

EW LESSONS LEARNED Russian Hybrid Warfare in Ukraine



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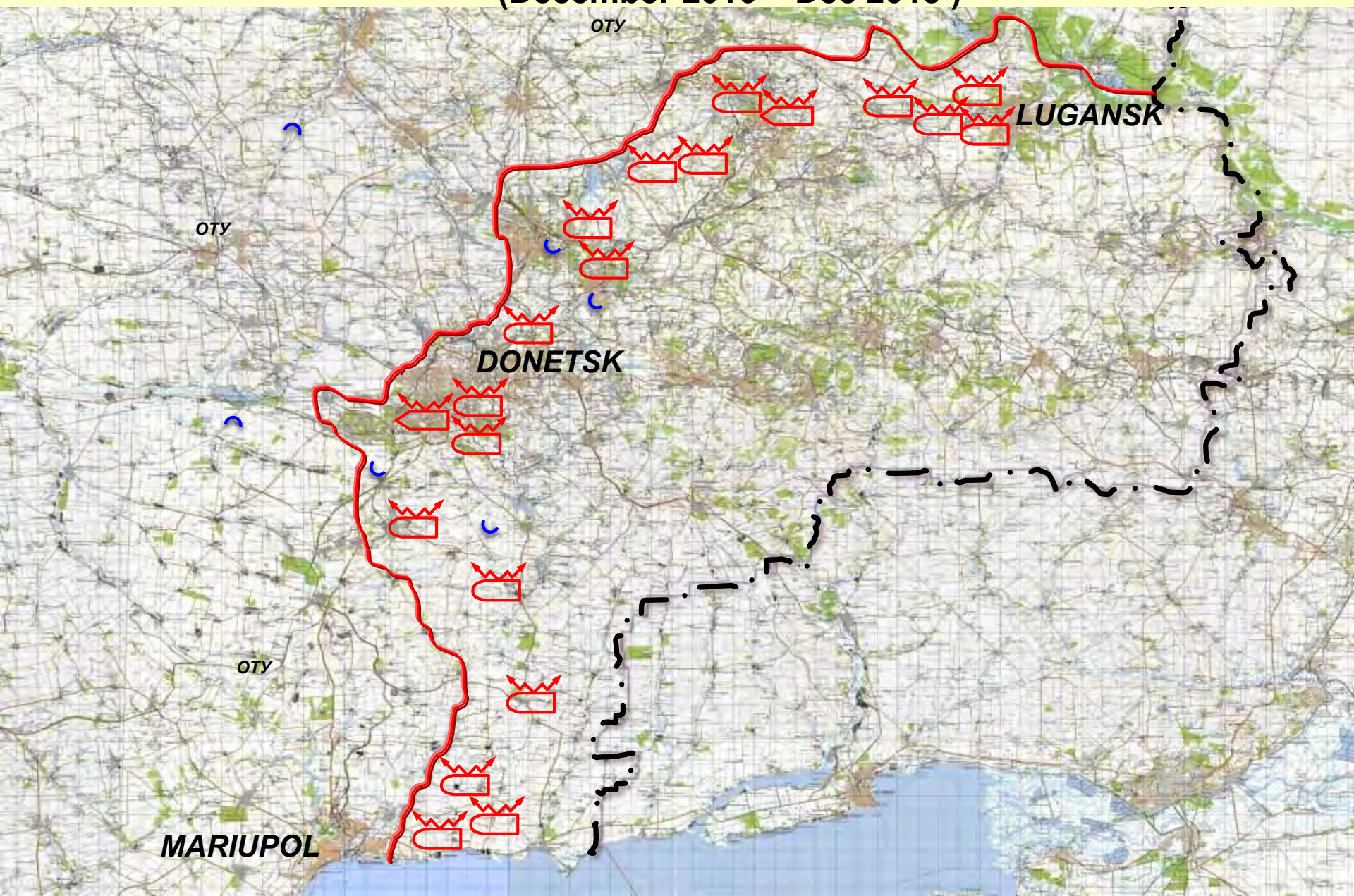
RUSSIAN AGGRESSIVE POSTURE AGAINST UKRAINE & THE REST OF EUROPE





