

# Colton and Associates, Inc.

A Private Fact Finding Organisation

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## How Secure Are Your Examinations Examination Security 101

March 25, 1997

Presented at N.C.M.E  
by Gregg D. Colton  
Examination Security &  
Loss Prevention Consultant

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## A few Words About Our Firm

*Colton and Associates, Inc.* is a firm which provides investigation, loss prevention and examination security consulting services to state and private organizations throughout the country. Gregg Colton is considered a leading authority on examination security. Mr. Colton has conducted literally hundreds of investigations relating to examination compromises and theft. He has spearheaded numerous undercover investigations into the methods and operations of various nationally networked preparatory or cram schools, who openly market stolen examination materials to candidates.

The information and recommendations contained herein are being provided as a thumbnail sketch for the purposes of creating awareness to some security concerns, or issues that occur in various facets of the production and administration of any professional Licensure, collage admission or certification examination. Special efforts have been made to keep the information provided herein brief and basic, and as such should not be considered or interpreted as a total or complete security program. If you are interested in having a review of your current security measures or if you are interested in formulating such a plan you are encouraged to contact us at your earliest convenience.

## Personnel Screening

Employee theft is far more prevalent and damaging than most realize. It is estimated that up to 30% of all employees have stolen while on the job, and the cost to industry is in excess of 60 billion annually.

The thefts of intellectual and proprietary property, as well as trade secrets, are increasing drastically every year with no end in sight. These thefts are not merely restricted to huge financial losses. The damage to a company's reputation also translates into other forms of loss.

Over the years, I have personally investigated 100's of employee and contractor related losses from embezzlement to industrial espionage. I have found that most of the losses had some of the commonalties cited below.

- The policies and procedures were weak, lackadaisical or nonexistent.
- The perpetrator had prior criminal convictions that were not disclosed.
- There was no segregation of duties in place or enforced.
- No checks and balances were in place or were not consistently used.
- Staff had not been properly supervised.
- The employee had been terminated previously under similar conditions.
- The employee identified a weakness that was easy to exploit.
- Employees believed that there would be little to no chance of the loss being discovered.

Losses are generally preventable, if a pro-active approach to loss prevention is taken. Such measures include but are not limited to; having a comprehensive background investigation conducted on current and new staff, contractors, proctors and temporary employees.

This investigation could include the areas below.

- Statewide Criminal History
- County Criminal History
- Driving History
- Credit History
- SSN validation
- US District Court
- US Bankruptcy Court
- Employment Verification
- Reference Verification
- Verification of information provided on the employment application
- An employee drug-free workplace program

In many instances the use of the above screening techniques will identify individuals who have prior felony convictions, a history of financial instability and more. The use of a comprehensive background screening process will also assist management in selecting the most suited candidate for any given position and helps to identify “transient” employees.

### **Case in Point**

A State Agency responsible for examinations and professional Licensure, hired an individual to proctor their examinations and failed to conduct a criminal history check. Approximately a year after this individual had been hired, and in response to some security concerns, criminal history checks were conducted on the State employees involved with the examinations. As a result of these checks numerous staff members were found to have prior convictions for various felony offenses.

The individual in particular was found to have the below criminal history.

- Possession of marijuana
- Battery on a Law Enforcement Officer
- Resisting arrest with violence
- Burglary to an automobile
- DUI
- Petty theft
- Dealing in stolen property

Upon discovery of this history, the State terminated this individual's employment. However, one could wonder if the examinations that this employee was charged with safeguarding are compromised?

## Personnel Training

Detailed written security policy and procedures must be established, implemented and consistently enforced. If followed systematically they will immediately set the stage and send a clear and unambiguous message to employees and contractors that you are serious about the security of your examination material and other assets. Written procedures will also provide staff and contractors with consistent direction and information as to what is expected and how things are to be done.

These procedures will also provide significant savings in the areas below.

- Reduced employer liability
- Operational cost control
- Reduced employee turnaround
- Reduction of loss through theft
- Increased employee activity
- Protection of public image

It is also recommended that a signed statement be obtained from all staff and contractors attesting to the fact that they have received and fully understand the provisions of the established procedures. Thereby circumventing such responses as:

“I did not know.”

“That’s not how I was trained.”

“I misunderstood.”

“I was confused.”

“We have always done it that way.”

Annual in-service training is a fundamental requirement of an overall program and will reinforce the seriousness of the procedures and provide staff and contractors an opportunity to obtain any clarification needed.

