



Federal Space Agency



GNSS Applications

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Satellite System Technologies in Sub-Saharan Africa,
26 - 30 June 2006, Lusaka, Zambia





State Policy on GNSS applications development

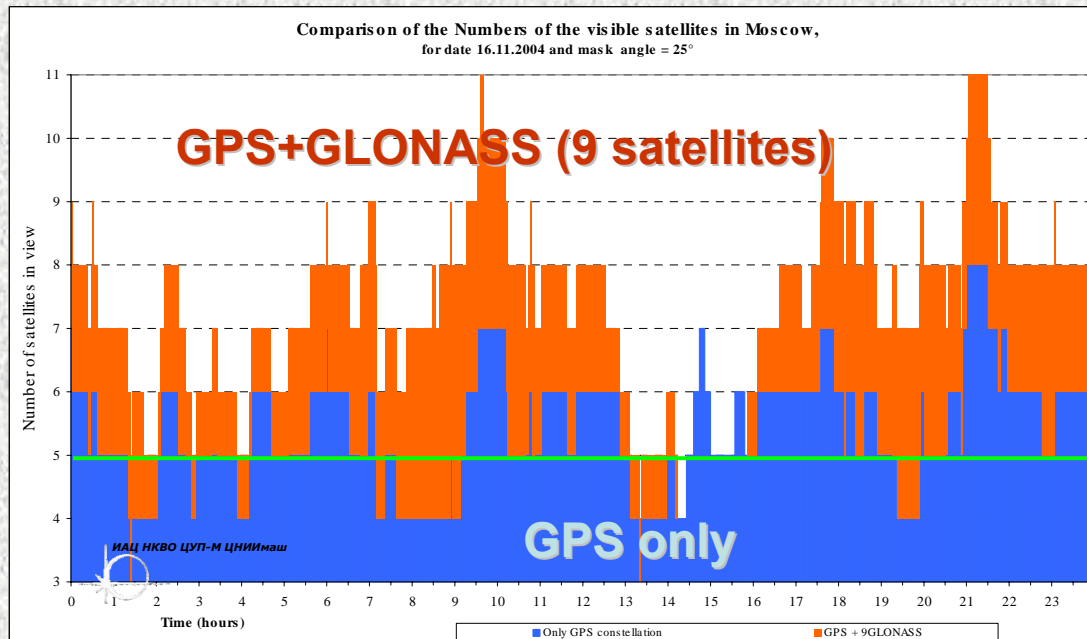


- ❑ **No direct user fees for civil GLONASS service**
- ❑ **Open access to the GLONASS civil signal structure for user equipment manufacture, applications development and value-added services**
- ❑ **Combine GLONASS/GPS receivers development and manufacture**
- ❑ **Governmental Decision at June 9, 2005 , № 365**
 - ↪ **Equipment of spacecrafts (and launchers), transport vehicles, geodesy means by the GLONASS receivers or combined GLONASS/GPS receivers (not only GPS)**
- ❑ **Presidential Directive issued at April 19, 2006**
 - ↪ **To ensure the navigation equipment mass production: encourage the industry in the manufacture renovation**
 - ↪ **Mass market development**
- ❑ **Pilot projects implementation**
 - ↪ **Different areas of economy**



Real-Time Precision Navigation for construction and geodesy (GDOP < 5, угол места 25°)

Number of satellite visible for Moscow region during a day



- ❑ **Continuous navigation during a day:**
 - ↪ **With GPS only 83.1%**
 - ↪ **With GPS + GLONASS (9 satellites) 100%**

