

# FM ACOUSTICS NEWS

Volume 2, Summer 1989

Reactions to the first issue of FM ACOUSTICS NEWS were very positive, so here is another issue with further information.

## INTRODUCTION

### 15 Years of FM ACOUSTICS

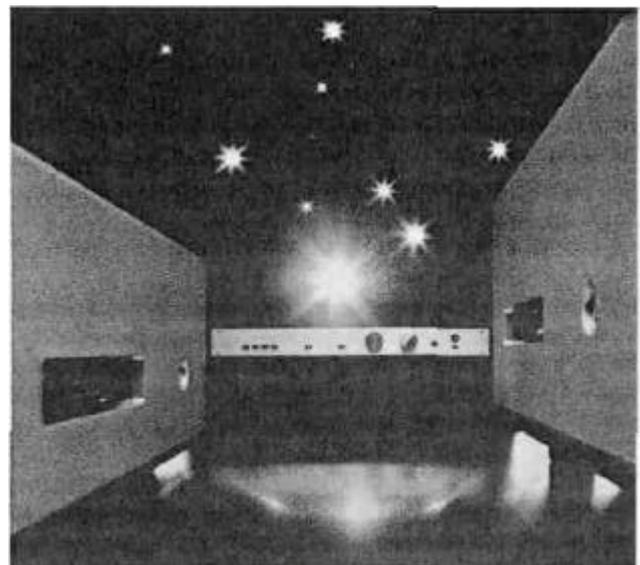
15 years of product integrity and continuous progress.  
15 years without succumbing to compromise.  
15 years of striving to create the ultimate.  
15 years of developing new methods of component selection and tolerance reduction.  
15 years of sometimes very exhausting research and development at the leading edge of technology.

But also 15 years of gratitude from satisfied clients, professionals and audiophiles alike. The basis of FM ACOUSTICS' long-term success comes from the self motivation of the FM ACOUSTICS team and their spirit for creating the absolute best without any concessions. This dedication has given us the ability to design products that truly stand the test of time. In fact, every single FM ACOUSTICS product that has been manufactured during the past 15 years is still being produced today! This shows that precision audio technology evolves continuously and not in "giant steps" as some people would have you believe. But while today many companies claim to produce "high class" products, it is in reality only a handful of dedicated people who adhere to the true philosophy of precision audio. All too often only strongly promoted and highly visible products are given praise and recognition, despite the fact that most of these actually do little or nothing to help the cause of accurate sound reproduction. Fashion and false promises, however, are always shortlived. Looking back on product evolution over the past 15 years, it is rewarding to see that many innovations that produced definite improvements

were first introduced by the FM ACOUSTICS research team and later copied in simplified form by other manufacturers. Some of these are now accepted as standard. Those select few companies and personalities who have assisted in substantially advancing the cause of precision audio reproduction are now receiving their due recognition.

Praise must also go to our faithful distributors and clients, whose constructive criticism and field reports have consistently helped us to stay far ahead. Without this feedback FM ACOUSTICS could never have achieved its present status. We extend our gratitude to all those who have contributed and continue to do so.

However, **looking forward** is much more interesting than looking back! During its fifteenth year FM ACOUSTICS LTD will introduce more innovations than ever before. Some are announced in this issue of FM ACOUSTICS NEWS; others will be covered in subsequent issues.



*The RESOLUTION SERIES opens new horizons in accuracy of sound reproduction at home.*

## A GLIMPSE INTO THE FUTURE *THE*

### *RESOLUTION SERIES*

Long-term tests of a new generation of precision audio electronics - electronics with magical performance and designed for the most demanding domestic applications - have been completed. The *RESOLUTION SERIES* is designed and crafted for those few individuals who require the ultimate in musicality and can afford the privilege of owning the absolute best. With the *RESOLUTION SERIES* the absolute standard in precision audiophile amplification is set.

The *RESOLUTION SERIES*, the world's most expensive line of precision audio electronics, is the quintessence of a State-of-the-Art development program. The engineering team at FM ACOUSTICS completely re-analyzed the entire concept of precision amplification. With the advantage of no limits on research time or funds, a line of amplifiers and preamplifiers was created which will determine the future of audio technology. With total dedication to achieving the absolute Non-Plus-Ultra, utilization of the most advanced proprietary selection procedures, the use of MIL-, DIN- and IEC-specified parts, and a standard of manufacturing unseen anywhere before, a precedent for ultimate sound reproduction accuracy has been set.

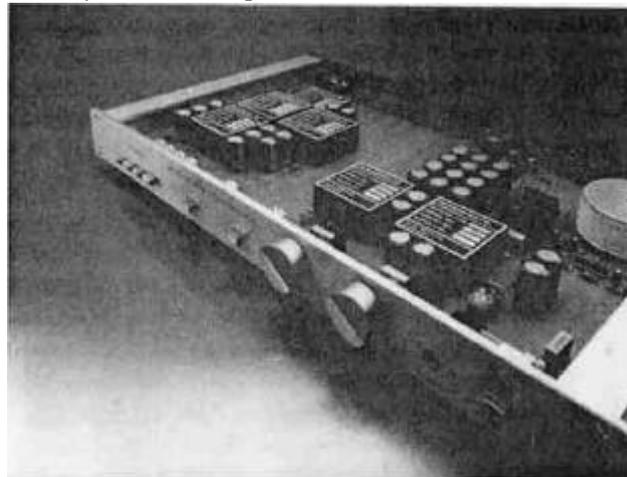
"...If there is one singular expression which best describes the experience of listening to the *RESOLUTION SERIES*, it is realism. There is a simply arresting quality of realism with a concomitant phenomenal reproduction of emotional content which suddenly appears after connecting these units..." comments one of the world's most experienced reviewers.

#### **The secret behind the singular performance accuracy of the *RESOLUTION SERIES*?**

"...We have utilized numerous proprietary technologies and production methods, the details of which cannot be fully disclosed; but there is no single characteristic which alone explains such reproduction accuracy. A vast number of crucial details, many of them unique to FM ACOUSTICS products, receive the most careful attention. Combined they result in a quantum leap forward in performance..." explains Alan Solomon, head of research at FM ACOUSTICS.

