System Assessment and Validation for Emergency Responders (SAVER)

Ruggedized Tablets Market Survey Report

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Prepared by Space and Naval Warfare Systems Center Atlantic

FOREWORD

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions. Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency responder community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL). The SAVER Program mission includes:

- Conducting impartial, practitioner-relevant, operationally oriented assessments and validations of emergency response equipment; and

- Providing information, in the form of knowledge products, that enables decision-makers and responders to better select, procure, use, and maintain emergency response equipment.

Information provided by the SAVER Program will be shared nationally with the responder community, providing a life- and cost-saving asset to DHS, as well as to Federal, state, and local responders.

The SAVER Program is supported by a network of Technical Agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

As a SAVER Program Technical Agent, the Space and Naval Warfare Systems Center (SPAWARSYSCEN) Atlantic has been tasked to provide expertise and analysis on key subject areas, including communications, sensors, security, weapon detection, and surveillance, among others. In support of this tasking, SPAWARSYSCEN Atlantic conducted a market survey of commercially available ruggedized tablets. Ruggedized tablets fall under AEL reference number 04HW-01-HHCD titled Computing Device, Handheld.

Visit the SAVER section of the Responder Knowledge Base (RKB) website at http://www.rkb.us/saver for more information on the SAVER Program or to view additional reports on ruggedized tablets or other technologies.

POINTS OF CONTACT

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1.   INTRODUCTION

Ruggedized tablets are mobile computing devices that are able to withstand various environmental and hazardous conditions and rough handling, making them suitable for use by law enforcement in field operations. To provide emergency responders with information on ruggedized tablets running Microsoft® Windows® operating systems, the System Assessment and Validation for Emergency Responders (SAVER) Program conducted a market survey.

This market survey report is based on information gathered from November 2012 through June 2013 from vendors, Internet searches, industry publications, an emergency responder focus group, and a government-issued Request for Information (RFI) that was posted on the Federal Business Opportunities website. For inclusion in this report, the Microsoft Windows-based tablets had to be inherently ruggedized (i.e., resistant to water, dust, impact).

Due diligence was performed to develop a report that is representative of products in the marketplace.

2.   RUGGEDIZED TABLETS OVERVIEW

Increasing demands on law enforcement agencies to operate while mobile and from remote locations have amplified the need for tablet computers capable of withstanding extreme conditions in various field environments. Many ruggedized tablets have differences in the display type, means of connectivity, level of ruggedness, and optional peripherals and accessories.

2.1   Display Type

Ruggedized tablets feature a display with either a resistive or capacitive touch screen. Resistive touch screens respond to pressure applied to the screen by the user's finger, a resistive stylus, or other objects such as a gloved finger or an unopened pen. However, due to the pressure that is applied during use, a resistive touch screen is more prone to damage (e.g., cracking, splitting) than a capacitive touch screen. They may also require regular recalibration and more vendor support than capacitive touch screens.

Capacitive touch screens respond to human touch or capacitive/conductive styluses without pressure being applied to the screen but do not respond to gloved fingers or other non-conductive objects such as unopened pens. They typically provide better image clarity but are often more expensive than resistive touch screens.

2.2   Connectivity

Most ruggedized tablets are Wi-Fi®-enabled, permitting wireless connection to the Internet when connected to a Wi-Fi network. Wi-Fi-enabled tablets may also be able to communicate with other devices on the same Wi-Fi network, such as computers or printers. Many ruggedized tablets are also Bluetooth® compatible, which permits the tablet to wirelessly connect to other Bluetooth-compatible devices (e.g., headsets, smartphones) once they are paired using a security code.

Ruggedized tablets may also be configured with a mobile broadband module that enables users to access the Internet via a cellular network. Third generation (3G) and fourth generation (4G)

options may be available. A data plan with a cellular provider, such as AT&T, Sprint, or Verizon, is required. A data plan typically provides a specified amount of data (e.g., 4GB, 6GB) per month for a set fee; however, some plans may provide unlimited data use. Data speeds can vary greatly from one carrier to the next, as well as from one coverage area to the next. Though difficult to measure due to many variables, 4G data speeds are significantly faster than 3G on the same carrier.

