

# KEC<sup>®</sup> MOBILE APPLICATIONS

MODEL: LSM104

## 10.4" TFT LCD TELEVISION MONITOR/RECEIVER SYSTEM

### INSTALLATION INFORMATION & OPERATING INSTRUCTIONS

**THIS PRODUCT IS INTENDED FOR PROFESSIONAL INSTALLATION ONLY**

*FOR MOBILE-SPECIFIC 12 VOLT DC-ONLY OPERATION  
PLEASE READ ALL OPERATING INSTRUCTIONS BEFORE USING THIS PRODUCT.*



THIS PRODUCT HAS BEEN DESIGNED, MANUFACTURED AND  
INSPECTED IN COMPLIANCE WITH THE  
ISO9001 QUALITY ASSURANCE SYSTEM.

#### IMPORTANT NOTE :

WHEN USED IN A VEHICLE, THIS SYSTEM IS INTENDED PRIMARILY AS A MONITOR FOR A VIDEO CASSETTE PLAYER, VIDEO GAME, OR CAMERA. TELEVISION BROADCAST RECEPTION WILL BE ADVERSELY AFFECTED BY CONDITIONS SUCH AS MOTION, CHANGE OF DIRECTION, ATMOSPHERIC ACTIVITY, AND LOCAL SURROUNDINGS. IT IS THEREFORE LIKELY THAT BROADCAST PICTURE QUALITY WILL BE MARGINAL WHEN THIS SYSTEM IS USED IN A MOBILE ENVIRONMENT.

## CAUTIONS

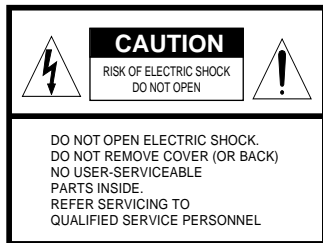
### CAUTION :

- ANY CHANGES OR MODIFICATIONS IN CONSTRUCTION OF THIS DEVICE WHICH ARE NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

### WARNINGS :

- TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.
- DO NOT OPEN THE CABINET. DANGEROUS HIGH VOLTAGE IS PRESENT. SERVICING SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL.
- THIS LCD VIDEO SYSTEM SHOULD ONLY BE OPERATED WITH 12V DC.

### GRAPHICAL SYMBOLS EXPLANATION



This lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (Servicing) instructions in the literature accompanying the appliance.

### FCC WARNINGS :

This equipment may generate or use radio frequency energy. Change or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual.

The user could lose the authorization to operate this equipment if an unauthorized change or modification is made.

### INFORMATION TO THE USER

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## IMPORTANT SAFEGUARDS

- 1. Read Instructions-**All the safety and operating instructions should be read before the appliance is operated.
- 2. Retain Instructions-**The safety and operating instructions should be retained for future reference.
- 3. Heed Warnings-**All warnings on the product and in the operating instructions should be adhered to.
- 4. Follow Instructions-** All operating and use instructions should be followed.
- 5. Cleaning-**Unplug this product from power cable connector before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- 6. Attachments-**Do not use attachments not recommended by the product manufacturer as they may cause hazards.
- 7. Water and Moisture-**Do not install this product near water-for example, near a bath tub, wash-bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.
- 8. Accessories-**Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the equipment. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting approved by the manufacturer.
- 9. A product and cart combination should be moved with care.**  
Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.
- 10. Ventilation-**Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these should never be blocked by placing the product on a bed, sofa, rug, or other similar surface.  
This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
- 11. Power Sources-**This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your car, consult your product dealer.  
For products intended to operate from battery power, or other source, refer to the operating instructions.
- 12. Servicing-**Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.



## IMPORTANT SAFEGUARDS

- 13. Damage requiring Service**-Unplug this product the wall outlet and refer servicing to qualified service personnel under the following conditions :
- When the power-supply cord or plug is damaged.
  - If liquid has been supplied, or objects have fallen into the product.
  - If the product has been exposed to rain or water.
  - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
  - If the product has been dropped, or the cabinet has been damaged.
  - When the product exhibits a distinct change in performance-this indicates a need for service.
- 14. Replacement Parts**-When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original part.Unauthorized substitutions may result in fire, electric shock or other hazards.
- 15. Safety Check**-Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks to determine that the video product is in proper operating condition.
- 16. Wall or Ceiling Mounting**-The product should be mounted to a wall or ceiling only safety recommended by the manufacturer.
- 17. Heat**-The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

## TABLE OF CONTENTS

We urge you to carefully read all of the descriptions and operating procedures contained in this Owner's Manual before operating your new LSM104.

► CAUTIONS .....	2
► IMPORTANT SAFEGUARDS .....	3
► TABLE OF CONTENTS (THIS PAGE) .....	5
► FEATURES .....	6
► ACCESSORIES .....	7
► IDENTIFICATION OF LSM104 CONTROLS & CONNECTORS .....	8
► REMOTE CONTROL USE .....	9
► SIGNAL CONNECTION .....	11
► POWER CONNECTION .....	13
► DOME LIGHT CONNECTION .....	14
► SET UP FOR CAR USE .....	15
► LSM104 OPERATION .....	16
► MENU BUTTON - GENERAL INFORMATION .....	17
► MENU BUTTON - OPERATIONS .....	18
► PICTURE BUTTON .....	22
► STATUS BUTTON .....	23
► OTHER USEFUL FUNCTIONS .....	24
► RECEPTION DISTURBANCE .....	26
► TROUBLESHOOTING GUIDE .....	27
► SPECIFICATIONS .....	28

## FEATURES

- ❖ 10.4 INCH TFT LCD Panel
- ❖ 12 Volt DC Operation
- ❖ Wireless Remote Control
- ❖ Frequency Synthesizer Tuning System
- ❖ Full On-Screen Display of all Switching Functions
- ❖ Full On-Screen Display of all Picture Functions
- ❖ Automatic Power On, Automatic Power Off & Memory Power On Functions
- ❖ High Voltage Protection (Over 18 Volts DC)
- ❖ Polarity Reversal Protection
- ❖ Four Input Selections (Built-in TV Tuner, Stereo Audio/Video Inputs 1, 2, & 3)
- ❖ Low Level Stereo Audio/Video Output
- ❖ Powered Stereo External Speaker Output
- ❖ Built-In Stereo FM Transmitter with On-Screen Frequency Selection & Control
- ❖ Built-In Stereo IR Transmitter
- ❖ External Antenna Input
- ❖ 10-Year Memory Back Up
- ❖ 15' Extension Cable Supplies Power To & Receives Signal From KEC Mobile Applications VCP's

*The Remote Controller that is packaged with this unit will also control any KEC Mobile Applications VCP*

### NOTES:

#### Automatic Power On Function:

This system will automatically power on whenever the LCD screen is lowered to its viewing position.

