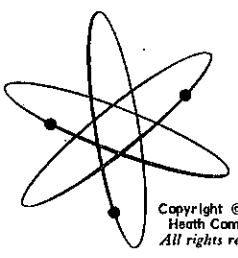
PRICE $2.00

HEATHKIT®
ASSEMBLY MANUAL



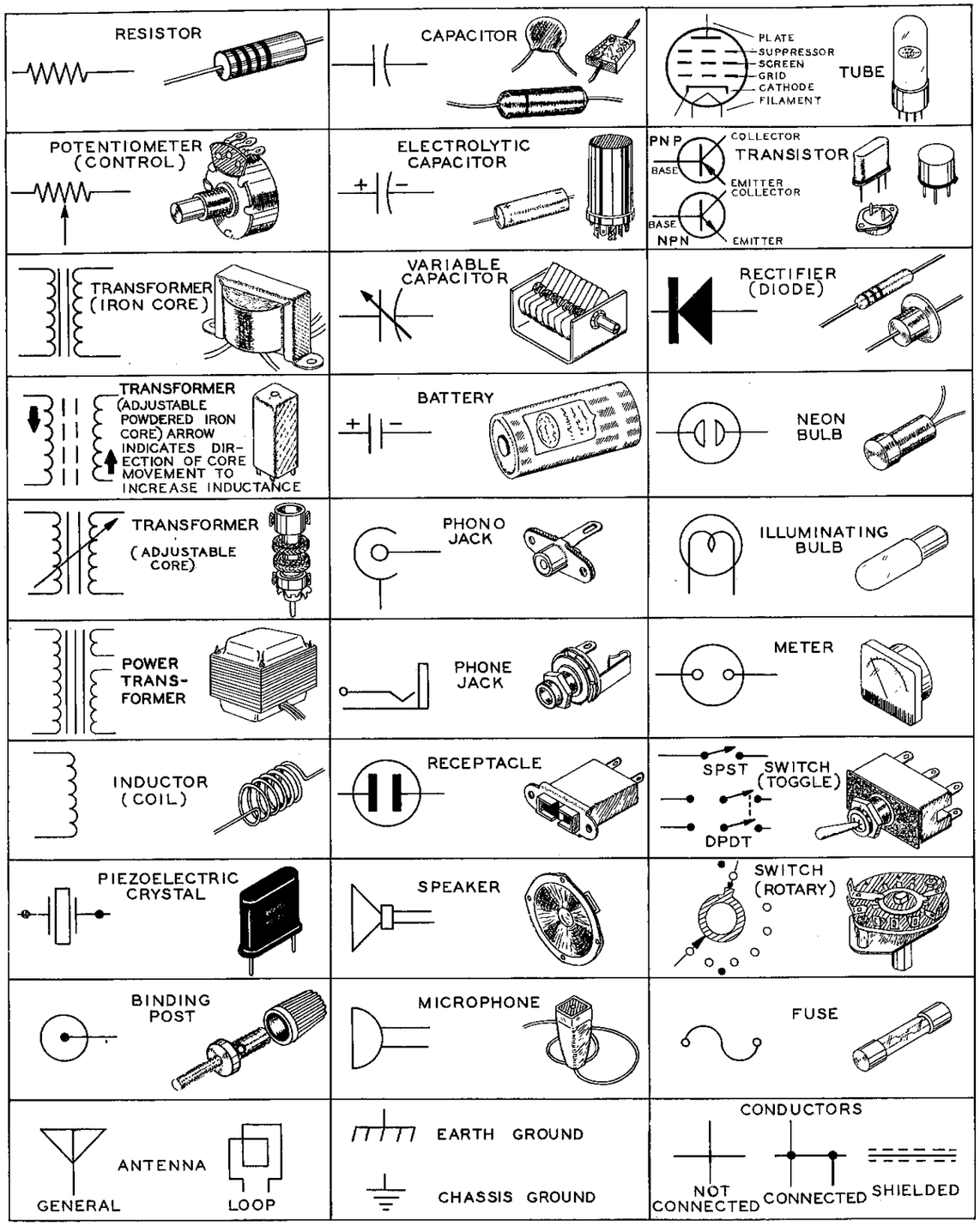
TUBE TESTER

MODEL TT-1A

595-553-01
8-29-69

TYPICAL COMPONENT TYPES

This chart is a guide to commonly used types of electronic components. The symbols and related illustrations should prove helpful in identifying most parts and reading the schematic diagrams.

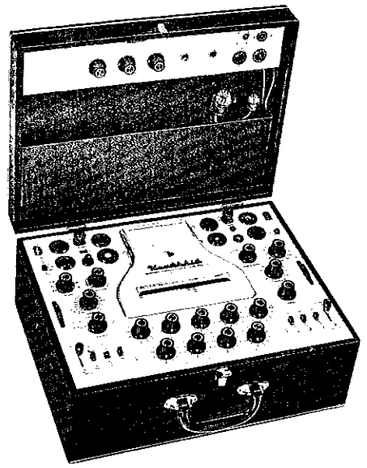


Assembly and Operation of the

HEATHKIT

TUBE TESTER

MODEL TT-1A



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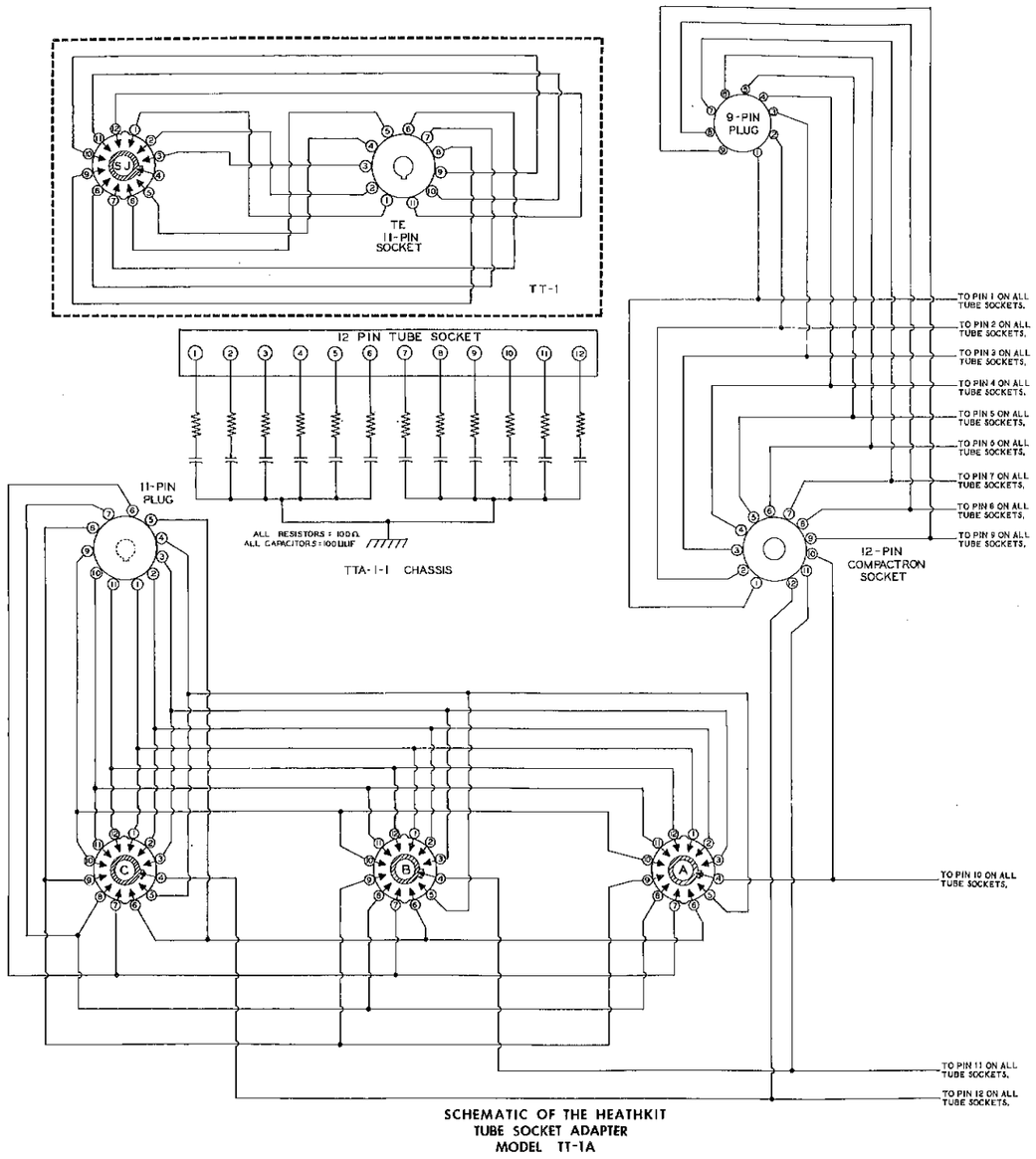
HEATH COMPANY
BENTON HARBOR, MICHIGAN 49022



