

# Section 8.

## Applications

### 8.1 General

The PM4000M is designed primarily for audio mixing of stage monitors in live sound reinforcement applications. However, in creating the design, Yamaha engineers anticipated other uses as well, including theatrical production, TV production, and even as the primary "house mixer" in certain instances. Its exceptional flexibility gives the PM4000M the ability to serve in these and many other applications, too. We explain a few reasons why the PM4000M is well suited to applications in subsequent pages. We also point out how some of the PM4000M subsystems can be used to accomplish specific mixing tasks. It is up to you, as the sound engineer or mixing console operator, to best utilize these capabilities in your specific application. This manual is by no means comprehensive, and we expect that many of you will devise unique means to connect and utilize the PM4000M. In fact, Yamaha encourages you to share your special applications with us so that we may, in turn, share the general concepts with other PM4000M users.

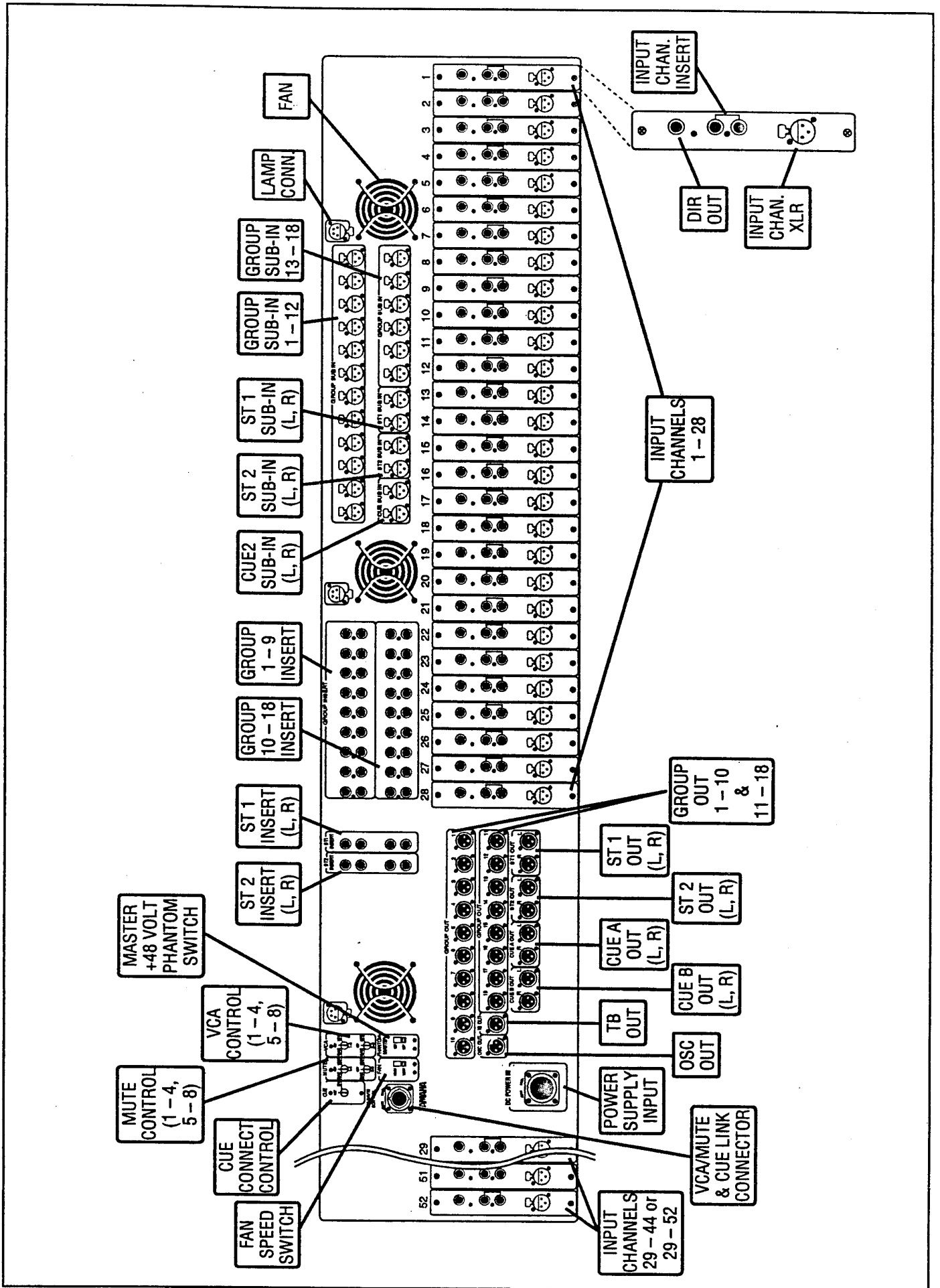
## 8.2 The "Super Band" Input Source List

Some of the following application diagrams and descriptions are based on mixing a large number of input sources from a band (or from several bands). Rather than repeat the source listing multiple times, we have compiled a representative list of microphone-level and line-level audio sources for a large pop-music band — the "Super Band" input list. When we use that term elsewhere in this Section of the manual, please refer to the following list (Chart 8-1.) Observe also that we have noted the use of various signal processing devices in the INSERT out/in loop of some channels; this is only a suggestion based on typical usage.

CH	Input Source	(Insert Processor)
1	Kick 1	Compressor
2	Kick 2	Compressor
3	Snare Top	Compressor
4	Snare Bottom	Compressor
5	Hi-Hat	Gate
6	Rack Tom 1	Gate
7	Rack Tom 2	Gate
8	Rack Tom 3	Gate
9	Rack Tom 4	Gate
10	Floor Tom	Gate
11	Overhead SR	Gate
12	Overhead SL	Gate
13	Percussion SR Overhead	Gate
14	Percussion SL Overhead	Gate
15	Conga SR	Gate
16	Conga SL	Gate
17	Toys	Gate
18	Chimes	Gate
19	Timbales	Gate
20	Keys SL Left	—
21	Keys SL Right	—
22	Keys SR Left	—
23	Keys SR Right	—
24	Piano High	—
25	Piano Low	—
26	Bass Direct In	Compressor
27	Bass Microphone	Compressor
28	Lead Guitar L	—
29	Lead Guitar R	—
30	Rhythm Guitar L	—
31	Rhythm Guitar R	—
32	Tenor Sax	—
33	Baritone Sax	—
34	Trumpet	—
35	Trombone	—
36	Lead Vocal 1	Compressor
37	Lead Vocal 2	Compressor
38	Lead Vocal 3	Compressor
39	Background Vocal 1	—
40	Background Vocal 2	—
41	Background Vocal 3	—
42	Background Vocal 4	—
43	Background Vocal 5	—
44	Background Vocal 6	—
45	Effect Return 1 L	—
46	Effect Return 1 R	—
47	Effect Return 2 L	—
48	Effect Return 2 R	—
49	Effect Return 3 L	—
50	Effect Return 3 R	—
51	Effect Return 4 L	—
52	Effect Return 4 R	—

**Table 8-1. "Super Band" Input Source List for 52-Channel PM4000M**

**Figure 8-2. (facing page).  
Legend of Rear Panel Connectors and Switches  
For the Applications Drawings in Section 8.**



### 8.3 Stage Monitor Speaker Mixes

In a stage monitor system where the performers are listening to individually-tailored mixes via loudspeakers, the PM4000M offers many benefits. Its 18 Group mixes can each be routed to a different wedge, cube or other shaped monitor speaker system (each with its own power amplifier channel and, if biamplified, its own electronic crossover network).

Because the Group outputs all have INSERT points, it is possible to connect graphic equalizers (and/or dynamic processors such as compressors or noise gates) in each monitor mix ahead of the bus fader. This is advantageous because any noise contributed by the outboard EQ (or other processor) will be attenuated when you pull down the bus fader. Overall noise at the speaker will track program level adjustments, which is much quieter sounding when an output is faded than if the EQ and/or signal processor were connected between the bus output and the power amp. Besides, with level-dependent processors (such as a compressor or gate), you don't want the effect to be dependent on where you set the bus fader, so the INSERT point is crucial to proper operation.

Similarly, each input channel has an INSERT point so that special effects or dynamic processors that are intended to be used on one input source only can be readily applied to that input. Typical devices include: compressor/limiters, specialized signal processors that create various effects (i.e., spatial modification, phasing, reverb, chorus, etc.), and digital or parametric equalizers. The input channel INSERT points have one feature not present (or needed) on the bus inserts – a switch that lets you move the insert point before or after the channel equalizer. The INSERT PRE switch [12] gives you the option of equalizing the feed to an external processor (a good idea if that processor is a gate or compressor), or of equalizing the incoming INSERT signal (a good idea if you are using the INSERT as an alternate line input).

The previous sentence touches on an important feature of the PM4000M. You can use the INSERT IN jack [82] as a line input to the channel. You can have another signal source simultaneously connected to the channel's XLR connector [81] if you wish. To select the line input, simply engage the INSERT ON switch [13]. This is very handy if, for a given set or cue, you need lots of mics, and on another set (or cue) you have some different equipment which produces line-level signals. Ideally, it would be nice to have sufficient input channels to accommodate everything simultaneously... and with up to 52 in one PM4000M, you may have enough input channels. Then again, you may not. So connect those part-time line input sources to the INSERT input

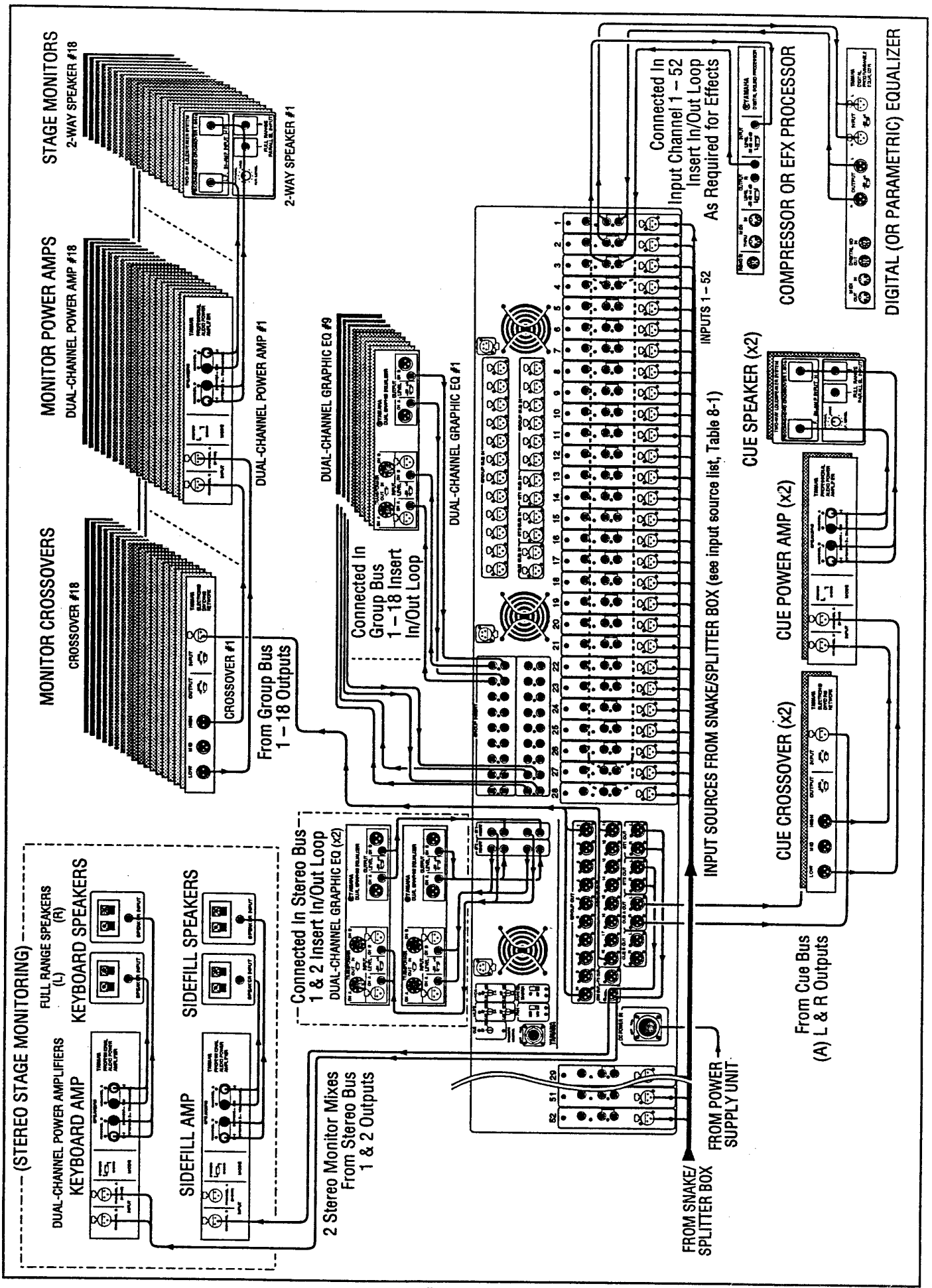
jacks, and label the channels accordingly. When it comes time to use them, press the INSERT ON switch, and you immediately switch from XLR to phcne jack input source on that channel.

