Price: $5.00

MODEL SP-6E PREAMPLIFIER

OWNER'S MANUAL

9/10/82

audio research corporation
6801 SHINGLE CREEK PARKWAY
MINNEAPOLIS, MINNESOTA 55430

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INTRODUCTION

Please take the time to read this manual prior to installation or use of the unit. Because it is a vacuum tube device utilizing high voltages there are several things you need to know prior to placing it in operation.

DISCUSSION

The SP-6 (and later versions including the SP-6A, SP-6B, SP-6B/RC, SP-6C and SP-6C-1) has been recognized through much of its life as the state-of-the-art for the reproduction of music. Introduced in 1978, it has enjoyed prominence longer than most products that come and go at the state-of-the-art.

This latest version, the SP-6E, embodies all of the technology advances that are applicable to this circuitry topology. Included are such refinements as the use of the polypropylene dialectric "wonder caps" throughout the audio signal path, as well as in some power supply "reference" locations; a special proprietary interconnect wire utilizing a high copper purity "litz" configuration with an outer polypropylene dialectric jacket; special high performance vacuum tubes; and our proprietary "DC" feedback concept circuitry.

When used with commensurate quality equipment, the SP-6E is capable of providing a very wide bandwidth of great dynamic range and good musicality with unsurpassed stage width and depth.

If low output moving coil cartridges are to be used, it is recommended that ARC MCP-2 or MCP-3 (available in January, 1983) or a good transformer be utilized. Most "competetive" pre-preamplifiers just do not provide the dynamic stability to be used with the SP-6E.

If you have experienced feedback, hum, noise or instability problems with the turntable/arm/cartridge combination you are presently using, be sure to resolve these problems prior to placing your SP-6E in service. Your authorized ARC dealer can provide help with these kinds of problems.

When these use conditions are met, we believe you will enjoy a very satisfying experience in the reproduction of recorded music.

WARRANTY STATEMENT

A Limited 90-Day Warranty (from date of purchase by the original purchaser; but must be within two (2) years of the date of manufacture) is provided by Audio Research Corporation. This includes vacuum tubes. This warranty is subject to the conditions and limitations stated within the documents attached to the outer shipping carton and is repeated in full on Page 9 of this manual. Please read the following WARRANTY REGISTRATION CAUTION as well as the WARRANTY TERMS on Page 9 of this manual to understand your responsibility as well as your rights regarding the warranties.

WARRANTY REGISTRATION CAUTION

It is your responsibility to register your unit. While it is true that Audio Research Corporation will provide warranty service for 90 days even if you do not (proof of purchase, such as a photocopy of your bill of sale, will be required), you will lose the extended Limited 3-Year Warranty unless you register the unit within 30 days of the date of your purchase. (Note that this extended warranty does NOT include vacuum tubes.)

Please note that it is not Audio Research's (or your dealer's) responsibility to insure this registration. It is yours, and yours alone. The warranty papers are attached to the carton. Do not delegate this responsibility to anyone else. You can know that your unit is registered only if you do it yourself and if you receive back from Audio Research a validated Warranty Certificate. Audio Research wants you to have the extended Limited 3-Year Warranty; however, the validated warranty will not be issued if the unit is not registered within 30 days of the date of purchase.

Take time now to read Paragraph 1 of the WARRANTY TERMS on Page 9 of this manual so that you will clearly understand what is required of you in order to accomplish the warranty registration.

USE CAUTIONS

1. Please be certain to read this manual over to familiarize yourself with your new preamplifier before placing it in service.

2. The power cord on your SP-6E is equipped with a standard three-prong grounding plug which, if used normally, will provide a safe earth ground connection of the chassis and all equipment plugged into its AC receptacles. While this procedure provides the maximum possible safety in use it will, in some cases, cause your audio system to have a small residual hum.

It is usually best to keep the SP-6E "earth grounded" and "float" the grounds of power amplifier and other equipment to eliminate ground loop hum. The audio interconnect cables then keep the power amplifiers at safe earth ground potential. For further information on grounding, see RECEPTACLES and GROUND TERMINAL on Page 4 of this manual. If there is any question as to the safety of grounding procedures, be certain to seek competent help with the installation.

WARNING

A. To prevent fire or shock hazard, do not expose this equipment to rain or moisture.

B. This unit contains voltages which can be lethal. Do not operate this unit with its covers removed. Refer servicing to qualified personnel.

