

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
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EPAS ID: PAT4531141

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	SECURITY INTEREST

**CONVEYING PARTY DATA**

Name	Execution Date
ETHERTRONICS, INC.	10/13/2016

**RECEIVING PARTY DATA**

<b>Name:</b>	NH EXPANSION CREDIT FUND HOLDINGS LP
<b>Street Address:</b>	1585 BROADWAY, 37TH FLOOR
<b>City:</b>	NEW YORK
<b>State/Country:</b>	NEW YORK
<b>Postal Code:</b>	10036

**PROPERTY NUMBERS Total: 12**

Property Type	Number
Patent Number:	7764124
Patent Number:	8081032
Patent Number:	8049566
Patent Number:	7834690
Patent Number:	7834691
Patent Number:	8058938
Patent Number:	8150352
Patent Number:	8143946
Patent Number:	9543916
Application Number:	14989566
Application Number:	15367995
Application Number:	15368026

**CORRESPONDENCE DATA**

**Fax Number:** (858)550-6420

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*

**Phone:** 858-550-6433

**Email:** jmfitzpatrick@cooley.com

**Correspondent Name:** JENNIFER FITZPATRICK

**Address Line 1:** C/O COOLEY LLP

**Address Line 2:** 4401 EASTGATE MALL

**PATENT**

<b>Address Line 4:</b>	SAN DIEGO, CALIFORNIA 92121
<b>ATTORNEY DOCKET NUMBER:</b>	136453-190 ETHERTRONICS
<b>NAME OF SUBMITTER:</b>	JENNIFER FITZPATRICK
<b>SIGNATURE:</b>	/JENNIFER FITZPATRICK/
<b>DATE SIGNED:</b>	08/02/2017
<b>Total Attachments: 10</b> source=Ethertronics - IPSA (updated 2017)#page1.tif source=Ethertronics - IPSA (updated 2017)#page2.tif source=Ethertronics - IPSA (updated 2017)#page3.tif source=Ethertronics - IPSA (updated 2017)#page4.tif source=Ethertronics - IPSA (updated 2017)#page5.tif source=Ethertronics - IPSA (updated 2017)#page6.tif source=Ethertronics - IPSA (updated 2017)#page7.tif source=Ethertronics - IPSA (updated 2017)#page8.tif source=Ethertronics - IPSA (updated 2017)#page9.tif source=Ethertronics - IPSA (updated 2017)#page10.tif	

## INTELLECTUAL PROPERTY SECURITY AGREEMENT

This Intellectual Property Security Agreement is entered into as of October 13, 2016 by and between NH EXPANSION CREDIT FUND HOLDINGS LP, a Delaware limited partnership ("Holder") and ETHERTRONICS, INC., a Delaware corporation ("Grantor").

### RECITALS

**A.** Holder has agreed to make certain advances of money and to extend certain financial accommodations to Grantor (the "Loans") in the amounts and manner set forth in that certain Secured Promissory Note issued by Grantor dated of even date herewith (as the same may be amended, modified or supplemented from time to time, the "Secured Note"; capitalized terms used herein are used as defined in the Secured Note). Holder is willing to make the Loans to Grantor, but only upon the condition, among others, that Grantor shall grant to Holder a security interest in certain Copyrights, Trademarks and Patents to secure the obligations of Grantor under the Secured Note.

**B.** Pursuant to the terms of the Secured Note, Grantor has granted to Holder a security interest in all of Grantor's right, title and interest, whether presently existing or hereafter acquired, in, to and under all of the Collateral.

**NOW, THEREFORE,** for good and valuable consideration, receipt of which is hereby acknowledged, and intending to be legally bound, as collateral security for the prompt and complete payment when due of its obligations under the Secured Note and all other agreements now existing or hereafter arising between Grantor and Holder, Grantor hereby represents, warrants, covenants and agrees as follows:

### AGREEMENT

To secure its obligations under the Secured Note and under any other agreement now existing or hereafter arising between Grantor and Holder, Grantor grants and pledges to Holder a security interest in all of Grantor's right, title and interest in, to and under its Intellectual Property Collateral (including without limitation those Copyrights, Patents and Trademarks listed on Exhibits A, B and C hereto), and including without limitation all proceeds thereof (such as, by way of example but not by way of limitation, license royalties and proceeds of infringement suits), the right to sue for past, present and future infringements, all rights corresponding thereto throughout the world and all re-issues, divisions continuations, renewals, extensions and continuations-in-part thereof.

This security interest is granted in conjunction with the security interest granted to Holder under the Secured Note. The rights and remedies of Holder with respect to the security interest granted hereby are in addition to those set forth in the Secured Note and the other Note Documents, and those which are now or hereafter available to Holder as a matter of law or equity. Each right, power and remedy of Holder provided for herein or in the Secured Note or any of the Note Documents, or now or hereafter existing at law or in equity shall be cumulative and concurrent and shall be in addition to every right, power or remedy provided for herein and the exercise by Holder of any one or more of the rights, powers or remedies provided for in this Intellectual Property Security Agreement, the Secured Note or any of the other Note Documents, or now or hereafter existing at law or in equity, shall not preclude the simultaneous or later exercise by any person, including Holder, of any or all other rights, powers or remedies.

Grantor represents and warrants that Exhibits A, B, and C attached hereto set forth any and all intellectual property rights in connection to which Grantor has registered or filed an application with either the United States Patent and Trademark Office or the United States Copyright Office, as applicable.

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original but all of which together shall constitute the same instrument.

IN WITNESS WHEREOF, the parties have caused this Intellectual Property Security Agreement to be duly executed by its officers thereunto duly authorized as of the first date written above.


