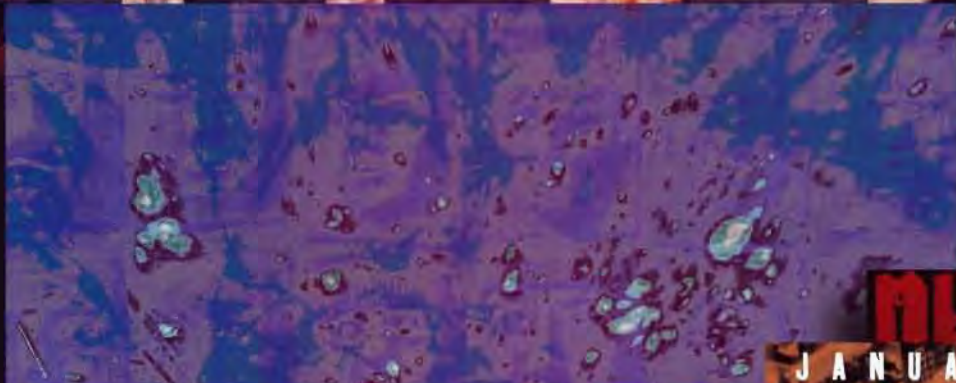
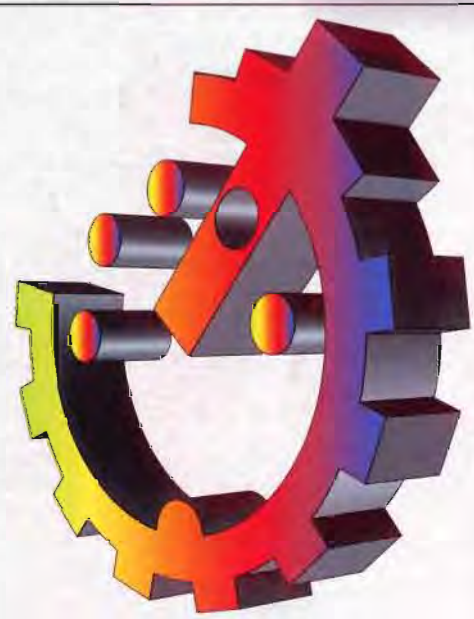


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JANUARY 1995

OTTO-34



ULTRAMIX PRO
UNIVERSAL MIXER AUTOMATION SYSTEM

MACKIE.

introducing
powerful,
affordable
34-136
channel
Midi
automation
for the
8-Bus
and
beyond.

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POWER

Mixing automation is the **single** most **powerful** creative tool **available**

to the recording engineer and producer.

Automation elevates mixing to a higher level of artistry where—liberated from repetitive tasks and empowered by “superhuman” control capabilities—the mixing engineer enjoys unprecedented freedom to shape and polish the final form of a musical performance.

Only a few years back, mixing automation was reserved for the privileged few. If you didn't have a major-label budget, you probably couldn't afford it.

Not so today. A whole new generation of MIDI-controlled mixing automation systems is hitting the market. These systems are enticingly affordable, and they fit hand-in-glove with the way musician/engineers work in a MIDI-based studio.

Whether you produce albums, soundtracks or commercials, working with automation gives you the creative edge. Automation makes you more productive. Automation lets you incrementally improve your mixes instead of compromising with “almost right.” And, if you haven't yet sampled the advantages of automation, chances are you soon will.

This year, Mackie Designs is introducing a new Universal Automation System that is specifically designed for MIDI-based studios. The system consists of three separate but related elements: OTTO-34 gain cell unit, Ultramix Pro™ software for the Macintosh, and the OTTOpilot™ fader pack.

Mackie's automation package is not only far and away the most powerful in the “affordable” category, it even offers capabilities lacking in the horrendously expensive “big studio” systems.

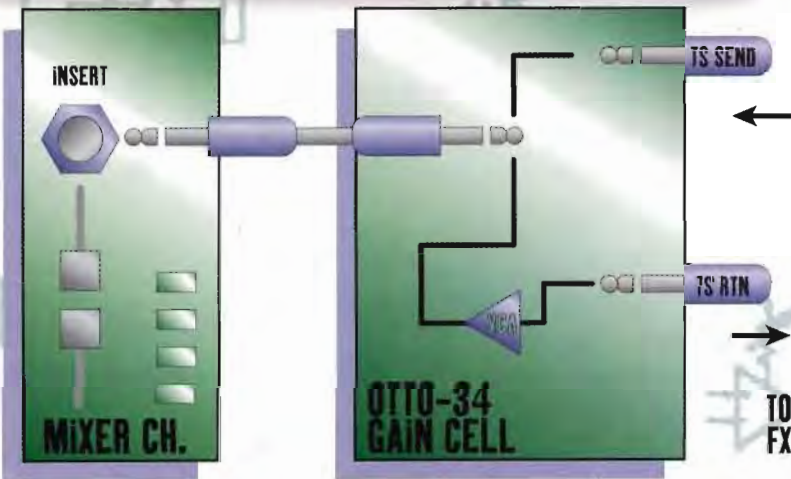
The color pages at the beginning and end of this brochure tell the story of Mackie's Universal Automation System.

However, the wordy part inbetween is equally as important. It's a definitive look back at how the whole concept of mixing automation came into being. When you're through reading “Ghost in the Machine,” we think you'll understand just how much of a breakthrough Mackie's automation system really is.

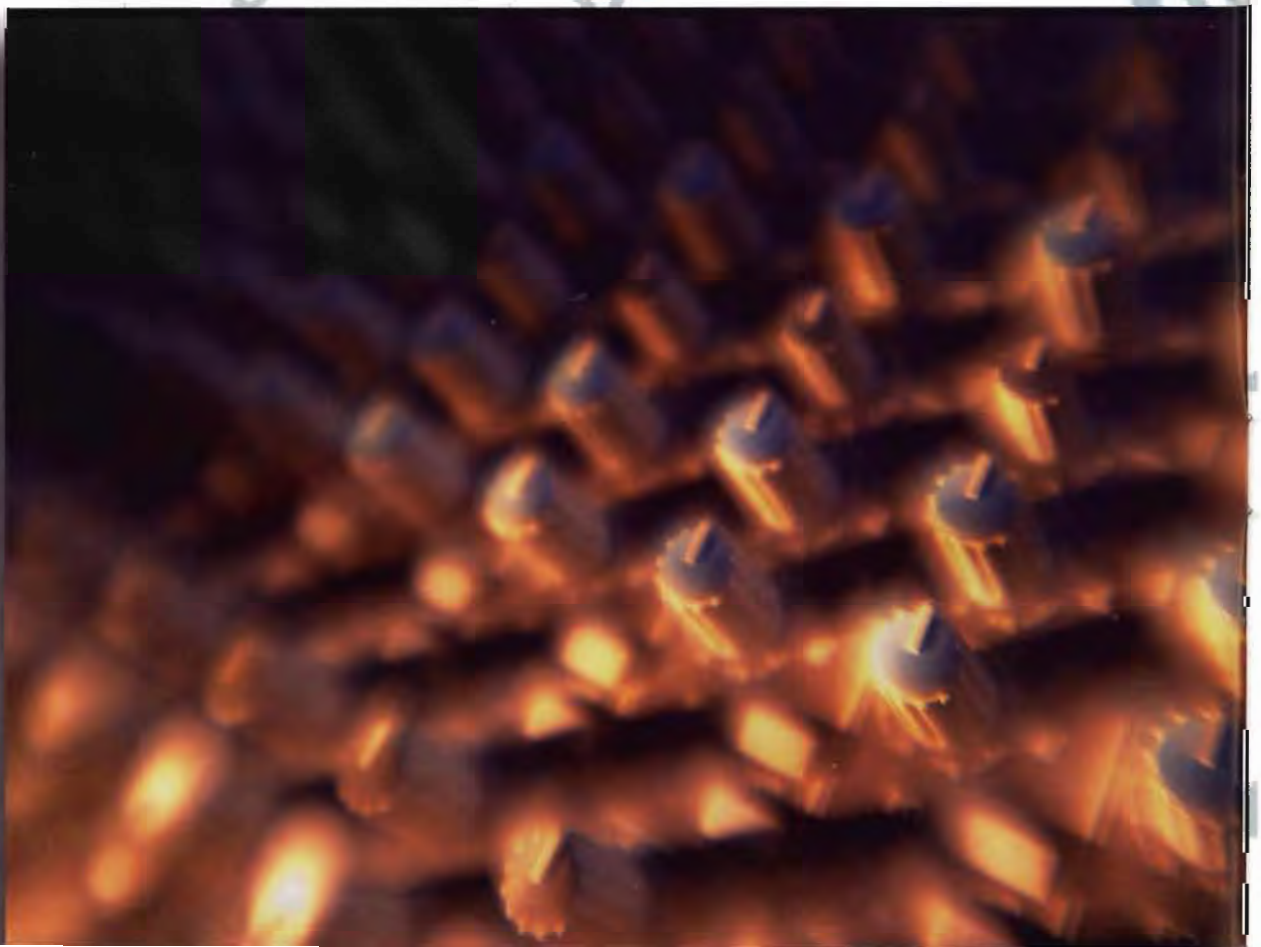


The Hardware:

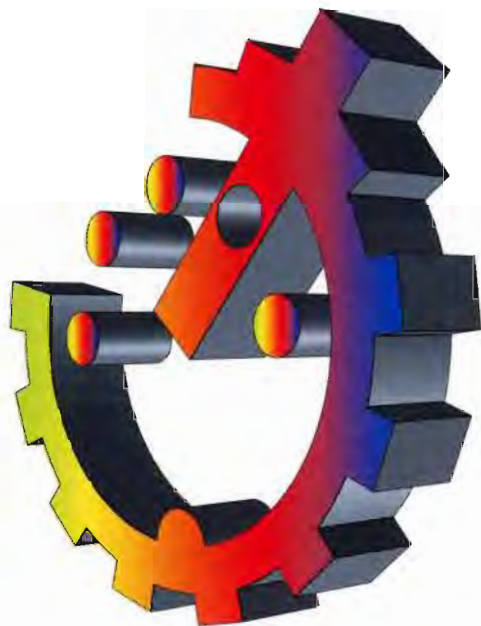
Otto-34 34-channel Universal Automation System.



Otto-34 is a 34-channel VCA system for MIDI control fader levels and muting. It connects to the console via the mixer's channel (and main) inserts. A duplicate insert patchbay is provided on the front panel of Otto-34, offering more ergonomic access to inserts than consoles can offer. Up to four Otto-34s can be daisy-chained (and simultaneously controlled via Ultramix Pro software) for continuous, real time automation of any line level signals in your studio—even someone else's mixer!



OTTO-34



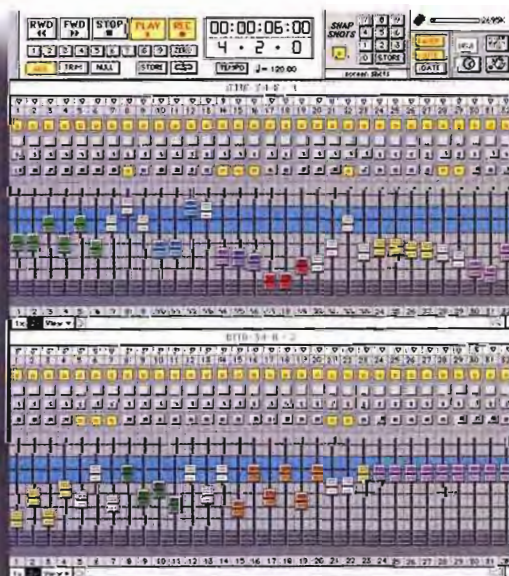
ULTRAMIX PRO

UNIVERSAL MIXER AUTOMATION SYSTEM

The Software:

Ultramix Pro™ Automation Software System for Mac

Ultramix Pro™ provides a virtual representation of Mackie's upcoming OTTOpilot™ large-format fader pack layout. It can simultaneously control up to 128 input channels and 8 main Left/Right outputs. Tightly coded in C++, Ultramix Pro features sub-groups, graphic editing, the ability to play MIDI files and full OMS 2.0 compatibility for use with Mackie OMS drivers. The program also offers a reduced system requirement allowing Ultramix Pro to run OTTO-1604/CR-1604 mixes on systems as small as the Mac™ Classic II. Yet it is also one of the first pro music industry's "fat" applications, capable of running in Power Mac native mode at lightning speed.



*Preliminary Screen Shots

OTTO-34

34-channel Universal Automation System.

OTTO-34 is a two-rack-space external device capable of automating up to 34 control points. When used with the Mackie 8•Bus console, OTTO-34 would be normally used to control up to 32 inputs plus Master Left and Right.

The system is also fully compatible with any mixing board equipped with channel inserts. For example, it could be used with a 24•8 console and a CR-1604 via the compact mixer's eight channel inserts.

Channel access is provided through TRS patch cords that connect the inserts of the mixer's inputs and masters to the OTTO-34 rear panel. The front of OTTO-34 provides these same channel points using one pair of individual send and return jacks per input in a normalised patchbay setup.

OTTO-34 is equipped with hardware bypass capability, allowing you manual control of the signal path if desired for tracking, etc. These bypass switches are also accessible through software control via Ultramix Pro™.

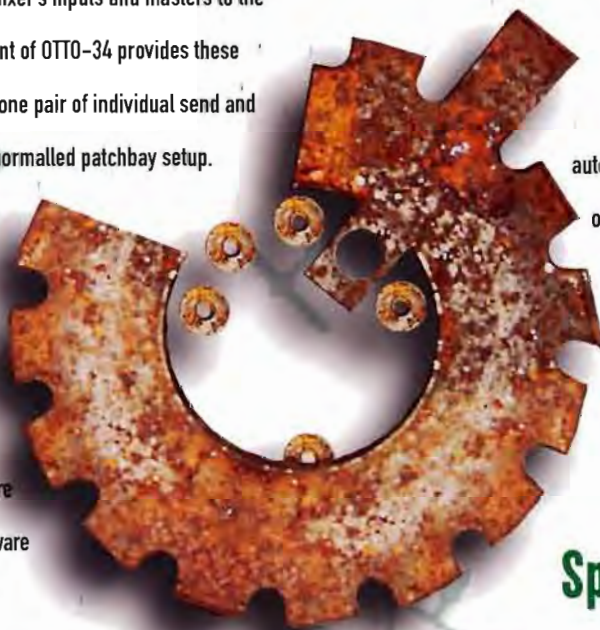
Any line level signal can be passed through OTTO-34 and automated: tape sends, tape returns, effect sends, effect returns, etc.

Other OTTO-34 features include snapshot editing/storage and the ability to daisy-chain two, three or four OTTO-34 units together to create a larger system.



Designed by Carl Malone of CM Automation fame (now a Mackie staff member), OTTO-34 provides continuous, step-

less gain control. It is free of zipper noise and other artifacts found in automation systems that rely on MIDI stepping (see inside back page).



OTTO-34 Audio Specifications

Total harmonic Distortion: no greater than 0.009% at 1kHz
Frequency Response: +0/-1dB from 10Hz-65kHz • Gain Range (Input channels 1-32): -80dB to +10dB (Main Left and Right): -90dB to 0dB • Maximum input level +22dBu
Patchbay Sends and Returns are balanced







Reflections on How Mixing Automation Came to Be, and What it Means to Your Future in Audio Production ■



in the beginning! . . .

recording consoles had three or four big, round knobs and one cyclops-eye VU meter. Everything was mono. There was no mixing automation.

Until the mid-1950s, everything was mixed "live" to mono in real time. When stereo came along, mixing procedures didn't change much. Pan pots were introduced,

and everything was mixed "live" to stereo.² After that, more often than not, stereo was mixed down to mono for the multitudes who still didn't have stereo.

Easy mix. You could do it with one hand tied behind your back.



By the late fifties, state-of-the art recording was three-track. (Left, center, right—hey, what more could we possibly need?)

This odd but logical format reigned as the recording standard until the middle of the next decade. Many early pop producers (P. Spector, B. Wilson) used those three tracks to construct primitive multitrack productions. They might, for example, use one track for the rhythm section, one for lead instruments or orchestra, and one for vocals. As for the natural stereo spread, well, they didn't worry about that. Stereo was for classical highbrows. Pop radio and jukeboxes were mono, and that's where the hits came from.

So, three tracks mixed down to one, maybe two. Still easy. Just use both hands now.

Next, in mid-60's, the first four-track machines appeared. Around the same time, stereo LPs gradually took over as the dominant medium for recorded music sales. That meant all pop music recordings now had to be mixed to stereo as well as mono, a requirement often demanding considerable creative track-bouncing when multiple overdubs were required. George Martin, Geoff Emerick, and the Beatles pushed four-track to the limit with Sergeant Pepper's Lonely Hearts Club Band. It got pretty tricky, what with wild-tracked slaves and multiple reverbs feeding into the mix. More hands were needed. Two or three people got in the act.

"Here's a little mix you can all join in with, it's not too simple..."

In the late sixties, tracks multiplied at an exponential rate. First, half-inch 4-track doubled to 1-inch 8-track.³ Then Ampex modified their 2-inch videotape transports for

audio duties and—presto!—16 tracks hit the market at the dawn of the '70s. Within just a couple years, 24 tracks became the standard for studios aspiring to the avant-garde. By 1974, a renegade company in California, Stephens Electronics, actually made and marketed 32 and 40 track 2-inch recorders. But they had ventured too far ahead of the curve. Most mixing engineers had their hands full with 24, thank you.