SCHEMATIC OF THE HEATHKIT
TUBE SOCKET ADAPTER
MODEL TT-1A

INTRODUCTION

Your Model TT-1A Tube Tester consists of the TT-1 Tube Tester, plus a Tube Socket Adapter that will enable you to test a greater variety of new tubes than was possible with the TT-1 Tube Tester alone.

To accommodate using the Tube Socket Adapter, it is necessary to make minor changes to the existing circuitry of the Tube Tester. Necessary changes to the Tube Tester can be handled best by working them into the Step-By-Step Assembly instruction of the TT-1 manual before putting the Tube Tester together. To get the manual changes in proper sequence, we suggest that you mark the pages of the TT-1 Manual to indicate that a change is required on the marked page. Then, when a change is needed during assembly of the Tube Tester, you can refer back to this manual for the new assembly steps and changes.

The parts which make up the Tube Tester and the Tube Socket Adapter are all packed together. However, the Adapter should be wired after the Tube Tester is completed. Therefore, the parts for each unit should be kept separate, according to the Parts Lists in the TT-1 Operational Manual and in this, the TT-1A Manual.

The proper sequence of "What To Do To Get Your TT-1A Tube Tester Together And Operating" is provided in this manual. Use this manual as a guide to coordinate the instructions in the other two manuals, TT-1, furnished with this kit.

CHECKING PARTS

Please mark the following changes in the Parts List of the TT-1 Operation Manual.

Page 18 -

Add:	134-43	1	11-conductor cable assembly
Delete:	434-1	1	Blank socket
Add:	434-118	1	11-pin socket
Delete:	91-50	1	Cabinet
Add:	91-104	1	Cabinet

After making the preceding changes in the TT-1 Parts List, check the Tube Tester parts. Then check the remaining parts, using the following Parts List. These parts will be used to assemble the Tube Socket Adapter after the Tube Tester is assembled. Set these parts aside until they are called for later.

TUBE SOCKET ADAPTER PARTS LIST

PART No.	PARTS Per Kit	DESCRIPTION
Wire-Cable-Sleeving		
347-5	1	11-conductor cable
347-25	1	9-conductor cable
344-50	1	Black hookup wire
344-51	1	Brown hookup wire
344-52	1	Red hookup wire
344-53	1	Orange hookup wire
344-54	1	Yellow hookup wire
344-55	1	Green hookup wire
344-56	1	Blue hookup wire
344-57	1	Violet hookup wire
344-58	1	Gray hookup wire
344-59	1	White hookup wire
346-1	1	Length sleeving
Hardware		
250-8	3	#6 x 3/8" sheet metal screw
250-170	3	#6 x 1/4" sheet metal screw
250-49	6	3-48 x 1/4" screw
250-56	4	6-32 x 1/4" screw
252-1	6	3-48 nut
252-3	4	6-32 nut
252-7	3	Control nut
253-10	3	Control flat washer
254-7	6	#3 lockwasher
254-1	3	#6 lockwasher
254-5	3	Control lockwasher
259-1	1	#6 solder lug

PART No.	PARTS Per Kit	DESCRIPTION
Sockets		
434-118	1 ✓	11-pin
434-119	1 ✓	5-pin Nuvistor
434-139	1 ✓	7-pin Nuvistor
434-120	1 ✓	9-pin Novar
434-121	1 ✓	12-pin Compactron
434-122	1 ✓	10-pin miniature
Plugs		
432-19	1	9-pin
438-29	1 ✓	11-pin

PART No.	PARTS Per Kit	DESCRIPTION
Miscellaneous		
63-217	3 ✓	Rotary switch
73-1	2	Rubber grommet
84-18	2 ✓	P.E.C. (Packaged Electronic Circuit)
440-1	1	11-pin plug cap
440-4	1	9-pin plug cap
462-67	3	Knob
485-2	2	Plug button
203-295-1	1	Panel
391-34	1	Blue and white label
	1	Manual (See front cover for part number.)
		Solder

ROSIN CORE SOLDER HAS BEEN SUPPLIED WITH THIS KIT. THIS TYPE OF SOLDER MUST BE USED FOR ALL SOLDERING IN THIS KIT. ALL GUARANTEES ARE VOIDED AND WE WILL NOT REPAIR OR SERVICE EQUIPMENT IN WHICH ACID CORE SOLDER OR PASTE FLUXES HAVE BEEN USED. IF ADDITIONAL SOLDER IS NEEDED, BE SURE TO PURCHASE ROSIN CORE (60:40 or 50:50 TIN-LEAD CONTENT) RADIO TYPE SOLDER.

TT-1 ASSEMBLY CHANGES

Please make the following changes in the Step-By-Step Assembly instructions of the TT-1 Assembly Manual.

Page 8 - Change the last step in the left-hand column to read:

( ) 11-pin socket at TE.

Pages 16, 18, 19, and 20 - Change the soldering instructions in all steps that refer to switch SJ to (NS). This includes terminals 1 through 3 and 5 through 12.

Page 28 - After completing all of the steps on Page 28 of the TT-1 Assembly Manual, perform all of the following steps. This additional information concerns installing the 11-pin socket wiring harness so the Tube Socket Adapter can be added later.

Refer to Pictorial 1 (of this manual) for the following steps.

