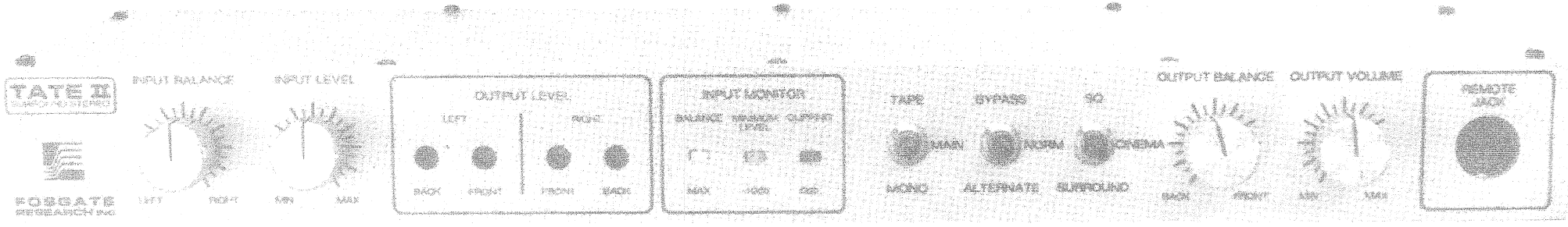
FOSGATE RESEARCH MODEL 101A



TATE II SURROUND STEREO SYSTEM

INTRODUCTION

Somewhere deep in the grooves of the stereo record is thought to lurk the ultimate reality; Information; that were it extracted and reproduced in the proper format could transport the listener to the live performance. Now at last the magic of the TATE II SURROUND STEREO SYSTEM makes this dream a reality.

The Model 101A is the result of more than 10 years of research, incorporating FIVE PATENTS (others pending). It is the highest technology product of its type ever conceived. Every effort has been made to build the most reliable "State of the Art" component possible. You can rest assured that the sound quality of your system will not be limited by your 101A, only enhanced by it. The 101A is compatible with practically all existing audio equipment, all that is required are four separate amplifier channels, and four separate speakers.

INDEX

BACK CHANNEL AMPLIFIER REQUIREMENTS

Component amplifiers, integrated amplifiers, and receivers can be used for back channel amplification. The amount of power needed will depend on back speaker efficiency, and how loud the fronts are able to play. Ideally the back channels should be able to attain the same volume levels as the fronts. If all four speakers are of the same efficiency, the back amplifier should be of approximately the same power as the front amplifier. If the back speakers are more efficient than the front, then lower power will be sufficient. For every 3DB more back speaker efficiency you will need only half as much power in the back amplifier as the front amplifier.

Some listeners can tolerate a back channel amplifier/speaker combination that goes into clipping sooner than the front channels. On most program material the front channels are the more predominant channels which means much of the time the back channels are running at slightly lower levels than the fronts, however there will be times when the back channels will be called upon to provide the same loudness as the front channels. If back channel clipping does occur it is somewhat masked by the front channels. The 101A is designed to operate from any preamplifier or receiver which can supply a normal 300 MV high level stereo output level.

SOURCE AND AUXILIARY EQUIPMENT

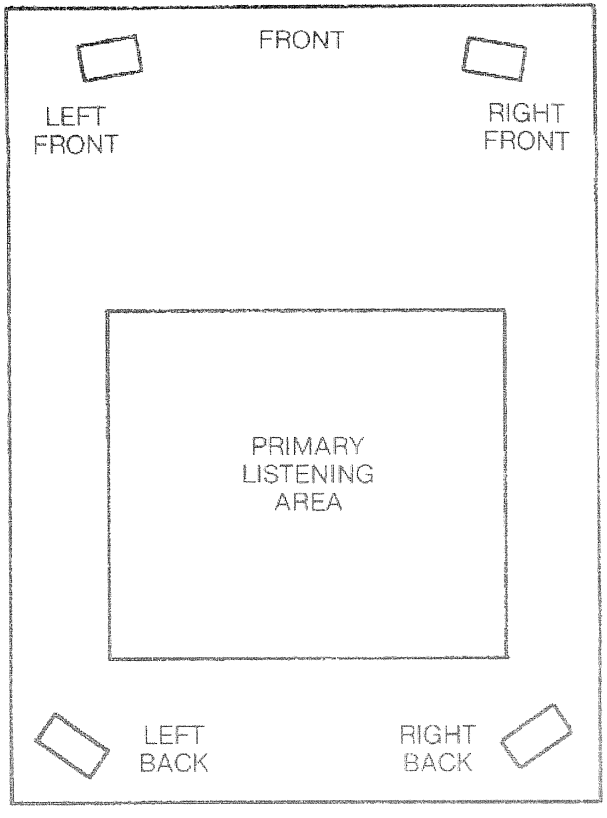
The 101A utilizes advanced cancellation techniques to achieve its high degree of channel separation. It is important to maintain good channel balance in terms of frequency response and phase angle, theoretically nothing should be connected in front of the 101A that could cause a channel imbalance greater than a few percent. Any device used in front of the 101A should have high precision components to assure accurate balance between the channels. Care must be exercised when using equalizers with different adjustments for each channel, even with the knobs for each channel adjusted similarly there can be electrical differences between the channels due to tolerances of their control pots and other components.

