

Spatially it did not totally collapse in-head but the feeling of space remained relatively confined to a smallish virtual enclosure. Sitting closer to the screen, or investing in a larger-screen TV would of course give more impact.

In non-blockbuster material like *The Piano* or *The Three Tenors* videos, and the growing numbers of TV surround productions (*Prime Suspect 4*, *A Touch of Frost*, etc.) the surround channels are actually given very little to do, and the Pro-Logic benefits are perhaps less obvious. However, there is added realism and a greater sense of space which can be appreciated too on the few Dolby Surround encoded audio-only CDs which have come my way. The most impressive of these is the two-CD set *The Music Surround Spectacular: The Music, The Tests* (Delos Ⓛ DE3179)

which, besides 21 impressive music tracks, contains numerous test signals for checking any Dolby Surround loudspeaker (or headphones) set-up.

Applying Dolby decoding to normal stereo or mono material was almost always disappointing. The frontal arc was squeezed and highlighted to such an extent that switching to the straight-through stereo mode, or bypassing the Lucas entirely, came as a welcome relief despite the loss of centre channel integrity.

I have said nothing so far about the DSP ambience synthesizing facilities, which are now built into almost all home cinema hardware. I must confess to a certain antipathy towards these manipulations but they do certainly widen any system's potential for tweaking reverberation, time delays, appar-

ent listening distance and venue acoustics. The effects are very subjective, of course, and I have no doubt that the majority of users will find a satisfactory blend of settings to suit every kind of programme material. This tiny unit is quite as versatile as the much bigger A/V processors on the market. Indeed its extra output adaptor leads can be used to turn the Lucas into a conventional home cinema decoder and drive any set of surround loudspeakers/amplifiers when these are to hand and headphone surround is not required.

The review sample came with the optional Sennheiser HD-580 headphones which would seem to be ideally suited to the high quality demands of this versatile control centre (though see my review of the new HD-600 headphones last month, which I was evaluating

when the Lucas box arrived). Some run-of-the-mill headphones I tried took a good deal of the shine off the special effects which are such an important ingredient in Dolby encoded movies, particularly with respect to extreme bass where these top Sennheiser models excel.

"Home cinema" is in itself a kind of contradiction in terms and, if you really want to recreate the special excitement of the cinema experience in your own home, a domestic harmony-straining array of loudspeakers is probably essential. Nonetheless, the designers of this miniaturized processor have come up with an intriguing method for anyone to enter a private world of surround sound and enjoy videos, TV, multimedia and games at any time of the day or night without disturbing other people. It deserves to succeed ☺

Quad 77FM tuner, preamplifier and stereo power amplifier

Ivor Humphreys

It is now well over two years since Quad released the first products in its 77 Series – the 77 Integrated Amplifier (reviewed in February 1995) and System Console. They were joined by a CD player later in the year (reviewed November 1995) and by a small box loudspeaker soon after that (77-10L, reviewed March 1996), but it has been a long wait for the range to expand as envisaged. In the interim Quad has had to adjust to new regimes within Verity Group Plc, which acquired it towards the end of 1995. As I noted in "Quad in the groove" last month this has involved a lot of rearrangement one way or another, so that although new designs were on the drawing board, indeed rather beyond that in several cases, it has taken longer than anticipated to bring them to the marketplace. However, the eagerly awaited tuner is now available, along with the pre-amplifier, an 80 watts per channel stereo power amplifier and the 707, a 120Wpc stereo power amplifier which derives from the famous 606. A 150 watt monoblock power amplifier is expected soon.

From a cursory glance, few would expect that the 77 units hide beneath their covers the essentials of a radically advanced, 'organic' high fidelity system which can grow with the requirements of the customer and even keep pace with new technologies as the need arises. Indeed this seems scarcely possible looking at the meagre complement of seven push-buttons on the integrated amplifier or preamplifier, the labelling of which implies that they have inputs for a bare handful of components. At first sight too the



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System Console, with its ten buttons and single rotary control, also looks incapable of managing anything at all sophisticated, yet nothing could be further from the truth. Look at the back of any of the system units and you will see a pair of 15-pin D-sockets. These carry QuadLink, an inter-component 'bus' which conveys balanced audio and control signals, obviating the need for the normal mess of phono-to-phono leads but more importantly allowing up to 32 of the 77 series units to be connected together.