2.3　Ruggedness

The ruggedness of a tablet may be determined by its resistance to impact and ingress protection (IP) rating. Though vendors vary in the way they conduct ruggedness tests, the tests are often similar enough to allow comparisons between different products.

Impact resistance testing is typically performed by dropping a ruggedized tablet from different heights and then reporting the height at which there is no cracking or breakage. IP ratings, which most ruggedized tablets have, specify a device's level of protection against solid foreign objects and liquids. See Appendix A for more information on IP ratings

2.4　Optional Peripherals and Accessories

Many vendors offer external or integrated magnetic stripe readers and barcode readers for their ruggedized tablets. Other optional peripherals and accessories offered by ruggedized tablet vendors may include: hand and shoulder straps; desktop and vehicle docking stations; extended-life batteries; external battery chargers; power adapters/chargers; external keyboards; carrying cases and handles; and screen protectors. Third-party peripherals and accessories are also available.

3.　MICROSOFT® WINDOWS® 8 RUGGEDIZED TABLETS

This section identifies five Microsoft Windows-based ruggedized tablets that range in price from $1,440 to $4,999. As of June 2013, these ruggedized tablets were pre-loaded with Microsoft Windows 8, feature integrated speakers, and have a drop test rating of at least 2.7 feet. Technical support for all vendors can be reached by e-mail or phone, as well as by filling out an online form. The latest mobile broadband options can be found on vendor websites. Product data presented in this section was obtained directly from vendors and their websites. The information has not been independently verified by the SAVER Program. Features in this product comparison matrix are defined as follows, listed in column order:

- **MSRP** refers to the manufacturer's suggested retail price (MSRP) of the ruggedized tablet before any upgrades.

- **Warranty (years)** refers to the duration of the warranty.

- **Minimum Storage Capacity (GB)** refers to the internal storage capacity included at the MSRP provided.

- **Maximum Storage Capacity (GB)** refers to the maximum internal storage capacity available for an additonal cost. *Note: The maximum storage capacity does not include storage expansion options (e.g., microSD card slot).*

- **Minimum RAM (GB)** refers to the amount of internal RAM included at the MSRP provided.

- **Maximum RAM (GB)** refers to the maximum amount of internal RAM available for an additional cost.

- **Screen Size (inches)** refers to the screen size, measured diagonally.

- **Display Type** refers to whether the ruggedized tablet features a capacitive or resistive touch screen.

- **Camera Resolution** refers to the resolution and location of the camera(s) on the ruggedized tablet.

- **Integrated Microphone** indicates if the ruggedized tablet has an integrated microphone.

- **IP Rating** refers to the IP rating of the ruggedized tablet.

- **Operating Temperature (°F)** refers to the operating temperature range of the ruggedized tablet.

Table 3-1. Microsoft® Windows® 8 Ruggedized Tablets Product Comparison Matrix

Vendor	Product Name	MSRP	Warranty (years)	Minimum Storage Capacity (GB)	Maximum Storage Capacity (GB)	Minimum RAM (GB)	Maximum RAM (GB)	Screen Size (inches)	Dislpay Type	Camera Resolution	Integrated Microphone	IP Rating	Operating Temperature (°F)
Bluebird USA Inc.	Pidion® BP80	$2,190	1	32	64	2	2	10.1	C	1.3 MP (front) / 3.0 MP (rear)	✓	65	41 to 110
DT Research Inc.	DT315CT	$1,440	1	8	256	4	4	9.7	C	5.0 MP (rear)		54	41 to 95
MobileDemand LLC	xTablet® T1200	$3,100	1	64	128	8	16	10.4	R	1.3 MP (front) / 5.0 MP (rear)	✓	65	-4 to 140
Panasonic Corporation of North America	Toughpad® FZ-G1 Tablet PC	$3,000	3	128	256	4	8	10.1	C	720p webcam (front) / 3.0 MP (rear)	✓	65	14 to 122
Xplore Technologies Corp	iX104C5 DMSR LTE	$4,999	3	80	320	4	8	10.4	C	3.0 MP (rear)	✓	67	-30 to 140