**GRANTOR:**

**Address of Grantor:**

5501 Oberlin Drive, Suite 100  
San Diego, CA 92121

Attn: Rich Johnson

**ETHERTRONICS, INC.**

By:   
Name: Richard Johnson  
Title: CEO

**HOLDER:**

**Address of Holder:**

1585 Broadway, 37<sup>th</sup> Floor  
New York, NY 10036

Attn: Debra Abramovitz

**NH EXPANSION CREDIT FUND HOLDINGS LP**

By: MS Expansion Credit GP L.P., its general partner  
By: MS Expansion Credit GP Inc., its general partner

By: \_\_\_\_\_  
Name: William Reiland  
Title: Managing Director

IN WITNESS WHEREOF, the parties have caused this Intellectual Property Security Agreement to be duly executed by its officers thereunto duly authorized as of the first date written above.

**GRANTOR:**

Address of Grantor:

**ETHERTRONICS, INC.**

5501 Oberlin Drive, Suite 100  
San Diego, CA 92121

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

Attn: \_\_\_\_\_

**HOLDER:**

Address of Holder:

**NH EXPANSION CREDIT FUND HOLDINGS LP**

1585 Broadway, 37<sup>th</sup> Floor  
New York, NY 10036

By: MS Expansion Credit GP L.P., its general partner  
By: MS Expansion Credit GP Inc., its general partner