Deployment of the Russian EW Units on the occupied territory of Ukraine (December 2016 – Dec 2018)

3





RUSSIAN EW TACTICS

TACTICS

**Disturbing and
turbulent jamming
tactics**

**Demonstration of
presence in the
specified areas**

**EW Superiority
(Domination) in the
Electronic Domain**

TASKS and MISSIONS

- Jamming some designated equipment;
- Suppression of some networks;
- Sending SMS to the enemy soldiers;
- Interference in specific areas.

- Full network suppression;
- Blocking all communication;
- Enforce to use GSM or SATCOM or mobile Internet;
- Determine access points for GSM and mobile Internet.



PECULIARITIES of EW EMPLOYMENT by RUS FORCES

FEATURES

- hidden influence of radio-electronic warfare means on radio communication (sudden disappearance of radio communication due to unknown reasons);
- sending SMS messages to private phones of the military with the indication of places for their gathering, in fact, places for planned fire shooting;
- blocking GSM radio communication with its further restoration, defining the points of access and shooting the areas of mass access to GSM radio communication;
- using the capabilities of radio-electronic warfare means for spotting the places of the location of counterbattery radars with further shooting on them;
- use of new physical principles, the effect of application equals electromagnetic weapons which destroy electronic equipment (System Murmansk BH in some types of operation radiates the signal of blocking with the power of 400 kWt that covers the distance up to 5000 km and affects the receiving equipment in UHF lines.



COURSE OF ACTIONS by Russian EW Units in Ukraine

BEFORE THE ACTIVE COMBAT ACTIONS



the enemy defines C2 of the UKR forces and determines the most important (crucial) objects,

searches and defines the most effective positions for radio-electronic warfare means,;

evaluates the effectiveness of blocking radio means of the UKR Armed Forces executing short-term radio break offs of different functional purposes and registers the reaction on the loss of radio communication in the UKR units

blocks radio communication of the UKR units in some tactical episodes.

NEGATIVE EFFECTS



disclosing of UKR units control systems on the level union – battalion – brigade,

defining the most critical purposes of radio blockings that can lead to the loss (violation) of control;

learning the scenarios of actions of UKR units in case of the loss of communication.



COURSE OF ACTIONS by Russian EW Units in Ukraine

DURING ACTIVE COMBAT ACTIONS



To disorganize C2 of UKR units in the area of active combat;

Spotting of the operating radio systems, jamming systems, counter-battery radars and targeting fire on them,;

operational maneuver by EW units on the new directions of actions;

breaking the control (misleading) of the UAV.

NEGATIVE EFFECTS



loss of control over the ATO units in the directions of active combat;

damage of the positions of jamming systems, counter-battery radars;

impossibility to use UAV.



RUSSIAN ARMED FORCES PRIORITIES in EW in the EASTERN UKRAINE

8

PRIORITIES

1

To suppress
enemy's UAV by
deployment of
Jamming
stations

R-330Zh
“SHYPOVNIK –
AERO”

2

Jamming of VHF
and UHF, GSM
communication by
deployment of
BORISOGLEBSK -2
AND INFAUNA SPR-
2M SYSTEMS

3

EW SYTEMS AND
STRIKE WEAPONS
INTEGRATION

4

DETECTIONS OF
THE INFORMATION
LEAKAGE
CHANELS AND
THEIR Suppression
Systems SVET-KU,
“Dziudoist”