Notes:
✓—product is equipped with corresponding feature
Blank cell—product is not equipped with corresponding feature
MSRP—manufacturer's suggested retail price
IP—ingress protection
°F—degrees Fahrenheit
MP—megapixels
p—progressive
Display Type: Capacitive (C); Resistive (R)

Information presented in this table is based on data gathered from November 2012 to June 2013.

3.1   Bluebird USA Inc. Pidion® BP80

The Bluebird USA Inc. Pidion BP80 has a base price of $2,190, which includes a 1-year warranty and an AC power adapter/charger. It weighs 2.1 pounds and features a 10.1-inch capacitive touch screen with a resolution of 1280x800 pixels.

The Pidion BP80 features an Intel® 1.6 gigahertz (GHz) processor, a user-configurable LED camera flash, and six external ports: a docking connector, a microSD expansion slot, a micro Subscriber Identity Module (SIM) port, a USB 2.0 port, an HDMI port, and an audio-out jack. Security features include Stonewall Security™ Microsoft BitLocker®, Microsoft BitLocker To Go®, Microsoft AppLocker®, and Trusted Platform Module (TPM).

The ruggedized tablet is powered by a rechargeable lithium-polymer battery and has a continuous-use runtime of 8 hours. It can also be powered by AC or DC, with the appropriate adapter/charger.

Integrated options available for an additional cost include a barcode reader, a magnetic stripe reader, Wi-Fi, Bluetooth 4.0, a GPS module, and near field communication (NFC). Accessories offered for an additional cost include:

- Desktop docking station;

- Vehicle docking station;

- Capacitive stylus;

- Ruggedness pack that increases the drop test rating to 5 feet;

- Spin hand strap pack;

- Square handle;

- Smartcard® reader;

- Secure Access Module (SAM) that enhances security for Smartcard reader applications; and

- Screen protector.

The ruggedized tablet can be decontaminated with ethanol and a cloth and features a scratch-resistant screen.

3.2   DT Research Inc. DT315CT

The DT Research Inc. DT315CT has a base price of $1,440, which includes a 1-year warranty, a capacitive stylus, an AC/DC power adapter/charger, protective bumpers, and a hand strap. It weighs 2.7 pounds and features a 9.7-inch capacitive touch screen with a resolution of 1024x768 pixels.

The DT315CT features an Intel Atom™ Dual Core 1.86 GHz processor, a user-configurable LED camera flash, and six external ports: a docking connector, a USB 2.0 port, an SD expansion slot, a microphone jack, an audio-out jack, and a half-slot Smartcard reader. The ruggedized tablet is Wi-Fi enabled and Bluetooth 3.0+HS compatible. Security features include TPM and encryption.

The ruggedized tablet is powered by a rechargeable lithium-ion battery and has a continuous-use runtime of 4 hours. It can also be powered by AC or DC, with the appropriate adapter/charger, and by an optional external rechargeable lithium-ion battery.

Integrated options available for an additional cost include a GPS module. Accessories offered for an additional cost include:

- Desktop docking station;
- Vehicle docking station;
- External barcode reader;
- External magnetic stripe reader;
- Vehicle power adapter/charger;
- Protective rubber grips set;
- Carrying case with compact USB keyboard;
- Mini USB keyboard; and
- Shoulder strap.

The ruggedized tablet can be cleaned with a dry screen cleaning cloth and features a scratch-resistant screen.

