YAMAHA CORPORATION
P.O.BOX 1, Hamamatsu Japan
www.global.yamaha.com
www.yamaha.co.jp/product/proaudio/homeenglish/navi/index.htm

YAMAHA

YAMAHA

DIGITAL PRODUCTION CONSOLE

DM2000

ISO9001
JQA-1868

PRINTED WITH SOY INK
This document is printed on chlorine-free (ECF) paper with soy ink.

PRA01-5 Printed in Japan

PRELIMINARY

Beyond Mixing
To Total Production Control

It took a while, but at long last the seminal standard of digital sound — 16 bits at 44.1 kHz — has seen its day … at least on the production front.

We've seen bit depths of 18, 20, and 24 at sampling rates of 48 kHz and sometimes higher come and go, but now the entire industry has its sights set on one formula that is the future of digital sound: 24 bits at 96 kHz. Now we really do have a digital standard that delivers the smooth, natural sound of analog recordings without the attendant disadvantages. And, in the same way that the Yamaha DMC1000, 02R and then the PM1D revolutionized the fledgling field of digital mixing as it grew in rapidly increasing leaps and bounds throughout the last decade, the Yamaha DM2000 Digital Production Console is ready to define the industry standard for the foreseeable future.

But the DM2000 is much more than simply a high-performance digital mixer, it is a total production tool that also offers 96 kHz effects, advanced surround production facilities, extensive integrated DAW and machine control, computer and memory-card based data management, an extraordinarily flexible bus system with digital patching, inserts, and much more.

Yamaha defined the first generation of affordable, professional digital mixing consoles. Get ready for the next generation — total production control.

Dedicated DSP LSIs Deliver Unprecedented 24 bit, 96 kHz Performance

Unlike conventional equipment that achieves operation in 96K mode with reduced number of tracks, with DM2000 there is no limitation dependent on sampling frequencies - 44.1 kHz, 48 kHz, 88.2 kHz or 96 kHz. For DM2000 96 kHz is the standard. To achieve this, no fewer than 14 newly-developed DSP7 LSIs are utilized in the mixer section, and eight DSP6 LSIs for effects. These chips are designed and manufactured by YAMAHA specifically for professional audio applications, and deliver 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. DM2000 provides more than 9 times the processing power of 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.

24 bit/96 kHz Onboard AD/DA Conversion

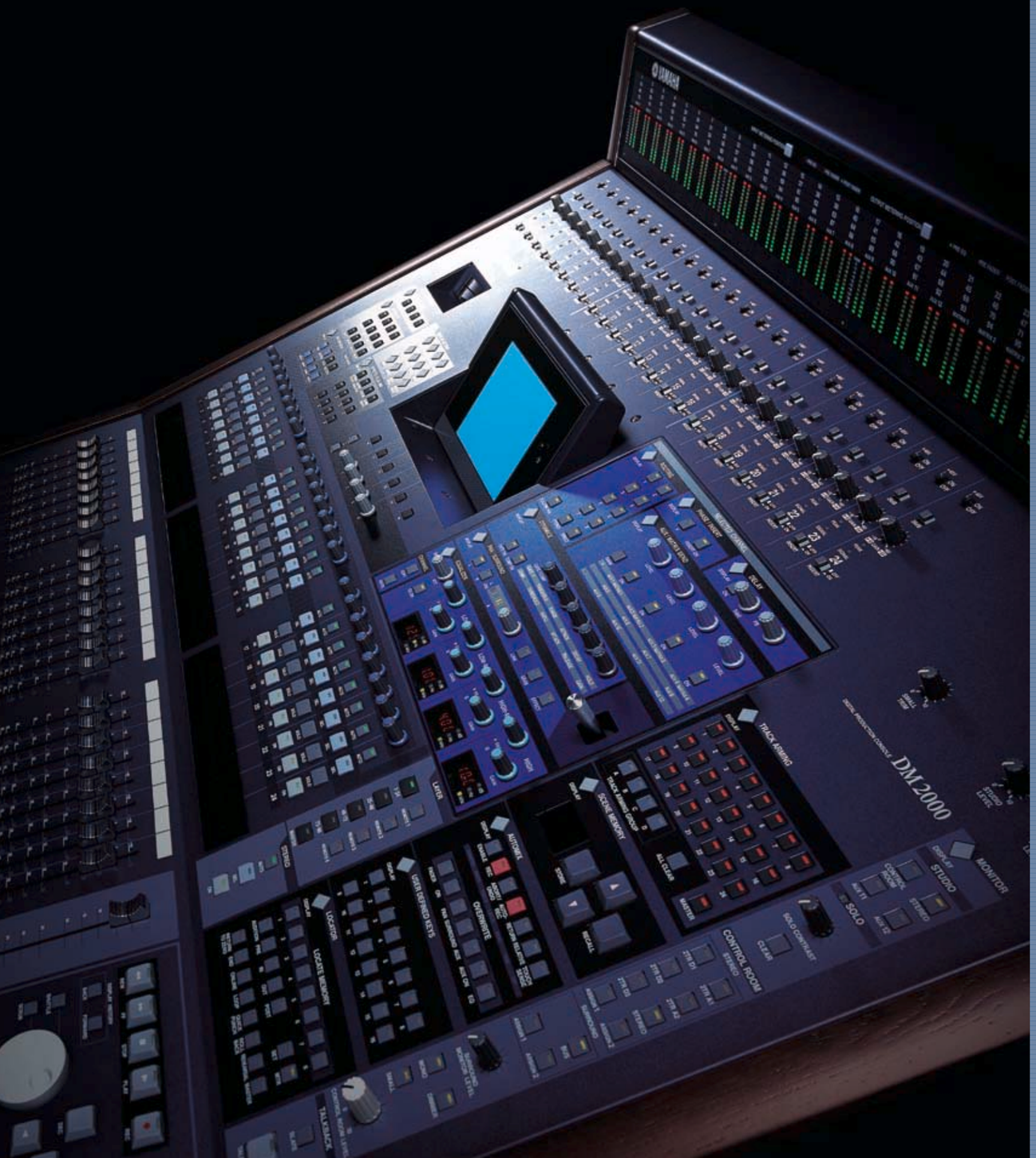
Taking the preceding discussion a step further, what about analog-to-digital and digital-to-analog conversion? The same applies: if you don't have all 24 bits at the full 96 kHz in top-quality converters, you're definitely going to be missing something (i.e. part of your sound). Once again, the DM2000 imposes no limitations. All onboard A/D and D/A conversion makes use of the finest 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.

