GlobalTechnical

GT200 SYSTEM

REMOTE SUBSTANCE DETECTION

OPERATORS MANUAL

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OPERATORS MANUAL

PLEASE NOTE THAT THIS MANUAL IS NOT INTENDED TO BE USED ON ITS OWN. IT DOES NOT CONSTITUTE A FULL DESCRIPTION OF THE OPERATION OF THE GT200 SYSTEM.

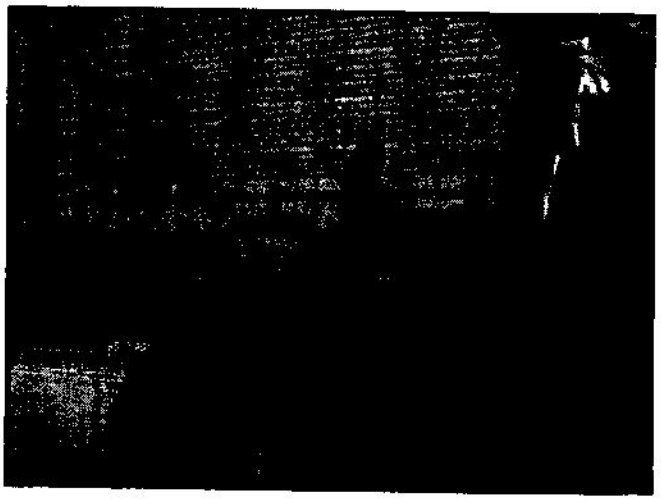
IT IS MEANT TO BE A SUPPORT TOOL AND REFERENCE GUIDE FOR OPERATORS WHO HAVE ALREADY BEEN THROUGH THE OPERATORS COURSE. INFORMATION SUPPLIED DURING THE OPERATORS COURSE IS IN MUCH MORE DEPTH THAN CAN BE PROVIDED IN WRITTEN FORM.

PEOPLE WHO HAVE BEEN ON THE OPERATORS COURSE SHOULD NOT ATTEMPT TO TRAIN OTHERS AND THOSE THAT HAVE NOT ATTENDED THE TRAINING COURSE SHOULD NOT USE THE MANUAL AS A SUBSTITUTION TO ATTENDING THE COURSE.

OPERATORS MANUAL

TRAINING COURSE REMINDERS

The antenna should be extended to its full length and raised so that it is horizontal to the floor and the hand unit is vertical. The antenna should NEVER be pointing upwards. Make sure, when extending it, that the swivelling black plate which houses the antenna fitting (known as the flag) is free on the brass pivot and is touching the plastic handle at the base of the pivot.



The more relaxed you are, the more normal your stance, the more easily you will use the device, the more easily you will receive and recognise the signal. Being relaxed and keeping your mind free of preconceived notions as to where the target might be, are the two keys to successful operation of the GT200 SYSTEM and assists in the generation of static electricity.

Do not allow your hand to move towards the centre of your body as the system may not work as efficiently.

It is better to reconfirm each lock than to spend a lot of time searching the wrong place. Remember, the GT200 SYSTEM indicates the search area to between 1 and 3 meters.

Your body is amplifying the signal you receive, just as it does when you touch a radio or TV aerial. If you keep your 'Empty Shoulder' between the target and the GT200 SYSTEM, the signal you receive will be stronger and more definitive. The unit should be kept on the hip at the side of the body.

Effectively, when the signal from the substance has been detected by the sensor card, the created resonance draws the antenna into its field. It is possible to 'feel' the antenna turn and this helps the operator determine the difference between irregular balance or the wind moving the antenna, and a lock.

There are several ways to test that the lock is true. The quick one is to discharge the antenna, bring it up and re take the reading. Now, generally, a lock will not hold more than 30 seconds. Environmental considerations determine the exact time to discharge. It is held there by static electricity, which drains or dissipates into the air around you, so you need to do this fairly quickly after you stop, once you are convinced you have a lock. This has to be a fairly quick operation or the antenna balance can be interpreted as a lock.

By discharging the antenna and taking the reading again by taking deep breaths, the antenna will come to rest in the same position if the reading was correct.

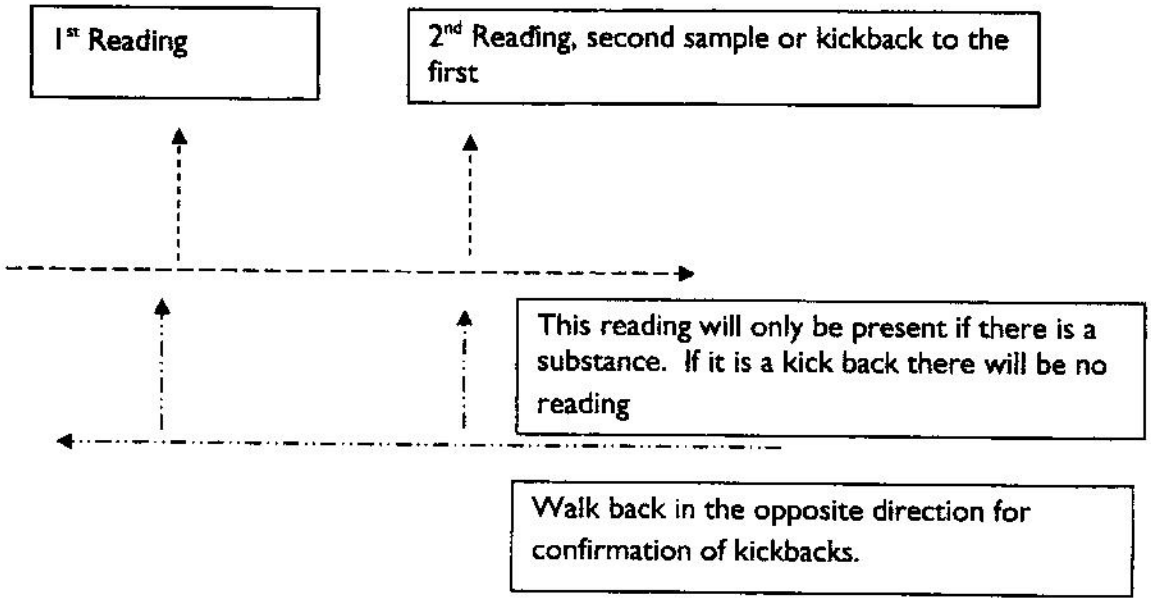
You can also back up 5 meters and re check to see if the 'lock' occurs again.

