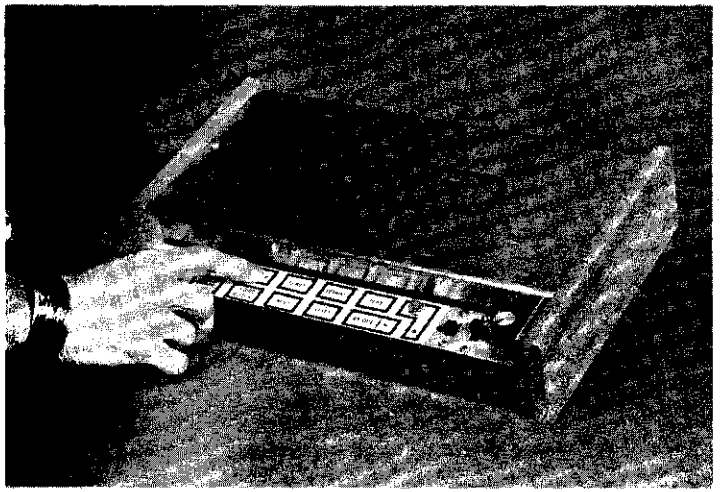
PAIA ELECTRONICS, INC.

3750

PROGRAMMABLE DRUM SET



While most electronic rhythm units offer only a limited choice of pre-determined rhythm patterns, the PAIA Programmable Drum Set allows the user to tailor pattern, time signature and drum sounds to each application. Among the unique features provided by the unit are touch sensitive electronic controls and the provision for an independently structured bridge rhythm.

SOLDERING

Use care when mounting all components. Use only rosin core solder (acid core solder is never used in electronics work). A proper solder joint has just enough solder to cover the round soldering pad and about 1/16-inch of the lead passing through it. There are two improper connections to beware of: Using too little solder will sometimes result in a connection which appears to be soldered but actually there is a layer of flux insulating the component lead from the solder bead. This situation can be cured by re-heating the joint and applying more solder. If too much solder is used on a joint there is the danger that a conducting bridge of excess solder will flow between adjacent circuit board conductors forming a short circuit. Unintentional solder bridges can be cleaned off by holding the board upside down and flowing the excess solder off onto a clean, hot soldering iron.

Select a soldering iron with a small tip and a power rating not more than 35 watts. Soldering guns are completely unacceptable for assembling transistorized equipment because the large magnetic field they generate can damage solid state components.

CIRCUIT BOARD ASSEMBLY

There are two circuit boards supplied with the 3750 Programmable Drum Set; the much larger 3750A circuit board, and the smaller 3750LED board, which will be used to mount the light emitting diodes in later steps.

( ) Prepare for assembly by thoroughly cleaning the conductor side of the "A" circuit board with a scouring cleanser. Note: Be careful not to scrub over the printed area. Rinse the board with clear water and dry completely.

Solder each of the fixed resistors in place folliwng the parts placement designators printed on the circuit board and the assembly drawing figure 1. Note that the fixed resistors are non-polarized and may be mounted with either of their two leads in either of the two holes provided. Cinch the resistors in place prior to soldering by putting their leads through the holes provided and pushing them firmly against the board. One the conductor side of the board bend the leads outward to about a 45° angle. Clip off each lead flush with the solder joint as the joint is made. Note: Not all resistors will be installed on the circuit board at this time.

Silver or gold - disregard this band.

DESIGNATION	VALUE	COLOR CODE A-B-C
( ) R1	10K	brown-black-orange
( ) R2	6800 ohm	blue-grey-red
( ) R3	2.2 meg	red-red-green
( ) R4	2.2 meg	red-red-green
( ) R5	10K	brown-black-orange
( ) R6	1 meg	brown-black-green
) R8	1 meg	brown-black-green

DESIGNATION	VALUE	COLOR CODE A-B-C
( ) R9	18K	brown-grey-orange
( ) R10	3.9 meg	orange-white-green
( ) R11	2.2 meg	red-red-green
( ) R12	2.2 meg	red-red-green
( ) R13	33K	orange-orange-orange
( ) R14	1 meg	brown-black-green
( ) R16	330K	orange-orange-yellow
( ) R17	18K	brown-grey-orange
( ) R18	3.9 meg	orange-white-green
( ) R19	2.2 meg	red-red-green
( ) R20	2.2 meg	red-red-green
( ) R21	39K	orange-white-orange
( ) R22	1 meg	brown-black-green
( ) R24	330K	orange-orange-yellow
( ) R25	18K	brown-grey-orange
( ) R26	3.9 meg	orange-white-green
( ) R27	2.2 meg	red-red-green
( ) R28	2.2 meg	red-red-green
( ) R29	68K	blue-grey-orange
( ) R30	1 meg	brown-black-green
( ) R32	330K	orange-orange-yellow
( ) R33	18K	brown-grey-orange
( ) R34	3.9 meg	orange-white-green
( ) R35	2.2. meg	red-red-green
( ) R36	2.2 meg	red-red-green
( ) R37	15K	brown-green-orange
( ) R38	1 meg	brown-black-green
( ) R40	220K	red-red-yellow
( ) R41	10K	brown-black-orange
( ) R42	3.9 meg	orange-white-green
( ) R43	1 meg	brown-black-green
( ) R44	2200 ohm	red-red-red
( ) R45	220K	red-red-yellow
( ) R46	10K	brown-black-orange
( ) R47	68K	blue-grey-orange
( ) R49	100 ohm	brown-black-brown
( ) R50	150K	brown-green-yellow
( ) R51	2.2 meg	red-red-green
( ) R52	1 meg	brown-black-green
( ) R53	39K	orange-white-orange
( ) R54	150K	brown-green-yellow
( ) R55	150K	brown-green-yellow
( ) R56	330K	orange-orange-yellow
( ) R57	68K	blue-grey-orange
( ) R58	10K	brown-black-orange
( ) R59	68K	blue-grey-orange
( ) R60	10K	brown-black-orange
( ) R61	68K	blue-grey-orange
( ) R62	10K	brown-black-orange
( ) R63	68K	blue-grey-orange
( ) R64	10K	brown-black-orange
( ) R65	6800 ohms	blue-grey-red

DESIGNATION	VALUE	COLOR CODE A-B-C
( ) R66	47K	yellow-violet-orange
( ) R67	10K	brown-black-orange
( ) R68	4700 ohm	yellow-violet-red
( ) R69	680K	blue-grey-yellow
( ) R70	680K	blue-grey-yellow
( ) R71	680K	blue-grey-yellow
( ) R72	680K	blue-grey-yellow
( ) R73	680K	blue-grey-yellow
( ) R74	680K	blue-grey-yellow
( ) R75	680K	blue-grey-yellow
( ) R76	680K	blue-grey-yellow
( ) R77	680K	blue-grey-yellow
( ) R78	680K	blue-grey-yellow
( ) R79	680K	blue-grey-yellow
( ) R80	680K	blue-grey-yellow
( ) R81	680K	blue-grey-yellow
( ) R82	680K	blue-grey-yellow
( ) R83	680K	blue-grey-yellow
( ) R84	680K	blue-grey-yellow
( ) R85	680K	blue-grey-yellow
( ) R86	680K	blue-grey-yellow
( ) R87	680K	blue-grey-yellow
( ) R88	680K	blue-grey-yellow
( ) R89	680K	blue-grey-yellow
( ) R90	680K	blue-grey-yellow
( ) R91	680K	blue-grey-yellow
( ) R92	680K	blue-grey-yellow
( ) R93	680K	blue-grey-yellow
( ) R94	47K	yellow-violet-orange
( ) R95	47K	yellow-violet-orange
( ) R96	47K	yellow-violet-orange
( ) R97	47K	yellow-violet-orange
( ) R98	47K	yellow-violet-orange
( ) R99	47K	yellow-violet-orange
( ) R100	47K	yellow-violet-orange
( ) R101	15K	brown-green-orange
( ) R102	15K	brown-green-orange
( ) R103	15K	brown-green-orange
( ) R104	15K	brown-green-orange
( ) R105	4700 ohms	yellow-violet-red
( ) R106	15K	brown-green-orange
( ) R107	15K	brown-green-orange
( ) R108	33K	orange-orange-orange
( ) R109	470K	yellow-violet-yellow
( ) R110	33K	orange-orange-orange
( ) R112	33K	orange-orange-orange
( ) R113	2200 ohm	red-red-red
( ) R114	220K	red-red-yellow
( ) R115	33K	orange-orange-orange
( ) R117	33K	orange-orange-orange
( ) R118	15K	brown-green-orange

DESIGNATION	VALUE	COLOR CODE A-B-C
( ) R119	150K	brown-green-yellow
( ) R120	470K	yellow-violet-yellow
( ) R121	10K	brown-black-orange
( ) R122	33K	orange-orange-orange
( ) R123	33K	orange-orange-orange
( ) R124	33K	orange-orange-orange
( ) R125	33K	orange-orange-orange
( ) R126	47 ohm	yellow-violet-black
( ) R127	10K	brown-black-orange

( ) Using the bare wire provided form and install the thirty-six (36) wire jumpers as indicated by the solid lines printed on the circuit board.

Install the ceramic disk capacitors. Without exception the value will be marked on the body of the part.

DESIGNATION	VALUE
( ) C1	.01 mfd.
( ) C2	.001 mfd.
( ) C3	.001 mfd.
( ) C4	.005 mfd.
( ) C5	.05 mfd.
( ) C6	500 pf.
( ) C7	500 pf.
( ) C8	500 pf.
( ) C9	.005 mfd.
( ) C10	.05 mfd.
( ) C11	.01 mfd.
( ) C12	.001 mfd.
( ) C13	.001 mfd.
( ) C14	.005 mfd.
( ) C15	.05 mfd.
( ) C16	.01 mfd.
( ) C17	.001 mfd.
( ) C18	.001 mfd.
( ) C19	.005 mfd.
( ) C20	.05 mfd.
( ) C21	.01 mfd.
( ) C22	.005 mfd.
( ) C23	.005 mfd.
( ) C24	.05 mfd.
( ) C25	.05 mfd.
( ) C26	.05 mfd.
( ) C27	500 pf.
( ) C28	500 pf.
( ) C31	.05 mfd.
( ) C32	.005 mfd.
( ) C33	.01 mfd.
( ) C34	.001 mfd.
( ) C35	.005 mfd.

