

ELK-MV480

400 Channel Recordable Voice Annunciator

Features

- 400 individually recordable and addressable message channels.
- 480 seconds maximum record time.
- Message channels are 1.2 seconds in length, however they may be combined for longer messages.
- Messages may be played using commands from a ELK-MM443 or MM447 Magic Module, a personal computer, or many popular brands of controls and equipment which have an RS-232 or RS-485 serial port and are capable of transmitting ASCII strings*.
- Up to 31 MV480 units may be networked over the RS-485 Data Bus.
- Messages may be recorded via a built-in microphone or they may be downloaded as .WAV files from a computer using it's sound card output and an ELK-129 sound card interface.
- 24 Watt built-in audio amplifier for driving multiple speakers.
- Two speaker connections.
- Adjustable volume control.
- Lifetime Limited Warranty, Call ELK or visit our website for details.

Specifications

- Operating Voltage: 10.25 to 15 Volts D.C., well regulated. Note: Low cost plug in DC power supplies may not work due to AC hum present on the power supply. Recommended: ELK-624 Power Supply with ELK-1240 standby battery or ELK-P1216 regulated plug-in power supply.
- Maximum current draw at full volume: ~1.25 amps. Adjust volume for desired maximum current draw.
- Maximum output speaker load: 4 ohms.
- Data Bus: RS-485, max bus length: 4000 feet w/22 AWG wire, Two data: A&B, Two power: +12VDC & NEG.
- Type 4 Magic Module, Addressed from 1 to 31. Address 0 = global listen (non-acknowledged) address.

* Since the MV480 accepts RS485 data only, an RS232 to RS485 Data Converter (ELK-MB485) may be needed.

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OVERVIEW

The ELK-MV480 Recordable Voice Annunciator is the perfect companion for adding Voice and/or Sounds to the Magic Module System. It offers superb quality, "tape less" voice/sound for applications in: home automation, access control, industrial control, sales promotions, museums, waiting rooms, theme parks, etc. The MV480 may be used to issue instruction, greetings, or warning messages automatically. There are 400 channels of words or phrases which may be played in any sequence or combination, ensuring maximum versatility.

INSTALLATION and HOOKUP

1. Set the RS-485 Data Bus Address Jumpers. Each Voice Module must have a data bus address and multiple voice modules connected to a single data bus must each be assigned a separate (individual) address. There are 5 plug-on DATA BUS ADDRESS JUMPERS located along the top of the board. See Figure 1. Each jumper has a position of [0] or [1] and a binary value (1, 2, 4, 8, 16) which can be read directly above each jumper. The addition of the binary values (sum total) for jumper(s) set to the [1] position determines the data bus address. For example: Data bus address 5 would be set by placing jumpers 1 and 4 in the [1] position ($1 + 4 = 5$). All five jumpers are required to set the address, none can be missing.

2. Connect the four wires of the RS-485 Data Bus between the MV480 and the Magic Module or other device(s) involved with the installation. For proper operation Data Bus "A" must connect to Data Bus "A" and Data Bus "B" must connect to Data Bus "B" on other modules. The RS-485 Data Bus may be connected to either of these two locations:

- A. Screw Terminals 2 & 3 – Terminal 2 is "A" side of the data bus, Terminal 3 is "B" side of the data bus.
- B. Four pin header connector J2 – Pin 3 is "A" side of the data bus, Pin 2 is "B" side of the data bus.

3. Connect the Speaker(s): There are two sets of connections for 8 ohm speakers, SPKR1 and SPKR2. These connections are in parallel to each other. If two speakers are connected then an effective 4 ohm speaker load is placed on the amplifier. Maximum speaker load on the audio amplifier is 4 ohms. The speakers may also be wired in series to add more speakers to the system. Use the Volume Control to adjust the speaker output level.

Application Note: To connect the Voice Module to a low level line input going into a paging system or an audio amplifier refer to Figure 3. When using this connection adjust volume level to no greater than one quarter turn.

4. Connect the Power Supply: The unit must be powered from a well regulated 12VDC power source using any one of three different locations on the printed circuit board.

