Audioaccess

Installation Guide and Technical Notes

Compiled and revised December 1997

Table of Contents

Table of Contents

Table of Contents

AUDIOACCESS

Madrigal Audio Laboratories

2081 South Main Street, Middletown, CT. 06457

Main Voice line 860-346-0896
Main Fax line 860-346-1540
Customer Support Toll Free line 888-691-4171
Customer Support Fax line 860-347-6251

Audioaccess Profile

History

Chris Stevens, owner of Phoenix Systems, a high-end Audio/Video Custom Installation and Design Company, found there was an increasing need for Multi-Room Control Audio Systems. Phoenix Systems built custom controls for each job until a new product was developed that could be manufactured and promoted in a bigger market.

This marks the start of Audioaccess in 1987 with its first product, the PX-4 Multi-Room Remote Control System.

Audioaccess has become a leading manufacturer of Multi-Room Control Systems, with distribution in the US and Canada to approximately 400 dealers. The international market is growing, with qualified distributors in: Europe, Asia, Central America, South America, Australia and New Zealand.

In August 1993, Harman International Industries acquired Audioaccess.

In September 1996, Madrigal Audio Laboratories assumed the management and manufacturing of the Audioaccess brand. Madrigal is best known for the manufacture and worldwide distribution of the Mark Levinson and Proceed line of high end audio components. Under Madrigal's leadership, Audioaccess continues to address the needs of the custom installation specialist.

Objective

The primary objective of Audioaccess is to provide effortless, intuitive control of home electronics that have become extremely difficult to understand and operate.

Current Products

- PX-600 Multi-Room Pre-amp/Controller (6 zones/5 sources), expandable to six Controllers
- PX-603 Multi-Room Zone Expander Line Amplifier (up to 6 per PX-600)
- PX-612 Multi-Room Amplifier (12 channels, 50 WPC, bridgeable)
- MRX-NT Multi-Room Controller/Receiver
  A six-zone remote control system with Tuner, four additional audio inputs, 6 stereo preamplifiers, 6 stereo amplifiers (40 Watts per channel) and an infrared learning device built in. System is controlled via Keypad and hand-held infrared remote control. Systems are expandable to a total of six Controllers.

PX-600 Installation Manual

This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. Audioaccess reserves the right to make changes without further notices to any products or software herein to improve reliability, function or design.

Mention of third-party products is for informational purposes only and constitutes neither an endorsement nor a recommendation. Audioaccess assumes no responsibility with regard to the performance or use of these products.

CAUTIONS AND SAFETY INSTRUCTIONS

Operator's Safety Summary

The safety information in this summary is for installation and operating personnel. Warnings and cautions can also be found throughout the manual where they apply.

Power Source

This product is intended to operate from a power source that does not apply more than the specified volts RMS indicated on the rear panel of the unit, as referenced between the supply conductors or between either supply conductor and ground.

Grounding the PX-600 Controller

This product is grounded through the ground conductor of the power cord. To avoid the potential of electrical shock, plug the power cord into a properly wired and grounded receptacle before operating the PX-600. A protective ground connection, by way of the ground conductor in the power cord, is essential for safe operation. A standard 3-pin IEC type and in good operational condition is the only acceptable cord that may be used to connect the PX-600 to a power source.

Fuses

To avoid potential fire, electrical hazard and damage to internal components, replace fuses only with fuses of the correct type, voltage and current rating as specified in this manual.

Removal of PX-600 Cover and Front Panel

To avoid personal injury and to ensure proper operation, do not remove the PX-600 cover or front panel except as directed within this manual. Do not operate the unit without the covers and panels properly installed.

Operating Environment

For the best operating results, install the PX-600 in an area where it will not be exposed to direct sunlight or any heat source. The unit should be operated in a temperature range from 40° to 95°F (5° to 35°C). Place the controller where there is sufficient air circulation.

Unpacking and Inspection

Use caution when unpacking this product and follow these procedures:

Inspect the shipping carton(s) for exterior damage before opening them. If any damage is discovered, notify your freight agent and Audioaccess immediately.
To open the shipping box, cut the tape and carefully remove the staples.[1]
Inspect the PX-600 Controller for signs of damage.
Verify that the following items are contained in the package:

	Domestic		**Export**
[1]	PX-600 Multi-Room Controller	[1]	PX-600 Multi-Room Controller
[1]	IEC AC power cord (USA and Canada Only)	[3]	Infrared emitters
[3]	Infrared emitters	[1]	Installation Manual
[1]	Limited Warranty card (USA and Canada only)	[1]	Owner's Manual
[1]	Installation Manual	[1]	Declaration of Conformity
[1]	Owner's Manual	[1]	Keypad Ferrite Core
		[1]	Trigger & IR output Ferrite Core

COMPANION PRODUCTS

To complement the PX-600 both functionally and aesthetically, Audioaccess has developed the PX-612 Multi-Room Amplifier. The PX-612 is a 12-channel amplifier. Any two adjacent channels may be bridged for increased power. The combination PX-600 and PX-612 system is a compact, easy to install, simple to operate, cost-effective solution for all your multi-room needs. In addition, the PX-612 may be used to provide multi-channel amplification for a surround sound system. It need not only be used with a PX-600. We have included system design and installation information pertaining to the PX-612 in this manual.

Additionally, the PX-603 Zone Expander is available for further system design flexibility. The PX-603 is a set of three line-level amplifiers in a single chassis. It is for use ONLY with the Audioaccess PX-600. Like the PX-612, it compliments the PX-600 in function and aesthetics. The PX-603 is referred to in this manual only in instances where information is given pertinent to both units, or where a function of the PX-600 hardware or software is directly related to the PX-603. Detailed PX-603 specifications and installation instructions are provided in a separate PX-603 manual.

The following accessories are part of the PX-600 family of products. These products will be referred to throughout the manual as they relate to a PX-600 installation.

?? KPS Wall-mounted keypad (available in white, ivory or black)
?? KP-3 PX-603 three button keypad (available in white only)
?? RT-A Dedicated hand-held IR remote control
?? URC-5000 Programmable hand-held IR remote control
?? KPT Keypad Termination Board
?? MCI Multi-room Computer Interface Module
?? PDM Page/Doorbell Module

[1] Save the carton and all packing material in case it becomes necessary to ship the equipment for repair.

PX-600 PRODUCT DESCRIPTION

The PX-600 is a multi-room pre-amp/controller for six zones. It includes five audio inputs, six stereo pre-amps and an infrared (IR) interface for controlling audio and video sources. Up to six PX-600s may be connected together for a total of 36 independent zones. Each zone may be controlled from a simple, eight-button, wall-mounted keypad or with an Audioaccess hand-held IR remote control through the IR receiver in each keypad. The main zone may be controlled from the front panel as well as the keypad or IR remote. You may access independent on/off, volume control, source selection and source control in each zone.

The PX-600 IR outputs, used to control source equipment, are fully compatible with industry standard IR systems. These outputs may be combined with the outputs of most IR repeaters. An IR repeater may be connected directly into the back panel of the PX-600 for control of the main zone as an alternative to the front panel IR input.

The optional Page/Doorbell Module (PDM) provides paging and door chime capability through any or all zones of the PX-600. Another optional module, the Multi-room Computer Interface (MCI), allows control of the PX-600 from computer-based home automation systems.

Zone setup and IR source control programming is done by the installer with a detachable PX-600 Programmer. The PX-600 Programmer plugs into the left end of the front panel on the PX-600.

General Features

? ? Simple, intuitive operation, installation and programming
? ? External keypad termination board for easy advance hookup/troubleshooting
? ? Independent access to each of five audio inputs and paging input in each zone
? ? Independent volume control and programmable EQ in each zone
? ? Infrared receiver built into each keypad
? ? Four-conductor wiring to keypads (unshielded telephone or data cable, or shielded twisted pairs)
? ? External fuse for protection from shorted keypad wiring
? ? Main zone operable from front panel, keypad or IR remote
? ? Keypads control basic functions of audio sources via learned infrared commands
? ? External plug-in programmer (required for set-up)
? ? Zone setup and IR commands stored in non-volatile memory
? ? Each zone assignable to one of three ALL ON groups (or none)
? ? Compatible with the Audioaccess PX-612 six-zone, stereo, multi-room amplifier
? ? Compatible with the Audioaccess PX-603, stereo, multi-room zone expander
? ? Paging and doorbell features available with optional Page/Doorbell Module
? ? RS-232 interface with optional MCI for use with home automation systems
? ? Special grounding, filtering and intelligent circuit design for superior protection
? ? Zone trigger outputs drive relays independently for each zone
? ? System trigger output active when *any* zone is on
? ? Main zone rear panel IR input, compatible with standard IR repeaters
? ? IR outputs to source equipment compatible with industry standard systems
? ? IR loop-thru output

Inputs

? ? Five stereo audio inputs, and a mono paging input
? ? Paging trigger for the Page/Doorbell Module
? ? System trigger input allows sharing of audio sources with other systems
? ? Voltage input for operation of zone triggers
? ? Four-conductor keypad input
? ? Rear panel IR input
? ? AC power input

Outputs

? ? Loop-thru audio output for each audio input
? ? Six independent pre-amp outputs w/independent volume, bass and treble
? ? Six independent fixed level outputs monitor source selected in each zone, used with PX-603
? ? Record output from the Main Zone (Zone 6)
? ? System trigger output to control a relay
? ? Six zone trigger outputs to control relays for each zone
? ? Six discreet IR emitter jacks, one for each audio input, and one installer defined blaster or emitter
? ? Loop-thru IR output to control other equipment from an IR repeater
? ? Switched AC power outlet (200 Watt max)

Technical Specifications

Specification	Preamp Outputs	Zone Outputs
Frequency Response	10 - 84k Hz, +0, -1 dB	10 - 95k Hz, +0, -1 dB
S/N (ref.: 1k Hz, 1 Vrms, filter at 22k Hz, Volume at unity gain)	>99 dBV	>100 dBV
THD + Noise @ 1k Hz, Filter at 80k Hz, Volume set at unity gain)	<0.008% (500m V input signal)	<0.004% (1 v input signal)
Maximum Output Level	3.5 Vrms	3.5 Vrms
Output Impedance	470?	470?
Left/Right Crosstalk (@ 1k Hz, each input)	<-85 dB	<-85 dB
Input to Input Crosstalk (@ 1k Hz, any two inputs)	<-100 dB	<-100 dB
Zone to Zone Crosstalk (@ 1k Hz, any two zones)	<-100 dB	<-100 dB
Maximum Gain	20 dB	Unity
Volume Control	80 dB in 2 dB steps	
Bass (Shelving type, 100 Hz)	+15, -12 dB (3 dB steps)	N/A
Treble (Shelving Type, 10k Hz)	+12, -12 dB (3 dB steps)	N/A

Connector Type: RCA with short hot pin (makes shield connection first)

Power requirements: 115volts AC, 50Hz, 40 watts (not including equipment connected to switched outlet)

Dimensions: 17 3/8" W x 4" H x 15 1/2" D (442 mm x 102 mm x 394 mm)
Includes connectors, front panel knob and feet

Front Panel

? Power

The POWER button turns the Main Zone (Zone 6) on and off. Press-and-hold the POWER button to turn on all zones that are set to the same ALL ON group as the Main Zone.

? Infrared Input Window

Behind this window is an infrared input eye for controlling the Main Zone with a handheld IR remote control.

? Source Input Selection Buttons

The TUNER, CD, TAPE, AUX and VIDEO buttons select and control the audio sources for the Main Zone (Zone 6). There are three programmable commands (plus STOP) for each audio source and eight commands for the video source. There are also macros and special command sets for CD changers, etc.[2]

? Mute

Pressing the MUTE button mutes the audio in the Main Zone (Zone 6). Pressing the MUTE button again restores the audio. The red LED beside the button will light when mute is active. In the ALL ON mode, the MUTE button mutes the audio in all the zones in the same ALL ON group as the Main Zone.

? All Off

Pressing the ALL OFF button turns off *all zones in all PX-600s*, regardless of the ALL ON zone grouping.

? Volume Knob

The volume knob controls the volume level in the Main Zone. In the ALL ON mode, it controls the volume level of all the zones assigned to the same ALL ON group as the Main Zone. (For further information on Volume knob function and control, see the Learn IR section on Zone Six Macro.)

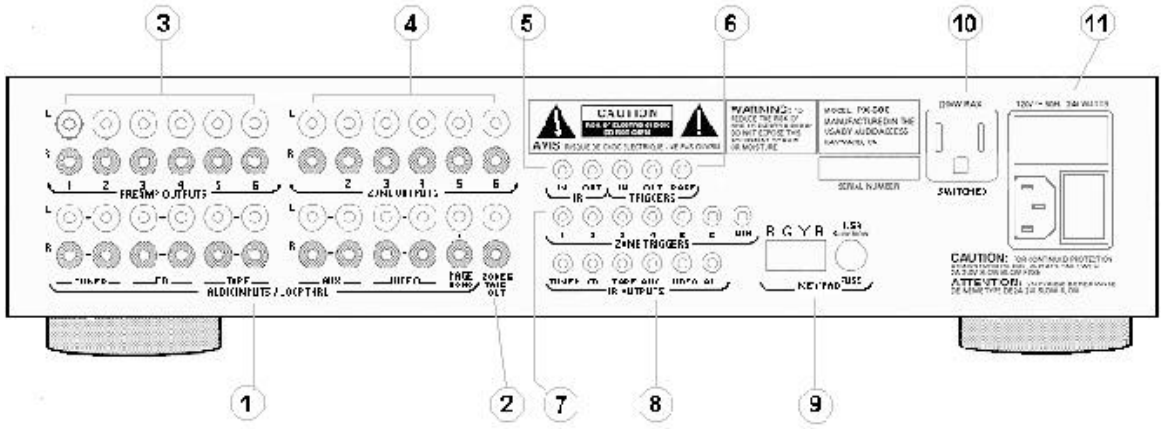
? PX-600 Programmer Input

(26-pin dual row IDC connector)

A detachable PX-600 Programmer (sold separately) accesses zone setup and IR programming. It plugs into the **left side** of the front panel on the PX-600. Remove the plastic endcap to access the input connector (not labeled).

[2] All of these functions can be customized for your particular application.

Rear Panel



? Audio Inputs / Loop-Thru

(RCA connectors)

The AUDIO INPUTS and PAGE INPUT have corresponding LOOP-THRU OUTPUTS for connecting sources to multiple PX-600s or to other systems which share the same sources (e.g. surround-sound processors or other receivers).

? Zone 6 Tape Out

(RCA connectors)

Connect this output to the input of the tape deck used for recording. The signal selected in the Main Zone (Zone 6) is routed to this output.

? Preamp Outputs

(RCA connectors)

There is one stereo PREAMP OUTPUT per zone. These variable outputs are controlled from the keypads, IR remotes or front panel. They can be programmed as fixed outputs if required.

? Zone Outputs

(RCA connectors)

These are fixed unity gain outputs for each zone designed specifically to provide audio source to the PX-603. They may also be used as fixed outputs to an amp that powers speakers through passive attenuators (autoformers). However, if the amplifier has a signal-sensing power circuit, use the zone trigger output to activate the amp, as signal is always present at <u>all</u> of the zone outputs when any zone or PX-603 room in the system is on.

? IR In/Out

(mono 1/8"/3.5mm mini-phone jacks)

The IR IN jack allows hook up of an IR repeater to control the Main Zone (Zone 6) of the PX-600. Use this when installing the PX-600 in a closed cabinet. This automatically disables the IR receiver on the front panel. Plug an emitter into the feed-thru IR OUT jack to control other equipment. Normally, the PX-600 controls the basic functions of the audio sources, unless the system requires control of more than the basic functions or access to other equipment such as lighting and drapes, etc.

? Triggers

(mono 1/8”/3.5mm mini-phone jacks)

Use the TRIGGER IN when sharing sources with a system other than another PX-600. A 12VDC input from the local system (such as an AC adapter plugged into a switched outlet) switches on the AC OUTLET of the PX-600 then sends IR POWER and STOP commands if necessary and alerts the PX-600 system that the sources are in use. Thus, the STOP and POWER commands are not sent while sources are also being used by the auxiliary system(s).

The TRIGGER marked OUT is active whenever any zone is on. It provides a means to energize a 12VDC relay while any zone in the system is on. Relays connected to this trigger activate whenever any zone in the system comes on.

Use the PAGE TRIGGER with the Page/Doorbell Module. When this jack is shorted, all zones programmed to receive paging and doorbell signals switch to the PAGE AUDIO INPUT until the jack is un-shorted. See instructions enclosed with the Page/Doorbell Module.

? Zone Triggers

(mono 1/8”/3.5mm mini-phone jacks)

The ZONE TRIGGERS provide a means to energize a relay *per zone* while that zone is on. Relays connected to these triggers activate whenever the particular zone comes on. You may want to switch on a remote amplifier for that zone, or you may develop some other creative application. Determine the voltage and current requirements of the relays you intend to use, then connect a power supply to the VIN (Voltage Input) next to the ZONE TRIGGERS. This power supply drives the relays attached to any of the ZONE TRIGGERS at the voltage selected.

? IR Outputs

(mono 1/8”/3.5mm mini-phone jacks)

Audio sources connected to the PX-600 are controlled by IR commands taught to the PX-600. Source specific IR OUTPUTS for each of five audio inputs allow multiple tuners, CD players or tape desks of the same brand to be controlled independently. IR Commands can be sent to the sources either via a 1/8” mono mini-plug from the IR Output to an IR input jack on the source equipment or through an IR Emitter glued over the IR receiver on the source.

The jack marked ALL may be connected to a blaster-type IR output device for control of multiple sources. Or, you may use it with a 1/8” mini-plug to control source components which have opto-isolated IR input and output jacks on their back panels. Jumper inside the unit behind IR jack can switch the ALL IR output for use as a blaster or an emitter output.

? Keypad

(4-conductor pluggable screw terminal)

The PX-600 comes equipped with one detachable 4-conductor screw terminal connector. Connect a single keypad or the last leg of daisy-chained cable from the keypads into this connector. If keypad cables are home run, connect them to a Keypad Termination Board (KPT), then run a jumper between the KPT and the PX-600.

(Fuse: 1-1/4”, 1.5A, slo-blo for versions suffixed ¼ and lower)
(Fuse: US 5X20mm, 1.6amp,250v, slo-blo NON-US 5X20mm T 1.6amp 250v)

This fuse will blow if there is a short on the keypad line or one of the IR emitter outputs. When an emitter fails, it may short and cause the fuse to blow. Replace this fuse only with a fuse of the correct type and rating.

? Switched Outlet

(3-conductor grounded, 200Watt maximum)

This outlet turns on when the first zone is turned on, and off when the last zone is turned off. It is also controlled by an input to the system TRIGGER IN as described above. Use this outlet with a power strip to supply AC power for source equipment connected to the PX-600. *It is not designed to handle an amplifier or any combination of components that draw more then 200 watts of current.*

⑪ Power Module

The POWER INPUT is a standard IEC type 3-prong male connector.

The POWER SWITCH turns the main power to the PX-600 on and off.

A 5mm x 20mm, 2A,(US) slo-blo fuse , a 5X20mm T 1A fuse (NON-US) is located in the drawer beneath the switch. One replacement fuse is located in the same drawer. Replace this fuse only with the correct type and rating.

SYSTEM DESIGN

We suggest you incorporate the following ideas into your sales and design process. These suggestions come from our most successful dealers. We believe you'll see some important benefits from these practices:

Easily serviced systems.
Reduced trouble-shooting time.
Systems that work right the first time.
Satisfied clients and installers.

A detailed system design is essential to the optimum operation of a PX-600 system. To come up with the best possible system design:

Meet with your clients to outline their needs, wants and budget for the project.
Determine equipment requirements for the system.
Select locations for the PX-600, amplifier(s), source equipment, keypads, speakers and other equipment.
Construct a block diagram depicting the entire system and all connections.
Produce a contract agreement covering all aspects of the project from payments, to work schedules, to communication flow, etc.

During the design phase, consider where the "head-end" will be located. Make sure the designer of the equipment cabinet allows sufficient space for all the equipment, accessories, and access to connections. You'll have one or more PX-600s, source equipment, amplifiers, interface modules, cabling between components and cabling out to speakers, keypads, etc. Most importantly, provide ample space for air circulation and flow through ventilation around all the electronics, especially amplifiers. Allow room for growth of the system and a "fudge" factor. Don't forget storage for the CDs, tapes and accessories!

In a system of this type, it is a good idea to have access to the back of the equipment. This can be accomplished with pull-out cabinets, pull-out shelves, or through an adjoining room or crawlspace behind the cabinet. It makes good sense to be insistent about this. You'll be glad you have the access when you go back and swap out the CD player for a new model or hook up cables for an extra pair of deck speakers.

Request a dedicated circuit for the audio system. Any system beyond a receiver and a pair of speakers will need a minimum 20 amp dedicated circuit. Consult the specified current requirements for the equipment you are planning to use and determine the maximum potential current draw. Review this information with the electrician or engineer on the job to determine the requirement for your circuit.

SYSTEM INSTALLATION

Keypad Wire Requirements

In addition to audio switching and routing, Audioaccess multi-room systems are data network control systems that operate in a similar fashion to an office computer network . The proper installation and termination of the Audioaccess communications bus is one of the most critical elements in a reliable and problem free installation. Loose or incorrect terminations of the keypad bus will cause inconsistent operation, lock ups, or even damage to Audioaccess components.

Audioaccess systems operate on standard RS-485 communications at a 9600-baud rate. An RS-485 transceiver is located in each PX-600, MRX, KPS keypad, KP3 keypad, and MCI translator. The transceiver is responsible for sending and receiving data between components of a system. The four wire communications bus includes one power carrier wire, one ground carrier wire, one transmit data wire, and one receive data wire. The connections of these wires are sensitive to polarity, in power, and ground. If the lines are connected improperly there is the potential for destruction of the transceivers in any component. Be sure to follow the correct color code and be consistent while making your terminations.

Audioaccess systems can run on virtually any wire meeting the following minimum requirements.

KPS: 24 ga, 4 conductor, stranded, non-shielded telephone wire (this is the minimum specification).
KP3: 24 ga, 6 conductor, non-shielded telephone wire. (Refer to PX 603 manual)

In addition to the above, any of the following wire types may be used for Audioaccess installations. They must have a minimum of 4 conductors for connection to KPS keypads and a minimum of 6 conductors for connection to KP3 keypads.

?? Category 3, Category 5 or Category 5 Enhanced, Data cables.
?? 22 ga / 4 or 6 conductor or 22ga / 4 or 6 conductor shielded.
?? 20 ga /4 or 6 conductor or 20 ga / 4 or 6 conductor shielded.
?? 18 ga /4 or 6 conductor or 18 ga/ 4 or 6 conductor shielded.

RS –485 theoretically can travel down wire for several thousand feet. The typical problem encountered is the resistance of the wire, which can cause the “Hysteresis Effect.” Hysteresis is when the data signal wave form has rounded edges and this may cause the receive end not to recognize the data string. A good rule of thumb is to choose wire that has low resistance over distance. Typically the larger the wire the less resistance it will have.

In areas prone to high incidences of lighting, many installers have found that using 4 conductor shielded is preferred over unshielded cable. If using this method, utilize the shield in the cable as a drain to ground. This may help in resisting damage from high electromagnetic interference (EMI) caused by lighting. Damage to RS-485 transceivers from lightning strikes is not covered under the manufacturer’s warranty.

Pre-wire

During the pre-wire phase, all speaker, keypad and other wiring is routed, and gang boxes or rings are installed for the keypads. The following are some points to consider during this phase:

Wire keypads in a Daisy Chain or Home Run?

Daisy Chained Wiring:
Daisy chaining is a wiring method in which you connect a cable from one keypad to the next, with the final termination made to the KEYPAD input on the PX-600 rear panel. This method is suited for retrofitting existing homes where home runs are difficult and time consuming. In new construction, risk of wire damage is high, and with the daisy chain method you could lose connection to many keypads with one non-terminated point. Thus, while daisy chaining may be efficient, extra care must be used when routing the wiring, especially in new construction.

Home Run Wiring:
This method calls for each keypad to be wired independently back to the keypad termination board (KPT), then to the KEYPAD input on the PX-600 rear panel. This is by far the safest, most reliable method. If you are connecting more than six keypads, or have a PX-603 in the system, use an additional KPT. It is possible to terminate more than one set of wires onto any one of the plug-in screw terminals on the KPT, however you give up the ability to disconnect individual keypads for troubleshooting purposes.

Other Wiring Considerations
Keep low-voltage cables, especially audio and data wires, well away from cables carrying AC house current, all antennas, and television cable. If your wire must *parallel* these types of cables, maintain at least 12" of separation and use shielded wire. If your cables must *cross* AC cables, cross at a right angle to minimize interference. Never run low-voltage cables though the same hole as high-voltage AC wiring or through the same conduit.

To avoid damage from nails and screws during construction, keep your cables at least 2" away from the surface on which the sheetrock or plaster will be attached. Use metal nail guards in areas where space is not available or where extra precaution seems appropriate.

Be aware of any remaining electrical or plumbing work to be done after your wires are in place. Protect them accordingly and inspect them before they are covered by the wall surface.

Avoid splices. This will save time and prevent problems in general. However, if you must splice a cable, do not bury the splice! Make sure it will be accessible after the walls are finished or re-run the cable.

When making "trunks" of cables (several cables groups together going the same direction for a long distance), keep wires with like signals together. Especially be sure that speaker cables, which carry relatively high current, are kept away from audio and data cables.

Clearly identify your cables. Label them when you pull them. Re-label them when you trim and terminate them. Keep the labels approximately the same distance back from the point of termination to make them easier to read.