DESIGNATION	VALUE
( ) C36	.005 mfd.
( ) C37	.005 mfd.
( ) C38	.005 mfd.
( ) C39	.005 mfd.
( ) C40	.005 mfd.
( ) C41	.005 mfd.
( ) C42	.005 mfd.
( ) C43	.005 mfd.
( ) C44	.005 mfd.
( ) C45	.005 mfd.
( ) C46	.005 mfd.
( ) C47	.005 mfd.
( ) C48	.01 mfd.
( ) C49	.005 mfd.
( ) C52	.001 mfd.
( ) C53	100 pf.
( ) C54	.01 mfd.
( ) C55	.01 mfd.

Up to this point all components have been non-polarized and either lead could be placed in either of the holes provided without effecting the operation of the unit. Electrolytic capacitors are polarized and must be mounted so that the "+" lead of the capacitor goes throught the "+" hole in the circuit board. In the event that the "-" lead rather than the "+" lead of the capacitor is marked, it is to go through the unmarked hole in the circuit board.

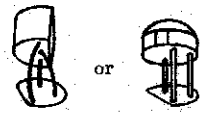
Note that the operating voltage (v.) specified for a capacitor is the minimum acceptable rating. Capacitors supplied with specific kits may have a higher voltage rating than that specified and may be used despite this difference. For instance, a 100 mfd. 25 v. capacitor may be used in place of a 100 mfd. 16 v. capacitor without affecting the operation of the circuit.

Mount the following electrolytic capacitors and solder them in place. Their values, voltage rating, and polarization are marked on the body of the part.

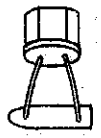
DESIGNATION	VALUE
( ) C29	2.2 mfd. 10v.
( ) C30	1 mfd. 10v.
( ) C50	1 mfd. 10v.
( ) C51	1 mfd. 10v.
( ) C56	33 mfd. 10v.
( ) C57	2.2 mfd. 10v.

Install the transistors. Orient as illustrated in figure 1 and the parts placement printed on the circuit board. All semiconductors are heat sensitive and may be damaged if allowed to get too hot while soldering. To be on the safe side, heat sink each transistor lead during the soldering operation by grasping it with a pair of needle nose pliers at a point between the circuit board and the body of the transistor.

DESIGNATION	TYPE NUMBER	
( ) Q2	2N5129	NOTE: 2N5129 and 2N5139
( ) Q3	2N5129	transistors are currently
( ) Q4	2N5129	being supplied in the two
( ) Q5	2N5129	case styles shown below.
( ) Q6	2N5129	Install as illustrated.
( ) Q7	2N5129	
( ) Q8	2N5129	
( ) Q9	2N5139	
( ) Q10	2N5139	
( ) Q11	2N5129	
( ) Q12	2N5129	



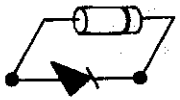
Note that the middle lead of one of the transistors has been removed. This transistor has been selected for its noise generating characteristics and is intended for use as Q1. Install this transistor as shown.



( ) Q1 noise transistor

Install the diodes. Like transistors these parts are heat sensitive and the precautions listed for transistor installation apply here also. The physical appearance of the diodes is related to their schematic symbol in the drawing below.

DESIGNATION	TYPE NUMBER
( ) D1 through D47	1N914 or 1N4148



( ) Install and solder the four rows of IC connector pins at the IC-14 and IC-15 positions. NOTE: These pins should be installed with their carriers to the inside. Refer to the drawing to the right. As each row of connector pins is installed use a pair of pliers to break away the carrier. DO NOT INSTALL IC-14 OR IC-15 AT THIS TIME.

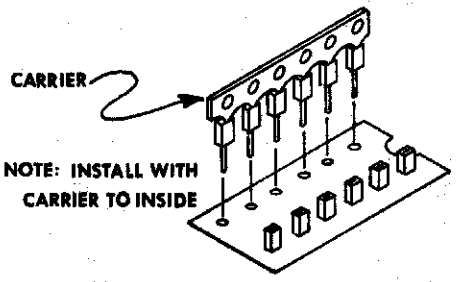


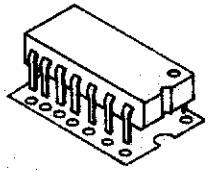
Figure 2 - Installation of IC Connector Pins

Install the trimmer potentiometers.

DESIGNATION	VALUE
( ) R7	50K
( ) R15	50K
( ) R23	50K
( ) R31	50K
( ) R39	50K
( ) R48	50K

Install the integrated circuits. Note that the orientation of the integrated circuits is keyed by a notch at one end of the case which aligns with the semicircular key on the designators printed on the circuit board. Use particular care when installing these parts. Like any other semiconductor they are heat sensitive and should not be exposed to extraordinarily high soldering temperatures. Make sure that the orientation is correct before soldering. Once these parts are in place they cannot be removed without destroying them.

DESIGNATION	TYPE NUMBER
( ) IC1	LM3900 or CA3401 Quad Norton amp
( ) IC2	LM3900 or CA3401 Quad Norton amp



WARNING: CMOS CIRCUITS

The remainder of the integrated circuits used in this kit are Complementary Metallic Oxide Semiconductors (CMOS). While state of the art internal protection is provided, these circuits are still susceptable to damage from STATIC ELECTRICITY. You should not experience any difficulties if you observe the following precautions.

1) The circuits are supplied to you inserted in blocks of conductive foam. Leave them in these blocks until you are ready to install the part.
2) Do not install the parts in sequence other than that called for in the instructions.
3) Do not wear synthetic (e.g. nylon) clothing while handling these parts.
4) A three wire grounded soldering iron is ideal but if you don't have one your present iron may be used by allowing it to heat, then UNPLUGGING it during the actual soldering operation. Before soldering and after unplugging, touch the tip of the iron momentarily to the ground screw of an electrical outlet or other source of ground to drain static charges.

DESIGNATION	TYPE NUMBER
( ) IC3	CD4001 Quad Nor Gate
( ) IC4	CD4001 Quad Nor Gate
( ) IC5	CD4001 Quad Nor Gate
( ) IC6	CD4001 Quad Nor Gate
( ) IC7	CD4001 Quad Nor Gate
( ) IC8	CD4001 Quad Nor Gate
( ) IC9	CD4001 Quad Nor Gate
( ) IC10	CD4001 Quad Nor Gate
( ) IC11	CD4001 Quad Nor Gate
( ) IC12	CD4024 Seven Stage Counter
( ) IC13	CD4013 Dual D Flip Flop

Install IC-14 and IC-15. NOTE: Be certain that all pins from these two integrated circuits have properly engaged their respective connector pins before pushing them into place. Once you are certain that all pins are properly engaged push the IC's firmly into place.

DESIGNATION	TYPE NUMBER
( ) IC14	2112 256 X 4 Random Access Memory
) IC15	2112 256 X 4 Random Access Memory

In the following steps insulated wire jumpers will be attached to the circuit board. At each step cut the wire to the specified length and remove 1/4-inch (7 cm) of insulation from both ends. Twist the exposed wires together and "tin" by melting a small amount of solder into the exposed wire at both ends. NOTE: Sufficient wire length have been allowed to route the wires around components mounted on the circuit board. Preferred wire routing paths are shown in figure 3. Note also that five different colors of insulated wire have been provided. Alternate these colors as much as possible to aid in trouble shooting should this be necessary.

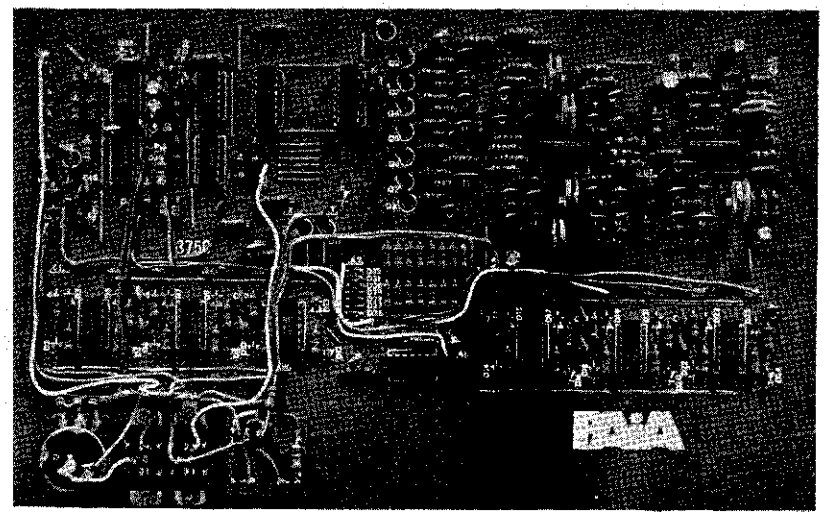


Figure 3

FROM	TO	LENGTH inches (cm)	COLOR USED
( ) A1	A2	3-1/8 (8)	
( ) B1	B2	3-1/2 (9)	
( ) C1	C2	3-1/2 (9)	
( ) D1	D2	2-1/8 (5.5)	
( ) E1	E2	1-1/2 (3.9)	
( ) F1	F2	2-1/2 (6.5)	
( ) G1	G2	2-7/8 (7.2)	
( ) H1	H2	3-1/4 (8.2)	
( ) J1	J2	4-1/2 (11.7)	
( ) K1	K2	2-1/4 (5.7)	
( ) L1	L2	3-1/4 (8.2)	
( ) M1	M2	5-1/4 (13.4)	
( ) N1	N2	4-1/8 (10.5)	

Temporarily set the 3750A circuit board aside and begin construction of the 3750LED circuit board. Note that some of the components will be installed on the copper side of this circuit board, while other components will be installed on the normal compone side. Be sure to follow the assembly steps carefully.

( ) Thoroughly clean the conductor side of the 3750LED circuit board with a scouring cleanser, rinse with clear water, and dry completely.

( ) Melt a small amount of solder onto the pads of the 3750LED board labeled 1 - 4. This will aid in connecting wires to these pads in later steps with a minimal amount of heat build-up.

( ) Referring to figure 4 install the two 2200 ohm (red-red-red) resistors, R128 and R129, from the COPPER SIDE of the 3750 circuit board. Once these resistors have been soldered into place, clip the leads protruding from the component side of the board flush with the board.