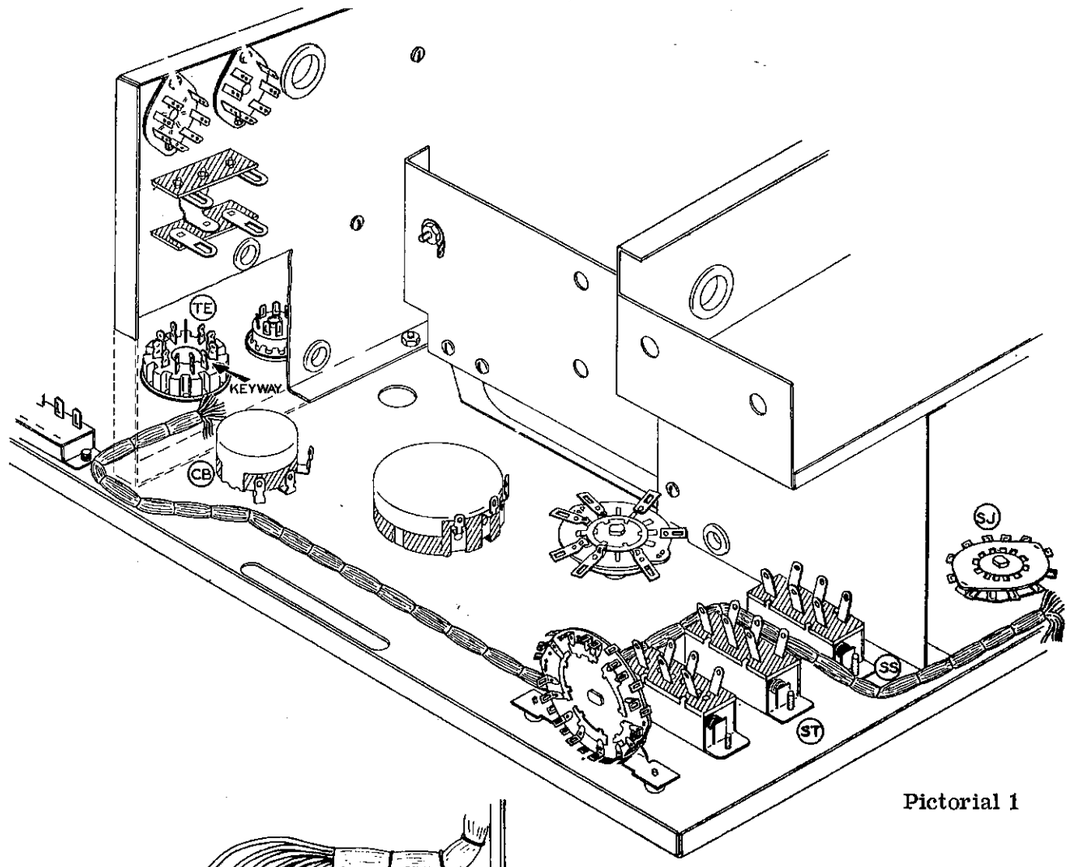
( ) Position the cable harness (#134-43) as shown. The end with the long gray and white wires should be at switch SJ. Work the harness into place carefully to avoid cutting the harness wire insulation on the sharp chassis edges.

Refer to Detail 1A and connect the socket end of the wiring harness to socket TE as follows:

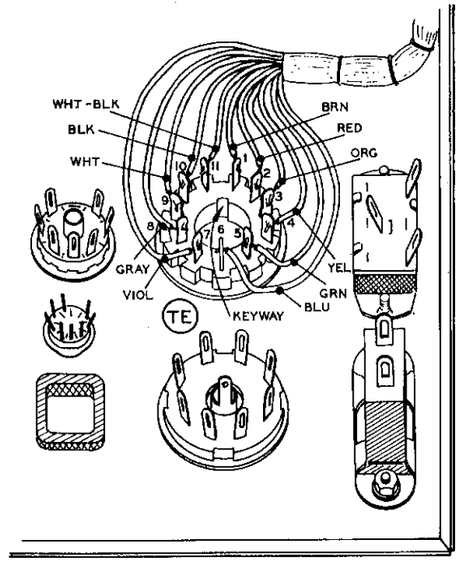
	COLOR	LUG
( )	Brown	1 (S-1)
( )	Red	2 (S-1)
( )	Orange	3 (S-1)
( )	Yellow	4 (S-1)
( )	Green	5 (S-1)
( )	White-black	11 (S-1)
( )	Black	10 (S-1)
( )	White	9 (S-1)
( )	Gray	8 (S-1)
( )	Violet	7 (S-1)
( )	Blue	6 (S-1)

( ) Position the wires of the harness down against the panel.

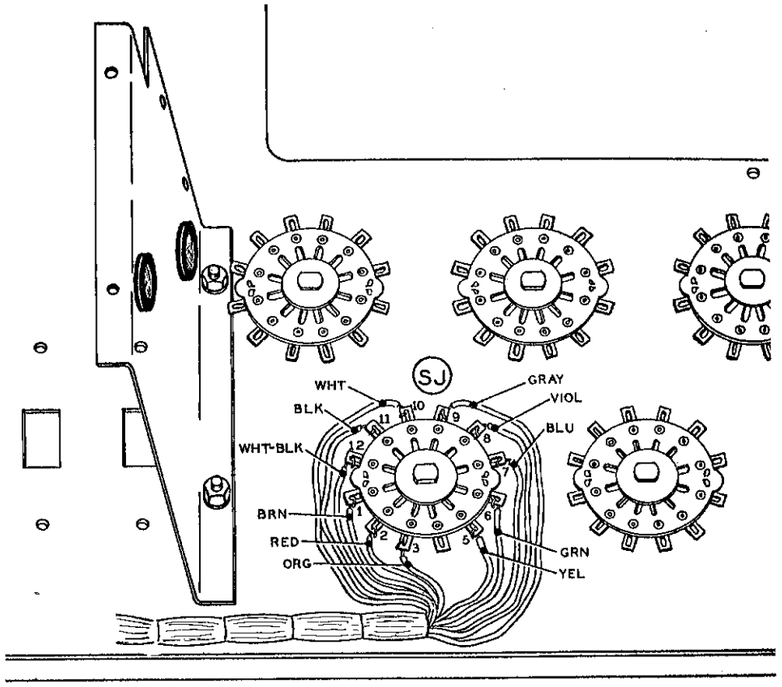
( ) Position the wires of adjacent sockets down against the panel.



Pictorial 1



Detail 1A



Detail 1B

Refer to Detail 1B and connect the wires at the other end of the harness to switch SJ as follows:

COLOR	LUG
( ) Brown	1 (S-2)
( ) Red	2 (S-2)
( ) Orange	3 (S-2)
( ) Yellow	5 (S-2)
( ) Green	6 (S-2)
( ) Blue	7 (S-2)
( ) Violet	8 (S-2)
( ) Gray	9 (S-2)
( ) White	10 (S-2)
( ) Black	11 (S-2)
( ) White-black	12 (S-2)

( ) Position the wires down against the panel.

( ) Repeat the continuity test, described under Figure 8 on Page 13 of the TT-1 Assembly Manual, on socket TE. Be sure the switch rotors are in the long (common) clip (#4) during this testing procedure.

( ) In a like manner, test selector switch SJ by the following instructions 1 and 2 at the bottom of Page 20 of the TT-1 Assembly Manual.

Page 61 - Change the first step in the left-hand column to read:

( ) Prepare one tube cap with an 18" lead as shown in Figure 77: and prepare the other tube cap with a 24" lead.

Change the second step in the left-hand column to read:

( ) Pass the 18" tube cap lead through the square panel grommet as shown and connect it to H1 (S-2).

Change the third step in the left-hand column to read:

( ) Pass the 24" tube cap lead through the other square panel hole and connect it to J1 (S-2).

This completes changes in the Step-By-Step Assembly section of the TT-1 Assembly Manual.

After the TT-1 Tube Tester has been completed and tested, refer back to this manual to assemble and install the Tube Socket Adapter, according to the following steps. Use the Adapter Parts that you separated when checking the Parts Lists.

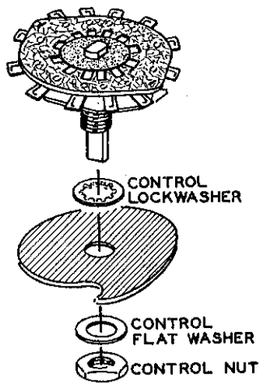
ADAPTER ASSEMBLY

PARTS MOUNTING

Refer to Pictorial 2 for the following steps.

( ) Position the Adapter panel as shown.

( ) Refer to Detail 2A and mount a Selector switch at A on the panel. Use a control lockwasher, a control flat washer, and a control nut. Position the long clip of the switch toward the flange as shown by the large arrows.