Needless to say, the System Console is no ordinary remote handset issuing simple control commands; this unit also 'listens' so here a two-way link is established. The first time a 77 system is switched on the Console interrogates it and builds a software model of exactly which units are connected – how many CD players, tuners, amplifiers etc. It then keeps a running account of this model, regularly monitoring each unit's status: the sensitivity of each amplifier input, the volume, balance and tone control settings, the track data of the CD player,

RDS details of the FM tuner and so on. Relevant data is shown dynamically on the Console's liquid crystal matrix display.

Four of its ten buttons are 'hard', i.e. fixed in function. The remaining six are 'soft', their operation at any given moment defined by the adjacent text label in the display. A system of computer-like menu 'pages' is employed, with only the currently relevant options available. Bring this 77FM/pre/power system out of Standby and as expected the display initially shows the available inputs – 77Tun(er) plus the non-77 inputs of Phono, Aux1, 2, 3 and Tape against the six soft buttons. Change the source and the preamplifier switches as expected; press any of the non-77 input buttons again and a second page appears which allows the input Sens(itivity) of that source to be altered or its name to be Edit(ed). Pressing Sens reveals a third page where a line-level input sensitivity of 775, 300 or 100mV can be chosen, with a fourth soft button to Store the choice and Up to go back. There are many more pages according to the extent of the sys-

tem. To cover them in depth would make for several impossibly weighty paragraphs but I shall return to some of those concerning the preamplifier and tuner below.

This is a very cleverly thought-through control system and it has been substantially refined since I first confronted it two and a half years ago. Those used to the pop-up menus of Macintosh or Windows computers will take to it in moments but technophobes will take a while longer to think it through. For them, simply bearing in mind that pressing the Source button is the quick way out of the maze, always returning to the opening menu, should be enough to instill some early confidence. It is well worth persevering with the effort.

All the 77 units, with the exception of the larger 707 power amplifier, have in common the strikingly styled and remarkably compact aluminium die-casting which forms the top, sides and front panel of the housing. This also features secondary internal panels which form heatsinks for the output transistors of the power amplifiers. The cabinets differ only in the detail and layout of the sheet steel insert rear panel and the plastics fascia.

77 preamplifier

The preamplifier looks almost identical to the 77 integrated amplifier, and has the same number of fascia buttons. With the space freed up by the omission of a pair of power amplifier stages, however, it has been possible to offer a rather more comprehensive range of features. Whereas the ☺

integrated amplifier is a line-level only device, the preamplifier includes provision for a moving-magnet or moving-coil phono cartridge. It also has three line-level inputs for non-77 series units plus tape (a proper input, this, allowing off-tape monitoring with three-head recorders, although there is no separate tape record selector – but see 77FM below). Volume and balance controls are as before but in addition there is a neat implementation of Quad's excellent Tilt control, a bass boost or cut option and a high frequency filter. In addition to the RIAA equalization poles at 50, 500 and 2,122Hz, (3,180, 318 and 75µs) Quad has included a permanent low frequency 'rumble' filter at 5Hz for the phono input (interestingly two octaves below the IEC-advocated pole at 20Hz).

Each of the seven fascia push-buttons has an embedded dual-colour LED which shows its status. These glow red when pressed or green if the function is activated from the Console. The buttons are for Standby, Up or Down Volume/Balance, Tape, Phono and Source. The Up and Down buttons increment volume by default or left-right balance, and Source cycles around the three external line-level inputs. A seven-segment red LED display to the right shows volume level (in steps from zero to 32) or balance (nine steps left or right from a centre zero) and which, if any, of the three line-level inputs is selected (a little unhelpfully if one has edited the default names it shows just 1, 2 or 3). All higher functions are available only from the Console, where the display is comprehensive and where the menu pages come into their own.

Pressing the Console's Menu Swap button at the opening level menu reveals the Equalization button and pressing this shows the Tilt, Bass boost/cut and treble Filter settings. As its name implies, tilt produces a gradual change in tonal balance across the musical spectrum without changing the overall subjective level. Pivoting about 1kHz it offers six settings (plus flat, when it is effectively out of circuit) calibrated in ± 1 dB steps, thus the maximum extent of the tilt in either direction is ± 3 dB. This control is far more subtle than conventional bass and treble controls (which are arguably better at compensating for transducer than acoustic problems), allowing one to tame an over-bright recording or illuminate a dull one without significantly colouring the sound. Bass has just one position of cut (-3 dB at 100Hz, reaching a shelf of -4.5 dB at 30Hz) and would typically be used when full range loudspeakers have to be placed closer to the room boundaries than would be



77FM tuner

ideal, and one of boost ($+4.5$ dB at 60Hz) which can add a little LF muscle to small box loudspeakers. The treble Filter is either on or off: it is a conventional LP surface noise filter of moderate slope with a -3 dB point at 7kHz but will operate on any input. All settings are retained in memory and one can compare the chosen settings with the Flat condition simply by toggling between the Eq and Flat buttons in the preceding menu.

