

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

DIFF SCALE OPERATION RESEARCH,  
LLC,

Plaintiff,

v.

CYPRESS SEMICONDUCTOR  
CORPORATION,

Defendant.

**Civil Action No.** \_\_\_\_\_

**JURY TRIAL DEMANDED**

**COMPLAINT FOR PATENT INFRINGEMENT**

DIFF Scale Operation Research, LLC (“Plaintiff”), by its undersigned counsel, brings this action and make the following allegations of patent infringement relating to U.S. Patent Nos.: 7,881,413 (the “’413 Patent”); 6,664,827 (the “’827 Patent”); and 6,721,328 (the “’328 Patent”) (collectively, the “Patents-in-Suit”). Defendant Cypress Semiconductor Corporation (“Cypress” or “Defendant”) infringes each of the Patents-in-Suit in violation of the patent laws of the United States of America, 35 U.S.C. § 1 *et seq.*

**INTRODUCTION**

1. This case arises from Cypress’s infringement of a portfolio of semiconductor and network infrastructure patents. This patent portfolio arose from the groundbreaking work of ADC Telecommunications, Inc. (“ADC Telecommunications”).

2. In 1935, ADC Telecommunications, then known as the Audio Development Company<sup>1</sup> was founded in Minneapolis, Minnesota by two Bell Laboratory engineers to create

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<sup>1</sup> Audio Development Company was later renamed ADC Telecommunications, Inc. *U.S. Senate Executive Reports*, U.S. PRINTING OFFICE at 39 (1999) (“The story of ADC Telecommunications begins in 1935, the height of the great depression . . . . The company got its start with a new innovation called the audiometer, an electronic device designed to test hearing.”).

custom transformers and amplifiers for the broadcast radio industry. In the 1950s, ADC Telecommunications began to produce jacks, plugs, patch cords, and jack fields, which would be cornerstones for ADC Telecommunications' later entry into telecommunications equipment.<sup>2</sup>

3. In the late 1990s, ADC Telecommunications pioneered the development of microchips and network switches for the burgeoning telecommunications industry.<sup>3</sup> ADC Telecommunications' products included fiber-optic video, data, and voice transmission systems, and its clients included all the major domestic cable TV operators, numerous phone companies, and a majority of TV broadcasters.<sup>4</sup>

4. Prior licensing of ADC Telecommunications' patents confirms the significant value of ADC Telecommunications' innovations. In 2011, HTC the Taiwan based smartphone manufacturer, bought a portfolio of 82 patents and 14 pending applications related to mobile technology from ADC Telecommunications.<sup>5</sup> HTC asserted two of these patents against Apple before the International Trade Commission.

Apple Inc. may face a difficult task invalidating two HTC Corp. patents for data transmission in wireless devices, a U.S. Trade Judge said at a trial that could lead to import bans on the newest iPad and the next version of the iPhone. ... In this case, though, HTC acquired the patents at issue in April 2011, around the same

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<sup>2</sup> *High Fidelity Audio Devices Boost Capitol Diskery Sales*, BILLBOARD MAGAZINE at 12 (August 8, 1950) (describing Audio Development Company's amplifiers).

<sup>3</sup> David Beal, *Seeing the Light; ADC Telecommunications Has Grown From Making Telephone Jacks And Plugs Into A Force For The Global Fiber-Optic Future*, ST. PAUL PIONEER PRESS at E1 (December 25, 1995).

<sup>4</sup> George Lawton, *Fiber Optic Architecture Evolution Evident at Cable-TV Exhibition*, LIGHTWAVE MAGAZINE (August 1, 1995) ("Cable-Tec Expo's exhibition area featured new fiber-optic products and technologies for the optical-fiber and cable-TV industries. For example, Minneapolis-based ADC Telecommunications Inc.").

<sup>5</sup> *HTC Buys Patents from ADC Telecommunications for \$75 million*, THE NATIONAL LAW REVIEW (April 19, 2011), available at: <https://www.natlawreview.com/article/htc-buys-patents-adc-telecommunications-75-million> ("HTC, the Taiwan based smartphone manufacturer, has bought a portfolio of 82 patents and 14 pending applications related to mobile technology from US based ADC Telecommunications.").

time it began selling its first LTE phone, the Thunderbolt. ***The patents are part of a portfolio HTC bought for \$75 million from ADC Telecommunications Inc.*** [Judge] Pender told McKeon. “They are a property right.”

Susan Decker, *HTC Patents Challenged by Apple Probably Valid, Judge Says*, BLOOMBERG NEWS (September 7, 2012) (emphasis added).

5. HTC’s assertion of two patents acquired from ADC Telecommunications was described by commentators as forcing Apple to the negotiating table following a series of lawsuits between Apple and HTC:

A separate case before the ITC may have ***forced Mr. Cook to the negotiating table*** after a judge at the agency said Apple would be likely to face difficulty getting a series of HTC patents invalidated. ***HTC bought those patents, which covered technology used in LTE high-speed wireless devices, from ADC Telecommunications for US \$75 million.*** “The settlement is a big surprise and is likely due to HTC’s LTE patents, which is bought from ADC last year, as Apple’s LTE patents are relatively weak,” said Jeff Pu, an analyst from Fubon Financial Holding Co.

*Apple Settles HTC Patent Suits, Signaling Shift from Jobs’ War Plan*, FINANCIAL POST / BLOOMBERG NEWS (November 12, 2012) (emphasis added).

6. ADC Telecommunication’s revolutionary products included Homeworx Hybrid Fiber/Coax Access Platform (“ADC Homeworx”).<sup>6</sup> ADC Homeworx was an integrated broadband transport system that could deliver video, telephony, data, and other services over a network of fiber optic and coaxial cables.<sup>7</sup> The ADC Homeworx network utilized fiber-optic and radio frequency transmission technologies for transporting various services over a network.<sup>8</sup>

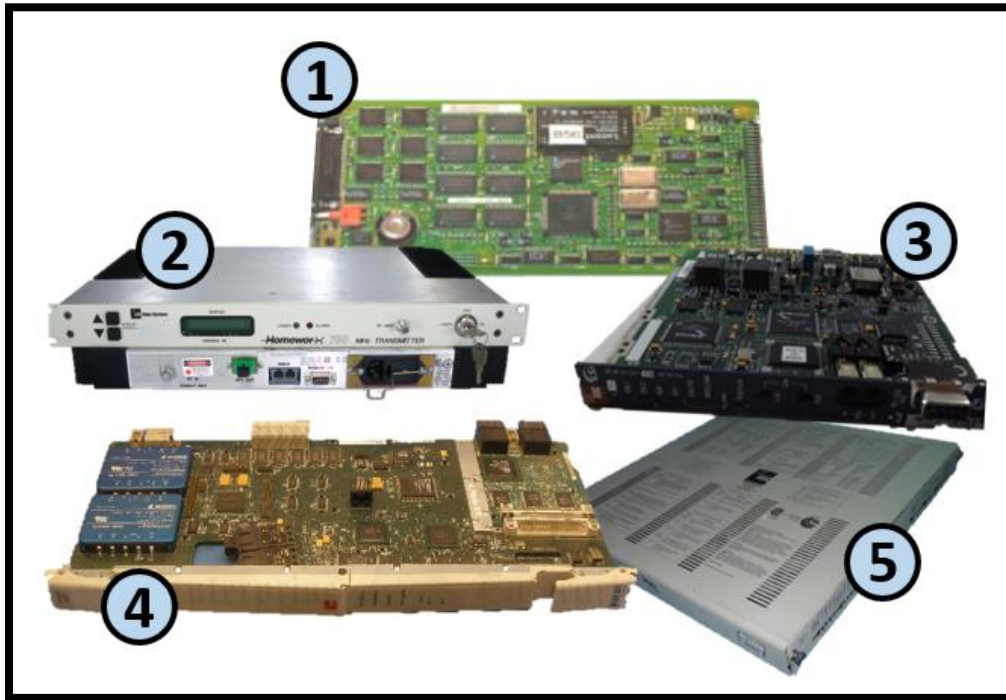
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<sup>6</sup> Sue Boyle, *Cable-Telephony Platform*, LIGHTWAVE MAGAZINE Vol. 17; No. 16 at 185 (September 1, 2000) (“The Homeworx cable-telephony system adds new features to the carrier-class hybrid fiber/coaxial telephony platform. The system offers improvements in flexibility, manageability, and robustness.”).

