Film-Tech

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INSTALLATION AND OPERATION MANUAL

MS1000 MONAURAL SOUND SYSTEM

SMART THEATRE SYSTEMS

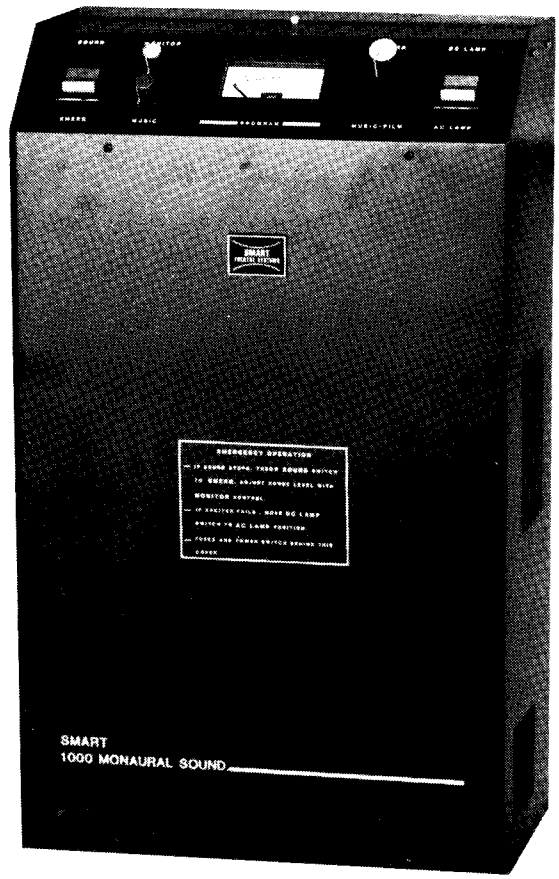
SMART THEATRE SYSTEMS

3856 Green Industrial Way, Atlanta, GA 30341 (404) 452-1820

MS1000 MONAURAL SOUND SYSTEM

FEATURES

Field Replaceable Modules
Two Projector System
Dual Voltage Exciter Supply
100 Watt RMS MOSFET Main Amplifier
100 Watt RMS Emergency-Monitor Amplifier
Built-In Monitor Speaker
Electronic Soundtrack Cleaner
Music Fade-In and Out
Automation Capable
117-230 VAC 50/60 Hz Operation
Quality Heavy Monitor Speaker
Emergency AC Lamp Supply
Dual Low Noise Preamplifiers
HF and LF Sound Shaping Controls
Large Program Meter
:parate Music Level Control
Film High Pass Filter
Modular Construction
Heavy Steel Wall Cabinet
Modified Academy Playback Curve
Quality Engineered
Separate Monitor Control
Stylish Design



LATEST DESIGN TECHNOLOGY IN A COMPLETE THEATRE SOUND PACKAGE

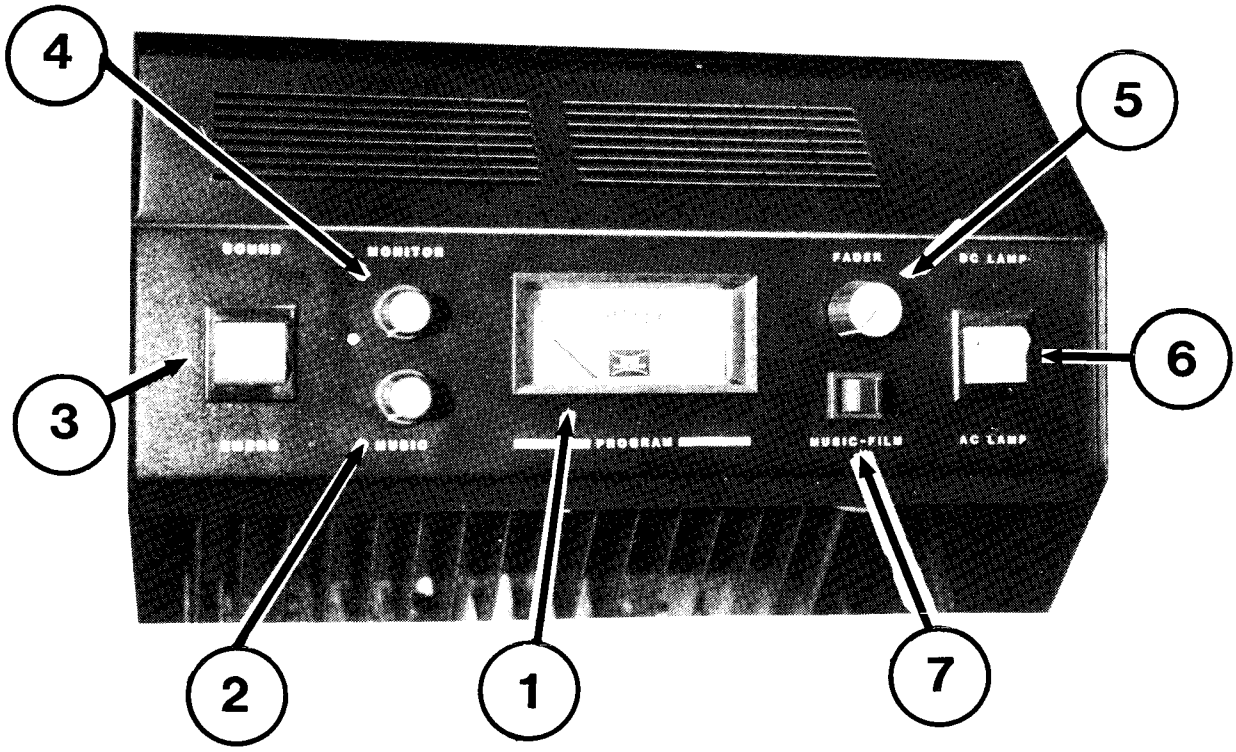
The SMART MS1000 Monaural Sound System features the lastest technology in motion picture presentation capability. A compact wall mounted sound package that includes all the features you would expect in a customized system. Modular construction assures easy servicing with field replaceable amplifiers, power pack, and projector preamplifier card. The exclusive "Electronic Soundtrack Cleaner" removes minor film scratch noises from worn prints without affecting the fidelity whatsoever. This sophisticated circuit is especially important to second and third run theatres that receive prints that may have been abused. The SMART MS1000 may be used in single or dual projector booths. Internal projector trim controls assure a perfect balance during changeover. BASS and HF-Academy sound shaping controls let you "sweeten" the sound playback for the most pleasing effect. The Intermission music (Non-Sync) Fade-In and Fade-Out module may be activated by automation equipment for a professional presentation in the auditorium. The DC exciter Lamp supply can handle a hefty 5 Amperes of current in two ranges for domestic or foreign exciter bulbs. The built-in AC backup supply is activated from the front panel, as is the the emergency amplifier. When the emergency amplifier is in standby, it is used as the booth monitor amplifier. The MONITOR-EMERGENCY power amplifier s the same power capability as the main amplifier. Premium components like the MOSFET power amplifier and large broadcast type program meter make the SMART MS1000 a leader in the field.