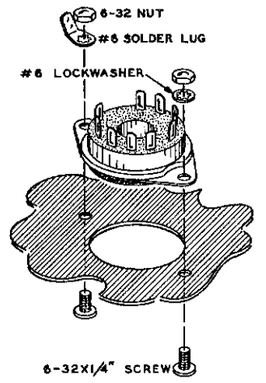


Detail 2A

( ) In a like manner, mount Selector switches at positions B and C.

( ) Install the knobs on the switch shafts. Be sure the knob screw is tightened against the flat of the shaft. Rotate the pointer of the knobs to "0" on the panel. Loosen control nut and adjust if necessary for proper knob alignment with the panel markings.

( ) Refer to Detail 2B and mount the 9-pin Novar tube socket at position F. Use a 6-32 x 1/4" screw, a #6 solder lug, and a 6-32 nut at the rear hole. Use a 6-32 x 1/4" screw, a #6 lockwasher, and a 6-32 nut at the other hole. Position the socket as shown.



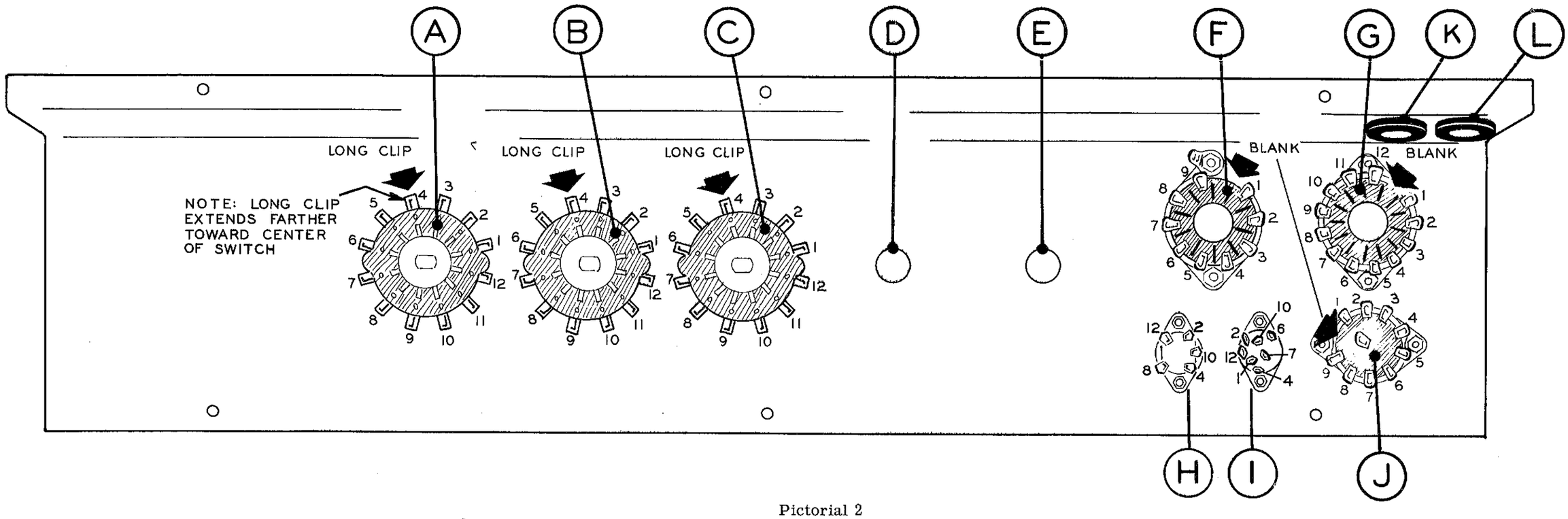
Detail 2B

( ) Mount the 12-pin Compactron socket at G. Use 6-32 x 1/4" screws, #6 lockwashers, and 6-32 nuts. Position as shown.

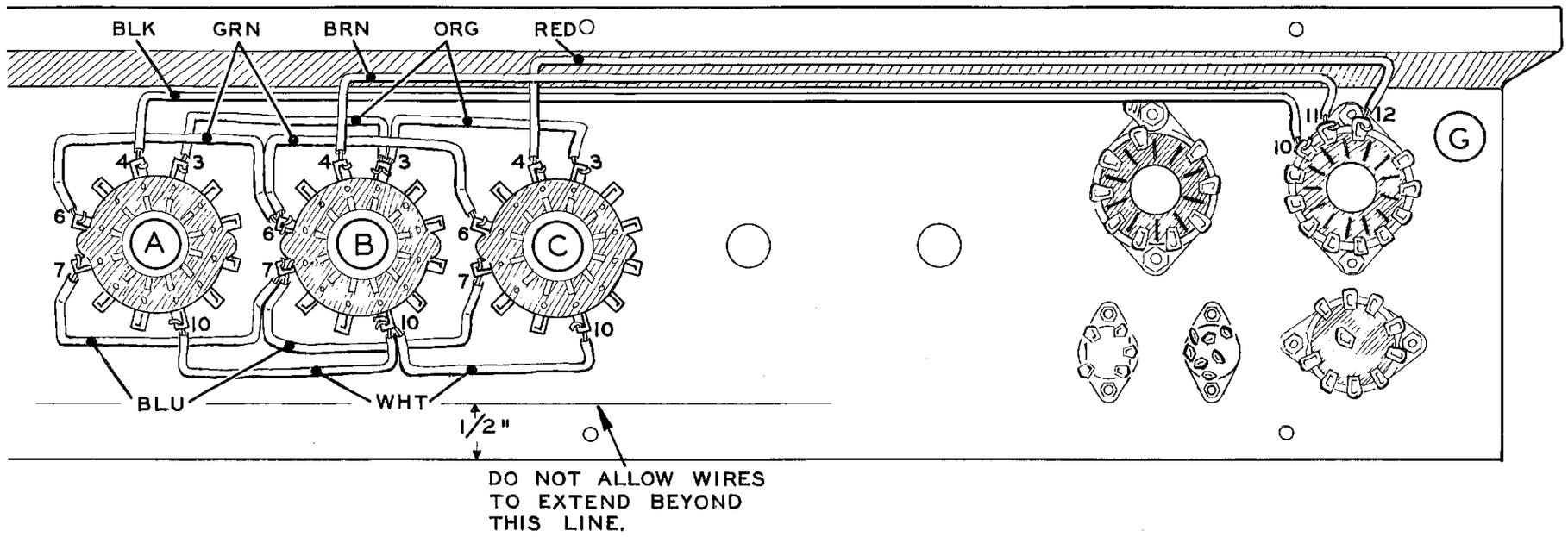
( ) Locate the 10-pin (9-pin with center pin) tube socket and mount it at J. Use 3-48 x 1/4" screws, #3 lockwashers, and 3-48 nuts. Position as shown.

( ) In a like manner and using the same variety of hardware, mount the 5-pin Nuvistor socket at H, and the 7-pin Nuvistor socket at I. Position as shown.

( ) Mount 3/8" rubber grommets at K and L.


A
B
C
D
E
F
G
K
L
H
I
J
LONG CLIP
LONG CLIP
LONG CLIP
NOTE: LONG CLIP EXTENDS FARTHER TOWARD CENTER OF SWITCH
BLANK
BLANK

Pictorial 2



Pictorial 2A

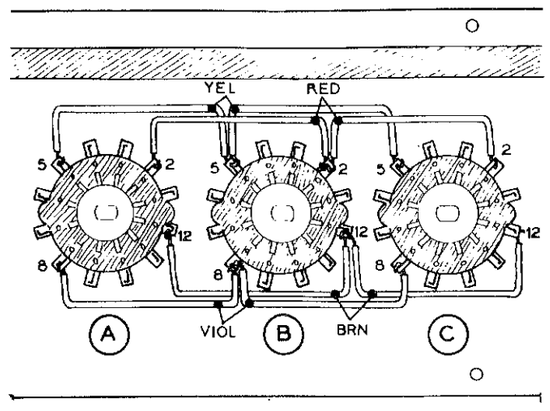
SWITCH WIRING

NOTE: Cut hookup wires to the specified lengths for each group of wiring steps and strip 1/4" of insulation from each end. Keep the wires in the sequence listed, then do the wiring.

