



PS-ZOT Country of origin: Czechoslovakia

DATA SUMMARY

Organisation: Czechoslovak Army.
Design/Manufacturer: VOP 014 (Vojenský Opravárenský Podnik 014, Uherský Brod).
Year of Introduction: 1988.
Purpose: Electronic surveillance.
Frequency coverage: Three groups of 3 channels 46.5 to 46.9MHz, spaced 50kHz.
Receiver: (M-Monitor unit).
Circuit features: FM. 3 selectable channels. Sensitivity better than 2uV.
Transmitter: (AČ and SČ Sensor units).
RF output: 1W. F3E modulation; 625Bd transmission speed. 10 selectable address numbers.
Aerial: Short and long vertical rod aerial, wire aerial.
Range: Vertical rod: short 1km/long 3km; wire aerial 5km.
Power Supply: All units were powered by RF-10 type 6V 4Ah rechargeable batteries.
Dimensions (mm) and weight without battery (g) :

	height	length	width	weight
Monitor unit M:	54	222	200	1610
Acoustic Sensor unit AČ:	68	222	200	1480
Seismic Sensor unit SČ:	54	222	200	1440
Line Terminal unit:	54	97	195	850

Working temperature range: -30 ° C to + 50 ° C

REMARKS

PS-ZOT (Poľný Systém- Zisťovania Osôb a Techniky -translated in to English- ‘field system for detection of persons and technology’) was developed for electronic surveillance of buildings, field camps, roads, observation points, temporary objects etc. in extremes of weather conditions, day and night.
 The system worked on the principle of seismic waves. A seismic sensor could detect the motion of a person up to about 10m, a group of people up to about 15m, and the movement of vehicles up to at least 50m. This information was encoded into digital data and sent to a monitor unit.
 A basic PS-ZOT system comprised Sensor units via a one-way VHF FM radio link or a field telephone line connected to a Monitor unit. A combination of both radio link and field telephone lines was not provided.
 There were two types of sensor units: a standard Seismic Sensor unit (SČ) and an Acoustic Sensor unit (AČ). Both had a separate seismic sensor; the Acoustic Sensor unit had an additional acoustic sensor (microphone). For concealment the sensor units were packed in a canvas cover and completely buried 20cm into the ground.
 The whole system was modular and allowed the setup of various configurations of sensors, monitors and ways of transmission.
 The radio link operated in the 46.5 to 46.9MHz band, with encrypted digital signals. The range with a wire aerial was up to 5km, a rod aerial up to 3km, and a maximum of 500m for a field telephone line.

References:

All information and photographs for this chapter courtesy Jozef Burda, OM0ASB, Slovakia. Without his cooperation this chapter would not have been possible.
 See his website: www.sptech.sk
 - http://www.military.cz/army_cr/vystroj/pozorovaci.htm
 - PS-ZOT - Field system for detecting persons and technology, Description and use, Operating instructions, 1988.

PS-ZOT was introduced in 1988. A modernized system with infrared sensors (PIR) called PS-ZOT SAFIR, and a system of detectors LADOG were fielded around 1995. Another development was the SAMBA system operating on the same principle; this project was abandoned due to lack of financial support.

Based on information and known serial numbers, it is believed that only 30 complete PS-ZOT sets were produced. The PS-ZOT used the enclosure, control knobs, rechargeable batteries and chargers also used with the RF-10 radio.



Monitor unit (M)



Line Terminal unit (LS)



Acoustic Sensor unit (AČ)



Seismic Sensor unit (SČ)

The **Monitor unit (M)** could monitor up to ten Sensor units. Digital information from a Sensor unit, - the type of alarm- was displayed on a LED indicator.

The types of alarm were as follows:

SO- group of persons	D1- additional sensor
T- technique (vehicle)	D2- additional sensor
O- person	AD- address of the sensor

A Monitor unit had 10 'channels' (addresses), which meant that it could receive and evaluate up to 10 Sensor units, providing they were from the same group, either A, B, or C, and set to the same radio channel.

In addition to a radio link, the Monitor unit could be connected to Line Terminal unit (LS), which connected up to 5 field telephone lines (max. 500 m) to Sensor units.

Each of the 10 sensor 'channels' were displayed on 6 LEDs. The alarm remained permanently displayed until reset to clear. Acoustic transmission from an Acoustic Monitor unit could be listened to with headphones for the duration of the alarm + 15 seconds. Transmission of voice was on a different channel f₀.

Low battery voltage was indicated by a LED.

A **Line Terminal unit (LS)** Linková Svorkovnice) was used as an interface to connect up to 5 different Sensor units to a Monitor Unit by field telephone lines up to a length of 500m.

An **Acoustic Sensor unit (AČ)** Akustické Čidlo) contained an external seismic sensor and a sensitive rod microphone, which allowed the transmission of nearby sound to the Monitor unit thus listening to what was happening around the device in the event of an alarm. Apart from a switch to set the frequency channel (1-3), a second channel switch was for selecting a different voice channel f₀.

The unit could be used without a microphone connected. The Acoustic Sensor unit could be buried, protruding above the ground were just the aerial, microphone and seismic sensor.

It was functionally similar to the Seismic Sensor unit (SČ) which had not the acoustic feature.

A **Seismic Sensor unit (SČ)** (Seizmické Čidlo) had only an external seismic sensor but was otherwise functionally similar to the Acoustic Sensor unit.

