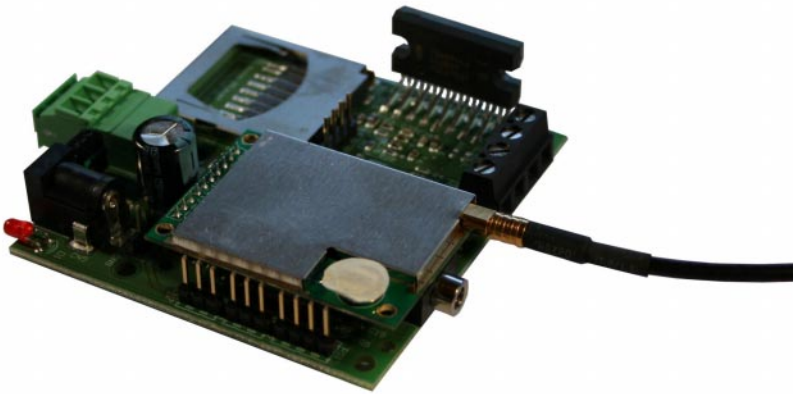
Audio Line
Interactive Digital

GeoPlayer

Audio Player
MP3 & WAV
with GPS function



MANUAL

Table of content

ID-AL products are exclusively manufactured by Waves System
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WARNING: DO NOT EXPOSE TO MOISTURE AND DUST !
Unplug the power cord before any intervention !
FOR YOUR SAFETY, PLEASE READ CAREFULLY THIS OPERATION MANUAL
BEFORE USING YOUR PLAYER

A. SAFETY INSTRUCTIONS

A.1 CE marking

The CE marking is on the ID plate, at the back of the product. It means this product complies with the low voltage CE directive, according the EN 55022 standard, and the EMC directive 61000-4-x.

A.2 Directives

• Electro-magnetic compatibility (EMC) and low voltage directive requirements are satisfied.

A.3 Overview

• The user's manual forms an integral part of the unit. It must be kept close to the unit. Precise observance of these instructions is a pre-condition to use the unit for the intended purpose and for its correct operation.

This user's manual must be passed on to any future purchaser or operator.
The staff would receive instructions concerning the correct use of the product.

• Safety for the operator as well as trouble-free operation of the unit is only ensured if use is made of original equipment parts. Moreover, use may only be made of those accessories that are specified in the technical documentation or that have been expressly approved by the manufacturer. The manufacturer cannot guarantee for the safety or proper functioning of the unit in the case where accessories or consumables are used which are not supplied by the manufacturer.

• The warranty doesn't cover damages caused by use of accessories or consumables which are not supplied by the manufacturer.

• The manufacturer only regard himself as being responsible for the equipment with regard to safety, reliability and proper functioning if assembly, re-settings, changes or modifications, extensions and repairs have been carried out by the manufacturer or a company authorized by the manufacturer and if the equipment is used in conformity with the operating instructions written in this manual.

• The AP103 MicroPlayer complies with the applicable technical safety standards at the date of print. All rights reserved for electrical diagrams, procedures, mentioned names and equipments.

A.4 General safety instructions

This equipment left our facilities in perfect conditions of operation. In order to maintain these conditions, for safety and to avoid any risk of injury, the user must imperatively follow the safety instructions and read the ´Warning!´ notes in this manual.
This equipment, manufactured by Waves System, has been so designed that any danger is virtually excluded provided it is used according to its purpose. However, for safety reasons, we are obliged to point out the following measures:

• When operating this appliance, observe all local rules and enforced regulations!
The homologation shall be invalid if any modification or alteration is made on the appliance. Operating modified appliances may lead to a penal suit. In the interest of the safety of work, the manager and the operator will be responsible for respecting the instructions.

• Retain all packing material in case the device must be shipped. Take care that it does not fall into the hands of children. Only the original packing guarantees optimal safety of the appliance during transport. Should it be necessary to ship the product during the guarantee period, Waves System will not accept claims for damage arising during the transport from using incorrect packing material!

• This product is dedicated to broadcasting music. It may only be operated by trained or knowledgeable personnel who can handle the device correctly.

