

Methods of combating UAVs:

DISTRIBUTION OF PERSONNEL PERSONNEL AND EQUIPMENT

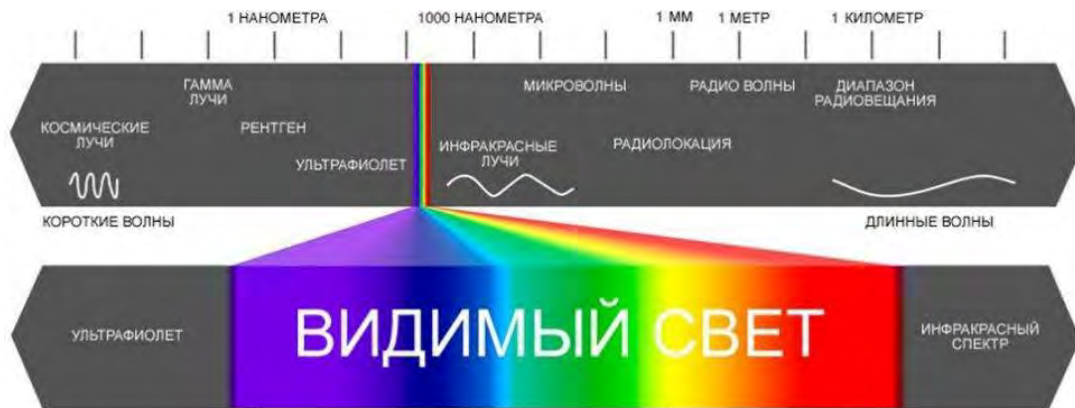
Concentrations of infantry and equipment are vulnerable to UAV attacks



Distance of at least 10-15 m!

Author's comment: when hit by a drone, spreading out will reduce losses and give soldiers the opportunity to help the wounded

Multispectral camouflage:



The most relevant ranges for reconnaissance with UAVs



Visible range



Near IR range
(NIR)



Medium and long IR ranges (thermal
imaging)



Radar/microwave
ranges

SPECTRUM RANGES

Modern optical-electronic reconnaissance is active in several ranges of the electromagnetic spectrum at once:

Comment from the author: This is a complex issue. Soldiers need to understand that camouflage must be multi-layered and constant. They should also study the detection methods used by the enemy and understand how the devices work.

Multispectral camouflage:

VISIBLE RANGE

IT IS NOT RECOMMENDED TO USE DARK CAMOUFLAGE IN LIGHT-COLORED AREAS (AND VICE VERSA)



The correct choice of camouflage should take into account the background and terrain features, as contrast is noticeable from UAVs

Multispectral camouflage:

VISIBLE RANGE

SEASONAL (WINTER) CAMOUFLAGE



Dark figures stand out against the snow – use white camouflage!

Multispectral camouflage:



Weapon camouflage should also take into account the background of the terrain

VISIBLE RANGE

Incorrect: contrast with the terrain



Correct: matches the terrain



Multispectral camouflage:

WEAPON PAINTING:



1. Apply primer,
tape
moving parts

2. Paint in typical
local colors (not
matte aerosols)

3. Deform the
silhouette of
the weapon

VISIBLE RANGE



Multispectral camouflage:

VISIBLE RANGE



Bandages can be used as camouflage tape for weapons

Author's comment: it is worth noting that all known methods of camouflage were widely used in the First World War and the Second World War – this experience should not be ignored

Multispectral camouflage:

VISIBLE RANGE



INDIVIDUAL CAMOUFLAGE ELIMINATION OF
DISGuising FEATURES



The recognizable silhouette of a full-length human figure, a helmeted head and shoulder area, a white face against a background of vegetation, exposed areas of skin on the hands—all these are revealing signs (RS) that should be consistently eliminated



Equipment for individual camouflage: viper hood

Multispectral camouflage:

VISIBLE RANGE

HIDING THE SILHOUETTE: HEAD AND SHOULDERS



Options for individual camouflage using a helmet cover and vegetation

Multispectral camouflage:

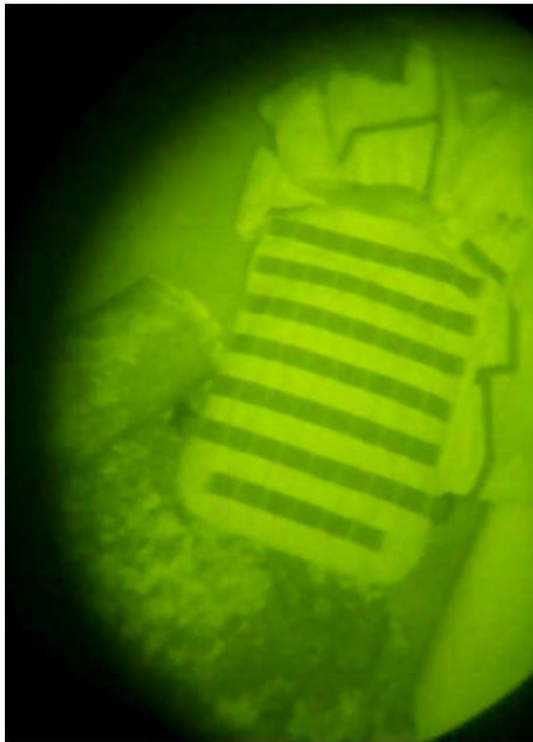
NEAR INFRARED (NIR)
RANGE



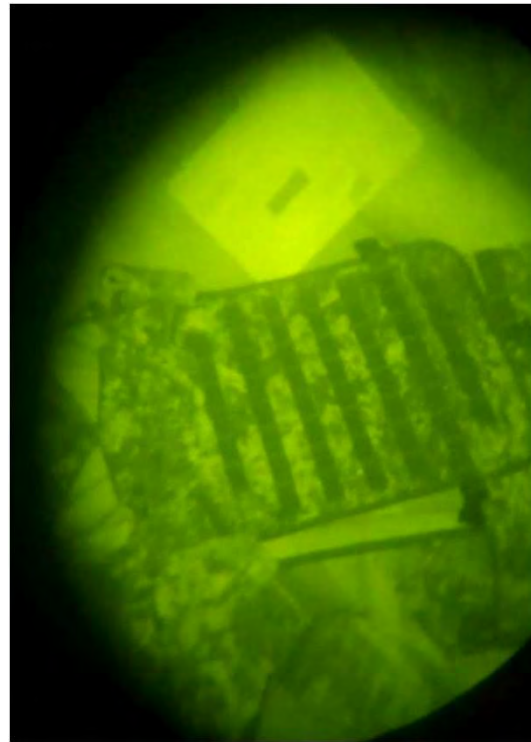
Check equipment for signs of exposure in the near-infrared range (NIR)

Multispectral camouflage:

IR remission



No IR remission



With IR remission

Author's comment: As a rule, IR remission is applied together with fabric dyeing during production. If this is not available, you can use matte paints, apply them with a brush or spray, remove the glow, and imitate the natural texture.

NEAR INFRARED (NIR)
RANGE



Application options

Multispectral camouflage:

NEAR INFRARED (NIR) RANGE



Be sure to check the masking, check for the absence of unmasking elements, and use equipment with laser pointers with caution: the operation of a laser rangefinder is visible in night vision goggles.

Multispectral camouflage:

THERMAL VISION RANGE

FEATURES OF TYPICAL BACKGROUNDS IN THE THERMAL IMAGING RANGE:



Open terrain: neutral and negative contrast (especially in spring, autumn, and winter)



