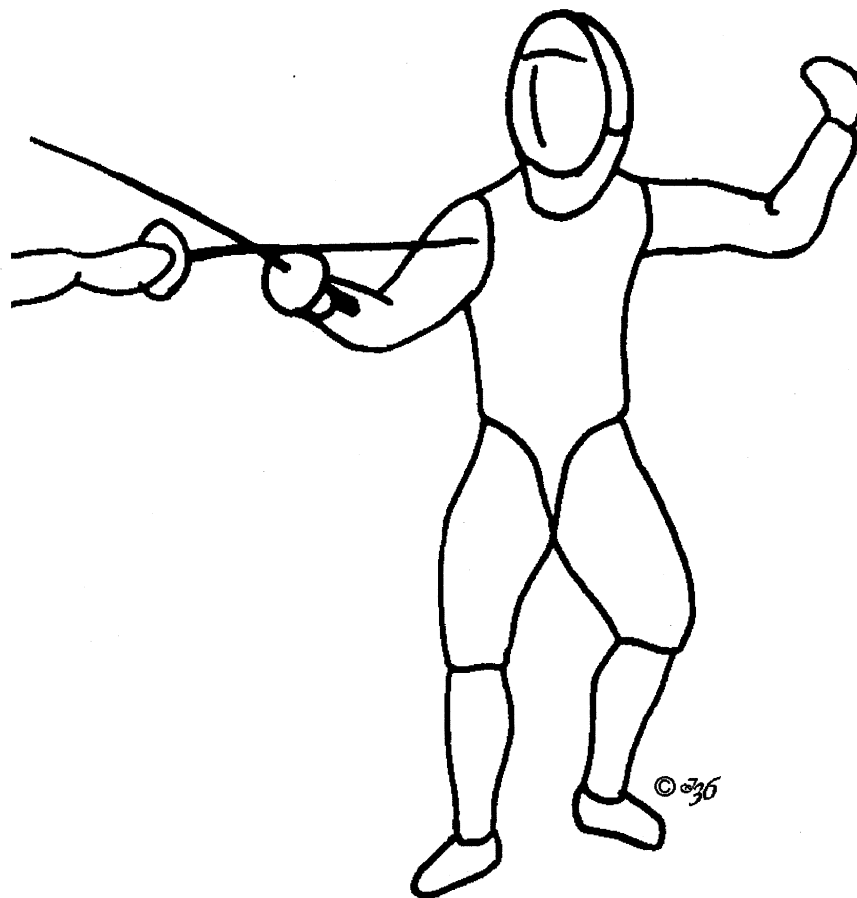


# **The Fencers' Workbook**

## **GENERALITIES**



# Acknowledgements

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# CHAPTER I

## ATTACKS ON THE PREPARATION

### THE PREPARATIONS

#### DEFINITION

*The preparations are varied actions consisting of footwork, movements of the blade and weapon arm, and combinations of both that allow offensive actions to be facilitated and reinforced.*

#### CLASSIFICATION

The preparations can be classified into three categories:

##### A - Preparations consisting of leg actions

Consisting of the following displacements:

- steps,
- jumps,
- half-lunge.

##### B - Preparations consisting of actions of the blade and weapon arm

- Engagements, change of engagements, double engagements etc.

- Attacks on the blade: pressure, beat, froissement.
- Takings of the blade: opposition, bind etc.
- Feints: direct, indirect, compound.
- Absence of blade: invitation.

##### C - The combinations of these preparations

- The engagement and the step forward.
- The change of engagement and the step forward.
- The beat and the jump.
- The feint and the step forward.
- The feint and the half-lunge, etc.

## THE ATTACKS ON THE PREPARATION

#### DEFINITION

*Attacks on the preparation consist of various offensive actions that allow a fencer to exploit the opponent's different preparations.*

#### TECHNICAL STUDY

Attacks on the preparation are carried out by:

##### A - Simple attack

Direct: by straight hit in the line of the engagement at the precise instant of blade contact.

Indirect: by disengagement or cutover without blade contact.

These actions are executed by derobing the engagement, change of engagement, the second contact in a double engagement, a beat, a froissement, an attempt to take the blade etc.

##### B - Compound attack

Compound attacks should preferably consist of only one feint (direct disengagement, cutover). The indirect feints are executed by derobing the preparation. The final part of the attack is made whilst deceiving the parry (trompement) that has been provoked by the feint.

##### C - Attack on the blade

Attacks on the blade are executed:

- by a beat, preferably on feints of the weapon arm, followed by direct or indirect attacks,
- by a beat or pressure in the form of a counter-beat or counter-pressure, followed by direct or indirect attacks.

##### D- Takings of the blade

Takings of the blade are executed on the feints of the weapon arm. These takings may be simple or compound, and the attacks to which they are linked may be direct or indirect.

#### TACTICAL STUDY

To be effective, the offensive actions must in general be as simple as possible. They naturally depend on correct judgement and the ability to assess and exploit a favourable situation (à propos) at a glance, in order to benefit from the element of surprise, without allowing the opponent to terminate the preparation and execute an effective defensive action in time.

An offensive action on the preparation is difficult to parry: the fencer who is attacked is concentrating on the preparation and the offensive action that he is developing, to the detriment of his defence. An effective defence demands excellent footwork, and moving closer to the opponent is always dangerous.

If the offensive action is developed at the correct moment by exploiting the preparations of the weapon arm of a fencer who steps forward, this fencer is at a disadvantage for the following reasons:

1. He is attacked at the moment that he has only one point of support on the ground.
2. He is obliged to complete his step forward to regain stability and consequently begin a retreat.
3. The effectiveness of his defence is reduced.

Attacks on the engagement, change of engagement or double engagements, etc. are not common in electric Foil because few fencers use them for attacking. It is, however, possible to give the opponent the opportunity to take the blade and to then exploit his ensuing preparation of the weapon arm. On the other hand, the beat is frequently used and precedes many attacks. It is possible to derobe it, or even to respond to this attack on the blade, by developing a direct or indirect offensive action.

The most common preparations are still the feints. They tend to reveal or elicit a reaction, but they are vulnerable to attacks on the blade or takings of the blade from the beginning of the extension of the arm. In these cases, the conventions oblige the fencer to return to defence during the development of the opponent's attack.

### **APPROPRIATE DEFENCE**

The appropriate defensive actions are those reflex actions corresponding to the type of offensive action used; discussed for the three weapons in the individual Workbooks.

A premeditated defensive action can be used when the attack on the preparation has been judged. In this case, it must be determined by the choice, size and speed of the preparation and thus allow for a parry and riposte to be executed.

### **GENERAL CONSIDERATIONS - FOIL**

Judgement and a'propos are naturally the essential qualities for utilising offensive actions on the opponent's preparation.

The short instant during which the offensive action on the preparation can be executed requires great speed and perfect coordination. It must surprise the opponent before his offensive action is developed. If executed too late it takes the form of an attack into the attack, or of a counter-attack and naturally cannot be favourably judged. The necessity to be in distance for developing the offensive action obliges the fencer to step forward. Generally he covers the step forward by actions of the weapon arm with the aim of protecting himself and preventing any classical offensive action on the step forward. Attacks on the preparation allow these movements of the weapon arm and the legs to be exploited.

An offensive action that consists of deceiving a change of engagement is often mistakenly called a "counter-disengagement"; in reality a counter disengagement is the action of deceiving a counter parry. Although the point returns to the same line, it does not make a complete circular movement, therefore it is not deceiving a counter parry, and the trajectory that the point follows is that of disengagement corresponding to the line in which the change of engagement finishes.

### **GENERAL CONSIDERATIONS - EPEE**

In Epée, attacks on the preparation are infrequent. It is rare to find épéists whose preparations can be exploited effectively. Maintaining good covering of the advanced target limits the preparations consisting of engagements, change of engagements or beats, etc.

The most commonly used preparations in Epée are the feints, principally those with angulation that sufficiently uncover the advanced targets to attract a counter-offensive action to be utilized in developing the attack. The derobement of this action is that of a counter-time.

The advanced targets are choice targets and the épéist can attract the opponent or facilitate his preparations by deliberately opening up a target, then reacting at the precise moment when the opponent exploits what he believes to be a fault.

### **GENERAL CONSIDERATIONS - SABRE**

In Sabre, a simple offensive action can easily be parried, or a compound attack can be counter-attacked, so numerous sabreurs reinforce their actions with preparations and thus offer the opportunity to exploit them very effectively. In general, the preparations used most frequently are the feints and beats. Engagements, change of engagements, etc. are not used as the distance and the position of the blades make them much too dangerous.

Feints provide the opportunity to attack the advanced targets, and they can be reinforced with beats, but they must be direct, or at most indirect (never compoud), in order to reduce the risk of counter-offensive actions.

Counter-time offensive actions which are very common in Sabre, are often prepared with feints having the arm 3/4 extended, or by invitations. When the action is well judged it is possible to derobe with second intention. This tactic is very common in Sabre.

### **TEACHING RECOMMENDATIONS**

As soon as the pupil possesses good technique, the attacks on the preparation must be worked on in each lesson as they correspond to the reality of the bout and develop the pupil's sense of timing, ability to choose the most opportune action and speed.

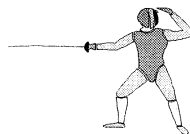
Attacks on the preparation require the Master to sustain his attention, especially when he

combines the movements of the weapon arm and the footwork in order to maintain correct distance.

The Master first teaches simple attacks having the aim of derobing or acting on preparations that are easy to exploit. He increases the difficulty by the choice of preparations he uses, their size and speed.

To develop the pupil's ability to choose the most opportune action as much as possible the Master chooses two different preparations that he first executes normally, then without giving instructions. He then varies his actions to approximate, as closely as possible, bouting conditions.

When the Master knows the time to draw out the pupil by using his natural speed and speed of execution, these exercises are very attractive. They are profitably applied in the bout by exploiting the opponent's game and with continual displacements and mobility of the blade.



## CHAPTER II

# COUNTER TIME

### DEFINITION

*Counter time is an offensive action that is executed after having parried an opponent's counter-offensive action.*

### CLASSIFICATION

Two technical elements contribute in determining the classification of counter-time actions.

1. The manner in which the counter-offensive action is parried: either with opposition or as a beat.
2. The nature of the final part of the offensive action: either it deflects the blade aside, or it dominates it.

As a function of these technical considerations the classification is as follows:

- counter time by attack on the blade,
- counter time by taking of the blade.

### TECHNICAL STUDY

The execution of a counter-time action comprises three principal phases:

- the preparation,
- the defensive action,
- the final offensive action.

#### A - The preparation

The preparation must provoke a counter-offensive action, studied in detail in the preceding chapter. It naturally has an offensive character.

#### B - The defensive action

Although it is closely linked to the final action, it differs little from a parry. It must deflect the opponent's counter-offensive action in time and is executed in two ways: with opposition or as a beat by extending the arm either for beginning the taking of the blade, or for immediately launching the attack.

#### C - The final part of the offensive action

The final offensive action is carried out immediately after the defensive action; sometimes it is not possible to precisely determine the moment in which the defensive action finishes and the final offensive action begins.

Generally, the offensive action is developed:

- 1 - By attack on the blade:
  - direct or indirect after a parry as a beat (or as a beat attack),
  - indirect or compound of one feint after a parry with opposition (or pressure).
- 2 - By taking of the blade:
  - simple without intensity after a parry with opposition,
  - simple with intensity and followed by an indirect attack after a parry with opposition.

### TACTICAL STUDY

Counter-time actions are typically actions of second intention. They consist of provoking, by an offensive preparation, the opponent's counter-offensive action in order to exploit it.

#### A - The preparation

Of the three parts which make up a counter-time action, the preparation requires the most tactical sense, namely:

- *judgement*, in order to provoke a counter-offensive action in a favourable line,
- *realism*, in order that the opponent is sure that he is exploiting the preparation without guessing the trap that has been laid.

#### B - The defensive action

Is the least tactical phase because its role consists of deflecting the opponent's blade. On the other hand, it requires:

- 1 - A good notion of distance:
  - so as to not be hit by the counter-offensive action or be obliged to draw back the arm to parry,
  - to sufficiently control the blade in order to dominate.
- 2 - Correctness in the execution of the defensive action by making the speed of the parry correspond to the speed of the counter-offensive action in order to deflect the blade without allowing the opponent to deceive or derobe it.

### **C - The final offensive action**

This last phase of the counter-time action depends on:

- the type of defensive action used,
- the opponent's reaction after the parry of the counter-offensive action.

In general, the final part of the offensive action must be a simple action that prevents the opponent from recovering. The final phase of the counter-time action possesses all the qualities of a simple attack.

### **FAULTS TO AVOID**

The principal faults to avoid in counter-time actions are mostly of a tactical nature. However, the following technical faults often lead to the failure of counter-time actions.

- 1) Preparation badly executed  
The opponent clearly perceives the tactical intention and can exploit it. Quite often it does not even attract a counter-offensive reflex action as it has been too restrained and lacks realism.
- 2) Error in distance  
As a result of a step forward that is too small, the preparation is not sufficiently deep which gives the opponent the chance to withdraw his blade from the defensive action.  
If the preparation is too deep as a result of a step forward that is too large, the risks of being hit by the opponent's counter-offensive action are increased. In addition, defensive actions are shortened, which facilitate the opponent's defensive movements during the final phase of the action.
- 3) Hasty launching of the lunge or the flèche  
The weapon arm has not completely finished its action and precision is compromised. This fault is common in fencers who begin the lunge or flèche at the same time as the defensive action and thus can be derobed.

### **APPROPRIATE DEFENCE**

#### **A - Reflex defensive actions**

Parry the counter-time action in the line in which it finishes.

Remise or reprise of the counter-attack if the execution of the final parry of the counter-time action is slow to develop or if it is indirect, compound or by taking of the blade.

#### **B - Premeditated defensive actions**

Derobement of the counter-time action by a compound attack. The feint of a counter-attack must contain all the qualities of a veritable counter-attack and be reinforced by a staccato stamp on the ground by the ball of the foot (appel du pied), the deception is executed with a half lunge (Finta in tempo).

Remise or reprise of the counter-attack if the counter time finishes with an indirect or compound action, or by taking of the blade.

### **GENERAL CONSIDERATIONS - FOIL**

Counter-offensive actions are greatly valued in electric Foil, however they can be made to fail by the use of simple actions. The counter-attack with a half-lunge reduces the precision of the attack which passes or reaches an off-target area following the breaking of correct distance. Offensive actions with second intention by counter-time are a more reliable way of causing the failure of the opponent's counter-offensive action. It prevents it hitting and then offers the possibility of executing various offensive actions, which can be developed depending on the opponent's reactions. This tactic not only calls on the fencer's technical qualities but also on his intelligence, because it must provoke a counter-offensive action in a natural manner while leaving the opponent with the illusion that he is exploiting a fault. This condition is essential to provoke the counter-attack, and also to bring it into the desired line without the risk of encountering a compound counter-attack, the initiative this time changing sides.

When the opponent possesses a game based on counter-offensive actions, the difficulty is no longer in the choice of the preparation for provoking it but rather in its execution in order to leave only one line vulnerable. It is preferable to choose the one that suits the most natural of the opponent's counter-offensive movements, since any other target can increase the difficulty and lead to a loss of time.

In general, counter-offensive actions in Foil are directed to the low line, which naturally requires excellent technique in the parries of septime and octave. However, when the preparations used have allowed the opponent's counter-offensive defensive reflexes to be discovered, the counter-time action is executed as a reflex in order to have greater speed and effectiveness. When the line of the counter-attack is anticipated, it is not necessary to wait for it or see it, but preferable to go forwards to parry it and immediately develop the offensive action. In this way, the opponent is not given the possibility of parrying or derobing.



## GENERAL CONSIDERATIONS - EPÉE

Counter-time actions in Epée are essentially done by takings of the blade in order to avoid the remise of the counter-attack.

The distance, as well as the difficulty of securing the opponent's blade, limits preparations to the following actions; classical feints or feints with angulation - beats - coordinated with steps forward.

The defensive action is always executed with opposition so as to be able to maintain the blade after having deflected it. The extension of the arm is complete in order to obtain entire protection of the advanced targets and make any derobement difficult.

The final offensive action is developed by taking of the blade to the advanced targets (arm - thigh) or to the body. A compound action is not recommended. The taking of the blade can be reinforced with another taking when the counter-offensive action is executed with a step back: the distance is maintained by stepping forward and the taking more deeply engaged.

Counter-time actions to the body can be executed with a flèche, which is more closely linked to movement and a gain in fencing time.

There is a greater variety of defensive actions in Epée than in Foil due to the derobement and to the target areas that can be reached. The compound derobement "on blade contact" is very effective, especially when it is premeditated, as are remises and redoublements (classical or with angulation).

Counter-time actions make up a large proportion of offensive actions to the body and their use is facilitated by counter-offensive actions. Feints with angulation and beats are excellent preparations for provoking a counter-offensive action. It is quite rare that the distance between the fencers allows an engagement to provoke a derobement and even rarer for the change of engagement.

The Epéist who uses offensive counter-time must always be ready to execute the action against compound counter-attacks to the advanced targets. In consequence the derobement, even with contact, is very often used and obviously in cases when it is premeditated. It is indispensable to maintain a certain reserve in the first defensive action to be able to rapidly and correctly retake the opponent's blade in the line in which it is presented.

## GENERAL CONSIDERATIONS - SABRE

In Sabre, counter-time actions are essentially done by attacks on the blade as the defensive actions consist of blocking the stroke and not of deflecting it. The position of the blade in the execution of the parry of the counter-attack, which is naturally a thrown stroke, does not allow the blade to be seized and dominated, especially since the counter-attack is always immediately followed by a parry.

The preparations are not more varied in Sabre than in Epée. They consist of feints, either classical or with angulation, reinforced or not with a beat, but always coordinated with steps in order to give maximum realism to the preparation and allow sufficient distance to be gained.

