sunn®

p. a. eight and p. a. twelve

generation II

automated sound amplification system

operations manual

sunn musical equipment company - a hartzell corporation company

amburn industrial park, tualatin, oregon 97062

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SECTION I: INTRODUCTION

A Few Words About Automated Sound

Setting up a sound system in a night club or auditorium has traditionally required near mystical powers. Without costly monitoring gear or an experienced ear, the resulting sound was too often a lifeless, whistling compromise at best. Thus, when we set out to design the five Automated Sound Amplification Systems, we had one goal in mind -- to take the headaches out of sound system set-up while still providing the power and performance flexibility needed to meet the challenges of contemporary music. In short, the Automated Sound Systems were designed with the performer as well as the sound man in mind.

Distortion and feedback are the two problems which are most universally encountered when dealing with a sound system of any type. Unfortunately, they are also the most subjective. Distortion and feedback are easy symptoms to recognize, but the causes are often illusive and complex requiring an abnormal understanding of electronic systems design. Sunn's Automated Sound Systems are designed to simplify the solutions to these problems and more. Features like AUTO-MATCH and SUNN SENSOR place you back in front of the microphone as a musician rather than off to the side as an engineer.

Distortion and noise in a sound system are two interrelated problems both caused by a mismatch between the input circuitry of the sound system and the input signal. Background noise, that annoying hiss occuring in many sound systems, is generally caused when the sound system's input circuitry is not sensitive enough for the input signal necessitating running the volume at near maximum to produce the desired output level. Distortion is most often caused when the input circuitry is too sensitive for the input signal allowing peaks to drive the input circuitry into distortion. Sunn's exclusive AUTO-MATCH feature allows you to easily "tune" your sound system's input circuitry to match the input signal perfectly. This perfect matching provides you with the quietest, most efficient distortion-free sound system possible.

Feedback can be thought of simply as excess energy in a particular frequency or group of frequencies in the audio spectrum. These excesses of energy, unlike distortion, which is caused by internal electronic problems in your system, are caused by external acoustical environmental imperfections such as room size, room shape and microphone placement. These environmental imperfections cause your sound system to react differently to different frequency bands which results in a sound system with a non-linear frequency response containing many peaks and valleys. Graphic equalizers were designed to smooth out these peaks and valleys thereby eliminating feedback. Unfortunately, because of the large number of frequencies in the audio band, graphic equalizers must have several controls. Most consumers find relating a control on a graphic equalizer to a particular

feedback frequency to be pushing the boundaries of human comprehension. Sunn's innovative new SUNN SENSOR indication system takes the guesswork out of tuning a room. Very simply, if feedback is occuring, a light emitting diode (L.E.D.) indicator will come on to tell you which frequency band is causing the problem and which graphic equalizer control to utilize.

Maintaining proper phase relationships between all of the different input signals which are mixed in your sound system is of the utmost importance. Improper phasing or phase relationships cause the resultant output of your system to become harsh, blaring and outright annoying to listen to. All of Sunn's Automated Sound Amplification Systems are equipped with PHASE-SYNC tone control networks on each of the individual input channels to assure proper phase relationships throughout your system. Virtually all bass-treble tone control circuits currently in use exhibit phase cancellation which is accented each time the treble control is boosted. This phase cancelling causes the resultant output to be harsh, blaring and particularly susceptible to feedback. Sunn's all new PHASE-SYNC tone controls eliminate this problem. As you turn up the treble control, notice the increased clarity and sibilancy. Sunn's PHASE-SYNC tone controls boost the upper and lower harmonics while maintaining the proper musical balance and eliminating the all-too-common phase distortion.

There are two basic types of sound amplification systems -- sound modifiers and sound level amplifiers. Sound modifiers amplify an input signal and in the process modify or color the signal so that the resultant output has a different tonal characteristic from the original source. This type of amplification is good for guitar or musical instrument amplification as it can provide added warmth and variety. When used as an amplification system for vocals or instruments where sound accuracy is important, the same characteristics which enhance a guitar cause distortion.

Sunn's all new Automated Sound Systems were created expressly to provide the working musician with a tool capable of amplifying his vocals or instruments without producing unwanted distortion or tonal coloration inherent with sound modification systems currently in use. The key to Sunn's Automated Sound Systems lies in the skillful combination of state-of-the-art technology with human engineering which together yield a system which is easy to operate and produces all of the natural tones and harmonics without causing coloration or distortion. After all, music is the thing and we're here to help.

A Few Words About This Manual

Though we've taken pain to make sound management straight-forward and efficient, we would like you to keep in mind that each member of the Sunn P.A. family is a professional tool. Whichever mixing console you've chosen, it provides many features to help you create and enhance your own distinctive sound. But remember, as with any quality instrument, to get the most out of it, you've got to know how to play it!

This manual has been written with just that thought in mind -- to help you make the most of your Automated Sound Amplification System. Again, taking things from the performer's as well as the sound wizard's point of view, we began with the assumption that you have some basic knowledge of what a P.A. system in general is all about, but more important, an idea of what kind of sound you'd

like to create. This manual then shows you some of the many options available to you when using your Automated Sound Amplification System and provides you with some ideas to help you make the best use of your console to produce your sound in the various rooms and stage set-ups you are called to play in.

The Controls and Connectors section will help you familiarize yourself with the location and function of the various controls and connectors on the Automated Sound System you have chosen. Note that the P. A. EIGHT and P. A. TWELVE consoles and the P. A. EIGHT STEREO and P. A. TWELVE STEREO consoles are treated as one.

The Feature Operation section is intended to provide you with the procedures for using the AUTO-MATCH and SUNN SENSOR graphic equalizer.

The Patching section provides some of the most common patching arrangements and how to add accessories. For the technically minded, the Technical Discription section contains schematic diagrams and system block diagrams.

A final word -- the warranty is important. Please read and understand it!

A Few Words About Your Warranty

In a non-legal nutshell, your new Sunn product is guaranteed for one year. But remember, your Sunn warranty statement which follows is a legal document which spells out mutual responsibilities -- yours and ours -- in the unfortunate event something goes wrong with your Sunn product and it is our fault. Before you do anything else, read and understand the warranty. See where it says that you are responsible for completing and mailing to us your Sunn Warranty Application card within 15 days of purchase? Do it now, later may be too late. If you did not receive a warranty card with your new Sunn product, contact your dealer at once!

