ELECTRONIC TECHNICIAN

Including SERVICE Magazine

104

Volume 4

- 104 TV-RADIO Schematics
- OVER 30 MANUFACTURERS
- Covers Hundreds of CHASSIS & MODEL Numbers

ELECTRONIC TECHNICIAN Now Including SERVICE Magazine

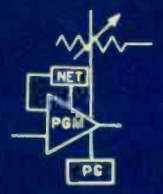
ELECTRONIC CIRCUIT SYMBOLS

ELECTRONIC TECHNICIAN Magazine
World's Largest
Electronic Trade Circulation

Graphical representation of electronic and related components provides an efficient shortcut in conveying technical information. To establish a universal meaning for each of these symbols, a set of standards have been developed jointly by the Institute of Radio Engineers (54IRE21S1) and the American Standards Association (Y32.2—1954). Presented here are more than 175 symbols selected from the 67 major categories included in the IRE-ASA standards. These symbols represent those most frequently used in the electronic industries, and may be considered the building blocks of the complete set of standards.

AMPLIFIERS

General:
Triangle points in direction of transmission



Program Amplifier with Associated Variable Attenuator, Feed Back Path, and Power Supply

ANTENNAS

Types or Functions may be indicated by words or abbreviations adjacent to the symbol

General

Dipole

Loop

Counterpoise

ARRESTORS, Gap

For Lightning or Electric Surges

General

Carbon Block

Horn Gap

Protective Gap

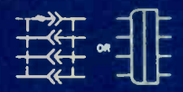
CHASSIS

Chassis Frame not necessarily at ground potential

CONNECTORS

Symbol not an arrowhead, but larger lines at 90°

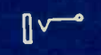
Male Contact



Engaged 4-conductor connectors. Plug has 1 male & 3 female contacts

Female Contact

Engaged coaxial connectors. Outside conductor carried through

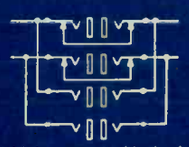


Two Conductor Jack

Two Conductor Plug

Jacks with circuit normalled through one way

Jacks with circuit normalled through both ways



Jacks in Multiple, one set with circuit normalled through both ways

2, 3, 4 Conductor Polarized Plugs, female contacts

CONTACTS, Electric

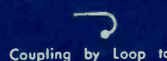
Fixed Contact

COUPLING

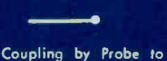
E, H or HE inside circle indicates type of coupling. E indicates plane of aperture is perpendicular to transverse component of major E lines. In H the plane is parallel. HE indicates coupling by all other kinds of apertures. Transmission loss may be indicated.

E-plane Coupling By Aperture to Space

E-plane Coupling 3 ends of Transmission Path Available



Coupling by Loop to Space



Coupling by Probe to Space

Coupling by Loop from Coaxial to Circular Waveguide with DC Grounds Connected

Coupling by Probe from Coaxial to Rectangular Waveguide with DC Grounds Connected

CRYSTALS

Piezoelectric Crystal

DEVICES, Audible Signal

Bell, general telephone ringer

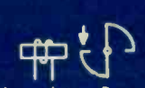
Buzzer

Horn, Howler, Loudspeaker, Siren

DEVICES, Visual Signal

Switchboard Type Lamp

Annunciator, general



Annunciator, Drop or Signal, Shutter or Grid Type

Manually Restored Drop

Electrically Restored Drop

DISCONTINUITY

LAMP

Ballast Lamp, Tube

4 terminal fluorescent lamp

2 terminal fluorescent lamp

Incandescent illuminating lamp

MACHINE, Rotating

General, Generator and Motor

Rotating Armature with Commutator and Brushes or Slip Rings

Compensating, or Commutating, Series and Shunt Fields

Generator or Motor dc, Permanent Magnetic Field

DC compound Motor with Commutating or Compensating Field Winding

1 Phase Hysteresis Motor

Reluctance Motor

Synchronous Motor with Neutral brought out

MAGNET, Permanent

METERS

A letter or letter combination from the following list shall be placed within the circle to indicate the function of the meter or instrument unless some other identification is provided in the circle and explained on the diagram.

A	Ammeter
AH	Ampere-hour meter
CMA	Contact-making (or breaking) ammeter
CMC	Contact-making (or breaking) clock
CMV	Contact-making (or breaking)

RECTIFIERS & DIODES

Solid State

RELAYS

Relay, basic

Relay coil

2-pole, double make

Polarized Relay with Transfer Contact

Relay Protective Function Balance, General

Relay Protective Function under, General

Relay Protective Functionot Differential, General

RESISTORS

General

Tapped Resistor

Resistor with Adjustable Control

Adjustable or Continuously Variable Resistor

Instrument or relay shunt

RESONATORS

General: Common for coax and waveguide

SHIELDING

TERMINATIONS

Coble Termination

Short Circuit, Movable Common for Coax and Waveguide

Terminating Resistor Common for Coax and Waveguide

Path Open Path Shorted Terminating Series Capacitor

THERMISTORS

THERMOCOUPLES

Temperature Measuring Thermocouple

TRANSFORMERS

General

Double Tuned

Shielded Transformer with Magnetic Core

One Winding with Top, one Winding Adjustable

3-phase Induction Regulator

Current Transformer, Polarity Marked

Potential Transformer Polarity Marked

Delta Transformer Wye Connections 3-phase

TRANSISTORS

Sphere Gap

Multigap

ATTENUATORS

Balanced, General

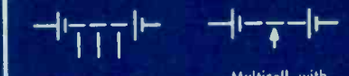
Unbalanced, General

BATTERIES

Long line always positive; polarity may be indicated in addition

dc source, General

Multicell



Multicell with 3 taps

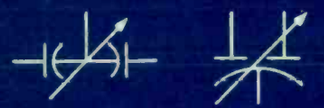
Multicell with adjustable tap

CAPACITORS

Curved Electrode represents: Outside Electrode and/or Negative Electrode and/or Moving Element in Variables and/or Low-potential in Feed-thrus

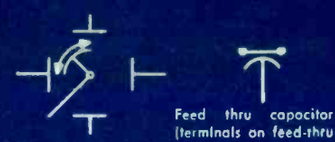
Shielded capacitor

Variable capacitor



Split stator Capacitor Both parts increase simultaneously

Variable differential capacitor



Phase-shifter capacitor

Feed thru capacitor (terminals on feed-thru element)

CELLS, Photosensitive

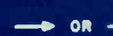
λ indicates Element Varies with Light

Asymmetrical Photo Conductive Transducer

Symmetrical Photo Conductive Transducer

Photovoltaic Transducer

Sleeve



Adjustable or sliding contact for resistor, inductor, etc.

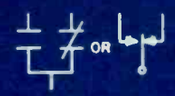
Segment: bridging contact

Vibrator Reed

Rotating Contact and brush

Closed Contact (break)

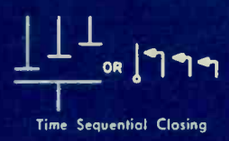
Open Contact (make)



Transfer

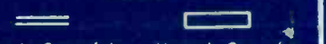
Make-before-break

Open Contact w/time delay closing feature



Time Sequential Closing

CORE



Magnetic Core of Inductor or Transformer

Magnetic Core of Magnet or Relay

COUNTER, Electromagnetic Operated

General

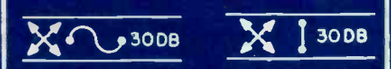
With Make Contact

COUPLER, Directional

Arrow Indicates Direction of Power Flow. Number of Coupling Paths, Type of Coupling, and Transmission Loss May Be Indicated

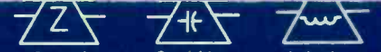
General

E-plane Aperture Coupling 30 db Transmission Loss



Loop Coupling 30 db Transmission Loss

Probe Coupling 30 db Transmission Loss



General

Capacitive Reactance

Inductive Reactance

L and C with Infinite Reactance at Resonance

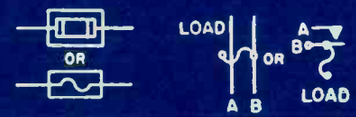
L and C with Zero Reactance at Resonance

Equivolent Shunt Element General

FUSES

Fusible element

High Voltage Primary Fuse Contact, Dry



High Voltage Primary Fuse Contact, Oil

With Alarm Contact (When fuse blows alarm bus B is connected to power bus A. Letters for explanation only)

GROUND

HANDSET

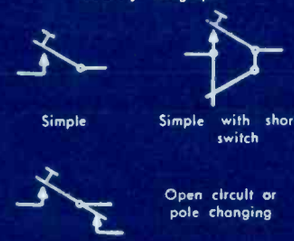
General

With push-to-talk switch

3 conductor handset

4 conductor handset with push-to-talk switch

KEY, Telegraph



Simple

Simple with shorting switch

Open circuit or pole changing

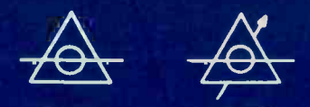
	voltmeter
CRO	Oscilloscope or cathode-ray oscillograph
D	Demand meter
DB	DB (decibel) meter
DBM	DBM (decibels referred to 1 milliwatt) meter
DTR	Demand-totalizing relay
F	Frequency meter
G	Galvanometer
GD	Ground detector
I	Indicating
M	Integrating
μA or UA	Microammeter
MA	Milliammeter
N	Noise meter
OHM	Ohmmeter
OP	Oil pressure
OSCG	Oscillograph, string
PH	Phase meter
PI	Position indicator
PF	Power-factor meter
RD	Recording demand meter
REC	Recording
RF	Reactive-factor meter
S	Synchroscope
TLM	Telemeter
T	Temperature meter
TT	Total time
VH	Varhour meter
V	Voltmeter
VA	Volt-ammeter
VAR	Varmeter
VI	Volume indicator
VU	Standard volume indicator
W	Wattmeter
WH	Watthour meter

MICROPHONE

NOTE: IRE-ASA standards provide two types of symbols, single line and complete. Single line symbols are intended to show essential components and functions in simplified form. Complete diagrams indicate the complete circuit and the devices used therein. In some cases, only a single or complete symbol is available for a particular component. Where a choice of single or complete is available, the complete type is used here, with the exception of amplifiers, adjustable phase shifters, and synchros, where more common usage has dictated the use of single line forms.

Normally used for electric or magnetic shielding. For other shielding, note should so indicate

SHIFTER, Phase



General

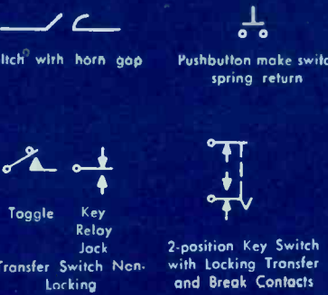
Adjustable

SWITCHES

General Single Throw

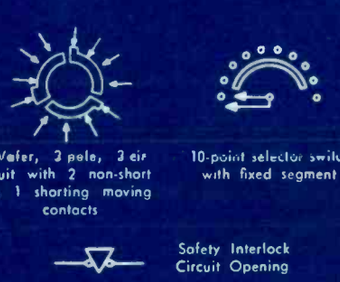
2-pole double-throw switch showing terminals

3-pole double-throw knife switch with auxiliary contacts and terminals



Switch with horn gap

Pushbutton make switch spring return



Toggle

Key

Relay

Jack

Transfer Switch Non-Locking

2-position Key Switch with Locking Transfer and Break Contacts

Wafer, 2 pole, 3 circuit with 2 non-short & 1 shorting moving contacts

10-point selector switch with fixed segment

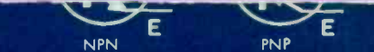
Safety Interlock Circuit Opening

SYNCHROS

Synchro, general

If identification is required, add abbreviations

CDX—Control Differential Synchro Transmitter
CT —Synchro Control Transformer
CX —Synchro Control Transmitter
TDR—Torque-Differential Synchro receiver
TDX—Torque-Differential Synchro Receiver
TR —Torque-Synchro Receiver
TX —Torque-Synchro Transmitter



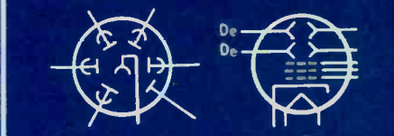
NPN

PNP

TUBES, Electron

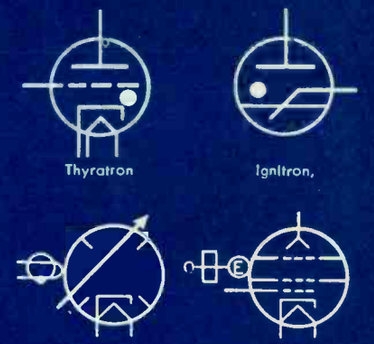
Triode, Indirectly Heated Cathode. Add grids for tetrode, pentode, etc.

Cold Cathode Gas Tube, Rectifier, regulator for dc



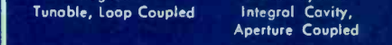
Photomultiplier Tube

Cathode-ray Tube with Electrostatic Deflection. Remove De for Magnetic Deflection



Thyratron

Ignitron,



Magnetron Tunable, Loop Coupled

Reflex Klystron Integral Cavity, Aperture Coupled

Transmit-Receive (TR) Tube. Gas filled, tunable integral cavity, operature coupled, with starter

UHF triode (disk-seal type) with internal capacitor. Tube terminals added as shown where desired

VIBRATORS

Shunt Drive Vibrator

Series Drive Vibrator

ELECTRONIC TECHNICIAN

Including SERVICE Magazine

104 TV-RADIO Schematics

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TELEVISION

CONTENTS

(Continued on following page)

TELEVISION

Continued

PHILCO

RCA

RCA CANADA

SYLVANIA

TRAV-LER

TRUETONE

WESTINGHOUSE

ZENITH

RADIO

ADMIRAL

BLONDER-TONGUE

CHANNEL-MASTER

CONTINENTAL

DELCO

DEWALD

FISHER

GENERAL ELECTRIC

GRANCO

MAGNAVOX

HOFFMAN

MOTOROLA

PHILCO

PILOT

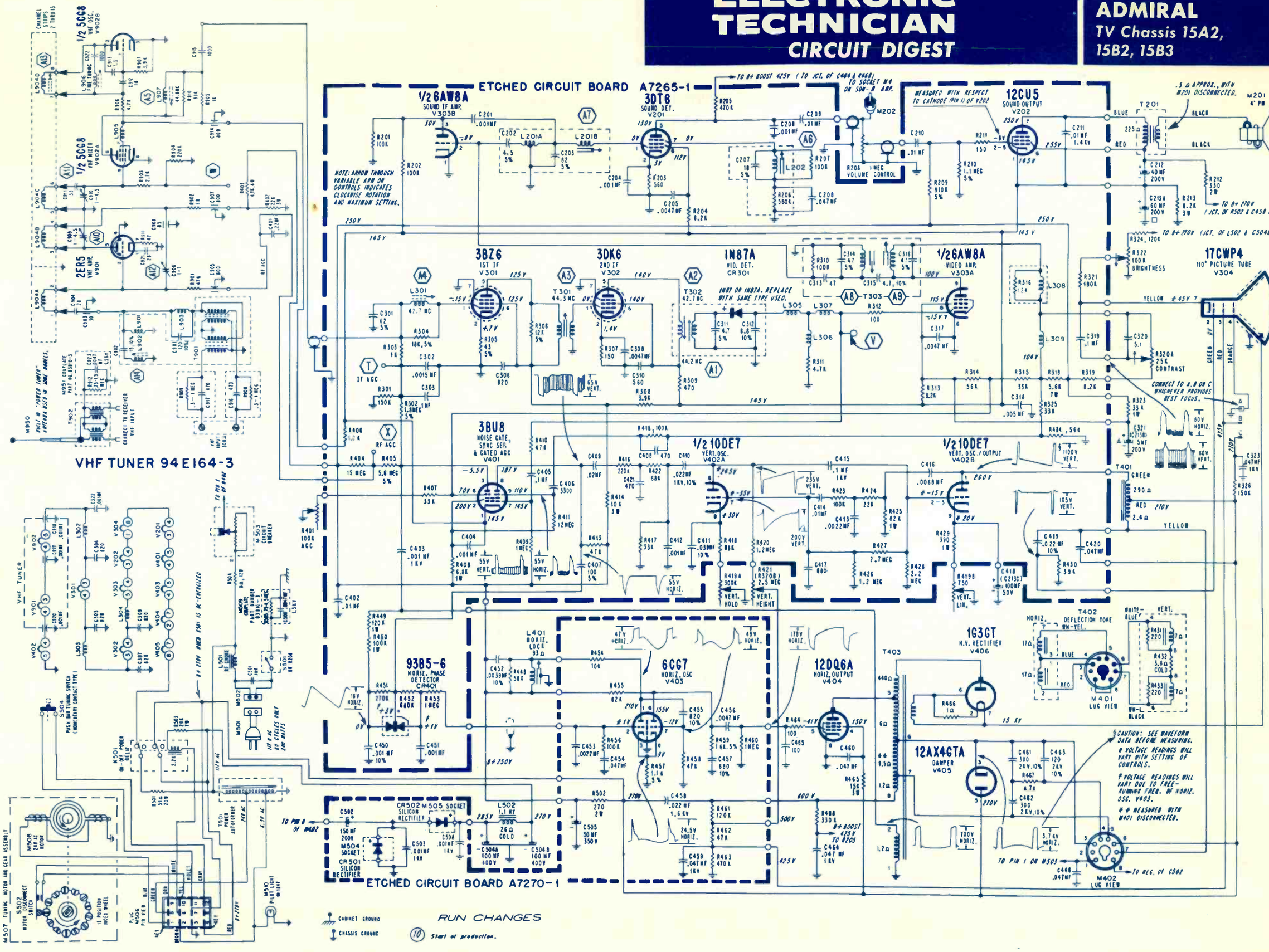
RCA

SONY, JAPAN

WESTINGHOUSE

ZENITH

ADMIRAL
TV Chassis 15A2, 15B2, 15B3



ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

ADMIRAL
Chassis 14YP3D

Model T170, T171, T172AL, T173AL, T1710

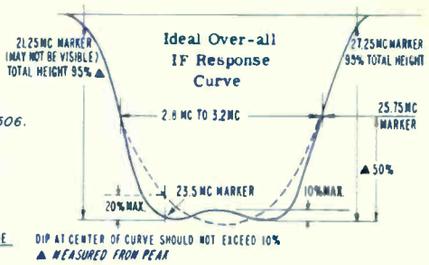
RUN CHANGES

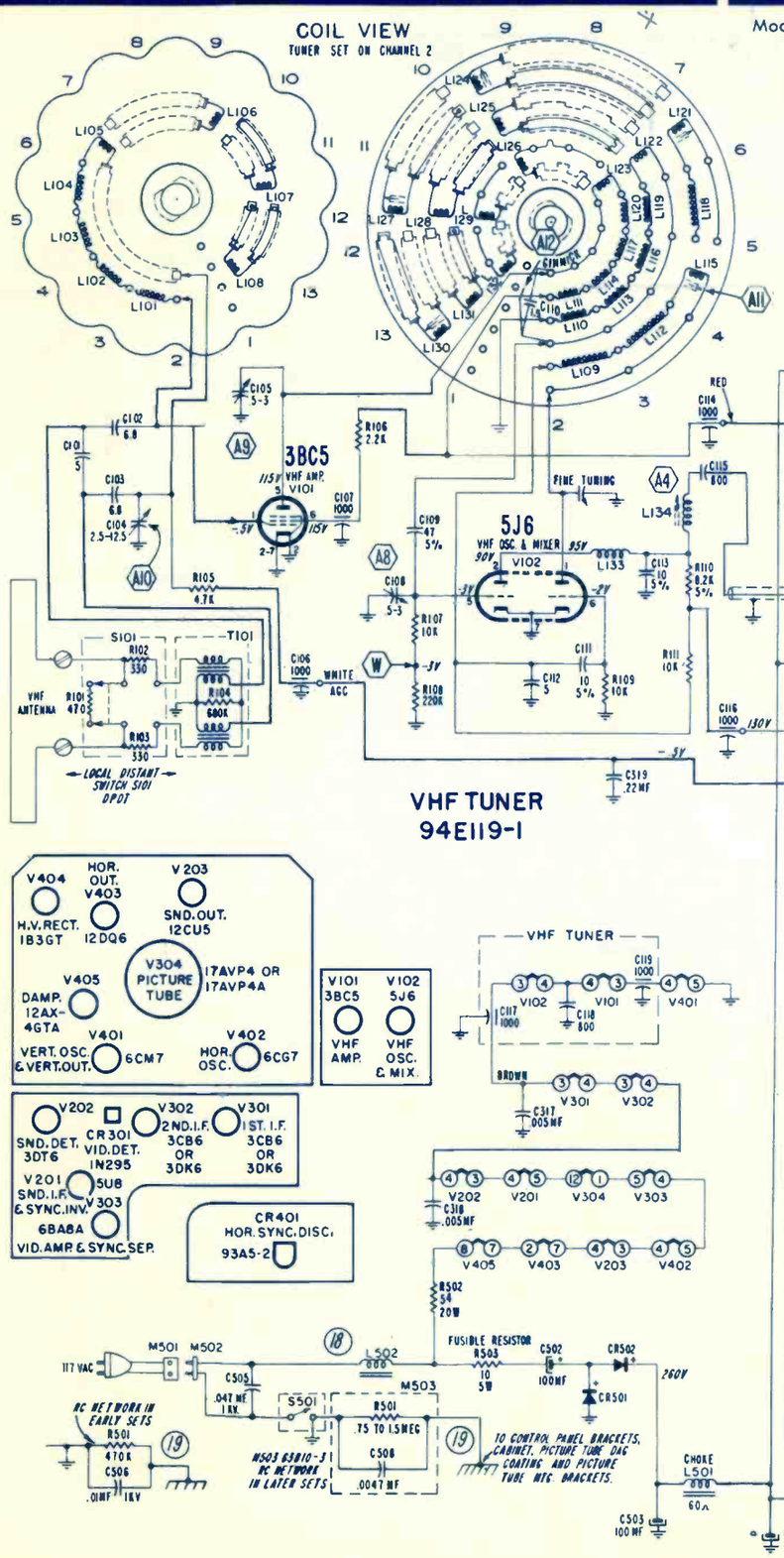
(16) For improved sync, C429, C430, R444, and R445 were added, R419 changed from 47K to 27K, R420 changed from 330K to 150K, R421 changed from 3300 to 1500, R423 changed from 6.8K to 3.3K, R424 changed from 3300 to 1500, R422 was removed. Printed circuit boards A5290 and A5291-B used in Run 15 sets.

(17) No changes made.

(18) To conform with FCC regulations for reduction of horizontal sweep frequency radiation, C501 was omitted. C505 and L502 were added.

(19) Coupiate M503 used for RC network R501 & C506. C427 rating changed from 1.6 to 2kv for improved safety factor.





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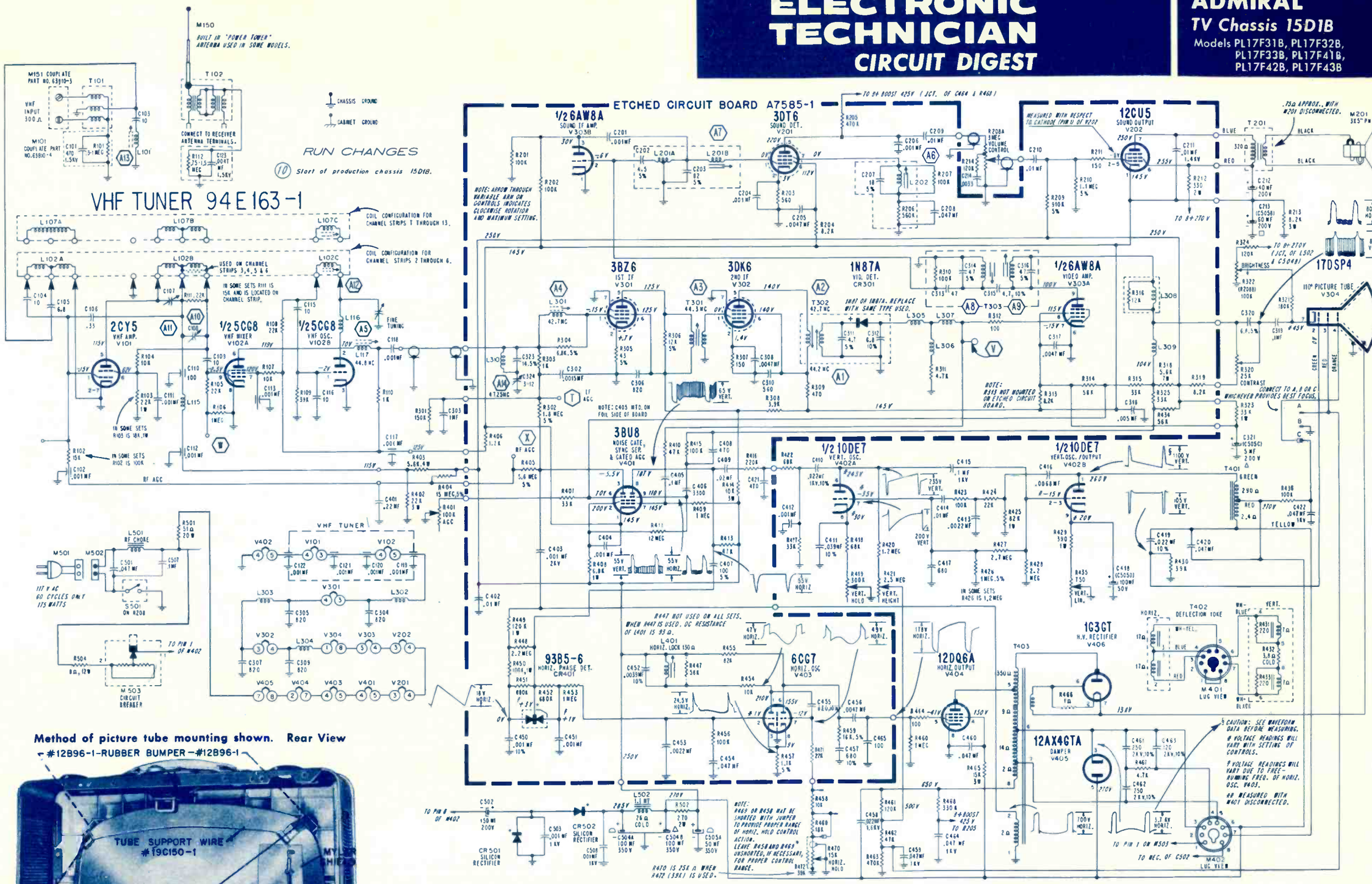
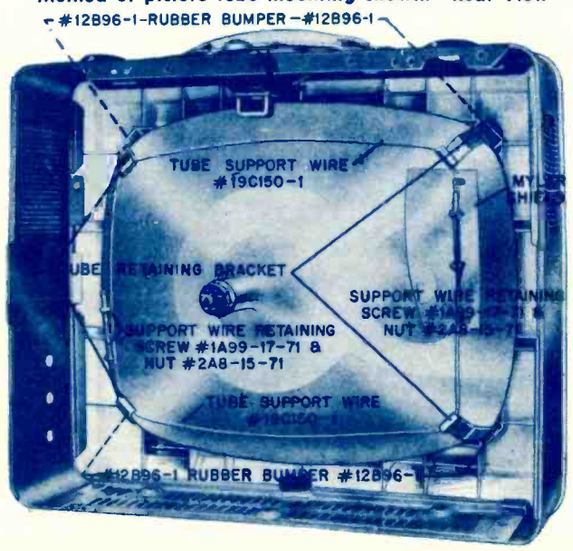
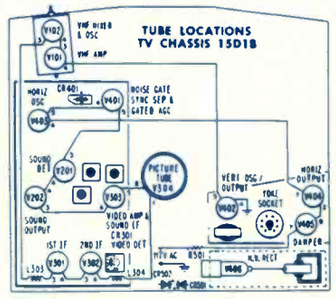
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

ADMIRAL
TV Chassis 15D1B
Models PL17F31B, PL17F32B, PL17F33B, PL17F41B, PL17F42B, PL17F43B



Method of picture tube mounting shown. Rear View





TUBE COMPLEMENT

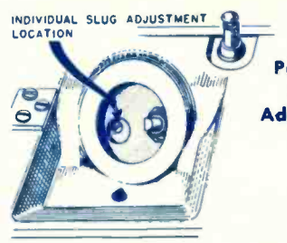
V101—2CY5	V304—17DSP4
V102—3CG8	V401—3BU8
V201—3DT6	V402—10DE7
V202—12CU5	V403—6CG7
V301—3BZ6	V404—12DQ6A
V302—3DK6	V405—12AX4GTA
V303—6AW8A	V406—1G3GT

CR301—1N87 or 1N87A
CR401—9385-6
CR501—93B12
CR502—93B12

SCHEMATIC NOTES

(2), (3), . . . etc. indicate production changes covered by a Run number. Run numbers are stamped at the rear of the chassis. Brief description of Run changes given on schematic. (A1), (A2), . (Y), (Z), etc. indicate alignment points and connections.

Fixed resistor values shown in ohms ±10% tolerance, ½ watt, capacitor values shown in micromicrofarads ± 20% tolerance unless otherwise specified.
NOTE: K=x 1000, MEG=x 1,000,000, MF=microfarad.



Partial Top View Showing Channel Adjustment Slug Locations.

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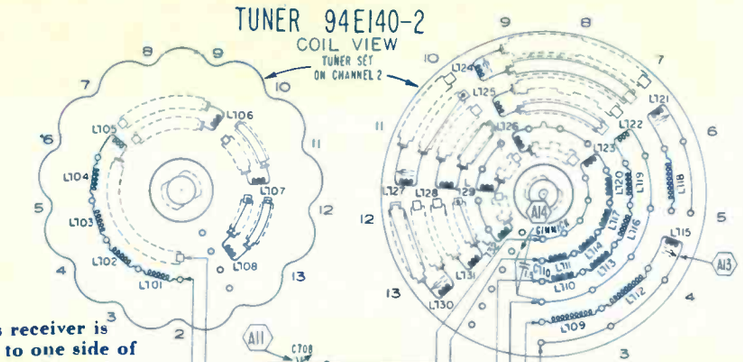
ADMIRAL
TV Chassis 17Z3DBM, 17Z3DBN

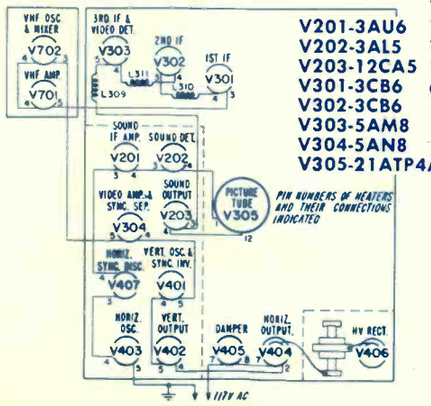


WARNING:
The chassis of this receiver is connected directly to one side of the 117 volt, 60 cycle power line.

SCHEMATIC NOTE

(A1), (A2), . . (Y), (Z), etc., indicate alignment points and alignment connections.

Tube Locations of 17Z3DBM and 17Z3DBN Chassis Showing Heater Wiring on Opposite Side.



TUBE COMPLEMENT

V201-3AU6
V202-3AL5
V203-12CA5
V301-3CB6
V302-3CB6
V303-5AM8
V304-5AN8
V305-21ATP4A
V401-6CG7
V402-6S4A
V403-6CG7
V404-12DQ6
V405-12AX4GTA
V406-1B3GT
V407-3AL5 or
CR401-Dual Selenium Diode 93A5-4
V701-4BZ7
V702-5J6

RUN CHANGES

(15) Start of Production 17Z3DBM and 17Z3DBN

PRODUCTION CHANGES:

HORIZONTAL SYNC DISCRIMINATOR REPLACED WITH 3AL5 TUBE

Run 12 in All Chassis Except 17F1 and 17AF1

To provide a more stable horizontal circuit, CR401 (93B5-4) was replaced with a 3AL5 tube. The tube socket was added to the printed wiring board in the same position. No changes in the etched foil were required. A jumper (shorting) wire was removed from across the two circuits representing the heater terminals.

TO PREVENT RADIATION INTERFERENCE, CHOKE COIL ADDED TO VIDEO DETECTOR CIRCUIT

Run 13

In keeping with the television industries practice of complying with FCC regulations for reduced radiation interference, a self resonant choke coil (L308) was inserted into the video detector plate circuit, between L302 and L304.

CHANGE TO IMPROVE VIDEO RESPONSE AND CONTRAST

Run 14

To improve video response, C318 (.005 mf) screen bypass capacitor deleted; R333 (3,900 ohms) video amplifier screen resistor changed to 18,000 ohms; R329 (5,600 ohms) video amplifier plate dropping resistor changed to 6,800 ohms; and R318 (5,600 ohms) video detector load resistor changed to 3,900 ohms.

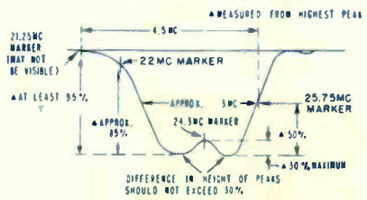
To improve the contrast, R335 (47 ohms) and C328 (.02 mf) added across the low side of the contrast control circuit.

VERTICAL BLANKING COUPLATE REPLACED BY SEPARATE COMPONENTS. SPEAKER PLUG AND SOCKET DELETED.

Run 15

To simplify circuitry, the vertical blanking couplate, M402 (used to supply a vertical blanking pulse to grid of V305), replaced by individual components. C431 (.047 mf) connected across vertical section of yoke (T402A). R443 (39,000 ohms) connected from pin 2 (V305) to chassis ground; and C432 (.022 mf) connected from pin 2 (V305) to junction of C431 and T402A. The speaker plug (M202) and socket (M201) deleted and speaker output leads wired in to a terminal strip mounted on the chassis.

Ideal IF Response Curve.



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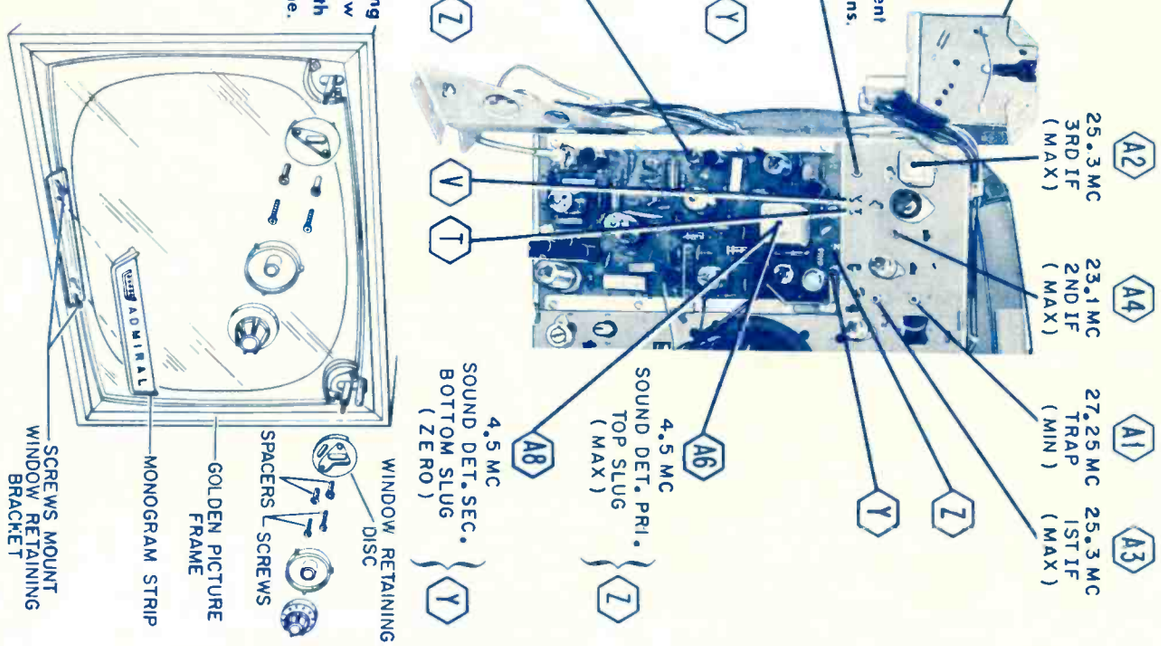
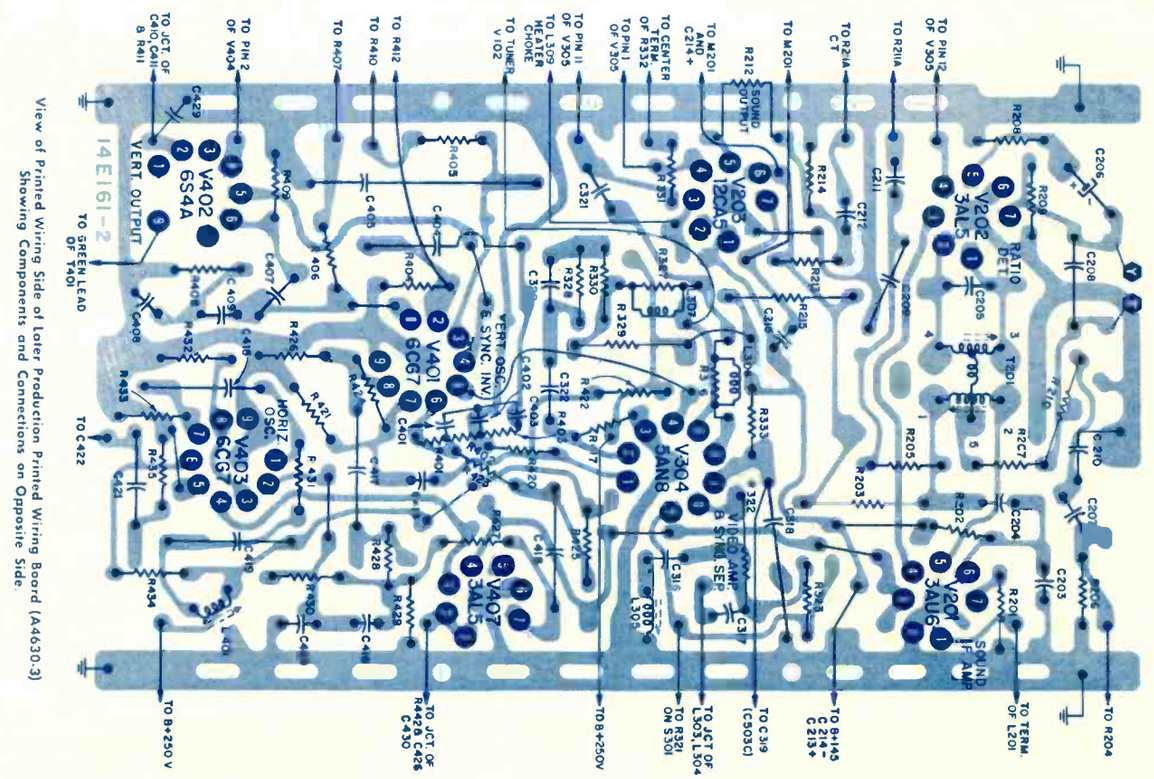


Rear View of 17Z3D and 17Z3DB Chassis Showing Alignment and Test Point Locations.

Removing Picture Window in Models with "Golden" Picture Frame.

Rear View of Chassis Showing Adjustments.

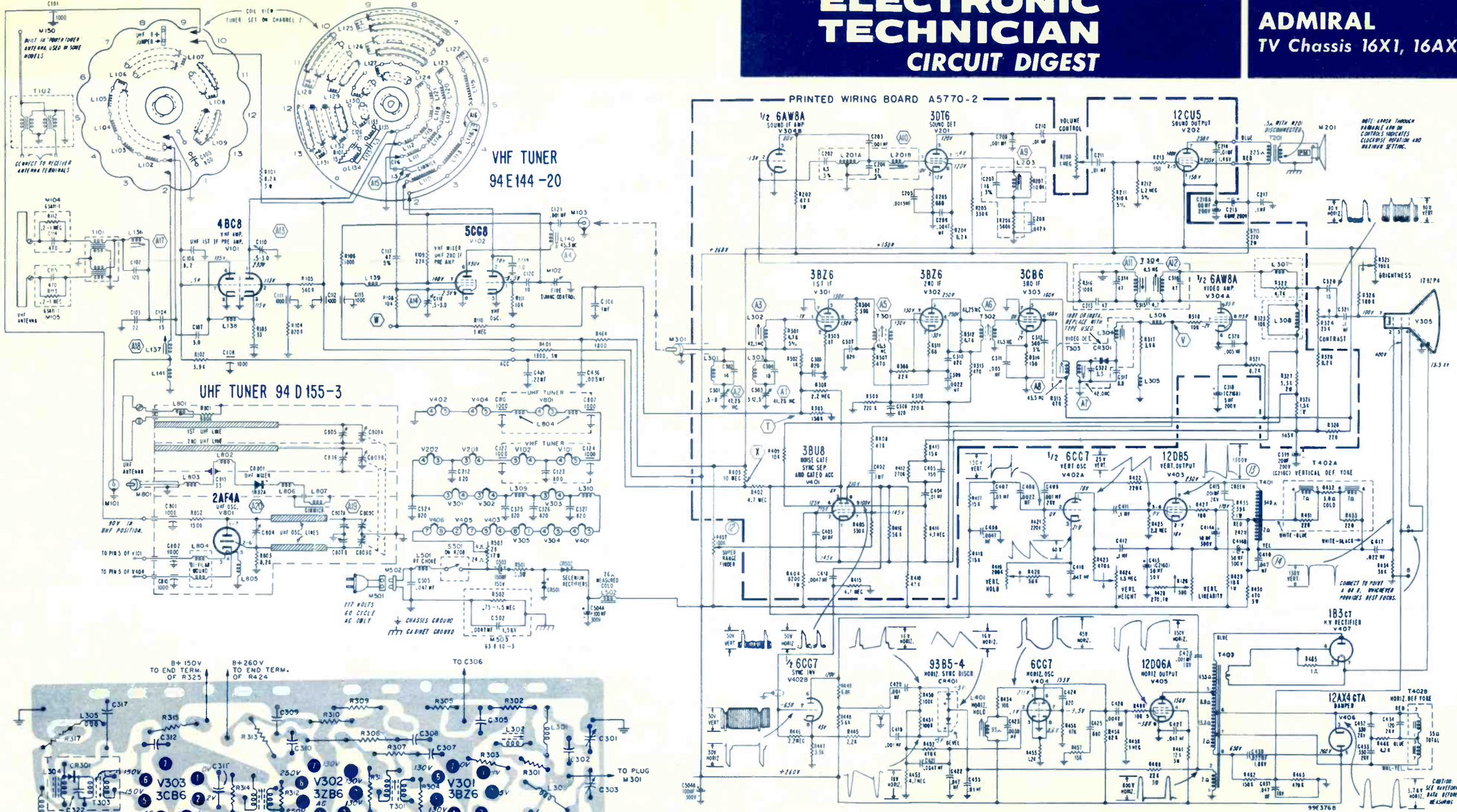


View of Printed Wiring Side of Later Production Printed Wiring Board (A4630-3) Showing Components and Connections on Opposite Side.

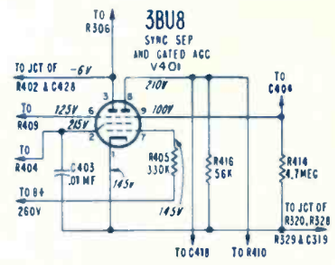
ADMIRAL
TV Chassis 17Z3DBM, 17Z3DBN

Electronic Technician
CIRCUIT DIGEST

ADMIRAL
TV Chassis 16X1, 16AX1



View of Wiring Side of Printed Wiring Board. Gray Area Represents Printed Wiring; Black symbols and lines represent components and connections on opposite side.



Partial Schematic of V401 stage showing Runs 10 and 11 connection in Chassis 16AX1 and Run 11 connection in Chassis 16X1.

PRODUCTION CHANGES

CHANGE TO PREVENT HORIZONTAL SYNC INSTABILITY AT HIGH SIGNAL LEVELS
16AX1 Chassis Stamped Run 11

To reduce possibility of horizontal sync overload and resulting Horizontal oscillator instability at extremely high signal level, C401 changed to .22MF.

DIFFERENT CIRCUIT FOR V401 STAGE USED
16X1 and 16AX1 Chassis Stamped Run 12

To improve rejection of external noise interference, R408 (47K), C402 (.1MF) and Super Range Finder control R407 (100K) added.

CHANGE IN VERTICAL OUTPUT CIRCUIT
16X1 and 16AX1 Chassis Stamped Run 13

To reduce pulse voltage at V403, a series network consisting of C415 (.001MF, 2KV) and R435 (39K, 1W) added from pin 9 of V403 to red lead of Vertical Output transformer (T401). C416 (.047MF) removed.

CHANGE TO MINIMIZE HORIZONTAL PULSE INTERACTION IN VERTICAL OUTPUT CIRCUIT
16X1 and 16AX1 Chassis Stamped Run 14

C416 (.047MF, 600V) added between red and yellow leads of Vertical Output Transformer (T401) to minimize Horizontal pulse interaction in Vertical Output circuit.