We recommend a long period of listening to the 101A without anything extra connected to its input, then add the device and

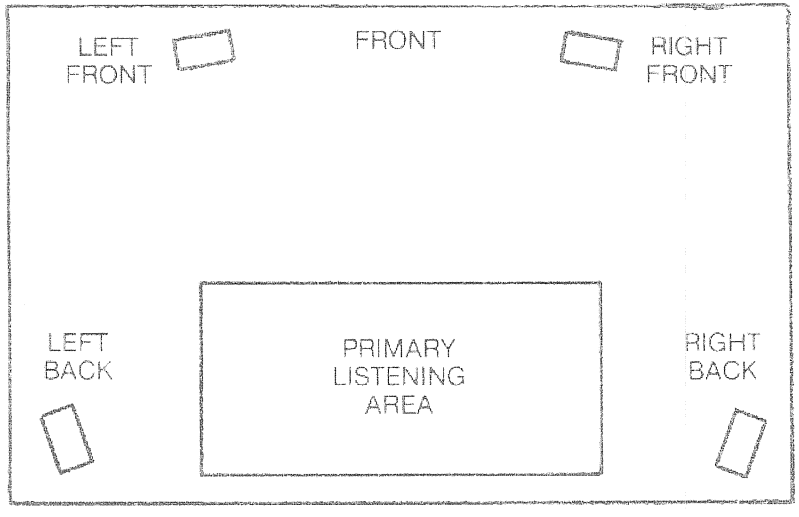
audition it to be sure the performance has not diminished. The phono cartridge must have good channel balance. If the phono cartridge is axial tilted the performance of the 101A will suffer because of phase imbalances and loss of separation between the two stereo channels. Part of the information that should be in front will be directed to the back. Proper adjustment of the axial tilt is covered on page 6. It is recommended that a high quality late model phono cartridge be used with the 101A. If the cartridge isn't open and doesn't image well in stereo, the performance of the 101A will be far below its capability. If the phono cartridge, or tape head leads for just one channel are reversed this will cause a 180° phase difference between channels and the 101A will not work properly at all. We have been told that some "FM" stations invert the phase of one channel, "So they sound better." This of course, will not work well either. Signal processors that do not act on both channels simultaneously will cause all sorts of problems in front of the 101A. DBX, Dolby, and CX noise reduction systems are all on the list of compatible units with the 101A.

SPEAKER SELECTION

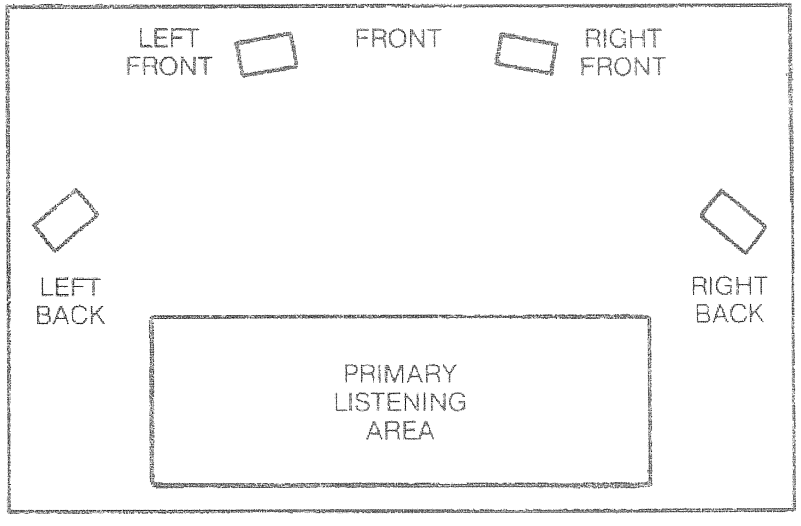
For optimum performance we recommend that all four speakers be of the same type. Satisfactory results can be obtained, if the back speakers sound similar to the fronts above 200HZ. in other words, all four speakers should sound as similar as possible in the upper mid-bass range, mid-range and top end. Since most low bass frequencies are recorded in-phase and with equal volume on most stereo records the bass will be located predominantly in the front channels, therefore, a roll off of back channel low frequency response is acceptable to most listeners. There are however, a few stereo and SQ recordings that do produce powerful bass fundamentals in the back channels and it is more enjoyable if it can be reproduced. Boosting bass response in the back channels above what would be considered "flat" will impair the "openness" of the system and should be avoided. Subwoofers can be used very effectively when connected to the front channels. We prefer summing the front channels together and passing the signal through a low pass filter with an upper cutoff frequency (3DB down) at 75HZ and then driving the amplifier and subwoofer. Bass frequencies are fairly non-directional below 75HZ and no loss of directionality should be noticed. The subwoofer should be positioned directly in between the front channel speakers.



This placement is best for total surround and will literally immerse you in sound. It can image all the way around a 360° circle, even up and down. This is our favorite for electronic music, live recordings, and rock music. It's also very good for classical.



This placement offers tremendous depth and width with less sound coming from the back. It is of particular interest for classical music lovers who don't like primary instruments located behind them.



This placement provides the equivalent of **SUPER** stereo across the front of the room with tremendous depth and width, with no sound coming from the back. Obviously there are variations of the positions shown. If space is limited, the back speakers may be suspended in the upper back corners of the listening room and pointed downward slightly.