Complete Surround Solution

It looks as though an industry-standard surround format is finally here, and 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 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 5.1 surround mix to DVD, bass management, and speaker alignment facilities for optimum speaker system tuning. The DM2000 will even handle multiple 5.1 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".

Extraordinary Patching Flexibility

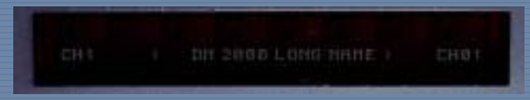
All available inputs, outputs, effects, and channel inserts can be assigned to any of the console's channels or outputs via the DM2000's remarkably versatile, easy-to-use digital patching system. For example, any of the 8 effect processors can be assigned to an auxiliary buss for send-type operation, 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 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 allows 30 of DM2000's busses — eight record/subgroup busses, 12 auxiliary sends, L/R stereo bus, and four stereo matrix busses — to be assigned to any available output connector.

Flexible and Expandable for any Application

In addition to its built-in analog and digital inputs and outputs, DM2000 provides six mini-YGDAI slots that will accept a wide range of I/O and effects plug-in cards.
And if 96 channels aren't enough to handle your application, dedicated cascade ports allow two DM2000s to function effectively as one very large digital mixing system - providing a maximum of 192 input channels!

Channel Name Display

A much-appreciate d 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.



Integrated 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. Support for Steinberg's Nuendo® DAW is also under development.

Studio Manager 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.

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.

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.

2. Display Control

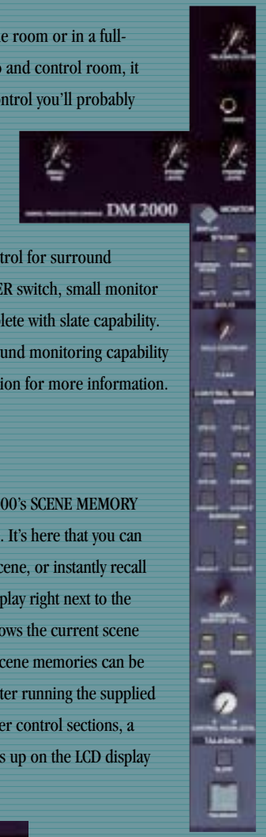
The DISPLAY ACCESS keys determine which type of data will be shown on the DM2000's LCD panel: digital inputs and outputs, channel parameters, utility functions … a total of 12 selectable categories are provided here, in addition to the DISPLAY keys provided for each of the DM2000's control sections. 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 high-mid 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.

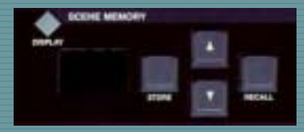
4. Monitor Section

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 folddown, 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.



5. Scene Memory

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.



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.

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 ProTools® Remote Layer mode is selected, the USER DEFINED KEYS are automatically assigned to ProTools® control functions by default.

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. The DM2000's machine control features are divided into three main sections, as summarized below:

8-1. Transport Controls

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

8-2. Locator

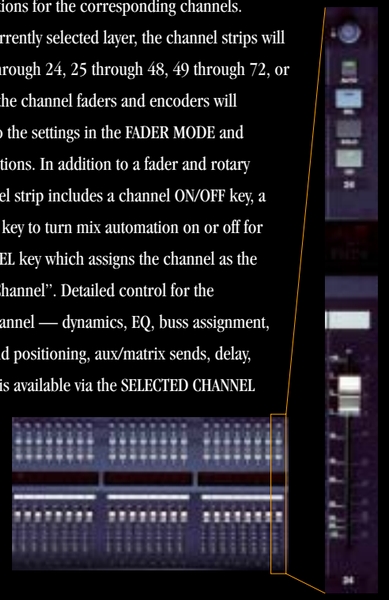
All the locator controls you would normally find on an advanced locator panel — plus a few extras — are duplicated right here on the DM2000 console.