( ) Install the two light emitting diodes (LED's). These parts should be inserted from the component side of the circuit board. Note the flat on one side of the LED case. This flat corresponds to the "-" lead of this device. Insert this lead in the hole marked "-". After insertion into the 3750LED board fold the leads of the LED back tightly against the solder pads and lightly solder. Refer to figure 4.

( ) Using the hardware supplied with the push button switch install the 3750LED circuit board onto the 3750A circuit board. Refer to figure 4.

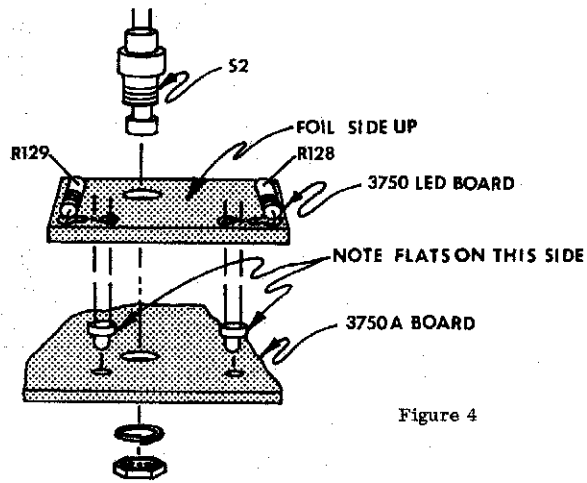


Figure 4

( ) Locate the 9-lug terminal strip supplied and cut as shown in figure 5.

( ) Using two 4-40 X 1/4-inch machine screws, and two 4-40 machine screw nuts mount the terminal strip along with slide switch S4. Refer to figure 5.

( ) Using two 4-40 X 1/4-inch machine screws and two 4-40 machine screw nuts mount slide switch S3.

( ) Mount the potentiometer, R130, using the two 3/8-inch nuts provided; one behind the circuit board as a spacer, and the second on the front side to secure the potentiometer. Adjust the rear nut so that none of the threaded shaft is exposed when the front nut is tightened down. This will allow the control knob, which will be mounted in a later step, to seat as closely as possible to the circuit board. Orient as illustrated in figure 5.

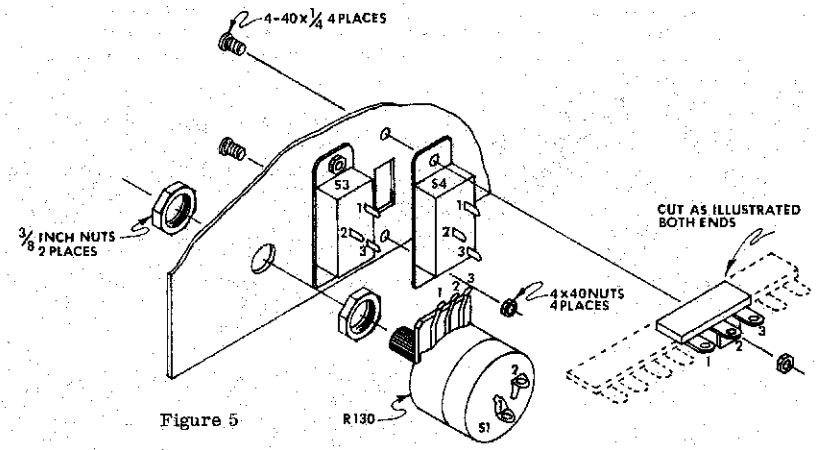


Figure 5

PROCEED TO THE FINAL WIRING OF THE CONTROLS AND SWITCHES. REFER TO FIGURE 6.

NOTE: In the following four steps wires will be connected between the 3750LED circuit board and various points on the 3750A circuit board. At each step prepare the end of the wire that is to connect to the 3750LED board by removing 1/16-inch (2 mm) of the insulation. "Tin" the exposed inner wires. Prepare the remaining end by removing 1/4-inch (7 cm) of the insulation and "tinning" the inner conductor. Note that the wires connected to the 3750LED board will not pass through a hole in the board, but will merely be "tacked" into place.

( ) Connect a 3-3/4-inch (9.7 cm) length of insulated wire between point "X" on the 3750A circuit board and pad #1 of the 3750LED board. SOLDER BOTH ENDS.

( ) Connect a 4-1/8-inch (10.6 cm) length of insulated wire between point "Y" on the 3750A circuit board and pad #4 of the 3750LED board. SOLDER BOTH ENDS.

( ) Connect a 1-1/4-inch (3.5 cm) length of wire between lug #1 of S2 and pad #3 of the 3750LED board. SOLDER AT PAD #3 of the 3750LED BOARD ONLY.

( ) Connect a 2-inch (5 cm) length of insulated wire between lug #3 of the terminal strip and pad #2 of the 3750LED board. SOLDER AT PAD #2 OF THE 3750LED BOARD ONLY.

( ) Connect a 6800 ohm (blue-grey-red) resistor, R111, between point "W" and lug #2 of S2. SOLDER AT POINT "W" ONLY.

Prepare the following wires by stripping away 1/4-inch (6 mm) of the insulation from both ends before soldering.

( ) Connect a 5-1/2-inch (14.6 cm) length of wire between point "T" and lug #2 of S2. SOLDER TWO WIRES AT LUG #2 of S2 AND POINT "T".

( ) Connect a 2-3/4-inch (7.7 cm) length of wire between point "V" and lug #3 of the terminal strip. SOLDER AT POINT "V" ONLY.

( ) Connect a 7-1/4-inch (17.9 cm) length of wire between point "AA" and lug #3 of the terminal strip. SOLDER AT POINT "AA" ONLY.

( ) Connect a 4-1/2-inch (11.4 mc) length of wire between point "Q" and lug #1 of the terminal strip. SOLDER AT POINT "Q" ONLY.

( ) Connect a 82K (grey-red-orange) resistor, R116, between lug #1 of the terminal strip and lug #3 of potentiometer R130. SOLDER BOTH ENDS.

( ) Connect a 5-1/4-inch (13.3 cm) length of wire between point "P" and lugs #1 and #2 of potentiometer R130. NOTE: Strip away 3/8-inch (1 cm) of the insulation from the end that is to connect to the potentiometer. This will allow sufficient wire to connect to both lugs of the potentiometer. SOLDER BOTH ENDS.

( ) Connect a 1-1/2-inch (4 cm) length of wire between lug #1 of S2 and lug #2 of S4. SOLDER TWO WIRES AT S2 ONLY.

( ) Connect a 4-1/2-inch (12 cm) length of wire between point "S" and lug #2 of the terminal strip. SOLDER AT POINT "S" ONLY.

( ) Connect a 7-1/4-inch (18.5 cm) length of wire between point "Z" and lug #2 of the terminal strip. SOLDER AT POINT "Z" ONLY.

( ) Connect a 1-3/4-inch (4.5 cm) length of wire between lug #2 of the terminal strip and lug #2 of S1 which is mounted atop of the potentiometer. SOLDER AT S1 ONLY.

( ) Connect a 1-1/2-inch (3.8 cm) length of wire between lug #2 of the terminal strip and lug #2 of S-4. DO NOT SOLDER.

( ) Connect a 7-1/2-inch (19.2 cm) length of wire between point "U" and lug #2 of the terminal strip. SOLDER POINT "U". SOLDER 5 WIRES AT LUG #2 OF THE TERMINAL STRIP.

( ) Connect a 1-1/2-inch (4 cm) length of wire between lug #2 of S3 and lug #1 of S1. SOLDER AT S2 ONLY.

( ) Connect a 5-3/4-inch (14.5 cm) length of wire between point "R" and lug #1 of S3. SOLDER BOTH ENDS.

( ) Connect a 5-3/8-inch (13.7 cm) length of wire between point "AB" and lug #1 of S4. SOLDER BOTH ENDS.

( ) Locate one of the battery connectors supplied and connect the red lead to lug #1 of S1. SOLDER TWO WIRES.

( ) Connect the black lead of the battery connector to lug #3 of the terminal strip. SOLDER FOUR WIRES.

( ) Connect the red lead of the remaining battery connector to the point on the 3750A circuit board labeled "+15". SOLDER.

( ) Connect the black lead of the above battery connector to point "AC". SOLDER.

( ) Connect a 5-1/2-inch (14.2 cm) length of wire to poing "AD". This wire will connect to the sync jack in a later step.

( ) Locate the co-axial cable supplied and begin preparation by stripping away 1/2-inch (1.3 cm) of the outer insulation to expose the shielding wires. Using a pointed object, carefully unbraid the shielding wires, twist tightly together, and "tin". Now cut the shield wires to a length of 1/4-inch (6 mm).

( ) Remove 1/4-inch (6 mm) of the insulation from the inner conductor, and twist and tin the exposed inner conductor wires. This end of the co-ax will attach to the circuit board in a later step.

( ) Prepare the remaining end of the co-ax by stripping away 1-inch (2.5 cm) of the outer insulation. Once again, unbraid the shielding wires, twist tightly together, and tin. Cut the shielding wires to a length of 1/4-inch (6 mm).

( ) Strip away 1/4-inch (6 mm) of the insulation from the inner conductor, and tin the exposed wires. This end will attach to the output jack in a later step.

( ) Connect the end of the co-ax with the least amount of inner conductor showing to the circuit board. Connect the shield first to the point marked "⏚", then connect the inner conductor to the point marked "out". SOLDER BOTH THE SHIELDING WIRES AND INNER CONDUCTOR.

( ) Locate the foam tape supplied and cut into two equal parts.

( ) Attach one strip of foam to the component side of the circuit board in the position illustrated in figure 1.

( ) Mount the circuit board in the wood ends as illustrated in figure 7.

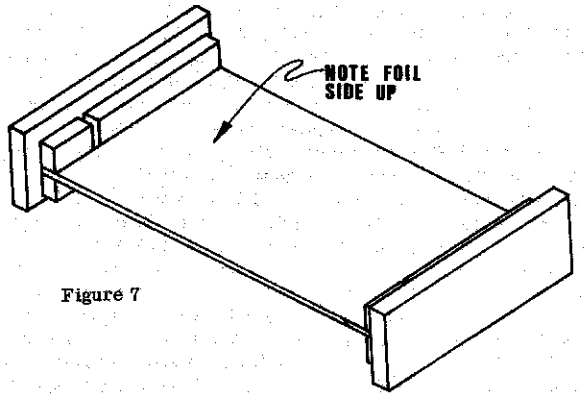


Figure 7

( ) Connect the shield of the co-ax originating at point "⏚" to the ground lug of the 1/4-inch phone jack. Refer to figure 8.