If you go back and listen to CDs of recordings produced in the 1965 to 1974 era, you will marvel at the sonic progress as multitrack recording evolved at breakneck speed. However, if you listen carefully, you might also hear quite a bit of tape hiss on the quiet passages. And, if you could transport yourself in time back to the control rooms of the studios where those albums were produced, you would find panic-stricken



"Automation has become a necessity in commercial music production, because we do so many variations of the same basic mix. Automation lets us create a basic mix "template" for the music bed then modify it as needed for various vocal tracks and voiceovers. It takes the guesswork and inconsistency out of mixing, it literally automates the thinking process."

Christopher Davis, Staff Writer/Producer, Hummingbird Productions, Nashville

(Commercials for CoCa-Cola, Kelloggs, Radio Shack, Ford, among others, and scoring for Family Channel feature movies.)

engineers and producers struggling late into the night to keep their all their tracks in balance, trying to reproduce that last mix that was almost perfect—arrgh!—except for the glockenspiel that got buried in the bridge.

Yes, even as far back as the 8-track era, the need for automated mixing was becoming obvious. Good grief, if we Americans could send a man to the moon, couldn't we figure out a way to mute tracks when they weren't being used and remember the fader moves when they were?

In 1969, Americans did walk on the moon. However, two years later, it was a pioneering group of Canadians who first tantalized the recording world with a fully functional, automated mixing console.



Northern Experiment: The Great Olive Adventure

In October of 1971, a small group of about twenty audio and recording enthusiasts gathered at Thundersound Studio in Toronto for a regional meeting of the Audio Engineering Society. Wayne Jones, president of Olive Electro Dynamics, Inc. gave a short presentation on the automation capabilities of his company's new Series 2000 console. Then, Thundersound engineer Phil Sheridan rolled a 16-track master tape and started mixing. A few minutes later, he rewound, rolled the 16-track again, then sat back with his hands off the faders. To the amazement of all in the room, the Olive console duplicated every move of his mix. Then, on a third pass, he modified a couple fader moves in the "update" mode, played it back, and the console once again reproduced the first mix, but this time also added in the new fader moves.

The dream had become reality. But the technology was in its wobbly infancy, and the price tag was daunting, to say the least. A basic automated Olive console with only 24 inputs would still set you back about \$95,000, and a fully loaded 32-input board topped out close to \$200,000. True, that was in Canadian

dollars, so Yanks gained a few percent on the exchange rate. But at over twice the price of the average new home⁴, such consoles necessarily had limited market potential. Only the elite studios of the world could afford them.

That hard reality, Jones recalls, made it a constant struggle to gain widespread acceptance for Olive's first

automated desks. "There were no precedents for a number of things we were doing. A lot of new technology was being introduced or adapted for the first time. And basic component costs were high. A good VCA at the time cost over \$100."

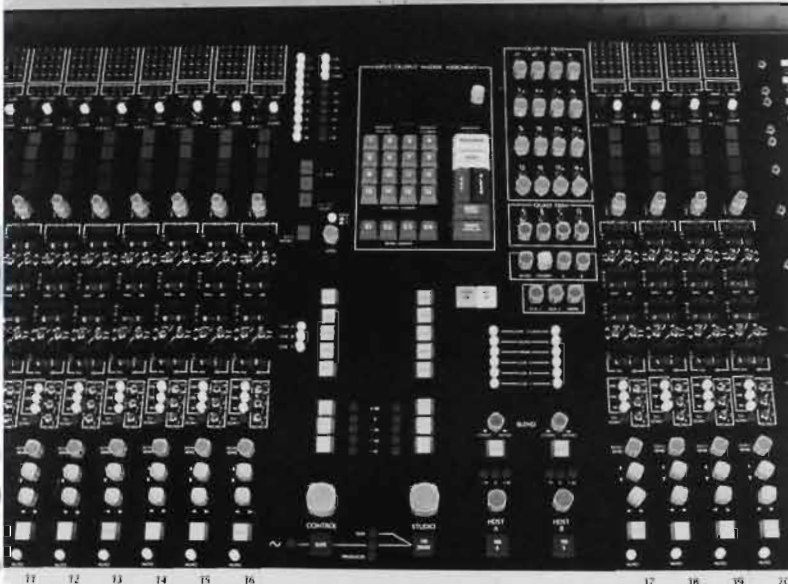
The Olive Series 2000 mapped out a technological blueprint for the first generation of automated mixing. The system consisted of an automated fader package equipped with a VCA for each channel, and an external automation programming computer. During the initial mix, each fader sent out a DC control voltage to the automation programmer. The control voltages were changed to quasi-digital pulses through primitive A-D converters and this information was multiplexed into a single data stream, which was then modulated back into an analog signal for recording on one track of the multitrack master tape.



During the first mix, the system read and recorded static levels and dynamic level changes. If the mixer wanted to change something, he switched to an update mode on those channels, and replaced the old data for that channel with new data.

Olive Series 2000 with Automated Remix Programmer at AES convention, 1972





Unfortunately, that meant another track had to be available for writing the updated data stream. Since 16-track was the standard at the time, losing two tracks to data storage was a significant sacrifice.

Also, although Olive's system worked remarkably well for brand-new technology, it wasn't 100% perfect 100% of the time. Temperature variations could cause VCA drifting, and extreme tape dropouts could confuse the data error-correction circuits. Some people were willing to forgive the imperfections in order to enjoy the advantages of automation—the mixing engineers in particular. But some others were less tolerant.

"Many artists and producers, those who were not engineering-oriented, had zero tolerance for any technical malfunction," Jones recalls. "They figured if it worked at the demo, it should work flawlessly all the time."

Yet those first demos certainly had the recording world buzzing at the time. Olive showed the console at the AES convention in the spring of 1972, and gave a series of demonstrations at Westlake Audio shortly thereafter. Orders were accepted, and the world's first automated consoles were delivered later that year to studios in the USA, Canada and France.

But, like many other brave pioneers, the founders of Olive eventually paid a price for blazing trails ahead of the others. The costs of development and manufacturing were too high to be supported by a small company in a limited market. Funding ran out, and Olive was forced to close up shop. But Wayne Jones and his adventurous crew had carved a niche in the history of multitrack audio production.

Mid-1970's: First Generation Frenzy

By most accounts, Olive was first across the line with a working system. But others were close behind. Alas, for Wayne Jones, the basic concepts behind Olive's groundbreaking console could not be patented.

So within months, other manufacturers were rushing into the market with automated mixers that functioned essentially the same. All used VCAs for level control and solid-state switches for muting, and all used two tracks of the multitrack for data storage. Also, like the Olive, most



offered VCA subgrouping, which allowed a single fader to control levels on any or all inputs.

Over the next few years, the automation field exploded. By 1976, at least a half-dozen manufacturers were offering VCA automation, including MCI, Harrison, Quad-Eight, and Sphere. Neve had introduced its first moving-fader NECAM system, and as far back as 1973, API was building fully loaded consoles with automated panning and equalizers in addition to level and mute functions. However, several of these companies merely modified existing designs to incorporate VCA fader packages, and then turned to one supplier for their automation programming device: Paul Buff's Allison Research⁵.

Buff had been tinkering with the idea of console automation as early as 1970, back when he first started building and marketing his Kepex and Gain Brain devices—two pioneering dynamics controllers also based on VCA technology. But, because he didn't make his own mixing consoles, the idea simmered on the back burner for a couple years.

Then, at an AES meeting, he joined up with the folks at Automated Processes, Inc. (API). They had

already started an ambitious automation project, but had experienced problems with their own programmer. API latched on to the advantages of Buff's device, and quickly entered into a joint marketing agreement with him. Within a year, the first fully automated (including EQ and panning functions) API

boards were offered for sale.

They were not an overnight success. Only about a dozen were ever sold. Once again, the dreamers had ventured ahead of the real needs, and beyond what the market could realistically afford. As engineer Jay Mark of Sigma

Sound pointed out in an R-E/P interview at the time, level and mute functions make up 90% of what is actually changed after the initial mix is set up. So, why pay three times as much to automate the remaining 10%?

By the middle of the decade, the initial excitement had worn off, and the industry began to cope with some inherent problems that still plagued most first-generation systems.

First, because all systems stored the automation data on the multitrack master tape, two nonadjacent, non-edge tracks had to be given up. And the tape machines had to be meticulously aligned and maintained to keep bad data from overwhelming primitive error correction circuits. Horror stories were circulated through the grapevine about automated mixes that had to be abandoned because the console started mixing with a mind of its own.

Second, the systems were not particularly easy to use. Mixers from the "old school" had trouble grasping the fundamentals of WRITE, READ, and UPDATE modes. And even those who mastered the concept had to contend with the fact that, after updating on an early VCA system, the position of the fader on the console no longer bore any relation to the actual signal level of the channel.

