

AHB

ALLEN AND HEATH BRENNELL LTD.

S R M S E R I E S

O W N E R H A N D B O O K

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i) INTRODUCTION

The ALLEN AND HEATH BRENELL SRM Series designed as "On Stage" monitor mixers for use by artists requiring 6 or 8 independent mixes within their performing environment. There are two models - SRM186 and SRM248.

To be used in conjunction with a high quality monitor system (ie Speakers, Amplifiers, Equalizers, etc), both the needs of the artist and engineer are easily satisfied by extensive use of patch and insert points, and the liberal use of status LED indicators throughout. Incorporation of an internal microphone splitter eliminates the need for costly external systems.

Monitor systems have been shown to be capable of producing higher and more intelligible sound levels before feedback when the mixing equipment and engineer are in the same environment as the artist (on stage, usually behind the main speaker system). Because of the better communications between the artist and engineer, the mix can more easily be tailored to the artist's needs.

The engineer's portion of the monitor system is designed so that external equalization can easily be patched into any of the 6 individual groups. The equalized signal can be monitored through the PFL (Solo) system, exactly as the artist is hearing it. The engineer has a choice of monitoring, using headphones or his own speaker system. A mute switch is provided on this output to eliminate the need for adjusting engineering monitor levels when switching between headphones and speakers. A separate LED meter is used to follow the PFL (Solo) function of the mixer. This prevents confusion that could occur if one meter were used for multiple functions, as employed in some current designs.

Physical layout and colour selections have been chosen for ease of operation under low light conditions as are often encountered on stage wings during a performance. BNC connectors are provided for use with optional goose neck lighting fixtures. An arm rest is provided for engineering comfort during long performances.

All together, the ALLEN & HEATH BRENELL SRM Monitor Series represents the best value in reliable, high quality on stage mixing equipment.

Section 1: SPECIFICATIONS

GENERAL SPECIFICATIONS

All Outputs Except Headphones

Normal operating level	+4dBv
Maximum output level	+21dBv
Output impedance	30 ohms

Headphone Output

Bridging amp output will drive stereo headphones of 8 ohm to 2K ohm design.

Maximum Gain (dB referring to voltage gain)

Mic in to group out	+80dB
Line in to group out	+50dB
Aux in to group out	+32dB
TB in to group out	+50dB

EQ Characteristics

HF \pm 15dB continuously variable at 10kHz
 MID \pm 12dB continuously variable at any frequency between 250Hz and 6kHz. $Q = 1.4$
 LF \pm 15dB continuously variable at 100Hz

Total Harmonic Distortion

Channel input to group output. Typically .05% THD at any frequency between 20Hz to 20kHz and any level up to clipping.

Noise

Noise measured in bandwidth of 20Hz to 20kHz.
 Figures are RMS Noise ref to 0dBv (.775vRMS)
 Microphone equivalent input noise -125dBv measured with 200 ohm termination.

- i) Group output with group fader closed -90dBv
- ii) Group output with group fader at '0' (unity gain) -68dBv
 All input mix levels at min.
- iii) Group output with group fader at '0' (unity gain) -68dBv
 1 input mixed at unity gain (mic level at 3 o'clock)
 Input gain set at 40dB, EQ bypassed.
- iv) Group output with group fader at '0' (unity gain) -65dBv
 12 inputs mixed at unity gain (mix level at 3 o'clock)
 Input gains set for 40dB, EQ bypassed.

Crosstalk

Group to group

1 group output at +4dBv

Adjacent group output measured at

100Hz	-	-80dBv
1kHz	-	-80dBv
10kHz	-	-76dBv

Channel Inputs

Mic input electronically balanced suitable for safe connection of external phantom power supply of up to +48vDC. Phantom power is not provided by the mixer PSU.

XLR pin 3 hot (+)
pin 2 cold (-)
pin 1 screen (GND)

Input impedance Mic 4kohm no pad
 8kohm with pad

Line inputs. Electronically balanced. Can be used for balanced or unbalanced inputs.

1/4" jack tip hot (+)
 ring cold (-)
 sleeve screen (GND)

Input impedance balanced 40Kohm
 unbalanced 20Kohm

Mic output: Male XLR in parallel with input female XLR. Connections are direct.

Gain Mic - continuously variable from +15dB to +60dB
 Line - continuously variable from -15dB to +30dB

Pad Mic - -20dB
 Line - -6dB

Insert points - unbalanced 1/4" stereo jacks
 tip = return
 ring = send
 sleeve = GND

Normal operating level = +4dBv.

Aux Inputs

Mono 1/4" jack. 50kohm impedance
Maximum gain to group output +32dB

Group and Monitor Outputs

Unbal 1/4" jack output. Nom output +4dBv
Max output +21dBv into 2kohms or higher
+18dBv into 600ohms

Metering

10 segment LED ladder. 27dB range, from -21dB to +6dB ref to OVU (OVU = +4dBv) 3dB/step. OVU is indicated when the first red segment lights.
Each group meter follows the group output
The PFL meter always follows the PFL system.

Talkback Input

Unbal 3 pin XLR. Pin 3 hot, pins 2 and 1 tied to earth. Input impedance 50kohm when TB operating, 2kohm when not selected.

Power Supply

AHB type MPS8P only is suitable, this is stowed under the mixer armrest.

Connection to mixer is by locking XLR 5 pin plug.

NB. Mixer power supply does NOT provide +48v phantom power at mic inputs. An external power source must be used.

Supply type MPS8P provides DC for all mixer functions. It is factory set for operation on the required AC supply as follows:

Europe	220/240v AC 50Hz
North America	110/120v AC 60Hz
Japan	100v or 110/120 or 220/240v AC.

The supply voltage setting may be altered to suit local requirements if required. Refer to service section.

Lamp Facility

Each 50ohm panel BNC connector carries 15 volt DC supply in series with a 22ohm current limiting resistor. Suits connection of 'Littlite' type gooseneck fittings.

Section 2:

PANEL CONTROL SUMMARY

INPUT CHANNEL

a) GAIN CONTROL

This control adjusts the sensitivity of the first amplification stage of the microphone/line input. Use this in conjunction with the PFL function, as described in the OPERATION section, to find the correct operating level.

b) PAD SWITCH

Reduces the input level to the pre amplifier stage by 20dB when operating in the MIC input mode and approximately 6dB in the LINE input mode to enable very high signal levels to be accommodated. Use if the gain control has already been turned down fully and there is still too much signal.

c) MIC/LINE SWITCH

Selects signal source from either the XLR microphone input connector or the 1/4" line input connector.

d) HIGH FREQUENCY EQUALISATION CONTROL

Boosts or cuts the high frequency content of the incoming signal. The high frequency EQ has shelving characteristics with a maximum boost/cut of 15dB at 10kHz.

e) MID FREQUENCY SWEEP CONTROL

Sets the mid-equalizer centre frequency. Sweepable between 250Hz and 6kHz.

f) MID FREQUENCY EQUALISATION CONTROL

Boosts or cuts the mid frequency content of the incoming signal. The mid frequency EQ has peak/dip characteristics with a maximum boost/cut of 13dB (Q = 1.4) at the frequency selected by the MID FREQUENCY SWEEP control.

g) LOW FREQUENCY EQUALISATION CONTROL

Boosts or cuts the low frequency content of the incoming signal. The low frequency EQ has shelving characteristics with a maximum boost/cut of 15dB at 100Hz.

h) EQ IN/OUT SWITCH

By-passes the EQ without returning controls to '0'.

i) PFL SWITCH AND LED INDICATOR

Sends input program to the monitor output and PFL LED meter. This allows monitoring of individual channel inputs, and enables proper adjustment of INPUT GAIN CONTROL using the monitor LED meter. An associated yellow LED indicates when this switch is depressed.

j) PEAK LED INDICATOR

When illuminated, indicates high signal levels that are approaching overload. Source is pre-fader and responds to equaliser adjustments as well as INPUT GAIN CONTROL position. When PEAK INDICATOR briefly illuminates, PFL switch should be employed to check channel level and INPUT GAIN re-adjusted.

k) CHANNEL ON SWITCH AND LED INDICATOR

When depressed, assigns input signal to all individual input channel group send level controls. Green LED indicator illuminates when channel switch is on. PFL SWITCH is functional regardless of position of CHANNEL ON switch.

l) INPUT CHANNEL MIX MATRIX

Controls individual signal levels to each output mix buss 1-6.

OUTPUT CHANNEL

a) GROUP LED METER

VU characteristics with 3dB resolution. Range is from -21 to +6VU with 0VU equal to +4dBv (1.23 volts RMS).

b) AUX 1 LEVEL CONTROL

Auxiliary input into group mix derived from AUX 1 master level control in master section of board.

c) AUX 2 LEVEL CONTROL

Auxiliary input into group mix derived from AUX 2 master level control in master section of board.

d) INSERT IN/OUT SWITCH

Removes whatever equipment is connected into insert points from the active signal path.

e) PFL SWITCH AND LED INDICATOR

Sends output program (post insert point) to the monitor output and PFL meter. This allows monitoring of individual output channels, and enables a proper mix of input channels and signal processing adjustments to be made. An associated LED illuminates when this switch is depressed.

f) PEAK LED INDICATOR

When illuminated, indicates high signal levels that are approaching overload. Signal is sampled pre insert point, and post fade. Any indication of overload should be investigated as described in the OPERATION section.

g) GROUP ON SWITCH AND LED INDICATOR

When depressed, allows signal to appear on output connector. LED indicator illuminates when channel is turned on. This switch allows output to be turned off when not needed.

h) 80Hz LOW CUT SWITCH

Applies a 12dB per octave roll-off to all signal below 80Hz (-3dB point).

i) TALKBACK SWITCH (TB)

Sends TB mic into the selected group at volume set by TB level control. TB volume is independent of group level and group on switch.

j) GROUP FADER

Controls overall group output level. Normal position '0' +10dB gain is available.

MASTER SECTION

a) PFL LED METER

VU characteristics with 3dB resolution. Range is from -21 to +6VU with 0VU equal to +4dBv (1.23 volts RMS). Indicates level of selected PFL position.

b) AUX 1 MASTER

Controls overall gain of Aux 1 signal.

c) AUX 2 MASTER

Controls overall gain of Aux 2 signal.

d) AUX 1/AUX 2 PFL SWITCHES AND LED INDICATOR

Sends individual Aux input signals to monitor output and PFL meter. An LED is illuminated when either AUX 1 or AUX 2 PFL switch is depressed.

e) PFL ON LED INDICATOR

Illuminates when any PFL switch is depressed on the board, ie PFL is in use.

f) MONITOR ON AND LED INDICATOR

Overall on/off switch for engineers monitor system. LED illuminates when engineer's monitor system is activated.

g) MONITOR LEVEL CONTROL

Master level control of the engineer's monitor speaker system.

h) TALKBACK LEVEL CONTROL AND LED INDICATOR

Master level control of talkback microphone to group outputs. LED indicator illuminates when any TALKBACK switch is depressed.

i) PHONE LEVEL

Controls headphone output level - not affected by monitor controls.

