

# Cello

## Professional Audio Equipment

Cello,Ltd. 315 Peck Street - Bldg. 23, New Haven, CT 06513 U.S.A.  
Telephone: (203) 865-1237      FAX: 624-3679

## Table of Contents

1. Introduction
2. The Audio Suite
4. The Audio Palette
5. The Performance Amplifier
6. The Amati Speaker
7. Cello Strings cable, Cello connectors, Cello 59-position control
8. Michael Kuscuna - Mosaic Records (N.Y., U.S.A.)
9. Bob Ludwig - Masterdisk (N.Y., U.S.A.)
10. Tom Jung - Digital Music Products (CT, U.S.A.)
11. Dennis Drake - Polygram (NJ, U.S.A.)
12. Ted Jensen - Sterling Sound (N.Y., U.S.A.)
13. Nat Johnson - RCA (N.Y., U.S.A.)
14. Steven Innocenzi - Atlantic Studios (N.Y., U.S.A.)
15. Christa Maria Bilz - Sonomaster (Stuttgart, West Germany)

## **Introduction**

Cello designs and manufactures state-of-the-art audio equipment for live recording, mastering, and monitoring. Cello products give engineers new tools to make compact discs and records which sound more natural, more like live music. New technology, circuitry, subassemblies, and production techniques provide measurably and audibly superior performance plus many unique practical advantages.

Cello products can be used separately to upgrade existing systems and installations, or as a complete system for recording, mastering, and monitoring. You choose the microphones and recorder and Cello can provide the rest of your analog system. Large consoles can be upgraded with Cello outboard microphone preamplifiers and equalization.

Record reviewers are noting that recordings made with Cello electronics are consistently sonically superior. In the competitive world of recording and mastering, Cello provides the "edge" for those who want it.

Thank you for your interest in Cello.

Mark Levinson  
President, Cello, Ltd.

## **The Audio Suite**

The Audio Suite is a 10-bay mainframe which accepts plug-in modules of different types. Ten nickel-plated copper bars on a rear delrin panel provide interconnections. Screws go through the bars and into threaded contacts on the modules for rock-solid DC, ground, and audio connections. Two bars provide grounds, two carry +/-30VDC from an external power supply, and 6 are audio lines. Normally, the audio lines are used as summing busses, terminated by summing amplifiers in the output module. The bars can be programmed to provide other functions as well.

### Applications:

**Live recording:** The Audio Suite can be used as a mixer by inserting the desired number of microphone preamplifier, line input, and output modules. Two microphone channels fit into one bay. For example, eight bays provide sixteen microphone inputs and an output module requires two bays for live to 2-track recording. Cue and aux sends, line returns, and other features are available.

**Monitoring:** The Audio Suite functions as a control console by inserting line input modules and an output module. Up to forty single ended inputs or up to sixteen active balanced inputs can be accommodated. Multiple independent outputs are available by inserting additional output modules.

**Mastering:** Cello has developed the first new tape head playback circuitry in 30 years. Studios have been taking original analog tapes and making digital masters on very modern expensive equipment. Standard circuitry in tape decks between the playback head and the "real world" introduces audible sonic coloration, distortion, and noise which limit the quality of the final product. The Cello Audio Suite Mainframe can be equipped with P603/P301 modules which serve as state-of-the-art playback electronics for decks by Studer, Telefunken, Ampex, and other companies.

The Audio Suite accepts up to 10 bays of modules. The P603 Tape Head Preamp takes 3 bays, the P301 Output section takes 2 bays. Therefore, 5 bays remain for other uses, or two sets of electronics could be contained in one mainframe. Mastering systems for 3 channel or 4 channel tapes can be created with all mixing functions included. The output signal from the P301 is balanced, +32dBV (5kOhms load or more).

The P603 has ten-turn calibrated dials for 1kHz, 10kHz, and 31.5Hz levels. NAB, CCIR, AES, and special equalizations can be reproduced quickly. Settings can be written down and found again to within .1db. Continuous rotation of the controls allows test tones on existing master tapes to be reproduced exactly. A switch allows selectable head damping characteristics to be obtained when required.