The INSERT ON switch is also helpful when you wish to apply a special effect for a particular cue. Instead of reaching over to the effects rack and turning the device on, or bypassing it, you can simply turn ON (or off) its return to the channel. The send is always on, and this is particularly beneficial with reverb or echo since you won't get a "thump" or transient start-up sound when you "punch in" the effect.

Because the PM4000M has two independent stereo mix busses, you can set up one mix for the solo performer's sidefills, and a separate stereo mix for the keyboard player. Again, each of these mixes offers bus INSERT points so you can place EQ and dynamic processing where it belongs—ahead of the output fader.

Note that the two stereo mixes also allow you to set up a wireless stereo monitor mix for the key performer while the 18 Group mixes can be used for all other monitor speaker mixes. (See Section 8.4 for a system tailored to wireless monitor mixing.)

**Figure 8-2. (facing page).  
Typical Stage Monitor Mix Setup for Use With  
Monitor Speakers. Refer also to Table 8-1 for  
Typical Input Source List.**



STAGE MONITORS  
2-WAY SPEAKER #18

MONITOR POWER AMPS  
DUAL-CHANNEL POWER AMP #18

MONITOR CROSSOVERS  
CROSSOVER #18

(STEREO STAGE MONITORING)  
FULL RANGE SPEAKERS (L) (R)  
KEYBOARD SPEAKERS  
SIDEFILL SPEAKERS

DUAL-CHANNEL POWER AMPLIFIERS  
KEYBOARD AMP

SIDEFILL AMP

From Group Bus  
1-18 Outputs

Connected In Stereo Bus  
1 & 2 Insert In/Out Loop  
DUAL-CHANNEL GRAPHIC EQ (x2)

2 Stereo Monitor Mixes  
From Stereo Bus  
1 & 2 Outputs

Connected In  
Group Bus  
1-18 Insert  
In/Out Loop

DUAL-CHANNEL GRAPHIC EQ #9

DUAL-CHANNEL GRAPHIC EQ #1

INPUTS 1-52

FROM SNAKE/  
SPLITTER BOX

FROM POWER  
SUPPLY UNIT

Connected In  
Input Channel 1-52  
Insert In/Out Loop  
As Required for Effects

CUE SPEAKER (x2)

CUE POWER AMP (x2)

CUE CROSSOVER (x2)

From Cue Bus  
(A) L & R Outputs


COMPRESSION OR EFX PROCESSOR

DIGITAL (OR PARAMETRIC) EQUALIZER

## 8.4 Wireless Stereo Stage Monitoring


Wireless stage monitor systems are becoming increasingly popular, although the high cost of such systems has restricted their use to leading acts – or at least lead performers in a given act – for the most part. As more systems are built and sold, the cost may come down and we can expect to see more wireless monitoring in the future.

What is a wireless monitor system? Generally it consists of a stereo transmitter at the monitor mixing console, a portable stereo receiver worn by the performer, and a set of earphones or headphones to convey the received audio to the performer's ears. Often the earphones are custom-molded to the individual's ear canals and are therefore capable of completely excluding other sounds. This has the potential for preserving the individual's hearing in the midst of intense on-stage sound fields — provided the wireless monitor system is well designed and properly used. The wireless monitor also eliminates a primary source of feedback in the overall sound system, thus permitting higher gain-before-feedback in the house mix. It also reduces coloration of the house mix due to the contribution of stage monitors. A good design for such a system includes carefully devised compression to prevent extremely loud transients, especially at low frequencies, from reaching the eardrums.

 **WARNING: Never attempt to use any transmitter/receiver/transducer system for this application unless it is designed explicitly for wireless monitoring. To do otherwise risk permanent damage to the user's hearing.**

Aside from protection against hearing damage (due to excessive loudness), the wireless monitors can provide a constant acoustic reference for the performer regardless of changes in hall acoustics. For that matter, a solo vocalist or guitarist moving around the stage can enjoy a constant monitor reference instead of a constantly changing sound field. On the other hand, since external sounds are attenuated, if not completely eliminated, users of wireless monitors generally prefer to hear a stereo mix in which some ambience (via reverb and/or audience reaction mics) has been inserted. Otherwise the sound will feel "dead." Because the PM4000M has two independent stereo mix busses, you can set up two different wireless monitor mixes with ease. Should you be mixing for a band where there is a need for more than two stereo monitor mixes, the PM4000M Group busses can be used in pairs to create up to nine additional stereo mixes. In "real world" situations, you will probably use some of the Group mixes for conventional loudspeaker monitors, and others for stereo wireless monitors.

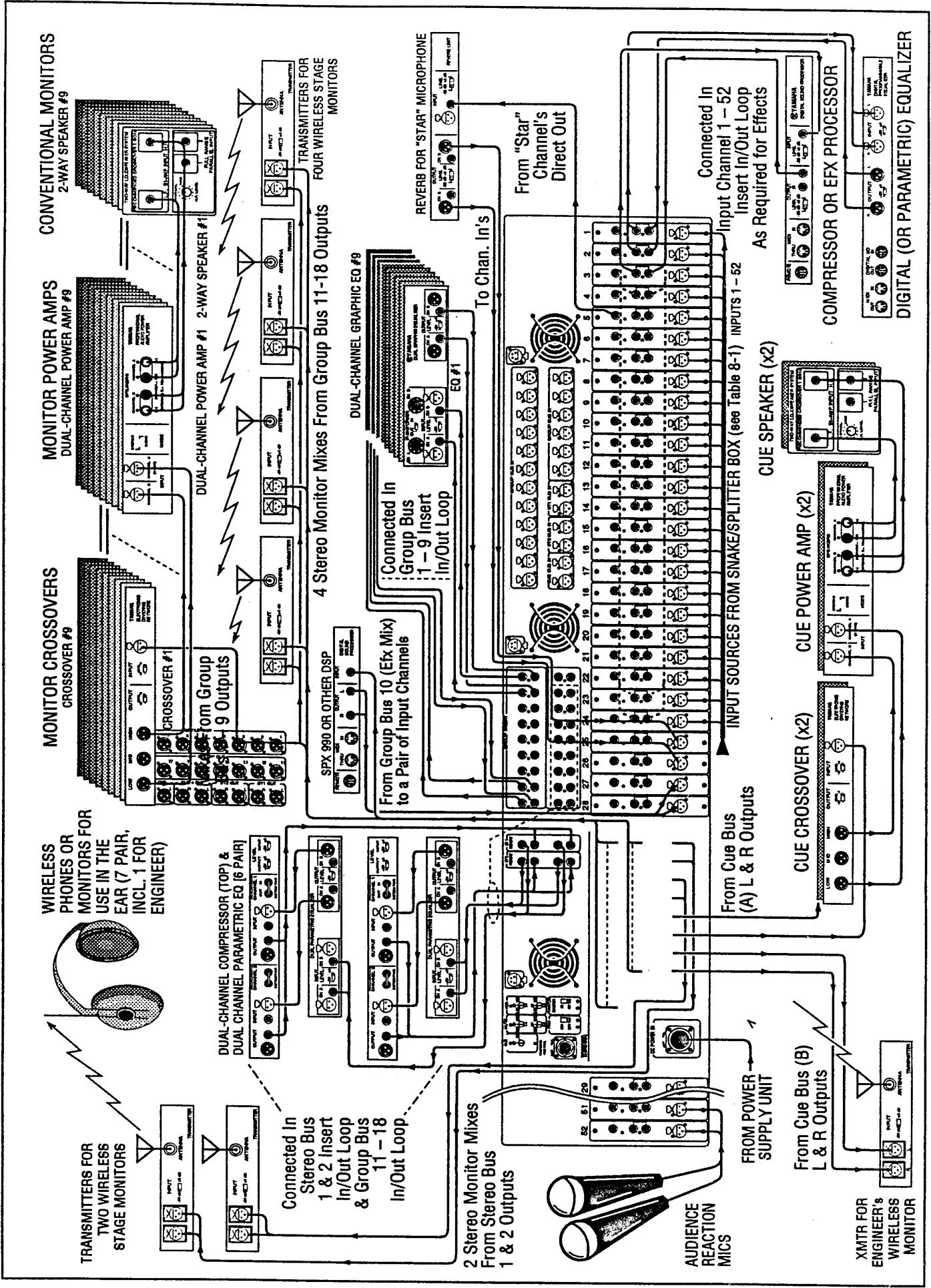
The extensive INSERT out/in points in the PM4000M enable the engineer to patch in all the analog or digital signal processing required to sweeten the various monitor mixes on a bus-by-bus basis. Of course, multiple input channels can still be assigned to a given group bus (or several) to create an effect send mix. The large number of available input channels allows for multiple effects returns, as required, each with complete EQ capability.

 **CAUTION: Never assign an effect return back onto a bus which is contributing to that effect's (signal processor's) input. To do so can cause feedback (howling) which can harm hearing and, in many cases, can damage the sound system, too. It's a good idea to mark or block "off limits" bus assign controls for a given return channel with colored tape to prevent inadvertent errors.**

Given the reduced feedback and reduced coloration afforded by a good wireless monitor system, performers will tend to become even more demanding with regard to the quality of their monitor mixes. Fortunately, the PM4000M's inherent sonic accuracy, quiet circuitry and flexible features make it easier for the engineer to achieve that goal. An important aspect of mixing for wireless monitors is that the monitor engineer should be able to listen on an identical system. That means that his (or her) cue mix should be stereo and should be fed to a wireless transmitter. The PM4000M goes a step further... it provides two cue outputs, CUE A [103] and CUE B [104], each with its own LEVEL control [68]. One of the cue outputs can be connected to the wireless transmitter, and the other to a conventional pair of monitor amps and speakers (or self-powered speakers) for the monitor engineer. In this way, the engineer can set an appropriate level to his local monitor speakers and a different, appropriate level for his wireless system. He will want to listen on the speakers when evaluating mixes for those performers who are monitoring with speakers, and listen on the wireless system when evaluating mixes for performers using wireless monitors.