Lastly remember that the antenna is indicating a line along which, in either direction, the target may be lying.

AREA FOR ADDITIONAL NOTES

KICK-BACKS

Sometimes once you have the first lock and you then continue to search the remainder of the target area, within 5 – 7 steps after the first indication, the antenna can swing round as if it were indicating a second reading, when in fact it could be that it is trying to swing back to the first reading. This is a common possible error as you could think there are two samples when in fact there is only one. In order to confirm if it is a kick back or a second sample, you should walk back along the line in the opposite direction and if the reading is a kick back you will have no indication at the point you had the kick back but you should get a reading at the first point.



AREA FOR ADDITIONAL NOTES

SEARCH OPERATIONS

BUILDING SEARCH

Sometimes it may not be possible to identify just one localised cross point as the substance may be in a large quantity and spread throughout the building or floor and there may be contamination on areas such as entrances and stairs especially if it is a block of apartments. Two or more samples close together will be difficult to identify as the energy will join together and be seen as one. With experience this can be seen from the search drawing.

Individual Buildings

With experience you should quickly check the target area to see if it is positive to the material you are looking for before marking up a plan of the area. This will save time if there are no readings.

Task List

1 Walk the perimeter and mark the outline on a drawing.

2 Use the straight line search method for all sides of the building to eliminate any readings outside the perimeter and confirm with one or two diagonals.

3 Mark **ALL** readings on the drawings.

4 If space is limited for the diagonal, use the 'zig-zag' diagonal and be careful of the angle used if there are two or more internal cross points. If more than one exists then keep the angle small with reference to the wall.

5 Two lines crossing do not constitute a search point. 3 would mean possibly a secondary area. 4 or 5 would indicate a primary area.

6 If there is any confusion about the cross point, check to see if any of the readings continue outside the area and take note and refer to this when making an analysis of the drawing.

7 Search the indicated area/s.

Searching the Building

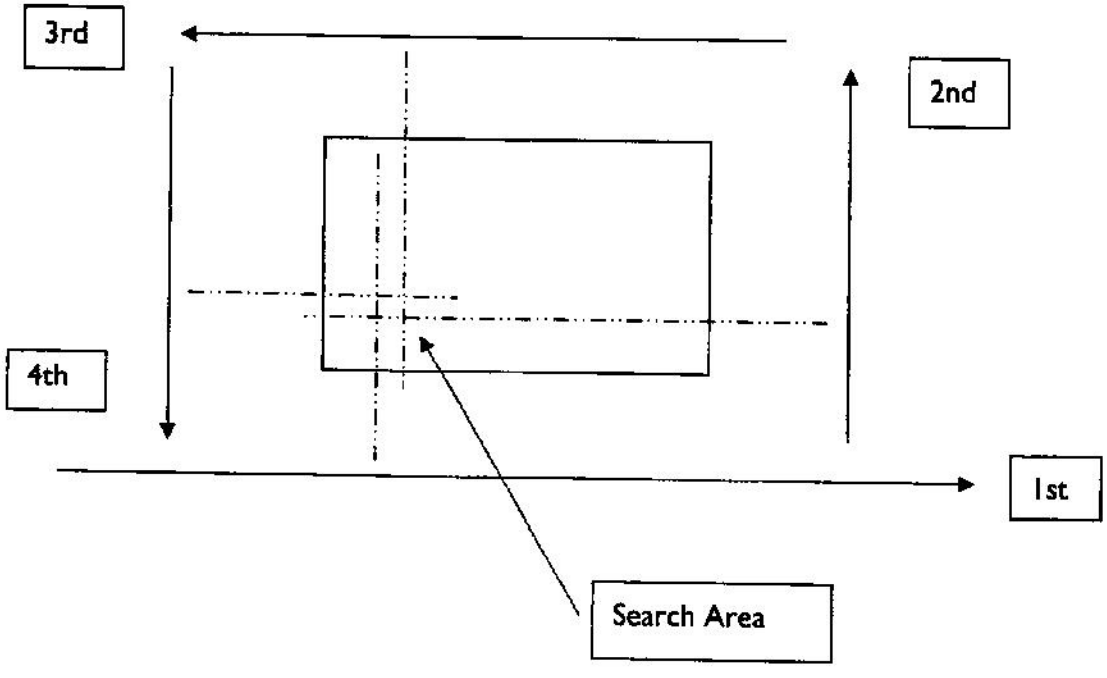
1 Search the primary area closest to the perimeter as the clearance procedure is just as important.