EXPLANATION OF CONTROLS

Input Balance Control
This control is used in conjunction with the yellow balance indicator to insure that the input signal to the 101A is *Exactly* balanced. Channel balance can vary from one source to another and even one record to another. Refer to page 10 set up procedures for adjustment procedure.

Input Level Control
This control is used in conjunction with the clipping and minimum level indicator as a means of adjusting the input level to the 101A for optimum performance. Signal levels can vary from source to source and even from one record to another. Refer to page 10 set up instructions for adjustment procedure.

Input Monitor Indicators
To attain maximum performance it is most important that the input signal to the 101A be of the correct level and be properly balanced. Three leds are provided on the front panel to facilitate the adjustments. Refer to the set up instructions for information on how to use these indicators.

Tape-Main-Mono Switch
This dual purpose control selects the tape monitor or main input. When it is desired to have information coming from the back channels on a mono source, placing this switch in the mono position reduces front to back separation to just 3DB instead of the normal 35 to 50DB.

Bypass-Normal-Alternate Switch

This dual purpose control is used to completely bypass the 101A and listen to normal stereo. In the bypass mode the main input signal travels through an "Integrated Circuit FET Switch" and directly to the front output jacks, and the signal is removed from the back channels. There is a strapping option on the P.C. board that will connect the stereo signal to the back channels as well as the fronts. Consult the factory for information on this option. NOTE! The 101A must be plugged in for the bypass mode to function. IMPORTANT! When operating in the bypass mode, the 101A volume control is also bypassed and the volume level of the system must be adjusted at your pre-amp or receiver volume control. Before switching to bypass reduce your system volume control.

The normal-alternate switch positions change internal time constants that control decoding dynamics. Exhaustive listening tests have proven that if the 101A is optimized for maximum performance on properly recorded source material it may become unsmooth and produce some distortion on recordings with phase abnormalities, or FM broadcast with a degraded signal. We chose not to compromise the set-up of the 101A, but instead have incorporated circuitry which optimizes internal time constants to take care of different program signal situations, theoretically, the "Normal" position has the highest degree of separation, and the "Alternate" position has the lowest distortion. In actual listening tests the difference is subtle, sometimes inaudible. We recommend playing everything in the normal position unless distortion or unsmoothness is encountered. (usually most noticeable in the back channels) in which case use the alternate position. If the problem still persists check input balance or try another position on the surround, cinema, SQ switch. If the condition still persists you can be sure you are dealing with source material with phase abnormalities, probably a microphone or mixer panel wired out of phase during the recording process.

Surround-Cinema-SQ Switch

This control selects three modes of operation to accommodate different types of recordings and to suit personal tastes. Basically the surround position images the farthest to the back, the cinema position images farther forward and the SQ position images still further forward. The surround position is used when playing stereo material when it is desired to surround the listener with not only ambiance information in the back, but primary sound sources as well. In this position the in phase information from the left and right stereo channels is wrapped around the room like a giant horseshoe. Certain out of phase information is directed to the front channels and other out of phase information is directed to the back channels. The cinema position is recommended for playing video material encoded in the Dolby multichannel process, Dolby films, video discs, and tapes. Many listeners play Dolby encoded material in the surround position as well, so audition them both. The SQ position is used when playing SQ encoded material and properly decodes all four channels as the recording engineer intended. SQ material can also be played in cinema position. The correct decoding code is still observed, but the soundfield will image further back due to different phase relationships of the back channels. Stereo material can be played in any switch position; classical music listeners will usually prefer the cinema or SQ positions which direct mostly ambiance information to the back channels, keeping the primary instruments up front. You may encounter a few stereo recordings which will cause primary information to be directed to the back in the cinema or SQ position — this is due to out of phase information on the disc, and can be partially corrected for by balancing the front to back balance control more to the front. Surround-Cinema-SQ switch is duplicated on the remote control to facilitate adjustments from the listening position.

Output Balance Control

This control is used to balance the soundfield front to back depending on listener position, program material, and personal taste. This control is duplicated on the remote control and provides adjustment from the listening position.

Output Volume Control

This control adjusts the volume level from all four channels simultaneously. Overall system balance is maintained at any volume setting due to the excellent tracking of the control. This control is also duplicated on the remote for adjustment from the listening position.

Remote Jack

There are two remote jacks, one located on the front panel and one on the rear. When the remote control unit is plugged in it mutes the front panel "Front-To-Back Balance," "Output Volume," and "Surround-Cinema-SQ" Switch. If you leave the

remote at your easy chair and are standing in front of your equipment and want to change the volume you can unplug the remote and the front panel controls work again; thus the reason for the front panel jack. Some users will rack mount the unit in a glass front cabinet and the remote must be plugged into the rear. The rear jack may be used if you wish to conceal most of the connecting cord by routing the cable around the walls. WARNING: Never plug two remotes in at the same time — a short circuit will damage the remotes and possibly the main unit.

CARTRIDGE AXIAL TILT ADJUSTMENT

"Axial tilt" refers to the mechanical mis-alignment of the stylus in the record groove. The stylus must be perpendicular to the record surface or there will be unwanted phase differences between the two stereo channels. This will cause the 101A to mis-direct some front channel information to the back channels. Visual adjustment of the cartridge is not accurate enough. The headshell or arm must be adjusted electronically to be sure the adjustment is correct and that the cartridge is satisfactory.

