



**EMP PROTECTED DATA STORAGE  
PATENT PORTFOLIO  
PROSPECTUS**

**SEPTEMBER 6, 2017**

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All offers to acquire or license the EMP Protected Data Storage Patent Portfolio are to be made through New England Intellectual Property, LLC, 291 Main Street, West Newbury, MA 01985. Please contact **Richard Baker** at **978-363-1700** or [rbaker@newenglandip.com](mailto:rbaker@newenglandip.com) for more information. There is no binding offer to purchase or license until a definitive Agreement is executed. Owner Twin Harbor Labs, LLC reserves the right to accept or reject any offer or no offer, and the company makes no warranty whatsoever regarding validity, use, scope, enforceability, infringement, or litigation value of any intellectual property related to the EMP Protected Data Storage Patent Portfolio. The description provided herein represents a reasonable effort to describe the patents at this point in time. No promise is made to update this information should it change, but we reserve the right to revise our analysis should new information be discovered. Copyright 2017 New England Intellectual Property, LLC.

## A. Executive Summary

The Carrington Super Flare of 1859 crippled the World's nascent telegraph system. Some scientists think we are overdue for another such eruption, while others think the North Koreans will achieve the same result with an electromagnetic pulse (EMP) attack. The patented technology in the EMP Protected Data Storage Portfolio describes a low-cost, always-on external backup system that could survive a solar flare, EMP attack, or even a lightning strike.

Using fiber optics to transmit data and power through an EMP hardened enclosure, the design described in this patent portfolio provides a data storage device, such as a rotating disk drive or a solid state drive, that will survive a serious disaster. Other embodiments describe moving power using mechanical or other means that are not susceptible to electromagnetic pulses.

The market ranges from governmental agencies such as the Department of Defense, to survivalists, to the well-prepared homeowner afraid of losing his data to a lightning strike.

The EMP Protected Data Storage Patent Portfolio consists of an issued US Patent, a pending US continuation application, and a pending provisional patent application.

The patents in the EMP Protected Data Storage Patent Portfolio were invented at Twin Harbor Labs by Jim Logan, an entrepreneur and inventor in conjunction with Rich Baker, David Lentini and Garrett Malagodi.

### KEY FACTS

#### US Patent 9,420,733

- Filed 10/12/2015
- Issued 8/16/2016
- Expires 10/13/2034
- 20 Claims
- No encumbrances

#### US Pub. 2016-0378148

- Filed 8/15/2016
- Pending
- Expires 10/13/2034
- 18 Claims
- No encumbrances

#### Markets

- Developing a new market
- \$175 Million market potential

## B. EMP Protected Data Storage Technology Description

### 1. Historical EMP Protections

Since the Manhattan project in the 1940s, governments and businesses have been worried about the effects of nuclear explosions on electronics. At first, the concern was limited to the damage cause by blast and radiation. Later, however, as microelectronics (e.g., transistor-based) technologies began to dominate military and civilian use over vacuum tube-based electronics (vacuum tubes being more resistant to EMP effects), the concern expanded to include a phenomenon called “electromagnetic pulse” (“EMP”). Hundreds of millions of dollars were spent by the US Government on nuclear tests in the 1950s and 1960s to determine the characteristics of electromagnetic pulses on various military aviation and weapons systems. Shielding was designed and equipment modified to avoid damage from a nuclear event. But this work addressed military requirements and not the needs of the private sector.



Generally, EMP protections are implemented at the “site” level, along with construction and design to protect a site from nuclear blast and radiation. Data centers are included among such sites, and there are numerous data center designs that are EMP protected. However, like most military implementations, these data centers are designed to generate power from within, so that EMP damage through the power lines can be eliminated. This solution is quite expensive, and not useful for personal computers. However, given the concerns over nuclear proliferation and the possibility of a terrorist nuclear attack, the interest in providing protection for critical data for non-military uses has become acute.

Most personal computer owners who attempt to address EMP risks use uninterruptable power supply (“UPS”) systems. These UPS systems include surge protection to block EMP impact on the connected devices. However, UPS and most other surge protection devices protect against a relatively low number of joules (hundreds of joules) whereas a lightning strike or other EMP event could produce 5 billion joules of energy or more. With this amount of energy, the electricity could easily jump through all wires within the UPS, causing energy to follow to the connected devices.

The other option for the personal computer owner is to disconnect the hard drive by operating the computer wirelessly and with a battery. The disadvantages of this solution is that eventually the battery needs to be recharged, opening the system to EMP risk during the recharging.