- A. J3 Power Connector – Accepts a 2.1mm ID x 5.5mm OD female plug cord "center pin positive".
- B. Screw Terminals 1 & 4 – Terminal 1 is + Positive and Terminal 4 is Negative.
- C. Four pin header connector J2 – Pin 4 is +12VDC and Pin 1 is Negative.

INDICATOR LIGHTS, SWITCHES, AND MISC. CONNECTIONS

Playback Active LED (D7): This will light during message playback.

Playback Active SolderPad: This solderpad is pulled to ground by a transistor during message playback and may be connected to an ELK-924 Relay to trigger other equipment. The maximum current draw at the solderpad is 50 milliamps.

Recording Input: (MIC & J1): Messages can be recorded by using the on-board microphone and record switch or by using the optional ELK-129 Computer Sound Card Interface connected to J1 to play computer WAV files into the MV480. Set MIC jumper to "IN" if using the on-board microphone to record messages. Set MIC to "OUT" if using the ELK-129.

Record Switch (SW1): To manually program utilizing the on-board microphone, press and hold this switch while speaking into the microphone. NOTE: A record command must be issued from the Magic Module computer software. Momentarily pressing this switch (without a record command issued from the computer) will play back the last message recorded.

Record/EOM LED (D5): This will light during message recording.

Status LED (D6): This blinks when the Voice Module is in normal operation. Status LED will be lit continuously when a record command has been received from the PC computer. The Status LED will return to blinking within 45 seconds if the record switch is not pressed on the Voice Module.

PLAYBACK OF MESSAGES

Messages recorded in the MV480 may be played back using commands from an ELK-MM443 or MM447 Magic Module, a personal computer, or many popular brands of controls and equipment which have an RS-232 or RS-485 serial port and are capable of transmitting ASCII strings. Message channels are factory recorded (See Table 1) but may be custom recorded using the on-board microphone or computer downloaded WAV files. Refer to the Magic Module instruction manuals and software for procedures on playing messages.

PROGRAMMING NEW MESSAGES

Programming of new messages requires the following basic items: 1) A personal computer equipped with Windows 95 or higher and an available RS232 serial port. 2) An ELK-MK485 Magic Module Programmers Kit. The kit contains the ELK Development software, a RS-232 to RS-485 data bus interface, a 9 pin serial cable, a 4 pin ribbon cable, and a 12 Volt DC Power Pack. Figure 1 shows the hardware connections. Install the development software and follow the directions.

1. Start the Magic Module Development software and click on the VOICE tab.
2. Set the System box (top left corner) to MV480 and the Address box to match the RS-485 address of the MV480

Direct programming using the MV480's on-board microphone

- 3a. Estimate the message length to determine how many message locations will be needed. Each location is 1.2 seconds.
- 4a. Highlight the message location(s) (1 to 400) by clicking or dragging the mouse pointer. Enter a description and click the purple **Replace**. The message start and ending locations will be reflected in the **Start and Stop Boundary** window.
- 5a. Click the yellow **Microphone Program** button. Instructions will be sent to the MV480 board and a message box will inform you to press the Record switch while speaking into the MV480's microphone. Release the record switch when you are finished. The message will automatically play back. If you speak longer than the length set by the start and stop boundary a portion of your message will be lost. If that happens you must re-record the message and either increase the number of messages channels or shorten your message. **If the record switch is not pressed within 45 seconds after the record command is received the command cancels and the unit returns to normal operating mode.**

Application Note: Instead of using the on-board microphone to record your spoken phrases, we recommend using the Windows Sound Recorder to record and store those phrases into .WAV files. WAV files are easier to program into the MV480 as shown below. In addition, they may be reused on future programming sessions.

