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Residential Break and Enter Expert System

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TECHNICAL REPORT
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NOTE: Further information
about this report can be
obtained by calling the
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Executive Summary

The *Ottawa Police Residential Break & Enter Expert System* is a collaborative project with the Ottawa Police, the Canadian Police Research Centre and the Institute for Information Technology at the National Research Council of Canada.

Residential break and enters are the focus of the expert system because of the volume and the low rate of solvency. The Expert system encodes rules of reasoning defined by police investigators for a given situation.

To create an information data base a work sheet was developed. This computerized worksheet is made up of 232 break and enter characteristics and 176 suspect characteristics. The NRC team is responsible for the expert system development.

Today the Ottawa police platoon officers have been trained to gather the information for the expert system.

The possibility of integrating a "Geographical Information System" into the expert system would allow the analyst to use "proximity analysis" finding the actual distance of the incidents. The G.I.S. would also pin point the location of every break and enter.

It is expected that the Ottawa Police expert system will become an extremely useful and valuable tool in their effort to provide the highest quality of service to the community they serve.

Résumé

Le *Système expert sur les vols par effraction dans les résidences* de la police d'Ottawa est un projet réalisé en collaboration par la police d'Ottawa, le Centre canadien de recherches policières et l'Institut de la technologie de l'information du Conseil national de recherches du Canada.

Le système expert a été créé pour aider à élucider les nombreux cas de vols par effraction commis dans les résidences, dont les auteurs sont rarement identifiés. Le système encode des règles de raisonnement définies par les policiers chargés de l'enquête dans une situation donnée.

On a élaboré une fiche de travail pour créer une base de données. Cette fiche informatisée inclut 232 caractéristiques de vols par effraction et 176 caractéristiques de suspects. L'équipe du CNRC est chargée de l'élaboration du système expert.

Les policiers d'Ottawa ont maintenant reçu la formation nécessaire pour entrer les données dans le système.

L'éventuelle intégration d'un système d'information géographique au système expert permettrait à l'analyste d'avoir recours à une «analyse de proximité» pour découvrir la distance réelle entre les lieux où se produisent les vols. Le SIG indiquerait le lieu où chaque vol est commis.

On pense que le système expert de la police d'Ottawa va devenir un outil très utile et très précieux qui va l'aider à fournir un service de qualité supérieure à la communauté dans laquelle il oeuvre.

RESIDENTIAL BREAK AND ENTER EXPERT SYSTEM

PROGRESS REPORT

APRIL 1993

BREAK & ENTER EXPERT SYSTEM

PROGRESS REPORT

APRIL 1993

The following is a progress report on the Residential Break & Enter Expert System that is currently being developed by the Ottawa Police, the National Research Council and the Canadian Police Research Centre.

1992 In Review

Arrangements were made in December of 1991 to have the "Expert Team," which consists of past and present members of the Break & Enter squad as well as members of the Identification and Crime Analysis sections, meet on January 17th, 1992.

At this brainstorming session the members went over a residential break-in form being used by Tucson Police Force (part of the U.S. experiment in Expert Systems). The result of this brainstorming meeting was approximately two hundred and sixty characteristics that might describe a break and enter, such as "glass cut," "searched concealed compartment" and "victim at home at time of incident."

These break-in characteristics were divided into four groups with each characteristic being amended into the form of an "if-then" statement. On March 20th, 1992 each team member was given a book with one of the groups of questions. They were then asked to complete the book by reviewing a given if/then statement and then writing down what, if anything, this statement told them about the suspect. This process, being very abstract, was quite difficult but the response was excellent.

The books, once completed, were then reviewed and compiled onto a computerized worksheet. This resulted in approximately 2,000 if/then statements in 232 break & enter characteristics and 176 Suspect Characteristics.

These statements including their "weights" or confidence factors were then divided into four groups. On June 22nd, 1992 the Expert Team met again at the N.R.C. for an entire day (some groups did not finish that day and met again later to complete the task) to review the findings. They were asked to come to a consensus on each statement including assigning a weight to each statement.

This resulted in two things. First, the basis for the new break and enter form; second, the basis for the rules that will run the system.

The new break & enter form was completed in July and testing began with twenty officers from platoon (four per platoon) in August. The officers were provided with in depth training, lasting between 2-3 hours, on the new form and the system it will be used in. The officers involved expressed positive feedback at that time regarding both the form and the reasons for requiring it.

The N.R.C. completed an interface to be used for data entry. This interface was installed on an I.B.M. compatible 486/33. Data entry has begun and this has resulted in a number of changes to both the data entry interface and in certain rules.