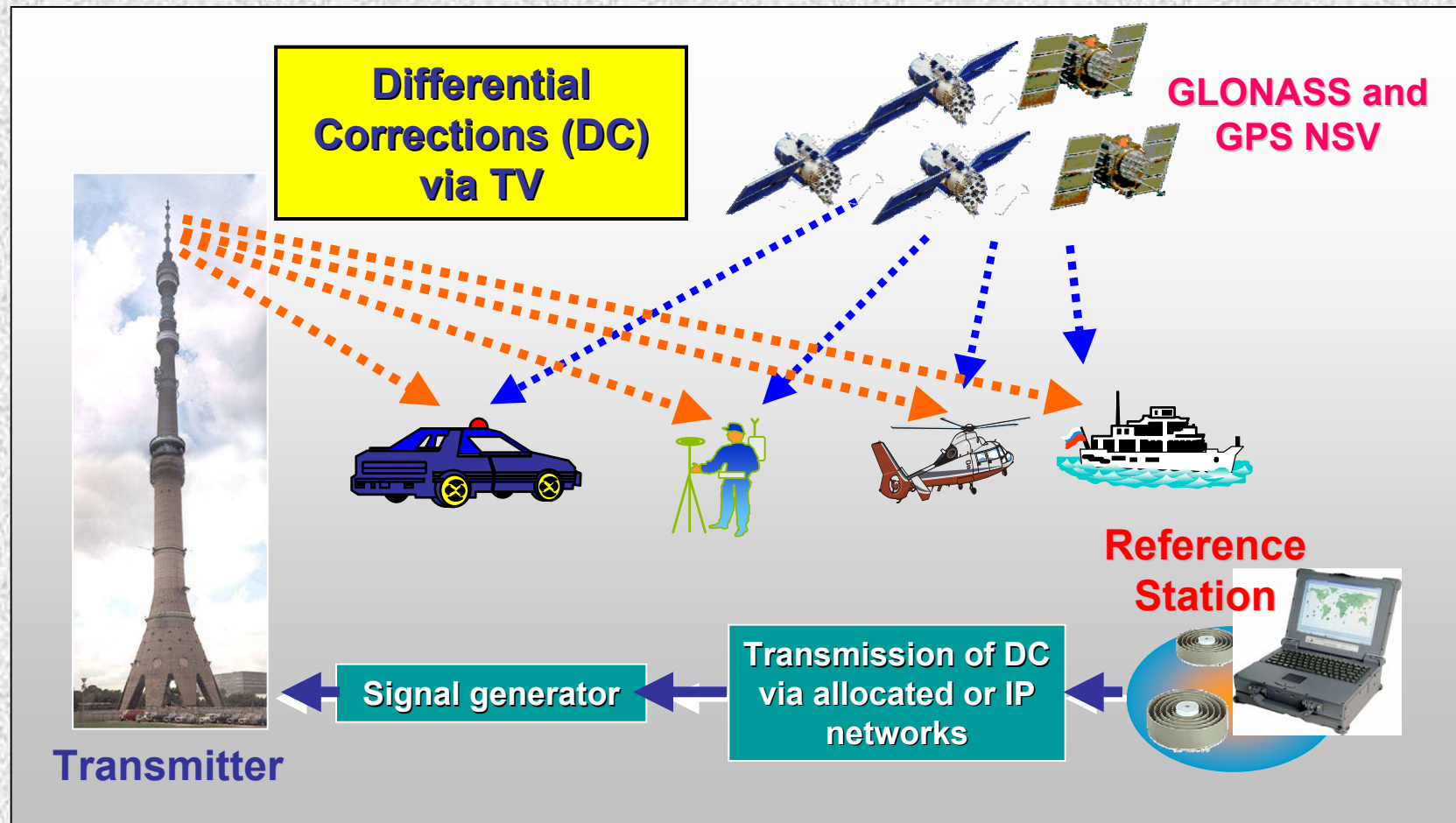


Implementation directions



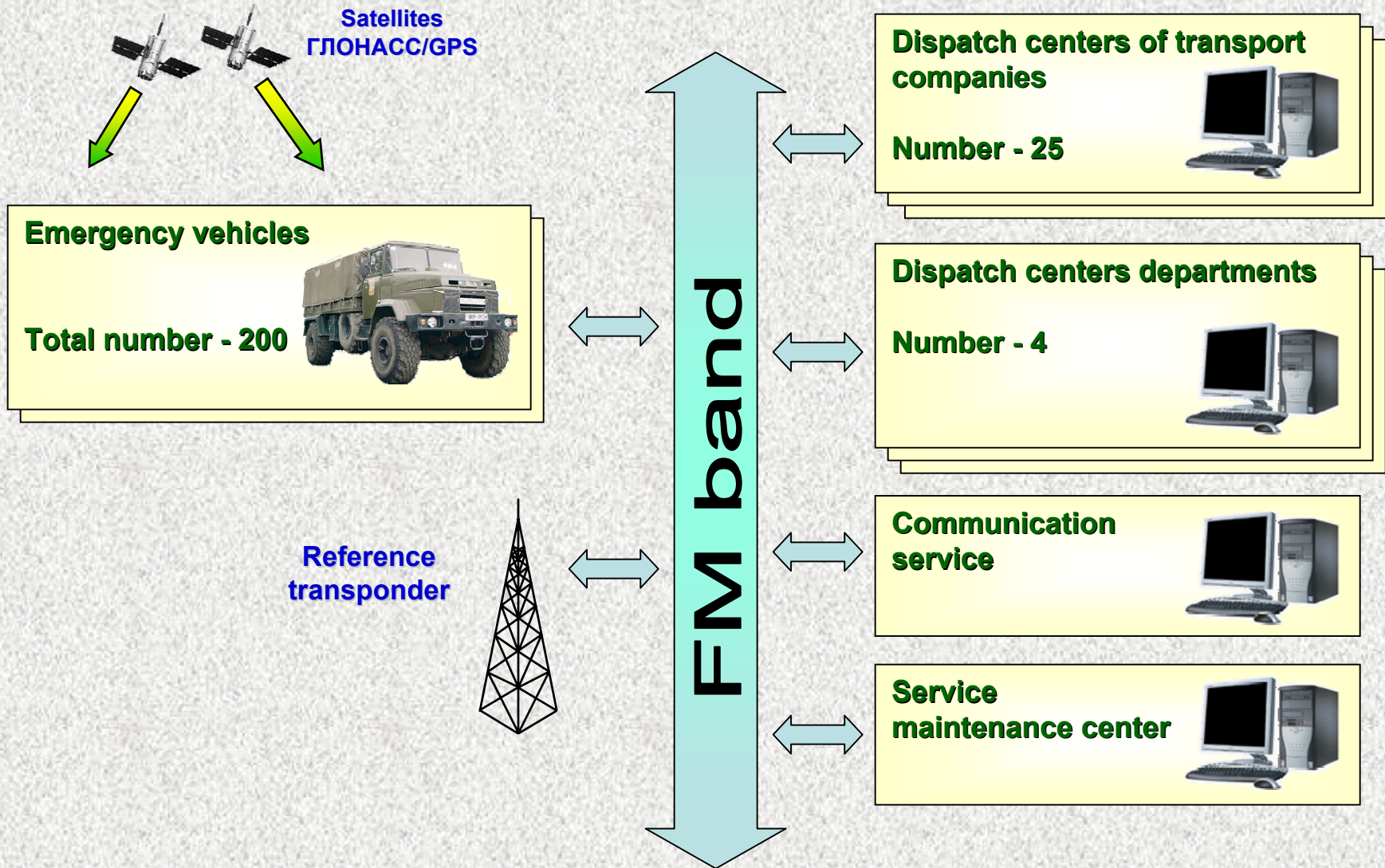
- Local differential augmentations**
- Emergency city transport management**
- Ecology monitoring**
- Long distance transportation control**
- Automated geodesic system of land cadastre and real estate registration**
- User equipment**





Task of the System:

to provide improved position accuracy within a certain region by means of transmitting corrections via TV-signal





Emergency city transport monitoring: user interface (2/2)



ИНС-Контроль [s] 24.05.2005 10:02:03

Окна Транспорт Анализ Настройка О программе Выход

СЕВЕРО-ВОСТОЧНЫЙ АДМ.ОКРУГ

Статус	Радиообмен	Категория	Информация	Код
●●	205	10 а/п	057, е023СР Икарус	205
●●	198	10 а/п	042, а901ОС90	198
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●●	194	10:02:00	2 тр/п ... БД, х316СР77 Газель	194
●●	193	10:02:00	2 тр/п ... Тех1, м152НХ77 Газель	193
●●	191	10:01:59	2 тр/п ... Тех2, м151НХ77 Газель	191
●●	187	10:01:58	13 а/п ... 4, 068, т904АС99 Газель	187
●●	190	10:01:58	18 а/п ... 017, о847АМ, Икарус	190
●●	185	10:01:57	13 а/п ... 5, 069, т905АС97 Газель	185
●●	183	10:01:56	13 а/п ... диспетчер, 112-8492	183
●●	180	10:01:55	11 а/п ... диспетчер, 458-9211 ?	180
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●●	178	10:01:54	Филевский... диспетчер 148-1280	178
●●	176	10:01:53	4 а/п ... диспетчер, 207-0596	176
...	...	...	123, м123РО, ИЖ	175
...	...	...	диспетчер, 491-1370	167
...	...	...	926 Газель, а743НН97	168