Refer to Pictorial 2A for the following steps.

Connect wires as follows:

	COLOR	LENGTH	FROM	TO
( )	Green	3-3/4"	A6 (S-1)	B6 (NS)
( )	Green	3-3/4"	B6 (S-2)	C6 (NS)
( )	Orange	3-3/4"	A3 (S-1)	B3 (NS)
( )	Orange	3-3/4"	B3 (S-2)	C3 (NS)
( )	Blue	3-3/4"	A7 (S-1)	B7 (NS)
( )	Blue	3-3/4"	B7 (S-2)	C7 (NS)
( )	White	3-3/4"	A10 (S-1)	B10 (NS)
( )	White	3-3/4"	B10 (S-2)	C10 (NS)
( )	Black	12-1/2"	A4 (S-1)	G10 (NS)
( )	Brown	11"	B4 (S-1)	G11 (NS)
( )	Red	9-1/2"	C4 (S-1)	G12 (NS)

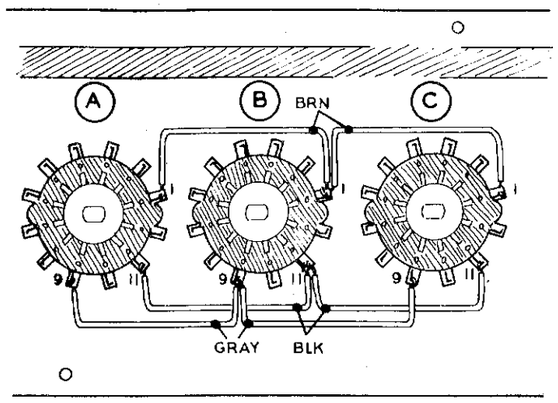


Pictorial 3

Refer to Pictorial 3 for the following steps.

Connect wires as follows:

	COLOR	LENGTH	FROM	TO
( )	Yellow	3-3/4"	A5 (S-1)	B5 (NS)
( )	Yellow	3-3/4"	B5 (S-2)	C5 (NS)
( )	Red	3-3/4"	A2 (S-1)	B2 (NS)
( )	Red	3-3/4"	B2 (S-2)	C2 (NS)
( )	Violet	3-3/4"	A8 (S-1)	B8 (NS)
( )	Violet	3-3/4"	B8 (S-2)	C8 (NS)
( )	Brown	3-3/4"	A12 (S-1)	B12 (NS)
( )	Brown	3-3/4"	B12 (S-2)	C12 (NS)



Pictorial 4

Refer to Pictorial 4 for the following steps.

Connect wires as follows:

	COLOR	LENGTH	FROM	TO
( )	Brown	3-3/4"	A1 (S-1)	B1 (NS)
( )	Brown	3-3/4"	B1 (S-2)	C1 (NS)
( )	Gray	3-3/4"	A9 (S-1)	B9 (NS)
( )	Gray	3-3/4"	B9 (S-2)	C9 (NS)
( )	Black	3-3/4"	A11 (S-1)	B11 (NS)
( )	Black	3-3/4"	B11 (S-2)	C11 (NS)

Wiring mistakes or short circuits in the Selector switch wiring will be much easier to locate and correct before proceeding further with the assembly. Any type of continuity tester or ohmmeter is suitable for this purpose. If no instrument of this nature is at hand, a simple continuity tester may be made up quickly from ordinary flashlight components.

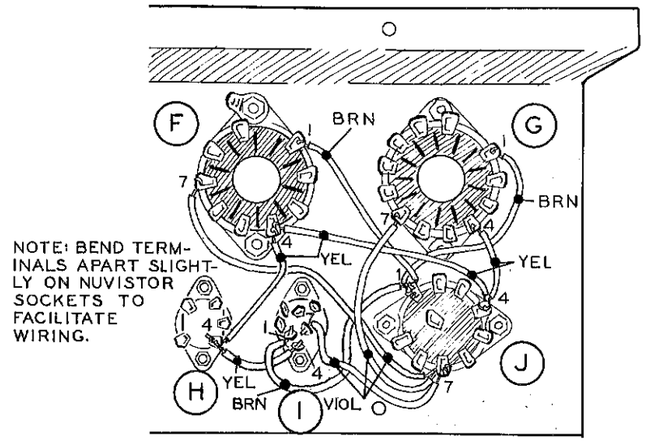
Be sure the switches are in the "0" position during this testing procedure.

The Selector switches are wired correctly if:

1. Continuity is shown between all terminals of the same number (except #4).

2. Continuity is NOT shown from the panel to any terminal, regardless of number.

3. Continuity is NOT shown between any differently numbered terminals.



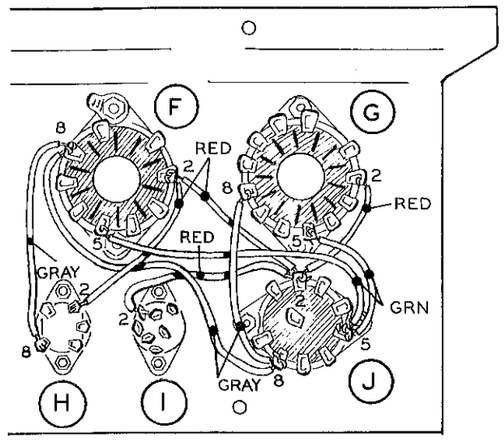
Pictorial 5

TUBE SOCKET WIRING

Connect wires as follows:

Refer to Pictorial 5 for the following steps.

	COLOR	LENGTH	FROM	TO
( )	Brown	3"	G1 (NS)	J1 (NS)
( )	Brown	2-1/2"	J1 (NS)	F1 (S-1)
( )	Brown	2-1/2"	J1 (S-3)	I 1 (S-1)
( )	Yellow	2"	G4 (NS)	J4 (NS)
( )	Yellow	3"	J4 (S-2)	F4 (NS)
( )	Yellow	2-1/4"	F4 (S-2)	H4 (NS)
( )	Yellow	2-1/4"	H4 (S-2)	I4 (S-1)
( )	Violet	2-3/4"	G7 (NS)	J7 (NS)
( )	Violet	3-3/4"	J7 (NS)	F7 (S-1)
( )	Violet	2"	J7 (S-3)	I7 (S-1)

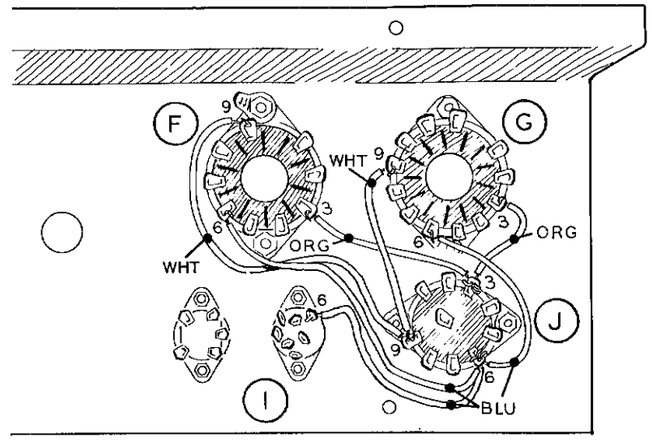


Pictorial 6

Refer to Pictorial 6 for the following steps.