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.

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

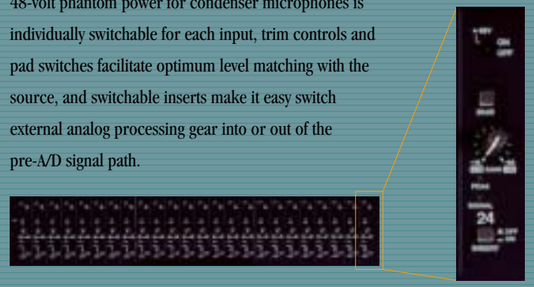
In addition to the master stereo fader with its own ON, SEL and AUTO keys, the master section includes keys for input channel layer selection (Master Layer 1-24, 25-48, 49-72, 73-96) as well as selectors for four remote control layers.

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.

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, or extra analog I/O capability, the appropriate Mini-YGDAI cards are available. Apogee's high-performance A/D and D/A cards are supported, as is the very powerful Waves Y56K effects plug-in card.

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.

An Awesome Performer On the Inside, Too

The DM2000 offers as much "below the surface" as it does directly via its physical interface. In fact, many of this remarkable console's greatest strengths are not visible from the outside. Precision 32 bit/96 kHz processing throughout is just one example. Here are a few others:

Expandable Data Libraries

Setting up EQ, compression, and other parameters for a mix from scratch can be a daunting task, so Yamaha has provided an extensive selection of presets in a range of "libraries" that can simply be selected and used unmodified, or edited to suit specific requirements. Libraries are provided for effects, compression, gating, EQ, I/O patching, and more. Of course, your own setups can be added to the libraries for instant recall whenever they are needed.

32 bit/96 kHz Effects

The DM2000 has eight independent internal 32 bit/96 kHz multi-effect processors that can be patched into any of the console's input, stereo, mix, or matrix channels, and returned to any channel. An extensive range of detailed effect parameters are adjustable via easy-to-use graphic on-screen controls. A comprehensive selection of reverb, delay, modulation, combination effects, and range of newly developed effects including multiband dynamics are provided so that unless a mix calls for a specific external effects processor, you won't need any external processing at all. And, like most other parameter groups, an extensive preset "library" is provided for fast, easy setup. Of course, you can add your own setups to the library for instant recall whenever needed. In addition to stereo effects, the DM2000 features a number of preset effects specifically designed for surround applications. Up to eight stereo or surround effects can be used simultaneously (Note: Some surround effects use as many as four processors).

Channel EQ

In addition to the panel controls and numeric displays, you can view and control all parameters for the 4-band parametric channel equalizers with graphic response representations via the LCD display. You also have the advantage of being able to store and recall EQ setups to or from the EQ library, or you can tweak one of the many presets provided to achieve the response you need.

6 Graphic Equalizers

The DM2000 provides six 31-band graphic equalizers that can be patched into any of the eight busses, 12 aux sends, four stereo matrixes or the main left and right output busses. The graphic equalizers will be particularly valuable for SR applications. Each equalizer features both a graphic slider and response graph display.

Compression and Gating

The DM2000 channel gates and compressors operate independently, so you can use compression and gating simultaneously. Setting up optimum compression and gating parameters can be a tricky business, but the graphic displays accessible via the DM2000 LCD panel make the process as easy as possible. In addition to duplicating the panel controls, the on-screen compressor and gate displays include the parameters you'll need for key-in signal routing and setup. Once again, you have a broad selection of application-specific presets in the gate and compressor libraries, or you can store and recall you own settings.

Patching

Several patch displays allow the system's inputs, inserts, and outputs to be patched to appropriate built-in inputs and outputs as well as I/O added via the rear-panel expansion slots. You can also assign channel names for easy identification. Centralized control means you'll never have to run around to physically re-patch cables whenever you need to reconfigure the system, and patch setups you might want to use again can be stored in the patch library for instant recall at any time.

Surround Monitoring & Processing

In surround mode the DM2000 will comfortably handle 3-1 (LCRS) and 5.1, surround monitoring without any external equipment or the need to reassign channels for surround use. In addition to graphic monitor configuration displays, the DM2000 also provides multi-channel surround pan/position displays so you can see where multiple channels sit in the surround mix at a glance. The joystick provided for surround panning in the console's SELECTED CHANNEL control section has high 128 x 128 step resolution for exceptionally smooth control, and a divergence parameter can be used to adjust the hard/phantom center ratio for each channel.
Matrix mixing and bus-to-stereo functions can be used to provide a 5.1 to 3-1 (LCRS) downmix or 5.1 to stereo downmix while you are working on the 5.1 mix. Furthermore, the 3-1 (LCRS) output can be fed to a 2-track master recorder via a Dolby Surround® encoder, and then back to the console via a decoder to allow instant real-time comparison between the pre-encode and post-decode sound.
Additional facilities provided by the monitor processing section include individual bus (speaker) muting and attenuation, overall level control for all monitor outputs, stem mix monitoring via independent source selection capability for each expansion slot, bass management for subwoofer delivery, and independent delays for precision speaker tuning.