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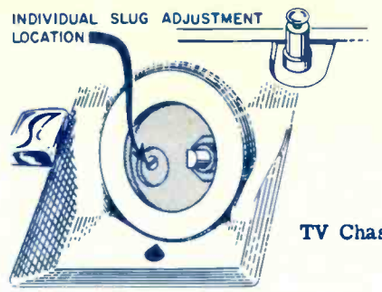
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

ADMIRAL
TV Chassis 15G1
Model PL19J131, -33, -35, -40, -41, -49

VHF Channel INDIVIDUAL SLUG ADJUSTMENT LOCATION



SCHEMATIC NOTES

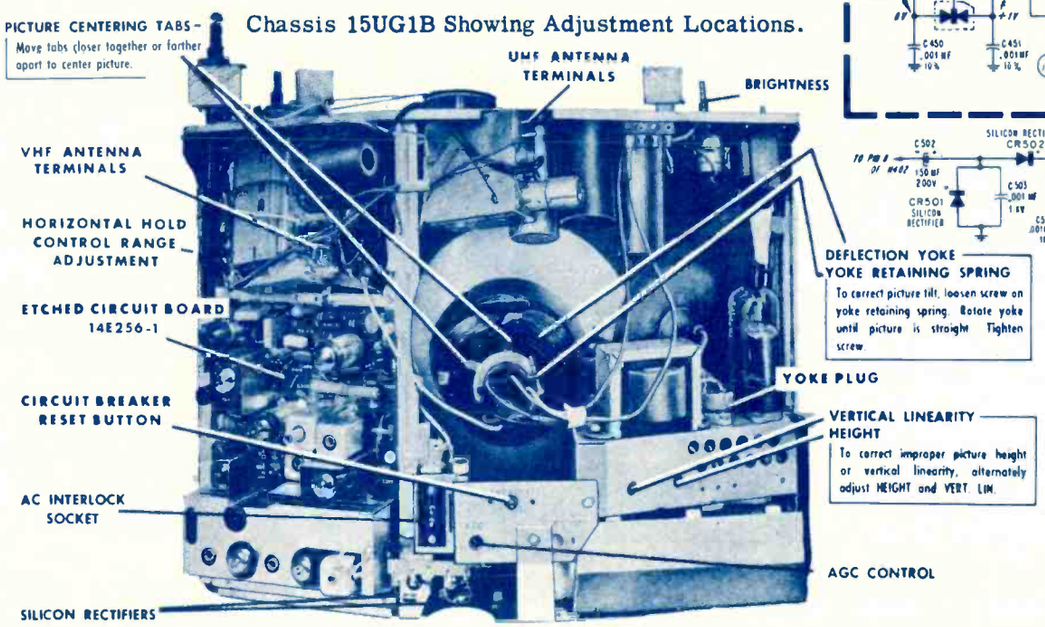
②, ③, . . . etc. indicate production changes covered by a Run number. Run numbers are stamped at the rear of the chassis. Brief description of Run changes given on schematic.

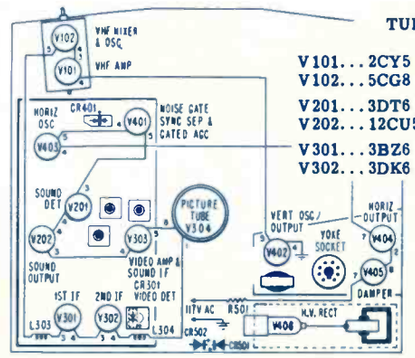
Ⓐ1, Ⓐ2, . . Ⓨ, Ⓩ. etc. indicate alignment points and connections.

TV Chassis 15G1B Stamped Run 12.

ETCHED CIRCUIT BOARD 14E256

Chassis 15UG1B Showing Adjustment Locations.





TUBES AND CRYSTAL DIODES

V101 . . . 2CY5
V102 . . . 5CG8
V201 . . . 3DT6
V202 . . . 12CU5
V301 . . . 3BZ6
V302 . . . 3DK6
V303 . . . 6AW8A
V304 . . . 19XP4
V401 . . . 3BU8
V402 . . . 10DE7
V403 . . . 6CG7
V404 . . . 12DQ6A
V405 . . . 12AX4GTA/B
V406 . . . 1G3GT or 1K3GT
CR301 . . . 1N87 or 1N87A
CR401 . . . 93B5-6
CR501 . . . 93B12-1
CR502 . . . 93B12-1

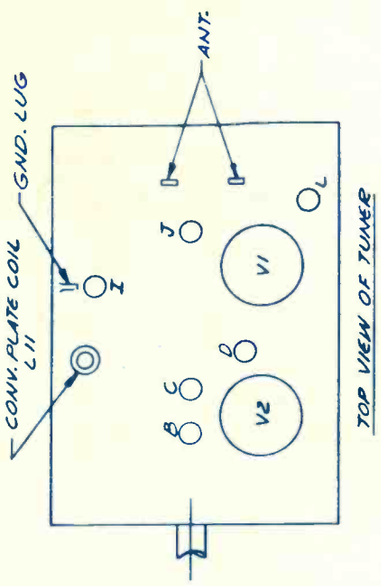
RUN CHANGES

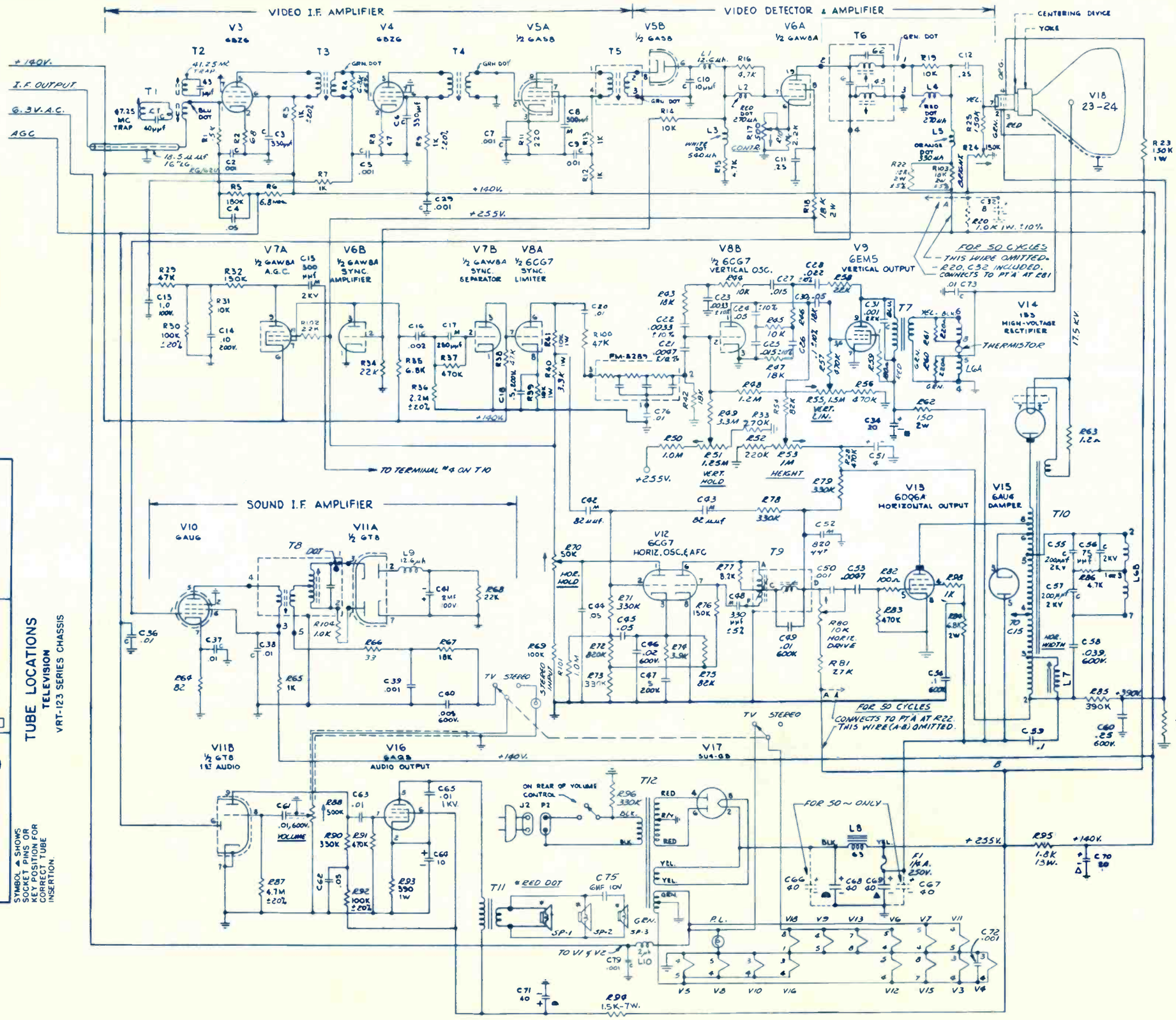
⑩ Start of production.

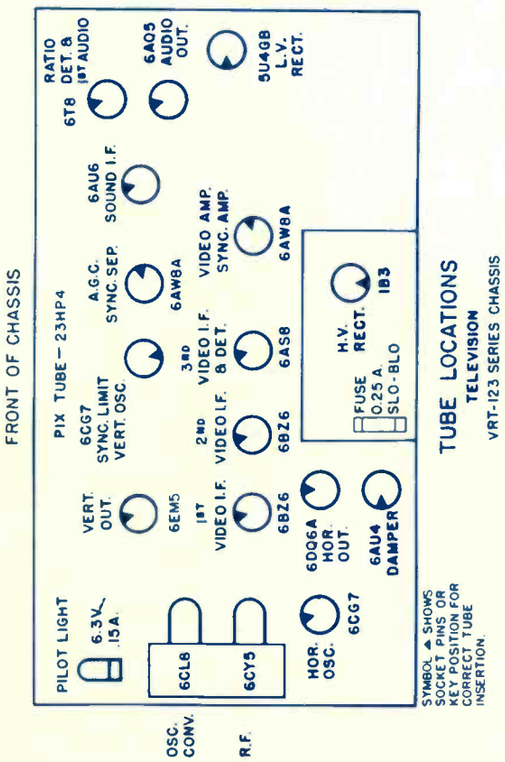
⑪ For increased power supply protection, "FOCUS" and B+ Boost circuit revised. R456 was 100K and was connected from Focus term. "G" to B+ 270V. C422 was connected from jct. of Focus term. "G" and B+ 270V to ground. C420 was connected across T401 secondary. Focus term. "A" was connected to jct. of pin 3 of V304, R462, and C459. C421 was 470mmf and was connected from jct. of R486 and R422 to ground. R437 (2.7 megohms) added. R467 was 1.8 megohms. R461 was 150K, R463 was 470K, and R462 was 2.7 megohms. R468 (330K) deleted. C464 voltage rating was 1KV.

⑫ To improve Vertical Lock-in range centering, R426 changed to 1.2 megohms, 5%. Also, C451 changed to 10% tolerance.

ANDREA
TV Chassis
VRT-123 Series







TUBE LOCATIONS
TELEVISION
VRT-123 SERIES CHASSIS

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ANDREA
TV Chassis VS-323 Series

R.F. TUNING UNIT — VIDEO I.F. AMPLIFIER — VIDEO DETECTOR & AMPLIFIER

V1 6HS R.F. — V2A 6CG8A CONV. — 1/2 V2B 6CG8A OSC. — V2 6CG8A — V1 6FH5

I.F. OUTPUT — CO-AX
+140V. — ORANGE
R.F. T.P.
A.G.C. — WHITE
6.3V.A.C. — BROWN

TUNER — TERMINAL LOCATIONS

- (L) A.G.C. (WHITE)
- (I) I.F. TEST OUTPUT (CO-AX)
- (B) R.F. TEST POINT
- L8
- (O) +140 (ORANGE)
- (J) 6.3VAC. (BLACK & BROWN)

6FH5 6CG8A ANT.

CHANNEL SELECTOR

NOTE: FLATS ON FINE TUNING (TUNER) SHAFT & (GEAR) TRAIN SHAFT TO BE PRE-SET AS SHOWN BEFORE ADJUSTING OSC SLUG.

4.5° APPROX.

OSC SLUG ADJUSTMENT

FINE TUNING SHAFTS

V3 6BZ6 — V4 6BZ6 — V5A 1/2 6AS8 — V5B 1/2 6AS8 — V6A 1/2 6CX8

T1 T2 T3 T4 T5 T6

V7A 1/2 6AW8A A.G.C. — V6B 1/2 6CX8 SYNC. AMPLIFIER — V7B 1/2 6AW8A SYNC. SEPARATOR — V8A 1/2 6CG7 SYNC. LIMITER

V8B 1/2 6CG7 VERTICAL OSC. — V9 6EM5 VERTICAL OUTPUT

FOR 50 CYCLES — THIS WIRE OMITTED. — R20, C32 INCLUDED, CONNECTS TO PT 'A' AT L81

V18 23MP4 — CENTERING DEVICE — YOKE

V14 1B3 HIGH-VOLTAGE RECTIFIER — THERMISTOR — L5A

TO TERMINAL #4 ON T10

SOUND I.F. AMPLIFIER

V10 6AU6 — V11A 1/2 6T8 — V11B 1/2 6T8 1ST AUDIO — V16 6BQ5 AUDIO OUTPUT — V17 5U4-GB

V12 6CG7 HORIZ. OSC. & AFC — V13 6DQ6A HORIZONTAL OUTPUT — V15 6AU6 Ddamper

T9 T10 T11 T12

FOR 50 CYCLES — CONNECT T8 (PT A AT P20) — THIS WIRE (A-B) OMITTED.

FOR 50~ ONLY

ON REAR OF VOLUME CONTROL — TREBLE — BASS

TO V1 & V2

CAPACITOR UNIT ASSEMBLIES:
1. C71, C70, C34
2. C68, C69
3. C66, C67

50 CYCLE MODELS:
1. POWER SUPPLY FILTER CONTAINS C-66 AND C-67.
2. POWER XFMR. (T-12) IS 50 CYCLE TYPE.
3. VIDEO AMPL. HAS ADDITIONAL R-C FILTER, AS SHOWN.

UHF — UHF TUNER — VHF TUNER — I.F. OUTPUT — UHF 300Ω BAL. INPUT — V19 6AF4A — HEATER 6.3V

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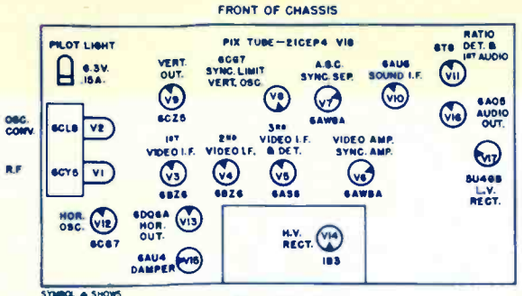
ANDREA
TV Chassis VR 121 Series



SYMBOL ▲ SHOWS SOCKET PINS OR KEY POSITION FOR CORRECT TUBE INSERTION.

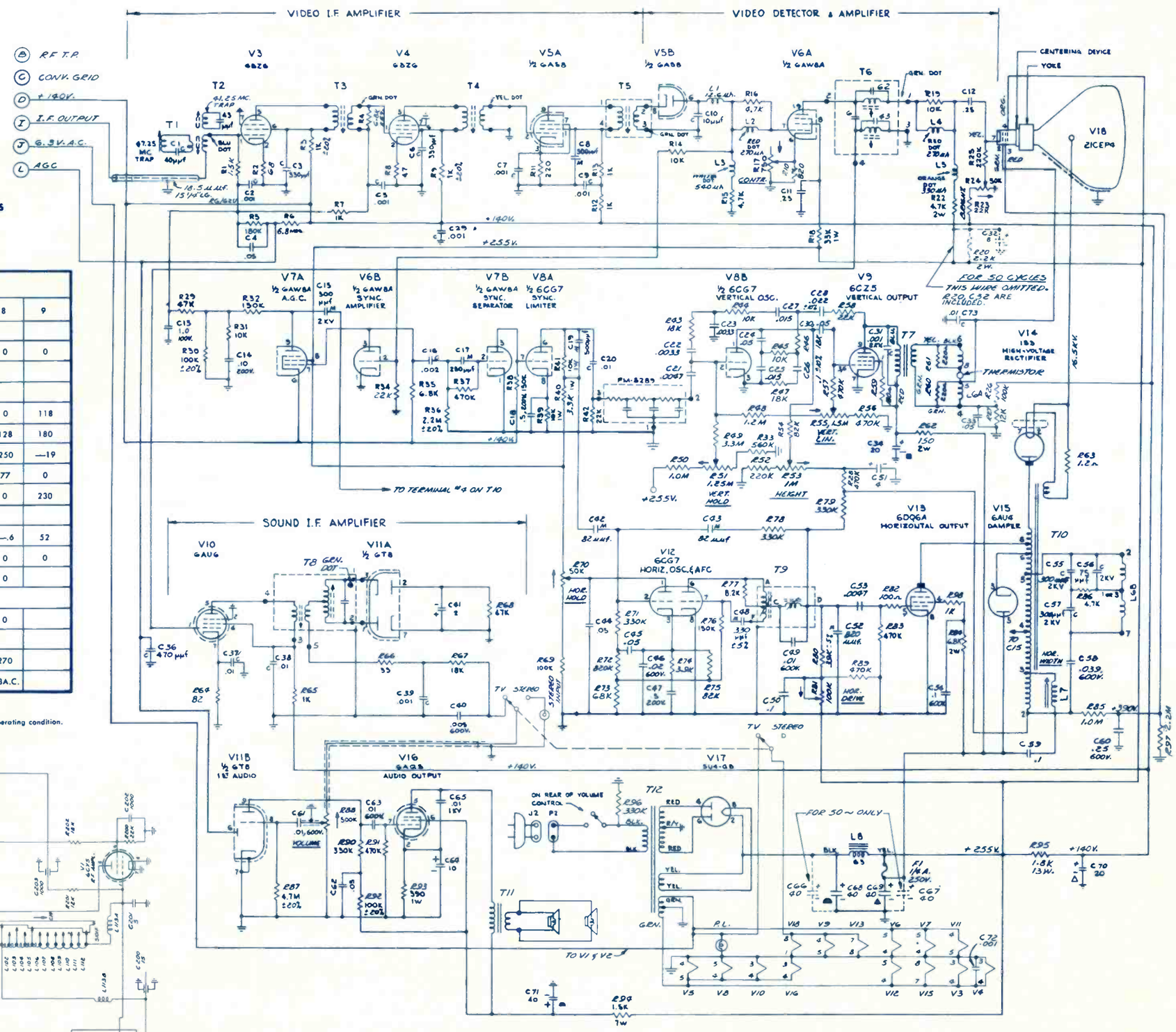
TUBE LOCATIONS
TELEVISION
VR 121 & VR 121-1 ONA8818

VR-121 VOLTAGE READINGS

TAKEN WITH R.C.A. SENIOR VOLTOHMYST WV98A
READINGS TAKEN FROM TUBE SOCKET CONTACTS TO CHASSIS
SOME SOCKET CONTACTS ARE USED ONLY AS TIE POINTS
CHANNEL SWITCH SET AT CHANNEL 4 — NORMAL SIGNAL
Line Voltage = 117V A.C.

TUBE REF. NO.	TUBE PIN NO.								
	1	2	3	4	5	6	7	8	9
V1 6CY5*	—.3	0	6.3A.C.	0	136	64	0		
V2 6CL8*	0	125	0	0	6.3A.C.	125	125	0	0
V3 6BZ6	—5.8	.3	0	6.3A.C.	130	140	0		
V4 6BZ6	—5.5	.2	0	6.3A.C.	130	140	0		
V5 6AS8	128		1.8	0	6.3A.C.	—2.2	2	0	118
V6 6AW8A	0	—1.5	128	0	6.3A.C.	1	—2	128	180
V7 6AW8A	0	—12	74	0	6.3A.C.	145	128	250	—19
V8 6CG7	62	—44	0	6.3A.C.	0	142	74	77	0
V9 6CZ5	235	28	—17	6.3A.C.	0	—17	0	0	230
V10 6AU6	0	0	0	6.3A.C.	134	134	1		
V11 6T8	—10	—32	—10	6.3A.C.	0	—2	0	—.6	52
V12 6CG7	220	—4.5	20	6.3A.C.	0	185	—56	0	0
V13 6DQ6A	355	0	—34	155	—34	560	6.3A.C.	0	
V14 1B3	PIN 2 and PIN 7 = 16.5 KV								
V15 6AU4GT	170	0	620	0	245	365	6.3A.C.	0	
V16 6AQ5	0	12	0	6.3A.C.	180	200	0		
V17 5U4G8	200	270	0	270A.C.	0	270A.C.	0	270	
V18 21CEP4	0	26	390	255	0	0	80	6.3A.C.	

B+ AT C68 FIRST FILTER CAPACITOR = 260 V
HIGH VOLTAGE AT 2nd ANODE OF PICTURE TUBE 16.5 KV
* = Readings on V1 & V2 taken from top of socket without tube in socket. All other tubes in normal operating condition.



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ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

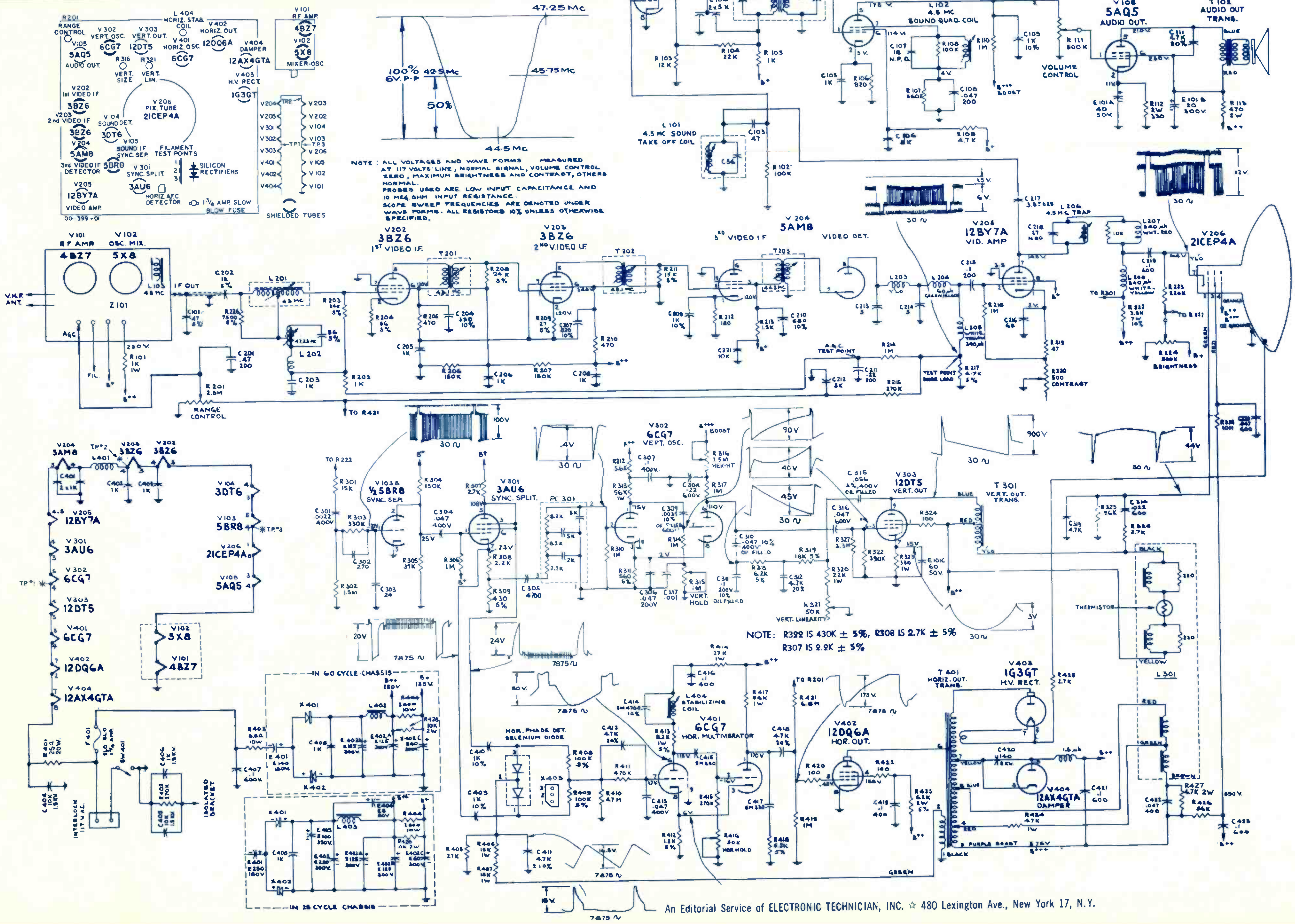
DOMINION ELECTROHOME (Canada)
TV Model Viscount, Viscount MK1, Viceroy, Viceroy MK1

NOTE: ALL VOLTAGES AND WAVEFORMS ARE MEASURED AT 117 VOLTS LINE, NORMAL SIGNAL, VOLUME CONTROL ZERO, MAXIMUM BRIGHTNESS AND CONTRAST, OTHERS NORMAL.
PROBES USED ARE LOW INPUT CAPACITANCE AND 10 MEG OHM INPUT RESISTANCE.
SCOPE SWEEP FREQUENCIES ARE DENOTED UNDER WAVE FORMS. ALL RESISTORS 10% UNLESS OTHERWISE SPECIFIED.

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

ELECTROHOME, Canada
TV Chassis
17 Tube VHF Series

Models: Viscount MK II;
Sheldon, Viceroy MK II



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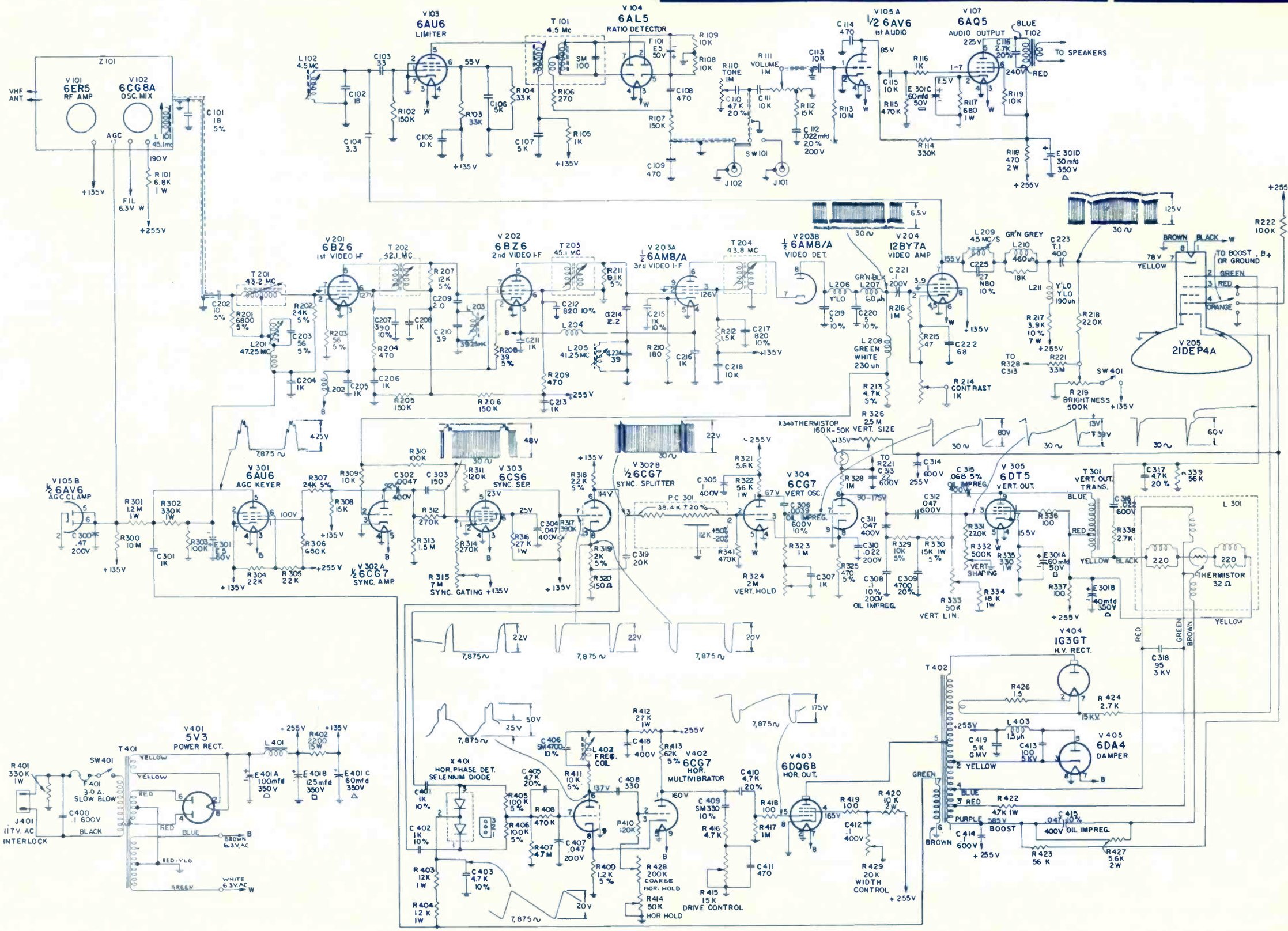
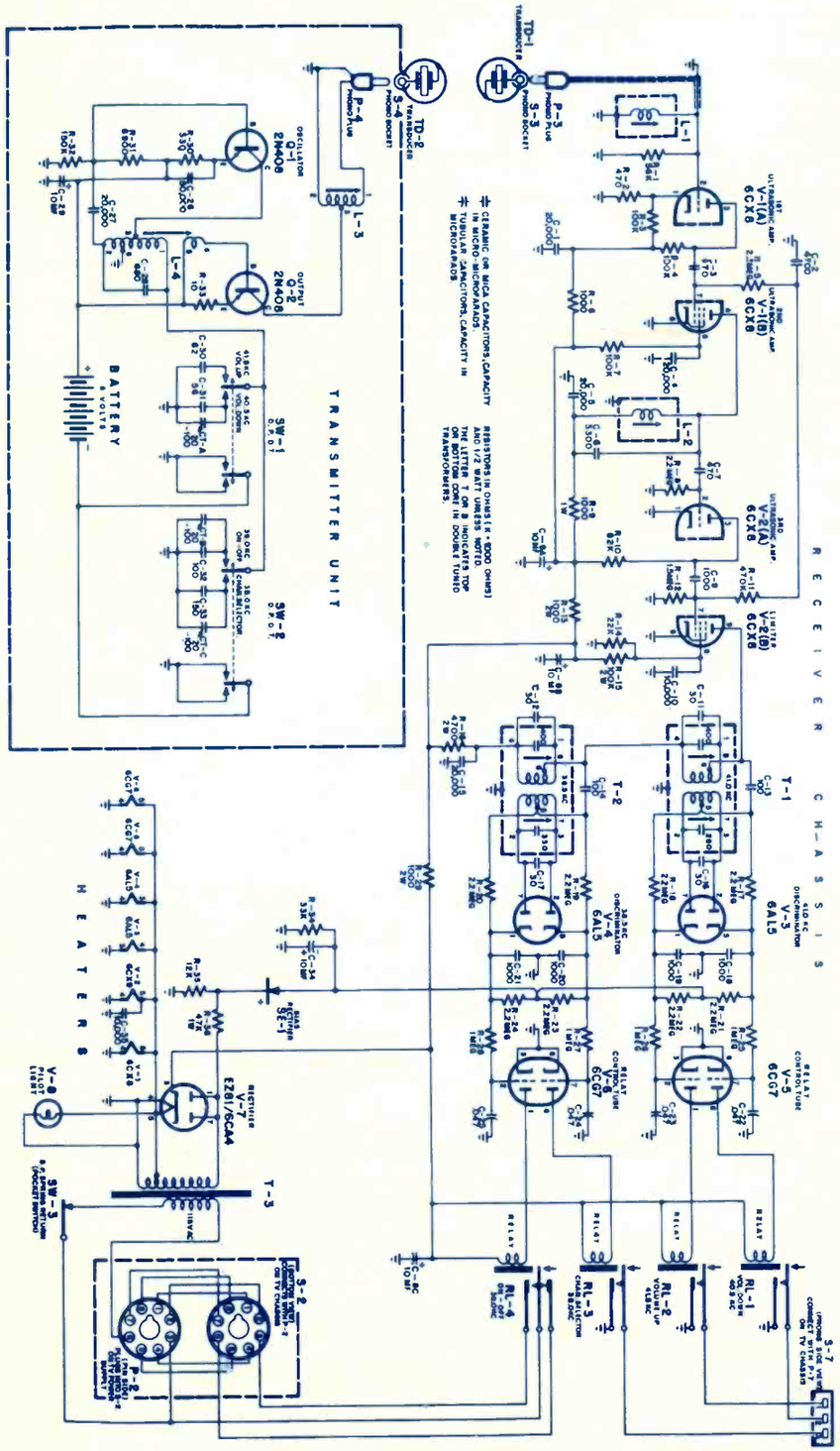
ELECTROHOME, Canada

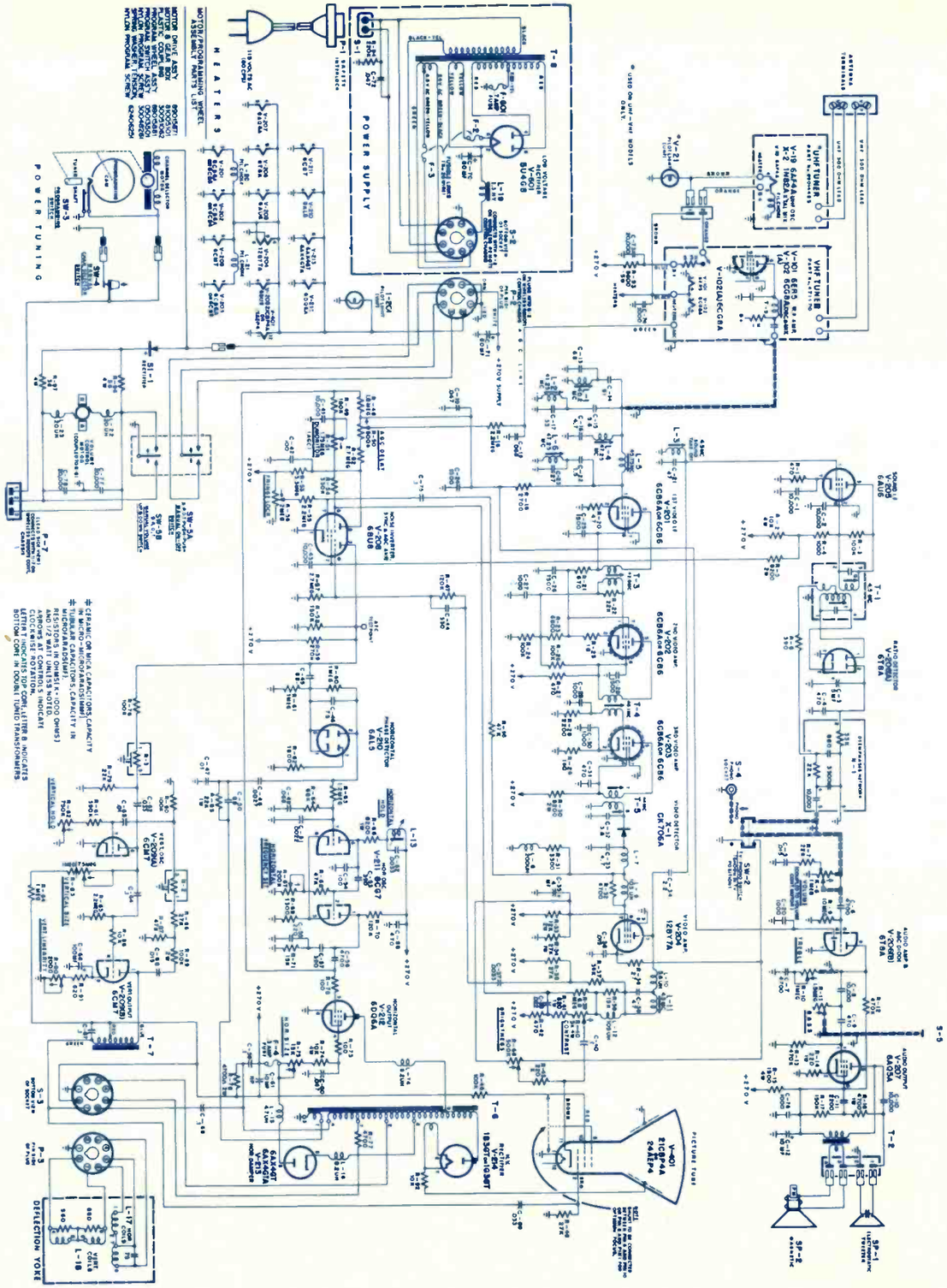
TV Models Breton, Breton "A", Burnaby



ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

DUMONT
TV Chassis 120601-A
Model RA-601A





CHASSIS No. 120601-A

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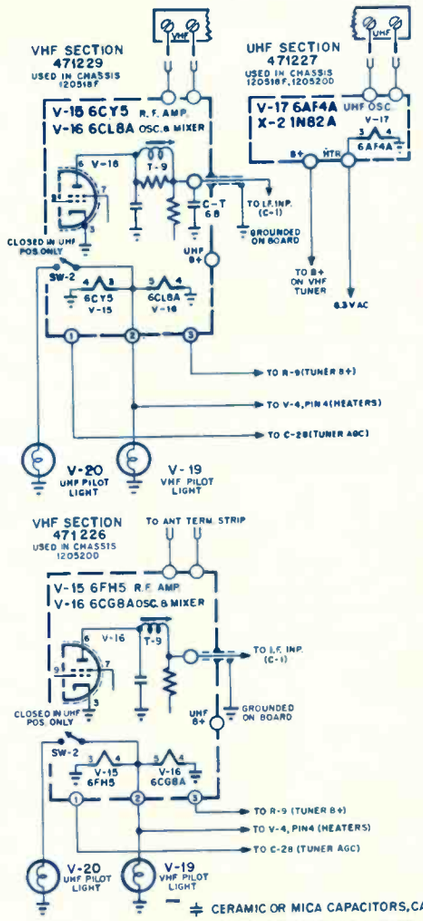
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

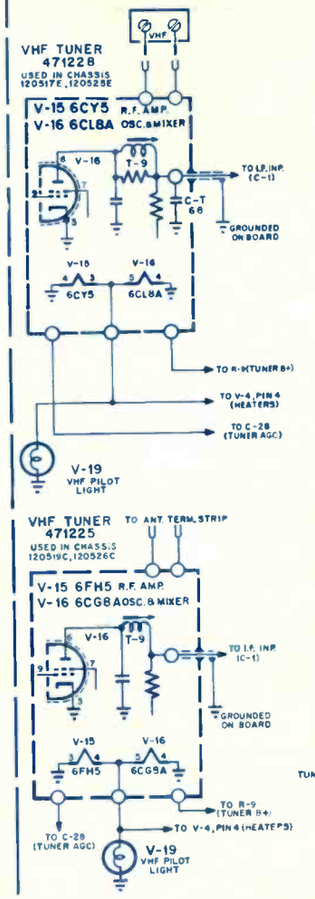
EMERSON
TV Chassis 120517E, 120518F, 120519C, 120520D, 120525E, 120526C

TYPE	MODEL	CHASSIS	REMOTE	STYLE	CRT	TUNER
VHF	1600	120517E		PORT TM	17DTP4	471228
	1602	120525E	471235			
	1604	120517E		TABLE MODEL	21DAP4	471225
	1608	120519C				
	1610	120526C	471235	LO BOY CONSOLE		
	1612	120519C				
	1614	120526C	471235			
UHF VHF	1601	120518F		PORT TM	17DTP4	471229 VHF 471227 UHF
	1606			TABLE MODEL	21DAP4	471226 VHF 471227 UHF
	1609	120520D		LO BOY CONSOLE		
	1613					

UHF-VHF TUNER ASSEMBLIES



VHF TUNERS



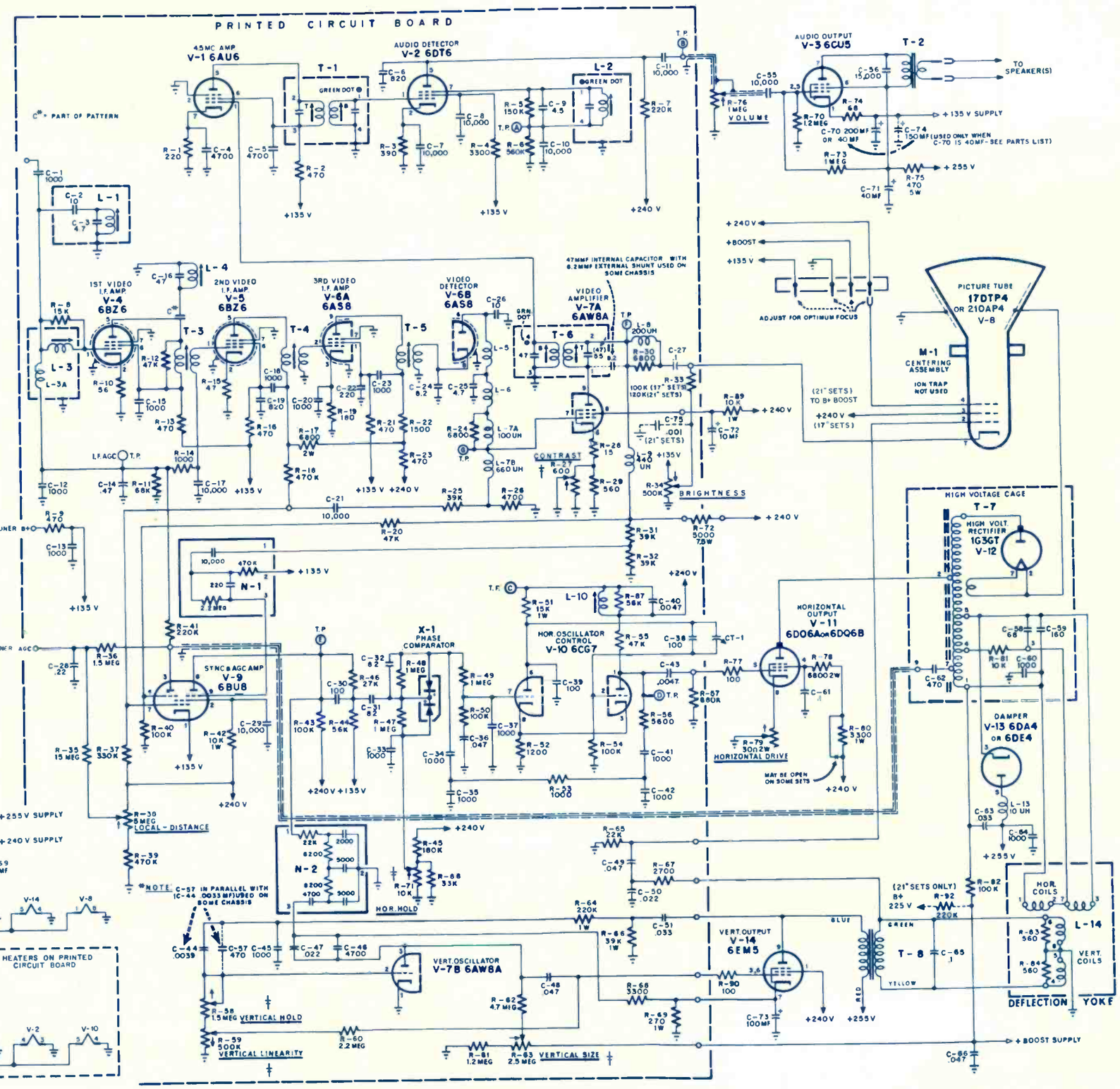
CERAMIC OR MICA CAPACITORS, CAPACITY IN MICRO-MICROFARADS.
TUBULAR CAPACITORS, CAPACITY IN MICROFARADS.

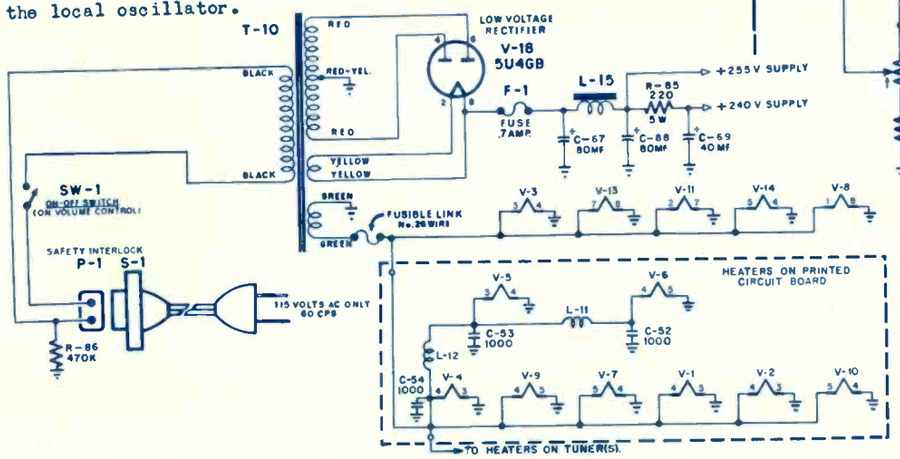
RESISTORS IN OHMS (K = 1000 OHMS) AND 1/2 WATT, UNLESS NOTED. ARROWS AT CONTROLS INDICATE CLOCKWISE ROTATION. T INDICATES TOP CORE, B INDICATES BOTTOM CORE IN DOUBLE TUNED TRANSFORMERS.

TUNER ADJUSTMENT

VHF tuners 471225 and 471226 used in chassis 120519C, 520D and 526C are new MINI-TURRET tuners which require the use of an alignment tool with a tip no wider than 1/8" for adjustment of the local oscillator.

