LA NOUVELLE REVUE DU SON

Below is an English translation of the report on the RESOLUTION SERIES 244A and 811

The Swiss manufacturer FM ACOUSTICS is well known by professionals for its very high quality power amplifiers which are used in studios and in the most demanding sound reinforcement installations. Several years ago research and development of a series of true high fidelity components was intensified. Based on the knowledge gained with the professional products the goal was to create the absolutely ultimate in high-end components with truly zero compromise in performance, the principles employed, the quality of the components used, and the reliability.

The engineers at FM ACOUSTICS wanted to go ev en farther and create the absolute reference standard in respect to semiconductor amplifiers and preamplifiers. Using technologies based on those utilized in their professional products and by not accepting any trace of compromise, a true "Price is no object" approach was followed. This allowed the RESOLUTION SERIES to reach new heights in performance, musicality, reliability and.... price.

The stereophonic FM 811 power amplifier is certainly one of the most precious available in France, and the reasons for this can be explained.

Power Amplifier Resolution Series 811

This incredible amplifier is the result of an extensive research program on the effects of circuits and components when driven with music and dynamic signals and when driving real-world loads. The result is an amplifier capable of providing a continuous power level of 400 W per channel into a load of 8 Ohms. The output current capabilities are also incredible: more than 60 A continuous RMS and absolutely no limitation on repetitive peak current (a repetitive peak current of 400A is guaranteed!).

Don't be surprised about the imposing size (45 x 25 x 55 cm) or the weight (close to 60 kg) of this high-power amplifier which presents itself discretely with its gorgeous, chamfered frontpanels. The same is true for the preamplifier which can be connected to conventional non-symmetrical unbalanced amplifiers or to balanced XLR-type inputs as in the professional field.

The output connectors to the loudspeakers are "colossal". FM ACOUSTICS has developed an extremely interesting way of precisely verifying the performance of speaker cables. We will not fail to report on that in detail in one of the coming issues.

Upon removing the top cover one is struck by the perfect layout and the obvious capabilities of the power supply and the output circuits. The heart of this power supply is a very special power transformer created by FM ACOUSTICS with a particular winding technique.

Contrary to the usual technology utilized in other high power amplifiers, only one single power transformer is used for both channels. The explanation for this is that instead of using two transformers (each with half the rating of the single transformer actually used) it is preferable to use just one single transformer with twice the power. The final result is higher dynamic capability as a single transformer reacts better to the power requirements of each single channel. With stereo signals it is very rare that both channels require the same amount of power at the same time especially so when such amounts of power are available as in this case.

The transformer is not the typical toroidial design, **the** manufacturer also explains the reason for this. This transformer has the capability of producing 2900 VA contmuous at 80' temperature and this repetitively. A toroidial transformer is not recommendable since it could not guarantee any degree of security. Instead of the classic transformer style a transformer made with very special materials and extreme highest-efficiency steel has been utilized. The low-loss transformer leaves are bonded down, which results in a quieter transformer that is more compact and mechanically much more robust.

The transformer - which is entirely hand wound and assembled - also has a higher isolation voltage than usual and uses special winding techniques. In me assembly greatest care and extremely low tolerances are enforced to guarantee freedom of parasitic mechanical vibrations. This guarantees - we have verified this - that there is a total absence of noise and an absolute freedom from

resonances.

The design of the power supply allows lower internal resistances than is the case with other power supplies.

For the filter capacitors various technologies have been compared. The choice fell on capacitors which have an extremely low ESR (electrical series resistance) and which have more linear response characteristics over a large frequency range. The implementation of the power supply features the principle of star grounding. This means that each amplification stage is separately connected to the central grounding point. This is the only solution to arrive at a clean internal ground free of ground modulation. It also guarantees very low impedance. The individual stages and channels cannot influence each other negatively through the common ground. This is one of the reasons why FM ACOUSTICS can announce crosstalk figures for a stereo power amplifier that are equivalent to or even surpass the ones of mono-phonic power amplifiers.

The audio circuitry is further proof of an outstandingly intelligent conception. It is grouped around a highly efficient cooling system for the power transistors. At the back of the cooling "tunnel" a fan guarantees rapid evacuation of "superfluous calories". This is far from being useless when one knows that the various discrete amplification stages work in pure Class A and have no feedback. It is clear that the gain stages need local feedback, but contrary to other manufacturers who pretend to use little or no feedback FM ACOUSTICS has the honesty to precisely explain the principle.

