



# ATC SCM150ASL PRO

## *Active Professional Monitor Loudspeakers For Accurate Home Theatre And Music Monitoring*

GARY REBER

### Pursuit Of Accuracy

Founded in 1974, ATC Loudspeaker Technology, Limited (Acoustic Transducer Company) is a British loudspeaker and electronics company based in Stroud, Gloucestershire, England. Australian born and raised William (Billy) Woodman is the company's founder and Managing Director, and, as well, the designer of an extensive line of professional monitor loudspeakers. ATC loudspeakers are used in over 1,000 recording studios worldwide by the most respected professional recording and mastering engineers, to produce music and movie sound recordings, both stereo and multichannel, of the finest sound quality.

ATC professional monitors have become the preferred choice at the Sony DVD Mastering Suite, New York; the Pioneer Mastering Suite, Barcelona; Todd-AO, Hollywood; Paramount Pictures, Hollywood; Warner Bros., Burbank; Abbey Road Studios, London; Pink Floyd; Nimbus; Telarc; Angel Recording Studios, London; Sydney Opera House; Bob Ludwig's Gateway Mastering; Bruce Leek Mastering; and the BBC; to name only a few professional facilities the company has attracted over the years, since the introduction in 1976 of the first ATC complete loudspeaker system. ATC loudspeakers also were chosen by DTS® to launch its new 96 kHz/24-bit algorithm at AES Amsterdam 2001, and by Sony to demo Multichannel SACD at the 2002 Consumer Electronics Show (CES) in Las Vegas. ATC active loudspeakers also will be used by Sony and Philips to demo and update new SACD developments at the 113th Audio Engineering Society (AES) Convention in Los Angeles, October 5-8 2002. ATC is providing five SCM300ASL Pro loudspeakers and four SCM 0.1/15 powered subwoofers.

The company has had one objective and that is "to build the finest loudspeakers money can buy." Woodman, an educated acoustical engineer and accomplished



pianist, as well as a loudspeaker designer with decades of experience, observed that neither hi-fi loudspeakers nor studio monitors were of suitable quality to deliver true sound accuracy. The best hi-fi loudspeakers had reasonable sound quality but limited dynamic range, while studio monitors had plenty of dynamic range but relatively poor sound quality.

The aim was to build a line of ATC loudspeakers that would equal, or better, the acoustic performance of the best hi-fi loudspeakers, and produce the near-dynamic range of the big horn-loaded studio monitors. At the same time, ATC's design philosophy would pay special attention to the creation of accurate reverberant fields and wide horizontal dispersion, which Woodman states "is the key to being able to precisely recreate spatial information in five or more channels." (See exclusive On Screen conversation with Billy Woodman in this issue.) To achieve this required that ATC's dedicated research and development team hand-make

their own heavily engineered, well-damped driver units and associated audio electronics (audiophile-quality preamplifiers and power amplifiers). The company's manufacturing operation covers everything from the parts that go into the drive units to the complete system. The driver units use massive magnets and heavy cast loudspeaker baskets. They are designed to reproduce dynamic range, which significantly affects the clarity of reproduced sound, with minimal compression and timbre, which is consistent throughout the product range.

ATC loudspeakers are tested using a sweep at 20 volts, which assures that each loudspeaker will handle as much power that is required of them when they are used in home theatre or professional studio applications. Furthermore, every loudspeaker that is manufactured at ATC is measured, and the pairs are matched within 0.5 dB.

With the exception of the enclosures (built to spec by old-world cabinet makers) and the tweeters, every loudspeaker component is hand-built and assembled at ATC's factory, using modern computer-controlled production. The resulting manufacturing quality represents the best of rugged, over-built cottage industry craftsmanship with a strong professional heritage.

ATC loudspeakers have been available in recognizable form since 1980. ATC's first electronic crossover was produced in 1982 and brought recognition to the company when it was installed in a famous London recording studio. The company is famous for the design of its 75mm (three-inch) soft dome midrange driver, which is now often copied, though mostly cosmetic—lacking, as ATC points out, the unique engineering incorporated in the areas of magnet assembly design, coil technology, and linear suspension. Their larger top-end systems became active in 1985. Since that time both the crossover, midrange driver, and the larger monitors have been refined considerably, and are regarded as among the finest and most accurate in the world.



## Active vs. Passive Designs

The emphasis on active designs rather than passive is due to Woodman's research that shows that active loudspeakers, due to each drive unit amplifier operating only over a restricted frequency band, will have much lower amplifier-borne amplitude intermodulation distortion (IM) than the same loudspeaker passively driven over the full audio frequency range. Woodman has demonstrated and written in technical papers that there is a full 20 dB difference in amplitude IM distortion, in favor of the active system, and for a given amount of amplifier power an active loudspeaker can be expected to produce approximately 6 dB more level than the equivalent passive system.

The result of ATC's meticulous quest for quality is a line of home and professional monitor loudspeakers that are among the best of the truly accurate loudspeakers produced in the world.



In the Home Series product range, the 25th Anniversary Concept 7 Collection, with Active 70 loudspeakers, is ATC's flagship fully-active 5.1 or 6.1 surround loudspeaker system (with *WSRs* recommended one center back surround configuration) based on the SCM70ASL and the C7 (SCM0.1/15 Pro) matching down-firing powered subwoofer. (All the components in the Concept 7 Collection are available without on-board amplifiers—the C7 Collection Passive.) Other home theatre systems in the "Collection" series descend in size—The Concept 6 Collection with Active 50 and 20T loudspeakers (active or passive), The Concept 4 Collection with T16 loudspeakers (active only), The Concept 2 Collection with Active 10 loudspeakers (active or passive), and The Concept 1 Collection (passive only with active subwoofer). With two new multichannel systems to be launched later this year, the C3 system with SCM12 passive loudspeakers, and the C5 system



with Active 20 loudspeakers, ATC's product range covers most medium and high-end home theatre installation options. The home range also includes the ATC Active 50, 100, and 150 loudspeakers.

