UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

DIFF SCALE OPERATION RESEARCH, LLC, ***Plaintiff,*** v. **ON SEMICONDUCTOR CORPORATION AND SEMICONDUCTOR COMPONENTS INDUSTRIES, LLC,** ***Defendants*.**	**Civil Action No._____** **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

DIFF Scale Operation Research, LLC ("Plaintiff"), by its undersigned counsel, bring 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"); 7,106,758 (the, "'758 patent"); and 6,721,328 (the, "'328 patent"); (collectively, the "patents-in-suit"). Defendants ON Semiconductor Corporation and Semiconductor Components Industries, LLC (collectively, "ON Semiconductor" or "Defendants") infringe 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 ON Semiconductor'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[1] was founded in Minneapolis, Minnesota by two Bell Laboratory engineers to create 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.[2]

3. In the late 1990s, ADC Telecommunications pioneered the development of microchips and network switches for the burgeoning telecommunications industry.[3] 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.[4]

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.[5] HTC asserted two of these patents against Apple before the International Trade Commission.

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[1] 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.").

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

[3] 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).

[4] 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.")

[5] *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-

> 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 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").[6] 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.[7] The ADC Homeworx network utilized fiber-optic and radio

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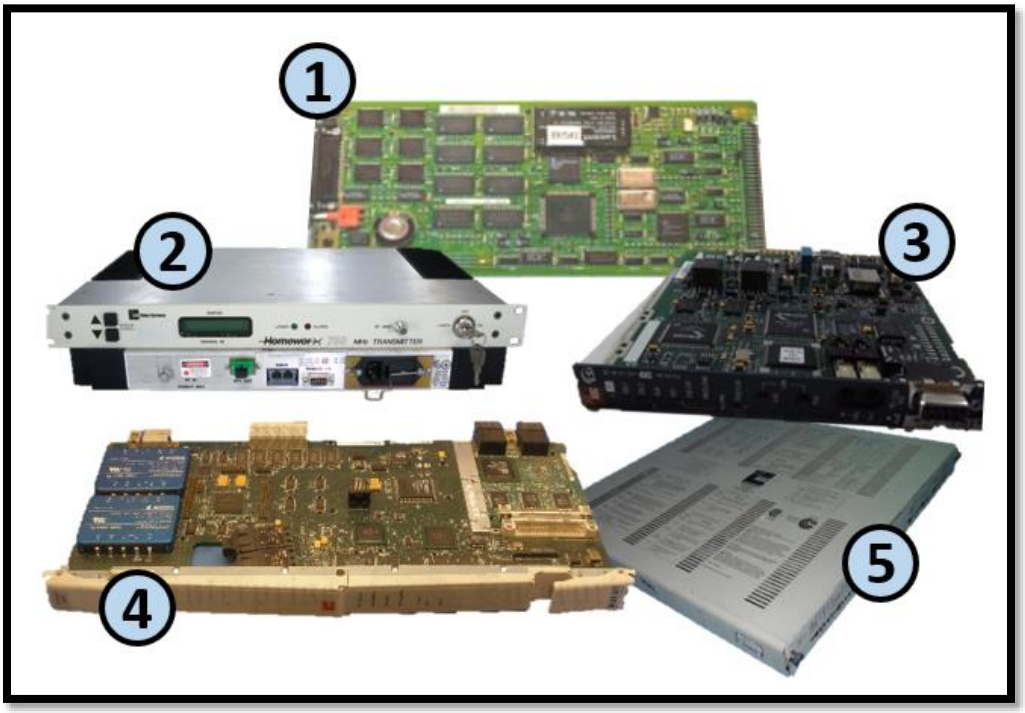
adc-telecommunications-75-million ("HTC, the Taiwan based smartphone manufacturer, has bought a portfolio of 82 patents and 14 pending applications related to mobile technology from US based ADC Telecommunications.").

[6] 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.").

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

frequency transmission technologies for transporting various services over a network.[8] 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.[9]



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 BA4IKKLBAA; and (5) ADC Telecommunications EZT1 Access Multiplexer).

[8] *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.").

[9] *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.").

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.[10]

8. A 1999 New York Times article on the telecommunication industry foreshadowed the difficulties that ADC Telecommunications would face when competing against much large 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.

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[10] 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.").

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[11]
- Apple, Inc.[12]
- Intel Corporation[13]
- Broadcom Corporation[14]
- Microsoft Corporation[15]
- Sony Corporation[16]
- Cisco Systems, Inc.[17]
- Hewlett-Packard Enterprise Company[18]
- Huawei Technologies Co., Ltd.[19]
- Alcatel-Lucent S.A.[20]
- Fujitsu Ltd.[21]
- Panasonic Corporation[22]
- Telefonaktiebolaget L.M. Ericsson[23]
- NEC Corporation[24]

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[11] *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.

[12] *See, e.g.*, U.S. Patent Nos. 9,026,680; 7,457,302; and 8,275,910.

[13] *See, e.g.*, U.S. Patent Nos. 7,248,246; 7046675; 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.

[14] *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.

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

[16] *See, e.g.*, U.S. Patent No. 8,200,873.

[17] *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.

[18] *See, e.g.*, U.S. Patent Nos. 7,103,654; 7,187,674; 7,266,598; and 7,478,260.

[19] *See, e.g.*, U.S. Patent Nos. 7,664,051 and 7,916,758.

[20] *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.

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

[22] *See, e.g.*, U.S. Patent Nos. 8,648,632 and 7,457,979.

[23] *See, e.g.*, U.S. Patent Nos. 8,780,695 and 7,215,664.

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

- Marvell Technology Group, Limited[25]

THE PARTIES

DIFF SCALE OPERATION RESEARCH, LLC

12. DIFF Scale Operation Research, LLC ("DIFF Scale Operation Research") is a limited liability company organized 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; 7,106758; 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;

[25] *See, e.g.*, U.S. Patent Nos. 7,733,588; 7,737,793; and 7,944,313.

