

Full Length Research Article

Synthesis of Arcon Method

***Jaime Parejo Garcia**

Researcher in Animal Behaviour and Specialized Instructor for Search and Rescue Dogs,
Firefighter in Seville Town Hall, Spain

Accepted 17th February, 2014; Published 04th April, 2014

Arcon Method is a training and intervention system for search and rescue dogs (earthquakes, avalanches, landslides, hurricanes, explosions...), narcotic detection dogs, explosive detection dogs, anti-personnel mines detection dogs and endangered animal species detection dogs.

Key words: Arcon method; Behavior; Detection dogs; Rescue dogs; Dog training method; Jaime Parejo; Jaime Parejo Garcia

INTRODUCTION

Arcon Method is a training and intervention system for search and rescue dogs (earthquakes, avalanches, landslides, hurricanes, explosions...), narcotic detection dogs, explosive detection dogs, anti-personnel mines detection dogs and endangered animal species detection dogs. It was created by Jaime Parejo after twelve years of study and research. The method was deemed finished in October 1994, and he chose the name Arcon in honour of his pet and pionering student. The Arcon Method proven success in rescue operations has led it to win numerous major official awards both nationally and internationally, such as the First Prize for Research granted by the Spanish Royal Canine Society and the Sasakawa Certificate of Distinction from the United Nations. Ten years later, it has also been adapted by many different police corps (Ecuador, Colombia, Venezuela, etc.) to detect explosives, narcotics, anti-personnel mines and endangered animal species, as its greater effectiveness compared to all the traditional systems has been demonstrated.

The Arcon Method is primarily based on a set of seven innovative behavioural techniques which complement each other and have an effective impact on three fundamental, interrelated parameters in search operations: autonomy, motivation and concentration. The moulding processes (reinforcement of successive approximations to the desired response) that characterise traditional canine search training methods and which are still currently used, are excessively limited to basic or primary learning processes (classical conditioning, operant conditioning, avoidance, extinction, generalisation, discrimination, cognitive perspectives, etc.). However, the same does not hold true with the Arcon Method. After twelve years of persistent, intense and complex endeavours entailing observation, study, measurement and analysis of variables and responses, verification of multiple hypotheses and field experimentation, in short, scientific research, Jaime Parejo, a tireless, rigorous scholar and

researcher into animal behaviour and learning, was able to painstakingly develop a series of techniques that are minutely interrelated and ultimately manage to positively optimise the possible levels of autonomy, motivation and concentration of the animals when performing operations involving searches for buried people, either outdoors or in confined spaces with no visibility and living space reduced to the minimum feasible displacement values. With the aforementioned enhancement of the levels of motivation, working, autonomy and concentration, fulfilment of the objective set from the start, namely better speed and efficacy when locating buried persons, was repeatedly verified (with a substantial, noticeable operative difference). The first canine rescue unit that Jaime Parejo officially assembled using this system was for the firefighters of Seville (Spain) back in 1996. Since then, official guides, instructors and rescue dogs have been trained and certified for important firefighting squads and police corps in a number of countries where there is a heightened risk of disasters (Colombia, El Salvador, México, Ecuador, Chile...).

This revolutionary transcendent scientific method has enriched and expended especially the field of animal learning. For several years now, this has also in parallel led to the rescue of buried people in several countries. It has also the Arcon Method to be chosen and approved by governments as the official training and intervention system, and this method has also been officially adopted by the leading emergency squads and security forces and corps in countries with a high risk of earthquakes. The 250 hours in the official basic Arcon courses specialisation are devoted virtually in their entirety to the introductory theoretical-practical transmission of the complex dynamics of application, interaction and performance of the Arcon techniques, in both training and in accident interventions. The Arcon Method is regarded as a major step forward for humanity, and it is currently the sole rescue system with official status, due to its exceptional efficacy in searching for and localising buried people. Following are several examples. Since 1999, many living people buried in extreme difficult search conditions have been localised by the Canine Rescue Units of firefighters, Police Forces, Civil Defense...