Connect wires as follows:

	COLOR	LENGTH	FROM	TO
( )	Red	2-1/4"	G2 (NS)	J2 (NS)
( )	Red	2-1/2"	J2 (NS)	F2 (NS)
( )	Red	2-1/2"	J2 (S-3)	I2 (S-1)
( )	Red	2-1/2"	F2 (S-2)	H2 (S-1)
( )	Green	2"	G5 (NS)	J5 (NS)
( )	Green	3-1/2"	J5 (S-2)	F5 (S-1)
( )	Gray	2-1/2"	G8 (NS)	J8 (NS)
( )	Gray	4"	J8 (S-2)	F8 (NS)
( )	Gray	3-1/2"	F8 (S-2)	H8 (S-1)

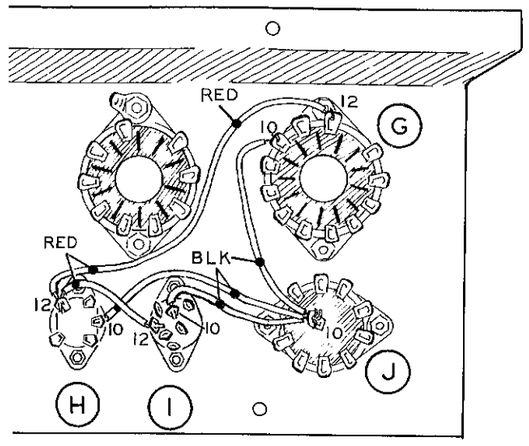


Pictorial 7

Refer to Pictorial 7 for the following steps:

Connect wires as follows:

	COLOR	LENGTH	FROM	TO
( )	Orange	2"	G3 (NS)	J3 (NS)
( )	Orange	2-1/4"	J3 (S-2)	F3 (S-1)
( )	Blue	3"	G6 (NS)	J6 (NS)
( )	Blue	3-3/4"	J6 (NS)	F6 (S-1)
( )	Blue	2-1/2"	J6 (S-3)	I6 (S-1)
( )	White	2-1/2"	G9 (NS)	J9 (NS)
( )	White	4"	J9 (S-2)	F9 (S-1)



Pictorial 8

Refer to Pictorial 8 for the following steps.

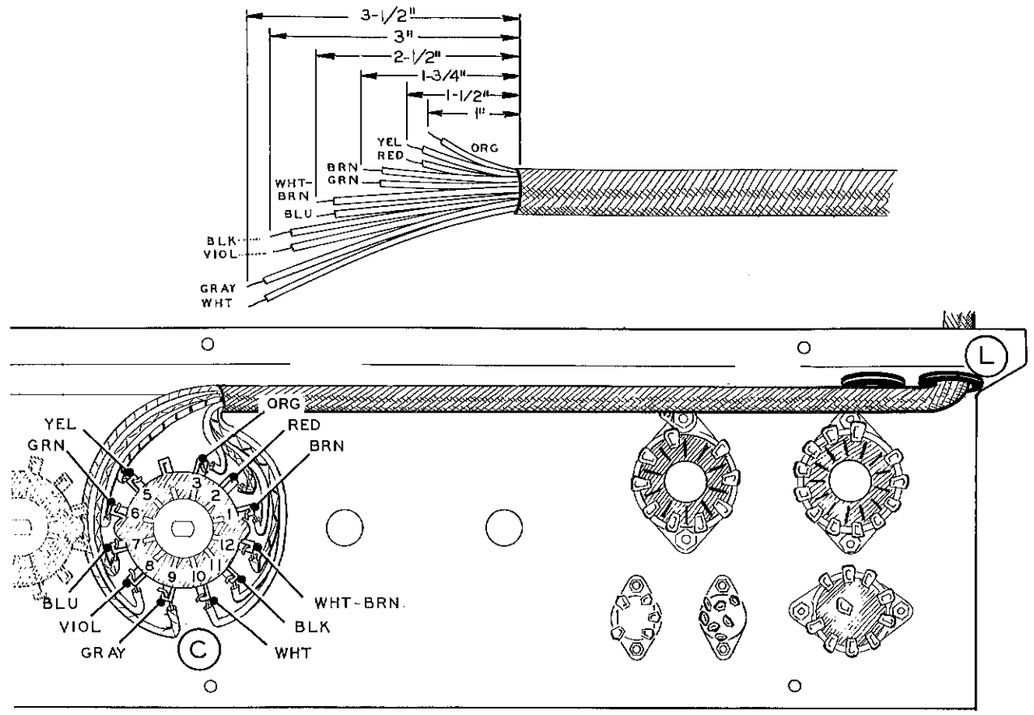
Connect wires as follows:

	COLOR	LENGTH	FROM	TO
( )	Black	3"	G10 (NS)	J10 (NS)
( )	Black	1-3/4"	J10 (NS)	I 10 (S-1)
( )	Black	2-1/2"	J10 (S-3)	H10 (S-1)
( )	Red	4-1/4"	G12 (NS)	H12 (NS)
( )	Red	2"	H12 (S-2)	I 12 (S-1)

The continuity and short circuit testing procedure outlined for the Selector switch wiring should be applied now to the tube sockets.

With all Selector switches in the "0" position the tube sockets are wired correctly if:

1. All socket pins show continuity between like numbers; that is, any #1 pin should show continuity to all other #1 pins, any #2 pin to all other #2 pins, etc.
2. There is no continuity from the panel to any pin, regardless of its number.
3. No continuity is shown between pins of different numbers; that is, the #1 pins should not be connected to any other number, the #2 pins should not be connected to any other number, etc.



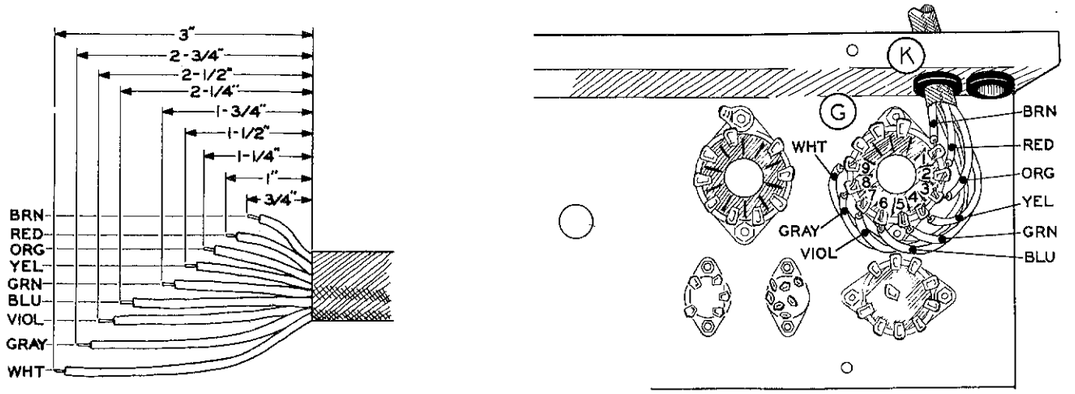
Pictorial 9

Refer to Pictorial 9 for the following steps.

(√) Locate the length of 11-conductor cable and prepare one end as shown. Strip each lead end 1/4", and tin. "Tin" means to melt a small amount of solder on the exposed lead end.

( ) Install the 11-conductor cable through grommet L as shown and connect the wires of the 11-conductor cable to Selector switch C as follows:

	COLOR	LUG
( )	Brown	1 (S-2)
( )	Red	2 (S-2)
( )	Orange	3 (S-2)
( )	Yellow	5 (S-2)
( )	Green	6 (S-2)
( )	Blue	7 (S-2)
( )	Violet	8 (S-2)
( )	Gray	9 (S-2)
( )	White	10 (S-2)
( )	Black	11 (S-2)
( )	White-brown	12 (S-2)



Pictorial 10

Refer to Pictorial 10 and prepare one end of the 9-conductor cable as shown. Strip each lead end 1/4" and tin.