THE STRUCTURE OF THE DETACHED EW COMPANY 9

1 AND 2 ARMY CORPS OF THE RUSSIAN PROXIES

EW COMPANY

C2 PLATOON

LEER - 3 * 2 pcs

VHF JAMMING /INTERFERENCE PLATOON

P-378БМВ – 2 pcs

UHF JAMMING /INTERFERENCE PLATOON

P-330БМВ – 2 pcs

JAMMING /INTERFERENCE PLATOON

P-330Ж – 2 pcs
РП-377Л – 2 pcs
P-934УМ – 2 pcs

РБ-341В "Леер-3"



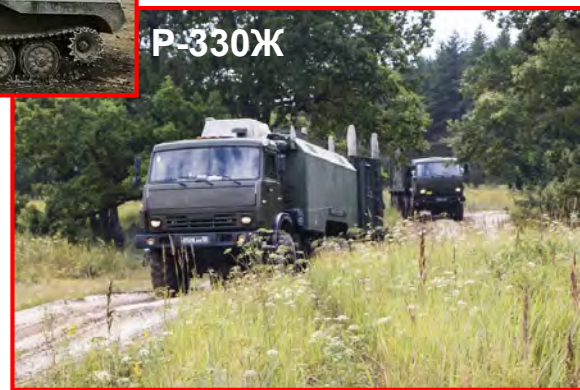
P-378БМВ



P-330БМВ



P-330Ж





EW System “Leer – 3”

10



Jamming frequencies ,
MHz

935-960, 1805-1880
890-915, 1710-1785



Territory of Ukraine



Donetsk, Ukraine 2016



Training of Russian proxies (May 2015). On the left in
the red frame Leer-3”



Electronic Interference Station P-378BMV

from "Borisoglebsk-2" SYSTEM

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Territory of Ukraine



Pictured 18.12.2014, in Internet since 08.05.2016



R-378BM INTERFERENCE/JAMMING STATION

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(Occupied territory of Lugansk Region)