On Friday November 6th, 1992 eight of the twenty officers who used the form met with J. Brahan, R. Shevel of the N.R.C. along with Sgt. Valcour and Cst. Patterson. This meeting was extremely positive with the officers providing suggestions for correcting and adding data to the form. They also made a number of helpful recommendations to assist in both the implementation of the project and in training the platoon members.

The unanimous nature of the acceptance of the new form, not only by these officers but also by fellow officers they showed it to was a pleasant surprise. A number of officers also stated that they had learned a number of new things about the investigation of break & enters by taking the new report. For example one officer indicated that he was not aware of the fact that some suspects who pick locks plug the cylinders so that the victim cannot walk in on them.

Some of the officers also stated that during the training they learned a great deal about what was important to investigators. The reverse was also true, with the patrol officers having an opportunity to express their observations and concerns to an investigator.

Even more meaningful was the response by members of the public. The officers indicated that the victims were very positive about the form. The perception was that the police were asking more questions about the crime in an attempt to catch the suspect and the public was more than willing to assist by providing whatever data was required.

Final approval was then received to commence platoon wide training on the revised form. Most of the training was completed at 05:00 hours so that the training could be completed quickly and with little interruption to the platoons. The officers were trained in groups of five to ten officers so that individual attention could be spent on all officers.

The sessions lasted approximately 1 1/2 to 2 hours each and entailed a detailed briefing on what expert systems are, types of expert systems currently in use, reasons for the Ottawa Police developing a system, future potential applications and finally training on the data gathering form.

This in depth training was very well received by the officers. The common sentiment was that by taking the time to explain how and why they were being asked to complete a new form they took some ownership in the project. Their only request was that they be kept informed of the project's development.

At this time almost all of the platoon officers have been trained with the few remaining to be completed as time permits.

With the patrol officers completing the data gathering forms, the data entry has been commenced. This pointed out some flaws in the internal paper flow process of the Ottawa police. With minor alterations this problem has been rectified and the process is now flowing smoothly.

A number of data collection errors were also observed as the reports began to flow in. Many of these were written off as being the result of training officers at 5:30 A.M. when they are very tired. To rectify these problems and to brief the officers on recent developments Sgt. Valcour attended the last series of training days.

In half hour long lectures the officers were advised of the need for data integrity and the most common errors were pointed out to them. They were also updated on the new developments in the project. By keeping the officers informed it is believed that they will continue to take ownership of the new system and will attempt to complete the forms as effectively as possible.

NEW DEVELOPMENTS

One extremely interesting new development has been the realization of the fact that this project could greatly be enhanced by the utilization of "Geographical Information Systems." A number of meetings have now been held with personnel from the G.I.S. Applications Group at Energy Mines and Resources with a view to obtaining their assistance in this project.

The reason G.I.S. is such an exciting development is its ability to enhance our system. For example, when investigators look at a number of break and enters they normally key on the fact that break and enters that are physically close in distance to one and another are often done by the same people. By using "proximity analysis" a G.I.S. system, running underneath the expert system, can quickly tell the true distance from one incident to another.

The fact that a river is between the two incidents is not a major hurdle as the G.I.S. system uses "routing" to determine the true distance. So one break-in that is four hundred yards "as the crow flies" to another may in fact be miles away by vehicle.

A second use for G.I.S. is its ability to place "buffers" around geographical areas such as schools, shopping centres, bike paths, parks etc.. This allows the expert system to have rules fire such as "is there a school near here..." The G.I.S. answers the question for the expert system and the system then continues firing rules depending on the answer it receives.

Of course the G.I.S. will allow for mapping the break and enters and various cosmetic tools such as labeling and colouring the maps.

Another development may be the use of pen based computing for the data gathering. While in Rochester recently the project team was given a demonstration of this new type of computing. It appears that this type of data entry tool would be very user friendly for the officers taking reports. As well the data form can be made "smart." This means that when officers fill in reports they can not close the file until all the required data has been gathered.

Finally, Sgt. Valcour has met with members of the Royal Canadian Mounted Police Security Engineering Unit. These officers have a great deal of expertise in safe cracking and lock picking. It is hoped that they will provide the information required to create a data gathering form to be used at the scene of break and enters where safes were attacked. The officers will also provide the information required to write rules for these specific types of incidents.

CONCLUSION

At this time the Ottawa Police are waiting for the N.R.C. to complete the development of the prototype and are anxiously waiting for the "Alpha" test stage to begin. It is hoped that this will take place in the near future. At the same time we will commence work on methods to capture suspect data including physical characteristics and sightings (suspect cards).