The Professional Series consists of the SCM50ASL Pro, SCM100ASL Pro, SCM150ASL Pro, SCM200ASL Pro, and SCM300ASL Pro. ATC also builds the SCM20ASL Pro, a portable, active two-way monitor, and two Professional Series powered subwoofers, the SCM0.1/12 Pro, and the SCM0.1/15 Pro, two of which were used in this review.

Both professional and products for the home are built to the same high standards, with identical drivers and amplifiers. The only differences are cosmetic.

The number in the designation of each full-range loudspeaker refers to the internal cubic capacity in litres.

All ATC products, both loudspeakers and electronics, carry a six-year warranty.

## Mix And Match

ATC prides itself on its "Mix And Match" concept, which allows users to select from a wide range of active and passive professional and home loudspeakers, to precisely match system requirements in terms of budget, number of channels, sound pressure level (SPL) capability, room size, and decorative finish. The available finishes include high-tech alloys, traditional real wood veneers (black ash, mahogany, cherry, natural oak, and any special veneer to order), high-gloss "piano," and professional black. Dedicated stands are supplied for enclosures as an option, where required.

All ATC loudspeakers are hand-built to order. Thus, ATC acoustic engineers can design and build special enclosures (and consult on ideal loudspeaker configurations and installation), thereby solving the installer's problem of how to deal with specific or difficult installation requirements.

ATC loudspeakers are available in free-standing, wall, or soffit (in-wall) options.

This "Mix And Match" concept assures that the user will experience the same accuracy within the specified frequency response range capability of the particular model as well as wide dispersion and a tonal timbre or sonic signature which is neutral sounding—whether reproducing stereo or discrete multichannel music and movie soundtracks. Thus, as the size increases, the bass extension and dynamic range capability is enhanced while maintaining the same accuracy and sonic signature with all the other models.

## The ATC SCM150ASL Pro Loudspeaker

The ATC SCM150ASL Pro is the subject of this review. This active three-way monitor system is suitable for larger home theatres. The loudspeaker is reflex-loaded with the port tuned for the bottom octave of the loudspeaker, to limit the excursion of the cone and reduce mechanical distortion at very low frequencies. The driver complement consists of a critically damped 20 kilogram (44 pound), 375mm (15-inch) Super Linear bass driver, ATC's unique and proprietary 75mm (three-inch) Super Linear SM75-150S soft dome midrange driver, impregnated with a proprietary plasticized PVA damping compound, and a select Vifa Ferrofluid-cooled soft dome 25mm (one-inch) tweeter. The ATC tweeter, with LDR thermal protection, incorporates a selected rare earth Neodymium magnet for superb high-frequency reproduction above 2.8 kHz.

Maximum continuous SPLs of up to 117 dB at 1 meter are possible. The larger SCM200ASL Pro and SCM300ASL Pro can produce even higher continuous SPLs of up to 118 dB and 121 dB at 1 meter, respectively, with extended bass and increased transient headroom, while perfectly matching the sonic signature of the SCM150ASL Pro.

The amplitude linearity of the SCM150ASL Pro is specified at  $\pm 2$  dB from 60 Hz to 12 kHz, with -6 dB free-standing half-power response specified at 25 Hz and 20 kHz. The horizontal dispersion is specified at  $\pm 80^\circ$  (down -6 dB at 10 kHz) and the vertical dispersion at  $\pm 10^\circ$ . This produces a wide seating area while limiting reflections from the floor and ceiling, for minimal smearing. It also means that within a well-behaved room with controlled reverberation response, the reverberant field will be consistent with the direct field in the listening area. The fundamental system resonance is well-damped with a Q between 0.3 and 0.5. This assures that bass response will be well-defined and not mask midrange detail.



The SCM150ASL Pro's enclosure is composed of a massively cross-braced, inert composite Medite front baffle, supported with heavily damped, thick MDF (medium density fiberboard) side and back, and top and bottom panels, to achieve total freedom from resonance and vibration, and quiet cabinet signature. The weight of the components and enclosure is 75 kilograms or 165 pounds. The color specified for the review samples was professional black.

### ATC Super Linear SM75-150S Soft Dome Midrange Driver



ATC's Soft Dome Technology, developed by Billy Woodman some 20 years ago, has received accolades of praise as being responsible for the critically acclaimed smoothness and accuracy of the company's midrange drivers.

The hand-built ATC Super Linear Soft Dome SM75-150S midrange driver is a proprietary unit, developed to produce a smoother wave guide, wider-than-normal horizontal dispersion, and thus even better impulse response for superb linear performance. Such wide dispersion is essential for seamless listening to both stereo and multi-channel sources.

ATC's Soft Dome Technology is largely attributable to the flat power response (sum of direct plus reverberant fields) exhibited by the SCM150ASL Pro. It is important that the off-axis response of the loudspeaker system be smooth and consistent, particularly in the midrange. Woodman credits this driver with the phenomenal accuracy, transparency, and dynamics that ATC loudspeakers are renowned for.

The SM75-150S handles the critical wave band between 380 Hz and 3.8 kHz. The driver is constructed with two suspensions with a 75mm (three-inch) voice coil of edge-wound ribbon wire in a massive, 7.5-kilogram (16-pound) magnet system operating at 22,000 Gauss. The three-inch coil is positioned in a gap of only a ten-thousandth of an inch clearance, which reduces thermal compression by allowing the coil to be cooled by the magnet system. The ATC short coil/long magnetic gap design ensures that the coil never leaves the linear magnetic field

during normal operation. According to ATC, the resulting output is comparatively free of conventional drive unit distortions and compression, which can seriously compromise tonal balance in a manner which is level-dependent. The radiated soundfield has smooth, even dispersion, matching precisely the characteristics of the high-performance bass drivers and the soft-dome tweeter.