Attn: Debra Abramovitz

By:   
Name: William Reiland  
Title: Managing Director

**EXHIBIT A**

**Copyrights**

**None.**

**EXHIBIT B**

**Patents**

**See attached**

Count	Number	Status	Patent Portfolio Effective October 10, 2016	Title	Patent #	Inventors	Issue or the Date	Expiration
1	1	U.S. Issued Patents	Multi-mode Grounded Finger Patch Antenna	6,323,810	G. Pollara, L. Desdes	11/27/2011	11/27/2021	
2	2	U.S. Issued Patents	Multimode Magnetic Dipole Antenna Structures and Methods of Feeding the Volume of an Antenna	6,456,243	G. Pollara, L. Desdes, S. Rowson	9/24/2002	9/24/2012	
3	3	U.S. Issued Patents	Circular Polarization Antennas and Methods	6,468,848	G. Pollara, L. Desdes, S. Rowson	11/26/2002	11/26/2012	
4	4	U.S. Issued Patents	Compact Patch Antenna Employing Transmission Lines with Insertable Components Spacing	6,468,887	L. Desdes, G. Pollara, S. Rowson	12/24/2002	12/24/2012	
5	5	U.S. Issued Patents	Integrated Multimode SlotPatch Antenna and Method	6,518,924	L. Desdes, S. Rowson, G. Pollara	2/11/2003	2/11/2013	
6	6	U.S. Issued Patents	Magnetic Dipole Antenna Structure and Method	6,567,053	E. Yaldirovitch, L. Desdes, S. Rowson	5/20/2003	5/20/2013	
7	7	U.S. Issued Patents	Small Embedded Multi-Frequency Antennas for Portable Wireless Communications	6,573,867	L. Desdes, G. Pollara, S. Rowson	6/3/2003	6/3/2013	
8	8	U.S. Issued Patents	Automated Tuning and Testing Devices to Produce Magnetic Dipole Antennas	6,675,461	S. Rowson, L. Desdes, G. Pollara	1/13/2004	1/13/2014	
9	9	U.S. Issued Patents	Shielded Spiral Sheet Antenna Structure and Method	6,677,915	E. Yaldirovitch, L. Desdes, S. Rowson	6/4/2004	6/4/2014	
10	10	U.S. Issued Patents	Multi-Band, Low Profile, Capacitively Loaded Magnetic Dipole Antennas	6,744,410	J. Shamblin, L. Desdes, G. Pollara, S. Rowson	6/12/2004	6/12/2014	
11	11	U.S. Issued Patents	Multi-Frequency Antennas with Reduced Space and Relative Assembly	6,759,175	G. Pollara, L. Desdes, S. Rowson	2/22/2005	2/22/2015	
12	12	U.S. Issued Patents	Multi-Frequency, Capacitively Loaded Magnetic Dipole Antennas	6,800,729	G. Pollara, L. Desdes, S. Rowson	5/31/2005	5/31/2015	
13	13	U.S. Issued Patents	Active Antenna	6,906,657	L. Desdes, S. Rowson	6/28/2005	6/28/2015	
14	14	U.S. Issued Patents	Active Antenna	6,919,857	J. Shamblin, L. Desdes, G. Pollara, S. Rowson	7/19/2005	7/19/2015	
15	15	U.S. Issued Patents	Differential Mode Capacitively Loaded Magnetic Dipole Antenna	6,943,750	G. Pollara, J. Shamblin, L. Desdes, S. Rowson	9/13/2005	9/13/2015	
16	16	U.S. Issued Patents	Low Profile, Multi-Frequency, Multi-Band, Capacitively Loaded Magnetic Dipole Antenna	7,012,268	V. Parikh, G. Pollara, L. Desdes, S. Rowson	8/12/2006	8/12/2016	
17	17	U.S. Issued Patents	Multimode Magnetic Dipole Antenna Structures and Methods of Feeding the Volume of an Antenna	7,084,813	L. Desdes, G. Pollara, S. Rowson	10/17/2006	10/17/2016	
18	18	U.S. Issued Patents	Antennas with Reduced Space and Improved Performance	7,123,428	L. Desdes, V. Parikh, G. Pollara, S. Rowson	12/19/2006	12/19/2016	
19	19	U.S. Issued Patents	Low Profile, Multi-Frequency, Differential Antenna Structures	7,310,858	L. Desdes, G. Pollara, J. Shamblin, S. Rowson	3/4/2008	3/4/2018	
20	20	U.S. Issued Patents	Multi-Frequency, Magnetic Dipole Antenna Structures and Methods of Feeding the Volume of an Antenna	7,359,531	L. Desdes, G. Pollara, S. Rowson, S. Rowson	5/5/2009	5/5/2019	
21	21	U.S. Issued Patents	Capacitively Loaded Dipole Antenna	7,528,290	L. Desdes, G. Pollara, S. Rowson, S. Rowson	7/8/2009	7/8/2019	
22	22	U.S. Issued Patents	Optimized Capacitive Dipole Antenna	7,616,164	M. Kier, L. Desdes, S. Rowson, S. Rowson	7/8/2009	7/8/2019	
23	23	U.S. Issued Patents	Antenna Configured for Low Frequency Applications	7,653,556	L. Desdes, S. Rowson, S. Rowson	2/16/2010	2/16/2020	
24	24	U.S. Issued Patents	Antenna Configured for Low Frequency Applications	7,671,816	L. Desdes, S. Rowson, J. Shamblin	4/16/2010	4/16/2020	
25	25	U.S. Issued Patents	Antenna Configured for Low Frequency Applications	7,689,932	L. Desdes, S. Rowson, R. Jones	4/13/2010	4/13/2020	
26	26	U.S. Issued Patents	Multi-Layer Isolated Magnetic Dipole Antenna	7,777,866	A. Finnem, S. Rowson, J. Shamblin	10/15/2009	10/15/2019	
27	27	U.S. Issued Patents	Active Tuned Loop Coupled Antenna	7,812,774	J. Shamblin, L. Desdes, J. Shamblin	11/12/2009	11/12/2019	
28	28	U.S. Issued Patents	Antenna with Active Elements	7,890,320	S. Rowson, L. Desdes, S. Rowson, C. Han, R. Jones	11/9/2010	11/9/2020	
29	29	U.S. Issued Patents	Antenna and Method for Steering Antenna Beam Direction	7,911,402	Laurent Desdes, Sebastian Rowson, Jeff Shamblin	3/5/2008	3/5/2018	
30	30	U.S. Issued Patents	Antenna with Near Field Deflector	7,964,986	Chulhan Han, Rowland Jones, Jeff Shamblin, Sebastian Rowson, Laurent Desdes	8/9/2011	8/9/2021	
31	31	U.S. Issued Patents	Antenna with Near Field Deflector	7,992,869	L. Desdes, M. Kier, S. Thonwall, V. Parikh, G. Pollara	2/4/2008	2/4/2018	
32	32	U.S. Issued Patents	Capacitively Loaded Dipole Antenna Optimized for Size	8,059,047 B2	S. Rowson	11/15/2011	11/15/2021	
33	33	U.S. Issued Patents	Antenna with Active Elements	8,077,116	J. Shamblin, L. Desdes, S. Rowson, C. Han, R. Jones	12/13/2011	12/13/2021	
34	34	U.S. Issued Patents	Low Cost Integrated Antenna Assembly And Methods For Fabrication	8,179,323	Laurent Desdes, Jeff Shamblin, M. Kier	5/15/2012	5/15/2022	
35	35	U.S. Issued Patents	Antenna and Method for Steering Antenna Beam Direction	8,362,862	Sebastian Rowson, Laurent Desdes, Jeff Shamblin	1/29/2013	1/29/2023	