With time, and a great deal of effort, it is believed that the Ottawa Police expert system will become an extremely useful and valuable tool in our effort to provide the highest quality of service to the community we serve.

RESIDENTIAL BREAK AND ENTER EXPERT SYSTEM

PROGRESS REPORT

JULY 1992

OVERVIEW

For some time now the Ottawa Police have been working with the Canadian Police Research Centre and the Institute for Information Technology of the National Research Council on a new computer system known as a knowledge based, or *Expert System*.

Expert Systems have evolved over the years from the ongoing research into artificial intelligence. Essentially, expert systems use a new way of programing that makes it possible to encode basic rules of reasoning for a given situation. An example of rules for a break & enter system might be:

IF: the glass is smashed, *THEN*: the suspect is unsophisticated
IF: the glass is cut, *THEN*: the suspect is sophisticated.

An Expert System is designed to automatically use these rules in attempting to solve a given problem, in our case, a break & enter. The system accomplishes this by generating a profile of the person responsible for a given break-in. It then looks for similar profiles or 'behavioural fingerprints' from its suspect data base and attempts to match them. The system will then generate a suspect profile and list his/her characteristics. From there a list of any suspects who match those characteristics is displayed, with each match being rated in a percentage.

Logically, it takes time to build a large enough data base, both of break and enters and of suspect profiles, for the expert system to begin to provide useful information to analysts and/or investigators.

Crime Analysis

As well as matching suspect characteristics with those of known offenders, the system will provide the means to analyse residential break and enters in much finer detail. This portion of the system will be of immediate assistance to its users. The user will be able to analyse residential break and enters however they see fit.

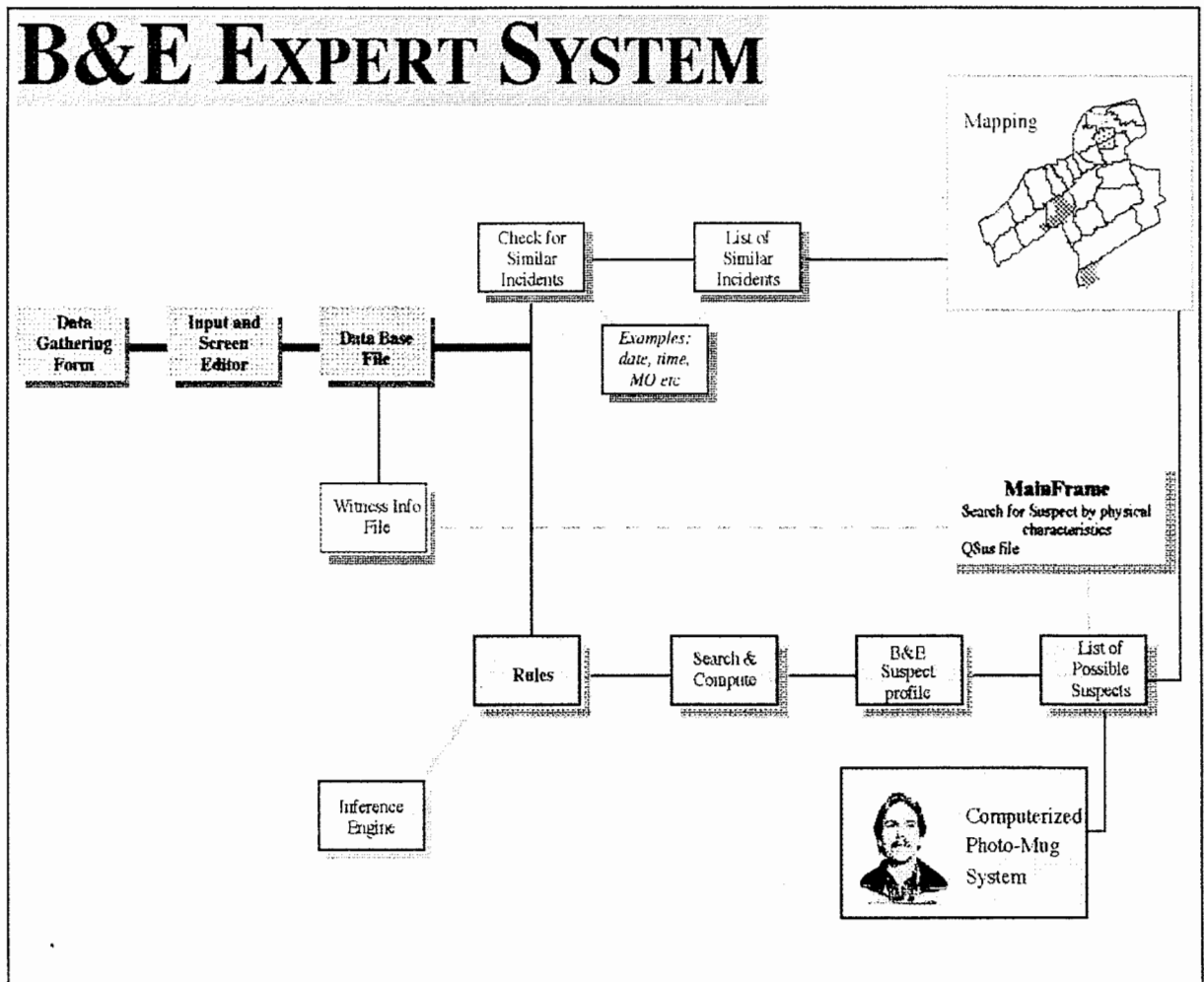
As an example of this crime analysis, the user would be able to ask for all break & enters where lock-picks were used. Another user may want to see all break-ins from the south end where the suspect defecated at the scene. The system will be designed to allow on line queries with simple commands, providing crime analysts, investigators and uniformed officers easy access to this extremely helpful tool.

