

# MANUFACTURING EXCELLENCE

Story Edgar Kramer

THE RELATIVELY NEW AUSTRALIAN COMPANY SGR AUDIO HAS MADE GIANT LEAPS, IN A RELATIVELY SHORT TIME, TO BECOME A MAJOR FORCE IN THE LOCAL HIGH-END AUDIO MARKET. EDGAR KRAMER REPORTS ON THE COMPANY'S NEW AND VERY IMPRESSIVE FACTORY IN MELBOURNE, VICTORIA.



Over the last decade or two, Australia has built a solid reputation as a country that's able to produce world-class audio products that feature extraordinary design and a very distinctive home-grown view of the high-end. Duntech Audio was probably one of the first, back in the 1980s, with its massive time-aligned ultra-accurate towers. In the latter years of the 20th century, brands like Halcro, Continuum and Eichmann Technologies offered unique products with strong and, at the time (perhaps even still),

1. THE CONVEX SERIES CX4F SPEAKER'S MASSIVELY OVER-ENGINEERED POWER SUPPLY IN ITS SEPARATE CHASSIS
2. THE HORIZONTAL BANDSAW. DUE TO ITS INACCURACY IT IS ONLY USED FOR ROUGH CUTS, IN PREPARATION FOR PRECISION CNC MACHINING TO FINE TOLERANCES
3. ALUMINIUM EXTRUSION FOR EL SERIES AMPLIFIERS. THE RAW EXTRUSION COMES IN PRE-PRODUCTION 4M LENGTHS
4. VARIOUS CUTTING AND ALIGNMENT TOOLS
5. THE TOOL HEIGHT ADJUSTMENT MACHINE ALLOWS FOR EXTREMELY ACCURATE ALIGNMENT
6. STAINLESS STEEL AND ALUMINIUM CNC-MACHINED PARTS FOR THE NEW SGR AUDIO SIGNATURE HI-FI EQUIPMENT RACK
7. TOP PANEL OF AN EL AMPLIFIER, IN RAW ALUMINIUM TAKEN STRAIGHT OUT OF THE CNC MACHINE AFTER ETCHING THE COMPANY LOGO ALONG WITH OTHER COSMETIC DESIGN ELEMENTS

unique ideologies that became respected, even revered, around the world.

A local company that exemplifies these principles of originality and autonomy is SGR Audio. In a relatively short time this father-and-son company, manned by principals Harry and Stuart Ralston, has gone from producing extraordinarily well-engineered active loudspeakers, now expanded to two lines, to its own family of amplifiers, an about-to-be-launched proprietary custom software all-in-one

8. MATERIAL STOCKS OF VARIOUS TYPES AND GRADES
9. SECTION OF THE WAREHOUSE: STORES, BAYS AND DOCK
10. STUART RALSTON AT THE MANUAL LATHE
11. THE FINAL STEP IN THE SGR JOURNEY AND WHAT AUDIO IS ALL ABOUT: THE EQUIPMENT AT THE READY TO PLAY MUSIC, IN THIS CASE ONE OF SGR'S AUDITIONING ROOMS WITH THE BRINKMANN OASIS TURNTABLE, SUTHERLAND PHONO STAGE, MSB DIGITAL SOURCE, EL SERIES AMPLIFIERS AND MT3F SPEAKERS
12. THE CNC LATHE
13. CNC LATHE SHOWING THE BAR FEEDER. A 1-METRE SECTION OF ROD GOES INTO IT AND IS AUTOMATICALLY FED INTO THE LATHE. MACHINED PARTS THEN EXIT AT THE OTHER END. PARTS SHOWN ON THE TABLE ARE MACHINED DISCS USED AS FLOOR-PROTECTING SPIKE RECEPTACLES
14. CLOSE UP OF BLANK INSERTION SHOWING 3-JAW CHUCK
15. MACHINE OPERATOR PUTTING IN A NEW BLANK
16. CNC ROUTER FOR TIMBER AND PLASTIC
17. VERTICAL MINI BANDSAW AND 18-INCH SGR SUBWOOFER







