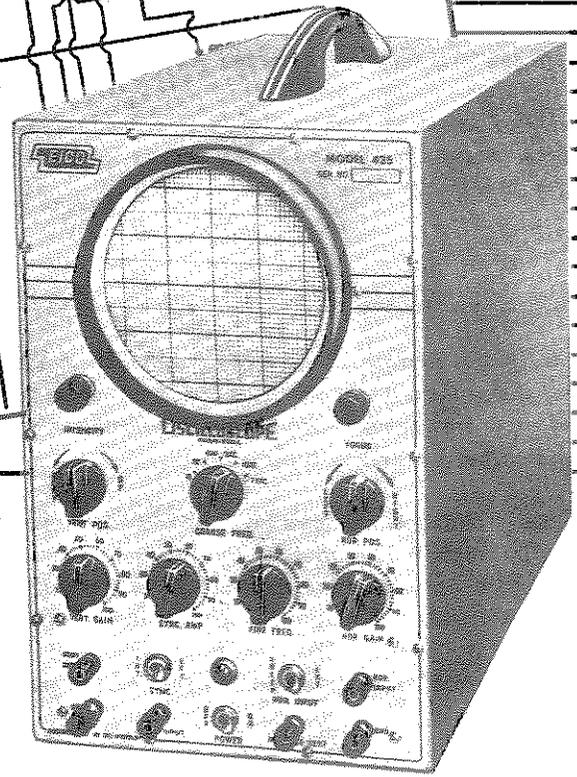
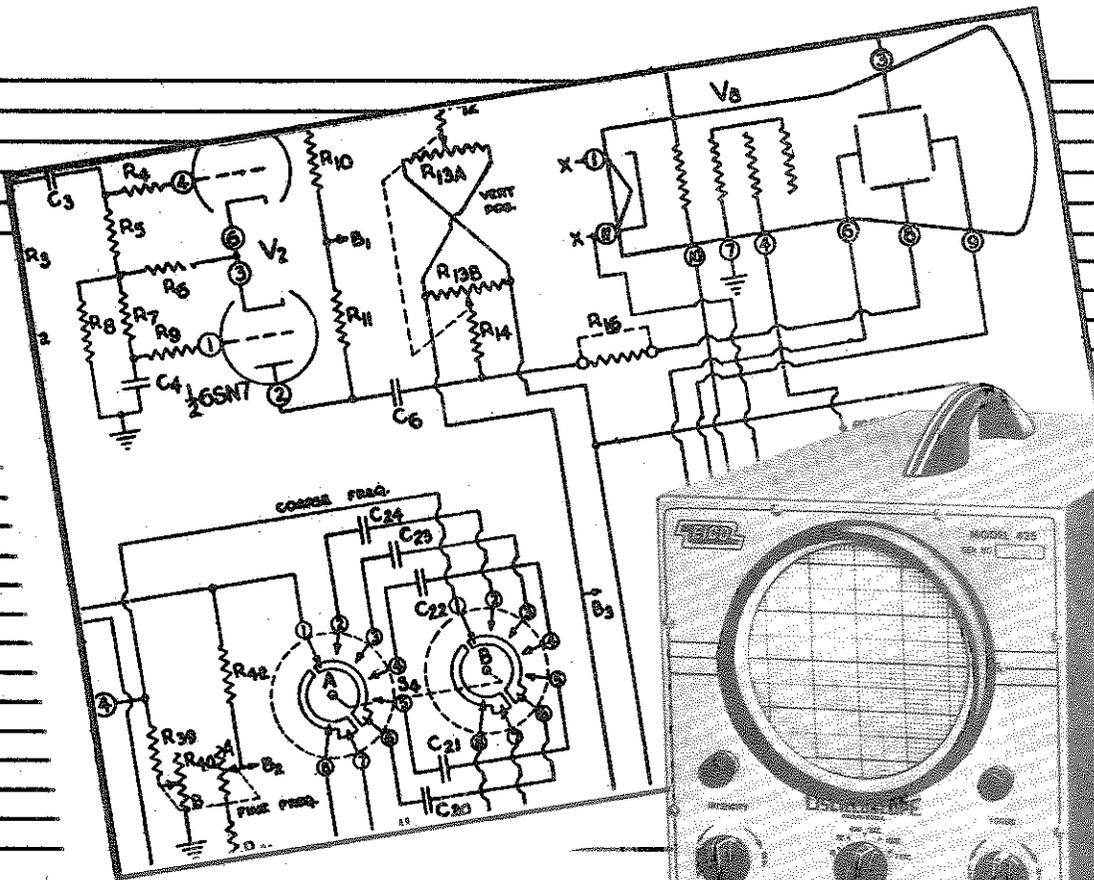




CONSTRUCTION MANUAL

Model 425

5" PUSH PULL OSCILLOSCOPE



ELECTRONIC INSTRUMENT CO., Inc.

GENERAL INSTRUCTIONS

Care taken in the construction of this instrument will reward the constructor with many years of satisfactory service and greater confidence in his instrument. We urge you to not rush the construction, but to take all the time necessary for proper assembly, wiring, and adjustment.

Furthermore, we urge strongly that you follow the wire and parts layout shown in the pictorial diagrams as closely as possible. This is essential, because the position of wires and parts is quite critical in this instrument; changes may seriously affect the characteristics of the circuit.

UNPACKING THE KIT: Unpack the kit carefully and check each part against the parts list including those parts that are mounted to the chassis. If you have trouble identifying any parts, refer to the pictorial diagrams or the color code chart.

You may find that the value of a component will vary within the allowable circuit tolerance. As an example, a 470K ohm resistor may have substituted for it a 510K ohm resistor if the circuit is such as to allow this substitution. In general, resistors and controls have a tolerance of $\pm 20\%$ unless otherwise specified. Therefore, a 100K resistor may measure anywhere between 80K and 120K ohms. Tolerances on capacitors are even greater. Limits of +100% and -50% are usual for electrolytic capacitors.

CONSTRUCTION HINTS: USE THE BEST GRADE OF ROSIN CORE SOLDER ONLY, preferably one containing the new activated fluxes such as Kester "Resin-Five", Ersin "Multicore" or similar types. **UNDER NO CIRCUMSTANCES USE ACID CORE SOLDER OR ACID FLUX** since acid flux can cause serious corrosion. Before soldering make certain of a good mechanical connection. Use a clean, freshly tinned soldering iron, no smaller than 100 watts, and place the solder on the joint (not on the iron) so that the solder is melted by the heat from the joint itself. Do not remove the soldering iron until the solder flows and check to see that the resulting joint is smooth and shiny when the solder has cooled. There are two extremes to be avoided; too little heat and too much heat. If too little heat is applied, the joint will appear pitted and grey, indicating a rosin joint which is unsatisfactory. On the other hand, if too much heat is applied to a joint, the parts connected to it may either change value, lose their protective coating, or break down. If you are soldering close to a part, hold the lead between the part and the joint being soldered with the tip of a pair of longnose pliers. The pliers will conduct the heat away and prevent the component from being unduly overheated. If for any reason it is necessary to resolder a joint, be sure to use new solder.

It should also be noted that the leads on transformers, capacitors, and resistors are very often longer than necessary. These leads should be trimmed to the proper length when wiring. The instrument will not operate properly with overly long leads in critical parts of the circuit.

STEP 1: PANEL ASSEMBLY & WIRING, COARSE FREQ. SELECTOR SWITCH PRE-WIRING

All controls are secured to the front panel with a lock washer behind the panel, and a flat washer in from under the fastening nut. (This prevents the front panel from being marred.) Do not insulate the controls from the panel. In the event of a control breakdown, an insulated control might deliver very high voltage to the operator, while an uninsulated control will result in a blown fuse.

The assembly instructions have been broken down into columns. Column 1 is marked check; when an operation is completed a small \checkmark is placed in that space. The second column is the part number; this corresponds with the parts list. The third column is the description of the part; this permits fast identification. The fourth column lists the hardware with which to mount the part. The fifth column gives the location of the component or other pertinent information. Consider the first item as an example: #H11 is the tube bezel and is mounted with two #H25 (self tapping) screws. The bezel is mounted on the rear of the panel and the self-tapping screws are inserted from the front of the panel.

The next operation is the pre-wiring of the coarse frequency selector switch. In this assembly, the condensers going to the various terminals of the two wafer "Frequency Selector Switch" are wired before the switch is secured to the front panel in order to facilitate the wiring. Since this switch is in a section of the oscilloscope where leakage caused by rosin between contacts, would be detrimental, it is recommended that the solder connections be cleaned with a stiff brush and carbon tetrachloride. Note: Be very careful not to spring the contacts when cleaning the switch.

The coarse frequency selector switch is then mounted on the panel and the panel wiring completed.

STEP 2: CHASSIS ASSEMBLY & WIRING

All components in this assembly are mounted on the bottom of the chassis except those specifically designated as being mounted on top. In the latter case they will appear as dotted lines in the pictorial diagrams. Polarity need not be observed on an oil filled condenser and if it has only one terminal the shield (or can) is ground.

The next operation is the wiring of the chassis.

STEP 3: FINAL ASSEMBLY & WIRING

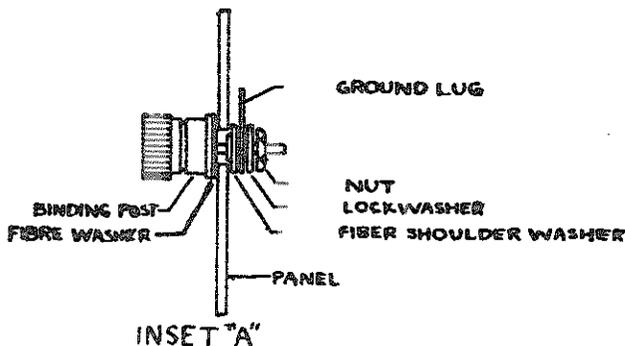
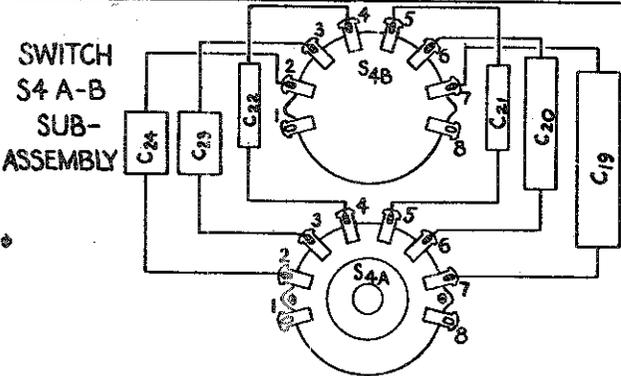
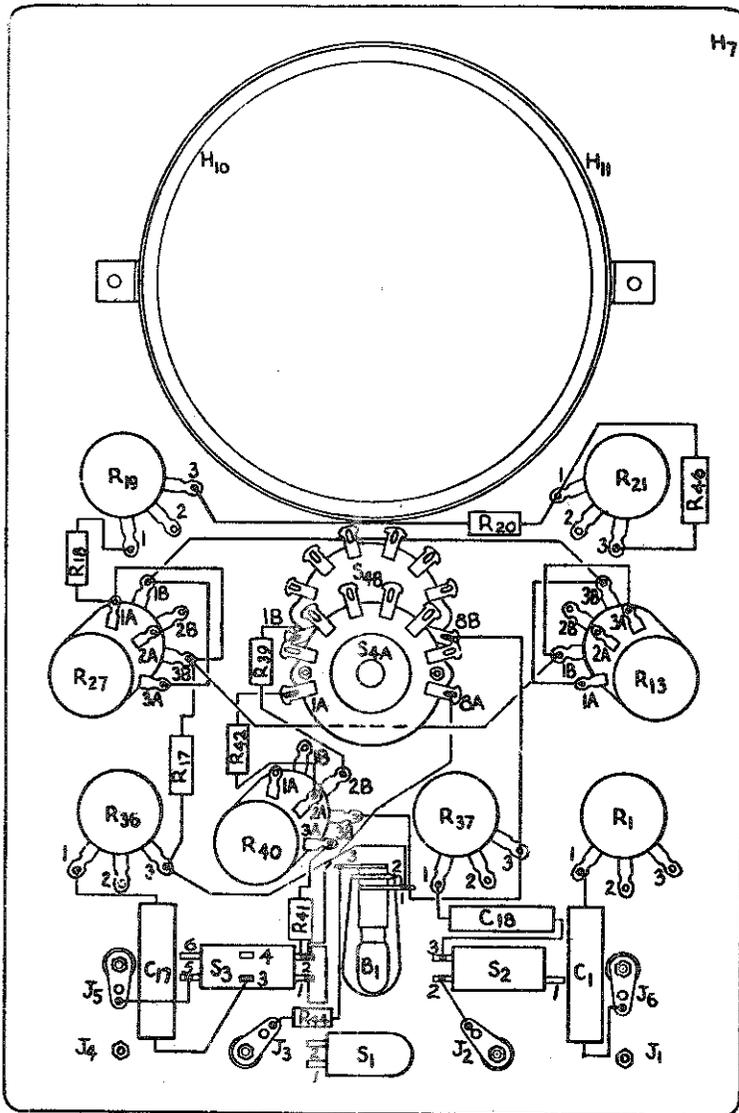
In this step the front panel is secured to the chassis and the final wiring completed.