It is also hoped that the Ottawa Police Expert System will utilize a software package presently available to plot the results of any search on a colour map of the city. This user friendly program is able to manipulate the data on the mapping system in any way the user sees fit.

Once the Identification Section purchases their Computerized Photo-Mug System it is expected that the expert system will interface with it allowing for the immediate display of a colour photograph of any suspect the system, or the user, wishes to view.

Another future expectation is that the expert system would interface with the CADRE system so that it can search for a suspect who matches any *physical* characteristics that a witness might provide. This will mean updating the CADRE system's suspect data base but with time this should not be a problem.

To visualize the entire system please refer to this flow chart...



METHODOLOGY

It was decided early in the project to use residential break & enters as the focus of the Expert System. This was based on a number of factors: volume of cases, low rate of solvency and recidivism of suspects. The decision was also based on the fact that there were a number of police agencies in the United States who are also involved in similar projects, also focused on residential break and enters.

In January of this year the project team, whose names are listed below, was formed and brought together for a brainstorming session. The members went over a residential break-in form being used by Tucson Police Force. The members confirmed that many of the characteristics that describe a break-in were the same in Ottawa as in Tucson. The team decided however, that there were numerous characteristics from the Tucson form that were not relevant in Ottawa and that many more needed to be added to any form to be used in Ottawa for various reasons.

EXPERT TEAM

S/SGT. RAYMOND ROY
 S/SGT. HURB DURAND
 S/SGT. TERRY LYNCH
 S/SGT. FRANK BOWES
 SGT. BARRY DAWSON
 SGT. TONY SEGLIN
 SGT. DENNIS SMITH
 SGT. DOUG MUNRO
 SGT. TOM CALLAGHAN
 SGT. BOB MEEK
 SGT. MAYNARD PROULX

SGT. DOUG WHITE
 SGT. ED FLYNN
 SGT. KEN DUMONT
 SGT. GERRY SCHARFE
 SGT. DOUG YOUNG
 SGT. RICK WILHELM
 SGT. RON BIRD
 SGT. DAVE LENGACHER
 DET. JOHN RADMORE
 DET. BRIAN MCMAHON
 DET. TERRY WELSH

DET. BRUCE MUNRO
 DET. RALPH HEYERHOFF
 CST. REG MACDONALD
 CST. MIKE CAYER
 CST. STU DONALDSON
 CST. ALISTER MCLEAN
 CST. GORD TANDRUP
 CIV. MAUREEN BURKE
 CIV. MARIANNE PETHKE

This brainstorming meeting resulted in the listing of approximately two hundred and sixty characteristics that might describe a break and enter, such as "Glass Cut". These break and enter characteristics were then divided into four groups with each characteristic being amended into the form of an "IF-THEN" statement. For example: **IF** Glass cut on entry..... **THEN:** the suspect is...

Each team member was then given a book with one of the groups of questions and asked to complete the questions.

The books, once completed, were then reviewed and compiled onto a computerized worksheet. It was agreed that any break-in characteristic that could not make a statement about a suspect would not be placed on the data gathering form (with the exception of Statistics Canada requirements and elements which may assist in Crime Analysis).

