PCM 91

Digital Reverberator

User Guide

lexicon

H A Harman International Company

UNPACKING AND INSPECTION

After unpacking the PCM 91, save all packing materials in case you ever need to ship the unit. Thoroughly inspect the PCM 91 and packing materials for signs of damage. Report any shipment damage to the carrier at once; report equipment malfunction to your dealer.

PRECAUTIONS

Save these instructions for later use.

Follow all instructions and warnings marked on the unit.

Always use with the correct line voltage. Refer to the manufacturer's operating instructions for power requirements. Be advised that different operating voltages may require the use of a different line cord and/or attachment plug.

Do not install the unit in an unventilated rack, or directly above heat producing equipment such as power amplifiers. Observe the maximum ambient operating temperature listed in the product specification.

Slots and openings on the case are provided for ventilation; to ensure reliable operation and prevent it from overheating, these openings must not be blocked or covered. Never push objects of any kind through any of the ventilation slots. Never spill a liquid of any kind on the unit.

This product is equipped with a 3-wire grounding type plug. This is a safety feature and should not be defeated.

Never attach audio power amplifier outputs directly to any of the unit's connectors.

To prevent shock or fire hazard, do not expose the unit to rain or moisture, or operate it where it will be exposed to water.

Do not attempt to operate the unit if it has been dropped, damaged, exposed to liquids, or if it exhibits a distinct change in performance indicating the need for service.

This unit should only be opened by qualified service personnel. Removing covers will expose you to hazardous voltages.

This triangle, which appears on your compo
alerts you to the presence of uninsulat
dangerous voltage inside the enclosure
voltage that may be sufficient to
constitute a risk of shock

CAUTION

RISK OF ELECTRIC SH
DO NOT OPEN
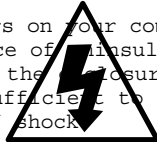
This triangle, which appears on your component,
alerts you to important operating and
maintenance instructions in this
accompanying literature.

NOTICE

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Part 15 of FCC Rules, which are designated to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna

Relocate the computer with respect to the receiver

Move the computer away from the receiver

Plug the computer into a different outlet so that the computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to identify and Resolve Radio/TV Interference Problems."

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Introduction

Section 1: Getting Started

Section 2: Basic Operation

Section 2: Basic Operation (continued)

Section 3: Algorithms and Parameters

Section 4: Presets

DANSK
VIGTIG INFORMATION OM SIKKERHED

DK **DK**

Gem denne vejledning til senere brug.

Følg alle anvisninger og advarsler på apparatet.

Apparatet skal altid tilsluttes den korrekte spænding. Der henvises til brugsanvisningen, der indeholder specifikationer for strømforsyning. Der gøres opmærksom på, at ved varierende driftsspændinger kan det blive nødvendigt at bruge andre lednings- og/eller stiktyper.

Apparatet må ikke monteres i et kabinet uden ventilation eller lige over andet udstyr, der udvikler varme, f.eks. forstærkere. Den maksimale omgivelsestemperatur ved drift, der står opført i specifikationerne, skal overholdes.

Der er ventilationsåbninger i kabinettet. For at sikre apparatets drift og hindre overophedning må disse åbninger ikke blokeres eller tildækkes. Stik aldrig noget ind igennem ventilationsåbningerne, og pas på aldrig at spilde nogen form for væske på apparatet.

Dette apparat er forsynet med et stik med jordforbindelse. Denne sikkerhedsforanstaltning må aldrig omgås.

Udgangsstik fra audioforstærkere må aldrig sættes direkte i apparatet.

Apparatet må ikke udsættes for regn eller fugt og må ikke bruges i nærheden af vand for at undgå risiko for elektrisk stød og brand.

Apparatet må aldrig bruges, hvis det er blevet stødt, beskadiget eller vådt, eller hvis ændringer i ydelsen tyder på, at det trænger til eftersyn.

Dette apparat må kun åbnes af fagfolk. Hvis dækslet tages af, udsættes man for livsfarlig højspænding.

Denne mærkat på komponenten advarer om uisoleret, farlig spænding i apparatet ... høj nok til at give elektrisk stød.

Denne mærkat på komponenten advarer om vigtig drifts- og vedligeholdsinformation i den tilhørende litteratur.

SUOMI
TÄRKEITÄ TURVALLISUUSOHJEITA

FI **FI**

Säilytä nämä ohjeet tulevaa käyttöä varten.

Seuraa kaikkia yksikköön merkittyjä ohjeita ja varoituksia.

Käytä aina oikeaa verkkojännitettä. Tehovaatimukset selviävät valmistajan käyttöohjeista. Huomaa, että eri käyttöjännitteet saattavat vaatia toisenlaisen verkkojohdon ja/tai -pistokkeen käytön.

Älä asenna yksikköä telineeseen jossa ei ole tuuletusta, tai välittömästi lämpöä tuottavien laitteiden, esim. tehovahvistimien, yläpuolelle. Ympäristön lämpötila käytössä ei saa ylittää tuotespesifikaation maksimilämpötilaa.

Kotelo on varustettu tuuletusreiillä ja -aukoilla. Luotettavan toiminnan varmistamiseksi ja ylilämpenemisen välttämiseksi näitä aukkoja ei saa sulkea tai peittää. Mitään esineitä ei saa työntää tuuletusaukkoihin. Mitään nesteitä ei saa kaataa yksikköön.

Tuote on varustettu 3-johtimisella maadoitetulla verkkopistokkeella. Tämä on turvallisuustoiminne eikä sitä saa poistaa.

Älä kytke audiotehovahvistimen lähtöjä suoraan mihinkään yksikön liittimeen.

Sähköiskun ja palovaaran välttämiseksi yksikkö ei saa olla sateessa tai kosteassa, eikä sitä saa käyttää märässä ympäristössä.

Älä käytä yksikköä jos se on pudonnut, vaurioitunut, kostunut, tai jos sen suorituskyky on huomattavasti muuttunut, mikä vaatii huoltoa.

Yksikön saa avata vain laitteeseen perehtynyt huoltohenkilö. Kansien poisto altistaa sinut vaarallisille jännitteille.

Tämä kolmio, joka esiintyy komponentissasi, varoittaa sinua eristämättömän vaarallisen jännitteen esiintymisestä yksikön sisällä. Tämä jännite saattaa olla riittävän korkea aiheuttamaan sähköiskuvaaran.

Tämä kolmio, joka esiintyy komponentissasi, kertoo sinulle, että tässä tuotedokumentoinnissa esiintyy tärkeitä käyttö- ja ylläpito-ohjeita.

NO NORSK NO
VIKTIG INFORMASJON OM SIKKERHET

Ta vare på denne veiledningen for senere bruk.

Følg alle anvisningene og advarslene som er angitt på apparatet.

Apparatet skal alltid anvendes med korrekt spenning. Produktbeskrivelsen inneholder spesifikasjoner for strømkrav. Vær oppmerksom på at det ved ulike driftsspenninger kan være nødvendig å bruke en annen ledning- og/eller støpseltype.

Apparatet skal ikke monteres i skap uten ventilasjon, eller direkte over varmeproduserende utstyr, som for eksempel kraftforsterkere. Den maksimale romtemperaturen som står oppgitt i produktbeskrivelsen, skal overholdes.

Apparatet er utstyrt med ventilasjonsåpninger. For at apparatet skal være pålitelig i bruk og ikke overopphetes, må disse åpningene ikke blokkeres eller tildekkes. Stikk aldri noe inn i ventilasjonsåpningene, og pass på at det aldri søles noen form for væske på apparatet.

Dette apparatet er utstyrt med et jordet støpsel. Dette er en sikkerhetsforanstaltning som ikke må forandres.

Utgangsplugger fra audioforsterkere skal aldri koples direkte til apparatet.

Unngå brannfare og elektrisk støt ved å sørge for at apparatet ikke utsettes for regn eller fuktighet og ikke anvendes i nærheten av vann.

Apparatet skal ikke brukes hvis det har blitt utsatt for støt, er skadet eller blitt vått, eller hvis endringer i ytelsen tyder på at det trenger service.

Dette apparatet skal kun åpnes av fagfolk. Hvis dekselet fjernes, utsettes man for livsfarlig høyspenning.

Komponenten er merket med denne trekanten, som er en advarsel om at det finnes uisolert, farlig spenning inne i kabinettet ... høy nok til å utgjøre en fare for elektrisk støt.

Komponenten er merket med denne trekanten, som betyr at den tilhørende litteraturen inneholder viktige opplysninger om drift og vedlikehold.

SE SVENSKA SE
VIKTIGA SÄKERHETSFÖRESKRIFTER

Spara dessa föreskrifter för framtida bruk.

Följ alla anvisningar och varningar som anges på enheten.

Använd alltid rätt nätspänning. Se tillverkarens bruksanvisningar för information om effektkrav. Märkväl, att andra matningsspänningar eventuellt kräver att en annan typs nätsladd och/eller kontakt används.

Installera inte enheten i ett oventilerat stativ, eller direkt ovanför utrustningar som avger värme, t ex effektförstärkare. Se till att omgivningens temperatur vid drift inte överskrider det angivna värdet i produktspecifikationen.

Behållaren är försedd med hål och öppningar för ventilering. För att garantera tillförlitlig funktion och förhindra överhettning får dessa öppningar inte blockeras eller täckas. Inga föremål får skuffas in genom ventilationshålen. Inga vätskor får spillas på enheten.

Produkten är försedd med en jordad 3-trådskontakt. Detta är en säkerhetsfunktion som inte får tas ur bruk.

Anslut aldrig audioeffektförstärkarutgångar direkt till någon av enhetens kontakter.

För att undvika elstöt eller brandfara får enheten inte utsättas för regn eller fukt, eller användas på ställen där den blir våt.

Använd inte enheten om den har fallit i golvet, skadats, blivit våt, eller om dess prestanda förändrats märkbart, vilket kräver service.

Enheten får öppnas endast av behörig servicepersonal. Farliga spänningar blir tillgängliga när locken tas bort.

Denna triangel, som visas på din komponent, varnar dig om en oisolerad farlig spänning inne i enheten. Denna spänning är eventuellt så hög att fara för elstöt föreligger.

Denna triangel, som visas på din komponent, anger att viktiga bruksanvisningar och serviceanvisningar ingår i dokumentationen i fråga.

DE   DEUTSCH   DE
WICHTIGE SICHERHEITSANWEISUNGEN

Heben Sie sich diese Sicherheitsanweisungen auch für später auf.

Befolgen Sie alle auf der Vorrichtung stehenden Anweisungen und Warnungen.

Immer nur mit der richtigen Spannung verwenden! Die ebrauchsanweisungen des Herstellers informieren Sie über die elektrischen Anforderungen. Vergessen Sie nicht daß bei verschiedenen Betriebsspannungen ggf. auch verschiedene Leitungskabel und/oder Verbindungsstecker zu verwenden sind.

Stellen Sie die Vorrichtung nicht in ein unbelüftetes Gestell oder unmittelbar über wärmeerzeugende Geräte wie z.B. Tonverstärker. Halten Sie die in den Produktspezifikationen angegebene maximale Umgebungstemperatur bei Betrieb ein.

Schlitze und Öffnungen im Gehäuse dienen der Belüfung; um verläßlichen Betrieb sicherzustellen und Überheizen zu vermeiden dürfen diese Öffnungen nich verstopft oder abgedeckt werden. Stecken Sie nie irgend einen Gegenstand durch die Belüftungsschlitze. Vergießen Sie keine Flüssigkeiten auf den Apparat.

Dieses Produkt is mit einem 3-drahtigen Erdungsstecker ausgerüstet. Diese Sicherheitsmaßnahme darf nicht unwirksam gemacht werden.

Schließen Sie nie Tonverstärker unmittelbar an einen Anschluß des Apparates an.

Um elektrischen Schlag oder Feuer zu vermeiden, setzen Sie den Apparat weder Regen noch Feuchtigkeit aus und betreiben Sie ihn nicht dort wo Wasser eindringen könnte.

Versuchen Sie nicht den Apparat zu betreiben falls er fallen gelassen, beschädigt, oder Flüssigkeiten ausgesetzt wurde, oder falls sich seine Arbeitsweise derart ändert daß daraus ein Bedarf nach Raparatur zu schließen ist.

Dieser Apparat sollte nur von qualifizierten Fachleuten geöffnet werden. Das Abnehmen von Abdeckungen setzt Sie gefährlichen Spannungen aus.

Dieses Dreieck auf Ihrem Apparat warnt Sie vor nicht-isolierter, gefährlicher Spannung im Gehäuse ... stark genug um eine Berührungsgefahr darzustellen.

Dieses Dreieck auf Ihrem Apparat bedeutet daß wichtige Betriebs- und Wartungsanweisungen in der mitgelieferten Dokumentation zu finden sind.

ES   ESPAÑOL   ES
INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Guarde esta instrucciones para uso posterior.

Utilice siempre el voltaje correcto. Diríjase a las instrucciones de operación del fabricante para obtener las especificaciones de potencia. Esté al tanto de que voltajes de operación distintos requieren el uso de cables y/o enchufes distintos.

No instale esta unidad en un estante sin ventilación, ni tampoco directamente encima de equipos que generen calor tales como amplificadores de potencia. Fíjese en las temperaturas ambientales máximas de operación que se mencionan en las especificaciones del producto.

Las aperturas y ranuras del chasis sirven para proveer la ventilación necesaria para operar la unidad con seguridad y para prevenir sobrecalentamiento, y por lo tanto no pueden ser obstruidas o cubiertas. No introduzca objetos de ningún tipo a través de las ranuras de ventilación, y nunca deje caer ningún líquido sobre la unidad.

Este producto está equipado con un enchufe de 3 clavijas con conexión a tierra. Éste es un elemento de seguridad que no debe ser eliminado.

Nunca conecte ningún tipo de salida de amplificadores de sonido directamente a los conectores de la unidad.

Para prevenir descargas eléctricas o incendios, mantenga la unidad alejada de la lluvia, humedad o cualquier lugar en el que pueda entrar en contacto con agua.

No trate de hacer funcionar la unidad si se ha caído, está dañada, ha entrado en contacto con líquidos, o si nota cualquier cambio brusco en su funcionamiento que indique la necesidad de hacerle un servicio de mantenimiento.

Esta unidad deberá ser abierta únicamente por personal calificado. Si usted quita las coberturas se expondrá a voltajes peligrosos.

Este triángulo que aparece en su componente le advierte sobre la existencia dentro del chasis de voltajes peligrosos sin aislantes ... voltajes que son lo suficientemente grandes como para causar electrocución.

Este triángulo que aparece en su componente lo alerta sobre las instrucciones de operación y mantenimiento importantes que están en los materiales de lectura que se incluyen.

FR FRANÇAIS FR
INSTRUCTIONS DE SÛRETÉ IMPORTANTES

Gardez ces instructions pour réference future.

Observez toutes les instructions et tous les avertissements marqués sur l'appareil.

Branchez uniquements sur un réseau de tension indiquée. Consultez le manuel d'instruction du fabriquant pour les spécifications de courant. N'oubliez pas que différentes tensions peuvent nécessiter l'utilisation de cables et/ou de fiches de connexion différents.

N'installez pas l'appareil en un compartiment non-aéré ou directement au-dessus d'équipements générateurs de chaleur, tels qu'amplificateurs de courants, etc. Ne dépassez pas la température ambiante maximale de fonctionnement indiquée dans les spécifications du produit.

Des fentes et ouvertures sont prévues dans le boîtier pour l'aération; Pour assurer le bon fonctionnement et pour prévenir l'échauffement, ces ouvertures ne doivent pas être couvertes ou bloquées. N'insérez pas d'objets dans les fentes d'aération. Empêchez tout liquide de se répandre sur l'appareil.

Ce produit est muni d'une fiche à trois fils pour la mise à terre. Ceci est une mesure de sécurité et ne doit pas être contrariée.

Ne connectez jamais d'amplificateurs audio directement aux connecteurs de l'appareil.

Pour empêcher les chocs électriques et le danger d'incendie, évitez d'exposer l'appareil à la pluie ou à l'humidité, et ne le mettez pas en marche en un endroit où il serait exposé aux éclaboussures d'eau.

N'essayez pas de faire fonctionner l'appareil s'il est tombé à terre, a été endommangé, exposé à un liquide, ou si vous observez des différences nettes dans son fonctionnement, indiquant la nécessité de réparations.

Cet appareil ne doit être ouvert que par un personnel de service qualifié. En enlevant les couvercles vous vous exposez à des tensions électriques dangereuses.

⚡ Ce triangle, sur votre appareil vous avertit de la présence de tension dangereuse, non-isolée à l'intérieur du boîtier...une tension suffisante pour représenter un danger d'électrocution.

⚠ Ce triangle sur sur votre appareil vous invite de suivre d'importantes instructions d'utilisation et d'entretien dans la documentation livrée avec le produit.

IT ITALIANO IT
IMPORTANTI NORME DI SICUREZZA

Conservare le presenti norme per l'utilizzo futuro.

Osservare tutte le istruzioni e le avvertenze apposte sull'unità.

Utilizzare esclusivamente con la tensione di rete corretta. Consultare le istruzioni operative fornite dal fabbricante per i dati riguardanti la tensione e l'assorbimento di corrente. Potrebbe essere necessario l'uso di cavi di rete e/o di spine diverse a seconda della tensione utilizzata.

Non installare l'unità in uno scaffale privo di ventilazione oppure direttamente sopra una fonte di calore, come, ad esempio, un amplificatore. Non superare la temperatura ambientale massima di funzionamento riportata nei dati tecnici del prodotto.

Le fessure e le altre aperture nella scatola servono alla ventilazione. Per un funzionamento affidabile, e per evitare un eventuale surriscaldamento, queste aperture non vanno ostruite o coperte in nessun modo. Evitare in tutti i casi di inserire oggetti di qualsiasi genere attraverso le fessure di ventilazione. Non versare mai del liquido di nessun tipo sull'unità.

Questo prodotto viene fornito con una spina a 3 fili con massa. Tale dispositivo di sicurezza non va eliminato.

Evitare sempre di collegare le uscite dell'amplificatore audio direttamente ai connettori dell'unità.

Per prevenire il pericolo di folgorazione e di incendio non esporre l'unità alla pioggia o ad un'umidità eccessiva; evitare di adoperare l'unità dove potrebbe entrare in contatto con acqua.

Evitare di adoperare l'unità se la stessa è stata urtata violentemente, se ha subito un danno, se è stata esposta ad un liquido o in caso di un evidente cambiamento delle prestazioni che indichi la necessità di un intervento di assistenza tecnica.

Ogni intervento sull'unità va eseguito esclusivamente da personale qualificato. La rimozione della copertura comporta l'esposizione al pericolo di folgorazione.

⚡ Il presente triangolo impresso sul componente avverte della presenza di tensioni pericolose non isolate all'interno della copertura... tali tensioni rappresentano un pericolo di folgorazione

⚠ Il presente triangolo impresso sul componente avverte l'utente della presenza nella documentazione allegata di importanti istruzioni relative al funzionamento ed alla manutenzione.

1

Getting Started

ABOUT THE PCM 91

Thank you for your purchase of the PCM 91 Digital Reverberator. The PCM 91 gives you Lexicon's renowned high-end reverb effects with a powerful new interface that provides easy access to superbly crafted presets as well as a wealth of programming capabilities for the sound designer.

THE PRESETS

The PCM 91 contains a built-in library of 450 reverb effects that simulate realistic halls, rooms and plates, and let you create completely natural, or other-worldly spaces. The presets are organized into 9 Banks of 50, and are functionally grouped for different applications. Be sure to experiment with all 450 presets to get a feel for the full range of PCM 91 capabilities.

Bank P0 Halls		**Bank P1 Rooms**		**Bank P2 Plates**	
0.0-0.9	Orchestral	0.0-0.9	Instrument	0.0-0.9	Instrument
1.0-1.9	Vocal	1.0-1.9	Vocal	1.0-1.9	Vocal
2.0-2.9	Live Sound	2.0-2.9	Live Sound	2.0-2.9	Live Sound
3.0-3.9	Instrument	3.0-3.9	Drums&Perc	3.0-3.9	Drums&Perc
4.0-4.9	Custom	4.0-4.9	Custom	4.0-4.9	Custom

Bank P3 Post		**Bank P4 Splits**		**Bank P5 Studio**	
0.0-0.9	Indoor Small	0.0-0.9	Mono	0.0-0.9	Environments
1.0-1.9	Indoor Large	1.0-1.9	Stereo	1.0-1.9	Instruments
2.0-2.9	Outdoor	2.0-2.9	Live Sound	2.0-2.9	Vocal
3.0-3.9	Spatial	3.0-3.9	Instrument	3.0-3.9	Drums/Perc
4.0-4.9	Custom	4.0-4.9	Custom	4.0-4.9	Custom

Bank P6 Live		**Bank P7 Post**		**Bank P8 Surround**	
0.0-0.9	Acoustic	0.0-0.9	Small Spaces	0.0-0.9	Small Spaces
1.0-1.9	Electric	1.0-1.9	Med Spaces	1.0-1.9	Large Spaces
2.0-2.9	Vocal	2.0-2.9	Large Spaces	2.0-2.9	Unnatural FX
3.0-3.9	Drums/Perc	3.0-3.9	Cool Places	3.0-3.9	Custom
4.0-4.9	Custom	4.0-4.9	Custom	4.0-4.9	"Clean Slate"

PROGRAM SORTING

A program sorting function allows you to tag programs with KeyWords and display only programs which have been tagged. (Press Program Banks or Register Banks repeatedly to step through all available banks and then to the KeyWord display.) The default KeyWord selection, A to Z, allows you to view all of the presets in alphabetical order. Others allow you to view, for example, only Acoustic or Spatial effects. Each preset has already been assigned from 1 to 4 KeyWords — you can easily change these assignments in Edit mode. The selection of the KeyWord you want to use for sorting is accessed in Control mode.

SOFT CONTROL

Each preset has one or more of its parameters patched to the front panel ADJUST knob, giving you instant control over the primary aspect of the effect — without going into Edit mode.

As many as four additional Custom Controls can be created for any effect, allowing you to tailor presets for specific applications. We've created some interesting Custom Controls in the presets, and assigned them descriptive names. You can change both the parameter assignments and the names in Edit mode.

THE ALGORITHMS

The PCM 91 uses 5 stereo algorithms to create different types of reverb effects and 10 Dual Reverb algorithms which offer superb dual reverb and cascade configured stereo effects. Each single algorithm includes an uncompromised stereo reverb effect with selected "tools" for ambience, post-processing, compression/expansion, as well as modulation and patching parameters which are common to each algorithm. Each dual algorithm contains two independent reverb blocks, as well as the full set of modulation and patch features in the single effects.

TEMPO CONTROL

The PCM 91 gives you a unique set of tempo controls.Tempos can be tapped in with the front panel Tap button (or an assigned controller) or "dialed-in", in BPM (beats per minute) on the display. The PCM 91 also lets you generate MIDI clock from your tempo, as well as receive MIDI tempo from an external sequencer or drum machine. In the PCM 91, tempo can control LFO speeds and Time Switch controls, as well as all delay parameters, ensuring that all of your modulations are in tempo with your music. You can even set independent rhythmic values for different parameters within a single program.

Tempo can be set and displayed in either rhythmic value or time values. Many presets have delay times assigned to Tap tempo. Try loading some of these and pressing Tap twice in rhythm to change tempo.

EDITING

An enormous range of editing control is provided for each algorithm, with parameters organized in an edit matrix. In addition to providing this powerful sound design capability, the PCM 91 also allows you to customize these controls for your day-to-day editing needs, or to use a subset of controls specially designed for each preset.

The PCM 91 has two levels of Edit Mode control called Go mode and Pro mode. In Go mode, the most useful parameters within an effect are grouped for instant access via the front panel Edit button. Parameters can even be grouped for control by a single master control. These master parameters, called Custom Controls, can be labeled with names that describe their function. Each preset has a specially selected set of Go mode parameters which let you make value changes to the effect without losing the character of the

sound. Pro mode gives you access to the full parameter editing matrix for the algorithm of any loaded effect when you press Edit. In this mode, you can access a complete set of Modulation and Patching parameters, create your own ADJUST knob patch, create Custom Controls, and assign your own Go mode parameters.

A unique Patching and Modulation system provides unprecedented control over your effects, with a versatile set of internal modulators: two LFOs, AR Envelope, Envelope Follower, Latch and Time Switches, MIDI Delay and Sample and Hold. These allow you to create modulation sweeps which move in time with music, or animated effects. You can create as many as 10 patches per effect, each with as many as 8 pivot points. You can patch multiple parameters to a single controller, or patch multiple sources to a single destination.

USER INTERFACE

For all of its programming power and flexibility, you'll find the PCM 91 simple to use. The large, 2-line fluorescent display is easy to see from any angle whether the surroundings are bright or dark. Separate SELECT and ADJUST knobs make program loading and editing quick and easy. We've even designed in a special Info mode — press and hold any button to find out what its function is, or to get status information such as the name of the running effect, current tempo rate, etc.

To get the most out of the PCM 91, we suggest that you invest the time to explore this manual. We think you'll agree that the time spent investigating will reward you with enjoyment of its full capabilities.

FRONT PANEL OVERVIEW
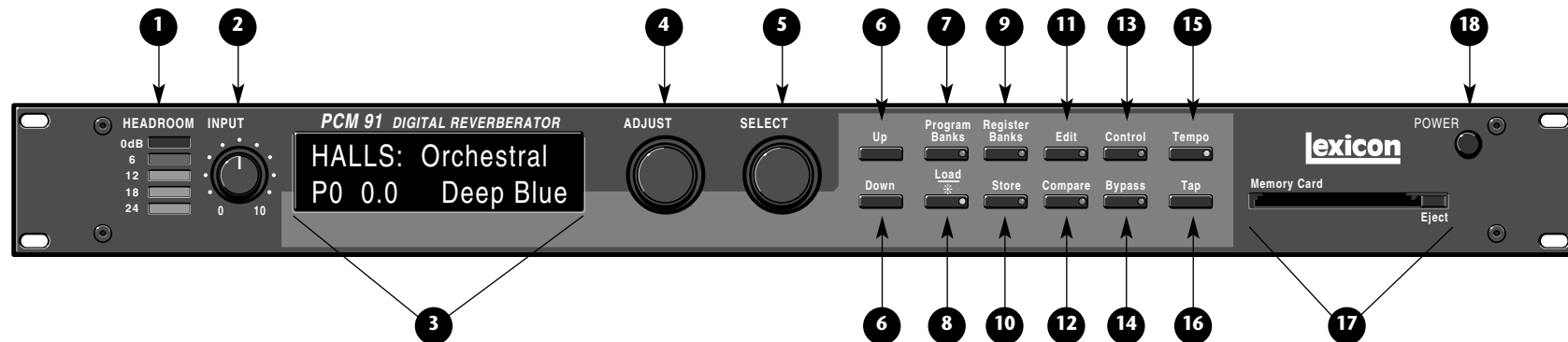
1. Headroom

Five-position indicator for analog and digital signal levels and overload conditions.

2. INPUT

Adjusts analog input level.

3. Display

Two rows of 20 alphanumeric characters display effect names and ID numbers, and parameter names and values.

4. ADJUST

In Edit mode, changes values of parameters chosen with SELECT. With Program Banks or Register Banks selected, behaves as a soft knob for patched parameters.

5. SELECT

Scrolls through presets, registers or parameters. With Program Bank or Register Bank selected, scrolls through the 50 programs in the selected bank, then begins scrolling through the programs in the next bank. With Edit selected, scrolls through matrix parameters.

6. Up/Down

Press to move up and down through program and register banks, or a parameter matrix.

7. Program Banks

Enables selection of factory presets. Press repeatedly to cycle selection of 5 internal preset banks and a KeyWord sorted display. Press and hold to display the name and algorithm of the current program.

8. Load/✳

In Program or Register mode, loads the selected program. In Edit mode, scrolls through any multi-field parameter.

9. Register Banks

Enables selection of user memory. If a RAM card is loaded into the Memory Card slot, each press of this button selects a new register bank. Press and hold to display the name and algorithm of the current program.

10. Store

Initiates register store function.

11. Edit

Enables parameter selection for editing of values.

12. Compare

Active in Program, Register, and Edit modes. Press to compare the active version of the current effect with the most recently stored version.

13. Control

Enables selection of system and global parameters.

14. Bypass

Bypasses or mutes audio, depending on the setting of each program's bypass parameter.

15. Tempo

Press to display tempo rate and to initiate tempo functions. LED flashes in time with current tempo rate.

16. Tap

Sets tempo. Press twice in rhythm to establish tempo rate. Press once to reset LFO.

17. Memory Card

Slot for optional preset ROM or register RAM cards. Press Eject button to remove card.

18. POWER

On/Off.

REAR PANEL OVERVIEW
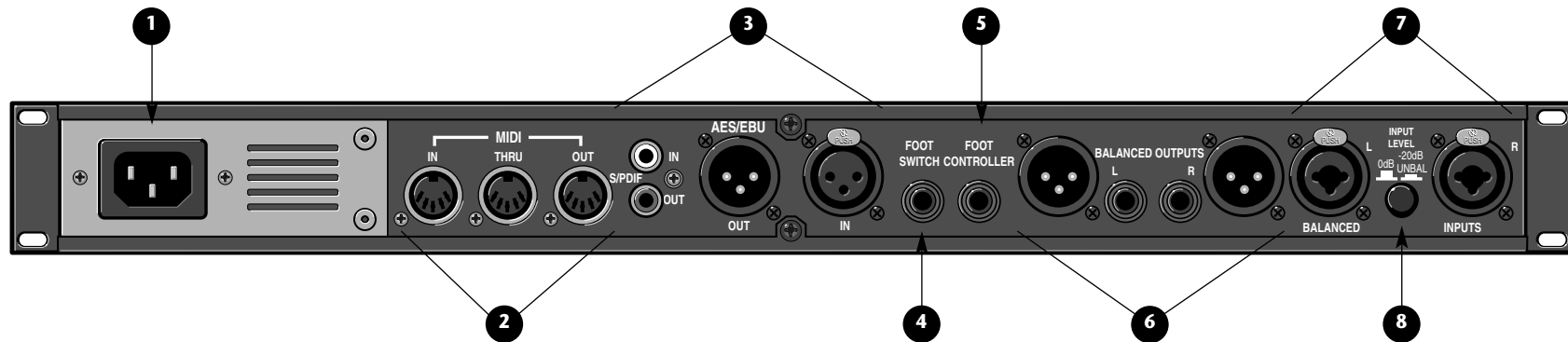
1. AC Power

Standard 3-pin IEC power connector. 100-240V, 50-60Hz automatic switching to correct voltage range.

2. MIDI IN

Receives MIDI information from other MIDI equipment such as master keyboard controllers, MIDI foot controllers, sequencers and synthesizers.

MIDI THRU

Passes received MIDI data without change.

MIDI OUT

Transmits MIDI data to other equipment.

3. AES/EBU and S/PDIF Inputs

AES/EBU format digital connectors conform to AES professional standards. S/PDIF format digital connectors conform to CP-340 Type II and IEC-958 consumer standards. Only one of these options (AES or S/PDIF) may be selected for input.

4. FOOTSWITCH

A 1/4" Tip/Ring/Sleeve phone jack for two independent momentary footswitches.

5. FOOT CONTROLLER

1/4" Tip/Ring/Sleeve phone jack provided for footpedal with 10kΩ to 100Ω impedance.

6. BALANCED OUTPUTS

Output impedance is 105Ω, balanced, and levels up to +18dBu maximum full scale. 1/4" phone connectors and XLRs provided. Both S/PDIF and AES outputs are active at all times.

Balanced I/O

7. BALANCED INPUTS

Combined 3 pole XLR and 1/4" jacks, electronically balanced. Input impedance is 50kΩ unbalanced, and 100kΩ balanced. Inputs accept input levels from -22dBu to +20dBu.

8. INPUT LEVEL

Two-position (In/Out) switch for matching input gain to the source being used. In position adds 20dB of input gain (unbalanced) to the input stages. Out position provides 0dB of gain (balanced).
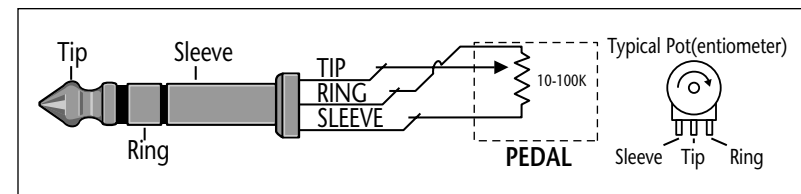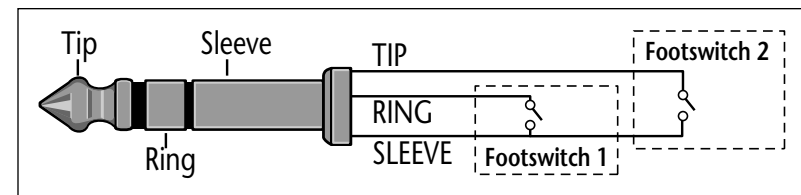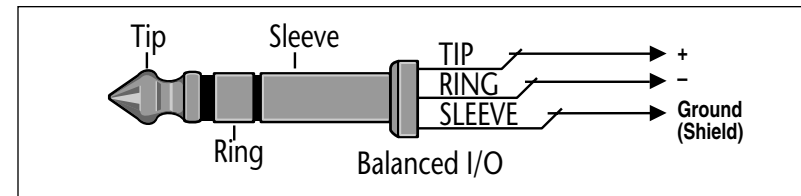
BLOCK DIAGRAM
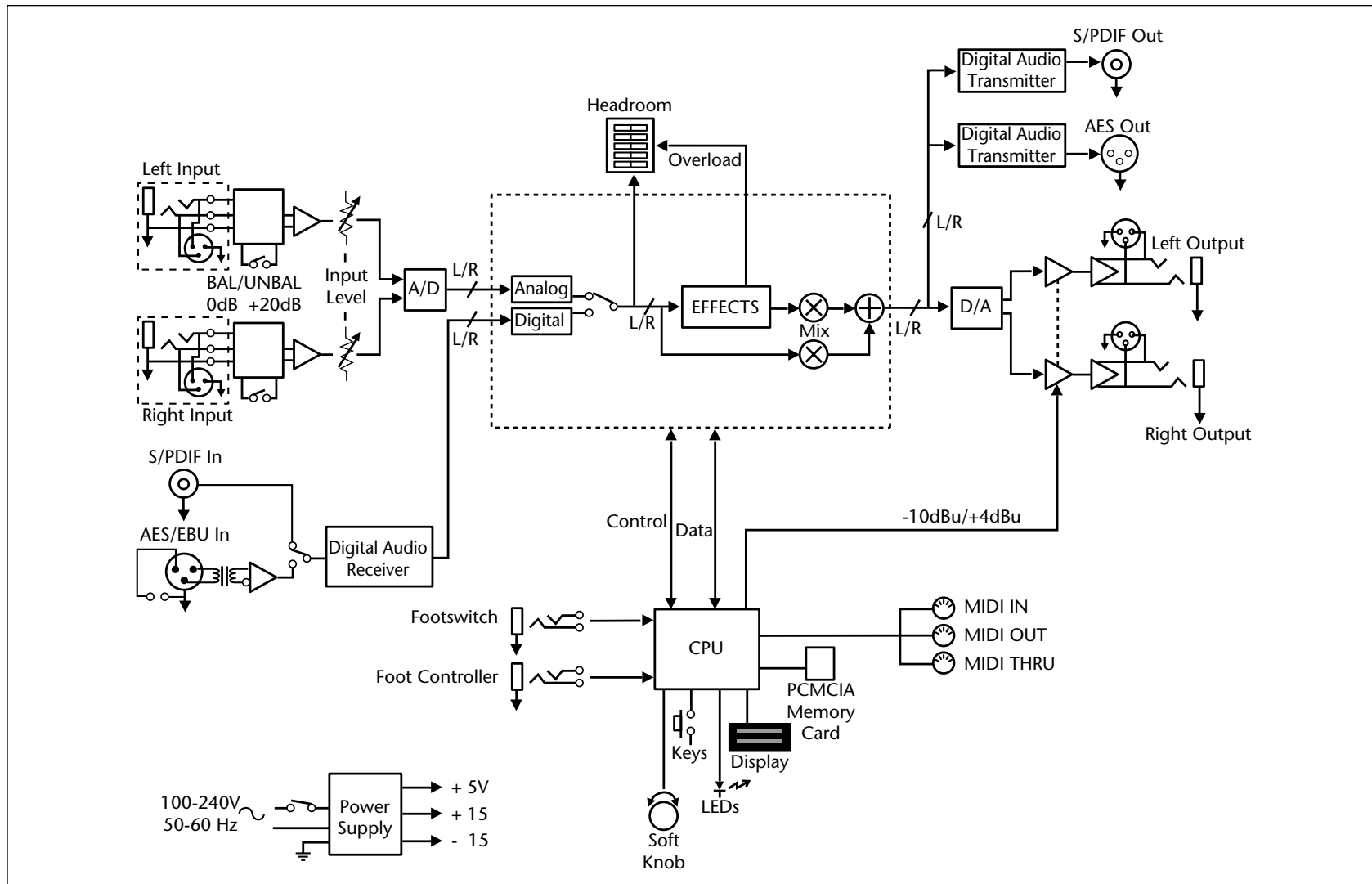
INSTALLATION NOTES

MOUNTING

The PCM 91 uses one EIA-standard rack space, and can be mounted on any level surface or in a standard 19 inch (483 mm) rack. If the PCM 91 is mounted in a rack or road case, support the rear of the chassis to prevent possible damage from mechanical shock and vibration.

The maximum ambient operating temperature is 104°F (40°C). Provide adequate ventilation if the PCM 91 is mounted in a closed rack with heat-producing equipment such as power amplifiers.

POWER REQUIREMENTS

The PCM 91 is equipped with a 3-pin IEC power connector and detachable cord.

The PCM 91 will operate with power sources from 100 to 240 volts AC, 50-60Hz. Power switching to actual line voltage is automatic.

AUDIO CONNECTIONS

Analog Audio

For best performance, maintain balanced connections, and use high-quality, low-capacitance, twisted-shielded pair cable.

When connecting to single-ended, unbalanced devices, connect the low side to signal ground at the unbalanced piece of equipment. Output level does not change when connected to an unbalanced input.

Mono Applications

Use a Y-connector inserted at the analog inputs and outputs to have the signal summed to mono.

Note:

Be careful to keep input and output to all channels wired consistently. Out-of-phase wiring can produce audible effects.

Digital Audio

S/PDIF (CP-340 Type II) Consumer Digital Audio I/O. 75Ω coaxial cable suited for digital audio or video signals is required. Audio grade cable is not suitable. AES/EBU connections require balanced connections using high quality, low capacitance, controlled impedance, data communication, twisted-shielded pair cable. **Microphone cable may introduce a significant amount of jitter into the signal, causing distortion.**

CONTROL CONNECTIONS

Dual Footswitch/Foot Controller

One 1/4 inch T/R/S phone jack is provided for 2 momentary footswitches. Another 1/4 inch T/R/S phone jack is provided for a footpedal (minimum 100Ω to maximum 10kΩ impedance). Normally open or normally closed momentary switches are suitable. At power on, the PCM 91 assumes the switch is off. Use shielded, twisted-pair cable with shield connected to sleeve. See

CONTROL CONNECTIONS *(continued)*

MIDI

Five-pin DIN connectors are provided for MIDI IN, THRU and OUT. Use standard 5-pin DIN MIDI cable assemblies, available from your local dealer.

CONNECTORS

Signal	Mating Connector	Description
L and R Analog Audio Input	XLR A3M	Active balanced, pin 2 high +2dBu min; +20dBu max at 0dB setting
L and R Analog Audio Output	XLR A3F	Active balanced, pin 2 high -2dBu to +18dBu at full scale output
AES/EBU Digital Input	XLR A3M	Balanced RS-422 pin 2 high
AES/EBU Digital Output	XLR A3F	Balanced RS-422 pin 2 high
S/PDIF CP-340 Type II Consumer Digital Audio Input and Output	1/4"	EIAJ Consumer Digital Audio Format tip high
MIDI In MIDI Out MIDI Thru	5-pin DIN	Standard MIDI Interface

Pin 2 high by convention

Male — 2 = high, 3 = low, 1 = ground
Female — 1 = ground, 3 = low, 2 = high
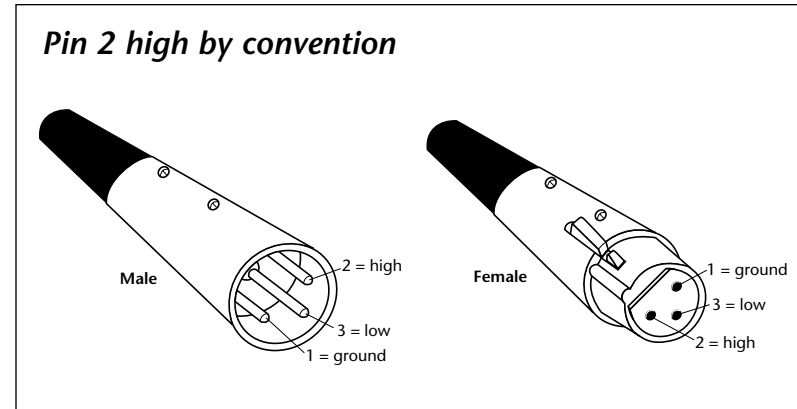
SETTING AUDIO LEVELS

The PCM 91, with both analog and digital input and output connections, requires some attention to proper setting of signal level.

Analog inputs are first gain-conditioned by the rear panel input gain switch, and then by the front panel INPUT knob. Proper setting of both the switch and knob are important for best performance of the A/D converter.

Analog and the selected digital sources are selected in Control mode (0.0 Audio Input Source). The selections are: 44.1, 48, Ext: XLR and Ext: Coax.

Proper setting of Input level on the PCM 91 is dependent on:

- Proper signal level into the analog front end to avoid signals causing overload at the DSP input (rear panel Input Level button),

- Proper adjustment of the signal level into the analog-to-digital converter to optimize noise and avoid overload (front panel INPUT knob),

- Proper setting of signal level into the digital signal processor to optimize noise (InLvl parameter in each algorithm).

Headroom Display

The headroom display provides both headroom and overload information from a variety of measurement points. The meters display analog or digital input data, depending on the selected Audio Input Source (Control mode 0.0).

The chart below illustrates the adjustment range that will set input levels for both balanced and unbalanced operation. When a choice can be made, it is best to operate at the higher amplitude end of the recommended range to optimize noise performance.

	Unbalanced	Balanced
overload:	>+20dBu	>0dBu
acceptable:	+20dBu to -2dBu	0dBu to -22dBu
too low (noisy):	<-2dBu	<-22dBu

Overload

The 0db (overload) indicators will light under the following conditions:

- A/D overload

- Overload at any point in effects processing

- Input level within 1dB of maximum

For example, level buildup from certain reverberation modes can result in overload, even when the input A/D or digital receiver data stream is not at full scale. Such conditions are most often caused by a combination of extreme parameter settings. Adjusting parameter/level settings can eliminate these overload conditions.

Selecting a Digital Input Source

1. Press Control.

2. Press Up or Down until the left-most digit in the lower left-hand corner of the display is 0.

3. Turn SELECT to 0.0 Word Clock, and turn ADJUST to display Ext: XLR or Ext: Coax, depending on the input you are using.

SETTING AUDIO LEVELS *(continued)*

Setting Input Levels

1. Press Control.

2. Press Up or Down until the left-most digit in the lower left-hand corner of the display is 0.

3. Turn SELECT to 0.0 Audio Input Source.

4. Turn ADJUST to select Analog: 48kHz or Analog: 44.1kHz.

5. Adjust the front panel INPUT knob so that program material level peaks cause the headroom display to reach the top of the column without lighting the overload indicators. An occasional large signal peak causing momentary flashing of the overload indicator is acceptable in most instances, but should be validated by listening to the actual result.

6. Turn ADJUST to select Dig:. The display will show any valid digital format which is properly connected to the PCM 91 rear panel digital input.

Setting Analog Output Level

While still in Control mode, turn SELECT to 0.3 Output Level. The Output Level parameter has two range positions. The appropriate position depends on the level handling capability of the device connected to the analog outputs. Devices capable of handling outputs with peak levels of 18dBu require setting Output Level to the +4dBu   setting. Devices which cannot handle peak levels greater than +4dBu require the -10dBu setting.

CONFIGURATIONS

If you will be using a PCM 91 as your primary effects unit, and your system includes a console with one or more auxiliary (effects) sends, connect the PCM 91 as shown at the top of page 1-13. In most applications, it is preferable to connect the PCM 91 outputs to two of the console's input channel strips, panned full left and right, rather than to the effects returns. This allows the greatest flexibility in routing and equalization.

In this configuration the console controls are used to set the amount of effect heard—the PCM 91's MIX control should be set for 100% wet. To assign a global MIX setting:

1. Press Control.

2. Press Up or Down until 1.x is displayed in the lower left of the display and System is displayed on the upper line.

3. Turn SELECT until System Mix Mode is displayed on the upper line. 1.1 will be displayed in the lower left.

4. Turn ADJUST until the lower line reads:

   1.1 ✱ Global

5. Press Load /✱ to show the current global setting of MIX; use ADJUST to set it to 100% wet.

Connecting to a Mixing Console's Effects Sends

Effects Send (R)

Effects Send (L)

Channel Input or
Effects Return (L)

Channel Input or
Effects Return (R)
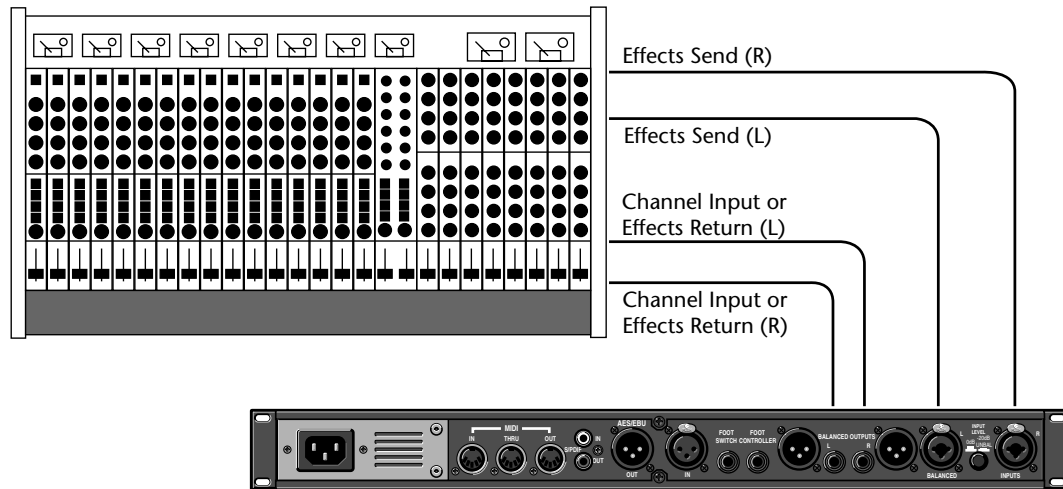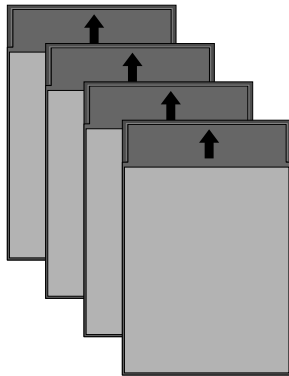
MEMORY CARDS

You can use Memory cards to store as many as 1000 PCM 91 registers (20 banks of 50 — on a 1 Meg card). Registers stored on a properly formatted card will be recognized whenever the card is inserted, and can be accessed via the front panel Register Banks button, exactly as internal registers.