These units combine unlimited output current drive capability (above 200A, the output current is limited by the mains supply only) and absolute stability when driving any load, even the lowest impedances. Their unique, correctly designed and true balanced symmetrical input circuitry

guarantees pristine reproduction of even the most complex input signals. One must be aware of the fact that most so-called "balanced" circuits are not truly symmetrically balanced, and with most of those, compromises such as non-satisfactory common-mode rejection are accepted. The *RESOLUTION SERIES* power amplifiers are capable of driving any speaker available with unparalleled performance and accuracy - by controlling the diaphragms in a way never before possible.



*Setting new standards worldwide: THE RESOLUTION SERIES 244 precision preamplifier.*

The precision preamplifier of the *RESOLUTION SERIES* comes in 3 distinct versions: the 244 Version "A" has a built-in MC stage; Version "B" has a built-in MM stage; and in Version "C" the phono input becomes a high-level input as well. Featured on this preamplifier is a unique system of cartridge loading and frequency response linearising. This system is active with MM (moving magnet) as well as MC (moving coil) cartridges. Thanks to an FM ACOUSTICS exclusive module system limitless resistance-capacitance combinations are available. Another point that makes the FM 244 absolutely outstanding is the fact that there is absolutely 0 (zero) feedback or feedforward. Coupled with FM ACOUSTICS' pure discrete enhanced Class A circuitry, a performance standard is achieved that never before has been possible. Also featured are superb precision Volume and highest resolution "spread" Balance controls (another FM ACOUSTICS exclusive); these are carefully isolated from the gain stages by pure Class A buffers (something which is not done in most other designs and which is consequently one of their inherent weaknesses).

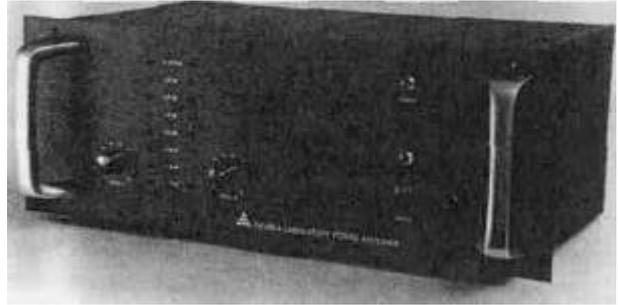
The *RESOLUTION SERIES* 244 is indeed fully loaded with unique features which, combined with FM ACOUSTICS' discrete enhanced Class A circuitry, create a quality of sound reproduction which is simply unparalleled.

## PHILOSOPHY OF MANUFACTURING

"We have never made a compromise and we never will," states Manuel Huber, President of FM ACOUSTICS. "Over all these years we have repeatedly been requested to cut down a little bit on our extreme perfection in order to make our products available to a larger audience. But compromises do not fit into our way of thinking, nor are they compatible with our way of manufacturing. A craftsman who is motivated and wants to create the very best will be frustrated when he or she is asked to "cut down a little bit" on quality and perfection. Motivation will automatically suffer, as will the quality of workmanship. The resulting loss of pride in craftsmanship most certainly will lead to mediocrity."

There are ample other reasons for avoiding compromises. As a matter of principle it is annoying to be asked to accept compromise. The world is full of products with flashy front-panels that beneath the surface show disturbing signs of extensive compromising. For FM ACOUSTICS only the absolute best is acceptable. We must consistently disappoint those who expect a "cheap" FM ACOUSTICS product. Upon close examination one realises that our products - while admittedly the most expensive - do provide astonishingly high value for the money. The second-hand prices of FM ACOUSTICS products speak for themselves. Often units which are 10 and more years old are sold at prices which are above(!) the original cost, something only a handful of components in the audio field have ever achieved. FM ACOUSTICS products truly stand the test of time.

Considering that the FM 800A power amplifier, first introduced in 1975 and still manufactured today, continues to be one of the ten best power amplifiers on the world markets, one can easily appreciate how advanced FM ACOUSTICS products actually are. This also clearly illustrates just how far ahead research and development are planned. It is precisely this kind of long-term thinking and planning that contribute to the uniqueness of FM ACOUSTICS products. By avoiding superficial trends and designing for the future, a product is obtained which not only has unmatched longevity but also avoids early obsolescence - something which is all too common with products manufactured nowadays.



*The first FM 800A power amplifier manufactured in 1975 . Regularly updated and improved the FM 800A is still in production today!*

## THE IMPORTANCE OF AN ACCURATE MONITOR SYSTEM

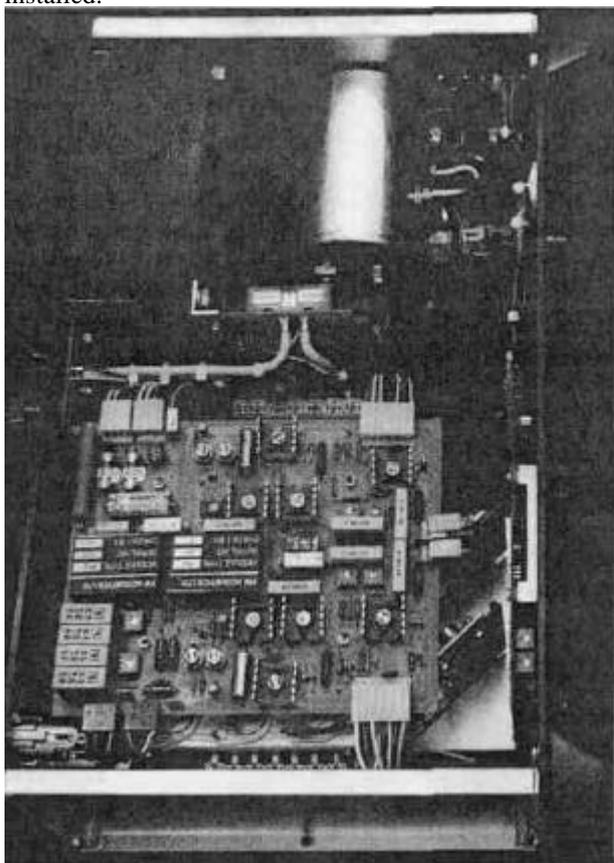
Low resolution monitoring systems quite literally destroy the entire production environment built around them. It is impossible to calculate the monetary loss from repetitive error correction and lost production time that results from the use of low-resolution monitoring systems. Over a period of a few months these losses will certainly far exceed any savings realized at the time of initial acquisition. Consequently, there are few items in the modern recording studio which are as important as the monitor system. Far too little attention is given to the fact that the monitor chain is a system which is not just comprised of the speakers alone. Too often the power amplifiers and crossovers are regarded as secondary, without adequate consideration being given to the extremely important function these units play in the studio environment. World renowned studio designer Tom Hidley explains it quite clearly:

"...The room can sound no better than the complete monitoring system selected for the installation. A budget allocation of 10% of the total studio equipment expenditure is not out of line for the monitor chain. If the monitor is weak, the room's potential cannot be realized. Would you put a garden hose nozzle on a fire hose? Only if you wanted to restrict and negate the purpose of the fire hose. Restrict the monitor budget and you lose the studio's full potential for sonic performance. Restrictions at the monitor level is false economy, as this limits the remaining 90% equipment investment **and** the investment in the room itself..."

In fact, in film or video production no one would suggest that picture quality be evaluated using cheap little TV sets. To the contrary, every effort is made to see as much as possible in order to get the picture right, and this is only possible with highest resolution monitors. Precisely the same applies for audio monitors.

The statement sometimes heard - that the usual smaller near-field monitors are sufficiently accurate for recording, video, film and post-production studios - is complete nonsense. Such speakers are compromised designs and cannot possibly reveal the subtleties and distinctions that make the difference between a bland, ill-defined recording and one that accurately captures fine detail. In truly professional applications a high-resolution monitoring system is mandatory. The world's top video and post production studios, as well as film screening and scoring studios, are now realising the importance of precision monitoring;

and consequently the need for truly accurate power amplifiers is greater than ever. Every day more and more FM ACOUSTICS precision audio electronics are being installed.



*Inside view of the FM 801 Precision High Power amplifier. Superior craftsmanship is evident. Very advanced technology and proprietary selection processes are used throughout resulting in an absolutely incomparable performance.*

## PRODUCTION METHODS AND MANUFACTURING TECHNOLOGY

FM ACOUSTICS maintains a large and costly stock of components in order to assure the continuous availability of parts and service for a guaranteed minimum period of 10 years. In fact even today there are spare parts available for **every** product

that FM ACOUSTICS has ever manufactured. Many of these components are not readily available, being non-standard, MIL (military) parts or parts specially manufactured for FM ACOUSTICS. Suppliers of some of these specialized components quote us delivery terms of up to 60 weeks! And when they are finally received they must be selected to comply with the even more stringent standards required by FM ACOUSTICS. Therefore, careful long-term planning and exacting inventory control is necessary to guarantee smooth and continuous production. It must also be realised that to a large extent the long-term accuracy and performance of a product depends on the quality of the components used. All components inside FM ACOUSTICS equipment are of the highest quality and conform to IEC, DIN and/or MIL standards. Each and every incoming part is carefully inspected. In addition, capacitors, transistors, diodes and other components, are also checked for various parameters using methods proprietary to FM ACOUSTICS. Most of these components are selected by hand on specially-built testing machines. For instance, all transistors go through a gain and beta check and thereafter a linearity check. Then every single transistor is individually analyzed, statically as well as dynamically, at various power levels and temperatures. Another example: all critical capacitors are selected for tolerance to an accuracy of 0.25%! There are various additional selection procedures which are proprietary to FM ACOUSTICS and which will be described in future issues of FM ACOUSTICS NEWS.

## SPOTLIGHT

FORCELINES, FM ACOUSTICS' precision high-energy signal transfer cables, are now being employed in many critical applications where they are consistently outperforming every other cable available on the world market, including the most exotic and expensive brands. There are no unsupportable claims made for FORCELINES. The physical laws governing signal transfer are well-known. A variety of criteria have to be observed, and the ideal cable has an optimal mix of these criteria. Reactions to the performance of FORCELINES have been emphatically positive. Reports from all over the world relate the same thing: a definite improvement, termed anything from "remarkable" to "totally incredible". For instance, in carefully controlled tests at the reference installation located at Masterfonics Studios in Nashville, Tennessee, FORCELINES positively outperformed the other contenders. Among the numerous comments made were the following:

Glenn Meadows, President of Masterfonics:

"...The cables were exactly the same length and perfectly terminated. Great care was taken that everything was identical, so that a true A-B comparison would be possible. The difference between FORCELINES and the other cables was not subtle. That is quite an accomplishment for FORCELINES, as so far the other cable was the most highly regarded speaker cable on the market..."

Another comment from the same listening session:

"...There was absolutely no contest. The other cables clearly exhibited current saturation. At low levels they were just acceptable, but at middle and high levels it sounded like the source had gone into tape compression...."

Listeners were simply knocked out by the accuracy of Masterfonics' room, where FM 1000's are driving Kinoshita/Hidley monitors through FORCELINES 5

Another comment on FORCELINES which **was** received recently:

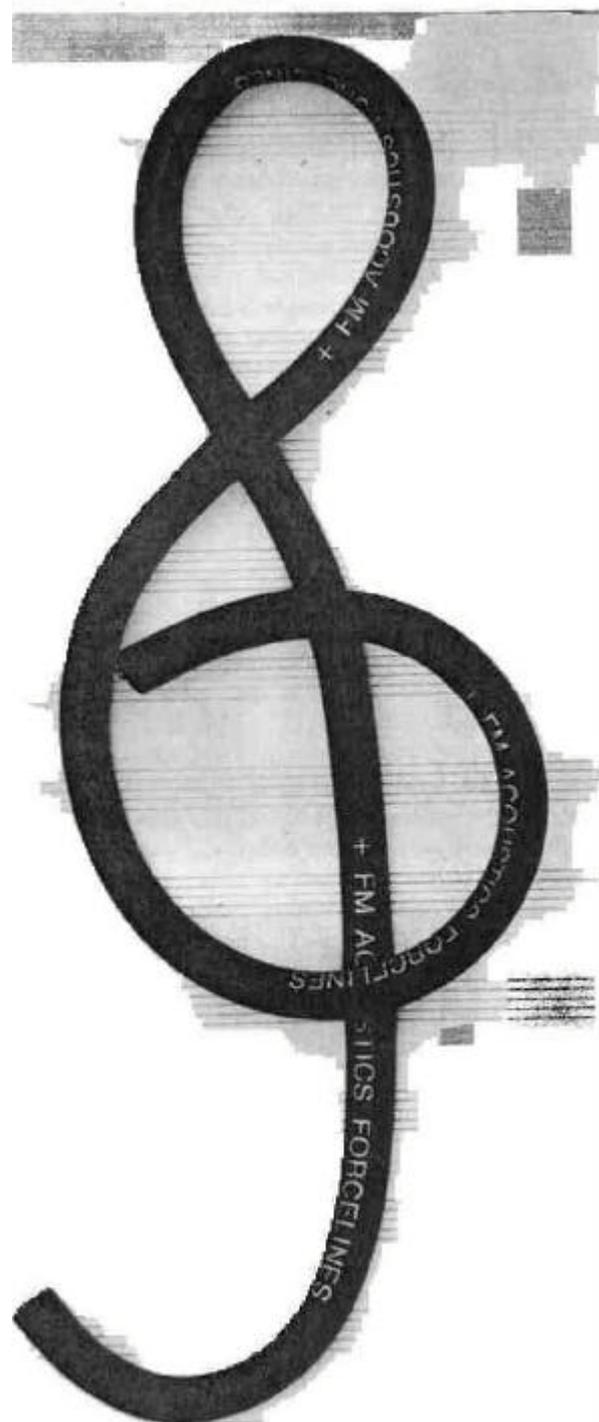
"...I would like to confirm how much I have been satisfied with your FORCELINES 5 cables. Since installing them I get a much more detailed bass and the high frequencies are incredibly improved. It also sounds like the cables' propagation time is shorter. The timbre is definitely far more natural. This result is very surprising, as I was using a famous first grade cable before. I thank you for your valuable advice..."

The new FORCELINES 7 are now available. All of the unique features of FORCELINES 5 are incorporated. FORCELINES 7 have a somewhat smaller cross-section (they feature a pure copper cross-section of 10.3 mm<sup>2</sup> corresponding to AWG 7, rather than the AWG 5 size of FORCELINES 5, which have a 16.5 mm<sup>2</sup> cross-section). The main applications for FORCELINES 7 are:

- for medium length (up to about 15mt hookups of home speakers
- for wiring mid- and high-frequency drivers in multi-way applications
- for connecting medium and smaller speaker systems in professional applications and for near-field monitor systems
- for use in automotive systems

Yes, in car installations cable quality is very important! Because of the low impedances of car speakers, very high currents must be conducted with the lowest possible resistance and interference. In these applications environmental effects are of great concern, and full stability

combined with lowest-loss signal transfer is required. Throughout the entire audio band FORCELINES provide better signal transfer than any other speaker cable.



*FORCELINES, without doubt the most musical and accurate high-resolution cable for connecting speakers.*

**Here are some specifications for FORCELINES:**

Type: Single conductor precision high-energy transfer cables Conductors individually identified as + or - FORCELINES Special high-purity, linearised, low-oxide copper, highly flexible, high-temperature resistant and flame retardant insulation

Identification: 1.5/3/5/10 mt. (Any other length on special order) FORCEPLUG 200, FORCELUG 25 -25° C to +80° C operating, max. continuous: 95° C

Conductors: Precision cable spacers included. Re-usable foam lined thermo plastic case.

Std. Lengths: FORCELINES 7 FORCELINES 5

Connectors: FORCELUG 25 -25° C to +80° C operating, max. continuous: 95° C

Temperature: Precision cable spacers included. Re-usable foam lined thermo plastic case.

Accessory: FORCELINES 7 FORCELINES 5

Packing: FORCELINES 7 FORCELINES 5

Resistance:	1.7 Ohms/km	1 Ohm/km
Wire size:	AWG7 (10.3mm <sup>2</sup> )	AWG5 (16.5mm <sup>2</sup> )
Current:	100A RMS, 600Ap	200A RMS, 1200Ap
Voltage:	500V RMS	500V RMS
Net weight:	13 kg (p. 100mt)	22 kg (p. 100mt)
Pure copper wt:	11 kg (p. 100mt)	17 kg (p. 100mt)
Diameter:	<b>7.9mm</b>	10mm

Most of today's sophisticated speakers resemble actual dynamic impedances in the region of 1 Ohm and lower! Such real-world impedances demand huge output currents from the amplifier, and this current must be transferred to the speaker with minimum loss and interference. Peak output current requirements in excess of 100A are not uncommon! Every bit of improved transfer and every m-Ohm (milliohm) of lower resistance makes a difference.

To guarantee ultimate sound reproduction throughout the overall system, FM ACOUSTICS has considered the whole system interface, not just the cable. FORCELINES incorporate the specially developed FORCELUG 25 and the unique FORCEPLUG 200 - highest-performance/lowest-loss connectors that can handle continuous currents of 200A RMS and voltages of 500V. Precision terminated and hand-soldered to FORCELINES, this combination sets the world standard in lowest-loss, highest-precision amplifier-speaker interfacing. To guarantee non-compromised performance, FM ACOUSTICS power amplifiers are only available in conjunction with FORCELINES.

FORCELINES are ready for installation without any need of soldering or crimping. They are available in a variety of configurations with various connector combinations. They come in sets, with a re-usable carrying case. Standard lengths

are 1.5/3/5/10 mt, but any length is available upon request. For further detailed information ask for the data-sheet and Technical Bulletin 23: "Selecting The Correct Speaker Cable."