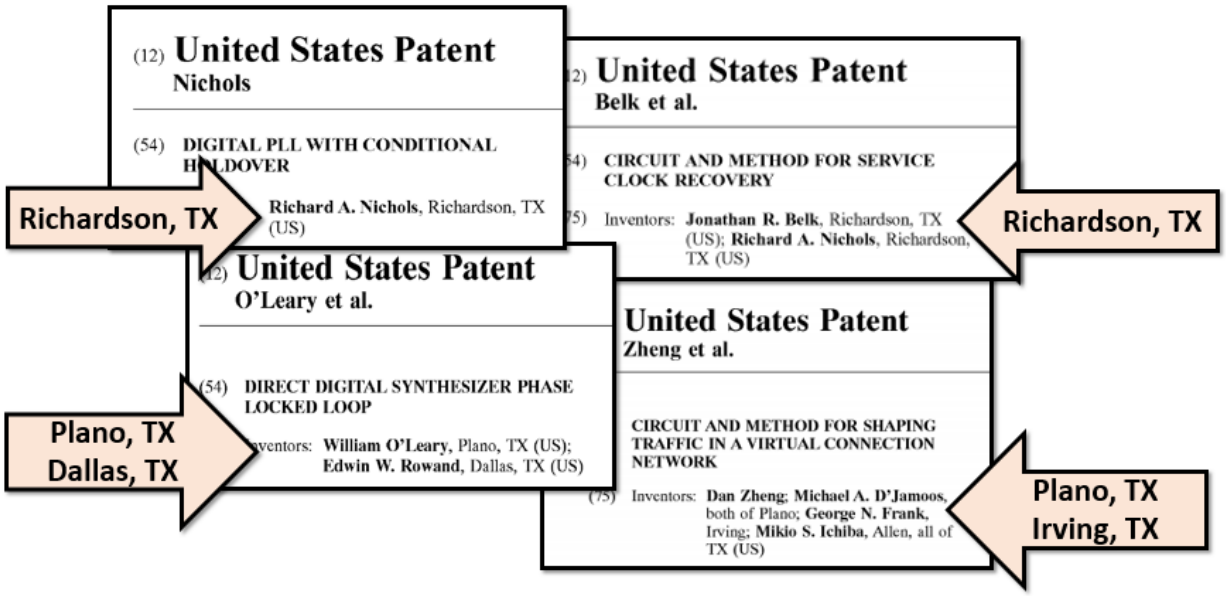
JP03811007B2; JP2001523059A; JP2002502146A; JP2002504793A; JP3811007B2; WO1999025066A1; WO1999038285A1; WO1999043184A1; WO2001037468A2; WO2001037468A3; WO2002084927A2; WO2002084927A3; WO2002101959A1; WO2008104282A1; WO2008104284A1.[26]

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

16. CommScope maintains 79,950 square feet of office space at 2601 Telecom Pkwy, Richardson, Texas. Over 200 CommScope employees are employed at its Richardson, Texas location. CommScope maintains off-site document storage at its Richardson, Texas office where hard-copy documents are stored, at least some of which are relevant to this case. CommScope also maintains a datacenter located in Richardson, Texas, where at least some information and software relating to the patents-in-suit in this action are stored. In addition, CommScope maintains a Wide Band Multimode Fiber testing facility in Richardson, Texas.

17. ADC Telecommunications had a significant presence in Richardson, Texas and many of the inventions disclosed in the ADC Telecommunications patent portfolio were made at its Richardson location. On information and belief, many of the named inventors of the ADC Telecommunications patent portfolio continue to be located in and in close proximity to the Eastern District of Texas.

[26] The patents were assigned to DIFF Scale Operation Research by CommScope DSL Systems, LLC and CommScope Technologies, LLC.



U.S. PATENT NOS. 7,881,413; 6,664,827; 7,106,758; 6,407,983 (annotations added) (showing the named inventors located in and in close proximity to the Eastern District of Texas).

ON SEMICONDUCTOR CORPORATION

18. On information and belief, ON Semiconductor Corporation is a Delaware corporation with its principal place of business at 5005 East McDowell Road, Phoenix, Arizona 85008. ON Semiconductor Corporation may be served through its registered agent The Corporation Trust Company, Corporation Trust Center 1209 Orange Street, Wilmington, Delaware 19801.

19. On information and belief, ON Semiconductor Corporation conducts business operations within the Eastern District of Texas in its facilities at 2400 Dallas Parkway, #420, Plano, Texas 75093.

20. On information and belief, ON Semiconductor Corporation has offices in the Eastern District of Texas where it sells, develops, and/or markets its products including sales offices in Plano.

SEMICONDUCTOR COMPONENTS INDUSTRIES, LLC

21. On information and belief, Semiconductor Components Industries, LLC is a Delaware limited liability company with its principal place of business at 5005 East McDowell Road, Phoenix, Arizona 85008. Semiconductor Components Industries, LLC may be served through its registered agent The Corporation Trust Company, Corporation Trust Center 1209 Orange Street, Wilmington, Delaware 19801. On information and belief, Semiconductor Components Industries, LLC is registered to do business in the State of Texas and has been since at least July 22, 1999.

22. On information and belief, Semiconductor Components Industries, LLC is the principal domestic operating subsidiary of ON Semiconductor Corporation and does business under the name of ON Semiconductor. On information and belief, both Defendants Semiconductor Components Industries, LLC and ON Semiconductor Corporation operate together as alter egos of one another to design, manufacture, and market its portfolio of products.

23. On information and belief, Semiconductor Components Industries, LLC has offices in the Eastern District of Texas where it sells, develops, and/or markets its products including sales offices in Plano.

JURISDICTION AND VENUE

24. 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).

25. Upon information and belief, this Court has personal jurisdiction over Defendants in this action because ON Semiconductor has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Defendants would not offend traditional notions of fair play and

substantial justice. Defendants directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), have committed and continue 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. Moreover, Semiconductor Components Industries, LLC is registered to do business in the State of Texas, Defendants have offices and facilities in the Eastern District of Texas, and Defendants actively direct their activities to customers located in the Eastern District of Texas and the State of Texas.

26. Venue is proper in this district under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). Semiconductor Components Industries, LLC is registered to do business in the State of Texas, Defendants have offices in the State of Texas and in the Eastern District of Texas, and upon information and belief, Defendants have transacted business in the Eastern District of Texas and have committed acts of direct and indirect infringement in the Eastern District of Texas.

ADC TELECOMMUNICATIONS LANDMARK SEMICONDUCTOR AND NETWORKING TECHNOLOGIES

27. 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.[27]

[27] 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").

The Billboard

High-Fidelity Audio Devices Boost Capitol Diskery Sales

WASHINGTON, July 29. — High fidelity listening equipment to spur disk sales and please the customers is fast becoming a byword in retail diskeries here, with considerable credit for the trend going to a local firm, the Shrader Manufacturing Company, which specializes in high-fidelity installations. The Shrader company is doing a land-office business not only in store installations but in even greater volume in high fidelity custom sets for homes, a two-way course of operation which, as one enthusiastic dealer has commented, "has been literally filling the Washington air with good music and filling the record shops with good customers."

With customers showing more and more discrimination in choosing recordings ever since the battle of the disk speeds, disk dealers figure that by using high-fidelity equipment in their listening booths they are satisfying a natural trade need. They point out that results of high-fidelity gear are being shown not only in volume of improved high-fidelity recordings.

Among numerous retail diskeries here equipped by Shrader with high-fidelity gear are the Super Music Company, which has three outlets in the city; the Disc Shop, the Hollywood Music Shop and the John Learmont record and book store. The Super Music Company group and the Disc Shop have recently undergone expansion (*The Billboard*, July 22) and are completely rigged with high-fidelity equipment. The Disc Shop alone has half a dozen listening booths, each equipped with individual high-fidelity amplifiers and speakers. The Super Music group has a total of nearly 70 disk listening posts rigged to high-fidelity equipment. Particularly popular with dealers who have installed high-fidelity gear are the Livingston tone arm, the Rek-O-Kut heavy transcription turntable, Audio Development Company (ADC) amplifiers and Altec 15-inch speakers.