Top Far Left: Olive automated console at Andre Perry's Le Studio Marin Heights, near Montreal, early 1970's.

Near left: Paul Buff, Automation pioneer, in his lab at Allison Research, 1979.





Paul Buff at Allison attempted to remedy this problem with the "positionless fader" of his Memory Plus system. He replaced the fader with a traveling loop of clear plastic. Horizontal black bars on the plastic film optically fed data to the automation read-write circuits, while rows of LEDs indicated the true level in all modes. An ingenious solution, but engineers at the time were reluctant to give up the feel of real faders, and the full benefits of this kind of "virtual control" could not be realized for many years to come. It sank without a trace.⁶

Replacing the VCA with servo-controlled moving faders was the other obvious solution, the one adopted by Neve for their NECAM system. Although the first of those systems had bugs of their own to work out, the moving fader system did work reasonably well. Nice, if you could afford it.

Finally, early non-NECAM systems were vilified in some quarters by golden-eared mixers who could not tolerate "the VCA sound." To some extent, sonic objections to some first-



Automation programmer and VCA retrofit card for the Olive Series 2000 console.

generation systems were justified. But by the dawn of the 1980s, second and third-generation VCA technology (principally from Allison/Valley and dbx) had vastly improved sonic performance, to the point where skeptics were hard-pressed to hear any differences in blind listening tests.

How much did first-generation automation cost? In 1974, you could add a 24-track, level-only Allison system to your existing automation-ready console for about \$13,000. That's American dollars this time, but 1974 dollars. Translate that into 1994 dollars, and you're looking at roughly the cost of completely equipping a midline project studio. Pricey gadgetry.

Notable Quotes from the Vintage Automation Years

Excerpts from a special console automation issue of *Recording Engineer/Producer*, December, 1974.

"It's a question of logistics. When you're mixing 24-track and bringing back a few effects, you may very well have 30 faders going, which at times can be more than two or three people can properly handle."

Tom Hidley, renowned studio designer

"Acceptance of the [Allison Memory's Little Helper] system has been unanimous and overwhelming. In fact, no one who has mixed with automation will even consider going back to conventional methods."

Jay Mark, Engineer at Sigma Sound, Philadelphia

"In traditional mixing, you can spend hours getting your vocal balance just right, and often you'll end up making a slight compromise as it is! With automated mixing, you never have to compromise."

Producer John Boylan

"I, for one, like to consider a good mixer as one who has the talent to listen, think and create, as opposed to a person of physical dexterity with a photographic memory. Automated mixdown can provide the memory and the physical help, thereby freeing the mixer and producer to create."

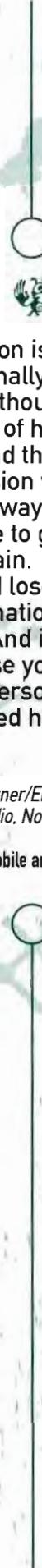

Paul Buff, automation pioneer and founder of Allison Research

The 1980's: Off the Tracks, on to Disks and Screens

Through the early 1980's, console makers and third-party system suppliers started introducing a new generation of technology into automation systems. First, the automation data was taken off the audio tape—where it never really felt at home—and was put on a separate outboard storage medium, most commonly an 8" floppy disk. For this type of system to work, the outboard data had to be synchronized with the audio, a task usually accomplished with SMPTE time code interlock.

This new approach had two important advantages. First, only one track of the multitrack tape was needed for the SMPTE code, since it didn't have to be updated as the mix progressed. And second, the data-friendly storage media were more reliable. The ghost in the machine was, by and large, much better behaved.

The second major development was the adoption of computer-type keyboards for entry of supplemental mix data, coupled with the addition of video screens for displaying mix data of all types. In first-generation systems, you had to rely on your ears, a few blinking LEDs, and scribbled notes to guide your mix. Now you could enter everything into the computer, then watch as the mix unfolded in rows of numbers and letters, or on bouncing rows of bar-graph meters.



"Automation is wonderful, because it finally lets me enjoy mixing. Without it, you need extra pair of hands on the console, and that makes the mix session very tense. Somebody always misses a cue and you have to go back and do it all over again. You mix under stress, and lose the feeling. With automation you can be relaxed. And it saves your voice, because you don't have to yell at the person because he missed his cue!"

Guy Charbonneau, Owner/Engineer, le Mobile remote recording studio, North Hollywood, CA

(Both Guy and le Mobile are TEC award winners.)



The ultimate embodiment of 1980's automation was, of course, the Studio Computer/Total Recall system in those fabulous consoles from Solid State Logic.

The fundamental idea behind the SSL's Total Recall was to bring all elements of the recording process under the guidance of a central computer. Virtually every pot and switch in the console was connected to the computer, though all functions were not necessarily operated directly by the computer. In other words, although the computer remembered your EQ settings, and guided you on a video screen when it came time to reset the board, it didn't physically recreate settings automatically. You still had to find the null point manually.

However, without question, SSL's comprehensive "snapshot" automation marked a quantum leap forward in automating the studio system. For facilities that booked different projects in-and-out of the same room during the same time period, owning an SSL board saved endless hours of resetting and repatching. For some studios, this feature alone justified the lofty price.

Advancing technology eventually trickled down to lower price levels. A number of companies, perhaps most notably Sound Workshop and MCI, offered consoles with second-generation level/mute automation at sub-\$100k prices. But that's primarily because overall console prices had drifted down substantially. The automation systems themselves remained quite expensive. When Sound Workshop introduced DiscMix


in 1982, the list price was a hair under \$20,000—console not included.

Consequently, by the end of the 1980's, reliable and workable console automation was available and affordable to most high-end and midline professional recording

studios. Automated mixing had become the rule, rather than the exception, in the major recording centers.

But the world of music recording was about to go topsy-turvy, and it would take console automation a few years to catch up with the changes.

The 1990's: Responding to MIDI, MDMs, Hard Disks, and DAT



"Automation gives you the opportunity to do things you were not able to do before. For example, say I wanted a delay on a particular guitar or vocal line only at a particular part of the mix. I can trigger that by muting the track into another channel and sending, sending the new channel into the delay, and automating it. I did that on a Pat Benatar song, "Sex Is A Weapon," where practically every other word she sang had a delay on it, something really impossible to do without automation."

Michael Frondelli, producer and/or engineer for Eric Johnson, Crowded House, Georgio Moroder, many others.

Welcome to a brave new world of music recording, broadcast production, multimedia production, interactive media...call it what you will.

Ten years ago, virtually all of what we heard on records or over the air was produced in dedicated, booked-by-the-hour, professional recording studios.

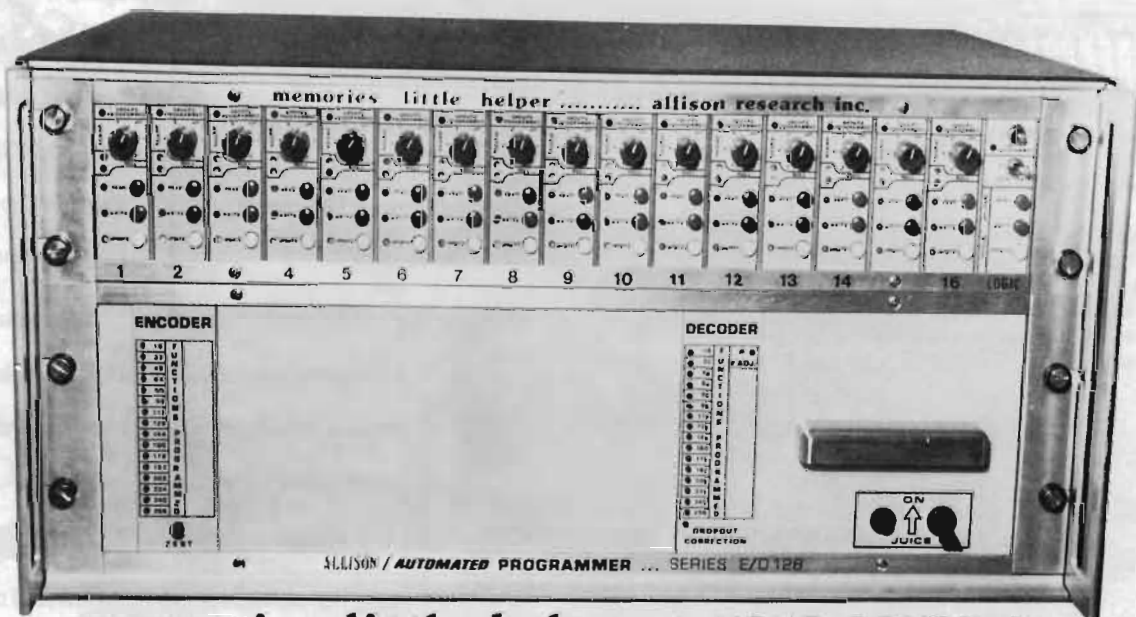
Not today. A paradigm shift has forever altered the landscape of audio production. What was once the exclusive territory of union musicians, time-clock engineers, label-employed producers, and big-time studio owners is gradually slipping into the hands of renegade MIDI mavericks working out of basements and garages.