Trim-Out

During this phase the keypads and speakers are installed. This is a good time to inspect cables for possible damage. You may want to "ring out" your cables to confirm there are no shorts or opens.

Trim cables to a length that allows you to remove and service the speaker, keypad or equipment. Do not, however, leave so much cable that it creates an unsightly tangle and unnecessary extra cable length for the signals to run though.

When making terminations, strip the jacket and insulation off conductors carefully. The jacket can be "scored" in the same direction as the conductors without cutting the insulation on the wires inside the jacket. Peel back the jacket and trim it off.

Remove the insulation from the wires with wire strippers. Make sure none of the strands of wire are nicked or cut during the stripping process. Expose no more bare wire than is necessary to make the connection to avoid potential shorts.

Make sure all strands of each wire go into the terminal. DO NOT ALLOW ANY INSULATION TO BE CAUGHT INSIDE THE TERMINATED CONNECTOR. This may cause intermittent system lock ups that are difficult to find and fix.

Double check for stray strands of wire, exposed bare wire, or pieces of cut wire that may have fallen into places they don't belong.

Final Hookup

During Final Hookup, the PX-600, amps, source equipment and all other equipment is installed and connected. The PX-600 is not designed to be rack mounted, but it can be installed in a rack by using a rack shelf.[3] See the Keypad Installation section for complete installation information for the keypads in the system.

Refer to the notes in the Trim-Out section above regarding trimming and terminating cables before proceeding. The PX-600 is shipped ready to operate with default settings programmed for each of the six zones. The system will operate for hardware troubleshooting purposes with no further programming. When any zone is turned on, TUNER is always the default source selected. During the final phase of hardware installation, we advise the following sequence of hookup and testing:

Power Cord (Grounding):

Connect the AC power cord to the rear panel of the PX-600 and then to a properly grounded AC outlet. Make all of the remaining connections with the power cord plugged in (for grounding) and the AC power switch OFF.

Audio Inputs:

Plug in RCA-type audio cables from the source equipment to the Audio Inputs on the rear panel. Connect the TAPE OUT to the RECORD IN of the tape deck if one is used.

Each Audio Input jack has a corresponding loop-thru jack. Connect these to the next PX-600 in a multi PX-600 system or to a separate system such as a surround sound system.

Preamp Outputs:

Connect the PREAMP OUTPUTS to amplifiers used to power the main zones. These outputs are normally variable, but can be programmed as fixed at any level in the normal range. In the Main Zone (Zone 6), the PREAMP OUTPUT may be fixed and the IR volume control of a surround sound system may be controlled by the PX-600.

Zone Outputs:

These are secondary, fixed, unity gain line level outputs for each zone. The outputs are designed primarily to route audio to PX-603 room expanders. The output signal is determined by the source selected in the zone (Tuner if the zone is not on). Signal is present at ALL of the Zone Outputs any time at least one PX-600 zone or PX-603 room is on. You can use the zone outputs in conjunction with amplifiers and autoformers, but in designing this sort of configuration, keep in mind the active status of the Zone Outputs, especially if the amplifier you are using has a signal-sensing turn-on circuit.

IR In:

If you are using an IR repeater to control the Main Zone (Zone 6), connect the output to the PX-600 via this jack using a mono 1/8" mini phone plug (signal and ground only). The IR input eye on the front panel is automatically disabled when this plug is inserted.

IR Out:

This output merely passes the signal that comes into the IR IN jack - do not confuse it with the Source IR Output jacks. Plug in IR emitters to control equipment (other than sources controlled by the PX-600) into this mono 1/8" mini phone jack.

[3] Shelving and accessories of this type are available through Middle Atlantic Products, 400 Union Avenue, P.O. Box 96, Haskell, NJ 07420.

Trigger In:

If your audio sources are shared with a separate system such as a surround sound system, supply a 12VDC trigger to this input that is active when that system is on. A simple way to do this is to plug in a 12VDC, AC adapter (power supply) into a switched outlet on the other system and connect its output into the TRIGGER IN jack using a mono 1/8" mini phone plug. Applying voltage to this trigger powers on (or doesn't switch off) the AC outlet of the PX-600. This powers up the source equipment and blocks the STOP and POWER commands to CD, TAPE and AUX when the other system is on. If the PX-600 system is on first, the PX-600 will not issue STOP or POWER commands as long as the other system is on.

Trigger Out:

The system TRIGGER OUT provides a 12 VDC constant trigger whenever *any* zone or PX-603 room is on. Use a mono 1/8" mini phone jack to connect this output to a 12VDC relay or the equivalent. The relay remains active as long as any zone or room in the system is on.

Page Trigger:

When this jack is shorted, all zones and PX-603 rooms programmed to receive paging and doorbell signals switch to the PAGE AUDIO input until the jack is un-shorted. To use a Page/Doorbell Module, connect the MUTE OUT jack of the Page/Doorbell Module to the PAGE TRIGGER jack.[4]

Zone Triggers:

ZONE TRIGGERS provide a means to energize a relay per zone while that zone is on. Relays connected to these triggers start an action required whenever a particular zone comes on. For example, you may want to switch on a remote amp for that zone. Provide the voltage and current to operate the relays via a power supply connected to the VIN (Voltage Input) next to the ZONE TRIGGERS.

IDENTIFICATION

A PX-600 unit will have a suffix after the six-digit serial number of ***1/05 or higher***.

OPERATION

In previous versions of the PX-600 (*suffix number 1/04 and lower*), the Zone Triggers were designed to sink current and were intended to directly drive the coil of a relay. When the voltage between the "tip" and "shield" of the Zone Trigger jack is measured it shows the voltage supplied to VIN regardless whether the system or zone is on or off. This can not be used as a voltage trigger.

In the new version (1/05 and greater), the PX-600 has been redesigned and this condition no longer exists. The unit will now source both voltage and current. This allows voltage sensing devices to be triggered from these outputs as well as driving the coils of relays. The Zone Trigger outputs will now supply a positive voltage from VIN when that zone is on and 0 volts when the zone is off. The voltage and current are derived from an external power supply feeding the VIN input to the right of the zone trigger outputs. The Zone Trigger output can source up to 100mA, with voltages between 3VDC to 24VDC, through each trigger output. You must supply the external power supply for the Zone Trigger outputs. The PX-600 will supply the Main trigger out with approximately 12 VDC @ 100mA.

SELECTING A POWER SUPPLY FOR THE ZONE TRIGGER OUTPUTS.

You will need to select a power supply capable of handling the current requirements to drive the triggered devices. In order to do this you must first find out the voltage and the current necessary to drive the devices being hooking up to the trigger outputs. First, determine the voltage desired and select a wall transformer of that voltage. Power supply voltages can range from 3VDC to 24VDC. Second, determine the current draw of each device and add them up by the number of devices being triggered. Remember, do not exceed 100mA per output port. This sum will be the minimum current rating of the wall transformer. If you are using all six outputs and get a number higher then 600mA, you are exceeding the rated output of the trigger outs.

[4] See instructions enclosed with the Page/Doorbell Module.

Zone Trigger continued

CONNECTION

When hooking up the 1/8" (3.5mm) mini jack to the trigger outputs the "Tip" is positive and the "Shield" is ground. If you are still using an older unit and have a need for a voltage only trigger please contact our Customer Support Department at 888-691-4171.

IR Outputs:

Audio sources connected to the PX-600 are controlled by IR commands taught to the PX-600. IR commands can be sent to the sources via a 1/8" mono mini-plug from the IR Output to an IR input jack on the source equipment or through an IR Emitter glued over the IR receiver on the source. Connect an emitter[5] for each source that is to be controlled by the PX-600. The jacks marked TUNER, CD, TAPE, ETC. are source specific; only the IR commands programmed in the CD LEARN IR sequence, for example, will play through the CD jack.

Connect the jack marked ALL to a standard IR emitter for control of *all* sources. The factory default for this output is as an emitter. You may use it with a 1/8" mini-plug to control source components which have opto-isolated IR input and output jacks on their back panels. When using these components, connect the output of the ALL jack into the IR input on one component then out to the next one in the stack. Cascade from one source to the next until all are connected.[6] A blaster-type IR emitter may be connected into the ALL jack if you do the following:

Remove the cover of the PX-600.
Find a small jumper with the words "FLASHER" and "BLASTER" next to it, directly in front of and about 2" away from the ALL jack.
Remove the shorting plug and place on the side marked "BLASTER".
Replace the cover.

Switched Outlet:

This outlet powers up when the first zone is turned on, and off when the last zone is turned off. It is also controlled by an input to the SYSTEM TRIGGER. Plug a power strip into this outlet, then plug the audio source equipment into the power strip (200 watts maximum).
Do not use this outlet with amplifiers or any combination of components that draw more than 200 watts!

[5] Use any emitter compatible with a 9-12VDC output. Three #282, stick-on emitters are shipped with the PX-600.

[6] The cascaded connection described above will not allow independent control of multiple sources of the same type. These must be connected to the back panel jacks using separate emitters from each source specific IR OUTPUT.

KEYPAD INSTALLATION

This section covers aspects of installing, configuring and using the Audioaccess KPS keypads with the PX-600 Multi-room Pre-amp/Controller (for additional information regarding use of the KPS keypad with a PX-603, consult the PX-603 Installation Manual).

Keypad Termination Board (KPT):

The KPT (sold separately) is used to connect multiple, home run KPS keypads. Up to six separate connections may be made to the KPT plus a jumper to the PX-600 itself. The KPT may be mounted in any location between the PX-600 and the keypads. It should be easily accessible. The KPT is very useful when troubleshooting keypad operation problems, since individual keypad lines may be tested by unplugging all but the one in question. Mis-wiring, incorrect DIP switch settings or malfunctioning keypads can be quickly identified in this manner.

Keypad Fuse (PX-600 rear panel):

The keypad fuse is a 1-1/4", 1.5A, slow blow fuse in versions with serial number suffixes 1/04 and lower. Versions with suffix serial numbers of 1/05 and above will have a 5X20mm 1.6 A 250V slo-blo fuse (US) and a 5X20mm T1.6A 250V (Non-US). This fuse will blow if there is a short on the keypad line. Sometimes failed emitters short the output and cause the fuse to blow. Replace this fuse only with the correct type and rating.

The KPS IR Receiver:

Many people confuse the *IR receiver* on a KPS keypad with an *IR repeater*. A repeater takes any IR signal (light) and converts it to electrical signals and sends it down a wire. That signal is converted back into light through an infrared emitter. The KPS IR receiver, on the other hand, takes **specific** IR signals from the Audioaccess RT-A or the URC-5000 remote controller and *decodes them at the keypad*. Control data is then sent to the PX-600. No actual IR signal is transmitted to the PX-600 from the keypad. If a repeater is needed, plan for the addition of a separate IR repeater next to the keypad or somewhere conveniently located in the room!

For keypads installed outside or in bright rooms, we recommend that you turn off the IR receiver on the keypad. This is done by setting DIP switch #9 on the keypad in the UP position. Sunlight can slow the operation of the keypad or act as false data.
Noise radiated from manually operated light dimmers interferes with the operation of keypads. Maintain at least 4" of space between keypads and dimmers. If installing them closer is unavoidable, turn off the IR receiver on the KPS by lifting DIP switch #9. A metal box around the keypad will also help protect it from interference.

Keypad Mounting and Connection:

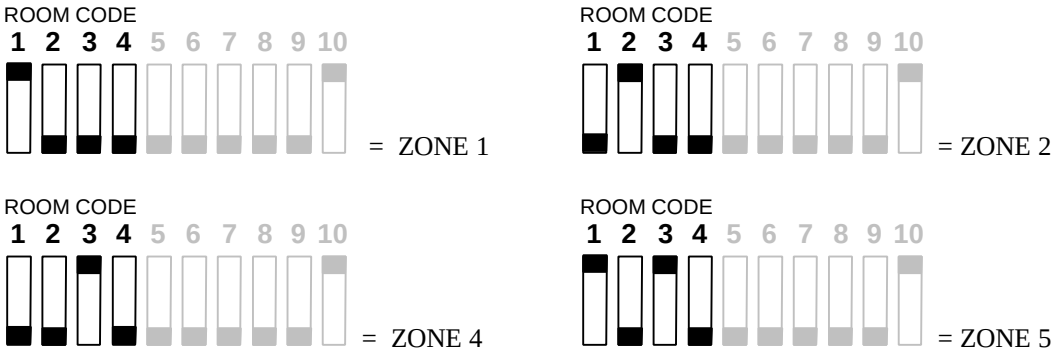
Mount the keypads in ordinary electrical boxes or plaster rings. The keypad bezel is sized for a Leviton™ brand "Decora" style wall plate. Use caution when attaching the wall plates to the keypads so as not to chip the paint on the bezels.

The wiring color code is shown on both the back plate of each keypad and on the rear panel of the PX-600. Be certain to follow the wire color code for all connections. *Terminate the cable on the keypad first, then to the KPT and PX-600*. This is the best way to avoid blowing the keypad fuse on the PX-600. All four conductors of the wire must be connected to the keypad. To avoid shorting, do not leave any of the wires disconnected or twisted together. Also, be certain that none of the insulation on the wires gets caught in the screw terminals. (Refer to the Wire Requirements and Pre Wire sections for related information)

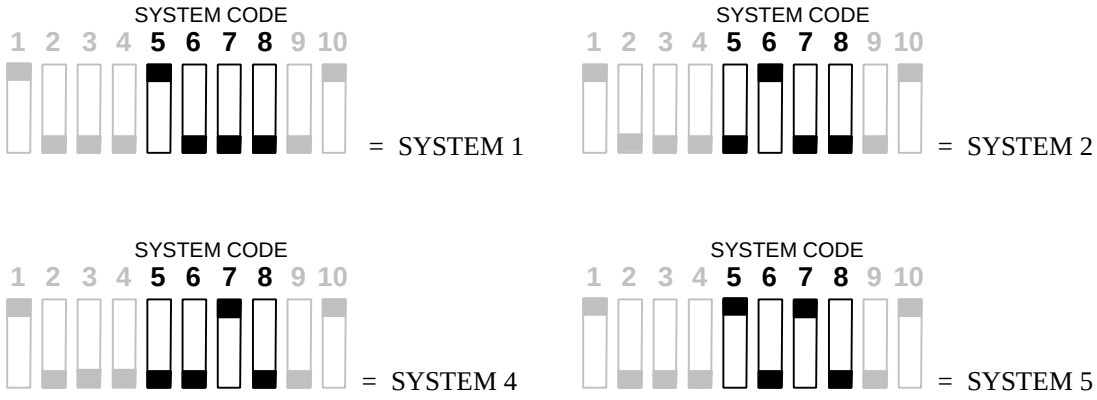
Setting the KPS Dip Switches:

The Audioaccess KPS keypads have a set of 10 DIP address switches that assign each keypad to a specific zone, system, and room driven by a PX-603. Additional dip switches control turn on the IR receiver and add impedance to the data lines. It is not necessary to turn off the PX-600 or disconnect the keypad while changing these switch settings. The changes automatically take effect when the keypad is used to operate the system. All switch settings in this section refer to PX-600 main zone settings only. For detail on DIP switch addresses on KPS keypads used to control PX-603 rooms, consult the charts in the PX-603 Installation Manual.

The ROOM CODE on a keypad must be set to match the ZONE you wish to control with that keypad. The ZONE/ROOM CODE switches have these values: 1=1, 2=2, 3=4, (switch 4 is used for rooms attached to the PX-603). Add these values together to get totals equal to the zone numbers.



For a single-PX-600 system, the SYSTEM CODE should be set to “0” (switches 5 - 7 down). In a multi PX-600 system, the SYSTEM CODE on the keypads must be set to the SYSTEM CODE of the corresponding PX-600. Think of the SYSTEM CODE switches as having these values: 5=1, 6=2, 7=4, (8 is used with the PX-603). Add these values together to get totals equal to the system numbers. For example, for System 1, lift switch 5, for System 3, lift switches 5 and 6, for System 6, lift switches 6 and 7, etc. Commit this pattern to memory and you'll never have to consult a switch setting chart!



Switches #4 and #8 are PX-603 room codes used to program one of three additional rooms within a zone when using the PX-603 room expander. Dip switch #4 in the UP position identifies room 1, #8 in the UP position, identifies room 2, and #4 and #8 up identifies room 3. The rooms addressed to the PX-603 are also addressed to main zone settings on the PX 600. (Consult your PX-603 manual for details)

Switch #9 controls the keypad IR eye. In the *down* position it is *on*, in the *up* position it is *off*. When a keypad is placed outdoors, or in a bright, sunny room or within 4" of a manually operated light dimmer, the IR eye should be turned off. (This is opposite of all other dip switch "on" and "off" positions.)

Switch #10 controls the "terminator". This switch inserts a 1 K ohm resistor across the two data lines. Keypads are shipped with the terminator in the up position. In daisy chain keypad installations, terminate the last keypad furthest away from the controller in the down or ON position. In a home run keypad installation, terminate the keypad on the longest run in the system. One keypad should be terminated in each system or controller in multi-PX600 systems.

Identification	
Switch #1, #2 and #3	set Zone codes
Switch #4 and #8	set Room codes on PX-603
Switch #9	enable or disable the IR receiver on KPS keypads
Switch #10 (terminator)	add 1K ohms of impedance across data lines

The chart below will guide you in programming any combination of Zone, Room and System setting. A blank field indicates a dip switch in the *down* position.

Switch #:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Zone 1	up									
Zone 2		up								
Zone 3	up	up								
Zone 4			up							
Zone 5	up		up							
Zone 6 (main)		up	up							
Room 1				up						
Room 2								up		
Room 3				up				up		
System 1					up					
System 2						up				
System 3					up	up				
System 4							up			
System 5					up		up			
System 6						up	up			
IR On									down	
IR Off									up	
Terminate										down
Non-Terminate										up

PROGRAMMING

PX-600 Programmer:

The detachable programmer is used to:

1. Program System features
2. View System Status and provide individual Zone Control from the front panel of the PX-600.

To hook up the Programmer, remove the plastic end cap from the left end of the front panel and plug in the 26-conductor ribbon cable included in the Programmer case. The end cap is friction fit and may be removed with your fingers or small flat head screwdriver. Be sure to install the PX-600 so that the front left end panel may be easily accessed after installation.

Zone Control
Press the ZONE button to toggle the LCD display showing the status of each individual zone. The ZONE display shows on/off condition, volume setting, and source information on the LCD panel of the programmer. When a zone is highlighted, it may be controlled using the control buttons on the front panel of the PX-600. As a default, the front panel of the PX-600 controls zone 6. Volume control is only available for Zone 6.

Zone control is especially helpful to program maximum volume settings for each zone. With your client present, turn on a zone from the keypad and raise the volume level to the highest level the homeowner indicates is the maximum level they desire. Observe this setting on the front of the programmer (hopefully it is less than the maximum setting) and adjust the MAX VOLUME level in the programming menu's ZONE SET UP to this level. This process may save you from replacing speakers and/or amplifiers in future service calls.

At times, system diagnostics is made easier by having the ability to observe zone status from the programmer versus wandering around a large home to check the status of each keypad.

System Programming
To program system features and learn IR to control source components, press the PGM and ENTER buttons to access the MAIN MENU screen.

Important Note - All control commands from keypads <u>will</u> <u>not</u> operate while any programming menu is accessed. Any keypad button press will "stack up" in system memory and will execute only after exiting the "Main Menu". It is therefore important to instruct all persons in the home not to press keypad buttons during programming. This will avoid the "system going crazy" syndrome after exiting the program menu .

To select an option or set a value, use the ^ and v buttons to highlight the appropriate choice or change the alphanumeric value and then press ENTER to confirm your selection.

The following programming instructions are presented in the order in which they occur on the MAIN MENU.

Always perform a DATA RESET before actual programming begins. This will insure that your set up will start at factory settings.

Zone Setup

With the factory default settings, each zone turns on at a reasonable listening level, bass and treble settings are flat, no zones are locked out, and maximum volumes are set to the maximum level available. In ZONE SETUP you may customize all these settings as follows:

Select ZONE SETUP from the MAIN MENU.

Select a MAINROOM.

Select NAME.

Use ^ and v to select letters and numbers to designate a name for the zone. Press ENTER after each character (this step is optional, but is useful for troubleshooting operations).

Select MAXIMUM VOL. The default maximum is 44. Select any value between 0 and 44 if you wish to limit the volume available in a given zone.

Select TURN ON VOL.

The default TURN ON VOL is 22. Select any value between 0 and 44. This is the volume at which the zone will turn on. It is also the volume at which the PREAMP OUTPUT will be fixed if the FIX volume option is selected for the preamp output (see notes on Zone Setup). PX-603 Room volume is set at the keypad for the Room - see the PX-603 Installation Manual for instructions.

Select BASS. The default is 00 or flat. Select any value between -12 and +15 in 3dB increments. Bass level for PX-603 rooms is set at the DIP switches on the PX-603 rear panel.

Select TREBLE. The default is 00 or flat. Select any value between -12 and +15 in 3dB increments.

Select LOCKOUT (see notes below for a description of this feature). The default is OFF. Select ON or OFF.

Select FIX VOLUME YES or NO. Select YES if you are going to use the pre-amp output with external amplifiers and volume controls - see notes below (this only affects the Pre-amp Outputs. Zone Output is fixed regardless of FIX VOLUME selection).

Press ENTER again with EXIT highlighted to return to the ZONE SETUP MENU.

Repeat above steps for each zone as needed.

Notes on Zone Setup:

Program any, all or none of the steps for each zone. You may exit the Zone Setup menu *at any time* by pressing ENTER while the word EXIT is highlighted.

As you exit the setup screen for Zones 1-5, you have the option to FIX the pre-amp output for that zone. If you select YES, the volume is fixed at the TURN ON VOLUME and the volume controls on the keypad, front panel and IR remotes are inactive for that zone. Use this option with additional amplifiers and auto-formers for volume control to expand the zone. Connect the fixed pre-amp output to the amplifier (to use the Zone Output, see below). In this way all the rooms in that that zone will have access to a full range of volume via the auto-formers. For Fixed Volume and related features for the Main Zone (Zone 6), see ZONE 6 MACRO under LEARN IR below.

The ZONE OUTPUTS are *permanently* fixed at the unity gain level. These are specifically designed to provide source audio to the PX-603, however they may also be used as described in the last paragraph. You can use the ZONE OUTPUTS and still have variable PREAMP OUTPUTS, thus providing a means to have "active" volume control via the keypad in the main room of the zone. Remember that the ZONE OUTPUTS pass signal any time any zone or room in the system is on, and plan for remote amplifier turn-on accordingly (i.e. by using the Zone Trigger Out to turn on the amp, rather than relying on signal-sensing circuitry).

If LOCKOUT ON is selected in a zone, that zone (including PX-603 Rooms) will operate normally *except* when another zone is on and *listening to* the same source as the locked out zone. If this is the case, the person in the locked out zone will not be able to *control* the source. He/she may continue to listen to it and adjust the volume, or select an unused source and control it normally. LOCKOUT selections for multi PX-600 installations are made in the MULTI PX-600, MULTI SETUP menu.

Learn IR

The key to IR programming is familiarity with the IR functions and remote control layout of the source equipment you select to use in the system. Stay away from units that have a toggle command on the remote for common IR functions. Buttons on the remote show have a single discrete command except for "Power" buttons. Follow the basic steps to get started, then use the programming charts as examples for completing the process. The LEARN IR sequence prompts the most commonly used commands for each source as well as the "housekeeping" commands used in the system. However, there are other creative uses for the command slots than the programming screens listings. For further tips and techniques on IR programming, read the "Quick Reference Guide" included in this manual.

Select LEARN IR from the Main Menu.
Select the source you wish to program.
Select sub-menu if applicable.
Enter IR commands from the source remote following the prompts displayed on the LCD screen.
At the bottom of each screen, below the command name, are the words KEEP OLD and LEARN NEW. If you press the ENTER button with KEEP OLD highlighted, whatever command is stored there will remain. Pressing the ENTER button with LEARN NEW highlighted erases the command stored.

Tuner

PROGRAMMER DISPLAY	IR COMMAND OR ACTION
NUMBER OF PRESETS 9	Set the number of presets to access (1 - 9)
INPUT IR FOR TUNER POWER	POWER (if unit has standby power)
INPUT IR FOR PRESET 1	PRESET 1
INPUT IR FOR PRESET 2	PRESET 2
INPUT IR FOR PRESET ...	PRESET ... (up to 9)
INPUT IR FOR SHIFT	SHIFT (optional)
INPUT IR FOR ENTER	ENTER (optional)
INPUT IR FOR PRESS-AND-HOLD FUNCTION	Enter command to be sent when user presses and holds the FM button

Notes on Tuner Programming:

The preset memory capabilities of tuners vary from model to model. A tuner on a switched outlet that is not used regularly *may lose its presets.* In this case, plug the tuner into an unswitched outlet.
Use the POWER command with tuners that come up in "standby" mode when main power is applied. This type of unit will not respond to IR commands until it receives the POWER command

For simplicity, choose the number of presets the client needs. Enter stations they *actually use*. This makes it much easier for them to identify the station they are on and to get to another without wading through unused presets.

The optional SHIFT command works with tuners that have multiple "banks" of presets. The PX-600 sends the SHIFT command immediately following the last preset selection. For example, let's say you select "6" as the number of presets and you enter a SHIFT command. As you repeatedly press the FM button, you will get: PRESET 1 (of bank "A"), PRESET 2, and so on until you get to PRESET 6. Immediately following PRESET 6, the PX-600 sends the SHIFT command. The tuner is then on PRESET 6 of bank "A", *with the bank selection of "B" ready.* The next time you press FM, the tuner goes to PRESET 1 of bank "B". After you reach PRESET 6 of bank "B", the SHIFT command is sent again, and the tuner returns to bank "A" or goes to bank "C" depending on how your tuner works.