Integrated DAW Control

When you purchase a DM2000, you also get a sophisticated DAW control surface in the bargain! The DM2000 has actually been designed to provide seamless control of computer-based digital audio workstation software such as Digidesign's ProTools®. In addition to a number of controllers specifically included for this purpose, the DM2000 faders, channel switches, encoders, and other controls can be used to directly control the corresponding DAW parameters. You also have extensive control over plug-in effects. Total transport and automation control are provided as well. Although the DM2000 is directly compatible with current ProTools® software, and support for Steinberg's Nuendo® DAW software is on the way, any other MIDI-controllable DAW can be accommodated by appropriate assignment of the consoles MIDI messages.

More ...

Any parameter that can be controlled via the DM2000's physical interface can also be controlled via the LCD panel. But there are many features and functions that are only accessible via the LCD. Most of these are the set-it-and-forget-it type, so you can do all actual mixing from the control surface. Some examples would be word clock or MIDI setup. There are also a number of convenient functions that you might use more often, such as an oscillator with sine as well as pink noise and burst noise output, or channel pairing and fader grouping. The point is that it's all there. Whatever you need for the most advanced, highest quality sound production, the DM2000 has it, or can be expanded to provide it.

Studio Manager Software

The DM2000 comes supplied with Yamaha's Studio Manager software application for both Macintosh and Windows platforms. Studio Manager gives you complete access to all DM2000 parameters for either on-line or off-line control. The program's visual interface makes it easy to relate on-screen controls to the corresponding console functions, while many of the graphic displays provide a more comprehensible visual reference to parameter settings. Of course you can use the Studio Manager while connected to the DM2000 for real-time control, but you can also use the program off-line — on a portable computer, for example — to make rough adjustments or preliminary settings that can be finalized when you actually connect to the console. The Studio Manager can also be used to manage an extensive archive of mix data.

The Studio Manager includes the following main display pages:

Console Window

Almost a complete virtual mixer, this display shows the primary DM2000 channel parameters "in-line", as they would appear on an analog console. This is a comprehensive overview designed for fast, efficient editing of the most essential mix elements.

System Setup dialog

This display includes all the basic setup parameters for the DM2000. Here's where you'll define your production "environment".

Selected Channel Window

Similar to the SELECTED CHANNEL section on the DM2000 console, this display includes all parameters for the currently selected channel: level, buss assignments, sends, gate, compressor, equalization, delay, and more.

Patch Editor Window

When you add several Mini-YGDAI expansion cards to the DM2000 to create the input/output configuration you need, input and output patching can become an issue.The Patch Editor display makes patch assignments easy with an easy-to-use matrix type visual interface.

Effect Editor Window

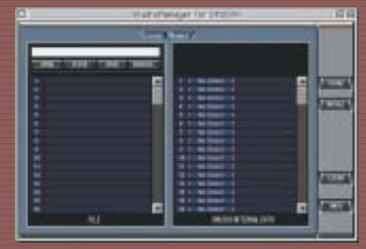
In addition to offering superb quality, the DM2000's internal effects include an extensive range of editable parameters so the effects can be precisely customized for your requirements. The Effect Editor brings all related parameters for the selected effect together in a comprehensive display to make detailed editing easier than ever.

Surround Editor Window

When the console is being used in surround mode the Surround Editor display can facilitate surround positioning of individual tracks.

Library Window

The DM2000's dynamics, EQ, and effect libraries are an extraordinarily convenient tool for managing frequently-used setups.The Studio Manager Memory Management display makes operation easier than ever.



GEQ Editor Window

Here you can set up any of the DM2000's six graphic equalizers via a fully graphic interface that displays both the virtual graphic equalizer sliders and the resulting response graph.

Timecode Counter Window

Displays current SMPTE time code in hours, minutes, seconds, and frames.