### ATC SCM0.1/15 Pro Powered Subwoofer



While designing and building Sony's Multichannel DVD Mastering Suite in New York, the need arose for a system-matching subwoofer, capable of deep bass response with an SPL 10 dB greater than the sum of all the other channels. This led to the development of ATC's SCM0.1/15 Pro powered subwoofer. For the home theatre market, this subwoofer was tagged the C6, and is featured in the Concept 6 and 7 Collections.

The SCM0.1/15 Pro down-firing powered subwoofer is a sealed enclosure (acoustic suspension) design that features a modified version of the 20-kilogram (44-pound), 375mm (15-inch) driver used in the SCM150ASL Pro. Using Super Linear Magnet (SLM) technology (described below), the driver is driven by a massive built-in 1,000-watt (650 watts continuous RMS) MOSFET amplifier, to deliver over 118 dB SPL at very low distortion, down to well below 20 Hz. The specified cut-off frequencies (-6 dB free-standing) is 18 Hz and 2 kHz. The amplitude linearity is specified as 25 Hz to 1 kHz,  $\pm 2$  dB. As all ATC bass drivers have critically damped low frequency cut-offs, there is minimum phase disturbance at the bottom end of the frequency range, and there is always useable output well below the specified point. Furthermore, ATC specifies that there is no hump or coloration before the ultimate roll-off. A huge power amplifier and a robust Super Linear (SL) driver ensure

that there is minimal distortion in the LFE channel, even at very high levels.

The ATC hand-wound 10mm (7/16 inch) short voice coil uses high-density edge-wound flat oxygen-free copper (OFC) wire, operating in a 20mm (7/8 inch) long narrow magnetic gap, with linear suspensions for large linear diaphragm excursion and front and rear magnet venting, to reduce airflow noise and distortion, and increase power handling and long-term reliability. ATC prefers the short coil in a long-gap approach because, says Woodman, it is the best solution regarding geometry, and results in improved heat dissipation, and therefore, reduced operating temperature of the voice coil, as well as a reduction in the variation of voice coil induction in relation to its instantaneous position in the magnet gap.

A versatile interface provides for easy setup with phase, level, low-pass, and contour controls to make filter adjustments. Low-pass requirements are adjustable to include the Dolby® and THX® recommended 80 Hz crossover. The SCM0.1 amplifier module also facilitates phase reversal to aid in the combination with satellite loudspeakers. With the Contour control set to the Flat+ position the frequency response is flat. Change the Contour control to Flat- and the same frequency response is achieved but with a reversal of the phase, which can achieve better summing of the acoustic wave from satellite loudspeakers and the subwoofer, depending on their relative positions and other room considerations.

The SCM0.1 amplifier module also features a theatre equalizer with a range of boost between 40 to 60 Hz at +6 dB, making movie sound effects more dramatic. The low-pass control changes the crossover frequency as indicated on the panel—50 Hz, 60 Hz, 70 Hz, 80 Hz, 90 Hz, 2 kHz.

For this review, I used two SCM0.1/15 Pro subwoofers for the low frequency effects (LFE) channel, set to the Flat+ position with the low-pass control set at 2 kHz.

### ATC Tri-Amplifier Pack

In 1985, ATC experienced another breakthrough when Tim Isaac completed the first prototypes of the "active amplifier pack." Although active systems are recognized as having the potential for superior audio performance, they have been slow to catch on in hi-fi (stereo and home theatre, if you will) circles, where considerable sums of money have been spent on amplifiers.

In the case of ATC, each monoblock power amplifier in their active loudspeaker systems is optimized for its frequency range and the transducer it is driving. The three amplifiers, each with its own isolated and

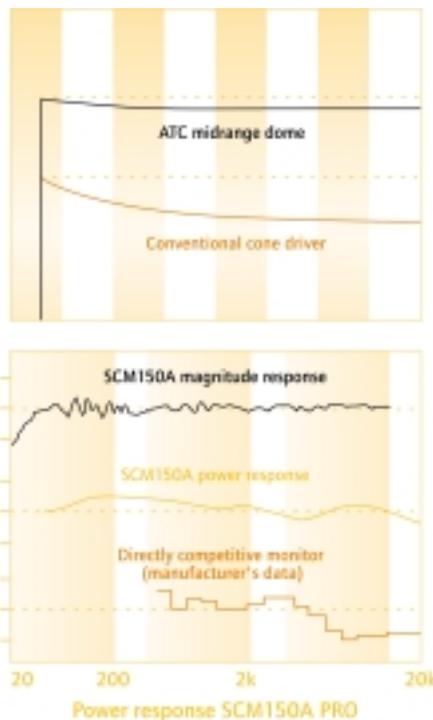


stabilized power supply from a single power transformer, are mounted on a space-saving single chassis. The amplifiers are Class A/B MOSFET designs and operate predominantly in Class A up to two-third maximum output, with considerable headroom available in Class B if required. The SCM150ASL Pro's power output is 200 watts to the bass driver, 100 watts to the midrange driver, and 50 watts to the high-frequency driver. Several types of protection are incorporated—thermal cutouts on the heat sink, a back panel mains fuse, and a light-dependent resistor arrangement to safeguard the tweeter. The MOSFET output devices consist of parallel pairs of complementary N-Channel and P-Channel MOSFETS mounted directly to a single large heat sink in an ATC proprietary Grounded Source® topology mode.