36	36	U.S. Issued Patents	Multi-Frequency Noise Optimized Active Antenna	8,421,895	A. Finnem, L. Desdes, X. Su	4/16/2013	4/16/2023	
37	37	U.S. Issued Patents	Spatial Filter for Near Field Medication in a Wireless Device	8,421,965	Xiaomeng Shi, Ting Ting Dong, Sebastian Rowson, Laurent Desdes, Jeff Shamblin	4/16/2013	4/16/2023	
38	38	U.S. Issued Patents	Multi-Function Array For Access Point and Mobile Wireless Systems	8,421,965	J. Shamblin, L. Desdes, S. Rowson	4/16/2013	4/16/2023	
39	39	U.S. Issued Patents	Active Self-reconfigurable Multimode Antenna System	8,604,988	B. Meisunem, J. Shamblin, L. Desdes	12/12/2013	12/12/2023	
40	40	U.S. Issued Patents	Active Front and Module Using a Modal Antenna Approach for Improved Communication System Performance	8,581,139	L. Desdes, B. Meisunem, J. Shamblin, L. Desdes	11/12/2013	11/12/2023	
41	41	U.S. Issued Patents	Modal Adaptive Antenna Using Pilot Signal in CDMA Mobile Communication System and Signal Receiving Method	8,570,231	L. Desdes, S. Rowson, J. Shamblin	10/29/2013	10/29/2023	
42	42	U.S. Issued Patents	Multi-Band MIMO Antenna	8,633,663	L. Desdes, S. Rowson, J. Shamblin	12/1/2013	12/1/2023	
43	43	U.S. Issued Patents	Multi-Band MIMO Antenna	8,542,159 B2	L. Desdes, S. Rowson, J. Shamblin, V. Cira	9/24/2014	9/24/2024	
44	44	U.S. Issued Patents	Multi-Band MIMO Antenna	8,592,861	Sebastian Rowson, Laurent Desdes, Jeff Shamblin	3/5/2008	3/5/2018	
45	45	U.S. Issued Patents	Antenna and Method for Steering Antenna Beam Direction	8,648,755	J. Shamblin, L. Desdes, S. Rowson, C. Han, R. Jones	5/6/2014	5/6/2024	
46	46	U.S. Issued Patents	Multiple Feed Antenna For Beam Optimization	8,717,241	Y. Cira, C. Han, L. Desdes, S. Rowson, B. Kwak, J. Shamblin	2/11/2014	2/11/2024	
47	47	U.S. Issued Patents	Multi-Layer, Reactively Loaded Isolated Magnetic Dipole Antenna	8,648,756	J. Shamblin	4/16/2013	4/16/2023	
48	48	U.S. Issued Patents	Multi-Layered Active Antenna Configuration for Multi-Band MIMO LTE System	8,421,702	L. Desdes, J. Shamblin, S. Rowson	9/12/2012	9/12/2022	
49	49	U.S. Issued Patents	Media Antenna for Communication System	8,638,682	L. Desdes, S. Rowson, J. Shamblin, S. Bansal	4/4/2014	4/4/2024	
50	50	U.S. Issued Patents	Multi-Antenna Module Containing Active Elements and Control Circuits for Wireless Systems	8,528,540	L. Desdes, S. Rowson, J. Shamblin	1/6/2014	1/6/2024	
51	51	U.S. Issued Patents	COMMUNICATION SYSTEM WITH BAND, MODE, IMPEDANCE AND LINEARIZATION SELF-ADJUSTMENT	9,014,699	A. Dupuy, L. Desdes	4/21/2015	4/21/2025	
52	52	U.S. Issued Patents	Pre-optimization of Antenna Circuits	8,993,866	S. Rowson, L. Desdes, J. Shamblin	3/31/2015	3/31/2025	
53	53	U.S. Issued Patents	Multi-Frequency MIMO Antenna	8,643,065	L. Desdes, S. Rowson, S. Rowson	9/23/2014	9/23/2024	
54	54	U.S. Issued Patents	Multi-Frequency MIMO Antenna	8,995,489	J. Shamblin, L. Desdes, S. Rowson	3/24/2015	3/24/2025	
55	55	U.S. Issued Patents	Active MIMO Antenna for Cognitive Radio	8,928,841	A. Dupuy, L. Desdes, S. Rowson, S. Rowson	1/6/2015	1/6/2025	
56	56	U.S. Issued Patents	Active MIMO Antenna for Cognitive Radio	8,928,841	A. Dupuy, L. Desdes, S. Rowson, S. Rowson	1/6/2015	1/6/2025	
57	57	U.S. Issued Patents	Antenna with Multiple Coupled Regions	9,030,851	L. Desdes, J. Shamblin, S. Jeong, SW Cho/Ch-Seoul, WS Lee	5/12/2015	5/12/2025	
58	58	U.S. Issued Patents	Adaptive Resonator for Improved Communication System Performance	9,030,372	L. Desdes, J. Shamblin, S. Rowson, A. Dupuy	5/12/2015	5/12/2025	
59	59	U.S. Issued Patents	Super-Imposed Multimode Antenna for Entrance System Filtering	9,037,190	J. Shamblin, S. Rowson, L. Desdes	5/19/2015	5/19/2025	
60	60	U.S. Issued Patents	Transmit Receive Low Band Antenna	9,035,856	L. Desdes, S. Rowson, J. Shamblin	5/19/2015	5/19/2025	
61	61	U.S. Issued Patents	Location Finding Using Cellular Modal Antenna	9,046,555	J. Shamblin, S. Rowson, L. Desdes	6/2/2015	6/2/2025	
62	62	U.S. Issued Patents	Antenna System for Interference Suppression	9,110,109	J. Shamblin, S. Rowson, L. Desdes	8/18/2015	8/18/2025	
63	63	U.S. Issued Patents	Communication systems with enhanced isolation provision	9,123,986	J. Shamblin, S. Rowson, L. Desdes	10/27/2015	10/27/2025	
64	64	U.S. Issued Patents	Antenna with Multiple Coupled Regions	9,172,422	L. Desdes, A. Dupuy	11/17/2015	11/17/2025	
65	65	U.S. Issued Patents	MODAL ANTENNA WITH CORRELATION MANAGEMENT FOR DIVERSITY APPLICATIONS	9,160,733	Cheer Chwee Heng, L. Desdes, S. Rowson, J. Shamblin	11/17/2015	11/17/2025	
66	66	U.S. Issued Patents	Method and Apparatus for Switched Combined Diversity With a Modal Antenna	9,112,276	L. Desdes, B. Meisunem, S. Rowson, J. Shamblin	10/13/2015	10/13/2025	
67	67	U.S. Issued Patents	Method and Apparatus for Switched Combined Diversity With a Modal Antenna	9,065,485 B2	J. Shamblin, L. Desdes	6/23/2015	6/23/2025	
68	68	U.S. Issued Patents	A multi-band communication system with isolation and impedance matching provision	9,253,526	L. Desdes, S. Rowson	6/23/2015	6/23/2025	
69	69	U.S. Issued Patents	Beam Forming and Steering Using LTE Diversity Antenna	9,287,941	A. Dupuy, L. Desdes	2/22/2016	2/22/2026	
70	70	U.S. Issued Patents	High Speed Tunable Matching Network For Antenna Systems	61,590,303	O. Pajota, S. Rowson, L. Desdes	3/15/2016	3/15/2026	
71	71	U.S. Issued Patents	Chip			allowed, TBD		
72	72	U.S. Issued Patents	Chip			allowed, TBD		
73	73	U.S. Issued Patents	Chip			allowed, TBD		
74	74	U.S. Issued Patents	Chip			allowed, TBD		