R-378BM deployed
close to
Stahanov
Lugansk Region

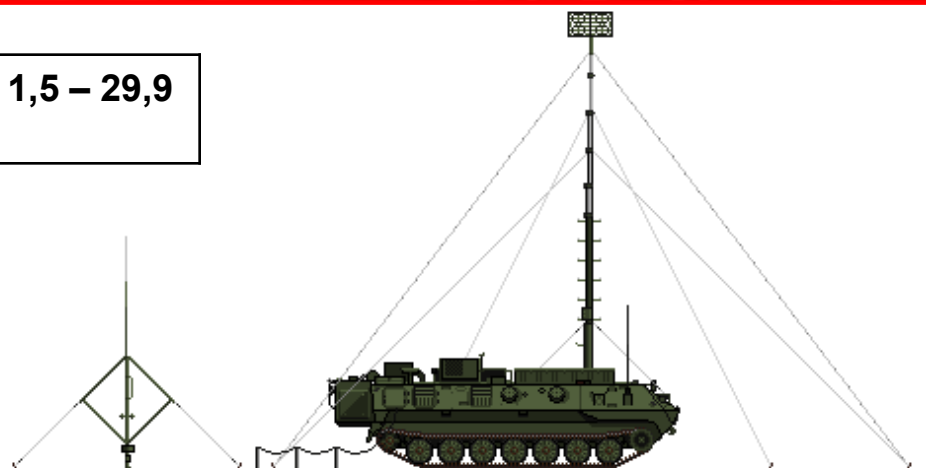


Jamming, interference and signal intelligence
frequencies, MHz

1,5 – 29,9



P-378B





JAMMING STATION R-330BMV AS PART OF BORISOOGLEBSK-2 SYSTEM

13



**TRANSPORTATION OF R-330BMV
TOWARDS UKRAINE TERRITORY,
26.05.2015**

**Jamming, interference and signal intelligence
frequencies, MHz**

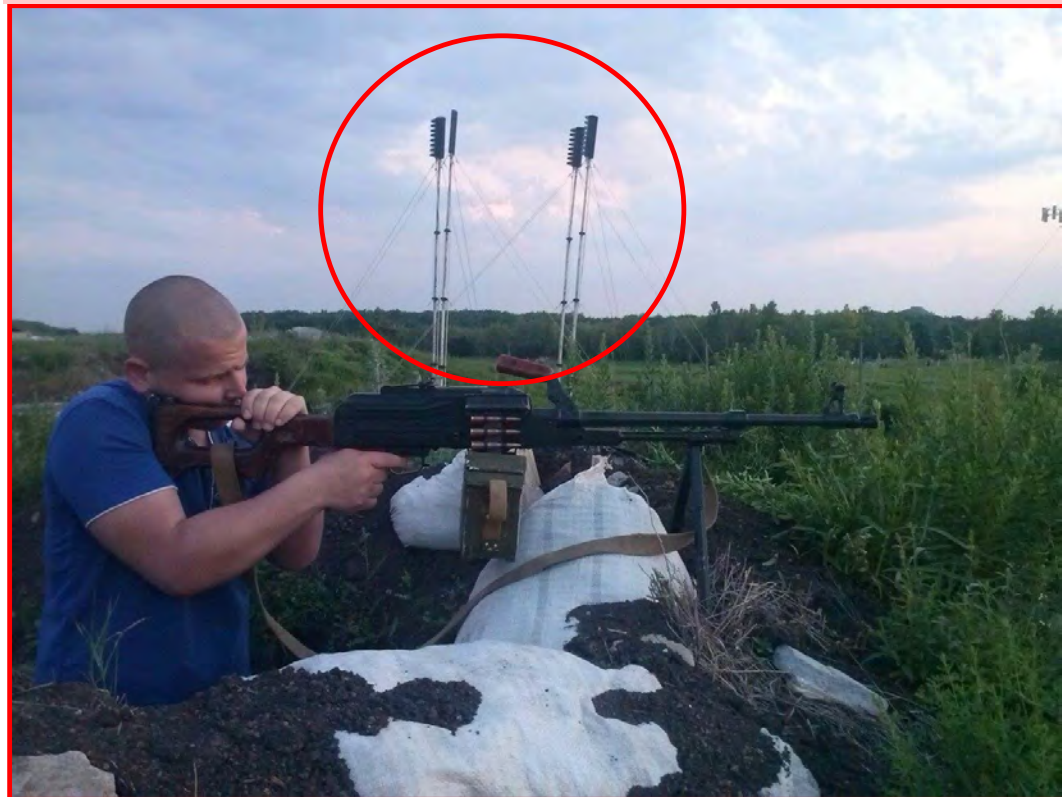
25 – 960



JAMMING STATION R-330Z “Zhitel”



Territory of Ukraine



01.07.2015, MAKIIVKA, DONETSK REGION
ANTENNAS OF R-330Z “Zhitel”

SIGNAL INTELLIGENCE frequencies, MHz	100 – 2000
JAMMING frequencies, MHz	1227,6; 1575,42; 1500 – 1900



EW STATION RB-531B “INFAUNA”



RB-531B “INFAUNA”



**22.06.2014,
OCCUPIED TERRITORY OF
DONETSK REGION**

Jamming, interference and signal intelligence frequencies, MHz	25 – 2500
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EW SYSTEM “LORANDIT”



RP-377LA “LORANDIT”

signal intelligence frequencies, MHz	20 – 2000
Jamming, interference frequencies, MHz	137 – 174 410 – 470 100 – 500

