UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

DIFF SCALE OPERATION RESEARCH, LLC, ***Plaintiff,*** v. **NXP SEMICONDUCTORS N.V.; NXP B.V.; AND NXP SEMICONDUCTORS USA, INC.,** ***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"); 6,407,983 (the, "'983 patent"); and 6,721,328 (the, "'328 patent") (collectively, the "patents-in-suit"). Defendants NXP Semiconductors N.V.; NXP B.V.; and NXP Semiconductors USA, Inc. (collectively, "NXP" or "Defendants") 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 NXP'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

[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

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.

> 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,

---

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-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.").

> 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 frequency transmission technologies for transporting various services over a network.[8] ADC Telecommunications' groundbreaking products also included: the Soneplex Platform, CityCell,

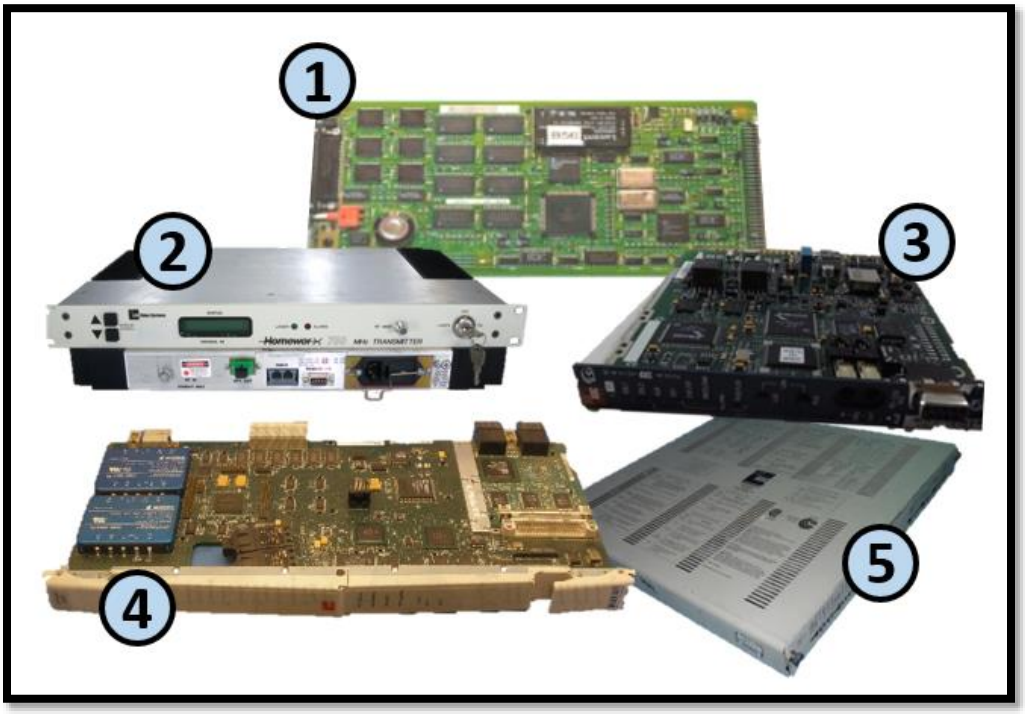
---

[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).

[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.").

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).

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

[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.").

[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.").

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[11]
- Apple, Inc.[12]

[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.

- 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]
- Marvell Technology Group, Limited[25]

12. Further confirming the value of the inventions at issue here, NXP has cited the patents-in-suit in its own patents and patent applications including U.S. Patent No. 7,420,426 and U.S. Patent App. No. 2007/0153952.

---

[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.

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

THE PARTIES

DIFF SCALE OPERATION RESEARCH, LLC

13. 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.

14. 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.

15. 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; JP03811007B2; JP2001523059A; JP2002502146A; JP2002504793A; JP3811007B2; WO1999025066A1; WO1999038285A1; WO1999043184A1; WO2001037468A2;

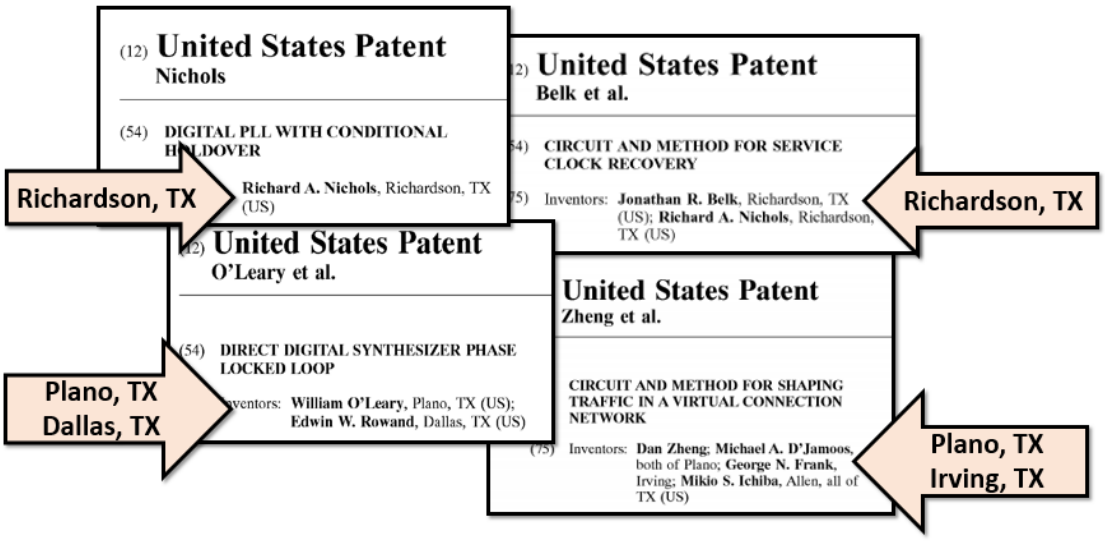
WO2001037468A3; WO2002084927A2; WO2002084927A3; WO2002101959A1; WO2008104282A1; WO2008104284A1.[26]

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

17. 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.

18. 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).

NXP SEMICONDUCTORS N.V.

19. On information and belief, NXP Semiconductors N.V. is a corporation organized under the laws of The Netherlands, with its principal place of business located at High Tech Campus 60, 5656 AG, Eindhoven, The Netherlands.

20. On information and belief, NXP Semiconductors N.V. conducts business operations within the Eastern District of Texas in its facilities at 101 E. Park Blvd., Floor 6, Plano, Texas 75074.