• Before every use, the operator must check the functional safety and the condition of the appliance.

• The operator must be knowledgeable in the operation of the appliance.

• This device must not be used in places with potential explosion risk. Moreover, it must not be used in an environment favouring combustion neither in a wet or excessively hot or cold place.

A.5 Safety instructions against risks pertaining to electrical current

• The appliance must be connected to a grounded AC power outlet or a correctly wired CEE AC outlet.

• Before connecting the appliance, verify that the power supply voltage and frequency match the specifications indicated on the appliance.

• Before powering, check that the appliance and the cables are not damaged. Damaged cables and connections must be immediately replaced.

• Never leave power cords enter in contact with other cables! Handle the power cord and all the cables connected to a power supply with extreme care.

• Always connect the power supply last. Check that the power switch is ´off' before connecting the appliance to mains supply. The mains outlet must be accessible after installation.

• Check the appliance and its power cord from time to time.
Unplug the power supply if you don't use the appliance anymore or for maintenance.

• Always grasp only the plug on the power supply cord. Never pull the cable to unplug.

• Power supply, repairs and maintenance must be done by qualified personnel.

• Do not switch the appliance on and off in short intervals, as this may reduce its life, especially concerning the hard disk.

A.6 - Conditions of use :

• This product has been designed for indoor use only.

• If the device has been exposed to drastic temperature fluctuation (e.g. after transportation), do not switch it on immediately. The arising condensation water might damage your device. Leave the device switched off until it has reached room temperature.

• Do not shake the device. Avoid brute force when installing or operating the device.

• When choosing the installation-spot, please make sure that the device is not exposed to extreme heat, moisture or dust. There should not be any cables lying around, for your own safety and that of bystanders.

B. PRODUCT INFORMATION

B.1 Correct usage

The player is designed for automatically broadcasting audio files.
Correct usage implies observation of the instructions in this manual as well as observing the requirements concerning installation.

B.2 Incorrect usage

Any other use beyond this is considered as incorrect usage. The manufacturer will not be liable for any damage resulting from incorrect usage. The operator carries all risks.

B.3 CONTENT

GeoPlayer audio board
User manual

B.4 TECHNICAL SPECIFICATION

Audio Player MP3 and WAV - Model GeoPlayer
Nominal values for power supply : 12V DC

B.5 INSTALLATION

The apparatus must be set up in a dry and dust-free room.

Do not install the player too close to a wall. To avoid overheating, the ventilation holes must be kept clear and an air circulation gap must be left above the unit.

B.6 ELECTRICAL CONNECTION

Before use, compare mains voltage with that specified on model plate.

1 - Product presentation

The GeoPlayer is an audio player which reads MP3 and WAV files stored on a SD memory card. Playback of audio files is triggered by global positioning coordinates recorded by the integrated GPS sensor.

The GeoPlayer can read files in loop automatically on powering on ; at any time broadcast of background audio can be interrupted to play a file when a identified geographical position is reached.

Through the integrated GPS sensor, the GeoPlayer compares its current position with the positions listed in a correlation table. When they match, the GeoPlayer plays the audio file(s) associated to the position.

The GeoPlayer offers interactive GPS broadcast for tourist vehicles such as trains, buses, boats...

2 - Functionnalities

Geopositioning and interactivity: The GeoPlayer broadcasts audio files in relation to GPS positions. Three trigger modes are available: Track mode, Alarm and Free Tour mode.

Autoplay: This function is available on the GeoPlayer; the player will automatically start playing the selected files on powering on.

Broadcast mode: The way files are organized and named on the SD card defines the broadcast mode. Directory and file names provide powerful automation of playback patterns.

