

COST ANALYSIS - APPLE VS. SHADOW MASK RECEIVERSMarch 21,1958

During the past month, Research has made a rather thorough study of the relative costs of the RCA shadow-mask receiver (CT7A) and an hypothetical Apple receiver that is within the present state of the art. This was done to evaluate our present position with respect to shadow mask as best we can and to provide a base for consideration of further cost reduction and product improvement. It should be noted that this hypothetical receiver is not intended to be an approximation to receiver #10. Its design is intended to reflect the present state of the art with the present 1 1/2" neck tube, while Receiver 10 is intended to have numerous circuit and tube improvements permitting shallower cabinetry.

Our conclusion is that, costwise, the two receivers are a standoff but the hypothetical Apple receiver would have a performance edge over the shadow-mask receiver and has more room for improvement both costwise and productwise.

THE HYPOTHETICAL APPLE RECEIVER

In order to perform a cost analysis on Apple, the hypothetical receiver was designed on paper. The chassis is based upon the CT7A. That is, as much as possible, the CT7A circuitry is used. In the areas where this could not be done, we used circuitry and components that have already been checked out either on the Research stand (Diane) or Receiver 8XP. We assumed the present standard CRT assembly (CRT, yoke and focuser). This hypothetical receiver we call the "CT7A Conversion." We believe that such a receiver would have a performance level equal to that of Receiver 8XP and could be built fairly quickly because there is very little in it that is novel. The attached circuit diagrams cover all areas that are not CT7A circuitry. If this receiver were to be built, there would certainly be some changes; however, these changes shouldn't change the cost estimate by more than five dollars.

FURTHER COST REDUCTION OF APPLE

It is, of course, highly speculative to predict the steps by which substantial cost reduction will be achieved; however, it might be valuable to point out some possible areas.

1. Gun - If we had a gun having a much higher g_m it might be possible to eliminate the monochrome and chroma output stages, resulting in a direct saving of about \$7.45.

2. Yoke-focuser - If it became possible to use electrostatic focus and a deflection system similar to that of the TV 400 (by sharply reducing CRT beam current for example), savings of the order of \$10.00 could be achieved.

3. Loop - Intensive work on the loop (phototube though modulators) might result in savings of the order of \$8.00.

4. CRT - The \$73.00 figure used in this cost estimate certainly does not represent the terminal price of the tube.

SOURCES OF PRICE INFORMATION

1. The major part of the cost analysis is based on a list of cost rules obtained from the Cost Estimating Department. The list was compiled October 11, 1957 and revised March 7, 1958.

2. The items that were not included in the list were estimated on the basis of 1958 list prices. A factor was obtained relating Philco costs to list prices and was used to extract the needed information. This factor was approximately 1/4 of list for tubes, and 1/3 of list for other components.

3. The CRT assembly information is based on the latest available information from the Cost Estimating Department.

4. The mounting cost of the Apple tube was taken as the cost of mounting a 21" black and white tube.

5. The yoke costs are based on the following information:
 - a. Apple yoke - latest available cost estimating department information (dated January 1957).
 - b. RCA type yoke - based on cost of "Sickles #905."
6. The cost of the photomultiplier tube is taken to be \$5.00. This represents an estimate of the large quantity prices.

Signed _____

J. B. Chatten

Approved _____

S. W. Moulton

JBC/ro

Encls.

CTC7A and Conversion Material Cost Analysis

	<u>CTC7A</u>	<u>Conversion</u>
Subbase	1.500	1.500
Coils	5.502	4.919
Capacitors, fixed	10.716	11.839
Capacitors, variable		.330
Electrolytics	2.170	5.420
Controls	5.990	3.945
Light	.155	.155
Resistors	4.398	5.664
Sockets	1.060	1.593
H.V. Cage	.820	.990
Transformers	16.161	21.909
Tubes (does not include tuner tubes or photomultiplier)	17.561	27.100
Rectifiers, Selenium	1.500	
Diodes	.534	2.035
Hardware and other	7.712	7.476
TOTAL CHASSIS	<hr/> 77.899	94.909
VHF Tuner (Tuner tubes 1.676)	11.320	11.320
Anode cable	.450	.450
CRT Mtg. Parts	2.360	1.140
Yoke Assy.	17.520	9.850
Focus Assy.		3.580
Convergence	3.350	
Color Purity Coils	2.540	
Blue Pos. & Color Purity	.620	
Magnet Band Assy.	.660	
CRT Assy.	<hr/> 27.050**	15.880*
Chassis, Tuner, CRT Assy.	116.269	120.775
CR Tube	83.300	73.300
Photomultiplier		5.000
(Incl. CRT & Photomultiplier)		
TOTAL	199. 569	200.409