Automated programming using computer stereo sound card and stored .WAV files

If your computer is equipped with a speaker output jack, you have the option of using computer sound .WAV files for messages. In addition to the basic hardware requirements you will need an ELK-129 Sound Card Interface. This connects between the computer's speaker output and the MV480 as shown in Figure 1. The software that comes with the ELK-129 is not required. **Note: When using an ELK-129 with an MV480, DO NOT CONNECT an AC Transformer to the ELK-129's 12VAC input terminals.**

- 3b. To program using a computer .WAV file, highlight the location (1 to 400) where you want the message to begin. Click the tan **Browse** button and find the desired .WAV file. Double click on the file or click Open. The .WAV file name will appear in the selected location. Messages of 1.2 seconds or less occupy one location. Messages longer than 1.2 seconds will overrun in the following location(s) as indicated by the "...". This allows for longer messages, but it also decreases the total number of available messages. Note: Location 400 cannot overrun. **The software supports .WAV files recorded at sampling rates of 11khz, 22 khz, or 44khz.**
- 4b. To hear the .WAV file, click the green **Play Computer WAV File** button. The volume slider can be used to individually lower the volume of loud wavs in your message list. Continue to add more WAV files into your list.
- 5b. When you have finished selecting .WAV files and are ready to program the MV480 you may either click the orange **Program all WAV'S** button or highlight message(s) number(s) and click the green **Program A WAV** . The appropriate message(s) will then automatically record into the MV480.
6. To playback a message(s) that has been programmed into the MV480 simply highlight the message(s) and click the yellow **Play Voice Module Message** button.
7. A listing of your programmed messages can be saved onto your computer as a .VCM file for future use. Just click File, Save As, and type in a descriptive filename.
8. The purple **Find Messages** button can be used to scan the MV480 and return message lengths stored in it's memory.