<sup>7</sup> *Homeworx HFC Access Platform Outdoor ISU-32 Integrated Services Unit Installation Manual*, ADC Telecommunications Manual at 1-1 (July 1999).

<sup>8</sup> *ADC AT&T Bis Team for Cable Telephony*, CABLE WORLD MAGAZINE Vol. 11 at 28 (May 31, 1999) (“The company’s Homeworx cable telephony platform has the largest capacity in the fledgling 6 MHz bandwidth channel compared to conventional telephone carriers.”).

ADC Telecommunications' groundbreaking products also included: the Soneplex Platform, CityCell, Cellworx STN Service, the EZT1 Voice Multiplexer, FOLENS (Fiber Optic Local Exchange Network System), and the DS3 Fiber Loop Converter.<sup>9</sup>



ANNOTATED GRAPHIC OF SELECTED ADC TELECOMMUNICATIONS PRODUCTS (numbered annotations showing: (1) ADC Soneplex SPX MPU Board MC68302; (2) ADC Homeworx 750MHz XMTR; (3) ADC HiGain HDSL4 Remote Unit H4TUR402L53; (4) ADC Cellworx BA4IKKLBA; and (5) ADC Telecommunications EZT1 Access Multiplexer).

7. By 1999, ADC Telecommunications had almost 10,000 employees and annual sales of 1.5 billion dollars. Although ADC Telecommunications was a leading innovator in its field, it was a mid-sized company in a market dominated by multinational corporations.<sup>10</sup>

<sup>9</sup> *Modems, Test Gear, Return Path Hot at Expo*, CED MAGAZINE (June 30, 1997), available at: <https://www.cedmagazine.com/article/1997/06/modems-test-gear-return-path-hot-expo> (“ADC Telecommunications introduced a new forward path receiver that extends performance to 860 MHz for cable TV and telephony applications.”).

<sup>10</sup> Barnaby J. Feder, *Optical Fiber (Almost at Home)*, N.Y. TIMES at F-6 (March 24, 1991) (“AT&T’s competitors range from giants like Alcatel of France and Fujitsu of Japan to mid-sized companies like ADC Telecommunications Inc.”).

8. A 1999 New York Times article on the telecommunication industry foreshadowed the difficulties that ADC Telecommunications would face when competing against much larger competitors who were able to use their market power to dominate the market at the expense of smaller players:

Cisco's is not the only approach in the M.M.D.S. broad-band data market, however. The company's wireless competitors will include Spike Technologies, ADC Telecommunications and Adaptive Broadband. But *Cisco's prominence as an Internet technology vendor, along with the powerful alliance it has built, could give the company an inside edge*, some analysts said.

John Markoff, *Cisco to Offer More Details on Wireless Technology*, N.Y. TIMES a C-1 (November 29, 1999) (emphasis added).

9. In 2015, ADC Telecommunications (including its foundational intellectual property) were acquired by CommScope, Inc. ("CommScope"). CommScope, a spin-off of General Instrument Corporation, manufactures optical fiber cabling, multiplexers, and telecommunications antennas.

10. To facilitate the licensing of ADC Telecommunications' technology, CommScope assigned 73 patents and patent applications covering ADC Telecommunications' pioneering innovations relating to electronic circuits for timing and network traffic management to DIFF Scale Operation Research. DIFF Scale Operation Research protects and licenses ADC Telecommunications' inventions, which are widely adopted by leading technology companies.

11. Highlighting the importance of the Patents-in-Suit is the fact that the Patents-in-Suit have been cited by over 600 U.S. Patents and Patent Applications by a wide variety of the largest companies operating in the field. For example, the Patents-in-Suit have been cited by companies such as:

- International Business Machines Corporation<sup>11</sup>
- Apple, Inc.<sup>12</sup>
- Intel Corporation<sup>13</sup>
- Broadcom Corporation<sup>14</sup>
- Microsoft Corporation<sup>15</sup>
- Sony Corporation<sup>16</sup>
- Cisco Systems, Inc.<sup>17</sup>
- Hewlett-Packard Enterprise Company<sup>18</sup>
- Huawei Technologies Co., Ltd.<sup>19</sup>
- Alcatel-Lucent S.A.<sup>20</sup>
- Fujitsu Ltd.<sup>21</sup>
- Panasonic Corporation<sup>22</sup>
- Telefonaktiebolaget L.M. Ericsson<sup>23</sup>
- NEC Corporation<sup>24</sup>
- Marvell Technology Group, Limited<sup>25</sup>

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<sup>11</sup> *See, e.g.*, U.S. Patent Nos. 7,894,478; 8,270,296; 8,559,460; 7,398,326; 7,827,317; 7,321,648; and 7,746,777.

<sup>12</sup> *See, e.g.*, U.S. Patent Nos. 9,026,680; 7,457,302; and 8,275,910.

<sup>13</sup> *See, e.g.*, U.S. Patent Nos. 7,248,246; 7,046,675; 7,263,557; 7,903,560; 8,233,506; 7,248,246; 6,507,915; 6,996,632; 7,346,099; and 7,673,073.

<sup>14</sup> *See, e.g.*, U.S. Patent Nos. 7,161,935; 7,203,227; 7,436,849; 7,724,661; 8,401,025; 8,411,705; 8,462,819; and 9,544,638.

<sup>15</sup> *See, e.g.*, U.S. Patent Nos. 7,526,677; 7,533,407; 7,793,096; 7,827,545; and 9,225,684.

<sup>16</sup> *See, e.g.*, U.S. Patent No. 8,200,873.

<sup>17</sup> *See, e.g.*, U.S. Patent Nos. 7,023,883; 7,523,185; 7,631,055; 7,653,924; 7,751,412; 8,144,591; 8,289,873; 8,379,648; and 8,811,281.

<sup>18</sup> *See, e.g.*, U.S. Patent Nos. 7,103,654; 7,187,674; 7,266,598; and 7,478,260.

<sup>19</sup> *See, e.g.*, U.S. Patent Nos. 7,664,051 and 7,916,758.

<sup>20</sup> *See, e.g.*, U.S. Patent Nos. 6,798,741; 6,895,004; 7,209,530; 7,525,913; 7,536,716; 7,583,689; 7,602,701; and 8,379,509.

<sup>21</sup> *See, e.g.*, U.S. Patent Nos. 6,647,012; 7,330,057; 7,450,505; 7,469,298; and 7,664,217.

<sup>22</sup> *See, e.g.*, U.S. Patent Nos. 8,648,632 and 7,457,979.

<sup>23</sup> *See, e.g.*, U.S. Patent Nos. 8,780,695 and 7,215,664.

<sup>24</sup> *See, e.g.*, U.S. Patent Nos. 6,218,875; 6,707,823; 6,810,497; 6,885,676; and 7,486,663.

<sup>25</sup> *See, e.g.*, U.S. Patent Nos. 7,733,588; 7,737,793; and 7,944,313.

**THE PARTIES**

**DIFF SCALE OPERATION RESEARCH, LLC**

12. DIFF Scale Operation Research, LLC (“DIFF Scale Operation Research”) is a limited liability company formed under the laws of Delaware. DIFF Scale Operation Research is committed to advancing the current state of electronic circuitry and network infrastructure.

13. Brooks Borchers, a former leader of research and development divisions at Boston Scientific Corporation, is the president and owner of DIFF Scale Operation Research, LLC.

