



# Boundless Security Systems, Inc.

*the communications bandwidth experts*



Custom built  
and configured  
in USA

## Smart PTZ Cameras with *Stranger Detector™* and *Rapid Review™* Automate Unmanned Video Surveillance

### Benefits

- **Labor-saving strategic weapon automates unmanned video surveillance**, enabling you to undercut your competition and get more jobs while increasing your margins for combating theft, vandalism, break ins, illegal dumping, illegal presence, liability, absenteeism, and workers' comp., *both forensically and in real time*
- Ideal for short projects and fast installs, quickly move from job to job, avoid need for electrician and IT dept.
- Set up sharp, covert 1920x1080 HD digital video surveillance with live and internally recorded video, ***Stranger Detector™*** locating system and opt. ***Rapid Review™*** / ***Integrated Timelapse*** via Internet in minutes
- Patented ***Stranger Detector™*** Smartphone WiFi Monitoring locating system passively receives WiFi probes from wireless mobile devices, determines patterns of presence of persons whose identities may be unknown, integrates live and recorded video, sends alerts, and receives messages from WiFi physical security devices and motion-activated WiFi asset tags
- Indoor models have fixed focus lens, 8MP color sensor with digital PTZ at true 1920x1080 resolution
- Outdoor models have true, motorized PTZ with long range zoom lens (license plate up to 450 feet)
- Ultra low bandwidth is network-friendly, places negligible load on LAN for indoor models and slashes cellular data costs for outdoor models
- Battery-powered outdoor models<sup>2</sup> typically provide 2 weeks' *continuous* video capture on a battery charge (approx. 1 day/pound of ext. LiFePO4 battery, not incl.)
- 2+ weeks' (typ. 4) continuous high definition (960x540 and 1920x1080) internal video recording<sup>3</sup> with *rapid access video file system* before overwriting older video
- Opt. ***Rapid Review™*** / ***Integrated Timelapse*** documents project progress and enables viewing an hour or a day over the air in just 30 seconds
- Custom built and configured, just apply power and go to URL, camera tunnels through LAN or WWAN to Internet (cell service for outdoor models not included)

Boundless' same core low power, ultra low bandwidth technology, is packaged multiple ways, other models are available

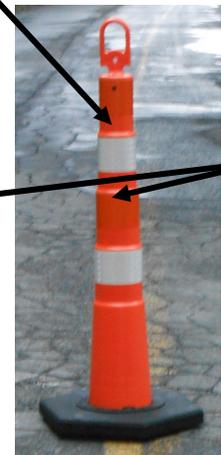
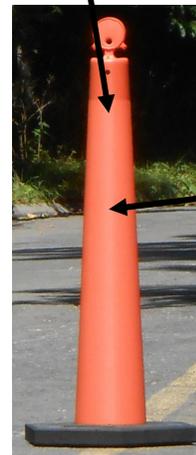


***5MP Outdoor Covert Cellular Smart uPTZ Camera*** (8"W x 6"H x 3.5"D) mimics outdoor telecom eqpt.

***8MP Indoor Covert Smart dPTZ Camera***  
(uses LAN)



Concealed ***5MP Outdoor Covert Cylindrical Cellular Smart uPTZ Camera*** (8"H x 3.5" dia.) mimics 3" PVC conduit, can be removed and used exposed or in other housings in many orientations (antennas not shown)