21. On information and belief, NXP Semiconductors N.V. has offices in the Eastern District of Texas where it sells and/or markets its products including sales offices in Plano.

NXP B.V.

22. On information and belief, NXP B.V. is a corporation organized under the laws of The Netherlands, with its principal place of business located at High Tech Campus 60, 5656 AG, Eindhoven, The Netherlands.

23. On information and belief, NXP B.V. is a subsidiary of Defendant NXP Semiconductors N.V.

NXP SEMICONDUCTORS USA, INC.

24. On information and belief, NXP Semiconductors USA, Inc. is a Delaware corporation with its principal place of business located at 411 East Plumeria Drive, San Jose, California 95134. On information and belief, NXP Semiconductors USA, Inc. is registered to do business in the State of Texas and has been since at least December 3, 2003.

25. On information and belief, NXP Semiconductors USA, Inc. conducts business operations within the Eastern District of Texas in its facilities at 101 E. Park Blvd., Floor 6, Plano, Texas 75074.

26. On information and belief, NXP Semiconductors USA, Inc. operates as the alter-ego of its parent companies, NXP Semiconductors N.V. and NXP B.V.

JURISDICTION AND VENUE

27. 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).

28. Upon information and belief, this Court has personal jurisdiction over Defendants in this action because Defendants have 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, Defendant NXP Semiconductor USA, Inc. is registered to do business in the State of Texas, and Defendants NXP Semiconductor N.V. and NXP Semiconductor USA, Inc. have offices and facilities in this District, and actively direct their activities to customers located in the State of Texas and in this District.

29. Venue is proper in this district under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). 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

30. 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.

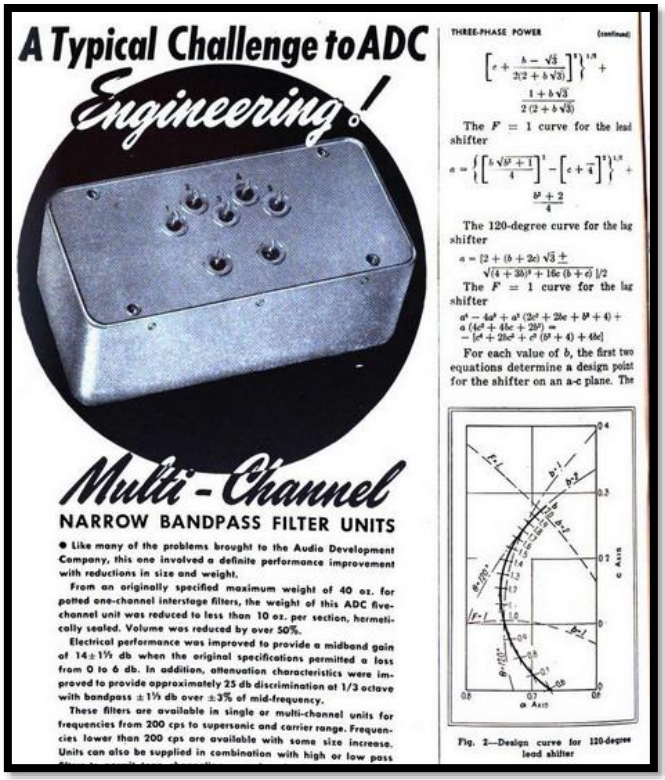
High-fidelity gear is considered by

(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).

31. 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).

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

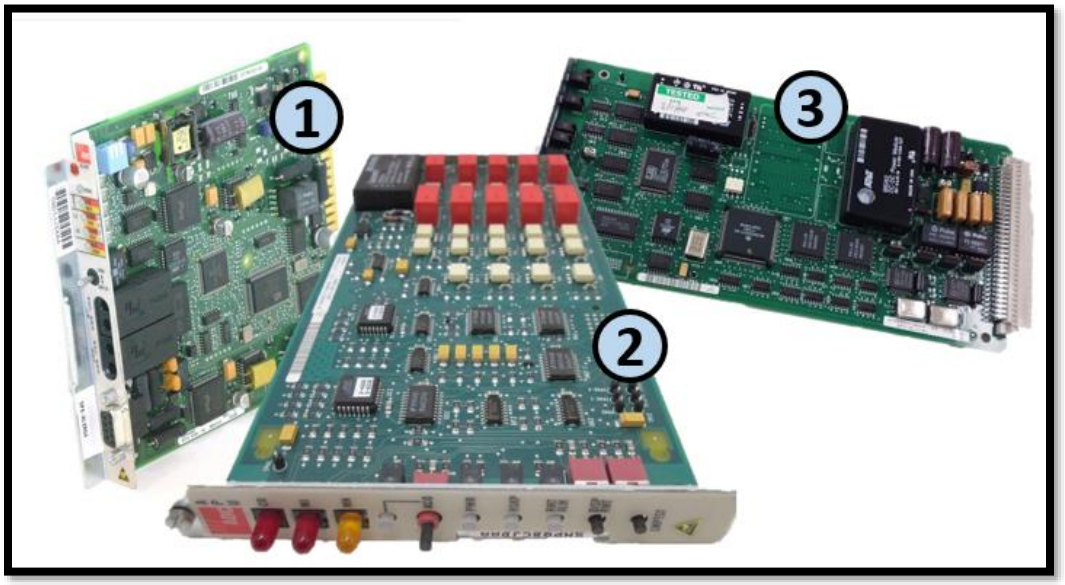
power supply board. The transceivers used are the CAF model manufactured by ADC Telecommunications, Inc.. The transceiver use bidirectional, full-duplex signal transmission over a single optic fiber. The transceiver is a self-contained, circuit-board-mountable device that contains the transmitting LED,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

33. 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]

34. 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).

35. 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."

36. 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

37. 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.

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

39. 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

40. 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.

41. 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.

42. 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.

43. 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.

44. 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.

45. 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.

46. 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

47. 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.

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

49. 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.

50. 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.

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

52. 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.

53. 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.

54. 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.

55. 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. 6,407,983

56. U.S. Patent No. 6,407,983 (the "'983 patent") entitled, *Circuit and Method for Shaping Traffic in a Virtual Connection Network*, was filed on February 20, 1998. DIFF Scale Operation Research is the owner of all right, title, and interest in the '983 patent. A true and correct copy of the '983 patent is attached hereto as Exhibit D.

