.

4. Monitor Section

Whether you use the DM2000 in a single room or in a full-blown studio layout with isolated studio and control room, it provides all the monitor routing and control you'll probably ever need. You have separate, multiple source selectors for the studio and control room sends, solo capability with "SOLO CONTRAST" control, separate source selectors and level control for surround monitoring, MONO fold down, a DIMMER switch, small monitor selector, and a TALKBACK section complete with slate capability. The DM2000 also offer advanced surround monitoring capability — see the "Surround Monitoring" section for more information.

In Version 2, for broadcast applications there's a "mix minus one" function that allows the announcer's voice to be instantly removed from the mix. Also, live sound engineers will really appreciate the new AUX pre-fader/pre-ON feature that allows monitor AUX output to be active at all times, regardless of whether the FOH send is on or off. Another feature that will be an advantage in live sound applications is instant AUX monitoring: solo monitor any desired AUX signal simply by pressing the AUX Select button. The ability to instantly switch to AUX without having to switch the master layer can be an enormous advantage for monitor control.

DM 2000

5. Scene Memory

This although simple and concise, the DM2000's SCENE MEMORY section will undoubtedly see a lot of use. It's here that you can store all console parameters as a new scene, or instantly recall previously-stored scenes. A numeric display right next to the STORE, RECALL, and UP/DOWN keys shows the current scene number — 01 through 99. Additional scene memories can be managed via memory cards or a computer running the supplied Studio Manager software. Like most other control sections, a DISPLAY key brings all scene parameters up on the LCD display panel. And for even greater versatility Version 2 features a global paste function that lets you simultaneously paste selected parameters from one scene to multiple scenes – your EQ and AUX settings from final rehearsal, for example, can easily be copied to all other scenes that will be used during the performance. Fade time and recall safe settings can also be copied to multiple scenes in one easy operation.

GLOBAL PASTE

GLOBAL PASTE

6. Automix

Automated mixdown has become a major part of modern production. That's why most automix functions have been made directly accessible from the DM2000 console rather than being relegated to hard-to-find display screens. Without even looking at the display you can write and enable automation for the console's faders, channel on/off switching, panning, surround positioning, aux levels and on/off switching, and EQ. Writing automation requires as much concentration as real-time mixdown, and by providing a comprehensive AUTOMIX section Yamaha have made the job considerably easier. Versatility is further enhanced in Version 2 with an automix static insert function that allows pre-defined parameter settings to be punched in and out to, for example, adjust the EQ for a short dialog sequence during pre-production. Version 2 additionally includes a fader touch-sense function that allows automix parameter punch in/out operations to be carried out with unprecedented speed and efficiency. When a fader is touched the parameter for that fader is punched in and the automix parameter overwrite mode is engaged. Two modes are provided: in the TOUCH mode the fader parameter is punched out and overwrite ends when the fader is released, and in the LATCH mode overwrite continues even after the fader is released.

AUTOMIX STATIC INSERT

AUTOMIX STATIC INSERT
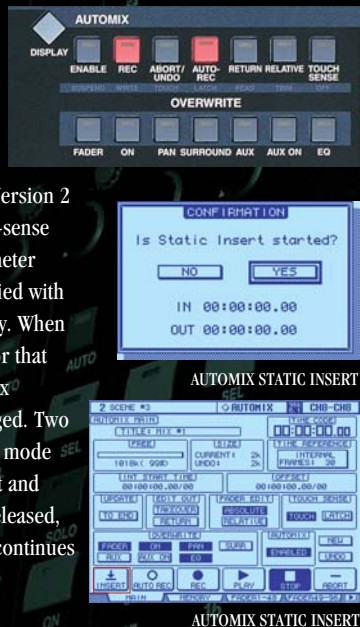
7. User Defined Keys

These 16 keys can be assigned to control any functions you choose. You could, for example, individually mute surround monitor speakers, directly recall scene memories, etc. When the Pro Tools® Remote Layer mode is selected, the USER DEFINED KEYS are automatically assigned to Pro Tools® control functions by default. Version 2 adds the capability to assign group master mute to the user defined keys. Any of the console's inputs and outputs can be assigned to mute groups as required, then muting of the assigned group can be engaged or disengaged with one touch via the user defined keys – a tremendous advantage in live sound applications. Instant Group Assignment via the User Defined Keys enables you to quickly set up fader groups and mute groups. User Defined Bank F is preset for input group assignment. If you select a channel, the relevant User Defined Keys light up if the channel is in a fader or mute group. You can press a User Defined Key to add a channel to a group or exclude a channel from a group.

REMOTE USR DIFINED KEY

INPUT MUTE GROUP

OUTPUT MUTE GROUP
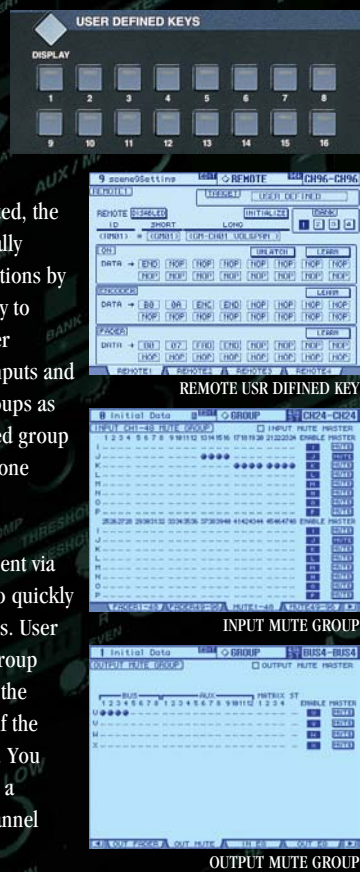
8. Machine Control

Since the DM2000 will almost certainly be used with some sort of multitrack recorder — tape, hard-disk, or DAW — it has been provided with a comprehensive range of facilities for external machine control. Both Sony 9-pin (P2) and MMC protocols are supported, and control can be switched between MTR and master target machines. Version 2 provides additional control capability with the ability to remotely control MMC and P2 equipment directly from the console's DAW layer, so you can simultaneously control a DAW and MMC/P2 recorders without having to switch layers. The DM2000's machine control features are divided into three main sections, as summarized below:

MACHINE CONTROL

8-1. Transport Controls

Standard transport controls in the familiar layout — REW, FF, STOP, PLAY, and REC — for fast, efficient transport operation.

REW   FF   STOP   PLAY   REC

8-2. Locator

All the locator controls you would normally find on an advanced locator panel — plus a few extras — are duplicated right here on the DM2000 console.

LOCATOR

8-3. Track Arming

24 track arming (record on/off) buttons can be used directly for up 24 tracks on a single recorder, or to control track arming on three separate 8-track recorders. Additionally, up to four complete track-arming setups can be memorized and recalled via TRACK ARMING GROUP keys A through D.