Sunn Musical Equipment Company's Personal Limited Warranty

Sunn Musical Equipment Company warrants this new product to be free from defective materials and workmanship for a period of one year from date of purchase to the original purchaser according to the following conditions:

The purchaser is responsible for completing and mailing to Sunn within 15 days of purchase the warranty application enclosed with each product,upon receipt of the warranty application Sunn will issue a warranty validation sticker that must be affixed to the product as instructed. In the event you do not receive your Sunn warranty validation sticker within 60 days from mailing, you should notify the factory in writing immediately. Products that have not been registered within 15 days from date of purchase are not covered by this warranty. The purchaser has the sole responsibility for completing and mailing the warranty application card.

The purchase must be made by an individual from an Authorized Sunn Dealer.

Tubes and meters carry a 90-day warranty from date of purchase.

Speaker cabinet components such as loudspeakers and drivers that have been subjected to abuse and overload conditions causing failure will not be covered by this

warranty. The determination of loudspeaker and driver abuse will be made by Sunn.

A Sunn product that has not been registered or belongs to a group, club or organization of any type or any product that has been subject to accident, alteration, rental, misuse, improper installation, removal or defacing of the serial number or validation sticker is not covered under this warranty.

The normal wear and tear of appearance items such as handles, corners, casters, and knobs are not covered under this warranty.

If your Sunn product requires service during the warranty period, Sunn will repair or replace, at its option, defective materials provided you have identified yourself as the owner of the validated product to any Sunn Authorized Service Center or contact Sunn for service assistance. Transportation charges to and from an Authorized Service Center or factory for Sunn products and components to effect repairs shall be the responsibility of the owner. In the event a product is to be returned to Sunn for repairs, a written return authorization from Sunn must be obtained prior to shipping.

Sunn is not liable for any incidental or consequential damages resulting from any defect or failure of this instrument other than the repair of the Sunn product subject to the terms of this warranty. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties expressed or implied, except as may be otherwise required by law.

Thank you for choosing Sunn!

If All Else Fails

Your new Sunn Automated Sound Amplification System was designed to be a professional tool for the performing musician. Flexibility and reliability are synonymous with Automated Sound. In the following pages of this manual, ideas and general concepts are discussed which cover the major areas of sound system usage. I've tried to include the most commonly used system and patching arrangements; however, each group and their applications are as varied and unique as the individuals who comprise it. If you have any questions concerning your sound system which are not covered in the manual, contact your nearest authorized Sunn dealer -- it's his business to know about all types of musical sound equipment.

If you have any questions which your dealer can't answer; or if you have any comments and/or suggestions, please call or write to me.

Many thanks for choosing a Sunn Automated Sound System!

Gregg Hildebrandt
Product/Training Co-ordinator
SUNN MUSICAL EQUIPMENT COMPANY
Amburn Industrial Park
Tualatin, Oregon 97062
1-503-638-6551

SECTION II: CONTROLS AND CONNECTORS

P.A. Eight And Twelve Front Panel Description

The following descriptions coincide with the front panel drawing on next page.

Individual Channel Controls And Connectors

1. Lo-Z Input: Standard Three pin XLR type connector for plugging in low impedance microphones.

2. Hi-Z Input: Standard phone jack connector for plugging in high impedance microphones or other high impedance sources. (Tape deck, guitar, etc.)

3. Channel Volume Control

4. AUTO-MATCH Control And Indicators: See the feature operations section for specific usage.

5. Bass Control

6. Treble Control

7. Reverb (Effects): Controls the amount of internal reverb or external effects in each channel independently.

8. Monitor: Controls the amount of monitor send for each channel. This control is independent of the channel volume control.

Master Controls And Connectors

9. Master Main System Volume: Controls the overall output level of the main system.

10. Master Monitor System Volume: Controls the overall output level of the monitor system. This control is independent of the master main system volume control.

11. Master Reverb: Controls the overall level of the INTERNAL reverb.

12. Master Effects: Controls the overall level of the EXTERNALLY patched effects. This control may be used in conjunction with the master reverb control if both reverb and effects are desired.

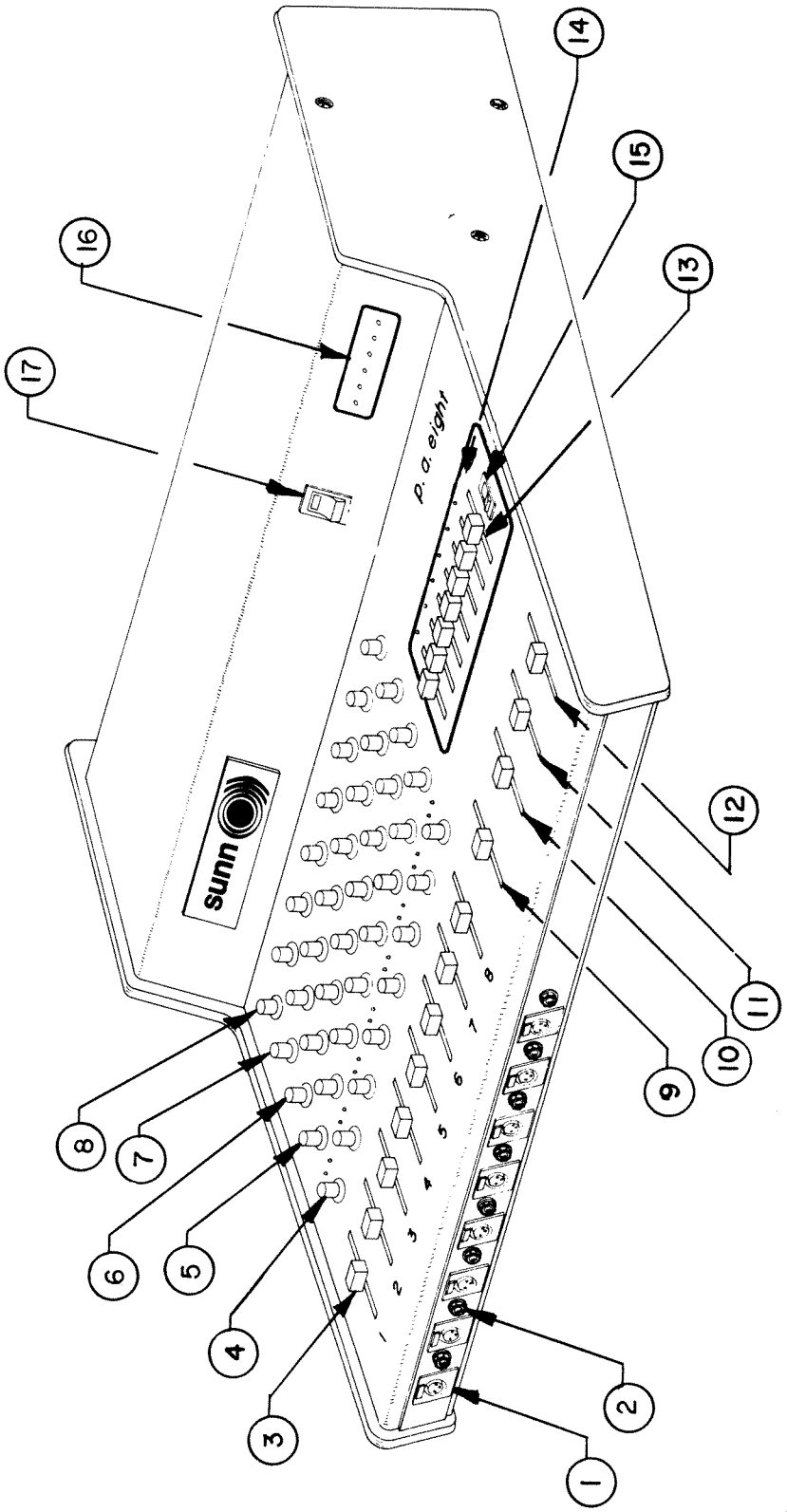
13. Seven-Band Graphic Equalizer: See the feature operations section for specific usage.