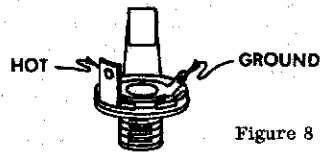


Figure 8

( ) Connect the inner conductor to the hot lug of the 1/4-inch phone jack.

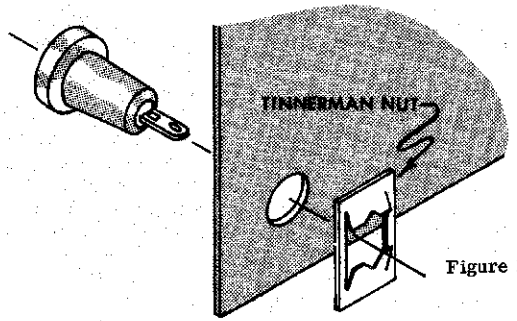


Figure 10

( ) Using the tinnerman nut supplied mount the pin jack, J2, in the case top as illustrated in figures 9 and 10.

( ) Rotate the shaft of the pot fully counter-clockwise until a click is heard, then press the knob firmly onto its shaft with the pointer pointing to the "off" position.

BEFORE COMPLETING ASSEMBLY OF THE 3750 CASE PROCEED TO THE TESTING ND CALIBRATION SECTION.

TESTING AND CALIBRATION

NOTE: THE CAPACITIVE TOUCH SWITCHES EMPLOYED IN THE 3750 PROGRAMMABLE DRUM SET REQUIRE A MODERATE QUALITY EARTH GROUND TO OPERATE PROPERLY. In most cases, the ground established to the amplifier through the audio output cable will suffice.

After carefully checking for misplaced components, solder bridges and cold solder joints, turn the TEMPO control fully counter-clockwise past the "click" and turn all 6 internal trimmer potentiometers (R7, R15, R23, R31, R39 and R48) to their minimum sustain position (OPPOSITE the direction of the arrows on the circuit board and parts placement diagrams). Slide the control panels SCORE switch up to SCORE 1 and turn the SAVE off by sliding this switch down.

Load the 6 volt battery pack with 4 "AA" size penlight cells, being sure to observe the orientation of the batteries as imprinted inside the plastic battery holder. Connect this battery pack to the snap that attaches to the on-off switch on the tempo control. Connect a fresh 9 volt transistor radio battery to the remaining snap which ties to the point on the circuit board marked "+15". NOTE: While no damage should result from interchanging these two batteries, the unit will not operate under these conditions.

Using an appropriate jumper cable, connect the phone jack output of the drum set to an instrument amplifier on the "aux" input of a hi-fi amp.

Turn the drum set power on by advancing the TEMPO control in a clockwise direction. When the unit is first turned on, you may (if the volume of the amplifier is set high enough) hear a burst of noise lasting about 1 second. This is normal.

One or both of the PROGRAM and BRIDGE LED's may also come on when power is first applied. Touching the RESET pad should extinguish these LED's.

Test the drum oscillator circuit by seeing that they are all capable of sustained oscillation. By advancing the internal trimmers one at a time in the sustain direction (the direction of the arrows) until the drum circuits break into oscillation. Once you have established that an oscillator is capable of sustained operation, retard its trimmer control fully (OPPOSITE the direction of the arrow) before proceeding to the testing of the next oscillator. NOTE that trimmer R48 is an adjustment of the noise source used in the snare drum circuits and will not produce a tone but rather a steady hiss as it is advanced.

To adjust the drum sound oscillators, proceed as follows:

Touch the reset pad and then press the PROGRAM button. Observe that the PROGRAM LED lights indicating that you are in the PROGRAM mode. Advance the TEMPO control approximately 3/4 of its total rotation in the clockwise direction.

At this point, pressing any of the drum sound pads should produce a repeating percussion sound to be heard from the amplifier's speaker. The rate at which this sound repeats should be adjustable with the TEMPO control.

While holding a finger on the WOOD-BLOCK pad, adjust trimmer R7 in the sustain direction (the direction of the arrow) until the sound from the speaker approximates that of a wood-block.

Similarly, press CLAVE and adjust R15; TOM and adjust R23, CONGA and adjust R31. Touch ACCENT BASS and adjust R39 then touch BASS and confirm that the bass drum sound is heard here also - though at a lower volume level than ACCENT BASS.

Touch the SNARE pad and adjust R48 until the voicing of the noise source approximates that of the snare of a snare drum. It may be necessary to adjust the TOM control R23 to obtain the maximum realism from the SNARE generator.

After all of the drum circuits have been tested and adjusted, you may proceed to the testing of the units programming circuits.

Touch RESET and observe that the PROGRAM LED extinguishes (this resets the units internal event counter to zero) then once again press PROGRAM and observe that the PROGRAM LED comes on. Tap each of the drum sound control pads in turn - ACCENT BASS, TOM, CONGA, CLAVE, BASS, SNARE, WOOD-BLOCK and REST. Do not hold these pads down long enough for the sound to repeat, only long enough for a single drum sound to be generated. Finally, touch the REPEAT pad (to indicate to the unit they point at which the pattern is to repeat), the RESET pad (to reset the program counter to the beginning of the pattern) and finally, the PLAY pad. At this point the drum set should begin playing back the pattern that you entered.

Having verified the unit's ability to store a program, you are ready to test the operation fo the bridge pattern. Reset the unit, and while resting a finger on the BRIDGE pad touch RESET again. (Note - the activation of the bridge circuit is sequence sensitive; this can only be activated by touching RESET while the BRIDGE pad is being touched). The BRIDGE LED will come on indicating that you are in the BRIDGE mode. Push the PROGRAM button (observing that the PROGRAM LED lights) and you are ready to program the bridge.

Program some easily recognized pattern (such as 4 clave beats) then touch REPEAT and RESET.

Touch PLAY, and the test pattern of all drum sounds programmed previously should be heard. Allow this to play for a couple of cycles then touch BRIDGE. When the pattern playing reaches the point at which it would normally repeat, the unit should switch to the BRIDGE pattern - as indicated by the BRIDGE LED lighting - and as long as the pad is touched should continue to play this. Release the BRIDGE pad. The BRIDGE LED may not immediately extinguish and the unit may not immediately shift back to the main pattern. The return to the main pattern should only happen when the unit gets to the point in the bridge pattern where it would ordinarily repeat.

( ) Connect the wire coming from point "AD" to the pin jack. NOTE: As the case top is installed this wire will be routed around the back edge of the circuit board.

Cut a 10-3/4-inch (27.2 cm) length of the rubber extrusion supplied and mount on the case top as illustrated in figure 7.

( ) Using four #4 X 3/8-inch wood screws mount the case top to the wood ends.

( ) Mount the 1/4-inch phone jack in the case top as illustrated in figure 9.

( ) Cut a 11-1/2-inch (29.2 cm) length of the rubber extrusion supplied and mount on the front edge of the case bottom as illustrated in figure 11.

( ) Mount the remaining piece of foam tape to the case bottom as illustrated in figure 11.

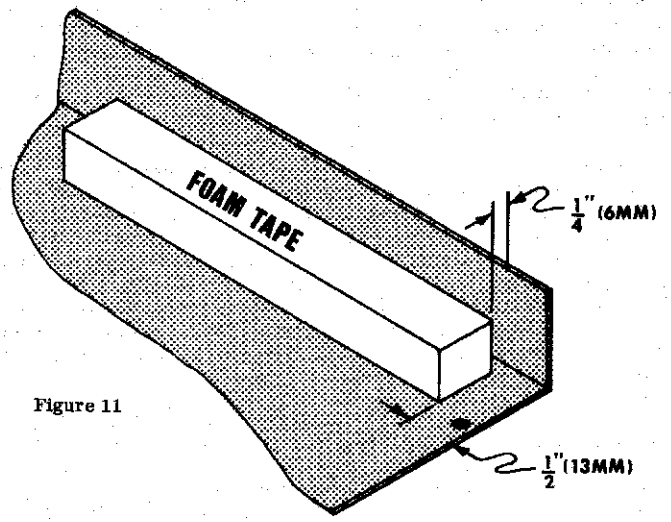


Figure 11

( ) Using four #4 X 3/8-inch wood screws and four rubber feet mount the case bottom to the woodends as illustrated in figure 9. NOTE: Before fastening the case bottom down make sure that the battery pack and the 9 volt battery are firmly wedged in place by the foam tape mounted on the circuit board and case bottom.

THIS COMPLETES ASSEMBLY OF THE 3750 PROGRAMMABLE DRUM UNIT.

USING THE PAIA 3750 PROGRAMMABLE DRUM SET

Before getting into the operation and use of the controls, there are a few important points that need to be covered:

1) The touch switches used in the 3750 require a moderately good ground for their proper operation. In all cases, the ground established through the audio cord to a power line operated amplifier will suffice. If using the 3750 with a battery powered amplifier, however; this ground may have to be supplied externally by clipping the case of the 3750 to cold water pipe or other suitable ground.

2) Current drain from the batteries is a significant 100 ma. in full operation and 30 ma. in the SAVE mode. Use the SAVE sparingly and TURN THE UNIT OFF WHEN NOT IN OPERATION. The penlight cells should be good for 10 hours of intermittent operation and the 9 volt transistor radio battery should have essentially shelf life.

3) There is a natural tendency on the part of everyone who has ever played with the Programmable Drums to try and enter patterns "in tempo" by beating out the rhythm on the touch switches. THIS IS NOT THE WAY THAT IT IS DONE. Any pattern that you enter must have REST's entered with the pattern for proper spacing of the drum beats.

Operation of the controls is as follows:

TEMPO - This knob, at the right hand edge of the control panel, sets the tempo at which a programmed rhythm pattern will play back - clockwise rotation of the control increases tempo.

The power switch is a part of this control and full counter-clockwise rotation of the control past the "snap" turns off the power. THE POWER SHOULD BE TURNED OFF ANY TIME THAT THE UNIT IS NOT BEING PLAYED OR PROGRAMMED.