STEP 4: FINAL OPERATIONS

In this step, the tubes are inserted in place in the oscilloscope and knobs secured. Resistance checks are made before the set is turned on, and next an operational check is made. The oscilloscope is then inserted in the cabinet.

PARTS LIST - MODEL 425

Chk.	Stk.#	Symbol	Description	Am't.	Chk.	Stk.#	Symbol	Description	Am't.
92000	B1		Pilot light & assembly ...	1	52000	J1-6		Binding posts	6
24002	C10-12		Triple 10 mfd cond.	1	50000	J7		Pin jack	1
27000	C7		1 mfd HV condenser	1	30003	PT1		Power transformer	1
20005	C3,4,15, 17,19		.5 mfd tubular	5	18003	R13A,B R27A,B		Dual 4 meg pot.	2
20004	C1		.25 mfd tubular	1	16006	R1,36		1 meg potentiometer ...	2
20006	C5,6,8,9 C13,14,16,20		.1 mfd tubular	8	18006	R40A,B		Dual 250K 1 meg pot ...	1
20008	C18,21		.02 mfd tubular	2	16002	R19		250K potentiometer	1
20010	C25		.01 mfd 1200 volts	1	16005	R21,37		100K potentiometer	2
20002	C2		.002 mfd tubular	1	10034	R12,14,15 R16,26,28		4.7 meg 1/2 W res.	6
20007	C22		.003 mfd tubular	1	10030	R5,7		1 meg 1/2 W res.	4
21002	C23		.00068 mfd Mica	1		R32,43			
22001	C24		.0001 mfd Mica	1	10812	R18,47		510K 1 W res.	2
97801	F1		Fuse mount	1	10025	R41		200K 1/2 W res.	1
91000	F2		Fuses	2	10811	R20		100K 1 W res.	1
81042	H1		Left mounting bracket ...	1	10024	R17,24 R25,33		100K 1/2 W res.	4
81043	H2		Right mounting bracket...	1		R34		50K 1 W res.	1
59502	H3		H.V. condenser bracket and hardware	1	10810	R3,30,42		47K or 50K 1 W res.	3
46002	H4		3/4" Rubber grommet ...	1	10019	R46		30K 1/2 W res.	1
46000	H5		3/8" Rubber grommet	1	10809	R11,29,39		22K 1 W res.	3
42012	H6		Pin jack star washer	1	10808	R10		18K 1 W res.	1
80008	H7		Front panel	1	10016	R44		10K 1/2 W res.	1
81015	H8		CRT Support	1	10806	R8		6K 1 W res.	1
	H9		CRT Socket retaining ring	1	10903	R23		5K 2 W res.	1
59302	H10		Felt strip	1	10013	R45		5K 1/2 W res.	1
81041	H11		Tube shield	1	10010	R35		3.6K 1/2 W res.	1
44001	H12		3/8" standoffs	2	10008	R2,31		1200 ohm 1/2 W res.	2
81014	H13		Chassis	1	10902	R22		1K 2 W res.	1
88003	H14		Cabinet	1	10007	R6		680 ohms 1/2 W res. ...	1
87001	H15		Handle	1	10005	R38		470 1/2 W res.	1
41008	H16		6/32 X 1/2 screws	2	10002	R4,9		47 ohms 1/2 W res.	2
42003	H17		Flat washers fibre	6	61000	S1		SPST Sw. (2 lug)	1
57000	H18		Line cord	1	61001	S2		SPDT Sw. (3 lug)	1
59500	H19		Cond. Mounting wafer ..	1	61002	S3		DPDT Sw. (6 lug)	1
42006	H20		Fibre shoulder washer ...	4	60008	S4A,B		2 Wafer 5 pos. Sw.	1
42001	H21		3/8 Panel washer	9	54003	T1, 6-8		2 post term. strips	4
40001	H22		3/8 Pot. nuts	9	54006	T2-3		3 post terminal strips ...	2
40002	H23		7/16 Toggle Sw. nuts ...	6	54008	T4-5		4 post terminal strips ..	2
42000	H24		3/8 Lock washer	9	54500	T9		4 post term. board	1
41002	H25		#6 Self tapping screw ...	16	90004	V1, 6		6J5 Tube	2
41006	H26		10/24 Handle screws ...	2	90019	V2,5,7		6SN7 Tube	3
41000	H27		6/32 X 1/4 screws	45	90001	V3,4		5Y3 H.V. Rect.	2
40000	H28		6/32 nuts	55	90000	V8		5BP1 CRT	1
41007	H29		6/32 X 3/4 screws	2	58000			Roll wire	
97004	H30		CR tube socket	1	58300			Spaghetti	
97003	H31		Octal sockets	7	58501			Bare wire	
53000	H32		Knobs	9	54001	T10		Single post term. strip... 1	
42002	H33		#6 Lock washers	48	54002	T11		Single post term. strip with gnd	1
59000	H34		Oscillograph screen ...	1	81056			Back plate	1
43000	H35,L1-11		Solder lugs	14				Instruction book	1



FRONT PANEL MOUNTING INSTRUCTIONS				
See Attached Insert				
Chk.	Symbol	Description	Mounted with	Location & Remarks
	H11	Tube shield	2 [#] H25	On rear of panel. Insert screws from front.
	H10	Felt	Glue to [#] H11	
	R21	100K Pot	*1 [#] H21, 1 [#] H22, 1 [#] H24	Intensity
	R13A, B	Dual 4 meg pot	*1 [#] H21, 1 [#] H22, 1 [#] H24	Vert. Pos.
	R1	1 Meg. Pot	*1 [#] H21, 1 [#] H22, 1 [#] H24	Vert. Gain
	R37	100K pot	*1 [#] H21, 1 [#] H22, 1 [#] H24	Sync. Amp.
	R40A, B	Dual 250K 1 Meg Pot	*1 [#] H21, 1 [#] H22, 1 [#] H24	Fine Freq.
	R36	1 Meg Pot	*1 [#] H21, 1 [#] H22, 1 [#] H24	Hor. Gain
	R27A, B	Dual 4 Meg Pot	*1 [#] H21, 1 [#] H22, 1 [#] H24	Hor. Pos.
	R19	250K Pot	*1 [#] H21, 1 [#] H22, 1 [#] H24	Focus
	S1	2 lug switch	2 [#] H3	Power
	S2	3 lug switch	2 [#] H3	Sync.
	S3	6 lug switch	2 [#] H3	Hor. input
	J1	Gnd binding post	1 [#] H17, 1 [#] H28, 1 [#] H33	
	J4	Gnd binding post	1 [#] H17, 1 [#] H26, 1 [#] H33	
	J2	Sync. Input bind. post	1 [#] H17, 1 [#] H20, 1 [#] H35	
	J3	60 Cycle bind. post	1 [#] H28, 1 [#] H33	See Inset A
	J5	Hor. input bind. post	1 [#] H17, 1 [#] H20, 1 [#] H35	See Inset A
	J6	Vert. input bind. post	1 [#] H23, 1 [#] H33	See inset A
	B1	Pilot Light Assembly	1 [#] H17, 1 [#] H20, 1 [#] H35	Center Bottom

Note: Switch S4AB has not as yet been mounted.
 * Place flat washer on the front of the panel; lock washer at rear. If pot. has a centering tab which prevents flush mounting, bend down or remove before insertion; orient pins as shown on diagram.

SWITCH WIRING					
Chk.	Symbol	Description	From	To	Remarks
	C19	.5 Mfd Tubular	(S) S4A [#] 7	S4B [#] 7 (S)	See switch sub-assembly
	C20	.1 Mfd Tubular	(S) S4A [#] 6	S4B [#] 6 (S)	
	C21	.02 Mfd Tubular	(S) S4A [#] 5	S4B [#] 5 (S)	
	C22	.003 Mfd Tubular	(S) S4A [#] 4	S4B [#] 4 (S)	
	C23	.00968 Mfd Mica	(S) S4A [#] 3	S4B [#] 3 (S)	
	C24	.0001 Mfd Mica	(S) S4A [#] 2	S4B [#] 2 (S)	

Mount switch on front panel using lockwasher [#]H24, panel washer [#]H21 and nut [#]H22.

