Crown Field Support Engineering

Issue Date: 15 May 2014
Ref. No: STB GEN Proportional Speed Fans #0004
Subject: Various modes of fan operations used in Crown amplifiers

Applicability: The following information lists both current and legacy amplifiers with the type of fan mode functionality were used in their designs.

Over the years Crown has used various designs for cooling amplifiers. Some designs the fans ran all the time, some on demand or proportional with heat and even convection cooled. This note is providing just an overview as to which models of Crown amplifiers have which type of fan mode operation starting with current models leading to legacy models.

Current Models

XLi Series; (Same as "X" models purchased through Guitar Center and their affiliates)

Fan Design; Forced Air, Front to Back air flow. These models the fans run at a low speed and ramp up as temperatures increase. Once cooled down they will remain running at the low speed operation.

XLS Drive Core Series; (1000, 1500, 2000 and 2500 models)

Fan Design: Proportional with heat, Front to Back air flow. The fan will only turn on as needed. The output heat sinks need to reach 53c before the fan will turn on and will ramp up in speed as the temperature increases. Once cooled down below 53c the fan will turn off.

XTi/CDi/DSi Series

Fan Design: Proportional with heat, Front to Back air flow. This line as the above XLS Drive Core series, the fan will only turn on as needed. The factory default mode of operation, the fan will also turn on when the output heat sinks reach 53c and ramp up in speed as the temperature increases. Once cooled down below 53c the fan will turn off. Now this line of amps has fan mode options which no other amps have. You have options to have the fan turn on at 33c but not fully turn off until 27c or to have run full speed all the time. For information on these options see *STB Cequel Fan Configuration #0001*. This bulletin explains how to change fan mode operation.

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Drive Core Install Series: (Includes Analog and Network versions)

Analog: Fan Design: Proportional with heat, Front to Back air flow. The fans will run as needed based on temperature. As heat increases the fan will ramp up and ramp down and turn off when cooled down.

Network: Fan Design: Continuously variable Front to Back air flow: At power up the fans will run until the amplifier goes into ready mode. At that point the fans run at a low speed and ramp up as temperature increases and ramps down to the low speed as it cools down.

CTs Series: (Includes 2-CH and Multi-Channel models)

CTs600/1200: Fan Design: Proportional with heat, Front to Back air flow. These two models the fans will run as needed. As the temperature increases the fans will ramp up and ramp down to an idle state as the amp cools down.

CTs2000/3000: Fan Design: Continuously variable Front to Back air flow: These two models being Class I design and with the option of the USP4CN and PIPBLU cards, the fan mode of operation changed for proper cooling of the amplifier and PIP cards during idle times. The fans on these amps will run at a low speed and ramp up as temperature increases and ramp down as to cools to low speed mode. ***Note: Early models of the CTs2000/3000 the fans performed the same way as the CTs600/1200 models listed above. The fan mode can be changed by a service modification if needed*.****

CTs4200/8200: Fan Design: Proportional with heat, Front to Back air flow. The CTs4200A model of amps, a firmware change to the microprocessor changed the fan mode operation to run at a low speed all the time to help keep the optional USPCN version and keep the low voltage power supply run cool at idle times. The fan will ramp up as temperature increases and ramp back down to the low speed as it cools. The CTs8200A model, this amp has 4 fans internal, 1 Power supply side, 3 in the output side. They are design as proportional with heat and will only run as needed. By the layout design of this amplifier and how the it's being used in the application, fans only turn on as needed based on the temperature of the individual output channels. For example; if only 2 channels are actually being used and passing audio, only the fans that are by those output modules will run. Others could remain in the idle state until required.

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MAi/ITHD/IT4HD Series: Fan Design; Continuously variable speed, Front to Back air flow. The amplifiers within these two lines, being Class I design and marketed for touring applications. The fan has a true tachometer feedback for fan fault protection and precise control over thermal performance. At first power up the fans will run until the amplifier goes to sleep then the fans will ramp down to an idle state. Once signal is applied or the amplifier comes out of sleep mode the fans will ramp up as needed based on temperature and ramp down in speed as it cools down.

Legacy Models

***PB/CSL/PT/MT/MA Series:** Excluding the MA5000/5002VZ)

Fan Design: Always running full speed. Front intake, exhaust air out the sides. The fans in this line of amplifiers were also a low voltage power supply. They referred to the fan as a fanformer, you cannot just replace these fans with a simple AC voltage based fan as it has a low voltage power supply designed in to create the +/-15V for the amplifiers logic circuits.

***CT and CT10 Series:** Fan Design; Proportional with heat. Front intake, exhaust air out the sides. The fans in these amplifiers are driven by the ODEP circuit. As the amplifier heats up the ODEP voltages would drive the fan as to how fast the fan would run. **Exception is the CT200 or CT210 models; these shipped from the factory as convection cooled amp. The fan for this model was an option.**

MA5000/5002VZ Series: Fan Design: Proportional with heat. Front to Back air flow. The fans in these models also work of the ODEP circuit but they don't have a built in low voltage power supply. These fans as typical AC rated box style fans

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CE/CH/CL Series: Fan Design; Proportional with heat. Front to Back air flow. Fan will turn on based on thermal sensor imbedded on the output heat sinks. Once cooled down the fan will go back to idle mode.

***MR/SMR Series: :** Fan Design: Proportional with heat. Front to Back air flow. The fans in these models also work of the ODEP circuit but they don't have a built in low voltage power supply. These fans as typical AC rated box style fans

Xs Series: Fan Design: Proportional with heat. Front to Back air flow. The fans will run as needed. As the temperature increases the fans will ramp up and ramp down to an idle state as the amp cools down.

ITech Series: Fan Design; Continuously variable speed, Front to Back air flow. At first power up the fans will run until the amplifier goes to sleep then the fans will ramp down to an idle state. Once signal is applied or the amplifier comes out of sleep mode the fans will ramp up as needed based on temperature and ramp down in speed as it cools down.

Definitions for (*) under Legacy models:

PB=Power Base, CSL same just different overlay. PT=Power Tech, MT=Micro Tech, MA=Macro Tech, CT=Com Tech, MR=Macro Reference, SMR= Studio Marco Reference