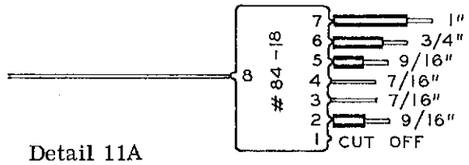
( ) Pass one end of the cable through grommet K and position the prepared end next to socket G.

( ) Connect the wires of the cable to socket G as follows:

	COLOR	LUG
( )	Brown	1 (NS)
( )	Red	2 (NS)
( )	Orange	3 (NS)
( )	Yellow	4 (NS)
( )	Green	5 (NS)
( )	Blue	6 (NS)
( )	Violet	7 (NS)
( )	Gray	8 (NS)
( )	White	9 (NS)

Refer to Pictorial 11 for the following steps.

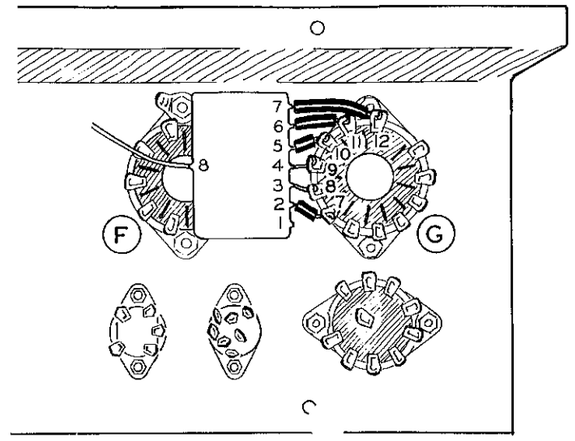
( ) Refer to Detail 11A and prepare one of the P.E.C. units (#84-18, Packaged Electronic Circuit) as shown. Place sleeving on the leads indicated.



Detail 11A

( ) Connect the leads of the P.E.C. to tube socket G as follows:

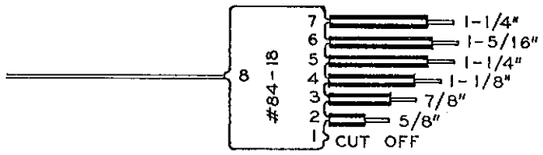
	LEAD	LUG
( )	7	12 (S-3)
( )	6	11 (S-2)
( )	5	10 (S-3)
( )	4	9 (S-3)
( )	3	8 (S-3)
( )	2	7 (S-3)



Pictorial 11

Refer to Pictorial 12 for the following steps.

( ) Refer to Detail 12A and prepare the other P.E.C. as shown. Place sleeving on all leads.



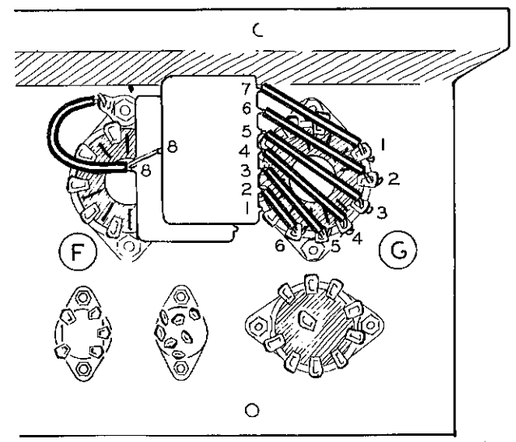
Detail 12A

( ) Connect the leads of the P.E.C. to tube socket G as follows:

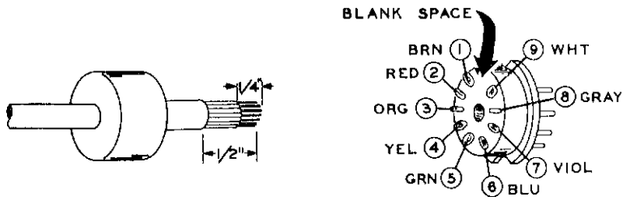
	LEAD	LUG
( )	7	1 (S-3)
( )	6	2 (S-3)
( )	5	3 (S-3)
( )	4	4 (S-3)
( )	3	5 (S-3)
( )	2	6 (S-3)

( ) Position the two P.E.C. units as shown and slip a 2" piece of sleeving over the two #8 leads. Connect both #8 leads to the solder lug at socket F (S-2). Be careful not to burn the cable or leads near the solder lug.

All connections on the panel should now be soldered. Check to see that no shorts exist between tube socket pins or switch terminals. Remove all wire clippings and solder splashes.



Pictorial 12



Pictorial 13

Refer to Pictorial 13 for the following steps.

( ) Prepare the free end of the 9-conductor cable as shown. Strip each lead end 1/4" and tin.

( ) Place the rubber 9-pin plug cap on the 9-conductor cable.

NOTE: Disregard any numbers that may be stamped on the plug when connecting wires in the following steps. See Pictorial 13 for the numbering sequence used.

	COLOR	PIN
( )	Brown	1 (S-1)
( )	Red	2 (S-1)
( )	Orange	3 (S-1)
( )	Yellow	4 (S-1)
( )	Green	5 (S-1)
( )	Blue	6 (S-1)
( )	Violet	7 (S-1)
( )	Gray	8 (S-1)
( )	White	9 (S-1)

( ) Check to see that no shorts exist between the pins of the plug.

( ) Push the rubber plug cap down onto the 9-pin plug.

Refer to Pictorial 14 for the following steps.

( ) Prepare the free end of the 11-conductor cable as shown. Strip each lead end 3/4" and tin.

( ) Place the 11-pin plug cap on the 11-conductor cable.

( ) Connect the wires of the cable to the 11-pin plug as follows:

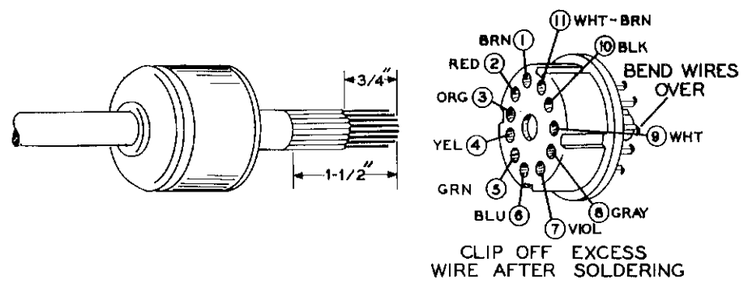
	COLOR	PIN
( )	Brown	1 (S-1)
( )	Red	2 (S-1)
( )	Orange	3 (S-1)
( )	Yellow	4 (S-1)
( )	Green	5 (S-1)
( )	Blue	6 (S-1)
( )	Violet	7 (S-1)
( )	Gray	8 (S-1)
( )	White	9 (S-1)
( )	Black	10 (S-1)
( )	White-brown	11 (S-1)

( ) Snap the plug cap on the 11-pin plug.

This completes the wiring of the Tube Socket Adapter. Check it carefully to insure that no shorts or errors exist.

( ) Push a plug button into each of the two blank holes in the panel.

( ) Refer to Pictorial 15 and mount the Tube Socket Adapter in the cabinet top. Use #6 x 3/8" screws in the top row of holes, and #6 x 1/4" screws in the bottom row of holes. CAUTION: If the long screws are used on the bottom holes, they will come through the top of the cabinet top.