SMART THEATRE SYSTEMS

SMART THEATRE SYSTEMS

3856 Green Industrial Way, Atlanta, GA 30341 (404) 452-1820

MS1000 OPERATING CONTROLS



(1) PROGRAM METER. Indicates the audio level of the soundtrack or intermission music source. This broadcast type meter is also used to calibrate the system during installation.

(2) MUSIC CONTROL. Sets the audio level of the non-sync music source. This control is independent of the MASTER FADER. A different volume level may be set for music and film programs.

(3) SOUND-EMERGENCY SWITCH. This switch is used in case there is a main power amplifier failure. The switch is normally in the SOUND position. If the backup power amplifier is needed, switch to EMERG and use the MONITOR fader control to set the house sound level. The monitor speaker will continue to operate when in the EMERG position.

(4) MONITOR. The monitor fader sets the booth monitor sound level when the system is in normal operation. The control is also used to set the sound level in the auditorium if the SOUND-EMERG switch is in the EMERG position.

(5) MASTER FADER. This is the main sound level control for the film soundtrack. The fader is independent of the MUSIC control. Soundtrack and music programs may be set to different levels. The MASTER FADER is not used during emergency operation.

(6) DC LAMP - AC LAMP. Normal operation is with the switch in the DC LAMP mode. If the exciter lamp power supply should fail, switch to the AC LAMP mode. The exciter bulb will receive AC voltage for this emergency.

(7) MUSIC-FILM. A manual switch to initiate a Fade-Out of non-sync music, and Fade-In of film. If the sound system has been wired to an automation system that controls this function, then the switch *MUST be left in the FILM mode.*

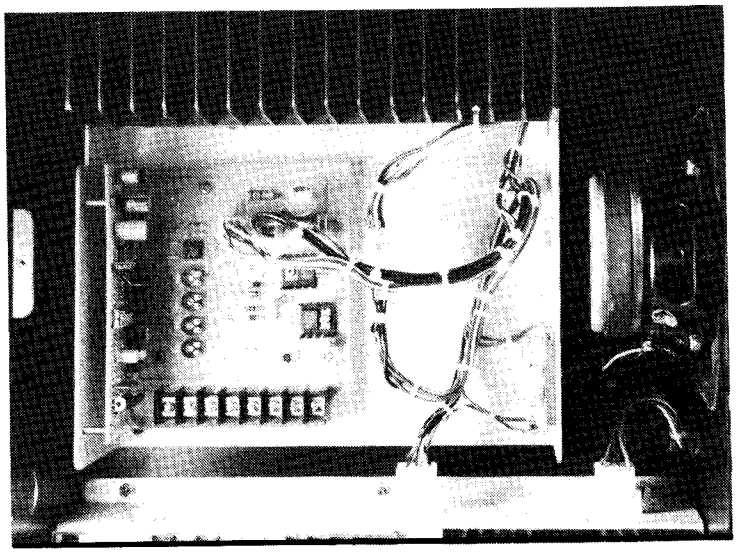
A complete description of the operation of the MS1000 System is covered in this manual. Refer to the proper section for an expanded explanation of each function and control.

MODEL MS1000 INSTALLATION INSTRUCTIONS

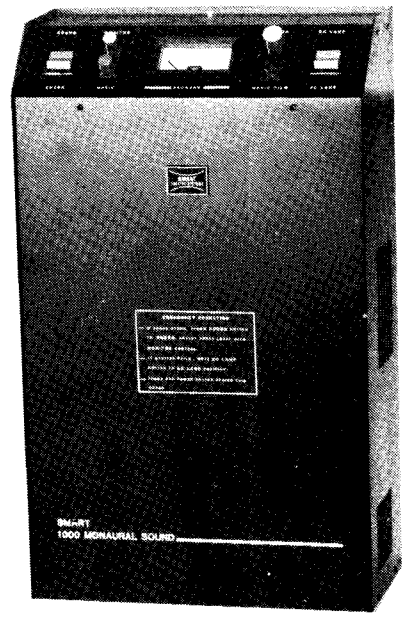
The Model MS1000 is a complete, state-of-the-art monaural sound system containing two projector inputs, intermission music fade, a 100 watt MOSFET amplifier, an exciter lamp supply, and emergency lamp and amplifier backup systems.

The system is modular and all components are removable for service or replacement. Spare modules are available from the factory and are recommended for multiple screen installations. The service section of this manual explains the procedures for removing and replacing sub modules of the MS1000 system.

The MS1000 system features a powerful ELECTRONIC SOUNDTRACK CLEANER system that removes up to 10 dB of noise in monaural soundtracks caused by minor film scratches, photographic grain noise, and dirt picked up on the film. This special circuitry is called Dynamic Noise Reduction. The proper threshold setting is established when the system is calibrated to a known reference level during installation. The circuitry is very stable and will does not require any special attention once it is set.