TRACK ARMING GROUP

TRACK ARMING

TRACK ARMING GROUP

9. Channel Strips

The 24 channel strips on the DM2000 panel provide access to the most essential operations for the corresponding channels. Depending on the currently selected layer, the channel strips will control channels 1 through 24, 25 through 48, 49 through 72, or 73 through 96. Also the channel faders and encoders will function according to the settings in the FADER MODE and ENCODER MODE sections. In addition to a fader and rotary encoder, each channel strip includes a channel ON/OFF key, a SOLO key, and AUTO key to turn mix automation on or off for that channel, and a SEL key which assigns the channel as the console's "Selected Channel". Detailed control for the currently selected channel — dynamics, EQ, buss assignment, panning and surround positioning, aux/matrix sends, delay, and phase/insert — is available via the SELECTED CHANNEL controls.
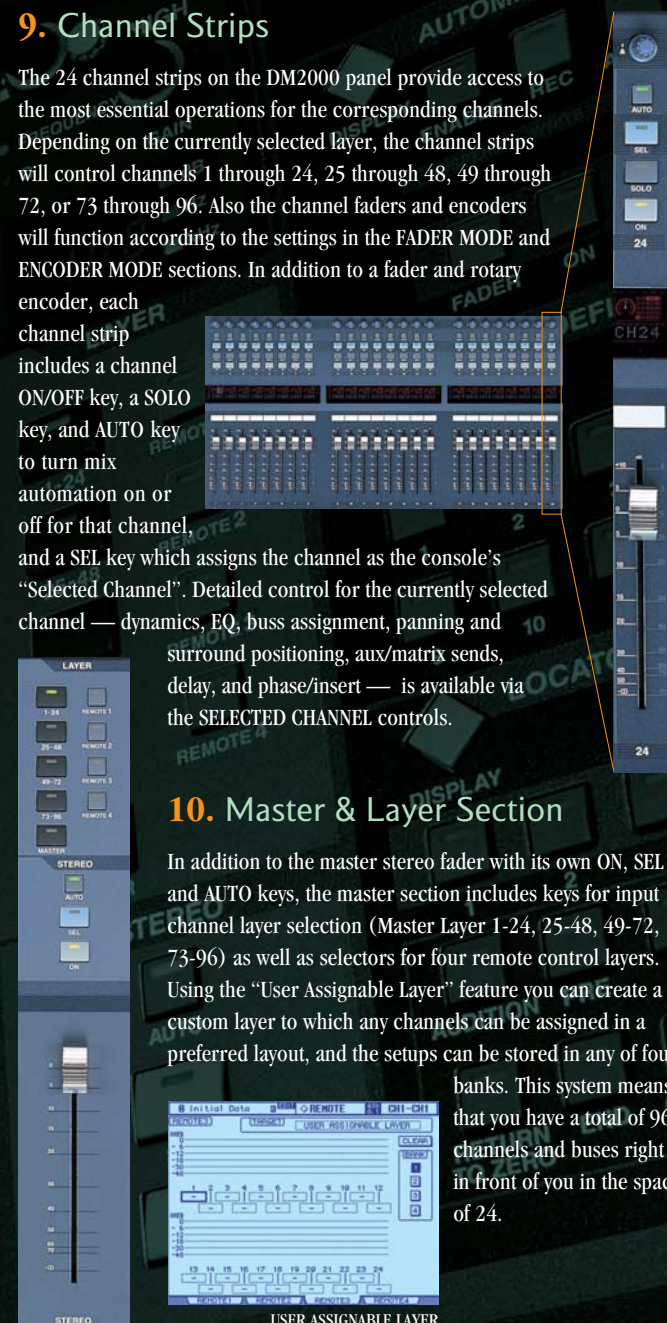
10. Master & Layer Section

In addition to the master stereo fader with its own ON, SEL and AUTO keys, the master section includes keys for input channel layer selection (Master Layer 1-24, 25-48, 49-72, 73-96) as well as selectors for four remote control layers. Using the "User Assignable Layer" feature you can create a custom layer to which any channels can be assigned in a preferred layout, and the setups can be stored in any of four banks. This system means that you have a total of 96 channels and buses right in front of you in the space of 24.

USER ASSIGNABLE LAYER
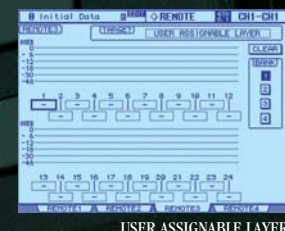
11. Data Entry

When it does become necessary to get into detailed numeric parameter editing, the DM2000 makes the task as easy as possible. Large cursor, INC/DEC, and enter keys are complemented by a data entry dial that lets you spin in values quickly and easily. The data entry dial also doubles as a shuttle/scrub dial for recorder or DAW control. A PC-compatible computer keyboard can also be directly connected to the rear-panel keyboard connector for extra data entry ease and convenience.

12. Analog Input Section

No digital console is completely free of analog circuitry, and any analog that does exist must be of the highest quality so as not to negate the performance potential of the digital system. The DM2000 features 24 high-performance head amplifiers for microphone or line input that deliver a pristine signal to the console's precision 24 bit/96 kHz A/D converters. These head amplifiers are the result of extensive development and field testing, and deliver transparent performance that rivals – and in many cases exceeds –that of the most expensive component microphone preamplifiers. 48-volt phantom power for condenser microphones is individually switchable for each input, trim controls and pad switches facilitate optimum level matching with the source, and switchable inserts make it easy switch external analog processing gear into or out of the pre-A/D signal path.

13. Meter Bridge

The MB2000 Peak Meter Bridge is a complete level-monitoring station for the DM2000. 48 12-segment level meters can be used individually or in pairs to display pre-EQ, pre-fader, or post-fader input channel signal levels. The same meters can also display levels on the console's eight buses, 12 auxiliary sends, and four stereo matrix buses. A separate 32-segment stereo meter is provided for the main stereo program. The MB2000 also features a time-code display for complete, centralized visual monitoring.

14. Rear Panel

A quick look at the rear panel should tell you that the DM2000 is designed for serious production. Balanced XLR and TRS connectors are provided for all 24 inputs, and rather than the common single TRS jacks for unbalanced

insert send and return, each input channel features independent balanced send and return jacks (insert switches are provided on the console). Then there are balanced analog studio, stereo, control room, and monitor outputs as well as eight balanced "omni" bus outputs. Two analog 2-track inputs are also provided — one balanced and one unbalanced. Other connectors. Digital I/O is provided via digital 2-track inputs and outputs featuring both AES/EBU and coaxial connectors. On-board sample rate conversion allows CD players and other digital sources connected to the digital input to be monitored or routed to an input channel without having to be synchronized to the system clock. A wide range of synchronization and control options are available via word clock inputs and outputs, SMPTE and MTC time code inputs, MIDI connectors, a keyboard connector, and both serial and USB "to host" connectors. Cascade in and output connectors allow two DM2000 consoles to be cascaded to provide up to 192 channels. Even the cooling fan is specially designed for ultra-quiet operation so that machine noise doesn't interfere with critical monitoring or recording operations.

The CONTROL port provides a General Purpose Interface (GPI) that you can configure to output or receive trigger signals to which you can assign various functions. In the DM2000 Version 2, the GPI Setup page has been completely renovated.

The following are some examples of how you might utilize GPI functionality:
- You could use a fader to send a signal to start a CD player.
- A producer could have his own remote talkback switch in the control room to communicate with the musicians in the studio.
- You could control from the console a "Recording" warning light located outside the studio.
- You could control the console's dimmer function using an outside switch.

15. Memory Card Data Storage

Automix and scene recall capability are important features that can dramatically streamline the production process, but data portability via compact SmartMedia™ memory cards takes this convenience to a new level. All automix and scene data can be saved to memory cards and transferred and simply archived or transferred to another DM2000. A mix you make in one studio can, for example, be instantly replicated in another so you don't have to spend time manually setting up parameters to achieve the same results.

* SmartMedia™ is a registered trademark of the Toshiba Corporation.

Options

mini-YGDAI Cards

The DM2000's real I/O versatility comes in the form of six mini-YGDAI expansion slots. The expansion slots are 24 bit/96 kHz compatible, so you can select mini YGDAI plug-in cards to create the input/output configuration that's perfect for your needs. Whether you need digital I/O in ADAT, TASCAM, or AES/EBU format, Ethernet or CobraNet connectivity, extra analog I/O capability, or other functions, the appropriate cards are available.

