



HORIZONTAL CIRCUIT BOARD

PARTS LIST

Remove the parts from the pack marked #2 and check each part against the following list. The key numbers correspond to the numbers on the Horizontal Circuit Board Parts Pictorial (Illustration Booklet, Page 6).

To order a replacement part, always include the PART NUMBER. Use the Parts Order Form furnished with the kit. If one is not available, see "Replacement Parts" inside the rear cover. For prices, refer to the separate "Heath Parts Price List."

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
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RESISTORS

All resistors are 5% (fourth band gold) unless designated 10% (fourth band silver).

NOTE: The resistors may be packed in more than one envelope (stamped RES). Open all the resistor envelopes in this pack before you check the resistors against the Parts List.

1/2-Watt

A1	6-279	5	2.7 Ω (Red-Viol-Gold)	R241, R275, R276, R277, R281
A1	6-100	3	10 Ω (Brn-Blk-Blk)	R244, R269, R270
A1	6-470	2	47 Ω (Yel-Viol-Blk)	R214, R215
A1	6-221	8	220 Ω (Red-Red-Brn)	R230, R237, R238, R246, R253, R254, R259, R260
A1	6-271	2	270 Ω (Red-Viol-Brn)	R212, R255
A1	6-331	2	330 Ω (Org-Org-Brn)	R209, R228
A1	6-391	1	390 Ω (Org-Wht-Brn)	R229
A1	6-511	2	510 Ω (Grn-Brn-Brn)	R206, R207
A1	6-561	2	560 Ω (Grn-Blu-Brn)	R235, R258
A1	6-821	1	820 Ω (Gry-Red-Brn)	R217

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
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Resistors (Cont'd.)

A1	6-102	13	1000 Ω (Brn-Blk-Red)	R12, R202, R204, R218, R219, R221, R227, R245, R262, R268, R273, R278, R282
A1	6-152	1	1500 Ω (Brn-Grn-Red)	R248
A1	6-182	5	1800 Ω (Brn-Gry-Red)	R205, R208, R213, R216, R250
A1	6-222	1	2200 Ω (Red-Red-Red)	R272
A1	6-682	1	6800 Ω (Blu-Gry-Red)	R226
A1	6-103	1	10 k Ω (Brn-Blk-Org)	R256
A1	6-153	1	15 k Ω (Brn-Grn-Org)	R210
A1	6-473	2	47 k Ω (Yel-Viol-Org)	R220, R222
A1	6-683	1	68 k Ω (Blu-Gry-Org)	R225
A1	6-104	5	100 k Ω (Brn-Blk-Yel)	R201, R239, R243, R252, R274
A1	6-684	1	680 k Ω (Blu-Gry-Yel)	R224
A1	6-914	1	910 k Ω (Wht-Brn-Yel)	R242
A1	6-105	1	1 M Ω (Brn-Blk-Grn)	R280
A1	1-163	1	6.8 M Ω (Blu-Gry-Grn)	R223
A1	1-166	1	10 M Ω (Brn-Blk-Blu)	R240

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
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Other Resistors

A2	1-21-1	1	680 Ω , 1-watt, 10% (Blu-Gry-Brn)	R232
A3	1-23-2	2	5600 Ω , 2-watt (Grn-Blu-Red)	R263, R265
A4	5-2-2	2	22 k Ω , 2-watt	R233, R264

CAPACITORS

Ceramic

B1	21-157	1	5 pF	C219
B1	21-7	1	33 pF	C204
B1	21-32	2	47 pF	C220, C235
B1	21-121	2	56 pF	C205, C213
B1	21-75	1	100 pF	C212
B1	21-21	1	200 pF	C222
B1	21-56	1	470 pF	C214
B1	21-36	3	.002 μ F	C211, C218, C229
B1	21-16	2	.01 μ F	C202, C224
B1	21-82	1	.02 μ F	C210
B1	21-199	3	.1 μ F	C209, C228, C232

Tantalum — Electrolytic

C1	25-221	1	2.2 μ F tantalum	C208
C2	25-820	2	10 μ F NP (non-polarized) electrolytic	C203, C221
C2	25-115	9	10 μ F electrolytic	C206, C217, C223, C225, C226, C227, C230, C231, C234
C2	25-233	1	22 μ F electrolytic	C207

Other Capacitors

C3	29-5	1	1000 pF polystyrene	C216
C4	27-47	1	.1 μ F Mylar	C201
C5	27-2	1	1 μ F film	C215

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
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DIODES

D1	56-56	8	1N4149	D201, D204, D207, D208, D209, D210, D213, D214
D1	56-59	1	1N750A	D206
D1	56-67	2	VR10A	D205, D211

TRANSISTORS — INTEGRATED CIRCUITS (IC's)

NOTE: Transistors and integrated circuits are marked for identification in one of the following four ways:

1. Part number.
2. Type number. (On integrated circuits this refers only to the numbers and letters listed. Any additional letters or numbers on an IC are not significant.)
3. Part number and type number.
4. Part number with a type number other than the one listed.

E1	417-134	5	MPS6520 transistor	Q209, Q210, Q212, Q213, Q217
E2	417-154	1	2N2369 transistor	Q216
E1	417-235	2	2N4121 transistor	Q203, Q204
E1	417-801	4	MPSA20 transistor	Q202, Q205, Q206, Q211
E3	417-834	2	MPSU10 transistor	Q214, Q215
E4	417-902	3	5566 transistor	Q201, Q207, Q208
E5	443-6	1	7474 IC	U201
E5	443-22	1	74121 IC	U205
E5	443-23	1	74122 IC	U203
E5	443-44	1	7413 IC	U204
E5	443-625	1	74132 IC	U202



KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
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CONTROLS

F1	10-918	2	500 Ω control	R231, R247
F2	10-391	1	1000 Ω (1K) control	R236
F1	10-936	1	1000 Ω (1K) control	R257
F1	10-398	1	2000 Ω (2K) control	R251
F1	10-904	1	5000 Ω (5K) control	R211

HARDWARE

G1	250-52	2	4-40 \times 1/4" screw
G2	250-186	4	#4 \times 3/8" screw
G3	252-15	2	4-40 nut
G4	254-9	2	#4 lockwasher

MISCELLANEOUS

H1	434-230	3	8-pin IC socket	
H2	434-298	5	14-pin IC socket	
H3	475-16	2	Short ferrite bead	FB
H4	475-10	2	Long ferrite bead	FB

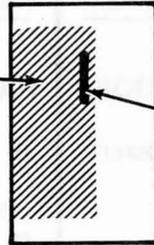
KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
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PARTS FROM FINAL PACK

J1	63-1315	1	Rotary switch with 5 k Ω and 10 k Ω controls	SW5-R10-R11
	85-2044-2	1	Horizontal circuit board	
J2	215-95	2	Heat sink	
	344-51	6'-8"	Brn wire	
	344-163	2'	Blk wire	
	344-165	1'	Red wire	
	344-166	1'	Org wire	
	344-167	1'	Yel wire	
	344-168	1'	Grn wire	
	344-56	2'	Blu wire	
	344-170	1'	Viol wire	
	344-58	2'	Gry wire	
	344-172	1'	Wht wire	
	344-173	1'	Wht-Blk wire	
	344-174	1'	Wht-Brn wire	
	344-175	1'	Wht-Red wire	
	344-176	1'	Wht-Org wire	
	344-177	1'	Wht-Yel wire	
	344-178	1'	Wht-Grn wire	
	344-179	1'	Wht-Blu wire	
	344-180	1'	Wht-Viol wire	
	344-181	1'	Wht-Gry wire	

STEP-BY-STEP ASSEMBLY

The steps performed in this Pictorial are in this area of the circuit board.