57. The '983 patent claims specific methods and systems for delivering data packets from a traffic source to a virtual connection at a uniform rate using a traffic shaper. For example, one or more of the '983 patent claims describe a system where a buffer receives packets from a traffic source (e.g., a server on a computer network that originates data packets). The claimed system utilizes a counter that indicates the beginning of each of a number of timeslots over a selectable time period. Further, the claimed system contains a request generator that creates request signals that request timeslots for transmitting data out of a buffer. The requests are distributed so that a desired data rate for the traffic source is established.

58. The '983 patent teaches a method and system for an improved traffic shaper. At the time the inventions disclosed in the '983 patent were conceived "conventional[] telecommunications services [had] been provided to subscribers using dedicated channels." '983 patent, col. 1:11-12.

59. In the late 1990's, conventional traffic shaping technology could not selectively allocate timeslots for data transmission in a measurement window. The '983 patent teaches specific solutions to the problem apparent in the technology at the time. For example, the '983

patent teaches the use of a request generator that generates requests during a specific time window. The request generator attempts to evenly distribute the requests over the duration of the window.

60. The ‘983 patent discloses additional improvements to the functioning of traffic shapers by teaching the delivery of data packets from at least one traffic source to a virtual connection network at a substantially uniform rate.

61. The ‘983 patent further teaches the use of generating requests for timeslots for data transmission according to a stored pattern based on a selected data rate.

62. Another insight for improving the performance of traffic shaping systems described by the ‘983 patent is to use a counter which can generate pulses that indicate the beginning of each timeslot in a measurement window.

63. The inventions taught in the ‘983 patent achieve improvements in traffic shaping systems by creating request signals that request timeslots for transmitting data out of the buffer. Implementation of the system and methods disclosed in the ‘983 patent is directed to a specific improvement in computer technology - delivering data packets from at least one traffic source at a substantially uniform rate. Further, the claims of the ‘983 patent are directed to specific asserted improvements in computer capabilities. For example, the claims recite specific steps – a counter that indicates the beginning of each of a number of time slots over a selectable time period – that accomplish the desired result – delivering data packets at a substantially uniform rate.

64. The ‘983 patent claims a technical solution to a problem unique to computer systems: delivering data packets to a virtual connection.

65. The ‘983 patent family has been cited by 61 United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ‘983 patent family as relevant prior art:

- Alcatel-Lucent S.A.
- AT&T, Inc.
- Broadcom Corporation
- End II End Communications, Inc.
- Intel Corporation
- InterDigital, Inc.
- International Business Machines Corporation
- ORBCOMM, Inc.
- PRO DESIGN Electronics GmbH
- Riverstone Networks, Inc.
- Verizon Communications, Inc.

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

66. 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 E.

67. 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.

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

69. 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.

70. 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.

71. 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.

72. 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.

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

74. 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

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

76. NXP 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.

77. NXP designs, makes, sells, offers to sell, imports, and/or uses products incorporating timing circuits, including the following products: S12XE Automotive and Industrial Microcontroller, S12P Automotive and Industrial Microcontroller, S12XS Automotive and Industrial Microcontroller, S12NE Microcontroller, MAC7100 Microcontrollers (MAC7101, MAC7106, MAC7111, MAC7112, MAC7116, MAC7121, MAC7122, MAC7126, MAC7131, MAC7136, MAC7141, MAC7142), OL2300NHN Fractional-N PLL Based Transmitter, OL2385AHN:Low-Power Multi-Channel UHF RF Wireless Platform, OL2381AHN Highly integrated single-chip sub 1 GHz RF transceiver, and OL2311AHN Highly integrated single-chip sub 1-GHz RF receiver (collectively, the "NXP '413 Product(s)").

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

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

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

3.8.2 PLL Filter Characteristics

The oscillator provides the reference clock for the PLL as shown in Figure 3. The voltage controlled oscillator (VCO) of the PLL is also the system clock source in self clock mode. In order to operate reliably, care must be taken to select proper values for external loop filter components.

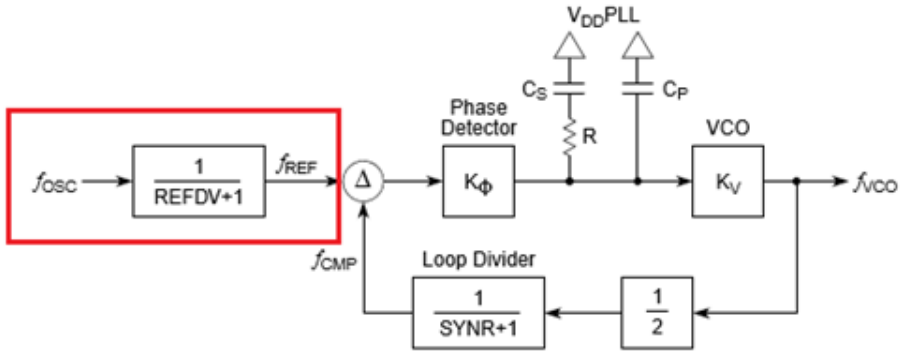
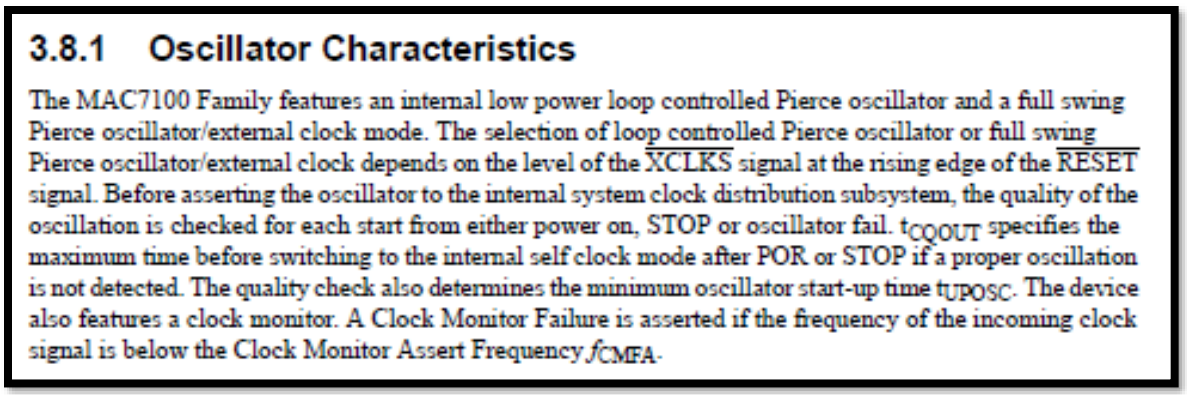


Figure 3. Basic PLL Functional Diagram

MAC7100 MICROCONTROLLER FAMILY HARDWARE SPECIFICATIONS, NXP DATASHEET at 16 (February 2006) (annotation showing that the reference clock is used to generate the timing signal).