***Corresponding author: Jaime Parejo Garcia**

Researcher in Animal Behaviour and Specialized Instructor for Search and Rescue Dogs, Firefighter in Seville Town Hall, Spain

In 2005, the Intervention and Rescue Group of Ecuador's National Police Force demonstrated the unique effectiveness of the system for detecting explosives by winning first prize in the International K-9 Competition in Indiana, United States for Police and Military Corps, after vying for the prize with leading units from the United States, Canada and Latin America. Since 2006, the number of anti-personnel mines detected by the Mobile Customs Squads of Colombia's National Police Force has increased. The number of endangered animals detected by the Environmental Protection Unit of Ecuador's National Police Force has also risen, thus stanching the illegal trafficking of these animals in the Galapagos National Park, the Canine Brigade of the Caracas Police Corps has stepped up its detection of narcotics and explosives, etc. The basic instruments used when applying the Arcon techniques include:

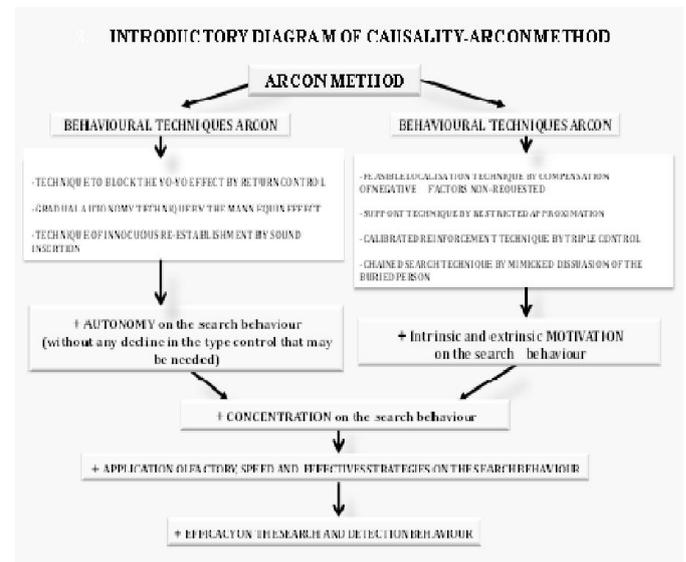
The guides bodily comportment. A methodical process of analysing and observing canine behaviours and work environments. Individualised and constant technical dosage of the behavioral resources. Painstakingly-designed procedure of interaction amongst all the behavioral techniques. The animal trained using this method tends to more intensely exploit its physical and psychological resources during the search process in a way that is particularly natural, voluntary and fruitful. Below is a very basic, schematic assessment of the incidence of the Arcon Method on the three main parameters: autonomy, motivation and concentration.

Autonomy: There is repeated proof that when a dog experiences a higher degree of work autonomy, its degree of concentration on the job increases in a parallel fashion. This system allows this level of autonomy associated with a solid focus on the search behaviour to be optimised. The animal dissociates from the guide without any harmful interruptions in its line of search, such as sporadic returns to the guide or bodily actions with the goal of catching sight of the guide. We stress the fact that excessive participation by the guide (a very common mistake), either verbal or physical, during the canine work behaviour generates the consequent negative expectation of support in the dogs memory storage, which only becomes more pronounced and meddlesome during the search as time goes by without the animal having managed to perceive the desired scent stimulus of a potential buried person. There are three main Arcon techniques that taken together largely enable the goals on the expected working autonomy to be achieved: Technique to block the yo-yo effect by return control (applied preventatively). Gradual autonomy technique by the action of the mannequin effect (applied in the phases of education, training and occasionally in intervention). Technique of innocuous re-establishment by sound insertion (applied occasionally in the initial education phase).

Motivation: Applying this system generates in the animal a motivational drive that is especially strong for this type of work, thus fostering the dogs levels of intensity, perseverance and concentration during the search operation, as well as shielding it from possible deviating stimuli. There are four Arcon techniques aimed at preserving or nurturing this level of specific motivation: Calibrated reinforcement technique by triple control (applied in education and training phases). Feasible localisation technique by compensation of negative factors (a technique that helps to keep the dog motivated in the