- 18. CHEVALIER CNC MILLING MACHINE WITH DUAL STATION, USED FOR HIGHER QUANTITY PRODUCTION MACHINING. THIS MACHINE USES TWO ROTATING WORK STATIONS: ONE LOADS WHILE THE OTHER CUTS, WITH THE OBVIOUS EFFICIENCY BENEFITS
- 19. ANOTHER IMAGE OF THE EL AMPLIFIERS' TOP PLATE IN THE VACUUM HOLD DOWN JIG
- 20. A VACUUM HOLD DOWN JIG. SGR NEEDS TO DESIGN AND MAKE ONE OF THESE FOR EACH PART IT MAKES!
- 21. MANUAL MILLING MACHINE WITH DIGITAL POSITION READOUT. THIS MACHINE IS USED FOR PROTOTYPES OR MANUAL PREPARATION BEFORE CNC MILLING
- 22. WAVE SOLDERING MACHINE. POPULATED PCBs CLIP INTO THE RACKING SYSTEM AND TRAVEL ON A CONVEYOR THROUGH THE WAVE-SOLDERING MACHINE, WHERE THEY ARE BATHED IN SOLDER
- 23. COMPONENT BUCKETS. THESE HOUSE ELECTRONIC PARTS WHICH HAVE BEEN PREPARED AND ARE READY FOR PCB INSERTION (BY HAND)
- 24. EXTRUSION WHICH HAS BEEN CUT TO SIZE (ALSO SEE IMAGE 3)
- 25. COMPONENTS FROM MT3FSL'S IN THE SPRAY BOOTH AFTER THE 2-PAC UNDERCOAT PROCESS. INSET: MT SERIES TWEETER/MID CABINET. ENCLOSURES ARE MADE IN A MULTI-LAYER CONSTRUCTION UTILISING A VERY EFFECTIVE CONSTRAINED LAYER DAMPING TECHNIQUE
- 26. UPSTAIRS PRODUCTION AREA. THIS IS NOMINATED AS A "CLEAN" AREA (ASSEMBLY, TESTING, ETC) AS OPPOSED TO THE "DIRTY" SECTION DOWNSTAIRS (MACHINING, CNC'ING, ETC)
- 27. ASSEMBLED EL30M MONOBLOCKS READY FOR MEASUREMENT AND TESTING
- 28. LINE-UP OF EL30M MONOBLOCK CHASSIS
- 29. CX4F PLATE AMPS
- 30. STUART RALSTON WITH MT3FSL PLATE AMPS
- 31. INITIAL MEASUREMENTS AND TESTING AFTER ASSEMBLY
- 32. SGR HAS ITS PRIORITIES WELL SORTED - THE CRUCIAL COMPONENT IN ANY AUDIO-RELATED ENDEAVOUR IS TO HAVE A GOOD COFFEE MACHINE. INSET: SGR-MACHINED TAMPER MILLED TO ULTIMATE PRECISION (BECAUSE THEY CAN!)
- 33. PCB DESIGN IN STUART'S OFFICE (6-LAYER BOARD, EACH COLOUR ON SCREEN REPRESENTS A DIFFERENT LAYER)
- 34. BOXED SGR AUDIO PRODUCTS AWAITING DISPATCH
- 35. NEAR-COMPLETION LINE UP OF MT3FSL PLATE AMPS
- 36. THE HOME THEATRE AUDITIONING ROOM WITH OCTAGON SPEAKERS, AN EARLIER SGR DESIGN



plug'n'play media player, and finally a beautifully constructed audio equipment support system.

It didn't take long into the tour to understand that considerable capital investment has been poured into the superb SGR facility, especially when you take into account the current high-stakes economic times. The risks have paid off, however, with SGR Audio now enjoying a raised local profile, impending expansion into overseas markets and, as I'm told, very strong local sales. This is the kind of market penetration and respect which normally takes many more years to achieve. This time compression is a consequence of SGR's business model: to provide mature products of high quality which are built with pride and technical excellence, backed up by outstanding service during and after the sale.

Although at its core it remains a speaker and electronics engineering company, the in-house CNC machines – apart from being used to manufacture many of the products' steel and aluminium components, amplifier chassis, etc – have been capitalised to expand SGR Audio's core lines to include the manufacture of ancillary products. The facilities include extensive testing and design laboratories, where modern engineering and design tools are used in on-going research and development. They include Finite Element Analysis, Computer-Aided Design (CAD), Clio speaker measurement software, and Autodesk Inventor 3D modelling software, among others.

Dedicated areas are run efficiently and purposefully, from the workshop where the metal parts are CNC machined, to the ventilated spray booth where the automotive finishes are immaculately applied to the flagship range of speakers. I came across an expansive area

which was subdivided into sections dedicated to component amplifier assembly, in-speaker amplifier assembly and, on a high bench, a area where a number of beautifully-finished speakers were being populated with SGR custom drivers. This area of the factory was also the location for the circuit-boards' solder bath machine, and for the storage of large spare parts and electrical components. It was obvious that there were a number of efficient systems in place to oversee all aspects of assembly, testing and QC at this stage of production.

**CONCLUSION**

Such has been the growth of SGR that plans for product auditioning and business meeting rooms have had to be scratched in order to accommodate the expanding production requirements. The whole SGR facility was a reciprocal reflection of the company's products (or vice versa) – of efficiency, functionality, solid engineering and purposeful aesthetics. At a time where many international companies are 'feeling the pinch' of our global economic circumstances, SGR Audio is moving forward with clear objectives and a determined drive.

No guts, no glory, we say. £

