LTO mobile™

DYNAMATE

User's Manual

Version 1.5

---English---

Safety Instructions

All safety and operating instructions should be read before the equipment is installed and operated. We recommend that installation be carried out by an authorised mobile electronics installation company. Please contact your local ALTO Mobile™ distributor for a list of authorised installers in your country.

- To reduce the risk of electric shock and potentially damaging the equipment, do not disassemble the product. No user serviceable parts inside; refer servicing to qualified personnel.
- The equipment should be protected from moisture and rain, especially if mounted in the vehicle's trunk area or any location that may be susceptible to water ingress.
- The equipment should be situated so that its location or position does not interfere with its proper ventilation. For example, the product should not be situated under carpeting or in a totally sealed enclosure. Trunk-mounted equipment /amp racks should be well ventilated, using forced air cooling fans if necessary. The equipment should be situated away from heat sources such as engine exhaust systems and radiators.
- This product is designed for vehicles with a 12 VOLT NEGATIVE GROUND electrical circuit. This product must not be used in vehicles that use a 24 Volt supply or a positive ground electrical circuit.
- Great care must be taken when wiring the product to the vehicle's electrical system. Unless you are fully familiar and trained in wiring automotive electrical systems, installation should only be undertaken by a qualified automotive electrician.

Dear Customer,

Thank you for choosing the ALTO Mobile™ DYNAMATE digital dynamic sound processor. We hope you'll love the results you get from it and enjoy using it as much as we enjoyed developing it.

The DYNAMATE is the result of considerable development work in our R&D centres in Europe and the Far East and is a close cousin of ALTO's professional audio products. We've been designing products for musicians and recording studios for many years - the product you now have in your hands has a fine pedigree.

The core of our digital audio products is a sophisticated DSP (Digital Signal Processor) coupled with state-of-the-art algorithms developed by our software team over the last 7 years.

The car audio environment is worlds away from the controlled listening area of the recording studio, and yet much of the sound processing so important to recording engineers can be applied with spectacular success to the automotive environment. ALTO Mobile™ is a specialist division of audio and computer software engineers, but above all we're car audio enthusiasts. We love the challenge of trying to reproduce studio quality sound inside a moving vehicle.

We're convinced you are an important member of our team and we listen to what you say and take on board your suggestions. It's this feedback that helps us create the products you want. Thank you.

ALTO MOBILE™ TEAM

Introduction

In purchasing DYNAMATE, you purchased a very powerful dynamic processor that is easy to use. No programming or complex skills are required since it's just a case of choosing a preset function. DYNAMATE does all the required processing dynamically - that is, automatically in response to the changing level and characteristics of the music.
Once it's all correctly installed, you'll be eager to play with your new buy. If the product has been installed for you there's nothing stopping you, so go ahead - just read the following warning first and remember to come back and read the rest of this manual.

Important Warning Take it easy at first. Avoid operating your system at high volume initially. When you switch from Bypass mode to one of the active modes, the dynamic AGC (Automatic Gain Control) may increase the overall level substantially and this could damage speakers if you're not expecting it.

Keep the volume level down until you are familiar with the unit.

If you've purchased the product but haven't had it installed in your vehicle, that's obviously the first thing you'll need to do. We strongly recommend that you have the unit professionally installed by a specialist company authorised by the ALTO Mobile™ distributor in your country. The installation instructions in this manual are for guidance only and are not intended to be a thorough explanation of all the steps involved in correctly fitting this unit. The instructions assume that the person installing the equipment has been trained to carry out such work.

Once you've had a quick play with it you'll have some idea of what the DYNAMATE can do, but it's worth taking time to understand each of the preset algorithms and the kind of results you can expect. For example, the effect of the processing is in many cases influenced by the level of the input signal across different frequency bands - something that may not have been immediately obvious from your initial experiments.
Understanding how each group of presets manipulates the sound will help you to know when to apply a certain preset for best results.