Wherever FORCELINES are installed an astounding improvement over any other cable is guaranteed. Even with small speakers and low-power amplifiers the improvement is immense. The time has come to replace existing cables with FORCELINES and experience the difference. There is no better way to obtain such a marked improvement with such a minimal investment. FORCELINES are the ultimate solution for quality system interfacing, and they will reward you with definite improvements in system accuracy.



*Backpanel of FM ACOUSTICS FM 801 Precision High-Power amplifier. Clearly visible are FM ACOUSTICS' precision lowest-loss 200A FORCEPLUG connector receptacles. In conjunction with FORCELINES these high-performance connectors guarantee absolutely unparalleled highest-precision signal transfer.*

**NEW PRODUCTS**

The updated version of the FM 1000, called the FM 1000-1, is now available. Keeping all of the well-proven features of the FM 1000, a signal presence LED has been included - a feature which has been repeatedly requested. In all other respects the exterior appearance has remained identical. Inside certain parts which have just become available and some slight modifications now bring measurable and very audible improvements. The more difficult the load, the more massive the improvement in sound quality. R&D never stops at

FM ACOUSTICS, and if some development will bring a definite improvement (and it has passed all required trials and long-term tests) it is incorporated - whatever the cost.

A 19" rack adapter that can hold up to three units of the FM 214 and/or FM 216 is now available. Order No: FL 20150. This precision machined mounting plate is 1 unit high (44.1mm) and has a satin anodised finish. For clients who use only one or two FM 214's or FM 216's with this rack mounting panel, there are hand-polished blank panel plates available which cover the unused cutouts. Order No. FL 20153.

New level potentiometer damping grommets are now available. The precision level potentiometers on FM ACOUSTICS power amplifiers are not detented, as there are no detented pots available that meet our quality standards. But now there is an easy way to protect against accidentally touching the level controls: special rubber grommets can be installed between the front-panel and the level knobs. The turning resistance can be adjusted from very light to strong by exerting a corresponding pressure when tightening the Alien screws on the knobs. Installation is a snap, as the only tool required is an 0.05" Alien key. Your distributor has these rubber grommets in stock and will assist you in mounting them.

#### TECHNICAL TIPS

##### EQUALIZATION:

When changing from another brand to FM ACOUSTICS power amplifiers and/or crossovers, it is of utmost importance that the monitoring system be re-equalized. In most installations one will be able to soften the equalization considerably, and frequently when installing FM ACOUSTICS amplifiers the equalizers can be eliminated entirely, resulting in a corresponding improvement in accuracy. Equalizers introduce considerable phase shift and ripple, thereby appreciably degrading the accuracy of the audio signal. Wherever possible the equalizers should be eliminated. Obviously this is not always feasible, and in certain situations controlled phase shift is less obstructive than sharp resonances. It should be noted that equalizing is a static correction only and will not necessarily yield accurate results when playing complex dynamic material such as music. Even systems that seem perfectly equalized may still sound unacceptable because the typical 1/3rd octave analysers and equalizers can only correct broader-band errors. The final judging must always be done by ear. If a system measures o.k. but consistently sounds disappointing, trust the listening evaluation rather than the measurement.

##### SWITCH-ON:

An important point that is sometimes neglected is the recommendation concerning switch-on sequence. It is mandatory that the power amplifiers are turned on only **after** all ancillary equipment has been switched on. While one may never actually hear a turn-on transient from preceding equipment, this does not mean that there **is** no turn-on transient. All FM ACOUSTICS power amplifiers employ relays with heavy-duty, multiple paralleled contacts for delayed turn-on and various other functions of the protection circuits. This way speakers are fully protected from possible turn-on transients. However, this still does not protect the amplifier's input from turn-on transients from preceding equipment. And while a switch-on surge from preceding equipment may actually not be heard, it can still heavily upset the audio circuitry. In extreme cases and with extremely heavy surges, an amplifier can get damaged -especially if very heavy surges happen repeatedly.

##### FAN FILTER CLEANING:

In the heat of daily activities things that are not so prominent often get easily overlooked. The FM 800, FM 801, FM 1000 and the RESOLUTION SERIES 810 power amplifiers need no maintenance - with one exception: they use many stages of discrete class A circuitry and require large amounts of fresh air. There must be as little obstruction to air flow as possible, so that the fan can efficiently control the operating temperature. Cleaning of the fan filter is often put aside until later or simply forgotten. It is astonishing how fast a fan filter gets filled up with dust and dirt, and this happens even in rooms with filtered high-performance air conditioning. However, when considering that in a typical operating day the amplifier's fan moves between 500'000 and 2'000'000 liters of air, it becomes quite clear that the fan filter needs regular attendance. If the fan filter is not cleaned or replaced the parts inside the amplifier will get too hot. Even a fan filter that "looks ok" can be filled with fine dust-particles which are too small to be detected by the human eye. For example, in a typical studio installation where the amplifier is running 24 hours per day, if the filter has not been cleaned for 6 weeks the temperature inside the amplifier can rise more than 20°C just because of dust accumulation! In the long-term this will put unnecessary strain on parts and result in a shorter than normal lifetime. In your own interest make sure that the fan filter is cleaned or replaced about once a month. New high performance fan filters are available in a package containing ten pieces. Order No: FL 20154.

## APPLICATIONS FOR THE FM 214 PRECISION LINE DRIVER

A popular application for the FM 214 Precision Line Driver is to use it at the output of a mixing desk and generally at the output of line level equipment. At first one might be inclined to say:

"But that's an additional stage!" Yes, this is an additional stage, but a perfect one that improves the overall performance. How does it do this? With very few exceptions the design and execution of output and buffer stages leave a lot to be desired. Quite often insufficient attention is given to these stages, probably because there are so many other work-intensive design aspects. This, however, limits the performance capability of the whole unit. The difference that is possible when using a perfect line-level stage is only realised once the FM 214 is added! Practically every time a FM 214 precision buffer is connected to the output, a definite improvement is obtained. Even famous console makes and most professional and consumer equipment do not employ really clean output buffer stages. This is also true with balanced circuitry. Therefore, these units can benefit remarkably from the addition of an FM 214. One of the reasons for these improvements is that practically all standard output stages employ ICs and the usual feedback circuits described in design textbooks. These circuits were neither designed for real world situations nor with consideration for the capacitance and inductance of the interconnect cables and the input load of the following units. The capacitance and inductance of the cable and the input stage of the following equipment form a filter circuit which - together with the output circuitry - changes the performance of this output circuitry. At worst it can become an oscillator which endangers the following circuits and seriously detracts from performance. In addition the output impedance of such stages is generally far too high, so that the subsequent cables and input stages are not driven accurately and can have a negative influence on signal transfer.