16 I/O Series

MY16-AT
16 channel ADAT format I/O

MY16-AE
16 channel AES/EBU format I/O

MY16-TD
16 channel TDIF format I/O

MY16-CII
16 channel CobraNet™ I/O

MY16-mLAN
mLAN format I/O

96-kHz Series

MY8-AD96
8 channel Analog Input Card

MY8-DA96
8 channel Analog Output Card

MY8-AE96
8 channel AES/EBU format I/O

MY8-AE96S
8 channel AES/EBU format I/O (w/Sample rate converter)

MY8-ADDA96
8 channel Analog I/O

Standard Series

MY8-AE
8 channel AES/EBU format I/O

MY8-AT
8 channel ADAT format I/O

MY8-TD
8 channel TDIF format I/O

MY8-AD24
8 channel Analog Input Card (24 bit)

MY8-AEB
8 channel AES/EBU format I/O (w/REF VIDEO Input)

MY4-AD
4 channel Analog Input Card (24 bit)

MY4-DA
4 channel Analog Output Card (20 bit)

Third Party Models

AVIOM 16/o-Y1
16 channel AVIOM A-Net Output Card
http://www.aviom.com/

AuviTran AVY16-ES
16 channel EtherSound I/O
http://www.auvitran.com/

Audio-Service MYMADI64
MADI I/O
http://www.audio-service.com/

Peak Meter Bridge MB2000
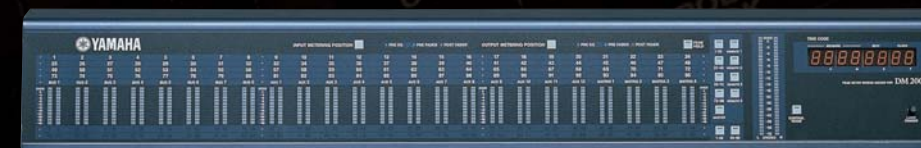
Gooseneck Lamp LA5000

Side Pad SP2000

Extraordinary New Effects

The DM2000VCM offers unprecedented effect performance with a selection of new effect programs that employ Yamaha's revolutionary VCM (Virtual Circuitry Modeling) and ISSP (Interactive Spatial Sound Processing) technologies for unprecedented effect quality and control. Check out the Effect List on page 19 for a complete overview of the available effects.

CHANNEL STRIP

The Channel Strip effect includes 5 models that employ VCM (Virtual Circuitry Modeling) technology to recreate the sound and characteristics of several classic compression and EQ units from the 70's. Not only do these models faithfully capture the unique saturation of analog circuitry – in part thanks to precise modeling of the original FET gain reduction, Tube/Transformer buffer amplifier, VCA (Voltage Controlled Amplifier) and RMS detector circuits – but they have also been fine-tuned by leading engineers and feature carefully selected parameters in a simple interface that makes it easier than ever to create the ideal sound.

Compressor 276 (mono), Compressor 276S (stereo)

These models recreate the fast response, frequency characteristics, and tube-amp saturation of the most in-demand analog compressors for studio use, delivering classic-style compression with all the punch and fatness you'd expect from a fine piece of studio-grade analog gear. Not limited to processing drums and bass, these compressors are also an excellent choice for vocals and master stereo mix compression. The 276 is a dual mono unit, while the 276S operates in stereo.

Compressor 260 (mono), Compressor 260S (stereo)

Featuring faithful modeling of the solid-state voltage-controlled amplifier and RMS detection circuitry of the late 70's, these effects bring back the sound of classic comp / limiters used primarily for live sound reinforcement applications. They offer three selectable compression knee types – hard, medium, and soft – and although variable attack and release are provided, presets recreate the fixed settings of the vintage gear. Top-level sound-reinforcement engineers have carefully tweaked the parameters of optimum response in live situations. The 260 is a dual mono unit, while the 260S operates in stereo.

Equalizer 601

The 601 equalizer offers two equalizer types – Clean and Drive. The Drive type models the distortion characteristics of 70's analog EQ circuitry, delivering musical-sounding drive and saturation. The 601 is a stereo six-band parametric equalizer with LO and HI shelving filters and four MID peaking filters, and it accurately reproduces both the boost and cut frequency response and band interaction of vintage analog gear. And you get EQ capability over a wide 16 Hz ~ 40 kHz range when operating at 88.2 / 96 kHz. The 601 features a familiar knob-style interface as well as graphical editing capability on both the console and PC displays.

MASTER STRIP

The Master Strip effect Open Deck employs Virtual Circuitry Modeling technology to recreate both the analog circuitry and tape characteristics that shaped the sound of open-reel tape recorders. Because of their ability to smooth out peak levels and tidy up the response, many high-end recording studios still maintain open-reel recorders such as the Studer A80mk1, A80mk4 and A820, and the Ampex ATR100 and others from the 70's and 80's to be used to provide tape compression at the mastering stage. Different types of tape – new BASF, old Ampex, etc. – are also selected and used according to the unique sounds they produce. The Open Deck provides models of four machine types: Swiss '70, Swiss '78, Swiss '85, and America '70. You can even combine different record and playback decks for a wider range of variation. You also have a choice of "old" and "new" tape types, tape speed, bias, and EQ settings that can vary the "focus" of the sound, distortion, and saturation characteristics. Now you can easily take advantage of top-end sound-shaping techniques in real time using Yamaha digital consoles.

America '70 + Swiss '78

America '70 + America '70

Swiss '78 + Swiss '78

Swiss '70 + Swiss '70

Swiss '85 + Swiss '85

REVERB

These reverb effects employ the latest "REV-X" algorithms first introduced in Yamaha's SPX2000 Professional Multi Effect Processor. The REV-X programs feature the richest reverberation and smoothest decay available, based on years of dedicated research and development. REV-X Hall, REV-X Room, and REV-X Plate programs are provided, with new parameters such as room size and decay envelopes that offer unprecedented definition and finer nuance control. The REV-X Hall and REV-X Room programs have a very open sound, while REV-X Plate delivers a brighter tonality that is ideal for vocals. All models deliver dense, warm reverb that does not interfere with the natural timbre of the source.
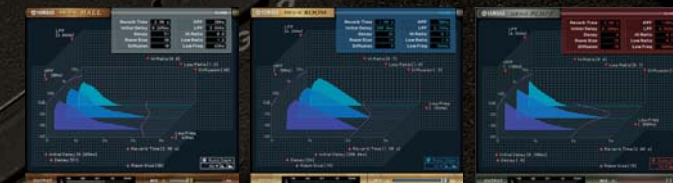
REV-X (HALL)   REV-X (ROOM)   REV-X (PLATE)

SURROUND POST

The three effects in this package take full advantage of Yamaha's remarkable iSSP (Interactive Spatial Sound Processing) technology to deliver precisely-controllable spatial processing capabilities that are particularly suited to cinema or television sound post-production and mixing facilities. All effects are applicable to a range of surround formats, providing unprecedented precision in matching visual motion with sound, and vast creative control for the creation of fantastic sonic environments. The Surround Post Package effects are compatible with Yamaha Digital mixing Consoles (except the 01V96, PM5D, and PM1D), and can be controlled directly from the console's joystick.

Room-ER

Room-ER is capable of simulating the acoustic properties of a room of about 30 meters in length, with accurate reproduction of the direct sound and early reflections as affected by distance from the source, source motion, speed of motion, and room surface characteristics. This effect is ideal for placing a mono source in a precisely controllable surround environment.

Auto Doppler

Perhaps the most common example of the Doppler effect is the change in pitch of an ambulance siren as it moves toward and then away from the listener. Auto Doppler effectively simulates this effect in a wide variety of scenarios. In addition to objects moving linearly past the listener, Auto Doppler can recreate the effect of objects moving toward and then away from the listener, for example, with precise speed and distance control. Timecode automation is also possible.

Field Rotation

The Field Rotation effect can be used to rotate or distort the sound field around the listener. The listener can be at the center of rotation, or the listener can be rotated or moved around a sound source. The axis of rotation, amount of movement, distance from the center of rotation, and speed of motion can be specified and controlled manually via a joystick like the one provided on the DM2000 console, or automated as required.

VINTAGE STOMP

This package includes a number of super-realistic recreations of vintage guitar stomp-box effects that are highly values for their rich, warm sound. VCM technology brings these outstanding effects back to life with greater controllability and flexibility than ever!