Section 3: CONNECTION DETAILS**GENERAL**

The SRM is designed to be used as an on-stage monitoring mixer in conjunction with another mixer for house sound. Because both mixers must get the signals from the stage microphones, we have the problem of how to get 1 microphone into 2 mixers. A device that performs this function is called a 'Microphone Splitter' or just a 'Splitter'. There are various types of splitters available, these range from lowcost 'Y' splitters through resistor splitters to expensive transformer or active splitters. They are all designed to do the same thing, get a microphone to go to two or more mixers without de-grading the signal or adding any buzzes or hum.

The type of splitter used will depend on the type of mixers that are in use and where the mic signal has to go. A situation that would call for a transformer splitter is one that involves splitting a mic between a balanced house mixer and an unbalanced monitor mixer. In this case, the transformer splitter is necessary to keep the monitor mixer from unbalancing the microphones to the house mixer which could cause hum pick-up or other forms of signal degradation.

Another case where a transformer split is desired is when a remote truck or location is fed in addition to the monitor and house mixers. The remote location may have a different ground reference than the building you are working in. This ground difference could cause hum in the main system. A transformer splitter with ground lift switches would be the best choice in such a situation.

This is not to say that a transformer splitter is always needed, we just wanted to point out situations that would call for drastic measures. In most cases that a soundman will be dealing with, the mic signal has to go to the monitor desk on stage and then travel 100 feet or so to get to the house desk. If both mixers have balanced inputs, then a passive 'Y' splitter is all that is needed.

A 'Y' splitter gets its name from what the signal path of the mic looks like. We have one signal from the mic at the bottom branching off along 2 paths at the top. The connectors would have their corresponding pins wired together (pin 1 to pin 1 etc).

This is the type of splitter in the SRM series. Each input channel has the normal MIC input XLR plus an extra MIC out XLR. It is designed to split the mic signal between the SRM's balanced input and the balanced input of the house desk. Any AHB mixer can be used as the house desk, depending on application, since all AHB mixers have balanced inputs. If any other brand mixer is to be used, check it's inputs to be sure its balanced. the 'Y' split will not work properly with an unbalanced input.

Now that you know what a splitter does, let's see how to connect the SRM to your mic's and snake.

Illustration 2.1 shows a typical mic wiring situation without SRM. The mics simply go to the house desk via the snake. The monitor mix is performed by the house desk.

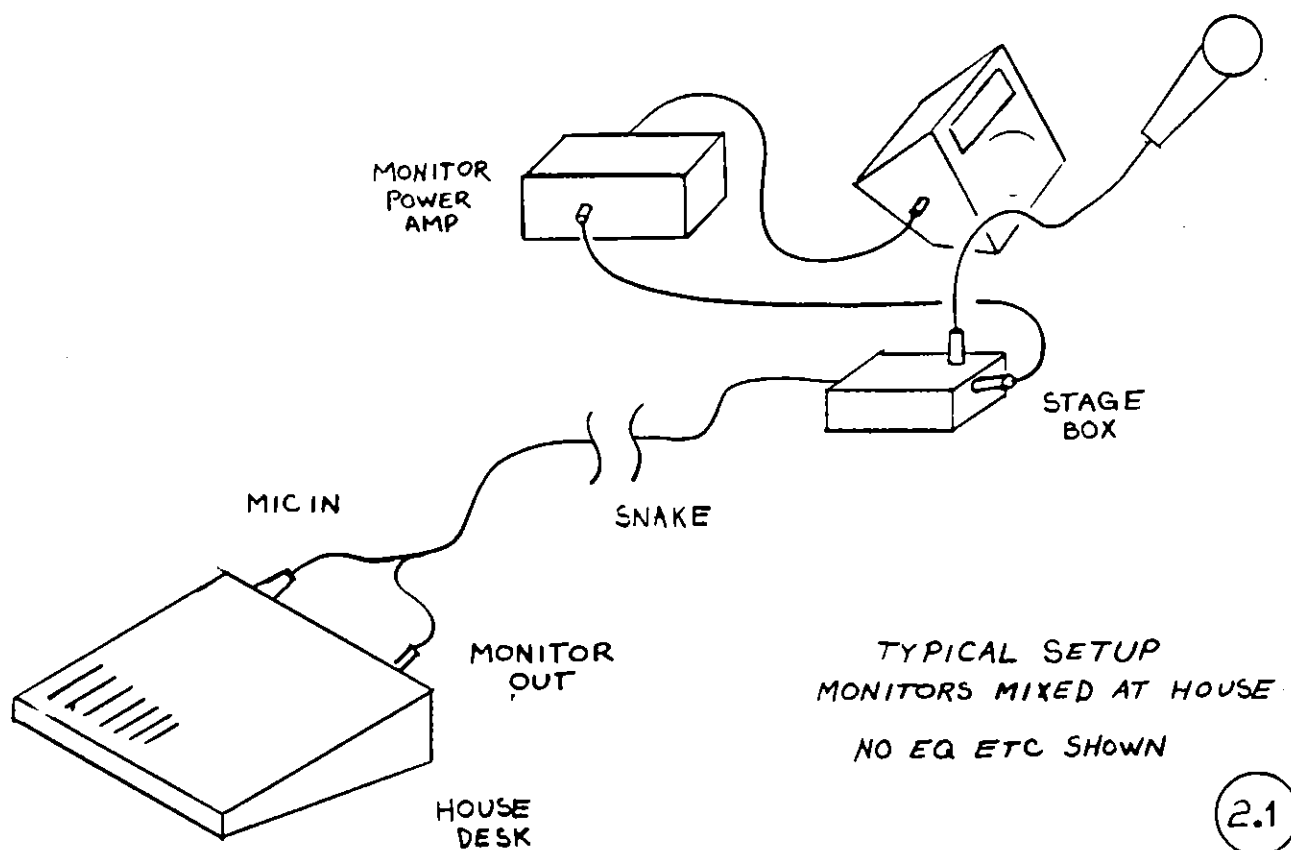
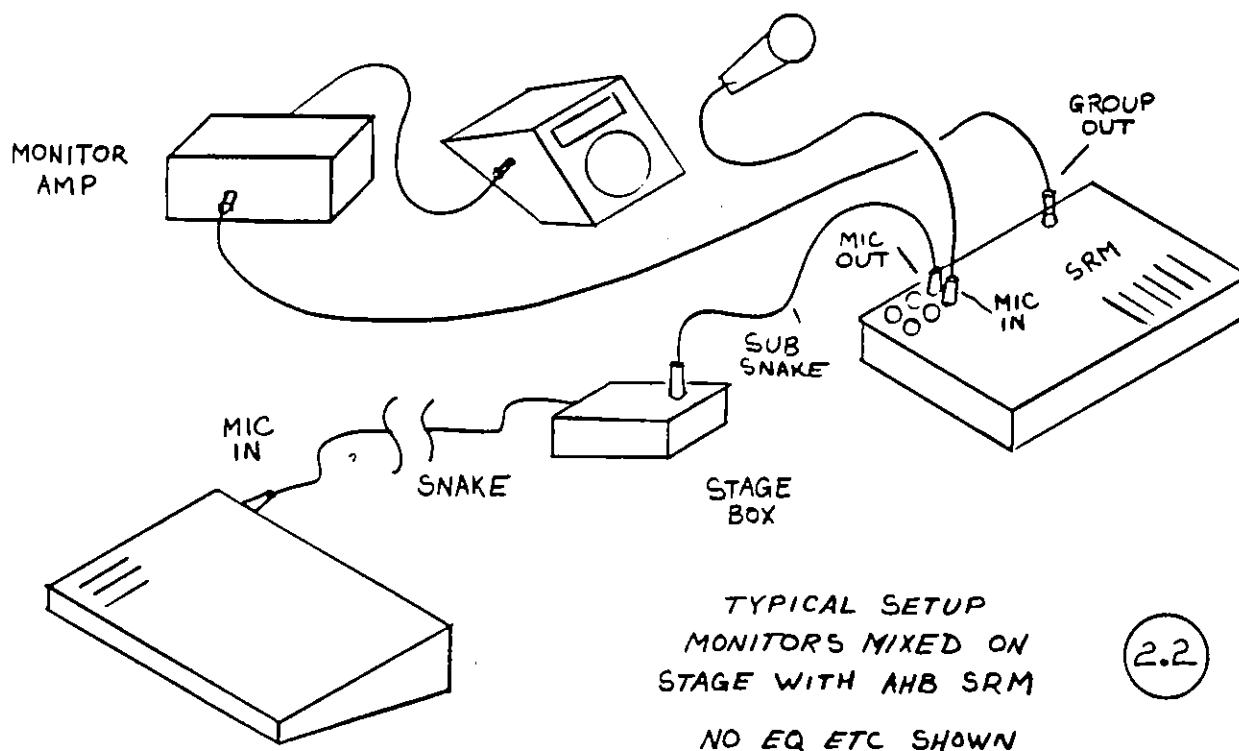


Illustration 2.2 shows the use of an SRM on stage. The mic cable is plugged into the SRM 'mic in' XLR jack. Another mic cable is plugged into the SRM 'mic out' XLR jack and the other end is plugged into the stage box. Since the SRM mic in and mic out connectors are wired together, the microphone signal travels through the connectors to the stage box. Along the way, as it passes through the SRM, it is 'Y' split and therefore appears on the corresponding SRM input channel.



