CURRENT ISSUES OF LAW ENFORCEMENT

UDC 351.74
DOI: 10.31733/2078-3566-2019-5-7-12

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CONTROL SYSTEMS FOR MOBILE PATROL SERVICES GROUPS

Андрій Фоменко, Володимир Вишня. СИСТЕМИ УПРАВЛІННЯ НАРЯДАМИ МОБІЛЬНОЇ ПАТРУЛЬНОЇ СЛУЖБИ. Досліджено особливості діяльності нарядів мобільної патрульної служби та її сформулювало пропозиції щодо її вдосконалення.

Одним із важливих елементів реформування Національної поліції України є створення мобільних патрульних нарядів, які першими реагують на виклик про допомогу, або повідомлення про вчинине правопорушення чи злочин.

В основу вдосконалення системи управління нарядами мобільної патрульної служби, зокрема управління каналами відеопотоків між диспетчером і патрульним поліцейським, пропонується, шляхом уведення нових зв'язків елементів, забезпечити можливість відображення у диспетчера інформації, яка потрапляє в об'єктив відеореєстратора патрульного. В існуючій системі управління відсутня можливість автоматичного включення каналів передачі відеопотоків після прибуття наряду на місце події, що не дозволяє виключити вплив людського фактору при активізації каналів системи.

Інколи виникає ситуація, коли наряд патрульної служби потрапляє до зони нестабільного прийому сигналу та втрачає зв'язок з диспетчером. Як наслідок – наряд не має змоги отримувати нові завдання, надсилати звіти про виконання та передавати відео з місця події. Для вирішення цієї проблеми пропонується встановлювати на автомобілі патрульної служби стільниковий мультиплексор, який надає змогу підключатися до декількох мобільних операторів зв'язку в залежності від якості сигналу. Таким чином буде забезпечено стабільність каналу передачі даних незалежно від якості зони покриття мобільного оператора.

Перевагою запропонованої системи управління нарядами мобільної патрульної служби з відеопотоками є можливість автоматичного включення каналів передачі відеопотоків з місця події або злочину до диспетчера, оскільки інколи, патрульним доводиться негайно втручатися в ліквідацію обставин, що виникли при правопорушеннях.

Ключові слова: *наряд, диспетчер, відеопотоки, відеореєстратор, канали, патрульна служба, планшет.*

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Problem statement and analysis of publications that started solving this problem. One of the important elements of the reform of the National Police of Ukraine is the creation of mobile patrol units, which are the first to respond to a call for help, or to report an offence or a crime. Therefore, it is advisable to consider the effectiveness of responding to the notification of units of the National Police of Ukraine (hereinafter – the police) and working out the tasks received by mobile patrol service [1].

The **article's objective** is elaboration of technical devices and algorithmic methods of increasing the effectiveness of the activities of the mobile patrol service in the execution (completion) of their tasks.

Basic content. Improving the mobile patrol control system, including the management of video feeds between the dispatcher and the patrol officer, is proposed to provide the dispatcher with information that enters the patroller's lens by introducing new element connections. This allows the dispatcher to control in real time the actions of the patrol officer in the process of completing the task and, if necessary, to interfere in his/her work in a timely manner, and thereby increase the efficiency and safety of patrol groups (Fig. 1).