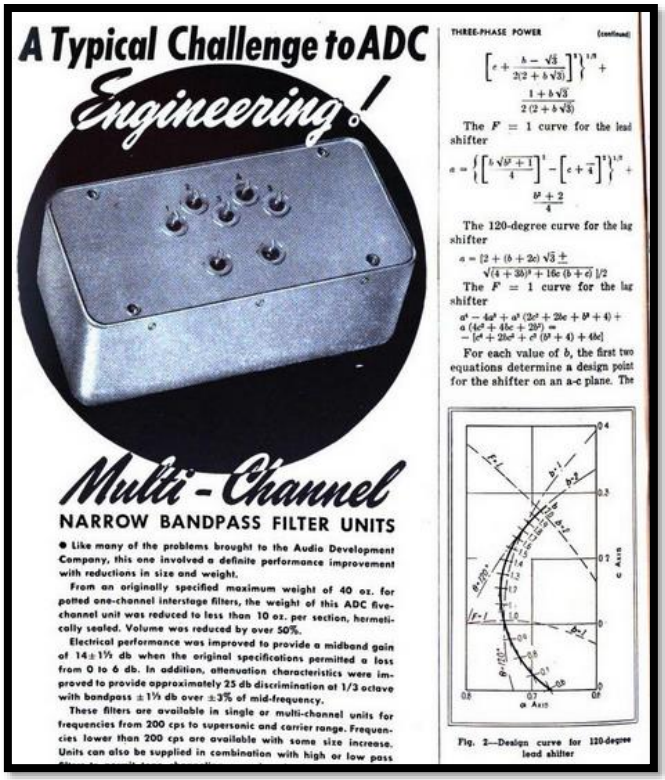
High-fidelity gear is considered by

(See High-Fidelity Audio, page 38)

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

28. 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.[28]

[28] 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 ± 1½ 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 ± 1½ db over ±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

THREE-PHASE POWER (continued)

The $F = 1$ curve for the lead shifter

The 120-degree curve for the lag shifter

The $F = 1$ curve for the lag shifter

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).

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

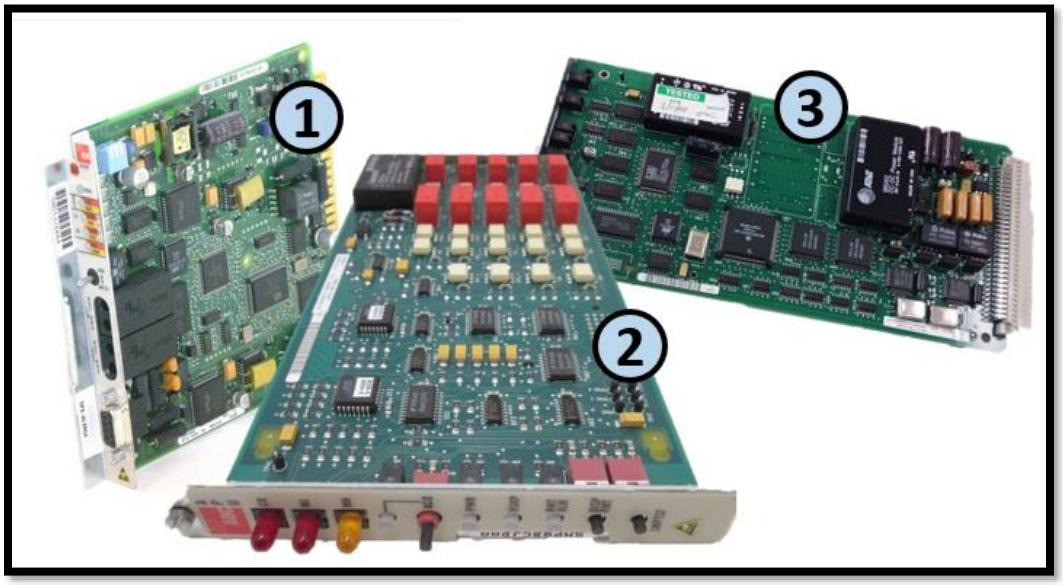
power supply board. The transceivers used are the CAF model manufactured by ADC Telecommunications, Inc.. The transceiver use bidirectional, full-duplex signal transmission over a single optic fiber. The transceiver is a self-contained, circuit-board-mountable device that contains the transmitting LED, 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).

30. 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.[29]

31. 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.



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.).

[29] Carol Wilson, *ADC Launches Fiber-Coax Platform*, TELEPHONY AT 11 (May 24, 1993).

32. 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."

33. 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 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

34. U.S. Patent No. 7,881,413 (the "'413 patent") 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 '411 patent is attached hereto as Exhibit A.

35. The ‘413 patent teaches novel phase locked loops (PLL) that provide for conditional holdover that is especially suited for use in communications networks.

36. 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

37. U.S. Patent No. 6,664,827 (the “‘827 patent”) 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.

38. 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.

39. 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.

40. 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.

41. 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.

42. 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.

43. 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. 7,106,758

44. U.S. Patent No. 7,106,758 (the "'758 patent") entitled, *Circuit and Method for Service Clock Recovery*, was filed on August 3, 2001. The '758 patent is subject to a 35 U.S.C. § 154(b) term extension of 885 days. DIFF Scale Operation Research is the owner by assignment of the '758 patent. A true and correct copy of the '758 patent is attached hereto as Exhibit C.

45. The '758 patent teaches synchronizing a service clock at a destination node with a service clock at a source node.

46. The '758 patent discloses the use of control values to set a service clock frequency at a computer node that is receiving data over a network.

47. The ‘758 patent teaches clock synchronization for a circuit emulation service over a packet network wherein data packets are received from a source node at one or more ports of a computer system.

48. The ‘758 patent discloses improvements in techniques for recovering a service clock at a destination node.

49. The clock synchronization technologies described in the ‘758 patent include the use of an adaptive clock recovery technique to recover the service clock. Further, the ‘758 patent claims the use of a service clock that is controlled based on values calculated over a plurality of time periods.

50. The ‘758 patent describes the use of a microcontroller that uses information from a counting circuit to control a direct digital synthesis circuit (“DDS”). The DDS is used to generate a local service clock signal for a destination node.

51. Further, the ‘758 patent teaches the use of a microcontroller that utilizes the fill level of a buffer to control the frequency of the local service clock generated by the DDS circuit.