The problems of obtaining distortion-free circuits were solved at the base. This may seem utopic, given the difference that exist even within the same type of transistors. In fact, if there is a difference between two transistors, one used for the positive side and one for the negative side, the result is a nonlinearity of the circuitry. This nonlinearity transforms into static as well as dynamic distortion phenomena, such as harmonic inter-modulation, dynamic distortion etc.
To arrive at a totally symmetrical, distortion-free stage it is necessary to guarantee absolutely identical transistors and to pair them perfectly. While several other high-end manufacturers also select the beta of transistors, they do so only at a single current and at a single voltage; but it has to be remembered that these transistors must be functioning linearly over a large variety of voltages and currents. With the selection as done by FM ACOUSTICS one achieves very different results.
At FM ACOUSTICS the selection of each transistor is done dynamically and at a large variety power levels. These types of measurements require special high-power curve tracers which are very expensive. Using static as well as dynamic methods *the* transistors can be accurately paired. This way one can obtain transistors which have identical transfer curves. Thanks to the use of such transistors the engineers at FM ACOUSTICS have been able to develop circuits which do not require feedback to correct the fundamental non-linearities and errors. No need to mention the number of transistors that are rejected and end up in the bin. This is one of the reasons for the high price of the amplifier.

The various stages are cascaded. At the input is a balanced symmetrical, discrete Class A stage that features a common mode rejection of 90 dB over the full frequency range. This characteristic is of highest importance to guarantee true symmetry of the balanced circuits.

After this there are three voltage gain stages and then a pro-driver stage. It supplies the driver stage with the required voltage and current which in turn feeds the output stage. Such a succession of stages is more than can usually be found even in very high class amplifiers. However, this succession of several stages is intended by the designer as it assures perfect linearity and long-term stability as well as greatest reserve under dynamic conditions.

Via multiple sensors the FM 811 power amplifier employs a protection system that surveys the amplifier in real time. The amplifier is fully protected against short-circuit, high frequency oscillations, RF interferences, positive and negative DC offset, unusual temperature increases, blockage of the cooling fan, dirty fan filters or malfunctioning of the protection system itself. With an error situation the analog computer instantly disconnects the output and at the same tune indicates on the frontpanel the type of fault. This ultra-sophisticated circuitry which controls the protection systems has absolutely no influence on the audio signal. There is no limiting whatsoever and there are no fuses or any other components which could limit the output current or voltage.

Another aspect of reliability is that each amplifier is subjected to a whole series of tests, amongst them long-term bum-in tests and very strenuous measuring and listening tests. The manufacturer guarantees spare parts availability for a minimum of 10 years. The amplifier is guaranteed to work with temperatures ranging from -20' to +45' and in humid climates (humidity of up to 95%).

MEASUREMENTS

Even with a too low mains voltage of 210 V, we have been able to verify a power output at 2 x 390 W into 8 Ohms both channels driven and this at extremely low distortion. The extraordinary conception of this amplifier is manifested by its rejection of noise - not the tiniest bit of 50 Hz hum is visible. This results in a linear unweighted signal-to-noise ratio of 116 dB.

The distortion spectrum at 1 kHz confirms that there are only even harmonics; odd harmonics are practically invisible. It must also be noted that at very low power outputs the distortion figures remain low. The absence of crossover distortion confirms Class A operation.

The clipping characteristics are excellent and clipping is perfectly symmetrical. It is obvious that every effort made is concentrated on the musicality of this amplifier.

PREAMPLIFIER RESOLUTION SERIES 244

In the same league as the power amplifier, FM ACOUSTICS lias created a preamplifier that is equally astonishing. The FM 244 comes in three different versions: Version "C" only has line inputs; Version "B" has a moving magnet phono input; and Version "A" comes with a moving coil phono input. This later version was the one we received for our tests.

This preamplifier is characterized by research to the limits as is the case with the power amplifier. The result is a product which lias no precedent and which establishes a new standard of quality. One of the unique features of the preamplifier is the phono stage and the adaption of a phono loading system to optimize the characteristics of the moving coil cartridge and linearize its frequency response. The interface between the moving coil cartridge and the preamplifier has to be perfect. And at this point one can find the limitations of ordinary preamplifiers which have fixed resistances and capacitances in their input circuits.