The ENTER command is also optional. Some tuners require an ENTER command after selecting a PRESET number for the tuner to go to that PRESET. If you program an ENTER command, the PX-600 adds it *automatically* to each of the PRESET selection commands. As you repeatedly press the FM button on the keypad, front panel or IR remote, you will get PRESET 1 + *ENTER*, PRESET 2 + *ENTER*, PRESET 3 + *ENTER* ... and so on until the last preset is selected.

If you wish to program another command, such as SEEK up or down, a favorite preset, AM/FM toggle, or some other tuner function, use the FM press-and-hold function.

CD

The CD selection has sub-menus: NSM-3101, OTHER HIGH CAP and LOW CAPACITY. The NSM-3101 selection is intended for use with the NSM, model 3101 *only*. OTHER HIGH CAP is designed for use with most high-capacity CD changers that are controllable with IR commands. The LOW CAPACITY selection is for use with single-disc players and CD changers up to 20 discs.

NSM-3101 CD Changer:

The PX-600 can access up to nine of the ninety nine FPS (Favorite Program Selection) groups that can be stored in the NSM-3101 controller. Each FPS group can contain up to one hundred steps. Each step can be a single track from a disc, or an entire disc. The PX-600 can be programmed to play the FPS programs in either PLAY or RANDOM modes.

PLAY Mode:

Using the PLAY mode, the FPS steps are played in the order that they were entered into the NSM controller. When you first press the CD button, the PX-600 will send a three-step macro to the NSM-3101: FPS / 1 / PLAY, which will select and play the first FPS Program. On the second and subsequent presses of the CD button, the PX-600 sends a SKIP TRACK command. The NSM skips to the next numerical step of the FPS program in play. If the step you're on is an entire disc rather than a track, SKIP TRACK advances to the *next track on that disc* until it reaches the end of the disc before advancing to the next *step*. This is a function of the NSM-3101 player.

When you press and hold the CD button, the PX-600 sends: STOP / FPS / 2 / PLAY, thus advancing to the next FPS program. On each subsequent press-and-hold command, the PX-600 instructs the NSM to play the next FPS in sequence. After the last FPS, the PX-600 instructs the NSM to go back to FPS 1. Please advise your client to wait until music starts to play before using the press-and-hold CD function again. Otherwise, the NSM (or your client) can become confused.

RANDOM Mode:

The operation in random mode is identical to that above, but in place of PLAY commands, the PX-600 sends the command for RANDOM play. Just as in the normal PLAY mode, if the step you're on is a disc rather than a track, SKIP TRACK will advance to the next *random* track on that disc until it reaches the end of the disc. Then it will advance to the next step.

This Sample Programming Table begins with the first screen that appears after selecting NSM-3101 from the CD LEARN IR menu.

PROGRAMMER DISPLAY	IR COMMAND OR ACTION
NUMBER OF FPS #	Select the number of FPS groups to be accessed (1 - 9)[7]
INPUT IR FOR PLAY OR RANDOM	PLAY > or RANDOM
INPUT IR FOR STOP (A)	STOP ?
INPUT IR FOR STOP (B)	STOP ?[8]
INPUT IR FOR SKIP TRACK (A)	TRACK forward skip
INPUT IR FOR SKIP TRACK (B)	TRACK forward skip[9]
INPUT IR FOR -1-	1
INPUT IR FOR -2-, -3-, -4...	2, 3, 4... up to the number of FPS programs selected (up to 9)
INPUT IR FOR FPS	FPS

After completing the IR programming for any source, you may select another source, or press ENTER twice while EXIT is highlighted to exit programming.

LOW CAPACITY CD changers:

LOW CAPACITY contains the simplest protocol for CD control. Use it with CD changers that handle a number of discs between 1 and 20, or with high capacity changers requiring only the most basic control. The functions are: PLAY, SKIP TRACK, SKIP DISC and STOP. Use the DISC "#" B command if the changer requires two IR commands to change discs (i.e. disc number and PLAY). If the remote has a skip disc button, enter the number of discs as one, and enter the IR for DISC SKIP in DISC 1 A, leaving DISC 1B blank.

Sample Programming Table: LOW CAPACITY CD

PROGRAMMER DISPLAY	IR COMMAND OR ACTION
NUMBER OF DISCS #	Select number of discs to be accessed (1 - 20)
INPUT IR FOR STOP	STOP ?
INPUT IR FOR PLAY	PLAY >
INPUT IR FOR SKIP TRACK	SKIP TRACK >>?
INPUT IR FOR DISC 1A	DISC 1
INPUT IR FOR DISC 1B	Not used. Press ENTER to skip.
INPUT IR FOR DISC 2A	DISC 2
INPUT IR FOR DISC 2B	Not used. Press ENTER to skip.
INPUT IR FOR DISC ... A	DISC ... (up to capacity of player)
INPUT IR FOR DISC ... B	Not used. Press ENTER to skip.

OTHER HIGH CAP CD Changers:

OTHER HIGH CAP is designed for use with most high-capacity CD changers controlled with IR commands. When you first select CD, the PX-600 sends out a macro of up to six steps to start the changer playing a group or playlist. Second and subsequent momentary presses of CD send a command to skip

[7] Because of the time required for the NSM to advance to a new FPS, we advise keeping this number low, say, 4 or 5.

[8] The command is entered twice for both STOP and SKIP TRACK to accommodate the "toggle bit" IR used by Phillips. Therefore, it is important that the two times you press SKIP TRACK be sequential.

track (or step in a playlist); CD press-and-hold sends a six-step macro to skip to the next group or playlist (up to six groups total).

At the bottom of the programming screens for PLAY and GROUP macros, you will see the word DELAY in addition to KEEP OLD and LEARN NEW. You may select DELAY instead of teaching a command for any of these steps. This adds about 1.5 seconds to the standard delay of .7 second between commands when needed to make the macro work properly. If two or more consecutive steps are used as delays, the delays will be added together to form one longer delay. This may be necessary for older units that have slow physical reaction to the sequentially issued commands.

This Sample Programming Table for the Sony CDP-CX150 begins with the first screen that appears after selecting OTHER HIGH CAP from the CD LEARN IR menu.

PROGRAMMER DISPLAY	IR COMMAND OR ACTION
INPUT IR FOR PLAY STEP 1	STOP
INPUT IR FOR PLAY STEP 2	Group
INPUT IR FOR PLAY STEP 3	1
INPUT IR FOR PLAY STEP 4	ENTER
INPUT IR FOR PLAY STEP 5	PLAY
INPUT IR FOR PLAY STEP 6	Not used. Press ENTER to skip.
INPUT IR FOR STOP	STOP ?
INPUT IR FOR SKIP TRACK	SKIP TRACK FORWARD
NUMBER OF GROUPS #	Select number of groups to be accessed (1-6)
INPUT IR FOR GROUP 1 STEP 1	STOP ?
INPUT IR FOR GROUP 1 STEP 2	GROUP
INPUT IR FOR GROUP 1 STEP 3	1
INPUT IR FOR GROUP 1 STEP 4	ENTER
INPUT IR FOR GROUP 1 STEP 5	PLAY >
INPUT IR FOR GROUP 1 STEP 6	Not used. Press ENTER to skip.

The following screen begins IR programming for Group 2, Step 1 through the six steps for Group 2. This process continues until programming is complete for the number of groups selected. After Step 6 of the last group, the display shows the source selection screen for LEARN IR. From there, program IR commands for another source or press EXIT twice to exit programming mode.

Zone 6 Macro

The set of three features in the ZONE 6 MACRO simplifies the integration and operation of a surround sound processor in Zone 6. Begin by selecting ZONE 6 MACRO from the LEARN IR menu.

Trap Volume:

If you select YES for this option, the pre-amp for Zone 6 are fixed at the TURN ON VOLUME set in the ZONE SETUP menu. A setting of 41 is approximately equal to unity gain. When using TRAP VOLUME, the front panel volume knob is always inactive, keypad and IR remote volume buttons are inactive in Zone 6 unless Learn Volume is programmed. This function is available no matter which source may be selected.

Learn Volume:

This IR capacity allows you to teach the PX-600 IR commands for volume control of a surround sound processor or receiver. The volume control buttons on the keypad or IR remote control in Zone 6 then control the volume of the processor or receiver. You must select YES on TRAP VOLUME to access this function. Use the All IR Output jack to send this signal; to the local unit.

NOTE: For multi PX-600 systems, LEARN VOLUME is available only on Zone 6 of System 1. LEARN VOLUME must always be used in conjunction with TRAP VOLUME. TRAP VOLUME does not have to be used with LEARN VOLUME if you wish only to fix the output level to the turn on volume.

Video Macro

A sequence of up to 10 IR commands can be sent via the VIDEO and ALL IR output jacks when VIDEO is selected in Zone 6. Another 10 commands can be issued when you switch out of VIDEO or when Zone 6 is turned off while in VIDEO. Use this feature to send IR codes to the surround processor to put it in the correct mode for VIDEO sound, then send commands to the video projector, screen, drapes, lights, etc. When exiting VIDEO, a separate set of IR codes can re-set everything for normal listening.
For multi PX-600 systems, VIDEO MACRO is available only on Zone 6 of System 1.

Group Setup

Use GROUP SETUP to set ALL ON groups and TIMEOUT MODE for all PX-600 zones and PX-603 rooms in the system (only software version 2.01 and above includes the necessary programming screens for the PX-603 - see the PX-603 manual for instructions on software upgrades and other modifications necessary when adding a PX-603 to older PX-600 systems).[9]

This segment of programming tells the PX-600 software that you have added PX-600 rooms, and to which zones. You will, of course, have to set the DIP switches on the PX-603 and any KPS's that control those rooms and enter information in the necessary programming screen. For additional and more comprehensive information on adding PX-603 rooms to zones of your system, consult the PX-603 Installation Manual.

All-On

ALL ON is a feature that allows you to organize zones (as well as the PX-603 rooms attached) into groups that can be turned on and operated together. This is most often used for social situations or any time background music is desired throughout the house. Zones (with their attendant rooms) may be assigned to groups A, B, C or N for none. Each Zone may be assigned to only one group, and you must indicate any room attached to that zone for proper PX-603 function.

Initiate ALL ON in a group of zones by pressing and holding the ON button on a keypad, or IR remote while the zone is in the off condition. Press-and-hold the POWER button on the front panel of the PX-600 to turn on the zones assigned to the same group as the Main Zone (Zone 6). Once you have assigned zones to groups, select one of three ways that the ALL ON feature can work for all the groups in the system.

[9] GROUP SETUP for a multi PX-600 system is done under MUTI-PX-600, see below.

Group Setup Programming Instructions

For single systems, Select GROUP SETUP.

To set groups for Multi-Systems, see Multi Set Up in this manual. The steps reflected here are the same for both areas of programming, however they are accessed from MULTI SET UP in the main menu.

Press ENTER.

The default setting is Group A for all PX-600 main rooms (Zones). If you wish to change the Group assigned to any zone, select the zone you wish to change and press ENTER.

Select A, B, C or N. Press ENTER.

When you have all the zones assigned to the groups you want, highlight --EXIT-- and press ENTER.

As you exit the GROUP SETUP screen, the TIMEOUT MODE options will appear. Select YES or NO and press ENTER.

If you have selected YES for the TIME OUT mode, you will see the TRACK POWER AND SOURCES AFTER TIMEOUT option. Select YES or NO and press ENTER. If you select NO for TIMEOUT MODE, this screen will not appear.

The following screen shows the Zone names with Room numbers and allows a Y or N option. For zones with a PX-603 room, change the ROOM selection to Y or N as appropriate. Remember - the first PX-603 room in any Zone is ROOM 1, no matter how many PX-603 rooms are attached to the zone or system, and the software as well as the PX-603 and KPS DIP switches must reflect this for accurate operation of the PX-603 rooms.

Notes on programming TIMEOUT MODE:

TIMEOUT MODE allows all zones (including PX-603 Rooms) in the ALL ON group to revert to independent volume and source operation after 60 seconds, to track only source, or to track all functions within the group of zones and rooms until the group is turned off.

If you select NO for the TIMEOUT MODE, zones turned on using ALL ON will track source selection, on/off, and volume until the group is turned off.

If you select YES for the TIMEOUT MODE and YES for TRACK POWER AND SOURCE AFTER TIMEOUT, zones will track source selection, on/off and volume for 60 seconds, then revert to independent volume control, but continue to track sources and on/off.

If you select YES for the TIMEOUT MODE and NO for TRACK POWER AND SOURCE AFTER TIMEOUT, zones will track source selection, on/off and volume for 60 seconds, then will revert to completely independent operation.

PX-603 rooms respond to ALL ON and TIME OUT modes in the same manner as the Zones they are attached to.

Paging Setup

The Page/Doorbell Module ("PDM", sold separately) generates doorbell chimes and/or routes paging audio through selected zones at selected volumes. PX-603 Rooms are set for paging along with their zones; they page with zone on/off in the same way (See the PX-603 manual).

Programming Instructions:

Select PAGING SETUP.

Press ENTER.

The first screen says PAGE IF ZONE OFF. All the zones are listed with the default choice of YES. If you wish to set any zone so that it will *not* receive paging/door chime signals when the zone is off, select the zone to change and press ENTER (PX-603 rooms will respond in the same manner as the rest of the zone).

Use the ^/v buttons to select NO. Press ENTER.

Repeat for any zone you wish to exclude from receiving paging/door chime signals when off.

Press ENTER while the highlighter is on --EXIT--.

The next screen reads PAGE IF ZONE ON. The default choice is YES for each zone. If you wish to set any zone so that it will *not* receive paging or door chimes when it is on, select the zone to change and press ENTER.

Use the ^/v buttons to select NO. Press ENTER.

Repeat for any zone you wish to exclude from paging/door chime signals when on.

Press ENTER while the highlighter is on --EXIT--.

The next screen will say PAGE ZONE VOLUME. Set the volume for the page or door chime to play. This volume is independent of the volume at which the zone is operating. The default volume setting is 16.

Select zone number. Press ENTER.

Select desired volume. Press ENTER (PX-603 Rooms page at their turn-on volume).

Repeat for each zone and then press ENTER while the highlighter is on --EXIT--.

For Multi-systems programming must be done to each individual system.

Multi PX-600

Up to six PX-600s may be connected together to operate as one system for expanded flexibility and independent control. There are a number of differences between multi PX-600 and single PX-600 installations; all are important for proper system operation.

Connecting the PX-600s

The PX-600s communicate with each other via the keypad bus. Use one or more Keypad Terminator Boards (KPT) for each PX-600 depending on the total number of keypads and PX-603s in the system. Once all the keypads and PX-603s are terminated; parallel the yellow, green and black conductors of each KPT together. Use terminals on the KPTs for this connection, or if none are available, double up the conductors on one screw terminal on each KPT.

Do not connect the power conductor (red) *between* PX-600s! Each PX-600 should power the keypads plugged into its respective KPT only. Distribute all the keypads evenly between the PX-600s, regardless of whether they control a PX-600 zone or PX-603 room. The DIP switch setting on each keypad determines which system, zone and room it controls, but each PX-600 should *power* an equal number of keypads. The maximum number of keypads per PX-600 is twenty (20).

To connect audio sources, use regular RCA cables to connect sources to the AUDIO INPUTS on the rear panel of the first PX-600. With additional RCA cables, connect the LOOP-THRU jacks to the AUDIO INPUTS of the next PX-600. Cascade the AUDIO INPUTS and LOOP-THRU outputs in this manner until you have connected all the PX-600s.

To connect a Page/Doorbell Module to a multi PX-600 system, parallel the AUDIO OUT and MUTE OUT from the PDM into the PAGE AUDIO INPUT and PAGE TRIGGER of each PX-600. The PAGE AUDIO INPUT may be cascaded just like the audio from the sources described above. To parallel the PAGE TRIGGER, use a two-way 1/8" mono mini plug splitter or "Y" adapter (available at most electronic supply shops) and an extra mini plug to mini plug cable to connect each additional PX-600.

Multi PX-600 Software Setup:

Determine which PX-600 is System 1 (Main), System 2, System 3, etc. The ALL ON and LOCKOUT settings for each PX-600 in the system are done at System 1.

Begin with System 1. Enter programming.
Select MULTI PX-600.

Press ENTER.

Select MULTI-SETUP. Press ENTER.

The screen will say, WHICH PX-600 AM I. Select --1-- MAIN. Press ENTER.

The next screen asks for the number of PX-600s in the system. Select the appropriate number. Press ENTER.

On the next screen you will see a reminder to set the system code on the keypads for this system to "1". Make sure the DIP switches are set properly on all keypads. Press ENTER.

SYSTEM 1 ALL ON - If you wish to change the default (Group A) in any zone, use the ^/v buttons to select a zone in System 1. Press ENTER. Use the ^/v buttons to select A, B, C or N and press ENTER. When all the selections are the way you want them, highlight --EXIT-- and press ENTER.[10]

SYSTEM 1 LOCKOUT - Select zones 1 - 6 in System 1 and press ENTER if you wish to change the lockout status from the default of "NO". When all the selections are the way you want them, highlight --EXIT-- and press ENTER.
Next you will see the SYSTEM 2 ALL ON and LOCKOUT setup screens. Once these are completed, you will see setup screens for SYSTEM 3, SYSTEM 4, etc. up the total number of PX-600s in the system.
TIMEOUT MODE - If you select YES, zones will become totally independent or continue to track on/off and source (but not volume) 30 seconds after ALL ON is initiated. Select YES or NO and press ENTER.

[10] On ALL ON groups that span across more than one PX-600, the volume tracks only on the zones within a PX-600.

TRACK POWER AND SOURCES AFTER TIMEOUT - If you selected YES to TIMEOUT MODE, select whether the zones will become totally independent or continue to track on/off and source after time-out. Select YES or NO and press ENTER. (If you selected NO to TIMEOUT MODE, this screen will not appear.)

This setup information will be sent to the other PX-600s in the system using the PX-600 CONNECT function discussed later in this section.

Setup for Systems 2 - 6 in a Multi PX-600 System:

Enter programming mode on System 2 - 6.

Select MULTI PX-600. Press ENTER.

Select MULTI-SETUP. Press ENTER.

Highlight the system number of the current PX-600 (2 - 6). Press ENTER.

On the next screen you will see a reminder to set the system code on the keypads to this system number. Press ENTER.

To return to the Main Menu press ENTER again to exit programming.
For each additional PX-600 in the system, repeat the above steps.

Run PX-600 CONNECT:

Note: This must be done after you have interconnected the PX-600s with the green, yellow and black conductors as described above.

Enter programming on System 1.

Select MULTI PX-600. Press ENTER.

Select PX-600 CONNECT. Press ENTER. A message will come up advising you that you are about to send setup data to the other systems.

Press ENTER again. The ALL ON group and LOCKOUT data will be sent to the other PX-600s in the system and the display will say “PROCESSING...” for a moment, and then return to the MULTI PX-600 screen. Press ENTER twice to return to the Main Menu and exit programming.

YOU MUST NEXT PRESS THE FRONT PANEL *ALL OFF* BUTTON ON THE HIGHEST NUMBERED SYSTEM AND CONTINUE TO THE LOWEST NUMBERED SYSTEM (6,5,4,3,2,1) TO COMPLETE THIS STEP!! This allows subsequent PX-600s to handshake to the master unit (system 1). Note - There is no indication or acknowledgment on the front panel that these commands are carried out. The system will, however, blindly complete the connection process with the only installer feedback is that a K will appear briefly on the programmer screen.

Multi PX-600 Notes:

Use MULTI PX-600/MULTI-SETUP on the PX-600 designated as System 1 - MAIN to change GROUP and LOCKOUT settings for each PX-600 in a multi PX-600 system. Once you have set up System 1 as a multi PX-600 system, you cannot access GROUP SET UP from the Main Menu, nor can you change the LOCKOUT settings when you go into ZONE SETUP from the Main Menu.
To go back to a single-PX-600 setup, select MULTI PX-600/SINGLE-SETUP and press ENTER. You will see a reminder to set your keypads to System “0”. Press ENTER twice more and you'll be back to the MAIN MENU.

Test Menu

The TEST MENU houses the RESET DATA function that is used to reset the factory default settings. It may be used in the field in a number of situations. *Always* do a data reset immediately after hardware installation and before any IR programming.

Reset data after replacing the PX-600 software. If you have had difficulty in IR programming, a data reset wipes the IR slate of any unwanted code that may have inadvertently been programmed into the wrong slots. Data is stored in non-volatile memory and we do not expect any memory loss, however power fluctuations, electrical static discharge, or several other causes can affect memory. If the PX-600 functions and/or IR commands begin to act erratically, select RESET DATA and press ENTER. *RESET DATA resets all the factory defaults and dumps any IR control codes that have been learned*. After a DATA RESET, you will need to re-program the Zone Setup and IR control codes.

About PX-600:

If you highlight ABOUT PX-600 and press ENTER, you will see the current software version in the unit. If you have any problems with or questions about your PX-600 system, call Technical Support at 888-691-4171. We will do everything we can to ensure that your questions are answered and that you and your client are satisfied with the system.

LCD Messages and Codes:

As mentioned earlier, the PX-600 Programmer is a powerful troubleshooting tool. Be sure to have it with you any time you respond to a service call and throughout system installation. While all codes appear periodically during normal system use, certain codes will appear in the LCD screen that help isolate system difficulties.

I — Located in the lower left corner, this indicates that the PX-600 is receiving IR signal through its front panel. This can be any kind of IR, valid, invalid or just noise in the IR band. If the I is on constantly, check for sunlight flooding an IR receiver on the PX-600 front panel.

K — This letter appears in the lower right corner indicating data transmission to the PX-600 from a keypad or from a home automation system through an MCI. A constantly flashing K is usually a sign that a keypad is not connected correctly, has a stuck button or that it receiving spurious IR into the KPS.

P — The “P” appears on the lower left-hand side while the PX-600 is sending IR commands to the source equipment.

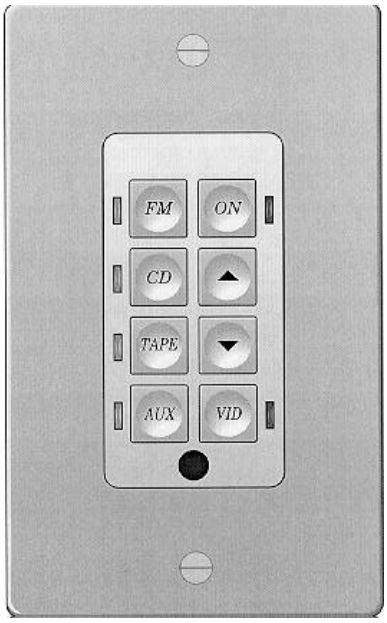
1-6 — A number between 1 and 6 in the upper right-hand corner indicates the System code of that PX-600. No number in that location indicates System code 0 or a single PX-600. If you have a single-PX-600 system, but there is a number in the upper right-hand corner, go into programming, MULTI PX-600, MULTI-SETUP and select SINGLE-SETUP to restore normal single PX-600 operation. Be sure that the keypads for this system are set to system zero (0) as well, if they are not system operation is inhibited.

SYSTEM OPERATION

The Audioaccess remote keypads and IR remote controllers are an integral part of a PX-600 system. They are, to a large extent, the whole system from your clients' point of view. The following is a description of the operation of a PX-600 system from a KPS keypad or IR remote; operation of PX-603 rooms with the KP-3 keypad is outlined in the PX-603 Installation Manual. Certain optional functions outlined in the LEARN IR section may apply.

The URC-5000 contains a pre-programmed code for the PX-600 under the AUDIO button. To initialize this code, press AUDIO - DO - ENTER - RECALL - 4 - 0 – 3.

The following instructions apply with a keypad, IR remote or the front panel of a PX-600. The front panel controls only the Main Zone (Zone 6). Exceptions are noted below.



KPS

RT-A-2

ON
(Substitute the word POWER for PX-600 front panel operation.)
To turn on a single zone, momentarily press the ON button. The ON LED illuminates on keypads. TUNER input is selected when any zone first turns on.
To turn off a single zone, momentarily press the ON button again.
To turn on a group of zones (called an ALL ON group), start with the zone off, then press-and-hold the ON button for about 2 seconds or until the ON LED flashes on the keypad.
To turn off an ALL ON group, momentarily press the ON button from any zone within the group.
To turn off all zones in the system regardless of ALL ON grouping, go to any keypad, make sure it is ON, then press-and-hold the ON button for about 2 seconds or until the ON LED flashes on the keypad. All zones will turn off (the front panel has a separate ALL OFF button).

VOLUME ^/v
To increase the volume, press ^. To decrease the volume, press v (use the large knob on the front panel for zone 6). To mute the audio, press ^ and v together (press the MUTE button on the front panel or IR remote control to get the same response).
To un-mute the audio, press either the ^ or v buttons (press MUTE again on the front panel).

FM
To select the TUNER, momentarily press the FM button. The FM LED illuminates.
Once the tuner is selected, you can cycle through up to 9 tuner presets by repeatedly pressing the FM button. If your tuner has a SKIP PRESET feature, the possible number of presets you can cycle through may be more, up to the total number of presets the tuner itself can support.
Press-and-hold the FM button for about 2 seconds or until the FM LED flashes on the keypad (or front panel) to access an optional, additional command for the tuner (such as SEEK).