The tempo control also sets the rate at which drum sounds will be iterated during programming. When in the PROGRAM mode, continuously activating a drum pad will cause that drum sound to be repeated at a rate set by the tempo control. During this time, each drum sound heard will also be entered into memory.

SAVE - The SAVE switch provides a convenient means of holding a programmed pattern for short periods of time. Sliding the SAVE switch to the "on" position allows the TEMPO control to be rotated to the full power off position without losing the scores currently programmed into memory. The SAVE switch should be left in the "off" position any time that it is not being used to actually save a score.

SCORE 1/2 - The SCORE switch allows two independent rhythm patterns (each with its own bridge pattern) to be programmed and selected for playback.

PROGRAM - The PROGRAM push-button, when pressed, puts the unit into the PROGRAM mode of operation for entry or modification of patterns. The PROGRAM LED contained in the graphics for this button will be lit anytime that the unit is in the programming mode.

CONTROL - There are four "control" touch pads; RESET, REPEAT, PLAY and BRIDGE. You should get in the habit of touching the RESET pad every time before you do anything else. This control resets the internal event counter that determines which programmed event is to occur next as well as taking the unit out of the PROGRAM or BRIDGE mode.

The primary funciton of the REPEAT pad is to enter into the memory of the 3750 the point at which the pattern you are currently programming is to repeat. This pad may also be used during playback to go back to the beginning of a pattern without stopping the unit entirely (useful for special effects, intros, etc.)

Touching the PLAY pad causes the unit to begin reproducing the programmed pattern selected by the SCORE switch at a rate set by the TEMPO control. This control pad latches so that a single tap will start the unit which will then continue to play until stopped by touching the RESET pad.

The BRIDGE pad is used one of two ways depending whether you are programming a score or playing one back. To program the bridge, the following sequence of pad activations must be followed: RESET (always RESET before you do anything else), then while touching the BRIDGE pad, tap the RESET again (the BRIDGE LED should light indicating that you are in the BRIDGE mode) the push PROGRAM (the BRIDGE LED should still be on and now the PROGRAM LED should light indicating that you are also in the PROGRAM mode). The bridge pattern may then be programmed in the same manner as a main score.

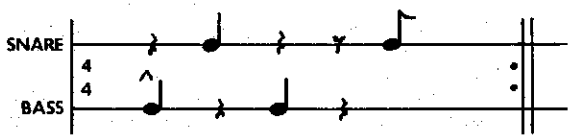
During playback, touching the BRIDGE pad at the time of the repeat will cause the circuitry of the drummer to begin playing the bridge rather than the main score. The bridge key does not latch and you must be touching it at the time of the repeat in order for the unit to shift to the bridge pattern. When the repeat point of the bridge pattern is reached, the unit will shift back to the main score unless the BRIDGE pad is still being touched - in which case the bridge pattern will repeat again.

DRUMS - The eight touch pads on the left end of the control panel control the drum sounds: BASS, ACCENT BASS (down-beat, etc.), TOM, SNARE, CONGA, WOOD-BLOCK, CLAVE and most importantly REST.

A PROGRAMMING EXAMPLE:

A single, simple programming illustration will get the idea of the usefulness (necessity) of the rest pad as well as many pages of explanatory text would.

As an example, we'll use a simple shuffle/fox trot that in tablature looks like this:



The most basic principle that needs to be grasped is that since the shortest note that we'll use here is an eighth note, and since the tempo clock once set pulls events out of memory at a constant tempo, each event from memory will represent an eighth note. The quarter note accented bass will actually be entered into memory as an ACCENT BASS followed by a REST.

To prepare for programming we touch RESET (always) then press the PROGRAM button (acknowledged by PROGRAM LED) then enter the score on the drum pads like this:

HEAVY BASS / REST / SNARE / REST / BASS / REST / REST / SNARE

and since we want this line to repeat again and again we finish it off by touching REPEAT.

To play that back, RESET/ PLAY.

TRICKS & THINGS

There is more versatility and power here than is implicit in the labeling of controls. Here are some that we've found and you can be sure that there are others waiting for you to discover.

USING THE BRIDGE AS AN INTRO

You can begin playing with the bridge rather than the main score by placing the unit in the BRIDGE mode then touching PLAY.

PLAYING A MANUAL TEMPO

You can play a score to a manual tempo by tapping on the REST pad in the tempo that you want. Each tap advances the event counter and causes any programmed drum sounds to play. The REST pad can also be used a a non-latching "play" key. Simply touching this pad continuously causes the unit to play at the rate set by the tempo control.

PLAYING ONLY A PORTION OF A SCORE

The REPEAT pad can be used in the PLAY mode to cause a pattern to begin again before the programmed repeat point is reached. Simply tap the pad. If you are touching the BRIDGE pad at the same time, the unit will switch to the beginning of the bridge.

EDITING

Editing capabilities are limited, but some editing is possible by single stepping to the point to be changed using the REST pad. When you get to the event that is to be changed, put the unit in the PROGRAM mode (in this case, DO NOT RESET - simply press the PROGRAM button) and alter the events desired.

EXTERNAL SYNCHRONIZATION/MANUAL PLAY

The pin jack on the rear of the 3750 case provides a means of either foot pedal controlling the unit or synchronizing to external events. A 5 volt trigger applied to this input causes the clock to run at the rate set by the tempo control. If the triggers applied to this input are short (as trigger pulses from a PAIA 4780 Sequencer, for instance) the event counter will advance one event for each pulse.

IN CASE OF DIFFICULTY

Recheck the wiring with the parts placement diagram & control wiring diagram. Check the value of the parts to make sure that the proper part has been installed in each position. Check polarity of the diode and transistor basing. Many kits which are returned for repair are malfunctioning due to poor solder connections. Look over all solder connections to see that they are as described in the assembly manual
section of this manual. Finally check for solder bridges, wire bits or other foreign matter which may be lodged in the wiring or across conductors on the circuit board.

A repair service is available should you be unable to determine the difficulty. Before sending a unit back for repair please write:

PAIA Electronics, Inc.
Technical Services Dept.
P.O. Box 14359
Oklahoma City, OK 73114

Give as full a description of the malfunction as possible. It is possible that some malfunctions can be diagnosed by mail but if no diagnosis can be made you will be supplied with a repair address and shipping instructions. Repairs are charged at the rate of $6.00/hr. plus parts and shipping. Repairs ordinarily take from an hour to and hour and a half but repair times in specific cases cannot be estimated in advance.

DESIGN ANALYSIS

DRUM OSCILLATORS

A schematic drawing of the 5 drum oscillators, voiced noise source and buffer amplifier is shown in figure 12. All 8 of the current differencing amplifier stages used in this circuitry are contained in the two quad amplifiers IC-1 and IC-2.

All of the drum oscillators are parallel-T filter sections typified by the wood-block oscillator built up around the (a) stage of IC-1. The parallel-T filter section consisting of R3, R4, R5, C1, C2 and C3 has band-rejecting notch characteristics which when placed in the negative feed-back loop of the amplifier produce a band-pass filter. Activating pulses from the memory/logic circuitry are coupled to the oscillator by C4 and R8 where they produce a ringing response from the circuit.

The sustain characteristics of the sound produced (how long the ringing persists) is a function of the gain of the entire section which in the case of the wood-block is set by the secondary feed-back loop through C5 and R6. Trimmer resistor R7 sets the amount of signal fed-back through this loop and consequently the sustain of the entire stage.

The remaining Clave, Tom, Conga and Bass oscillators built up around IC-1b, IC-1c, IC-1d and IC-2c respectively, operate in the same manner with different component values to produce different drum sounds.

All of the drum oscillators share a common bias source consisting of R1, R2 and by-pass capacitor C57.

Generation of the snare sounds is handled by the noise voicing circuit comprising IC-2b, IC-2a and associated circuitry. Noise is produced by the avalanching reverse-biased base emitter junction of transistor Q1 and coupled to the gating amplifier IC-2b by R44 and C26. When not activated, IC-2b's output is held at the upper supply voltage by the current flow into this amplifier's non-inverting input through R47, R48 and R50. Under these saturated conditions, no signal can pass through the amplifier. A snare activating pulse at point (f) grounds R49 and causes C29 to discharge slightly, producing a decreased current flow through R50 into the amplifiers non-inverting input and allowing the amplifier to come out of saturation and signal to pass. When the activating pulse ends, C29 slowly charges through R47 and R48 until the point is reached at which the amplifier goes back into a saturated condition, terminating the signal passing through it. The noise signal is coupled to the filter section consisting of IC-2a and associated components where the low frequency components are attenuated to simulate the sound of snare.

The signals from all of the drum oscillators and noise source are summed together by resistors R9, R17, R25, R33, R41 and R53 and applied to the input of the buffering amplifier IC-2d. The output of the buffer amplifier is the output of the drum unit.

TOUCH SWITCHES

The bulk of the touch switch circuitry is shown in figure 13. Two gates from the MOS quad NOR IC-3 are connected together along with R68 and C34 to form an

astable multivabrator generating square waves with a frequency of approximately 50 kHz. After being buffered by the third gate in IC-3, these square waves serve as a common clock to all of the touch switch drivers comprising IC-4, IC-5, IC-6, IC-7, IC-8 and IC-9.

Taking the SNARE switch as typical, when the switch is not being activated, the square waves from the clock are applied to the two inputs of the gate IC-8a which serves simply as an inverter. The resulting square waves at the output of IC-8a are rectified by D19 and used to charge C44. With this capacitor charged to supply voltage, IC-8b also serves as an inverter whose output is at a low logic level - essentially ground - and the switch can be considered to be off.

Placing a finger on the touch pad at pin 6 or IC-8 has the effect of placing a capacitor of several hundred pico-farad from this pin to ground. During the high half-cycles of the square wave clock this capacitance is easily charged through D18, but during low half-cycles the only discharge path for the capacitor is through R86; the net result is a charge build-up on pin 6 that holds this pin at a high logic level and consequently the output (pin 4) at a low level. With D19 now reverse-based, charge begins to leak off C44 through R87 until the point is reached at which low logic level conditions are met for IC-8b at which time the output of this gate switches high; representing the switch being on. Removal of your finger and the capacitance that it represents allows the output of IC-8a to once again switch at the clock rate allowing C44 to charge and the output of IC-8b to once again switch low.

The remaining stage of IC-3 along with R69 and C35 produces a "de-bounce" circuit that momentarily turns off the clock buffer when a switch is released.