## 2. Invention Summary

This invention allows for an EMP Protected Data Storage to be actively used without the fear of corrupted or lost data. The EMP Protected Data Storage protects a rotating or solid state hard drive, or other similar electronic device, against an Electromagnetic Pulse (EMP) that could otherwise prove damaging. The invention consists of a faraday cage surrounding the hard drive, a power source capable of withstanding extreme power surges, and a fiber optics cable for transporting data to and from a processor. The data store is designed to endure the effects of an electromagnetic pulse from boosted electrical charges traveling through the power lines and electronic current radiating through the air; both of which are the main effects of an EMP strike.



In one embodiment, the storage device is surrounded by a copper faraday cage to reroute potentially damaging electrostatic and electromagnetic fields away from the contents of the cage. The faraday cage is surrounded by a lead shield to protect against nuclear radiation. The cage is then surrounded by a steel layer to protect against electromechanical pulses.

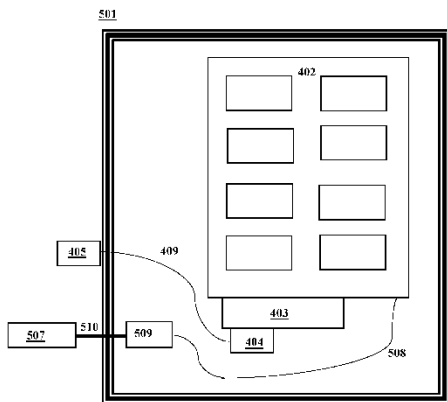


Figure 5

The storage could be a rotating media hard drive or a solid state drive.

Data is sent through the cage with a fiber-optic link, which provides for electrical isolation through optics.

Power is transmitted through the cage through one of a number of embodiments. Power over fiber could be used to transmit power through a light. Power could be transmitted mechanically by running a motor outside of the enclosure, the motor spinning a Teflon shaft that spins a generator inside of the cage. Or the inside could be powered by a battery that is isolated from the storage during charging.

### 3. Representative Claim

Claim 1. A storage device incorporating protections from electromagnetic pulses, the storage device comprising:

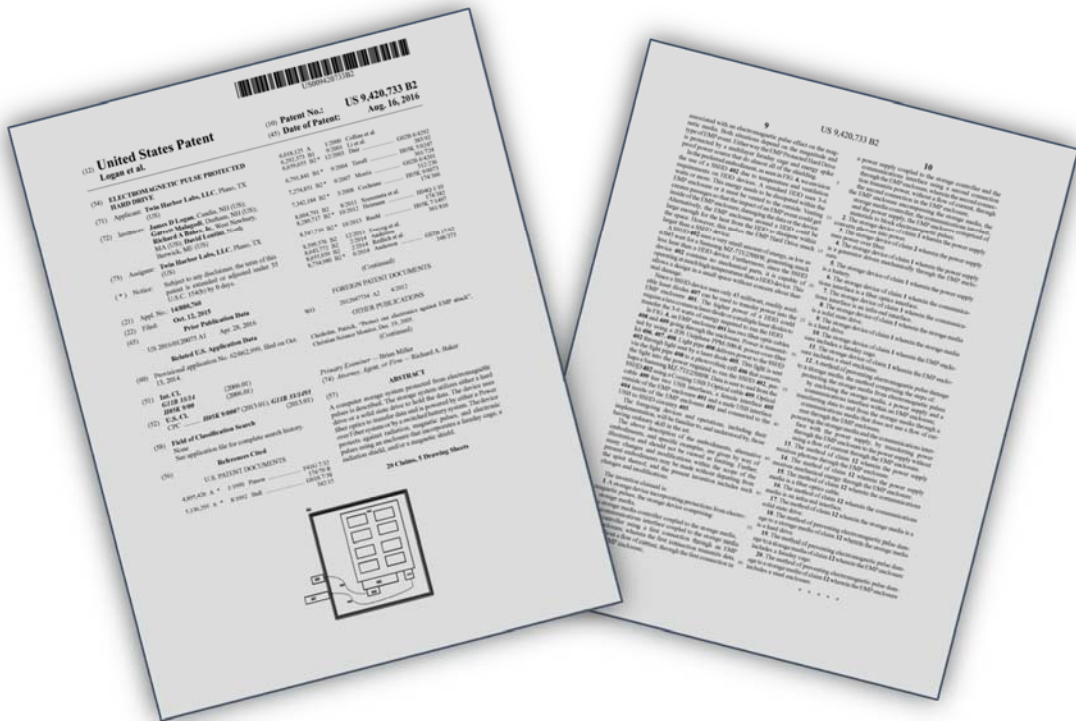
storage media,

a storage media controller coupled to the storage media,

a communications interface coupled to the storage media controller using a first connection through an EMP enclosure, wherein the first connection transmits data, without a flow of current, through the first connection in the EMP enclosure,