52. The ‘758 patent family has been cited by 46 United States patents and patent applications as relevant prior art. Specifically, patents and patent applications issued to the following companies have cited the ‘758 patent family as relevant prior art:

- Intel Corporation
- Broadcom Corporation
- Fujitsu, Ltd.
- Huawei Technologies Co., Ltd.
- Juniper Networks, Inc.
- LSI Corporation
- National Semiconductor Corporation
- Texas Instruments, Inc.
- Nortel Networks, Ltd.
- Siverge, Ltd.
- Symmetricom, Inc.
- Microsemi Corporation
- Tellabs Operations, Inc.
- Via Technologies, Inc.

- Wideband Semiconductors, Inc.
- Acorn Packet Solutions, LLC
- ADC Telecommunications, Inc.
- Axerra Networks, Ltd.
- British Telecommunications PLC
- INOVA Semiconductors GmbH

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

53. U.S. Patent No. 6,721,328 ("the '328 patent") 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 D.

54. 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.

55. The '328 patent teaches a method and system for adaptive clock recovery.

56. 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.

57. 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.

58. 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.

59. 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.

60. The ‘328 patent claims a technical solution to a problem unique to computer systems: clock recovery in a packet network.

61. 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

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

63. ON Semiconductor 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.

64. ON Semiconductor designs, makes, sells, offers to sell, imports, and/or uses products incorporating timing devices, including the following products: NB3H5150, NB3H5150-01, NB3N3010B, NB3N3020, NB3N51032, and NB3N51054 (collectively, the "ON Semiconductor '413 Product(s)").

65. On information and belief, one or more ON Semiconductor subsidiaries and/or affiliates use the ON Semiconductor '413 Products in regular business operations.

66. On information and belief, one or more of the ON Semiconductor '413 Products include technology for generating a timing signal from a reference clock signal.

67. On information and belief, one or more of the ON Semiconductor '413 Products contain a phase comparator.

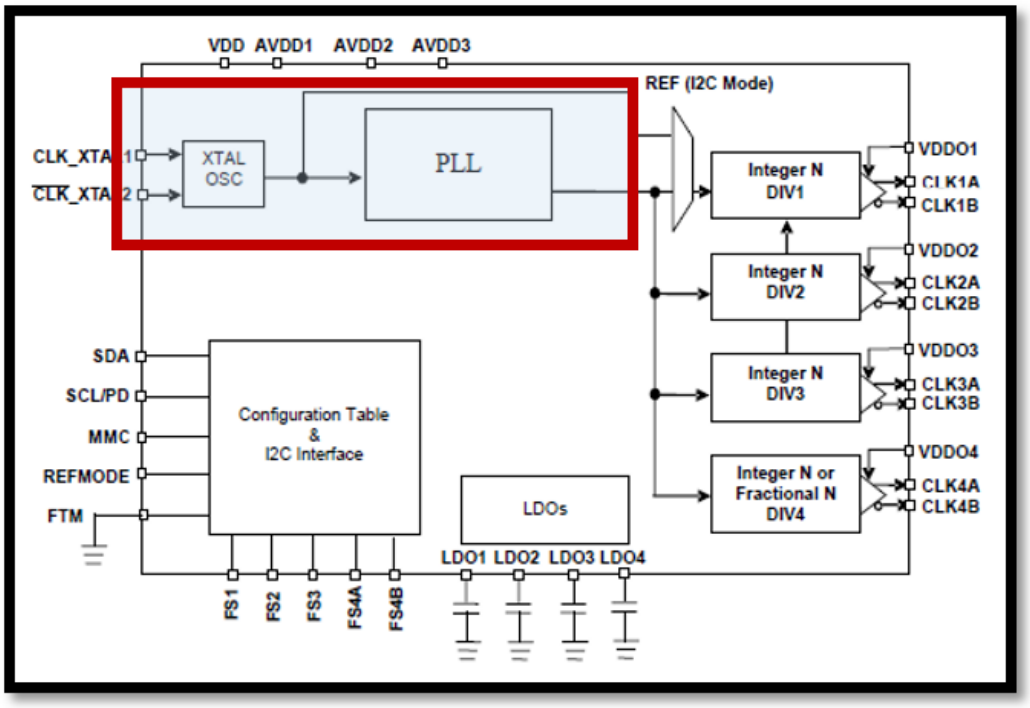
68. On information and belief, one or more of the ON Semiconductor '413 Products contain a low-pass filter.

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

70. On information and belief, one or more of the ON Semiconductor ‘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.

71. On information and belief, the ON Semiconductor ‘413 Products are available to businesses and individuals throughout the United States.

72. On information and belief, the ON Semiconductor documentation shows that the ON Semiconductor ‘413 Product utilize a phase locked loop to generate a timing signal.



NB3H5150 2.5V / 3.3V Low Noise Multi-Rate Clock Generator, ON SEMI DATASHEET at 2 (May 2016) (annotations showing the reference clock signal and the phase locked loop that outputs a timing signal).

73. On information and belief, the ON Semiconductor ‘413 Products are provided to businesses and individuals located in the Eastern District of Texas.

74. On information and belief, ON Semiconductor 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 ON Semiconductor '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 ON Semiconductor '413 Products.

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

76. On information and belief, the ON Semiconductor '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.

77. On information and belief, the ON Semiconductor '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.

78. The ON Semiconductor '413 Products comprise a system for performing the elements in a proscribed order.

79. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the ON Semiconductor '413 Products, ON Semiconductor 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).

80. On information and belief, ON Semiconductor also indirectly infringes the '413 patent by actively inducing infringement under 35 USC § 271(b).

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

82. On information and belief, ON Semiconductor intended to induce patent infringement by third-party customers and users of the ON Semiconductor '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. ON Semiconductor specifically intended and was aware that the normal and customary use of the accused products would infringe the '413 patent. ON Semiconductor 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, ON Semiconductor provides the ON Semiconductor '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 ON Semiconductor further provides documentation and training materials that cause customers and end users of the ON Semiconductor '413 Products to utilize the products in a manner that directly infringe one or more claims of the '413 patent.[30] By providing instruction and training to customers and end-users on how to use the ON Semiconductor '413 Products in a manner that directly infringes one or more claims of the '413 patent, including at least claim 21, ON Semiconductor specifically intended to induce infringement of the '413 patent. On information and belief, ON Semiconductor engaged in such inducement to promote the sales of the ON Semiconductor '413 Products, e.g., through ON Semiconductor user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '413 patent. Accordingly, ON Semiconductor has induced and continues to induce users of the accused products to use the

[30] *See, e.g.*, NB3H5150 2.5V / 3.3V LOW NOISE MULTI-RATE CLOCK GENERATOR, PUBLICATION ORDER NUMBER: NB3H5150/D (March 2016); NB3N3010B 3.3V, 12.288 MHZ AUDIO OVERSAMPLING CLOCK GENERATOR FOR USB APPLICATIONS, PUBLICATION ORDER NUMBER: NB3N3010B/D (May 2011); NB3N51032 3.3 V, CRYSTAL TO 25 MHZ, 100 MHZ, 125 MHZ AND 200 MHZ DUAL HCSL/LVDS CLOCK GENERATOR, PUBLICATION ORDER NUMBER: NB3N51032/D (Sept. 2017).

