



A sleek, black, rectangular electronic device, possibly a portable music player or a small amplifier, is shown against a dark background. The device features a series of horizontal metallic ridges or a brushed metal finish. In the center, the text "BACH-SP" is displayed in a stylized, white, sans-serif font. Below the main body, there is a row of small, rectangular ventilation slots. The device is resting on a dark, reflective surface, which creates a subtle reflection of the unit.

BACH-SP

Professor Edgar Y. Choueiri

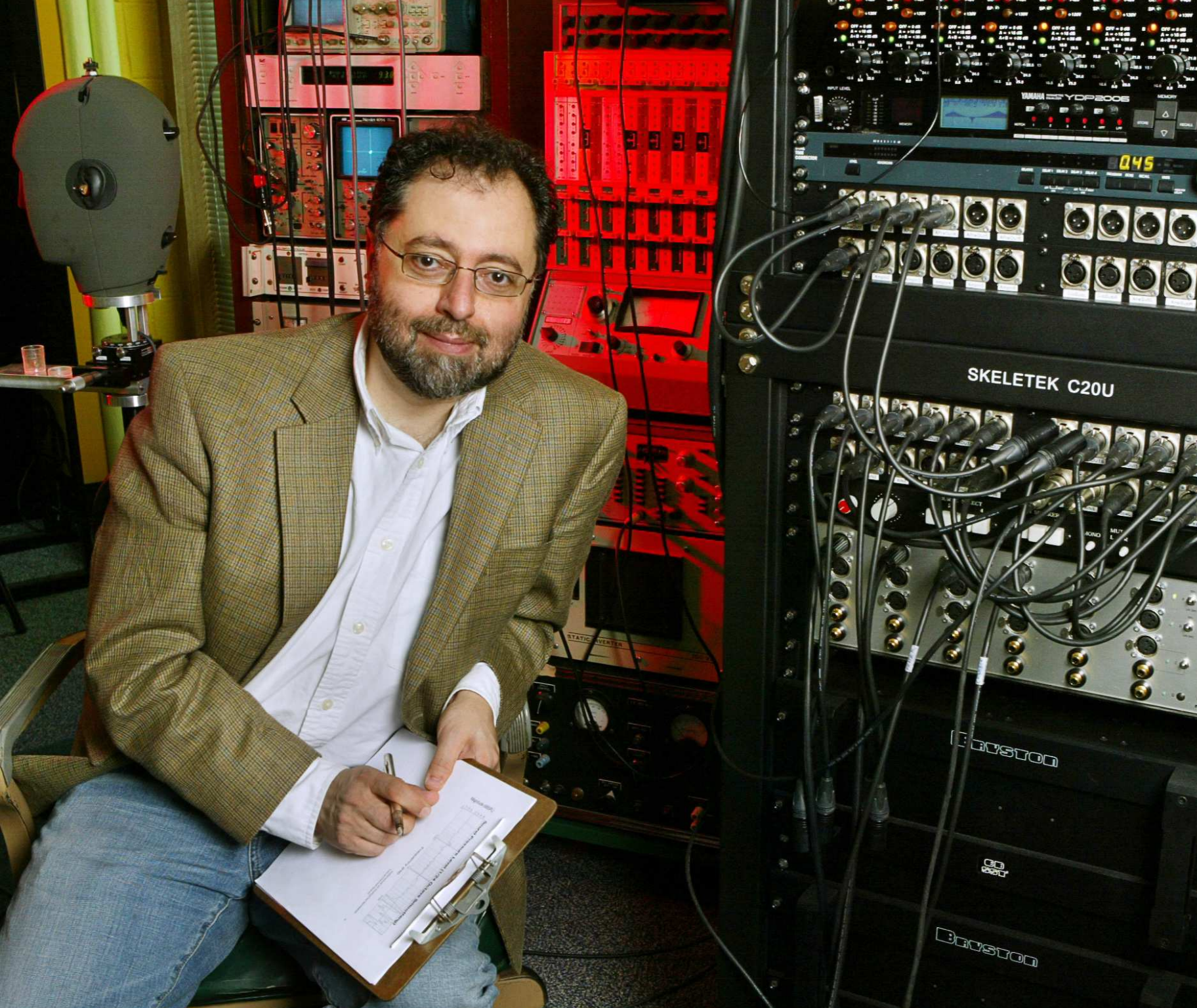
The Inventor, The Scientist, The Brain and The Soul of BACCH[®].