Vegetation: neutral or positive contrast

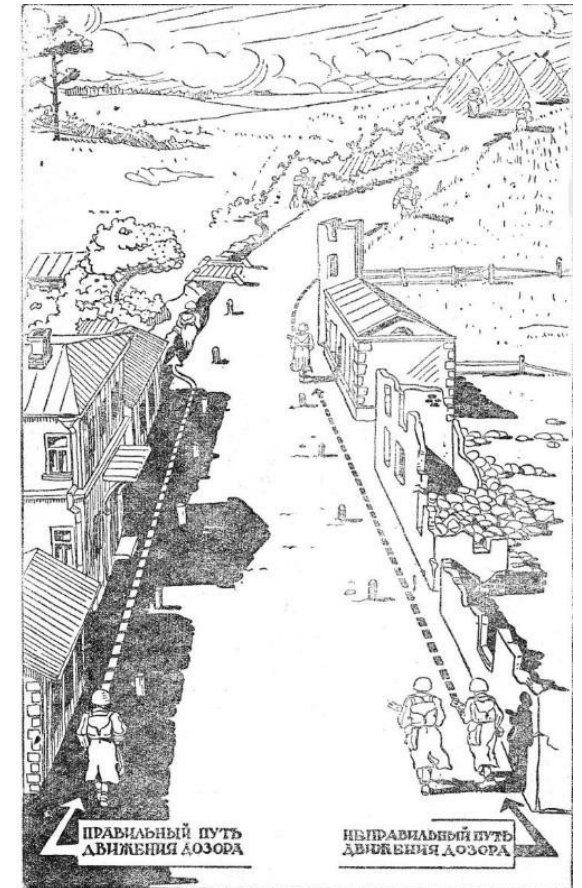
Multispectral camouflage:

THERMAL VISION RANGE

FEATURES OF TYPICAL BACKGROUNDS IN THE THERMAL IMAGING RANGE:



Author's comment: It is difficult to hide from a thermal imager, but you can use a system of screens: from homemade (curtains, shields, special products) to environmental ones – buildings, dugouts, vegetation. The urban background is neutral, but you need to take into account the heating of rooms and equipment.

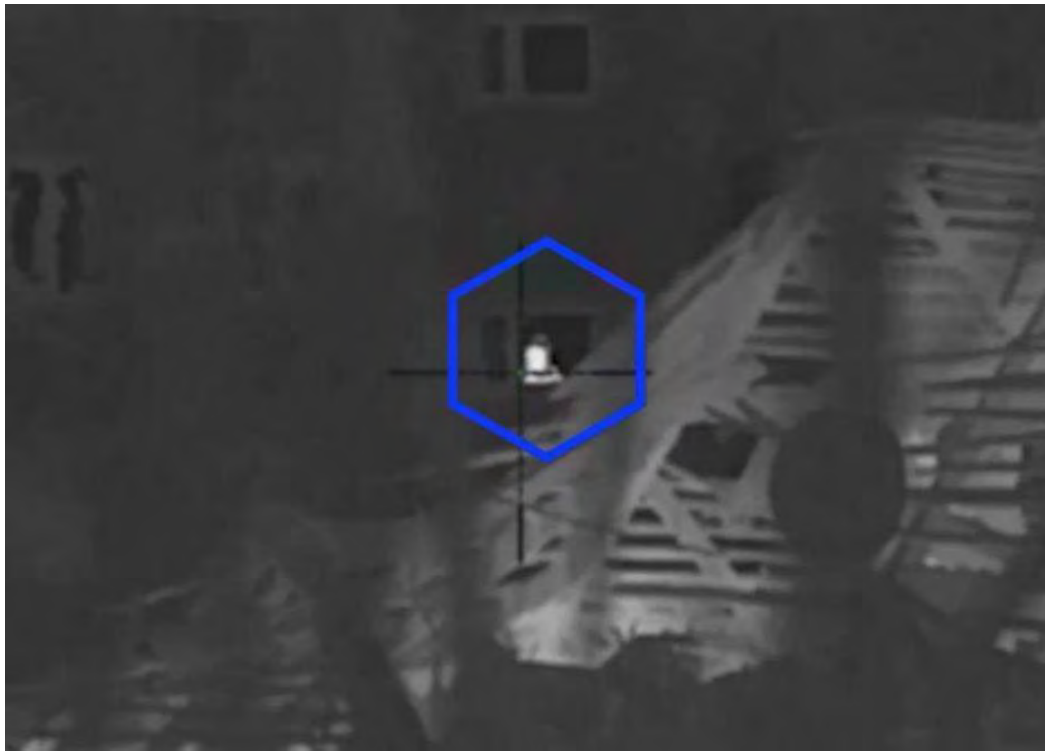


Move while taking cover!