The defensive action is, according to the preparation used, a beat from one or the other system. In both cases it is executed with the arm 3/4 extended in order to have a sufficient amount of blade contact when the counter offensive action is directed to the advanced targets. In the case where the counter-offensive action is launched to the body, and in particular to the head, the defensive action must be taken with the weapon arm shortened to effectively protect the target.

The offensive action can be direct or indirect, or even consisting of one feint. While in Foil and Epee (point weapons) it is not recommended to use compound actions, in Sabre it is different. The natural defensive actions taken after a counter-offensive action allow even a perfectly executed counter-time action to be parried.

The feint of the final compound action must be done in the line that is uncovered by the counter-offensive action in a manner that will provoke a parry that will close this line. It is followed by the movement necessary to immediately deceive this parry. Indirect feints are not recommended as they expose the fencer to remises and redoublements of the counter-attack which can gain a fencing time on the final action.

Generally, the offensive action in counter-time should be directed to the body much more than to the advanced targets because the defensive reflexes, being much larger, are more easily exploited. In addition, the advanced targets only offer a minimal target that is always moving and often in a position parallel to the stroke, which increases the difficulty. Finally, being at a closer distance one must, in order to hit them, control and hold back the final action at the expense of speed.

The defence to counter-time actions is very diverse since the ultimate target can be either the body or the advanced valid areas.

Five types of defensive action are recommended for the fencer who has assessed an attack with counter-time.

1. A parry closing the line in which the final part of the action finishes.
2. The “finta in tempo” (compound counter-attack) to the body or to the head, and preferably with a half-lunge.
3. A compound counter-attack to the advanced targets (classical or with angulation).
4. The remise of the counter-attack (generally with angulation to the advanced targets).
5. The redoublement of the counter-attack (classical or with angulation to the advanced targets).

The size of the defensive action facilitates the trompement, therefore the sabreur must have perfect knowledge of the opponent and quick reflexes to allow him to continue the counter-time action even on compound counter-attacks. The obligation to deceive or derobe without blade contact facilitates the parry of the compound counter-attack.

The possibility of launching the counter-offensive movement to different targets for the same preparation requires sure judgement, and also perfect technique and excellent reflexes.

In Sabre as in Foil, where numerous counter-attacks are executed with a half-lunge; the difference between the counter-time and the parry-riposte with second intention is difficult to determine - especially when the latter is executed with a lunge. One must consider:

- that it is counter-time when the action executed exploits the opponent’s counter-offensive action,
- that it is a parry and riposte with second intention when the action exploits an attack on the preparation that has been deliberately provoked.

### **TEACHING RECOMMENDATIONS**

It is difficult to practise counter-time actions under the same conditions as the bout as the tactical intentions of the fencer are practically nil during a lesson. However, the execution and the technical study of the different parts that make up the movement must be practiced, in particular the coordination of the combined movements of the weapon arm and the legs as well as the change of rhythm.

The Master must break down each phase of the counter-time movement and adopt the following

progression:

- 1 - The preparation, coordinated with the selected footwork is executed:
  - on the front foot if the displacement is a step forward or the Hungarian slip step,
  - with predominance of the arm action if the displacement is a jump or half-lunge.
- 2 - The defensive action, coordinated with the final part of the footwork selected, is done:
  - on the back foot if the displacement is a step forward,
  - on the jump of the front foot if the displacement is a Hungarian slip step,
  - on the landing of both feet on the ground if the displacement is a jump,
  - before the beginning of the extension of the lunge if there is a preparation by half-lunge.
- 3 - The offensive action, coordinated with the lunge and is done:
  - by completely extending the arm whichever method is used.

Whatever the weapon, the Master only proceeds to the study of the defensive action when the preparation is perfect. Likewise the final part of the offensive action is not developed until the two first parts are exactly coordinated.

The Master must teach counter-time actions without losing sight of the change of rhythm between the preparation, in which the speed must be controlled while retaining realism, and the attack on the blade or the taking of the blade which are extremely rapid in order to avoid the derobement. The Master works on this change of rhythm in the first two phases of the counter-time action, the final offensive action must have a speed two to three times greater than the first two.

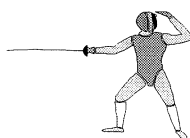
Naturally for the study of counter-time actions, the master chooses actions moving from the most simple and natural to compound and more difficult actions. When the pupil has assimilated the technical study and possesses good technique, the Master can choose exercises of several intentions. He teaches without speaking, and it is up to the student to execute the action which suits the Master’s movement.

*For example:*

The pupil executes a preparation, the Master counter-attacks or holds back, the pupil executes counter-time or continues his action according to the reactions of the Master. The Master executes a simple or compound counter-attack and the pupil reacts accordingly.

So that the lesson given remains as close as possible to reality, the Master must:

- 1 - Maintain the exact distance justified by a counter-time action.
- 2 - Carry out his counter-attack to hit; whether to the advanced target or to the body.
- 3 - If he counter-attacks to the body, return to guard correctly and rapidly as in a bout.
- 4 - Sometimes parry the counter-time action which requires a counter-riposte in Foil and Sabre or a remise or redoublement in Epée.
- 5 - Sometimes derobe the pupil's defensive action in order to control the correctness of his reflexes and balance and in this case require an immediate jump backwards from the pupil.
- 6 - Teach the pupil all the defensive actions appropriate to the counter time studied, and execute all actions with maximum realism.



## **CHAPTER III**

# **FALSE ATTACK - FALSE PARRY - FALSE COUNTER-ATTACK**

### **DEFINITION**

*The false attack, parry and counter-attack are simulations of attacks, parries, or counter-attacks.*

### **CLASSIFICATION**

There are as many false attacks, false parries and false counter-attacks as the varieties of actions of the same type.

### **TECHNICAL STUDY**

False attacks, parries, and counter-attacks are actions in which the technical qualities are identical to those of the actions for which they must be mistaken, at least for the beginning of their execution.

### **TACTICAL STUDY**

The false attacks, parries and counter-attacks have

the aim of provoking defensive, offensive or counter-offensive reflexes and then exploiting them.

### **GENERAL CONSIDERATIONS**

All the actions used in Fencing can be executed and applied with the aim of inducing the opponent into error.

All the preparations can, according to the case, trick the opponent as to tactical intention. The attempted remises and redoublements can also offer the opportunity to exploit the opponent's actions that they provoke.

## **TACTICS OF SECOND INTENTION**

### **DEFINITION**

*The tactic of second intention is the art of provoking the opponent into defensive, offensive or counter-offensive actions and of putting these to profit.*

### **CLASSIFICATION**

All Fencing actions can be executed with second intention. They are classified in two categories.

1. Those that have the aim of exploiting an error of judgement duly provoked.
2. Those that have the aim of exploiting a reflex duly provoked.

These actions can have the following characteristics:

- offensive,
- defensive,
- counter-offensive.

### **TECHNICAL STUDY**

The attack with second intention is preceded by a

preparation which must provoke the expected movement. This preparation can be varied; repeated, of varying accentuation or fast or slow, according to the opponent and the aim that it must fulfil.

The attack is developed by exploiting:

- the offensive, defensive or counter-offensive action which is the result of an erroneous judgement,
- the offensive, defensive or counter-offensive action which is the result of a reflex.

### **TACTICAL STUDY**

The aim of this section is not to analyse all the

actions that can be executed with second intention as this topic is too vast. It only discusses some typical actions exploited according to the two tactical possibilities given in the preceding section.

#### **A - Simple attacks with second intention**

*Examples:*

- 1 - Preparation:  
feint of a disengagement with a half lunge, starting in the line of sixte, intended to provoke a parry of quarte.
- 2 - Attack:  
direct attack in the line of sixte after an absence of blade intending to give the impression of a disengagement.
- 1 - Preparation:  
repeated and exaggerated engagements in a line to oblige the opponent to change the engagement to regain dominance and cover his target.
- 2 - Attack:  
attack with a derobement of the change of engagement, by disengagement or by a cutover.

#### **B - Compound attacks with second intention**

*Examples:*

- 1 - Preparation:  
direct feint with a half lunge in the inside line to provoke a parry of quarte.
- 2 - Attack:  
attack by feint of a straight hit inside-underneath deceiving the parry of quarte by a disengagement low.
- 1 - Preparation:  
feint of a disengagement with a half lunge low to provoke the parry of octave.
- 2 - Attack:  
attack by feint of a disengagement low-high by deceiving the parry of octave.

#### **C - Attacks on the blade with second intention**

*Examples:*

- 1 - Preparation:  
beat of quarte followed by feint of a disengagement high line to provoke a defensive reaction in sixte.

- 2 - Attack:  
beat of quarte, straight hit inside.
- 1 - Preparation:  
repeated pressures in a line to assure a reaction in this line (counter or return pressure).
- 2 - Attack:  
pressure followed by a disengagement in another line.

#### **D - Takings of the blade with second intention**

*Examples:*

- 1 - Preparation:  
beats of quarte followed by indirect or compound feints, arm bent and with a step forward to provoke an extension of the arm with the point in line.
- 2 - Attack:  
simulate a beat and immediately take the blade by quarte - bind to octave.
- 1 - Preparation:  
feints with angulation to under the hand with a half lunge to provoke a high line counter-offensive action.
- 2 - Attack:  
Feint with angulation to under the hand and take the blade at the moment of the counter-offensive action. Develop the taking of the blade with opposition or envelopment.

#### **E - Ripostes with second intention**

*Examples:*

- 1 - Preparation:  
execute a preparation several times at the desired speed to provoke an attack, then simulate a reflex defensive movement to attract a compound attack in the desired line.
- 2 - Final action:  
parry the compound attack and riposte.
- 1 - Preparation:  
execute, several times on the opponent's preparation, the same defensive movement as an uncontrolled reflex action, having the aim of facilitating the attack.

- 2 - Final action:  
parry the attack at the moment it is triggered by using a parry different to the one the opponent hoped to exploit. Follow the parry with an appropriate riposte.

### **F - Counter-ripostes with second intention**

*Examples:*

- 1 - Preparation:  
attack several times but with reserve to discover the opponent's preferred parry and riposte.
- 2 - Final action:  
attack, then parry the riposte and counter-riposte in the chosen line.

### **G - Counter-attacks with second intention**

*Examples:*

- 1 - Preparation:  
on the preparations by feints, give the opponent the impression of seeking the blade in all the lines in which it is presented, in order to make him believe in the success of a compound action.
- 2 - Final action:  
counter-attack the compound action in a chosen line to gain a fencing time.
- 1 - Preparation:  
on the opponent's preparation, take the parry of counter-sixte similar to an automatic reflex to provoke an attack by doublement.
- 2 - Final action:  
execute a time of interception octave on this doublement.

### **H - Remises - Redoublements with second intention**

#### **I - Counter-time - "Finta in Tempo":**

These actions have been described and studied tactically in the corresponding chapter on second intention.

#### **J - Counter-stop hit - "Finta in cavazione di tempo":**

These actions are executed to the advanced targets, therefore they are only used in Epée and Sabre.

*Examples:*

The counter-stop hit:

- 1 - Preparation:  
execute several feints of the attack to the advanced targets to provoke a counter-offensive action.
- 2 - Final action:  
counter-attack with angulation on the opponent's counter-offensive action .

Finta in cavazione di tempo:

- 1 - Preparation:  
give the impression of wanting to attack with a counter-time action to provoke a compound counter-attack action (Finta in tempo).
- 2 - Final action:  
counter attack with angulation to the wrist by moving the target laterally with the aid of a jump backwards.

### **GENERAL CONSIDERATIONS**

The tactic of second intention must be permanently present in a fencer's mind. It allows offensive actions to be varied and sometimes it becomes a necessity. In effect, a fencer is not always in a position to carry out actions a'propos. He can be inferior in speed, conditioned reflexes, technique, or he can be faced with an excellent defence. In these cases there is little chance of dominating. Using the tactic of second intention an intelligent fencer can cause the failure of a game that is superior in technique, particularly in Epée. When, after a preparation a fencer discovers a reflex, it is wise to not exploit it immediately but to change and give the impression of seeking a different action.

The best tactic of second intention consists of exploiting the strong points of an opponent's game, as they are quite often the preferred offensive, defensive or counter-offensive reflexes. Certain fencers adopt a completely different tactic and prefer to avoid them. This is recommended in certain circumstances, but offensive actions with second intention must not be prepared by upsetting the opponent's game. This is where the choice of preparation is vital as it must not make the opponent wary, nor force him to vary his game and execute other actions to those he prefers. If this does occur, the fencer risks executing the second intention actions less well and with a different speed which

can be exploited by the opponent.

The preparations are of varying intensity according to the tactical intention:

- to provoke the expected reflex,
- to avoid being hit by this reflex action whether it is defensive-offensive, offensive, counter-offensive.

The false attack that allows easier variation in the depth of the preparation must be:

- very obvious to provoke a parry and deceive it,
- slightly less pronounced to provoke a parry-riposte and hit with a counter-riposte,
- very reserved to provoke a counter-attack and exploit it with a counter-time action, counter-stop hit, etc.

Certain fencers use the term "third intention". There is no third intention as the fencer who guesses the tactical intention of his opponent, even if this intention is second intention, in fact only applies second intention on that which he has calculated.

It is obvious that the use of actions with second intention is very delicate. An experienced, aware fencer guesses or quickly senses the tactical intention of the opponent, confident in his perception, parries, and notion of distance. Only a well selected, well executed preparation can lead to success.

## TEACHING RECOMMENDATIONS

In lessons it is impossible for the fencer to be placed in the same tactical conditions as in a bout. The Master, in a very pedagogical manner, always seeks to put his pupil in conditions which enable him to

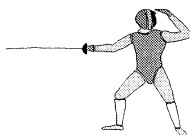
execute the required action correctly. It is not the same in a bout in which a fencer tries to upset or exploit the opponent's game and intentions.

Therefore, even though second intention can not really be reproduced in a lesson, it can be studied by conventional work that is as close as possible to it, in the form of logical bouting exercises.

In these exercises, the initiative is naturally with the pupil who, by a preparation, must provoke a logical reaction from the Master and exploit it. The Master facilitates the final execution by adopting a classical position that allows the pupil to correctly finish his action. The Master must have the pupil study the technique of using different actions of second intention that can follow from the same preparation.

In this way the pupil learns to exploit all the reactions that he can provoke in a bout depending on his tactical idea. To appreciate the tactical awareness of the pupil the Master can bout with him in a logical way. That is to say, each time he finds it useful, he criticises or comments on what the pupil has done or should have done on an action that he has provoked.

The controlled bout is difficult to manage as the Master must not systematically upset the pupil's game nor facilitate his actions, but respond logically to his preparations when they are correctly executed. This type of bout is very beneficial as it forces the pupil to think and to apply himself. The Master immediately corrects any faults, whether they are tactical or technical, and must explain clearly the cause. A pupil prepared in this way is much less confused when bouting.



## CHAPTER IV

# THE QUALITIES TO DEVELOP IN A FENCER

*Fencing is a sport that can be played by any reasonably athletic person. It requires the general qualities characteristic of all sports, as well as other specific ones, necessary for success in this sporting discipline.*

### PHYSICAL QUALITIES

The physical qualities necessary for good practical fencing are: sensory, neural, muscular and functional.

#### A - Sensory qualities

The sensory qualities that must be particularly developed in a fencer are the following:

##### *Tactile:*

Tactile sensitivity gives finger dexterity and creates blade feeling necessary for all actions on the blade as well as precision at the moment of the hit.

##### *Visual:*

Good eyesight and perception can instantly detect the nature of an opponent's action. Acuteness of vision also allows the acquisition of an exact and permanent notion of distance.

#### B - Nervous qualities

##### *Neural conductivity:*

This is essential in a fencer who must execute in a fraction of a second the action commanded by the brain in order to have a chance of success.

##### *Ability to choose the most opportune action*

This requires speed of reflexes: it allows the execution in a very short period of time of the most suitable action to catch the opponent by surprise.

##### *Nervous resistance:*

This is the resistance specific to sports in which the participant must always remain aware. A permanent effort is required of the nervous system. This tension is exhausting. Training and the experience of many competitions can reduce its effect.

When the nervous resistance is lowered, the effects on the fencer are sudden and leave the fencer "empty" and unable to react normally, as if physically exhausted.

#### C - Muscular qualities:

##### *Suppleness:*

This is the result of permanent relaxation of all non-solicited muscles and allows the immediate execution of actions without any of the stiffness that can be detrimental to precision.

##### *Speed:*

This is an innate quality that varies - the speed of the lower limbs being different from that of the upper limbs. In Fencing, as in any technical sport, the repetition of an action in training creates a speed of coordination. This is more important than natural speed as it is controlled and can be varied in rhythm (acceleration).

##### *Muscular reaction time:*

This is also an innate muscular quality that depends on muscle tone. It is developed through muscular exercises appropriate to fencing.

#### D - Functional qualities:

##### *Resistance:*

The long duration of fencing competitions require maximum and sustained effort from all the major functions - cardiac, pulmonary etc. The value of all the other qualities depends on the normal functioning of these organs and of their recuperative abilities. Such endurance is acquired through training.

### INTELLECTUAL QUALITIES

The intellectual qualities give value to the physical qualities. In fencers of equal technical and physical qualities the advantage is with the "finer" (intelligent) fencer.

#### A - Intelligence:

Intelligence is a fundamental quality of a fencer. It allows a game to be adapted to that of different opponents, in addition to the tactical variations during a bout.



Certain fencers show an intelligence particular to fencing - they seem to possess an innate sense of this sport and adapt instantaneously to any circumstances. On the other hand, some intelligent people do not seem to be able to transfer this intelligence into the field of fencing, and their results reflect this.

#### **B - Judgement**

Judgement is a function of the intelligence of a fencer. It allows, through a sound knowledge of fencing, the application of tactics and an appropriate choice of actions designed to combat or exploit the opponent's game.