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

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



3.8.1 Oscillator Characteristics

The MAC7100 Family features an internal low power loop controlled Pierce oscillator and a full swing Pierce oscillator/external clock mode. The selection of loop controlled Pierce oscillator or full swing Pierce oscillator/external clock depends on the level of the $\overline{\text{XCLKS}}$ signal at the rising edge of the $\overline{\text{RESET}}$ signal. Before asserting the oscillator to the internal system clock distribution subsystem, the quality of the oscillation is checked for each start from either power on, STOP or oscillator fail. t_{CQOUT} specifies the maximum time before switching to the internal self clock mode after POR or STOP if a proper oscillation is not detected. The quality check also determines the minimum oscillator start-up time t_{UPOSC}. The device also features a clock monitor. A Clock Monitor Failure is asserted if the frequency of the incoming clock signal is below the Clock Monitor Assert Frequency f_{CMFA}.

MAC7100 MICROCONTROLLER FAMILY HARDWARE SPECIFICATIONS, NXP DATASHEET at 16 (February 2006) ("The MAC7100 Family features an internal low power loop controlled Pierce oscillator and a full swing Pierce oscillator/external clock mode.").

83. On information and belief, one or more of the NXP '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.

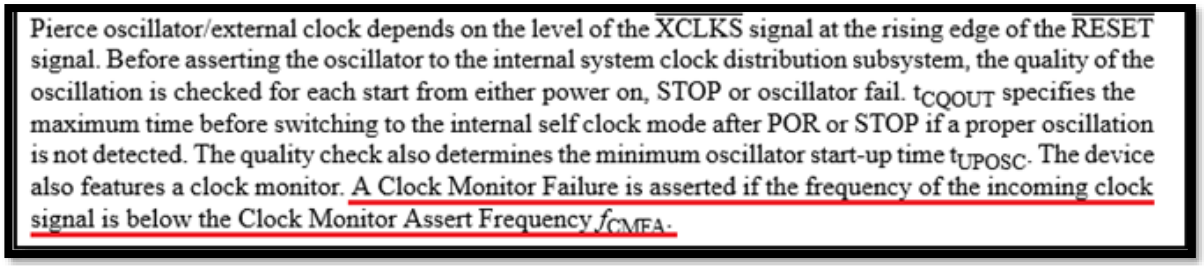
84. On information and belief, the NXP '413 Products are available to businesses and individuals throughout the United States.

85. On information and belief, the NXP '413 Products are provided to businesses and individuals located in the Eastern District of Texas.

86. On information and belief, NXP 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 NXP '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 NXP '413 Products.

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

88. On information and belief, the NXP '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.


Pierce oscillator/external clock depends on the level of the $\overline{\text{XCLKS}}$ signal at the rising edge of the $\overline{\text{RESET}}$ signal. Before asserting the oscillator to the internal system clock distribution subsystem, the quality of the oscillation is checked for each start from either power on, STOP or oscillator fail. t_{CQOUT} specifies the maximum time before switching to the internal self clock mode after POR or STOP if a proper oscillation is not detected. The quality check also determines the minimum oscillator start-up time t_{UPOSC}. The device also features a clock monitor. A Clock Monitor Failure is asserted if the frequency of the incoming clock signal is below the Clock Monitor Assert Frequency f_{CMFA}.

MAC7100 MICROCONTROLLER FAMILY HARDWARE SPECIFICATIONS, NXP DATASHEET at 16 (February 2006) (annotation showing that the NXP '413 products perform the step of placing the signal in a holdover condition if the quality level from the status message received is below a target.).

89. On information and belief, the NXP '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.

90. The NXP '413 Products comprise a system for performing the elements in a proscribed order.

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

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

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

94. On information and belief, NXP intended to induce patent infringement by third-party customers and users of the NXP '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. NXP specifically intended and was aware that the normal and customary use of the accused products would infringe the '413 patent. NXP 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, NXP provides the NXP '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 NXP further provides documentation and training materials that cause customers and end users of the NXP '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 NXP '413 Products in a manner that directly infringes one or more claims of the '413 patent, including at least claim 21, NXP specifically intended to induce infringement of the '413 patent. On information and belief, NXP engaged in such inducement to promote the sales of the NXP '413 Products, e.g., through NXP user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '413 patent.

[30] *See, e.g.*, MAC7100 MICROCONTROLLER FAMILY REFERENCE MANUAL, NXP (Feb. 2009); OL2385 INDUSTRIAL RF TRANSCEIVER, PRODUCT DATA SHEET (June 2016); STEVEN MCLAUGHLIN, *Comparison of the S12XS CRG Module with S12P CPMU Module*, FREESCALE SEMICONDUCTOR APPLICATION NOTE (March 2008); MC9S12P128 REFERENCE MANUAL, S12 MICROCONTROLLERS (June 24, 2013).

Accordingly, NXP 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 '413 patent, knowing that such use constitutes infringement of the '413 patent.

95. 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. NXP is utilizing the technology claimed in the '413 patent without paying a reasonable royalty. NXP 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.

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

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

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

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

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

100. NXP designs, makes, sells, offers to sell, imports, and/or uses products incorporating timing circuits, including the following products: MAC7100 Microcontrollers (MAC7101, MAC7106, MAC7111, MAC7112, MAC7116, MAC7121, MAC7122, MAC7126,

MAC7131, MAC7136, MAC7141, MAC7142), OL2300NHN Fractional-N PLL Based Transmitter, OL2385AHN:Low-Power Multi-Channel UHF RF Wireless Platform, OL2381AHN Highly integrated single-chip sub 1 GHz RF transceiver, OL2311AHN Highly integrated single-chip sub 1-GHz RF receiver (collectively, the "NXP '827 Product(s)").

