Film-Tech

The information contained in this Adobe Acrobat pdf file is provided at your own risk and good judgment.

These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

If you are not a qualified technician, please make no adjuatments to anything you may read about in these Adobe manual downloads

www.film-tech.com

INSTALLATION AND OPERATION MANUAL

SR300 DELUXE OPTICAL STEREO DECODER

SMART
THEATRE SYSTEMS

SMART THEATRE SYSTEMS
P.O. Box 80361, Atlanta, GA. 30341, (404) 452-1820

SR300 STEREO DECODER

CRASH COURSE

For those installers who have installed this product before, here is a brief checklist of each step of hookup and adjustment. A detailed description is offered for each phase or option within this manual. If you have not installed his product before, we suggest you become familiar with the unit by reading this manual.

- Hook up solar cells using *three conductor shielded* audio cable. Ground shield to the SR300 input terminal end *only*.
- Connect stereo tape player to music input terminals using *shielded* audio cable. (page 3)
- Use shielded wire to connect each output channel to it's respective input terminal of the next piece of equipment in the system. (page 3)
- Hook up emergency power supply (or move option shunt inside the SR300) and power the emergency preamplifier. (page 4)
- Select the changeover scheme (if dual projector booth) and move internal shunt to desired action. (page 4) Route changeover wire to automation equipment or manual remote switch and connect to SR300 and switch.
- Run twisted pair to remote switch for music fade to transition between film and music. (page 5)
- Remove the two front panel security covers and adjust preamps, music input level, time delay, and output levels as outlined in this manual. (page 6)
- Set mono playback level, emergency level, and other optional equipment that may be used in system (mag preamps, Stereo Generator, etc.)
- Replace security cover and play Stereo and Mono prints to check sound quality.

This manual gives a complete procedure for each of the installation and calibration steps. Additional information can be obtained from the factory from Technical Support.

SR300 INSTALLATION INSTRUCTIONS.

In order to properly install the SR300, you must know all of the features of the unit and how they operate. You then can get the most from the system, and instruct the owner or operator on how to use the unit to it's maximum potential. A complete description of each of the adjustments is included. Before installing or operating this product, please familiarize yourself with the various options and interconnection techniques mentioned in this manual.

The SR300 is a complex and complete Optical Stereo processor that contains a number of features that are not included in competitive products. Also there are several redundant circuits used for backup, or separate processing of the audio signals. For instance, there are three audio paths from the solar cell inputs. Solar cell stereo preamps (2 pair) process the high fidelity stereo soundtracks. A mono chain shapes the signal and sums the Left and Right solar cell signals to feed the **ELECTRONIC FILM CLEANER**. Another preamp is used for a separate emergency system in the event of a problem with the main systems. In all, there are four solar cell preamps in the unit, an emergency preamp system, and a separate mono signal path. A review of the system block diagram may be helpful in understanding the flow of audio signals through the processor.

Make sure the SR300 shipping box contains the following:

(1) The SR300 Optical Stereo Decoder.
(2) A Dolby Cat.69 reference film (5 ft.)
(3) A Dolby Cat.97 Left-Right Alignment film (5 ft.)
(4) A plastic tuning tool (for setting hidden controls).
(5) A 5/64th hex Allen wrench (for removing the security covers.)
(6) Warranty card, and a return envelope.
(7) Emergency Power Supply Pack.
(8) Package of 4 rack mounting screws (10-32 X 3/4).
(9) Four 1500 ohm termination resistors.

Also, this manual is included with each shipment so that you can leave a copy with the theatre owner or operator.

The large front panel meter is not only used for monitoring program material during the theater's performance but is also used to *make all set up calibrations* during the installation phase. See the section of this manual that describes meter use.

INSTALLATION INSTRUCTIONS

SOLAR CELLS. Align the solar cells using the Left-Right alignment loop for maximum separation and minimum crosstalk. A convenient point to attach your dual trace scope is the *LEFT main* and *RIGHT main* outputs of the SR300. Adjust the sound optical lens focus and azimuth using the X-Y inputs of the scope, while monitoring a real time analyzer. A good place to connect the scope is to the N/C terminals on the rear barrier strip. These terminals are labeled N/C (No connection) because they are test points and not used in system wiring. One terminal contains the LEFT preamp output and the other the RIGHT preamp output. The standard procedure for aligning the "A" chain of the projector soundhead is covered thoroughly in other publications.

ADDITIONAL STEREO PREAMP GAIN.

Many foreign projectors with low voltage exciter lamps cannot generate enough light to satisfy the input level from the solar cell to calibrate to Dolby level. With narrow slit optical sound lenses, the SR300 may fall 1 or 2 dB short of gain when you attempt to calibrate to the proper reference level for the noise reduction circuits to track properly. The input gain of the SR300 has been increased 5 db to compensate for low signal input. However, the increased gain *may be too much* for high output exciter lamps. You may be forced to reduce the input trim controls of the SR300 to minimum. Often a reduction of the exciter lamp supply will allow the signal input to fall into proper calibration range. The proper way to compensate for too much input signal is to use the two 1500 ohm resistors (per solar cell input channel) furnished with the SR300 to reduce the termination at the barrier strip of the SR300 solar cell input terminals. Figure 2 shows the preferred connections. **DO NOT CONNECT THE ADDITIONAL RESISTORS TO THE GROUND TERMINAL.**

INPUT WIRING. The stereo solar cells for each projector is wired to the input terminals on the rear of the SR300. It is *MANDATORY THAT YOU USE CABLE THAT CONTAINS THREE CONDUCTORS PLUS SHIELD.* The solar cell inputs of this unit are BALANCED, using a precision differential amplifier circuit with high common mode rejection. If you ignore this advise by using two conductor shielded cable, and grounding the shield, you will cause more problems than you may wish to handle. Connect the Left solar cell lead to the LEFT(L) input terminal. This lead is RED. Connect the GREEN Right solar cell wire to the RIGHT(R) input terminal. The Black common solar cell wire should connect to the NEUTRAL(N) terminal. *Cut the shield lead off the cable at the projector end* and wrap the cable with electrical tape so that none of the shield can touch the grounded projector parts. Connect the shield wire on the other end of the cable to the GROUND(GND) terminal of the SR300. Perform the same procedure for the second projector inputs if the booth has two machines.

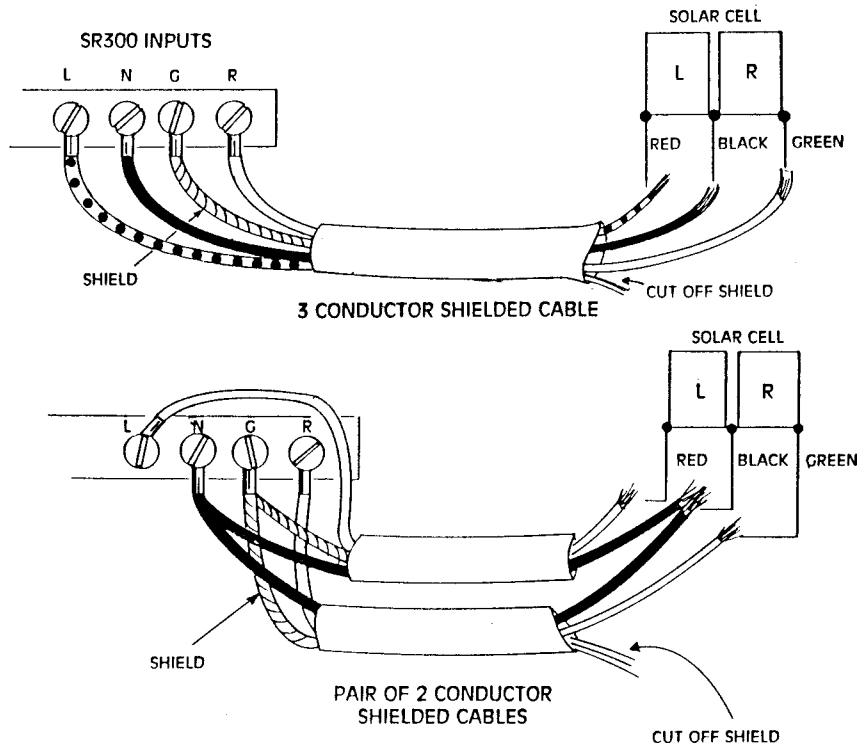
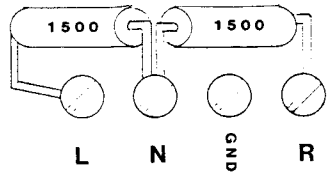


Fig. 1

Figure 2



DOUBLE CHECK your work to see that the solar cell leads arrive at the proper terminals. A reversal of two of the three leads will cause very strange results. You may hear the center channel information through the surround speakers, the surround through the stage, and the left channel out of phase with the right. This is a common error, so verify correct wiring before proceeding.

SYSTEM WIRING

MUSIC INPUTS. The SR300 will accept most outputs from music stereo machines used for intermission music in theaters. A low or high impedance tape player with 1 volt to ¼ volt output capability is satisfactory. Connect the left output to the LEFT(L) music input on the rear barrier strip. Likewise, connect the right output of the stereo player to the RIGHT(R) put terminal. The shield ground should connect between the L & R terminals to the GROUND(GND) terminal.

OUTPUTS. The four channel outputs are labeled (L)LEFT, (C)CENTER, (R)RIGHT AND (S)SURROUND. Shielded cable should be run between these terminals and the next piece of equipment in the sound system (equalizer, amplifier, etc.). Convenient ground (GND) terminals are provided near each output.

PROGRAM SELECTOR. Terminals marked PGM (PROGRAM) A & B allow remote wiring of the program buttons on the front panel of the SR300. This allows the operator to switch modes of operation without returning to the equipment rack. He can set the "A" program selector switch to his first choice, *i.e.* MONO for trailers, and the "B" selector for SVA STEREO. A momentary contact remote switch will toggle the logic and electronic audio switching system between the modes. The front panel program buttons also perform this function. Unshielded small gauge wire can be run to the remote location because there is no audio on the wires, only DC control voltages.

CHANGEOVER(X-OVR) WIRING. Changeover between projectors is done electronically in the SR300. This necessitates that *BOTH* exciter lamps be lit at the same time. No exciter light changeover is provided in the unit. An exciter light changeover is at least 3dB noisier than an electronic changeover. See the wiring options offered in the SR300 in another section of this manual before wiring the X-OVR terminals. If the product is to be used in a single projector booth, connect a short piece of bare wire between the X-OVR 1 terminal and the nearby GND terminal. This will "lock" the changeover logic into the projector one position, so that it cannot be accidentally triggered to the other machine input causing a loss of sound.

ALTERNATE COMMAND CHANGEOVER. This method of changeover is primarily intended for *manual changeover* equipped booths and requires two *momentary contact* (SPST) switches. One switch is placed near projector each projector, and wired back to the two SR300 preamplifiers. Connect a pair of unshielded wires to each switch and route to where the SR300 is mounted. Connect one wire of the twisted pair from the first switch to *projector 1 x-over* and *ground* the other wire of the pair. Connect one wire of the twisted pair from the second switch to *projector 2 x-over*, and *ground* the other conductor. When each switch is activated it will cause the selected projector to "latch" into the desired mode. To select the "alternate" mode of operation leave the internal "shunt" jumper on the main PC board in the *A* position.

CONTINUOUS COMMAND CHANGEOVER. Another method of remote changeover between pairs of projectors uses only a single pair of wires. This method is preferred for automated systems. A relay closure in the automation equipment will execute a changeover by grounding the X-OVER terminals. Run a pair of twisted unshielded wires to the "dry" contacts of the automation changeover relay. Connect the other end of the pair to the *projector two X-OVER* terminal of the SR300 *only*. Ground the other wire of the pair to the nearest *ground* terminal. When the automation relay closes, projector one of the SR300 will be "enabled", and the second pair of stereo preamplifiers will be "disabled". Releasing the relay will cause the reverse action to occur. Select the "continuous" option by moving the internal "shunt" jumper on the main PC board to *C*.

EMERGENCY POWER SUPPLY. A calculator type supply is shipped with the SR300 for use with the extra solar cell preamp-line amp that is built into the unit. This supply will deliver 12 volts DC at ½ amp and is self contained in a plug-in-the-wall package. Connect the wire with the *white stripe* from the supply to the PLUS terminal of the EMER POWER(EMERGENCY) terminal on the rear barrier strip. Connect the black lead to the MINUS terminal. If the emergency supply is *not used, the main system will HUM*. To correct this problem, move the jumper on the emergency supply SHUNT from the two top pins, to the two lower pins inside the unit. This will allow the internal emergency circuit to pick up power from the main supply instead of the external supply. Also, a ground loop will not be created in the main system.

COMMAND. The terminal labeled CMD controls the transition switching between the **FILM** source and the **MUSIC** (non-sync) source. This action is the same as the panel switch labeled FILM-MUSIC, but from a remote switch. A switch (SPST) may be mounted near the projector and cable run to the equipment rack for remote control of the intermission music. Unshielded twisted pair may be used because there is no audio signals on the control cable. Connect one of the remote wires to the CMD terminal, and the other to the GND(GROUND) terminal. To use the remote feature, the front panel FILM-MUSIC SWITCH must be left in the FILM position.