### **ETHICAL QUALITIES**

The moral qualities complement the physical and intellectual qualities. Success in the sport as well as the real value of this success depends on these.

#### **A - Strength of Will:**

The presence of will power in a fencer promotes victory. Results can only be achieved when determination is added to all the other physical and intellectual qualities that make up a successful fencer. Without it the fencer "lacks spirit", and does not possess the resources for turning around a situation that is momentarily disadvantageous to him, for some reason or

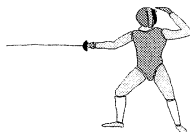
other.

#### **B - Honesty:**

Honesty must be emphasised. A victory only has value if it is acquired within the rules, without having recourse to deceits such as: doping, clothing or weapon trickery (personal interpretation of the rules).

All these qualities comprise the value of a fencer. Whether they are innate or able to be perfected, they must be constantly present in the Master's mind. The duration of his teaching, and the personal nature of lessons means that the Master has a certain influence on his pupils, and this is particularly beneficial when his own qualities are exemplary.

As soon as he considers it necessary the Master fights several bouts with his pupils in order to know them better. The personality and character of a fencer are reflected in the way he conducts a bout. An old proverb says "Show me how you fence and I will tell you who you are". This procedure offers the master opportune occasions for correcting technical faults, developing weak points, orienting and advising on the tactics best suited to the physical and intellectual qualities and ethics of his pupil.



## CHAPTER V

# FENCING LESSONS

*The lesson in Fencing allows the diverse attacking and defensive movements necessary for bouting to be learned. To varying degrees it also allows these movements to be perfected, and to acquire or maintain physical conditioning.*

This lesson can be individual or class/group.

### THE GROUP LESSON

During this century, sport has become a social reality which inspires passion in young people, girls or boys. It also contributes to physical stability in adults who continue to practice (after having passed the age of competing) as a way of maintaining physical health; thus better fulfilling the various responsibilities of their lives.

As in other sports, fencing has also seen an increase in the number of participants compared to the number of fencers registered previously. The time when the Master alone was sufficient for instructing his fencers has passed. He is sometimes assistant to another Master, or with one or several provost masters in order to give individual instruction to each of the pupils. This formula has however proved excessive; either because the Master could not spend sufficient time with each fencer for the work and practice to progress, or because he could not give a lesson to everyone.

A coach from another sport entering a Fencing salle would be surprised to see 10 to 15 fencers (or aspiring fencers) waiting on a bench for the brief moment in which the Master (or one of his assistants) could finally give them an individual fencing lesson. For experienced fencers who also participate in bouting, this process was not too bad. However, for beginners who were giving approximately two hours of their precious time for several brief minutes of effective work, it was unproductive.

In addition, through ignorance of the elementary principles of sport, these young pupils left the bench to execute a few fencing movements in a lesson without previously warming up. Since a minimum of five minutes is necessary for a fencer to warm up, these pupils only benefited from five minutes of real lesson, which was rarely longer than ten or fifteen minutes.

Once the problem was identified it proved easy to resolve. It was sufficient to examine what happened in other sporting venues, viewing the participants training in groups under the direction of the instructor, such as swimming, athletics and judo, which is also a combat sport.

However several difficulties remained to be resolved. The principal concern was that of the traditionalist fencing spirit which could not appreciate any teaching situation other than that of individual lessons with the Master; arguing that any group method would be harmful to the fencer's reflexes as he would have to take specific positions that would facilitate the partner's hits. A further concern was that a fencer would develop faults and not train either his speed or coordination.

However the detractors failed to understand that, without trying to replace the Master, the group lesson was entirely different. In the following pages the method for group work will be studied in detail. Before reaching this stage, however, it remains important to resolve other difficulties. These come particularly from the age differences of participants, which influence the understanding of fencing.

Other differences, for example technical, depend on the number of years of practice, and the ability of a fencer. In addition the time of arrival of fencers to the salle varies according to each person's occupation, which creates another handicap in the formation of a working group. And of course there must be a sufficient number of fencers practicing the same weapon.

All these difficulties are not insurmountable, and with correct administration they can be resolved; but it is evident that the training of fencers in schools, in industrial sport centres as well as in military salles, in which the participants come and indulge in their favourite sport at regular hours, does not create the same problems and facilitates group work. Training venues are in general large, well aerated gymnasiums that are not cramped like fencing salles, which have some difficulty accommodating real group work.

The aim of this evaluation is not to highlight the difficulties but to define them and, wherever possible, offer solutions. Some of these are:

### **DURATION OF THE LESSON**

This can be variable, but usually from about 45 to 60 minutes, broken up as follows:

- a) Warm up  
From 5 to 6 minutes of general movements of the arms, legs, and torso as well as some reflex exercises.
- b) Specific educative fencing exercises  
From 5 to 10 minutes consisting of basic displacement exercises such as step forward - lunge - jump - retreat - flèche, or combinations of these movements.
- c) Fencing lesson  
From 20 to 30 minutes that can begin with revision of the previous session, then continuing with the study of one or several offensive actions, then of the corresponding defensive actions, without omitting to work on their tactical use in the bout.
- d) Conventional bouting and games adapted to fencing  
From about 5 to 20 minutes, the bout being conducted on a given theme related to the lesson.

This is a model which can be adapted to the different types of lessons that will follow and allow for modification of the duration of the various parts depending on the instructor's goals for the lesson.

Before moving on, it is important to define to which categories of fencers group lessons can be addressed. The response is easy - to all categories, without exception.

While in general it is only currently applied to beginners to teach them the fundamental fencing movements, the Master directs the lesson as would a physical education teacher giving a physical education lesson, moving on to actions which are more difficult after the basic movements have been assimilated.

At this stage the lesson is either a study lesson, to learn the technique of a movement, or a lesson for perfecting technique or tactics, in which different variations of actions previously studied can interest fencers already possessing more or less complete technique.

It also is suitable for experienced fencers, of

either national or international class, and can, in this last case, lend itself in various forms to a conventional bouting lessons containing exercises of multiple choice and combinations.

Three main types of lessons that are adaptable to the three weapons are discussed in the following pages. These are:

- study lessons,
- maintenance or training lessons,
- bouting lessons.

### **STUDY LESSON**

This addresses all fencers, whatever their technical level.

1. To a beginner, for learning a new action.
2. To an experienced fencer for correcting a fault or familiarisation with all the varieties of an action, or to teach all the defensive actions which make an opponent's offensive action fail.
3. To a competitor, to teach him all the different tactical applications that make an action really effective in a bout, as well as the study of diverse preparations allowing a stroke to be carried out on an opponent of varying character and dissimilar reactions.

This lesson consists of the complete and detailed study of one or two actions and the appropriate defensive or counter-offensive actions. It can, if necessary, contain a brief revision of previously studied movements. Revision can be incorporated at the moment the instructor senses that the pupil's attention is wandering. But with all the varieties of execution that can enrich an action, this compromise should be avoided.

### **MAINTENANCE OR TRAINING LESSON**

This applies to two categories of fencers:

1. To pupils possessing a certain technical level, in order to help them revise movements that they already know, but at a sustained pace.
2. To fencers with complete technique, to maintain them in physical and technical condition.

This lesson can vary in duration depending on the rhythm chosen and will consist of four or five actions from simple to compound, alternated equally with the various reciprocal defensive actions. In addition they will be chosen in such a way that they hit a different target each time and thus require the use of all the parries.

Fencers who are suddenly attacked should sometimes parry and riposte or counter-riposte in different lines to develop the partner's mechanics, and avoid the habit of using unchanging reflexes.

Each new action must be preceded by various preparations and executed on preparations which may or may not involve initial blade contact.

### **THE BOUTING LESSON**

As the name suggests, this lesson concerns only those fencers preparing for a competition. The characteristic intensity requires it to be shorter and interrupted due to the tactical character with explanations.

This lesson can contain from 8 to 10 basic actions: offensive, defensive, counter-offensive keeping in mind the succession of effort. The fencer who controls the basic actions, sometimes varies, without warning, the distance and the reaction; the partner must immediately adapt himself to each of the opponent's reflexes.

It is understood that the basic conventional action will always be simple and at each change will concern a different line or target. The progression does not reside in the choice of the basic action but, more precisely, in the ever-increasing difficulty that there is in exploiting the different reactions.

As an indication, here is an example given for a conventional starting action executed with "beat - disengage".

The partner can allow the attack to land, parry and riposte, increase the distance, derobe the beat, counter-attack before the final action, parry and not riposte, parry and compound riposte, attack between the two actions, etc.

Having discussed the major types of lessons, which can be subdivided according to the aim of the lesson (with predominance given to a specific fundamental technical or tactical situation), there remains the description of the group lesson structure, which can be adapted without difficulty to the three varieties of lessons already cited.

In the structure of the group lesson, it is important to analyse the different formations, as well as the manner in which it must be directed by the instructor.

### **DIFFERENT FORMATIONS**

These are quite varied for the two first parts of the lesson, consisting of the warm up and the special educative exercises. Depending on the number of pupils and the exercises used, the instructor can use a line, semi-circular, or even circular formation of one or two levels.

For the actual "lesson" part, two formations

are particularly recommended; in which the pupils are spread out in two lines or in a two-tiered semi-circle.

### **STRUCTURE OF THE LESSON**

Whichever type of lesson is chosen, for the first two parts of the lesson the Master must proceed in the same manner as a Physical Education teacher. So that the rest of the lesson is beneficial, it must follow the four following phases:

1. Demonstration
2. Explanation
3. Correction
4. Verification

It is important to look at each one of these in detail:

#### **1. The demonstration**

This is done with the aid of an assistant or the most advanced pupil, and consists of two distinct parts: the first concerns the starting position and reactions of the partner who responds to the action, and the second on those of the partner who is executing the action.

#### **2. Explanation**

This must be given by the Master in a very detailed manner. It should cover all the positions, actions, or reactions that will be taken or executed, so that there is no confusion. It must be a logical explanation and remain identical to those executions observed in a bout.

#### **3. Correction**

The Master must continually keep all the fencers in his field of vision and rectify the slightest errors, ready, if it is necessary, to repeat the demonstration. He continually passes from one to the other until perfect execution of the movements are achieved by everyone.

#### **4. Verification**

This consists of a new demonstration, but executed by two pupils chosen at random. In addition to providing some minutes of relaxation for the rest of the class, it enables the instructor to be sure that the exercise has been well assimilated. This method develops the power of observation and assessment of the pupils in the class who are always ready to pick out the smallest fault committed by their two classmates. It therefore proves beneficial through the sustained attention that they bring to it.

If the number of students in a group is left to the choice of the instructor, this must not be less than 8 or greater than 20, which in the first case reduces interest, and in the second makes correction of faults too difficult.

The teaching method of the instructor must allow for the students to be placed in pairs, selecting them by size or by equal or different technical ability - depending on the aim of the exercise. Similarly, he will be careful that all the right handed and left handed fencers work alternatively with each other; the instructor using this as an occasion to offer explanations about different techniques and tactics for a similar action executed between opposite handed fencers.

The advantages that the group lesson in fencing offers, and which have been developed throughout the presentation, can only encourage sporting directors to favour this modern method of teaching. In addition, it is much closer to competitive fencing than an individual lesson where the Master is always careful about the aesthetics of the movements, tending to facilitate the final part of the action contrary to competitive fencers who use their technical and tactical attributes to upset the opponent's game.

This method of training facilitates the understanding of Fencing much more than work in an individual lesson, which can automate the fencer in lessons of little variation, most of the time without using the intelligence of the pupil.

In turn, the pupils execute the required action and also see the faults which are detrimental to their effectiveness when they are on the receiving end. Self analysis makes corrections much easier.

All these reasons must not, however, lead to the total suppression of the individual lesson, which allows the Master to detect in a fencer the actions that are adapted to his body shape and his character. These become necessary at a certain stage of training for perfecting a fencer who is called on to take part in competitions at national and international level.

### **THE INDIVIDUAL LESSON**

The individual lesson, which should only be given to a confirmed fencer, is usually the lesson the most widely practiced in fencing salles. This comes from the following reasons:

- 1 - Young pupils leave their classes at different hours, and adult fencers have personal situations that do not allow them to arrive at the same hour at the salle.

- 2 - A club is composed of different categories of fencers from beginners to experienced, which sometimes makes it impossible, even if everyone arrives at the same time in the salle, to do group work that will be beneficial and interesting for everyone.

- 3 - Numerous older fencers have never taken a group lesson and can only conceive of learning through individual lessons with the Master. This requires less attention on their part. But they are wrong in arguing that participating in a group lesson interferes with a fencer's reflexes and creates faults. However this view point can find an attentive ear in young fencers and sometimes makes any attempt at group lessons extremely difficult.

The individual lesson must use the same qualities of progression, succession of muscular work, etc., as the group lesson. As the Master can only devote a limited time to each pupil (from 20 to 30 minutes approximately), he must require that the pupil warm up before beginning the lesson. Ten minutes are necessary for this generalised warm up (arms, legs, torso) which must contain special fencing exercises (footwork). With such preparation the pupil is ready to begin the lesson which requires sustained effort and rhythm from the start, without risk of pulling a muscle.

The individual lesson consists of three varieties which can suit the fencer depending on the requirements of the moment. These are: the study lesson, the training lesson and the bouting lesson.

### **THE STUDY LESSON**

The study lesson is applicable to all fencers and all levels of instruction.

- 1 - To a beginner for learning an action.
- 2 - To an experienced fencer to correct faults and learn all the varieties of an action.
- 3 - To a strong competitor, for teaching the different tactical procedures and the diverse preparations, allowing the same action to be carried out on several opponents with different characters and reactions.

This lesson consists of the complete and detailed study of a fencing action and its appropriate defensive actions. It can consist of a slight revision of one or two actions previously learned so as not to tire the pupil. This "revision" part is used when the Master senses the pupil's attention wandering. However, the different ways of executing the same fencing action makes the lesson interesting and avoids this inconvenience.

## THE TRAINING LESSON

The training lesson concerns two categories of fencers:

1. It is given to revise, at a sustained rhythm, actions that have previously been studied by fencers having a certain technical level.
2. It is given to fencers possessing a complete technique to maintain them in physical and technical condition.

This lesson lasts between 20 and 30 minutes depending on the tempo in which it is given, and consists of 4 or 5 actions and their corresponding defensive actions. The actions must reach a different line or target each time and thus require all defensive actions to be used. The Master sometimes parries the attack and ripostes, or parries the riposte and counter-ripostes, in order to develop the pupil's mechanics and ability to choose the most opportune action. So as not to make a habit of the same reflexes, the Master varies his parries, ripostes and counter-ripostes. Each action must be preceded with different preparations or executed on different preparations, which corresponds to fencing in a bout.

## THE BOUTING LESSON

The bouting lesson, as its name indicates, concerns a fencer who is preparing for competition. Its typical intensity requires that it lasts less than the other lessons, 10 to 15 minutes approximately. This lesson comprises 3 or 4 offensive, defensive and counter-offensive actions. With regard to the succession of efforts demanded from the pupil, the Master states the basic action, and then varies, without warning, his reactions - distance, etc.

For example: On a conventional action, the master lets the hit land, parries and ripostes, increases the distance, counter-attacks, parries and not riposte, attacks between two actions, deceives the preparation, changes his own preparation etc.

The pupil must immediately exploit the Master's reaction as simply as possible. This work is invariably done on a conventional defensive or counter-offensive action.

The Master corrects the pupil's technical or tactical errors verbally and, unlike a study lesson, he does not interrupt the action being carried out. He varies his speed, rhythm and distance while trying to imitate that of various opponents.

It is understood that the conventional action upon which this exercise is based will be simple, as is done in bouting. The progression of this lesson resides in the ever-increasing difficulty for the student to exploit the Master's reactions.

This lesson is very difficult to give. It is similar

to bouting, though it lacks the use of second intention as the initiative is always with the Master.

As an example, a typical training lesson in each weapon is described at the end of this chapter. This lesson can also be used as a model for the two other types of lesson.

## TYPES OF TRAINING - FOIL

### SIMPLE ATTACK

*Disengage in the inside line*

- Middle distance: on the Master's engagement
- Long distance: preceded by an engagement (step forward).
- Long distance: by derobing the engagement and on the Master's step forward.

*Simple parries and ripostes*

- Middle distance: Quarte - direct riposte.
- Long distance: Quarte with a step forward - riposte by disengagement low.
- Middle distance: Counter-sixte with a step back - riposte by disengagement with a flèche.

### COMPOUND ATTACK

*Direct feint inside - deceive the parry of quarte*

- Middle distance: by disengagement in the high line.
- Long distance: by cutover in the high line.
- Long distance: by disengagement low on the Master's parry and step forward.

*Successive parries and ripostes*

Quarte and sixte:

- riposte by disengagement high,
- riposte by cutover high (pressure).

Quarte septime:

-riposte direct low.

Quarte and counter-quarte with a step back:

- riposte by 1-2.

### ATTACK ON THE BLADE

*Beat sixte, double.*

- Middle and long distance.
- On the Master's step forward.

*Successive parries and ripostes*

- Counter of sixte quarte - cutover.
- Counter of sixte quarte - croise.
- Two counter of sixte (the 2nd with a step back) riposte by opposition with a lunge.

### TAKING OF THE BLADE

- At middle distance on the extension of the Master's arm.
- At long distance by counter-time (engagement

of sixte with a step forward, derobed by the Master).

#### *Defensive actions*

- Octave with a step back - Riposte with opposition low.
- Low quarte with ceding and a step forward - Riposte direct.
- Derobement with a half-lunge.

### **EXERCISE WITH SEVERAL CHOICES**

#### *Feint of a disengagement with a step forward:*

- 1) Followed by a straight hit if there has been no reaction from the Master.
- 2) Followed by deceiving the parry if the Master parries quarte or counter-sixte.
- 3) Followed by a beat of quarte straight hit if the Master stop hits on the inside.
- 4) Followed by a beat of septime straight hit if the master stop hits underneath.