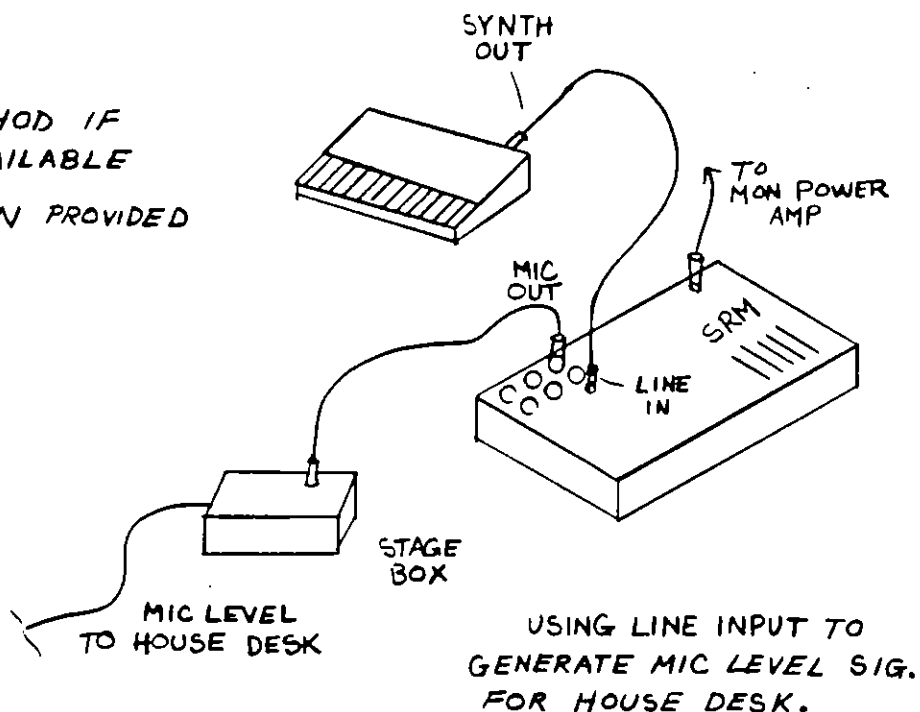
The input impedance of the SRM is approximately 4kohms which is 20 times higher than the output of a typical microphone which is usually 200ohms. As a result, the signal strength is not weakened because of connection to the SRM. The shield connection (pin 1) of the XLR's is not connected directly to the SRM case ground this allows the SRM and the house desk to be at different grounds without generating a lot of hum. For this ground isolation to be maintained the mic cables that you use should not have the XLR shell connected to pin 1. Some cable manufacturers do this. If you have this type of cable, you should modify it so that the shield connection of the mic wire only goes to pin 1 of the XLR connector and not to the XLR shell connector too. Having a cable wired with shell tied to pin 1 will also give you problems when using direct boxes; you will not be able to ground lift the instrument since the ground lift switch serves to disconnect the direct box case from pin 1. If the XLR shell is tied to pin 1 on your cable, then no amount of switch throwing will isolate your grounds. The case of the direct box will be at instrument/amp group and pin 1 will be at mixer ground. The shell will be in contact with the direct box case and therefore will be tying the 2 different grounds together. I repeat, your cables should not have the XLR shell tied to pin 1. Get them modified if they do.

CONNECTION OF INSTRUMENTS TO SRM

Instruments with low level unbalanced outputs such as guitars, basses, and most keyboards should be connected into the PA system through a direct box. This will transform the unbalanced instrument signal into a balanced mic level signal suitable for splitting and traveling the length of the snake without problems. Use a good quality direct box for best results. It should have a ground lift switch, in addition to any other features, for isolating the instrument from the PA system if hum develops.

The line inputs on the SRM are primarily designed to be used with line level signals that only go to the monitor system such as tape cues or effects returns into the monitors, however in an emergency they can be used to transform a line signal to mic level for the house desk. When a line signal is plugged into a SRM channel line input and the 'line' switch is depressed, the signal is padded down to microphone level and placed across the mic in and out connectors. It will then behave as a mic level signal to the SRM and also to the house desk if the PA snake is used to bring this modified instrument signal down to the house desk. The SRM line input jack in conjunction with the mic out jack act as a direct box when 'line' is selected on a channel. It performs the function of turning a line level unbalanced signal into a mic level signal suitable for use by the house desk but it will not perform one of the main functions of a direct box, ie. ground isolation. See illustration 2.3 for connection details.

ONLY USE THIS METHOD IF
NO DIRECT BOX IS AVAILABLE
NO GROUND ISOLATION PROVIDED



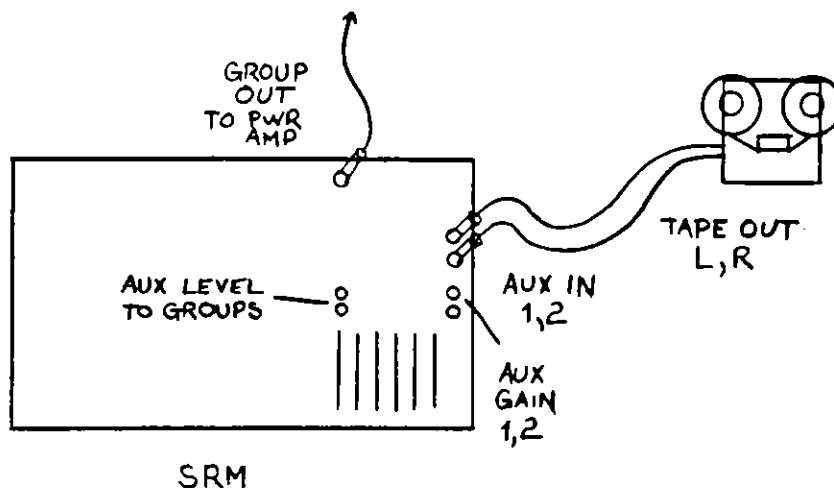
2.3

A direct box is recommended for the best and most consistent results, you can always get a direct box to work. The SRM line function can be used if desired, but depending on the club electrical wiring, the instrument and amp that connection is being made to, and the day of the week, the line function may or may not provide a suitable signal to the house desk.

USE OF AUX INPUTS

The aux inputs are two line inputs into the SRM. They can be used to bring any line type signal into the groups through the aux level controls. They allow two additional line inputs without tying up input channels. Typical applications include tape recorder input for artists who play along with pre recorded tracks (increasingly popular in the 80's), or for bringing back effects into the SRM, either from the house desk or locally. A group mix that is not needed can be used as an effects send if desired. The SRM is used normally, but one of the group outs goes to an effects device which is returned either to the aux ins or to an input channel line input. If returned to an input channel, the engineer can EQ the returned sound in addition to having the ease of turning off the effect with the channel on/off switch, he also has a spin (feedback) control available for the effect by using the level control on the input channel corresponding to the group being used for the effects send, illustration 2.4 shows various connections for aux ins.

USE OF AUX INPUTS TO BRING TAPE (OR OTHER SIGNAL) INTO SELECTED GROUPS.