Refer to the discussion in Section 8.3 for additional notes regarding stage monitoring in general and how the PM4000M can be used to advantage in this type of application.

**Figure 8-3 (facing page).  
Typical Stage Monitor Mix Setup for Use With  
Wireless Stereo Monitors. Refer also to Table 8-1  
for Typical Input Source List.**



CONVENTIONAL MONITORS  
2-WAY SPEAKER #9

MONITOR POWER AMPS  
DUAL-CHANNEL POWER AMP #9

MONITOR CROSSOVERS  
CROSSEVER #9

WIRELESS OR  
PHONES OR  
MONITORS FOR  
USE IN THE  
EAR (7 PAIR,  
INCL. 1 FOR  
ENGINEER)

TRANSMITTERS FOR  
TWO WIRELESS  
STAGE MONITORS

DUAL-CHANNEL COMPRESSOR (TOP) &  
DUAL-CHANNEL PARAMETRIC EQ (6 PAIR)

Connected In  
Stereo Bus  
1 & 2 Insert  
In/Out Loop  
& Group Bus  
11-18  
In/Out Loop

2 Stereo Monitor Mixes  
From Stereo Bus  
1 & 2 Outputs

4 Stereo Monitor Mixes From Group Bus 11-18 Outputs

DUAL-CHANNEL GRAPHIC EQ #9

From Group Bus 10 (Efx Mix)  
to a Pair of Input Channels

Connected In  
Group Bus  
1-9 Insert  
In/Out Loop

REVERB FOR "STAR" MICROPHONE

To Chan. In's

From "Star"  
Channel's  
Direct Out

Connected In  
Input Channel 1-52  
Insert In/Out Loop  
As Required for Effects

COMPRESSION OR EFX PROCESSOR

DIGITAL (OR PARAMETRIC) EQUALIZER

CUE SPEAKER (x2)

CUE POWER AMP (x2)

CUE CROSSOVER (x2)

From Cue Bus  
(A) L & R Outputs

FROM POWER  
SUPPLY UNIT

FROM Cue Bus (B)  
L & R Outputs

AUDIENCE  
REACTION  
MICS

XMTR FOR  
ENGINEER'S  
WIRELESS  
MONITOR

### 8.5 Theatrical Production

The PM4000M has features that make it ideal for theatrical sound reinforcement. Its eight Master Mute groups [41], together with the eight Mute assign switches on each input module [21], enable all the sound sources for a given scene to be preset so they can be turned on or off at the press of a single switch. Since the console has up to 100 dB of gain, distant microphones and quiet speaking voices will cause no problems. When less amplification is needed, the PM4000M's eight VCA groups make it possible to alter the balance of different groups of inputs in a way that the conventional group faders cannot: the VCAs can affect all outputs from an input module, and they can control overlapping groups of inputs for "additive" or "subtractive" fades. VCA groups are thus ideal in this application for use in mixing the house sound system for various scenes – not for traditional subgrouping of related input sources.

The dual stereo mixes are very helpful. One might be used for the primary left/right house system, and the other for lobby and "green room" feeds – or perhaps for a tape mix to stereo cassette or DAT (digital audio tape).

The 18 Group mixes provide the means to create discrete mixes for strategically located effects loudspeakers, for under-balcony and balcony sends, and for multiple stage monitor and orchestra monitor speakers (and/or wireless monitors).

The channel insert points can be helpful in applying effects such as reverb, chorus, pitch shift/harmonizing, and so forth to individual mics. Effects can then be applied on cue merely by pressing the channel's INSERT ON switch [13].

Group and stereo busses often benefit from dynamic processing (compressors and gates) and from graphic or parametric equalization. The INSERT points on these busses [90] [91] [92] [93] are perfect for connection of such signal processors.

Both the 44 and 52 input versions have center masters so two operators can work conveniently to handle the show. The dual CUE outputs [103] [104] enable two operators to set their own monitor speakers at different levels, if desired. Alternately, as described in the Wireless Stage Monitor discussion of Section 8.4, the dual cue outputs are helpful for correct level setting for both speaker and wireless monitors for the console operator.

The PM4000M's low profile means better sight lines from a high balcony (typical in theatrical installations). Its rugged construction means it can travel, reliably, along with a touring production.

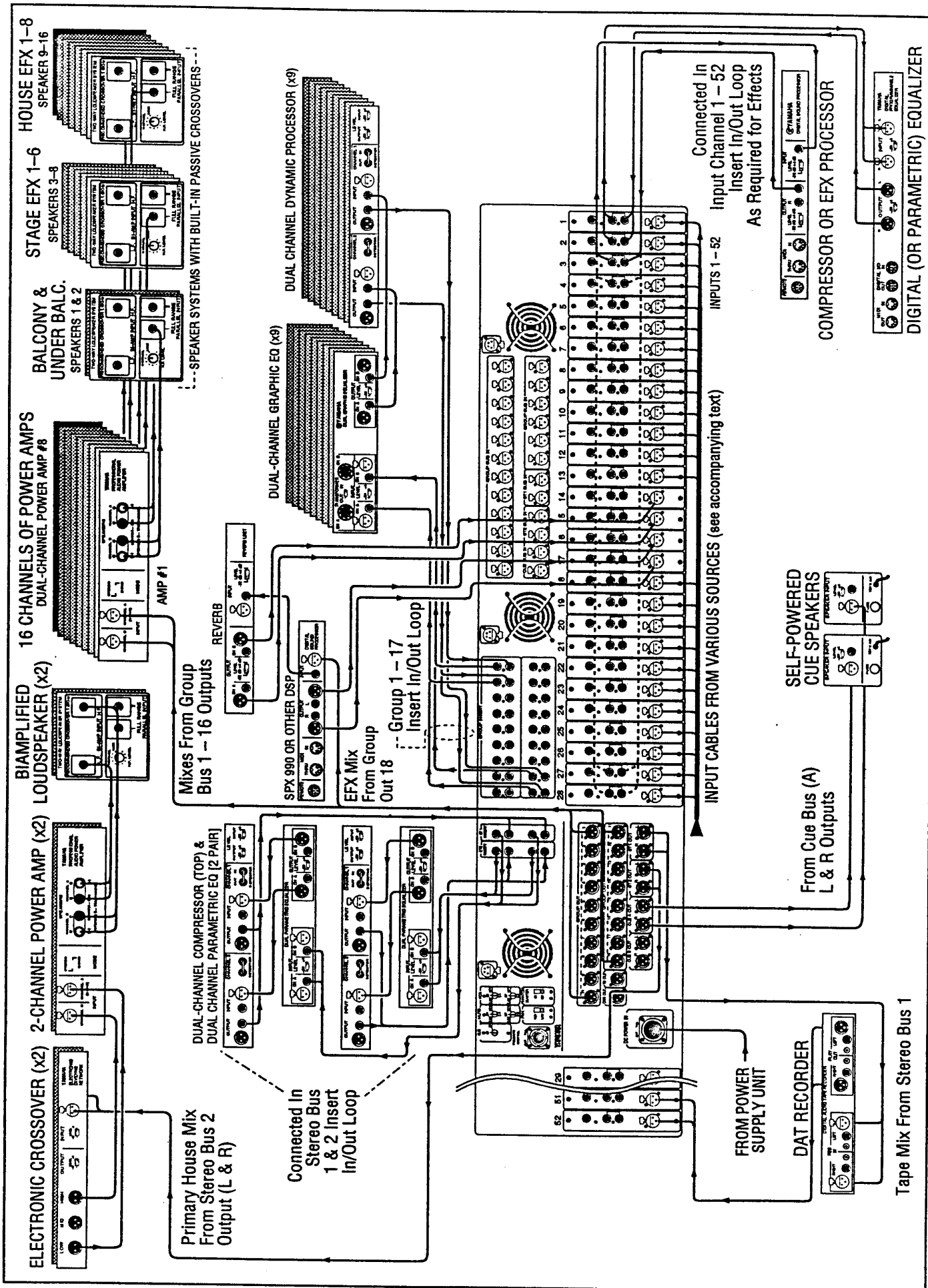
CH	Input Source	(Insert Processor)
1	Announcer	Compressor
2	RF Mic 1	Gate
3	RF Mic 2	Gate
4	RF Mic 3	Gate
5	RF Mic 4	Gate
6	RF Mic 5	Gate
7	RF Mic 6	Gate
8	RF Mic 7	Gate
9	RF Mic 8	Gate
10	RF Mic 9	Gate
11	RF Mic 10	Gate
12	RF Mic 11	Gate
13	RF Mic 12	Gate
14	Effect Return 1 L	—
15	Effect Return 1 R	—
16	Effect Return 2 L	—
17	Effect Return 2 R	—
18	Tape 1 L	Dolby NR
19	Tape 1 R	Dolby NR
20	Tape 2 L	Dolby NR
21	Tape 2 R	Dolby NR
22	Tape Cart L	—
23	Tape Cart R	—
24	Tap Mic 1	Gate & EFX
25	Tap Mic 2	Gate & EFX
26	Tap Mic 3	Gate & EFX
27	Tap Mic 4	Gate & EFX
28	Orchestra	—
29	Orchestra	—
30	Orchestra	—
31	Orchestra	—
32	Orchestra	—
33	Orchestra	—
34	Orchestra	—
35	Orchestra	—
36	Orchestra	—
37	Orchestra	—
38	Orchestra	—
39	Orchestra	—
40	Orchestra	—
41	Orchestra	—
42	Orchestra	—
43	Orchestra	—
44	Orchestra	—
45	Orchestra	—
46	Orchestra	—
47	Orchestra	—
48	Orchestra	—
49	Orchestra	—
50	Orchestra	—
51	Orchestra	—
52	Orchestra	—

Signal Processing as Required on Orchestral Inputs

Table 8-2. Theatrical (Large Musical) Production Input Source List for 52-Channel PM4000M

Figure 8-4. (facing page) Setup for Mixing a Theatrical Musical Production (i.e., a top "Broadway Show") with the PM4000M.





### 8.6 TV Production (General)

TV production today uses more live music, more pre-recorded sources, and more special effects than ever. Music videos in particular have brought the quality of audio for video to the forefront. The PM4000M is a logical choice for many video sound production requirements, thanks to its high quality, flexibility, and large number of input positions.

Sub inputs allow two consoles to be linked together for occasions when even more inputs are needed (also see Section 8.10). For example, the Stereo Sub Ins ([87] and [88]) allows other mixers' or consoles' stereo mixes to be applied directly to the PM4000M stereo mix(es). The Group Sub Ins [86] will accommodate line-level sweetening sources, thus freeing up PM4000M input channels (and space for the operator).

Since the PM4000M has 18 Group busses, different groups of instruments or mics can be assigned to their own group and controlled with a single fader. The two stereo busses support independent, direct-assigned mixes of the inputs, or they will take signals directly from the Group Master Faders [34]; in this latter mode, the Stereo Master Faders [50] [54] act as "grand masters" for the console.

Typical designation of the Group busses in TV production include: discrete mix minus feeds, ATR (Audio Tape Recorder) sends to the floor, tape ISO feeds, effects sends, and so forth, as noted in Figure 8-5. The two stereo busses can be used to create a program mix and a clean feed for the ATR.

Yamaha designed this console so effect returns come directly into Input channels. Because the channels have four-band parametric equalization with plenty of overlap between bands, the PM4000M eliminates the need for racks full of outboard equalizers. The equalizers, and especially the variable-knee high pass filters, make it easy to eliminate vocal breath sounds and "P-pops" and to reduce sibilance somewhat (though a de-esser in the channel INSERT in/out point is best for that job).