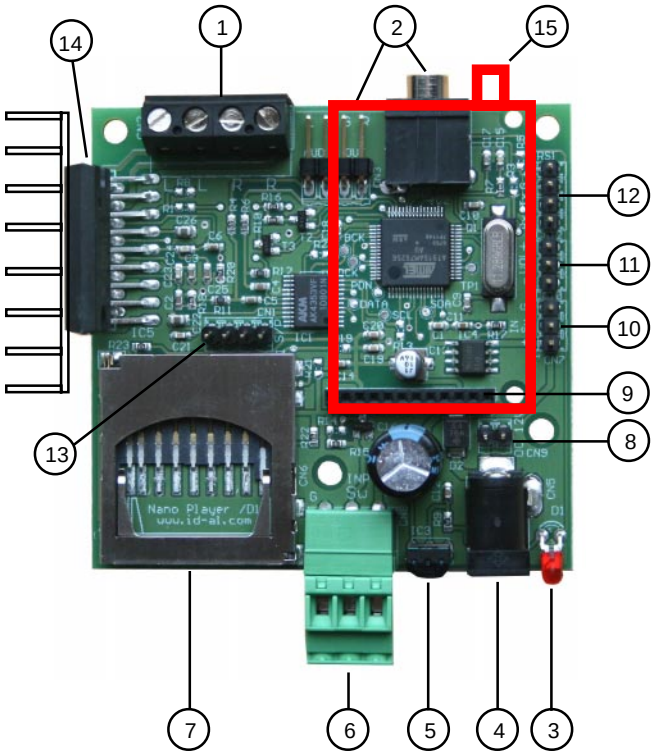
Updating: By removing the SD card from the player to transfer updates using a card reader on a PC.

Audio output: Two audio outputs are available. Line level stereo output on standard 3.5 stereo Mini-jack to connect the player onto a sound system and amplified output on screw-in terminal block to connect directly onto speakers. The ouput power is sufficient for any vehicle.

Power supply: The player is protected against polarity reversal. Caution, the NanoPlayer accepts variations between 10 and 15V. Outside this range, the player could be damaged.

Amplifier output power is determined by the power supply. When the line level output is used a 500mA 6W unit is enough to power the player. If the integrated amplifier is used a 2A (24W) power supply unit minimum is required. If the supply unit has insufficient power, sound will be very bad and the power unit will heat up and eventually break down.

3 - Installation



1 - Amplified audio output

2 - Line level audio output

3 - Luminous indicator

4 - Power supply

5 - Infrared detector

6 - Input contact

7 - SD card connector

8 - Secondary power supply

9 - GPS extension

10 - Input contact

11 - Volume level setting

12 - Option (Serial link)

13 - Option S/PDIF

14 - Amplifier+heat dissipation device to be added

15 - GPS antenna input

Memory card: choose a good quality card of a **minimum size of 64Mo** - New cards are usually formatted in «FAT». You can also use FAT32 format for SD card above 512Mo.

Push the card without forcing. To remove, push on the card to release it.

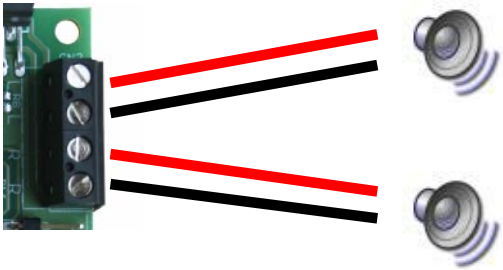
Caution, the GeoPlayer does not have any on-off switch. The player is powered on as soon as it is plugged in.

The SD card must be inserted or removed when the GeoPlayer is NOT POWERED ON.

The amplifier heats up. It is important to add a cooling device whose size must be in relation with the required power

1 - Speaker Output: The GeoPlayer includes a built-in amplifier. The board can therefore be connected directly onto speakers. Connect the speaker wires onto the output of each of the 2 channels.

Caution: Never connect outputs between themselves, do not create short-circuits and do not use speakers with lower impedance than specified in the player specification.



2 - Audio Output: on the line level stereo output, connect an amplifier, sound system, mixer or any device providing a line level input. The 4 pins connector offers an internal connection link.

Left output
Ground
Ground
Right output

Stereo audio output on mini-jack 3.5

3 - Luminous indicator: a red LED displays the status of the player
- LED on permanently: no playback, GPS connected
- LED on and flashing twice: no playback, GPS non connected
- LED flashes regularly: reading, GPS connected
- LED off and flashing twice: reading, GPS non connected
- LED flashing slowly: Error signal (SD card problem...)