NOTE: Each action is executed between 6 and 10 times (with the necessary corrections). Sometimes the Master parries and ripostes so that the pupil has to counter-riposte.

### **TYPES OF TRAINING - EPEE**

#### **SIMPLE ATTACK**

- Direct hit to the top of the wrist: classical counter-attack to under the wrist while returning to guard.
- Direct hit to inside the wrist: counter-attack to the outside wrist.
- Etc. on the uncovered targets.

#### *Simple parries*

At middle distance:

- Sixte opposition with a step back.
- Quarte opposition with a step back.
- Counter-attack with angulation to under the wrist.

#### **COMPOUND ATTACKS**

Direct feint to the top of the wrist as a false attack, deceive the counter of sixte and extend the lunge or flèche to the body.

- Counter-offensive: Derobe the opposition or the envelopment of quarte by returning to guard with a step back.

#### *Successive parries:*

- Two counter-of sixte with opposition whilst stepping back.

- Counter of sixte quarte opposition with a step back.

### **ATTACKS ON THE BLADE**

#### *Beat quarte, attack to inside the wrist:*

- Counter-offensive: Derobe the opposition of quarte, or the bind of quarte-octave on blade contact while returning to guard and stepping back.

#### *Parries:*

- Bind of septime sixte to the arm.
- Bind of octave quarte to the arm, and classical counter-attack with a step back to the opposite side in which the bind finishes.

### **TAKING OF THE BLADE**

#### *Envelopment in octave*

- At middle distance to the body on the extension of the Master's arm.
- At long distance, with a counter-time to the thigh after a counter-attack provoked to under the hand.
- By flèche to the body

#### *Defence:*

- At middle distance: opposition octave with a step back, riposte by opposition with a lunge.
- At middle distance: ceding quarte with a step forward, riposte direct by keeping the blade.
- At long distance: derobement on blade contact to above the hand.

### **COMBINED EXERCISES**

- 1 - Attack to above the hand.
- 2 - Counter-attack to under the hand on an angulated attack by the Master.
- 3 - Parry of sixte and riposte with envelopment to the arm on the Master's attack to the arm.
- 4 - Beat of quarte followed by a feint with a step forward that the Master counter-attacks to inside the hand.
- 5 - Counter-time by bind of quarte to octave with a lunge or a flèche.

NOTE: All these actions are sometimes parried to provoke the pupil to remise or redouble.

### **TYPES OF TRAINING - SABRE**

#### **SIMPLE ATTACK**

#### *Attack to the head*

- Middle, long distance on the Master's step forward.

#### *Simple parries*

- Quinte - Riposte to the flank.
- Quinte with a step back, compound riposte to head/flank with a lunge.

## COMPOUND ATTACK

*Feint to the head - flank*

- At middle distance, thrown feint to the head.
- At long distance, feint direct during the step forward.
- At long distance with a jump forward and lunge, the feint is executed with the arm more or less extended depending on the distance and accentuated with the guard.

*Successive parries*

- Quinte-seconde, riposte to the right cheek.
- Counter-attack to outside the hand at the moment of the deception, tierce with a jump back, riposte by chest cut with a jump forward.

## ATTACK ON THE BLADE

*Beat tierce - chest cut*

- At middle distance.
- At long distance on a feint to the head executed by the Master with a step forward (beat on the step).
- At long distance with a jump - lunge.

*Defensive actions*

- Prime, riposte to the head.
- Counter-attack by derobement of the beat to the upper wrist by cutover, quarte with a step back, riposte to the right cheek with a lunge.

## COUNTER-TIME

- At long distance: feint to the right cheek with a step forward, on the counter-attack to under the wrist by the Master, beat seconde and hit on the right cheek with a lunge.

*Defensive actions*

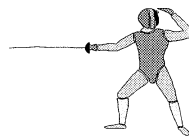
- Same offensive action from the Master (feint to right cheek etc.).
- Tierce, riposte to the flank.
  - Compound counter-attack (top wrist).
  - Finta in tempo on a half lunge to the head.

## EXERCISES WITH SEVERAL CHOICES

*Feint to the head with a step forward.*

- 1 - If the Master does not react, continue the attack to the head.
- 2 - Followed by a deception to the flank or a chest cut if the Master takes a parry of quinte.
- 3 - If the Master counter-attacks, do a counter-time action
- 4 - Counter-attack to under the wrist and execute the parry of quinte with a jump backwards if the Master attacks on the preparation.

NOTE: Each action is sometimes parried, the ripostes varying to provoke a counter-riposte from the pupil.





## CHAPTER VI

# PROGRESSION OF SERIES OF EXERCISES

### FOIL

#### 1st Series

Special educative exercises (flexibility).

#### 2nd Series

On guard position - footwork - fencing positions.

#### 3rd Series

Development - return to guard backwards and forwards - reprise forwards - footwork (forwards and backwards) coordinated with the four fencing positions.

#### 4th Series

*Simple attack:*

- On the absence of blade: Straight hit in the four lines at middle and long distance.

*Defensive:*

- Lateral parries of sixte - quarte - octave - septime, followed by direct ripostes coordinated with footwork (forwards and backwards).

#### 5th Series

Finger exercises (such as: engagement - change of engagement - double engagement), coordinated with footwork.

Revision of the exercises of the 4th series.

#### 6th Series

On the engagement: Disengagement in the four lines at close, middle, and long distance.

Defence after the engagement: Simple lateral and counter parries in the four lines followed by direct ripostes and by disengagements. The simple parries and ripostes are co-ordinated with the different displacements of the feet.

#### 7th Series

On the engagement: Cutover in the two high lines at the three distances.

After the engagement: Parries of the cutover by simple lateral and circular parries followed by direct ripostes - by disengagement - by cutover, coordinated with the different displacements of the feet.

#### 8th Series

Revision of the 4th, 5th, 6th and 7th series; attacks preceded by an engagement, change of engagement, double engagement, co-ordinated with footwork and the different defensive actions.

Study of the first and second direct counter-ripostes after the attack or the riposte in the different positions (on guard - from a lunge - while lunging).

#### 9th Series

Feint of a straight hit - disengagement - and 1-2 in the four lines at the three distances - corresponding successive parries and ripostes varied for the three distances.

#### 10th Series

Feint of a straight hit- counter disengagement and doublement from the four lines and at the three distances - corresponding successive parries and ripostes varied for the three distances.

#### 11th Series

Compound attacks consisting of one feint of a cutover, or the deceiving of the parry by cutover, in the high lines and at the three distances.

Corresponding successive parries with various ripostes for the three distances.

#### 12th Series

Compound attacks consisting of one feint and a deception of semi-circular and diagonal parries.

#### 13th Series

Various compound attacks consisting of two feints, in all the lines at the three distances.

Corresponding successive parries and ripostes varied for the three distances.

#### 14th Series

Finger exercises (beat - pressure - change-beat - change pressure).

Same exercises preceded by an engagement - change of engagement etc.

Same exercises coordinated with footwork.

Revision of the 9th, 10th, 11th, 12th and 13th series.

### **15th Series**

Simple attacks preceded by pressure in the four lines and at the three distances, corresponding simple parries and various ripostes at the three distances.

### **16th Series**

Simple attacks preceded by beat in the four lines and the three distances, corresponding simple parries and various ripostes at the three distances.

### **17th Series**

Compound attacks consisting of one feint preceded by pressure in the four lines and at the three distances. Corresponding successive parries, and various ripostes at the three distances.

### **18th Series**

Compound attack consisting of one feint preceded by beat in the four lines and at the three distances.

Corresponding successive parries and ripostes varied at the three distances.

### **19th Series**

Simple and compound attacks in the four lines by derobing preparations on the Master's step forward. Simple and successive parries preceded by a preparation that has been derobed, and various ripostes.

### **20th Series**

Simple and compound attacks on the preparation preceded by attacks on the blade and executed on the Master's step forward.

Corresponding simple and successive parries and various ripostes.

### **21st Series**

Takings of the blade with opposition in the lines that allow their correct execution (right and left handed fencers), at the three distances.

Indirect or compound attacks of one feint preceded by an opposition in the four lines and at the three distances.

### **22nd Series**

Takings of the blade by bind in the lines corresponding to their correct execution at the three distances.

Simple indirect or compound attacks of one feint, preceded by a bind in the four lines and at the three distances.

Parries followed by ripostes by croisé and ceding parries followed by direct ripostes.

### **23rd Series**

Takings of the blade by envelopment in the lines corresponding to their correct execution and at the three distances.

Simple indirect or compound attacks of one feint, preceded by the envelopment in the four lines and at the three distances.

Parries by ceding and ripostes. Parries followed by ripostes by taking of the blade at the three distances.

### **24th Series**

Counter-attacks: stop hits, time hits, derobements, and esquives.

Revision of the 15th to the 20th series.

### **25th Series**

Remises of the attack. Riposte, counter-riposte etc.

Redoublements. Riposte, counter-riposte etc.

Reprises of the attack: Simple, compound, with attack on the blade, etc.

Revision of the 21st, 22nd and 23rd series.

### **26th Series**

Counter-time by attack on the blade - simple and compound with one feint and corresponding defensive actions (parries - derobements).

### **27th Series**

Counter-time by taking of the blade - direct or followed by indirect attacks. Corresponding defensive actions (parries, derobements).

### **28th Series**

Combined co-ordination exercises.

*For example:*

Simple attack - simple parry - compound attack with step forward and lunge - successive parries the last action with a step back - counter time with step forward and lunge.

### **29th Series**

Study of the flèche and the exercises that suit this action.

Revision of the 24th and 25th series.

### **30th Series**

Exercises with several choices for pupil:

*For example:*

Preparation: Engage with a step forward.

- No reaction - direct attack.

- Reaction (pressure) - attack with disengagement
- Engagement evaded - counter time by attack on the blade or taking of the blade.

## **EPÉE**

When teaching Epée to a fencer who began with Foil, the first three series remain valid. Only the on guard position and the return to guard need modification. The same progression also applies when a fencer starts directly with Epée since the basic fencing positions are essentially the same.

### **4th Series**

Classical simple attacks to the advanced targets (four targets).

Classical simple counter-attacks to the advanced targets (four targets)

Classical attacks followed by classical counter-attacks to the advanced targets (four targets).

### **5th Series**

Study of remises and reprises after the attack and the counter-attack.

Revision of the 4th series - with reprises and remises.

Simple parries of sixte and quarte, riposte to the arm.

### **6th Series**

Compound attacks of one feint to the advanced target - as a false attack or - attack with a step forward and lunge.

Counter-attacks consisting of one feint (compound derobement) by returning to guard followed by a step back.

Compound attacks followed by compound counter-attacks.

### **7th Series**

Revision of the 4th, 5th and 6th series - with remises and reprises.

Counter parries of sixte and quarte.

Successive parries of sixte and counter-sixte, riposte to the arm.

Successive parries of quarte and counter-quarte.

### **8th Series**

Simple attacks to the advanced targets on the withdrawal of the hand:

- to the hand and arm (four targets)
- to the leg
- as a false attack
- with a step forward and lunge

Revision of simple parries of sixte, quarte, counter sixte and counter-quarte with remises and reprises.

### **9th Series**

Compound attacks to the body on short parries with a flèche.

Simple attacks to the body on the withdrawal of the hand with a flèche

Successive parries sixte - counter-sixte, quarte - counter-quarte

Ripostes to the arm.

### **10th Series**

All of the following actions should be interspersed with remises or reprises.

Attacks on the blade followed by direct attacks to the advanced targets; beats of quarte, sixte, octave, septime followed by direct attacks.

Corresponding defensive actions; counter-attacks on the beat - derobement with and without contact followed by direct attacks to the advanced target.

### **11th Series**

Attacks on the blade followed by direct attacks to the advanced targets; beats followed by indirect attacks.

Corresponding defensive actions.

Revision of the 4th, 5th, 6th and 7th series.

### **12th Series**

Revision of the 8th to 11th series.

Parries of octave - bind and of septime - bind to the arm whilst retreating.

### **13th Series**

Attacks with angulation to the advanced targets (four targets).

Counter-attacks with angulation to the advanced targets (four targets).

Specific defensive actions for angulated attacks (foil type parries).

Combined exercises with simple classical attacks and counter-attacks with angulation and vice-versa.

### **14th Series**

Attacks with angulation to the advanced targets preceded by attacks on the blade to the four targets.

Appropriate defensive actions against the attacks on the blade.

Parries with a step back - opposition ripostes with a lunge or flèche.

### **15th Series**

Combined revision exercises of all the

preceding series consisting of: attack - counter-attack - parry and riposte - compound attack or attack on the blade.

### **16th Series**

Takings of the blade - opposition to the body in sixte or octave for a left hander. The opposition of sixte and quarte to the arm.

Corresponding defensive actions (parries and derobements with and without contact).

### **17th Series**

Taking of the blade - binds of quarte-octave and septime-sixte to the body (reversed for left handers) and binds of quarte-octave to the front thigh and of septime-sixte or octave-quate to the arm.

Corresponding defensive actions.

### **18th Series**

Takings of the blade - envelopment to the same targets as the opposition.

Appropriate defensive actions.

### **19th Series**

Revision of simple and compound attacks and attacks on the blade to the advanced targets.

Simple and successive parries and ripostes by bind and envelopment to the arm with a step back or to the body with a lunge or a flèche.

### **20th Series**

Revision of simple or successive parries and attacks followed by classical counter-attacks or with angulation.

Revision of takings of the blade and appropriate defensive actions coordinated with a variety of displacements and interspersed with remises and reprises executed in the different positions.

### **21st Series**

Counter time using simple takings of the blade preceded by various preparations, compound counter-attacks to the advanced targets or to the body, with or without blade contact).

### **22nd Series**

Double takings of the blade, finishing in appropriate lines for left and right handed fencers - with a step forward and lunge - several steps and lunge - step forward and flèche.

Corresponding defensive actions.

### **23rd Series**

Compound takings of the blade executed at the same distances as for double takings (22nd Series). The final taking of the blade must be appropriate for left and right handed fencers.

Varied appropriate defensive actions.

### **24th Series**

Combined takings of the blade.

Corresponding defensive actions.

### **25th Series**

Remises and redoublements with second intention, to the advanced targets and to the body.

Remises and redoublements with angulation to the advanced targets.

Counter-stop hit.

Revision of simple and successive parries and attacks to the advanced targets.

### **26th Series**

Progressive combined exercises, typified by:

Classical simple attacks to the advanced targets, counter attack with angulation to the advanced targets, simple parry and riposte to the arm, counter-time to the body with a flèche, with remise or redoublement in the final part depending on the Master's reaction.

### **27th Series**

Exercises with several choices for the pupil, for example:

Feint of a straight hit with a half lunge or a step forward and depending on the Master's reaction which can be:

- withdrawal of the arm: follow through to the hand,
- simple short parry: deceive to the arm,
- counter-attack: counter-time to the body by taking of the blade.

## **SABRE**

### **1st Series**

Special educative exercises for sabre fencing (flexibility).

### **2nd Series**

On-guard position - footwork - fencing positions (tierce, tierce-parry, quarte, quinte).

### **3rd Series**

Development, return to guard forwards, backwards, reprise forwards - footwork forwards and backwards combined with the fencing positions and the different feints of the attack.

#### **4th Series**

Finger work exercises at close range (five attacks - double the hits, engage in the different positions - beats - change-beats, etc.).

Revision of the 2nd and 3rd series.

#### **5th Series**

The attack to the head at three distances - coordinated with the different footwork. Simple parry of quinte and varied ripostes at close distance.

#### **6th Series**

Attacks to the right cheek (right hander) and to the flank at the three distances.

Simple parry of tierce and varied ripostes at close distance.

#### **7th Series**

Attack by chest cut at the three distances.

Simple parry of quarte and varied ripostes at close distance.

#### **8th Series**

Attack with the point at the three distances.

Study of the counter-riposte in the different positions (on guard, with a lunge and from a lunge).

Revision of the three simple basic parries, varied ripostes at the three distances.

#### **9th Series**

Revision of the five simple attacks: from immobility, on the Master's step forward, with a step forward feint and interspersed with varied counter ripostes.

Revision of the three basic parries, varied ripostes at the three distances.

#### **10th Series**

Simple secondary parries: seconde, prime and quinte at close range and with different displacements.

Revision of finger dexterity exercises.

#### **11th Series**

Attacks consisting of one feint (to the head) at the three distances and the appropriate defensive actions (simple basic parries and secondary successive parries).

#### **12th Series**

Attacks consisting of one feint (to the flank or the cheek) with the appropriate and varied defensive actions.

#### **13th Series**

Attacks consisting of one feint (with the point

or chestcut).

Appropriate and varied defensive actions.

#### **14th Series**

Revision of attacks consisting of one feint; at long distance, with a step forward and lunge and with a jump forward and a lunge. Perfecting the ability to choose the most opportune action with varied ripostes at all distances.

#### **15th Series**

Attacks consisting of two feints - varied execution.

Corresponding defensive actions with varied ripostes.

#### **16th Series**

Classical simple attacks to the advanced targets or with angulation and the corresponding defensive actions.

Compound attacks to the advanced targets with the corresponding defensive actions.

#### **17th Series**

Counter-attacks to the four advanced targets.

Counter-attacks to the advanced targets followed by simple parries and ripostes.

Counter-attacks to the body with a half-lunge.

Revision of simple and compound attacks and of their defensive actions.

#### **18th Series**

Attack on the blade; beat of quarte followed by the corresponding attacks depending on whether the fencers is left or right handed at the three distances and of varied execution.

Appropriate defensive actions (simple parries and counter-attacks by derobement).

#### **19th Series**

Attack on the blade; beat of tierce followed by the corresponding natural indirect attack or attack consisting of one feint (right hander).

Appropriate defensive actions.

#### **20th Series**

Attack on the blade; beat of seconde followed by appropriate attacks.

Appropriate defensive actions.