14. In an effort to obtain compensation for ADC Telecommunications’ pioneering work in the fields of semiconductors, electronic circuitry, and network infrastructure, CommScope assigned the following patents and patent application to DIFF Scale Operation Research: U.S. Patents and Application Nos. 5,986,486; 6,008,734; 6,157,646; 6,216,166; 6,233,221; 6,363,073; 6,407,983; 6,433,988; 6,664,827; 6,721,328; 6,757,247; 6,847,609; 6,859,430; 6,940,810; 6,959,006; 6,980,565; 6,990,110; 7,106,758; 7,170,894; 7,239,627; 7,881,413; 8,121,455; US20010000071A1; US20020150108A1; US20020163886A1; US20020176411A1; US20020180498A1; US20020190764A1; US20030063625A1; US20030118033A1; US20070019686A1; US20100061686A1; US20100150515A1 and International Patents and Application Nos. AT519138T; AU199914551A; AU199923274A; AU199923353A; AU200134402A; AU2002309562A1; CA2442738A1; CA2447983A1; CA2447983C; CN1278969A; CN1289489A; CN1291414A; DE102007010863A1; DE102007010863B4; DE102007032186A1; DE202007008151U1; DK2132589T3; EP1031185A1; EP1050125A1; EP1057361A1; EP1386450A2; EP1386450A4; EP2132589A1; EP2132589B1; ES2368361T3; JP03811007B2; JP2001523059A; JP2002502146A; JP2002504793A; JP3811007B2; WO1999025066A1; WO1999038285A1; WO1999043184A1;

WO2001037468A2; WO2001037468A3; WO2002084927A2; WO2002084927A3;  
WO2002101959A1; WO2008104282A1; WO2008104284A1.<sup>26</sup>

15. DIFF Scale Operation Research pursues the reasonable royalties owed for Cypress's use of ADC Telecommunications' and CommScope's groundbreaking technology both here in the United States and throughout the world.

### **CYPRESS SEMICONDUCTOR CORPORATION**

16. On information and belief, Cypress Semiconductor Corporation ("Cypress"), is a Delaware corporation with its principal place of business at 198 Champion Court, San Jose, California 95134. Cypress may be served through its registered agent Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

### **JURISDICTION AND VENUE**

17. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has exclusive subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

18. Upon information and belief, this Court has personal jurisdiction over Cypress in this action because Cypress resides in the District of Delaware, and because Cypress has committed acts within the District of Delaware giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Cypress would not offend traditional notions of fair play and substantial justice. Defendant Cypress, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has

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<sup>26</sup> The patents were assigned to DIFF Scale Operation Research by CommScope DSL Systems, LLC and CommScope Technologies, LLC.



committed and continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the Patents-in-Suit.

19. Venue is proper in this district under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). Defendant Cypress is a Delaware corporation, and upon information and belief, has transacted business in the District of Delaware and has committed acts of direct and indirect infringement in the District of Delaware.

**ADC TELECOMMUNICATIONS LANDMARK SEMICONDUCTOR  
AND NETWORKING TECHNOLOGIES**

20. In 1935, ADC Telecommunications, then known as the Audio Development Company was founded in Minneapolis, Minnesota by two Bell Laboratory engineers to create custom transformers and amplifiers for the radio broadcast industry. In 1941, while participating in a project to develop a sophisticated audio system for Coffman Union at the University of Minnesota, ADC Telecommunications began to produce jacks, plugs, patch cords, and jack fields, which would be cornerstones for ADC Telecommunications' later entry into telecommunications equipment.<sup>27</sup>

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<sup>27</sup> James F. Mauk, INDUSTRIAL RESEARCH LABORATORIES OF THE UNITED STATES at 47 (1947) (listing the research activities of the Audio Development Company as “high temperature electronic transformers; miniaturization of electronic transformers; high frequency electrical wave filters, encapsulation techniques; epoxies”).



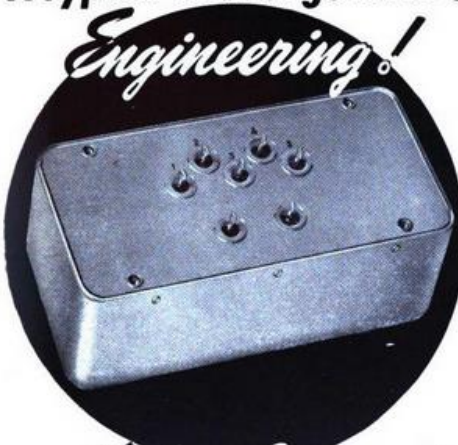
*High Fidelity Audio Devices Boost Capitol Diskery Sales*, BILLBOARD MAGAZINE at 12 (August 8, 1950) (describing Audio Development Company’s amplifiers).

21. In 1961, ADC Telecommunications released the Bantam jack. This product was an amalgam of miniaturized components and became standard for telephone circuit access and patching.<sup>28</sup>

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<sup>28</sup> Steven Titch, *ADC Unveils Loop Product Strategy*, TELEPHONY at 9 (February 24, 1992).

## A Typical Challenge to ADC Engineering!



### Multi-Channel NARROW BANDPASS FILTER UNITS

● Like many of the problems brought to the Audio Development Company, this one involved a definite performance improvement with reductions in size and weight.

From an originally specified maximum weight of 40 oz. for potted one-channel interstage filters, the weight of this ADC five-channel unit was reduced to less than 10 oz. per section, hermetically sealed. Volume was reduced by over 50%.

Electrical performance was improved to provide a midband gain of  $14 \pm 1\frac{1}{2}$  db when the original specifications permitted a loss from 0 to 6 db. In addition, attenuation characteristics were improved to provide approximately 25 db discrimination at 1/3 octave with bandpass  $\pm 1\%$  db over  $\pm 3\%$  of mid-frequency.

These filters are available in single or multi-channel units for frequencies from 200 cps to supersonic and carrier range. Frequencies lower than 200 cps are available with some size increase. Units can also be supplied in combination with high or low pass filters.

THREE-PHASE POWER (continued)

$$\left[ c + \frac{b - \sqrt{3}}{2(2 + b\sqrt{3})} \right]^{1/2} + \frac{1 + b\sqrt{3}}{2(2 + b\sqrt{3})}$$

The  $F^2 = 1$  curve for the lead shifter

$$a = \left\{ \left[ \frac{b\sqrt{b^2+1}}{4} \right]^2 - \left[ c + \frac{1}{4} \right]^2 \right\}^{1/2} + \frac{b^2 + 2}{4}$$

The 120-degree curve for the lag shifter

$$a = \frac{(2 + (b + 2c)\sqrt{3}) \pm \sqrt{(4 + 3b)^2 + 16c(b + c)}}{\sqrt{(4 + 3b)^2 + 16c(b + c)}/2}$$

The  $F^2 = 1$  curve for the lag shifter

$$a^2 - 4b^2 + a^2(2c^2 + 2bc + b^2 + 4) + a(4c^2 + 4bc + 2b^2) = -[c^2 + 2bc + c^2(b^2 + 4) + 4bc]$$

For each value of  $b$ , the first two equations determine a design point for the shifter on an  $a$ - $c$  plane. The

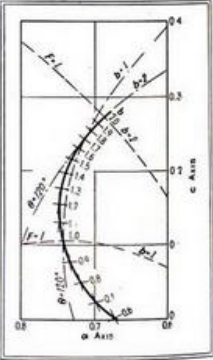


Fig. 2—Design curve for 120-degree lead shifter

*A Typical Challenge to ADC Engineering!*, ELECTRONICS MAGAZINE Vol. 18 at 288 (August 1945) (describing one of the early innovations of ADC Telecommunications).

22. In the 1960s, ADC Telecommunications began an ongoing partnership with NASA’s space missions, designing and manufacturing sensors for the Columbia space shuttle.

power supply board. The transceivers used are the CAF model manufactured by ADC Telecommunications, Inc.. The transceiver use bidirectional, full-duplex signal transmission over a single optic fiber. The transceiver is a self-contained, circuit-board-mountable device that contains the transmitting LED, the receiving photodetector, and the beam splitter. The transceivers are a matched pair which utilize two different light frequencies for receiving and transmitting. This configuration allows for full-duplex and bidirectional operation over a single fiber optic line. The optic fiber connects to the transceivers with SMA-type connectors.