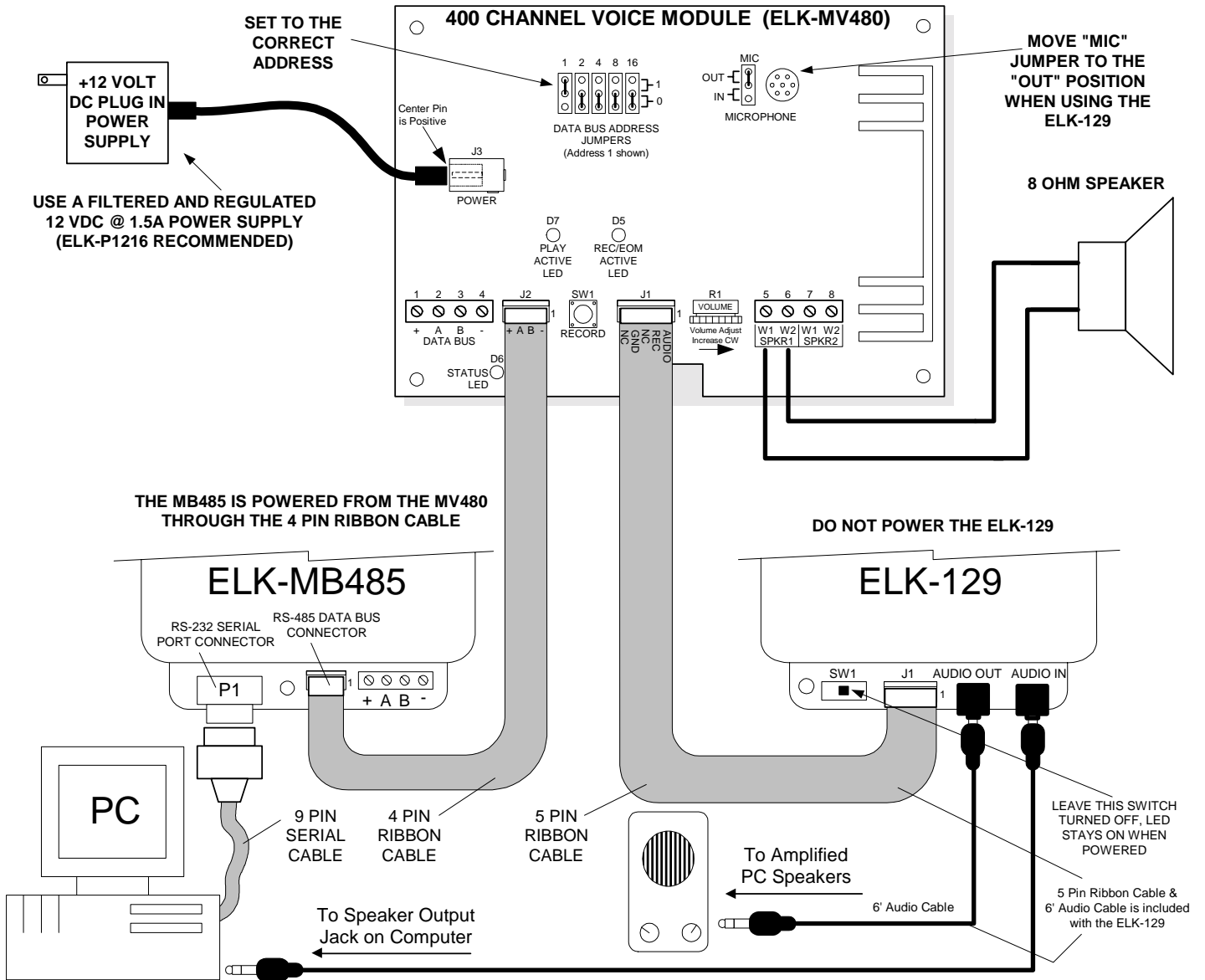
TABLE 1 FACTORY RECORDED VOCABULARY

1 One	81 Condition	158 Indicator	235 Pound	312 Warning	318 What	
2 Two	82 Connect	159 Input	236 Power	313 Water	319 When	324 Yard
3 Three	83 Container	160 Inside	237 Press	314 Way	320 Where	
4 Four	84 Control	161 Interior	238 Program	315 Wednesday	321 Will	325 Zero
5 Five	85 Cool	162 Intruder	239 Programming	316 Welcome	322 Window	326 Zone
6 Six	86 Curtain	163 Intrusion	240 Protected	317 West	323 With	
7 Seven		164 Is	241 Pump			
8 Eight	87 Data					
9 Nine	88 Day	165 Keep	242 Ready	327 AC Power Loss, Check Transformer and Power Circuit		
10 Ten	89 Defective	166 Key	243 Record	328 " "		
11 Eleven	90 Degrees	167 Keypad	244 Relay	329 " "		
12 Twelve	91 Delay	168 Kitchen	245 Repeat	330 Enter Code to Disarm		
13 Thirteen	92 Delivery		246 Report	331 " "		
14 Fourteen	93 Denied	169 Lamp	247 Reporting	332 Enter Code		
15 Fifteen	94 Department	170 Laundry	248 Reserved	333 Enter Function Number		
16 Sixteen	95 Detector	171 Leak	249 Reset	334 " "		
17 Seventeen	96 Device	172 Leave	250 Return	335 Exit Expires In Ten Seconds		
18 Eighteen	97 Dial	173 Less	251 Room	336 " "		
19 Nineteen	98 Digits	174 Level	252 Running	337 Exit Immediately		
20 Twenty	99 Dim	175 Light		338 " "		
21 Thirty	100 Dining Room	176 Line	253 S (plural)	339 Not Secure		
22 Forty	101 Door	177 Living Room	254 Saturday	340 Record Message After The Beep		
23 Fifty	102 Down	178 Load	255 Second	341 " "		
24 Sixty	103 Drive	179 Location	256 Secure	342 System is Armed		
25 Seventy		180 Locked	257 Security	343 " "		
26 Eighty	104 East	181 Log	258 Select	344 System is Disarmed		
27 Ninety	105 Emergency	182 Low	259 Sensor	345 " "		
28 Hundred	106 Empty		260 Sent	346 Then Call The Monitoring Station		
29 Thousand	107 Enabled	183 Machine	261 Service	347 " "		
30 200ms silence	108 End	184 Macro	262 Set	348 A C Power Loss / h		
31 800hz Tone	109 Energy	185 Mail	263 Setting	349 " "		
	110 Enter	186 Main	264 Shunted	350 " "		
32 A	111 Entry	187 Malfunction	265 Side	351 Access Denied / h		
33 Access	112 Equals	188 Manual	266 Sign	352 " "		
34 Account	113 Erase	189 Master	267 Silence	353 Access Granted / h		
35 Activate	114 Error	190 Medical	268 Sliding	354 " "		
36 Activated	115 Evacuate	191 Memory	269 Smoke	355 Activated / h		
37 Activation	116 Event	192 Menu	270 Someone	356 Alarm, Unauthorized Access / h		
38 Active	117 Exhaust	193 Message	271 South	357 " "		