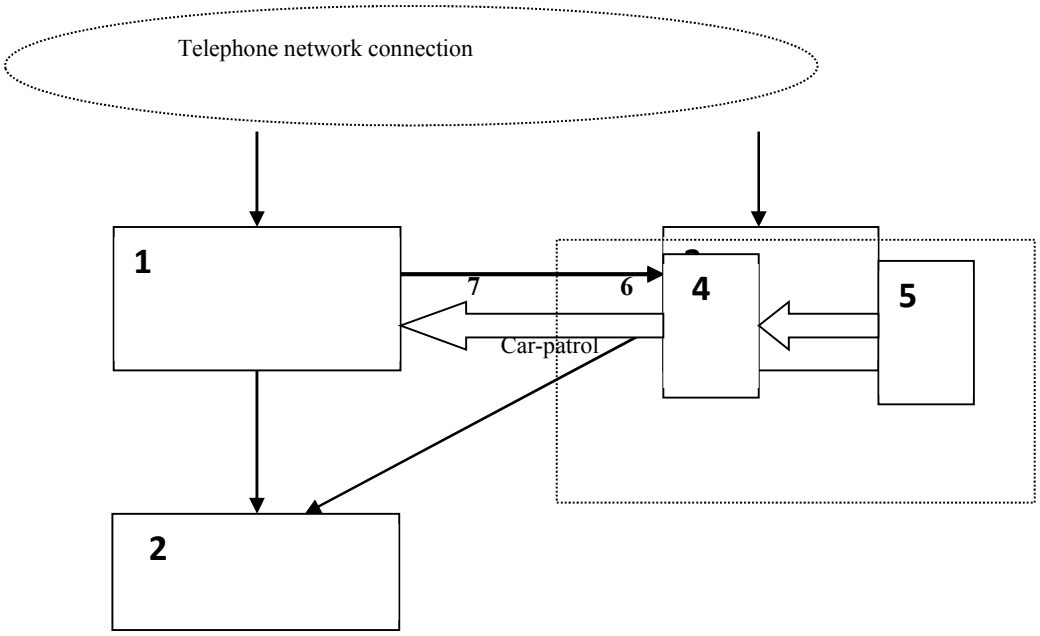

Fig. 1. Video channel patrol control system

It is well known that the short-term training of police officers for the mobile patrol service does not always provide sufficient knowledge for the quality of patrol troop performance. Therefore, in order to improve the interaction of the dispatcher and police mobile patrol uniforms, in the Dnepropetrovsk State University of Internal Affairs was offered a solution when, upon arrival at the scene of an event or crime, the patrol officer switches the video current transmission channel from the video current plan Wi-Fi standard and the transmission channel from the tablet to the 4G or 5G alerts manager unit on the dispatcher monitor the moment of the event from the lens of the personal video recorder of the patrol while completing the task (Fig. 1). This allows the next dispatcher to intervene, if necessary, in the course of the task execution, to quickly correct the actions of the groups, to exclude cases of unqualified actions [2].

Unfortunately, the existing control system does not have the ability to automatically turn on the transmission channels of video currents after the arrival of the groups at the scene, which does not allow to exclude the influence of the human factor when activating the channels of the system.

Therefore, for further improvement of the mobile patrol service management system, we are offered to provide the ability to automatically switch channels of video currents and display on the monitor the information from the lens of the personal video recorder patrol while completing the task, while leaving the possibility of personal control of these channels and patrolmen.

To do this, in the known system of management of mobile patrol service groupss (Fig. 1), including related blocks of operator 102, dispatcher, regular district police department, tablet mobile patrol along with satellite GPS-positioning system and unit personal video recorder patrol, the first and second channels of video current transmission from the patroller's personal video recorder to the tablet and from the tablet to the dispatcher unit, respectively, the coordinate unit (address) of the event (task) whose input is connected is entered The output of the event coordinate receiving unit is connected to the second input of the comparison module, the first input of which is connected to the satellite GPS positioning system output, and the output of the comparison module is connected to the first input of the logic circuit OR, the second input of which is connected to the output of the tablet, and the third – to the second output of the dispatcher, although the output of the logic circuit OR is connected to the input of the block generating a signal to open the first and second channels of transmission of video currents, the output of which is connected to the first go plate, the second input is connected to the output power signal to close the first and second channels of video currents, and its input is connected to the third dispatcher output unit.

Fig. 2 presents a diagram of the proposed system of control of mobile patrol service.