*Apple yoke - Jan, 1957

**Sickles #905 yoke

GTC7A CONVERSION-MATERIAL COST ANALYSIS

	Coils	Cap. Fixed	Cap. Variable	Cap. Electrolytic	Controls Light	Resistors	Sockets	H.V. Cage	Transformer	Tubes	Diodes	Circuit Totals
1	2.240	1.852	.745	---	---	.366	.080	---	.510	1.676	---	7.469
2	.050	1.540	---	.708	.390	.241	.111	---	1.250	1.406	.267	6.118
3	.484	1.406	---	---	.140	.514	.094	---	.540	1.438	.267	4.883
4	---	1.399	---	---	.560	.771	.137	---	---	2.285	---	5.152
5	.235	1.512	---	---	.475	1.431	.160	---	1.098	3.015	---	7.926
A	.300	1.646	.055	1.300	.700	.561	.288	.990	5.122	6.795	---	17.757
B	---	.140	---	2.910	---	.254	.168	---	11.582	1.392	.700	17.146
C	.750	1.005	---	.510	.560	.632	.176	---	.317	2.567	.267	6.784
D	3.100	3.211	.275	---	1.120	1.260	.459	---	2.000	8.208	.534	20.167
Chassis Totals	7.159	13.711	1.075	5.428	3.945	6.030	1.673	.990	22.419	28.782	2.035	93.402