MAX100

Born in the late '70's, this phaser is still available in reissue form. There are many who believe the original '70's models sounded better than the current models, and so the K's Lab team have painstakingly modeled the original circuit and components. Even the original light-sensitive CdS cell that was used for modulation has been modeled so the subtle change in modulation character with modulation speed of the original is recreated in perfect detail.

DUAL PHASE

Like the MAX100, there are many guitarists who will go to any lengths to get an original version of this stomp box to enhance their sound. This is a faithful reproduction of the original with dual phaser circuits and dual LFOs that can be configured to deliver a dazzling array of effects. Special care has been taken in modeling the effect of the CdS cell in the phase-shifting circuit so that the exquisite balance at all modulation speeds that was a major part of the sound of the original has been retained.

VINTAGE PHASER

Rather than a simulation of a specific phaser, this model has been designed to deliver the best qualities of the most sought-after classic phasers in one versatile effect. Different mode settings transform this effect into dramatically different phaser types. Stereo and mono versions are provided.

THX pm3™ Approval

Yamaha Digital consoles DM2000VCM, DM1000V2 & 02R96V2 are the worlds first digital consoles equipped with complete surround monitoring facilities built-in, eliminating the need to connect and feed the signal to external monitoring equipment and offer perfect solution used in combination with the Powered Monitor Speaker MSP10 STUDIO.

Known worldwide for high quality entertainment sound and picture, the THX pm3™ (Professional Multi-Channel Mixing & Monitoring) Studio Certification Program addresses the need for reliable, translatable, and superior performance in professional multi-channel mixing and monitoring studios worldwide. THX has created a performance standard that focuses on the listening and viewing environment, selection of audio and video equipment, layout of the working area, and calibration. DM2000VCM, DM1000V2 & 02R96V2 are included in the THX pm3™ Approved Equipment list as Studio Monitoring Systems, and Powered Monitor Speaker MSP10 STUDIO as Front & Surround speakers.

Yamaha Digital Consoles have the following surround functions built-in.

Surround production functions

- Fully compatible with 3-1, 5.1 and 6.1 surround processing, panning and monitoring
- Flexible surround bus set up
- Built-in Joy stick
- Graphical user interface and parameters to assist accurate surround PAN positioning and efficient moves of sound image.
- Built-in surround effects including "Reverb 5.1", "Comp 5.1", "Expand 5.1" etc.

SURROUND PAN POSITIONING

THX pm3™ Approved surround monitoring functions

- Downmix monitoring matrix
- Bass Management: comprehensive filter and attenuator setting and THX pm3™ presets
- Monitor Alignment functions (Attenuator and delay for individual speakers)
- Build-in Oscillator
- "Snap to 85dB SPL" function

SURROUND MONITOR SETUP
(THX pm3™ MONITOR FLOW)

THX Bass Management Presets:

The following presets have been approved by THX™ Ltd. for use in THX pm3™ Certified Studios*. They are designed to provide dedicated parameters for the proper playback of multi-channel audio content in bass managed systems and to be compatible with subwoofer-satellite type consumer systems.

* Use of a THX preset does not permit a studio to use the designation THX pm3™ Certified Studio. The THX pm3™ Studio Certification Program uses performance and design specifications to create calibrated environments for optimum sound and picture presentation. For more information, visit the THX website at http://www.thx.com

[THXD] THX DVD	This preset is configured for DVD-Video production. Use this preset when mixing and/or monitoring audio content not from a theatrical film source. The parameters cannot be changed.
[THXF] THX Film	This preset is configured for Film pre-production. Use this preset when mixing and/or monitoring theatrical film-based content (such as a pre-mix for film). The parameters cannot be changed.
[THXM] THX Music	This preset is configured for DVD-Music production. Use this preset when mixing and/or monitoring multi-channel music content (including DVD-Audio and SACD). Only one parameter can be changed. The LFE gain (AMP) can be set to +10dB (default) or 0dB. Select the level that complies with the standards of the target media. Please note: The LFE output gain on some DVD players, receivers, and/or decoders may already be set to +10dB. Select the 0dB setting only if the destination environment (home theatre, etc.) has the LFE gain set to 0dB. Otherwise, use the default setting.

The THX pm3™ logo is a trademark of THX Ltd. which may be registered in some jurisdictions. All rights reserved.
For more information on THX pm3™, please visit THX website at http://www.thx.com.
Visit Yamaha website at http://www.yamahaproaudio.com/ to find DM2000/1000, 02R96 surround set up manual, Quick Guide and Surround Tutorial Booklet.

Studio Manager Version 2

The DM2000 Studio Manager application has undergone a significant evolution and has been reborn as Studio Manager Version 2.

The hybrid Windows®/Macintosh® Studio Manager application has been rewritten as a host application

which hosts the DM2000 Editor which actually controls the DM2000 console, and which can be used simultaneously

with other editors for professional digital audio gear such as the 02R96 Version 2 digital mixer or the SPX2000 professional multi-effect processor.

Simply connect the console to a computer via its TO HOST port (combined USB/serial), and the computer functions as comprehensive control center for the entire system. You can even open and close Studio Manager Version 2 windows from the DM2000 console controls, for seamless system integration and optimum operation efficiency in any application.

STUDIO MANAGER Version 2 also integrates an advanced GUI for the new VCM and ISSP effects.

Studio Manager V2 Host Window

GEQ Editor Window

Library Window

Meter Window

Layer Window

Master Window

Patch Editor Window

Patch Editor-Effect Window

Surround Editor Window

Selected Channel Window

SPX 2000 Editor (REV-X)

DM2000 Editor

The DM2000 Editor runs under the Studio Manager Version 2 host application, and offers features and functionality that have been refined and updated for professional-level control. Some of the most significant updates include:

- Master Fader Window provides independent master fader display and control.
- Meter Window shows levels on all 96 channels.
- A new Automix tab has been added to the library windows.
- Layer Window allows selection and display of effects and other sources above the panel pan controls.
- Selected Channel Window adds graphic gate displays and long-stroke channel metering.
- Patch Edit Window is now resizable, and displays effect block inputs and outputs.
- Effect Editor Window adds a VCM and ISSP effect interface and fine control.

Sample Applications

Pro Tools® Setting

In this system the Yamaha DM2000 and a Digidesign Pro Tools® HD2 Accel setup are combined in a powerful recording and production system that provides as many as 64 input channels with up to 192 tracks at 48 kHz or up to 96 tracks at 96 kHz. While the DM2000 functions as an advanced control surface for the Pro Tools®, it can also handle critical audio processing tasks as well as monitoring.

Mics

Audio Interface(s)
- HD Core card with I/O Unit
- HD Accel card with I/O Unit

192 I/O*

*Operation up to 96-kHz.

Guitars etc.

Signal

Signal

Mini-YGDAI Cards
MY16-AE x 2

Word Clock

Signal

USB

Synthesizer

Macintosh or PC

Tone Generator

DM2000VCM

Connection with 96-kHz recorders

Although the DM2000 handles 96-kHz audio as standard, most of the currently available digital recorders can handle 96-kHz audio only in double channel mode (using 2 tracks to make one). In this configuration, the DM2000 uses one channel for one (96-kHz) track, but twice the number of I/O connections must be used. MY8-AT/TD/AE cards work in double channel mode to handle 96-kHz audio. The MY16-AT/TD/AE cards can handle 16 channels of 44.1 / 48-kHz audio or up to 8 channels of 96-kHz audio in double channel mode. With the latest equipment that handles 96-kHz audio as standard (in double speed mode like the DM2000) you can make standard connections using the MY8-AE96 card. MY8-AE96 card can work either in double speed or double channel mode.

Nuendo® Setting
(24tr 96 kHz Recording)

Steinberg's Nuendo® software is designed to handle 96 kHz audio, so it is an ideal companion for the DM2000. While the DM2000 functions as a basic controller for the Nuendo® software in this 24 track, 96 kHz system (full Nuendo® support is currently under development), it also handles extra mixing and processing of the outputs from high-end audio cards.