## Termination of Personnel

The involuntary termination of staff or a private contractor always presents a potential for loss. Quite often after an employee or contractor is terminated they are angry and will attempt to retaliate against the company if given the opportunity.

### Case in Point

In one month a National testing company involuntarily terminated three employees from their Test Development area. When the employees were escorted to their respective work areas, they attempted to remove computer files that contained examination items.

The computer disks were clearly marked as containing such items, and there was absolutely no question that the employees knew what it was they were taking.

*In addition to this, one of the employees attempted to gain access to the company's item banks located on the file server in an effort to delete crucial information.*



Because of attempts to remove or keep materials that are of a proprietary or a trade secret nature, the whole termination process must be controlled and the terminated individual's movements must be highly restricted. In keeping with this, here are some recommended guidelines.

- Escort all terminated employees when clearing out their personal work area.
- Do not permit the employees to have any access to their computer or the network.
- Inspect any and all personal effects that they wish to remove.
- Prior to advising the individual of their termination, make sure that they do not have any classified materials checked out that cannot be immediately recovered.
- Do not permit the individual to remove any computer disks or tapes.
- Do not permit them to return to any secure area after being terminated and escorted from the building for any reason.
- Change alarm and access codes.
- Recover keys and identification badges.

## **Examination Materials and Documents**

The creation, printing, distribution and tracking of examination-related materials must be inventoried and have a document trail that can be tracked at all times. Such tracking should commence at the inception of any examination material being created.

Some common pitfalls are:

- No accurate inventory.
- Examination tracking records are irreconcilable.
- Serial numbers on booklets are inadvertently duplicated.
- Examination materials are disposed of improperly.
- Examination materials are improperly packed and shipped.
- Use of an outside printer whose employees have not been subjected to background investigations.

**Did you know.....**

**Printing and document production is one of the leading vocations taught in America's prisons?**

## Examination Administration

Examination materials are subject to loss at any given point. However, there are special issues when the materials are exposed to unscrupulous candidates, or organized efforts to compromise the materials for financial gain.

Losses such as these are attempted for any examination given without exception. The only variable is the extent and sophistication used to facilitate the compromise.

I have conducted numerous investigations into organized and unorganized theft of examination-related materials. Some of the attempts to compromise examination materials and/or the examination processes are covered on the following page.

- Organized efforts by individuals who obtain examination materials through a variety of means, and in turn provide such materials to candidates for a fee under the auspices of an exam preparation school.
- Candidates who have sent other people to sit for the examination in their place.
- Candidates have attempted to bribe the examination administration staff to either change their grade or provide them with some of the examination items in advance.
- Candidates attempt and successful removal of an examination booklet and other materials from the administration site.

The theft of examination materials by an individual from an administration site can be facilitated through a wide variety of efforts. With today's technology, sophisticated electronic devices have helped facilitate these such efforts.

The theft of examination materials is no longer restricted to traditional methods such as taking a booklet, or copying down examination items. With the easy accessibility to micro-video equipment, audio recorders and still cameras, the traditional methods are essentially archaic.

On a daily basis electronic devices are becoming smaller, more powerful and more accessible to the general public.

Technology that had been previously reserved for the international spy is now available for rent to anyone who wishes to do so. Additionally, with the current lack of awareness it is highly unlikely that they would be discovered using such devices.

Current technology includes, but is not limited to:

- Micro-Video cameras exist that are not much bigger than a quarter in size. These cameras are quite often concealed within an eyeglass case, a necktie, a pager, a euro pouch, fanny pack, women's purse, a hat, a jacket, a wristwatch, etc. (These cameras can record in color or black and white. They can also be used with or without a microphone.)
- A video transmitter that is smaller than the size of a pack of cigarettes and will easily transmit a signal to a remote location nearby.
- A micro-video recorder the size of which will easily fit in a woman's purse,
- fanny pack, backpack or book bags.
- Still cameras that are concealed within a wristwatch, a cigarette lighter, necktie, etc.

Proctors should be trained in the various ways examination materials could be stolen or compromised and alerted to look for any unusual actions of candidates. Some of those actions may include:

- Candidates standing over an open booklet or examination material.
- Candidates holding an examination booklet upright.
- Candidates who appear to be talking or mumbling to themselves.
- Candidates who makes unusual visits to the restroom.