#### Automatic Power Off Function:

This system will automatically turn off approximately 15 minutes after it last receives a video signal.

#### Memory Power On Function:

If this system was in power on mode when power was last removed (unplugged or ignition off), it will automatically turn on when power is reapplied.

## ACCESSORIES

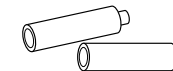
Please check to make sure that all of these items have been included:



◆ REMOTE CONTROL



◆ 12V DC Power extension cable



◆ BATTERIES (AAA × 2)



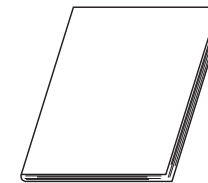
◆ External Speaker Extension Cable



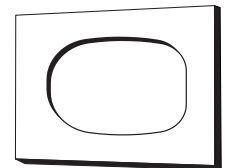
◆ A/V 1 EXTENSION CABLE  
(Design may vary with packaging)



◆ WARRANTY CARD  
◆ SAFETY TIPS

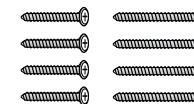
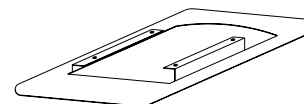


◆ OWNERS MANUAL



◆ CUTOUT TEMPLATE

The following optional accessory is available from KEC Mobile Applications and/or its distributors at additional cost:

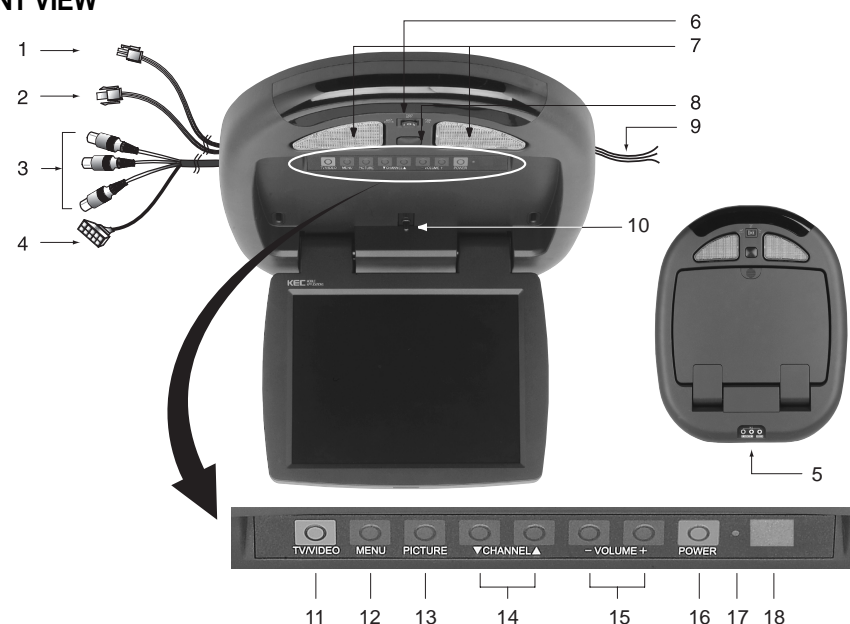


◆ HOUSING FRAME & INSTALLATION SCREWS

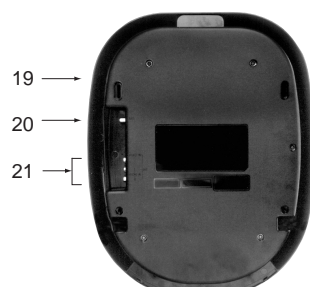
Other vehicle specific mounting and installation accessories may also be available.

## IDENTIFICATION OF LSM104 CONTROLS AND CONNECTOR

### ◆ FRONT VIEW



### ◆ REAR VIEW

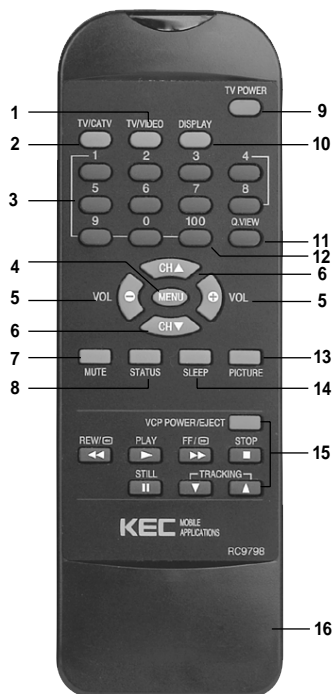


**Note :** The Volume (-/+) Keys are also used for picture adjustments and other MEMU items.

1. **DC INPUT JACK**  
For connection to source of 12 Volt DC power.
2. **EXTERNAL SPEAKERS OUTPUT CONNECTOR**  
Supplies 2.0 W/Channel @ 4Ω (variable) for connection of optional external speakers. Use with supplied External Speaker Extension Cable (L&R+ & Common Ground).
3. **L&R AUDIO/VIDEO (THROUGH) OUTPUT JACKS**  
Supplies L&R Audio and Video signal for connection to additional monitors, external amplifiers, etc.  
When the screen is lowered, these outputs always feed the signal from the selected input source.  
When the screen is in the closed position, these outputs always feed the signal from the program source connected to A/V1.
4. **AUDIO/VIDEO 1 EXTENSION CABLE CONNECTOR**  
For connection of supplied 15 foot L&R Audio/Video 1 Extension Cable. The Extension Cable receives A/V signals from and supplies 12 Volt DC Power & R-Link Connection to KEC Mobile Applications VCP's.
5. **AV3 INPUT JACK**  
For connection of a 3rd program source.
6. **LAMPS SWITCH**  
Selects lighting mode.
7. **LAMPS**  
Provides additional vehicle lighting.
8. **LCD PANEL DROP-DOWN BUTTON**  
Push to release LCD Panel from stored position.
9. **LAMP POWER INPUT WIRES**  
12V Constant, Chassis Ground & Door Switch.
10. **AUTO POWER SWITCH**  
Lowering LCD Panel automatically turns power on.
11. **TV/VIDEO BUTTON**  
Selects program source: Broadcast TV, A/V1, A/V2, A/V3.
12. **MENU BUTTON**  
Displays on-screen Main menu.
13. **PICTURE BUTTON**  
Displays on-screen Picture menu
14. **CHANNEL DOWN (▼), UP (▲) BUTTONS**  
Selects the next lower or higher channel stored in memory.
15. **VOLUME DOWN (▼), UP (▲) BUTTONS**  
Adjusts volume of [optional] speakers wired to External Speakers Output Connector (#2). Also used in conjunction with the on-screen menus.
16. **POWER BUTTON**  
Press to power the LCD Panel ON/OFF.
17. **STAND-BY INDICATOR**  
Illuminates to indicate that 12 Volt DC Power is available, but that LCD screen is not powered on.
18. **REMOTE CONTROL SENSOR**  
Receives control signals from the remote control hand unit. Also passes controls signals to a KEC Mobile Applications Videocassette Player that is connected via an R-Link cable.
19. **FM TRANSMITTER ANTENNA**  
Transmits low-power stereo audio signal for reception on vehicle's FM Radio.
20. **ANTENNA INPUT JACK**  
For connection of an external television broadcast antenna.
21. **L&R AUDIO/VIDEO 2 INPUT JACKS**  
For connection of a 2nd program source.