INSIDE VIEW OF MODULAR CONSTRUCTION OF THE MS1000



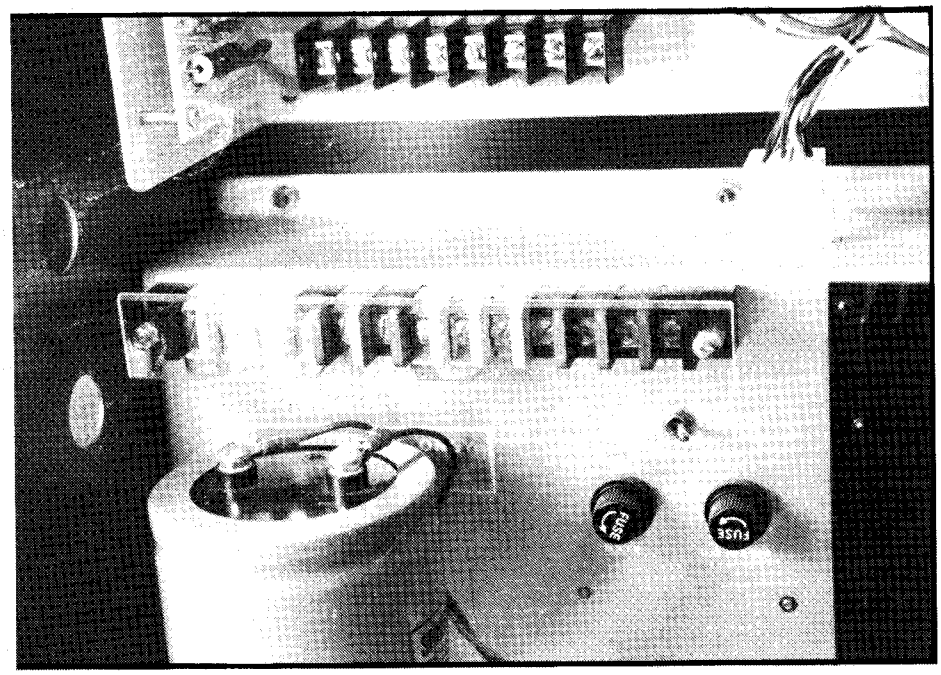
HOOKUP

The MS 1000 package may be operated on either 117VAC or 230VAC 50/60 Hz power. Two conduit entry holes are on the left side of the wall mount cabinet and should be used to route all power, inputs , and outputs to the system. The lower conduit entry is intended for the AC power entry plus the stage speaker exit conduit. Also, a remote COMMAND line can be connected to automation equipment, or connected to a remote manual switch to transition between pre-show music and the film source.

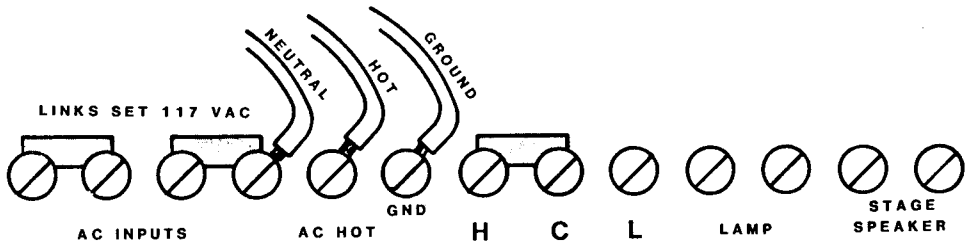
The top conduit entry hole is for the projector solar cell input line(s) and the music player. It is important the these *low level audio lines not be run in the same conduit as the high level speaker lines and AC power lines in order to avoid hum and oscillation problems.* If the Model 1000 system is used on a temporary basis (and not permanently installed), the entry holes should have conduit nipple fittings installed before lines are pulled, so that the sharp edges of the cabinet do not cut the lines.

A third conduit entry is available on the right side of the cabinet for more versatility in rounting conduit runs, and ease of wiring. Observe the rules of keeping low level and high level lines separated.

THE POWER SUPPLY. Care should be used in routing wires to the AC input to the power supply so that power leads do not come in contact with other components in the system. Long AC leads can generate HUM in the audio portion of the chassis. Leads *should be short* and *dressed away from the preamplifier section* of the system. The 1000 is capable of either 117VAC or 230 VAC operation by placing the metal shorting links on the AC input terminals in the proper position before connecting the leads. The diagram below indicates the 117VAC hookup. The NEUTRAL AC lead should be connected to the NEUTRAL AC terminal (the fourth terminal from the left end of the barrier strip). The "HOT" AC lead to the next terminal (fifth from the left), and the AC GROUND wire (Green) to the sixth AC terminal. The terminals are clearly labeled under the barrier strip. Two metal shorting links are supplied installed on the barrier strip for selecting 117 VAC or 230 VAC operation. These links must be in the correct position for the selected voltage. The MS1000 is shipped with the links in the 117 VAC position.

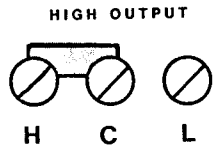


A SAFETY SHIELD COVERS THE HIGH VOLTAGE INPUT BARRIER STRIP AND MUST BE REPLACED AFTER INSTALLATION.

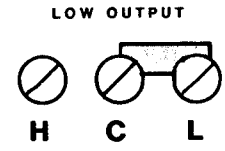


HOOKUP OF THE BARRIER STRIP ON THE MS1000 POWER SUPPLY

EXCITER LAMP HOOKUP. The two terminals labeled LAMP on the right side of the barrier strip are the EXCITER OUTPUT terminals. The operating voltage is set by a metal shorting link across two of the VOLTAGE SELECT terminals. "H" indicates HIGH voltage (for American exciter bulbs) and "L" indicates LOW for European bulbs. The link must be placed between "C"(Common) and one of these terminals for output to appear on the LAMP Output terminals. Use 14 AWG wires (or larger) between the Exciter supply and the lamp.