Concealed high gain directional WiFi antenna views subject zone

***Covert Traffic Channelizer Cones***

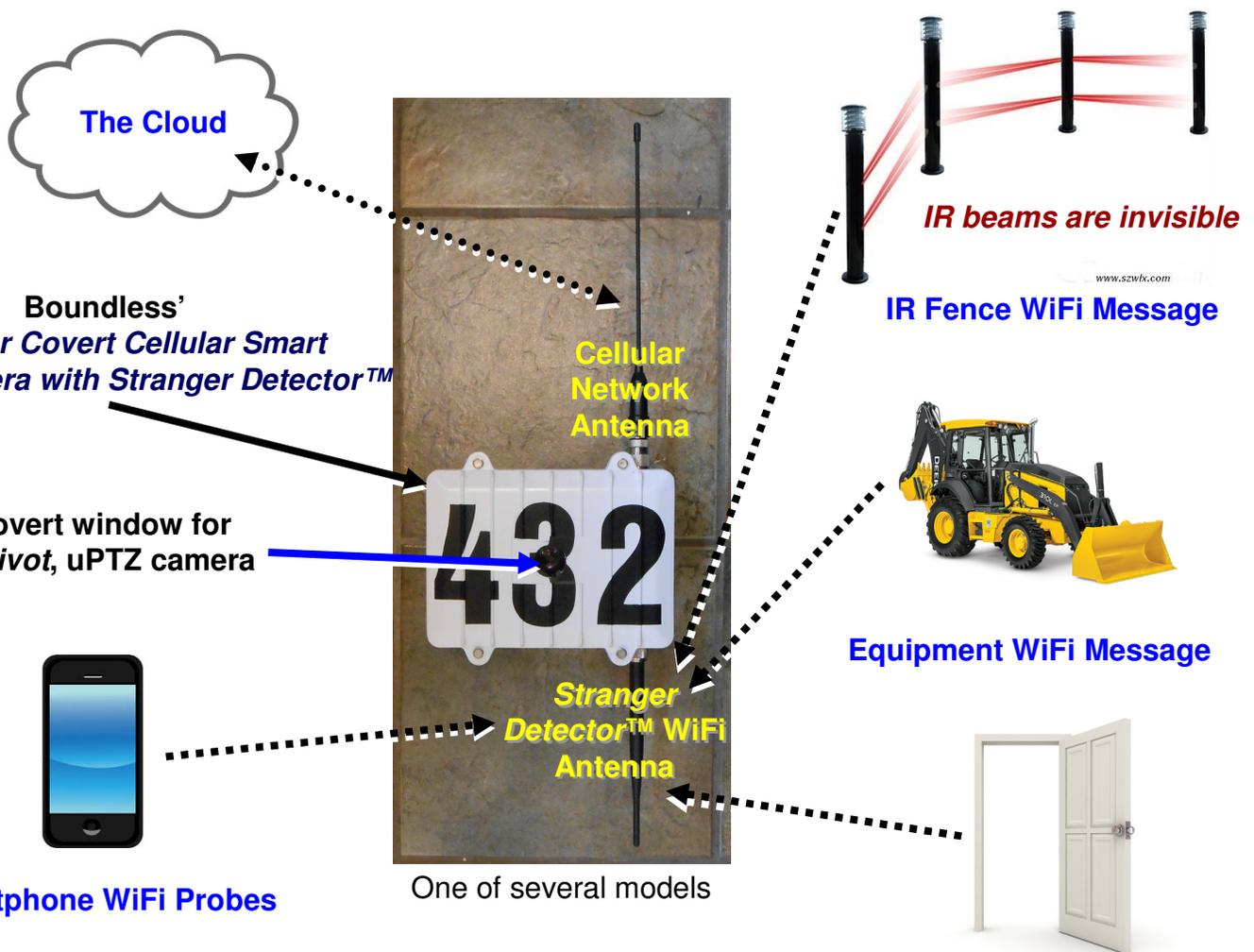


## Stranger Detector™ Locating System

A more powerful, more flexible and more efficient way to determine subject presence and build wireless physical security systems, that is built into Boundless' **Smart PTZ Cameras**

### Two Primary Uses

- **Smartphone WiFi Monitoring System: Smart Camera** detects mobile devices via their WiFi probes, determines patterns of presence of persons whose identities may be unknown via WiFi probes, and integrates WiFi probes with video surveillance and Internet.
- **Physical Security System: Smart Camera** optionally receives, processes and responds to WiFi messages from third-party sensors, and integrates with video surveillance and Internet. **Smart Camera** would respond to WiFi messages from various types of sensors (not incl.). A simple, battery-powered, WiFi transmitter can be added to sensing devices lacking WiFi.



Messages can be triggered by a make or break signal, vibration...

Door WiFi Message



## Ways to Use the *Stranger Detector*<sup>TM</sup> Locating System

- Forensically and in real-time
- Determine which mobile devices, and by extension, which persons or WiFi-enabled vehicles, were present during an incident at a particular location or group of locations that have Boundless' ***Stranger Detectors***
- Determine when a particular mobile device was present previously and view recorded video from those times to obtain images of the user of the mobile device and others who accompanied the user; video can be viewed simply by clicking a link provided by a search report or alert from the ***Stranger Detector*<sup>TM</sup>**
- Determine when a particular mobile device, and by extension, person, is, or has been, at a particular location where the device connects to a WiFi network for long periods of time (see Appendix 1)
- Obtain images of persons when they were not wearing masks when they earlier surveyed a location prior to a robbery
- Avoid reviewing large amounts of recorded video to find a subject
- Send an alert, with links to live and relevant recorded video, when particular mobile devices are detected
- Send an alert, with links to live and relevant recorded video, when any mobile devices are detected
- Create a wireless perimeter around a location to give an early warning of the presence of a particular mobile device, and by extension, individual or WiFi-enabled vehicle
- Determine which mobile devices satisfy certain *patterns of presence*, such as lingering for at least a half hour every Monday
- Send an alert when a motion-activated WiFi tag or WiFi-enabled physical security device, such as an IR fence, sends a message



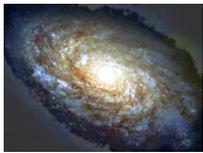
## **Stranger Detector™ Locating System Theory of Operation**

- People are attached to their smartphones because they customize them for their own use
- Smartphones, which are one of many kinds of wireless mobile devices, have unique identification codes that can be used as proxies for the identity of the user
- The presence of a particular mobile device, combined with video of the user at the time a WiFi probe from the mobile device was received, enables the user to be identified
- Wireless mobile devices constantly send WiFi probes to look for WiFi hotspots as an inexpensive way to connect to the Internet, unless the mobile device is in airplane mode or turned off
- WiFi probes contain a unique WiFi MAC address to identify the mobile device to a wireless local area network; no device can connect to a local area network without a MAC address
- Mobile device manufacturer name, probe date and time, and probe signal strength, the latter with which distance can be estimated, can also be obtained from WiFi probes
- Mobile devices sleeping in one's pocket continue searching for WiFi hotspots, but not as frequently as mobile devices in use; the typical time between WiFi probes for handheld mobile devices is one to several minutes, or several seconds for laptops
- The data base of WiFi probes received is stored indefinitely within each **Stranger Detector™**
- A WiFi MAC address is to a WiFi network interface device within a mobile device as a Vehicle Identification Number is to a vehicle, and is similar to but different from the MEID, mobile equipment identification, for a cell modem
- Mobile devices making or receiving calls or texts, or connected to the Internet, use a unique static WiFi MAC address assigned by the device manufacturer and able to identify the mobile device
- Mobile devices that only have WiFi communications, no cellular communications, can be handled
- The range to receive a WiFi probe depends on the receiving antenna, distance, and obstructions in the signal path, the range is typ. 50 to 75 feet indoors or 300 feet outdoors with an omni-directional receiving antenna, or up to a mile outdoors with a high gain directional receiving antenna
- When searching for hotspots, some mobile devices use a dynamic MAC address to circumvent tracking; Alphabet (Google) / Android smartphones are much less likely to have dynamic MAC addresses than Apple / iOS smartphones; connecting to a network requires the static MAC address (see Appendix 1 for an example of in-home use, where the home WiFi network is always used)
- Smartphone operating system vendors, Apple (iOS) and Alphabet (Google / Android), can be subpoenaed to disclose the owner of a mobile device identified by its static WiFi MAC address
- WiFi MAC addresses of burner smartphones are generally not recorded by sellers
- In contrast to the FBI's *Stingray*, which acted as a mobile cell tower and actively solicited cellular communications, Boundless' **Stranger Detector™** passively listens for WiFi probes and cannot be detected; it is not a WiFi hotspot and does not solicit WiFi probes; the **Stranger Detector™** only receives a WiFi probe if a mobile device, on its own, decides to send one
- Retail locations should provide free WiFi Internet to encourage the use of static WiFi MAC addresses by visitors', employees' and vendors' mobile devices