39 Address	118 Exit	194 Minus	272 Stairs	358 Alarm / h		
40 Adjust	119 Exterior	195 Minute	273 Stairway	359 Bedroom 2 / h		
41 Air		196 Missing	274 Star	360 DiningRoom / h		
42 Alarm	120 Fahrenheit	197 Mode	275 Start	361 Enter Code to Disarm / h		
43 All	121 Fail	198 Module	276 Status	362 " "		
44 A M	122 Failure	199 Monday	277 Stay	363 Exit Expires in 10 seconds / h		
45 An	123 Family Room	200 More	278 Stop	364 " "		
46 And	124 Fan	201 Motion	279 Storage	365 Exit Immediately / h		
47 Answer	125 Feed	202 Motor	280 Summary	366 " "		
48 Any	126 Feet		281 Sunday	367 Family Room / h		
49 Appliance	127 Fire	203 Negative	282 Switch	368 Hallway / h		
50 Are	128 Followed	204 Next	283 System	369 Kitchen / h		
51 Area	129 Friday	205 Night		370 Living Room / h		
52 Arm	130 Front	206 Normal	284 Tank	371 Main Entry / h		
53 At	131 Full	207 North	285 Telephone	372 Master Bedroom / h		
54 Authorities	132 Function	208 Not	286 Temperature	373 Not Secure / h		
55 Authorized	133 Furnace	209 Notified	287 Temporarily	374 Please Close the Door / h		
56 Automatic	134 Fuse	210 Number	288 Test	375 " "		
57 Auxiliary			289 Thank You	376 System is Armed / h		
58 Away	135 Garage	211 Of	290 That	377 " "		
	136 Gas	212 Off	291 The	378 Then Call The Monitoring Station / h		
59 Back	137 Gate	213 Office	292 Thee	379 " "		
60 Bad	138 Glass	214 O K	293 Thermostat	380 Window / h		
61 Basement	139 Go	215 On	294 Thursday	381 At 5 5 5 - 1 2 3 4 / h		
62 Battery	140 Good	216 Online	295 Time	382 " "		
63 Bedroom	141 Greeting	217 Only	296 Toggle	383 " "		
64 Been		218 Open	297 Transformer	384		
65 Break	142 Hallway	219 Or	298 Trouble	385		
66 Bright	143 Hangup	220 Output	299 Tuesday	386		
67 Building	144 Has	221 Outside	300 Tum	387		
68 By	145 Have	222 Oven	301 Twice	388		
	146 Heat			389		
69 Call	147 Help	223 Parking	302 Undefined	390		
70 Cancel	148 High	224 Partition	303 Unit	391		
71 Carbon Monoxide	149 Home	225 Patio	304 Unlocked	392		
72 Card	150 Hot	226 Percent	305 Up	393		
73 Change	151 Hour	227 Personnel	306 Utility	394		
74 Check	152 House	228 Play		395		
75 Chime	153 Humidity	229 Please	307 Valve	396		
76 Circuit		230 Plus	308 Violated	397		
77 Clear	154 If	231 P M	309 Visitor	398		
78 Closed	155 Immediately	232 Police	310 Volts	399		
79 Code	156 In	233 Pool		400		
80 Cold	157 Inches	234 Porch	311 Warehouse			

Phrases

Locations 384 - 400 were intentionally left blank so that custom words, phrases, greetings, etc. may be recorded.