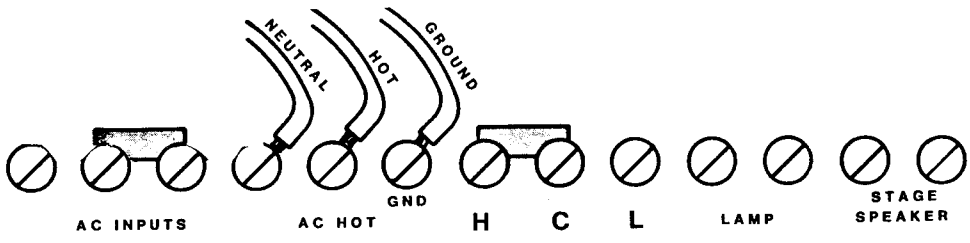


INSTALL THE METAL LINK AS SHOWN FOR HIGH VOLTAGE OUTPUT AT THE EXCITER LAMP OUTPUT TERMINALS

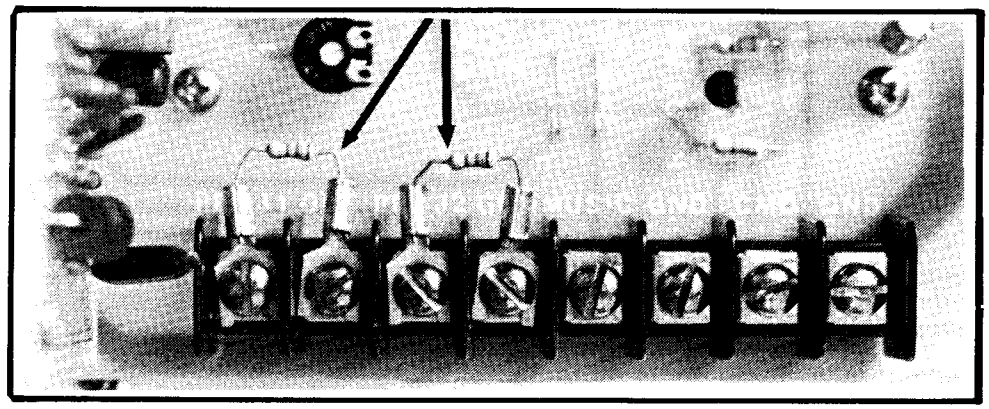


THE METAL LINK IS MOVED TO THE "L" AND "C" TERMINALS FOR LOW EXCITER VOLTAGE REQUIRED WITH FOREIGN EXCITER BULBS

STAGE SPEAKER. The terminals on the far right of the power supply barrier strip feed the output of the main power amplifier to the stage speaker. The main and emergency amplifiers are both rated at 100 watts RMS into 8 ohms (160 watts into 4 ohms). The SPEAKER terminal on the far right is connected to the system chassis ground. Before connecting the stage speaker to the terminals, *check the wires with an ohmeter* to see that they are not shorted. Also check resistance from each wire to building ground to see that they are not shorted to conduit. Connecting a grounded speaker wire to the "Hot" amplifier output could damage the power amplifier.



THE AC INPUT VOLTAGE MAY BE EASILY CHANGED TO 230 VAC OPERATION BY REMOVING THE TWO METAL LINKS AND REPLACING ONE AS SHOWN



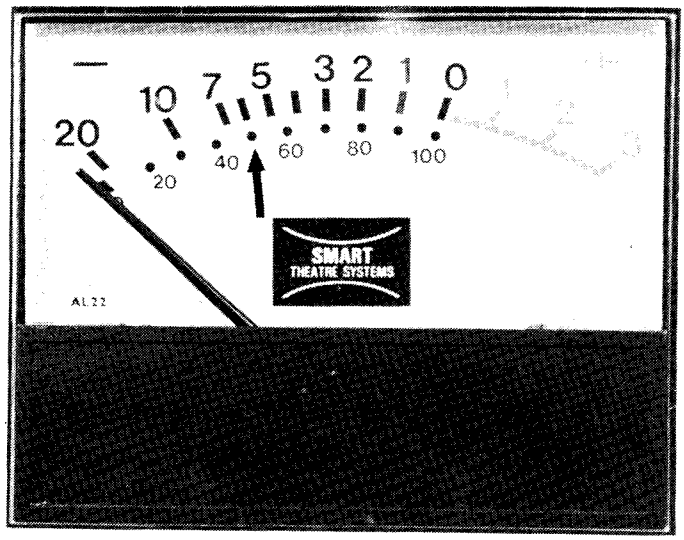
THE TWO TERMINATING RESISTORS MUST BE REMOVED IF THE "LOW" EXCITER VOLTAGE OPERATION HAS BEEN SELECTED

SOLAR CELL INPUTS. The Model MS1000 system will handle two projector inputs. Exciter changeover must be employed to transition between two projectors. The inputs are unbalanced. The terminal labeled PROJ 1 is the Projector 1 input, with the next terminal as ground. The PROJ 2 terminal is Projector 2 input, and the adjacent terminal is ground. TWO 1200 ΩRESISTORS are installed on the Projector input terminals when shipped from the factory. These resistors are supplied to lower the input termination to the preamplifiers and thereby reduce the drive to the preamplifiers. See the section of this manual that covers the calibration of the system for more details on the use of the input termination resistors.

MUSIC INPUT. A tape player or CD player may be connected to the MUSIC INPUT terminals for intermission music. The terminal labeled CMD (COMMAND) initiates a music fade and film fade-in when grounded to the nearby GROUND terminal. This action may be controlled by automation equipment or by a remote manual SPST switch. The action *is duplicated on the front panel MUSIC-FILM switch* for manual operation. The switch must be in the FILM position if automation equipment is used. Wires used for remote control of the Music-Film transition do not need to be shielded. Only DC voltage is carried on the cable.

CALIBRATION

After completing the hook-up procedure, run a Dolby™ reference test loop (50% modulation) on one projector. Set the MUSIC-FILM switch into the FILM mode. Adjust the Projector one input gain pot until a -6 level (50% on lower meter scale) is read on the front panel program meter. THIS PROCEDURE SETS THE TRACKING OF THE ELECTRONIC SOUNDTRACK CLEANER CIRCUIT. Also, the best signal-to-noise figure for the system will be reached when the system is calibrated to the test loop.