3.3   MobileDemand LLC xTablet® T1200

The MobileDemand LLC xTablet T1200 has a base price of $3,100, which includes a 1-year warranty, a resistive stylus, an AC/DC power adapter, a hand strap, a briefcase handle, and a 4-point shoulder strap. It weighs 4.8 pounds and features a 10.4-inch resistive touch screen with a resolution of 1024x768 pixels.

The xTablet T1200 features an Intel i5-3427U 1.8 GHz processor, a user-configurable LED camera flash, and

eight external ports: a docking connector, an RJ-45 Ethernet port, a mini USB port, two USB 3.0 ports, an audio-out jack, a Smartcard reader, and an SD card slot. The ruggedized tablet is Wi-Fi enabled and Bluetooth 4.0 compatible. Security features include Microsoft BitLocker, Windows Defender® anti-virus application, and Virtual Private Network (VPN).

The ruggedized tablet is powered by two rechargeable lithium-ion batteries and has a continuous-use runtime of 11.5 hours. It can also be powered by AC or DC, with the appropriate adapter/charger.

Integrated options available for an additional cost include a barcode reader, magnetic stripe reader, and GPS module. Accessories offered for an additional cost include:

- Desktop docking station;

- Vehicle docking station;

- Vehicle power adapter/charger;

- External battery charger;

- 2-point shoulder strap; and

- Ruggedized keyboard.

The ruggedized tablet can be decontaminated with rubbing alcohol and features a scratch-resistant screen.

3.4   Panasonic Corporation of North America Toughpad® FZ-G1 Tablet PC

The Panasonic Corporation of North America Toughpad FZ-G1 Tablet PC has a base price of $3,000, which includes a 3-year warranty, an AC power adapter/charger, and a capacitive stylus. It weighs 2.5 pounds and features a 10.1-inch capacitive touch screen with a resolution of 1920x1200 pixels.

The Toughpad FZ-G1 Tablet PC features an Intel Core™ i5 vPro processor (1.9 GHz with Turbo Boost up to 2.9 GHz), a user-configurable LED light, and four external ports: a 24-pin docking connector, an HDMI (Type A) port, an audio-out jack, and a USB 3.0 port. The ruggedized tablet is Wi-Fi enabled and Bluetooth 4.0 compatible. Security features include password security, a Kensington™ cable lock slot, and Computrace® theft protection agent.

The ruggedized tablet is powered by a rechargeable lithium-ion battery and has a continuous-use runtime of 8 hours. It can also be powered by AC or DC, with the appropriate adapter/charger.

Integrated options available for an additional cost include one of the following: a GPS module, a serial port, an RJ-45 Ethernet port, a microSD expansion slot, or a USB 2.0 port. Accessories offered for an additional cost include:

- Vehicle docking station;

- Vehicle power adapter/charger;

- Long-life battery pack;

- Rotating hand strap;

- ToughMate® G1 X hand strap;

- ToughMate G1 Always-On Case with hand strap;

- ToughMate G1 Professional Portfolio (case);

- Tether; and

- Screen protector.

The ruggedized tablet can be cleaned with detergent and a soft cloth.

3.5 Xplore Technologies Corp. iX104C5 DMSR LTE

The Xplore Technologies Corp. iX104C5 DMSR LTE has a base price of $4,999, which includes a 3-year warranty, an AC power adapter/charger, a hand strap, and a capacitive stylus. It weighs 5.4 pounds and features a 10.4-inch capacitive touch screen with a resolution of 1024x768 pixels.

The iX104C5 DMSR LTE features an Intel Core i7 620 UE processor (up to 2.13 GHz with Turbo Boost technology) and eight external ports: a docking connector, two USB 2.0 ports, an RJ-45 Ethernet port, a microSD and SIM port, a VGA port, an audio-out jack, and a microphone jack. The ruggedized tablet is Wi-Fi enabled and Bluetooth 2.1 compatible. Security features include a biometrics/fingerprint reader, TPM, Intel Anti-Theft, Computrace theft protection agent, and a Kensington cable lock slot.