Circuit Component Costs

Total 2 through D hardware & other subbase

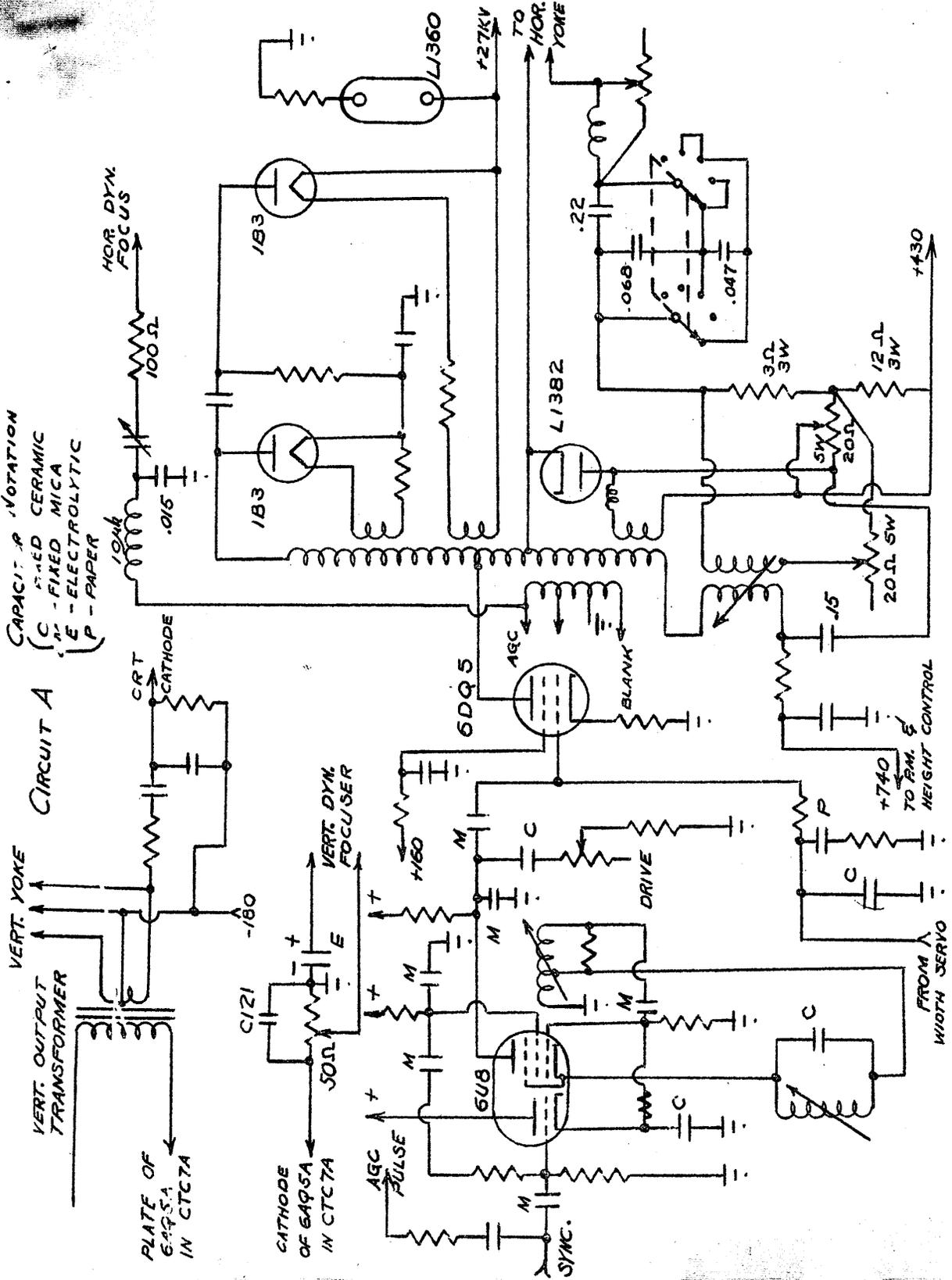
Total - Chassis

\$85.933
7.476
1.500

94.909

CAPACITOR NOTATION