THIRD POSITION OF MUSIC/FILM SWITCH. When the SR300 is used with automation equipment, the **MUSIC/FILM** switch is left in the **FILM** position and the rear barrier strip **COMMAND** terminal is grounded by the automation equipment to execute a fade transition between the non-sync source and the solar cell source. If the automation should fail, or a grounding problem develops on the command line, the operator may not be able to get the SR300 out of the non-sync mode. A three position **MUSIC/AUTO/FILM** switch is now a standard feature of the SR300. The operator should leave the switch in the **FILM POSITION** for normal operation with automation, but has full manual overide if he needs it. The **MIDDLE POSITION** is **EMERGENCY FILM** and disconnects the automation from the SR300. DOWN is manual non-sync music. If no automation is used in the system, then the switch becomes a normal manual operation as the panel labels indicate.

MUSIC MATRIX. The SR300 is capable of producing four (4) channels of auditorium non-sync music from a two (2) channel tape or phono record. All modern commercial recordings contain some out-of-phase material created by the microphone placement in the studio, or ambience material on the tracks. This source material can be extracted and placed in the surround channel by placing the internal **M-S** "shunt" jumper on the main PC board in the **S** position. If a *sum* of the Left and Right music sources is desired, place the "shunt" in the **M** position. Monaural source material should be played with the jumper in the **M** position.

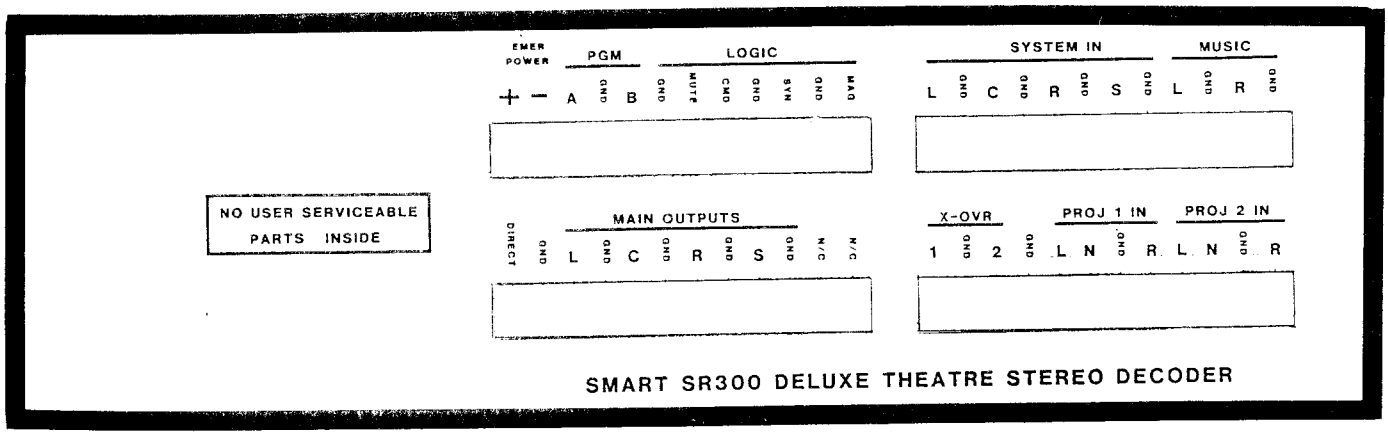
MUTE. The SR300 has a built in electronic mute feature that will silently switch all four output channels OFF when the mute terminal is grounded. This capability may be valuable when automation equipment strikes the Xenon lamp. Many lamphouses on the market have "dirty" ignitors that radiate RF energy into the sound system during strike. Hook a wire from the MUTE terminal to the remote relay, and another wire to the GND(GROUND) terminal. When the relay closes, the sound will be muted. Make sure the relay contacts are not connected to any other source of current. They must be "dry" contacts.

SYNTHESIZER. The terminal marked **SYN** in the LOGIC group controls a SMART SG1130B Stereo Generator. All switching is provided by the SR300. This terminal is not used if no synthesizer is present in the system. See the section of this manual that discusses connecting a Stereo Generator.

MAGNETIC. A terminal in the LOGIC group is marked **MAG**. This controls the SMART SMP435 magnetic 4 channel preamplifier(s) OR the SMART MP7035 Magnetic Programmer for 70MM and 35MM soundtracks. The terminal is not used if no magnetic system is present.

SYSTEM IN. A group of terminals are provided to allow external audio devices to pass through the SR300 MASTER FADER so that all sources (synthesizer, magnetic, etc) are controlled by the main **MASTER**. These inputs (Left, Center, Right, Surround) are not used unless other SMART preamps with bus switching are present in the system.

DIRECT OUT. The center channel mono chain in the SR300 provides a left plus right sum from the split stereo solar cells and feeds the Master Fader. However, it also feeds a buffer amplifier that permits a separate mono output that appears at the **DIRECT OUT** terminal on the rear barrier strip. This signal is unaffected by the Master Fader. It is used to feed a Stereo Generator, or the SMART EX500, EX510, or MN520 amplified monitor panels. This output is also handy for feeding any amplified booth monitor because of it's low impedance, high level output properties. Shielded cable must be used from the terminal to any other device.



SETUP AND CALIBRATION

The top cover does not have to be removed from the SR300 to perform any of the setup adjustments during installation. Two security covers on the front panel hide the calibration controls from the operator. All adjustments are from the front of the unit, using the built in meter. No other test equipment is necessary.

The SR300 is shipped with a 5/64th hex wrench and a tuning wand that has a small blade tip on one end. These tools are used to set the hidden controls. Use the hex wrench to remove the 4 button head screws on the two security covers. This will expose the legend that is centered over each control. The blade end of the wand fits each of the pots. Clockwise rotation will increase the action of each control. The blade is also used to select settings of the small DIP switch at the right side of the first row of controls.

DIP SWITCH. The DIP (dual in-line package) switch contains 5 independent switches that can be turned on or off using the tuning tool. When all the switches are in the up position, the individual switches are OFF. Only one switch may be *DOWN AT A TIME*. The front panel meter will respond to the audio level of the selected circuit. The meter switch is labeled LRNCO.

L = Left channel preamplifier output.
R = Right channel preamplifier output.
N = Null. Used to indicate minimum crosstalk on surround.
C = Center channel output after the Master Fader.
O = Output of center channel (mono or Stereo) before the Fader.

EMERGENCY LEVEL(EMG LVL). This pot controls the output level of the special solar cell preamp-line amp that is connected to the external power supply. The proper operating level setting is made *after the system has been calibrated for stereo and mono*. The emergency channel is not affected by the Master Fader setting, and cannot be changed by the operator. This circuit is for emergency only, and should be adjusted for a normal listening level with monaural feature film material playing. The SWITCH on the front panel must be in the down position to use this feature. The output of the emergency channel is monaural, and feeds the *center channel output* only.

OUTPUTS (L)LEFT, (C)CENTER, (R)RIGHT, (S)SURROUND. Output trim controls are provided for balancing channels or compensating for small differences in the levels that drive the next piece of equipment in the system (equalizer, amplifiers, etc.). A service meter or scope across the main output terminals will assist in determining the proper trim balance. The *surround channel has 6 dB more gain* in the circuitry that the front channels in order to drive the surround amplifier harder. This is to compensate for the difference in efficiency of the surround speakers generally used.

MONO LEVEL. This pot will control the mono material output. The mono chain in the SR300 is independent of the stereo channels, and must be adjusted separately. Also, mono films are generally compressed during recording and *appear to be louder*. The separate pot can compensate for the loudness differences when stereo and mono material is run during the same performance.

MUSIC TRIM (L)LEFT & (R)RIGHT. Intermission music is routed through stereo music fade modules in the SR300. This circuit not only transitions on command from the COMMAND logic, but also has contains a signal processing circuit that derives a 4 channel output from a 2 channel (stereo) input. Different material will appear on the surround speakers than is presented on the front channels. The (L) and (R) trim controls should be adjusted for even balance in the auditorium. The MUSIC-FILM front panel switch must be in the MUSIC position before adjustment.

TIME DELAY. The film surround material passes through a built in time delay circuit before appearing at the surround output. The delay must be set for the length of the auditorium so that any crosstalk between the center channel and surround channel is "masked". **CW (CLOCKWISE) - LONGER** indicates that a clockwise rotation of the delay pot will increase the amount of delay. The range of delay is continuously adjustable from 30 milliseconds to 105 milliseconds.

SYSTEM CALIBRATION

The SR300 contains two noise reduction (NR) modules that very effectively decode the special noise reduction encoding process used on SVA optical stereo prints. The SMART NR circuitry does not violate any patented process that now exists. However, like true noise reduction processors, the modules *must be calibrated to a known reference*. The Dolby Cat.69 test film is ideal for this purpose. A 5 ft. strip is supplied with the SR300 in order to make a test loop. Use the reference tone side of the film.

1. Make a sound changeover to the projector you wish to calibrate first.

2. Move the (L) DIP switch down (ON). All other switch positions should by OFF (UP).

3. Place the PROGRAM A selector in the SVA position.

4. Adjust the (L) projector trim control clockwise on the selected projector until the front panel meter reads 0 VU.

5. Move the (L) DIP switch UP (OFF). Turn on the (R) DIP switch (DOWN).

6. Adjust the (R) projector trim pot clockwise until the meter reads 0 VU.

7. Turn the (R) DIP switch OFF, and select (N).

8. Adjust EITHER (L) or (R) trim pot *very, very slightly* until you get the **LOWEST** reading on the panel meter. This is the null adjustment. If your solar cell L-R adjustment, lens focus and azimuth are correct, the meter would register so low that you could not get a usable reading. This would be a perfect null. For this reason, *an expander circuit* is added to the surround channel meter switch to permit the meter to register a higher value for easy viewing and adjustment. The meter will register -10 for a null of 50 dB or better.

9. Turn the NULL switch OFF, and select (C). The meter will now become a VU meter indicating the center channel level through the Master Fader.

10. Changeover the projector sound and perform the same procedure on the other machine.

11. Turn *ALL* DIP switches OFF, except the (O)OUTPUT switch. This is the program output signal that will indicate the relative levels coming off the film. The meter should be left in this position so that the operator can gauge relative loudness volume in the auditorium. The meter reading is not affected by the Master Fader control when in the (O) switch setting.

12. Replace the two security covers to hide the setup controls.

AUDITORIUM LEVEL. With the Master Fader set fully clock-wise run the pink noise side of the Cat.69 test loop. Turn all level controls on the individual power amplifiers to their minimum settings and apply AC power to the amps. Temporarily short the neutral terminal to the the LEFT solar cell wire. Raise the level of the RIGHT power amplifier until 79 dBA is present at the rear of the auditorium. If you don't have a sound pressure meter for these measurements, adjust for normal listening level. Now re-move the LEFT solar cell short and short the RIGHT solar cell lead to neutral at the input of the SR300. Adjust the LEFT channel power amplifier level for 79 dBA in the room.

Remove the short from the Right solar cell lead and raise the CENTER channel power amplifier level to a reading of 85 dBA (this is temporary) in the auditorium. *You may have noticed that when both of the solar cell shorts were removed on the SR300, the side channels went down considerably in level. This is because the matrix circuit senses in-phase material that produces a "hard" center channel. When left or right program material appears on the stereo optical soundtrack the side channels will be at their proper level.* Now, reduce the master fader to a lower level so that soundtrack program material does not damage the speakers. The pink noise track recording level is 12 dB below the Dolby reference level, far below normal soundtrack level. Keep the loop running for the next phase of the calibration setup procedure.

MONAURAL LEVEL. A small control on the rear of the chassis controls the playback level of the mono soundtrack. Switch the front panel PROGRAM A SELECTOR switch to the MONO position. While the pink noise loop is running, adjust the sound level in the auditorium to 80 dBa. This completes the mono and stereo stage speaker balance and level adjustments.

SURROUND CHANNEL ADJUSTMENTS. The surround channel speakers must be adjusted for level and time delay. Short either solar cell input lead to the neutral terminal. This will force the surround channel to full output. Using any available soundtrack (feature, trailers, short subject, etc.) adjust the time delay control for a proper setting when standing ⅔rds of the length of the auditorium from the screen. The time delay control on the rear of the chassis increases the delay with a *clockwise* rotation on the control. A point will be reached where the sound from the center stage speaker and the sound from the surround speakers will be "syncronized". Adjust the control a *little farther* to increase the delay about 10 milliseconds greater. This is the correct setting. The operating range of the built in time delay circuit in the SR300 is from 30 milliseconds to 105 milliseconds.

Replace the film you were using for the time delay test with a Front-surround test loop (choo-choo track). The sound on this track will quickly alternate between the center channel and the surround channel. Adjust the surround channel power amplifier for *equal sound pressure* from the front stage speaker and the surround speakers.

FINAL CHECKOUT. It's now showtime! Place a reel of feature film stereo optical material on the projector and evaluate your work. Pay particular attention to any crosstalk that appears on the surround channel. The small amount that may appear could be due to projector "skew" caused by lateral play in the soundhead mechanism. Normally the time delay on the surround channel will *mask* the crosstalk so that the audience is not aware of it.

During soundtrack passages of dialog, the sound should be reproduced through the center stage speaker. Side channels (left-stage and right-stage) should be down considerably. When music or effects appear on the track, the sides will be instantaneously opened for the proper balance of material. This "logic control" in the matrix module produces a hard center channel, and also reduces film noise on the side channels when only dialog is present in the photoplay.