CAUTION

For continued protection against fire hazard, replace the fuses only with the same type and rating of fuses as specified at the fuse holder.

PACKAGING

Save all packaging. Your Audio Research® preamplifier is a precision electronic instrument and should be properly cartoned any time shipment is made. You may not have occasion to return it to the factory for service, but if that should prove necessary, or other occasion to ship it occurs, the original packaging may save your investment from unnecessary damage or delay.

USE INSTRUCTIONS

The front panel has a total of 4 controls and 4 switches.

GAIN CONTROL: This controls volume or loudness, and is a special metal film segmented control with approximately 2dB steps and accurate tracking. It is highly recommended that the user develop the habit of always turning the gain control to its fully counter-clockwise position (minimum) between any listening uses (between records, whenever switching inputs or impedance or prior to turning the unit "on" or "off" are examples). This will insure no inadvertent misuse of the unit with possible damage to amplifier and/or speaker.

In the case of some high efficiency speakers (such as Klipshorn, etc.) and/or high output cartridges it will probably be necessary to use a power amplifier that has input level controls. Proper adjustment is accomplished as follows: With the SP-6E gain control in the 10 to 2 o'clock position range advance the amplifier input level controls for normal listening level.

BALANCE CONTROL: A conventional stereo control. Moves the sound from left to right or vice versa when rotated. Normally should remain centered.

MODE CONTROL: Also a conventional stereo control. Allows operation as indicated.

INPUT SELECTOR: Chooses between various possible source material for your listening choice.

The "phono" input is an RIAA compensated high gain input for use with most magnetic cartridges. The input is 50K ohms, with very low (40pF) input capacitance. If your cartridge needs more capacitance, there is built-in provision to add whatever is required. Contact your ARC dealer or our Customer Service Department if you need help with this.

PRE-AMP "ON" SWITCH AND INDICATOR: Turns the unit on in the "up" position, and the associated green LED will light, indicating that power is reaching the unit. During the 2-minute warmup period the green LED will blink slowly, indicating that the output is muted.

OUTLETS ON: Turns the power receptacles on the rear chassis panel on in the up position, and the associated LED will light, indicating that they are on. This switch is specifically provided to allow the amplifier(s) to be turned on after the preamplifier is "warmed up." A vacuum tube device requires up to several minutes to fully stabilize its operating parameters. Power amplifiers should be turned off with the outlet switch before the SP-6E is turned off to avoid turn-off thumps. The SP-6E mutes just after turn-off to minimize any excessive output surges.

MUTE OPERATE SWITCH: Shorts the output of the preamplifier for the warmup (and cooldown) period. Also, to allow changing records (and maintaining a previous gain setting), answering the telephone and the like.

INPUT MONITOR: Primarily aimed for use with tape recorders, but may be used with any line level signal source where bypassing the input selector is desirable.

RECEPTACLES: There is one unswitched outlet which may be used for a turntable, or the like, where switching is not needed or wanted. There are 3 outlets, relay controlled, capable of providing power to large amplifiers and the like. Incidentally, the "click" you hear internally when activating the receptacle switch is the relay operating. (The line cord is a 3 conductor, #16 guage, providing ample safe grounded power to these 3 outlets.)

In some locations, with low line voltage, connecting auxiliary equipment to the SP-6E receptacles will cause some degredation of the sound quality, as well as causing more muting circuit activation. If this is experienced, it is recommended that power amplifiers be connected directly to an AC receptacle.

FUSE: Always use the same size and type as indicated on the rear of the chassis for safety. For best results use Buss MDL or MDX fuses.

GAIN SWITCH: Previous versions of the SP-6 (SP-6, SP-6A, SP-6B, SP-6C, SP-6C-1) have had a gain switch which has allowed a 6dB reduction in gain. This feature has been eliminated from the SP-6E since it has been found to degrade the sound quality in this circuitry.

OUTPUT CONNECTORS: Main outputs should be connected to your power amplifier inputs. Tape outputs should be connected to your take recorder "AUX" or "LINE" inputs.

INPUT CONNECTORS: These are all clearly marked and are all 50K ohms.

GROUND TERMINAL: To be used for "grounding" associated input equipment, such as tonearms, turntables and the like. Should not be connected to tape recorders and/or power amplifiers.

"CHASSIS" AND "B-" BANANA JACKS: Special emphasis has been placed in the design of this product to reduce and/or eliminate "hum," "TVI," "RFI" and "CB" type interferences.