The final result was that approximately 2,000 statements (IF/THEN) were made by the team members in 232 *Break & Enter* characteristics : (IF **glass cut on entry** THEN.....).

This generated 176 *Suspect* characteristics: (IF vandalism extensive THEN **the suspect is sophisticated**). A portion of the actual worksheet is reproduced below. If the entire worksheet was printed on paper it would measure sixteen feet by nine feet. The break & enter characteristics are listed on the left column and the suspect characteristics are listed on the top row.

	uses body force	brought tools	uses tools	wants quiet entry	experienced	has knowledge of victim or residence	break-in did not occur	total count	total sum
tools left at scene						3		6	23
entry visually screened					5	3		7	42
entry by removing air conditioner		5	7	5	5	3		11	51
minimal body force used						5	4	7	42
excessive body force used	10	-6			6	5		7	35
glass broken on entry						3		5	27
glass cut on entry		10	10	10		6		10	74
slit screen on entry			9			3		4	28
entry by scam					6	3		7	45
no sign of forced entry					8	5	4	11	55
molding pryed on entry			10	5	7	3		6	41
window/door removed				7	8	4		9	28
iron bars removed					8	8		8	41
entry through walls (garage?)					8	3		7	35

(Worksheet: Break & Enter Characteristics vs. Suspect Characteristics, with scoring of -10 to 10, the highest confidence factor being 10)

This allowed for the drafting of a new residential break & enter report form which you see on the following page.

This form will now be used, on a trial basis, by four members of each platoon, one officer per zone. The officer's comments will be used to draft a final form. Training of all platoon members is expected to be complete by December and the new form in use by January 1st, 1993.

Multiple Responses Allowed

VICTIM & INCIDENT CHARACTERISTICS SEARCH PROPERTY TAKEN/NOT TAKEN

VICTIM <input type="checkbox"/> HOME OCCUPIED AT TIME OF B&E <input type="checkbox"/> ON HOLIDAYS <input type="checkbox"/> AT FUNERAL <input type="checkbox"/> AT WEDDING <input type="checkbox"/> LIVES ALONE <input type="checkbox"/> HAS TEENAGE CHILDREN <input type="checkbox"/> IS A STUDENT <input type="checkbox"/> IS A CELEBRITY <input type="checkbox"/> JUST MOVED IN <input type="checkbox"/> RECENTLY SEPARATED	ASSOCIATED INCIDENT(S) <input type="checkbox"/> ARSON <input type="checkbox"/> ASSAULT <input type="checkbox"/> CAR THEFT _____ <div style="text-align: right; font-size: small;">Case No.</div> <input type="checkbox"/> DOMESTIC <input type="checkbox"/> HOMICIDE <input type="checkbox"/> ROBBERY <input type="checkbox"/> SEXUAL ASSAULT <input type="checkbox"/> OTHER _____ <div style="text-align: right; font-size: small;">Specify</div>
--	--

TYPE <input type="checkbox"/> GRAB/NO SEARCH <input type="checkbox"/> NO SIGN OF SEARCH <input type="checkbox"/> RANSACK <input type="checkbox"/> SYSTEMATIC <input type="checkbox"/> TIDY EXTENT <input type="checkbox"/> ENTIRE PREMISE <input type="checkbox"/> BASEMENT <input type="checkbox"/> ATTIC <input type="checkbox"/> KITCHEN <input type="checkbox"/> LIVING ROOM <input type="checkbox"/> DINING ROOM <input type="checkbox"/> FAMILY/REC ROOM <input type="checkbox"/> CHILD'S ROOM <input type="checkbox"/> SPARE ROOM/OFFICE <input type="checkbox"/> GARAGE <input type="checkbox"/> MASTER BEDROOM <div style="text-align: center; font-size: x-small;">In Master bedroom Property Dumped</div> <input type="checkbox"/> ON BED <input type="checkbox"/> ON FLOOR <input type="checkbox"/> ON DRESSER <input type="checkbox"/> LIQUOR CABINET <input type="checkbox"/> MEDICINE CABINET <input type="checkbox"/> PACKAGES <input type="checkbox"/> REFRIGERATOR <input type="checkbox"/> TOILET TANK <input type="checkbox"/> CONCEALED COMPARTMENT <input type="checkbox"/> STORAGE CONTAINER <input type="checkbox"/> LIGHT SWITCH <input type="checkbox"/> AIR DUCT <input type="checkbox"/> OTHER _____ <div style="text-align: right; font-size: x-small;">(specify)</div>