IDENTIFICATION DRAWING

PART NUMBER

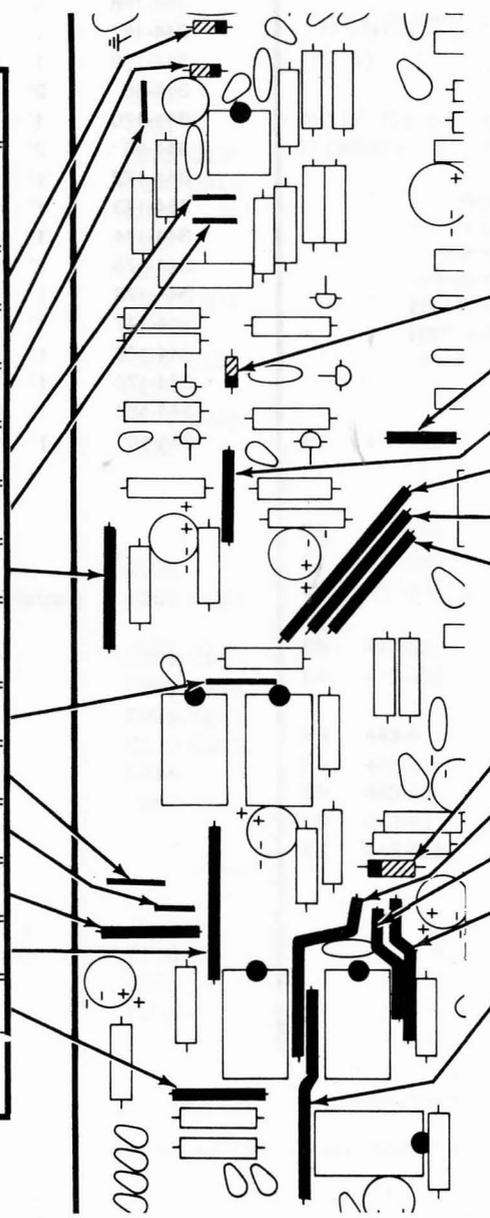
2035
2125

START

Position the circuit board printed side up as shown.

NOTE: When you install a diode, always match the band on the diode with the band on the circuit board.

- D201: 1N4149 diode (#56-56).
- D214: 1N4149 diode (#56-56).
- 1" bare wire.
- 1" bare wire.
- 1" bare wire.
- 1-3/8" Brn wire.
- 1-3/8" Brn wire.
- Solder the leads to the foil and cut off the excess lead lengths.
- 1" bare wire.
- 1" bare wire.
- 1" bare wire.
- 1-1/8" Brn wire.
- 1-5/8" Brn wire.
- 1-1/8" Brn wire.
- Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE

- D204: 1N4149 diode (#56-56).
- 1" Brn wire.
- 1-1/8" Brn wire.
- 1-3/4" Brn wire.
- 1-5/8" Brn wire.
- 1-3/8" Brn wire.
- Solder the leads to the foil and cut off the excess lead lengths.
- D206: 1N750 diode (#56-59).
- 1-7/8" Brn wire.
- 1-1/4" Brn wire.
- 1-1/2" Brn wire.
- 2" Brn wire.
- Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 2-1

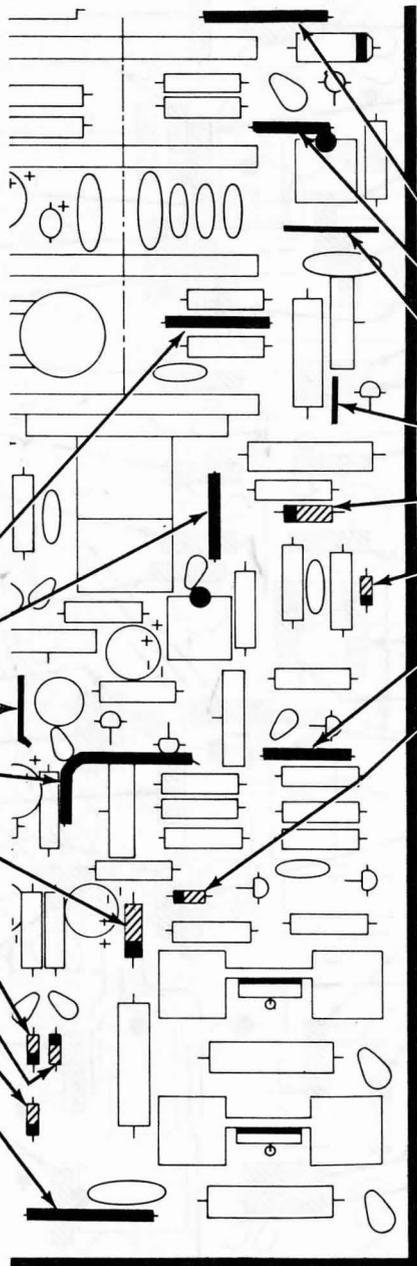


The steps performed in this Pictorial are in this area of the circuit board.



IDENTIFICATION DRAWING

PART NUMBER



START ↓

- (✓) 1-1/8" Brn wire.
- (✓) 1" Brn wire.
- (✓) 1" bare wire.
- (✓) 1-3/4" Brn wire.
- (✓) D211: VR10 diode (#56-67).
- (✓) D208: 1N4149 diode (#56-56).
- (✓) D207: 1N4149 diode (#56-56).
- (✓) D213: 1N4149 diode (#56-56).
- (✓) 1-3/8" Brn wire.
- (✓) Solder the leads to the foil and cut off the excess lead lengths.

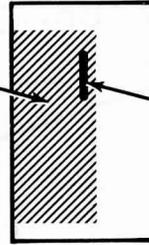
CONTINUE ↘

- (✓) 1-3/8" Brn wire.
- (✓) 1" Brn wire.
- (✓) 1-1/8" bare wire.
- (✓) 1" bare wire.
- (✓) D205: VR10 diode (#56-67).
- (✓) D209: 1N4149 diode (#56-56).
- (✓) 1-1/8" Brn wire.
- (✓) D210: 1N4149 diode (#56-56).
- (✓) Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 2-2

2730

The steps performed in this Pictorial are in this area of the circuit board.