PRINTED CIRCUIT BOARD





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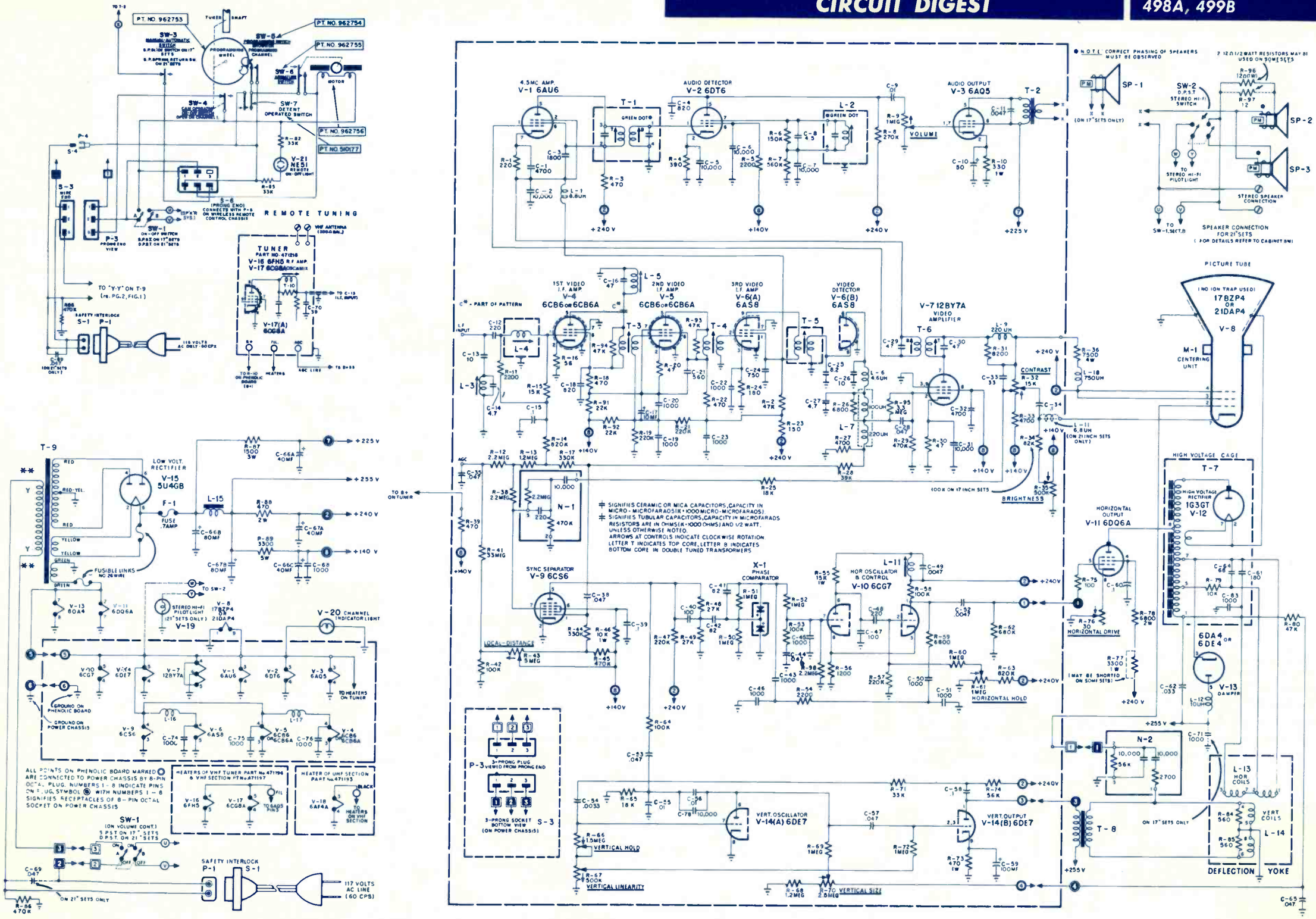
EMERSON

TV Chassis 120488A, 489A, 496A, 497B, 498A, 499B



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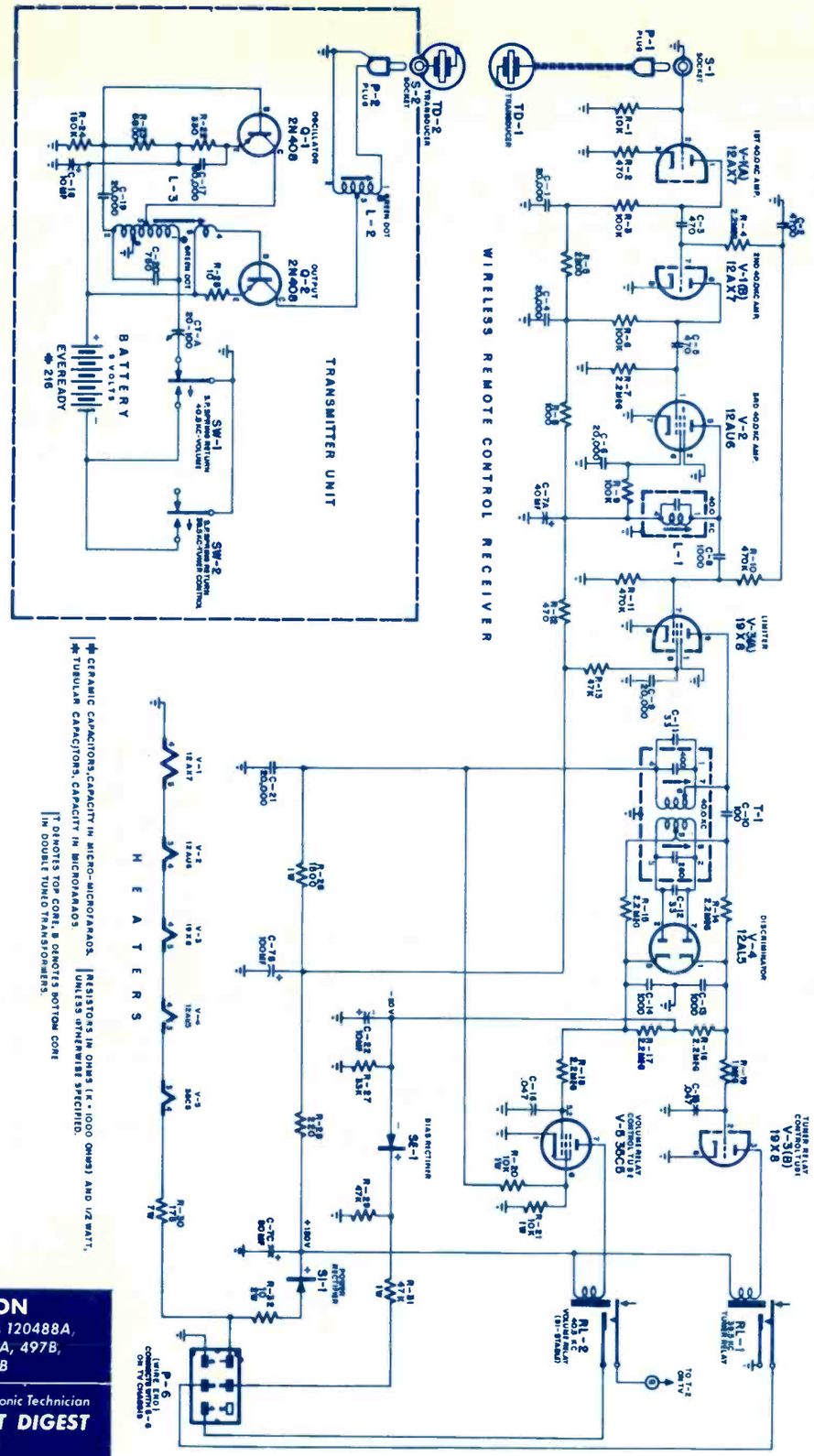
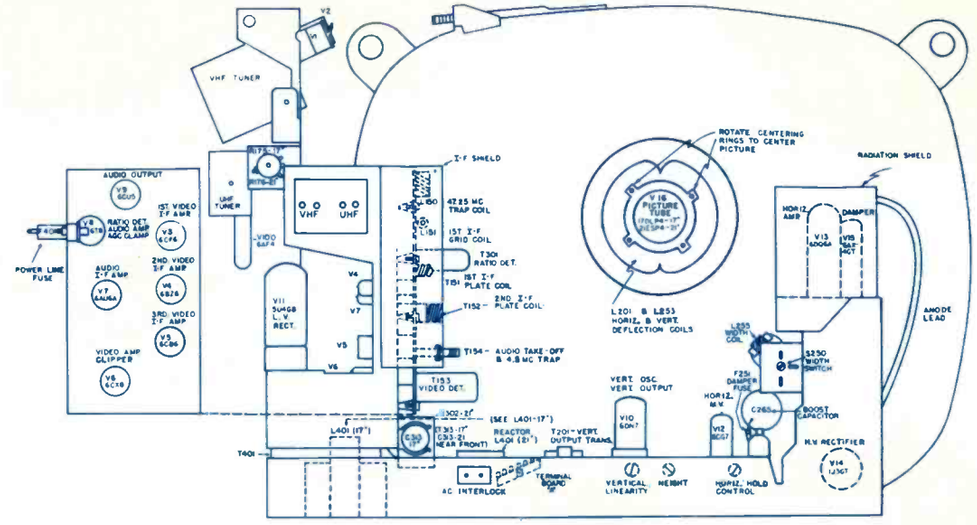
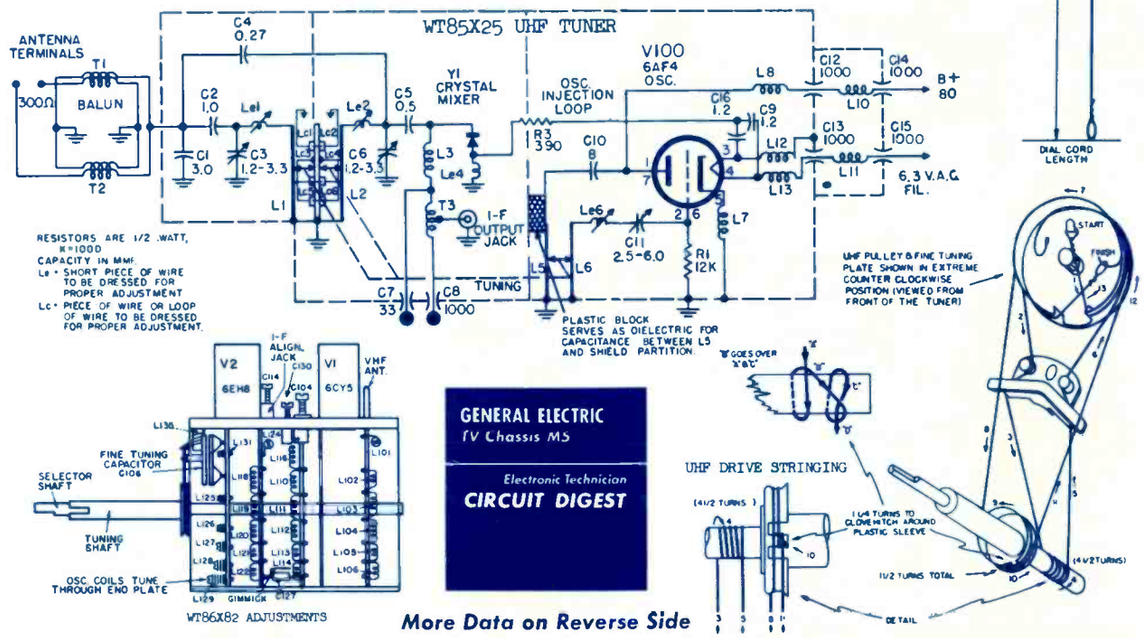


EMERSON
TV Chassis 120488A, 489A, 496A, 497B, 498A, 499B

Electronic Technician
CIRCUIT DIGEST

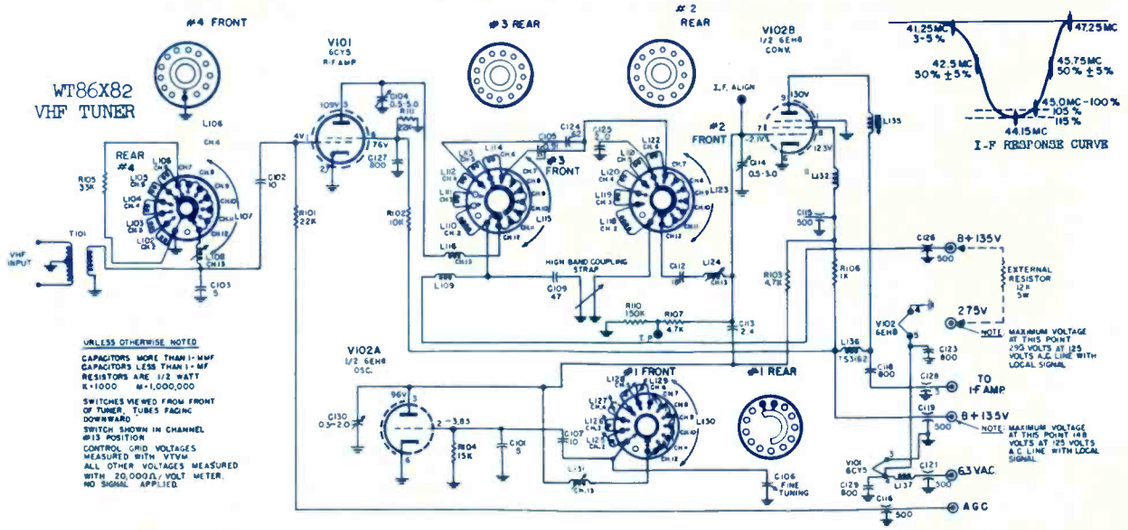


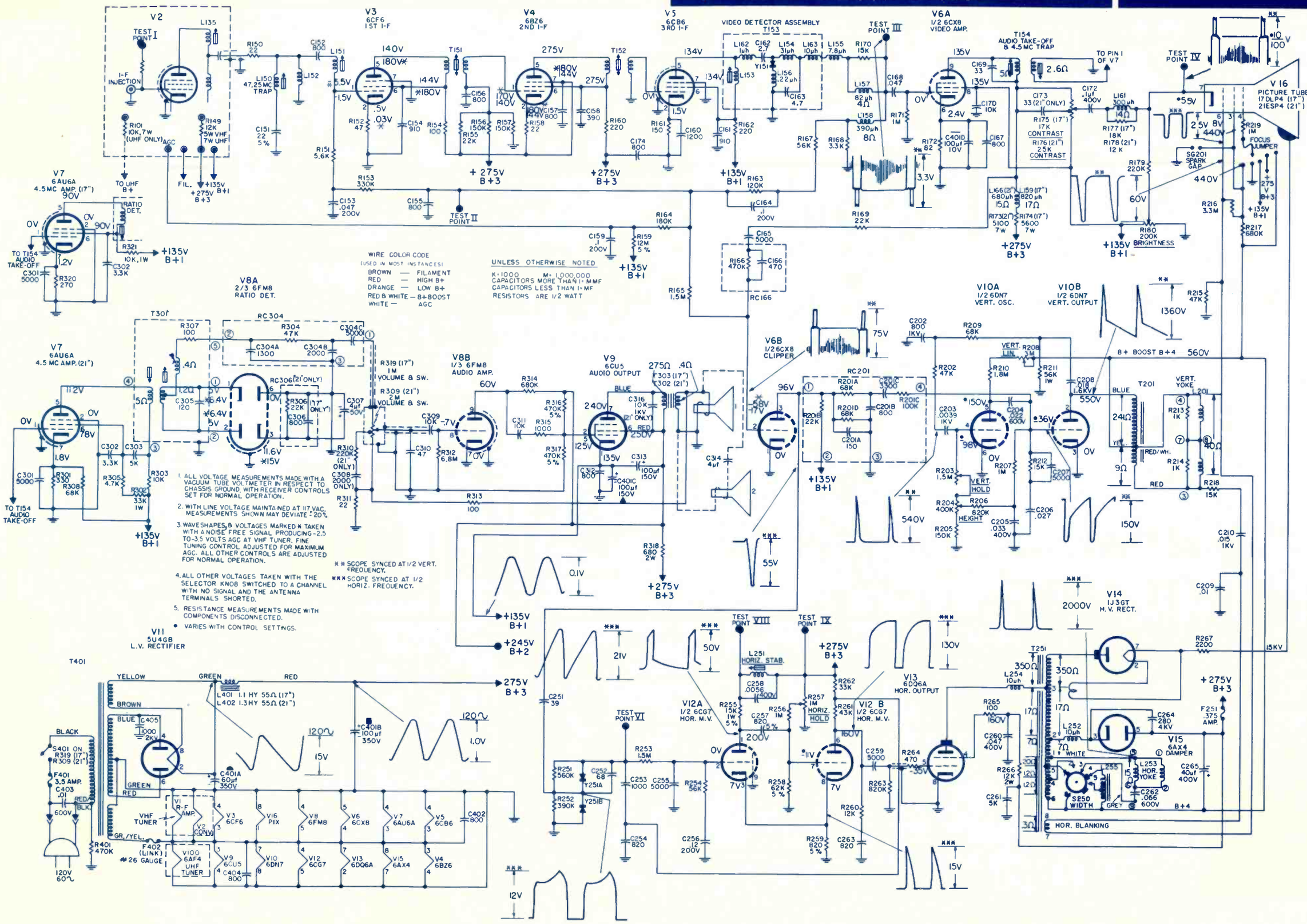


GENERAL ELECTRIC
TV Chassis MS

Electronic Technician
CIRCUIT DIGEST

More Data on Reverse Side





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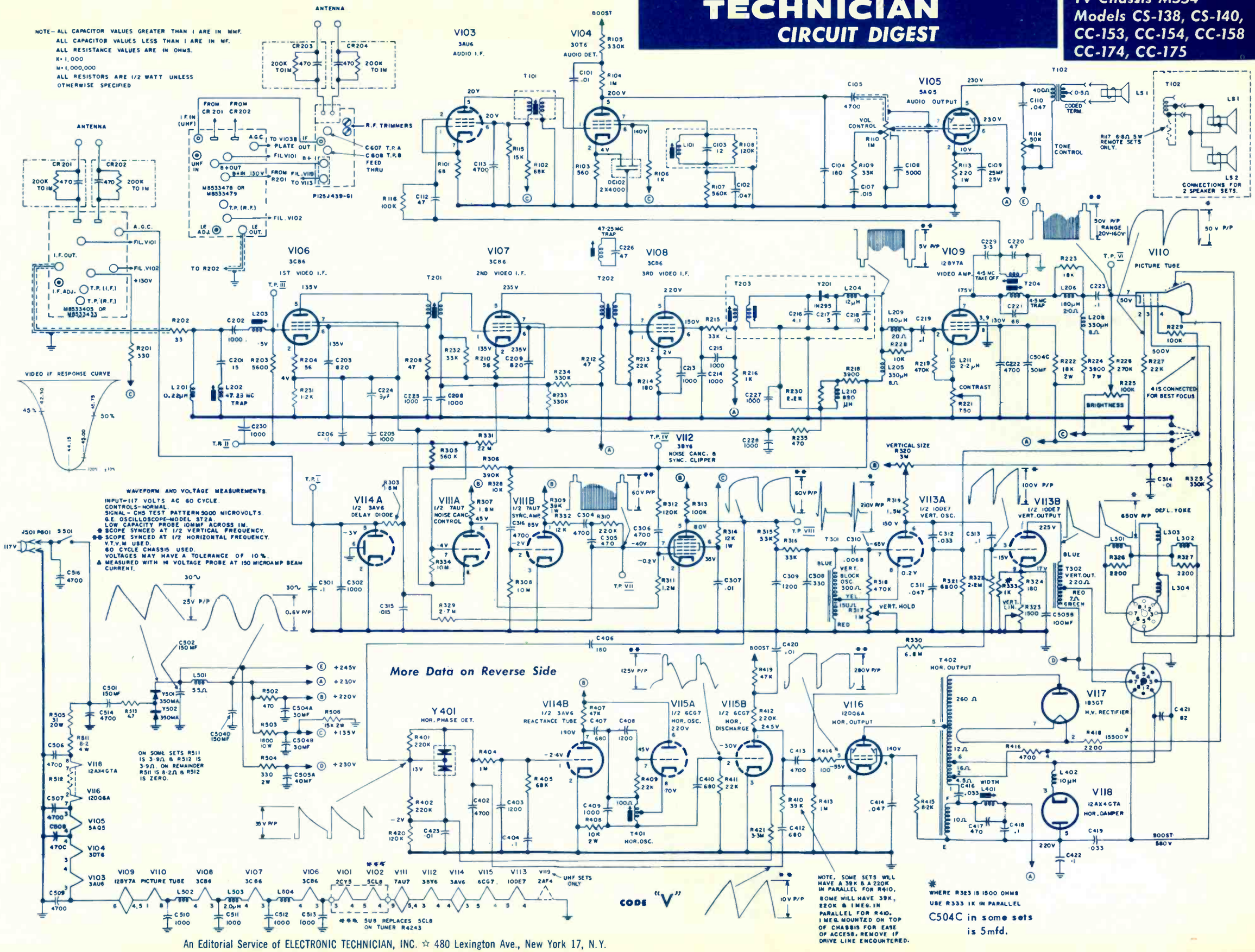
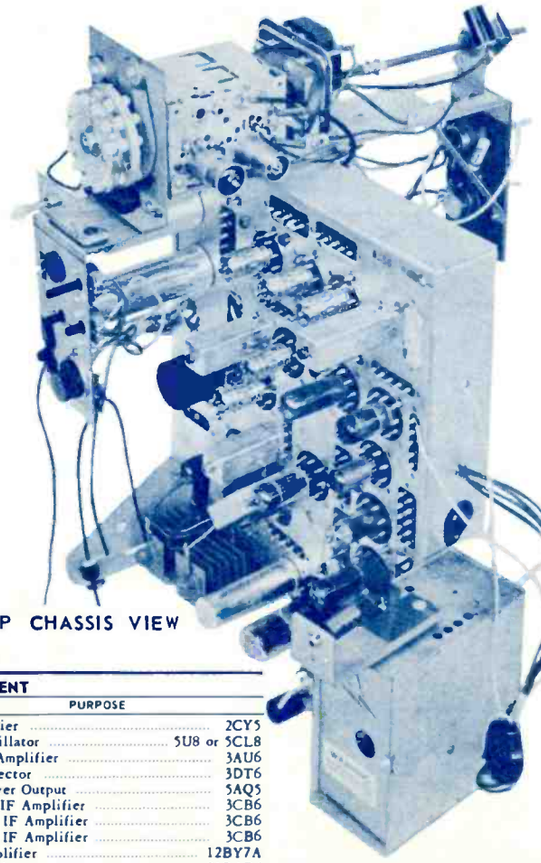
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

GENERAL ELECTRIC

TV Chassis M554
Models CS-138, CS-140, CC-153, CC-154, CC-158 CC-174, CC-175



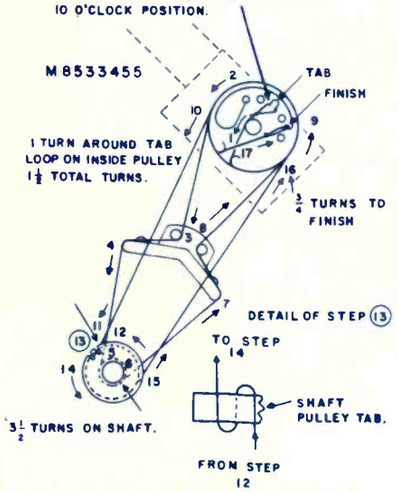
DIAL CORD LENGTH.



TOP CHASSIS VIEW

UHF DIAL STRINGING

START STRINGING WITH LARGE UHF PULLEY FULLY COUNTER CLOCKWISE AS SHOWN & WITH SMALL PULLEY TAB LOCATED AT 10 O'CLOCK POSITION.



More Data on Reverse Side

TUBE COMPLEMENT

SYM.	PURPOSE	
V101	RF Amplifier	2CY5
V102	Mixer Oscillator	5U8 or 5CL8
*V103	Audio IF Amplifier	3AU6
V104	Audio Detector	3DT6
V105	Audio Power Output	5AQ5
V106	1st Video IF Amplifier	3CB6
V107	2nd Video IF Amplifier	3CB6
V108	3rd Video IF Amplifier	3CB6
V109	Video Amplifier	12BY7A
V110	Picture Tube	21DAP4
V111	Noise Canc. Control & Sync Amp.	7AU7
V112	Noise Canc. & Sync Clipper	3BY6
V113	Vertical Oscillator and Output	10DE7
*V114	Reactance Tube, Delay Diode	3AV6
V115	Horizontal Oscillator and Discharge	6CG7
V116	Horizontal Output	12DQ6A
V117	High Voltage Rectifier	1B3-GT
V118	Damper	12AX4GTA
V119	U.H.F. Converter	2AF4
Y501	Low Voltage Rectifier	Selenium
Y502	Low Voltage Rectifier	Selenium
†Y401	Horizontal Phase Detector	R3057

*M554 Early Production Sets only, use the following tubes:
V103 Audio IF Amplifier, Delay Diode 5AM8
V114 Horizontal Phase Detector, Reactance Tube 6CN7
†Y401 Horizontal Phase Detector, not used.

GENERAL ELECTRIC
TV Chassis M554
Models CS-138, CS-140, CC-153, CC-154, CC-158 CC-174, CC-175

Electronic Technician
CIRCUIT DIGEST

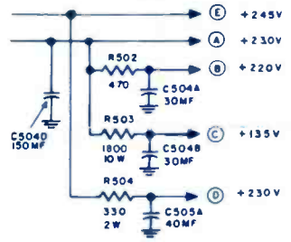
PRODUCTION CHANGES:

"NO" CODE:

"No code" schematic applies as printed.

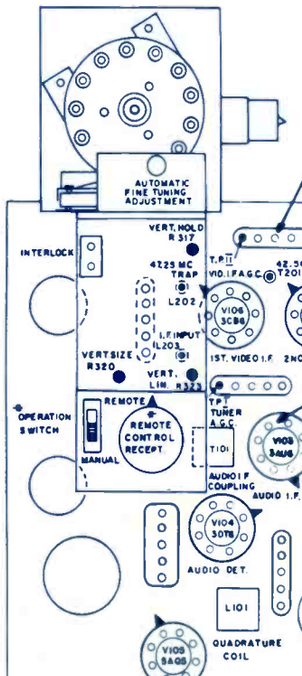
"Z" CODE:

"No code" schematic applies with the following change.
To increase vertical size R504 location changed to provide B+ to V113 from (E) instead of from (A).



"Y" CODE:

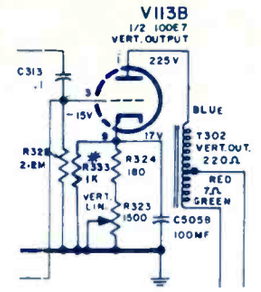
"No code" schematic applies with "Z" change and the following changes.
To reduce current through vertical linearity control – 1K resistor R333 added from Pin 9 of 10DE7 to chassis.
R324 changed from 33 ohms to 180 ohms.
L503 in filament string changed from 2.2 μh to 2.0 μh



TEST POINT & TUBE LOCATION CHART M554 AND M556 CHASSIS

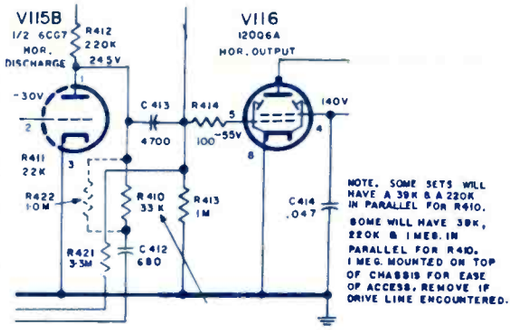
"X" CODE:

"No code" schematic including "Z" and "Y" changes applies with the following changes.
To reduce drive lines 150K resistor added in parallel with R410 39K resistor.



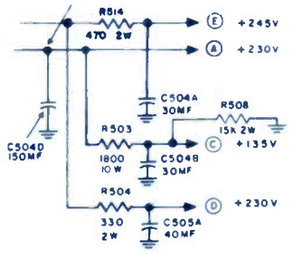
"W" CODE:

"No code" schematic including "Z" and "Y" changes applies with the following changes.
To reduce drive lines 220K resistor added in parallel with R410 in place of the 150K resistor referred to under "X" code change.
See note under M 554 "V" code schematic referring to R410.



"V" CODE:

Code "V" schematic applies as printed.



More Data on Reverse Side

"U" CODE:

Code "V" schematic applies with the following changes.
To reduce 60 cycle hum in Audio.
R502 deleted. R514-470 ohms 2 watts added. C504A reconnected to point (E).
Points (B) in schematic changed to read (A).

"T" CODE:

Code "V" schematic applies with "U" change.
Connections of R513 (R501 in M554 "No code" schematic) and C501 reversed to connect R513 directly to switch S501 and capacitor C501 directly to Junction of Y501 and Y502.

"S" CODE:

Code "V" schematic applies including "U" and "T" and the following changes.
To prevent spurious vertical synchronization, C308 330mmf mica capacitor deleted.

"R" CODE:

Code "V" schematic applies with "U", "T" and "S" and the following changes.
To improve stability of Audio I.F. and detector alignment.
R102 - value changed from 68K to 220K.
R106 - value changed from 1K to 15K.
R115 - 15K resistor, deleted. C114 5mmf. ceramic capacitor N5600 temperature coefficient, added in parallel with T101 Audio I.F. Transformer. Secondary voltage at pin 6 of V104 (screen) changed from 140 volts to 100 volts due to above changes.

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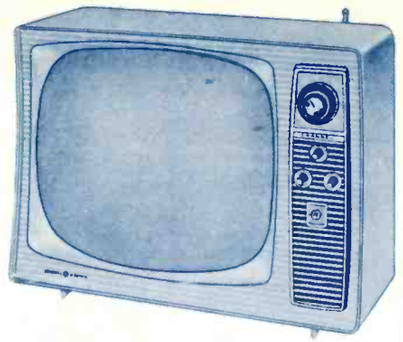
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

GENERAL ELECTRIC
TV Chassis M569
Models CS732M8V, CS732M9V

TUBE AND CRYSTAL COMPLEMENT

SYMBOL	PURPOSE	TYPE
V1	R-F Amplifier	6CF6
V2	VHF Mixer-Osc. (WT86X80 Tuner)	6CL8/ 6CL8A
V2	VHF Mixer-Osc. (WT86X81 Tuner)	6CL8A
V2	VHF Mixer-Osc. (WT86X82 Tuner)	6EH8
V3	1st I-F Amplifier	6CF6
V4	2nd I-F Amplifier	6BZ6
V5	3rd I-F Amplifier	6CB6
V6	Video Amplifier & Sync Clipper	6CX8
V7	Audio I-F Amplifier	6AU6A
V8	Ratio Detector, Audio Amplifier	6FM8
V9	Audio Output	6CU5
V10	Vertical Osc. Vertical Amplifier	6DN7
V11	Low Voltage Rectifier	5U4GB
V12	Horizontal Multivabrator	6CG7
V13	Horizontal Output	6DQ6A
V14	High Voltage Rectifier	1J3GT
V15	Horizontal Damper	6AX4GT
V16	Picture Tube 110° deflection, rectangular, Electrostatic focus, aluminized, straight gun	17DLP4 or 17DSP4
T151	Video Detector Crystal Diode	1N64
T261A/ T261B	Horizontal Phase Detector	R2067

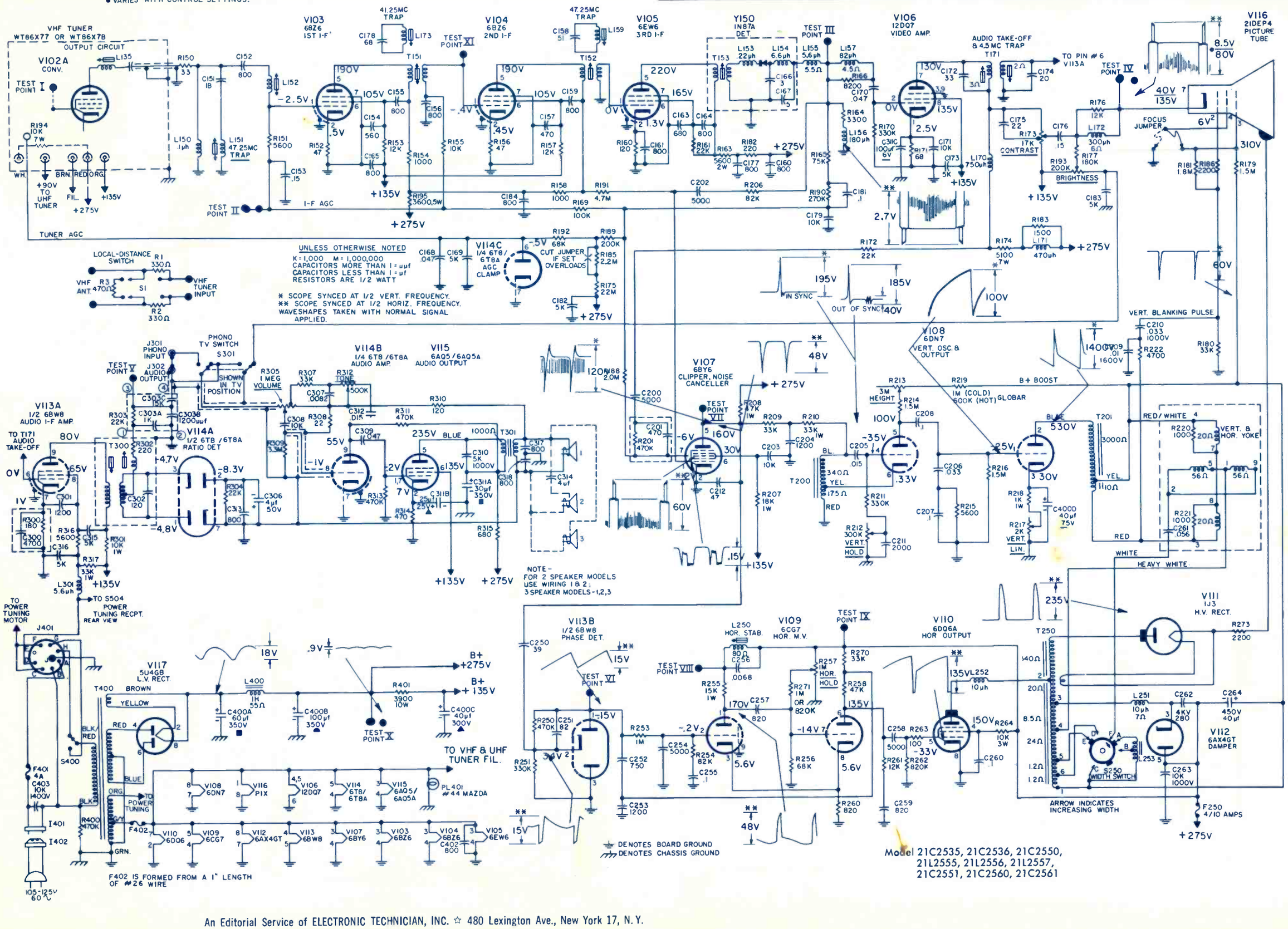


WIRE COLOR CODE (USED IN MOST INSTANCES)
BROWN — FILAMENT
RED — HIGH B+
ORANGE — LOW B+
RED & WHITE — B+ BOOST
WHITE — AGC

* SCOPE SYNCED AT 1/2 VERT. FREQUENCY.
** SCOPE SYNCED AT 1/2 HORIZ. FREQUENCY.

VOLTAGE MEASUREMENTS ARE IN RESPECT TO CHASSIS MEASURED WITH A VTVM. CONTROLS SET FOR NORMAL OPERATION, 117V NOMINAL LINE. ANTENNA TERMINALS SHORTED.

• VARIES WITH CONTROL SETTINGS.



Model 21C2535, 21C2536, 21C2550, 21L2555, 21L2556, 21L2557, 21C2551, 21C2560, 21C2561

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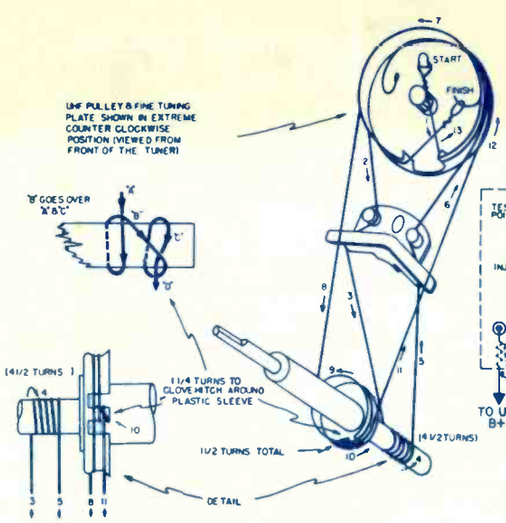
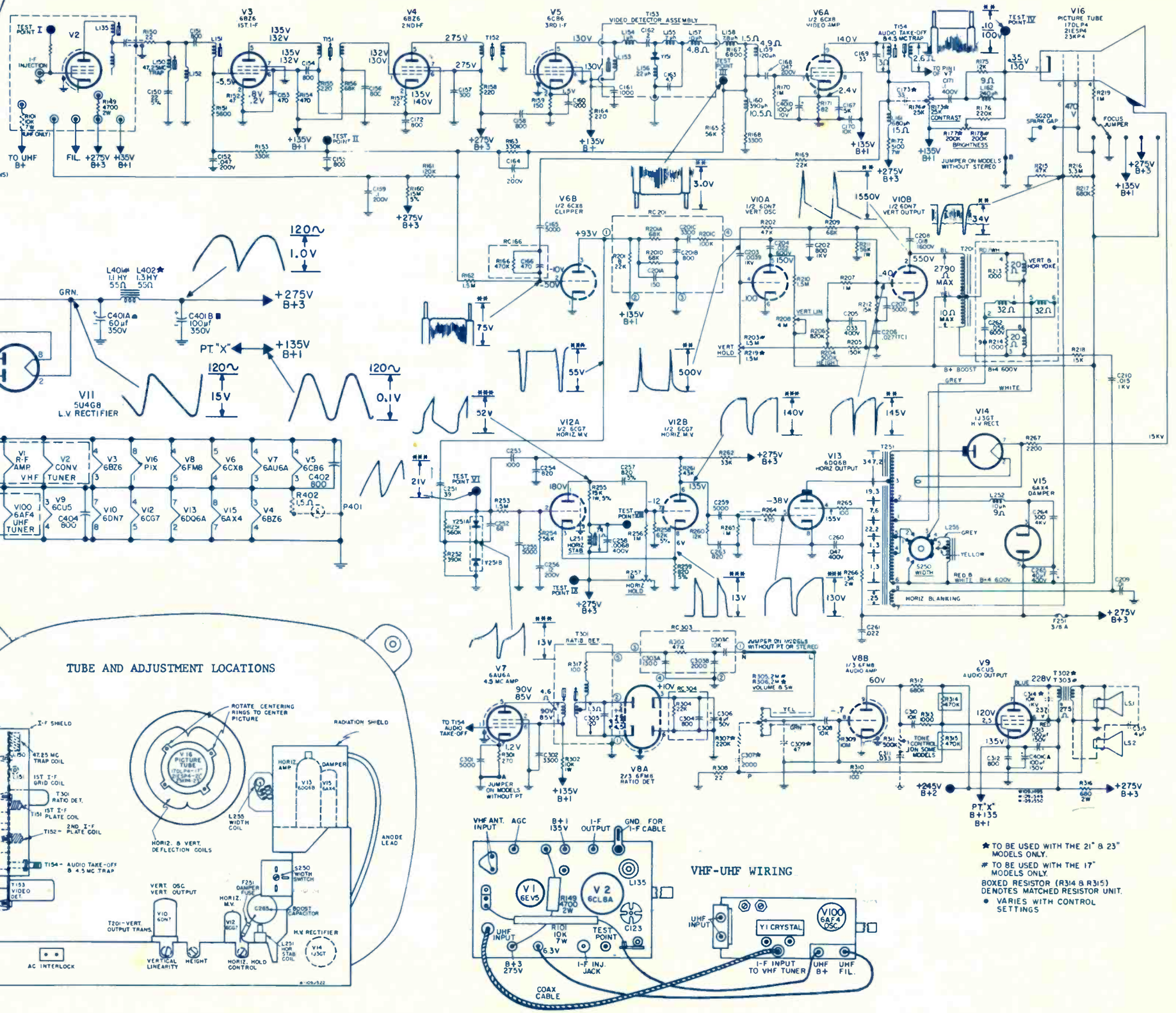


UHF TUNER DIAL STRINGING DIAGRAM



★ TO BE USED WITH THE 21" & 23" MODELS ONLY.

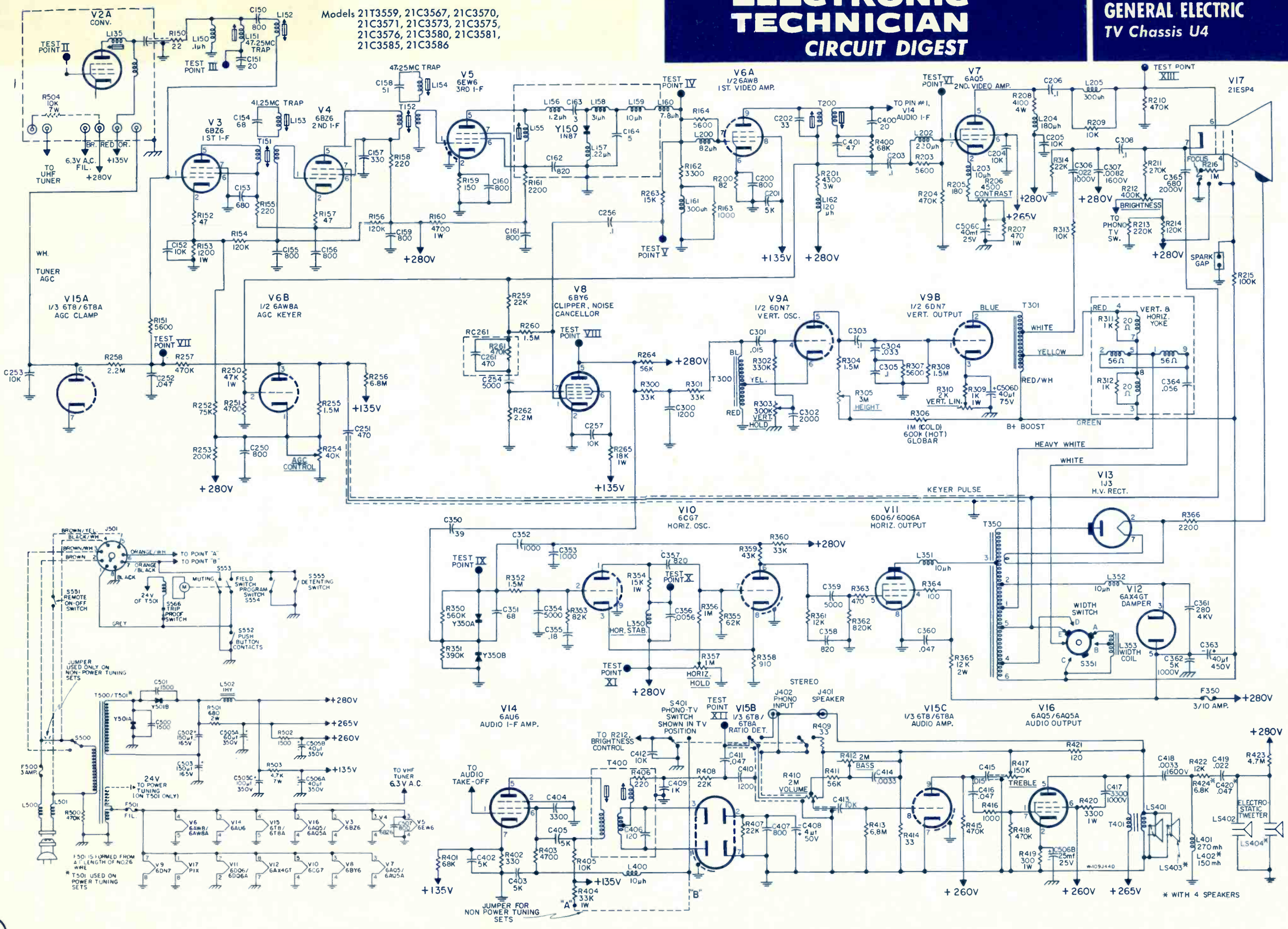
TO BE USED WITH THE 17" MODELS ONLY.

BOXED RESISTOR (R314 & R315) DENOTES MATCHED RESISTOR UNIT.