#### **21st Series**

Attack on the blade; beats of prime and quinte followed by the appropriate attacks.

Corresponding defensive actions.

### **22nd Series**

Revision of simple and compound attacks by seeking rhythm and ability to choose the most opportune action.

Similarly, revision of all the simple and successive parries.

### **23rd Series**

Study of remises - reprises - redoublements.

Corresponding defensive actions.

Revision of attacks on the blade and their defensive actions.

### **24th Series**

Counter-time using tierce, quarte and quinte followed by simple actions or those consisting of one feint.

Appropriate defensive actions (simple or successive parries), finta in tempo, compound counter-attack and reprise of the counter-attack.

### **25th Series**

Counter-time using seconde, quinte and prime followed by simple actions or those consisting of one feint.

Appropriate defensive actions.

### **26th Series**

Combined and co-ordination exercises.

For example: attack to the head and on the counter-attack outside wrist do a simple parry of tierce with return to guard. Attack by feint to the head, chest cut with a step forward and lunge, parry the counter-attack under the wrist with successive parries of quinte and seconde while returning to guard and with a step back. Counter-time by quinte

flank on the Master's counter-attack to the head.

### **27th Series**

Defensive exercises with several choices for the pupil:

The Master does a simple attack to the head or a compound attack by feint flank or chest cut. In the case of the former, simple parry of quinte and riposte and for the latter successive parries of quinte -seconde and riposte or quinte-prime and riposte.

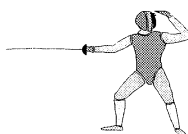
The pupil need not react but parry the final part if it has been well judged.

### **28th Series**

Exercises with several choices for the pupil:

For example: preparation by feint to the head with a step forward:

- 1) The Master does not react, the pupil continues to the head.
- 2) The Master does a simple parry of quinte, the pupil does a compound action to the flank or chest.
- 3) The Master counter-attacks to the wrist, the pupil executes a counter-time action followed by a simple or compound attack.
- 4) The Master attacks to the head, the pupil counter-attacks to under the wrist, parries and ripostes.
- 5) The Master steps back or does a jump backwards, the pupil continues to the head with jump forward and lunge.



# EQUIPMENT AND ELECTRICAL APPARATUS

## SECTION 1

### ELECTRICAL APPARATUS

To facilitate judgement and reduce errors, particularly concerning the validity of hits, modern technology has replaced human judgement with electrical equipment. This equipment offers the advantage of being able to indicate all hits by light and sound signals. Its design naturally depends on the conventions for each weapon.

The rational use, maintenance, and repair of this apparatus requires the Master to have a certain knowledge of electricity.

#### ELECTRICITY

*Electrical current* is produced by electrical generators or sources of current (accumulators, batteries, dynamos, alternators). It is carried by metal wires to the equipment used.

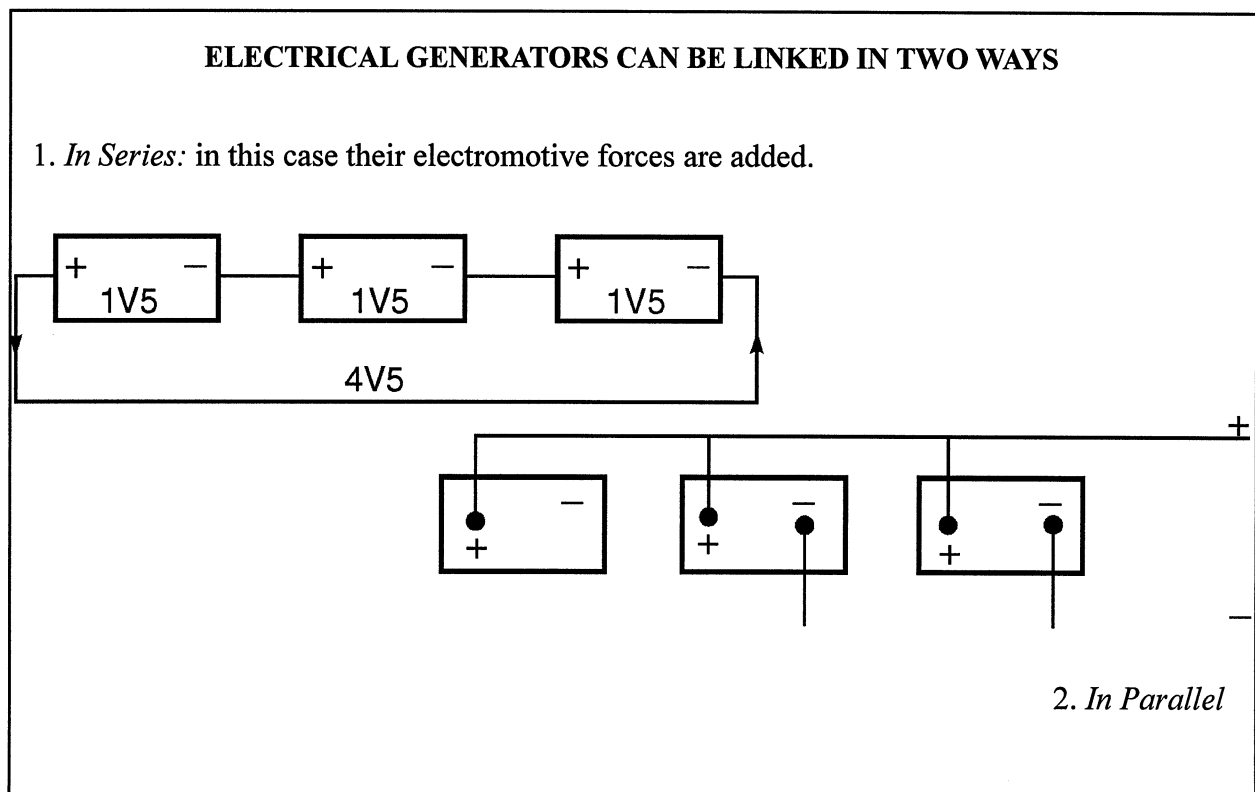
*Conducting materials:* metals, acidic or basic solutions and salts.

*Insulating materials:* glass, porcelain, rubber, paraffin, ebonite, etc.

*The electrical current is unidirectional:* the positive pole is that which is linked to the wire of the voltmeter from which oxygen is released.

*The amount of current is measured in amperes.*

*A fuse wire* made of lead/tin alloy is inserted in the circuit through which the current flows. When the amount of current is above a certain strength considered dangerous, the fuse wire temperature reaches its melting point and breaks the circuit.



The *resistance* of a conductor is a measure of its ability to oppose the flow of the electric current. The unit of resistance is called an *ohm*.

The *volt* is a unit of measure which quantifies difference in potential between two points of a conductor. The electromotive force of a generator can be measured with a *voltmeter*. Electrical generators can be linked together in two ways:

1 - *In series*: in this case their *electromotive forces* are added.

2 - *In parallel*:

The *current* can be *direct* (batteries) or *alternating* (mains 110 or 220 volts).

For use by different equipment, the alternating current can be transformed into direct current by a *rectifier* and its voltage can be raised or lowered by a *transformer*.

## PRINCIPLE OF ELECTROMAGNETISM

### SOLENOID

The passage of current in a conductor creates a magnetic field. Winding a conducting wire around the surface of a metallic cylinder creates a solenoid which has the properties of a magnet.

An *electromagnet* is a temporary magnet consisting of a solenoid made of a soft metal core. The magnetism is controlled by the passage of current.

## INTRODUCTION

Historically, two different types of signalling apparatus existed: one for Epee, which was invented first, and one for Foil which was introduced in 1955.

Mixed boxes for both Epee and Foil followed soon after. Today combination boxes for all three weapons are in use.

However, the use of the mixed box (Foil and Epee) is still quite common. Its operation is discussed below.

Each electrical control installation consists of:

- 1 - An electric box
- 2 - A connecting conducting wire:
  - to the mains (alternating current 110 - 220 volts) by two pins,
  - on batteries (direct current 12 volts) by two crocodile clips and a jack plug.
- 3 - Two lengths of wire that have triple pins linking the box to the spools (length approx

12 m).

- 4 - Two spools.

## THE MIXED BOX

The functional principles of all mixed boxes are the same. Some design or constructional differences exist between them depending on the manufacturer.

### THE CONNECTING WIRES:

Mains connecting wire - two male plugs 20mm apart (current model).

Battery connecting wire - two removable crocodile clips, a triple connector plug to the weapon.

Connecting wire linking the box to the spools. Length: 15 to 20 m; two triple pin plugs.

## THE SPOOLS

The appearance of the spools varies depending on the manufacturer's design. However, the transmission of the current must conform to one of two modes:

- a) Integral transmission via the triple conducting wires.
- b) Partial transmission via the triple wires with the metallic body of the spool playing the role of conducting wire for a part of the circuit.

- 1 - *Modern spool* (integral transmission)

Triangular base screwed onto the concave cover that has a hole at its centre for the passage of the triple wire.

Flat cylinder container consisting of:

- Outside - a triple socket and a bearing case holding the end of the axle
- Inside - three conducting wires soldered onto the triple socket.

Circular plate (fixed onto the box), consisting of:

Outside: the reel, the pulley and its guide.

Inside - a bearing case holding the other end of the axle (the axle and its spring being keyed together).

Triple wire: winds around the outside of the



spring from a spool contained by the circular disk and the box.

Advantage: No voltage drop in the circuits.

2- *Old style spool* (transmission of the circuit current in a metallic body)

Support or base.

Cover: consists of a triple socket or a place for the passage of a socket block with a hole in the centre for the passage of the axle.

Triple socket: the two connectors (central and 15mm) are insulated but the other 20mm plug is always connected to the metallic body of the spool. It is not linked with a wire to the body of the spool.

The concave cylindrical container has two holes, one for the passage of the other end of the axle and the other on the side for the triple spool wire.

Axle: is threaded at each end for holding the bearing cases, the fixing screws - the end of one of the springs is fixed to the middle of the axle.

Spring spool: has a hole in the side for the triple wire.

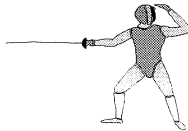
Inside: frictional contact with the two insulated metallic conductors and also of the metallic body of the spool.

Outside: one or several retaining caps for the springs (depending on the type, there are either one, two or three springs).

Carbon brushes are part of the friction system. They transmit the current from the central and 15mm plugs of the triple socket to which they are linked by insulated conductors inside the spool.

3- *Use*

The spools are used under constant tension from the spring. This tension is obtained by turning (from six to ten turns) either the axle or the spool, while preventing the other from turning.



# THE CIRCUITS

## MIXED APPARATUS

### EPEE CIRCUITS (Closing)

#### 1 - Outward circuit

- a) Central plug of the triple plug of the box.
- b) Plug and wire corresponding to the connecting wire of the central female plug of the spool.
- c) Type M: Wire in one piece soldered to the interior of the metallic shell of the central female socket.

Type A: Two insulated wires linking the central female socket to brush holders - springs - carbon brushes - metallic piste - insulated wire linking the piste to the corresponding spool wire - or depending on the type: spool wire soldered directly onto the piste.

- d) Central wire of the triple plug of the spool wire.
- e) Wires and central wire of the body wire.
- f) Central wire of the guard socket.
- g) Corresponding wire glued to the blade ending in a contact insulated within the cup inside the barrel.

#### 2- Return or "hit" circuit

The circuit is closed when the contact spring fixed onto the point touches the two contacts.

- a) Contact corresponding to the second wire of the blade.
- b) 15mm socket in the guard.
- c) Pin and corresponding wire in the body wire.
- d) Pin at the other end of the body wire and 15mm connector of the spool socket -

corresponding spool wire.

- e) Type M: Spool wire soldered to the 15mm spool socket connector.

Type A: Wire soldered on the second metallic piste or depending on the spool, linked with the aid of an intermediary insulated wire - metallic piste - carbon brushes - springs - insulated conductors linking the brush carriers to the 15mm spool socket connector.

- f) Plugs and corresponding wires to the 15mm socket connector of the box.

#### 3- Earth circuit

The current is carried by the opponent's point to its point of contact with the metal of the blade at the moment of closure.

- a) Metal part of the epée.
- b) 20mm plug of the guard socket which is linked by a conductor to the metallic support of the guard socket.
- c) 20mm connector of the wire corresponding to the wire in the body wire.
- d) 20mm connector of the spool socket.
- e) Type M: Length of the corresponding spool wire soldered to the 20mm spool connector socket.

Type A: Length of the corresponding spool wire soldered on a metal part of the spool, current transmitted by the metal case of the spool - 20mm non-insulated spool connector.

- f) Plugs and corresponding 20mm of the connecting wire to the case.

## FOIL CIRCUITS (Breaking)

### 1 - Outward circuit

- a) Identical to the outward circuit in Epee up to the central pin of the triple plug of the body wire.
- b) Corresponding wire of the body wire.
- c) 3mm diameter pin of the two pin plug of the body wire.
- d) Insulated socket of the guard socket.
- e) Insulated blade wire finishing with a

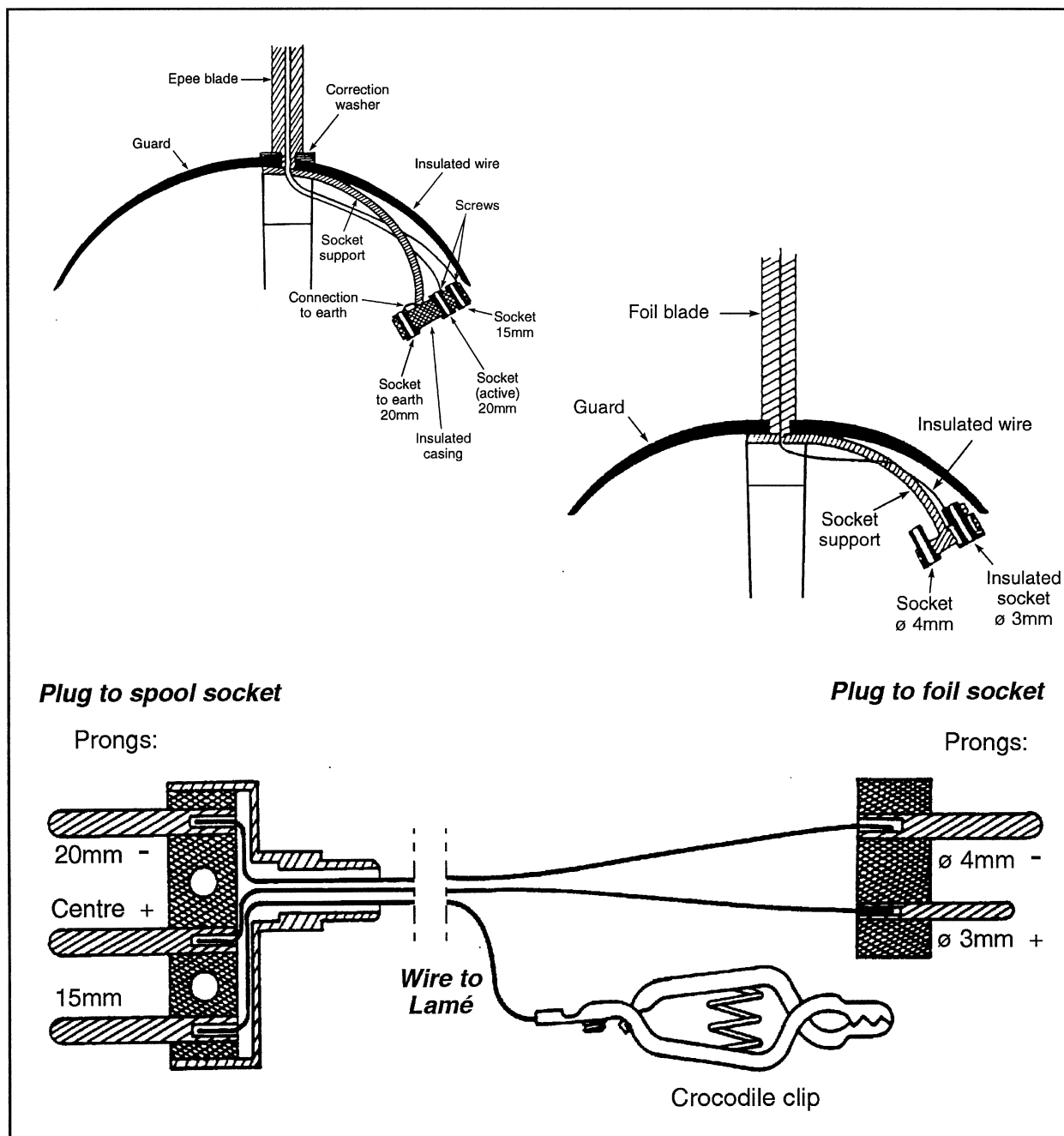
metallic contact.

- f) Contact and return spring - contact in the point.

### 2- Return or off target circuit

This circuit is only effective at the instant that the point is depressed in the barrel. The timing is determined by the parts that cease to carry the current.

- a) Contact and fixing washer - grub screws.
- b) Barrel - blade and spring of the guard socket.



Foil Body Wire

- c) Non-insulated plug of the guard socket.
- d) 4mm diameter pin of the double connector plug of the body wire.
- e) Corresponding wire and 20mm pin on the other end of the body wire.
- f) Identical to the earth circuit of Epée to the 20mm plug of the box.