FIGURE 1 RECORDING HOOKUP FOR ELK-MV480



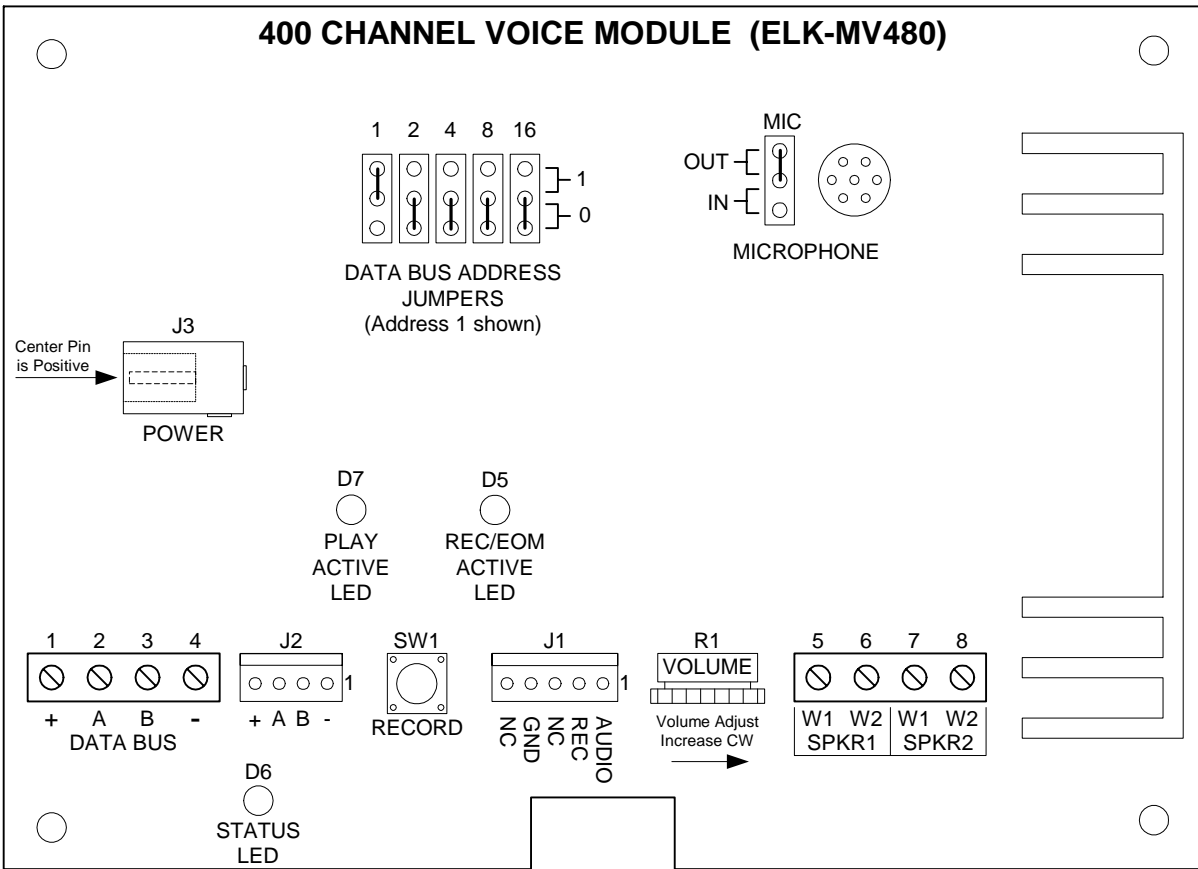


FIGURE 2 ELK-MV480 BOARD LAYOUT

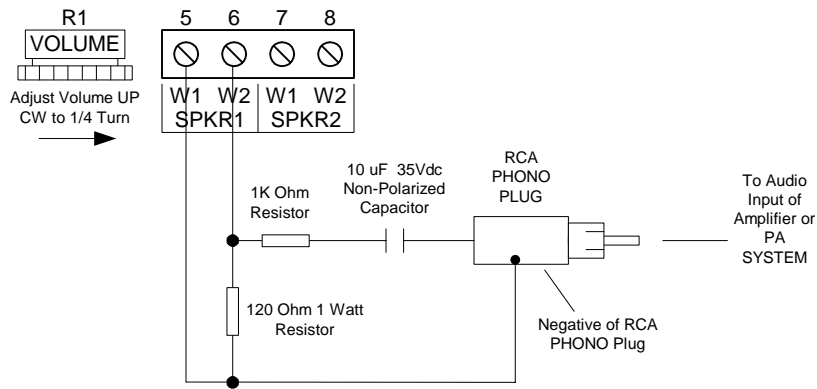


FIGURE 3 LINE LEVEL OUTPUT EXAMPLE

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. NOTE: 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 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 or more of the following measures: 1) Reorient or relocate the receiving antenna. 2) Increase the separation between the equipment and receiver. 3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. 4) Consult the dealer or an experienced radio/TV technician for help.