search by eliminating some items in the field that may adversely affect its search, such as passing animals, food, etc- this technique is applied only in educational phases, and occasionally during training). Chained search technique by mimicked dissuasion of the buried person (a technique used to dissuade the dog from stagnating at the first buried person and to encourage it to go and find the next buried person. It is applied in the phases of education, training and during interventions). Non-requested support technique by restrained approximation (a technique based on providing moderate support to the dog to help it find the buried person. the support is only given when not requested and is applied occasionally only during the initial stages of education to keep motivation high). It is important to bear in mind that in the education or learning phase, the animals experience of not successfully achieving the goals, that is, of failure, will lower the expectation evoked by the training activity and the respective setting, thus seriously jeopardising the degree of motivation required to face the learning process and for the future performance of the search work. This negative circumstance can be avoided by applying the aforementioned techniques, while they also contribute to the fact that the mere search and the environment of rubble in themselves generate a powerful reinforcement effect for the animals. The search activity provokes in dogs a positive rise in their excitation level, which is added to the motivation spurred by the incentive.

Concentration: In this case, the animals degree of voluntary attention in the search will be primarily associated with the two previous parameters (autonomy and motivation), and will not be dependent on a possible application of specific techniques. The dog trained using this system shows a visible and continuous high degree of concentration in the search, experiencing a solid line of attention. Concentration could be defined as the organisation of the animals attention in order to perform a given task. In the case at hand this entails the olfactory process of sniffing with the goal of capturing human scent molecules in the air that allow the animal to head towards the source, namely, the person buried among rubble, earth, snow, clay, etc. A higher level of concentration will enhance the application of the dogs olfactory reception and elaboration devices, thus limiting its field of awareness and in consequence fostering its ability to capture the scent of persons who may be buried.



ARCON METHOD TECHNIQUES

- 2.1 Technique to block the yo-yo effect by return control
- 2.2 Gradual autonomy technique by the mannequin effect
- 2.3 Technique of innocuous re-establishment by sound insertion
- 2.4 Feasible location technique by compensation of negative factors non-requested
- 2.5 Support technique by restricted approximation
- 2.6 Calibrated reinforcement technique by triple control
- 2.7 Chained search technique by mimicked dissuasion of the buried person

The Arcon Techniques are strictly faithful to the rational demands of the conventional scientific technique and have been repeatedly subject to the corresponding process of experimentation and verification

Technique to block the yo-yo effect by return control

Objective

To avoid possibly generating the yo-yo effect in the dog by applying a series of specific preventative guidelines. The yo-yo effect is a behavioural phenomenon that I discovered in certain dogs, who systematically returned to their guide after going a certain distance, thus obeying a type of entrenched mental inertia. This is a habit that is especially detrimental in canine rescue work, which impairs the dogs autonomy and initiative in search operations.

Circumstances when applied

Fundamentally when the dog makes some type of return to the guide, or stays away waiting to be called.

Basic guidelines

- Keep the use of call orders to a minimum. I have noticed that excessive use of call orders was the main cause leading dogs to acquire this habit.
- When the dog returns, avoid any type action that implies a certain reinforcement effect (saying affectionate words, petting, play-type behaviour, etc.).

Gradual autonomy technique by the mannequin effect

Objective

By managing to get the dog to dissociate the guide as a possible support element, we will gradually enhance:

- The level of autonomy and concentration in the search.
- The scope of the reinforcement due to the important effect of the contrast produced from the guides unchanging mannequin attitude to the subsequent active, euphoric reinforcement.
- The dog duly remaining at the location point while signaling.

Circumstances when applied

When in the working session the dog returns to the guide or without distancing itself from the guide tries to draw his/her

attention in any way (barking, standing on hind legs, etc.) the guide should assume the mannequin pose, giving reinforcement in a rational and balanced way in working sessions or real interventions.

Basic guidelines

The guide should always keep a firm, inert and unchanging stance before the dog, omitting any type of physical (even facial) or verbal reactions, as if s/he were a mere mannequin.

Technique of innocuous re-establishment by sound insertion

Objective

To innocuously re-establish the dogs working behaviour in view of possible deviating distractions. Generally speaking, as repeating the search order is regarded as harmful due to its negative incidence in the dogs line of initiative, I chose to select this peculiar procedure, which is highly effective

Circumstances when applied

This resource can be applied under the relative silence that tends to characterise the initial stages of learning, although obviously it would not be feasible in a search operation with adverse auditory factors. However, it should be borne in mind that a dog in that phase no longer suffers from the same fragile susceptibility as at the start, since their own ability to re-establish their behaviour has also been substantially developed.

