



**CRYSTAL CABLE INTEGRATED**



## **A NEW TAKE ON INTEGRATED AMPLIFICATION...**

Crystal Cable's engineers wanted to make an amplifier that equals or surpasses separate component amplifiers. The Crystal Cable designers also wanted a compact cabinet fitting all practical situations in a living room. It should be purely analog to reach the highest performance. And it should provide enough power for all normal loudspeakers including ESL's. Its dynamic range should suite the current 24bit resolution at normal listening levels. So many challenges to take...It took from 2012 till mid-2016 to reach all goals.

### **THE FIRST CHALLENGE...**

#### **The heating and cooling of class A circuits**

The most effective cooling principle is chimney cooling. For this to operate successfully a certain ratio between diameter and height was needed.

Some may remember the Cubic prototype at 2014 CES.

The cooling was insufficient for what was then a 100W amplifier.

By increasing the height and slightly slimming the design, now full 200W per channel can be achieved (or 300W at 4 Ohms). At normal dynamic playing levels the passive cooling is sufficient, even though every channel is in a high class-A mode. At laboratory testing a very silent fan helps push the air up the chimney faster. So the chimney proved an excellent and very efficient way to lose the heat without the need for ventilator at practical use.

### **THE SECOND CHALLENGE...**

#### **Low noise and high dynamic range at your typical listening level.**

A normal volume control is usually placed at the input of an amplifier. This causes higher thermal noise varying with the volume setting. Lowering the impedance would short the connected sources like CD player.

To largely make the performance volume independence, our engineers opted for a double amplifier. The first amp perfectly amplifies all incoming signals. This amplifier is an ultra-silent and wide band, wide dynamic class A amplifier, capable to deliver about 125Vpp into the volume control.

This volume control is unique. Its very low impedance means thermal noise is brought back to an absolute minimum. Further the input signal is first amplified ten times before entering the volume control, so that possible losses and noise due to the switches are subsequently reduced 10 times.

Volume controls come in many shapes and forms. Digital, analog slider, mechanical switch, light controlled and relay switch. The latter is universally recognized as the best but also most expensive.

## FOR AN EVEN BETTER SOUND, MORE HAD TO BE DONE....

In our engineers' view no manufacturer yet took thermocouple noise into account. This is a well know problem; if two metals make contact, a differential temperature will generate a fixed offset voltage. The solution is that all thermocouple signal changes are neutralized by using a balanced order of metal-to-metal contacts. The sum of thermal errors is designed to be zero. The full effect of all measures are clear when listening to the amplifier. Never before so much is heard in known recordings. This shows that all measures correctly preserve fine detail as it should.



The result is a single chassis amplifier whose advanced circuitry and technology allows it to rival the musical performance of many high-end separates at many times its price - in a compact, place anywhere package of unprecedented practicality and versatility.

A complete error detection prevents the amplifier from overload and fully protects any connected loudspeaker. All protection systems have auto recovery. The amplifier is maintenance free. However dust build-up over the years could block or reduce the airflow inside. This will not damage the amplifier but the higher inner temperature could activate the fan. (Normally when switch on the amp, a built in fan blows out most dust for a few seconds). So occasional checking and vacuuming the bottom plate should ensure maximum cooling.

## TECHNICAL DETAILS

Amplifier DF=200 (20-20k)

Frequency range DC-200kHz

Cross talk >80dB (not final)

IM > 0.003% @ 10W in 8 Ohm

Square wave overshoot=0% (best) Capacitive load stable (for ESL)

Output noise at zero volume <12uV IHF-A

Power consumption will playing average efficiency loudspeaker at 95dB 100W (Class-A)

Max power consumption 600VA

Power in Standby 22W

Power full off <0.1W

## MATERIALS:

- Full aluminum body, anodized and/or gold plated.
- PCboards gold plated, produced by ESA company for outstanding reliability (European Space Agency)
- In and outputs gold plated.
- Inner wiring for audio Crystal Cable's **MONOCRYSTAL ABSOLUTE DREAM**
- All resistors designed for audio (Japan)
- Ultra-low ESR (Japan) capacitors for low noise power supply.
- Ultra-low noise relays for input and output switching.  
(life 10 million operations)



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