Mini-YGDAI Cards
MY16-AE x 2 or MY16-AT x 2

Signal

Hi-End Multi Channel Audio Card(s)

DM2000VCM

Macintosh or PC

High-capacity Sound Reinforcement With Remote Head Amp Control

Using Yamaha's AD8HR highest quality 8-channel AD converter it is possible to put together a 48 mic/line input system with digital signal transfer at 48-kHz/24-bit resolution. The AD8HR head amps can be remotely controlled from the DM2000 via the REMOTE terminal, so the head amps themselves can be located right on stage. Up to 48 channels of high-resolution digital (AES/EBU) audio can then be transferred to the console over distances of up to 200 meters without loss or degradation. If you also use the DM2000's 24 built-in microphone inputs you have a total of 72 inputs available – on a par with large live-sound systems, but with relatively simple setup and operation. In the system example a second DM2000 is used for monitoring as well as live recording.

AD8HR
- HA remote
- HA remote
- HA remote
- HA remote
- HA remote
- HA remote

Mini-YGDAI Cards
MY16-AE x 3 (for AD8HR)

Signal

Mini-YGDAI Cards
MY8-AE (up to 6)

Mini-YGDAI Cards
MY16-AE x 1 (up to 3) (for DA824)

Mics & Lines

F.O.H

DA824 (up to 6)

HA remote

For Stage

DM2000VCM

Mini-YGDAI Cards
MY16-AE x 3 (for AD8HR)

Signal

Mini-YGDAI Cards
MY16-AT x 3 (for Recorder)

48tr HD Recorder with ADAT I/O (24 bit/48-kHz)

For Monitor

Word Clock

DM2000VCM

DVD Authoring
(6.1 Surround Monitoring)

Both the DM2000 and Yamaha's MSP10 STUDIO powered monitor speakers have been officially approved for use in THX pm3™ Certified Studios, and are thus ideal choices for the most advanced DVD authoring applications. In the system shown here the 6.1 program is monitored via powered monitors and a subwoofer connected to the console's OMNI outputs (the DM2000 also includes bass management facilities for full-range playback). At the same time surround encoders and decoders can be inserted in the system to burn a stereo mix as well as the surround mix to Lt/Rt Master.
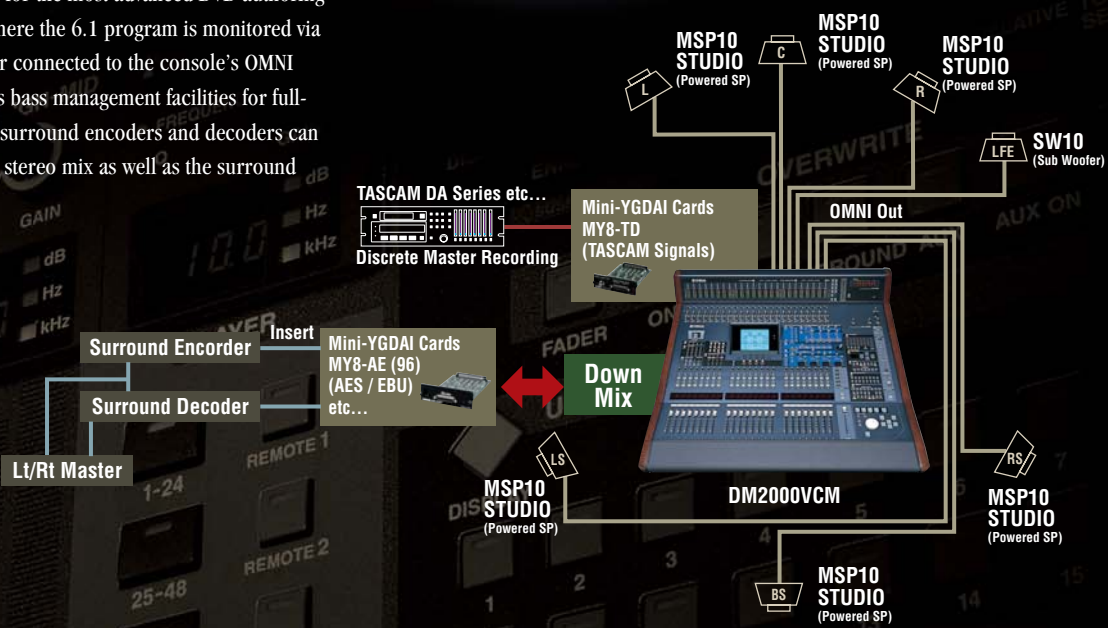
Relay Broadcast

With the MY8-AEB 8-channel AES/EBU-format interface card with "eXi-Clock" sync capability, the DM2000VCM becomes an ideal platform for live broadcasting as well as video post production, delivering the highest audio quality with reliable synchronization to a wide range of video sources.

Effect List

The DM2000 effect library includes a total 67 superb effects.

All feature full 24 bit/96 kHz processing for unprecedented resolution and quality with any type of program material.

EFFECT TYPE LIST

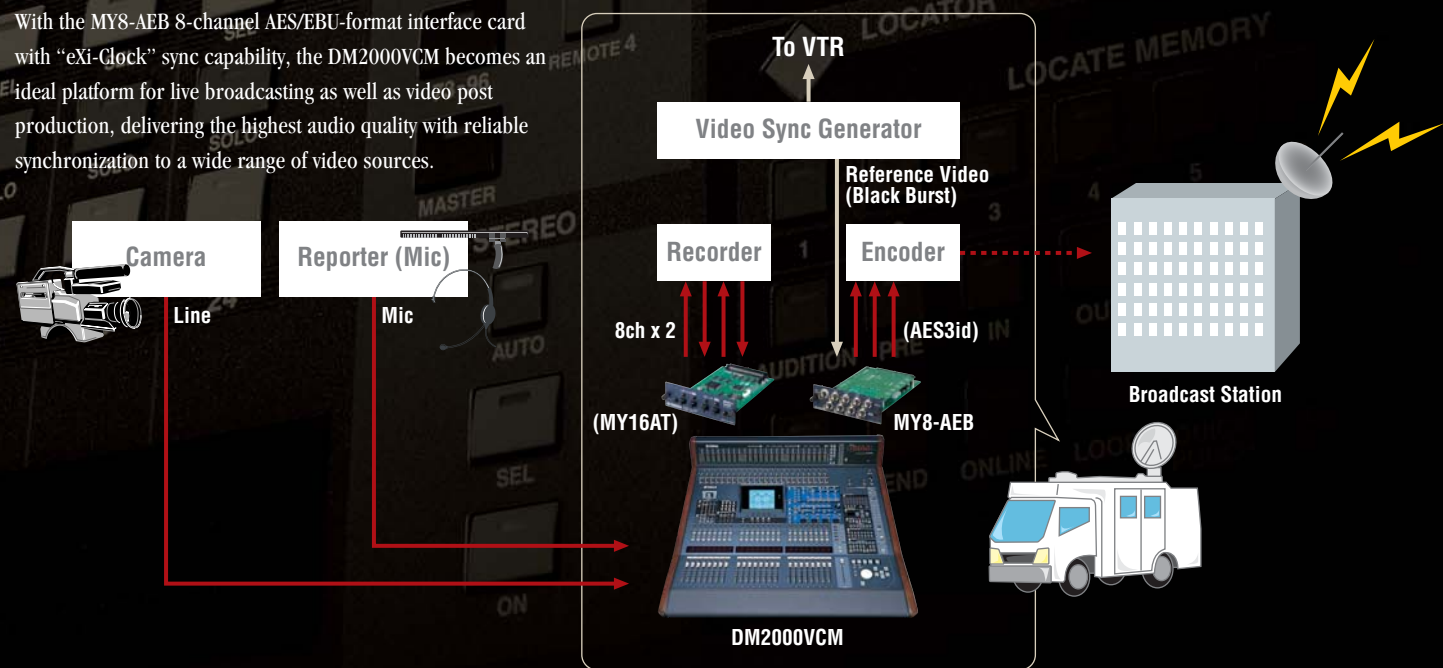|	EFFECT	TYPE	Input	Output	DSP
1	Reverb Hall	Hall simulation reverb with gate	1	2	1
2	Reverb Room	Room simulation reverb with gate	1	2	1
3	Reverb Stage	Reverb for vocals with gate	1	2	1
4	Reverb Plate	Plate simulation reverb with gate	1	2	1
5	Early Ref.	Early reflections	1	2	1
6	Gate Reverb	Gate reverb setting of early reflections	1	2	1
7	Reverse Gate	Reverse gate setting of early reflections	1	2	1
8	Mono Delay	Very simple repeat delay	1	2	1
9	Stereo Delay	Simple stereo delay	2	2	1
10	Mod.delay	Simple repeat delay with modulation	1	2	1
11	Delay Lcr	3 taps (left, center, right) delay	1	2	1
12	Echo	Stereo delay with cross feedback loop	2	2	1
13	Chorus	Chorus effect	2	2	1
14	Flange	Flange effect	2	2	1
15	Symphonic	Symphonic effect	2	2	1
16	Phaser	16 stage phase sifter.	2	2	1
17	Auto Pan	Auto-pan	2	2	1
18	Tremolo	Tremolo effect	2	2	1
19	Hq.Pitch	High quality pitch change effect	1	2	1
20	Dual Pitch	2 voice pitch change	2	2	1
21	Rotary	Rotary speaker simulation	1	2	1
22	Ring Mod.	Ring modulator	2	2	1
23	Mod.Filter	LFO modulation type filter	2	2	1
24	Distortion	Distortion	1	2	1
25	Amp Simulate	Guitar amp simulator	1	2	1
26	Dyna.Filter	A filter controlled by input dynamics	2	2	1
27	Dyna.Flange	Flange effect controlled by input dynamics	2	2	1
28	Dyna.Phaser	Phase sifter controlled by input dynamics.	2	2	1
29	Rev+Chorus	Parallel combination of reverb and chorus	1	2	1
30	Rev->Chorus	Series combination of reverb and chorus	1	2	1
31	Rev+Flange	Parallel combination of reverb and flange	1	2	1
32	Rev->Flange	Series combination of reverb and flange	1	2	1
33	Rev+Sympho.	Parallel combination of reverb and symphonic	1	2	1
34	Rev->Sympho	Series combination of reverb and symphonic	1	2	1
35	Rev->Pan	Series combination of reverb and auto-pan	1	2	1
36	Delay+Er	Parallel combination of delay and early reflections	1	2	1

