Supplement #2 to the order #70
of State Committee for Telecommunications
of Russian Federation dated 04.20.99

TECHNICAL REQUIREMENTS
to SOSM function facilities
at public paging networks
(PPN SOSM)

1. SOSM purpose and composition

1.1. The system of technical facilities for providing operative-search measures at public paging networks (PPN SOSM) is intended for technical supporting of corresponding measures at this networks in accordance with current legislation of the Russian Federation.

1.2. The present Technical Requirements (TR) cover PPN systems irrespective of property forms, which are created on the base of licenses distributed by Communications Administration of the Russian Federation.

1.3. PPN SOSM should be provided at the following networks:

a) at regional paging networks within one or several settlements of the Russian Federation subjects;

b) at federal paging networks within several regions of the Russian Federation subjects or within all the State as a whole.

1.4. SOSM should provide observation of information of PPN subscribers being under monitoring. The subject of observation is information transmitted by PPN subscribers under monitoring according both individual and group numbers.

Note:

An individual number is used when sending a message to any single subscriber of a network, group number - when sending a message to a group of network subscribers.

1.5. SOSM consists of the following:

a) hardware and software included into PPN equipment (PPN SOSM HW/SW);

b) hardware and software included into remote control point (CP) equipment;

c) communication lines and channel terminating equipment to provide communications between PPN and CP.

1.6. The present requirements should be provided irrespective of supplementary services furnished to PPN subscribers.

1.7. The present requirements should be provided irrespective of methods, which are used to protect transmitted information in PPN.

2. Organization of SOSM at PPN networks

2.1. PPN SOSM management should be executed from CP through its interaction with PPN SOSM HW/SW via communication channels (lines), which provide transferring control commands from CP to SOSM HW/SW and messages from SOSM HW/SW to CP.

2.2. The following information should be transmitted to CP from SOSM HW/SW in real time:

a) subscriber number where a message is destined for;

b) contents of a message intended to transfer to the subscriber, including subscriber using PPN roaming;

c) time of registering a message by PPN operator;

d) ordered time of transferring a message;

e) phone number or electronic address (when entering PPN via data communication networks) of the correspondent, who had ordered the message transmission;

f) sign of provisioning/canceling service for the subscriber.

2.3. When technical possibility is available at PSTN network and data communication networks, PPN SOSM HW/SW should provide identification of a correspondent number, who orders message transmission, and following transferring this number to CP.

2.4. Possibility to suspend provisioning communication services to certain PPN subscribers by a command from CP should be provided.

2.5. PPN SOSM HW/SW should provide transmission of information with the following data about PPN subscriber by request of CP operator:

- carrier wave of a paging receiver;
- radioidentification code (RiC);
- standard of PPN SOSM protocol;
- transmission rate;
- identity of character coding;

- codes of active supplementary services;
- sign of provisioning/canceling services for the PPN subscriber.

2.6. Two data communication channels should be provided: primary and back-up with possibility to switch over them automatically at the primary channel failure.

2.7 Reaction time of SOSM (from the moment of a message input at PPN till the moment of writing information about this event into PPN SOSM HW/SW transmission port) should be not more than 1 s.

3. SOSM operability check

3.1. During operating of SOSM hardware and software, functional check of its efficiency against the background of PPN equipment operation should be foreseen.

3.2. All the information about faults, which affect SOSM operation, should be transferred to CP.

4. Protecting information against unauthorized access

4.1. Possibility of unauthorized intervention in the process of PPN SOSM HW/SW and CP functioning and interaction should be eliminated.

4.2. Possibility of unauthorized access to data and software of PPN SOSM should be eliminated.

4.3. All the attempts of unauthorized access or intervention in PPN SOSM HW/SW functioning should be reported to CP.

5. Restart of SOSM

5.1. In the case of restarting software (SW) of PPN equipment corresponding message should be sent to CP.

5.2. Technological conditions of PPN SW restart should include PPN SOSM HW/SW restart procedures. At this no data about objects under monitoring are restored, they should be resent from CP.

5.3. Possibility of the restart from CP for software part, which provides PPN SOSM HW/SW operation should be foreseen.

6. Communications interface and protocol of information interchange between PPN SOSM HW/SW and CP

6.1. Communications interface between PPN SOSM HW/SW and CP

6.1.1. Communications between PPN SOSM HW/SW and CP should be fulfilled via data communications channel (DCC) for managing information and messages under monitoring.

6.1.2. Commands and messages interchange between PPN SOSM HW/SW and CP should be fulfilled in accordance with protocol X.25.

