

PARTS LIST * AR-326 * OUTPUT CONTROL MODULE

NUMBER	QUANTITY	DESCRIPTION	VALUE AND RATINGS
C1	2	Capacitor, Disc	0.1 mfd, 25v
C2	2	" "	100 pf
C3	2	" "	33 pf
D1 thru 4	8	Diode, Silicon	1N914, 1N4148 or equivalent
P1	2	Potentiometer, 1/4" shaft	100k, log
Q1, 3	4	Transistor, NPN	2N3393 or TE3393
Q2	2	Transistor, PNP	2N3638
R1	2	Resistor, Carbon	100k, 10%
R2, 3, 4, 5	8	" "	10 ohm, 10%
R6	2	" "	10k, 10%
R7, 13, 14	4	" "	1k, 10%
R8	2	" "	270 ohm, 10%
R9, 10	4	" "	220 ohm, 20%, 1/2W
R11, 12	2	" "	470 ohm, 20%, 1/2W
S1	1	Switch, Toggle	SPST, 117 VAC, 1A
U1	2	Operational Amplifier	LM301A
PL1	1	Pilot Lamp Assembly	
R15	1	Resistor, Carbon	47k10%
	2	Jack, Phono	Switchcraft 3501 fp
	1	Jack, Stereo Phone	Switchcraft 12B
	14	Jack, Miniphone	Switchcraft 42A
	2	Printed Circuit Board	#1162
	1	Front Panel	
	2	Knob	
	9	#4 x 1/2" Wood Screw	
	8	1/8" Phenolic Spacer	
	1	Terminal Strip, 6 Point	

ARIES System 300 Music Synthesizer
Module AR 326
Output and Power Assembly Instructions

AR326 Output & Power
Assembly Page 1 of 5
22 September 1975

The previous pages were written as a general guide, to familiarize the builder with the components. Here, now, are the specific assembly instructions for building your Output and Power module.
It is recommended that you do the following before you proceed:

Find a place where you can work through completion, without disturbing your set-up.
Use adequate lighting.
Wash your hands before starting. This removes contaminating oils and perspiration and makes assembly more comfortable.
As you proceed, check off each step with a pencil.

NOTE!

The AR 326 Output and Power Module is slightly different in construction from the other ARIES modules. Instead of a frame and regular sized circuit board, two smaller circuit boards and a terminal strip will be mounted on the inside right hand panel of the synthesizer case. PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

- () 1. Preparation
Unpack the parts carefully and place in a large box or tray so they won't get lost.

Find the two circuit boards and lay one aside. Assemble one board completely before you begin assembly of the other one.

Lay the circuit board down on a sheet of white paper. PLACE METAL SIDE DOWN! Turn board so that wire terminals are to the left.

Lay the assembly drawing down near the board.

Have the following tools nearby:

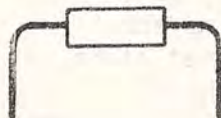
Pencil tip soldering iron, hot and tinned (solder coated)
Solder--Use only thin rosin core solder!
Small diagonal wire cutters
Small wire strippers
Small long nose pliers
Regular pliers
Flat blade screw driver

- () 2. Resistors
Carefully install all 10 resistors on the circuit board. (R1 through R10)

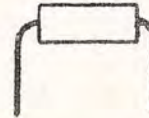
To avoid breaking the resistors leads, bend the leads at least 1/16 of an inch away from the body of the resistor.

For example:

Correct



Incorrect



- () 3. Capacitors
Install all three capacitors on the circuit board. (C1 through C3)
- () 4. Diodes
Install all four diodes on the circuit board. (D1 through D4)
Be careful to observe correct polarity as indicated on the assembly drawing.
- () 5. Transistors
Carefully install all three transistors. (Q1 through Q3) Double check to insure proper installation.
- () 6. Integrated Circuit Amplifier
Install the Integrated Circuit Amplifier on the circuit board.
- () 7. Terminal Connections
Solder an 8 inch piece of wire to each of the seven terminals on the circuit board. Wires are indicated by arrows on the assembly drawing.

Assemble both circuit boards before proceeding.