For normal use a jumper MUST be placed between these connectors. Otherwise, severe hum and/or oscillation will occur.

(Special off-chassis construction is employed to accomplish these interference reduction methods, and this connection is the only one from the "common" or "B-" circuit to the chassis so that it can act as a shield to outside interferences.)

For rack cabinet mounting, when ground connections are used (via inputs/outputs), this jumper may be removed to allow only one shield ground path, thereby eliminating what is known as "ground loop" induced hum. Note that this may or may not necessarily be helpful in a given system.

If your SP-6E is ever removed from the rack, be sure to remember that a jumper MUST be reinstalled.

SERVICING

First of all, a very serious CAUTION: This unit contains over 500 volts of DC, with sufficient voltage and current available to be lethal. So, please do not poke around inside the unit. Refer any needed service to a qualified technician. (Even with the unit turned off, a charge remains in the energy storage filter for some time.)

This unit is constructed to the highest of commercial standards and will require only reasonable maintenance and repairs to provide high definition service for many years.

The vacuum tubes furnished with your SP-6E are long life industrial tubes, and will not have to be changed for several thousand hours of use. Even these tubes can fail, however, and the following service hints are offered.

If excessive noise should develop in the phono section only, it is most likely V1.

If degraded sound should occur in the phono section only, it is most likely V2.

V3 is not normally critical, although occasionally excessive hum can be caused by failure of this tube.

If excessive noise developes in the high level section (ie: inputs other than phono), it is most likely V4.

If degraded sound developes in the high level section, it is most likely V5.

V6 is also not normally critical, although it also can introduce hum.

It is also important to remember that just as a chain is no stronger than its weakest link, the quality of the vacuum tubes used in this unit will have a direct effect upon the resultant sound quality, and will indeed be the limiting "link."

A schematic diagram is appended hereto which is fully annotated with operating voltages and component part values. Your service technician will require this information when working on your unit.

DISCUSSION OF MUTING PROVISIONS

The SP-6E has five (5) provisions to guard against possible misuse of the exceptional dynamic range and wide bandwidth that it offers. The SP-6E is not subject to damage itself, but some power amplifiers and speakers are more limited in their ability to withstand signal extremes. These provisions, both manual and automatic, are designed to allow a flawless listening experience while providing unprecedented realism, yet giving protection against operator error and other improper conditions beyond the operator's control.

1. OUTLET SWITCH to allow the power amplifier to be "off" during warmup or shutdown of the SP-6E. A minimum of 5 minutes warmup time is recommended to insure optimum performance.

2. MUTE/OPERATE SWITCH allows manual disabling of the SP-6E's main outputs during any moving of the tonearm or switching of equipment. Use of this switch will minimize stress on your amplifier even if it is "off." Absolute protection is afforded when this switch is used, and it is recommended that manual muting be employed during the 5 minute initial warmup period as well as during turnoff.

If you are willing to develop the habit of always turning the Gain Control down, together with utilizing the manual mute switch whenever the unit is turned on or off (as well as in between uses, such as changing records), then you will almost certainly never experience the damaged amplifiers and/or speakers that can result from misuse of this very wideband, wide dynamic range preamplifier.

3. AUTOMATIC MUTING. The SP-6E has the most sophisticated automatic muting of all ARC preamplifiers, and will limit the amount of unwanted subsonic output, without restricting the useable dynamic range for program material. These unwanted signals could result from:

A. Severe power line distrubances or poor wall receptacles.
B. Disconnecting input cables, or faulty cables.
C. Failure to use the manual mute switch when moving a tonearm or when switching equipment.
D. Driving the preamp momentarily into clipping, such as by connecting a line level program source into the phono input.
E. Residual subsonic output from pre-preamps, tuners or other signal sources.
F. Servicing procedures such as tube changing or tube defects.

4. WARMUP TIMER that mutes the SP-6E outputs for 2 minutes after the power switch is turned "ON," to ensure complete circuit stabilization to well within the limits of the automatic muting threshold, before the outputs come "ON."

5. IMPROVED POWER SUPPLY to tolerate power line disturbances or "brown-outs" down to 100VAC or less, without degredation of circuit performance.

The automatic muting operates as follows:

1. The main pilot lamp slowly blinks between dim and bright at about 1/2 second in each state to indicate that the outputs are automatically disabled by either the warmup timer or the output "fault sensors." This visual indication occurs independent of the position of the manual mute switch so you will know if the SP-6E is ready to perform before the mute switch is set to "Operate."