6.1.3. The link layer of the protocol should correspond ISO 7776, 1988 year, and provide operation according single-link procedure in the base mode (modulo 8) in the configuration DTE/DCE and DTE/DTE.

6.1.4. The package layer of the protocol should correspond ISO 8208, 1988 year, and provide configuration DTE/DCE, DTE/DTE in the fixed DTE role, and package numbering by modulo 8. A virtual connection and a permanent virtual channel should be provided.

6.1.5. The filled in form of the statement about correspondence with protocol implementation (PICS Proforma) according ISO/IES 8882-2 and 8882-3 should be furnished for supplied equipment.

6.1.6. Possibility of SOSM interaction with data communication equipment should be provided via interfaces in accordance with V.24, V.36 Recommendations.

Note.

Type and number of interfaces for transmission via channel DCC are defined by a contractor and agreed with a customer.

6.1.7. To check PPN SOSM operability, “life signals” should be used, which are transmitted between SOSM HW/SW equipment and CP.

6.1.8. On damage of information interchange channel equipment or a cable between CP and SOSM HW/SW, SOSM HW/SW should provide accumulating information to be send during time period, necessary to switch over PPN SOSM HW/SW to back-up communication channel to CP, and following transmission of this information to CP.

6.1.9. Facilities for implementing communications protocol in DCC should provide setting variable parameters of the second and third layers in accordance with ITU-T Recommendations X.25. Values for variable parameters can be specified at the stages of development of SOSM operating documentation and test run.

6.2. Information field format for packages of managing commands and messages transferred in data communication channels between PPN SOSM HW/SW and CP.

6.2.1. Information, which is transferred via data communication channels between SOSM HW/SW and CP, is classified into managing commands and information itself (messages).

6.2.1.1. The information field of managing command packages (hereinafter commands) transmitted from CP to PPN SOSM HW/SW should be of the following format:

Header
Command parameters

Header has the following format:

Byte number	**Field name**	**Field size (bytes)**
1	Preamble	1
2	SOSM number	1
3	Command code	1
4 5	Command length in bytes	2
6		

7 8 9 10 11 12 13	Password	8

1 byte - preamble. Used to identify protocol version. Equal to OAAH.
2 byte - SOSM number. Used to identify SOSM when managing several systems of operative-search measures from single CP.
3 byte - command code.
4 and 5 bytes - length of command parameters field in bytes.
6-13 bytes - password. Password consists of characters in ASCII code.

Note: Parameters format for every command see in i.6.2.2.

6.2.1.2. The information field of message packages (hereinafter messages) transmitted from PPN SOSM HW/SW to CP should be of the following format:

Header
Message contents

Header is of the following format:

Byte number	**Field name**	**Field size (bytes)**
1	Preamble	1
2	SOSM number	1
3	Message code	1
4 5	Message length in bytes	2

1 byte - preamble. Used to identify protocol version. Equal to OAAH.
2 byte - SOSM number. Used to identify SOSM when managing several systems of operative-search measures from single CP.
3 byte - message code.
4 and 5 bytes-length of message contents field in bytes.

Note: Message parameters are defined in i.6.2.3.

6.2.2. The following commands should be sent from CP to PPN SOSM HW/SW:

6.2.2.1. Start of SOSM

Command format:

Field	Size (bytes)
Header	13

Description: PPN SOSM HW/SW initializing is being fulfilled.
Command code: 01H
Parameters: none.

6.2.2.2. Stop of SOSM

Command format:

Field	Size (bytes)
Header	13

Description: removing data concerned PPN SOSM operation.
Command code: 02H
Parameters: none.

6.2.2.3. The password setting

Command format:

Field	Size (bytes)
Header	13
New password	8

Description: the command realizes a new password set up
Command code: 03H
Parameters: new password - 8 bytes.

Note: A new password takes effect after acknowledgment of the command accomplishment from SOSM side.

6.2.2.4. Selection of messages for PPN subscriber

Command format:

Field	Size (bytes)
Header	13
Subscriber's address length	1
Subscriber's address	N
Correspondent's address length	1

Correspondent's address	N
Type of monitoring	1
Priority	1

Description: Subscriber's number is sent from CP to PPN SOSM. According this number messages are selected to be sent to CP.
Command code: 04H
Parameters:

1. Subscriber's address length - 1 byte: size of the following field in bytes.
2. Subscriber's address - N bytes (the size is defined by the preceding field):
number in ASCII code, according this number transmission of a message to the subscriber is ordered.
3. Correspondent's address length - 1 byte: size of the following field in bytes.
4. Correspondent's address - N bytes (the size is defined by the preceding field):
number in ASCII code, from this number transmission of a message to the subscriber is ordered.
5. Type of monitoring - 1 byte:
1- full;
2- statistical.
6. Priority - 1 byte: a number from 0 to 255. It defines sequence of messages transmission from users on high traffic in SOSM - CP channel.
High priority messages are transmitted earlier.