Built-in talkback capability that can be slated to any or all busses makes it easier for the producer or director to speak with crew or talent in an emergency (i.e., if the dedicated intercom should fail for any reason).

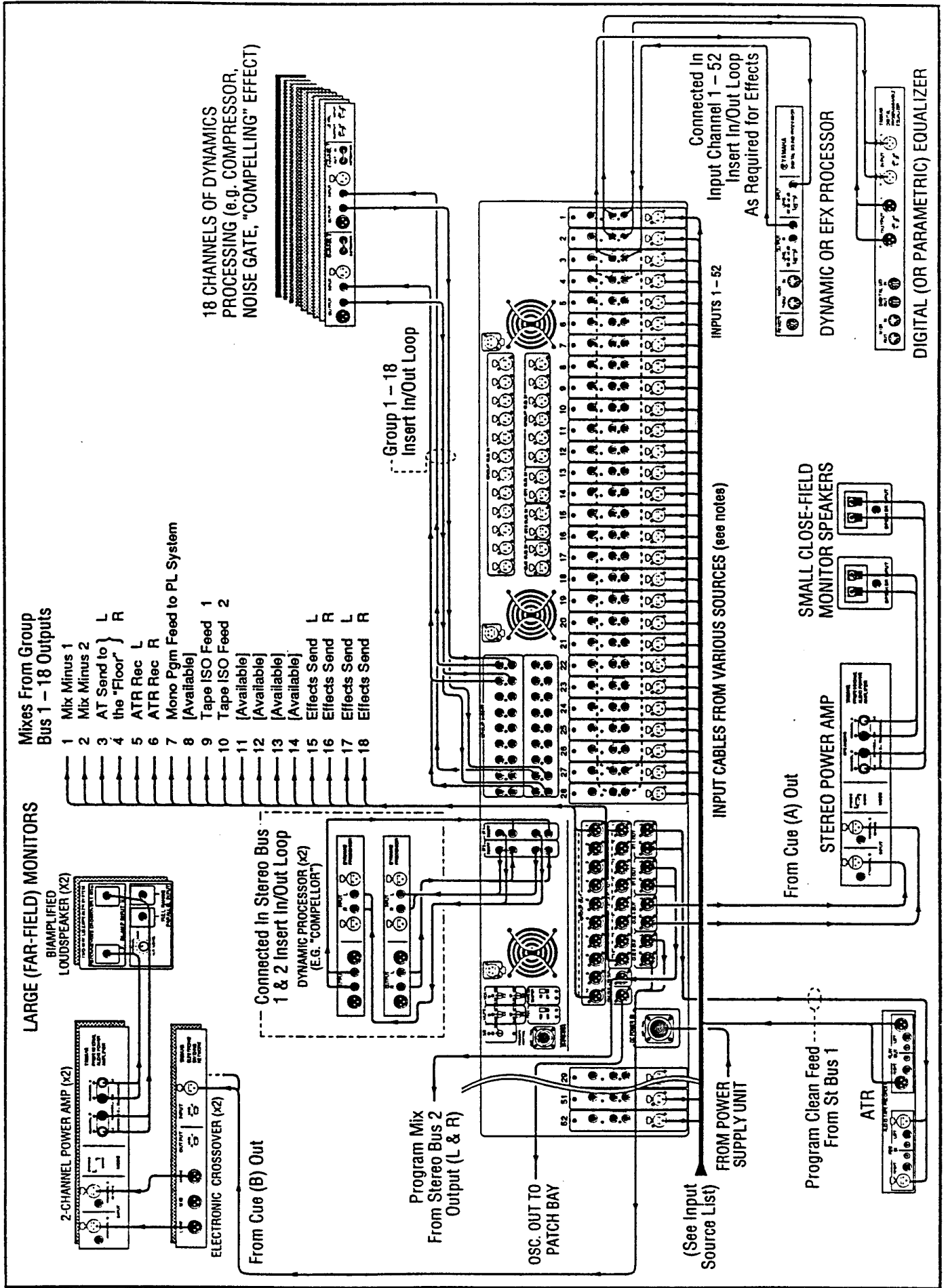
Both the 44 and 52 input versions have center masters so two operators can work conveniently to handle the show. The dual CUE outputs [103] [104] the operators to set up a pair of large monitors and a set of small, near-field monitors – and to easily balance the level of both sets of monitors for useful comparisons.

CH	Input Source	(Insert Processor)
1	Announcer	Compressor
2	VT "A" Left	Limiter
3	VT "A" Right	Limiter
4	VT "B" Left	Limiter
5	VT "B" Right	Limiter
6	VT "X" Left	Limiter
7	VT "X" Right	Limiter
8	VT "Y" Left	Limiter
9	VT "Y" Right	Limiter
10	ATR Left	Dolby NR
11	ATR Right	Dolby NR
12	Cart 1 Left	Limiter
13	Cart 1 Right	Limiter
14	Cart 2 Left	Limiter
15	Cart 2 Right	Limiter
16	DAT Left	—
17	DAT Right	—
18	RF 1	—
19	RF 2	—
20	RF 3	—
21	RF 4	—
22	RF 5	—
23	RF 6	—
24	RF 7	—
25	RF 8	—
26	P1	—
27	P2	—
28	P3	—
29	P4	—
30	P5	—
31	P6	—
32	Podium 1 A	Gate & Compr.
33	Podium 1 B	Gate & Compr.
34	Podium 2 A	Gate & Compr.
35	Podium 2 B	Gate & Compr.
36	AR 1	—
37	AR 2	—
38	AR 3	—
39	AR 4	—
40	AR 5	—
41	AR 6	—
42	AR 7	—
43	Satellite Feed 1 L	Limiter
44	Satellite Feed 1 R	Limiter
45	Satellite Feed 2 L	Limiter
46	Satellite Feed 2 R	Limiter
47	Effect Return 1 L	—
48	Effect Return 1 R	—
49	Effect Return 2 L	—
50	Effect Return 2 R	—
51	Effect Return 3 L	—
52	Effect Return 3 R	—

Signal Processing as Required

**Table 8-3. TV Production Input Source List for 52-Channel PM4000M**

**Figure 8-5. (facing page) Setup for Mixing a Typical TV Production with the PM4000M.**



**LARGE (FAR-FIELD) MONITORS**

**Mixes From Group Bus 1 - 18 Outputs**

- 1 Mix Minus 1
- 2 Mix Minus 2
- 3 AT Send to L
- 4 AT Send to R
- 5 ATR Rec L
- 6 ATR Rec R
- 7 Mono Pgm Feed to PL System
- 8 [Available]
- 9 Tape ISO Feed 1
- 10 Tape ISO Feed 2
- 11 [Available]
- 12 [Available]
- 13 [Available]
- 14 [Available]
- 15 Effects Send L
- 16 Effects Send R
- 17 Effects Send L
- 18 Effects Send R

18 CHANNELS OF DYNAMICS PROCESSING (e.g. COMPRESSOR, NOISE GATE, "COMPELLING" EFFECT)

Group 1 - 18 Insert In/Out Loop

Connected in Stereo Bus 1 & 2 Insert In/Out Loop DYNAMIC PROCESSOR (x2) (E.G. "COMPELLOR")

Connected In Input Channel 1 - 52 Insert In/Out Loop As Required for Effects

DYNAMIC OR EFX PROCESSOR

DIGITAL (OR PARAMETRIC) EQUALIZER

INPUT CABLES FROM VARIOUS SOURCES (see notes)

SMALL CLOSE-FIELD MONITOR SPEAKERS

STEREO POWER AMP

From Cue (A) Out

From Cue (B) Out

Program Mix From Stereo Bus 2 Output (L & R)

OSC. OUT TO PATCH BAY

(See Input Source List)

FROM POWER SUPPLY UNIT

Program Clean Feed From St Bus 1

ATR

### 8.7 TV Sports Production (Golf)

TV sports production requires many commentator/report microphone inputs, as well as inputs from multiple camera mics, guests, and remote (satellite) feeds. Thanks to its flexibility and large number of input positions, the PM4000M is a logical choice in this area where the production requirements can be demanding and constantly changing.

The example cited here, coverage of a golf match, involves a lot of instant replay. The multiple busses used for ISO tape feeds make this easy to accomplish. The busses allocated for pre-listen mixes enable the director to accurately cue various reporters and commentators. With clean feeds, the director can have two-way communication with people in the field when they are off camera (they listen to the IFB and talk back to the director via the pre-listen mix).

In our example, we have shown dynamic processing in the mix busses. This may eliminate the need for a compressor/limiter on each and every green, tee and fairway mic as well as on the camera mics. However, there are insert points available should individual input channels require special signal processing (i.e., a noise gate, equalizer or de-esser).

Note that the console's oscillator output is brought to the patch bay so that test signals are readily available and under the immediate control of the audio engineer at the console. The two cue systems enable mixes to be set at different levels for the local monitor speakers and for any headphone distribution system that might be employed (local phones plugged into the console have their own level control).

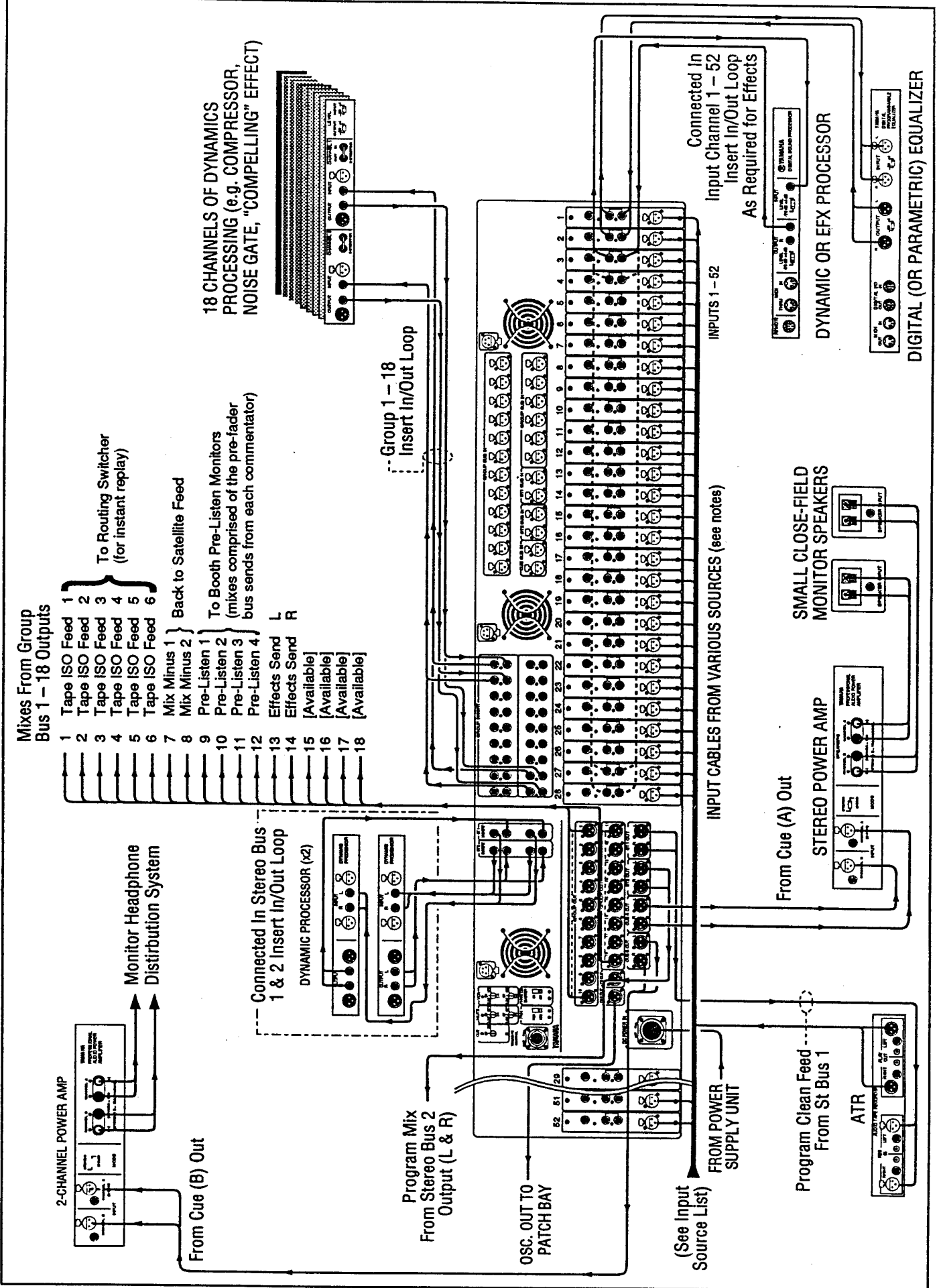
As you can see, with two mics on the longer fairways, we have allocated 33 microphones in this typical golf match setup – and that's only for the last 5 holes!