75	US, Issued Patents	Manufacturing	Flexible Substrate Battery Jacket	9,214,860	O. Rohlf, F. Sanchez	12/15/2015
76	US, Issued Patents	Active Antenna	Antenna and Method for Steering Antenna Beam Direction	9,240,834	Sebastian Rowson, Laurent Desdes, Jeff Shantlin	1/19/2016
77	US, Issued Patents	Antenna	Antennas Integrated into Shield Car Assembly	9,343,806	L. Desdes, J. Shantlin	5/17/2016
78	US, Issued Patents	System	Internal LC Antenna for Wireless Communications	9,368,858	Eric Lin	5/7/2016
79	US, Issued Patents	System	LOOP ANTENNA WITH SWITCHABLE FEEDING AND GROUNDING POINTS	9,397,999	O. Pajola, L. Desdes	7/19/2016
80	US, Issued Patents	System	Multi-Mode Active Circuit Control and Activation System	9,325,543	O. Pajola, L. Desdes	4/26/2016
81	US, Issued Patents	Chip	High Speed Tunable Matching Network for Antenna Systems	9,425,042	O. Pajola, L. Desdes	4/26/2016
82	US, Issued Patents	System	State Prediction Process and Methodology	9,425,497	O. Pajola, S. Rowson, J. Shantlin	8/23/2016
83	US, Issued Patents	System	Modal Antenna Integrated Battery Assembly	9,431,700	L. Desdes, S. Rowson, J. Shantlin	8/23/2016
84	US, Issued Patents	Manufacturing	Composite Thermally Formed Antenna	9,425,501	O. Pajola, S. Rowson, J. Shantlin	10/4/2016
85	US, Issued Patents	Active Antenna	SYSTEM AND METHOD FOR OPTIMIZING SIGNAL QUALITY IN A WIFI NETWORK	9,426,488	O. Pajola, L. Desdes, S. Rowson, J. Shantlin	10/25/2016
86	US, Issued Patents	Active Antenna	Antenna With Proximity Sensor Function	9,472,848 / 14,145,769	O. Pajola, L. Desdes, S. Rowson, J. Shantlin	10/25/2016
87	US, Issued Patents	System	Multi-Loop Antenna	9,479,242 / 14,662,176	L. Desdes, J. Shantlin	10/25/2016
88	US, Issued Patents	System	Modal Antenna Based Communication Network and Methods for Optimization Thereof	9,501,582	L. Desdes	1/5/2016
89	US, Issued Patents	System	Tunable Duplexing Circuit	9,231,689 B2	O. Pajola, S. Rowson, L. Desdes, J. Shantlin	1/5/2016
90	US, Issued Patents	System	Modal cognitive diversity for MOBILE communication MIMO systems	13,717,550	O. Pajola, A. Dupuy, L. Desdes, S. Rowson	alikeev, 13D
91	US, Issued Patents	System	Provision of linearly enhancement for RF communication devices	14,071,560	J. Shantlin, L. Desdes, S. Rowson	alikeev, 13D
92	US, Issued Patents	System	Multi-Function Array For Access Point and Mobile Wireless Systems	13,821,811	L. Desdes, J. Shantlin, S. Rowson	alikeev, 13D
93	US, Issued Patents	System	ANTENNA SYSTEM OPTIMIZED FOR SISO AND MIMO OPERATION	14,630,323	A. Singh, B. Masumori, L. Desdes, S. Rowson	alikeev, 13D
94	US, Issued Patents	System	MOULTING FLANGE FOR INSTALLATION OF DISTRIBUTED ANTENNA SYSTEMS	9,413,062	F. Sanchez	8/9/2016
95	US, Issued Patents	System	Multi-Mode, Multi-Band, Self-Resonating Power Amplifier	9,231,536	A. Dupuy, L. Desdes	1/3/2016
96	US, Issued Patents	System	Multi-Band MIMO Antenna	9,231,530	A. Dupuy, L. Desdes, J. Shantlin, Y. Chia	1/3/2016
97	US, Issued Patents	Active Antenna	Magnetic Dipole and Shielded Spiral Sheet Antennas Structures and Methods	EP1371111 B1	E. Yalovovitch, L. Desdes, S. Rowson	alikeev, 13D
98	E. P. Issued	Antenna	Multi-Frequency Magnetic Dipole Antenna Structures and Methods of Measuring the Volume of an Antenna	101816978A	Gregory Palisne, Laurent Desdes, Sebastian Rowson	7/1/2008
99	China Issued	Antenna	Antenna with Active Elements	ZL 2009 0 011592 X	J. Shantlin, L. Desdes, S. Rowson, C. Hart, R. Jones	8/12/2012
100	China Issued	Active Antenna	Antenna and Method for Steering Antenna Beam Direction	1020037010556	S. Rowson, L. Desdes, J. Shantlin	1/27/2016
101	Korea Issued	Active Antenna	Magnetic Dipole and Shielded Spiral Sheet Antennas Structures and Methods	1011298560000	E. Yalovovitch, L. Desdes, S. Rowson	9/1/2010
102	Korea Issued	Antenna	Multi-Frequency/Magnetic Dipole Antenna Structures and Methods of Feeding the Volume of an Antenna	1011525020000	G. Palisne, L. Desdes, S. Rowson	3/1/2010
103	Korea Issued	Antenna	Low Profile, Multi-Frequency, Multi-Band, Capacitively Loaded Magnetic Dipole Antennas	1011934800000	L. Desdes, J. Shantlin, G. Palisne, S. Rowson	5/25/2012
104	Korea Issued	Antenna	A Contact For a Cellular Probe	1010333140000	S. W. Chid	4/17/2012
105	Korea Issued	Antenna	Built-In Wire Antenna Module for Mobile Device and Manufacturing Method of the Same	1015902620000	L. Desdes, S. Jeong	11/20/2013
106	Korea Issued	Manufacturing	Built-In Wire Antenna Module for Mobile Device and Manufacturing Method of the Same	1015331250000	Jeff Shantlin, Chulmin Han, Rowland Jones, Sebastian Rowson, Laurent Desdes	6/25/2015
107	Korea Issued	Manufacturing	Antenna with Active Elements	1014420530000	Yoon, Lee	9/12/2014
108	Korea Issued	Active Antenna	The Using Module and Methods of Switchable and Tunable Mobile Antenna	1014601560000	Yoon, Nam	1/30/2015
109	Korea Issued	Active Antenna	Switchable and Tunable Mobile Antenna Chip for Advanced LTE Antenna	1014927850000	Lee, Ryu	2/5/2015
110	Korea Issued	System	RF Front-End with Asymmetric RF Switch Unit	1019277610000	E. Yalovovitch, L. Desdes, S. Rowson	10/22/2008