IDENTIFICATION DRAWING

PART NUMBER

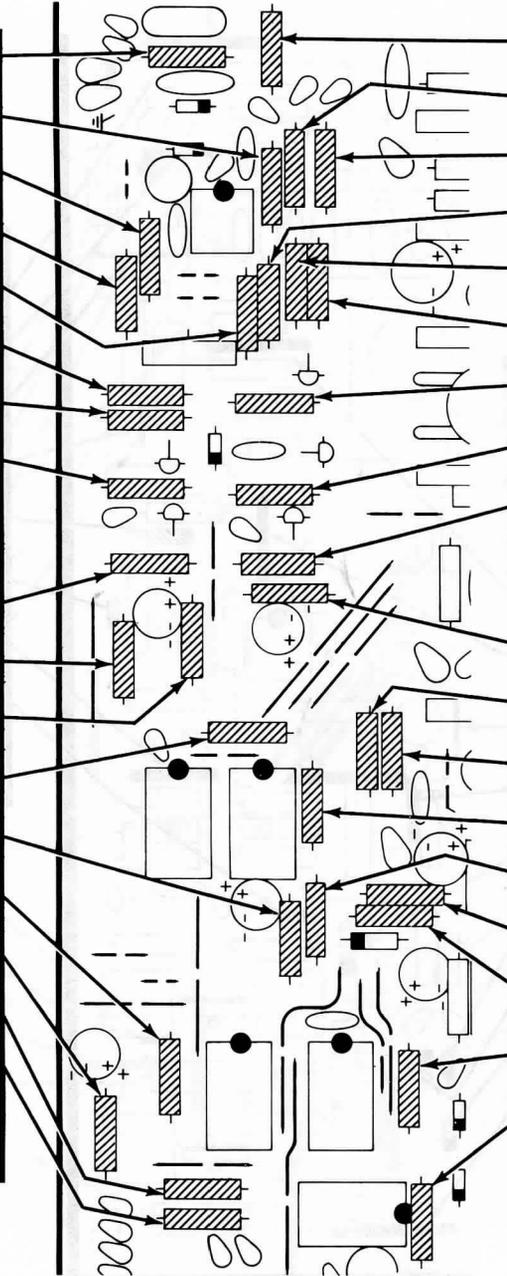
2340

START

- (✓) R201: 100 k Ω (Brn-Blk-Yel).
- (✓) R252: 100 k Ω (Brn-Blk-Yel).
- (✓) R207: 510 Ω (Grn-Brn-Brn).
- (✓) R208: 1800 Ω (Brn-Gry-Red).
- (✓) R206: 510 Ω (Grn-Brn-Brn).
- (✓) R212: 270 Ω (Red-Viol-Brn).
- (✓) R215: 47 Ω (Yel-Viol-Blk).
- (✓) R216: 1800 Ω (Brn-Gry-Red).
- (✓) Solder the leads to the foil and cut off the excess lead lengths.
- (✓) R219: 1000 Ω (Brn-Blk-Red).
- (✓) R241: 2.7 Ω (Red-Viol-Gold).
- (✓) R281: 2.7 Ω (Red-Viol-Gold).
- (✓) R229: 390 Ω (Org-Wht-Brn).
- (✓) R228: 330 Ω (Org-Org-Brn).
- (✓) R268: 1000 Ω (Brn-Blk-Red).
- (✓) R277: 2.7 Ω (Red-Viol-Gold).
- (✓) R278: 1000 Ω (Brn-Blk-Red).
- (✓) R227: 1000 Ω (Brn-Blk-Red).
- (✓) Solder the leads to the foil and cut off the excess lead lengths.

CONTINUE

- (✓) R280: 1 M Ω (Brn-Blk-Grn).
- (✓) R204: 1000 Ω (Brn-Blk-Red).
- (✓) R202: 1000 Ω (Brn-Blk-Red).
- (✓) R205: 1800 Ω (Brn-Gry-Red).
- (✓) R210: 15 k Ω (Brn-Grn-Org).
- (✓) R209: 330 Ω (Org-Org-Brn).
- (✓) R214: 47 Ω (Yel-Viol-Blk).
- (✓) R213: 1800 Ω (Brn-Gry-Red).
- (✓) R218: 1000 Ω (Brn-Blk-Red).
- (✓) Solder the leads to the foil and cut off the excess lead lengths.
- (✓) R217: 820 Ω (Gry-Red-Brn).
- (✓) R242: 910 k Ω (Wht-Brn-Yel).
- (✓) R244: 10 Ω (Brn-Blk-Blk).
- (✓) R237: 220 Ω (Red-Red-Brn).
- (✓) R238: 220 Ω (Red-Red-Brn).
- (✓) R276: 2.7 Ω (Red-Viol-Gold).
- (✓) R275: 2.7 Ω (Red-Viol-Gold).
- (✓) R222: 47 k Ω (Yel-Viol-Org).
- (✓) R220: 47 k Ω (Yel-Viol-Org).
- (✓) Solder the leads to the foil and cut off the excess lead lengths.

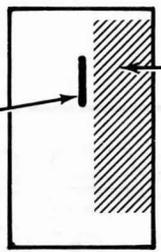


PICTORIAL 2-3

four 2.7J 5% 1/2W

IDENTIFICATION
DRAWING

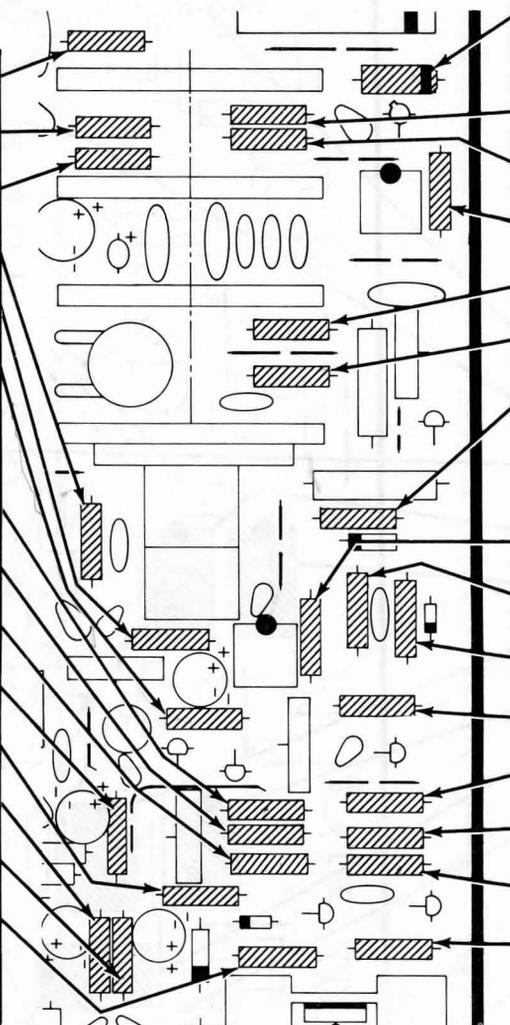
PART
NUMBER



The steps performed in this Pictorial are in this area of the circuit board.

START

- R221: 1000 Ω (Brn-Blk-Red).
- R223: 6.8 M Ω (Blu-Gry-Grn).
- R224: 680 k Ω (Blu-Gry-Yel).
- R243: 100 k Ω (Brn-Blk-Yel).
- R274: 100 k Ω (Brn-Blk-Yel).
- R254: 220 Ω (Red-Red-Brn).
- Solder the leads to the foil and cut off the excess lead lengths.
- R262: 1000 Ω (Brn-Blk-Red).
- R256: 10 k Ω (Brn-Blk-Org).
- R260: 220 Ω (Red-Red-Brn).
- R255: 270 Ω (Red-Viol-Brn).
- R282: 1000 Ω (Brn-Blk-Red).
- R250: 1800 Ω (Brn-Gry-Red).
- R248: 1500 Ω (Brn-Grn-Red).
- R270: 10 Ω (Brn-Blk-Blk).
- Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE

- C216: 1000 pF polystyrene. Match the band (colored end) on the capacitor with the band on the circuit board.
- R225: 68 k Ω (Blu-Gry-Org).
- R226: 6800 Ω (Blu-Gry-Red).
- R230: 220 Ω (Red-Red-Brn).
- R273: 1000 Ω (Brn-Blk-Red).
- R272: 2200 Ω (Red-Red-Red).
- R235: 560 Ω (Grn-Blu-Brn).
- Solder the leads to the foil and cut off the excess lead lengths.
- R246: 220 Ω (Red-Red-Brn).
- R240: 10 M Ω (Brn-Blk-Blu).
- R239: 100 k Ω (Brn-Blk-Yel).
- R253: 220 Ω (Red-Red-Brn).
- R245: 1000 Ω (Brn-Blk-Red).
- R258: 560 Ω (Grn-Blu-Brn).
- R259: 220 Ω (Red-Red-Brn).
- R269: 10 Ω (Brn-Blk-Blk).
- Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 2-4

START ↓

NOTE: When you install a part in this Pictorial, solder the pins of each part to the foil as each part is installed.

(✓) 8-pin IC socket at Q201.

(✓) 8-pin IC socket at Q207.

(✓) 8-pin IC socket at Q208.

(✓) 14-pin IC socket at U204.