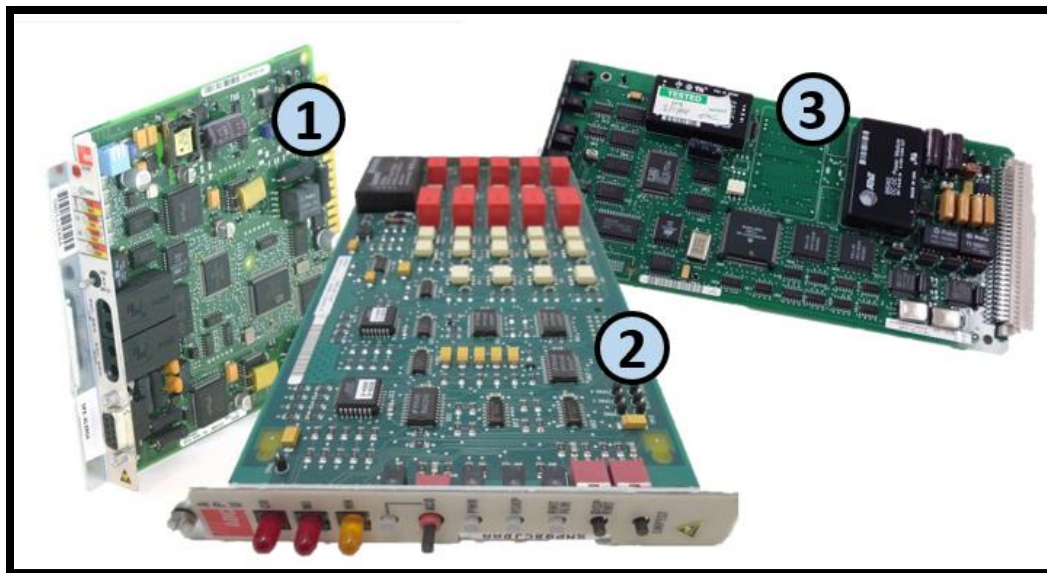
R. L. Glassell et al., *Custom Electronic Subsystems For The Laboratory Telerobotic Manipulator*, PROCEEDINGS OF THE FOURTH ANS TOPICAL MEETING ON ROBOTICS AND REMOTE SYSTEMS at 151 (1991) (describing the work ADC Telecommunications was doing for NASA).

23. The 1970s and 1980s ushered in technological advancement in all areas of telecommunications and data processing. Public and private computer use increased, and telecommunications evolved into the computer age, with telephonic digital transmission and the expansion of data communications. As a leading innovator in these fields, ADC Telecommunications grew dramatically. ADC Telecommunications entered the video services delivery market and was a leading supplier of fiber-optic video transmission equipment for cable operators.<sup>29</sup>

24. In the 1990's ADC Telecommunications utilized its fiber-optics expertise to develop a local loop system with the goal of providing economical fiber directly to private homes. ADC Telecommunications also created Networx, a novel transmission platform that integrated cable management and private networking products, using synchronous optical network and the asynchronous transfer mode (ATM). The cornerstone of Networx was Sonoplex, a multi-rate, multimedia system that brought fiber to the customer's work or residence site, while making use of existing copper lines.

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<sup>29</sup> Carol Wilson, *ADC Launches Fiber-Coax Platform*, TELEPHONY AT 11 (May 24, 1993).



ANNOTATED GRAPHIC OF SELECTED ADC SONOPLEX TELECOMMUNICATIONS PRODUCTS (numbered annotations showing: (1) SPX-HLXRG4 Sonoplex HDSL Module; (2) ADC SPX-APU0B1 SONEPLEX ALM Processor Module; and (3) ADC SPX-RLX1B1 CARD.).

25. In the 1990s, ADC Telecommunications partnered with South Central Bell, Mississippi Educational Television, Northern Telecom, IBM, and Apple Computer to create Fibernet, a network linking students at four high schools in Clarksville, Corinth, West Point, and Philadelphia, Mississippi, with teachers at Mississippi State University, Mississippi University for Women, and Mississippi School for Mathematics and Science to create “electronic classrooms.”

26. ADC Telecommunications became an “early leader” in the asynchronous transfer mode (ATM) market, developing some of the first ATM switches. The ADC Telecommunications ATM switch enabled the handling of the massive flows of simultaneous high-speed digital information that the industry projected would be generated during the latter half of the 1990s and into the 21st century, arising from the blending of the communications, computing, and entertainment industries. ADC Telecommunications also landed a coup in March 1994 when Ameritech chose ADC to supply equipment for its fiber-optic video system.

This \$4.4 billion project would bring 70 channels of analog television and 40 channels of digital video to customers, with unlimited program choices and interactive, customer-controllable programming. By 1999, ADC Telecommunications employed 9,700 people and was selling \$1.5 billion dollars in communications equipment.

### **THE ASSERTED PATENTS**

#### **U.S. PATENT NO. 7,881,413**

27. U.S. Patent No. 7,881,413 entitled, *Digital PLL with Conditional Holdover*, was filed on March 1, 2002, and claims priority to March 2, 2001. The '413 Patent is subject to a 35 U.S.C. § 154(b) term extension of 2,127 days. DIFF Scale Operation Research is the owner by assignment of the '413 Patent. A true and correct copy of the '413 Patent is attached hereto as Exhibit A.

28. The '413 Patent teaches novel phase locked loops (PLL) that provide for conditional holdover that is especially suited for use in communications networks.

29. The '413 Patent and its underlying patent application have been cited by 24 United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '413 Patent and its underlying patent application as relevant prior art:

- Fujitsu Ltd.
- Infineon Technologies AG
- Mediatek Inc.
- Schweitzer Engineering Laboratories, Inc.
- Silicon Laboratories Inc
- Sony Corporation
- Thomas & Betts International, LLC
- National Semiconductor Corporation
- L3 Communications Integrated Systems, L.P.
- Xilinx, Inc.
- Nortel Networks Limited
- Lattice Semiconductor

- Emerson Electric Co., Ltd.
- Furuno Electric Co., Ltd.
- Panasonic Corporation
- Huawei Technologies Co., Ltd

**U.S. PATENT NO. 6,664,827**

30. U.S. Patent No. 6,664,827 entitled, *Direct Digital Synthesizer Phase Locked Loop*, was filed on March 1, 2002, and claims priority to March 2, 2001. DIFF Scale Operation Research is the owner by assignment of the '827 Patent. A true and correct copy of the '827 Patent is attached hereto as Exhibit B.

31. The '827 Patent discloses phase locked loops for establishing a timing signal for signal communication synchronization. The various embodiments of the invention make use of phase locked loops adapted to filter and store data indicative of the control signal applied to an oscillator. Such phase locked loops permit suppression of tracking in the event of a step change in the phase difference between the reference clock signal and the feedback signal in the phase locked loop. Such phase locked loops further facilitate compensation for drift of the oscillator.

32. The '827 Patent teaches, in one embodiment, a phase locked loop that includes a digital phase comparator having a first input for receiving a reference clock signal, a second input for receiving a feedback signal, and an output for providing an error signal; a digital loop filter having an input for receiving the error signal and an output for providing a control signal; a numerically-controlled oscillator having an input for receiving the control signal and an output for providing a timing signal, wherein the feedback signal is derived from the timing signal.

33. The '827 Patent teaches detecting a step change in a phase relationship between the reference clock signal and the feedback signal, and to recenter the digital phase comparator if a step change is detected.

34. The '827 Patent teaches the sampling of data from a low-pass filter indicative of an average control signal and comparing the average control signal to a threshold limit. The '827 Patent describes trimming the oscillator if the average control signal is outside the threshold limit.

35. The '827 Patent further teaches monitoring a phase comparator for a step change in the phase difference between the reference clock signal and the feedback signal; and recentering the phase comparator if a step change in the phase difference between the reference clock signal and the feedback signal is detected.

36. The '827 Patent and its underlying patent application have been cited by 48 United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '827 Patent and its underlying patent application as relevant prior art:

- Advantest Corporation
- Agilent Technologies Inc.
- Air Products and Chemicals, Inc.
- Broadcom Corporation
- Datang Group
- Freescale Semiconductor, Inc.
- NXP Semiconductors
- Infineon Technologies AG
- International Business Machines Corporation
- Marvell International Ltd.
- Cavium
- Metrotech Corporation
- Nvidia Corporation
- Siemens Aktiengesellschaft
- Standard Microsystems Corporation
- Western Digital Technologies, Inc.
- Hewlett-Packard Development Company, L.P.
- Rambus, Inc.
- Panasonic Corporation
- National Semiconductor Corporation



- Alcatel
- Lightlab Imaging, Inc.
- Matsushita Electric Industrial Co., Ltd.
- National Aeronautics and Space Administration (“NASA”)
- Advanced Micro Devices, Inc.
- Nihon Dempa Kogyo Co., Ltd.