BOARD AND TERMINAL MOUNTING INSTRUCTIONS --

Please refer to module assembly drawing. (page 4)

Also--please see note on bottom of page 3 ***

- () 1. Unpack the bag of hardware & front panel.
- () 2. Take the terminal strip and attach R11 between pins 1 and 2, and R12 between pins 4 and 5 as shown on the module assembly drawing.
Also install R13 and R14, as shown at upper right corner of module assembly drawing.
- () 3. With the wood screw provided, mount the terminal strip to the inside right hand panel of the synthesizer case in the approximate center of the panel.
- () 4. Run insulated wires from pins 1, 3, and 5, of the terminal strip to the appropriate power supply connections on the edge connector, pins A, M, and Z, as shown on the module assembly drawing.
- () 5. Using four small wood screws and four 1/4 inch stand off washers, mount a circuit board to the side panel about one inch from the top and two inches from the front edge of the case.
- () 6. Mount the other circuit board about 1/2 inch below the top one.
- () 7. Connect the power supply wires from each board to the appropriate pins on the terminal strip.

The terminal strip and boards are now mounted. Unconnected wires will later be wired to the front panel.

FRONT PANEL ASSEMBLY INSTRUCTIONS --

Refer to panel wiring diagram and module assembly drawing. (page 5)

- () 1. Take two 100K log potentiometers and bend the tabs, if any, out flat. Insert the shafts through the panel from behind. Align as shown on the wiring diagram and secure with the nuts. **BE CAREFUL NOT TO SCRATCH THE PANEL**
- () 2. Install all 14 mini-phone jacks, as shown.
- () 3. Install both RCA output jacks, as shown.
- () 4. Install the stereo output jack and align, as shown.
- () 5. Install the ON/OFF switch, as shown.
- () 6. Install the pilot light. Insert through the front panel and flat retaining clamp. Slide the clamp up the shaft of the light to the front panel until the light is securely held in place.