Memory cards can also be used to store "setups" (your system configuration, as set in Control mode). As many as 5 PCM 91 setups can be stored on a card, allowing you to transport not only your effects, but complete PCM 91 environments to another PCM 91. Cards also provide storage for additional program maps and effect chains.

See Control Mode Store and Load functions for details on saving setups on a card and reloading them.

Memory cards must be of the following type:

PCMCIA SRAM Memory Card — 68 pin, Type I

Usable densities:	64 kByte
	128 kByte
	256 kByte
	1 MByte*
Access Time:	250 nsec or faster

* Cards larger than 1MByte can be used, but the PCM 91 will only make use of 1MByte.

Conforms to PCMCIA 2.0/JEDIA 4.1. Can use either 8-bit or 8/16-bit bus configuration. Attribute memory can be present, but is not used.

2

Basic Operation

The PCM 91 provides a wide range of control over an extraordinary set of reverb effects. All of the controls are easily accessed from the front panel and are described in detail in this section.

MODES OF OPERATION

The PCM 91 has five basic modes of operation, each of which is selected by pressing a front panel button (Program Banks, Register Banks, Edit, Control and Tempo). Each of these first four mode buttons has an LED which lights when the mode is active. The Tempo LED (unless you elect to have this function turned off) flashes the current tempo. When Tempo mode is active, no other mode LEDs will be lighted.

The PCM 91 always operates in one of these modes. Here, the lit LED indicates that Control Mode is active.
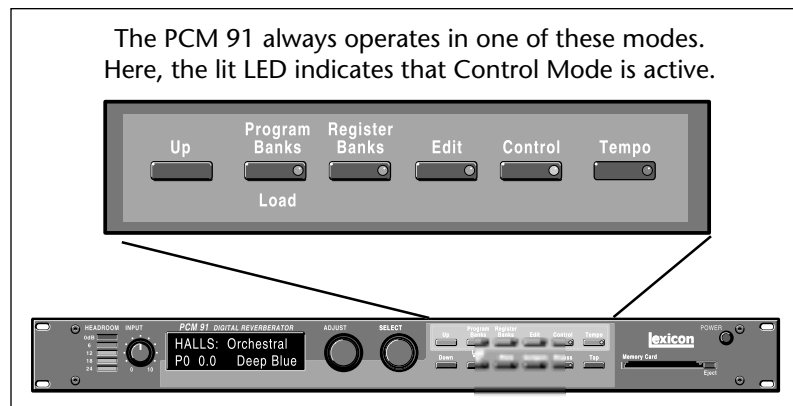
The five mode buttons give you the first level of access to all of the functions and parameters in the PCM 91.

- Press **Program Banks** repeatedly to access five banks of 50 factory presets and a KeyWord mode where programs can be viewed according to type. The PCM 91's KeyWord function is activated in Control mode.

- Press **Register Banks** repeatedly to access two banks of 50 memory locations, called registers, where you can store your customized effects. Memory cards can be used for storage of additional banks of registers. When a formatted memory card containing stored registers is inserted, pressing Register Banks repeatedly will cycle through both the internal and the card banks. Registers can be sorted and viewed according to type when the PCM 91's KeyWord function is activated in Control mode.

- Press **Edit** to access all of the available parameters for the currently running effect.

- Press **Control** to select system parameters, MIDI, card formatting, etc.

- Press **Tempo** to set tempo-related values that affect the delay time and LFO rate parameters of the currently-running effect.

NAVIGATING A MATRIX

All of the controls available in a mode are arranged in a matrix of up to 10 columns (numbered 0-9) and 10 rows (each numbered .0-.9). This arrangement allows any one of as many as 100 parameters to be selected simply by using the SELECT knob and the Up and Down buttons to select a position in the matrix.

GO OR PRO

The PCM 91 offers a choice between two levels of Edit mode parameter access. We call these Go mode and Pro mode.

Go mode makes use of an extra row in the edit mode matrix called the Soft Row, where you can assign as many as 10 effect parameters or Custom Controls for easy access. Selecting Go mode (Control mode 1.0) limits the action of the Edit button to displaying only the Soft Row parameters assigned to the current effect.

Simultaneously pressing Up and Down will always return you to 0.0.

SELECT

The Select knob moves you horizontally across the matrix.

Navigating a Matrix

0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	
2	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7		
3	3.0	3.1	3.2	3.3	3.4	3.5	3.6			
4	4.0	4.1	4.2	4.3	4.4	4.5				
5	5.0	5.1	5.2	5.3	5.4					
6	6.0	6.1	6.2	6.3						
7	7.0	7.1	7.2							
8	8.0	8.1								
9	9.0									

The Up and Down buttons move you vertically through the rows of the matrix.

Up

Down

An asterisk in the display indicates that Load/✱ is active and, depending on the mode, will load effects or will display additional parameters when pressed.

PCM 91   DIGITAL REVERBERATOR
XXXXXXX ✱XXXXXXXXXX
3.6 XXXXXXXXXXXXXXXX

Your current location in the matrix is shown in the lower lefthand corner of the display.

ADJUST

In the Program and Register Banks, the Adjust knob acts as a soft knob for adjustment of one or more patched effect parameters. In the other modes, Adjust scrolls through the range of available settings for the control you have selected.

Each preset has a set of Soft Row assignments which we've selected for you (as well as an assignment for the ADJUST knob and Custom Controls). When shipped, the PCM 91 will power up in Go mode with the first preset (P0 0.0) loaded. Press Edit to display the Soft Row of parameters. Press Up or Down to access a Pro mode selection display.

Pro mode gives you access to the full parameter matrix, including the Soft Row. Use this mode when you want to do in-depth effects editing or patching, or when you want to customize Soft Row assignments.

Go mode and Pro mode selection is made in Control mode at matrix location 1.0.

INFO

The PCM 91 offers an extensive set of informative display messages which can be activated from the front panel.

The front panel switches perform various functions when pressed. Most of these functions are activated on release of the button. If you want to know more about the function of a particular button (without actually executing any action) press and hold the button down. While you are holding down the button, an explanatory message will appear on the display. The activation of an Info message overrides the normal function of the button, so that no action is taken on release.

Info messages are displayed when a button is **pressed and held down**. Generally, info messages describe the function of a button, or provide current status information.

Displays the currently loaded effect name, bank, and matrix location.

Displays the current tempo and the clock source (MIDI or internal).

Displays the current function assigned to the Up button and the Adjust knob.

Displays the current function assigned to the Down button and the Select knob.

Displays action needed to perform a store operation or Memory Protect message when store function is disabled.

Displays the type of system bypass currently selected, and the current status (on or off).

Inactive until an effect has been altered, then displays "Press to hear stored effect."

HISTORY OF EFFECTS LOADED

The PCM 91 allows you to review the last ten effects loaded. This is useful when you want to return to an effect you were using earlier, but can't remember its name or location. This History view is accessed from Program Banks or Register Banks mode by simultaneously pressing and releasing both the Program Banks and the Register Banks buttons. The display pictured at the right will appear.

The label 1 back in the example, means that the effect shown on the bottom line was running just before the current effect. Turning SELECT to the right will scroll you through the stored list of effects, all the way to 10 back. Press Load/✳ to load any of the displayed programs. Press any key to exit.

Note that loading programs from the review display does not update the historical record, nor does loading from MIDI, Chain or Map. Only program loads from Programs Banks or Register Banks mode are recorded.

The top line of the display shows the position in the review list of the displayed effect.

History: 1 back
XX X.X ✳XXXXXXXXXX

The bottom line of the display shows the bank and matrix location and the name of the effect.

CONTROL MODE

Simultaneously press **Up** and **Down** to return to 0.0.

0 Audio	0.0 *Word Clock	0.1 Analog In Lvl	0.2 Dig In Lvl	0.3 Word Size	0.4 SCMS	0.5 Emphasis Bit	0.6 Output Level		
1 System	1.0 Edit Mode	1.1 Mix Mode	1.2 Tempo Mode	1.3 Bypass Mode	1.4 Pgm Bypass	1.5 Mem Protect	1.6 Auto Load	1.7 Patch Update	1.8 Initialize
2 Card	2.0 Bank Copy	2.1 Load	2.2 Format						
3 MIDI	3.0 Reset	3.1 Receive	3.2 Transmit	3.3 *Pgm Change	3.4 Automation	3.5 *Send	3.6 Int Clock	3.7 SysEx	3.8 Dump	3.9 Dump Speed
4 Setup	4.0 Store	4.1 Load							
Mapx	Map 0	Map 1							
Chain	Chain Pgm Assign								
	Chain 0	Chain 1	Chain 2	Chain 3	Chain 4	Chain 5	Chain 6	Chain 7	Chain 8	Chain 9

An asterisk (✱) accompanying a parameter name indicates available subparameters at that matrix location. The Load/✱ LED will light when an asterisk appears on the display. Press Load/✱ to step to the next subparameter. From any point in the matrix, press Up or Down together with Load/✱ to backstep to the previous parameter.

Selections of various system states and conditions are made in Control Mode. Press Control to enter this mode. The Control button LED will light to indicate that the mode is active. Note that Control Mode functions are not available when the Compare function is active.

The Control Mode matrix is shown above. Following are descriptions of each available selection.

ROW 0 AUDIO

0 Audio	0.0 *Input Source	0.1 SCMS	0.2 Emphasis Bit	0.3 Outpu Level

0.0 Input Source

The PCM 91 can use its own internal clock as a timing reference, or it can reference an external clock source from the rear panel S/PDIF or AES jacks. Use ADJUST to select Ext XLR (AES), Ext Coax (S/PDIF), Int: 48kHz or Int: 44.1kHz. When either analog rate is selected, the digital input is disabled. To process audio from the digital input, you must select Ext.

When External clock is selected, and the PCM 91 detects valid digital audio, the rate of the external word clock will be displayed with a label indicating the digital audio format type: Prf (Professional) or Cns (Consumer, also called S/PDIF).

Audio   ✱Input Source
0.0   Ext: XLR   Prf   48

Audio   ✱Input Source
0.0   Ext: Cns   48kHz

When the PCM 91 is receiving valid digital audio, selecting Input Source will display the input connector, audio format, and the rate of the incoming signal.

When digital clock is selected, any loss of lock detected in the incoming digital audio, or reception of non-audio data will cause the PCM 91 to immediately mute the digital input and switch to internal clock at the sample rate of the last valid external signal. An error message will be displayed if this occurs. The PCM 91 will repeatedly try to establish lock, returning automatically to External clock if and when lock is confirmed.

The following types of errors are detected when the PCM 91 is set to Ext:

- **No Lock:** The PCM 91, at some point, lost lock to the incoming digital audio signal. Digital audio input is muted.

- **Out of Range:** The sampling rate of the incoming audio signal is outside of acceptable tolerance limits of +4%. Digital audio input is muted.

- **Non Audio:** Indicates transmission of non-audio data, such as from a CD ROM. Digital audio input is muted.

- **CRC:** The error is reported, but incoming audio is accepted.

Dig In Status

Pressing Load/✱ from Input Source will display the current digital input status. This status display is continuously updated, acting as a real-time monitor of the PCM 91 digital input. This display is active even when the PCM 91 is set to Internal clock. Note that in the case of an AES Pro format signal, "Emp:Yes" means either CCITT or 50/15μs emphasis.

If valid digital audio is detected, the display will show the external clock rate and format information, along with the status of the Emphasis bit(s) in the incoming audio signal. If the PCM 91 has lost lock, the display message will indicate "No Lock" and parenthetically show the internal clock rate now in use.

Upon loss of lock, or reception of non-audio data, the PCM 91 will mute the digital input and display the following messages when Input Source or Dig In Status is selected:

Input Source	Dig In Status
Not Locked	No Lock (Int 44.1)
Out of Range	No Lock (Int 44.1)
Non Audio: 44.1	Non Audio: 44.1

Error Log

```
Audio        *Dig In Status
0.0  Prf  44.1  Emp:Yes
```

```
Audio        *Dig In Status
0.0   No Lock   (Int:44.1)
```
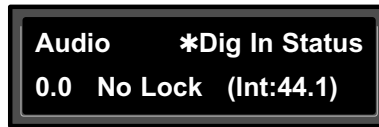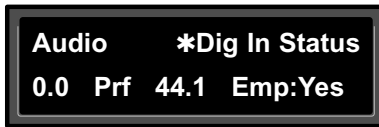
When the PCM 91 loses lock, it will mute the digital input.

The following errors are continuously logged and are available for review by pressing Load/✱ from the Dig In Status display and using ADJUST to scroll through the error list.

- **Validity:** A Validity error indicates that the Validity bit was set in a frame of incoming data and that the data attached to it may be corrupted. This bit may also be sent when the transmitting device is paused.

- **Confidence:** The PCM 91 is detecting excessive jitter or noise on the digital audio line. No data has been corrupted, but corrective action should be taken.

- **SlipSample:** Indicates that a single sample is misaligned with the window defined by the Input Source. This may occur when an external master changes sample rate, or when it is just powering up, but should not occur in normal operation. (This type of error is reported for reference only, as the PCM 91 does not accept digital data when using its own internal clock.)

- **CRC:** Indicates a Cyclic Redundancy Check error in the incoming data.

- **Parity, Biphase:** Indicate that at least one bit (and therefore at least one audio sample) was corrupted.

Parity, Biphase, and Confidence errors are most often caused by inappropriate cabling. Be sure to use 75Ω video-grade cable, kept as short as possible — standard audio cable will not work reliably.

Each error is reported by name, with the number of occurrences of that particular type of error. The display might show, for example "CRC: 4752". As many as 9999 instances of each error can be shown. If the number of actual errors exceeds 9999, the display will indicate ">9999". A special symbol (n) before the error type indicates the most recently received error.

Press Load/✱ from the Dig In Status display and use ADJUST to scroll through the Error Log.

A typical Error Log display showing that the last error received was a CRC error (■ CRC) and that there have been more than (>) 9999 instances of CRC errors since Word Clock was last set to Ext.

```
Audio        *Error Log
0.0    ■    CRC    >9999
```

To clear the Error Log, reselect Dig from the Control Mode Input Source display. This will cause the PCM 91 to attempt to lock to the current external source and will reset the Error Log. The log is also cleared on power up, and whenever it relocks (Auto Lock On).

ROW 0 AUDIO *(continued)*

0.1 SCMS

Digital audio signals, in order to comply with copyright standards, are encoded with control information which can limit the ability to copy audio data. This control information is generally known as SCMS (Serial Copy Management System). Under this system, you can choose to have the audio material processed by the PCM 91 encoded to allow one of three levels of copy restriction. To make your selection, use ADJUST to select No Copy, One Copy, or Multi Copy.

0.2 Emphasis Bit

The Emphasis control allows you to explicitly set the emphasis "flag" in the digital audio, or to pass along the incoming signal without changing its emphasis coding. (The PCM 91 does not perform any emphasis or de-emphasis as part of its signal processing.) The choices available with ADJUST are: Yes, No, and Pass Thru.

0.3 Output Level

This control allows you to select the maximum output level at the PCM 91's analog outputs. Use ADJUST to select +4 dBu, or –10 dBu.

Note:

Exercise care when switching this control, as a 14dB level change instantly occurs when going from -10dBu to +4dBu.

ROW 1 SYSTEM

1 **System**	1.0 Edit Mode	1.1 Mix Mode	1.2 Tempo Mode	1.3 *Bypass Mode	1.4 Pgm Bypass
	1.5 Mem Protect	1.6 Auto Load	1.7 Patch Update	1.8 *KeyWord	1.9 Initialize

1.0 Edit Mode

The PCM 91 has been designed with a "plug and play" feature called Go mode. In this mode, the most useful parameters of each effect are grouped together in a single row which is available whenever you press Edit.

Each PCM 91 preset has a set of Go mode parameters which we've selected for you. When shipped, the PCM 91 will power up in Go mode, with the first preset (P0 0.0) loaded. Press Edit to display the first available parameter in the Soft Row.

If you want access to the full parameter matrix for any effect, including the Soft Row parameters, use ADJUST to select Pro mode. Now, when Edit is pressed, you can select any parameter for adjustment, and customize any effect with your own Soft Row assignments. For more information about the Soft Row, see Editing an Effect later in this chapter.

1.1 Mix Mode

Each PCM 91 effect has its own Mix parameter, with the Mix setting stored as an integral part of the effect. Mix Mode allows you to override these individual Mix settings and set a global Mix value for all effects. This is useful when using a mixing console's controls to set the amount of wet signal in a mix. In such a case, you can use this control to set all PCM 91 effects to 100% wet.

When shipped, the PCM 91 has the Mix Mode set to Pgm. This setting determines that effects will be loaded with their stored Mix settings, and allows the individual Mix controls in the edit matrix of each effect to be adjusted from 0-100% Wet. To set a global Mix value, use ADJUST to select Global, press Load/✱ to display the current value, and use ADJUST to assign any value from 0-100% Wet.

1.2 Tempo Mode

The PCM 91 gives you an exciting new approach to working with delay times and modulation parameters. Now you can set these parameters in beats, allowing you to control your effects in a completely musical way. Each PCM 91 effect has its own Tempo parameters, with tempo settings stored as an integral part of the effect. These include: Tempo Rate, Tempo Beat, Tempo Source (internal or MIDI), Tap Duration, and Tap Average. The Global setting here allows you to override individual Tempo Rate settings with a global value which can then be changed on the fly.

Whether Tempo Mode is set to Global or Pgm, you can set a new tempo rate by pressing the front panel Tap button twice. Alternatively, you can choose to have tempo set automatically from incoming MIDI clock. The rate you tap, or the MIDI tempo, will be displayed here.

For more information about working with the tempo parameters, see Tempo Mode later in this chapter.

1.3 Bypass Mode/Bypass Src

This control allows you to determine the behavior of the PCM 91 when the front panel Bypass button is pressed. You can also assign an external controller to perform identically to the front panel button. When the Bypass button is pressed, the LED will light, and a message indicating bypass type will be displayed. Pressing Bypass again will turn bypass off.

The choices available via ADJUST are:

- **AllMute:**   Mutes both the input and the output signal, giving complete silence.

- **InputMute:**   Mutes the input to the PCM 91, allowing the tail of the effect to ring out. (This is the default setting.)

- **OutputMute:** Mutes the output. Audio signals are still being fed to the PCM 91, so processed audio returns immediately when Bypass is turned off.

- **Bypass:**   Completely bypasses the PCM 91, passing unprocessed audio directly through to the outputs.

To assign an external controller to perform the selected bypass function, press Load/✱ to display Bypass Src. Use ADJUST to select a footswitch or any MIDI controller (or Off). Once a source is selected, it will perform the same function assigned to the front panel Bypass button.

1.4 Pgm Bypass

This control allows you to determine the behavior of the PCM 91 when a new effect is loaded. The choices available are: AllMute or Bypass.

ROW 1 SYSTEM *(continued)*

1.5 Mem Protect

The PCM 91 provides a memory protection feature to prevent accidental overwriting of your stored effects. When this control is set to On, pressing the front panel Store button will cause an error message to be displayed. The PCM 91 is shipped with the Memory Protection function turned Off.

1.6 Auto Load

This control allows you to choose whether PCM 91 effects will be loaded immediately when selected with SELECT and the Up and Down buttons (On), or whether they will require a press of the Load/✱ button (Off).

1.7 Patch Update

When a controller is patched to an effect parameter, this control determines when the controller will take control of the parameter. If Immediate is selected, stored parameter values will jump to the current controller position when the effect is loaded. If Delayed is selected, the stored parameter value will remain in effect until the controller is moved. See Patching later in this chapter.

1.8 KeyWord

For convenient effect sorting, the PCM 91 allows you to assign KeyWords (as many as four) to each effect. The KeyWord function here allows you to display effects according to type, or to turn this function off. Turn ADJUST to select an effect type from the list shown at the right. Press Load/✱ and use ADJUST to turn the KeyWord function On or Off.

When shipped, the PCM 91 has the KeyWord function turned On, with A to Z selected. This allows you to view all of the effects in the Program or Register banks alphabetically. To access this display, press Program Banks or Register Banks repeatedly to step through all of the available banks. The KeyWord display will appear after the last bank. Press Control to jump to Control mode, where you can use ADJUST to select a different KeyWord for sorting. Press Program Banks or Register Banks to return to the KeyWord display — resorted according to your new selection.

Most KeyWords (except for User 1-4 which are reserved for your use) have been assigned to several presets. KeyWords are assigned to effects in Edit mode. (See Editing an Effect.)

PCM 91 KeyWords			
A to Z	Drums/Perc	Medium	Special FX
Acoustic	Dynamic	MIDI	Splits
Ambience	Echo	Mono	Stereo
Ballad	Film-ADR	Natural	Surround
Bright	Gated	Orchestral	Tempo
Broadcast	Guitar	Outdoor	Unnatural
Cascade	Indoor	Plate	Vocal
Chamber	Instrument	RandomHall	User 1
Classical	Keyboard	Room	User 2
Cncrt Hall	Large	Short	User 3
Custom	Live PA	Slap FX	User 4
Dark	Long	Small	
Dialog	Mastering	Spatial	

1.8 Initialize

Selecting this control arms the PCM 91 to revert to its factory settings. **This will erase all registers and setups, and return the PCM 91 to its default states.**

If you press Store, the display will ask "Are you sure?" (Press STORE). If you don't want to reinitialize your unit, press any button to cancel the operation. If you press Store in response to this message, the display will flash "Restoring original factory settings" and your unit will be reinitialized.

ROW 2 CARD

2 Card	2.0 Bank Copy	2.1 Load	2.2 Format	2.3 Name	2.4 Labels

2.0 Bank Copy

This control allows you to copy banks of effects from one location to another. Banks can be copied internally, or to and from PCMCIA Memory Cards. Try, for example, copying Preset Bank 0 into internal Register Bank R0.

1. Press Store. The following display will appear briefly.

> **Select and copy**
> **effect banks**
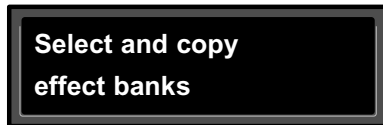
The display will then change to show:

> **Card   Bank Copy**
> **2.0   Src: ✱P0   Dst: R0**
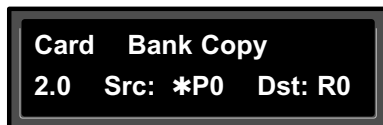
The asterisk indicates that Src is available for adjustment. ADJUST will scroll through all available banks, including internal preset and register banks, as well as any banks on inserted cards. Internal banks are labeled "P0...P4" and "R0, R1". Card registers will be labeled "C0, C1, C2" etc.

2. Press Load/✱ to move the asterisk to Dst.

> **Card   Bank Copy**
> **2.0   Src: P0   Dst: ✱R0**
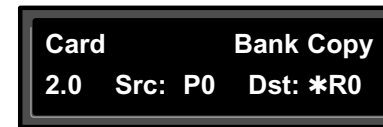
Now, use ADJUST to select the destination of your copy. Selecting a register bank here will cause its contents to be erased and overwritten with the bank you have selected as the source when Store is pressed.

4. Press Store to copy the selected source (in this case Preset Bank 0) into internal Register Bank R0. The display will ask "Are you sure?" (Press STORE). Press any button to cancel. Press Store to complete the store operation.

2.1 Load

This control is provided for future enhancement. It will allow you to load audio software from a Memory Card simply by inserting the new card and responding to the display prompts. The PCM 91 can also share registers, maps and chains with the PCM 90 via RAM cards. (Sharing Setups between the PCM 90 and the PCM 91 is not recommended.)

ROW 2 CARD *(continued)*

2.2 Format

This control allows you to format a Memory Card for PCM 91 use. (Make sure the Write Protect switch on the card is set to Off.) Insert an unformatted card (or one you don't mind erasing), then press Store. The display will ask "Are you sure?" (Press STORE). Press Store. The following display will appear briefly.

> **Format and name**
> **memory card**
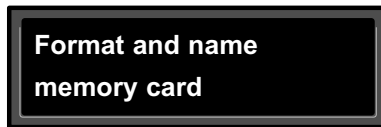
The display will then change as shown below.

> **Name: N ew Card**
> **(press STORE)**

This display allows you to assign a name (of 10 characters or less) to the card. A blinking cursor indicates that a particular character is available for changing. Use ADJUST to select the character you want in that position. Turn SELECT to move the cursor to another character. Press Store to execute. The display will ask "Are you sure?" (Press STORE). Press Store again to complete the operation. Press any front panel button to cancel.

2.3 Name

This control allows you to rename a formatted card. Insert a formatted card and press Store. The card name will appear with the blinking cursor as shown above. Use ADJUST to select a new

character at the location marked by the cursor. Turn SELECT to move the cursor to another position. Press Store twice to execute.

2.4 Labels

This control allows you to rename Register bank and row labels. Any changes made here are executed immediately. To rename bank and row labels, press Store and use ADJUST to display any bank. Press Load/✱ to access the naming function for the selected bank, then use ADJUST and SELECT to enter a new bank name.

> **PCM 91 Character Set**
> ! " # $ % & ' ( ) * + , - . / 0 1 2 3
> 4 5 6 7 8 9 : ; < = > ? @ A B C D
> E F G H I J K L M N O P Q R S T U
> V W X Y Z [¥] ^ _ ' a b c d e f g
> h i j k l m n o p q r s t u v w x y z
> { : } ~ z (space)
>
> *The @ and the $ symbols are used to represent Custom Control values.*

Press Load/✱ to display the first row in the selected bank. Use ADJUST to select any other row within the bank. Press Load/✱ to access the naming function for any displayed row, then use ADJUST and SELECT to enter a new bank name. Pressing Load/✱ from the row label naming display will jump you back to bank selection.

ROW 3 MIDI

3 MIDI	3.0 Reset	3.1 Receive	3.2 Transmit	3.3 *Pgm Change	3.4 Automation
	3.5 *Send	3.6 Int Clock	3.7 SysEx	3.8 Dump	3.9 Dump Speed

3.0 Reset

This control resets all patched parameters to their previously stored values. When this control is activated, a MIDI "Reset All Controllers" message is also transmitted on the current channel by the PCM 91.

3.1 Receive

Turn ADJUST to select OFF, 1-16, or OMNI for receipt of MIDI messages.

3.2 Transmit

Turn ADJUST to select OFF, or 1-16 for transmission of MIDI messages.

3.3 Pgm Change

This control specifies the PCM 91's response to incoming MIDI Program Change messages. There are four selections available via ADJUST: On, Off, Map and Chain.

Pgm+ and Pgm –, are available as subparameters in each location. Pgm+ will load the next higher effect in the current bank, map , or chain. Pgm – will load the next lower effect. You can select the following sources to activate Pgm+ and Pgm –:

Off
Footswitch 1
Footswitch 2
•
•
•
MIDI Controller #119.

On

Program Change messages 0-49 correspond to PCM 91 Effects 0.0-4.9 in the current bank. Program Change messages 50—127 are ignored. The current bank can be changed with MIDI Continuous Controller 32 and Bank Select Messages as follows:

- **0–8:**   Program Banks 0–8

- **9-10:**   Internal Register Banks 0-1

- **11-15:**   reserved for ROM Card Banks

- **16-24:**   Memory Card Banks. The number of banks available on a given card will vary with its size, as follows:

Card Size	# Banks
64	1
256	5
512	10
1 Meg	20

Off

All Program Change and Bank select messages are ignored.

Map

Program Change 0-127 can be mapped to any PCM 91 effect in any internal or card bank. Two 128 element maps are stored internally, additional maps may be stored on RAM cards. Once you have selected Map, press Load/✱ to display:

```
MIDI Pgm Change
3.3   ✱Map Select   0
```
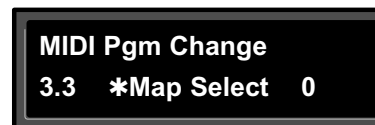
Turn ADJUST to select the desired Program Change Map.

ROW 3 MIDI *(continued)*

Chain

Any Program Change number can be selected to load any one of ten customized effect "chains". Additional chains can be stored on RAM cards. Once a chain is loaded, effects in the chain are accessed by the controller patched to Pgm + and Pgm – (program increment and program decrement). Once you have selected Chain, press Load/✱ to display:

```
┌─────────────────────────────────┐
│  MIDI Pgm Change                │
│  3.3      ✱Chain      MIDI      │
└─────────────────────────────────┘
```
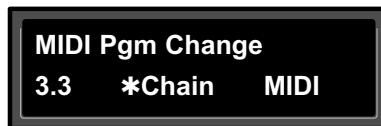
Turn ADJUST to select the desired Program Chain. When set to MIDI, Program Chains will be loaded by MIDI Program Change messages according to the settings of Chain Pgm Assign in Row 6.

To load a specific Program Chain, without sending the PCM 91 a MIDI Program Change message, use ADJUST to display the desired chain number.

```
┌─────────────────────────────────┐
│  MIDI Pgm Change                │
│  3.3      ✱Chain         3      │
└─────────────────────────────────┘
```

3.4 Automation

This control is provided to allow one PCM 91 to act as a master for any number of slaved PCM 91s. Select On to have values resulting from front panel operations sent out as SysEx messages. Press Load/✱ to select the ID (0-126 or All) of the target PCM 91(s).

Automation sends all MIDI commands in PCM 90 format which can be received by either a PCM 90 or a PCM 91. This means that Automation mode can control both PCM 90s and PCM 91s, and that a PCM 90 can control a PCM 91 in Automation mode. As the PCM 90 does not have banks 5-8, it will not recognize programs from those banks in Automation mode.

3.5 Send (Foot Pedal, Foot Sw 1, Foot Sw 2, ADJUST)

If Transmit is set to On these controls can transmit MIDI controller messages. Press Load/✱ to cycle through the controller selections. Use ADJUST to select the MIDI Controller message to transmit. Receipt of MIDI Controller messages will affect the PCM 91 in the same manner as if the internal controls were adjusted.

3.6 Int Clock

You can choose to have the PCM 91 transmit MIDI Clock at the current tempo rate by setting this control to On and Tempo mode Source (0.2) to Internal. If this control is set to Off, MIDI Clock will not be transmitted.

3.7 SysEx

This control is provided for communication with one or more additional PCM 91s or computer editor software. On (the default setting) allows SysEx messages to be received by the PCM 91. Press Load/✱ to select device ID (0-126).

3.8 Dump

Press Store to configure the PCM 91 to execute MIDI dumps of single effects, banks, maps, chains, or setups. With the exception of Setup Dumps, all dumps are transmitted in PCM 90 format, which is also recognized by the PCM 91. You can dump from the front panel of either unit to the other. As the PCM 90 has only five Banks

(0-4), references to Banks 5-8 will be ignored when transmitted to a PCM 90.

3.9 Dump Speed

Turn ADJUST to select dump speeds of Slow, Medium or Fast to achieve compatibility with the connected MIDI device.

ROW 4 SETUP

4 **Setup**	4.0 Store	4.1 Load

4.0 STORE

Control mode Audio, System, and MIDI parameter settings, along with two settings from the Tempo matrix, comprise a "Setup." Five setups can be stored and named in the unit, or on a Memory Card, allowing you to transport not only your effects, but complete PCM 91 environments to another PCM 91. Press Store to initiate the Setup Store function.

When the PCM 91 is shipped (or when you reinitialize the unit) default values are assigned to these parameters. The following table shows the Setup parameters along with the factory default setting of each parameter.

4.1 Load

This control allows you to load any of five stored setups, restore the factory default setup shown at the right, or load a setup from a Memory Card. Press Load/✱ to cycle through the selections. (Memory Card selections will only appear when an appropriate card is inserted.)

Control Mode Matrix Location		System Parameter	Default Setting
Audio	0.0	Input Source	Analog: 48kHz
	0.1	SCMS	Multi Copy
	0.2	Emphasis Bit	Pass Thru
	0.3	Output Level	+4dBu
System	1.0	Edit Mode	Go
	1.1	Mix Mode	Pgm
		Global Mix Value	100% Wet
	1.2	Tempo Mode	Pgm
		Global Tempo Value	120 BPM
	1.3	Bypass Mode	InputMute
		Bypass Src	Off
	1.4	Pgm Bypass	AllMute
	1.5	Mem Protect	Off
	1.6	Auto Load	Off
	1.7	Patch Update	Delayed
	1.8	KeyWord	On (A to Z)
MIDI	3.1	Receive	OMNI
	3.2	Transmit	1
	3.3	Pgm Change	On
		Pgm+	Off
		Pgm–	Off
		Map select	0
		Chain	MIDI
	3.4	Automation	Off
	3.5	Footpedal	None
		Sw 1	None
		Sw 2	None
		ADJUST	None
		Custom 1-4	None
	3.6	Int Clock	Transmit Off
	3.7	SysEx	Receive On
		Device ID	0
	3.8	MIDI Dump	Current Program
	3.9	Dump Speed	Slow

Tempo Mode Matrix Location		System Parameter	Default Setting
Tempo	0.2	Source	Internal
Tap	1.3	Display	On

ROW 5 MAPX

Mapx	Map 0	Map 1

Map 0 and Map 1

When Control mode 3.3 is set to Map, received MIDI Program Change messages will be mapped according to the selections made here. The selections available are: MIDI Program Change # (0-127), Bank # (PCM 91 preset, register, or card bank) and Pgm # (PCM 91 effect number 0-49). When shipped, the PCM 91 has the two internal maps configured to access all presets and registers:

Map 0	Map 1
MIDI 0 = P0 0.0	MIDI 0 = P2 2.8
MIDI 127 = P2 2.7	MIDI 121 = P4 4.9

ROW 6 CHAIN

Chain	Chain Pgm Assign				
	Chain 0	Chain 1	Chain 2	Chain 3	Chain 4
	Chain 5	Chain 6	Chain 7	Chain 8	Chain 9

The PCM 91 has 10 internal program chains, numbered 0-9. (Ten additional chains are available if a memory card is inserted.) Each chain is made up of 10 "links" (numbered 0-9). You can assign any program or register to any link in the chain.

A chain can be loaded with a MIDI Program Change message, or by selecting its number directly at Control mode 3.3. Once a chain is loaded, the source assigned to Pgm+ and Pgm– will load the next higher or lower program in the chain.

Pgm Assign

When Control mode 3.3 is set to Chain, received MIDI Program Change messages will be mapped according to the selections made here. Two assignments are available: MIDI Program Change # (0-127) and Chain # (0-9). When the PCM 91 is shipped, all program numbers are mapped to Chain #0. To change assignments, set Pgm#, with ADJUST, press Load/✱ to move the ✱ to Chain# and set it with ADJUST. (You cannot assign more than one chain/MIDI #.)

```
Chain   Pgm Assign
Pgm#: ✱  3  Chain#:     3
```

Chain 0-9

Use SELECT to choose a chain. Once a chain is selected, any PCM 91 program or register can be assigned to any link in the chain. Press Load/✱ to move the ✱ from Link# to the Bank ID, to the program number. Depending on the field marked with the ✱, ADJUST will select link numbers 0-9, Banks (Pn or Rn), or the desired program within the displayed bank.

```
Chain 3   Deep Blue
Link#: ✱  0          P0 0.0
```
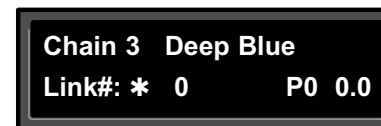
PROGRAM AND REGISTER BANKS

The PCM 91 has 450 factory-designed programs, organized into nine Program Banks of 50 each, and 100 memory locations, called registers, for storing your customized effects. Two Register Banks are available in the PCM 91 itself. Additional Register Banks can be stored on PCMCIA cards.

The PCM 91 has 9 Program Banks, each with 50 factory-designed programs.

All PCM 91 programs have one or more parameters patched to the Adjust knob.

In Program Banks or Register Banks mode, turn Adjust to change the sound of the currently running effect. While Adjust is turned, the patch name and value are displayed.

Two Register Banks provide 100 memory locations for storing your own effects.

Custom controls allow you to create additional group parameter controls.

SELECTING EFFECTS

The procedure for loading effects is the same, whether you are choosing from banks of factory presets, or from your own banks of registers. When first turned on, the PCM 91 will load whatever effect was running when it was last turned off. When shipped from the factory, the first effect in the first Program Bank (P0 0.0 Deep Blue) is loaded. The Bank ID (P0-P8), matrix location, program name, and bank and row labels are all displayed.

Bank Label

Halls: Orchestral   — *Row Label*

Program Bank ID — P0   0.0   **Deep Blue**   — *Program Name*

Matrix Location
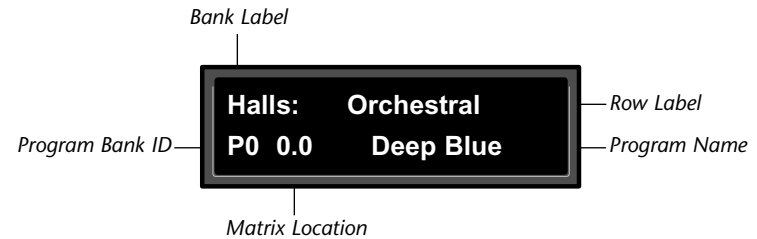
Turn SELECT to display another effect.

Halls: Orchestral

P0   0.1   ✱ **Large Hall**
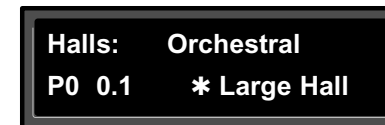
An asterisk in the display indicates that the displayed effect is not loaded.

Press Program Banks repeatedly to cycle through the program banks. Simultaneously press Program Banks along with either Up or Down to backstep.

SELECT will scroll sequentially through all of the effects in one bank and then begin scrolling through the next bank. Press Program Banks to reselect the last displayed effect in another bank. Press Load/✱ to load any displayed effect.

SELECTING EFFECTS *(continued)*

In the Program and Register Banks, ADJUST is a Soft Knob. Each of the factory-designed programs has one or more parameters patched to this knob, providing a quick way to make useful changes to the effect.

Turning ADJUST will display the patch name and the current value, as well as any name assigned to the current value. Continue turning ADJUST to alter the patched parameter's value. You can create your own ADJUST knob parameter assignments for your registers. (See Editing, later in this chapter.)

Turn ADJUST to briefly display the Soft Knob assignment.

Soft Knob name ———

```
┌────────────────────────────────────┐
│  ADJUST is patched to              │
│                                    │
│  Decay                    30       │
└────────────────────────────────────┘
```

Current Soft Knob parameter setting. Turn ADJUST to alter this value.

Note that scrolling through the effects in the Program or Register banks will not load the effects, but will merely display them (unless you have specifically turned on the Auto Load function in Control Mode). Displayed effect names will be preceded by an ✱ indicating that they can be loaded by pressing Load/✱. (The Load/✱ LED will light to indicate that the load function is available.) To find out at any time what the currently running effect is, press and hold Program Banks or Register Banks. An Info message will be displayed providing the name of the currently running effect, as well as the algorithm from which it is derived.

To select an effect stored in a register, press Register Banks. If you have registers stored on a memory card, and have the card inserted, pressing Register Banks repeatedly will cycle through all of your stored bank selections. Simultaneously press Register Banks along with either Up or Down to backstep. Turn SELECT to scroll through all of the effects in the bank. As in Program Banks mode, an asterisk in front of the effect name indicates that the displayed effect is not loaded. Press Register Banks to reselect the last displayed effect in another bank. Unused registers are indicated by the message "available" on the display. Press Load/✱ to load the displayed effect.

Register Bank ID
The PCM 91's internal register banks are labeled R0 and R1; register banks created on memory cards will be labeled C0, C1, C2, etc.

```
┌────────────────────────────────────┐
│                    User Effects    │
│                                    │
│  R0   0.0         ✱ available      │
└────────────────────────────────────┘
```

Matrix Location

The name you assign to a stored effect will appear here. "available" indicates that no effect has been stored at this location.
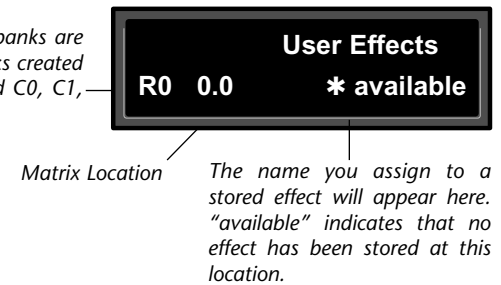
The organization of programs in the five program banks and descriptions of the 450 preset programs are given in Chapter 3.

BANK AND ROW LABELS

Each bank and row in the Program and Register Banks has a descriptive name to help you locate different types of effects. For instance, if you want to process dialog to sound as though it's in a shower stall, the Rooms bank is a good place to start. Bank and row labels appear on the top line of the display in Program and Register modes.

Banks and rows that you create yourself can be renamed at Control 2.4.

SORTING EFFECTS

To make finding the effects you want even easier, the PCM 91 has an effect sorting function called KeyWord which lets you display only a selected type of effect. When the KeyWord function is activated (at Control 1.8), pressing Program Banks or Register Banks one push beyond the available banks will access a list of effects sorted by one of the KeyWords shown at the right. SELECT will scroll you through the effects in that category. When shipped, the PCM 91 has the KeyWord function turned on, with A to Z selected. This displays all of the effects in alphabetical order. Each preset has at least one KeyWord assignment.

The KeyWord categories cover a wide variety of effect types. To select a different KeyWord for sorting, go to Control 1.8. (If you are in the KeyWord section of the Program Banks or Register Banks mode, pressing Control will jump you directly to this location.) Turn ADJUST to select any KeyWord from the list. Now, when you return to Program Banks or Register Banks mode, the display of programs will be limited to those which have been tagged with that particular KeyWord.

KeyWords are assigned to effects in Edit mode. As many as four KeyWords can be assigned to a single effect to allow sorting into more than one group. An effect might, for example, be assigned the KeyWords: Acoustic, Ballad, Guitar and Small. The effect would then be displayed when any of these KeyWords was selected.

To turn the KeyWord function off, go to Control 1.8 System *KeyWord. Press Load/✱ and use ADJUST to select On or Off.

PCM 91 KeyWords

A to Z	Gated	Room
Acoustic	Guitar	Short
Ambience	Indoor	Slap FX
Ballad	Instrument	Small
Bright	Keyboard	Spatial
Broadcast	Large	Special FX
Cascade	Live PA	Splits
Chamber	Long	Stereo
Classical	Mastering	Surround
Cncrt Hall	Medium	Tempo
Custom	MIDI	Unnatural
Dark	Mono	Vocal
Dialog	Natural	User 1
Drums/Perc	Orchestral	User 2
Dynamic	Outdoor	User 3
Echo	Plate	User 4
Film-ADR	RandomHall	

TEMPO MODE

The PCM 91 gives you unique control over tempo. In the PCM 91, tempo is not just a matter of setting echo rates. Any delay parameter and any time-based modulator (LFO1, LFO2, Sw 1, Sw 2 and Mod: Delay) can be individually assigned to an absolute time value, or assigned to a tempo value.

For example, a delay time can be set to a specific number of milliseconds, and you will always get a delay of that number of milliseconds, regardless of tempo changes. Alternatively, a delay time can be set to a specific ratio of echoes to beats. Now, if you create a rhythmic echo pattern, delay times will be linked to tempo. When you change tempo, the delay time will change to maintain the same rhythm at the new tempo.

With the LFOs, time-based switches, and Mod: Delay, the rate of change can be an absolute value (such as once per second), or it can be linked to tempo (for example, once every four beats). Almost any delay parameter, or time-based modulator, can be set to its own individual rhythm, allowing you to set up an effect which will change in a rhythmically interesting way — evolving over time, for example, as opposed to being a mere series of repetitions. Once delays and time-based modulators are assigned, tempo rate can be easily changed in a variety of useful ways.

Tempo Rate can be set internally or via MIDI. If Tempo Source is set to Internal, you can dial in any tempo from 40-400 BPM at location 0.0 in the Tempo mode matrix. Alternatively, you can press the front panel Tap button twice in rhythm to establish the rate you want, or you can have the value of a patch source act as a tap trigger. (See Patching.) The tap function, whether performed by the front panel Tap button, or by an assigned controller, is always active, allowing you to change tempo on the fly from any mode.

You can also choose to have your tempo transmitted as a MIDI Clock signal to control the tempo of connected MIDI devices (Control mode 3.6). If Source is set to MIDI Clock, PCM 91 tempo will sync to incoming MIDI Clock. Whether tempo is set internally or via MIDI, the LED in the Tempo button will flash at the current rate. (You can disable the Tempo LED flashing under Tempo mode 1.3.) Press and hold the Tempo button at any time to display the current Tempo Rate and Source.

Each effect in the PCM 91 has its own tempo rate setting which is stored with the effect. You can override these individual tempo rates with a global tempo rate at Control Mode 1.2. Tempo is also available as an independent patch source which can control any effect parameter. (See Patching later in this chapter.)

When Compare is on, Tap will not alter the tempo, but will still reset the LFOs. See Modulation in Chapter 3.
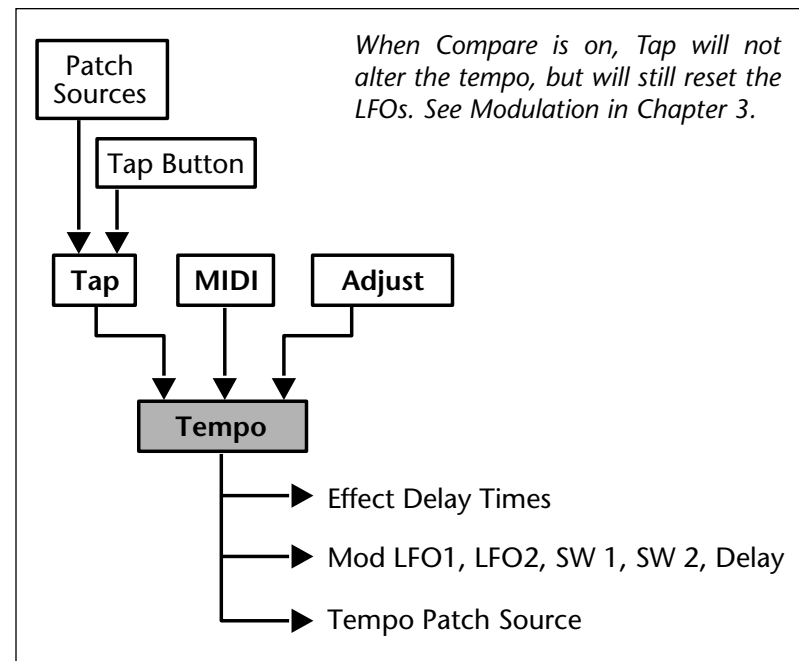
THE TEMPO MODE MATRIX

Press Tempo to access the following tempo parameters:

Simultaneously press Up and Down to return to 0.0.