Recently Michael Fay, editor of REP magazine, stated: "The true heart and soul of any board lays in the input, equalization and output stages." He is correct. The simple addition of an FM 214 at the balanced or unbalanced outputs helps a great deal. The unmatched drive capability improves the output stages of practically all equipment working at line levels. This in turn dramatically improves the interface between the output stage and the succeeding load and produces a correspondingly better overall signal transfer. The addition of an FM 214 is a small investment which pays off in terms of greatly improved system performance.

## TESTS

Today's speaker loads are getting more and more difficult to drive. For instance, a well-known middle-sized 3-way studio monitor system requires considerably more than 100A of peak current capability from the amplifier! And this is despite the supplier's impedance rating of 8 Ohms (which would indicate a maximum current in the region of around just 20A peak!). With such current demands other amplifiers will clamp the signal down, seriously limit, switch off or even self-destruct, as such requirements put an incredible strain on the power amplifier. It is precisely under such conditions, with real-world loads and signals (and not just resistors and static signals like sine waves or square waves), that FM ACOUSTICS power amplifiers show their true capabilities and outperform all other amplifiers.

For instance, the power that the FM 1000-1 delivers into a well-regarded large studio monitor speaker is no less than 7000 Wpp - corresponding to 2500 RMS! - when driven with a demanding signal, a bass drum. FM ACOUSTICS rates the FM 1000-1 at 750W into a 4 Ohm load. This shows the immense reserve capabilities inherent in an FM ACOUSTICS product and explains the much more dynamic rendering of signal levels, something for which FM ACOUSTICS power amplifiers are world-famous. It also demonstrates that the usual power output ratings into resistive loads do not accurately portray actual real-world situations;

nor do they give an accurate indication of true power output.

At the above power levels a single mono FM 1000-1 draws over 40A from a 220V mains (and over 80A from a 117V mains)! For a pair of FM 1000-1's this figure must be doubled! This explains why the stability and quality of the mains is of prime importance. Standard power outlets will often not provide the required power levels and performance consequently suffers. Occasionally this has not been realised, and when clients performed tests the amplifier's full performance could not be attained. In order to be certain that you are obtaining optimal performance, have the mains voltage of your installation checked while in actual use. In critical applications separate high-power mains lines for each amplifier must be installed. A collapsing mains reduces a top class amplifier's performance dramatically. For instance, a mains voltage drop of 10% (not uncommon in certain countries) reduces the amplifier's power output by almost 20%.

## PERPETUAL MOTION

Yet another company has discovered perpetual motion! A client recently sent us copies of the

specifications for a series of US made so-called "pure" class A amplifiers. On the phone the client mentioned that some of the specifications were "rather strange." That was putting it mildly! For instance, one of the models is rated as follows:

100W RMS into 8 Ohms  
200W RMS into 4 Ohms  
400W RMS into 2 Ohms  
800W RMS into 1 Ohms  
2000W RMS into 0.1 Ohms

And it provides these power levels with a power consumption of 500W continuous! No comment.

#### AGENCIES, DISTRIBUTORS AND CONTRACTS

After visiting Korean distributors and clients, FM ACOUSTICS appointed Seoul Sound Technology as its exclusive agent for the Korean market. Extensive presentations were made and various lectures were given. Shortly thereafter FM ACOUSTICS power amplifiers were installed in various leading studios in Korea: CBS/Jigu Records, EMI/Jeil Recording Studios, Munhwa Broadcasting Corp., Daedo (Donam Recording Studios), Seoul Recording Studios, etc. After initial hesitation CBS/Jigu Records also replaced all of their crossovers with FM ACOUSTICS' unique FM 236 linear-phase electronic crossovers. Their initial hesitation was due to the considerably higher price of the FM 236 as compared to the other electronic crossovers on the market. But after auditioning the improved system, the engineers at CBS/Jigu Records were thrilled! One remark received in a fax from Korea: "FM ACOUSTICS' sound is great! Thank you very much for recommending the FM 236..."



*Combining proprietary filters that guarantee 36dB/octave attenuation, precise linear-phase response, discrete enhanced Class A circuitry .with entirely hand-selected transistors and extremely narrow manufacturing tolerances, the FM 236 series of linear-phase electronic crossover improves system performance dramatically*

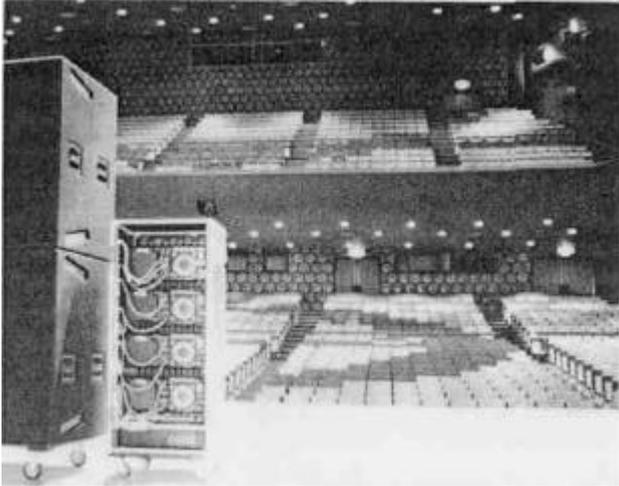
In all music centres of the world there is a continuous trend toward FM ACOUSTICS precision electronics. In 1988 no fewer than 14% of the European top 50 hits came from one single studio in London: PWL. PWL uses 4 FM 1000 Precision Ultra-High Power Amplifiers. After installing the first pair of FM 1000's together with FORCEUNES and making a total re-check of the whole system and grounding arrangement, Mike Picking of PWL mentioned that they experienced a dramatic improvement in reproduction accuracy. By following the recommendations given in FM ACOUSTICS' Technical Bulletin No. 5 they were also able to considerably reduce the hum and noise level of the mixing desk and the entire installation. After auditioning the completed installation, Mike Picking called and said just four words: "They sound just marvelous."