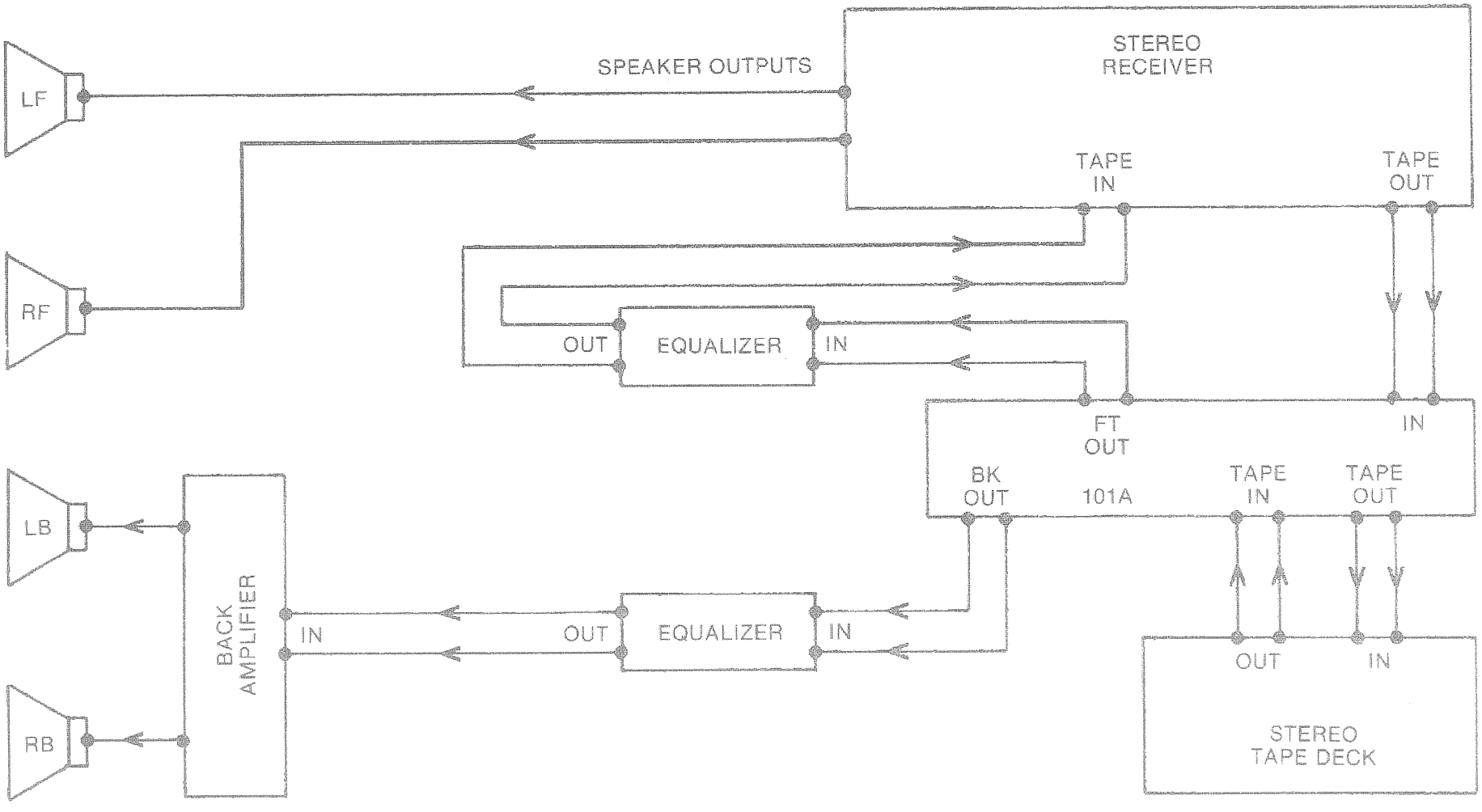
You will need a test record that has a test tone or pink noise band playable on first one channel and then the other. Your tape recorder can be used to read the levels of both channels by putting it in the record mode and observing your record meters. The procedure is as follows: Play the test tone on the left channel and adjust the left tape record level for 0 DB on the left meter. Next play the right channel test tone and adjust the right tape record level for 0 DB reading on the right meter. Now observe how far down the left meter is reading. (This reading is how much separation there is from the right to the left channel.) Next play the left channel again and observe how far down the right meter is reading (this reading is how much separation there is from the left channel to the right channel). When the cartridge is adjusted properly for axial tilt both separation readings will be the same. If both readings are not the same try turning the head shell or arm (if it's adjustable) or shim one side of the cartridge or the other with paper or thin cardboard until both readings are the same. If your cartridge will not adjust to within a few DB of being balanced you need a new stylus or new cartridge. Our expensive moving coil lab cartridge measured 32DB separation on both channels until it accidently dropped on a record — after that it measured 32DB on one channel and 16DB on the other. The stylus didn't look bent and it still sounded good in stereo. When played on the 101A certain information that should have stayed in front kept finding its way to the back, and the system wasn't near as open as before.