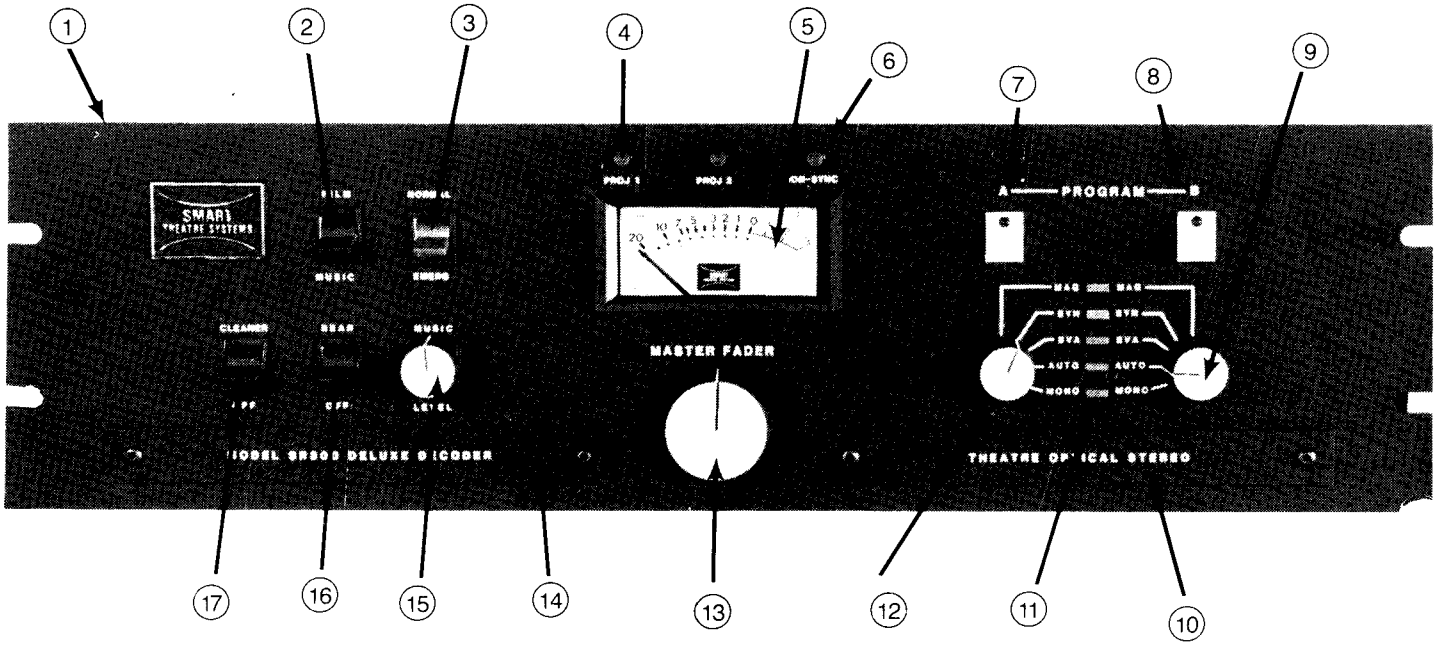
BIG TIP. We recommend that the projector soundhead has a *.6 mil slit* (or smaller) in the optical sound lens for extended high frequency response. No slit correction circuitry is used in the SR300 to avoid the phase shift normally associated with silt correction filters.

HOUSE EQUALIZATION. The performance of the SR300 can be improved with the addition of the EQ600 three channel Theatre Equalizer. This product follows the SR300 and shapes the room response of the house by removing large "lumps" in the speaker system response and treating room acoustic anomalies. Also, the soundtrack playback can be "sweetened" for a more pleasant overall sound quality. Refer to the EQ600 equipment manual for a complete description of features and capabilities.

EQUALIZATION PROCEDURES. Connect the PINK NOISE SOURCE *directly to the House Equalizer inputs* and equalize for the ISO 2969 response curve. *DO NOT USE THE PINK NOISE LOOP* to equalize the "A" chain response errors. The "A" chain problems should be corrected separately. Also, keep in mind that equalizers are intended to correct room response anomolies and are not intended to fix speaker problems. Balance the HF and LF elements of the stage speakers with the network attenuation control for the flattest response. Check component phasing. When the speakers have been set for the best results, then equalize the room. Equalization procedures are covered in other publications.

OPERATION

MASTER FADER (13). The main operating control. This is a four channel attenuator that controls all outputs with close tracking accuracy. With a normal gain setup on the power amplifiers, the Master Fader should be normally operated in it's *mid range* position.



PROGRAM SELECTORS (12)(9). Two rotary switches allow the operator to pre-program any combination of events during a performance. The show could start in mono with trailers by selecting MONO on the A PROGRAM bank (12), followed by Synthesized Stereo (if the system has a SMART SG1130BX Stereo Generator) for special short subjects by selecting **SYN** on the **B PROGRAM** bank **(9)**, and finally the main feature in **SVA** stereo by presetting the **A PROGRAM (12)** while the **B PROGRAM (9)** is playing. This deluxe feature is fully remoteable and is very handy when the operator is making a lens change during the presentation. The logic circuitry that switches the modes of operation is quiet and fast. If the automation system is capable, mode switching can be performed by additional "foil tape" on the film.

PROGRAM BUTTONS (7) (8). These panel switches actuate the **A** or **B** program switches **(12),(9)** that pre-select the next sound event. The A program button will come on first when the system is first turned on for the day. (default position)

AUTOMATIC MODE. The SR300 has a very special feature built into the circuitry that will *automatically switch* from mono to stereo without operator assistance when the film format soundtrack material changes. The program selector (12) OR (9) must be in the AUTO MODE on the selected bank at the start of the show. Mono trailers or featurettes will be reproduced through the mono chain. When the SR300 "hears" a difference signal caused by the appearance of an SVA recording, the SYSTEM WILL AUTOMATICALLY SWITCH TO STEREO. The system logic will reset itself at the end of the show when intermission music is activated, or the operator toggles the PROGRAM switches to another selection. The soundtrack must have a stereo recording level of at least 50% modulation for the system to switch while in the AUTO MODE. We recommend that you not use the AUTO MODE feature *without a suitable "snipe" to preceed the feature film* to accurately and reliably trigger the circuits.

ELECTRONIC FILM CLEANER. The SR300 contains a very valuable module in the mono chain that will remove much of the noise on an optical soundtrack **WITHOUT AFFECTING THE FIDELITY.** This feature is very important to theaters that receive second or third run prints. Smart Theatre Systems is licensed by National Semiconductor to use the patented Burwen Noise Reduction System. This excellent design is now reduced to an elaborate integrated circuit that is ideal for film cleaning. The Dynamic Noise Reduction process will produce *better than 10 dB* of noise removal without filtering the wide bandwidth of the soundtrack material. Place the CLEANER panel switch (17) in the UP position for cleaning action, and DOWN to turn the cleaner OFF.

REAR OFF SWITCH (16). Allows the operator to "kill" the surround channel when desired. Some stereo prints *contain no surround material. The REAR OFF switch should be in the OFF position for such prints.*

MUSIC LEVEL CONTROL (15). Intermission music (non-sync) can be set at a different level from the film material by using the Music Level panel control. Also, various tapes used for music may have a different playback level that can be compensated for by this control. All music channels are controlled by this one knob.

EMERGENCY SWITCH (3). Activates a separate preamp-line amplifier circuit *on the center channel only*. The output level of this circuit is preset and not affected by the Master Fader. No changeover is available in this mode of operation. All four solar cell signals are summed together.

TALLY LIGHTS (4). Two LED lights indicate which projector, in a dual projector system, is activated. The default (when system is powered up for the day) is PROJ 1.

NON-SYNC LIGHT (6). This LED shows the operator that the system is in the intermission music mode. As soon as the automation releases the COMMAND terminal on the rear of the SR300, or the operator moves the FILM-MUSIC (2) switch to the FILM position, the operation will transition to the proper program source.

NORMAL CONTROL SETTINGS. When all internal adjustments have been made, and the SR300 is wired into the system, it is necessary to set the primary operating controls to their normal position before setting the house power amplifier levels for optimum auditorium loudness. The normal operating position for the MASTER FADER is at the 2 o'clock setting. This allows more than adequate range for the operator to adjust for various soundtrack levels. This setting is necessary to allow the SR300 to operate at the best signal-to-noise ratio, and also reduce the chance of "bleed through" from the non-sync source. Remember that the non-sync intermission music control *is independent* from the film circuits and misadjustment of the controls and their proper relationship could cause an improper gain structure within the SR300. Once the MASTER FADER is set, then the power amplifier levels can be set. Finally, the intermission music level can be adjusted. The PROGRAM METER (5) on the front panel is a handy indicator of the level of material originating from the booth.

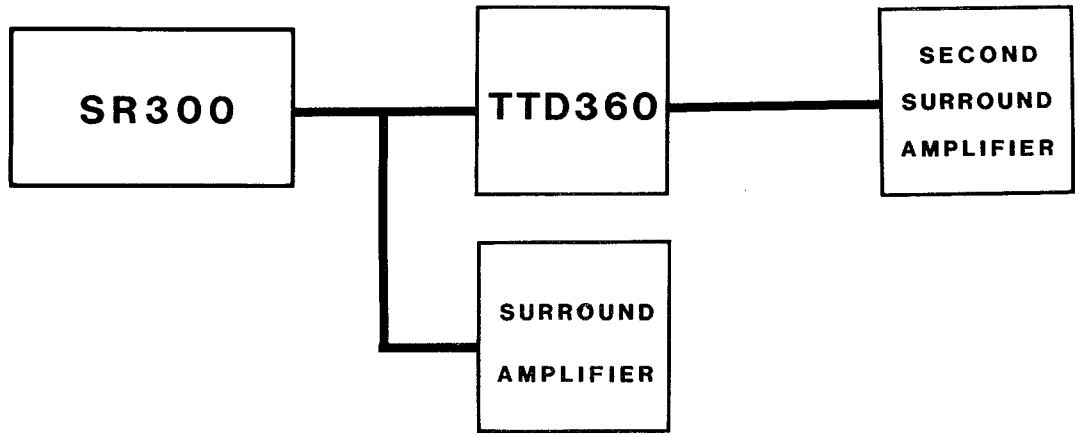
DON'T TOUCH! Inside the SR300 chassis there are *four upright pots* on the main P.C. card that are factory adjusted for maximum common mode rejection of RF and extraneous noise at the inputs of the balanced solar cell preamplifier. *Changing these settings will degrade the performance of the circuit*. Also, two pots associated with the time delay section are *factory adjusted* for optimum bias to the MN3005 time delay chips. These pots are set for the individual characteristics of each chip and should not be touched unless a chip has been replaced.

SECURITY PANELS (14),(10). Removable panels conceal the system set-up trim controls. A special wrench is required to remove the panels.

ADDITIONAL COMMENTS

FRONT-SURROUND USE. The SR300 is ideally suited for theatres that intend to equip for two channel stereo using a single center screen stage speaker and surround speakers. The center channel output of the SR300 is not affected by the "Dyna-Span" matrix, and represents a *sum of all front channels*. Use the same set up and calibration procedure outlined in this manual for four channel operation, except for the auditorium balance settings of the LEFT and RIGHT stage channels.

SPLIT SURROUNDS. Very long, narrow theatres and large motion picture palaces have a special problem setting the time delay properly because of the extreme distance from the rear seats and the screen. If the time delay of the surround channel is set to accommodate listeners in the rear of the house, the listeners in the center of the auditorium will hear an echo due to the long delay setting. Likewise, if the time delay setting is set for the middle of the seating area, the listeners in the rear will hear crosstalk in the surround speakers because of insufficient delay "masking". This problem can be corrected by using a second time delay following the built-in time delay in the SR300. Set the SR300 for proper delay in the center of the auditorium. Feed the input of another time delay product from the surround output terminals of the SR300. Adjust the second delay to accommodate the rear seats. Check for proper playback level through each system with a "choo-choo" test loop. This method requires another surround channel power amplifier and separate wiring to the second group of speakers. An ideal product for this application is the SMART TTD360 Time Delay.



POWER AMPLIFIERS. Some power amplifiers do not have input level controls and rely on the device that is feeding it to control the drive. The SR300 *has individual output trim pots* for each channel, and can adjust the individual balance between channels. The master fader will vary the stereophonic signals to the amplifiers. If you cannot obtain the proper settings recommended in this manual we suggest you use only amplifiers that have some type of input adjustment controls when interfacing a SR300 to the system.

BOOTH MONITORING. The SR300 has two outputs that can drive an active booth monitor (one that has it's own amplifier). The main outputs feed each channel of the house power amplifiers. The direct output feeds a Stereo Generator accessory, but does not include intermission music at this output. However,the direct output produces a constant level that is not affected by the setting of the Master Fader. It also sums the stereophonic channels for use with a monaural booth monitor. The ideal product to use with the SR300 is the SMART EX500 four channel active monitor-exciter lamp supply, or the MN520 four channel active monitor. This allows the operator to listen to each channel that is being sent to the separate power amplifiers. Remember that booth monitoring should be monitored *before any house equalizers* in order to have an "unshaped" response curve appear at the active monitor.