## REMOTE CONTROL USE

### ◆ Remote Control



1. **TV/VIDEO BUTTON**  
Press repeatedly to cycle program source selection between TV, A/V1 IN & A/V2 IN & A/V3 IN. This button is duplicated on the LSM104's Control Panel.
2. **TV/CATV BUTTON**  
Used to choose between regular broadcast television reception and cable broadcast reception. Pressing repeatedly cycles between "TV" and "CATV". The system must be in TV mode for this to function.
3. **DIRECT CHANNEL SELECTION (0 ~ 9) BUTTONS**  
Used for the direct selection of broadcast channels.
4. **MENU BUTTON**  
Press to call up an on-screen menu. Press again to advance to the next menu item. The selected item will be displayed in MAGENTA. If the final item in the menu list is selected, pressing again will remove the menu from the screen. This button is duplicated on the LSM104's Control Panel.
5. **VOLUME DOWN (▼), UP (▲) BUTTONS**  
These 2 buttons are primarily used in conjunction with the MENU (#4) and PICTURE (#13) buttons. However, if speakers are connected to the EXTERNAL SPEAKERS OUTPUT CONNECTOR, these buttons will also work to adjust their volume. These buttons are duplicated on the LSM104's Control Panel.
6. **CHANNEL DOWN (▼), UP (▲) BUTTONS**  
Press to view the next higher or lower channel stored in memory. These buttons are duplicated on the LSM104's Control Panel.
7. **MUTE BUTTON**  
Press to temporarily reduce sound to minimum level. Press again to restore sound.
8. **STATUS BUTTON**  
Press repeatedly to cycle between a user-adjustable picture and 3 different preset picture balances.

### 9. TV POWER BUTTON

Press to turn the LCD Panel ON/OFF. This button is duplicated on the LSM104's Control Panel.

### 10. DISPLAY BUTTON

Press to display the Program Source (A/V1, A/V2, A/V3 or Channel #) you are viewing and the setting of the SLEEP TIMER.

### 11. QUICK VIEW BUTTON

Press to cycle between the current and the previously viewed channel. The system must be in TV mode for this button to function.

### 12. 100 BUTTON

Used with Direct Channel Selection buttons for CATV channel numbers 100 and above.

### 13. PICTURE BUTTON

Press to call up the on-screen Picture Menu. Press repeatedly to select *Contrast*, *Brightness*, *Sharpness*, *Color*, *Tint* or *Display Off*. The selected item will be displayed in MAGENTA. Adjust the desired item with the VOLUME buttons.

### 14. SLEEP BUTTON

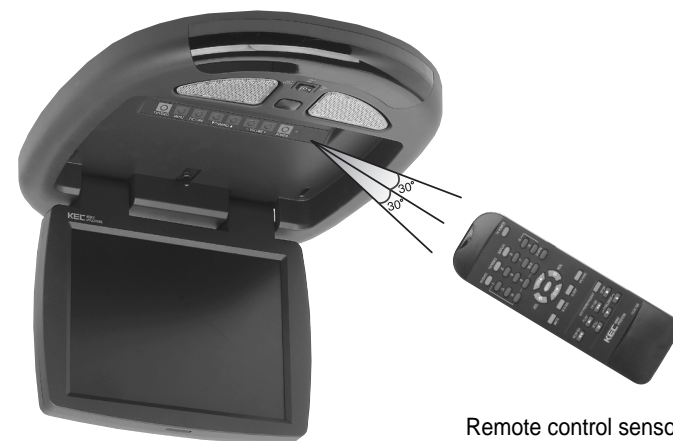
Sets the TV to automatically power off in 15-180 minutes.

### 15. VCP CONTROL BUTTONS

These 8 buttons will control any KEC Mobile Applications Video Cassette Player.

### 16. BATTERY COVER

## REMOTE CONTROL USE



### NOTES :

- ◆ The Remote control should be directed at the Remote Control sensor just below the LCD Screen as shown above.
- ◆ The maximum operating distance of the Remote Control is about 10 feet.
- ◆ The Remote Control should be kept away from UV exposure which may disrupt its operation.
- ◆ It may be difficult to receive Remote Control signal when UV is present. If this occurs, it will be necessary to operate it closer to the Remote Control Sensor.

### REMOTE CONTROL BATTERY INSTALLATION

It is time to replace the batteries when the remote control is not working properly.  
( Alkaline batteries usually last for 6 months to 1 year. )

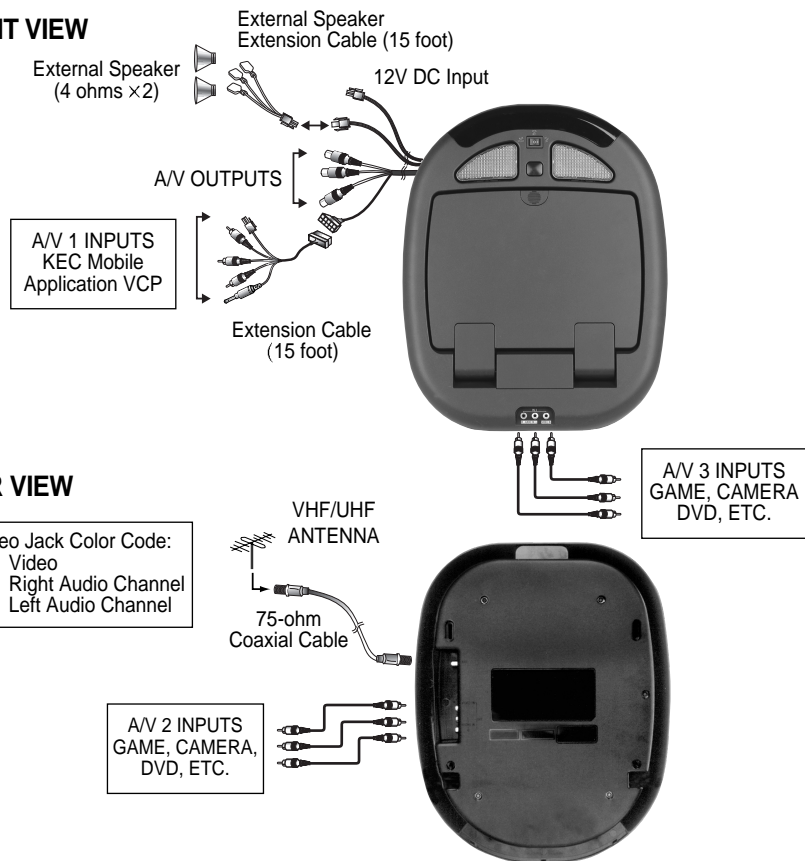
- ◆ Press down and push the battery compartment cover in the direction of the arrow and lift off.
- ◆ Install new batteries in the compartment. Be sure to observe the correct polarity (+/-) as indicated in the compartment.
- ◆ Use only new AAA batteries of the same type.
- ◆ If batteries become exhausted, remove them immediately to avoid leakage.
- ◆ Should battery leakage occur, clean the battery compartment with a soft cloth and replace with new batteries.