14. Sunn-Sensor Indicators: See the feature operations section for specific usage.

15. Contour Switch: When in the contour position, this switch changes the overall output frequency response to increase vocal sibilancy.

16. Output Level Indicator: Displays power output relative to speaker load.

17. Power On-Off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P.A. Eight And Twelve Rear Panel Description

The following descriptions coincide with the drawing on the next page.

16. Fuse: Replace only with 5 amp slo-blo type.

17. A.C. Outlet: For use in connecting the 110 volt A.C. mains of an electronic accessory. This outlet is not effected by the power on-off switch.

18. Speaker Output Jacks: These speaker jacks are internally connected in parallel. For maximum power output, connect speakers which in combination reflect a system impedance of four ohms. (Do not operate power amplifier with less than a four ohm load or damage may result.)

19. Pre-Graphic Accessory Jacks: These jacks are the patch points for disconnecting the signal line between the master mixer and the graphic equalizer. (See the patching section for specific operation)

20. Post-Graphic Accessory Jacks: These jacks are the patch points for disconnecting the signal line between the graphic equalizer and the power amplifier. (See the patching section for specific operation.)

21. Effects Line Out: This is the output of the effects mixer and should be connected to the input of an external electronic accessory. (See the patching section for specific operation.)

22. Monitor Line Out: This is the signal line output for the monitor mixer and should be connected to the input of an external slave amplifier. (See the patching section for specific operation.)

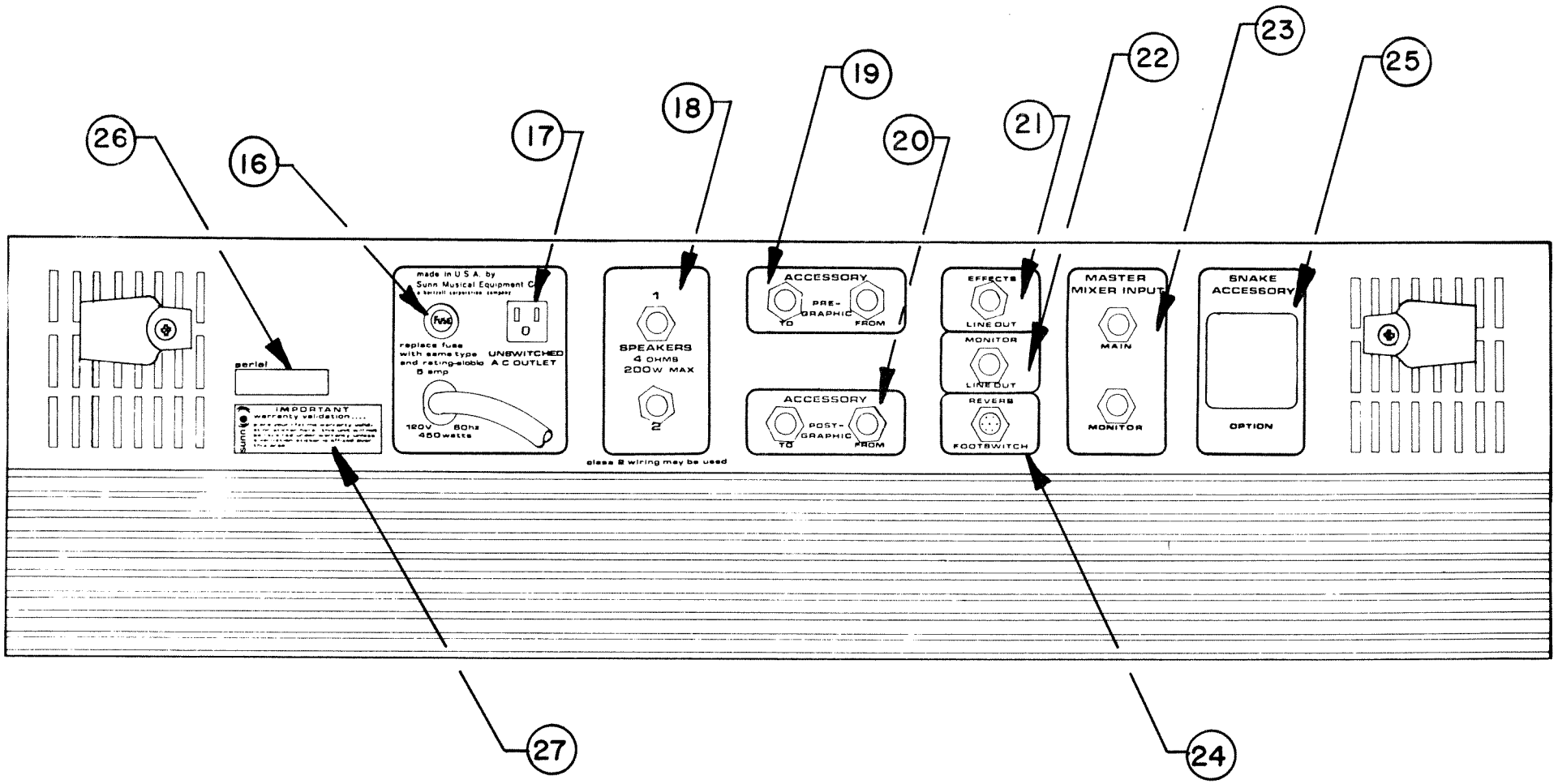
23. Master Mixer Inputs: These jacks are the inputs to the master mixers, both main and monitor. (See the patching section for specific operation.)