Three-pin Fischer (Swiss) connectors are used for highest performance. XLR types are available as well. Audio+, audio-, and audio ground are separate from chassis ground for both input and output.

The P301 Output section offers fixed and adjustable level outputs (1 set each). Level adjustment is in precise 1dB steps from +10 to -40, then a number of increments to full off. 0dB can be set to +4dB with 28dB of headroom before clipping.

The Audio Suite is powered by the Master Supply which produces +/-30 VDC (8A), fully regulated. Each channel of the P603 and each channel of the P301 features its own precision +/-25V regulators. The standard DC power supply cord is 9 meters. Longer or shorter lengths can be supplied as required.

The tape play head can be connected to the P603 by Cello Strings soldered to the head or head block connector, or by adapter boards available from Cello.

The ultra-high quality of parts and construction assures trouble-free life for decades of operation.

## **The Audio Palette**

The Audio Palette is an equalizer of extremely high quality design, performance, and construction. Based on 45 years of research by Richard S. Burwen, the Audio Palette allows sonic improvements in live recording, mastering, and monitoring which have never before been possible.

The Audio Palette and power supply contain over 6,000 parts comprising 48 discrete Class A push-pull amplifiers, nine 59-position Cello rotary controls, and many premium, custom-made components.

The Audio Palette offers 6 bands of equalization, input level controls, phase reversal, low frequency blending, master output level control, and eq in/out switching.

Full specifications are available, but an audition of the Audio Palette speaks for itself.

### Controls:

Input Level: +5 to -22dB in .5dB steps

Output Level: +10 to -40 in 1dB steps, increments to off.

15Hz: +/-29dB in 1dB steps

120Hz: +/-14dB in .5dB steps

500Hz: +/-6dB in .25dB steps

2kHz: +/-6dB in .25dB steps

5kHz: +/-12dB in .5dB steps

25kHz: +/-24dB in 1dB steps

Absolute Phase: 0 deg, 180 deg, right 180 deg, left 180 deg.

Eq out, in, blend (same as in, but mono at 40Hz).

Monitor/Center: Optional features not normally supplied, i.e. second independent output level, filter, etc.

Input: 10kOhms balanced with 6dB gain, single ended input operation 10k and 100k input impedance, switchable gain 6, 12, 18 dB.

Output: +32dBzn balanced (+26 each side to ground).

Noise: more than 100dB below full output.

Distortion: typically at residual level of test instruments. .01% maximum.

Power consumption: 100 Watts.

## **Performance Amplifier**

The Performance Amplifier has outstanding detail, resolution, sound stage, and delicacy of sound with punch, control, and dynamics to fulfill the most demanding professional applications.

The Performance Amplifier is rated at 200 Watts into 8 Ohms. At clipping, it produces over 350 Watts into 8 Ohms, 700 into 4 Ohms, 1400 into 2 Ohms, and 1300 into 1 Ohm with ease. In bridge mode, 1.06 Volts is available for 1400 Watts into 8 Ohms, 2800 Watts into 4 Ohms.

The Performance Amplifier is a stereo system of four chassis comprising a mono power supply and mono amplifier per channel. The power supply is a dual choke input design. Unlike capacitor input supplies which utilize only the peaks of the AC waveform, the choke input system uses the whole AC waveform and so is much more efficient. The audio amplifier employs 8 driver transistors and 40 250W output devices per channel on two electrically conductive heatsink tunnels cooled by two very quiet fans per chassis.

Input: Balanced 3-pin Fischer connector

Input impedance: 1M $\Omega$   
5k $\Omega$

Input sensitivity: 1.5 Volts for rated output

Output connections: 4 terminal strips in parallel, number 8 screws.