	EFFECT	TYPE	Input	Output	DSP
37	Delay->Er	Series combination of delay and early reflections	1	2	1
38	Delay+Rev	Parallel combination of delay and reverb	1	2	1
39	Delay->Rev	Series combination of delay and reverb	1	2	1
40	Dist->Delay	Series combination of distortion and modulation delay	1	2	1
41	Multi Filter	Three-band parallel filter (24 dB/oct.)	2	2	1
42	Freeze	A simple sampler.	1	2	1
43	St Reverb	Stereo reverb.	2	2	1
44	Reverb 5.1*	Reverb with surround positioning.	1	6	4
45	Octa Reverb*	8-channel reverb.	8	8	4
46	Auto Pan 5.1*	LFO-controlled 5.1 surround pan.	6	6	1
47	Chorus 5.1*	5.1 surround chorus.	6	6	1
48	Flange 5.1*	5.1 surround flange.	6	6	1
49	Sympho. 5.1*	5.1 surround symphonic.	6	6	1
50	M.Band Dyna.	Multi-band dynamics processor.	2	2	1
51	Comp 5.1*	5.1 surround multi-band compressor.	6	6	4
52	Compand 5.1*	5.1 surround multi-band compander.	6	6	4
53	Comp276	VCM technology compressor	2	2	1
54	Comp276S	VCM technology compressor	2	2	1
55	Comp260	VCM technology compressor	2	2	1
56	Comp260S	VCM technology compressor	2	2	1
57	Equalizer601	VCM technology EQ	2	2	1
58	OpenDeck	VCM technology open-reel tape recorder simulator	2	2	1
59	REV-X Hall	REV-X algorithms reverb	2	2	1
60	REV-X Room	REV-X algorithms reverb	2	2	1
61	REV-X Plate	REV-X algorithms reverb	2	2	1
62	Room ER	ISSP technology acoustic property simulator	1	5	1*
63	Auto Doppler	ISSP technology Auto Doppler	1	5	1*
64	Field Rotation	ISSP technology Field Rotation	6	6	1*
65	Max100	VCM technology modulation	1	1	1
66	Vintage Phaser	VCM technology phaser	1	1	1
67	Dual Phaser	VCM technology dual phaser	1	1	1

* Effects marked with an asterisk (*) can only be recalled for the EFFECT 1 and EFFECT 2 processors.

* If an effect which uses 4 DSP processors is used the total number of effects that can be used simultaneously is reduced by three. For example, if REVERB 5.1 is selected for EFFECT 1 and DYNAMICS 5.1 is selected for EFFECT 2, EFFECT 3 through EFFECT 8 cannot be used.

COMP LIBRARY

	TITLE	TYPE
1	Comp	COMP
2	Expand	EXPAND
3	Compander(H)	COMPAND-H
4	Compander(S)	COMPAND-S
5	A.Dr.BD	COMP
6	A.Dr.BD	COMPAND-H
7	A.Dr.SN	COMP
8	A.Dr.SN	EXPAND
9	A.Dr.SN	COMPAND-S
10	A.Dr.Tom	EXPAND
11	A.Dr.OverTop	COMPAND-S
12	E.B.Finger	COMP
13	E.B.Slap	COMP
14	Syn.Bass	COMP
15	Piano1	COMP
16	Piano2	COMP
17	E.Guitar	COMP
18	A.Guitar	COMP

	TITLE	TYPE
19	Strings1	COMP
20	Strings2	COMP
21	Strings3	COMP
22	BrassSection	COMP
23	Syn.Pad	COMP24
24	SamplingPerc	COMPAND-S
25	Sampling BD	COMP
26	Sampling SN	COMP
27	Hip Comp	COMPAND-S
28	Solo Vocal1	COMP
29	Solo Vocal2	COMP
30	Chorus	COMP
31	Click Erase	EXPAND
32	Announcer	COMPAND-H
33	Limiter1	COMPAND-S
34	Limiter2	COMP
35	Total Comp1	COMP
36	Total Comp2	COMP

GATE LIBRARY

	TITLE	TYPE
1	Gate	GATE
2	Ducking	DUCKING
3	A.Dr.BD	GATE
4	A.Dr.SN	GATE

EQ LIBRARY

	TITLE
1	Bass Drum 1
2	Bass Drum 2
3	Snare Drum 1
4	Snare Drum 2
5	Tom-tom 1
6	Cymbal
7	High Hat
8	Percussion
9	E.Bass 1
10	E.Bass 2
11	Syn.Bass 1
12	Syn.Bass 2
13	Piano 1
14	Piano 2
15	E.G.Clean
16	E.G.Crunch 1
17	E.G.Crunch 2
18	E.G.Dist. 1
19	E.G.Dist. 2
20	A.G.Stroke 1

	TITLE
21	A.G.Stroke 2
22	A.G.Arpeg. 1
23	A.G.Arpeg. 2
24	Brass Sec.
25	Male Vocal 1
26	Male Vocal 2
27	Female Vo. 1
28	Female Vo. 2
29	Chorus&Harmo
30	Total EQ 1
31	Total EQ 2
32	Total EQ 3
33	Bass Drum 3
34	Snare Drum 3
35	Tom-tom 2
36	Piano 3
37	Piano Low
38	Piano High
39	Fine-EQ Cass
40	Narrator