The ruggedized tablet is powered by a rechargeable lithium-ion battery and has a continuous-use runtime of 6.5 hours. It can also be powered by AC or DC, with the appropriate adapter/charger.

Integrated options available for an additional cost include a GPS module and barcode reader. Accessories offered for an additional cost include:

- Desktop docking station;

- Vehicle docking station;

- External magnetic stripe reader;

- Vehicle power adapter/charger;

- Various hand straps;

- Various carrying cases; and

- Screen protector.

The ruggedized tablet can be decontaminated with any lens cleaner, including isopropyl alcohol, and features a scratch-resistant screen.

4.   MICROSOFT WINDOWS 7 RUGGEDIZED TABLETS

This section identifies 22 Microsoft Windows-based ruggedized tablets that range in price from $1,200 to $5,334. As of June 2013, these ruggedized tablets were pre-loaded with Microsoft Windows 7 and were not available from the vendor pre-loaded with Microsoft Windows 8. Product data presented in this section was obtained directly from vendors and their websites. The information has not been independently verified by the SAVER Program. Features in this product comparison matrix are defined as follows, listed in column order:

- **MSRP** refers to the MSRP of the ruggedized tablet before any upgrades.

- **Warranty (years**) refers to the duration of the warranty.

- **Minimum Storage Capacity (GB)** refers to the internal storage capacity included at the MSRP provided.

- **Maximum Storage Capacity (GB)** refers to the maximum internal storage capacity available for an additonal cost. *Note: The maximum storage capacity does not include storage expansion options (e.g., microSD card slot).*

- **Minimum RAM (GB)** refers to the amount of internal RAM included at the MSRP provided.

- **Maximum RAM (GB)** refers to the maximum amount of internal RAM available for an additional cost.

- **Screen Size (inches)** refers to the screen size, measured diagonally.

- **Display Type** refers to whether the ruggedized tablet features a capacitive or resistive touch screen.

- **Camera Resolution (megapixels)** refers to the resolution and location of the camera(s) on the ruggedized tablet.

- **Integrated Microphone** indicates if the ruggedized tablet has an integrated microphone.

- **Integrated Speaker** indicates if the ruggedized tablet has an integrated speaker.

- **Integrated GPS** indicates if the ruggedized tablet has an integrated GPS module.

- **Integrated Wi-Fi** indicates if the ruggedized tablet has an integrated Wi-Fi module.

- **IP Rating** refers to the IP rating of the ruggedized tablet.

- **Operating Temperature (°F)** refers to the operating temperature range of the ruggedized tablet.

Table 4-1. Microsoft® Windows® 7 Ruggedized Tablets Product Comparison Matrix

Vendor	Product Name	MSRP	Warranty (years)	Minimum Storage Capacity (GB)	Maximum Storage Capacity (GB)	Minimum RAM (GB)	Maximum RAM (GB)	Screen Size (inches)	Dislpay Type	Camera Resolution	Integrated Microphone	Integrated Speaker	Integrated GPS	Integrated Wi-Fi®	IP Rating	Operating Temperature (°F)
DRS Technologies	Armor X7	NP	3	40	80	2	2	7.0	R	2.0 MP (rear)	✓	✓	✓	✓	65	-4 to140
	Armor X7et	$1,499	1	40	40	1	2	7.0	C	1.3 MP (front) / 5.0 MP (rear)	NP	NP	✓	✓	65	-4 to140
	Armor X10gx	$3,599	3	32	160	2	4	10.4	NP	NP	✓	NP	✓	✓	65	-4 to140
DT Research Inc.	DT362	$2,372	1	8	256	2	2	8.4	R	2.0 MP (rear)	✓	✓	NP	✓	NP	32 to 104
	DT365	$1,907	1	8	256	4	4	8.4	C	5.0 MP (rear)	✓	✓	✓	✓	NP	32 to 104
	DT390	$2,372	1	8	64	2	2	8.9	R	2.0 MP (front) / 2.0 MP (rear)	NP	NP	✓	✓	64	32 to 104
	DT395	$1,490	1	8	256	4	4	9.0	R	1.0 MP (front) / 1.0 MP (rear)	✓	✓	✓	✓	65	-4 to 122
	DT398B	$1,823	1	8	256	4	8	9.7	R	1.0 MP (front) / 1.0 MP (rear)	✓	✓	✓	✓	65	32 to 104