2. The manual mute switch always disables both outputs and overrides any automatic provisions, even when the SP-6E is turned off. There is no visual indication of manual mute condition other than the position of the switch handle. (the "Operate" position of the manual mute switch is functional only after the unit is no longer in automatic mute mode.)

3. The main outputs of both channels are switched "off" and "on" simultaneously even if an unwanted signal is sensed in only one channel. The tape outputs are not muted.

4. The 2-minute warmup timer will restart automatically if the power is temporarily interrupted for 0.2 second or more, which is sufficient time to disturb the heater temperature in the tubes.

5. Automatic output sensing thresholds are designed to limit both amplitude and duration of unwanted subsonic signals, so that heating effects in power amplifiers or speakers are kept well within safe limits. High amplitude disturbances are muted much more quickly than those of lower amplitude. Slowly changing disturbances of ±one volt at the SP-6E output are muted in about 1 second and 2 volt signals in less than .5 second, etc. Large surges are muted in less than .05 second. Disturbances of less than ±0.3 volts are not muted at all.

6. The automatic output sensors detect only "silent" subsonic energy below 1Hz, and they do not sense excessive output in the normal audio or ultrasonic spectrum that could damage speakers. Proper fusing of speakers is essential to protect against excessive audio level or power amplifier faults.

7. Assymetrical program wavefronts or single "DC step" signals are not muted regardless of duration if they are one volt or less in amplitude at the SP-6E outputs. The gradual decay of these signals due to the .05Hz low frequency limit of the amplifier presents a sufficiently low average level during the sensor's one second time constant to prevent reaching the .3V threshold at the output sensors. Very short assymetrical transients of as high as 60 volts are unmuted.

8. The muting is accomplished without clicks by "soft-switching" photocouplers, with pure resistive photoconductive elements. No electrical contacts or moving parts are used in the audio path to insure no degredation of sonic performance. All photocoupler lamps are light-emitting diodes to provide essentially infinite service life.

9. Qualified service personnel may wish to disable the warmup muting and output sensor muting for testing purposes. This may be done by desoldering jumper J16 near the mute switch. Manual mute is still operational.

INSTALLATION CAUTIONS

The SP-6E will function in any position; however, for long term reliable service the following precautions should be observed.

1. Upright and horizontal mounting is required for the SP-6E if extended operation (longer than 1 hour) is contemplated.

2. Do not "stack" the SP-6E above or below another unit such as a power amplifier. Excessive heat and induced hum will result.

3. Do not place or operate the SP-6E on a soft or irregular service such as a rug. This will prevent the unit from having proper ventilation.

4. Do not operate the unit without the top and bottom covers installed. These are required both for safety as well as shielding fron interference (except in service operations, obviously).

5. If rack mounting is employed, use ARC Rack Mount Ventilators (RMV-3) below and above the unit.

SUMMARY OF FEATURES

As expected with a product of this caliber, the SP-6E offers many outstanding features to the audiophile perfectionist.

AUTOMATIC MUTING: A two minute warmup timer insures muting of undesirable sub-sonic output during circuit stabilization. Continuous protection against unwanted DC output due to any cause is provided by four output sensors that automatically mute both main outputs. No troublesome relays or electrical contacts are used. A blinking front panel LED provides a visual indication when the automatic mute is activated.

MANUAL MUTING: A front panel mute switch is included for repeat settings, interruptions, etc.

HIGH ACCURACY, CLOSE TRACKING, SEGMENTED GAIN CONTROL: A metal-film stereo volume control assures trouble-free, close tracking volume selection in 2dB steps (guaranteed 1.5dB tracking, .5dB typical).

SEPARATE FRONT PANEL POWER RECEPTACLE SWITCH: A front panel switch operates 3 relay-controlled outlets with a 1600 watt capacity for power amplifiers and other outboard devices.

SPECIAL OFF-CHASSIS CONSTRUCTION: The special isolated ground construction floats all inputs and outputs from the chassis. Special rejection filters are also included to minimize or eliminate RFI, TVI and CB interference.

SONICALLY SELECTED COMPONENTS: Exclusive use of long life industrial-grade tubes, special metal film resistors and polypropylene dialectric capacitors provide optimum sonic accuracy.