24. Reverb Footswitch: When connected to a Sunn Footswitch I, the internal reverb may be remotely turned on and off.

25. Snake Accessory: All Sunn Automated Sound Amplification Systems are equipped with the mounting hardware for adding a snake or umbilical accessory. See your authorized Sunn dealer for more information.

26. P.A. Eight And Twelve Serial Number: Write this number and keep it in a safe place. Refer to it in all dealings with your unit. It will also aid in the recovery of your system if it is ever stolen.

27. Warranty Validation Plate: Affix your warranty validation sticker over this space. See the introduction section for more details. Remember, you have no warranty without the validation sticker.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SECTION III: SYSTEM PATCHING

General Information

One of the many unique features of your Automated Sound System is its ability to be patched -- connected in a manner other than that of a normal P.A. top with the use of external patch cords. It is best to think of your P.A. top as a complete component system, pre-wired for you in the normal P.A. configuration which you can modify to fit your specialized needs simply and quickly with the use of patch cords.

All P.A. systems, whether complete P.A. tops or separate components, contain the same basic parts -- mixer, equalizer, power amp and speakers. The component system has several advantages in that you can select exactly the proper equipment for your needs. Unfortunately, separate components create many problems for the average user. Improper choice of components often results in incredible cord and adaptor hassles as well as electronic mismatch, hum, hiss and pop. In addition, components are bulky, cumbersome and, in short, a pain to carry around.

The complete line of Automated Sound Systems is fully patchable. That is, even though all of the electronic components in your system are in one package and are electronically matched to work together, each one can be used independently or in combination to provide you with the utmost in versatility as well as simplicity, stability and portability. The following is a step-by-step discussion of some of the most popular patching combinations.

Adding A Monitor System

All of the Automated Sound Amplification Systems are equipped with a monitor mixer which is fully independent from the main system mixer. All that is needed to utilize the monitoring capabilities of your sound system is an additional power amplifier (s) or slave (s) and suitable monitor speaker (s).

1. With the power switches on your Automated Sound System and slave in the "off" position, plug in a shielded guitar cord from the "monitor-lineout" jack on the back of your sound system to the "input" of your slave amplifier.

2. Plug your monitor speaker (s) into the "speaker output" jack (s) on the back of the slave amplifier. (Be sure to use heavy duty speaker cords and not signal cords).

3. Hookup the rest of your sound system, main speakers, microphones,

etc. as usual.

4. Turn the power switches on your sound system and slave amplifier to the "on" position.

5. Adjust the level of your slave amplifier to maximum volume.

6. On your sound system, adjust the individual channel monitor level controls and the master monitor level control until the monitor speakers are producing the desired level.

NOTE: Make sure the total impedance of your monitor speakers is within the operating limits of your slave amplifier. If you are in doubt, consult your Sunn dealer. If more than one slave is needed, more can be added by hooking the "line output" of one slave into the "line input" of the next, or by wiring the inputs of all of the slaves in parallel.

Adding Additional Slave Amplifiers

Your Sunn Automated Sound System is equipped with a power amplifier module which will deliver a full 200 watts continuous power into any combination of speakers reflecting a system load of 4 ohms. For most applications this is more than enough power. However, if your group plays at excessive volume levels or in unusually large clubs or auditoriums, you may wish to add additional slave amplifiers and speakers.

1. With the power switches on your Automated Sound System and slave amplifier in the "off" position, plug in a shielded guitar cord from the "post graphic accessory-to" jack on the back of your sound system to the "input" of your slave amplifier.

2. Plug your additional "main" speakers into the speaker jacks on your slave using heavy duty speaker cables.

3. Plug your normal speakers into the speaker jacks on the back of your sound system.

4. Turn the power switches on your sound system and slave amplifier to the "on" position.

5. Adjust the volume control on your slave amplifier to the desired level.

6. Make sure the total speaker system impedance for the speakers on each slave amplifier is within its operating limits. If in doubt, check with your Sunn dealer. Speaker system mismatch could cause your slave amplifier to overheat and turn itself off.

NOTE: If your slave amplifier has its own graphic equalizer or tone controls, you may want to bypass the graphic equalizer in your sound system for the additional slaves and speakers. This will allow you to "tune" your additional speakers to match the tone of your normal speakers if they are of a

different type. To do this, instead of plugging the "input" of your slave amplifier into the "post graphic accessory-to" jack on the back of your sound system, plug it into the "pre-graphic accessory-to" jack.

Using The Built-In Amplifier For Monitors

Some musicians have expressed the desire to use the built-in power amplifier for monitors and use an external amplifier for the main speakers.

1. With the power switch on your Automated Sound System in the "off" position, plug in a shielded guitar cord from the "monitor-lineout" jack on the back to the "post-graphic accessory-from" jack.

2. Plug in a shielded guitar cord from the "post-graphic accessory-to" jack to the "input" of your external slave amplifier.

3. Plug your monitor speakers into the speaker jacks on the back of your sound system.

4. Plug your main speakers into the speaker jacks on the back of your external slave.

5. Make sure the total speaker system impedance for the speakers on each power amplifier is within its operating limits. If in doubt, check with your Sunn dealer. Speaker system mismatch could cause your amplifier to overheat and turn off.

NOTE: In the above configuration the graphic equalizer is utilized in the main system. If you wish to use it in the monitor system, instead of patching into the "post-graphic accessory-to and from" jacks, utilize the "pre-graphic accessory-to and from" jacks. Follow all of the above procedure.

Adding External Effects (Echo, Phase Shifter, Etc.)

Your Sunn Automated Sound Amplification System is equipped with an effects mixer to allow you to add just the right amount of reverb from the internal reverb system, or blend in a hint of echo, phase-shift or any number of other electronic devices. The effects system is designed to operate with any standard electronic accessory having high impedance line level inputs and outputs.

1. With the power switch on your Automated Sound System in the "off" position, plug in a shielded guitar cord from the "effects-lineout" jack on the back of your sound system to the "input" of your electronic accessory.

2. Plug in another shielded guitar cord from the "output" jack on your electronic accessory to the "main-master mixer input" on the back of your sound system.

3. Connect the rest of your sound system, speakers, monitors, etc. as normal.

4. Turn the power switch on your sound system to the "on" position. Make sure your electronic accessory is also on.

5. Using the individual channel "reverb-effects" controls and master "effects" control, adjust the system for the desired amount of effect.

