

T² TACTILE TECHNOLOGY



Fully Automated Mixing Systems

M4000

THE T² CONCEPT

No longer are you limited by fixed architectures, slow speed, not enough automation, second rate audio quality, or the number of available inputs. From our design labs to your studio or stage, the M4000 is a unique audio control tool that sets new standards for the next generation of automated mixer performance and cost-effectiveness.

The M4000 is a fully automated, digitally controlled analog mixer with an innovative architecture (patent pending) that separates the mixer electronics from the physical controls. The M4000 consists of two sections. The first is the Digital Controller, which is the control surface for the user and sends all the control information via RS-422 serial connections to the Mixing Engine (audio processing center) which contains all the audio processing circuitry and input/output connections.

This fundamental architectural difference makes the M4000 the ideal choice for virtually all applications, from studio to remote truck to stage. The price and performance characteristics of this unique new mixer make the M4000 the **ONLY** choice for a professional quality automated console. Our concept and design of the control surface and the Mixing Engine's architecture is so advanced, yet so useful, we're willing to bet that within a few years many manufacturers will be following our lead. It is the intimate understanding of the balance between hardware you can touch and the power of the computer to manage tasks that creates the best designs.

Make an appointment for a demonstration of the M4000 and you'll know why the M4000 is fast becoming the best selling automated console.

AUTOMATION FEATURES

The M4000 expands the meaning of **FULLY AUTOMATED** beyond anything known in its class. It's automated functions include:

- Mic input gain
- Mic phase reverse
- 150 Hz high pass filter
- Group insert defeat on/off
- All bus routings
- All auxiliary returns
- Channel (large fader) level & mutes
- Analog stereo master output balance
- Digital stereo master output balance
- Group output levels
- EQ function (peaking or shelving)
- Midi program changes
- Cue and Solo bus levels
- VCA subgrouping
- Low freq EQ shelving/peaking
- Channel pan
- Line input gain
- 75 Hz high pass filter
- Channel insert defeat on/off
- All EQ settings
- All auxiliary sends
- Monitor (small fader) level & mutes
- Analog stereo master output level
- Digital stereo master output level
- All user set defaults
- Group output panning
- Event controls
- Channel insert routing
- Stereo links between inputs
- Aux Send AFL/PFL switching
- High freq EQ shelving/peaking
- All control room monitor settings

Full automation is only useful if it's **FAST**. The M4000 is extremely fast. Our Distributed Intelligence operating system design uses multiple CPUs in all sections of the system. This allows the entire mixer to change **all** scene data (input gain, phase reverse, EQ, bus routing, mutes, fader level, etc.) in less than 20 milliseconds! In practical terms, this means any automation changes will take place in **less than one video frame** (worse case scenario).

You can even turn off the M410 or M411 controller during a session and the audio and its automation will continue to run!

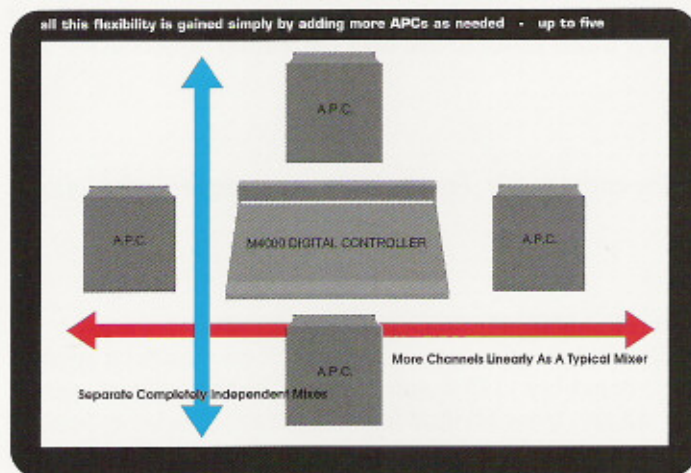
With the M4000, all the key control surfaces you want to reach are at your fingertips. And best of all, you

don't need to squint at a computer screen to see where you (or the computer) have set the controls. All knobs, switches, and faders have LEDs to indicate where the controls are set.

M4000 ARCHITECTURE ADVANTAGES

Putting the control surface under your fingers and the mixer neatly tucked away in a standard 19" rack has the following advantages:

- The two-piece architecture allows engineers more latitude in laying out the electronics. The audio path is not compromised to fit the control surface design and the digital and analog circuits can be separated and shielded. This means superior audio quality and better crosstalk characteristics.
- The Digital Controller is smaller than conventional designs and takes less space in the control room, offering the possibility of designing smaller control rooms to save costs (or using the extra space for more musicians in the control room). In addition, the smaller footprint of the M4000 Digital Controller versus conventional designs means the control room acoustics will be improved and the acoustical designer will have fewer problems dealing with the sonic "splash" of the control room monitor speakers reflecting off the console surface.
- The superior packaging of the M4000 solves many space problems in remote trucks, video post houses, project studios, and shipping/portability for location recording.
- The Digital Controller can control up to 5 Mixing Engines (also referred to as APCs), giving you the smallest footprint of any **240 input mixer**. Unlike conventional designs, the cost of moving fader automation does not increase as you add more channels, dramatically lowering your expansion costs.
- Another unique **T²** feature is the first-ever ability to offer different expansion architectures (patent pending). By adding more APCs, you can change the mixer architecture in two dimensions:
 - 1) Use additional APCs to expand the number of linear inputs, as you would with a conventional mixer design. Just daisy chain the input/output buses together.
 - 2) Use additional APCs to expand the number of completely separate mixes, monitor feeds, and buses available. For example, using the M4000 at a live concert with two APCs would allow you to have two completely separate mixes; one for the live PA feed and one for recording. Each mix output would have



its own EQ, effects, and bus routing. For studio recording, additional APCs can be configured to give you more Aux Sends (up to 30 Aux Sends; 70 using the Group Outputs), Monitor mixes, etc. You can even assign multiple signals to one fader so one fader controls both the live and recording feeds or the main and monitor feeds. You can use both linear and vertical expansion modes at the same time! For example, add one more APC for more inputs for a PA feed; then add two more APCs for a separate live recording feed. It all depends on how you assign the APCs.

- Using two or more APCs also allows you to have sophisticated monitor mixes complete with their own EQ and effects. No more "cannibalizing" split EQs from the channel

signal to the monitor signal. This prevents confusing both the engineer and musician when they don't hear the same EQ in the mix or forgetting to re-configure the split EQ at mixdown time.

- The Mixing Engine can be used as a patch bay. Simply rack mount it backwards and all the input/output connections are immediately available. This saves you both space and money in project studios, remote trucks, and PA.
- The Mixing Engine can be located near the microphones, thus avoiding signal loss and RFI in long cable runs for your microphones. This is especially important for sound reinforcement and theater, where conventional mixer designs require the mic cables are run for at least 300 feet.