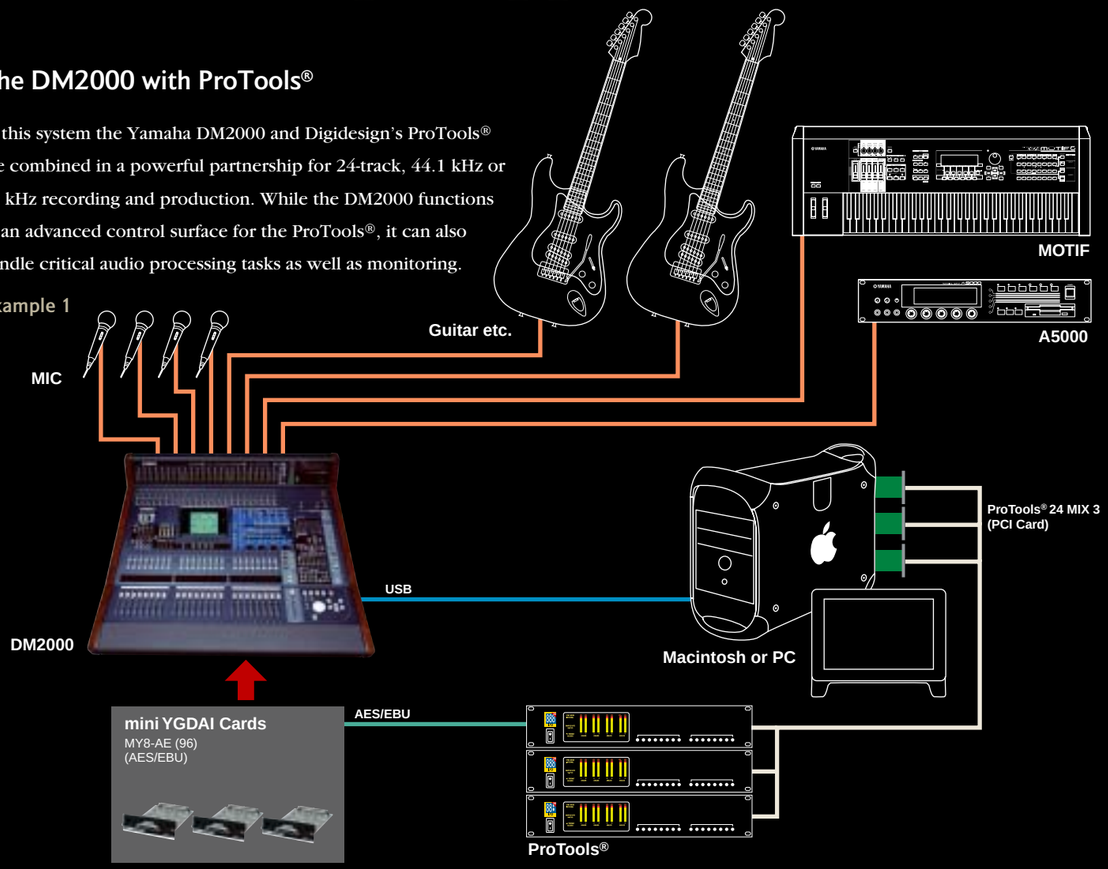
Software screens are not final.

Sample Applications

The DM2000 with ProTools®

In this system the Yamaha DM2000 and Digidesign's ProTools® are combined in a powerful partnership for 24-track, 44.1 kHz or 48 kHz recording and production. While the DM2000 functions as an advanced control surface for the ProTools®, it can also handle critical audio processing tasks as well as monitoring.

Example 1



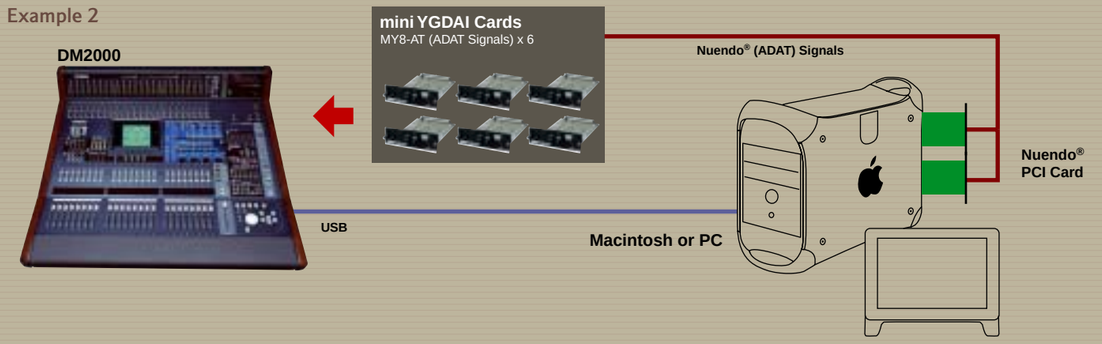
Connection with 24 bit/ 96 kHz recorders

Although DM2000 handles 24 bit/96 kHz audio as standard, currently available digital recorders can handle 24 bit/96 kHz audio only in double channel mode (using 2 tracks to make one).
So the I/O connections have to use double the number of channels, too. MY8-AT/TD/AE cards work in double channel mode to handle 24 bit/96 kHz audio.
Even in this configuration, DM2000 uses one channel for one track, but twice the number of I/O connections are required. With next generation recorders that handle 96K audio as standard (in double speed mode like DM2000) you will be able to make standard connections using the MY8-AE96 card. Also, DM2000 slots are ready to cope with 16 I/O at up to 48 kHz when MY16 I/O cards (currently under development) are released in the future.

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 the Nuendo® audio cards.