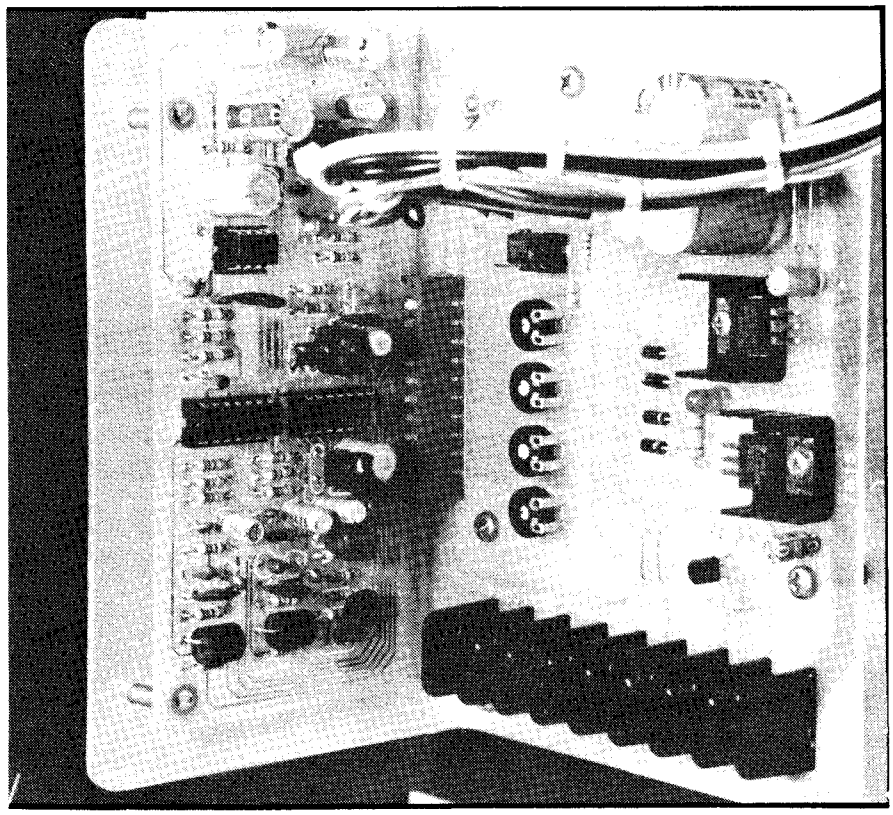


WITH A DOLBY™ TONE FILM LOOP RUNNING, ADJUST THE FRONT PANEL METER TO 50% USING THE PROJECTOR PREAMP CONTROLS IN ORDER TO SET THE TRACKING OF THE "ELECTRONIC SOUNDTRACK CLEANER"

TWO PROJECTOR BOOTHS. After calibrating the first projector, make an exciter light changeover. Move the test loop to the other projector and adjust the Projector two input gain for the same value.

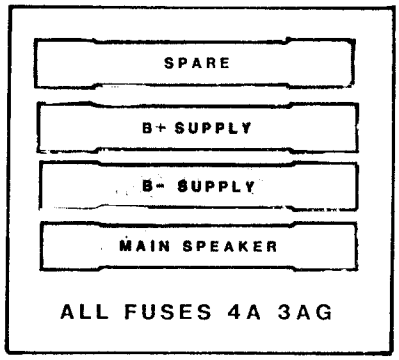
If you DO NOT HAVE A DOLBY™ TEST LOOP, follow the procedure outlined in the previous paragraph using Preview Trailers instead of a Dolby test loop. Adjust the first projector input gain control until 100% modulation (0 VU) is observed during program peaks on the panel meter. Remove the trailers and use any constant tone test loop you may have handy (a SMPTE 1 kHz loop is ideal). Note the level on the program meter. Now, run the loop on the second projector and set the PROJ 2 gain control for the same reading as the PROJ 1 level.

INPUT TERMINATION RESISTORS. Two resistors are installed on the PROJ 1 and PROJ 2 solar cell inputs when shipped from the factory. They are supplied because of various conditions that may exist in field installations. Each resistor will lower the gain of the input preamplifier by 6 dB. Projectors with wide slit lenses, large solar cell collectors, and high light output exciter lamps may overdrive the preamplifier inputs causing distortion during loud soundtrack passages. *The resistors should be left in place if gain reduction is required.* However, modern narrow slit soundhead lenses, reduced exciter lamp light output may result in not being able to calibrate the system to the 50% mark on the meter. In this case, the resistors should be removed to increase the gain of the preamplifier. In other words, if the soundhead you are using has plenty on sound output and calibration is achievable with the resistors in place, leave them in the circuit. If not, remove them.



THE PREAMP CARD PLUGS INTO THE CARD EDGE CONNECTOR ON THE MOTHER BOARD.

When the MS1000 is used with foreign projectors that have low voltage exciter lamps it is necessary to remove the input termination resistors. Failure to remove the resistors will result in a system HUM when the exciter supply is in the LOW LAMP output position.



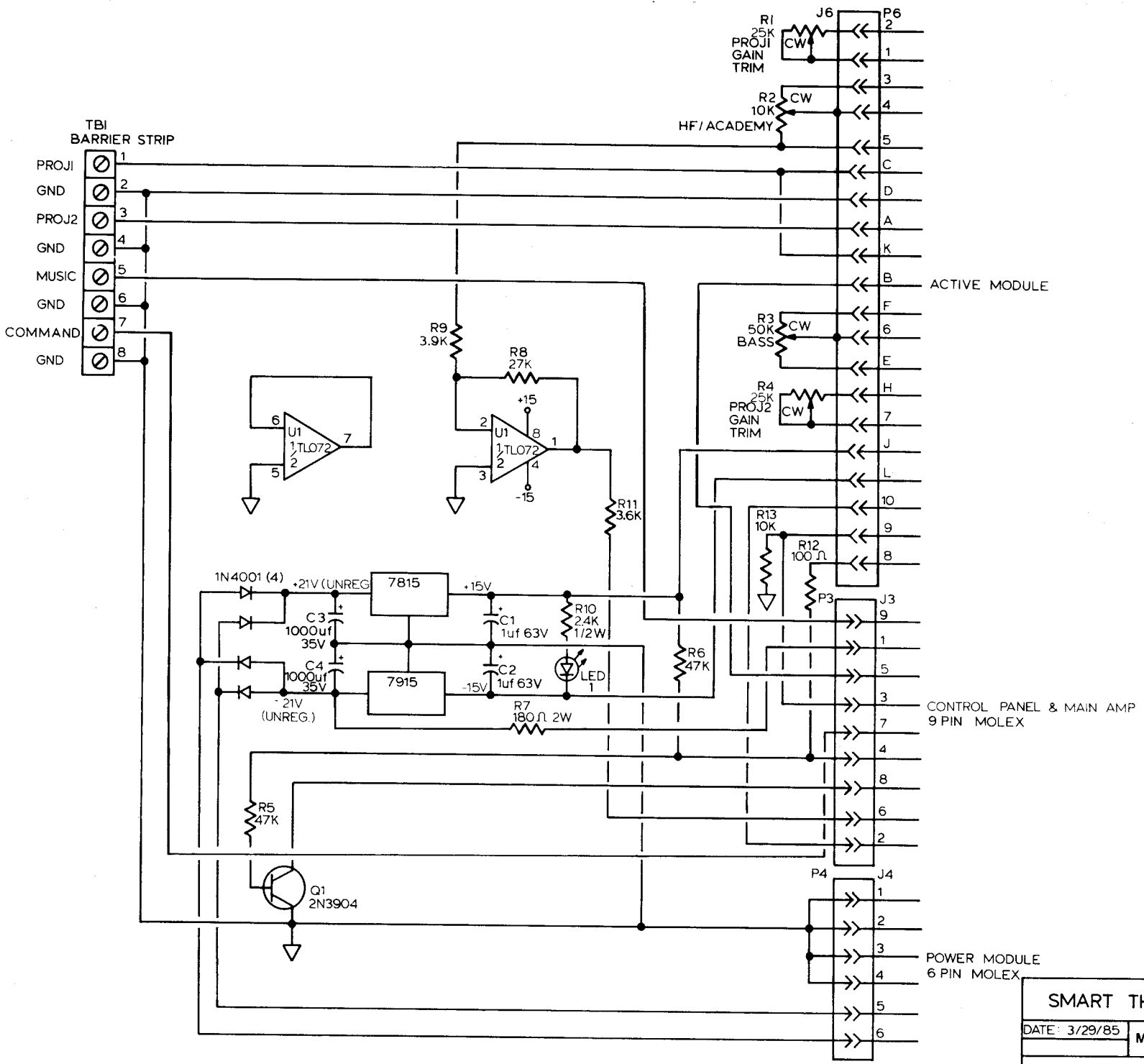
FUSE BLOCKS. There are four(4) fuse holders in the inner chassis that protect the main power amplifier and stage speaker. The chart diagram to the left shows the position of the fuses. Notice that the top fuse is a spare and is not connected electrically. All fuses are 4 amp 3AG fast blow types. The Backup amplifier output is*not fused* because a failure of the main amplifier may take the speaker fuse out, leaving the speaker circuit open.