- For project studios, our unique architecture means you can dedicate one Mixing Engine as your “MIDI submixer.” You can have all your MIDI gear normalled to this Mixing Engine and call it up as you need it to bring in your MIDI generated sounds with the live instruments or additional effects sends/returns.

Besides all the advantages of our distributed intelligence design, we also designed the M4000 to have all the controls you really need. For example, all faders, mute/solo switches, and channel overload LEDs are readily available. We supply one set of input controls and output controls to prevent the typical “forest of knobs” from confusing the operator. The complete input control strip is assigned by pressing the “channel activate” button above the channel fader or subgroup fader.

With our design concept, all the channel fader levels, channel monitor levels, subgroup levels, master analog outs, master digital outs, solos, and mutes are immediately available, as on a conventional design. All other input and output controls are one button away (just press the “channel activate” button). Less frequently used “utility” type controls (i.e., the test tone oscillator) are accessible from the LCD Function section.

Normally, you would need to slide your chair from input #1 to input #56 and hunt for the knob or switch to adjust. Worse, conventional console widths can be so great that the sound of the control room monitors changes as you move from one end of the console to the other. Of course, your near-field monitors have just one small “sweet spot,” making them inaccurate at the extremes of the console. So why use a conventional mixer that requires you to roll your chair from one end to the other, adjusting controls to inaccurate speaker positions? Conventional mixer designs do not lend themselves to easy expansion, take up too much space, give off too much heat, and require the producers and engineers mate with gorillas to develop the extremely long arms necessary to reach all the controls.

"The M4000's equalization is remarkably smooth in operation and worthy of that much-vaulted accolade of being "musical." Within a few minutes' use, you realize that you need far less boost/cut than might the case with other analog designs-this certainly is a sweet sounding EQ section - with plenty of overlap."

– **Mix Magazine, March 1995**

As you’ve already realized, our control surface concept is much faster to use than the virtual mixers using a CRT and a mouse to move 48 faders.

GLOBAL FUNCTIONS

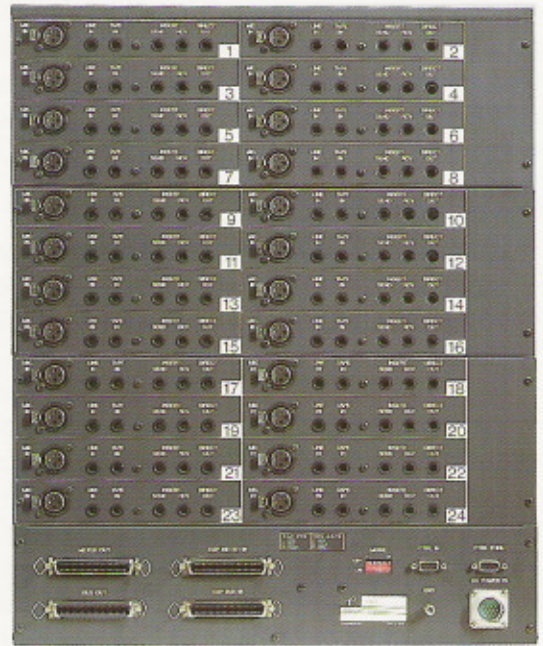
The “Global” buttons make sweeping changes across the entire mixer. For example, pressing the “Mix” global causes every channel to do the following:

- Null the EQ settings
- Defeat the channel inserts
- Remember the channel and monitor fader levels (can be changed in set-up defaults)
- Remember the Aux Sends
- Remember the Aux Returns
- Routes Tape Returns to the large faders

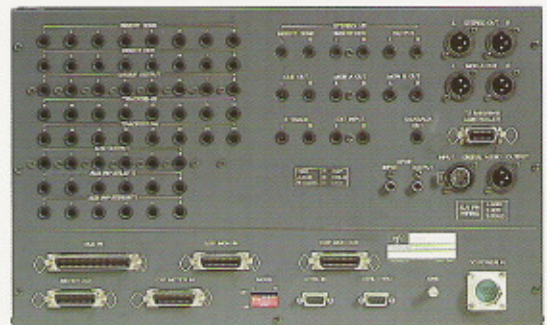
These are time consuming functions you would normally have to do manually, instead of the instant response of our Global automation system. You can even alter the characteristics of any of the Global commands in the set-up defaults menu (i.e., instruct it to “zero” the channel fader levels). At any time, you can activate a channel and adjust any of the controls, i.e., adjust the EQ or turn the channel insert on. You no longer need to constantly reset knobs and switches as you move between tracking and mixdown operations.

The Global functions are set up to work the way you do. The original mode of operation is the “Tracking” mode, where you are recording the individual tracks onto your tape or other media. The next mode would be the classic “Mixdown” mode (which we label “Mixdown”) where you’ve recorded all your tracks and now want to mix down from your recording medium. The next mode is used for virtual tracking or other cases

The **M420** is the input section of the M4000 Mixing System. It contains 24 mic inputs, 24 line inputs, 24 tape inputs, and 24 sets of EQ. Up to 5 M420s can be used with one M410/M411 Digital Controller for a total of 240 inputs.



The **M430** is the output section of the M4000 Mixing System. Each M430 contains 8 group outputs (triple-bused to drive 24 tracks), 6 mono aux sends, 6 stereo aux returns, monitor outputs, main L/R outputs, and the digital audio inputs/outputs.



The **M440** is the data controller of the M4000 Mixing System. It includes a 3.5" floppy drive that writes to MS-DOS format, an event controller with 8 relay, 4 TTL, and 4 opto-isolated switches, and an additional buffered serial port for communication to computer networks. The dynamic automation versions (M440B and M440C) add a 250 meg hard drive and SMPTE time code generator/reader.



The **M490** is the power supply of the M4000 Mixing System. Each M490 has three power taps. Because it has no fans, it can be used in low noise situations.



where you need to mix new live signals in with the previously recorded ones (we label this “Allmix”). The main difference between the “Mixdown” Global described above and the “Allmix” Global is that we route the tape returns to the small faders and the new live tracks to the large faders. The small fader mix (Monitor) is routed to the L/R bus. **This doubles the number of inputs available for mixdown.** This could be reversed via the set-up defaults.

The Global Functions include:

- **Tracking.** This assigns mic and line inputs to the lower (100 mm) faders, assigns tape returns/monitor to the upper faders, undoes all mutes and solos, and opens (turn on) the channel inserts.
- **Mixdown.** This assigns the tape (or signal storage) returns to the lower faders, undoes all mutes and solos, and defeats the inserts.
- **Allmix.** This is for using virtual tracks during mixdown. To help you record new input signals along with sequenced signals, the mic and line inputs are routed to the lower faders, all inserts defeated, and the tape returns are routed to the upper faders which are then routed to the L/R bus. This gives you double the inputs available for mixdown.
- **Copy all input settings** of one channel to another channel(s). Just press the “Activate” button above the channel(s) to which you want the settings copied.
- **Copy channel EQ** settings to another channel(s).
- **Scratch pad memories** M1 and M2 are short term memories designed to let you compare mixer settings (for example, two different EQ settings can be compared by just bouncing back and forth between the M1 and M2 buttons without destroying anything else you may have set up).