Статистика в разрезе по датам

С 01.05.2005 по 30.05.2005 Обновить Подробнее Печать

Дата	Запросов	Ответов	%	Ответов с навигацией	%	Запросов ГС	Сеансов
01.05.2005	159803	84919	53	51079	60	57	16
02.05.2005	164022	75952	46	38295	50	41	9
03.05.2005	163400	80839	49	42230	52	52	12
04.05.2005	159439	80881	51	44737	55	73	21
05.05.2005	161393	75536	47	40441	54	52	13
06.05.2005	111048	58381	53	31950	55	54	12
11.05.2005	111520	60927	55	33885	56	59	17
12.05.2005	159399	82949	52	42228	51	69	19
13.05.2005	129272	65080	50	31751	49	46	15
14.05.2005	158994	83675	53	40511	48	66	16
15.05.2005	159201	80346	50	37983	47	63	14

Позывной/№ 176

Радиообмен 24.05.2005 10:01:53

Навигация

Категория 4 а/п

Информация диспетчер, 207-0596

Контроллер 176

Опрос Да Интервал 600

Запрос ГС Нет

Ид. в БД 223

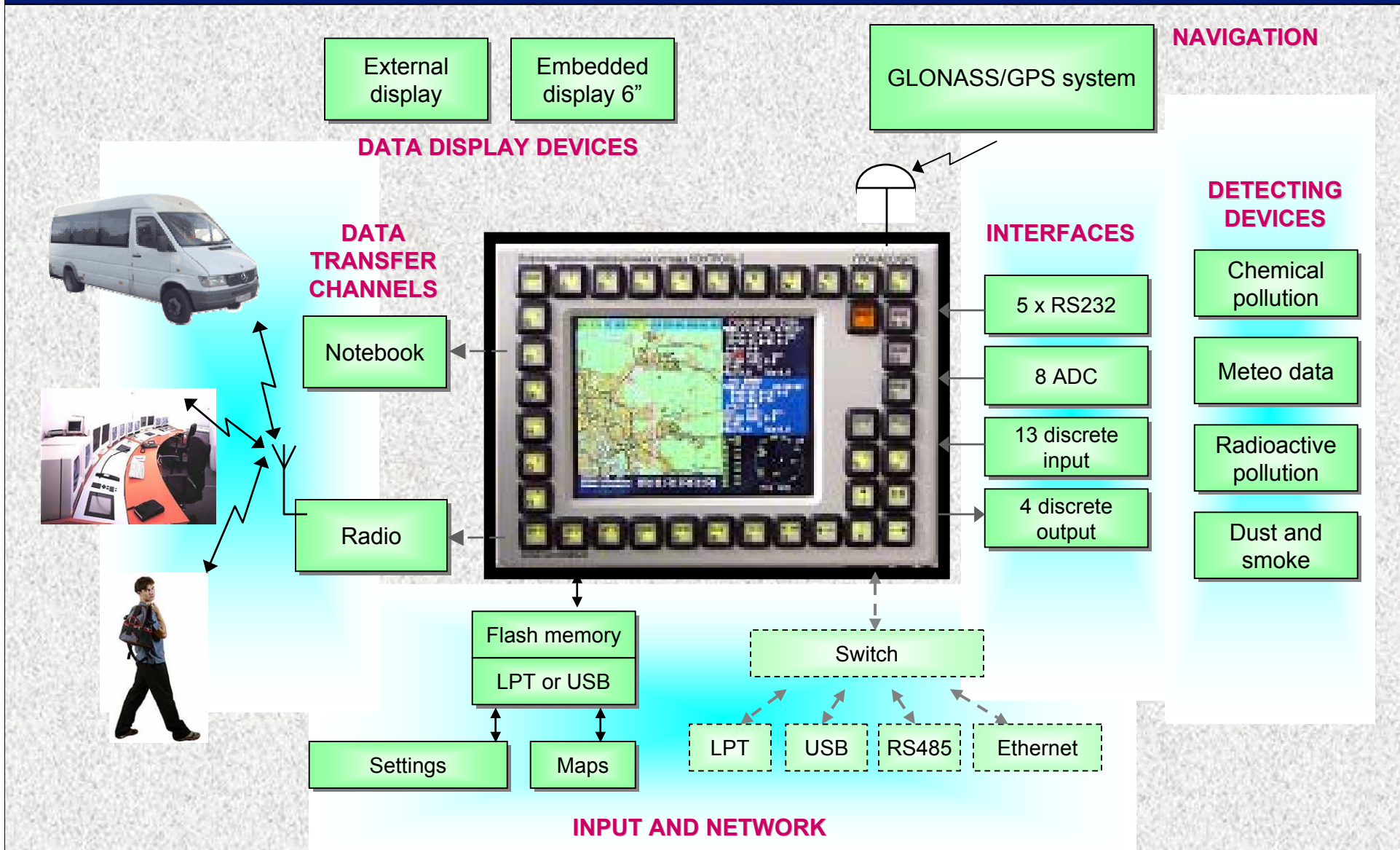
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Канал Дисп. ТС Пролс