2 If you have other primary or secondary search areas within the location re check them once you have cleared the first location as the overall picture may change with the removal of one sample.

3 When searching for explosives extend the search area and work from the outside in and for narcotics search from the centre out.

4 The area indicated should be viewed as a vertical sector and not just the ground level.

5 Remember the substance can be under the floor boards, in the wall cavity, in the ceiling or on the second floor. Once the building has been searched it may be useful to check again but be careful that residue has not been spread around.



If there is a moving substance inside, such as a weapon then it can be difficult to pinpoint a specific location. The antenna may move slowly and this should be looked for when obtaining readings.

Multiple Buildings

The principle for the search is the same as for the single building but this time we can use the arc search for the first reading and straight line searches for the remainder, especially if the area is large.

Check the area first if required to see if the location is positive or not for the programmed substance.

Task List

1 Walk the perimeter and mark the outline on a drawing.

2 Use the straight line search method for all sides of the building to eliminate any readings outside the perimeter and if you wish use the arc for the first reading.

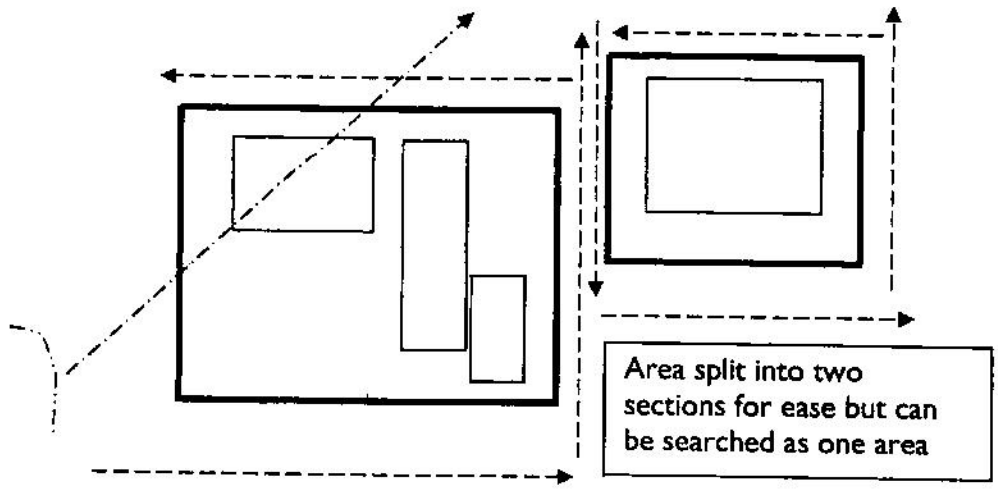
3 Mark **ALL** readings on the drawings.

4 Two lines crossing do not constitute a search point. 3 would mean possibly a secondary area. 4 or 5 would indicate a primary area.

5 If there is any confusion about the cross point, check to see if any of the readings continue outside the area and take note and refer to this when making an analysis of the drawing.

6 Check to see if the readings continue outside the area and take note.

7 Search the indicated area/s.



The accuracy of the readings depend upon how far away you from the buildings, but normally if you are within 10m of the walls, the pinpointed position can be relied upon as being accurate to 1-2m.

The cross points of the readings mark the centre of the search area. The search area is then extended in a circular method to 2-3m.

AREA FOR ADDITIONAL NOTES

OPEN AREA SEARCH

The perimeter or extent of the search must be determined initially. If the 1st sweep is to be conducted by aircraft or helicopter the search method is the same as that for the outside of a building but in this case the accuracy will be less; an area will be defined though. If the search is to be conducted from the ground the following procedures must be followed.

Make a quick check of the area first to see if any indications are obtained before making a more detailed search of the area.

Task List

1 Walk the perimeter of the area and either make your own drawing or preferably use a map. The reason to walk the perimeter is to see how it can be subdivided into roughly areas of no more than 500m sq and mark the possible hide or drop points. The sizes of the grids are adjusted to suit the complexity of the area. Alternatively, you can make a primary drawing and adjust the reference points as you move around the area. This also helps in areas where search time is low and danger levels may be high.

2 When making the drawing you can use two methods:
- Use steps to size the area if there are not many reference points.
- Use simple reference points for the drawing and be prepared to adjust the drawing as you move through the area and search as the your perspective may change.

3 Subdivide the area and split the work between the number of teams you have available to conduct the search.

4 The subdivided areas are searched marking on all the readings but being aware of where the other teams may be.

5 An additional unit can be used to check specifically the hide and drop off areas at the same time as the open areas. Again be aware of the other units.

6 Use marker flags to define the direction of each indication if available. If the areas can be viewed from all sides. This method is useful for desert search.