NOTE: By adjusting the balance between the master effects control and the master reverb control, you may use the internal reverb simultaneously with the external electronic accessory.

Recording

The Sunn Automated Sound Systems were designed primarily for live sound reinforcement applications. However, many of the automated features which make it excellent for P.A. also aid in making live recordings. There are two basic methods for recording with your sound system:

1. When using your sound system as a recording mixer only, plug in a shielded audio cable from the "post-graphic accessory-to" jack on the back of your sound system to the "line in" jack on any standard tape deck. You'll probably need an adaptor as most tape decks use RCA type jacks. In this configuration, the graphic equalizer can be used to equalize the tape.

2. Many groups have expressed the desire to make live recordings of their performances through their sound system. If this is the case, since the graphic equalizer would be used to "tune" the room, the signal going to the tape deck should be taken out before the graphic equalizer to achieve the flattest, most natural response. To do this, plug in a shielded audio cable from the "pre-graphic accessory-to" jack on the back of your sound system to the "line in" jack on any standard tape deck. You'll probably need an adaptor as most tape decks use RCA type jacks. In this configuration, the graphic equalizer does not affect the signal going to the tape deck, only the signal to the main sound system.

Patching Two Sound Systems Together

Groups often have the desire to patch two Automated Sound Amplification Systems together to provide one system with more input channels. There are many possibilities for accomplishing this with your Automated Sound System depending on your specialized needs. The following is perhaps the most popular method yielding the most versatility and resulting in a fully independent, self-contained monitor system. For this discussion we'll call unit "A" the main control and unit "B" will be used both as additional input channels and graphic equalizer and amplifier for the monitor system.

1. With the power switches on both unit "A" and unit "B" in the "off" position, plug in a shielded guitar cord from the "pre-graphic accessory-to" jack on unit "B" to the

"master mixer input-main" jack on unit "A".

2. Plug in another shielded guitar cord from the "monitor-lineout" jack on unit "B" to the "master mixer input-monitor" jack on unit "A".

3. Plug in another shielded guitar cord from the "monitor-lineout" jack on unit "A" to the "pre-graphic accessory-from" jack on unit "B".

4. Using heavy duty speaker cables, connect the main system speakers to the speaker jacks on unit "A".

5. Using heavy duty speaker cables, connect the monitor speakers to the speaker jacks on unit "B".

6. Turn on the power switches on both units.

NOTE: All functions of each of the input channels on both units will be fully functional. The master volume control, graphic equalizer and power amp for the main system will be on unit "A". The master volume control for the monitors will also be on unit "A". However, the graphic equalizer and power amp for the monitors will be on unit "B".

Adding Additional Input Channels

Many groups occasionally find themselves in a position where they need more input channels than they have available on their P.A. tops. In this instance an additional mixer can be patched into your Automated Sound Amplification System.

1. With the power switch on your sound system in the "off" position, plug in a shielded guitar cord from the "lineout" jack on your auxiliary mixer to the "master mixer input-main" jack on your sound system.

2. If your auxiliary mixer has a "monitor output" jack, run a shielded guitar cord from it to the "master mixer input-monitor" jack on your sound system.

3. Hookup the rest of your system -- microphones, speakers, monitors, etc. -- as normal. All of the master controls on your sound system will control all input channels.

Patching Concepts

The above are only a few of the most common patching configurations. There are many more possibilities depending on your specific needs. For those who are technically minded, the system block diagram should be of assistance. Your factory authorized Sunn dealer can be a great help in answering specific questions or solving technical problems.

SECTION IV: FEATURE OPERATION

Seven Band Sunn Sensor Graphic Equalizer

One of the most commonly encountered problems in dealing with sound systems of any type is feedback. Feedback can be thought of simply as excess energy in a particular frequency or group of frequencies in the audio spectrum. These excesses of energy, unlike distortion which is caused by internal electronic problems in your system, are caused by external acoustical environmental imperfections such as room size, room shape, and microphone placement. These environmental imperfections cause your sound system to react differently to different frequency bands which results in a sound system with a non-linear frequency response containing many peaks and valleys. Graphic equalizers were designed to smooth out these peaks and valleys thereby eliminating feedback. Unfortunately, because of the large number of frequencies in the audio band, graphic equalizers must have several different controls. Most consumers find relating a control on a graphic equalizer to a particular feedback frequency to be pushing the boundries of human comprehension. Sunn's innovative new SUNN SENSOR indication system takes the guesswork out of tuning a room. Very simply, if feedback is occurring, one or more light emitting diodes (L.E.D.) will illuminate to tell you which frequency band is causing the problem and which graphic equalizer control to utilize. You will find the following steps useful in tuning your sound system to achieve maximum gain before feedback:

1. Set the entire soun d system up in the room in which it will be used. Include speakers, amp top, microphones, and monitors.

2. Set the graphic equalizer controls flat. (All controls all of the way at the top.)

3. Set the individual channel controls, volume, bass, treble, reverb, pan, monitor, to your normal "mix".

4. Start with the master volume set at "0". (On stereo PA tops, tune each of the two output channels separately).

5. With no one singing or talking into the microphones, slowly increase the master volume control until your sound system begins to "ring". (On the threshold of feedback).

6. As your sound system rings, one of the SUNN SENSOR indicators will come on. (As the ringing continues, more SUNN SENSORS will begin to illuminate. We are concerned only about the first one which comes on).

7. Reduce the graphic equalizer control below the SUNN SENSOR which comes on until the SUNN SENSOR goes out and the ringing stops.

8. Slowly increase the master volume control more until the system again begins to ring. (This could be in the same frequency band or another one).

9. Continue tuning your system, steps 5-8, until one of two things happen. First, you're at maximum volume on the master volume control and no feedback is occurring. Second, you have one or more of the graphic equalizer controls all of the way down. In eithor case, you are now at the maximum gain before feedback possible in the room you're in with the equipment set up in the configuration you're using.

10. Reduce the master volume control to achieve the desired output level.

11. When playing through the sound system it is normal for the SUNN SENSOR indicators to flash or remain on constantly.

Auto-Match

Your new Sunn Automated Sound Amplification System is equipped with Sunn's exclusive Auto-Match circuitry. This control with its two indicator lights, allows you to "tune" your sound system's input circuits to match the input signal to get the maximum efficiency with the least amount of background noise and distortion. Here is how to use Auto-Match.

1. Plug the input source, microphone, guitar, synthesizer, etc. into the appropriate input jack on the front of your sound system.