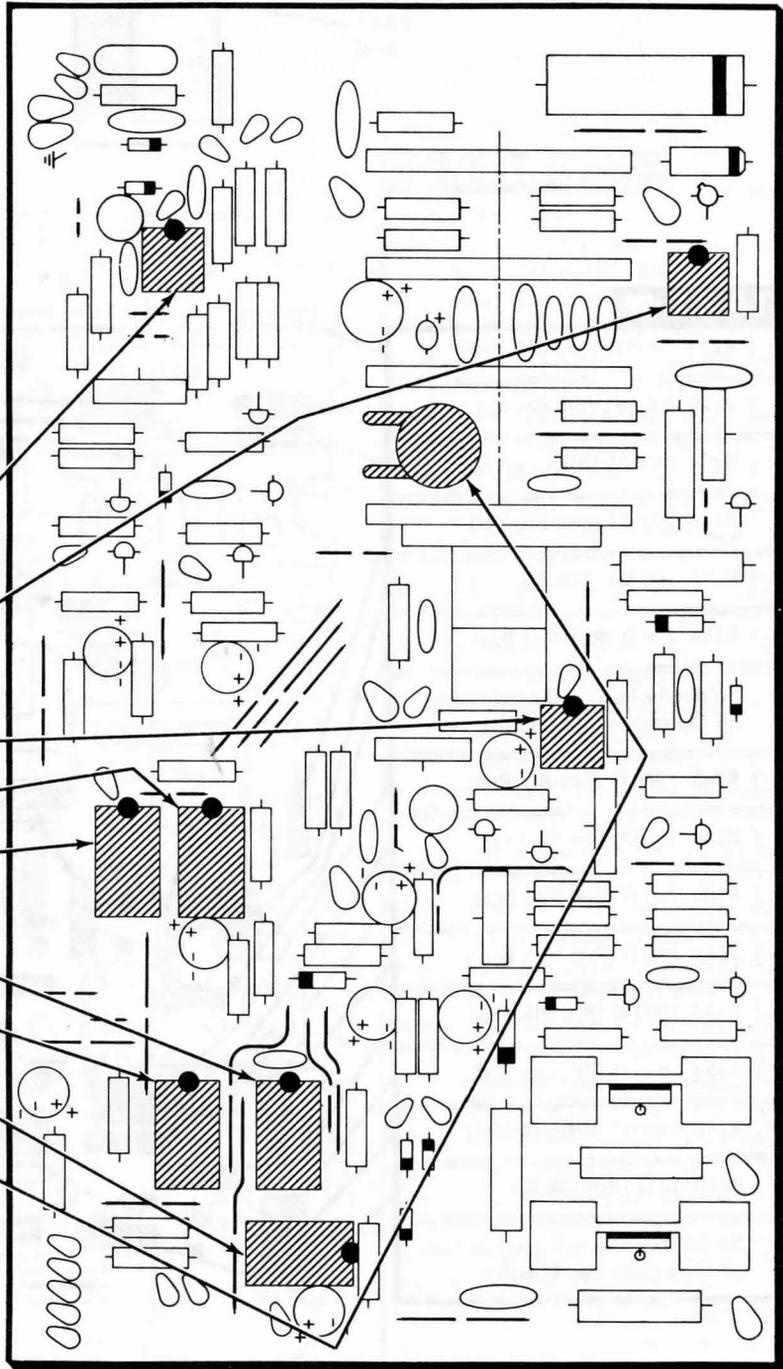
(✓) 14-pin IC socket at U202.

(✓) 14-pin IC socket at U205.

(✓) 14-pin IC socket at U201.

(✓) 14-pin IC socket at U203.

(✓) R236: 1000 Ω (1 k) control (#10-391).

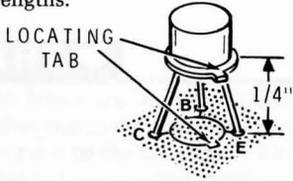


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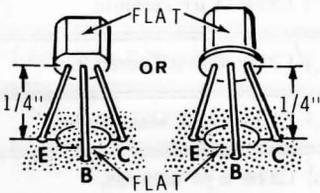
START

1755

✓ Q216: 2N2369 transistor (#417-154). Align the tab on the transistor with the tab outline on the circuit board. Insert the C, B, and E leads into the corresponding holes of the circuit board. Position the transistor 1/4" above the circuit board. Solder the leads to the foil and cut off the excess lead lengths.



NOTE: When you install a transistor, align its flat with the flat on the board. Insert the leads into their correct E, B, and C holes. Position the transistor 1/4" above the board. Then solder the leads to the foil and cut off the excess lead lengths.



✓ Q202: MPSA20 transistor (#417-801).

() Q204: 2N4121 transistor (#417-235).

✓ Q203: 2N4121 transistor (#417-235).

() Q206: MPSA20 transistor (#417-801).

✓ Q205: MPSA20 transistor (#417-801).

() Q217: MPS6520 transistor (#417-134).

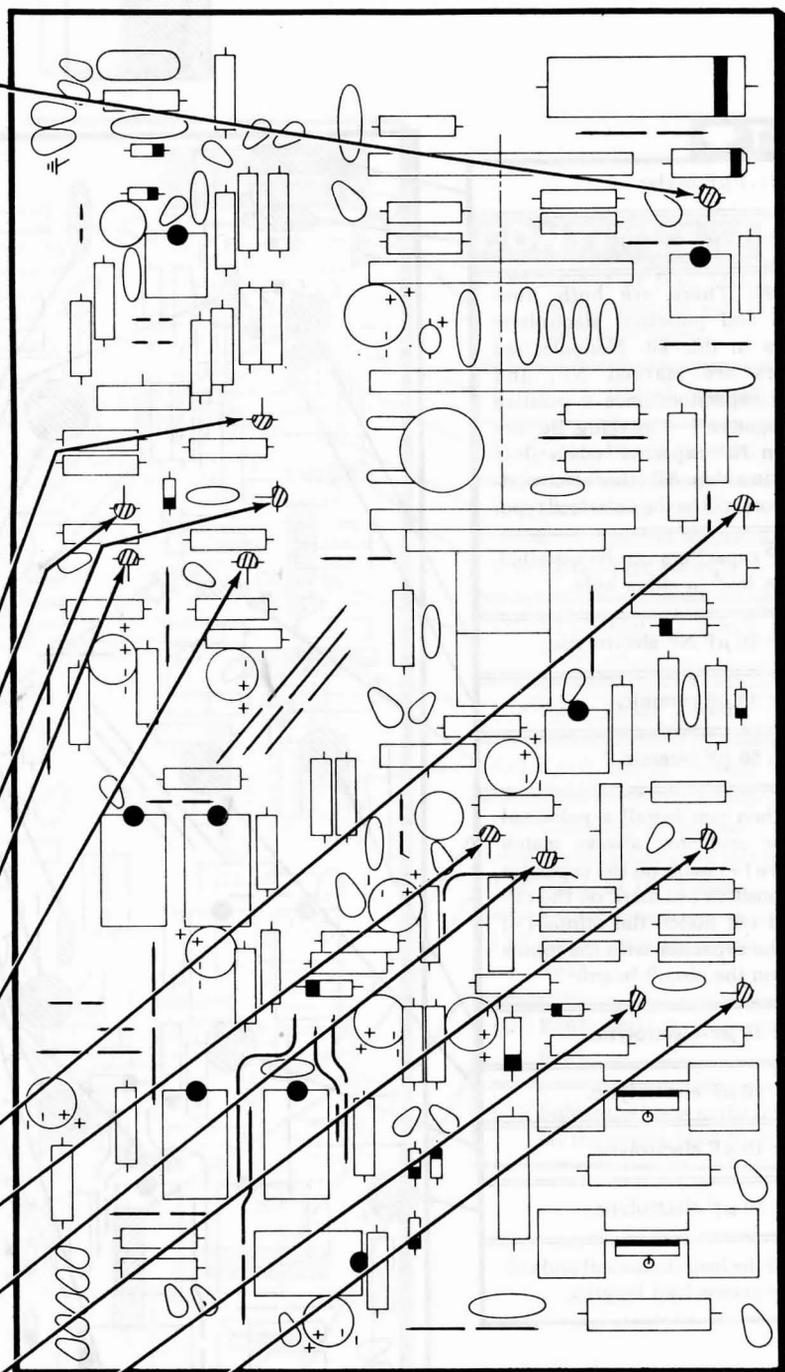
✓ Q211: MPSA20 transistor (#417-801).