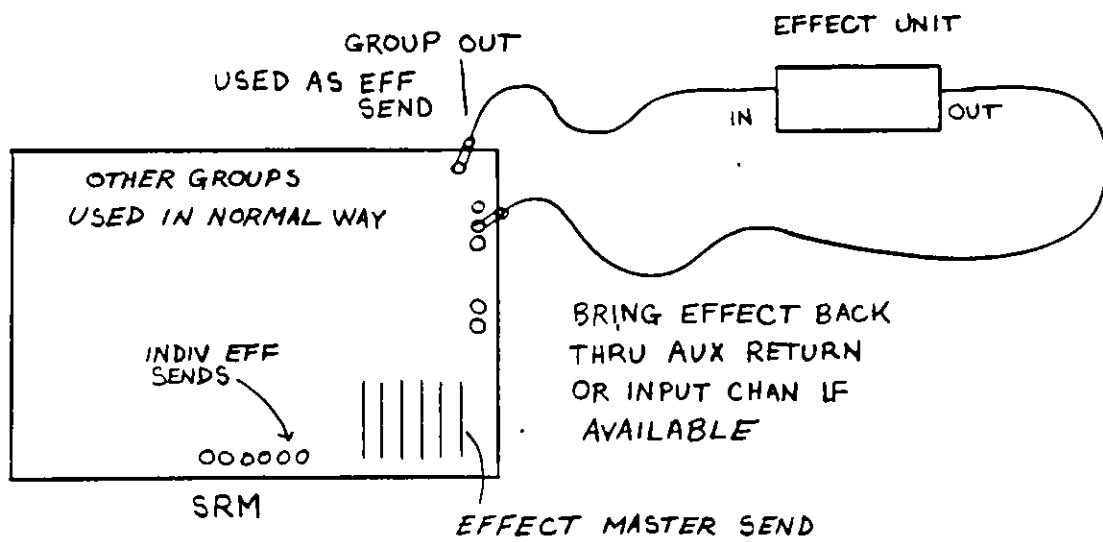


2.4A

USE OF AUX INPUTS

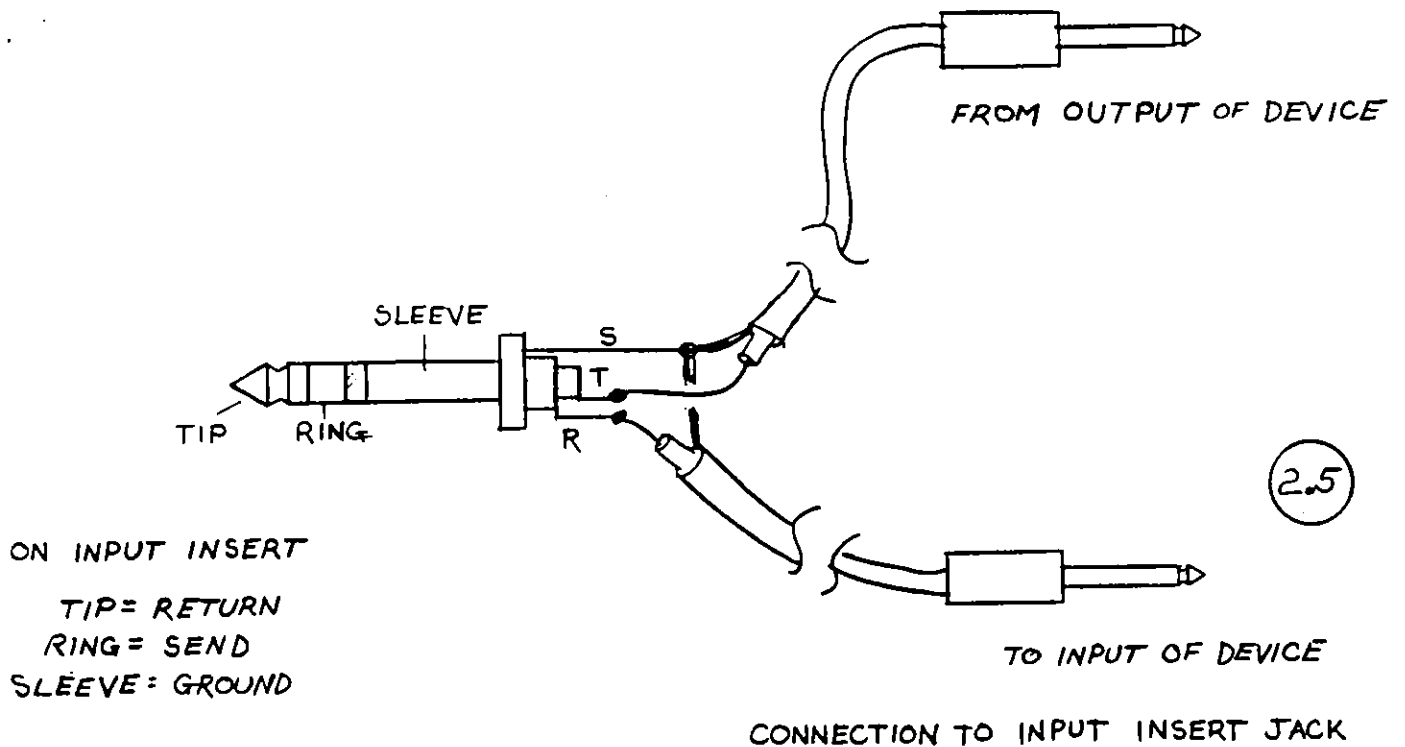
USING AN SRM GROUP AS AN EFFECTS SEND

2.4B



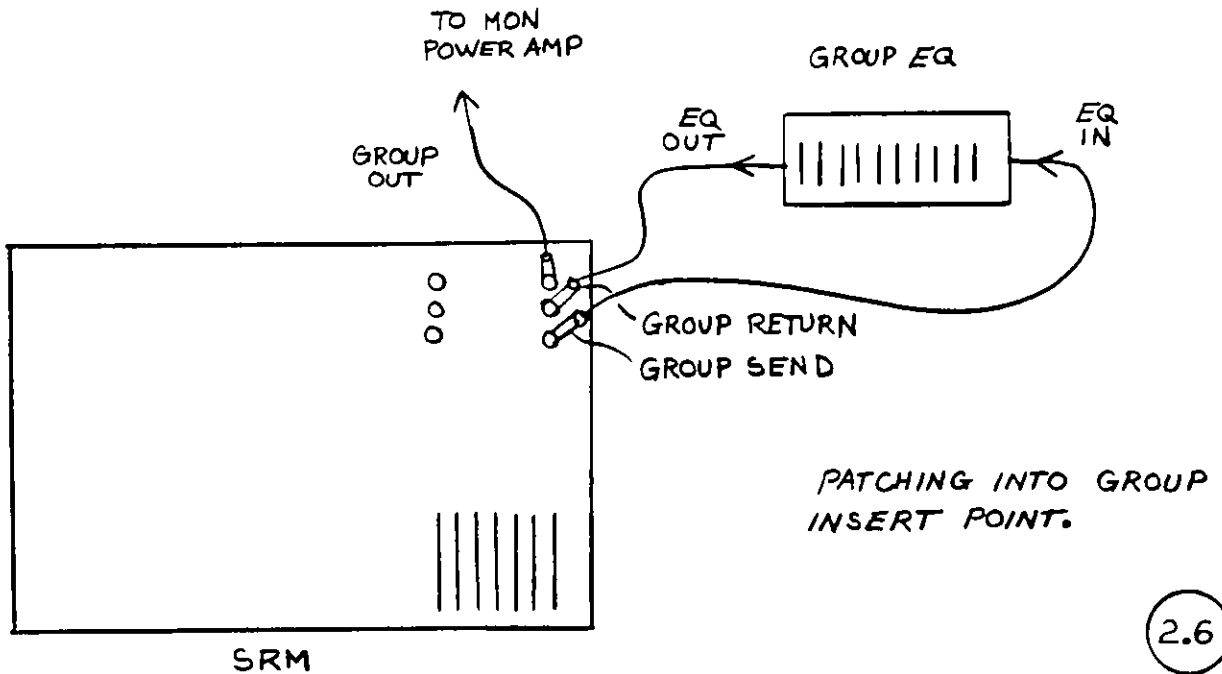
CONNECTION OF EXTERNAL PROCESSING GEAR

The SRM is designed for easy interfacing to external gear. There are two main ways to connect gear to the SRM, depending on the application and desired result. The two connection points are the input channel insert jacks and the group insert jacks. The input channel insert is located after the input gain stage but before the EQ section it is a stereo jack with the tip being the return, the ring the send and the sleeve is ground. See illustration 2.5 for cable wiring and connection information. The channel inserts are intended for use whenever a particular effect or function is desired on one particular input signal. A typical situation is compression of the kick drum in the monitors, in which case a compressor would be inserted into the kick drum channel and adjusted for desired sound. The same applies for a vocal doubler or any other type effect. The signal level at this insert point is +4dBv so guitar type effects which are designed for lower signal levels are not recommended for use. Although, depending on the signal and which effect you use, some guitar type boxes will work OK. Try it, it is the only way to really tell.



The group insert jacks are intended for use whenever an effect or function is to be applied to an entire group. The usual procedure is for an EQ to be patched in here to tailor the sound of the monitor speakers. A separate EQ is needed for each group since the group mixes are independent of each other. The group insert jacks consist of separate send and return jacks. These jacks are half-normaled meaning that the return jack gets its signal normally from the send jack. Whenever a plug is inserted into the return jack, the normal signal is disconnected and the return then gets its signal from whatever is plugged in. This insert point is post mix amp pre group fader. The PFL system on the group monitors the signal after the return jack, so any processing that takes place can be heard by the monitor or headphones. Illustration 2.6 shows the group patching.

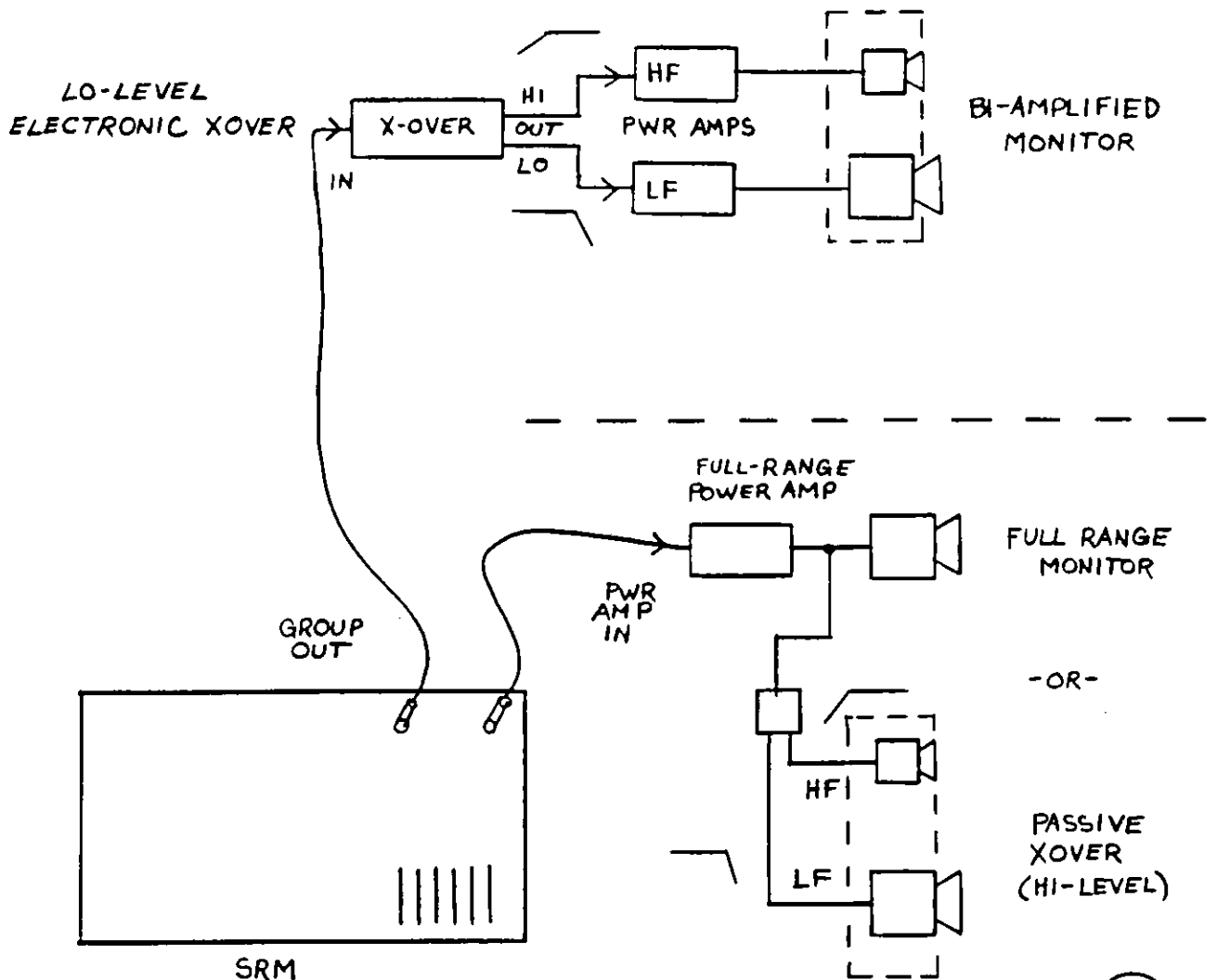
GROUP EQ INSERTION
(PREFERRED METHOD)



2.6

CONNECTION TO AMPS

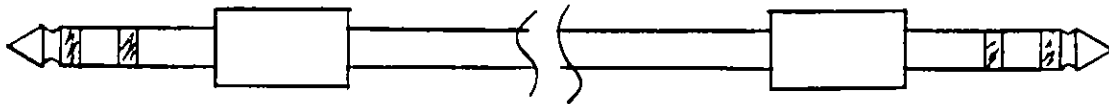
The SRM group outputs are low impedance (30ohms) high level (+4dBv) signals. As such, they can be used to drive any commonly available amplifier or crossover with an input impedance of 600ohms or greater. Depending on the type of monitors used, the SRM group outputs should be connected to either a crossover (for Bi-amplified monitors) which will then connect to 2 amplifiers, or directly to an amplifier for full range or passively crossed monitors. Illustration 2.7 shows the proper method of connection for various input types. The output of the SRM is unbalanced but there is no problem in interfacing to a balanced device.