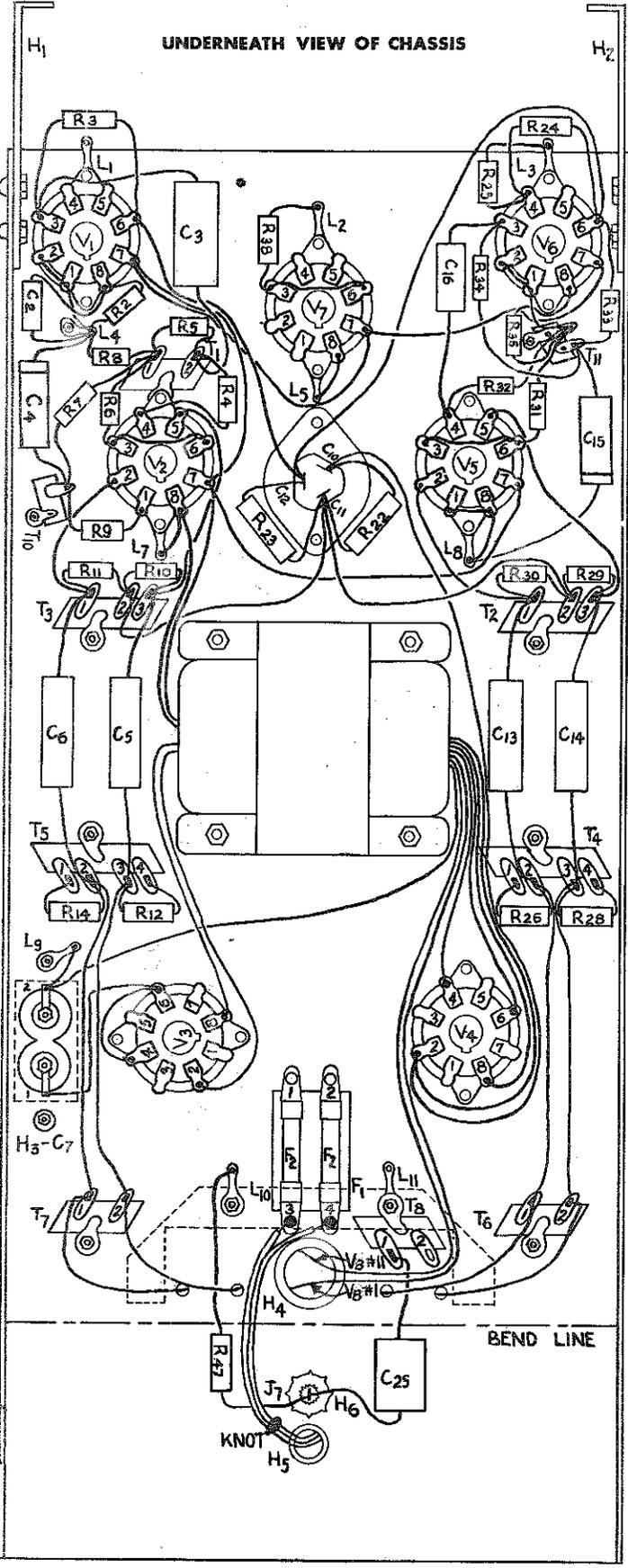
PANEL WIRING					
Chk.	Symbol	Description	From	To	Remarks
	R20	100K 1W res.	(S) R19 [#] 3	R21 [#] 1 (C)	Spaghetti
	R46	30K 1/2W res	(C) R21 [#] 1	R21 [#] 3 (C)	
	R18	510K 1W res.	(S) R19 [#] 1	R27 [#] 1A (C)	
		wire	(S) R27 [#] 1A	R27 [#] 3B (C)	
		wire	(C) R27 [#] 3B	R13 [#] 1B (C)	
		wire	(S) R13 [#] 1B	R13 [#] 3A (C)	
		wire	(S) R13 [#] 1A	R13 [#] 3B (C)	
		wire	(S) R13 [#] 3B	R27 [#] 1B (C)	
		wire	(S) R27 [#] 1B	R27 [#] 3A (C)	
	R17	100K 1/2W res.	(S) R27 [#] 3B	R36 [#] 3 (C)	
		wire	(C) R36 [#] 3	B1 [#] 1 (C)	
		wire	(C) B1 [#] 1	R40 [#] 3B (S)	
		wire	(C) B1 [#] 1	R37 [#] 3 (C)	
		wire	(C) B1 [#] 1	B1 [#] 2 (S)	
		wire	(S) R37 [#] 3	S4B [#] 8 (S)	
	R39	22K 1W res.	(S) R40 [#] 2B	S4B [#] 1 (C)	
	R42	47K 1W res.	(C) S4A [#] 1	R40 [#] 2A (C)	
	R41	200K 1/2W res.	(S) R40 [#] 3A	S3 [#] 2 (C)	Spaghetti
		wire	(C) S3 [#] 2	S4A [#] 8 (S)	
		wire	(S) S3 [#] 2	S3 [#] 1 (S)	
	R44	10K 1/2W res.	(S) J3	B1 [#] 3 (C)	
	C17	.5 mfd. tub.	(S) R36 [#] 1	S3 [#] 3 (S)	
		wire	(S) J5	S3 [#] 5 (S)	
	C18	.02 mfd. tub.	(S) R37 [#] 1	S2 [#] 3 (S)	
		wire	(S) J2	S2 [#] 2 (S)	
	C1	.25 mfd. tub.	(S) R1 [#] 1	J6 (S)	

(S) means Solder (C) means Connect

MODEL 425 OSCILLOSCOPE
 ASSEMBLY DIAGRAM 1.



UNDERNEATH VIEW OF CHASSIS



CHASSIS ASSEMBLY - MOUNTING INSTRUCTIONS

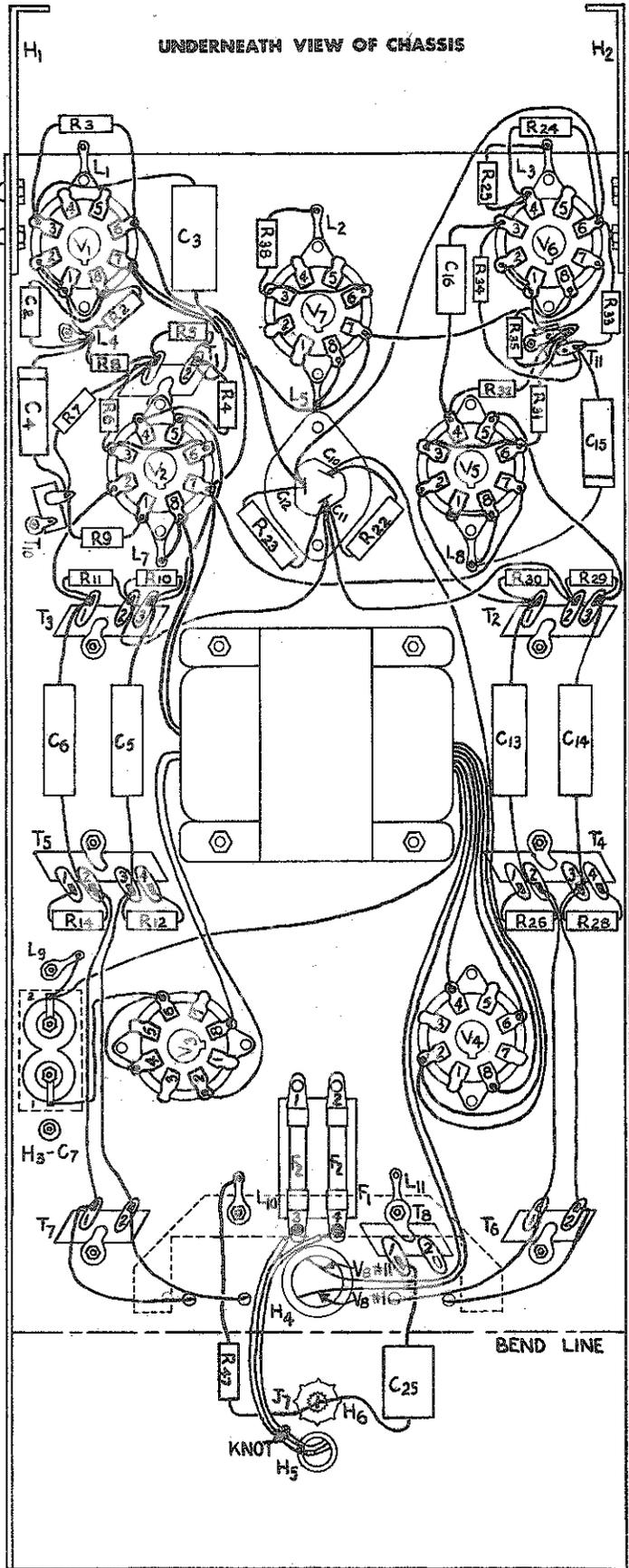
NOTE: #H33 goes under every 6/32 screw head

Chk.	Symbol	Description	Mount with	Location & Remarks
	H1	Left bracket	2#H27, 2#H33	Front left
	H2	Right bracket	2#H27, 2#H33	Front right
	T6	2 lug terminal strip	1#H27, 1#H33	Rear right
	T7	2 lug terminal strip	1#H27, 1#H33	Rear left
	F1	Fuse mount	2#H27, 2#H33	Center rear
	F2	Fuses	F1	
	T5	4 lug terminal strip	1#H27, 1#H33	Center left
	T4	4 lug terminal strip	1#H27, 1#H33	Center right
	T3	3 lug terminal strip	1#H27, 1#H33	Center left
	T2	3 lug terminal strip	1#H27, 1#H33	Center right
	L4	Ground lug	1#H27, 1#H28	Front left
	T10	single post term. strip	1#H27, 1#H28	Front left
	T11	Single post with gnd term. strip	1#H27, 1#H28	Front right
	PT1	Power transformer	4#H27, 4#H33	Center yellow leads to right
	H3-C7	High voltage cond. and bracket	3#H27, 3#H28 L9, 3#H33	Rear center, Top chassis place lug L9 on right hand bolt beneath chassis
	H4	3/4 grommet	press in	Rear center
	H5	3/8 grommet	press in	Rear center on upright
	J7	Jack	part #H6	
	C10	Triple 10 mfd	#H19, 2#H28	Front center
	C11	Electrolytic	2#H33, 2#H27	
	C12	Condenser		
	H31	Octal sockets	14#H27, 18#H28 14#H33, L1-3	As shown on diagram, Keyways to rear
	H8	Tube support	4#H27, 4#H33	See sub-assembly of H8 and Assembly Print #4
	H30	CRT socket	4#H28, T8, L10, L11	On H8
	T9	4 post terminal board	H9- press in 2#H27, 2#H28 2#H12	On H8

