

ARIES SYSTEM 300 Music Synthesizer  
ARIES MODULE AR-317

VOLTAGE CONTROLLED OSCILLATOR ASSEMBLY INSTRUCTIONS

The previous pages were written as a general guide, to familiarize the builder with the components. Here, now, are specific assembly instructions for building your Voltage Controlled Oscillator. It is recommended that you check off each step with a pencil as you proceed.

- ( ) 1. PREPARATION Lay the circuit board on a sheet of white paper. PLACE METAL FOIL SIDE DOWN! Also, turn board so that connector strip is to the LEFT. Use adequate lighting.

Lay the assembly drawing(layout) down near the board.

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

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 stripper  
Small long-nose pliers

- ( ) 2. JUMPERS Find jumper wire J1 on the drawing. Cut off a piece of insulated, solid wire, ONE INCH LONGER THAN J1. Strip 1/2 inch of insulation from each end (being careful not to damage the wire itself). Bend the bare ends to a right angle and insert into the holes on the board, according to the drawing. While holding the ends down against the board, bend them at a 45 degree angle on the foil side of the board, to hold the wire in place. Solder and cut off the excess.(Refer to introduction on parts installation.)Repeat for all the remaining jumpers (J2 thru J27.)
- ( ) 3. RESISTORS Carefully install all 69 resistors (R1 thru 70). Note there is no R9.
- ( ) 4. INTEGRATED CIRCUIT AMPLIFIERS Install all 7. (U1 thru U7)
- ( ) 5. DIODES Install all 6 (D1 thru D6). OBSERVE POLARITY!
- ( ) 6. CAPACITORS Install all 20 (C1 thru C20). On C1 and C2, observe polarity. On C 15,16,17, and 18, observe direction of the band if there is one. If there is no band, the capacitor may be installed in either direction.
- ( ) 7. TRANSISTORS Install all 11 transistors (Q4 thru Q14).NOTE: There is no Q1, Q2, or Q3. Also, the general shape of transistors may vary from that shown on the assembly drawing. To be sure, check each transistor type on pages 4-6 of the introduction, and make sure that the correct letters (E,B,C, or S,D,G,) are in the proper holes.

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- ( ) 8. TRIMPOTS Install all 6. (T1 thru T6). Make sure you use the correct value. (There are two, 10K and 50K ). The 10K trimpots have the number U201R103B or MTC14L4 on them. The 50K trimpots are numbered U201R503B or MTC54L4.

AT THIS POINT , ALL THE BOARD COMPONENTS ARE MOUNTED.

MODULE ASSEMBLY-PLEASE REFER TO MODULE ASSEMBLY DRAWING

- ( ) 1. Unpack the frame, bag of hardware, and front panel.  
( ) 2. Snap the two black plastic card guides into the frame holes. The tabs must point to the rear. (Bottom one is shown, installed, on drawing.)  
( ) 3. Slide the board into the frame. Hold top and bottom of frame down upon board, so that the board fits snugly in the card guide tabs.  
( ) 4. Mount the board to the two brackets, as shown, using four 4-40X3/8" screws and nuts. Use a fiber or plastic insulating washer on the FOIL side of the board to keep the heads of the screws from making electrical contact with the circuit.  
( ) 5. Unpack the front panel carefully. Avoid scratching its surface  
( ) 6. Mount the top of the panel to the top of the module frame, using pots P1 and P2. Insert the pot shafts through the frame and panel from behind.  
( ) 7. Attach the bottom of the panel to the frame using the remaining 4-40 screws and nuts.  
( ) 8. Install the other pots (P3 and P4).  
( ) 9. Install switch S1, as shown.  
( ) 10. Install all 12 mini-phone jacks, as shown.  
( ) 11. Turn all potentiometer shafts fully counter-clockwise, and mount the knobs pointing to the left most number. Tighten knob screws.  
THIS COMPLETES THE MODULE ASSEMBLY.