a power supply coupled to the storage controller and the communications interface using a second connection through the EMP enclosure, wherein the second connection transmits power, without a flow of current, through the second connection in the EMP enclosure,

the EMP enclosure encompassing the storage media, the storage media controller, the communications interface, and the power supply, the EMP enclosure comprised of materials to block electromagnetic pulses.



## C. Market Opportunity

There market for the EMP Protected Data Storage Patent Portfolio is a subset of the overall data storage market.



The EMP Protected Data Storage patent portfolio protects a specialized segment of the US external storage systems market, a \$7 Billion worldwide market<sup>1</sup>. Assuming a 30% US share of the worldwide market, the US external storage market size is about \$2.1 Billion. Assuming that 3% of the external storage market would prefer to have the additional protection of their data provided by an EMP protected device, the potential market for this device is \$63 Million. But the price of the EMP Protected Data Storage Device will command a premium price, perhaps 50% more than an unprotected drive. With the higher price, the market size would be \$95 Million.

Looking at the market from another angle, this patent portfolio's technology is part of the global electromagnetic compatibility (EMC) shielding market. According to the Markets and Markets market research firm, the EMC shielding market was valued at \$3.51 Billion in 2015, with a 6% CAGR through the later part of this decade. Assuming that the USA is 30% of the worldwide market, the US EMC shielding market is \$1.1 Billion. Assuming that data storage shielding comprises about 10% of this market, we have a market size of about \$110 Million.

For a manufacturer selling this product, additional sales may be possible internationally, selling outside of the patent protected areas. Given the unique aspects of this product, international copying will likely be limited, allowing sales worldwide. We estimate that this may generate another \$75 Million outside of the USA.

Within the EMP protected data storage market, there are three subgroups of buyers. One group of buyers are businesses concerned about business continuity should their vital business records be damaged or destroyed by an EMP event. Failure to protect the data at all times could be fatal to the business if an EMP event occurred. Since the cost of data loss is so high, this market is not price sensitive.

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<sup>1</sup> IDC, "Worldwide Enterprise Storage Market Sees Decline in Fourth Quarter, According to IDC", Press Release, 11 Mar 2016.

The second market group are government entities, where data integrity and reliability is critical at all times. This group could include defense organizations, intelligence community, police, emergency management, and executive government that need to operate immediately after an EMP disaster to preserve order and restore society. This is not a price sensitive market.



The third market is made up of consumers concerned about their personal data in the face of any occurrence. This includes preppers and wealthy individuals who need to keep track of their photos and assets through a disaster. This market is not price sensitive.

Overall, there is an approximately \$175 Million market to be developed as part of the development of the market for this patent portfolio.



## D. Inventors

The inventions in the EMP Protected Data Storage Patent Portfolio came out of the Twin Harbor Labs invention factory, where inventor Logan teamed up with Rich Baker, David Lentini and Garrett Malagodi to create these inventions. Twin Harbor Labs was founded in 2012 and is dedicated to researching and developing innovative technologies, product ideas, and business models. The intellectual property created from the THL research results in patents that are licensed to and incubated in startups or sold to existing companies.



Inventor **Jim Logan** is an experienced entrepreneur and inventor. Early in his career, Jim founded MicroTouch Systems, a company that in the 90's became the world's largest touch screen company and the pioneer of today's ubiquitous capacitive touch screens. He took that company public in 1992 and sold it to 3M in 2000. The early success of the company was facilitated by a set of patents licensed from a solo inventor, Bill Pepper. Following MicroTouch, Jim founded Gotuit Media in 2000. The company was built around a set of patents developed in the mid-90's by Jim and specialized in adding metadata to video streams. Gotuit was funded by a large Angel round, and later by Highland Capital and Atlas Ventures. Gotuit was sold in 2010 and today its products are part of the Tivo technology suite. In 2009, he founded Personal Audio, a well-known patent holding company that has been successful in licensing over two dozen major technology companies. During his career, Jim has raised over \$100M in equity funding. He has also been a lead inventor on 38 patents—patents which have generated over \$32M in licensing fees. Jim holds a BS from Hamilton College and an MBA from the Tuck School at Dartmouth College.