Basic guidelines

The dogs perception of a brief interfering noise provoked occasionally (something dragging on the ground, the blow of an object, etc.) causes a type of instantaneous rupture in their deviated and incipient line of attention, acting as a sort of fleeting pause after which the desirable base conduct is once again re-established. - We should try to ensure that the dog does not perceive the source of the sound made. - The sound issued should be inserted as simultaneously as possible with the dogs manifest distraction and intensely enough without being excessive to achieve the OBJECTIVE in each instance.

Feasible location technique by compensation of negative factors

Objective

- To ensure that the dog is successful in the search work without undermining the target learning progress of the exercise.
- To preserve and foster the dogs motivational state, which is key for the proper evolution of the learning process.
- To avoid detrimental situations of failure and frustration in the initial training stage, thus fostering an increase in the positive stimulus that the rubble environment should provoke in the dog.

Circumstances when applied

During the learning phase and occasionally during training.

Basic guidelines

- An analysis and differentiation should be carried out on those factors or elements that might hypothetically affect the dogs search either positively or negatively (level of motivation, presence of major stimuli, weather conditions, etc.).
- We should then define the basic lines of the exercise to be performed, obeying a supposed state of balance or prior compensation that makes it possible for the dog to achieve success with the corresponding progress and without support from the guide. We shall primarily intervene on basic factors that can be manipulated, such as the position of the release point or the location of the hideouts.

Non-requested support without request technique by restricted approximation

Objective

- To carry out a successful search. - To increase the level of security when signalling the buried person.

Circumstances when applied

- This technique is exclusively applied in those occasional cases when providing controlled support is considered less counterproductive than the dogs imminent failure, although repeated use of this technique could jeopardise the dogs potential autonomy.
- When a certain dose of insecurity negatively affects the signalling guidelines.
- This is mainly used during the initial learning phase.

Basic guidelines

- The guide approaches the dog by walking soberly towards the localisation point (where the dog tends to be) without any type of extraneous movement or verbal utterance. The guide should stop when s/he estimates that s/he has conveyed to the dog the minimum support needed.
- This technique should not be applied should there exist a prior request for support or a return by the dog to the guide, with the goal of avoiding possible negative conditioning.

Calibrated reinforcement technique by triple control

Objective

- To enhance the positive effect of reinforcement
- To foster the signalling pattern when needed
- To control the positive achievement of success by the dog in the search task, thus preserving and fostering its motivational level towards the activity.

Circumstances when applied

During the initial learning and training phase especially when carrying out chained searches.

Basic guidelines

The instructor places him/herself at a strategic point that allows him/her to observe with minimal interruptions the

behaviour of the dog carrying out the search and act in consequence. S/he will control three fundamental variables via the transceiver:

- The specific stunt person who effects the reinforcement.
- The best time to start the reinforcement.
- The type of reinforcement (intensity, duration, etc.). The instructor must previously evaluate an entire set of essential factors:
 - Learning goals of the exercise.
 - Signalling by dog (fluency, perseverance, target, etc.).
 - Energy or motivational state observed in the dog.
 - Possible states of confusion or inhibition in the dog.

In fact, during the exercise the instructor should capture and analyse any meaningful nuances reflected by the dog during the search or signalling action in order to thus truly effectively control the three aforementioned variables.

Chained search technique by mimicked dissuasion of the buried person

Objective

- To keep up the dogs required levels of autonomy, motivation and concentration during possible consecutive searches and their respective signalling.

Circumstances when applied

- In search operations during learning, training or intervention.

Basis Guidelines

When the guide notices that the dog is signalling one of the hidden extras, s/he shall approach the dog at a run to reward it with a discreet pet and a brief verbal congratulation (in a real intervention, mark the rubble with spray paint should the victim not be accessible), attach the leash quickly to the dog and in plain view make a energetic, determined bodily turn away from the signalled point, which should remain then at the guides back. Then s/he should turn towards the new area to be searched, and a new search begins. I have seen that this bodily avoidance action by the guide at the signal point tends to provoke in the dog a special dissuasive effect, usefully freeing it from the attraction exerted by the extra and thus fostering its predisposition to try to localise another buried person, especially driven by the expectation of the chained search already created, in which the reinforcement comes unpredictably. The guide should try to ensure that this back-turning is seen by the dog, and should always keep the point signalled by the dog at his or her back. Likewise, the possible sense of frustration that could be sparked by the total lack of reinforcement is positively attenuated by the discreet reinforcing actions of the guide, thus avoiding the emergence of a possible inhibiting effect. We should take advantage of this incipient sense of frustration, a certain impulsive drive, which will serve to energise and motivate the next search behavior.