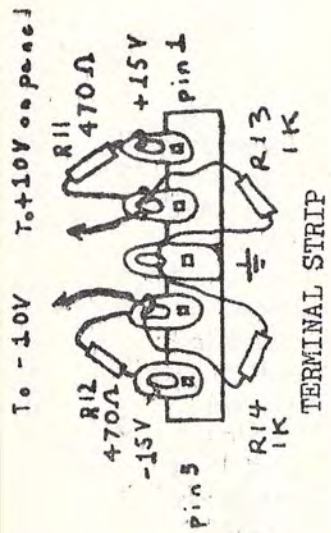
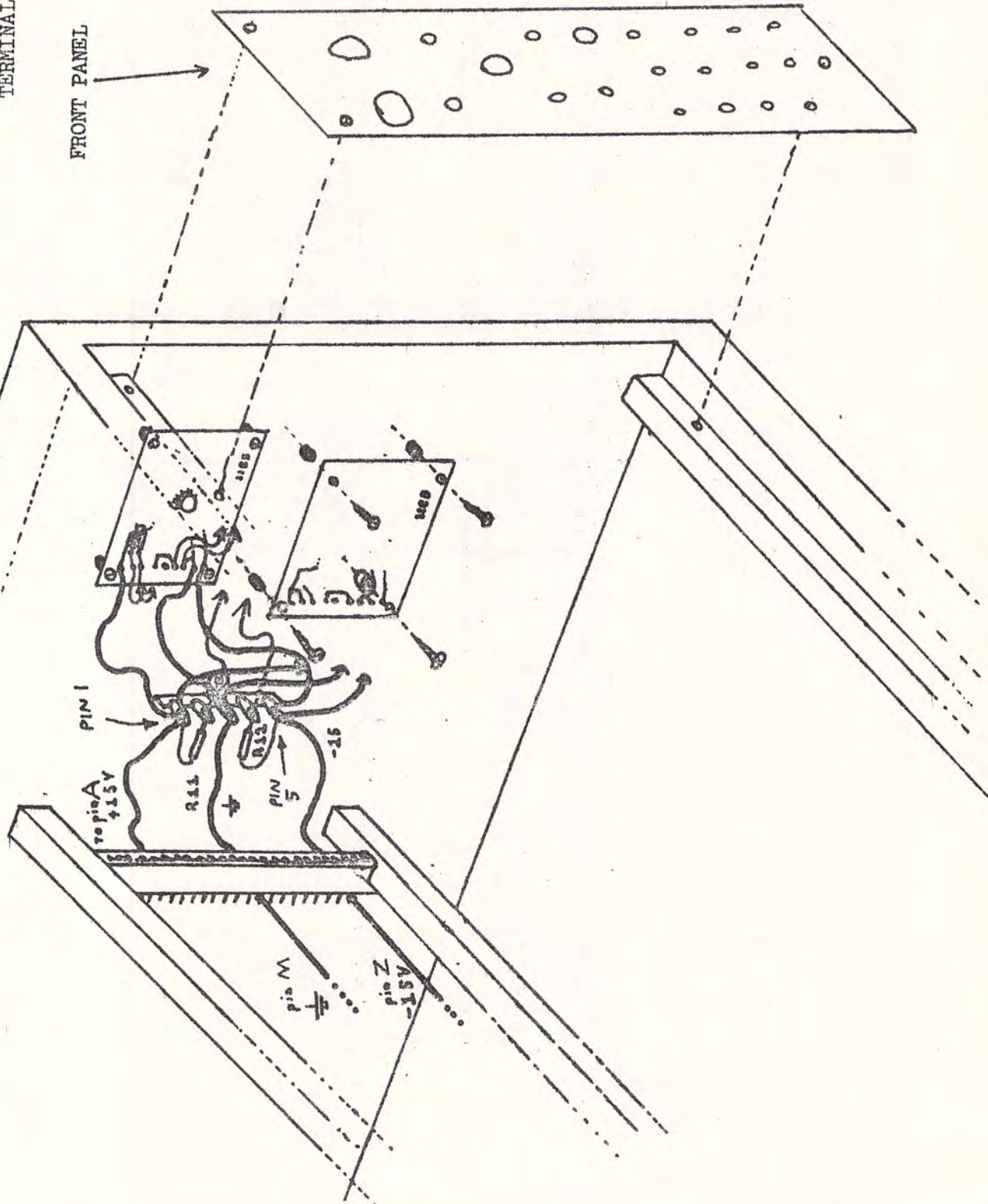
- () 7. Run a wire connecting the tips of each set of four jacks labelled PATCH as shown.
- () 8. Run a wire connecting the grounds of all 14 mini-phone jacks, both RCA output jacks, the stereo output jack and pin 1 of P1 (channel 1), as shown.
- () 9. Cut three pieces of INSULATED 18 GAUGE hookup wire, two pieces 12" long, the third 7 1/2" long. Strip 1/4" of insulation from each end of each wire.
- () 10. Connect one 12" piece between pin 1 of S1 and pin 2 of P1. (P1 is the four pin plug supplied as part of the AR322 Power Supply.)
- () 11. Connect the other 12" piece between pin 2 of S1 and pin 4 of P1.
- () 12. Using solder, splice the 7 1/2" piece of wire so as to extend one of the two leads of the pilot lamp PL1. Carefully insulate the splice with electrical tape.
- () 13. Clip the other pilot lamp lead leaving 1" of wire. Strip 1/4" of insulation from the end. Shorten the two leads of R15 to 3/8". Using solder, splice the shortened pilot lamp lead to one end of the resistor and insulate the splice carefully with electrical tape. Solder the other end of R15 to pin 2 of S1.
- () 14. Using electrical tape, insulate the connections at S1. REMEMBER: THESE CONNECTIONS WILL BE AT LINE VOLTAGE!
Bundle the three wires leading to P1 into a single cable.
- () 13. Run wires from the +10V and -10V terminals on the terminal strip (pins 2 and 4) to the appropriate jacks on the front panel, as labelled on the panel wiring diagram.
- () 14. Wire the remaining wires on the circuit boards to the appropriate points on the front panel. Wire one circuit board at a time to avoid confusion.
- () 15. Plug the Jones plug into the receptacle on the power supply.
- () 16. With the screws supplied, Mount the front panel to the synthesizer case.

YOUR AR 326 OUTPUT AND POWER MODULE IS NOW READY TO USE.