RACK MOUNTING ADAPTERS

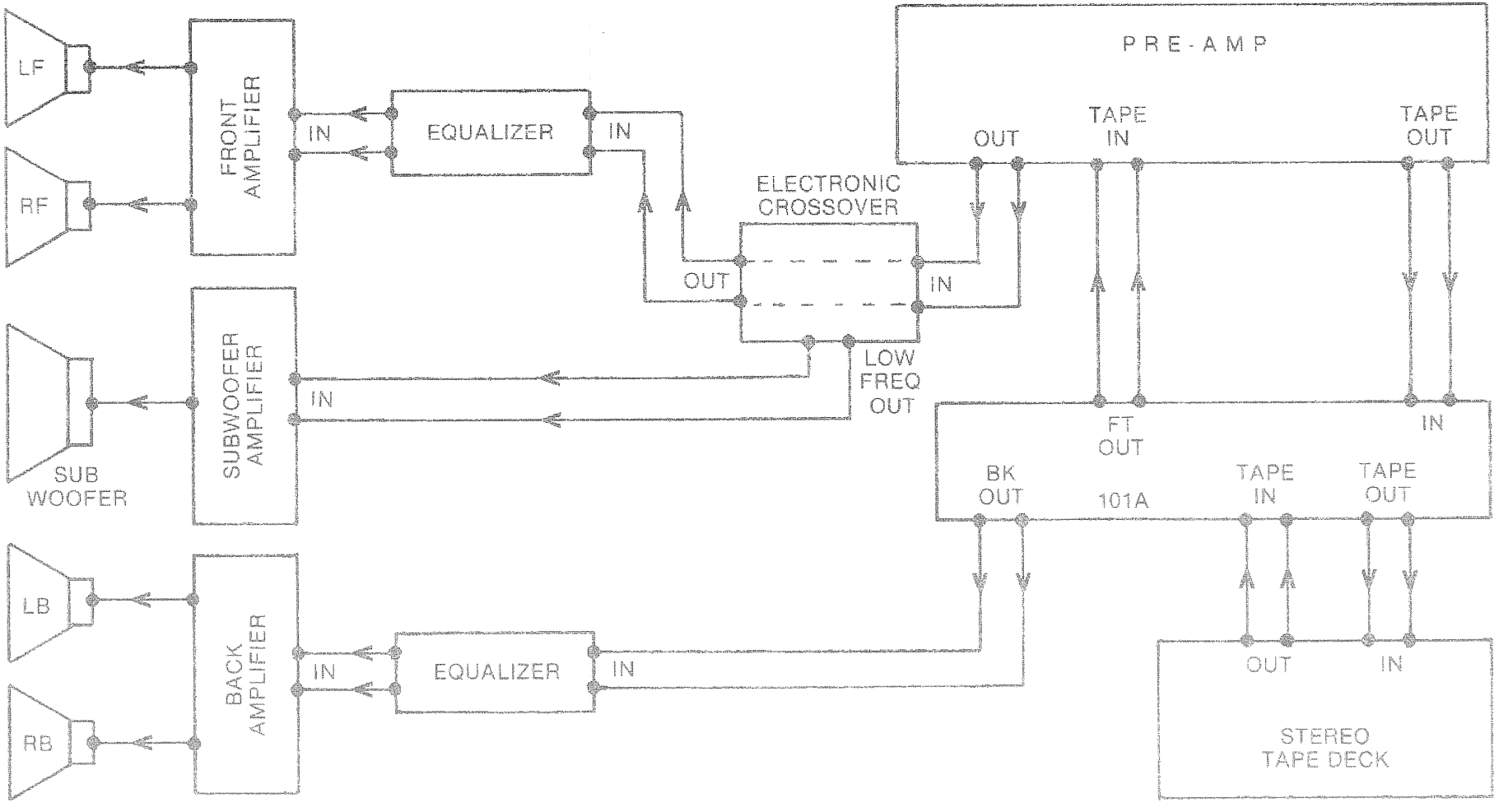
To install the adapters remove the two 1/4" phillips head screws located on each side of the case near the front panel. Position one of the 1/16" thick spacer brackets under each "L" bracket and fasten with the 1/4" phillips screws previously removed. To avoid stripping the threads in the sides of the case do not overtighten the screws.