Phases in the training process Arcon

3.1 Signalling

3.1.1 Exposed Chest

3.1.2 Concealed Chest

3.2 Simple Search (one buried person)

3.2.1 Introductory Rubbish Heap

3.2.2 Working Rubbish Heap

3.3 Chained Search (two or more buried persons)

3.3.1 Two Buried People

3.3.2 Three or more buried people

3.1 Signalling (Exposed and Concealed chest)

The goal of this phase is to condition the dog to emit a bark towards a non-visible human located underground. The dog must have previously become accustomed to share play with unknown people, as well as the act of barking fluently, due to the simple natural impulse generated by the excited desire to share this play with a determined object. It should be pointed out that conditioning the dog to bark at any visible person to play should be avoided, as the dog might learn to bark to achieve goals in other situations. I also believe that the bark should not be conditioned to a prior order, which would generate in the dog a wrong expectation. The dog would have previously been subjected to several days of deprivation of fun activities and exercise. By doing so, we foster the momentum needed to energise the execution of these first few guidelines while simultaneously increasing the positive effect of reinforcement. The extra (stuntman) must be a person that the dog knows (but not the guide), thus fostering the initial degree of trust and stimulation needed. From the start, the dog dissociates from the guide as a possible primary element-goal. The dog must previously become familiar with the setting where the chest is placed. We should use whatever motivator provides the most incentive for the dog (ball, roller, doll, stick, etc.), clarifying that this should only be used in the initial stage of learning with the purpose of dog associating its simple specific smell as the sole discriminatory stimulus it reacts to by signalling and thus avoid signalling towards the buried person, who will not have this stimulus.

We should avoid working under adverse weather conditions (high temperatures, heavy rains, etc.) that could spur negative reactions or distraction in the dog. The observers should place themselves at least 15 metres from the working area and avoid movements, postures or sounds that might distract the animals behaviour. In this initial phase, the dog will be especially susceptible to any type of distraction, yet it is fundamental for it to perform successfully. For this phase, I feel a special predilection for the use of chests located on paved surfaces (asphalt, concrete, etc.) with no traffic. Obviously, with pavement we substantially minimise the potential presence of interfering olfactory stimulants, which nevertheless would be inherent in what we call the terrain. We should remove any object or material from the surface that hypothetically might erroneously draw the dogs attention (tools, clothing, excrement, etc.). At first a hard wood or plastic lid should be used, as they are more manageable and durable (with a handle in the middle). The dog should first be left in a zone away from the working area for a few minutes so that it may urinate, defecate and relax. This is a general rule in the entire learning phase. Bare chest: 1st step The guide with the dog on a leash should head towards a place around 20 metres in front of the chest (variable according to the motivational state observed in

the animal). During the walk towards the leash release point, is removed the guide must emotionally activate the dog, mentally warming it up for the job. The guide should not repress any possible valuable impetus shown by the animal by avoiding, for example, the use of extensible leads or pull backwards on the lead. The extra will be waiting for the guide halfway between the chest and the release point. S/he should make movements to incite the dog, showing the dog the motivator and making voices that truly stimulate it until achieving a positive effect of attraction on the dog.

When the extra deems that the dog has been provoked to a sufficient degree of excitability and impetus, s/he will quickly move towards the chest and will get into the chest, in plain view of the dog, repeating the stimulation moves before immersing him/herself fully in the hole and covering him/herself with the lid. The instructor should carefully observe the dogs behaviour outside and indicate to the hidden extra (by means of a transceiver) the right time to reinforce the emission of barking (even though the extra might hear the dog barking, s/he cannot know whether the barking is addressed improperly to the guide or another element, and thus whether or not s/he should stop the signalling based on the possible state of inhibition or another aspect in the dog. Thus, technical guidance from the outside is necessary). The extra should not verbally praise the dog precisely when s/he is indicated as this might dovetail with a silent pause. This praise should, to the extent possible, be simultaneous with the next bark issued in order to thus foster the required time contiguousness that allows for proper association and conditioning. Immediately afterwards the lid is removed and the extra immediately praises the dog by petting it and encouraging it to draw closer in order to thus heighten its level of confidence in this strange new situation. Now is when the guide may approach the dog to praise it and pet it as well. The extra may come out of the chest in order to share the euphoria and play with the dog alongside the guide.