• VARIES WITH CONTROL SETTINGS

GENERAL ELECTRIC
TV Chassis U4

Models 21T3559, 21C3567, 21C3570, 21C3571, 21C3573, 21C3575, 21C3576, 21C3580, 21C3581, 21C3585, 21C3586



"U4" SCHEMATIC DIAGRAM

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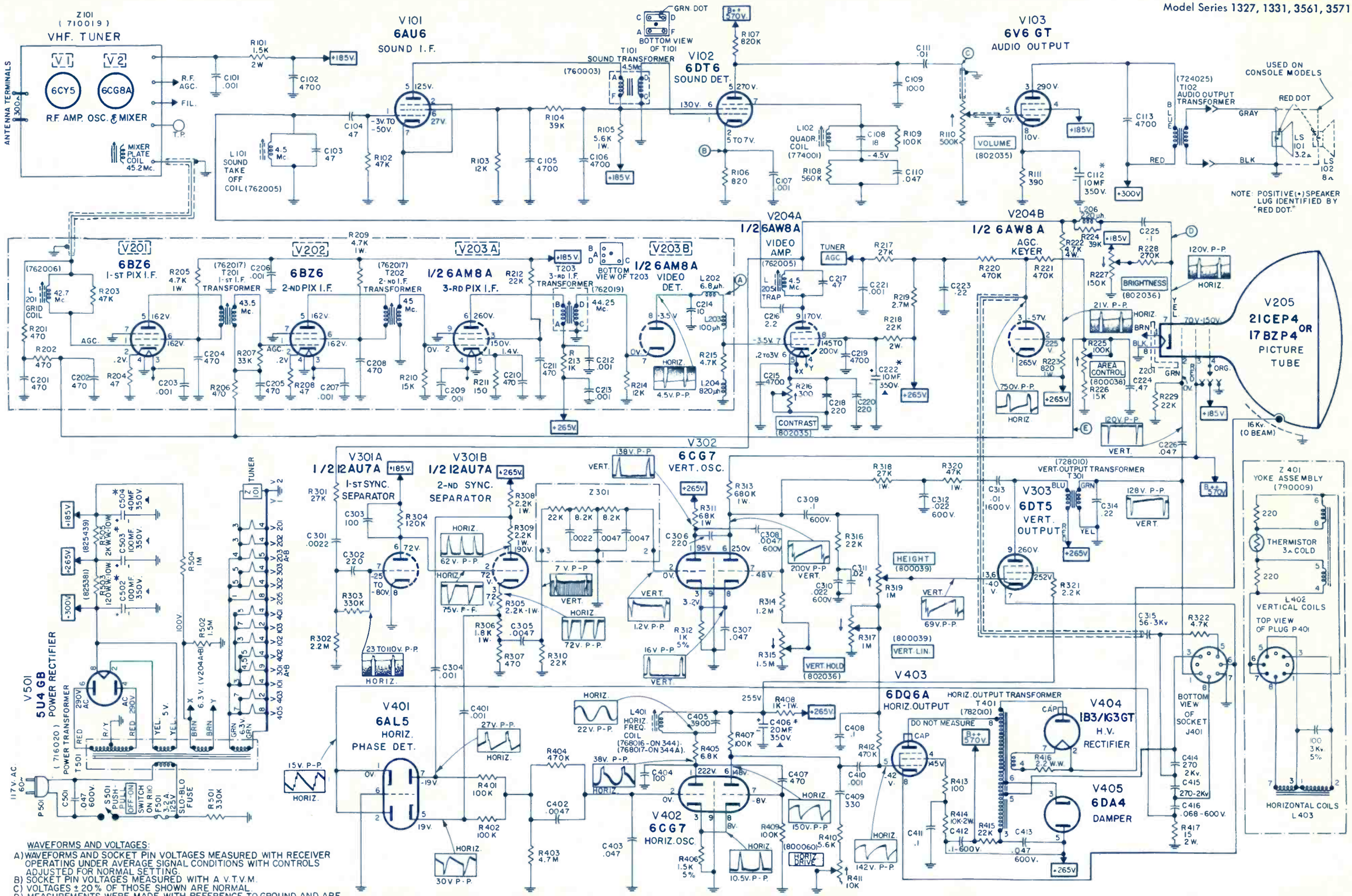
HOFFMAN
TV Chassis 344, 344A

Model Series 1327, 1331, 3561, 3571

NOTES:
1. ALL CAPACITIES SHOWN AS DECIMAL FRACTIONS ARE MICROFARADS AND SHOWN AS WHOLE NUMBERS ARE MICROMICROFARADS UNLESS OTHERWISE NOTED.
2. ALL RESISTANCES ARE GIVEN IN OHMS: K=1,000; M=1,000,000.
3. ARROWS ON POTENTIOMETERS INDICATE C.W. ROTATION.
4. ENCIRCLED LETTERS ARE REFERRED TO IN ALIGNMENT INFORMATION.
5. UNLESS OTHERWISE NOTED ALL RESISTORS ARE 1/2 WATT AND 10%.
6. ——— INDICATES ASSEMBLY. - - - - - INDICATES SHIELD.
7. NUMERALS SHOWN IN PARENTHESIS (XXXXXX) INDICATE HOFFMAN PART NO.
8. ELECTROLYTIC CAPACITORS MARKED * ARE IN CONTAINER PART NO. 857104, AND MARKED ÷ ARE IN CONTAINER PART NO. 856704.



WAVEFORMS AND VOLTAGES:
A) WAVEFORMS AND SOCKET PIN VOLTAGES MEASURED WITH RECEIVER OPERATING UNDER AVERAGE SIGNAL CONDITIONS WITH CONTROLS ADJUSTED FOR NORMAL SETTING.
B) SOCKET PIN VOLTAGES MEASURED WITH A V.T.V.M.
C) VOLTAGES ± 20% OF THOSE SHOWN ARE NORMAL.
D) MEASUREMENTS WERE MADE WITH REFERENCE TO GROUND AND ARE POSITIVE UNLESS OTHERWISE INDICATED.

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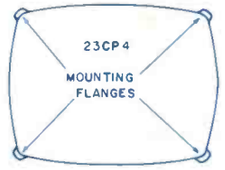
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

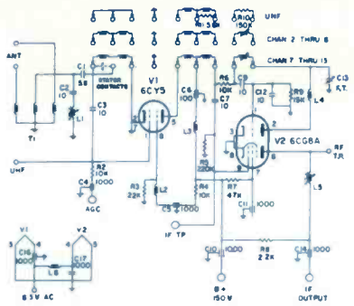
HOFFMAN
TV Chassis 348, 350
Models 3653, 3663, 3673, 3683

PICTURE TUBE REMOVAL
3653, 3663, 3673, 3683 SERIES

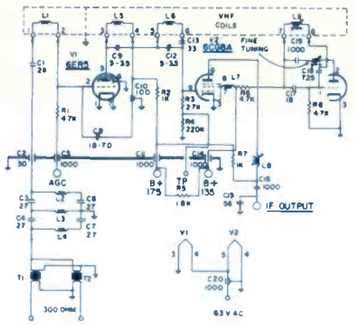
This series, known as the PAN-O-VISION series, uses the new 23" picture tube. The lens is an integral part of the picture tube. The lens is formed to closely fit the face of the picture tube. There is no air space between the lens and the face of the picture tube to collect dust. The only cleaning required on the PAN-O-VISION series is to clean the outer surface of the lens in the same manner as cleaning a window.

To remove the picture tube. The escutcheon around the edge of the tube is held in place with 4 clips from the rear. The clips are removed by depressing and sliding to the side. The escutcheon can now be pulled out from the front. Located at each corner of the picture tube is a small bracket, held in place with an Allen head screw. Remove the 4 brackets and the entire picture tube assembly can be lifted out of the cabinet. Special flanges are molded into the corners of the lens and serve as the mounting lugs for the picture tube. Reverse the above procedure to reassemble.





SCHEMATIC DIAGRAM - TUNERS 710019, 710021



SCHEMATIC DIAGRAM - TUNER 710022

TUNER NOTE:
Z101A (710021) - USED ON CHASSIS 348.
Z101 (710022) - USED ON CHASSIS 350.

ANTENNA TERMINALS 300Ω
TUNER VHF
6CY5 (V1) RF AMP
6CG8 (V2) OSC MIXER
Z101A (710021)
Z101 (710022)
MIXER PLATE COIL 45.5Mc
RF AGC
FIL
TP

R101 470 (350 CHASSIS) 1K-1W (348 CHASSIS)
L104 4700
C103 .001
C102 47
L101 SOUND TAKE OFF COIL (762005)
4.5 Mc
C101 47
R102 47K
R103 15K
R104 47K 1W.
R105 4.7K
C105 .0047
C106 .0047
C107 2.2

V101A 1/2 6U8A I.F. SOUND
+185V
(774006) RATIO DET. TRANSFORMER T101
BOTTOM VIEW OF T101

V102A 2/3 6BN8 RATIO DET.
R106 220
C108 .0047
C109 .001
C110 5MFD 50V.
R107 47K
C111 .01
R108 6.8K
R109 68K
C112 5600
R110 500K VOLUME (802040)
C113 .01
R111 4.7M
C114 820
C115 470
C116 .001

TV SOUND OUTPUT J101
PHONO INPUT J102
PHONO
S101 SWITCH ON R112
TV

V102B 1/3 6BN8 AUDIO AMP.

V103 EL84/6BQ5 AUDIO OUTPUT
R113 22K
C117 5600
TONE (800069)
R112 1M
R114 680K
R115 1K
R116 330K
C118 .01
R117 100
R118 100
C119 10MFD 350V.
C120 10MFD 350V.
C121 3300
R119 39K 1W.
C122 40 MFD. 350V.
R120 1.8K 2W.
+280V

(724021) AUDIO OUTPUT TRANSFORMER T102
STEREO OR EXT SPEAKERS
GRAY
BLUE
BLK
RED
J103
LS 101 3.2Ω
LS 102 8Ω
NOTE: POSITIVE (+) SPEAKER LUG IS IDENTIFIED BY A RED DOT.

Z201 I.F. ASSEM.
47.25 Mc
43.75 Mc
(762013) GRID COIL
Z202
R201 470
R202 470
C201 470
C202 470
R203 47K
R204 47
C203 .001

V201 6BZ6 1-ST PIX I.F.
R205 2.2K
(762017) T201 1-ST I.F. TRANSFORMER
43.25 Mc
C204 470
C206 .001

V202 6BZ6 2-ND PIX I.F.
R207 33K
C205 470
R208 47
C207 .001
R209 2.2K
(762025) T202 2-ND I.F. TRANSFORMER
47.25 Mc
45.25 Mc
Z203
C208 470

V203A 1/2 6AM8A 3-RD PIX I.F.
C209 .001
R210 15K
C210 .001
R211 150
C211 470
R212 22K
C212 470

T203 3-RD I.F. TRANSFORMER (762019)
BOTTOM VIEW OF T203
R213 1K
C213 .001
C214 .001

V203B 1/2 6AM8A VIDEO DET.
(750014) L202 6.8μh.
C215 4.7
L203 100μh (771008)
R214 12K
R215 4.7K
L204 820μh (771019)
HORIZ.

V204A 1/2 6AW8A VIDEO AMP.
(762005) L205 TRAP 4.5 Mc
C217 4.7
C216 4.7
C219 47
R216 300
R217 470
C220 4700
C221 220
C222 220
C224 20MF 300V.
R218 47K
R219 22K 2W.
R220 2.7M
C223 4700
C225 .22
CONTRAST (802040)

V204B 1/2 6AW8A AGC KEYER
TUNER AGC
R221 470K
R222 470K
R223 4.7K 4W.
R225 30K
R228 150K
BRIGHTNESS (802048)
R229 220K
C227 .1
R231 330K
C229 4700
TO SWITCH S502
120V. P-P HORIZ.
21V P-P HORIZ.
70V.
R226 100K
AREA CONTROL (800038)
C226 .47
R227 15K
R230 22K
R224 820
750V. P-P HORIZ.
255V
+255V
120V P-P VERT.
C228 .047
R232 4M
FOCUS (800061)
18 Kv. (O BEAM)

V205 23CP4 PICTURE TUBE
B+ 360V
ORG
GRN
YEL
BLU

Z401 YOKE ASSEMBLY (790009)
THERMISTOR 3Ω COLD
L402 VERTICAL COILS
TOP VIEW OF PLUG P401
HORIZONTAL COILS L403

V501 5U4GB POWER RECTIFIER
(716020) POWER TRANSFORMER T501
290V AC
6.3V (V204A+B)
6.3V GRN
L501 (750015) 1.5μh.
P501 110-120V AC 60~
C501 .047-600V.
(953001) CIRCUIT BREAKER 3.5A 125V
S501 SWITCH ON R110 "OFF-ON"
R501 330K
R502 1.5M
R503 100W-W-10W
R504 1M
R505 2.5K-W-10W
C502 80MF 400V
C503 100MF 350V.
C504 40MF 350V.
TO JUNCTION OF R231 & C229
S502 SWITCH ON R112
+255V
+280V
+185V
(825377)
(825444)
100V.

V301A 1/2 6U8A 1-ST SYNC. SEPARATOR
R301 33K
C303 100
C301 .0025
C302 220
R304 120K
R303 330K
R302 2.2M
23 TO 110V P-P HORIZ.

V301A 1/2 6BJ8 2-ND SYNC. SEPARATOR
R308 2.2K 1W.
R309 2.2K 1W.
R305 2.2K-1W.
R306 1.8K 1W.
C305 .0047
R307 560
R310 22K
HORIZ.
62 V. P-P
75V. P-P

Z301 (986001)
22K 8.2K 8.2K
.0022 .0047 .0047
7 V. P-P VERT.
72V. P-P HORIZ.

V302 6CG7 VERT. OSC.
138V P-P VERT.
R311 68K 1W
C306 220
C308 .0047 600V
R313 680K 1W.
C309 .1 600V.
200V. P-P VERT.
R316 22K
C310 .022 600V.
C311 .022
R314 1.2M
R315 1.5M
1.2V. P-P VERT.
16V P-P VERT.
R312 1K 5%
C307 .047
R317 1M
HEIGHT (800039)
R319 1M
R321 100
69V. P-R VERT.
(800039) VERT. LIN.
VERT. HOLD (802048)
C304 .001

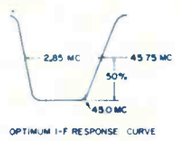
(728010) VERT. OUTPUT TRANSFORMER T301
V303 6DT5 VERT. OUTPUT
C313 .01 1600V.
C314 .22
128V. P-P VERT.
R322 2.2K
C315 82-3Kv
R323 4.7K
BOTTOM VIEW OF SOCKET J401

V301B 2/3 6BJ8 HORIZ. PHASE DET.
C401 .001
27V P-P HORIZ.
R401 100K
R402 100K
19V
15V. P-P HORIZ.
30V P-P HORIZ.
R404 470K
C402 .0047
R403 4.7M
C403 .047

L401 HORIZ FREQ. COIL (768017)
22V. P-P HORIZ.
C405 3900
C406 20MF 300V.
R408 1K-1W.
+255V
R407 100K
C408 .1
38V. P-P HORIZ.
C404 100
R405 6.8K
R406 1.5K 5%
V401 6CG7 HORIZ. OSC.
150V. P-P HORIZ.
R409 100K
HORIZ. DRIVE (800060)
10.5V. P-P HORIZ.
R410 10K
142V. P-P HORIZ.
R412 6.8K
C409 330
C410 .001
R411 470K
R413 100
42V.

V402 6DQ6A HORIZ. OUTPUT
HORIZ. OUTPUT TRANSFORMER T401 (782009)
DO NOT MEASURE
580V
CAP
48V.
V403 1B3GT/1G3GT H.V. RECTIFIER
R416 2.2 W-W
V404 6DA4/6DE4 DAMPER
C411 .1
R414 10K 2W.
C412 .1 600V.
R415 22K
C413 .047 600V.
-255V
C414 170 3Kv.
C415 170-3Kv.
C416 .068-600 V.
R417 15 2W.

ARROWS ON POTENTIOMETERS INDICATE C.W. ROTATION
ENCIRCLED LETTERS ARE REFERRED TO IN ALIGNMENT INFORMATION.
NUMERALS SHOWN IN PARENTHESIS (XXXXXX) INDICATE HOFFMAN PART NO.



OPTIMUM I-F RESPONSE CURVE

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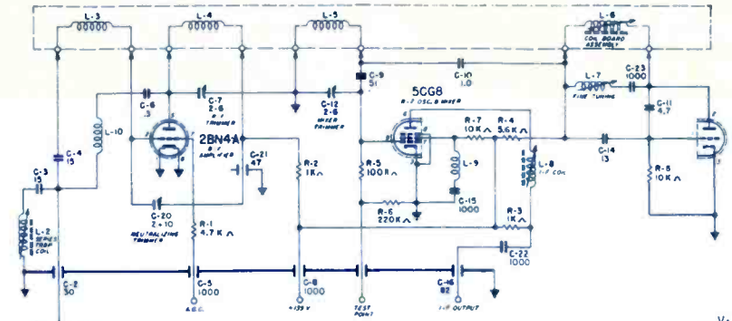
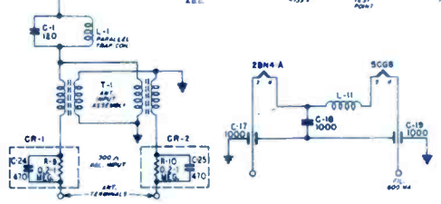
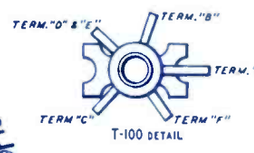
HOFFMAN
TV Chassis 360
Model 1777

V-1 . . . 2BN4	R-F Amplifier	V-109 . . 12D4	Damper
V-2 . . . . 5CG8	R-F Mixer/Oscillator	V-110 . . 1K3	High Voltage Rectifier
V-101 . . 6AW8A	Sound I-F/Video Amplifier	V-111 . . 17CFP4	Picture Tube
V-102 . . 3DT6	Sound Detector	CR-101 . CK-706A	Video Detector & AGC
V-103 . . 12CA5	Audio Output	SD-101 . SEL . Diode	Horizontal AFC
V-104 . . 5B8	1st I-F/Vertical Oscillator	SR-101 . IN1084	Low Voltage Rectifier
V-105 . . 5B8	2nd I-F/Sync. Clip		
V-106 . . 12W6	Vertical Output		
V-107 . . 6SN7GTB	Horizontal Oscillator		
V-108 . . 25DN6	Horizontal Output		

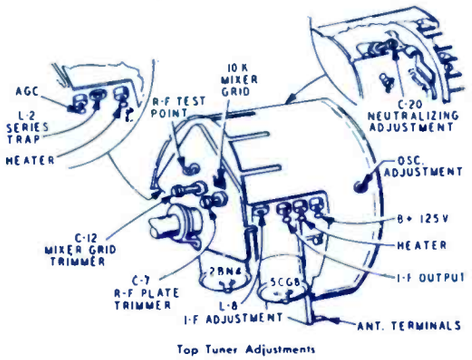


TUNER 710031





T-100 DETAIL

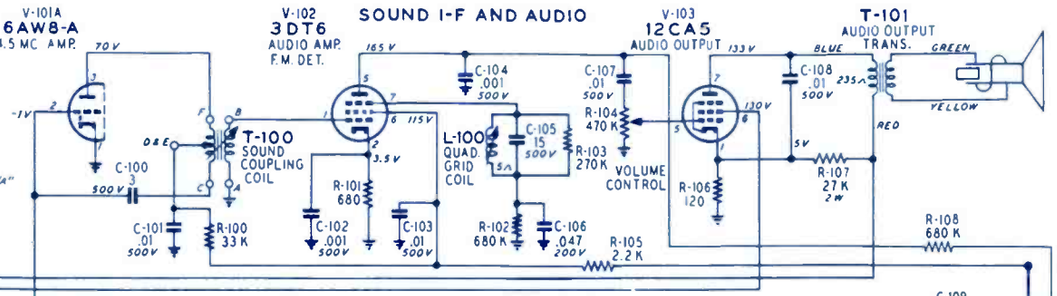


Top Tuner Adjustments

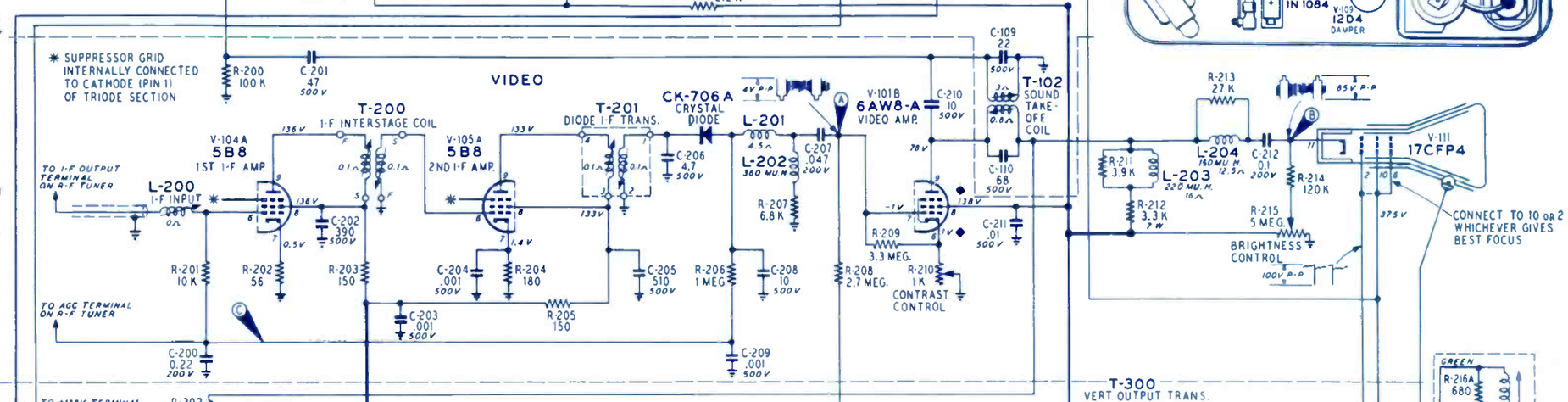
T-200 DETAIL

T-201 DETAIL

SOUND I-F AND AUDIO



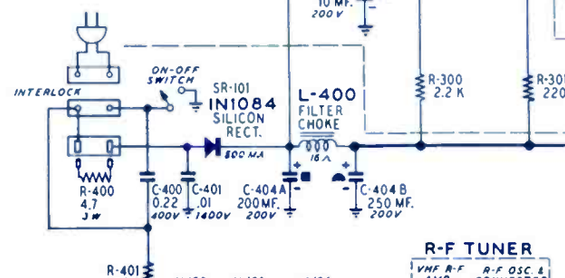
VIDEO



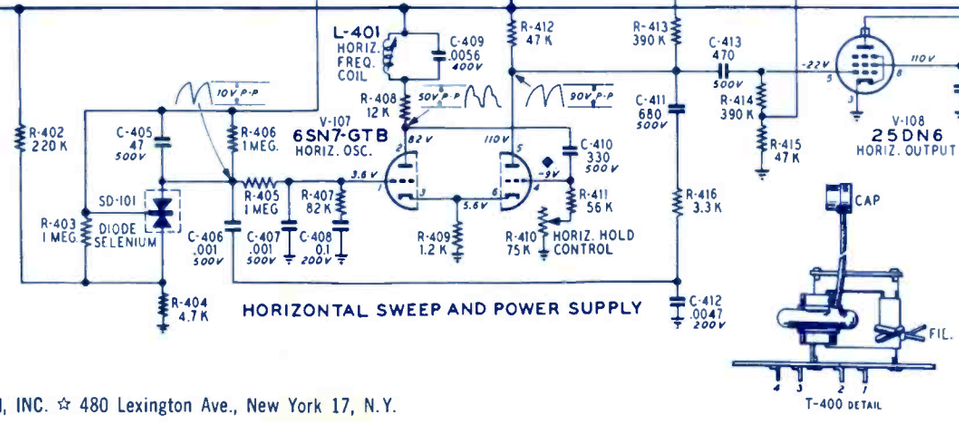
T-200 DETAIL

T-201 DETAIL

VERT. SWEEP AND SYNC.



HORIZONTAL SWEEP AND POWER SUPPLY



T-400 DETAIL

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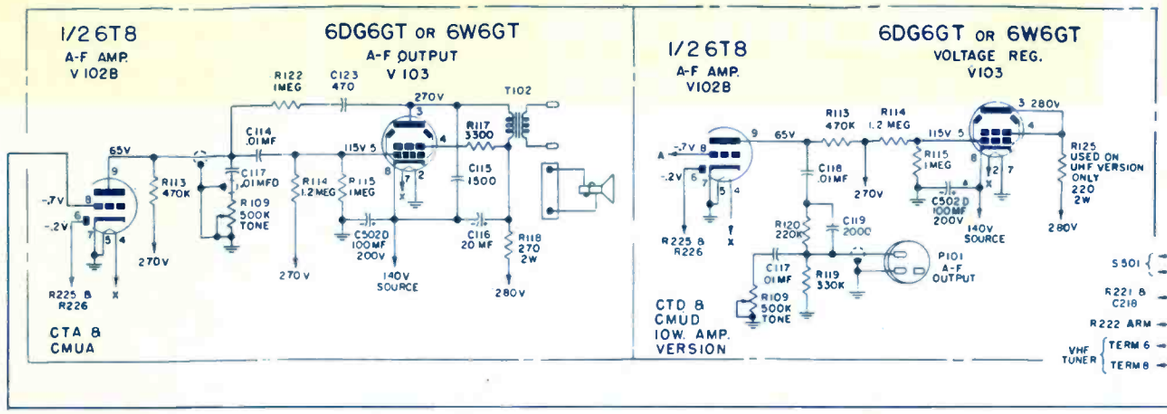
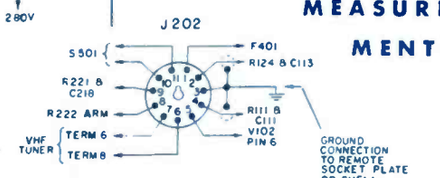


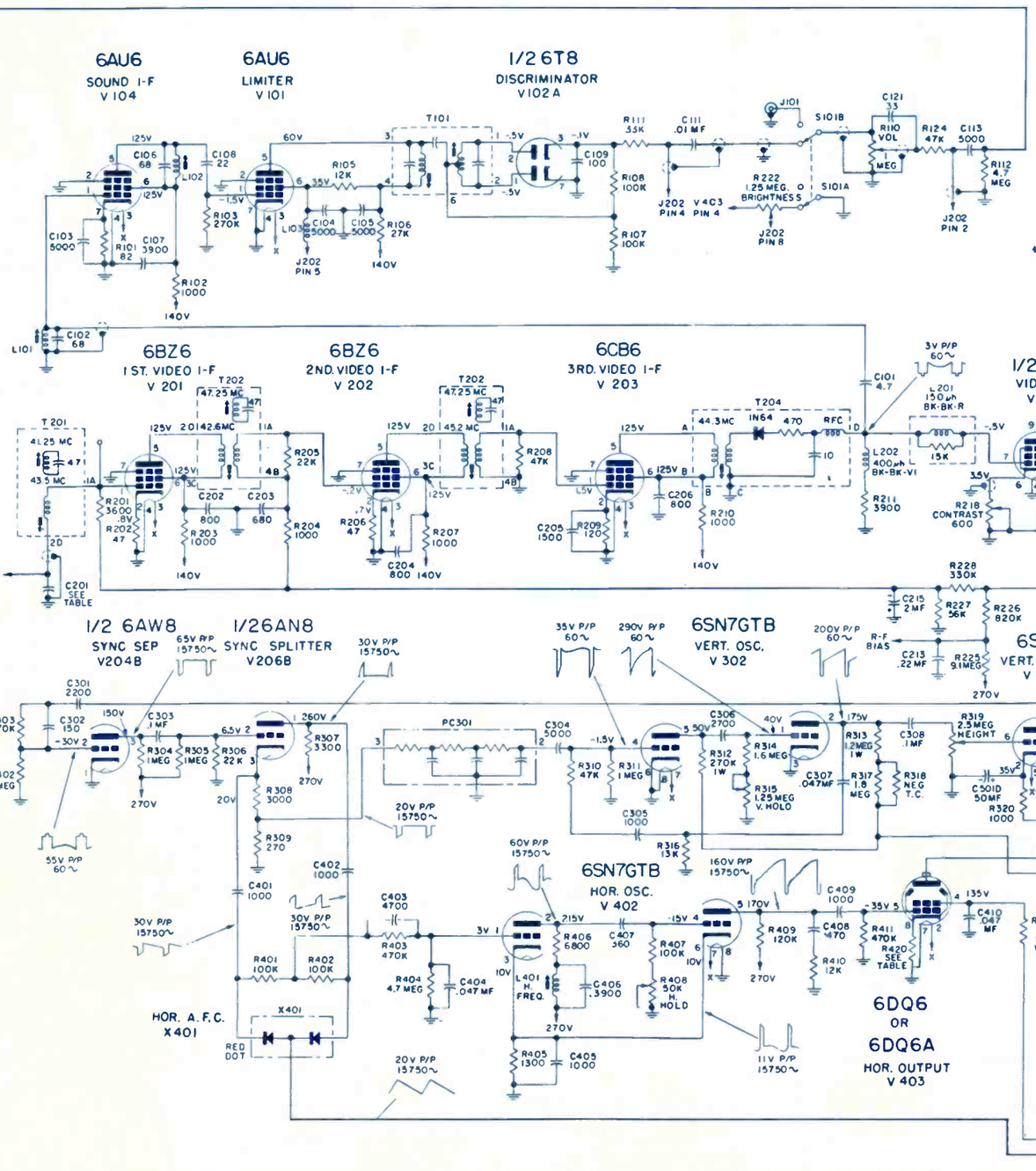


RESISTANCE MEASUREMENTS

REF.	TYPE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	* PIN 8	PIN 9
V1	6BC8	#2200	250K	INF	0	.1	INF	1.1 meg	0	0
V2	6U8	*4800	360K	*10K	0	.1	#5500	0	0	10K
V101	6AU6	.4	0	.1	0	*1000	*1000	82	-----	-----
V102	6T8	100K	100K	200K	.1	0	1 meg	0	4.7 meg	#470K
V103	6DG6	NC	.1	#220	#220	530K	NC	0	●●25K	-----
V104	6AU6	270K	0	.1	0	*27K	*39K	0	-----	-----
V201	6BZ6	56K	47	.1	0	*1000	*1000	0	-----	-----
V202	6BZ6	57K	47	.1	0	*1000	*1000	0	-----	-----
V203	6CB6	.1	120	.1	0	*1000	*1000	0	-----	-----
V204	6AW8	0	4.7 meg	41 meg	0	.1	#170	3900	#13K	#7500
V205	21ATP4	0	0	Pin 6 **1500	Pin 10 **270K	Pin 11 430K	Pin 12 .1	-----	-----	-----
V206	6AN8	#4000	22K	3300	0	.1	350K	**1500	#36K	#3300
V302	6SN7	●2 meg	**1.7meg	0	1 meg	**270K	0	.1	0	-----
V303	6S4	NC	●2500	●950K	0	.1	●950K	NC	NC	**2700
V402	6SN7	450K	#6900	1300	●115K	#120K	1300	0	.1	-----
V403	6DQ6	NC	0	NC	#10K	470K	TP	.1	0	Top Cap **5K
V404	1B3	INF	INF	INF	INF	INF	INF	INF	INF	Top Cap **490
V405	6AX4	TP	NC	●●20K	NC	**0	NC	0	.1	-----
V501	5U4	NC	●●20K	NC	22	TP	24	NC	●●20K	-----
V601	6AF4	*920	22K	0	.1	1.1	22K	*92K	-----	-----

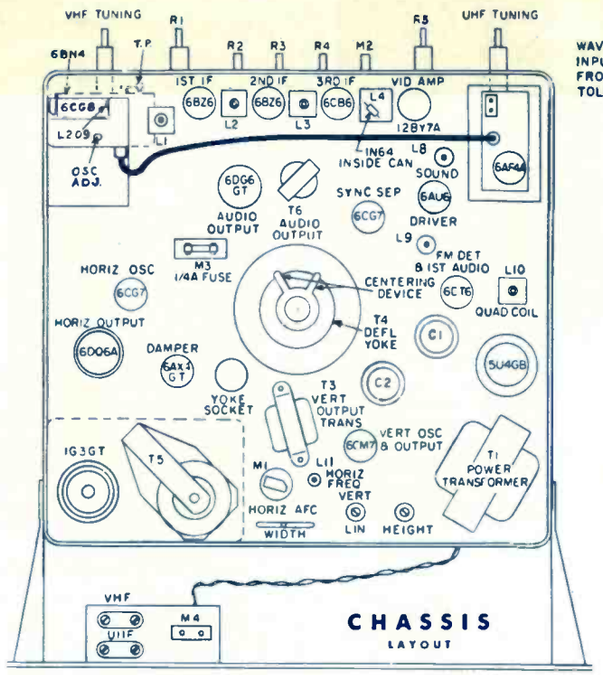
* Measured from 140V source
**Measured from Pin 3 of V17
● Varies with Control Setting
●●Varies with condition of electrolytic.

#Measured from 280V source.
NC - No Connection
TP - Tie Point



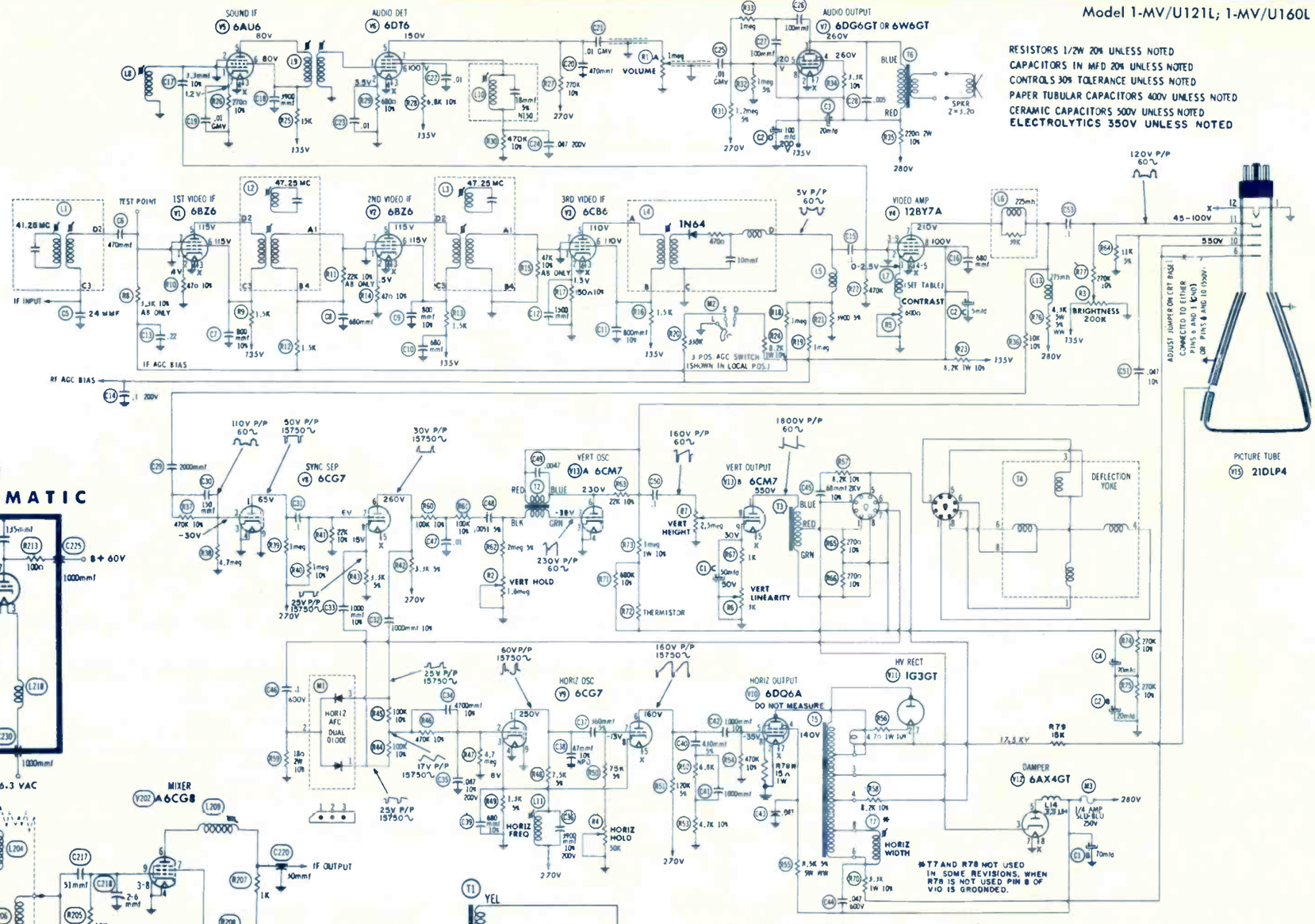
MAGNAVOX
Chassis 28 Series

Model 1-MV/U121L; 1-MV/U160L



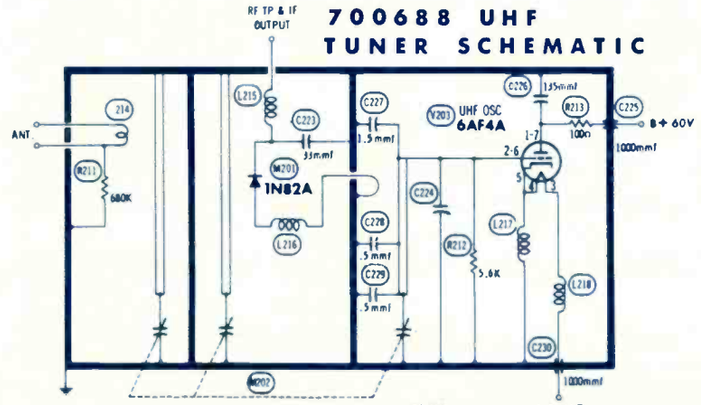
WAVEFORMS & P/P VOLTAGES MEASURED WITH AVERAGE SIGNAL INPUT, CONTRAST CONTROL AT MAX.; D.C. VOLTAGES MEASURED FROM CHASSIS GROUND WITH V.T.V.M. LINE VOLTAGE 117V. TOLERANCE OF ±20% NORMAL ON ALL READINGS.

RESISTORS 1/2W 20% UNLESS NOTED
CAPACITORS IN MFD 20% UNLESS NOTED
CONTROLS 30% TOLERANCE UNLESS NOTED
PAPER TUBULAR CAPACITORS 400V UNLESS NOTED
CERAMIC CAPACITORS 500V UNLESS NOTED
ELECTROLYTICS 350V UNLESS NOTED

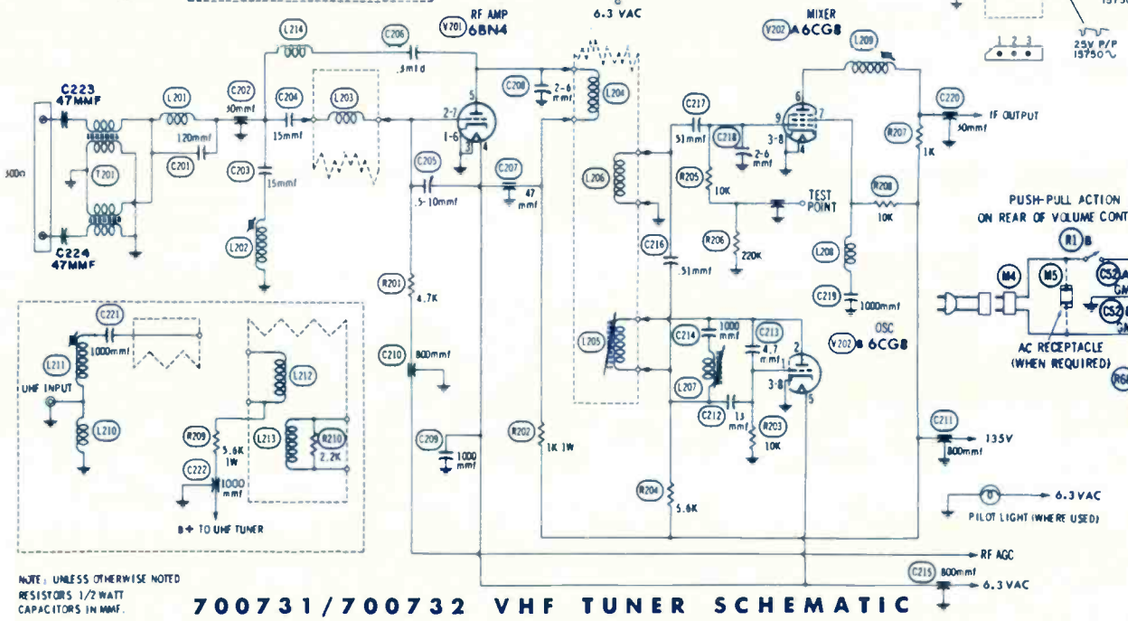


CHASSIS	C5	L7
PLUG-IN CONTROLS	OMIT	USE
CLUSTER CONTROLS	24 mmf	USE
TOP CONTROLS	24 mmf	OMIT

700688 UHF TUNER SCHEMATIC

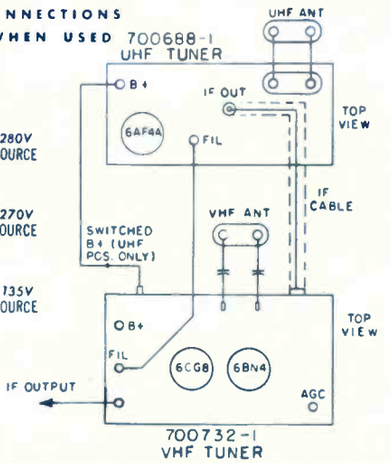


700731/700732 VHF TUNER SCHEMATIC

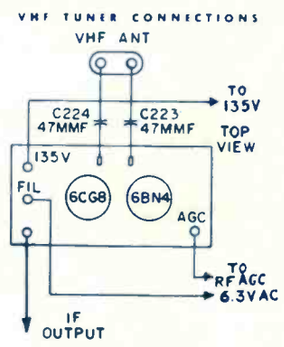


NOTE: UNLESS OTHERWISE NOTED
RESISTORS 1/2 WATT
CAPACITORS IN MMF.

UHF CONNECTIONS WHEN USED 700688-1 UHF TUNER

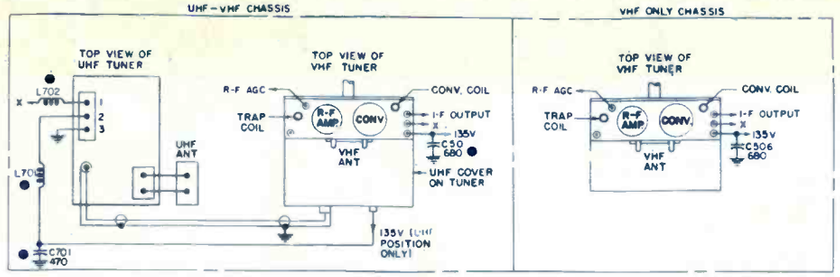


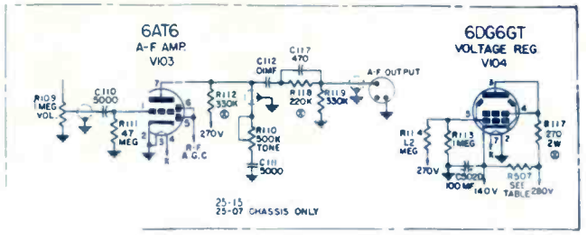
VHF TUNER CONNECTIONS



MAGNAVOX
TV Chassis 25 Series

25-08 THRU 25-17 TUNER CONNECTIONS

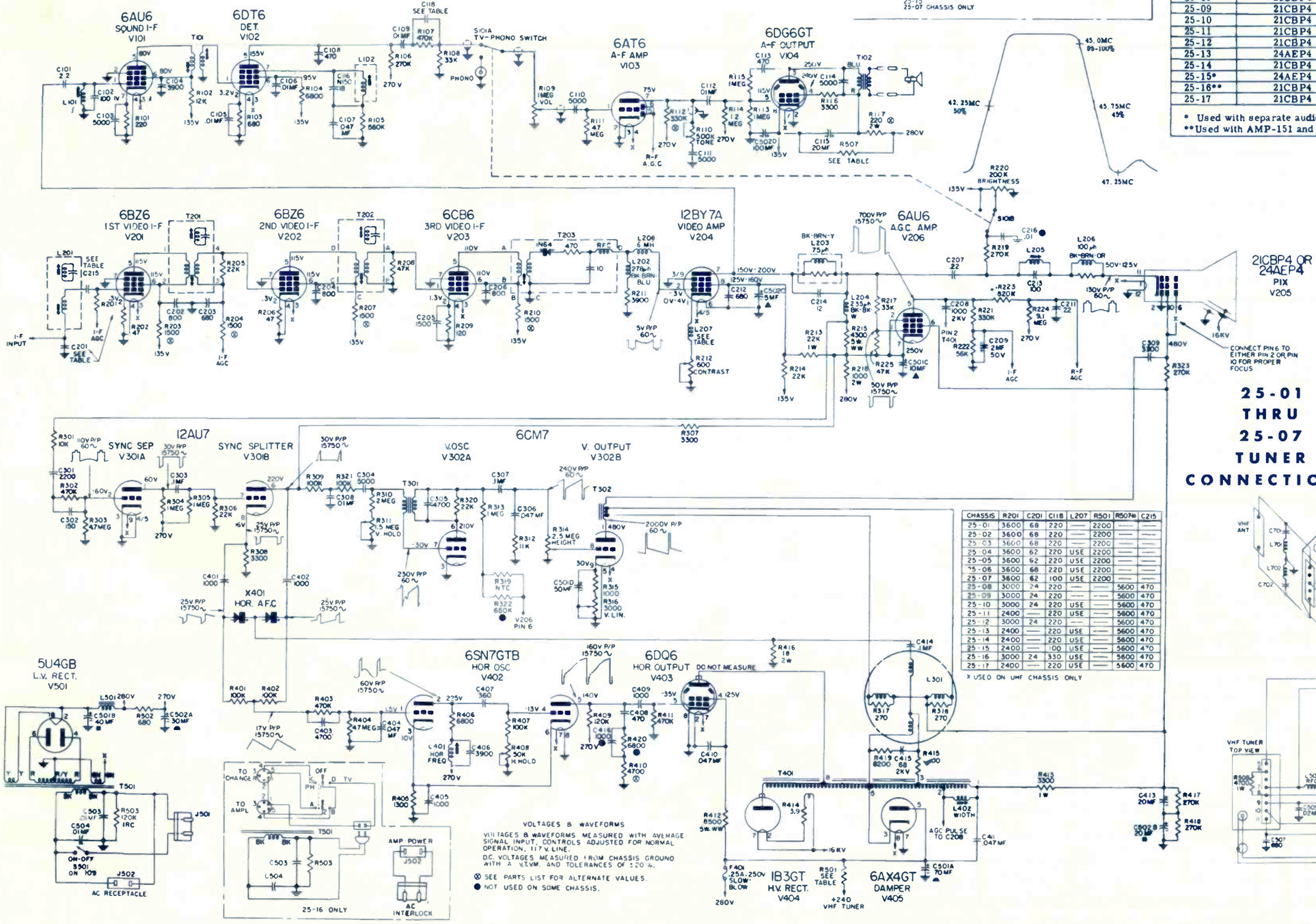




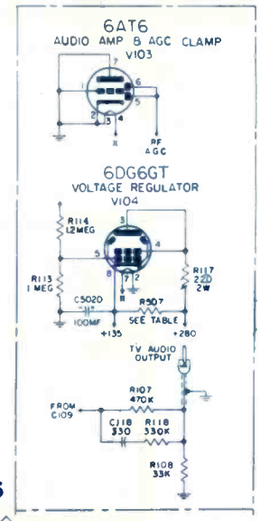
CHASSIS DIFFERENCES

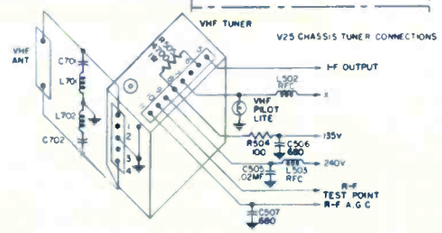
CHASSIS	CRT USED	CONTROLS	VHF TUNER
25-01	21CBP4	Top Tuning	700584-6
25-02	21CBP4	Top Tuning	700584-6
25-03	21CBP4	Top Tuning	700584-6
25-04	24AEP4	Front Tuning	700584-6
25-05	21CBP4	Front Tuning	700584-6
25-06	21CBP4	Top Cluster	700584-6
25-07*	24AEP4	Front Tuning	700584-6
25-08	21CBP4	Top Tuning	700624/627
25-09	21CBP4	Top Tuning	700624/627
25-10	21CBP4	Top Cluster	700624/627
25-11	21CBP4	Top Cluster	700624/627
25-12	21CBP4	Top Tuning	700624/627
25-13	24AEP4	Front Tuning	700624/627
25-14	21CBP4	Front Tuning	700624/627
25-15*	24AEP4	Front Tuning	700624/627
25-16**	21CBP4	Top Cluster	700624/627
25-17	21CBP4	Top Tuning	700624/627

* Used with separate audio amplifier.
**Used with AMP-151 and either 700531-9 or 700770-1 Control Unit.