Other sporting events may differ significantly in the way they are produced, and in the requirements for the mixing console. Truck the same PM4000M to another venue, repatch the cables, and you can accommodate tennis, baseball, football, basketball... you name it.

CH	Input Source	(Notes)	
1	Hole 14 Tee	} Par 3	Signal Processing as Required
2	Hole 14 Fairway 1		
3	Hole 14 Fairway 2		
4	Hole 14 Green	} Par 4	
5	Hole 15 Tee		
6	Hole 15 Fairway 1		
7	Hole 15 Green	} Par 3	
8	Hole 16 Tee		
9	Hole 16 Green	"	
10	Hole 17 Tee	} Par 4	
11	Hole 17 Fairway 1		
12	Hole 17 Fairway 2		
13	Hole 17 Green	} Par 3	
14	Hole 18 Tee		
15	Hole 18 Green	"	
16	Camera Mic 1		
17	Camera Mic 2		
18	Camera Mic 3		
19	Camera Mic 4		
20	Camera Mic 5		
21	Camera Mic 6		
22	Camera Mic 7		
23	Camera Mic 8		
24	18th Hole Stick Mic 1		
25	18th Hole Stick Mic 2		
26	RF Mic 1 (Roving)		
27	RF Mic 2 (Roving)		
28	Commentator	} Booth Mics	
29	Color		
30	Guest		
31	Spare		
32	Stick 3		
33	Stick 4		
34	VTR A Audio		
35	VTR A Effects		
36	VTR B Audio		
37	VTR B Effects		
38	VTR X Audio		
39	VTR X Effects		
40	VTR Y Audio		
41	VTR Y Effects		
42	Betacam Audio		
43	Betacam Effects		
44	ATR L		
45	ATR R		
46	DAT L		
47	DAT R		
48	Cart 1		
49	Cart 2		
50	Satellite input		
51	CD L		
52	CD R		

**Table 8-4. TV Sports Production (Golf Match) Input Source List for 52-Channel PM4000M**

**Figure 8-6. (facing page) Setup for Specialized TV Sports Production (Golf in this case) with the PM4000M.**



Mixes From Group Bus 1 - 18 Outputs

- 1 Tape ISO Feed
- 2 Tape ISO Feed
- 3 Tape ISO Feed
- 4 Tape ISO Feed
- 5 Tape ISO Feed
- 6 Tape ISO Feed
- 7 Mix Minus 1
- 8 Mix Minus 2
- 9 To Booth Pre-Listen Monitors (mixes comprised of the pre-fader bus sends from each commentator)
- 10 Pre-Listen 1
- 11 Pre-Listen 2
- 12 Pre-Listen 3
- 13 Effects Send L
- 14 Effects Send R
- 15 [Available]
- 16 [Available]
- 17 [Available]
- 18 [Available]

To Routing Switcher (for instant replay)

Back to Satellite Feed

18 CHANNELS OF DYNAMICS PROCESSING (e.g. COMPRESSOR, NOISE GATE, "COMPELLING" EFFECT)

Group 1 - 18 Insert In/Out Loop

Connected In Stereo Bus 1 & 2 Insert In/Out Loop

DYNAMIC PROCESSOR (x2)

Program Mix From Stereo Bus 2 Output (L & R)

OSC. OUT TO PATCH BAY

(See Input Source List)

FROM POWER SUPPLY UNIT

Program Clean Feed From St Bus 1

ATR

INPUT CABLES FROM VARIOUS SOURCES (see notes)

INPUTS 1 - 52

Connected In Input Channel 1 - 52 Insert In/Out Loop As Required for Effects

DYNAMIC OR EFX PROCESSOR

DIGITAL (OR PARAMETRIC) EQUALIZER

SMALL CLOSE-FIELD MONITOR SPEAKERS

STEREO POWER AMP

From Cue (A) Out

2-CHANNEL POWER AMP

Monitor Headphone Distribution System

From Cue (B) Out

## 8.8 House of Worship Applications

The PM4000M is well suited to sound reinforcement in houses of worship. Because there are a large number of inputs and mixing busses, this single console can be used to mix several things at once: the stage monitor speakers for music and choir, the "house" sound for the congregation, the hearing-impaired mix for the infra-red system, and any broadcast feeds or tape-ministry recording mixes.

The eight Master Mute groups [41], together with the eight Mute assign switches on each input module [21], enable all the sound sources for a given event to be preset so they can be turned on or off at the press of a single switch; thus, you can instantly activate the 'sermon' setup, the 'choral' setup, the 'concert' setup, etc. Since the console has up to 100 dB of gain, an unfamiliar speaker at the podium who remains too distant from the microphone, or those with quiet speaking voices will cause no problems. When less amplification is needed, the PM4000M's eight VCA groups make it possible to alter the balance of different groups of inputs in a way that the conventional group faders cannot: the VCAs can affect all outputs from an input module, *and* they can control overlapping groups of inputs for "additive" or "subtractive" fades. This can be useful in balancing the choir against the orchestra (and congregation).

The dual stereo mixes are very helpful. One might be used for the primary left/right congregation reinforcement system, and the other for a tape mix to stereo cassette or DAT (digital audio tape) or a broadcast feed.

You can decide how many of the 18 Group mixes you need to create discrete mixes for stage monitoring, and how many you wish to use for subgrouping as part of the house mix. You may even wish to allocate a few busses for strategically located loudspeakers under a balcony, for overflow areas during holiday services, etc.

The channel insert points can be helpful in applying effects such as reverb, chorus, pitch shift/harmonizing, and so forth to individual mics. Effects can then be applied on cue merely by pressing the channel's INSERT ON switch [13].

The center masters enable two operators to work conveniently side-by-side, and this means that no monitor engineer is required on the stage. The dual CUE outputs [103] [104] enable two operators to set their own monitor speakers at different levels, if desired.

The PM4000M's low profile means better sight lines from a high balcony, and less obstruction for congregation members in any case.

\*Optional signal processors

CH	Input Source	(Insert Processor)
1	Reverb Return 1 L	Gate & EQ*
2	Reverb Return 1 R	Gate & EQ*
3	Reverb Return 2 L	Gate & EQ*
4	Reverb Return 2 R	Gate & EQ*
5	Reverb Return 3 L	Gate & EQ*
6	Reverb Return 3 R	Gate & EQ*
7	Reverb Return 4 L	Gate & EQ*
8	Reverb Return 4 R	Gate & EQ*
9	Pipe Organ 1	
10	Pipe Organ 2	
11	Pipe Organ 3	} (Organ mics for tape & IR feeds)
12	Pipe Organ 4	
13	Pipe Organ 5	
14	Pipe Organ 6	
15	Pipe Organ 7	
16	Pipe Organ 8	
17	CD L	—
18	CR R	—
19	ATR L	—
20	ATR R	—
21	Podium 1 A	Compressor, and
22	Podium 1 B	or De-Esser
23	Podium 2 A	"
24	Podium 2 B	"
25	Podium 3 A	"
26	Podium 3 B	"
27	RF 1	Gate
28	RF 2	Gate
29	Soloist 1	Compressor
30	Soloist 2	Compressor
31	Background Vocalist 1	Gate
32	Background Vocalist 2	Gate
33	Choir	—
34	Choir	—
35	Choir	—
36	Choir	—
37	Choir	—
38	Choir	—
39	Choir	—
40	Choir	—
41	Orchestra / Band	—
42	Orchestra / Band	—
43	Orchestra / Band	—
44	Orchestra / Band	—
45	Orchestra / Band	—
46	Orchestra / Band	—
47	Orchestra / Band	—
48	Orchestra / Band	—
49	Orchestra / Band	—
50	Orchestra / Band	—
51	Orchestra / Band	—
52	Orchestra / Band	—

Signal Processing as Required on These Inputs

**Table 8-5. House of Worship Mixing Input Source List for 52-Channel PM4000M**

**Figure 8-7. (facing page) Setup for House of Worship Mixing (Sermon, Choir and Orchestra/Band) with the PM4000M.**



## 8.9 Concert “House” Mixing

The PM4000M was not designed as a front-of-house console — the PM4000 was. However, the -M model happens to work quite well in that capacity and, in a few instances, it may even be better suited to the job than the PM4000. For one thing, if you need to mix the house and monitors, and either cannot afford the budget or the space for a separate on-stage monitor console and engineer position, the PM4000M lets you handle the entire job from the house mixing position. Given the center position of the PM4000M’s master controls, it is certainly feasible for two engineers to work side-by-side, sharing the house and monitor mixing duties at the same console.

Because the Group outputs all have INSERT points, it is possible to connect graphic equalizers (and/or dynamic processors such as compressors or noise gates) in each monitor mix ahead of the bus fader. This is advantageous because any noise contributed by the outboard EQ (or other processor) will be attenuated when you pull down the bus fader. Overall noise at the speaker will track program level adjustments, which is much quieter sounding when an output is faded than if the EQ and/or signal processor were connected between the bus output and the power amp. Besides, with level-dependent processors (such as a compressor or gate), you don’t want the effect to be dependent on where you set the bus fader, so the INSERT point is crucial to proper operation.

Similarly, each input channel has an INSERT point so that special effects or dynamic processors that are intended to be used on one input source only can be readily applied to that input. Typical devices include: compressor/limiters, specialized signal processors that create various effects (i.e., spatial modification, phasing, reverb, chorus, etc.), and digital or parametric equalizers. The input channel INSERT points have one feature not present (or needed) on the bus inserts — a switch that lets you move the insert point before or after the channel equalizer. The INSERT PRE switch [12] gives you the option of equalizing the feed to an external processor (a good idea if that processor is a gate or compressor), or of equalizing the incoming INSERT signal (a good idea if you are using the INSERT as an alternate line input).

The previous sentence touches on an important feature of the PM4000M. You can use the INSERT IN jack [82] as a line input to the channel. You can have another signal source simultaneously connected to the channel’s XLR connector [81] if you wish. To select the line input, simply engage the INSERT ON switch [13]. This is very handy if, for a given set or cue, you need lots of mics, and on another set (or cue) you have some

different equipment which produces line-level signals. Ideally, it would be nice to have sufficient input channels to accommodate everything simultaneously... and with up to 52 in one PM4000M, you may have enough input channels. Then again, you may not. So connect those part-time line input sources to the INSERT input jacks, and label the channels accordingly. When it comes time to use them, press the INSERT ON switch, and you immediately switch from XLR to phone jack input source on that channel. Alternatively, you can link two consoles to obtain more inputs, as explained on following pages.