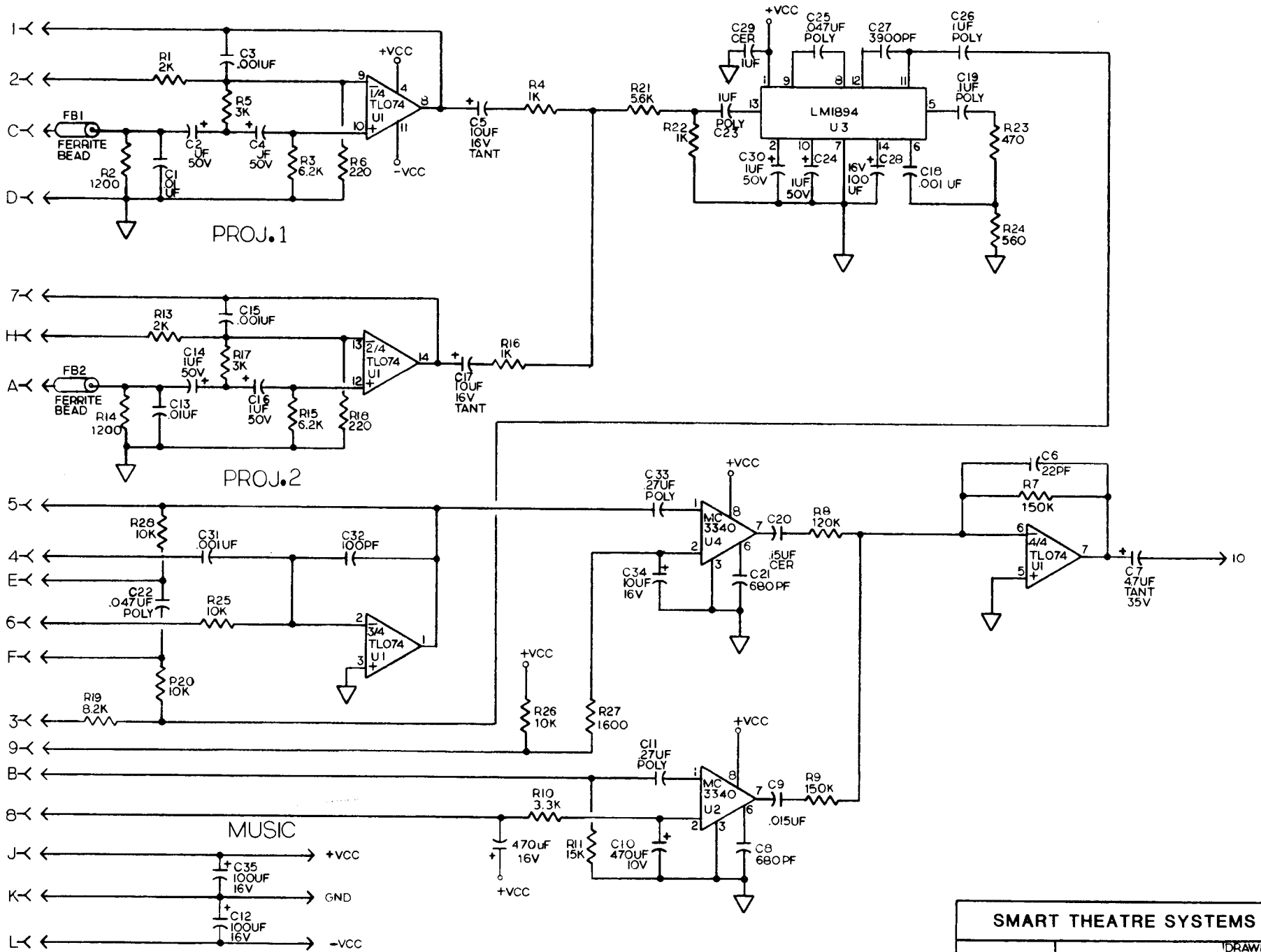
EMERGENCY POWER AMPLIFIER. When the front panel switch is moved from the SOUND to the EMERG (Emergency) position, the *backup amplifier will feed the stage speaker* and the internal monitor speaker will reduce in sound level. This is necessary in order to be able to drive the stage speaker with sufficient power to equal the level of the main power amplifier. If the monitor speaker level were not automatically reduced, the sound would be too loud in the booth, and not loud enough in the auditorium. Adjust the *FRONT PANEL MONITOR FADER* for proper sound when in the EMERG position.