CD
To select the CD input and issue a PLAY command, momentarily press the CD button. The CD LED illuminates on the keypads (or front panel).
The second and subsequent momentary presses of the CD button sends the SKIP TRACK command to the CD player.
To skip to the next disc, press-and-hold the CD button for about 2 seconds or until the CD LED flashes on the keypad (or front panel).
High-capacity CD changer operation
If your CD player is a high capacity changer (usually 100 or more discs), substitute this outline of functions:

CD button pressed, first time:
The PX-600 sends a PLAY macro to the CD changer. The CD changer begins to play GROUP 1.
CD button pressed second and subsequent times:
The PX-600 sends a SKIP TRACK command. The CD changer advances to the next track on the current CD or the next step in the group or playlist. There are some variables depending on how your CD changer works.
CD press-and-hold:
The PX-600 sends the next sequential group IR macro of up to six commands to CD changer. After sending the macro for the last group, the next macro starts GROUP 1 again.

TAPE
To select the TAPE input and issue a PLAY command, momentarily press the TAPE button. The TAPE LED illuminates on the keypad (or front panel).

To reverse the play direction of the tape, momentarily press the TAPE button again. Each subsequent quick press of the TAPE button toggles the play direction.

Depending upon whether you have a single or multiple cassette player, the tape button press-and-hold function operates differently:

Single Cassette Players
The press-and-hold function can be used for many functions on the cassette deck, depending on IR programming. Some examples of functions are: Automatic Music Search [AMS], Fast Forward, Rewind, Stop, etc.

Multiple Tape Player
If your tape player holds multiple tapes, the press-and-hold function may be used to advance to the next tape.

AUX
The AUX operation depends on what you have attached to that input. If it is a second CD player or a tape deck, it will most likely work in the same way as the examples above.

VID
To select the audio from your VIDEO, momentarily press the VID button.

The IR remote control has these buttons dedicated to control of VIDEO functions: PLAY, STOP, FAST FORWARD, REWIND, CHANNEL UP, CHANNEL DN, PAUSE, TV/VCR. Program these functions for your specific needs. The simplest for your client to follow, of course, will be to program the functions as labeled.

Stop Commands
STOP commands are automatically sent to CD, TAPE and AUX when the first zone turns on, when the last zone turns off and when the last zone listening to a particular source switches to another source or turns off. On the VIDEO input, STOP commands are sent to the video source only when you press the STOP button on the handheld IR remote control.

ACCESSORIES

Multi-room Computer Interface (MCI)

The MCI is a serial communications translator used to interface computer-based "home automation" systems with the Audioaccess PX-600. Properly configured with our CONDI communications protocol, these systems control all the functions of the PX-600 normally controlled via keypads, the front panel and/or hand-held infrared remotes.

A number of control system manufacturers develop software in accordance with the CONDI protocol and generate user interfaces consistent with their particular product line. The extent of control possible and the appearance of the user interface is dependent entirely on the individual software developer's design.

MCI Hook-up information:

The MCI comes mounted on a "snap track" and is approximately 4½" x 2¾" x 1". The RS-232 port from the control system is connected to a 9-pin "D" connector at one end of the MCI: Pin 2 = Receive, Pin 3 = Transmit and Pin 5 = Ground. Wire the 4-pin screw terminal at the other end (P1) like a KPS keypad and connect it in parallel to the keypad bus (RS-485). The "1" near one end of the connector indicates Pin 1 or power (RED). Pin 2 = data (GREEN), Pin 3 = data (YELLOW) and Pin 4 = ground (BLACK).

The red LED at D2 indicates the MCI is receiving power. The green LED at D1 shows activity on the bus. It flickers as data travels to or from the PX-600 when a button is pressed on a keypad, front panel or infrared transmitter, or when a command is sent from the control system to the PX-600.

Page/Doorbell Module (PDM)

The Page/Doorbell Module (sold separately) generates doorbell chimes and/or routes paging audio through selected zones at selected volumes. There are two doorbell triggers and two paging audio inputs. The doorbell chime audio and the paging audio are mixed together and fed into the PAGE AUDIO INPUT on the PX-600. Zones can be programmed to receive doorbell chimes or paging when ON or OFF or both. The chime or page volume is preset and is not affected by the current listening level in each zone. There is one AUDIO OUT and one MUTE OUT (trigger) from the Page/Doorbell Module. Whatever zone and volume information is programmed will apply to both the paging audio as well as the door chime levels.

Connect the doorbell inputs to the four-conductor plug-in screw terminal (supplied). It will accept wire size between 22 and 18AWG. Audioaccess provides a 12VDC POWER SUPPLY and the two cables used to connect the MUTE OUT (trigger) and the AUDIO OUT signal to the PX-600. Each paging input requires a mono 1/8" (3.5mm) plug which is not supplied with the unit.

Doorbell Inputs:

The doorbell inputs can each be triggered in one of three ways:

1. contact closure
2. voltage (10-24VAC)
3. The output of a Panasonic Door phone, model KX-T30865.

The input types may be mixed. For example, you may have a contact closure on Door Input 1, and a Panasonic Door phone on Door Input 2. Manually set the jumpers inside the module for the type of input used.

The PDM generates a doorbell chime upon receiving one of the signals described above. Door Input 1 and Door Input 2 have the ability to be set for one, two, or three tone chimes. Factory settings are Door Input 1 as two chimes and Door Input 2 as Three Chimes. If you have an application where you want to mute the system audio when the doorchime is triggered but *not* play the doorbell chime through the system, remove the resistor at R20 inside the PDM.

Paging Inputs:
The signal-sensing audio inputs for paging accept a mono, line level, audio signal (1.0V RMS) on a mono 1/8" (3.5mm) plug. The paging output of an electronic key telephone system is typically around this level. A separate microphone requires a pre-amp to bring its signal up to line level.

When it detects an audio signal, the PDM switches the audio in selected zones to the Page audio input. The paging audio is heard in those zones at the programmed paging volumes. You can adjust the audio level that triggers the PDM by adjusting the potentiometer at R42 inside the module.

TECH NOTES

IR PROGRAMMING

Ideal Programming Conditions
In order to minimize interference and maximize the reliability of source control, follow these guidelines during programming:

1. Eliminate direct or bright indirect sunlight near the PX-600 Programmer.
2. Turn off any halogen, fluorescent and neon lights in the area.
3. Position Programmer so that no lights, even incandescent lights, shine directly into the IR input window.
4. Hold the transmitter for the source equipment you are programming 2" to 6" from the PX-600 Programmer. Hold it level and squarely aligned with the red IR input window.
5. Except as directed elsewhere in these Tech Notes, when you enter a command into the PX-600 Programmer, press and hold the button on the IR remote until you see the words: "Storage Successful" on the LCD screen.

CD - Multiple Skip Track

You may encounter some CD players that skip more than one track when you issue the SKIP TRACK by pressing the CD button the second and subsequent times. These players probably utilize 32 bit IR codes. When learning these 32 bit codes, the PX-600 will take 2-3 seconds before indicating "Storage Successful", whereas 16 bit codes are stored almost immediately. When 32-bit codes are learned and played back, often the player sees two separate commands and thus skips more than one track.

To compensate for this and skip only one track, get into programming and proceed to the spot where you are to enter the SKIP TRACK command. Briefly tap SKIP TRACK on the CD's remote and immediately press and hold another button on the remote until the PX-600 indicates "Storage Successful" on the display. The PLAY button works well for this unless the player has a combination PLAY/PAUSE button. If this is the case, or if the player is affected in some other way when you press PLAY while it is already in PLAY, use a command from a remote that has nothing to do with the audio system to complete the storage of that IR address. The point is to fill the space allotted for the command without duplicating the SKIP TRACK command.

System Learning Remotes

These remotes are designed to control the functions of a stack of same-brand equipment, as well as learn the IR commands of other equipment. Often the PLAY buttons on these remotes send two IR commands: one to the receiver to select the input, and one to the player (CD, Tape, etc.) to start it playing. When using this type of remote to program IR commands into the PX-600, the PLAY command often gets cut off and is not stored properly. When this happens it will appear that the PX-600 cannot control the source equipment. For this reason, it is best to use the transmitter for the player itself whenever possible.

However, sometimes the individual player's remote is not available or doesn't exist. To program the PLAY command or any other command using a System Remote, follow this procedure:

1. Place the remote in the proper location for programming.
2. Place your hand between the remote and the PX-600 Programmer.
3. Press PLAY - your hand will block the first command (SOURCE SELECTION).
4. Move your hand in time to record the second command (PLAY). This may take only a fraction of a second.

It may take a little practice to get the timing right, but it works and it may get you out of a jam.

IR Programming tips for Tape Players

There are different formats for the control of tape players, and clients have differing needs or expectations of how a player should respond from a keypad or remote. With this in mind, we have outlined the programming protocol for the TAPE input along with some suggested ways of using it.

During IR programming for TAPE, enter the number of tapes the player has and the commands for: PLAY, STOP, REVERSE PLAY and FORWARD PLAY, then TAPE 1A/1B, TAPE 2A/2B, etc. The PX-600 issues PLAY the first time TAPE is selected in a zone, unless it was already selected in another zone. STOP is issued shortly after the first zone is turned on in the system, after the last zone is turned off and whenever the user switches out of TAPE, unless another zone has TAPE selected.

The REVERSE PLAY and FORWARD PLAY commands toggle back and forth each time you press TAPE after the first time. Normally these provide a CHANGE DIRECTION function on players that have two PLAY buttons.

TAPE 1A/1B, 2A/2B, etc. are two-step commands issued when you press and hold the TAPE button. The intended use of the two steps is to accommodate multi-tape changers that require a tape select command followed by the tape number or the tape number followed by PLAY. Most players change tapes by pressing the tape number only, in which case enter the tape number in the "A" step and skip the "B" step. If you have a tape player with one PLAY button and a DIRECTION button:

1. Enter DIRECTION for both the REVERSE PLAY and FORWARD PLAY commands so that you get the DIRECTION function each time you press TAPE after the first time. Using this option, you could tell the PX-600 you have 2 tapes and enter FF into TAPE 1A, press STORE to skip TAPE 1B, then enter PLAY into TAPE 2A and press STORE to skip TAPE 2B. You'll now be able to toggle between FF and PLAY on the press-and-hold function.
2. Enter FF into REVERSE PLAY and PLAY into FORWARD PLAY, then enter DIRECTION in TAPE 1A. This toggles between FF and PLAY to find a particular part of a tape. When you press and hold TAPE, you change the direction of play. Another twist to this is to tell the PX-600 that the player has 2 tapes as in Option 1, and enter REW and PLAY in TAPE 1A and TAPE 2A. Then you toggle between FF and PLAY by momentarily pressing TAPE and toggle between REW and PLAY using the TAPE press-and-hold function.

Sources with IR input on back panel

Many sources, particularly tape decks and tuners, have no IR input to the front panel. These products are designed for use with receivers and a "system" remote. Some tape players and other source components have opto-isolated IR inputs as with Harman Kardon equipment. With these components, plug the emitter outputs of the PX-600 directly into the IR inputs on the back panels using mono mini plug to mini plug cables.

When the IR inputs are not opto-isolated, route the IR through a CD player in the system that is the same brand and series, and connect the CD player via the IR port to the back of the tape deck. Use the ALL OUTPUT in this case. If this is not an option consider using a Xantec 794/797 connecting block and route the IR signal through this device which provides opto-isolation for the source component.

Using a CD Player on the Tape input
The programming is the same for PLAY, STOP and SKIP DISC (SKIP TAPE). However, enter SKIP TRACK for both REVERSE PLAY and FORWARD PLAY. Then each time you press TAPE on the transmitter, keypad or front panel, you will get SKIP TRACK on the CD Player.

Laser Video Disc Players as main CD Players

Many current LD players play regular CDs as well as laserdiscs. One may be tempted to use these players as both the CD and VIDEO source. We recommend a separate, dedicated CD player on the CD input. However, if you must use the LD/CD arrangement, please consider the following:

Split the audio output into both the CD input and the VIDEO input of the PX-600. If you're using some other means of video switching, connect one of the splits into that device and then into the PX-600. In this way the audio will track with the labeling on the keypad.

LD players often have PLAY/PAUSE buttons which means you will undoubtedly get PAUSE at some point when you really want PLAY.

LD players often have STOP and EJECT on the same button, so it is likely that the drawer will open when you don't want it to. You may opt to eliminate the STOP command altogether.

If you plug the LD player into the PX-600 for AC power, it may power up into a "standby" mode. Before it accepts any other commands, the player needs the IR POWER command. Use the POWER command from either the CD or the VIDEO input - not both. You can get around this on some players by setting the timer to the "on" position if it has this feature (this solution *may* work for *any* equipment with stand-by power).

Sharing Sources with Other Systems

Some pre-amps, receivers and A/V surround receivers short their audio inputs together when they are turned off. This will show up in the PX-600 as cross talk between CD, TAPE, AUX and VIDEO if the PX-600 is on and the other system is off. This cross talk or bleed from one source to another is often accompanied by low frequency distortion. One solution is a line level switch made by Sonance, Model AL-1S, which has A/B switching between multiple sources and provides the necessary isolation. It requires a 12VDC power supply, also available from Sonance, and is reported to work perfectly in this situation. The only other way to deal with it is to build a relay circuit that isolates the preamp or receiver from the source equipment when it is off.

AUDIOACCESS Reference Guide for Programming

Note: A full DATA RESET should always be performed before programming a system. Consider a DATA RESET as your first step in system programming.

For PX-600 – enter the main menu on the programmer and choose TEST MENU. From TEST MENU choose DATA RESET and press the ENTER Key.
For MRX (NT) press tuner preset numbers 5 and 6 simultaneously to access the TEST MENU, choose DATA RESET, press the STORE Key on the front panel.

LEARN IR FOR TUNER	*Description and what to do.*	*Button presses and housekeeping information.*
Number of Presets	Enter the number of presets here, up to nine (9).	At power up unit defaults to last station accessed
Enter IR for Power	Enter the POWER command for tuner here. If the tuner that is being used has a hard switch, it is not necessary to enter an IR code.	This is an Audioaccess housekeeping command. Power commands are given when 1st zone is turned on and last zone is turned off.
Preset number	Enter preset call IR for the appropriate # of the preset.	Press function - Advances to the next preset station.
Enter IR for SHIFT	Enter the shift command here if necessary to access multiple banks of presets. Not all tuners need this command.	Press function - after last preset number allows user to advance to next preset bank.
Enter IR for ENTER	Enter the ENTER command here. This function is used with the shift command for some tuner models. It is not always necessary to use this command.	Issued after each preset command. Some tuners need this command to force preset banks.
IR for Press and Hold function	Enter the IR code for the Press and Hold function, usually a scan up code.	Press and hold function. Usually used for SCAN UP to next strongest station or advance to next preset.

LEARN IR FOR CD

Block CD PLAY command when trigger is active

YES - When the TRIGGER IN is held active, commands will NOT be issued to CD changer. Set this when the source is being shared with another system.

NO - All commands will be issued to source regardless of trigger state. If you are not sharing the source with another system, this is the appropriate answer.

Low Capacity	*Description and what to do*	*Button presses and housekeeping information.*
Number of Discs - 1 to 20	Enter the number of discs that are in the CD changer. If the remote you are using has a Disc advance button, enter the number of discs as 1.	
Enter IR for CD power	Enter the CD changer's power command here. If the unit has a hard switch and does not power up in stand-by, it is not necessary to enter this code.	Housekeeping - not button related
Enter IR for Play	Enter the CD changer's PLAY command here.	First button press. This command is issued on initialization of this source.
Enter IR for Stop	Enter the CD changer's STOP command here.	Housekeeping - Command given when last zone exits source.
Enter IR for Skip Track	Enter the CD changer's SKIP TRACK command here.	Subsequent momentary press function - issues command to SKIP TRACK on currently playing CD.
Enter IR for Disc 1A	Enter the DISC SKIP command here. For some units you must enter the disc # and then go to disc 1B	Press and HOLD function. Issues command or commands to advance to next sequential disc (go to Disc 1B) >>>
Enter IR for Disc 1B	Enter the PLAY code here if the unit needs a disc # to advance to the next disc. IF you have entered a SKIP DISC command in Disc 1A, leave this slot empty.	This is part TWO of the press and hold function. Disc A & Disc B provide a two step macro for disc skip commands
Enter IR for Disc 2A & 2B etc.	Enter the codes for the next sequential SKIP DISC command or commands. There will be two step macros for the # of discs that were originally entered.	Same as disc 1A &1B - These commands are available for up to 20 discs.

Other High Capacity - The power command (if needed {see low capacity}) should be put into low capacity - leave other low capacity commands blank.	***Description and what to do.***	***Button presses and housekeeping information.***
Macro - six steps available. Input IR for PLAY step 1	This is the first step to access and play the first play group.	Original access of this source - up to six steps to make the unit play.
Input IR for PLAY step 2	This is the second step to access and play the first play group.	see step 1
Input IR for PLAY step 3	This is the third step to access and play the first play group.	see step 1
Input IR for PLAY step 4	This is the fourth step to access and play the first play group.	see step 1
Input IR for PLAY step 5	This is the fifth step to access and play the first play group.	see step 1
Input IR for PLAY step 6	This is the sixth step to access and play the first play group.	see step 1
Enter IR for STOP	Stop Command	housekeeping command - not button related.
Enter IR for SKIP TRACK	Skip Track command	Momentary press - advances to next track of currently playing CD.
Number Favorite Play Groups - up to six	Put the number of Play Groups you wish to have here. ***PLEASE REFER TO ADDENDUM ON NEXT PAGE!!!***	Access for up to six favorite play groups. Housekeeping command.
MACRO - 6 steps - Enter IR for Group 1 Step 1	First command to access favorite play group < NEXT>	1st Press & Hold (if there is 1 group). -- Loop macro(if there is more than 1 group). - Accesses <NEXT> favorite play group of CDs.
Enter IR for Group 1 Step 2	Second command to access favorite play group <NEXT>	see step 1
Enter IR for Group 1 Step 3	Third command to access favorite play group <NEXT>	see step 1
Enter IR for Group 1 step 4	Fourth command to access favorite play group <NEXT>	see step 1
Enter IR for Group 1 Step 5	Fifth command to access favorite play group <NEXT>	see step 1
Enter IR for Group 1 Step 6	Sixth and final command to access <NEXT> favorite play group.	see step 1
Enter IR for Group 2 Steps 1,2,3,4,5,6	Enter the appropriate commands to access favorite play group number 2	Second press & Hold - accesses second favorite play group
Enter IR for Group 3 Steps 1,2,3,4,5,6	Enter appropriate commands to access favorite play group number 3	Third Press & Hold - accesses third favorite play group.
Enter IR for Group 4 Steps 1,2,3,4,5,6	Enter appropriate commands to access favorite play group number 4	Fourth Press & Hold - accesses fourth favorite play group.
Enter IR for Group 5 Steps 1,2,3,4,5,6	Enter appropriate commands to access favorite play group number 5	Fifth Press & Hold - accesses fifth favorite play group.

Enter IR for Group 6 Steps 1,2,3,4,5,6	Enter appropriate commands to access favorite play group number 6	Sixth Press & Hold - accesses sixth favorite play group. The next Press & Hold will revert back to the first Group.

Addendum for High Capacity Programming

When there is **more than one play group**, the **first press and hold** command issued **will access Play Group # 2.** In this case it is necessary to enter IR codes in Group 1 that are the consistent with the original Play macro. Group 1 will be accessed after the last Group macro has been issued. There are up to six Play Group Macros.

In cases where there is only 1 Group macro, the codes that are programmed are always emitted upon press and hold commands.

LEARN IR FOR TAPE	*Description and what to do.*	*Button presses and housekeeping information*
Enter the number of tapes. 1 to 20	Enter the number of tapes in the tape player.	Housekeeping - not button related.
Enter IR for TAPE POWER	Enter the POWER command here. If the unit has a hard switch and comes on in the powered up mode it is not necessary to enter this code.	Housekeeping - Command issued when 1st zone is turned on and when last zone is turned off.
Enter IR for TAPE PLAY	Enter the PLAY command here.	Initial access of source. - First button press.
Enter IR for TAPE STOP	Enter the STOP command here.	Housekeeping - issued when last zone exits source.
Enter IR for TAPE Reverse PLAY	Enter the Reverse PLAY command here.	First quick press to change tape direction for bi directional players.
Enter IR for TAPE Forward PLAY	Enter the forward PLAY command here.	Second quick press to change tape direction. Quick presses will toggle from one direction to the other. Optional command.
Enter IR for TAPE 1A	First step of two-step macro to switch to alternate tape bay.	Press and hold function
Enter IR for TAPE 1B	Some units require an enter command to switch bays. If this is not needed, leave this slot blank.	This is part two of the press and hold function. 1A & 1B commands provide a two step macro for this function.
Enter IR for TAPE 2A & 2B	Two-step macro to switch to alternate tape bay.	Second press and hold function.
Enter for IR TAPE 3A & B, 4A & B, 5A & B, ECT.	Two-step macros to switch to alternate tape bays.	Subsequent press and hold functions.

LEARN IR FOR AUX	**Choose from CD or Other for source.** CD also listed on sheet 2	
CD	***Description***	***Button Presses and housekeeping information***
Choose the number of discs. From 1 to 20	Enter the # of discs that are in the CD changer. If the remote has a DISC ADVANCE button, enter the # of discs as 1.	Housekeeping command - not button related.
Auxiliary Power	Enter the auxiliary unit's POWER command. If the unit has a hard switch and does not come up in stand-by, it is not necessary to enter this code.	Housekeeping command - Power commands are given when first zone is turned on and last zone is turned off.
Play	Enter the auxiliary unit's PLAY command here.	Command issued upon initialization of source. - First button press.
Stop	Enter the auxiliary unit's STOP command.	Housekeeping command - Command given when last zone exits source.
Skip Track	Enter the auxiliary unit's SKIP TRACK command.	Quick press - issues command to SKIP TRACK on currently playing CD.
Disc 1 A	Enter the auxiliary unit's DISC SKIP command. For some units you must enter the disc # then go to Disc 1 B.	Press and Hold - Issues command or commands to advance to next sequential disc.>>>>>>>>(see disc 1B).
Disc 1B	Enter the auxiliary unit's PLAY command if the unit needs a disc # to advance to the next disc. ** If you have entered a DISC SKIP command in Disc 1 A, leave this slot empty.	This is part two of the press and hold function. $A & $B provide a two step macro for disc skip commands.
Disc 2A & 2B ECT.	Enter codes for the next sequential DISC SKIP commands. There will be two step macros for the number of discs entered at the beginning of the program sequence.	See Disc 1A & 1B

Learn IR for AUX	**Choose from CD or Other for source.**	
Other	***Description***	***Button Presses and housekeeping information***
Function 1	First function for initialization of source. Power or Play command.	Housekeeping command. First press when accessing source.
Stop	Stop command - it is not always necessary to use this command.	Housekeeping command. - Command given when last zone exist source.
Function 2	Second function to be accessed. Track Skip or Next Preset Advance.	Subsequent momentary press function.
Function 3	Third and final function to be accessed. Disc Skip or other command.	Press and Hold function

NOTE: If an IR POWER command is necessary in this area, then enter it under CD programming for this source input.

VIDEO	*Description*	*Button Presses and housekeeping information.*
Enter IR for VIDEO POWER	Enter the code for POWER for this source	Housekeeping - Command is issued when 1st zone is turned on and last zone is turned off.
Enter IR for PLAY	Enter the PLAY command. Used for source initialization.	Housekeeping -This command is issued upon initialization of source - First button press.
Enter IR for STOP	Enter the STOP command.	Housekeeping - Command issued when last zone exits source.
Enter IR for REWIND	Enter command for REWIND.	Extended function - used with Hand-held remotes URC-5000 or RT-A
Enter IR for FAST FORWARD	Enter command for FAST FORWARD.	Extended function - used with hand-held remotes URC-5000 or RT-A.
Enter IR for CHANNEL UP	Enter command for CHANNEL UP.	Extended function - used with hand-held remotes URC-5000 or RT-A.
Enter IR for CHANNEL DOWN	Enter command for CHANNEL DOWN.	Extended function - used with hand-held remotes URC-5000 or RT-A.
Enter IR for PAUSE	Enter the command for PAUSE.	Subsequent momentary press function.
Enter IR for TV//VCR	Enter the command for TV//VCR.	Press and Hold function.
Block Video power & stop commands - YES	Blocks these two commands regardless of trigger-in condition.	Housekeeping command – used while sharing as a local source. Monitor Audio only
Block Video power and stop commands - NO	Will always allow these commands to be issued regardless of trigger state.	Commands issued as normal.