There is no equalization applied, and the crossover filters are phase-compensated fourth-order (24 dB per octave) and critically damped to produce highly linear amplitude (frequency) response ( $\pm 1.5$  between dB 100 Hz to 10 kHz) with excellent balance between bands (better than 1 dB) for exceptional imaging. ATC focuses on drive unit development in order to meet the specified linear magnitude response and simple crossover filters, rather than employ lesser drivers and complex equalization circuits before crossover filters, in an effort to correct drive unit magnitude response anomalies.

Analogue phase correction is employed using a variable all-pass Butterworth filter at each crossover point, to correct the phase response of the drive units through the crossover regions. This enables correction for the time delays, due to the extra sound path length caused by the various drive unit misalignments when mounted flush on the baffle. Such correction serves to steer the main radiation lobe at the crossover frequency toward the listener, to align the acoustic center of the loudspeaker for greatly improved polar response and radiated power response, and therefore improved coherence of the audio signal.

The filter networks, which process the signal, are designed so that no additional loading on the signal occurs. The active crossover network consists of a wide bandwidth, electronically balanced input stage with high common mode rejection and very low distortion. The electronic crossovers are set at 380 Hz and 3.8 kHz. The phase of the bass and midrange amplifiers is electronically adjustable for phase correction through 180 degrees, thus ensuring that the system is in phase at the crossover point (impossible in a passive design). Each of the three channels are derived from a balanced or unbalanced input, to an XLR socket via a buffer IC, and paralleled off to three



filter amplifiers which separate the frequency range and signal level to be fed to each driver. The input impedance of the Tri-Amplifier Pack is 10,000 ohms and requires a 1 volt-rated signal. As stated above, the crossover networks do not equalize the signal to account for drive unit requirements, as the drive units themselves have been optimized by design. However, as with the powered subwoofer, the SCM150ASL Pro features a low-frequency EQ adjustment up to +6 dB between 40 to 60 Hz.

The amplifier modules in ALL ATC active loudspeakers incorporate an indicator, which shows the status of the amplifier: "green" indicates the amplifier is powered and "red" indicates overdrive. A brief change from green to red indicates the amplifier has reached the full available output. Constant or long durations of red indicate that the gain reduction circuits are in operation.

While solid state amplifiers "clip" if overdriven, which can damage drive units and produce distorted sound, the MOSFET design developed for ATC's drive units are claimed to have much lower levels of distortion than conventional solid-state amplifiers, especially at high power. The design incorporates proprietary circuits to momentarily round off the square wave or waveform caused by clipping, and pull down the gain at the instant the amplifier would otherwise "clip." The active FET momentary gain reduction circuits are designed to be very fast-acting and only introduce non-linear harmonic distortion at the instant they oper-

ate (maximum specified: 1 percent). ATC claims that their operation is normally undetectable. Their function is to protect the drive units from damage and relieve stress to the amplifier. Otherwise, when not in operation, they have no effect on the sound.

Having often experienced amplifier stress and clipping when playing conventional amplifiers at high levels, the ATCs played at extreme loud levels without fault or strain, an important consideration for loud monitoring and home theatre soundtrack peaks, surpassing the maximum SPL capability of our reference loudspeakers, the Dunlavy Signature Series SC-Vs, manufactured by Dunlavy Audio Labs. In our extensive listening tests of the ATC SCM150ASL Pro monitors, I never detected ANY anomaly in sound quality, even when the reference SPL was exceeded on motion picture soundtracks such as *The Haunting* and *The Fast And The Furious*, and during listening sessions playing a variety of discrete multi-channel DVD-Audio and SACD music recordings at loud "studio" SPL levels. I auditioned several DVD soundtracks with system-threatening deep bass—*Air Force One* (Superbit™), *Dark City*, *Mission: Impossible*, *The X Files* (DTS), *Titanic*, *The Matrix*, *Saving Private Ryan* (DTS), *The Thirteenth Floor*, *The Bone Collector*, *Titan A.E.* (DTS), *U-571* (DTS) *Pearl Harbor* (DTS) and *A.I. Artificial Intelligence* (DTS)—which the ATCs played flawlessly.

The ATC Tri-Amplifier Pack currently powers the ATC Active 50, 100, and 150 loudspeakers in the Home Series product range, and the SCM ASL Pro 50, 100, and 150 Professional Series. A Quad-Amplifier Pack, the P4, powers the SCM300ASL Pro and the SCM200 ASL Pro. ATC's SCM20ASL Pro portable active two-way monitor is capable of accurate, high SPL performance up to 108 dB at one meter.

## Passive Systems

The ATC line also consists of a range of passive loudspeakers—the SCM 7,10,12, and 20 SL and, to be launched later this year, the three-way SCM 35. In addition to these, the Active 50, 100, and 150 loudspeakers are available in passive form to order. The passive loudspeaker range employs sophisticated crossover designs which have evolved over many years, and are made from the finest components (air core inductors, metallized polypropylene capacitors, and T-pad attenuators). The filters are fourth-order acoustic and there is impedance equalization on the midrange dome driver. As with the active models, all the components are matched, and each pair is carefully trimmed for a flat amplitude response (fre-



quency response) within very tight limits (better than  $\pm 2$  dB) and matched within 1 dB.

## ATC Super Linear Magnet Material (SLMM) Technology



Super Linear Magnet Material (SLMM) Technology, introduced in 1996, is the culmination of two years research and development by Billy Woodman into the inherently non-linear magnetic performance of soft steel, and eddy current and hysteresis distortion in driver magnet assemblies. ATC claims the result is a major breakthrough in moving coil drive unit design.

Hysteresis refers to the discrepancy between the amount of magnetic energy applied to a soft-steel driver magnet assembly with current passing through a coil, and the degree to which the soft steel is actually magnetized by that energy. A parallelogram or "hysteresis box" is a plot of this relationship. Other manufacturers of high-performance loudspeakers are aware of the problem and have addressed the solution differently.

