

# 320D Compellor®

## Dual Mono/Stereo Automatic Level Controller with Digital and Analog I/O

### The World Standard

Since the introduction of the original Compellor in 1983, no other audio level controller has met with such success. Around the world, in broadcasting, recording or sound reinforcement, the Compellor is specified more than any other level controller.

### Leading ApheX Technology

The Compellor circuits are totally unique. By throwing away all conventional design ideas, we created audio processing with unprecedented sound transparency, yet is exceedingly effective at controlling levels. Because our designs are patented, no other company has been able to match the performance. Algorithms like our exclusive "DVG", "DRC", and "FDL" have yet to find any rivals.

### Unmatched Reliability

ApheX engineering and manufacturing produces products that last and last without need for repairs or calibration. Some Compellors have literally been in 24-hour use in the same rack for a decade or longer! When you specify a Compellor, you know it will do its job flawlessly and give you peace of mind.

### Digital Advancements

The first Compellor was introduced in 1983 as an analog product. Because of their advanced technology, most of those older units are still in regular use. Since that time, newer models have been produced, still in analog form. Digital technology of today promises many improvements in user interfaces, and sometimes in sound quality, but not in audio processing algorithms. No digital processor can match an analog Compellor for sound quality and effectiveness. Nevertheless, many of today's sys-

tems need a Compellor that can interface to digital audio. With the model 320D, ApheX brings you just that. You get all the advantages of the analog processor with AES3 connectivity.

### Compression - Leveling - Limiting: A Very Brief Tutorial

Two properties of audio that can cause problems are the average level (the "loudness"), and unpredictable peaks that can clip. The Compellor handles both problems for you, fitting the sound into an ideal sound envelope package.

The Compellor's "Frequency Discriminate Leveler (FDL)" section with the "Dynamic Verification Gate (DVG)" and the "Silence Gate (SG)" slowly corrects the volume level of an audio stream with very complex algorithms that hide its work. It works differently at different frequencies, for example. It locks up when the sound stops, and resumes instantly when sound reappears. When you listen, you know the levels are made more even, but you don't perceive the levels are shifting.

The Compellor's Variable Slope Compressor with the "Dynamic Recovery Computer" and the "DVG" work on top of the leveling platform to add adaptable compression that helps match the texture of changing audio sources. Again, you don't hear "pumping" or other compressor artifacts. Just very natural sound that is evenly consistent in loudness.

The Compellor's limiter acts on peaks that shoot beyond typical audio crest factors. Extremely peaky sounds will be brought into an envelope that is easy to handle by any analog or digital recording or transportation medium including digital codecs.

### Typical Uses

Broadcast pre-processing, MP3 encoding, Recording, Installed and Mobile Sound, DAW Input, Mastering, Satellite Uplinks, Home Stereo, Ham Radio, Background Music, Tape Duplication, Cable TV.