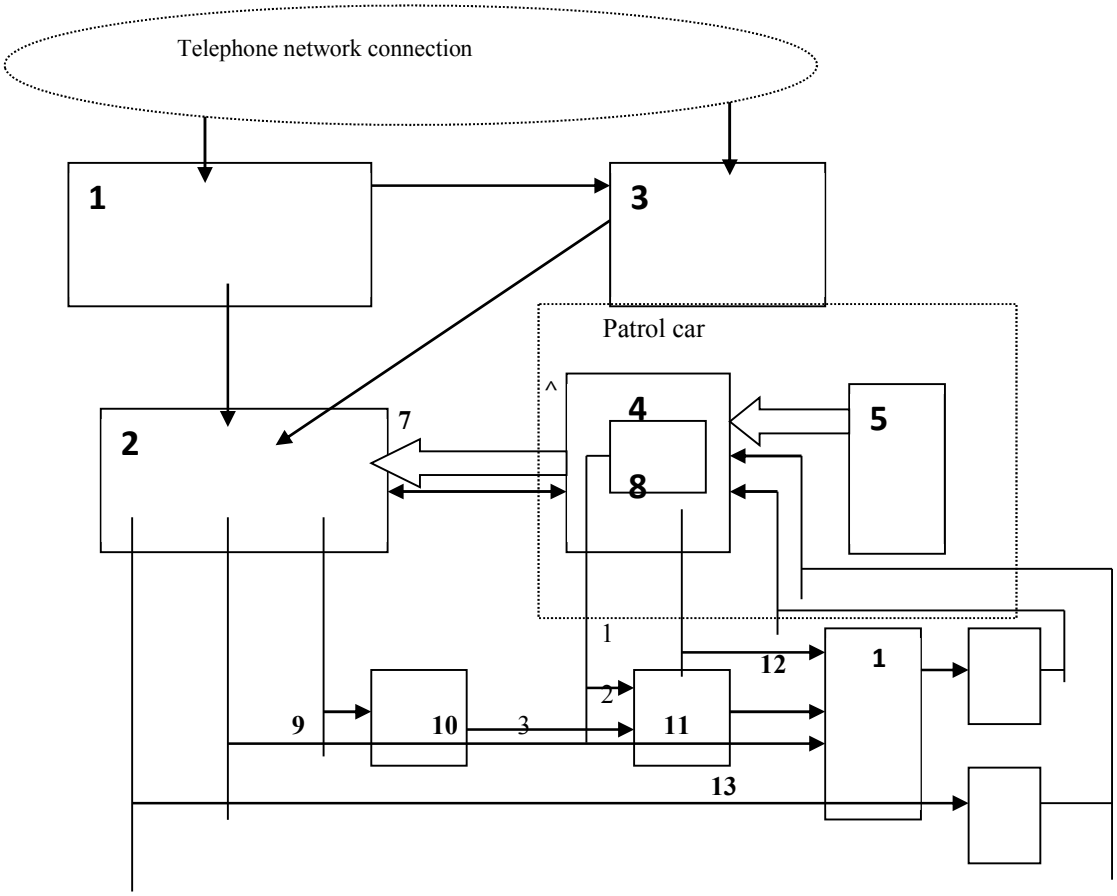

Fig. 2. The system of control of the mobile patrol service groups with different ways of connection of video channels “the dispatcher – the patrolman”.

The scheme of the system includes a block 1 of the operator 102, the input of which is connected to the telephone network, and the first and second outputs are connected according to the first input of the block 2 of the dispatcher and the first input of the block 3 of the next police department, the second input of which is connected to the telephone network . At the same time, the output of block 3 of the next police department is connected to the second input of the block 2 of the dispatcher, the third input of which (compatible with the output) is connected to the tablet 4 of the mobile patrol uniform, which is equipped with a satellite GPS positioning system 8, and on which the first channel is built transmission of video current 6 from the personal video recorder of the patrol 5 to the tablet 4 and the second channel of the video current 7 from the tablet 4 to the dispatcher unit 2.

In addition, the system further includes a block 9 receiving the coordinates (addresses) of the event (task), the input of which is connected to the output of block 2 of the manager, and the output of block 9 receiving associated with the second input of the comparison module 10, the first input of which is connected to the output of the system 8 satellite GPS positioning. The output of the comparison module 10 is connected to the input of the logic circuit OR 11, the second input of which is connected to the output of the tablet 4, and the third to the second output of the block 2 of the dispatcher, although the output of the logic circuit OR 11 is connected to the input of the block 12 of the signal opening channels 6 and 7 transmitting video currents, the output of which arrives at the first input of the tablet 4, the second input of which is connected to the output of block 13. Generation of the closing signal of the channels of video currents the input of which is associated with the third output of block 2 of the dispatcher.

The system is implemented as follows. Police notices of crimes and events, or a call for assistance made by telephone 102, are received and processed by operator 102 (block 1). As a result, an electronic message card is generated, which immediately goes to Unit 2 of the dispatcher, the next patrol police mobile control unit, who assigns a free mobile patrol crew to respond to the message. At the same time, the electronic card of the message is sent to the regular (block 3) regional police department, to whose territory the appeal is registered, which is registered in the magazine "Uniform accounting of crimes and offenses" of the regional department. It should be noted that a message from citizens can be received directly on the phone of the next part of the regional department (block 3). In this case, it is logged in the district department log and forwarded to the Operations Manager (Unit 2) for response.