The extra should always begin the verbal reinforcement from inside the hideout, rectifying as much as possible the delay that there might be between the signalling bark of the dog and the opening of the chest. The reason why the guide does not verbally reinforce nor draw close to the dog until the extra has done so is for the dog to clearly identify the extra(s) as the goal-element, and thus dissociate the guide with this role and with that of possible means for getting reinforcement. This is the main reason why the Arcn method does not include the possibility of the guide taking on the role of extra, even though this is quite a widespread practice in the initial phase. Thus we solidly manage to avoid the risk that in the accident the dog improperly leaves the localisation point and returns to the guide occasionally. Additionally, we preserve the dogs invaluable potential for autonomy in the search process. The dog learns to bark at the person hidden under the surface thanks to its basic mechanism of associative learning. Exposed chest: 2nd step The release point is kept, but in this case the dog can make out the chest covered by a lid without the prior presence of the extra.

Concealed chest: 1st step

- The lid is partially covered with rubble. The instructor should control more or less covering when carrying out

this next exercise based on the possible degree of inhibition observed in the dog before including the new concealed element, until reaching the point in which the dog signals confidently and fluently towards a lid that is totally covered in rubble.

- When the figure and guide reinforce the dog, they should bear in mind that it is crucial to convey to it the necessary degree of emotion, imbuing their movements, voice intonations and petting with the required excitement that will manage to intensely stimulate the dog.

Concealed chest: 2nd step

The signaling phase will end when the dog satisfactorily performs this exercise with another chest that is totally concealed and in a different location. Thus we should check whether the element rubble has acquired enough strength as a predictive stimulus for the dog. - The rubble used with the second chest should be different from that used with the first one, although obviously they will share similar basic features that will enable the dog to generalise. - One key factor to bear in mind when preparing these exercises is to always predict that the extra must be able to remove the lid covered with rubble without help. Thus, the weight and position of the elements lying on top of it must be controlled and the necessary trials at opening the chest should be held before the exercise. - With the actions with the concealed chest, all the extras must wear the appropriate protective helmet and any other safety gear required. The extra should partially move the lid to give immediate reinforcement. During the signalling phase, the following techniques should be applied whenever necessary:

- Gradual autonomy technique by the mannequin effect
- Technique of innocuous re-establishment by sound insertion
- Feasible localization technique by compensation negative factors

Simple Search (one buried person)

(Introductory rubble heap and rubble heap training site)

An introductory heap of rubble is that which does not exceed an approximate surface area of 50m² and has a moderate height. The emotional activation factor must be applied in all the search exercises, as prior stimulus is key during the walk (several metres) before releasing the dog. The distance from the release point to the rubble heap should not be more than 25 m. For the first cover of the hideout, a fragment of board or something similar should be used, and rubble should be placed over it until achieving a totally hermetic closure that prevents the dog from catching any glimpse of the extra (stuntman) or from reaching him/her. In the burials, you should also try to avoid any possible distinctive features that might foster in the dog any type of visual discrimination in the future work areas and their consequent harmful association. When the extra removes the closure it might be very harmful for the dog to get any sort of negative impact from any element in the rubble and thus generate the consequent negative conditioning in the animal. This circumstance must be prevented and controlled by means of prior rehearsals, as mentioned above. The dogs should be in inside their corresponding transport cages, in the

waiting area, without any possibility of seeing the working area. The extras (stuntmen) are still people who are familiar to the dog during the introductory rubble heap phase and the first search in the rubble heap training site phase in order to continue thereafter with extras who are total strangers. The dog should not be allowed to become familiar with the training site in order to foster the ability to adapt to new environments. The dog should feel attracted at first by the simple sight of the rubble heap, which after the concealed chest phase should have become a powerful predictive stimulus. Occasionally it can be seen that when certain dogs perceive the source of the human scent of the buried person they urinate or even defecate after the unavoidable relaxation of the sphincters prompted by the consequent emotional reaction. In some dogs there is an impairment of their barking ability which they cannot properly control and that harmfully hinders the fluency of the barking signal. The sense of frustration or anxiety during the search may at times be expressed with repeated chewing of blades of grass or other items. Rubble heap training site.