HF-ACADEMY CONTROL. This control sets the playback high frequency brightness of the sound. Fully clockwise is the brightest setting (flat response), and rotation counter-clockwise introduces a HF rolloff. Set the control to the most pleasing setting while listening to a normal feature film.

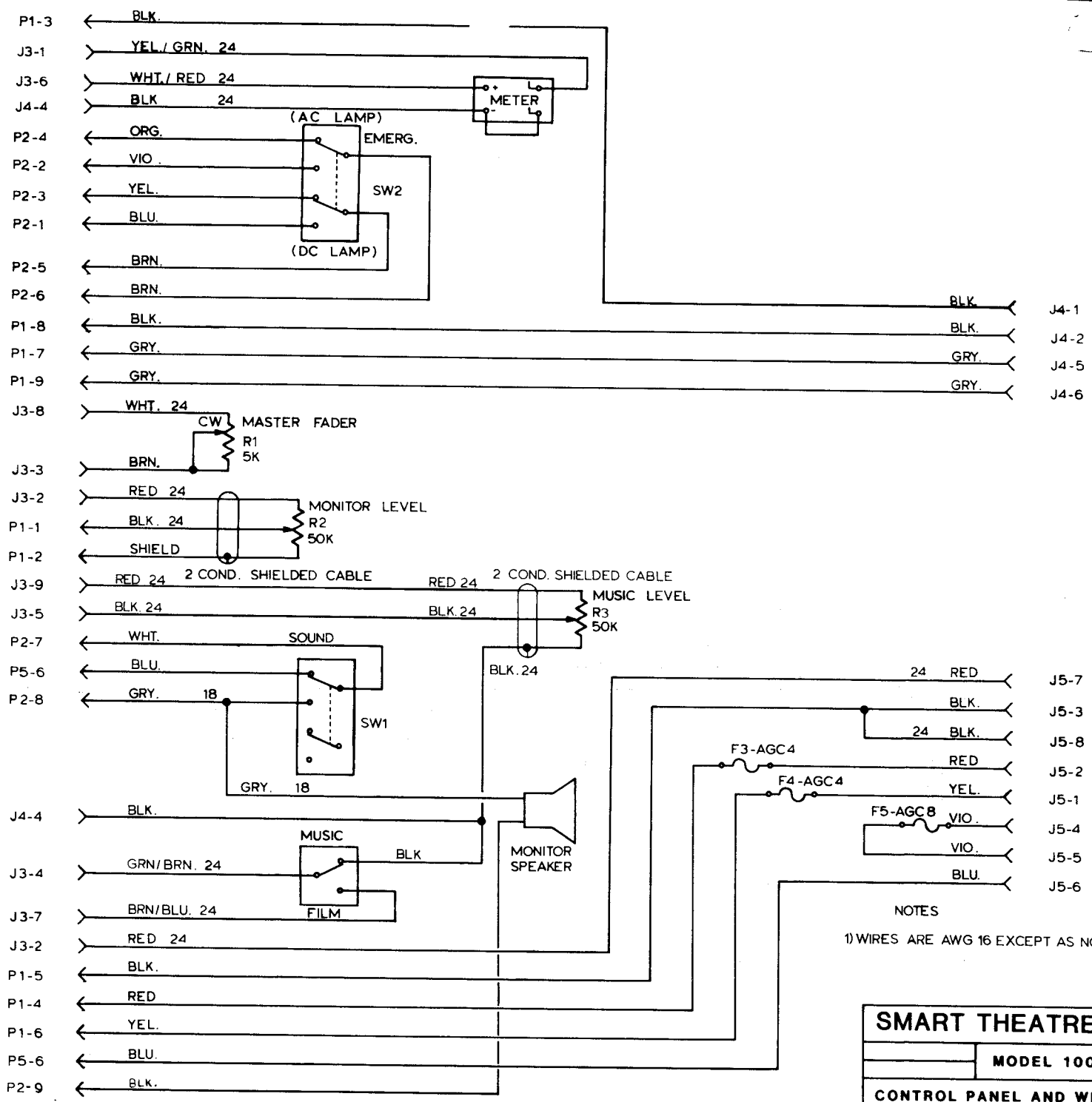
BASS CONTROL. The bass control on the preamplifier mother board is normally shipped in the mid-rotation position. This is the approximate flat response setting. Rotation of the control clockwise will introduce a bass boost, and counter rotation will cut the bass response. Be aware that some stage speakers do not have extended bass capability, and adding more bass boost will cause overload and distortion in the speaker system. Set the control to the most pleasing setting while listening to a monaural feature film soundtrack.