4 + 8 - Power supply: If the player is powered with a filtered and regulated power supply unit or a battery, the recommanded tension is 12V DC, even if the player can be powered between 10V and 15V. The current used will depend on the power of the amplifier.
Connector DC 2.1mm/5.5mm - + in the centre.

Power supply
12V - DC

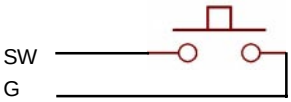
Connect a PSU or a 12V battery - The 2 pins connector allows internal supply when the board is integrated. Diode protection against polarity reversal

5 - Infrared: The GeoPlayer can be controlled with a infrared remote handset (not supplied with the OEM board - available as an option).

6 + 10 - Input on dry contact: Connect a push button to be able to select/force the next GPS position when the GeoPlayer is in track mode. See the GPS mode description chapter in the manual. Create a brief contact between «SW» input and the ground G.

- 12V (+) power supply output (to power an external device)
- Input contact (SW)
- Ground (G)

- Ground (G)
- Input contact (SW)
- 12V (+) power supply output

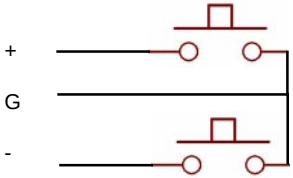


7 - SD memory card: Insert a memory card in the slot (minimum storage capacity 64Mo). **When inserting or removing the memory card, make sure that the player is not powered on.**

9 - GPS extension connector: a GPS sensor is fitted on the connector to allow automated broadcast of audio information in relation to the geographical positioning coordinates.

11 - Volume setting: volume setting is provided by connecting 2 push buttons on the «VOL» connector. Adjust volume by pressing Volume + and Volume - buttons.

- Volume + button
- Ground (G)
- Volume - button



12 - Option connector for serial link: for future extensions. On request.

13 - S/PDIF connector: To provide a digital audio S/PDIF output. On request.

14 - Amplifier: The amplifier heats up and it is important to add a cooling device. The size of the device must be proportional to the desired power; the wall of the case, a piece of metal or a purchased cooling device can be used.

15- GPS antenna input: Both passive and active antennas can be used to receive satellite's signals. Acitve antennas are more sensitive. MMCX type connector is required.

A magnetic active antenna is available as an option. It can be placed on the vehicle roof. Simply connect the cable onto the connecteur on the GeoPlayer.

4 - Operating the player and naming of files

The GeoPlayer reads files and playback instructions stored on the SD memory card. No extra software is required to configure the player. Playback options are provided by the way files are named and organized in the directories.

There are two categories of files:
1 - Files to be played on powering on the player and played back in loop.
2 - Files to be played on GPS position detection.

These 2 categories of files are represented by 2 directories or folders. Naming of directories results in various playback options.

A configuration file «gps.csv» must also be copied at the root of the SD card ; this file contains the various GPS positions and associated information (see details in chapter 5).

Example of use:
On powering on, one or several files are played and loop (background music for instance). When GPS location is reached, the looping files stop and the audio file associated to the GPS location is played; after playing the triggered file, the loop file is played again.

4.1 Organization of the two directories:

Only one level of directory is allowed at the root of the memory card. Two directories only are permitted. Directory names are composed of 2 meaningful characters.

Exemple : «0R» or «0S» and «GPS»

4.1.1 Directory «0x»

Place in this directory audio files to be played in loop on powering on the player. When the player is powered, presence of this directory is checked. If it is found, all the files are played. If it is not present on the SD card, the player goes to standby mode and awaits for a GPS input.

The maximum number of files in this directory is 250.

- **The first digit «0» defines the directory number.**

0x : Directory 0 is the default directory played on powering on the player.

- **The letter defines the broadcast mode of the files in the directory.**

xR : R for random mode (RND)
xS : S for sort mode in sequenced order (SORT)

- When choosing «R», files are played in random mode.

In random mode, files names are free followed by extension .mp3 for MP3 files and extension .wav for WAVE files. It is possible to mix both types of files in the same directory.

- When choosing «S», files are played in a sequential order. Sorting is in numerical order of the first 3 digits of file names. Therefore files need to be numbered with 3 figures, which can be or not followed by complementary characters.