The INSERT ON switch is also helpful when you wish to apply a special effect for a particular cue. Instead of reaching over to the effects rack and turning the device on, or bypassing it, you can simply turn ON (or off) its return to the channel. The send is always on, and this is particularly beneficial with reverb or echo since you won’t get a “thump” or transient start-up sound when you “punch in” the effect.

Because the PM4000M has two independent stereo mix busses, you can set up one mix for the primary house stereo feed, and another for recording or broadcast. Separate stereo mixes of some of the group busses can be used to drive stereo stage monitors such as performer’s sidefills, keyboards and/or wireless monitors. Again, each of these mixes offers bus INSERT points so you can place EQ and dynamic processing where it belongs—ahead of the output fader.

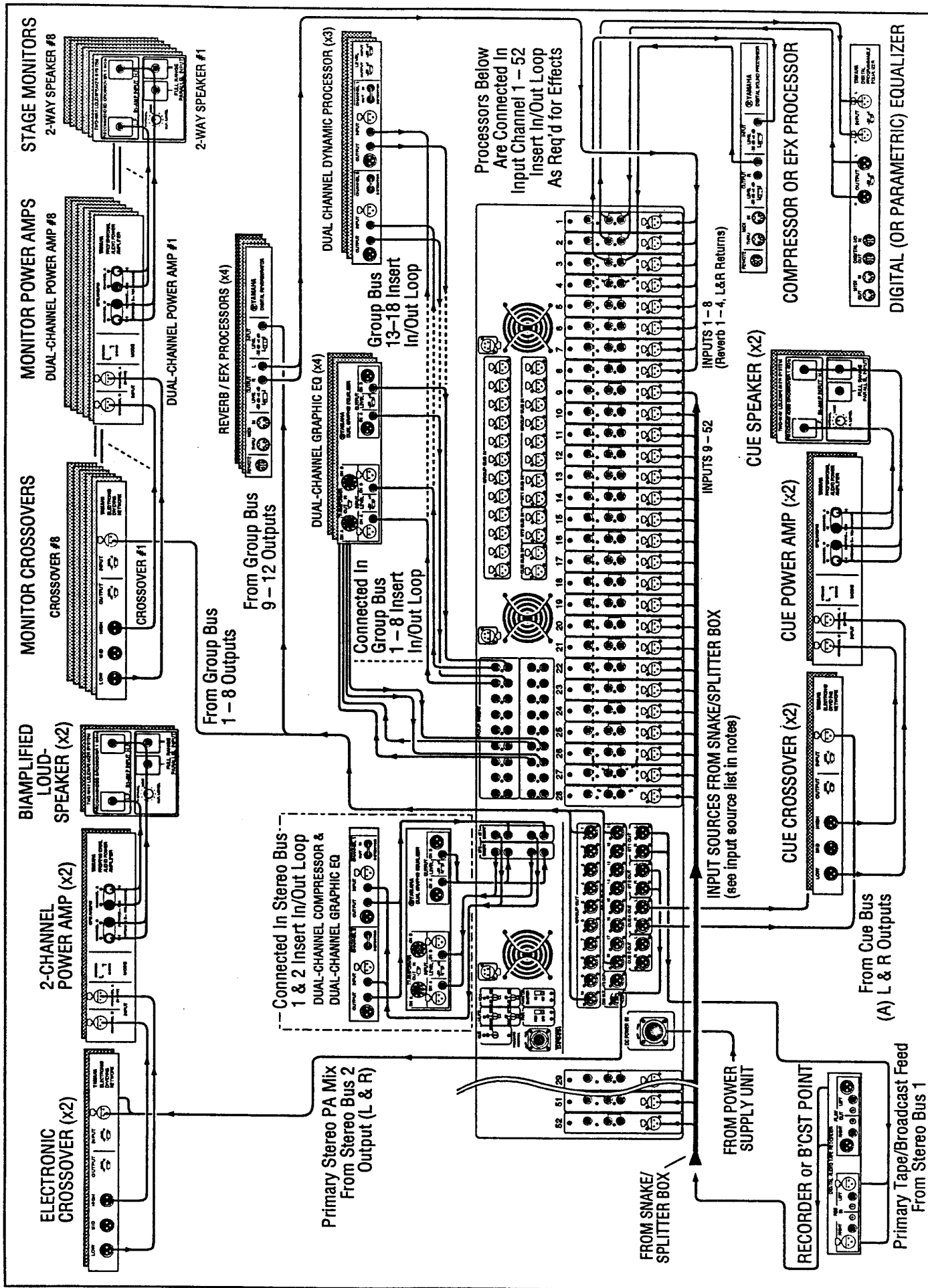
In concerts where many special effects are employed, the PM4000M’s monitor mixing structure facilitates your ability to precisely create multiple and varied mixes from the same sets of input sources, but with different effects applied or different balances. Thus, you can create apparent motion, multi-dimensional acoustic “spaces” and so forth.

The VCA and mute groups make it much easier to set up cues for different portions of the show, and to balance entire sections of sources on non-consecutive input channels.

For the touring or rental sound company with requirements for high-quality sound and highly-capable mixing, tremendous flexibility, and durability — yet a less than unlimited budget, the PM4000M might make a better choice than its sister product, the PM4000. If you have the requirements and the budget, of course one of each model would be an even better option.

**Figure 8-8. (facing page)  
Setup for Concert “House” Mixing using the  
PM4000M as the Primary Mixing Console.**





## 8.10 Linking Two PM4000M's for 104 Input Channel Operation

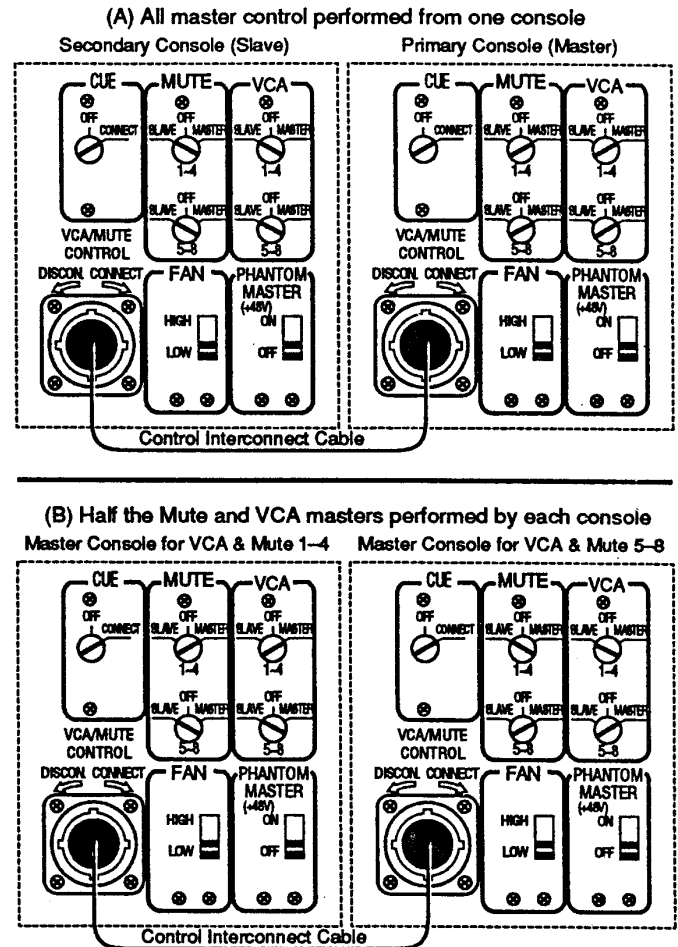
The PM4000M, like the PM4000 and PM3000 that preceded it, is designed to facilitate linking to other consoles. It has sub-inputs to all the primary mixing busses: Group [86], Stereo 1 [87], Stereo 2 [88] and Cue [89]. The console's cue, mute and VCA logic control lines are all available at a multi-pin rear-panel connector [99], and rear-panel switches enable these circuits to be selectively controlled remotely or locally [94], [95] and [96].

To many people, 44 or 52 inputs seem like quite a few. In reality, sometimes they are not nearly enough. For the very large, complex job — perhaps a multi-stage show or an extravaganza such as the Academy Awards — linking a pair of PM4000M consoles makes a lot of sense. And it takes just a couple of minutes to accomplish. Just designate one console as the “slave” and the other one as the “master.” Actually, you can make one console the master for some functions, and the other the master for other functions, which may be preferable when two engineers are handling the mixing duties. In the simplest setup, though, you will use the output section of the master console to make final mixing adjustments, while setting the slave master section at nominal values — for the most part. You can, of course, use some output busses directly from the slave console, in which case its master controls are primary. The slave console's function is essentially to provide more input channels.

The interconnection between PM4000M's is simple. As illustrated on the facing page, you need only to connect XLR patch cords from the Cue, Group and (in some cases) Stereo outputs of the slave console to the respective Cue, Group and Stereo Sub-Inputs of the master console. You should have created a logic patch cable ahead of time (described right after this) to link the VCA/Mute Control connectors of the two consoles, and you need to connect this cable to both consoles. Then you set the master control switches adjacent to the VCA/Mute Control connectors accordingly.

What do we mean by “accordingly?” If one console is strictly to be the slave, then its VCA [94] and MUTE [95] switches should all be set to SLAVE position, and the master console's corresponding switches should all be set to the MASTER position (per Figure 8-9a). The CUE interconnect switches [96] on both consoles should be set to CONNECT so that pressing a CUE switch on either console will mute all other signals on both consoles. However, if you wish to have half the VCA and Mute functions controlled by one console and half by the other, set the interconnect switches per Figure 8-9b.

It is conceivable that, in a given installation, you may wish to slave one console to the other some of the time, and then operate the consoles separately at other times... for instance in a large Las Vegas style show-room where the room may be divided in half for two