EXPORT MODELS. The SR300 can be supplied with the AC power transformer strapped for 230 volt 50/60 Hz operation. If you wish to change from 115 VAC to 230VAC or vice versa, special wire jumpers on the main PC board must be installed in their proper positions. Two (2) jumpers are required for 115 VAC operation, but only one (1) jumper is used for 230 VAC. The portion of the PC card that contains these parts is very crowded and not easily accessible. An easy method to effect a conversion is to remove the chassis top cover and "snip" the existing jumpers from the top side of the board. Replace the top cover and remove the bottom chassis cover. You now have a clear view of the area in which the new jumpers must be installed. The double sided PC card will easily permit new jumpers to be soldered into position. After the jumpers are installed, remove the AC power plug used on domestic U.S. units and refit with the desired local type plug.

EMERGENCY POWER SUPPLY ON EXPORT UNITS. The small power pack used for the emergency sections of the SR300 is offered in the 115 VAC version only. Export customers must supply a light duty converter to use with the power pack. The converter must be transformer isolated step down type.

USING THE SR300 WITH THE SG1130BX STEREO GENERATOR

Hooking the SG1130BX or SG1130B Stereo Generator into the sound system through the SR300 is easy. The Master Fader on the SR300 becomes the *new master for all functions*, and the programming logic of the SR300 controls the switching operation between the Generator and Stereo channels.

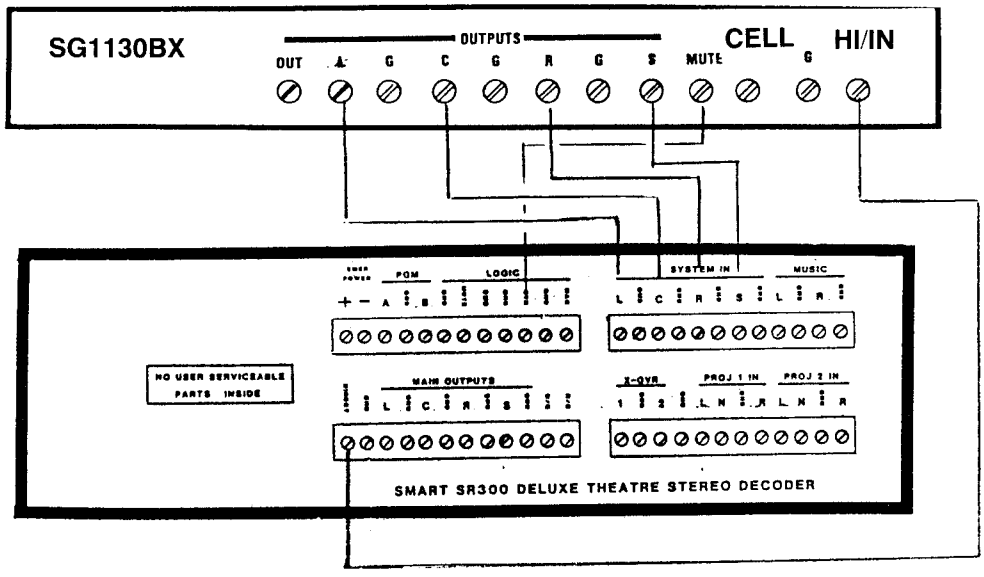
1. Run a single conductor wire from the SYN terminal on the back of the SR300 to the mute terminal of the SG1130BX.

2. Connect a single conductor shielded audio cable from the **(DIR)**ECT OUTPUT of the SR300 and connect the shield to ground. Connect the other end of this cable to the HI/IN (HI level INPUT) terminal (and ground the shield) of the SG1130B. The Input 1 terminal is not used when the SG1130B is mated to an SR300.

3. Run shielded audio cable from each output of the SG1130BX to the SYSTEMS INPUT terminals of the SR300. Left channel goes to Left channel, Center to Center, etc. All four channels must agree with their respective outputs and inputs.

This completes the inter-wiring of the two units. Refer to the SG1130BX manual for calibration instructions. The unit *must be calibrated* in order for the logic circuits to respond properly.

When the SG1130BX is properly calibrated with a Dolby Cat 69 reference tone, set the time delay to the desired delay. If you are using the SG1130B version of the Stereo Generator, set the MASTER FADER ON THE SG1130B **TO ITS HIGHEST SETTING**. This should be about right for operation through the SR300 system circuits. If you are using the SG1130BX version, there is no master fader to adjust. Advise the operator to use only the FADER on the SR300. A slight adjustment of the SG1130B fader may be necessary in order for levels to match between the Stereo program and Synthesized program. The Solar Cell input of the SG1130B version *is not used* when interfacing the Stereo Generator to the SR300 Stereo Decoder.



The **WIDE SCREEN STEREO** logo shown above may be used by the theatre that installs a SMART stereo product to advertise the playback capability of the theatre. This logo may be incorporated into a newspaper ad, program flyers, or reproduced for special promotional activities. The logo tells the patrons that the theatre is presenting it's feature in Stereo. This pertains to optical stereo, synthesized stereo, or magnetic 35MM/70MM formats. A special Marquee Sign is available from Bevelite-Adler that the theatre owner can use to tell the public that his theatre is presenting the feature film in "Wide Screen Stereo". A selection of **WIDE SCREEN STEREO** marquee signs are available from Bevelite-Adler to help inform your patrons of your stereo playback capability.

SR300 SERVICE

A fanning strip makes connecting input and output leads easier. Leads are permanently soldered to the strip and then mated to the screw terminals. If the unit ever has to be removed for service, the fanning strip can be quickly removed. Fanning strips may be ordered separately from SMART THEATRE SYSTEMS is you cannot procure them locally.

The latest SMART equipment uses "shunts", instead of switches to select the various operation selections. This is generally a one time function, and is set by the sound engineer during installation. To move the "shunt", simply pull the plastic shorting plug straight up, and place on the desired pins. Note that the two small holes face downward when properly installed.

The knobs used on SMART equipment are COLLET type. A special wrench may be is necessary to remove or tighten them. Slip a fingernail or small screwdriver between the plastic color cap and the knob to remove the cap. Use the wrench to remove the knob. Clockwise rotation tightens the collet.

Almost every component used in the SR300 is available locally from a radio parts house. The only parts that are not likely to be found are the special sealed modules, and the time delay chip. Refer to the schematic diagram and parts list for information regarding a component description. IC sockets are used to facilitate easy removal and replacement of any Integrated Circuit, should this ever become necessary.

Each unit is burned in for a minimum of 48 hours before Q.C. testing and packaging. A failure of one or more functions of the SR300 will result in a service call from the owner. Always check the *obvious causes* of the symptoms first.

1. Is the unit receiving A.C. power? (Power L.E.D. ON)

2. Has the fuse blown? (replace with 1/2 amp 3AG type only)

3. Are all controls in their normal operating mode?

4. Is the supporting equipment functioning properly? (amplifiers, equalizers, exciter lamp supply, etc.)

When all symptoms point to an internal problem, your only choice is to substitute a spare (or similar piece of equipment) and fix the unit in the booth or shop.

A quick check of the power supply voltages will indicate the proper operating voltages for the active components. Place your service meter **negative lead** on a convenient chassis **GROUND** point. Switch the meter to the PLUS 30 D.C. range and measure the voltage input to the POSITIVE regulator(pin 1). It should be 18-24 volts. Now measure the output of the regulator (pin 3). This voltage should be very close to PLUS 15 volts. Now, do the same with the NEGATIVE regulator. Use the *positive lead* of your meter on the chassis *GROUND*, and the negative lead for voltage measurements. Pin 2 is the input to the regulator, and pin 3 is the output. Again, you should measure nearly 15 volts. If you cannot obtain the voltages mentioned, you could have a bad diode in the rectifier bridge, a shorted filter capacitor, or an open winding on the transformer. **BE CAREFUL NOT TO SHORT THE PINS ON THE REGULATORS WHILE MAKING THESE TESTS. A MOMENTARY SHORT COULD DESTROY THE IC REGULATORS.**

When you are satisfied that the voltages are correct, go the schematic diagram and study the circuit layout. *The most practical way to troubleshoot audio circuits is through signal tracing*. Put an audio signal into the input and follow the signal with a scope until the signal stops. This method allows you to locate a defective component in the related section.

Since the SR300 uses a bi-polar supply, each audio IC op-amp output should measure nearly 0 volts D.C. with no signal. That is, you should be able to probe each output pin with your service meter and see a minimum offset. If the op-amp is showing a few volts at the output pin, it it likely that a bad capacitor or resistor is causing an input bias that forces the output of the amplifier to shift. A defective IC could also be the culprit. Also check for a hairline short in the PC card foil traces. Here are several tips that will aid in troubleshooting.

1. Make sure the switches are in the proper position before testing the unit.

2. Very hot IC's usually indicate an internal short.

3. An open resistor may lead you to believe that an IC is defective. Use a substitute device to see if problem is in the device itself, or elsewhere.

4. Shorted input capacitors may bias an IC op-amp OFF.

5. Be sure IC's are firmly in their sockets. They can be vibrated loose during shipment.

Signal tracing procedures may also be employed when servicing the time delay portion of the SURROUND CHANNEL. A signal at the input, through the filter circuit, the delay chip, and the anti-alias filter will reveal where the signal has stopped. Refer to the schematic for pin identification of the signal flow. The HFE4047 clock associated with the delay chip must be operating properly for the audio signal to pass through the delay chip. An oscilloscope will reveal high level square wave pulses on pins 10 and 11 of the 4047 when this device is operating. If either phase of the clock fails, no audio can pass. We suggest you NOT REMOVE the delay chip itself unless you are positive it has failed. This component is very expensive, and can be easily destroyed by stray static caused by handling. The BIAS pots near the chips are factory set to each individual chip, and should not be moved unless the IC must be replaced by a new device.

The MATRIX MODULE in the SR300 contains many components and IC's that are factory calibrated. The module is not intended to be serviced without special test equipment and test fixtures. A defective module is replaced on an *EXCHANGE ONLY* basis. We suggest the SR300 be returned to the factory for servicing if a module failure is verified. The "plated through" holes on the main PC card are easily damaged when service is attempted without the aid of the proper de-soldering equipment.

An important part of any pre-service call is to make sure that the operator or other theater personnel *is fully familiar* with the operation of this equipment. Often service calls are made un-necessarily because the operator was not trained with the correct operation procedures.

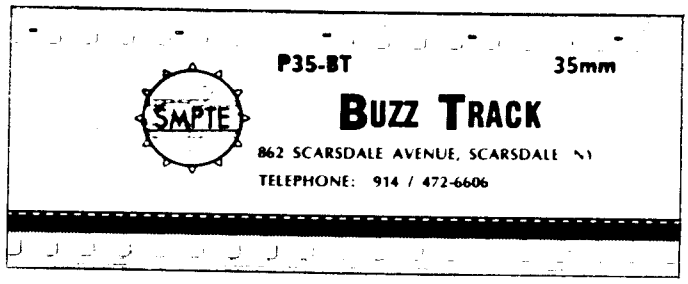
MANY IC DEVICES CAN BE DESTROYED BY HANDLING. CMOS logic devices and Bi-FET Op Amps *are very static sensitive*. They are safe when plugged into their sockets, but removal can expose the inputs to conduct static electricity from tools, your hands, or other static generating components. **USE PROPER HANDLING PROCEDURES** when removing IC's from their sockets.

SMART THEATRE SYSTEMS maintains a factory service department that can provide quick handling of replacement parts, or telephone advice in the event of a problem in installation or service.

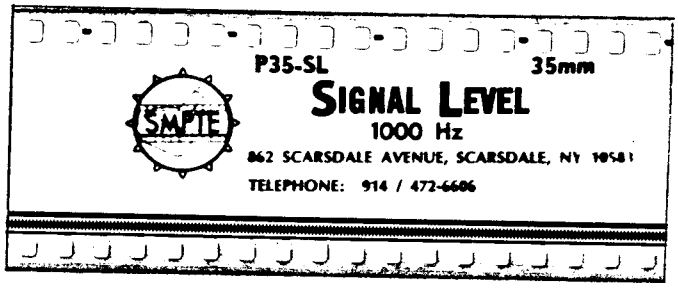
STANDARD 35MM TEST FILMS

Test films are basic to the alignment and calibration of many stereo optical and monaural sound theatre systems. Several of these films are available from SMPTE, while others are produced by Dolby Labs.

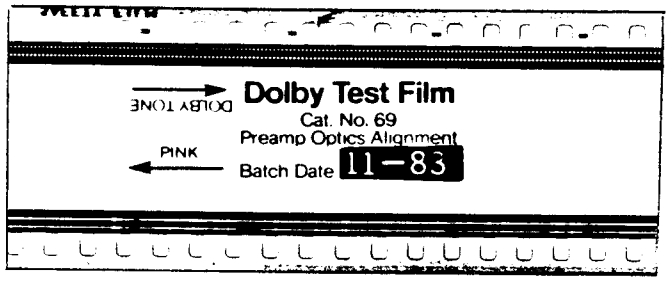
Loops may be made by wrapping and splicing a length of test film so that it forms a circle. Generally 5 feet is more than enough. The test "loop" is threaded only through the optical sound head components. Threading procedures will vary among different brands of sound heads.



