Home Theater Control Systems
Everyone knows that operating a sophisticated home theater is simply a matter of picking up a fist-full of remote controls and turning on the right pieces of equipment, right? In 80% of the home theaters out there this is absolutely correct but the remaining 20% have a better, or at least easier, way, they have a control system to perform the multiple key presses and system control that complex home theaters require.

In this section we will examine several ways to automate your home theater. In the first section we will examine wireless control systems as a product category. We will profile wireless remote control systems from hand-held remotes to expensive network-type control systems.

After that we examine a new type of infrared controller that basically can be described as a “remote-in-the-wall”. These Infrared Learning Keypad (ILK) devices are built by three different companies, Niles, Xantech and Russound, and are a great way to add automation to a home theater.

Finally we explain the “low cost” alternative: X-10 control. Because these modules are so flexible we have written a section that generically explains X-10 modules and how you can use them to control your home theater, or your entire house.

Finally, for those high-end home theater enthusiasts, there are several companies that manufacture more expensive touch screen control systems. Some of the larger names are Crestron, AMX, TronArch and others. Most of these may be beyond the realm of the ordinary do-it-yourselfer mainly because of cost issues, but we have included information about them so you know what’s available in that level of control systems.
You know the problem. Even with a very simple home theater system, it's not difficult to accrue a half a dozen or more remote controls, and have them end up scattered across your home theater room's coffee table. In reality, this wouldn't be so bad if the remotes would actually stay there, however if you have a family, you know that "having children" and "finding remotes" are mutually exclusive principles. This is because all children know that remotes make not only great interactive toys, but are excellent sources for fresh "AA" and "AAA" batteries. And the best part is: after donating their batteries to other household toys, the remainder of the remote can be left anywhere in the house for adults to locate later! If you find yourself putting down this magazine and feeling an uncontrollable urge to run down to your home theater to survey the room - you may want to finish this article first. In the future, a wireless home theater control system could make that trip unnecessary!

Home theater control systems, in particular, wireless ones, offer the immediate benefit of reducing the number of remotes lying on the coffee table to smaller number -like one. This alone will decrease your home theater problems because you should be able to hide that one from the kids. Another benefit is the tremendous ease of use you will gain. Many manufacturers of wireless home theater controllers have put a great deal of thought into simplifying the control of home theater systems via proper ergonomic and electronic design. Several even state they have reduced the system to "complete one button control". Have they achieved it? In many cases, yes, but choosing the best device for your home theater still involves some research and thought. In this article we will explore the topic of wireless home theater controllers and help you choose the one that will best fit your needs.

Basic Control Issues

The basic operating principle behind virtually all wireless home theater controllers is "infrared command code emulation". In short, wireless controllers learn the codes of other dedicated IR remotes controls. This is why most people call the more basic controllers "learning remotes". Here is how the process works: the "teacher" remote is pointed directly at the learning remote and the command button to be emulated is pushed. With a special microprocessor orchestrating the whole affair, the learning remote captures the transmitted IR code and stores it in it's memory. This code, a mirror image of it's original factory code, sits there until the right key is pushed on the learning remote and the code is reissued. The equipment being controlled "sees" this IR code and executes the command just like it was coming from original remote.

Besides just parroting the commands of dedicated remotes, wireless home theater controllers can perform...
Home Theater Control Systems

Standard infrared wireless systems use unidirectional communication to control home theater components. The advantages are affordability and simplicity of use.

More advanced wireless systems use bi-directional RF communication to control home theater components. The advantages are operational reliability due to status feedback and immunity to noise because of RF transmission.
other tricks. One of the most basic is macro capability. For those of you who enjoy life without a computer, the term macro usually refers to program that issues a number of commands under control of a single keyboard keystroke. An everyday example would be the memory dialing buttons on your phone. Here one single button press replaces the action of keying in the entire eight digit telephone number. In the world of A/V remote controls, the same principle applies except that instead of dialing a phone, a single keystroke will act like many sequential command buttons are pushed. Example: Pushing “Macro 1” on the controller can turn on the A/V preamp, then the amplifier, then the tuner and finally tune it to NPR. As you can imagine, macro capability is a big hit with many consumers because of the ease of use it lends to complex A/V systems.