() Q210: MPS6520 transistor (#417-134).

✓ Q209: MPS6520 transistor (#417-134).

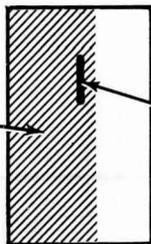
() Q213: MPS6520 transistor (#417-134).

() Q212: MPS6520 transistor (#417-134).



PICTORIAL 2-6

The steps performed in this Pictorial are in this area of the circuit board.



IDENTIFICATION DRAWING

PART NUMBER

START

C201: .1 μ F Mylar.

C202: .01 μ F ceramic.

CAUTION: There are both non-polarized and polarized electrolytic capacitors in this kit. Nonpolarized capacitors are marked NP, and polarized capacitors have a positive "+" or negative "-" marking. Be sure to use an NP capacitor when it is specified in a step. All other electrolytic capacitors will be the polarized type.

NOTE: NP capacitors can be installed with either lead in either hole.

C203: 10 μ F NP electrolytic.

C204: 33 pF ceramic.

C205: 56 pF ceramic.

NOTE: When you install a polarized electrolytic capacitor, always match the positive (+) mark on the capacitor with the positive (+) mark on the circuit board OR match the minus (-) mark on the capacitor with the minus (-) mark on the circuit board.

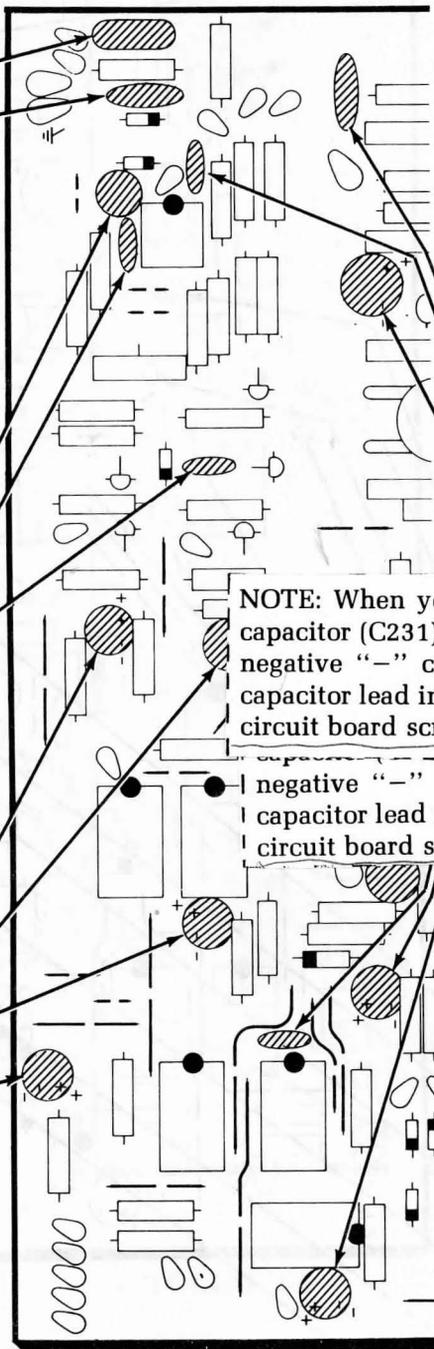
C225: 10 μ F electrolytic.

C234: 10 μ F electrolytic.

C217: 10 μ F electrolytic.

C227: 10 μ F electrolytic.

Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE

C228: .1 μ F ceramic.

C229: .002 μ F ceramic.

C207: 22 μ F electrolytic.

C219: 5 pF ceramic.

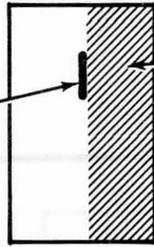
NOTE: When you install the following electrolytic capacitor (C231), insert the positive "+" lead in the negative "-" circuit board hole and the negative capacitor lead in the positive circuit board hole. The circuit board screen is incorrect.

negative "-" circuit board hole and the negative capacitor lead in the positive circuit board hole. The circuit board screen is incorrect.

185

IDENTIFICATION
DRAWING

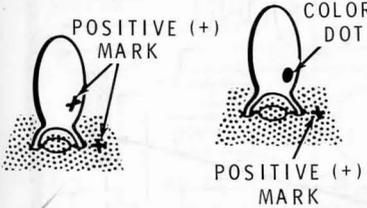
PART
NUMBER



The steps performed in this Pictorial are
in this area of the circuit board.

START ↓

NOTE: When you install a tantalum capacitor, match the positive (+) mark, or color dot on the capacitor with the positive (+) mark on the board.



() C208: 2.2 μ F tantalum.

(✓) C209: .1 μ F ceramic.

(✓) C210: .02 μ F ceramic.

(✓) C235: 47 pF ceramic.

(✓) C220: 47 pF ceramic.

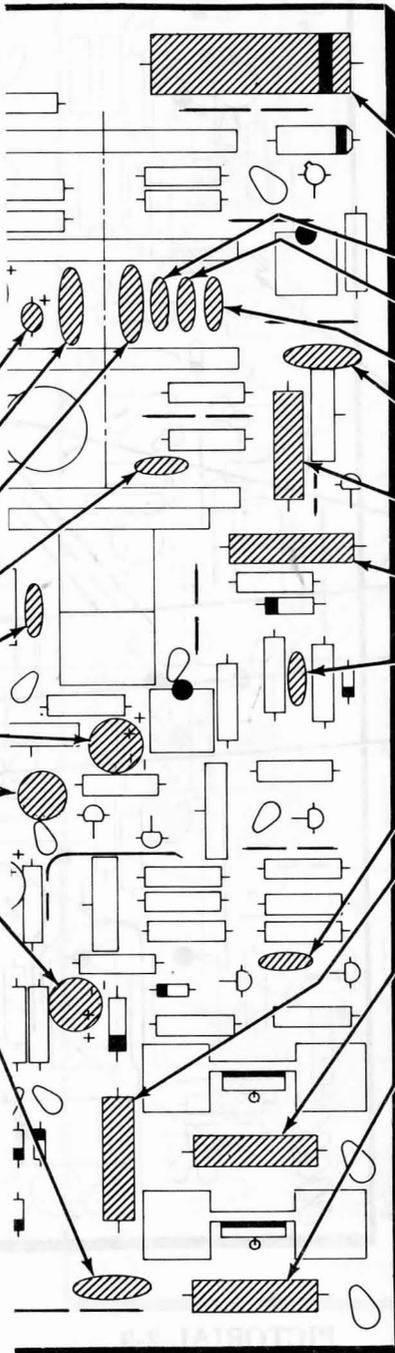
(✓) C226: 10 μ F electrolytic.

(✓) C221: 10 μ F NP electrolytic.

(✓) C223: 10 μ F electrolytic.

(✓) C224: .01 μ F ceramic.

() Solder the leads to the foil and cut off the excess lead lengths.



CONTINUE ↓

(✓) C215: 1 μ F film. Match the band on the capacitor with the band on the circuit board.

() C211: .002 μ F ceramic.

(✓) C212: 100 pF ceramic.