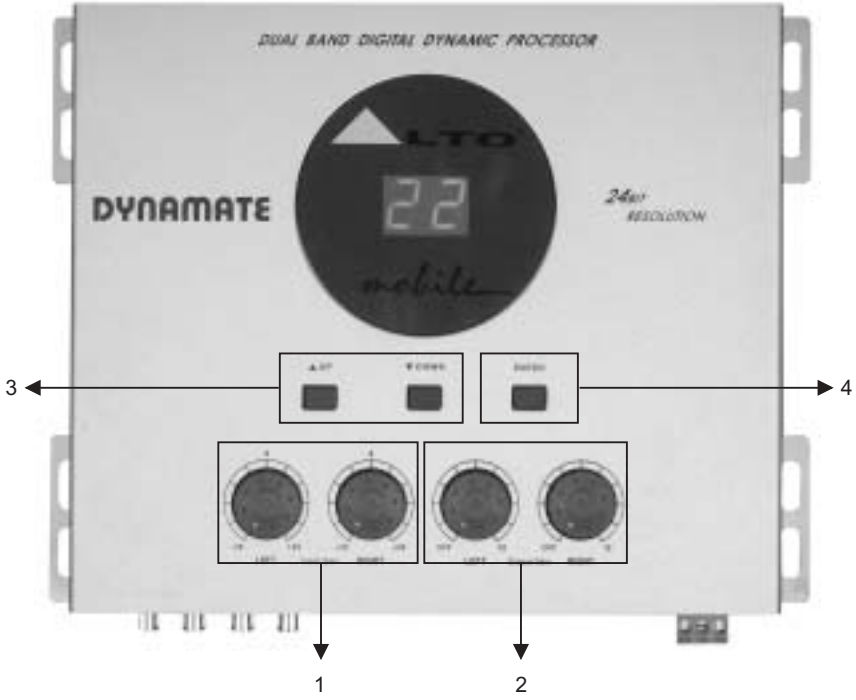
It's also worth mentioning that while DYNAMATE's processing abilities may be greatly appreciated even when the vehicle

is stationary, it really comes into its own when the vehicle is moving. It's then that the full benefits of the dual-band dynamic AGC come into play, helping to compensate for road and engine noise. It does this by dynamically tailoring the sound in much the same way as a sound engineer optimises the recording so that it sounds well-balanced on a small radio as well as a ten thousand-dollar hi-fi system.

Brief Technical Overview

The DYNAMATE's dynamic sound processing algorithm is based on a "multi-band" processing concept, splitting the original full band signal into two "sub-bands". This results in a band of lower frequencies and a band of mid/high frequencies, allowing the subsequent signal processing to be applied separately to each - the low frequencies (with their higher energy content) and the mid/high frequencies. This dual band technique - along with the settings for the attack and release times programmed for each preset - successfully prevents the bass from dominating the way in which the processing is applied and prevents the pumping effect that used to be common with dynamic processors.

Once split into the two separate bands, DYNAMATE applies selective processing to each of the bands before re-combining the bands and applying additional processing. The sound processing covers several forms including gain control, parametric equalization, high- and low-pass frequency filtering and dynamic balancing of the music's energy levels (dynamic companding). Companding is a combination of signal compression and expansion used extensively in pro audio recording, production work, noise reduction and live performance applications. It's basically a variable gain device, where the amount of gain used (which can be a positive or negative value) depends on the level of the dynamically changing input.



1. *Input Gain Controls:* Use these controls to match the pre-amp output level from your car audio source unit. If a dot shows on the display next to one or both the digits, this indicates clipping (excess signal level/distortion) of one or both the channels of the input stage. Set the input level so that the LED dots light only very occasionally on musical peaks. DYNAMATE MAX Input level: 15 V

2. *Output Gain Controls:* Use these controls to match the optimum pre-amp input level of your amplifier or active crossover. DYNAMATE MAX Output level: 9.5 V

Input/Output Gain Setting: Proper setting of the input and output levels is important in achieving the best signal-to-noise ratio. Use of test tones and an oscilloscope will greatly assist in setting the optimum gain levels. For this reason, system setup is best left to a professional car audio installer.
However, if you need to get up and running without professional help, follow these steps and you won't go far wrong.