For example:

001 my song.mp3
002 another song.mp3
003 music.wav
004.wav
....
250 another music.mp3

In sequential order mode «S», non numbered files will be ignored.

Caution: 250 files maximum !

Note : in sequential mode (SORT), only numbered files will be read, non-numbered files will be ignored. In random, all files will be read.

If no file needs to be played on powering on, do not create this directory.

4.1.2 Directory «GPS»

The «GPS» directory contains files to be broadcast in relation to the geographical positions of the GeoPlayer. File names are compulsory and composed of 3 or 4 figures followed by an optional file name.

Example : 001.mp3 or 0011 my file.mp3 or 0011.wav ....

The first 3 figures define the main file number. This number is the number called in the configuration file of GPS coordinates - See related chapter.

The main file number is between 001 and 999.

Each of the files to be broadcast in relation to a GPS position is identified by its main file number, made of 3 figures between 001 and 999. These 3 meaningful digits may be followed or not by a chosen name. Extensions «.mp3» or «.wav» define the audio file format.

For any one given GPS location, it is possible to broadcast a series of audio files, i.e. up to 10 files. A sub-number is then added to the main file number to specify the broadcast order of the messages.

The sub-number is between 0 and 9.

Example : when the GeoPlayer reaches a given location, you could broadcast an introduction jingle, an information message, an advert and an end jingle.

To achieve this scenario, you need to create 4 files with the same main file number and 4 different sub-numbers to define the sequence order in which the files will be played back:

0010 introduction jingle.mp3
0011 information message.mp3
0012 advert.wav
0013 end jingle.mp3

- The main file number is 001
- The sub-numbers are 0 to 3. Files are read in this order.
- Every file includes an optional name followed by the extension defining its format.
Both mp3 and wav files can be played.

Note : Files are broadcast in sub-numbers order but they do not have to be consecutive numbers:

0012.mp3
0015.mp3
0018.mp3

- The main file number is 001
- The sub-numbers are 2, 5, 8. Files will be read in this order.

Other example:
When a tourist train reaches each GPS location, information are broadcast in various languages. The sub-numbers specifies the broadcast order of each language.

0050 French.mp3
0051 English.mp3
0052 German.mp3

- The main file number is 005
- The sub-numbers are 0, 1, 2. Files will be read in this order.

Note : the fourth number is only necessary if several files need to be broadcast.

5 - GPS configuration file

The GeoPlayer broadcasts audio files in relation to geographical locations. The integrated GPS sensor, permanently compares the player's position with a pre-established table listing the points to be scrutenized.

The Global Positioning System, known as GPS, is presently the main international satellites positioning system. It uses the geodesic system WGS 84 and is based on calculation of the distance between the sensor and several satellites. Data necessary to calculate position of 31 satellites are regularly transmitted to the sensor which is able to work out the coordinates.

Each point of interest is identified by the following data:
- Latitude
- Longitude
- Tolerance around the point
- Main number of the triggered file
- Trigger mode

Maximum number of files = 150

Latitude et longitude
Latitude and longitude are the coordinates of a desired trigger point. They can be obtained using a GPS device, a software such as Route 66 or via internet services such as GoogleMaps...

Several formats are used to indicate latitudes and longitudes. The most common are:
- degrees (°), minutes ('), seconds, decimal - DMSd (often used in mobile GPS devices)
- degrees (°) decimal - Dd (often used in cartography software)

The GeoPlayer uses the degrees decimal Dd format.

Tolerance:
For each point, a tolerance expressed in metres can be specified. This tolerance forms a square around the point and its choice is very important. The tolerance depends on the moving speed and on the size of the detection area. If the area is too small, there is a risk of not triggering the point. If it is too large, the audio file could be triggered too early.

It is important to understand that the GPS sensor updates its coordinates every second. At high speed, a big distance is covered in one second.

Example :

On foot - about 5km/h which is 1m/s
Slow vehicle - at 20km/h which is 6m/s
Fast vehicle - at 60km/h which is 17m/s
Very fast vehicle - at 100km/h which is 28m/s

The precision of the GPS sensor is about 5 m. Nevetheless, we advise not to specify a too small tolerance to obtain a reliable trigger. The maximum tolerance is 1000m (1km).