2.7A

GROUP OUT TO BAL AND UNBAL INPUTS

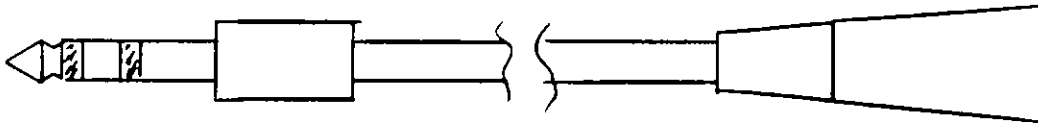
2.78



GROUP OUT (UNBAL)
RING IS TIED LOW ON SRM
OUTPUT JACK SO CAN USE
A STEREO PLUG (TRS) FOR
BOTH BAL OR UNBAL EQUIP

TO DEVICE INPUT
FOR BAL IN TIP IS HOT
RING IS COLD
SLEEVE IS COMMON

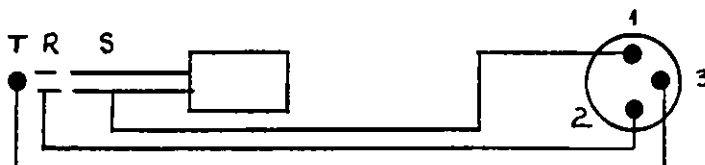
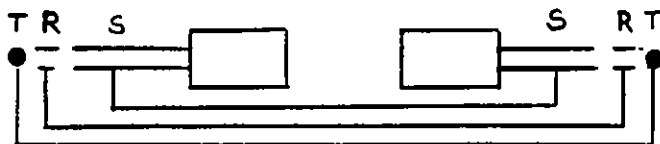
FOR UNBAL IN TIP IS HOT
RING IS NOT USED
SLEEVE IS COMMON



GROUP OUT (UNBAL)
SEE ABOVE

TO XLR DEVICE INPUT
CAN BE BAL OR UNBAL
WITH PIN 2 OR PIN 3 HOT
CHECK INDIVIDUAL EQUIP

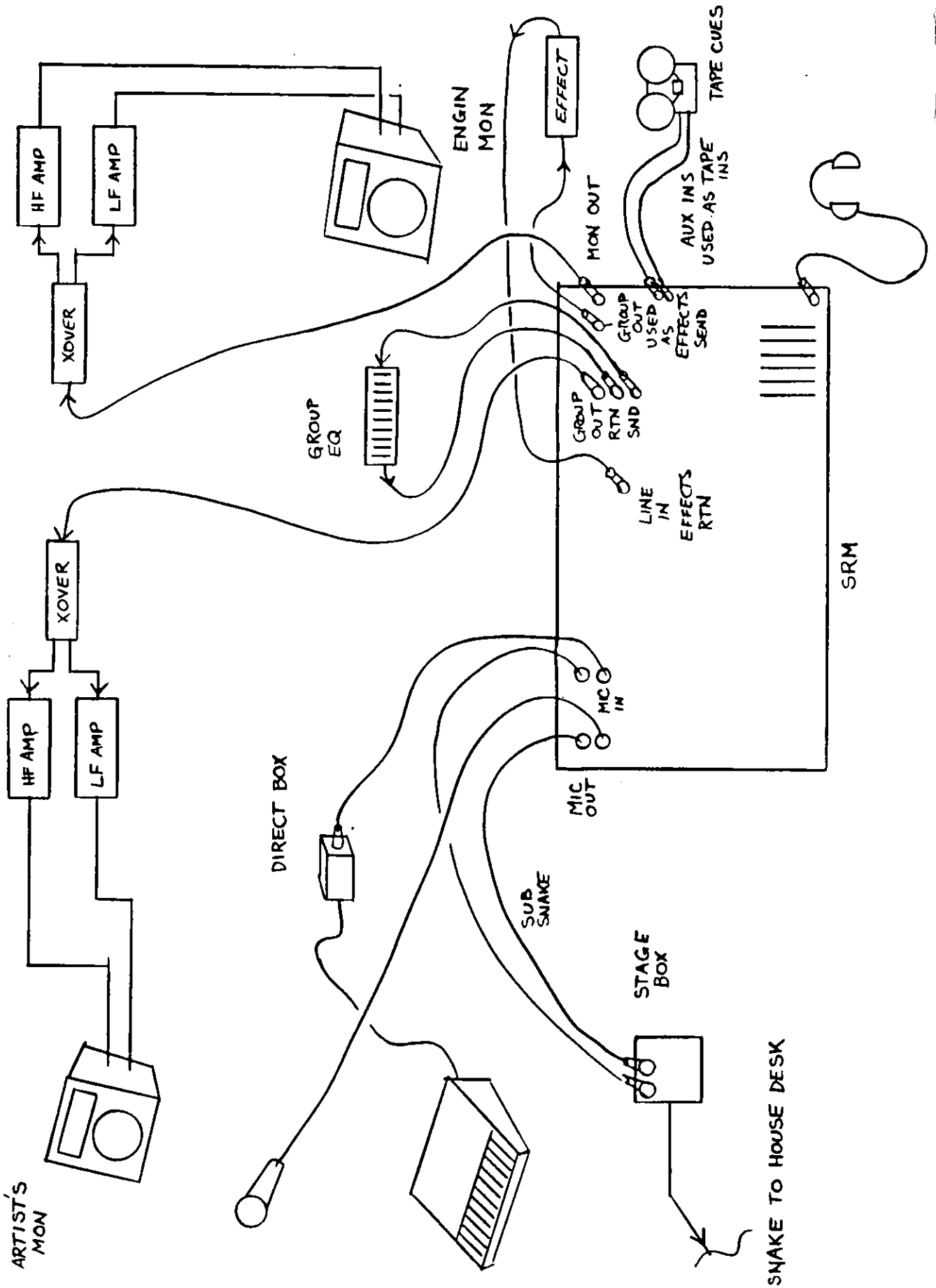
FOR BEST RESULTS WITH BALANCED INPUTS, EITHER
XLR OR 1/4 IN, THE COLD OR - INPUT SHOULD BE
BROUGHT TO THE RING OF THE GROUP OUT PLUG.



SHOWN WITH PIN 3 HOT
INTERCHANGE TIP AND RING
FOR PIN 2 HOT

TYPICAL SRM SETUP
(ONLY ONE GROUP SHOWN)

2.9



Section 4:**OPERATION**

The mix matrix is either an 18 x 6 or 24 x 8 array of level controls allowing the user to mix up to 18/24 line or mix input sources to any of 6 or 8 separate output groups or to any combination of groups as necessary. The level controls feeding each individual group are made easily recognisable through the use of colour coding. For example, brown knobs = Group 1, red knobs = Group 2, and so on.

Convenient identification of individual signal sources is made possible by placing a strip of masking tape across the write-on strip which runs the length of the desk between the input gain controls and the channel insert jacks.

Because of this method of identification, operation of the SRM-186 mix matrix has been made as straightforward as possible.

Example: The performer whose monitor is assigned to mix 1 desires to hear all four vocals, bass guitar, and the drums. Figure 4.1A illustrates how a mix of this kind might appear on the matrix.

A slightly different mix for the performer covered by mix 2 is illustrated in figure 4.1B. This performer desires all of the inputs in mix 1, but with the addition of keyboards and drum computer.

With the SRM it is possible to continue in this manner until you have created the required number of mixes up to a maximum of six. In the opposing direction, it is possible that a situation may arise where a mix will be comprised of only a few inputs as shown in figure 4.1C. This performer only wants to hear tuba and clockenspiel. (And only he knows why...) While it is very unlikely that such a situation will ever be encountered, when you are mixing stage monitors anything can (and probably will) happen. With the SRM you are ready for anything.

PFL MONITOR SYSTEM

Any input or output signal can be mounted on the SRM using the PFL system. Whenever a PFL button is depressed, several events occur. They are:

1. LED will illuminate next to the button to indicate that input/output signal is being fed to the PFL system.
2. The "PFL ON" LED at the right hand side of the desk will illuminate to indicate that the PFL system is in use.
3. The level of the input/output signal selected will be displayed on the PFL meter.
4. The signal selected will appear at the monitor and headphone outputs.

4.1

	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	GROUP 6
VOCAL 1						
VOCAL 2						
VOCAL 3						
VOCAL 4						
KEYBOARD						
GUITAR 1						
GUITAR 2						
BASS						
TUBA						
GLOCKENSPEIL						
KICK DRUM						
SNARE						
TOM 1						
TOM 2						
FLOOR TOM						
DRUM COMP.						
HORN 1						
HORN 2						

4.1A

4.2B

4.3C

It is important to note that only signals which you select via the PFL buttons will appear at the monitor and headphone outputs. When all PFL buttons are released, and the PFL on LED is extinguished, there is no signal available at the outputs. Furthermore, if more than one PFL button is depressed at a time, the meter will display (and you will hear) both signals at once. For this reason it is good practice to always check the PFL on LED to ensure that the system is not already in use.

MASTER SECTION

MONITOR AND HEADPHONE OUTPUTS

As described above, the monitor and headphone outputs follow the PFL system at all times. The monitor output is on a 1/4" phone jack located at the top right corner of the mixer, and is used to drive the engineer's monitor (which is usually identical to that used by the performer) via a separate power amplifier. A level control for this output is provided at the right-hand side of the mixer and allows the user to adjust the loudness of the monitor as needed. An on/off switch with indicator LED is provided for this output to allow voice communications on stage without the need for adjusting the monitor level. The headphone output and its level control are located at the low right side of the desk, and they function in a manner identical to the monitor output.

USE OF GROUP CONTROLS

Six glass smooth 100mm faders located at the low right side of the SRM control the level of any group of inputs to the monitor power amps (or crossovers for bi-amplified systems). Note: external monitor equalisation in the SRM is inserted before the fader for monitoring purposes. Normal position of the faders is at the '0' mark on the panel, and is always a good starting point. If more gain is required for a given group, up to 10dB extra may be obtained by raising the fader to its full up position. Group levels are displayed on the LED meters at the top of each group output.

MONITORING THE SRM/MONITOR OUTPUTS

Well, they can hear it, now how do I hear it?

Two methods of monitoring the SRM are provided. Using a separate power amplifier it is possible to monitor all SRM functions using a monitor speaker identical to that which is in use on stage. If such an amplifier or extra monitor is unavailable, a set of headphones may be used. The output jack for the monitor output is located at the extreme right side of the SRM, and is labelled 'MON OUT'. The output jack for the phones is at the lower right side of the SRM. Separate level controls for the two outputs are located just above the phones jack. The monitor level control

also incorporates an on/off switch and LED status indicator to allow the monitor to be muted without the need for adjusting level controls. The monitor outputs work together with the solo meter located below the talkback input. Whenever a PFL button is depressed, the monitor outputs and the meter circuit are activated simultaneously, allowing the operator to preview any input or output, verifying both signal level and quality before bringing that signal up to listening levels.

Note: The monitor outputs and the solo meter always follow the PFL system. You cannot verify signal level without a PFL button depressed.

PFL ON LED

Anytime a PFL button is depressed, an LED will illuminate next to the button selected, and the PFL busy LED between the monitor level controls will illuminate. This provides immediate indication that something or other is already in the PFL system and should be deselected before monitoring another channel unless a combination of inputs/outputs specifically desired.