PS-ZOT system components

A PS-ZOT system comprised three groups:
 Group A marked with red letters, Group B with white letters and
 Group C with blue letters. (M, LS, AČ, SČ on the front panel).

Group A:

- 1x M-Monitor unit
- 1x AČ- Acoustic sensor unit
- 1x SČ- Seismic sensor unit
- Assigned radio frequencies:
- Channel 1 46.500MHz
- Channel 2 46.650MHz
- Channel 3 46.800MHz

Group B:

- 1x M-Monitor unit
- 3x AČ- Acoustic sensor units
- 3x SČ- Seismic sensor units
- Assigned radio frequencies:
- Channel 1 46.550MHz
- Channel 2 46.700MHz
- Channel 3 46.850MHz

Group C:

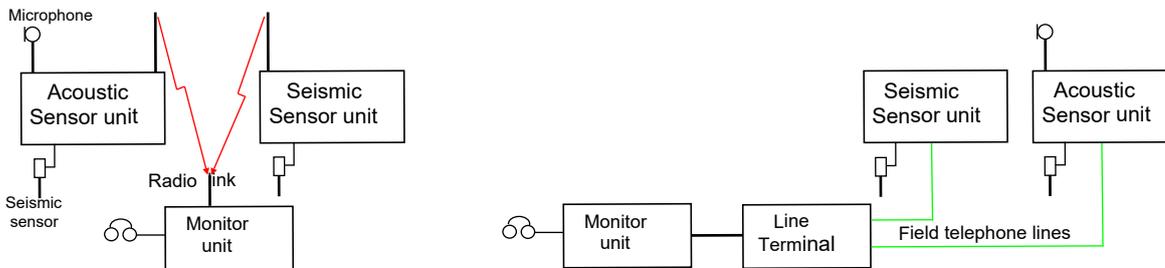
- 1x M-Monitor unit
- 3x AČ- Acoustic sensor units
- 3x SČ- Seismic sensor units
- Assigned radio frequencies:
- Channel 1 46.600MHz
- Channel 2 46.750MHz
- Channel 3 46.900MHz

In total:

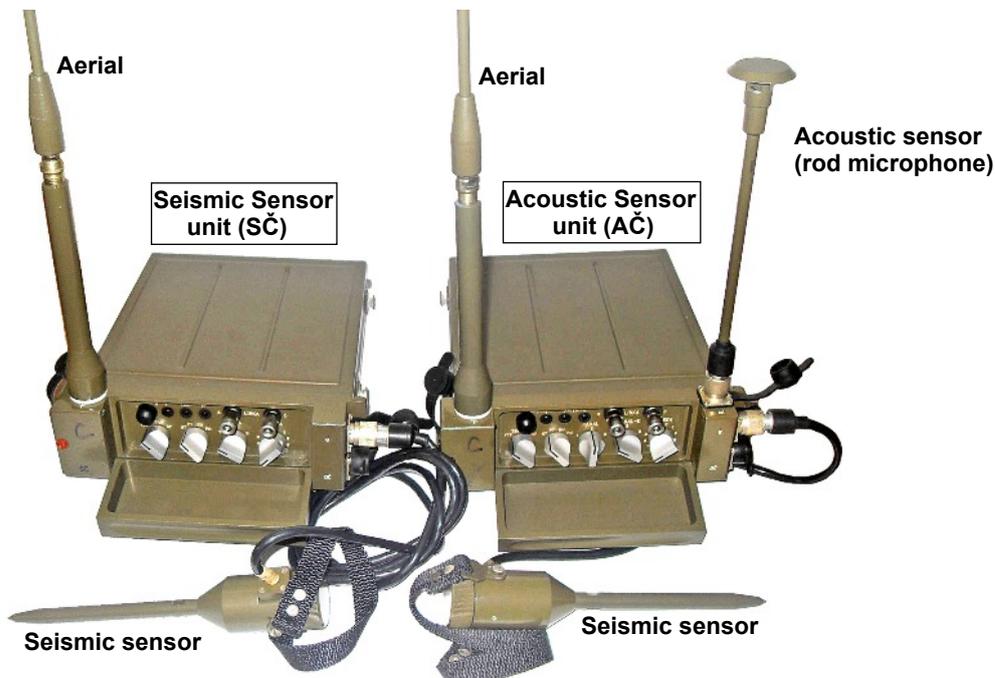
- 3x Monitor units
- 7x AČ Acoustic sensor units
- 7x SČ Seismic sensor units

In addition:

- 1x LS - Line terminal unit
- 1x Quick charger N2 RF-10 battery
- 1x Conservator K-30 from RF-10
- 1x RF-10 Battery charger (D-E box)
- 34 RF-10 batteries



Simplified block diagrams of typical PS-ZOT configurations via a radio link (left) and via field telephone lines (right). A combination of both radio link and field telephone lines was not possible.



Connecting a Seismic Sensor unit (left) and an Acoustic Sensor unit (right). Both units were principally similar, with the exception that a sensitive microphone on top of a rod could be connected to the Acoustic Sensor unit. During the alarm this unit transmits any nearby sounds to the monitor, allowing it to listen to possible intruders. As this was transmitted in standard voice FM, a RF-10 radio could also be used to receive an acoustic transmission.

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