ADA candidates who use readers, or take the examination from an audio tape, present a special concern. The entire examination can be easily recorded and removed from the secure environment of the examination administration site.

Post administration procedures are just as important as those used in the preparation of the administration and should include, but are not limited to:

- **Verification** that all of the examination material was retrieved from each candidate prior to their being permitted to leave.
- Restrict access to the administration room, only permit **properly scheduled** candidates to enter.
- When a candidate is checked out, do not permit them to return to the administration room.
- Have two people verify the materials shipped just prior to the package being sealed with tamper resistant tape.
- Notify a person at the package's destination that the package is being shipped, as well as identification of the exact contents, method of shipment, tracking number and expected arrival.

## Cram Schools

No occupational or professional Licensure examination is exempt from compromise or theft because the nature of this type of crime ensures the cram school's financial gain.

However, the occupational areas of certification or Licensure examinations are particularly subject to theft and subsequent compromise.

Preparatory schools that are traditionally not licensed or regulated are for the most part corrupt. The school's sole existence is dedicated to the theft and resale of active examination items.

There have been numerous documented incidents of cram schools stealing examination material for almost every occupational or professional licensing exam and certification.

However, for the purpose of illustrating my point, I will primarily be referring to those cram schools that provide "classes" for Licensure and certification. Many of the references below are techniques used by cram schools.

Most cram schools guarantee that if you take their "class" you will pass the examination, or they will pay for any retake fees.

Owners and employees of cram schools routinely sit for and intentionally fail examinations. In addition, the owners and employees will sit for a review of the examination when permitted, after they intentionally failed. If a candidate can be assured of passing the examination by attending the schools classes, why can't the instructors seem to pass the examination themselves.

Candidates are aggressively solicited by the cram schools to steal examination items and smuggle them from the examination room and sell them to the cram school.

School owners and employees have been known to create a distraction, such as pulling the fire alarm during an administration for the purpose of facilitating the theft of examination items.

Cram schools often start their classes by asking if there is anyone in the room who is affiliated with the District Attorney's office, Law Enforcement or other State official.

Cram schools often do not use or even have instructors in the room during their classes. They simply provide questions and answers for students to study and memorize.

At cram schools students **are not permitted** to:

- Take any notes
- Remove any materials from the room
- Bring briefcases, jackets, purses or other such items into the "classroom."

Cram schools typically recruit current and former employees of a testing organization, who have knowledge of a targeted examination for which they are providing cram or coaching services.

There was a recent incident where we became aware that a cram school was providing candidates with a copy of an active Licensure examination. In response to this and at the last minute, we supplemented the compromised examination with a new form. As a result, all of the students of this school failed the examination. In response the owner of the cram school filed a formal complaint with the State protesting the switch, claiming that it was not fair to his students that we changed the examination!

Students are instructed how to conceal actual examination items within their reference books for use during the examination.

Candidates are shown how to use movable tabs or clips to mark specific points of reference that correlate to items contained within the examination.

## **Industrial Espionage**

Industrial espionage has increased as the poor economy and corporate layoffs have created a greater number of disgruntled workers, and cram schools are using this to their advantage. "An unhappy disgruntled or greedy employee...plays an important role in king

getting information out of a company. You cannot get that much information out of a company without having some inside help. Employees may attempt to hurt their employers before being laid off or to enhance their future employment prospects by misappropriating proprietary information." In fact, a survey recently conducted indicates that approximately 58% of the industrial espionage cases involve current or former employees.

Approximately 49% of the companies surveyed reported industrial espionage incidents. As previously cited, the FBI claims the theft of corporate secrets, such as intellectual or proprietary property, costs U.S. businesses \$60 billion dollars annually.

Sales of paper shredders have increased over 600 percent over the past seven years.

The best way to prevent the theft and compromise of examination material is summed up below.

- Screen any and all employees who have access to the examination material.
- Develop and implement standard test administration policies, coupled with comprehensive security procedures.
- Thoroughly investigate any losses or incidents of compromise.
- Restrict access to the examination materials to only those individuals who have a need.
- Be fully aware of the cram schools in your area, and who is working for them.
- Create a heightened awareness of the threat with staff and management, as always education is the first step.