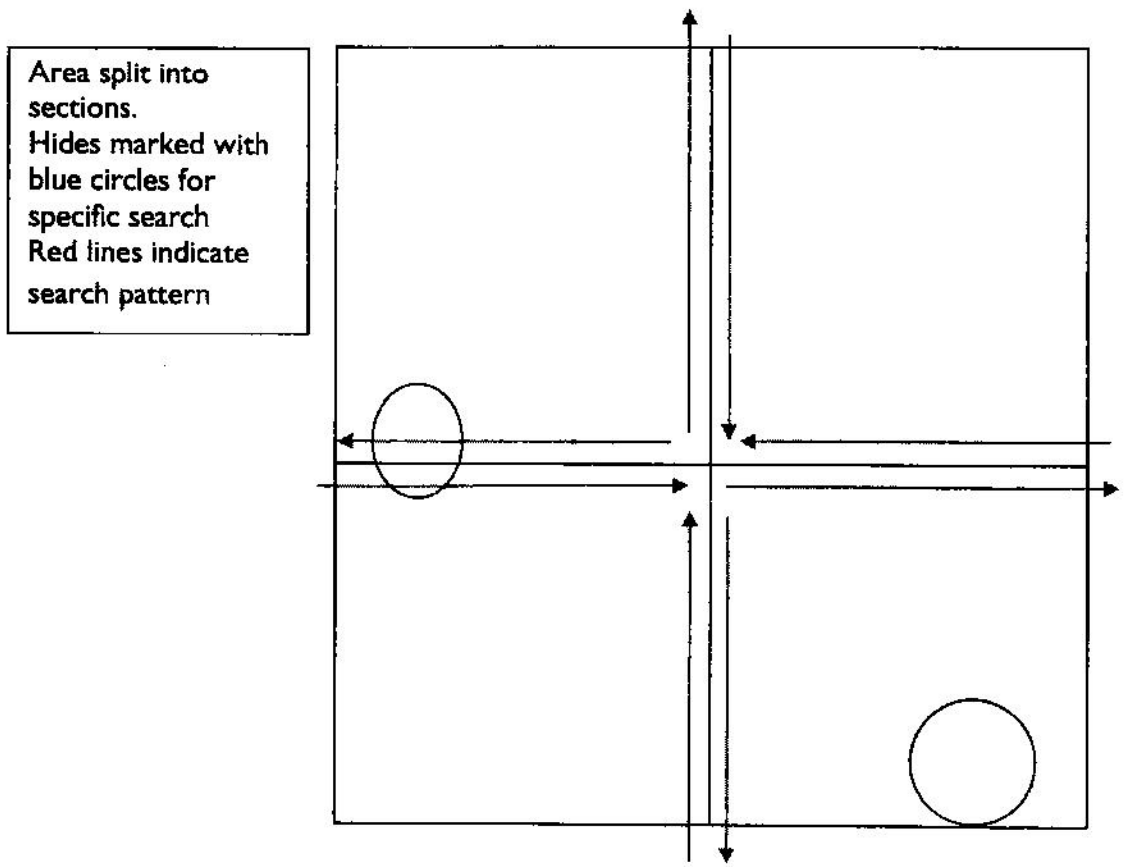
7 Check to see if the readings continue outside the area and take note and adjust as necessary.

8 Remember the substance could be under the ground or in the vegetation.

9 Once the area has been searched and substance found check again to make sure nothing has been missed. The one you found could be a decoy!

10 Beware that any subsequent readings may be residue, but sometimes the presence of one sample can mask the presence of another if close.

- Indications received from long distances may not be accurate and should be taken only as confirmation of the closest indications. Accuracy of putting the indications on the drawing correctly and using an accurate map will improve the target area accuracy.
- The initial location may not be accurate if searched from a long distance. The centre of this area can be marked, then another search area extending from the search area to 20m -30m can be used as the new perimeter and searched again to further identify the exact location. If you have identified the area from the perimeter first and then try to further reduce the area around the centre and the search becomes very confusing you have two alternatives:
  a) Use another method of search for the area around the first centre point such as physical or the dog.
  b) Go back to the first centre area and extend the next target area by an area larger. We can then employ two methods of search: The grid search but integrating diagonals with the straight lines or The reducing arc method.



Area Search with no reference points

1 Walk on a chosen bearing for a chosen distance.

2 Mark the indication.
A: Use marker flags tall enough to be seen from a distance.
B: Use a team member to remain in the position

3 Once you have two alternative angular readings move 20m further on than the second line and parallel to it.

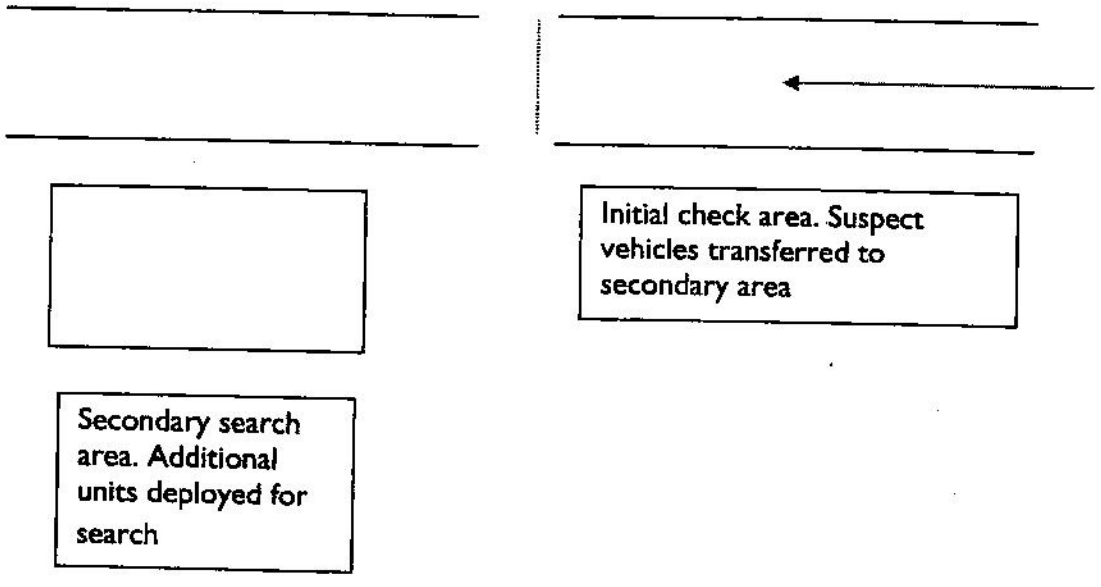
4 Walk along this line until the antenna turns back into the area near to the first flag or team member.