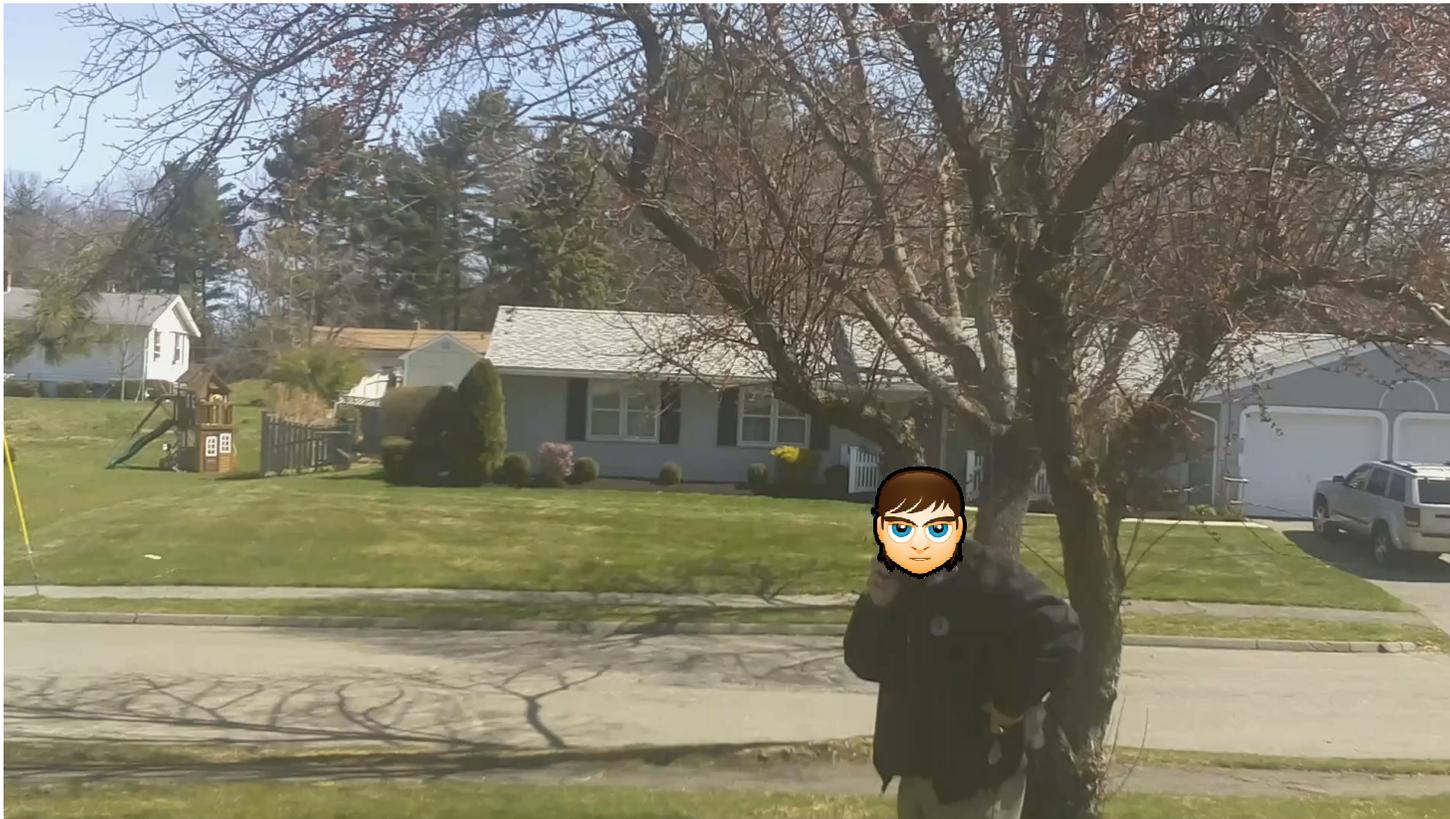


## **Stranger Detector™ Locating System Theory of Operation**

- Every WiFi probe, but no user data, received is recorded by the **Stranger Detector™** internally
- Boundless' **Smart PTZ Cameras** are powerful, multi-faceted systems in the guise of a camera and integrate the **Stranger Detector™** with video capture; other video sources can also be used
- An hour's or more probes can be viewed sorted various ways, enabling viewing all the probes with a given WiFi MAC address, sorted various ways, and enabling viewing video recorded at the times the probes were received, to assist in visually identifying the person using a particular mobile device
- Sorting functions for display include time, selected time period, WiFi MAC address, frequency of occurrence, signal strength, and device manufacturer, and combinations
- Users can set alerts on one or more WiFi MAC addresses so the **Stranger Detector™** sends an e-mail when those MAC addresses are detected; the e-mail includes links to live video, recorded video starting a number of seconds before the latest WiFi probe was received, and a number of the most recent previous times a WiFi probe with the selected MAC address was received, where the video can be viewed natively in browsers without any plug-ins or special apps
- Central monitoring stations can forward e-mail alerts to law enforcement without having to retrieve and forward video since links to video are contained in the alerts
- During selected time periods, the **Stranger Detector** can detect the presence of any WiFi probes with a certain range of signal strengths, and send alerts, such as for detecting the presence of someone when no one should be present
- Following an incident such as a robbery, the user can determine which mobile devices were present during the incident, then select WiFi MAC addresses in turn so the **Stranger Detector™** can automatically search its data base for previous times those WiFi MAC addresses were present so recorded video from those times can be viewed to determine the unmasked appearance of persons who were surveying the establishment (*casing the joint*) prior to an incident
- As above but multiple **Stranger Detectors** can be grouped into an **Internet Neighborhood** so searches can automatically be made through all **Stranger Detectors** in that Internet Neighborhood; an Internet Neighborhood can be whatever one chooses it to be, e.g., all stores in a particular chain, or all stores in a particular geographic area, that have Boundless' **Stranger Detectors**
- During selected time periods, the **Stranger Detector** can respond to messages from motion-activated WiFi tags, which can be placed on a door, gate, merchandise or equipment, to indicate the unexpected movement of the object and send an alert
- During selected time periods, the **Stranger Detector** can respond to WiFi messages from WiFi-enabled physical security devices, such as infrared fences, to indicate an intruder and send an alert
- The **Stranger Detector** automatically builds a data base of recurring WiFi MAC addresses, such as for employees' mobile devices, and can exclude them from display; however, users should be careful not to exclude them when investigating possible inside jobs