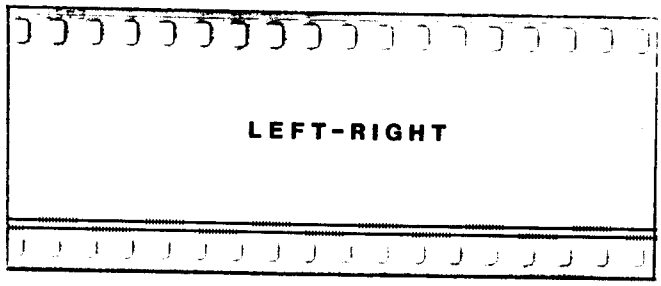
BUZZ TRACK. Is Used to set the lateral position of the "idler" or sound impedance drum. As the adjusting screw is turned a high frequency sound is heard, or a low buzz. Adjust the drum until your are between the two tones, and no sound is heard.



SIGNAL LEVEL. A 1 kHz tone used to set reproducible level in monaural systems. The level is not an absolute reference, but may be used as a reference if special equipment is calibrated to this film.



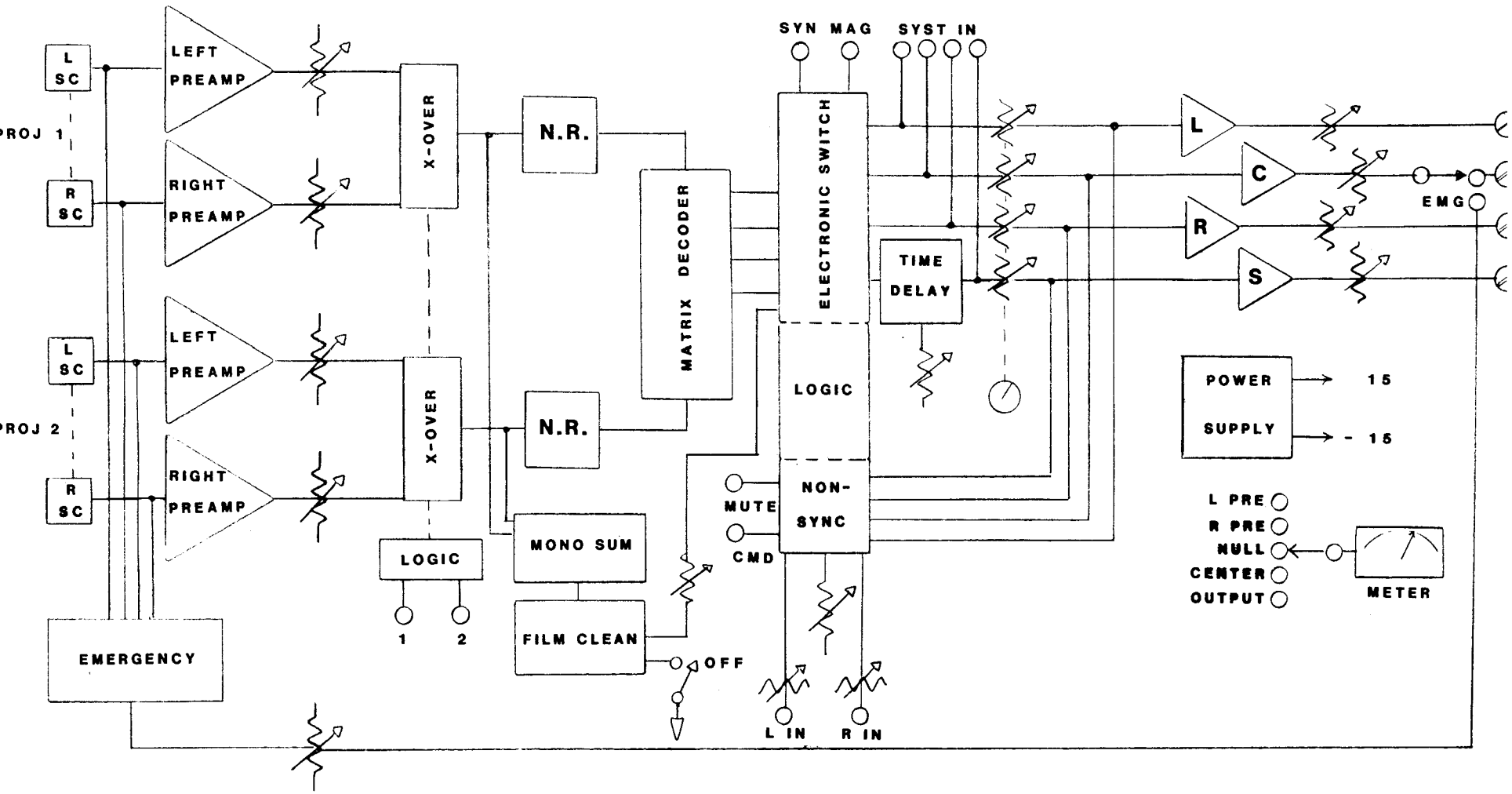
DOLBY TEST FILM. Contains two test tracks. One is the Dolby reference tone for setting noise reduction tracking, and the other is pink noise for EQ applications. Film is turned over to use each side.



LEFT-RIGHT. Alignment film for setting mechanical position of a split stereo solar cell. Must be used with a dual trace oscilloscope with each input monitoring a each channel of the solar cell outputs.

Many other special test films are available for sound system alignment.

SR300 STEREO DECODER



BLOCK DIAGRAM

PARTS LIST

MAIN BOARD

R1-RESISTOR-1.5K-5% 1/4 WATT
R2-RESISTOR-2740-1% 1/4 WATT
R3-RESISTOR-5490-1% 1/4 WATT
R4-RESISTOR-2740-1% 1/4 WATT
R5-POT- TRIM-500-HORIZONTAL
R6-RESISTOR-5230-1% 1/4 WATT
R7-RESISTOR-150K-5% 1/4 WATT
R8-POT- TRIM-5K-HORIZONTAL
R9-RESISTOR-1800-5% 1/4 WATT
R10-RESISTOR-1.5K 5% 1/4 WATT
R11-RESISTOR-2740-1% 1/4 WATT
R12-RESISTOR-5230-1% 1/4 WATT
R13-POT- TRIM-500-HORIZONTAL
R14-RESISTOR-10K-5% 1/4 WATT
R15-RESISTOR-10K-5% 1/4 WATT
R16-RESISTOR-150K-5% 1/4 WATT
R17-POT- TRIM-5K-HORIZONTAL
R18-RESISTOR-1800-5% 1/4 WATT
R19-RESISTOR-68K-5% 1/4 WATT
R20-RESISTOR-68K-5% 1/4 WATT
R21-RESISTOR-330K-5% 1/4 WATT
R22-RESISTOR-20K-5% 1/4 WATT
R23-RESISTOR-82K-5% 1/4 WATT
R24-RESISTOR-10K-5% 1/4 WATT
R25-RESISTOR-100K-5% 1/4 WATT
R26-RESISTOR-100K-5% 1/4 WATT
R27-RESISTOR-100K-5% 1/4 WATT
R28-RESISTOR-10K-5% 1/4 WATT
R29-RESISTOR-1 MEG-5% 1/4 WATT
R30-RESISTOR-10K-5% 1/4 WATT
R31-RESISTOR-10K-5% 1/4 WATT
R32-RESISTOR-10K-1% 1/4 WATT
R33-RESISTOR-10K-1% 1/4 WATT
R34-RESISTOR-10K-1% 1/4 WATT
R35-RESISTOR-10K-5% 1/4 WATT
R36-RESISTOR-10K-5% 1/4 WATT
R37-RESISTOR-10K-5% 1/4 WATT
R38-RESISTOR-820-5% 1/4 WATT
R39-RESISTOR-1.5K 5% 1/4 WATT
R40-RESISTOR-2740-1% 1/4 WATT
R41-RESISTOR-5490-1% 1/4 WATT
R42-RESISTOR-2740-1% 1/4 WATT
R43-RESISTOR-5230-1% 1/4 WATT
R44-POT- TRIM-500-HORIZONTAL
R45-RESISTOR-10K-5% 1/4 WATT
R46-RESISTOR-150K-5% 1/4 WATT
R47-POT- TRIM-5K-HORIZONTAL
R48-RESISTOR-1800-5% 1/4 WATT
R49-RESISTOR-1 MEG-5% 1/4 WATT
R50-RESISTOR-10K-5% 1/4 WATT
R51-RESISTOR-1.5K 5% 1/4 WATT
R52-RESISTOR-2470-1% 1/4 WATT
R53-RESISTOR-5230-1% 1/4 WATT
R54-RESISTOR-10K-5% 1/4 WATT
R55-POT- TRIM-500-HORIZONTAL
R56-RESISTOR-150K-5% 1/4 WATT
R57-POT- TRIM-5K-HORIZONTAL
R58-RESISTOR-1800-5% 1/4 WATT
R59-RESISTOR-68K-5% 1/4 WATT
R60-RESISTOR-68K-5% 1/4 WATT
R61-RESISTOR-330K-5% 1/4 WATT
R62-RESISTOR-20K-5% 1/4 WATT
R63-RESISTOR-82K-5% 1/4 WATT
R64-POT- PANEL-10K-LINEAR TAPER
R65-RESISTOR-1.8K 5% 1/4 WATT
R66-RESISTOR-1.8K 5% 1/4 WATT
R67-RESISTOR-5600-5% 1/4 WATT
R68-RESISTOR-1K-5% 1/4 WATT
R69-RESISTOR-470-5% 1/4 WATT
R70-RESISTOR-560-5% 1/4 WATT
R71-RESISTOR-18K-5% 1/4 WATT
R72-RESISTOR-22K-5% 1/4 WATT
R73-POT- TRIM-100K-HORIZONTAL
R74-RESISTOR-15K-5% 1/4 WATT
R75-RESISTOR-47K-5% 1/4 WATT
R76-RESISTOR-100K-5% 1/4 WATT
R77-RESISTOR-100K-5% 1/4 WATT
R78-RESISTOR-9100-5% 1/4 WATT
R79-RESISTOR-9100-5% 1/4 WATT
R80-RESISTOR-22K-5% 1/4 WATT
R81-RESISTOR-22K-5% 1/4 WATT
R82-RESISTOR-18K-5% 1/4 WATT
R83-RESISTOR-22K-5% 1/4 WATT
R84-RESISTOR-22K-5% 1/4 WATT
R85-RESISTOR-3600-5% 1/4 WATT
R86-RESISTOR-180-10% 2 WATT
R87-RESISTOR-10K-5% 1/4 WATT
R88-RESISTOR-22K-5% 1/4 WATT
R89-RESISTOR-240K-5% 1/4 WATT
R90-RESISTOR-10K-5% 1/4 WATT
R91-RESISTOR-10K-5% 1/4 WATT
R92-RESISTOR-100K-5% 1/4 WATT
R93-RESISTOR-3300-5% 1/4 WATT
R94-RESISTOR-10K-5% 1/4 WATT
R95-RESISTOR-47K-5% 1/4 WATT
R96-RESISTOR-4700-5% 1/4 WATT
R97-RESISTOR-200K-5% 1/4 WATT
R98-RESISTOR-2200-5% 1/4 WATT
R99-RESISTOR-3300-5% 1/4 WATT
R100-POT- TRIM-100K-HORIZONTAL
R101-RESISTOR-100K-5% 1/4 WATT
R102-RESISTOR-100K-5% 1/4 WATT
R103-RESISTOR-100K-5% 1/4 WATT
R104-RESISTOR-10K-5% 1/4 WATT
R105-RESISTOR-120K-5% 1/4 WATT
R106-RESISTOR-36K-5% 1/4 WATT
R107-RESISTOR-100K-5% 1/4 WATT
R108-POT- TRIM-10K-HORIZONTAL
R109-POT- TRIM-25K-HORIZONTAL
R110-RESISTOR-47K-5% 1/4 WATT
R111-RESISTOR-3600-5% 1/4 WATT
R112-RESISTOR-3K-5% 1/4 WATT
R113-POT- QUAD-10K X4-MASTER PANEL
R114-RESISTOR-10K-5% 1/4 WATT
R115-RESISTOR-22K-5% 1/4 WATT
R116-RESISTOR-10K-5% 1/4 WATT
R117-RESISTOR-4700-5% 1/4 WATT
R118-POT- TRIM-25K-HORIZONTAL
R119-RESISTOR-4700-5% 1/4 WATT
R120-RESISTOR-47K-5% 1/4 WATT
R121-RESISTOR-100K-5% 1/4 WATT
R122-RESISTOR-10K-5% 1/4 WATT
R123-RESISTOR-3600-5% 1/4 WATT
R124-RESISTOR-3K-5% 1/4 WATT
R125-RESISTOR-47K-5% 1/4 WATT
R126-RESISTOR-10K-5% 1/4 WATT
R127-RESISTOR-47K-5% 1/4 WATT
R128-RESISTOR-10K-5% 1/4 WATT
R129-RESISTOR-4700-5% 1/4 WATT
R130-POT- TRIM-25K-HORIZONTAL
R131-RESISTOR-100K-5% 1/4 WATT
R132-RESISTOR-10K-5% 1/4 WATT
R133-RESISTOR-3600-5% 1/4 WATT
R134-RESISTOR-3K-5% 1/4 WATT
R135-RESISTOR-10K-5% 1/4 WATT
R136-RESISTOR-22K-5% 1/4 WATT
R137-RESISTOR-10K-5% 1/4 WATT
R138-RESISTOR-4700-5% 1/4 WATT
R139-POT- TRIM-25K-HORIZONTAL
R140-RESISTOR-100K-5% 1/4 WATT
R141-RESISTOR-10K-5% 1/4 WATT
R142-RESISTOR-3600-5% 1/4 WATT
R143-RESISTOR-3K-5% 1/4 WATT
R144-RESISTOR-10K-5% 1/4 WATT
R145-RESISTOR-4700-5% 1/4 WATT
R146-POT- TRIM-25K-HORIZONTAL
R147-RESISTOR-100K-5% 1/4 WATT
R148-RESISTOR-10K-5% 1/4 WATT
R149-POT- TRIM-25K-HORIZONTAL
R150-RESISTOR-47K-5% 1/4 WATT
R151-RESISTOR-10K-5% 1/4 WATT
R152-RESISTOR-10K-5% 1/4 WATT
R153-RESISTOR-47K-5% 1/4 WATT
R154-RESISTOR-10K-5% 1/4 WATT
R155-RESISTOR-47K-5% 1/4 WATT
R156-RESISTOR-4700-5% 1/4 WATT
R157-RESISTOR-1.8K-5% 1/4 WATT
R158-RESISTOR-47K-5% 1/4 WATT
R159-RESISTOR-470K-5% 1/4 WATT
R160-RESISTOR-47K-5%-1/4 WATT
R161-RESISTOR-470 OHM-5%-1/4 WATT
R162-RESISTOR-470 OHM-5%-1/4 WATT
R163-RESISTOR-100 OHM-5%-1/4 WATT
R164-RESISTOR-100 OHM-5%-1/4 WATT
C1-CAPACITOR-.001 UF-100 VOLT POLY
C2-CAPACITOR-10 UF-10 VOLT TANT
C3-CAPACITOR-10 UF-10 VOLT TANT
C5-CAPACITOR-.68 UF-100 VOLT POLY
C6-CAPACITOR-.001 UF-100 VOLT POLY
C7-CAPACITOR-10 UF-10 VOLT TANT
C9-CAPACITOR-.68 UF-100 VOLT POLY
C10-CAPACITOR-.1 UF-100 VOLT POLY
C11-CAPACITOR-.1 UF-100 VOLT POLY
C12-CAPACITOR-.1 UF-50 VOLT CERAMIC
C13-CAPACITOR-1 UF-50 VOLT ELECTRO
C14-CAPACITOR-.1 UF-50 VOLT CE
C15-CAPACITOR-10 UF-16 VOLT EL
C16-CAPACITOR-.001 UF-100 VOLT POLY
C17-CAPACITOR-10 MF-10 VOLT TANT
C18-CAPACITOR-10 UF-10 VOLT TANT
C20-CAPACITOR-.68 UF-100 VOLT POLY
C21-CAPACITOR-10 UF-16 VOLT ELECTRO
C22-CAPACITOR-.001 UF-100 VOLT POLY
C23-CAPACITOR-10 UF-10 VOLT TANT
C25-CAPACITOR-.68 UF-100 VOLT POLY
C26-CAPACITOR-.1 UF-50 VOLT CERAMIC
C27-CAPACITOR-.1 UF-100 VOLT POLY
C28-CAPACITOR-.1 UF-100 VOLT POLY
C29-CAPACITOR-1 UF-50 VOLT POLY
C30-CAPACITOR-.1 UF-50 VOLT CERAMIC
C31-CAPACITOR-.047UF-100 VOLT POLY
C32-CAPACITOR-3900PF-50 VOLT CERAMIC
C33-CAPACITOR-1 UF-50 VOLT ELECTRO
C34-CAPACITOR-1 UF-50 VOLT ELECTRO
C35-CAPACITOR-100 UF-10 VOLT ELECTRO
C36-CAPACITOR-.001UF-100 VOLT POLY
C37-CAPACITOR-.1 UF-100 VOLT POLY
C38-CAPACITOR-1 UF-50 VOLT POLY
C39-CAPACITOR-.001UF-100 VOLT POLY
C40-CAPACITOR-4.7 UF-16 VOLT TANTALM
C41-CAPACITOR-1 UF-50 VOLT POLY
C42-CAPACITOR-10 UF-16 VOLT ELECTRO
C43-CAPACITOR-10 UF-16 VOLT ELECTRO
C44-CAPACITOR-.15 UF-50 VOLT CERAMIC
C45-CAPACITOR-.047UF-100 VOLT POLY
C46-CAPACITOR-330 PF-50 VOLT CERAMIC
C47-CAPACITOR-.47 UF-16 VOLT TANTALM
C48-CAPACITOR-.1 UF-100 VOLT POLY
C49-CAPACITOR-.1 UF-100 VOLT POLY
C50-CAPACITOR-47 PF-50 VOLT CERAMIC
C51-CAPACITOR-.1 UF-50 VOLT CERAMIC
C52-CAPACITOR-.1 UF-100 VOLT POLY
C53-CAPACITOR-.01 UF-100 VOLT POLY
C54-CAPACITOR-.1 UF-50 VOLT CERAMIC
C55-CAPACITOR-10 UF-16 VOLT EL
C56-CAPACITOR-100 UF-10 VOLT E
C57-CAPACITOR-1 UF-50 VOLT ELEC
C58-CAPACITOR-1 UF-100 VOLT POLY
C59-CAPACITOR-2.2 UF-25 VOLT ELECTRO
C60-CAPACITOR-.1 UF-50 VOLT CERAMIC