MEMORY/CONTROL LOGIC

At the heart of the memory/control logic circuitry are the 2112 type memory chips IC-14 and IC-15. Each of these chips represents 1024 bits of memory organized as 256-4 bit words. The two chips together, then, represent 256-8 bit words. Each bit in the word represents a drum sound or a signal to the rest of the circuitry to re-set to the beginning of the pattern and start again. A logical x 1 recorded in memory causes the corresponding drum to sound and if nothing is written in a given memory location then the event that location represents is a rest.

Six bits of address to the memory are supplied by the seven stage counter IC-12 whose most significant bit is not used. The remaining 2 bits of address can be thought of as select lines that select one of 4 "pages" of memory. The first of these page selecting lines originates at the SCORE 1/2 switch S4 while the second originates at the bridge selecting flip-flop which is one-half of the Dual D bi-stable IC-13.

When the RESET touch pad is activated, a number of things happen simultaneously. The PROGRAM bistable built up of IC-11a and IC-11b is reset causing the read/write (R/W) lines of the memory to go to their high "read" state. The address counter IC-12 is also reset to 000000 address. The Tempo-clock controlling bi-stable IC-13a is reset so that its $\overline{Q}$ output goes high keeping the tempo clock from running. Finally, a clocking pulse is applied to the bridge select bi-stable IC-13b which strobes the current state of the BRIDGE SELECT touch pad to the Q output of this bi-stable.

Activating the PLAY pad causes the $\overline{Q}$ output of IC-13a to go to a low state which when applied to pin 8 of IC-10a causes the tempo clock comprising IC-10a, IC-10b, R116, C50, C51 and tempo control R130 to begin generating a train of square waves at a rate set by the tempo control. This clock signal is coupled by D38 to the input of IC-10c which is serving as a buffer and inverter and in turn applies the clocking waveform to the address counter IC-12, making it advance by one count for each cycle of the clocking waveform. Simultaneously, the differentiating network R119, R120 and C52 buffered and inverted by IC-10d produces a short pulse which activates the $\overline{CE}$ input pins of the memories. When taken to a low logic level, these $\overline{CE}$ pins cause the data stored in the memories at the location specified by the address lines to appear at the output of the memories.

If the data stored is for a drum sound, one of the transistors Q2 - Q8 is turned on providing an activating pulse to the drum oscillators. If the data stored is a repeat, this data (a logic 0) is applied to the collector Q12 (which will be "off" under these conditions) and through R127 to one of the inputs of IC-11c causing this gates output to go high producing the same effects as the RESET pad except that the PLAY flip-flop is not reset.

If the BRIDGE SELECT pad had been activated at the time the repeat data occured, the output of the bridge select flip-flop IC-13b would have changed state selecting the bridge "page" of memory corresponding to the setting of the SCORE 1/2 switch.

Closing the PROGRAM push-button S2 causes pin 11 of IC-11a to go low (putting the memories into a "write" state) and pin 10 of this IC to go high which disables IC-11c to prevent the entry of a repeat into memory from resetting the remainder of the circuitry.

With the unit in this PROGRAM mode, touching any of the drum sound input pads (including REST and REPEAT) produces the same results. Taking the CONGA as typical, the high output of the touch switch drives, by way of R101 and R94 provides a voltage to the base of Q2 which will ultimately turn this transistor on to produce a drum sound - but, at this point Q9 is off so that there is no ground path from the emitter of Q2. The voltage that appears at the junction of R101 and R94 is also applied to the DATA I/O lines where it will shortly be an entry into the memory.

The output of the touch switch driver is also applied by way of D26 to the inverter IC-11d which by way of D35 lowers the control input to the tempo clock (pin 8 of IC-10a) thereby allowing the clock to generate square waves. If the touch is simply a tap, a single clock cycle is generated, but holding the drum activating pad will allow the clock to run at its normal rate as set by the tempo control. On the first half-cycle of the clock a short pulse is generated by IC-10d producing two important results. First, the $\overline{CE}$ pins of the memories are lowered allowing the data on the I/O lines to be strobed in. At the same time, Q9 is turned on briefly providing a ground path at the emitter of Q2 causing this transistor to turn on activating the Conga Drum Oscillator.

On the second half-cycle of the tempo clock the address counter increments so that the next input will be placed in memory at the next sequential address.

Activating the REST pad produces all of the above effect - incrementing address counter, etc. - except that no drum sounds are activated.

Activating the REPEAT pad produces all of the above effect except that Q12 is turned on causing a "0" to be entered in the repeat bit of the memory. It is important to notice that whereas drum sounds are stored in memory as logical "1's"; repeats are stored as logical "0's".

Transistors Q10 and Q11 serve as current drivers for PROGRAM and BRIDGE mode indicating LED's respectively.

Capacitors C32 and C33 in the wood-block and clave circuits act to make the activating pulses to these oscillator circuits less sharp.

Power distribution circuitry is shown in figure 14. The 6 volt supply is filtered by R126 and C56 and applied to the drum oscillators circuits IC-1 and IC-2. Power to all of the logic with the exception of the memories pass through D40 which provides a .7v. drop leaving slightly over 5 volts to run the logic. Similarly, power to the memories IC-14 and IC-15 passes through D41 leaving slightly more than 5 volts to power these chips. Closing the SAVE switch allows a reduced "keep-alive" voltage to be applied to the memory chips by way of diodes D42 - D47 while turning off power to the remainder of the circuitry.

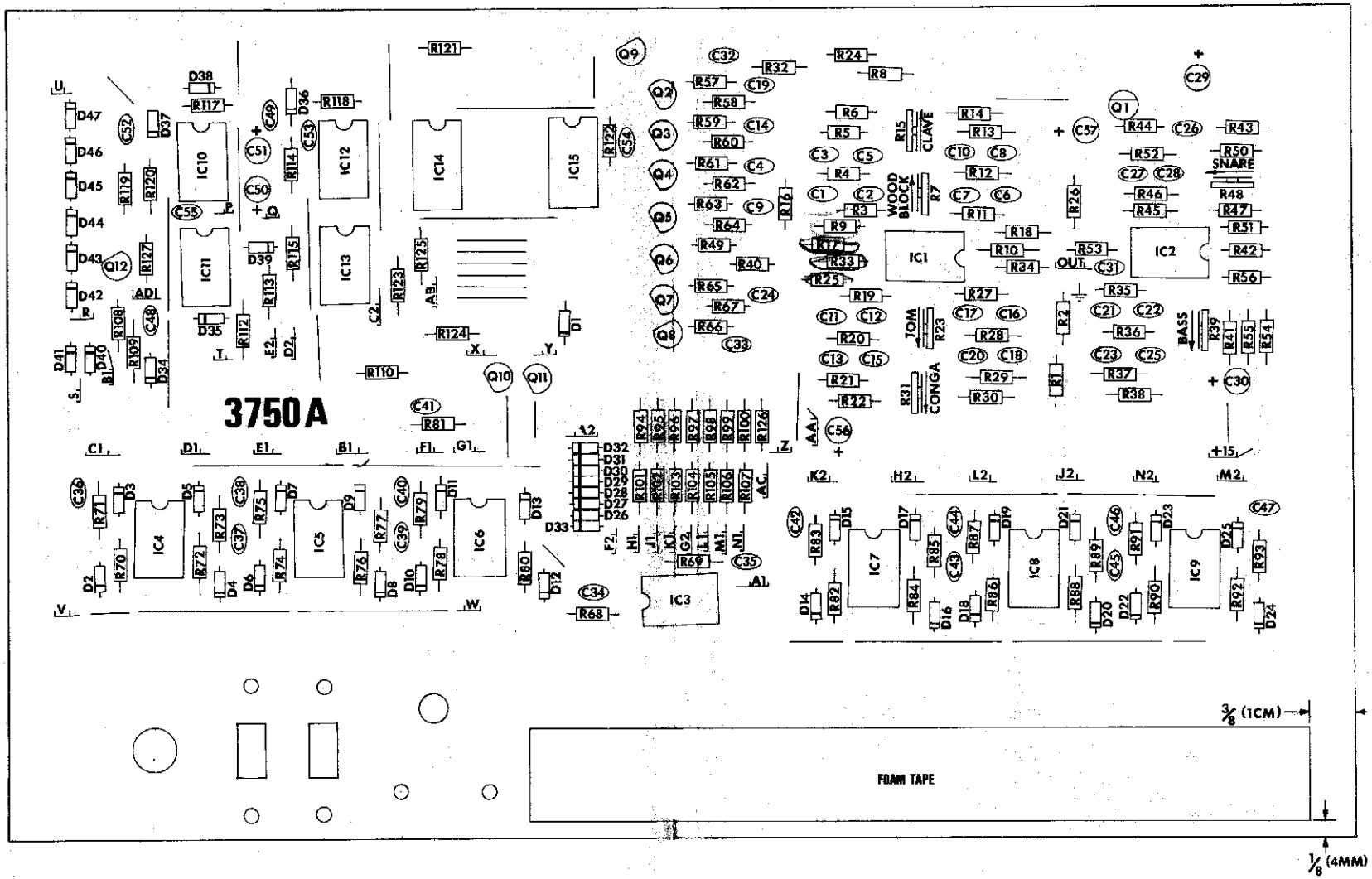


Figure 1

ASSEMBLY DRAWINGS

Remove this section for easy reference during assembly.