2. While singing into the microphone or playing the instrument, simply adjust the Auto-Match control to a point where the green "normal" indicator comes on and the red "clip" indicator stays off. (Increase the Auto-Match control as much as possible without lighting the red indicator.)

3. Adjust each individual input channel as above.

4. If at any time during your performance the red indicators come on, readjust your Auto-Match controls.

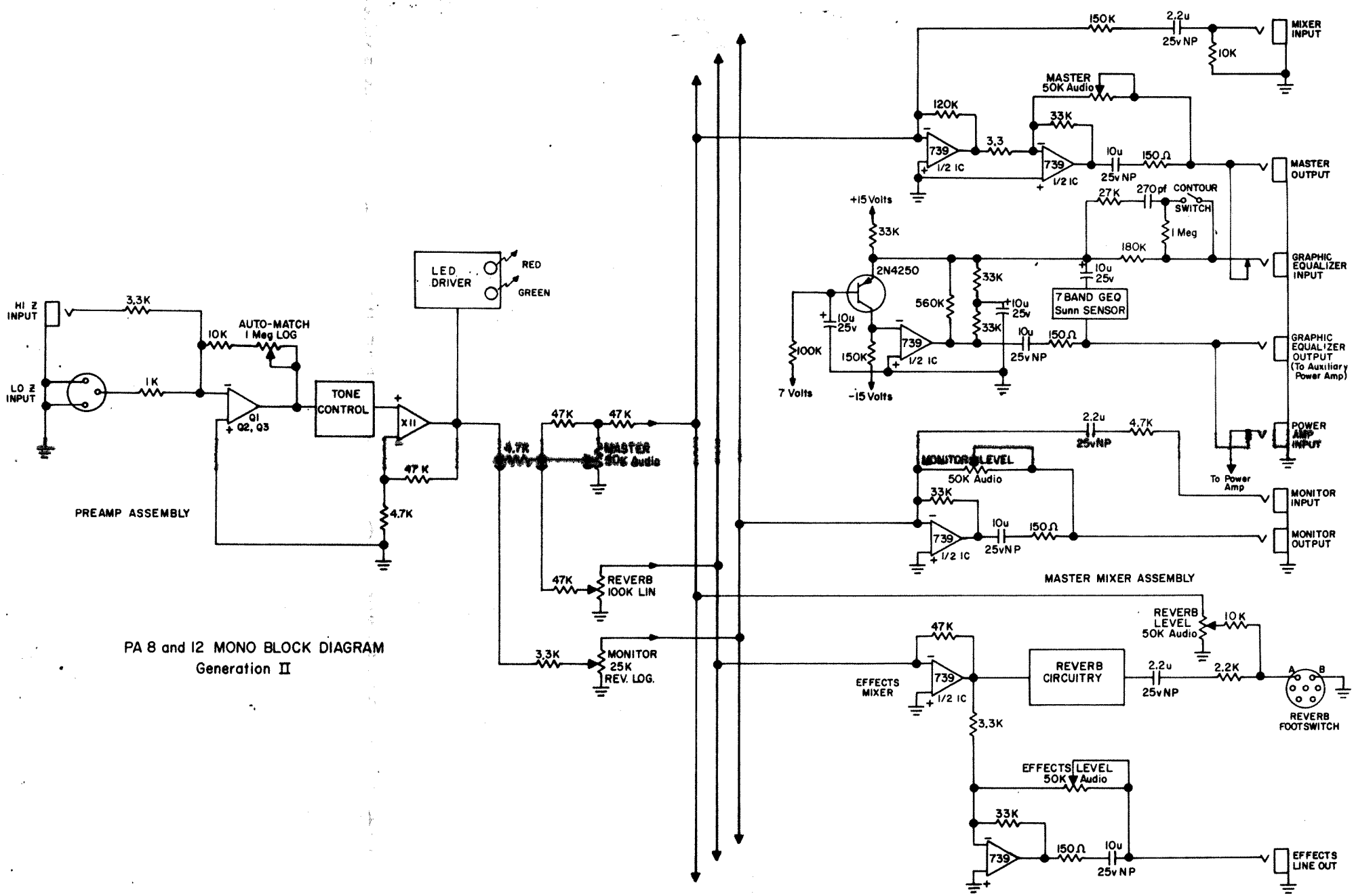
NOTE: In cases where there is an excessive amount of input signal and the red indicator light comes on with the Auto-Match control all the way down, an external line pad should be used.