 C - CERAMIC
 M - FIXED MICA
 E - ELECTROLYTIC
 P - PAPER

CIRCUIT A



VERT. YOKE

VERT. OUTPUT TRANSFORMER

PLATE OF 6AQ5A IN CTCTA

CATHODE OF 6AQ5A IN CTCTA

50Ω

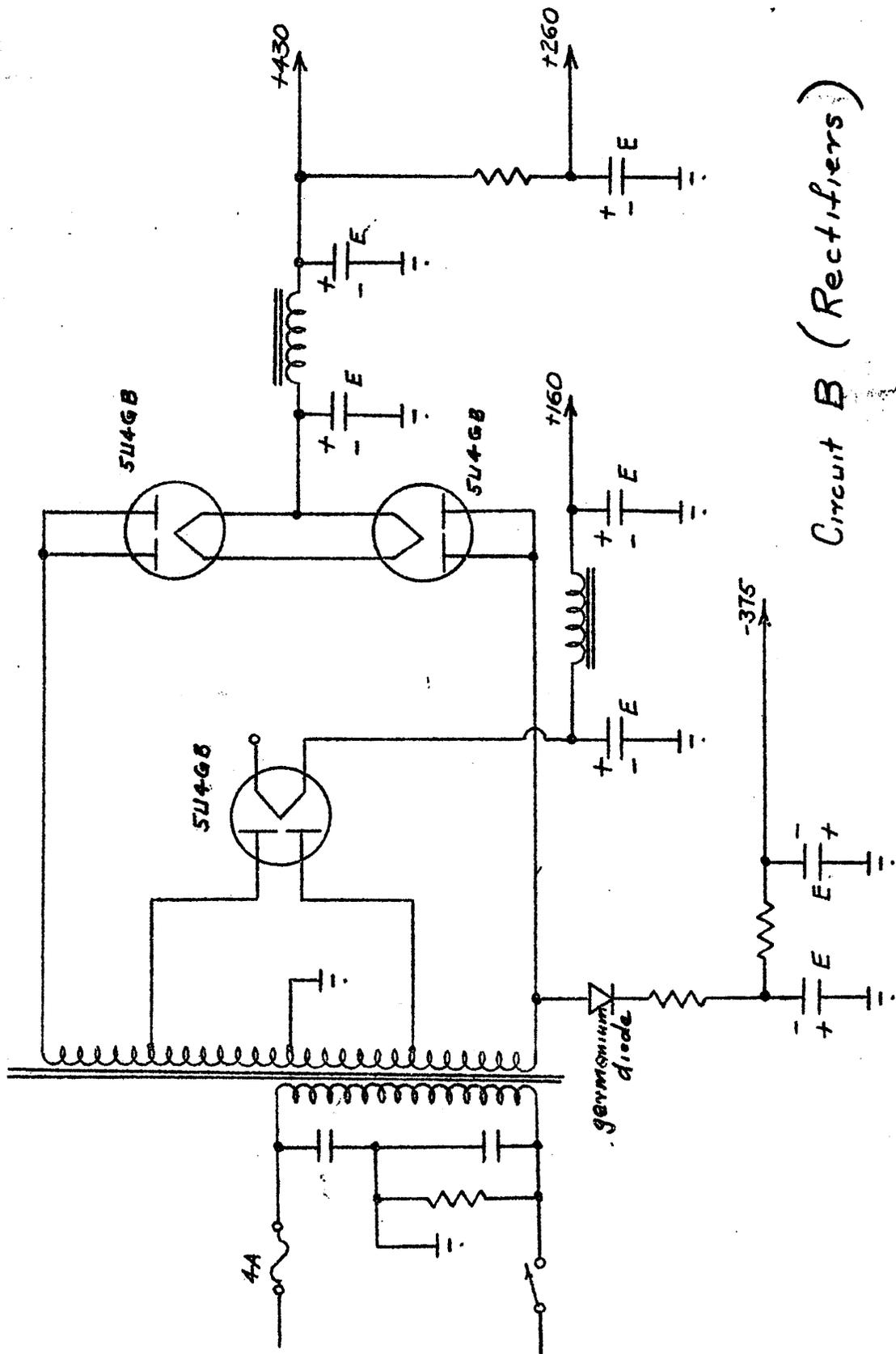
50V

10MΩ

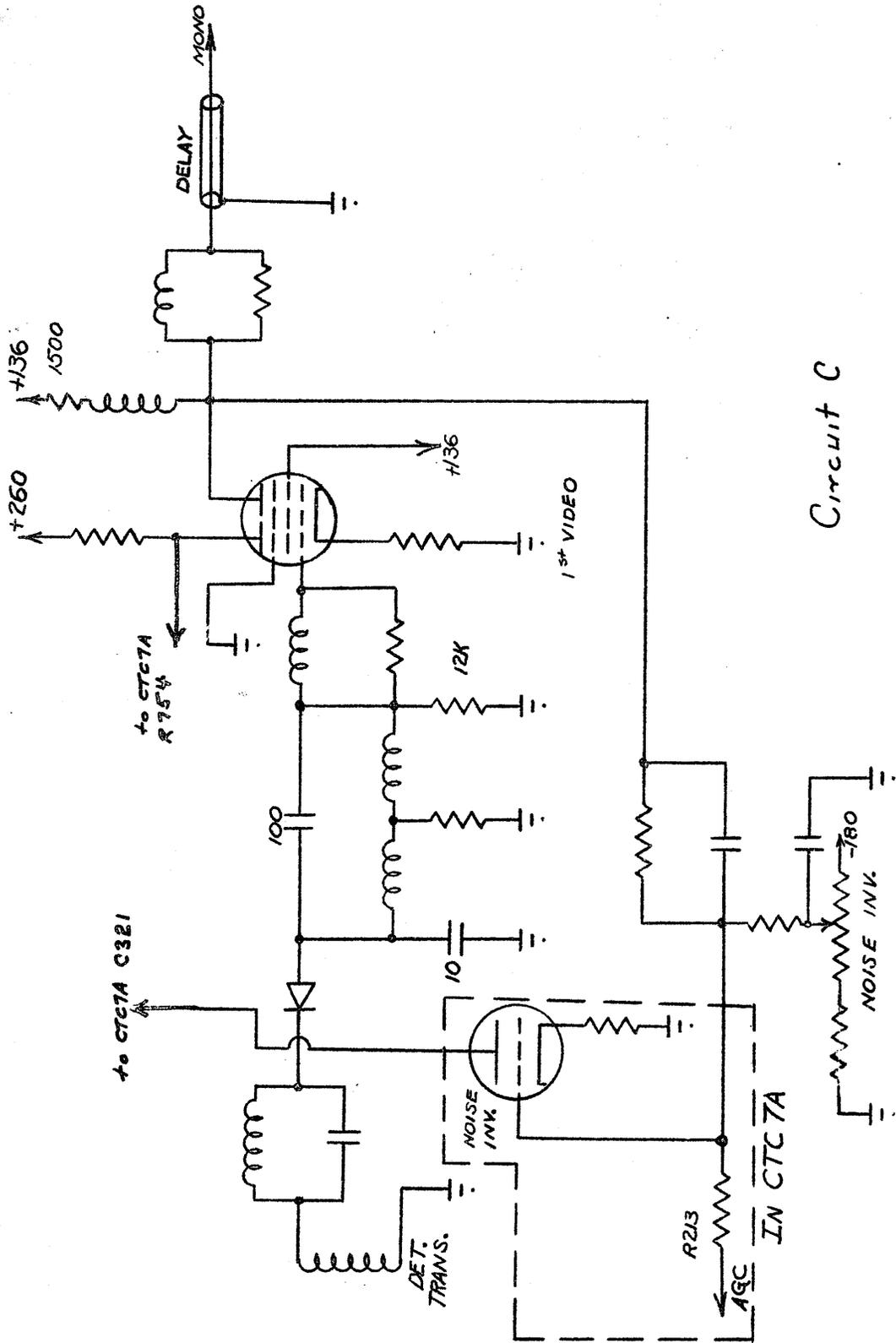
100V

100Ω

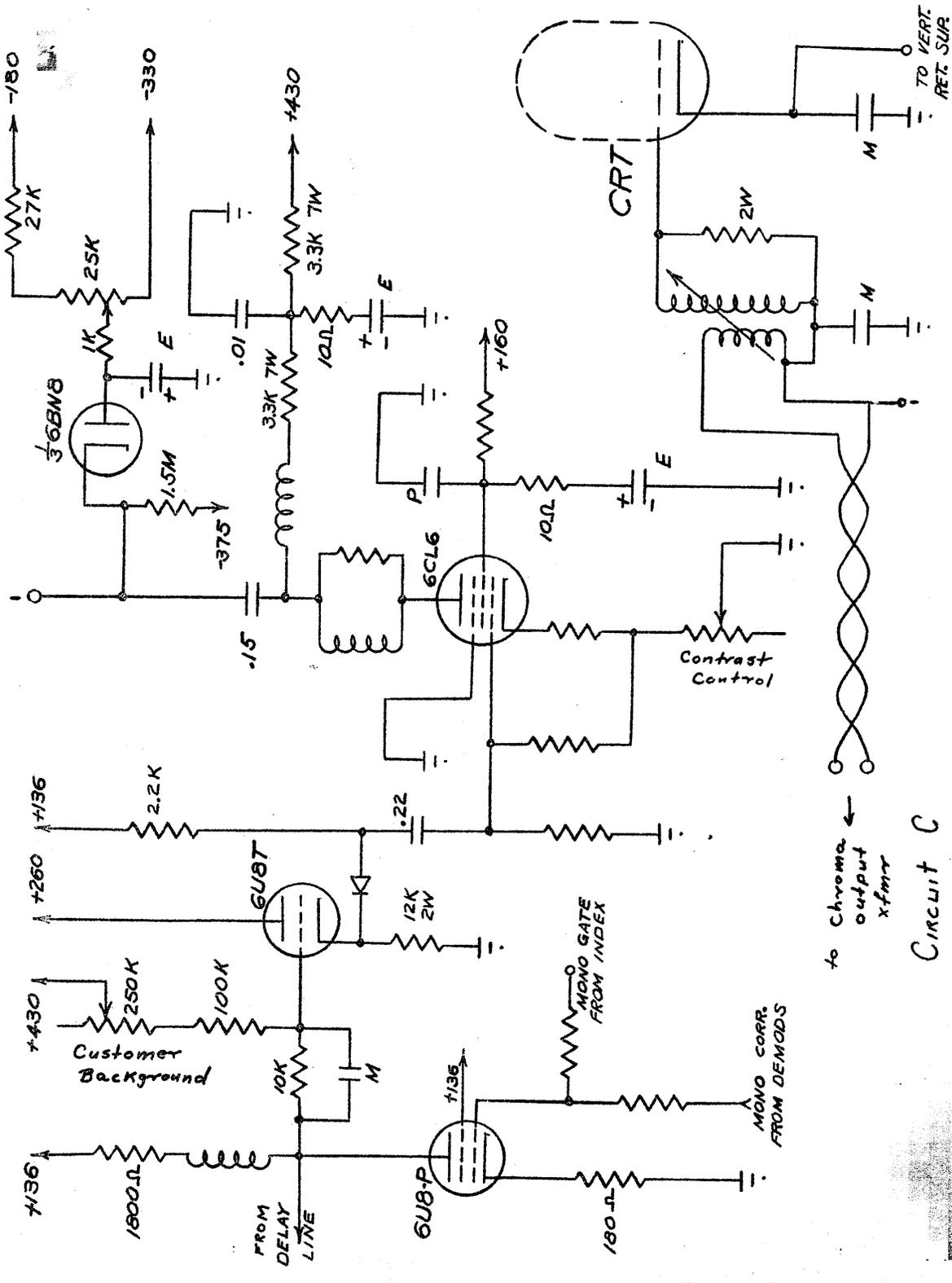
100V



Circuit B (Rectifiers)