Select Preset 09.
Set the ALTO's Output Gains to their 12 o'clock positions.
Turn the Input Gain controls fully counter-clockwise (minimum gain).
Turn the volume control on your CD player to about 75%.
Turn your amplifier input gains to a low setting (say 25%).
Now play some music and increase the ALTO's Input Gains until you see the red dots (next to each digit on the display) begin to flash occasionally on musical peaks. This will in most cases be the optimum setting for the input gains. Note that setting the volume control of your CD player at 75% rather than maximum is done to ensure that the signal output from the player is pure and undistorted.

Pause the music. Now set the ALTO's Output Gains to about their 3 o'clock position (i.e. 75% of maximum) and set your amplifier input gains to their Minimum Gain position (i.e. where the amp gives its lowest output level).
Note that the maximum output level from the ALTO processor exceeds 9 volts.

Play some music and gradually increase your amplifier's gain controls until you reach your preferred maximum listening level, or where you begin to hear any stress from the speakers. If the music sounds distorted with the amp gains at minimum, reduce the Output Gains on the ALTO unit.

3. *Up/Down Keys:* Use these to select the required preset number as viewed on the display. There are 8 groups of different processing types, and each of these has 8 variations. Refer to the description of the preset groups for an explanation of how each group differs.

4. *Enter Key:* While searching using the *UP/DOWN* keys, the currently selected preset remains active. Once you have decided on a new preset (the preset number is showing on the display), press *ENTER* and DYNAMATE will apply the new processing algorithm.

Device Initialisation, Preset Selection & Bypass

During the device initialisation the display digits will blink and, after a brief time, will show the number of the last loaded preset. You can then scroll through the 64 pre-loaded presets and select an alternative program.

During preset scrolling, the display blinks while showing the ID numbers of the various presets. After a few seconds, if a new selection is not confirmed, the display will stop blinking and return to show the number of the currently active preset ID.

Pressing the *ENTER* key for a few seconds switches the system into BYPASS mode (the display shows a blinking 'bP'). To exit this status, simply press the *UP* or *DOWN* key.
Preset ID "00" also represents a BYPASS.

DYNAMATE Sound Processing Groups

DYNAMATE's presets are divided into 8 groups of sound processing algorithms and each of these has 8 variations. The first preset in each group does not make use of the AGC (Automatic Gain Control) element, so it effectively offers an AGC-Bypass mode.

Presets 1-8: Acoustic
The general impression this preset group gives is of definition and power. The timbre is lively and brilliant, ideal for small ensemble music and to keep soft musical passages sounding alive. The frequency response is slightly rolled off in the low end. Since the vehicle cabin tends to boost frequencies in the lower end, a reduction here can help restore the original balance between low, mid and high, thus improving clarity and definition.

Presets 9-16: Master
"Master" is very neutral and provides a pure, high quality automatic gain control. The resulting timbre is very similar to that of the original sound and so the appreciable differences are in the dynamic range corrections.
This helps to maintain a sound that is lively and naturally dynamic but at the same time dynamically optimised for in-car listening on the move.

Presets 17-24: Clean
This is a "high definition" preset, giving great brilliance and dynamic impression. Nevertheless, it's never fatiguing. It lifts the sound without unbalancing it. Highs are in good evidence. There's good "punch" to the music too, and low frequencies are not too attenuated. A good preset for underlining the detail in female voices, for example.

Presets 25-32: Dance
Selecting active presets in this group causes the midrange and mid-low range to be emphasised, while high frequencies are slightly attenuated in order to control dance music's intrinsic brilliance in this frequency region. It's well suited to dynamic and bright recordings, while increasing their "punch".

Presets 33-40: Kick Drum
With the "Kick Drum" preset it won't surprise you that the mid-low region is very well in evidence. High and mid frequencies are slightly attenuated. You'll find this well suited to tracks where you want to give extra emphasis to the drums and bass.

Presets 41-48: Mixdown
"Mixdown" is less bright than "Clean" and the mid-low region is more in evidence. It's good for underlining bass and drums without losing definition in the rest of the range. Suited also to harmonically complex instruments, such as double bass.

Presets 49-56: Jumping Up
The sound of the curiously named "Jumping Up" preset group is quite similar to "Clean" in its general timbre.
It does a great job of getting the best out of male voices and is capable of maintaining the balance and definition in the performance even during soft musical passages. For female voices the "Clean" preset is likely to be preferred, so it all depends on whether you're into Divas or Crooners.