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

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

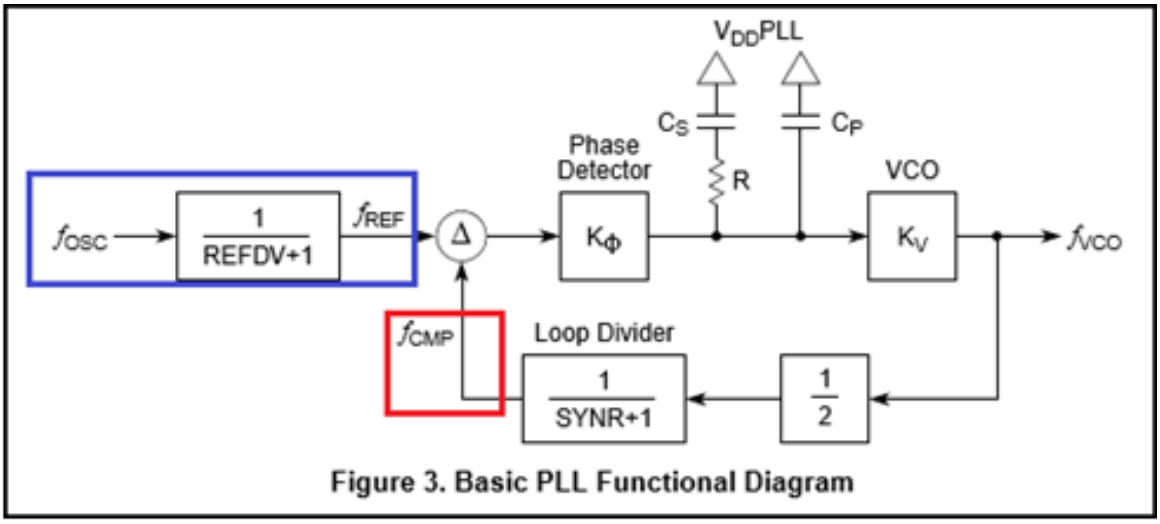


Figure 3. Basic PLL Functional Diagram

MAC7100 MICROCONTROLLER FAMILY HARDWARE SPECIFICATIONS, NXP DATASHEET at 16 (February 2006) (Annotations showing that NXP Products use a Phase Detector within a Phase Locked Loop (PLL) to monitor the phase relationship between the reference clock signal (blue box) and the feedback signal (red box).).

103. On information and belief, the NXP '827 Products are available to businesses and individuals throughout the United States.

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

105. On information and belief, the NXP '827 Products comprise a phase locked loop adapted to filter and store data indicative of a control signal.

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

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

108. On information and belief, the NXP '827 Products include a phase comparator.

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

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

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

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

3.8.2.1 Jitter Information

With each transition of the clock f_{CMP}, the deviation from the reference clock f_{REF} is measured and input voltage to the VCO is adjusted accordingly. The adjustment is done continuously with no abrupt changes in the clock output frequency. Noise, voltage, temperature and other factors cause slight variations in the control loop resulting in a clock jitter. This jitter affects the real minimum and maximum clock periods as illustrated in Figure 4. It is important to note that the pre-scaler used by timers and serial modules will eliminate the effect of PLL jitter to a large extent.

MAC7100 Microcontroller Family Hardware Specifications, NXP DATASHEET at 17 (February 2006) ("With each transition of the clock f_{CMP}, the deviation from the reference clock f_{REF} is measured.")

113. On information and belief, the NXP '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.

114. On information and belief, NXP 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 NXP ’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 NXP ’827 Products.

115. 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.

116. 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.

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

118. On information and belief, NXP also indirectly infringes the ’827 patent by actively inducing infringement under 35 USC § 271(b).

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

120. Alternatively, NXP has had knowledge of the ’827 patent since at least December 2015. U.S. Patent No. 7,420,426, which was issued on September 2, 2008, cites the ’827 patent

as relevant prior art. Assignee of U.S. Patent No. 7,420,426 upon its issuance was Freescale Semiconductor, Inc. On information and belief, in December 2015, NXP acquired Freescale Semiconductor, Inc.

121. On information and belief, NXP intended to induce patent infringement by third-party customers and users of the NXP '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. NXP specifically intended and was aware that the normal and customary use of the accused products would infringe the '827 patent. NXP 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, NXP provides the NXP '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 NXP further provides documentation and training materials that cause customers and end users of the NXP '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 how to use the NXP '827 Products in a manner that directly infringes one or more claims of the '827 patent, including at least claim 28, NXP specifically intended to induce infringement of the '827 patent. On information and belief, NXP engaged in such inducement to promote the sales of the NXP '827 Products, e.g., through NXP user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '827 patent. Accordingly, NXP has induced and continues to induce users of the accused products to use the

[31] *See, e.g.*, MAC7100 MICROCONTROLLER FAMILY REFERENCE MANUAL, NXP (Feb. 2009); OL2385 INDUSTRIAL RF TRANSCEIVER, PRODUCT DATA SHEET (June 2016); OL2300 FRACTIONAL-N PLL BASED TRANSMITTER, PRODUCT DATA SHEET (Oct. 28, 2010); OL2311 HIGHLY INTEGRATED SINGLE-CHIP SUB 1 GHZ RF RECEIVER, PRODUCT DATA SHEET (Dec. 8, 2011).

accused products in their ordinary and customary way to infringe the '827 patent, knowing that such use constitutes infringement of the '827 patent.

122. 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. NXP is utilizing the technology claimed in the '827 patent without paying a reasonable royalty. NXP 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.

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

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

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

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

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

127. NXP designs, makes, sells, offers to sell, imports, and/or uses timing devices, including the following products: SC28L194A1A - Quad UART for 3.3 V and 5 V supply

voltage and SC28L194A1BE - Quad UART for 3.3 V and 5 V supply voltage (collectively, the "NXP '758 Product(s)").

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

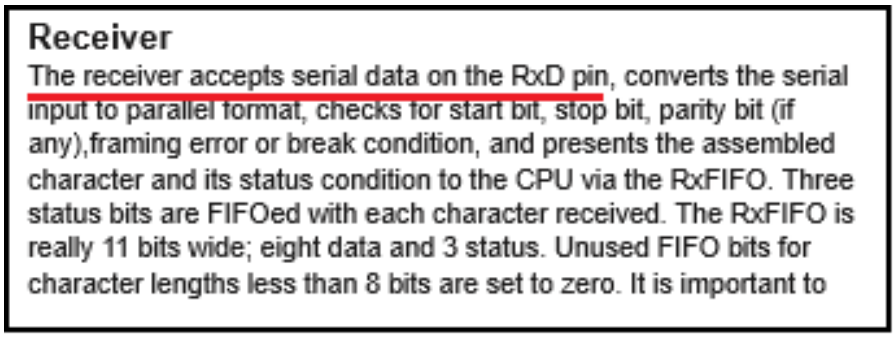
129. On information and belief, one or more of the NXP '758 Products include clock recovery technology.

130. On information and belief, the NXP '758 Products are available to businesses and individuals throughout the United States.

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

132. On information and belief, NXP 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 NXP '758 Products, which include infringing technology for adaptive clock recovery. Such products and/or services include, by way of example and without limitation, the NXP '758 Products.