OTHER FEATURES INCLUDE: A rear panel provision for disconnecting the common ground from the chassis so that rack mount installations may be accomplished without ground loop induced hum. Front and rear panels are of two-color anodized aluminum construction for permanent finish and lettering. Industrial grade components and construction are used for long service life.

WARRANTY TERMS

This unit is offered with a limited warranty as follows:

1. Warranty. Audio Research warrants the product designated herein to be free of manufacturing defects in material and workmanship, subject to the conditons hereinafter set forth, for a period of three (3) years from the date of purchase by the original purchaser. To obtain this Warranty, THE ORIGINAL PURCHASER MUST MAIL TO AUDIO RESEARCH WITHIN THIRTY (30) DAYS OF THE DATE OF PURCHASE THIS WARRANTY REGISTRATION FORM COMPLETED, DATED AND SIGNED BY BOTH THE PURCHASER AND THE SELLING DEALER TOGETHER WITH A COPY OF THE BILL OF SALE OR OTHER PROOF OF PURCHASE OF THE PRODUCT. Audio Research will then validate the Warranty and return the validated Warranty to the purchaser.

2. Conditions. This Warranty is subject to the following conditions and limitations. The Warranty is void and inapplicable if the product has been used or handled other than in accordance with the instructions in the owner's manual, abused or misused, damaged by accident or neglect or in being transported, or the defect is due to the product being repaired or tampered with by anyone other than Audio Research or an authorized Audio Research repair center. The product must be packed and returned to Audio Research or an authorized Audio Research repair center by the customer at his or her sole expense. A RETURNED PRODUCT MUST BE ACCOMPANIED BY A WRITTEN DESCRIPTION OF THE DEFECT AND A PHOTOCOPY OF THIS VALIDATED WARRANTY. Audio Research reserves the right to modify the design of any product without obligation to purchasers or previously manufactured products and to change the prices or specifications of product without notice or obligation to any person.

3. Remedy. In the event the above product fails to meet the above Warranty and the above conditions have been met, the purchaser's sole remedy shall be to return the product to Audio Research or an authorized Audio Research repair center where the defect will be rectified without charge for parts or labor, except vacuum tubes (see 6 below).

4. Limited to Original Purchaser. This Warranty is for the sole benefit of the original purchaser of the covered product and shall not be transferred to a subsequent purchaser of the product.

5. Duration of Warranty. This Warranty expires on the third anniversary of the date of purchase. During the first ninety (90) day period following the date of purchase by the original owner, the Audio Research Limited 90-Day Warranty supersedes this Warranty.

6. Vacuum Tubes. Vacuum tubes and replacement thereof are warranted for the original 90-day period only.

7. Miscellaneous. ANY IMPLIED WARRANTIES RELATING TO THE ABOVE PRODUCT SHALL BE LIMITED TO THE DURATION OF THIS WARRANTY. THE WARRANTY DOES NOT EXTEND TO ANY INCIDENTAL OR CONSEQUENTIAL COSTS OR DAMAGES TO THE PURCHASER. Some states do not allow limitations on how long an implied warranty lasts or an exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

SP-6E PRELIMINARY SPECIFICATIONS (AC line set @120V 60Hz for these specifications)

Frequency Response:
  High level section: ±.25dB, 5Hz to 30Hz
                      -3dB points below 1Hz and above 100kHz
  Magnetic phono: ±.25dB of RIAA, 30Hz to 40kHz

Harmonic Distortion:
  Less than .01% at 2V RMS output, 20Hz to 20kHz (Typically less than .0002% in midband)

Intermodulation Distortion:
  Less than .002% at 2V RMS output

Gain:
  Magnetic phono input to tape output: 34dB High level inputs to tape output: 0dB
  Magnetic phono input to main output: 60dB High level inputs to main output: 26dB

Input Impedance:
  50K ohms, all inputs (Magnetic phono may have any value from 10 ohms to 100K ohms substituted. Also has provision to add to the 40pF input capacitance for matching certain magnetic cartridges.)

Output Impedance:
  Less than 500 ohms main output, 100 ohms tape output. Recommended minimum load for maximum audio quality 20K ohms and .001uF maximum capacitance.

Maximum Inputs:
  Magnetic phono, 900mV at 1kHz. (3.5V RMS, 10kHz) High level inputs essentially overload-proof.