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

83. 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. ON Semiconductor is utilizing the technology claimed in the '413 patent without paying a reasonable royalty. ON Semiconductor is infringing the '413 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

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

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

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

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

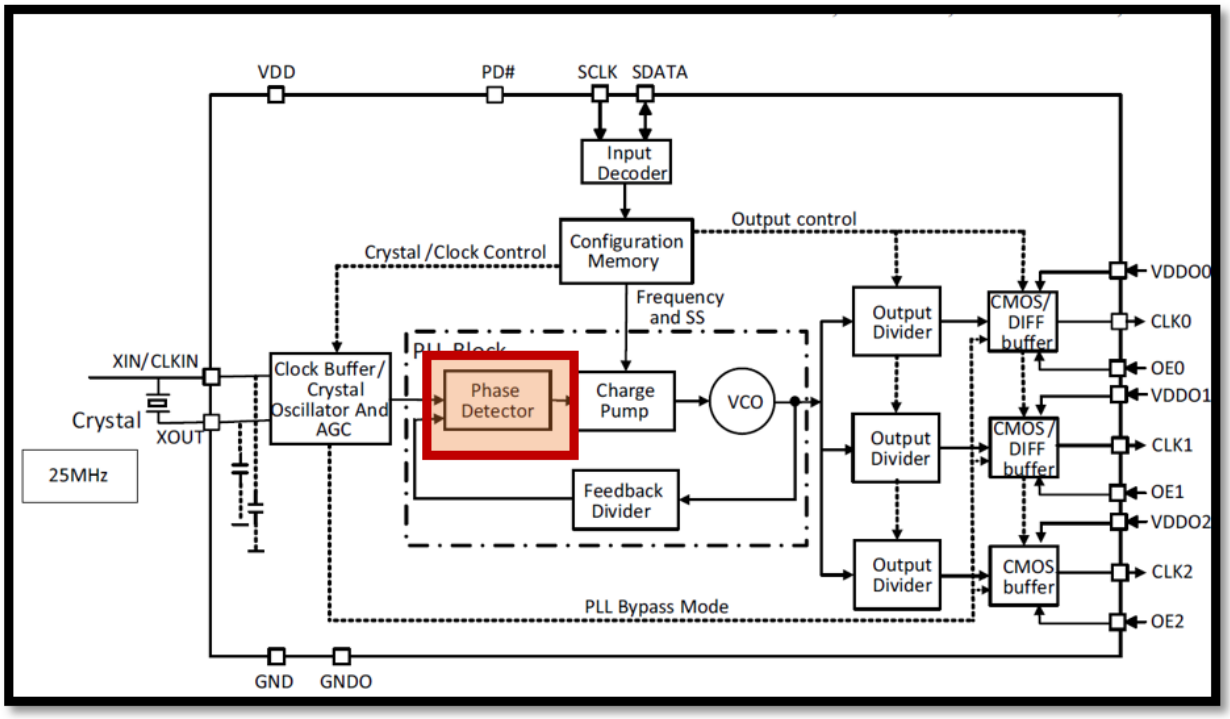
87. ON Semiconductor designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for timing circuitry.

88. ON Semiconductor designs, makes, sells, offers to sell, imports, and/or uses products incorporating timing devices, including the following products: NB3H60113G,

NB3H63143G, NB3H73113G, NB3V60113G, NB3V60113GV3, and NB3V63143G (collectively, the "ON Semiconductor '827 Product(s)").

89. On information and belief, one or more ON Semiconductor subsidiaries and/or affiliates use the ON Semiconductor '827 Products in regular business operations.

90. On information and belief, one or more of the ON Semiconductor '827 Products include technology for a phase locked loop.



NB3H73113G 3.3 V / 2.5 V Programmable OmniClock Generator with I2C / SMBus Interface, ON SEMICONDUCTOR DATASHEET at 2 (March 2017) (annotation identifying the phase detector).

91. On information and belief, the ON Semiconductor '827 Products are available to businesses and individuals throughout the United States.

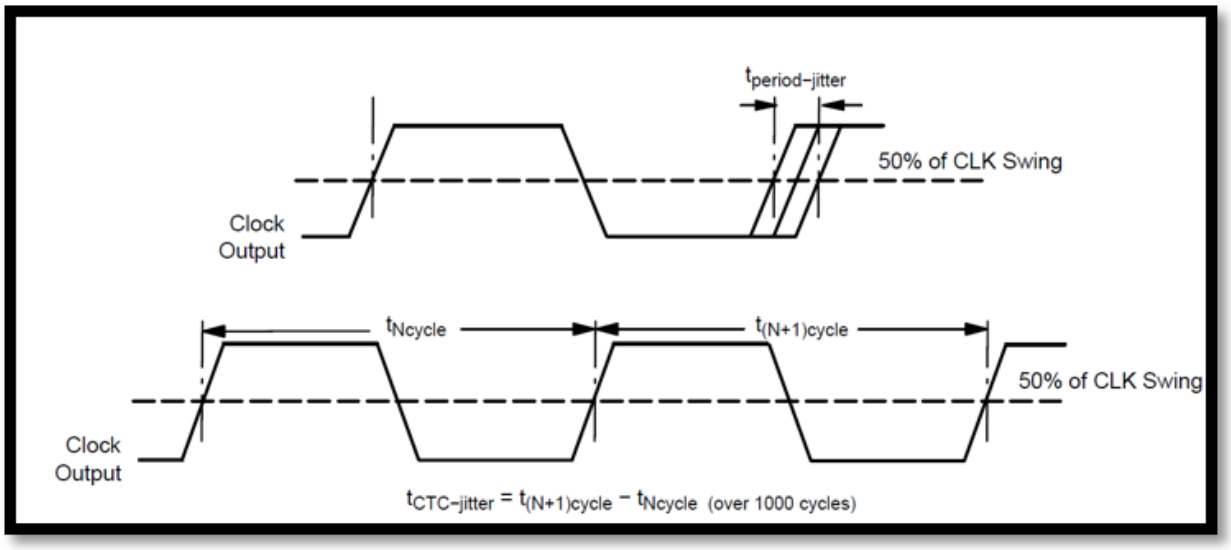
92. On information and belief, the ON Semiconductor '827 Products are provided to businesses and individuals located in the Eastern District of Texas.

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

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

95. On information and belief, the ON Semiconductor ’827 Products comprise a frequency-selective circuit.

96. On information and belief, the ON Semiconductor ’827 Products include a phase comparator.



NB3H73113G 3.3 V / 2.5 V Programmable OmniClock Generator with I2C / SMBus Interface, ON SEMICONDUCTOR DATASHEET at 17 (March 2017) (showing how period and cycle to cycle swings in the clock are measured).