PARTS LIST

MAIN BOARD

C61-CAPACITOR-4.7 UF-16 VOLT ELECTRO
C62-CAPACITOR-10 UF-16 VOLT ELECTRO
C63-CAPACITOR-1 UF-50 VOLT ELECTRO
C64-CAPACITOR-680 PF-50 VOLT CERAMIC
C65-CAPACITOR-.22 UF-25 VOLT TANTALM
C66-CAPACITOR-10 UF-10 VOLT TANT
C67-CAPACITOR-10 UF-10 VOLT TANT
C68-CAPACITOR-10 UF-10 VOLT TANT
C69-CAPACITOR-1 UF-50 VOLT ELECTRO
C70-CAPACITOR-680 PF-50 VOLT CERAMIC
C71-CAPACITOR-.22 UF-25 VOLT TANTALM
C72-CAPACITOR-10 UF-10 VOLT TANT
C73-CAPACITOR-10 UF-25 VOLT ELECTRO
C74-CAPACITOR-3300UF-35 VOLT ELECTRO
C75-CAPACITOR-3300UF-35 VOLT ELECTRO
C76-CAPACITOR-1 UF-50 VOLT ELECTRO
C77-CAPACITOR-100 UF-16 VOLT ELECTRO
C78-CAPACITOR-100 UF-16 VOLT ELECTRO
C79-CAPACITOR-4.7 UF-50 VOLT ELECTRO
CR1-DIODE-1N4148-SILICON
CR2-DIODE-1N4148-SILICON
CR3-DIODE-1N4737-7.5 VOLT 1 WATT
CR4-DIODE-1N4737-7.5 VOLT 1 WATT
CR7-DIODE-1N4001-1 AMP 50 VOLT
CR8-DIODE-1N4148-SILICON
CR9-DIODE-1N4148-SILICON
C10-DIODE-1N4148-SILICON
CR11-DIODE-1N4001-50 VOLT 1 AMP
CR12-DIODE-1N4001-50 VOLT 1 AMP
CR13-DIODE-1N4001-50 VOLT 1 AMP
CR14-DIODE-1N4001-50 VOLT 1 AMP
U1-IC-TL074-QUAD OP AMP
U2-IC-TL074-QUAD OP AMP
U3-IC-TL072-DUAL OP AMP
U4-CMOS IC-CD4011-QUAD NAND GATE
U5-IC-LM1894-DNR
U6-IC-1458-DUAL OP AMP
U7-IC-TL607-BI-FET SWITCH
U8-IC-TL185-QUAD AUDIO SW.
U9-IC-NE570-COMPANDER
U10-IC-1458-DUAL OP AMP
U11-IC-TL074-QUAD OP AMP
U12-CMOS IC-CD4016-QUAD BILATERAL
U13-IC-TL074-QUAD OP AMP
U14-IC-1458-DUAL OP AMP
U15-IC-1458-DUAL OP AMP
U16-IC-TL074-QUAD OP AMP
U17-IC-TL185-QUAD AUDIO SW.
U18-IC-MC3340-ANALOG VCA
U19-IC-MC3340-ANALOG VCA
VR2-REGULATOR-LM7815-POS 15 VOLT 1 A
VR3-REGULATOR-LM7915-NEG 15 VOLT 1 A
T1-TRANSFORMR-34-340-DUAL PRIMARY
LED1-DIODE-NS5056-RED T-1 3/4
LED2-DIODE-NS5056-RED T-1 3/4
LED3-DIODE-NS5056-RED T-1 3/4
MOD1-MODULE-122965-NOISE REDUCTION
MOD2-MODULE-122965-NOISE REDUCTION
MOD3-MODULE-52139-DYNASPAN MATRIX
SW1-SWITCH-50002-FILM-MUSIC
SW2-SWITCH-50002-REAR OFF
SW3-SWITCH-50002-FILM CLEANER
SW4-SWITCH-50005-6 POSITION DIP
SW5-SWITCH-50003-EMERGENCY RED
JMP1-JUMPER-40004-ALT-CONTINUOUS
JMP2-JUMPER-40004-INT-EXT SUPPLY
JMP3-JUMPER-40004-MONO-STER MUSIC