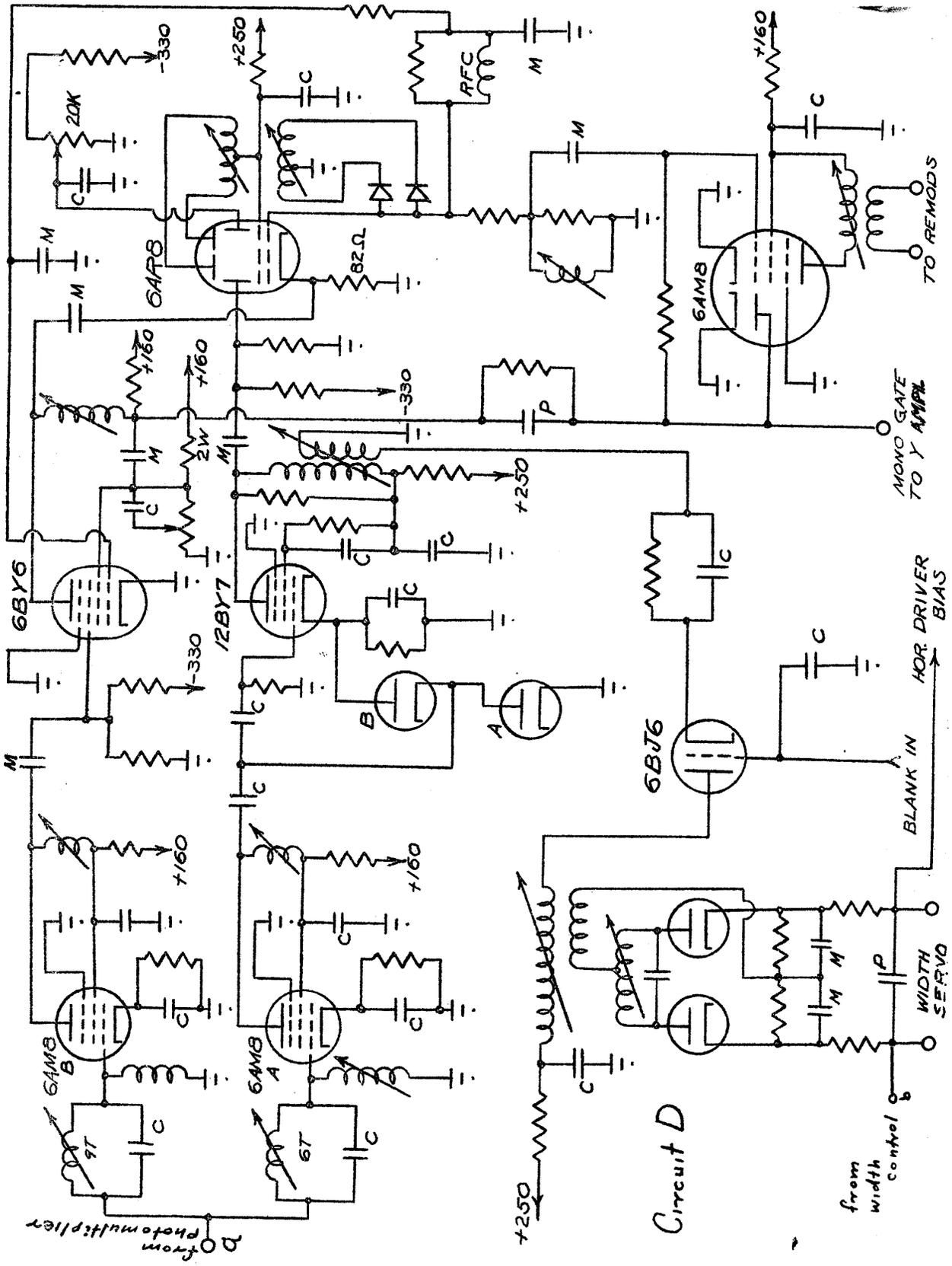


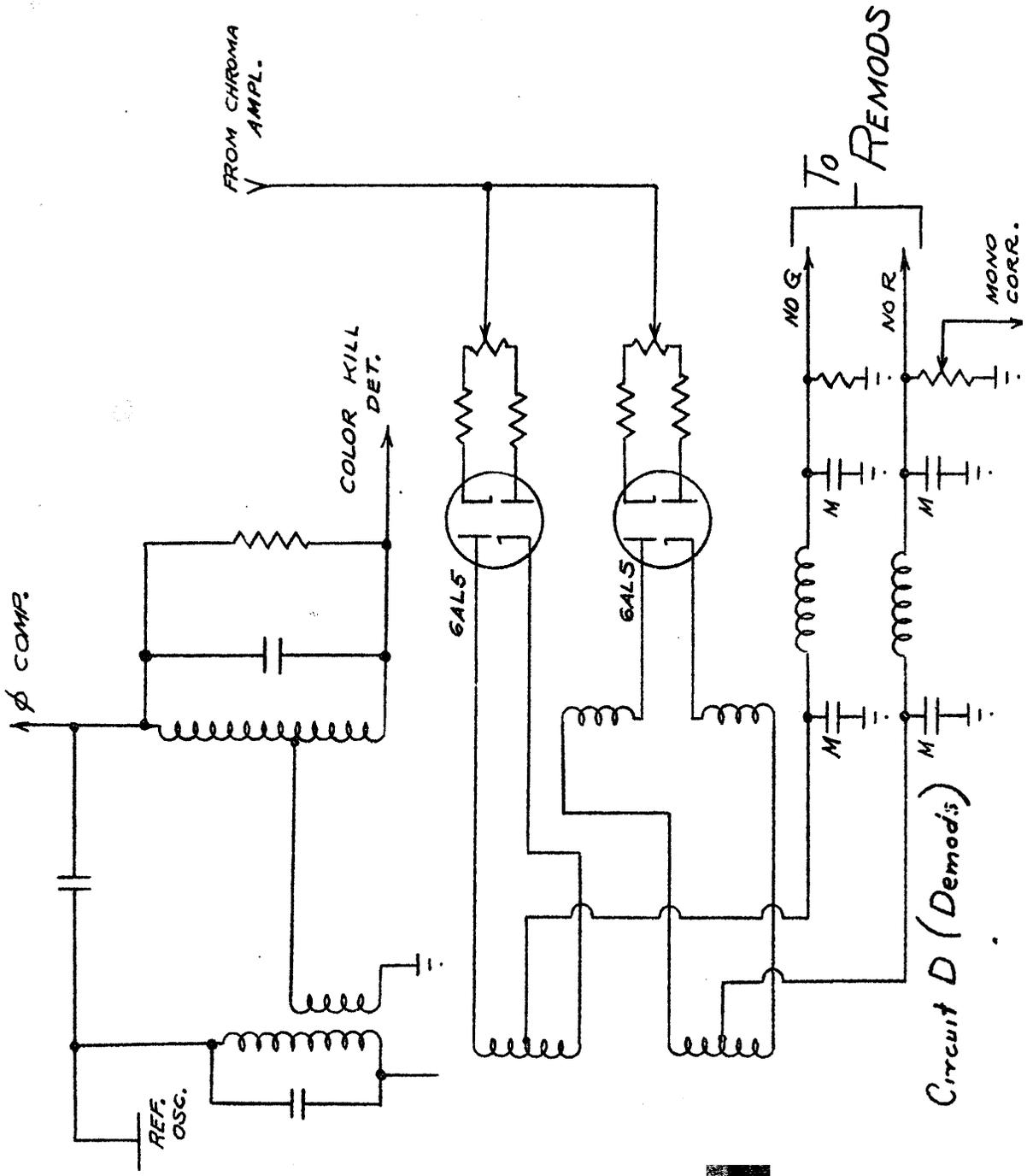