Main file number for the triggered file
One or several audio files are associated to each location. The files to be broadcast are stored on the SD card in the «GPS» directory. (see chapter 4 for details).
File numbers are between 001 and 999
Several GPS locations may call the same audio file(s) ; it is possible to listen to the same message at different locations.

Trigger mode
Depending on applications and vehicles, the way audio files are triggered may vary.
Three trigger modes are available on the GeoPlayer:

1 - Track mode
2 - Alarm mode
3 - Free tour mode

- **1 - Track mode**

Use this mode to trigger the various positions one after the other in a defined sequential order. Define the complete track and the sequence of selected positions. The player is only watching one point at a time and will move to the next one once the current position has been triggered.
In this mode, it is possible to pass twice by the same point at different times, for example for return journeys or crossroads, and play a different messages each time.
If a problem occurs, a detour or no trigger for some reason, it is possible to force trigger of a point manually by using the input contact of the player, by connecting a push button for example.

- **2 - Alarm mode**

Use this mode when it is necessary to watch positions in no specific order and broadcast the associated audio files. The message will loop as long as the player stays in the GPS position, including the tolerance. The Alarm mode has priority over the Track mode. Typical use is to warn about danger in a specific zone.

- **3 - Free tour mode**

Use this mode to broadcast messages during a tour without any pre-defined sequence order. All the positions are constantly watched. In this mode, it is not possible to broadcast different messages for a same position (round trip situation) ; to achieve this scenario, the Track mode must be used.

Note : It is possible to use different modes in a trip. Locations specified in Alarm mode are permanently watched when only one point at a time is watched in Free tour mode. The next location will only be triggered once the current location has been played.

5.1 Creation of the configuration file «gps.csv»

For the GeoPlayer to broadcast audio files associated to GPS positions, it is necessary to create a configuration file which is a cross reference table between the audio files and the GPS data.
The table includes the following data: latitude and longitude of the position, tolerance around the point, main audio file number to be broadcast, broadcast mode and optional comments.

Any spreadsheet can be used to create this configuration file, Excel type or Open Office equivalent. An ID-AL assistant is also available for download from the www.id-al.com web site.

Example of table:

	A	B	C	D	E	F	G	H
1	Position N°	Dd Latitude	Dd Longitude	Tolerance (in m)	Mode	Audio File	Optional Comments	
2	1	47,13833	-1,680629	50	1	001	Start point	
3	2	47,142004	-1,6724	50	1	002	Monument 1	
4	3	47,142183	-1,667553	100	1	003	Town center statue	
5	4	47,192874	-1,570521	100	1	004	Town Hall	
6	5	47,198654	-1,561783	100	1	005	Monument 2	
7	6	47,19956	-1,56886	50	1	006	Arrival point	
8	7	47,201515	-1,572177	50	2	007	Danger : dead end	
9	8	47,206493	-1,564276	100	2	008	Forbidden area	
10	9	47,208277	-1,565915	50	3	009	Church	
11	10	47,210173	-1,568486	50	3	010	Tourist office	
12								
13								

Column A: Position number - maximum 150 points
Column B: Latitude in Degree/decimal format - Dd (use a dot, not a coma, as separator)
Column C: Longitude in Degree/decimal format - Dd (use a dot, not a coma, as separator)
Column D: Tolerance in meters (whole number, no decimal)
Column E: Trigger Mode 1 - Track / 2 - Alarm / 3 - Free tour
Column F: Main audio file number to be read (see chapter 4) - **3 digits mandatory** (text format)
Column G: Optional comments

Important notes in creating the configuration file:
- Do not add any column - Do not modify their order
- Do not add any line - no extra header, no empty line nor additional line at the end of the table
- Latitudes and longitudes stated in degree/decimal format
- Do not include units of measure nor symbols (m, km, °, ‘, ...) ONLY values
- It is possible to indicate different trigger modes. The broadcast order is defined by the Track mode order (the 2 other modes have no order). It is easier to put together locations with the same trigger mode.
- The point number (column A) is only an indication and any figure can be used. **The sequence of broadcast is defined by the line number of the table.**