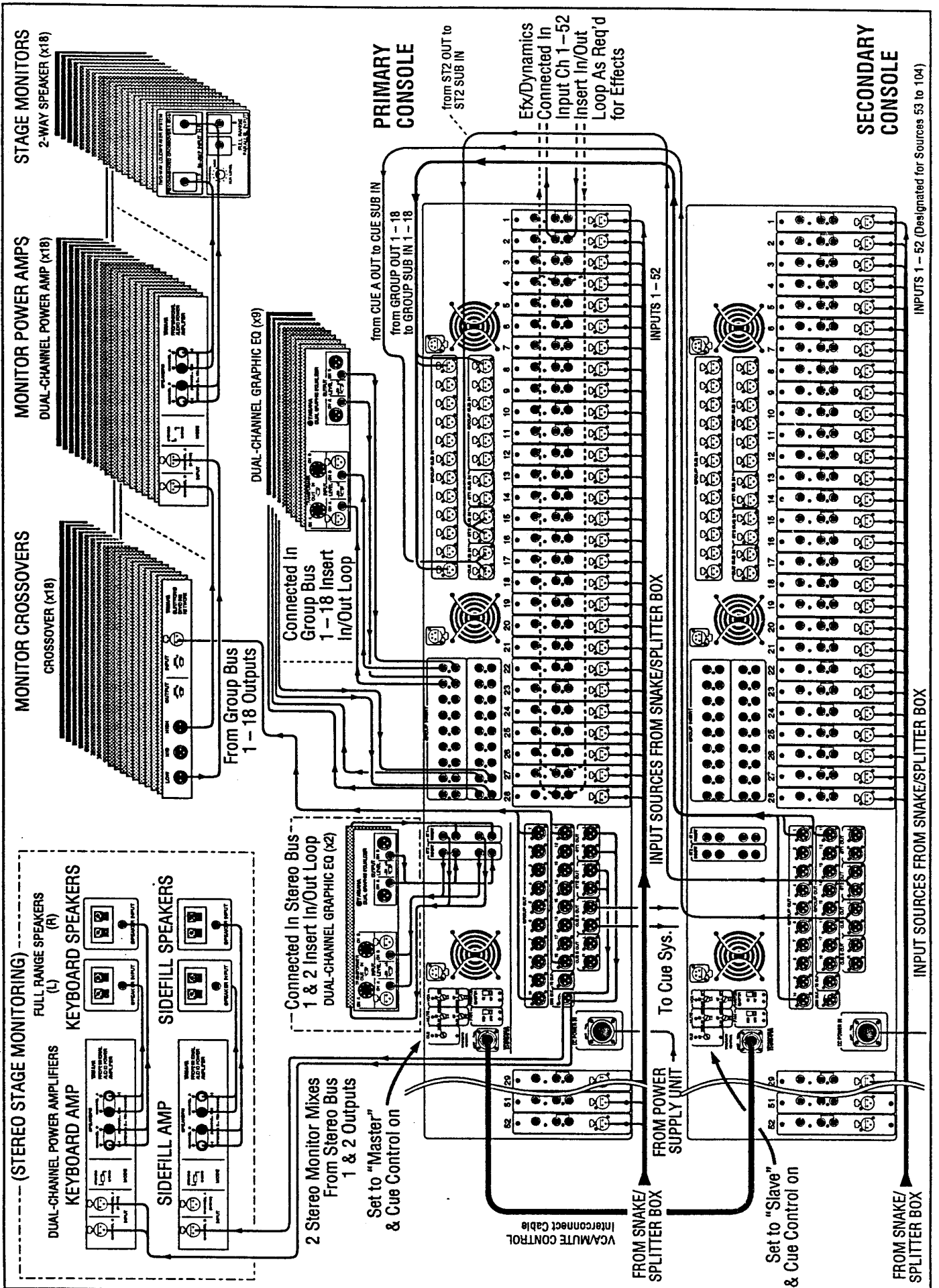


**Figure 8-9. Two Ways to Set Up the Linkage Between a Pair of PM4000M Consoles**

smaller shows most of the time, but opened up to create one large room for really big acts. In such cases, you need not change any patch cords. Just reset the switches on back of the consoles. The settings for no-linkage operation are illustrated in Figure 2-11 (i.e., Cue, Mute and VCA master control switches are all set to OFF).

Each PM4000M is shipped with a mating 24-pin in-line connector for the rear-panel VCA/MUTE control connector. Obtain a suitable length of jacketed, 24-conductor DC control cable, preferably with stranded conductors, and wire the two connectors together, matching pin numbers on each; pins 10, 23 and 24 are not used, so three conductors can be reserved for spares should another wire in the cable break.

**Figure 8-10. (facing page)  
Setup for Linking Two PM4000M's For Greater  
Overall Mix Capability With Consistent "Feel"**



## 8.11 Linking a PM4000M to a Yamaha MC2410 for 76 Input Channel Operation

The 104-channel system described on the previous page utilized a pair of PM4000Ms. If you need more than 44 or 52 inputs, but don't have the budget or need for a second PM4000M, you can use a Yamaha MC2410 instead. The MC2410 does not have VCA and Mute control, so you can leave the corresponding PM4000M Master Control switches set to OFF position. However, the MC2410 does have a cue control circuit. In order to interconnect the cue circuits on the two consoles, you will have to fabricate a custom interconnect cable using the 24-pin connector that comes with the PM4000M plus a 1/4-inch phone plug. The cable is illustrated in Figure 8-11. Once you connect this cable to the Cue Control connector on the MC2410 and the VCA/Mute Control connector on the PM4000M, set the PM4000M Cue Master Control switch to CONNECT position.



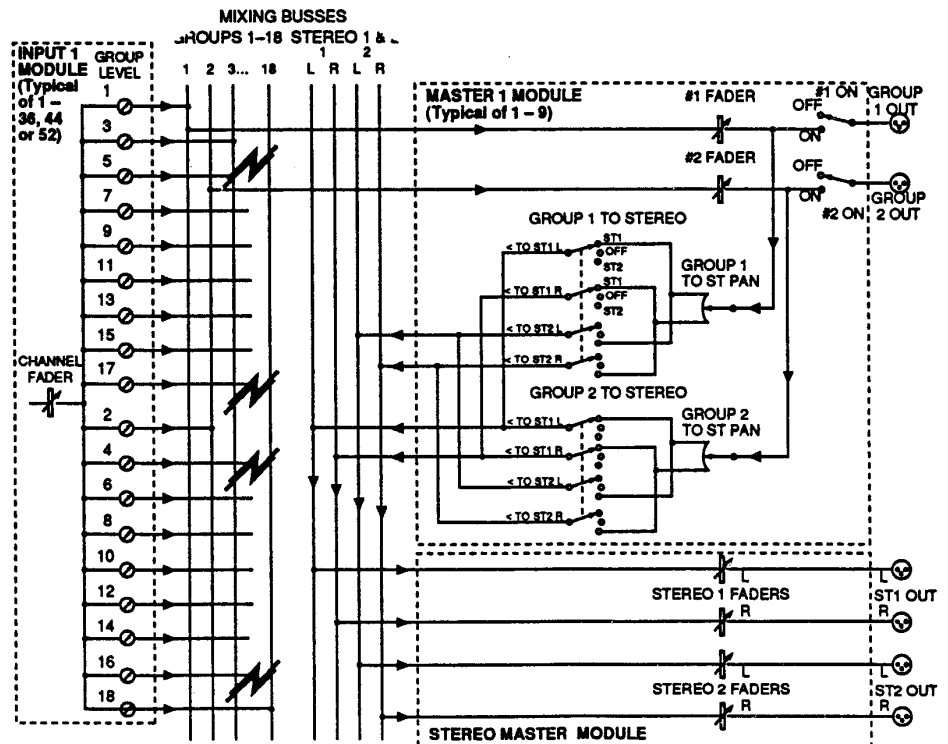
**Figure 8-11. Custom Cable to Join the Cue Control Functions of the MC2410 and PM4000M**

## 8.12 Setup Concepts

### 8.12.1 Ways to Derive a Stereo Mix From Groups 1 - 18

There are a number of ways to obtain a stereo mix with this console. One technique is to utilize Groups 1-18 for subgrouping input channels. The post Group Master Fader [39] signals then can be assigned to the stereo mixing bus using the GROUP-TO-ST controls [33] on each Master Module. The Stereo 1 (and/or Stereo 2) Master Faders [50] [54] then become the overall stereo output control for the mixed groups. In this setup, the input channel Stereo Bus assign controls [15] [16] would not normally be utilized, except on those input channels which may be used for effects returns. This is a very straightforward means of achieving a stereo mix (or two) with subgroup control — without using the VCA system.

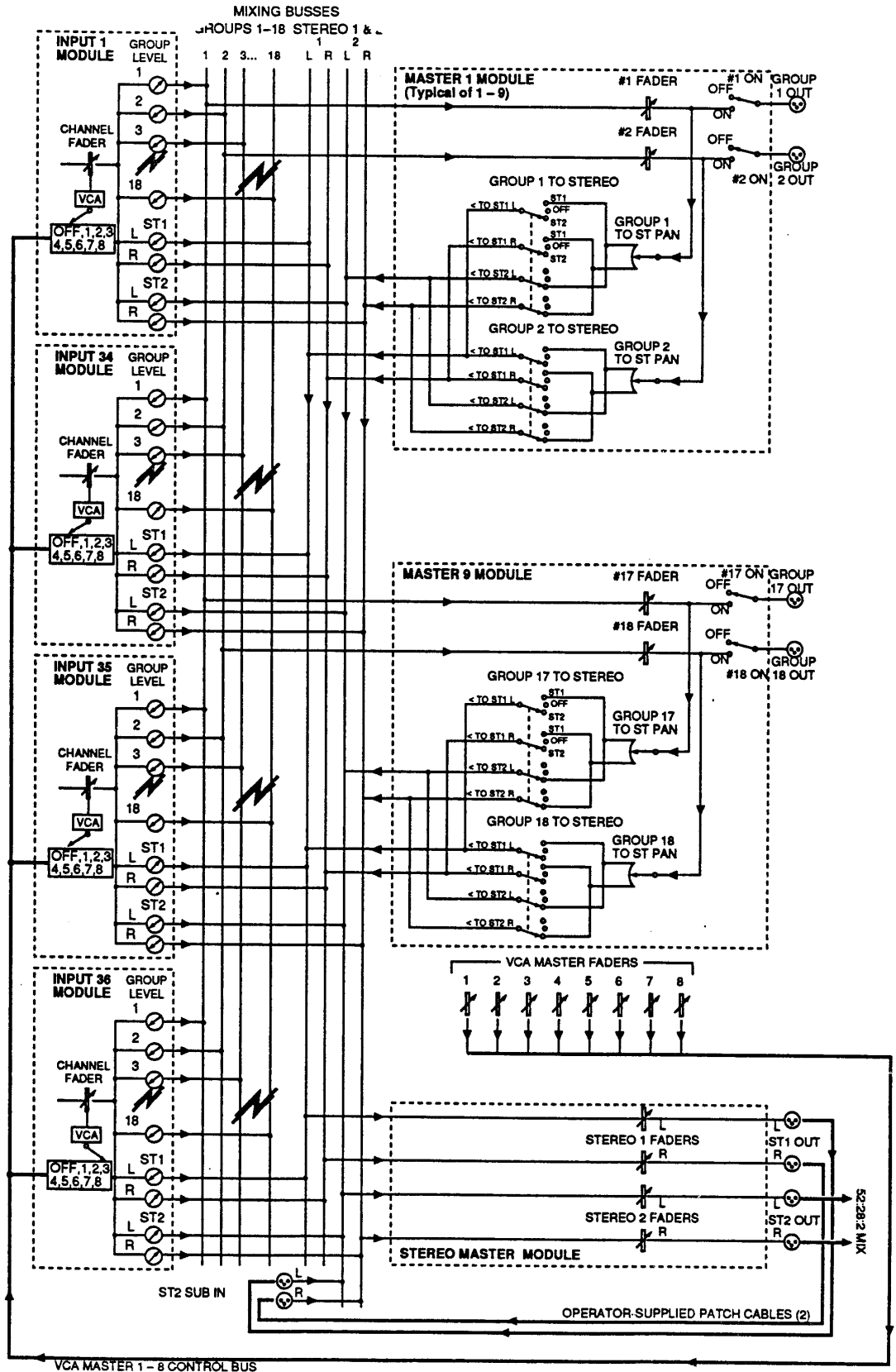
**Figure 8-12. System Diagram Showing How Groups 1 - 18 Serve as Submasters, and the Main Feed is From the Stereo 1 and Stereo 2 Masters**



### 8.12.2 How to Use the VCA Masters Plus the Group Master Faders to Obtain the Functional Equivalent of 28 Subgroups

This is an exercise to see how much control we can exercise over groups of signals. Let's assume the object is to obtain a single stereo output. Most input channels can be applied, via their assign controls [14] to one or more Group busses. One of the two Stereo Sends [15] can also be switched to operate as a pair of mono sends, increasing the number of "Group" busses to 20. The 18 Group Master Faders [34] and one pair of Stereo Master Faders [50] then control these 20 subgroups. Set the Group-to-Stereo controls [33] on Groups 1 - 18 so they reassign these 18 subgroups for control by the Stereo 2 Master Faders [54]. The Stereo 1 mix cannot be directly assigned to the Stereo 2 mix, but you can achieve the same result by connecting a pair of XLR "patch cables" between the Stereo 1 L & R Outputs [101] and the Stereo 2 L & R Sub-Inputs [88]. At the same time, you can assign other input channels (those that are not assigned to the groups) directly to the Stereo 2 bus (and the Stereo 2 Master Faders) by means of their ST 2 assign controls [16]. In order to exercise group control of the direct-to-stereo 2 input channels, those channels' VCA assign

Figure 8-13. System Diagram with VCA-controlled Inputs Plus Group Busses and One Stereo Bus Used to Create 28 Subgroups, Which All Mix Into a Single Stereo Output



switches [20] are engaged (typically just one switch per module). The correspondingly numbered VCA Master Faders [39] then exercise control over subgroups of input channels which are assigned directly to the Stereo 2 Master Fader. The eight VCA Master Faders [39] plus the 18 Group Master Faders [34] and the two Stereo 1 Master Faders [50] thus control 28 different subgroups, all of which are mixed into the same Stereo 2 output.