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



Receiver

The receiver accepts serial data on the RxD pin, converts the serial input to parallel format, checks for start bit, stop bit, parity bit (if any),framing error or break condition, and presents the assembled character and its status condition to the CPU via the RxFIFO. Three status bits are FIFOed with each character received. The RxFIFO is really 11 bits wide; eight data and 3 status. Unused FIFO bits for character lengths less than 8 bits are set to zero. It is important to

SC28L194 Quad UART for 3.3V and 5V Supply Voltage, NXP DATASHEET at 8 (August 2006) (annotation added).

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

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

Receiver FIFO

The receiver buffer memory is a 16 byte ripple FIFO with three status bits appended to each data byte. (The FIFO is then 16 11 bit "words"). The receiver state machine gathers the bits from the receiver shift register and the status bits from the receiver logic and writes the assembled byte and status bits to the RxFIFO. Logic associated with the FIFO encodes the number of filled positions for presentation to the interrupt arbitration system. The encoding is always 1 less than the number of filled positions. Thus, a full RxFIFO will bid with the value or 15; when empty it will not bit at all; one position occupied bids with the value 0. An empty FIFO will not bid since no character is available. Normally RxFIFO will present a bid to the arbitration system when ever it has one or more filled positions. The MR2[3:2 bits allow the user to modify this characteristic so that bidding will not start until one of four levels (one or more filled, 1/2 filled, 3/4 filled, full) have been reached. As will be shown later this feature may be used to make slight improvements in the interrupt service efficiency. A similar system exists in the transmitter.

SC28L194 Quad UART for 3.3V and 5V Supply Voltage, NXP DATASHEET at 8 (August 2006) (annotation added).

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

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

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

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

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

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

> To minimize interrupt overhead an interrupt arbitration system is included which reports the context of the interrupting UART via direct access or through the modification of the interrupt vector. The context of the interrupt is reported as channel number, type of device interrupting (receiver COS etc.) and, for transmitters or receivers, the fill level of the FIFO.

SC28L194 Quad UART for 3.3V and 5V Supply Voltage, NXP DATASHEET at 8 (August 2006) (annotation added).

142. On information and belief, the NXP '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.

143. On information and belief, the NXP '758 Products' clock controls the rate at which data is read out of the buffer by varying the control signal. If the control signal is high a start condition is indicated and data is transferred out of the buffer.

> **10.1 Data transfers**
>
> One data bit is transferred during each clock pulse (see Figure 12). The data on the SDA line must remain stable during the HIGH period of the clock pulse in order to be valid. Changes in the data line at this time will be interpreted as control signals. A HIGH-to-LOW transition of the data line (SDA) while the clock signal (SCL) is HIGH indicates a START condition, and a LOW-to-HIGH transition of the SDA while SCL is HIGH defines a STOP condition (see Figure 13). The bus is considered to be busy after the START condition and free again at a certain time interval after the STOP condition. The START and STOP conditions are always generated by the master.

Dual UART with I2C-bus/SPI interface, 64 bytes of transmit and receive FIFOs, IrDA SIR built-in support, NXP DATA SHEET at 35 (March 22, 2012).

144. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the NXP '758 Products, NXP 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).

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

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

147. On information and belief, NXP intended to induce patent infringement by third-party customers and users of the NXP '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. NXP specifically intended and was aware that the normal and customary use of the accused products would infringe the '758 patent. NXP 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, NXP provides the NXP '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 NXP further provides documentation and training materials that cause customers and end users of the NXP '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 how to use the NXP '758

[32] *See, e.g.*, SC28L194 QUAD UART FOR 3.3 V AND 5 V SUPPLY VOLTAGE, DATA SHEET (Aug. 15, 2006); *Dual UART with I2C-bus/SPI interface, 64 bytes of transmit and receive FIFOs, IrDA SIR built-in support*, NXP Data Sheet at 35 (March 22, 2012).

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

148. 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. NXP is utilizing the technology claimed in the '758 patent without paying a reasonable royalty. NXP 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.

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

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

COUNT IV
INFRINGEMENT OF U.S. PATENT NO. 6,407,983

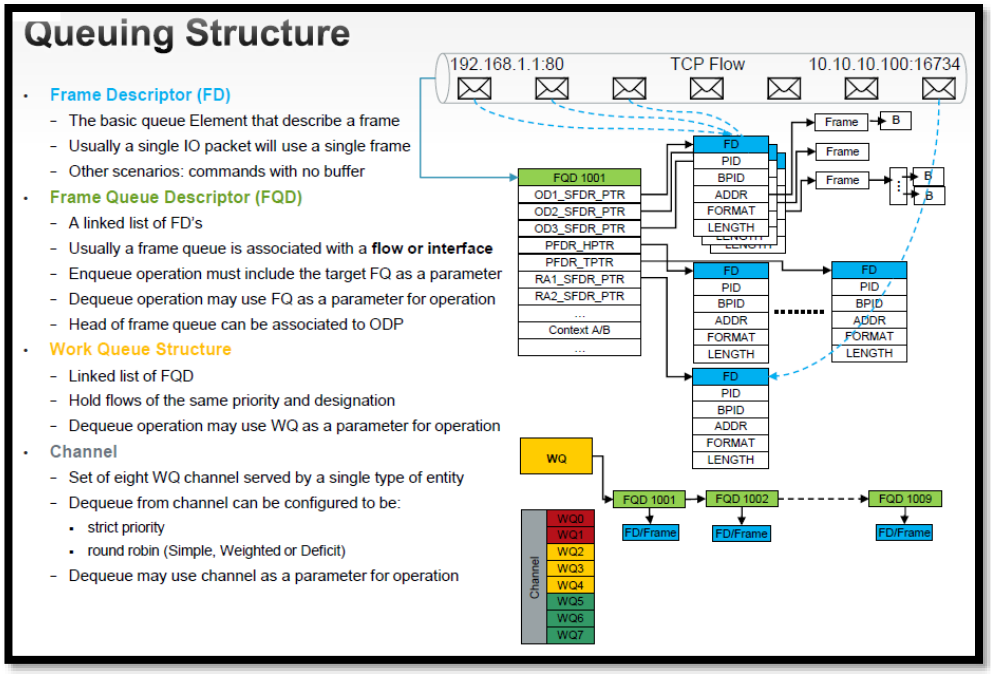
151. DIFF Scale Operation Research references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

152. NXP designs, makes, uses, sells, and/or offers for sale in the United States products and/or services for traffic shaping that deliver data packets from one traffic source at a substantially uniform rate.

