

# Fire Control

## T 5 - Adjusting fire without utilization of artillery survey.

## References and further reading 1/4:

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MO ČR. *Dělostřelecký průzkum, topograficko-geodetická a meteorologická příprava dělostřelectva všeobecné palebné podpory*. Dě1-6-4. Praha: 1996. 144 s.

MO ČR. *Palebná služba pozemního dělostřelectva*. Dě1-3-1. Praha: 1995. 185 s.

MO ČR. *Doktrína Armády České republiky*. Praha: 2004. 148 s.

## References and further reading 2/4:

MO ČR. *Bezpečnostní strategie České republiky*. Praha: 2003. 22 s.

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## References and further reading 3/4:

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## References and further reading 4/4:

*Pravidla střelby a řízení palby pozemního dělostřelectva (dělo, četa, baterie, oddíl). Pub-74-14-01. Vyškov: Správa doktrín Ředitelství výcviku a doktrín, 2007. 256 s.*

## Course Objectives:

Explain the principles of determining the elements for effective fire due to adjusting fire without utilization of artillery reconnaissance.  
Clarify the rules and procedures during different ways of adjusting fire.

## Content:

- 1) Targets
- 2) Accuracy fire is provides a reliable observation of explosions
- 3) Fire by the use of artillery survey – general rules
- 4) Military Communication in the framework of the Artillery Fire Control System
- 5) MATH

## Content:

- 6) Call for Fire Procedure
- 7) Principles of communications at the call for fire
- 8) Transmission of information about the target
- 9) Specifications



## 1) Targets

Management of Fire (fire and effective fire) is an essential attribute of ground artillery. This part of the rules of fire based on the requirement to specify options to current technical means of reconnaissance and artillery at the same time be able to fire when the fire is necessary to prepare traditional (alternative manual) way.

Determining elements for effective fire is done:

- ☐ to determine the starting elements for fire a shortened training (in addition to Article 174 and simplified training;
- ☐ for small size targets and shooting at various targets very important;
- ☐ if the specific conditions of performance firing task.

## 1) Targets

- ☐ Fire is done with or without recovery of (technical) resources survey.
- ☐ For fire are selected track missiles, missile type, lighter, and the series number of cartridges to be used as guidance for effective shooting.
- ☐ It is allowed to perform fire and other projectiles or missiles with other lighters, when tabular correction for changes in conditions for firing the missiles and the missiles, designed for effective fire management are the same. In these cases, the elements of sight for the effective management of fire determined by fire distance.

## 2) Accuracy fire is provides a reliable observation of explosions

At the same time:

- ☐ define (evaluate) the individual deviations from the target explosions in the distance in meters or signs (characters in the group rounds explosions) and in the direction of the divisions;
- ☐ *evaluate the kinds of explosions when using lighter bullets with non-contact (bursty, shock) and when shooting for reflection and measured height bursty.*

## 2) Accuracy fire is provides a reliable observation of explosions

- ☐ Deviations from the target explosions (center of the group targets) in the distance in meters to determine the rangefinder and favorable conditions of observation and estimation.
- ☐ If you cannot determine the size of deviations from the target explosion in the distance in meters, assessed as the morning "short" with marking "-" or "long" with marking "+".
- ☐ When shooting for reflection and fire missiles with non-contact or proximity timing lighter deviations are determined by cloud bursts bursty (shock) and on flat ground by the impact of the fragments.

## 2) Accuracy fire is provides a reliable observation of explosions

Reduction ratio is calculated with an accuracy of 0,1 according to the formula:

$$Rp = \frac{d_c}{D_t^c}$$

where:

$d_c$  *viewing distance target;*

$D_t^c$  *topographical distance target.*

## 2) Accuracy fire is provides a reliable observation of explosions

Side step to change the shooting distance of 100 m is calculated with an accuracy of 1 component by the formula:

$$Ss_{100} = \frac{i}{0,01 \cdot D_t^C}$$

where:

- $i$  viewing angle (angle, constricted viewing line and shot).

To determine the direction of repair, resulting from a change in the distance, the distance multiplied by a hundredth repair lateral jump according to the equation:

$$\Delta S = 0,01 \cdot \Delta D \cdot Ss_{100}$$

## 2) Accuracy fire is provides a reliable observation of explosions

Fire gun control one squad can only be used when the following conditions:

- ☐ topographic-geodetic control connection cannon are carried out under the terms of ÚP;
- ☐ aiming cannon are carried out using the bearing of one landmark direction or one compass;
- ☐ Both fire crews keep fire cartridges of the same series;
- ☐ Elements are determined for shooting PC (program PVNPG 95) or the fire control unit for controlling gun crews of both the inclusion of corrections for the mutual inconsistency of control cannon.

