

**PROCEDURE ON THE OPERATION
OF THE ST 202 UDAV-M CELLULAR JAMMER
PROTECTING CONFIDENTIALITY DURING NEGOTIATIONS
IN COMBINATION WITH ST 062 DETECTOR
OF MOBILE DIGITAL COMMUNICATION DEVICES**

1. Introduction

This procedure is intended for users of ST 202 UDAV-M devices protecting confidentiality during negotiations. It allows to perform effectively the following tasks:

- 1) Protection of premises allocated for confidential negotiations against unauthorized use of mobile communication appliances.
- 2) Ensuring of proper operation of mobile communication appliances outside the coverage areas.

2. The algorithm of the complex

Upon detection of signals (GSM900 or GSM1800 mobile devices), which level exceeds a set threshold, ST 062 detector of mobile digital communication devices (hereinafter – ST 062) generates an alarm and closes the relay contacts, thereby forming the command to activate the device ST 202 UDAV-M protecting confidentiality during negotiations (hereinafter - ST 202). When the detection threshold is configured properly, one can assume with certainty that the active mobile phone is within the protected area, and it should be blocked.

Transition to the operating mode continues within 5-15 sec. and then the communication channel is broken. ST 202 emits a blocking signal within 1 min., after which the irradiation is terminated. Within 30-35 sec. after switching off the interference, ST 202 is in the passive mode (not controlled) and then it goes again into the standby mode waiting for “switch on” command. This delay is provided for the restoration of the operating mode of ST 062.

3. Location of the equipment

It is optimally, if this place is located at the geometric center of the protected area. This is connected to the fact that antennas of ST 062 and ST 202 are isotropic ones, i.e. the directional pattern conventionally is a ball. Such an arrangement of the equipment is shown in Fig. 1. In this case, there is an approximate coincidence of the boundaries of all areas (green colour indicates the boundaries of the protected area, blue colour – the area of suppression, red colour – the detection area).

Fig. 1 (Equipment is placed at the geometric center of the protected area)



Fig. 2 (Equipment is placed not at the geometric center of the protected area)



If the devices are biased toward one of the boundaries of the protected area, it will be difficult to match the boundaries of the reception and suppression areas with the boundary of the protected area. Fig. 2 and 3 show such a variant of the location.

Fig. 3 (Equipment is placed not at the geometric center of the protected area)

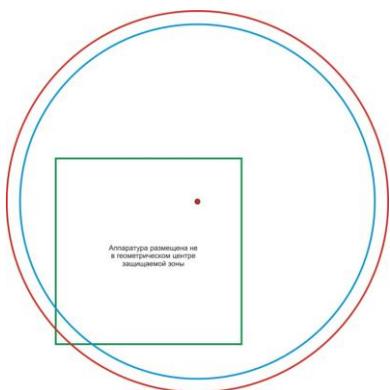


Fig. 2 shows a variant when equipment is located away from the center of the protected area. In order to ensure normal communication outside the protected area it will be necessary to increase the detection threshold and to reduce the signal strength of ST 202. However, in the protected area it can not be ensured the guaranteed detection of cellular phone signals as well as their blocking.

Fig. 3 shows a variant when equipment is located outside the geometric center of the protected area. Herewith the detection threshold of ST 062 and the signal level of ST 202 are set so that you may achieve the guaranteed detection and blocking of the cellular phone signals. Fig. 3 shows that the size of the detection and blocking areas considerably exceeds the size of the protected area. In this case, equipment operation will cause problems of cellular communication outside the protected area, which is unacceptable.

Fig. 1-3 show an ideal example of radio-signal propagation. In reality, the size and configuration of the detection and blocking areas are greatly affected by shielding properties of filler structures. But in spite of this fact, the correct placement of the equipment will largely facilitate further adjustment of the complex.

4. Selection of the type of signals to be blocked

Before you start setting up the equipment it is necessary to determine the type of signals to be blocked.

According to the mentioned algorithm of the complex (see item 1) the detection channels of ST 062 in automatic mode and the channels of ST 202 should match. The table shows possibilities of ST 062 to detect different signals in automatic mode as well as the possibilities of ST 202 to block the various signals.

The name of detection channel of ST062/suppression channel of ST202	ST062	ST202
SDMA450		+
GSM in 900 MHz range	+	+
GSM in 1800 MHz range	+	+
GSM-3G	+	+
DECT	+	
WiFi	+	+
WiMAX (4G)		+
Bluetooth	+	+
Active radio transmitters with constant frequency in 2.4 GHz range (for example, wireless video cameras).	+	

The table shows that coincidence of detection and blocking possibilities occurs for the following types of communications: GSM900, GSM1800, GSM-3G, WiFi, Bluetooth. Exactly from the given list it is necessary to select the signals most relevant to blocking.

As an example, we consider one of the common variants – blocking of GSM900 and GSM1800 signals.