## **Mandatory Reporting**

The preservation of assets should be the concern of any company or state agency. The mandatory reporting of any and all suspected or actual loss is a crucial component of any systematic security program. A policy that mandates such reporting should be established and should essentially contain the following verbiage:

*“Anyone who knows, or has reason to suspect that examination materials have been lost, stolen, or compromised will report such knowledge to the appropriate authority. Failure to make such report could result in immediate termination.”*

## **Mandatory Investigation**

Every loss regardless of the potential exposure or amount should be thoroughly investigated and documented. Such investigation would include:

- An interview with all parties involved or at the site of the loss.
- Examination of all available documentation (e.g., shipping records, administration records, printing records, etc.).
- Review of the background investigation files of those individuals involved.
- Review of policy compliance.

## Incident Tracking and Trend Identification

All incidents should be tracked and documented in an organized incident tracking program. At a minimum, this program should track the areas listed below.

- Location of loss
- Specific loss
- Individuals involved
- Date of loss
- Facts and circumstances surrounding the loss
- Law enforcement involvement
- Disposition

This and other information will assist in the tracking, identification of trends, and commonalties of losses. This information is crucial to identify those individuals and circumstances that are repetitive in nature and thereby provide insight into future losses.

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## High-Tech Approaches to Breaching Examination Security Espionage 101

March 25, 1997

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Examination Security &  
Loss Prevention Consultant

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The information and recommendations contained herein are being provided as a thumbnail sketch for the purposes of creating awareness to some security concerns, or issues that occur in various facets of the production and administration of any professional licensure, collage admission or certification examination. Special efforts have been made to keep the information provided herein brief and basic, and as such should not be considered or interpreted as being a total or complete security program. If you are interested in having a review of your current security measures conducted or if you are interested in formulating such a plan you are encouraged to contact us at your earliest convenience.

## **High-Tech Approaches to Breaching Examination Security**

### **An Introduction To Espionage**

When you took your first examination in grade school, at least one student sitting in the classroom with you was trying to determine a means of cheating on that examination. It was and is, common practice for one student to ask a friend who has taken the exam earlier in the day, about the questions contained on the test or to look at the paper of the student at the next desk.

As time progressed the necessity of passing examinations grew to include admittance into college, licensure in a chosen profession, occupation, or certification. In response to this increased challenge, the efforts to gain prior knowledge of the exam contents has advanced, respective to the gain of passing the exam.

As the stakes grew to passing examinations, so did the attempts to steal or compromise them. In keeping with the theory of supply and demand, organized efforts to steal exams surfaced, and provided for a black market source. It did not take long for unscrupulous individuals to realize that candidates would be more than willing to pay for advanced knowledge of the examination for which they were about to take.

The only question is:

*How would, or does one obtain advanced knowledge of the exam questions without being discovered?*

This is a question which was easily answered by the natural developments of technology, coupled with the long-standing techniques used in industrial espionage.

Technology provides the general public with the ability to steal the contents of multiple examinations in an extremely short period of time and with minimal cost. Enabling the miscreant entrepreneur to supply their customers with the information instantly, with little to no chance of being caught.

## The Threat

Examination materials are subject to loss at any given point. However, there are special issues when materials are exposed to unscrupulous candidates, or organized efforts to compromise examinations for financial gain. No examination is safe from compromise, the only variable is the extent and sophistication used to facilitate the compromise or theft.

Throughout the years, I have conducted numerous investigations into organized and unorganized theft of examination related materials. Some of the attempts to compromise examination materials and/or the examination process are as follows:

- Organized efforts by individuals who obtain examination materials through a variety of means, and in turn provide such materials to candidates for a fee under the auspices of examination preparation.
- Candidates have sent other people to sit for the examination in their place.
- Candidates have attempted to bribe the examination administration staff to either change their grade or provide them with some of the examination items in advance.
- Candidates attempt and successfully remove an examination booklet and other materials from an administration.
- Candidates have been caught with body worn tape-recording devices and have attempted to record the contents of the examination.
- Candidates have been caught attempting to photograph the pages of an examination.

The theft of examination materials by an individual from an administration site can be achieved through a wide variety of efforts. With today's technology, sophisticated electronic devices have helped facilitate these efforts.

The theft of examination materials is no longer restricted to traditional methods such as taking a booklet, or copying down examination items. With the easy accessibility to micro-video equipment, audio recorders and still cameras, the traditional methods are essentially archaic. On a daily basis electronic devices are becoming smaller, more powerful and more accessible to the general public.