DM2000VCM Specifications

General Specifications

Internal Signal Processing	32-bit (Accumulator 58-bit)	
Sampling Frequency	Internal	44.1 kHz,48 kHz,88.2 kHz,96 kHz
	External	Normal rate 44.1 kHz-10% to 48 kHz+6% Double rate 88.2 kHz-10% to 96 kHz+6%
Signal Delay	Less than 2.3 ms CH INPUT to STEREO OUT (@Sampling frequency = 48 kHz) Less than 1.2 ms CH INPUT to STEREO OUT (@Sampling frequency = 96 kHz)	
Fader	motorized, touch sensitive: 100mm x 25	
Total Harmonic Distortion CH INPUT to STEREO OUT Input Gain = Min.	Less than 0.05% 20Hz to 20 kHz @+14dB into 600 Ω Less than 0.01% 1 kHz @+18dB into 600 Ω (@Sampling frequency = 48kHz) Less than 0.05% 20Hz to 40 kHz @+14dB into 600 Ω Less than 0.01% 1 kHz @+18dB into 600 Ω (@Sampling frequency = 96kHz)	
Frequency Response CH INPUT to STEREO OUT	0.5,-1.5dB 20Hz - 20 kHz @+4dB into 600 Ω (@Sampling frequency = 48 kHz) 0.5,-1.5dB 20Hz - 40 kHz @+4dB into 600 Ω (@Sampling frequency = 96 kHz)	
Dynamic Range (maximum level to noise level)	110 dB typ. DA Converter (STEREO OUT) 108 dB typ. AD+DA (to STEREO OUT) @ fs=48 kHz 106 dB typ. AD+DA (to STEREO OUT) @ fs=96 kHz	
Hum & Noise* (20Hz–20 kHz) Rs =150W Input Gain = Max. Input Pad = 0dB Input Sensitivity = -60dB	-128dB Equivalent Input Noise. -92dB residual output noise. STEREO OUT STEREO OUT off. -92dB (96dB S/N) STEREO OUT STEREO fader at nominal level and all CH INPUT faders at minimum level -64dB (68dB S/N) STEREO OUTPUT STEREO fader at nominal level and one CH INPUT fader at nominal level	
Maximum Voltage Gain	74dB CH INPUT (CH1-24) to STEREO OUT / OMNI (BUS) OUT 74dB CH INPUT (CH1-24) to OMNI (AUX) OUT (via pre input fader) 74dB CH INPUT (CH1-24) to OMNI (AUX) OUT (via pre input fader) 74dB CH INPUT (CH1-24) to CONTROL ROOM MONITOR OUT (via STEREO bus)	

* Hum & Noise are measured with a 6dB/octave filter @12.7 kHz;
  equivalent to a 20 kHz filter with infinite dB/octave attenuation.
* Input Gain = Min.
* Total Harmonic Distortion is measured with a 6dB/octave filter @80kHz

Crosstalk (@1 kHz)	80dB adjacent input channels (CH1-24) 80dB input to output.	
Power Requirements	U/C	120V	300W	60Hz
	H	230V	300W	50Hz
	B	230V	300W	50Hz
Dimensions	Height	257mm (including LCD)
	Depth	821mm
	Width	906mm
Net Weight	43kg	
Operating free-air temperature range	10~35°C	
Storage temperature range	-20~60°C	

Libraries

	Number of factory presets		Number of user libraries	
Effect libraries (EFFECT1-8)	Number of factory presets	67 (EFFECT3-8: 56)	
	Number of user libraries	61	
Compressor libraries	Number of factory presets	36	
	Number of user libraries	92	
Gate libraries	Number of factory presets	4	
	Number of user libraries	124	
EQ libraries	Number of factory presets	40	
	Number of user libraries	160	
Channel libraries	Number of factory presets	2	
	Number of user libraries	127	
GEQ libraries (EQ1-6)	Number of factory presets	1	
	Number of user libraries	128	
Surround Monitor libraries	Number of factory presets	1	
	Number of user libraries	32	
Input patch libraries	Number of factory presets	1	
	Number of user libraries	32	
Output patch libraries	Number of factory presets	1	
	Number of user libraries	32	
Bus to stereo libraries	Number of factory presets	1	
	Number of user libraries	32	

Analog Input Characteristics

Input Terminals	GAIN	Actual Load Impedance	For Use With Nominal	Input Level			Connector in Console
				Sensitivity *1	Nominal	Max. before clip	
CH INPUT A/B 1-24	0	-60dB	3K Ω	50-600 Ω Mics & 600 Ω Lines	-70dB (0.245mV)	-60dB (0.775mV)	-46dB (3.88mV)	A:XLR-3-31 type (Balanced) *2
		-16dB			-26dB (38.8mV)	-16dB (0.123V)	-2dB (616mV)	B:Phone Jack (TRS) (Balanced) *3
	26				0dB (775mV)	+10dB (2.45V)	+24dB (12.28V)	
INSERT IN 1-24		10K Ω	600 Ω Lines	-6dB (388mV)	+4dB (1.23 V)	+18dB (6.16V)	Phone Jack (TRS) (Balanced) *3
2TR IN ANALOG 1 [L,R]		10K Ω	600 Ω Lines	+4dB (1.23V)	+4dB (1.23 V)	+18dB (6.16V)	Phone Jack (TRS) (Balanced) *3
2TR IN ANALOG 2 [L,R]		10K Ω	600 Ω Lines	-10dBV (0.316 V)	-10dBV (0.316 V)	+4dBV (1.58V)	RCA Pin Jack (Unbalanced)

*1. Sensitivity is the lowest level that will produce an output of +4dB (1.23V) or the nominal output level when the unit is
    set to maximum gain. (all faders and level controls are maximum position.)
*2. XLR-3-31 type connectors are balanced. (1/Sleeve = GND, 2/Tip = HOT, 3/Ring = COLD)
*3. Phone jacks are balanced. (Tip = HOT, Ring = COLD, Sleeve = GND)

• In these specifications, when dB represents are specific voltage, 0dB is referenced to 0.775 Vrms.
• For 2TR IN ANALOG 2 levels, 0dBV is referenced to 1.00 Vrms.
• All 24 AD converters (CH1-24) are 24 bit linear,128times oversampling.
• +48V DC (phantom power) is supplied to CH INPUT (1-24) XLR type connectors via each individual switch.

Analog Output Characteristics

Output Terminals	Actual Source Impedance	For Use With Nominal	GAIN SW	Output Level		Connector in Console
				Nominal	Max. before clip	
STEREO OUT [L,R]	600 Ω	10k Ω Lines	-	-10dBV (0.316V)	+4dBV (1.58V)	RCA Pin Jack (Unbalanced)
	150 Ω	600 Ω Lines	-	+4dB (1.23V)	+18dB (6.16V)	XLR-3-32 type (Balanced) *1
STUDIO MONITOR OUT [L,R]	150 Ω	10k Ω Lines	-	+4dB (1.23V)	+18dB (6.16V)	Phone Jack (TRS) (Balanced) *2
C-R MONITOR OUT LARGE [L,R]	150 Ω	600 Ω Lines	-	+4dB (1.23V)	+18dB (6.16V)	XLR-3-32 type (Balanced) *1
C-R MONITOR OUT SMALL [L,R]	150 Ω	600 Ω Lines	-	+4dB (1.23V)	+18dB (6.16V)	XLR-3-32 type (Balanced) *1
OMNI OUT 1-8	150 Ω	10k Ω Lines	+18dB (default)	+4dB (1.23V)	+18dB (6.16V)	Phone Jack (TRS) (Balanced) *2
			+4dB	-10dB (0.245V)	+4dB (1.23V)	
INSERT OUT 1-24	150 Ω	10k Ω Lines	-	+4dB (1.23V)	+18dB (6.16V)	Phone Jack (TRS) (Balanced) *2
PHONES	100 Ω	8 Ω Lines	-	4mW	25mW	Stereo Phone Jack (TRS) (Unbalanced) *3
		40 Ω Lines	-	12mW	75mW	

*1. XLR-3-32 type connectors are balanced. (1 = GND, 2 = HOT, 3 = COLD)
*2. Phone jack are balanced. (Tip = HOT, Ring = COLD, Sleeve = GND)
*3. PHONES stereo phone jack is unbalanced.
    (Tip = LEFT, Ring = RIGHT, Sleeve = GND)

• STEREO OUT [L,R] , 0dBV is referenced to 1.00 Vrms.
• In these specifications, when dB represents are specific voltage,
  0dB is referenced to 0.775 Vrms.
• All output (except INSERT OUT 1-24) DA converters are 24 bit,
  128times oversampling.