Vendor	Product Name	MSRP	Warranty (years)	Minimum Storage Capacity (GB)	Maximum Storage Capacity (GB)	Minimum RAM (GB)	Maximum RAM (GB)	Screen Size (inches)	Dislpay Type	Camera Resolution	Integrated Microphone	Integrated Speaker	Integrated GPS	Integrated Wi-Fi®	IP Rating	Operating Temperature (°F)
HHCS Handheld USA Inc.	Algiz® 7	$2,699	1	128	128	4	4	7.0	R	2.0 MP (rear)		✓	✓	✓	65	-9 to 140
	Algiz 10x	$2,849	1	128	128	4	4	10.0	R	5.0 MP (rear)	✓	✓	✓	✓	65	-4 to 140
	Algiz XRW	$3,099	1	128	128	4	4	10.0	NP	2.0 MP (rear)	✓	✓	✓	✓	65	-4 to 131
Logic Instrument USA	Fieldbook® A2	$2,700	3	64	128	2	2	7.0	R	5.0 MP (rear)	✓	✓	✓	✓	65	-4 to 131
	Fieldbook B1	$2,650	3	32	128	2	2	10.4	R	2.0 MP (front) 5.0 MP (rear)	✓	✓	✓	✓	65	-4 to 120
MobileDemand LLC	xTablet T7200	$1,900	3	32	128	2	2	7.0	R	5.0 MP (rear)	✓	✓	✓	✓	65	-4 to 140
Motion Computing Inc.	C5t	$2,300	3	64	128	2	4	10.4	C	1.3 MP (front) 3.0 MP (rear)	✓	✓		✓	54	14 to 104
	CL910	$1,200	1	64	128	2	2	10.9	C	1.3 MP (front) 3.0 MP (rear)	✓	✓	✓	✓	52	41 to 110
	F5t	$2,300	3	64	256	2	8	10.4	C	1.3 MP (front) 3.0 MP (rear)	✓	✓	✓	✓	54	14 to 104
	J3500	$2,000	1	NP	128	2	4	12.1	C	3.0 MP (rear)	✓	✓	✓	✓	52	41 to 104
	J3600	$2,000	1	NP	256	8	16	12.1	C	3.0 MP (rear)	✓	✓	✓	✓	52	41 to 113

Vendor	Product Name	MSRP	Warranty (years)	Minimum Storage Capacity (GB)	Maximum Storage Capacity (GB)	Minimum RAM (GB)	Maximum RAM (GB)	Screen Size (inches)	Dislpay Type	Camera Resolution	Integrated Microphone	Integrated Speaker	Integrated GPS	Integrated Wi-Fi®	IP Rating	Operating Temperature (°F)
Patrol PC (Subsidary of Advanced Electronic Design Inc.)	RT12i	$5,334	3	250	1000	2	16	12.1	R	Not Applicable	✓	✓	✓	✓	NP	-13 to 149
Telaeris Inc.	Titan T8	$3,000	NP	NP	160	NP	2	8.4	C	1.3 MP (front) 3.0 MP (rear)	✓	✓	✓	✓	65	32 to 122
Trimble Navigation Limited	Yuma® 2	NP	1	64	128	4	4	7.0	C	5.0 MP (rear)	✓	✓	✓	✓	65	-22 to 144

Notes:
✓—product is equipped with corresponding feature
Blank cell—product is not equipped with corresponding feature
MSRP—manufacturer's suggested retail price
IP—ingress protection
°F—degrees Fahrenheit
MP—megapixels
NP—information was not provided by the vendor or available on the vendor's website
Display Type: Capacitive (C); Resistive (R)

Information presented in this table is based on data gathered from November 2012 to June 2013.