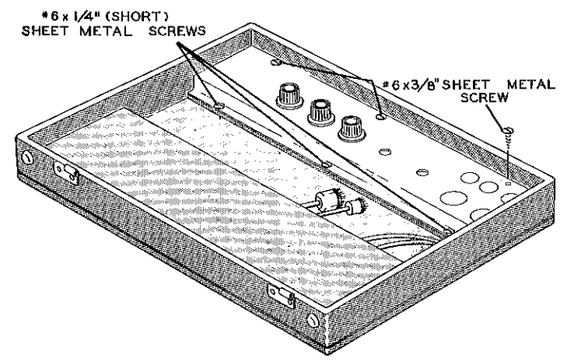


Pictorial 14

NOTE: In the following step, install the identification label where it can easily be seen when needed, but will not show when the unit is in operation. Refer to the numbers on this label in any communications you have with the Heath Company.

( ) Carefully peel away the backing paper. Then press the label into position.

This completes the assembly of the Tube Socket Adapter.



Pictorial 15

OPERATION

When testing a tube in the Tube Socket Adapter, the Tube Tester will function the same as for any of its other tube sockets. Selectors 10, 11 and 12 (on the Adapter) read from left to right, just as in the case of the Tube Tester.

The following procedure should be used when checking a tube in the Tube Socket Adapter.

1. Plug the 9-pin plug extending from the Adapter into the 9-pin socket of the Tube Tester.
2. Plug the 11-pin plug extending from the Adapter into the 11-pin socket of the Tube Tester.
3. Set the controls to the proper settings in accordance with the test data.
4. Place the tube in the proper socket of the Adapter and make the test as with any other tube. Determine whether the tube is good or bad by following the information given on the roll chart and in the Operation Manual for the Tube Tester.

The majority of tubes that will require testing in the Adapter will be multi-element tubes. Although some tubes having two sections (dual-triode, etc.) can be tested by the use of the K, P, G switches, other tubes may have three sections (triple triode, etc.) and will require more than one setup of the controls. In such a case, always remember to place the Normal-Disconnect switch in the Disconnect position when changing Selectors to prevent damage to the Tester and tube being tested.

There is a handy pocket in the cabinet top for storing the Adapter cables when the Tube Tester is being transported. Room is also available for the Operation Manual and roll chart supplements.

IN CASE OF DIFFICULTY

1. Recheck the wiring. Trace each lead in colored pencil on the Pictorial as it is checked. It is frequently helpful to have a friend check your work. Someone who is not familiar with the unit may notice something consistently overlooked by the constructor.

2. It is interesting to note that about 90% of the kits that are returned for repair do not function properly due to poor connections and soldering. Therefore, many troubles can be eliminated by reheating all connections to make sure that they are soldered as described in the Construction Notes section of this manual.

3. Check for bits of solder, wire ends or other foreign matter which may be lodged in the wiring.

NOTE: In an extreme case where you are unable to resolve a difficulty, refer to the Service and Warranty sections of the "Kit Builders Guide", and to the "Factory Repair Service" information on Page 21 of this manual.

FACTORY REPAIR SERVICE

You can return your completed kit to the Heath Company Service Department to have it repaired for a minimum service fee. (Kits that have been modified will not be accepted for repair.) If you wish, you can deliver your kit to a nearby Heath Authorized Service Center. These centers are listed in your Heathkit catalog.

To be eligible for replacement parts under the terms of the warranty, equipment returned for factory repair service, or delivered to a Heath Authorized Service Center, must be accompanied by the invoice or the sales slip, or a copy of either. If you send the original invoice or sales slip, it will be returned to you.

If it is not convenient to deliver your kit to a Heath Authorized Service Center, please ship it to the factory at Benton Harbor, Michigan and follow the following shipping instructions:

Prepare a letter in duplicate, containing the following information:

- Your name and return address.
- Date of purchase.
- A brief description of the dif iculty.
- The invoice or sales slip, or a copy of either.
- Your authorization to ship the repaired unit back to you C.O.D. for the service and shipping charges, plus the cost of parts not covered by the warranty.

Attach the envelope containing one copy of this letter directly to the unit before packaging, so that we do not overlook this important information. Send the second copy of the letter by separate mail to Heath Company, Attention: Service Department, Benton Harbor, Michigan.

Check the equipment to see that all parts and screws are in place. (Do not include wooden cabinets when shipping receivers, tuners, amplifiers, or TV sets, as these are easily damaged in shipment.) Then, wrap the equipment in heavy paper. Place the equipment in a strong carton, and put at least THREE INCHES of resilient packing material (shredded paper, excelsior, etc.) on all sides, between the equipment and the carton. Seal the carton with gummed paper tape, and tie it with a strong cord. Ship it by prepaid express, United Parcel Service, or insured parcel post to:

Heath Company
Service Department
Benton Harbor, Michigan 49022

REPLACEMENT PARTS PRICE LIST

To order parts, use the Parts Order Form furnished with this kit. If this Form is not available refer to "Replacement Parts" in the "Kit Builders Guide."

TT-1 TUBE TESTER CONVERSION KIT

PART No.	PRICE Each	DESCRIPTION
134-43	1.20	11-conductor cable assembly
434-118	.40	11-pin socket
91-104	11.65	Cabinet

TT-1A TUBE SOCKET ADAPTER PARTS LIST

WIRE-CABLE-SLEEVING

PART No.	PRICE Each	DESCRIPTION
347-5	1.05/ft	11-conductor cable
347-25	.80/ft	9-conductor cable
344-50	.05/ft	Black hookup wire
344-51	.05/ft	Brown hookup wire
344-52	.05/ft	Red hookup wire
344-53	.05/ft	Orange hookup wire
344-54	.05/ft	Yellow hookup wire
344-55	.05/ft	Green hookup wire
344-56	.05/ft	Blue hookup wire
344-57	.05/ft	Violet hookup wire
344-58	.05/ft	Gray hookup wire
344-59	.05/ft	White hookup wire
346-1	.05/ft	Length sleeving

HARDWARE

PART No.	PRICE Each	DESCRIPTION
250-8	.05	#6 x 3/8" sheet metal screw
250-170	.05	#6 x 1/4" sheet metal screw
250-49	.05	3-48 x 1/4" screw
250-56	.05	6-32 x 1/4" screw
252-1	.05	3-48 nut
252-3	.05	6-32 nut
252-7	.05	Control nut
253-10	.05	Control flat washer
254-7	.05	#3 lockwasher
254-1	.05	#6 lockwasher
254-5	.05	Control lockwasher
259-1	.05	#6 solder lug

SOCKETS

PART No.	PRICE Each	DESCRIPTION
434-118	.40	11-pin
434-119	.30	5-pin Nuvistor
434-139	1.00	7-pin Nuvistor
434-120	.20	9-pin Novar
434-121	.20	12-pin Compactron
434-122	.15	10-pin miniature

PLUGS

PART No.	PRICE Each	DESCRIPTION
432-19	.45	9-pin
438-29	.40	11-pin

MISCELLANEOUS

PART No.	PRICE Each	DESCRIPTION
63-217	1.00	Rotary switch
73-1	.10	Rubber grommet
84-18	1.25	P.E.C. (Packaged Electronic Circuit)
440-1	.20	11-pin plug cap
440-4	.10	9-pin plug cap
462-67	.25	Knob
485-2	.10	Plug button
203-295-1	1.25	Panel
331-6	.15	Solder
	2.00	Manual (See front cover for part number.)

The above prices apply only on purchases from the Heath Company where shipment is to a U.S.A. destination. Add 10% (minimum 25 cents) to the price when ordering from an authorized Service Center or Heathkit Electronic Center to cover local sales tax, postage and handling. Outside the U.S.A. parts and service are available from your local Heathkit source and will reflect additional transportation, taxes, duties and rates of exchange.

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