111	France Issued	Antenna	Magnetic Dipole and Shielded Spiral Sheet Antennas Structures and Methods	1371111	Y. Lin, T. Chiu	5/1/2015
112	France Issued	Antenna	Antenna Configured for Low Frequency Applications	1483461	L. Desdes, S. Rowson, R. Jones, K. Kim	11/14/2011
113	Taiwan Issued	Antenna	Antenna for 2.4 GHz Band	10540505559	L. Desdes, S. Rowson, J. Shantlin	1/31/2011
114	Taiwan Issued	Active Antenna	Antenna System Coupled to an External Device	13,205,979	L. Desdes, S. Rowson, J. Shantlin	2/9/2011
115	US, Pending Patents	System	Null Steering Antennas for Diversity Applications	13,018,413	L. Desdes, B. Masumori, S. Rowson, J. Shantlin	9/2/2011
116	US, Pending Patents	System	Methods For Controlling Operation Modes Within a Wireless Antenna System	61,441,263	S. Nam, J. Lee, S. Hawon, C. Yoon, L. Desdes	9/18/2012
117	US, Pending Patents	System	Active Antenna Structure Maximizing Aperture and Anchoring RF Behavior	61,532,822	J. Lee, S. Nam, M. Chun, C. Yoon, L. Desdes	9/18/2012
118	US, Pending Patents	System	Reconfigurable multi-mode active antenna system	13,702,744	S. Rowson, O. Pajola, L. Desdes, J. Shantlin	12/6/2011
119	US, Pending Patents	System	MODAL COGNITIVE DIVERSITY FOR MOBILE COMMUNICATION SYSTEMS	13,707,506	B. Masumori, S. Rowson, J. Shantlin	5/28/2011
120	US, Pending Patents	System	Modal Adaptive Antenna for Mobile Applications	13,118,574	B. Masumori, S. Rowson, J. Shantlin	7/4/2011
121	US, Pending Patents	System	Antennas Configured for Self-Learning Algorithms and Related Methods	13,957,176	B. Masumori, L. Desdes	7/25/2012
122	US, Pending Patents	System	Method and System for Priority Based Handoff	13,958,308	A. Singh, L. Desdes, S. Rowson, J. Shantlin	9/8/2011
123	US, Pending Patents	System	SAR Reduction Architecture and Technique for Wireless Devices	61,532,466	L. Desdes	disclosure
124	US, Pending Patents	System	Applications And Methods For Null Steering Antenna Systems	61,535,360	L. Desdes	11/13/2012
125	US, Pending Patents	System	Tunable Matching Network for Antenna Systems	13,675,981	A. Dupuy, L. Desdes, C.S. Yoon	5/21/2012
126	US, Pending Patents	Chip	A multi-band communication system with isolation and impedance matching provision II	61,649,369	B. Masumori, R. Johnson, L. Desdes	9/18/2012
127	US, Pending Patents	Chip	WIRELESS COMMUNICATION SYSTEM & RELATED METHODS FOR USE IN A SOCIAL NETWORK	15,085,335	L. Desdes	8/15/2012
128	US, Pending Patents	System	Beam Steering multi-band architecture	61,683,675	L. Desdes	12/17/2012
129	US, Pending Patents	System	Beam Steering Techniques Applied to Cellular Systems	14,109,897	J. Lee, S. Nam, M. Chun, C. Yoon, L. Desdes	3/25/2014
130	US, Pending Patents	System	Active Antenna Adapted For Impedance Matching and Band Switching Using a Strated Component	13,884,495	A. Dupuy, L. Desdes	4/1/2013
131	US, Pending Patents	Chip	Multi-Band Communication System with Isolation and Impedance Matching Provision	14,213,959	J. Shantlin, L. Desdes	3/4/2013
132	US, Pending Patents	Chip	Beam Shaping Techniques for wideband antenna	61,772,434	O. Pajola, S. Rowson, L. Desdes, J. Shantlin	3/14/2014
133	US, Pending Patents	Active Antenna	Antenna Like Matching Component II	61,828,555	O. Pajola, S. Rowson, L. Desdes, J. Shantlin	6/24/2013
134	US, Pending Patents	Active Antenna	Antenna Like Matching Component I	61,884,934	O. Pajola, A. Singh	9/30/2013
135	US, Pending Patents	Active Antenna	Antenna System For Metalized devices	14,589,576	L. Desdes, O. Pajola, J. Shantlin, S. Rowson	12/12/2014
136	US, Pending Patents	Chip	RF Integrated Component and Memory	61,922,645	O. Pajola, M. Rae, M. Zahi, S. Rowson, L. Desdes	12/31/2013
137	US, Pending Patents	Chip	Tunable Filter	14,680,086	L. Desdes	5/7/2015
138	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, O. Pajola	2/25/2015
139	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	A. Singh, J. Shantlin	3/12/2015
140	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, J. Shantlin	3/12/2015
141	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin	3/12/2015
142	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
143	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
144	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
145	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
146	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
147	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
148	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
149	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
150	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
151	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
152	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
153	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
154	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
155	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015
156	US, Pending Patents	System	Method for Feeding Signal's direction using modal antenna	14,681,801	L. Desdes, S. Rowson, J. Shantlin, Y. Chia	3/12/2015