In Japan more and more recording studios are replacing their power amplifiers with FM ACOUSTICS units. The FM 801 Precision High Power amplifier has virtually become standard power amplifier for all critical applications where accuracy of sound reproduction is of prime importance. Recently the following studios moved up to FM ACOUSTICS power amplifiers:

Cherry Island Studios, Tokyo  
CMS Studios  
Freedom Studios, Tokyo  
Kawaguchiko, Kawaguchiko  
Miyoshi Listening Room  
National Broadcasting Corp. "NHK", Tokyo  
Studio Pan, Yokohama  
Taihei Studios  
Terra Studios (Toshiba-EMI), Tokyo  
Wamer-Pioneer Studios, Tokyo  
Zero Studios, Tokyo

Unicus, FM ACOUSTICS' Japanese distributor, also won the tender for installing amplifiers at Tomakomai City Hall near Sapporo, thus prevailing against strongest competition from various American and Japanese manufacturers. Six FM 1000's and two FM 801's were installed in this State-of-the-Art system where they are driving a speaker system composed of Electro-Voice "Thunderbolts". Initially a different brand of power amplifiers was used. When the system was set up and tried, various engineers and users commented on a certain lack of bass punch and definition in the lower frequencies. All of the traditional ways of enhancing bass reproduction were tried, but a major improvement in performance was not attained. Someone finally suggested trying various power amplifiers. After the FM 1000's were connected, engineers were amazed at the perceptible improvements achieved by just replacing the power amplifiers. "The effect was as

if we had added a series of extremely clean and powerful subwoofer systems," was one comment. Because of the rather dramatic differences observed, the management of the hall decided to use FM ACOUSTICS power amplifiers exclusively.



*FM 1000 and FM 801 Precision High-Power Amplifiers at Tomakomai City Hall near Sapporo*

"Terra", the brand-new Toshiba/EMI studio complex in Tokyo, one of the largest and most advanced in Japan, is exclusively using FM 1000 precision power amplifiers for the main monitoring in all studios. 6 FM 1000's are being used in the three top-notch facilities which have been built without compromise.



*The large control room in Terra Studio A in Tokyo. Pictured between the Kinoshita monitor and the Neve desk are (from left to right): Shozo Kinoshita, designer of the Kinoshita/Hidley monitors, Victor Lu of Taisheng Trading Corporation, Taipei, Manuel Huber, president of FM ACOUSTICS, Switzerland, and Hiro Kimoto, president of Unicus International Corporation, the Japanese distributor for FM ACOUSTICS' professional products line.*

**Shozo Kinoshita**, famous for his design work on the TAD drivers, and now manufacturing the remarkable Kinoshita/Hidley studio monitors that are being installed in top-class studios around the world, recently visited FM ACOUSTICS with his family. Impressed by the precision standards, the dedication of the workforce and their craftsmanship, Mr. Kinoshita confirmed that after many years of the most intensive experience with power amplifiers there remains no doubt that the FM 1000-1 and the FM 801 are the absolutely most accurate of all professional power amplifiers available on the world market.

Tsuneo Mazumoto, a highly experienced producer and engineer working at Pan Studios in Yokohama, Japan, mentioned that he recently took the FM 600A that he normally uses in his home system to the studio and hooked it up to a set of Yamaha NS10 mini monitors. He states that the FM 600A never left the studio again. The great difference in sound quality when compared with the other amplifiers in the studio - even when using these small and relatively inexpensive monitors - was so dramatic that he now "has to" acquire another FM 600A for his home system.

Again and again clients simply do not expect that such dramatic differences are possible by replacing the power amplifiers. The unique technology and proprietary circuitry utilized in FM ACOUSTICS power amplifiers continue to surprise even the most sophisticated listeners.

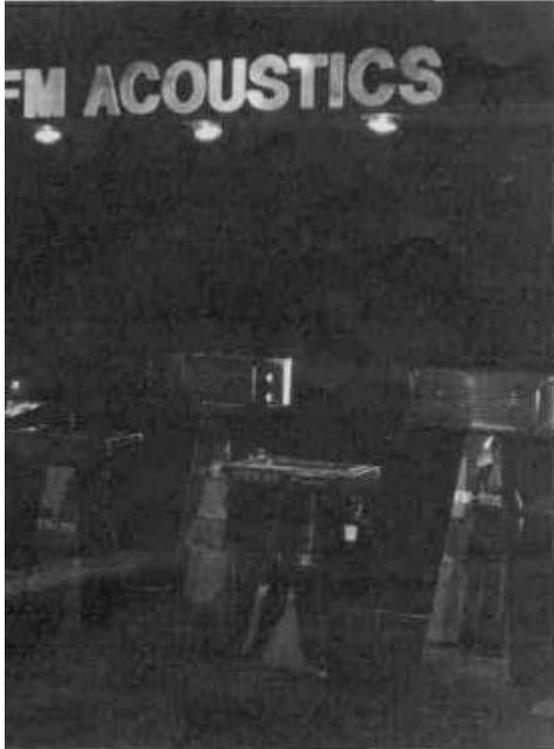
Famous producer Phil Ramone has been using a pair of FM 1000 power amplifiers on a recent project with Billy Joel. Phil Ramone remarked that "...this system gives definitely the best monitor-sound I have ever heard."

**During the recent Interbee exhibition in Tokyo,**

Unicus International Corp., FM ACOUSTICS' Japanese distributor, staged a most staggering display of FM ACOUSTICS' products. Manuel Huber, who flew to Tokyo for the show, was rather pleased:

"...I have seen the whole show, and this was definitely One of the most attractive booths. It caught your eye immediately, but it also provided a rational background for in-depth discussions and lecturing about the unique features and performance of FM ACOUSTICS products. It was also satisfying to see the FM 801 being used on various booths of other manufacturers, some of which make power amplifiers themselves..."