**This technology which had been previously reserved for the international spy is now available for rent to anyone who wishes to do so.**

Additionally with the current lack of awareness it is highly unlikely that anyone using this technology would be discovered using them.

Current technology includes, but is not limited to:

- Micro-Video cameras that are not much bigger than a quarter in size. Cameras which are quite commonly concealed within a necktie, eyeglass case, baseball cap, pager, euro pouch or just about anything!
- A video transmitter that is smaller than the size of a pack of cigarettes and will easily transmit to a remote location up to 20 miles away.
- A micro video recorder ½ the size of a pack of cigarettes and which can be easily concealed in a purse or on your person.
- An Electromagnetic Spectrum Recorder, which is a device that will record whatever data is displayed on the screen of a computer, or the data as it is accessed from the hard drive of a computer. Again this device is smaller than a pack of cigarettes and is extremely effective.
- Still cameras are concealed within a wristwatch, cigarette lighter, necktie, etc.

Due to the nature of the espionage business, the full extent of this type of activity is unknown. However, last year there were in excess of 2,000 news stories involving failed attempts of industrial espionage, bugging and wiretaps, all of which were illegal.

The growth of the spy industry within the United States has drastically increased over the past five years. This growth is clearly evidenced by increased number of spy shops opening everywhere. There is not a major city in the U.S. which does not have a spy shop.

With the arrival of relatively inexpensive and easy to use micro miniature cameras, wire tapping devices, bugs and micro recorders, came the open availability of these devices to the general public. In a mere 15 minutes a novice can be shown how to use and wear a concealed body video camera and use it for whatever purpose they see fit. With the availability of this high-tech low cost equipment, one can easily see how these devices could be used to target and get any information desired!

An article in the **Washington Post** indicated that consumer surveillance or spy gear alone is now a \$600 million dollar industry.

**The Associated Press** reports that an official of *“General Electric Company of Fairfield, Conn. has said that a rash of industrial spying cases, at its primary plants cost them millions of dollars in recent years and was a factor in the layoff of thousands of employees.”*

**Newsweek** - *“Eighty per cent of the Fortune 1000 companies now maintain in house snoops, according to the Society of Competitive Intelligence Professional.”*

**Detroit Free Press** - *“Gerber will end tours of its baby food plant Gerber Products Company, citing concerns about industrial espionage and public safety, announced that it will discontinue public tours of its Fremont baby food plant after almost 80 years.”*

**Upjohn Company of Kalamazoo** canceled its tours last year. Other companies have either cut back or eliminated tours, citing security and safety reasons.

**Time Magazine** - *“According to the F.B.I., several foreign governments are employing their spy networks to purloin business secrets and give them to private industry.”*

Maybe you have seen some of the covert surveillance devices contained within this presentation, then again maybe you haven't!!!

## Available Technology

### Still Cameras

#### *Wrist Watch Camera*

The wrist watch camera is the smallest still camera in the world. Developed in Germany, this ingenious digital watch conceals an actual working camera. Take photographs undetected! A developer kit which includes everything needed to develop your own negatives, is commonly included within the purchase price. The camera uses 7-exposure cartridges utilizing black and white 35mm film. This fully functional watch features alarm, chronograph and a timer and sells for less than \$300.00. More than 58,000 people in the United States have put this example of German high-technology to work for them, within the past two years.

#### *Cigarette Lighter Camera*

The cigarette lighter camera is the smallest camera in the world which uses a standard film, available in 12 or 24 exposures. This stylish camera is a fully functional cigarette lighter as well! This covert camera measures 4 3/8 x 1 1/16 x 3/4 and weighs 62 grams and sells for less than \$400.00.

A still camera capable of photographing the contents of any document or examination can be easily concealed within almost any object imaginable.

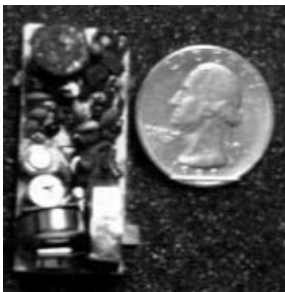
### Audio Recorders and Transmitters

#### *Micro-Mini Recorder*

This is the worlds 2<sup>nd</sup> smallest high quality recorder. This recorder is small enough to be covered by a normal business card or fit inside a pack of cigarettes. This tiny little recorder has more features than most full size units. It features a built-in super sensitive microphone and a tiny tie clip microphone extension. The 2-speed operation allows a person to record for three hours. This little recorder is the hottest unit on the market, sales within the United States are reported at 4500 annually.