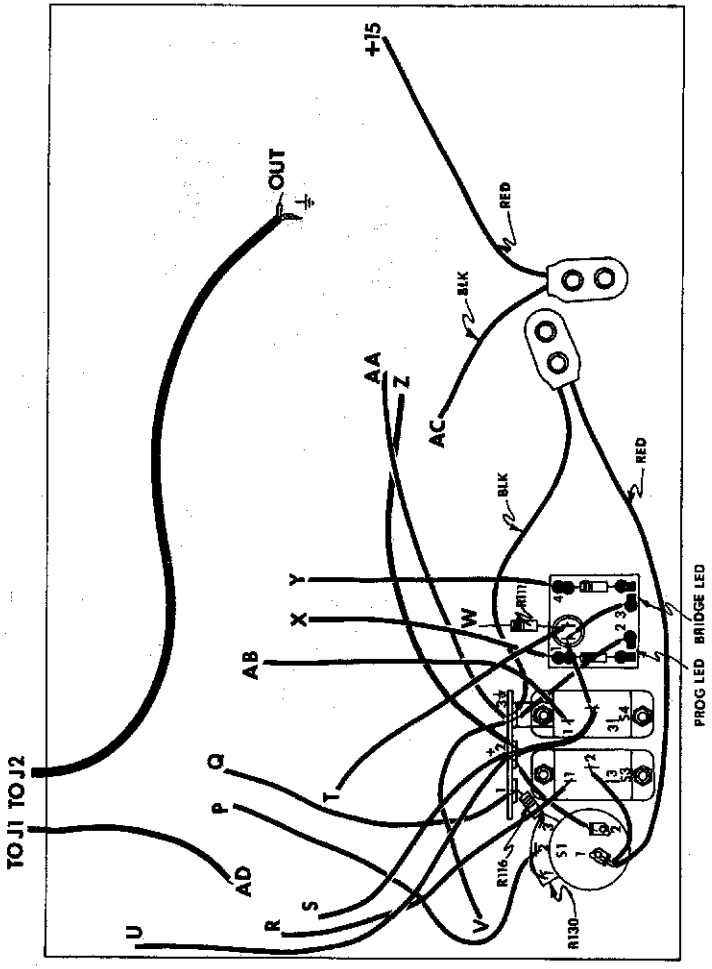


Figure 6

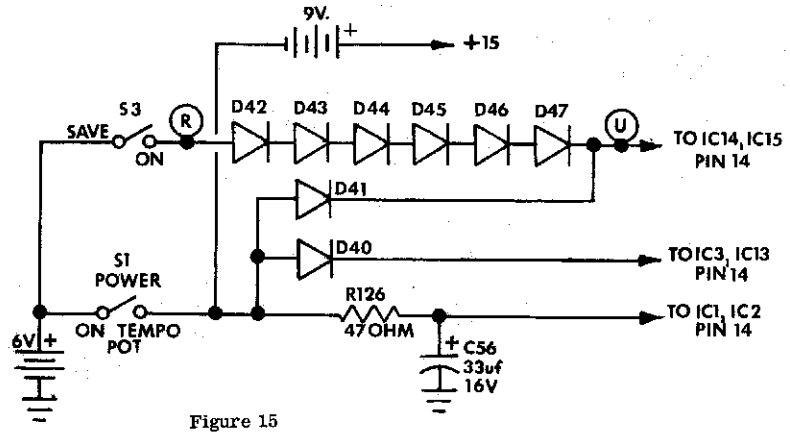


Figure 15

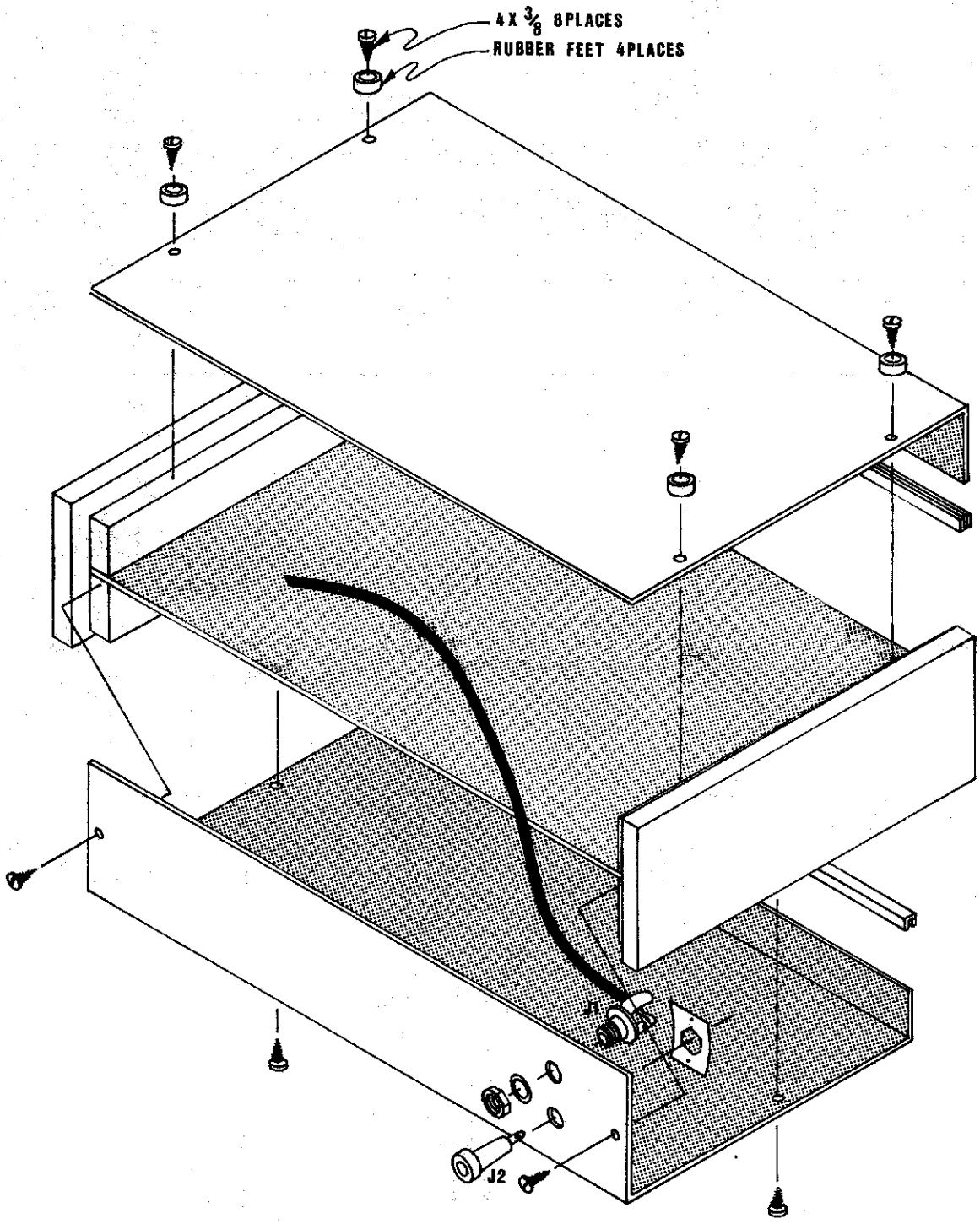


Figure 9

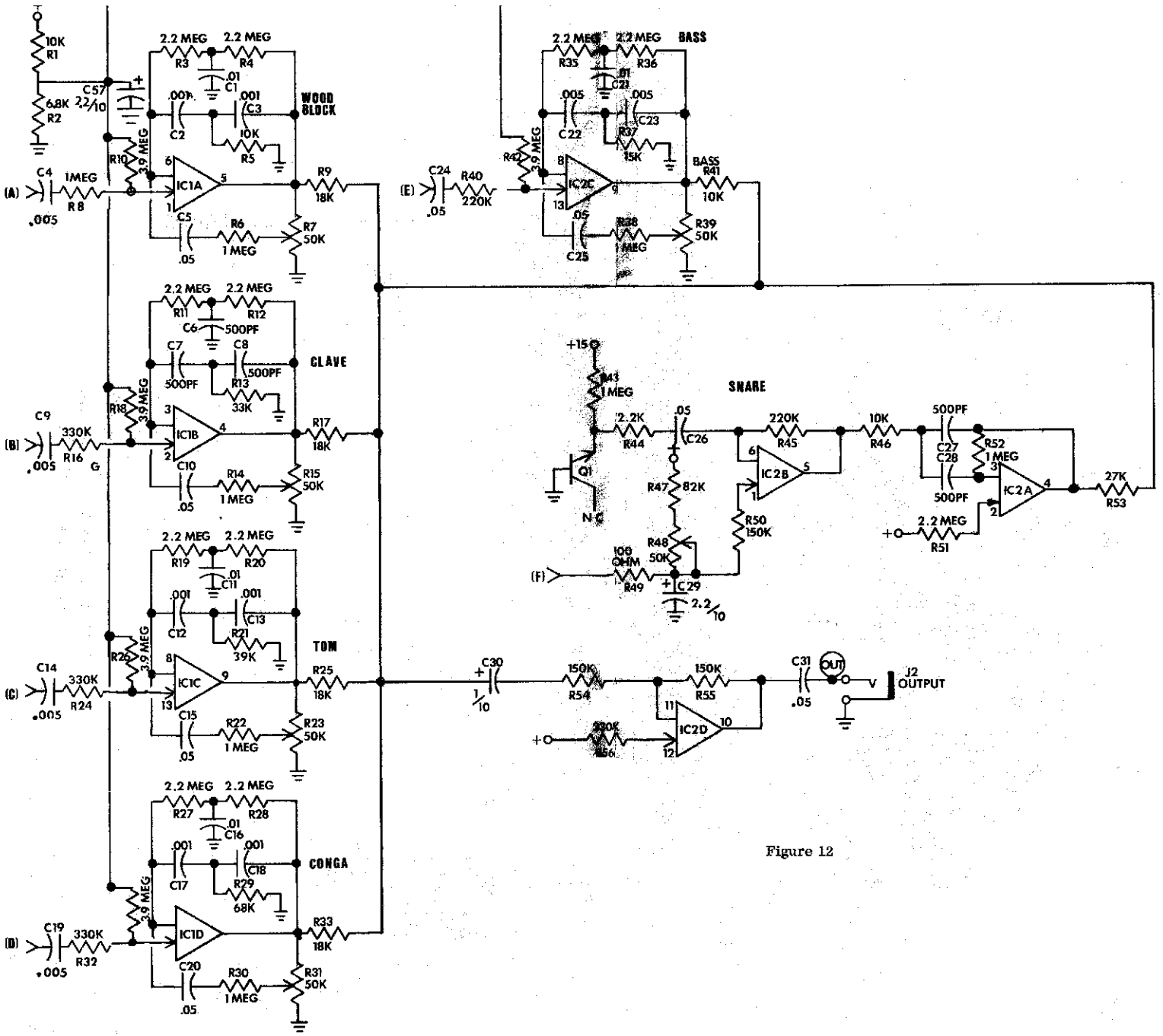

WOOD BLOCK
CLAVE
TOM
CONGA
BASS
SNARE
OUTPUT
10K R1
6.8K R2
C57 22/10
2.2 MEG R3
2.2 MEG R4
.01 C1
.001 C2
.001 C3
10K R5
3.9 MEG R10
C4 .005
1MEG R8
IC1A
R9 18K
C5 .05
R6 1 MEG
R7 50K
C9 .005
330K R16
IC1B
R17 18K
C10 .05
R14 1 MEG
R15 50K
C14 .005
330K R24
IC1C
R25 18K
C15 .05
R22 1 MEG
R23 50K
C19 .005
330K R32
IC1D
R33 18K
C20 .05
R30 1 MEG
R31 50K
C24 .05
R40 220K
IC2C
R41 10K
R38 1 MEG
R39 50K
C25
R42 3.9 MEG
R35 2.2 MEG
R36 2.2 MEG
C23 .01
C22 .005
C23 .005
R37 15K
+15
R43 1 MEG
Q1
N-C
R44 2.2K
C26 .05
R47 82K
R48 50K
100 OHM R49
C29 2.2/10
(F)
220K R45
IC2B
R50 150K
10K R46
500PF C27
500PF C28
R52 1 MEG
IC2A
27K R53
2.2 MEG R51
C30 1/10
150K R54
150K R55
IC2D
C31 .05
OUT
J2 OUTPUT
(A)
(B)
(C)
(D)
(E)

