# MZC-66

*Multi-Zone Audio/Video Amplifier Controller*

**SpeakerCraft**

**ABOUT MZC-66 QUICK START GUIDE**

MZC-66 QUICK START GUIDE is intended to provide top-level instructions for Installation, Configuration and Connection of a SpeakerCraft MZC-66 System. MZC-66 Quick Start focuses on a MZC-66 'default' system, that is, a basic six zone system that includes up to six audio/video sources, that matches the MZC-66 default project included in the EZ-Tools download. This Quick Start Guide can also be used for getting more sophisticated systems started, but when planning and installing expanded systems with multiple controllers, external amplifiers, multi-room zones or when changing the layout of the keypad buttons, it is highly recommended that the MZC-66 Hardware Installation Instructions be used for reference and guidance. Additionally, the Hardware Installation Instructions provide much greater detail in regard to instructions given here. MZC-66 Hardware Installation Instructions are available as a download from www.speakercraft.com.

Once a MZC system has been installed, though capable of some basic functions out of the box such as ON/OFF, Source Selection and Volume/Mute, configuration of MZC-66 advanced features requires Speaker-Craft EZ-Tools Programming Software. EZ-Tools and the EZ-Tools MZC Programming Instructions can be downloaded from: www.speakercraft.com.

## MZC-66 FEATURES-FRONT PANEL
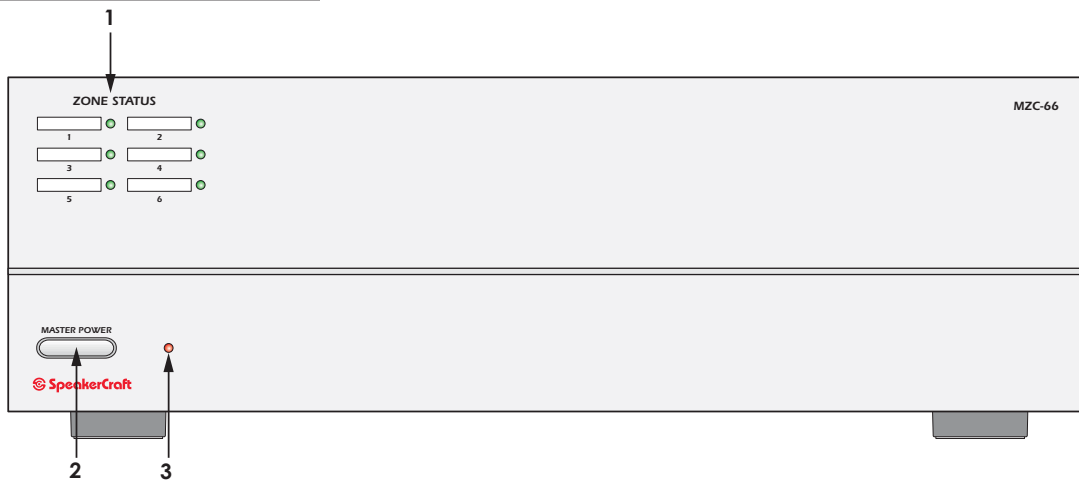


1. **ZONE STATUS LED Indicators and Labels –** Six, green LEDs indicate the zones that are currently active. Indented spaces accept adhesive backed labels for zone/room identification. A sheet of descriptive labels, typical of room or area names used in homes, is included.
2. **MASTER POWER Switch –** When pressed to the in position, the MZC-66 is placed in the power ON standby condition, permitting individual zones to be turned ON and OFF by keypad or touch panel commands. In the OFF (out) position, power from the AC mains is completely turned off.
3. **Red Indicator LED –** Indicates when the Master Power Switch is in the depressed position and that power has been applied from the AC mains.