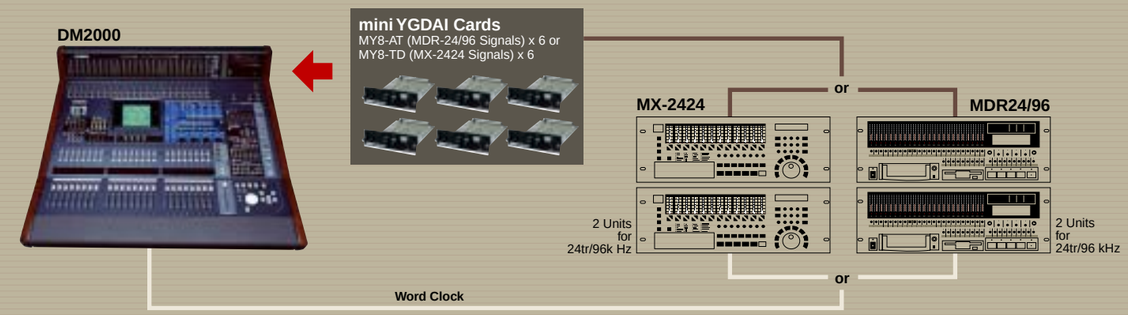
Example 2



HDR 24tr Recording Setting (96 kHz)

Stand-alone hard disk recorders such as the Tascam MX-2424 or Mackie MDR24/96 are rapidly gaining popularity. Here's a system in which either recorder is paired with the DM2000 for an all-digital signal path and awesome mixing and processing power for a full 24 tracks of 24 bit/96 kHz audio.

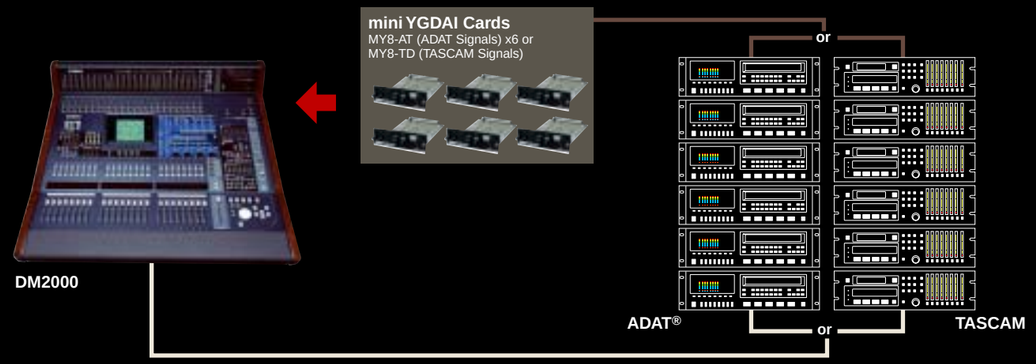
Example 3



24tr Tape Based Setting (96 kHz Recording)

The latest ADAT and Tascam multitrack digital tape recorders are also capable of handling 24 bit/96 kHz audio and, as such, are potential candidates for combinations with the DM2000. With the appropriate Mini-YGDAI I/O cards a 24-track system like the one shown here is easy to set up.

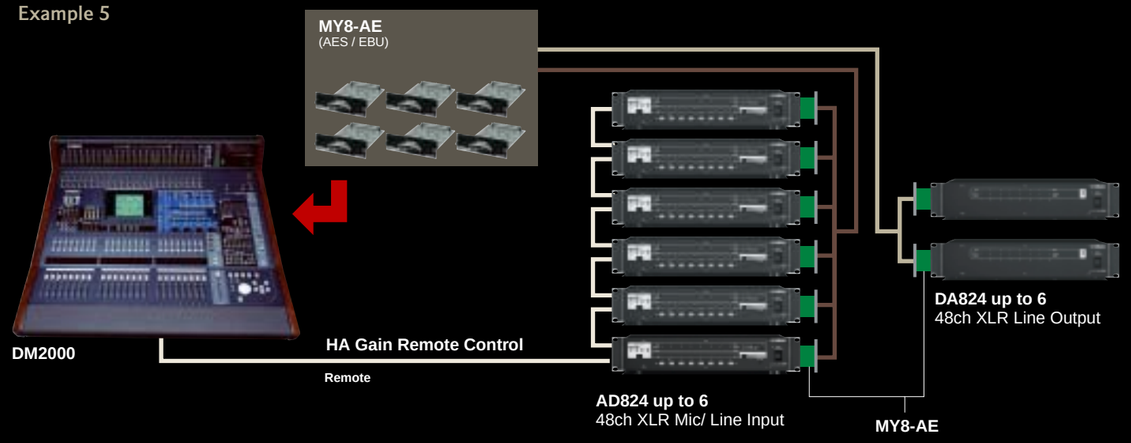
Example 4



Sound Reinforcement

Although the DM2000 is designated as a “production” console, its flexibility and convenience (not to mention unparalleled sound quality) make it an excellent choice for many sound reinforcement applications as well. In the 48-channel system shown here the DM2000 is teamed up with high-performance external head amplifiers/AD converters and DA output stages. Head amp gain is remotely controllable from the DM2000.