**CAUTION :** Avoid dropping the remote control.



## SIGNAL CONNECTION

### ◆ FRONT VIEW



### ◆ REAR VIEW

Audio/Video Jack Color Code:  
Yellow = Video  
Red = Right Audio Channel  
White = Left Audio Channel

Be sure to disconnect POWER *before* making any connections.

This illustration shows only one possible example of external equipment connection. For a more detailed understanding of each connection, please refer to the instruction manuals supplied with each component you plan to connect.

This 15 foot cable simplifies connection and installation of the primary program source. If a KEC Mobile Applications Videocassette Player is used as the A/V1 program source, only this single cable is needed as it supplies 12V power to and receives signal from the VCP.

Connector	Connect To
10-Pin Mate & Lock	LSM104 10-Pin Mate & Lock Connector
2-Pin Mate & Lock	KEC VCP 12V Power Input ( <i>Designed to provide power to KEC products ONLY</i> )
RCA Plug Yellow (Male)	A/V1 Video Output
RCA Plug Red (Male)	A/V1 Right Audio Output
RCA Plug White (Male)	A/V1 Left Audio Output
Mini Phone Plug (Male)	KEC VCP R-Link Input/Output

## SIGNAL CONNECTION (continued)

### SELECTING THE PROGRAM SOURCE

Press the TV/VIDEO button on the Remote Control or LSM104 Control Panel to select the desired program source. Repeatedly pressing the button will switch between inputs as follows:

Broadcast TV (built-in) → A/V 1 → A/V 2 → A/V 3 → Broadcast TV .....

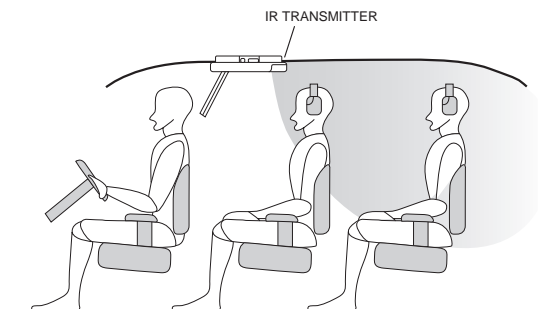
### AUDIO SYSTEM

- The Audio Outputs always feed a low-level audio signal from the selected input.
- The Audio Outputs feed a Monophonic signal whenever the selected input source has a Monophonic audio signal (e.g. a monophonic broadcast from the built-in TV Tuner, or the signal from a Monophonic VCP connected to the A/V 1, 2 or 3 input terminals).
- The Audio Outputs feed a Stereo signal whenever the selected input source has a Stereo audio signal (e.g. a stereo broadcast received by the built-in TV Tuner, or the signal from a Hi-fi Stereo VCP or DVD that is connected to the A/V 1, 2 or 3 input terminals).
- The EXTERNAL SPEAKERS OUTPUT CONECTOR feeds a high level mono or stereo signal whose level is Variable up to 2.0W maximum when connected to 4-ohm speakers.

### • IR (Infrared Rays) Transmitter

The built-in IR Transmitter allows you to listen to the Stereo or *Monophonic* audio signal from the selected program source (TV, A/V1, A/V2 or A/V3) on IR Wireless Headphones manufactured by Unwired® Technology LLC. We do not offer these headphones ourselves, but they are widely available under the Unwired® brand name. Headphones sold under other brand names that are compatible with Unwired® may also be used. The IR signal is always *live*.

### TRANSMITTER POSITIONING



### • Wireless FM Transmitter

The built-in FM Broadcast Transmitter allows you to listen to the Stereo or Monophonic audio signal from the selected program source (TV, A/V1, A/V2 or A/V3) on the FM Band of the vehicle's radio or on headphones equipped with an FM tuner. See page 20 of this manual for a full description and details of operation.

### VIDEO SYSTEM

This model incorporates 3 sets of STEREO AUDIO/VIDEO INPUTS (A/V1, A/V2, & A/V3 for direct) connection of up to 3 external program sources (Videocassette Player, Video Game, DVD Player, Camcorder, etc.). Direct connection results in superior video quality and should be used whenever the external program source provides direct outputs. Refer to the instruction manual supplied with each external instrument for details.

## POWER CONNECTION

### CONNECTING TO CAR POWER

From Vehicle Battery:  
RED: DC12V  
BLACK: GROUND



#### NOTE

The cable assembly used to connect the LSM104 to the 12Volt power supply varies depending on product packaging.

MANUFACTURER : TEASUNG ELECTRIC CO.,LTD. TYPE# : AWM STYLE 1015

#### WARNING

The DC Battery Cord is ONLY for use with this model. Do not use it to power any other product

## DOMELIGHT CONNECTION

### IMPORTANT NOTE - NEGATIVE & POSITIVE DOOR CIRCUITS:

The 3-wire harness for the LSM104's built-in dome lights is color-coded for use in vehicles that employ a **negative** door circuit. This includes most US and imported vehicles.

Most Ford Motor Company vehicles and some imported vehicles employ a **positive** door circuit.

First verify which type of circuit is used in the installation vehicle and then follow the instructions in the appropriate section below.

### (1) NEGATIVE Door Circuit

**Red wire** - Connect to 12V *unswitched* power.

**Black wire** - Connect to chassis ground.

This wire provides a ground. The lights will illuminate when the LSM104's 3-position dome light switch is in the ON position. Failure to connect this wire to ground will prevent the dome lights from illuminating with the switch in the ON position

**White wire** - Connect to *negative* door switch.

This wire will short to ground when a door is opened. The lights will illuminate if the LSM104's 3-position dome light switch is in the DOOR position.