ASSEMBLY PRINT #2 MODEL 425



UNDERNEATH VIEW OF CHASSIS



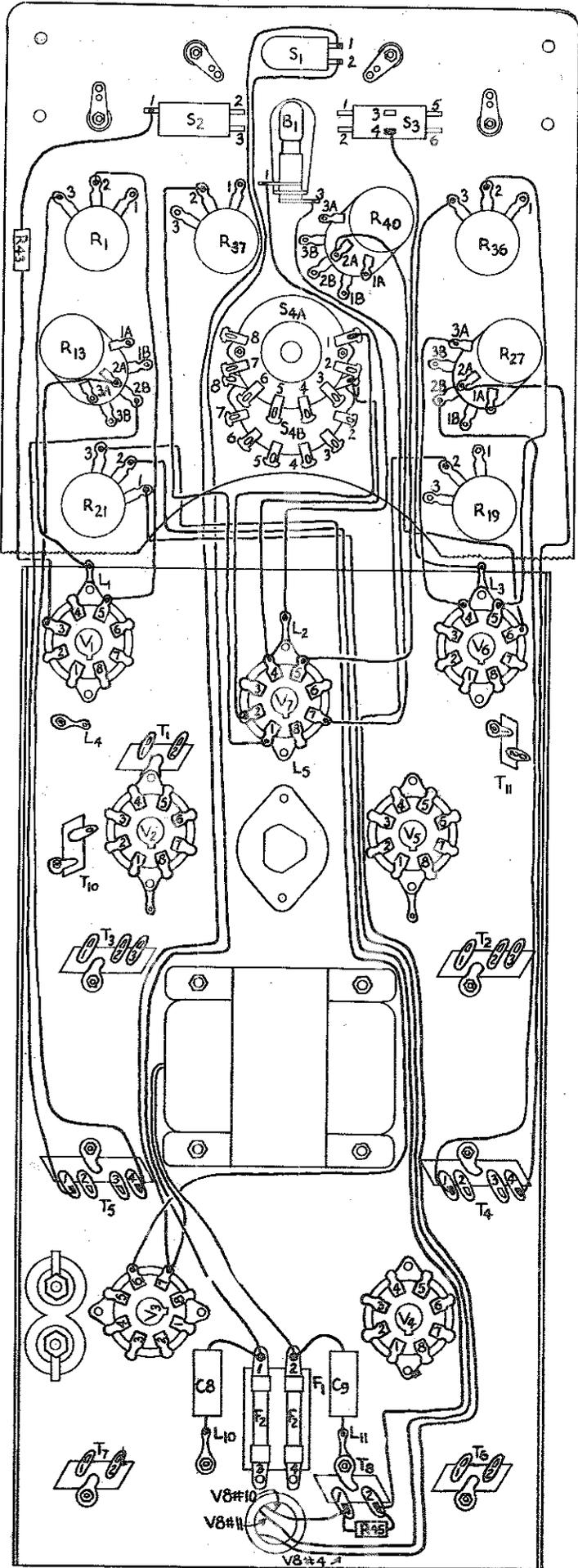
CHASSIS ASSEMBLY - WIRING INSTRUCTIONS

Chk.	Symbol	Description	From	To	Remarks
PT1		Power transformer	Blue lead	V3-8 (S)	
PT1		Power transformer	Blue-white lead	V3-2 (S)	
		Bare wire	(S) V3-4	V3-6 (C)	
		Hookup wire	(C) V3-6	V3-1 (S)	
PT1		Power transformer	yellow lead	V8-11 (C)	
PT1		Power transformer	yellow lead	V8-11 (C)	
PT1		Power transformer	red-yellow lead	C7-2 (C)	
		Bare wire	(S) lug 9	C7-2 (S)	
PT1		Power transformer	orange lead	V4-4 (S)	
PT1		Power transformer	red lead	V4-6 (S)	
PT1		Power transformer	green lead	V4-8 (S)	
PT1		Power transformer	green lead	V4-2 (C)	
		Hookup wire	(S) V4-2	C10 (C)	
R22		Resistor, 1KΩ, 2W	(S) C10	C11 (C)	Spaghetti
R23		Resistor, 5KΩ, 2W	(C) C11	C12 (C)	Spaghetti
		Hookup wire	(C) C11	T3-2 (C)	
		Hookup wire	(S) C11	T2-2 (C)	
R29		Resistor, 22KΩ, 1W	(C) T2-2	T2-3 (C)	
R30		Resistor, 47KΩ, 1W	(S) T2-2	T2-1 (C)	
		Hookup wire	(C) T2-1	V5-2 (S)	
C14		Condenser, .1 MFD	(S) T2-1	T4-2 (C)	
C13		Condenser, .1MFD	(C) T2-3	T4-3 (C)	
		Hookup wire	(S) T2-3	V5-5 (S)	
R28		Resistor, 4.7MΩ	(C) T4-3	T4-4 (C)	
R26		Resistor, 4.7MΩ	(C) T4-2	T4-1 (C)	
		Hookup wire	(S) T4-2	V8-9 thru T6-1	
		Hookup wire	(S) T4-3	V8-6 thru T6-2	
R10		Resistor, 18KΩ, 1W	(C) T5-2	T3-3 (C)	
R11		Resistor, 22KΩ, 1W	(S) T5-2	T3-1 (C)	
C5		Condenser, .1 MFD	(C) T3-3	T5-3 (C)	
C6		Condenser, .1 MFD	(C) T3-1	T5-2 (C)	
		Hookup wire	(S) T3-3	V2-5 (S)	
		Hookup wire	(S) T3-1	V2-2 (S)	
R12		Resistor, 4.7MΩ	(C) T5-3	T5-4 (C)	
R14		Resistor, 4.7MΩ	(C) T5-2	T5-1 (C)	
		Hookup wire	(S) T5-2	V8-2 thru T7-1	
		Hookup wire	(S) T5-3	V8-4 thru T7-2	
		Hookup wire	(S) V8-8 *	T9-1 (C)	
R16		Resistor, 4.7MΩ	(S) T9-1 *	T9-2 (S)	
R15		Resistor, 4.7MΩ	(S) T9-4 *	T9-3 (C)	
		Hookup wire	(S) T9-3 *	V8-3 (S)	
		Bare wire	(S) V8-7 *	bracket (S)	
PT1		Power transformer	brown lead	V2-8 (C)	
		Bare wire	(S) V2-8	lug 7 (S)	
PT1		Power transformer	brown lead	V2-7 (C)	
		Hookup wire	(C) V2-7	V1-7 (C)	
		Hookup wire	(S) V2-7	V5-7 (S)	thru V5-8 (S)
		Bare wire	(S) V5-1	lug 8 (C)	
		Hookup wire	(S) V1-7	V7-7 (C)	
		Hookup wire	(C) V7-7	V6-7 (S)	
		Bare wire	(S) V7-8	lug 5 (S)	thru V6-1 (S)
		Hookup wire	(S) V6-2	T11-1 (C)	thru V1-1 (S)
		Bare wire	(S) V1-2	lug 4 (C)	
R9		Resistor, 47Ω	(S) V2-1	T10 (C)	
R7		Resistor, 1MΩ	(C) T10	T1-1 (C)	
C4		Condenser, .5 MFD	(S) T10	lug 4 (C)	thru V2-3 (S)
R6		Resistor, 680Ω	(C) T1-1	lug 4 (C)	
R8		Resistor, 6KΩ	(C) T1-1	T1-2 (C)	
R5		Resistor, 1MΩ	(S) T1-1	V2-4 (S)	
R4		Resistor, 47Ω	(C) T1-2	V1-3 (C)	
C3		Condenser, .5 MFD	(S) T1-2	T11-1 (C)	
R31		Resistor, 1200Ω	(S) V5-3, 6	T11-1 (C)	
R32		Resistor, 1MΩ	(C) V5-4	T11-1 (C)	
C16		Condenser, .1 MFD	(S) V5-4	V6-3 (C)	
R35		Resistor, 3600Ω	(S) V6-8	T11-1 (S)	
R34		Resistor, 50KΩ	(S) V6-3	T11-2 (C)	
R33		Resistor, 100KΩ	(C) T11-2	V6-6 (C)	
C15		Condenser, .5 MFD	(S) T11-2	lug 8 (S)	
R24		Resistor, 100KΩ	(C) V6-6	V6-4 (C)	
R25		Resistor, 100KΩ	(C) V6-4	lug 3 (C)	
		Hookup wire	(C) V6-6	C12 (C)	
		Hookup wire	(S) C12	V1-6 (C)	
R38		Resistor, 470Ω	(S) V7-6	lug 2 (C)	thru V7-3 (S)
R2		Resistor, 1200Ω	(C) V1-8	lug 4 (C)	
C2		Condenser, .002 MFD	(S) V1-8	lug 4 (S)	
R3		Resistor, 47KΩ	(S) V1-6	V1-3 (C)	
H18		line cord		F1-3 (S)	Knot
		other lead		F1-4 (S)	Knot
R47		Resistor, 510KΩ	(C) J7	lug 10 (C)	
C25		Condenser, .01 MFD, 1200 V	J7	T8-1 (C)	

* CRT Support is shown on Assembly Print #31

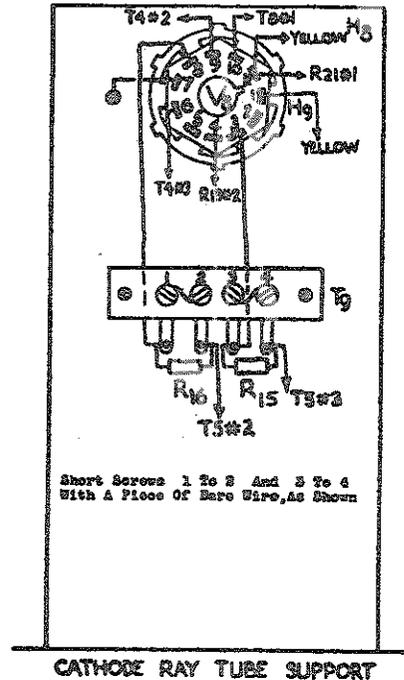


**VIEW OF COMPLETED
ASSEMBLY UPSIDE DOWN**



ASSEMBLY OF PANEL AND CHASSIS					
Chk.	Symbol	Description	From	To	Remarks
H7		Panel		H13	Mount with 4 [#] H27, 4 [#] H28 4 [#] H33
PT1		Transformer	Black lead	F1 [#] 2 (C)	
C9		.1 mfd condenser	(S) F1 [#] 2	L11 (S)	
PTI		Transformer	Black lead	V3 [#] 7 (C)	
		Wire	(S) V3 [#] 7	S1 [#] 1 (S)	
		Wire	(S) S1 [#] 2	F1 [#] 1 (C)	
C8		.1 mfd condenser	(S) F1 [#] 1	L10 (S)	
R43		1 meg resistor	(S) S2 [#] 1	V1 [#] 3 (S)	
		Bare wire	(S) R1 [#] 3	L1 (S)	
		Wire	(S) R1 [#] 2	V1 [#] 5 (S)	
		Wire	(S) R3 [#] 2	V7 [#] 1 (S)	
		Wire	(S) S3 [#] 4	V7 [#] 5 (S)	
		Wire	(S) S4 [#] 1	V7 [#] 4 (S)	
		Wire	(S) R3 [#] 2	V6 [#] 5 (S)	
		Bare wire	(S) R3 [#] 3	L3 (S)	
		Wire	(S) R1 [#] 2A	T5 [#] 4 (S)	
		Wire	(S) R1 [#] 2B	T9 [#] 1 (S)	
		Wire	(S) R2 [#] 2A	T4 [#] 4 (S)	
		Wire	(S) R2 [#] 2B	T4 [#] 1 (S)	
		Wire	(S) R2 [#] 1	V8 [#] 11 (S)	
		Wire	(S) R2 [#] 2	T8 [#] 2 (C)	
R45		5K resistor	(S) T8 [#] 2	T8 [#] 1 (S)	
		Wire	(S) T8 [#] 1	V8 [#] 10 (S)	
		Wire	(S) R19 [#] 2	V8 [#] 4 (S)	
		Wire	(S) R27 [#] 3A	V8 [#] 4 (S)	
		Wire	(S) S4 [#] 1	V7 [#] 2 (S)	
		Wire	(S) B1 [#] 1	L2 (S)	
		Wire	(S) R4 [#] 2A	V6 [#] 6 (S)	
		Wire	(S) B1 [#] 3	V7 [#] 7 (S)	
		Wire	(S) R21 [#] 3	V3 [#] 6 (S)	
H32		Knobs			Mount on front panel controls
H15		Handle			Mount with 2 [#] H26