(✓) C213: 56 pF ceramic.

(✓) C232: .1 μ F ceramic.

(✓) R232: 680 Ω , 1-watt (Blu-Gry-Brn).

() R233: 22 k Ω , 2-watt.

(✓) C218: .002 μ F ceramic.

(✓) C222: 200 pF ceramic.

(✓) R264: 22 k Ω , 2-watt.

(✓) R215: 5600 Ω , 2-watt (Grn-Blu-Red).

(✓) R263: 5600 Ω , 2-watt (Grn-Blu-Red).

() Solder the leads to the foil and cut off the excess lead lengths.

PICTORIAL 2-8

START 

NOTE: Solder the pins to the foil as each part is installed.

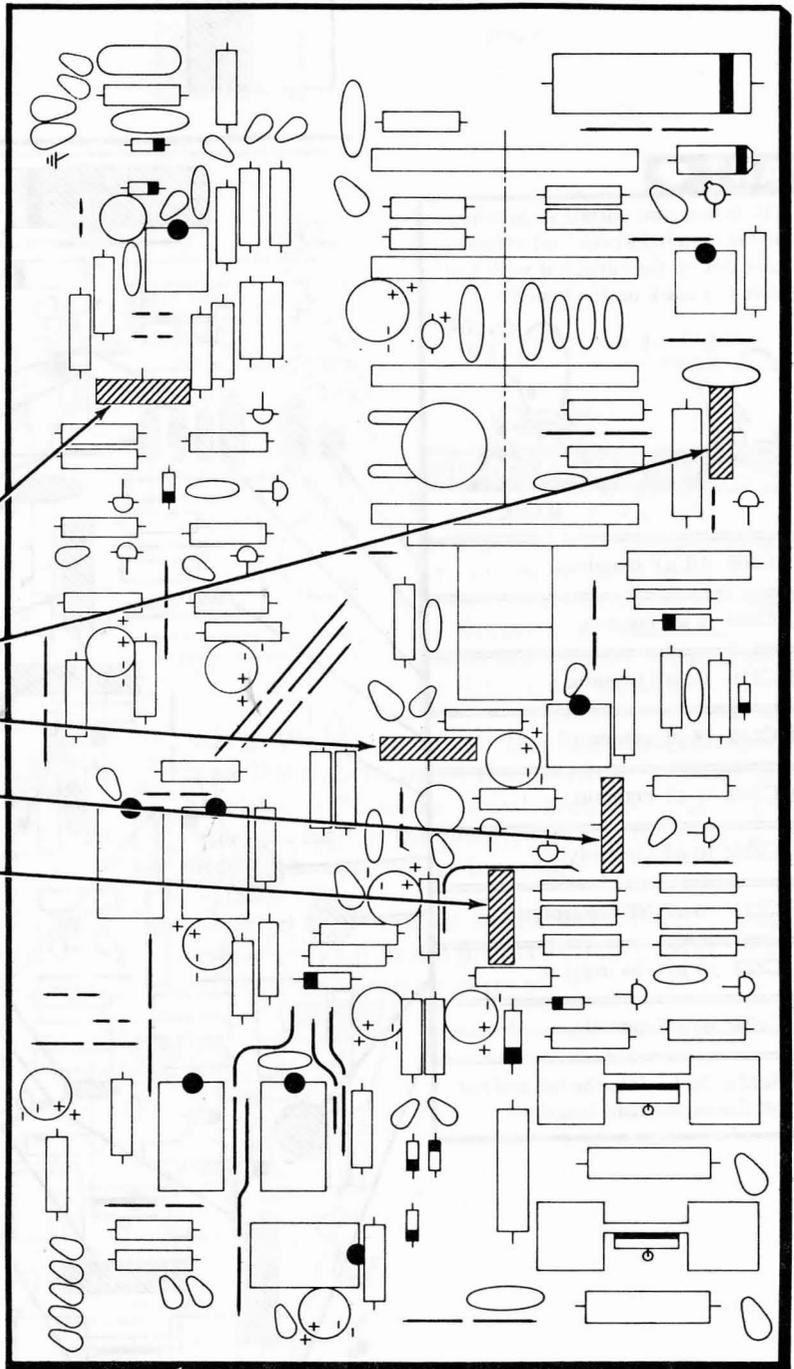
() R211: 5000 Ω (5 k) control (#10-904).

() R231: 500 Ω control (#10-918).

() R247: 500 Ω control (#10-918).

() R251: 2000 Ω (2 k) control (#10-398).

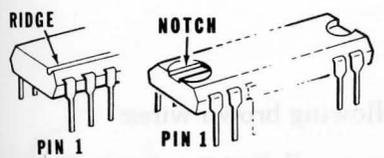
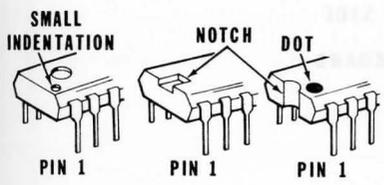
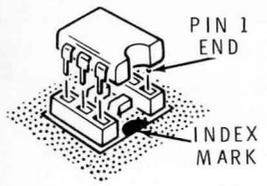
() R257: 1000 Ω (1 k) control (#10-936).