Multispectral camouflage:

THERMAL VISION RANGE

FEATURES OF TYPICAL BACKGROUNDS IN THE THERMAL IMAGING RANGE:



At night, the thermal contrast is more pronounced, so **it is extremely dangerous** to approach windows and go out into open spaces. Observation should be conducted from deep inside a building or shelter.

Multispectral camouflage:

SCREENING PRINCIPLE: TO HIDE HEAT RADIATION BETWEEN ITS SOURCE (PERSON, EQUIPMENT, ETC.) AND THE OBSERVER, THERE SHOULD BE A BARRIER THAT SHIELDS THE RADIATION AND IS NOT SUBJECT TO DIRECT HEAT

THERMAL VISION RANGE



Multispectral camouflage:

THERMAL VISION RANGE

ANTI-HEAT VISION CAPES/PONCHOS: METHODS AND FEATURES OF USE:



USE OF SIMILAR
PRODUCTS: NO MORE
THAN 15 MINUTES

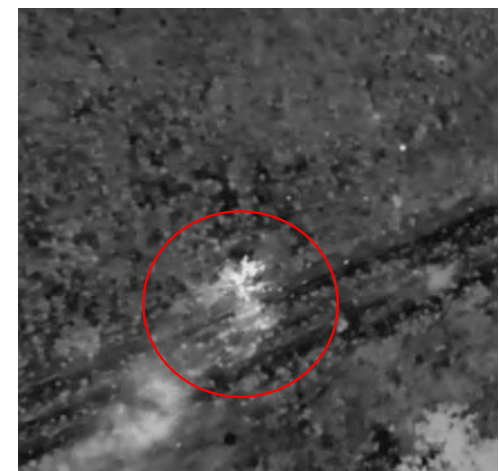
Risk of
overheating

Must be cooled

Consider the
background

Face, hands, feet – heat
escape, unmasks!

MANUFACTURED BY SEWING SEVERAL
LAYERS OF POLYMER INSULATION (2 M,
FOAMED POLYETHYLENE WITH A TWO-
LAYER LAVSAN COATING) BETWEEN 2
LAYERS OF WATER-REPELLENT CAMOUFLAGE
FABRIC (OXFORD, 1.5X1.5M)



However: despite good camouflage, the target was hit because it was detected long before the cape was used.

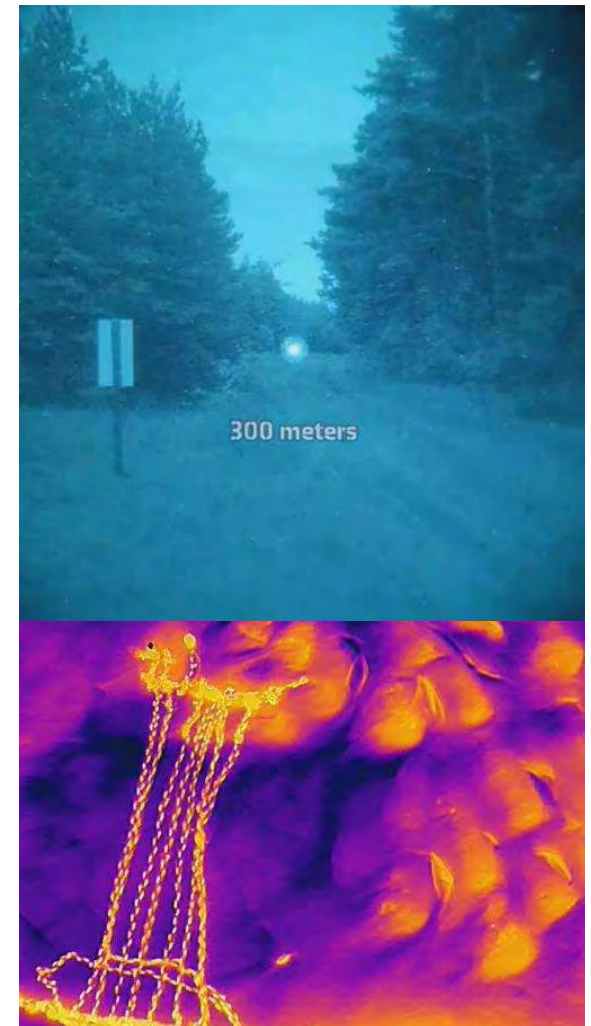
Multispectral camouflage:



DEMASKING:

- Items that heat up during operation: generators, batteries, equipment, antennas
- Visible heated parts of weapons, etc.
- Waste products
- Smoking, traces
- Any thermal contrast (including negative)

THERMAL VISION RANGE



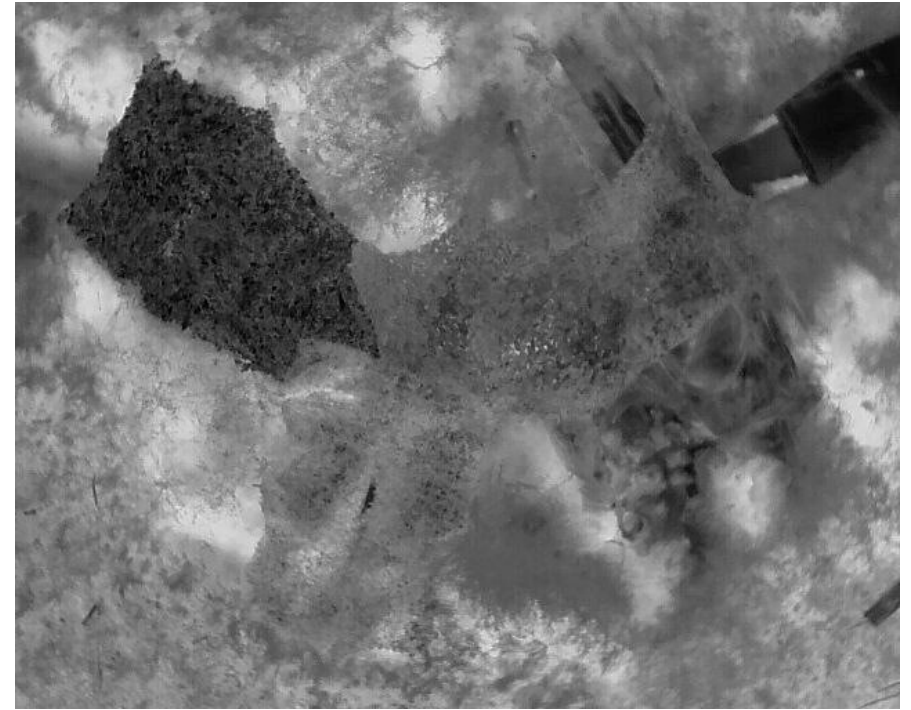
Multispectral camouflage:

"CAMOUFLAGE MUST BE ACTIVE, CONVINCING, CONTINUOUS, VARIED, AND COMPREHENSIVE!"