5 Move in an ever reducing arc so the antenna will point into the centre of the area and gradually reduce the target area and should lead you to a centre.

AREA FOR ADDITIONAL NOTES

ROAD BLOCK AND CHECKPOINT SEARCH

The ideal method for setting up roadblocks is to either slow the traffic down as much as possible or for best results stop it.
Multi lane roads need to be condensed into a single lane, or in the worst case two lanes. Before setting up a temporary roadblock a background check of the area needs to be carried out.



Task List

1. Background check area for roadblock – especially if there are toilets at the checkpoint because if the general public use them there may be possible residues in the drainage areas from the people who use drugs or narcotic based medicine and this may change from time to time.
2. Walk around the vehicles at a distance of 2 – 3 m and walk slowly in order to obtain the highest chance of detection.
3. Initial check carried out at stop point or before. If in doubt stop and send to the secondary area.
4. Multiple units can be employed at the initial stage.
5. At the secondary area the vehicle is rechecked for immediate release or further investigation.

6 Ask for any medicines to be removed before searching the vehicle again and if clear then release, if not move the passengers out and check the vehicle and passengers. If the vehicle is clear the passengers maybe users or traffickers or taking medicine based on drugs. If the signal remains on the vehicle we can do the following:

A If the vehicle is a car, we remove all items of luggage and check the vehicle then the luggage for substances. If the signal remains on the vehicle we can then use a trace detector or dog to further confirm the reading before the vehicle is impounded.
B If the vehicle is a lorry we must try and specify a smaller area for search and utilise other equipment at our disposal to confirm the reading before removing the contents. As the vehicle is unloaded bear in mind that each offload should be checked and the lorry rechecked. In addition to checking the contents of the lorry, look for signs of new work or possible false compartments. In order for this to be successful a good knowledge of the vehicles passing through the roadblock would be an advantage.
C If the vehicle is a bus, identify the area/s of indication and only unload those passengers in the area. The indicated person and one either side for check outside the bus. The indication could be from the luggage area or a false compartment of the bus. It may be easier to use a dog to quickly check the buses which the GT200 System has identified. Remember people who have swallowed drugs may not be detected by the dog.

7 Weak indications normally mean a residual reading.

8 On occasions the readings may be residual and when we unload the luggage and separate the reading disappears but when we put the luggage back together it re appears. This is a sign of weak indications, when together, looking as a larger one.

If the traffic cannot be stopped it must be slowed down by utilising an "S-Bend" and/or speed bumps, and the GT200 System used at these points.

Multiple units can be used at a checkpoint in a method similar to this:

1 1 or 2 units for the initial rapid check area.
2 1 unit at the second slow small vehicle check.
3 1 unit at the bus check area.
4 1 unit at the truck check area.

AREA FOR ADDITIONAL NOTES

CONTAINER PORT SEARCH

Our first consideration is the safety of the operator using the GT200 System and container ports are usually very busy. If it is too dangerous to check the static containers we can search them as they are brought in or out of the port.
When searching container areas we use the following procedures:

Task List

1 Split the port into small sections.
2 Check all containers but not if they are stacked three or more high as you could never check them properly. Those that are indicated need to be marked and then set up in singles for further investigation. At the same time these can be placed in line with those that have already been profiled. By using the GT200 System we save time on customs seal renewal and the subsequent paper work involved.
3 Those that cannot be easily opened need to be noted and checked against shipping documents.
4 Be aware of port personnel in the area as these people may be narcotic users and the unit will react.

In the port environment it is highly likely that you will have many different chemicals coming through in the containers in high quantities so may give some unexpected readings on occasions.

Some of these chemicals form the basis of explosives or in the processing of narcotics and hence cause reactions with the relative sensor cards, so in the event of unexpected results keep a record of the substance detected and which sensor card/s detected this, so we can investigate further.

AREA FOR ADDITIONAL NOTES

CAR PARK SEARCH

The principle for car park search is the same as for many of the other operations.

Task List

1 Draw the perimeter if a quick check of the area proves positive.
2 Split the car park into sections if necessary.
3 Carry out the search and identify each location down to one or two vehicles.
4 Mark **ALL** the indications on the drawing.
5 Check to see if the readings continue outside the area and take note.
6 Recheck each identified location to attempt to close in on the exact location.
7 If the suspect vehicles can be moved this can help identify the exact vehicle if they are parked close together. [This may not always be practical]
8 The substance may be on the floor or in the car park roof. [if applicable]

AREA FOR ADDITIONAL NOTES

ADDITIONAL INFORMATION

Why can we not determine the exact position?