Circuit C

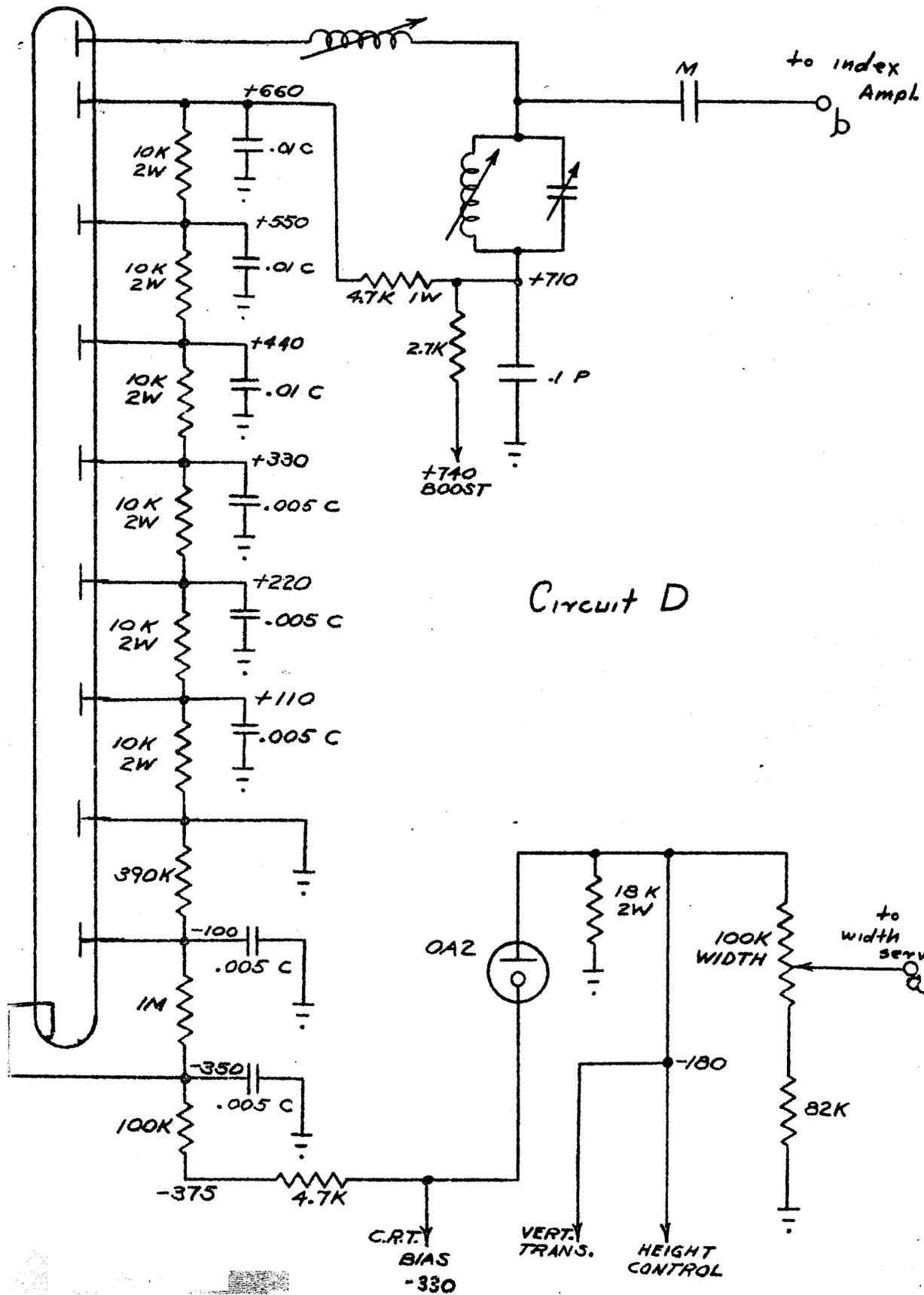


to Chroma output
x4mm