AR-317 V.C.O. PANEL WIRING

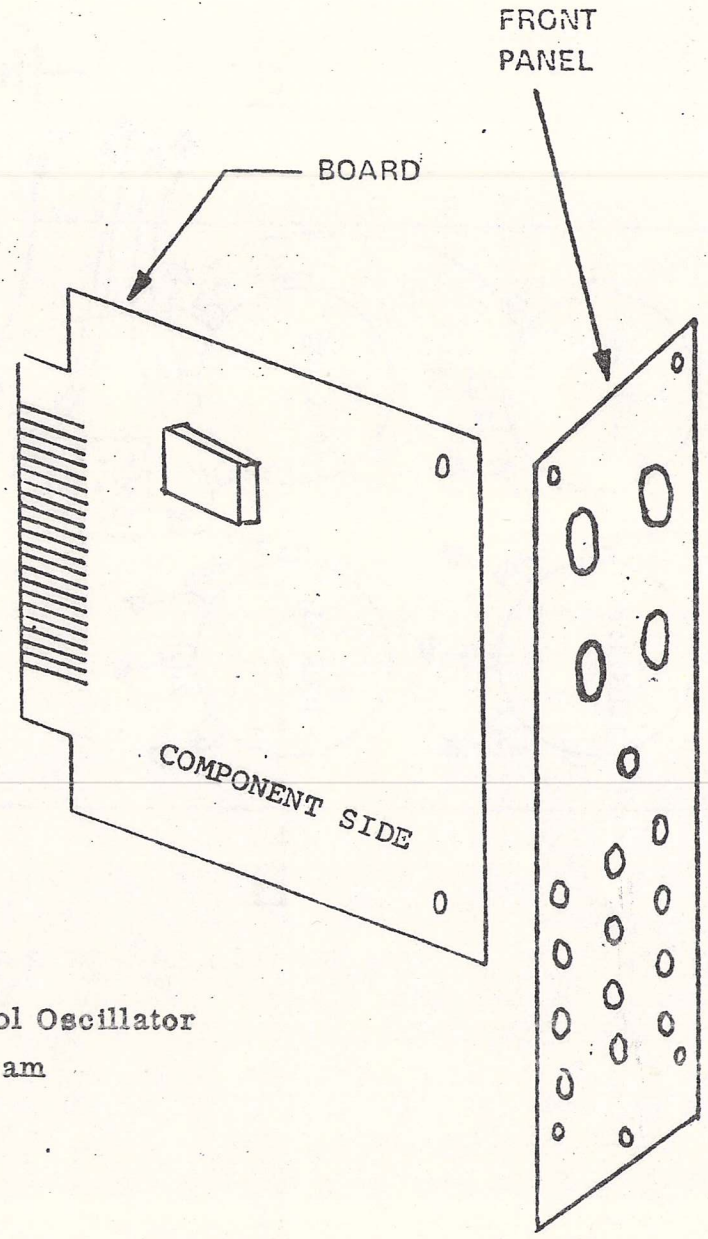
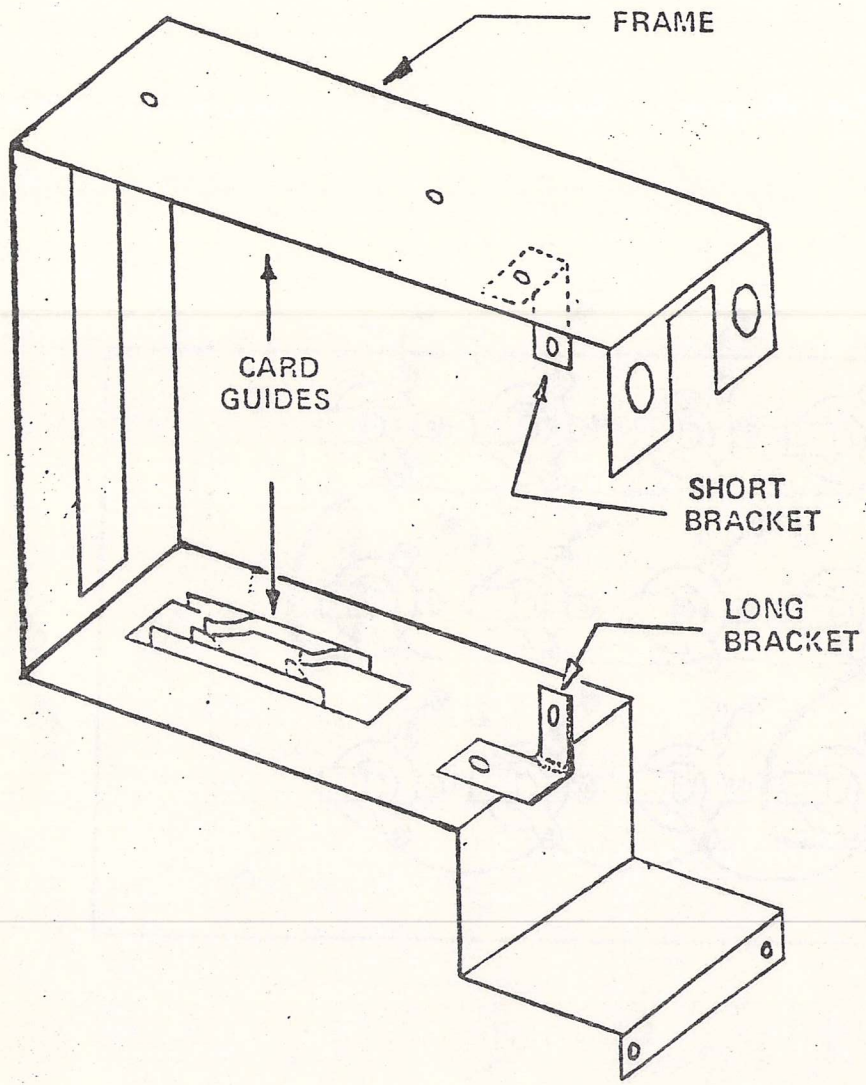
PLEASE REFER TO PANEL WIRING DIAGRAM AND BOARD ASSEMBLY DRAWING.