The immediate area around the substance produces a high energy field which is the same as the substance, therefore making it difficult for the GT200 System to indicate its exact position. When you are very close to the substance it can be extremely difficult to pinpoint it. The effect can be compared to that of two like magnetic poles repelling each other when very close. This is why we should be confident of our readings which are taken at a distance of at least 2 meters.

How to track a moving target

Moving targets can be tracked from a stationary position. This position can either be from the side, or from a height overlooking the road.

Standing with the 'empty shoulder' diagonally towards the road, make small movements, such as a couple of steps forward and then back. Make the angle between you and the on coming traffic as small as possible so that speed is less of an issue. The antenna will lock onto the selected substance and follow it but there can sometimes be a delay in response which can make it difficult to identify which vehicle is positive. The alternative is to take one reading to on coming traffic, the 2nd as the vehicle passes and the 3rd as the vehicle moves away. This method can only be used in times of low traffic flow.

How to track from a moving vehicle

The movement of the vehicle, be it car, boat, fixed wing aircraft or helicopter provides the static electricity. Since the vehicle travels at far higher speed than when walking, the static charge is greater and the response more definite, but handling is more difficult due to the movement of the vehicle and sometimes the working area inside the vehicle is small so the operator tends to crunch up in the seat and the ability to generate static reduces. The lung cavity must be as open as possible.

The antenna should be shortened, which delays the initial reception, but gains an extra sharp response. It is certainly possible to drive past buildings and overtake vehicles, recognising those that may have substances, but it takes practice. Do not expect this procedure to be mastered quickly.

The system can be used either from inside or outside the vehicle. When being used from inside the vehicle you may have to reduce the length of the antenna. When using from the outside of the vehicle you can either face forward or back depending upon the conditions. When you operate from the inside you may be able to increase the speed of the vehicle but the recommendation for the general speed when passing the target is a maximum of 30km/h. Speeds in excess of this will greatly reduce the ability to obtain detections.

How to sweep a line of people.

It is sometimes advisable to check people out, such as immigrants or 'tourists' coming through a point of entry, i.e. prison visitors - even guards and prisoners.

Search the line of people and where you have an indication isolate the people either side of your chosen target. Separate these people and re-check to confirm which one the GT200 System has indicated on. Make sure you are at least 3m from the line. If you are too close it will be too difficult to operate.

The GT200 SYSTEM will recognise the presence of drugs on or in the body, in cavities or even in the blood. Scanning the people in a line up should be undertaken with care and the one or two suspected persons indicated by the GT200 SYSTEM should be drawn aside and checked again. Great care must be taken not to accuse people, solely on the result of the GT200 SYSTEM lock. Standard conventional means should be used to verify the indication. Although there is some suggestion of invasion of privacy, this is no worse than having a hand held metal detector swept over you, as used in clubs and airports. Be aware that some medicines contain a base of illegal drugs, and if people are users, drugs will be indicated by the GT200 SYSTEM, so tread carefully and gain all the facts first before relying solely on the GT200 SYSTEM in this instance! Remember it will detect users and party goers.

Remember Marijuana remains detectable in the body for up to 30 days and cocaine for 3-4 days.

Reading unwanted signals.

In selecting an area to search for your chosen target, be aware that there may be samples of the same product out there, not within your search area. The GT200 System will lock the first signal it aligns with, not necessarily the nearest.

You must not continue to take readings over and over again as there is a possibility of obtaining a stray reading which will lead to confusion and you must consider why are you trying to obtain more readings? Confidence in the equipment and your ability is required.

There are other objects which may contain trace elements of the substance you are seeking and we cannot eliminate this as the substance is real but not always in the form we require.

Some medicines contain drugs legally and can be detected.

Nitro-glycerine is used in heart medicines and can be picked up by our recognition signal for that explosive.

With this in mind - the GT200 SYSTEM is not totally infallible, use the GT200 SYSTEM with confidence and with caution.

For this reason it is important that all indications are put onto the drawing of the area. Do not think that you will remember where they are; it is almost impossible. Take the point of the majority readings as your primary target search area and be prepared to accept the possibility of secondary areas. It is better to include secondary areas and search them rather than to miss the substance.

PLEASE NOTE:

THE GT200 SYSTEM IS NOT INTENDED AS A STAND ALONE INSTRUMENT

The GT200 SYSTEM should be used as a first indication only, and we advise the use of conventional methods to help confirm the result of a 'lock'.

It can be used as confirmation of suspicions, intelligence by informers and to check an area after the search team has been in, to see if anything had been missed.

The GT200 SYSTEM saves the dog's working time, and it's 'nose', for more efficient working and when the GT200 SYSTEM is used by a dog team, the area of search can be indicated from a greater distance than the dog can smell, and hence putting the dog in the right area quickly. This ensures that the dog is sent in to more specific areas, thus saving it from sniffing fruitlessly in unproductive areas.

REMEMBER!!!!!

Do not assume that the antenna is going to point in a specific way. Allow it to lock on and watch as it comes into your body.

Work in pairs where possible.

There can be more than one substance in the area that we are working in. Learn to eliminate.

This tool will help you to LOCATE an area for you to start your search. It will NOT point to the substance e.g. explosives under the car. It will point to the car. It is up to you to find out where.

Use pen and paper to draw a rough outline of the search area, this helps remember where the locks have occurred. It does get difficult to remember where locks have occurred when searching 100 containers. Mark ALL indications and check to see if they continue outside the search area.

DETECTABLE SUBSTANCES

Below is a detailed list which shows the substances that each card can detect.