## MZC-66 FEATURES-REAR PANEL
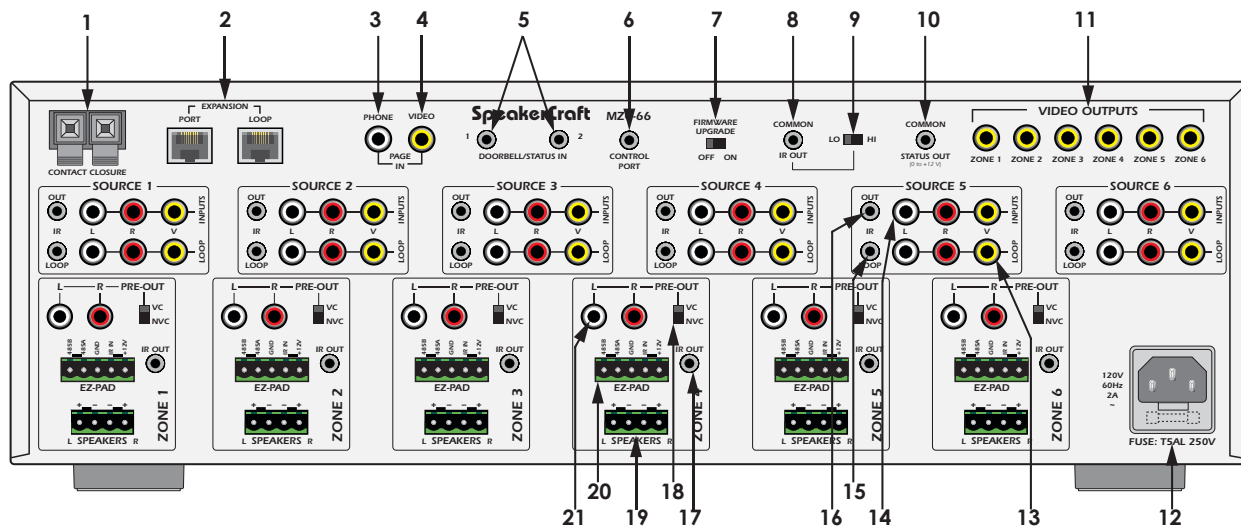


1. **CONTACT CLOSURE –** One, single pole dry relay contact used to activate any device that can be controlled or triggered by a switch closure. The closure can be programmed within EZ Tools for Momentary, Toggle and Open/Close Paired operation. Spring loaded terminals accept wire sizes from 28 to 14 AWG. Internal relay contacts are rated at 2A/30V AC or DC.

2. **EXPANSION PORT/LOOP –** Two, RJ45 jacks primarily used for looping system data to multiple MZC-66's in expanded systems. These jacks can also be used for connection of specialized RS485 controlled products such as the SpeakerCraft MODE Adapter/Base for adding iPods and SpeakerCraft RSA-1.0(s) for control of multiple RS232 devices.

3. **PHONE PAGE IN –** One, RCA jack provides input for line level audio from sources such as telephone systems, door mics or other audio paging devices. This jack is programmable in EZ Tools, to turn on as an Event, when triggered by the DOORBELL/ STATUS IN Jacks, item 5.

4. **VIDEO PAGE IN –** One RCA jack provides input for composite video from doorbell paging systems, cameras or other composite video sources. This jack is programmable in EZ Tools, to turn on as an Event, when triggered by the DOORBELL/ STATUS IN Jacks, item 5.

5. **DOORBELL/STATUS IN 1 & 2 –** Two, 3.5mm mini jack trigger inputs work in conjunction with the PHONE and VIDEO PAGE IN jacks, items 3&4. When triggered, the Page Inputs can be turned on in selected zones as programmed in **EZ Tools**. If Paging is not required, these jacks can also be programmed as STATUS INPUTS for power management of Source or Zone components. **POLARITY:** TIP= +V; SLEEVE=GND. **INPUT VOLTAGE:** 3-30V AC or DC to trigger the ON condition. Voltage must drop below 1V AC or DC for OFF.

6. **CONTROL PORT –** One, 3.5mm 4-circuit mini jack used for all Controller and Keypad programming. It also accommodates factory firmware upgrades in conjunction with the **FIRMWARE UPGRADE ON/OFF SWITCH.** See: **EZ Tools MZC Programming Instructions** for additional information. This port also serves as a bi-directional RS-232 serial interface allowing the MZC-66 system to be controlled by external devices.

7. **FIRMWARE UPGRADE ON/OFF SWITCH –** One, two position switch enables the MZC-66 Control Port for Firmware Upgrades. See: **EZ Tools MZC Programming Instructions** for additional information.

8. **COMMON IR OUTPUT –** One, 3.5mm mini jack outputs all IR commands from IR sensors and Keypads regardless of zone origin. **POLARITY:** TIP=SIGNAL; SLEEVE=GND.