The actual method by which wireless home theater controllers communicate with A/V equipment and other devices can either be unidirectional or bi-directional. Understanding the differences between these two transmission methods will give you insight into the wireless control process and its capabilities. Let's take the unidirectional systems first. Most IR home theater controllers are unidirectional (see our diagram). Commands are executed by transmitting an IR code directly to the IR windows of A/V equipment and other IR controlled devices. This is a highly effective method to control equipment but because it is unidirectional, no feedback can be given to the controller about system status (on/off, volume level, functions enabled, etc.). If you are controlling A/V equipment lacking front panel displays, or that is hidden from view, this can be annoying because you can't be sure what "state" the equipment is in.

When home theater systems get more complex, or when greater control is desired, bi-directional systems are best. Bi-directional systems take commands from controllers and "reports back" with changes and status. The following scenario will help to explain. Suppose you have designed and built your dream home theater room, and you opted to hide all your expensive A/V equipment in an equipment closet. In order to control this...
equipment, you install a infrared repeater so that IR commands will "flash" the equipment inside the cabinet. As you sit down with your family to watch a new DVD release, you push the macro button on your remote which is programmed to switch the entire system on. The result: everything goes on, except there's no sound. The question is what's wrong?

With a uni-directional system, all you can do is mash away on the keys and change states (on to off, or off to on). You don't know which audio component in the system is off and has killed the sound. This situation is much easier to troubleshoot (and may not occur at all) with a bi-directional system because power status is fed back to the controller. You simply look at the display to see which component is turned off, and turn it on.

The Playing Field

Although the stated mission is the same -providing complete wireless control for home theaters, the variety of products to accomplish this task is quite broad and is rapidly getting broader. Let's look at the more affordable controllers first.

The entry point into home theater controllers comes in the form of “super remotes”. These devices are sophisticated handheld remote controls that are designed not only to emulate hundreds of separate IR commands but organize them in a fashion that is more intuitive than standard remotes. Possibly the best known of this breed is the Marantz RC 2000 II. Priced at $250, this remote has received a great deal of press lately for it's capabilities and ergonomic design. The bottom section of the remote contains button sets similar to other learning remotes, but the top has a series of blank buttons that can be programmed for any function and then custom labeled in the center LCD panel. Combined with 4 front-located macro buttons, this remote is well thought out. It is designed to control up to ten components, with 32 special functions available for each component, and all keys are brightly back lit. Marantz says the design of this control was based on the input from over 100 Marantz dealers and custom installers. It shows.

If customization of a remote's button sets sounds exciting, you've got to take a look at Rotel's RR-990. Lacking actual physical buttons, this remote is essentially one big LCD touchpad with buttons that are images on the pad. The touchpad button images are divided into three parts. The top section has four programming control buttons (reset, delete, learn and macro), the middle are the standard A/V control function buttons (numeric keypad, play, volume, Even though the Lexicon 500T is easy to program via the touchpad, Lexicon offers installers their windows-based software package, LexiDraw, to streamline the procedur e.
For those who want the flash of touchscreen control but live on a limited budget, Kenwood has a product for you. Their KC-Z1 controller, a full featured A/V pre-amp and part of their Stage 3 product line, comes with a RF-based, docking, touch-panel controller. The Touch panel itself cosmetically resembles the $1195 Lexicon 500T controller and you can use it to control up to 6 additional home theater components and accessories. Since it comes completely programmed to control Kenwood products, installation is a snap.

etc.) and the bottom are eight component selection buttons (TV, VCR, CD, etc.). When you choose one of the component selection buttons, VCR for example, a menu page appears with a button set programmed for that component. Preprogrammed by the factory, each menu page can be easily modified by the owner. For readability in the dark, the RR-990 touch pad is fully back-lit, soft green lights come on when the touch pad is touched and fade out slowly after the last keystroke.

For those who want an affordable unidirectional controller but want total customization of their touchpad graphical interface, Lexicon has a solution. The Lexicon 500T is a powerful IR-based home theater controller that can be configured almost anyway that you can imagine. All control actions occur via button images on the 500Ts bright, light-blue touch panel. All of the menus are completely "soft" meaning that all the button sets, sizes, locations, and labels are completely customizable. One can even create display that simply shows buttons labeled "Play CD" and "Watch Movie" and "Dim lights", each of which evokes a macro series of IR commands. Aside from it's wonderful flexibility, this is also a very powerful unit. It can support up to 23 pages of menus with a total of 500 button images, and control up to 23 A/V components or other devices. Because of the complexity of this device, Lexicon recommends you talk to your Lexicon dealer about programming. Most home theater enthusiasts will find it manageable but some may find that having the dealer do the programming is worth the extra cost.