**U.S. PATENT NO. 6,721,328**

37. U.S. Patent No. 6,721,328 entitled, *Adaptive Clock Recovery for Circuit Emulation Service*, was filed on November 19, 1999. DIFF Scale Operation Research is the owner of all right, title, and interest in the ’328 Patent. A true and correct copy of the ’328 Patent is attached hereto as Exhibit C.

38. The ’328 Patent claims specific methods and systems for clock recovery in a packet network. The system includes a network which receives data packets at a destination node. Further, the data packets are stored in a buffer and read out of the buffer using a locally generated clock. The fill level of the buffer is monitored over a first period. A relative maximum fill level for the buffer is identified during the first period of time. Further, the relative maximum fill level is used to control the frequency of the locally generated clock so as to control the rate at which data is read out of the buffer.

39. The ’328 Patent teaches a method and system for adaptive clock recovery.

40. The ’328 Patent further teaches the use of a peak buffer fill level as an indicator to lock a local clock at a destination node with the service clock at a source node.

41. Another insight for improving the performance of clock recovery in a packet network described by the ’328 Patent is using the relative maximum fill level to control a frequency of the locally generated clock so as to control the rate at which data is read out of the buffer.

42. Among the inventions disclosed in the '328 Patent is a system comprising a peak fill detector that compares a read address and a write address for the buffer and stores the maximum buffer fill level observed over a period of time.

43. The inventions taught in the '328 Patent achieve improvements in clock recovery systems by using adaptive clock recovery using a buffer. Implementation of the system and methods disclosed in the '328 Patent are directed to a specific improvement in computer technology – clock recovery. Further, the claims of the '328 Patent are directed to specific asserted improvements in computer capabilities. For example, the claims recite specific steps – controlling the frequency of a recovered clock signal based on the relative maximum fill level – that accomplish the desired result.

44. The '328 Patent claims a technical solution to a problem unique to computer systems: clock recovery in a packet network.

45. The '328 Patent and its related patents have been cited by 35 United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '328 Patent family as relevant prior art:

- Axerra Networks, Inc.
- Broadcom Corporation
- Cisco Systems, Inc.
- ENENSYS Technologies SA
- Gennum Corporation (now part of Semtech Corporation)
- Hewlett-Packard Development Company, L.P.
- Infineon Technologies AG
- Lantiq Deutschland GmbH (now part of Intel Corporation)
- Lycium Networks (B.V.I.) Ltd.
- Network Equipment Technologies, Inc. (now part of Ribbon Communications, Inc.)
- RAD Data Communications Ltd.
- Rohde & Schwarz GmbH & Co. KG
- Siverge Networks, Ltd.
- Sony Corporation
- Yamaha Corporation

- Zarlink Semiconductor Limited (now part of Microsemi Corporation)
- Semtech Corporation
- Microsemi Corporation

**COUNT I**  
**INFRINGEMENT OF U.S. PATENT NO. 7,881,413**

46. DIFF Scale Operation Research references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

47. Cypress designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for generating a timing signal in a phase locked loop.

48. Cypress designs, makes, sells, offers to sell, imports, and/or uses timing devices, including timing devices with the following product numbers: CY2292; CY23FS04; CY26049-36; CY7B9945V; CYP15G0401DXB; and CYV15G0401DXB (collectively, the “Cypress ’413 Product(s)”).

49. On information and belief, one or more Cypress subsidiaries and/or affiliates use the Cypress ’413 Products in regular business operations.

50. On information and belief, one or more of the Cypress ’413 Products include technology for generating a timing signal from a reference clock signal.

51. On information and belief, Cypress documentation describes one or more of the Cypress ’413 Products as a “redundant clock source in the event of a reference clock failure.”

**Functional Description**

The CY23FS04 is a FailSafe™ zero delay buffer with two reference clock inputs and four phase-aligned outputs. The device provides an optimum solution for applications where continuous operation is required in the event of a primary clock failure.

The continuous, glitch-free operation is achieved by using a DCXO. This serves as a redundant clock source in the event of a reference clock failure by maintaining the last frequency and phase information of the reference clock.

The unique feature of the CY23FS04 is that the DCXO is the primary clocking source, which is synchronized (phase-aligned) to the external reference clock. When this external clock is restored, the DCXO automatically resynchronizes to the external clock.

*CY23FS04 Failsafe™ 2.5V/3.3V Zero Delay Buffer, CYPRESS DATASHEET at 1 (December 2017)* (emphasis added).

52. On information and belief, one or more of the Cypress '413 Products contain a phase comparator.

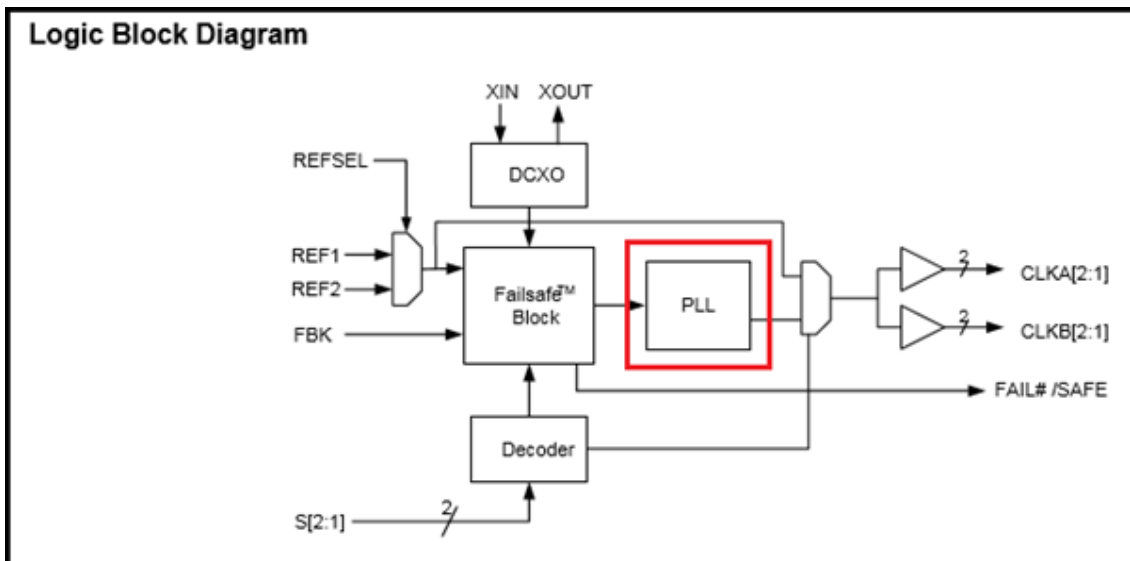
53. On information and belief, one or more of the Cypress '413 Products contain a low-pass filter.

54. On information and belief, one or more of the Cypress '413 Products comprise an oscillator coupled in a feedback arrangement.

55. On information and belief, one or more of the Cypress '413 Products comprise a control system that generates an output signal where the phase of the output signal is related to the phase of an input signal.

56. On information and belief, the Cypress '413 Products are available to businesses and individuals throughout the United States.

57. On information and belief, Cypress documentation shows that the Cypress '413 Products use a phase locked loop (PLL) to generate the timing signal as shown in the below figure.