25-01 THRU 25-07 TUNER CONNECTIONS





CHASSIS	R201	C201	C118	L207	R501	R507*	C215
25-01	3600	68	220	—	2200	—	—
25-02	3600	68	220	—	2200	—	—
25-03	3600	68	220	—	2200	—	—
25-04	3600	62	220	USE	2200	—	—
25-05	3600	62	220	USE	2200	—	—
25-06	3600	68	220	USE	2200	—	—
25-07	3600	62	100	USE	2200	—	—
25-08	3000	24	220	—	—	5600	470
25-09	3000	24	220	—	—	5600	470
25-10	3000	24	220	USE	—	5600	470
25-11	2400	—	220	USE	—	5600	470
25-12	3000	24	220	—	—	5600	470
25-13	2400	—	220	USE	—	5600	470
25-14	2400	—	220	USE	—	5600	470
25-15	2400	—	100	USE	—	5600	470
25-16	3000	24	330	USE	—	5600	470
25-17	2400	—	220	USE	—	5600	470

* USED ON UHF CHASSIS ONLY

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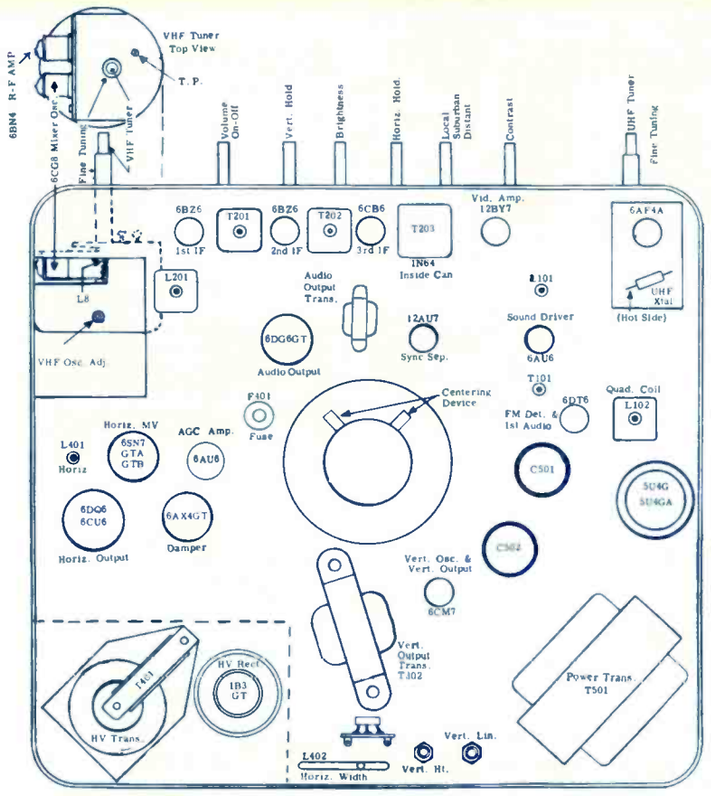
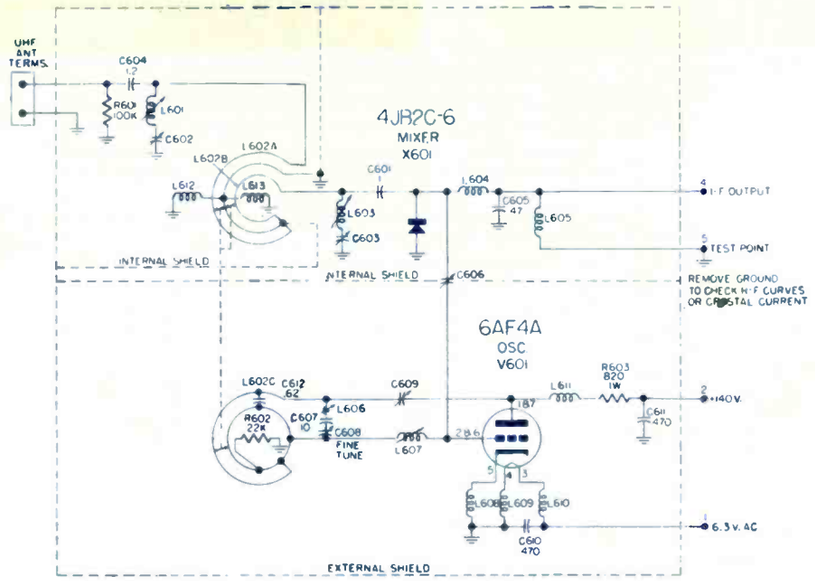
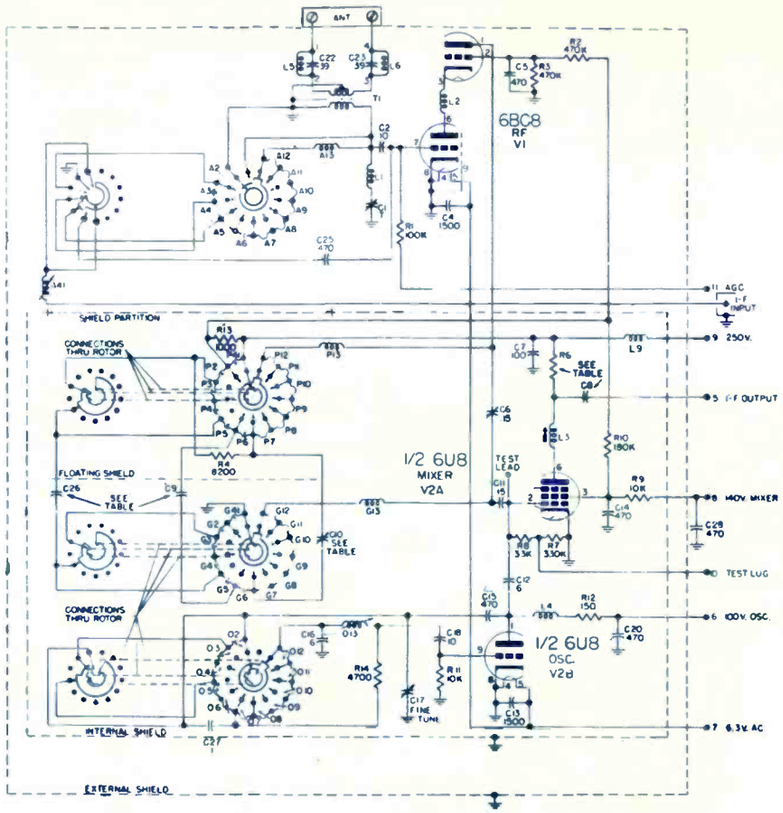
CHASSIS LAYOUT



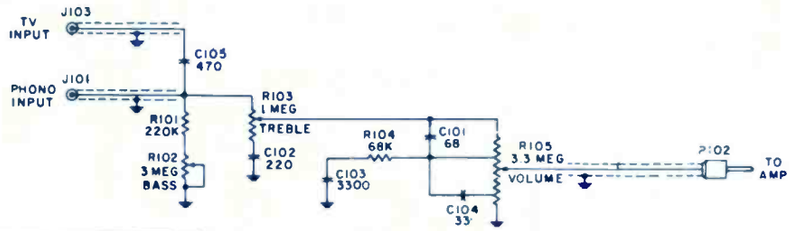
700530 UHF TUNER SCHEMATIC



700584 VHF TUNER SCHEMATIC



700531-9 CONTROL UNIT



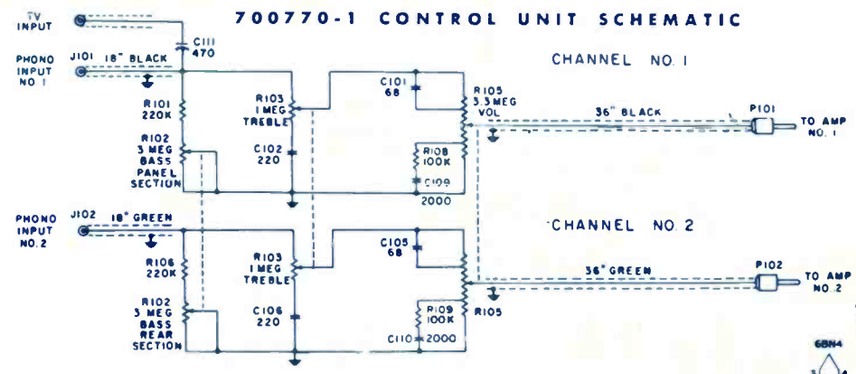
RESISTANCE MEASUREMENTS

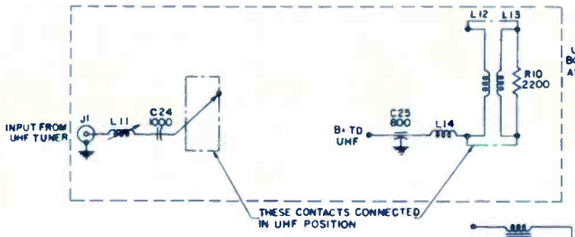
REF	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V1	6BN4	0	1.1 meg	0	.1	*470	0	1.1 meg	-	-
V2	6GG8	10K	*5600	0	0	.1	*1000	*10K	0	230K
V101	6AU6	1.2	0	.1	0	*12K	*12K	220	-	-
V102	6DT6	3.8	680	.1	0	**270 K	*6800	560K	-	-
V103	6AT6	4.7 meg	0	0	.1	1.1 meg	NC	**330K	-	-
V104	6DG6	TP	0	**390	**3500	500K	TP	.1	30K	-
V201	6BZ6	58K	47	.1	0	*1500	*1500	0	-	-
V202	6BZ6	58K	47	.1	0	*1500	*1500	0	-	-
V203	6CB6	.1	120	.1	0	*1500	*1500	0	-	-
V204	12BY7A	• 200	3900	0	.1	.1	0	**5500	*11K	0
V205	21CBP4	0	0	pin 8 ∮270K	pin 10 ∮270K	pin k ∮280K	pin 12 .1	-	-	-
V206	6AU6	**20K	**1000	.1	0	350K	∮3300	**1000	-	-
V301	12AU7	**1 meg	4.7 meg	0	0	0	**4000	22K	3300	.1
V302	6CM7	∮5000	NC	0	0	.1	∮1.8meg	• 2.5 meg	• 1.5meg	• 1750
V402	6SN7GTB	500K	**7500	1300	• 100K	**120K	1300	0	.1	-
V403	6DQ6	NC	.1	TP	**8500	470K	TP	0	15	top cap ∮28
V404	1B3GT	INF	INF	INF	INF	INF	INF	INF	INF	top cap ∮383
V405	6AX4GT	TP	NC	330K	NC	**0	NC	0	.1	-
V501	5U4GB	NC	30K	TP	21	NC	19	TP	30K	-
V601	6AF4A	*820	22K	.1	.2	.1	22K	*820	-	-

• VARIES WITH CONTROL SETTING
* measured from 135V source.
** measured from 280V source.
∮ measured from Pin 3 of V405.

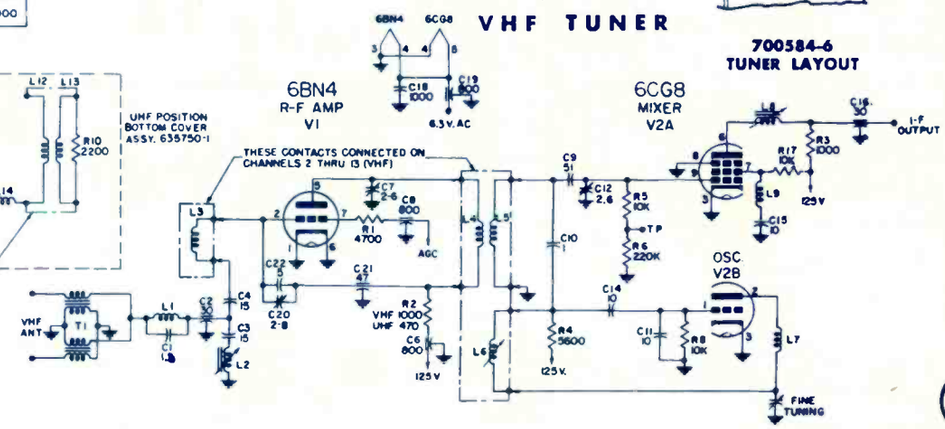
TP Tie Point
NC No Connection
Note: Measurements taken on 25-08 chassis. Measurements taken across electrolytics will depend on the condition of the capacitor. Minimum reading 20 K.

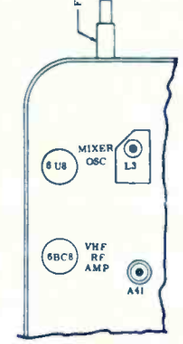
700770-1 CONTROL UNIT SCHEMATIC





700624/700627 VHF TUNER





700584-6 TUNER LAYOUT

MAGNAVOX
TV Chassis 25 Series

Electronic Technician
CIRCUIT DIGEST

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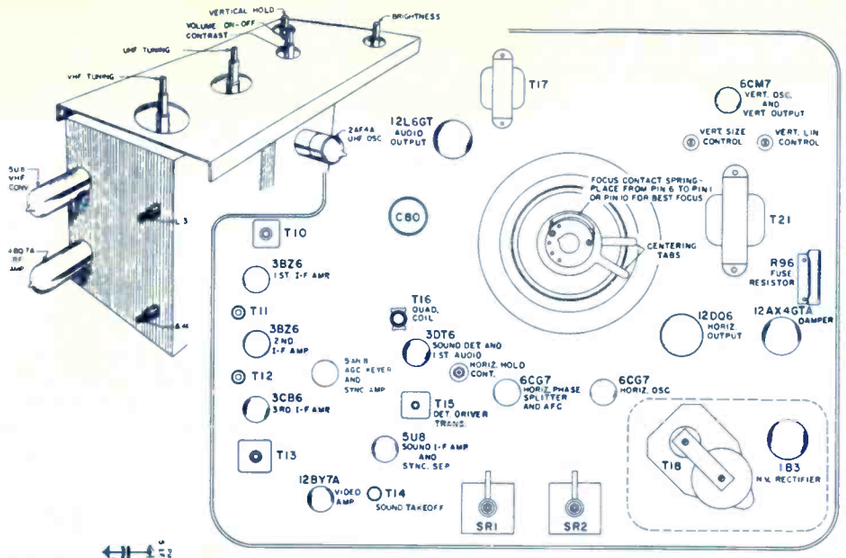
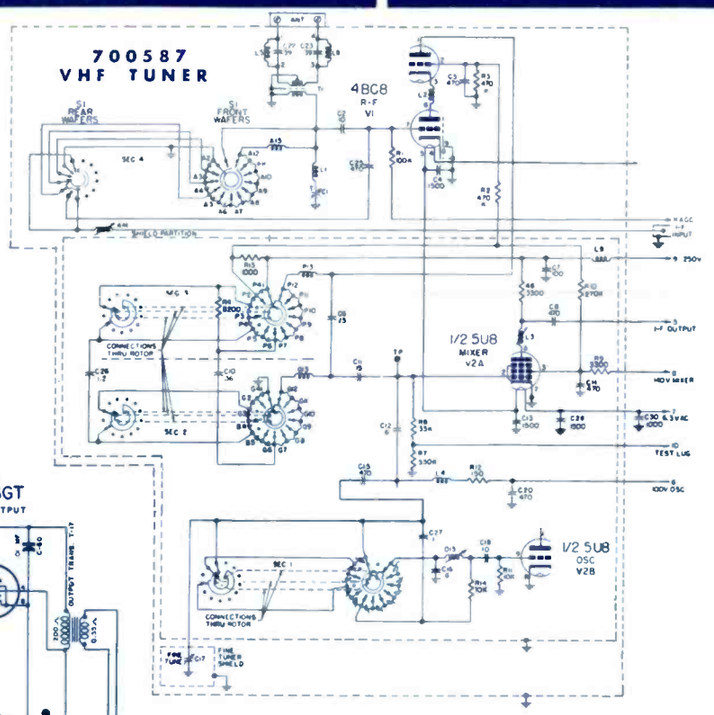
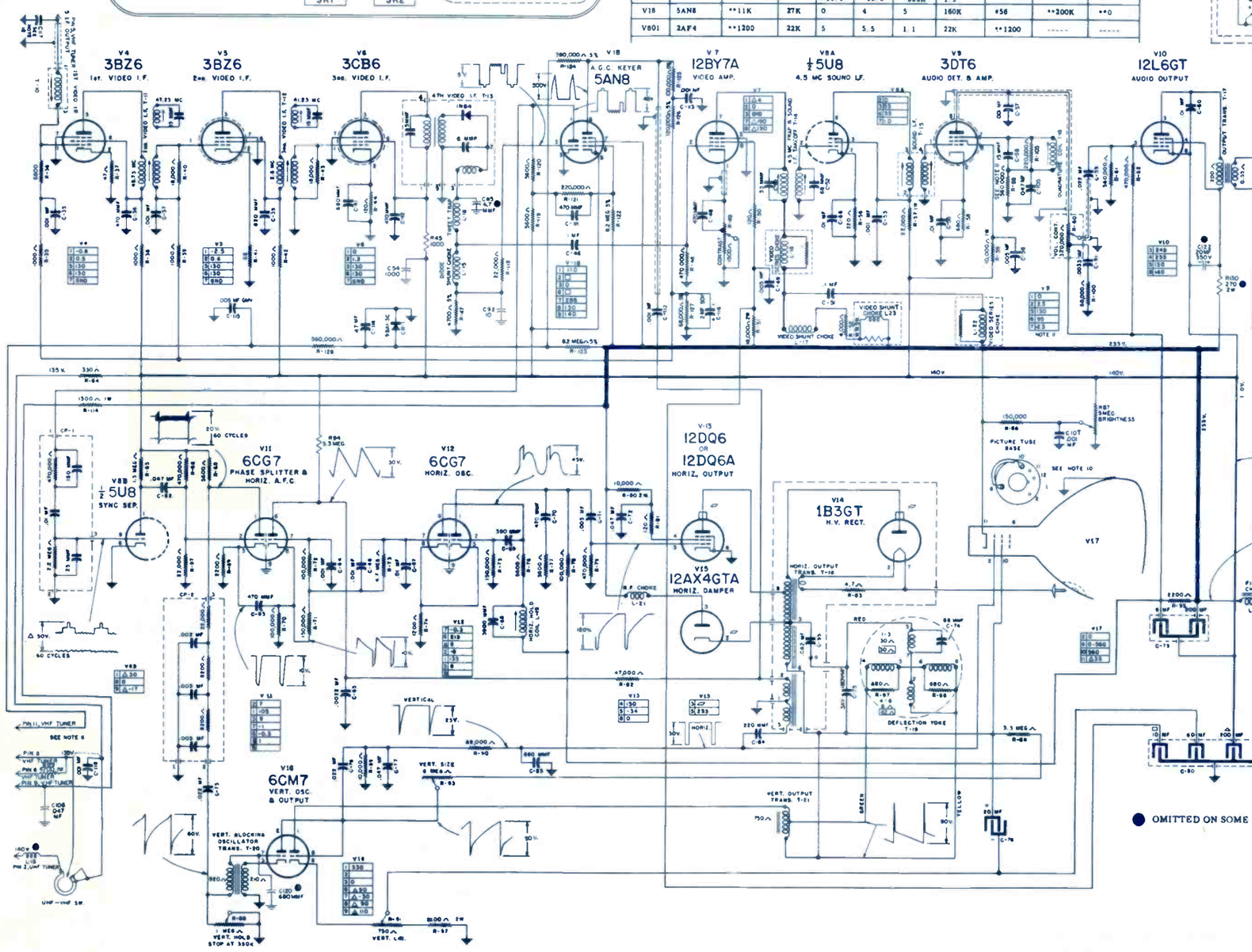


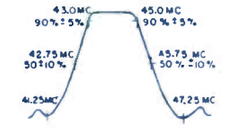
\# Measured from SR1 output.
TP - Tie Point
NC - No Connection
* Measured from Pin 3 of V15
** Measured from Pin 8 of V10
● Varies with Control setting
●● Depends on condition of electrolytic

RESISTANCE MEASUREMENTS

REF	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V1	5U8	**5000	360K	**47K	5.5	7.5	*6800	0	0	10K
V2	6BQ7A	*1500	230K	INF	5.5	6.5	INF	600K	0	0
V4	3BZ6	75K	47	9	10	**1000	**1000	0	-----	-----
V5	3BZ6	69K	68	8	9	**1000	**1000	0	-----	-----
V6	3CB6	1	120	7.5	8	**1000	**1000	0	-----	-----
V7	12BY7	*140	470K	0	15	15	16	*4100	*18K	0
V8	5U8	**1.5meg	8	**22K	16	17	**22K	220	0	2.2 meg
V9	3DT6	7	680	4	3.0	*320K	**10K	560K	-----	-----
V10	12L6	NC	11	*270	*54	250K	TP	14	**20K	-----
V11	6CG7	**5600	20K	2200	15	13	40K	350K	100K	0
V12	6CG7	*100K	150K	1200	1.5	3	*8000	5 meg	1200	0
V13	12DQ6	TP	17	TP	*10K	470K	TP	22	0	Top Cap *7.5
V14	1B3GT	INF	INF	INF	INF	INF	INF	INF	INF	Top Cap *260
V15	12AX4GT	NC	NC	**20K	NC	*54	TP	24	22	-----
V16	6CM7	*730	NC	215	11	10	*4 meg	*550K	*4 meg	*1000
V17	21ATP4	0	78K	Pin 6 *10.5	Pin 10 *10.5	Pin 11 *330K	Pin 12 1.5	-----	-----	-----
V18	5AN8	**11K	27K	0	4	5	160K	*58	**200K	**0
V801	2AF4	**1200	22K	5	5.5	1.1	22K	**1200	-----	-----







VOLTAGE READINGS TAKEN WITH VACUUM TUBE VOLTMETER BETWEEN SOCKET LUGS AND CHASSIS GROUND, WITH NO SIGNAL INPUT AND CONTRAST AT MINIMUM. INPUT VOLTAGE 117V. AC.

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

△ INDICATE VOLTAGE VARIATIONS WITH CONTROL SETTINGS, OR SIGNAL INPUT LEVEL

▱ DO NOT MEASURE AT THESE POINTS.

C-118 LOCATED ON CHASSIS BASE ON UHF MODELS.

DOTTED LINE & C-118 LOCATED ON VHF TUNER (VHF MODELS ONLY).

RESISTANCE VALUES OF COILS SHOWN IN BOXES IS RESISTANCE OF WINDING WHEN REMOVED FROM CIRCUIT.

RESISTANCE VALUES OF COILS UNDER 1 OHM IS NOT SHOWN.

MOUNT FOCUS CONTACT SPRING BETWEEN PIN 8 AND EITHER PIN 1 OR PIN 10 OF PICTURE TUBE BASE TO OBTAIN BEST FOCUS.

MEASURE ACROSS R-98 -2.5V.

C-117 68MMF ON TOP TUNING MODELS. 56MMF ON FRONT TUNING MODELS.

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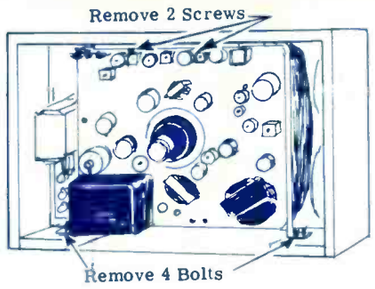

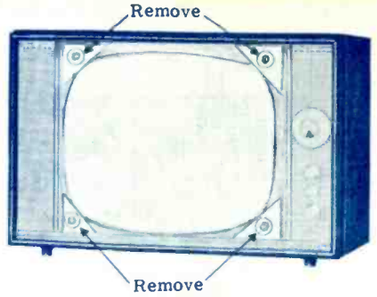

Resistors 1/2w 20% Unless Noted. Capacitors in MFD 20% Unless Noted. Paper Tubular Capacitors 400V Unless Noted. Ceramic Capacitors 500V Unless Noted. Electrolytic Capacitors 350V Unless Noted.

VOLTAGES AND WAVEFORMS MEASURED WITH AVERAGE SIGNAL INPUT, AGC SWITCH IN "NORMAL" POSITION, CONTRAST AT MAX., ALL OTHER CONTROLS SET FOR NORMAL OPERATION. LINE VOLTAGE 117V, VOLTAGE TOLERANCE OF 20% NORMAL. DC VOLTAGES MEASURED WITH VTVM TO CHASSIS GROUND.

MAGNAVOX
TV Chassis 30 Series

CHASSIS DIFFERENCES

Chassis	Audio Circuit	Picture Tube	Controls
30-01	6DG6GT AF Output	21CEP4	Top Tuning
30-02	External Amplifier	24ANP4	Front Tuning
30-03	Radio & Amplifier	24ANP4	Front Tuning
30-04	External Amplifier	24ANP4	Top Tuning
30-05	6DG6GT AF Output	21CEP4	Top Tuning
30-06	External Amplifier	24ANP4	Front Tuning
30-07	External Amplifier	24ANP4	Front Tuning
30-08	Radio & Amplifier	24ANP4	Front Tuning
30-09	6DG6GT AF Output	24ANP4	Front Tuning
30-10	6DG6GT AF Output	24ANP4	Top Tuning
30-11	6DG6GT AF Output	21CEP4	Top Tuning

Resistors 1/2W 20% Unless Noted. Capacitors in MFD 20% Unless Noted.
Paper Tubulars Caps 400V Unless Noted. Ceramics 500V Unless Noted.
Electrolytics 350V Unless Noted.

L16 & R83 ARE NOT USED ON SOME CHASSIS.
R53 IS 82K ON SOME CHASSIS
VOLTAGES AND WAVEFORMS TAKEN WITH AVERAGE SIGNAL, CONTRAST CONTROL SET TO MAXIMUM AND BALANCE OF CONTROLS SET FOR NORMAL OPERATION.

Line Tap Plug Shown in 117V Position.
Reverse Plug for 127V Position

THIS PLUG IS NORMALLY IN NO ON TV CHASSIS. WHEN REMOTE CONTROL UNIT IS USED, THIS PLUG IS INSERTED IN REMOTE RECEPTACLE.

USED ON 10-WATT AMP VERSION ONLY

CHASSIS SHOWN WITH INTERNAL AUDIO CONTROL PANEL

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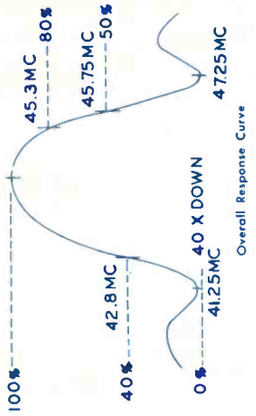
ELECTRONIC TECHNICIAN CIRCUIT DIGEST

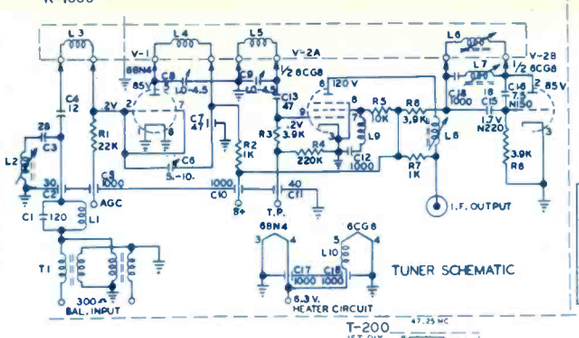
MATHES
TV Models 7323, 9323

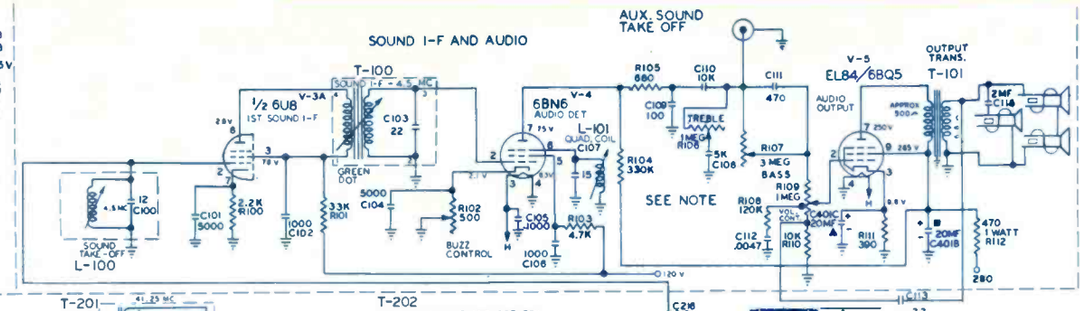
SCHEMATIC IS DIVIDED INTO FIVE SECTIONS WITH EACH SECTION HAVING ITS OWN SERIES OF REFERENCE NUMBERS.

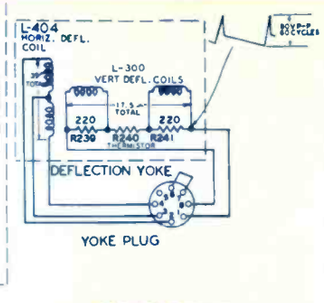
COIL RESISTANCE VALUES LESS THAN 1.0 OHM ARE NOT SHOWN.

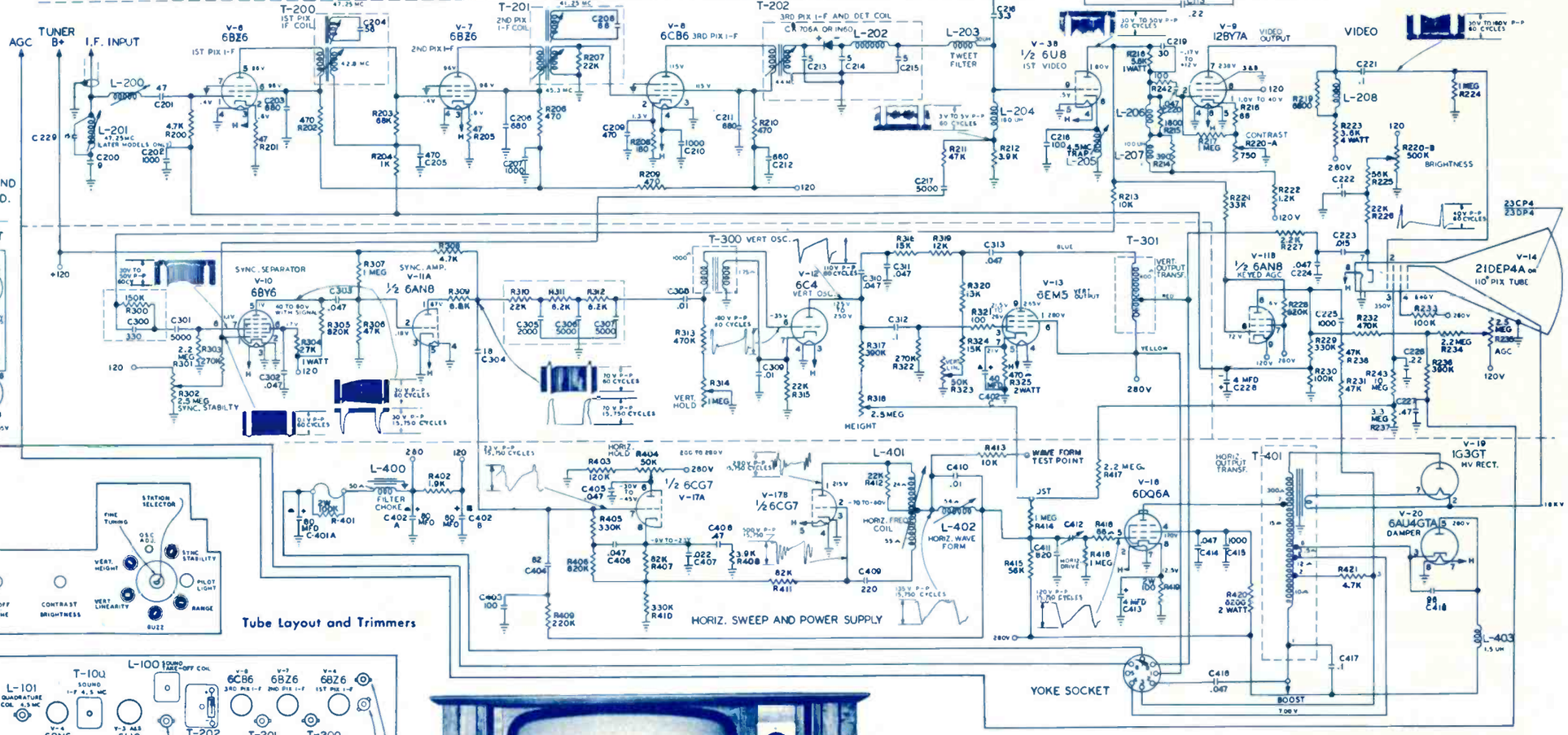
K=1000





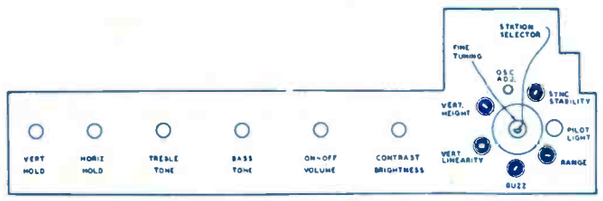




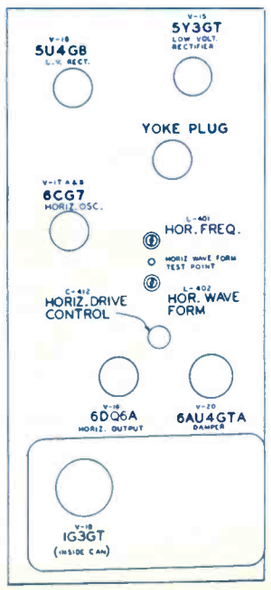


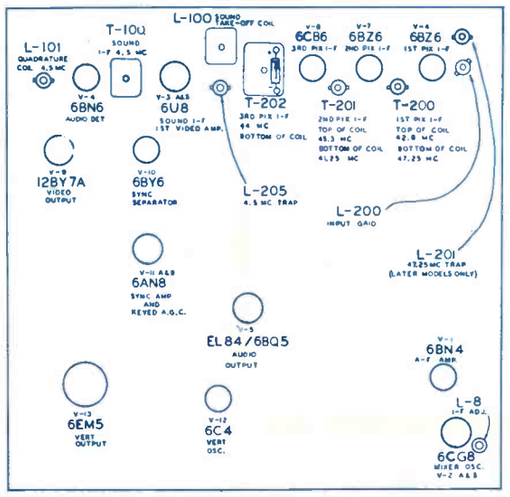
NOTE:

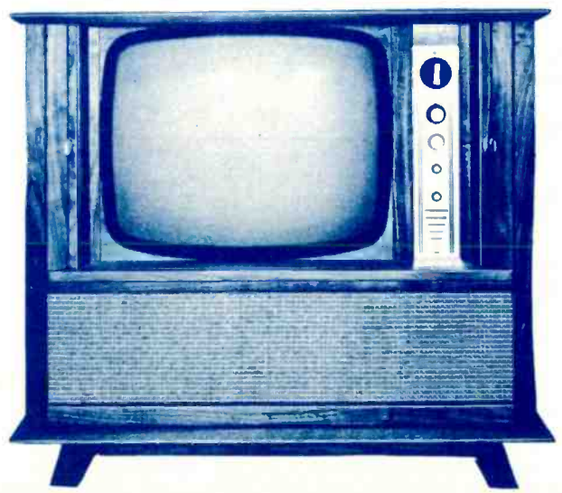
ON SOME MODELS C109 IS .001 MMF AND C108, C111, R106 AND R107 ARE NOT USED.



Tube Layout and Trimmers







TUBE COMPLEMENT

Symbol	Type	Function
V-1	6BN4 or 6ER5	R-F Amplifier
V-2A & B	6CG8A	R-F Osc. & Mixer
V-3A & B	6U8A	1st Sound I-F & 1st Video Amplifier
V-4	6BN6	Audio Detector
V-5	6BQ5	Audio Output
V-6	6BZ6	1st Pix I-F Amp.
V-7	6BZ6	2nd Pix I-F Amp.
V-8	6CB6	3rd Pix I-F Amp.
V-9	12BY7A	Video Output
V-10	6BY6	Sync. Separator
V-11A & B	6AN8	Sync. Amp. & Keyed AGC
V-12	6C4	Vertical Oscillator
V-13	6EM5	Vertical Output

Symbol	Type	Function
V-14	23CP4	Picture Tube 23" Glass Rectangular (Electrostatic)
V-15	5Y3GT	Low Voltage Rectifier
V-16	5U4GB	Low Voltage Rectifier
V-17A & B	6CG7	Horizontal AFC & Horizontal Oscillator
V-18	6DQ6A	Horizontal Output
V-19	1G3GT	High Voltage Rectifier
V-20	6AU4-GTA	Damper

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MONTGOMERY WARD
TV Models GTM 4202B, C
GTM 4302B, C

NOTES:

1. DC VOLTAGES MEASURED WITH VTVM FROM POINTS INDICATED TO B- ANT. TERMINALS SHORTED.
2. PEAK TO PEAK WAVE FORMS WERE TAKEN WITH CONTRAST CONT. SET FOR A 2.5 VOLT PEAK TO PEAK SIGNAL AT THE CRT CATHODE, ALL OTHER CONTROLS SET FOR NORMAL PICTURES.
3. ALL CAPACITANCE VALUES LESS THAN 1 ARE IN MFD AND VALUES GREATER THAN 1 ARE IN MMFD, WHILE ALL RESISTORS ARE 1/2 W UNLESS OTHERWISE INDICATED.
4. * INDICATES VOLTAGES TAKEN WITH PICTURE ADJUSTED FOR NORMAL RASTER.

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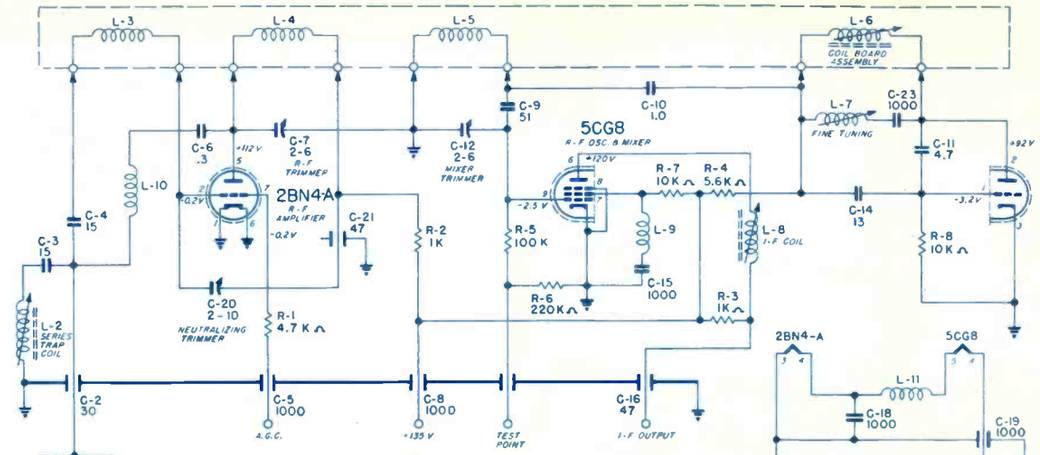
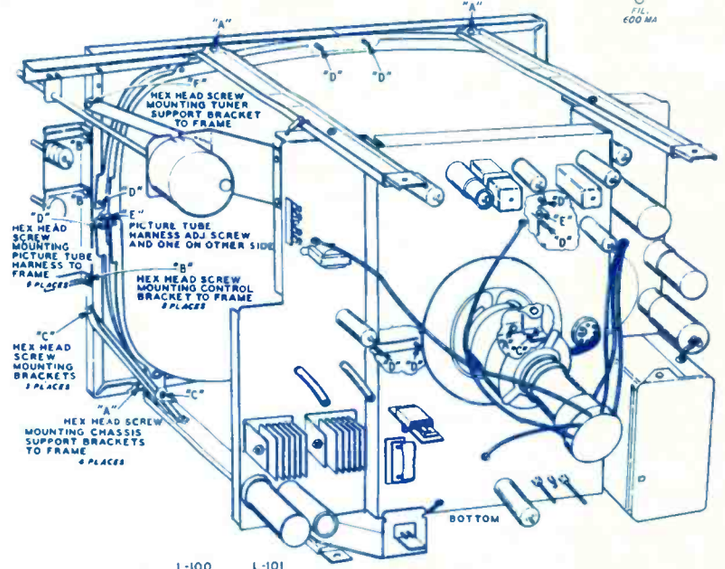
25A1178 TUNER INFORMATION
STANDARD COIL PART No. FDNS-110



Tuner Schematic Diagram

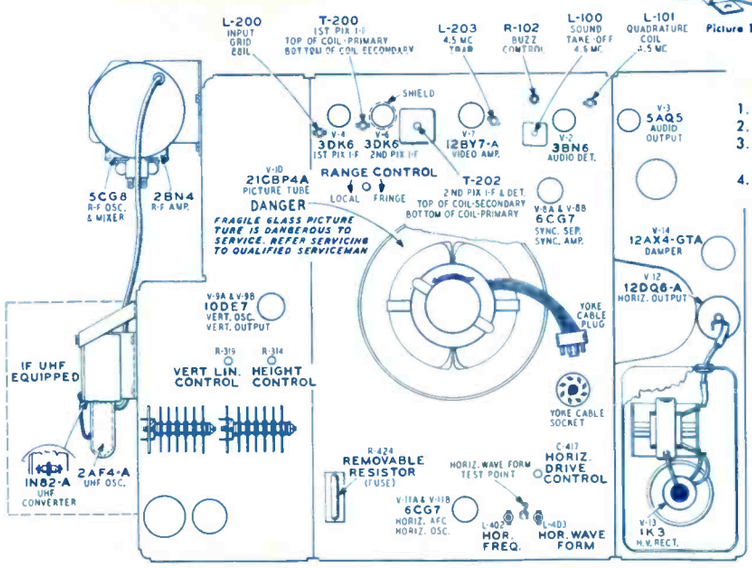


Picture Tube Replacement

MONTGOMERY WARD (Airline)
TV Models WG-5025A, WG-5026A, WG-5125A, WG-5126A
Electronic Technician
CIRCUIT DIGEST

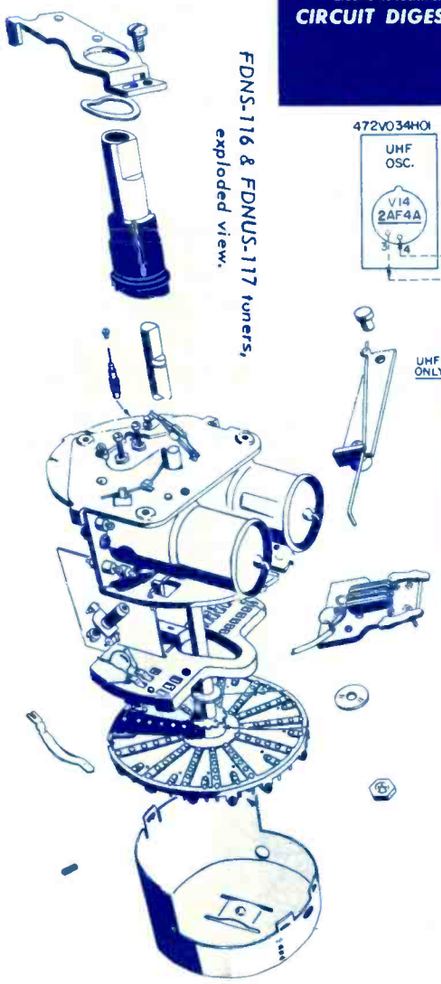
PICTURE TUBE REMOVAL (See Fig. 2)

1. Remove 4 screws marked "A".
2. Remove 3 screws marked "B" & 1 screw marked "F".
3. Remove 3 screws marked "C" and lift chassis from Pix Tube Frame Assembly.
4. Loosen 8 screws marked "D" and 2 screws marked "E".



Chassis Tube Layout and Trimmers

More Data on Reverse Side



FDNS-116 & FDNUS-117 tuners, exploded view.