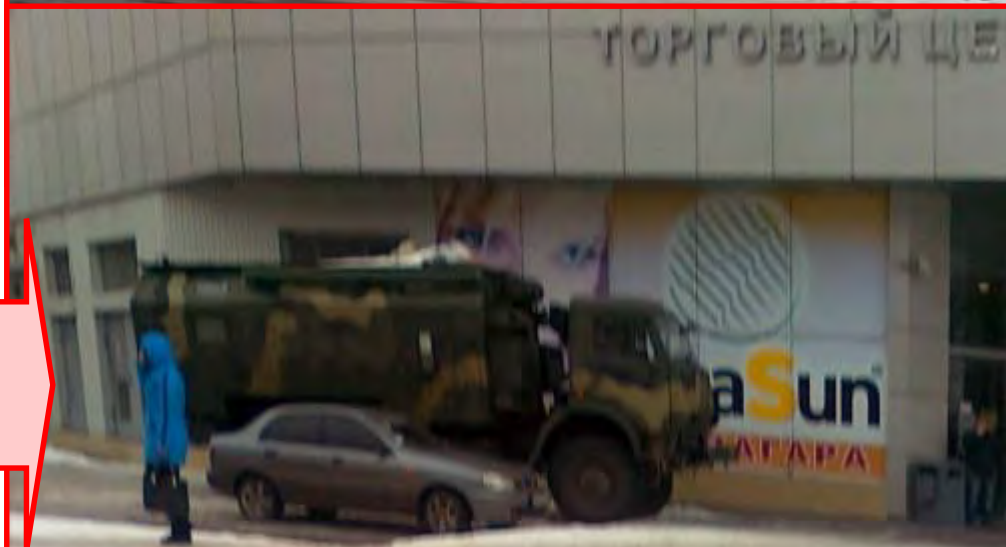
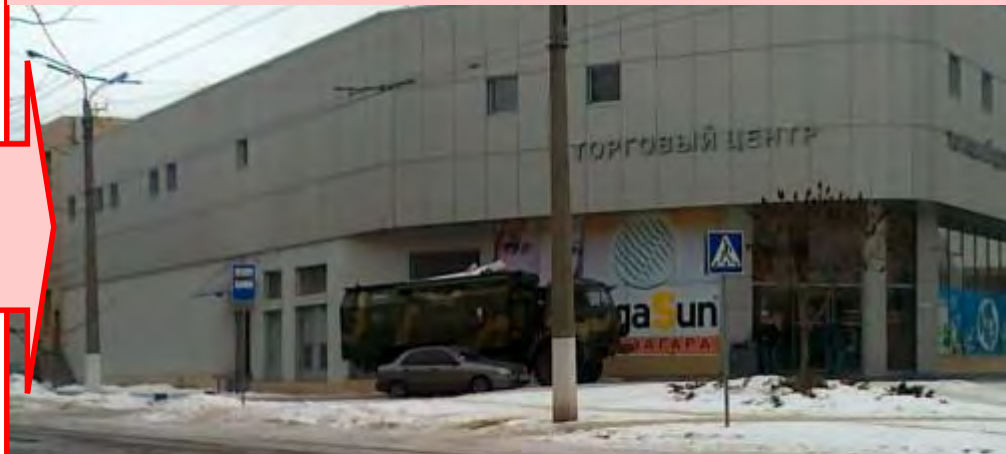




MOBILE AUTOMATED RADIO CONTROL SYSTEM “DZIUDOIST”

17

TOT of Ukraine



16.01.2015, 12.40 – LUGANSK, Shopping
Center AURORA



INTERFERENCE AND JAMMING STATION R-330BMV

18

“BORISOGLEBSK-2”