### (2) POSITIVE Door Circuit

**Red wire** - Connect to chassis ground.

**Black wire** - Connect to 12V *unswitched* power.

If there is no constant power wire under the factory dome light, a constant power lead will have to be run to a source of unswitched 12V power.

**White wire** - Connect to *positive* door switch.

This wire will have 12V power when a door is opened.



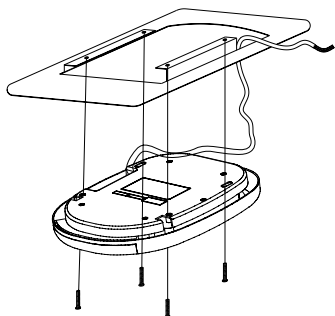
## SET UP FOR CAR USE

### 1. LSM104 INSTALLATION

#### WARNING:

UNDER NO CONDITION SHOULD THE LCD DISPLAY BE MOUNTED IN ANY POSITION WHERE A PICTURE MIGHT BE VISIBLE TO THE DRIVER. EVEN IN THOSE CASES WHERE SUCH AN INSTALLATION IS NOT PROHIBITED BY LAW, DOING SO MIGHT INCREASE THE LIKELIHOOD OF A SERIOUS ACCIDENT.

#### EXAMPLE(Using optional mounting bracket)



Install the unit with 4 screws.

- Use extreme care to insure that tools do not damage the unit.
- Use extreme care to insure that cutting tools and/or mounting screws do not contact, cut or drill through exterior body panels.

#### NOTES:

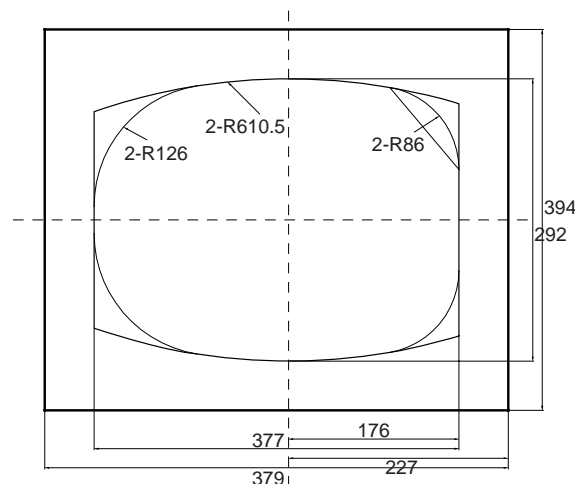
The DC Power plug should not be accessible to the consumer.

When the components are mounted with screws, be certain that the *minimum* thickness of the mounting material is as follows:

- Wood : 10mm or more
- Metal : 3mm or more
- Plastic : 4mm or more

### 2. LSM104 CUTOUT DIMENSIONS

A cutout template is packaged with this unit.



## LSM104 OPERATION

### 1. INITIAL PREPARATION

- Insert batteries into the Remote Control unit by following the procedure described in the "REMOTE CONTROL BATTERY INSTALLATION" section in this manual.
- Follow the procedure described in the "MENU OPERATION" and "AUTO PROGRAM" sections that follow to automatically scan and store active television channels into memory.

### 2. BASIC OPERATION PROCEDURE

1. Lowering the LCD Screen releases the AUTO POWER SWITCH (see item #10 on page 8) and turns power on. The input source last viewed will be automatically selected.

If the screen is already lowered but power has been turned off manually (or by the *AUTO POWER OFF* function), press the POWER button on the LSM104 Control Panel or remote control to turn power back on.

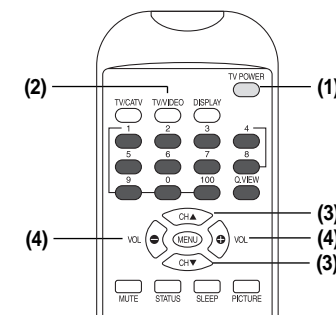
2. Press the TV/VIDEO button on the LSM104 Control Panel or Remote Control to select the desired mode (TV, VIDEO 1, VIDEO 2, VIDEO 3).

3. If TV mode has been selected, select the desired channel using the CHANNEL  $\nabla/\blacktriangle$  buttons on the LSM104 Control Panel or Remote Control. Pressing the  $\nabla/\blacktriangle$  buttons advances to the next lower or higher channel stored in memory.

Channels can be selected directly by using the 10-digit Keypad on the Remote Control. Example: To select Channel 5, press "0" first, then press "5". (If "0" is not pressed first, there will be a delay of about 5 seconds before the channel changes.)

4. If external speakers are connected to the EXTERNAL SPEAKERS OUTPUT CONNECTOR, the VOLUME  $-/+$  buttons on the Remote Control may be used to adjust the speaker's volume.

The volume level will be shown on the screen with a bar scale and a reference number (0-100) as shown.



VOLUME 33



**NOTE :** The volume level can be muted instantly by pressing the MUTE button on the Remote Control. See "MUTE Button" on page 25.

## MENU BUTTON - GENERAL INFORMATION

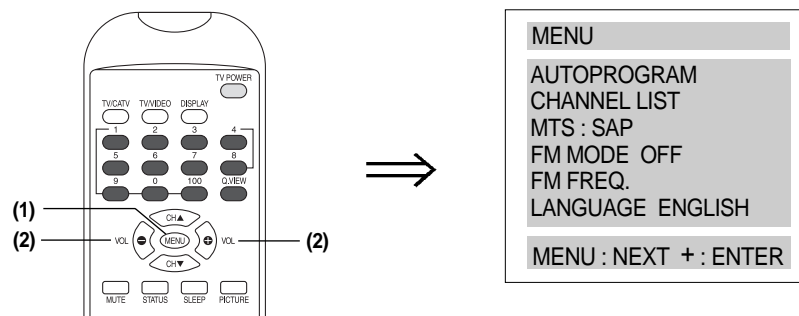
### On-Screen Display

- On-screen displays automatically disappear after about 5 seconds if no selection is made.

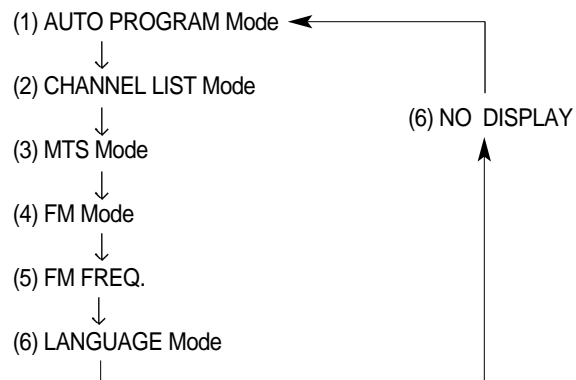
The MENU button gives you access to a variety of TV and Monitor functions.