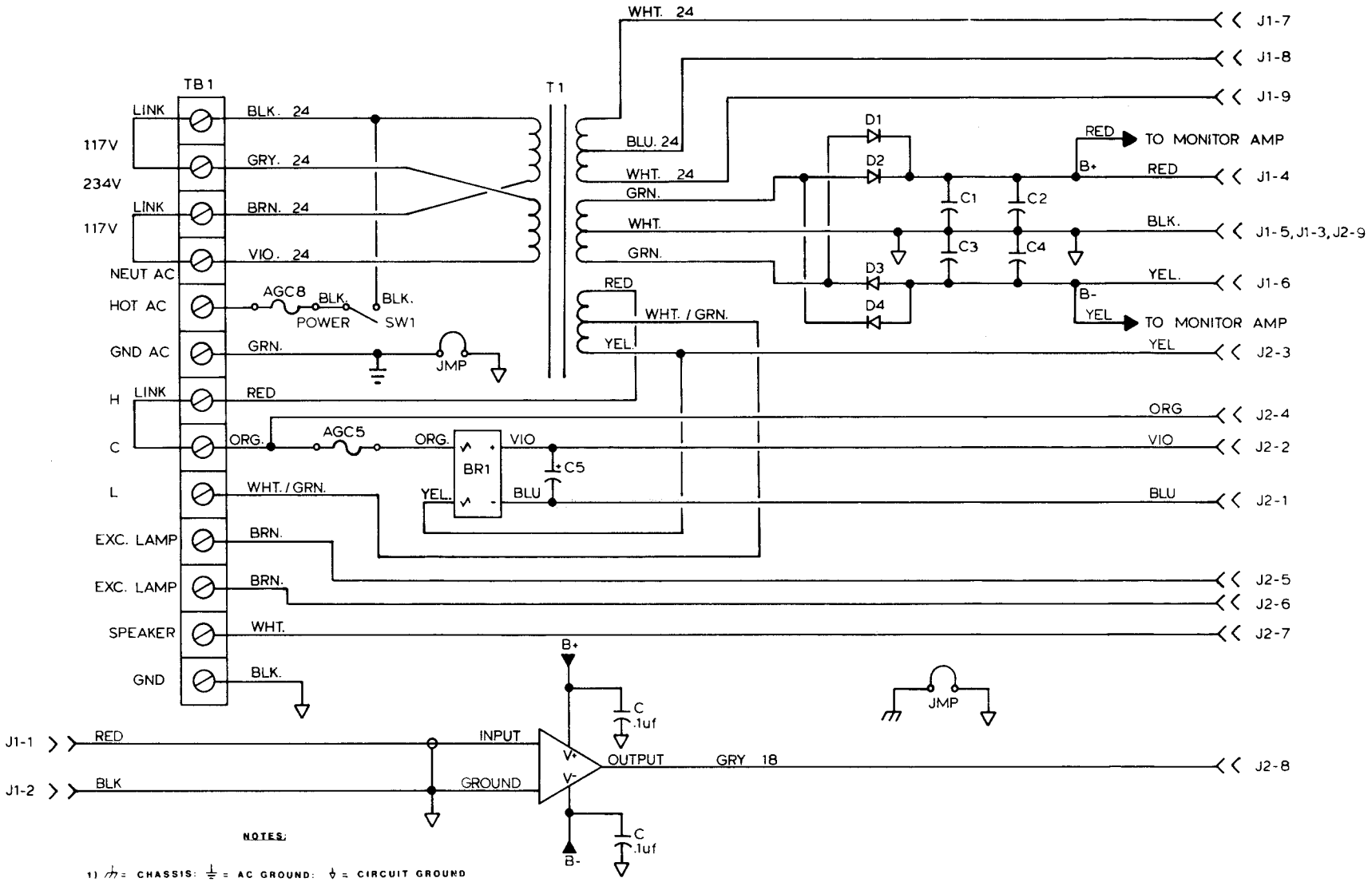
230 VOLT OPERATION. The power supply in the MS1000 is capable of either 117 VAC or 230 VAC 50/60 Hz operation. Remove the two metal jumpers that are supplied for 117 VAC operation and replace only one in the position shown in the diagram. AC input wiring is the same for both voltage options.


TBI
BARRIER STRIP
PROJ1
GND
PROJ2
GND
MUSIC
GND
COMMAND
GND
R1
25K
PROJ1
GAIN
TRIM
CW
R2
10K
HF/ACADEMY
CW
J6
P6
ACTIVE MODULE
R3
50K
BASS
CW
R4
25K
PROJ2
GAIN
TRIM
CW
R9
3.9K
R8
27K
U1
1/TL072
+15
-15
R11
3.6K
R13
10K
R12
100Ω
P3
J3
1N4001 (4)
+21V (UNREG.)
7815
+15V
C3
1000uf
35V
C1
1uf 63V
R10
2.4K
1/2W
C4
1000uf
35V
7915
-15V
C2
1uf 63V
LED
1
R6
47K
-21V
(UNREG.)
R7
180Ω 2W
CONTROL PANEL & MAIN AMP
9 PIN MOLEX
R5
47K
Q1
2N3904
P4
J4
POWER MODULE
6 PIN MOLEX
SMART THEATRE SYSTEMS INC
DATE: 3/29/85
MODEL 1000
DRAWN BY: K.L.M
1000 MOTHER BOARD
SHEET 1 of 4
1000B301



SMART THEATRE SYSTEMS INC.	
DATE: 11/27/84	DRAWN BY:
MODEL 1000 PREAMP CA	
SCHEMATIC SHEET2 OF 4	1000B310


P1-3
BLK.
J3-1
YEL./ GRN. 24
J3-6
WHT./ RED 24
J4-4
BLK 24
METER
(AC LAMP)
P2-4
ORG.
EMERG.
P2-2
VIO.
P2-3
YEL.
SW2
P2-1
BLU.
(DC LAMP)
P2-5
BRN.
P2-6
BRN.
BLK.
J4-1
P1-8
BLK.
BLK.
J4-2
P1-7
GRY.
GRY.
J4-5
P1-9
GRY.
GRY.
J4-6
J3-8
WHT. 24
CW
MASTER FADER
R1
5K
J3-3
BRN.
J3-2
RED 24
MONITOR LEVEL
P1-1
BLK. 24
R2
50K
P1-2
SHIELD
J3-9
RED 24
2 COND. SHIELDED CABLE
RED 24
2 COND. SHIELDED CABLE
MUSIC LEVEL
J3-5
BLK. 24
BLK. 24
R3
50K
P2-7
WHT.
SOUND
P5-6
BLU.
P2-8
GRY.
18
SW1
BLK. 24
24
RED
J5-7
BLK.
J5-3
24
BLK.
J5-8
F3-AGC4
RED
J5-2
F4-AGC4
YEL.
J5-1
F5-AGC8
VIO.
J5-4
VIO.
J5-5
BLU.
J5-6
GRY.
18
J4-4
BLK.
MONITOR
SPEAKER
MUSIC
BLK
J3-4
GRN/BRN. 24
FILM
J3-7
BRN/BLU. 24
J3-2
RED 24
P1-5
BLK.
P1-4
RED
P1-6
YEL.
P5-6
BLU.
P2-9
BLK.
NOTES
1) WIRES ARE AWG 16 EXCEPT AS NOTED.
SMART THEATRE SYSTE
MODEL 1000
CONTROL PANEL AND WIRING HARN
SCHEMATIC SHEET 3 OF 4
1000



NOTES:

1) ⏚ = CHASSIS; ⏚ = AC GROUND; ⏚ = CIRCUIT GROUND

2) C1-C4 = 2200uF 63v

3) T1 = PART #900007

4) JMP = JUMPER

5) BR1 = BRIDGE RECTIFIER,25A,STUD MOUNT

6) D1-D4 = IN5402

7) C1-C4,D1-D4,B+,B-,⏚ ON POWERSUPPLY BOARD

8) C5 = 66000uF,15v

SMART THEATRE SYSTEMS		
5/15/85	MODEL 1000	
POWER SUPPLY ASSEMBLY		
SHEET 4 OF 4		1000B330