AC POWER CONNECTION

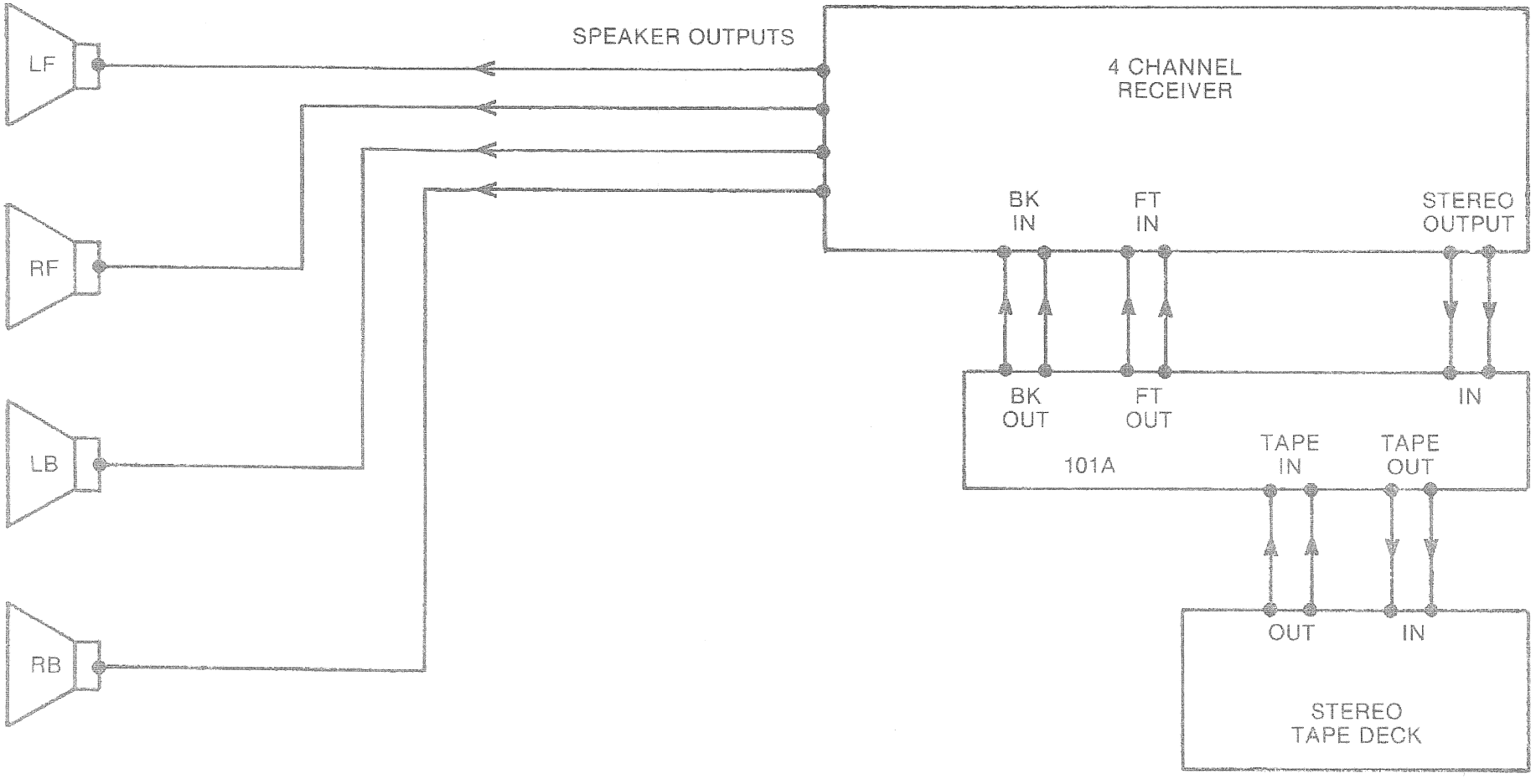
The power supply section of the 101A incorporates Integrated Circuit power supply regulators for absolute rock solid regulation. Units are shipped with dual winding power transformers for operation on either 110V or 220V line voltage 50 or 60HZ. The 110V version is standard with 220V available. The voltage requirement for your unit is marked on the back panel next to the serial number. The power supply can be changed from one voltage to another by changing jumpers on the printed circuit board. The jumpers are located to the rear of the power transformer. Refer to markings located on the circuit board which show two jumpers for 110V version and one jumper in center for 220V version. PLEASE NOTE! When replacing case bottom panel make sure the shorter 1/8" long screws are located around the outside edges and the longer 1/4" screws are located in the center holes, otherwise the longer screws may hit the P.C. board and cause a circuit board land to become grounded disabling the unit. There is a large switching transit when turning the 101A on or off. Even if your power amplifiers have a time-delay turn on circuit you may have turn off thump. For this reason and the fact that some of the circuitry requires 15 minutes to fully stabilize, it is recommended that the unit be plugged into an outlet that remains on at all times. The power consumption is only a few watts and it is commonly believed that most solid state equipment will last longer if it is left on. There is only a slight loss in performance until the 101A has warmed up for 15 minutes, so if your particular system doesn't have a turn on or turn off "thump" you can switch the 101A on and off with your system.



WIRING DIAGRAM FOR USE WITH RECEIVER USING SEPARATE BACK CHANNEL AMPLIFIER. (OPTIONAL EQUALIZERS SHOWN.)



WIRING DIAGRAM FOR USE WITH SEPARATE PREAMPLIFIER AND POWER AMPLIFIER(S). (OPTIONAL SUB-WOOFER AND EQUALIZERS SHOWN.)



WIRING DIAGRAM FOR USE WITH 4-CHANNEL RECEIVER. The input and output jacks available will differ on different units. Read your receiver instruction manual for information. The stereo output jacks may be called stereo tape out. The front and back inputs may be called "main input." Most 4-channel units can be accommodated. It's a matter of locating the proper jacks, and switching facilities.

SET-UP PROCEDURE

1. Turn off power to your entire system.

2. Select a place for the Model 101A where it won't be heated up by amplifier or receiver heatsinks. The unit produces a hum field around the power supply area on the right hand end. If it is placed too near a sensitive phono cartridge, head amp, preamp or tape recorder it may cause hum.

3. Select the appropriate diagram for your system depending on the type of components you have, and connect all the audio cables. The output impedance of the 101A is a low 500 ohms, therefore cable lengths connected to the main output jacks can be up to 100 feet long without loss of performance. Special low capacitance cables enable even greater distances. It is desirable to keep the left and right input cables, and all four output cables close together throughout their length to minimize the likelihood of hum pickup. They should cross AC cords at right angles, never running parallel to AC lines at close range.

The tape in and out, and audio output connectors on the 101A have fairly tight spacing. Some audio cables may not fit, it may be necessary to purchase some with smaller diameter plugs.