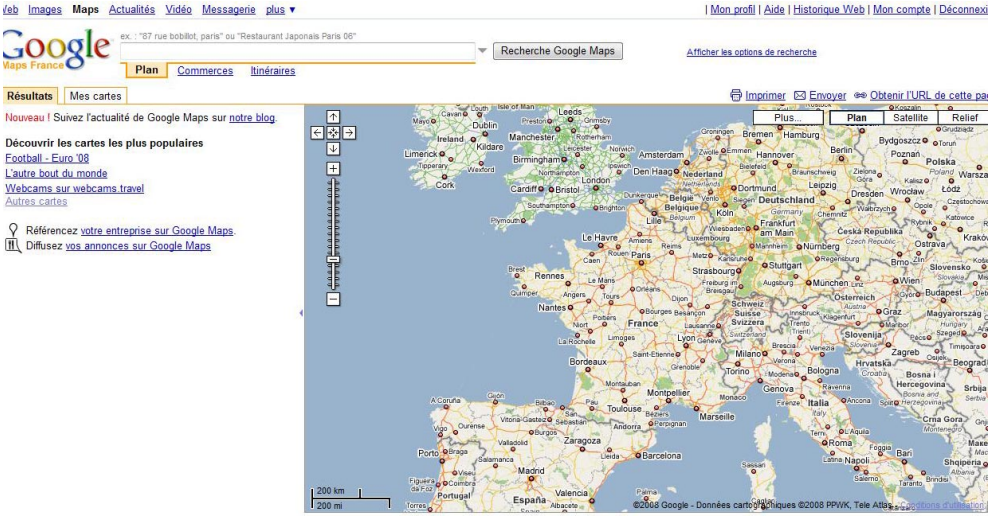
After saving the completed table, export it a «csv» file. This is a text format supported by most spreadsheet software. In the file menu, choose «save as» and select format «csv separated by semicolon (;)».

Save this file under «**gps.csv»** and copy it at the root of the SD card. Do not change the name «gps.csv».

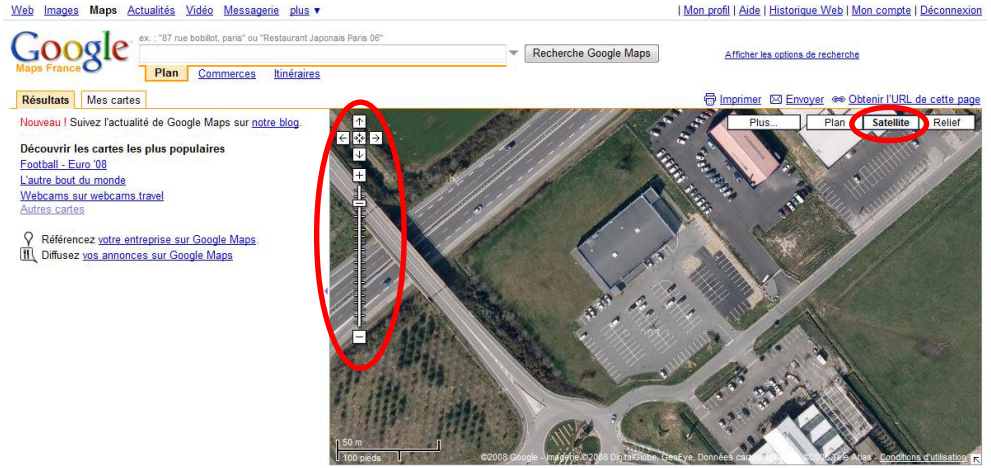
5.1 Finding GPS coordinates using GoogleMaps

GPS coordinates of locations can be found for free from the GoogleMaps web site. There are indicated in degree decimal format.