## 2) Accuracy fire is provides a reliable observation of explosions

Artillery can calibrate target once or gradually each battery with or without the use of technical means artillery survey.

Fire one battery can be used when the following conditions:

- ☐ battery firing positions are distributed in its entirety;
- ☐ topographic-geodesic connecting the firing position is done with precision, fully meeting the conditions of preparation, or is made to one point common to all batteries;
- ☐ Battery emplacements are located in one section firing position;
- ☐ Include the repair cannon of the inconsistency of control due to the battery management cannon, which performs fire;
- ☐ Shooting is conducted in a series of fillings or fillings when shooting different series included corrections for changes in their initial speed.

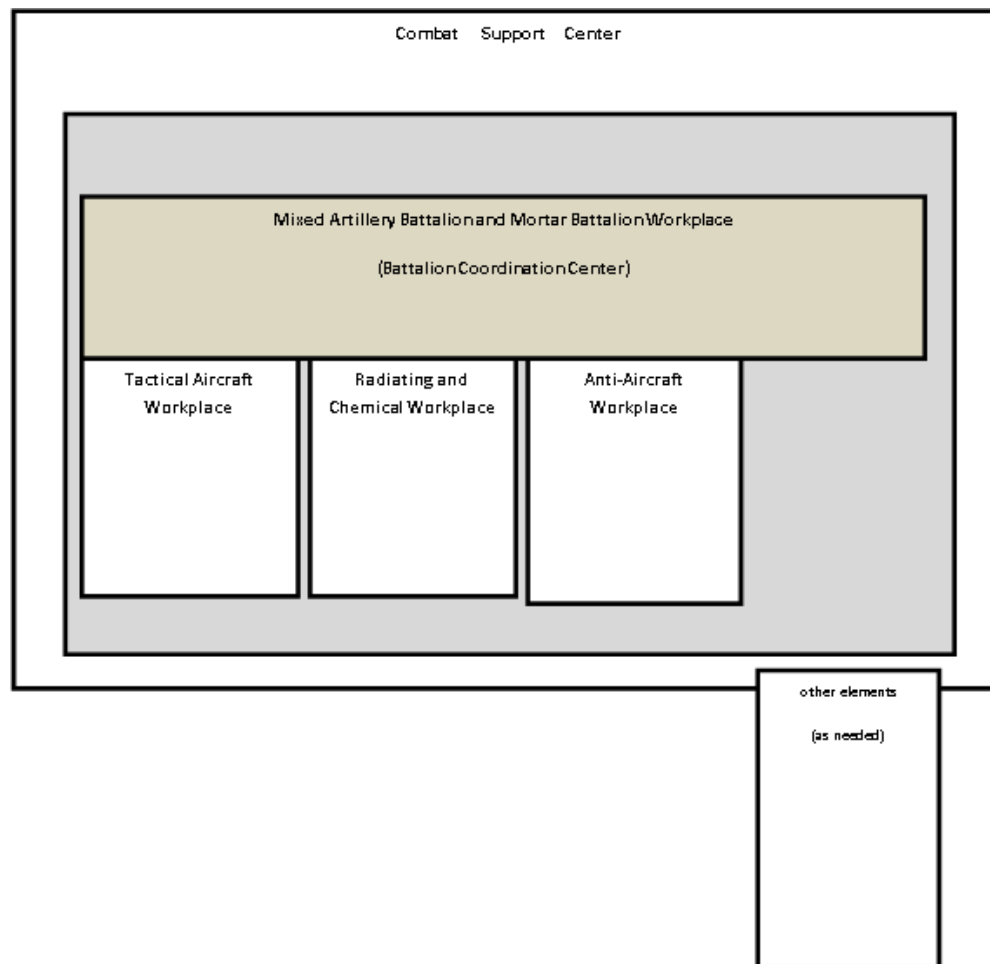


### 3) Fire by the use of artillery survey – general rules

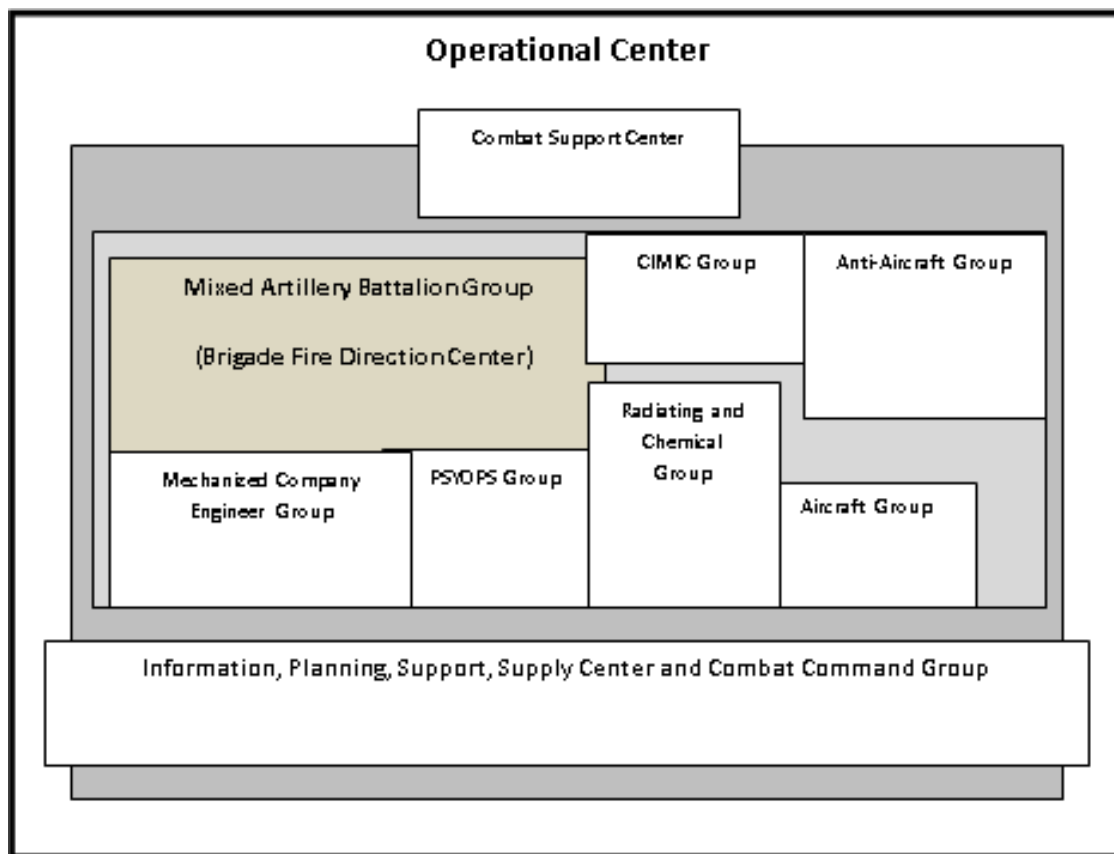
When fire, or even observation and renovation (evaluation) of the active fire can cooperate:

- ☐ Intended for observation combined with surveillance device (KPzP) - with a laser rangefinder;
- ☐ integrated observation system LOS - with a laser rangefinder;
- ☐ for observation (two) - with protractor device;
- ☐ reconnaissance and observation SNĚŽKA – with a laser rangefinder or radar;
- ☐ radar ARTHUR (fire rules are part of a separate policy for the determination of combat use).