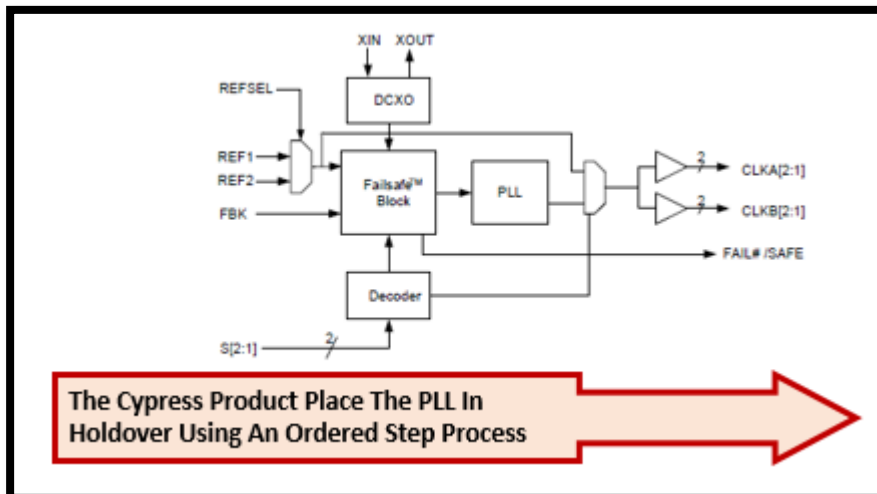
*CY23FS04 Failsafe™ 2.5V/3.3V Zero Delay Buffer*, CYPRESS DATASHEET at 1 (December 2017) (emphasis added).

58. On information and belief, the Cypress '413 Products are provided to businesses and individuals located in the District of Delaware.

59. On information and belief, Cypress has directly infringed and continues to directly infringe the '413 Patent by, among other things, making, using, offering for sale, and/or selling technology for generating a timing signal in a phase locked loop, including but not limited to the Cypress '413 Products, which include infringing technology for generating a timing signal in a phase locked loop. Such products and/or services include, by way of example and without limitation, the Cypress '413 Products.

60. On information and belief, the Cypress '413 Products comprise a system for generating a timing signal from a reference clock signal in a phase locked loop.

61. On information and belief, documentation from Cypress establishes that the Cypress Products place the PLL in holdover based on an ordered series of steps. This ordered series is identical to the order presented in the claims of the '413 Patent.



*CY23FS04 Failsafe™ 2.5V/3.3V Zero Delay Buffer*, CYPRESS DATASHEET at 1 (December 2017) (annotation added).

62. On information and belief, the Cypress '413 Products include functionality for monitoring a status message received from a source of the reference clock signal indicative of a quality level of the reference clock signal.

63. On information and belief, the Cypress '413 Products are a system containing functionality for placing the phase locked loop in a holdover condition if the quality level indicated by the status message is below a target level.

64. The Cypress '413 Products comprise a system for performing the elements in a proscribed order.

65. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Cypress '413 Products, Cypress has injured DIFF Scale Operation Research and is liable to the Plaintiff for directly infringing one or more claims of the '413 patent, including at least claim 21 pursuant to 35 U.S.C. § 271(a).

66. On information and belief, Cypress also indirectly infringes the '413 Patent by actively inducing infringement under 35 USC § 271(b).

67. Cypress has had knowledge of the '413 Patent since at least service of this Complaint or shortly thereafter, and on information and belief, Cypress knew of the '413 Patent and knew of its infringement, including by way of this lawsuit.

68. On information and belief, Cypress intended to induce patent infringement by third-party customers and users of the Cypress '413 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Cypress specifically intended and was aware that the normal and customary use of the accused products would infringe the '413 Patent. Cypress performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '413 Patent and with the knowledge that the induced acts would constitute infringement. For example, Cypress provides the Cypress '413 Products that have the capability of operating in a manner that infringe one or more of the claims of the '413 Patent, including at least claim 21, and Cypress further provides documentation and training materials that cause customers and end users of the Cypress '413 Products to utilize the products in a manner that directly infringe one or more claims of the '413 Patent.<sup>30</sup> By providing instruction and training to customers and end-users on how to use the Cypress '413 Products in a manner that directly infringes one or more claims of the '413 Patent, including at least claim 21, Cypress specifically intended to induce infringement of the '413 Patent. On information and belief, Cypress engaged in such inducement to promote the sales of the Cypress '413 Products, e.g., through Cypress user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '413 Patent. Accordingly, Cypress has induced and

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<sup>30</sup> See, e.g., CYB9945V ROBOCLOCK, HIGH SPEED MULTI-PHASE PLL CLOCK BUFFER (Nov. 14, 2014); CY23FS04, FAILSAFE 2.5V/3.3 V ZERO DELAY BUFFER (Dec. 14, 2017); CY2292, THREE-PLL GENERAL-PURPOSE EPROM-PROGRAMMABLE CLOCK GENERATOR (Dec. 7, 2017); and CYP15G0401DXB CYV15G0401DXB QUAD HOTLINK II TRANSCEIVER (Aug. 18, 2017).

continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '413 Patent, knowing that such use constitutes infringement of the '413 Patent.

69. The '413 Patent is well-known within the industry as demonstrated by multiple citations to the '413 Patent in published patents and patent applications assigned to technology companies and academic institutions. Cypress is utilizing the technology claimed in the '413 Patent without paying a reasonable royalty. Cypress is infringing the '413 Patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, or flagrant.

70. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '413 Patent.

71. As a result of Cypress's infringement of the '413 Patent, DIFF Scale Operation Research has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Cypress's infringement, but in no event less than a reasonable royalty for the use made of the invention by Cypress together with interest and costs as fixed by the Court.

**COUNT II**  
**INFRINGEMENT OF U.S. PATENT NO. 6,664,827**

72. DIFF Scale Operation Research references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

73. Cypress designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for timing circuitry.

74. Cypress designs, makes, sells, offers to sell, imports, and/or uses timing devices, including timing devices with the following product numbers: CY7B9973V; CY7B9945V;



CY7B993V; CY7B994V; CY7B9930V; CY7B9940V; CY7B9911V; CY7B995; and CY7B9950 (collectively, the “Cypress ’827 Product(s)”).

75. On information and belief, one or more Cypress subsidiaries and/or affiliates use the Cypress ’827 Products in regular business operations.

76. On information and belief, one or more of the Cypress ’827 Products include technology for a phase locked loop.

77. On information and belief, Cypress documentation states that one or more of the Cypress ’827 Products contain functionality for lock detection that is “accomplished by comparing the phase difference between the reference and feedback inputs.”

**Lock Detect Output Description**  
The LOCK detect output indicates the lock condition of the integrated PLL. Lock detection is accomplished by comparing the phase difference between the reference and feedback inputs. An unacceptable phase error is declared when the phase difference between the two inputs is greater than about 700 ps.

*CY7B9973V RoboClock<sup>®</sup> High-Speed Multi-Output PLL Clock Buffer*, CYPRESS DATASHEET at 6 (November 2017) (emphasis added).

78. On information and belief, the Cypress ’827 Products are available to businesses and individuals throughout the United States.

79. On information and belief, the Cypress ’827 Products are provided to businesses and individuals located in the District of Delaware.

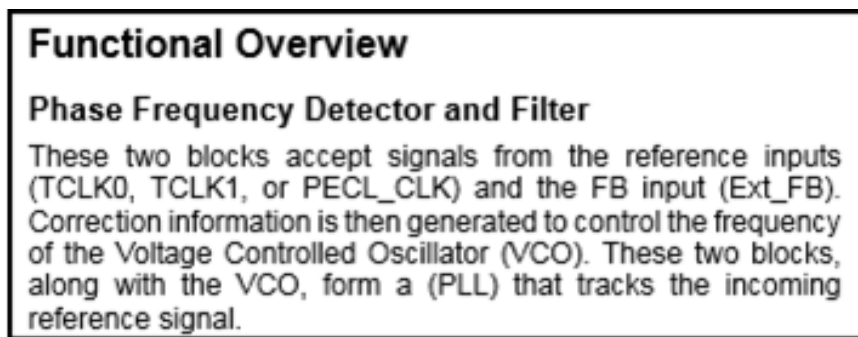
80. On information and belief, the Cypress ’827 Products comprise a phase locked loop adapted to filter and store data indicative of a control signal.

81. On information and belief, the Cypress ’827 Products comprise a control system that generates an output signal whose phase is related to the phase of an input signal.