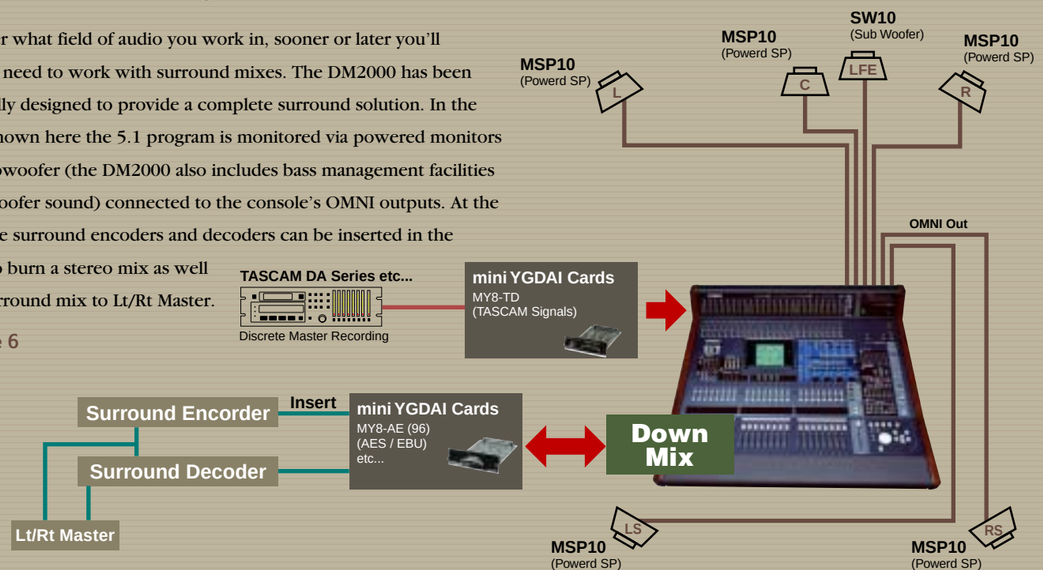
Example 5



5.1 Surround Monitoring

No matter what field of audio you work in, sooner or later you’ll probably need to work with surround mixes. The DM2000 has been specifically designed to provide a complete surround solution. In the system shown here the 5.1 program is monitored via powered monitors and a subwoofer (the DM2000 also includes bass management facilities for subwoofer sound) connected to the console’s OMNI outputs. 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.

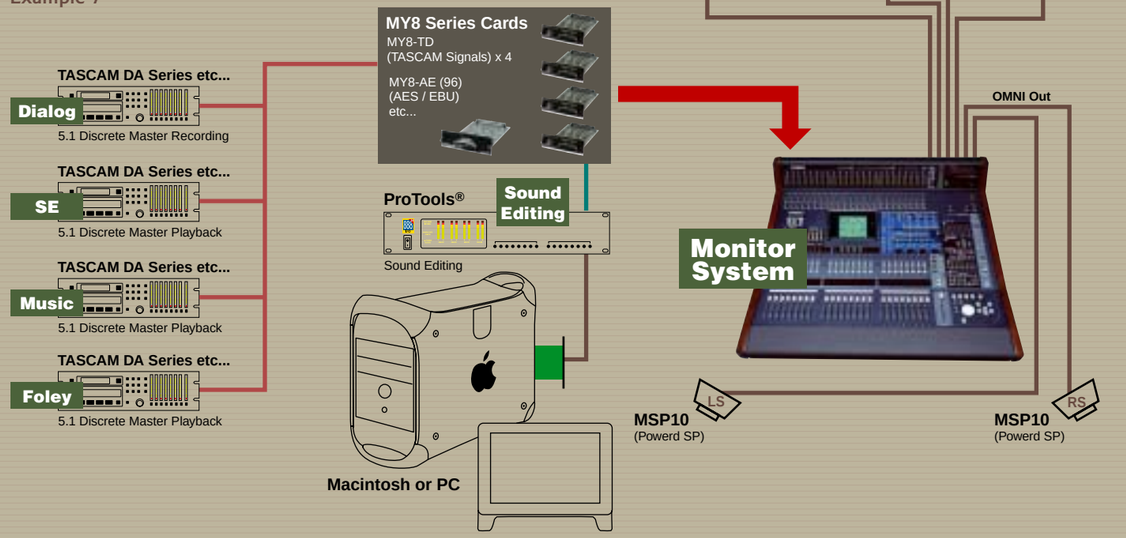
Example 6



Stem Mix Monitoring

With the DM2000 monitoring stem mixes for film or video is easy. Even if your dialog, sound effects, music, and Foley sources are all in the form of 5.1 mixes, they can be combined and processed via the DM2000 without the need for any extra monitoring facilities.

Example 7



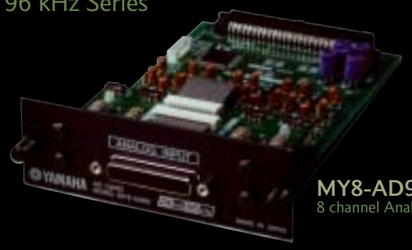
Options

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, or extra analog I/O capability, the appropriate cards are available.

mini YGDAI Cards

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)

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)

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

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

MY8-mLAN
mLAN interface card

Third Party Models

Y56K : Waves effect and ADAT I/O
AP8AD : Apogee AD coverter
AP8DA: Apogee DA coverter

MB2000

Peak Meter Bridge

LA1800

Light Gooseneck

Side Pad
SP2000

Effect List

The DM2000 effect library includes a total 52 superb effects — 44 stereo and 8 surround.