#### *Pearlcorder L-400 Micro Mini Recorder*

This is the worlds smallest high quality recorder. This unit offers an auto reverse mode, and dual tape speeds for up to 3 hours of continuous recording, variable voice activation control, auto shut-off and a highly sensitive built-in microphone.



## Transmitters

Audio transmitters have technologically advanced to the point where they are just larger than a dime and can literally be concealed anywhere. Below are just some of the examples of the covert audio transmitter devices that are available to the public.

- Audio transmitter just larger than a dime
- Transmitter concealed within a pen
- Audio transmitter
- Audio transmitter just larger than a quarter
- Microphone in the heel of a shoe
- Microphone powered by and concealed within a wall plug



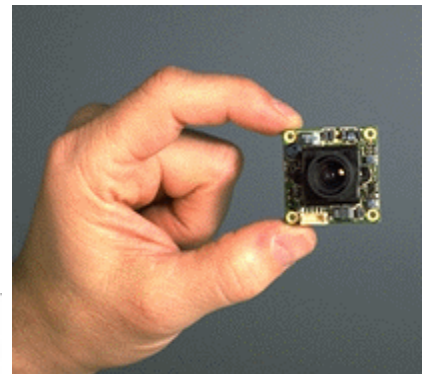
## Video Cameras, Recorders and Transmitters

### *Covert Video Cameras*

With the development of micro electronics came the ability to produce a high resolution video camera which is not much larger than a quarter. As a result, this camera is easily concealed in a number of objects, all of which would not cause any suspicion. This pinhole board camera is the worlds finest and smallest and sells for about \$150.00

These board cameras are commonly concealed within:

- Eyeglass case that easily fits in a pocket
- Pager - standard belt, pocket or purse-worn pager provides hands-free video
- Hat Cam -standard baseball cap
- Tie Cam - camera system concealed within a tie
- Jacket Cam - a video camera which has been sewn into the fabric of a vest or jacket



### ***Covert Wireless Video Link***

This professional grade wireless video transmitter provides unparalleled image quality, full color capability. It is the smallest crystal-controlled color/B&W video transmitter currently available and no special receiver is required; any cable-ready TV or VCR can receive its signal and recorder at another location. The wireless Video Link is currently selling for \$199.99.

There are a wide variety of covert video transmitters on the open market and that are capable of transmitting a clear signal up to 20 miles away.



## **Electromagnetic Spectrum Interception**

We all remember our mothers telling us not to sit so close to the TV! This was because of Electromagnetic radiation which was believed to be harmful. Throughout the years the government has regulated Televisions and have reduced the amount of electromagnetic radiation emitted from not only Televisions, but other electronic devices such as computers and computer monitors.

In 1985 a group of Swedish Engineers, led by William Van Eck, presented a paper called "Electromagnetic Radiation from video display units: An Eavesdropping Risk?" The paper described how one could easily and inexpensively convert a normal television set into a non-trespassing, passive device to intercept and reconstruct the information from any digital device, most notably computers.

An offshoot of the electromagnetic field is security. These same emissions carry with them the necessary information which, when decoded with the right, and relatively inexpensive equipment, can be used to recreate an exact replica of what is displayed on a monitor. Under the right circumstances, it is possible to do so over a distance of several hundred yards.

If you have the knowledge you can build a unit to intercept and decode the electromagnetic signals of another device such as a computer or monitor for \$50.00 or \$60.00. Models are also available commercially through local spy shops for about \$150.00.

These devices are highly effective and created an unparalleled risk to any and all secure digital data. A risk which has been clearly exploited by unscrupulous individuals.

This is a threat that is real, present and could potentially compromise any information contained on a computer or viewed on a video screen.

## Miscellaneous

### *Ultraviolet Pen*

This felt-tipped pen provides the user with an inexpensive and convenient ultraviolet writing instrument. The pen is ideal for taking covert notes! The markings remain invisible until examined under an ultraviolet light source. Sales of this instrument in the United States exceed 19,000 per year and costs \$9.00 each.

### *Pagers*

In this day and time it would be unusual for someone not to have a pager clipped to their belt, pocket, book-bag or purse. It is believed that drug dealers were among the first to create coded messages to be used by their customers, that way if or when the dealer was arrested, the police would be unable to obtain any information from the dealer's pager.

With the development of alpha numeric pagers the ability to send coded messages has greatly increased.