Power dissipation at idle: 400W per channel

## **The Amati Speaker System**

The Amati is a relatively compact full range speaker (27 x 20 x 10 inches) offering a number of advantages including natural tonal balance, wide dynamic range, extended response, good efficiency, high reliability, and modular stackable construction.

One outstanding feature of the Amati system is exceptionally low listener fatigue. This is a result of very low distortion driver complements and crossovers developed exclusively for this product. No one monitor speaker is right for everyone. The Amati does provide punch, reliability, and dynamic range previously found in horn speakers, with a natural tonal quality and transparency going far beyond most monitor systems used in the field. Stacks of two, three, or four Amatis per side can be created for larger spaces and ultra-wide dynamic range applications.

The Amati can be trusted even in the toughest professional recording and mastering environments. Amati field problems have been almost zero because quality has been maximized in every single design aspect. Careful examination of the Amati reveals no compromises in design or construction.

Four tweeters, four midranges, and one woofer are housed in a massively braced cabinet. Over 200 microfarads of pure polypropylene capacitors are used in each crossover board. The tweeter, midrange, and woofer crossover are separate for tri-wiring, but can be bussed together for 2-wire connection. The Amati harness has 3 red and 3 black wires in a single jacket (3 black wires attach to the amplifier with one lug, 3 red wires attach to the amplifier with one lug).

The Amati can be stacked in towers of 1, 2, 3, or 4 speakers per channel. One Performance Amplifier can drive 2 speakers per channel in normal or bridge mode. Granite stands are available which hold the speakers steady and offer a choice of elegant stone finishes.

Size: 27" wide, 20" tall, 10" deep.

Weight: 85 lbs.

Sensitivity: about 90dB, 2.83V

Impedance: 4 Ohms nominal, 2 Ohms above 5kHz

Maximum SPL: about 115dB 1 pair

121dB 2 pair

127dB 4 pair

(Greater dynamic range is obtained with bridged Performance Amplifiers)

### **Cello Strings cable**

Cello Strings balanced line interconnect cable features three Litz conductors, teflon dielectric, Litz shield, and special mechanical construction. Cello Strings have been selected by the most critical professionals because they provide better sound quality. Cello Strings are required to obtain full advantage from Cello electronics.

Cello String cable requires solder pot stripping. Most users find it simplest to order Cello Strings ready made, but bulk cable is available for those who are prepared to deal with a solder pot.

### **Cello connectors**

Cello uses the Fischer 3-pin connector system because it offers performance and reliability far superior to conventional XLR connectors. Cello equipment can be provided with XLR connectors, however most studios are selecting the Fischer connectors and using Fischer to XLR cables where necessary. A series of adaptors converts Cello cables to unbalanced RCA (Cinch) connectors, or Cello can provide a premium RCA (Cinch) male line mount connector termination.