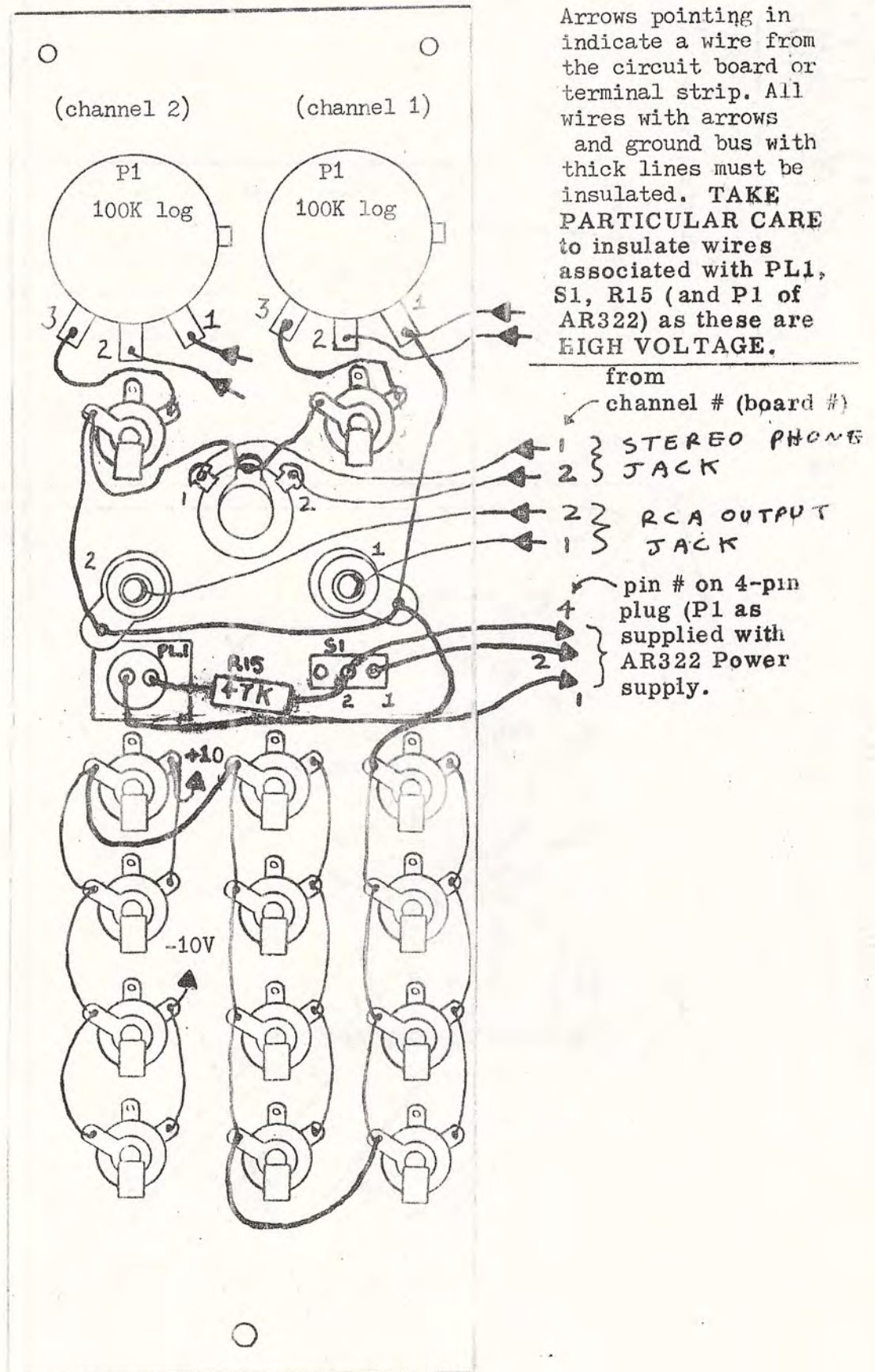
*** A note about connecting the 5 volt supply:

You will notice that the parts list calls for a 6-point solder terminal, whereas the instructions (on page 2) and the diagram (page 4) only refer to a 5-point terminal. The extra terminal point can be used for the +5v supply to allow for modules of your own design which require +5v. Use pin "N" (the one BELOW ground pin "M") on the edge connector if you wish to bus the 5v as in instruction 4 of the Board & Terminal Mounting Instructions (page 2).