- The **Stranger Detector** can automatically identify WiFi MAC addresses that satisfy certain *patterns of presence*, such as being present for a certain range of number of minutes, to exclude regulars such as delivery personnel, who are present briefly, and workers, who are present for long periods



## Stranger Detector™ Integrates WiFi Probes with Video



1920x1080 HD image captured by Boundless' BSSI-8 Smart Camera with Stranger Detector™ at 11:36:48 04/16/16

### All Raw WiFi probes captured by Stranger Detector™

BSSI-8, Apr 16 2016 11:36:08.712,1460820968.712,,cc:c3:ea:1f:c5:24,-91  
 BSSI-8, Apr 16 2016 11:36:09.488,1460820969.488,H&DWirel ,78:c4:0e:02:2d:3f,-69  
 BSSI-8, Apr 16 2016 11:36:11.556,1460820971.556,HonHaiPr ,68:94:23:0a:16:d3,-85  
 BSSI-8, Apr 16 2016 11:36:15.770,1460820975.770,H&DWirel ,78:c4:0e:02:2d:3f,-69  
 BSSI-8, Apr 16 2016 11:36:16.014,1460820976.014,SeikoEps ,00:26:ab:01:80:cd,-43  
 BSSI-8, Apr 16 2016 11:36:16.601,1460820976.601,SeikoEps ,00:26:ab:01:80:cd,-37  
 BSSI-8, Apr 16 2016 11:36:27.018,1460820987.018,H&DWirel ,78:c4:0e:02:2d:3f,-69  
 BSSI-8, Apr 16 2016 11:36:36.497,1460820996.497,H&DWirel ,78:c4:0e:02:2d:3f,-71  
**BSSI-8, Apr 16 2016 11:36:42.055,1460821002.055,,bc:54:36:5b:98:79,-75**  
 BSSI-8, Apr 16 2016 11:36:47.765,1460821007.765,H&DWirel ,78:c4:0e:02:2d:3f,-67  
 BSSI-8, Apr 16 2016 11:36:54.037,1460821014.037,H&DWirel ,78:c4:0e:02:2d:3f,-69  
 BSSI-8, Apr 16 2016 11:36:56.845,1460821016.845,,d4:21:22:9e:37:59,-87  
 BSSI-8, Apr 16 2016 11:36:56.968,1460821016.968,,d4:21:22:c9:84:11,-85  
 BSSI-8, Apr 16 2016 11:36:57.108,1460821017.108,H&DWirel ,78:c4:0e:02:2d:3f,-69  
 BSSI-8, Apr 16 2016 11:36:59.701,1460821019.701,IntelCor ,a4:4e:31:7b:5e:b8,-81  
 BSSI-8, Apr 16 2016 11:37:00.994,1460821020.994,,28:e3:47:fd:be:a3,-43  
 BSSI-8, Apr 16 2016 11:37:11.588,1460821031.588,H&DWirel ,78:c4:0e:02:2d:3f,-67  
 BSSI-8, Apr 16 2016 11:37:12.466,1460821032.466,,78:fd:94:31:23:2e,-83  
 BSSI-8, Apr 16 2016 11:37:16.776,1460821036.776,SeikoEps ,00:26:ab:01:80:cd,-37  
 BSSI-8, Apr 16 2016 11:37:32.141,1460821052.141,NestLabs ,18:b4:30:04:85:ee,-89  
 BSSI-8, Apr 16 2016 11:37:34.846,1460821054.846,,d4:21:22:c9:84:11,-85  
 BSSI-8, Apr 16 2016 11:37:35.411,1460821055.411,H&DWirel ,78:c4:0e:02:2d:3f,-69  
 BSSI-8, Apr 16 2016 11:37:37.103,1460821057.103,,fc:92:3b:ea:49:70,-87  
 BSSI-8, Apr 16 2016 11:37:38.220,1460821058.220,,30:10:b3:01:8c:e2,-87  
 BSSI-8, Apr 16 2016 11:37:44.834,1460821064.834,,bc:54:36:5b:98:79,-85

*See Appendix for 24 hours, showing when a subject leaves and returns, and how active they are throughout the day.*

WiFi probes from just subject's smart phone captured by Stranger Detector™

BSSI-8, Apr 16 2016 11:36:42.055,1460821002.055,,bc:54:36:5b:98:79,-75  
 BSSI-8, Apr 16 2016 11:37:44.834,1460821064.834,,bc:54:36:5b:98:79,-85  
 BSSI-8, Apr 16 2016 11:38:17.579,1460821097.579,,bc:54:36:5b:98:79,-87  
 BSSI-8, Apr 16 2016 11:38:54.454,1460821134.454,,bc:54:36:5b:98:79,-83  
 BSSI-8, Apr 16 2016 11:39:00.894,1460821140.894,,bc:54:36:5b:98:79,-89  
 BSSI-8, Apr 16 2016 11:39:07.551,1460821147.551,,bc:54:36:5b:98:79,-87

Patented Stranger Detector™ locating system detects patterns of presence of persons whose identities may be unknown. It receives and processes static WiFi MAC addresses from mobile devices, and integrates them with video.