9. **HI/LO SWITCH –** One, two position switch, sets high or low IR power output to the Common IR Output jack. Set to the **LO** setting when driving standard low power emitters (SpeakerCraft IRE-1.0, 2.0, 3.0 and 4.0). Set to **HI** when driving a high power emitter (SpeakerCraft IRE-5.0 Blaster) for teaching IR commands into learning remotes. **HI OUTPUT:** 110mA; **LO OUTPUT:** 13mA. **CAUTION:** The **HI** position will smoke low power emitters!

10. **COMMON STATUS OUT –** One, 3.5mm mini jack will go high (+12V DC) when any zone is turned ON and will go LOW (under 1V DC) when the last zone is turned OFF. **POLARITY:** TIP=+12V DC; SLEEVE=GND. **MAX OUTPUT:** 100 mA at 9.5V DC.

11. **VIDEO OUTPUTS –** Six, RCA jacks provide a dedicated composite video output, one for each Zone. 75 ohm outputs provide matched line impedance for high quality video over RG6 coax for lengths up to 500 feet.

12. **IEC TYPE AC MAINS RECEPTACLE AND FUSE –** One, Standard IEC 3-conductor AC line cord receptacle, connects to included AC power cord. Also houses the rear panel replaceable AC mains fuse (T5AL 250V).

13. **L, R & V LOOP (Source Left/Right Audio/Video Loop) –** Eighteen, RCA jacks, three per Source, provide buffered left and right line-level audio and composite video outputs that are typically used to loop Source Audio signals to additional zone inputs on Slave MZC-66's in expanded systems. i.e. The L, R, V LOOP on the MZC Master would connect to the appropriate L, R, V INPUT on MZC Slave 1. Slave 1 would then loop to Slave 2, etc. These outputs can also be used to drive local components, such as a local surround receiver, when not used for expansion.

14. **L, R & V INPUT (Source Left/Right Audio/Video Input) –** Eighteen RCA jacks, three for each Source, provide left and right line-level audio and composite video signal inputs for up to six external common source components.

15. **IR LOOP –** Six, 3.5mm mini jacks, one per Source, provide connections for an IR signal path for external common source components, when using multiple MZC-66's in expanded systems. i.e. If using two MZC-66s, the SOURCE IR OUTS on the MZC Slave unit would connect to the appropriate SOURCE IR LOOPS on the MZC Master unit to pass Source IR commands between controllers from expanded zones. The IR OUTS on the Master connect to IR EMITTERS attached to the source components for source IR control from all zones. **POLARITY:** TIP=SIGNAL; SLEEVE=GND.

16. **IR OUT (Source) –** Six, 3.5mm mini jacks, one per Source, output IR commands to external common source components. When a source is selected, from a keypad or remote control, IR commands are routed directly to that source. This allows selective control of multiple same-brand, same-model source components (multiple Satellite Receivers, DVD Players etc). **POLARITY:** TIP=SIGNAL; SLEEVE=GND.

17. **IR OUT (Zone) –** Six, 3.5mm mini jacks, one per zone, provides dedicated Zone IR output for exclusive control of a specific zone component. (i.e., a dedicated satellite receiver or DVD player, that cannot be controlled from any other zones). **POLARITY:** TIP=SIGNAL; SLEEVE=GND.

18. **VC/NVC –** Six, two-position switches, one per zone, switch the PRE-OUT jacks to **VC** - internal Volume Control (variable, zone volume controlled by keypads or IR remote) or **NVC** - No Volume Control (fixed, zone volume controlled by in-wall volume control or volume control on an external device such as an A/V Receiver). In either case, the tone control action remains available for room "EQ" settings.

19. **L & R SPEAKERS –** Six, removable screw-down connectors, one terminal per zone, provide quick connection of the internal amplifiers to Zone stereo speaker pairs. **WIRE GAUGE:** 14 to 24 AWG.

20. **EZ-PAD –** Six, removable screw-down connectors, one per zone, connect zone keypads to the MZC via CAT5 or better. Standard five conductor wire (24-14AWG, stranded, non-sheilded) can also be used in retro-fit applications. Allows runs of up to 1000'. See section: **Keypad Connections** for additional information.

21. **L & R PRE-OUT –** Two, RCA jacks, one pair per Zone, provide left and right line-level audio outputs for driving external high-power/audiophile two-channel amplifiers in large or outdoor zones or a critical listening zone, or driving a multi-channel amplifier for additional rooms, (sub-zone expansion) where needed.