CHANNEL (•) 13th POSITION (UHF)
REAR COVER ASSEMBLY (FDNUS-117)

MONTGOMERY WARD
TV Models GTM 4202B, C GTM 4302B, C
Electronic Technician
CIRCUIT DIGEST

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

MONTGOMERY WARD (Airline)
TV Models WG-5025A, WG-5026A, WG-5125A, WG-5126A

More Data on Reverse Side

NOTE—In UHF receivers the filament voltages in the tuner and above the tuner in the heater string will be slightly greater because of the filament voltages of the tuner tubes

DC SOCKET VOLTAGES

All DC socket voltages shown on the schematic are measured with a high impedance VTVM and under zero signal conditions.

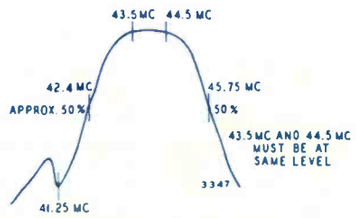
SCHEMATIC IS DIVIDED INTO FOUR SECTIONS WITH EACH SECTION HAVING ITS OWN SERIES OF REFERENCE NUMBERS

ALL RESISTANCE VALUES IN OHMS AND $\frac{1}{2}$ WATT UNLESS OTHERWISE SPECIFIED.

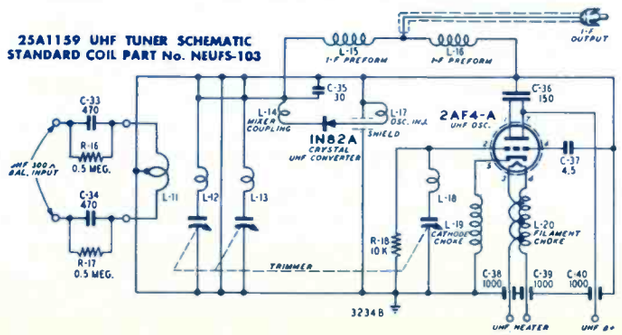
ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. AND ABOVE 1.0 IN MMF. UNLESS OTHERWISE NOTED.

COIL RESISTANCE VALUES LESS THAN 1.0 OHM ARE NOT SHOWN.

K=1000



Overall Pix I-F Response Curve



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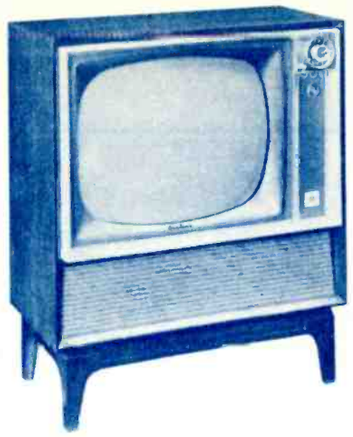
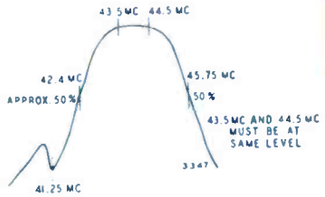
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

MONTGOMERY WARD
(Airline)
TV Chassis

Models WG-4082A, 4092A, 4182A, 4192A, 5082A, 5086A, 5087A, 5088A, 5092A, 5097A, 5182A, 5186A, 5187A, 5188A, 5192A, 5197A





Overall Pix I-F Response

SOUND I-F AND AUDIO

VIDEO

VERTICAL SWEEP AND SYNC.

HORIZ. SWEEP AND POWER SUPPLY

R-F TUNER

NOTE—In UHF receivers the filament voltages in the tuner and above the tuner in the heater string will be slightly greater because of the filament voltages of the tuner tubes.

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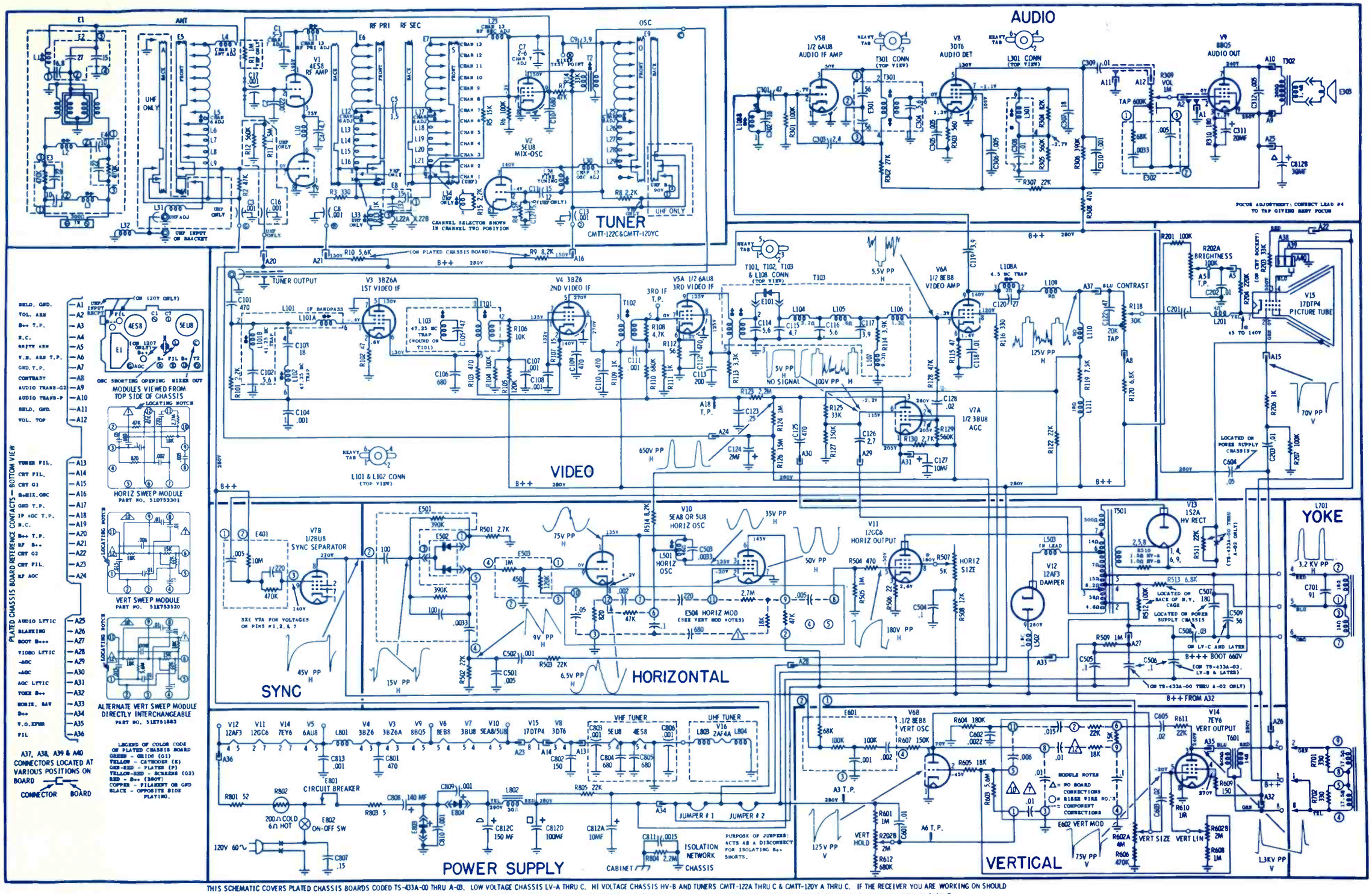
MOTOROLA
TV Chassis TS-433
Model 17P6 Series



THIS SCHEMATIC COVERS PLATED CHASSIS BOARDS CODED TS-433A-00 THRU A-03. LOW VOLTAGE CHASSIS LV-A THRU C. HI VOLTAGE CHASSIS HV-B AND TUNERS CMTT-122A THRU C & CMTT-120V A THRU C. IF THE RECEIVER YOU ARE WORKING ON SHOULD HAVE A PLATED CHASSIS BOARD, OR RELATED SECTION, WHICH IS STAMPED WITH A CODE LETTER OR NUMBER LATER THAN THAT SHOWN ON THIS SCHEMATIC... THE DIAGRAM WILL STILL BE APPLICABLE SINCE THE CHANGES WILL BE SLIGHT.

USE ISOLATION TRANSFORMER

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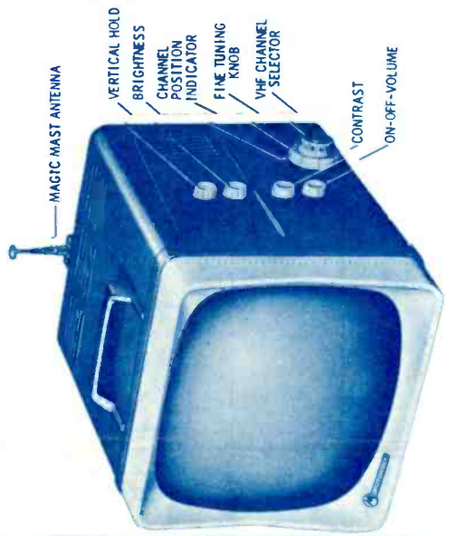
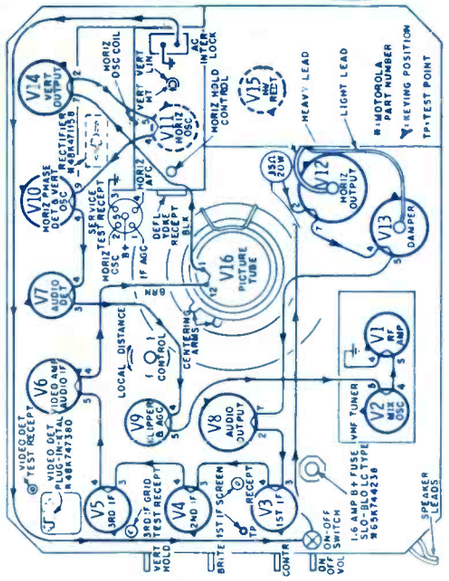
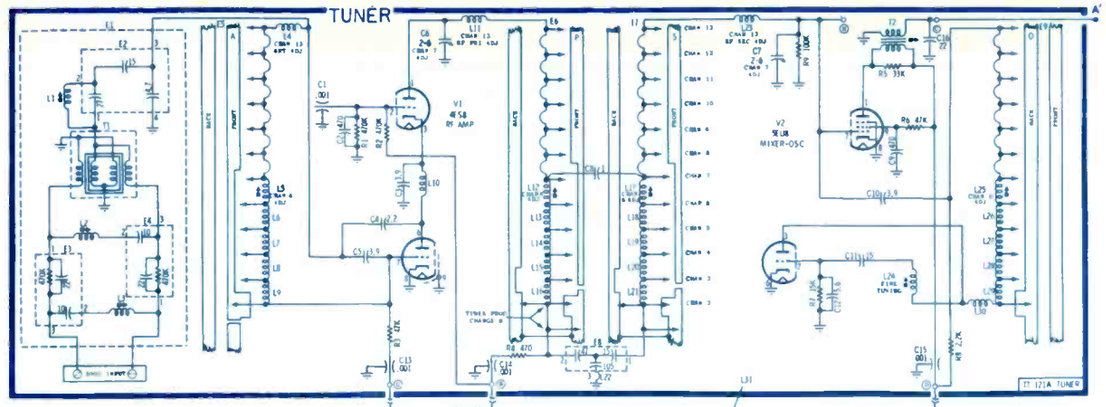
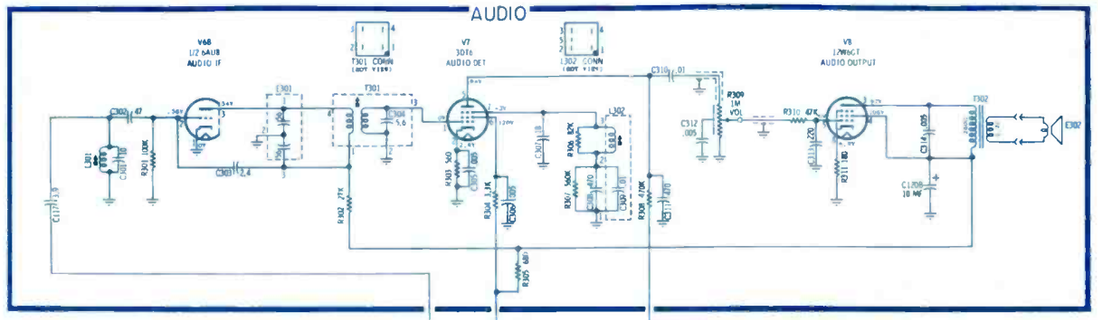
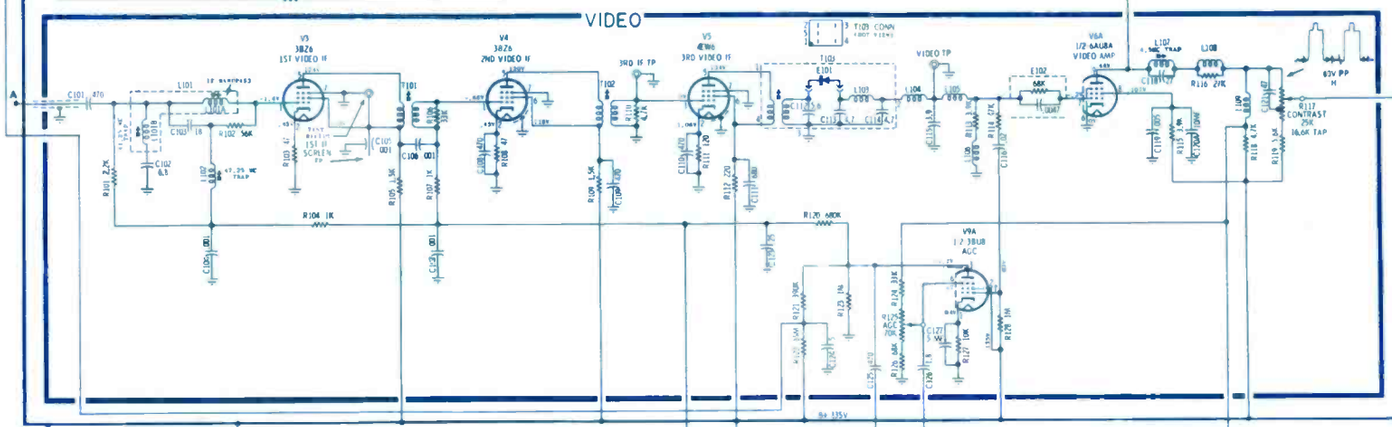
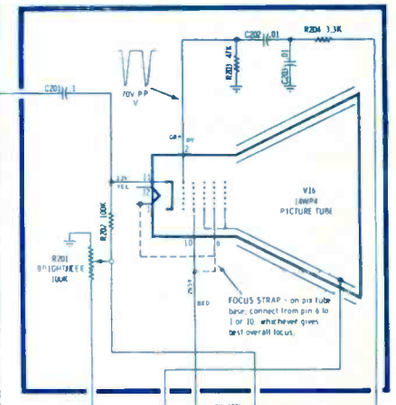


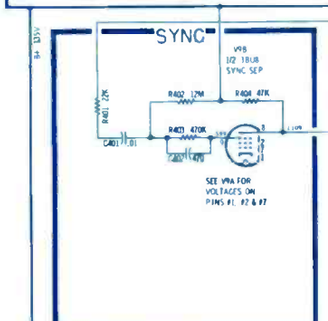


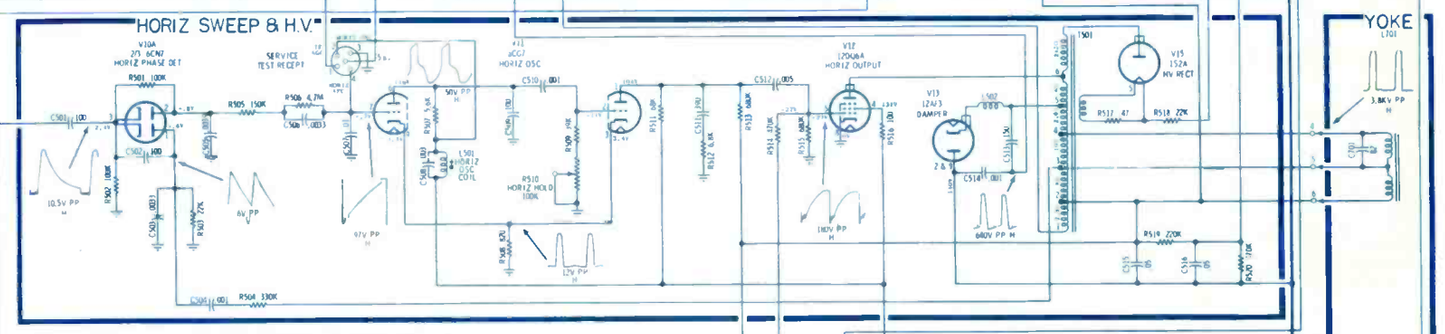


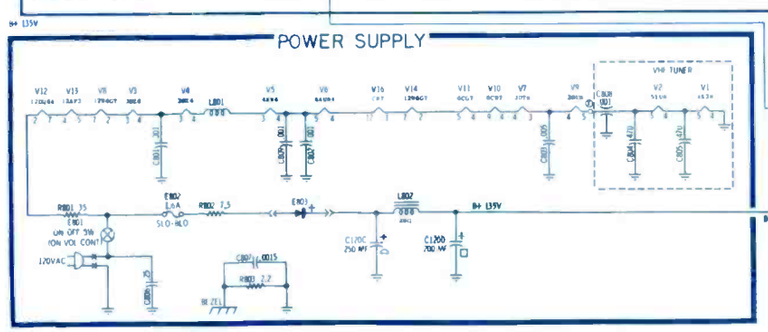


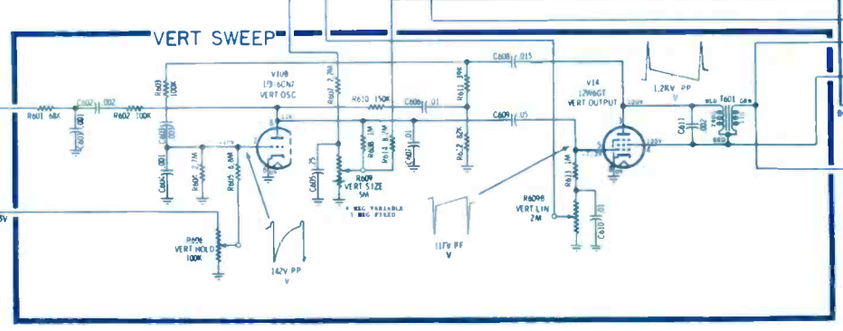












Chassis Changes

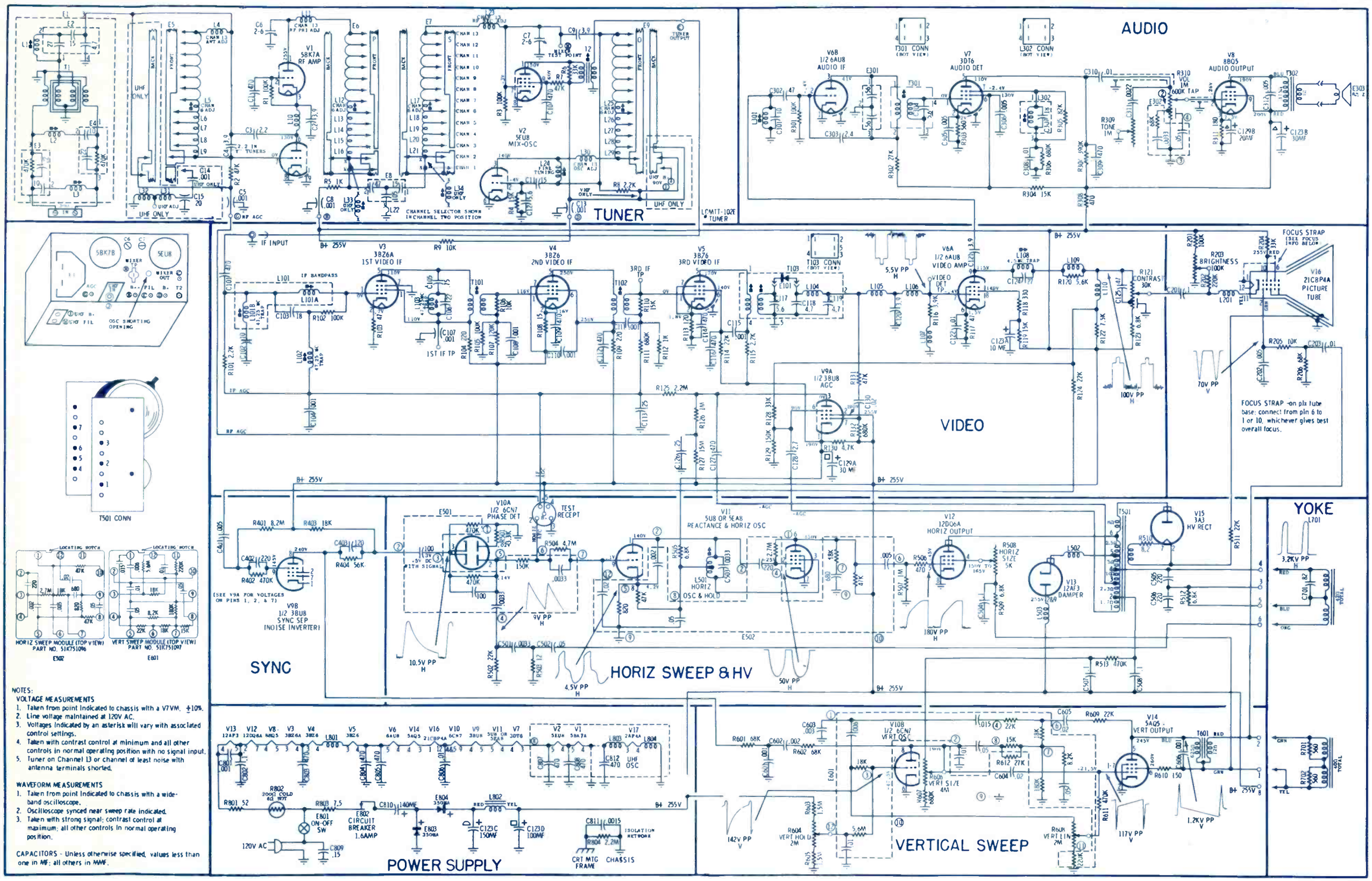
A-01 TO IMPROVE VERTICAL SYNC STABILITY: R-502 (100K) moved from ground to pin #1 of V-10 (6CN7 -Horiz Phase Det).
DESIGN CHANGE: C-125 (470 mmf) removed. The plate of V-9A (3BU8) is now connected to junction of C-513 (150) and C-514 (.001).

A-02 TO REDUCE NOISE LEVEL: R-121 (390K) changed to 470K.

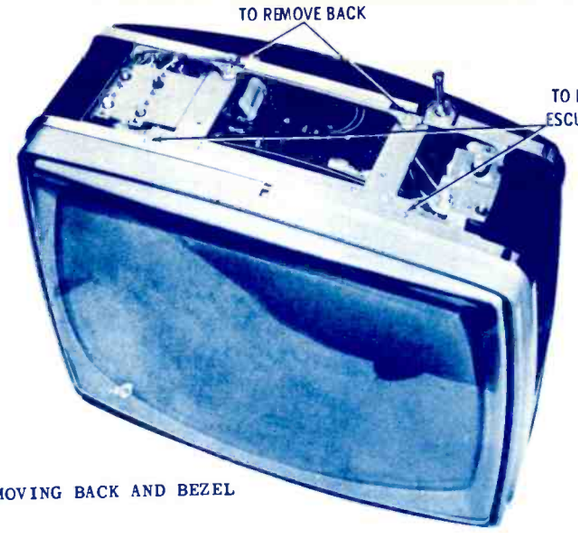
Tuner Changes

TT-121B TO MAINTAIN B+ ON RF PRI TRIMMER: A buss lead is added to RF pri wafer. See Tuner Schematic.

TT-121C TO MINIMIZE RESPONSE CURVE TILT ON CHANNEL 5: C-2 (470) changed to .0022 mf. This change reduces parasitic oscillation creating the tilt.


TUNER
AUDIO
VIDEO
SYNC
HORIZ SWEEP & HV
YOKE
POWER SUPPLY
VERTICAL SWEEP
T501 CONN
HORIZ SWEEP MODULE (TOP VIEW) PART NO. 51K751096
VERT SWEEP MODULE (TOP VIEW) PART NO. 51K751097
NOTES:
VOLTAGE MEASUREMENTS
1. Taken from point indicated to chassis with a V7VM, ±10%.
2. Line voltage maintained at 120V AC.
3. Voltages indicated by an asterisk will vary with associated control settings.
4. Taken with contrast control at minimum and all other controls in normal operating position with no signal input.
5. Tuner on Channel 13 or channel of least noise with antenna terminals shorted.
WAVEFORM MEASUREMENTS
1. Taken from point indicated to chassis with a wide-band oscilloscope.
2. Oscilloscope synced near sweep rate indicated.
3. Taken with strong signal; contrast control at maximum; all other controls in normal operating position.
CAPACITORS - Unless otherwise specified, values less than one in MF; all others in MMF.

MOTOROLA
TV (Transistorized)
Chassis TS-432
Model 19P1 "Astronaut"



REMOVING BACK AND BEZEL

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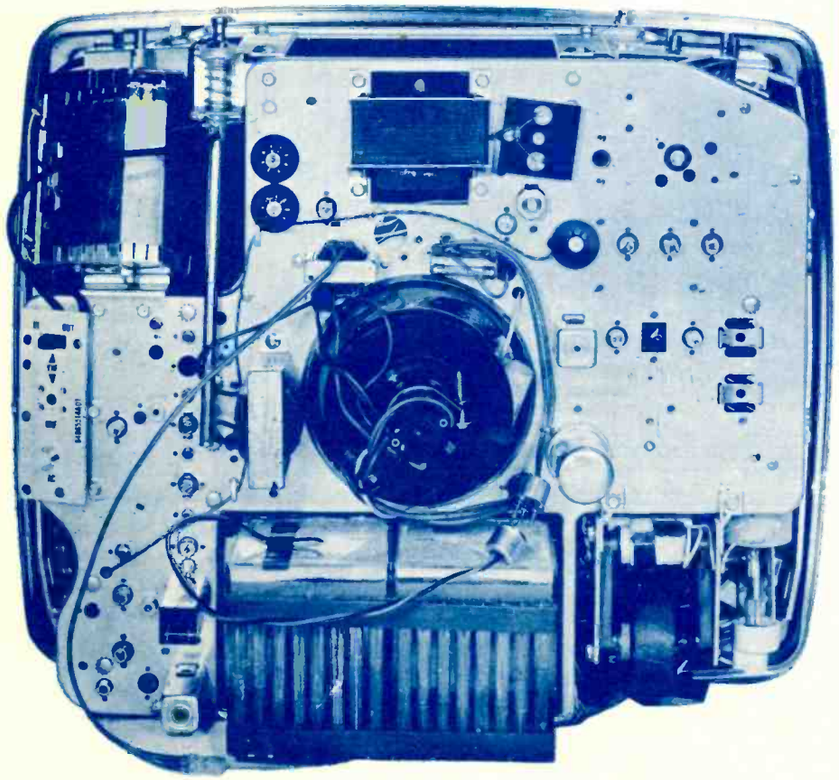
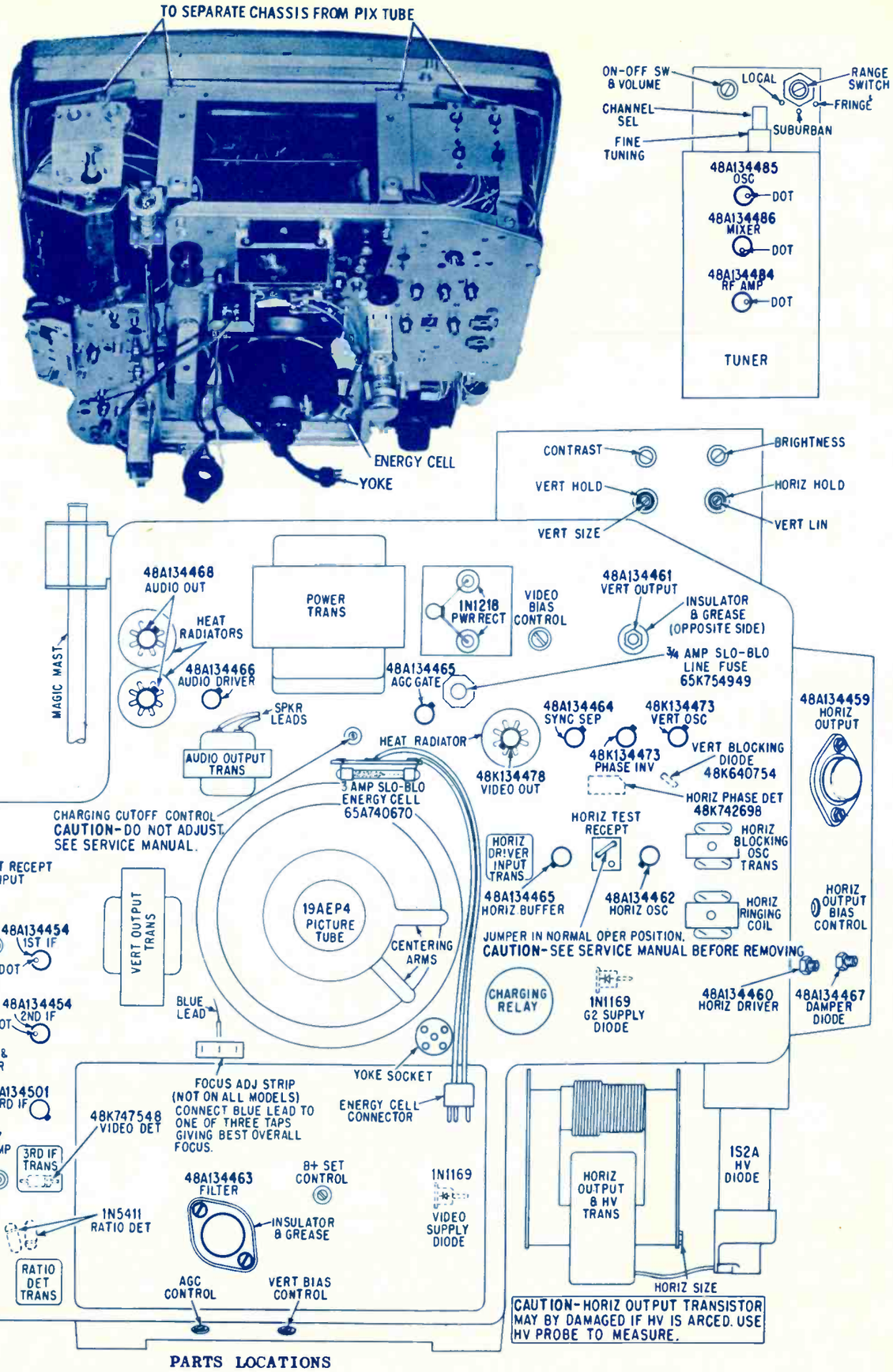
More Data on Reverse Side

MOTOROLA
TV (Transistorized)
Chassis TS-432
Model 19P1 "Astronaut"

Electronic Technician
CIRCUIT DIGEST

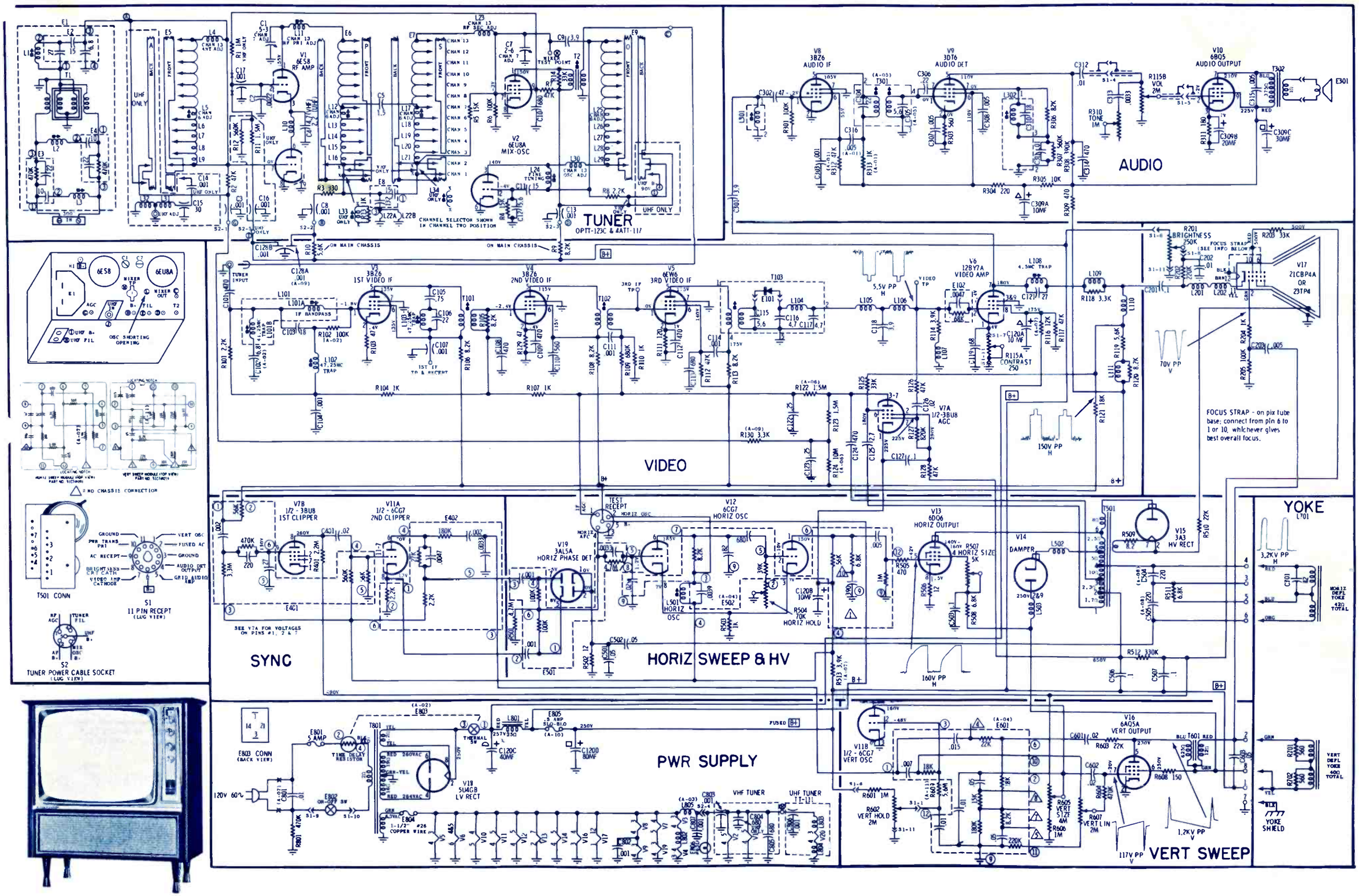


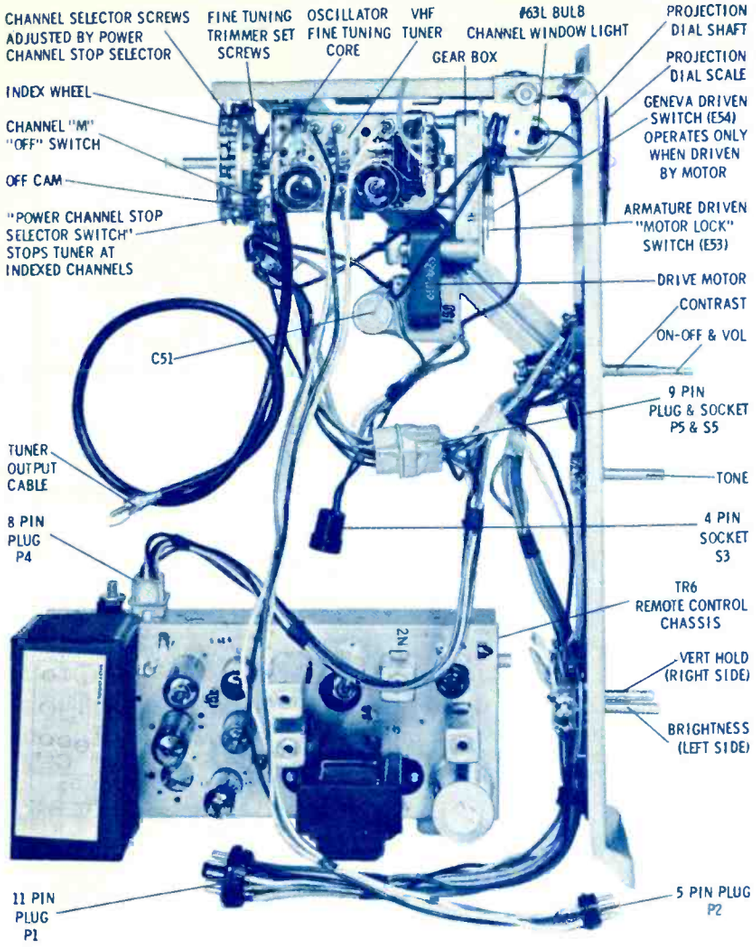
SET WITH BACK REMOVED AND ENERGY CELL INSTALLED



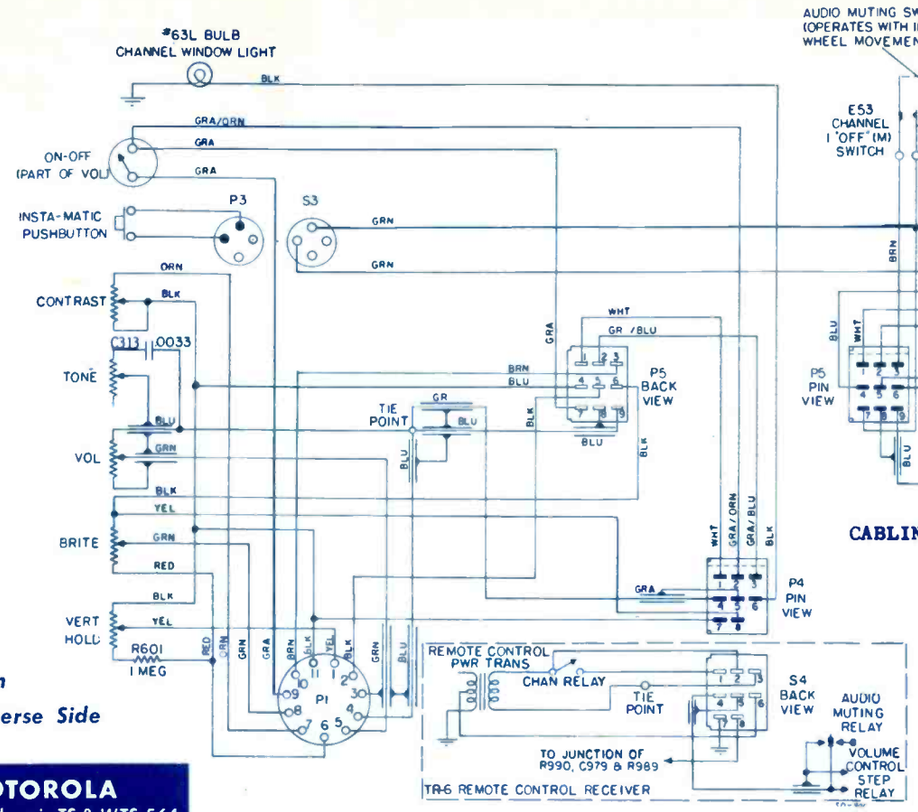
PARTS LOCATIONS

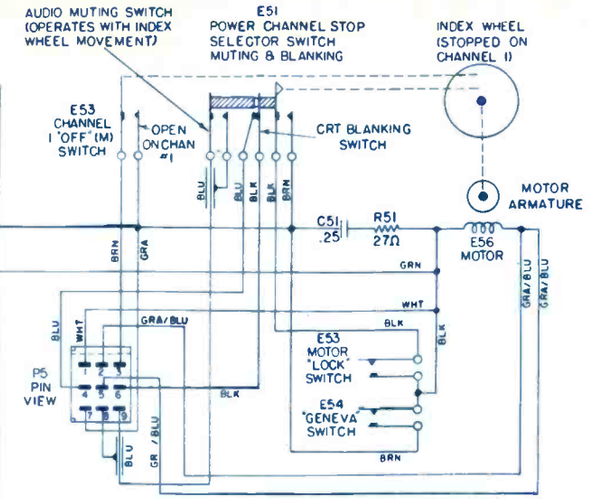
MOTOROLA
TV Chassis TS & WTS 564
Models 23K1, -2, -3





COMPLETE CONTROL BRACKET ASSEMBLY ((WTS-564 CHASSIS)





CABLING CONNECTIONS (WTS-564 CHASSIS)

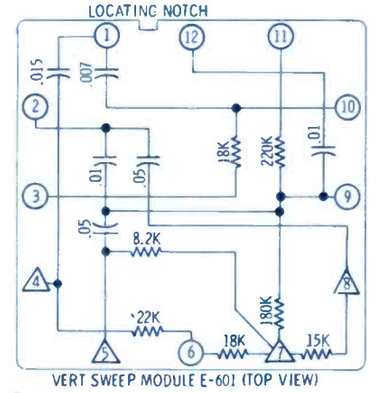
More Data on Reverse Side

MOTOROLA
TV Chassis TS & WTS 564
Models 23K1, -2, -3
Electronic Technician
CIRCUIT DIGEST

TV CHASSIS CODING SYSTEM

TS-564A-00. . . . . The original chassis
A-01, 02, etc. . . . . Minor electrical revisions of the "A" chassis
A-01-0, A-02-1 . . . Deviations from minor electrical revisions
B-00. . . . . First major revision of the original chassis
B-01, 02, etc. . . . . Minor electrical changes of the "B" chassis
Prefixes such as W, R, V, T, etc... Mechanical differences between chassis

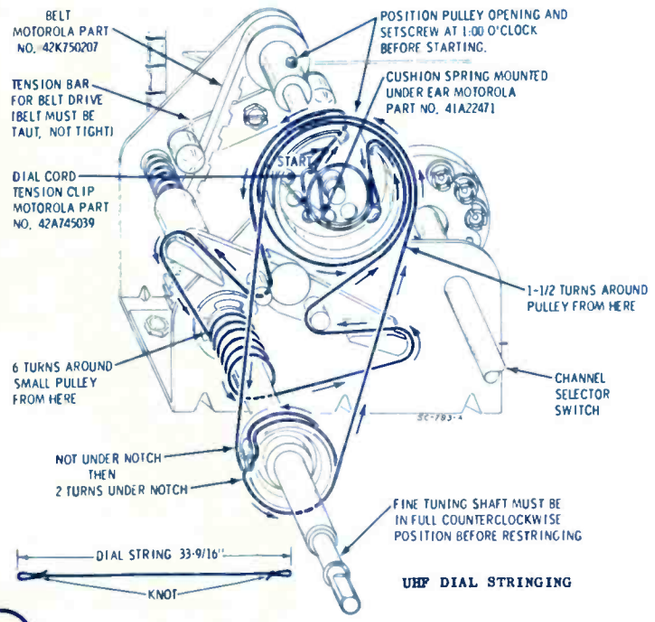
A "Y" suffix added to the basic chassis (example, TS-564YA-00) indicates that the chassis contains a factory-installed UHF tuner.



VERT SWEEP MODULE E-601 (TOP VIEW)

△ INDICATES NO RISER WIRE CONNECTION

PRODUCTION CHANGE A-11 VERTICAL MODULE



UHF DIAL STRINGING

CHASSIS PRODUCTION CHANGES

TS-564A-00 thru A-11

Chassis Coding	Changes
A-00-1	Same as the A-03 production change.
A-01	TO INCREASE AUDIO SENSITIVITY: Plate and screen voltage feed points of the 1st audio IF stage changed from a common resistor B+ feed to individual B+ feed points by the following revisions: R-302 (10K) changed to R-312 (47K), C-316 (.005 mf) added; R-313 (1K) added, and resistors separated by removal of jumper wire between screen and lug 1 of T-301.
A-02	TO FACILITATE VIDEO IF ALIGNMENT: R-102 (100K) removed and C-102 (10 mmf) changed to 6.8 mmf.
A-03	TO REDUCE THE POSSIBILITY OF REGENERATION IN THE UHF TUNER: L-805 (filament choke) added between pin 4 of S-2 (tuner power cable socket) and filament line; C-807 (.001 mf 1KV) added between pin 4 of S-2 (tuner power cable socket) and ground.
A-04	TO REDUCE EFFECT OF HIGH HUMIDITY ON THE MODULES: The horizontal module (E-502) and the vertical module (E-601) have additional wax impregnation.
A-05	TO REDUCE DRIFT OF THE SOUND DETECTOR WITH TEMPERATURE CHANGES: C-305 (5.6 mmf) replaced with a capacitor of improved temperature coefficient characteristic. C-305 is part of the assembly comprising the 1st audio IF transformer T-301. A new assembly number is listed for T-301 which includes the new capacitor.
A-06	TO IMPROVE SIGNAL TO NOISE RATIO ON MODERATELY STRONG SIGNALS: R-122 (2.2 meg) changed to 1.5 meg; R-124 (15 meg) changed to 10 meg. This change improves the noise factor by increasing the gain in the tuner while decreasing the gain in the IF system. MODULE RELIABILITY CHANGE: To protect the majority of the module components from damage in the event of filter capacitor short or leakage, the B+ dropping resistor of 3.9K ohms (located between riser wires 1 and 4) of the horizontal module E-502 is removed from the circuitry and an external resistor wired in its place. This is accomplished by cutting off riser 1 and wiring a 3.9K resistor (R-513) from riser wire 4 to the proper B+ point.
A-08	TO INSURE SUFFICIENT HORIZONTAL SIZE AT LOW LINE VOLTAGES: C-504 and C-505 (180 mmf) changed to 220 mmf.
A-09	FOR INCREASED UHF TUNER STABILITY BY REDUCING POSSIBILITY OF REGENERATION: Additional filtering added to the VHF tuner's AGC system by addition of R-130 (3.3K) resistor. Also, additional bypass filtering added at the VHF tuner's UHF, and RF-Amp B+ points by inclusion of C-128 (dual .001 mf capacitor).
A-10	TO REDUCE FUSE FAILURES IN HIGH LINE VOLTAGE AREAS: The B+ fuse E-805 (.4 amp, slo-blo) changed to .5 amp slo-blo. The .5 amp fuse is recommended as a replacement for all field sets.
A-11	FOR INCREASED VERTICAL SWEEP STABILITY: The 5.6 meg resistor between the vertical hold control and grid of the vertical oscillator tube replaced with an external resistor of 5.6 meg ohms. This change is applicable to module No. 51C749219 which is equivalent to module No. 51C753673 when the 5.6 meg resistor is eliminated by cutting off the proper riser wires between the wafers. The external resistor that takes its place is noted as R-609 (5.6 meg) on the schematic. New module is shown in Figure 4.