## Stranger Detector™ Sortable Table User Interface

A tool for displaying, sorting and searching WiFi probes and corresponding video from one or more locations, and setting alerts

Many sorting functions

Choose one or more hours (previous menu selects starting time)

Color-coded groups of MAC addresses help spot patterns of presence



**Boundless Security Systems, Inc.**  
*the communications bandwidth experts*

### Boundless' BSSI-8 Stranger Detector™ Sortable Table

Level 1 Sort by: Frequency  Ascending  Descending  
Level 2 Sort by: Time  Ascending  Descending  
Level 3 Sort by: None  Ascending  Descending

Number of Previous Hours to Display: 0

Number of Future Hours to Display: 0

Hide MAC Addresses in Skip List:

Hide MAC Addresses in URL List:

Update Table Clear All Selections Save as CSV

Display Skip List View Video Show/Hide Alerts

Show Unique MAC Addresses Restore All Records

Local Search Find Presence Elsewhere Wide Area Search

Self-learning exclusion of recurring MAC addresses, or manual entry

Video and Alerts integration

Search within one location or across multiple

Select	Group Select	Found	Date/Time	Vendor	MAC Address	Signal
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:42:00.940	Sercomm	00:0e:8f:3a:90:e1	-91
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:47:44.065		be:86:7a:06:a1:cc	-85
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:49:13.454	Hewlett-	00:9c:02:cb:2a:86	-87
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:59:47.406		28:9afa:ea:cd:28	-83
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:40:39.516		16:de:32:e2:8e:ab	-75
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:42:54.510		16:de:32:e2:8e:ab	-73
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:39:12.975	Apple	20:c9:d0:74:d4:25	-87
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:41:15.682	Apple	20:c9:d0:74:d4:25	-83
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:58:07.989		48:d7:05:8e:8c:62	-87
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:58:19.695		48:d7:05:8e:8c:62	-89
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:50:28.436		a6:c0:04:19:3a:e9	-77
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:54:58.421		a6:c0:04:19:3a:e9	-79
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:05:26.460	Apple	c8:bc:c8:bc:53:6b	-37
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:05:33.970	Apple	c8:bc:c8:bc:53:6b	-37
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:33:13.935		c2:4e:b2:b2:eb:34	-75
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:35:28.926		c2:4e:b2:b2:eb:34	-75
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:24:42.283		ea:a4:80:db:d6:cc	-77
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:26:57.276		ea:a4:80:db:d6:cc	-77
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jan 23 2015 07:17:40.696		fe:98:23:df:07:ed	-85



## **Stranger Detector™ Push E-mail for Alerts**

Please see our White Paper on *Smartphone WiFi Monitoring* integrated with outdoor video surveillance, aka **Stranger Detector™**: <http://tinyurl.com/cgycmxm>

Example Alert push e-mail from a system that has been given the host name, *M-1* (note: *view* links are active in Alerts sent, but not in this document):

To: M-1.alerts@BoundlessSecurity.com  
Subject: M-1 10:40:f3:56:a5:00 on Watch List detected

### **Smartphone on Watch List with WiFi Signature 10:40:f3:56:a5:00 Detected**

Click any *view* link for live video. To view recorded video: (1) click the *view* link for the desired probe and wait for live video, (2) click **REC** and wait for recent recorded video, and then (3) click **SET\_TS** to see recorded video starting 15 seconds before the probe was received.

The less negative the signal strength, the stronger the signal and the closer the smartphone or other WiFi-enabled mobile device was to the camera. Signals are received in all directions, not just where the camera views.

Probe received at Sep 6 2012 08:19:55 with signal strength -85 dBm [view](#)  
Probe received at Sep 6 2012 08:19:55 with signal strength -84 dBm [view](#)  
Probe received at Sep 20 2012 16:39:08 with signal strength -87 dBm [view](#)  
Probe received at Sep 20 2012 16:39:14 with signal strength -86 dBm [view](#)  
Probe received at Sep 21 2012 17:01:44 with signal strength -87 dBm [view](#)  
Probe received at Sep 27 2012 16:23:28 with signal strength -78 dBm [view](#)  
Probe received at Sep 28 2012 14:10:44 with signal strength -84 dBm [view](#)

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#### **Notes:**

1. Cellular networks are not intended for continuous viewing. Live and recorded video should be viewed only as needed.
2. Power dissipation and run time on a battery charge depend on many factors. Figures are not guaranteed.
3. Storage duration is typical but not guaranteed.



### Rapid Review™ / Integrated Timelapse

Opt. internal **Rapid Review™ / Integrated Timelapse** documents project progress and enables reviewing an hour's or day's video in just 30 seconds over the air with minimal data

BSSI-8 Low Power, 5 MP Covert Cellular Smart Micro-PTZ Camera with Stranger Detector(TM)

BSSI-8 Low Power, 5 MP Covert Cellular Smart Micro-PTZ Camera with Stranger Detector(TM)

BSSI-8 Low Power, 5 MP Covert Cellular Smart Micro-PTZ Camera with Stranger Detector(TM)

This **Smart Camera™** was accessible when this page loaded. This page updates every 30 minutes or right-click it to update.