have it your way,

OK. LOOK. TAKE OUT THE STRINGS ON THE SECOND EIGHT OF THE FIRST VERSE, RAISE THE HORNS ON THE "DO DUM DUMS"; BRING UP THE VOCAL GROUP ON THE "LA-LA'S" BUT KEEP THEM DOWN ON THE "LU-LU'S". THE LEAD VOICE IS FLAT ON THE FIRST EIGHT OF THE SECOND VERSE, SO TAKE HIM OUT AND BRING UP THE FLUGEL HORN. THE BRIDGE IS WEAK SO LET'S RE-STRUCTURE THE WHOLE MIX AT THE SECOND EIGHTH NOTE OF BAR TWO. YOU KNOW, BASS, GUITAR AND DRUMS UP, STRINGS AND HORNS OUT, AND START PANNING EVERYTHING ELSE IN CIRCLES, BUT WATCH THE "LA-LA'S" AND "LU-LU'S". BY THE WAY, IF YOU DON'T GET IT RIGHT THIS TIME I'M GOING TO HIT YOU WITH THIS WRENCH!!!



oh ours!!



**memories little helper + YOUR CONSOLE
= AUTOMATED MIXING**



**allison research inc
nashville, tennessee
[615] 385-1760**

R-e/p 52

Circle No. 135

Of course, the home studio and demo studio had been around for years. TEAC introduced their nifty 3340S at about the same time as the first generation of automation systems emerged. Slowly but inevitably, the home studio, garage studio and demo studio side of the industry grew and matured.

Remarkable recordings were made in these primitive facilities, though for the most part they were unmarketable as masters. Too noisy, too distorted, too flat-sounding, or all of the above. But rapidly evolving technology chewed away at the quality gap.

While the high-rolling studios of the '80s flourished on generous label budgets, lean-and-mean home studios and demo studios evolved upward into "the project studio" — defined as any facility owned by an artist and/or producer and generally not available for outside rental. The dawn of

the 90's witnessed an industry-wide shakeout,⁷ and the project studio emerged as a major player in the audio production market.

Oh yes, back to automation. Well, the spectrum of project studios stretches from just above a teenage kid in his bedroom with a 4-track cassette up to a couple notches below the Power Station. At the upper level, some commercially-oriented facilities could justify the purchase of consoles in the \$30,000 to \$50,000 bracket, and therefore had access to the lowest-priced versions of the "second-generation" automation systems.

However, for most of the rest, the difference between a \$30,000 mixer and \$300,000 super-board was purely academic. If your entire equipment budget for an 8-track facility was only \$20,000, then you had few options. You rode the faders manually, just like everybody did back before '72.

Bridging the Automation Gap

Cost isn't the only problem. Even the most expensive automated boards won't necessarily fulfill the needs of a MIDI-fied facility. For example, a sophisticated SSL board will automatically store on-board EQ settings, but it might not be the best choice when you want to run your automation in tandem with MIDI files as an integrated system. Which function is more important to you? It's a matter of appropriate technology for the task.

In other words, the new generation of recording facilities faces an automation gap. What we need is a new approach to mixing automation, one consistent with the peculiar needs of the MIDI-centered home/project studio. Ideally, this type of system should offer the following:

1. Appropriate pricing. A

high-quality, automated 24-input/8-bus console should be available in the \$8,000 to \$10,000 range, depending on the sophistication of external control elements.

2. Complete MIDI integration. The system should operate using MIDI command protocols. The dedicated mix software should run simultaneous standard MIDI files, as well as multitask on the host computer with most popular MIDI sequencing programs.

3. Popular, third-party control computer. Basic computer horsepower shouldn't sit idle when no mixing is being done. In many cases, the necessary host computer will already exist in the studio.

4. Broad compatibility. Instead of straining for competitive advantage through incompatibility, allow



"I, for one, like to consider a good mix engineer a one who has the talent to listen, think and create, as opposed to a person of physical dexterity with a photographic memory. Automated mixdown can provide the memory and the physical help, thereby freeing the mixer and producer to create."

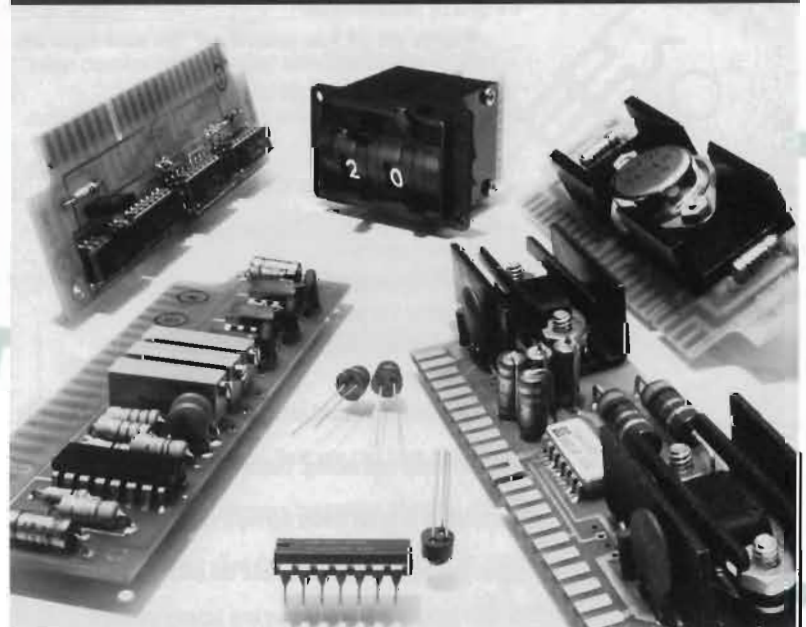
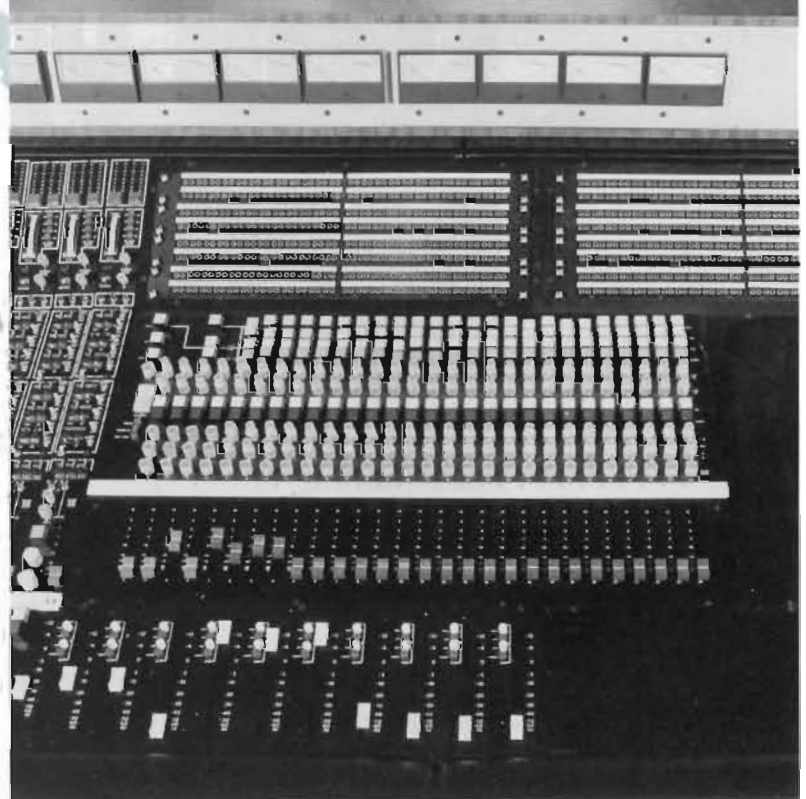
Paul Buff, automation pioneer and founder of Allison Research

(Quote from a special December 1974 console automation issue of *Recording Engineer/Producer Magazine*)

others—competitors included—to integrate the system into their consoles.

5. External, universal hardware components. Take the control elements out of the console, and let the engineer plug them in as needed, wherever needed. Allow the same automation system to be used with virtually any mixing console now on the market.

6. More powerful software. In addition to full MIDI compatibility, dedicated mixing software should have ample channel capacity (100 minimum) as well as comprehensive control, editing, and monitoring capabilities. It should incorporate a sophisticated MIDI management system to allow multitask playback of automation software along with MIDI sequencer programs and/or hard disk recording systems. Other features should include simultaneous Standard MIDI File (SMF) playback (for engineers who do not have machines fast enough to handle a multitasking environment), high resolution color graphics, graphic fader curve adjustment, and multilevel event editing.