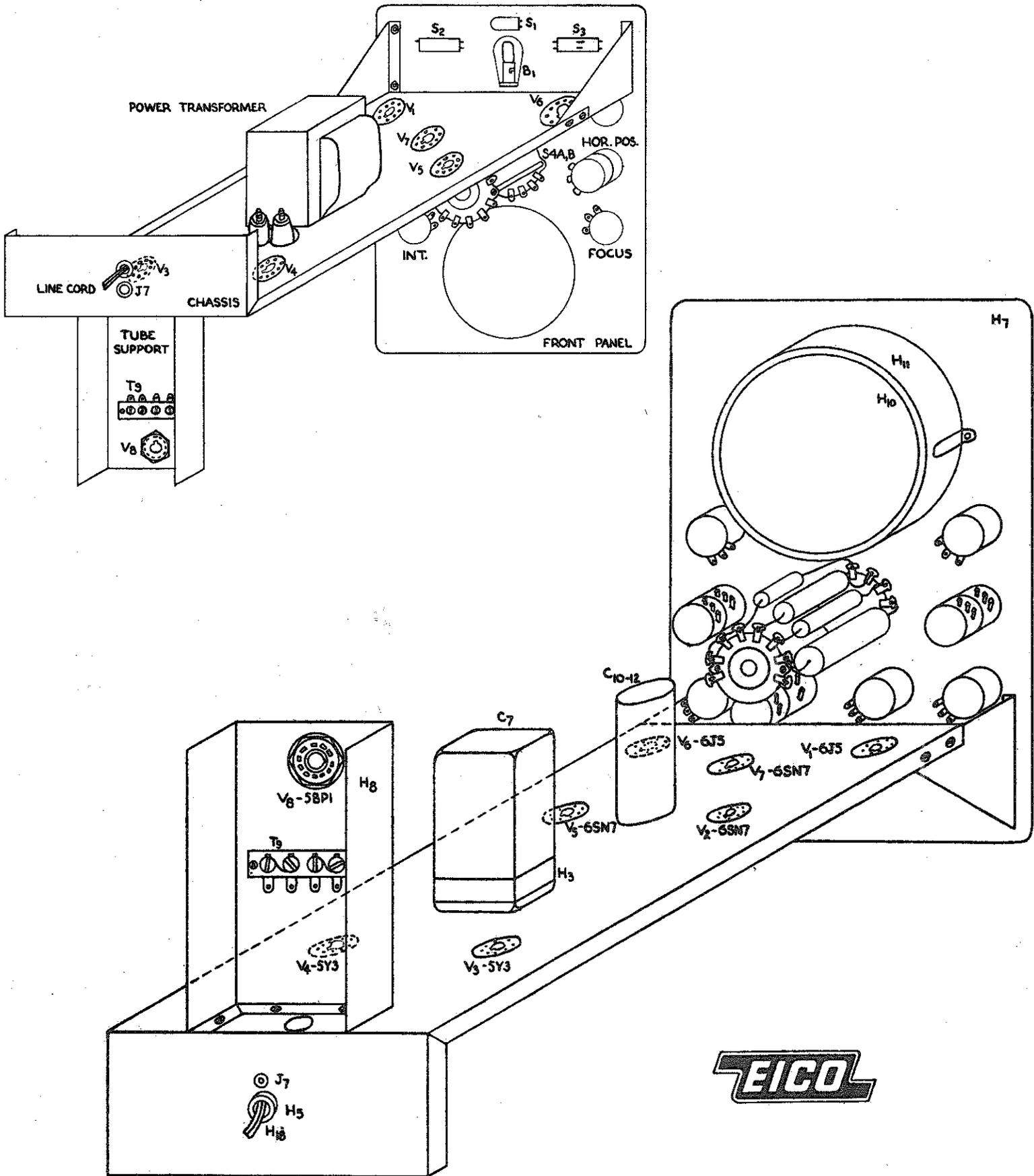
NOTE: After final checks are made (see following step) mount oscilloscope into cabinet with 10[#]H25 in front and 2[#]H25 in rear. Insert [#]H34 over tube face (if desired).



ASSEMBLY PRINT #3
MODEL 425 OSCILLOSCOPE



ASSEMBLY PRINT #4 MODEL 425 - OSCILLOSCOPE



FINAL STEPS

You have now completed the assembly and wiring of your oscilloscope. When you have completed the following steps, your instrument will be ready for use.

- 1) Make a careful examination of the unit to determine whether all joints are soldered properly. Check for loose lumps of solder and straighten out the wiring and components so that there are no accidental shorts.
- 2) The flowing of rosin between switch contacts causes leakage. If examination reveals the presence of rosin, remove it by briskly cleaning the area between the contacts with a stiff brush saturated with carbon tetrachloride. Be very careful not to spring the contacts when cleaning switches.
- 3) Insert tubes in their sockets in accordance with Assembly Print 4. Note: Insert the 5BP1 CRT in the V8 socket through the hole in the front panel.
- 4) Measure the resistance to ground at the following points; pin 2 of V4 (low B +) ___ should be at least 75,000 ohms; pin 4 or 6 of V3 (high B-) ___ should be at least 1 megohm. If either resistance measures low, check the wiring and components of the rectifier circuit involved. Do not connect to the a-c power line until the reason for the low reading is found and corrected. NOTE: Wait until the ohmmeter reading reaches its final value.
- 5) Place a knob on each of the controls and tighten the set screws. Rotate all knobs maximum counter-clockwise and loosen the set screws. Adjust each knob and tighten the set screw so that the pointer indicates as follows in the maximum counter-clockwise position: VERT. GAIN, SYNC. AMP., FINE FREQ., HOR. GAIN ___ all at zero; COARSE FREQ. ___ 15 to 75; SYNC. ___ INT.; HOR. INPUT ___ SWEEP; VERT. POS., HOR. POS. ___ 30 degrees clockwise from straight down.
- 6) Install the chassis in the cabinet and secure with 10 self-tapping screws in the front panel and 2 in the rear.
- 7) Consult your instruction manual for complete operating procedures. Remember that this instrument may only be operated from the 105-125 volts a-c, 50/60 cycle line.

NOTE

If the instrument fails to operate properly, make certain that the wiring is correct, test for continuity and check individual components for breakdown. In addition check the voltages given in the following table, using a VTVM if you have one. (When measuring across high impedance circuits, loading effect must be considered if a VTVM is not used.) All voltages may vary from the values shown by as much as 20%. Failure to obtain the proper voltages at any point should indicate where to look for the trouble.

CAUTION: The voltages in this instrument are dangerous. Extreme care must be exercised that no personal contact is made with these voltages when the instrument is being operated outside of its cabinet. While the instrument is being removed from or inserted in the cabinet, be sure that the power cord is disconnected from the a-c line. Remember that capacitors may still be charged to dangerously high voltages for some time after the instrument has been turned off and disconnected from the power line.

VOLTAGE CHART

PIN#	TUBE							
	V1 6J5	V2 6SN7	V3 5Y3	V4 5Y3	V5 6SN7	V6 6J5	V7 7SN7	V8 5BP1
1	0	60	0	0	0	0	0	-1380
2	0	275	925AC	420	230	0	91	0
3	140	72.5	0	0	9.8	120	2.2	0*
4	0	59	-1400	300AC		140	-15	-1100
5	0	270	0	0	255	0	58	0
6	320	72.5	-1400	300AC	9.8	320	2.2	0*
7	6.3AC	6.3AC		0	6.3	6.3AC	6.3AC	0
8	4.2	0	925AC	420	0	4.6	0	0*
9								-1380
10								-1380
11								

* Varies from +100 to -100 depending upon setting of positioning control.

Control Settings: VERT. GAIN, SYNC. AMP., FINE FREQ. — all at 0; HOR. GAIN at 50; INTENSITY — almost full; FOCUS — almost full; HOR. INPUT at SWEEP; SYNC. at INT.; VERT. POS.; HOR. POS. — half-rotation.

Unless otherwise indicated, all voltages are dc, positive, and measured to chassis.

Line Voltage: 115 volts, 60 cps.

All measurements made with VTVM

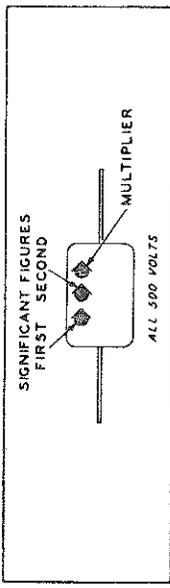
Voltages may vary up to 20% without affect.

SERVICE

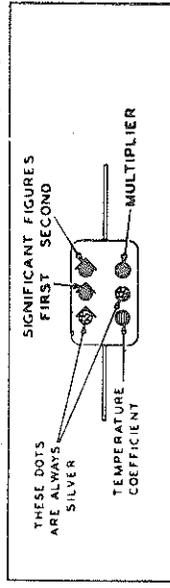
If you are still having difficulty, write to our service department listing all possible indications that might be helpful. If desired, you may return the instrument to our factory where it will be placed in operating condition for \$5.00 plus the cost of parts replaced due to their being damaged in the course of construction. This service policy applies only to completed instruments constructed in accordance with the instructions as stated in the manual. Instruments that are not completed or instruments that are modified will not be accepted for repair. Instruments that show evidence of acid core solder or paste fluxes will be returned not repaired. **NOTE:** Before returning this unit, be sure all parts are securely mounted. Attach a tag to the instrument, giving your home address and the trouble with the unit. Pack very carefully in a rugged container, using sufficient packing material (cotton, shredded newspaper, or excelsior), to make the unit completely immovable within the container. The original shipping carton is satisfactory, providing the original inserts are used or sufficient packing material is inserted to keep the instrument immovable. Ship by prepaid Railway Express, if possible, to the Electronic Instrument Co., Inc., 84 Withers Street, Brooklyn 11, New York. Return shipment will be made by express collect. Note that a carrier cannot be held liable for damages in transit if packing, IN HIS OPINION, is insufficient.

CAPACITOR COLOR CODES

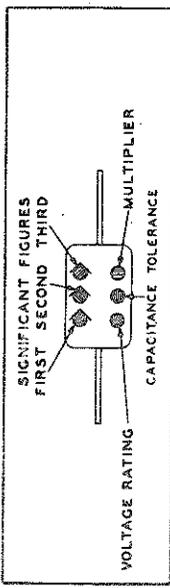
RMA 3-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



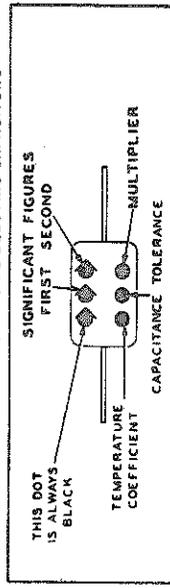
JAN 6-DOT COLOR CODE FOR PAPER-DIELECTRIC CAPACITORS



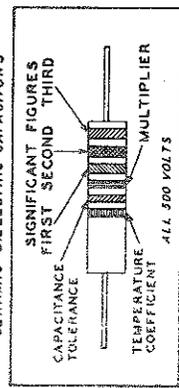
RMA 6-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



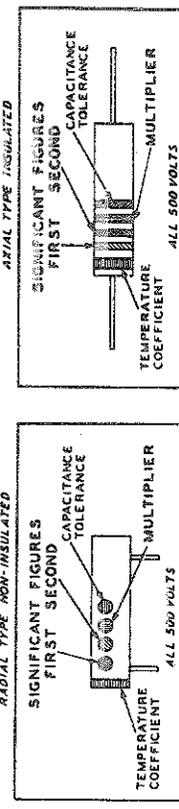
JAN 6-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