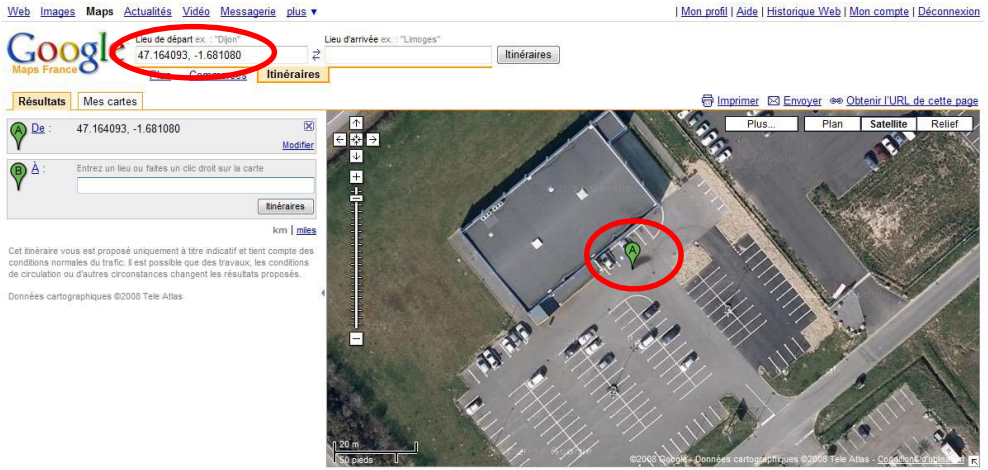
Connect to this address: http://maps.google.fr/



Zoom on a selected value and press «satellite» tab to display the photo



Place the mouse at the desire point on the map and do right click. Then select «directions from here». A tag appears on the map and coordinates are displayed in the window on the left hand side of the screen. The green tag can be moved around using the mouse.
Copy these coordinates into the table and proceed the same way for the other locations to be identified.



6 - Infrared remote control

The GeoPlayer includes an infrared sensor and can therefore be controlled by a remote control handset. An ID-AL remote is available as an option.

This remote controls the following functions:

Transport bar : Play / Stop / Next - Previous
Volume control : Increase or decrease volume
Trigger key : Play the next GPS position when the GeoPlayer is in track mode. (same as Input contact function)

Appendix A - Characteristics

Power supply:
• Nominal voltage: 12V DC
• Power supply range: 10V to 15V DC

Consumption on 12V power supply:
• Stand-by: 100mA
• Reading (line level output - amplified output not used): 130mA
• Reading - amplifier maximum @8Ohms: 2A (varies with volume level)

Output audio power:
• Voltage 12V - THD 10% - Charge 8 Ohms: 2 x 7W
• Voltage 12V - THD 0,5% - Charge 8 Ohms: 2 x 5W

Dimensions:
• Width: 70mm - Height: 18mm
• Depth without connectors: 67mm - Depth with connectors: 80mm

Weight: 45g

Appendix B - Functions

Audio characteristics
• Reads stereo MP3 files (MPEG ½ layer 3), 44.1KHz, from 112kbit/s to 320kbits/s
• Reads CBR (Constant Bit Rate) files and VBR (variable Bit Rate) files
• Reads stereo Wav files, 44.1kHz, 16 bits
• Volume setting = 32 steps (from Mute to maximum)

SD Memory card
• Accepts SD card - 64Mo minimum - Formatted in FAT16 and FAT32
• Supports long file names

Interfacing
• Status indicator LED
• Infrared sensor - Play, Stop, Next, Previous, Trigger, Volume +, Volume -
  Protocole SONY SIRC 12bits modulated at 38kHz
• 1 input on dry contact on Phoenix 3.81mm plug-in connector
• External power supply connector DC 2.1/5.5 and internal
• Stereo output on mini-jack and internal connector
• Amplified stereo output on screw-in terminal block
• GPS antenna with MMCX connector

GPS function
Reception norm NEMEA-0183 V3.01
• Protocole GPRMC upto 16 satellites
• Acquisition at 1Hz (1 per seconde
• Module precision: 5m (CEP)
• Sensitivity: -140dBm in acquisition / -155dBm in surveillance
• Acquisition time: < 5 seconds hot / < 60 secondes cold

MP3 Files encryption
• Compatible with encryption software tool v1 and v2. On request.

Notes :

http://www.id-al.com

http://www.wsystem.com