Professor Edgar Choueiri, is a professor of applied physics at the Mechanical and Aerospace Engineering Department of Princeton University, and Associated Faculty at the Department of Astrophysical Sciences, Program in Plasma Physics. He is also Director of Princeton University's Engineering Physics Program and Chief Scientist at the university's Electric Propulsion and Plasma Dynamics Lab, a recognized center of excellence in research in the field of advanced spacecraft propulsion. He is also the director of Princeton's 3D Audio and Applied Acoustics (3D3A) Lab.

Professor Choueiri is a world-renown leader in the field of plasma physics and plasma propulsion for spacecraft. He is the author of more than 150 scientific publications, and encyclopedia articles on plasma rockets, plasma physics, instabilities and turbulence in collisional plasmas, plasma accelerator modeling, space physics and applied mathematics. He has been the Principal Investigator (PI) in more than 30 competitively selected research projects (including two space experiments), funded by NASA, the US Air Force the National Science Foundation, and other governmental and private institutions. He is Fellow of the American Institute of Aeronautics and Astronautics and the recipient of many awards and honors including a knighthood.

An avid audiophile, acoustician and classical music recordist, his decades-long passion for perfecting the realism of music reproduction has led him to work on the the difficult fundamental problem of designing advanced digital filters that allow the natural 3D audio to be extracted from stereo sound played through two loudspeakers, without adding any spectral coloration to the sound (i.e. without changing its tonal character). He was able to solve this problem mathematically by applying analytical and mathematical tools he uses in his plasma physics research.



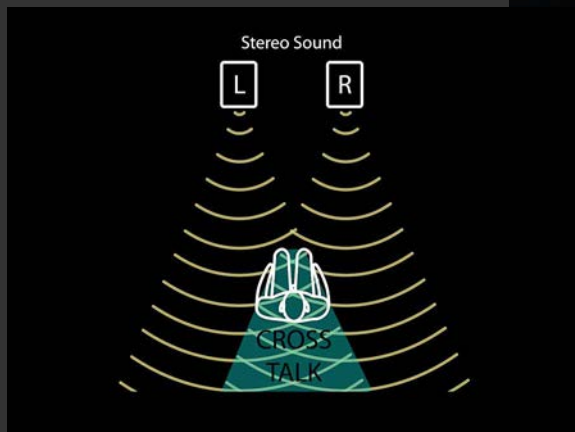




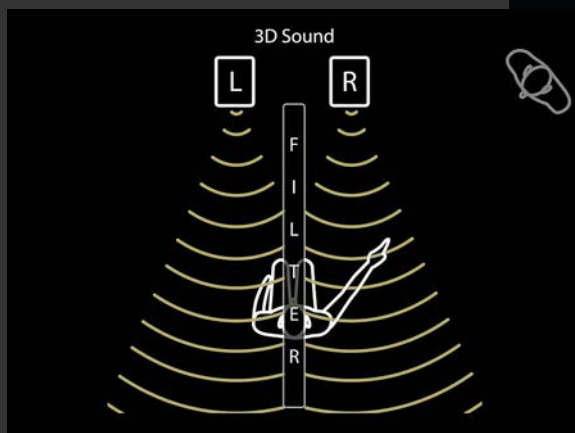
BACC

H-SP

Jeffrey R. Rasmussen



With BACCH[®], ITDs and ILDs can be properly restored



BACCH-S



BACH-SP





BACH-SP





I/OBACCH PurifierTest SignalsMeasure IRSpeakers EQXOAdvancedShutdownXTC PlotsHead Tracker