### 3- Valid circuit

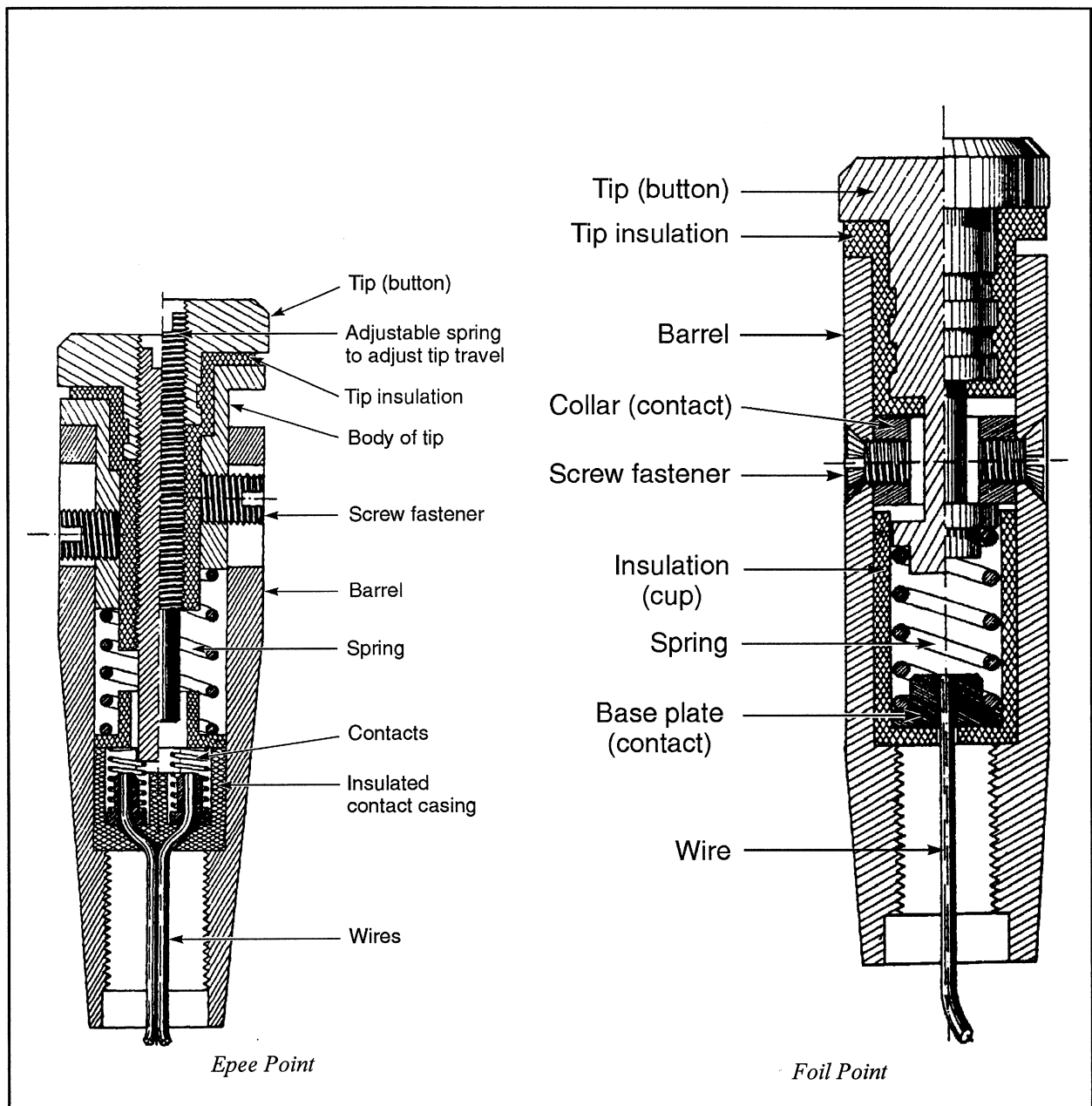
The current is carried by the foil point to the point of contact with the electric jacket at the instant of breaking the circuit.

- a) Electric jacket - crocodile clip of the body wire.
- b) Corresponding wire and 15mm pin of the triple connector plug of the body wire.
- c) Identical to the return circuit of Epée to the 15mm connector of the box.

### 4- Earth circuit

The current is carried by the opponent's point to its point of contact with the metal of the weapon at the moment of breaking the circuit.

- a) Identical to the *non-valid* circuit in Foil, from the blade.



# VARIOUS ELECTRICAL PHENOMENA

*When the point meets any surface with sufficient pressure to close or break the circuit, the box registers or translates the variations in current in the various circuits concerned into light and sound signals. On certain types of boxes the signalling of the earth circuit is not visible.*

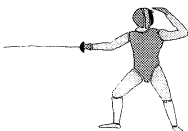
## **EPEE:**

- 1- *Signalling a "hit"*: Closure of a circuit resulting in a coloured light on the opposite side. It is impossible to close the opponent's circuit in a period of time greater than 1/25th of a second (the boxes are regulated between 1/20th and 1/25th of a second).
- 2- *Signalling of the "double hit"*: Closing of the two circuits in a period of time less than 1/25th, the two coloured lights (opposite side) are lit.
- 3- *Earth*: Hit on the metal of the blade or the metallic piste. The current goes to the box via the opponent's 20mm circuit and annuls the signal of the "hit". Certain boxes have an earth lamp which lights up on the side of the fencer who makes a hit on the weapon or the piste.

## **FOIL:**

- 1- *Signalling "off-target" breaking of a circuit hit*: A white light on the opposite side. In this case there is a possibility of lighting the coloured light (valid hit) on the same side but impossible to break any circuits in a period of time greater than two seconds (all boxes are regulated at two seconds).
- 2 - *Signalling (double non-valid hit)*: The breaking of the two circuits in a period of time less than two seconds resulting in the lighting of the two white lights (opposite sides). It is also possible to light the two coloured lights (valid) in the same period of time.
- 3 - *Signalling (valid hit)*: The current goes to the box via the opponent's 15mm electric jacket circuit and annuls the signalling of the break resulting in a coloured light on the opposite side. Immediate lighting of the non-valid light on the same side and breaking any of the opponent's circuits in a period of time greater than two seconds is impossible.
- 4 - *Signalling (double valid hit)*: The current goes to the box via the two 15mm electric jacket circuits resulting in the lighting of the two colored lights (opposite sides) and the instantaneous annulment of a non-valid signal.
- 5 - *Earth*: Hit on the metal of the blade or on the metal piste. The current goes to the box via the opponent's 20mm circuit and annuls the signalling of the break.

NOTE: From the explanation of these various phenomena it should be apparent that a non-valid hit can't prevent the signalling of an immediate valid hit from the same side. On the other hand the signalling of a valid hit prevents the signalling of an immediate non-valid hit from the same side.



# PATH (closing or breaking) OF THE POINT

The different electrical points must conform to the manufacturing and functioning standards given in the international rules. It is therefore necessary to define the different physical travels of the point.

## EPEE:

### Lighting travel:

The lighting travel is the distance that the point must cover by sliding in the barrel so that the contact spring connects with the two contacts at the end of the conducting wires of the blade. It must be greater than 1.0mm.

### Supplementary travel:

The supplementary travel is the distance that the point can cover by sliding in the barrel after the closure of the circuit so that its lower edge hits the upper edge of the barrel. It must be less than 0.5mm.

## FOIL:

### Breaking travel:

The breaking travel is the distance that the point must cover in the barrel so that it is no longer in contact with the fixation washer. It is infinitely small.

### Supplementary travel:

The same as in the Epée but less than 1.0 mm.

## FUNCTION TESTING

Before using the different parts (boxes, spools,

wires) in a control installation, it is necessary to check them to insure they are working order. To proceed with the different checks the following equipment is necessary:

- two single wires, each finishing in a single plug,
- one Epée body wire (triple pin).

## THE CURRENT

Before turning anything on, check the voltage source being used and verify that the red indicator of the power switch, placed on the back of the box, corresponds to this voltage. Turn the on/off switch to "on"; the voltmeter gives the voltage and its needle must settle between the two red lines. In the case of high voltage supply adjust the voltage with the voltage switch.

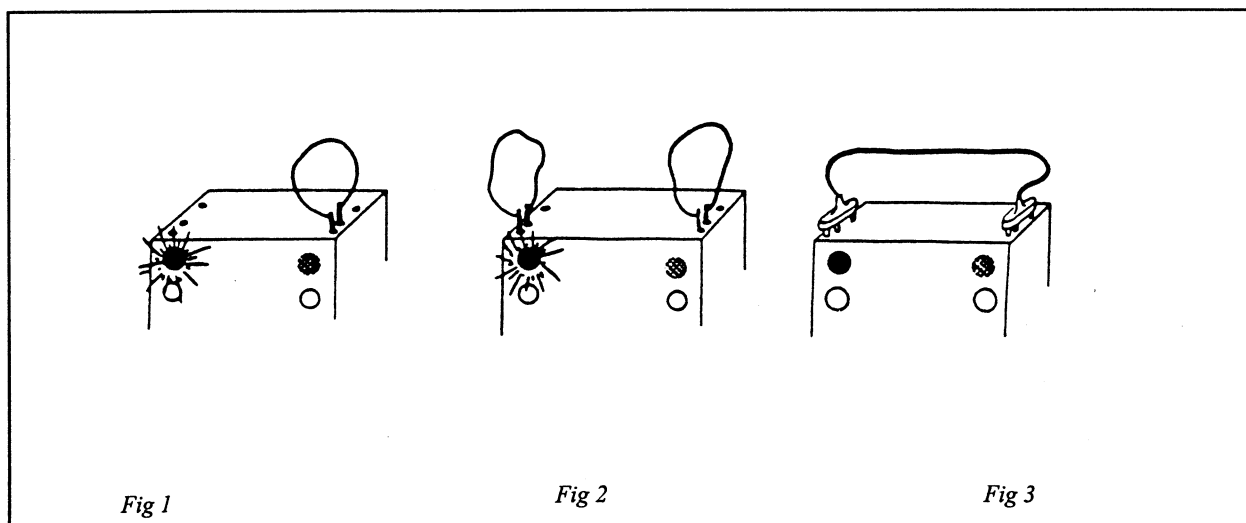
## CHECKING THE BOX

### FOR EPEE:

- 1 - Verify the "hit" circuit (manual)

On one of the triple plugs, make contact between the central plug and the one 15mm away, the opposite colored light comes on (figure 1).

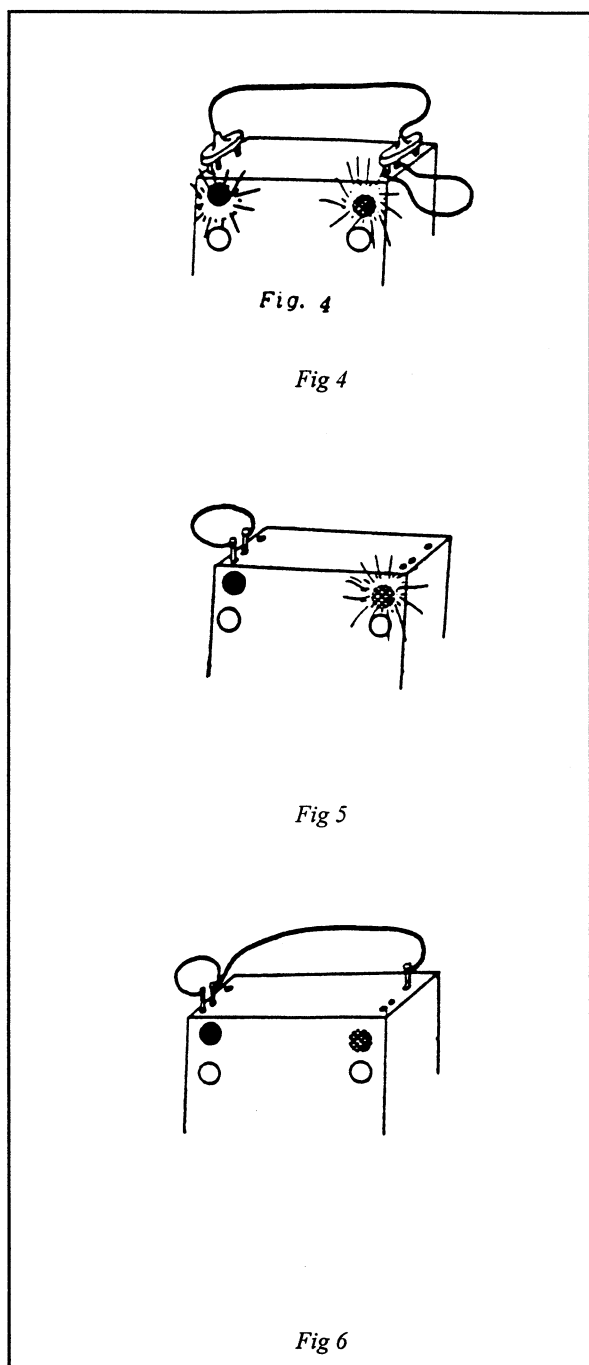
Without resetting the box, proceed in the same



way with the other triple plug (in a time greater than 1/20th second), the opposite coloured light must not come on (figure 2).

2 - *Verify the double hit* (manual)

Linked by the body wire, the triple plug of the box (figure 3). Using a single wire make contact between the central and 15mm plug of the same side. The two coloured lights should come on simultaneously (figure 4).



3 - *Verify the weapon earth circuits* (automatic)

Link the central plug and 15mm plug of the same side with the body wire. The opposite coloured light is illuminated (figure 5). With another single wire connect the central plug

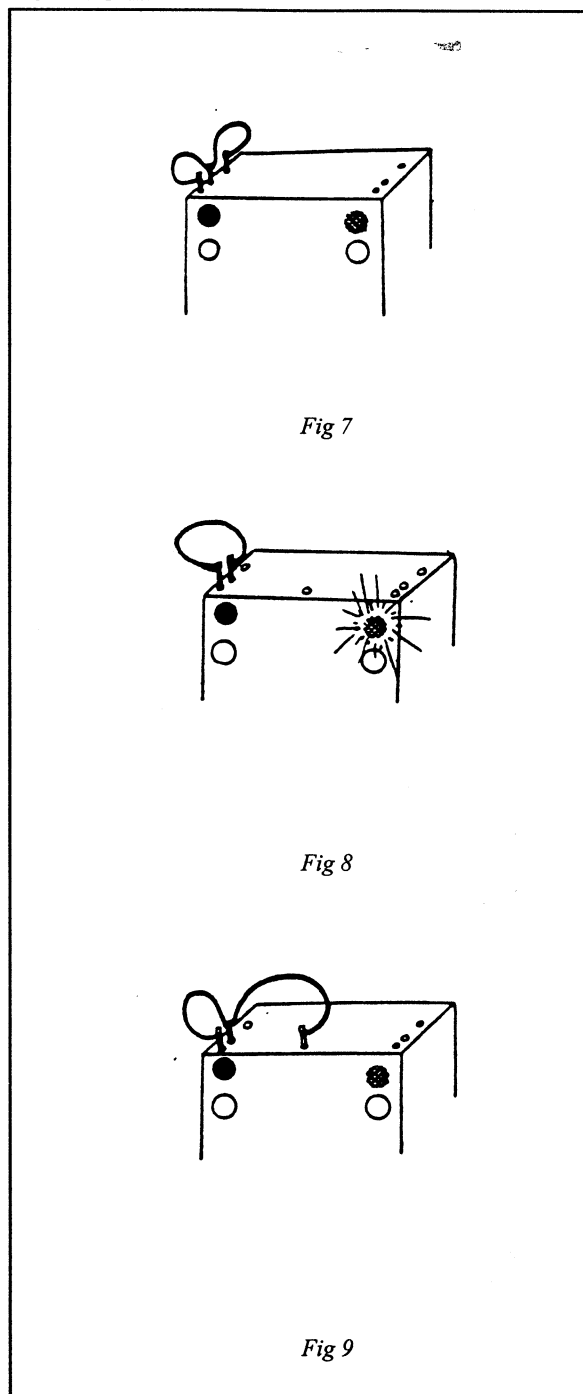
with either the opposite 20mm plug (figure 6) or the 20mm plug of the same side (figure 7). The coloured light should go off.

NOTE: It is possible to check the earth by contacting the 15mm plug and the other 20mm plugs. This operation corresponds to the temporary earth.

4- *Check the earth circuit "metal piste"* (automatic)

Identical to the preceding operation (figure 8). Contact the socket of the metallic piste (figure 9), the coloured light should go off.

FOR FOIL



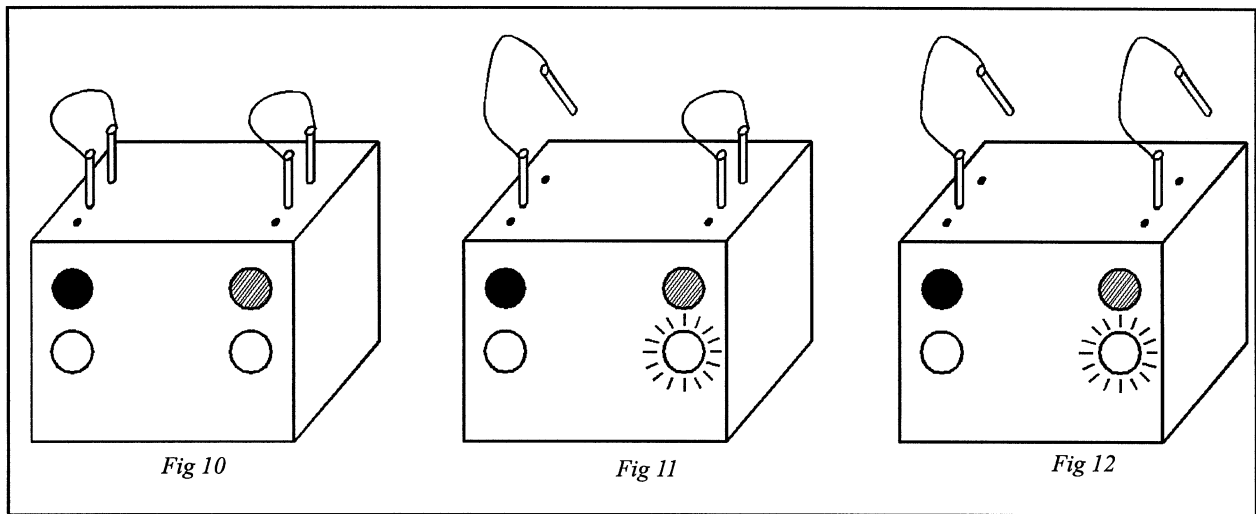


Fig 10

Fig 11

Fig 12

1 - Check the non-valid hit (manual)

By using two single wires make contact between the central and 20mm plug of each side of the box. All four lights will go off (figure 10). Break the contact of one side by unplugging the 20mm plug. The opposite white light goes on (figure 11). In more than two seconds after unplugging the 20mm plug of the other side the opposite white light must not go on (figure 12).

