

## PAVO Labs, L.L.C.

*PAVO is an R&D firm specializing in digital technologies for arts and entertainment. Since 1989, we have developed digital audio, MIDI, IEEE 1394, concealed data, and computer control technologies for use in pro audio gear, consumer electronics, and musical instruments.*



*PAVO's technologies are used in many hot, new audio products*

*In addition to our IP (intellectual property) licensing program, PAVO provides product design services under contract to our OEM partners. These products have earned nearly US\$100 million in sales revenue for our customers.*

*First in Audio...since 1394™*

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PAVO

## IP Licensing Program and Design Services

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Arts and Entertainment



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PAVO

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# PAVO's IP Portfolio

PAVO is positioned to become the premier source of licensable technologies for the home and professional audio industries by capitalizing on:

- a technological and market lead in important new digital technologies, including IEEE 1394
- an unequaled engineering development team
- international patents and trade secrets
- close relationships with industry leaders such as Microsoft, Crystal Semiconductor, Analog Devices, Nippon Columbia/Denon, Harman, Rane, Lucid/Symetrix, and many others
- key positions held on standards committees, including the 1394 Trade Association, IEC, CEMA, CEDIA, DVD Forum, MMA, and AES.

PAVO's licensing model is simple and uniform:

1. For an NRE fee, we customize the relevant PAVO Reference Design to your functional specification.
2. After PAVO's prototype is accepted, both companies sign a License Agreement; Licensee pays PAVO a one-time license fee.
3. All documentation is delivered to Licensee.
4. Licensee develops the product using PAVO's sustaining engineering services.
5. Licensee pays royalties to PAVO every quarter, based on units sold; minimum royalties apply for the first two years of production.
6. A one-time "re-use" license fee is paid to PAVO for each additional design/model number manufactured using PAVO's technology.



*PAVO brings new digital technologies to arts and entertainment!*

## **BiDAT™**

### ***Bidirectional Data-over-Audio Transceivers***

- Designs for line-level, high-power, guitar/mic level, and PC audio level
- Data signal does not interfere with audio signal
- Full duplex, bidirectional signal tested up to 56Kbit/s
- Very low cost per transceiver, modest space requirements
- Operates over conventional audio or speaker cables
- Line-powered option eliminates the need for additional wiring.



## **Realm™**

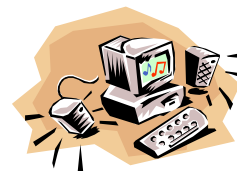
### ***Recordable Data-Encoded Audio***

- Data is recorded with audio on Red Book CDs
- Data retrieved from analog output of any CD player
- Very low per unit cost for decoding circuitry
- Data signal does not interfere with audio signal
- Allows for data to be synchronized with audio.

## **PAWST™**

### ***PAVO Audio Watermarking System***

- Discreet—does not perceptibly interfere with audio
- Robust—watermark integrity/extractability survives through lo-fi conditions, including broadcast radio
- Secure—watermark can not be removed or altered
- Accepted—approved for use by major TV broadcast networks
- Proven—currently in use by a major media research company.



## **Digital Harmony Pro™** ***IEEE 1394 Audio/Video/Control***

- 400 Mbit/s transmission over selectable channels
- Compatible with mLAN protocol for audio+MIDI
- Supports PCM, Dolby Digital, DTS, MP3, DV, MPEG-2, etc.
- Bridges to legacy control protocols
- Supports all industry standard word lengths
- Plug and Play compatibility with Microsoft WDM 1394 audio class driver
- Papaya™ 1394 Audio Reference Designs are available for evaluation.



## **WireFree™ (available Q1 2000)** ***10Mbit/s Wireless Audio***

- Revolutionary technology addresses new FCC DTV frequency allocations
- Suitable for multichannel microphones, home theater/cinema systems, electric guitars, sound reinforcement loudspeakers.



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