AR 326 MODULE ASSEMBLY DRAWING



AR 326 OUTPUT AND POWER MODULE PANEL WIRING DIAGRAM --- rear view



THEORY OF OPERATION * AR-326 * OUTPUT POWER CONTROL MODULE

The AR-326 consists of two identical head phone driver amplifiers. The input, from the lower mini phone jack, is attenuated by P1, and coupled into op amp U1 through C1. U1 drives Q1 and Q2, which form class AB power amp, which is biased by constant-current source (Q3). Feedback from the output to pin2 of U1 establishes the proper gain and keeps distortion low. The output is coupled to (1) 1/2 of a stereo phone jack, and (2) an RCA phone jack. R9 and R10 provide the proper impedance for driving both low and high impedance phones, and also provide short-circuit protection.

In addition, two sets of jacks provide +10 volts and -10 volts (approximately) from voltage dividers R11-R13 and R12-R14.

There are two sets of four jacks connected together, provided for assistance in multiple patching.

Finally, the power switch S1, and pilot light PL1, from the synthesizer power supply are mounted on the front panel.

ARIES SYSTEM 300 MUSIC SYNTHESIZER *****
SYSTEM ASSEMBLY

(AR-310 CASE, AR-322 POWER SUPPLY, AR-326 OUTPUT
CONTROL MODULE)

- () 1. Mount the power supply to the cabinet. Use two angle brackets mounted to the holes in the lower corner of the power supply board, with machine screws and nuts. NOTE: Some earlier boards do not have holes. If yours doesn't, drill a 1/8" hole, 1/2" up from the bottom and 3/16" in from the side, through each lower corner. Then screw them down to the cabinet, using the dimensions shown on the drawing (Power supply board 1 7/8" in from back recess, and 3" from side).
- () 2. Using a long wire, connect the terminals labelled "A" on all 10 connectors together. You may use bare wire, but run the wire tightly enough so it can't short to any other pin or to the metal bar.
- () 3. Similarly, connect all "M" terminals together.
- () 4. Finally, connect all "Z" terminals together.
- () 5. Cut three pieces of insulated wire, each 30" long, and strip 1/4" of insulation from each end.
- () 6. Solder one wire to terminal "A" of the connector closest to the left side of the cabinet (right side when viewed from rear). Solder the other end to pin 2 of one of the 8-pin (octal) plugs furnished with the power supply.
- () 7. Connect the second wire from terminal "M" of the same connector to pin 8 of the octal plug.
- () 8. Connect the last wire from terminal "Z" of the same connector to pin 4 of the octal plug.
- () 9. Twist, lace, or tape the three wires together neatly.
- () 10. Plug the octal plug into any one of the three sockets on the power supply.
- () 11. Assemble and wire in the AR-326 Output and Control Module if you've not already done so. (Refer to AR-326 Assembly Instructions). However, BEFORE CONNECTING +15v and -15v wires to the module, check the power supply connections as follows: (Disconnect if already wired).
- () 12. Plug in the Jones plug from the AR-326 On-off switch to the power supply.

() 13. Plug in the A C Line Cord from the power supply. Connect D C volt meter from the "M" terminal of any module connector to the "A" terminal (+ lead on "A"). Turn on AR-326 switch. Meter should read within 1 volt of 15 volts. If not, TURN OFF! Supply or wiring needs trouble shooting.

() 14. Turn off supply. Connect voltmeter from the "Z" terminal of module connector to the "M" terminal (+lead on "M").

() 15. Turn on supply. Meter should, again, read within 1v of 15volts.