SECTION V: TECHNICAL DESCRIPTION

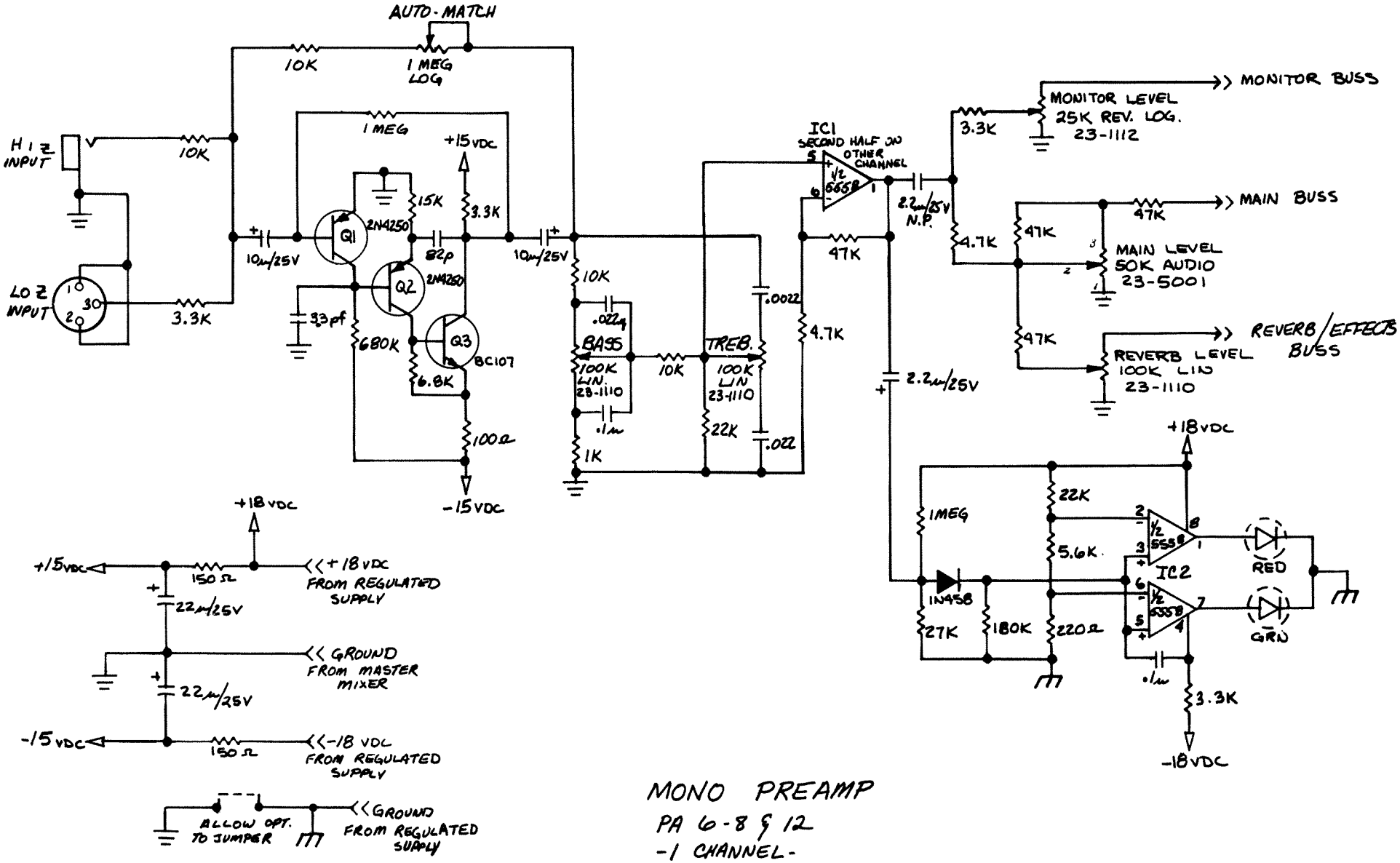
This section is intended for those who are technically minded. Included are typical performance specifications, a system block diagram showing where the patch points occur and complete schematic diagrams. A word of caution -- the schematic diagrams are included as an information source only. Even though many musicians are qualified electronic technicians, all repairs or modifications must be made only by a factory authorized Sunn service center. Any other tampering must be considered abuse and as such will void your warranty.

Typical P.A. Eight And Twelve System Specifications

Channel Input Impedance:	Phone Jack - 10,000 ohms XLR Connector - 3,300 ohms
Max. Channel Input Level:	Phone Jack - 9 volts rms (sine) XLR Connector - 2.5 volts rms (sine)
Max. System Gain:	Phone Jack - 77 db (x7,000) XLR Connector - 86 db (x20,000)
Auto-Match Indication:	Green - 100 m.v. rms Red - 3 volts rms
Master Mixer Inputs:	Impedance - 8,300 ohms (main) 4,700 ohms (monitor) Max. Input Level - 10 volts rms (sine)
Graphic Equalizer Input:	Impedance - 10,000 ohms Max. Input Level - 3.2 volts rms (sine)
Power Amplifier Input:	Impedance - 50,000 ohms Max. Input Level - 3.6 volts rms (sine)
Maximum Output Power:	Four Ohm Load - 200 watts continuous Eight Ohm Load - 120 watts continuous



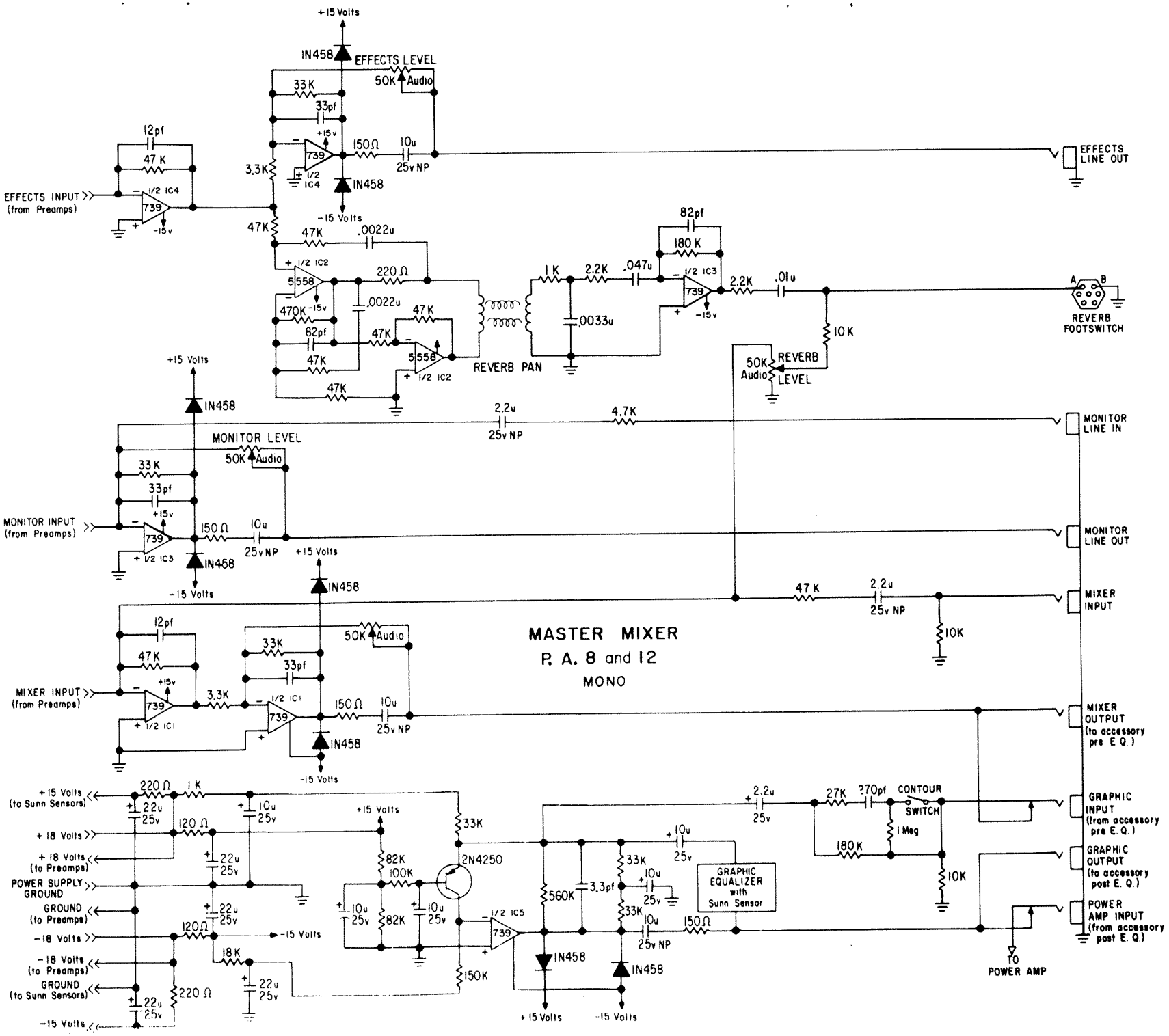
PA 8 and 12 MONO BLOCK DIAGRAM
Generation II