97. On information and belief, the ON Semiconductor ’827 Products contain a low-pass filter.

98. On information and belief, the ON Semiconductor ’827 Products comprise an oscillator coupled in a feedback arrangement.

99. On information and belief, the ON Semiconductor ’827 Products include a phase comparator having a first input for the reference clock signal and a second input for the feedback signal.

100. On information and belief, the ON Semiconductor ’827 Products contain functionality for sampling values of an error signal.

101. On information and belief, the ON Semiconductor ’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.

102. On information and belief, ON Semiconductor 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 ON Semiconductor ’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 ON Semiconductor ’827 Products.

103. 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.

104. 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.

105. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the ON Semiconductor ’827 Products, ON Semiconductor 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).

106. On information and belief, ON Semiconductor also indirectly infringes the '827 patent by actively inducing infringement under 35 USC § 271(b).

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

108. On information and belief, ON Semiconductor intended to induce patent infringement by third-party customers and users of the ON Semiconductor '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. ON Semiconductor specifically intended and was aware that the normal and customary use of the accused products would infringe the '827 patent. ON Semiconductor 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, ON Semiconductor provides the ON Semiconductor '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 ON Semiconductor further provides documentation and training materials that cause customers and end users of the ON Semiconductor '827 Products to utilize the products in a manner that directly infringe one or more claims of the '827 patent.[31] By providing instruction and training to customers and end-users on

[31] *See, e.g., NB3H73113G 3.3 V / 2.5 V Programmable OmniClock Generator with I2C / SMBus Interface*, ON SEMICONDUCTOR DATASHEET (March 2017); *NB3H73113G 3.3 V / 2.5 V Programmable OmniClock Generator with I2C / SMBus Interface*, ON SEMICONDUCTOR DATASHEET (March 2017).

how to use the ON Semiconductor '827 Products in a manner that directly infringes one or more claims of the '827 patent, including at least claim 28, ON Semiconductor specifically intended to induce infringement of the '827 patent. On information and belief, ON Semiconductor engaged in such inducement to promote the sales of the ON Semiconductor '827 Products, e.g., through ON Semiconductor user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '827 patent. Accordingly, ON Semiconductor 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.

109. 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. ON Semiconductor is utilizing the technology claimed in the '827 patent without paying a reasonable royalty. ON Semiconductor is infringing the '827 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

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

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

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 7,106,758

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

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

114. ON Semiconductor designs, makes, sells, offers to sell, imports, and/or uses transceivers, including the following products: AX5043, AX5051, and AX5042 (collectively, the "ON Semiconductor '758 Product(s)").

115. On information and belief, one or more ON Semiconductor subsidiaries and/or affiliates use the ON Semiconductor '758 Products in regular business operations.

116. On information and belief, one or more of the ON Semiconductor '758 Products include clock recovery technology.

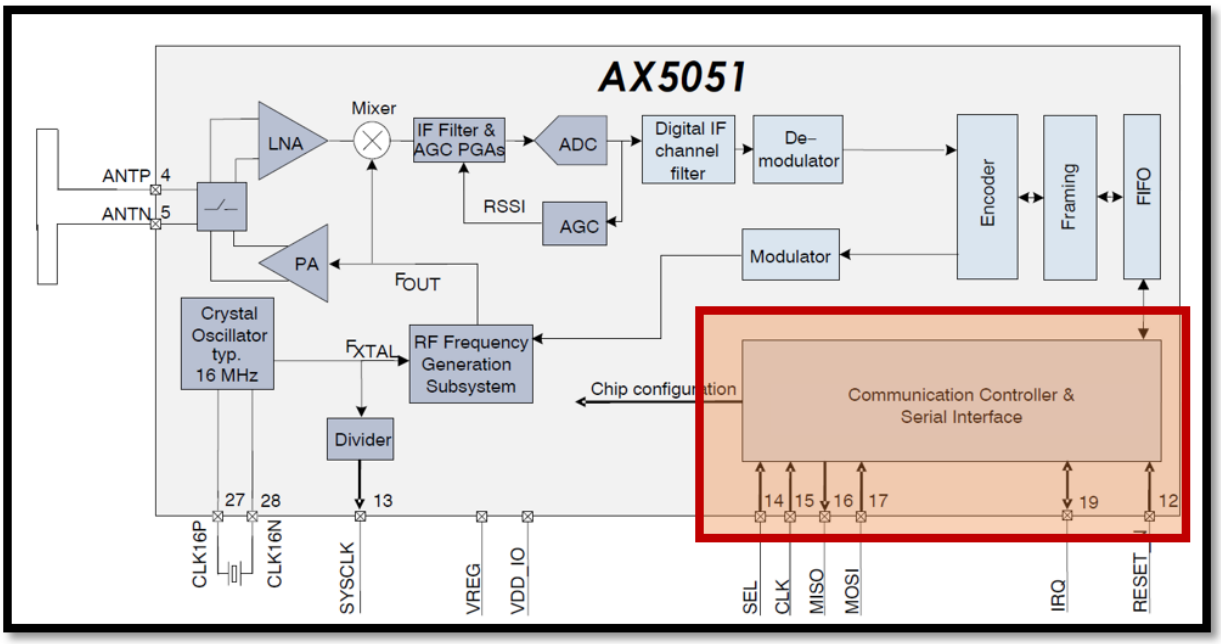
117. On information and belief, the ON Semiconductor '758 Products are available to businesses and individuals throughout the United States.

118. On information and belief, the ON Semiconductor '758 Products are provided to businesses and individuals located in the Eastern District of Texas.

119. On information and belief, ON Semiconductor has directly infringed and continues to directly infringe the '758 patent by, among other things, making, using, offering for sale, and/or selling technology for clock recovery, including but not limited to the ON Semiconductor '758 Products, which include infringing technology for adaptive clock recovery. Such products and/or services include, by way of example and without limitation, the ON Semiconductor '758 Products.

120. On information and belief, the ON Semiconductor '758 Products comprise a system for recovering a service clock at a destination node.

121. On information and belief, the ON Semiconductor '758 Products include functionality for receiving data packets at a destination node.



AX5051 Advanced Multi-Channel Single Chip UHF Transceiver, ON SEMICONDUCTOR DATASHEET at 2 (April 2016) (annotations showing where data packets are received by the '758 Product).

122. On information and belief, the ON Semiconductor '758 Products systems with functionality for storing data from data packets in a buffer.

123. On information and belief, the ON Semiconductor '758 Products comprise a system for reading the data packets out of the buffer using a locally generated clock.