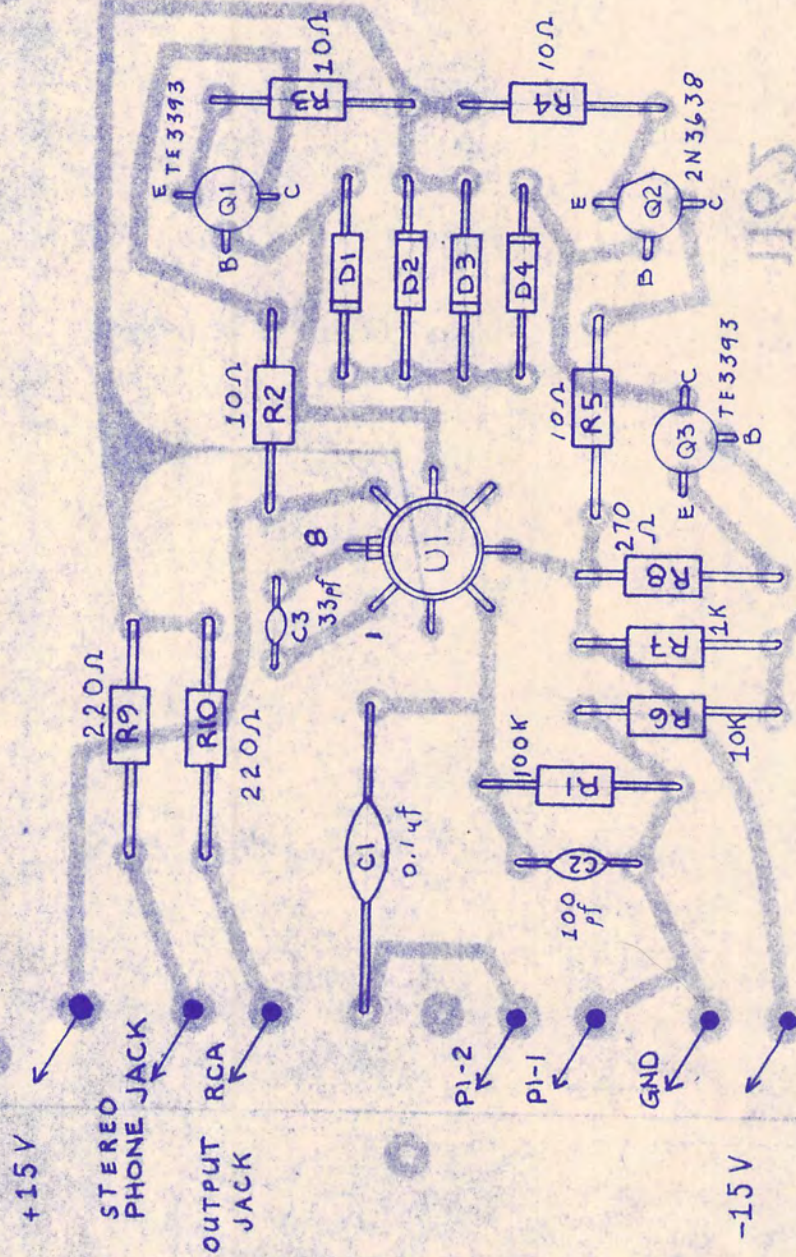
() 16. Turn off supply, unplug A C line cord, and finish AR-326 assembly (wire up +15v and -15v lines).

() 17. Now plug in all of your synthesizer modules, if you have any. Be sure the board terminals are fully inserted in the connectors .