- Press the MENU button on the Remote Control.

The first time it is pressed, the following display appears on the screen.



Press the MENU button repeatedly to select the desired item for adjustment. Each time the button is pressed, the selected item will change from WHITE to MAGENTA, indicating that it may be adjusted.



- After selecting the desired mode, press the VOLUME + button on the Remote control.

**NOTE:** TV Broadcast related items -- AUTO PROGRAM, CHANNEL LIST & MTS -- are only shown in the MENU display if the LSM104 is set to TV Mode.

## MENU BUTTON - OPERATIONS

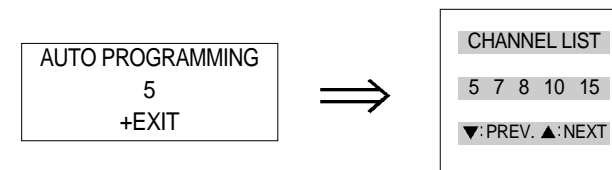
### (1) AUTO PROGRAM

This function allows automatic memorization of all the active TV channels in your viewing area. Once memorized, channels can be selected with the CHANNEL ▼/▲ buttons on the Remote Control or on the LSM104's Control Panel.

To activate AUTO PROGRAMMING.

- Press the MENU Button until "AUTO PROGRAM" is selected,
- Then press the VOLUME + button.

The following display will appear and the program set-up procedure will begin automatically.



All possible channels will be rapidly scanned and all active channels will be memorized.

- Note that very weak broadcast signals will not be memorized.
- If you wish to stop the Auto Programming procedure before it is finished, press the VOLUME (+) button.

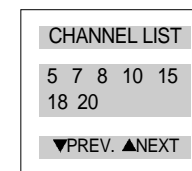
### (2) CHANNEL LIST

You will note that the AUTO PROGRAM procedure generates and displays a CHANNEL LIST of the active channels which have been stored in memory.

You may select channels directly from this list as follows:

- Press the MENU Button until "CHANNEL LIST" is selected,
- Then press the VOLUME + button.

A display of channels will appear:



Press the CHANNEL ▼/▲ buttons to select the channel you wish to view.

## MENU BUTTON - OPERATIONS

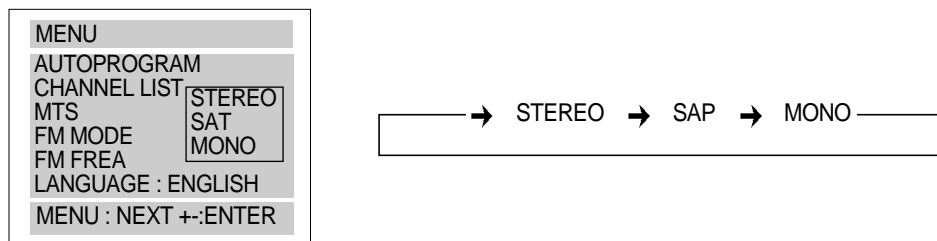
### (3) MTS

Your TV set incorporates an MTS(Multichannel Television Sound) decoder to receive stereo broadcasts and any accompanying SAP (Second Audio Program), such as a bilingual broadcast.

The sound will be available :

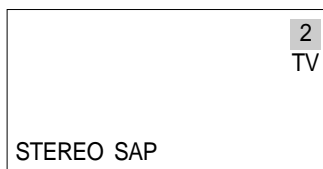
1. Press the VOLUME+ button

To change the reception mode among "STEREO", "SAP", "MONO" Whenever this button is pressed, the mode will be changed as follows.



In this mode, the STEREO, SAP indicates that MTS mode is being broadcasted.

When the power is switched-on or channel is changed, the STEREO, SAP symbol is automatically displayed, depending on the current broadcast.



#### NOTES:

- If the received signal is weak, noise may be heard.  
In such a case, press VOLUME+ button to set the MONO mode for better sound reception.
- If the received SAP signal is weak, the SAP will not be heard.
- Even if both STEREO and SAP broadcasts are received, both broadcasts cannot be heard at a time.
- Transmission of CABLE TV signals differ from off-air TV broadcasts.  
It is possible the TV sound(MTS) may not be received satisfactorily.

## MENU BUTTON - OPERATIONS

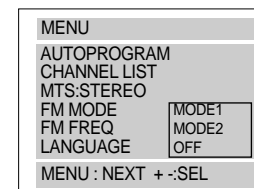
### (3) FM BROADCAST MODE & FM FREQUENCY

This function allows you to listen to the audio signal from the selected program source (TV, A/V1, A/V2, or A/V3) on the vehicle's radio.

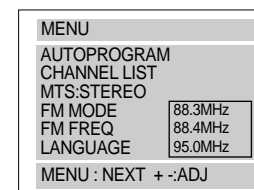
#### Procedure

1. Press the MENU button as many times as necessary to select "FM MODE".
2. Press the VOLUME + button as many times as necessary to set FM MODE as desired to: "OFF", "MODE1" or "MODE2".
3. If "MODE1" was set in Step 2 above, press the MENU button again to select "FM FREQ.", then press the VOLUME -/+ buttons repeatedly to choose one of 4 preset FM Frequencies: 88.3MHz, 88.7MHz, 89.1MHz or 90.3MHz.

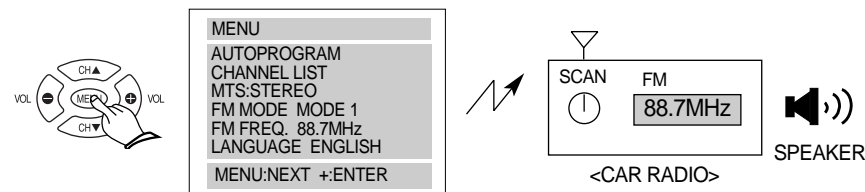
— OR —



If "MODE2" was set in Step 2 above, press the MENU button again to select "FM FREQ.", then press the VOLUME -/+ buttons to choose any FM Frequency from 88.3MHz to 95.0MHz in 0.1MHz (100KHz) increments.



4. Tune the vehicle's radio to the frequency chosen in Step 3 above.  
It may be necessary to repeat Step 3, choosing a different frequency each time, before you are able to receive a satisfactory signal. The best signal is usually obtained by choosing a frequency that is not actively broadcasting in your area. Also note that better results may be obtained if the vehicle's antenna can be lowered independently.