4. MAKE SURE none of the speaker wires are wired out of phase on any channel. This will destroy the system's excellent imaging qualities.

5. Adjust system volume controls to mid position. BE SURE TO PUT TAPE MONITOR SWITCH IN CORRECT MONITOR POSITION.

6. Adjust system balance controls to center.

7. Do not connect remote until set-up is completed.

8. Set 101A controls as follows:

Input Balance . . . . . Center
Input Volume . . . . . Mid Position
Tape-Main-Mono Switch . . . . . Main
Bypass-Norm-Alternate Switch . . . . Normal
Surround-Cinema-SQ Switch . . . . Surround
Front to Back Output Balance . . . . . Back
Output Volume . . . . . Minimum

9. Turn on all system power.

10. Play the center front test signal on the test tape or record provided. A monophonic recording or "FM" interstation noise may also be used as a signal source.

11. For maximum performance it is most important that the input signal to the Model 101A be of the correct level and be properly balanced. Three input monitor leds are provided on the front panel to facilitate the adjustments. If the Model 101A is over driven excessive distortion will result. If under driven separation may be impaired and the signal to noise ratio will suffer. Adjust the input level control until the red clipping indicator lights and then reduce the level until the red indicator just extinguishes. The —10DB green indicator should still be lit indicating there is sufficient input level.

    Think of the red and green indicators as a "10DB Window" for adjusting the level of the signal peaks, the green indicator should light and the red indicator should remain extinguished. Try to maintain the level as high as possible without clipping. There will be times when the green indicator will not light on low level passages, this is normal and will not cause loss of performance. The 101A detects signals lower than —60DB for its directional information.

    NOTE! The red indicator is calibrated so that at the exact point where it lights the 101A has approximately 2DB of dynamic headroom before actual clipping occurs. If the red indicator flashes briefly once in a while on signal peaks there should be no audible distortion.

12. Turn up the output volume to a comfortable level and observe the yellow balance indicator while rotating the input balance control. Find the point where the yellow indicator is maximum brilliance. Listen to the sound coming from the back channels

and slowly turn the input balance control to find the point where the sound "nulls out" (the point where the sound level is the lowest and equal in both back channels). When playing stereo recordings with a vocalist or instrument located in the center front perform the same adjustment until the sound is "nulled out" of the back channels.

NOTE! To insure the 101A is properly balanced always recheck the input balance after changing the input level control.

13. Position the front to back balance control to mid position, the sound should now be coming predominantly from the front channels.

14. Switch the Surround-Cinema-SQ Switch to SQ and play the rest of the test record, or tape, and observe the volume level coming from the different channels. If the front or back is too high or low touch it up with the level control on your amplifiers or receiver. If you don't have level controls or enough gain to attain the correct level, adjust the output level controls on the front panel of the 101A. NOTE! The output level adjustments should be set so when the front panel volume control is wide open the sound level from your speakers is the loudest that you want to play the system, and no louder. Adjusted this way the volume control will have the proper control range. Differences in amplifier gains, speaker efficiencies, and room acoustics can be adjusted for by setting each channel for equal volume and balance in the listening room.

As a final touch up on the front channels, play the last test band and adjust the front channel gains until the sound seems to be coming directly between the two front speakers — we call this position center front. If the sound doesn't give a good tight center front image, move the front speakers closer together or toe them in a little.

The width of the soundfield is adjusted by toeing the back channels in or out. The farther they are turned toward the side walls the wider the soundfield, and the better the side image. If they are turned out too far the center back image will suffer.

Now that you have completed the set up adjustments, plug in the remote control unit, sit back in your favorite listening position and play some of your favorite program material. Start with selections that have good stereo information — the best sounding material in normal stereo will usually be the most outstanding on the 101A. Check the input level and balance frequently, with practice you will be able to listen to the back channels and quickly tell if the system is balanced. A vocalist or other instrument located in center front can be used for balance by "nulling it from the back channels." After spending some time listening to different types of program material you may need to touch up the overall system balance by adjusting the output level trimmers on the front panel.

DOLBY ENCODED VIDEO MATERIAL

There are a large number of films encoded in the Dolby four channel process intended for playback in motion picture theaters with the special Dolby decoder, which by the way, is built around the "Tate" integrated circuits. Many of these films have been transferred to video discs and tapes with the four channel information on the sound track. Someday they will also appear on "stereo television."

The Dolby system works like this: There is a left front channel positioned to the left of the screen, a center dialogue channel positioned in the center of the screen, a right front channel positioned to the right of the screen, and a surround channel with multiple speakers positioned around the sides and rear of the theater. When the Model 101A is in the cinema position information intended for the left front Dolby channel is directed to the left front channel. Information intended for the right front Dolby channel is directed to the right front channel. Information intended for the Dolby center dialogue channel is reproduced in the center front of the room as a phantom channel. The information intended for the Dolby surround channel is reproduced in both back channels.