# MKP-1.1 FEATURES

The MZC-66 System can be controlled using SpeakerCraft EZ-Pads, IMKPs and MODE 3.1s. Keypad configurations vary from system to system and some parts may need to be ordered separately.
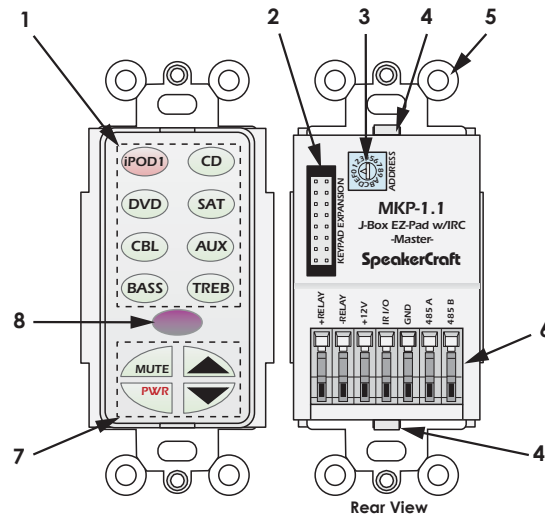
Each keypad comes with a set of factory installed "default buttons" plus a good variety of loose buttons packed with them. The default buttons can be easily changed to meet the needs of the installation. For more information on changing keycaps, see: **MZC-66 Hardware Installation Instructions**. The MKP-1.1 shown reflects the Source configuration of the EZ Tools MZC-66 Default Project.

A Function Module (FKP-1.0) and Numeric Module (NKP-1.0) are available options for additional control capability, however, a MKP-1.1 or MKP-1.0 Master Keypad is required for each zone as the NKP-1.0 and FKP-1.0 will not function on their own. See: **MZC-66 Hardware Installation Instructions** for additional information.
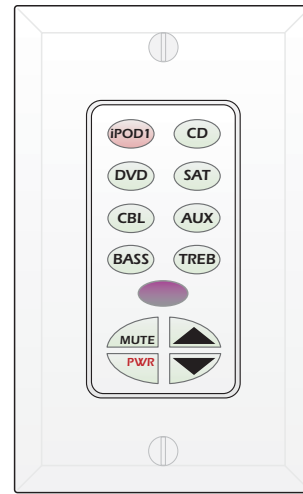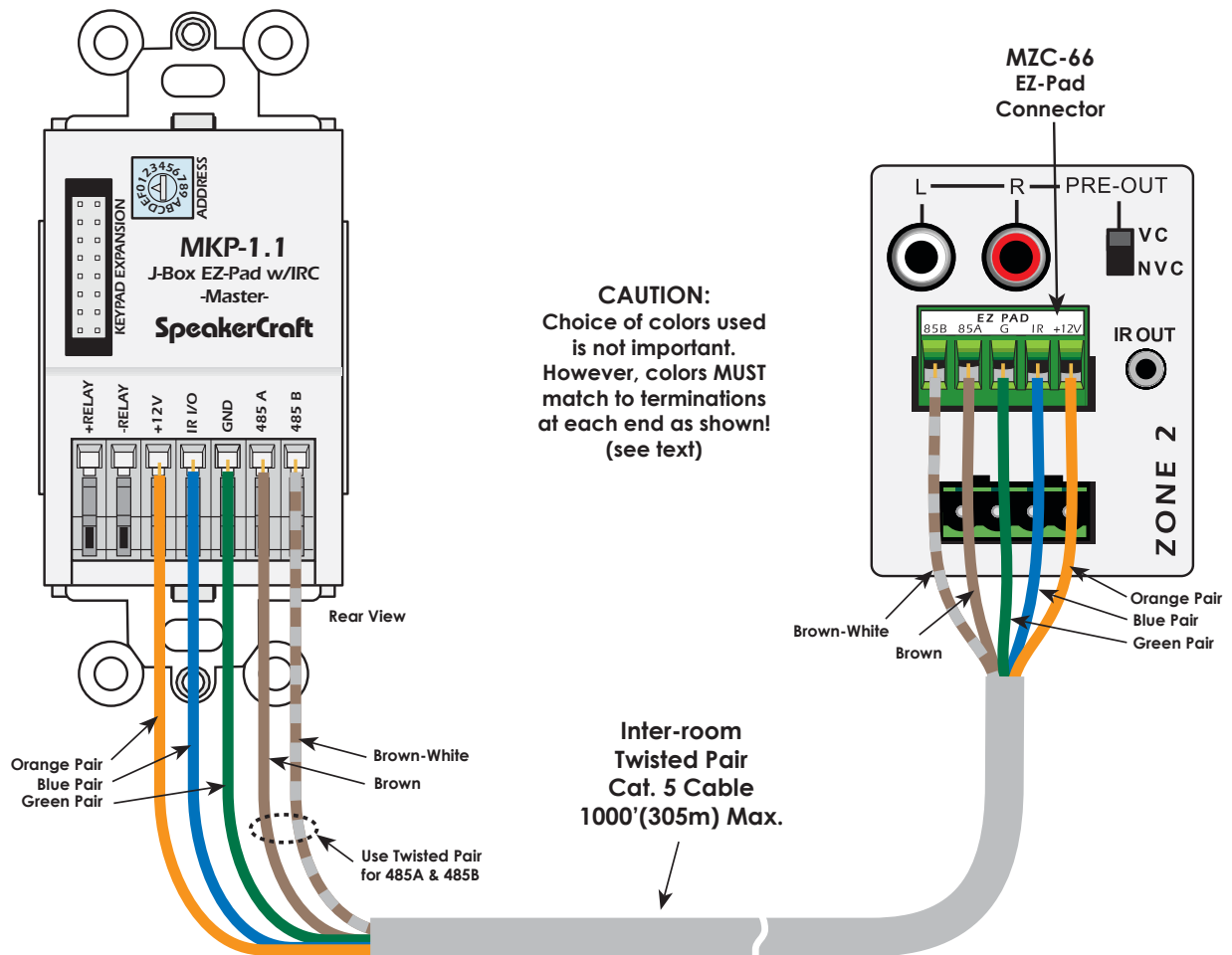