Example - Receiving Audio through the FM Radio at 88.7MHz.

#### NOTE

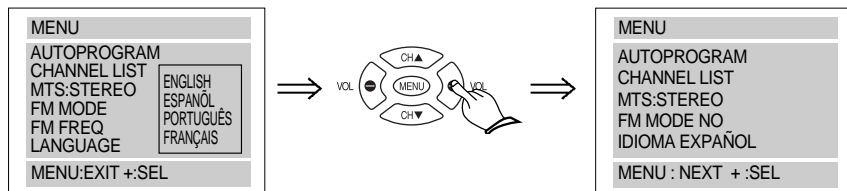
The FM Transmitter Antenna (Page 8#9) should be installed in the direction of the vehicle's main FM Antenna.  
Never adjust the LA01 coil on the FM Transmitter board. It was optimally adjusted at the factory.

## MENU BUTTON - OPERATIONS

### (4) LANGUAGE

The on-screen displays may be set to appear in your choice of 4 languages - English, Spanish, Portuguese or French.

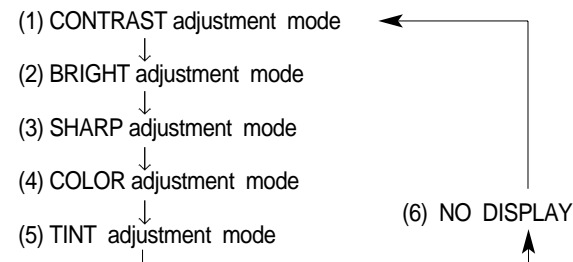
1. Press the MENU button repeatedly until "LANGUAGE" is selected.
2. Press the VOLUME + button as many times as necessary to select between "ENGLISH", "ESPAÑOL", "PORTUGUÊS" and "FRANÇAIS".



## PICTURE BUTTON

The PICTURE button allows you select each picture adjustment element.

- Press the PICTURE button on the Remote Control to bring up the PICTURE Menu.
- Press the PICTURE button repeatedly to select the items you wish to adjust.
- The selected item will change from CYAN to RED, indicating that it may be adjusted.

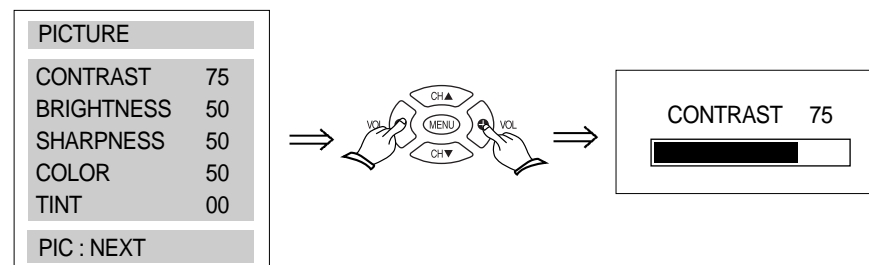


- After selecting the desired mode, press the VOLUME -/+ buttons to adjust the picture as you prefer according to the chart below.:

VOL -	ITEM	VOLUME +
LIGHT	CONTRAST	STRONG
DARK	BRIGHT	BRIGHT
SOFT	SHARP	SHARP
SUBDUED	COLOR	VIVID
REDDISH	TINT	GREENISH

### Example - Adjusting CONTRAST

1. Press the PICTURE button on the remote control to display the picture menu.
2. Press the VOLUME -/+ buttons to call up and adjust the CONTRAST bar display.



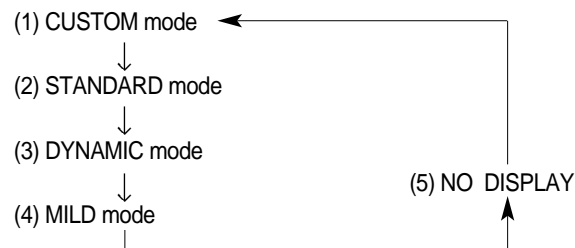
### NOTES ON THE PICTURE FUNCTIONS:

- Picture adjustments are only memorized if the STATUS Mode (see next page) is set to "CUSTOM".
- Color LCD screens operate differently than conventional color picture tubes. As you operate the picture controls, you will notice that the range of adjustment is somewhat less dramatic than would occur with a conventional picture tube.

## STATUS BUTTON

The STATUS button on the Remote Control lets you select between a CUSTOM adjustable picture setting mode or any one of 3 factory preset picture modes.

- Pressing the PICTURE button repeatedly changes the mode as follows:



MODE	PICTURE
CUSTOM	Select this mode to view a picture that may be adjusted to your own personal taste. <i>Note: While picture adjustments may also be made in the other 3 modes, adjustments will only be stored in memory in CUSTOM mode.</i>
STANDARD	Select this mode to restore picture adjustments to the normal factory-preset mode.
DYNAMIC	Select this mode to view a powerful and clear picture. This mode is intended especially for viewing in brighter (daylight) environments.
MILD	Select this mode to view a milder picture. This mode is intended especially for viewing in darker (nighttime) environments or to lessen eye fatigue.

## OTHER USEFUL FUNCTIONS

### (1) QUICK VIEW Button

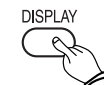
Press the Q. VIEW button on the Remote Control.



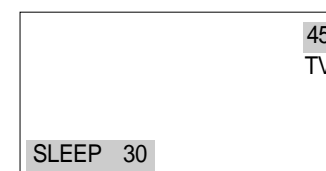
The previously viewed channel will appear on the screen. Press Q.VIEW again to switch back to the original channel.

### (2) DISPLAY Button

Press the DISPLAY button on the Remote Control.



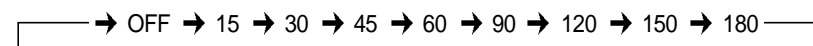
The Program Source (Channel #, A/V1, A/V2 or A/V3) you are viewing and the setting of the SLEEP TIMER will be displayed as shown.



### (3) SLEEP Button

You can select a time period between 15 and 180 minutes after which the LSM104 will automatically switch to power-off mode.

Repeatedly pressing the SLEEP button on the Remote Control cycles the SLEEP timer as shown below.



#### NOTE :

To cancel the sleep timer function, press the SLEEP button repeatedly until the word "SLEEP OFF" is displayed.

## OTHER USEFUL FUNCTIONS

### (4) MUTE Button

Press the MUTE button on the Remote Control.

Audio from any speaker(s) attached to the EXTERNAL SPEAKER OUT JACK will be reduced to near zero and "MUTE" will appear on the screen.

Pressing the MUTE button again will restore the audio to its original level.