RMA COLOR CODE FOR TUBULAR CERAMIC-DIELECTRIC CAPACITORS

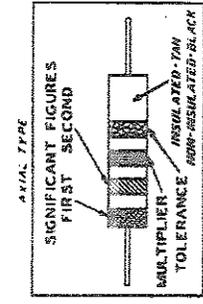


JAN COLOR CODE FOR FINED CERAMIC-DIELECTRIC CAPACITORS

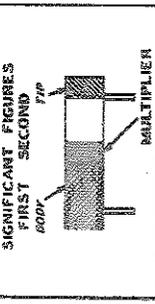


RESISTOR COLOR CODES

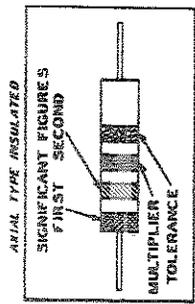
RMA COLOR CODE FOR FINED COMPOSITION RESISTORS



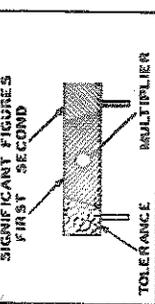
RADIAL TYPE



JAN COLOR CODE FOR FINED COMPOSITION RESISTORS



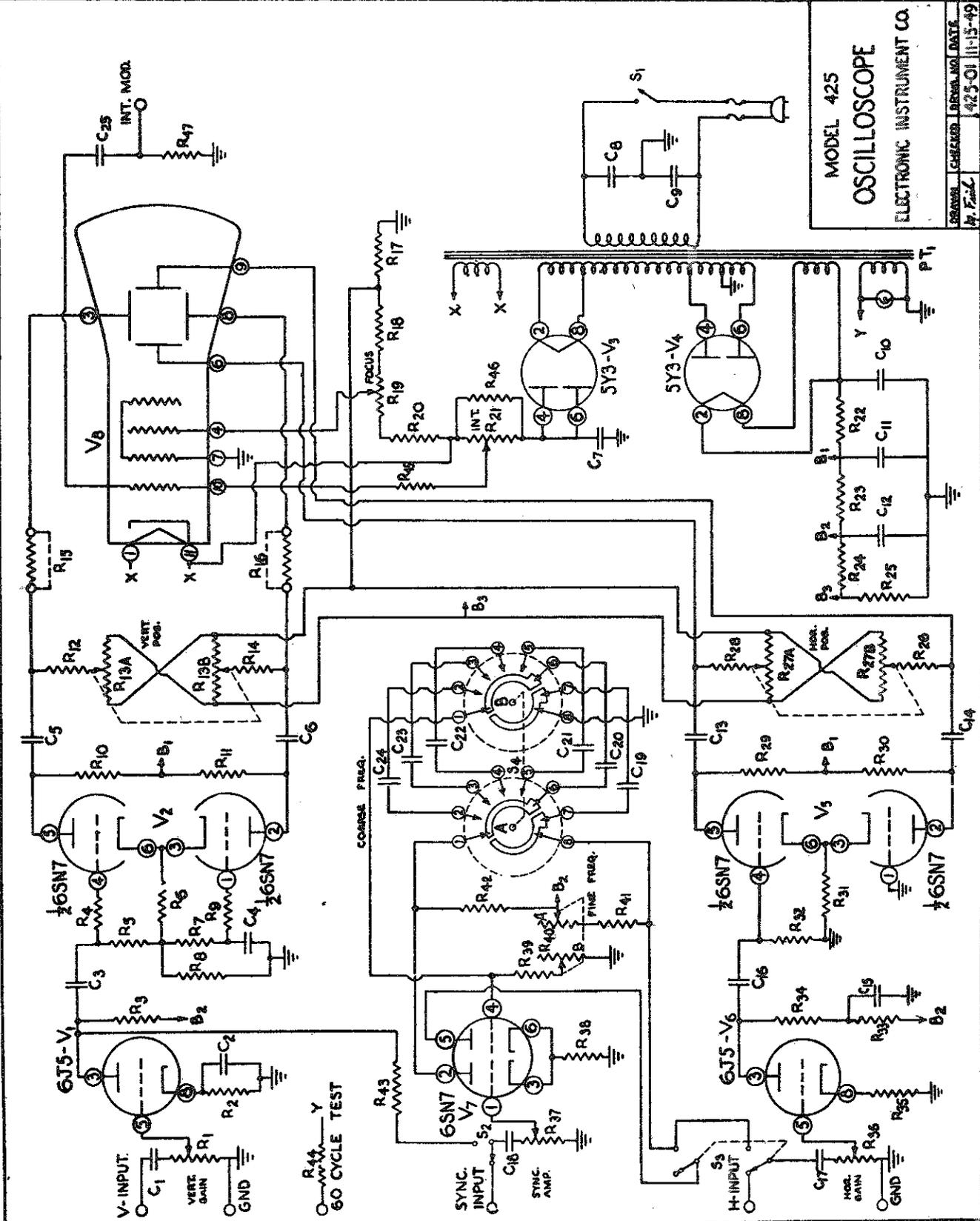
RADIAL TYPE NON-INSULATED



RMA: RADIO MANUFACTURERS ASSOCIATION
JAN: JOINT ARMY-NAVY

RESISTORS		CAPACITORS						
TOLERANCE	MULTIPLIER	SIGNIFICANT FIGURE	COLOR	RMA MICA AND CERAMIC-DIELECTRIC	JAN MICA AND PAPER-DIELECTRIC	JAN CERAMIC DIELECTRIC	VOLTAGE RATING	TEMPERATURE COEFFICIENT
1	1	0	BLACK	1	1	1	A	
	10	1	BROWN	10	10	10	100	B
	100	2	RED	100	100	100	200	C
	1000	3	ORANGE	1000	1000	1000	300	D
	10000	4	YELLOW	10000	10000		400	E
	100000	5	GREEN	100000	100000		500	F
	1000000	6	BLUE	1000000	1000000		600	G
	10000000	7	VIOLET	10000000			700	
	100000000	8	GRAY	100000000		0.01	800	
	1000000000	9	WHITE	1000000000		0.1	900	
5	0.1		GOLD		0.1		1000	
10	0.01		SILVER		0.01		2000	
20			NO COLOR				500	

PART #	SYMBOL	SPECIFICATION
6	C1	.25 MFD TUBULAR
10	C2	.002 MFD TUBULAR
4	C3	.001 MFD TUBULAR
7	C4	.1 MFD TUBULAR
5	C5	.1 MFD TUBULAR
6	C6	.1 MFD TUBULAR
7	C7	.1 MFD TUBULAR
7	C8	.1 MFD TUBULAR
7	C9	.1 MFD TUBULAR
7	C10-12	TRIPLE TONED TRIMMER
2	C13	.1 MFD TUBULAR
7	C14	.1 MFD TUBULAR
7	C15	.1 MFD TUBULAR
7	C16	.1 MFD TUBULAR
4	C17	.1 MFD TUBULAR
8	C18	.1 MFD TUBULAR
4	C19	.1 MFD TUBULAR
7	C20	.1 MFD TUBULAR
7	C21	.1 MFD TUBULAR
7	C22	.1 MFD TUBULAR
11	C23	.00088 MFD NICA
12	C24	OR CERAMIC
9	C25	.01 MFD 100V DLT'S
9	C26	1000 OHM 1/2 WATT RESISTOR
35	R1	1 MEG POTENTIOMETER
75	R2	1500 OHM 1/2 WATT RESISTOR
66	R3	47K 1/2 WATT RESISTOR
66	R4	100 OHM 1/2 WATT RESISTOR
66	R5	1 MEG 1/2 WATT RESISTOR
66	R6	680 OHM 1/2 WATT RESISTOR
66	R7	1 MEG 1/2 WATT RESISTOR
66	R8	1 MEG 1/2 WATT RESISTOR
66	R9	47 OHM 1/2 WATT RESISTOR
66	R10	18K 1/2 WATT RESISTOR
66	R11	22K 1/2 WATT RESISTOR
66	R12	22K 1/2 WATT RESISTOR
66	R13	DUAL .4 MEG POTENTIOMETER
34	R14	4.7 MEG 1/2 WATT RESISTOR
59	R15	4.7 MEG 1/2 WATT RESISTOR
59	R16	100K 1/2 WATT RESISTOR
61	R17	510K 1/2 WATT RESISTOR
61	R18	200K POTENTIOMETER
58	R19	200K POTENTIOMETER
58	R20	100K POTENTIOMETER
74	R21	1K 1/2 WATT RESISTOR
74	R22	5K 1/2 WATT RESISTOR
74	R23	10K 1/2 WATT RESISTOR
64	R24	100K 1/2 WATT RESISTOR
64	R25	100K 1/2 WATT RESISTOR
59	R26	4.7 MEG 1/2 WATT RESISTOR
54	R27A	DUAL .4 MEG POTENTIOMETER
54	R27B	DUAL .4 MEG POTENTIOMETER
48	R28	22K 1/2 WATT RESISTOR
66	R29	47K 1/2 WATT RESISTOR
74	R30	1200 OHM 1/2 WATT RESISTOR
74	R31	100K 1/2 WATT RESISTOR
74	R32	100K 1/2 WATT RESISTOR
66	R33	500K 1/2 WATT RESISTOR
66	R34	500K 1/2 WATT RESISTOR
66	R35	3.6K 1/2 WATT RESISTOR
58	R36	1 MEG POTENTIOMETER
58	R37	1 MEG POTENTIOMETER
78	R38	470 OHM 1/2 WATT RESISTOR
68	R39	21K 1/2 WATT RESISTOR
56	R40A	DUAL .50K 1 MEG POT.
56	R40B	DUAL .50K 1 MEG POT.
66	R41	47K 1/2 WATT RESISTOR
60	R42	1 MEG 1/2 WATT RESISTOR
60	R43	100K 1/2 WATT RESISTOR
70	R44	100K 1/2 WATT RESISTOR
61	R45	510K 1/2 WATT RESISTOR
61	R46	510K 1/2 WATT RESISTOR
61	R47	510K 1/2 WATT RESISTOR
80	S1	SPST SWITCH (2 LUG)
81	S2	DPDT SWITCH (6 LUG)
82	S3	2 WAFER POSITION SWITCH
83	S4	2 WAFER POSITION SWITCH



MODEL 425
OSCILLOSCOPE
ELECTRONIC INSTRUMENT CO.

DESIGNED	CHECKED	REVISION NO.	DATE
M. F. L.		425-O1	11-15-49

Model 425 Addenda

Please make the following changes in your construction and instruction books on the Parts List, Wiring tables, Schematic Diagram etc.

<u>Sym.</u>	<u>Old Stk. #</u>	<u>Old Description</u>	<u>New Stk. #</u>	<u>New Description</u>
F1	97801	Fuse mount	97802	No change
H9	None	CRT socket retaining ring	42503	No change
R34	10810	50K Ω , 1W	No change	47K Ω , 1W
R8	10806	6K Ω , 1W	No change	6.2K Ω , 1W
R23	10903	5K Ω , 2W	No change	4.7K Ω , 2W
R45	10013	5K Ω , 1/2W	No change	5.1K Ω , 1/2W
T10	54001	Single post term. strip	54000	No change
R35	10010	3.6K Ω , 1/2W	10420	3.3K Ω , 1/2W
R10	10808	18K Ω , 1W	10833	No change
H15	87001	Handle (plastic)	87004	Handle (leather)
H26	41006	10-24 screw	89527	Handle holder
B1	92000	Pilot light & assembly	No change	Pilot light, #47
Add: None	None	None	97700	Pilot light assembly

As a leather handle is now supplied instead of the plastic type used previously, the handle mounting instruction on Assembly Print #3, no longer applies and is superceded by the following procedure:

Lay the leather handle on the cabinet top so that the slots rest over the center holes of each set of three holes. Place a U-shaped bracket over each slot, passing the prong through the slot and the holes beneath. Fasten the brackets to the cabinet with 4 #6-32 X 3/8 screws, 4 #6 hex nuts and 4 #6 lockwashers.

Please make the following corrections on the voltage chart for V8-5BP1.

<u>Pin#</u>	<u>Voltage</u>
1	-1250
2	N/C
3	0 *
4	-900
5	N/C
6	0 *
7	0 *
8	0 *
9	0 *
10	-1250
11	-1250

The sockets now supplied with the kit contain their own ground lugs so that separate ground lugs need not be mounted with these sockets. Wherever connection to a separate ground lug mounted with a tube socket is indicated, use the closest integral ground lug on the socket base.

MODEL 425 ADDENDA

The Model 425 kit is supplied with six (6) binding posts, J1 thru J6. Each binding post assembly as supplied, consists of 6 individual pieces.

1. The binding post.
2. A bakelite shoulder washer, about 1/8" thick.
3. A bakelite cylindrical washer, about 1/8" thick.
4. A metal flat washer.
5. Two #8 hex nuts.

Note that on two of these binding post assemblies, item #3, is supplied with a metal cylindrical washer, instead of the bakelite. These are to be used as jacks J1 and J4.

The procedure used for mounting these pieces on the panel is as follows:

1. Through the appropriate hole, from the front side of the panel, push the narrow part of the shoulder washer (piece #2) so that the wider part rests on the panel.
2. Through the hole in the shoulder washer, push the threaded end of the binding post (piece #1). This is also done from the front side of the panel.