Automation is nice. But i'm Still not sure i need it.

Fair enough. If you are still a bit fuzzy about what automation can do for you, right now, in your own studio, then the next section is for you.

Why Everybody Who Mixes Deserves Automation

What do you get from automation? The advantages can be summarized under eight key points:

1. Better sound
2. Better studio performances
3. More creative freedom
4. More control
5. 100% reproducibility
6. Better live performances
7. Better interpersonal relationships
8. Better focus

Let's face it, without automation, most of us don't really do that much real mixing. Outside of a final fade, the temptation is to set levels during a couple trial passes, and then just leave them alone while the master tape rolls.

Why? Mostly because we're burned out after long hours of tracking and overdubbing. It's hard enough to do a mix once and get it close, let alone do it over and over, trying to get small improvements. More important, you always risk NOT getting on your next mix what you DID like about your last mix.

You're stuck in compromise city, a place the big-time professionals abandoned long ago.

Automation: Better Sound

The first rule for producing an acceptable master in the digital age is the same thing the librarian hissed at you back in grade school: QUIET, PLEASE!



That's why the first part of every professional mixdown session is dedicated to going through the song and automating the mutes. Using automation, the engineer mutes every track at any time it's not being used for the mix. This eliminates tape hiss⁴, punch-in noise, string noise, and any other unwanted ambient noises in the studio (Hey, who belched?).

This has been absolute standard procedure ever since automation was introduced. It dramatically cleans up a mix, lowering noise and effectively pumping up the dynamic range of the remaining signals.

Automation: Better Recorded Performances

How do seasoned professionals get such killer, dead-perfect performances from marginally talented singers and instrumentalists? Easy. They use automation to assemble one perfect take from a number of imperfect tracks.

The technique is called "comping" and it works like this. First, during overdubbing, you record the same vocal or lead instrumental performance several times on three or four different tracks. During mixdown, you use automation to mute the unwanted parts of each take, keeping only the best parts, with your automation smoothing level transitions when switching from one comp track to another. The automation "compiles" one perfect track from three or four flawed versions.

Don't feel guilty. It's not cheating. What's more, just knowing that you can use comp tracks when you need to

has a positive psychological effect. You'll likely find your takes are better to begin with, since you know you can redo a whole performance rather than chopping it up with endless punch-ins.

Automation: More Creative Freedom


Listen to just about any current pop/rock/rap album and you hear a rich tapestry of crossfades, complex manipulations of reverb and delay, and dynamic moves within individual vocal and instrumental tracks. In other words, a mix that reaches out and grabs your attention.

Unfortunately, when you mix alone without automation, you have only two hands to work with. And your brain, sorry, presents a further handicap. Although amazingly good (we assume) at creative things like making music, your brain has trouble repeating commands for exactly the

same complex motions either simultaneously with other motions or in precisely timed sequence. At Robot U., we all flunk the entrance exams.

Of course, if you need more than two hands on the mix at the same time, you have two brains involved in the procedure, which only compounds the problem. (More on this later.)

Enter automation. Now you can have dozens of level and mute changes happening one right after the other, or even all at the same time. Effects can vary between chorus and verse. Instruments can stab out



"I've been using automation for ten years and it's been hard to imagine working without it. Using automation is almost second nature now. I gotta have it?"

Ricky Peterson, Staff Producer, Paisley Park Studios, Minneapolis

(Producer of Prince's Most Beautiful Girl, keyboard player for David Sanborn)





and then fall back into the mix. For example, let's say you want the snare sound to have a light echo during the vocal, but suddenly switch to a louder, shotgun-like sound with deep echo to punctuate the opening of every chorus. Further complicating matters is the fact that, because of track limitations, you had to add some syncopated conga parts in the bridge using the same tape track.

Without automation, you have a five-handed, all-night job. With automation, you simply split the track into three channels, add EQ and processing that's right for each, and adjust the levels and mutes precisely the way you want using as many passes as you need.

Automation: More Control

A mechanical fader is a fixed device. It can't be reprogrammed to be any different than it is.

So what? Well, each mechanical fader has a defined taper curve. The faders on most low-cost mixers have linear faders—that is, the volume tapers off in direct proportion to the position of the fader. More expensive boards, like the Mackie 8-Bus, have logarithmic faders, which give more precise control the closer you get to the off position. You can have one or the other, but not both.

However, with today's better automation systems, you are not limited by fixed mechanical hardware. Even if your console has linear faders, you can select logarithmic fader curves for your automated mixing. In fact, some automation software even lets you custom-design your own fader curves by literally drawing them with a mouse on the monitor screen!

Simply put, automation gives you a level of precision and flexibility you will not find in any non-automated mixer, no matter how much you pay for it.

Automation: 100% Reproducibility

How many times have you done the "almost perfect" mix, except for one itty-bitty detail. And when you go back to fix that on another mix, something major screws up. Oh, well...

Even worse, how many times have you finally come up with the perfect mix (on a radio jingle, for example), only to have the client come back three weeks later wanting the exact same thing "except replace electric guitar with banjo for the country market." Whoopee.

Without automation, you might be up all night. Again. But with automation, you're done and on your way by Miller time. The early shift.

Automation lets you store a mix, then reproduce it exactly⁹. Five minutes later, or five years later.¹⁰ No matter how complex your mix was, it will come back sounding exactly the same. Then you can tweak it further to your heart's content.

Automation: Better Live Performances

Most of you will use automation primarily for recording. But some features of automation are handy for live performance as well. And since some of the new automation systems utilize outboard VCA units¹¹ that plug into the console, you can take your automation out to the gig even if you use a different mixer for your PA.

The most useful automation feature for live sound is snapshot recall. The automation memory stores a record (a "snapshot") of the fader position and mute status of every input channel and the master outputs. This allows you to preset the board for every song of the performance, and then recall it instantly, usually by simply sending a MIDI program change command.

In a fraction of a second, you can mute channels dedicated to instruments not used on the song, change effects or effects levels (assuming they are patched into an automated input or Aux return), or rearrange keyboard submixes. Automation helps you control the flow and tempo of a performance. You don't lose a hot groove while laboriously resetting the board yourself, or waiting for your sound mixer¹² to do it for you.

Automation: Better interpersonal Relationships

If you work exclusively by yourself, cloistered away in your own home studio, that's okay. Great records have been made this way.¹³ What's more, you can skip this section because it doesn't apply to you.

But, in most cases, mixing is a collaborative effort. Everybody who played on the tracks wants to have a say on the final mix. If it's a complex mix without automation, sometimes everybody has to be physically involved—whether they want to be or not!

The problem? Inevitably, somebody screws up. They miss the mute. The fader level is too high, too low, too late, or too early. Next pass, they get it right but YOU screw up. Tension builds. Some mixers may indulge in substances to ease tension, which eventually makes bungling more frequent. The situation degenerates, everybody tires, the group agrees on the least objectionable compromise, and everybody leaves thinking, "If he just hadn't screwed up on that one mix I really liked..."

Automation takes away the tension. True, everybody involved still has to come to a consensus on what they want, but nobody has to feel tense or defensive about dropping the ball. Just missed a move? No problem. Save the rest, put me in update mode, and I'll fix it.

Of course, if you own the studio, automation has a further advantage. If everybody has agreed on a final mix but you want to make a teeny-weeny change, just wait until they leave. Hey, who's gonna know? "No, the guitar really was that up-front. It just sounds different because you're hearing it with fresh ears today."

Automation: Better Focus

This advantage is so obvious that we often overlook it. Automation lets you focus on the sound of your mix. Automation lets you listen. If you are preoccupied with remembering a complex sequence of moves, you can't focus your full attention on listening to what you are creating.

With automation, you have the full luxury of listening without distractions. Do a mix, then sit back and just listen. Listen two or three times, if you like. If your ears are tired, listen to it tomorrow. No hurry. It's all saved.

Listen. And enjoy. In the long run, that's how you get the best mixes.

¹A compressed history of Mixing Automation. We had to squash it through an LA-2A to keep it short, so our apologies to individuals and companies left out or passed over lightly. Watch for the complete, unexpurgated, fully annotated version coming soon on CD-ROM. Maybe.

²Of course, even back in the mono days, ambitious pop producers were building their sounds by bouncing tracks between tape machines, adding in overdubs with each pass. But once that new part was mixed in, there was no going back. And, after three or four passes, everything started to drown in tape noise buildup.

³Les Paul had been recording on his personal custom 8-track long before this time, a pioneering achievement which now earns him yet one more footnote.

⁴In 1971.

⁵Allison later became Valley People, then Valley Audio. Buff sold out his interest in the company some time ago, and he now makes a highly successful line of auto exposure lighting systems for studio photography.