### **Cello 59-position control**

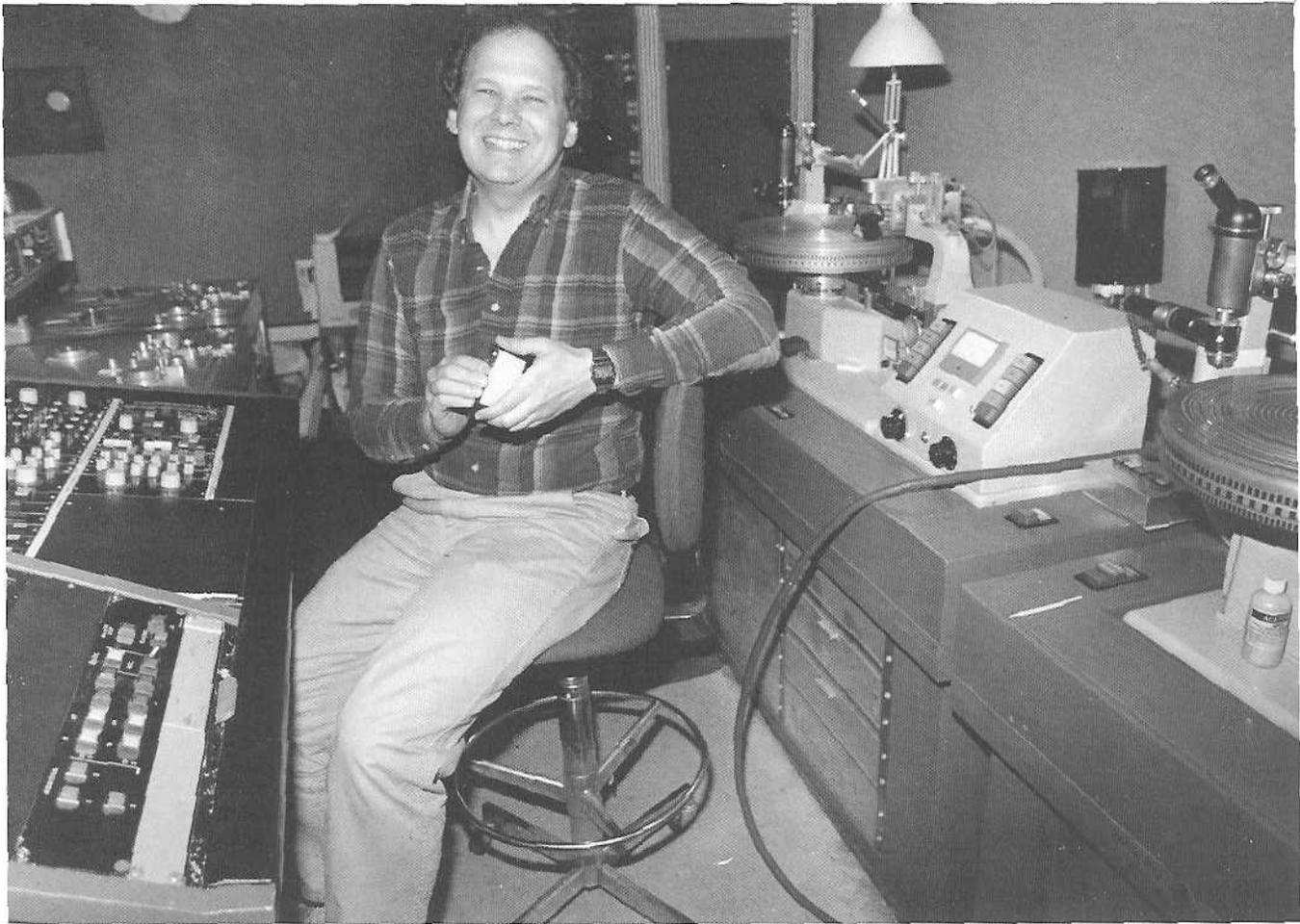
Cello has designed its own 59-position control to obtain sonic and practical advantages. Potentiometers have range but suffer from channel tracking problems, sonic degradation, and cannot be exactly calibrated for repeat settings. Step switches do not have enough positions to offer adequate range and resolution. The Cello control is made from machined brass parts, gold-over-nickel-over-copper circuit boards, palladium alloy contacts, precision metal film resistors (59 per deck), stainless steel precision-ground shaft and bushing, and other top quality materials. When you use a Cello control, you obtain sound quality, feel, and calibration which results in better, more efficient production, user-friendly convenience, and absolute accuracy.



**Michael Cuscuna — Mosaic Records**

"I've never used anything like Cello before because there's never been anything like Cello before. It's the first of a kind; the Palette completely enhances recordings without compromising anything — you lose nothing so you have your cake and eat it too. Normal EQ never even comes close to it — it's the difference between a Model T and a Maserati."

Mosaic Records uses the Audio Palette.