2 - Check the double non-valid hit (manual)

Using two single wires make contact between the central and 20mm plug on each side of the box. The four lights go off (figure 13). Break the contact of each side in a period of time less than two seconds by unplugging the two 20mm plugs. The white lights should come on (figure 14).

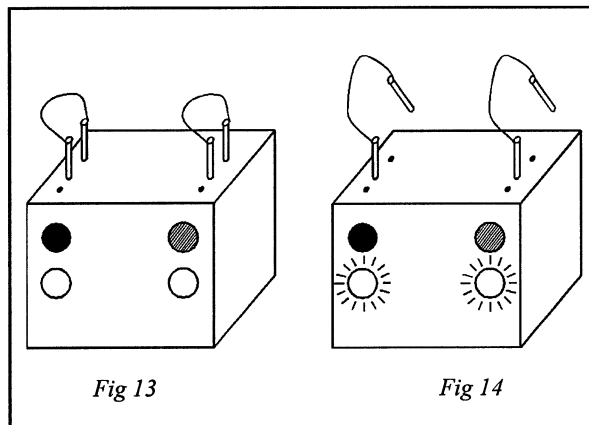


Fig 13

Fig 14

3- Check the valid hit circuit (automatic):

As above, make contact between the two central and 20mm plugs of each side of the box. The four lights go off (figure 15). Unplug the 20mm plug on one side. The opposite white light should go on (figure 16). If this wire is brought into contact with the 15mm plug of the opposite side, the coloured light is illuminated instead of the white light, which simultaneously goes off (figure 17).

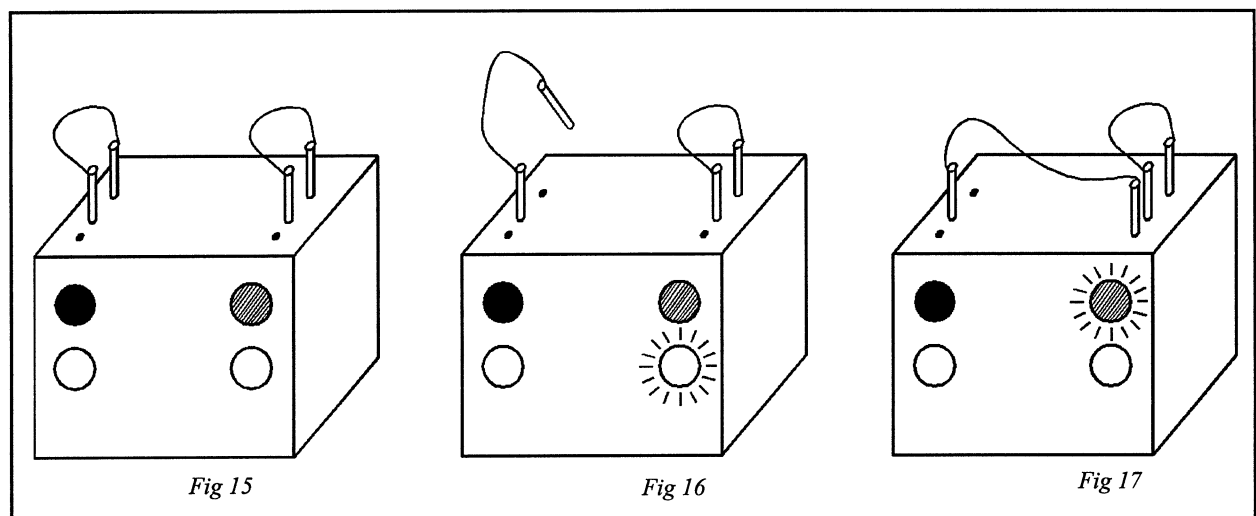


Fig 15

Fig 16

Fig 17



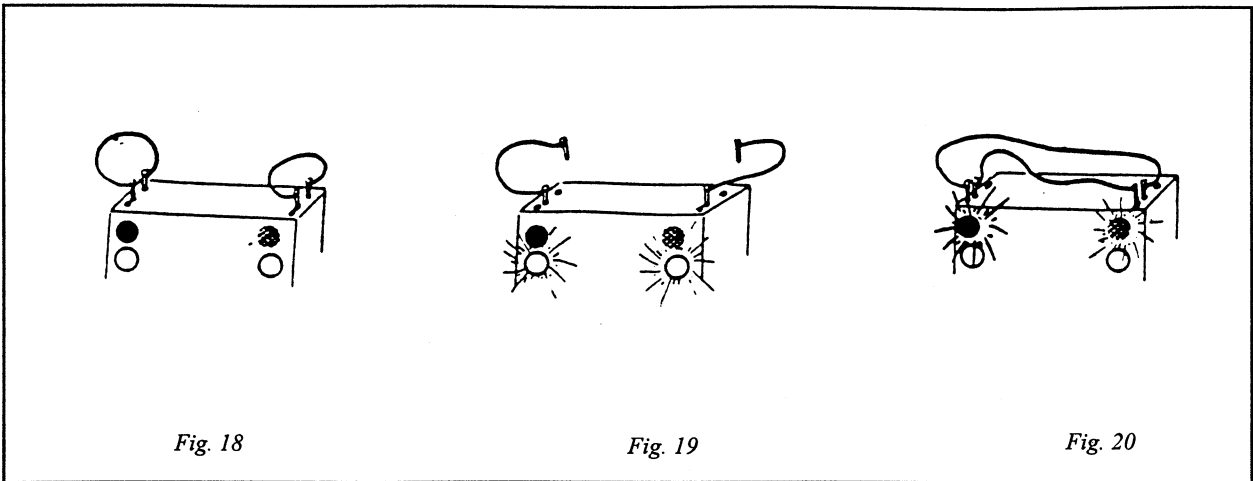


Fig. 18

Fig. 19

Fig. 20

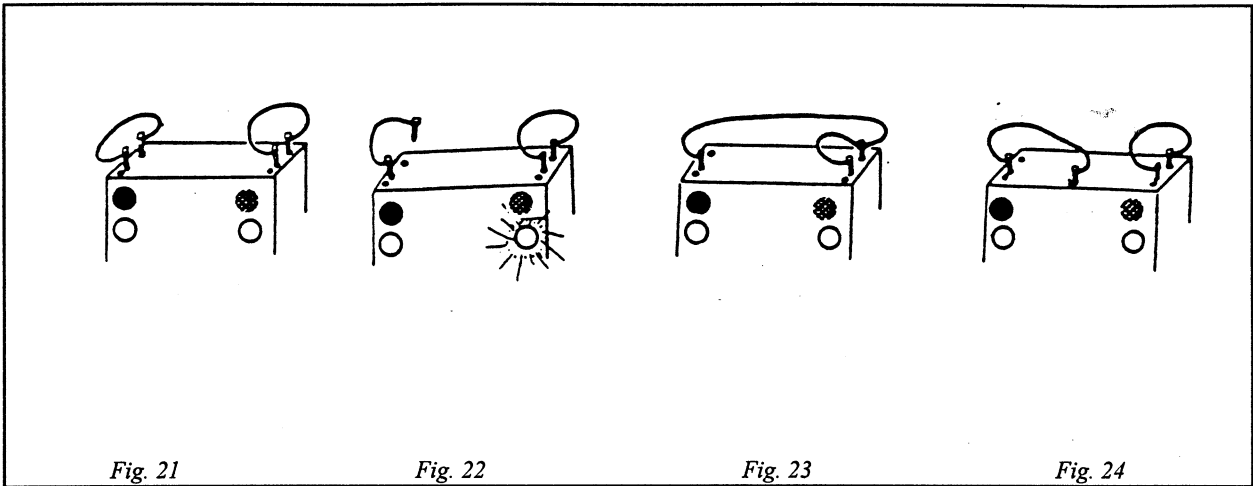


Fig. 21

Fig. 22

Fig. 23

Fig. 24

4 - Check the double valid hit (automatic):

As above, link the central and 20mm plug of each side of the box (figure 18), unplug the two 20mm plugs, the two white lights should come on (figure 19). With the two wires contact the two opposite 15mm plugs, the two coloured lights should go on simultaneously and the white lights turn off (figure 20).

5- Check the earth circuit: weapon and metallic piste (automatic):

As above link the central and 20mm plug of each side of the box (figure 21), unplug the 20mm plug, the opposite white light should come on (figure 22). With this wire contact either the opposite 20mm plug (figure 23), or

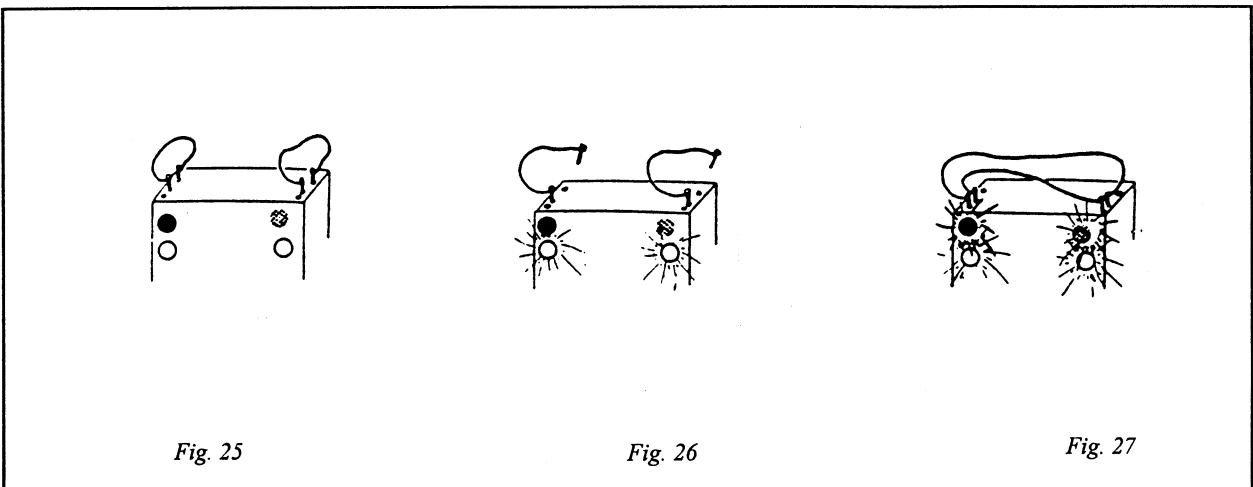


Fig. 25

Fig. 26

Fig. 27

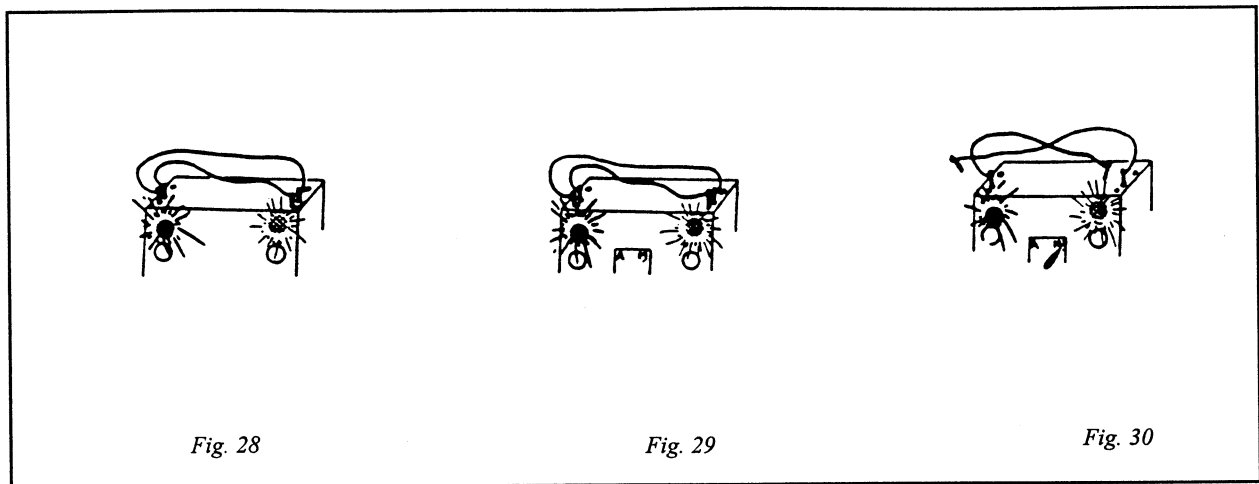


Fig. 28

Fig. 29

Fig. 30

the plug of the metal piste (figure 24) and the white light should go out.

6 - *Check the order of the non-valid lighting (manual)*

As above, link the central and 20mm plug, all four lights are off (figure 25). Unplug the two 20mm plugs and the two white lights turn on (figure 26). Plug in, in a period of time less than two seconds these two wires in the 15mm plugs of the opposite side, the two coloured lights should also turn on (figure 27).

7 - *Verify the order of the lighting of valid - non-valid (manual)*

The box signals the double hit, the two coloured lights are on (figure 28). Put the box on manual while leaving the contacts of the double hit (figure 29) and unplug the two 15mm plugs within two seconds, the coloured lights do not turn off and the white lights cannot turn on (figure 30).

**CHECKING THE CONNECTING WIRES**

(Box - spools)

Setting the box to "Epee":

- contact the central and 15mm plug, the opposite coloured light should go on,
- contact the 3 pins together, the opposite light must not go on.

**CHECKING THE SPOOLS**

Proceed in the same way as for the connecting

wires, by unrolling the spool wire after having put on the automatic resetting, the opposite coloured light comes on (intermittantly and continuously).

**LOCATING FAULTS - CHECKING THE CIRCUITS**

When a breakdown occurs, it is indispensable to proceed in a methodical way to locate the fault and fix it, or if necessary to change the equipment.

**Principles of searching for the defective equipment**

- 1 - The checking is done from the side on which the circuit shows a failure by commencing with the weapon and following the circuit to the box if necessary.
- 2- Stop the checking as soon as correct electrical functioning occurs.
- 3- Generally conclude that the fault is situated in the part of the equipment immediately preceding the part that shows normal electrical functioning.

When the fault has been located, replace the defective part of the equipment by a similar one in good working condition and again proceed with the checking to ensure that no other part of the equipment is failing, either permanently or momentarily.

A good knowledge of the circuits and of the electrical changes involved in the closing or breaking the circuits is necessary for searching and locating the cause or causes of any abnormal electrical functioning.

## CASES AND CAUSES OF ABNORMAL ELECTRICAL FUNCTIONING

Two fencers X and Y are fencing.

A - EPEE (Outward = Central; return = 15mm; earth = 20mm).

- 1) X hit: no light.
  - the outward or return circuits for Y or both are cut,
  - the outward circuit, the return circuit of Y or the two are in contact with the earth circuit.
- 2) X hit in the guard: X signals hit.
  - the earth circuit for X is cut,
  - X's guard or the end of the point of Y are insulated.

B - FOIL (outward = Central; return and earth = 20mm; electric jacket = 15mm).

- 1) X hit on the valid surface: no signalling.
  - the outward and return circuits of Y are in contact,
  - the electric jacket and return or earth circuits for X are in contact.
- 2) X hit on valid surface: X signals off target hit.
  - the electric jacket circuit for X is cut,
  - the outward and return circuits for Y are reversed.
- 3) X hit on valid surface: X and Y are signalled valid hits.
  - the electric jacket circuits and outward of Y are in contact (depending on the type of box).
- 4) X hit on non-valid surface: no signalling.
  - the outward and return circuits of Y are in contact.
- 5) X hit on non-valid surface: X signalled valid hit.
  - bad insulation of the valid surface of X.

6) X hit on non-valid surface: Y signalled valid hit.

- the electric jacket and return circuits for Y are in contact (according to the type of box).

7) X hit on the guard: X signalled non-valid hit.

- the guard of X or the end of the point of Y are insulated.

8) X is not hit: X signals non-valid hit permanently.

- the outward or return circuits for Y or the two circuits are cut.

These electrical phenomena are caused by typical types of failures. The different breakdowns for any piece of equipment can be described by one or several of these abnormal phenomenon. Further details of their effects and causes are the subject of the next section.

## CHECKING WHILE IN USE

In the case of the failure of one of the circuits, the other can be used to help in the location of the breakdown. Metal objects such as keys, pocket knives, nail files etc. can also be used.

### Use of the épée opposite to the circuit

Contact, with the point by using sufficient pressure:

- 1) The outward or central plug: signalling of the opposite hit in Epée.
- 2) The return or 15mm plug: signalling of the double hit.
- 3) The earth or 20mm plug; no signalling.

These three observations are proof of the correct functioning of the circuit tested.

### Use of the foil opposite to the circuit

It is recommended to only use the opposite foil for testing the valid circuit:

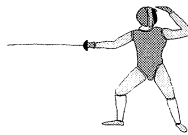
Contact the point (with sufficient pressure) and

the 15mm plug of the central plug: valid signalling of the opposite side.

**Use of a metal object  
(keys, pocket knives, etc.)**

Allows the non-valid circuit to be tested:  
The central and 20mm plug: no non-valid signalling of the opposite side.

These two observations are proof of the correct functioning of the tested circuits.