Check the quality of camouflage using a drone

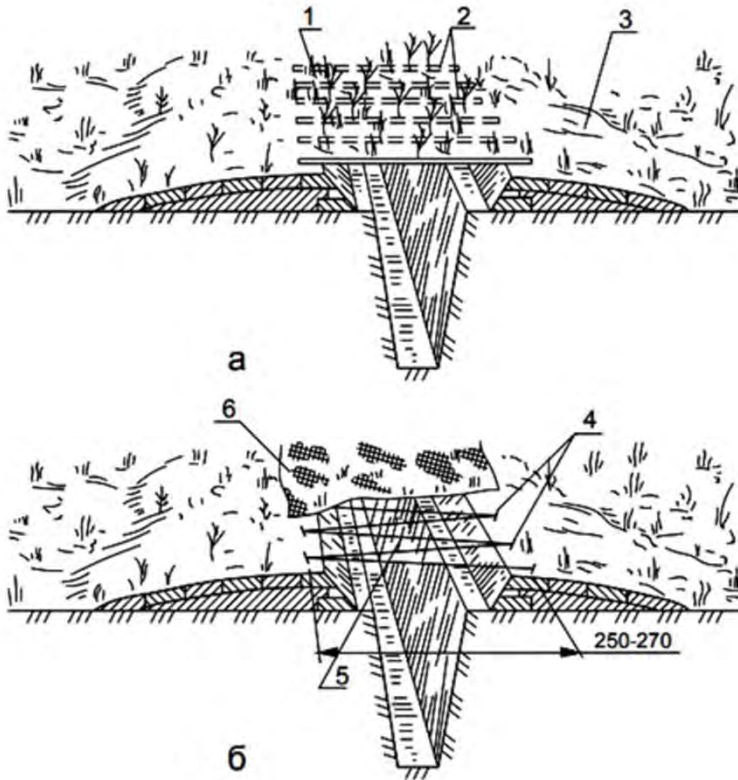
POSITION CAMOUFLAGE



Including in the thermal imaging and night vision ranges

Multispectral camouflage:

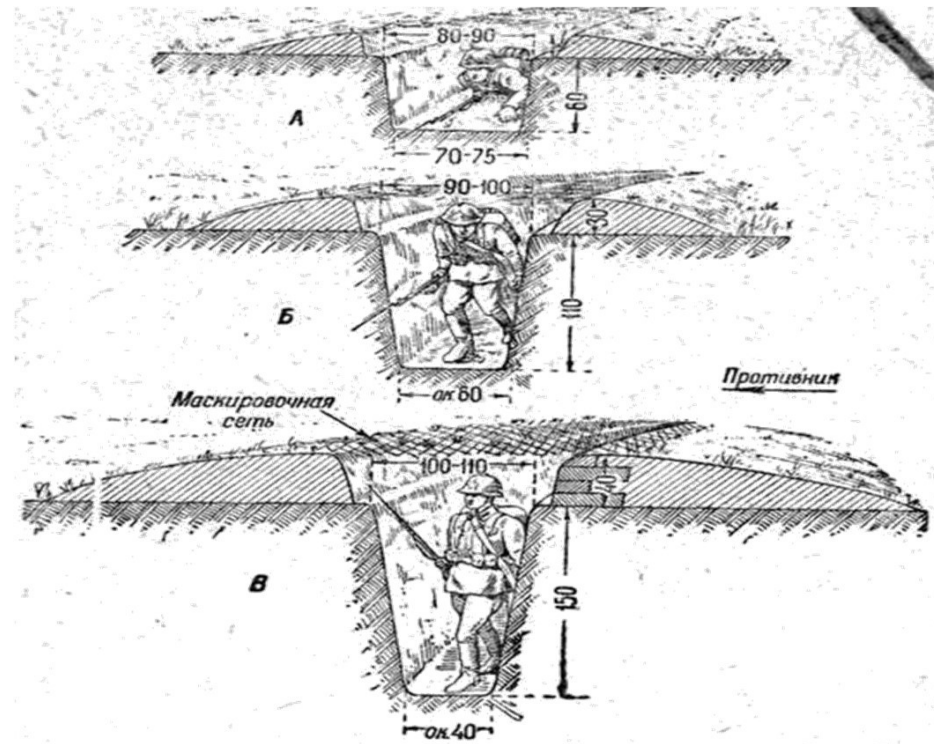
Create overlaps and improve positions



Camouflage trenches and communication passages against plant backgrounds

POSITION CAMOUFLAGE

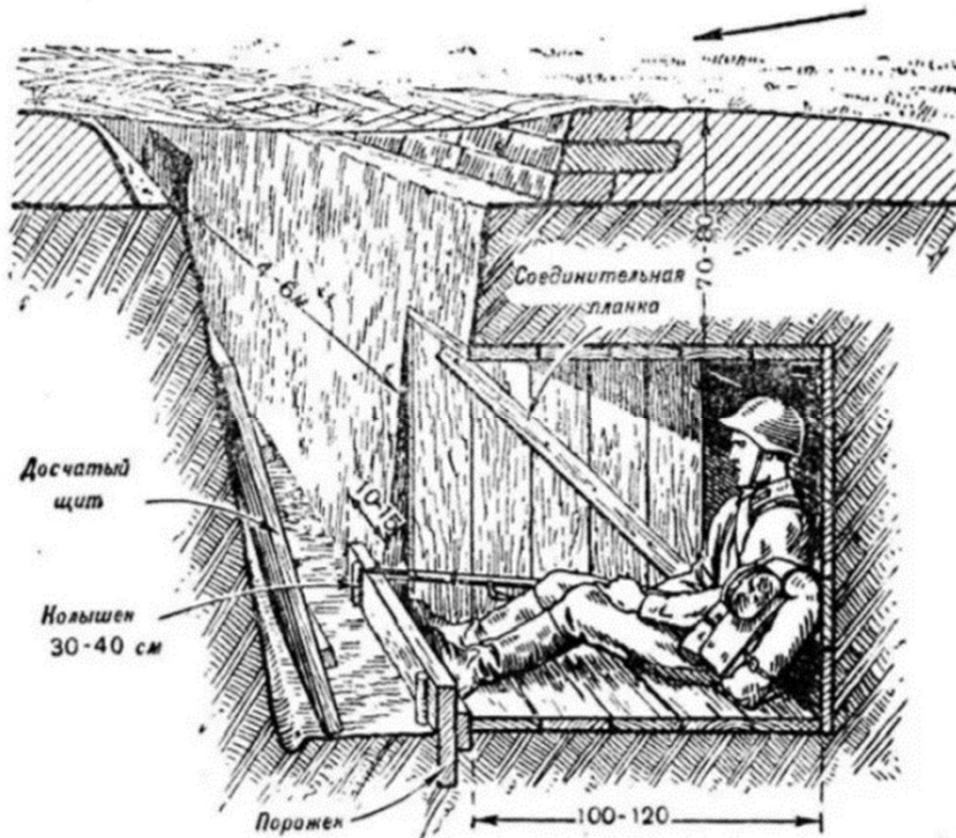
For covert communication between positions and the rear, communication passages should be arranged



Development of a trench communication passage: A – passage for crawling, B – passage for moving in a crouched position, C – passage for moving upright

Multispectral camouflage:

POSITION CAMOUFLAGE



Foxhole-type shelter equipment



Author's comment: shelters should be well camouflaged; when located outside trenches, leave no traces, debris, etc.

Multispectral camouflage:

POSITION CAMOUFLAGE

CREATE PROTECTIVE SCREENS FROM DROPS AND IPV FOR TRENCHES AND EQUIPMENT



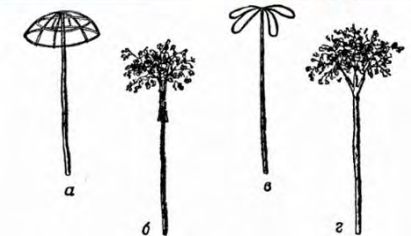
Author's comment: A large number of metal structures pose a risk of detection by enemy radar; wood is preferable.

Multispectral camouflage:

USE CAMOUFLAGE NETS CORRECTLY

CAMOUFLAGE NETS SHOULD BE PAINTED IN CONTRASTING SHADES TO THE LOCALITY, PREFERABLY DARK AND LIGHTER SHADES.

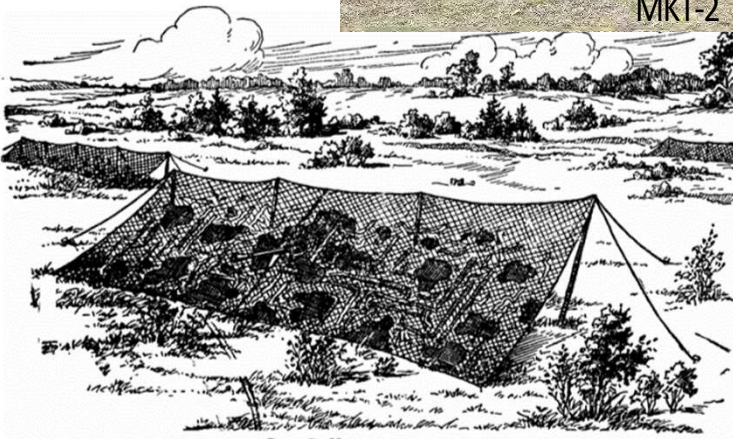
MAY HAVE A THREE-DIMENSIONAL TEXTURE THAT IMITATES FOLIAGE



USE SUPPORTS

ADDITIONALLY: POLYMER MATERIALS SUCH AS SPANBOND CAN BE USED AS A MATERIAL FOR MAKING CAMOUFLAGE NETS

BE SURE TO CHECK THE QUALITY OF YOUR CAMOUFLAGE WITH UAV!