Note:

1. Address field can contain group symbols: "?" and "*", which means one symbol or any symbol consequence accordingly. So value "12*" in the address field means all the addresses beginning from 12, and "*" - all the possible addresses.
2. The address field is obligatory.
3. The field of correspondent's address is optional. In the case of its lack, the field of correspondent's address length should contain 0.

6.2.2.5. Terminating selection of messages for PPN subscriber

Command format:

Field	Size (bytes)
Header	13
Subscriber's address length	1
Subscriber's address	N

Description: Subscriber's number is sent from CP to PPN SOSM. According this number selection of messages to be sent to CP is terminated.
Command code: 05H
Parameters: 1. Subscriber's address length - 1 byte:
size of the following field in bytes.
2. Subscriber's address - N bytes (the size is defined by the preceding field):
number in ASCII code, according this number transmission of a message to the subscriber is ordered.
Note: Address field can contain group symbols: "?" and "*".
See note 1 to item 6.2.2.5.

6.2.2.6. Interruption of furnishing services

Command format:

Field	Size (bytes)
Header	13
Subscriber's address length	1
Subscriber's address	N

Description: this command suspends communication services furnished by PPN for certain subscriber.
Command code: 06H
Parameters: 1. Subscriber's address length - 1 byte:
size of the following field in bytes.
2. Subscriber's address - N bytes (the size is defined by the preceding field):
number in ASCII code, according this number transmission of a message to the subscriber is ordered.
Note: Address field can contain group symbols: "?" and "*".
See note 1 to item 6.2.2.5.

6.2.2.7. Resuming of furnishing services

Command format:

Field	Size (bytes)
Header	13
Subscriber's address length	1
Subscriber's address	N

Description: this command resumes previously suspended from CP communication services, which were furnished by PPN for certain subscriber.
Command code: 07H
Parameters: 1. Subscriber's address length - 1 byte:
size of the following field in bytes.
2. Subscriber's address - N bytes (the size is defined by the preceding field):
number in ASCII code, according this number transmission of a message to the subscriber is ordered.
Note: Address field can contain group symbols: "?" and "*".
See note 1 to item 6.2.2.5.

Request for transmission of correspondence table for PPN subscriber numbers

Command format:

Field	Size (bytes)
Header	13
Subscriber's address length	1
Subscriber's address	N

Description: request for information about correspondence of PPN subscriber numbers is fulfilled.
Command code: 08H

Parameters: 1. Subscriber's address length - 1 byte:
size of the following field in bytes.
2. Subscriber's address - N bytes (the size is defined by the preceding field):
number in ASCII code, according this number transmission of a message to the subscriber is ordered.

Note: Address field can contain group symbols: "?" and "*".
See note 1 to item 6.2.2.5.

6.2.3. The following messages should be transmitted from PPN SOSM HW/SW to CP:

6.2.3.1. Result of command execution.

Command format:

Field	Size (bytes)
Header	5
Command code	1
Result	1

Description: transmitted as response to commands from CP.
Message code: 80H
Message contents:
1. Command code - 1 byte:
code of command sent from CP, which execution is acknowledged.
2. Result - 1 byte:
result of the command execution. One of the following results is possible:
0 - successful command execution.
1 - 0AH - defined by a customer at development stage.
10H - unknown command code.
11H - invalid command format.
12H - unexpected command.
13H - unknown subscriber.
14H - 20H - defined by a customer at development stage.
21H - 0FFH - defined by a contractor and agreed with a certification centre at the stage of TT&C agreement in respect of SOSM.

6.2.3.2. Failure of PPN

Message format:

Field	Size (bytes)
Header	5
Failure type	1
Failure code	1

Description: the message is sent at equipment wreck, which affects SOSM operation or maintenance of a paging terminal.
Message code: 81H
Message contents:
Failure type - 1 byte:
01H - causes distortion (loss) of SOSM internal data and necessitates to restore SOSM tables at the

exchange from CP side.

02H - doesn't cause distortion (loss) of SOSM internal data, but necessitates CP operator intervention.

03H - doesn't cause loss of SOSM internal data and necessitates no CP operator intervention.

Failure code - 1 byte. Failure codes should be supplied by a company-manufacturer of PPN SOSM HW/SW and agreed with a certification centre at the stage of TT&C agreement in respect of SOSM.