According to ATC, by damping or suppressing the eddy currents, which circulate and penetrate four or five millimeters into the metal parts of the driver and cause detrimental effects, third-order non-linear harmonic distortion produced as a result of the eddy currents is reduced by 10 to 15 dB between 100 Hz and 3 kHz. This makes for distortion comparable with most electronics. SLMM transducer technology also has enabled the noise floor of all the ATC loudspeaker systems to be reduced by 15 to 18 dB across the band.

In order to achieve this result, ATC replaced the magnetic soft-steel area concentrically surrounding the voice coil, on the top of the pole and on the inner ring of the front plate adjacent to the coil, with two sleeves of SLMM. The Super Linear Magnet Material is electrically insulating and non-conducting, but magnetically permeable, and is pressure-formed to produce powdered polymer composite iron particle magnets, with insulating layers of oxide. SLMM allows the magnetic flux from the permanent magnet to pass

through and thus energize the coil, but restrict the flow of the eddy currents. The rings of SLMM sleeves fitted to either side of the voice coil in the mild-steel magnetic circuit significantly suppress eddy currents and raise the impedance and therefore the voltage across the coil. The result claimed is an unveiling of a new level of detail and transparency, particularly in regard to ambient sounds and low-level effects, and transient articulation and depth, with a demonstrative effect over the sound, particularly in regard to bass performance in the mid-band.

## Loudspeaker Selection

I have often preached in the pages of *Widescreen Review* that matched accurate loudspeakers should be employed at each of the five (six, including the center back surround) channel vector points positioned in a circular arrangement, equidistant and equiangular relative to the listener seated in the "sweet spot" or "the chair," as I often refer to this optimal listening position. The positioning of the loudspeakers is critical to both pure stereo imaging and seamless, discrete multichannel holosonic™ imaging. While I recognize that the majority of *WSR* readers will need to compromise the ideal playback scenario using precisely matched loudspeakers in their home theatre and/or discrete multichannel music systems, the main stereo loudspeaker pair should be the best quality you can afford, as this pair is the foundation on which a high-performance multichannel system should be built.

Manufacturers who take pride in their loudspeaker designs that exhibit true measurable and audible accuracy, of which there are few, provide the best solution when it comes to having to compromise on this ideal approach. ATC is one of those manufacturers whose design philosophy is consistent across the product range. Thus, the product range exhibits the same accuracy and timbre within the constraints of the frequency response range of each of the ATC models. Consequently, a more accurate representation of a multichannel soundfield is possible, even though the individual loudspeakers may be dissimilar. With proper bass management or bass redirection, in which the bass response below 80 Hz (or lower so as not to allow the onset of directionality) in the center channel and surround field loudspeakers (and if not full-range, the main stereo loudspeaker pair) can be directed to the main stereo loudspeaker pair or to an LFE subwoofer(s), one can achieve a much better result (though not optimized in ideal terms) than otherwise possible with less-than-accurate or modest, cost-sensitive, compromised loudspeaker designs.

Each model in the ATC range is capable of reproducing music, speech, and effects with accuracy, transparency, and realistic dynamics. The company's "Mix And Match" product range affords a wide choice in the selection of loudspeaker models to integrate into ANY environment and experience the full impact a home theatre and/or discrete multichannel music system is capable of.

## Bass Management

The movie sound 5.1 discrete channel system was developed as five full-range channels and one ".1" channel to provide additional system headroom to reproduce high SPL low frequency effects (LFE). The level calibration of this channel provides for 10 dB headroom above the main channels between 20 Hz and 120 Hz.

Bass management benefits non-full-range and low-power-capable loudspeaker arrangements to redirect bass frequencies and increase the dynamic range, or the total sound pressure level that can be delivered by a multichannel loudspeaker system without damage. Simply put, the more damaging low frequencies are diverted away from the vulnerable loudspeakers and into a subwoofer(s) specially designed for the purpose of reproducing those frequencies.

With matched full-range loudspeakers having lifelike dynamic range capability and positioned at each channel vector in the room, the sound pressure distribution, overall flat frequency response, and phase response of the system is better optimized, and thus the sense of spatial dimension and soundfield coherency. If at all possible, bass management should be avoided in a high-quality, high-performance loudspeaker system.

When having to use bass management to extend the low-frequency limit of the five main channels, ATC recommends you high-pass filter the five main channels at the low frequency limit of the loudspeakers, and low pass filter a mix of the five channels, then add the LFE channel in proper proportion, and send all the system low-frequency content to one or more subwoofers. This is the system that most home theatres use, though it is not optimal. For this review, I did not use bass management, nor do I use bass management with the in-house Dunlavy Signature Series loudspeaker reference system.

## SLDMCU6 Series Controller

The MCU6, a model within a line of versatile SLDMCU6 series six-channel controllers (remote-controllable with the MCU6-REM wired remote console), was developed to assist in the transmission of line-level sig-



nals over extended cable runs. In such a scenario, problems may be caused for the source equipment with active loudspeakers and situations where the amplification is located close to the loudspeaker (as is the case in typical standalone monoblock-power amplifier applications).

The MCU6 is equipped with six gold-plated balanced inputs and outputs (with individual multi-turn gain trim potentiometers with a 14 dB range for fine adjustment of each channel) and analog gain circuits with a single variable rotary level control, to address setup of such systems.

A nice touch provided on the MCU6 is that the output level can be set and controlled by two preset buttons or by the variable rotary control. The preset buttons are labeled as reference levels—the absolute value of these levels must be set by a technician or engineer (level set at source). Setting the 85 dB output level is required only, as the 79 dB level is an exact -6 dB from this point. Operation of both presets together will provide a level at 75 dB. When either or both presets are in use the variable rotary control is overridden. The status of the reference levels is indicated by the LED in the center of each button. The MCU6 also provides front panel patching to permit the subwoofer(s) on the LFE channel to support any of the other five channels.