INCLINED MASK



VERTICAL MASK

Multispectral camouflage:

POSITION CAMOUFLAGE

CAMOUFLAGE BLINDAGES WITH MASKS



It is necessary to conceal entrances and add canopies to minimize heat loss.

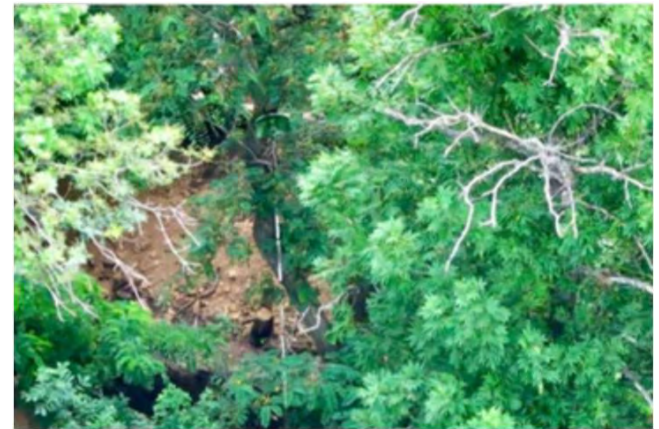


You can secure the net at the base: with wedges, metal cord, etc. - without excessive tension, but firmly

Multispectral camouflage:



POSITION CAMOUFLAGE



ANTENNAS AND WIRES MUST BE CAREFULLY CONCEALED

Author's comment: however, with a large amount of paint and camouflage, there is a risk of loss/deterioration of communication quality due to the density of the material

Multispectral camouflage:

POSITION CAMOUFLAGE

KINESCOPIES AND MIRRORS CAN ALSO BE USED FOR COVERT SURVEILLANCE
FOR UAVS



TR-8 and TR-4 periscopes ("Scout's Tube")

Even if the UAV is not in direct sight, observe **the rules of sound and light camouflage!**



Multispectral camouflage:

HIDE TRACES OF EQUIPMENT, CREATE DECOYS

POSITION CAMOUFLAGE

ПРИМЕР СЛЕДОВ ОТ ТЕХНИКИ



**ПО СЛЕДАМ МОЖНО ОПРЕДЕЛИТЬ
МЕСТОНАХОЖДЕНИЕ ПОЛЕВЫХ СКЛАДОВ**



**НАБЛЮДАТЕЛЬНЫЙ ПУНКТ ВЫДАЛИ
СВЕЖИЕ СЛЕДЫ ЗАЕЗДА НА БРОШЕННЫЙ ТЕРРИКОН**



**Артиллерийские позиции выдают
следы характерного разворота техники**



Multispectral camouflage:

СТАРЫЕ ГОРИЗОНТАЛЬНЫЕ СЛЕДЫ И
СВЕЖИЙ КРУГ РАЗВОРОТА



ПО ИНТЕНСИВНОСТИ И КОЛИЧЕСТВО СЛЕДОВ МОЖНО
ОПРЕДЕЛИТЬ ЧАСТОТУ ИСПОЛЬЗОВАНИЯ ДАННЫХ ПОЗИЦИЙ



POSITION CAMOUFLAGE

ПРИМЕР СЛЕДОВ ОТ ПЕШИХ ТРОП



ТЕНЬ ПРИДАЕТ ФОТОГРАФИИ ИНФОРМАТИВНОСТИ



Multispectral camouflage:

TECHNOLOGY CAMOUFLAGE

Equipment should be camouflaged to match the terrain without compromising functionality



Author's comment: on the right is a handmade camouflage net made by weaving strips of spunbond into a mesh net in the simplest way possible

Multispectral camouflage:



Protecting armored vehicles with chain-link fencing from drops and simple kamikaze drones

TECHNOLOGY CAMOUFLAGE



When installing camouflage nets on equipment, avoid geometrically regular shapes and strive for natural ones.