- **4 mute groups.**
- **4 “immediate access” scene buttons** that can be used to call up specific configurations or macros of functions and/or routings you often use. For example, different mixer set-ups or defaults that you’d use for different types of mixing projects such as film, PA, and studio recording. You could even configure a “fader flip” switch as one of these scenes. The main scene memory (480 scenes in each APC) is retrieved via the Function section of the M4000.

When switching from Globals “Mixdown” to “Allmix” to “Tracking,” the global can be set to store the last control settings of the mixer with the appropriate Global. The advantage is when you switch from Tracking to Mixdown, you get the Mix levels and EQ the way you originally stored them. When you switch back to tracking (to add new tracks), the M4000 recalls your original level and EQ settings for the tracking mode.

We also allow you to “slave” or start the M4000 scene changes from your recorder (if it sends MIDI “play” commands) or sequencer. Assuming the recorder or sequencer’s MIDI output is connected to the APC’s MIDI input and the APC is set to expect external commands, you then press “play” on the recorder/sequencer and when the MIDI start time or “play” command is sent, the M4000 automatically switches to either the “Mixdown” Global or the “Allmix” Global (which you have already set your preference with a software switch on the M4000). The “record” command from the MIDI recorder/sequencer could set the M4000 to the Tracking or Allmix mode (once again, user set with software switch). This saves you even more time during your sessions.

A FAMILIAR INTERFACE

The M4000 is familiar enough to a conventional mixer design that it only takes a few minutes to be acclimated. The automated “Global” functions make moving from the different mixing modes (tracking, mixdown, virtual tracking mixdowns, etc.) much faster than conventional designs. In fact, the time saved in mixing with the M4000 potentially covers its original cost in the first few months of operation.

BASIC CONFIGURATION

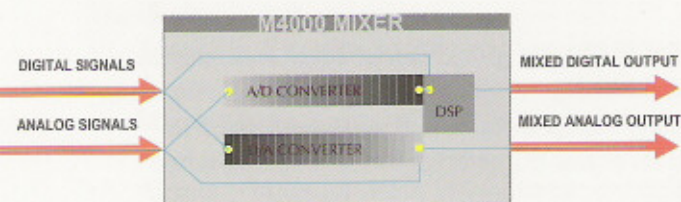
The M4000 Mixing Engine basic configuration has:

- 24 mic, 24 line, and 24 tape input channels (analog)
- 24 sets of EQ which can be switched between paths every 30 milliseconds.
- 1 stereo digital input channel (both AES/EBU and S/PDIF formats)
- 8 bus outputs for easy connection to 8, 16, 24, 32, 48 (& beyond) track recorders. These outputs are “tripled bused.”
- 8 bus inputs with inserts
- 6 aux sends (5 & 6 can be linked as a stereo send with pan control)
- 6 stereo aux returns
- Monitor and Cue sends/returns
- 1 stereo master analog output with insert
- 1 stereo master digital output (both AES/EBU and S/PDIF formats)
- Inserts for all input channels and the 8 buses
- 3.5” floppy drive (MS-DOS format with ASCII tab-delimited text files for easy cross-platform use to Atari, MS-DOS, Macintosh, and Silicon Graphics)
- RS-422 DB-9 serial connectors
- MIDI in and MIDI out connectors

The 24 dual in-line inputs allow a maximum of 48 input signals during mixdown. **Even a two APC setup offers a minimum of 96 inputs for mixdown!** 5 Mixing Engines (or APCs) stacked together would then offer 240 inputs available for mixdown, and this is without adding any of the group inputs or auxiliary inputs to the total!

NOW YOU CAN MIX YOUR DIGITAL AND ANALOG INPUTS TOGETHER AND STAY IN THE DIGITAL DOMAIN! (patent pending)

Virtually every studio has some digital audio equipment (a DAT recorder, magneto-optical recorder, hard disk recorder, etc.). One of your biggest problems is the need to mix those digital output signals with your analog



signals. Until now, you've had to convert these digital sources to analog and then mix down to your digital or analog stereo master. The M4000 has a stereo digital input and a stereo digital output. With its built-in A/D converter, the M4000 converts the analog "mix" signals to digital and enables you to mix these in with the stereo digital input via our built-in DSP and adjust the "blend" of these signals at the digital output.

Therefore, your original digital input signal stays in the digital domain through mixdown

To make the M4000 complete, we also include a D/A converter to convert the digital input signal to analog and be mixed in with the analog signals. You get **all** signals (analog and digital) available at **both the analog master stereo output and the digital stereo output**. The M4000 allows you to make both analog and digital mixdown passes at the same time.

APPLICATIONS

RECORDING STUDIOS

Great automation. Our system remembers everything...mic phase, input gain, EQ, routing,...even control room settings! If you're using a hard disk recording system, you could map the M4000's faders to control the virtual faders on your computer screen via MIDI.

Digital input/digital output. As mentioned earlier, you can mix the **digital** outputs of your digital workstation, DAT, M.O., digital effects, etc., directly into the M4000. These digital input signals can stay in the digital domain for mixing directly to hard disk, DAT, etc., or to analog.

Easy expansion. Just add more APCs as you need them; rent an extra APC for a particular session or live venue.

Sound quality. Our two-piece design and excellent electronics yields superior crosstalk and quiet operation.

Globals. T² is the first company to offer all these "macros" to save you time with your typical recording sessions. These functions are explained later.

Architecture. With our unique concept, you can simultaneously create different mixes for live sound, recording, FM radio, movies, etc.

Network capable. In the future, the M4000 will be capable of communicating and updating mixes to other **T²** mixers. It's perfect for film dubbing facilities because the different rooms (ADR, sound effects, music, etc.) can hear the other room's changes in the mix.

MIDI submixer. For project studios, our architecture means you can dedicate one APC (or more) as your "MIDI submixer." You can have all your MIDI gear normalled to this APC and call it up as you need it with the controller to bring in your MIDI generated sounds with the live instruments or additional effects sends/returns.

LIVE SOUND

Our concept solves your problems in sound reinforcement and theater. The M4000 puts all the audio processing on stage, where it should be, next to all the mics and power amps. Now you can finally get rid of that fat snake and all its problems. All you need is one serial cable between the digital controller and the APC(s); 300 foot cable runs or more with fiber-optical connection (you can even run duplicate feeds for emergency backup). Therefore, virtually no R.F.I. And less crosstalk.