The following steps are all done from the rear of the panel:

3. Slip the cylindrical washer (item #3) over the threaded section and the part of the shoulder washer protruding through the rear of the panel. Note that this washer is a bakelite for J2, 3, 5, 6, and metallic for J1 and J4.
4. A flat washer is now placed over the cylindrical washer (item #4).
5. This entire assembly is then tightened with one of the #8 hex nut (item #5). Before tightening, orient each binding post so that the small wire hole is horizontal.
6. A #8 ground lug supplied with the kit is put over the hex nut (on J2, 3, 5, and 6).
7. A second hex nut (item #6) tightens the ground lug onto the binding post. In front panel mounting instructions, delete steps J1 thru J6.

I. E. 1213 Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N.Y.

MODEL 425 ADDENDA

The CRT tube now supplied is type 5CP1, not 5BP1. The related parts and the construction manual have been changed accordingly. Please note that these two CRT tube types are not inter-changeable, differing as they do in various dimensions, type of base, and also the incorporation of a post accelerating electrode in the 5CP1. If at any time you should desire to replace the CRT tube in your instrument, it is essential that you specify type 5CP1. No change in the Model 425 specifications is entailed by this change in the CRT tube type employed.

1) Disregard the Parts List printed in the book, use enclosed parts list in its place.

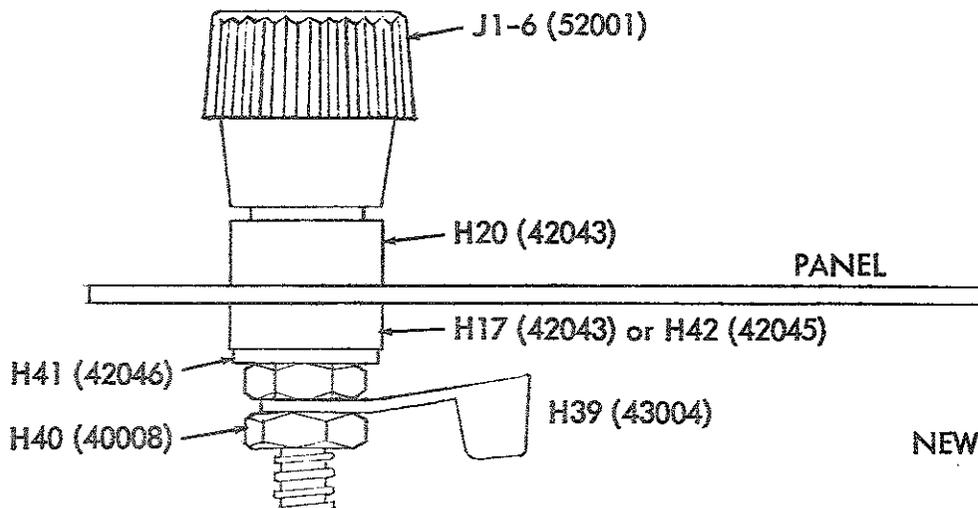
2) Please note that various resistors were changed in value. Make the corrections as follows before you begin the assembly.

- | | |
|--|---|
| <p>a) Assembly Print 1
R46 from 30KΩ, 1/2W to 47KΩ 1W</p> <p>b) Assembly Print 2A
R23 from 5KΩ to 4.7KΩ
R8 from 6KΩ to 6.2KΩ</p> | <p>c) Assembly Print 3
R35 from 3600 Ω to 3300 Ω
R34 from 50KΩ to 47KΩ
R45 from 5KΩ to 4.7K</p> |
|--|---|

3) On assembly diagram #1 — Front Panel Mounting Instructions. Disregard Step #14 (J1) to Step #19 (J6). In its place substitute the following:

<u>Check</u>	<u>Symbol</u>	<u>Description</u>	<u>Mounted With</u>	<u>Remarks</u>
	J1	ground binding post	1 #H20, 1 #H42, 1 #H41, 1 #H40	See new Inset "A"
	J4	ground binding post	1 #H20, 1 #H42 1 #H41, 1 #H40	
	J2	sync. input binding post	1 #H20, 1 #H17, 1 #H41, 2 #H40, 1 #H39	
	J3	60 cycle binding post	1 #H20, 1 #H17, 1 #H41, 2 #H40, 1 #H39	
	J5	horizontal input binding post	1 #H20, 1 #H17, 1 #H41, 2 #H40, 1 #H39	
	J6	vertical input binding post	1 #H20, 1 #H17, 1 #H41, 2 #H40, 1 #H39	

Panel Wiring - Assembly Print #1
6th line change R13 #3A (C) to R13 #3A (S).



NEW INSET A

4) On assembly print #2 — Mounting Directions. Disregard Step #23 (H8) to Step #25 (T9). In its place substitute the following:

<u>Check</u>	<u>Symbol</u>	<u>Description</u>	<u>Mounted With</u>	<u>Remarks</u>
	H8	tube support	4 #H27, 4 #H28, 4 #H33	see enclosed dwg.
	L10	solder lug	1 #H27, 1 #H28	
	L11-T8	solder lug, 2 post term. strip	1 #H27, 1 #H28	
	T9	4 post terminal board	4 #H27, 2 #H12	

5) Make the following substitutions for the lines indicated in Assembly Print 2A.

<u>Line#</u>	<u>Check</u>	<u>Symbol</u>	<u>Description</u>	<u>From</u>	<u>To</u>	<u>Remarks</u>
5th add line		PT1	power transformer bare wire	yellow lead (C) V8-1	V8-1 (C) * V8-2 (S) *	
6th		PT1	power transformer	yellow lead	V8-14 (S) *	
26th			hook-up wire	(S) T4-2	V8-11 (S) *	thread thru T6-1
27th			hook-up wire	(S) T4-3	V8-10 (S) *	thread thru T6-2
38th			hook-up wire	(S) V8-7 *	T9-1 (C)	
41st			hook-up wire	(S) T9-3 *	V8-8 (S)	
42nd			bare wire	(S) V8-9 *	bracket (S).	

* See new drawing of Assembly Print #3 inset (cathode ray tube support)

NOTE: On assembly print 2A — change the designation on one of the wires passing thru H4 from V8 #11 to V8 #14.

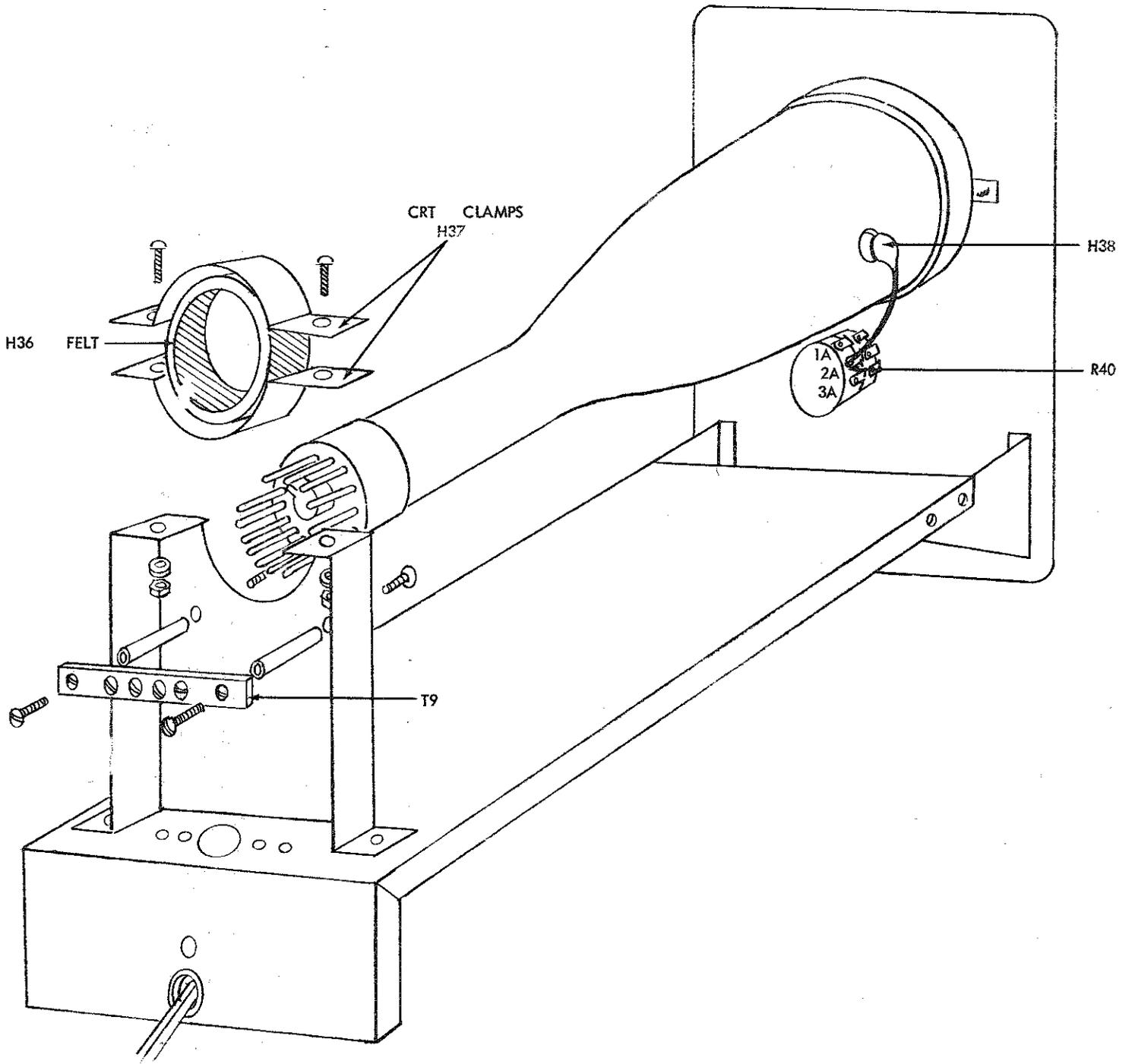
6) Make the following substitutions for the lines indicated on Assembly Print #3.

<u>Line#</u>	<u>Check</u>	<u>Symbol</u>	<u>Description</u>	<u>From</u>	<u>To</u>	<u>Remarks</u>
20th			wire	(S) R21 #1	V8 #1 (S)	
23th			wire	(S) T8 #1	V8 #3 (S)	
24th			wire	(S) R19 #2	V8 #5 (S)	
28th			wire	(C) R40 #2A	V6 #6 (S)	
add			wire (12")	(S) R40 #2A	anode connector	

7) Replace Step #3 in the final steps with the following:

Insert the tubes in their sockets in accordance with Assembly Print #4. Note: Insert the 5CP1 CRT in the V8 socket thru the hole in the front panel. Wrap the small felt strip around base of 5CP1 and insert between CRT clamps H38. To tighten clamps, use 2 #H29, 2 #H33 and 2 #H28. Tighten until the CRT does not move. Plug the anode connector into the anode of the 5CP1.