The dog that manages to properly localise and signal the stuntman buried in the introductory rubble heap will then go on to work in larger areas, called rubble heap training sites. We should gradually push the dog to search further, beginning with a moderate distance from the release point to the buried person. Should the motivator be an object whose scent might be detrimental to the dogs search ability, it should be replaced by a simple stick or another innocuous item (with no scent), while striving not to diminish the intensity of the reinforcement. We thus avoid the future risk of possible avoidance actions when signalling buried persons. The source of human scent coming out of the rubble now becomes a powerful predictive stimulus for the dog. - Just like other species, dogs have the capacity to respond in the same way to different stimuli that bear certain similarities. For this reason, it is feasible for them to generalise when faced with any rubble heap or different human scents. In the rubble heap training site, the distance from the release point to the location of the buried person should gradually be increased, as it is the dogs own motivational state that will drive it to carry out the olfactory search for human scent molecules that will guide it towards the source emerging from the rubble, emanating from the buried extra.

The instructor should determine

- Possible suitability of the rubble area
- Location of the hideout
- Position of each dogs release point

The dog should get used to searching for buried people by sniffing. To achieve this, we should gradually try to reduce the possibility of it using existing traces on the terrain to head towards the target, and these traces should not be associated with key localisation signals. Sniffing is the only reliable procedure for searching for buried people after a cave-in. The people moving around the rubble area during the set-up when digging out the hiding place and hiding the extra should adhere to a pre-set route for entering and leaving this area. The release point should always be on the opposite side of this route. Another resource regarded as valid is to riddle the terrain with multiple traces in a premeditated fashion.

Likewise, I discovered that certain dogs even used the traces left by the dog that went before them as a resource to guide themselves to the buried person. This circumstance can easily be solved by a methodical control of the dogs turns at searching. Upon noticing that certain dogs presented symptoms of stress (lack of vigour, inability to concentrate, increase in salivation, etc.) in their a search behaviour without any apparent cause, I managed to detect that the origin lay in the previous capture of pheromones by the male that had been excreted by some female in heat in another place and time (aerially, in the urine, etc.). This state can last up to several weeks, during which the dog should be withdrawn from any activity that requires psychological effort. The hideout should not be used more than once by the same dog, nor should the rubble heap once the feasible burials have been done. Under no circumstances should the dog ever be upbraided in the rubble area, thus avoiding among other consequences the possibility that this area becomes a conditioning inhibiting stimulus for the dog, which might even slightly diminish its possible state of motivation or concentration.

I should point out that even though I am in favour of the dogs learning by certain direction orders (a relatively simple operation), I am steadfastly opposed to using these orders during everyday training, as it could harm the dogs initiative and autonomy to a greater or lesser degree, as it might harmfully identify the guide as a possible guiding resource during search operations and certain situations, thus visibly harming its required level of concentration. The following techniques are applicable in this simple search phase: Gradual autonomy by the mannequin effect -Techniques of Innocuous re-establishment by sound insertion. Feasible localization technique by compensation of negative factors. Support without request by restricted approximation.

Chained Search (two or more buried persons)

We should begin the chained search learning process with only two buried extras. The respective hideouts should be located in the rubble heap training site separated by an average distance of 50 metres. Once one of the two extras has been signalled by the dog, the chained search technique by mimicked dissuasion of the buried person should be applied, so that as soon as the extra who has been localised and signalled secondly is the one who reinforces the dog as described in the simple search. After reinforcing the dog and then withdrawing, the guide puts on the leash and takes the dog up to a middle point towards the second buried person, and releases the dog once again. In this way, we strive to ensure the dogs success in the second localisation and the consequent inclusion of this new work scheme in its memory and behavioural repertoire. The instructor should watch carefully in order to use the transceiver to warn the extra who should reinforce, as it will be impossible to fully predict which buried person the dog will capture and signal first. When it has been confirmed that the dog properly performs the chained search behaviour with two buried people, a third hideout and extra should be added, keeping the average distance of 50 metres from the other two. We should continue applying the same basic mechanism, mimicked dissuasion with the first two extras signalled and the reinforcement (especially pronounced) in the case of the third and last extra signalled. Following this pattern, several different search operations with variable