153. NXP designs, makes, sells, offers to sell, imports, and/or uses processors, including the following products: QorIQ T4 family of processors (*e.g.*, QorIQ T4240 Multicore Communications Processors, QorIQ T4160 Multicore Communications Processors, QorIQ T4080 Multicore Communications Processors) (collectively, the "NXP '983 Product(s)").

154. On information and belief, one or more NXP subsidiaries and/or affiliates use the NXP '983 Products in regular business operations.

155. On information and belief, one or more of the NXP '983 Products include technology for traffic shaping.



Charlie Li, *QorIQ T4240 DPAA Deep Dive*, AMF-NET-T1282 PRESENTATION at 30 (October 2013).

156. On information and belief, one or more of the NXP '983 Products include technology for controlling data traffic on a network to match its transmission to the speed of the remote target interface.

157. On information and belief, the NXP '983 Products are available to businesses and individuals throughout the United States.

158. On information and belief, the NXP '983 Products are provided to businesses and individuals located in the Eastern District of Texas.

159. On information and belief, NXP has directly infringed and continues to directly infringe the '983 patent by, among other things, making, using, offering for sale, and/or selling technology for traffic shaping, including but not limited to the NXP '983 Products, which include infringing technology for delivering data packets from at least one traffic source at a substantially

uniform rate. Such products and/or services include, by way of example and without limitation, the NXP '983 Products.

160. On information and belief, the NXP '983 Products comprise a buffer that receives packets from at least one traffic source.

161. On information and belief, the NXP '983 Products include a counter that indicates the beginning of each of a number of timeslots over a selectable time period.

162. On information and belief, the NXP '983 Products comprise a request generator that creates request signals that request timeslots for transmitting data out of the buffer, wherein the requests are distributed over the time period based on at least one table so as to establish a desired data rate for the traffic source.

163. By making, using, testing, offering for sale, and/or selling products and services, including but not limited to the NXP '983 Products, NXP has injured DIFF Scale Operation Research and is liable for directly infringing one or more claims of the '983 patent, including at least claim 8, pursuant to 35 U.S.C. § 271(a).

164. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '983 patent.

165. As a result of NXP's infringement of the '983 patent, DIFF Scale Operation Research has suffered monetary damages, and seeks recovery in an amount adequate to compensate for NXP's infringement, but in no event less than a reasonable royalty for the use made of the invention by NXP together with interest and costs as fixed by the Court.

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

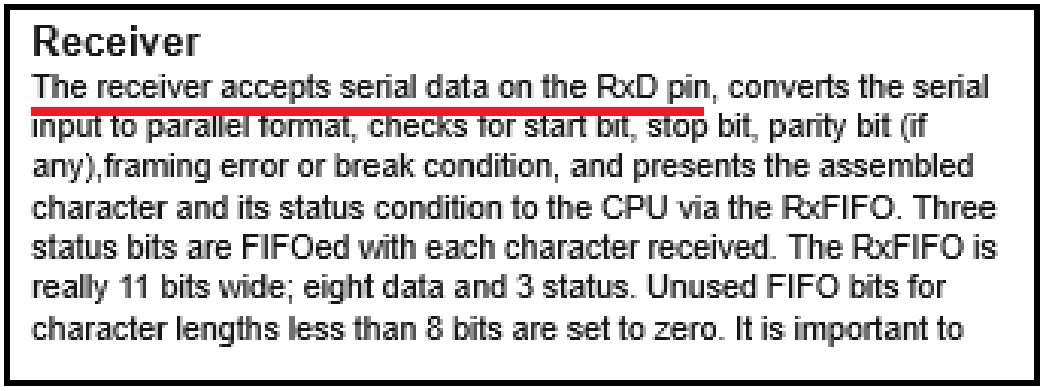
166. DIFF Scale Operation Research references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

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

168. NXP designs, makes, sells, offers to sell, imports, and/or uses SC28L194A1A - Quad UART for 3.3 V and 5 V supply voltage and SC28L194A1BE - Quad UART for 3.3 V and 5 V supply voltage (collectively, the "NXP '328 Product(s)").

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

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



Receiver

The receiver accepts serial data on the RxD pin, converts the serial input to parallel format, checks for start bit, stop bit, parity bit (if any),framing error or break condition, and presents the assembled character and its status condition to the CPU via the RxFIFO. Three status bits are FIFOed with each character received. The RxFIFO is really 11 bits wide; eight data and 3 status. Unused FIFO bits for character lengths less than 8 bits are set to zero. It is important to

SC28L194 Quad UART for 3.3V and 5V Supply Voltage, NXP DATASHEET at 8 (August 2006) (annotation added).

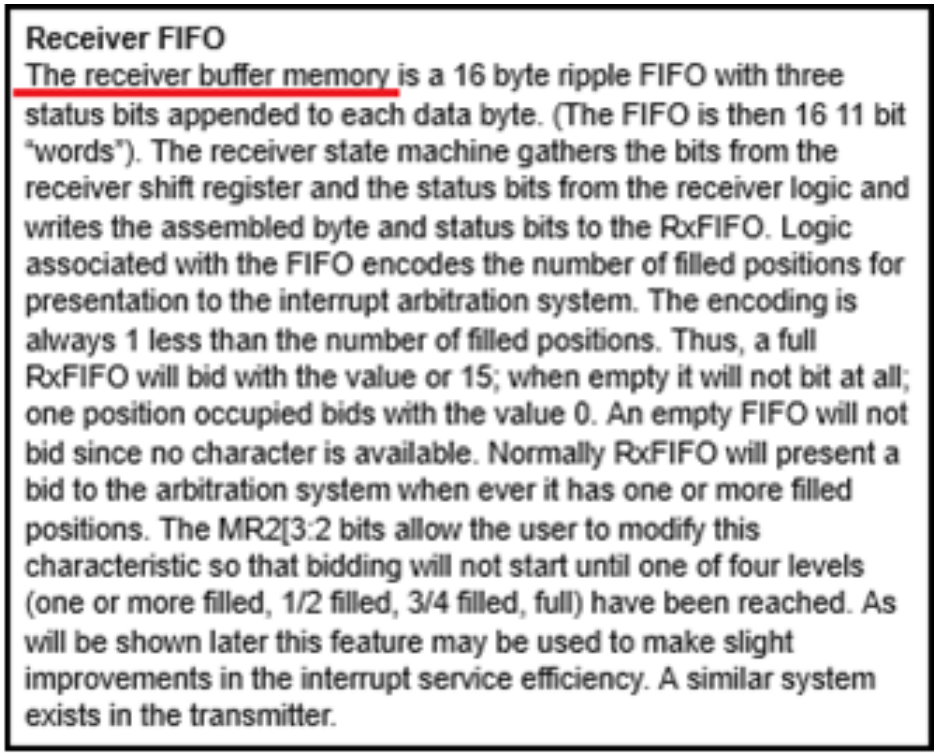
171. On information and belief, the NXP '328 Products are available to businesses and individuals throughout the United States.

