FORM PTO-1595

4-13-00

05-12-2000

|||||||||||||||||||||||||||||
101354686

IEET

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

Attorney Docket No.

To the Honorable Commissioner o. .... record the attached original documents or copy thereof.

1. Name of conveying party(ies): Crystal Semiconductor Corporation 4210 S. Industrial Drive Austin, Texas 78744 Additional name(s) of conveying party(ies) attached? [ ] Yes [X] No	2. Name and address of receiving party(ies): Name: CIRRUS LOGIC, INC. Address: 4210 S. Industrial Drive Austin, Texas 78744

3. Nature of conveyance:

[X] Assignment   [ ] Merger
[ ] Security Agreement   [ ] Change of Name

Other:

Execution Date: March 22, 2000

Additional name(s) & address(es) attached? [ ] Yes [X] No

4. Application number(s) or patent number(s):

A. Patent Application No.(s)

B. Patent No.(s) 4,709,225; 4,746,899; 4,748,418; 4,804,863; 4,805,198; 4,849,662; 4,851,841; 4,918,454; 4,939,516; 4,941,156; 4,943,807; 4,988,954; 5,012,244; 5,039,989; 5,055,846; 5,061,925; 5,068,660; 5,079,550; 5,087,914; 5,088,107; 5,111,451; 5,117,200; 5,121,080; 5,140,279; 5,150,386; 5,157,395; 5,172,115; 5,187,390; 5,196,850; 5,198,782; 5,208,597; 5,212,659; 5,220,483; 5,239,210; 5,245,344; 5,247,210; 5,248,970; 5,257,026; 5,258,758; 5,268,651; 5,274,375; 5,319,319; 5,319,370; 5,339,067; 5,351,050; 5,376,936; 5,397,944; 5,412,348; 5,440,305; 5,475,323; 5,477,481; 5,497,122; 5,528,239; 5,541,599; 5,541,864; 5,579,247; 5,583,501; 5,585,763; 5,590,065; 5,594,439; 5,594,442; 5,594,612; 5,608,676; 5,621,339; 5,631,900; 5,642,078; 5,644,098; 5,644,257; 5,644,308; 5,652,585; 5,665,929; 5,668,794; 5,696,708; 5,698,805; 5,744,739; 5,748,040; 5,748,684; 5,751,179; 5,764,753; 5,767,722; 5,777,909; 5,777,912; 5,787,029; 5,818,370; 5,824,936; 5,825,244; 5,886,658; 5,917,917; 5,923,273; 5,960,401; and 5,978,825.

Additional numbers attached? [ ] Yes [X] No

5. Name and address of party to whom correspondence concerning document should be mailed: Name: CIRRUS LOGIC, INC. - Legal Dept. Address: 4210 S. Industrial Drive. Austin, Texas 78744	6. Total number of applications and patents involved: 91
	Total fee (37 CFR 3.41):$ 40.00 X 91 = $3,640.00 [ ] Enclosed [X] Authorized to be charged to deposit account, if necessary
	8. Deposit account number: 03-2028

DO NOT USE THIS SPACE

9. Statement and signature.
To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Peter T. Rutkowski
Name of Person Signing
Registration No. 32,627

Peter T. Rutkowski
Signature

April 4, 2000
Date

Total number of pages including cover sheet, attachments, and document: 4

05/10/2000 DNGUYEN 00000377 032028 4709225

01 FC:581   3640.00 CH

Express Mail Label No.