TALKBACK SYSTEM

A talkback system is provided to allow communications with the performing artist during set up and pre performance sound check. The system consists of a front panel XLR microphone input connector (marked TB), level control, and LED status indicator, all located in the master module (located to the extreme right of the board) and talkback switches located in line with the individual output channels.

When a talkback switch is depressed, the LED indicator next to the talkback level control illuminates. Talkback levels are independent of the group output level controls. Care should be taken when using the talkback system during a performance, as under certain program conditions, even a low level signal may be distracting to the audience and/or performer. Talkback system use should be limited to set up communications and critical communications with the artist during a performance.

AUX INPUT LEVEL CONTROLS

Two independent auxiliary line inputs are provided with individual PFL switching. These enable the return of effects devices or additional inputs derived from an external mixer source such as the monitor send from the house mixer location.

Using the PFL switches, levels should be adjusted using the Aux 1 and Aux 2 gain controls for correct readings on the PFL VU meter system. Individual Aux return controls are provided into each group section. A blend of input channel signal and Aux input signal can be achieved using these level controls and monitored using the associated groups PFL switch and monitor system.

Section 5: SERVICE AND GUARANTEE INFORMATION**SERVICE**

There are no adjustments or alignment procedures required to maintain the performance standard of SRM products.

To preserve the working life of the unit and its presentation, avoid the use of chemicals, abrasives and solvents. The control panel is best cleaned with a soft brush and a damp cloth. Faders, switches and potentiometers are lubricated for life; the application of electrical lubricants to these parts is not recommended.

In the event of a failure, refer the work to your AHB Sales and Service Agent. He has the information and staff to make an effective repair, and is authorised to make repairs under Guarantee. If the equipment has to be returned to the Service Agent, always include the Power Supply and as much information as possible in writing on the nature of the fault. Always include the model number and serial number with service queries to ensure that accurate information is obtained.

GUARANTEE

SRM products are made in the UK by ALLEN AND HEATH BRENELL LTD, and are guaranteed against defective parts and workmanship for a period of ONE YEAR from the date of purchase by the original owner. No alterations to the original construction of the product are authorised by AHB or its agents and any such work invalidates the Guarantee.

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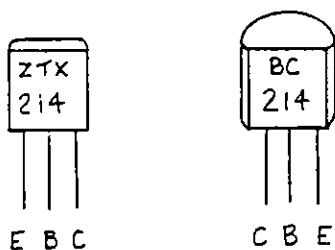
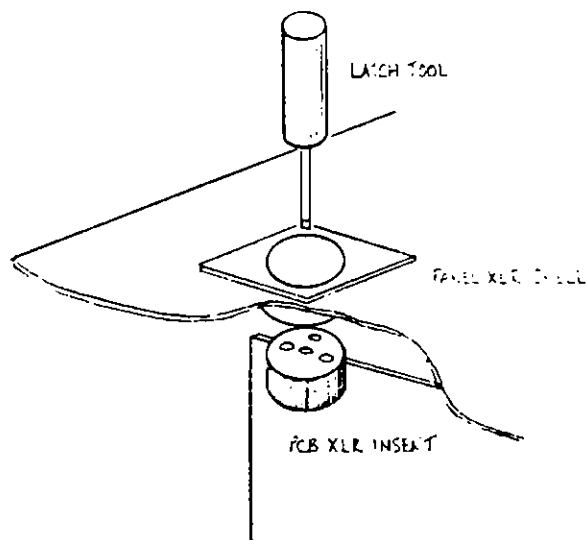
SERVICE NOTES: SRM SERIES

SPECIAL TOOLS

1. XLR latching tool (AHB part no. AT0008)
2. 2pt posidrive screwdriver
3. 1pt posidrive screwdriver
4. 14mm nutdriver
5. 15mm nutdriver

SERVICE CAUTION

1. Should it become necessary to remove a pcb assembly from the top panel for service or replacement, it is essential that the XLR microphone connectors be delatched. Neglecting to do this may result in irreversible pcb damage. Refer to the illustration below.
2. Exercise great caution when handling the mixer when it has been removed from its flight case. The master pcb assembly is slightly larger than the group and input pcb's due to high parts density making this assembly susceptible to severe damage if the desk is not handled correctly.



TRANSISTOR PIN-OUTS

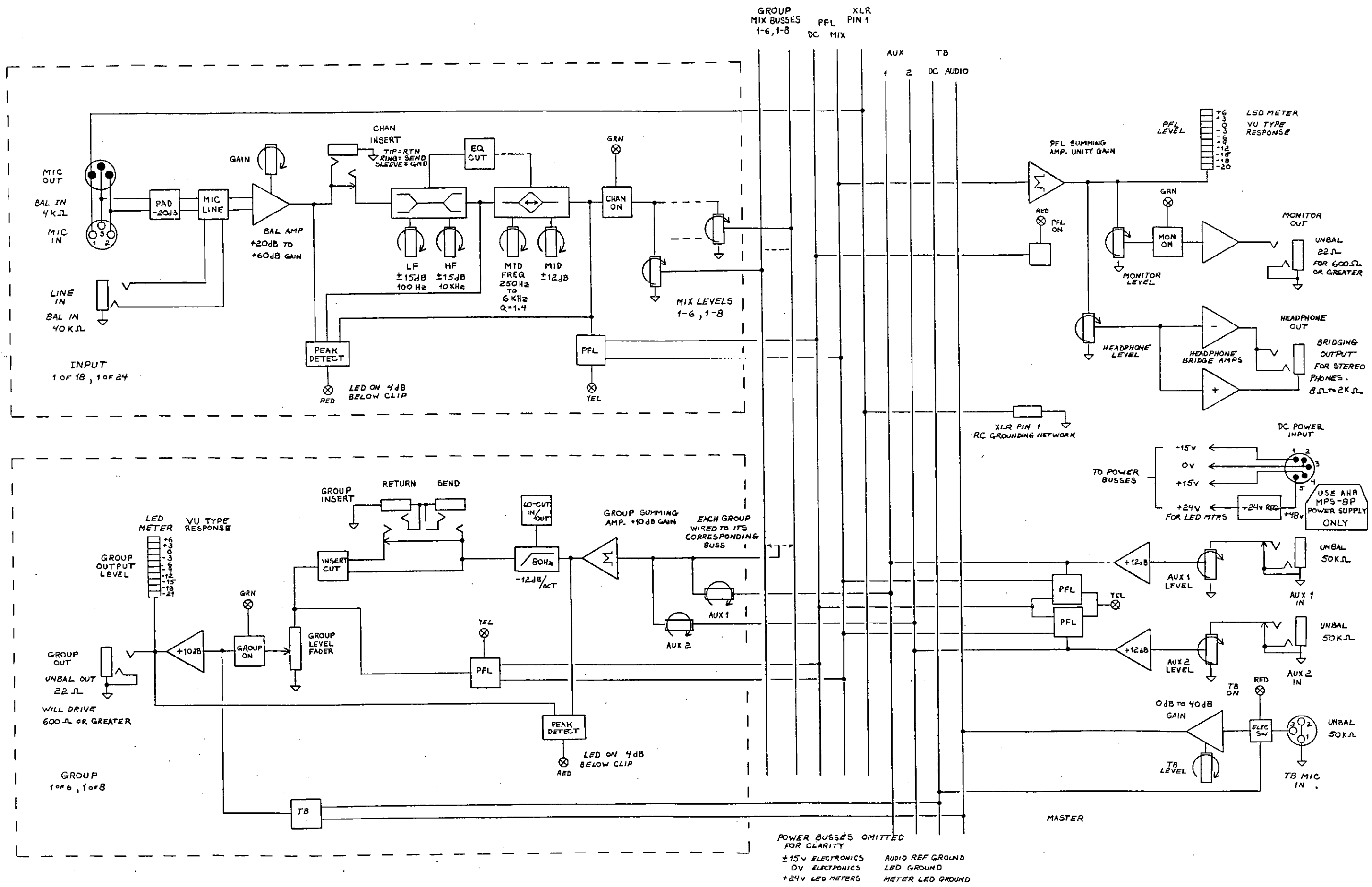
SPARES PARTS LIST: SRM 186/248

To order spare parts for service replacement specify the items as described below.

<u>FUNCTION</u>	<u>DESCRIPTION</u>	<u>AHB STOCK</u>
Group fader	100mm 10K ALPS	AI0091
Fader knob	Black ALPS	AJ0048
Fader screw	M3 CSK 5mm	AB0070
Knob	6mm grey	AJ0050
Knob cap	Red	AJ0045
Knob cap	Brown	AJ0046
Knob cap	Green	AJ0047
Knob cap	Blue	AJ0052
Knob cap	Yellow	AJ0054
Knob cap	Cream	AJ0056
Pushbutton cap	4748 White	AJ0029
Panel screw	8B X 5/8"	AB0217
Pot, input gain	10K/C metric bckt	AI0049
Pot, H.F.	100K/A metric	AI0047
Pot, H.L.	100K/A metric	AI0047
Pot, mid	100K/A metric	AI0047
Pot, mid sweep	100K/C X 2 metric	AI0048
* Pot, mix level	47K/B metric bckt	AI0045
Pot, aux 1 return levels	47K/B metric	AI0050
Pot, aux 2 return levels	47K/B metric bckt	AI0045
Pot, monitor level	47K/B metric bckt	AI0045
Pot, talkback level	47K/B metric	AI0050
Pot, headphone level	47K/B metric bckt	AI0046
Pushbutton switch	ALPS 2PCO	AL0162
IC	TLO-72CP	AE0046
IC	NE 5534N	AE0081
IC	LM 3915N	AE0136
Input transistor	ZTX-214C/BC214	AE0031
LED T-1	Red	AE0086
LED T-1	Yellow	AE0084
LED T-1	Green	AE0085
Meter LED	Yellow rect.	AE0082
Meter LED	Red rect.	AE0088
XLR mic in	Neutrik female 3 pin	AL0156
XLR mic out	Neutrik male 3 pin	AL0155
XLR DC input	Neutrik male 5 pin	AL0017
Jack socket	3 pole switched	AL0009
Desk illumination	Gooseneck lamp 12"	
XLR latching tool		AT0008
Input pcb assembly	SRM input pcb	ZS500-002(A)
Group pcb assembly	SRM group pcb	ZS500-003(A)
Master pcb assembly	SRM master pcb	ZS500-004(A)