### (5) NOISE TIME Mode(Automatic power shut-off)

If the system is not switched off when a TV Station stops broadcasting, (or any other program source ends) the system will automatically go to power off mode after approximately 15 minutes have passed.

## RECEPTION DISTURBANCE

The most common types of television interference are as follows :



#### IGNITION NOISE:

Black spots or horizontal lines may appear, picture may flutter or drift. Usually caused by interference from automobile ignition systems, neon lamps, electric drills and other electric appliances.



#### GHOSTS :

Ghosts are caused by the television signals following two paths. One is a direct path and the other is reflected from tall buildings, hills or other objects. Changing the direction or position of the antenna may improve the reception.



#### SNOW :

If you are located on the fringes of a television reception area, the signal will be weak, and your picture may contain many small dots. When the signal is extremely weak, it may be necessary to install an external sensitive antenna to improve the picture.



#### RADIO FREQUENCY INTERFERENCE :

This interference produces moving ripples or diagonal streaks, and in some cases causes loss of contrast in the picture.

#### IMPORTANT NOTE :

WHEN USED IN A VEHICLE, THIS SYSTEM IS INTENDED PRIMARILY AS A MONITOR FOR A VIDEO CASSETTE PLAYER, VIDEO GAME, OR CAMERA. TELEVISION BROADCAST RECEPTION WILL BE ADVERSELY AFFECTED BY CONDITIONS SUCH AS MOTION, CHANGE OF DIRECTION, ATMOSPHERIC ACTIVITY, AND LOCAL SURROUNDINGS. IT IS THEREFORE LIKELY THAT BROADCAST PICTURE QUALITY WILL BE MARGINAL WHEN THIS SYSTEM IS USED IN A MOBILE ENVIRONMENT.



## TROUBLESHOOTING GUIDE

Before requesting service, please refer to the following chart for the symptom and possible solution.  
For more information, see the corresponding page in this manual.

SYMPTOM	CHECKING POINTS
No image, no sound	<ul style="list-style-type: none"> <li>Is the system receiving power? (page 12)</li> <li>Is the TV/VIDEO selector set properly? (page 15)</li> <li>Are connections to other equipment properly made? (page 11~12)</li> </ul>
Sound but no image	<ul style="list-style-type: none"> <li>Are contrast and brightness adjusted properly? (page 19)</li> <li>Are video connections from other equipment properly made? (page 11~12)</li> </ul>
Noisy picture	<ul style="list-style-type: none"> <li>Is antenna cable connected properly? (page 11)</li> <li>Is broadcast signal strong enough for proper reception?</li> </ul>
No sound or volume control does not operate	<ul style="list-style-type: none"> <li>Is a speaker connected?</li> <li>Is MUTE set to on?</li> <li>Are audio outputs properly connected? (pages 12, 15, 22)</li> </ul>
Poor color	<ul style="list-style-type: none"> <li>Are COLOR &amp; TINT adjusted properly? (page 19)</li> </ul>
Unstable picture on screen	<ul style="list-style-type: none"> <li>Is antenna cable connected and located properly? (page 11)</li> <li>Is broadcast signal strong enough for proper reception?</li> </ul>
Spots on the screen	<ul style="list-style-type: none"> <li>Is there any interference from high voltage wires, or passing vehicles?</li> </ul>
Ripple on the screen	<ul style="list-style-type: none"> <li>Is there any interference from FM Radio or wireless telephones?</li> </ul>
Multiple image or ghosts on the screen	<ul style="list-style-type: none"> <li>Is the antenna located properly? (page 11)</li> <li>Are delayed reflected signals being received from tall buildings or mountains?</li> </ul>
Remote Control operating poorly or not at all	<ul style="list-style-type: none"> <li>Is remote control aimed at the remote sensor?</li> <li>Are there any obstacles between remote control and remote control sensor?</li> <li>Is Remote control within working distance?</li> <li>Are batteries fresh and inserted properly? (page 10)</li> </ul>
Power Off	<ul style="list-style-type: none"> <li>Has there been a no-signal condition for 15 minutes or more? (page 6)</li> <li>Is the system receiving power? (page 13)</li> <li>Are any external fuses blown?</li> </ul>

**NOTICE :** For additional information or the location of an authorized service center please contact  
KEC Mobile Applications/KTV Inc. at (800) 524-1216 or (973) 470-9191.

## SPECIFICATIONS

ITEM	SPECIFICATION	
<b>GENERAL</b>	Display Panel	10.4 Inch TFT LCD
	Television System	NTSC-M
	Tuning System	Frequency Synthesizer
	Receiving Channel	VHF 2~13/UHF 14~69/+113 CATV
	Antenna Impedance	UHF/VHF 75 Ohm
<b>DISPLAY SCREEN</b>	High Resolution Picture	800H × 600V=48,000Pixels
	<b>Contrast Ratio</b>	<b>300:1 Typical</b>
	Pixel Pitch	0.264 × 0.264(mm)
	Pixel Configuration	RGB Stripe Arrangement
	<b>LCD Panel Dimension(WHD)</b>	<b>9.6" × 6.8" × 0.24(244.0mm × 172.0mm × 6.1mm)</b>
	Active Screen Area	8.3" × 6.2" √(211.2mm H × 158.4mm V)
	<b>Off Axis Viewing Range</b>	<b>Horizontal: ± 60° / Vertical: 50° UP, 50° Down</b>
	Operating Temperature	0°C~50°C / 32°F~122°F
<b>VIDEO</b>	Operating Humidity	35% ~ 85%
	Power Source	<b>DC 12Volt(Car Battery)</b>
	Power Consumption	<b>22W(DC 12V)</b>
	Input Level	1.0 ± 0.1 Vp-P(75 Ω Load)
<b>AUDIO (ALL STEREO)</b>	Output Level	1.0 ± 0.1 Vp-P(75 Ω Load)
	Input Level	400 ± 50mVrms(RCA Jacks)
	Output Level	400 ± 50mVrms(RCA Jacks)
	External Speaker Outputs	2.0W × 2 @ 4 Ω , <10% THD(Variable)
		<10mVrms Hum / <200mVrms Buzz
	Wireless IR Transmitter	Compatible With Most IR Headphones
	Wireless FM Broadcast Modulator	Off+4Preset Frequencies+Any Frequency Between
		<b>88.3MHz~95.0MHz In 100 kHz Steps</b>

### ACCESSORIES

<b>Supplied</b>	Unified Remote Controller (LSM-104 + KEC Mobile Applications VCP'S); AAA Cells ×2; A/V 1 Extension Cable; 12V DC Input Power Extension Cable; External Speakers Extension Cable; Installation & Operating Manual; Installation Template; Warranty Card
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