The controller takes up fewer "paying" seats and ruins fewer sight lines. After all, many of you are working with the latest in stage design, so why should you continue to use old mixer technology? With extra APCs, the M4000 gives you the opportunity for simultaneous, but discrete, mixes for both PA and recording (or even a

third mix for live FM broadcast!). Other mixers may give you two or three different mixes, but they can only offer different levels of the same basic mix. Only **T²** can give you two or more different mixes with completely different EQ, grouping, routing, etc.!

The packaging of the M4000 makes it easier to ship; therefore your freight costs and the potential for shipping damage are reduced.

Our scene automation is perfect for PA and theater, especially because we remember everything except the headphone and talkback levels! You no longer need to have 2 or 3 large mixers to handle the different band mixes. Just select the scene for that band and your setup is finished. For theater work, we have dedicated "Next Scene" and "Previous Scene" buttons that enable you to easily switch from one scene to the next, rather than having to use a time-consuming keypad to recall the next scene. You could also handle multiple bands by assigning each act their "own" APC with their related scene changes by song. To save you set-up time, you can link the upper (monitor) faders to the lower faders, giving you an instant monitor mix that you can later modify channel by channel. Each APC has its own 480 scene memory so you can have independent memory automation on each unit, or copy the scene memory of one to the other.

We can also control lighting systems via our digital controller. You could actually put the stage audio mix on the large faders, and put the lights on the small faders...both will work perfectly with our scene automation! You could have both the audio mix and the lighting "mix" on the same data diskette controlled by the same scene automation. The M4000 can control (and be controlled) via MIDI so you can use MIDI lighting controllers to run the scene changes of the M4000.

The M4000 also contains a "real world" event controller. We include 8 relays, 4 TTLs, and 4 opto-isolated connections located on a DB-25 connector on the rear of the M440 section of the APC. Now you can use your mixer automation to start/stop cart machines, lights, CD players, etc.

For theater work, the 8 bus outputs can be used as a matrix out. Control of gain, mute, insert, and pan is available in this matrix.

VIDEO POST HOUSES

All the advantages listed above for recording studios apply to post work. Of special consideration is the relatively small space required and the optional ability to make scene changes relative to SMPTE time code. The M4000's network capability (via external computers) allows you to have dedicated rooms for voice, picture, music, sound effects, Foley, ADR, etc., and automatically update each of the M4000s in each of the different rooms. For ease of use, the SMPTE time code display is separate from the function LCD and located in the top center of the meter bridge so it is in perfect "line of sight" to the video monitor. This display uses LEDs instead of LCDs for superior readability.

MOBILE TRUCKS AND REMOTE RECORDING

Once again, all the advantages listed above may apply to your mobile facility. Special advantages in this application are the ease of use (yet powerful enough for any situation), and the ability to make live PA mixes as well as recording mixes from the same console. The M4000 is the most space efficient mixer available with its level of sophistication.

OTHER FEATURES

- Polarity reverse switch for the mic preamp is automated so you get the proper mic phase when you come back to mix the project (especially important for drum overheads and acoustic piano).
- Insert defeat is automated so you spend less time patching and re-patching effects units across the channel/group inserts. This also prevents you from "doubling up" the inserted effect when mixing down. How many times have you "tracked" with an effect unit patched in, then continued to mix down with the effect unit still patched in because you forgot to un-patch it or to hit the bypass switch? The "Insert Defeat" control works for all input signal interrupt paths: Mic, Line, and Tape. This feature lets you program an outboard compressor or limiter to be inserted when tracking, but to be bypassed when mixing

down. Automatically!

- You may VCA subgroup up to 225 groups by 8 faders per group. Touching any one fader within the group (any combination of faders: input, monitor, group, master, etc.) will make all the other faders follow in relative levels.
- “Q” control for mid EQ section allows you more control over the all-important midrange and is automated as well.
- EQ null switch lets you reset all the EQ settings to “zero” or their nominal values by pressing just one button instead of manually turning every knob.
- EQ on/off allows you to completely bypass the tone controls and is automated.
- Dedicated solo and mute buttons on the monitor faders make them easier to use during virtual tracking.
- You can assign two signal paths to be controlled by one fader (i.e., you can put both the monitor and input signals on the large fader).
- The input channel’s direct output follows the fader flip.
- You can copy channel settings to other channels (see GLOBALS).
- You can link channels to other channels, thus creating all the subgroups you may want.
- Cut and paste between mix passes. For example, if Mixpass #1 is OK, but you prefer the lead guitar on track 16 of Mixpass #2, you can move that fader data to Mixpass #1. You can move it completely (replacing the original Mixpass #1 levels of track 16), or just part of the track between 2 time code locations.
- Relative update in real time.
- “Punch in” fader automation by touching fader knob or setting time code in/out points.
- Run scene and dynamic automation simultaneously. The M4000 allows you to unlink the dynamic fader automation from the scene automation so the scene changes will not affect the fader levels.
- The M4000 has a separate expanded scale LED bargraph for the input section that has more segments to give you finer control over your input gain levels.
- 4 “immediate access” scene buttons in addition to the 480 scene memory for quick access to common setups or to store comparative control settings. For example, to compare two different EQ settings, you would store the first setting as scene A, the second setting as scene B. You could then simply toggle between the two for comparison.
- Easily link two channels together as a stereo pair. The left channel fader becomes the master for the two channels. No more worrying how many mono versus stereo input modules you have. The EQ and PAN can also be linked when in Stereo Link mode.
- The M4000 offers a slightly different type of solo function which we call “Highlight,” or Solo-over-Mix. Many engineers complained to us that when soloing a channel to adjust the EQ, they were not able to hear the phase cancellation effects against the other tracks because the other tracks were completely muted. Therefore, our solo function mutes the other channels about 10 dB (like a “ducker”) so you can still hear changes against the mix. However, if you need the more traditional solo function, you simply change the amount of muting via the Function/Utility setup controls.
- 4 mute groups with dedicated switches, but our automation actually allows for 480 mute groups as scenes.
- Chose between AFL or PFL (the default mode) monitoring.
- The six Auxiliary returns are stereo.
- If you’re using EDnet for a long distance link between recording studios, you can also send the M4000 automation data simultaneously along with your digital audio. You will need two additional EDnet channels to handle the bandwidth of the M4000 automation data.
- The low and high frequency EQ functions can be changed from peaking to shelving characteristics via the LCD function section. You can even have one channel set for peaking type controls and the next channel set for shelving type; or change the functions between verse and chorus!
- Peak hold time is adjustable via the FUNCTION section. It changes from .1 second to 6.2 seconds in .1

"This is a heck of a mixing desk! The combination of features and facilities is quite simply amazing, especially at the price. Clearly, a great deal of thought has gone into the design. It is rare to find a desk that slips easily into so many different styles of work."

– Audio Media, November, 1994

second increments. It can also be set to "permanent," which is very useful when you need to bring in pre-recorded sources.