The classic booth in black velvet and mirrored glass was an ideal display for the full range of FM ACOUSTICS' products. Hiro Kimoto, director of Unicus International, remarked that never before had there been such an overwhelming interest in FM ACOUSTICS products.



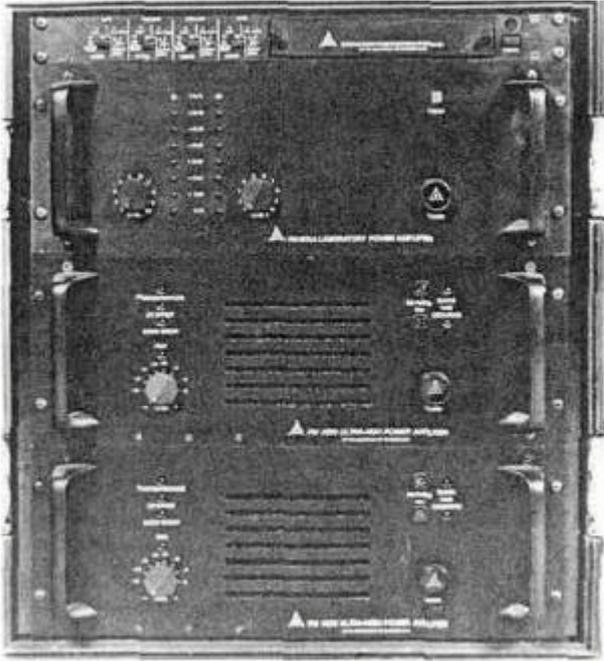
*The elegant Unicus booth at the Interbee exhibition, Tokyo. The crowded booth confirms the pronounced interest of Japanese professionals in FM ACOUSTICS' precision electronics.*



*Kazu Nakajima of Unicus International Corp./ Atlantic Audio explaining the unique virtues of the FM 236 series of Linear-Phase Electronic Crossovers.*

Some time ago a letter from internationally acclaimed bass virtuoso Anthony Jackson was received. Jackson's amplification system consists of a 4-way Turbosound speaker system with the FM ACOUSTICS FM 236/4 Linear Phase Electronic Crossover employed to guarantee perfect sound reproduction. The FM 236/4 drives two FM 1000's for bass and low/mid and an FM 600A for the high-mid and high frequencies. The whole system is assembled to a standard of craftsmanship that has never before been encountered in musical instrument amplification. Jackson's letter is self-explanatory:

"...Anything I might say about your amplifiers you have already heard before, since I cannot claim to be the first to use FM ACOUSTICS amps. My usage, however, is perhaps rather unique - precision amplification of the contrabass guitar. This instrument is perhaps more demanding on a sound system than any other instrument, and your model 1000 is nothing short of awesome in its ability to handle low frequency transients. There is no detectable sound of stress nor any sense of thermal stress. Although the amp always runs warm, it doesn't get much warmer when working hard. I've owned many power amps, and I've heard and played through many more. As far as I'm concerned the search for the ultimate stops here. Let me also add a word about pride of ownership: There is nothing that compares to lifting the lid on a piece of equipment and realizing that it has been designed and constructed with no regard for cost. After 15 years as a professional musician I must say that my standards regarding musicianship are as high as yours are regarding accuracy of sound. Therefore, it seems sensible that sooner or later I was bound to come over to FM ACOUSTICS. Thanks for your most inspiring performance!..."



because these people **are** comprehensively researching each and every stage with due respect for real-life applications; they do not just succumb to the usual straightforward A-B testing and inherently limited test-bench designing. FM ACOUSTICS' combination of such successively optimised stages yields unsurpassed results."

FM ACOUSTICS also received an order from Jerusalem Music Center. The FM 600A/ULI will be used in their studio, where primarily classical music is recorded. Jerusalem Music Center is sponsored by Isaac Stern, and many world-famous musicians are using these studios for their recordings.

After hearing the FM 600A/ULI driving the B+W 801 monitors at Jerusalem Music Center, Israel Broadcasting Authority also ordered an FM 600A/ULI for their own recording studios.

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*Crossover/amplifier rack for bass virtuoso Anthony Jackson. The 4-way active system consists of an FM 236/4-4L driving a pair of FM 1000's for low and low-middle frequencies and an FM 600A/LJ for high-mid and high frequencies.*

A. German client, who has the opportunity to evaluate and review practically every new audiophile product coming onto the market, reports:

"...For one thing it is extremely satisfying to have a system that you know is an absolute reference. The bass response of my FM ACOUSTICS system -to which I compare all of the equipment that I receive - is far (and I mean far) more realistic than with any other system. With most of these systems the bass drum dies away much too quickly - which is totally unrealistic. With FM ACOUSTICS electronics the attack and the sustain of the bass drum are precisely preserved. And the dynamics are much more realistic! But every time a single one of the FM ACOUSTICS components is replaced with another make, definite losses in performance are observed. As soon as you go back to the entire FM ACOUSTICS chain, the reproduction again becomes startlingly realistic. I think that FM ACOUSTICS products provide such unique results

In France most of the leading studios have now moved up to FM ACOUSTICS, including world-renowned studios such as:

AB Productions, Paris,  
Davout Studios, Paris  
Dolphine Studios, Paris  
Guillaume Tell Studios, Paris  
Polygone Studios, Toulouse  
Societe de la Cordee "Les Amandines", Sete  
Studio Mega, Paris  
Studios Des Dames, Paris

These facilities have acknowledged that there is no alternative to the unmatched reproduction accuracy of FM ACOUSTICS precision electronics.

#### LITERATURE

Since the last issue of FM ACOUSTICS NEWS the following information has become available:

Technical Bulletin No. 20: "Importance Of Regular Cleaning Of Fan Filter".  
Technical Bulletin No. 22: "New Fan Filter Type".  
Technical Bulletin No. 23: "Selecting the correct speaker cable".



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