Presets 57-64: AGC Pure
As the name suggests, this group of presets provides a pure and simple automatic level control. Its speed (that is, the speed with which it applies itself to the incoming signal) varies with the seven different variations.
From the timbre point of view it's a rather neutral process, and it doesn't alter the general balance of the original signal. It simply keeps the level in proximity of a predetermined 'ideal' level. This helps to correct for differences between signal sources (AM/FM radio, cassette tape, CD etc.) as well as compensating for the effects of background road, wind and engine noise on the detail and tonal balance of the music.

Mounting the Unit
DYNAMATE has two fixing 'ears' at each side, allowing it to be firmly screwed to a suitable surface. It may be mounted vertically or horizontally. Take care not to mount the unit where it may become wet or subject to damage from items placed in the trunk area.

Signal Inputs/Outputs
The Left and Right Channel input and output terminals are standard phono type sockets. Connect the low-level pre-amplifier output cables from your car radio/cassette player, CD/receiver or other source unit to the Input terminals of DYNAMATE.
Connect suitable cables (not supplied) from the Output terminals of DYNAMATE to the corresponding input terminals of your power amplifier.

Where to place DYNAMATE in the signal path
DYNAMATE should normally be placed in line after an equalizer (if you have one of these in your system) but before an active crossover (if you have one of those in your system). In some circumstances you may wish to dedicate the DYNAMATE processing to only certain channels/speakers (the front speakers, for example). In this case you could connect DYNAMATE in line between the front channel outputs of the active crossover and the inputs of the power amplifier which powers the front speakers.
Caution: DYNAMATE must always be placed in line BEFORE the power amplifier stage.

Power, Ground and Remote Switch-On (REM) Terminals
Caution: Before making any connections, you must stop power delivery from the battery to avoid accidental short-circuits. The conventional way is to disconnect the Negative terminal of the battery but beware - *this action will disconnect power from all electrical items in the vehicle, including*:
- the audio source unit (which may require a code number to reactivate it - do you know the code?)
- the security system (which may trigger and sound an alarm from its back-up battery - do you know how to override the alarm system?)
- memory modules (which may suffer memory loss if disconnected for too long).

If you have any doubts you should seek professional assistance first. Professional auto electricians will

Isolate individual circuits to maintain power to the remainder of the vehicle's electrical system.

At the far right of the side panel is a POWER INPUT terminal block with three screw terminals. The terminal marked +12V should be connected to a permanent 12 Volt supply from the vehicle battery.

The terminal marked GND (Ground) should be connected to a cable which is terminated to the vehicle chassis. Ensure that the point where this cable attaches to the vehicle chassis provides good electrical contact. If drilling a new ground point, ensure that it is safe (check that there is nothing behind the panel you are about to drill, such as the fuel tank). It may be necessary to rub away paintwork to expose the metal at this point - in this case, after making a firm screw connection of the ground cable to the chassis, paint over the terminal point to protect it from the possibility of corrosion.
Where a ground point already exists (for an existing power amplifier, for example) it is generally best practice to ground the DYNAMATE to this same point on the vehicle chassis.

The terminal marked REM accepts a 12V switched input from the source unit (Cassette or CD player). When the source unit is switched on, a 12V pulse is sent down this line. The DYNAMATE senses this pulse and switches itself on or off. The source unit should be equipped with a suitable Remote Switch cable - check the instruction book supplied with your audio source unit.
If the Remote output from the source unit is already being used to switch on a power amplifier, it is usually possible to create a 'daisy-chain' by connecting a cable from the REM or Remote terminal on the amplifier to the REM terminal of the DYNAMATE. This avoids the need to run a separate cable from the source unit.

Before reconnecting power to the circuit, double check all connections (be particularly careful to check there are no strands of wire that could touch the chassis of the DYNAMATE or one of the other terminals).
The power-on LED next to the power input terminal block will light to show the unit is receiving power.