Readily Available; Not Taken

↓ Taken

<input type="checkbox"/>	<input type="checkbox"/> ANTIQUES
<input type="checkbox"/>	<input type="checkbox"/> ART
<input type="checkbox"/>	<input type="checkbox"/> CAMCORDER
<input type="checkbox"/>	<input type="checkbox"/> CAMERA EQUIPMENT
<input type="checkbox"/>	<input type="checkbox"/> CASH
<input type="checkbox"/>	<input type="checkbox"/> CD PLAYER
<input type="checkbox"/>	<input type="checkbox"/> CD'S
<input type="checkbox"/>	<input type="checkbox"/> COIN/MONEY COLLECTION
<input type="checkbox"/>	<input type="checkbox"/> COLLECTIBLES
<input type="checkbox"/>	<input type="checkbox"/> COMPUTER EQUIPMENT
<input type="checkbox"/>	<input type="checkbox"/> ELECTRONIC GAMES
<input type="checkbox"/>	<input type="checkbox"/> FURS
<input type="checkbox"/>	<input type="checkbox"/> HAND GUNS
<input type="checkbox"/>	<input type="checkbox"/> LONG GUNS
<input type="checkbox"/>	<input type="checkbox"/> JEWELRY
<input type="checkbox"/>	<input type="checkbox"/> JUNK JEWELRY
<input type="checkbox"/>	<input type="checkbox"/> MICROWAVE
<input type="checkbox"/>	<input type="checkbox"/> SAFE TAKEN
<input type="checkbox"/>	<input type="checkbox"/> SAFE ATTACKED
<input type="checkbox"/>	<input type="checkbox"/> SAFE OPENED
<input type="checkbox"/>	<input type="checkbox"/> SILVERWARE/SILVER
<input type="checkbox"/>	<input type="checkbox"/> SILVERPLATE
<input type="checkbox"/>	<input type="checkbox"/> SPORTS CARD COLLECTION
<input type="checkbox"/>	<input type="checkbox"/> STAMP COLLECTION
<input type="checkbox"/>	<input type="checkbox"/> STEREO
<input type="checkbox"/>	<input type="checkbox"/> TELEVISION
<input type="checkbox"/>	<input type="checkbox"/> VCR
<input type="checkbox"/>	<input type="checkbox"/> VEHICLE
<input type="checkbox"/>	<input type="checkbox"/> KEYS FOR A/M VEHICLE
<input type="checkbox"/>	<input type="checkbox"/> CREDIT CARDS / CHEQUES
<input type="checkbox"/>	<input type="checkbox"/> CHILDREN'S ARTICLES
<input type="checkbox"/>	<input type="checkbox"/> CIGARETTES

CLOTHING

<input type="checkbox"/>	<input type="checkbox"/> FEMALE
<input type="checkbox"/>	<input type="checkbox"/> FEMALE UNDERGARMENTS
<input type="checkbox"/>	<input type="checkbox"/> MALE
<input type="checkbox"/>	<input type="checkbox"/> DRUGS/ PRESCRIPTION
<input type="checkbox"/>	<input type="checkbox"/> DRUGS/ NON-PRESCRIPTION
<input type="checkbox"/>	<input type="checkbox"/> DRUGS/ ILLEGAL
<input type="checkbox"/>	<input type="checkbox"/> FEMALE MAKE-UP
<input type="checkbox"/>	<input type="checkbox"/> FOOD
<input type="checkbox"/>	<input type="checkbox"/> FRIDGE/ LARGE APPLIANCES
<input type="checkbox"/>	<input type="checkbox"/> FURNITURE
<input type="checkbox"/>	<input type="checkbox"/> HARD LIQUOR
<input type="checkbox"/>	<input type="checkbox"/> WINE
<input type="checkbox"/>	<input type="checkbox"/> BEER
<input type="checkbox"/>	<input type="checkbox"/> NON-ALCOHOLIC BEVERAGES
<input type="checkbox"/>	<input type="checkbox"/> LAWN/SNOW EQUIPMENT
<input type="checkbox"/>	<input type="checkbox"/> PASSPORT
<input type="checkbox"/>	<input type="checkbox"/> PIGGY BANK
<input type="checkbox"/>	<input type="checkbox"/> POWER TOOLS
<input type="checkbox"/>	<input type="checkbox"/> WALLET / POCKETBOOK
<input type="checkbox"/>	<input type="checkbox"/> BLANKETS
<input type="checkbox"/>	<input type="checkbox"/> PILLOW CASE
<input type="checkbox"/>	<input type="checkbox"/> SUITCASE
<input type="checkbox"/>	<input type="checkbox"/> HOCKEY / SPORTS BAG