High End Control For High End Theaters

The next rung up the wireless control ladder encompasses devices that are more sophisticated in their design and, as a result, use RF-based bi-directional communications protocols. First example: the Niles Intellicontrol™, Niles, a veteran manufacturer of home A/V control systems, designed their new Intellicontrol with a specific goal in mind: to provide one button, foolproof control of home theaters. The result is an ergonomically designed table top unit with 43 backlit keys capable of controlling up to nine A/V components -plus the room lights. The Intellicontrol system uses RF communication to eliminate interference with the command pulses, and bi-directional transmission was for status feedback and control. Besides the table-top control module, the Intellicontrol system utilizes a Main System Module (MSU). The MSU is actually the brains behind the system and controls all the A/V components via IR commands. The reason it is so smart is that it senses the power status of each component in the system via special AC sensing modules and by knowing which components are drawing power and which are not, it can never be fooled by components that accidentally get triggered into different power states. The Niles Intellicontrol system retails for $1195.

Crestron Electronics, a company known primarily for it's high-end control systems, has recently introduced it's affordable SmarTouch STS™ wireless home theater controller. Resembling Lexicon's 500T touch pad, STS touchpanel offers a 6" grayscale or optional full-color display. The SmarTouch system also includes a main system unit, which Crestron refers to as STS Control Processor. The STS Control Processor interfaces with home theater components and other control equipment via IR and RS-232 commands. The SmarTouch STS ST-1500 system with a grayscale display will retail for $1350 and the color version for $2400.

Located on the top shelf of the home theater control
Home Theater Control Systems

 hierarchy are systems that are best described as networks-total home control networks. These systems generally utilize large, full-color touch screen panels and are either hardwired or are connected via bi-directional, RF wireless transmission to MSUs. The MSUs employed usually differ from their less expensive counterparts by having the ability to speak in many "languages". Typically, they can control not only IR-based equipment, but X10-based, computers and other equipment via RS-232/422 ports, contact-closure relay devices, and many other specialty protocols. Two companies have a very strong presence in this high-end control system area. The first, AMX, has been building consumer and commercial control system components for over 20 years. It's AXCESS™ control systems consist of a large selection of touch panels, main system units, sensors and control interface modules, all designed to provide control for virtually any home theater system. As matter of fact, after looking over their full-line catalog, it would be hard to imagine anything this system couldn't control. This company does it all, but at a price. Full featured AXCESS systems can run $20,000 and up. For those who consider that kind of investment a bit stiff, AMX has another option. Their wholly-owned subsidiary, PHAST, offers a line of home control equipment at more affordable prices. For more information, see the list of manufacturers at the end of this article.

Another company that offers a complete selection of high-end control systems is Crestron Electronics. Crestron, a company with a very strong presence in the commercial control marketplace, was one of the first to offer full-color flat panel displays as control interfaces for home applications. Like AMX, they offer a large variety of modules to interface with virtually any device. By the time this article goes to press, Crestron's new SPECTRUM™ line of wireless touch panels will be available. This system is specifically designed to make full-color, wireless control available at reasonable prices. An interesting technical feature of the SPECTRUM line is that it uses spread spectrum RF transmission. This technique guarantees immunity to RF interference by changing the frequency of the transmission during use. It wasn't so long ago that this technology was only available for critical military purposes.

A new company to the high-end home theater marketplace is Interface Controls, Inc.. Based in Ontario, Canada, they offer several touch panel control systems. Their SQUID™ system, according to the factory, is completely user programmable. We will explore this feature in more detail in the next section.

Getting With The Program

As we mentioned previously, some manufacturers recommend that their dealers install and program their controllers, others say customers can complete the task. It all depends on the type of controller you choose, the complexity of the installation and how handy you are. Certainly inexpensive handheld remotes, like the Marantz RC2000 and Rotel RR990, can be successfully programmed by most consumers. Both come with excellent booklets designed to guide you through the entire process. However, if you aren't up to an evening of "remote training" and testing the results, you may want call your local A/V specialty dealer in to perform the task for you. The situation with the more powerful system controllers, such as the Niles IntelliControl and the AMX and Crestron touch panel systems, is more clear cut. These systems are complex enough that having a dealer perform the installation is generally mandatory. (Dealers have two advantages. Besides having installed other systems, they usually have learned the ropes at factory training seminars.)