**MKP-1.1**
**With Trim Plate (Not Included)**



**MKP-1.1 Master Keypad**

1. **MKP-1.1 Source/Function Buttons –** When used with MZC-66, up to six of this set of eight buttons may be programmed as Source Selects for the MZC-66. Any mix of source/transport/function buttons is allowed as long as one of the eight is designated as a Source Button. All buttons have an optional green backlight, configurable in EZ Tools. Default timeout is 60 sec. When a Source Button is pressed, it turns to a low-level red color to show that it is the active source and the system is on.

2. **KEYPAD EXPANSION Terminal –** This 16-pin header terminal is used to inter-connect the NKP-1.0 and FKP-1.0 modules for numeric and function key expansion as needed. A ribbon cable is packed with each NKP-1.0 and FKP-1.0 for making these connections.

3. **ADDRESS Switch –** An unique hex address must be set for each master keypad when connected on a common bus within a single zone. Unique addresses are not required zone-to-zone. (One keypad per zone.) It provides up to 16 addresses (0 to F).

4. **Snap Tabs –** These tabs hold the decorator style insert panel to the metal mounting plate and are easily released for custom changing of the buttons.

5. **Mounting Plate –** Standard plate allows the keypad module to be attached to standard in-wall J-Boxes using the 2 screws provided. Allows attachment of standard decorator type cover plates (also screw-less snap-on plates).

6. **EZ-Connect Terminals –** These spring-loaded terminals accept wire sizes 14 to 28 AWG for connection of the following:
   **+Relay/–Relay –** For connection of an optional **EPR-1.0** EZ-Pad Relay Speaker Muting Module. See MZC-66 Hardware Installation Instructions for additional information.
   **+12V DC –** Powers the Keypad, including the internal IR Receiver. Includes reverse voltage protection.
   **IR/IO (Data) –** Sends IR control signals for control of system components.
   **GND –** Return for Power, IR signal and Data
   **485 A/485 B –** Balanced, bi-directional system communications data.

7. **Function Buttons –** These lower 4 buttons (5 buttons in the case of the MKP-1.0) can be programmed for any function except source select.

8. **IR Receiver Lens –** EZ-Pad version MKP-1.1 includes SpeakerCraft's exclusive ANS IR Receiver, built-in. The IR Receiver allows use of a handheld remote for control of system components.

# KEYPAD CONNECTIONS



**CAUTION:**
Choice of colors used is not important. However, colors MUST match to terminations at each end as shown! (see text)

Rear View

Orange Pair
Blue Pair
Green Pair

Brown-White
Brown

Use Twisted Pair for 485A & 485B

Inter-room Twisted Pair Cat. 5 Cable 1000'(305m) Max.