This **Smart Camera™** was accessible when this page loaded. This page updates every 30 minutes or right-click it to update.

This **Smart Camera™** was accessible when this page loaded. This page updates every 30 minutes or right-click it to update.

This page has a demo version of our optional, patent-pending, **Integrated Timelapse Software** that runs within our **Smart uPTZ Camera™** and **reduces time reviewing recorded video 100x**. Contact us for more information.

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Status: Playing delayed live video  
Date: 5/27/16, 09:44:51  
Data rate: low

Status: Playing recorded video  
Date: 5/27/16, 06:44:17  
Data rate: low

Status: Playing timelapse video, 1-hour files  
Date: 5/27/16, 06:04:00  
Data rate: low

[View/Refresh live video](#) [Copy time to time selector](#)

[View/Refresh live video](#) [Copy time to time selector](#)

[View/Refresh live video](#) [Copy time to time selector](#)

Year: 2016 Month: May Day: 27

Year: 2016 Month: May Day: 27

Year: 2016 Month: May Day: 27

H(24): 09 M: 44 S: 15

H(24): 06 M: 44 S: 15

H(24): 06 M: 44 S: 15

[View recorded video](#) Data rate: low Speed: 1x Type: Normal

[View recorded video](#) Data rate: low Speed: 1x Type: Normal

[View recorded video](#) Data rate: low Speed: 120x Type: Timelapse File Duration: Hour

[Download files](#) Duration: 1 minute Data rate: low Type: Normal

[Download files](#) Duration: 1 minute Data rate: low Type: Normal

[Download files](#) Duration: 1 minute Data rate: low Type: Normal

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Initial view from camera main viewing page, showing **delayed live video**.

View from camera main viewing page showing **Normal recorded video** being viewed over the air.

View from page showing optional, **Timelapse recorded video**, being viewed over the air, speeding up the reviewing of an hour's recorded video **120X** for when you are looking for activity. Click over to **Normal recorded video** for more details once you know when something occurred. Then switch back.



## More Efficient Paradigm for Determining Subject Activity

Boundless' **Stranger Detector™** locating system and optional **Rapid Review** provide a new, much more efficient paradigm for private investigators to monitor subjects and determine patterns of activity.

Boundless' **Stranger Detector™** locating system and optional, **Rapid Review / Integrated Timelapse** software run in Boundless' **Smart uPTZ Cameras** along with all the other camera functions. **Smart Cameras** can automatically create timelapse videos internally enabling long periods of time to be viewed very quickly, at **120X speed over the air** for "hour" files. The **Cylindrical Covert Smart uPTZ Camera** creates a 960x540 timelapse video of the previous hour at the beginning of each hour from one snapshot every 15 seconds. It can be viewed over the air in just 30 seconds. No cellular bandwidth, external equipment, software or effort is required to create the timelapse videos because they are automatically and continuously created within the **Smart uPTZ Camera**. It is a new kind of analytics.

Viewing of the timelapse video is integrated with Boundless' normal, high definition video recordings, and Boundless' **rapid access video file system**. To search for a subject and drill down for more details, timelapse video is viewed *over the air* at very high speed, paused, and the 960x540 and then the 1920x1080 normal recorded video quickly and easily viewed *over the air* starting at the time paused. Once you've seen the subject come and go, find his/her smartphone's WiFi MAC address in the **Stranger Detector™** at those times. Then use the **Stranger Detector™** data to pin point other times of arrival, departure and activity.

There is no need to: (a) watch live video to determine patterns of subject activity, (b) have a WiFi live video connection and investigator nearby to avoid large cellular expense, or (c) wait to retrieve video recordings from the field to review them to determine subject activity or verify camera function.

Determine subject activity using Boundless' recorded videos from a previous day or days as follows:

1. While Boundless' **Smart uPTZ Camera** is online in the field, a distant monitoring person remotely accesses the **Smart uPTZ Camera** via the Internet and views a subject's previous day's or days' activity. Video is reviewed at very high speed, and low bandwidth per hour of video, using Boundless' **Rapid Review / Integrated Timelapse** video *hour files*. An hour's video can be viewed over the air in 30 seconds, a 120X speedup, and with typically only 2 to 4 MB of data in daylight, much less at night.
2. When a possible subject is spotted, pause playback of the timelapse video, back up the playback time a few seconds, click over to that point in time in the normal recorded video, and view the normal recorded video. Correlate subject's presence in recorded video with WiFi MAC addresses in **Stranger Detector™** Smartphone WiFi Monitoring Locating System hour files to determine the WiFi MAC address of the subject's smartphone. See Appendix.
3. To most quickly confirm the presence of the subject, the lesser (960x540) resolution, view the lesser data rate, normal recorded video stream first. When you obtain the time of the best view of the subject, pause playback and click over to the 1920x1080 normal recorded video.
4. Switch back to the timelapse video at the time paused, resume playing, and repeat the above process for the entire time period desired.
5. A 48-hour period, with timelapse video created from snapshots every 15 seconds, can be viewed over the air in as little as 24 minutes, plus time to confirm activity.



### Appendix: *Stranger Detector*<sup>TM</sup> Probes for One WiFi MAC Address for 24 Hours Show User Activity, part 1 of 3

Easily see in detail when a particular smartphone, and by extension, person, is present and when s/he uses their phone. The table below contains actual data and was obtained, uncolored, using the **Sortable Table User Interface**. Probes occur every few minutes throughout the day, with their frequency showing phone and user activity. Many of these times, the phone sat idle on a table, but still sent probes and maintained its Internet connectivity via home WiFi. Alternate hours are bolded to show user activity.