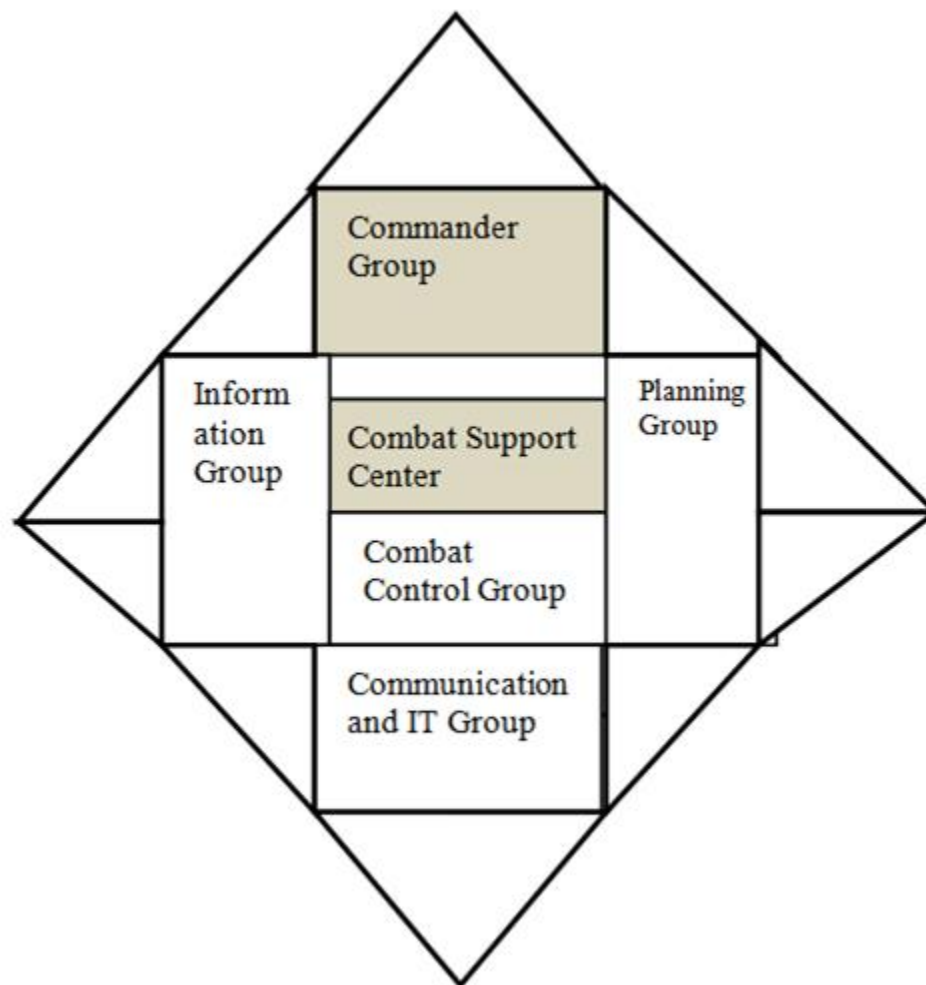
#### 4) Military Communication in the framework of the Artillery Fire Control System



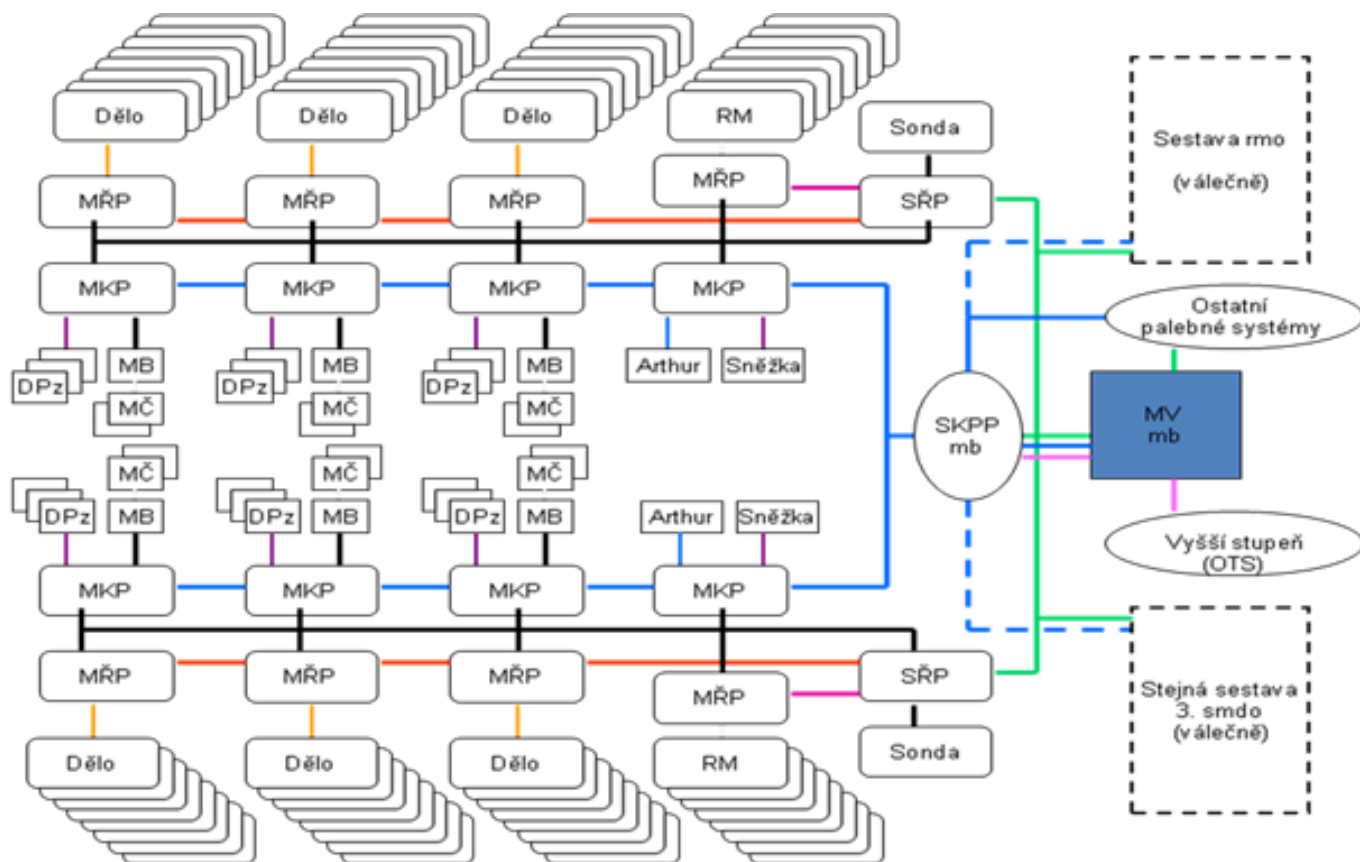
#### 4) Military Communication in the framework of the Artillery Fire Control System