The unit incorporates an On/Off function that can be either program-sensing or switched 5 V or 12 V trigger wire. Requiring only 1 to 2 volts input for maximum output, ATC active loudspeakers are capable of being driven with cable lengths of up to 15 meters, by all of today's better multichannel processor-pre-amplifiers. ATC can supply suitable leads terminated as required.

## Discovery

I first became aware of ATC professional monitor loudspeakers while visiting the Telarc studios in Cleveland, Ohio, and on various on-location recording projects with CEO, Chairman, and Chief Engineer Jack Renner and Producer Robert Woods. Bruce Leek, a friend and noted recording and mastering engineer, who has worked with Telarc and also uses ATC monitors, often suggested that I evaluate ATC loudspeakers. Bruce dropped by our facility a couple of times during the review process to offer assistance with setup.

At the 2002 CES, I attended several times the Multichannel Super Audio CD (SACD) presentation put on by Sony. In the demonstration, the output of a Sony SCD-XA777ES multichannel SACD player was fed directly into ATC's Pro MCU6 multichannel line driver to the seven active ATC loudspeakers.

I was so impressed with the high-resolution reproduction quality and spatial performance of the multichannel SACD format played through the ATC loudspeakers. I requested that the exact system be sent on to *Widescreen Review's* facility for review following CES. Thus, the system is comprised of five full-frequency channels that feature ATC's SCM150ASL Pros and two SCM0.1/15 Pro subwoofers to reproduce the dedicated 0.1 LFE channel.

## The Sound Of Accuracy

From the first listening I was immensely impressed with the "sound of accuracy" the ATC SCM150ASL Pro loudspeakers delivered. At different volume thresholds, the SCM150ASL Pros exhibited consistently low distortion, flat frequency response, extremely wide dispersion, and wide dynamic range. There was no indication of level-dependent drive unit compression at full reference SPL, which normally compromises tonal balance. I was delighted that the SCM150ASL Pros closely matched the accurate sound quality of *WSR's* Dunlavy Signature Series SC-V sealed enclosure, full-range loudspeakers, that I had become accustomed to listening to. The SC-Vs also are widely used in professional recording and mastering studios (reviewed in Issue 52, September 2001).

I positioned the ATCs, finished in matte professional black, to effectively render them invisible, next to the black oak veneer Dunlavys along the same 20-foot diameter of our reference circular loudspeaker arrangement, at a 10-foot distance from the face of the tweeters to the "sweet spot" chair position in *WSR's* Reference Holosonic™ Home Theatre Laboratory (see diagram at the front of the magazine under "Reference Systems"). To accommodate the horizontal mounting requirement below *WSR's* fixed *ElectriMask™* *AeroView®* and *ElectriScreen™* *GrayHawk®* and *FireHawk®* Stewart Filmscreens, the tweeter was re-positioned on the baffle of one of the SCM150ASL Pros used for the center channel. This is a useful feature designed into the SCM50ASL Pro, SCM100ASL Pro, and SCM150ASL Pro.

As for weight differences, the massively imposing Dunlavy SC-Vs, at 305 pounds each, are heavy weights, while the ATC SCM150ASL Pros, even with the added weight of three amplifiers in addition to three drivers, each with a massive magnet assembly, weighed about half that of the Dunlavys or 165 pounds each. Nonetheless, these are heavy enclosures, and it is therefore advisable that you have a friend help you position these loudspeakers in your room.

The SCM150ASL Pros are described by ATC as "professional monitors," a term used

to generically describe a certain standard of performance accuracy that loudspeakers are expected to meet, to be used as a reference tool for recording purposes.

The SPL requirement of mastering and monitoring movies, precisely as the filmmakers intended at the specified industry reference level, demands of a loudspeaker that it deliver high SPL with constant timbre. The dynamic range capability of the ATCs exceeded that of the Dunlavys. Overall, the dynamic range capability of direct-radiating loudspeakers distinguishes the better designs. To qualify in all respects as a high-performance loudspeaker, the requirements of dynamic range will for most designs be the largest compromise. Both the ATCs and Dunlavys are capable of continuous output at better than 94 dB at 1 meter, while being driven from an amplifier of 100 watts or more, and excel in huge dynamic range delivery, easily reproducing the 12 to 16 dB peak to average swings encountered in digital recordings.

A note about room acoustics should be mentioned at this point. Even the most accurate audiophile systems are always dependent upon room acoustics and proper placement of the loudspeakers within the room, relative to the room boundaries (walls, doors, etc.) and the primary listening position, if truly accurate reproduction and stereo imaging between two loudspeakers are to be achieved.

*WSR's* reference laboratory is a well-behaved room with an ideal controlled reverberation response. This allows for the direct sound to be dramatically prominent, with the reverberant field less able to mask the direct sound, particularly with respect to percussive or impulsive sounds. Thus, we are able to make critical judgments related to the reproduced sound, principally on the basis of hearing the first arrival or direct sound, which provides most of the phase- or time-related cues, and also the low-level or ambient detail, which deteriorates quickly in the reverberant field. With accurate loudspeakers, such as the ATCs and Dunlavys, whose power response evenly excites the reverberant field, we are able to discern the full capability of a loudspeaker's performance without the intrusion of bad room acoustics.

Unlike several outrageously expensive loudspeaker systems on the market, typically exhibiting impressive adventuresome, if not exotically attractive, cosmetic design, and generally attract compulsive millionaire buyers, the ATCs represent true accurate performance and superb value for the money. Yes, they are expensive, as are the Dunlavy SC-Vs, and no doubt will not be in the budget range but for a few readers. Nonetheless, they are worth the asking price.