ZONE SIX MACRO	*Description*	*Button presses and Housekeeping information.*
TRAP VOLUME	Trap Zone SIX volume and FIX outputs	Programming
YES	Pre-amp and Amplifier outputs for this zone will be fixed at the turn on volume. (This level can be changed in ZONE SETUP for ZONE SIX)	Housekeeping
NO	Normal operation; Zone 6 volume control acts the same as any other zone in the system.	Housekeeping
LEARN VOLUME	Learns the volume codes for a surround pre-amp used in Zone 6 accessed through an Audioaccess keypad or remote control. Front Panel knob becomes inactive.	Programming
Input IR for VOLUME UP	Enter the command for VOLUME UP from surround decoder or receiver in Zone 6.	Zone Six External Volume Up Button
Learn IR for VOLUME DOWN	Enter the command for VOLUME DOWN from a surround decoder or receiver in Zone 6.	Zone Six External Volume Down Button

Video Macro lo**cated in Zone Six Macro** *Select* **Video**	***Description***	***Button Presses and Housekeeping information.***
Zone six *selects* VIDEO	Macro - 10 steps - operates when *SELECTING VIDEO* in Zone SIX only.	Macro is sent via the IR BLASTER output upon initialization of this source from ***ZONE SIX ONLY***.
Input IR for Step 1	Enter code for select video step 1 - Usually a Power On code for TV or Projector.	Housekeeping commands - Activated when zone 6, Video is first accessed.
Input IR for Step 2	Enter code for select video step 2 - Usually a code to choose a specific mode for a surround sound decoder. I.E. 6 AXIS, THX, or Pro Logic	see step 1
Input IR for Step 3	Enter code for select video step 3 - usually a code to drop a ceiling screen or switch to an auxiliary input on a TV.	see step 1
Input IR for Step 4	Enter a code for select video step 4 - set a lighting scene	see step 1
Input IR for Step 5	Enter code for select video step 5	see step 1
Input IR for Step 6	Enter code for select video step 6	see step 1
Input IR for Step 7	Enter code for select video step 7	see step 1
Input IR for Step 8	Enter code for select video step 8	see step 1
Input IR for Step 9	Enter code for select video step 9	see step 1
Input IR for Step 10	Enter code for select video step 10	see step 1

Video Macro **Located in Zone Six Macro** *Exit* **Video**	***Description***	***Button Presses and housekeeping information***
Zone six *exits* VIDEO	Macro - 10 steps - operates when *EXITING VIDEO* in Zone SIX only.	Macro is sent via the IR ALL output upon exiting of this source from ZONE SIX ONLY.
Input IR for step 1	Enter code for exit video step 1 - usually a Power Off command for a TV or projector.	Housekeeping commands - Activated when exiting Video in zone six.
Input IR for step 2	Enter code for exit video step 2 - Usually a code to choose a specific mode for a surround sound decoder. I.E. Stereo Bypass	see step 1
Input IR for step 3	Enter code for exit video step 3 - Usually a code to return a screen to it's hidden position or have a TV revert to RF signal.	see step 1
Input IR for step 4	Enter code for exit video step 4 - reset a lighting scene to original brightness.	see step 1
Input IR for step 5	Enter code for exit video step 5	see step 1
Input IR for step 6	Enter code for exit video step 6	see step 1
Input IR for step 7	Enter code for exit video step 7	see step 1
Input IR for step 8	Enter code for exit video step 8	see step 1
Input IR for step 9	Enter code for exit video step 9	see step 1
Input IR for step 10	Enter code for exit video step 10	see step 1

SOFTWARE GUIDE and TECH NOTES

Revised January, 1997

Introduction:

This guide for the latest software and revised Tech. Notes contains many tips and suggestions for programming and using Audioaccess systems. We assume you have a basic familiarity with the Installation and Training Manuals, so none of the basic hookup and operation information is covered. The following information is for both the PX-600 and MRX systems and is only product specific where indicated.

MRX SOFTWARE HISTORY

MRX Revision of March, 1993

If your most recent experience with MRX software is prior to March 1993 (V2.0), you'll notice some differences in the programming:

1) Access the programming mode by pressing tuner Preset 1 and MUTE together. This can be done with the system on or off. We recommend that you program your system with all zones off.

2) The first screen that appears when you go into the programming mode is the Main Menu. When you select a feature, sub-menus prompt you to complete the desired programming.

3) All selections and changes are made by pressing the TUNE UP/DOWN buttons, which move a highlight or change an alphanumeric value. Press STORE to confirm a selection. *The volume knob is no longer used for programming.*

Recent MRX Software Versions

V2.3

1) In both single and multi-MRX systems, we have added an ALL ON group option of "N" for NONE. This means that zones are no longer *required* to be part of an ALL ON group.

2) Fixed Volume is now available in *all zones.* An IR volume control (Learn Volume) for controlling the volume of a surround sound unit *is available in Zone 6 only*. In a multi-MRX system, only Zone 6 of System 1 has the learn volume feature. See ZONE 6 MACRO below for details.

V2.4

3) An IR "power on" command may be programmed for each source. It is issued when the first zone is turned on, about one second before the STOP command. It is used to control the power of components that remain in a standby condition when AC power is initially applied.

4) Keypads may be reset from the front panel by pressing Presets 3 and 4 together. This will cause a power interrupt to the keypads causing them to re-boot.

V2.5

5) The IR "power on" command is played again when the last zone is turned off just *after* the STOP command. This will allow control of sources with IR power control that are not plugged into the switched AC outlet on the MRX.

V3.0

6) After a power interruption or when the keypads have been reset from the front panel, the keypad LED status can be updated by pressing Volume Up.

7) Controls a Speaker Mute Module so that the output from a Page and Doorbell Module can be heard through the speakers of zones that are OFF.

V3.2

8) Protocol (macros) added for IR control of high-capacity CD changers.

V3.26 and V3.43

Please Note: Due to differing control requirement between the old and the new tuners, V3.26 can only be used on the MRX and V3.43 can only be used on the MRX-NT. The operational information provided below applies to both.

New Feature Highlights:

1) Generally improved speed and reliability, particularly in Multi-MRX systems and in high-traffic conditions. The software has been streamlined so that data communications between keypads and MRXs are reduced to the minimum necessary to properly carry out commands. This cuts down on the possibility of data collision and resulting lock ups and increases the speed with which commands are carried out.

2) Page Doorbell Modules connected to Multi-MRX systems will now work correctly. However, if you use a Page Doorbell Module (PDM) with a Speaker Mute Module (SMM), the SMM must have Software Revision 1.2 in order to function properly.

3) Improved communications with the watchdog circuit have been added to reduce the likelihood of conflicts with computer-based control systems interfaced with the MRX.

4) With the tuner spacing set to 9KHZ on the AM band (non-US), the displayed frequency will now match the actual tuned frequency.

5) The All-On operation has been changed so that when any ALL-ON group is turned on, all zones in that group turn on at their programmed turn-on volume. Previously, in ALL-ON groups that did not include Zone 6, only the zone initiating the ALL-ON command came on at the turn-on volume, the others would be "on" but muted until someone pressed Volume Up or Volume Dn in another zone within that group.

6) Another change in the ALL-ON operation ensures that a STOP command is issued to whatever source is currently being listened to in zones that are part of an ALL-ON group when the ALL-ON command is issued for that group. This is done because the default source after ON or ALL-ON is TUNER, therefore any other source should be STOPPED. Of course, if another zone outside of the ALL-ON group were listening to the source this STOP command would not be issued.

7) With this version you have the ability to completely erase unwanted, individual IR commands. You will no longer have to Reset Data to accomplish this. To do this while in the IR LEARN mode of programming, simply press the ENTER button on the front panel instead of entering an IR command when the display says "ENTER IR FOR..."

Cautions and Limitations for MRX V3.26 and MRX-NT V3.43:

1. If no zones are on and you press the "ON" button to turn on a zone and then immediately select a source other than "FM", the keypad source LED will take about 3 to 5 seconds to change. This corresponds with the time needed to complete the initial turn-on IR code sequence.

2. When using second and subsequent button press commands such as SKIP TRACK on the CD player, you must pause between presses to ensure accurate and reliable control of the source equipment. The duration of this pause will vary but may be as much as 2 seconds. If you do not wait, the most likely result will be that more tracks are skipped than are desired or expected.

3. When issuing an ALL ON command from a keypad (press and hold the "ON" button), you must wait until the "ON" LED stops flashing before making a source selection to prevent the loss of the PLAY command to the source selected. This will take about 3-4 seconds.

4. While setting up a Multi-MRX system, after you execute an MRX CONNECT command and exit out of the programming menu, wait about 10 seconds before you press any buttons on the MRX or keypad. This is required to allow the MRX to download all the information to the other units in the system. When this function has finished the "P" in the bottom left hand corner of the screen and the "K" in the bottom right hand corner of the screen of System 1 will no longer be present.

5. If you use both a SMM and a PDM on an MRX, the SMM must have V1.2 software in it, or the SMM and PDM will not work correctly and may cause the system to lock up.

6. If multiple keypads are used simultaneously (buttons or IR), the CONDI commands will "stack up" and the execution of these commands will be slowed briefly. Once the MRX is finished receiving commands, it will execute the commands in the order in which they were received. Up to 60 commands can stack up and all of them would be played! The best way to advise your clients is this: if you press a button on a keypad and you don't see a response right away, wait. If there is no response after 5-10 seconds then try again.

ABOUT MRX:

If you highlight ABOUT MRX and press STORE, you will see the software version. If you have any problems with or questions about your MRX system, please Tech Support at 888-691-4171. We will do everything we can to ensure that your questions are answered and that you and your client are satisfied with the system.

KPS Reset:

Keypads may now be reset from the front panel of the MRX. Power will be interrupted and reset to all keypads. In multi-MRX systems, all keypads on all MRXs will be reset.

1) With the unit ON or OFF, press Presets 3 and 4 together.

2) Select YES and press STORE.

Reset Data:

After installing new software, re-installing an MRX or if you just want to start over, use Reset Data to clear all IR codes and set all options to factory defaults. ***Multi-MRX system codes will not be changed.***

1) With the unit ON or OFF, press Presets 5 and 6 together.

2) Select RESET DATA and press STORE.

ROOM Button Operation:

With Zone 6 ON, press the ROOM button on the front panel to display the ZONE, SOURCE and VOLUME of each zone. If the zone is off it will say "OFF" next to SOURCE. Each time you press ROOM, the screen will advance to the next zone. **The front panel will control the zone displayed.** As you adjust the volume, the volume in Zone 6 will track along with whatever zone is displayed so you can hear the volume changes in the remote zone as well as see the numbers change on the LCD. Press ROOM repeatedly until the display shows the name of Zone 6, or wait 20 seconds to regain front panel control of Zone 6.

PAGING SETUP:

The MRX Page and Doorbell Module (PDM), in conjunction with an MRX system equipped with V2.0 software or above, will generate doorbell chimes and/or route paging audio through selected zones at selected volumes.

Connecting a Page Doorbell Module to a Multi-MRX System:

The AUDIO and MUTE outputs of a PDM may simply be paralleled into a Multi-MRX system. Check the Rev. level of your MRXs to make sure they are -x10 or above. (The Rev. level is the number immediately following the 6 digit serial number on the back of the MRX. The "x" may be a 2, 3 or 4.) If you have MRXs made prior to Rev. -x10 and wish to add the PDM, call Tech Support and request a new Control Board which has the necessary revisions for this type of hookup. *This new control board is not needed to connect a PDM to a single MRX system.*

MULTI-SYSTEMS

MULTI-MRX and PX-600 Systems

Up to 6 PX 600 and MRX controllers may be daisy chained together to expand a system from 6zones to up to 36 zones.

Connecting Units:

MRXs or PX-600s communicate via their keypad busses. Use one or more KPS Connector Boards (KPT) for each controller, depending on the total number of keypads (and PX-603s) in the system. Once all the keypads are terminated, parallel the yellow, green and black conductors of each KPT together. You may install a jumper wire in the same connector with any keypad wire to interconnect one KPT with another. **Do not connect the power conductor (red) between MRXs or PX-600s. Each controller must power only the keypads plugged into its respective KPT.** The keypad DIP setting will determine which system and zone each keypad will control, but each MRX or PX-600 must power its share of keypads.

SYSTEM DATA BUS INTERCONNECTION: Wiring the four (4) wire bus between controllers is accomplished by connecting the Ground (black), and Data (yellow & green) wires between each unit .

The RED wire (power) is not connected. Each controller is designed to operate and power it's own dedicated system keypad network.

Sharing Sources in Multi-MRX Systems:

To connect the sources to two MRXs, use the Audio Input Board which has two 20-pin ribbon cable outputs. One is labeled "TO MRX" and the other "LOOP THRU." Connect one ribbon cable to each MRX from these outputs. The Audio Input Board has only one tape output, and since each MRX has one, you must cut conductors 1-3 on the 20-conductor ribbons connected to any MRX other than System 1 to avoid cross-talk. A colored stripe on the ribbon indicates conductor #1. For systems with more than 2 MRXs use "Y" connectors into additional Audio Input Boards.

Final Multi-System Connection:

When Connecting Multiple systems, **you must issue an ALL OFF command to EACH PX-600 / MRX in the multi system after issuing the connect commands.** Configure multi systems as follows:

1. Plug the programmer into the main controller for system 1. Enter the system number (1) and the quantity of controllers in the system.
2. Plug the programmer into subsequent controller(s) and number them in relation to the main controller. (2, 3, 4, etc.)
3. Reconnect the programmer to system 1 and execute the PX-connect or MRX-connect command.
4. **Issue ALL OFF commands** to each PX-600 / MRX in the multi system by pressing the " **All Off** " button on each unit. This will complete the connection sequence. NOTE : There will be no light response from the front panel indicating that the All Off command.

System set up recommendation : Before installing any controller in a client's home we recommend that you execute a DATA RESET command before programming. Although programming is kept in non-volatile memory, on rare occasions program material may become tainted from Elector Magnetic Interference. A simple Data Reset insures that the controller has the factory defaults set in programming memory.

KEYPAD TIPS

Beware of Miswire!

Miswiring keypads can damage them! In some cases, they may just not work, but in others the keypads will have to be repaired by AUDIOACCESS. Avoid the aggravation: check all terminations carefully before plugging the keypads into the MRX or PX-600.

Setting the Keypad System Codes:

For a single-MRX system, the keypad System Code should be set to "0" (switches 5 - 8 down). In a multi-MRX system, the System Code on the keypads must be set to the System Code of the corresponding MRX or PX-600. The System Code switches have these values: 5=1, 6=2, 7=4, (8 is not used). Add these values together to get totals equal to the system numbers.

For example, for System 1, lift switch 5, for System 3, lift switches 5 and 6, for System 6, lift switches 6 and 7, etc. Commit this pattern to memory and you'll never have to consult a switch setting chart! This pattern applies to zone code settings, also, i.e., switches 1,2 and 3 have values of 1,2 and 4.

Fuses

If you have a keypad that does not respond to finger presses or IR input at all, the first thing to do is measure the voltage across the black and red conductors on the keypad. You should see 7 to 12 VDC. If it is below that, make sure all of the conductors follow the correct color codes and check that all conductors are making contact in the screw terminals. If all connections are good, check the keypad fuse on the back of the unit. It may look good, but test its continuity with a volt/ohm meter or try replacing it. This slo-blo fuse has been known to blow and still visually appear OK.

If the keypad fuse is good and/or if the MRX appears "dead" in addition to the keypads not functioning, most likely the "F1" fuse on the power supply board inside the MRX has blown. The circuit protected by F1 supplies voltage to the keypads, the IR emitters and the front panel LCD. F1 is located on the Power Supply board in the back, left corner of the unit directly in front of the left-most large blue caps. You will find a spare fuse for F1 cable tied to a bundle of wires just to the right of the tuner.

If the keypad fuse or F1 is blown, find and correct whatever caused the failure. Common causes are: temporary shorts during hook up or while changing keypads, miswires, screws or nails through cables, etc. In addition to these causes, damaged or miswired IR emitters can cause F1 to blow.

Keypad Resistor Modification

The following diagram depicts the recommended KPS keypad modification for use with MRX, PX-600 and PX-603 installations. This modification can improve system operation and speed of any Audioaccess installation. Please note the following items:

1. Any older PX-600 system which includes the PX-603 multi-room expander **MUST** have the following Keypad Resistor Modification made to ONE KPS in the system. This two-resistor modification keeps the communication bus “high” at all times, and allows proper data transmittal between the PX-603 and the PX-600. PX-600 units that have a serial Number suffix of xxxxxx-**1/04** or above have this modification incorporated into the internal circuitry. For MRX this incorporated in serial numbers xxxxx-803 and above.

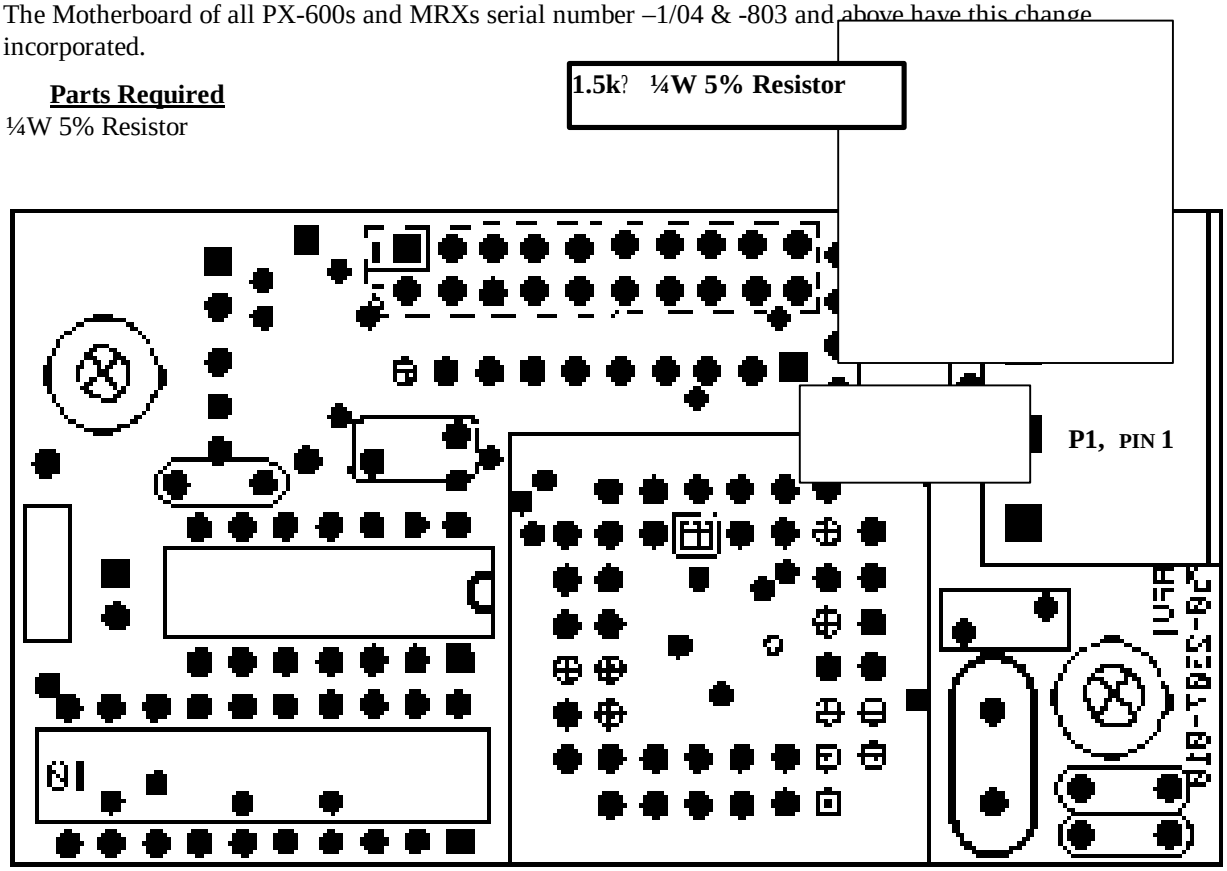
2. One modified KPS keypad should also be included in all multiple MRX and PX-600 installations, as well as any single **MRX or PX-600** system which exhibits slow operation. This simple modification to **ONE** of the keypads in single and multi-systems ensures that no data collisions occur and improves the operating speed of the Audioaccess system.

NOTE - When connecting a PX-603 to a PX-600 system, two particular items require attention. First, all PX-600s in the system must have **version 2.0 software** or above, and all PX-600s must have the SAME version of software. Software upgrades for older PX-600s are available from Audioaccess Technical Support for a nominal fee.

The Motherboard of all PX-600s and MRXs serial number –1/04 & -803 and above have this change incorporated.

Parts Required

2 @ 1.5k? ¼W 5% Resistor



KPS Processor Board.
Solder side

DIRECTIONS

1) Solder a 1.5k? ¼W 5% resistor between P1 pin 3 (Yellow wire) and P1 pin 4 (Black wire).
2) Solder a 1.5k? ¼W 5% resistor between P1 pin 2 (Green wire) and the Resistor Pack pin 1.

SPECIAL NOTES

1) All connections are done on the solder side of the processor board.
2) This modification only needs to be done to one keypad in the system.
3) Please take ESD precautions when modifying the board.

IR INTERFACE

Cassette Decks (and other sources) with Serial IR:

Many tape decks have no direct IR input to the front panel. These decks are design to be used in conjunction with their receivers and controlled using a "system" remote. You should be able to work around this by either routing the IR through a CD player in the system that is the same make and series and connecting the CD player via the serial IR port to the back of the tape deck, or by using the Video Link 794 or 797 Universal Interface Modules into the tape deck's serial IR port. (Call Video Link at 1-800-VIDLINK for more information on these products. See also: "Signal Voltage Conflict with Video Link below.)

Emitter Placement:

The MRX is shipped with two Video Link 282 emitters, the PX-600 is shipped with 3 Video Link 282 emitters. These emitters are designed to attach to the front panel of the equipment being controlled. They have a low power side and a high power side, as stated in the instruction manual that is packaged with each emitter. You should experiment to see which side works best for your equipment.

Also, the placement of the emitter relative to the center of the IR input may affect reliability. The Sony CDP-C90ES CD player, for example, works best with the emitter on the high power side, placed horizontally with the top edge of the emitter even with the bottom edge of the IR window on the player's front panel.[11]

IR Repeater to MRX:

If you are using a Video Link IR repeater to control the MRX, such as when it is installed in a cabinet with a solid door, we recommend the use of an "IR only" filter on the repeater. These filters are available from Video Link; P/N: SUN + the model # of the repeater you are using.
When placing the emitter on the MRX, watch the talk back LED behind the red window. If it flickers with no intentional signal fed into the repeater, you're seeing the presence of IR noise. This noise is likely to slow the operation of the MRX from a transmitter, keypad and front panel. By using the filter mentioned above and placing the emitter off to one side, you can minimize the noise and the MRX will respond normally.

Signal Voltage Conflict with Video Link:

Our products are compatible with Video Link products from the standpoint of emitter operation and the connection of the IR repeaters into or out of our systems. However, if you hook the emitter output of the MRX (or SEI which is used with the PX-6 line of products) into a 790 or 791 connecting block that is also connected to a Video Link repeater, it will damage the repeater!

[11] On MRXs made after August 12, 1993 the power output from the emitters was reduced so this practice has not been necessary.

The reason is this: the signal portion on our output is normally high (voltage) and signals low (ground). With Video Link products, the signal line is normally low (ground) and signals high (+12VDC). When the two are connected, the voltage on our signal line pulls the Video Link signal line high and makes it behave like it is repeating a very l-o-n-g signal and soon burns out. One way to handle this problem is to use two emitters per source that you need to control: one from the MRX and one from the Video Link repeater(s).
Please note that if you're using the MRX to control the basic functions of the audio source equipment in a system, the need for controlling them via separate repeaters should be limited if not eliminated, unless your client has a need for functions not available from the keypad.

Video Link Models 794 and 797 Interface Modules:
The voltage conflict described above also affects hook-ups with Models 794 and 797 which are used to input IR signal into components that have a serial IR input and no IR on the front panel. However, in this case, Video Link offers this advice:

> "The Model 794 and 797 can be used to interface the MRX directly to the remote input of receivers or other components. In addition to the Model 794 or 797, you will need a Model 6015900 cable. Connect the wire with the white stripe to the INPUT connection on the 794 or 797 terminal block. Connect the wire without the stripe to the GND1 connection. Use the switch table supplied with the 794 or 797 to set the DIP switches, then make the following changes: On the 794 set switch 1 and switch 3 to the OFF(0) position; on the 797 set switch 1 and switch 2 to the OFF(0) position. GND2 on the 794 or 797 can be used for power supply grounds. Do not connect anything other than the Model 6015900 cable GND1."
>
> - Xantech Corp., Number 1, October 1992

PROGRAMMING SPECIFIC EQUIPMENT

We do not recommend the use of CD players with PLAY/PAUSE buttons on the IR remote. It is possible in certain situations for a PLAY command to be issued after the initial PLAY. This would cause a PLAY/PAUSE machine to go into PAUSE. Please note that some CD players that have PLAY/PAUSE buttons on the front panel and separate buttons on the IR remotes and that is OK!

Luxman DC-114 CD Player:

Although this unit and others like it does not have a NEXT DISC button as such, there is a way of programming that produces the same result and actually tracks the DISC sequencing better than the usual method of sequentially selecting DISC numbers. The Luxman uses the 32-bit codes as mentioned above, so you will need to use the technique outlined there for the DISC SELECT and SKIP TRACK buttons.

On the DC-114, when you press DISC SELECT followed by SKIP TRACK, it goes to the next disc and starts playing. So, at the beginning of the CD IR programming menu where it asks for the number of discs, select "1". Then after programming PLAY, STOP, and SKIP TRACK, enter the DISC SELECT function into DISC 1A and SKIP TRACK (again) into DISC 1B. Then each time you press and hold the CD button on the keypad, remote or front panel, the CD player will skip to the next disc.

Denon CD Players: DCM-520, DCM-550:

Several dealers have reported problems getting reliable IR control of these players, which is they don't respond to commands *every* time. Both of these modes have a new feature called FTF or Favorite Track File. As new models are introduced with this feature, they may or may not exhibit the same problems. What we've been able to gather from Denon representatives is that in the course of developing the software for this new feature, they changed the way the IR input works. Now instead of it keeping a watchful eye on the IR input at all times, the processor "samples" the IR whenever it's not busy doing something else. Therefore, it is probable that at the particular moment that you decide to issue a command, the processor will be "busy" and not see the command. The timing on this type of sampling is changeable and difficult to predict, so we have not been able to write our software to work around it.