C:\WINDOWS\TEMP\ASSIGNMENT COVER SHEET.DOC

ASSIGNMENT OF PATENT RIGHTS

For the sum of ten dollars ($10.00) and other good and valuable consideration, Crystal Semiconductor Corporation ("Crystal"), a Delaware Corporation, having a place of business at 4210 S. Industrial Drive, Austin, Texas 78744, hereby sells, assigns and transfers to Cirrus Logic, Inc., ("Cirrus Logic") a Delaware Corporation, having a place of business at 4210 S. Industrial Drive, Austin, Texas 78744, its successors and assigns, one half (50%) of the entire right, title and interest in and to:

A. United States Patent Nos.: **4,851,841** Gain scaling of oversampled analog-to-digital converters; **4,746,899** Method for reducing effects of electrical noise in an analog-to-digital converter, and **5,220,483** Tri-level capacitor structure in switched-capacitor filter except with respect to all rights of Crystal in the pending litigation between Crystal Semiconductor Corporation and Opti, Inc., TriTech Microelectronics International, Inc., and TriTech Microelectronics International Pte Ltd., which rights Crystal expressly retains, and

B. United States Patent Nos.:
1. **5,978,825** Zero detection circuitry and methods 2. **5,960,401** Method for exponent processing in an audio decoding system 3. **5,923,273** Reduced power FIR filter 4. **5,917,917** Reduced-memory reverberation simulator in a sound synthesizer 5. **5,886,658** Serial port interface system and method for an analog-to-digital converter 6. **5,825,244** Low power class AB integrated circuit amplifier having improved linearity when driving high impedance loads 7. **5,824,936** Apparatus and method for approximating an exponential decay in a sound synthesizer 8. **5,818,370** Integrated CODEC with a self-calibrating ADC and DAC 9. **5,787,029** Ultra low power multiplier 10. **5,777,912** Linear phase finite impulse response filter with pre-addition 11. **5,777,909** High pass filter with coefficient switching to improve settling time 12. **5,767,722** Delta sigma switch capacitor filter using curent feed forward 13. **5,764,753** Half-duplex controller 14. **5,751,179** Output driver for PCI bus 15. **5,748,684** Resynchronization of a synchronous serial interface 16. **5,748,040** Fully differential high gain cascode amplifier 17. **5,744,739** Wavetable synthesizer and operating method using a variable sampling rate approximation 18. **5,698,805** Tone signal generator for producing multioperator tone signals 19. **5,696,708** Digital filter with decimated frequency response 20. **5,668,794** Variable gain echo suppressor 21. **5,665,929** Tone signal generator for producing multioperator tone signals using an operator circuit including a waveform generator, a selector and an enveloper 22. **5,652,585** Multiple function analog-to-digital converter with multiple serial outputs 23. **5,644,308** Algorithmic analog-to-digital converter having redundancy and digital calibration 24. **5,644,257** Sampling circuit charge management 25. **5,644,098** Tone signal generator for producing multioperator tone signals 26. **5,642,078** Amplifier having frequency compensation by gain degeneration 27. **5,631,900** Double-Talk detector for echo canceller 28. **5,621,339** Method and apparatus for removing trapped oxide charge from a differential input stage 29. **5,608,676** Current limited current reference for non-volatile memory sensing 30. **5,594,612** Analog-to-digital converter with digital linearity correction 31. **5,594,442** Configuration programming of a digital audio serial port using no additional pins 32. **5,594,439** Diagnosing problems in an electrical system by monitoring changes in nonlinear characteristics 33. **5,590,065** Digital decimation filter for delta sigma analog-to-digital conversion with reduced hardware compelexity 34. **5,585,763** Controlled impedance amplifier 35. **5,583,501** Digital-to-analog converter with digital linearity correction 36. **5,579,247** Method and apparatus for decreasing the interference and noise