## Features

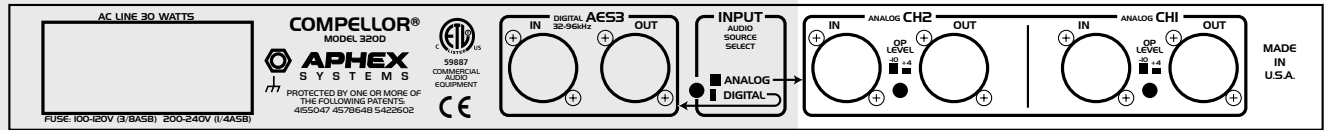
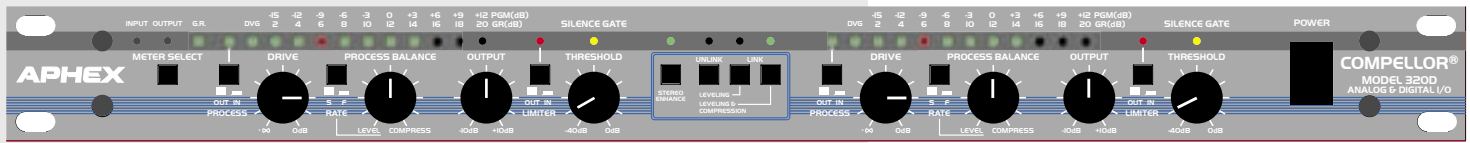
- **Frequency Discriminate Leveler**  
No bass pull-back in music
- **Dynamic Release Computer**  
Adds compression intelligently smoothing out transitions.
- **Dynamic Verification Gate**  
adds greater transparency
- **Silence Gate**  
Locks gain when audio stops
- **Process Balance**  
Lets you have any combination of leveling and compression
- **True Bypass**  
No electronics in bypass
- **AES3 I/O**  
up to 96kHz
- **Analog I/O**  
Fully professional balanced
- **High Reliability**  
Famous ApheX engineering
- **Stereo & Dual Mono**  
Use as two separate channels or linked for stereo
- **Source Select**  
Chose digital or analog input
- **Dual Outputs**  
Use both digital and analog outputs at the same time with either input selected



*Improving The Way The World Sounds*

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# 320D Compellor

## Get the Best of Both Worlds

### DUAL MONO or STEREO

The 320D converts between acting as two independent mono processors and one linked stereo processor by front panel selection. This is true with both analog and digital I/O.

### ANALOG or DIGITAL IN, ANALOG and DIGITAL OUT!

The 320D serves as a fine A to D converter with processing. When you use the analog input, the digital output contains the Compellor's processing and is therefore ready for use in almost any application. Conversely, the 320D serves as a fine D to A converter. When you use the digital input, the analog output contains the Compellor's processing, and is properly leveled and packaged.

### ANALOG and DIGITAL AUDIO INTERFACES

The professional analog audio inputs and outputs are fully balanced and adapt to consumer or professional operating levels at the touch of a button. Analog or digital source selection is made at the rear panel.

For digital interfacing, the 320D contains a high quality 24-bit low noise codec to receive digital audio and to transmit digital audio. Once the incoming digital audio is converted by the DAC section, it passes through the Compellor as normal audio. The audio output is then converted back into digital by the ADC section of the codec.

The rear panel AES3 jacks are standard professional XLR 110 ohm interfaces. There is no word clock input or output. Synchronizing is accomplished from the AES3 input signal or an internal clock. When a digital input is present, the output is synchronized to the input sample rate. If no digital input is present, the digital output automatically locks to the internal default sample clock. The user can specify the default sample rate by changing the internal crystal. Spare crystals for 32kHz, 44.1kHz, 48kHz, and 96kHz are supplied with the unit free of charge.

The Model 320D codec translates the -20dBFS level of the digital audio source to the 0dB reference within the Compellor circuits. The average output levels will target around -20dBFS. The selectable peak limiter's threshold translates to -6dBFS. Thus, no digital audio output peaks will rise above -6dBFS when the limiter is on. The combination of averaging the level around -20dBFS and holding peaks below -6dBFS packages the audio perfectly for natural sound quality and for most transfer or transmission purposes. For example, the digital audio would be ready for direct input to an MP3 coder, HD recorder, broadcast digital STL, .wav file, etc.

### ARCHITECT'S SPECIFICATIONS

A single rack space electronic audio level controlling device with both analog and AES3 digital audio I/O combining leveling, compression, and limiting for automatically and continuously correcting audio levels. The level controller shall be of such design as to reduce the audible artifacts of compression. It shall also be of such design as to prevent the rising of background noises when the audio source stops producing sound. The leveling function shall adapt discriminately to frequencies in a manner to reduce the impression of bass sounds losing impact in music. The compression function shall contain a means to adapt itself to the peak factor of sound so as to improve the consistency of volume levels. The limiter shall operate at a threshold 14dB above the 0VU reference level. Digital and analog audio outputs shall be simultaneously available. The input shall be switchable between the analog and digital sources. The AES3 I/O shall operate normally at sample rates from 32kHz to 96kHz.