8) As a leather handle is now supplied instead of the plastic type used previously, the handle mounting instructions on Assembly Print #3, no longer applies and is superseded by the following procedure:



ASSEMBLY PRINT #4

REPLACEMENT LIST PARTS

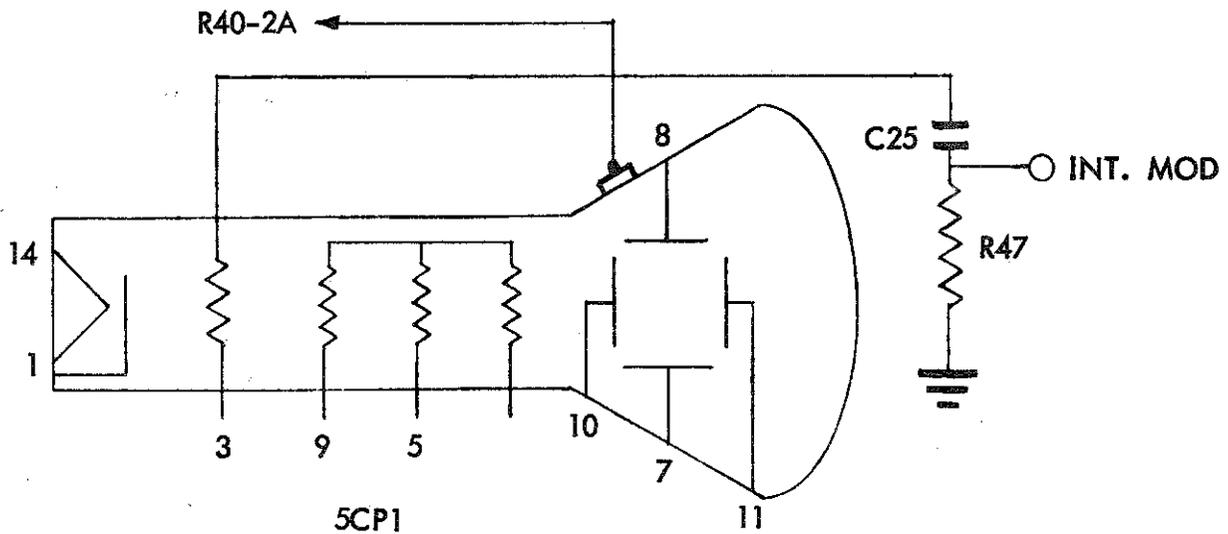
Stock#	Sym.	Description	Am't.	Stock#	Sym.	Description	Am't.
97700	B1	pilot light assembly	1	43004	H39	lugs (for binding post)	4
24002	C10-12	triple 10 mfd condenser	1	40008	H40	8-32 nuts (for binding post)	10
27000	C7	1 mfd HV condenser	1	42046	H41	#8 flat metal washer	6
20005	C3, 4, 15, 17, 19	cap., .5 mfd tubular	5	42045	H42	metal washer 1/8" thick	2
20004	C1	cap., .25 mfd tubular	1	52001	J1-6	binding posts	6
20006	C5, 6, 8, 9 C13, 14, 16, 20	cap., .1 mfd tubular	8	50000	J7	pin jack	1
20008	C18, 21	cap., .02 mfd tubular	2	30003	PT1	power transformer	1
20010	C25	cap., .01 mfd 1200V	1	18003	R13A, B R27A, B	pot. 4MΩ dual	2
20002	C2	cap., .002 mfd tubular	1	16006	R1, 36	pot. 1MΩ	2
20007	C22	cap., .003 mfd tubular	1	18006	R40A, B	pot., 250KΩ-1MΩ, dual	1
21002	C23	cap., .00068 mfd mica	1	16002	R19	pot., 250KΩ	1
22001	C24	cap., .0001 mfd mica	1	16005	R21, 37	pot., 100KΩ	2
97802	F1	fuse mount	2	10034	R12, 14, 15 R16, 26, 28	res., 4.7MΩ 1/2W	6
91000	F2	fuses	2	10030	R5, 7	res., 1MΩ, 1/2W	4
81042	H1	left mounting bracket	1		R32, 43		
81043	H2	right mounting bracket	1	10812	R18, 47	res., 510KΩ, 1W	2
59502	H3	H.V. condenser bracket w/hardware	1	10025	R41	res., 200KΩ, 1/2W	1
46002	H4	3/4" rubber grommet	1	10811	R20	res., 100KΩ, 1W	1
46000	H5	3/8" rubber grommet	1	10024	R17, 24 R25, 33	res., 100KΩ, 1/2W	4
42012	H6	pin jack star washer	1	10810	R34	res., 47KΩ, 1W	4
80008	H7	front panel	1		R3, 30, 42		
81178	H8	support, CRT	1	10810	R46	res., 47KΩ, 1W	1
92000	H9	pilot lite #47	1	10809	R11, 29, 39	res., 22KΩ, 1W	3
59302	H10	felt strip	1	10833	R10	res., 18KΩ, 1W	1
81041	H11	tube shield	1	10016	R44	res., 10KΩ, 1/2W	1
44009	H12	standoffs 1 1/2"	2	10806	R8	res., 6.2KΩ, 1W	1
81179	H13	Chassis	1	10903	R23	res., 4.7KΩ, 2W	1
88003	H14	cabinet	1	10013	R45	res., 4.7KΩ, 1/2W	1
87004	H15	handle, leather	1	10420	R35	res., 3.3KΩ, 1/2W	1
41008	H16	6/32 x 1/2 screws	2	10008	R2, 31	res., 1200Ω, 1/2W	2
42044	H17	bakelite flat washer	4	10902	R22	res., 1KΩ, 2W	1
57000	H18	line cord	1	10007	R6	res., 680Ω, 1/2W	1
59500	H19	condenser mounting wafer	1	10005	R38	res., 470Ω, 1/2W	1
42043	H20	bakelite shoulder washer	6	10002	R4, 9	res., 47Ω, 1/2W	2
42001	H21	3/8 panel washer	9	61000	S1	SPST switch (2 lug)	1
40001	H22	3/8 pot. nuts	9	61001	S2	SPDT switch (3 lug)	1
40002	H23	7/16 toggle switch nuts	6	61002	S3	DPDT switch (6 lug)	1
42000	H24	3/8 lock washer	9	60008	S4A, B	2 wafer 5 pos. switch	1
41002	H25	#6 self tapping screw	16	54003	T1, 6-8	2 post term. strips	4
89527	H26	handle holder	2	54006	T2-3	3 post term. strips	2
41000	H27	6/32 x 1/4 screws	51	54008	T4-5	4 post term. strips	2
40000	H28	6/32 nuts	53	54500	T9	4 post term. board	1
41007	H29	6/32 x 3/4 screws	2	54000	T10	Single post term. strip	1
97146	H30	CR tube socket	1	54002	T11	single post term. strip with gnd	1
97003	H31	octal sockets	7	90004	V1, 6	6J5 tube	2
53000	H32	knobs	9	90019	V2, 5, 7	6SN7 tube	3
42002	H33	#6 lock washers	46	90001	V3, 4	5Y3 H.V. rectifier	2
59000	H34	oscillograph screen	1	90054	V8	5CP1 CRT	1
43000	H35, L1-11	solder lugs	10	58000		roll wire	
59301	H36	felt strip, CRT base	1	58300		spaghetti	
81032	H37	CRT clamp	2	58501		bare wire	
89620	H38	anode connector	1	81056		back plate	1
						instruction book	1

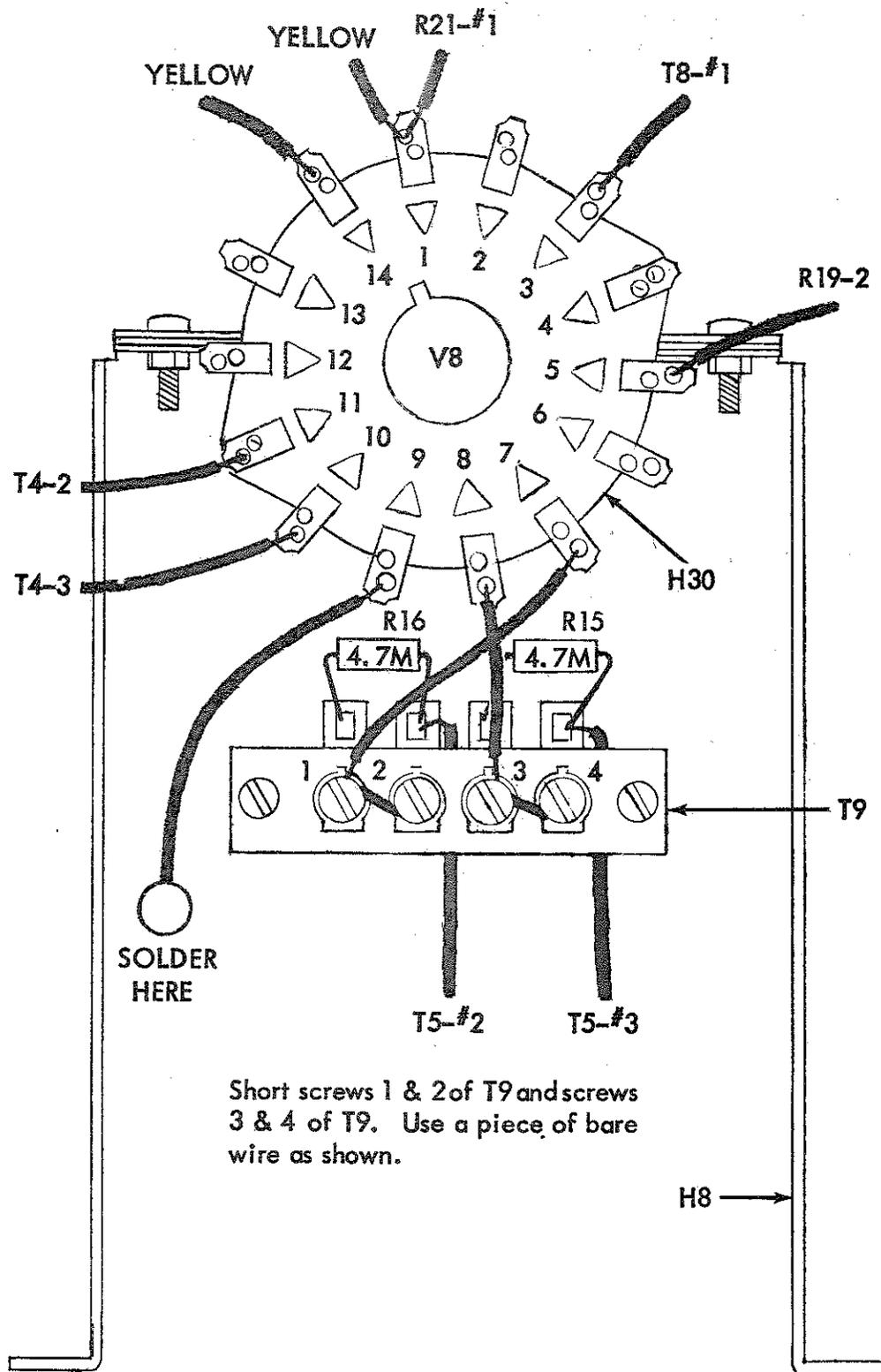
Lay the leather handle on the cabinet top so that the slots rest over the center holes of each set of three holes. Place a U-shaped bracket over each slot, passing the prong through the slot and the holes beneath. Fasten the brackets to the cabinet with 4 #6-32 x 3/8 screws, 4 #6 hex nuts and 4 #6 lockwashers.

9) Please make the following corrections on the voltage chart for V8 - 5CP1.

<u>Pin#</u>	<u>Voltage</u>	<u>Pin#</u>	<u>Voltage</u>
1	-1120	8	0*
2	-1120	9	0*
3	-1120	10	0*
4	-NC	11	0*
5	-790	12	NC
6	-NC	13	NC
7	0*	14	-1120

* Varies from +100 to -100 volts depending upon setting of positioning control.





Short screws 1 & 2 of T9 and screws 3 & 4 of T9. Use a piece of bare wire as shown.

CATHODE RAY TUBE SUPPORT
ASSEMBLY PRINT 3