And learning about the design principles embodied in these loudspeakers can serve as a good reference for knowing whether you bought an accurate loudspeaker.

The ATC monitors and a few other high-performance loudspeaker designs are highly regarded by a select group of respected professionals who consistently put out the best sounding recordings. They are produced by one of the few companies with its heart and soul fully committed to measurable and audible accuracy, good engineering, and skill in the design and manufacture of high-performance loudspeakers.

I think that it is important to state that the high-performance reproduction attributable to the ATCs is in large measure because the powered active components are precisely matched and optimized to the drive units, for a fully engineered, integrated system. The transition between drivers was seamless, as expected.

While the active, integrated design approach, theoretically at least, promises superb performance, this is not to say that a well-engineered, passive loudspeaker system, driven with competent power amplifiers of high quality, won't perform equally superb or even surpass the performance of the ATC SCM150ASL Pros and SCM0.1/15 Pro subwoofer system. This is the case in a direct comparison with the Dunlavy SC-Vs and TSW-V Tower Subwoofer system in the exact same room setup. The amplifiers driving the Dunlavys are custom-built California Audio Labs, five stereo pairs with each pair housed in a CL-2500 chassis. Each channel can output 1,000 watts at 6 ohms. Both systems produced a sound that was convincingly lifelike, not the lifelessly veiled sound of so many loudspeakers from most loudspeaker companies.

With great soundtrack recordings, movie effects sounded just like the real thing when reproduced by the ATC ACM150ASL Pros. Dialogue intelligibility was exemplary with outstanding clarity and inner detail. Realism was imparted in the reproduction of the four sound elements that are the essence of movie sound—dialogue, music, Foley, and effects. Subtle ambient soundscapes were rendered with uncanny realism and spatial dimension. Loud, even extremely loud movie sound passages never sounded compressed, making explosions, rumbles, and sci-fi and horror effects sound riveting with an unusually "live" presence. The rendering of Foley effects, from subtle sounds, such as rustling clothing, produced by common objects depicted in everyday scenes, to rooftop jumps and rapid-fire gunshots, was impressive. The better the soundtrack recording quality, the more startling realism the ATCs imparted.

The ATCs were absolutely quiet with no hum or hiss audible, even with the gain at

full reference level. The loudspeakers produce absolutely no audible sound in the room without an active signal, even when I put my ear up to the loudspeakers. A contributing factor to the utter quietness of the system in the WSR reference laboratory is the implementation of Equi=Tech's Model ET12.5W SIF balanced power AC system and Richard Gray's Power Company Model 400S and 1200S power treatments.

The ATC SCM0.1/15 powered subwoofer is in a class with the best subwoofers I have ever experienced, exhibiting impressive musicality with good pace, rhythm, and slam. Rated at 118 dB of *continuous* output, they never stressed out on even the most demanding and system-threatening material. The subwoofer response is extremely fast. On the most demanding material, such as in *The Haunting*, *The Fast And The Furious*, etc., the subwoofers never faulted. The ATCs in WSR's reference laboratory produced an extremely smooth and deep bass response below 16 Hz on *The Haunting* and virtually matched the deep bass capability of WSR's two reference Dunlavy SCW-Vs passive subwoofers, with multiple bass drivers in a large and massive sealed enclosure, each driven by 1,000 watts of California Audio Labs power amplification. With seemingly endless bass extension, the ATCs effectively pressurized the listening environment and delivered an exhilarating, room-pounding tactile experience. Without question, the ATC SCM0.1/15 is a robust subwoofer!

With a background as a musician, a recording engineer, and a producer (among other past interests), I was immensely impressed by the "you are there" realism the ATC SCM150ALS Pro loudspeakers impart when reproducing music. As with the Dunlavys, the ATCs are fully capable of reproducing the real sound and spatial dynamics of a symphony orchestra or jazz heard in an acoustic concert, as well as electronically amplified music, as in rock presentations—with precision, resolution, and real-world, uncompressed dynamic range that is musically involving.

With our ability to isolate discrete channels when monitoring multichannel music recordings (or for that matter movie soundtracks) in the WSR reference laboratory, I was able to focus on an individual instrument or small cluster of instruments isolated on multichannel DVD-Audio and SACD recordings, which revealed just how audibly accurate the ATCs sounded. Instruments sounded astonishingly real and a real joy to experience. In WSR's darkened black room, the realism imparted an uncanny dimensionality and holosonic soundfield that brought me face-to-face with the musicians. So real! So wonderful!

On excellent recordings, I never had to strain to listen into the most complex performances and follow particular instruments, even at an extremely loud SPL. It's no wonder that critically-demanding professional recording and mastering engineers use ATC loudspeakers to monitor at real-world "live" performance levels.

Dynamic range was impressively wide. I detected no compression anomalies. Transient attacks were impressively fast with substantial headroom, resulting in a perception of musical intimacy and excitement rarely experienced with less accurate loudspeakers. Their transparency, clarity, and openness is exemplary, and they exhibited neutral fidelity, with no particular sonic signature.

The ATC SCM150ASL Pros always made me painfully aware of the sound quality difference between recordings, as all accurate loudspeakers should be expected to do. They are utterly revealing of the nature of recordings. This aside, the really good recordings sounded so real that they imparted that rare "you are there" experience that audiophiles live for and are defined by.

As for deficiencies, I would be forced to nitpick. The ATC SCM150ASL Pros did not have quite the inner detail and depth perception of the large Dunlavy SC-Vs, nor the razor-sharp bass articulation that the Dunlavys produce. Soundstage width and depth was excellent and stable, and equaled the Dunlavys in those respects. The ATCs had a more pronounced forward presence though, but without midrange beaming. The Dunlavys were more proficient at exposing recording deficiencies often encountered in center and phantom images positioned between the left/right extremes of the soundstage.