Optional A-LINK Remote Control

An optional remote control unit is available. This uses a proprietary interface/control system and allows presets to be selected from the driver or passenger seat even if the unit itself is installed in the trunk. Connections are made to the *A-LINK IN* and *A-LINK OUT* terminals. Follow the instructions supplied with the A-LINK remote control unit.

Further Information

Because of the nature of our digital sound processors and the variety of effects that can be achieved with them, there are operational details, tips and advice too numerous to include in an instruction manual such as this. For additional information, please visit our website at **www.altomobile.com**, which includes a technical discussion forum where users can exchange ideas.

Troubleshooting
Power LED not lit: Is the Remote switch cable from the source unit (Cassette or CD Player) attached to the REM terminal of the DYNAMATE, and is the source unit switched on? Are the +12V and GND (Ground) terminals connected correctly? Is the Ground cable properly attached to the chassis of the vehicle or to an existing ground point that is known to be OK?

No Sound: Adjust the level of the Input Gain Controls. Adjust the level of the Output Gain Controls. Are the Input and Output signal cables correctly connected? If there is only sound from one channel, swap the Left and Right channel Input cables at the DYNAMATE - if the fault moves to the other channel then the fault is with the cable or source unit. If the fault remains in the same channel, swap the Left and Right channel Output cables at the DYNAMATE - if the fault still remains on the same *speaker* then the fault is with a cable or a unit after the DYNAMATE (power amplifier, active crossover or the speaker). Check gain controls on those units and any input switching options. If the fault moves to the other *speaker* then the DYNAMATE may be faulty - leave it installed in your system and return to your dealer so that they can check it.

Distorted Sound or Low Volume: Adjust the Input and Output Gain Controls of the DYNAMATE, and the Input Level Controls of the power amplifier (and/or active crossover or additional processor where applicable). Check if the amplifier has a built-in crossover network - is it switched correctly?

To be protected by this warranty, the buyer must be able to produce a numbered, machine printed sales receipt (original only accepted, not a copy) from his supplying dealer that clearly shows the dealer's name and address, the buyer's name and address, purchase date, model name/number and serial number of the product. ALTO® reserves the right to verify the authenticity of the receipt directly with the supplying dealer.

- ALTO® warrants the mechanical and electronic components of this product to be free of defects in material and workmanship for a period of one (1) year from the original date of purchase. If any defects occur within the specified warranty period that are not caused by normal wear and tear or inappropriate use, ALTO® shall, at its sole discretion, either repair or replace the product.
- To obtain warranty service, the product must be returned in its original shipping carton. A description of the problem will be appreciated.
- Damages/defects caused by the following conditions are not covered by this warranty:

a. Misuse, neglect or failure to operate the unit in compliance with the instructions given in the user or service manuals.
b. Connection or operation of the unit in any way that does not comply with the technical or safety regulations applicable in the country where the product is used.
c. Damages/defects that are caused by force majeure or by any other condition beyond the control of ALTO®.

- Any repair carried out by unauthorised personnel will void the warranty.
- This warranty is extended exclusively to the original buyer (customer of retail dealer) and is not transferable to anyone who may subsequently purchase this product. No other person (retail dealer, etc.) shall be entitled to give any warranty promise on behalf of ALTO®.
- Failure of ALTO® to provide proper warranty service shall not entitle the buyer to claim (consequential) damages. In no event shall the liability of ALTO® exceed the invoiced value of the product.
- This warranty does not exclude or limit the buyer's statutory rights provided by national law, in particular, any such rights against the seller that arise from a legally effective purchase contract.

Channel Layout

2 inputs —> 2 outputs

Analog Input section

Inputs:	2 RCA - F
Input Impedance:	>400 kOhms
Max. input Level:	15 V

Analog Output section

Outputs:	2 RCA - F
Output Impedance	<600 Ohms
Max. output level:	9.5 V

Digital / Analog Interface

Amplitude Response:	20 Hz - 20KHz ±1.5 dB
Signal to Noise Ratio	>85 dB
THD+N	0.03 % @ 1KHz —3 dB
Conversion:	18 bit a-d and d-a converters

Power Supply

Type:	Servo - controlled, Switching
Voltage supply:	11V - 16V DC (negative ground)

Remote Control: Alto Mobile A-Link-

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