Inventor **Rich Baker** is a senior IP licensing executive with over 15 years' experience negotiating deals and settling patent disputes. Rich is a Certified Licensing Professional and served as trustee of the Licensing Executives Society (LES) USA and Canada. Mr Baker is a named inventor on 29 US patents. Mr Baker currently works as the president of New England Intellectual Property (NEIP), a Massachusetts-based IP firm specializing in patent brokerage, licensing, inter partes reviews, consulting and expert witness services. He also served as President of Twin Harbor Labs from 2014-2016. Before NEIP, he spent five years at 3Com Corporation as the director of IP licensing.



Before joining 3Com, Mr Baker was the director of intellectual property at Schneider Automation. At Schneider Automation he founded the company's IP program, including the creation of IP strategies, the organization of a portfolio of patents and the authorship of a number of patents. Mr Baker's graduate studies include intellectual property classes at Franklin Pierce Law Center (now UNH Law School) and computer science courses at Harvard University. He holds a BSc in computer science and English (dual major) from the University of New Hampshire, where he also minored in electrical engineering. Mr. Baker is an accomplished public speaker and holds the title of distinguished toastmaster from Toastmasters International. He is the Vice-Chairman of the West Newbury (MA) Board of Assessors and has served as a member on the Pentucket Regional School Committee. Mr Baker was the nominee from a major political party for the US House of Representatives in 2008.

**David Lentini** is an inventor and a patent attorney (CA Bar) with nearly 25 years of experience in preparing and prosecuting patent applications around the world, in addition to providing IP protection and enforcement strategies, and patent validity, infringement, and value analyses, and IP licensing. He presently works in a private consulting capacity, Lentini Consulting, handling clients through personal recommendations and introductions. Prior to Lentini Consulting, David was Patent Counsel at Prosetta Corporation and Practice Director at Cognition IP Solutions. He also worked a Senior Counsel at Foley & Lardner. David has a BS in Chemistry from the University of Chicago and a MA in Chemistry from Harvard University. David has a JD from the University of California Hastings College of Law.



**Garrett Malagodi** is computer engineer and a recent graduate of the University of New Hampshire.



## E. Intellectual Property Portfolio

The EMP Protected Data Storage Patent Portfolio consists of one (1) issued US patent asset, one (1) pending continuation patent application, and two (2) provisional patent applications, one expired and one pending. The list of these patents is included in Appendix A. No patent asset in this family of patents has been the subject of a litigation or a reexamination.

Furthermore this portfolio is free and clear of any licenses or encumbrances. However, owner Twin Harbor Labs, LLC desires to retain a license to the portfolio after any sale.

### 1. Patent Description – US Patent 9,420,733

Patent Title:	Electromagnetic pulse protected hard drive
USPTO Patent:	US 9,420,733 B2
USPTO Publication	US 2016-0120075 A1
Original Application Number:	14/880,760
Abstract:	A computer storage system protected from electromagnetic pulses is described. The storage system utilizes either a hard drive or a solid state drive to hold the data. The device uses fiber optics to transfer data and is powered by either a Power over Fiber system or by a switched battery system. The device protects against radiation, magnetic pulses, and electronic pulses using an enclosure that incorporates a faraday cage, a radiation shield, and/or a magnetic shield.
Figures	5
Claims	20
Independent Claims	1, 12

### Dates

Date Patent Was Filed:	12 October 2015
Priority Date:	13 October 2104
Date Patent Issued:	16 August 2016

### Maintenance

Current Maintenance Status:	Maintenance fees not yet due
Future Maintenance Dates:	Maintenance fees due on 19 February 2020 17 February 2024 17 February 2028

## Inventor, Assignees & Individuals

Inventor(s):	James Logan (Candia, NH), Richard Baker (West Newbury, MA), David Lentini (North Berwick, ME), Garrett Malagodi (Durham, NH)
Examiner:	Examiner Brian Miller
Front Page Assignee:	Twin Harbor Labs, LLC (Plano, TX)
Current Owner:	Twin Harbor Labs, LLC (Plano, TX)
Assignee Location:	Reel 036796, Frame 0255
Assignment History:	15 October 2015 assignment from inventors to Twin Harbor Labs