- ( ) 1. Run a wire from pin 1 of part "P1" to pin 1 of "P3" , and to the grounds of all 12 jacks as shown. You may use either separate pieces of wire or one continuous piece.  
( ) 2. **IN THE FOLLOWING STEPS, 2-5, USE INSULATED WIRE!** Cut a piece of wire to fit between "P1" pin1 , and the point on the board called "module ground" on the board drawing. NOTE: Make the wire at least two inches longer than necessary to provide adequate slack.  
( ) 3. Run wires from pins 2 and 3 of all four pots (P1 thru 4) to the appropriate points on the board (see board assembly drawing).  
WIRE ONE AT A TIME TO AVOID CONFUSION!  
( ) 4. Run wires from pins 1, 2, 4, and 5 of switch S1 to the proper board points.

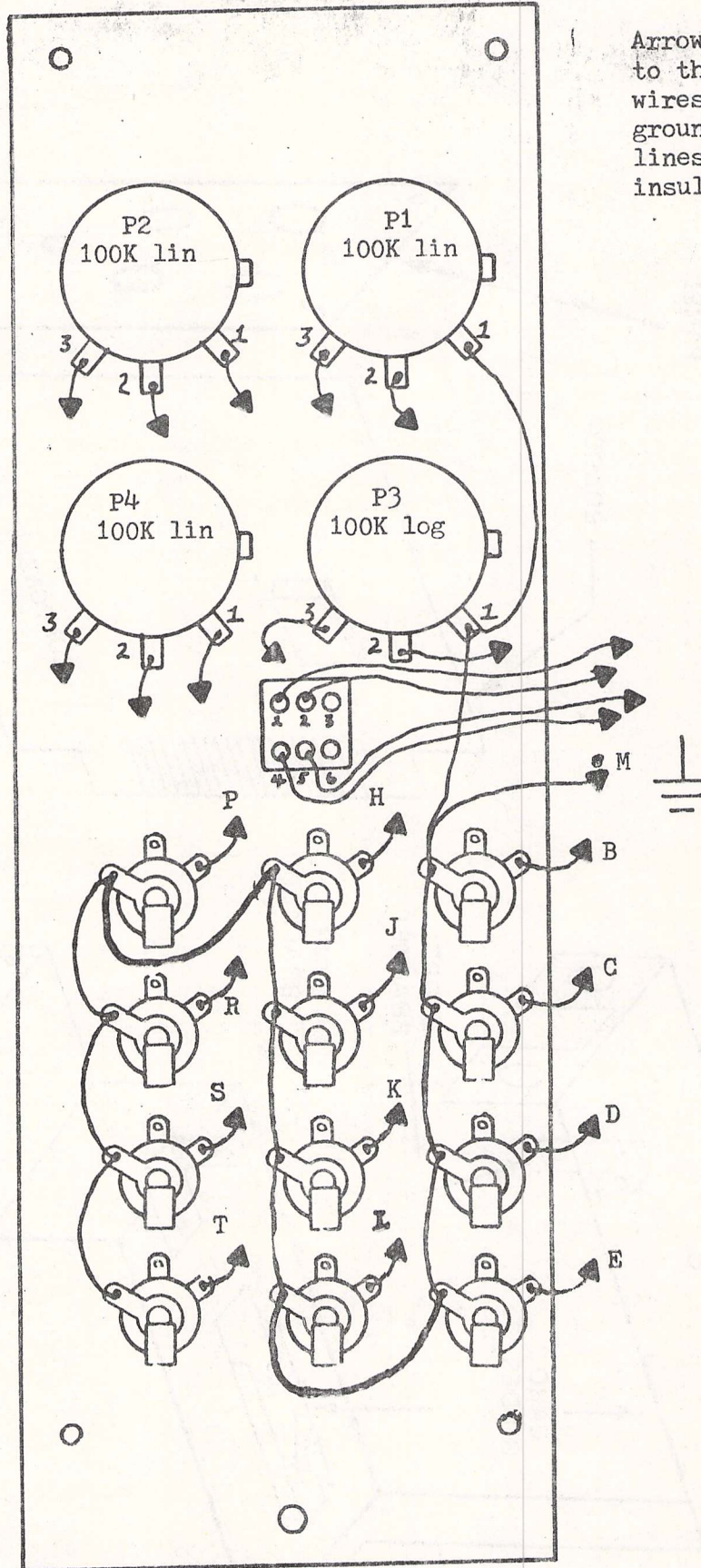
- ( ) 5. Now, connect a wire from I0 of the 12 jacks, shown by the lettered arrows, to the holes near the edge of the board, labelled by letters on the board drawing. NOTE: The lower two jacks in the middle are unused.

As an option, if LINEAR frequency modulation is desired, you may connect one of these jacks (left unused in previous step) to an additional 330k resistor (not supplied), and the other end of this resistor to R70, at the side where R70 goes into the potted block on the board.

THIS COMPLETES ASSEMBLY OF YOUR AR-317 V.C.O.



AR 317 Voltage Control Oscillator  
Module Assembly Diagram



Arrows indicate a wire to the PC board. All wires with arrows and ground bus with thick lines must be insulated.