numbers of buried persons (one, five, six, etc.) should be performed. The extra who gives the reinforcement should also vary, but always bearing in mind that the chained search comes to an end for each dog with the appearance of the main reinforcement (from the guide and extra). The dog gradually includes this new scheme of chained searches into its behavioural repertoire, developing the new expectation of the possible continuity of the search after a variable number of signalling acts, with the main reinforcement appearing in an unpredictable fashion. This type of circumstance actually becomes an added stimulus for the dog. The dog should gradually come to be released from the signal point itself. Before each search instruction, the dog will always be placed on the leash with the purpose of its gradually becoming used to restarting the search without ever having to await the guides order.

The following techniques will be applied in this chained search phase:

Gradual autonomy technique by the mannequin effect - Feasible localisation technique by compensation negative factors

Calibrated reinforcement technique by triple control

Chained search technique by mimicked dissuasion of the buried person

When the chained search behaviour is deemed to be consolidated in the dog, we should gradually subject it to different types of discriminatory trainings (olfactory, visual, etc.) and have it carry out searches with the presence of adverse factors (confinement, noise, etc.).

A moderate process of individualised intensification should always be applied. Once the initial training process has been completed, the dog will show an especially solid and effective level of autonomy, motivation and concentration in the searches.

From here on out, the following techniques should be applied constantly:

Gradual autonomy technique by the mannequin effect

Calibrated reinforcement technique by triple control

Chained search technique by mimicked dissuasion of the buried person.

Approved by Legal Resolution No. 1998/41/12727 on 5 May 1998 by the Ministry of Education and Culture of Spain, in compliance with Royal Decree (1/1996, 12 April), that the Arcon Method, (including among other content, the set of innovative behavioural techniques, training phases and corresponding denominations), whose author is Jaime Parejo Garcia, is duly registered and legally protected as scientific copyright in the General Registry of Intellectual Property under No. 23474.

About the Author Jaime Parejo Garcia

Jaime Parejo is Canine Rescue Expert of the Firefighters of Seville, Spain. He is regarded as an internationally renowned expert in the speciality of canine catastrophe rescues. To date, he has been given numerous official awards, distinctions and congratulations both nationally and internationally from different governments and institutions (the Spanish Committee of the Mankind Programme and UNESCO's Biosphere, the UNESCO Centre in Melilla, the governments of Spain,

Colombia, China, etc.). Specific examples include the First Prize for Research granted by the Spanish Royal Canine Society in 1998, and the Sasakawa Certificate of Distinction from the United Nations in 2005, both entailing worldwide recognition of his transcendent international research and teaching efforts as well as the scientific advances of the Arcon Method in reducing the number of disaster victims. In both case, he was the first Spaniard to earn such prominent distinctions. Santo Tomas University in Colombia: award for "A Life Time of Support to Science and Investigation" and their recognition of Arcon Method as "Transcendent legacy to Science and Human Welfare", the Official Association of Veterinaries in Malaga, Spain, maximum official award: "The Gold V", etc. The Canine Units in Spain, El Salvador, Colombia, Ecuador, etc. using Arcon Method, are finding and

saving people's lives survivors in earthquakes, land slide, and by finding mines and explosives... in general from the year 1999.

REFERENCE

- Jaime Parejo García, ARCÓN, Un Nuevo Método para la Formación del Perro de Salvamento en Catástrofes, (Edita Servicio de Publicaciones de la Escuela Andaluza de Técnicos en Emergencias, Grupo PROYEMER), ISBN: 84-605-8508-5
- Jaime Parejo García, El Perro de Salvamento. Formación Método Arcón (Edita TIKAL) ISBN : 84-305-9456-6
- Jaime Parejo García, Método Arcón. Reconocido avance científico que incrementa el salvamento de vidas (Edita Editorial Académica Española), ISBN-13: 978-3-8473-6242-5