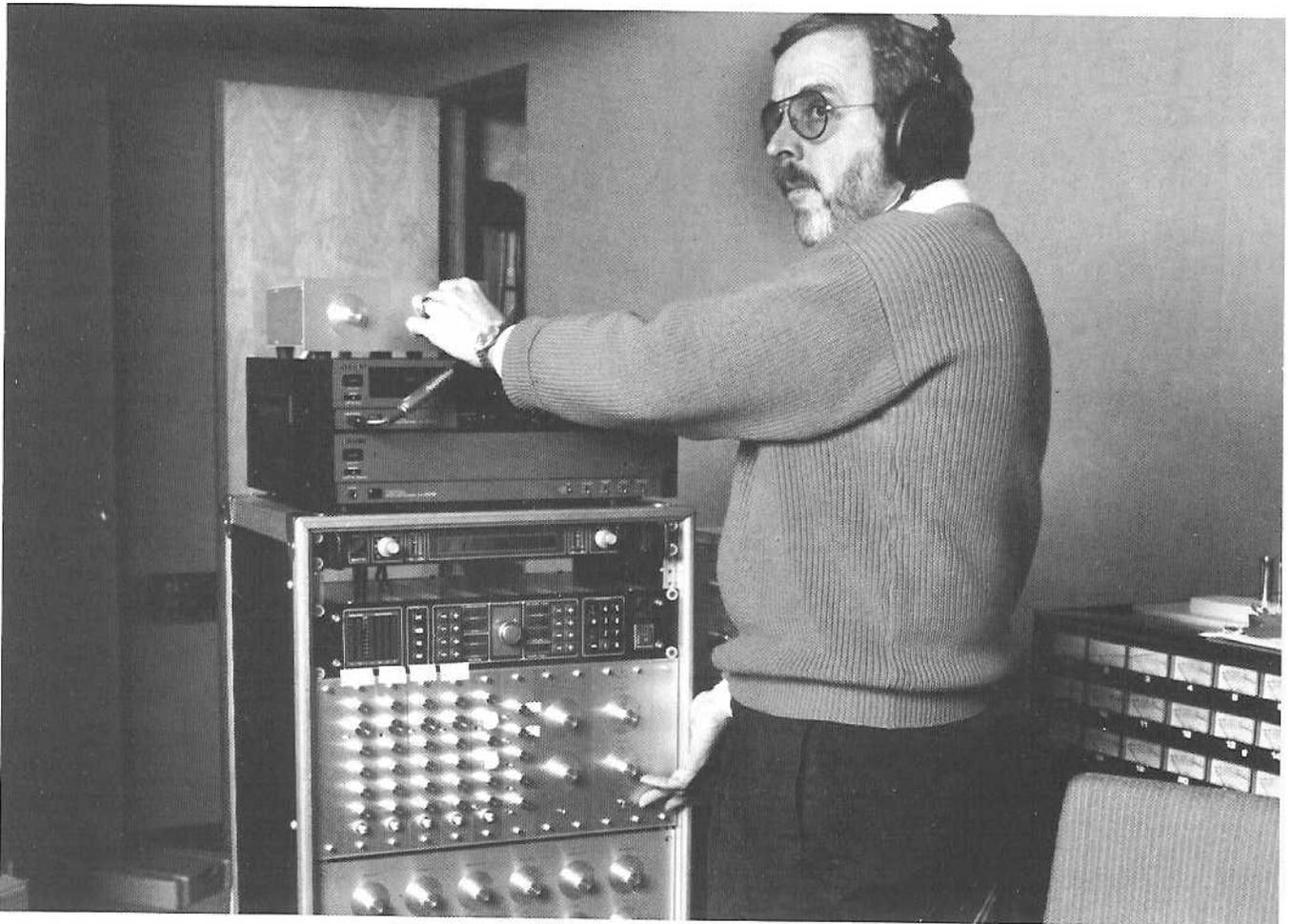


**Bob Ludwig — Masterdisk**

"It sounds as if a compression was removed from the chain. The Cello tape electronics are smoother sounding and have more depth to the sound than the Studer electronics. There's a high degree of craftsmanship in the construction."

"The combination of the tape amplifier, Performance Amplifier, and Cello Strings represents the most musical playback I've ever heard."