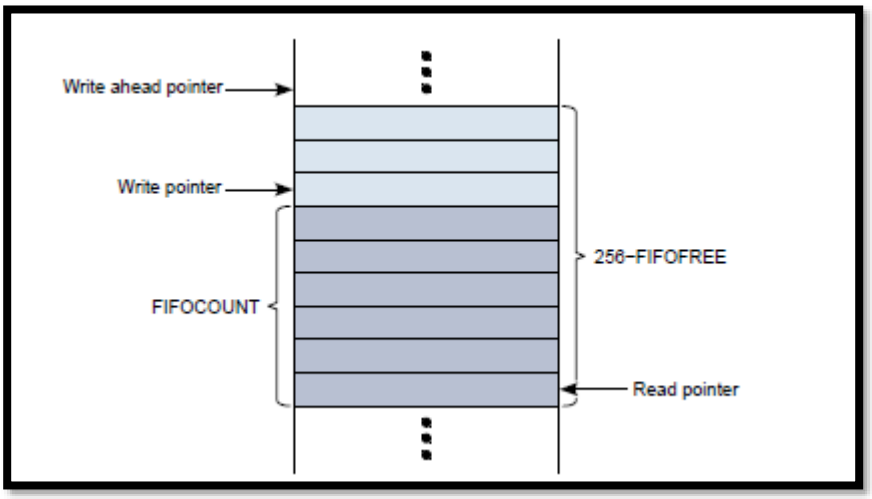
124. On information and belief, the ON Semiconductor '758 Products comprise a system for monitoring a fill level of the buffer over a plurality of time periods.

125. On information and belief, the ON Semiconductor '758 Products comprise a buffer having an input that is adapted to receive data packets from another node.

126. On information and belief, the ON Semiconductor '758 Products comprise a variable oscillator coupled to the buffer that controls the rate at which data is processed in the node.

127. On information and belief, the ON Semiconductor '758 Products comprise a system for controlling the frequency of the recovered clock signal.

128. On information and belief, the ON Semiconductor '758 Products comprise a system for identifying a relative maximum fill level for a buffer during a time period.



AX5043 Programming Manual, ON SEMICONDUCTOR PUBLICATION NO. AND9347/D at 7 (February 2017) ("In order to prevent transmitting premature data, the FIFO contains three pointers. Data is read at the read pointer, up to the write pointer. Data is written to the write ahead pointer. The write pointer is not updated when data is written, therefore, new data is not immediately visible to the consumer.").

129. On information and belief, the ON Semiconductor '758 Products use the relative maximum fill levels for the plurality of time periods to control the frequency of the locally generated clock so as to control the rate at which data is read out of the buffer.

130. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the ON Semiconductor '758 Products, ON Semiconductor has

injured DIFF Scale Operation Research and is liable for directly infringing one or more claims of the '758 patent, including at least claim 40, pursuant to 35 U.S.C. § 271(a).

131. On information and belief, ON Semiconductor also indirectly infringes the '758 patent by actively inducing infringement under 35 USC § 271(b).

132. On information and belief, ON Semiconductor has had knowledge of the '758 patent since at least service of this Complaint or shortly thereafter, and on information and belief, ON Semiconductor knew of the '758 patent and knew of its infringement, including by way of this lawsuit.

133. On information and belief, ON Semiconductor intended to induce patent infringement by third-party customers and users of the ON Semiconductor '758 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. ON Semiconductor specifically intended and was aware that the normal and customary use of the accused products would infringe the '758 patent. ON Semiconductor performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '758 patent and with the knowledge that the induced acts would constitute infringement. For example, ON Semiconductor provides the ON Semiconductor '758 Products that have the capability of operating in a manner that infringe one or more of the claims of the '758 patent, including at least claim 40, and ON Semiconductor further provides documentation and training materials that cause customers and end users of the ON Semiconductor '758 Products to utilize the products in a manner that directly infringe one or more claims of the '758 patent.[32] By providing instruction and training to customers and end-users on

[32] *See, e.g.,* AX5051 PROGRAMMING MANUAL, PUBLICATION ORDER NUMBER: AND9348/D (Sept. 2016); AX5043 ADVANCED HIGH PERFORMANCE ASK AND FSK NARROW-BAND TRANSCEIVER FOR 27 – 1050 MHZ RANGE, PUBLICATION ORDER NUMBER: AX5043/D (Oct. 2015); AX5042 PROGRAMMING MANUAL, PUBLICATION ORDER NUMBER: AND9354/D (Aug. 2016).

how to use the ON Semiconductor '758 Products in a manner that directly infringes one or more claims of the '758 patent, including at least claim 40, ON Semiconductor specifically intended to induce infringement of the '758 patent. On information and belief, ON Semiconductor engaged in such inducement to promote the sales of the ON Semiconductor '758 Products, e.g., through ON Semiconductor user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '758 patent. Accordingly, ON Semiconductor 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 '758 patent, knowing that such use constitutes infringement of the '758 patent.

134. The '758 patent is well-known within the industry as demonstrated by multiple citations to the '758 patent in published patents and patent applications assigned to technology companies and academic institutions. ON Semiconductor is utilizing the technology claimed in the '758 patent without paying a reasonable royalty. ON Semiconductor is infringing the '758 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

135. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '758 patent.

136. As a result of ON Semiconductor's infringement of the '758 patent, DIFF Scale Operation Research has suffered monetary damages, and seek recovery in an amount adequate to compensate for ON Semiconductor's infringement, but in no event less than a reasonable royalty for the use made of the invention by ON Semiconductor together with interest and costs as fixed by the Court.

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

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

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

139. ON Semiconductor designs, makes, sells, offers to sell, imports, and/or uses transceivers, including the following products: AX5043, AX5051, and AX5042 (collectively, the "ON Semiconductor '328 Product(s)").

140. On information and belief, one or more ON Semiconductor subsidiaries and/or affiliates use the ON Semiconductor '328 Products in regular business operations.

141. On information and belief, one or more of the ON Semiconductor '328 Products include technology for clock recovery in a packet network.

142. On information and belief, the ON Semiconductor '328 Products are available to businesses and individuals throughout the United States.

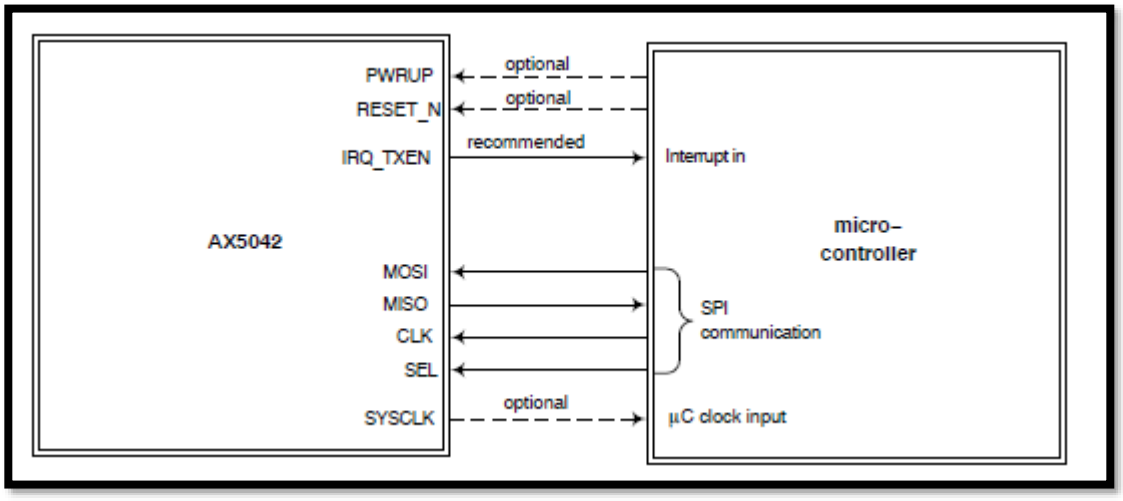
143. On information and belief, the ON Semiconductor '328 Products are provided to businesses and individuals located in the Eastern District of Texas.