TOT of
Ukraine
25.07.2015,
Bryanka,
Lugansk
Region





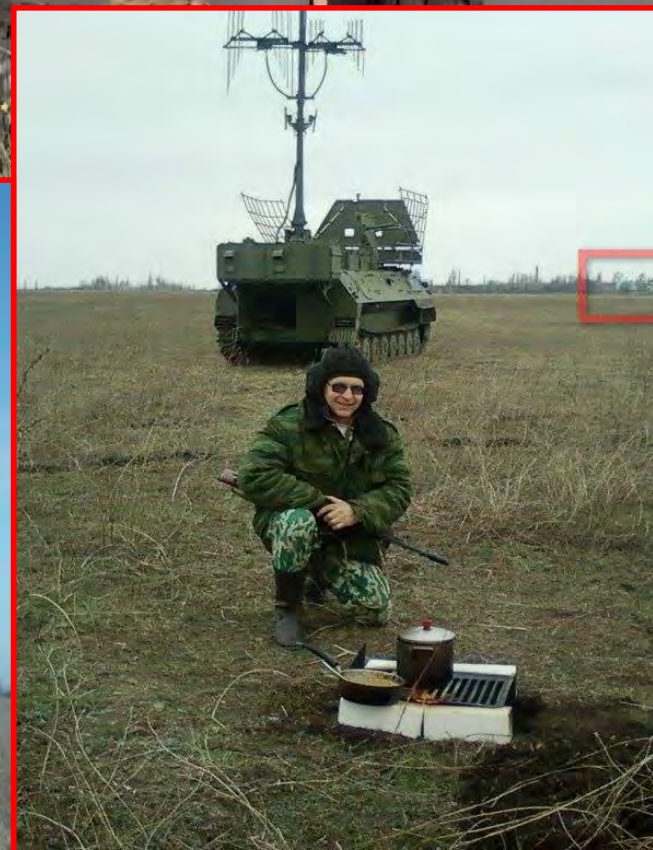
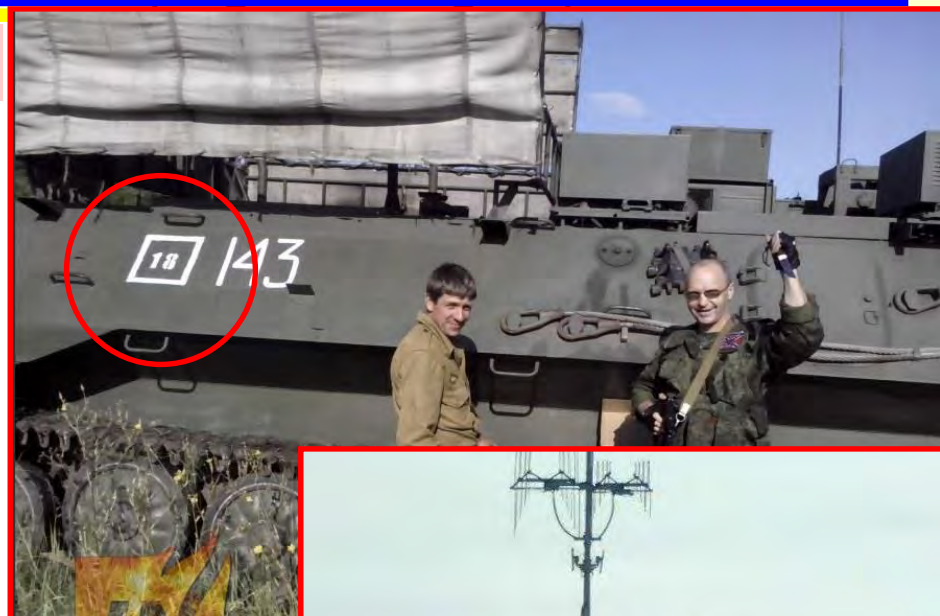
INTERFERENCE AND JAMMING STATION SPR-2M "Rtut'-BM" 19

On the TOT of Ukraine (Lugansk Region)

TOT of Ukraine

Interference System SPR-2M at Lugansk Airport area.

Pictured 21.09.2016, tactical Sign 18 in Square belongs to the Russian proxies unit 05776





EW System “SHIPOVNIK-AERO”

20

On TOT of Ukraine Donetsk Region



Yandex maps picture

“Terraserver”



22.07.2016 Donetsk city center
“SHIPOVNIK - AERO.



RUSSIAN EW UNITS on the TOT of UKRAINE



R-330Z Antennas trailer

RB-636

R0330



R-330Z



R-330Zh

R-330 Zh Antennas trailer

RB-636

12.11.2016

West side of Bryanka town, Donetsk reg.