## Patent Classification

US Patent Classes:	H05K 9/0007; G11B 33/1493
US Class Description:	H05K 9/0007: PRINTED CIRCUITS; CASINGS OR CONSTRUCTIONAL DETAILS OF ELECTRIC APPARATUS: Screening of apparatus or components against electric or magnetic fields G11B 33/1493: INFORMATION STORAGE BASED ON RELATIVE MOVEMENT BETWEEN RECORD CARRIER AND TRANSDUCER: Constructional parts, details or accessories: EMI or RFI shielding
International Class(es):	G11B 33/14; H05K 9/00

## Patent Family

US Patent Family:	Parent – US Provisional Application 62/062,999 (expired) Child – US Patent Publication 2016-0378148 A1 (pending) – Continuation in Part
Foreign Components	None

## 2. Patent Description – US Patent Publication 2016-0378148

Patent Title:	Electromagnetic Pulse Protected Cable
USPTO Patent:	None
USPTO Publication	US 2016-0378148 A1
Original Application Number:	15/237,298

Abstract:	A computer storage system protected from electromagnetic pulses is described. The storage system utilizes either a hard drive or a solid state drive to hold the data. The device uses fiber optics to transfer data and is powered by either a Power over Fiber system or by a switched battery system. The device protects against radiation, magnetic pulses, and electronic pulses using an enclosure that incorporates a faraday cage, a radiation shield, and/or a magnetic shield.
Figures	4
Claims	18
Independent Claims	1, 8, 13

## Dates

Date Patent Was Filed:	15 August 2015
Priority Date:	October 13, 2014
Date Patent Issued:	

## Maintenance

Current Maintenance Status:	Maintenance fees not yet due
Future Maintenance Dates:	

## Inventor, Assignees & Individuals

Inventor(s):	James Logan (Candia, NH), Richard Baker (West Newbury, MA), David Lentini (North Berwick, ME), Garrett Malagodi (Durham, NH)
Examiner:	Examiner Ingrid Wright
Front Page Assignee:	Twin Harbor Labs, LLC (Plano, TX)
Current Owner:	Twin Harbor Labs, LLC (Plano, TX)
Assignee Location:	
Assignment History:	

## Patent Classification

US Patent Classes:	G06F1/182; G11C5/005; G02B6/3817; G02B6/4246; G02B6/4277; G06F1/1635; G11B33/1493; H01R24/64; G11C5/14; H01R2107/00
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US Class Description:	<p>G06F1/182: Enclosures with special features, e.g. for use in industrial environments; grounding or shielding against radio frequency interference [RFI] or electromagnetic interference [EMI]</p> <p>G11C5/005: Circuit means for protection against loss of information of semiconductor storage devices</p> <p>G02B6/3817: Dismountable connectors, i.e. comprising plugs of the ferrule type, e.g. fibre ends embedded in ferrules, connecting a pair of fibres containing optical and electrical conductors</p> <p>G02B6/4246: Bidirectionally operating package structures</p> <p>G02B6/4277: Protection against electromagnetic interference [EMI], e.g. shielding means</p> <p>G06F1/1635: Details related to the integration of battery packs and other power supplies such as fuel cells or integrated AC adapter</p> <p>G11B33/1493: Electro-Magnetic Interference [EMI] or Radio Frequency Interference [RFI] shielding; grounding of static charges</p> <p>H01R24/64: Sliding engagements with one side only, e.g. modular jack coupling devices for high frequency, e.g. RJ 45</p> <p>G11C5/14: Power supply arrangements, e.g. Power down/chip (de)selection, layout of wiring/power grids, multiple supply levels</p> <p>H01R2107/00: Four or more poles</p>
International Class(es):	G06F 1/18; H01R 24/64; G11C 5/00; G02B 6/42; G11B 33/14; G06F 1/16; G02B 6/38

## Patent Family

US Patent Family:	CIP Parent – US Provisional Application 62/062,999 (expired) US Patent 9,426,627 (active)
Foreign Components	None

### 3. Patent Description – US Provisional Patent 62/062,999

Patent Title:	Electromagnetic pulse protected hard drive
USPTO Patent:	None
USPTO Publication	None
Original Application Number:	62/062,999
Abstract:	A computer storage system protected from electromagnetic pulses is described. The storage system utilizes either a hard drive or a solid state drive to hold the data. The device uses fiber optics to transfer data and is powered by either a Power over Fiber system or by a switched battery system. The device protects against radiation, magnetic pulses, and electronic pulses using an enclosure that incorporates a faraday cage, a radiation shield, and/or a magnetic shield.
Figures	15
Claims	0