82. On information and belief, the Cypress '827 Products comprise a frequency-selective circuit.

83. On information and belief, the Cypress '827 Products include a phase comparator.

84. On information and belief, the Cypress '827 Products contain a Phase Frequency Detector which contains the same functionality as the phase comparator taught in the '827 patent claims.



*CY7B9973V RoboClock<sup>®</sup> High-Speed Multi-Output PLL Clock Buffer*, CYPRESS DATASHEET at 6 (November 2017).

85. On information and belief, the Cypress '827 Products contain a low-pass filter.

86. On information and belief, the Cypress '827 Products comprise an oscillator coupled in a feedback arrangement.

87. On information and belief, the Cypress '827 Products include a phase comparator having a first input for the reference clock signal and a second input for the feedback signal.

88. On information and belief, the Cypress '827 Products contain functionality for sampling values of an error signal.

89. On information and belief, the Cypress '827 Products contain functionality for sampling an error signal where the error signal is indicative of a phase relationship between a reference clock signal and a feedback signal.

90. On information and belief, Cypress documentation states that one or more of the Cypress '827 Products will go into an "out-of-lock state" and attempt to recenter if a step change in the phase difference has occurred for four or more consecutive cycles. Once the device has recentered (*e.g.*, no more phase errors) for 32 consecutive cycles, the Cypress '827 Product will go back to a lock condition.

When in the locked state, after four or more consecutive feedback clock cycles with phase-errors, the LOCK output is forced LOW to indicate out-of-lock state.  
When in the out-of-lock state, 32 consecutive phase-errorless feedback clock cycles are required to allow the LOCK output to indicate lock condition (LOCK = HIGH).

*CY7B9973V RoboClock<sup>®</sup> High-Speed Multi-Output PLL Clock Buffer*, CYPRESS DATASHEET at 6 (November 2017).

91. On information and belief, Cypress has directly infringed and continues to directly infringe the '827 Patent by, among other things, making, using, offering for sale, and/or selling timing circuitry, including but not limited to the Cypress '827 Products, which include infringing technology for monitoring the sampled error signal values for a step change in the phase difference between the reference clock signal and the feedback signal. Such products and/or services include, by way of example and without limitation, the Cypress '827 Products.

92. On information and belief, the '827 Products comprise a system for monitoring the sampled error signal values for a step change in the phase difference between the reference clock signal and the feedback signal.

93. On information and belief, the '827 Products include functionality for recentering a phase comparator if a step change in the phase difference between the reference clock signal and the feedback signal is detected.

94. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Cypress '827 Products, Cypress has injured DIFF Scale Operation Research and is liable for directly infringing one or more claims of the '827 Patent, including at least claim 28, pursuant to 35 U.S.C. § 271(a).

95. On information and belief, Cypress also indirectly infringes the '827 Patent by actively inducing infringement under 35 USC § 271(b).

96. On information and belief, Cypress has had knowledge of the '827 Patent since at least service of this Complaint or shortly thereafter, and on information and belief, Cypress knew of the '827 Patent and knew of its infringement, including by way of this lawsuit.

97. On information and belief, Cypress intended to induce patent infringement by third-party customers and users of the Cypress '827 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Cypress specifically intended and was aware that the normal and customary use of the accused products would infringe the '827 Patent. Cypress performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '827 Patent and with the knowledge that the induced acts would constitute infringement. For example, Cypress provides the Cypress '827 Products that have the capability of operating in a manner that infringe one or more of the claims of the '827 Patent, including at least claim 28, and Cypress further provides documentation and training materials that cause customers and end users of the Cypress '827 Products to utilize the products in a manner that directly infringe one or more claims of the '827 Patent.<sup>31</sup> By providing instruction and training to customers and end-

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<sup>31</sup> See, e.g., CY7B993V/CY7B994V ROBOCLOCK, HIGH-SPEED MULTI-PHASE PLL CLOCK BUFFER (Nov. 27, 2017); CY7B9930V/CY7B9940V ROBOCLOCK II JUNIOR, HIGH-SPEED MULTI-FREQUENCY PLL CLOCK BUFFER (Nov. 15, 2016); CY7B9945V ROBOCLOCK, HIGH-

users on how to use the Cypress '827 Products in a manner that directly infringes one or more claims of the '827 Patent, including at least claim 28, Cypress specifically intended to induce infringement of the '827 Patent. On information and belief, Cypress engaged in such inducement to promote the sales of the Cypress '827 Products, e.g., through Cypress user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '827 Patent. Accordingly, Cypress has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '827 Patent, knowing that such use constitutes infringement of the '827 Patent.

98. The '827 Patent is well-known within the industry as demonstrated by multiple citations to the '827 Patent in published patents and patent applications assigned to technology companies and academic institutions. Cypress is utilizing the technology claimed in the '827 Patent without paying a reasonable royalty. Cypress is infringing the '827 Patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, or flagrant.

99. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '827 Patent.

100. As a result of Cypress's infringement of the '827 Patent, DIFF Scale Operation Research has suffered monetary damages, and seek recovery in an amount adequate to compensate for Cypress's infringement, but in no event less than a reasonable royalty for the use made of the invention by Cypress together with interest and costs as fixed by the Court.

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SPEED MULTI-PHASE PLL CLOCK BUFFER (June 19, 2017); and CY7B9973V ROBOCLOCK, HIGH-SPEED MULTI-OUTPUT PLL CLOCK BUFFER (Nov. 29, 2017).

**COUNT III**  
**INFRINGEMENT OF U.S. PATENT NO. 6,721,328**

101. DIFF Scale Operation Research references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

102. Cypress designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for clock recovery in a packet network.

103. Cypress designs, makes, sells, offers to sell, imports, and/or uses Backplane Physical Layer (PHY) devices including the following PHYs: CYV15G0204RB, CYP15G0401DXB, CYV15G0401DXB, CYP15G0101DXB, CYV15G0101DXB, CYV15G0104TRB, CYP15G0201DXB, CYP15G0401DXB, CYP15G0403DXB, and CYV15G0404DXB (collectively, the “Cypress ’328 Products”).

104. On information and belief, one or more Cypress subsidiaries and/or affiliates use the Cypress ’328 Products in regular business operations.

105. On information and belief, one or more of the Cypress ’328 Products include technology for clock recovery in a packet network.

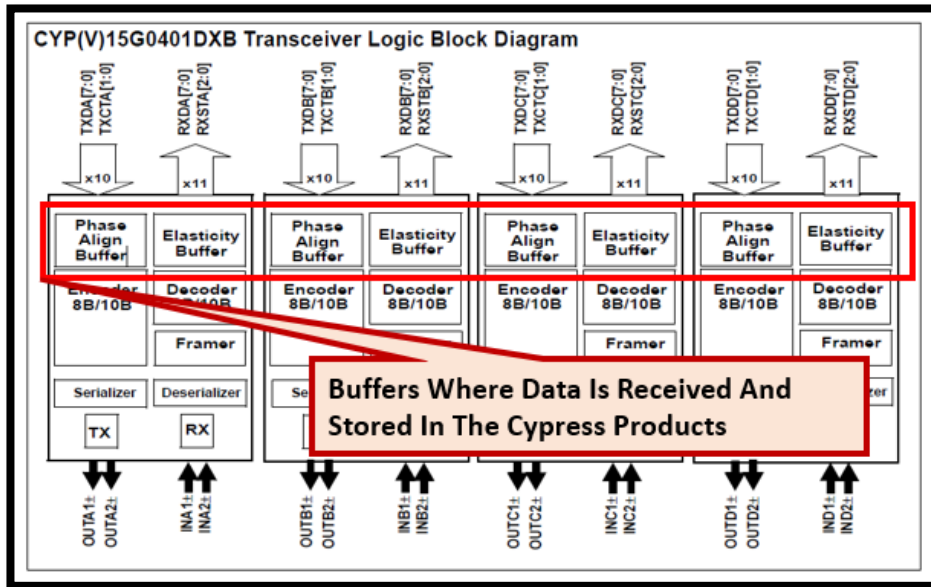
106. On information and belief, the Cypress ’328 Products are available to businesses and individuals throughout the United States.

107. On information and belief, the Cypress ’328 Products are provided to businesses and individuals located in the District of Delaware.