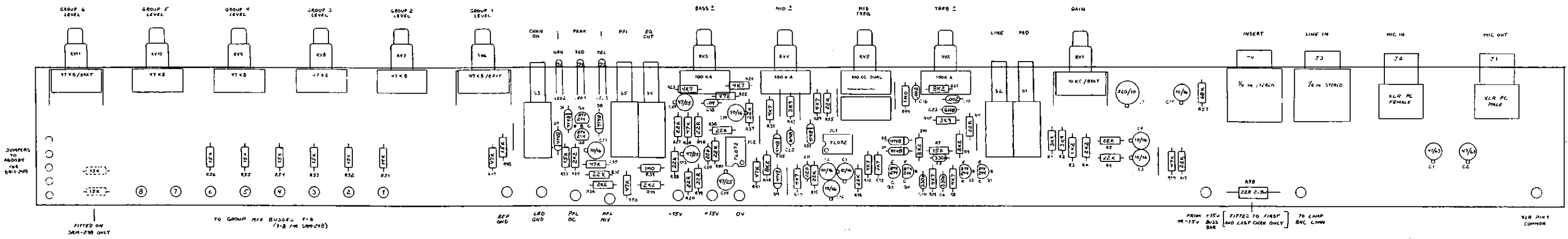
* Mix level 1 & 6 are bracketed and are





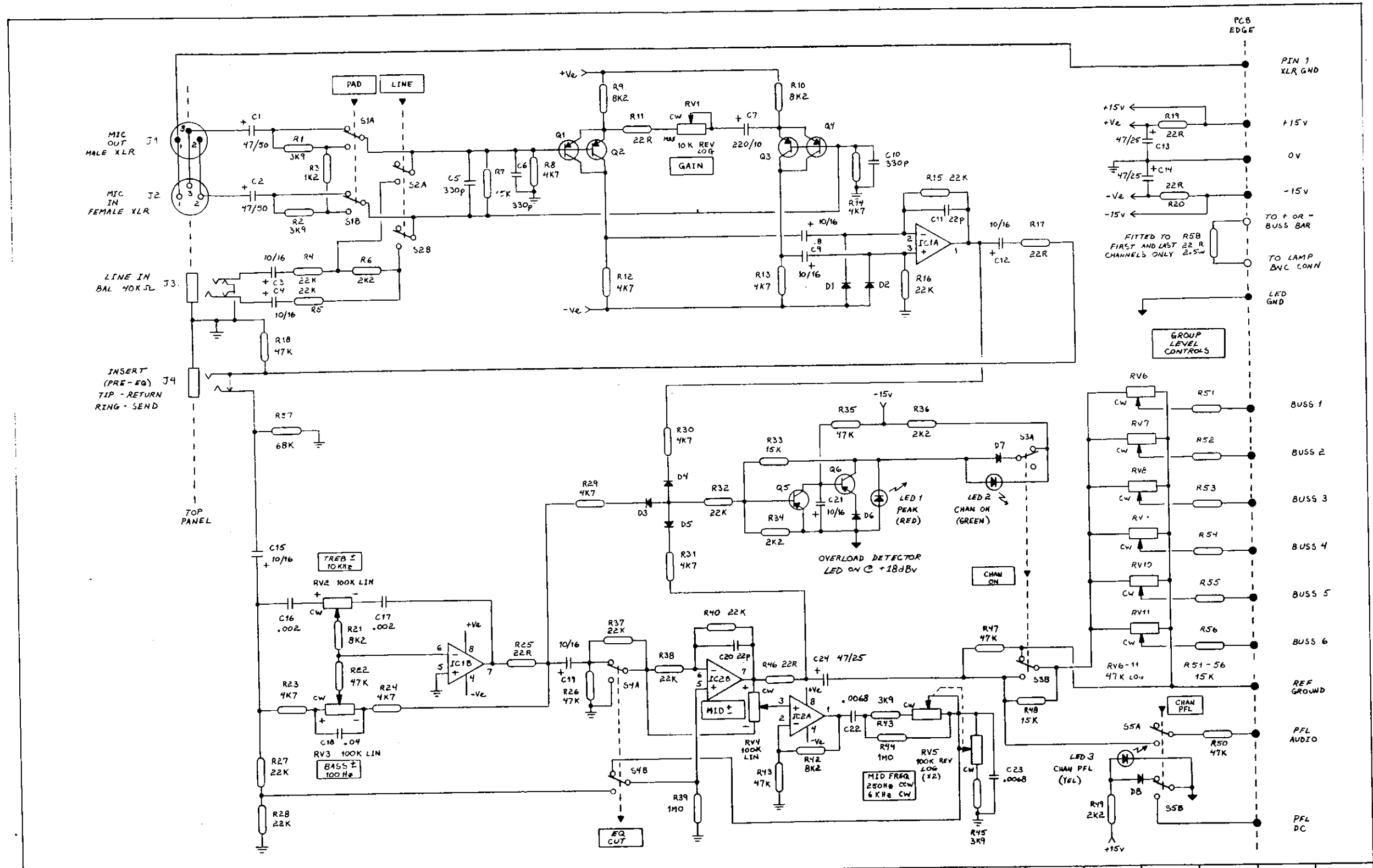
AHB SRM SERIES SYSTEM SCHEMATIC iss 1 JUNE '84

SRM-186 18 INPUT X 6 GROUPS
 SRM-248 24 INPUT X 8 GROUPS



AHB SRM INPUT PCB AGO081 ISSUE 1 COMPONENT VIEW 2:1 JP 4-84

AHB
 ALLEN AND HEATH BIRNELL USA, LTD.
 100 COMMERS ROAD - GAITHERSBURG, MARYLAND 20878



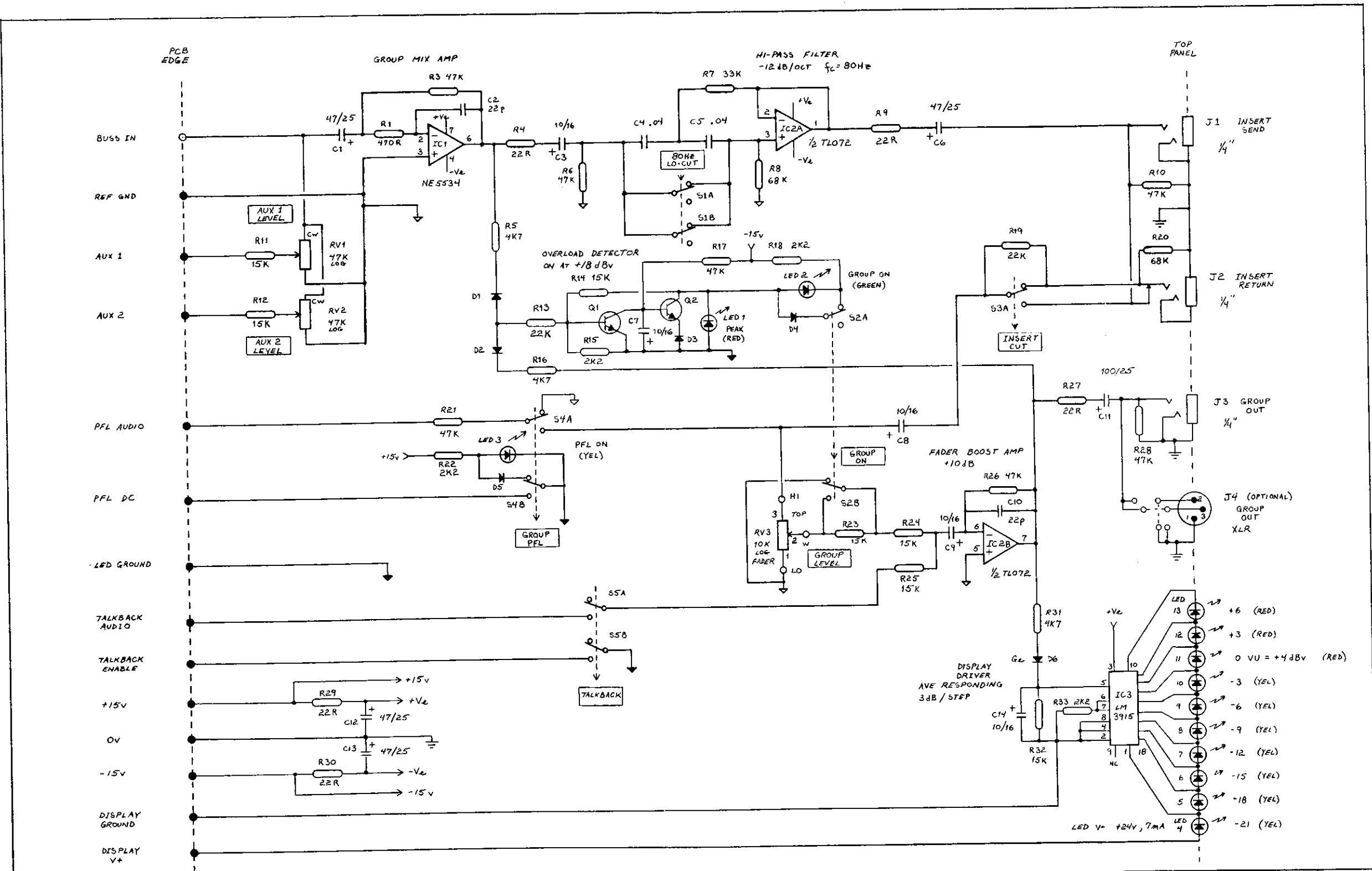
● BUSS BARS ○ WIRING PADS

NOTES
 1 ALL SWITCHES SHOWN OUT
 2 RESISTORS 1/4 WATT 5% UNLESS SPECIFIED
 3 CAPACITORS SHOWN MICROFARADS/VOLT
 4 ALL DIODES 1N4148 UNLESS SPECIFIED
 5 ALL TRANSISTORS ZTY-214

ALLEN & HEATH SRM-186

CIRCUIT DETAIL INPUT PCB
 TYPE AHB SRM INPUT
 AG0081 ISS. 1

DRAWN JP	TRACED	CHECKED JP	APPROVED	DATE 4-94	LAST USED R58 C24
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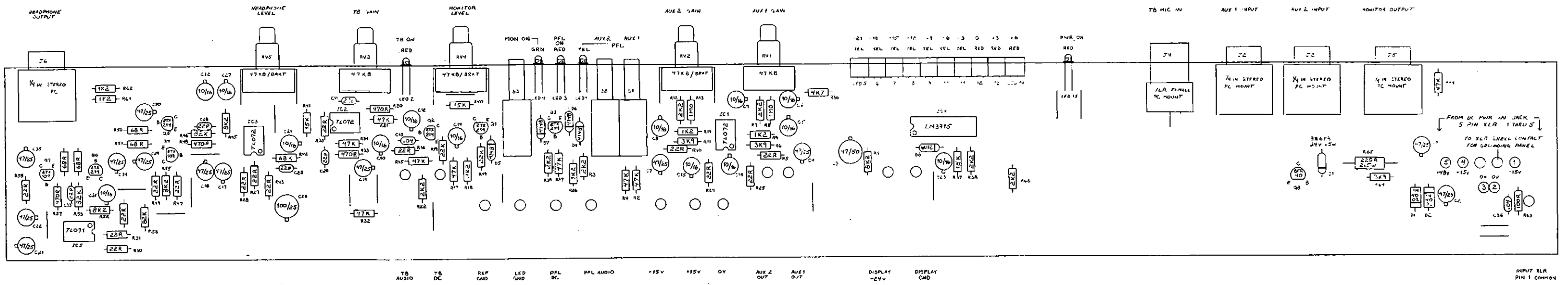
NOTES: ● BUSS BARS ○ WIRING PADS
 1. ALL SWITCHES SHOWN OUT
 2. RESISTORS 1/4 WATT 5% UNLESS SPECIFIED
 3. CAPACITORS SHOWN MICROFARADS/VOLT
 4. ALL DIODES 1N4148 UNLESS SPECIFIED