Now for the gray area. Several of the more complex systems can be probably be user installed and programmed; the Lexicon 500T controller and the Crestron SmartTouch STS, for example. Although these

AMX offers WavePack and Mini-Wave pack modules to convert their touch panels into two way RF wireless home theater controllers
controllers are complex to program, both manufacturers suggest that enthusiasts may be capable of doing it themselves. It, frankly, all depends on one's DIY abilities and patience level. In the arena of control network products, Interface Controls, Inc, does offer their products to do-it-yourselfers. Although the SQUID system is not for lightweights -we are talking about routing cables, wiring interfaces and installing cards in MSUs here, Interface Controls believes enthusiasts can perform installations. The main reason for this optimism is that they have streamlined the oft difficult programming phase with computer software. Called “Point and Click", their windows-based software allows one to program the entire system and download it to the SQUID MSU.

Battery Park

Any discussion of wireless controllers would be incomplete without a discussion about batteries. Fact: wireless remote controllers are pretty useless when the batteries are dead. Managing this situation so that it doesn't occur in the middle of a special event is something most home theater owners ought to be concerned about. Let's start with handheld remotes. It's a fact that illuminating buttons and touch panels on remotes can gobble up lot's of battery power. Knowing this the smart engineers at Marantz and Rotel have built light sensors into their handheld remotes so they only illuminate in the dark, not in daylight or when lights are on. Batteries in these remotes can last many months.

The larger table top touch-screen controllers have bright back-lit panels and thus require a great deal more power. For convenience purposes, this power comes from rechargeable Ni-Cad battery packs. Combined with power management techniques, like time-limiting the display illumination (they stay on for just 10-15 seconds), these controllers can work for many weeks before recharging. However, for those of us mortals who occasionally forget to plug in rechargeable devices consistently, dead controllers can still be a problem. The solution, of course, is not to forget to charge these things periodically. Our suggestion: do it every time you water the plants!

The Niles Intellipad, in spite of it's table-top size, has an advantage here. Since it does not use an energy-thirsty backlit touch panel, only conventional backlit keys, the life of it's three “D” batteries is rated at about 300 hours of continuous illumination. This remote should give you many months of usage before the batteries need to be changed.

Not So Stupid Home Theater Control Tricks

As you undoubtedly know by now, wireless home theater controllers do more that just control A/V equipment, they can be equally adept at controlling other equipment in the home theater room and devices elsewhere in the house. One of the first accessories that makes sense to put under control of a home theater controller would be the room lighting. Doing this with an IR-based controller is easiest via X10 modules which are available at Radio Shack and most home automation dealers. More elaborate control systems with MSU modules generally offer interfaces to other lighting control products also via RS-232/422 and other protocols. With the AMX ACCESS system, for example, you can purchase a controller that directly
Home Theater Control Systems

interfaces via AXlink with LUTRON and RADIA lighting control systems. AMX also offers a series of modules that directly connect to incandescent, fluorescent and low voltage lighting systems.

If you have a front projection system with a motorized electric screen, the control of the screen is also an option to consider. This can be accomplished several ways. The first is to simply trigger the screen from a relay connected to the video projector; when the projector turns on, the screen drops down. But there are times that you may want the screen down and not watch video, such as using a slide projector. In cases like this you want to control the screen separately. Here’s how: for IR-based controllers many of the screen manufacturers offer IR control modules. These modules are reasonable priced and often mount right on the screen housing. More elaborate control systems with MSU modules generally offer interfaces you can use. Crestron, for example, offers a series of relay interface cards designed specifically to control video projection screen motors. Got the picture? Other things you may want to consider controlling are motorized blinds, ceiling fans, projector lifts, screen curtains, room temperature, video cameras, etc. Almost anything is possible with the right equipment and proper programming.

Who To Call:

AMX Corporation, 11995 Forestgate Drive, Dallas, TX 75243  800-222-0193

Crestron Electronics, Inc., 101 Broadway, PO Box 394, Cresskill, NJ 07626  800-237-2041

Interface Controls Inc., 250 Shields Court, Markham, Ontario, Canada L3R9W7  905-477-1049

Kenwood USA Corp., PO Box 22745, Long Beach, CA  90801

Lexicon, Inc., 3 Oak Park, Bedford, MA01730  617-280-0300

Marantz America, Inc., 440 Medinah Road, Roselle, IL 60172  708-307-3100

Niles Audio Corporation, Inc., 12331 SW 130 Street, Miami, FL 33186  800-289-4434
Want to automate your home theater but don’t want to dump four figures into the control system? If you answered yes, then Wall Mounted Infrared Learning Keypads (ILK) are an option to consider.