TUNER PRODUCTION CHANGES

OPTT-123B and C

Tuner Coding	Changes
OPTT 123C	TO MINIMIZE OSCILLATOR DRIFT: C-11 (15 mmf) changed from a tubular type to a disc type of better temperature coefficient characteristics; L-26 (osc coil, Channel 5) changed to a coil of greater outside diameter and color code changed from turquoise to clear.

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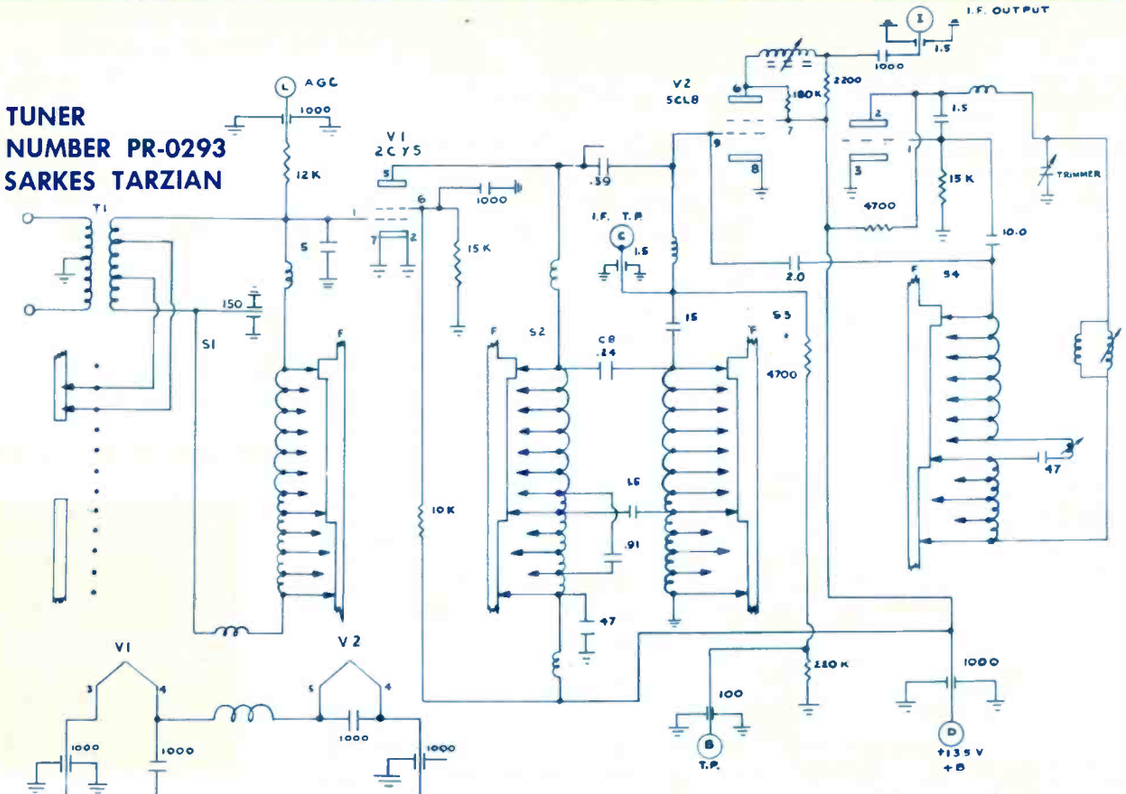
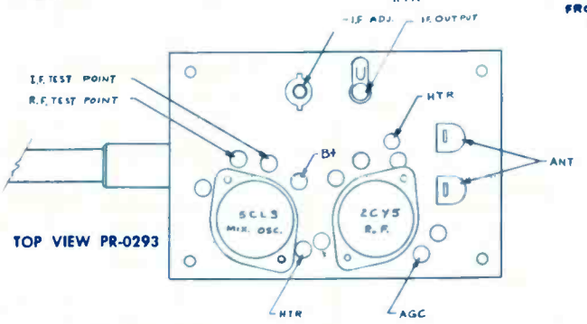
MUNTZ

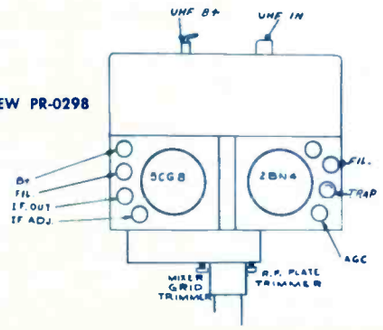
TV Chassis T37L05, -04U, T37P05, -04U, T37S05, -04U

TUNER NUMBER PR-0293 SARKES TARZIAN

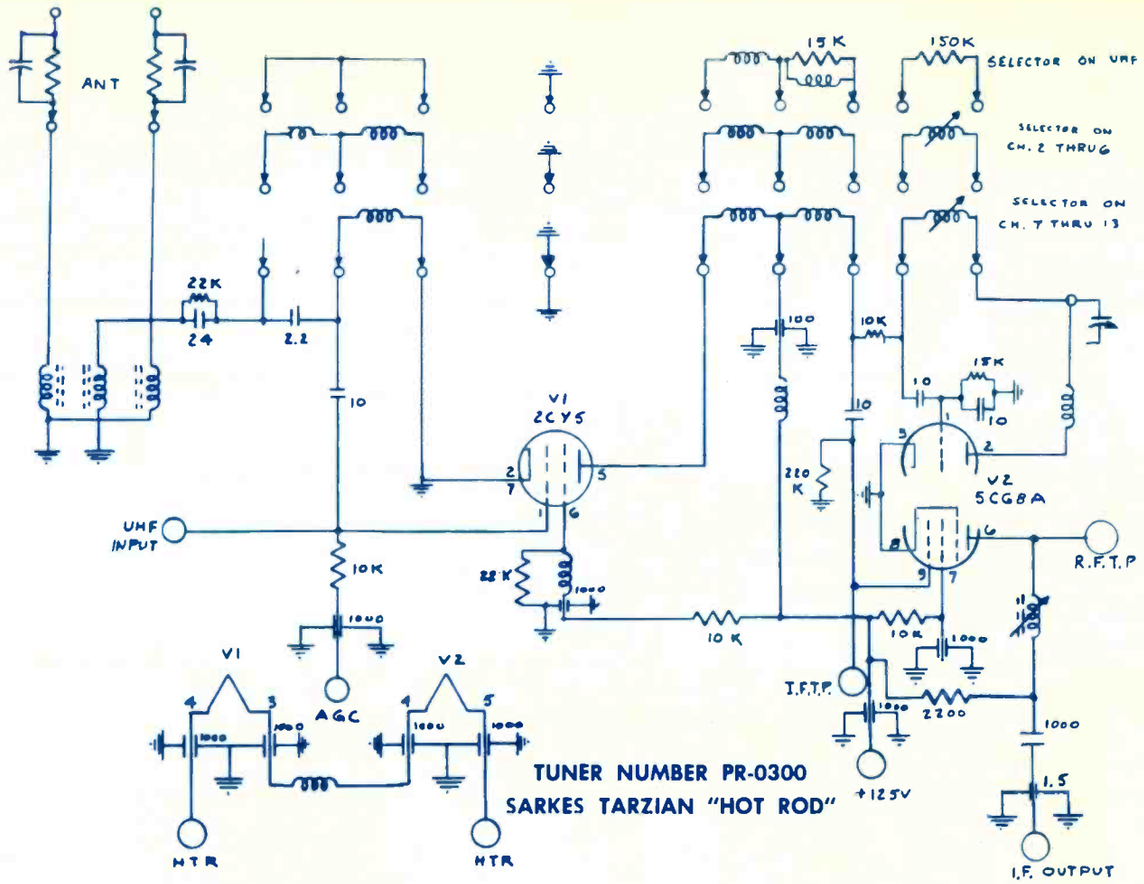




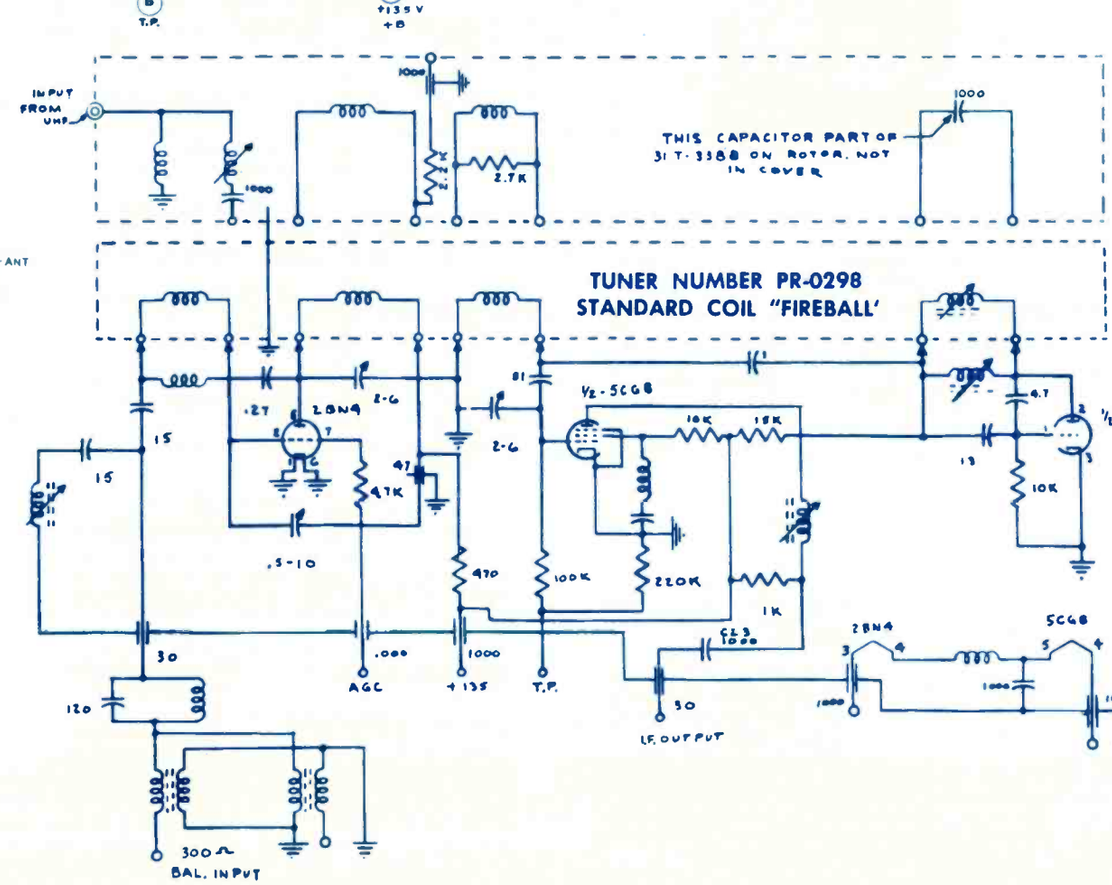
TOP VIEW PR-0293

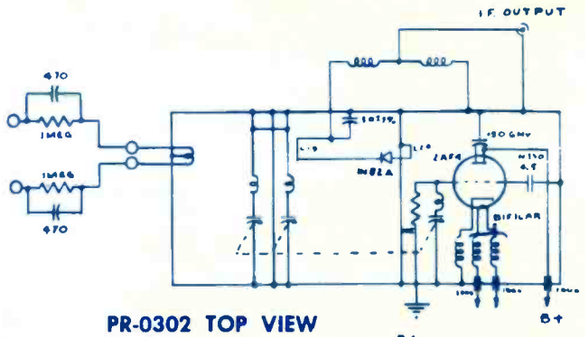


TOP VIEW PR-0298

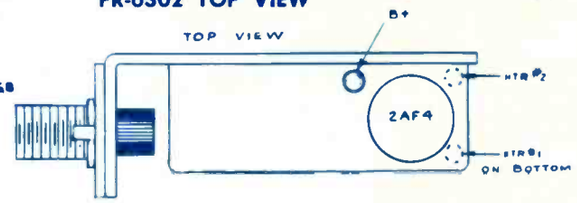


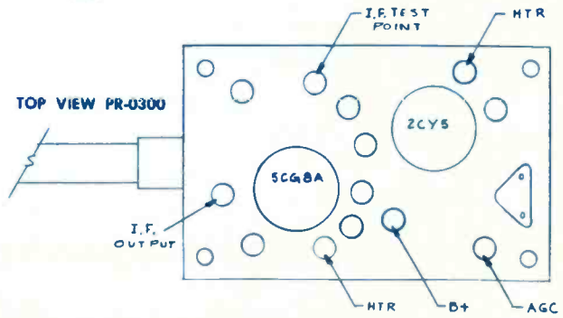
TUNER NUMBER PR-0300 SARKES TARZIAN "HOT ROD"





PR-0302 TOP VIEW





TOP VIEW PR-0300

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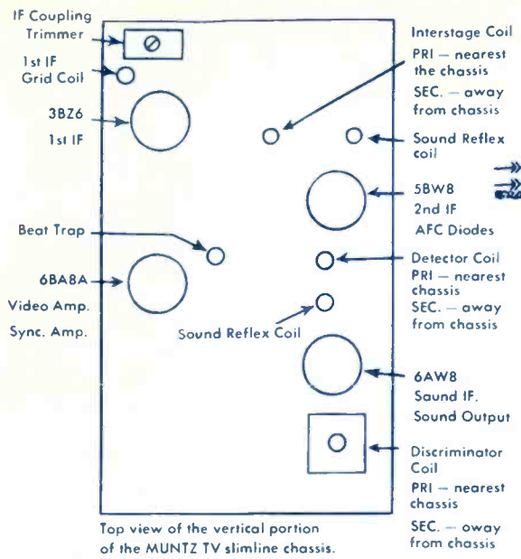

Top view of the vertical portion of the MUNTZ TV slimline chassis.

OBSERVE THE FOLLOWING PRECAUTIONS

1. Antenna isolation networks are located on terminal strips for all VHF tuners. This network consists of 330K OHM ± 10%, ½ Watt resistors in parallel with 470MMFD ± 10%, 1500VAC capacitors. One pair is installed in series with *each* antenna lead. These are for protection of the user against shock hazard. If any work is done on tuners, always check antenna terminals to chassis for resistance. This must be 330K OHM ± 10%. UHF tuners have built in isolation networks but should also be checked for failure of this protective circuit.
2. The volume control, picture tube supports and all metal parts which the customer can touch are protected by isolation networks. Do not, under any circumstances, defeat these networks when you service the sets.

More Data on Reverse Side

MUNTZ
TV Chassis T37L05, -04U
T37P05, -04U,
T37S05, -04U

Electronic Technician
CIRCUIT DIGEST

VOLTAGE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10
V3	3BZ6	-.1	.67	33.5 AC	33.0 AC	122	122	GND			
V4	5BW8	GND	3.3	-.2	4.7 AC	GND	0	1.25	118	118	TP
V5	6BA8A	GND	-2.6	75	33.5 AC	38.0 AC	*1.6	*.9	87	72	TP
V6	6AW8	GND	-.45	85	39.0 AC	46.0 AC	GND	-2.75	138	138	TP
V7	12AV5	-5.3	23.0 AC	GND	TP	134	NC	10.6 AC	*52		
V8	6CG7	109	-.2	3.6	46.0 AC	52.0 AC	98	-6	3.6	GND	TP
V9	25DN6	NC	76.0 AC	GND	NC	-24	NC	52.0 AC	115		
V10	19AU4	NC	NC	+410	NC	137	NC	70.0 AC	94.5 AC		
V11	1K3							11.6KV			
P1X		4.7 AC		350	‡138				10.6 AC		

NOTES

1. All voltages D.C. unless otherwise noted. Reading taken with a VTVM.
2. All readings taken at 117 VAC line.
3. All readings taken to chassis gnd. No signal applied and local-distant switch in local position.
4. All readings subject to 20% variations.
5. *Voltage varies with setting of controls.
6. †Measure boost voltage on terminal strip at junction of 180K OHM resistor, .luf 600V and .luf 400V capacitors.
7. ‡See focus instructions

FOCUS

On portable models a connecting wire is available at the base of the CRT to obtain best focus and line detail. This wire connects between Pin 6 and Pin 2 or 10. On all 110° sets, focusing anode (Pin No. 4-Orange Wire) is connected at the factory to a B+ point. Some tubes may focus better at a different voltage. This can be determined experimentally by connecting the orange focus lead mentioned above to the boost voltage or ground.

Model Number	Chassis No.
21CM, 21CB, 21CW, 21TM, 21TB 21TW, 21LBM, 21LBB, 21LBW	T37L05
21CM82, 21CB82, 21CW82, 21TM82, 21TB82, 21TW82, 21LBM82, 21LBB82, 21LBW82	T37L04U
24CM, 24CB, 24CW, 24TM, 24TB, 24TW	T37P05
24CM82, 24CB82, 24CW82, 24TM82, 24TB82, 24TW82	T37P04U
21CS	T37S05
21CS82	T37S04U

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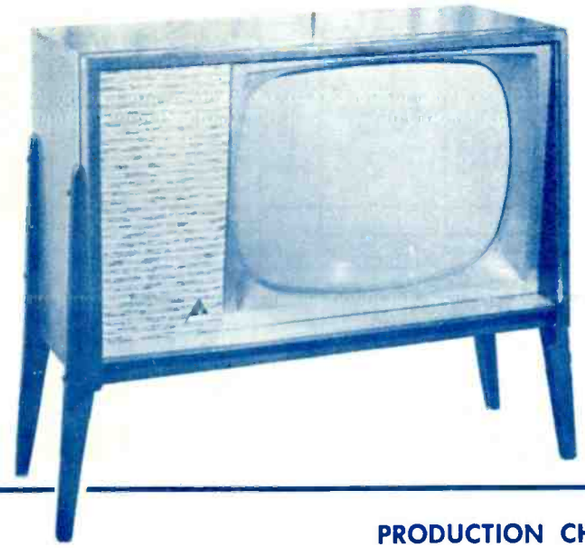
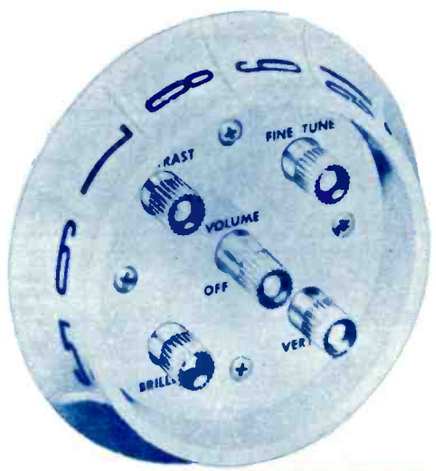


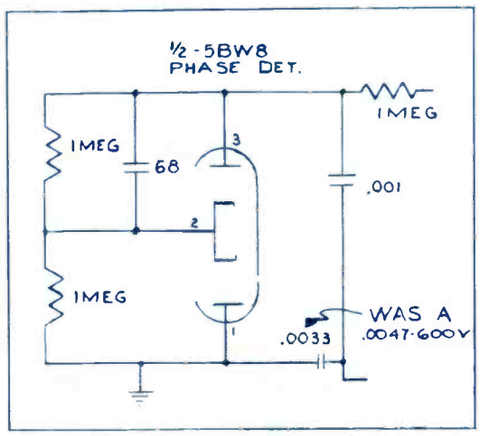


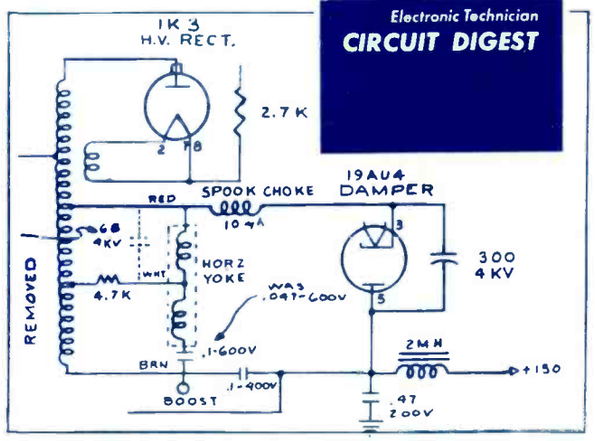
MUNTZ
TV Chassis T37L05, -04U, T37P05, -04U, T37S05, -04U

Electronic Technician
CIRCUIT DIGEST

PRODUCTION CHANGES

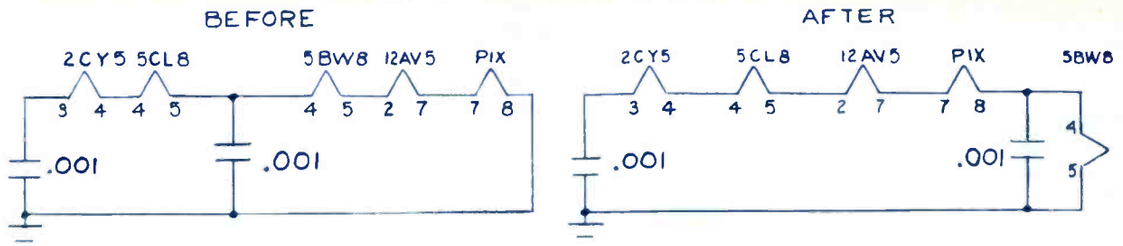
TO INCREASE WIDTH IN 110° 21" SETS



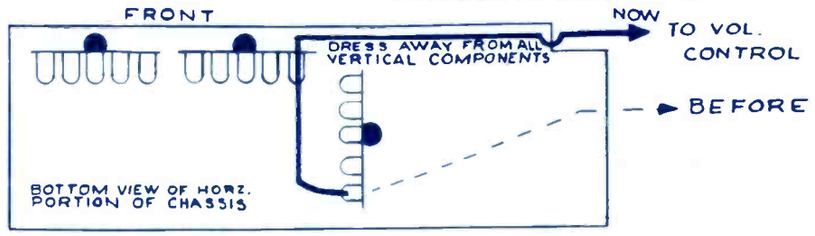


ATTENUATOR PADS In some localities where the signal strength is excessive, overload of the set may occur. This will result in an over-contrasted picture and possibly buzz.

TO ELIMINATE HUM IN HORIZONTAL AFC



TO ELIMINATE AUDIO BUZZ



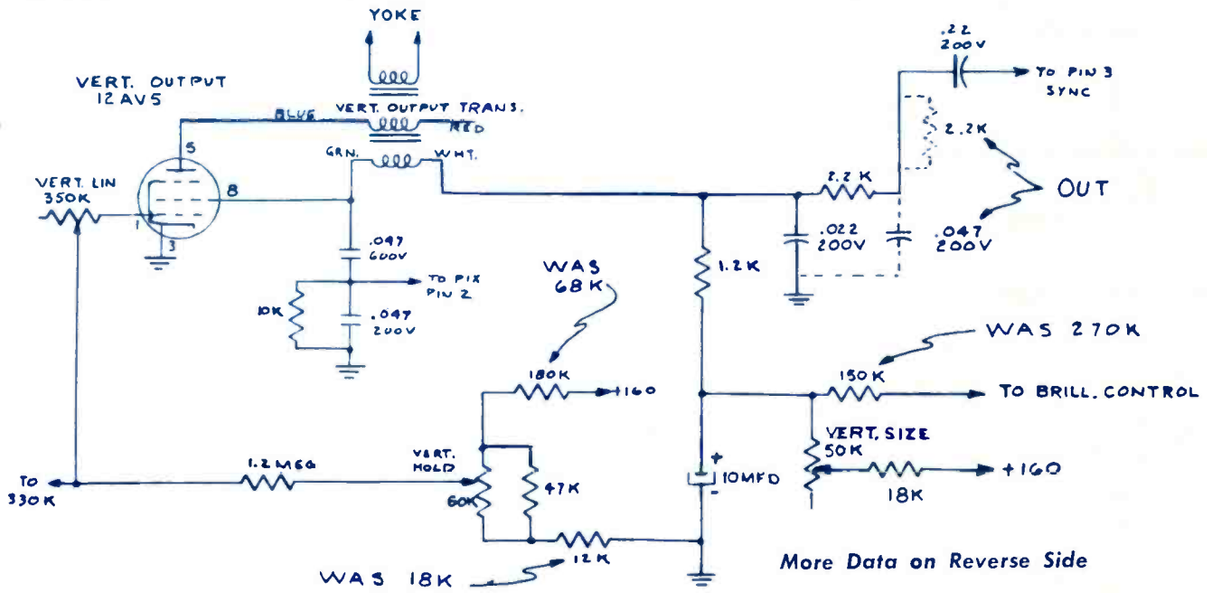
To Improve Vertical Stability In The 110° Sets

In the feedback circuit of the vertical stage, change the 1.5 Meg OHM resistor to a 2.2 Meg OHM. This resistor is located on the terminal strip at the front of the chassis. Also change the .0022 microfarad capacitor to a .0015 microfarad N4200 capacitor at 600 Volts. This is located on the same terminal strip as the resistor. Change the 270K OHM resistor that connects from the center arm of the vertical linearity control to a 330K OHM resistor.

Note: Be certain that the aquadag contact spring has sufficient tension against the picture tube.

Change the integrating network to increase the Vertical Sync. This is done by removing the 2.2K OHM resistor and the .047 MFD capacitor. See diagram.

Change the Vertical Hold network to stabilize the control voltage to the grid of the 12AV5. This is accomplished by changing the 68K OHM resistor on the Vertical Hold control to a 180K OHM and connecting it to the B+. The B+ point is available at the Brightness control. It is recommended that sleeving be used on these leads so that no shorts will develop. The 18K OHM resistor from the Vertical Hold control to ground is changed to 12K OHM. The 270K OHM resistor from the center of the Brightness control is changed to a 150K OHM. See diagram.



More Data on Reverse Side

FILAMENT DROPPING RESISTOR All portables that have a 30 OHM ± 10% 15 Watt Wire Wound Resistor in the filament. Change to a 36 OHM ± 10% 15 Watt Wire Wound Resistor. This is to eliminate possible hum on Horizontal Sync. Since our portables have no pilot light this is needed to lower the filament.

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OLYMPIC
TV Chassis KU, KUU

NOTE
ALL RESISTOR VALUES IN OHMS AND ALL CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE NOTED.
** NEG. TEMP. COEFFICIENT.

TUNER CL26063

TUNER CL5583 (KUU)

†† FILAMENT WIRING FOR KUU CHASSIS

PRELIMINARY RUN 1

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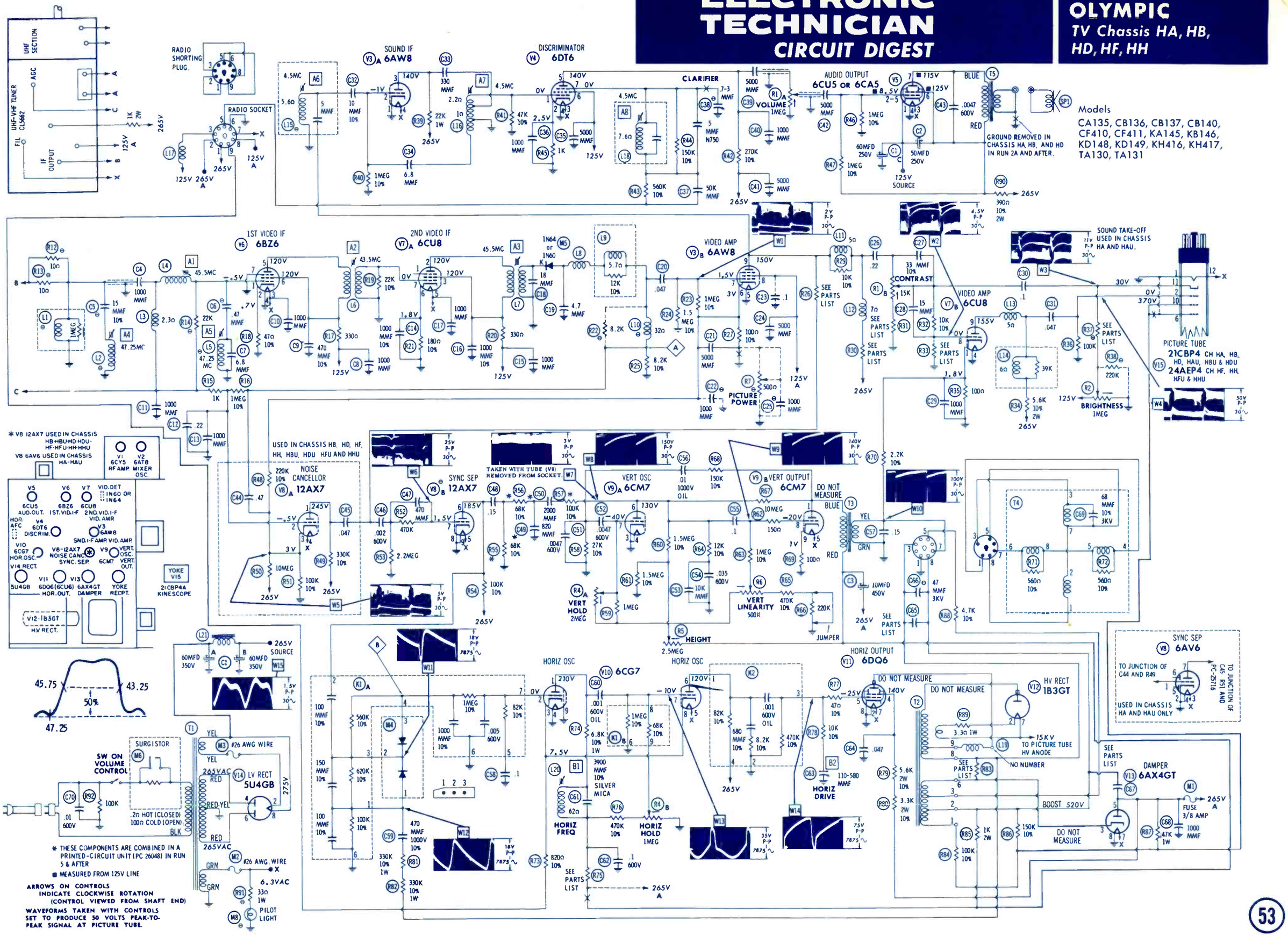
OLYMPIC

TV Chassis HA, HB, HD, HF, HH

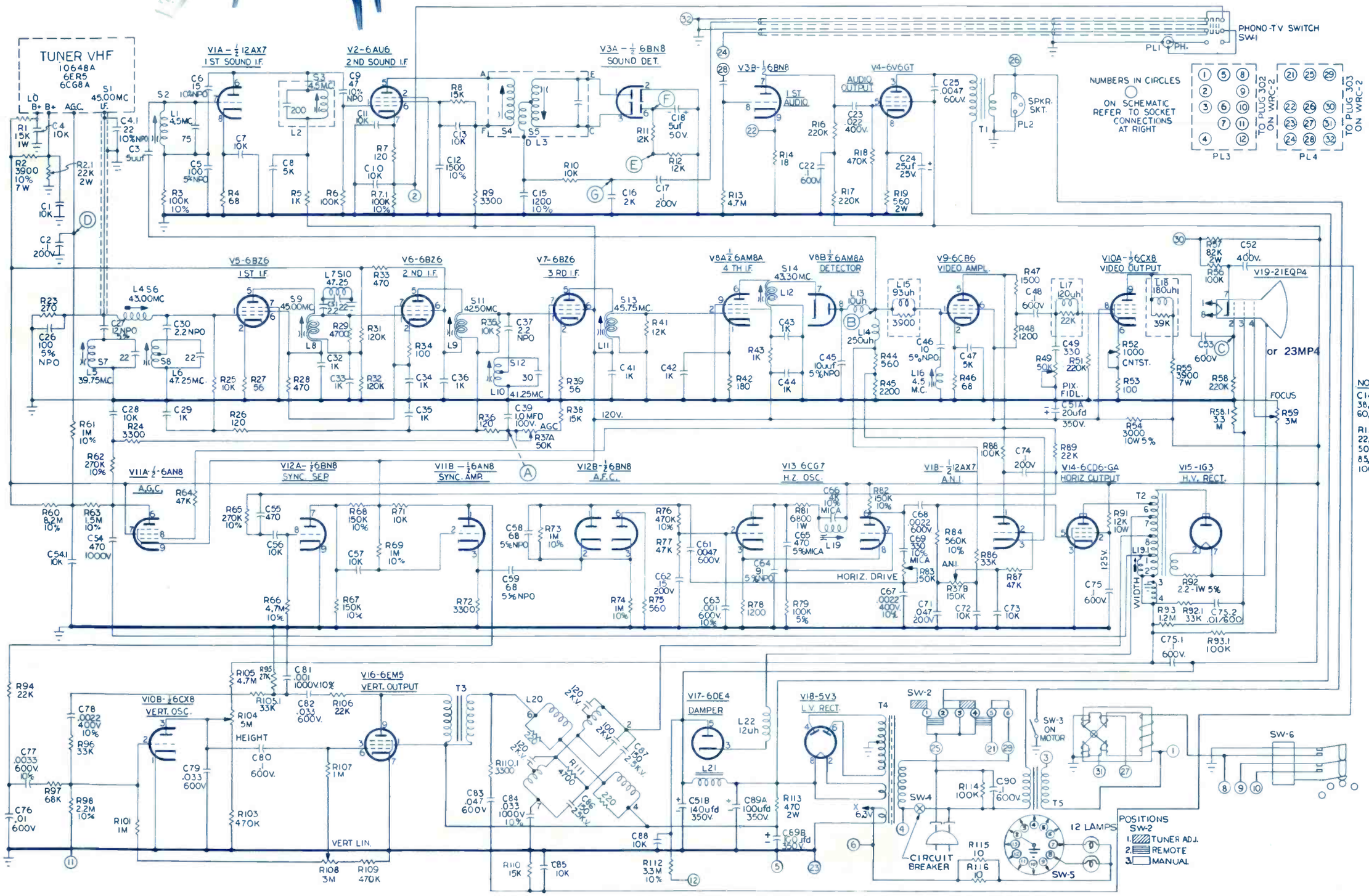
Models

CA135, CB136, CB137, CB140, CF410, CF411, KA145, KB146, KD148, KD149, KH416, KH417, TA130, TA131



ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

PACKARD-BELL
TV Chassis 98D6
Models 21DC16
23DC5, 23DC6



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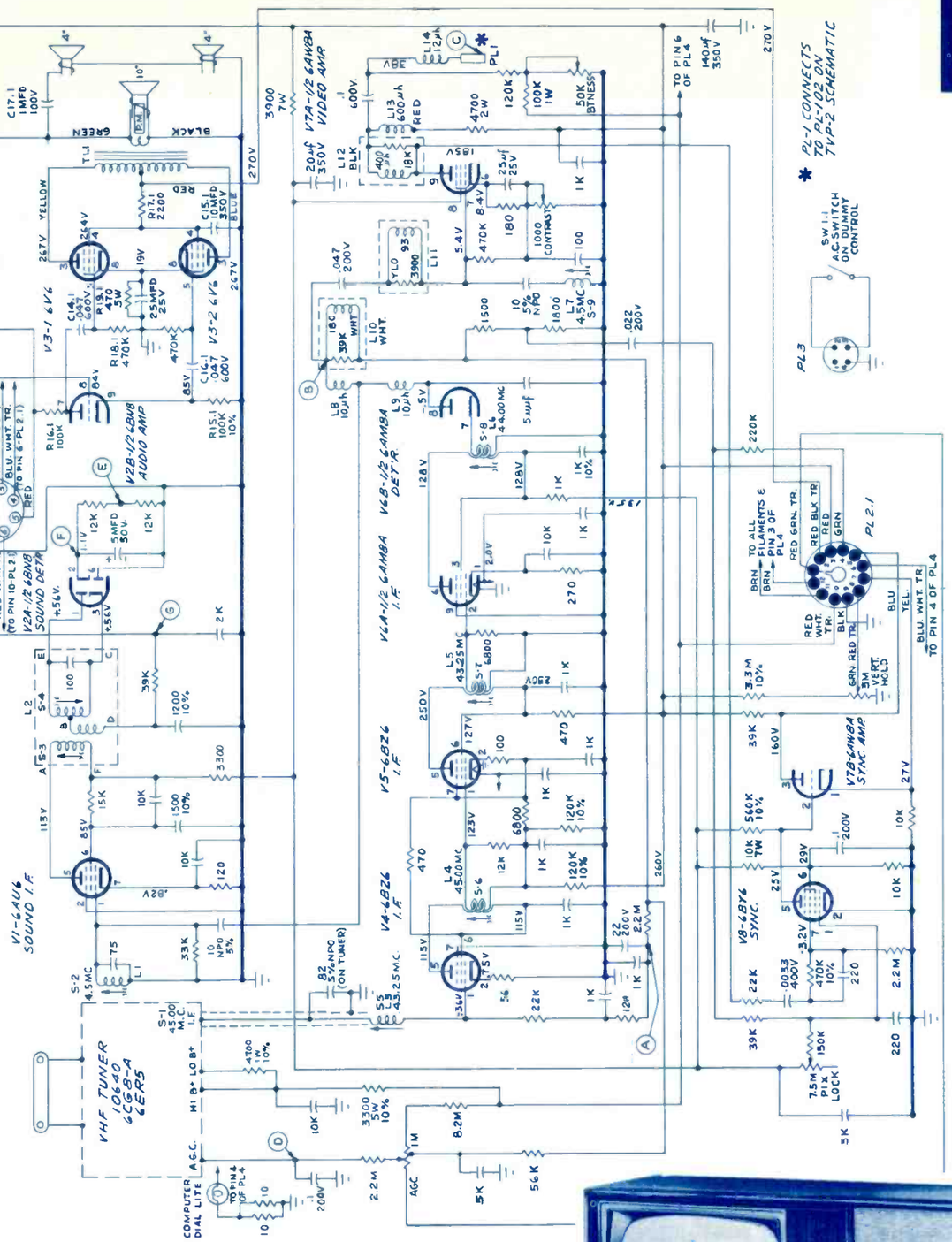
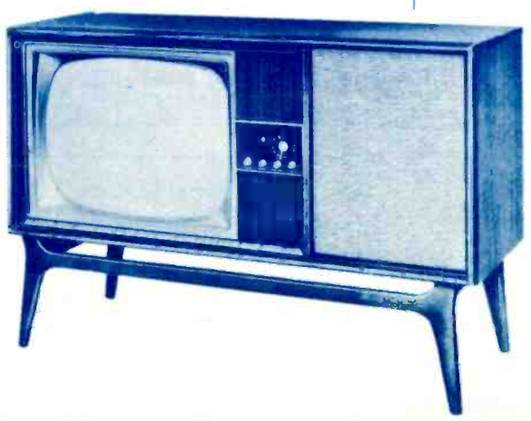
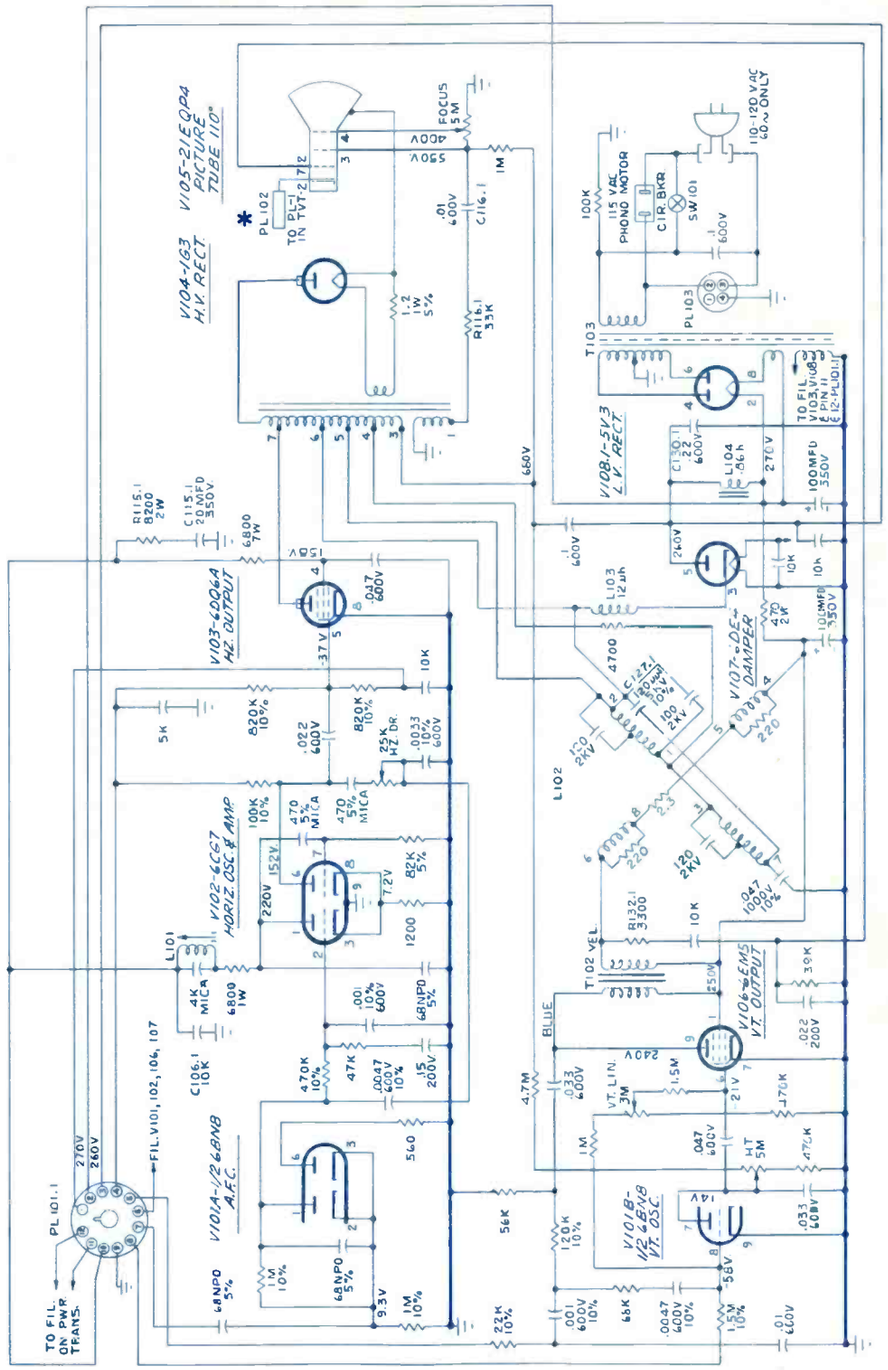
PACKARD-BELL
TV-Radio-Phono Combination Model 21K2



TVT-2 Tuner Chassis

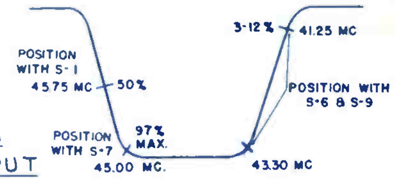




TVP-2 Power Chassis

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

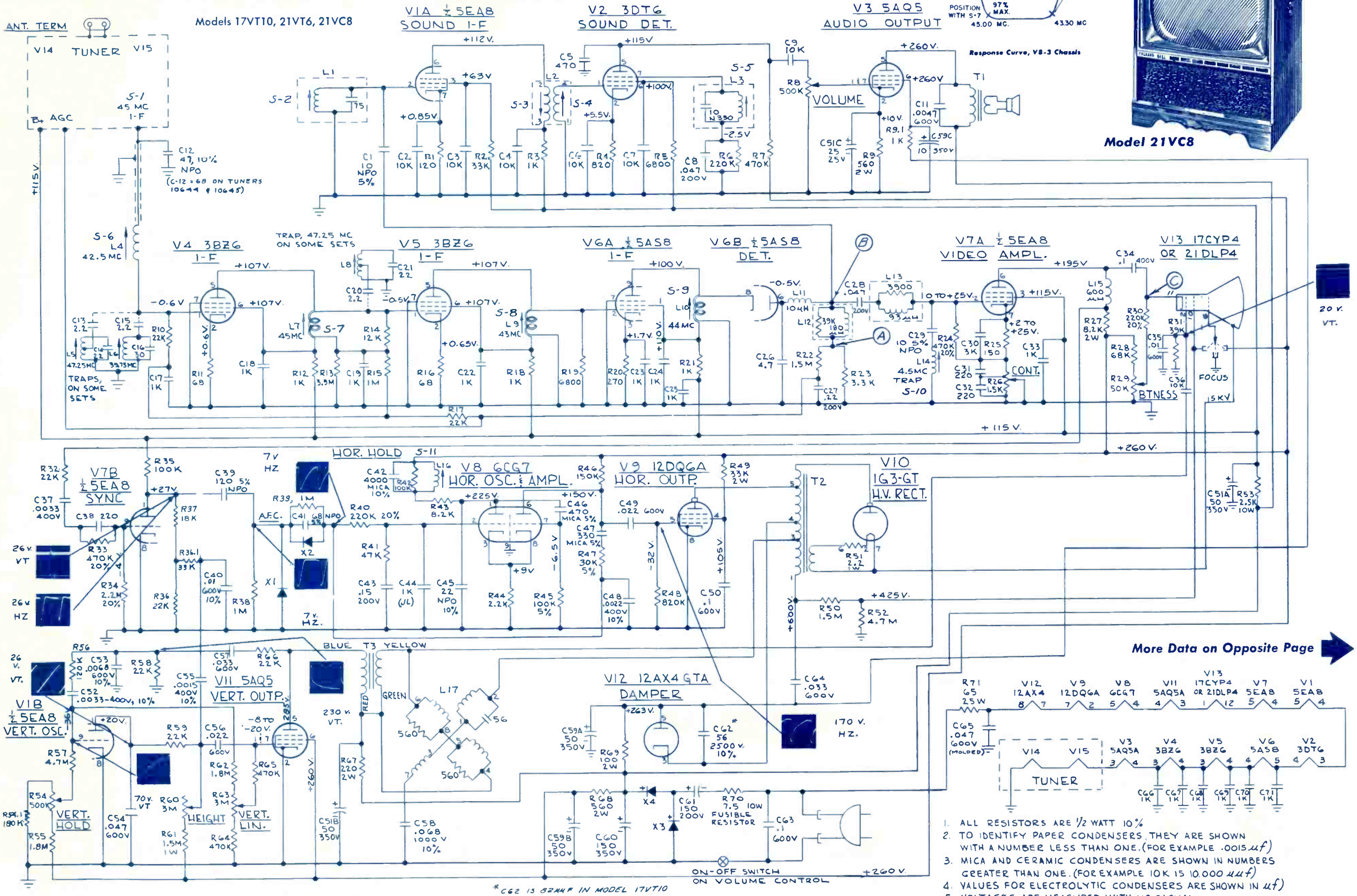
PACKARD-BELL
TV Chassis V8-3



Response Curve, V8-3 Chassis

Model 21VC8

Models 17VT10, 21VT6, 21VC8



More Data on Opposite Page

NOTES
UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE ½ WATT 10%
2. TO IDENTIFY PAPER CONDENSERS, THEY ARE SHOWN WITH A NUMBER LESS THAN ONE. (FOR EXAMPLE .0015 μf)
3. MICA AND CERAMIC CONDENSERS ARE SHOWN IN NUMBERS GREATER THAN ONE. (FOR EXAMPLE 10K IS 10,000 μμf)
4. VALUES FOR ELECTROLYTIC CONDENSERS ARE SHOWN IN μf)
5. VOLTAGES ARE MEASURED WITH NO SIGNAL.
6. SWEEP FREQUENCY (HORIZ. OR VERT.) AND PEAK TO PEAK VOLTAGE GIVEN BY WAVEFORM PHOTO.