0 Tempo	0.0 Rate	0.1 Beat Value	0.2 Source	
1 Tap	1.0 Duration	1.1 *Source	1.2 Average	1.3 Display

An asterisk (✱) accompanying a parameter name indicates that there are sub parameters available at that matrix location. The Load/✱ LED will light whenever an asterisk appears in the display. Press Load/✱ to step to the next sub parameter.

From any point in the matrix, press Up or Down together with Load/✱ to backstep to the previous parameter

ROW 0 TEMPO

0 Tempo	0.0 Rate	0.1 Beat Value	0.2 Source

0.0 Rate

This is the current tempo (in Beats Per Minute). When 0.2 is set to Internal, turning ADJUST allows you to select a different rate (40-400 BPM). The Tempo LED will flash at the new rate. Note that fractional tempos can be tapped in, but are not available via ADJUST. The display will always show the nearest whole number value.

0.1 BeatValue

Tempo is expressed in BPM. This control allows you to specify the value of the beat. Eighth, dotted-eighth, quarter, dotted-quarter,

half, dotted-half, and whole-note values are available. If, for example, the rate is 120 BPM, and you select eighth-note here, the tempo will be 120 eighth-notes per minute. If you select quarter-note here, the tempo will be 120 quarter-notes per minute. (The factory default is quarter-note.)

0.2 Source

You can choose to have tempo determined by the PCM 91 Tap and Rate controls (Internal), or by MIDI Clock. When MIDI Clock is selected as the tempo source, Tap acts as a reset, setting the downbeat of the LFO and the time-based switches.

ROW 1 TAP

1 Tap	1.0 Duration	1.1 *Source	1.2 Average	1.3 Display

1.0 Tap Duration

This control determines how many beats will occur in a tap interval. The default setting (1 beat) is probably adequate for most applications. With the default setting of 1 beat, if the tempo is set to 120 bpm, and the beat value is set to quarter-note, each TAP = 1 quarter-note = 1 beat. Available values are: 1/8, 1/7, 1/6, 1/5, 1/4, 1/3, 1/2, 1-8 beats.

1.1 Tap Source and Tap Level

Press Load/✱ to toggle between these two controls. Tap Source allows you to assign the Tap function to any of the PCM 91's Internal, MIDI, or MIDI controllers as listed under Patching. Tap Level allows you to set the level at which the Tap function is triggered.

ROW 1 TAP *(continued)*

1.2 Average

This control allows you to average the last 2-8 taps. Higher numbers mean that the response to incoming taps will be more gradual. (The tempo is updated on every tap, but with a value which is the average of the last 2-8 taps.) Higher average values are more useful if you're trying to lock into a pre-recorded track.

1.3 Display

This control allows you to disable the flashing of the Tempo LED. Turn ADJUST to select Off. The Tempo LED will turn off.

EDITING AN EFFECT

With 5 algorithms and 250 preset effects, the PCM 91 gives you a lot to play with right out of the box. An enormous range of editing control is provided for each algorithm, with parameters organized into a simple edit matrix. In addition to providing this powerful sound design capability, the PCM 91 also allows you to customize these controls for your day-to-day editing needs, or to simply use a subset of controls specially designed for each preset.

This section will describe three basic levels of editing, from the simplest "plug and play" method, through the full edit matrix.

THE SOFT KNOB

Every preset in the PCM 91 has one or more of its available parameters patched to the front panel ADJUST knob. This Soft Knob provides the first level of editing control. Once you have loaded a preset, simply turn ADJUST to alter the effect.

When shipped, the PCM 91 will power up with the first preset (P0 0.0 Deep Blue) loaded. The following display will appear:

Bank

Halls: Orchestral	*Row*
P0 0.0 Deep Blue	*Program Name*

Program Bank ID

Matrix Location
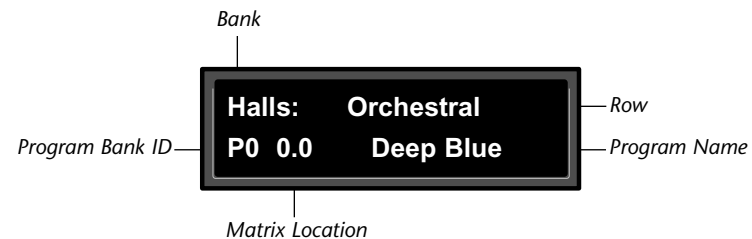
Turn ADJUST. The display will change to show the name assigned to the ADJUST patch, and the current value of the patch. Continue turning ADJUST to change the value of the patch along its entire range. The range of ADJUST knob control can be limited in the Custom row of the edit matrix, making it possible, for example, to have a range of only 0...1, in order to have the ADJUST knob behave as an Off/On control. Many of the presets have range limits to make them more convenient to use, and some have text assigned to range values for even greater clarity. In some of the presets, the changes effected by ADJUST will be as simple as altering the wet/dry mix. In others, turning ADJUST will affect multiple parameters over the complete control range of 0-127.

Details on how to create your own ADJUST knob patches are given at the end of this chapter under Patching.

Controlling the Soft Knob with a Foot Pedal

If you have a foot pedal connected to the PCM 91 rear panel Foot Controller jack, you can use it to control the soft knob patch. (Note that no MIDI connections are required to do this.) To assign a foot pedal control over the soft knob patches, set both Control mode 3.5 ADJUST and Control mode 3.5 Foot Pedal to the same MIDI Controller. See Chapter 5 MIDI Operation.

THE SOFT ROW

When shipped, the PCM 91 will power up in Go mode with the first preset (P0 0.0 Deep Blue) loaded. Press Edit to display the Soft Row of parameters which have been designed for this preset. In this example, 10 soft row parameters have been assigned. The name of each Soft Row parameter is displayed, along with a reference to its row in the Edit matrix. Turn SELECT to scroll all of the available parameters in the Soft Row. Turn ADJUST to change the value of any displayed parameter along its entire range.

Each effect has four available Custom Controls which can be patched to one or more parameters and assigned to the Soft Row. Like the ADJUST knob, Custom Controls can be individually named and can have customized range limits to make them more useful. In the presets, Custom Controls are assigned to the Soft Row in sequence after Mix, so that their positions in the Soft Row will always relate to their Control number. This is a convention you may want to follow in creating your own Soft Rows.

Each preset has a Soft Row of parameters which have been specifically selected to provide everything you need to play with the effect. This example show the Soft Row for P0 0.0 Deep Blue. An asterisk in front of a displayed parameter indicates additional parameters are available when you press Load/Q.

Controls	Custom	Controls	Time	Time	Time	Time	Design	Reflect	Delay
Mix	StereoWidth	In Lvl	Low Rt	Crossover	Rt HC	Pre Delay	Size	Mstr Dly	Mstr Dly

The Soft Row Display

0 Controls	0.0 Mix	0.1 In Lvl	0.2 RvbOutLvl	0.3 Out Width					
1 Time	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay	1.5 Shelf			
2 Design	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Wander	2.6 Link	2.7 High Cut	
3 Reflect	3.0 *Mstr Dly/Lvl	3.1 *Dly/Lvl L	3.2 *Dly/Lvl R						
4 Delay	4.0 *Master	4.1 *Dly/Lvl/Fbk L	4.2 *Dly/Lvl/Fbk R						
5 Modulation	5.0 *Mod:LFO1	5.1 *Mod:LFO2	5.2 *Mod:AR Env	5.3 *Mod:Follow	5.4 *Mod:Latch	5.5 *Mod:SW1	5.6 *Mod:SW2	5.7 *Mod:Delay	5.8 *Mod:S&Hold
Patch	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

PCM 91   *DIGITAL REVERBERATOR*

Design   Size

38.3 M

Edit Matrix Row Label   Parameter Name

Current Parameter Value

Soft Row parameters are derived from the full Edit matrix (with the exception of the Patch row). In the presets, they are arranged according to their numerical order in the matrix after Mix and any Custom Controls.

SELECT

ADJUST

Turn Select to move horizontally across the Soft Row.

Turn Adjust to change the value of a displayed parameter.
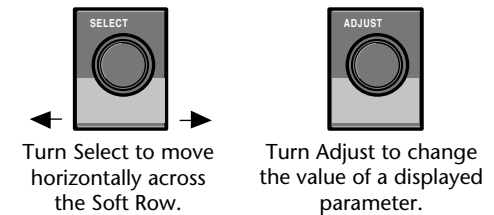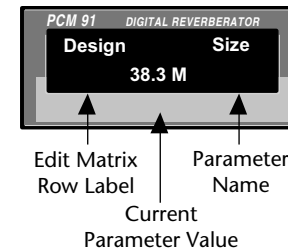
COMPARE

Whenever you edit a PCM 91 effect from the front panel, the LED in the Compare button will light. This lets you know that the effect has been altered since the last store operation, and that the edit compare function is active. Whenever this light is on, you can press Compare to hear the original version of the effect. A message will be displayed to inform you that the stored version of the effect is being loaded. Although this message is only displayed briefly, the Compare LED will flash to let you know the effect you are hearing is the stored version. While Compare is on, you can use the SELECT knob and the Up and Down buttons to view parameter values in the stored effect.

Press Compare again to reload your edited version. Another message will be displayed, and the Compare LED will stop flashing and remain lit until you store your edited version, or select and load another effect.

The Compare light is off until you make changes to an effect.

As soon as you alter an effect, the Compare light will go on.

If you press Compare while the light is on, a message will be displayed . . .

**Compare is on
stored effect active**

. . . and you will hear the original (stored) version of the effect. You can display the parameter values of the stored effect with Select and Up and Down.

The Compare light will flash until you press Compare again to reload the edited version of the effect. While Compare is on, you cannot select another effect.

Note:

Altering parameter values with patched sources other than ADJUST or Custom Controls will not light the LED.

BYPASS

The front panel Bypass button is always active, and will turn on the type of bypass (AllMute, InputMute, OutputMute, or Bypass) selected in Control Mode 1.3.

When you press Bypass, the button LED will light and a message will be displayed to inform you that bypass is on. The display message will also indicate the type of bypass which is in effect. Press Bypass again to turn both the LED and the bypass condition off. A brief display message will inform you that bypass is off.

Press and hold Bypass to display the current state and type of bypass.

STORE OPERATIONS

Turning Memory Protection On

The PCM 91 is shipped with its Memory Protection option off. To turn Memory Protection on, press Control and use Up and Down and SELECT to display matrix location 1.5. The display should read:

**System Mem Protect

1.5   Off**
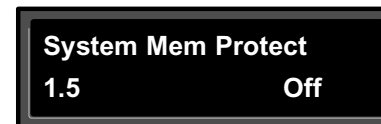
Turn ADJUST to select On. With Mem Protect on, when you press the front panel Store button, the following message will be displayed:

> **Store not active**
> **Mem Protect is on**

The PCM 91 will then jump to the Mem Protect display (Control 1.5) where you can use ADJUST to turn Mem Protect off.

Storing an Effect

With Memory Protection disabled, pressing Store will cause a message like the following one to be displayed:

An asterisk (✱) is positioned in front of the display label which is available for changing - in this case, the name of the effect.

The default bank and register will appear here.

> **Name:** ✱ D eep Blue
> **R 0.0** available

"available" means that this location is empty. If an effect is stored at this location, its name will appear here.
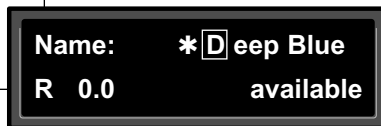
Press Load/✱ to move the cursor from the name, to the register bank, and again to select the register location within the selected bank.

If you press Store again, the display will ask "Are you sure?" (Press STORE). Pressing Store will cause the currently running effect to be saved, as is, in the location shown in the lower left-hand corner of the display. A brief message will inform you that the effect is being stored, then the PCM 91 will revert to the mode it was in before Store was pressed, with the newly-stored effect loaded.

When you store an effect, the following things are saved:

- Values of all Edit matrix parameters. This includes the initial values for any patch destinations when Patch Update (Control mode 1.7) is set to Delayed.
- Soft Row parameter assignments.
- Value of ADJUST when the effect was stored.
- Last parameter selected when the effect was stored.
- Tempo Rate and BeatValue.
- Tap Duration and Average.
- All names, labels and values for ADJUST and Custom Controls.
- Effect name.

How the PCM 91 Selects a Default Bank and Register

If a register is loaded when Store is pressed, the default location will be the same as the loaded effect. If a preset is loaded when Store is pressed, the default location is determined as follows:

The PCM 91 always uses the last-stored register location as a starting point. Its default choice is the next "available" register within that bank. If there are no available registers at a higher location number within the same bank, the default location will be that of the last stored register.

If the last stored register is on a RAM card, and the RAM card is not inserted, the PCM 91 will search for available registers starting at 0.0 in the Internal Register Bank R0.

STORE OPERATIONS *(continued)*

Renaming the Effect

Renaming an effect is straightforward. With the asterisk and the cursor positioned as shown below, turn ADJUST to select a new character. Press Up or Down to select a new character type (upper case, lower case, numeric, symbolic, or blank). Simultaneously press Up and Down to clear all characters from the cursor to the end of the line. Turn SELECT to

PCM 91 Character Set
! " # $ % & ' ( ) * + , - . / 0 1 2 3
4 5 6 7 8 9 : ; < = > ? @ A B C D
E F G H I J K L M N O P Q R S T U
V W X Y Z [¥] ^ _ ' a b c d e f g
h i j k l m n o p q r s t u v w x y z
{ : } ~ z (space)
The @ and the $ symbols are used to represent Custom Control values.

reposition the cursor over a character, and ADJUST to change it. Continue this until you have finished entering the new name. A maximum of 12 characters (including spaces) may be used.

Use ADJUST to select a new character. Turn SELECT to move the cursor to another position.

```
Name:       * D eep Blue
R    0.0             available
```

Selecting a Bank and Register Location

Press Load/✱ to move the asterisk to the Register Bank ID.

When the asterisk is positioned in front of the Bank ID, ADJUST or SELECT will scroll through available register banks.

```
Name:        Deep Blue
✱R0  0.0        available
```

Press Load/✱ again to move the asterisk to the register matrix location.

When the asterisk is positioned in front of the register matrix location, ADJUST or SELECT will scroll through the available registers.

```
Name:        Deep Blue
R0  ✱ 0.0      available
```
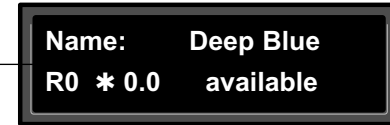
Once you have made all the changes you want to an effect, and have selected a register location, press Store. If you press Store, the display will ask "Are you sure?" (Press STORE). If you don't want to save the effect as shown, press any button to cancel the operation. Press Store to complete the operation.

THE FULL EDIT MATRIX

Setting Edit Mode to Pro (Control Mode 1.0) gives you access to the full parameter matrix of the algorithm for any loaded effect whenever you press the front panel Edit button.

To select any parameter for adjustment, use SELECT to move horizontally across the matrix and the Up and Down buttons to move vertically. An asterisk (✱) appearing before a displayed parameter indicates that more than one parameter is available at that location. Press Load/ ✱ to display these additional parameters.

Each of the five PCM 91 algorithms has a unique matrix, but many parameters are common to all effects, and their placement within the matrix is consistent. For example, all parameters within a given row of any matrix are related. This type of grouping is immediately apparent from the name of the row. For example the "Time" row in any matrix will contain all of the available duration controls for the effect's reverberator.

As far as possible, rows with similar controls will always appear in the same position in the matrix and, within each row, parameters will generally appear in the same position. For example, the first row (0) in every algorithm is "Controls". The Mix parameter, which is available in all effects, is always located in position 0 in this row. Similarly, the last three rows of every matrix are "Modulation," Patches" and "Custom". This makes it very easy to find your way around the large number of available parameters, and to anticipate where to find the controls you are looking for when you switch between effects.

Detailed information about each individual edit matrix, as well as parameter and effect descriptions are given in Chapter 3.

Concert Hall

0 Controls	0.0 Mix	0.1 FX Adjust	0.2 *InLvl/Pan	0.3 High Cut	0.4 Voice Dif	0.5 FX Mix	0.6 FX Width	0.7 *ADJUST
1 Rvb Time	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay	1.5 *Ref Lvl/Dly	1.6 *Pst/Gld	
2 Rvb Design	2.0 Size							
3 Levels	3.0 Master							
4 Delay Time	4.0 *Maste							
5 Feedback	5.0 Master							
6 Panning	6.0 Master							
7 Modulation	7.0 Mod:LF							
Patches	Patch 0							

Rich Plate

0 Controls	0.0 Mix	0.1 In Lvl	0.2 In Width	0.3 RvbOutLvl	0.4 Out Width		
1 Time	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay		
2 Design	2.0 Siz	2.1 Diffusion	2.2 Attack	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut
3 Reflect	3.0 *M						
4 Echo	4.0 *M						
5 Delay	5.0 *M						
6 Modulation	6.0 *M						
Patches	Pat						
Custom	*A						

Ambience

0 Controls	0.0 Mix	0.1 In Lvl	0.2 In Width	0.3 RvbOutLvl	0.4 Out Width				
1 Time	1.0 Decay	1.1 Decay Lvl	1.2 Pre Delay	1.3 DryDly	1.4 DryDlyMix				
2 Design	2.0 Size	2.1 Diffusion	2.2 Spin	2.3 Wander	2.4 High Cut				
3 Modulation	3.0 *Mod:LFO1	3.1 *Mod:LFO2	3.2 *Mod:AR Env	3.3 *Mod:Follow	3.4 *Mod:Latch	3.5 *Mod:SW 1	3.6 *Mod:SW 2	3.7 *Mod:Delay	3.8 *Mod:S&Hold
Patch	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

Similar parameters can be found in similar positions in every effect matrix.
Once you are familiar with one edit matrix, you will find it easy to
anticipate where to find controls in another matrix.

THE FULL EDIT MATRIX *(continued)*

Creating a Soft Row

In Pro mode you still have complete access to the Soft Row, which appears above row 0 of the full edit matrix. The parameters assigned here are duplicates of selected parameters in the matrix and can be adjusted from Row S (Soft Row), or from their matrix location.

The example below shows the edit matrix for the preset, P 0.0 Deep Blue (Random Hall algorithm). As you can see, parameters from locations throughout the matrix have been assigned to this Soft Row. In this preset (and in every preset) we have designed the Soft Row by assigning the Mix control first, followed by any Custom Controls, then the parameters in numerical order.

Parameters from the Controls row are assigned in order to the first locations, followed by assignments from the Time row, and so on. As Soft Row parameters are also labeled with the name of the row from which they were taken, this makes it relatively easy to find the source parameter for any Soft Row assignment.

In the presets, the convention of assigning Custom Controls 1-4 to Soft Row positions 1-4 allows you to identify the original control by its corresponding number, even when a name has been assigned to it.

Modifying the Soft Row, or creating a completely new Soft Row for an effect is easy:
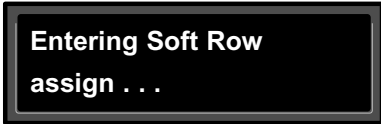
1. From the full Edit matrix, press Up until you get to the Soft Row, indicated by an S in the lower left corner of the display.

The Soft Row assigned to an effect appears
above Row 0 in the full Edit matrix.

S (Soft Row)	Controls Mix	Custom StereoWidth	Controls In Lvl	Time Low Rt	Time Crossover	Time Rt HC	Time Pre Delay	Design Size	Reflect Mstr Dly	Delay Mstr Dly
0 Controls	0.0 Mix	0.1 In Lvl	0.2 RvbOutLvl	0.3 Out Width						
1 Time	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay	1.5 Shelf				
2 Design	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Wander	2.6 Link	2.7 High Cut		
3 Reflect	3.0 *Mstr Dly/Lvl	3.1 *Dly/Lvl L	3.2 *Dly/Lvl R							
4 Delay	4.0 *Master	4.1 *Dly/Lvl/Fbk L	4.2 *Dly/Lvl/Fbk R							
5 Modulation	5.0 *Mod:LFO1	5.1 *Mod:LFO2	5.2 *Mod:AR Env	5.3 *Mod:Follow	5.4 *Mod:Latch	5.5 *Mod:SW1	5.6 *Mod:SW2	5.7 *Mod:Delay	5.8 *Mod:S&Hold	
Patch	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4	

We have highlighted those parameters in the Edit matrix which have been assigned to the Soft Row of P 0.0 Deep Blue, for example: Pre Delay and Control 1 (named StereoWidth in the Soft Row).

2. With any Soft Row parameter displayed, press and hold down the Edit button. The following display will appear briefly.

```
Entering Soft Row
assign . . .
```

When you release the Edit button, the display will change to the Soft Row Assignment display shown below. The Edit button LED will begin flashing and will continue to flash as long as you are in Soft Row Assign.

```
Soft Row param:   0
Controls   Mix
```

Here we show the first Soft Row parameter in our example — the actual Soft Row parameter selected will correspond to whichever one was displayed when you pressed and held Edit.

3. Turn ADJUST to scroll through all of the available parameters in the Edit matrix row by row, in numerical order. The entry "available" can be selected (at the fully counterclockwise position of ADJUST) to indicate that no assignment has been made at that position. Custom Controls are available for assignment at the end of the parameter list.

4. Turn SELECT to display another Soft Row position (0-9) for assignment. For each position, you can choose any effect parameter, including one(s) you have already assigned to a Soft Row position.

5. When you have arranged the Soft Row assignments as you want them, press Edit to exit Soft Row Assign and return to your last position in the Edit matrix. Pressing Up or Down once will also cause you to exit Soft Row Assign. Another push of either of these buttons will move you vertically through the Edit matrix.

When you return to Go mode, you will see the parameters in the order you assigned them — the spaces from any unassigned row positions will not appear.

PATCHING

Patching is the ability to assign a control (Source) to any PCM 91 parameter (Destination). This allows you to alter the value of the parameter by manipulating the control Source. For example, you can select the front panel ADJUST knob as a Source and an effect's Mix parameter as a Destination. This simple patch will allow you to dynamically alter the mix of the effect whenever you turn ADJUST. You can create as many as 10 patches, each with as many as 8 pairs of pivot points. You can patch multiple parameters to a single controller, or patch multiple Sources to a single Destination.

About Sources

All Sources are the same in the sense that each generates an output value in the range of 0-127. The output value is used to increase or decrease the setting of a Destination parameter. Sources differ in the way they generate an output. Some generate values continuously (they're always "on"); some generate output based on the position of a particular external MIDI controller, or an external footpedal, or footswitch. Some Sources generate output based on aspects of physical performance such as how loud, how fast, or how hard you play. The PCM 91 allows you to choose from a selection of Sources as shown for each Destination. A list of the available Sources is shown on the following page.

PATCHING *(continued)*

PCM 91 Patch Sources

Internal	
LFO1	Latch
Sine1	Sw 1
Cosine1	Sw 2
Square1	Sw 1 & 2
Sawtooth1	Delay
Pulse1	S&Hold
Triangle1	Mono Lvl
Random1	Left Lvl
LFO2	Right Lvl
Sine2	FootPedal
Cosine2	Foot Sw 1
Square2	Foot Sw 2
Sawtooth2	ADJUST
Pulse2	Custom 1
Triangle2	Custom 2
Random2	Custom 3
Env L	Custom 4
Env R	Tempo
Env L+R	On
AR Env	Off

MIDI Controller Numbers

000	Ignored	*(PCM 91 interprets 032 as Bank Select)*		082	General 7
001	Mod Wheel			083	General 8
002	Breath			084	Porta Ctl
003	Ctl 3	033	Ctl 33	085	Ctl 85
004	Foot Ctl				
005	PortaTime	063	Ctl 63	090	Ctl 90
006	Data Entry	064	Sustain	091	FX1 Depth
007	Volume	065	Porta On	092	FX2 Depth
008	Balance	066	Sostenuto	093	FX3 Depth
009	Ctl 9	067	SoftPedal	094	FX4 Depth
010	Pan	068	Legato	095	FX5 Depth
011	Xpression	069	Hold 2	096	Data Inc
012	Effect 1	070	Sound Var	097	Data Dec
013	Effect 2	071	Timbre	098	NRPN LSB
014	Ctl 14	072	Release	099	NRPN MSB
015	Ctl 15	073	Attack	100	RPN LSB
016	General 1	074	Bright	101	RPN MSB
017	General 2	075	Sound 6	102	Ctl 102
018	General 3	076	Sound 7		
019	General 4	077	Sound 8	119	Ctl 119
020	Ctl 20	078	Sound 9		
		079	Sound 10		
031	Ctl 31	080	General 5		
		081	General 6		

MIDI	
P Bend	Low Note
A Touch	High Note
Velocity	Clk Cmnds
Last Note	

The Patch Row

Each PCM 91 effect has an identical Patch row in its Edit matrix where you can make as many as 10 patches.

Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4
	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9

To make a patch, use SELECT and the Down button to move down through the Edit matrix to the Patch row. A display such as the following will appear.

The asterisk (✱) indicates that Sources will be selected when you turn ADJUST. Press Load/✱ to change the selection to Dst. Press Load/✱ again to bring up the Values display where you can select Src Value and Dst Value.

SELECT will move you across the Patch Row (0-9).

Patch 0   ✱Src
Int   LFO

The current Source assignment name is shown here. (The default assignment is Int . . . Off.

The Source type is indicated here. (Int, MIDI or 001-119 to indicate a MIDI Controller.)

Pressing the Load /✱ button will change the display to allow you to sequentially select: Src, Dst, Src Value and Dst Value. Press Up or Down together with Load /✱ to backstep to the previous parameter.

Assigning a Source

Three types of sources are available: Internal, MIDI and MIDI Controller. These types are indicated in the Source list by the labels: Int, MIDI, or a number (001-119). Turn ADJUST to scroll through the entire list of available sources.

Assigning a Destination

Once you have selected a Source, press Load /✱ and the display will change to allow you to assign a Destination (Dst).

The asterisk (✱) indicates that Destinations will be selected when you turn ADJUST. Press Load/✱ to bring up the Values display where you can assign Src Value and Dst Value. Press Load/✱ again to return to Source selection, etc.

SELECT will move you across the Patch Row (0-9).

Patch 0   ✱Dst
Reflect   Lvl L

The Edit matrix row label for the currently assigned parameter is shown here.

*The name of the current Destination assignment appears here. (*** Unassigned*** will appear across the bottom display line if no assignment is selected.)*

Turn ADJUST to scroll through all of the parameters in the Edit matrix of the currently loaded effect, including the Modulation parameters.

Once you have assigned a parameter as a Destination, the controller you have assigned "owns" that parameter. Adjustments made to this parameter from the Edit matrix, will only affect the initial value of the parameter when the program is loaded.

The behavior of the parameter on program load is determined by the setting of the Patch Update parameter in Control mode (1.7). This parameter can be set to Immediate or Delayed.

PATCHING *(continued)*

Assigning a Destination (continued)

When Immediate is selected, the initial value of the parameter value will correspond to the controller position. When Delayed is selected, the stored value of the parameter will continue to be in effect until the controller is moved. (It is, therefore, a good idea to set a sensible value to the parameter in the Edit matrix.)

Mod Row Parameters that Can Be Assigned as Patch Destinations

LFO1	Rate, Shape, P Width, Depth
LFO2	Rate, Shape, P Width, Depth
AR ENV	Attack, Release, Mode
Env L	Release
Env R	Release
Sw 1	Rate, P Width, Mode
Sw 2	Rate, P Width, Mode
Delay	Delay Time

Assigning Values

Once you have assigned a Destination, press Load /✱ to get to the Values display at the top of the next column.

This display allows you to assign Destination values to specific Source values. These assignments are made in pairs, each with a value for the Source and a value for the Destination. For example, the default is two pairs mapped as follows:

- minimum Src value (0) = minimum Dst value

- maximum Src value (127) = maximum Dst value

```
Patch 0      Values
✱000:            Off
```

Src values are shown here. The asterisk (✱) indicates that this field is available for control with the ADJUST knob (and that additional parameters are available by pressing Load/✱).

The current Dst value is displayed here. When you press Load/✱ again, the asterisk will move to indicate that this value is available to be changed by turning ADJUST.

```
Patch 0      Values
000: ✱           Off
```

This establishes a linear relationship between the parameter and the controller. Inverse control is accomplished easily by reversing these settings. As many as eight pairs of Destination/Source values, or pivot points, can be assigned here, providing an exciting new level of dynamic control.

Jump

When creating patches, there are situations in which you will want to leave the Patch row to adjust parameters. To make this convenient, a Jump command is available. Jumping is dependent on the current Patch display, and is activated simply by pressing Edit while a certain display is active. This will jump you out of the Patch row and to the location where you can make the necessary adjustments. Pressing Edit again will jump you back to the Patch Row. (Note that using any front panel controls other than those required to adjust the parameter to which you have jumped, will disable the jump. This is not catastrophic, but it will require you to return by using Up and Down and SELECT.)

The following Jumps are available:

From the Patch Row Src Display:

- With ADJUST or Custom 1-4 selected as the Source, press Edit to jump to the Controls row, where you can specify range limits. Press Edit again to return to the Patch row.

- With any modulation parameter selected as a Source, press Edit to jump to the Modulation row position of the Source. For example, if the Patch source LFO is displayed, press Edit to jump to Modulation row position 0 (LFO) where you can edit any LFO parameter value. Press Edit again to return to the Patch row.

From the Patch Row Dst Selection Display:

- Press Edit to jump to the Edit controls for the parameter you have selected as the Destination. You will have complete access to all parameter controls, including any subparameters at that location. Press Edit again to return to the Patch row.

From the Patch Row Values Display:

- Press Edit to jump to the next Src or Dst value. Default values are 0...minimum, 127...maximum.

Patching Examples

The following examples illustrate how to create a patch, use the patch jump features, modify the default patch values and add an additional pivot point to the example patch values.

Creating a Patch with Default Values

Load program P0 0.0 Deep Blue. Press Edit to enter Edit mode, then press Up to move to the Patch Row. Press Load/✱ until the display looks like the display that appears at the top of the next column:

```
┌─────────────────────────┐
│ Patch 0    ✱ Src         │
│                          │
│ Int            ADJUST    │
└─────────────────────────┘
```
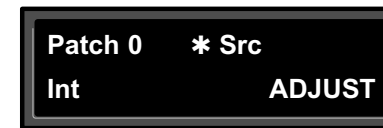
Turn SELECT to select Patch 2 (which is set to Off).

```
┌─────────────────────────┐
│ Patch 2    ✱ Src         │
│                          │
│ Int            Off       │
└─────────────────────────┘
```
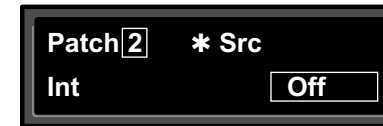
Turning ADJUST will scroll through the entire list of available patch Sources. Turn ADJUST counterclockwise until LFO1 is displayed in the lower right.

```
┌─────────────────────────┐
│ Patch 1    ✱ Src         │
│                          │
│ Int            LFO1      │
└─────────────────────────┘
```
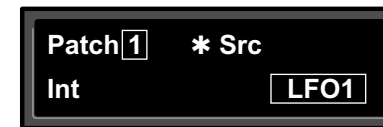
LFO1 is now assigned as a patch Source.

Press Load/✱ to bring up patch Destinations for selection. The display should show that Destination is unassigned.

```
┌─────────────────────────┐
│ Patch 2    ✱ Dst         │
│   ✱✱✱ Unassigned ✱✱✱      │
│                          │
└─────────────────────────┘
```
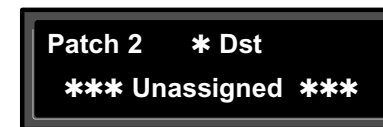
PATCHING *(continued)*

Creating a Patch with Default Values *(continued)*

The ADJUST knob will now scroll through all of the available parameters of Deep Blue. The lower line of the display will show the edit matrix row label on the left, and the parameters in that row on the right. Turn ADJUST clockwise until Out Width (in the effect's Controls row) is displayed in the lower right corner.

```
┌─────────────────────────┐
│  Patch 2    ✱ Dst       │
│  Controls  ┌──────────┐ │
│            │Out Width │ │
│            └──────────┘ │
└─────────────────────────┘
```

The Out Width parameter is now assigned as the patch Destination.

Now, press Load/✱ to bring up the Values display. This will show the default Destination value setting (-360 Mono). This is the value assigned to Out Width when LFO1 is at its minimum value (000).

```
┌─────────────────────────┐
│  Patch 2    Values      │
│ ┌────────────────────┐  │
│ │✱ 000     -360 Mono │  │
│ └────────────────────┘  │
└─────────────────────────┘
```
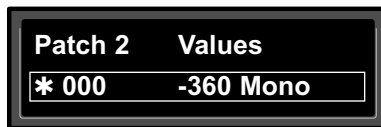
Turn ADJUST one click counterclockwise to display the default Destination value (+360 Mono) assigned to Out Width when LFO1 is at its maximum value (127).

```
┌─────────────────────────┐
│  Patch 2    Values      │
│ ┌────────────────────┐  │
│ │✱ 127     +360 Mono │  │
│ └────────────────────┘  │
└─────────────────────────┘
```

That's all there is to setting up a default patch— select a Source and Destination, and the minimum and maximum patch values are set automatically.

Of course, you will often want to modify the patch further, either by adjusting the modulation source parameters, changing the default values or adding additional pivot points. In the following sections, we'll continue using this patch to demonstrate examples of these modifications. When we're done, the new patch will add dynamic spatialization to the Deep Blue program.

Adjusting the Modulation Source Parameters

Continuing the previous example, we'll adjust the rate of LFO1 by jumping to it from the Patch row.

Press Load/✱ repeatedly to return to the Patch 2 Source selection display.

```
┌─────────────────────────┐
│  Patch 2  ┌──────────┐  │
│           │ ✱ Src    │  │
│           └──────────┘  │
│  Int            LFO1    │
└─────────────────────────┘
```
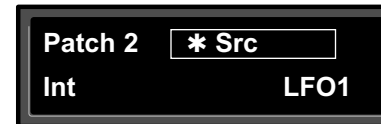
Press Edit to jump directly to the LFO1 parameters in the Mod row.

The asterisk (✱) indicates that LFO1 Rate will be altered when you turn ADJUST. Press Load/✱ to change the selection to the other LFO1 parameters (Shape, P Width, and Depth).

```
┌─────────────────────────┐
│  ■ Mod : LFO1    ✱ Rate │
│  5.0        0.00Hz      │
└─────────────────────────┘
```

The display now shows position 5.0 in the Edit matrix Mod Row.

Turn ADJUST to change the rate of LFO1 to 0.30Hz.

```
┌─────────────────────────────────┐
│  Mod : LFO1            ✱ Rate    │
│  5.0          │ 0.30Hz │         │
└─────────────────────────────────┘
```

Now, press Edit to jump back to your previous position in the Patch row.

```
┌─────────────────────────────────┐
│  Patch 2      ✱ Src             │
│  Int                   LFO1      │
└─────────────────────────────────┘
```
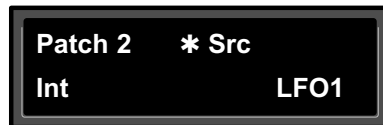
Changing the Default Destination Values

Let's modify the patch further by adjusting the Destination values to a more useful range.

Press Load/✱ repeatedly until the Patch 2 Values screen is displayed.

```
┌─────────────────────────────────┐
│     Patch 2    Values            │
│  ✱ 000        -360 Mono          │
└─────────────────────────────────┘
```

Notice that the ✱ is to the left of the Source value. This indicates that the Source value is selected and its value will be changed when you turn ADJUST.

Press Load/✱ once to move the ✱ to the right of the Source value. When the ✱ is in this position, ADJUST will change the Destination value.

```
┌─────────────────────────────────┐
│  Patch 2    Values               │
│ ✱ 000:       -360 MONO           │
└─────────────────────────────────┘
```
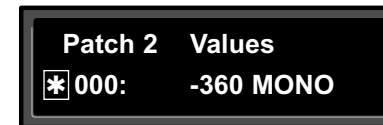
The asterisk (✱) indicates that the Source value will be altered when you turn ADJUST.

```
┌─────────────────────────────────┐
│     Patch 2    Values            │
│  000: ✱        -360 MONO         │
└─────────────────────────────────┘
```

Press Load/✱ to move the asterisk to this position, where it indicates that Destination values will be altered when you turn ADJUST.

With the Destination value selected, turn ADJUST clockwise to set the value to +0.

```
┌─────────────────────────────────┐
│  Patch 2     Values              │
│  000 : ✱     │ +0 Mono │         │
└─────────────────────────────────┘
```

Next, we'll want to adjust the Destination value when LFO1 is at its maximum value. One way to do this is to press Load/✱ three times to cycle the ✱ to the display of the Source value, and continue on from there — but we've provided a short cut! Press Edit to jump to the next assigned value (in our example, the maximum value for LFO1).

```
┌─────────────────────────────────┐
│  Patch 2     Values              │
│ │ 127 : ✱     +360 Mono │        │
└─────────────────────────────────┘
```
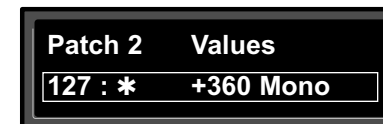
PATCHING *(continued)*

Changing the Default Destination Values *(continued)*

Note that the ✻ remains in the same position, so you can just turn ADJUST to set the new Destination value. Set the value to +90.

```
Patch 2      Values
127 : ✻    +90 L-R, R-L
```
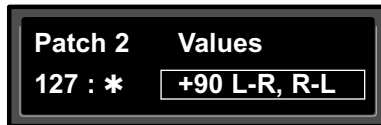
Now our example has been modified so that LFO1 sweeps the Out Width Value from 0 to 90. This creates a dynamic alteration of the effect's spatial characteristics. Its stereo image changes smoothly from mono to stereo, to surround, and back again.

Adding an Additional Pivot Point to the Patch

So far, our example uses only two pairs of patch values. The Destination parameter moves linearly between the value assigned at 000 and the value assigned at 127.

You can watch this change by displaying the Destination parameter. Here's how to jump directly to it from the patch:

Press Load/✻ repeatedly to return to the Patch 2 Destination selection display.

```
Patch 2     ✻ Dst
Controls        Out Width
```

Press Edit to jump directly to the Out Width parameter in the Controls Row.

Patch Destination Indicator

```
Controls    Out Width ■
0.3          +0...90 MONO
```

The Out Width value will be changing from 0 to 90 and back again.

The display will change to show position 0.3 in the Controls Row. Note that the value is changing continuously from 0 to 90 and back again. Notice also the small square in the upper right corner of the display. This patch destination indicator appears whenever a parameter has been assigned as a patch Destination in the effect being edited.

Now let's return to the Patch row to add a pivot point to the effect.

Press Edit to jump back to the Patch row.

```
Patch 2      ✻ Dst
Controls        Out Width
```
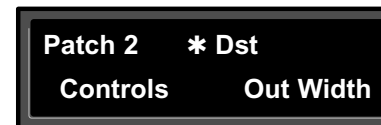
Press Load/✱ to bring up the Values display. The last value edited will be displayed, so you will see either the minimum or maximum value.

```
┌──────────────────────┐        ┌──────────────────────┐
│  Patch 2   Values    │        │  Patch 2   Values    │
│ ✱ 000      +0 MONO   │  or    │ 127 : ✱    +90 L-R, R-L │
└──────────────────────┘        └──────────────────────┘
```
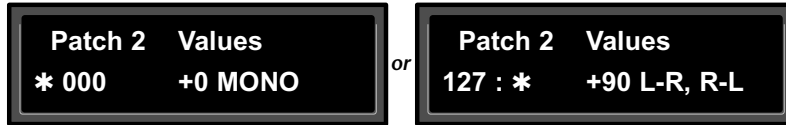
If the ✱ is not at the left of the Source value, press Load/✱ three times to move it there. (You can take a short cut instead — simultaneously press Down and Load/✱ to back-step.)

```
┌──────────────────────┐        ┌──────────────────────┐
│  Patch 2   Values    │        │  Patch 2   Values    │
│ ✱ 000      +0 MONO   │  or    │ ✱ 127 :    +90 L-R, R-L │
└──────────────────────┘        └──────────────────────┘
```
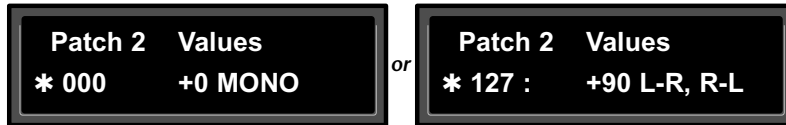
Turn ADJUST to display 64. This will be the Source value of our new pivot point. The string of dots in the destination value portion of the display indicate that there is no Destination value assigned when the source value is 64.

```
        ┌──────────────────────────┐
        │   Patch 2    Values      │
        │ ✱ 064 : . . . . . . . . . . . . . . . │
        └──────────────────────────┘
```
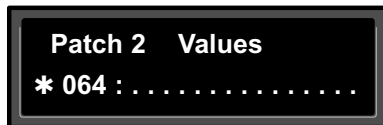
Press Load/✱ to move the ✱ to the right of the Source value, and turn ADJUST clockwise to set the Destination value for this point to –45.

```
        ┌──────────────────────────┐
        │   Patch 2    Values      │
        │ 064 :│✱           -45 R, L │
        └──────────────────────────┘
```

By adding this pivot point, we have put a "kink" in the patch. The value of the Destination parameter no longer moves in a straight line between 0 and 90. Instead it moves from 0 to –45, and then from –45 to 90. This will produce a very different sounding spatial change from the original patch. You can see the difference by pressing Load/✱ twice to display the patch Destination, then pressing Edit to jump back to the Destination parameter to watch its value change.

Multiple Patches with the Same Destination

If you create two or more patches with the same Destination, the Destination value will be the sum of all of the patches assigned to it.

For example, if Footpedal and ADJUST are both assigned to Mix, the Mix value will be the sum of the patch Destination values for those two patches. When creating multiple patches to the same Destination, you should set the individual Destinations to values which, when added together, are less than or equal to the maximum value for the parameter. Footpedal and ADJUST, for example, could each have a maximum value of 50%, or they could be assigned values of 25% and 75%, 60% and 40%, etc.

When the sum of multiple patched parameter Destination values is greater than the maximum value of the parameter, the parameter value will remain at maximum until the sum of the patches falls below it.

PATCHING *(continued)*

Mod Row Patches

AR ENV, Latch, Sw 1, Sw 2 , Delay and S&Hold are each activated by assigning a threshold source to T Src that is used to turn them on and off. This assignment is a subparameter in the Mod row — not in the Patch row.

THE CUSTOM ROW

Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4
	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4	

The Custom row of the full edit matrix allows you to customize an effect by adding defining ranges, as well as meaningful names and labels to the ADJUST knob and Custom Controls. It also provides controls for assigning KeyWords to effects for sorting purposes.

Setting Range Limits for ADJUST and Custom Controls

The first five positions in the Custom row: ADJUST and Control 1-4 allow customization of the ADJUST knob and any Custom Controls you want to place in the Soft Row. The controls for each of these behave identically. The first set of controls allows you to set range limits. Press Load/✶ and turn SELECT to display Low Limit, High Limit and MidPoint. Use ADJUST to select values from 0-127.

Low Limit is the minimum value that the control will output. In most cases this will be 0 (or 127 for inverted control). If ADJUST or the Custom Control is also mapped to a MIDI controller, incoming MIDI values below this minimum value will be treated as equivalent to the Low Limit.

High Limit is the maximum value the control will output. This can be set to any value above the Low Limit and effectively establishes the total range of the controller. If ADJUST or the Custom Control is also mapped to a MIDI controller, MIDI values above this maximum value will be treated as equivalent to the High Limit.

In many cases, where the control is to have full range (0-127) or where it is to behave as an off/on switch (0-1) these two values (Low and High) are the only ones which have to be specified. In other cases, the control can be enhanced by adding more than just these simple range limits.

MidPoint allows you to establish a fixed reference point between the selected Low and High Limits. The MidPoint has no effect on the established range , but does determine the number of positions within the controller's range which can be labeled with text.

Labeling ADJUST, the Custom Controls and Their Ranges

Press and hold the Edit button to access a submode which allows you to name the control, as well as any points you have assigned. While you are holding down Edit, the message: Entering Custom label assign ... will be displayed, followed by the current name of the control with a cursor positioned over the first character of the name. Use ADJUST to select a new character. Press Up or Down to select a new type of character (upper case, lower case, numeric, symbolic, or blank). Simultaneously press Up and Down to clear all characters from the cursor to the end of the line. Turn SELECT to move the cursor to a new position. Continue in this manner until you have finished entering the new name. A maximum of 20 characters (including spaces) may be used.

PCM 91 Character Set

! " # $ % & ' ( ) * + , - . / 0 1 2 3
4 5 6 7 8 9 : ; < = > ? @ A B C D
E F G H I J K L M N O P Q R S T U
V W X Y Z [¥] ^ _ ' a b c d e f g
h i j k l m n o p q r s t u v w x y z
{ : } ~ z (space)

The @ and the $ symbols are used to represent Custom Control values.

Press Load/✱ repeatedly to cycle through the remaining choices: LowLabel, HighLabel, MidLabel, LowRange and HighRange. Names are entered using ADJUST and SELECT in exactly the same manner.

- **LowLabel:**   The name you assign will appear on the bottom line of the display when the control reaches the value set as the Low limit.

- **HighLabel:**   The name you assign will appear on the bottom line of the display when the control reaches the value set as the High Limit.

- **MidLabel:**   The name you assign will appear on the bottom line of the display when the control reaches the value set as the MidPoint. (This naming display is not available if you have not assigned a MidPoint within the range established by the Low and High Limits.)

- **LowRange:**   The name you assign here will be displayed whenever the controller is between the MidPoint and the Low Limit.

- **HighRange:**   The name you assign here will be displayed whenever the controller is between the MidPoint and the High Limit.

You can display numerical values anywhere along the bottom line of the display by entering the characters @ or $ where you want values to appear. As many as three digits can be displayed, representing absolute distance from the Low Limit (@@@), or relative distance from the selected MidPoint ($$$). If the MidPoint is at or below the Low Limit, this range will be equivalent to the entire range of the controller. The default status of the label displays includes @@@ already entered at the beginning of the entry line. Check out the presets in the Custom row of any bank for examples of Custom Controls.

Assigning KeyWords to an Effect

The last four positions of the Custom row allow as many as four KeyWords to be assigned to the current effect. At each position (KeyWord 1-4), use ADJUST to select a representative KeyWord from the list shown below — or "none".