### SPECIFICATIONS

#### 5.1A ANALOG INPUTS

Connector: 3 pin XLR female  
 Type: transformerless, servo balanced, RFI filtered  
 Impedance: 22K-ohms balanced, 11K-ohms unbalanced  
 Operating Level: user selectable +4dBu or -10dBV  
 Max input level: +27dBu(ref = +8), +25dBu(ref = +4), +10.8dBV(ref = -10)  
 CMRR: >90dB/100Hz, >70dB, 1KHz, >50dB, 20KHz

#### 5.1B DIGITAL INPUT

Connector: 3 pin XLR female  
 Type: transformer balanced  
 Impedance: 110 ohms

#### 5.2A ANALOG OUTPUTS

Connector: 3 pin XLR male  
 Type: electronic servo balanced (unbalanced without 6dB loss)  
 Impedance: 65 ohms bal or unbal (nominal load 600 ohms or greater)  
 Max level out (bal): +25dBu(ref = +4), +10.8dBV(ref = -10)  
 Max level out (unbal): +20dBu(ref = +4), +10.8dBV(ref = -10)

#### 5.2B DIGITAL OUTPUTS

Connector: 3 pin XLR male  
 Type: transformer balanced  
 Impedance: 110 ohms

#### 5.3 AUDIO

Frequency response: +/- 1dB 10Hz to 65KHz  
 Hum & noise: measured for a 1KHz tone at unity gain  
 No gain reduction: -67dBu(ref = +4), -86dBV(ref = -10)  
 10dB gain reduction: -74dBu(ref = +4), -89dBV(ref = -10)  
 Crosstalk @ 20KHz: -65dBu(ref = +4), -78dBV(ref = -10)  
 Dynamic THD: typically .05% for 1KHz at 20dB gain reduction  
 Static THD: .025% at maximum output level  
 IMD, max output: .13%(ref = +4), .4%(ref = -10)

#### 5.4 SYSTEM FUNCTIONS

Compression  
 Frequency Discriminate Leveling  
 Peak Limiter  
 Dynamic Verification Gate (DVG)  
 Dynamic Recovery Computer (DRC)  
 Silence Gate  
 Stereo Enhance

#### 5.5 THRESHOLD

Compressor: 30dB below nominal level  
 Leveler: 30dB below nominal level  
 Limiter: 14dB above nominal level

#### 5.6 RATIO

Compressor: 1:1 to 3:1 program dependent  
 Leveler: 20:1  
 Limiter: >30:1

#### 5.7 ATTACK TIMES

Compressor: 5 to 50mSec program dependent  
 Leveler, fast: 20Hz = 1.5 Sec > 1KHz Frequency Discriminate Leveler  
 Leveler, slow: 20Hz = 5 Sec > 1KHz Frequency Discriminate Leveler  
 Limiter: 1 uSec

#### 5.8 RELEASE TIMES

Compressor: 200 mSec to 1 Sec program dependent  
 Leveler, fast: 3 Sec  
 Leveler, slow: 10 Sec  
 Limiter: 200 mSec

#### 5.9 DIGITAL AUDIO

Input SR: Locks to 44.1, 48, 88.2, 96kHz +/- 3%  
 I/O Type: AES/EBU 110 ohms XLR  
 Default Output SR: User definable by replacing crystal; 48kHz standard  
 Word Clock: Not Supported

#### 5.10 OTHER SPECIFICATIONS

AC input: IEC standard receptacle with voltage selector, fuse, & filter  
 Power requirements: 100-120-220-240VAC, 50-60Hz  
 Power input (max): 20 watts  
 Dimensions: 19"W x 1.75" H x 10.125" overall depth  
 depth behind front panel = 9.25"  
 Net weight: 8 lbs.  
 Shipping weight: 9 lbs.

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