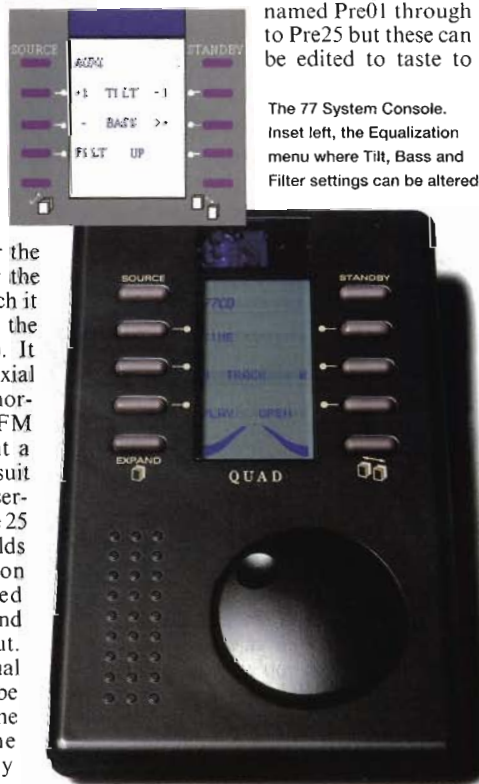
The Console allows all non-77 inputs to be configured for sensitivity. For the three line-level and tape inputs the options are 100, 300 or 775mV (curiously labelled Low, Medium and High in the Tape menu). Similarly, the phono cartridge input offers sensitivity settings for moving-coil at 100, 300 or 775µV or moving-magnet at 1, 3 or 7.75mV. The rear panel of the preamplifier carries an IEC mains input socket with an adjacent On/Off switch, an IEC mains output socket to feed the power amplifier(s), a pair of QuadLink sockets, seven pairs of gold-plated phono sockets and a ground terminal for a pickup arm.

77FM tuner

The new tuner is a digital synthesizer type covering the FM band only but including four of the more domestically relevant RDS features. It is dedicated to the 77 system and requires either the integrated amplifier or the preamplifier, from which it derives its power (via the QuadLink connection). It has two 75 ohms coaxial aerial inputs, one for a normal roof-mounted FM aerial and the other, at a lower sensitivity, to suit the feed from a Cable service provider. There are 25 presets and each holds details of the station frequency, preferred stereo/mono setting and the requisite aerial input. Tuning is either manual or automatic and can be managed either from the tuner itself or the Console. With fully

automatic tuning the tuner scans the FM band and stores the 25 strongest stations in decreasing order of strength.

Again there are seven fascia buttons, labelled Standby (a duplicate of the preamplifier and Console standby buttons), Preset increment up/down, Tune up/down, Cable (toggles between the cable and aerial inputs) and Mono (overriding stereo to make best use of weak, otherwise noisy, signals). The tuning buttons are triple function in that pressing them at their top edge invokes an automatic search up or down to locate the next usable station, while pressing the bottom edge causes frequency to increment in 50kHz steps – the keys repeat if held. If both are held in for five seconds or so the fully automatic scan/store sequence is initiated. On the handset this works slightly differently in that, while a pair of Search buttons is used for automatic searching, for manual tuning the knob is turned until the desired frequency (in 100kHz increments only) is displayed in its window, the tuner itself complying as soon as the knob is still. By default the presets are named Pre01 through to Pre25 but these can be edited to taste to



The 77 System Console. Inset left, the Equalization menu where Tilt, Bass and Filter settings can be altered

show, for example, station name or programme type, although the name is limited to five characters (alpha-numeric plus a choice of some punctuation marks).

As with the preamplifier, LEDs in the fascia buttons light (again, red or green) to show their functional status. In addition, the tuner window shows the preset number and tuned frequency (with a suffix 'decimal point' denoting displayed frequency plus 50kHz) plus an array of small indicators for Stereo and/or RDS reception and Signal strength (one to four LEDs) – which is all neat and logical.