Masterdisk uses the Audio Suite with P603 and P301 modules, bridged Performance Amps, and Cello String cables.



### **Tom Jung – Digital Music Products**

"I used the more conventional professional recording electronics consoles with mixers and was extremely unhappy with their sonic qualities. Cello's design is of the highest order. It's built strong and well. It's high quality construction and superior design yield a real superior product. Sonically and musically I really haven't heard anything that sounds better. Nothing is perfect — but Cello's close!"

Digital Music Products uses the Audio Palette, Etude, and Audio Suite with custom 20-channel mixer.



### **Dennis Drake – Polygram**

"We really like the solid stereo imaging, the wide soundstage, and the very nice depth it gives to the transfer. These are the sonic qualities we use it for. We used it recently on an older Rod Stewart transfer. The Palette really seemed to bring his voice to life: the 5kHz control did such a great job on the vocal compared to how it was on the master: the curve on that control is excellent for adjusting the vocal balance within the track. The Palette is built to a high degree of engineering standards that embodies excellent musical accuracy."

"The Performance Amplifier took the stereo sound field of our monitoring system into a whole new dimension. A greater depth and a more exacting sense of instrument localization was immediately evident. After many hours of in-studio use, I am still amazed at the effortless reproduction and eminent musicality of these amps."

Polygram uses the Audio Palette, Audio Suite with 4-channel tape electronics, and Performance Amps.



**Ted Jensen — Sterling Sound**

"I listened for 10 seconds and said — I want this! But an informed decision takes times so I used it and listened to it in my standard production routine for several days. The other Sterling engineers and I quickly agreed it was the single largest sonic improvement to come down the line in years. So we bought 5 units — one for each mastering room. We continue to be impressed with the incredible resolution of detail and natural transparency and our clients are very happy about the improvement Cello makes to the sound of their final product."

Sterling Sound uses the Audio Suite with modules P603 and P301 for each of their five mastering rooms.



Nat Johnson — RCA

"We use the Palette exclusively and find it absolutely indispensable. We are simply able to achieve consistently higher levels of quality than we could before we had it. With other EQ it is always a matter of compromise. You hear the curve at work and feel constrained to a predefined sonic envelope. The Palette never imposes itself on the music. In addition to it being utterly transparent you have the feeling using it that it is infinitely variable. Bass with the Palette is solid — never "tubby". The 15Hz control allows you to bring in the right amount — however much or little that is. Operating the Palette and listening with it is a musical, rather than a technical experience. The budget line of CD's we've done using the Palette are getting great reviews."

RCA uses the Audio Palette and Etude.



**Steven Innocenzi — Atlantic Studios**

"The Palette is incredible. Nothing I've used, including the latest digital EQ, approaches its musicality. Even in tough, tricky situations where I would normally "notch" with a parametric I prefer what I can get with the Palette. So I use it on everything. Where I can bypass the board going from the final mix to the Palette and then directly to the digital master. I think it's very interesting that reviews of CD's I've mastered or remastered with the Palette frequently rave about sound quality."

Atlantic Studios uses the Audio Palette.



### **Christa Maria Bilz — Sonomaster**

"We have been impressed by the Cello monitoring system since it was installed by Mark and we do not know of any system that comes close to it. This is also the opinion of all of our customers. It is the first system that sounds as transparent as an electrostatic speaker and has the punch of a dynamic system. During playback of master tapes we can immediately rate the recording. With this excellent monitoring system we are able to detect imperfections that have not been heard during recording and mastering in other studios. The Cello monitoring system is so precise also in respect of its phase characteristics that none of our editing points have to be corrected."

Sonomaster uses the following equipment in their studios:

Main Editing Room: The Audio Palette, Performance Amps, Audio Suite, and Cello String cables.

Second Editing Room: The Audio Palette, Encore Power Amp, one pair of Amati Speakers with granite stands.

Reference System: Double Amati Speakers with granite stands, bridged Performance Amps, Audio Palette, Audio Suite, and Cello String cables.