Effect sorting by KeyWord is accomplished in Control mode at location1.8. To view the sorted list, repeatedly press either Program Banks or Register Banks through all of the available banks, then to the KeyWord display. In Control mode, A to Z is available as a viewing selection. All effects are internally tagged to allow this option of alphabetical sorting.

Assignable KeyWords			
Acoustic	Dynamic	MIDI	Splits
Ambience	Echo	Mono	Stereo
Ballad	Film-ADR	Natural	Surround
Bright	Gated	Orchestral	Tempo
Broadcast	Guitar	Outdoor	Unnatural
Cascade	Indoor	Plate	Vocal
Chamber	Instrument	RandomHall	User 1
Classical	Keyboard	Room	User 2
Cncrt Hall	Large	Short	User 3
Custom	Live PA	Slap FX	User 4
Dark	Long	Small	
Dialog	Mastering	Spatial	
Drums/Perc	Medium	Special FX	

3

Algorithms and Parameters

The PCM 91 uses 15 algorithms to create different types of reverberation effects. Each of these algorithms and its associated parameters are described in detail in this section.

When you select any effect, the bank and row label will appear on the upper display line. The matrix location and the effect name will appear on the lower line. Press and hold Program Banks or Register Banks to display the algorithm from which the currently loaded effect is derived. Press Edit to display the last edited parameter in that algorithm's parameter matrix.

Halls: Orchestral

P0 0.0   Deep Blue

Press Edit to access the parameter matrix.
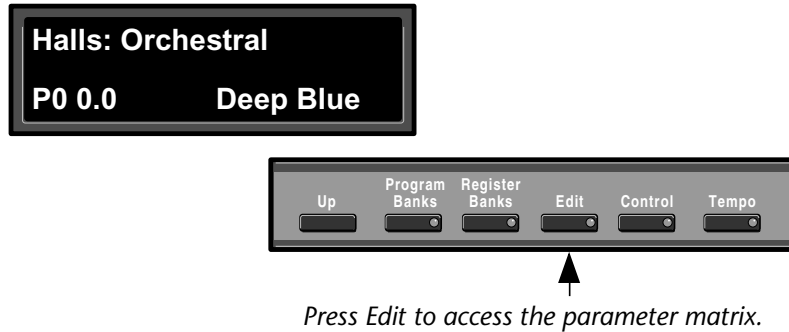
ABOUT THE ALGORITHMS

All of the PCM 91 algorithms share the same general structure, shown at the top of the next column. The shaded area of the diagram is detailed in the individual effect descriptions that follow.

The algorithms also share a common set of controls and parameters built around one or more of the five stereo reverb effects.
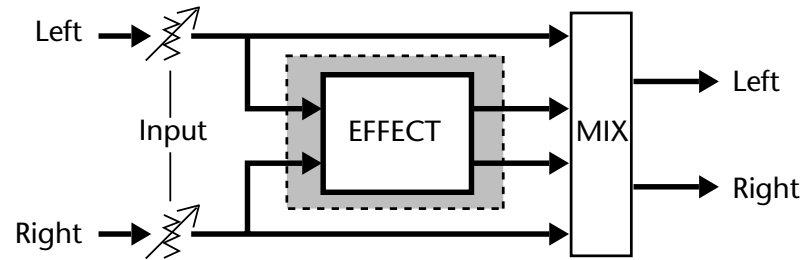
Input levels and hardwired pans determine the signal flow to left and right pairs of delay voices, and also to the reverb effect. Some delay voices have individually adjustable level, delay, and feedback controls, as well as master voice controls. A High Cut parameter provides high end rolloff. InWidth and OutWidth controls allow the creation of spatial effects.

In this chapter, diagrams and descriptions of each algorithm are presented first, along with pictures of each edit matrix. The diagrams are followed by a glossary of parameter descriptions, organized alphabetically by matrix row name. Within each matrix row, parameters are organized as far as possible in the sequence in which they appear in the row.

RANDOM HALL

The Random Hall algorithm gives recorded music a sense of being performed in a real acoustic location. The Size, Spread and Shape controls allow adjustment of the buildup and decay of the initial part of the reverberation envelope. Shape controls the shape of the envelope, while Spread and Size set the time over which this shape is active.

Size acts as a master control for the apparent size of the space being created. Both Spread and Reverb Time vary linearly with the setting of Size. Thus maximum reverb time and spread require high settings of Size. To find an appropriate reverb sound, start with a preset with a similar sound to what you want to end up with, turn ADJUST to see what effect it has, then investigate the parameters, starting with Size. Until you are familiar with the PCM 91, we recommend that you edit any patch driving a parameter rather than editing the parameter directly.

Once a size has been selected, Spread and Shape are used to adjust the shape and duration of the initial reverb envelope, which together provide the major sonic impression of room size.

When Shape is at minimum, the reverberation envelope builds up very quickly to a maximum amplitude, and then dies away quickly at a smooth rate. This envelope is characteristic of small reverberation chambers and plates. There are few (if any) size cues in this envelope, so it is ineffective in creating ambience. With this Shape setting, Spread has no effect. The density is set by the Size control, and the rate of decay is set by the reverb time controls.

0 Controls	0.0 Mix	0.1 In Lvl	0.2 RvbOutLvl	0.3 Out Width				
1 Time	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay	1.5 Shelf		
2 Design	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Wander	2.6 Link	2.7 High Cut
3 Reflect	3.0 *Mstr Dly/Lvl	3.1 *Dly/Lvl L	3.2 *Dly/Lvl R					
4 Delay	4.0 *Master	4.1 *Dly/Lvl/Fbk L	4.2 *Dly/Lvl/Fbk R					
5 Modulation	5.0 *Mod:LFO1	5.1 *Mod:LFO2	5.2 *Mod:AR Env	5.3 *Mod:Follow	5.4 *Mod:Latch	5.5 *Mod:SW1	5.6 *Mod:SW2	5.7 *Mod:Delay	5.8 *Mod:S&Hold
Patch	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

RANDOM HALL *(continued)*

As Shape is raised to about 1/8 of its range, the initial sharp attack of the reverberation is reduced, and reverberation builds more slowly. The envelope then sustains briefly before it begins to die away at the rate set by Mid Rt. Spread has little or no effect on this shape. When Shape is at 1/4 of its range, buildup is even slower and the sustain is longer. Now Spread affects the length of both the buildup and the sustain. As a rough estimate, the sustain will be approximately the time value indicated by the Spread display (in milliseconds).

As Shape is raised further, the buildup and sustain remain similar, but now a secondary sustain appears in the envelope, at a lower level than the first. This secondary plateau simulates a very diffused reflection off the back wall of a hall, and is effective in creating a sense of size and space. This reflection becomes stronger and stronger, reaching an optimal loudness when Shape is at about 1/2 of its range.

The highest Shape settings are typically used for effects. Near the top of the scale the back wall reflection becomes stronger than the earlier part of the envelope, resulting in an inverse sound.

Note that none of these shape effects are audible unless Mid Rt is set short enough. Generally, this control should be set to a value of about 1.2 seconds for small rooms, and up to 2.4 seconds or so for halls. Size should also be set to a value appropriate to the desired hall size (note, however, that small sizes color the reverberation).15 meters makes a very small room, and 38 meters is useful for a large hall.

Random Hall incorporates random delay elements which have several effects. First, there is a reduction of long-lived modes in the reverberant decay, which makes the decay less metallic and reduces the apparent reverb time. The random elements also improve the steady-state timbre of the program.

The speed at which the delay elements move is controlled by Spin. Values of Spin which are higher than about 40% can cause audible pitch wobble in very critical material (such as classical guitar or piano) and can also cause noise on pure tones. This noise is not audible in speech, however, and, for mixed music or speech, values up to 50% will give an improved sound. Wander is typically set to about 10ms at larger settings of Size. Smaller values of Wander should be used when smaller Sizes are used.

This algorithm also offers the option of adding early reflections which have been made into diffused clusters of pre-echoes. The density of the cluster is set by the Diffusion control. We recommend that these pre-echoes be used with caution, unless you are trying to match the sound of the reverberation to a particular location where such reflections are strong.

An output width control affects the stereo image of the signal leaving the reverb effect. OutWidth can add width to a signal, or move a reverb into a surround channel. Either control can be used statically or dynamically, but in certain positions may be mono-incompatible.

AMBIENCE

While Random Hall effects are designed to add a cushion of reverberance to recorded music, while leaving the clarity of the direct sound unaffected, Ambience is intended to become a part of the direct sound — to give it both better blend and a definite position in space. Ambience gives warmth, spaciousness and depth to a performance without coloring the direct sound at all.

This algorithm generates primarily the strong reflections which appear in the first few hundred milliseconds of the reverberation process. These early reflections constitute the primary audible effect, giving you the impression of a hall surrounding you while the music is playing. To avoid any coloration from these strong reflections, the time delays and amplitudes are random functions.

Ambience is very useful for adding a room sound to recorded music or speech. It is particularly easy to match a studio recording of dialog to a typical room environment. In music recording, it allows you to realistically add distance to a close-miked signal.

If an ensemble has been recorded with close-mic and pan pots, Ambience can provide the missing blend and depth. The apparent position of the instruments is preserved in the reverb while the apparent distance is increased. This algorithm is also useful in matching a closely miked accent microphone to the overall ambience of a recording. This allows a soloist to be increased in level without changing the apparent distance. Ambience can be used in a recording situation any time a close-miked sound is undesirable.

To use the algorithm with a console, it is best to use a stereo send to the PCM 91, carefully matching the panning of the various close-miked sources to their positions in the mix. Leave the Mix control at 100%. The apparent distance of each source can be controlled by the level of its feed.

0 Controls	0.0 Mix	0.1 In Lvl	0.2 In Width	0.3 RvbOutLvl	0.4 Out Width					
1 Time	1.0 Decay	1.1 Decay Lvl	1.2 Pre Delay	1.3 DryDly	1.4 DryDlyMix					
2 Design	2.0 Size	2.1 Diffusion	2.2 Spin	2.3 Wander	2.4 High Cut					
3 Modulation	3.0 *Mod:LFO1	3.1 *Mod:LFO2	3.2 *Mod:AR Env	3.3 *Mod:Follow	3.4 *Mod:Latch	3.5 *Mod:SW 1	3.6 *Mod:SW 2	3.7 *Mod:Delay	3.8 *Mod:S&Hold	
Patch	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4	

RICH PLATE

The Rich Plate algorithm mimics the sound of metal plates. It has a dense, smooth, colored sound that makes it a good choice for enhancing any type of percussion. Larger sizes and longer reverb times are particularly effective on vocals and brass, but this algorithm can be optimized for use on virtually any source.

0 Controls	0.0 Mix	0.1 In Lvl	0.2 In Width	0.3 RvbOutLvl	0.4 Out Width				
1 Time	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay				
2 Design	2.0 Size	2.1 Diffusion	2.2 Attack	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut		
3 Reflect	3.0 *Mstr Dly/Lvl	3.1 *Dly/Lvl L	3.2 *Dly/Lvl R						
4 Echo	4.0 *Mst Dly/Fbk	4.1 *Dly/Fbk L	4.2 *Dly/Fbk R						
5 Delay	5.0 *Master	5.1 *Dly/Lvl/Fbk L	5.2 *Dly/Lvl/Fbk R						
6 Modulation	6.0 *Mod:LFO1	6.1 *Mod:LFO2	6.2 *Mod:AR Env	6.3 *Mod:Follow	6.4 *Mod:Latch	6.5 *Mod:Sw 1	6.6 *Mod:Sw 2	6.7 *Mod:Delay	6.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4	

CONCERT HALL

This algorithm emulates a real concert hall. The reverberation is very clean, and designed to remain behind the direct sound — adding ambience, but leaving the source unchanged. This effect has a relatively low initial echo density which builds up gradually over time.

This algorithm also features a post-reverb compressor which can be used to shape the reverb tail in unusual ways. Spatial EQ controls, following the compressor, can be used to widen or narrow low-frequency stereo separation. A dry signal path allows you to process material with or without reverberation. This is useful in live recordings.

Note that the compressor and expander controls are computed simultaneously.

0 Controls	0.0 Mix	0.1 In Lvl	0.2 In Width	0.3 RvbOutLvl	0.4 Out Width					
1 Time	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay					
2 Design	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Def	2.5 Depth	2.6 Spin	2.7 Chorus	2.8 Link	2.9 High Cut
3 Reflect	3.0 *Mstr Dly/Lvl	3.1 *Dly/Lvl L	3.2 *Dly/Lvl R							
4 Compress	4.0 Ratio	4.1 Threshold	4.2 Gain	4.3 LookAhead	4.4 Attack	4.5 Release				
5 Expand	5.0 Ratio	5.1 Threshold	5.2 Gain							
6 Spatial EQ	6.0 Premix	6.1 Crossover	6.2 Gain	6.3 BassBoost						
7 Modulation	7.0 *Mod:LFO1	7.1 *Mod:LFO2	7.2 *Mod:AR Env	7.3 *Mod:Follow	7.4 *Mod:Latch	7.5 *Mod:Sw 1	7.6 *Mod:Sw 2	7.7 *Mod:Delay	7.8 *Mod:S&Hold	
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4	

CHAMBER/ROOM

This algorithm provides two independent reverbs which can be used in mono in/stereo out, or stereo in/stereo out configuration. Chamber provides an even, relatively dimensionless reverberation, with little change in color as the sound decays. Its unobtrusive character makes it useful on a wide range of program material. Room produces an excellent simulation of a very small room which is useful for dialog and voiceover applications, but which may be too colored for some sustained musical tones. Increasing the Size/Shape/Spread parameters produces an excellent reverb and an Infinite control allows you to freeze a signal for as long as you like. The outputs of the two reverbs are summed into a single stereo output.

Diagram labels — CHAMBER: EchoFbk L, EchoDlyL, RefDly L, RefLvl L, A InLvl, Diffusion, Pre Delay, Low Rt, Mid Rt, Crossover, Rt HC, Size, Shape, Spin, Spread, Link, Rvb Out, High Cut, A OutLvl, RefDly R, RefLvl R, EchoDlyR, EchoFbk R, In Routing, L Out, R Out.

Diagram labels — ROOM: EchoFbk L, EchoDlyL, B InLvl, Diffusion, Pre Delay, Low Rt, Mid Rt, Crossover, Rt HC, Size, Shape, Spin, Spread, Link, Infinite, Range, Rate, High Cut, B OutLvl, EchoDlyR, EchoFbk R.

0 Controls	0.0 Mix	0.1 *InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 Time:A	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay				
2 Design:A	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut	2.7 RvbOut	
3 Reflect:A	3.0 *Mstr Dly/Lvl	3.1 *Dly/Lvl L	3.2 *Dly/Lvl R						
4 Echo:A	4.0 *Mstr Dly/Fbk	4.1 *Dly/Fbk L	4.2 *Dly/Fbk R						
5 Time:B	5.0 Low Rt	5.1 *Mid Rt	5.2 Crossover	5.3 Rt HC	5.4 Pre Delay	5.5 Infinite			
6 Design: B	6.0 Size	6.1 Diffusion	6.2 Shape	6.3 Spread	6.4 Spin	6.5 Link	6.6 High Cut	6.7 Range	6.8 Rate
7 Echo:B	8.0 *Mstr Dly/Fbk	8.1 *Dly/Fbk L	8.2 *Dly/Fbk R						
8 Modulation	8.0 *Mod:LFO1	8.1 *Mod:LFO2	8.2 *Mod:AR Env	8.3 *Mod:Follow	8.4 *Mod:Latch	8.5 *Mod:Sw 1	8.6 *Mod:Sw 2	8.7 *Mod:Delay	8.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4	

THE DUAL REVERB ALGORITHMS

THE REVERB BLOCKS

Chamber

This algorithm (described earlier and repeated for completeness) produces an even, dimensionless reverberation, with little change in color as the sound decays. The initial diffusion is similar to the Concert Hall algorithm, but the sense of size and space is much less obvious. This characteristic, along with low color in the decay tail, makes Chamber useful on a wide range of program material. It is especially useful on spoken voice, giving a noticeable increase in loudness with very low color.

Inverse

This effect allows you to vary the slope of The initial portion of the reverb envelope. The slope can decay, remain level, or rise over a variable time interval. When the time interval is up, the reverberation cuts off abruptly, resulting in an effect similar to a gate, but not dependent on the level or complexity of the input signal. Slopes are adjustable over negative, even, or positive slopes. Positive slopes create inverse effects, while more even slopes create gated effects. Negative slope values have rather natural reverb tails.

Chamber

Inverse
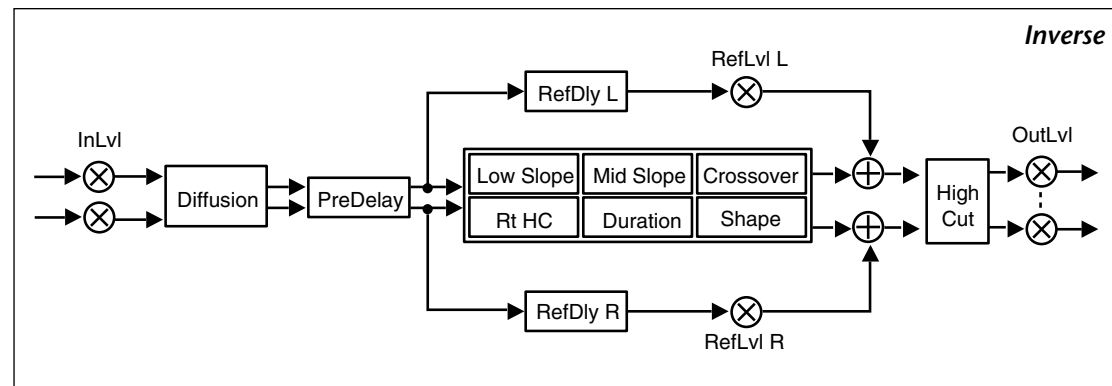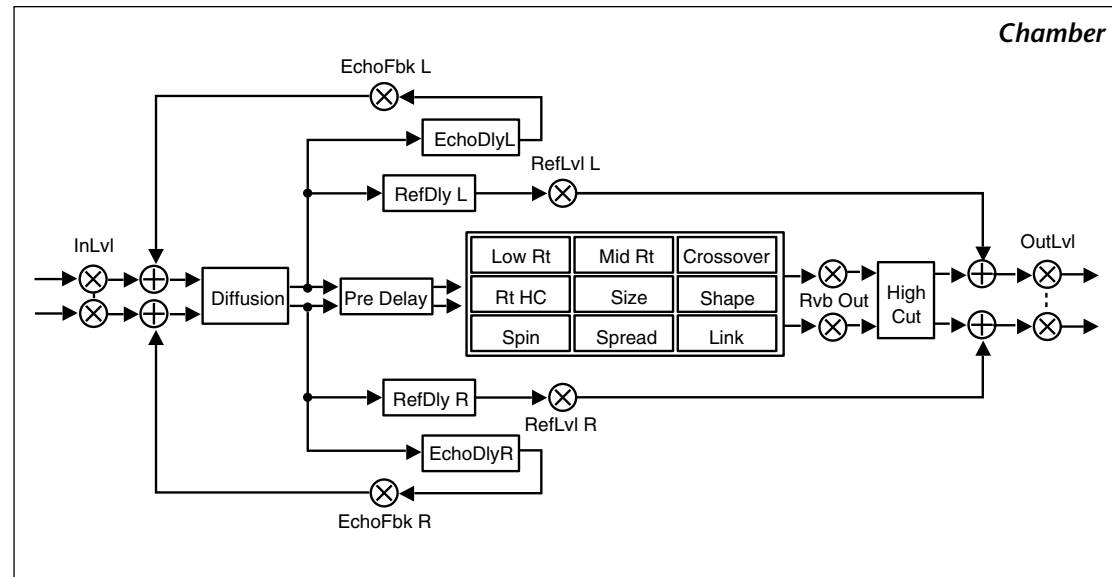
THE REVERB BLOCKS *(continued)*

Room2

This algorithm is a variation of the Room algorithm with different Shape and Spread characteristics, and an overall higher gain. This algorithm provides an excellent simulation of a very small room which is useful for dialog and voiceover applications, but which may be too colored for some sustained musical tones. Increasing the Size/Shape/Spread parameters produces an excellent reverb, and an Infinite parameter allows you to freeze the reverberation for as long as you like.

Room 2

EchoFbk L

EchoDlyL

Low Rt	Mid Rt	Crossover
Rt HC	Size	Shape
Spin	Spread	Link
Infinite	Range	Rate

InLvl

Diffusion

Pre Delay

High Cut

OutLvl

EchoDlyR

EchoFbk R
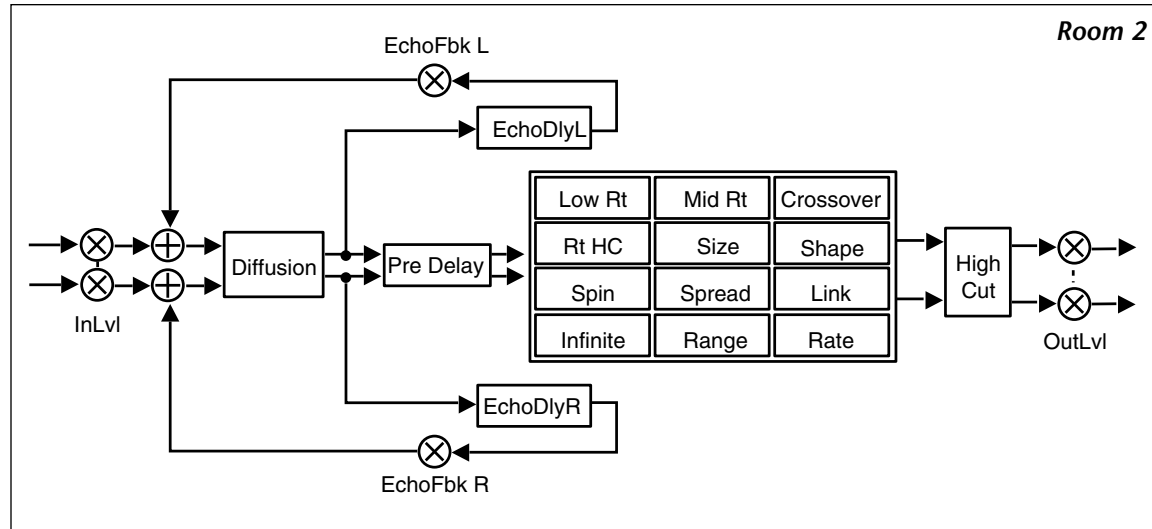
Surround Chamber

This algorithm is similar to Chamber, but has a mono output. This output is added to the output of another reverb block 180° out-of-phase to allow a surround decoder to identify which signals are to be routed to the surround channel.
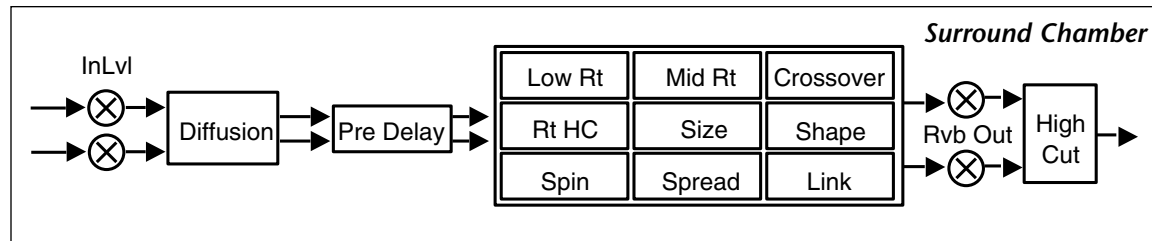
Note: This algorithm must be used through a surround decoder to avoid undesirable effects. When used with another reverb block (as in the Matrix Chamber algorithm, its entire signal can be canceled out when used in mono. In stereo, Surround Chamber can cloud the mix if it is of comparable loudness to the Chamber side of the algorithm.

Surround Chamber

InLvl

Diffusion

Pre Delay

Low Rt	Mid Rt	Crossover
Rt HC	Size	Shape
Spin	Spread	Link

Rvb Out

High Cut

DUAL MONO REVERBS

Room2-Room2

0 Controls	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 Time:A	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay	1.5 Infinite			
2 Design:A	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut	2.7 Range	2.8 Rate
3 Echo:A	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R						
4 Time:B	4.0 Low Rt	4.1 Mid Rt	4.2 Crossover	4.3 Rt HC	4.4 Pre Delay	4.5 Infinite			
5 Design:B	5.0 Size	5.1 Diffusion	5.2 Shape	5.3 Spread	5.4 Spin	5.5 Link	5.6 High Cut	5.7 Range	5.8 Rate
6 Echo:B	6.0 *Mstr Dly	6.1 *Dly L	6.2 *Dly R						
7 Modulation	7.0 *Mod:LFO1	7.1 *Mod:LFO2	7.2 *Mod:AR Env	7.3 *Mod:Follow	7.4 *Mod:Latch	7.5 *Mod:Sw 1	7.6 *Mod:Sw 2	7.7 *Mod:Delay	7.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

DUAL MONO REVERBS (continued)

Inverse-Inverse

0 Controls	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 Time:A	1.0 LowSlope	1.1 Mid Slope	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay				
2 Design:A	2.0 Duration	2.1 Diffusion	2.2 Shape	2.3 High Cut					
3 Reflect:A	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R						
4 Time:B	4.0 LowSlope	4.1 Mid Slope	4.2 Crossover	4.3 Rt HC	4.4 Pre Delay				
5 Design:B	5.0 Duration	5.1 Diffusion	5.2 Shape	5.3 High Cut					
6 Reflect:B	6.0 *Mstr Dly	6.1 *Dly L	6.2 *Dly R						
7 Modulation	7.0 *Mod:LFO1	7.1 *Mod:LFO2	7.2 *Mod:AR Env	7.3 *Mod:Follow	7.4 *Mod:Latch	7.5 *Mod:Sw 1	7.6 *Mod:Sw 2	7.7 *Mod:Delay	7.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

Chamber-Inverse

0 Controls	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 Time:A	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay				
2 Design:A	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut	2.7 RvbOut	
3 Reflect:A	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R						
4 Echo:A	4.0 *Mstr Dly	4.1 *Dly L	4.2 *Dly R						
5 Time:B	5.0 LowSlope	5.1 Mid Slope	5.2 Crossover	5.3 Rt HC	5.4 Pre Delay				
6 Design: B	6.0 Duration	6.1 Diffusion	6.2 Shape	6.3 High Cut					
7 Reflect:B	7.0 *Mstr Dly	7.1 *Dly L	7.2 *Dly R						
8 Modulation	8.0 *Mod:LFO1	8.1 *Mod:LFO2	8.2 *Mod:AR Env	8.3 *Mod:Follow	8.4 *Mod:Latch	8.5 *Mod:Sw 1	8.6 *Mod:Sw 2	8.7 *Mod:Delay	8.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

DUAL MONO REVERBS (continued)

Inverse-Room2

INVERSE

RefLvl L

RefDly L

A InLvl

Diffusion PreDelay

| Low Slope | Mid Slope | Crossover |
| Rt HC | Duration | Shape |

High Cut

A OutLvl

RefDly R

RefLvl R

In Routing

L Out

R Out

EchoFbk L

ROOM2

EchoDlyL

B InLvl

Diffusion Pre Delay

Low Rt	Mid Rt	Crossover
Rt HC	Size	Shape
Spin	Spread	Link
Infinite	Range	Rate

High Cut

B OutLvl

EchoDlyR

EchoFbk R

0 **Controls**	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl				
1 **Time:A**	1.0 LowSlope	1.1 Mid Slope	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay					
2 **Design:A**	2.0 Duration	2.1 Diffusion	2.2 Shape	2.3 High Cut						
3 **Reflect:A**	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R							
4 **Time:B**	4.0 Low Rt	4.1 Mid Rt	4.2 Crossover	4.3 Rt HC	4.4 Pre Delay					
5 **Design: B**	5.0 Size	5.1 Diffusion	5.2 Shape	5.3 Spread	5.4 Spin	5.5 Link	5.6 High Cut			
6 **Reflect:B**	6.0 *Mstr Dly	6.1 *Dly L	6.2 *Dly R							
7 **Modulation**	7.0 *Mod:LFO1	7.1 *Mod:LFO2	7.2 *Mod:AR Env	7.3 *Mod:Follow	7.4 *Mod:Latch	7.5 *Mod:Sw 1	7.6 *Mod:Sw 2	7.7 *Mod:Delay	7.8 *Mod:S&Hold	
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4	

Chamber-Chamber

0 Controls	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl				
1 Time:A	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay					
2 Design:A	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut	2.7 RvbOut		
3 Reflect:A	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R							
4 Echo:A	4.0 *Mstr Dly	4.1 *Dly L	4.2 *Dly R							
5 Time:B	5.0 Low Rt	5.1 Mid Rt	5.2 Crossover	5.3 Rt HC	5.4 Pre Delay					
6 Design: B	6.0 Size	6.1 Diffusion	6.2 Shape	6.3 Spread	6.4 Spin	6.5 Link	6.6 High Cut	6.7 RvbOut		
7 Reflect:B	7.0 *Mstr Dly	7.1 *Dly L	7.2 *Dly R							
8 Echo:B	8.0 *Mstr Dly	8.1 *Dly L	8.2 *Dly R							
9 Modulation	9.0 *Mod:LFO1	9.1 *Mod:LFO2	9.2 *Mod:AR Env	9.3 *Mod:Follow	9.4 *Mod:Latch	9.5 *Mod:Sw 1	9.6 *Mod:Sw 2	9.7 *Mod:Delay	9.8 *Mod:S&Hold	
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4	

DUAL MONO REVERBS
(continued)

Matrix Chamber

Matrix Chamber is designed to create surround-encoded reverb mixes. The algorithm sends the Chamber effect to the front speakers and the Surround Chamber effect to the surround speakers.

This effect should be recorded, monitored and played back in surround. The PCM 91 output must be decoded with any popular surround decoder.

0 Controls	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 Time:A	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay				
2 Design:A	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut	2.7 RvbOut	
3 Reflect:A	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R						
4 Echo:A	4.0 *Mstr Dly	4.1 *Dly L	4.2 *Dly R						
5 Time:B	5.0 Low Rt	5.1 Mid Rt	5.2 Crossover	5.3 Rt HC	5.4 Pre Delay				
6 Design: B	6.0 Size	6.1 Diffusion	6.2 Shape	6.3 Spread	6.4 Spin	6.5 Link	6.6 High Cut		
7 Modulation	7.0 *Mod:LFO1	7.1 *Mod:LFO2	7.2 *Mod:AR Env	7.3 *Mod:Follow	7.4 *Mod:Latch	7.5 *Mod:Sw 1	7.6 *Mod:Sw 2	7.7 *Mod:Delay	7.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

CASCADE REVERBS

Chamber>Room2

CHAMBER block: EchoFbk L, EchoDlyL, RefDly L, RefLvl L, Diffusion, Pre Delay, Low Rt, Mid Rt, Crossover, Rt HC, Size, Shape, Spin, Spread, Link, Rvb Out, High Cut, RefDly R, RefLvl R, EchoDlyR, EchoFbk R

ROOM2 block: EchoFbk L, EchoDlyL, Diffusion, Pre Delay, Low Rt, Mid Rt, Crossover, Rt HC, Size, Shape, Spin, Spread, Link, Infinite, Range, Rate, High Cut, EchoDlyR, EchoFbk R

Signal flow: In Routing → A InLvl → Chamber → B InLvl → Room2 → B OutLvl → L Out / R Out; A OutLvl

0 Controls	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 Time:A	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay				
2 Design:A	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut	2.7 RvbOut	
3 Reflect:A	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R						
4 Echo:A	4.0 *Mstr Dly	4.1 *Dly L	4.2 *Dly R						
5 Time:B	5.0 Low Rt	5.1 Mid Rt	5.2 Crossover	5.3 Rt HC	5.4 Pre Delay	5.5 Infinite			
6 Design: B	6.0 Size	6.1 Diffusion	6.2 Shape	6.3 Spread	6.4 Spin	6.5 Link	6.6 High Cut	6.7 Range	6.8 Rate
7 Echo:B	7.0 *Mstr Dly	7.1 *Dly L	7.2 *Dly R						
8 Modulation	8.0 *Mod:LFO1	8.1 *Mod:LFO2	8.2 *Mod:AR Env	8.3 *Mod:Follow	8.4 *Mod:Latch	8.5 *Mod:Sw 1	8.6 *Mod:Sw 2	8.7 *Mod:Delay	8.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

CASCADE REVERBS
(continued)

Inverse>Chamber

0 Controls	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 Time:A	1.0 LowSlope	1.1 MidSlope	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay				
2 Design:A	2.0 Duration	2.1 Diffusion	2.2 Shape	2.3 High Cut					
3 Reflect:A	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R						
4 Time:B	4.0 Low Rt	4.1 Mid Rt	4.2 Crossover	4.3 Rt HC	4.4 Pre Delay				
5 Design: B	5.0 Size	5.1 Diffusion	5.2 Shape	5.3 Spread	5.4 Spin	5.5 Link	5.6 High Cut	5.7 RvbOut	
6 Reflect:B	6.0 *Mstr Dly	6.1 *Dly L	6.2 *Dly R						
7 Echo:B	7.0 *Mstr Dly	7.1 *Dly L	7.2 *Dly R						
8 Modulation	8.0 *Mod:LFO1	8.1 *Mod:LFO2	8.2 *Mod:AR Env	8.3 *Mod:Follow	8.4 *Mod:Latch	8.5 *Mod:Sw 1	8.6 *Mod:Sw 2	8.7 *Mod:Delay	8.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

Room2>Chamber

0 **Controls**	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 **Time:A**	1.0 Low Rt	1.1 Mid Rt	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay	1.5 Infinite			
2 **Design:A**	2.0 Size	2.1 Diffusion	2.2 Shape	2.3 Spread	2.4 Spin	2.5 Link	2.6 High Cut	2.7 Range	2.8 Rate
3 **Echo:A**	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R						
4 **Time:B**	4.0 Low Rt	4.1 Mid Rt	4.2 Crossover	4.3 Rt HC	4.4 Pre Delay				
5 **Design: B**	5.0 Size	5.1 Diffusion	5.2 Shape	5.3 Spread	5.4 Spin	5.5 Link	5.6 High Cut	5.7 RvbOut	
6 **Reflect:B**	6.0 *Mstr Dly	6.1 *Dly L	6.2 *Dly R						
7 **Echo:B**	7.0 *Mstr Dly	7.1 *Dly L	7.2 *Dly R						
8 **Modulation**	8.0 *Mod:LFO1	8.1 *Mod:LFO2	8.2 *Mod:AR Env	8.3 *Mod:Follow	8.4 *Mod:Latch	8.5 *Mod:Sw 1	8.6 *Mod:Sw 2	8.7 *Mod:Delay	8.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

CASCADE REVERBS (continued)

Inverse>Room2

0 Controls	0.0 Mix	0.1 InRouting	0.2 A InLvl	0.3 A OutLvl	0.4 B InLvl	0.5 B OutLvl			
1 Time:A	1.0 LowSlope	1.1 Mid Slope	1.2 Crossover	1.3 Rt HC	1.4 Pre Delay				
2 Design:A	2.0 Duration	2.1 Diffusion	2.2 Shape	2.3 High Cut					
3 Reflect:A	3.0 *Mstr Dly	3.1 *Dly L	3.2 *Dly R						
4 Time:B	4.0 Low Rt	4.1 Mid Rt	4.2 Crossover	4.3 Rt HC	4.4 Pre Delay	4.5 Infinite			
5 Design: B	5.0 Size	5.1 Diffusion	5.2 Shape	5.3 Spread	5.4 Spin	5.4 *Link	5.4 *High Cut	5.4 *Range	5.4 *Rate
6 Echo:B	6.0 *Mstr Dly	6.1 *Dly L	6.2 *Dly R						
7 Modulation	7.0 *Mod:LFO1	7.1 *Mod:LFO2	7.2 *Mod:AR Env	7.3 *Mod:Follow	7.4 *Mod:Latch	7.5 *Mod:Sw 1	7.6 *Mod:Sw 2	7.7 *Mod:Delay	7.8 *Mod:S&Hold
Patches	Patch 0	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6	Patch 7	Patch 8	Patch 9
Custom	*ADJUST	*Control 1	*Control 2	*Control 3	*Control 4	KeyWord 1	KeyWord 2	KeyWord 3	KeyWord 4

THE PARAMETERS

Although there are similarities among all matrixes, such as having a row of Controls first, and Modulation, Patching and Custom Control rows last, some of the parameters within each row, and some entire rows are unique to specific algorithms.

This section contains descriptions for all PCM 91 parameters, organized alphabetically by row label as follows:

- Compress
- Controls
- Custom
- Delay
- Design
- Echo

- Expand
- Modulation
- Patches
- Spatial EQ
- Reflect
- Time

Individual parameter descriptions within each row are presented, as far as possible, in the order in which they appear from left to right in the edit matrix.

COMPRESS

Row 4 of the Concert Hall algorithm contains compression controls for a built-in compressor/expander. Remember that, in some ways, a digital compressor is the opposite of an analog compressor. An analog compressor reduces gain when the incoming signal is above a certain threshold; a digital compressor increases gain when the signal is below the threshold. The end result — lower dynamic range— is the same, but it's easy to become confused if you are familiar only with analog equipment.

Ratio

Ratio controls the slope of the gain curve or the ratio of input level versus output level.

Threshold

Threshold sets the level below which gain is increased. This should normally be set fairly high (-10dB or more).

Gain

Gain adjusts the gain of low level signals (below the compression threshold).

LookAhead

LookAhead sets the predelay of the audio before the digital VCA. If the source material has many strong transients, proper adjustment of this parameter can reduce the possibility of clipping.

Attack

Attack adjusts the attack time constant, determining how quickly the compressor responds to increasing input level. This should normally be set quite low to allow the compressor to react to sharp transients.

Release

Release allows adjustment of the release time constant, determining how quickly the compressor responds to decreasing input level. This should normally be set long. Short release times may cause an effect similar to "pumping" in an analog compressor.

CONTROLS

Row 0 of every algorithm contains parameters that provide overall control of both the reverb and voice effects.

Mix

Mix controls the ratio of dry and wet signal present at the PCM 91 outputs. When the PCM 91 is patched into a console or an instrument amplifier through an auxiliary or effects loop, this control should always be set to 100% wet. (Control Mode 1.1 allows you to select a global Mix setting.)

In Lvl

InLvl controls the level of the unprocessed (dry) signal into the effect. The range of this parameter in the Chamber/Room algorithm is +5.0dB, to –7.2dB, to Off. In all other algorithms the range is from +6dB, to -73dB, to Off. Individual controls for the A and B effects in the Chamber/Room algorithm are labeled A InLvl and B InLvl.

RvbOutLvl

RvbOutLvl controls the output level of the reverberator before it is mixed with the dry signal and any reflections or delays. The range is from Full (0dB) to -24dB, to Off. Individual controls for the A and B effects in the Chamber/Room algorithm are labeled A OutLvl and B OutLvl.

Out Width

Out Width controls the width of the entire processed signal. This can be thought of as an extension of typical mono to stereo imaging controls. The range of this parameter is -360 to +360, in single digit increments. Values of -360, 0, or +360 cause the effect's audio output to be mono. Values of -315 and +45 cause the output to be normal left/right stereo. Values of -45 and +315 cause "swapped", or right/left stereo.

Value	Display Label	Description
360	MONO	Phase Normal Mono
315	R, L	Phase Normal R/L stereo
270	R–L, L–R	R–L, L–R surround*
225	STEREO INV	Phase Inverted L/R Stereo
180	MONO INV	Phase Inverted Mono
135	R, L INV	Phase Inverted R/L Stereo
90	L–R, R–L	L–R, R–L surround
45	STEREO	Phase Normal L/R stereo
0	MONO	Phase Normal Mono
-45	R,L	Phase Normal R/L Stereo
-90	R–L, L–R	Phase Inverted R–L, L–R surround*
-135	STEREO INV	Phase Inverted L/R Stereo
-180	MONO INV	Phase Inverted Mono
-225	R, L INV	Phase Inverted R/L Stereo
-270	L–R, R–L	L–R, R–L surround
-315	STEREO	Phase Normal L/R Stereo
-360	MONO	Phase Normal Mono

* Disappears in mono

The large and duplicated range of the Out Width parameter allows smooth glides from any Left/Right Mix, Phase, Mono/Stereo image point to any other. Of particular interest are: 0 MONO, 45 STEREO, and 90 L–R, R–L (surround channel). This parameter can be changed in real-time for fascinating spatial effects.

In Width

In Width provides a width control for the input signal before it is fed to the reverberator. Careful use of this control can provide fascinating results. For example, a setting of 45 will provide a normal stereo reverberation effect, while a setting of 90 will exclude any mono (center) signal from the reverberator. Modulation of this control can result in the illusion of various parts of the input moving forward and backward in the reverberant field.

InRouting

In the Chamber/Room and in all of the Dual Reverb algorithms three controls are provided to determine reverb routing: Mono Split, RevMono Split, and Stereo Split.

- **Mono Split** Separates the two reverb blocks, creating two independent mono in/stereo out reverbs. Machine A receives input from the left channel, and Machine B receives input from the right channel.

- **RevMono Split** Separates the two reverb blocks, like the Mono Split setting, but reverses the inputs so that A corresponds to the right channel, and B corresponds to the left channel.

- **Stereo Split** Creates two stereo in, stereo out reverbs. The outputs from both A and B are stereo.

In the cascade algorithms, the three routing selections are: Left Cascade, Right Cascade, and Stereo Cascade. Left Cascade feeds the left input to the cascade, and ignores audio input from the right channel. Similarly, Right Cascade feeds only the right input to the cascade. Stereo feeds left and right inputs into the corresponding inputs to the cascade.

CUSTOM

The last row of each algorithm edit matrix allows customization and labeling of ADJUST, and four custom controls. It also allows the assignment of KeyWords for effect sorting.

ADJUST, Control 1, Control 2, Control 3, Control 4

These controls allow names and ranges to be specified for ADJUST and for four other Custom Controls. Press Load/✳ to display: Low Limit, High Limit and MidPoint for the displayed control. Turn ADJUST to select values from 0-127.

- **Low Limit** This is the lowest value that the controller will output (or accept, if connected to MIDI).

- **High Limit** This is the maximum value that the controller will output.

- **MidPoint** This allows you to set a fixed point within the range you have established between the high and low limits.

CUSTOM *(continued)*

Pressing and holding Edit accesses a submode which allows you to name the control, as well as any points you have assigned. Pressing Load/✱ will cycle through the following choices. From any of the displays, use ADJUST to select a character for the space marked by the flashing cursor. Use SELECT to move the cursor to another position.

- **Name**   The name assigned will appear on the top line of the display when the control is adjusted.

- **LowLabel**   The name assigned will appear on the bottom line of the display when the control reaches the value you have set as the Low Limit.

- **HighLabel**   The name assigned will appear on the bottom line of the display when the control reaches the value you have set as the High Limit.

- **MidLabel**   The name assigned will appear on the bottom line of the display when the control reaches the value you have set as the MidPoint (not available if you have not assigned a MidPoint within the established range.)

- **LowRange**   The name assigned here will be displayed whenever the controller is between the Midpoint and the Low Limit.

- **HighRange**   The name assigned here will be displayed whenever the controller is between the Midpoint and the High Limit.

You can display numerical values anywhere along the bottom line of the display by entering the characters @ or $ where you want these values to appear. As many as 3 digits can be displayed, representing absolute distance from the the Low Point (@@@) or relative distance from the selected Midpoint ($$$). If the Midpoint is at or below the Low Limit, this range will be equivalent to the entire range of the controller. The default status of the naming displays is to have @@@ already entered at the beginning of the entry line.

For additional information on Custom Controls, see Chapter 2: Basic Operation.

KEYWORD 1-4

The last four controls in the Custom row allow assignment of as many as four KeyWords to the effect. Each of the controls behaves identically. Simply turn ADJUST to select a KeyWord from the list shown at the right. All effects are tagged internally for alphabetical (A to Z) sorting, but this is shown in the list for completeness. For specialized sorting, four User KeyWords are provided at the end of the list.

PCM 91 Character Set
! " # $ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [¥] ^ _ ' a b c d e f g h i j k l m n o p q r s t u v w x y z { : } ~ z (space)

The @ and the $ symbols are used to represent Custom Control values.

PCM 91 KeyWords	
A to Z	Mastering
Acoustic	Medium
Ambience	MIDI
Ballad	Mono
Bright	Natural
Broadcast	Orchestral
Cascade	Outdoor
Chamber	Plate
Classical	RandomHall
Cncrt Hall	Room
Custom	Short
Dark	Slap FX
Dialog	Small
Drums/Perc	Spatial
Dynamic	Special FX
Echo	Splits
Film-ADR	Stereo
Gated	Surround
Guitar	Tempo
Indoor	Unnatural
Instrument	Vocal
Keyboard	User 1
Large	User 2
Live PA	User 3
Long	User 4

DELAY

In each the Random Hall and Rich Plate algorithms, a Delay row contains parameters for delay, feedback and level settings of each voice. Press Load/✱ to cycle through selections.

Mstr Dly, Dly L, Dly R

These controls provide delay voices to the left and right channels. The delays are routed to the output (through the Lvl controls) and also through a feedback path. The master delay control allows you to simultaneously change the delay times of both voices. The available range is from 0-200%. This provides a simple way to expand or close in the voice delay times. If a voice's delay time is set to 500ms, changing the setting of Mstr Dly to 200% will change the delay time to 1.000sec. Setting this parameter to 0% is an easy way to set both delays to 0 from a single control.

When display of values in BPM has been selected, these are set as fractions of a beat. The smallest fraction is 1/24th beat. Delay times can also be tempo modulated.

Mstr Lvl, Lvl L, Lvl R

These controls modify the levels of the delay voices (Dly L and R) as they are routed to the output. The range of the left and right controls is from Full (0dB), to -85dB, to Off. Mstr Lvl provides grouped control from 0-100%. With low or moderate settings, small changes in Mstr Lvl may not have any effect.

Mstr Fbk L, Fbk R

These controls modify delay feedback path levels. The left and right controls can be set from -100% to +100% in 1% increments. Mstr Fbk provides grouped control from 0-100%. With low or moderate settings, small changes in Mstr Fbk may not have any effect.

You can set and display delay values in units of time, or with tempo values. Press Up and Tempo simultaneously to toggle between these two options. When time units are selected, delay times are set and displayed in milliseconds or seconds (from 0ms to the maximum available delay for that parameter). When tempo values are selected, delay values are set and displayed as a ratio of echoes to beats (from 24:1 to 1:24). This will automatically synchronize the delay to the current tempo (MIDI, Internal, or TAP — see Tempo Mode in Chapter 2.) For example, a delay setting of 1:2 (1 echo for every 2 beats) will produce half-note delay rhythms synchronized to the current tempo.