EXPLOSIVE SUBSTANCES PER CARD

Ammunition Card
Ammunition, weapons, flares, fireworks, crackers, black powder, propellants, gunpowder.

Ammonium Nitrate Card
Ammonium Chlorates/ Perchlorates, Ammonium Nitrate/Diesel, ANFO, ANNIE, Fertiliser, NQ, Amatol, Minol.

PeTN/TNT Card
Det cord, TNT, Tetryl, Amatol family, Tetrytol, Comp A/B, Baratol, Detasheet, H-6, Minol, Pentolite, Torpex [mines and torpedoes], Nitroguandine, DNT, PeTN, picric acid.

RDX/PE Card
RDX, PE4, C1, C2, C4, Semtex, Comp A/B/B3/A5, Water gel, Slurry, emulsion, rubber, TNB, CH6, HBX, PBX, H6 [sea mines] , Gelatin, Cyclotol, MNX 194 [Artillery rounds], Pax Explosives 21/25/28/41 [Canon fired munitions], RS-RDX, Hexogen, Octogen, HMX, Octol, PBXN [missiles], Torpex [mines and torpedoes].

Nitroglycerine
NG based explosives, ammunition, heart medicine, Gelatine.

Dynamite
Dynamite.

Hydrazine
Highly explosive and used for rocket fuel.

Methyl Nitrate
[Highly explosive material but highly volatile] rocket fuel.

Potassium Chlorate
[booster charge to use with Tetryl].

Sodium Nitrate
Used in explosives and black powder but also fertilizers, glass and pottery enamels, and food preservative and naturally in leafy green vegetables; bleaches and flux agents for casting and electrophotographic carrier core materials.

Sodium Chlorate
HME when mixed with sugar. Used as a defoliant, and desiccant, weedkiller, obtained from heating bleach.

HMTD

TATP
TATP only

Aluminium Powder
Aluminium only

Uranium Acetate
Uranium Acetate only Isotope 238 Uranium

NARCOTIC SUBSTANCES PER CARD

Cocaine
Cocaine [powder and liquid], Crack, Cocoa Leaf, Cocaine based medicine.

Heroin
Heroin, Heroin based medicine.

Cannabis
Marijuana, Cannabis, Hemp, Large tobacco shipments [leaf and cigarettes], plant

Amphetamine/D Methamphetamine/Ecstasy
LSD, PCP, Shaking Head, Ecstasy, Ampehtamine, D-Meth.

Opium
Opium based medicine, Opiates, Opium, Morphine, poppy plant.

Ephedrine

Fentanyl

Ketamine

Human
Human dead up to 2-3 weeks, and alive.

REPAIR AND WORKSHOP MODULE

Overview

The GT200 System is constructed from ABS plastic and is therefore extremely durable. The maintenance and repair of the unit is very easy and can be carried out in very quick time.

All items are fully modular and interchangeable.

Direction Indicator

After some considerable use the copper washers supporting the antenna require renewal. This is carried out in the following sequence:

1 Remove retaining screw for the antenna.
2 Remove the antenna and discard the old washers.
3 Wipe the antenna clamp clean. Do not use any lubricants.
4 Replace the two washers and re fit the antenna.

The above sequence can also be used for the replacement of the antenna.

Routine Maintenance

Dust builds up in the rod which enables the antenna to swivel. This can be cleaned regularly by using a high pressure air line to clear the grime. No detergents or dissolving liquid is required to be used.
A damp cloth should be used to wipe the antenna and the unit on a weekly basis. Failure to do this can cause the unit to give a poor response to indications.
A high pressure airline should be used to clear the bottom card receptacle on a regular basis. No other maintenance is required.

Sensor Cards

No calibration is required for the sensor cards.
If the edges of the sensor card begin to part then the card should be returned to Global Technical Ltd for repair. No repair should be attempted by the user.

Testing Routine for the GT200 System

Testing of the GT200 system should be carried out by every user before each operational period.

A sample of material should be placed 3 meters from the operator. The operator carries out the straight line search method to confirm operation.

Yearly Maintenance

On a yearly basis each sensor card should be tested using the following method:

1 Test sample placed 3m from the operator.
2 Straight line method used to test for indication.
3 Test sample is placed in a metal box.
4 Metal box is placed 5m form the operator.
5 Straight line method used to test for indication.
6 Test Sample is placed under the ground 3m.
7 Straight line method used to test for indication.
8 Test Sample is placed in a tank of water.
9 Straight line method used to test for indication.
10 Test sample of 0.5kg is placed at a distance of 50m.
11 The static or arc method is then used to confirm the indication.

THE PARAMAGNETIC & DIAMAGNETIC THEORY OF THE GT200

There are three types of magnetism; Ferro, Para and Dia. The theory of the GT200 for detection is by using Para and Dia Magnetism. Ferromagnetic energy is too strong for us to utilise effectively.

The ferromagnetic field of the planet is very strong but contains little information, so the GT200 uses the very low energy levels associated with para and dia magnetism.

Para and Dia Magnetism:
The magnetic properties of the material are due to circulating and spinning electrons within the atom and molecule.

When a magnetic field is applied to a diamagnetic material the induced magnetism is in the opposite direction to the applied field and the material will therefore move away from the applied field. All substances have a diamagnetic contribution to their magnetic susceptibility. As atoms and molecules contain circulating and spinning electrons, the electron, as a result of the orbital and spin motions posses a resultant magnetic moment. In a diamagnetic atom these contributions to the magnetic moment cancel out. In a paramagnetic atom there is a residual resultant magnetic moment which will cause the magnetic field from the atom to line up with the applied field.