*NOTE: In this application, any groups requiring overall signal processing (such as compression of a drum group, or flanging of a vocal group) should be assigned to the Group or Stereo 1 Master Faders. This allows the Group INSERT IN/OUT patch points to be used to handle the overall mixed signal; there is no corresponding means to process a group which is created via VCA assignment.*

### **8.12.3 Using More Than One VCA Master to Control the Same Input Channels In Order To Handle Overlapping Scenes.**

In a multi-scene theatrical presentation, or a multi-set concert, to name a couple of examples, it may be necessary to mix the same input channels at different levels to suit changing stage requirements. Rather than have the console operator make copious notes and exercise super-human skill at instantly resetting 36 to 52 channel faders every so often, the PM4000M designers came up with a better idea. Use the VCA system. The eight VCA Master Faders can be thought of as eight "scene" controllers. In terms of the actual output mix and speaker assignments, the conventional Group and Stereo Master Faders may be used. However, the VCA Masters will determine those channels that actually contribute to the console outputs at any time.

If a specific input channel is needed only for one scene, then the channel's VCA assign switch [20] that numerically corresponds to the scene's VCA Master should be engaged. If an input channel is needed for several scenes, then more than one VCA assign switch [20] may have to be engaged. Of course, more than eight total scenes can be accommodated since some scenes may require two or more VCA Master Faders [39] to be brought up, whereas other scenes may require just one of those VCA Masters, or may require different settings of the same VCA Masters. In any event, just eight faders need be monitored and reset, not 36 or 44 or 52, each time there is a scene change.

As an adjunct to this technique, the channel MUTE switches [21] and MUTE MASTER switches [41] can be used to silence groups of channels.

An interesting conceptual example of VCA control involves a group of input channels that are assigned to the left and right sides of a stereo mix. Those input channels panned primarily to the left can be assigned to VCA Master 1. Those input channels panned primarily to the right can be assigned to VCA Master 2. All the input channels in this group are also assigned to VCA Master 3 (and 4, 5, 6, etc. if desired). In this way, overall stereo fades for one scene can be made with VCA Master Fader #3, for another with VCA master Fader #4, etc. At the same time, the left output for any of these scenes can be adjusted with VCA Master Fader #1, and the right output with VCA Master Fader #2. While this particular example may not mesh with your requirements, we feel it points out how one VCA might control several scenes, whereas others could control individual scenes... or parts of scenes.

# Section 9.

## Maintenance

### 9.1 Cleaning The Console

#### 9.1.1 The Console and Power Supply Exterior

The console and power supply are painted with a durable finish. To avoid damage to the paint, control knobs, switch caps and other parts, **DO NOT USE SOLVENTS**. Instead, keep the console as free of dust as practical. Cover it when not in use, and brush or vacuum it periodically. The surface may be cleaned with a soft rag moistened with a dilute solution of non-abrasive detergent and water. If sticky gum is left on the panel (from masking tape or other tape used for channel labeling), it may be necessary to use a specialized solvent. In general, rubber cement solvent will remove tape residue without harming the console; however, it is your responsibility to test any such solvent in an inconspicuous location to ensure it does not attack the console finish or mar any plastic part.

Avoid getting the inside of the console wet from excessively wet rags. **DO NOT USE AEROSOL OR SPRAY CLEANERS**.

#### 9.1.2 Power Supply Air Filters

The reticulated foam air filters on the front of the power supply screen cooling air as it is drawn through the unit. When the foam becomes clogged or dirty, it should be cleaned; check it periodically. Using a 3 mm allen wrench, remove the four cap screws that secure each front grille. The foam elements may now be removed and rinsed in cool water. For greasy or stubborn dirt, dip the elements in a mild solution of detergent and water, then rinse with clear water. Blot and/or air dry the elements thoroughly before returning them to the amplifier. **DO NOT USE SOLVENTS TO CLEAN THE FOAM ELEMENTS**.

#### 9.1.3 Pots And Faders

Yamaha **DOES NOT** recommend the routine use of any contact cleaners or solvents for cleaning pots or faders. Such "preventive maintenance" can actually do more harm than good by removing the lubricating film on certain pots or faders. While treatment with such solvents or cleaners may temporarily "clean up" a noisy control, it can also quickly result in a worn element (due to lack of lubrication) and even greater, incurable noise.

When a component is to be cleaned, use a very small amount of an appropriate cleaner, solvent, or pure

isopropyl alcohol. Try to get it on the element, and immediately work the pot or fader several times all the way between stops.

In general, cleaning pots and faders is not a trivial task. Some have carbon elements, some have conductive plastic elements, and others have cermet elements. What cleans one part reliably may not work on another. When in doubt, consult your authorized Yamaha PM4000M dealer or service center.

#### 9.1.4 The Console Interior

Dust and dirt are the enemy of electronic and mechanical systems. Switches and controls may wear prematurely due to the abrasive nature of dirt. A coating of dust may, in some cases, be conductive and change the electrical properties of the circuit. Similarly, dirt accumulations can reduce the thermal dissipation from heat sinks and transistors, leading to premature failure. It is advisable to use a soft brush or a vacuum cleaner with a soft brush attachment to clean the console periodically. Depending on the environment, this may be as often as once a month, or as infrequently as once a year. Use care not to bend or dislodge any components. Always do this work with the console power OFF.

If a beverage is spilled into the console, try to blot up as much excess moisture as possible immediately. If practical, immediately turn off the power and remove any affected modules. If not, wait until it is practical, and then turn off the power and proceed. Rinse contaminated parts on the module with distilled water, shake off the excess water, blot dry with a soft cloth, and air dry or use a warm (not hot) stream of air from a hair dryer to facilitate drying. If the console interior is contaminated, wipe it clean with a water-moistened cloth.

It is best to clean a spill as soon as possible. Unsweetened black coffee is probably the least harmful. The sugar in sweetened coffee can leave a sticky film on parts, and cream or milk will leave a residue that can be very troublesome. Similarly, sweetened soft drinks and fruit juices can leave sticky residues that degrade the performance of switches, faders and pots.

*NOTE: For module removal and replacement (see optional functions, Section 6.1)*

## 9.2 Meter Lamp Replacement

The VU meters and meter-assign indicators are illuminated by LEDs which should not require replacement. Contact your Yamaha dealer or service facility should a meter illumination LED fail.

## 9.3 Where To Check If There Is No Output

In general, when something appears not to be working properly in a sound system, it is necessary to

have a clear understanding of the system block diagram. One should look for a "good" signal by patching around suspect equipment, modules or circuits. Suspected "bad" cables can be replaced or swapped to see if the problem follows the cable. These techniques should be known to most experienced sound system operators. In the case of the PM4000M console, however, there are a number of apparent fault conditions, which the operator may inadvertently create simply by setting controls in a particular configuration, whereby no signal reaches the output. The following chart depicts the most likely errors you may encounter, and points out how to correct the problem.

"Fault Condition"	Possible Cause	Correction
Input channel signals do not appear at the Group, or Stereo outputs.	The affected input channel(s) have MUTE assign switches engaged, and the MASTER MUTE group to which the channel(s) is assigned is set to mute mode.	Disengage the MASTER MUTE switch, or the affected input channel MUTE switch(es).
	The affected input channel(s) have MUTE assign switches engaged, and the remote VCA/MUTE connection is causing the MASTER MUTE group to be engaged.	Disconnect the VCA/MUTE connector to check theory; if output is restored, check remote circuitry.
Certain input channels or groups of channels, cannot be heard at Post-Fader Group, Stereo, or Post-Fader outputs.	The affected input channel(s) have VCA assign switches engaged, and the VCA Master Fader to which the channel(s) is assigned is set to minimum level (down).	Disengage VCA assign switch on the channel affected or raise the VCA Master Fader to a higher setting.
	The affected input channel(s) have VCA assign switches engaged, and the remote VCA/MUTE connection is causing the VCA Master level to go to minimum.	Disconnect the VCA/MUTE connector to check theory; if output is restored, check remote circuitry.
Certain input channels or groups of channels cannot be heard at Group outputs, or Group-to-Stereo outputs.	The affected input channels are assigned to a Group Fader which is set to minimum level (down).	Raise the Group Fader setting to a higher level.
Individual input channel cannot be heard at the Group, or Stereo outputs.	Channel ON/off switch is off, or its PAD and GAIN controls are set so input sensitivity is too low.	Turn On the channel. Set the PAD for a lower value and / or GAIN at a higher value.
	Channel INSERT switch is engaged, and a plug is connected to the channel's INSERT IN jack, but no signal is applied to that plug.	Disengage INSERT switch or check the signal at the INSERT IN jack.
	A phantom powered condenser microphone or direct box is connected to the channel and is not receiving phantom power.	Check to be sure channel and master 48V switches are on.
There is no output, and no console functions work at all.	Power is not reaching the PM4000.	Verify that PW4000 is On and that its umbilical cable is properly connected. Check fuses and AC mains voltage.



## **9.4 What To Do In Case of Trouble**

The PM4000M is supported by Yamaha's worldwide network of factory trained and qualified dealer service personnel. In the event of a problem, contact your nearest Yamaha PM4000M dealer. For the name of the nearest dealer, contact one of the Yamaha offices listed below.

**Yamaha Corporation**  
Nakazawa-Cho 10-1  
Hamamatsu, 430 Japan

**Yamaha Corporation of America**  
6600 Orangethorpe Avenue  
Buena Park CA 90620 U.S.A.

**Yamaha Canada Music Ltd.**  
135 Milner Avenue, Scarborough  
Ontario M1S 3R1  
Canada

**Yamaha Europa G.m.b.H.**  
Siemensster. 22/342084  
Rellingen, b. Hamburg,  
Germany

**Yamaha-Kemble Music (U.K.) Ltd.**  
Sherbourne Drive, Tillbrook,  
Milton Keynes MK7 8BL  
England

**Yamaha Scandanavia AB**  
Box 300 53, 400 43 Göteborg,  
Sweden

**Yamaha Misuique France S.A.**  
Parc d'activités de Paris-Est  
Rue Ambroise Croizat 77183  
Croissy-Beaubourg, France

**Yamaha-Hazen Electronica Musical, S.A.**  
Jorge Juan 30, 28001 Madrid,  
Spain

**Yamaha Music Benelux B.V.**  
Kanaalweg 18G, 3526 KL. Utrecht  
The Netherlands

**Yamaha Musica Italia S.P.A.**  
Viale Italia 88, 20020 Lainate (Milano)  
Italia

**Yamaha Music Australia Pty., Ltd.**  
17-33 Market Street,  
South Melbourne, Vic. 3205  
Australia

