Maxx Map System – Technical Features

1. Architecture

The Maxx Map AVL System consist of the next elements:

- Server: This element carries the communications out with the mobile devices, and keeps a record of the geographical positions and sound recordings.
- Client: It visualizes geographically the mobile devices on the digital map and recordes the background sound
- Mobile devices: They are located in the vehicle which you want to know the geographical location and background sound.

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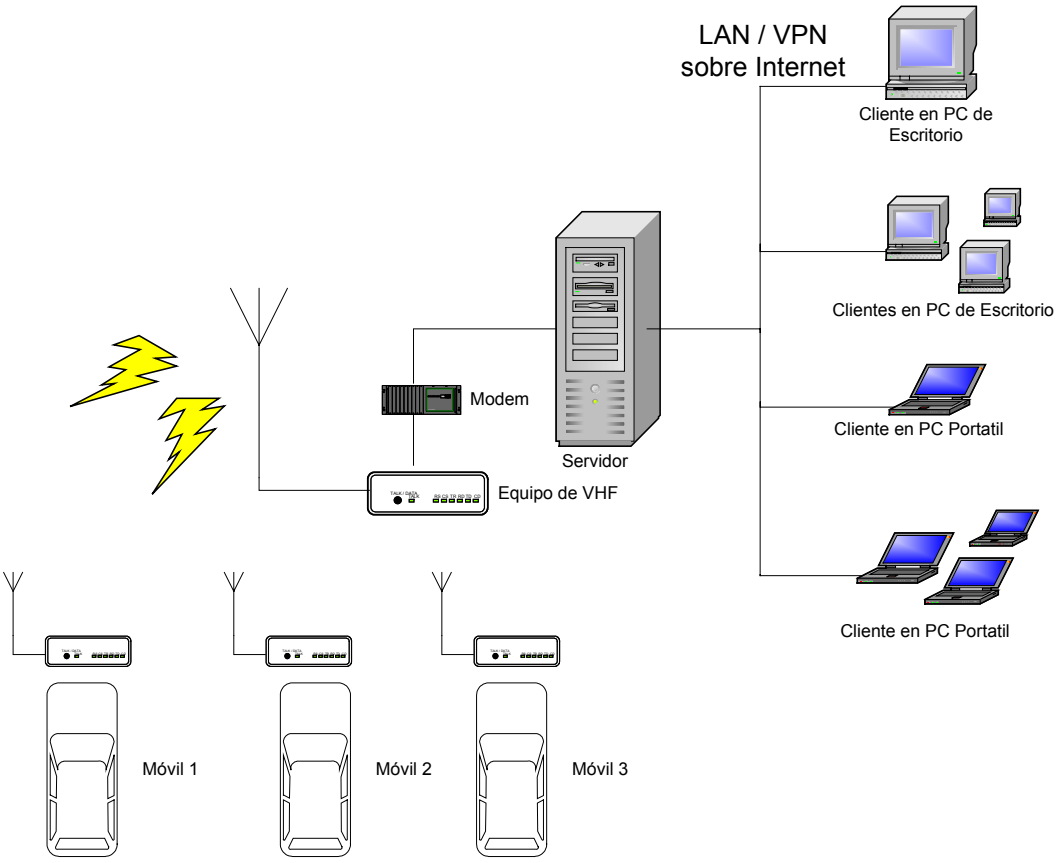
These elements are related to each other according to the next diagram:



The clients located in the work stations or in laptops run the client´s software of the system, and they connect to the server through a LAN net or a VPN (Virtual Private Network) in Internet, to ask a mobile device´s location or listen its background sound.

The server is engaged with the mobile devices through a modem connected to a VHF equipment, which carries the link out between the server and the client, requesting the location data and background sound, according to the client´s request.

The mobile device receives the requests from the server through the VHF link, and determinates it coordinates through its incorporated GPS system. The coordinates are trasmitted to the server.

The location data is received by the server and it is validated through the CHECKSUM technic, as prevention from incorrect data because of noises in the radio link. In case of incorrect data, this information is automatically requested again.

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The validated location data is sent to the client, which visualizes it on the digital map corresponding to the locating coordinates sent by the mobile device. About the background sound, its graphic is showned in real time.

This Client – Server architecture is totally upgradeable, allows to carry the system out from a single computer or multiple servers and clients connected to each other through a VPN on Internet, permitting to know the mobile devices´ location in remote way, through the Internet.

2. Server

The server contains hardware and software elements, which allows to centralize the data from the mobile devices, and send it to those clients that asked for it. The hardware receives the mobile devices´ signal and extracts the positioning data and background sound. The server´s software manages and commands the hardware to obtain the positioning data from the mobile devices, and it also replies the client´s requests and keeps the corresponding record.

2.1 Hardware

The hardware consist of a modem connected to a VHF equipment, which receives the mobile devices´ signals and send them to the computer that runs the server´s software.

2.1.1 Features

These are the main features:

- Data transmission through voice channel
- PSK or FSK modulation of positioning data.
- Connection to audio channel
- Connection to data channel through RS-232 Interface

2.1.2. Requirements

The hardware of the server system has the following requirements:

- 220Vdc – 50 Hz feed
- Data channel connection through DB-9 connector
- Voice channel connection through stereo mini-plug

2.1.3. Interface to ther systems

The hardware´s features allows to use it with any VHF equipment that arranges connection to the voice channel, because this data is transmitted in that channel. The commands and data are also transmitted through a RS-232 Interface, so any system that works with this interface can send commands and

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receive data from the hardware. The background sound is available in a mini-plug connector, so a recorder with microphone input can be connected to it.

2.2. Software

The server´s software consist of an application that sends the commands and receives the data from hardware, and It also carries the background sound recording out.

2.2.1. Features

The software´s features are the following:

- Pentium III computer, 256 Mb RAM and 20 Gb hard disk
- DB-9 connectors (data channels) and mini-plug (audio channel)
- Microsoft Windows 2000 or higher
- Ethernet 10Base-T net connection or equivalent for LAN implementation.

2.2.3 Interface to other systems

Due the link to the clients is made through LAN, the interface to other systems is carried out in the same way.

3. Client

The client´s function is request to the server the positioning data asked by the operator, and show it on the corresponding digital map with the background sound (if asked), and the “out of route” system with assigned stops control.

3.1 Software

The server´s software application has the necessary menues and commands to carry the connection to the server out and request the positioning data and background audio from the mobile device requested.

3.1.1 Features

These are the client´s features:

- Window of positioning visualization, with extension, reduction and movement commands
- Status bar
- Function indicators of the several commands
- Menues for connection to server, connection to a certain mobile device, positioning request and background audio.
- User´s Interface developed according to the Microsoft interface standards for Windows operating system.

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3.1.2. Requirements

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- Microsoft Windows 2000 or higher
- Ethernet 10Base-T net connection or equivalent for LAN implementation.

3.1.3. Interface to other systems

Just like the server´s software, the link is carried out through LAN, so the interface to other systems is made in the same way.

4. Mobile device

The mobile device is located in the vehicles of which is desired to know its geographical location, and/or background sound. It consists of a control board with GPS system incorporated, VHF equipment for the link and independent batteries of those of the vechicle.

4.1 Features

- Dual feed from the vehicle battery or own feed.
- Small size
- GPS system incorporated
- Circuit made with technology of superficial assembly
- 6 hours autonomy, without connection to the vehicle battery

4.2 Requirements

- Location in places with temperatures in the rank 0-50 ºC

4.3 Interface to other systems

The mobile device interface is carried out through the VHF equipment, so it connection to other systems can be made in the same way.

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