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

173. On information and belief, NXP 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 NXP '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 NXP '328 Products.

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

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



Receiver FIFO

The receiver buffer memory is a 16 byte ripple FIFO with three status bits appended to each data byte. (The FIFO is then 16 11 bit "words"). The receiver state machine gathers the bits from the receiver shift register and the status bits from the receiver logic and writes the assembled byte and status bits to the RxFIFO. Logic associated with the FIFO encodes the number of filled positions for presentation to the interrupt arbitration system. The encoding is always 1 less than the number of filled positions. Thus, a full RxFIFO will bid with the value or 15; when empty it will not bit at all; one position occupied bids with the value 0. An empty FIFO will not bid since no character is available. Normally RxFIFO will present a bid to the arbitration system when ever it has one or more filled positions. The MR2[3:2 bits allow the user to modify this characteristic so that bidding will not start until one of four levels (one or more filled, 1/2 filled, 3/4 filled, full) have been reached. As will be shown later this feature may be used to make slight improvements in the interrupt service efficiency. A similar system exists in the transmitter.

SC28L194 Quad UART for 3.3V and 5V Supply Voltage, NXP DATASHEET at 8 (August 2006) (annotation added).

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

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

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

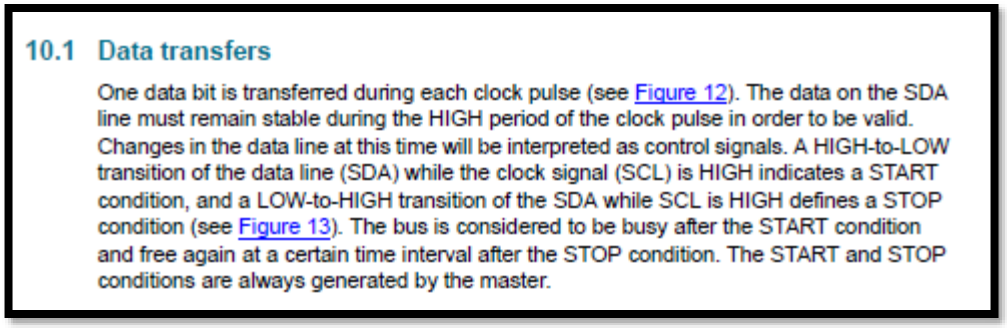
> To minimize interrupt overhead an interrupt arbitration system is included which reports the context of the interrupting UART via direct access or through the modification of the interrupt vector. The context of the interrupt is reported as channel number, type of device interrupting (receiver COS etc.) and, for transmitters or receivers, the fill level of the FIFO.

SC28L194 Quad UART for 3.3V and 5V Supply Voltage, NXP DATASHEET at 8 (August 2006) (annotation added).

179. On information and belief, the NXP '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.

180. On information and belief, the NXP '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.

181. On information and belief, the NXP '758 Products' clock controls the rate at which data is read out of the buffer by varying the control signal. If the control signal is high a start condition is indicated and data is transferred out of the buffer.



10.1 Data transfers

One data bit is transferred during each clock pulse (see Figure 12). The data on the SDA line must remain stable during the HIGH period of the clock pulse in order to be valid. Changes in the data line at this time will be interpreted as control signals. A HIGH-to-LOW transition of the data line (SDA) while the clock signal (SCL) is HIGH indicates a START condition, and a LOW-to-HIGH transition of the SDA while SCL is HIGH defines a STOP condition (see Figure 13). The bus is considered to be busy after the START condition and free again at a certain time interval after the STOP condition. The START and STOP conditions are always generated by the master.

Dual UART with I2C-bus/SPI interface, 64 bytes of transmit and receive FIFOs, IrDA SIR built-in support, NXP DATA SHEET at 35 (March 22, 2012).

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

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

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

185. On information and belief, NXP intended to induce patent infringement by third-party customers and users of the NXP '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. NXP specifically intended and was aware that the normal and customary use of the accused products would infringe the '328 patent. NXP 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, NXP provides the NXP '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 NXP further provides documentation and training materials that cause customers and end users of the NXP '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 how to use the NXP '328 Products in a manner that directly infringes one or more claims of the '328 patent, including at least claim 1, NXP specifically intended to induce infringement of the '328 patent. On information and belief, NXP engaged in such inducement to promote the sales of the NXP '328 Products, e.g., through NXP user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '328 patent. Accordingly, NXP 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.

186. 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. NXP is utilizing the technology claimed in the '328 patent without paying a reasonable royalty. NXP 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.

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

[33] *See, e.g.*, SC28L194 QUAD UART FOR 3.3 V AND 5 V SUPPLY VOLTAGE, DATA SHEET (Aug. 15, 2006); *Dual UART with I2C-bus/SPI interface, 64 bytes of transmit and receive FIFOs, IrDA SIR built-in support*, NXP DATA SHEET at 35 (March 22, 2012).

188. As a result of NXP's infringement of the '328 patent, DIFF Scale Operation Research has suffered monetary damages, and seeks recovery in an amount adequate to compensate for NXP's infringement, but in no event less than a reasonable royalty for the use made of the invention by NXP 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 NXP has infringed, either literally and/or under the doctrine of equivalents, the '413, '827, '758, '983, and '328 patents;

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

C. A judgment and order finding that NXP'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 NXP.

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

Elizabeth L. DeRieux
State Bar No. 05770585
Capshaw DeRieux, LLP
114 E. Commerce Ave.
Gladewater, TX 75647
Telephone: (903) 845-5770
Email: ederieux@capshawlaw.com

Dorian S. Berger (CA SB No. 264424)
Daniel P. Hipskind (CA SB No. 266763)
Eric B. Hanson (CA SB No. 254570)
BERGER & HIPSKIND LLP
9538 Brighton Way
Suite 320
Beverly Hills, CA 90210
Telephone: 323-886-3430
Facsimile: 323-978-5508
E-mail: dsb@bergerhipskind.com
E-mail: dph@bergerhipskind.com
E-mail: ebh@bergerhipskind.com

Attorneys for DIFF Scale Operation Research, LLC