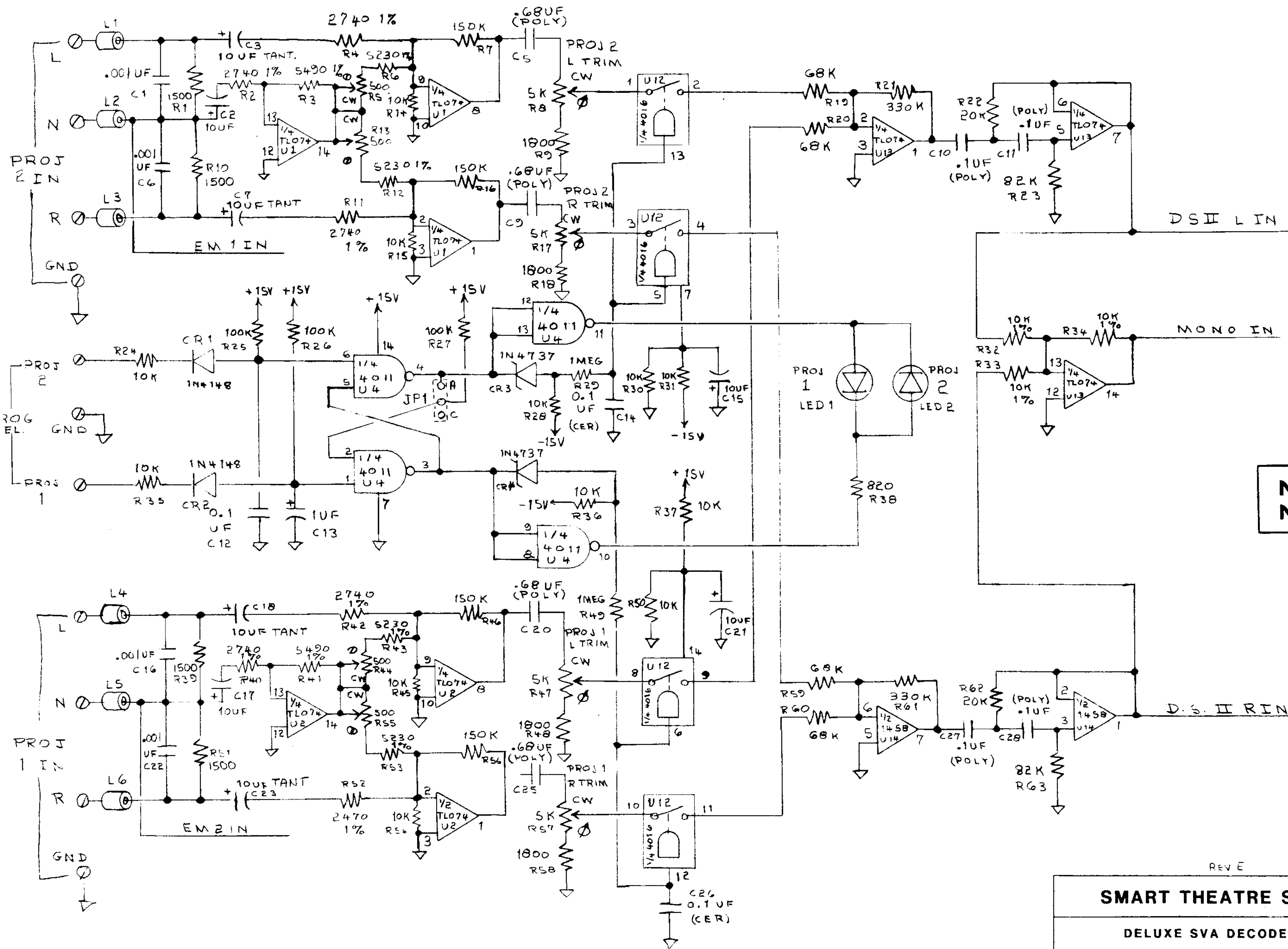
TIME DELAY BOARD

R1-RESISTOR-33K-5% 1/4 WATT
R2-RESISTOR-3300-5% 1/4 WATT
R3-RESISTOR-1200-5% 1/4 WATT
R4-RESISTOR-15K-5% 1/4 WATT
R5-RESISTOR-10K-5% 1/4 WATT
R6-POT- TRIM-26-VERTICAL
R7-RESISTOR-180K-5% 1/4 WATT
R8-RESISTOR-100K-5% 1/4 WATT
R9-POT- TRIM-10K-VERTICAL
R10-RESISTOR-100K-5% 1/4 WATT
R11-RESISTOR-100K-5% 1/4 WATT
R12-RESISTOR-2200-5% 1/4 WATT
R13-RESISTOR-2200-5% 1/4 WATT
R14-RESISTOR-3900-5% 1/4 WATT
R15-RESISTOR-2200-5% 1/4 WATT
R16-RESISTOR-39K-5% 1/4 WATT
R17-RESISTOR-47K-5% 1/4 WATT
R18-RESISTOR-39K-5% 1/4 WATT
R19-RESISTOR-2200-5% 1/4 WATT
R20-RESISTOR-750-5% 1/4 WATT
R21-RESISTOR-7500-5% 1/4 WATT
R22-RESISTOR-7500-5% 1/4 WATT
C1-CAPACITOR-.0022-50 VOLT POLY
C2-CAPACITOR-.0015-50 VOLT POLY
C3-CAPACITOR-.22 UF-50 VOLT POLY
C4-CAPACITOR-10 UF-16 VOLT ELECTRO
C5-CAPACITOR-.1 UF-50 VOLT POLY
C6-CAPACITOR-1 UF-50 VOLT POLY
C7-CAPACITOR-10 UF-16 VOLT ELECTRO
C8-CAPACITOR-.1 UF-50 VOLT CERAMIC
C9-CAPACITOR-330 PF-CERAMIC NPO
C10-CAPACITOR-1 UF-16 VOLT ELECTRO
C11-CAPACITOR-470 PF-50 VOLT CERAMIC
C12-CAPACITOR-330 PF-50 VOLT CERAMIC
C13-CAPACITOR-.022-100 VOLT POLY
C14-CAPACITOR-.0068-100 VOLT POLY
C15-CAPACITOR-680 PF-50 VOLT CERAMIC
C16-CAPACITOR-.1 UF-50 VOLT CERAMIC
C17-CAPACITOR-.1 UF-50 VOLT CERAMIC
VR1-REGULATOR-78L15-15 V 40 MA.
U1-CMOS IC-MN3005-TIME DELAY
U2-CMOS IC-MN3005-TIME DELAY
U3-CMOS IC-CD4047-CLOCK
U4-IC- BI-POL-1458-DUAL OP AMP

LOGIC BOARD

R1-RESISTOR-4.7K-1/4 WATT
R2-RESISTOR-100K-1/4 WATT
R3-RESISTOR-100K-1/4 WATT
R4-RESISTOR-1.6K-1/4 WATT
R5-RESISTOR-1.8K-1/4 WATT
R6-RESISTOR-1.8K-1/4 WATT
R7-RESISTOR-10K-1/4 WATT
R8-RESISTOR-10K-1/4 WATT
R10-RESISTOR-1.8K-1/4 WATT
R11-RESISTOR-1.8K-1/4 WATT
R12-RESISTOR-1.8K-1/4 WATT
R13-RESISTOR-4.7K-1/4 WATT
R14-RESISTOR-22K-1/4 WATT
R15-RESISTOR-22K-1/4 WATT
R16-RESISTOR-100K-1/4 WATT
R17-RESISTOR-100K-1/4 WATT
R18-RESISTOR-1.8K-1/4 WATT
R19-RESISTOR-1.8K-1/4 WATT
R20-RESISTOR-1.8K-1/4 WATT
R21-RESISTOR-10K-1/4 WATT
R22-RESISTOR-10K-1/4 WATT
R23-RESISTOR-10K-1/4 WATT
C1-CAPACITOR-1 UF-16 VOLT
C2-CAPACITOR-.1 UF-50 VOLT
C3-CAPACITOR-.1 UF-50 VOLT
C4-CAPACITOR-.1 UF-50 VOLT
C5-CAPACITOR-.1 UF-50 VOLT
C6-CAPACITOR-10 UF-16 VOLT
U1-CMOS IC-CD4069
U2-CMOS IC-CD4011
U3-CMOS IC-CD4011
CR1-DIODE-IN4148-SILICON
CR2-DIODE-IN4148-SILICON
CR3-DIODE-IN4148-SILICON
CR4-DIODE-IN4148-SILICON
CR5-DIODE-IN4148-SILICON
CR6-DIODE-IN4148-SILICON
CR7-DIODE-IN4148-SILICON
CR8-DIODE-IN4148-SILICON
CR9-DIODE-IN4148-SILICON
CR10-DIODE-IN4148-SILICON
CR11-DIODE-1N4148-SILICON
CR12-DIODE-IN4148-SILICON
CR13-DIODE-1N4148-SILICON
CR14-DIODE-1N4148-SILICON
CR15-DIODE-1N270-GERMANIUM
SW1-SWITCH-50004-MICRO W/ LED
SW2-SWITCH-50004-MICRO W/ LED
SW3-SWITCH-50001-2 POLE 5 POS
SW4-SWITCH-50001-2 POLE 5 POS
CAB1-DIP CABLE-40001-RIBBON 14 COND

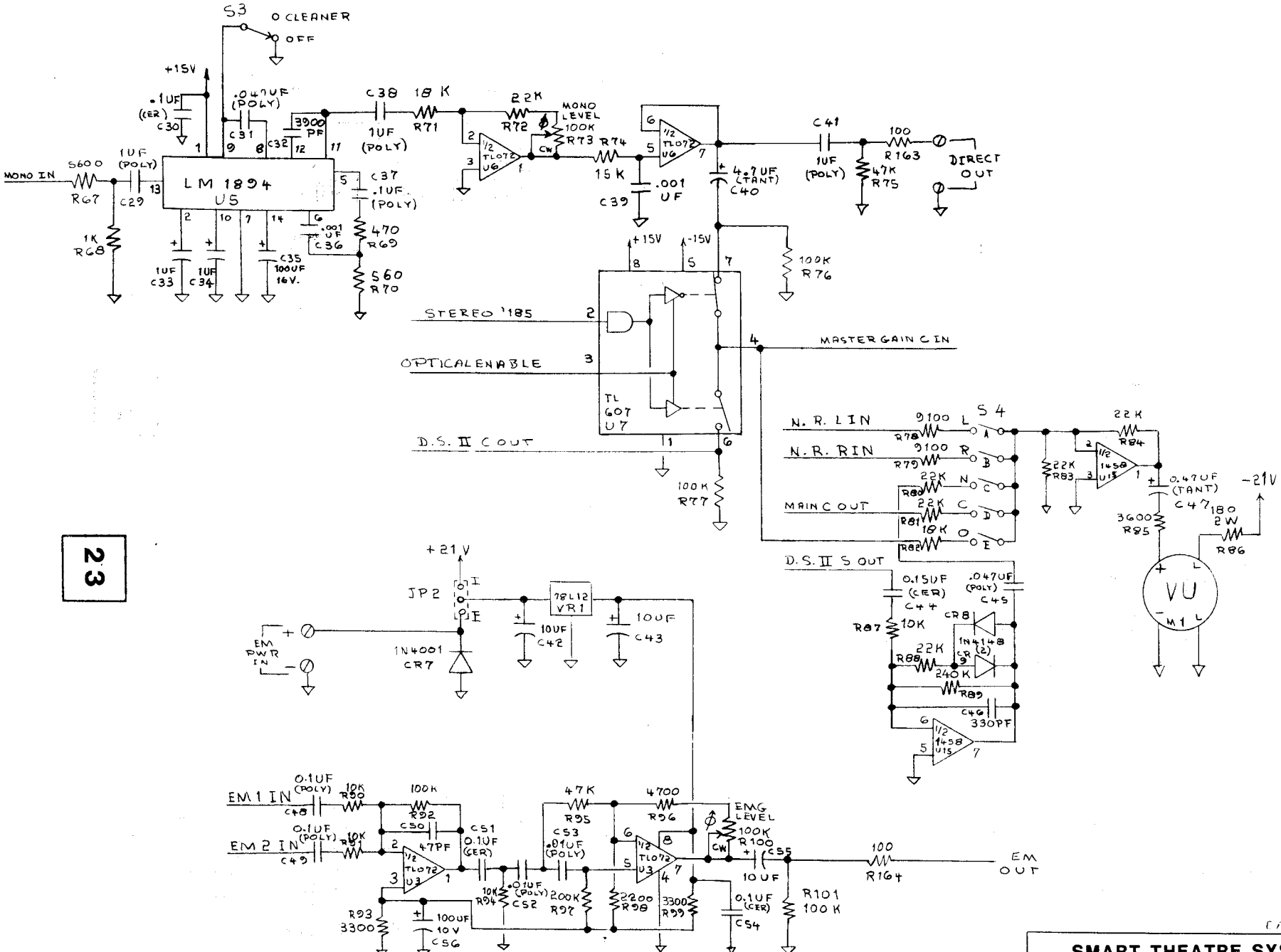
SMART
THEATRE SYSTEMS



22

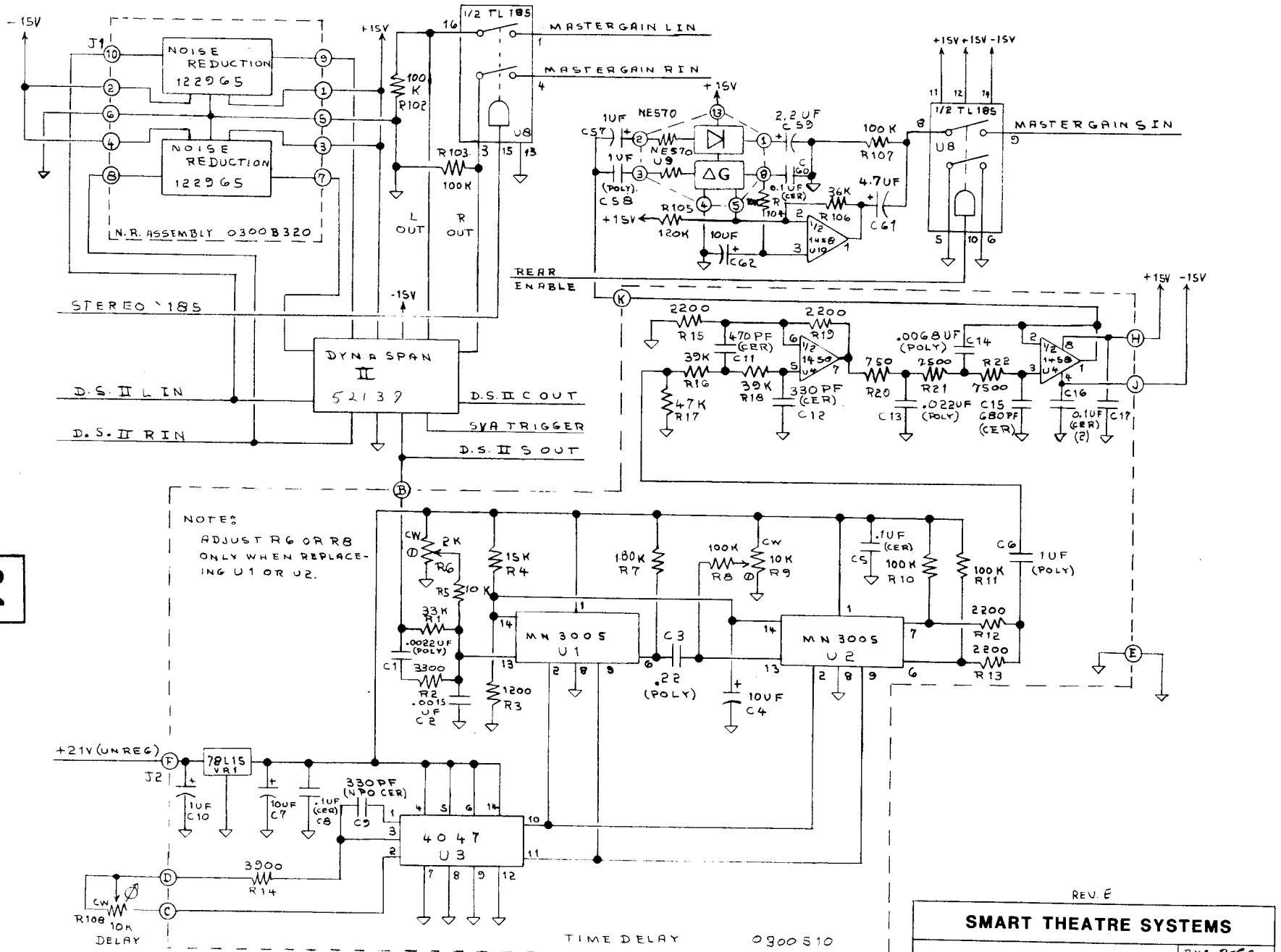
REV E

SMART THEATRE SYSTEMS	
DELUXE SVA DECODER	BY: [illegible] DATE: 9-4-83
MAIN CARD SCHEMATIC	
SHEET NO. 1 OF 6	DWG. NO: 0300C305