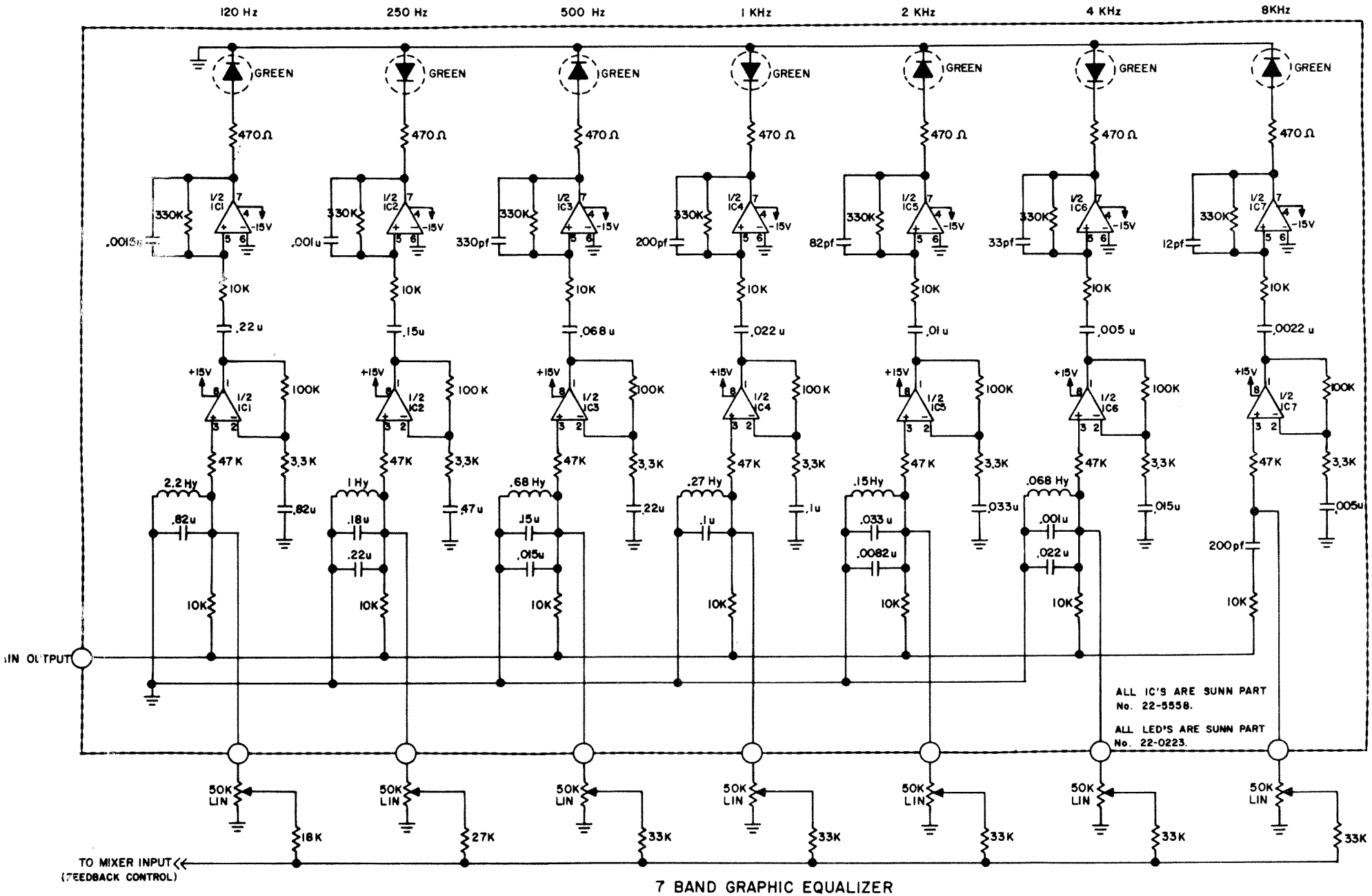


MONO PREAMP

PA 6-8 & 12

-1 CHANNEL-


MASTER MIXER
P. A. 8 and 12
MONO
+15 Volts
-15 Volts
IN458
EFFECTS LEVEL
50K Audio
33K
33pf
12pf
47 K
150Ω
10u
25v NP
3.3K
47K
.0022u
220Ω
5558
470K
82pf
180 K
1K
2.2K
.047u
.01u
.0033u
10 K
REVERB PAN
50K Audio
REVERB LEVEL
REVERB FOOTSWITCH
EFFECTS INPUT (from Preamps)
EFFECTS LINE OUT
MONITOR LEVEL
MONITOR INPUT (from Preamps)
MONITOR LINE IN
MONITOR LINE OUT
2.2u
4.7K
MIXER INPUT
MIXER INPUT (from Preamps)
MIXER OUTPUT (to accessory pre E Q)
+15 Volts (to Sunn Sensors)
+18 Volts
+18 Volts (to Preamps)
POWER SUPPLY GROUND
GROUND (to Preamps)
-18 Volts
-18 Volts (to Preamps)
GROUND (to Sunn Sensors)
-15 Volts
220Ω
1K
22u 25v
10u 25v
120Ω
18K
82K
100K
2N4250
33K
150K
560K
3.3pf
GRAPHIC EQUALIZER with Sunn Sensor
27K
270pf
CONTOUR SWITCH
1 Meg
180K
10K
GRAPHIC INPUT (from accessory pre E. Q.)
GRAPHIC OUTPUT (to accessory post E. Q.)
POWER AMP INPUT (from accessory post E. Q.)
TO POWER AMP
1/2 IC1
1/2 IC2
1/2 IC3
1/2 IC4
1/2 IC5
739
5558



7 BAND GRAPHIC EQUALIZER
WITH SUNN SENSOR

OUTPUT LEVEL
L.E.D. DISPLAY

POWER AMP ASSEMBLY

P.A. MIXERS

PA 8 & 12