MZC-66 EZ-Pad Connector

Brown-White
Brown

Orange Pair
Blue Pair
Green Pair

**CAT-5 WITHOUT RJ45 CONNECTORS –** Connect **EZ-Pads** to MZC-66 as shown above. Be sure to maintain consistent color code when making connections. For **IMKP,** use same pin-out. See **MODE 3.1 Installation Instructions** for plug-in connector and RJ45 pin-outs. Maximum recommended lead length with CAT-5 cable is 1000' (305m). (MODE, 500')



**CAT-5 WITH RJ45 CONNECTORS (EZ-Pad Only) –** When using RJ45 connectors, connect the CAT-5 cable to the keypads using SpeakerCraft model **RJA-1.1** RJ45-TO-WIRE PIN ADAPTERS. Insert the RJA-1.1 pins into the keypad's EZ-Connect Terminals and snap the levers in place. Be sure RJA-1.1 pin orientation is correct prior to powering up the system. CAT-5 cable should be configured in a pass-through (pin to pin) termination.

# TYPICAL MZC-66 SYSTEM
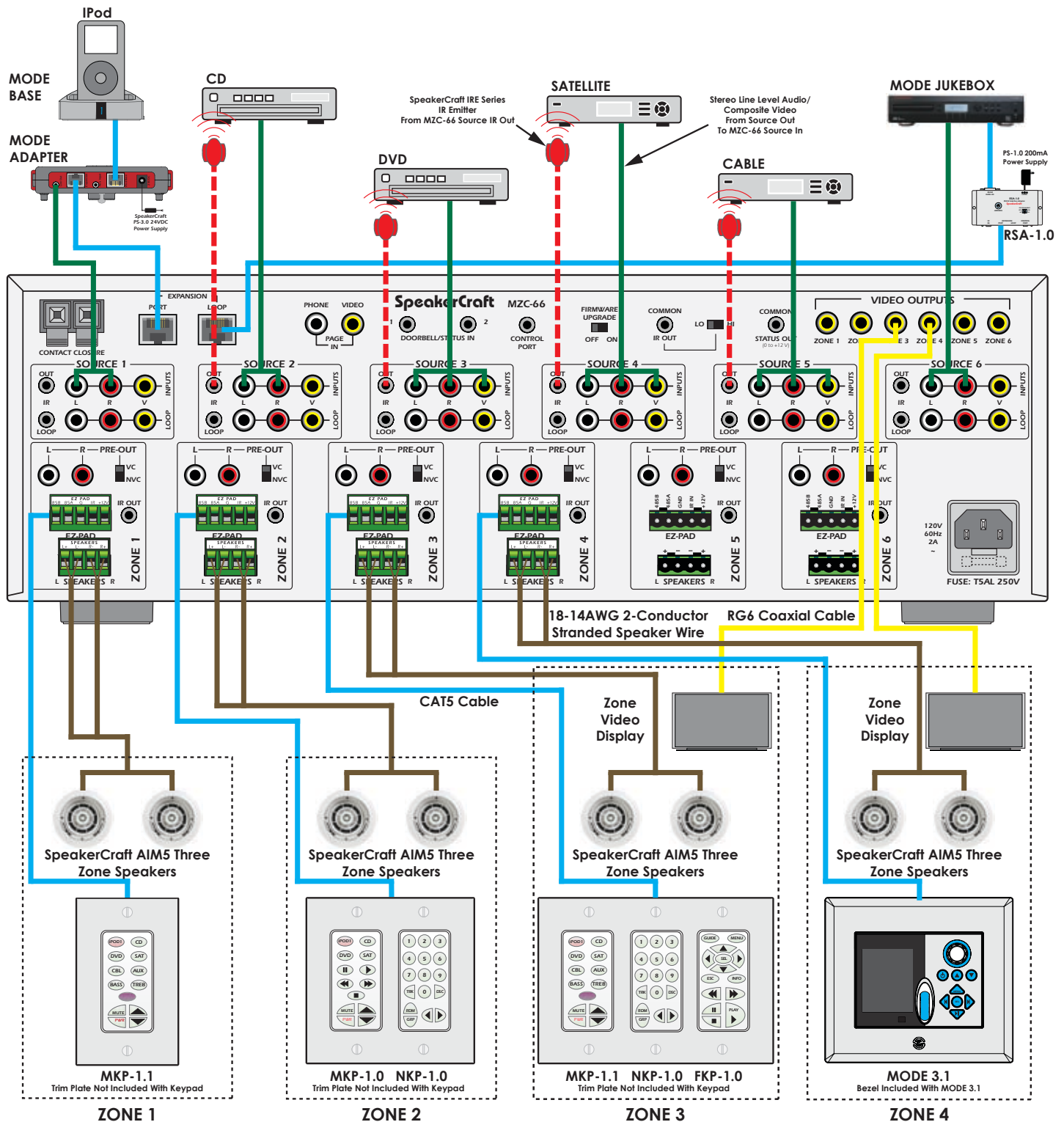


Typical MZC-66 System showing Keypad, Source and Speaker connections. A MZC-66 System will have limited functionality right out of the box such as ON/OFF, Source Select and Volume/Mute. Common source control and power management must be configured in EZ Tools. High power or multi-channel amplifiers can be added to the individual zones for high audio output in large rooms or outdoor zones or when adding additional rooms or "sub-zones" to a default system. Additionally, the MZC-66 has a programmable contact closure for control of lifts, screens, drapes etc.The MZC-66 also features two Doorbell/Status inputs that can be used for common source power management or tiggering a system 'event' from a doorbell module. For additional information on connection, configuration and programming of these optional features see: **MZC-66 Hardware Installation Instructions** and **EZ Tools MZC Programming Instructions**.

# MZC-66 SYSTEM INSTALLATION AND CONNECTIONS

### INSTALLATION-HEAD END

The MZC-66 and external source components will typically be installed at the System Head-End. They can be mounted on shelves in a wall unit, entertainment center or closet, or rack mounted in a standard 19" rack mount system. Source components such as DVD/CD players and VCR's should be installed so the user has easy access for loading discs and tapes.