The rear panel sports the pair of QuadLink connectors, the two 70 ohms aerial/cable sockets and a pair of phono output sockets intended for direct connection to, say, a DAT or CD-R recorder. In part this compensates for the lack of a tape record output selector on the preamplifier, especially for those who use tape primarily for time-shifting. As noted at the start of this section, power comes in via QuadLink so there is no mains input.

Four RDS functions are implemented: Station Name, Broadcast Frequency, Radio Text and Program(me) Type. This information is displayed in the Console window under control of two soft buttons which cycle either way through the sequence. One disappointment is that the super-accurate RDS Time function was not included, more especially as Broadcast Frequency is redundant with a digital synthesiser tuner. Station Name is helpful but the real benefit is Radio Text, which can be very valuable provided the broadcasters keep the information up-to-the-minute. It displays brief details about the current programme and on Radio 3, for example, will typically give information about the work in play. This is useful for compilation programmes where ordinarily, if you are distracted at the moment the presenter introduces the piece, you can be left frustrated. Radio Text itself can occasionally frustrate too when there are delays in transmitting updated information (not that I was entirely convinced during an unscheduled addition to a Radio 3 programme on Sir Peter Pears on the morning of Wednesday 30th April that a movement from Walton's *Façade* was actually an extension to Britten's *Winter Words!*). The Console can display up to 13 characters at a time so Quad has opted to group the text rather than present a continuous scroll, which is neat and generally more readable (although by no means always: "French Nation" ... "al Orch." is a little inelegant, for example). ↻

77 stereo power amplifier

Again built into the same 77 series housing, the Class B stereo power amplifier completely belies its modest dimensions, offering a beefy 84 watts per channel into 8 ohms (115W into 4) with a peak current capability of 11 amps per channel. There are no fascia controls, only a single bi-colour LED which shows red in standby and green in use. The rear panel carries an IEC mains input socket with adjacent On/Off switch, a pair of QuadLink sockets, two gold-plated phono sockets, a four-position rotary switch and two pairs of hefty terminals for the loudspeaker cables. These also have 4mm socket ends and so will accept the familiar 'banana' plugs, although as supplied the sockets are blanked off to satisfy EU requirements.

The amplifier can be used either as part of a 77 system or as a stand-alone unit in conjunction with earlier Quad or other makes of preamplifier. The rotary switch is used to define its set-up in this respect. There are three QuadLink options, selected according to whether the power amplifier is feeding the normal pair of loudspeakers in a stereo system, or the rear left and right channels, or the centre channel and subwoofer, in a multi-channel set-up. In this 77 context the power amplifier is normally left switched on and brought in and out of standby via QuadLink. The fourth position selects the line input, in which case the amplifier behaves as any other and is switched on and off by the mains switch.

Construction

All the 77 units are built upside down, as it were, with the circuit board mounted on stand-offs which are integral with the die-cast housing. In this sense the sheet steel base forms the 'lid'. The workmanship is second to none, in the Quad tradition, with each unit assembled for the most part on one large double-sided board. In the preamplifier and tuner a subsidiary pcb holds the input switching and display circuitry. All components are of very high quality, with widespread use of the excellent OP275GP operational amplifier and close tolerance resistors and capacitors. All switching is under microprocessor control and in the preamplifier is handled by integrated circuit CMOS devices in a clever "virtual earth" configuration originally devised for the integrated amplifier. This makes the 15 volt amplitude limitation of CMOS bilateral switches irrelevant and renders them transparent to the signal. The microprocessor momentarily ramps down the volume during input switching, so operation is devoid of clicks and pops.



77 stereo power amplifier

The volume control has just 32 steps but its contour is tailored to provide a subjectively comfortable rate of change: 1dB increments from "32" (0dB line-level) down to "24", 2dB down to "17", 3dB down to "9", then progressively larger steps down to silence. In practice in my room with ESL-63 loudspeakers I found myself operating mostly in the 17 to 24 region and occasionally wishing for the finer 1dB steps. I have no such reservations about the balance control.

I have described the essentials of the 77 control system in some detail but needless to say there is rather more to it than can be covered even in such a lengthy review as this. If it is a little confusing at first this is because it dares to be different, but with a little practice everything becomes perfectly clear. The menu structure gives ready access to the plethora of functions (filters, balance and tilt controls etc) but keeps the basic interface simple and uncluttered. This is analogous to the way some conventional hi-fi units hide their less often used controls beneath a flap - an idea I came to appreciate with the first amplifier I owned, the Ferrograph F307, back in 1971.