Rated Outputs:
  2V RMS 5Hz to 30kHz, all outputs; 60K ohm load (main output capability is 60V RMS output at 1/2% THD at 1kHz into a 500K ohm load with 3V RMS high level input)

Power Supplies:
  Electronically-regulated solid-state supplies. Frequency-compensated high-voltage supplies have a total equivalent low-frequency stability of greater than 1 farad of capacitance. Line regulation better than .001%.

Noise:
  High Level
    (1) 250V RMS maximum residual unweighted wide band noise at main output with gain control minimum (86dB below 5V RMS output)
    (2) More than 90dB below 1V RMS input (less than 20uV equivalent input noise)
  Magnetic Phono
    5uV equivalent input noise, wideband RMS (-66dB reference 10mV input)
    (Approximately 1uV above 200Hz or -80dB reference 10mV input)

Tube Complement:
  2 - reference grade E88CC or equivalent dual trides
  4 - reference grade E83CC or equivalent dual triodes

Power Requirements:
  100-125VAC 60Hz (190-240VAC 50Hz) 50 Watts

Dimensions:
  19" (48 cm) W x 5 1/4" (13.4 cm) H (standard rack panel) x 10 1/4" (26 cm) D. Handles extend 1 5/8" (4.1 cm) forward of front panel. Rear chassis fittings extend 7/8" (2.3 cm).

Weight:
  22 lbs. (10 kg)Net; 30 lbs. (13.75 kg) Shipping

MODEL SP-6E PREAMPLIFIER

SCHEMATIC

audio research corporation
6801 SHINGLE CREEK PARKWAY
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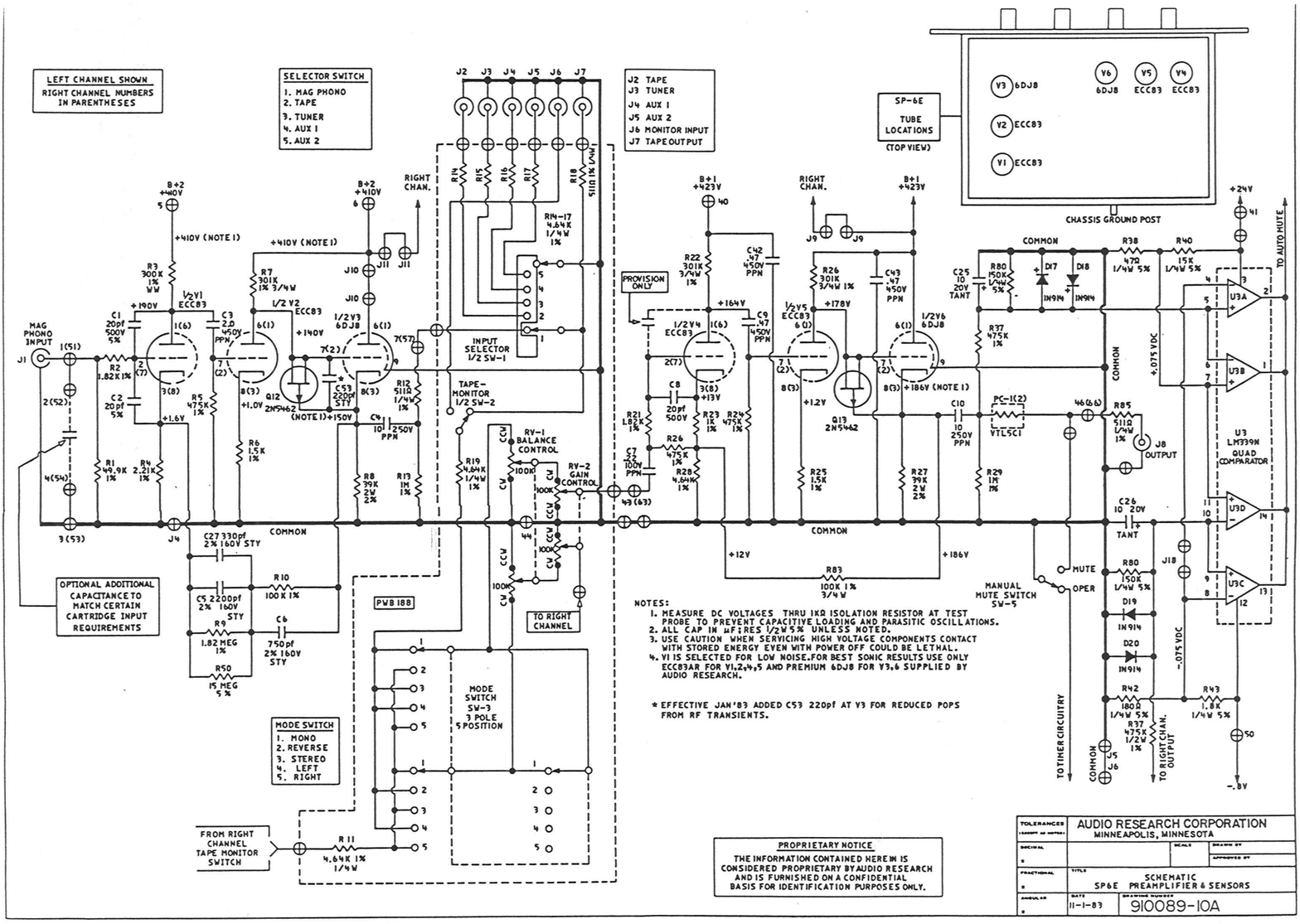
11-1-83