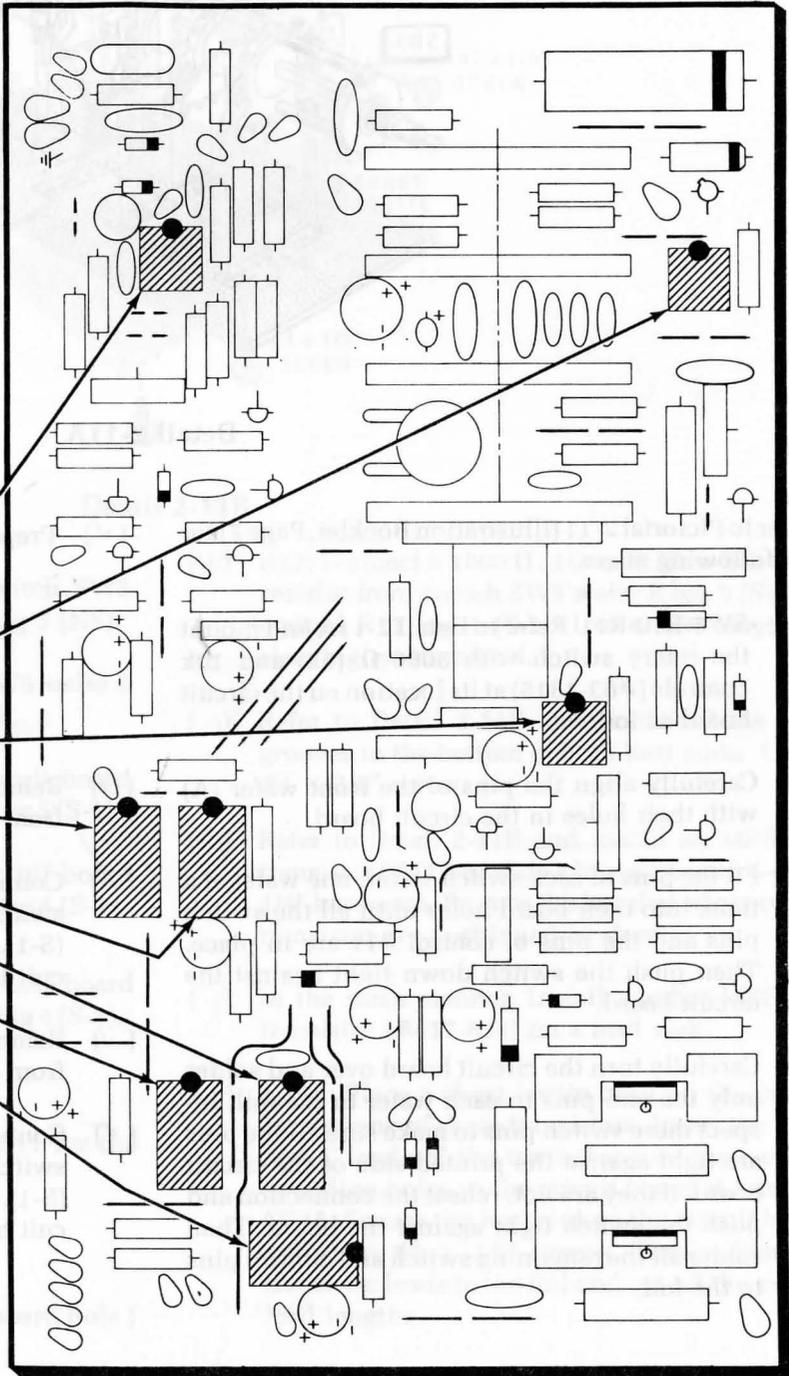
PICTORIAL 2-9

START ▼

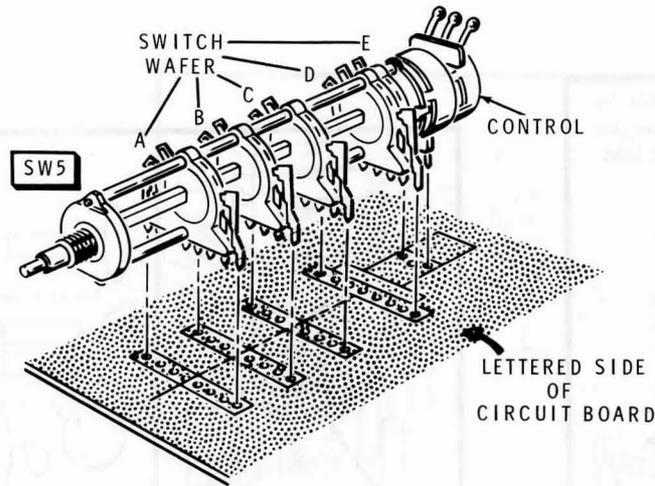
Align the pin 1 end of the IC with the index mark on the circuit board as you install each integrated circuit or transistor.



- (✓) Q201: 5566 transistor (#417-902).
- (✓) Q207: 5566 transistor (#417-902).
- (✓) Q208: 5566 transistor (#417-902).
- (✓) U202: 74132 IC (#443-625).
- (✓) U204: 7413 IC (#443-44).
- (✓) U205: 74121 IC (#443-22).
- (✓) U201: 7474 IC (#443-6).
- (✓) U203: 74122 IC (#443-23).



PICTORIAL 2-10



Detail 2-11A

Refer to Pictorial 2-11 (Illustration Booklet, Page 7) for the following steps.

(✓) SW5-R10-R11: Refer to Detail 2-11A and mount the rotary switch with 5000 Ω (5k) and 10k controls (#63-1315) at its location on the circuit board as follows:

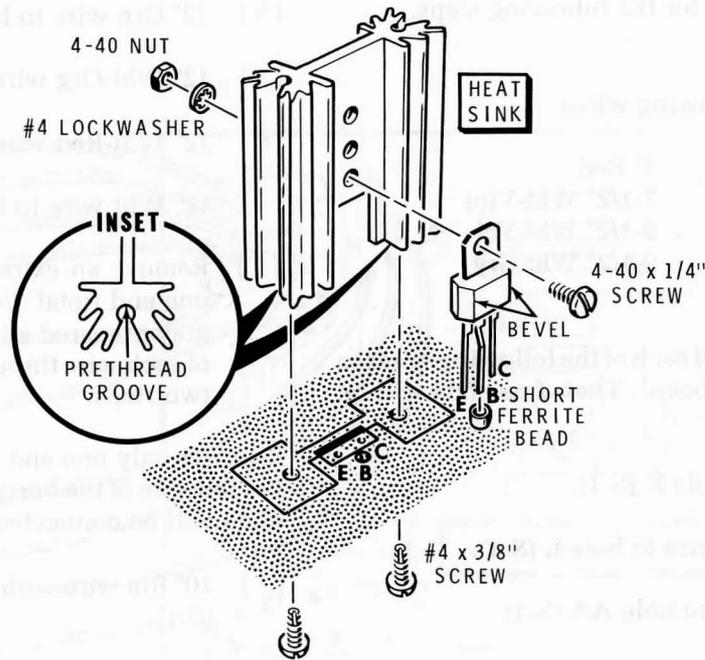
1. Carefully align the pins of the front wafer (A) with their holes in the circuit board.
2. Fit the pins of each switch wafer, one wafer at a time, into their board holes until all the switch pins and the pins of control R11 are in place. Then push the switch down tight against the circuit board.
3. Carefully turn the circuit board over and solder **only** the end pins in each wafer to the foil. Inspect these switch pins to make sure all the pins are tight against the printed side of the circuit board. If they are not, reheat the connection and push the switch tight against the board. Then solder all the remaining switch and control pins to the foil.

(✓) Prepare the following brown wires:

3-1/4"	3-1/4"
2"	3-1/4"
2-1/4"	4-1/4"
2"	

- (✓) Remove an extra 1/2" of insulation (total 3/4") from one end of a 3-1/4" Brn wire.
- (✓) Connect the longer bared end of this wire to switch SW5 wafer A through lug 5 (S-2) to lug 4 (S-1). Connect the other end of this wire in circuit board hole B9 (S-1).
- (✓) Remove an extra 1/2" of insulation (total 3/4") from one end of a 2" Brn wire.
- (✓) Connect the longer bared end of this wire to switch SW5 wafer B through lug 4 (S-2) to lug 5 (S-1). Connect the other end of this wire in circuit board hole A9 (S-1).





Detail 2-11B

- (✓) Connect a 2-1/4" Brn wire from switch SW5 wafer E lug 9 (S-1) to control R11 lug 3 (NS).
- (✓) Connect a 2" Brn wire from switch SW5 wafer E lug 8 (S-1) to control R11 lug 2 (NS).
- (✓) Connect a 3-1/4" Brn wire from circuit board hole D9 (S-1) to switch SW5 wafer D lug 5 (S-1).
- (✓) Connect a 3-1/4" Brn wire from circuit board hole M (S-1) to switch SW5 wafer E lug 4 (S-1).
- (✓) Connect a 4-1/4" Brn wire from circuit board hole D8 (S-1) to switch SW5 wafer D lug 4 (S-1).

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9015

Refer to the inset drawing on Pictorial 2-11 for the following steps.

- (✓) Prepare a 3" and a 2" Brn wire.
- (✓) Connect a 3" Brn wire from circuit board hole J (S-1) to control R11 lug 2 (S-2).
- (✓) Connect a 2" Brn wire from circuit board hole I (S-1) to control R11 lug 3 (S-2).

- (✓) R12: Connect a 1000 Ω , 1/2-watt (Brn-Blk-Red) resistor from switch SW5 wafer E lug 5 (S-1) to control R11 lug 1 (S-1). Use a 5/8" length of sleeving on each lead.
- (✓) Refer to Detail 2-11B and prethread the two grooves in the bottom of both heat sinks. Use a #4 \times 3/8" screw.
- (✓) Refer to Detail 2-11B and install an MPSU10 transistor (#417-834) on a heat sink with 4-40 \times 1/4" hardware. Be sure the beveled edges of the transistor are positioned as shown.
- (✓) In the same manner, install another MPSU10 transistor (#417-834) on a heat sink.
- (✓) Q215: Place a **short** ferrite bead on the center lead of one of these transistors. Insert the E, B, and C leads of the transistor into their corresponding holes in the circuit board at location Q215. Secure the heat sink to the circuit board with two #4 \times 3/8" screws. Then solder the transistor leads to the foil and cut off the excess lead lengths.
- (✓) Q214: In the same manner, install the other transistor and a **short** ferrite bead at location Q214 on the circuit board.