Save settings on mother unit

Test Connection

CROSSOVER NETWORK

Get present settings from mother unit

Bypass

(Out 1 = Out 2 = Out 3)

Senders

20 Hz

LF (Out 2)

XO = 172 Hz

HF (Out 1)

22 kHz

2-Band XO

LF (Out 3)

XO = 94 Hz

HF (Out 1)

3-Band XO

LF (Out 3)

XO1 = 237 Hz

MF (Out 2)

XO2 = 818 Hz

HF (Out 1)

LF Band Attenuation

-13.7 dB

8th

5th

4th

1st

XO and XO1 Filter Order

MF Band Attenuation

0 dB

8th

5th

4th

1st

XO2 Filter Order

HF Band Attenuation

0 dB

Battery:100%

BACCH-SP™

Designed & Developed by Prof. Edgar Choueiri
Theoretica Applied Physics, LLC

I/OBACCH PurifierTest SignalsMeasure IRSpeakers EQXOAdvancedShutdownXTC PlotsHead Tracker

Save settings on mother unit

Test Connection

Load Audio Files from Mounted Drive

Get present settings from mother unit

Analog Gain

Hi Gain

+4 dBu

-10 dBV

Sample Rate (kHz)

44.1

48

88.2

96

176.4

192

Get Thermal Data

Inside Air Temp: 54 °C

CPU Temp: 76 °C

Fan Speed: 1797 RPM

5000 RPM

BACCH Designer Engine Settings

NORMAL

STEREO DIPOLE

Refresh BACCH Filters

Refresh Internal Links

Resync Audio

Relaunch Internal Player

Relaunch BACCH Filter Design Engine

Relaunch Audio Processing

Clock Source

Internal

Digital In

Word In

Finish Remote Update

Battery:100%

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I/OBACCH PurifierTest SignalsMeasure IRSpeakers EQXOAdvancedShutdownXTC PlotsHead Tracker

Save settings on mother unit

ON

0.5 m

0.75 m

1.0 m

1.5 m

2.0 m

OFF

Get present settings from mother unit

Box Size

1

Camera Tilt

High

Normal

Low

0.42

Head Recognition Threshold

Top Limit: 369

Head Tracking: 1 Head Multiple heads

Find Head

Bottom Limit: -381

Left Limit: -403

124 (mm)

Right Limit: 347

2358 Back Limit

1675 (mm)

Z

Test Connection

Restart BACCH-SP

Shut down BACCH-SP

Battery:100%

BACCH-SP™

Designed & Developed by Prof. Edgar Choueiri
Theoretica Applied Physics, LLC

Battery:100%

BACCH-SP™

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Theoretica Applied Physics, LLC





Specifications:

Digital I/O: AES/EBU (XLR) or AES-3id (BNC) or S/PDIF (RCA) or S/PDIF (TOSLINK) and USB

Analog I/O: XLR, TRS, RCA (-10dBV, +4dBu, High Gain)