⊥ 0V GROUND ↓ REF GROUND ↓ LED GROUND

ALLEN & HEATH SRM-186

CIRCUIT DETAIL GROUP PCB
 TYPE AHB SRM GROUP
 AG0082 ISS. 1

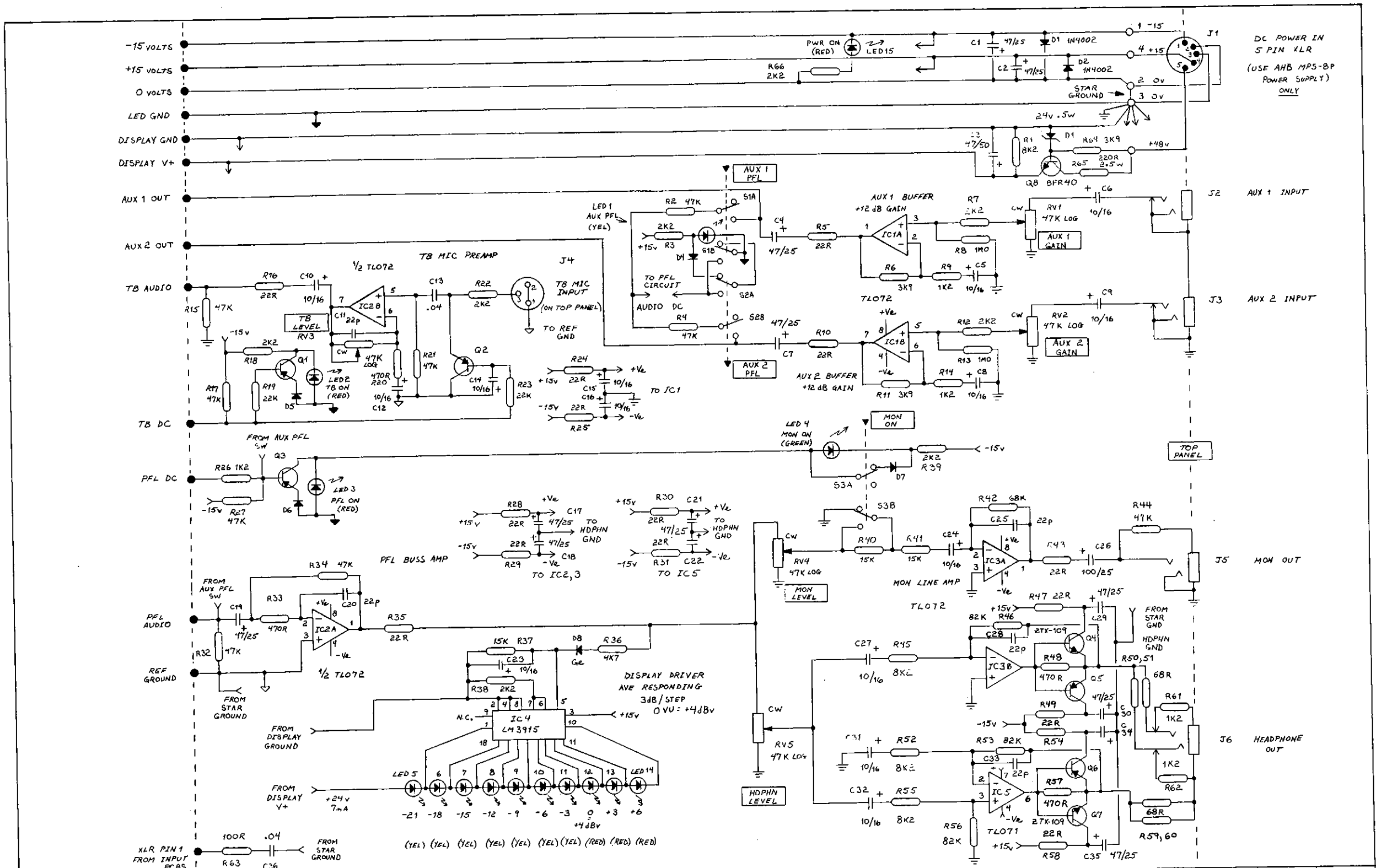
DRAWN	TRACED	CHECKED	APPROVED	DATE	LAST USED
JP	JP	JP		4-84	R 33 C 14



TB AUDIO TB DC REF GND LED GND PFL DC PFL AUDIO -15V +15V 0V AUX 2 OUT AUX 1 OUT DISPLAY +24V DISPLAY GND

AHB SRM MASTER PCB AG0083 ISSUE 1 COMPONENT VIEW 2:1 JP 4-84

AHB
ALLEN AND HEATH BARNET USA, LTD.
P.O. BOX 1000 - BARNET, CONNECTICUT 06030



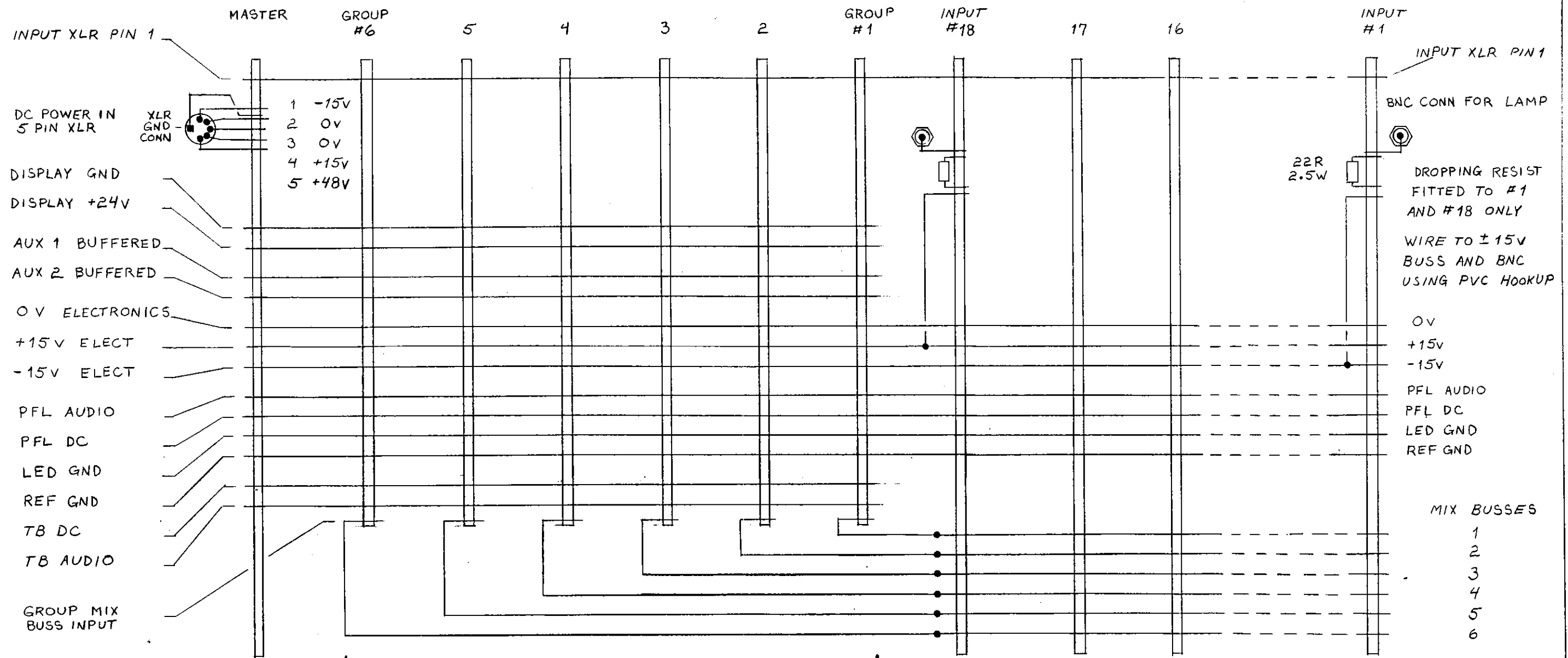
- BUSS BARS ○ WIRING PADS
- NOTES
- 1 ALL SWITCHES SHOWN OUT
 - 2 RESISTORS 1/4 WATT 5% UNLESS SPECIFIED
 - 3 CAPACITORS SHOWN MICROFARADS/VOLT
 - 4 ALL DIODES IN4148 UNLESS SPECIFIED
 - 5 TRANSISTORS ZTX-214 UNLESS SPECIFIED

ALLEN & HEATH SRM-186

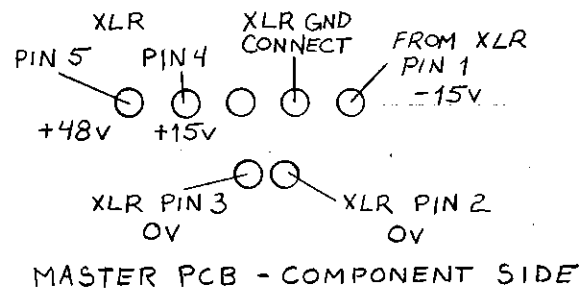
CIRCUIT DETAIL MASTER PCB
 TYPE AHB SRM MASTER
 AG0083 ISS. 1

DRAWN	TRACED	CHECKED	APPROVED	DATE	LAST USED
JP		JP		4-84	R 66 C 36

VIEW FROM REAR OF PANEL



DC PWR IN DETAIL



WIRE EACH GROUP BUSS INPUT TO THE
CORRECT BUSS BAR AT INPUT 18
USING PVC HOOKUP WIRE

AHB SRM MONITOR
BUSS BAR LAYOUT

ISS 1 31.7.85