How ILKs work

ILKs operate on the same principle as traditional infrared (IR) remote controls. Here’s what happens when you use one: Instead of pushing a button on a handheld remote, you use a wall mounted keypad that is connected to an IR sender. When you push the keypad “on” command, the digital pulse travels down a wire buried in the wall to an infrared sender, which then flashes the stereo receiver. The diagram below illustrates this chain of events. The elegance of the ILK system is its simplicity. You can use common stereo components and you can hide them in cabinets.

Who makes them

One of the pioneers of architectural audio, Niles Audio offers an ILK called the Intellipad that is not only stylish but highly flexible and easy to install. It retails for $350 and comes with an installation and operation guide, and a complete installation kit.

Xantech, a California-based architectural products company, offers the Smart Pad 2 modular keypad system. This second generation version of Xantech’s original Smart Pad, works with virtually any combination of audio/video equipment. The basic Smart Pad 2 retails for $150 to $300 depending on specific plug-in modules needed for your system.

Located in Newmarket, N.H., Russound also offers an ILK product. Its model 1582 Learning Keypad is similar to the original Xantech SmartPad and interfaces with a variety of other Russound products. the type of audio components you have.

How they can be used to control home theaters

On the next page we show a Niles Intellipad used to control a typical home theater. As we explained before, these are simple devices conceptually. On the next page this concept is explained diagrammatically.

Who To Call:

NILES Audio Corporation, 12331 SW 130 St., Miami, FL 33186 305-238-4373
XANTECH Corporation, 12950 Bradley Ave., Sylmar, CA 91342 818-362-9506
RUSSOUND/FMP, Inc, 5 Forbes Road., Newmarket Industrial Park, Newmarket, NH 03857 603-659-5388
Home Theater Control Systems

A Home Theater Controlled By A Niles Intellipad
Physical Installation of the Niles Intellipad

1) Install the duplex box

2) Tighten the securing tabs

3) Place the Intellipad in the Duplex box

4) Put on the Decora face plate

5) Mount the infrared flasher near the audio equipment
X-10 is a language whereby commands, like “turn light on”, are sent to electronic devices over standard electrical wiring in a home. Since you already have plenty of the right wiring running through your walls, you can achieve complete automation without the mess and expense of rewiring.

Each device on your X-10 network resides at a specified “address” of your choosing. A command can tell a single device (a lamp, for instance) or group of appliances (a lamp and the coffee maker) to switch on or off. Managing the signals traveling through your wiring network are controllers and modules, the core components of any X-10-based home control system.

**X-10 Controllers**

The controller, which comes in a variety of flavors from many manufacturers including the developer of X-10 technology, X-10 (USA), places commands on the powerline. Languages like X-10 are commonly called powerline carrier, or PLC, technologies. When you see “PLC,” you know you won’t have to add additional wiring for home theater automation. One of the most basic controllers on the market is the X-10 Mini-Controller, a table-top unit that accommodates up to four separate device codes. Several devices can be set to the same address code, so the unit can actually control more than four devices.

The Mini-Controller features on, off, dim, all lights on, and all units off controls. For activating more lights or devices, the X-10 Maxi-Controller controls as many as 16 addresses, but otherwise has the same features as the Mini-Controller.

**X-10 Modules**

Plug your A/V equipment into an X-10 compatible module, then plug the module into an ordinary AC outlet. Voila, you’ve just added automation to your home theater.

There are a variety of modules available to suit various devices in your home theater. Regardless of the module type, each device gets its own address, which you set with a screwdriver on the X-10 module. Multiple devices can share the same address if they’re all supposed to be operated together. For instance, two lamps in your bedroom might share the same address.

Addresses are easy to set: Choose a specific “House” code (A-P) and “Unit” code (1-16), for a total of 256 possible addresses. Alighting in the den might be set to A1. Your drapes might be G15. Each pushbutton on a controller is set up to correspond with the addresses you’ve assigned to your appliances. When the module hears its command code, it “wakes up” and listens next for a function command like on or off, or dim or brighten. (Some controllers also include an all units on command and all units off command.) Thus, if that den light is A1, it will awaken when A1 is pressed and turn on when the on button is pressed.