As before, one finds the principle of zero feedback / zero feedforward in conjunction with a pure Class A circuitry entirely made with discrete components.

The volume and balance controls were specially designed so that the signal cannot deteriorate.

This slim line preamplifier is composed of a main PC board onto which the various modules are mounted. The modules themselves contain the discrete components enclosed in epoxy resin so that they do not vibrate and proper thermal conduction is guaranteed. Each module has its predetermined function.

The power supply contains a totally shielded toroidial transformer. It is followed by multiple filtering and regulation stages.

The same care for selecting components as in the FM 811 is adopted so that true Class A operation of the preamplifier is achieved and this is true throughout a large dynamic range. With its modular construction this amplifier allows interfacing with any type of source without any risk of limitations or of becoming obsolete in the future.

MEASUREMENTS

The quality of a preamplifier can instantly be judged by its signal-to-noise values on the high gain (MC) input. Featuring a sensitivity of 0.14 mV on its moving coil input the FM ACOUSTICS preamplifier achieves the incredible S/N value of 89 dB on the MC input! The saturation values are extremely good as well. On the line inputs one has the impression of being connected to the generator itself as it is practically impossible to find any difference between the generator output and the output of the preamplifier.

This is a true no-compromise preamplifier that demonstrates the knowledge and experience of FM ACOUSTICS engineers in precisely amplifying very low-level signals.

LISTENING TEST

One could criticize us for using similar words to qualify an integrated amplifier for 1'500 French Francs and those of an amplifier which costs more than 200'OGO French Francs. While the French language is extremely rich it is difficult not to use the same adjectives; We assume that you are sufficiently mature not to entertain illusions. Fortunately on the listening tests the difference that these units make is as big as the measurements indicate.

It is quite obvious that when one moves up to the category ofFM ACOUSTICS the qualifications and criteria are much more severe. We believe that one must receive value for the money in this category too. Even those who are not used to the subtle play of audio comparisons and those who cannot explain in words the precise differences that they hear or feel will instantly realize that with the FM 811 one passes to a radically different level of reproduction accuracy. One enters another level of musical realism with captivating involvement.

We have tested this amplifier with various speaker systems of high as well as low efficiency. Every time the surprise was complete: this power amplifier controls the loudspeakers like no other electronics up to this day. Its dynamic power and the distinct impression of a "hand of steel in a velvet glove" is beyond the imaginable. On low efficiency systems these electronics offer entirely new insights and unheard dynamic expression. Even at the lowest volume levels one obtains the most detailed resolution with original width and depth of the stereo image. The dynamic performance from one extreme of the audio spectrum to the other is simply unimaginable. All of this is done with hyper-accurate control and without any pseudo-romantic excess. This is one of the rare high power transistor amplifiers that can be enjoyed at very low levels without giving the slightest impression of clouding or an even minimal lack of precision in depth perspective as usually is the case.

In effect, at discrete volume levels it performs as airy and quick as smaller amplifiers but with this singular trans-parence and this unique neutrality in the low and very low frequencies that are the reward for purchasing this monster amplifier.
At realistic volume levels - both with low- as well as high efficiency speakers - the stereo image is of an absolutely fantastic precision and stability. One realises that what has so far been attributed to speaker deficiencies and limitations are actually the limiting characteristics of power amplifiers. Compared with this amplifier one realises that other power amplifiers actually are collapsing, that they literally "bend down to their knees". With this amplifier this effect is non-existent.

When the speakers are controlled as well as is the case with this amplifier the impression of constraint that is usually present suddenly vanishes. The phenomena of "a straight firing canon" - the usual sharply projected sound field - and the typical aggressivity in the medium highs just disappear. With the FM 811 you find yourself in the middle of the concert hall with an authentic aural environment. The transparency allows you to discover without any effort the finest shades of colours of the various instruments.

The preamplifier is in the same league with a certain notion of general sweetness in tonal quality. LP lovers will be enthralled with the truly unique moving coil input stage is indeed in a class of its own. Its ability of expression, the absence of any aggressivity in the treble region permits the cohesive and precise transmission of all of the subtleties that are buried in the grooves.

FM ACOUSTICS has not failed to enter the market with a truly no-compromise realisation. This is an auspicious and very remarkable entrance into the field. Because it is truly very rare to encounter such a sum of performance qualities at such a high level that correlate so well both audibly and in measurements.

A new GREAT to be reckoned with.