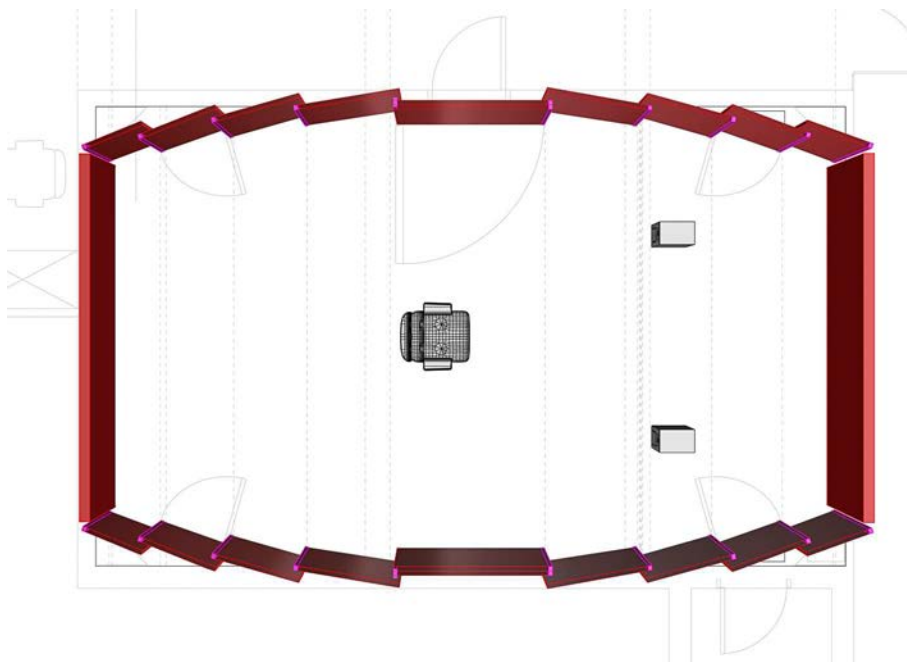
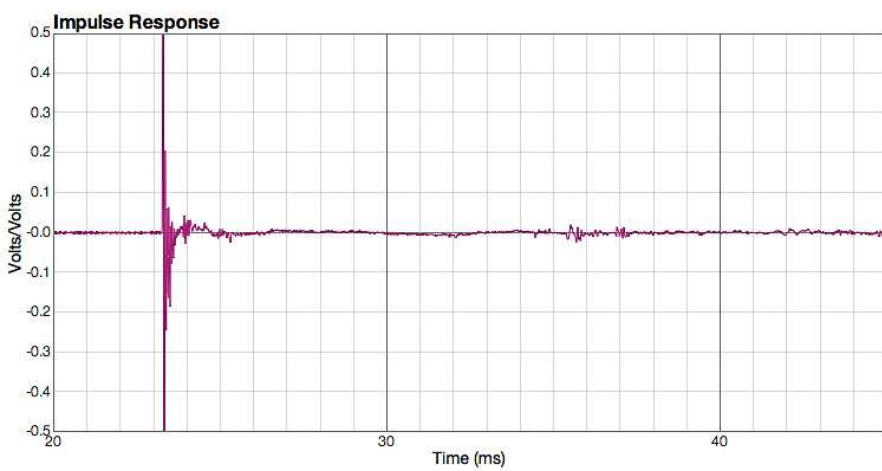
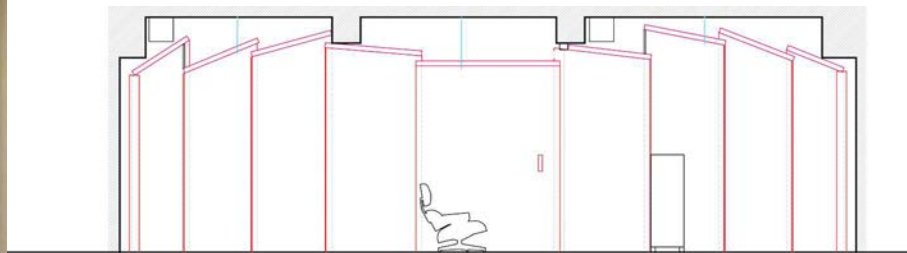
Word Clock In & Out (BNC)

24-bit Audio, 64-bit Processing | Sampling Rates: 44.1, 48, 88.2, 96, 176.4 & 192 kHz

Dedicated iPad as Remote Control | Remote Technical Support and Maintenance through the Internet (Wired Ethernet)

SNR: 113 dBA; THD: <-105 dB, < 0.0005%; Channel Separation: >110 dB; Max Input Level +19 dBu; Input Impedance: 10 kOhm









For more information about BACCH[®] 3D Audio or the BACCH-SP, please
contact MASIS Audio



www.masisaudio.com

BACCH[®] is a registered trademark of Princeton University

U.S. provisional patent application 61/379,891, and
PCT patent application PCT/US2011/50181



The BACCH-SP is an audiophile-grade BACCH[®] 3D Audio Processor
manufactured by Theoretica Applied Physics, Princeton, USA.