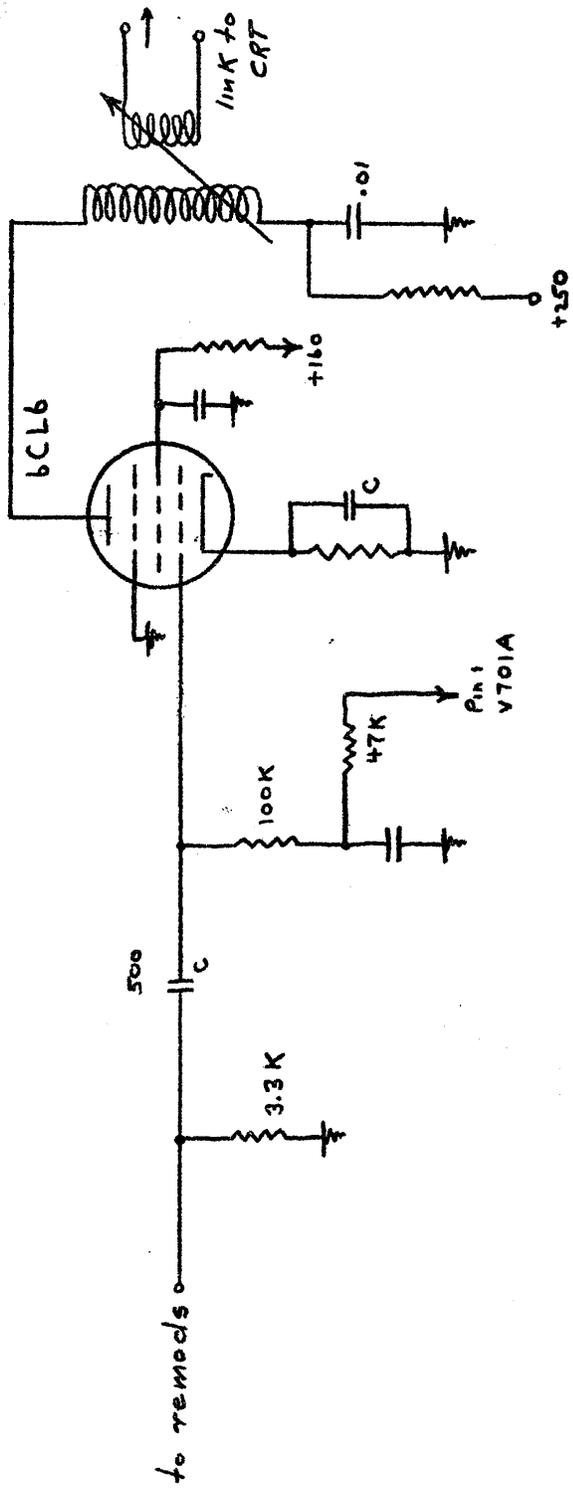
Circuit C







Circuit D



Circuit D (Chroma Output)