23

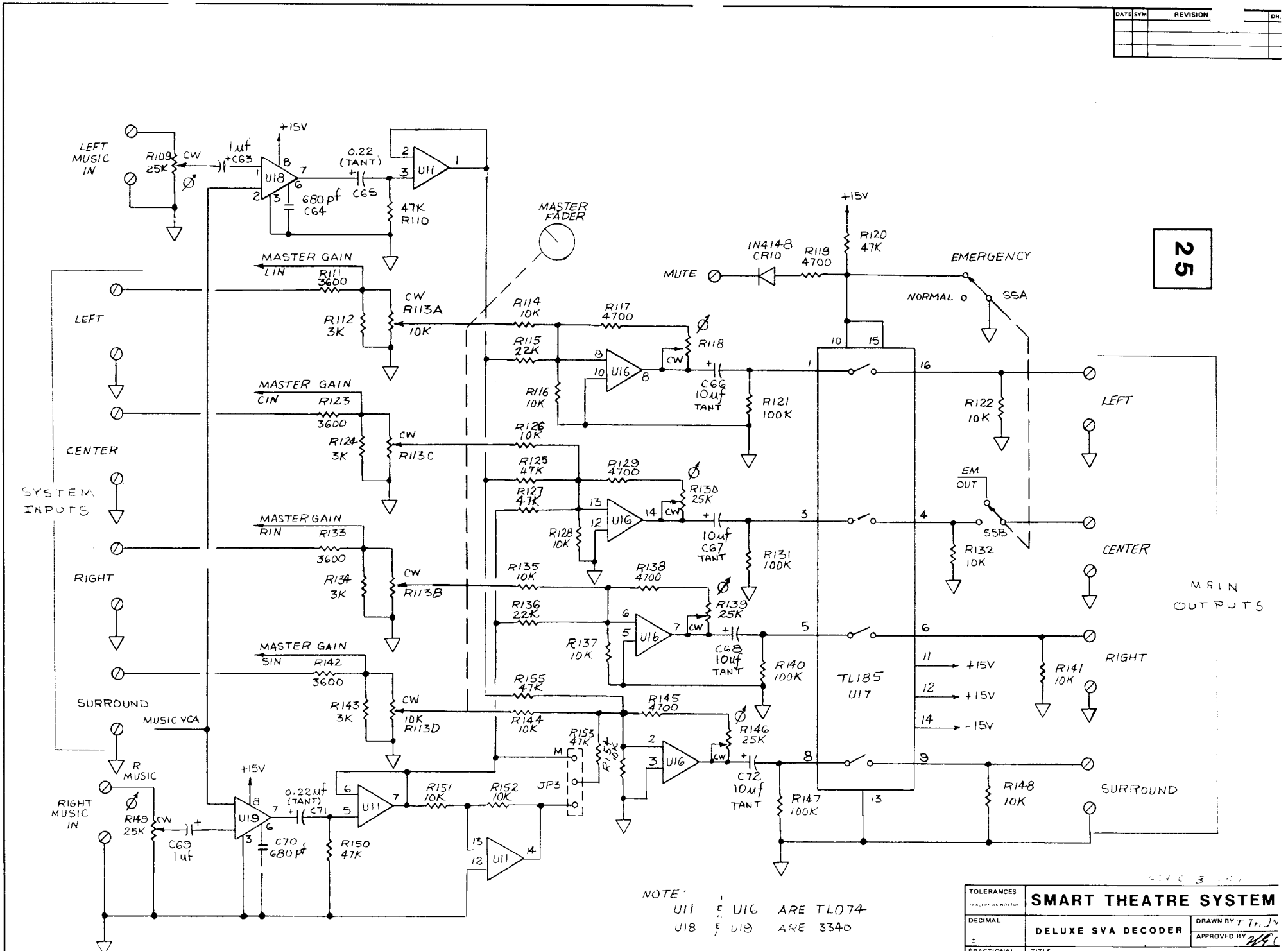
SMART THEATRE SYSTEMS	
DELUXE SVA DECODER	BY: MEC DATE 9-4-83
MAIN CARD SCHEMATIC	
SHEET NO: 2 OF 6	DWG NO: 0300C305



24

REV. E

SMART THEATRE SYSTEMS	
DELUXE SVA DECODER	BY: MEC DATE 9-4-83
MAIN CARD SCHEMATIC	
SHEET 3 OF 6	DWG NO: 0300C30F

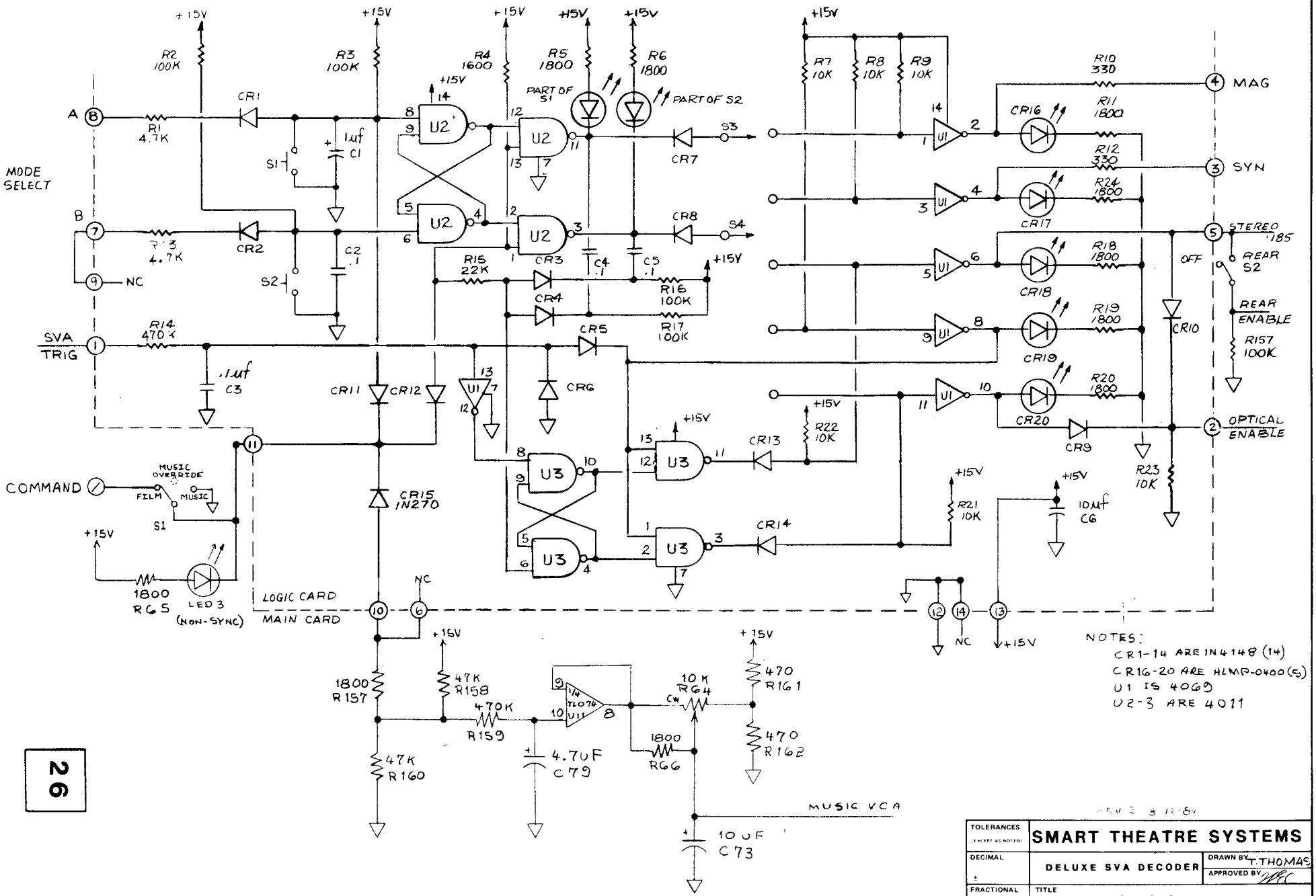


NOTE:
U11 & U16 ARE TL074
U18 & U19 ARE 3340

TOLERANCES (EXCEPT AS NOTED)	SMART THEATRE SYSTEM		
DECIMAL ±	DELUXE SVA DECODER	DRAWN BY	
		APPROVED BY	
FRACTIONAL ±	TITLE OUTPUT SECTION		
ANGULAR ±	DATE	DRAWING NUMBER 0300C305	SHEET 4 OF 6

GAF DRAFTRACE 250

DATE	SYM	REVISION RECORD	DR	CK

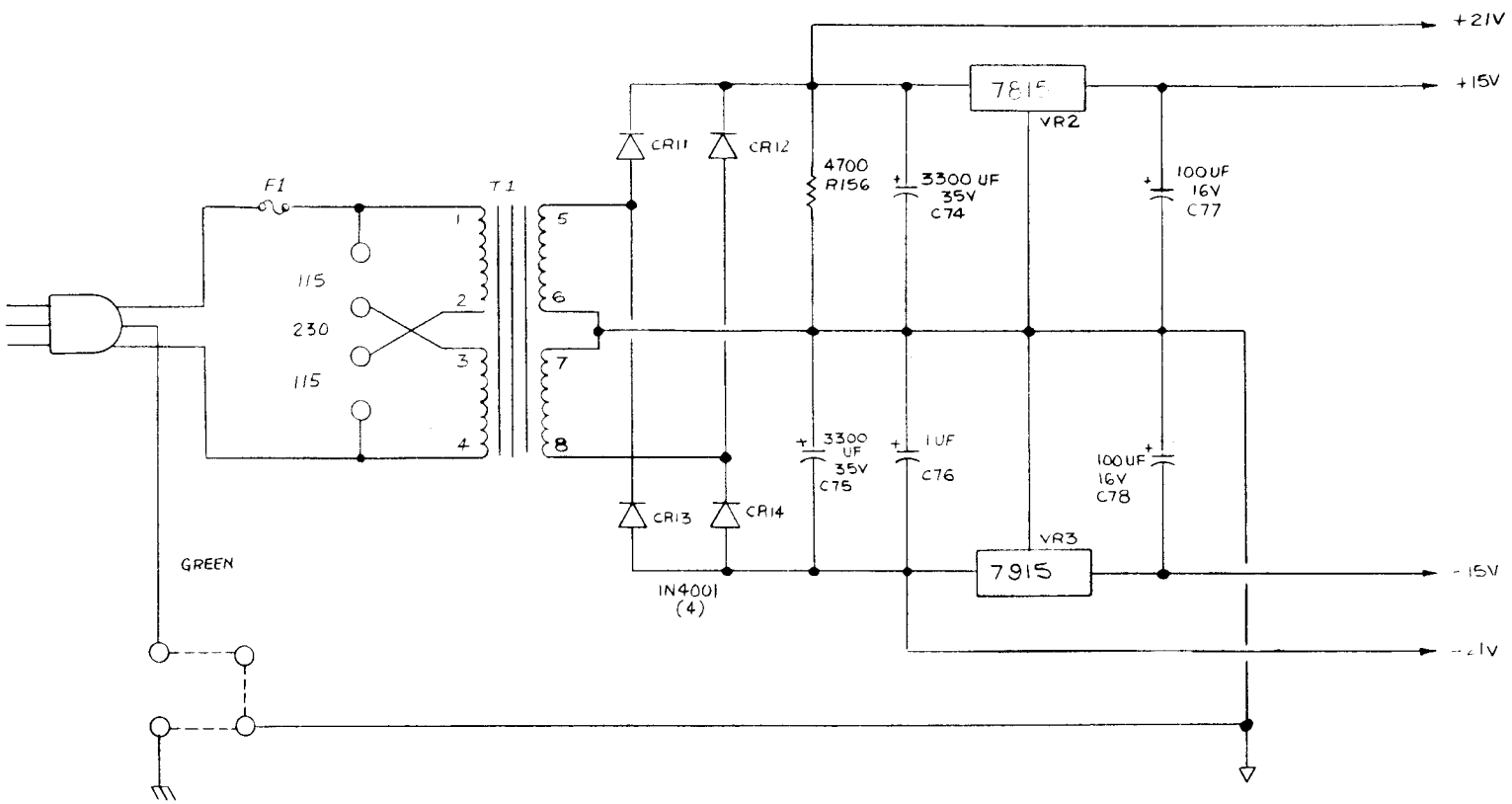


NOTES:
CR1-14 ARE IN4148 (14)
CR16-20 ARE HLMP-0400(5)
U1 IS 4069
U2-3 ARE 4011

26

TOLERANCES (EXCEPT AS NOTED)	SMART THEATRE SYSTEMS	
DECIMAL ±	DELUXE SVA DECODER	DRAWN BY T. THOMAS
FRACTIONAL ±	TITLE LOGIC CARD	APPROVED BY
ANGULAR ±	DATE	DRAWING NUMBER 0300C305 SHEET 5 OF 6

DATE	SYM	REVISION RECORD	DR	CK



27

TOLERANCES (EXCEPT AS NOTED)	SMART THEATRE SYSTEMS	
DECIMAL ±	DELUXE SVA DECODER	DRAWN BY T. THOMAS
FRACTIONAL ±	TITLE POWER SUPPLY	APPROVED BY
ANGULAR ±	DATE	DRAWING NUMBER 0300C305 SHEET 6 OF 6