DESIGN

The Design row, available in every algorithm, contains parameters that affect the structural aspects of the reverb effect. In the Chamber/Room algorithm, individual Design rows are available for Effect A and B.

Duration

This parameter in the Inverse algorithm determines the length of time, in milliseconds, which passes before the cutoff in Inverse effects.

Size

Size sets the build-up rate of diffusion after the initial period (which is controlled by Diffusion). The Size control changes reverb sound from very large to very small. Generally, set this control to the approximate size of the acoustic space being created, before adjusting anything else. The size in meters is roughly equal to the longest dimension of the space. Audio is temporarily muted when Size is changed.

DESIGN *(continued)*

Diffusion

A Diffusion control is provided in all algorithms. It controls the degree to which initial echo density increases over time. High settings of Diffusion result in initial build-up of echo density, and low settings cause low initial build-up. Echo density is also affected by Size; smaller spaces will sound denser. To enhance percussion, use high settings of Diffusion. For clearer and more natural vocals, mixes, and piano music, use low or moderate settings of Diffusion. Note that, at some extreme input levels, high settings of Diffusion may trigger the overload indicators on the headroom display.

Attack

Attack is provided in the Plate algorithm to set the sharpness of the initial response to an input signal. High settings cause an explosive sound, while low settings cause the sound to build up more slowly with time. Attack only affects the level of sound within the first 50 milliseconds.

Shape, Spread

In Random Hall, Concert Hall and Chamber/Room, Shape and Spread work together to control the overall ambience of the reverberation. Shape determines the contour of the reverberation envelope. With Shape all the way down, reverberation builds explosively, and decays quickly. As Shape is advanced, reverberation builds up more slowly and sustains for the time set by Spread. With Shape in the middle, the build-up and sustain of the reverberation envelope emulates a large concert hall (assuming that Spread is at least halfway up, and that Size is 30 meters or larger). Low Spread settings result in a rapid onset of reverberation at the beginning of the envelope, with little or no sustain. Higher settings spread out both the buildup and sustain.

Def

In the Concert Hall algorithm, Definition affects the echo density buildup rate during the latter part of the decay period. When set to Off, the rate is determined by the program material. Raising Definition through its range (1-99%) causes the sound to become choppier — the decrease in echo density creates increasingly distinct, repetitive echo trails.

Depth

In the Concert Hall algorithm, Depth sets the output amplitude envelope, changing the listener's perspective from the front to the rear of the hall.

Spin

Spin affects the movement of the reverberation tail. The object of Spin is to continuously alter the timbre of the reverberant sound. This makes the result more natural, without making the position of instruments unstable. Spin should typically be set to values between 10% and 50%. Higher values may make the timbre of piano or guitar unstable.

Chorus

In the Concert Hall algorithm, Chorus randomizes delay times and introduces modulation to make reverberation sound less metallic. Increasing Chorus increases the rate of modulation. Because Chorusing can cause pitch variation, this parameter should be set with care when using sources with very little pitch wobble (such as guitar or piano). A good practice is to increase the setting until pitch wobble becomes noticeable, then lower it slightly.

Link

This control is available in all algorithms except Ambience. When Link is set to On, the reverb time (Mid Rt) and Spread scale linearly as the Size control is varied. For some special effects, Mid Rt, Spread and Size can be unlinked.

High Cut

High Cut sets the high frequency cutoff of a low-pass filter. This parameter affects both channels.

Range and Rate

Range and Rate controls in the Room algorithm in Chamber/Room can be used to reduce coloration for small room sizes or to reduce the sense of periodicity when the Infinite control is on. These controls allow you to set the range of a moving delay and the speed at which it moves. High settings of either control may be unsuitable for sustained tones, like piano.

Wander

Wander sets the distance (in time) that early reflections will move. For best results with larger sizes, this control should be set to about 10ms.

ECHO

Mstr Dly, Dly L, Dly R

In Rich Plate and Chamber/Room, Dly L and Dly R provide echoes to the left and right channels. Unlike Delay and Reflect, which are isolated left and right delays, left and right echoes are blended in the diffusor. The echoes are routed both to the outputs and through a feedback path. Mstr Dly provides a simple grouped control that modifies the left and right values from 0-200%.

Mstr Fbk, Fbk L, Fbk R

Fbk L and Fbk R modify the levels of the echo feedback path. The range is from -100% to 0 to +100%. Mstr Fbk has a range of 0-100%. With low or moderate settings, small changes of Mstr Fbk may not have an effect.

EXPAND

Row 5 of the Concert Hall algorithm contains expansion controls for a built-in compressor/expander. (See also Compress at the beginning of this section.)

Ratio

Ratio controls the slope of the expander circuit.

Threshold

Threshold sets the threshold below which gain is reduced.

Gain

Gain sets the amount of negative gain.

MODULATION

The Modulation row, which is the same for every algorithm, contains the parameters for the PCM 91's internal modulation sources. Use the Patch row to assign these modulators to any PCM 91 effect parameter.

Mod: LFO1 and Mod:LFO2

Four parameters are available: Shape, P Width, Depth, and Rate.

MODULATION *(continued)*

- **Shape**   Allows you to select the wave shape that will be used when "LFO" is selected as a patch Source. The choices are: Sine, Cosine, Square, Sawtooth, Pulse, Triangle, and Random (outputs a new value on each LFO cycle).

- **P Width**   Determines the proportion of each pulse wave cycle for which the LFO is on (1-99%). For example, setting P Width to 50% means that the LFO is on for half of its cycle. The effect of this control will only be heard if you are using the Pulse shape.

- **Depth**   Scales the output of the LFO from 0 to 100%. This control affects the output of the LFO only. It has no effect on the outputs of the individual waveforms.

- **Rate**   Sets the speed (0-10Hz) at which the LFO cycles. It can be set in time values (such as 1.5Hz) or in tempo values (such as 3:2 cycles per beat). Simultaneously pressing Up and Tempo will toggle these two display options.

The PCM 91 allows six LFO shapes (sine, cosine, sawtooth, triangle, square and pulse) or a random shape to be selected as patch sources, as well as the LFO itself. All of these are generated by a single LFO, and are controlled by the single Rate control. When "LFO1" is selected, for example, as a patch source, the output will be the Shape selected here. The amplitude of the LFO output is controlled by Depth. Both Shape and Depth are available as patch

Shape, Rate and Depth can be controlled by a patch.
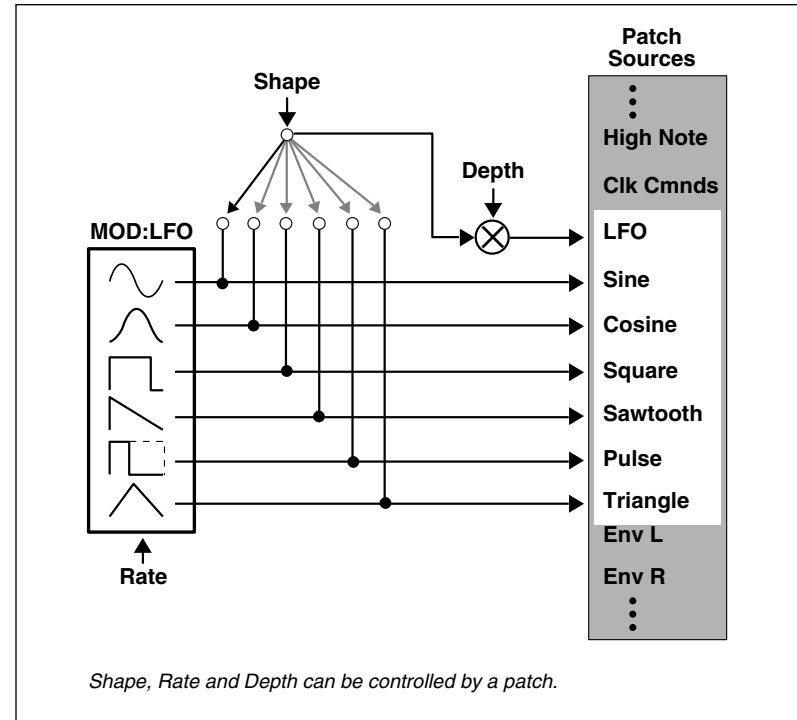
destinations and can be controlled externally. Shape, Pulse Width, Depth, and Rate are all available as patch destination parameters, and can be controlled externally. See Patching in Chapter 2.

Mod: AR Env

This envelope generator's output, when turned on, will go from 0 to127. How quickly it goes from 0 to 127 is determined by the setting of Attack (0-10 seconds). Once the envelope generator has reached 127, it remains there as long as it is turned on. When it is turned off, it goes from 127 to 0, at the rate determined by Release (0 to 10 seconds).

T Src allows you to select a Source to turn the envelope generator on and off. **T Lvl** allows you to select a specific threshold value which the T Src must reach to turn the envelope generator on. The **Mode** parameter allows you to determine the behavior of the envelope controller in relation to the threshold value. Four settings are available: Off, One Shot, Retrigger and Repeat.

- **Off**   This control turns the AR envelope off (and frees up processor time). To optimize PCM 91 real-time response, set AR Env to Off when it is not being used.

- **One Shot**   Once T Lvl is reached, the envelope will go through its entire attack cycle. Once the attack cycle is completed, if Source value is below T Lvl, the envelope will immediately fall at the specified Release rate. The envelope will go through its entire release cycle, even if the source subsequently rises above T Lvl. If the Source value is at or above T Lvl, the envelope will remain at 127 until the T Src falls.

- **Retrigger**   As long as the level is at or above T Lvl, the envelope will go through its attack cycle. If the level falls below T Lvl before attack is completed, the envelope immediately begins to release.Likewise, if the T Lvl is crossed again before the release is completed, the attack cycle will begin again.

- **Repeat**   As long as the threshold source remains at or above T Lvl, the envelope cycles from attack to release. If A=R, the output of the envelope is a triangle wave.

Mod: Follow

This control provides three input signal envelope followers. Press Load/✱ to select Env L, Env R or Env L+R. Release is the only available parameter, and is set in milliseconds. This control allows you to specify the release rate (0-10 seconds) when input level drops.

Mod: Latch

The latch is a very flexible modulation source. It can be used to do such things as derive a switch from a continuous "return to zero" source (like MIDI After Touch). It can turn a momentary (on/off) footswitch into a latching footswitch (push on/ push off), and it can divide the switching rates of sources in half or thirds.

With High set to 127, and Low set to 0, no latching will occur. The output is identical to the output of the selected source.

With High set to less than 127, and Low set to 0, the High value will be latched.

With High set to 127, and Low set to a value greater than 0, the Low value will be latched.

With High set to less than 127, and Low set to a value greater than 0, both values are latched.
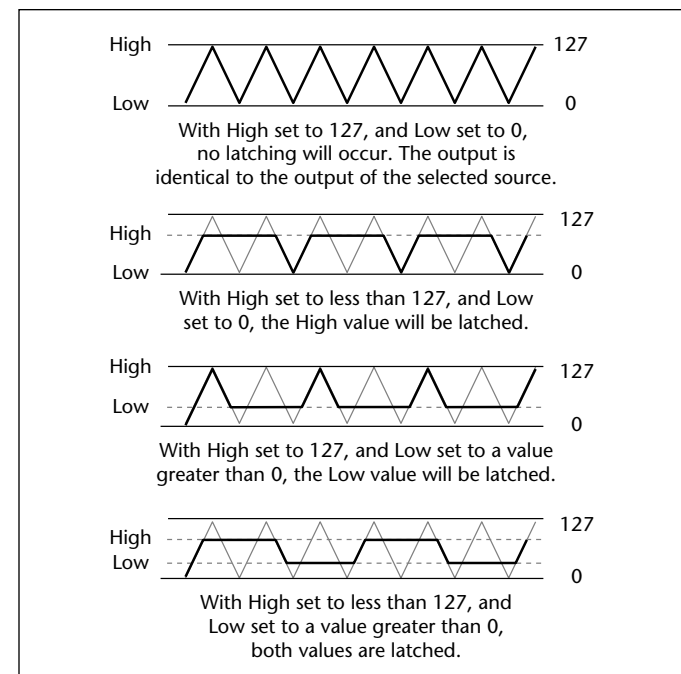
MODULATION *(continued)*

The latch has three parameters: Src, High and Low. Any patch source can be the Src (See Source listing under Patching.) High and Low are threshold values. The latch works as follows:

There is no output from the latch until the Src value falls within the range defined by the settings of High and Low. While the source value is between these thresholds, the output of the latch is the same value as the source. When the source value reaches or passes either threshold, the output of the latch holds at the limit value until the source value passes through the threshold twice. The latch can be set to hold at either the low threshold, the high threshold, or both. Setting Low to 0 disables latching at the low threshold. Setting High to 127 disables latching at the high threshold.

Mod: Sw 1 and Mod: Sw 2

These are identical time switches. Each has five parameters: Rate, P Width, Mode, T Lvl and T Src.

- **Rate**   Sets the speed (0-10Hz) at which the switch cycles. It can be set in time values (such as 1.5 Hz) or tempo values (such as 3:2 Cycles per Beat). Simultaneously pressing Up and Tempo will toggle these display options.

- **P Width**   Determines the proportion of each switch cycle during which the switch is on. For example, setting P Width to 50% means that the switch is on for one-half of a cycle.

- **Mode**   determines the "shape" of the switch output. Three settings are available: Off, Switch, and Ramp. Off turns the switch off (and frees up

processor time). To optimize real time response, set switch to Off when it is not being used. When Switch is selected, the transition from on to off is instantaneous, i.e. the switch output resembles a pulse wave. When Ramp is selected, the transition from on to off is continuous, i.e. the switch output resembles a triangle or sawtooth wave.

- **T Lvl**   Sets the threshold value at which the switch will begin to cycle.

The switch cycles between 127 and 0 as long as T Src is at or above T Lvl.

When Switch Mode is selected, transition from 127 to 0 is instantaneous.

When Ramp Mode is selected, transition from 127 to 0 is continuous.
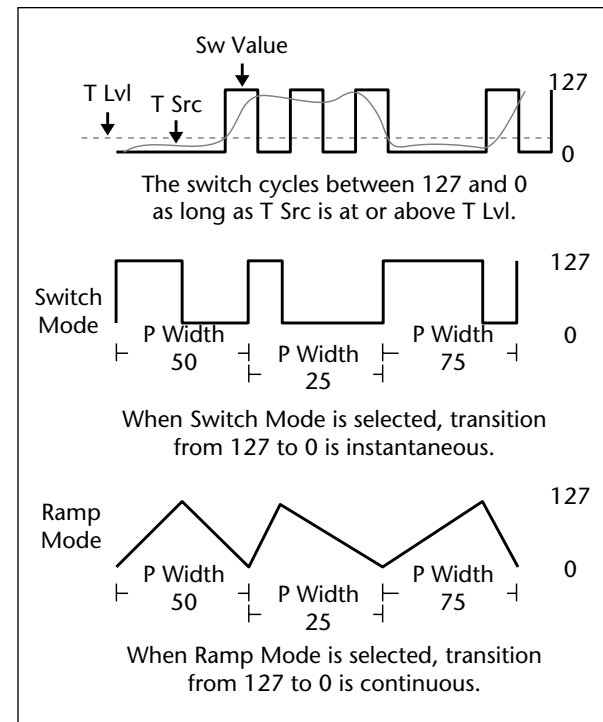
• **T Src**   Selects a patch source to drive the switch. The output of the switch is 0 as long as T Src is set to a value below T Lvl. Once the source value reaches or passes T Lvl, the switch will begin to cycle between on (127) and off (0) at the speed set by Rate.

Note that both Rate and P Width are available as patch Destinations, allowing them to be dynamically controlled by other patch sources. Switches are reset to the beginning of their cycles whenever Tap is pressed.

A special, composite output of these switches, called Sw 1&2 is available as a patch source. The value of Sw 1&2 alternates between the output of Sw 1 and the output of Sw 2. The alternation occurs on the transition from on to off. Note that both Sw 1 and Sw 2 must be active for the alternation to occur.
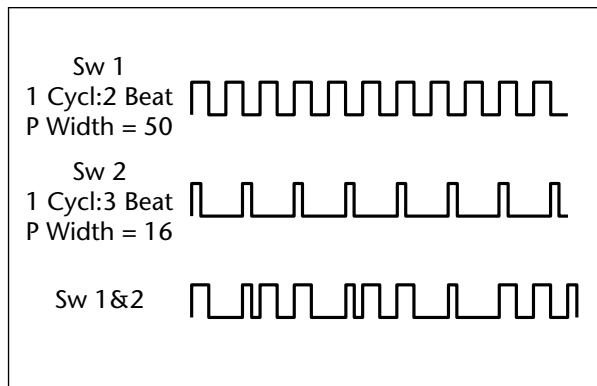
Mod: Delay

This control allows a copy of the output of any other patch source to be delayed. The delay time can be set as an absolute amount of time (0-5 seconds) or it can be related to tempo. The delayed value specified here can then be selected as a patch source.

Mod: S&Hold

The Sample & Hold control allows you to select an input source, a trigger for sampling the source, and a trigger threshold. Anything on the Patch Source list (shown on page 3-33) can be selected as an input source (Src). The trigger (Trigger) can be any other Patch Source. Each time the trigger rises above the threshold specified for T Lvl, the PCM 91 snaps a sample of the source and holds its value until the trigger once again exceeds the threshold. In example shown below, a sine wave is the source and Mono Lvl is the trigger. The threshold has been set at 90. Each time Mono Lvl rises above 90, the sine wave is sampled and held.
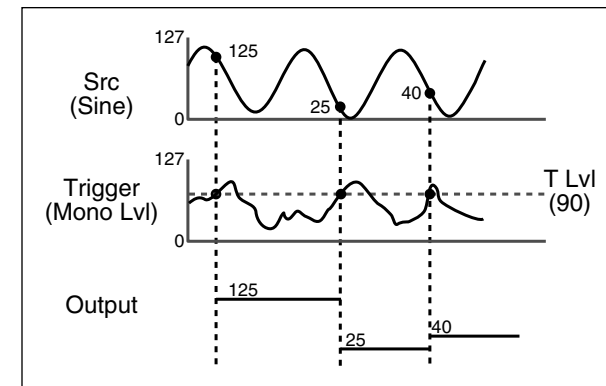
PATCHES

Following the Modulation row in each algorithm's edit matrix is the Patch row. This row provides parameters for creating as many as ten patches in each effect. Each row position (Patch 0-9) has three controls available: Src, Dst, and Values. Press Load/✱ to cycle among these selections.

Src

Use ADJUST to select any of the sources listed. (A complete list of sources is included on page 3-33.)

Dst

Use ADJUST to select any effect parameter except those on the Patch row.

Values

Use ADJUST to assign Destination values to specific Source values. These assignments are made in pairs, each with a value for the Source and a value for the Destination. For example, the default is two pairs mapped as follows:

- minimum Source value (0) = minimum Destination value
- maximum Source value (127) = maximum Destination value

This gives you a linear relationship between the parameter and the controller. Inverse control is accomplished easily by reversing these settings. As many as eight pairs of Destination/ Source values can be assigned here, providing an exciting new level of dynamic control.

See Chapter 2 for a complete description of the Patching System.

REFLECT

Mstr Dly, Dly L, Dly R

Dly L and Dly R provide pre-echoes to the left and right channels. Mstr Dly provides a simple grouped control that modifies the left and right values from 0-200%.

Mstr Lvl, Lvl L, Lvl R

In Random Hall, Concert Hall and Rich Plate, Lvl L and Lvl R modify the levels of the reflections (Dly L and R). The range of each is from Full (0dB) to -85dB, to Off. Mstr Lvl has a range of 0-100%.

SPATIAL EQ

Spatial EQ, when used to enhance the spaciousness of stereo material, increases low frequency differences between left and right channels. An effect called "negative cross-feed" is created by subtracting a copy of low frequency on the left from the right channel, and vice-versa. This effect can be dramatic when used judiciously on live stereo recordings.

Spatial EQ can also be used to reduce low frequency differences and steer the bass into mono. This might be used in mastering LPs to keep the stylus in the groove, in TV mixing, or in any situation in which the low frequency load should be shared by both speakers. Spatial EQ used in this manner is said to have "positive cross-feed".

In the PCM 91,Spatial EQ is placed in the signal path where it can process the dry signal, the reverberation, or both.

Internal

LFO1	Latch
Sine1	Sw 1
Cosine1	Sw 2
Square1	Sw 1 & 2
Sawtooth1	Delay
Pulse1	S&Hold
Triangle1	Mono Lvl
Random1	Left Lvl
LFO2	Right Lvl
Sine2	FootPedal
Cosine2	Foot Sw 1
Square2	Foot Sw 2
Sawtooth2	ADJUST
Pulse2	Custom 1
Triangle2	Custom 2
Random2	Custom 3
Env L	Custom 4
Env R	Tempo
Env L+R	On
AR Env	Off

MIDI

P Bend	Low Note
A Touch	High Note
Velocity	Clk Cmnds
Last Note	

MIDI Controller Numbers

000	Ignored	*(PCM 91 interprets 032 as*		082	General 7
001	Mod Wheel	*Bank Select)*		083	General 8
002	Breath			084	Porta Ctl
003	Ctl 3	033	Ctl 33	085	Ctl 85
004	Foot Ctl				
005	PortaTime	063	Ctl 63	090	Ctl 90
006	Data Entry	064	Sustain	091	FX1 Depth
007	Volume	065	Porta On	092	FX2 Depth
008	Balance	066	Sostenuto	093	FX3 Depth
009	Ctl 9	067	SoftPedal	094	FX4 Depth
010	Pan	068	Legato	095	FX5 Depth
011	Xpression	069	Hold 2	096	Data Inc
012	Effect 1	070	Sound Var	097	Data Dec
013	Effect 2	071	Timbre	098	NRPN LSB
014	Ctl 14	072	Release	099	NRPN MSB
015	Ctl 15	073	Attack	100	RPN LSB
016	General 1	074	Bright	101	RPN MSB
017	General 2	075	Sound 6	102	Ctl 102
018	General 3	076	Sound 7		
019	General 4	077	Sound 8	119	Ctl 119
020	Ctl 20	078	Sound 9		
		079	Sound 10		
031	Ctl 31	080	General 5		
		081	General 6		

SPATIAL EQ *(continued)*

Premix

In Concert Hall, Spatial EQ is placed in the signal path after the reverberator. An additional dry signal is also provided so that the dry input can be sent to the Spatial EQ. In this case, we recommend setting the value of Mix in the Controls row to 100% so that Premix controls the wet/dry mix.

Crossover

Crossover sets the frequency below which Spatial EQ effects take place. Setting this frequency too high may result in unusual imaging.

Gain

Gain sets the amount of crossfeed between channels. The signal first goes through a 6 dB/octave low-pass filter whose frequency is set with Crossover. When Gain is set positive (above 0) the crossfeed has a negative sign. This increases the sense of spaciousness. When Gain is set negative (below 0), the crossfeed has a positive sign. This reduces the sense of spaciousness. When the control is set to either maximum or minimum, the gain in the crossfeed circuit is unity. At maximum, low frequency mono signals are completely removed. This represents an extreme setting which should seldom be needed in practice.

Raising Gain may reduce the bass level. This effect can be compensated for by raising the overall bass level with BassBoost. Since both controls use the same Crossover setting, this compensation will be quite accurate as long as Gain is set to less than 3 dB boost. With Gain at its lowest setting, low frequency signals are completely mono. This may increase the bass level, which can then be cut by lowering the BassBoost control.

BassBoost

A positive value for Gain may reduce low frequencies in program material. Conversely, a negative value for Gain may increase low frequencies. BassBoost allows compensation for this effect by boosting or cutting frequencies below Crossover. The amount of boost or cut required is highly dependent on the material being processed. Start by setting this control to the same value as the Gain control, and then adjust it as necessary.

TIME

The Time row, available in every algorithm, contains parameters that affect the time-based aspects of the reverb effect.

Low Slope and Mid Slope

These parameters are found in the all of the Inverse Rvb Time rows. Low Slope determines the shape of the reverb envelope for low frequencies. When set to 0, the level of low reverb remains unchanged over its Duration, then cuts off abruptly (depending on the amount of diffusion in use). Setting Low Slope above 0 causes the level of low frequency reverb to rise smoothly from soft to loud until the sound is cut off. The greater the slope, the softer the initial reverberation and the more pronounced its rise. With negative values, the low frequency reverb drops from its initial level to a quieter one before cutoff. The lower the slope, the more pronounced the dropoff. Mid Slope is similar to Low Slope, but applies to middle and high frequencies. The actual frequencies affected are determined by Crossover.

Mid Rt and Low Rt

Mid Rt sets reverb time for mid-frequency signals. Because low frequency reverb time (Low Rt) is a multiplier of Mid Rt, Mid Rt acts as a master control for reverb time.

Low Rt sets the reverb time for low-frequency signals, as a multiplier of the Mid Rt parameter. For example, if Low Rt is set to 2X, and Mid Rt is set to two seconds, the low frequency reverb time will be four seconds. For a natural-sounding hall ambience, we recommend values of 1.5X or less.

Crossover

Crossover sets the frequency at which the transition from Mid Rt to Low Rt takes place. This control should be set at least two octaves higher than the low frequency you want to boost. For example, to boost a signal at 100Hz, set Crossover to 400Hz. (This setting works well for classical music.) Crossover works best around 400Hz for boosting low frequencies, and around 1.5 kHz for cutting low frequencies.

Rt HC

Rt HC sets the frequency above which a 6dB/octave low-pass filter attenuates the reverberated signal. It does not attenuate the reflections. High frequencies are often rolled off with this parameter, resulting in more natural-sounding reverberation. Setting a low frequency for this parameter can actually shorten the reverb time, as it damps the audio as it recirculates.

Pre Delay

Pre Delay adjusts an additional time delay between the input of signal and the onset of reverberation. The maximum range is 1000ms. This control is not intended to mimic the time delays in natural spaces. In real rooms, the build-up of reverberation is gradual, and the initial time gap is usually relatively short. Natural spaces are best emulated by adjusting Spread for the desired effective predelay. This parameter is available for tempo control in all algorithms except Ambience.

Shelf

In Random Hall, Shelf modifies the lowpass characteristic of Rt HC, turning it into a shelving filter. Shelf sets the gain of an output patch which is mixed with the output of Rt HC to form the main reverberant output. Both the pre-echoes and the reverberation are affected. For example, if Shelf is set to -6dB, frequencies below approximately Rt HC/2 will be boosted by 3.5dB. Above approximately Rt HC/2, the response will be flat.

Shelf provides a method for making the spectral content of the reverberation match the ideal spectrum for musical acoustics in rooms. For this application, Rt HC should be set between 700 and 1.5kHz, with Shelf set between -12 and -6dB.

Decay

In Ambience, Decay controls the length of the ambience "tail".

Decay Lvl

In Ambience, Decay Lvl controls the level of the ambience "tail". When Decay Lvl is off, ambience consists entirely of the early reflection signal.

Dry Dly

Dry Dly is used to add fine control to Ambience. An additional dry path is created "inside" the ambience effect. When necessary, this path can be delayed slightly to match an ambience.

TIME *(continued)*

DryDlyMix

In Ambience, DryDlyMix is used to control the relative levels of the internal dry path and the ambience effect itself. A value of 100% indicates a completely dry path. This is identical to the normal external dry path, except that it is delayed by DryDly. If this control is used to vary the wet/dry mix, it is recommended that the value of Mix on the Controls row be set to 100%.

Infinite

In the Room algorithm, this control is provided to turn the Infinite effect On or Off.

4

Presets

The PCM 91 has 450 factory-designed presets which are organized into nine banks of 50 each (labeled P0-P8). Each bank is organized in a matrix of 5 rows of 10. Press the front panel Program Banks button to display the first bank. Press it again to switch to another bank. Simultaneously press Program Banks and either the Up or Down button to backstep through the banks. The display will show the bank label and the matrix location, the preset name, and the algorithm from which the effect is derived.

Turn SELECT to scroll through all of the presets in a bank in numerical order. Use Up or Down to jump forward or backward by 10. Press Load/✱ to load any displayed preset.

In Program Banks mode (as in the Register Banks mode), ADJUST is a soft knob. Each preset has one or more parameters patched to this knob, providing a quick way to make useful changes to the effect.When you turn ADJUST, the display will show the name assigned to ADJUST, as well as the patch value. Continue turning ADJUST to alter the patch value along its available range. Many of the presets also have Custom Controls assigned to provide easy access to even more parameters. Look for these in the Soft row.

The program banks are organized as shown in the table at the right. Each preset is described in this section with a header which indicates the matrix location, the program name, the name assigned to the ADJUST knob, as well as any KeyWords assigned for sorting. This header is followed by a brief description of the effect and a list of any Custom Controls assigned.

The Dual Reverb preset names often give clues as to the routing configuration used. Effect blocks configured in series are separated by the symbol >. Dual Mono In/Stereo Out effects are separated by the symbol +. Stereo In/Stereo Out effects are separated by the symbol /.

Bank P0: Halls		Bank P5: Studio	
0.0-0.9	Orchestral	0.0-0.9	Environments
1.0-1.9	Vocal	1.0-1.9	Instruments
2.0-2.9	Live Sound	2.0-2.9	Vocal
3.0-3.9	Instrument	3.0-3.9	Drums/Perc
4.0-4.9	Custom	4.0-4.9	Custom

Bank P1: Rooms		Bank P6: Live	
0.0-0.9	Instrument	0.0-0.9	Acoustic
1.0-1.9	Vocal	1.0-1.9	Electric
2.0-2.9	Live Sound	2.0-2.9	Vocal
3.0-3.9	Drums&Perc	3.0-3.9	Drums/Perc
4.0-4.9	Custom	4.0-4.9	Custom

Bank P2: Plates		Bank P7: Post	
0.0-0.9	Instrument	0.0-0.9	Small Spaces
1.0-1.9	Vocal	1.0-1.9	Med Spaces
2.0-2.9	Live Sound	2.0-2.9	Large Spaces
3.0-3.9	Drums&Perc	3.0-3.9	Cool Places
4.0-4.9	Custom	4.0-4.9	Custom

Bank P3: Post		Bank P8: Surround	
0.0-0.9	Indoor Small	0.0-0.9	Small Spaces
1.0-1.9	Indoor Large	1.0-1.9	Large Spaces
2.0-2.9	Outdoor	2.0-2.9	Unnatural FX
3.0-3.9	Spatial	3.0-3.9	Custom
4.0-4.9	Custom	4.0-4.9	"Clean Slate" *

Bank P4: Splits			
0.0-0.9	Mono		** Clean slate versions of the*
1.0-1.9	Stereo		*dual reverb algorithms*
2.0-2.9	Live Sound		
3.0-3.9	Instrument		
4.0-4.9	Custom		

PROGRAM BANK 0: HALLS

ORCHESTRAL

0.0 Deep Blue   **ADJUST: Decay**

KeyWords: Large, Tempo, RandomHall

This is an all-purpose hall with moderate size and delay time. The reflection delays are set at 36 and 34 ms, but the master level is off. Set to desired level for initial reflections. The master delays are set to beat 3 against 2, but their levels are also off. Set the master delay level to hear the delays. You can also set the tempo of these delays with Tap. Custom 1 allows control of the source from stereo to a narrow setting just a bit wider than mono.

0.1 Large Hall   **ADJUST: Decay**

KeyWords: Large, Long, RandomHall

A classic reverb preset. The hall size is large, with a gentle bloom in the reverberation envelope. The first set of pre-echoes are set to 14 and 20 ms, but are turned off in the preset. Use ADJUST to add some initial reflections.

0.2 Medium Hall   **ADJUST: Decay**

KeyWords: Medium, Indoor, RandomHall, Orchestral

A natural sounding hall with moderate decay time. Similar to Large Hall, but a smaller room with proportionately shorter decay time.

0.3 Small Hall   **ADJUST: Predelay**

KeyWords: Small, RandomHall, Orchestral, Short

A natural sounding environment with bright initial reverb that decays quickly. Turn ADJUST up for a small early reflection or down for a diffused decay.

Presets 0.4-0.6 are similar in texture to the first 3 presets in this row, with added reflections from a stage. In each, ADJUST is designed to allow you to change the size of the stage.

0.4 L Hall+Stage   **ADJUST: Stage Size**

KeyWords: Large, RandomHall, Long, Orchestral

0.5 M Hall+Stage   **ADJUST: Stage Size**

KeyWords: Medium, RandomHall, Orchestral, Indoor

0.6 S Hall+Stage   **ADJUST: Stage Size**

KeyWords: Small, Short, RandomHall, Orchestral

0.7 Gothic Hall   **ADJUST: Decay**

KeyWords: Large, Long, RandomHall, Orchestral

A large, spacious and filtered medium-bright reverb, as in a space made of stone. Smaller room sizes add density to the sound.

0.8 Concert Hall   **ADJUST: Decay**

KeyWords: Large, Instrument, Cncrt Hall, Orchestral

A large, smooth, dark and lush concert hall. Very dense with reflections added to reinforce the sound. Classic Lexicon!

0.9 Small Church   **ADJUST: Decay**

KeyWords: Small, Film-ADR, RandomHall, Orchestral

A smaller version of Large Church with no reflections and much shorter decay time.

PROGRAM BANK 0: HALLS (continued)

VOCAL

1.0   Choir Hall   **ADJUST: Decay**

KeyWords: Large, Short, RandomHall, Vocal

A medium sized space with lots of reflections. Fairly dark timbre and a bit of predelay make it more suitable for a group of voices rather than a soloist.

1.1   Vocal Hall   **ADJUST: Liveness**

KeyWords: Medium, Natural, RandomHall, Vocal

This medium-sized hall has a short, clear reverb decay that doesn't get in the way of the source. Great for vocals or any other instrument with a very defined pitch, such as piano. ADJUST varies the room's tonal characteristics.

1.2   Vocal Hall2   **ADJUST: Liveness**

KeyWords: Short, Natural, RandomHall, Vocal

This is a fairly large hall with a generous reverb decay. A flat high cut keeps the tail from muddying the source. ADJUST varies the room's tonal characteristics.

1.3   VocalConcert   **ADJUST: Seating**

KeyWords: Short, Large, Concert Hall, Vocal

An enormous slightly reflective room. When ADJUST is low, the source is clear and close. Increasing ADJUST creates a longer decay and makes the source more diffuse and the higher frequencies roll off. This creates the illusion of moving the listener's vantage point further back, away from the stage.

1.4   Rise'n Hall   **ADJUST: Decay**

KeyWords: Vocal, Medium, RandomHall, Long

A strange hall with a long early reflection rise and a short decay, creating an echo verb effect on leads.

1.5   Good Ol'Verb   **ADJUST: Attitude**

KeyWords: Large, Natural, RandomHall, Vocal

A quick solution when you're looking for a well-rounded reverb. ADJUST is patched to stereo width, predelay, and the reverb's high cut parameter, giving you extensive control over effect sound.

1.6   Deep Verb   **ADJUST: Decay**

KeyWords: Large, Short, RandomHall, Vocal

A large, washy, chorused space.

1.7   Vocal Magic   **ADJUST: Decay**

KeyWords: Cncrt Hall, Vocal, Large, Long

A lovely reverb with a short decay that is perfect as a vocal reverb.

1.8   Wide Vox   **ADJUST: Width Arc**

KeyWords: Medium, Unnatural, RandomHall, Vocal

This preset doubles the source with close delays and widens the stereo signal. ADJUST controls width, delay feedbacks, Shelf, and Mid reverb time to alter the apparent width of the source on the sound stage.

1.9   Slap Hall   **ADJUST: Decay**

KeyWords: Cncrt Hall, Vocal, Dark, Slap FX

Provides a dense reverb with a soft initial double tap of the source, before darkening and decaying.

LIVE SOUND

2.0   Live Arena   ADJUST: Seating

KeyWords: RandomHall, Live PA, Large, Long

A very large hall with moderate reverb decay time. ADJUST allows you control the apparent distance from the sound source. Best suited for non-percussive sources.

2.1   Real Hall   ADJUST: Decay

KeyWords: Cncrt Hall, Live PA, Dark, Medium

A small, bright sounding hall, good for all program material.

2.2   Great Hall   ADJUST: Decay

KeyWords: Cncrt Hall, Live PA, Long, Bright

A great hall reverb that works well with all program material.

2.3   Brick Wallz   ADJUST: Decay

KeyWords: RandomHall, Live PA, Unnatural, Dark,

A wide and abrupt sounding, gated effect.

2.4   Cannon Gate   ADJUST: Decay

KeyWords: Ambience, Live PA, Gated, Short

This medium-sized room has a sharp, medium long decay. Great on percussive and lead sounds.

2.5   Spatial Hall   ADJUST: Decay

KeyWords: Cncrt Hall, Live PA, Spatial, Surround,

A strange hall with an LFO controlling spatial EQ. The reverb tail moves in and out of the stereo field.

2.6   Nonlin Wrhse   ADJUST: Decay Level

KeyWords: Ambience, Live PA, Gated, Unnatural

A large nonlinear reverb that sounds like a gated warehouse.

2.7   Sizzle Hall   ADJUST: Decay

KeyWords: RandomHall, Live PA, Medium, Bright

A bright, close hall with a medium short decay with very live reverb quality.

2.8   Bright Hall   ADJUST: Tail Brightness

KeyWords: Medium, Bright, RandomHall, Live PA

A light reverb with a great deal of high end activity. A short decay time keeps the reverb tail from muddying the effect. This hall was designed to provide a lush, bright reverb ideal for cutting through the darkness in live settings.

2.9   Utility Hall   ADJUST: Decay

KeyWords: RandomHall, Live PA, Dark, Medium

A truly useful large hall with very little high frequency content. Adds spaciousness to all sounds without getting in the way.

PROGRAM BANK 0: HALLS *(continued)*

INSTRUMENT

3.0   Horns Hall   **ADJUST: Timbre**

KeyWords: Cncrt Hall, Instrument, Natural, Acoustic

A very large space, ideal for horns. ADJUST optimizes the timbre of the horn for a bright, or warm sound.

3.1   Snare Gate   **ADJUST: Release & Threshold**

KeyWords: Cncrt Hall, Instrument, Gated, Drums/Perc

A very tight, gated hall reverb. Roomy and dense when open but slams shut abruptly. Perfect for snare drums and other percussive instruments.

3.2   Guitar Cave   **ADJUST: Decay**

KeyWords: Instrument, RandomHall, Guitar, Dark

Long predelay with recirculating echoes. The main delay taps give it a lot of left and right bouncing activity. Great solo preset.

3.3   Drum Cave   **ADJUST: Decay**

KeyWords: Drums/Perc, Small, RandomHall, Instrument

A medium sized cave with short decay time. Use ADJUST to vary reverb decay time to suit the tempo of the music.

3.4   Saxy Hangar   **ADJUST: Out Width**

KeyWords: Ambience, Instrument, Long, Acoustic

A large hall that sounds like an airplane hangar designed for a spacious sax solo.

3.5   Gated Hall   **ADJUST: Room Size**

KeyWords: Instrument, Large, RandomHall, Gated

If it were possible to have a gated hall, it would sound like this.

3.6   For The Toms   **ADJUST: Room Type**

KeyWords: Ambience, Instrument, Short, Drums/Perc

A large, dense room reverb for toms and other percussives.

3.7   Synth Hall   **ADJUST: Decay**

KeyWords: Cncrt Hall, Instrument, Keyboard, Long

A chorused hall with long decay time for all synth type pads and washes. Also good on strings. Pitched sound sources may seem to sway from center pitch. This can be made more or less dramatic dependent upon the chorus value.

3.8   ShortReverse   **ADJUST: Shape**

KeyWords: Cncrt Hall, Instrument, Special FX, Unnatural

A short reverse reverb with a quick build up and short decay. Good for leads and percussives.

3.9   GtrBalladBPM   **ADJUST: High Cut**

KeyWords: Instrument, RandomHall, Tempo, Ballad

This medium-sized room blends a 2-second reverb decay with delay taps that beat according to the tempo you Tap in.

CUSTOM

4.0   Tidal Hall   ADJUST: LFO1 Rate

KeyWords: Cncrt Hall, Custom, Dynamic, Unnatural

A strange hall with an LFO controlling the high cut of the reverb as well as the output width, creating an "in and out" kind of washing action on the verb.

- Custom 1: Wash Density
- Custom 2: Liveness
- Custom 3: Reverb Density
- Custom 4: Yank the Inputs

4.1   Dream Hall   ADJUST: LFO1 & LFO2 Rates

KeyWords: RandomHall, Custom, Bright, Slap FX

A bright, crystalline hall with potent but subtle delay taps that pan randomly from left to right, then fade. ADJUST controls pan rate.

- Custom 1: Dream Taps
- Custom 2: Reverb Density
- Custom 3: Shape & Spread

4.2   PumpVerb   ADJUST: Decay

KeyWords: Cncrt Hall, Custom, Large, Long

A strange, semi-gated reverb with pumping from the compressor, which is following the input signal. Sounds cool on drums and percussives.

- Custom 1: Expander Gate
- Custom 2: Reverb Density
- Custom 3: Spatial Bass EQ
- Custom 4: Liveness

4.3   PanHallBPM   ADJUST: Tap Rate

KeyWords: RandomHall, Custom, Spatial, Tempo

This unique hall patches LFO1 to OutWidth, creating a subtle sweeping sensation. The sweep rate is dependent upon either tempo set through Tap or ADJUST.

- Custom 1: Spiral Depth
- Custom 2: Reverb Density
- Custom 3: Liveness
- Custom 4: Brightness

4.4   Utility Verb   ADJUST: Out Width

KeyWords: Unnatural, Gated, Concert Hall, Custom

A general, all purpose reverb with medium parameter settings.

- Custom 1: Effect Gate Release
- Custom 2: Liveness
- Custom 3: Width/EQ
- Custom 4: Wah-Wah Speed

4.5   Museum Hall   ADJUST: Reflective Material

KeyWords: Cncrt Hall, Custom, Indoor, Bright

A large reverberant hall like a large room in a museum. ADJUST selects the physical characteristics of the walls.

- Custom 1: Source Proximity
- Custom 2: Width EQ
- Custom 3: Reverb Tail
- Custom 4: Room Size

PROGRAM BANK 0: HALLS *(continued)*

CUSTOM *(continued)*

4.6   Nonlinear#1   **ADJUST: Room Size**

KeyWords: Ambience, Custom, Gated, Short,

A dense, medium long, nonlinear gated verb. Good for all sorts of program material, especially percussive sounds.

- Custom 1: Tail Environment
- Custom 2: High Cut
- Custom 3: Decay
- Custom 4: Decay Level

4.7   Tap BrickBPM   **ADJUST: Tap Rate**

KeyWords: RandomHall, Custom, Tempo, Spatial

This preset has a very reflective sound, as if the source is pounding against a hard brick wall. The LFO opens up the Mid RT and controls OutWidth in cycles that are tempo dependent. Use Tap or ADJUST to control the rate.

- Custom 1: Liveness
- Custom 2: Size
- Custom 3: Tap Depth
- Custom 4: Outwidth Tap Sweep

4.8   Gen. Concert   **ADJUST: Not Patched**

KeyWords: Cncrt Hall

A generic concert hall. Use as a starting place to make your own concert hall effects.

4.9   Gen. RHall   **ADJUST: Not Patched**

KeyWords: RandomHall

A generic hall with random reflections. Use this as a starting place to make your own random hall effects.

PROGRAM BANK 1: ROOMS

INSTRUMENT

0.0   Large Room   **ADJUST: Decay**

KeyWords: Large, Room, Instrument, RandomHall

A perfectly smooth listening room with high diffusion. Very natural sounding on any sound source.

0.1   Medium Room   **ADJUST: Decay**

KeyWords: Medium, Room, Instrument, RandomHall

A smaller version of the Large Room preset.

0.2   Small Room   **ADJUST: Decay**

KeyWords: Small, Room, Instrument, RandomHall

Use ADJUST to quickly change the reverb decay time on this typically tight sounding room. Like its two larger counterparts, Small Room is smooth and natural sounding.

0.3   Guitar Room   **ADJUST: High Cut**

KeyWords: Guitar, Room, Instrument, Ambience

A tight and punchy ambience effect, combining the smallest of sizes and reverb times. Use the ADJUST knob to roll off the higher frequencies.

0.4 Organ Room   **ADJUST: Low Rt**

KeyWords: Keyboard, Room, Splits, Instrument

With its medium size, natural reverb, and a bit of predelay, this Chamber/Room effect is ideal for organ and other keyboards.

0.5 LargeChamber   **ADJUST: Decay**

KeyWords: Large, Chamber, RandomHall, Instrument

A smooth, large reverberant space using Shape and Spread to add some definition.

0.6 SmallChamber   **ADJUST: Decay**

KeyWords: Small, Chamber, RandomHall, Instrument

Just like its bigger predecessor, but with a tighter Mid Rt and a smaller size.

0.7 SpinningRoom   **ADJUST: Speed**

KeyWords: Room, Instrument, Spatial, Ambience

A nice Ambience reverb with a circular sweep of Out Width. Great as a special effect or for adding some movement to your mix. ADJUST controls the rate of the circular sweep.

0.8 Wide Chamber   **ADJUST: Decay**

KeyWords: Chamber, Orchestral, Instrument, RandomHall

A big, wide sounding space with a preset medium Mid Rt. A dark, somber reverb.

0.9 Tiled Room   **ADJUST: Rt HC**

KeyWords: Room, Bright, Instrument, Cncrt Hall

Just what you'd expect - an incredibly sibilant and bright reverberant space. Use ADJUST to soften the brightness of this short reverb.

VOCAL

1.0 Brite Vocal   **ADJUST: High Cut**

KeyWords: Bright, Room, Vocal, Ambience

This effect is ideal for vocalists using a bit of predelay to separate the bright reverb from the source for definition and clarity. ADJUST controls brightness.

1.1 Vocal Space   **ADJUST: Size**

KeyWords: Room, Vocal, Small, RandomHall

A short Mid RT and small Size - an ideal space for vocals due to the use of Shape and Spread.

1.2 Vocal Amb   **ADJUST: Diffusion**

KeyWords: Dark, Natural, Vocal , Ambience

Short and soft. A very realistic small room.

1.3 VerySmallAmb   **ADJUST: Width**

KeyWords: Small, Vocal, Ambience, Ballad

Just like Vocal Amb, but smaller and tighter. ADJUST provides mono to stereo OutWidth control.

PROGRAM BANK 1: ROOMS *(continued)*

VOCAL *(continued)*

1.4   S VocalSpace   **ADJUST: High Cut**

KeyWords: Vocal, Ambience, Small, Ballad

A small, smooth space, well-suited for vocals. A Decay Level of -8dB keeps the reverb from becoming overpowering.

1.5   L VocalSpace   **ADJUST: High Cut**

KeyWords: Large, Vocal, Ambience, Ballad

A bigger version of S VocalSpace.