Digital Input Characteristics

Terminal		Format	Data Length	Level	Connector in Console
2TR IN DIGITAL	1	AES/EBU	24 bit	RS422	XLR-3-31 type (Balanced) *1
	2	AES/EBU	24 bit	RS422	XLR-3-31 type (Balanced) *1
	3	IEC-60958	24 bit	0.5Vpp/75 Ω	RCA Pin Jack
CASCADE IN	-	-		RS422	D-SUB Half Pitch Connector 68P (Female)

*1. XLR-3-31 type connectors are balanced. (1 = GND, 2 = HOT, 3 = COLD)

Digital Output Characteristics

Terminal		Format	Data Length	Level	Connector in Console
2TR OUT DIGITAL	1	AES/EBU *1 Professional use	24 bit *3	RS422	XLR-3-32 type (Balanced) *4
	2	AES/EBU *1 Professional use	24 bit *3	RS422	XLR-3-32 type (Balanced) *4
	3	IEC-60958 *2 Consumer use	24 bit *3	0.5Vpp/75 Ω	RCA Pin Jack
CASCADE OUT	-	-	-	RS422	D-SUB Half Pitch Connector 68P (Female)

*1. channel status of DIGITAL OUT 1, 2
type   : 2 audio channels
emphasis   : NO
sampling rate   : depends on the internal configuration

*2. channel status of DIGITAL OUT 3
type   : 2 audio channels
category code   : 2 channel PCM encoder/decoder
copy prohibit   : NO
emphasis   : NO
clock accuracy : Level II (1000 ppm)
sampling rate   : depends on the internal configuration

*3. dither   : word length 16 - 24 bit
*4. XLR-3-32 type connectors are balanced. (1 = GND, 2 = HOT, 3 = COLD)

Available Mini-Ygdai Card Specifications

Yamaha	Model	Function	IN	OUT	Format	Res / Freq	Connector	Note
Maker	MY8-AT	Digital I /O	8	8	ADAT	24 bit 44.1/48 kHz	Toslink x 2	Can handle 24 bit/96 kHz by double channel mode
Yamaha	MY8-AE	Digital I /O	8	8	AES/EBU	24 bit 44.1/48 kHz	D-sub 25pin	Can handle 24 bit/96 kHz by double channel mode
	MY8-TD	Digital I /O	8	8	TDIF	24 bit 44.1/48 kHz	D-sub 25pin	Can handle 24 bit/96 kHz by double channel mode
	MY8-AD24	A to D In	8	-	-	24 bit 44.1/48 kHz	TRS x 8	Replacing MY8-AD (20 bit 44.1/48 kHz)
	MY8-AEB	Digital I /O (w/REF Video in)	8	8	AES/EBU (AES-3id)	24 bit 44.1/48 kHz	BNC x 9 (In x 4, Out x4, REF. Video in x 1)	"eXi-Clock" Sync Capability
	MY4-AD	A to D In	4	-	-	24 bit 44.1/48 kHz	XLR x 4	
	MY4-DA	D to A Out	-	4	-	20 bit 44.1/48 kHz	XLR x 4	
	MY8-AD96	A to D In	8	-	-	24 bit 44.1/48/88.2/96 kHz	D-sub 25pin	
	MY8-DA96	D to A Out	-	8	-	24 bit 44.1/48/88.2/96 kHz	D-sub 25pin	
	MY8-AE96S	Digital I /O	8	8	AES/EBU	24 bit 44.1/48/88.2/96 kHz	D-sub 25pin	Sampling Rate Converter for Input, 3 cards max. with DM2000
	MY8-AE96	Digital I /O	8	8	AES/EBU	24 bit 44.1/48/88.2/96 kHz	D-sub 25pin	
	MY8-ADDA96	Analog I /O	8	8	Analog	24 bit 44.1/48/88.2/96 kHz	Euro Block	
	MY16-CII	CobraNet Interface	16	16	CobraNet	20/24 bit 44.1/48/88.2/96 kHz	RJ45 x 2	Check instructions for multiple use
	MY16-C	CobraNet Interface	16	16	CobraNet	20/24 bit 44.1/48/88.2/96 kHz	RJ45 x 2	Check instructions for multiple use
	MY16-AT	Digital I /O	16	16	ADAT	24 bit 44.1/48/88.2/96 kHz	Toslink x 2	Can handle 24 bit/96 kHz by double channel mode
	MY16-AE	Digital I /O	16	16	AES/EBU	24 bit 44.1/48/88.2/96 kHz	D-sub 25pin	Can handle 24 bit/96 kHz by double channel mode
	MY16-TD	Digital I /O	16	16	TDIF	24 bit 44.1/48/88.2/96 kHz	D-sub 25pin	Can handle 24 bit/96 kHz by double channel mode
	MY16-mLAN	mLAN Interface	16	16	IEEE 1394	24 bit 44.1/48kHz	1394 6pin	Check instructions for multiple use

Third Party

Maker	Model	Function	IN	OUT	Format	Res / Freq	Connector	Note
AuviTran	AVY16-ES	Digital I /O	16	16	Ether Sound	24 bit 44.1/48 kHz	RJ45 x 2, D-sub 9pin	Refer to http://www.auvitran.com/
AVIOM	16/o-Y1	Digital I /O	-	16	A-net	24 bit 44.1/48 kHz	RJ45 x 1	Refer to http://www.aviom.com/
Audio-Service	MYMADI64	Digital I /O	64	64	MADI	24 bit 44.1/48/88.2/96.kHz	BNC x 2, Fiber optics	Refer to http://www.audio-service.com/

Guidance on the use of Mini-YGDAI cards   Go to **www.yamahaproaudio.com** to check "Guidance on the use of Mini-YGDAI cards"

Dimensions

371

247

821

883

900 (Not including Screw heads)

968

(mm)

Surround Monitoring Diagram

YAMAHA

Bus 1 2 3 4 5 6
L R LS RS C LFE

5.1 Master MTR

SLOT

※5.1→3-1 Down Mix

Dolby Surround®
DTS Stereo®
Encoder

Lt
Rt

Dolby Surround®
DTS Stereo®
Decoder

L
C
R
S

SLOT

RECORD MATRIX

2TR Master Recorder

RECORD MATRIX

※5.1→ST Down Mix

2TR Master Recorder

L
R

Bus to Stereo

To Monitor Processor

Recording
Monitoring

Monitor Processor
• Individual
• Bus Mute
• Global
• Level Control
• External Source Monitor

MONITOR MATRIX Processor
•5.1→3-1
•5.1→Stereo
•3-1→Stereo
Down Mix

Bass Management Processor

Att..
L
R
LS
RS
C
SW
LS2
RS2

Delay

OMNI OUT
or
SLOT 1-6

Monitor Speakers
L
R
LS
RS
C
SW
LS2
RS2

From SLOT

Monitor Alignment

Speaker Control

Bus 1 2 3 4 5 6
L R LS RS C LFE

DM2000 Block Diagram   8bus, 12aux, 4matrix, 6slot, 8effect, 6geq

INPUT PATCH

OUTPUT PATCH

STEREO L
STEREO R

STEREO OUT

OMNI OUT

TALK BACK

AD IN 1-24