- Universal power supply with a specially designed "R" core transformer has less leakage than a toroidal design, and doesn't generate any noise under any load. The coil bobbins are actually conceived as gears and are part of the winding machine during fabrication. This offers superior packing of the coils and has no magnetic gaps. This transformer works at 50Hz or 60Hz and is more efficient than a comparable switching power supply. All materials used in the transformer are UL approved.
- Only one M440 Data Unit is required for up to 5 Mixing Engines (APCs).
- The special 250 meg hard drive in the M440-B for the motor faders is specially designed to withstand a shock of 60 Gs.
- When the faders are flipped, the Mute and Solo controls and the Direct Out follow the flip.
- Fader crossfade for scene changes.
- Group Outputs 1-8, 9-16, and 17-24 can be bank switched on/off or isolated. This enables you to send different signals to 1, 9, and 17.
- Tape input levels are switchable from -10 dBu to -0 dBu to +4 dBu.
- Dynamic automation data and scene (snapshot) automation data are saved in the same file so that you do not have to make two or more different mix passes or keep your automation data in two different files. This data can be saved to the internal hard disk or to floppy.

SAVE YOUR OWN CONFIGURATIONS

With the M4000, you can save your own special setup(s) to diskette and recall them at any time. This could include a standardized routing plan, EQ settings, etc.

DATA COMPATIBILITY BETWEEN DIFFERENT MODELS

We've planned ahead and made our mixer automation data such that all stored data is readable by our smaller and larger mixers. For example, a user with an M4000 at home could take his automated mix data (3.5" floppy) to a studio with the M6000 (a much larger future system). All computer mix/scene automation data is stored as a subset/superset of our data protocol. Therefore, you'll be able to use a data diskette from one of our smaller mixers on one of our larger mixers and vice versa.

We encourage third party support for all of our products; our serial protocol will be available at no charge to qualified individuals/companies.

Do you need a hardware controller for your digital audio workstation? If you're getting tired of trying to move 10 faders simultaneously with a mouse, the M4000 can be MIDI mapped to act as a front end for your system. The APC could be used by itself as your audio slave for sequencing programs such as Performer and Vision or as a hardware controller for your Spectral Synthesis, Turtle Beach, DigiDesign, etc.. For those of you with AT&T Disq, Fostex Foundation, etc., our Digital Controller could be your front end via our serial protocol or MIDI mapping.

SO WHERE DO I PLUG IN MY STEREO INPUTS?

The Global "Stereo Link" locks any two adjacent input channels together. This means you can make a stereo pair from any mono signals as well. We even provide a "Linked" indicator light to remind you which adjacent signal pairs are linked for stereo operation. When doing a "fader flip," the stereo pair travel to the new path. Pressing either channel mute key engages the mutes of both channels instantaneously.

You can choose if you want only the fader levels linked, or add the EQ and the PAN to be linked when in this mode. The PAN "mirrors" between the two linked channels.

A MIDI EVENT CONTROLLER OR LIGHTING CONTROLLER

The scene change commands from the M4000 can be used to fire off changes for your MIDI controlled effects units or lighting systems. These events can be stored along with the M4000's scene data memory; thus enabling you to store your effects or lighting changes with your mixer data!

ALL THE SMALL DETAILS THAT MAKE YOUR LIFE EASIER...

- Larger than normal lettering. Aren't you getting tired of squinting to read the labels?
- AC power cord locking device to prevent the removable cord from accidentally unseating.
- Stereo master outputs have +4 XLR and 1/4" phone; all buffered so you can use them simultaneously.
- Universal power supplies.
- "Enter" and "Cancel" buttons are different colors to aid quick recognition and prevent errors.
- The text of the owner's manual is available on diskette so you can call it up on your personal computer and search for particular words or phrases. Ever notice how even the best owner's manuals never seem to have the particular function listed in the index (or at least under a name you'd normally associate with the function)? The text files are on an MS-DOS formatted diskette so it can be read by Atari, MS-DOS, and Macintosh computers.
- We use green LEDs for the "on" indicator lights instead of red LEDs. After all, red usually means "off" or "stop," so why use that color to indicate the "on" selection? This helps make our mixer more intuitive to use.
- There are separate overload indicators on each channel for **both** the mic and line signal paths; not just one.
- The LED knob position indicators are on the "south" side of the knobs so you can easily see them while sitting down at the mixer. If we had put them on the "north" side as other manufacturers do, then the knob would obscure the settings.
- All steel construction and extensive shielding to meet the latest low emission RF and EMI requirements.
- Pressing the SOLO key automatically invokes the ACTIVATE command for that particular channel; saving you one extra keystroke.
- MUTES can be additive or exclusive.
- SOLOs can be additive or exclusive.
- MONITOR OUTPUT selection can be additive or exclusive.

THE M4000 MAKES SMART FINANCIAL SENSE

Now you can update your existing studio configuration to a fully automated console, yet be able to afford this upgrade in your competitive hourly rate. For many studios, upgrading to a fully automated mixing console would not only be very expensive, but because of the high price, it would be impossible to recoup the additional cost via your hourly rate. Additionally, the M4000 costs less than most aftermarket moving fader automation systems (and only slightly more than the least expensive units), yet offers automation of **all** parameters and does not require an external, dedicated computer.



We also offer a cost-effective way to expand your system. Conventional mixers typically offer you no real expansion path or, if such a path exists, it's very expensive. The latter situation causes many studios to purchase an entirely new mixer when they need to expand. With the **T²** concept, the M4000 is readily expandable at any time in sets of 24 dual inputs and/or 8 bus outputs. Perhaps more importantly, you

do not have to pay for more moving fader automation or update/upgrade the computer. This is just one more example in which our concept saves you money.

MODELS

1) M4000B Dynamic automation w/SMPTE time code reader

All faders (60 mm and 100 mm) are dynamically automated along with the Mutes and the Channel Pan. You also have the ability to change scenes to SMPTE time code. The Scene automation can be unlinked from the dynamic fader automation, or you can run both types of automation concurrently. The Globals can also be unlinked from the fader settings. In addition, you can use the M4000 as a MIDI event controller to fire off other external MIDI devices to SMPTE timing references.

2) M4000C Moving faders

The M4000C has moving faders fitted as standard. The package consists of 34 of the long throw 100mm faders (24 inputs + 8 bus outputs + master analog output + master digital output) and 24 of the 60mm Monitor faders plus the necessary hardware/software.

COMING ATTRACTIONS

At last; fully automated compressors, limiters, gates, and de-essers! The Dynamic Dynamics is an external rack mount system consisting of 8 processors. Up to 10 of these rack units can be chained together for 80 channels of dynamics processing. When used with the Tactile Technology consoles, you may control the dynamics from the M410/411 Controllers and call up the appropriate dynamics channel from when using the Activate key. But the Dynamic Dynamics can also be used with **any** manufacturer's console when you add the optional remote control panel!