Even when operating the CD directly using a Denon transmitter, the player sometimes misses commands. The difference is that you, the operator, are able to see that the command was not followed and re-issue the command to close the loop.

Denon representatives are aware of this issue and are investigating possible solutions. We'll continue to experiment with other solutions that we can implement, will advise you of any developments. In the meantime, unfortunately we must recommend against the use of these two Denon models and possibly other Denon players with the FTF feature.

Jerrold DCR Cable Box:

The MRX can control the Jerrold DCR box. A change was made (May 1994) to the learning IR circuit on the MRX front panel printed circuit board that allows the MRX to control the Jerrold. The new PCB is called REV D. The only sure way to tell which board you have without opening the MRX is to look into the red IR input window on the MRX front panel with a flashlight. On a REV D PCB, the reference designator number for the red talk back LED is **D9**; on all other PCBs the number is **D10.**

There is also a trick you need to use when programming the IR commands of the Jerrold into the MRX. It is the same trick used for CD players that skip more than one track when controlled by the MRX. You need to press the channel up or down button (whichever you are programming at the time) very quickly,

then finish the load with a command that has nothing to do with the system. This will keep the DCR box from skipping two or more channels at a time. MRXs must have a Rev "D" or above PCB Board.

Using a CD Player on the Tape input:

The programming is the same for PLAY, STOP and SKIP DISC (SKIP TAPE). However, you must enter SKIP TRACK for both REVERSE PLAY and FORWARD PLAY. Then each time you press TAPE on the transmitter, keypad or front panel, you will get SKIP TRACK on the CD Player. (See "IR Programming for Tape Players".)

Laser Video Disc Players used as main CD Players:

LD players these days usually play regular CDs as well, and the temptation is to try to use these players as both the CD and VIDEO source. We recommend a separate, dedicated CD player on the CD input. However, if you must use the LD/CD arrangement, please consider the following:

1) You'll want to split the audio output into both the CD input and the VIDEO input of the MRX/PX-600. Or, if you're using some other means of video switching, connect one of the splits into that device and then into the MRX/PX-600. In this way the audio will track with the labeling on the keypad.

2) LD players often have PLAY/PAUSE buttons, which means you will undoubtedly get PAUSE at some point or another when you really want PLAY.

3) LD players often have STOP and EJECT on the same button, which means that at some point the drawer will open when you don't want it to or else you will have to eliminate the IR STOP command altogether.

4) If you plug the LD player into the MRX/PX-600 for AC power, it may power up into a "standby" mode. Before it will accept any other commands, the player will still need an IR POWER command. You may be able to get around this by setting the timer "on" if it has this feature. (This solution may work for any equipment with stand-by power.) Some determined dealers have used one of the VIDEO commands that are accessed from the IR transmitter for this "POWER" function.

5) MRX V2.4 and above allows you to program POWER commands for all inputs including VIDEO. However, be advised that since the player may get turned "on" or "off" manually, and since the MRX has no way of knowing the current status of the player, it may issue the command opposite to the one you want.

Programming for High-Capacity CD Changers

In order to accommodate the many high-capacity CD changers (50, 100, 200, etc.), that have arrived on the custom install scene in recent months, we have developed Version 3.2 software for the MRX. The high-capacity changer software that has been added is available for use on the CD input only. The CD Learn IR menu now reads:

NSM_3101
OTHER_HIGH_CAP
LOW_CAPACITY

The NSM_3101 selection is intended for use with the NSM, model 3101 only. The LOW_CAPACITY selection is for use with CD changers up to 20 discs and single-disc players.

The OTHER_HIGH_CAP selection is designed for use with most high-capacity CD changers that are controllable with IR commands[12]. This software is designed with the idea that when you first select CD, the MRX/PX-600 sends out a macro of up to six steps to start the changer playing a group or playlist. Second and subsequent momentary presses of CD will send one command to skip a track (or step in a playlist) and CD press-and-hold will send another six-step macro to skip to the next group or playlist (up to six groups total).

You may select DELAY instead teaching a command on any step of a macro. This will add about 1.5 seconds to the standard delay of .7 second if needed to make the macro work properly. If two or more consecutive steps are used as delays, they will be added together to form one longer delay.

High-capacity CD changer operation:

(From a keypad, MRX/PX-600 front panel or IR remote control)

CD button pressed, first time, first zone:

The MRX/PX-600 sends a PLAY macro of up to six IR commands to the CD changer. The CD changer begins to play group one.

CD button pressed second and subsequent times, any zone:

The MRX/PX-600 sends a SKIP TRACK command. The CD changer advances to the next track on the current CD or the next step in the group or playlist, depending on your particular changer.

CD press-and-hold, first time, first zone:

MRX/PX-600 sends GROUP TWO macro of up to six IR commands to CD changer. CD changer advances to group two and begins play.

CD press-and-hold, second and subsequent times, any zone:

MRX/PX-600 sends the next sequential group IR macro of up to six commands to CD changer. After the macro for the last group is sent, the next macro will start Group One again.

If the user switches out of CD, or turns off the zone and there are no other zones on that are listening to the CD, the MRX/PX-600 will send a single STOP command to the CD changer.

[12] As of this writing this feature software has been field-tested with the Sony CDP-CX100, 100-disc changer, only.

Sony CDP-CX 100

SAMPLE PROGRAMMING TABLE FOR SONY CDP-CX100	
MRX DISPLAY	***SONY IR REMOTE BUTTON***
INPUT IR FOR PLAY_STEP 1	GROUP
INPUT IR FOR PLAY_STEP 2	1
INPUT IR FOR PLAY_STEP 3	ENTER
INPUT IR FOR PLAY_STEP 4	PLAY >
INPUT IR FOR PLAY_STEP 5	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR PLAY_STEP 6	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR STOP	STOP ?
INPUT IR FOR SKIP TRACK	SKIP TRACK >>?
NUMBER OF GROUPS	USE ? ? TO SELECT THE NUMBER OF GROUPS (1 THRU 6)
INPUT IR FOR GROUP 1 STEP 1	STOP ?
INPUT IR FOR GROUP 1 STEP 2	GROUP
INPUT IR FOR GROUP 1 STEP 3	1
INPUT IR FOR GROUP 1 STEP 4	ENTER
INPUT IR FOR GROUP 1 STEP 5	PLAY
INPUT IR FOR GROUP 1 STEP 6	NOT USED - PRESS "STORE/Enter" TO SKIP

The next screen will begin IR programming for Group 2, Step 1 and continue through the six steps for Group 2. This process will continue until the programming is complete for the number of groups you have selected. After Step 6 of the last group the display shows the source selection screen for LEARN_IR. From there you may program IR commands for other sources or press STORE twice to exit programming mode.

Pioneer PD-F107 and PD-F109 Control of Favorite Play Groups

The following sample program is used with Audioaccess MRX or PX-600 for accessing favorite play groups. This feature is accomplished with this unit by accessing the CD number rather than favorite play selections or group commands. The Pioneer PD-F107/PD-F109 perform favorite play selections in the ALL mode, unlike other manufacture's high capacity CD changers which utilize their group commands. This program will initialize the favorite play group selections function.

Sample # 1 is for the CD setup/learn IR menu used for 4 favorite play groups with 25 discs each. There is one detail that must be observed to secure a reliable power on/off house keeping command for this unit. To start the programming see figure #1. **1)** Go to LEARN IR **2)** go to CD **3)** go to LOW CAPACITY **4)** enter number of discs as 1. **5)** Enter the CD power command in ENTER IR for CD Power slot. **6)** Skip through the rest of the low capacity commands by pressing select / enter which will leave those addresses in memory empty. **7)** Follow the example below(figure # 1) and then go to sample program (figure #2) --

FIGURE # 1 done in Learn IR for CD - Low Capacity.

PX-600 PROGRAMMER OR MRX SCREEN	BUTTON ON REMOTE
ENTER IR FOR # of DISCS	1 (in programmer)
ENTER IR FOR CD POWER	POWER
ENTER IR FOR PLAY	NOT USED - PRESS "STORE/Enter" TO SKIP
ENTER IR FOR STOP	NOT USED - PRESS "STORE/Enter" TO SKIP
ENTER IR FOR SKIP TRACK	NOT USED - PRESS "STORE/Enter" TO SKIP

ENTER IR FOR DISC 1A	NOT USED - PRESS "STORE/Enter" TO SKIP
ENTER IR FOR DISC 1B	NOT USED - PRESS "STORE/Enter" TO SKIP

8) Go back into CD, **9)** go to OTHER HIGH CAPACITY. **10)** Follow example below (figure # 2) --

FIGURE # 2 Done in Learn IR for CD - High Capacity

SAMPLE PROGRAMMING TABLE FOR PIONEER PD-F109 HIGH CAPACITY SECTION	
MRX DISPLAY	***PIONEER IR REMOTE BUTTON***
INPUT IR FOR PLAY_STEP 1	1
INPUT IR FOR PLAY_STEP 2	PLAY
INPUT IR FOR PLAY_STEP 3	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR PLAY_STEP 4	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR PLAY_STEP 5	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR PLAY_STEP 6	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR STOP	STOP ?
INPUT IR FOR SKIP TRACK	SKIP TRACK >>?
NUMBER OF GROUPS #	USE TUNE ? ? ON MRX TO SELECT THE NUMBER OF GROUPS (1 THRU 6)
INPUT IR FOR GROUP 1 STEP 1	1
INPUT IR FOR GROUP 1 STEP 2	PLAY
INPUT IR FOR GROUP 1 STEP 3	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 1 STEP 4	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 1 STEP 5	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 1 STEP 6	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 2 STEP 1	2
INPUT IR FOR GROUP 2 STEP 2	6
INPUT IR FOR GROUP 2 STEP 3	PLAY
INPUT IR FOR GROUP 2 STEP 4	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 2 STEP 5	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 2 STEP 6	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 3 STEP 1	5
INPUT IR FOR GROUP 3 STEP 2	1
INPUT IR FOR GROUP 3 STEP 3	PLAY
INPUT IR FOR GROUP 3 STEP 4	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 3 STEP 5	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 3 STEP 6	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 4 STEP 1	7
INPUT IR FOR GROUP 4 STEP 2	6
INPUT IR FOR GROUP 4 STEP 3	PLAY
INPUT IR FOR GROUP 4 STEP 4	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 4 STEP 5	NOT USED - PRESS "STORE/Enter" TO SKIP
INPUT IR FOR GROUP 4 STEP 6	NOT USED - PRESS "STORE/Enter" TO SKIP

Continue this process until the programming is complete for the number of groups you have selected. After Step 6 of the last group the display shows the source selection screen for LEARN_IR. From there you may program IR commands for other sources or press STORE twice to exit programming mode.

CAUTION : To set up the program in this manner the disc changer must be in the ***ALL*** mode. If the unit is not in the ***ALL*** mode you will not have reliable playback.

This is only a sample program; if you wish you can use all six groups and divide the discs into groups of various amounts. In some cases it may be more desirable to put a SKIP DISC function into the skip track slot. When using skip track, the program will advance to the last song after several quick button presses, but to have it advance to the next disc the song playing must play to the end before the unit will advance to the next disc.

If you put a RANDOM command into the skip track slot, the unit will play 100 songs from all favorite play groups then stop. To get out of random, do a press and hold. This will bring the unit to the next FPS and relinquish the random function.

Programming for the H/K Source Equipment:

PX-600: Most H/K source equipment may be controlled by connecting the proper IR output on the PX-600 to the remote input on the source equipment. * To do this, use a cable with an 1/8" (3.5mm) mono, mini-phone plug at each end. If you use the "blaster" IR output, which transmits the commands for all the source equipment, you may then use additional 1/8" mini-plug cables to daisy-chain IR control to the rest of the H/K equipment in the system.

** The exception is the FL-8400 CD changer which requires the use of a stick-on IR emitter OR 1/8' mini mono to RCA style connection.*

MRX: All H/K IR source equipment *can* be controlled by using the stick-on IR emitters or as described for the PX-600. The H/K TU-930 tuner, which does not have an IR input on the front panel, must be controlled via an 1/8" mini mono jack to its back panel from the MRX. Since the MRX has a tuner built in this will not be an issue in most cases.

IR Codes: We recommend that you have on hand: an H/K AVR-30 remote, an H/K TL-8500 remote (optional, but handy) *and* a URC-5000 remote. The AVR-30 remote has nearly all of the commands commonly used on all H/K source equipment. The TL-8500 remote has *all* the commands needed for the FL-8400 CD changer. The URC-5000 has most of the commands for all of the above, plus it has a tuner scan command that can work nicely with the TU-930 (see below).

IR Programming for the TU-930 Tuner

Use either an H/K AVR30 remote *or* a URC-5000. If you are using a URC-5000, program it to control an H/K tuner by pressing: **AUDIO (or CD) - DO - ENTER - RECALL - 1 - 1 - 0**. Watch for two green flashes of the LED which confirm that the code is in the remote's "standard load" and has been accepted. One yellow flash indicates that the code was not accepted and is probably *not* in the load. If the remote does not contain the 110 code under the AUDIO or CD button, contact Audioaccess Tech Support for assistance.

If access to 5 presets on the tuner is sufficient for your needs:
Enter the programming mode (PROG on programmer), select LEARN IR, select TUNER, and select "5" for the number of presets. From there use Table 1 below:

PX-600 PROGRAMMER SCREEN	BUTTON ON AVR-30 REMOTE OR URC-5000
INPUT IR FOR TUNER POWER	POWER
INPUT IR FOR PRESET 1	4
INPUT IR FOR PRESET 2	5
INPUT IR FOR PRESET 3	6
INPUT IR FOR PRESET 4	7
INPUT IR FOR PRESET 5	8
INPUT IR FOR SHIFT	"ENTER" ON PX-600 PROGRAMMER
INPUT IR FOR ENTER	"ENTER" ON PX-600 PROGRAMMER
INPUT IR FOR PRESS AND HOLD FUNCTION (ASSUMED IN THIS EXAMPLE TO BE "SEEK UP")	"TUNE ^" ON AVR30 REMOTE, OR "CH ^" ON THE URC-5000 REMOTE

Table 1

If you need to access more than 5 presets on your tuner:
This method requires the use of a URC-5000 remote for programming. It will allow access to all 30 presets of the TU-930. If you don't want or don't have 30 stations available in your area, pick a number of presets that will divide evenly into 30 and repeat the frequencies when storing in the TU-930 memory. Enter the programming mode (PROG on programmer), select LEARN IR, select TUNER, and select "1" for the number of presets. From there use Table 2 below:

PX-600 PROGRAMMER SCREEN	BUTTON ON URC-5000
INPUT IR FOR TUNER POWER	POWER
INPUT IR FOR PRESET 1	PRESS "**<**"
INPUT IR FOR SHIFT	PRESS "<"
INPUT IR FOR ENTER	"ENTER" ON PX-600 PROGRAMMER
INPUT IR FOR PRESS AND HOLD FUNCTION (ASSUMED IN THIS EXAMPLE TO BE "SEEK UP")	CH ^

Table 2

** The "<" command on the URC-5000 is the SCAN command for the TU-930. Entering this command in both the Preset 1 and SHIFT IR slots allows the tuner to scan up to the next preset and lock it in.*

IR Programming for the FL-8300, 8400, or 8450 CD Changers

The commands generally desired for use with CD Changers are: PLAY, SKIP TRACK, SKIP DISC and STOP. The only remotes that contains *all* of these codes for the FL-8400 are actually the remote for the TL-8500 CD changer (the top-loading carrousel) FL-8450 remote and the AVR-"10"/"20"/"25"/"30" remotes. The URC-5000 and the FL-8400 remotes have all but the SKIP DISC command. Therefore, to program all the normal commands for the FL-8400 CD changer, you must use the TL-8500 remote, FL-8450 remote or one of the AVR-"10"/"20"/"25"/"30".

If you are using a URC-5000, program it control an H/K FL-8400 changer by pressing: **AUDIO (or CD) - DO - ENTER - RECALL - 1 - 7 - 3**. Watch for two green flashes of the LED which confirm that the code is in the remotes "standard load" and has been accepted. One yellow flash indicates that the code was not accepted and is probably *not* in the load. If the remote does not contain the 173 code under the AUDIO (or CD) button, contact Audioaccess Technical Support for assistance.

Enter the programming mode (PROG on programmer), select LEARN IR, select CD, select OTHER LOW CAP and finally, select "1" for the number of discs. When the screen for CD POWER is displayed press "ENTER" to skip that command. From there use Table 3 below:

PX-600 PROGRAMMER OR MRX SCREEN	BUTTON ON REMOTE
ENTER IR FOR PLAY	PLAY (FL-8400,TL-8500 OR AVR"XX")
ENTER IR FOR STOP	STOP (FL-8400,TL-8500 OR AVR"XX")
ENTER IR FOR SKIP TRACK	?? (TL-8500 OR AVR"XX"REMOTE ONLY)
ENTER IR FOR DISC 1A	SKIP DISC (TL-8500 OR AVR"XX"REMOTE ONLY)
ENTER IR FOR DISC 1B	PRESS "ENTER" ON PROGRAMMER TO SKIP

Table 3

IR Programming for the H/K DC-5300 Dual Cassette Tape Deck

There are two programming options to be considered when programming the Harman Kardon DC5300 tape deck for use with the PX-600 or MRX.

Programming Option 1:

If you are using an AVR30 remote control or a URC-5000 to program the MRX, there is no access to A/B deck switching. We recommend programming the AUTO REVERSE capability as the first function, and FAST FORWARD or PAUSE as the press-and-hold function.

To use the FAST FORWARD command as the press-and-hold function, use the double arrow (>>) button on the AVR30 or URC-5000 remote to program the controller. NOTE: when listening to the reverse play side of the cassette, this function will issue a REWIND command.

To use the PAUSE command as the press-and-hold feature, select two tapes on the programming menu then program a FORWARD or REVERSE PLAY command in 1A and leave 1B blank (simply press select on the MRX front panel to bypass the slot). Use the same command as 1A in the 2A slot, and program the PAUSE command in 2B. This programming method creates the possibility that the tape player may reverse tape sides when coming out of the PAUSE mode, and there is no way to control the likelihood or frequency of this happening.

FAST FORWARD Command as Press-and-Hold Feature

Set number of tapes to 1.

PROGRAMMER SCREEN	BUTTON ON AVR-30 REMOTE OR URC-5000
INPUT FOR TAPE POWER	POWER
INPUT IR FOR PLAY	PLAY
INPUT IR FOR STOP	STOP
INPUT IR FOR REVERSE PLAY	<
INPUT IR FOR FORWARD PLAY	>
INPUT IR FOR TAPE 1A	>>
INPUT IR FOR TAPE 1B	ENTER OR STORE ON CONTROLLER

Table 1

PAUSE Command as Press-and-Hold Feature

Set number of tapes to 2.
All IR inputs required ***before*** INPUT IR FOR TAPE 1A are the same as in Table 1.

PROGRAMMING SCREEN	BUTTON ON AVR30 REMOTE OR URC 5000
INPUT IR FOR TAPE 1A	FORWARD OR REVERSE PLAY
INPUT IR FOR TAPE 1B	ENTER OR STORE ON CONTROLLER
INPUT IR FOR TAPE 2A	PAUSE
INPUT IR FOR TAPE 2B	ENTER OR STORE ON CONTROLLER

Table 2

The problem with using PAUSE as the press-and-hold feature is that the unit does not come out of pause until a play command is issued, so if you hit the wrong play command the tape can reverse sides when coming out of pause, there is no programming protocol to compensate for this.

Programming Option 2:

If you need to access the A/B switching capability of the DC5300, use the Harman/Kardon AVR25 remote, which has an A/B Select button to switch decks.

PX-600 PROGRAMMER OR MRX SCREEN	BUTTON ON REMOTE
ENTER IR FOR PLAY	PLAY
ENTER IR FOR STOP	STOP
....	(Commands as above)
ENTER IR FOR DISC 1A	A/B SELECT
ENTER IR FOR DISC 1B	FORWARD PLAY

Table 3

Programming Control of Sony's Digital Satellite System (DSS)

There are a number of alternatives for programming Audioaccess systems to effectively control the Sony (and other manufacturer's) DSS units. Foremost in the programming method is your choice of input - we suggest the CD (to take advantage of the High Capacity macro), TAPE or AUX inputs.

The input selected affects other system choices; if you select the CD input, you will not have the High Cap macro available for a CD library, but you will have more DSS functionality at the DSS unit itself. If you select the TAPE or AUX inputs, you have macros available for a high capacity CD changer, but you need to use the "Custom Guide" feature of the DSS for control.

By all means, **sit down with your client and discuss expectations of how their Audioaccess system should work.** Although the access to any one component of their audio system may be limited in scope from the standpoint of the keypads, the main Audioaccess concept is *intuitive* keypad control. Complex commands are always available from the front panel or remote of each source.

Sample # 1: (see figure 1, High-capacity CD option). **Caution: using this method takes away the option of having a High-capacity CD player in the system with group control. Additionally, the response time between changing channels tends to run a little slower.** On the other hand, you do not have to use any of the DSS program features, which leaves them open for their intended use. To start the programming:

1. Go to LEARN IR.
2. Go to CD.
3. Go to OTHER HIGH CAP (if the unit does not have discrete IR power, you must first go to LOW CAP and enter a power command).
4. Follow the steps outlined below to program your presets (groups), up to six.
5. The STOP command is not used. Leave this address in memory empty.
6. At SKIP TRACK, enter the DSS code for "channel up".
7. Enter the number of presets (groups), up to 6.

This sample is based on a total of 30 stations, with presets set at 5 station increments. The "delay" command is optional; it adds a 0.7 second delay between commands when necessary to run the macro correctly. Use of the delay depends on your particular unit - try it without the delay first. If there is more than one group, make sure GROUP 1 is the same as the "PLAY" macro. The first press and hold will go to GROUP 2.

Figure #1 (HIGH CAP CD)

SAMPLE PROGRAMMING TABLE FOR Sony DSS	
PX-600 DISPLAY	***DSS IR REMOTE BUTTON***
INPUT IR FOR PLAY STEP 1	5
INPUT IR FOR PLAY STEP 2	DELAY
INPUT IR FOR PLAY STEP 3	0
INPUT IR FOR PLAY STEP 4	DELAY
INPUT IR FOR PLAY STEP 5	0
INPUT IR FOR PLAY STEP 6	ENTER (OPTIONAL)
INPUT IR FOR STOP	NOT USED
INPUT IR FOR SKIP TRACK	CHANNEL UP
NUMBER OF GROUPS #	6
INPUT IR FOR GROUP 1 STEP 1	5 (FIRST DIGIT OF DESIRED STATION)
INPUT IR FOR GROUP 1 STEP 2	DELAY
INPUT IR FOR GROUP 1 STEP 3	0 (SECOND DIGIT OF DESIRED STATION)
INPUT IR FOR GROUP 1 STEP 4	DELAY
INPUT IR FOR GROUP 1 STEP 5	0 (THIRD DIGIT OF DESIRED STATION)
INPUT IR FOR GROUP 1 STEP 6	ENTER (OPTIONAL)
INPUT IR FOR GROUP 2 STEP 1	5 (FIRST DIGIT OF DESIRED STATION
INPUT IR FOR GROUP 2 STEP 2	DELAY
INPUT IR FOR GROUP 2 STEP 3	0 (SECOND DIGIT OF DESIRED STATION)
INPUT IR FOR GROUP 2 STEP 4	DELAY
INPUT IR FOR GROUP 2 STEP 5	5(THIRD DIGIT OF DESIRED STATION)
INPUT IR FOR GROUP 2 STEP 6	ENTER (OPTIONAL)

Continue this process until the programming is complete for the number of presets selected. Your client may want a specific station attached to the press-and-hold function. All the stations are determined by your programming. After the last GROUP is entered, the programming display shows the source selection screen for LEARN_IR. From there you may program IR commands for other sources or press STORE/ENTER twice to exit programming mode.

Sample # 2: (see figures 2A/2B) The second method uses the "Custom Guide" of the DSS to program desired stations, and the PX-600 to control it. However, you take away the "Custom Guide" from the client in the following manner: A. The "channel up/down" buttons will only scan the stations contained in the "Custom Guide". B. Your client will need to use the other "Guides" available to change channels on the DSS during regular DSS viewing. The advantage to this method is the ability to program as many stations as are available on the Custom Guide. LOW CAP CD, AUX, TAPE, or VIDEO can be used on the PX-600 to control the DSS. We've included samples from TAPE or CD under AUX programming.. Again, a POWER command is necessary if the unit does not have discrete IR power and you wish to have the source turn on and off with the system.