# PRINCIPAL BREAKDOWNS OF THE DIFFERENT PARTS OF THE EQUIPMENT

DESIGNATION	OBSERVED BREAKDOWN	CAUSE OF BREAKDOWN
<b>SOURCE OF CURRENT</b>		
Alternating or direct current	<p>Untimely activation</p> <p>Double hit falsely registering</p> <p>Hit signalled for only a short instant</p>	<p>Overvoltage of power supply (approximately greater than 14V)</p> <p>Undervoltage of power supply (less than 10V approximately)</p> <p>Undervoltage of power supply (less than 8 V approximately)</p>
<b>POWER SUPPLY CABLE (DOUBLE)</b>		
Power	The needle of the voltmeter is in the 0 position	One or two wires broken or unplugged
<b>I - IN EPEE</b>		
Control Box	<p>Circuit break in voltage communicator, the needle of the voltmeter stays at 0</p> <p>The needle of the voltmeter is not between the two red marks (12V).</p>	<p>The fuse circuit has blown.</p> <p>The switch is defective.</p>
Lights	One or several lights do not go on	They are blown, unscrewed or the links to the box are abnormally in contact
Relays	Bad functioning of the signalling	The relay contacts are dirty or buckled or the electro-magnet is faulty
Sounder	Inaudible sound	Regulating screw is too tight or blocked.

DESIGNATION	OBSERVED BREAKDOWN	CAUSE OF BREAKDOWN
<p><b>CONNECTING WIRES (Box-spool)</b></p> <p>Triple wires - Wire</p>	<p>Permanent hit on one side</p> <p>Hit not signalled.</p> <p>Hit signalled intermittently.</p> <p>Hit not signalled.</p> <p>Hit signalled on the guard or the piste</p>	<p>The 2 wires (central and 15mm plug) of the opposite side are exposed and in contact.</p> <p>The 2 wires or 3 wires of the opposite side are exposed and in contact. Permanent earth.</p> <p>The 2 wires (15 and 20mm plug) are exposed and are temporarily earthed at the moment of the hit.</p> <p>One of the wires (15mm or central plug) is cut.</p> <p>The wire of the earth circuit is cut or exposed.</p>
Spools	Remains wound	One or more springs broken or the cord is off the reel and jammed on the axle.
Spool cord	Insufficient unwinding	The springs are too tight (more than 10 to 12 revolutions)
	Lack of strength in rewinding	The springs are loose (less than 10 revolutions).
Contact Carbon Brush	Hit on the guard signals	Insulation of one of the metal parts that replace the earth wire (cover).
	Hit signalled intermittently.	The carbon brushes are unevenly worn or jammed (springs)
Axle	Hit signals intermittently	Axle or piste bent, the brushes make bad contact.

DESIGNATION	OBSERVED BREAKDOWN	CAUSE OF BREAKDOWN
Metallic reel	Hit signals intermittently	The wires (central and 15mm) are exposed and come into contact with the metal part of the reel.
Wires linking the cover to the carbon brushes	Signalling mixed or non-existent	Reversal of the wires
<b>BODY WIRES</b>  The faults are the same as for the connecting wires.		Same causes as for the connecting wires
<b>EPEE</b>		
Guard plug	Hit not signalling	The wires (central and 15mm plug) are cut or unplugged.
Interior surface of the guard	Hit not signalling or intermittent	One of the wires is exposed and in contact with the guard.
Interior guard plug support	Hit not signalling or intermittent	One of the wires is exposed and in contact with the guard
Exterior surface of the guard	Hit on the guard signals	Earthing. The handle crushing the wires
	Hit on the guard signals .	Socket insulated, earth circuit interrupted. There is insulating matter on the exterior surface of the guard or on the point of the weapon of the opposite circuit
Blade - barrel	Same breakdowns already cited for the wires	Same causes

DESIGNATION	OBSERVED BREAKDOWN	CAUSE OF BREAKDOWN
Tip - contacts	Hit not signalling	One or both contacts pushed into the insulation
Contact spring	Hit not signalling	Spring compressed or distorted.
	Hit signal delayed	Spring compressed or too tight.
	Hit signalled early	Spring stretched or too loose.
	Hit not signalling or intermittent	Spring distorted in contact with the return spring; intermittent earthing.
Grub Screws	Hit not signalling	A screw is bridging the insulation and comes into contact with the sleeve of the tip.

## II - IN FOIL

*To locate the breakdowns in electrical Foil equipment, it is necessary to remember the role of each of the circuits:*

- 1- *The central wire* has the same function as in Epée, it carries the positive current.
- 2- *The 15mm wire* does not carry the return current, but is linked to the electric jacket and carries the current of the valid hit circuit.
- 3- *The 20mm wire* has the same function as in Epée (earth) and also carries the current that acts by breaking the circuit for the non-valid circuit.

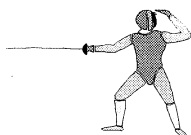


DESIGNATION	OBSERVED BREAKDOWN	CAUSE OF BREAKDOWN
<b>SOURCE OF CURRENT</b>		
Alternating or direct current	Untimely valid registering	Overvoltage of power supply (14V approx)
	Untimely non-valid registering	Undervoltage of power supply (less than 11V approx)
<b>CONTROL BOX</b>		
	Signal non-valid hit when there is a valid hit	Undervoltage of power supply (less than 11V)
<b>CONNECTING WIRES</b>		
Triple Plugs or wires	Non-valid light on permanently	Central and 20mm wire of the opposite side are exposed and in contact
	Valid light does not light up	15mm wire of the opposite side cut or unplugged
	Non-valid light does not come on	Central and 20mm wire of the opposite side are exposed and in contact
	Valid light comes on on the side of the fencer who hit valid or not-valid	Central and 15mm wire are exposed and in contact
	Non signalling	15mm and 20mm wires are in contact
<b>SPOOLS</b>		
Wire (cord) (lead)	Same faults as in Epee	Same causes
Wires of the brush carrier assembly	Untimely signalling, mixed or non-existent	The wires are reversed, therefore incorrectly plugged in
	Non-valid light on permanently	The plug is insulated or the metal parts of the spool are insulated
20mm plug of the cover	Non-valid light comes on intermittently	The carbon brushes are unevenly worn or jammed. Axle buckled. Cutting of the non-valid circuit

DESIGNATION	OBSERVED BREAKDOWN	CAUSE OF BREAKDOWN
Carbon Brushes - Axle	Valid light comes on intermittently	Same causes, the valid circuit is cut.
	Non-valid light comes on irregularly	Central wire exposed, touching the metallic body of the spool, closes the central and 20mm circuit.
Reel	No Signalling	The 15mm wire is exposed and touches the metallic body of the spool.
<b>BODY WIRE</b>		
Triple plug, wires, crocodile clip.	Same faults as for the connecting wires	Same causes
Wire	Valid light does not go on	Clip unplugged, wire cut
<b>WEAPON (Foil)</b>		
Crocodile Clip	Non-valid light on permanently	Wire of the 3mm plug unplugged or broken
	Non-valid light does not go on	The insulating cup of the 3mm plug is defective, or the wire is in contact with a metal part of the guard
Interior Guard Socket	Non-valid light comes on intermittently	Handle insufficiently tightened, and it produces breakages of current.
	Non-valid light does not come on	The central wire is crushed
Interior surface of the guard	Non-valid light permanently on	Bad contact between the socket and the interior surface of the guard.

DESIGNATION	OBSERVED BREAKDOWN	CAUSE OF BREAKDOWN
Exterior surface of the guard	Non-valid light comes on when a hit lands on the guard	Insulating matter on the exterior surface of the guard or of the point on the opposite side: the earth circuit is interrupted
Blade	Same faults as for the central and 20mm wire (the metallic body of the blade and the barrel replaces the 20mm wire)	Same causes
Contact Point	Non-valid light permanently or intermittently comes on	Wire has come unsoldered from the contact and leaves it when the blade is tapped.
Contact and Fixing Plate	Time taken to break the circuit is too long	The contact has come loose.
	Valid light does not come on	The body of the point has come unscrewed, the current can no longer pass from the point to the electric jacket
Return and contact spring	Non-valid light comes on from the shock of blade contact	Spring strength at less than 500 gram, and cannot hold the contact and the contact washer with sufficient pressure
Grub Screws	Non-valid light comes on from the shock of blade contact	The loosened screw shifts its position and causes breaking of the current
Electric Jacket	Is the source of a non-valid signal	The conducting fibres that constitute the fabric are worn and broken, and can no longer carry the current
	Valid light does not come on	A metal part of the fencer's blade is in contact with the electric jacket at the moment that the hit is received

DESIGNATION	OBSERVED BREAKDOWN	CAUSE OF BREAKDOWN
MASK	<p data-bbox="635 443 884 472">Valid light comes on</p> <p data-bbox="635 600 1007 660">Valid or non-valid lights for a hit on non-valid surface</p>	<p data-bbox="1077 443 1449 539">Too much current in the electric jacket badly insulated from the rest of the outfit</p> <p data-bbox="1077 600 1449 696">Perspiration can play the role of conductor between the electric jacket, the outfit, and the mask.</p>



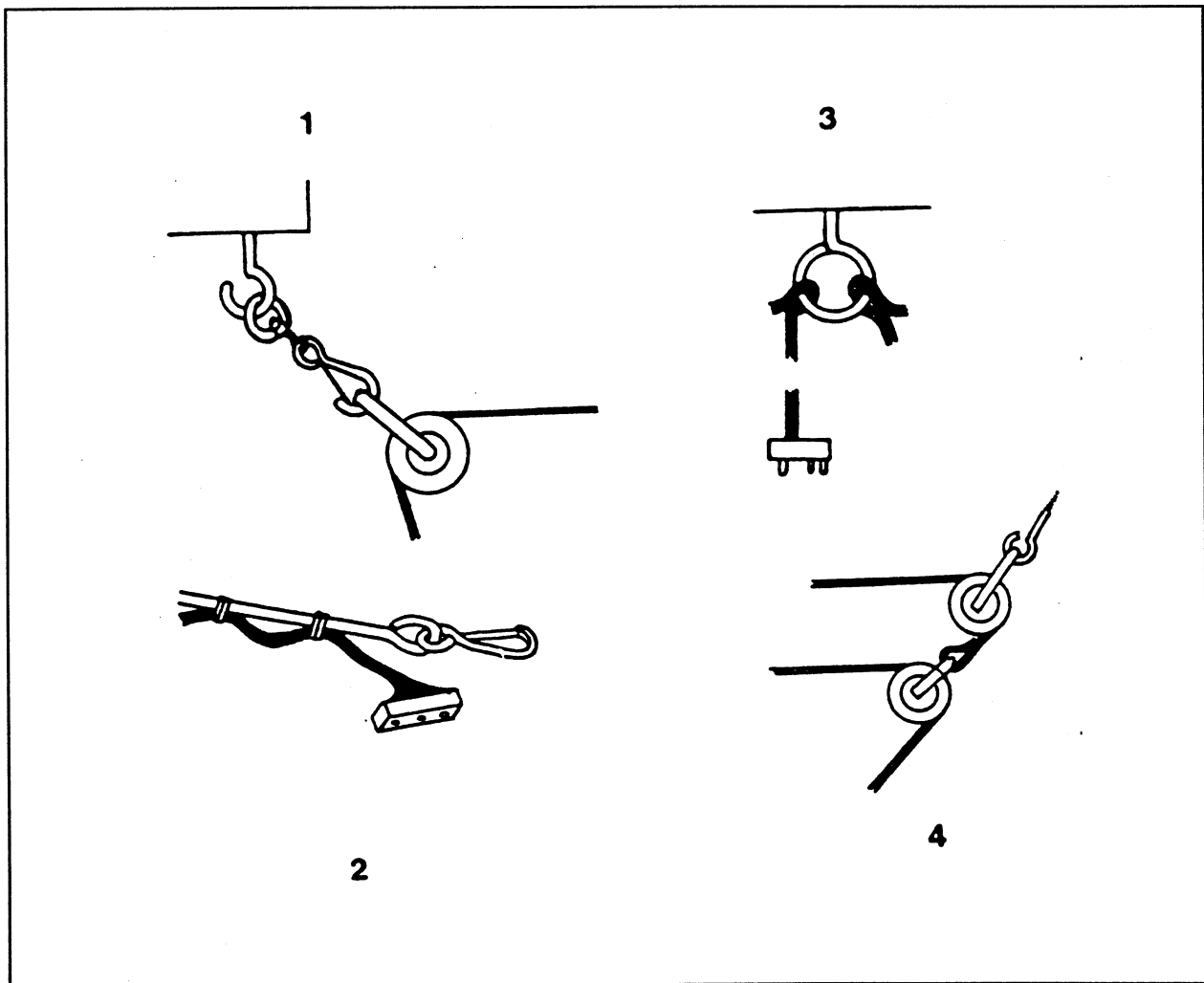
## SECTION II

# ELECTRICAL INSTALLATION

*Spools are fairly complex pieces of equipment and can be difficult to repair. If there is sufficient room in the salles, spools can be replaced by a fixed installation (designed by Lieutenant Rune Ramberg, officer in the Swedish Navy) which is both inexpensive and practical.*

### REQUIRED MATERIALS

- 1 - Four pulleys with a diameter of 6 to 7cm, of which two are mounted on a swivel (figures 1 and 4).
- 2 - One multiple strand elastic cord with a diameter of 5mm and the same length as the piste, plus 2m.
- 3 - Two lengths of triple electric wire (telephone wire can be used - see diagram).
- 4 - Two triple sockets (guard socket or body wire - figure 2).
- 5 - Two attachment buckles (figure 2).
- 6 - Two triple plugs (body wire plugs - figure 3).



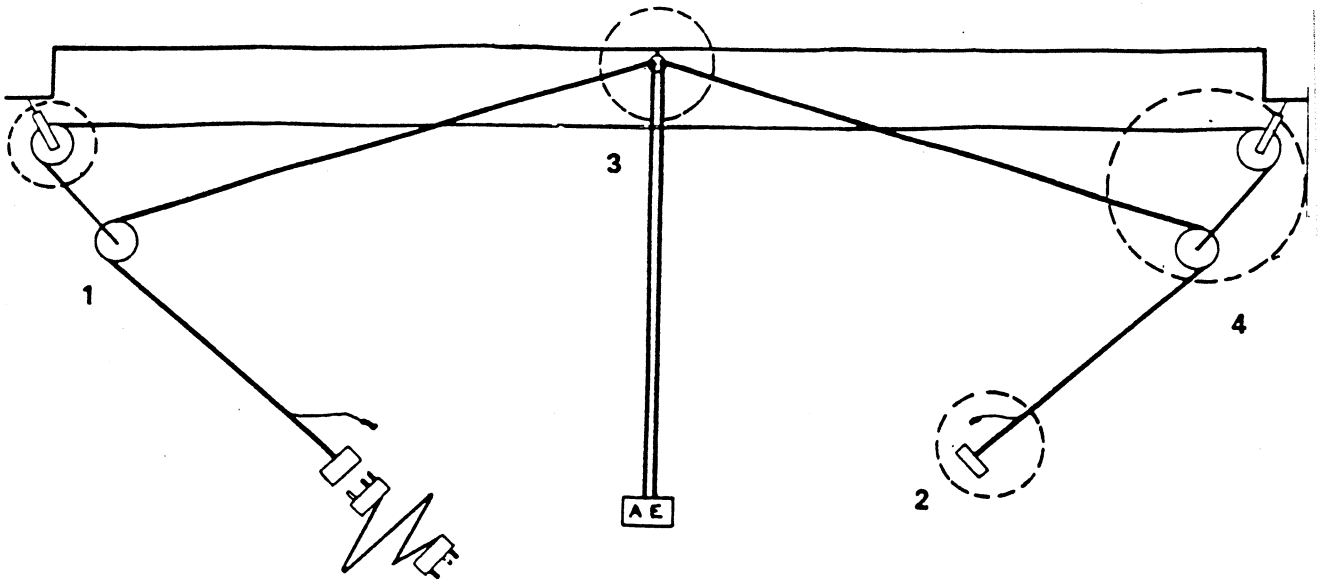
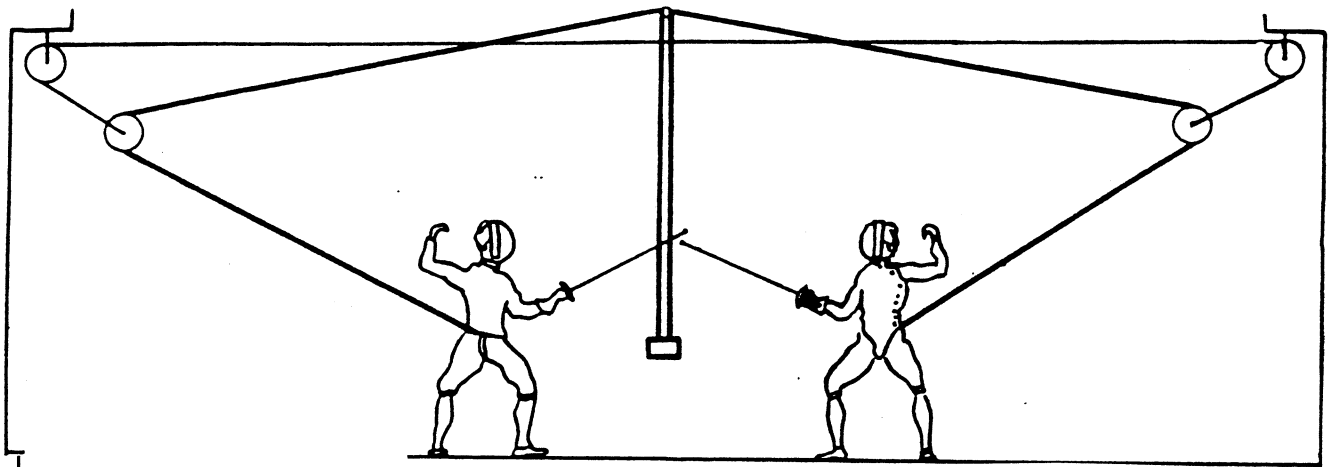


Diagram of a fixed electrical installation



(Thick Lines) = electric wire  
(Thin Lines) = elastic cord