LEFT CHANNEL SHOWN
RIGHT CHANNEL NUMBERS IN PARENTHESES
SELECTOR SWITCH
1. MAG PHONO
2. TAPE
3. TUNER
4. AUX 1
5. AUX 2
J2 TAPE
J3 TUNER
J4 AUX 1
J5 AUX 2
J6 MONITOR INPUT
J7 TAPE OUTPUT
SP-6E TUBE LOCATIONS (TOP VIEW)
V3 6DJ8
V6 6DJ8
V5 ECC83
V4 ECC83
V2 ECC83
V1 ECC83
CHASSIS GROUND POST
MAG PHONO INPUT
INPUT SELECTOR 1/2 SW-1
TAPE-MONITOR 1/2 SW-2
RV-1 BALANCE CONTROL
RV-2 GAIN CONTROL
PROVISION ONLY
TO AUTO MUTE
COMMON
+4.075 VDC
-.075 VDC
U3 LM339N QUAD COMPARATOR
J8 OUTPUT
MANUAL MUTE SWITCH SW-5
MUTE
OPER
TO TIMER CIRCUITRY
TO RIGHT CHAN. OUTPUT
OPTIONAL ADDITIONAL CAPACITANCE TO MATCH CERTAIN CARTRIDGE INPUT REQUIREMENTS
PWB 188
MODE SWITCH SW-3 3 POLE 5 POSITION
MODE SWITCH
1. MONO
2. REVERSE
3. STEREO
4. LEFT
5. RIGHT
TO RIGHT CHANNEL
FROM RIGHT CHANNEL TAPE MONITOR SWITCH
NOTES:
1. MEASURE DC VOLTAGES THRU 1KΩ ISOLATION RESISTOR AT TEST PROBE TO PREVENT CAPACITIVE LOADING AND PARASITIC OSCILLATIONS.
2. ALL CAP IN μFARES 1/2W 5% UNLESS NOTED.
3. USE CAUTION WHEN SERVICING HIGH VOLTAGE COMPONENTS CONTACT WITH STORED ENERGY EVEN WITH POWER OFF COULD BE LETHAL.
4. V1 IS SELECTED FOR LOW NOISE. FOR BEST SONIC RESULTS USE ONLY ECC83AR FOR V1,2,4,5 AND PREMIUM 6DJ8 FOR V3,6 SUPPLIED BY AUDIO RESEARCH.
* EFFECTIVE JAN'83 ADDED C53 220pf AT V3 FOR REDUCED POPS FROM RF TRANSIENTS.
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SP6E PREAMPLIFIER & SENSORS
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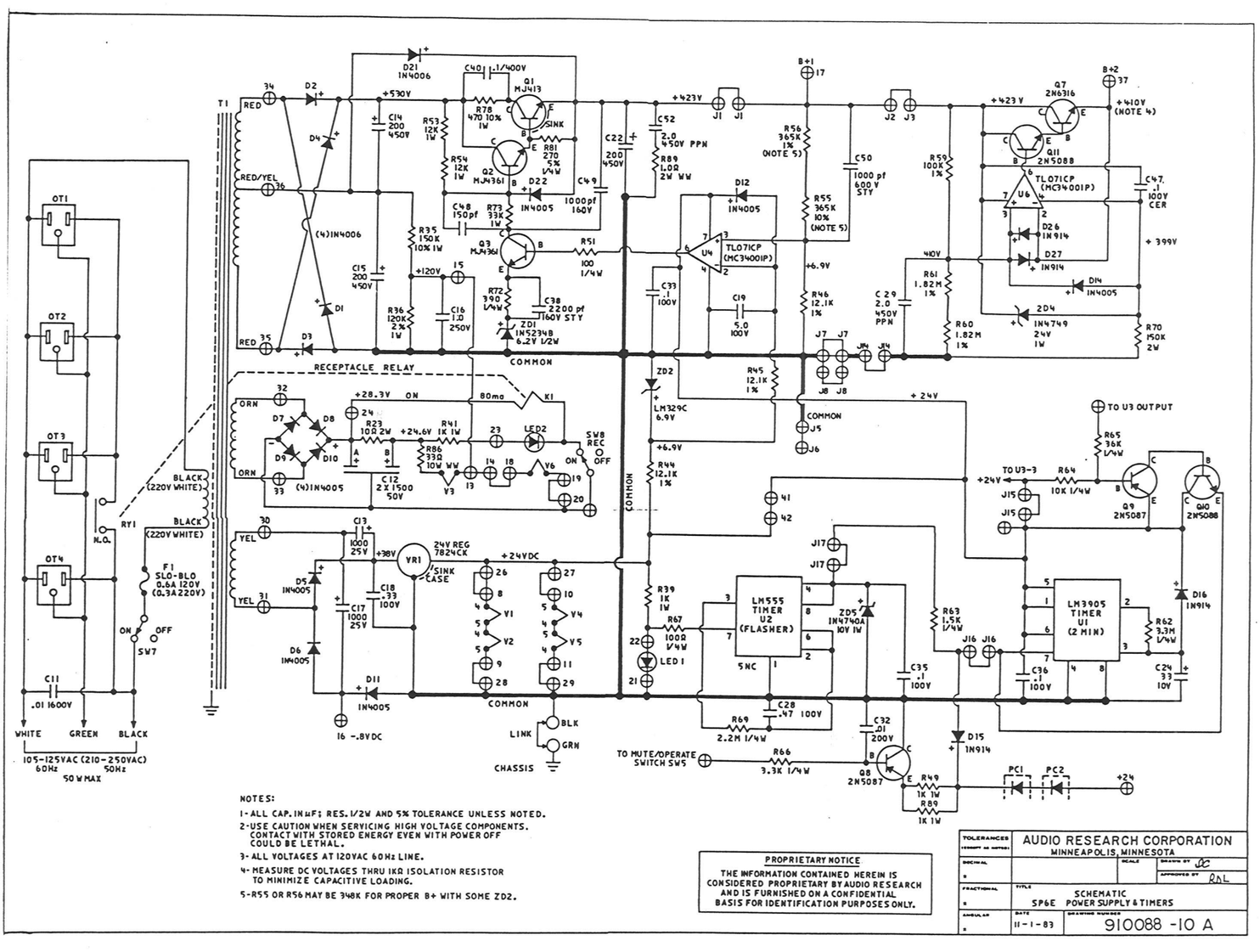
910089-10A