Detection Theory
The GT200 system is sensitive to, the diamagnetic fields of substances and is the weakest of the magnetic forces, and paramagnetic fields. The presence of the diamagnetic field can be shown by placing a diamagnetic material between magnets, say, North Pole and the GT200. A diamagnetic material moves away from the applied diamagnetic field because of Lens' Law. The North Pole develops to the face of the north pole of the applied field. This means that the side of the material facing the GT200 is now the South Pole.

The paramagnetic field of the magnet, which is at right angles to the diamagnetic field does not have its polarity reversed by certain substances but it does penetrate more readily than others.

The GT200 responds when cutting field lines at particular angles responding to diamagnetic fields. The GT200 is able to sense what is called the polarity of the field, that is whether the field is from the North or the South Pole of the source. Because the GT200 responds when cutting field lines at certain angles and at a tangents, it becomes a highly directional device.

The underlying theory can be shown as:
- All GT200 phenomena are due to Para and Dia magnetic fields.
- Paramagnetic fields are characteristic of their source.
- All materials are magnetic generating diamagnetic fields and most generate paramagnetic fields as well.
- The para and dia magnetic fields of a substance tend to oppose each other and are at right angles to each other.

- The para magnetic fields do not appear to interfere with each other and they retain their identity.
- There are commonly two paramagnetic axis at right angles to each other but some substances have more.
- The GT200 system is directionally sensitive.
- The detection distance of the substance is generally determined, above a certain distance, by the mass of the material giving rise to the field.

The static electricity generated by the body is used to power the sensor cards.

DRUGS SEARCH NOTES

1 THC

This is the compound found in cannabis and marijuana. It is also found in hemp. If someone smokes marijuana it stays in the blood stream for up to 30 days.

It takes the form of a leaf compound or block and is frequently mixed with tobacco in a hand made cigarette.

Contact with this drug can be quite common in a lot of countries.

Contamination and residue are common.

2 Cocaine & Heroin

These compounds are detected in the body for around 3 to 5 days. They are also found in some medicines. The heroin card will also detect morphine.

3 Opium

This card will also detect the poppy as well as the raw material.

4 Amphetamines

This combined card is for all designer drugs based on the club scene. It covers d-methamphetamine, ecstasy, LSD and amphetamines. It is also possible for these compounds to be found in some medicines.

The whole process of the search is similar to that of the explosives with the exception that we can try to get closer to the target location. Again it is not a tool to be used on its own, we need other equipment to confirm the type and quantity of the substance.

When searching people or vehicles the first thing to remember is the possible contamination of the drugs on the area. People may have taken the drug at a party or possibly be an addict, this needs to be investigated and can be quickly determined by the experienced officer. Secondly the vehicle or bags of the people may have been used before to transport drugs. Just because there is a reading it does not always mean that you will find large amounts of drugs.

It must also be noted that people who swallow drugs for shipment can also be detected.

5 Vehicle Search

The process has been laid out in the operator's manual but extra care should be taken to follow the procedure. The most difficult thing about vehicle search is the number of ways people hide the drug.

Below is a list of possible places that drugs can be found:

- Petrol tanks
- Spare wheels
- Airbags
- Side panels
- False floor and holes
- Light lenses
- Roof linings
- Steering wheels
- Seats
- Engine parts
- Axles

This list is not exhaustive but gives an idea as to how many places can be utilised.

Remember question the people and use your instincts in addition to the GT200, dog and any other equipment you may have.

6 Airport Search

Drugs can be isolated to individual bags or people but care must be taken as the movement and speed of the luggage can make it difficult. The process has been laid out in the operator's manual.

Below is a list of possible disguises used to transport drugs:

- Soaked into clothing, refill for toiletries such as talcum powder and deodorant
- Shoe soles
- False panels in bags
- Wrapped around the body
- Formed into objects such as roof tiles, or pottery
- Sent in liquid form in items such as Coke bottles, wine bottles or fire extinguishers

Again this list is not exhaustive but gives an introduction.

7 Building Search

The procedure is detailed in the operator's manual. Cross contamination is a common problem because people who tend to deal in drugs are not clean about how they store them so sometimes it is possible to have an indication on Marijuana but the drug is actually cocaine. A reading will occur with both cards but only one substance is found. Drugs contamination is a bigger problem when searching one house for the exact location of the substance. Contamination is highly probable and will give many readings. You must be prepared for this.

Overall the success rate of drugs detection is lower but the number of readings, tend to be higher. Do not expect too much from the GT200, remember it is only the first step.

8 Customs Use

The comments on the search for drugs and the operator's manual are all relevant to the Customs department.

The following areas are possible for using the GT200:

- Container areas
- Incoming/Outgoing passengers
- Luggage
- Aircraft
- Post and parcels
- Airfreight
- Airfreight with shipping deadlines
- Coastal searches of incoming shipping and coastal areas for drug drops [This may be the role of a customs investigations department]
- Ferries – vehicle and passenger

In certain circumstances the GT200 can be programmed to locate other sensitive materials that are not necessarily drugs or explosives but restricted all the same. The GT200 will help reduce the search time for all areas and overcome the problem of random selection for search. As with the EOD teams, the GT200 forms part of the tools to search, and used in conjunction, can improve success greatly.