1.6   S Vocal Amb   **ADJUST: Diffusion**

KeyWords: Small, Vocal, Ambience, Custom

Use Custom 1 to choose the right studio for your vocalist.

• Custom 1: Choose the Studio

1.7   L Vocal Amb   **ADJUST: Diffusion**

KeyWords: Large, Vocal, Ambience, Custom

A more spacious version of S Vocal Amb. Already set to Studio "A". Customize your vocals with ADJUST and the three studio settings on Custom 1.

• Custom 1: Choose the Studio

1.8   AmbientSus   **ADJUST: Size**

KeyWords: Ambience, Natural, Vocal

A bit of dry delay makes this a sweet selection for your vocal tracks. You'll find the subtleties of this preset will perfectly suit instruments as well.

1.9   Vocal Booth   **ADJUST: Walls/Size**

KeyWords: Vocal, Cncrt Hall, Small, Dialog

The most confining of isolation booths. ADJUST lets you select wall materials and booth size.

LIVE SOUND

2.0   LargeSpace   **ADJUST: Decay**

KeyWords: RandomHall, Live PA, Large, Bright

Designed for live sound reinforcement in all situations.

2.1   Med. Space   **ADJUST: Decay**

KeyWords: RandomHall, Live PA, Medium, Instrument

For a more intimate and small setting, choose this preset with its smooth reverb and softer timbre.

2.2   Delay Space   **ADJUST: Decay**

KeyWords: RandomHall, Live PA, Small, Tempo

Attitude for live drums, guitar, or vocals with a less dominating reverb, punchier sound, and lots of delay. Tap in delay time, or dial in the BPM of the song.

2.3   BigBoom Room   ADJUST: Blend

KeyWords: Split Rvb, Live PA, Custom, Large

This preset is saturated with bottom-heavy, dense reverb. Configure the input as stereo or mono to get your sound sources to this dense room. Use ADJUST to blend between rooms and to adjust distance from the sound source.

- Custom 1: Bass Boost

2.4   Tight Space   ADJUST: Proximity

KeyWords: Ambience, Live PA, Gated, Drums/Perc

An effect to give your live drums that extra push. Vibrancy and attitude with a gated feel. Use ADJUST to add space and reverb, or to bring the effect up to the front with less reverb.

2.5   Reflect Room   ADJUST: Arena Size

KeyWords: Concert Hall, Live PA, Large, Unnatural

Super-saturated, atmospheric quality. Great for creating a dreamy landscape for the solo instrument or vocalist.

2.6   RockRoom   ADJUST: Liveness

KeyWords: RandomHall, Live PA, Small, Drums/Perc

A great preset for live drum sound. Extremely bright with no RT HC.

2.7   Real Room   ADJUST: Size

KeyWords: Ambience, Live PA, Natural, Acoustic

A bit more natural reverb for a live setting. Smooth and subtle, perfect for anything you throw at it.

2.8   Spatial Bass   ADJUST: High Cut

KeyWords: Cncrt Hall, Live PA, Short, Spatial

A Spatial EQ bass boost enhances the lower frequencies of your sound source and combines it with a bright reverb on top.

2.9   Great Room   ADJUST: Liveness

KeyWords: Cncrt Hall, Live PA, Instrument, Acoustic

The same warm, smooth reverb as Real Room, with more decay time and an overall warmer timbre.

DRUMS&PERC

3.0   Drum Room   ADJUST: Size

KeyWords: Ambience, Drums/Perc, Instrument, Short

With the whole kit in mind, the staple for this dark drum preset is its dense, saturated reverb.

3.1   Snare Trash   ADJUST: Rt HC

KeyWords: Cncrt Hall, Drums/Perc, Instrument, Medium

The large room size, short Mid Rt, and cut of the Spatial EQ bass boost are all significant in the search for the perfect snare reverb.

3.2   MetallicRoom   ADJUST: Decay Lvl

KeyWords: Ambience, Drums/Perc, Instrument, Small

The resonant quality of this drum preset comes from its very small Size and Mid Rt settings. You'll find this preset works best on individual drums rather than the whole kit.

PROGRAM BANK 1: ROOMS *(continued)*

DRUMS&PERC *(continued)*

3.3   Slap Place   ADJUST: Pre Delay

KeyWords: Ambience, Drums/Perc, Instrument, Medium

A dark and wet reverb. Medium room size and long reverb tail make this a good choice for a big drum sound. For a bit of space before the reverb kicks in, dial in the Pre Delay with ADJUST.

3.4   PercussPlace   ADJUST: Decay Lvl

KeyWords: Ambience, Drums/Perc, Instrument, Medium

Congas, bongos, bells, and whistles are all at home with this preset. A full and resonant reverb accentuates the transients as well as the pitch material in percussive instruments.

3.5   PercussRoom   ADJUST: Decay Lvl

KeyWords: Ambience, Drums/Perc, Instrument, Short

Similar to PercussPlace with slightly smaller Mid Rt and Size settings for a more intimate effect.

3.6   Room 4 Drums   ADJUST: Decay Lvl

KeyWords: Ambience, Drums/Perc, Instrument, Short

All you could ever want for drums - punch, attitude, and a tight, beefy reverb. Crank it up!

3.7   Sloppy Place   ADJUST: Sloppiness

KeyWords: Ambience, Drums, Dark, Unnatural

An unnatural room reverb that will enhance any drum track.

3.8   WideSlapDrum   ADJUST: Spatial Enhance

KeyWords: Cncrt Hall, Drums, Slap FX, Spatial

Perfect as a special drum effect. ADJUST takes you from narrow and dry to wide and slap happy.

3.9   InverseDrums   ADJUST: Spread

KeyWords: RandomHall, Drums, Special FX, Unnatural

A backwards effect. Great as a special effect for one drum, or the whole kit. ADJUST lets you smooth out or tighten up the time it takes to get that perfect backwards sound.

CUSTOM

4.0   PCM 60 Room   ADJUST: Reverb Time

KeyWords: Plate, Large, Custom, Natural

Let this preset take you back to the good old days of 1984 when life was simple, and so were the reverbs. Use ADJUST to choose the color and reverb time that was your favorite, then use the Customs 1 and 2 to set Size and exercise that wonderful feeling of power with the Bass/Treble Contour control. Customs 3 & 4 offer effects you thought not possible in 1984 - backwards effects and adjustable echoes.

- Custom 1: Size
- Custom 2: Contour
- Custom 3: Inverse Effects
- Custom 4: Echoes

4.1   InverseRoom2   ADJUST: Width

KeyWords: RandomHall, Drums/Perc, Unnatural, Custom

Lots of options via ADJUST and the Customs to create a great backwards effect.

- Custom 1: High Cut
- Custom 2: Reflections
- Custom 3: Liveness
- Custom 4: Input Pulse

4.2   BeeBeeSlapz   ADJUST: Feedback

KeyWords: Cncrt Hall, Slap FX, Unnatural, Custom

Perfect for creating dreamy soundscapes, and atmospheric moods dripping with reverb. ADJUST takes you from dry delay taps to complete reverb abandon, Custom Controls set the atmosphere.

- Custom 1: Comp/Ratio Thrshld
- Custom 2: Spatial EQ
- Custom 3: Moving Reflections

4.3   Storeroom   ADJUST: Amount of Boxes

KeyWords: Cncrt Hall, Dark, Indoor, Custom

A storeroom where ADJUST lets you customize how empty or full it is, and hear how it affects the sound. Customs let you further define the space.

- Custom 1: BassBoost
- Custom 2: Delay Taps
- Custom 3: Width

4.4   Split Rooms   ADJUST: Reverb Balance

KeyWords: Split Rvb, Special FX, Dynamic, Custom

A Chamber/Room where both the small room and the big, bright chamber are patched with the AR Envelope to Mono InLvl. Below a certain point, only the Room reverb is heard. When the threshold is crossed, the Room drops out and the Chamber reverb kicks in. ADJUST lets you blend or separate the two rooms.

- Custom 1: In Routing
- Custom 2: Inverse HighPass
- Custom 3: Reverb Density

4.5   Spatial Room   ADJUST: Spatial Movement

KeyWords: Ambience, Spatial, Unnatural, Custom

Similar to SpinningRoom, but with a different parameters, and more Custom Controls.

- Custom 1: LFO Shape
- Custom 2: HighPass
- Custom 3: Gliding Chorus
- Custom 4: Verb Proximity

4.6   Hole Room   ADJUST: Decay

KeyWords: Cncrt Hall, Special FX, Custom, Unnatural

A dense ConcertHall reverb. Customize your decay time with ADJUST, Bass Boost with Custom 1, Liveness with Custom 2, throw in some backwards effects with Custom 3, and control the Wet/Dry mix with Custom 4.

- Custom 1: BassBoost
- Custom 2: Liveness
- Custom 3: Inverse Effects
- Custom 4: Dry/Wet Mix

PROGRAM BANK 1: ROOMS *(continued)*

CUSTOM *(continued)*

4.7   Storage Tank   **ADJUST: Fullness/Size**

KeyWords: Ambience, Dark, Indoor, Custom

A storage tank with a metallic sound and bright, resonant reverb. Change the Fullness and the Size of the tank with ADJUST, and the density of the Ambience with Custom 1. The AR Envelope is patched to OutWidth and triggered by the Mono InLvl. When the threshold is crossed, the effect changes from Mono to Stereo.

• Custom 1: Amb Density

• Custom 2: TriggerRelease Width

4.8   StrangePlace   **ADJUST: Chorus**

KeyWords: Cncrt Hall, Spatial, Custom, Unnatural

A super-tight ConcertHall effect with lots of spatial enhancement.

• Custom 1: Psychorus

• Custom 2: Comp Ratio/Thrshld

• Custom 3: Expand ratio/Thrshld

• Custom 4: High Cut

4.9 Gen. Ambi   **ADJUST: None**

KeyWords: Ambience

A generic ambience effect. Use this as a starting place to make your own ambience effects.

PROGRAM BANK 2: PLATES

INSTRUMENT

0.0   Just Plate   **ADJUST: Liveness**

KeyWords: Plate, Instrument, Large

A basic plate, good for any kind of sound source.

0.1   Rich Plate   **ADJUST: Decay**

KeyWords: Plate, Instrument

An old standard, bright and diffuse.

0.2   Gold Plate: **ADJUST: Size & Decay**

KeyWords: Plate, Instrument

A classic plate with a long decay and medium high end response.

0.3   Plate4Brass   **ADJUST: Rt HC**

KeyWords: Plate, Instrument

A good plate for brass sounds.

0.4   Rock Plate   **ADJUST: Out Width**

KeyWords: Plate, Instrument, Large

A big boomy dark plate with a moderate reverb tail great for high frequency sound sources where you do not want to add more high end.

0.5   Eko Plate   **ADJUST: Mstr Delay**

KeyWords: Plate, Instrument, Echo, Guitar

A sweet combination of recirculating pre-echoes and bright sounding reverb, great for guitar and keys.

0.6   A.Gtr Plate   **ADJUST: Dly Lvls**

KeyWords: Plate, Instrument, Guitar

A really smooth plate with a slow reverb build that great for acoustic guitar. ADJUST allows you to mix in delay.

0.7   SynthLdBPM   **ADJUST: Delay Lvl**

KeyWords: Plate, Keyboard, Echo, Tempo

A medium bright plate with tempo delays optimized for use with synth patches. Tap allows you to tap in the tempo of the delays.

0.8   Floyd Wash   **ADJUST: In Width:OutWidth**

KeyWords: Plate, Instrument, Echo, Guitar

A big plate reverb with long predelay and repeating echo delays adds a spacey wash to slow program material. Great for guitar and synth sounds. ADJUST controls a custom In Width/Out Width parameter that changes the spatial feel.

0.9   GtrPlateBPM   **ADJUST: Dry Dly**

KeyWords: Plate, Guitar, Echo, Tempo

A moderate size dark plate reverb optimized for guitar with tempo driven delays to fatten up the sound. Tap in the tempo of the delays.

VOCAL

1.0 Vocal Plate   **ADJUST: Decay**

KeyWords: Plate, Vocal, Short

A short plate with low diffusion great for a solo vocal track.

1.1   Vocal Plate2   **ADJUST: Liveness**

KeyWords: Plate, Vocal, Large

A large plate with a moderate decay time, great for backing vocals.

1.2   SmVoxPlate   **ADJUST: Decay**

KeyWords: Plate, Vocal, Small

A small bright plate that's good for vocals.

1.3   VoclEkoPlate   **ADJUST: PreDelay**

KeyWords: Plate, Vocal, Echo

A large dark plate with just enough delay to enhance vocal tracks.

1.4   Choir Plate   **ADJUST: Choir Size & Type**

KeyWords: Plate, Vocal, Large

A large silky plate with a long decay time, great for background vocals. ADJUST controls the choir from big and breathy to small and short.

1.5   Multi Vox   **ADJUST: Size & Decay**

KeyWords: Plate, Vocal, Short

A small short plate great for gang vocals. ADJUST simultaneously controls Size and Decay from small and short, small and long, medium and short, medium and long, and large and long.

PROGRAM BANK 2: PLATES *(continued)*

VOCAL *(continued)*

1.6   Bright Vox   **ADJUST: Darkknob**

KeyWords: Plate, Vocal, Bright

A large bright plate with a long decay time, great for various vocals. ADJUST controls the high and low frequency response of the plate.

1.7   VoclEcho BPM   **ADJUST: Dry Signal Pan**

KeyWords: Plate, Vocal, Echo, Tempo

A silky smooth plate with moderate decay time and recirculating delays, great for all vocals.

1.8   VocalTapBPM   **ADJUST: Reverb Level**

KeyWords: Plate, Vocal, Echo, Tempo

Similar to VocalEchoBPM with different delay taps.

1.9   VocalTapBPM2   **ADJUST: Size**

KeyWords: Plate, Vocal, Echo, Tempo

Similar to VocalEcho BPM with a more linear straight BPM delay. ADJUST lets you choose from five room sizes.

LIVE SOUND

2.0   Live Plate   **ADJUST: Decay**

KeyWords: Plate,Live PA, Bright

A crisp clean basic plate with medium decay time and low bass response optimized for live PA applications.

2.1   Clean Plate   **ADJUST: Diffusion**

KeyWords: Plate, Live PA, Bright

A clean plate with ADJUST control of diffusion.

2.2   Live Gate   **ADJUST: Gate or Inverse**

KeyWords: Plate, Live PA, Gated, Special FX

Change from a tight gate or crisp inverse sounds on the fly. ADJUST controls the choice from Gate to Inverse.

2.3   Bright Plate   **ADJUST: Liveness**

KeyWords: Plate, Live PA, Bright

A small bright plate with short decay time. Great for enhancing an instrument without overpowering it.

2.4   Hot Plate   **ADJUST: Plate Temperature**

KeyWords: Plate, Live PA, Bright

A medium sizzling plate optimized for live sound mixing, good for all material. ADJUST allows you to modify the high frequency of the plate.

2.5   Ever Plate   **ADJUST: Decay**

KeyWords: Plate, Large, Dynamic

Mono Level is patched to Attack and Spread making this an ever-changing plate.

2.6   Warm Plate   **ADJUST: Decay**

KeyWords: Plate, Live PA, Dark

A slightly warmer plate for those situations where you don't want as much edge. Try on a solo acoustic guitar performance.

2.7   Live Drums   **ADJUST: High Cut**

KeyWords: Plate, Live PA, Drums/Perc, Bright

A medium plate with short reverb time great for a full kit! ADJUST gives you a high cut filter with five EQ choices.

2.8   Great Plate   **ADJUST: Decay**

KeyWords: Plate, Live PA, Instrument

A basic plate that will work well with most any sound source. Not too dark and not too bright!

2.9   PlateDlyBPM   **ADJUST: Reverb Lvl**

KeyWords: Plate, Live PA, Echo, Tempo

This preset can be a plate reverb, a tap tempo delay or both!

DRUMS&PERC

3.0   Big Drums   **ADJUST: Size**

KeyWords: Plate, Live PA, Drums/Perc

A medium size plate with high diffusion and moderate decay time.

3.1   Drum Plate   **ADJUST: Decay**

KeyWords: Plate, Live PA, Drums/Perc, Dark

A large dark plate with high diffusion and a long decay time. This is the ultimate drum plate!

3.2   Fat Drums   **ADJUST: Reverb Attack**

KeyWords: Plate, Drums/Perc

A moderate sized deep sounding plate with a high attack time. ADJUST controls a combination of predelay, reflections and Rt HC.

3.3   Cool Plate   **ADJUST: Liveness**

KeyWords: Plate, Drums/Perc, Short, Dark

A short dull plate good for percussion.

3.4   Tight Plate   **ADJUST: Decay**

KeyWords: Plate, Drums/Perc, Small

Small and tight with moderate diffusion. Use this to add punch to any percussion track.

3.5   Short Plate   **ADJUST: Decay**

KeyWords: Plate, Drums/Perc, Short

A short plate reverb with a fairly short decay time and good high end, great for a full kit.

3.6   Dark Plate   **ADJUST: Diffusion**

KeyWords: Plate, Drums/Perc, Dark, Long

A classic! Dark and smooth with a long decay time. This fattens any percussion track.

PROGRAM BANK 2: PLATES *(continued)*

DRUMS&PERC *(continued)*

3.7   Plate Gate   **ADJUST: Pre Delay**

KeyWords: Plate, Drums/Perc, Gated

A gate with the tonal qualities of a plate. The ultimate drum gate!

3.8   Plate Gate 2   **ADJUST: Size**

KeyWords: Plate, Drums, Gated

A heavy dense and short nonlinear reverb designed to emulate a plate. ADJUST gives you five different size settings to choose from.

3.9   Bongo Plate   **ADJUST: Diffusion**

KeyWords: Ambience, Drums/Perc, Bright

Give bongo and native drums thickness with this preset. ADJUST allows you to smooth out the sound.

CUSTOM

4.0   Plate 90   **ADJUST: Attitude**

KeyWords: Plate, Dark, Instrument, Custom

A general purpose, dark plate. ADJUST gives you attitude which ranges from soft and short to harsh and dry. Custom Controls allow you to control the Reverb Density and delay levels. Play with all three of these controls to make your own plate

*   Custom 1: Reverb Density

*   Custom 2: Delay Lvls

4.1   WhatTheHeck?:   **ADJUST: LFO2**

KeyWords: Plate, Spatial, Tempo, Custom

Need we say more? A tap tempo-controlled LFO 1 modulates the High Cut parameter. ADJUST controls the speed of LFO 2 which modulates the OutWidth parameter.

*   Custom 1: Dly Lvls

*   Custom 2: Reverb Density

4.2   GtrDlyPlate: **ADJUST: Delay Separation**

KeyWords: Plate, Guitar, Echo, Custom

A basic guitar delay with some plate reverb mixed in. ADJUST lets you choose 100ms, 150ms, 250ms, 500ms, and 1 second delays. Custom 1 allow you to control the Width, from mono to stereo.

*   Custom 1: Width

4.3   Patterns BPM: **ADJUST: LFO Rate**

KeyWords: Plate, Spatial, Tempo, Custom

A tempo-driven spatial effect that moves delays around the room. ADJUST controls the LFO rate which is patched to Out Width. Slow it down or speed it up for more dramatic spatial effects Works great with any sound source!

*   Custom 1: Dly Lvls

4.4   MultPlateDly: ADJUST: Tap Delay Speed

KeyWords: Plate, Echo, Instrument, Custom

A multi-purpose plate delay. ADJUST control the tap speed of the echo delays. Custom Control 1 simultaneously controls InWidth and OutWidth for some unique spatial effects. Custom 2 controls the delay levels for the reflections and the dry delays. Custom 3 controls the reverb liveness.

- Custom 1: In Width:Out Width

- Custom 2: Dly Lvls

- Custom 3: Liveness

4.5   MonoOrStereo: ADJUST: Mono or Stereo

KeyWords: Plate, Instrument, Custom

A general plate that runs in mono, stereo, or 3 choices in between.

- Custom 1: Liveness

4.6   TapDelayBPM: ADJUST: Eko Feedback Decay

KeyWords: Plate, Echo, Tempo

An all-purpose tap tempo delay with a little plate reverb.

- Custom 1: Dly & Ref Lvls

4.7   Spatial Plate: ADJUST: LFO 1 & 2

KeyWords: Plate, Spatial, Custom

A spatial plate reverb with LFO 1 & 2 each independently controlling InWidth and OutWidth scaled inversely. ADJUST gives you three choices for LFO speed.

- Custom 1: Reverb Density

4.8   PanEkoBPM: ADJUST: Panning Speed

KeyWords: Plate, Echo, Tempo, Custom

LFOs modulate dry reflections levels to give you a panning effect. Use Tap to tap in the desired delay time. ADJUST controls the panning speed while Custom 1 controls InWidth and OutWidth - these parameters are inversely scaled to produce some interesting spatial effects.

- Custom 1: In Width:Out Width

4.9   Gen. Plate: ADJUST: Not Patched

KeyWords: Plate

A generic plate preset. Use this as a starting point to make your own plate presets.

PROGRAM BANK 3: POST

INDOOR SMALL

0.0   Cabin Fever   ADJUST: Decay

KeyWords: Cncrt Hall, Indoor, Small.

Sounds like you've been snowed in too long! Basically a dead space, muffled without much width. ADJUST provides some variation in the response of this small space.

0.1   Echo/Kitchen   ADJUST: Blend

KeyWords: Splits, Indoor, Small

A split program providing a syncopated echo delay and a reverb like the inside of a small kitchen. ADJUST controls the blend of the two effects

PROGRAM BANK 3: POST (continued)

INDOOR SMALL (continued)

0.2   HardwoodRoom   **ADJUST: Size**

KeyWords: Ambience, Indoor, Small, Room

Designed to sound like a room with a hardwood floor. Select room size with ADJUST.

0.3   MeetingRoom   **ADJUST: Decay**

KeyWords: Ambience, Indoor, Small, Room.

Hotel-like meeting room. Predelay is set to 46ms, so the wet mix sounds like the microphone is at the back of the room.

0.4   Locker Room   **ADJUST: Decay**

KeyWords: Ambience, Indoor, Small, Room

The ambience of a locker room.

0.5   Living Room   **ADJUST: Size**

KeyWords: Ambience, Indoor, Small, Room

A softer room with a short Rt and some of the stereo width removed.

0.6   Bedroom   **ADJUST: Size**

KeyWords: Cncrt Hall, Indoor, Small, Room

A small bedroom with furniture and heavy curtains. Good on lots of instruments and drums.

0.7   Dual Closets   **ADJUST: Blend**

KeyWords: Split Rvb, Indoor, Small

A split effect providing an empty closet, and a full closet. ADJUST controls the blend between the two.

0.8   Phone Booth   **ADJUST: Size**

KeyWords: Ambience, Indoor, Small.

How much sound can you squeeze into a phone booth? Adds a bit of space to all sounds. Custom Control 1 links pre delay, dry delay, and dry delay mix to easily change the characteristics of the booth.

•   Custom 1: Delay Mix 0 - 100

0.9   Coffin   **ADJUST: Mix**

KeyWords: Ambience, Indoor, Small.

Simulate a tight small space with this ambience preset. ADJUST controls dry delay mix to brighten or deaden the sound for an open or closed casket.

INDOOR LARGE

1.0   MetalChamber   **ADJUST: Decay**

KeyWords: RandomHall, Indoor, Large, Room

Short, boomy, and bright. Like the inside of an anechoic chamber without the absorption cones.

1.1   Stairwell   **ADJUST: Number Of Floors**

KeyWords: Cncrt Hall, Indoor, Large

Short decay of a single room, to large reflections lost in the high-rise. ADJUST lets you select from 20 floors.

1.2   Make-A-Space   **ADJUST: Decay**

KeyWords: RandomHall, Indoor, Large, Custom

ADJUST and Liveness can be used to design your own space.

• Custom 1: Liveness 0 - 127

1.3   Dly/Hallway   **ADJUST: Blend**

KeyWords: Splits, Indoor, Large, Echo

A split program with a short ping-pong delay, and a medium-long hallway reverb. ADJUST.

1.4   LectureHalls   **ADJUST: Blend**

KeyWords: Splits, Indoor, Large

A split program with an "empty" hall and a "full" hall.

1.5   Dance Hall   **ADJUST: Decay**

KeyWords: RandomHall, Indoor, Large

Preset at 1.4 seconds of reverb time for a medium bright hall, or use ADJUST to customize.

1.6   Ballrooms   **ADJUST: Blend**

KeyWords: Splits, Indoor, Large, Room

A split program providing two different shaped ballrooms: a rectangular-shaped room with strong reflections and a fan-shaped room with a smooth decay.

1.7   Empty Club   **ADJUST: Decay**

KeyWords: RandomHall, Indoor, Large, Empty

Typical Monday night at the club. Reflections and delays simulate the emptiness.

1.8   NYC Clubs   **ADJUST: Blend**

KeyWords: Splits, Indoor, Large

A split program with the acoustics of two famous New York City night clubs.

1.9   Sports Verbs   **ADJUST: Blend**

KeyWords: Splits, Indoor, Large

A split reverb with the inside of a locker room, and a large empty arena.

OUTDOOR

2.0   Inside-Out   **ADJUST: Decay**

KeyWords: Cncrt Hall, Outdoor, Spatial, Special FX

A strange hall reverb where the input envelope controls the output width of the reverb. At high levels the signal goes mono. As it decays, the sound fills out the stereo field.

2.1   Outdoor PA   **ADJUST: Mix**

KeyWords: Ambience, Outdoor, Echo

Open space, not much reflection. Takes advantage of maximum DryDly time with no Pre Delay to provide a simple outdoor echo. Use ADJUST to mix in the right amount of dry delay level.

2.2   Outdoor PA 2   **ADJUST: Decay/DecayLvl**

KeyWords: Ambience, Outdoor

Similar to Outdoor PA. ADJUST provides five different settings.

PROGRAM BANK 3: POST *(continued)*

OUTDOOR *(continued)*

2.3   Two Autos   ADJUST: Blend

KeyWords: Splits, Outdoor

A split program giving you the inside of a VW van and the inside of a VW bug. Use ADJUST to control the blend between the two.

2.4   NYC Tunnels   ADJUST: Blend

KeyWords: Splits, Outdoor, Large, Long

A split reverb simulating two of NYC's automobile tunnels: the Lincoln and the Holland.

2.5   Indoors/Out   ADJUST: Blend

KeyWords: Splits, Outdoor, Indoor

A split program with a medium chamber and an outdoor response.

2.6   Echo Beach   ADJUST: Mstr Delays

KeyWords: Splits, Outdoor, Echo, Custom

Echo, echo. Use Custom Control 1 to select between the two echoes.

• Custom 1: Echo Chamber/Room

2.7   Block Party   ADJUST: Pre Delay

KeyWords: Cncrt Hall, Outdoor, Custom

The music reflects off of the brick buildings and paved surfaces, down alley ways and up to the rooftops throughout the neighborhood.

• Custom 1: Liveness

2.8   Stadium   ADJUST: Decay

KeyWords: RandomHall, Outdoor, Custom

Designed to simulate a large sports stadium.

• Custom 1: Liveness

2.9   Dull/Bright   ADJUST: Blend

KeyWords: Splits, Bright, Dark

A split reverb with a dull backstage sound, and a large open space.

SPATIAL

3.0   Wobble Room   ADJUST: Delay Lvl

KeyWords: RandomHall, Spatial, Room, Custom

An LFO drives OutWidth to make the room wobble. A Custom Control allows you to set the LFO rate.

• Custom 1: Rate

3.1   Spatializer   ADJUST: Out Width

KeyWords: Cncrt Hall, Spatial, Special FX, Custom

Compress and Expand ratios are cranked. A Custom Control allows you to vary liveness from dull to bright. Compression and expansion parameters are available in the Soft row.

• Custom 1: Liveness

3.2   Mic Location   ADJUST: Delay Mix

KeyWords: Ambience, Spatial

Use bipolar ADJUST to add Predelay or Dry Delay effects; center position is dry close mic. Mono drops out at either extreme.

3.3   Voices?   **ADJUST: More Voices**

KeyWords: RandomHall, Spatial, Dialog, Custom

Get lost in a crowd. ADJUST sets delays to produce multiple voices.

3.4   Voices? 2   **ADJUST: More Voices**

KeyWords: RandomHall, Spatial, Dialog, Custom

Similar to Voices? with OutWidth controlled by an LFO for a maddening spatial effect. ADJUST sets delays. Custom Control 1 sets rate, decreasing depth as rate is increased to maintain smooth transitions.

- Custom 1: Rate

3.5   Voices? BPM   **ADJUST: More Voices**

KeyWords: RandomHall, Spatial, Custom, Tempo

Tempo drives individual left/right delays while ADJUST sets delay masters. As in Voices? 2, OutWidth is modulated by an LFO, with rate set by Custom Control 1.

- Custom 1: Rate

3.6   MovingDelays   **ADJUST: High Cut**

KeyWords: Plate, Spatial, Special FX

An LFO modulates OutWidth to produce wildly moving echoes with left and right delays 50 ms apart.

3.7   Window   **ADJUST: Window**

KeyWords: Plate, Spatial, Special FX

The sound source is opposite windows that can be opened or closed with ADJUST.

3.8   Wall Slap   **ADJUST: Decay Lvl**

KeyWords: Ambience, Spatial, Custom

Use ADJUST to determine wall texture. Custom Control 1 links pre-delay, dry delay, and the dry delay mix; fully clockwise is dry, anything less introduces ambience.

- Custom 1: Delay Mix

3.9   BombayClub   **ADJUST: Location**

KeyWords: Ambience, Spatial, Indoor, Custom

ADJUST varies Decay, Out Width, and High Cut to simulate different locations within the club. Custom Control 1 links predelay, dry delay, and the dry delay mix; fullly clockwise is dry, anything less introduces ambience.

- Custom 1: Delay Mix

CUSTOM

4.0   X Variable   **ADJUST: Decay**

KeyWords: Cncrt Hall, Indoor, Custom

Custom Controls are the solution to this variable equation. Custom 1 links Rt HC, Crossover, and Shape to vary liveness from dull to bright. Custom 2 links Reflect Mstr Dly and Size to setup different reflections; 0 is all pre delay with no reflections. Predelay is located in the Soft row for convenience.

- Custom 1: Liveness
- Custom 2: Reflections

PROGRAM BANK 3: POST *(continued)*

CUSTOM *(continued)*

4.1   Y Variable   **ADJUST: Decay**

KeyWords: RandomHall, Large, Indoor, Custom

Random Hall version of X Variable. Here, Custom 2 varies reflections, 0 is all Delay with no reflections. Delay parameters are located in the Soft row for convenience.

• Custom 1: Liveness

• Custom 2: Reflections

4.2   Sound Check   **ADJUST: Decay**

KeyWords: Cncrt Hall, Indoor, Large, Custom

Imagine an empty hall, club, or arena from the perspective of the stage. ADJUST lets you choose the venue.

• Custom 1: Liveness 0-127

• Custom 2: Reflections 0-50

4.3   Sound Stage   **ADJUST: Decay**

KeyWords: Ambience, Live PA, Indoor, Custom

For variations in ambience, try using Custom Control 1 to change Pre Delay/Dry Delay mix.

• Custom 1: Delay Mix

4.4   BPM Looper   **ADJUST: Response**

KeyWords: Plate, Custom, MIDI, Tempo

Tempo drives a mod row time switch which ramps delay feedback for interesting looping effects. ADJUST varies delay/decay response. Great for wild drum machine rhythms with Tempo Source set to MIDI.

• Custom 1: Attitude

4.5   Reverse Taps   **ADJUST: Decay**

KeyWords: Cncrt Hall, Custom, Special FX, Tempo

ADJUST provides five choices of Mid Rt from 0.292 sec to 32.49 sec. Tempo sets Reflect Dly L/R to vary the reverse effect.

• Custom 1: Liveness

• Custom 2: Reflections

4.6   Air Pressure   **ADJUST: Compress/Expand**

KeyWords: Cncrt Hall, Broadcast, Dialog, Custom

Use either compression or expansion with the bipolar functionality of ADJUST. Custom 1 allows you to add some reverb if desired.

• Custom 1: Reflections 0-50

4.7   The Tomb   **ADJUST: Decay**

KeyWords: RandomHall, Large, Dark, Custom

Places source material within a reflective tomb. ADJUST moves the source deeper into the scary space. Use Custom Controls for additional variations in darkness.

• Custom 1: Liveness

• Custom 2: Reflections

4.8   Mythology   ADJUST: Decay

KeyWords: RandomHall, Dialog, Unnatural, Custom

Size and delay are inversely proportionate to Custom 3; long delay with minimal size at 0, large size with half the delay at 50. Great for supernatural dialog, or Indian film music vocals.

- Custom 1: Liveness
- Custom 2: Rate
- Custom 3: ReverseReflect

4.9   Mr. Vader   ADJUST: Special Effect Type

KeyWords: Plate, Dialog, Special FX, Custom

Use ADJUST to select Buzzing or Modulated special effects for out-of-this-world voice or techno-pop.

- Custom 1: Attitude
- Custom 2: Rate

PROGRAM BANK 4: SPLITS

MONO

This row consists of dual independent mono input machines with a combined stereo output. This row (and portions of other rows) may be utilized fully when each input is connected to a dedicated effect send on a console, giving the PCM 91 a dual machine operation.

0.0   Chamber/Room   ADJUST: Chamber/Room

KeyWords: Splits, Chamber, Room, Mono

A fine example of the dual functionality and quality of the Chamber/Room algorithm. Set up as two independent reverberators, ADJUST allows you to monitor the Chamber, the Room or both.

0.1   Two Chambers   ADJUST: Wood/Brick

KeyWords: Chamber, Drums, Splits, Mono

The Brick Chamber has a live reflective sound while the Wood Chamber is designed to be dark and more dense.

0.2   Hall/Room   ADJUST: Hall/Room

KeyWords: Splits, Large, Small, Mono

The Chamber reverb is configured to sound like a large hall, and the Room reverb maintains its smaller size and depth.

0.3   Mono Halls   ADJUST: Left Hall, Right Hall

KeyWords: Splits, Large, Mono

This dual purpose program splits the left and right inputs to each reverberator, both of which are tailored to emulate halls.

0.4   LgKick/Snare   ADJUST: Kick/Snare

KeyWords: Large, Drums/Perc, Splits, Mono

This Program is meant to be dedicated to the kick drum and snare drum. ADJUST allows you to monitor a single input while Input Configuration in the Soft row allows you to switch the effect for each instrument.

PROGRAM BANK 4: SPLITS *(continued)*

MONO *(continued)*

0.5   Keys Room   ADJUST: Clavinet/Organ

KeyWords: Splits, Chamber, Keyboard, Mono

Two Rooms designed specifically for use with Clavinet and Organ. ADJUST lets you swap the input into each Room.

0.6   Two Guitars   ADJUST: Gtr1/Gtr2

KeyWords: Splits, Acoustic, Guitar, Mono

Designed with a duo in mind, the Acoustic guitar space is fairly small and ambient, while the Electric guitar is in a large wash with a bit of echo.

0.7   Fusion BD/SN   ADJUST: Kick/Snare

KeyWords: Splits, Drums, Small, Mono

Ideal for adding live Room ambience to the kick and snare drums. This program is useful when set up with a console for two independent auxiliary sends; the Soft row has a parameter for swapping the inputs.

0.8   Dual Drums   ADJUST: Chamber/Room

KeyWords: Splits, Drums/Perc, Mono

Similar to Fustion BD/SN, this preset is made up of two great drum rooms.

0.9   SmKick/Snare   ADJUST: Kick/Snare

KeyWords: Splits, Drums/Perc, Small, Mono

A smaller version of LgKick/Snare for snare and bass drums.

STEREO

This row utilizes the stereo input configuration of the Chamber/Room algorithm resulting in two stereo-in, stereo-out effects.

1.0   Vocal Verbs   ADJUST: Lead/Backing

KeyWords: Vocal, Echo, Splits, Stereo

One reverb designed for background vocals, and one designed for lead vocals.

1.1   Studio Rooms   ADJUST: StudioA/Studio B

KeyWords: Room, Chamber, Splits, Stereo

Provides two different studio rooms. Good for all program material.

1.2   Hard Rooms   ADJUST: Smooth/Ragged

KeyWords: Room, Short, Splits, Stereo

A ragged, bright, small, hard room, and a smooth, medium-large room.

1.3   Random Rooms   ADJUST: Rarely /Very Often

KeyWords: Special FX, Drums, Splits, Stereo

A large room is triggered in place of the small, constantly running Chamber. ADJUST controls the speed of LFO1's Random waveform output, which in turn, is used to trigger the AR Envelope providing a smooth transition from the small Chamber to the lrage Room.

1.4   Hall/Basemnt   **ADJUST: Hall/Bsmnt**

KeyWords: Room, Chamber, Splits, Stereo

A nice hall reverb, and a basement-like room.

1.5   Breath   **ADJUST: Pre Delay**

KeyWords: Splits, Large, Stereo

A dual reverb program with very large Size and Pre Delay.

1.6   Cathedrals   **ADJUST: St. Peters/St. Johns**

KeyWords: Large, Splits Stereo

The inside of two cathedrals.

1.7   Castle Chmbr   **ADJUST: Rt HC**

KeyWords: Bright, Splits, Stereo

An all-purpose Chamber with Reverb Time High Cut patched to ADJUST.

1.8   Warm Dual   **ADJUST: Chamber/Room**

KeyWords: Dark, Room, Splits, Stereo

A Chamber and Room edited to have low high-frequency content.

1.9   Rvb+DryDelay   **ADJUST: Stereo Delay Level**

KeyWords: Splits, Echo, Vocal

When the stereo reverb effect decays to silence, a slightly panned dry-signal delay is heard. This effect is Tempo based - the delays and reverb tail scale with BPM.

LIVE SOUND

Designed for Live Sound applications, all delay programs have their delays based on Tap Tempo. Programs 2.7-2.9 are dual mono input machines with a combined stereo output.

2.0   Dlys/HallsBPM   **ADJUST: Delays/Reverb**

KeyWords: Echo, Tempo, Splits, Live PA

A split program with a basic hall, and dual Tap-Tempo delays.

2.1   Split Elvis   **ADJUST: Slap-back echo**

KeyWords: Special FX, Echo, Splits, Live PA

Two slap-back echo effects: a large slap echo, and a small slap with Room ambience.

2.2   Room In Room   **ADJUST: Big/Small Room**

KeyWords: Room, Splits, Live PA, Stereo

A split reverb with a small room and a large pre-delayed room. Combined, they provide a "small room in a large room" effect. Separately, they are useful as standalone rooms.

2.3   Bloom Verbs   **ADJUST: Short/Long**

KeyWords: Drums/Perc, Stereo, Splits, Live PA

A long, "Blooming" reverb that rises and decays, and a short Bloom verb. Good on all types of sounds.

2.4   DualEcho BPM   **ADJUST: Echo 1/Echo 2**

KeyWords: Echo, Splits, Live PA, Stereo

A split effect with two different echo patterns, creating a syncopated echo/delay. ADJUST controls the blend between the two effects.

PROGRAM BANK 4: SPLITS *(continued)*

LIVE SOUND *(continued)*

2.5   Chords/Leads   ADJUST: Chords, Leads

KeyWords: Splits, Guitar, Live PA, Stereo

A large hall with Tap Tempo based Reflections for added delay and a small room for chord comping. The AR Envelope generator makes the crossfade between the two effects.

2.6   Two Delays   ADJUST: Delay 1/Delay 2

KeyWords: Echo, Stereo, Splits, Live PA

A split program with two different delay types: a syncopated multi delay, and a modulated resonant delay with LFO2 controlling Master Delay and Master Feedback.

2.7   Gloss & BPM   ADJUST: Gloss

KeyWords: Echo, Mono, Splits, Live PA

The left input feeds a Tap Tempo based stereo delay while the right channel comprises a large glossy reverb designed to add shine to the mix. Controls in the Soft row allow you to change the input assignments and adjust the amount of recirculation within the echoes.

2.8   BPMVox/Drums   ADJUST: Vocal Decay Time

KeyWords: Splits, Live PA, Splits, Mono

The left input feeds a large vocal reverb combined with a Tap Tempo based diffused echo. The right channel feeds a medium sized drum room with the bass response rolled off around 270 Hz.

2.9   DualDelayBPM   ADJUST: Ganged Delay Hi Cut

KeyWords: Splits, Echo, Live PA, Tempo

Tap Tempo based dual delays. These can be inserted in a console as two independent mono delays.

INSTRUMENT

The Programs in this bank have been created for specific instrument applications. Programs 3.5-3.9 are independent mono input machines with a combined stereo output.

3.0   Symphonic   ADJUST: Decay

KeyWords: Splits, Classical, Large, Instrument

This program uses the Chamber portion of the Chamber/Room algorithm to emulate a large dark hall. This orchestral setting is good for large vocal choirs, strings, and dark brass instruments.

3.1   Bass Mics   ADJUST: Blend

KeyWords: Guitar, Instrument, Splits, Stereo

This split program provides two mic'd bass amps: one close mic'd and one a bit farther away.

3.2   Dyna Room   ADJUST: Large Room Decay

KeyWords: Instrument, Short, Long, Splits

Similar to Random Rooms, but with input level used to kick in the large Room.

3.3 TwoDrumRooms ADJUST: Blend

KeyWords: Drums, Room, Splits, Instrument

A large, bright room with strong early reflections and a far mic, combined with a medium-large room with smoother response and a close mic.

3.4 Full Kit ADJUST: Size

KeyWords: Splits, Chamber, Drums/Perc, Instrument

A multi-purpose Chamber most suitable for adding life to a full drum kit.

3.5 Perc/Synth ADJUST: Blend

KeyWords: Drums/Perc, Keyboard, Splits, Instrument

A room reverb for percussion, and a reverb for synth washes.

3.6 Rhodes/Brass ADJUST: Rhodes/Brass

KeyWords: Keyboard, Splits, Instrument

This program is intended for keyboard instruments. The Brass reverb is highly reflective to accentuate keyboard samples. The Room reverb is tailored for the classic Fender Rhodes.

3.7 Organ/Piano ADJUST: Organ/Piano

KeyWords: Acoustic, Keyboard, Splits, Instrument

A room for organ sounds, and a hall for pianos.

3.8 Brass/String ADJUST: String/Brass

KeyWords: Keyboard, Instrument, Splits, Mono

A reverb suited for bright brass instruments, and one for strings.

3.9 Guitar Verbs ADJUST: Gtr1/Gtr2

KeyWords: Instrument, Guitar, Splits, Mono

A dual reverb for electric and acoustic guitars.

CUSTOM

4.0 Thunder&Ice ADJUST: Effects Blend

KeyWords: Splits Special FX, Spatial, Custom

Two completely opposite reverbs at your disposal. Use ADJUST to blend or separate the short, bright Room and the big, thunderous Chamber. For a backwards effect, use Custom 1. To change the In Routing configuration, use Custom 2. Custom Controls 3 and 4 are dynamic effects: a switch ramping Mix from Wet to Dry with the controller accessing the ramp speed, and an LFO patched to the High Cut of the Room (Ice) - you control the rate of oscillation.

- Custom 1: Inverse Effects
- Custom 2: In Routing
- Custom 3: Wet to Dry Ramp
- Custom 4: Im-Pulse Ice

PROGRAM BANK 4: SPLITS *(continued)*

CUSTOM *(continued)*

4.1   Ring Verb   ADJUST: Verb to Mod

KeyWords: Splits, Special FX, Spatial, Custom

This Chamber/Hall preset lets you have a long, bright reverb and an ultra-metallic ring mod. ADJUST lets you blend or separate these two effects. Custom 1 tunes the frequency of the ring mod. Custom 2 lets you change the In Routing status. Enhance your stereo sound with Custom 3, or use Custom 4 to turn up some delay and then Tap in the delay time or dial in the BPM.

- Custom 1: Mod Tuner
- Custom 2: In Routing
- Custom 3: Stereo Enhancer
- Custom 4: TapReflect Level

4.2   Dark & Brite   ADJUST: Reverb Blend

KeyWords: Splits, Special FX, Spatial, Custom

A dark, dense reverb and a bright, thin reverb. Use ADJUST to balance the two. Use the Inverse EQ effect on Custom 1 to cut the highs on the Room while boosting them on the Chamber. Custom 2 lets you change the effect from forwards to backwards, while Custom 3 adds a bit of Predelay to the signal. Custom 4 gives you a bit more EQ enhancement.

- Custom 1: Inverse EQ
- Custom 2: Inverse Effects
- Custom 3: Pre Delay
- Custom 4: Briteness Enhancer

4.3   Dark & Gated   ADJUST: Toggle Gate FX

KeyWords: Splits, Special FX, Custom, Gated

A dynamic effect with input level affecting the Shape setting of the Room, and triggering the Infinite switch on the Chamber reverb. When Infinite triggers, then releases, a gate effect is produced. Use ADJUST to change the Mode of the AR envelope. Use Custom 1 to change the release time of the gate. Custom 2 changes the balance of the Chamber/Room levels, Custom 3 changes their Sizes. Input level also controls a Master Delay line that is active at lower levels, then cuts out and the gate kicks in at higher levels. Use Custom 4 to change the level of this delay.

- Custom 1: Gate/Shape Release
- Custom 2: Effects Blend
- Custom 3: Switch the Sizes
- Custom 4: Master Delay Level

4.4   Pipe Reverb   ADJUST: PipeSize

KeyWords: Splits, Special FX, Bright, Custom

With the characteristics of a pipe in mind, this small drain to enormous tunnel reverb is a great special effect for television or film. Use ADJUST to choose pipe size, or Custom 1 to control basic Size settings. Use Custom 2 to change high-frequencies for more EQ control.

- Custom 1: Size
- Custom 2: High Cut

4.5   Weird Places   ADJUST: Eko Box/Oil Drum

KeyWords: Echo, Special FX, Splits, Custom

A split program with a short "Box" reverb with repeating echo delays, and a reverb like the inside of an Oil drum.

- Custom 1: Stereo Delay
- Custom 2: Oil Drum Timbre
- Custom 3: Oil Drum Texture

4.6   Two Rooms   ADJUST: Little Thin/Dark Room

KeyWords: Slap FX, Guitar, Splits, Custom

Two very distinct rooms allows for quick switching between different effects.

- Custom 1: Dual Decay
- Custom 2: Dual Liveness

4.7   TapDly&Hall   ADJUST: Tap Delay/Hall

KeyWords: Echo, Bright, Splits, Custom

This Program places a Tap-Tempo based delay on the left input with a hall reverb on the right input. The Soft row has Custom Controls created for swapping the inputs and adjusting the amount of feedback present in the delays.

- Custom 1: Input Assignment
- Custom 2: Tap Delay Master

4.8   E-NoseDelays   ADJUST: Nose 1/Nose 2

KeyWords: Echo, Dynamic, Splits, Custom

Two very strange delays. One with a highly resonant short delay with Random LFO1 modulating delay time, the other with long modulated delays modulated by LFO2.