5. VENDOR CONTACT INFORMATION

Additional information on the ruggedized tablets included in this market survey report can be obtained from the vendors listed in Table 5-1

Table 5-1. Vendor Contact Information

Vendor	Phone Number	Website/E-Mail Address
Bluebird USA Inc.	(201) 944-0822	http://www.mypidion.com na@bluebird.co.kr
DRS Technologies	(703) 416-7600	http://www.drsarmor.com sales@drsarmor.com
DT Research Inc.	(408) 934-6220	http://www.dtresearch.com sales@dtri.com
HHCS Handheld USA Inc.	(541) 752-0313	http://www.handheld-us.com sales@handheld-us.com
Logic Instrument USA	(410) 363-3405	http://www.logic-instrument.com sales.us@logic-instrument.com
MobileDemand LLC	(877) 925-2571	http://www.ruggedtabletpc.com
Motion Computing Inc.	(512) 637-1100 (866) 682-2538	http://www.motioncomputing.com supplymanagementresp@motioncomputing.com
Panasonic Corporation of North America	(877) 803-8492	http://www.panasonic.com b2bsales@us.panasonic.com
Patrol PC (Subsidiary of Advanced Electronic Design Inc.)	(508) 699-0458 Extension 201	http://www.patrolpc.com support@patrolpc.com
Telaeris Inc.	(858) 627-9700	http://www.telaeris.com info@telaeris.com
Trimble Navigation Limited	(408) 481-8000 (800) 874-6253	http://www.trimble.com
Xplore Technologies Corp.	(512) 336-7797 (888) 449-7567	http://www.xploretech.com

6. SUMMARY

This market survey report includes 27 ruggedized tablets with a Microsoft Windows operating system. The products differ in operating system; cost; storage capacity; RAM; screen size; display type; camera resolution; and integrated features such as internal microphones, speakers, GPS, and Wi-Fi.

The majority of the ruggedized tablets are available with 2 GB of RAM or more as well as a minimum storage capacity of 64 GB. Most also feature the following integrated options:

- Wi-Fi;
- Bluetooth;

- Speaker;

- Microphone; and

- Rear-facing camera.

Emergency responder agencies that consider purchasing ruggedized tablets should carefully research each product's overall capabilities and limitations in relation to their agency's operational needs.

APPENDIX A. INGRESS PROTECTION (IP) RATING

The International Electrotechnical Commission (IEC) Ingress Protection (IP) Rating specifies the level of protection an enclosure provides against solid foreign objects and liquids. The first number refers to protection against solid foreign objects, and the second number refers to protection against liquids. The highest possible rating is IP68.

First Number	Meaning	Second Number	Meaning
(Protection against solid foreign objects)		(Protection against liquids)	
0	No protection.	0	No protection.
1	Protected against solid objects over 50 mm (e.g., accidental touch by hand).	1	Protected against water falling vertically.
2	Protected against solid objects over 12 mm (e.g., accidental touch by finger).	2	Protected against direct sprays up to 15 degrees from vertical.
3	Protected against solid objects over 2.5 mm (e.g., tools, wires).	3	Protected against direct sprays up to 60 degrees from vertical.
4	Protected against solid objects over 1 mm (e.g., small wires).	4	Protected against sprays from all directions. Limited ingress permitted.
5	Protected against dust-limited ingress (no harmful deposit).	5	Protected against low pressure jets of water from all directions. Limited ingress permitted.
6	Totally protected against all dust.	6	Protected against strong jets of water. Limited ingress permitted (e.g., acceptable for use on ship decks).
		7	Protected against temporary effects of immersion between 15 cm and 1 m for 30 minutes.
		8	Protected against long periods of immersion under pressure.