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
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

* 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
19	Strings1	COMP
20	Strings2	COMP
21	Strings3	COMP
22	BrassSection	COMP
23	Syn.Pad	COMP
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
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

DM2000 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% - 48 kHz+6% Double rate 88.2 kHz-10% - 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	
Fader Resolution	0 - -96 - ∞dB (256 steps/100mm) master faders +10 - -72 - ∞dB (256 steps/100mm) other faders 0 - -96 - ∞dB (256 steps/100mm) stereo fader	
Total Harmonic Distortion Input Gain = Min.	Less than 0.05% 20Hz to 20 kHz @+14dB into 600 W Less than 0.01% 1 kHz @+18dB into 600 W CH INPUT to STEREO OUT Less than 0.05% 20Hz to 40 kHz @+14dB into 600 W Less than 0.01% 1 kHz @+18dB into 600 W CH INPUT to STEREO OUT	
Frequency Response	0.5,-1.5dB 20Hz - 20 kHz @+4dB into 600 W (@Sampling frequency = 48 kHz) 0.5,-1.5dB 20Hz - 40 kHz @+4dB into 600 W (@Sampling frequency = 96 kHz)	
Dynamic Range (maximum level to noise level)	110dB typ. DA Converter (STEREO OUT) 108dB typ. AD+DA (to STEREO OUT)	
Hum & Noise* Rs =150W Input Gain = Max. Input Pad = 0dB Input Sensitivity = -60dB	-128dB Equivalent Input Noise. (20Hz~20 kHz) -94dB residual output noise. STEREO OUT STEREO OUT off. -94dB (98dB 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 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		
	Depth	810mm (w/front pads)		
	Width	900mm		
Net Weight	40kg			
Operating free-air temperature range	10-35°C			
Storage temperature range	-20-60°C			

LIBRARIES

Effect libraries (EFFECT1-8)	Number of factory presets	52 (EFFECT3-8 :43)
	Number of user libraries	76
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
					Sensitivity *1	Nominal	Max. before clip	Console
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 (1.23 V)	+18dB (6.16 V)	XLR-3-32 type (Balanced) *1
STUDIO MONITOR OUT [L,R]	150 Ω	10k Ω Lines	-	+4dB (1.23 V)	+18dB (6.16 V)	Phone Jack (TRS) (Balanced) *2
C-R MONITOR OUT LARGE [L,R]	150 Ω	600 Ω Lines	-	+4dB (1.23 V)	+18dB (6.16 V)	XLR-3-32 type (Balanced) *1
C-R MONITOR OUT SMALL [L,R]	150 Ω	600 Ω Lines	-	+4dB (1.23 V)	+18dB (6.16 V)	XLR-3-32 type (Balanced) *1
OMNI OUT 1-8	150 Ω	10k Ω Lines	+18dB (default)	+4dB (1.23 V)	+18dB (6.16 V)	Phone Jack (TRS) (Balanced) *2
			+4dB	-10dB (0.245V)	+4dB (1.23 V)	
INSERT OUT 1-24	600 Ω	10k Ω Lines	-	+4dB (1.23 V)	+18dB (6.16 V)	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	1	AES/EBU	24 bit	RS422	XLR-3-31 type (Balanced) *2
	2	AES/EBU	24 bit	RS422	XLR-3-31 type (Balanced) *2
	3	IEC-60958	24 bit	0.5Vpp/75	RCA Pin Jack
CASCADE IN		-	-	RS422	D-SUB Half Pitch Connector 68P (Female)

*1. DIGITAL IN 1-3
DE-EMPHASIS is automatically processed when input signal contains emphasis
*2. 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

Maker	Model	Function	IN	OUT	Format	Res / Freq	Connector	Note
Yamaha	MY8-AT	Digital I /O	8	8	ADAT	20 bit 44.1/48 kHz	Toslink x 2	Can handle 24 bit/96 kHz by double channel mode
	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 44/48 kHz)
	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-mLAN	mLAN Interface	8	8	IEEE 1394	24 bit 44.1/48 kHz	1394 6pin	Maximum 5 Nodes
	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	

Third Party

Maker	Model	Function	IN	OUT	Format	Res / Freq	Connector	Note
Waves	Y56K	Effect & I/O	8	8	ADAT	24 bit 44.1/48 kHz	Toslink x 2	Check instructions for multiple use
Apogee	AP8AD	A to D In	8	-	-	24 bit 44.1/48/88.2/96 kHz	D-sub 25pin	Check instructions for multiple use
	AP8DA	D to A Out	-	8	-	24 bit 44.1/48/88.2/96 kHz	D-sub 25pin	Check instructions for multiple use

- Specifications and appearance subject to change without notice.
- All trademarks and registered trademarks are property of their respective owners.
Pro Tools® is a trademark of Digidesign, Avid Technology Inc.
Nuendo® is a trademark of Steinberg Media Technologies AG.
Adat is a trademark of Alesis Corporation.
Tascam, TDIF, MX2424 are trademarks of Teac Corporation
MDR24/96 is a trademark of Mackie Designs Inc.
Macintosh is a trademark of Apple Computer Inc.
Windows is a trademark of Microsoft Coporation.

DIGITAL PRODUCTION CONSOLE

Dimensions