4.9   Gen. Split   ADJUST: Not Patched

KeyWords: Splits, Custom

A generic Chamber/Room preset. Use this as a starting point to create your own split reverb effects.

PROGRAM BANK 5: STUDIO

ENVIRONMENTS

0.0   Lunar Blue   ADJUST: Lunar Cycle

KeyWords: Large, Custom, Special FX, Splits

Captures the mood of the cycles of the moon. Full Moon is a bright, natural sound while New Moon provides a dark, unnatural, inverse effect. ADJUST cycles between the two. Use the Custom Control: Full Moon Fury in the Soft Row to add a sizzling feedback to the Full Moon.

- Custom 1: Full Moon Fury

0.1   Air 1/Air 2   ADJUST: Blend

KeyWords: Bright, Dark, Small, Splits

Air 1 is a small bright room. Air 2 is the same size with more low end/dull sound. ADJUST is patched to OutLvl in each algorithm to allow you to blend the two rooms.

0.2   Ambi 1/Air 3   ADJUST: Blend

KeyWords: Bright, Dark, Small, Splits

Similar to Air 1/2. Ambi 1 is a small bright room with Mid RT set to minimum. Air 3 is the same room with a dull, muffled sound. ADJUST is patched to OutLvl, allowing blends of the two rooms.

PROGRAM BANK 5: STUDIO *(continued)*

ENVIRONMENTS *(continued)*

0.3   Big/Bigger   **ADJUST: Blend**

KeyWords: Bright, Echo, Large, Splits

Very large rooms with plenty of available reflections. ADJUST blends the two rooms. Increasing ADJUST causes more reverb and reflections to appear.

0.4   Big Rooms   **ADJUST: Blend**

KeyWords: Mono, Room, Large, Splits

Large rooms with a long reverb time. Big Room 2 gives you a more distant sound. ADJUST allows you to blend the two rooms.

0.5   HallA /HallB   **ADJUST: Blend**

KeyWords: Room, Long, Large, Splits

Typical large hall preset. Generous Mid Rt and Size settings allow for plenty of decay time. ADJUST blends the two halls.

0.6   Living Dead   **ADJUST: Blend**

KeyWords: Small, Short, Natural, Splits

Chamber rooms from a lively, reflective locker room to a muffled, carpeted room.

0.7   Wave/NuHall   **ADJUST: Blend**

Keyword: Bright, Large, Long, Splits

Wave produces a large booming effect with a quick reverb decay. NuHall is a typical large hall with a moderate amount of reflections.

0.8   Dual Chambrs   **ADJUST: Blend**

KeyWords: Bright, Chamber, Natural, Splits

Two chambers with varied brightness. Chambers are selectable via ADJUST.

0.9   Crusher   **ADJUST: Bark**

KeyWords: Room, Special FX, Splits

An interesting effect with AR Env patched to the output of channel A for a dynamic pumping effect. Channel B provides some light ambience to smooth the process.

INSTRUMENTS

1.0   Studio A + B   **ADJUST: Blend**

KeyWords: Acoustic, Mono, Room, Splits

A Mono Split preset that emulates a studio setting. Studio A is a smaller drier sounding room than Studio B where higher Mid Rt and Shape settings add a more reflective sounding effect. ADJUST blends A & B.

1.1   Two Rooms   **ADJUST: Blend**

KeyWords: Room, Mono, Medium, Splits

Medium size rooms with clean, clear ambience. ADJUST blends the different spatial effects of the two rooms.

1.2   Reversals   **ADJUST: Blend**

KeyWords: Gated, Special FX, Unnatural, Splits

A special effects preset for just about any instrument. Designed to emulate the sound source played in reverse. Listen at 100% wet.

• Custom 1: Delay Time

1.3   This/Flubb   **ADJUST: Blend**

KeyWords: Bright, Instrument, Special FX, Splits

A modest reverb preset with adjustable brightness via ADJUST. The two reverbs sound much like their names.

1.4   Sax Gates   **ADJUST: Blend**

KeyWords: Mono, Gated, Instrument, Splits

Preset gates made for saxophones. ADJUST controls decay amount.

1.5   Fat Guitars   **ADJUST: Blend**

KeyWords: Guitar, Gated, Mono, Splits

A mono split preset for guitar with a lively guitar room and an aggressive gated guitar effect.

• Custom 1: Woof

1.6   Vintage FX   **ADJUST: Blend**

Keyword: Dark, Instrument, Mono, Splits

A great chamber multi-tap tape echo with dark reverb, adjustable to a spring reverb effect.

• Custom 1: Spring Brightness

1.7   TremoloVerb   **ADJUST: Tremolo Speed**

KeyWords: Chamber, Large, Special FX, Splits

A bright chamber and a dark chamber, the outputs of which are alternated using an LFO, creating a tremolo effect.

1.8   Guitar Weeps   **ADJUST: Feedback**

KeyWords: Echo, Tempo, Guitar, Splits

For the ballad soloist. Perfect long decays that trail off on the "weeping" guitar solo. Delays are Tap tempo controlled.

1.9   Amp>Add Room   **ADJUST: Blend**

KeyWords: Room, Short, Cascade, Guitar

An inverse chamber mimics the dry amplifier sound associated with close miking. ADJUST adds some room ambience into the track. No need to set up all those extra ambience mics anymore.

VOCAL

2.0   Far/CloseMic   **ADJUST: Blend**

KeyWords: Chamber, Short, Vocal, Splits

This preset emulates the distance of source miking. ADJUST changes the distance between the sound source and the mic.

2.1   Vox Doublers   **ADJUST: Blend**

KeyWords: Bright, Vocal, Dark, Splits

A short reverb to brighten dialog.

2.2   Real Vocals   **ADJUST: Blend**

KeyWords: Vocal, Mono, Small, Splits

Two natural vocal chamber rooms, one of average size, the other small. A mono split preset.

• Custom 1: Room A Brightness

2.3   ErsatzPlates   **ADJUST: Blend**

KeyWords: Plate, Vocal, Mono, Splits

Mono split chamber rooms mutated to sound like plates. A Vocal plate with medium Rt and bright timbre and an Old plate with a darker sound.

PROGRAM BANK 5: STUDIO *(continued)*

VOCAL *(continued)*

2.4   Endless Vox   **ADJUST: Blend**

KeyWords: Vocal, Mono, Tempo, Splits

Two nice sounding vocal rooms, one with a clean vocal reverb, the other a vocal reverb room with echo, feedback patched to a pedal control, and infinite "bottomless pit" reverb activated via Footswitch 1. Delays are Tap tempo controlled.

- •   Custom 1: Feedback

2.5   Tapps/Mic   **ADJUST: Blend**

KeyWords: Vocal, Echo, Slap FX, Splits

A combination of Predelay and a large Shape setting give this preset a fast tapping effect. Mic is a simple room setting with little reverb.

2.6   Mic>Add Room   **ADJUST: Blend**

KeyWords: Vocal, Room, Short, Cascade

The Room2 side mimics a dry microphone, closely miked. ADJUST adds some room ambience.

2.7   Studio>Walls   **ADJUST: Blend**

KeyWords: Chamber, Indoor, Vocal, Cascade

The first space is a very diffuse inverse chamber. ADJUST adds high-frequency response.

- •   Custom 1: Master Brightness

2.8   Airclip>Room   **ADJUST: Blend**

KeyWords: Chamber, Vocal, Small, Cascade

This preset includes a small, clear environment with a very short reverb time. Use ADJUST to add a medium-sized room with a very natural and clear sound.

2.9   Plate>DifEko   **ADJUST: DifEko**

KeyWords: Vocal, Room, Echo, Cascade

This preset includes a large, clear space with good high-frequency response. The second chamber has a short reverberation time with multiple echo reflections. ADJUST toggles the two.

- •   Custom 1: Delay Time

DRUMS/PERC

3.0   Drum Gates   **ADJUST: Blend**

KeyWords: Drums/Perc, Gated, Mono, Splits

A gating effect for any percussion instrument.

3.1   Nonlin A+B   **ADJUST: Blend**

KeyWords: Gated, Mono, Drums/Perc, Splits

'A' is a bright, nonlinear reverb with a lengthy decay while 'B' is a duller sounding inverse reverb with a shorter decay.

3.2   Kick+Snare   **ADJUST: Blend**

KeyWords: Drums/Perc, Gated, Mono, Splits

This mono split preset has a dark room for your kick sound, and a lively reverb for the snare.

3.3   Kick+Snare2   **ADJUST: Blend**

KeyWords: Drums/Perc, Mono, Splits

This mono split preset can place your kick drum inside a dark chamber as well as gating a snare.

• Custom 1: Kick Air

• Custom 2: Snare Hype

3.4   Buckslam Oil   **ADJUST: Blend**

KeyWords: Drums/Perc, Mono, Splits

In this mono split preset the Buckslam setting helps create an aggressive snare and toms. The oil drum setting creates a classic oil drum kick verb.

3.5   Atom Jumper   **ADJUST: Blend**

KeyWords: Mono, Drums/Perc, Special FX, Splits

A nice mono split Inverse preset with effects similar to the classic PCM 70 Atom Smasher and Ski Jump presets. Great for special effects.

3.6   70Kick+Snare   **ADJUST: Blend**

KeyWords: Drums/Perc, Mono, Splits

Reproductions of the classic PCM 70 Kick and Snare chambers. A mono split preset.

3.7   Ballad Drums   **ADJUST: Blend**

KeyWords: Drums/Perc, Mono, Ballad, Splits

A mono split chamber preset with a large, lively chamber room and a darker, monstrous room.   Use   ADJUST to select the perfect chamber room.

3.8   HiphopDrumz   **ADJUST: Infinite Hold**

KeyWords: Drums/Perc, Tempo, Mono, Splits

For the hip-hop beat. Wild delays are tempo controlled. ADJUST gives you the Infinite Hold feature of Room2.

3.9   NuGate+Room   **ADJUST: Blend**

KeyWords: Gated, Drums/Perc, Mono, Splits

Great sounding gate with fairly quick reverb decay time. Room is a simple small sized room with little reverb.

• Custom 1: Room Brightness

CUSTOM

4.0   Rise n'Verbs   **ADJUST: Blend**

KeyWords: Bright, Echo, Splits, Slap FX

A large room with a high Shape setting for an inverse effect. Generous Mid RT settings allow for plenty of reverb. ADJUST blends the two rooms.

• Custom 1: Rise A Depth

• Custom 2: Rise B Depth

4.1   Brick n 'Wood   **ADJUST: Blend**

KeyWords: Acoustic, Indoor, Medium, Splits

Medium size rooms with moderate amounts of Mid Rt. The Brick room setting is brighter and more pronounced than the Wood room setting. ADJUST blends the two rooms.

• Custom 1: Brick Liveness

• Custom 2: Wood Room Type

PROGRAM BANK 5: STUDIO *(continued)*

CUSTOM *(continued)*

4.2   Grit Verbs   ADJUST: Blend

KeyWords: Large, Special FX, Unnatural, Splits

Large rooms with different Mid RT settings which are adjustable via ADJUST. When the Grits rise, the Mid RT increases.

- Custom 1: Rise Depth

4.3   Zippers A/B   ADJUST: Blend

KeyWords: Gated, Large, Unnatural, Splits

A great special effect with A and B providing drastically different effect options. With ADJUST set to Rise, maximum Duration and Shape settings create a reverse rumbling effect. ADJUST set to decay gives a tinny reverberation effect.

- Custom 1: Rise Depth
- Custom 2: Decay Depth

4.4   Stereoizers   ADJUST: Blend

KeyWords: Chamber, Gated, Stereo, Splits

A very dry, tight sounding preset with ADJUST varying the dimension of the sound between two small spaces.

- Custom 1: Master Brightness

4.5   EchoVerb   ADJUST: Delay Patterns

KeyWords: Echo, Tempo, Stereo, Splits

A cool echo reverb effect with ADJUST controlling the echoes from mono to stereo with different speeds.

- Custom 1: Delay Speed
- Custom 2: Delay Regen
- Custom 3: Rev Intensity
- Custom 4: Reverb Lvl

4.6   Flipped Tape   ADJUST: Blend

KeyWords: Special FX, Gated, Mono, Splits

Two distinct inverse reverbs achieve a "flipped tape" effect. Listen at 100% wet.

- Custom 1: Inverse Time A
- Custom 2: Inverse Time B

4.7   Direct GTR   ADJUST: Mic Proximity

KeyWords: Guitar, Ambience, Cascade

A great reverb preset for distorted guitar. The room adds reflections much like those found at the mic in front of the speaker cabinet.

- Custom 1: Liveness
- Custom 2: Ambience Level

4.8   Clipp/Bsmnt   ADJUST: Blend

KeyWords: Mastering, Room, Unnatural, Splits

Clipp is a quick gate. Bsmnt is a typical large sounding basement effect with a hollow sound.

- Custom 1: Clipp Room Liveness
- Custom 2: Basement Liveness

4.9   TrembleRobot   ADJUST:Mottle

KeyWords: Mono, Special Effects, Unnatural, Splits

Lots of movement and modulation. The left side is a long reverb with an LFO modulating OutLvl. ADJUST controls the pulsing speed of the level modulation while Axiom controls the depth. Machine B has high cut tied to a triggered switch that opens and abruptly shuts. This reverb has a pair of very short delays with a ton of feedback to create a robotic effect. Torque controls the aggression of the filter sweep effect triggered via Sw1. Overhang sets the amount of dark reverb tail left over after the high cut filter slams down. Wild!

•   Custom 1: Axiom

•   Custom 2: Torque

•   Custom 3: Overhang

PROGRAM BANK 6: LIVE

ACOUSTIC

0.0   Sprites A/B   ADJUST: Blend

KeyWords: Bright, Echo, Special FX, Splits

A bright/crisp reverb with adjustable decay times.

0.1   Brass+Room   ADJUST: Blend

KeyWords: Room, Mono, Acoustic, Splits

A bright room for brass instruments and a general purpose, average ambient room. A mono split preset.

0.2   Horns+String   ADJUST: Blend

KeyWords: Mono, Instrument, Acoustic, Splits

A mono Split preset for brass and strings. The brass room is bright and punchy. The string room is full of reverb, with reflections and long decay time with a slow attack.

0.3   Elecoustic   ADJUST: Blend

KeyWords: Guitar, Acoustic, Mono, Splits

A mono split preset with two chamber rooms, one for electric guitar, the other for acoustic guitar. Both are warm rooms.

0.4   Hall/Chamber   ADJUST: Blend

KeyWords: Acoustic, Classical, Orchestral, Splits

A large hall with fairly long reverb decay time and a medium sized chamber with short decay time.

0.5   Wind+Brass   ADJUST: Blend

KeyWords: Acoustic, Instrument, Mono, Splits

A medium size, clear room with lots of high end. No delays.

0.6   Place>Roomed   ADJUST: Blend

KeyWords: Room, Short, Small, Cascade.

An inverse chamber with a short duration and a small slope, creating a slightly gated effect, and a medium size, clear sounding room with short predelay. ADJUST adds the second chamber.

•   Custom 1: Place Brightness

PROGRAM BANK 6: LIVE *(continued)*

ACOUSTIC *(continued)*

0.7   Dream Hornz   **ADJUST: Fbks**

KeyWords: Dynamic, Acoustic, Slap FX, Cascade

A large, diffuse auditorium with long echo delays. Feedback level is alternated from chamber to room via ADJUST.

0.8   Dream Hornz2   **ADJUST: Brightness**

KeyWords: Slap FX, Acoustic, Dynamic, Cascade

A large, diffuse room with long echo delays. Feedback levels and Rt HCs are controlled by ADJUST.

0.9   Small Halls   **ADJUST: Blend**

KeyWords: Indoor, Natural, Acoustic, Splits

An average size, unintimidating, fairly bright hall and a mellow, smooth hall.

ELECTRIC

1.0   Griln/Flitt   **ADJUST: Blend**

KeyWords: Bright, Chamber, Gated, Splits

A heavy reverb with vibrato that sizzles with the right program material. Flitt is similar, but with a dry sound.

1.1   Pico Gates   **ADJUST: Blend**

KeyWords: Gated, Short, Unnatural, Splits

Quick, tight sounding gates with ADJUST varying the shape of the gate.

1.2   HiPass/Club   **ADJUST: Blend**

KeyWords: Bright, Indoor, Room, Splits

A fairly bright, hissy effect with high Shape and Spread settings to give a quick delay effect. Club is a medium size room with moderate decay.

1.3   Rock Guitars   **ADJUST: Blend**

KeyWords: Guitar, Instrument, Mono, Splits

Mono Split chamber rooms for electric and acoustic guitars. The electric room has a washy effect with a slow build and multi-echo effects. The acoustic room gives the guitar an aggressive sound.

1.4   Spritz>Verb   **ADJUST: Amt of Verb**

KeyWords: Chamber, Instrument, Echo, Cascade

The first chamber is a large room with multiple echo reflections and Mid RT set to the shortest duration. The second chamber is a smaller space with long Mid RT. ADJUST adds the second chamber to create a very diffuse reverberated sound.

1.5   Brite>Hallit   **ADJUST: Blend**

KeyWords: Bright, Chamber, Room, Cascade

A very clear, sibilant room is transformed into a huge, diffuse chamber using ADJUST. The second chamber helps accomplish this with long Mid RT and predelay.

1.6   Echo>Room   **ADJUST: Echo Attitude**

KeyWords: Tempo, Echo, Room, Cascade

The first chamber is a very small space, but has enough echo feedback to give a much larger overall sound. The second chamber is a huge, diffuse room. ADJUST adds the second chamber.

1.7   Gate>Hall   **ADJUST: Blend**

KeyWords: Gated, Chamber, Short, Cascade

An inverse chamber with short duration and large slope creating a gated sound, and a large, clear space added via ADJUST.

1.8   Gater>Silkey   **ADJUST: Blend**

KeyWords: Room, Short, Cascade

An inverse chamber with long duration, small slope and high diffusion settings to create a gated reverb. The second chamber is a large, clear hall with a similar frequency response. ADJUST adds the second chamber.

1.9   Slap>Bleed   **ADJUST: Blend**

KeyWords: Chamber, Short, Small, Cascade

This preset uses an inverse chamber with a short duration and very little low-end response. The second chamber is a small room with good high-end response. ADJUST adds the second chamber.

VOCAL

2.0   Vocals   **ADJUST: Contour**

KeyWords: Bright, Dialog, Vocals, Splits

This vocal reverb Ranges from a bright, almost plate-like room to a mid-size average room. ADJUST controls bass and treble settings.

2.1   Sax+Vox Hall   **ADJUST: Blend**

KeyWords: Vocal, Instruments, Mono, Splits

A mono split preset adjustable between a bright chamber with echoes (great for sax) and a vocal chamber.

2.2   LiveVoxPlate   **ADJUST: Blend**

KeyWords: Plate, Vocal, Mono, Splits

Mono split chamber rooms designed to sound like plates. A Vocal plate with medium Rt and bright timbre and a Dim plate with a darker sound.

2.3   Air>Club   **ADJUST: Blend**

KeyWords: Chamber, Natural,Vocal, Cascade

A short duration inverse chamber with a high diffusion setting, and a medium size, very clear room. ADJUST adds the second chamber.

2.4   Gated>Hiss   **ADJUST: Blend**

KeyWords: Vocal, Gated, Medium, Cascade

A medium-duration inverse chamber, with a large slope on the low end to give it a gated sound. This low-end response is enhanced by adding the second chamber, which has a very high-end responsive, diffuse room with long Mid RT.

2.5   ArchAngels   **ADJUST: Accent Level**

KeyWords: Vocal, Tempo, Echo, Splits

Bright reverb spaces with a dynamic delay/reverb accent for transients. Delay time is tempo-controlled. Perfect to widen a choir.

- Custom 1: Feedback
- Custom 2: Liveness

PROGRAM BANK 6: LIVE *(continued)*

VOCAL *(continued)*

2.6   Lead+BackVox   **ADJUST: Blend**

KeyWords: Live PA, Mono, Vocal, Splits

This split mono preset creates two very different reverbs to use on vocals. A short, bright reverb is used for the lead vocals. The background vocals get a much more pronounced reverb to widen their sound by using a longer decay time.

2.7   Small>Hall   **ADJUST: Blend**

KeyWords: Vocal, Room, Small, Cascade

A small hall and a large hall, both with a dark sound. The large hall is much more diffuse. ADJUST toggles the rooms.

*   Custom 1: Small Brightness
*   Custom 2: Large Brightness

2.8   Nonlin>Open   **ADJUST: Blend**

KeyWords: Room, Short, Unnatural, Cascade

The first chamber uses a medium duration with a high shape setting, creating a very diffuse, inverse reverberation. The second chamber is a very large, diffuse room which is added with ADJUST.

2.9   SmlGate>Chmb   **ADJUST: Blend**

KeyWords: Chamber, Gated, Medium, Cascade

An inverse chamber emulates a small room with a gated sound. ADJUST adds a second chamber with a larger size and Mid RT.

DRUMS/PERC

3.0   Nonlin Plus   **ADJUST: Tone(1-5)**

KeyWords: Drums/Perc, Live PA, Splits

Nonlin (a grainy trash vibe inverse) with an ambient tail to soften the gate.

3.1   PercussHalls   **ADJUST: Blend**

KeyWords: Drums/Perc, Live PA, Mono, Splits

Two different halls optimized for percussion sound sources. One is small and bouncy, the other is large and smoother. A mono split preset.

3.2   Drums+Vox   **ADJUST: Blend**

KeyWords: Drums/Perc, Vocal, Mono, Splits

A dual purpose mono split preset for drums and vocals. The drum setting is a medium multi-purpose percussion room. The vocal room is a nice reverb room with a slight echo.

3.3   Gate Weight   **ADJUST: Blend**

KeyWords: Drums/Perc, Gated, Mono, Splits

Two gated preset settings. One is large with a loose sound, the other is tight sounding with a couple of quick delays.

3.4   Kick+Sn Invrs   **ADJUST: Blend**

KeyWords: Gated, Drums/Perc, Mono, Splits

Gated percussion effects, one for the snare and a darker one for the kick. A mono split preset.

3.5   Drums/2Kill   ADJUST: Duration

KeyWords: Drums/Perc, Tempo, Room, Splits

Very diffuse chamber with left side reflection controlled by tempo. ADJUST controls duration of inverse chamber.

3.6   Live DRUMrms   ADJUST: Blend

KeyWords: Live PA, Drums/Perc, Tempo, Splits

A medium size room with moderate reflections giving a diffuse overall sound.

3.7   JumpinDrumZ   ADJUST: Feedback

KeyWords: Drums/Perc, Tempo, Live PA, Splits

A clear chamber with moderate taps end echo reflections. Feedback level is controlled by ADJUST.

3.8   Nonlin>Garaj   ADJUST: Blend

KeyWords: Drums/Perc, Unnatural, Short, Cascade

A gated, diffuse chamber with a small slope and a larger, sibilant chamber which is added with ADJUST.

3.9   Room>Woosh   ADJUST: Woosh

KeyWords: Chamber, Drums/Perc, Short, Cascade

A small chamber with accurate characteristics, and a medium-sized room with a high-end boost. ADJUST adds the second room.

CUSTOM

4.0   Angels Sing   ADJUST: Accent Level

KeyWords: Vocal, Bright, Echo, Splits

Bright reverb rooms with a dynamic delay/reverb accent for transients. Delay time is tempo controlled.

- Custom 1: Delay Regen
- Custom 2: Liveness

4.1   StompVox FX   ADJUST: Decay Power

KeyWords: Vocal, Tempo, Special FX, Splits

Designed for the vocalist who likes to add effects in short duration to voice. Mid RT can be cranked by holding down Footswitch1. To add a few seconds of strong delays, hold down Footswitch 2. The delays are tempo controlled.

- Custom 1: Regen Cycles

4.2   Flitz>Echo   ADJUST: Amount of Echo

KeyWords: Gated, Echo, Unnatural, Cascade

A very sibilant chamber with long duration setting, creating a very long inverse reflection. ADJUST adds a very large second chamber with the long echo settings and Mid RT.

- Custom 1: Flitz Depth

PROGRAM BANK 6: LIVE (continued)

CUSTOM (continued)

4.3   Horn Section   **ADJUST: Blend**

KeyWords: Mono, Medium, Instrument, Splits

This split mono preset provides two distinct reverbs for a horn section. The soloist gets a strong reverb with a long reverb time while the reverb designed for the horn section is much more subtle.

- Custom 1: Section Brightness
- Custom 2: Solo Brightness

4.4   Soliloquy   **ADJUST: Bass Multiply**

KeyWords: Vocal, Long, Special FX, Cascade

The mono level acts as a trigger for the reverb time. While signal is present, the reverb is very subtle. As signal lowers or disappears, Mid RT boosts significantly, processing the ends of phrases with a thick, lush reverb.

- Custom 1: Liveness

4.5   Room>Chamber   ADJUST: Amount of Chamber

KeyWords: Bright, Chamber, Room, Cascade

A medium size, diffuse chamber and a much larger, brighter chamber. ADJUST adds the second chamber.

- Custom 1: Room Liveness

4.6   Hang>BigCan   **ADJUST: Blend**

KeyWords: Chamber, Gated, Medium, Cascade

An inverse chamber with a long duration and large shape and a large room with a very diffuse sound. ADJUST adds the second chamber.

- Custom 1: Hang Depth

4.7   Chmbr+Plate   **ADJUST: Blend**

KeyWords: Chamber, Plate, Mono, Splits

A large, diffuse chamber controlled by ADJUST to become a large, bright, diffuse plate.

- Custom 1: Chamber Liveness

4.8   2 Big Halls   **ADJUST: Blend**

KeyWords: Bright, Large, Mono, Splits

Two chamber halls, one large and benign, the other very big with a darker sound.

- Custom 1: A Liveness
- Custom 2: B Liveness

4.9   2 FakePlates   **ADJUST: Blend**

KeyWords: Plates, Instruments, Large, Splits

Great sounding chamber reverb plates — one bright plate adjustable to a thicker, fuller sounding plate.

- Custom 1: Plate A Brightness
- Custom 2: Plate B Brightness

PROGRAM BANK 7: POST

SMALL SPACES

0.0   Booth 1/2   ADJUST: Blend

KeyWords: Dark, Room, Short, Splits

Booth 1 is a small, dull sounding room with a slight pre delay. Booth 2 is a small room with a more high end, open sound. ADJUST lets you blend the two rooms.

0.1   Bathroom M/W   ADJUST: Blend

KeyWords: Bright, Indoor, Natural, Splits

Small to medium size rooms with the characteristics of tiled bathrooms. ADJUST blends the two.

0.2   Bedroom/Gate   ADJUST: Blend

KeyWords: Dialog, Gated, Short, Splits

This dual use preset contains a room which sounds like a bedroom and a nice gate. ADJUST allows you to blend the two effects.

0.3   Bath/Gate   ADJUST: Blend

KeyWords: Chamber, Gated, Natural, Splits

A bathroom effect with very short reflections. ADJUST activates an effective gate while holding on to the same bathroom characteristics.

0.4   Car/Reverse   ADJUST: Blend

KeyWords: Gated, Indoor, Unnatural, Splits

The car setting is a muffled, dry effect that emulates the characteristics inside a car. Reverse makes the source sound as if its playing backward.

0.5   Oil Drums   ADJUST: Blend

KeyWords: Bright, Large, Small, Splits

The effect of tinny metal drums. ADJUST increases the size of the drums.

0.6   Two Coffins   ADJUST: Blend

KeyWords: Mono, Short, Small, Splits

A wooden coffin with a muffled sound and a metal coffin with a brighter, more reflective sound.

0.7   Small Rooms   ADJUST: Blend

KeyWords: Room, Small, Splits

A very small reflective room and small, warmer room. Both with little reverb.

- Custom 1: Room A Brightness
- Custom 2: Room B Brightness

0.8   Close/Closet   ADJUST: Blend

KeyWords: Dialog, Small, Room, Splits

Very small environment effects with very little reverb

0.9   Coffin>Heavn   ADJUST: Blend

KeyWords: Chamber, Room, Large, Cascade

A small, muffled environment with little high-end or low-end response and a very large, diffuse space with better high-end response.

PROGRAM BANK 7: POST *(continued)*

MEDIUM SPACES

1.0   Garage A+B   ADJUST: Blend

KeyWords: Indoor, Mono, Room, Splits

This Mono Split preset recreates the spatial characteristics of a garage. ADJUST increases and decreases the size of the garage.

1.1   Locker/Booth   ADJUST: Blend

KeyWords: Dialog, Chamber, Medium, Splits

A locker room effect with reflections and a booth effect which is very dry and tight.

1.2   Garage/Booth   ADJUST: Blend

KeyWords: Chamber, Gated, Large, Splits

A large empty garage effect with ADJUST controlling the size of the space from large down to the size of a booth.

1.3   Class/LoGate   ADJUST: Blend

KeyWords: Chamber, Dialog, Gated, Splits

The dry reverb characteristics of a classroom adjustable to a brassy gated effect which puts the sound source off to a distance.

1.4   Studio/Gate   ADJUST: Blend

KeyWords: Chamber, Dialog, Gated, Splits

Typical dry studio environment adjustable to a good sounding gate.

1.5   Farm Rooms   ADJUST: Blend

KeyWords: Indoor, Natural, Small, Splits

With ADJUST turned hard left, the rooms are moderate size. As you turn the knob to the right, the rooms get smaller with less and less reverb.

1.6   Barns   ADJUST: Blend

KeyWords: Indoor, Room, Splits

Two chamber rooms, one emulating a big wooden barn with haystacks to absorb the sound, and a metal barn with a brighter, tinnier sound.

1.7   Medium Rooms   ADJUST: Blend

KeyWords: Room, Medium, Splits

A room similar to the classic PCM 70 Medium Room. ADJUST turns it into a grainy, abnormal room.

1.8   Room>Smooth   ADJUST: Smoothness

KeyWords: Chamber, Room, Medium, Cascade

Two chambers, a bright, small room with a short Mid RT and a very large, diffuse chamber with less high-end response. ADJUST toggles the two.

1.9   Store>Wrhrse   ADJUST: Blend

KeyWords: Chamber, Room, Indoor, Cascade

A medium size, unmuffled chamber and a large, diffuse chamber with a high shape setting. ADJUST adds the second chamber.

LARGE SPACES

2.0   Club/Rehurse   ADJUST: Blend

KeyWords: Room, Bright, Large, Splits

Large size rooms with Club having a brighter, more live sound than Rehurse. ADJUST lets you blend the two.

2.1   Hangar/Wave   ADJUST: Blend

KeyWords: Chamber, Gated, Unnatural, Splits

A large airplane hangar with loads of decay, and a wash effect.

2.2   TajMahal/Gat   ADJUST: Blend

KeyWords: Chamber, Gated, Large, Splits

A very large chamber with a long decay and a simple, fairly dry, gated effect. ADJUST blends the two.

2.3   Gym/DublGate   ADJUST: Blend

KeyWords: Chamber, Gated, Large, Splits

Gym is a chamber room with a lengthy decay. DublGate has a reverse gate effect.

2.4   5:15 Hall   ADJUST: Blend

KeyWords: Film-ADR, Mono, Large, Splits

Mono split chamber rooms, one a pre-show hall with echoes and the other a backstage green room.

2.5   Wembley   ADJUST: Proximity

KeyWords: Large, Special FX, Long, Cascade

A preset made to emulate the characteristics of Wembley Stadium. ADJUST controls your position in relation to the stage.

2.6   Bloom>Gym   ADJUST: Blend

KeyWords: Chamber, Room, Long, Cascade

The first chamber consists of a medium-sized, diffuse room, which becomes a gymnasium via ADJUST.

2.7   Box>Hall   ADJUST: Blend

KeyWords: Chamber, Room, Small, Cascade

Box is a very close, unmuffled sound, like a wooden box. The other chamber is a large, clear hall with good high-end response. ADJUST toggles the two.

2.8   Small & Huge   ADJUST: Blend

KeyWords: Chamber, Large, Small, Splits

Two chambers adjustable between a very small chamber with little reverb to a very large chamber with loads of reverb and a long decay time.

2.9   Skydome   ADJUST: Liveness

KeyWords: Room, Large, Bright, Splits

A large indoor environment. ADJUST adds liveness to the sound source.

PROGRAM BANK 7: POST *(continued)*

COOL PLACES

3.0   Igloo   ADJUST: Blend

KeyWords: Ambience, Special FX, Splits

Two distinct chamber settings. One with a small, dry sound, the other with a huge, dark sound and a long reverb decay.

3.1   Scrap Yard   ADJUST: Blend

KeyWords: Drums/Perc, Mono, Unnatural, Splits

Two metallic sounding environments for percussion. A mono split preset.

3.2   Rolly+Arena   ADJUST: Blend

KeyWords: Large, Long, Mono, Splits

A medium size environment adjustable to a very large arena effect with a long decay.

3.3   Stair>Canyon   ADJUST: Blend

KeyWords: Chamber, Room, Large, Cascade

A large, diffuse first chamber — ADJUST adds a much larger chamber with very long Mid RT.

3.4   Close>Far   ADJUST: Distance

KeyWords: Chamber, Room, Short, Cascade

This preset moves the perceived sound source from nearby, to far away, while maintaining the environmental characteristics. One chamber emulates a small, slightly reverberant room, while the other creates the same environment with more distance.

3.5   Bricks>Wash   ADJUST: Wash

KeyWords: Chamber, Room, Bright, Cascade

The first chamber emulates a medium-sized, diffuse room. ADJUST adds a much larger chamber with a very long predelay.

3.6   Tin Castle   ADJUST: Wall Vibrancy

KeyWords: Chamber, Room, Bright, Cascade

A large, open space. ADJUST changes the texture of the walls to a very reflective, vibrant metal.

3.7   Cemetery   ADJUST: Blend

KeyWords: Room, Small, Mono, Splits

A short reverb with reflections creating the cemetery walls. The B side of this preset is one of the spooky underground crypts in the cemetery.

3.8   Log Cabin   ADJUST: Reflections

KeyWords: Chamber, Natural, Room, Cascade

An open, yet dead, space. ADJUST adds reflections and makes the space livelier.

3.9   Brick+Glass   ADJUST: Blend

KeyWords: Small, Mono, Bright, Splits

The A side emulates a brick basement room. The B side is greenhouse where the great amount of glass makes the sound very reflective and bright.

CUSTOM

4.0   Up & Down   **ADJUST: Speed (1-5)**

KeyWords: Special FX, Large, Cascade

A cool special effects preset with bright escalation and a large, dark fall. ADJUST controls the speed at which escalation and fall occur.

•   Custom 1: Inverse Height

4.1   Silos   **ADJUST: Blend**

KeyWords: Special FX, Splits

Chamber rooms with characteristics of a grain silo and a missile silo. The grain silo is darker, hollow sounding with a long reverb decay, the missile silo has a distinct metal sound to it with short reverb reflections.

•   Custom 1: Silo 1 Capacity

•   Custom 1: Silo 1 Capacity

4.2   Rivets>Tank   **ADJUST: Blend**

KeyWords: Chamber, Short, Long, Cascade

Two very diffuse chambers. The first is an inverse chamber with a large slope, shape and duration which creates a sound with two distinct echoes. The second chamber has a very long Mid RT setting, creating a tank effect when it is added with ADJUST.

4.3   Phazer>Hall   **ADJUST: Blend**

KeyWords: Chamber, Gated, Unnatural, Cascade

An inverse chamber with a long duration setting. ADJUST adds another chamber with a long Mid RT and a full diffusion setting. The result is a large, diffuse reverberation with multiple reflections.

•   Custom 1: Hall Type

4.4   Wind+Thunder   **ADJUST: Blend**

KeyWords: Custom, Special FX, Mono, Splits

Use this split mono preset with your nature effects. Use the wind reverb to add an eerie ambience to your signal. The Thunder reverb thickens a clap of thunder and the roar travels off in the distance.

4.5   Pitfall!   **ADJUST: Pit Depth**

KeyWords: Large, Special FX, Dialog, Cascade

Input Level acts as an inverse trigger to the reverb time. The weaker the signal gets, the longer the reverb time. Add to screams to simulate falling down a reverberant bottomless pit.

•   Custom 1: Delay Feedback

4.6   TemporalRift   **ADJUST: X Factor**

KeyWords: Large, Special FX, Cascade

An inverse reverb that can add a lot of strangeness to dialog or effects.

•   Custom 1: Rift Depth

4.7   Ricochets   **ADJUST: Blend**

KeyWords: Special FX, Mono, Cascade

Two different reverb effects for bullets ricocheting off of reverberant objects.

•   Custom 1: Ricochet 1 Length

•   Custom 2: Ricochet 2 Length

PROGRAM BANK 7: POST *(continued)*

CUSTOM *(continued)*

4.8   NaturaSpace   **ADJUST: Blend**

KeyWords: Room, Natural, Mono, Splits

A mono split preset with two general, all purpose, natural sounding chamber rooms.

- Custom 1: Room A Size
- Custom 2: Room B Liveness

4.9   Reverse>Echo   **ADJUST: Echo**

KeyWords: Chamber, Echo, Unnatural, Cascade

The first chamber uses a high shape setting to simulate a reverse echo sound in a medium-sized environment. The second chamber is a much larger room with a very long predelay. ADJUST adds the second chamber.

- Custom 1: Echo Feedback

PROGRAM BANK 8: SURROUND

SMALL SPACES

0.0   Submersible   **ADJUST: Fade**

KeyWords: Small, Short, Surround

This surround preset emulates the tight, resonant space of a diving submersible. Use ADJUST to dial in the amount of rear channel activity you want.

0.1   Tap Chamber   **ADJUST: Fade**

KeyWords: Small, Tempo, Surround, Drums/Perc

A tight chamber with liveness that is constantly changing. The change is tempo controlled. Use this preset to open up sampled drum mixes.

0.2   Tempo Verb   **ADJUST: Liveness**

KeyWords: Chamber, Surround, Tempo

In this tempo controlled reverb effect, decay changes in tempo. Slow tempos yield longer reverb time; fast tempos result in shorter decay.

0.3   SnareChamber   **ADJUST: Liveness**

KeyWords: Drums/Perc, Chamber, Surround

A classic PCM 70 preset, translated for surround. Use ADJUST to alter the liveness of the chamber.

0.4   Tiled Surrnd   **ADJUST: Decay**

KeyWords: Chamber, Indoor, Surround

A responsive tiled chamber. Use ADJUST to alter the decay time of the chamber.

0.5   SurrndChambr   **ADJUST: Fade**

KeyWords: Indoor, Chamber, Surround, Splits

A mid size chamber for surround. Use ADJUST to increase or decrease the rear channel levels.

0.6   Surrnd Room   **ADJUST: Fade**

KeyWords: Indoor, Natural, Surround, Splits

A small room for surround. Good for drums or spoken voice.

0.7   Surrnd Booth   ADJUST: Fade

KeyWords: Chamber, Dialog, Surround, Splits

A very tight space for surround. Great for dialog or vocals.

0.8   Dark Room   ADJUST: Decay

KeyWords: Dark, Medium, Surround

A small room with dark timbre. Use ADJUST to alter the decay time.

0.9   Phone Booth   ADJUST: Fade

KeyWords: Small, Dialog, Surround

Tight and reflective. Use ADJUST to add or decrease rear channel levels.

LARGE SPACES

1.0   Classical   ADJUST: Reflections

KeyWords: Chamber, Orchestral, Surround, Splits

A medium size, diffuse chamber with pronounced right side reflection. ADJUST controls the level of the surround channel and reflection time.

1.1   Surround Vox   ADJUST: Fade

KeyWords: Large, Surround, Vocal, Splits

A large, diffuse surround chamber designed for voice. ADJUST controls the level of the rear channel.

1.2   LincolnTunnl   ADJUST: Location

KeyWords: Large, Long, Surround

The large, reverberant sound from New York, optimized for surround. Choose how far from the tunnel entrance your listening position is with ADJUST.

1.3   Empty Stage   ADJUST: Liveness

KeyWords: Chamber, Surround

A small, clear surround chamber with pronounced short reflections. ADJUST increases liveness of the chamber.

1.4   Vox Chamber   ADJUST: Liveness

KeyWords: Chamber, Surround

Combines recirculating echoes which fall away quickly once signal is absent. ADJUST lengthens the reverb decay, which will mask the reflection echoes. For vocals.

1.5   Surrnd Club   ADJUST: Fade

KeyWords: Chamber, Indoor, Surround, Splits

The front chamber uses large size, Mid RT, Shape and diffusion settings. The surround chamber is very similar in reverberation pattern and is added to the preset with ADJUST.

1.6   Surrnd Space   ADJUST: Fade

KeyWords: Chamber, Long, Surround, Cascade

The front chamber creates a very large, diffuse reverberation. ADJUST adds the surround chamber, which creates an even larger space.

PROGRAM BANK 8: SURROUND (continued)

LARGE SPACES (continued)

1.7   Lecture Hall   ADJUST: Attendance

KeyWords: Chamber, Indoor, Surround, Natural

A large, clear chamber with overall brightness controlled by ADJUST. ADJUST adds people in the room to make it more diffuse without affecting the size.

1.8   Bayside Expo   ADJUST: Fade

KeyWords: Large, Surround, Long

A very large expo center. Lots of room to get lost in. Select the surround levels with ADJUST.

1.9   Tin RearWall   ADJUST: Fade

KeyWords: Chamber, Dialog, Surround, Splits

This surround preset has dual characteristics. The front of the chamber is medium size. The rear wall has a long decay and a ringy sound associated with metallic walls. ADJUST controls rear levels.

UNNATURAL FX

2.0   InvFront2Bak   ADJUST: Front 2 Back

KeyWords: Large, Surround, Drums/Perc, Splits

Large surround chamber preset with pronounced high end. ADJUST switches between front and rear channels.

2.1   DlyUpVerbBak   ADJUST: Delay Feedback

KeyWords: Large, Surround, Tempo, Splits

Clear chamber with long echo delay times controlled by tempo function. Echo Feedback is controlled by ADJUST.

2.2   DynamicSwell   ADJUST: Delays

KeyWords: Dynamic, Chamber, Surround, Special FX

A medium, diffuse matrix chamber. Input level acts as an inverse trigger for a set of delays in the front, and a long bright reverb in the rear. While signal is present the audio is fairly dry. As the level lowers or stops, the delays and reverb become apparent. ADJUST controls the delay times.

2.3   Steam Bath   ADJUST: Steam Valve

KeyWords: Chamber, Bright, Surround, Unnatural

A small, bright surround chamber. ADJUST controls the overall RT and brightness, using large values to create a hissing 'steam' sound.

2.4   Clockwise   ADJUST: Rotation Speed

KeyWords: Surround, Vocal, Echo, Unnatural

Whirling delays cause a spinning sensation. Excellent special effect for dialog.

2.5   Quad Tremolo   ADJUST: Tremolo Speed

KeyWords: Surround, Unnatural, Echo, Unnatural

A true surround tremolo. Tremolo speed is controlled with ADJUST.

2.6 HipHopSurrnd　　　　　　　**ADJUST: Fade**

KeyWords: Chamber, Tempo, Surround, Drums/Perc

Hiphop delays are patched to tempo.

2.7 Cyber Vortex　　　　　**ADJUST: Vortex Ferocity**

KeyWords: Long, Dialog, Surround, Tempo

A wild stuttering reverb. Stutter rate is tempo driven. Sort of like a turbo-tremolo.

2.8 Yodel!!　　　　　　　**ADJUST: Fade/Distance**

KeyWords: Long, Special FX, Surround, Slap FX

Sing it from the Alps! A long predelay in the rear makes a distant reply to the signal. Use ADJUST to make the reply move further away.

2.9 CyberVox　　　　　　　　**ADJUST: Fade**

KeyWords: Dialog, Special FX, Surround

This special effect uses tight delays with high feedback to create a "cyber" sound for dialog. Input to the fronts are somewhat gated. The lower the input level, the longer the decay time in the rear. Use ADJUST to increase or decrease the surround levels.

CUSTOM

3.0 Bombs Away!　　　　　　　**ADJUST: Srrnd Decay**

KeyWords: Film-ADR, Surround, Special FX, Splits

A large size chamber with long Low RT varied by LFOs. ADJUST increases Mid RT to full value, creating a 'Nuclear Meltdown' effect.

- Custom 1: Liveness

3.1 Brick Kick　　　　　　　**ADJUST: Liveness**

KeyWords: Drums/Perc, Chamber, Surround

A medium, diffuse surround chamber with a thick shape setting. ADJUST alters the chamber liveness. Great on kick drums or an entire submix.

- Custom 1: Master Delay

3.2 BypasStompFX　　　　　　　**ADJUST: Decay**

KeyWords: Chamber, Special FX, Surround

This is a large, breathy chamber. Use a footswitch to mute either or both of the machines in this preset. Footswitch 1 will mute the front signal. Footswitch 2 will mute the surrounds.

3.3 StompSwellFX　　　　　　　**ADJUST: Fade**

KeyWords: Large, Special FX, Surround

With a footswitch, you can control the decay times of the front and back of this chamber. Footswitch 1 swells the front decay. Footswitch 2 swells the rears.

3.4 RollinThundr　　　　　　　**ADJUST: Fade**

KeyWords: Large, Long, Surround, Special FX

An exaggerated decay that rolls over you from front to rear. Use ADJUST to control the surround levels.

- Custom 1: Master Decay

PROGRAM BANK 8: SURROUND *(continued)*

CUSTOM *(continued)*

3.5   Dark Cavern   **ADJUST: Fade**

KeyWords: Large, Dark, Surround, Long

Big and brooding. ADJUST controls the Fade to rear.

•   Custom 1: Master Delay

3.6   Invertigo   **ADJUST: Inverse Delay**

KeyWords: Special FX, Surround, Dialog

Listen to this one at 100% wet. An inverse reverb flies over you from the rear to meet the dry signal in the front. Super flipped tape effect! The inverse effect delays the dry signal 500-1000ms, depending on the setting of ADJUST.

3.7   Invertigo2   **ADJUST: Inverse Delay**

KeyWords: Special FX, Surround, Dialog

Listen to this one at 100% wet. Similar to Invertigo, with the inverse reverb in the front, and flying overhead to meet the dry signal in the rear. The inverse effect delays the dry signal 500-1000ms, depending on the setting of ADJUST.

3.8   Guitar Hero   **ADJUST: Fade**

KeyWords: Large, Guitar, Surround, Long

The perfect preset to put a wailing soloist on stage in a huge auditorium. Use ADJUST to increase or decrease the surround levels.

•   Custom 1: Master Decay

3.9   Stranglehold   **ADJUST: Fade**

KeyWords: Short, Surround

A tight, almost gated surround reverb.