⁶As far as we know. If you have a Memory Plus fader retrofit out there, still working, let us know. We'll respond with some kind of appropriate reward.

⁷High overhead and declining label spending doomed dozens of studios at the turn of the decade, but many survivors now thrive working in a "motherhip/satellite" partnership with project studios.

⁸This is important even with digital recorders and MIDI virtual tracks, since the output section of every electronic device generates some noise.

⁹To the extent of your system's capabilities, of course. Taking notes on EQ and effects settings may be required, though some automation software (like Ultramix Pro™, of course) will help you with the task.

¹⁰If five years is a likely possibility, don't forget to back up those files!

¹¹Mackie's OTTO-34, for example.

¹²Who is often grossly underpaid (and therefore has little incentive to be fast and thorough), or is somewhat inebriated, or both.

¹³J. Fogerty, P. McCartney, P. Townshend, S. Wonder, for example, though in our opinion their best performances were as part of a band.

Top 10 Reasons To Buy Mackie's New Universal Automation System

1. Keeps your mind on the music, not on the buttons.
2. Makes Multitrack mixdown a single person operation.
3. Makes mixing enjoyable by encouraging creativity and experimentation.
4. Reduces the tension of trying to mix perfectly on one pass.
5. It beats the Akroyd Bass-O-Matic.
6. Increases your studios productivity.
7. Easily recall and change previous mixes.
8. Automatically records your mutes in a single pass.
9. The Vatican isn't for sale.
10. Makes repeatable teeny-weeny changes easy.



Ultramix Pro

Automation Software System for the Macintosh™

Ultramix Pro™ was designed from the ground up to provide the fastest and most user friendly automation software package ever produced. We evaluated many currently available systems at both moderate and megabuck price ranges. Then we took the best of their features and added some new ideas of our own.

Because Ultramix Pro™ can stand on its own alongside any serious automation software, it is sold as a separate package, complete with extensive manual, Introduction to Automation Guide, Reference Card, and tips for achieving the best possible mixes. In the future, Ultramix Pro™ will offer the ability to control other automation systems and will support other mixers via the OTTO-34.

Using Ultramix Pro™ and Multiple OTTO-34 gain cells, the user can create very large automated systems indeed. As you connect more OTTO-34 gain cells to your setup, Ultramix™ will quickly accommodate the added channels, providing multiple 32-channel screens from which to monitor and control your growing system. In addition to multiple OTTO-34 screens, Ultramix Professional is also capable of controlling internal OTTO-1604 automation units and external OTTO-34's at the same time. This is especially handy for the many Mackie customers who are already taking advantage of our CR-1604 automation system for use as an automated sub-mixer of master effects return device.

*Preliminary Screen Shots

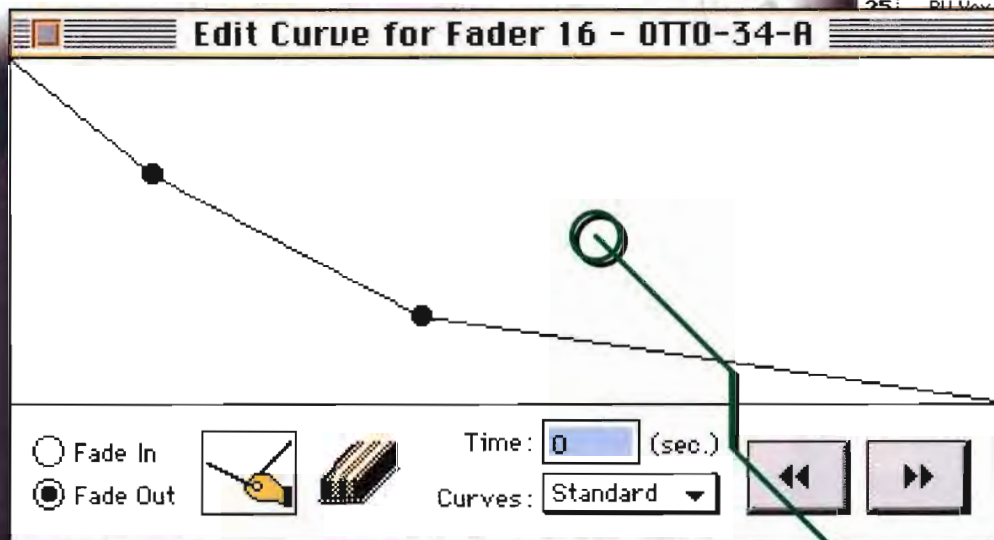
- Control up to 136 channels
- Subgroup any or all channels using color-coded subgroups
- Plays standard MIDI files as you automate your mix
- Fully OMS 2.0 compatible
- Fade curve editors
- Multilevel event editor
- Can also be used with OTTO-1604
- "Fat" Application: Tightly-coded for easy use on 030 20MHz Macs (including Powerbook™s)—but also runs NATIVE on Power Macs
- Future plug-ins will control MIDI-equipped effects devices
- Multiple monitor compatible



To make your job easier during the initial setup of your mix, we have provided you with the FADE LIST EDITOR WINDOW. This display offers multiple levels for defining each of your channels instrument name, group assignment and continuous controller number.

To change or add information, simply click the field you want to edit and the appropriate field will open to allow you to make changes.

Fader List				
#	Fader Name	G	Parent Mixer	Control
1	Snare		OTTO-34-A	0
2	Kick		OTTO-34-A	1
3	HiHat		OTTO-34-A	2
4	Mid Tom Center		OTTO-34-A	3
5	Mid Tom right		OTTO-34-A	4
6	Low Tom right		OTTO-34-A	5
7	Floor Tom		OTTO-34-A	6
8	Overhead left		OTTO-34-A	7
9	Overhead right		OTTO-34-A	8
10	Bass Drum		OTTO-34-A	9
11	Guitar Left		OTTO-34-A	10
12	Guitar Right		OTTO-34-A	11
13	Acoustic 1		OTTO-34-A	12
14	Acoustic 2		OTTO-34-A	13
15	MiniMoog		OTTO-34-A	14
16	Hammond Hi		OTTO-34-A	15
17	Hammond Low		OTTO-34-A	16
18	M1 Left		OTTO-34-A	17
19	M1 Right		OTTO-34-A	18
20	K2000 left		OTTO-34-A	19
21	k2000 right		OTTO-34-A	20
22	Mandolin L		OTTO-34-A	21
23	Mandolin R		OTTO-34-A	22
24	BU Vox 1		OTTO-34-A	23
25	BU Vox 2		OTTO-34-A	24
26	BU Vox 3		OTTO-34-A	25
27	BU Vox 4		OTTO-34-A	26
28	BU Vox 5		OTTO-34-A	27
29	BU Vox 6		OTTO-34-A	28
30	BU Vox 7		OTTO-34-A	29
31	BU Vox 8		OTTO-34-A	30
32	BU Vox 9		OTTO-34-A	31



Change the personality of any fader taper by using the FADER CURVE EDITOR graphic interface.

Using the mouse, grab and drag the fader curve to the shape you desire. When an OTTOfade is initiated, the fader will follow the curve that was defined in this editor.

To make things easier, we have provided two editors—one for fade ins and one for fade outs. Each fader can have its own unique fade curves preset by you!

Commonly used fade curves are included for your use and can be edited using the fade curve editor.

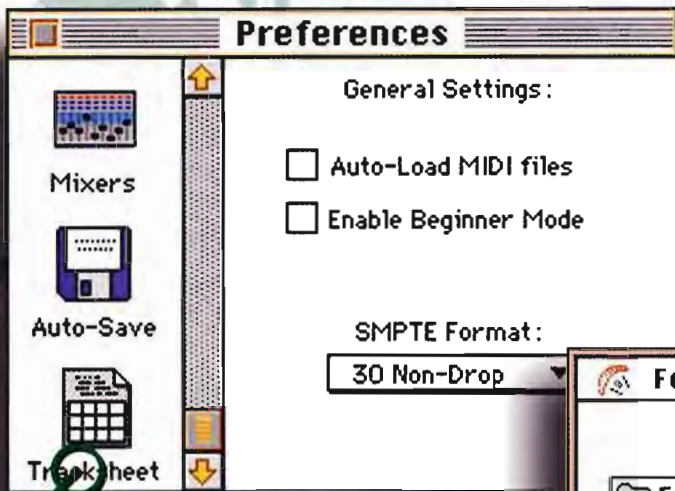
Ever wish you could create PRE-FORMATTED TRACK SHEETS quickly from your computer?

Like other Ultramix Pro features, we designed this system with the real world engineer/musician in mind. The track sheet feature allows you to format and print out your own custom track sheets to accompany your production. Provision are made for accommodating eight, sixteen, twenty-four and thirty-two channel mixers. Studio name, engineer, song title and of course track information are all user definable.