Independent Claims	N/A
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## Dates

Date Patent Was Filed:	13 October 2014
Priority Date:	13 October 2014
Date Patent Issued:	

## Inventor, Assignees & Individuals

Inventor(s):	James Logan (Candia, NH), Richard Baker (West Newbury, MA), David Lentini (North Berwick, ME), Garrett Malagodi (Durham, NH)
Examiner:	N/A
Front Page Assignee:	Twin Harbor Labs, LLC (Plano, TX)
Current Owner:	Twin Harbor Labs, LLC (Plano, TX)
Assignee Location:	Reel 039587, Frame 0909
Assignment History:	30 August 2016 assignment from inventors to Twin Harbor Labs

## Patent Family

US Patent Family:	Child – US Patent 9,426,627 (active) CIP - US Patent Publication 2016-0366560
Foreign Components	None

### 4. Patent Description – US Provisional Patent 62/526,145

Patent Title:	Electromagnetic pulse protected storage
USPTO Patent:	None
USPTO Publication	None
Original Application Number:	62/526,145

Abstract:	A computer storage system protected from electromagnetic pulses is described. The storage system utilizes either a hard drive or a solid state drive to hold the data. The device uses acoustic waves or fiber optics to transfer data and is powered by either a Power over Fiber system, acoustic waves, a mechanical motor/generator combination or by a switched battery system. The device protects against radiation, magnetic pulses, and electronic pulses using an enclosure that incorporates a faraday cage, a radiation shield, and/or a magnetic shield.
Figures	5
Claims	0
Independent Claims	N/A

## Dates

Date Patent Was Filed:	28 June 2017
Priority Date:	28 June 2017
Date Patent Issued:	

## Inventor, Assignees & Individuals

Inventor(s):	James Logan (Candia, NH), Richard Baker (West Newbury, MA)
Examiner:	N/A
Front Page Assignee:	Twin Harbor Labs, LLC (Plano, TX)
Current Owner:	Twin Harbor Labs, LLC (Plano, TX)
Assignee Location:	
Assignment History:	

## Patent Family

US Patent Family:	None
Foreign Components	None



## F. How to Acquire the EMP Protected Data Storage Patent Portfolio

The opportunity to purchase or license the EMP Protected Data Storage Patent Portfolio is being offered to a number of companies interested in data storage and protected data. All offers to license or acquire the EMP Protected Data Storage Patent Portfolio must be in writing, and owner Twin Harbor Labs reserves the right to accept or reject any offer or no offer. The patents portfolio are offered “as-is” with no warranty whatsoever regarding validity, use, scope, enforceability, infringement, litigation value, or litigation outcome. Purchasers are expected to perform adequate due diligence on Twin Harbor Labs, the patents, and the technology to determine the value to their own organizations. This prospectus is provided as assistance to buyers and all information herein should be independently verified. It is expected that the program will cumulate in a definitive License or Purchase Agreement in exchange for payment.

The opportunity to purchase or license the EMP Protected Data Storage Patent Portfolio is offered, as agent for Twin Harbor Labs, through:

Rich Baker  
President, New England Intellectual Property, LLC  
291 Main Street  
West Newbury, MA 01985 USA  
1-978-363-1700 (office)  
1-978-257-4101 (cell)  
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[www.newenglandip.com](http://www.newenglandip.com)



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## APPENDIX A – EMP Protected Data Storage Patent Portfolio

Title	Application Number	Priority Date	US Patent Number	Issue Date	Inventors	Status
<b>Electromagnetic Pulse Protected Hard Drive</b>	14/880,760	2014-10-13	9,420,733	2016-8-16	James Logan, Rich Baker, David Lentini, Garrett Malagodi	Issued
<b>Electromagnetic Pulse Protected Cable</b>	15/237,298	2014-10-13			James Logan, Rich Baker, David Lentini, Garrett Malagodi	Pending
<b>Electromagnetic Pulse Protected Hard Drive</b>	62/062,999	2014-10-13			James Logan, Rich Baker, David Lentini, Garrett Malagodi	Expired
<b>Electromagnetic Pulse Protected Storage</b>	62/526,145	2017-06-28			James Logan, Rich Baker	Pending