•   Custom 1: Master Decay

"CLEAN SLATE" PRESETS

•   4.0 Room2/Room2

•   4.1 Invrs/Invrs

•   4.2 Chmbr/Invrs

•   4.3 Invrs/Room2

•   4.4 Chmbr/Chmbr

•   4.5 Chmbr>Room2

•   4.6 Invrs>Chmbr

•   4.7 Room2>Chmbr

•   4.8 Invrs>Room2

•   4.9 Matrix Chmb

5

MIDI Operation

SELECTING A MIDI CHANNEL

All PCM 91 parameters, programs and registers can be accessed by MIDI. All MIDI applications require the PCM 91 to be connected with one or more MIDI devices with standard MIDI cables via the rear panel MIDI jacks.

MIDI controls, such as Transmit and Receive Channel selection are available in Control mode Row 3 MIDI. All of these controls are described in Chapter 2. Several are repeated here for your convenience.
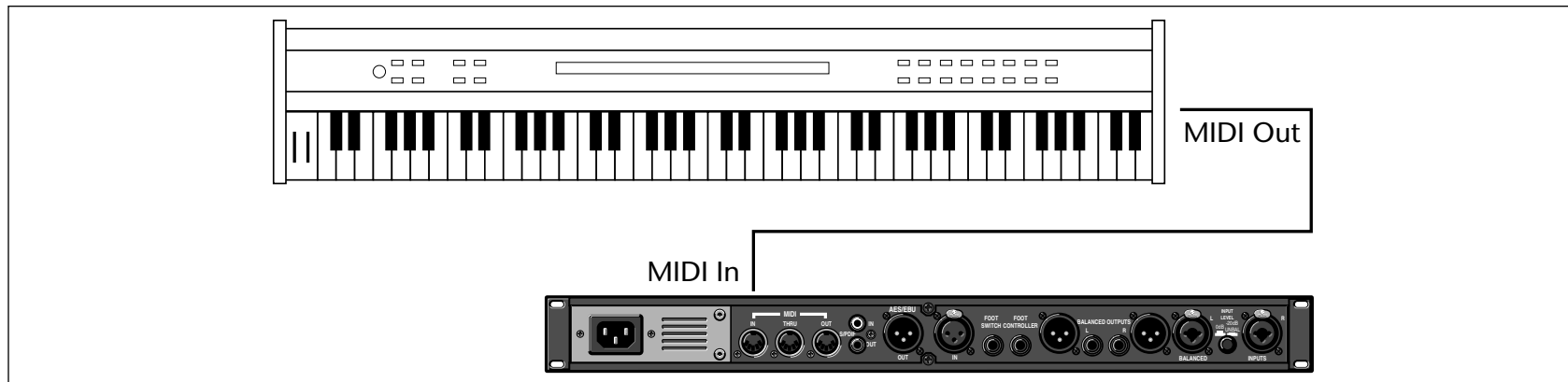
Before using the PCM 91 with other MIDI devices, all devices must be set to the same MIDI channel. To set the PCM 91 to receive MIDI:

1. Set the controller you will be using (keyboard, sequencer, other PCM 91, etc.) to transmit on any MIDI channel (1-16).

2. On the PCM 91, press Control. Use Select and Up or Down to locate matrix position 3.1 Receive.

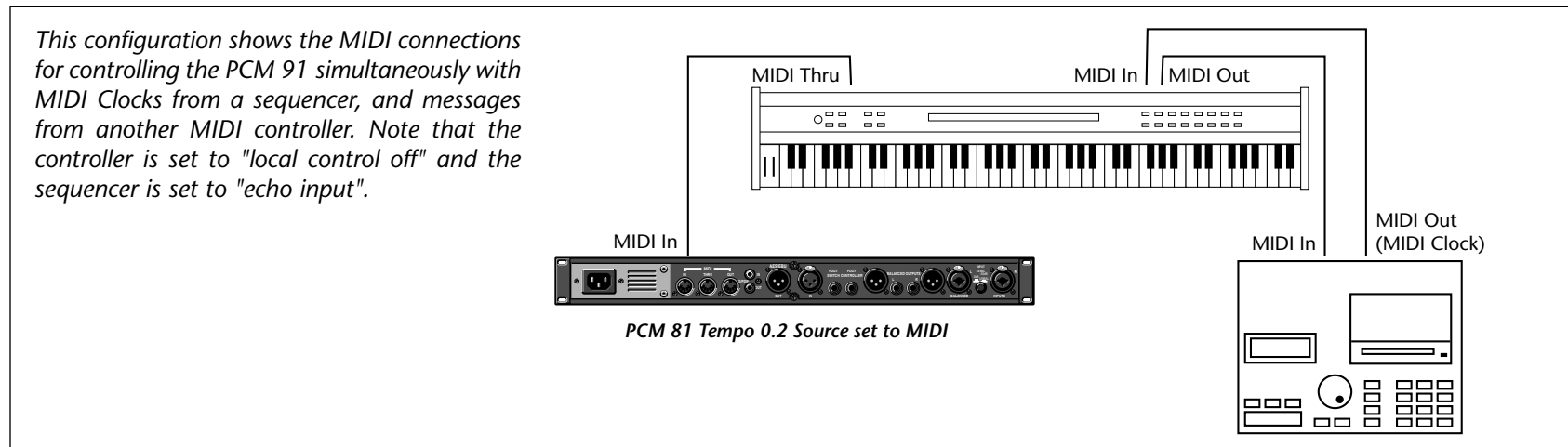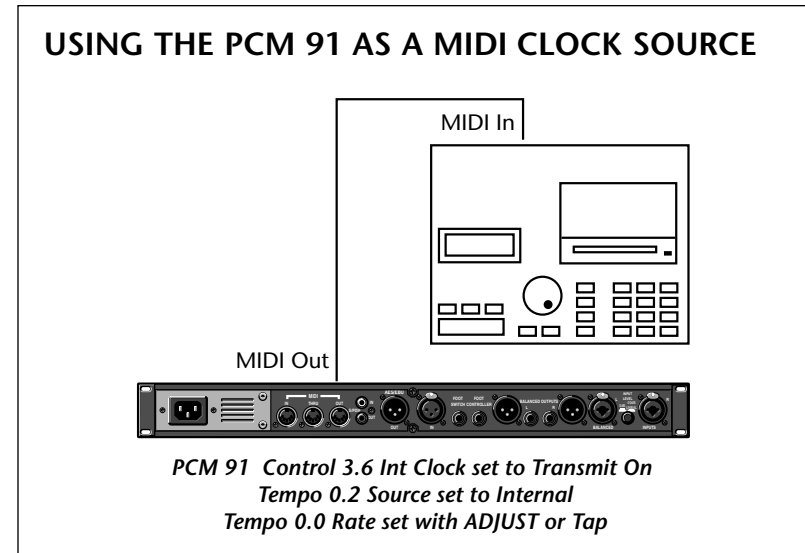3. Turn ADJUST to select OFF, 1-16, or OMNI for receipt of MIDI messages.

ACCESSING PROGRAMS AND REGISTERS

Some extremely useful effects can be created by controlling PCM 91 parameters remotely in real time. Almost all of the controllers found on a MIDI keyboard or MIDI foot controller (pitch benders, mod wheels, sliders, switches, breath controllers, foot pedals and footswitches) can be used to adjust PCM 91 parameters. We refer to this real time remote control capability as Dynamic MIDI®

Sending a MIDI Program Change message (0-49) from the controller will load the corresponding PCM 91 program from the current bank. If any MIDI sources are active as global or general purpose patches, moving the appropriate control on the controller will cause the patched destination parameter to change. (See Patching.) If you want to use Dynamic MIDI, but don't want the PCM 91 to load new registers when you change programs on your controller, set your controller so that it doesn't transmit Program Change messages, or set PCM 91 MIDI Program Change to Off at Control mode matrix location 3.3.

MIDI Out

MIDI In

CONTROLLING TEMPO RATE WITH MIDI CLOCK

MIDI TEMPO CONTROL

MIDI Out | (MIDI Clock)

MIDI In |

PCM 91 Tempo 0.2 Source set to MIDI

USING THE PCM 91 AS A MIDI CLOCK SOURCE

MIDI In |

MIDI Out

PCM 91 Control 3.6 Int Clock set to Transmit On
Tempo 0.2 Source set to Internal
Tempo 0.0 Rate set with ADJUST or Tap

This configuration shows the MIDI connections for controlling the PCM 91 simultaneously with MIDI Clocks from a sequencer, and messages from another MIDI controller. Note that the controller is set to "local control off" and the sequencer is set to "echo input".

MIDI Thru | MIDI In | MIDI Out

MIDI In |

MIDI In | MIDI Out
               (MIDI Clock)

PCM 81 Tempo 0.2 Source set to MIDI
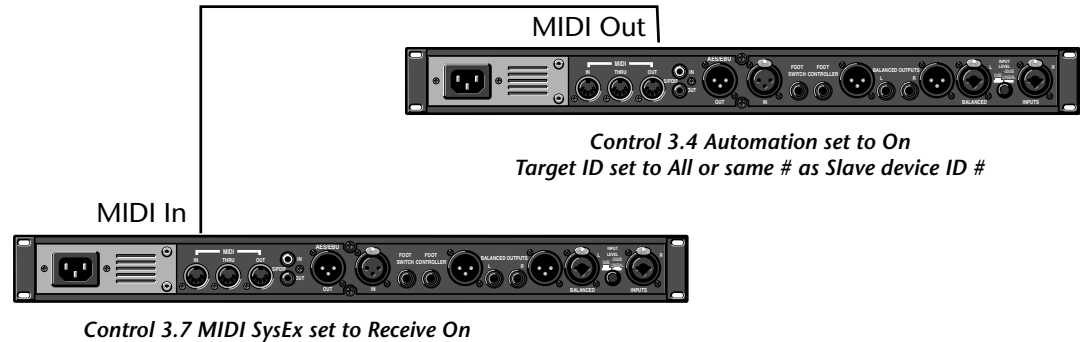
SLAVING TWO OR MORE PCM 91s

Two PCM 91s can be slaved together by connecting a cable from the MIDI OUT jack of the master to the MIDI IN jack of the slave. Additional PCM 91s can be slaved to the master by connecting a cable from the MIDI THRU port of one slave unit to the MIDI IN port of the next unit. All of the PCM 91s must be set to the same MIDI channel and Device ID.

MIDI Out

Control 3.4 Automation set to On
Target ID set to All or same # as Slave device ID #

MIDI In

Control 3.7 MIDI SysEx set to Receive On

CONTROLLER QUIRKS

Some synthesizers and controllers cannot send the full range of MIDI program change messages (1-128). Others may appear to be able to send only 32, but actually have a bank mode that does let you send all 128 program change messages. Also, be aware that some MIDI devices use a program numbering system that uses 0-127 instead of 1-128. If in doubt, see the manual for your controller. For reference, in the PCM 91, Program Change 0 will load the effect at 0.0 in the current bank. Program Change 1 will load the effect at 0.1, etc.

THE ADJUST KNOB, CUSTOM CONTROLS, FOOT PEDAL, FOOT SW 1, AND FOOT SW 2 AS MIDI CONTROLLERS

You can choose to have the PCM 91 send MIDI Controller messages whenever you turn ADJUST (the soft knob in Program Banks or Register Banks modes), when you modify a Custom Control, or use them to activate analog controllers connected to the rear panel Footswitch or Foot Controller jacks. This makes it possible to record real-time control of PCM 91 effects with a MIDI sequencer - a simple but quite powerful way to automate effects.

To send MIDI data from these controllers, first set Control mode 3.2 (Transmit) to the desired MIDI Channel. (The default is Channel 1.)

```
MIDI    Transmit
3.2                    1
```

Once a transmit channel has been set, go to Control mode 3.5 to assign MIDI Controllers. Press Load/✶ to display the available controllers: Foot Pedal, Foot Sw

```
MIDI    ✶Foot Sw 1
3.5   Send        Sustain
```

1, Foot Sw 2, ADJUST, or Custom 1-4. Turn ADJUST to assign the MIDI Controller data to be sent when the displayed controller is activated. (The default assignment is None.).

When a PCM 91 controller is assigned to a MIDI Controller, the PCM 91 will respond to incoming controller messages as though its own controller were moved. In other words, if FootSw1 is assigned to Sustain, the PCM 91 will respond to incoming Sustain messages as though Foot Sw 1 had been activated.

CONTROLLING THE SOFT KNOB WITH MIDI

Each PCM 91 preset has a unique soft knob patch that allows you to control the effect directly from Program or Register Banks mode with the ADJUST knob. You can also control the soft knob patch remotely from MIDI, or from the Foot Pedal.

To control the soft knob with MIDI, set Control mode 3.1 (Receive) to the desired MIDI Channel. Set Control mode 3.5 (ADJUST) to the desired MIDI Controller such as Mod Wheel.

```
MIDI    *ADJUST
3.5   Send   Mod Wheel
```

Now, the Mod Wheel on the MIDI instrument will control the soft knob patch of the running effect.

Note:

In Program Banks mode, the ADJUST display will not appear when the controller is moved. In this case, ADJUST is still independent of the controller.

CONTROLLING THE SOFT KNOB WITH A FOOT PEDAL

If a foot pedal is connected to the PCM 91 rear panel Foot Controller jack, you can use it to control the soft knob patch. (Note that no MIDI connections are required to do this.) Set both Control mode 3.5 ADJUST and Control mode 3.5 Foot Pedal to the same MIDI Controller.

```
MIDI    *ADJUST
3.5   Send          Ctl 3
```

```
MIDI    *Foot Pedal
3.5   Send          Ctl 3
```

Now, the foot pedal will control the soft knob patch of the running effect. Keep in mind that, if Patch Update (System 1.7) is set to Immediate, the current value of the controller will be sent to ADJUST when the program is loaded. For example, if your footpedal is at 0, ADJUST will be set to 0 on program load.

Note:

Footswitches are transmitted with an On value of 127, and an Off value of 0.

PROGRAM CHANGE MESSAGES

Reception of MIDI Program Change and Bank Select messages can be selectively enabled/disabled from Control Mode parameter 3.3, MIDI Pgm Change. The manner in which the PCM 91 interprets these messages is determined by the value of this parameter as follows:

Pgm Change: Off

All Program Change and Bank select messages are treated as "unavailable". Pgm+ and Pgm– will load the next higher or lower program in the current bank, then wrap to the adjacent bank.

Pgm Change: On

Program Change messages 0-49 correspond to PCM 91 Effects 0.0-4.9 in the current bank. Program Change messages 50-27 are ignored. Pgm+ and Pgm– will load the next higher or lower program in the current bank, then wrap to the adjacent bank.

PROGRAM CHANGE MESSAGES *(continued)*

The current bank can be changed with MIDI Continuous Controller 32 and Bank Select Messages as follows:

0-4	Program Banks 0-4
5-6	Internal Register Banks R0 and R1
7-11	reserved for ROM Card Banks
12-...	Memory Card Banks

The number of banks available on a given card will vary with card size as follows:

Card Size	Banks
64k	1
256k	5
512k	10
1 Meg	20

Pgm Change: Map

Program Change 0-127 can be mapped to any PCM 91 Effect in any internal or card bank. Two 128 element maps are stored internally, additional maps may be stored on RAM cards.

Map 0	Map 1
MIDI 0 = P0 0.0	MIDI 0 = P2 2.8
MIDI 127 = P2 2.7	MIDI 127 = R 4.9

Pgm+ and Pgm– will load the next higher or lower program in the map.

Pgm Change: Chain

Any Program Change number can be selected to load any one of ten customized effect "chains." Once a chain is loaded, effects in the chain are accessed by the controller patched to Pgm + and Pgm – (program increment and program decrement).

Note:

The PCM 91 requires a brief amount of time to change programs. Additional Program Change messages received during this time out may be lost.

AUTOMATION

SYSEX AUTOMATION

The PCM 91 will transmit SysEx automation messages when Control Mode parameter 3.4, MIDI Automation is set to On. Almost all changes made by front panel operations are transmitted as PCM 91 SysEx messages. This is intended primarily for use in configurations where it is desirable for one or more PCM 91s to be slaved to a single PCM 91 acting as a master. The current mode (Program Banks, Register Banks, Edit, Control or Tempo) of the slave does not follow the master, but the actual parameter values do. (SysEx automation can also be stored on a sequencer and replayed in real-time. As a general rule, automating more than two or three SysEx program changes at once is not recommended.)

The PCM 91 can receive SysEx messages when Control mode 3.7 MIDI SysEx is set to Receive On. Note that when using SysEx automation, the device of the receiving PCM 91 must match the Target ID of the transmitting PCM 91, or the transmitting device must use the All Devices ID.

The Target ID setting can be adjusted from Control 3.4 MIDI Automation. It is selected by pressing Load/✳ after setting Automation to On. The default setting for the Target ID is All.

The Device ID setting can be adjusted from Control mode 3.7 MIDI SysEx. It is selected by pressing Load/✳ after setting SysEx to Receive On. The default setting for the Device ID is 0.

CONTROLLER AUTOMATION

For applications where it is desirable to "automate" changes made to PCM 91 effects with its own controls (ADJUST, Custom 1-4, Foot Pedal, Footswitch 1 or Footswitch 2), we recommend assigning the controllers to MIDI destinations and recording the changes with a MIDI sequencer (see Control Mode parameter 3.5, MIDI Destinations).

RESET ALL CONTROLLERS

The PCM 91 recognizes the "Reset All Controllers" message. When received, all patched parameters are reset to their stored values. Patched parameters may also be reset from the PCM 91 front panel - Control Mode parameter 3.0 (the message will be transmitted from the PCM 91 as well).

MIDI CLOCK AND CLOCK COMMANDS

The PCM 91 recognizes MIDI clock messages when Tempo Mode parameter 0.2, Tempo Source is set to MIDI. Any Delay or Mod row parameter set to display tempo values will be synchronized to the tempo of the incoming MIDI clock.

MIDI Clock and Clock Commands are also available as Dynamic MIDI patch sources. The value of MIDI Clock when used as a patch source is a linear scaling of 0 to 127 (0 = 40 BPM and 127 = 400 BPM). The value of Clock Commands when used as a Dynamic MIDI patch source is 127 for START and CONTINUE and 0 for STOP.

PCM 90 COMPATIBILITY

The PCM 91 can receive MIDI data from either the PCM 90 or another PCM 91. It can also transmit certain messages in PCM 90 format. (See Bulk Data Dumps and SysEx Automation.) This allows most data to be exchanged between the two products, with any format translations handled automatically by the PCM 91.

DYNAMIC MIDI

The following MIDI messages are available as Dynamic MIDI patch sources:

- MIDI Controllers 1-31 and 33-119
- Pitch Bend
- After Touch (Polyphonic and Channel combined)
- Velocity (Note On)
- Last Note
- Low Note
- High Note
- Tempo (40–400BPM is converted to controller range 0-127)
- Clock Commands

DYNAMIC MIDI *(continued)*

These MIDI messages are also available as threshold sources for several Modulation parameters: AR Env, Latch, Sw 1 and Sw 2, and S&Hold. They may be used as a tap source for controlling Tempo.

Note:

MIDI Implementation Details, including System Exclusive documentation, are available to assist experienced programmers in developing software for use with the PCM 91. These can be obtained directly from Lexicon. Request: PCM 91 MIDI Implementation Details.

BULK DATA DUMPS

Control mode 3.8 (MIDI Dump) allows selection of types of bulk data listed in the table at the right to be dumped directly from the PCM 91 to another PCM 91, or to editor/librarian software. Use ADJUST to select bulk data type. Press Store to transmit the data.

Displayed Name	Description
CurrentPgm*	Currently running effect
Bank R0-R1*	Internal Register Banks
Bank C0-CJ*	Card Banks (card must be inserted)
Map 0, 1*	Internal Program Change Maps
Map 2-3*	Card Program Change Maps (card must be inserted)
Chain 0-9*	Internal Program Chains
Chain 10-19*	Card Program Chains (card must be inserted)
Int Chains*	All Internal Program Chains
Ext Chains*	All Card Program Chains (card must be inserted)
Setup C	Current Setup
Setup 0-4	Internal Setups
Setup 5-9	Card Setups
* Transmitted in PCM 90 format.	

MIDI IMPLEMENTATION CHART

Lexicon PCM 91
Digital Reverberator

Function		Transmitted	Recognized	Remarks
Basic	Default	1	1	
Channel	Changed	1-16	1-16	
Mode	Default	X	Mode 1, 3	
	Messages	X	X	
	Altered		X	

Function		Transmitted	Recognized	Remarks
Note Number		X	0-127	Last Note, Low Note, High Note used as controllers.
Velocity	Note ON	X	O 9n v = 1-127	Used as controller.
	Note OFF			
After Touch	Keys	X	X	
	Channel	X	O	
Pitch Bend		X	O	
Control Change	1-119	OX	OX	ADJUST, FootPedal, Footswitch 1 and 2, and Custom 1-4 can be assigned controllers 1-119 for MIDI transmit; 32 reserved for bank select.
Program Change		X	0-127	See implementation details.
	True #			
System Exclusive	Lexicon	OX	OX	Mfgr ID=6; Product ID=8
	Real-time	X	X	
	non Real-time	X	OX	Device ID
System Common	:Song Pos	X	X	
	:Song Sel	X	X	
	:Tune	X	X	
System Real Time	:Clock	OX	OX	START, STOP and CONTINUE are patchable as a switch: START/CONTINUE=127; STOP=0
	:Commands	X	OX*	
Aux Messages	:Local ON/OFF	X	X	
	:All Notes OFF	X	O	
	:Active Sense	X	X	
	:Reset All Controllers	OX	OX	

Mode 1: OMNI ON, POLY	Mode 2: OMNI ON, MONO	O: Yes X: No OX: Selectable
Mode 3: OMNI OFF, POLY	Mode 4: OMNI OFF, MONO	

Note: The PCM 91 transmits and receives in both PCM 90 (product ID 0x08) and PCM 91 (product ID 0x11) formats.

6

Troubleshooting

This chapter is intended primarily to help you recognize some common error states which can be corrected from the PCM 91 front panel, or by simple means such as cable replacement. Any error states which are not covered here should be referred to your local dealer for service by a qualified technician.

LOW VOLTAGE

In a low-voltage, or "brown-out" condition, the PCM 91 will freeze in its current state. None of the controls will have any effect. When power returns to a normal level, the unit will reset itself as though it had just been powered on. If the unit does not reset itself, turn the power OFF, then ON to resume normal operation.

OVERHEATING

Temperature extremes may cause the PCM 91 to exhibit unpredictable behavior. If the unit has been subjected to temperatures below 32°F (0°C) or above 95°F (35°C), it should be turned off and allowed to return to normal temperature before use. The unit may be damaged by exposure to temperatures below -22°F (-30°C) or above 167°F (75°C), or by exposure to humidity in excess of 95%. If a unit exposed to such conditions fails to operate after it returns to a normal operating temperature, contact your local service representative.

COMMON MIDI PROBLEMS

The PCM 91 doesn't respond to MIDI Program Changes.

Check Receive control at Control mode 3.1 and make sure it is set to On. Check the MIDI Channel selected as well as the MIDI Channel of the transmitting device. Make sure that Pgm Change at Control mode 3.3 is set to On. Also check MIDI In/Out connections between the units.

MIDI Program Change numbers are off by 1.

The PCM 91 transmits and recognizes ProgramChange messages 0-127. MIDI devices which transmit 1-128 rather than 0-127, will be off by 1. Simply adjust by 1 when working with such devices.

The PCM 91 doesn't respond to SysEx commands.

Check the SysEx setting (and the Device ID selection) at Control mode 3.7.

The PCM 91 does not transmit SysEx Automation commands.

Check the Automation setting (and the target device ID selection) at Control mode 3.4.

OPERATIONAL PROBLEMS

The PCM 91 will not lock onto an incoming digital signal.

Check the cables that you are using. DO NOT USE ANALOG AUDIO CABLE TO CONNECT DIGITAL AUDIO.

Also check to make sure that your input signal complies with S/PDIF format standards. The PCM 91 will recognize AES professional format signals from an appropriate connector, but will not necessarily read and transmit encoded information accurately.

NO DIGITAL AUDIO OUTPUT

Check the Bypass state for any mute settings.

NO EFFECTS OUTPUT

Check the setting of Mix Mode at Control mode 1.1. Also verify that any controllers patched to Input Level, or Mix are not turned off.

POWER ON BEHAVIOR

The PCM 91 performs a series of self tests each time it is powered on, then displays the PCM 91 copyright notice. This should be followed by the display and loading of the last loaded effect. If this sequence does not occur, contact Lexicon Customer Service.

RESTORING FACTORY DEFAULT SETTINGS

You can restore the PCM 91 to its default state without erasing registers by restoring the factory default setup:

1. Press Control.

2. Use the Up and Down buttons to locate Row 4 Setup.

3. Turn SELECT to 4.1 Load.

4. Turn ADJUST counterclockwise to select "Factory Settings".

5. Press Load/Q. The PCM 91 will display the message "Setup restored".

The following table shows the parameters which comprise a setup, along with the factory default setting of each parameter.

Control Mode Matrix Location		System Parameter	Default Setting
Audio	0.0	Input Source	Analog: 48kHz
	0.1	SCMS	Multi Copy
	0.2	Emphasis Bit	Pass Thru
	0.3	Output Level	+4dBu
System	1.0	Edit Mode	Go
	1.1	Mix Mode	Pgm
		Global Mix Value	100% Wet
	1.2	Tempo Mode	Pgm
		Global Tempo Value	120 BPM
	1.3	Bypass Mode	InputMute
		Bypass Src	Off
	1.4	Pgm Bypass	AllMute
	1.5	Mem Protect	Off
	1.6	Auto Load	Off
	1.7	Patch Update	Delayed
	1.8	KeyWord	On (A to Z)
MIDI	3.1	Receive	OMNI
	3.2	Transmit	1
	3.3	Pgm Change	On
		Pgm+	Off
		Pgm–	Off
		Map select	0
		Chain	MIDI
	3.4	Automation	Off
	3.5	Footpedal	None
		Sw 1	None
		Sw 2	None
		ADJUST	None
		Custom 1-4	None
	3.6	Int Clock	Transmit Off
	3.7	SysEx	Receive On
		Device ID	0
	3.8	MIDI Dump	Current Program
	3.9	Dump Speed	Slow

Tempo Mode Matrix Location		System Parameter	Default Setting
Tempo	0.2	Source	Internal
Tap	1.3	Display	On

REINITIALIZATION

Note:

Reinitializing will erase all registers and setups.

The following procedure will return the PCM 91 to the state it was in when shipped from the factory. This includes erasing all registers and setups, as well as restoring all of the default settings:

1. Press Control.

2. Use the Up and Down buttons to locate Row 1 System.

3. Turn SELECT to 1.9 Initialize.

4. Press Store. The PCM 91 will display the message "Are you sure? (Press STORE)".

    If you don't want to reinitialize your unit, press any button except Store to return to matrix position 1.9.

    If you press Store in response to this message, the display will flash "Restoring original factory settings" and your unit will be reinitialized.

A

Appendix

SPECIFICATIONS

Audio Input

Connectors:	Combined 3 pole XLR and 1/4 inch T/R/S phone jacks (2)
Impedance:	0dB/BAL switch position: 100kΩ, balanced
	-20dB/UNBAL switch position: 50kΩ, unbalanced
Levels:	0dB/BAL switch position: -2dBu min for full scale, +20dBu max
	-20dB/UNBAL switch position: -22dBu min for full scale, 0dBu max
CMRR:	0dB/BAL switch position: 50dB minimum, 10Hz to 20kHz

Audio Output

Connectors:	1/4 inch T/R/S phone jacks (2); balanced XLRs, pin 2 "high" (2)
Impedance:	100Ω, balanced
Levels:	+18dBm, full scale (+4dBu setting) balanced, unbalanced
	+4dBm, full scale (-10dBu setting)

Audio Output (continued)

Protection:	Relays provided for output muting during power on/off

A/D Performance

Frequency Response:	10Hz to 20kHz, ±0.5dB
Crosstalk:	<-65dB, 10Hz to 20kHz
S/N Ratio:	>102dB, 20kHz bandwidth
THD:	<0.003%, 10Hz to 20kHz
Dynamic Range:	>102dB, 20kHz bandwidth
Delay:	24 samples (0.54ms for 44.1kHz, 0.50ms for 48kHz)

D/A Performance

Frequency Response:	10Hz to 20kHz, ±0.5dB
Crosstalk:	<-80dB, 10Hz to 20kHz
S/N Ratio:	>98dB, 20kHz bandwidth
THD:	<0.005%, 10Hz to 20kHz
Dynamic Range:	>98dB, 20kHz bandwidth

D/A Performance (continued)

Delay:	50 samples (1.13ms for 44.1kHz, 1.04ms for 48kHz)

A/A Performance

Frequency Response:	10Hz to 20kHz, ±0.5dB
Crosstalk:	<-55dB, 10Hz to 20kHz
S/N Ratio:	>96dB, 20kHz bandwidth
THD:	<0.006%, 10Hz to 20kHz
Dynamic Range:	>96dB, 20kHz bandwidth

Digital Audio Interface

Connectors:	Coaxial, RCA type (2); Balanced, XLR (2)
Format:	S/PDIF (IEC-958) consumer and AES/EBU (AES3-1995) professional interface
Sample Rates:	44.1kHz, 48kHz

Internal Audio Data Paths

Conversion:	20 bits
DSP:	20 bits

External Memory Card

Connector:	Accepts PCMCIA Type I cards, 68 pins
Standards:	Conforms to PCMCIA 2.0 / JEIDA 4.0
Card Format:	Supports up to 1MB SRAM (attribute memory not required)

Control Interface

MIDI:	5-pin DIN connectors provided for MIDI IN, THRU, and OUT
Footswitch:	1/4 inch T/R/S phone jack provided for 2 independent momentary footswitches
	System detects normal-open, or normal-closed on power up
Foot Controller:	1/4 inch T/R/S phone jack provided for footpedal (100Ω minimum, 10kΩ maximum impedance)

General

Dimensions:	
Width:	19.0 inches (483mm)
Height:	1.75 inches (45mm)
Depth:	12.0 inches (305mm)
	19 inch rack mount standard, 1U high

Weight:	
Net:	6.4 lbs (2.9 kg)
Shipping:	9.5 lbs (4.3 kg)

Power Requirements:	100-240 VAC, 50-60Hz, 35 W, 3-pin IEC power connector
RFI/ESD:	Conforms to FCC Class B, EN55022 Class B (CE), IEC 801-2, IEC 801-3

Environment:	
Operating Temperature:	32 to 104˚F (0 to 40˚C)
Storage Temperature:	-22 to 167˚F (-30 to 70˚C)
Humidity:	Maximum 95% without condensation

Note:

Unless otherwise noted, all audio specifications assume rear-panel switch set to BAL, input level control is set for unity gain (0dB), and analog I/O connections wired for balanced configuration.

Specifications subject to change without notice.

DECLARATION OF CONFORMITY

Application of Council Directive(s):

73/23/EEC and 89/336/EEC

Standard(s) to which Conformity is Declared:

EN 50081-1:1992, EN 50082-1: 1992, and EN 55022:1994

Manufacturer:

Lexicon, Inc., 3 Oak Park, Bedford, MA 01730-1441 USA

The equipment identified here conforms to the Directive(s) and Standard(s) specified above.

Type of Equipment:

Digital Audio Effects Processor

Model:

Lexicon PCM 91

Date:

October 23, 1997

Lexicon, Inc.
Vice President of Engineering
3 Oak Park
Bedford, MA 01730-1441 USA
Tel: 781-280-0300
Fax: 781-280-0490

Importers:

AUDIO SALES
Neusiedlerstrasse 19
Molding A-2340, Austria

TRANSEUROPEAN MUSIC
Pontbleeklaan 41
1731 Zellik, Belgium

NEW MUSIK
Teatergarden
Vestergrade 48 k
8000 Arhus C, Denmark

STIRLING/ITA
Kimberly Road
London NW6 7SF, England

STUDIOTEC KY
Kuusiniewi 2
Espoo SF-02710, Finland

BEYERDYNAMIC FRANCE
7 rue Labie
75017 Paris, France

AUDIO EXPORT/
NEUMANN & CO.
Badstrasse 14
7100 Heilbronn/Neckar,
Germany

BON STUDIO LTD.
8 Zaimi St/Exarchia
106.83 Athens, Greece

GRISBY MUSIC PROFESSIONAL
S. S. Adriatica KM 309530
Localita Aspio Terme
60028 Osimo (Ancona), Italy

TM AUDIO
Zomerweg 14
Ijsselstein, Holland BV 3402

CAIUS-TECNOLOGIAS AUDIO
MUSICA
Rua Sta Catarina 131
4000 Porto, Portugal

TELCO ELECTRONICS S.A.
Gravina 27
28004 Madrid, Spain

SENNHEISER AB
P. O. Box 22035
Stockholm 10422, Sweden

LIMITED WARRANTY

Lexicon, Inc. offers the following warranty on this product:

What is the Duration of this Warranty?
This warranty will remain in effect for one (1) year from the original date of purchase.

Who is Covered?
This warranty may be enforced by the original purchaser and subsequent owners during the warranty period, provided the original dated sales receipt or other proof of warranty coverage is presented at time of service.

What is Covered?
This warranty covers all defects in material and workmanship on this product, except as specified below. The following are not covered:
1. Damage resulting from
   A. Accident, misuse, abuse, or neglect.
   B. Failure to follow instructions contained in the User Guide.
   C. Repair or attempted repair unauthorized by Lexicon, Inc.
   D. Failure to perform recommended periodic maintenance.
   E. Causes other than product defects, including lack of skill, competence, or experience on the part of the owner.
2. Damage occurring during any shipment of this product. Claims for shipping damages must be made with the carrier.
3. Damage to a unit that has been altered, or on which the serial number has been defaced, modified, or removed.

What Expenses will Lexicon, Inc. Assume?
Lexicon, Inc. will pay all labor and material expenses for covered items. Payment of shipping charges is discussed in the next section of the warranty.

How is Service Obtained?
When this product needs service, write, telephone, or fax Lexicon, Inc. to request information about where the unit should be taken or sent. When making a written request, please include your name, complete address, and daytime telephone number; the product model and serial numbers; and a description of the problem. Do not return the unit to Lexicon, Inc. without prior authorization.

When Shipping a Product for Service . . .
1. Pay any initial shipping charges, which are the responsibility of the owner. If necessary repairs are covered by this warranty, Lexicon, Inc. will pay return shipping charges to any destination in the United States using the carrier of our choice.
2. Pack the unit securely. Package insurance is strongly recommended.
3. Include a copy of the original dated sales receipt. (A copy of the original dated sales receipt must be presented whenever warranty service is required.)
4. Do not include accessories such as power cords or user guides unless instructed to do so.

What are the Limitations of Implied Warranties?
Any implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

What Certain Damages are Excluded?
Lexicon's liability for a defective product is limited to repair or replacement of that product, at our option. Lexicon, Inc. shall not be liable for damages based on inconvenience; loss of use of the product; loss of time; interrupted operation; commercial loss; or any other damages, whether incidental, consequential, or otherwise.

How do State Laws Relate to this Warranty?
Some states do not allow limitations on the duration of implied warranties and/or the exclusion or limitation of incidental or consequential damages. As such, the above limitations may not apply.

This warranty is not enforceable outside of North America. This warranty provides specific legal rights. Additional rights may be provided by some states.

lexicon
A Harman International Company

Lexicon, Inc.	Tel 781-280-0300	**Customer Support**
3 Oak Park	Fax 781-280-0490	Tel 781-280-0300
Bedford, MA 01730-1441		Fax 781-280-0495 (Sales)
USA	www.lexicon.com	Fax 781-280-0499 (Service)

Lexicon

HEADROOM INPUT *PCM 91* DIGITAL REVERBERATOR ADJUST SELECT Up Program Banks Register Banks Edit Control Tempo lexicon POWER

HALLS: Orchestral
P0 0.0   Deep Blue

Down Load/✱ Store Compare Bypass Tap Memory Card Eject
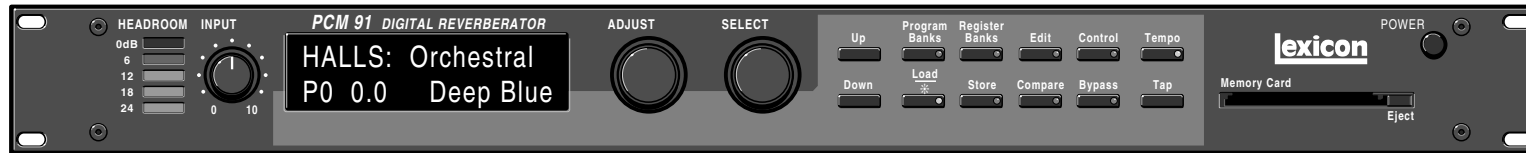
Basic Operation

The PCM 91 has 5 basic modes of operation, selected by pressing: Program Banks, Register Banks, Edit, Control or Tempo.

Program Banks and Register Banks

- Press Program Banks to cycle through 9 banks of 50 presets. Press Register Banks to access 2 internal banks of 50 registers (or PCMCIA card banks) where you can store your versions of the factory presets.

- Turn SELECT to view all of the effects. A ✱ in front of an effect name indicates that the effect is not loaded. Hold down either Banks button to see the name of the currently running effect.

- Press Load/✱ to load any displayed effect. ADJUST acts as a soft knob for adjustment of one or more patched effect parameters.

- Simultaneously press and release both Banks buttons to view the previously loaded effect. Turn SELECT to view as many as 10 effects back.
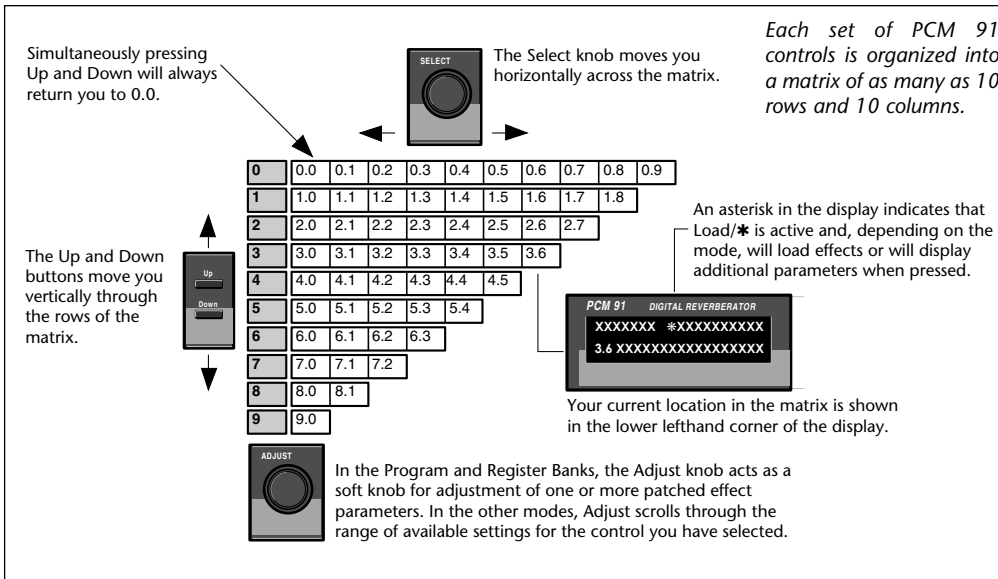
Simultaneously pressing Up and Down will always return you to 0.0.

The Up and Down buttons move you vertically through the rows of the matrix.

The Select knob moves you horizontally across the matrix.

Each set of PCM 91 controls is organized into a matrix of as many as 10 rows and 10 columns.

0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	
2	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7		
3	3.0	3.1	3.2	3.3	3.4	3.5	3.6			
4	4.0	4.1	4.2	4.3	4.4	4.5				
5	5.0	5.1	5.2	5.3	5.4					
6	6.0	6.1	6.2	6.3						
7	7.0	7.1	7.2							
8	8.0	8.1								
9	9.0									

An asterisk in the display indicates that Load/✱ is active and, depending on the mode, will load effects or will display additional parameters when pressed.

PCM 91 DIGITAL REVERBERATOR
XXXXXXX ✱XXXXXXXXXX
3.6 XXXXXXXXXXXXXXXX

Your current location in the matrix is shown in the lower lefthand corner of the display.

In the Program and Register Banks, the Adjust knob acts as a soft knob for adjustment of one or more patched effect parameters. In the other modes, Adjust scrolls through the range of available settings for the control you have selected.

Edit

- Press Edit to access all available parameters for the currently running effect. Turn ADJUST to alter the value of any displayed parameter.

Control

- Press Control to access system parameters, MIDI controls, and global control of parameters such as Mix, Tempo, and Bypass type.

Tempo

- Press Tempo to set tempo-related values that affect the delay time and LFO rate parameters of the currently running effect.

Effect Sorting

- The PCM 91 lets you perform KeyWord sorting of your effects. (The default KeyWord A to Z displays all of the effects in the box in alphabetical order.)

- As many as 4 KeyWords can be assigned in Edit mode to each effect. (We've already assigned at least one to every preset.)

- Press either Banks button one push beyond the last bank to view the list of sorted effects. Turn SELECT to scroll through the list.

- To select a different KeyWord for sorting, go to Control 1.8. and use ADJUST to select any KeyWord from the following list.

PCM 91 KeyWords

A to Z	Gated	Room
Acoustic	Guitar	Short
Ambience	Indoor	Slap FX
Ballad	Instrument	Small
Bright	Keyboard	Spatial
Broadcast	Large	Special FX
Cascade	Live PA	Splits
Chamber	Long	Stereo
Classical	Mastering	Surround
Cncrt Hall	Medium	Tempo
Custom	MIDI	Unnatural
Dark	Mono	Vocal
Dialog	Natural	User 1
Drums/Perc	Orchestral	User 2
Dynamic	Outdoor	User 3
Echo	Plate	User 4
Film-ADR	RandomHall	

Tempo

- Any PCM 91 delay parameter and any time-based modulator can be individually assigned an absolute time or tempo value.

- You can set delay times in milliseconds, or in a ratio of echoes/beats linked to tempo. When you change tempo, the delay times will change to maintain the same rhythm at the new tempo.

- To set PCM 91 tempo rate, press Tempo. Use SELECT and Up and Down to locate matrix position 0.0. Turn ADJUST to select any Tempo Rate from 40-400 BPM.

- Or, press Tap twice in rhythm to establish the tempo rate you want. Tap is always active, allowing you to change tempo on the fly.

- *Note:*

  You can set and display delay values in units of time, or with tempo values. Whenever a delay value is displayed in Edit mode, press Up and Tempo simultaneously to toggle these two options.

Audition the Programs

- Press Program Banks to cycle through 9 banks of 50 presets.
- Turn SELECT to view all of the presets in the selected bank.
- Press Load/✳ to load any displayed effect.
- Each preset has one or more parameters patched to the ADJUST knob.
- Turn ADJUST to display the name and the current value of the patch.
- Continue turning ADJUST to change the patch value along its entire range. The screen will return to its normal display when you stop turning ADJUST.
- In addition to ADJUST, as many as 4 Custom Controls can be created for any effect. We've created some interesting ones for the presets in the "Custom" row at the end of each bank (4.0-4.9). Look for these in the first Edit row.

Edit

The PCM 91 offers two levels of editing control: Go mode and Pro mode.

Go Mode

- Go mode gives you access to a specific set of as many as 10 parameters for each of the 250 presets. We've designed each set of parameters to allow you to make changes to the effect without losing the character of the sound.
- In Go mode, press Edit to access the most useful preset parameters for the currently running effect.
- Turn SELECT to view the available parameters.
- Turn ADJUST to change the value of any displayed parameter.

Pro Mode

- Pro mode gives you access to the full effect edit matrix whenever you press Edit. The edit matrix contains all effect parameters, Patching and Modulation controls, and tools for creating Custom Controls and assigning KeyWords to effects.
- The PCM 91 is shipped in Go mode. To change the Edit mode, press Control, use SELECT and Up and Down to locate matrix position 1.0. Turn ADJUST to select Go or Pro.

Info

- The PCM 91 offers an extensive set of informative display messages which can be activated from the front panel. If you want to know more about the function of a particular button, press and hold the button down. While you are holding down the button, an explanatory message will be displayed.
- In addition to these easy plug and play techniques, the PCM 91 provides extensive system control via front panel patching or MIDI. For complete details on these and other features, read the PCM 91 User Guide.

In addition to these easy plug and play techniques, the PCM 91 provides extensive system control via front panel patching or MIDI. For complete details on these and other features, read the PCM 91 Owner's Manual.

Bank P0 Halls	
0.0-0.9	Orchestral
1.0-1.9	Vocal
2.0-2.9	Live Sound
3.0-3.9	Instrument
4.0-4.9	Custom

Bank P1 Rooms	
0.0-0.9	Instrument
1.0-1.9	Vocal
2.0-2.9	Live Sound
3.0-3.9	Drums&Perc
4.0-4.9	Custom

Bank P2 Plates	
0.0-0.9	Instrument
1.0-1.9	Vocal
2.0-2.9	Live Sound
3.0-3.9	Drums&Perc
4.0-4.9	Custom

Bank P3 Post	
0.0-0.9	Indoor Small
1.0-1.9	Indoor Large
2.0-2.9	Outdoor
3.0-3.9	Spatial
4.0-4.9	Custom

Bank P4 Splits	
0.0-0.9	Mono
1.0-1.9	Stereo
2.0-2.9	Live Sound
3.0-3.9	Instrument
4.0-4.9	Custom

Bank P5 Studio	
0.0-0.9	Environments
1.0-1.9	Instruments
2.0-2.9	Vocal
3.0-3.9	Drums/Perc
4.0-4.9	Custom

Bank P6 Live	
0.0-0.9	Acoustic
1.0-1.9	Electric
2.0-2.9	Vocal
3.0-3.9	Drums/Perc
4.0-4.9	Custom

Bank P7 Post	
0.0-0.9	Small Spaces
1.0-1.9	Med Spaces
2.0-2.9	Large Spaces
3.0-3.9	Cool Places
4.0-4.9	Custom

Bank P8 Surround	
0.0-0.9	Small Spaces
1.0-1.9	Large Spaces
2.0-2.9	Unnatural FX
3.0-3.9	Custom
4.0-4.9	"Clean Slate"

Store

- Press Store. The current program name will appear with a flashing cursor over the first letter of the name.
- Turn ADJUST to select a new character. Press Up or Down to select a new type of character (upper or lower case, numeric, symbolic, or blank). Turn SELECT to move the cursor to a new character.
- Press Load/✳ to move the ✳ to the Register ID number. Use ADJUST or SELECT to choose the register where you want the effect saved.
- When the display shows the register number you want, press Store. Press Store in response to the "Are you sure?" message to save your new effect to the displayed register location.

Compare

- When you turn ADJUST or perform any other parameter edits, the front panel Compare light will go on to indicate that the program has been modified since it was last stored. Press Compare to hear the unedited version. Press again to return to your edited program.

Bypass

- Press Bypass to mute the input signal. A Bypass Mode parameter at Control mode 1.3 allows you to select input muting, output muting, input and output muting, or bypass as alternatives. You can also assign the bypass function to an external controller.