6.2.3.3. Failure of PPN SOSM HW/SW

Message format:

Field	Size (bytes)
Header	5

Description: the message is sent at failure of PPN SOSM.
Message code: 82H

Message contents:

Failure type - 1 byte:

01H - causes distortion (loss) of SOSM internal data and necessitates to restore SOSM tables at the exchange from CP side.

02H - doesn't cause distortion (loss) of SOSM internal data, but necessitates CP operator intervention.

03H - doesn't cause loss of SOSM internal data and necessitates no CP operator intervention.

Failure code - 1 byte. Failure codes should be supplied by a company-producer of PPN SOSM HW/SW and agreed with a certification centre at the stage of TT&C agreement in respect of SOSM.

6.2.3.4. Restart of PPN SW

Message format:

Field	Size (bytes)
Header	5

Description: the message is sent in the case of PPN SW restart.
Message code: 83H

6.2.3.5. Unauthorized access to software of PPN SOSM

Message format:

Field	Size (bytes)
Header	5
Access code	1
Date of current month	1
Hours	1
Minutes	1
Seconds	1

Description: the message is sent at detection of unauthorized access to software and data of PPN SOSM.
Message code: 84H
Message contents:

Access code - 1 byte:

01H - access out of a forbidden port.

02H - access with false password.

03H - reading/writing of SOSM internal data.

04H - reassignment of communications port to CP.
05H-0FFH - defined by a contractor and agreed with a certification centre at the stage of TT&C agreement in respect of SOSM.
Date of the current month, hours, minutes, seconds - by 1 byte: define time of access attempt.

6.2.3.6. Life signals

Message format:

Field	Size (bytes)
Header	5

Description: the message is sent when no information is transmitted out of PPN SOSM. Intervals between "life signals" are defined by a contractor and agreed with a customer at the stage of TT&C agreement in respect of SOSM.
Message code: 0FFH.

6.2.3.7. Transmission of PPN subscriber own messages to CP

Message format:

Field	Size (bytes)
Header	5
Subscriber's address length	1
Subscriber's address	N
Correspondent's address length	1
Correspondent's address	N
Additional information length	1
Additional information	N
Subscriber's message length	2
Subscriber's message	N

Description: Subscriber's messages are sent to CP.
Message code: 085H
Message contents:

1. Subscriber's address length - 1 byte:
size of the following field in bytes.
2. Subscriber's address - N bytes (the size is defined by the preceding field):
number in ASCII code, according this number transmission of a message to the subscriber is ordered.
3. Correspondent's address length - 1 byte:
size of the following field in bytes.
4. Correspondent's address - N bytes (the size is defined by the preceding field):
phone number in ASCII code, from this number transmission of a message to the subscriber is ordered.
5. Additional information length - 1 byte:
size of the following field in bytes. It should be equal 17.
6. Additional information - 17 bytes.

Field	Size (bytes)
$T_{reg.}$	4
$T_{ord.}$	8
Roam	3
Supplementary services	2

- $T_{reg.}$ - time of message registration at PPN (HH-MM);
- $T_{ord.}$ - ordered time for transmission of the message (MM DD HH MM);

- Roam - code of a city (toll code);
- Supplementary services - codes of activated supplementary services and sign of provisioning/canceling services for PPN subscriber.

7. Subscriber's message length - 2 bytes: size of the following field in bytes.
8. Subscriber's message - N bytes (size is defined by the preceding field).

Note: Maximum length of a message should be defined by allowed length, which is used for certain PPN.

6.2.3.8. Transmitting a table of correspondence to CP

Message format:

Field	Size (bytes)
Header	5
Subscriber's address length	1
Subscriber's address	N
RIC	20
Frequency	10
Rate	10
ISC	10
Supplementary services	2

Description: by the command a table of correspondence is transmitted.
Message code: 085H.
Message contents:

1. Subscriber's address length - 1 byte:
size of the following field in bytes.
2. Subscriber's address - N bytes (size is defined by preceding field):
number in ASCII code, according this number transmission of a message to the subscriber is ordered.
3. RIC - 20 bytes:
radioidentity code for paging receiver.
4. Frequency - 10 bytes:
carrier frequency of paging receiver operation (KHz);
5. Rate - 10 bytes:
transmission rate.
6. ISC - 10 bytes:
identity of symbol coding.
7. Supplementary services - 10 bytes:
codes of activated supplementary services and signs of provisioning/canceling services for PPN subscriber. Defined by a contractor and agreed with a customer at the stage development.