Simply enter the correct information into the appropriate fields. Font size and style are also fully definable using the standard Macintosh text formatting interface.

You can even print out blank sheets for use at underprivileged, non-automated studios.

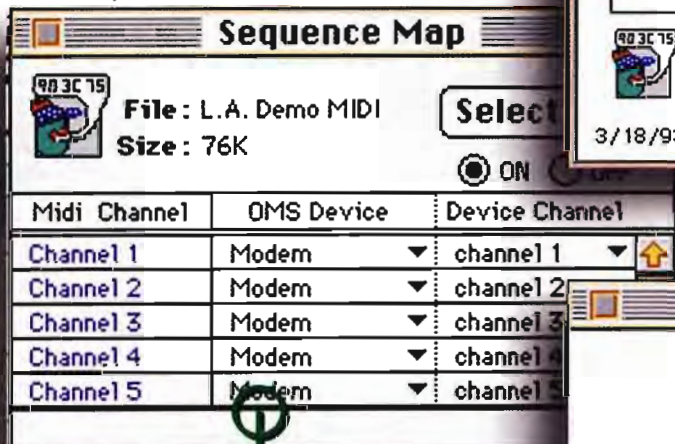
TrackSheet			
Mackie		Engineer	_____
UltraMix Professional		Assistant	_____
Title		Producer	_____
BPM: 12 reel# 1		Artist	_____
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24



In order to reduce system overhead on slower computers, Ultramix Pro™ offers you the ability to IMPORT AND PLAY STANDARD MIDI FILES, including sequences produced on NON-MACINTOSH SYSTEMS. As long as the file conforms to the standard MIDI file protocol, Ultramix Pro™ will be able to read and play it back for you. The power of this feature is obvious. Since Ultramix Pro™ can run both your automation and play your MIDI sequence during the mixdown, its not necessary to multitask another MIDI sequencer with Ultramix™. This dramatically improves system performance and allows Ultramix™ to run on less powerful Macintoshes, such as 030 20MHz systems.

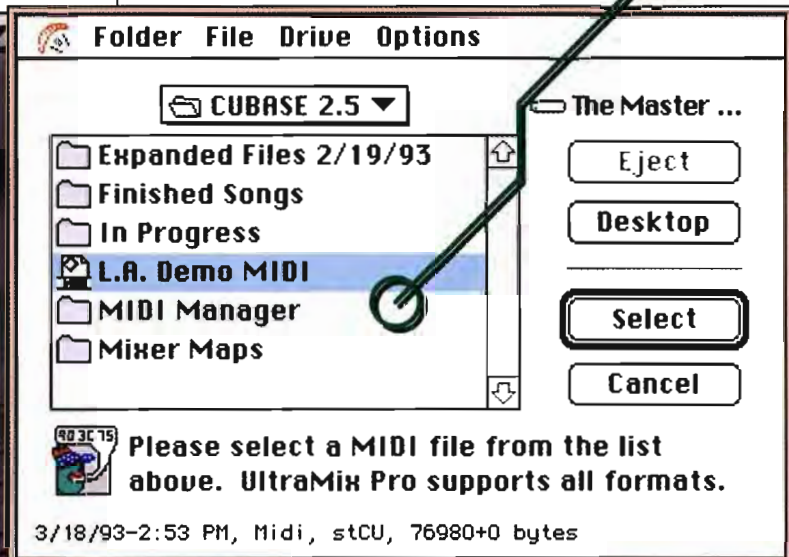
Setting up Ultramix Pro™ is a snap. We have provided full graphic PREFERENCE CONTROL PANELS like those you find in other quality Macintosh applications.

Provisions are made for fader position on start-up. Auto-save option, etc.



For those who still prefer having the ability to run their sequence and Ultramix™ simultaneously, Ultramix Pro™ is fully OMS 2.0 compatible, so you can take advantage of 2.0's powerful multitasking capabilities.

Since they share identical MIDI and SMPTE timing information, you can run any OMS compatible sequencer plus Ultramix™ side by side, providing the most accurate and stable multitasking arrangement available today. 040 25MHz or faster systems are recommended for this configuration



Please select a MIDI file from the list above. UltraMIX Pro supports all formats.

3/18/93-2:53 PM, Midi, stCU, 76980+0 bytes



MANUAL RECALL... a Virtual Mixer I/O track sheet

Ultramix Pro™ and OTTO-34 offer the highest performance fader and mute automation available today. Having the ability to instantly recall a mixdown that was produced months before is extremely powerful tool.

But what about remembering all of the NON-automated sections of the mix? Enter: Ultramix Pro™'s MANUAL RECALL feature. You can log all aspects of the mix, with a virtual representation of the Mackie CR-1604, 8•Bus series and the new LM-3204 I/O master sections.

Select the mixer and channel you wish to log using the radio buttons provided at the bottom of the recall window. Next, click and hold a knob with the mouse. By pushing or pulling the mouse you can rotate the knob. Now all you need to do is match the virtual channel strip with the settings on your console. When you're finished, you've logged every setting on your mixer that will be saved with your automation data. These manual recall settings can be printed out for later use and also edited anytime.

Ultramix provides you with EIGHT FULLY-DEFINABLE SUBGROUP FADERS plus a GLOBAL MASTER LEFT AND RIGHT FADER.

Via color coding, the user can quickly assign multiple input faders to one of the eight group master faders. Because the grouped input faders remain at their present positions, changes can be made to the proportional relationship of these inputs while they remain grouped. The Sub-group master will continue to control the grouped input faders, reflecting any changes made to the individual channels within the group.

Since the group master faders can control any of the input faders in use, it is possible to create large groups of inputs spanning multiple mixers and OTTO-34 units.



Event List Editor

View Start: **00:00:19:26** End: **00:00:19:26**

INCLUDE: Mutes, Fade Out, Fade In

Included Faders:

- Fader 16 OTTO-34-A
- Snare OTTO-34-A
- Kick OTTO-34-A
- HiHat OTTO-34-A
- Mid To... OTTO-34-A

Session Fader List:

- Snare OTTO-34-A
- Kick OTTO-34-A
- HiHat OTTO-34-A
- Mid To... OTTO-34-A
- Mid To... OTTO-34-A

Mutes Fade In Fade Out Snapshots Other

Fader Name	From	To	Start Time	End Time
Kick	6		00:00:06:01	-
▶ Kick	7	127	00:00:06:04	00:00:06:16
Kick		-	00:00:07:04	-
Kick		-	00:00:07:15	-
Kick		-	00:00:07:22	-
Kick		-	00:00:08:03	-
Snare		-	00:00:08:26	-
Snare		-	00:00:09:07	-
▼ Mid Tom right	89		00:01:11:15	
Mid Tom right	88		00:01:11:16	
Mid Tom right	87		00:01:11:17	
Mid Tom right	86		00:01:11:18	
Mid Tom right	85		00:01:11:19	
Mid Tom right	84		00:01:11:20	-



Ultramix™ Pro offers one of the most powerful EVENT EDITORS available.

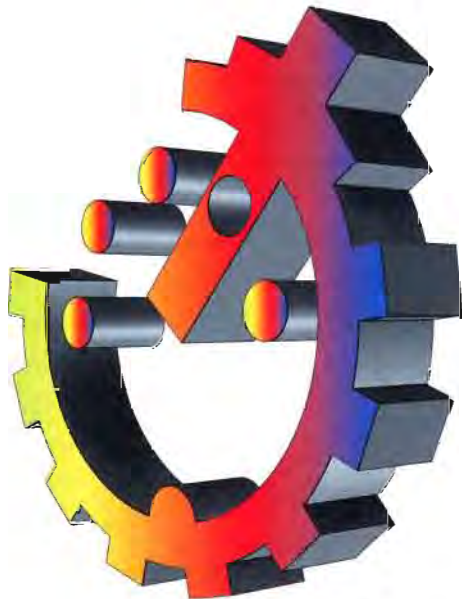
Using many aspects of the standard Macintosh file interface, Ultramix presents the operator with varied degrees of event displays. Each mute and fader event is displayed in progressing time. The user can expand the display to list every single volume change or mute event, or collapse the list to show only the basic move.

Changes to mute events are as simple as clicking the mute button in the edit display. By doing so, the user can reverse the state of the mute; plus, the position of the event can be altered by changing the timecode position on the right of the dialog box. Fader moves are just as easy to change by using the fader move edit controller.

Notice that a mix segment can be quickly changed using the time code position windows above. The channels to be edited can be quickly added or subtracted using the handy assign windows.

*Preliminary Screen Shots

OTTO-34



ULTRAMIX^{PRO}

UNIVERSAL MIXER AUTOMATION SYSTEM

MACKIE.

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206/488-4586 • On CompuServe: GO MACKIE • INTERNET: mackie.com

Represented in Canada by S.F. Marketing 800/363-8855

Represented internationally by M.M.S. 908/988-7800

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