3 2

Выбрано ТС: 157

27.9 км 176





Information & navigation system for ecology monitoring (2/2)



СИСТЕМА КОНТРОЛЯ ЭКОЛОГИЧЕСКОЙ ОБСТАНОВКИ (НПП 'ТЕРМОТЕХ')

Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 Ins Del Tab ^ >
 ? Вызов Поиск След Зап. МПС Обнов. >> Меню Выход М:1 1:М < v

17/04/96 М.Войковская Скор.: 4.70км/ч РАДОН RCA-007
 10:29:26 Ленинградское ш. Путь: 38.0км Опер.Пономарев

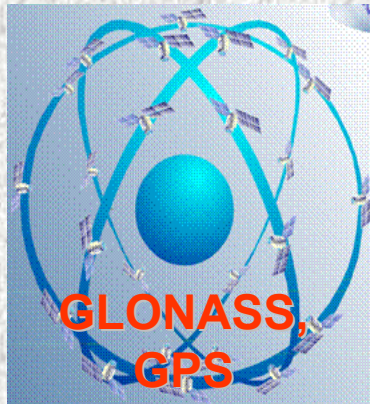
Имп.мкр/ч	0.00
Общий мкр/ч *1	8.95
Cs137 %	63.16
K40 %	17.54
Ra226 %	19.30
Th222 %	3.51

8 9 10
11

F9 Esc Up Dn ^ v

Эфир занят





Telematics module determines on the satellites navigational signals:

- position;
- velocity;
- direction.

Also determines the status of sensors.