sensitivity of a ratiometric converter type of circuit 37. **5,541,864** Arithmetic-free digital interpolation filter architecture 38. **5,541,599** Data independent loading of a reference in a discrete time system 39. **5,528,239** Low noise transmission of output data from a delta-sigma modulator 40. **5,497,122** Low power class-AB integrated circuit amplifier 41. **5,477,481** Switched-capacitor integrator with chopper stabilization performed at the sampling rate 42. **5,475,323** Amplifier with input common mode compensation 43. **5,440,305** Method and apparatus for calibration of a monolithic voltage reference 44. **5,412,348** Compound triple cascoded mirror 45. **5,397,944** Dense offset calibration circuitry and method 46. **5,376,936** One-bit switched-capacitor D/A circuit with continuous time linearity 47. **5,351,050** Detent switching of summing node capacitors of a delta-sigma modulator 48. **5,339,067** Integrated voltage divider and circuit employing an integrated voltage divider 49. **5,319,370** Analog-to-digital converter with a continuously calibrated voltage reference 50. **5,319,319** Low drift resistor structure for amplifiers 51. **5,274,375** Delta-sigma modulator for an analog-to-digital converter with low thermal noise performance 52. **5,268,651** Low drift resistor structure 53. **5,258,758** DAC shutdown for low power supply condition 54. **5,257,026** Method and apparatus for calibrating a multi-bit delta-sigma modular 55. **5,248,970** Offset calibration of a DAC using a calibrated ADC 56. **5,247,210** Method and circuitry for decreasing the recovery time of an MOS differential voltage comparator 57. **5,245,344** High order switched-capacitor filter with DAC input 58. **5,239,210** Low distortion unity gain amplifier for DAC 60. **5,212,659** Low precision finite impulse response filter for digital interpolation 61. **5,208,597** Compensated capacitors for switched capacitor input of an analog-to-digital converter 62. **5,198,782** Low distortion amplifier output stage for DAC 63. **5,196,850** Fourth order digital delta-sigma modulator 64. **5,187,390** Input sampling switch charge conservation 65. **5,172,115** Ratiometric A/D converter with non-rationometric error offset 66. **5,157,395** Variable decimation architecture for a delta-sigma analog-to-digital converter 67. **5,150,386** Clock multiplier/jitter attenuator 68. **5,140,279** Slew rate enhanced linear amplifier 69. **5,121,080** Amplifier with controlled output impedance 70. **5,117,200** Compensation for a feedback amplifier with current output stage 71. **5,111,451** Method and apparatus for synchronizing an optical transceiver over a full duplex data communication channel 72. **5,088,107** Linear channel bandwidth calibration circuit 73. **5,087,914** DC calibration system for a digital-to-analog converter 74. **5,079,550** Combining continuous time and discrete time signal processing in a delta-sigma modulator 75. **5,068,660** Combining fully-differential and single-ended signal processing in a delta-sigma modulator 76. **5,061,925** Phase equalization system for a digital-to-analog converter utilizing separate digital and analog sections 77. **5,055,846** Method for tone avoidance in delta-sigma converters 78. **5,039,989** Delta-sigma analog-to-digital converter with chopper stabilization at the sampling frequency 79. **5,012,244** Delta-sigma modulator with oscillation detect and reset circuit 80. **4,988,954** Low power output stage circuitry in an amplifier 81. **4,943,807** Digitally calibrated delta-sigma analog-to-digital converter 82. **4,941,156** Linear jitter attenuator 83. **4,939,516** Chopper stabilized delta-sigma analog-to-digital converter 84. **4,918,454** Compensated capacitors for switched capacitor input of an analog-to-digital converter 86. **4,849,662** Switched-capacitor filter having digitally-programmable capacitive element 87. **4,805,198** Clock multiplier/jitter attenuator 88. **4,804,863** Method and circuitry for generating reference voltages 89. **4,748,418** Quasi auto-zero circuit for sampling amplifiers 91. **4,709,225** Self-calibration method for capacitors in a monolithic integrated circuit

Executed this 22nd day of March, 2000.

_____
Crystal Semiconductor Corporation

Position: PResident i CEO

STATE OF TEXAS   §
   §
COUNTY OF TRAVIS   §

    On March 22, 2000, before me, _Crystal J. Levesque_ personally appeared _David D. French_ personally known to me or proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal:

[seal]

CRYSTAL J. LEVESQUE
MY COMMISSION EXPIRES
April 15, 2003
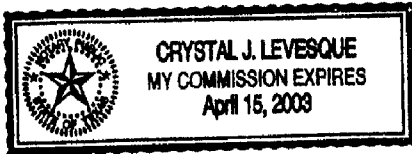
Crystal J. Levesque
NOTARY PUBLIC
By and for the State of _Texas_
My Commission expires: _April 15, 2003_

3