Over the past two years numerous candidates at the test site have been found in possession of pagers which have contained the key to the examination for which they were sitting. The key was predominately represented in the below two forms, they being:

1. 1A 2C 3A 4D 5A 6A 7C 8B 9B 10D...etc
2. 11 23 31 44 51 61 73 82 92 104...etc

In the first example the coding is quite obvious, the number represents the position number and the letter represents the correct or desired response. In the second example, again the number represents the position number and the last digit represents the letter of the correct or desired response converted to its corresponding letter, specifically 1=A, 2=B, 3=C & 4=D.

## Equipment Availability

All of the equipment which I have referenced within this document is readily available to anyone, without question from your local spy shop, the Internet or by mail order catalogs, such as **Time Magazine**, **Electronics Now**, **Popular Electronics** and a host of other main stream magazines and publications.

## Countermeasures

### General

There are generally two categories of countermeasures available, they being observation and electronic countermeasures. Proctors and staff trained in effective observation skills, and controlling the exposure are the most economical and easiest to implement.

The second being the use of electronic countermeasures which includes the use of a spectrum analyzer, which will pinpoint the source of any audio or video transmission or recorders present within a targeted area. Other electronic countermeasures include, nullifiers or noise generators which scramble the signal of a device either transmitting or recording. The down side of electronic countermeasures is the cost of the equipment and the level of expertise required to ensure the proper operation of the equipment.

- Hand held recorder detector
- Hand held transmitter detector
- Spectrum analyzer
- Metal Detectors
- The Super Scanner

Hand-held metal detectors have become the most popular weapons detector in the world! These detectors are also extremely useful for detecting body worn covert surveillance devices, such as video cameras & transmitters, tape recorders etc. These hand-held detectors commonly sell for \$180.00 and is an effective countermeasure.

### Transmission and Recorder Nullifiers

A transmission and recorder nullifier is a device which produces and emits a nullifying “noise” which will block the transmission of another device which is, or may be transmitting information from a targeted area.

There are a wide variety of effective devices readily available from the local spy shop, on the Internet and through the mail.

## Observation Techniques

The following are clear indications that your examination has been compromised and are warning signs that espionage has possibly occurred or is occurring at the site.

- Look for candidates who finish their examination in an unreasonably short period time.
- Candidates who are completing their answer sheet without opening the booklet, or seldom turning a page.
- A Candidate making multiple trips to the restroom.
- A candidate appears to be more attentive to what the administration staff are doing, rather than taking his examination.
- A candidate appears to be unreasonably nervous.
- Watch for candidates who hold their examination booklet upright, apposed to leaving it on the table like everyone else.
- Candidates who are continuously passing their wrist over the pages of the examination booklet, while having the face of their watch pointing downward toward the booklet. This is an example of a person who may be using a watch camera.
- Watch out for the candidate who stands over their examination booklet. If a candidate has not completed their examination and needs to leave their seat to use the restroom or get a drink of water, a Proctor should close the Candidate's examination booklet prior to the Candidate being permitted to stand up.
- Note any electrical interference during the announcement of candidate instructions, if a public address system is used. A variety of less sophisticated video and audio transmission devices will commonly cause problems with the use of this equipment.
- Pagers and cellular telephones should not be permitted within the examination room. Candidates should be instructed to leave such devices at home, the office or in their car, or placed on the proctors table and returned only as the candidate completes his examination and leaves the room. Turning off the device is not sufficient!

## Conclusion

The technology for cheating on examinations is not limited to talking to someone who sat for the same examination earlier, or looking at another candidates answer sheet as it was when you were in grade school. Today high-tech approaches of industrial espionage represent low-cost, low-risk means of stealing examination materials. Accordingly, high-tech approaches to detecting security breeches are now a necessary element of the testing business.

We have long looked to computer-based testing as a means of ensuring examination security. However, recent news articles concerning breeches of computer-based examination item banks and the availability of inexpensive spectrum interception equipment capable of reading and storing the image on a computer screen, makes this medium of testing at least as vulnerable as paper and pencil testing.

Significant sums of money are invested in the development of examinations, particularly those used to support high-stakes decisions such as college admissions, licensure and certification. The high level of these costs makes the possibility of examination espionage a real threat to the viability of such programs. These risks, combined with the financial motivation of cram-schools that guarantee that their students will pass, make it clear that countermeasures be considered.