Though heavy, the MZC-66 should be mounted at the top of the equipment rack so heat generated by the controller will not affect the other system components. Always leave adequate space between system and source components for airflow. Failure to do so can cause damage to the components from overheating. Never block the vent holes on the top or bottom of the MZC-66. Blocking the vent holes will cause the controller to overheat. For additional information on MZC-66 systems using multiple controllers or external amplifiers, see: **MZC-66 Hardware Installation Instructions**.

### CONNECTIONS-HEAD END

#### Keypads

1.  Connect each keypad run to the appropriate Zone on the MZC-66. Be sure CAT-5 cable and RJ45 connectors (if used) are properly configured. **NOTE: IMKP** uses the same pin-out as EZ-Pad. See: **MODE 3.1 Installation Instructions** for pin-out.

#### External Source Components

1.  Connect the L & R line-level audio and composite video OUT of each external source component to the appropriate L & R line-level audio and composite video SOURCE IN on the MZC-66 Rear Panel. Use quality Audio RCA-RCA stereo A/V cables terminated with gold connectors.

#### Emitters (Source)

1.  Carefully attach a SpeakerCraft IR Emitter (Models: 1.0, 2.0, 3.0, 4.0) over the IR eye on the front panel of each external source component to be controlled via infrared.
2.  Carefully pull the emitter wire to the rear panel of the MZC-66. Do not block accesses for discs and tapes. Do not pinch emitter wires between components.
3.  Connect the 3.5mm mini plug to the appropriate Source IR OUT.

#### Speakers

1.  Connect each Zone speaker run to the appropriate Zone SPEAKER terminal using the included removable screw down connectors.
2.  Strip approximately ¼ inch of each lead and twist the stripped ends so there are no loose strands that can cause shorts.
3.  Carefully slide the individual conductors into the appropriate L+,L-/R-,R+ speaker terminals on the removable screw down connector. Visually check for loose ends. Lightly pull the wire to confirm connection.
5.  Plug connector into the appropriate Zone SPEAKER Terminal.

### INSTALLATION-ZONES

Keypads should typically be located near a door or entry point to a room. Avoid mounting keypads, IR receivers, volume controls or any other control devices in areas of high moisture such as sinks, showers, bathtubs etc. Care should be taken to avoid mounting Keypads and IR receivers in locations subject to direct sunlight. Sunlight can interfere with system operation and, in time, cause deterioration to the keypad and trim plate materials.