VALUABLE PROPERTY STASHED IN AREA
 PROPERTY SHEET LEFT WITH VICTIM

CHARACTERISTICS OF RESIDENCE AND AREA

SIGNS OF OCCUPANCY <input type="checkbox"/> PEOPLE VISIBLE <input type="checkbox"/> DOOR OPEN <input type="checkbox"/> CAR PRESENT <input type="checkbox"/> → OBVIOUSLY NOT USED <input type="checkbox"/> TOOLS/EQUIPMENT IN YARD <input type="checkbox"/> LIGHTS ON <input type="checkbox"/> → ON ALL DAY/WEEKEND <input type="checkbox"/> RADIO/TV ON <input type="checkbox"/> NEWSPAPER LEFT OUT <input type="checkbox"/> MAIL / JUNK MAIL LEFT OUT <input type="checkbox"/> GARBAGE CANS LEFT OUT <input type="checkbox"/> NOTE IN WINDOW/ DOOR <input type="checkbox"/> GRASS NOT CUT <input type="checkbox"/> SNOW NOT SHOVELLED <input type="checkbox"/> HOUSE OBVIOUSLY VACANT (EMPTY) <input type="checkbox"/> OTHER SIGNS _____ <div style="text-align: right; font-size: x-small;">(specify)</div>	RESIDENCE <input type="checkbox"/> SINGLE FAMILY <input type="checkbox"/> ELEVATED APARTMENT <input type="checkbox"/> GARDEN HOME <input type="checkbox"/> ROOMING HOUSE <input type="checkbox"/> HOUSE BOAT <input type="checkbox"/> OTTAWA-CARLETON HOUSING <input type="checkbox"/> ON CORNER <input type="checkbox"/> AT STAIRS / ELEVATOR <input type="checkbox"/> RECENT SERVICES <div style="text-align: center; font-size: x-small;">(CARPET CLEANING, ALARM INSTALL)</div>
---	--

ADJACENT TO OR VISIBLE

<input type="checkbox"/>	<input type="checkbox"/> CONSTRUCTION
<input type="checkbox"/>	<input type="checkbox"/> GREEN SPACE
<input type="checkbox"/>	<input type="checkbox"/> BIKE PATH

PROTECTED

ACTIVATED EXISTS

<input type="checkbox"/>	<input type="checkbox"/> ALARM SYSTEM	<input type="checkbox"/>	<input type="checkbox"/> DEADBOLT LOCKS
<input type="checkbox"/>	<input type="checkbox"/> VIDEO SURVEILLANCE	<input type="checkbox"/>	<input type="checkbox"/> POOR LOCKS
<input type="checkbox"/>	<input type="checkbox"/> MOTION SENSOR LIGHTS	<input type="checkbox"/>	<input type="checkbox"/> POOR WINDOW SECURITY
<input type="checkbox"/>	<input type="checkbox"/> DOG PRESENT	<input type="checkbox"/>	<input type="checkbox"/> OTHER _____
<input type="checkbox"/>	<input type="checkbox"/> IRON BARS		<div style="text-align: right; font-size: x-small;">(specify)</div>

ENTRY

RISK REDUCTION <input type="checkbox"/> RING/KNOCK FIRST <input type="checkbox"/> CALLS RESIDENCE PRIOR <input type="checkbox"/> DISABLED ALARM <input type="checkbox"/> CUT PHONE CABLE <input type="checkbox"/> JAMMED/LOCKED DOORS <input type="checkbox"/> LOCK PLUGGED ENTRY POINT <input type="checkbox"/> ENTRY NOT GAINED <input type="checkbox"/> FRONT <input type="checkbox"/> SIDE <input type="checkbox"/> REAR <input type="checkbox"/> DOOR <input type="checkbox"/> PATIO DOOR <input type="checkbox"/> WINDOW <input type="checkbox"/> BASEMENT <input type="checkbox"/> GROUND FLOOR <input type="checkbox"/> UPPER FLOOR <input type="checkbox"/> BALCONY <input type="checkbox"/> ENTRY POINT SMALL <input type="checkbox"/> ENTRY VISUALLY SCREENED <input type="checkbox"/> ENTRY POINT HARDLY NOTICEABLE <input type="checkbox"/> ENTRY ATTEMPTED FROM MORE THAN ONE POINT	TYPE OF ENTRY <input type="checkbox"/> PRIED <input type="checkbox"/> → MOLDING <input type="checkbox"/> FORCED <input type="checkbox"/> NO SIGN FORCED ENTRY <input type="checkbox"/> GLASS BROKEN <input type="checkbox"/> GLASS CUT <input type="checkbox"/> SCREEN SLIT <input type="checkbox"/> BY OPEN DOOR/WINDOW <input type="checkbox"/> BY UNLOCKED DOOR/WINDOW <input type="checkbox"/> DOOR/WINDOW REMOVED <input type="checkbox"/> IRON BARS REMOVED <input type="checkbox"/> THROUGH WALL <input type="checkbox"/> REMOVED LOCKS <input type="checkbox"/> REMOVED AIR CONDITIONER <input type="checkbox"/> ENTRY BY SCAM <div style="text-align: center; font-size: x-small;">→ (E.G. GYPSIES, YOUTH)</div> <input type="checkbox"/> MINIMAL FORCE USED <input type="checkbox"/> EXCESSIVE FORCE USED <input type="checkbox"/> OTHER _____ <div style="text-align: right; font-size: x-small;">(specify)</div>
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TYPE OF TOOL