RECEPTACLE RELAY
TRANSFORMER
(4)IN4006
(4)IN4005
TL071CP (MC34001P)
LM329C 6.9V
LM555 TIMER U2 (FLASHER)
LM3905 TIMER U1 (2 MIN)
24V REG 7824CK
COMMON
CHASSIS
LINK
BLK
GRN
WHITE
GREEN
BLACK
105-125VAC (210-250VAC) 60Hz 50Hz
50 W MAX
F1 SLO-BLO 0.6A 120V (0.3A 220V)
SW7 ON OFF
RY1
N.O.
TO U3 OUTPUT
TO MUTE/OPERATE SWITCH SW5
NOTES:
1- ALL CAP. IN uF; RES. 1/2W AND 5% TOLERANCE UNLESS NOTED.
2- USE CAUTION WHEN SERVICING HIGH VOLTAGE COMPONENTS. CONTACT WITH STORED ENERGY EVEN WITH POWER OFF COULD BE LETHAL.
3- ALL VOLTAGES AT 120VAC 60Hz LINE.
4- MEASURE DC VOLTAGES THRU 1KΩ ISOLATION RESISTOR TO MINIMIZE CAPACITIVE LOADING.
5- R55 OR R56 MAY BE 348K FOR PROPER B+ WITH SOME ZD2.
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