I  
D  
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E

```

Apr 1 2017 00:03:14.100,1491019394.100,,78:f8:82:a9:aa:c7,-71,091612
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Apr 1 2017 00:45:05.175,1491021905.175,,78:f8:82:a9:aa:c7,-73,091612
Apr 1 2017 00:55:26.150,1491022526.150,,78:f8:82:a9:aa:c7,-69,091612
Apr 1 2017 00:56:03.080,1491022563.080,,78:f8:82:a9:aa:c7,-71,091612
Apr 1 2017 01:11:30.551,1491023490.551,,78:f8:82:a9:aa:c7,-73,091612
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Apr 1 2017 02:06:31.940,1491026791.940,,78:f8:82:a9:aa:c7,-73,091612
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Date and time, Linux epoch time,, WiFi MAC address, signal strength

```

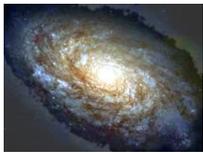
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Apr 1 2017 11:06:49.941,1491059209.941,,78:f8:82:a9:aa:c7,-61,091612
Apr 1 2017 11:07:09.789,1491059229.789,,78:f8:82:a9:aa:c7,-55,091612

```

A  
C  
T  
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V  
E

Legend: blue text for first block of times phone and user are present, red text for second block of times phone and user are present, alternate hours are bolded to show phone and user activity.



### Appendix: *Stranger Detector*<sup>TM</sup> Probes for One WiFi MAC Address for 24 Hours Show User Activity, part 2 of 3

User leaves after this probe, view recorded video over the air to confirm

A  
C  
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I  
V  
E

Apr 1 2017 11:09:12.100,1491059352.100,,78:f8:82:a9:aa:c7,-63,091612  
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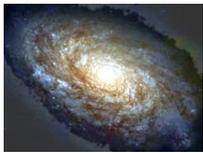
V  
E  
R  
Y  
A  
C  
T  
I  
V  
E

A  
C  
T  
I  
V  
E

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 Apr 1 2017 16:37:46.354,1491079066.354,,78:f8:82:a9:aa:c7,-51,091612  
 Apr 1 2017 16:37:56.551,1491079076.551,,78:f8:82:a9:aa:c7,-49,091612  
 Apr 1 2017 16:38:01.559,1491079081.559,,78:f8:82:a9:aa:c7,-49,091612  
 Apr 1 2017 16:38:04.885,1491079084.885,,78:f8:82:a9:aa:c7,-51,091612  
 Apr 1 2017 16:38:20.033,1491079100.033,,78:f8:82:a9:aa:c7,-49,091612  
 Apr 1 2017 16:38:25.676,1491079105.676,,78:f8:82:a9:aa:c7,-49,091612  
 Apr 1 2017 16:40:32.588,1491079232.588,,78:f8:82:a9:aa:c7,-71,091612  
 Apr 1 2017 16:42:45.834,1491079365.834,,78:f8:82:a9:aa:c7,-49,091612  
 Apr 1 2017 16:47:04.198,1491079624.198,,78:f8:82:a9:aa:c7,-69,091612  
 Apr 1 2017 16:48:18.190,1491079698.190,,78:f8:82:a9:aa:c7,-67,091612  
 Apr 1 2017 16:50:49.917,1491079849.917,,78:f8:82:a9:aa:c7,-71,091612  
 Apr 1 2017 16:50:54.437,1491079854.437,,78:f8:82:a9:aa:c7,-77,091612  
 Apr 1 2017 16:50:55.353,1491079855.353,,78:f8:82:a9:aa:c7,-77,091612  
 Apr 1 2017 16:51:16.220,1491079876.220,,78:f8:82:a9:aa:c7,-63,091612  
 Apr 1 2017 16:52:05.119,1491079925.119,,78:f8:82:a9:aa:c7,-73,091612  
 Apr 1 2017 16:52:16.768,1491079936.768,,78:f8:82:a9:aa:c7,-71,091612  
 Apr 1 2017 16:52:17.687,1491079937.687,,78:f8:82:a9:aa:c7,-81,091612  
 Apr 1 2017 16:52:38.581,1491079958.581,,78:f8:82:a9:aa:c7,-69,091612  
 Apr 1 2017 16:53:19.220,1491079999.220,,78:f8:82:a9:aa:c7,-75,091612  
 Apr 1 2017 16:54:33.606,1491080073.606,,78:f8:82:a9:aa:c7,-75,091612  
 Apr 1 2017 16:55:49.116,1491080149.116,,78:f8:82:a9:aa:c7,-71,091612  
 Apr 1 2017 16:56:02.558,1491080162.558,,78:f8:82:a9:aa:c7,-73,091612  
 Apr 1 2017 16:56:09.011,1491080169.011,,78:f8:82:a9:aa:c7,-73,091612  
 Apr 1 2017 16:56:29.886,1491080189.886,,78:f8:82:a9:aa:c7,-69,091612  
 Apr 1 2017 16:59:13.642,1491080353.642,,78:f8:82:a9:aa:c7,-79,091612  
 Apr 1 2017 17:02:24.492,1491080544.492,,78:f8:82:a9:aa:c7,-75,091612

User has returned, view recorded video over the air to confirm

Legend: blue text for first block of times phone and user are present, red text for second block of times phone and user are present, alternate hours are bolded to show phone and user activity.



## Appendix: *Stranger Detector*<sup>TM</sup> Probes for One WiFi MAC Address for 24 Hours Show User Activity, part 3 of 3

A  