Figure #2A (TAPE)

SAMPLE PROGRAMMING TABLE FOR Sony DSS	
PX-600 DISPLAY	***DSS IR REMOTE BUTTON***
NUMBER OF TAPES	1
INPUT IR FOR PLAY	CHANNEL UP /CUSTOM GUIDE
INPUT IR FOR STOP	NOT USED
INPUT IR FOR FORWARD PLAY	CHANNEL UP
INPUT IR FOR REVERSE PLAY	CHANNEL UP
TAPE 1A	CHANNEL DOWN
TAPE 1B	NOT USED

Figure #2B (CD)

SAMPLE PROGRAMMING TABLE FOR Sony DSS	
PX-600 DISPLAY	***DSS IR REMOTE BUTTON***
NUMBER OF DISCS	1
INPUT IR FOR PLAY	CHANNEL UP/CUSTOM GUIDE
INPUT IR FOR STOP	NOT USED
INPUT IR FOR SKIP TRACK	CHANNEL UP
DISC 1A	CHANNEL DOWN
DISC 1B	NOT USED

Scientific Atlanta's Digital Music Terminal (DMX)

This sample describes programming for the DMX on the AUX input, under LEARN IR/ AUX/ CD. The system will control the DMX unit in an individual channel advance and/or preset channel advance. Sample # 1: (see figure 1) To start the programming 1) Go to LEARN IR. 2) Go to AUX. 3) Go to CD. 4) Enter number of discs as 10 or the number of presets you intend to use. 5) At AUX POWER enter the power command for the DMX. 6) Skip the PLAY and STOP sections for entering IR codes (leave those addresses in memory empty). 7) At SKIP TRACK enter the DMX code for channel advance (the tune up button). 8) In all the disc "A" prompts enter the DMX code for PRESET. 9) In all the disc "B" prompts enter the number of the preset that you wish to access. The easiest way is to start at 1 through 9 and then end with 0, which will be the 10th preset. 10) Follow the example below --

FIGURE # 1

SAMPLE PROGRAMMING TABLE FOR scientific Atlanta DMX	
MRX / PX-600 DISPLAY	***DMX IR REMOTE BUTTON***
INPUT IR FOR AUX POWER	POWER
INPUT IR FOR AUX PLAY	NOT USED
INPUT IR FOR AUX STOP	NOT USED
INPUT IR FOR AUX SKIP TRACK	ADVANCE CHANNEL
INPUT IR FOR AUX DISC 1A	PRESET
INPUT IR FOR AUX DISC 1B	1
INPUT IR FOR AUX DISC 2A	PRESET
INPUT IR FOR AUX DISC 2B	2
INPUT IR FOR AUX DISC 3A	PRESET
INPUT IR FOR AUX DISC 3B	3
INPUT IR FOR AUX DISC 4A	PRESET
INPUT IR FOR AUX DISC 4B	4
INPUT IR FOR AUX DISC 5A	PRESET
INPUT IR FOR AUX DISC 5B	5
INPUT IR FOR AUX DISC 6A	PRESET
INPUT IR FOR AUX DISC 6B	6
INPUT IR FOR AUX DISC 7A	PRESET
INPUT IR FOR AUX DISC 7B	7
INPUT IR FOR AUX DISC 8A	PRESET
INPUT IR FOR AUX DISC 8B	8
INPUT IR FOR AUX DISC 9A	PRESET
INPUT IR FOR AUX DISC 9B	9
INPUT IR FOR AUX DISC 10A	PRESET
INPUT IR FOR AUX DISC 10B	0

This process will continue until the programming is complete for the number of presets you have selected. After the last disc B is entered, the programming display shows the source selection screen for LEARN_IR. From there you may program IR commands for other sources or press STORE/ENTER twice to exit programming mode.

CHANGING INTERNAL SOFTWARE AND BOARDS

Static Discharge:

Static discharge problems may occur especially in areas that have dry, cold winters. Upon getting "zapped," keypad symptoms range from the keypad resetting (indicated by flashing LEDs on the keypads), to temporary lock-up (cured by resetting the keypads), to permanent damage to the keypad and its inability to re-boot at all.

We now ship keypads with the bezel grounded to the ground wire of the keypad. If you have a keypad that does not have a bare wire between the bezel standoffs and the ground pin of the screw terminal input on the keypad, take a 2" piece of wire (18-22 ga.: size is not critical), clamp one end under the nut that holds the back panel onto the keypad and put the other end into pin 1 of the screw terminal (black). This will help to drain static charge away from delicate circuitry.

This is not a 100% fix. A keypad may still re-boot in response to a static zap with this arrangement, but it should come back to a "ready" state with no interruption of service or permanent damage.

WARNING !

Opening any Audioaccess equipment without express factory authorization will void the components warranty

ELECTRO-STATIC DISCHARGE

Before installing or touching any exposed printed circuit boards, chips, PROMs, electronic unit parts, etc., make certain that you are properly grounded. This is extremely important, as most internal electronic components are highly susceptible to damage from Electro-Static Discharge.

Service Technicians should ground themselves by wearing a wrist strap which is connected to an electrical ground. If you do not have wrist strap, you can ground yourself and dissipate any electro-static build up by doing the following:

1) Connect the unit's power cord between the unit and a three pronged (grounded) electrical outlet.

2) Turn the main AC power switch to the **OFF** position on the unit**.**

3) Touch, **and maintain continuous contact with,** an exposed metal surface of the unit, such as the inside of the unpainted chassis or grounded stainless steel screw, while handling any internal components, IC's, or printed circuit boards while performing modifications or repairs.

PX-600 EPROM CHANGE

CAUTION - ***Be sure to ground yourself before performing this procedure!! This is a static sensitive device***.

To change the EPROM in a PX-600 - Make sure to follow the ESD Warning on the page 1, provided. Take off the top cover and look for U803 on the main circuit board. With an IC puller or a small screwdriver, very carefully remove the old EPROM. Replace the new EPROM in the same location and make sure that notch in the IC is facing the same direction as the old one. You can also verify this by the drawing on the PCB. Replace the top cover with the same screws in the proper locations.

Hook up the programmer and power up the PX-600. Go into the TEST MENU and scroll to DATA RESET, then press ENTER. This will clear the memory of all IR codes and reset the controller to factory default settings. You are now ready to configure the system to your client's needs. After you finish programming, check each zone for proper operation. If there are any questions please contact the customer support department at one of the numbers above.

MRX Amplifier Exchange Procedure

Remove the ribbon cables from amp module and move aside. *Note which cable came from which connector.*

Remove RED, BLACK, and GREEN wires from amp module and set aside.

Turn MRX unit onto one side to expose the bottom of the unit. Find the four small zinc-plated (unpainted) Philips-head screws on the bottom of the unit. Hold the amp module so it does not fall out and carefully remove these screws.

Lower the unit back down onto its feet. Partially remove the amp module and then remove the thermal switch from the amp module.

Remove amp module and set aside.

Remove nylon ties from the power and ground harness. Remove and replace the negative (black) power supply line which runs from amp module to power supply module with the one enclosed.

Remove the wires from the old ground board and place them onto the new one. Add the two additional ground wires (green) that came with the new module. *Note direction of connector ends, the 90° degree end of the connector must be on the amp module*.

Remove the old ground board.

To ensure a good ground between the heat sink and the chassis, remove some paint from around one of the screw holes where each heatsink comes in contact with the chassis. A "Dremel" type rotary tool is useful for this purpose.

To ensure a good ground between the ground board and the chassis, remove some paint from the chassis around the screw holes for the ground board. *Proper grounding of the heat sink and the grounding board will help prevent the amp from going into oscillation.*

Reinstall the thermal switch onto the new amp module.

Reinstall the new ground board and the new amp module into the MRX.

Reinstall the ribbon cables to the amp module.

Install the RED wire to P2, install the BLACK wire to P8, install the DARK GREEN wire to P9, and the remaining LIGHT GREEN wires to P3-P5. Install new nylon ties in a similar fashion as on the old amp module. *NOTE: the positions of the RED and BLACK wires are opposite on the new amp module in comparison to the old amp module.*

Check all connections and test the unit. Exercise due caution as there are high voltages inside the unit.

Unplug the unit and reinstall the cover.

GENERAL NOTES

Documentation

Keep a detailed record of the Zone Setup and IR codes for each system and keep them with that system or with other documentation for that system. If for any reason someone needs to re-do the setup, this documentation simplifies the process.

---> Safety Notice <---

For safety reasons, the chassis of the MRX must be connected to earth ground. This is accomplished via the ground prong of the AC power cord. Therefore, please be advised that the third prong ground on the AC power entry cord MUST NOT be disabled for any reason! If is it cut off or defeated by the use of a three-prong adapter, safe operation of the unit will be compromised.

Amplifier Precautions

Do not connect more than 1 pair of 4-ohm speakers (unless you connect them in series), or 2 pair of 8-ohm speakers in parallel on any amplifier output. For additional speakers, or if you wish to drive loads less than 4 ohms, use an outboard amplifier on the pre-amp output or use an impedance-matching device to ensure a minimum impedance of 4 ohms.

Be advised that passive volume controls that are thought to provide impedance matching do so only if they are not turned all the way up. When most passive volume controls are turned up to their maximum volume, they make a direct connection to the amplifier and bypass any impedance matching that they may have.

Never attempt to bridge the amplifier outputs. Such a connection will not provide more power, and the amplifier may be damaged.

Ventilation

The MRX requires a generous supply of cooling air to dissipate the relatively large amount of heat generated by the power amplifiers. The unit must be installed with adequate clearance around the unit. In any enclosed cabinet or rack installation involving other equipment, convection air flow through the equipment is restricted. Therefore, forced air ventilation providing a minimum air exchange of 100 cubic feet per minute should be installed to avoid overheating of all the equipment in the cabinet or rack.

Mono outputs:

From time to time dealers require mono speaker level and/or preamp outputs in order to better distribute sound in certain situations. For example, sometimes two or more separate but very small areas are within the same zone, such as dressing rooms, or perhaps they want to run a row of speakers in a hallway or an outdoor area where the speakers will be too far apart to provide useful stereo effect.

While the MRX doesn't offer mono outputs as such, we would like to offer the following solutions:

1) It is possible to sum the L and R preamp outputs with a "Y" connector on the Preamp Terminator Board; however, this may stress the preamp circuit and we cannot guarantee its longevity.

2) Do NOT under any circumstances sum the L and R outputs of the power amps!

Sharing Sources with Other Systems:

From time to time you may find it necessary to connect your source equipment to both the MRX system and another system such as a media room or home theater setup. We have found that some preamps, receivers and A/V surround receivers (e.g. Denon AVC-3000) short their audio inputs together when they are turned off. This, of course, will show up in the MRX as cross talk between CD, TAPE, AUX and VIDEO if the MRX is on and the other system is off. This cross talk or bleed from one source to another is usually accompanied by a low frequency distortion.

A line level switch made by Sonance, Model AL-1S, has A/B switching between multiple sources and will provide the isolation necessary. It requires a 12VDC-power supply, also available from Sonance, and is reported to work perfectly in this situation. The only other way we know to deal with it is for you to build a relay circuit that isolates the preamp or receiver from the source equipment whenever it is off. If you need to interface with this type of equipment and want more information, please call our Tech Support Department.

KPL & KPL/PX - Keypad Electromagnetic Interference Suppresser

The KPL (MRX EMI Suppresser) and KPL/PX (PX-600 EMI Suppresser) are designed to suppress most high voltage transients that can enter a system through the data bus. It is not a foolproof method for preventing Electromagnetic Interference (EMI) damage, however it will limit the potential damage to the system under normal conditions. These devices are meant only to enhance protection to the main units and will not suppress transients at a keypad. Nor do they protect the AC power supply. For AC protection see TIPS toward the end of this document. The KPL and KPL/PX use chassis ground to shunt the dangerous voltages away from the transceivers inside the MRX or PX-600.

This circuit is **not** incorporated into MRX units. This means that whenever an MRX is installed in a lightning prone or high EMI area, the use of a KPL is appropriate.

The PX-600 **has** this circuit incorporated into units starting with serial numbered units that have a suffix of 1/05 or above. For example: The number will look similar to this: "123456-**1/05**". Units that have a suffix lower than this **do not** incorporate this circuit. This means that whenever a PX-600 with a suffix of 1/ 04 or lower is installed in a lightning prone or high EMI area, the use of a KPL/PX is appropriate.

The PX-603 **has** this circuit incorporated into its internal circuitry. Therefore, it is not necessary to use a KPL/PX when using a PX-603 in a system.

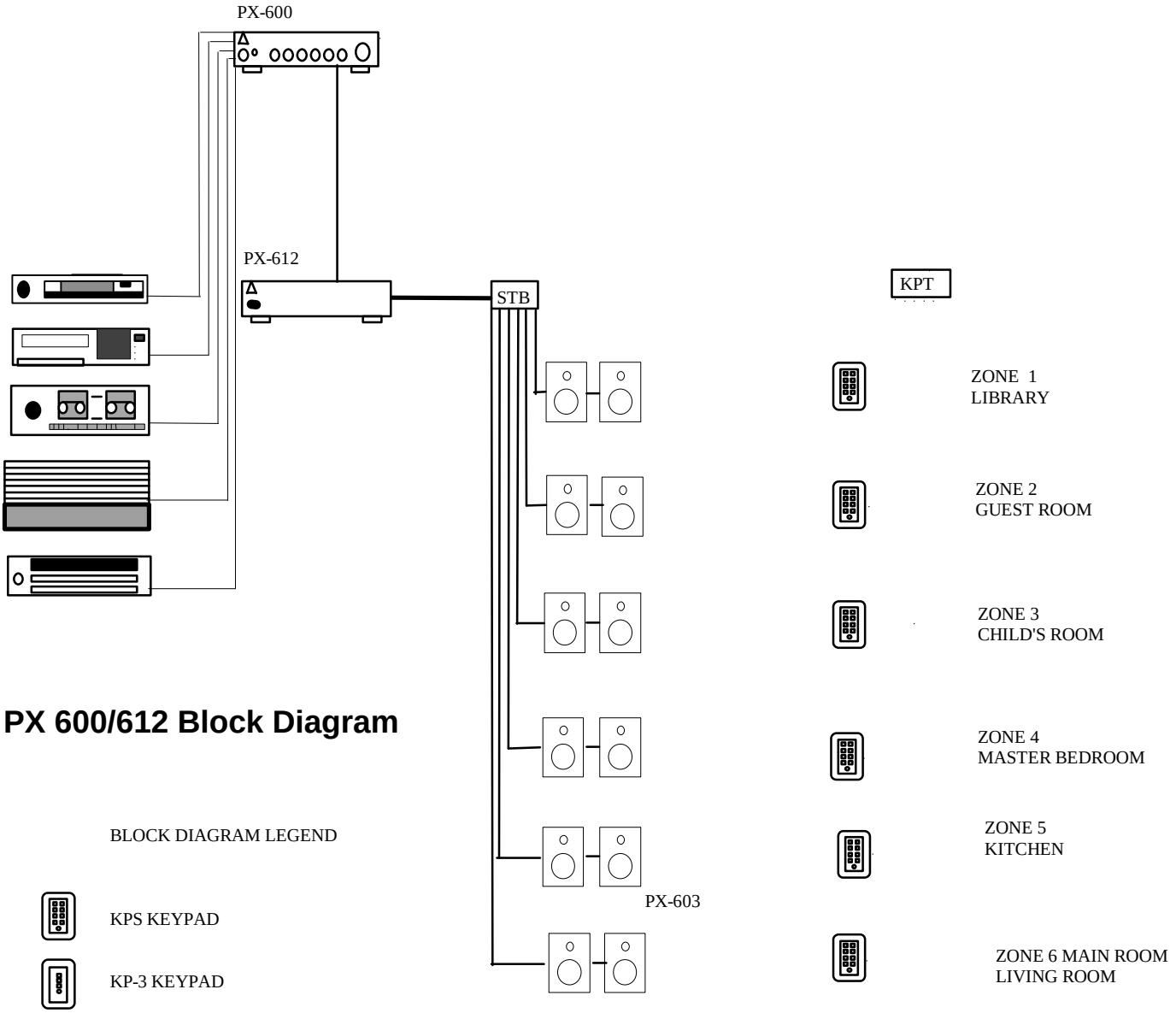
To install a KPL or KPL/PX, connect the gray terminals in series with the keypad bus outlet using the shortest wire lengths possible. The wires should be no longer than 3 to 4 inches. There is a color code on the Printed Circuit Board of the KPL (/PX) that matches the output from the data bus. Plug the pre-

KPL & KPL/PX - Keypad EMI Suppresser – Continued

existing connector into the socket side of the KPL (/PX). The color code remains the same. The other end of this connection goes to the KPT (Keypad Termination Board). Using the zinc-coated screw located next to the bus port (4-pin connection) on the back panel of the PX-600, attach the extended wire through the ring connector to make the ground contact. Use the double-sided tape (included) to attach the circuit to the back of the PX-600 in a location that is not in the way of the rear panel connections. Wire the system from this point on as normal, using the preferred Home Run Method. On MRX units the wire is substituted with a zinc coated stand off and screw (supplied). Mount the KPL using this stand off and the directions that come with the suppresser. All other wiring is the same.

TIPS: Lightning strikes occur in various voltages, currents and distances. Ambient Electromagnetic Interference can occur from lightning that is miles away. AC and data wires can act like antennas and pick up this EMI and transmit the voltage into electronic components. Be aware that there is no completely foolproof method of preventing this type of damage.

In addition to the KPL and KPL/PX, the following is a list of devices that can improve the odds: Surge protectors / suppressers, uninterrupted power supplies, AC line conditioners, AC line regulators, data bus surge protectors / suppressers and roof mounted lightning rods connected to earth ground. Not all of these devices will work for this application, please check the manufacturers' specifications to insure proper installation and usage. Beyond the devices stated here, there is really nothing else available.



PX 600/612 Block Diagram

BLOCK DIAGRAM LEGEND

KPS KEYPAD

KP-3 KEYPAD

4 CONDUCTOR WIRE

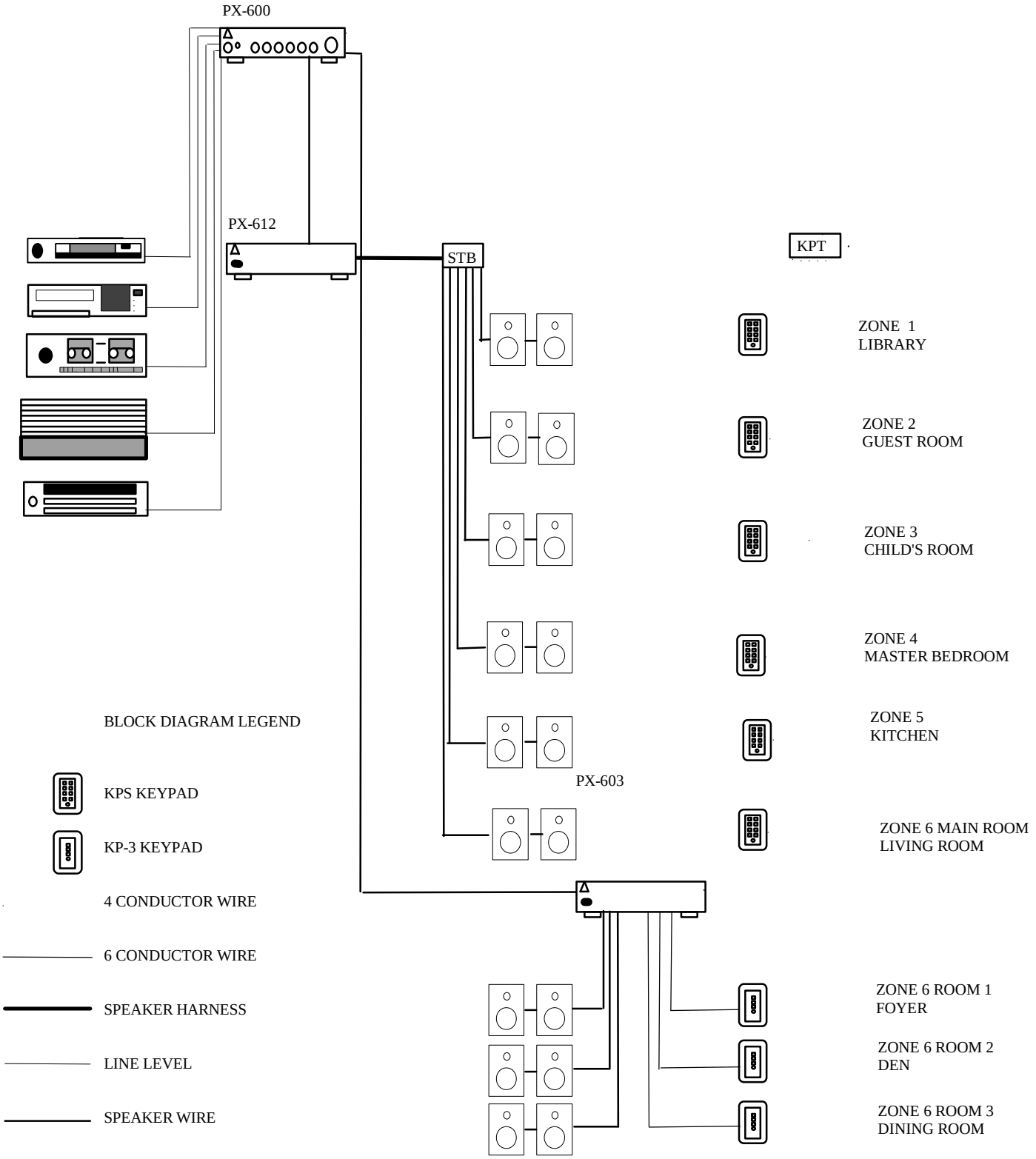
6 CONDUCTOR WIRE

SPEAKER HARNESS

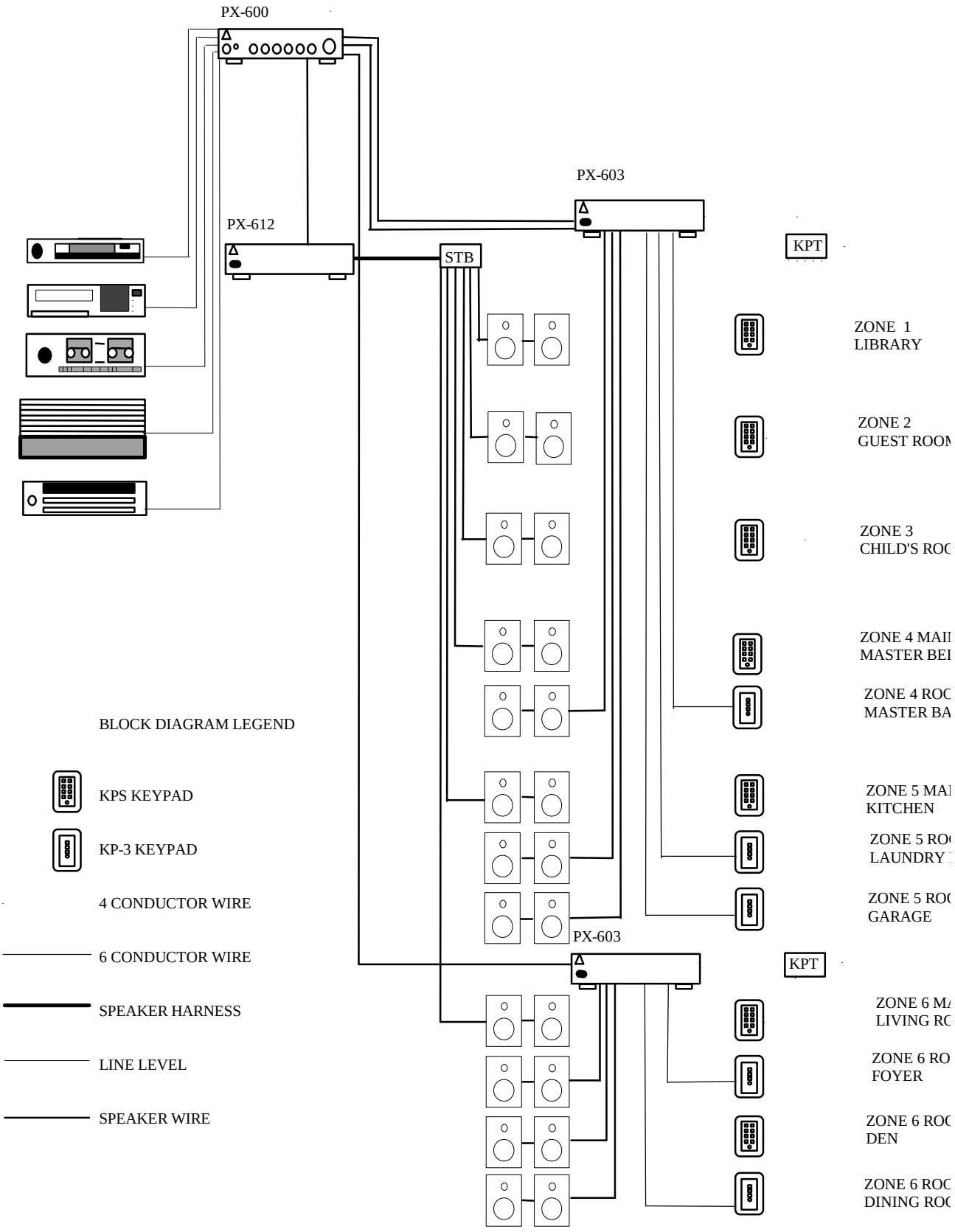
LINE LEVEL

SPEAKER WIRE

SIMPLE PX-603 System using KP-3 Keypads Only



Multiple PX-603 System using both KPS and KP-3 Keypads



Sample User's Guide

Following is an example of the sort of documentation you will want to provide your clients with once their system is installed and programmed. The system in this example is installed in an actual Audioaccess client's house. References to specific equipment are made to clarify system use, and do not constitute recommendation on the part of Audioaccess.

Sample Residence
123 Any Street
Some City, CA
123-555-1234

Audioaccess System and Main (local) room system operation

?? ***Press*** "**ON**" button - zone activated will turn on and default to "**FM**" (Tuner) at last preset station accessed. The approximate turn on time is between 3 and 5 seconds. The "**ON**" command MUST be initiated to turn on any individual zone and will also power up all sources.

?? ***Second Press*** of the "**ON**" button will cause the zone to turn off. It will also shut down the source equipment if there are no other zones active.