157	43	US, Pending Patents	Antenna System	WIDEBAND WIDE BEAMWIDTH-MIMO ANTENNA SYSTEM	62/159,103	J. Shamblin, L. Desclois	5/8/2015
158	44	US, Pending Patents	System	Beam Steering Techniques for External Antenna Configurations CO-LOCATED ACTIVE STEERING ANTENNAS CONFIGURED FOR BAND SWITCHING, IMPEDANCE MATCHING AND UNIT SELECTIVITY	13/299,869	L. Desclois, A. Singh, J. Shamblin	9/19/2016
159	45	US, Pending Patents	Active Antenna Chip	Tunable Logarithmic Amplifier	62/196,794	O. Pajota, J. Kyllonen, L. Desclois	11/13/2015
160	46	US, Pending Patents	System	Beam Steering System Configured for Multi-Client Network	62/255,375	L. Desclois, O. Pajota	11/23/2015
161	47	US, Pending Patents	System	Intra Dwelling Signal Management Using Reconfigurable Antennas	62/258,859	S. Rowson, A. Singh, L. Desclois	11/23/2015
162	48	US, Pending Patents	System	Network Repeater System	62/290,416	L. Desclois, O. Pajota	2/22/2016
163	49	US, Pending Patents	Manufacturing System	METHOD FOR MANUFACTURING CIRCUIT HAVING LAMINATION LAYER USING LDS PROCESS	62/290,419	L. Desclois, J. Shamblin	2/22/2016
164	50	US, Pending Patents	System	ADAPTIVE ANTENNA FOR CHANNEL SELECTION MANAGEMENT IN COMMUNICATION SYSTEMS	15/170,943	S. Choi, H. Hong, T. Kim, C. Ryu, Y. Kim, S. Kim	2/22/2016
165	51	US, Pending Patents	System	Reconfigurable Dynamic Mesh Network	62/291,432	O. Pajota, L. Desclois	2/22/2016
166	52	US, Pending Patents	Active Antenna System	ANTENNA AND METHOD FOR STEERING ANTENNA BEAM DIRECTION FOR WIFI APPLICATIONS	62/291,432	Sebastian Rowson, Lauren Desclois, Jeff Shamblin	12/10/2015
167	53	US, Pending Patents	System	RF System for distribution of Over the air content for in building applications	14/965,881	L. Desclois, V. Mariani, J. Shamblin	4/22/2016
168	54	US, Pending Patents	Antenna	Low Profile Antenna System With Feature for Detuning Resistance	62/326,592	L. Desclois	4/19/2016
169	55	US, Pending Patents	Antenna	Low Profile Antenna	62/324,540	L. Desclois, J. Shamblin	4/21/2016
170	56	US, Pending Patents	System	Tunable Duplexing Circuit	15/192,412	L. Desclois	6/14/2016
171	57	US, Pending Patents	System	Repeater with Multiple Antenna	15/282,514	A. Sneh, S. Rowson, L. Desclois, J. Shamblin	8/20/2016
172	58	US, Pending Patents	System	Antenna With Proximity Sensor Function	15/283,270	S. Rowson, L. Desclois, J. Shamblin	9/12/2016
173	59	US, Pending Patents	System	Adaptively Antenna Using Reference Signal LTE Protocol	15/281,540	L. Desclois, S. Rowson, J. Shamblin	9/9/2016
174	60	US, Pending Patents	System	Multi-Mode, Multi-Band, Self-Realigning Power Amplifier	14/955,175	A. Dhipuy, L. Desclois	5/17/2016
175	61	US, Pending Patents	System	Antenna With Multiple Coupled Regions			
176	62	US, Pending Patents	Active Antenna System	Reconfigurable multi-mode active antenna system	14,885,981	Cheer Cheung Heang, L. Desclois, S. Rowson, J. Shamblin	10/16/2015
177	63	US, Pending Patents	System	Modal Adaptive Antenna Using Pilot Signal in CDMA Mobile Communication System and Signal Receiving Method	14,781,889	L. Desclois, C. Yeon	9/19/2014
178	64	US, Pending Patents	Manufacturing	Two Step Manufacturing Method with Integrated Interconnects and Assemblies	14,109,789	L. Desclois, S. Rowson, J. Shamblin	12/17/2013
179	1	Foreign Pending Patents, Korea	Manufacturing	Method For Manufacturing Circuit Having Lamination Layer Using LDS Process	1-2010-043752-1	S.W. Choi	pending
180	2	Foreign Pending Patents, Korea	Manufacturing	Modal Antenna With Correlation Management for Diversity Applications	10-2015-0078172	S.W. Choi, H. Y. Hong, T.W. Kim, C.H. Ryu, Y.S. Kim, S.J. Kim	6/22/2015
181	3	Foreign Pending Patents, Korea	Antenna System	Antenna System For Interference Suppression	1020150781534	L. Desclois, B. Matsuura, S. Rowson, J. Shamblin	6/22/2015
182	4	Foreign Pending Patents, Korea	Antenna	Multi-Frequency Magnetic Dipole Antenna Structures and Methods of Reusing the Volume of an Antenna	1020150056601	J. Shamblin, S. Rowson, L. Desclois	7/22/2015
183	2	Foreign Pending Patents, China	Antenna	Antenna Configured for Low Frequency Applications	1020107003894		
184	3	Foreign Pending Patents, China	Antenna	Multi-Frequency Magnetic Dipole Antenna Structures and Methods of Reusing the Volume of an Antenna	2009800119992		
185	5	Foreign Pending Patents, EP	Antenna	Antennas With Reduced Space And Improved Performance	5728233.9		
186	6	Foreign Pending Patents, EP	Antenna	Antenna With Volume of Material	3808509.8		
187	7	Foreign Pending Patents, EP	Antenna	Antenna with Active Element	8797723.7		
188	8	Foreign Pending Patents, EP	Active Antenna System	Modal Antenna With Correlation Management for Diversity Applications			
189	9	Foreign Pending Patents, PCT	Active Antenna System	ANTENNA SYSTEM FOR INTERFERENCE SUPPRESSION	PCT/US13/20907		3/19/2014
190	10	Foreign Pending Patents, PCT	Active Antenna System	Reconfigurable multi-mode active antenna system	PCT/US14/31151	O. Pajota, M. Rae, M. Zaini, S. Rowson, L. Desclois	1/9/2013
191	11	Foreign Pending Patents, PCT	Active Antenna System	Method for finding Signal's direction using modal antenna	WO 2015/142863 A1		9/24/2015
192	12	Foreign Pending Patents, PCT	System	Modal Antenna Based Communication Network and Methods for Optimization Thereof	WO 2015/145094 A1	L. Desclois, J. Shamblin	9/24/2015
193	13	Foreign Pending Patents, PCT	System				