Dedicated by the dispatcher 2 to the mobile patrol groups (autopatrol) is forwarded to the tablet 4 task and block 9 receiving the coordinates of the event. The groups begins to complete the task. The location of the groups is constantly monitored by the GPS satellite positioning system 8 and the corresponding signal is sent to the first input of the comparison module 10. Upon arrival of the groups to the location specified in the reported citizens in the tablet 4, the arrival time is fixed, and the signals at both inputs of the comparison module 10 coincide with it. the output is formed by a signal that arrives at the first input of the logic circuit OR 11 and then to the input of the block 12 of the forming signal of the opening of the transmission channels of video currents. The output of block 12 generates a signal that arrives at the first input of the tablet 4 and automatically activates the channels of transmission of video currents 6 and 7 respectively between the personal video recorder 5 patrol and the tablet 4 and between the tablet 4 and the unit 2 of the dispatcher. From now on, video information of the scene from the lens of the patroller's personal DVR is transmitted to the monitor. Upon completion of the task in the tablet 4 is made a corresponding mark, which is sent to the block 2 of the controller, from the output of which through the block 13 of the formation of the signal closing channels on the second input of the tablet 4 receives a signal to disconnect the channels 6 and 7 transmission of video current.

It should be noted that in addition to the automatic inclusion of the channels of video currents 6 and 7, the system allows the personal activation of channels 6 and 7 by the command of the dispatcher signal from the second output of the block 2 of the dispatcher to the third input of the logic circuit OR 11 and beyond, from its output, through the block 12 generating a signal of the opening of the channels of transmission of video currents, at the first input of the tablet 4. By command of the patrol – the signal from the output of the tablet 4 the second input of the circuit OR 11 and further, from its output, through the block 12 of the formation of the signal of the opening of the channels of video currents, a first input tablet 4.

In our view, it is interesting to see a solution to the police groups control system that takes into account the quality of service made by the provider. We define A – components of the scheme related to the local network of the Ministry of Internal Affairs (Fig. 1, blocks 1, 2, 3) and B – components of the scheme related to the mobile groups of the patrol service (Fig. 1, blocks 4, 5, 6, 7). Then blocks between A and B are made using a cellular service provided by one of the country's mobile carriers (Kyivstar, Vodafone, PeopleNet). With this data feed, patrol teams receive tasks and send performance reports. It is also known that coverage of mobile operators in cities and beyond is not homogeneous and depends on the terrain, location of the operator's base stations and a number of other factors. Therefore, sometimes there is a situation where the patrol staff gets into the unstable reception area and loses contact with the dispatcher. As a result, the groups cannot receive new tasks, send performance reports, and transmit video from the scene.

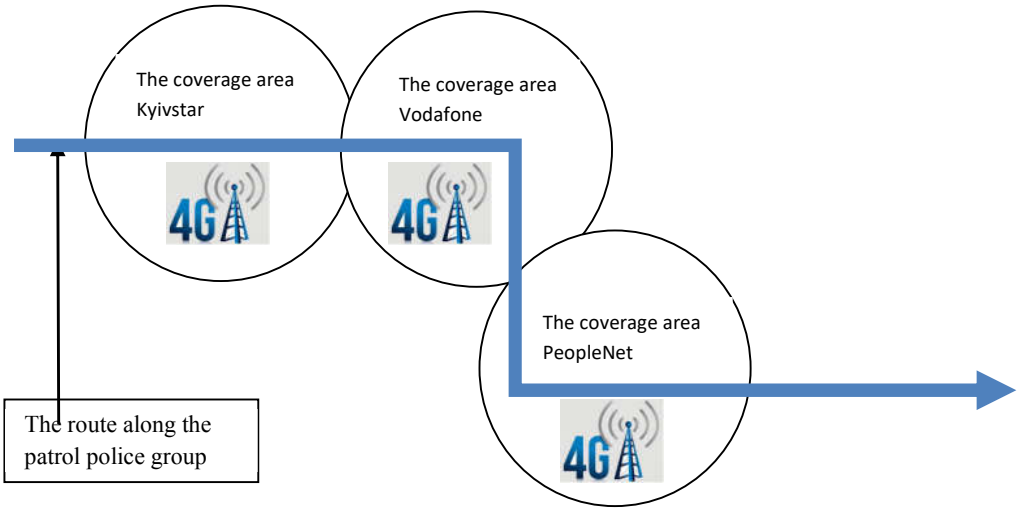

Fig. 3. Possible mobile patrol groups movement to the scene

To solve this problem, we suggest installing a cellular multiplexer on the patrol car that allows you to connect to multiple mobile carriers, depending on the signal quality. This will ensure the stability of the data channel regardless of the quality of the coverage area of the mobile operator. The schematic diagram of a control system with a multiplexer and a block for determining the quality of information transmission is given below:

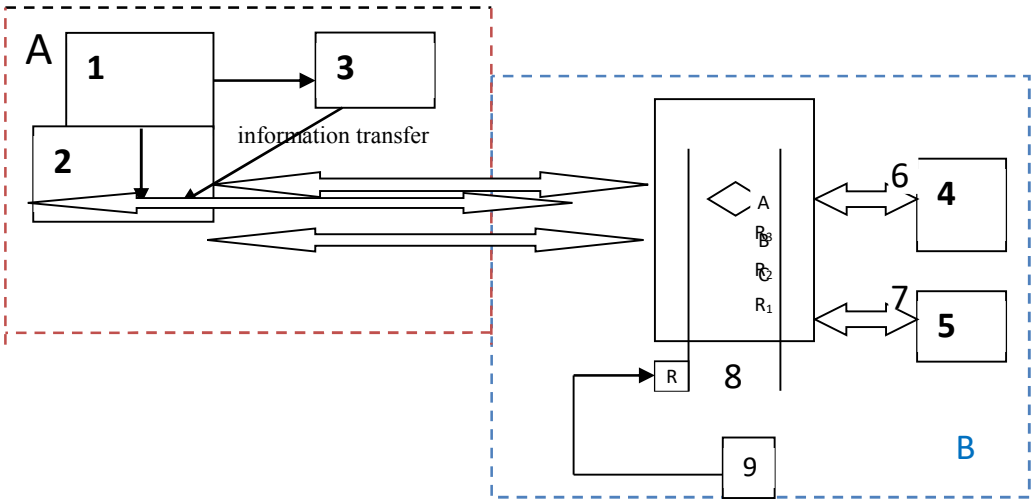

Fig. 4. Mobile patrolling groups control system with switching providers

The control system includes a multiplexer 8, the information outputs of which (A, B, C) are connected to the input of the controller 2, and the inputs 1 and 2 of the multiplexer 8 are connected to the tablet 4 and the personal video recorder 5, respectively, video channels 6 and 7, and the output of the block determine the quality of transmission information 9 is connected to the control input R of the multiplexer 8.

Conclusion. An advantage of the proposed video patrolling system for mobile patrol services is the ability to automatically include video transmission channels from the scene or crime to the dispatcher, since sometimes patrols have to immediately intervene to eliminate the circumstances of the offenses. An important aspect of the system's operation is the ability, at any time, to activate the channels of transmission of video currents directly by the command of the dispatcher or patrol, which increases the reliability of the functioning of a certain operation of the system.

The structural solutions of the patrol police groups control systems described in this article have been elaborated at the University within the framework of the training course "Information technical platform of professional role-playing game "Line 102" by cadets, master students, police officers in the framework of training and internship.

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Received to editorial office 02.12.2019

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SUMMARY

The peculiarities of the activity of the mobile patrol service's groups have been studied and proposals for its improvement have been formulated.

The advantage of the proposed video patrolling system for mobile patrol services with video streams is the ability to automatically include the channels of transmission of video streams from the scene or crime to the dispatcher, because sometimes patrols have to immediately intervene in the elimination of circumstances that occurred in the offenses.

***Keywords**: mobile group, dispatcher, video streams, video recorder, channels, patrol, tablet.*

UDC 241.8 : 254
DOI: 10.31733/2078-3566-2019-5-12-16

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THE ROLE OF CHAPLAINCY IN LAW ENFORCEMENT IN THE UNITED STATES

Ґреґ Янґ. РОЛЬ ІНСТИТУТУ КАПЕЛАНСТВА У ПРАВООХОРОННІЙ ДІЯЛЬНОСТІ США. В оглядовій статті висвітлено роль, відповідальність, необхідну підготовку та переваги від наявності в правоохоронних органах кваліфікованого капелана, який працює, здебільшого на добровільних засадах, у підрозділі поліції США. У вирішенні цього питання автор спирається на свій багатий досвід роботи капелана в правоохоронних органах, а також інструктура з підготовки поліцейських. Незважаючи не складність обгрунтування цінності програм з підготовки капеланів для правоохоронних органів, автор висвітлює переваги, які приносить капелан-правоохоронець конктетному підрозділу міліції та громаді, з якою він співпрацює.

Зокрема, зазначено, оскільки капелани правоохоронних органів у США або служать

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