> **WARNING: Never mount a keypad, IR receiver or volume control in the same J-box as high voltage devices. This can affect system performance and is a violation of Electrical Code in some areas. (Be aware of local Electrical and Building Codes. These codes can affect the type of J-boxes permitted, mandate wire specifications and regulate other aspects of the installation that may not pass inspection if necessary.)**

### CONNECTIONS-ZONES

#### Keypads

1.  Connect each Keypad cable run to the appropriate Zone Keypad. When not using RJ45 connectors, be sure to maintain consistent color code when making connections . When using RJ45 connectors, be sure the RJA-1.1 adaptor pins are oriented properly (EZ-Pad). Refer to: **MZC-66 Quick Start Guide/Keypad Connections**.
2.  Install each Keypad into a proper low-voltage J-box and finish with an appropriate trim plate (Not included with EZ-Pad).

#### Speakers

1.  Connect ZONE SPEAKERS L+,L-/R-,R+ OUTPUTS from the MZC-66, to the appropriate Zone Speaker pair.
2.  Strip approximately ¼ inch of each lead and twist the stripped ends so there are no loose strands that can cause shorts.
3.  Connect as appropriate to the L+,L-/R-,R+ terminals on each speaker.
4.  Visually check for loose ends. Lightly pull the wire to confirm connection.
5.  Install speakers into dry-wall cut-outs or SpeakerCraft InstaLLock™ New Construction Brackets (if used) as appropriate.

#### Video Displays

1.  Connect each Zone Video Output to the appropriate Zone Video Display.

# MZC-66 SPECIFICATIONS

## AUDIO SECTIONS

| | |
|---|---|
| **Rated Power/Channel** (RMS, 2 channels driven into 8 Ohms) | 30 Watts, 20 Hz to 20 kHz |
| **THD (at rated power)** | < 0.7 % |
| **Power/Channel** (RMS, 2 channels driven into 4 Ohms) | 45 Watts @ 1 kHz |
| **Input Sensitivity** (For rated power @ max VC) | 300 mV, VC / 2.8 V, NVC |
| **Input Impedance (Source Inputs)** | > 22 K Ohms |
| **Input Overload (Source Inputs)** | 2.5 V |
| **Output Voltage @ Pre-Outs** (w/300 mV @ source inputs) | 1.7 V, VC setting (max) / 810 mV, NVC setting |
| **Output Impedance (Pre-outs)** | < 300 Ohms |
| **Frequency Response** (1 Watt @ 8 Ohms) | 20 Hz to 20 kHz +/- 1.5 dB |
| **Channel Separation** | > 50 dB @ 10 kHz |
| **Crosstalk Between Sources** | > 65 dB @ 10 kHz |
| **S/N Ratio (Re: Rated output, IEC A, source inputs shorted)** | > 95 dB (VC 20dB below FCW) |
| **Bass Control Range** | +/- 10 dB @ 100 Hz |
| **Treble Control Range** | +/- 10 dB @ 10 kHz |

## VIDEO SECTIONS

| | |
|---|---|
| **Bandwidth** (Outputs 75 Ohms Terminated) | 10Hz to 6MHz +/- 1dB |
| **Input/Output Levels** (Outputs 75 Ohms Terminated) | 1.0V p-p +/- 5% |

## CONTROL SECTIONS

| | |
|---|---|
| **Contact Closures (dry)** | 2A, 30 VAC/DC max |
| **Phone Page In Audio Line Level, Voltage/Impedance** | > 22k Ohm |
| **Video Page In** | 1.0V p-p 75 Ohm |
| **Doorbell In 1 & 2, 3V to 30V AC or DC** | 10 mA @ 12 VDC/AC |
| **Common IR Out – HI** (High Power) **– LO (Emitter power)** | 9V Active High, 82 Ohms (110 mA Peak) / 9V Active High, 670 Ohms (13 mA Peak) |
| **Zone IR Outs – Voltage/Impedance** | 9.2V Active High, 620 Ohms (13 mA Peak) |
| **Source IR Outs (and loop) – voltage/impedance** | 11.5 V Active High, 390 Ohms (29 mA Peak) |
| **Common Status Out (0 to 12 VDC)** | 9.5 V @ 100 mA |

## GENERAL

| | |
|---|---|
| **Power Consumption No Signal (idle)** | 55 Watts |
| **At 1/8 Rated Power** (3.75 Watts/Channel) | 125 Watts |
| **Line Ratings (N.A. Version)** | 120 VAC, 2.0A |
| **Rear Panel Fuse** | T5AL 250V |
| **Dimensions** | 17" (432mm) W x *5-1⁄4" (133mm) H x 14-3⁄4" (375mm) D *5-3⁄4" (146mm) H, includ-ing feet |
| **Weight** | 23 lbs (10.5 kg) |