## 5) MATH



## 5) MATH



## 6) Call for Fire Procedure

This procedure can be divided into several parts:

- a) make a connection;
- b) providing information about the target;
- c) specification.

The content of this article is to derive, definition and justification documents that are necessary for effective artillery fire and fire control system are placed in the „Call for fire”.

## 7) Principles of communications at the call for fire

Content and realization of communication at the call for fire and during the firing task is governed by the principles of communication and rules of communication which should comply with the principles of management of radio operations of NATO.

These principles are included in the publication AArtyP-1 Artillery Procedures. Transmission of orders, commands, messages, information and signals must be fast and totally accurate. Flawless communication increases the security of transmission, reducing the possibility of confusion and reduces the time required for the realization of artillery support. In the case of use of automated artillery command and fire control system (ASRPP-DEL) through the communication using data transmission, which significantly reduces the transmission time, eliminating the possibility of garbled text.

## 8) Transmission of information about the target

Target information can be divided into three groups:

- a) target position;
- b) description of target;
- c) additional information about the target.

For the effectiveness of artillery support is also important that all the necessary information will be identified and submitted.



## 8) Transmission of information about the target

### Location of targets

The position of artillery fire target can be determined in the following ways:

- ☐ enter the target to map and read the target coordinates;
- ☐ read the previously registered target coordinates, which restored the activity or the new target discover on an already familiar place;
- ☐ to estimate the distance of the new target from the previously registered target along the axis E and N and the estimated distance attributed to (with the sign) to the coordinates of previously entered target;
- ☐ determine the coordinates of the target using reconnaissance device.

## 8) Transmission of information about the target

### Description of target

Exact description of the target influences the effectiveness of artillery fire particularly in terms of effects of projectiles in target position. It is not possible to fire without some of the data. In Call for fire it must be stated:

- ☐ the type of target;
- ☐ the character of target;
- ☐ the location of target;
- ☐ activity of target;
- ☐ if the target is observed or not.

## 8) Transmission of information about the target

### Additional information about target

Additional information is being used in call for fire in cases, where it is necessary to specify the size, shape and orientation of target, or specify its number, set limits, seek the firing task, set trajectory or set a specific type of ammunition for adjusting fire or effective fire.

## 9) Specifications

### Limitations

One of the fundamental limitations that are often used is warning "Danger Close". This is for combat support and coordination of fire control authority and fire units aware of the fact that the target is at a distance from friendly forces, which is in conflict to the existing security measures.

System calculates the safety distance from the point of aim of the protected element:

$$L_{MBV} = 4 \times (Ex^2 + \acute{u}d^2)^{1/2} + r_{str}$$

## List of tasks for students:

- ☐ Understand the basic principles of different ways of adjust fire without utilization of artillery reconnaissance.
- ☐ To acquire the determining of the values and ratios for firing and principles observation of explosions.
- ☐ To master the rules and procedures of different ways of adjust fire without utilization of artillery reconnaissance.