5. Setting of the operation threshold of ST 062

Turn on the detector. Turn off all channels, except for GSM900 and GSM1800. In order to set the detection threshold you will need cellular phones connected to different GSM operators. (It will be optimally, if you have phones connected to all operators working in your region).

Place the detector ST 062 to the selected location. Select the manual mode for detection of the mobile devices GSM900. Standing on the boundary of the protected area, make a call from one of the available phones. Write down the signal level value recorded by the detector. Repeat this operation from the other points located on the boundary of the protected area. Then do the same operation using cellular phones connected to other operators.

Switch the detector into the manual mode for control of the mobile devices GSM1800 and repeat the same actions. After measuring, you will get a table of values similar to the one, mentioned below:

	Local telephone station	Megaphone	Tele-2	Beeline
GSM900	Point1 – Point 2 – Point 3 – Point 4 –	Point1 – Point 2 – Point 3 – Point 4 –	Point1 – Point 2 – Point 3 – Point 4 –	Point1 – Point 2 – Point 3 – Point 4 –
GSM1800	Point1 – Point 2 – Point 3 – Point 4 –	Point1 – Point 2 – Point 3 – Point 4 –	Point1 – Point 2 – Point 3 – Point 4 –	Point1 – Point 2 – Point 3 – Point 4 –

From these values recorded at different points for GSM900, select the smallest one. Also choose the smallest value recorded for GSM1800.

Switch to the detection threshold setting mode. Set the threshold for GSM900 corresponding to the smallest value obtained in the experiment.

Set the threshold for GSM1800 corresponding to the smallest value obtained in the experiment.

Thus you can set the thresholds, which allow to record signals of the mobile devices GSM900 and GSM1800 within the boundaries of the protected area.

To make sure that the threshold is selected correctly, you can carry out one more experiment. Set the detector in automatic mode. Allow recording into the protocol. Go beyond the protected area. Sequentially make several calls from different points. If the detector records these calls, it is necessary to increase the threshold and to repeat the experiment.

The task is completed, if all calls from the phones connected to the different operators are:

- definitely recorded in the protected area;
- definitely not recorded outside the protected area.

6. ST 202 power adjustment

In order to configurate the suppression area it is necessary to determine the level of signals from GSM900 and GSM1800 base stations, using ST 062. Measurements are taken at several points on the boundary of the protected area. At the same time ST 062 is running in manual mode (base station control). The results are recorded for each of the points.

From the obtained values you should choose the greatest ones for GSM900 and GSM1800. Different points can be there. For example, the max signal value of base station for GSM900 can be in one point, however, for GSM1800 – in another one.

Locate ST 202 in the installation place and switch on. Switch off unused channels (in this case, leaving only GSM900 and GSM1800). Switch to the adjustment mode, adjusting the signal strength by channel.

Place ST 062 at the point where the max level of GSM900 base stations was obtained. Set the detector in manual mode for control of GSM900 base stations. Adjusting the signal strength level in the GSM900 channel (by ST 202) and controlling its value (by ST 062), set the value 10-20 units higher than the max measured value of the base station signal (for this point).

Set the level of signal for GSM1800 using similar method.

7. Connection of ST 202 to ST 062

In the settings of ST 202 set the remote control mode from ST 062. Switch off ST 202.

In the settings of ST 062:

- set the relay activation mode;
- switch off unused channels of the detector (in this case, leaving only GSM900 and GSM1800);
- allow recording into the protocol;
- switch off GSM base stations control;
- set the value of “min duration” equal to “0”.

In the selected placement of the complex, by means of cable, connect the relay output of ST 062 to the remote control input of ST 202. Set ST 062 in automatic mode. Switch on ST 202. The complex is ready for operation.

8. Check of the complex operation

Operation check is recommended to carry out, using cellular phones connected to the different operators. The whole point of check is that all attempts to contact by phone within the protected area should be blocked.

At the same time, outside the protected area both incoming and outgoing calls to mobile phones connected to different operators should not be blocked.

If it is possible to make calls within the protected area, it is necessary to increase the signal level in the appropriate channel.

If communication is blocked beyond the suppression area, it is necessary to reduce ST 202 signal level in the appropriate channel.

9. Some limitations

In automatic mode, the complex is not designed to block transmission and reception of SMS-messages, because the signals for this type of communication are too short. When you go into the protected area with a mobile phone in communication mode, communication will continue for some period of time. Instant blocking of communication when crossing the boundary is impossible.

ST 202 provides the possibility to block cellular phones, operating in standard CDMA450. However, ST 062 doesn't provide the possibility to detect this standard. Thus, blocking of CDMA450 in automatic mode is impossible.

10. Conclusion

In case of proper setting of the detection threshold and ST 202 signal level, operation of the complex will not cause inconvenience to communicate outside the protected area. At the same time, “Confidentiality” mode will be provided within the protected area.

It is necessary to remember that violation of the communication mode is a serious offence! Please strictly follow the items of the given procedure.