In the future, we will be introducing the fully digital Mixing Engine (APC) that performs the same functions as the analog M420 and M430 units. This has the same configuration and features of the M420/M430, but offers an all-digital signal path with AES/EBU inputs/outputs, ADAT fiber optic inputs/outputs, and TDIF (TASCAM DA-88 format) inputs/outputs. Due to the LAN-type architecture of the M4000, you can connect the DIGITAL APC anytime and even include the analog M420/M430 units with the entire system. In this way, you can easily expand the M4000 System to accommodate any combination of analog and digital signal mixing you may need... now or later.

Fiber-optic interface between M4000 Digital Controller and the APC(s)

If you need to run the Digital Controller and the APC(s) more than 300 feet apart, we suggest you use a fiber-optic link instead of copper wire. We will offer a fiber-optic link that includes one serial data connection, one analog data connector, and one serial port for MediaLink/IQ System interfaces. However, any third party serial data fiber-optic link should work.

THE M4000 is truly a "breakthrough" product. It not only offers complete automation with an advanced control surface, but offers a new architecture that improves the audio quality, allows you to conceive your mix in different "planes," and dramatically speeds up the mixing process. Its features, combined with a price that finally makes financial sense for professionals, make it **the #1** choice.

Features and specifications subject to change without notice.



Music Makers, NYC



Chicago Music Works

Size of the M410 or M411 Digital Controller (including meter bridge):

1,132 mm (W) x 786 mm (D) x 224 mm (H)

45.25" x 31.5" x 9"

Weight: 35 Kg, or 77 lbs. Without motorized faders.

Size of APC:

The APC is actually in four sections (all four units are 14" or 350 mm deep):

1) M440 Main Control Unit (memory processing, hard drive for B/C models, and 3.5" floppy drive)...3 rack spaces (5.25 inches, 132mm).

2) M490 Power Supply Unit (has power outputs for the other three units)...3 rack spaces (5.25 inches, 132mm)

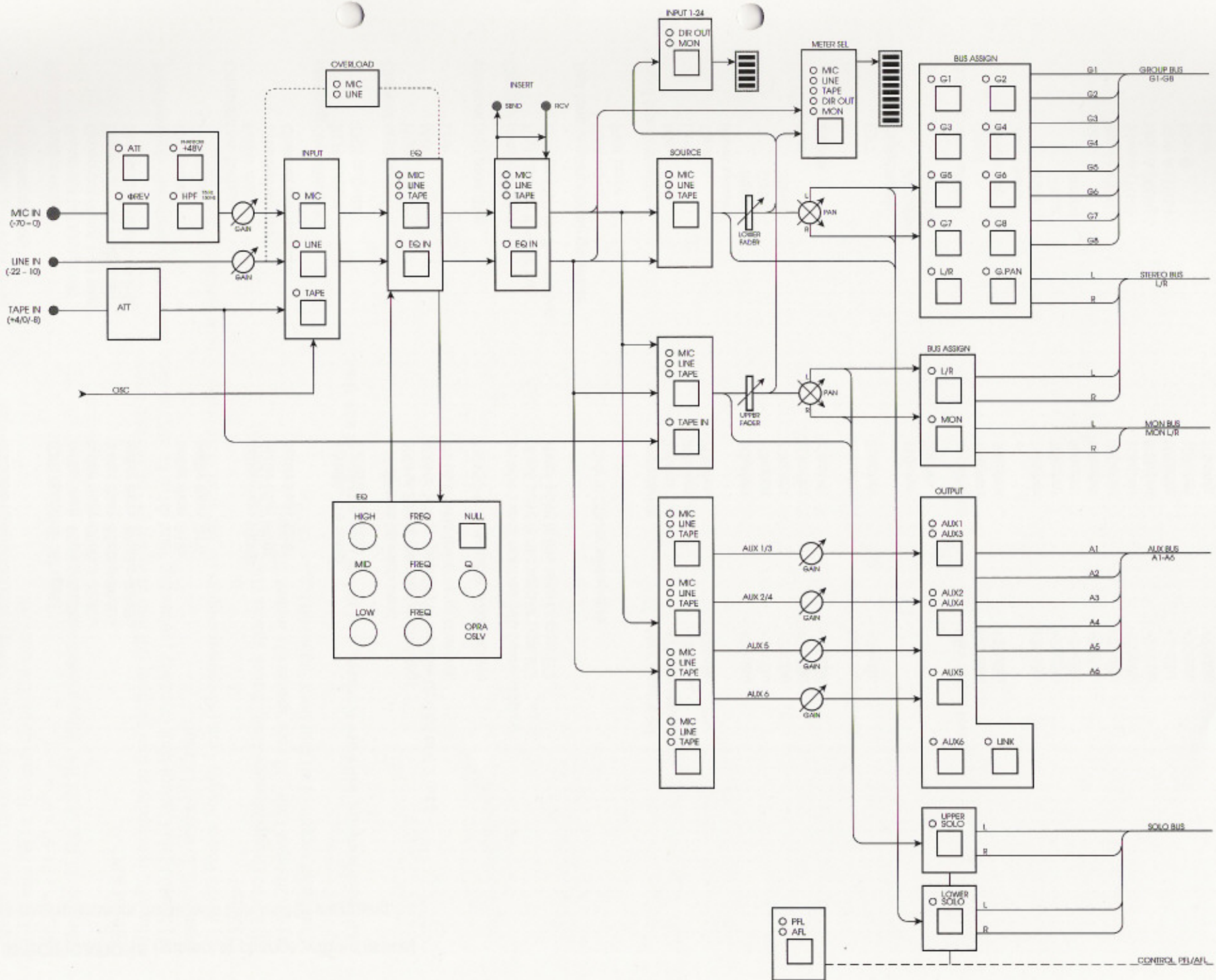
3) M430 Group/Monitor Unit...6 rack spaces (10.5 inches, 265mm)