Exhibit B  
Patents

1. U.S. Serial No. <u>11/904,604</u> filed <u>September 26, 2007</u> , now U.S. Patent No. <u>7,764,124</u> .
2. U.S. Serial No. <u>12/231,169</u> filed <u>August 29, 2008</u> , now U.S. Patent No. <u>8,081,032</u> .
3. U.S. Serial No. <u>12/231,170</u> filed <u>August 29, 2008</u> , now U.S. Patent No. <u>8,049,566</u> .
4. U.S. Serial No. <u>12/798,374</u> filed <u>April 02, 2010</u> , now U.S. Patent No. <u>7,834,690</u> .
5. U.S. Serial No. <u>12/798,375</u> filed <u>April 02, 2010</u> , now U.S. Patent No. <u>7,834,691</u> .
6. U.S. Serial No. <u>12/799,001</u> filed <u>April 14, 2010</u> , now U.S. Patent No. <u>8,058,938</u> .
7. U.S. Serial No. <u>12/799,547</u> filed <u>April 26, 2010</u> , now U.S. Patent No. <u>8,150,352</u> .
8. U.S. Serial No. <u>12/900,832</u> filed <u>October 08, 2010</u> , now U.S. Patent No. <u>8,143,946</u> .
9. U.S. Serial No. <u>14/745,261</u> filed <u>June 19, 2015</u> , now U.S. Patent No. <u>9,543,916</u> .
10. U.S. Serial No. <u>14/989,566</u> filed <u>January 06, 2016</u> , published as <u>US 2016/0197582A1</u> .
11. U.S. Serial No. <u>15/367,995</u> filed <u>December 02, 2016</u> .
12. U.S. Serial No. <u>15/368,026</u> filed <u>December 02, 2016</u> .
13. PCT Serial No. <u>PCT/US07/20803</u> , filed <u>September 26, 2007</u> .
14. PCT Serial No. <u>PCT/US15/36815</u> , filed <u>June 19, 2015</u> .
15. PCT Serial No. <u>PCT/US16/12370</u> , filed <u>January 06, 2016</u> .
16. PCT Serial No. <u>PCT/US17/12296</u> , filed <u>January 05, 2017</u> .
17. U.S. Provisional Serial No. <u>60/827,033</u> , filed <u>September 26, 2006</u> .
18. U.S. Provisional Serial No. <u>61/215,069</u> , filed <u>May 01, 2009</u> .
19. U.S. Provisional Serial No. <u>61/215,077</u> , filed <u>April 30, 2009</u> .
20. U.S. Provisional Serial No. <u>62/014,575</u> , filed <u>June 19, 2014</u> .
21. U.S. Provisional Serial No. <u>62/100,397</u> , filed <u>January 06, 2015</u> .

**EXHIBIT C**  
**Trademarks**

Patent No.	Patent Title	Patent No.	Patent Title	Patent No.	Patent Title	Patent No.	Patent Title	Patent No.	Patent Title	Patent No.	Patent Title	
ETHERTRONICS	Canada	Registered	09 Int. mobile wireless systems, namely antennas for mobile wireless devices	68786	112760	08/14/2001	647003	08/31/2005	08/31/2020	647003	08/31/2020	First Renewal
ETHERTRONICS	United States of America	Registered	09 Int. antenna, RF systems comprised of integrated circuits, antennae, operating systems software and operating systems protocol software and component parts thereof, for wireless devices; integrated circuits and software for signal processing in wireless devices; software for testing performance of wireless devices; small cell antennas and distributed antenna systems (DAS), namely, a network of spatially separated antenna node hardware connected to a common source and component parts thereof	226304	86-071461	09/23/2013	467691	01/13/2015	01/13/2021	467691	01/13/2021	6-Year Declaration of Use
ETHERTRONICS	Singapore	Registered	09 Int. mobile wireless systems	68793	T01-13117J		T01-13117J		02/22/2021		02/22/2021	Next Renewal
ETHERTRONICS	European Union	Registered	09 Int. mobile wireless systems	68788	08/21/2001	00238713	00238713	03/19/2003	08/13/2021	00238713	08/13/2021	Next Renewal
ETHERTRONICS	Mexico	Registered	09 Int. mobile wireless systems	68791	501904	08/13/2001	746508	08/16/2021	08/16/2021	746508	08/16/2021	Next Renewal
ETHERTRONICS	Japan	Registered	09 Int. mobile wireless communication apparatus, and other electrical communication machines and apparatus, applied electronic machines and apparatus and accessories thereof	68789	2001-75950	08/22/2001	4563465	04/26/2022	04/26/2022	4563465	04/26/2022	Next Renewal
ETHERTRONICS	China	Registered	09 Int. mobile wireless systems	68787	Z001152189	08/14/2001	2017095	11/27/2022	11/27/2022	2017095	11/27/2022	Next Renewal
ETHERTRONICS	Taiwan	Registered	09 Int. mobile wireless systems	68794	90033694	08/20/2001	1032996	02/15/2023	02/15/2023	90033694	02/15/2023	Next Renewal
ETHERTRONICS	South Korea	Registered	09 Int. antennas for mobile wireless devices	68790	40-2001-36603	08/21/2001	548186	05/16/2023	05/16/2023	40-2001-36603	05/16/2023	Next Renewal
ETHERTRONICS	United States of America	Registered	09 Int. mobile wireless systems comprised of mobile wireless telephones	67729	78-049798	02/22/2001	2768087	09/23/2023	09/23/2023	78-049798	09/23/2023	Next Renewal
ETHERTRONICS	South Korea	Registered	09 Int. antenna, RF systems comprised of integrated circuits, antennae, operating systems software and operating systems protocol software and component parts thereof, for wireless devices; integrated circuits and software for signal processing in wireless devices; software for testing performance of wireless devices; small cell antennas and distributed antenna systems(DAS), namely, a network of spatially separated antenna node hardware connected to a common source and component parts thereof	225277	70-2013-0000224	09/23/2003	548186	05/15/2014	05/15/2024	70-2013-0000224	05/15/2024	First Renewal
ACTIVE STEERING	United States of America	Filed	09 Int. antenna, RF systems comprised of integrated circuits, antenna, operating systems software and operating systems protocol software and component parts thereof, for wireless devices; integrated circuits and software for signal processing in wireless devices	244127	86-800161	10/27/2015				86-800161	10/27/2015	

**PATENT**