Sensor
S



Telematics
module

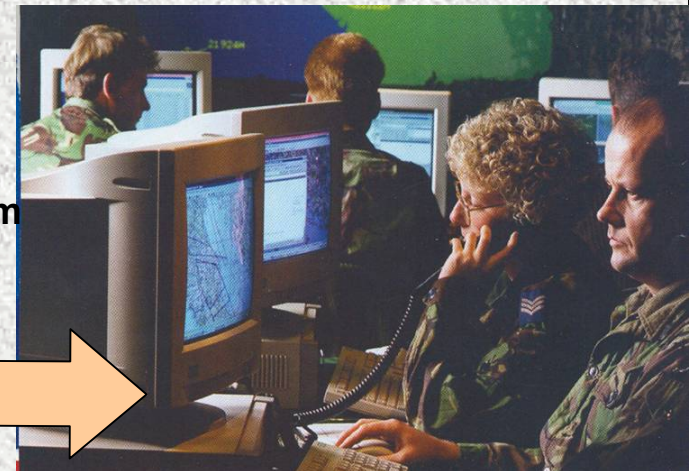


Automatic data transfer from
telematics module

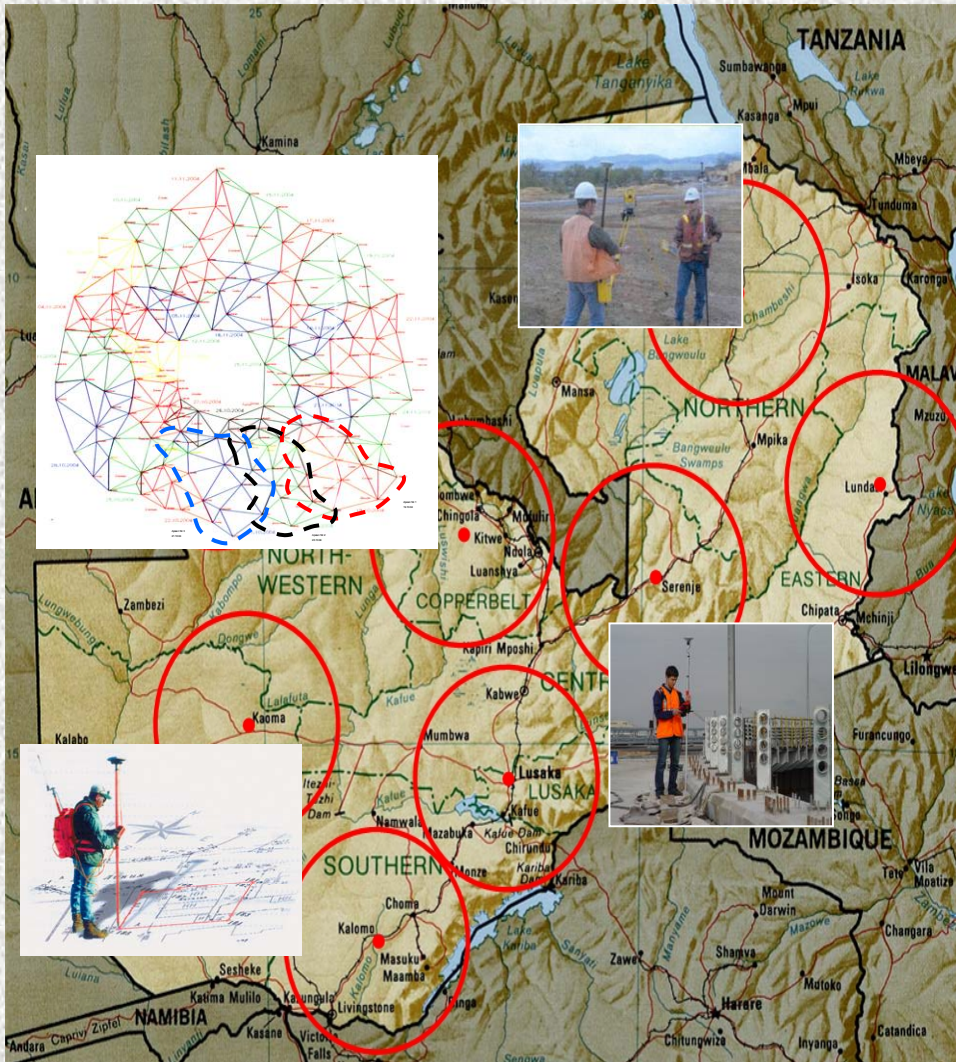


Communication links
Ultra-short Waves, GSM/GPRS,
Inmarsat, Global Star etc.

Control center



- ❑ **Control Center determines the following information based on data received from telematics module installed on transport vehicle**
 - ↪ **transport vehicle location**
 - ↪ **transport vehicle deviation from the waybill route**
 - ↪ **compliance of mileage indication on speedometer and the passed route**
 - ↪ **speed mode of transport vehicle along the route**
 - ↪ **stand-idle time**
 - ↪ **transportable loads status**
 - ↪ **status of transport vehicles use**
 - ↪ **etc.**



Main tasks:

- land-surveying, land lots lining etc.
- cadastre plans and maps development;
- coordinates mapping for space and air photography
- WGS84 transfer to local reference frames

High efficiency of satellite navigation use:

- Speeding-up work execution in 2-3 times
- Expenses reduction on works execution in 2 times
- "Land payments" increase on 150%



Samples of the GLONASS/GPS equipment of Russian production (1/2)



Telematics modules

Geodesic satellite equipment



Automatic differential corrections station



GNSS Integrity monitoring station



Maritime differential corrections station



Differential corrections receiver



Portable receiver



Samples of the GLONASS/GPS equipment of Russian production (2/2)



Maritime equipment



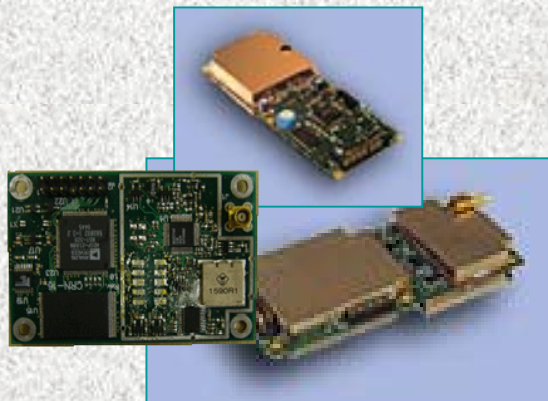
Equipment for launch vehicles, boosters



Portable equipment



Geodesic equipment



Receiving equipment



Telematics modules



Summary



- ❑ **GLONASS is a component of global utility GNSS**
- ❑ **GNSS applications are introduced into different domains in Russia**
- ❑ **Governmental support of domestic development and manufacture of the GNSS user equipment**
- ❑ **Pilot projects are envisaged in the Federal GLONASS Program**
- ❑ **GNSS techniques with GLONASS use benefit users already now in combination with GPS**
 - ↪ **Better robustness**
 - ↪ **Better geometry**





GNSS Applications



Thank you much for you attention!

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