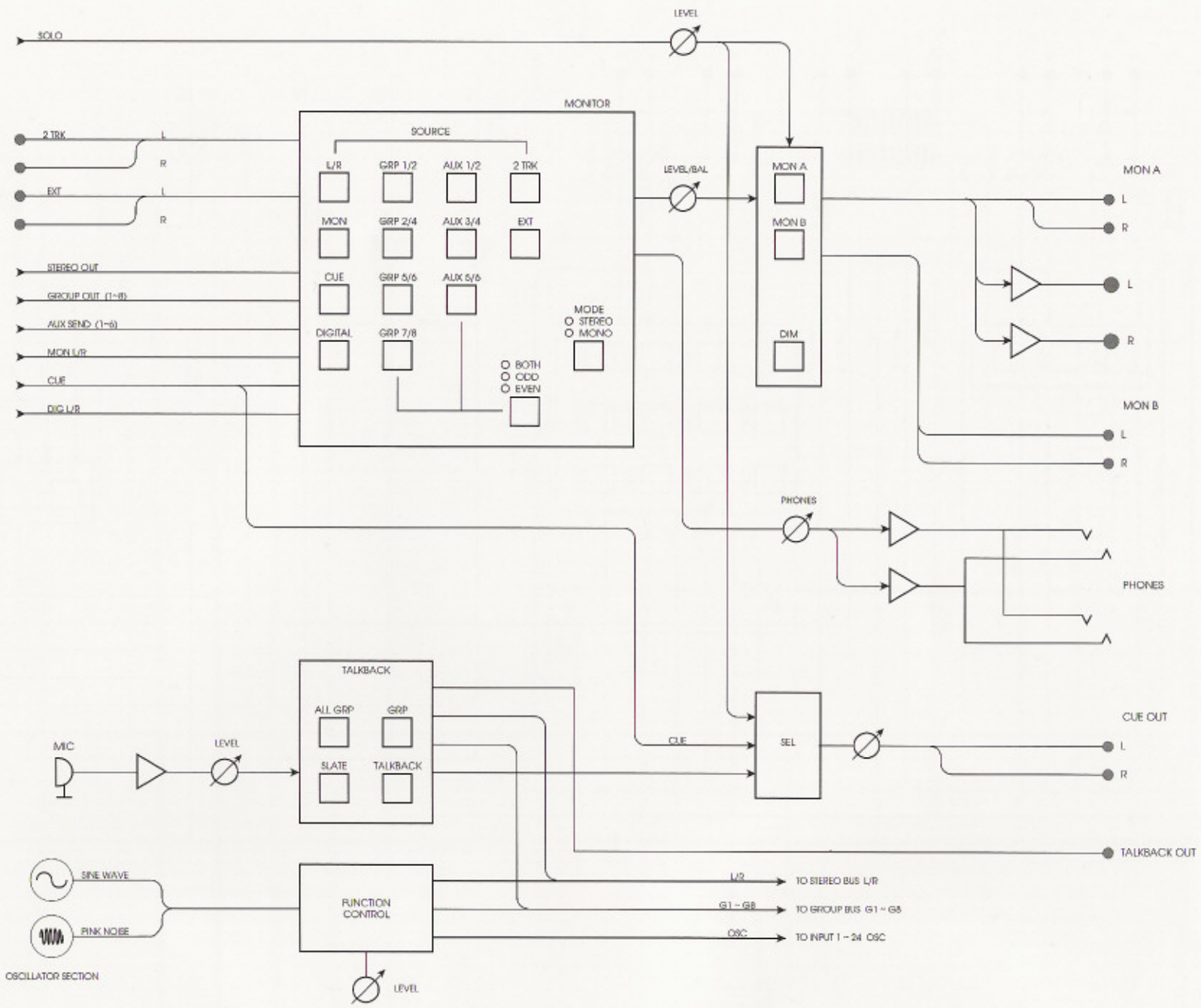
4) M420 Input Unit...12 rack spaces (21 inches, 532mm)

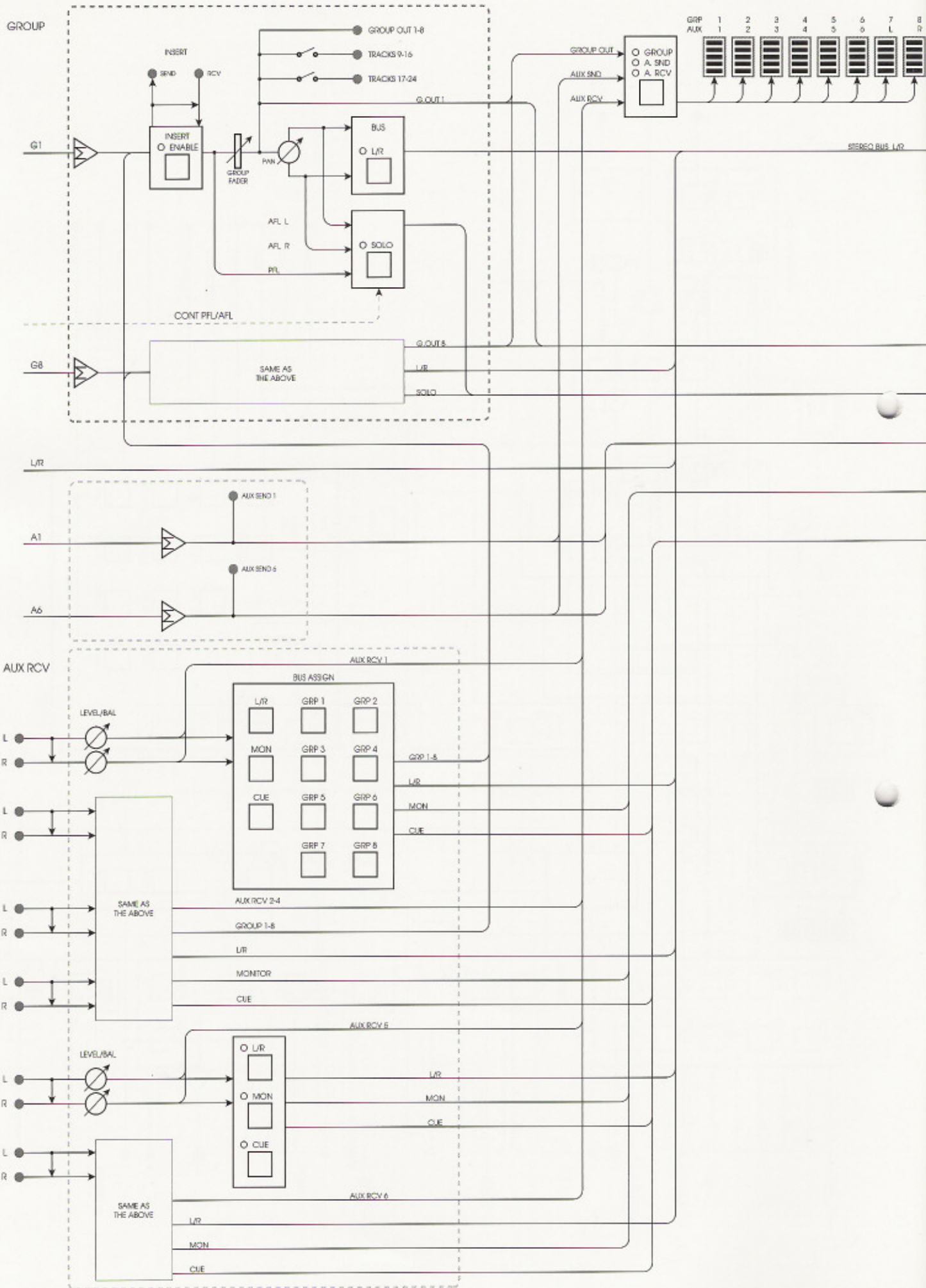
Combined weight of all four units: about 60 Kg, or 132 lbs.