108. On information and belief, Cypress has directly infringed and continues to directly infringe the ’328 Patent by, among other things, making, using, offering for sale, and/or selling technology for clock recovery, including but not limited to the Cypress ’328 Products, which include infringing technology for clock recovery in a packet network. Such products and/or services include, by way of example and without limitation, the Cypress ’328 Products.

109. On information and belief, the Cypress '328 Products comprise a system for receiving data packets at a destination node.

110. On information and belief, Cypress documentation shows that the Cypress '328 Products enable data to be received into a buffer where the data packets are stored.



*Cypress CYP15G0401DXB Data Sheet, CYPRESS SEMICONDUCTOR DATA SHEET 38-02002 at 4 (August 18, 2017) (annotations added).*

111. On information and belief, the Cypress '328 Products comprise a system for storing data packets in a buffer.

112. On information and belief, the Cypress '328 Products enable reading the data packets out of the buffer using a locally generated clock.

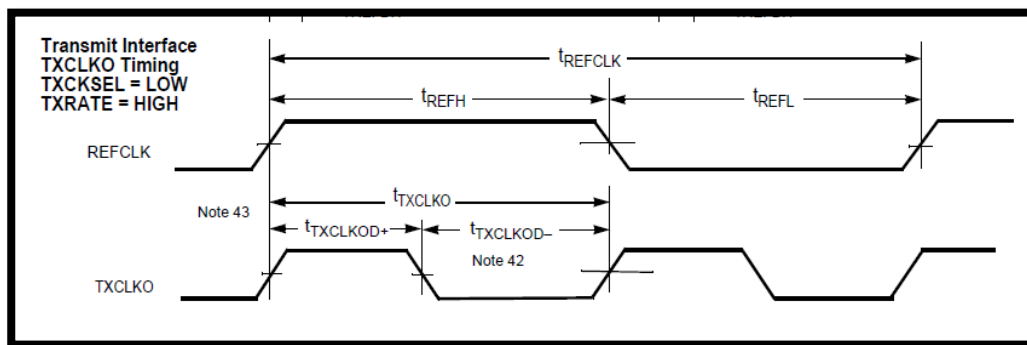
113. On information and belief, the Cypress '328 Products monitor a fill level of the buffer over a first period of time.

114. On information and belief, the Cypress '328 Products identify a relative maximum fill level for the buffer during the first period of time.

115. On information and belief, Cypress documentation states that data packets are read out of the buffer using a local clock that, “[w]hen sampled LOW, the transmit Phase-align Buffers are allowed to adjust their data-transfer timing (relative to the selected input clock) to allow clean transfer of data from the Input Register to the Encoder or Transmit Shifter. When TXRST is sampled HIGH, the internal phase relationship between the associated TXCLKx and the internal character-rate clock is fixed and the device operates normally.” *Cypress CYP15G0401DXB Data Sheet, CYPRESS SEMICONDUCTOR DATA SHEET 38-02002 at 10 (August 18, 2017).*

116. On information and belief, the Cypress ’328 Products identify a relative maximum fill level by comparing read and write address for the buffer and updating a register for a period of time when a buffer fill level, based on the difference between the read and write addresses is larger than a value previously stored in the register.

117. On information and belief, the Cypress ’328 Product documentation shows that the Cypress ’328 Products use the clocking information generated in the clock recovery function to control the rate at which data is transmitted out of the buffer.



*Cypress CYP15G0401DXB Data Sheet, CYPRESS SEMICONDUCTOR DATA SHEET 38-02002 at 39 (August 18, 2017).*



118. On information and belief, the Cypress '328 Products use the relative maximum fill level to control a frequency of the locally generated clock so as to control the rate at which data is read out of the buffer.

119. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the Cypress '328 Products, Cypress has injured DIFF Scale Operation Research and is liable for directly infringing one or more claims of the '328 Patent, including at least claim 1, pursuant to 35 U.S.C. § 271(a).

120. On information and belief, Cypress also indirectly infringes the '328 Patent by actively inducing infringement under 35 USC § 271(b).

121. On information and belief, Cypress has had knowledge of the '328 Patent since at least service of this Complaint or shortly thereafter, and on information and belief, Cypress knew of the '328 Patent and knew of its infringement, including by way of this lawsuit.

122. On information and belief, Cypress intended to induce patent infringement by third-party customers and users of the Cypress '328 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Cypress specifically intended and was aware that the normal and customary use of the accused products would infringe the '328 Patent. Cypress performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '328 Patent and with the knowledge that the induced acts would constitute infringement. For example, Cypress provides the Cypress '328 Products that have the capability of operating in a manner that infringe one or more of the claims of the '328 patent, including at least claim 1, and Cypress further provides documentation and training materials that cause customers and end users of the Cypress '328 Products to utilize the products in a manner that directly infringe one

or more claims of the '328 Patent.<sup>32</sup> By providing instruction and training to customers and end-users on how to use the Cypress '328 Products in a manner that directly infringes one or more claims of the '328 Patent, including at least claim 1, Cypress specifically intended to induce infringement of the '328 Patent. On information and belief, Cypress engaged in such inducement to promote the sales of the Cypress '328 Products, e.g., through Cypress user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '328 Patent. Accordingly, Cypress has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '328 Patent, knowing that such use constitutes infringement of the '328 Patent.

123. The '328 Patent is well-known within the industry as demonstrated by multiple citations to the '328 Patent in published patents and patent applications assigned to technology companies and academic institutions. Cypress is utilizing the technology claimed in the '328 Patent without paying a reasonable royalty. Cypress is infringing the '328 Patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, or flagrant.

124. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '328 Patent.

125. As a result of Cypress's infringement of the '328 Patent, DIFF Scale Operation Research has suffered monetary damages, and seeks recovery in an amount adequate to

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<sup>32</sup> See, e.g., CYP15G0401DXB CYV15G0401DXB, QUAD HOTLINK II TRANSCEIVER (Aug. 18, 2017); CYP15G0101DXB CYV15G0101DXB, SINGLE-CHANNEL HOTLINK II TRANSCEIVER (Nov. 9, 2017); and CYP15G0403DXB, INDEPENDENT CLOCK QUAD HOTLINK II TRANSCEIVER (June 9, 2014).

compensate for Cypress's infringement, but in no event less than a reasonable royalty for the use made of the invention by Cypress together with interest and costs as fixed by the Court.

**PRAYER FOR RELIEF**

WHEREFORE, DIFF Scale Operation Research respectfully requests that this Court enter:

- A. A judgment in favor of DIFF Scale Operation Research that Cypress has infringed, either literally and/or under the doctrine of equivalents, the '413, '827, and '328 Patents;
- B. An award of damages resulting from Cypress's acts of infringement in accordance with 35 U.S.C. § 284;
- C. A judgment and order finding that Cypress's infringement was willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, or flagrant, within the meaning of 35 U.S.C. § 284 and awarding to DIFF Scale Operation Research enhanced damages.
- D. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to DIFF Scale Operation Research their reasonable attorneys' fees against Cypress.
- E. Any and all other relief to which DIFF Scale Operation Research may show themselves to be entitled.

**JURY TRIAL DEMANDED**

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, DIFF Scale Operation Research, LLC requests a trial by jury of any issues so triable by right.

Dated: March 8, 2018

OF COUNSEL:

Dorian S. Berger (CA SB No. 264424)  
Daniel P. Hipskind (CA SB No. 266763)  
Eric B. Hanson (CA SB No. 254570)  
BERGER & HIPSKIND LLP  
1880 Century Park East, Ste. 815  
Los Angeles, CA 95047  
(323) 886-3430  
dsb@bergerhipskind.com  
dph@bergerhipskind.com  
ebh@bergerhipskind.com

BAYARD, P.A.

/s/ Stephen B. Brauerman  
Stephen B. Brauerman (#4952)  
Sara E. Bussiere (#5725)  
600 N. King Street, Suite 400  
P.O. Box 25130  
Wilmington, Delaware 19801  
(302) 655-5000  
sbrauerman@bayardlaw.com  
sbussiere@bayardlaw.com

*Attorneys for Plaintiff*  
*DIFF Scale Operation Research, LLC*