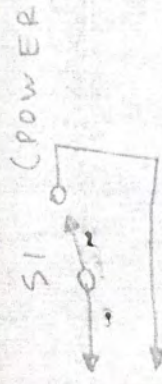
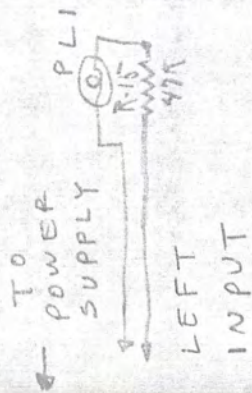
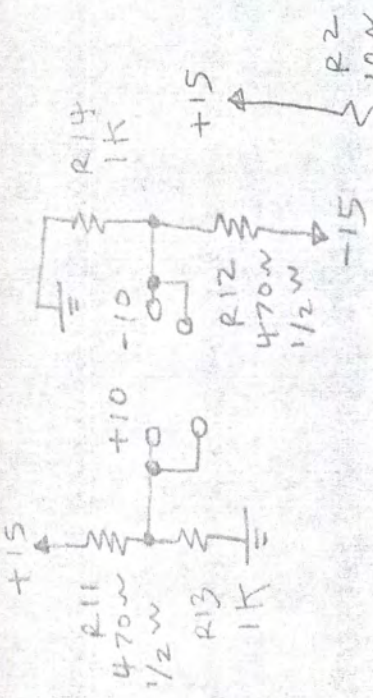
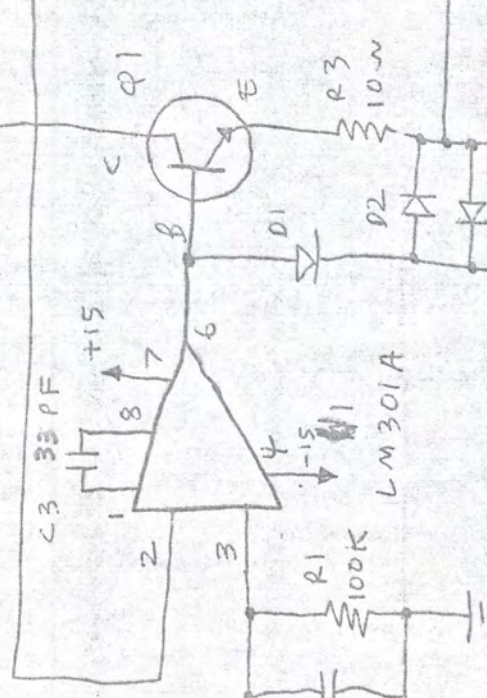
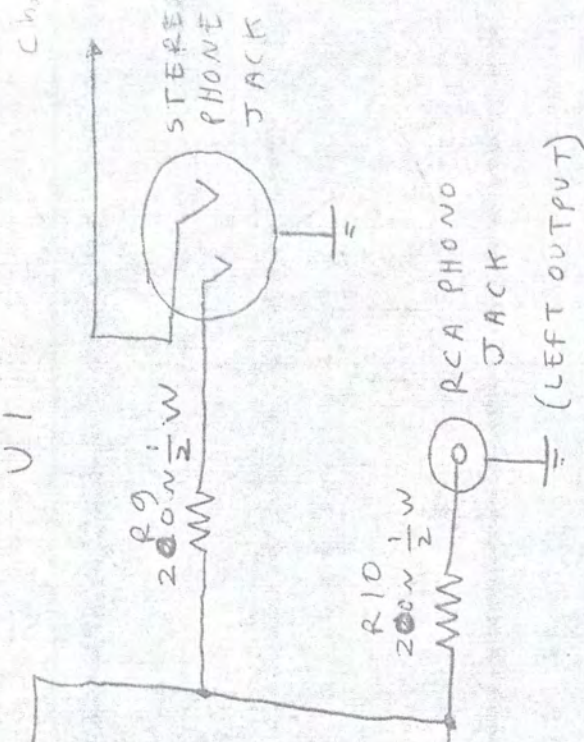
() 18. Trim and test each module, if not already trimmed WITH YOUR POWER SUPPLY.

() 19. Screw each module to the mounting strips, using 3 machine screws per module.

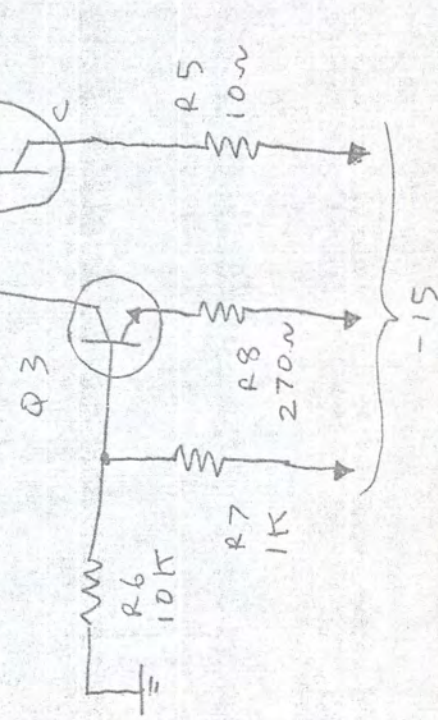
YOUR ARIES MUSIC SYNTHESIZER IS NOW READY FOR OPERATION !



AR-326 AUDIO AMP
COMPONENT SIDE



AR-326
ARIES, INC.
POWER CONTROL AND
STEREO OUTPUT
DRIVER
o.c.d.m 10/4/74
1/31/75



HIGHEST REF:

- A
- C 3
- D 4
- P 1
- Q 3
- R 10 14
- U 1

TO POWER
SUPPLY

LEFT
INPUT

100K
LOG

STEREO
PHONE
JACK

RCA PHONO
JACK
(LEFT OUTPUT)

-15