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V  
E

A  
C  
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V  
E

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L  
E

**Apr 1 2017 18:39:07.809,1491086347.809,,78:f8:82:a9:aa:c7,-77,091612**  
**Apr 1 2017 18:40:11.050,1491086411.050,,78:f8:82:a9:aa:c7,-71,091612**  
**Apr 1 2017 18:41:48.091,1491086508.091,,78:f8:82:a9:aa:c7,-69,091612**  
**Apr 1 2017 18:43:38.879,1491086618.879,,78:f8:82:a9:aa:c7,-69,091612**  
**Apr 1 2017 18:44:38.115,1491086678.115,,78:f8:82:a9:aa:c7,-71,091612**  
**Apr 1 2017 18:45:04.530,1491086704.530,,78:f8:82:a9:aa:c7,-69,091612**  
**Apr 1 2017 18:45:43.062,1491086743.062,,78:f8:82:a9:aa:c7,-73,091612**  
**Apr 1 2017 18:49:58.465,1491086998.465,,78:f8:82:a9:aa:c7,-63,091612**  
**Apr 1 2017 18:50:12.494,1491087012.494,,78:f8:82:a9:aa:c7,-63,091612**  
**Apr 1 2017 18:50:33.381,1491087033.381,,78:f8:82:a9:aa:c7,-61,091612**  
**Apr 1 2017 18:53:30.200,1491087210.200,,78:f8:82:a9:aa:c7,-71,091612**  
**Apr 1 2017 18:53:49.688,1491087229.688,,78:f8:82:a9:aa:c7,-63,091612**  
**Apr 1 2017 18:53:51.326,1491087231.326,,78:f8:82:a9:aa:c7,-65,091612**  
**Apr 1 2017 18:54:17.058,1491087257.058,,78:f8:82:a9:aa:c7,-67,091612**  
**Apr 1 2017 18:54:36.582,1491087276.582,,78:f8:82:a9:aa:c7,-63,091612**  
**Apr 1 2017 18:54:41.088,1491087281.088,,78:f8:82:a9:aa:c7,-61,091612**  
**Apr 1 2017 18:54:57.092,1491087297.092,,78:f8:82:a9:aa:c7,-67,091612**  
**Apr 1 2017 18:55:01.947,1491087301.947,,78:f8:82:a9:aa:c7,-65,091612**  
**Apr 1 2017 18:56:57.104,1491087417.104,,78:f8:82:a9:aa:c7,-73,091612**  
**Apr 1 2017 18:59:07.232,1491087547.232,,78:f8:82:a9:aa:c7,-75,091612**  
 Apr 1 2017 19:01:09.260,1491087669.260,,78:f8:82:a9:aa:c7,-79,091612  
 Apr 1 2017 19:02:12.000,1491087732.000,,78:f8:82:a9:aa:c7,-71,091612  
 Apr 1 2017 19:03:13.107,1491087793.107,,78:f8:82:a9:aa:c7,-73,091612  
 Apr 1 2017 19:04:13.253,1491087853.253,,78:f8:82:a9:aa:c7,-71,091612  
 Apr 1 2017 19:05:13.335,1491087913.335,,78:f8:82:a9:aa:c7,-73,091612  
 Apr 1 2017 19:06:14.478,1491087974.478,,78:f8:82:a9:aa:c7,-75,091612  
 Apr 1 2017 19:07:14.552,1491088034.552,,78:f8:82:a9:aa:c7,-67,091612  
 Apr 1 2017 19:08:14.625,1491088094.625,,78:f8:82:a9:aa:c7,-69,091612  
 Apr 1 2017 19:10:15.252,1491088215.252,,78:f8:82:a9:aa:c7,-69,091612  
 Apr 1 2017 19:12:17.575,1491088337.575,,78:f8:82:a9:aa:c7,-71,091612  
 Apr 1 2017 19:13:05.208,1491088385.208,,78:f8:82:a9:aa:c7,-73,091612  
 Apr 1 2017 19:13:33.096,1491088413.096,,78:f8:82:a9:aa:c7,-69,091612  
 Apr 1 2017 19:15:39.007,1491088539.007,,78:f8:82:a9:aa:c7,-73,091612  
 Apr 1 2017 19:19:07.918,1491088747.918,,78:f8:82:a9:aa:c7,-73,091612  
 Apr 1 2017 19:30:00.902,1491089400.902,,78:f8:82:a9:aa:c7,-59,091612  
 Apr 1 2017 19:30:11.142,1491089411.142,,78:f8:82:a9:aa:c7,-57,091612  
 Apr 1 2017 19:30:32.008,1491089432.008,,78:f8:82:a9:aa:c7,-57,091612  
 Apr 1 2017 19:34:20.150,1491089660.150,,78:f8:82:a9:aa:c7,-65,091612  
 Apr 1 2017 19:40:41.720,1491090041.720,,78:f8:82:a9:aa:c7,-67,091612  
 Apr 1 2017 19:41:07.108,1491090067.108,,78:f8:82:a9:aa:c7,-67,091612  
 Apr 1 2017 19:56:28.748,1491090988.748,,78:f8:82:a9:aa:c7,-63,091612  
**Apr 1 2017 20:05:30.400,1491091530.400,,78:f8:82:a9:aa:c7,-67,091612**  
**Apr 1 2017 20:05:56.061,1491091556.061,,78:f8:82:a9:aa:c7,-65,091612**  
**Apr 1 2017 20:20:56.134,1491092456.134,,78:f8:82:a9:aa:c7,-65,091612**  
**Apr 1 2017 20:31:30.665,1491093090.665,,78:f8:82:a9:aa:c7,-65,091612**  
**Apr 1 2017 20:31:57.100,1491093117.100,,78:f8:82:a9:aa:c7,-65,091612**  
**Apr 1 2017 20:47:04.147,1491094024.147,,78:f8:82:a9:aa:c7,-65,091612**  
**Apr 1 2017 20:55:31.116,1491094531.116,,78:f8:82:a9:aa:c7,-63,091612**  
**Apr 1 2017 20:56:00.068,1491094560.068,,78:f8:82:a9:aa:c7,-63,091612**  
 Apr 1 2017 21:09:56.078,1491095396.078,,78:f8:82:a9:aa:c7,-65,091612

Legend: blue text for first block of times phone and user are present, red text for second block of times phone and user are present, alternate hours are bolded to show phone and user activity.