While both the Dunlavys and the ATCs can be considered desirably full- and neutral-sounding (never too warm or too cool, or too soft or too hard), the ATCs sounded just a bit "fatter" or "bloated" in the lower-midrange and slightly "heavy" through a narrow bass range. Overall, the sound was just so slightly "weighty" in the lower-midrange and bass octaves which elicited a "rounder" and "larger" presence. I preferred, in this respect, the slight resolution edge and articulate bass definition that the Dunlavys elicited, as well as the timbre accuracy and balance in the mid- and high-frequency regions. Overall, the ATCs were a little less revealing than the Dunlavys, but then many of these differences I have been nitpicking at were so subjectively subtle that they may be interpreted differently, depending on the listener. And that's an important descriptive to keep in mind in a comparison where each loudspeaker system is so near perfect.

I haven't auditioned a more dramatically real-sounding accurate loudspeaker system



or one that sounds as good at its price. This is truly an exceptional product. At \$18,000 per pair, the ATC SCM150ASL Pros, while not inexpensive in absolute terms, represent a tremendous audiophile value when you consider that a full complement of six amplifiers are part of the package. The SCM0.1/15 Pro subwoofers are \$6,000 each. The total system package as configured will cost you \$57,000. But I recommend outfitting the system with one more SCM150ASL Pro positioned as the back center surround loudspeaker, for an additional \$9,000. At \$66,000, this represents tremendous value in a high-performance accurate loudspeaker system. Of course, if you want the ultimate ATC active active loudspeaker system that is installed in several professional facilities throughout the world, the huge quad-amplified SCM300ASL Pro costs \$35,250 a pair, driven by ATC's new, free-standing, top-of-the-range P4 four-way monoblock power amplifier. The SCM200ASL Pro, the next model up from the SCM150ASL Pro costs \$30,000 a pair. *WSR's* reference Dunlavy Signature Series SC-V system, configured to match the ATC system reviewed, with two TSW-V Tower Subwoofers, costs \$58,500, a little more than the ATC system reviewed, but without amplification. Seven channels of California Audio Labs amplification costs an additional \$28,000, which is a significant cost factor. The Dunlavys, however, can be driven by far less expensive amplifiers, as long as their minimum output is not less than 100 watts per channel into 8 ohms.

If all this sounds too rich for your budget, audition the smaller active and passive models in the ATC product range. They will exhibit the same midrange and upper frequency smoothness, openness, and transparency, while only sacrificing the deepest bass and dynamic range capability.

Even if you can't afford a system at these price levels, no matter *how* good it is, you still owe it to your self-education to learn what an accurate loudspeaker sounds like. So become more educated and audition the ATC product range. But be forewarned, you're not going to want to return the ATCs; they will forever pique your taste for an accurate loudspeaker system.

## Conclusion

While generally, there are now more good less expensive loudspeakers than ever, due to advances in computer modeling and advances in driver manufacturing, and as well, substantial engineering input (though there are still plenty designed with marketing pizzazz), to achieve true measurable and audible accuracy is a premium cost, and thus, relatively expensive, if you want the

performance differential that a truly accurate loudspeaker will deliver. The ATCs and Dunlavys, and a few other manufacturers produce accurate loudspeakers that deliver that performance differential. They are two of the finest loudspeakers available, yet worlds apart in design philosophy. They are expensive but worth the price differential to the person who values the satisfaction of music and movie sound reproduced with absolute realism.

The ATC SCM150ASL Pros are in the class of the finest loudspeakers in the world. They are truly accurate-sounding loudspeakers, and so nearly perfect in their capability to deliver the essence of the best soundtrack and music recordings—realism. These loudspeakers can sound like the real thing, when the real thing is captured in the recording. My quibbles aside, I could happily live with this ATC setup and listen seriously for countless hours auditioning the good and bad recording quality of movie sound and music performances. Now, if only more professionals would employ ATCs when they record and master, then us enthusiasts would be able to be even more appreciative of the practice of their art and more completely enjoy the movie and music experience. ■

P.S. At press time, ATC announced major drive unit upgrades to the SCM50, SCM100,

and SCM150. The new models, designated as the Home Active 50, Active 100, and Active 150, feature a revised range of drive units for all three loudspeakers, which are claimed to improve all major performance parameters, while retaining their time-honored character. Existing owners of all three of these loudspeakers interested in upgrading their loudspeakers should contact the ATC distributors listed below for further information and pricing.

ATC Loudspeaker Technology Limited is located at Gypsy Lane, Aston Down, Stroud, Gloucestershire, England GL6 8HR, phone 4+44(0)1285 760561, fFax +44(0)1285 760683, www.atc.gb.net. E-mail Billy Woodman at billywoodman@atc.gb.net, or Bob Polley, Operations Director, at bob@atc.gb.net, or Ted Adams ATC Loudspeaker Technology, 0034 966 495 189, adams@ctv.es.

For information on ATC Professional Monitors in the United States, contact Transamerica Audio Group at 702 365 5155, or www.transaudioreview.com.

For ATC domestic product sales in the United States, contact:

ATC Distributor Eastern States, Teresa Kregling, Chris Barry, Flat Earth Audio, P.O. Box 110, Seymour, Connecticut 06483, phone 312 201 0403 or 888-653-5454, fax 203 888 3769, fea@flatearthaudio.com.

ATC Distributor Western States, Brandon Howell, David Zooks, SONA Marketing Solutions, 537 Kalamth Street, Denver, Colorado, 80204, phone 720 932 5355, fax No: 720 932 5356, bhowell3@uswest.net.

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