Refer to Pictorial 2-12 for the following steps.

() Prepare the following wires:

- | | |
|----------------|-----------------|
| 8" Org | 8" Red |
| 6-1/2" Wht-Blk | 7-1/2" Wht-Viol |
| 6-1/2" Viol | 9-1/2" Wht-Yel |
| 6-1/2" Wht-Blu | 9-1/2" Wht-Gry |
| 4-1/2" Blk | |

Connect only one end of each of the following wires to the horizontal circuit board. Their free ends will be connected later.

- (✓) 8" Org wire to hole K (S-1).
- (✓) 6-1/2" Wht-Blk wire to hole L (S-1).
- (✓) 6-1/2" Viol wire to hole AA (S-1).
- (✓) 6-1/2" Wht-Blu wire to hole BB (S-1).
- (✓) 4-1/2" Blk wire to hole (\pm) ground (S-1).
- (✓) 8" Red wire to hole B (S-1).
- (✓) 7-1/2" Wht-Viol wire to hole N (S-1).
- (✓) 9-1/2" Wht-Yel wire to hole C (S-1).
- (✓) 9-1/2" Wht-Gry wire to hole A (S-1).

() Prepare the following wires:

- | | |
|------------|-------------|
| 7" Wht-Brn | 12" Wht-Org |
| 8" Wht-Grn | 12" Wht-Red |
| 9" Brn | 12" Wht |
| 8-1/2" Yel | 10" Blu |
| 12" Grn | 9-1/2" Gry |

Connect only one end of each of the following wires to the horizontal circuit board. Their free ends will be connected later.

- (✓) 8" Wht-Grn wire to hole P (S-1).
- (✓) 7" Wht-Brn wire to hole Q (S-1).
- (✓) 9" Brn wire to hole EXT (S-1).
- (✓) 8-1/2" Yel wire to hole R (S-1).

(✓) 12" Grn wire to hole E (S-1).

(✓) 12" Wht-Org wire to hole F (S-1).

(✓) 12" Wht-Red wire to hole D (S-1).

(✓) 12" Wht wire to hole G (S-1).

(✓) Remove an extra 1/2" of insulation from only one end (total 3/4") of the remaining blue and gray prepared wires. Pass the longer bared end of each wire through the ferrite bead in the next two steps.

Connect only one end of the two following wires to the foil side of the horizontal circuit board. Their free ends will be connected later.

- (✓) 10" Blu wire with a long ferrite bead to hole X2 (S-1).
- (✓) 9-1/2" Gry wire with a long ferrite bead to hole X1 (S-1).

CIRCUIT BOARD CHECKOUT

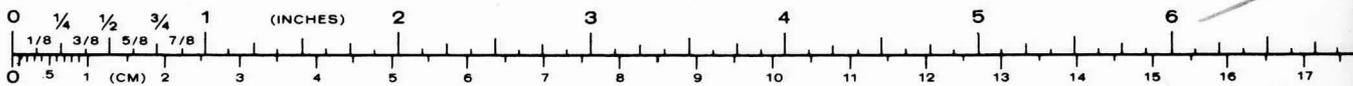
Carefully inspect the circuit board for the following conditions.

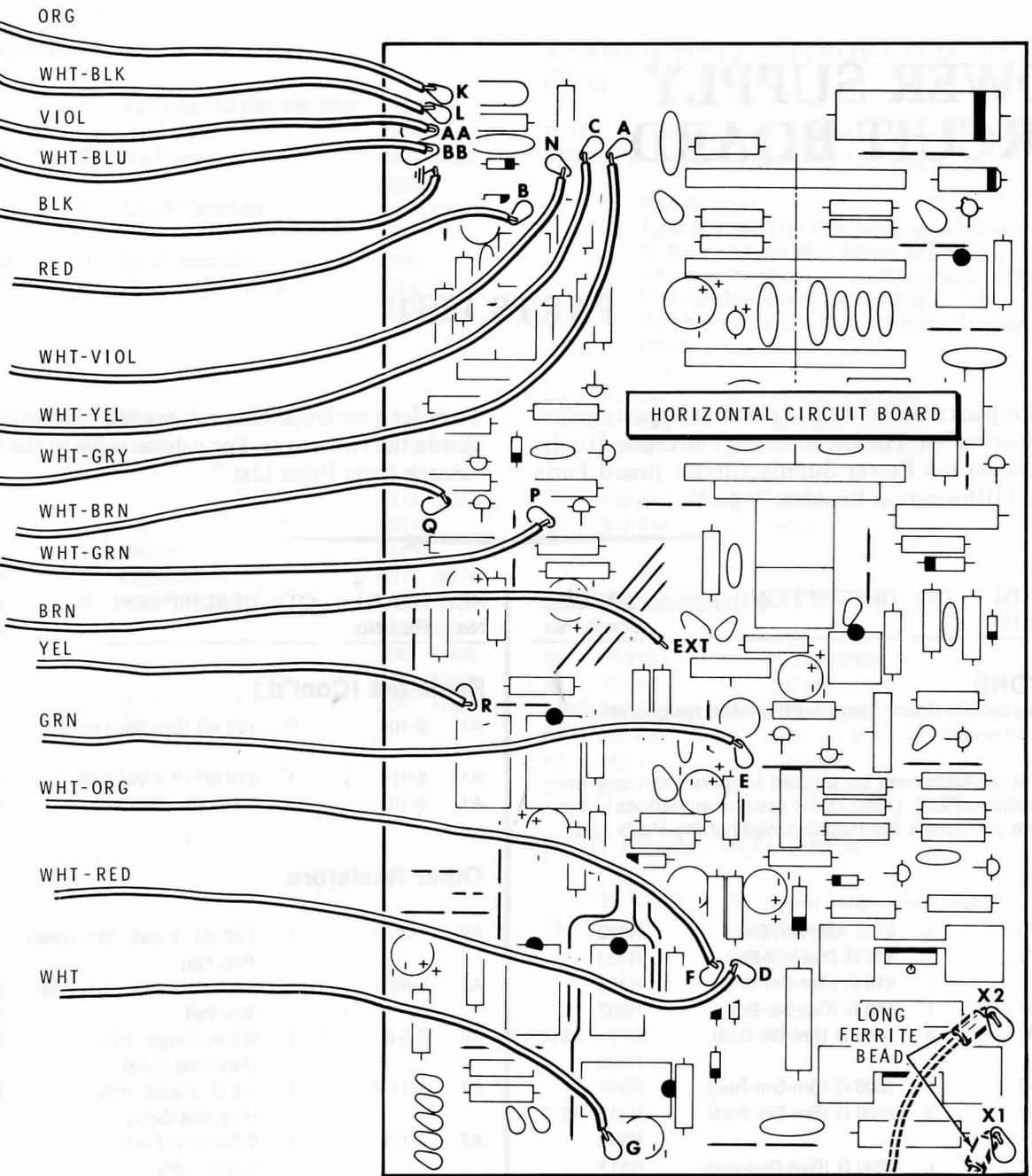
- () Unsoldered connections.
- () Poor solder connections.
- () Solder bridges between foil patterns.
- () Protruding leads which could touch together.
- () Transistors for the proper type and installation.
- () Electrolytic capacitors for the correct position of the positive (+) end.
- () Diodes for the proper type and the correct position of the banded end.
- () IC's for the proper type and installation.

There are a number of unused holes in the circuit board that will be used later. Set the circuit board aside temporarily.

Save the remaining parts for use later.

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PICTORIAL 2-12