RUSSIAN UHF JAMMING SYSTEMS

R-934UMV



signal intelligence frequencies, MHz	100 – 2000
Jamming frequencies, MHz	100 – 400

R-934BMV



signal intelligence frequencies, MHz	100 – 400
Jamming frequencies, MHz	100 – 150, 150 – 220, 220 – 400



STATION “MURMANSK-BN” (CRIMEA, cape FIOLENT)

23



Satellite
picture
26.03.2015



STATION “MURMANSK-BN” (CRIMEA, cap FIOLENT)

24





DEVELOPMENT OF THE RUSSIAN EW SYSTEMS WAY AHEAD

25

MULTIFUNCTIONAL EW COMPLEXES



“INFAUNA”



IED
PROTECTION

ARMORED

SIGINT
JAMMING

SPR-2M “RTUT-BM”



PROTECTION
FROM THE
RADIO
CONTROLLED
FUSES

SIGINT
SUPPRESSION
JAMMING

“LEER-2”



INTERFERENCE

SIMULATION
OF RADIO
ACTIVITY

SIGINT

R-330Zh “Zhytel”



GPS JAMMING

GSM 1800
JAMMING

IMMARSAT,
IRIDIUM
JAMMING



WAY AHEAD in DEVELOPING RUSSIAN EW SYSTEMS

- 1. Assets for blocking strategic, operational and tactical C4I. In 2017 instead of the system Borysohlibsk-2 a new system Palantin was deployed.**
- 2. Fighting the air assets equipment. It is ensured by blocking air communication and on-board radars, including ISTAR aircrafts.**
- 3. Assets for blocking signals of GPS and fighting UAV. In 2016 a new EW with small-size UAV Repellent-1 was developed.**
- 4. UAV EW Assets. UAV Leer-3 is used for collecting data from personal GSM, namely IMEI and MTIMSI.**



WE MUST STOP THEM

**DO NOT UNDERESTIMATE
RUSSIAN THREAT**

General Staff of the Armed Forces of Ukraine



STRONGER TOGETHER

RF produced weaponry and equipment found in the Eastern Ukraine (never used by UAF)

ARMOR



Armored vehicle
BPM-97 "Vystrel"

Air Defence



Artillery rocket missile complex
"Pantsyr-C"

Antitank Armament



Antitank rocket complex
"Konkurs-M"

Unmanned Aerial Vehicles



UAV "Eleron-3CB"



UAV "Takhion"



UAV "Orlan-10"

RUSSIAN MADE WEAPONS AND EQUIPMENT USED IN THE EASTERN UKRAINE



Mobile patrol complex
"Patriot-OKAPI"



REW station "LEER-2"



REW station "Shypovnyk--aero"



REW station R-330G "Gytel"



Mini UAV "ZALA"



UAV "Dozor-100"



UAV "Takhion"



Radio "Azart-P1"



REW station R-330M1P "Diabazol"



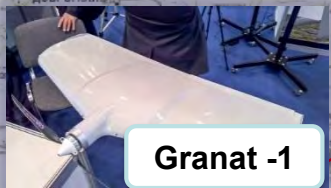
Artillery radar system "Rys"



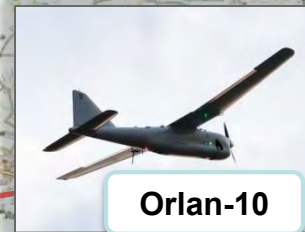
Small-size navigation equipment
14C822 "Grot-m"

RUSSIAN UAV'S ACTIVITY

2017 - 641 cases of the of enemy UAV usage observed



Granat -1



Orlan-10



Granat-2

MARIUPOL

250 cases of UAV employment by enemy have been observed in 2018.

Frequency of UAV usage in 2018:
Daily average - 1-2 flights; in case of favorable weather conditions – 10-13 flights