?? ***Press and Holding*** the "**ON**" button until the red LED flashes(approx. 2 seconds) will activate the **All On Group** and turn all the zones in house on to default volume and source. The **All On Group** is set for the time out mode and after one minute all zones will revert back to independent operation. Previous to the time out; sources and volume levels can be set from any of the keypads and will effect all zones.

?? ***Momentary press'*** of the "**FM**" button will advance Tuner to next preset station. The number of presets on the Tuner should all be programmed. If this is not done, it will appear as if the system is not working properly. As it stands, all presets are programmed. If any of these stations are undesirable note the preset number and bank and reprogram the Tuner with the desired station.

?? ***Pressing and Holding*** of the "**FM**" button until the green LED flashes (approx. 2 seconds) will have the same effect as the ***Momentary Press*** command. The Tuner will advance to the next preset station.

?? ***First Press*** of the "**CD**" button will choose the multi compact disc player (FL-8450) and issue the play command. Disc 1, Track 1 will play. Allow a few seconds for the disc changers transport mechanism to activate.

?? ***Momentary Press'*** of the "**CD**" button will advance the currently playing disc to the next sequential track.

?? ***Pressing and holding*** of the "**CD**" button until the green LED flashes will advance to the next sequential disc in the Multi changer. Allow a few seconds for the transport mechanism to advance the disc and play.

?? ***First Press*** of the "**AUX**" button will activate the single disc player (HD-7725) and issue the play command. Track 1 of the currently loaded disc will play.

?? ***Momentary press'*** of the "**AUX**" button will advance to the next sequential track on the currently loaded disc.

?? ***Press and Holding*** the "**AUX**" button will cause the currently loaded disc to go back to the previous track.

?? The "**TAPE**" button is not used and has no source connected to it.

?? The "**VIDEO**" button is not used and has no source connected to it.

?? *Operation of the Main Living Room Zone from the front panel of the AP-2500 preamplifier*.

?? Turn **ON** main power switch on AP-2500. This will automatically power all sources. There is no need to actuate any of the hard power switches. They have been hard wired and will give no response.

?? Choose the desired source preference from source control dial.

?? CD source = HD-7725 single disc player.

?? Tuner source = TU-9600 FM/AM tuner.

?? Aux source = FL-8450 5 disc carrousel changer.

?? Operate source controls via front panel or dedicated source IR remotes.

?? Turn **OFF** main power switch on AP-2500 will automatically shut off all of the source components. Condition: Source components will not power off if there is a zone active on the PX-600. Once again there is no need to actuate the power switches on the sources.

PLEASE NOTE: ***Power up of sources*** is now automatic and will turn on when any zone of the PX-600 is active **or** when the AP-2500 is active. ***Power down of sources*** will occur only when all PX-600 zones are off **and** when the AP-2500 is off. At this point the system is completely shut down. It may take 5 to 8 seconds for the AC relay in the PX-600 to power off sources.

Audioaccess Trouble Shooting Guide

ISOLATION OF INDIVIDUAL COMPONENTS IS THE KEY TO SUCCESSFUL SYSTEM DIAGNOSTICS.

The vast majority of system failures in the field are due to installation difficulties and not component failure. Although easy to install and program, a small installation mistake such as a keypad not terminated correctly, may cause a failure that affects overall system operation. Most system failures, however, are not catastrophic. Once problems are isolated through the process of elimination, most system malfunctions may be repaired in the field. Some will require reprogramming or terminations, some may require replacing components in the field, while others will need factory service. The following guide lists some specific problem descriptions, describes some basic diagnostics, and offers some common solutions.

Note - For any control related problems, first disconnect the keypad bus from the PX-600. If the PX-600 operates normally through the front panel, there is a problem with the keypads or their connections. If the PX-600 does not operate with keypads disconnected, their may be a problem in the PX-600.

Keypad Related		
Problem Encountered	**Find the problem component**	**solution**
Keypad locked up - lights come on but no functions. System locked up Zone or system locks up after ON button is pressed. Intermittent keypad lock up or control.	Unplug (isolate) all keypad wires from control unit and test unit functions from front panel. Test each keypad on system individually. Test using an alternate KPS addressed for the same zone. For alternate front panel control of zones use the “ROOM” button for MRX and “ZONE” button on PX-600 programmer. When zone # is called up the front panel controls that zone.	Set DIP switches for correct zone, room, & system. Check Keypad (data bus) wire insulation is not inserted in between the wire and the connectors. Insure data bus wires polarity. Replace KPS Processor assembly. Check front panel Volume knob is not rubbing on Motor Pot bracket. Gently pull out knob 1/16th”.
Keypad has no functions and no lights	On back panel of head unit. Check bus fuse - Use ohmmeter to measure for 0 ohms. Check bus voltage -Use voltmeter across pin 1 & 4 – DC voltage is unregulated and should be between 8 – 13 volts DC.	Replace bus fuse w/ 1.5 A slo-blo. Check data bus wires termination and polarity. Replace KPS Processor assembly.

Slow reaction time from keypad, front panel or RT-A remote.	Check KPS terminator switches. Check wire terminations. Check for IR interference (Ambient light source) Check for other high current draw electrical components on the same circuit. IE: Refrigerator, Large amplifiers, etc.	Change to opposite direction and test system speed. Make sure there are no cut or frayed wires, that there are no intermittent shorts in wiring. Disable IR on keypad - DIP switch 9 UP. Use dedicated electric circuit.
Keypad turns on but there is Audio in the wrong zone or more than one zone.	This usually indicates the wrong zone or system address on the KPS keypad Preamp output is connected to the wrong channels on the amplifier. All on group is active. Check PX-600 back panel outputs.	Check DIP switch address settings and make sure the proper zone, system, and room codes are set. Change wiring to correct amplifier input. Test Zone again but do not issue a press and hold command at turn on from keypad. Variable audio comes out of the preamp section and NOT the zone outputs. All zone outputs become HOT when any zone is active.
LED source indicator changes on keypad but audio does not follow change.	Check DIP Switch settings. Check data bus wiring.	Use correct settings for system and zone. Correctly connect wiring.
IR input on keypad does not respond to commands issued from hand held IR remote.	Check position of DIP Switch 9 Does the remote have good batteries?	To enable IR put DIP switch 9 in the down position. Replace batteries in remote.
KP3 keypad does not function.	Check data bus wiring. Is the PX-603 connected to the Data bus of the PX-600?	Data wires are 6 conductor and must be home run to PX-603. This is a one to one connection. Insure PX-603 data bus connection integrity to PX-600.
KP3 keypad lights up but controls the wrong room.	Check DIP switch settings on back panel of PX-603 Check data bus wiring. Check that KP3 bus wire is directly connected to PX-603 and plugged into the correct room port. Check Software of PX-600.	Use correct settings for system and zone and room. Correctly connect wiring. PX-603 has provision for attaching up to 3 KP3 keypads that are port dependent. PX-600 software to work w/ PX-603 is **Ver. 2.04 or higher.**

Troubleshooting Guide

Audio Related		
Problem Encountered	**Find the problem component**	**solution**
No Audio in one zone	Identify Zone. Check Speaker continuity. Check Preamp output. Check amp outputs. – What type of Amp is powering this zone? Is it signal sensing turn on/off? Check Fuse Source dependent? - Check source input continuity and line level signal.	Turn all zones off but the problem zone. Use program screen in Zone or Room mode to identify active zone. PX-612 – min. 4 ohms load, PX-603 min. 8 ohm load. MRX – min. 4 ohm load. Do not fall below rated impedance for amplifiers. Is there preamp line level signal. If so, check amp channel. Feed a direct signal into the amp – If it does not power up look to the amp for the problem. Replace fuse with same value. Change source or it's wiring connection.
No Audio in any zone	Amplifier ON? Is the amp plugged into a switched outlet that is not on? Check main power fuse in Amp and Preamp.	Insure AC power to Amp. Is not switched unless system is designed to use installed amp in this fashion. Replace fuse with same value.
Audio always very loud in all zones. Sources can be controlled but volume can not.	Check PX-600 back panel outputs.	Variable audio comes out of the preamp section and NOT the zone outputs. Use preamp output not zone outputs.
Audio drops out then returns	What volume level does this occur? Does this happen when music has soft passages in it? Does it always happen at the same volume level? Is it source dependent?	With PX-612 check by slowly adjusting the volume level to a softer point. Use the Zone button on PX-600 programmer to see what the actual level is. If the threshold is below "10" the amp needs to be modified. Check sources output for drop out. Repair or replace source.
Cross talk between inputs and zones.	Is the Audioaccess system used in conjunction with a local system? – IE: source sharing. Some MRX units inherently have this problem. How to minimize.	Disconnect the local system – if the problem is not present use a ground loop isolator in line with the local system feed. Install an SMM (Speaker Mute Module). In MRX, zones 1&4, 2&3, 5&6 are grounded together. If these pairs are the frequently used zones, reallocate combinations so that frequently used zones are not the pairs described.

Hum in speakers	Is there a cable system integrated with this unit?	Remove the cable connection. If the problem is not present then use an IN-LINE ground loop isolator or make your own using 2pcs. of 75 to 300 ohm transformers back to back on the 300-ohm side. This effectively makes an isolation transformer.
	Check for DC offset at source inputs.	There should be no DC voltage coming from your source.
	Is the Audioaccess system used in conjunction with a local system? – IE: source sharing.	Disconnect the local system – if the problem is not present use a ground loop isolator in line with the local system feed.
Popping sound in speakers – associated with switching lights, motors, etc.	Check terminations for bad connections and loose wiring.	Terminate wires correctly.
	Cabling routed too close to AC wiring, dimmers or electric motors.	Re-rout cables away from AC wiring.
	Systems connected to same AC circuit as electromechanical devices causing noise on system.	Use different AC circuit for either the system or electromechanical device.
System Related		
Problem Encountered	**Find the problem component**	**solution**
System or zone turns on by itself.	Is there an extra ordinary amount of light shining on any keypad or the front panel of the system?	Disable IR receiver in KPS keypad by putting DIP switch 9 in the UP position. If it is coming in through the front panel – PX-600 use a pigtailed 1/8" mono jack and plug it into the IR input on the back panel. MRX use a piece of Black tape to cover the IR receiver.
	Check for stuck button on keypad.	Make sure buttons do not stick in the down position.
	If using an outboard control system, check parameters of control system. Does it have functions for timed operations?	Disconnect control system and test. If operational, the problem lies in the control system
MRX tuner has little or no reception.	Is the antenna connected?	Connect antenna.
	Powered Antenna?	Make sure powered unit is supplied with the correct voltage (AC or DC).
	Check for Proper tuner set up.	US frequencies should be set at .2MHz.
	Data Reset	Will erase all programming.

Front Panel "talk back" LED lit or blinking – no intentional input.	Is there an extra ordinary amount of light shining on the front panel? Use programmer screen to check status identifiers: I = Front Panel is receiving IR. K = Information from A keypad is being received at head unit. Either a button press or receiving IR. P = head unit is send IR to sources.	Front panels – PX-600 use a pigtailed 1/8" mono jack and plug it into the IR input on the back panel. MRX use a piece of Black tape to cover the IR receiver.
Front Panel LCD (MRX) has no font	LCD intensity potentiometer needs adjustment.	Remove the top cover of the MRX and find the small hole directly behind and to the right of the LCD screen. Use a small #1 blade screwdriver to gently move the potentiometer till the font is visible on the LCD screen.
Front Panel LCD (MRX) has no back light or is split	Check ribbon connections to front panel.	Make sure there is a complete connection and there are no shorted wires inside the MRX chassis.
Programmer LCD (PX-600) has no font	LCD intensity potentiometer needs adjustment.	Remove the top cover of the programmer and find the only potentiometer on this circuit. Use a small #1 blade screwdriver to gently move the potentiometer till the font is visible on the LCD screen.
Programmer LCD (PX-600) has no back light or is split	Check ribbon connections to front panel	Make sure there is a complete connection and there are no shorted wires or broken connectors.
Characters remain on LCD after back light goes off.	After PX-connect or MRX-connect this is normal.	If this happens at any other time call Customer Support
Tuner frequency displayed on LCD (MRX) does not match station being listed to.	Check that tuner set up is set for US standards.	US frequencies should be set at .2MHz. Use the tuner preset button 1 and MUTE to activate main menu.
PX-600 or MRX constantly resets.	Remove keypads. If the problem still exists then it is an RS-485 Transceiver failure. If the problem stops then look for failed RS-485 transceivers on keypads.	Test from front panel. Change RS-485 Transceiver. Put one Keypad on the data bus at a time until the bad keypad is found. Replace KPS processor board or entire keypad.
MRX Overheats	Does the fan run? Is the unit installed in cabinet w/no ventilation?	Remove cover and find the power wire to the fan. Use a multi meter to see if the fan's windings are still in tact. NO- replace fan. Ventilate cabinet.
PX-600 Overheats	Is the unit installed in cabinet w/no ventilation?	Ventilate cabinet.

MRX main fuse blown PX-600 main fuse blown	Check for shorted wiring. Check for source input DC offset. Check correct wall voltage.	Repair faulty wiring. Change or repair source. Connect to 110VAC.
No power on MRX switched outlets.	Does the AC relay click on power up? Check fuse on Power supply.	Change relay. Change fuse w/ correct value.
No power on PX-600 switched outlet.	Does the AC relay click on power up? Check external fuse for Power supply. Check internal fuse link at location F1301 near power supply.	Change relay. Change fuse w/ same value. Install a jumper wire 24 ga. at location F1301 To replace this fuse.
Problems encountered after changing software.	Check that the IC is seated correctly and installed in the correct direction. Follow proper Electrostatic Discharge procedures while installing software.	Reinstall software correctly. Perform DATA reset to system. Make sure you are grounded to prevent ESD damage.
IR emitter blows	Check to make sure the emitter is plugged into an emitter port and not the All or Blaster port.	If using the ALL output on PX-600 then remove cover and set jumper to emitter @ location P120. If using an MRX Blaster output then install in line with the emitter a 100Ohm ¼ watt 5 %resistor to shunt the voltage.
MRX fan always runs.	Check thermo-couple on amplifier heat sink.	If always closed then replace.
MRX fan never runs.	Check thermo-couple on amplifier heat sink. Check fan windings.	If always open when hot replace. Use an ohmmeter to check for continuity. If open replace fan.
PX-603 Related		
Problem Encountered	**Find the problem component**	**solution**
PX-603 room does not come on.	Check DIP Switch settings on KPS or PX-603. Check data bus wiring. Make sure PX-603 is connected to PX-600. Check PX-600 software	Use correct settings for system, zone and room. Correctly connect wiring. PX-600 software to work w/ PX-603 is **Ver. 2.04 or higher**.
PX-603 KPS keypad controls main room (0) and not the attached room.	Check DIP Switch settings on KPS or PX-603. Check data bus wiring. Check PX-600 software	Use correct settings for system, zone and room. Correctly connect wiring. PX-600 software to work w/ PX-603 is **Ver. 2.04 or higher.**

PX-603 has no output.	Check feed to PX-603 from PX-600. Check speaker connection. Check speaker continuity. Check AC power.	Use Zone output from PX-600. Check continuity of interconnects from PX-600 to PX-603. Connect speaker. Replace speaker or wiring as necessary. The PX-603 requires constant power and **should not** be plugged into the PX-600 switched outlet.
PX-603 LED indicator light always stays RED. Unit is in protect mode.	Check AC line voltage. Check that speakers are not shorted. Check data bus connection.	Requires 110VAC constant. No lower than 8 Ohms per channel. Connect data bus with correct polarity.
PX-603 LED indicator light always stays Yellow. Unit is always in stand-by	Check line level signal feed continuity. Check DIP switch settings. Check Data bus connection.	Insure continuity to PX-603 input. Set switches to correct system, zone, and room address on PX-603 (and KPS if used). Insure correct connection and polarity to data bus. When using KP3 keypads a 6-conductor wire must be home run.
PX-603 LED indicator light always stays Green. Unit is always ON.	Check DIP switch settings. Check Data bus connection. Check ALL ON group settings. Was the room turned on by issuing an "All On" command?	Set switches to correct system, zone, and room address on PX-603 (and KPS if used). Insure correct connection and polarity to data bus. When using KP3 keypads a 6-conductor wire must be home run. All On commands are set in "Group set up" for single systems and in "Multi set up" in multi configurations. Issue "ON" command with momentary press. To issue an All On command press and hold the ON button from a keypad that is not currently on.
PX-612 Related		
Problem Encountered	**Find the problem component**	**solution**
PX-612 LED indicator light always stays RED. Amp is in protect mode.	Check AC line voltage. Check that speakers are not shorted and that the impedance is correct. Check for DC offset for sources or Preamp. Check for overheating.	Requires 110VAC constant. No lower than 4 Ohms per channel. Change or repair source. Change or repair Preamp. Ventilate cabinet.

PX-612 LED indicator light always stays Yellow. IE: unit does not come out of stand-by.	Check input signal from Preamp. Check continuity of cabling feeding amp.	Feed a direct signal to Amplifier such as from a CD player to see if it turns on and off with signal sensing. Change or repair defective cable.
PX-612 LED indicator light always stays Green. IE: Amp is always ON	Is there a cable system attached to the Audioaccess controller? Is there a local system sharing sources with the system? Some receivers short the input to ground when in the stand-by condition.	Disconnect cable. If the problem goes away then use a ground loop isolator in line with the cable input feed. Disconnect wiring feeding the local system. If problem goes away use an in line (RCA style) ground loop isolator to bring the signal to the local system.
Multi System Related		
Problem Encountered	**Find the problem component**	**solution**
Subsequent units in multi system (other than system 1) always jump back to FM after another source key has been pressed.	PX-connect or MRX-connect sequence was not performed correctly.	After running the connect sequence be sure to press the " ALL OFF" button on front panels from the highest system number to the lowest system number.
Subsequent units in multi system do not respond to any commands other than front panel.	Check Data bus connection. Check keypad connections. Check bus fuse on back panel. Voltage between pins 1 & 4 should be between 8 to 13 VDC.	Connect with correct polarity while not connecting the RED (or power) wire between systems. Make sure keypads are correctly connected for polarity. Change fuse w/ 1.5 amp slo-blo
MCI related		
Problem Encountered	**Find the problem component**	**solution**
MCI is not passing commands	Check Green LED is flashing when commands are sent. Check Data bus connection. Check that MCI is receiving power from Data bus. Check outboard control systems connection and polarity. (RS-232)	Issue a command fro0m a keypad – you should see the Green LED flash. Connect w/ correct polarity. The RED indicator LED should be lit if there is power at the MCI. Voltage between pins 1 & 4 should read between 8 to 13VDC. Insure correct connection and polarity from RS-232 connection.

MCI Red LED does not light	Check Data bus connection. Check data bus voltage at head unit.	Connect w/ correct polarity. The RED indicator LED should be lit if there is power at the MCI. Voltage between pins 1 & 4 should read between 8 to 13VDC.
PDM Related		
Problem Encountered	**Find the problem component**	**solution**
Page Doorbell Module chimes constantly.	Check jumper settings. Check trigger wiring. Insure door station is powered.	Set jumpers for correct triggering. See top cover of PDM Is trigger wire connected correctly at both PDM and trigger device location. Continuity, shorts? If using one Panasonic door station, only the trigger input used should be configured for this device. The other jumpers should be set for contact closure.

If all else fails

Source control and audio problems can sometimes be fixed by performing a data reset. System programming will lost but the problem may be resolved. A data reset should be done before sending units to Audioaccess service.

If the problem you encounter is not in this list or you are unsure of how to completely diagnose the system please call our Customer Support at 888-691-4171 or fax 860-346-1540. We will be glad to help you find the problem.

Terms and Phrases

ALL-ON GROUPS- All-On allows you to organize zones into groups that can be turned on and operated together. Zones may be assigned to one of three groups (A, B, or C) or to no group at all (see TIME-OUT).

BLASTER- this output contains all IR codes stored in the MRX or PX-600 memory will flood an area with any IR codes issued by the controller.

BUTTON COMMAND- The command sent to the controller from the keypad. The first press of a source button selects that source equipment and sends a play command, the second press sends another command, and press-and-hold accesses a third command. The ON button has four functions, zone on, zone off , All-On group on and system off. Volume up and down are single-function buttons.

DAISY CHAIN- A wiring method in which you connect a cable from one keypad to the next, with the final termination made directly to the PX-600 or MRX rear panel. This connection method is not recommended, as it increases troubleshooting time; however it may be necessary in retrofit installations.

EXTERNAL AC TRIGGER- When an external 12VDC input trigger is connected, it will power up the switched outlets on the back of the MRX without turning on the MRX system. Use this feature to share source equipment between the MRX and another system.

HOME RUN- A wiring method in which all keypads are run separately to a central location at the Keypad Termination Board (KPT), then connected to the PX-600 or MRX with a jumper. This is the most desirable method to wire keypads, since troubleshooting of the keypad system is simple with this of hook-up.

I/O FUNCTIONS- Functions such as dimming lights, drawing curtains or raising/lowering a projection screen can be triggered using the Trigger Out on the PX-600.

IR EMITTER- Low power infrared transmitter. This emits the programmed IR codes for an individual piece of source equipment. Usually, it is glued to the IR receiver on the front of the source.

KP-3 - Three button keypad for limited access to PX-603 rooms. It allows room on/off and volume control, as well as source control via IR only.

KPS - Wall-mounted Keypad for control of MRX and PX-600 systems Including PX-603 rooms).

KPT- Keypad Termination Board - a board for connection of Audioaccess keypads and PX-603s.

LOCKOUT- This feature limits zone control to source choice and volume control while another zone is using that source. If another zone has not selected that source, the keypad will function normally.

LOOP THRU- allows line level to feed into a controller and then continue to a different location

MAIN ZONE- This is usually the zone where the main group of hardware is. It is designated as Zone 6 because of the extra programming capabilities of that zone.

MAX VOLUME- Allows you to limit the volume available in a given zone.

MCI - Computer Interface Module. The MCI is a serial communications translator used to interface computer-based control or “home automation” systems with the Audioaccess Multi-Zone Controllers. It adapts RS232 to the RS485 Audioaccess keypad

MRX-NT - Multi-Room Preamp/Amplifier/Controller with built in Tuner and programming capabilities. It is basically the same as a PX-600 except that it contains a tuner, programmer, and amplifiers. There is usually no need to have external amplifiers, although it has this capability if you desire more power or wish to expand a system using autoformers.

PDM - Page and Doorbell Module. The PDM can be used with a PX-600 or MRX to generate doorbell chimes and/or route paging audio through selected zones at selected volumes independent of the listening volume in the zone. Zones can be programmed to receive doorbell chimes or paging when on or off. The doorbell input can be triggered in three ways: contact closure, 10-24 VAC, or the output of a Panasonic Doorphone (model KX-T30865). The PDM will accept a total of two of these input types.

PHANTOM ZONE- An external system (such as a Home Theater) that shares sources with the PX-600 or MRX.

POT- Preamp Output Terminator Board used with the MRX to route signal to external amplifiers.

PRESS-AND-HOLD- This is the third function of a button on a keypad. By pressing and holding the button down until the LED flashes, the keypad issues the third programmed function.

PROGRAMMER - Allows zone configuration, the capture of IR codes for the PX-600 to control source equipment, and system troubleshooting capability.

PX-600 - The PX-600 is a multi-room preamp/controller for six zones. It includes five audio inputs, six stereo preamps and an infrared interface for controlling audio and video sources. Zone setup and IR source control is configured by the installer with a detachable PX-600 Programmer which plugs into the side of the PX-600 control panel.

PX-603 - Three line level amplifiers in a single chassis used to expand the scope of any zone in a PX-600 system. The PX-603 room source and volume selection can be controlled by a KPS or a KP-3 keypad, any of the Audioaccess IR remote controllers, or a computer automation system.

PX-612 - 12 Channel Bridgeable Power Amplifier- This amplifier is the recommended amplifier to use with a PX-600.

RS 232/RS 485- Types of connectors/ports used for computer and CONDI communication connections.

RTA - Handheld remote control with all KPS button capabilities, as well as video transport functions.

SHARED AIRSPACE- One of the considerations in planning zones in a multi-zone system. A through dining-living room combination is a common example.

SMM - Speaker Mute Module. Used with the MRX, the SMM disconnects the speakers from the MRX amplifier when a zone is off so that external interference is not heard through speakers in zones that are not in use. The SMM has six relays controlled by a microprocessor that monitors the status of each zone and switches the zone relays on and off with each zone.

STB- Speaker Termination Board used to connect all speakers in the system to the MRX or PX-612.

SYSTEM CODE- Enables the programmer to set up single or multiple systems of MRX or PX-600.

TIME-OUT- Allows zones in an All-On group to track source selection, on/off and volume together, to track sources and on/off with independent volume control after 30 seconds, or for each zone in the group to revert to independent source, volume and on/off operation after 30 seconds

TRIGGER IN - The Trigger In is used when sources are shared with a system other than the PX-600 (a Home Theater, for example). A 12 volt DC input from that system alerts the PX-600 system that the sources are in use so that STOP and POWER commands are not sent when the external audio system is on.

TRIGGER OUT- The Trigger Out is active when any Zone in the system is on; relays connected to the trigger can be used to turn on amplifiers, fans or other devices

TURN-ON VOLUME- This is the volume at which the zone turns on. You can also fix the pre-amp output to this volume during programming if desired.

URC 5000- Handheld Universal Remote Control that stores and6 accesses IR codes for various manufacturers' equipment, including Audioaccess.

ZONE- A Zone is an area in a home that can access and control source equipment and regulate volume separately from another zone. A zone can be a specific room or a group of rooms.

ZONE TRIGGERS- Relays connected to Zone Triggers may be used to start an action that is required whenever a particular zone is turned on (turning on a remote amp, etc.).