144. On information and belief, ON Semiconductor 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 ON Semiconductor '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 ON Semiconductor '328 Products.

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

146. On information and belief, the ON Semiconductor '328 Products comprise a system for storing data packets in a buffer.

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



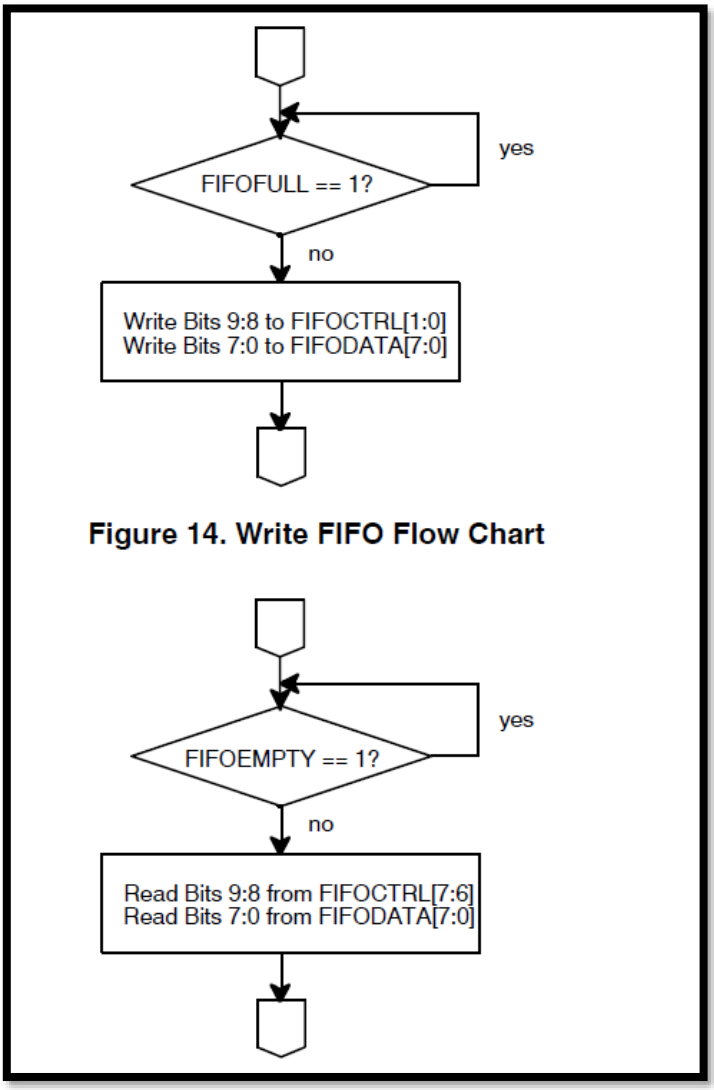
AX5042 Programming Manual, ON SEMI PUBLICATION NO. AND9354/D at 1 (August 2016) ("In Frame mode, the internal communication controller performs frame delimiting, and data is received and transmitted via a 3 level x 10 bit FIFO accessible via the register file.").

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

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

150. On information and belief, the ON Semiconductor '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.

151. On information and belief, the ON Semiconductor '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.



AX5042 Programming Manual, ON SEMI PUBLICATION NO. AND9354/D at 16 (August 2016) ("FIFO full, empty, overrun and underrun flags are also transmitted during the status phase of SPI transfers. See section: SPI Register Access and Table 2: Status Register Bits for details. FIFO flags may also be used to generate interrupts.").

152. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the ON Semiconductor '328 Products, ON Semiconductor 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).

153. On information and belief, ON Semiconductor also indirectly infringes the '328 patent by actively inducing infringement under 35 USC § 271(b).

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

155. On information and belief, ON Semiconductor intended to induce patent infringement by third-party customers and users of the ON Semiconductor '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. ON Semiconductor specifically intended and was aware that the normal and customary use of the accused products would infringe the '328 patent. ON Semiconductor 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, ON Semiconductor provides the ON Semiconductor '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 ON Semiconductor further provides documentation and training materials that cause customers and end users of the ON Semiconductor '328 Products to utilize the products in a manner that directly infringe one or more claims of the '328 patent.[33] By providing instruction and training to customers and end-users on

[33] *See, e.g.,* AX5051 PROGRAMMING MANUAL, PUBLICATION ORDER NUMBER: AND9348/D (Sept. 2016); AX5043 ADVANCED HIGH PERFORMANCE ASK AND FSK NARROW-BAND TRANSCEIVER FOR 27 – 1050 MHZ RANGE, PUBLICATION ORDER NUMBER: AX5043/D (Oct. 2015); AX5042 PROGRAMMING MANUAL, PUBLICATION ORDER NUMBER: AND9354/D (Aug. 2016).

how to use the ON Semiconductor '328 Products in a manner that directly infringes one or more claims of the '328 patent, including at least claim 1, ON Semiconductor specifically intended to induce infringement of the '328 patent. On information and belief, ON Semiconductor engaged in such inducement to promote the sales of the ON Semiconductor '328 Products, e.g., through ON Semiconductor user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '328 patent. Accordingly, ON Semiconductor 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.

156. 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. ON Semiconductor is utilizing the technology claimed in the '328 patent without paying a reasonable royalty. ON Semiconductor is infringing the '328 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

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

158. As a result of ON Semiconductor's infringement of the '328 patent, DIFF Scale Operation Research has suffered monetary damages, and seeks recovery in an amount adequate to compensate for ON Semiconductor's infringement, but in no event less than a reasonable royalty for the use made of the invention by ON Semiconductor 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 ON Semiconductor has infringed, either literally and/or under the doctrine of equivalents, the '413, '827, '758, and '328 patents;

B. An award of damages resulting from ON Semiconductor's acts of infringement in accordance with 35 U.S.C. § 284;

C. A judgment and order finding that ON Semiconductor's infringement was willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate 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 ON Semiconductor.

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 13, 2018

Respectfully submitted,

/s/ Daniel P. Hipskind

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