**Getting Elaborate**

Building on this basic configuration of controller and module you can get as elaborate as you want with home theater control. Several controllers and modules can be combined to max out the 256 addresses. Pressing button A1 then on using a controller in the living room could, for

---

**What it will cost you:**

<table>
<thead>
<tr>
<th>Module Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-10 Appliance Module (AM486)</td>
<td>$15.99</td>
</tr>
<tr>
<td>X-10 3-Prong Appliance Module (AM466)</td>
<td>$16.99</td>
</tr>
<tr>
<td>X-10 220-V Appliance Module (HD243)</td>
<td>$26.50</td>
</tr>
<tr>
<td>X-10 In-Wall Receptacle (SR227)</td>
<td>$21.95</td>
</tr>
<tr>
<td>X-10 Lamp Module (LM465)</td>
<td>$15.99</td>
</tr>
<tr>
<td>X-10 Maxi-Controller (SC503)</td>
<td>$26.50</td>
</tr>
<tr>
<td>X-10 Mini-Controller (MC460)</td>
<td>$13.75</td>
</tr>
<tr>
<td>X-10 Mini-Timer (MT522)</td>
<td>$31.99</td>
</tr>
<tr>
<td>Stanley Power Timer (370-2552)</td>
<td>$35.99</td>
</tr>
<tr>
<td>X-10 Remote Chime Module (SC546)</td>
<td>$26.50</td>
</tr>
<tr>
<td>X-10 Sundowner (SD533)</td>
<td>$21.25</td>
</tr>
<tr>
<td>X-10 Wireless Controller (RC5000)</td>
<td>$52.99</td>
</tr>
<tr>
<td>X-10 Powerflash Interface (PF284)</td>
<td>$29.99</td>
</tr>
<tr>
<td>X-10 Two-Way Interface (TW523)</td>
<td>$29.99</td>
</tr>
<tr>
<td>X-10 PC Interface (CP29)</td>
<td>$69.99</td>
</tr>
<tr>
<td>Home Intelligence Corp. Program Module</td>
<td>$119</td>
</tr>
<tr>
<td>IR Interface</td>
<td>$30-$300</td>
</tr>
<tr>
<td>Telephone Interfaces</td>
<td>$80+</td>
</tr>
</tbody>
</table>
instance, dim a set of lamps to create a movie viewing atmosphere, while pressing B2 could activate the coffee maker.

**Timers.** True automation, in which devices operate without any help from you, requires a slightly smarter controller like the X-10 Mini-Timer or the X-10 Sundowner. These devices are just as easy to install—just plug them into an AC outlet—but transmit commands automatically. The Mini-Timer lets you program on and off times for modules set to a single house code. A similar unit, the Power Timer, available from Stanley, adds an illuminated all lights on button.

**PC Control.** Maximum flexibility is achieved through a computer and software that let you create elaborate automation scenarios from an ordinary household PC (Mac versions are also available). X-10’s CP-290 interface and numerous spin-offs are available for the task. The interface plugs into the serial port of a computer. Unlike the standard fare of X-10 controllers, which can only control one set of house codes at a time, a PC-based system can operate modules of multiple house codes simultaneously. So, in addition to the A1 lights, it can activate other devices.

This capability can also be achieved with the new Program Module from Home Intelligence Corp., which allows basic controllers like the Mini-Controller to communicate with multiple house and unit codes simultaneously.

In its basic configuration, an X-10 based home control system can only transmit commands, not receive them. Thus, a controller can send out a signal to turn the lamp on, but turning the lamp on manually can’t send any kind of message to the controller.

The TW-523 interface, when connected to an X-10 home control interface, gives your system limited “two-way” capability. With this capability, pushing a button on a Mini-Controller, for example, could activate the dinner scene you have programmed into the PC. The PC system in turns sends out the dinner scene commands—like kitchen lights on, playroom lights off.

**Non-X-10 interfaces.** With the addition of other interfaces you can make your X-10 system communicate with non-X-10 devices like the stereo, security systems, and thermostats. The PF284 Powerflash module enables an X-10 system to receive and react to “relay” signals from a hardwired security system or doorbell. For instance, when a security system trips, the connected PF284 (or Leviton 6326) could activate flashing X-10 lights.

IR interfaces are also available that add infrared control of TVs, VCRs, and stereo gear to automation scenarios. These interfaces include the IR Xpander from JDS, HomeVision from Worthington Distribution, IR Master from Dancraft, IR Mini from X-10, and Universal IR Controller from Compco Engineering.

**Get Started**

The X-10 concept is easy to follow and opens up wonderful opportunities to automate many functions of the home yourself. Start small and as you become more familiar with the technology, you can add new components and experiment with new programs—all without the expense or hassles of routing new wiring throughout the home.
Home Theater Automation Using IIabs’ AutoStrip

[Diagram of Home Theater Control Systems with AutoStrip and IIAB modules connected to various devices like DVD/CD Player, Power Amplifier, AV Processor, and VCR]