REMOTE CONTROL UNIT

An optional Remote Control Unit is available for your Model 101A which provides adjustment of the Volume, Front-To-Back

Balance, Left-To-Right Output Balance, and Surround-Cinema-SQ Switch, directly from the listening position where the effect is most noticeable. NOTE! The front panel volume control should be turned down all the way or the remote will not be able to cut the volume all the way down. Also if the front panel volume control is left turned up the system volume may be much higher than desired when remote is unplugged. NOTE! The Right-Left Balance on the remote effects the 101A differently than the Right-Left Input Balance on the 101A. This is because the remote's Right-Left Balance is an OUTPUT Level Control while the Right-Left Balance on the main unit is an INPUT Level Control. The standard remote cable length is 20 ft. and is available in any extra length at a nominal extra charge to cover the cost of the extra wire. The remote can be operated at great distances from the main unit due to the fact that no audio signal travels through the cable, only D.C. control voltages.

SOURCE MATERIAL

It's sad but true that even today some new recordings are practically monophonic. These recordings will produce little or no sound from the back channels. This is not the fault of the 101A but a fault of the recording. Wouldn't it be nice if the recording studios would monitor their mix-downs with a Model 101A?

FOUR CHANNEL PUBLICATIONS

There are two publications published quarterly that are solely devoted to the multi channel medium. They feature interesting informative articles on the subject as well as a selection of hard to find quadraphonic recordings.

Evolution
23757 Canzonet Street
Woodland Hills, CA 91367

MCS Review
P.O. Box 19
Capron, Virginia 23829

SERVICING

This product was manufactured with reliable precision long life components. All controls are of high quality and will probably never have to be cleaned. Should you experience any problems in the set-up or performance of your Model 101A, contact your local dealer or the factory for assistance.

WARRANTY

Fosgate Research, Inc., proudly warrants products to be free of manufacturing defect in material and workmanship as follows: 1 year parts and labor.

This warranty and the extent of the responsibility of FOSGATE RESEARCH, INC., hereunder are subject to the following conditions and limitations: TO THE EXTENT NOT IN CONFLICT WITH APPLICABLE LAW, THIS WARRANTY EXTENDS ONLY IN FAVOR OF THE ORIGINAL OWNER. IT IS THE OWNER'S RESPONSIBILITY TO ESTABLISH THE DATE AND PLACE OF PURCHASE, BY ACCEPTABLE EVIDENCE, AT THE TIME SERVICE IS SOUGHT.

All shipping charges must be prepaid. If the requested repairs or service are within the terms of this warranty Fosgate Research, Inc., will return the unit C.O.D. for the amount of postage.

This warranty is void if the serial number has been altered or removed, or if the product is modified in any manner which Fosgate Research, Inc., concludes, after inspection, affects the reliability of the product; if the product has been repaired or serviced by anyone other than Fosgate Research, Inc.; if the product is damaged because not operated in accordance with the instruction manual.

CONCLUSION

We at Fosgate Research, Inc., take considerable pride in the design and manufacture of the Model 101A and truly hope it will be your favorite component. Any feedback you can give us to help build a better product will be appreciated. We are available to answer your questions on the phone.

It is recommended that you try ALL switch positions and controls to become familiar with how they function and interact, and after sufficient auditioning time, re-read this operation/owner's manual to insure that you comprehend how your Model 101A operates.

SPECIFICATIONS

SEPARATION:	35 TO 50 DB DEPENDING ON SIGNAL DIRECTION
T.H.D.:	TYPICALLY .05% @ 1 KHZ. 0.1 MAX 20 HZ TO 20 KHZ @ 1/2 VOLT OUTPUT, VOLUME CONTROL IN MID POSITION
FREQUENCY RESPONSE:	± 1/2 DB 20 HZ TO 20 KHZ
INPUT LEVEL:	300 MV RMS MINIMUM FOR FULL OUTPUT
INPUT IMPEDANCE:	60,000 OHMS
OUTPUT LEVEL:	ADJUSTABLE TO 3.5 VOLTS RMS
OUTPUT IMPEDANCE:	500 OHMS
NOISE:	—83 DB DOWN FROM FULL LEVEL (UNWEIGHTED)
VOLUME CONTROL TRACKING:	± 1/2 DB FOR 70 DB CONTROL RANGE
CONTROLS:	INPUT LEVEL INPUT BALANCE OUTPUT VOLUME OUTPUT LEVELS FRONT TO BACK BALANCE BYPASS-NORMAL-ALTERNATE DYNAMICS SWITCH TAPE-MAIN-MONO SWITCH SURROUND-CINEMA-SQ MODE SWITCH REMOTE CONTROL JACKS (FRONT AND REAR)
INDICATOR LEDS:	INPUT BALANCE INDICATOR (YELLOW) CLIPPING LEVEL INDICATOR (RED) MINIMUM LEVEL INDICATOR (GREEN)
SIZE:	1 3/4" HIGH X 17 1/4" WIDE X 5 3/4" DEEP 19" WIDE WITH RACK MOUNT ADAPTERS INSTALLED
REMOTE CONTROL:	LEFT TO RIGHT BALANCE FRONT TO BACK BALANCE MODE SWITCH VOLUME
REMOTE SIZE:	5" LONG X 1 7/8" WIDE X 1" DEEP 20' CONNECTING CORD
FRONT PANEL FINISH:	BLACK ANODIZED BRUSHED ALUMINUM STANDARD OPTIONAL SILVER PANEL AVAILABLE
WEIGHT WITH REMOTE:	NET WEIGHT 7.1 LBS. SHIPPING WEIGHT 10 LBS.
SOLID STATE DEVICES:	22 INTEGRATED CIRCUITS, 10 TRANSISTORS, 26 DIODES