Performance

Finally to the sound, which I've left almost as a postscript even though it is the most important aspect. I'm happy to report that basically it can be taken for granted in the most positive sense. I said of the 77 integrated that it was first-rate, with an impressive solidity about the image it projects, a stable sound-stage creating the firm impression of control and power in reserve. The 77 pre/power has these characteristics in abundance. Definition is superb, the sound clear and wonderfully open, the transient behaviour solid, dynamic.

Much of this, I'm sure, has to do with the power amplifier which, as an experiment, I tried between my Meridian front-end components (508-20 CD player and 502 preamplifier) and the ESL-63s. I am so impressed with it that I shall be pestering Quad to let me try out the 77 monoblocks. This is certainly as fine a stereo power amplifier as I have used.

Similarly transparent and eminently sensible in its arrangement of controls and filters, the preamplifier is a good match. It has an excellent implementation of the tilt circuit which even as a purist I should not hesitate to employ with CDs I find otherwise a little over-bright and wearing (and there have been rather a lot of these over the years). The LP circuit is excellent too, with a range of settings which will suit most pickup cartridges. The sound here is coherent, unflappable, with surface clicks and pops registered but not dwelt on.

The tuner has been worth the long wait, although the omission of AM (medium wave and long wave, if not short wave) is something of a disappointment. Personally, as long as I can have Radios 3 and 4 (and possibly Local Radio) in high quality stereo I am content but Radio 5, for example, is only broadcast on AM. The RDS functions are neat, but I did wonder if, given the Console's 13-character limitation, a scrolling

display might actually be more easy to read than Quad's clever paging arrangement. Occasionally some of the text becomes corrupted but I don't have a wide enough experience of RDS sets to know if this is typical, as I suspect, or a foible of the 77FM software. The data is cyclical, however, and usually clears the second time around. Other than that the unit is nicely conceived and works extremely well. One can never over-stress the need for a good aerial, which in most cases means a multi-element array standing proud of the roof. Fed with an adequate signal the 77FM gives an excellent account of itself, again tonally anonymous. Provided the broadcasters get the miking right and don't spoil the result by using compression, FM conveyed this well can be as, if not more, rewarding than CD or LP.

Quad deserves every success for the 77 system, especially now that there are enough units in the range to exploit the control system and provide a variety of options. Certainly anyone looking to make a fresh start would do well to peruse the brochure and arrange an audition. Having used the tuner, preamplifier and Console for a number of long sessions, I have been completely persuaded by its logic, which quickly became second nature. I shall miss that and also the preamplifier's subtle tilt control. My reservations are few, as noted. The clincher, for me, is that it also offers so convincing a sound **G**

Specifications

77FM Tuner

Tuning range 88-108MHz

Frequency response 20Hz-15kHz +0, -1dB

Sensitivity (for 50dB quieting) mono 2-7µV; stereo 25µV

Distortion 0-05% mono; 0-1% stereo at 1kHz ±25kHz deviation

Signal-to-noise ratio mono 76dB; stereo 70dB

Capture ratio 1-5dB

IF rejection 100dB

AM suppression 60dB

Weight 2-8kg

UK retail price £699-95

77 Preamplifier

Frequency response Line-level/QuadLink 10Hz-20kHz +0, -0-3dB; 3Hz-56kHz +0, -0-5dB; phono MM/MC 20Hz-20kHz ±0-5dB (-3dB) at 7Hz and 53kHz

Input sensitivity line-level 100, 300 or 775mV into 33k ohms; phono MM 1, 3 or 7-75mV into 47k/220pF; phono MC 100, 300 or 775µV into 100 ohms/22nF

Outputs preamplifier line-level 775mV/100 ohms; 77 QuadLink 2V/20 ohms balanced; Tape 100, 300 or 775mV/330 ohms

Weight 4-3kg

UK retail price £849-95 including System Console

77 stereo power amplifier

Maximum output power 84W per channel into 8 ohms

Maximum current output 11A peak per channel

Input sensitivity Line-level input 775mV; QuadLink 2V balanced

Frequency response 10Hz-50kHz +0, -0-3dB (-3dB at 3Hz)

Distortion 0-05% 20Hz any level up to 70W into 8 ohms resistive load

Weight 6-3kg

UK retail price £599-95

Dimensions (all units, W x H x D) 321 x 65 x 300mm

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