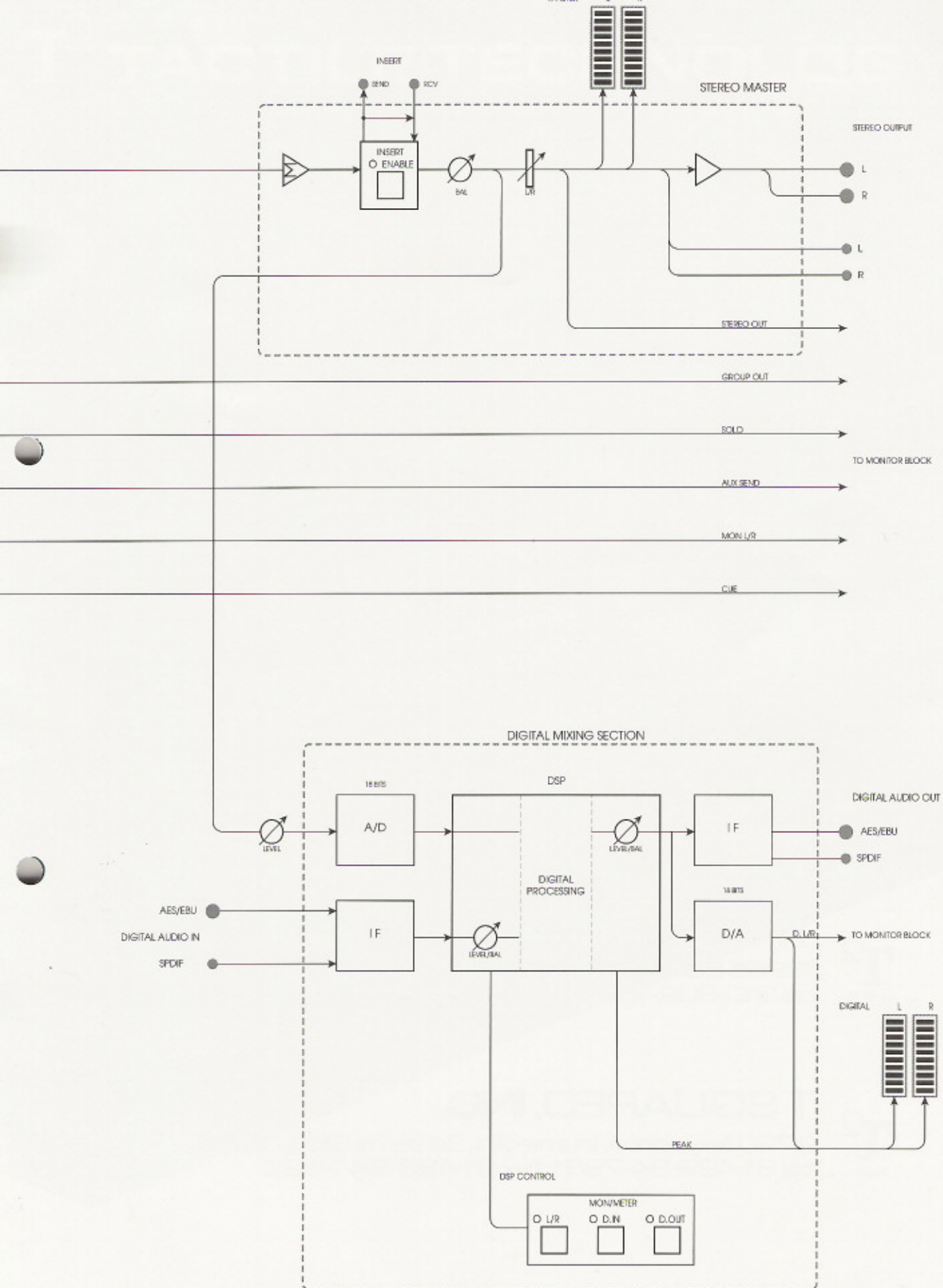
All specifications, software features, and prices may change at any time.

Frequency response		
Group output/master output	better than +0dB, -1dB, 20Hz-20kHz	
Noise		
Mic equivalent input noise (150 ohm source)	-128dBu (DIN), -130 dBu (IHF "A")	
Residual output noise	(DIN spec/IHF "A" spec)	
Group out (all assign off)	better than -92dBu/-94dBu	
Group out (input 1-24 mix)	better than -80dBu/-82dBu	
Stereo out (all assign off)	better than -92dBu/-94dBu	
Stereo out (input 1-24 mix)	better than -80dBu/-92dBu	
Total harmonic distortion		
Group out	better than .01%	
Stereo out	better than .01%	
Crosstalk (at 10kHz)		
Fader mute	better than 100dB	
Channel isolation	better than 85dB	
Channel pan isolation	better than 85dB	
Maximum input/output		
XLR outputs	+26dBu (16 volts)	
TRS outputs	+20dBu (8 volts)	
Channel equalization	±15dB max on each band	
High	800Hz-20kHz (peaking or shelving)	
Mid	400Hz-12kHz (peaking w/variable Q; 0.65 to 6.2 oct.)	
Low	45Hz-1.5kHz (peaking or shelving)	
Channel high pass filter	75/150Hz switchable, 12dB/octave	
Channel peak indicator	on when level reaches 3dB below clipping	
Red LED for the mic bus	check point is mic amp or post EQ	
Orange LED for the line bus	check point is line amp or post EQ	
Test tone oscillator/noise generator		
Sine wave	20Hz to 20kHz sweepable	
Pink noise		
Input characteristics	Impedance	Max input level
Mic	2kohm	+20dBu (w/pad)
Line	20kohm	+30dBu
Tape	20kohm	+24dBu
Insert receive		
Input	30kohm	+20dBu
Group	20kohm	+20dBu
Stereo	20kohm	+20dBu
Aux	20kohm	+30dBu
2 track	20kohm	+24dBu
EXT	Impedance	Max input level
Digital Audio	20kohm	+24dBu
AES/EBU	110ohm	
S/P DIF	75ohm	
Output characteristics	Impedance	Max output level
Direct	10kohm	+20dBu
Group (all)	10kohm	+20dBu
Insert send		
Input	10kohm	+20dBu
Group	10kohm	+20dBu
Stereo	10kohm	+20dBu
Aux	10kohm	+20dBu
Stereo (XLR)	600ohm	+24dBu
Stereo (TRS)	10kohm	+20dBu
Mon A (XLR)	600ohm	+24dBu
Mon A (TRS)	10kohm	+2 dBu
Mon B	10kohm	+20dBu
Cue	10kohm	+20dBu
Talkback	10kohm	+20dBu
Headphones	8-50ohm	200mW









M4000 SYSTEM BLOCK DIAGRAM 4/6/95