Figure 12

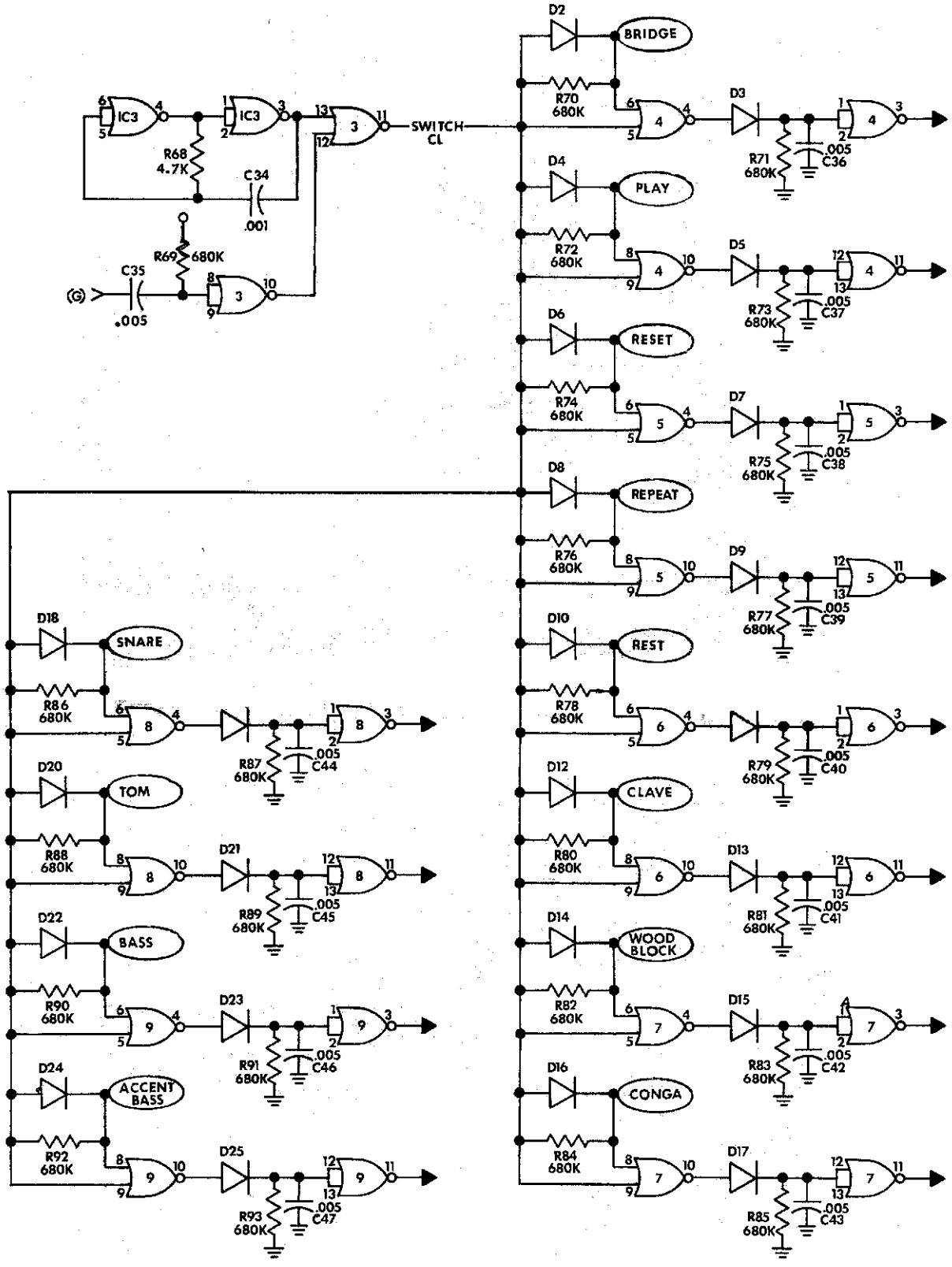

IC3
IC3
R68
4.7K
C34
.001
R69 680K
C35
.005
SWITCH
CL
D2
BRIDGE
R70
680K
D3
R71
680K
.005
C36
D4
PLAY
R72
680K
D5
R73
680K
.005
C37
D6
RESET
R74
680K
D7
R75
680K
.005
C38
D8
REPEAT
R76
680K
D9
R77
680K
.005
C39
D10
REST
R78
680K
R79
680K
.005
C40
D12
CLAVE
R80
680K
D13
R81
680K
.005
C41
D14
WOOD
BLOCK
R82
680K
D15
R83
680K
.005
C42
D16
CONGA
R84
680K
D17
R85
680K
.005
C43
D18
SNARE
R86
680K
R87
680K
.005
C44
D20
TOM
R88
680K
D21
R89
680K
.005
C45
D22
BASS
R90
680K
D23
R91
680K
.005
C46
D24
ACCENT
BASS
R92
680K
D25
R93
680K
.005
C47

Figure 13

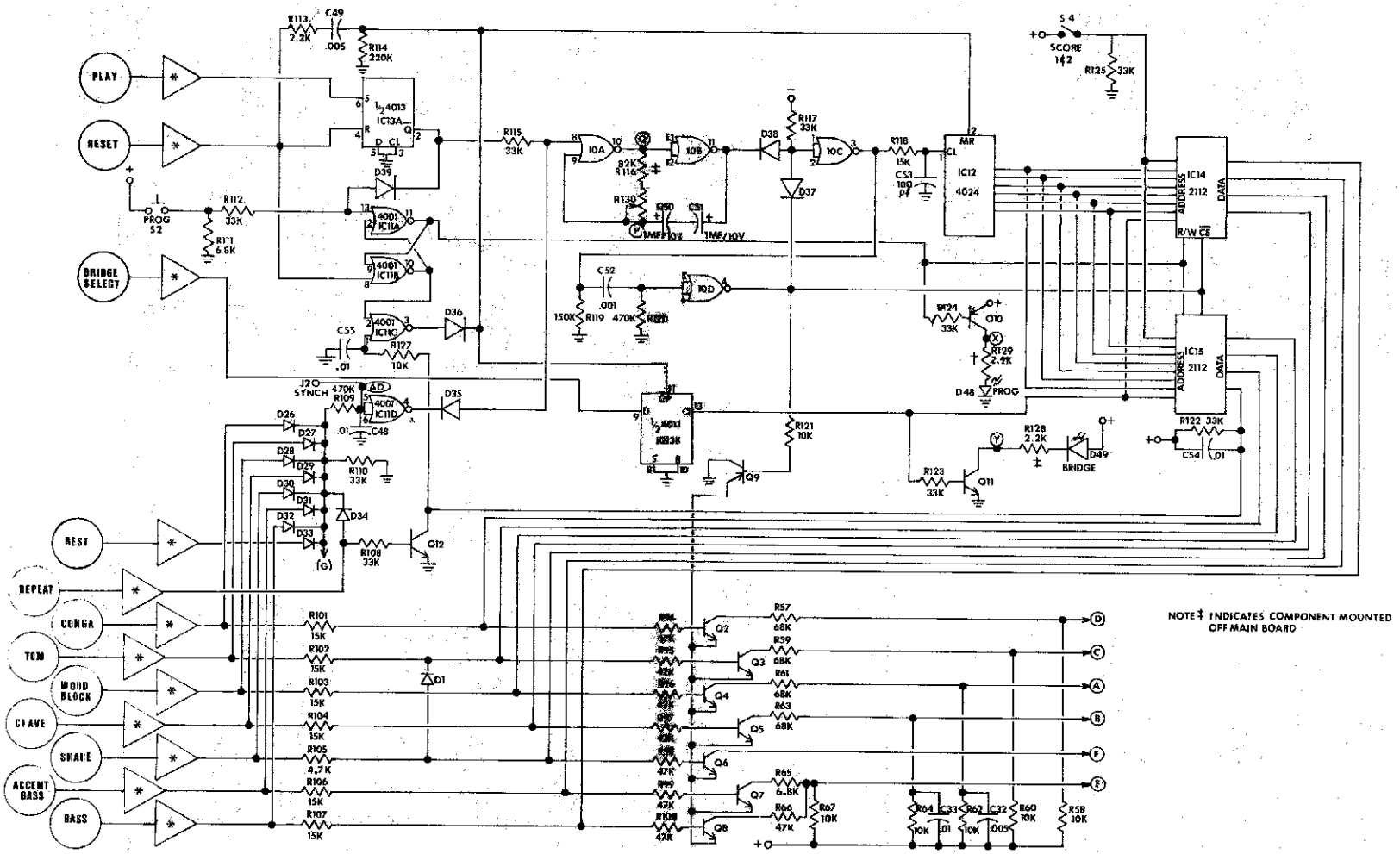

PLAY
RESET
PROG S2
BRIDGE SELECT
REST
REPEAT
CONGA
TOM
WOOD BLOCK
CLAVE
SHAKE
ACCENT BASS
BASS
SYNCH
S4
SCORE 1 2
BRIDGE
PROG
NOTE ‡ INDICATES COMPONENT MOUNTED OFF MAIN BOARD

Figure 14

F