<input type="checkbox"/>	<input type="checkbox"/> TOOLS BROUGHT TO SCENE
<input type="checkbox"/>	<input type="checkbox"/> TOOLS LEFT AT SCENE
	<div style="text-align: center; font-size: x-small;">(specify)</div>
<input type="checkbox"/>	<input type="checkbox"/> UNKNOWN TYPE USE
<input type="checkbox"/>	<input type="checkbox"/> PRY TOOL
<input type="checkbox"/>	<input type="checkbox"/> SCREW DRIVER
<input type="checkbox"/>	<input type="checkbox"/> VISE GRIPS
<input type="checkbox"/>	<input type="checkbox"/> PIPE WRENCH
<input type="checkbox"/>	<input type="checkbox"/> HAMMER
<input type="checkbox"/>	<input type="checkbox"/> SLEDGE HAMMER
<input type="checkbox"/>	<input type="checkbox"/> AXE
<input type="checkbox"/>	<input type="checkbox"/> HAND SAW
<input type="checkbox"/>	<input type="checkbox"/> POWER SAW
<input type="checkbox"/>	<input type="checkbox"/> ROCK/BRICK
<input type="checkbox"/>	<input type="checkbox"/> GLASS CUTTER
<input type="checkbox"/>	<input type="checkbox"/> SUCTION CUP
<input type="checkbox"/>	<input type="checkbox"/> WINDOW TAPED

POSSIBILITY OF

<input type="checkbox"/>	<input type="checkbox"/> PASS KEY
<input type="checkbox"/>	<input type="checkbox"/> LOCK PICK
<input type="checkbox"/>	<input type="checkbox"/> CREDIT CARD

BEHAVIOUR AT SCENE

CONSUMED <input type="checkbox"/> BEER <input type="checkbox"/> FOOD <input type="checkbox"/> LIQUOR <input type="checkbox"/> NON-ALCOHOLIC BEVERAGE <input type="checkbox"/> WINE	BEHAVIOUR <input type="checkbox"/> BURNING MATCHES <input type="checkbox"/> DEFECACTION <input type="checkbox"/> HANDLE FEMALE UNDERGARMENT <input type="checkbox"/> MADE THEMSELVES AT HOME <input type="checkbox"/> URINATION	USED <input type="checkbox"/> GLOVES <input type="checkbox"/> MASK <input type="checkbox"/> SOCKS <input type="checkbox"/> TISSUE/TOWELS <input type="checkbox"/> WEAPON	GRAFFITI <input type="checkbox"/> PERSONAL <input type="checkbox"/> RACIAL <input type="checkbox"/> SEXUAL <input type="checkbox"/> SATANIC <input type="checkbox"/> TRADEMARK	VANDALISM <input type="checkbox"/> EXTENSIVE <input type="checkbox"/> MINOR <input type="checkbox"/> OTHER BEHAVIOUR _____ <div style="text-align: right; font-size: x-small;">(specify)</div>
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Reporting Officer: _____	Cadre: _____	Date: _____	Minutes: _____	Entered: _____
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IMPLEMENTATION

The National Research Council is presently working on the software for the Ottawa Police Expert System. They will use the completed break & enter forms to review the data collection process and to assist in writing the program.

It is anticipated that a prototype will be installed in the police station sometime in the spring of 1993. The prototype will be tested and the evaluation results will be employed to further refine the system to meet operational requirements.

At that stage an evaluation plan will be developed. This plan will address system benefits, deployment considerations and future development needs.

Interim reports will be regularly filed and a final report will be submitted once the evaluation plan is completed.