CAUTION, HOT CHASSIS { **Chassis is connected to one side of AC line. Use an isolation transformer to connect power to set. Do not plug two sets into the same transformer.**

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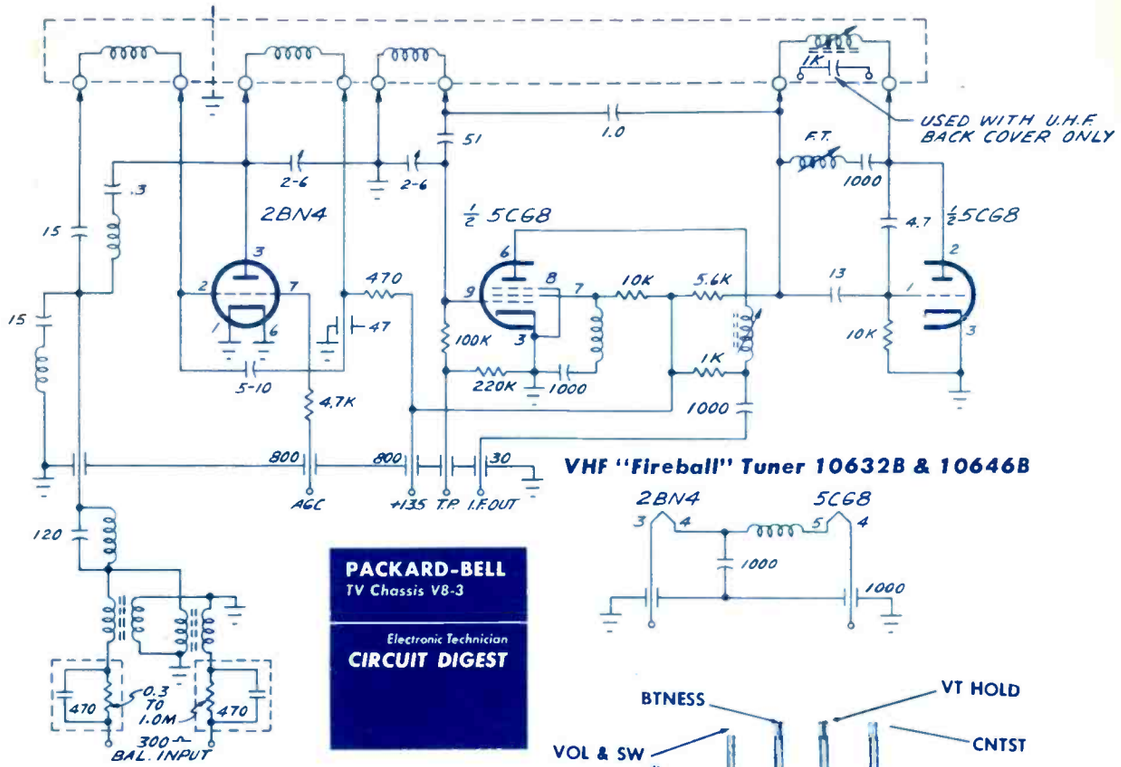
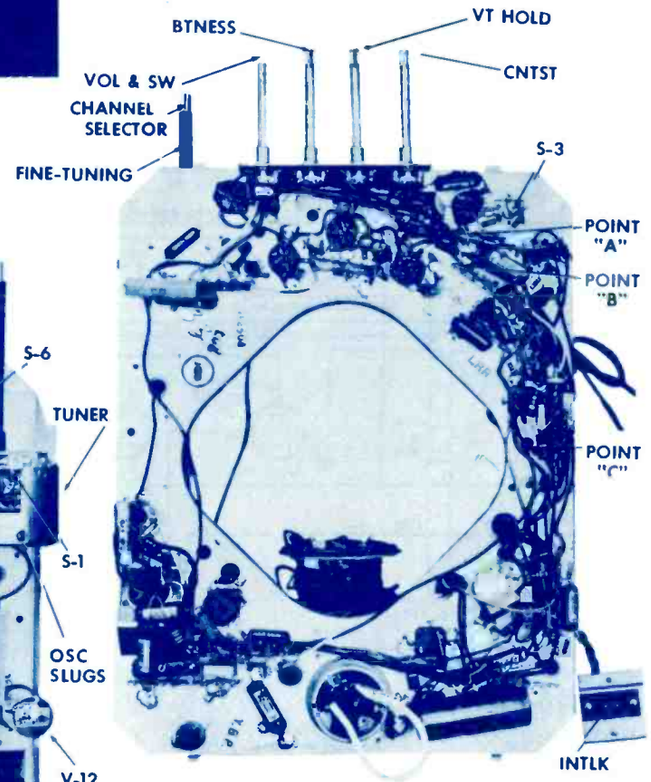
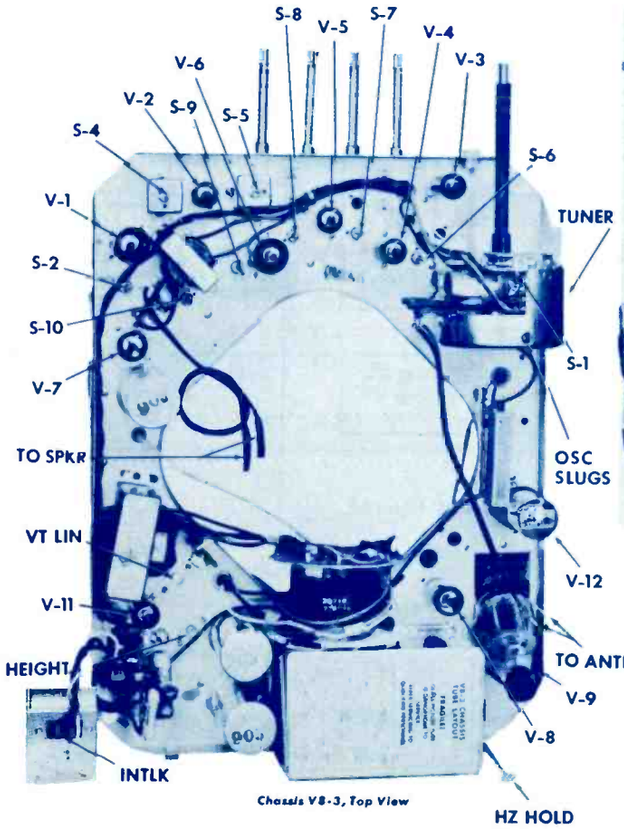


VHF "Fireball" Tuner 10632B & 10646B



Chassis V8-3, Bottom View

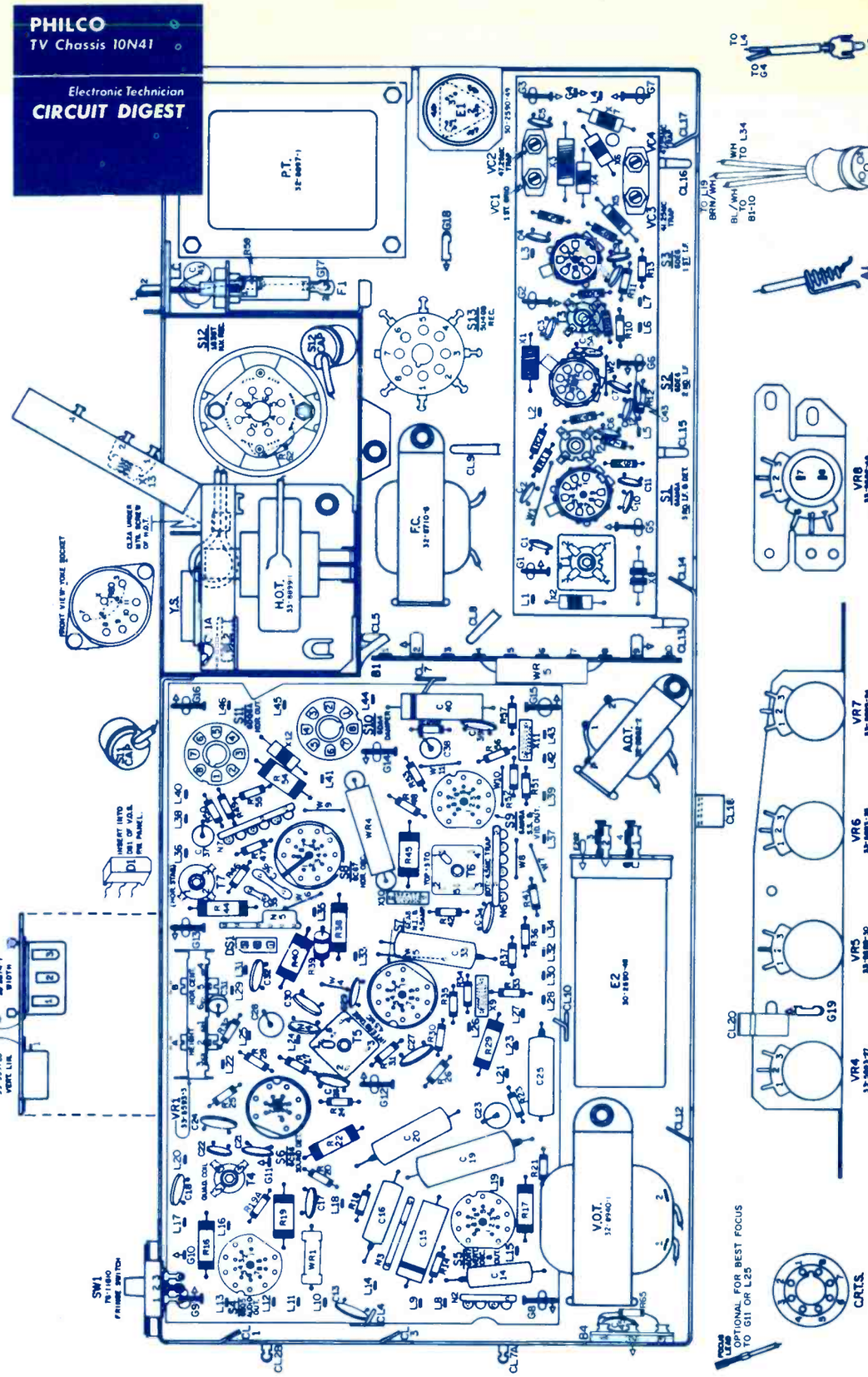


Chassis V8-3, Top View

LIST OF ADJUSTMENTS:

S-1	I-F on RF tuner
S-2	Sound take-off, 4.50 mc
S-3	Primary, sound I-F, 4.50 mc (bottom)
S-4	Secondary, sound I-F, 4.50 mc (top)
S-5	Quadrature coil
S-6	1st picture I-F
S-7	2nd picture I-F
S-8	3rd picture I-F
S-9	4th picture I-F
S-10	Trap, 4.50 mc
S-11	Horizontal hold

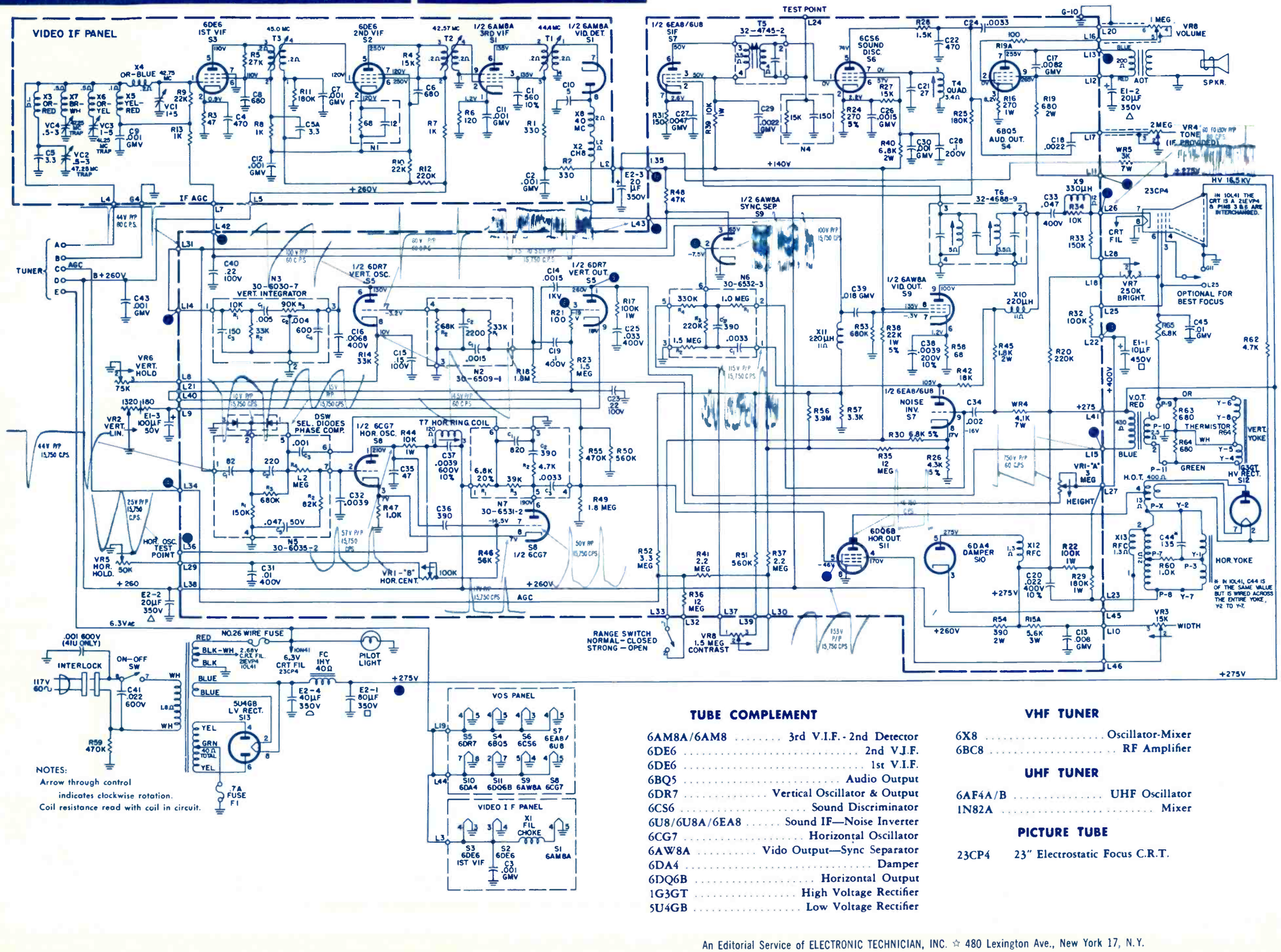
More Data on Opposite Page



10L41, Run B and 10N41—Top View Showing Component Placement

More Data on Reverse Side

PHILCO
TV Chassis 10N41



TUBE COMPLEMENT

6AM8A/6AM8	3rd V.I.F.-2nd Detector
6DE6	2nd V.I.F.
6DE6	1st V.I.F.
6BQ5	Audio Output
6DR7	Vertical Oscillator & Output
6CS6	Sound Discriminator
6U8/6U8A/6EA8	Sound IF—Noise Inverter
6CG7	Horizontal Oscillator
6AW8A	Vido Output—Sync Separator
6DA4	Damper
6DQ6B	Horizontal Output
1G3GT	High Voltage Rectifier
5U4GB	Low Voltage Rectifier

VHF TUNER

6X8	Oscillator-Mixer
6BC8	RF Amplifier

UHF TUNER

6AF4A/B	UHF Oscillator
1N82A	Mixer

PICTURE TUBE

23CP4	23" Electrostatic Focus C.R.T.

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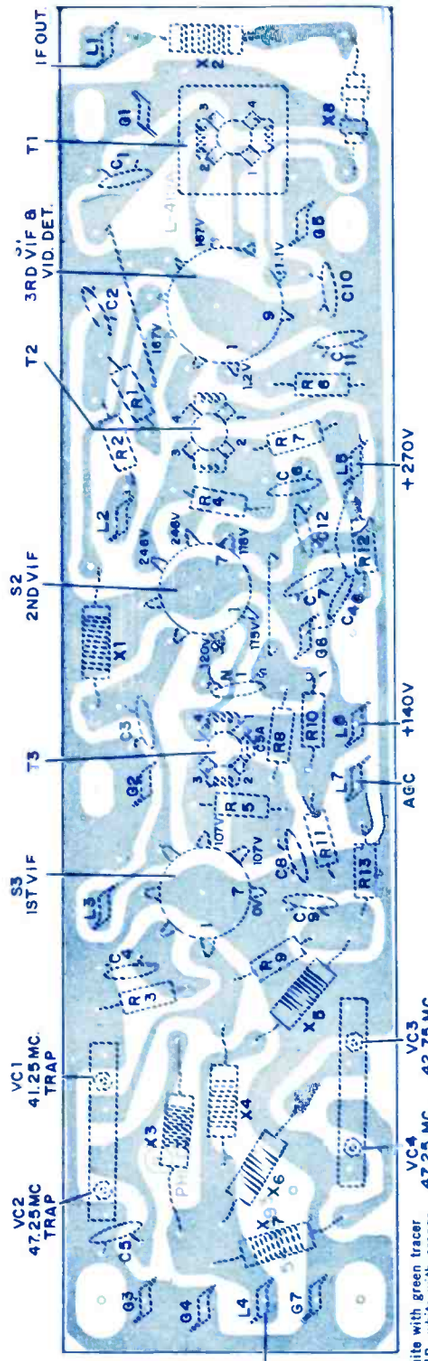
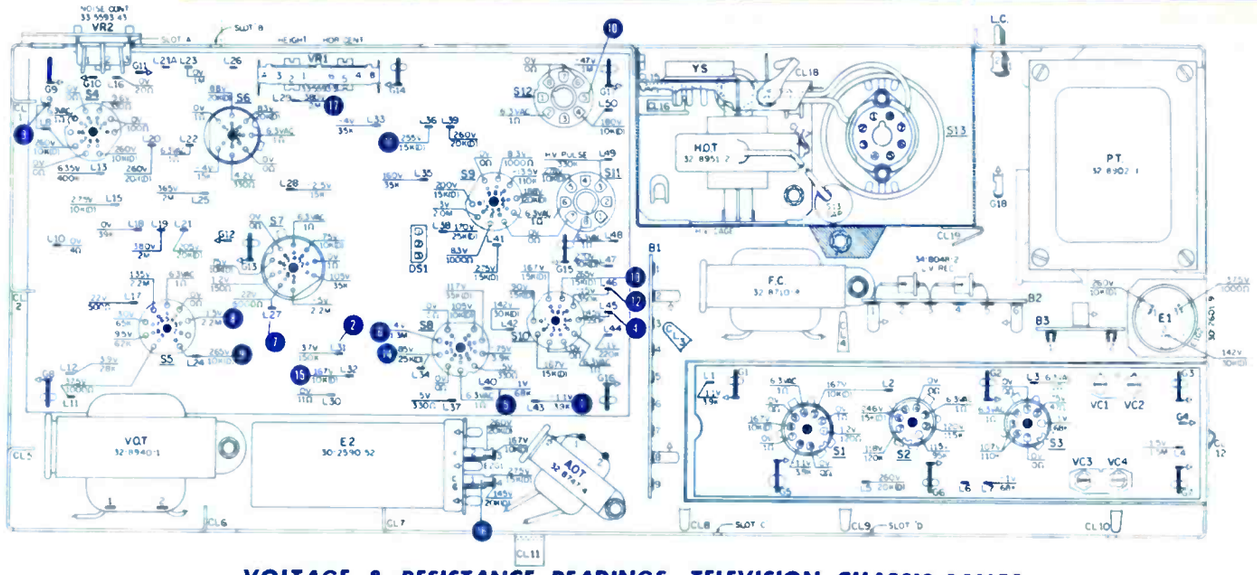
PHILCO
TV Chassis 11N51

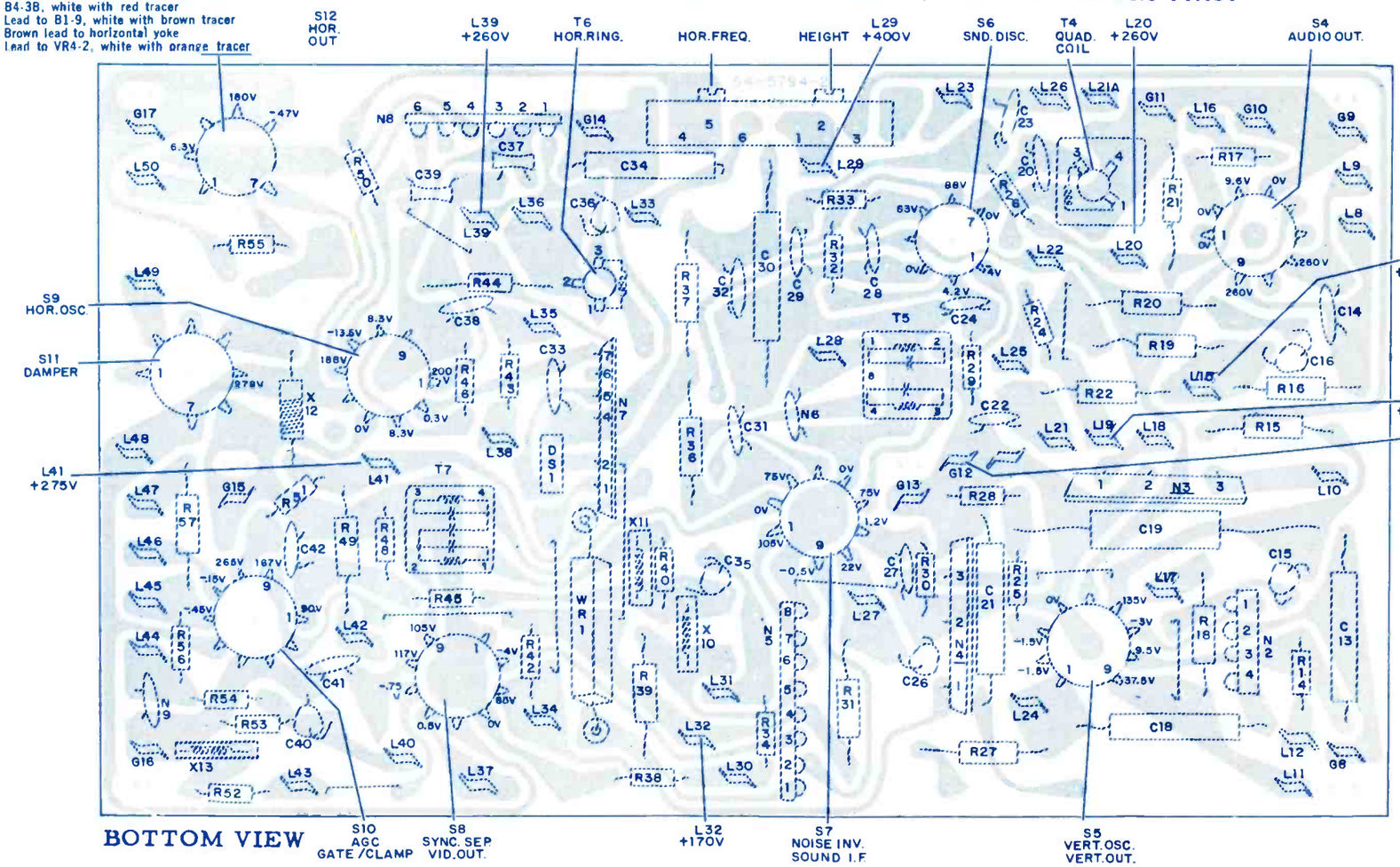


VOS PANEL

- L8 Red wire to A.O.T.
- L9 Blue wire to A.O.T.
- L10 Lead to V.O.T., white with green tracer
- L11 White lead to E1-3
- L12 Lead to VR5-2, white with yellow tracer
- L13 Lead to P8, horizontal yoke, white with brown tracer
- L15 Lead to E2-1, white with red tracer
- L16 Green wire to VR9-2
- L17 White wire to VR3-1
- L18 Leads to CRT socket, white with green tracer to pin 3, white with red tracer to pin 4
- L19 Lead to L29, white with orange tracer, lead to E4-1, white with orange tracer
- L20 Lead to E2-2, white with blue tracer
- L21 Lead to VR4-3, white with red tracer
- L22 Lead to B1-9, white with brown tracer
- L23 Blue lead to VR9-3
- L24 Blue lead to V.O.T.
- L25 Lead to CRT socket, white with orange tracer, pin 5
- L26 No connection
- L27 Lead to VR2-2, white with red tracer
- L28 No connection
- L29 Lead to L19, white with orange tracer
- L30 Lead to VR7-2, white with orange tracer
- L31 Lead to CRT socket, white with yellow tracer, pin 7
- L32 Lead to E2-3, white with yellow tracer
- L33 Lead to VR6-3, white with blue tracer
- L34 No connection
- L35 Lead to VR7-1, white with green tracer
- L36 No connection
- L37 Lead to VR8-2 & 3, white with blue tracer
- L39 Lead to B4-7B, white with blue tracer
- L40 White wire to L7 VIF panel
- L41 Lead to L47, white with black tracer
- L42 Lead to E1-2; white with orange tracer
- L43 Lead to L1 VIF panel, white with green tracer
- L44 White lead to gate-winding, 680K resistor to B1-2
- L45 White lead to B1-5, white lead to J1-1
- L46 Lead to gate-winding, white with blue tracer
- L47 Lead to L41, white with black tracer; lead to B4-3B, white with red tracer
- L48 Lead to B1-9, white with brown tracer
- L49 Brown lead to horizontal yoke
- L50 Lead to VR4-2, white with orange tracer



VOLTAGE & RESISTANCE READINGS, TELEVISION CHASSIS 11N51



BOTTOM VIEW

VIDEO-OSCILLATOR-SOUND PERMA-CIRCUIT PANEL

VIF PANEL

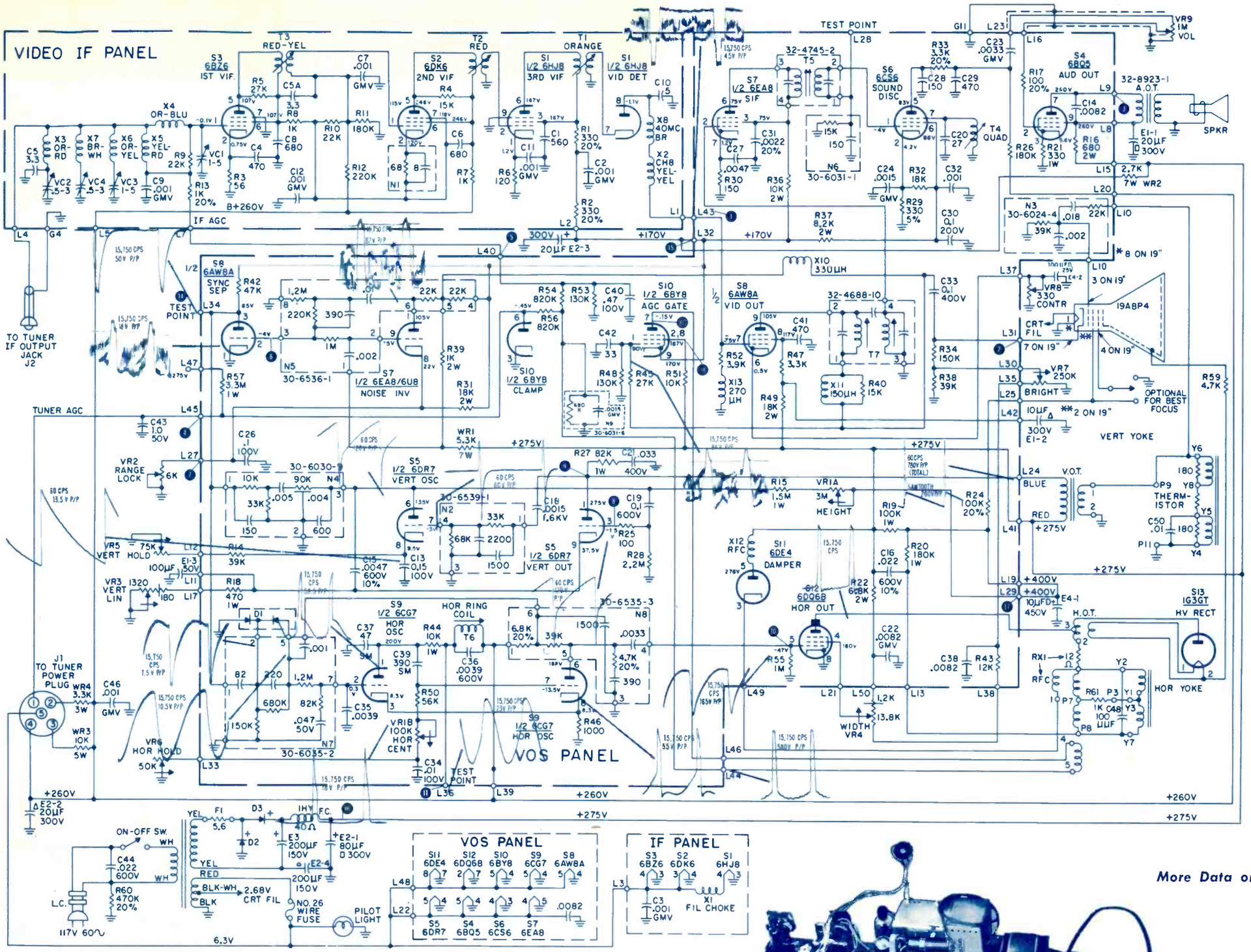
- L1 Lead to L43 VOS panel, white with green tracer
- L2 Lead to terminal strip B4-1B, white with orange tracer
- L3 Lead to terminal strip B1-9, white with brown tracer
- L4 I-F output
- L5 Lead to electrolytic capacitor E2-2, white wire with blue tracer
- L6 No connection
- L7 White wire to L40 VOS panel

BOTTOM VIEW

VIDEO I-F PERMA-CIRCUIT PANEL

PANEL LUG CONNECTIONS

More Data on Reverse Side



PHILCO
TV Chassis 11N51

Electronic Technician
CIRCUIT DIGEST

More Data on Reverse Side

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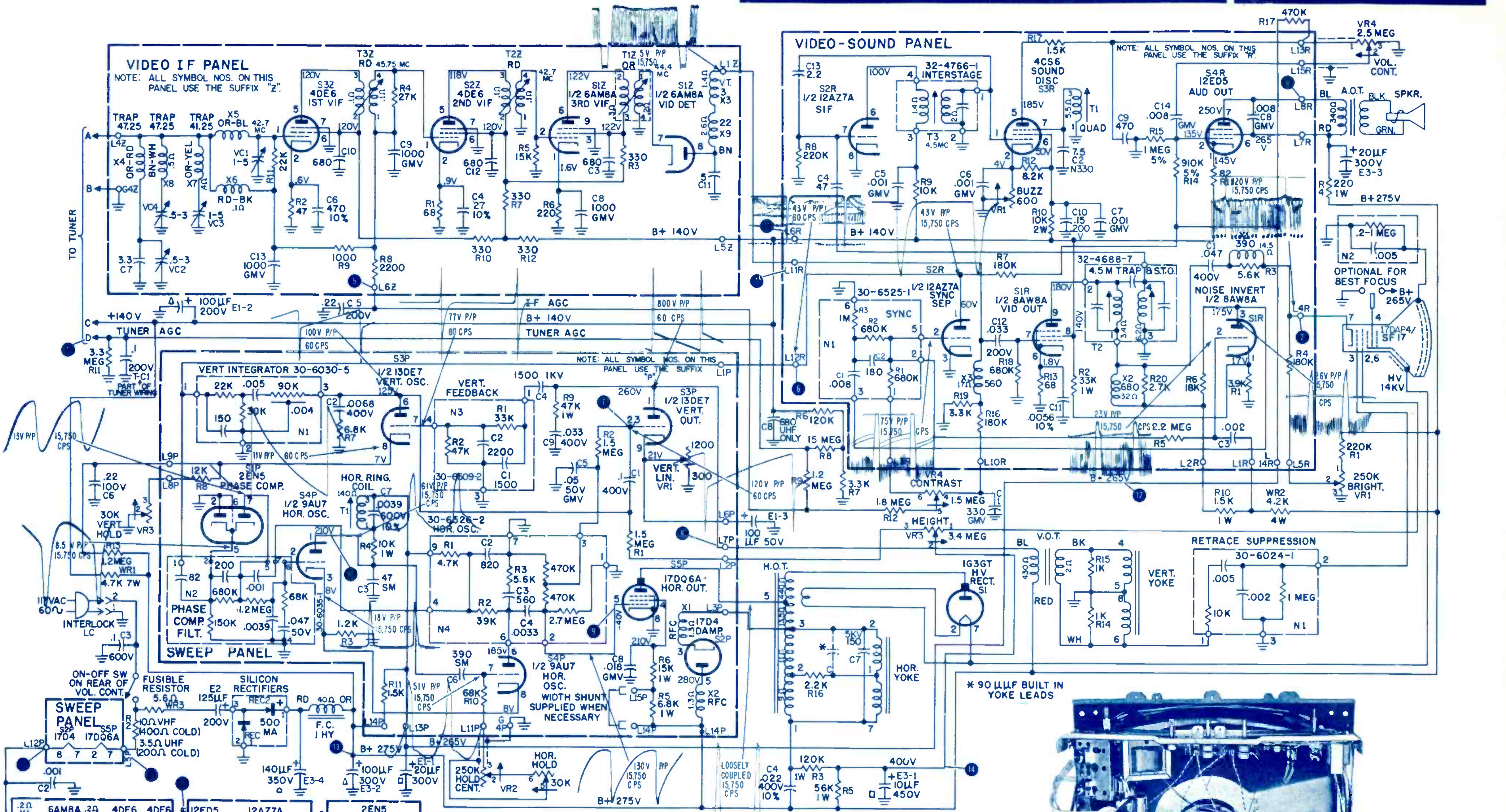
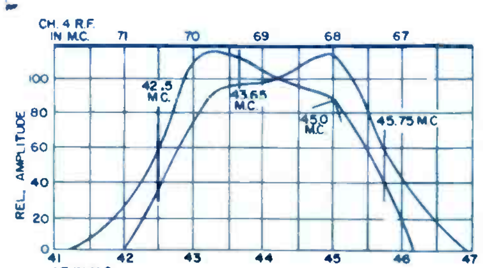
PHILCO

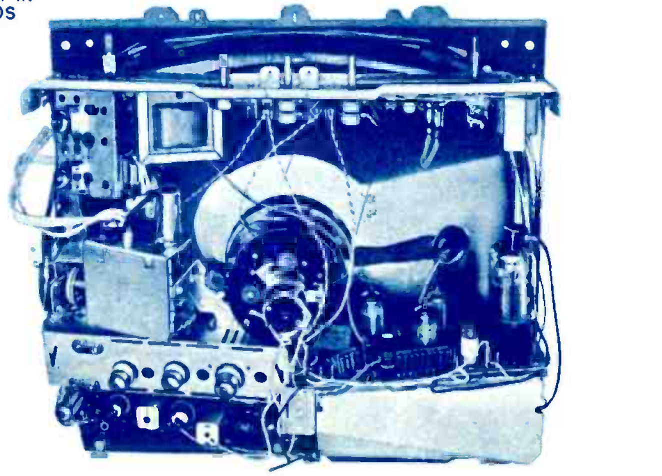
TV Chassis 9H25; 9H25U



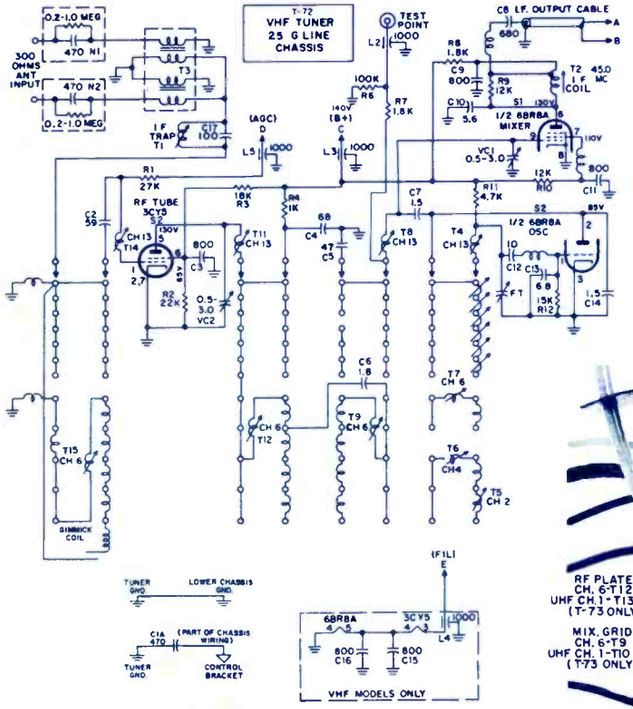
All capacitor values greater than 1 are in MMF unless otherwise noted.
All capacitor values less than 1 are in MFD unless otherwise noted.
Arrow through control indicates clockwise rotation.
Voltages are DC from point shown to chassis unless otherwise noted.
⊗ Focus voltage optional for best focus.



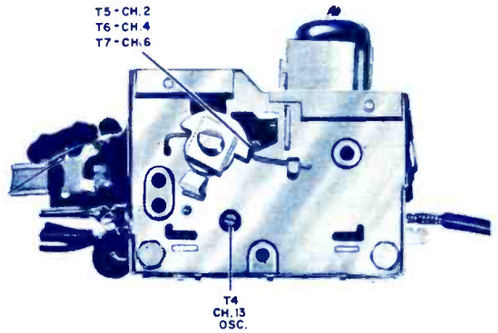
Overall R-F I-F Response Curve

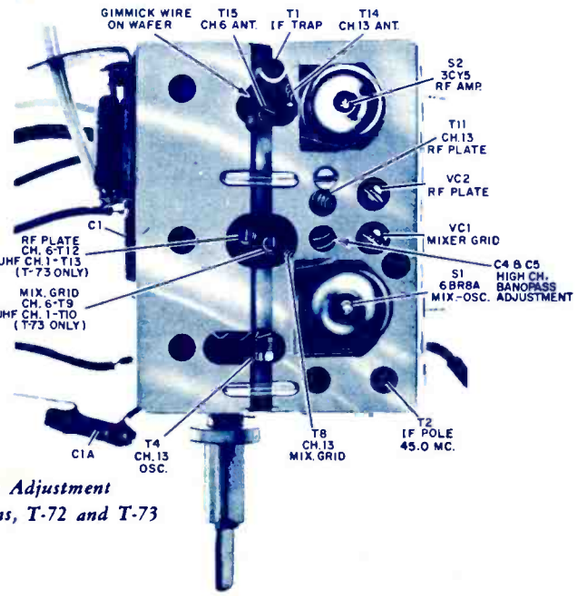


More Data on Reverse Side



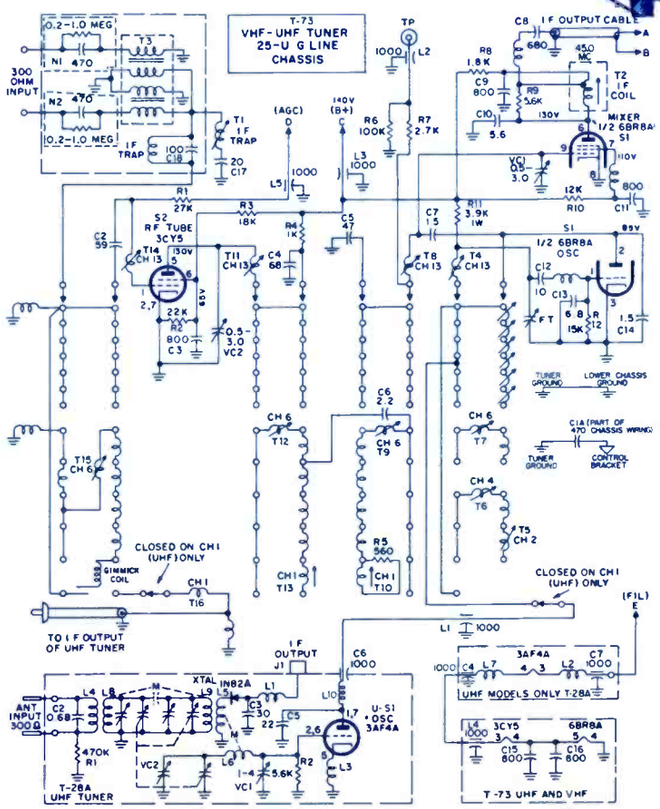
T-72 Tuner Schematic, 9H25 Chassis

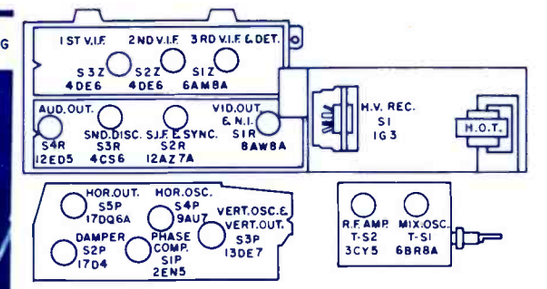


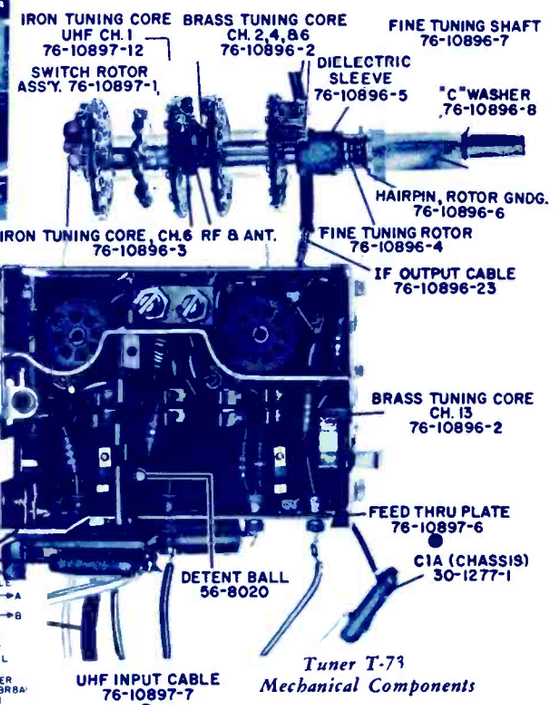


VHF Tuner Adjustment Locations, T-72 and T-73

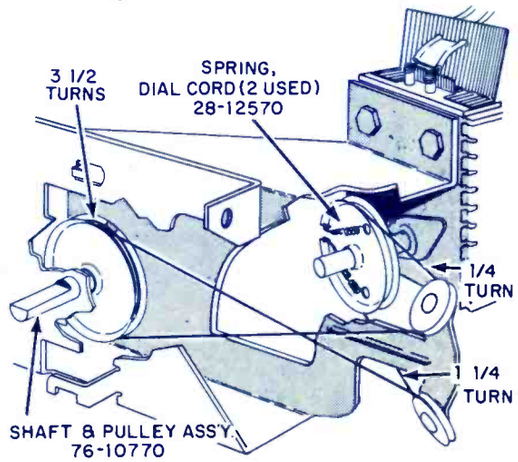
T-73 Tuner Schematic
9H25U Chassis



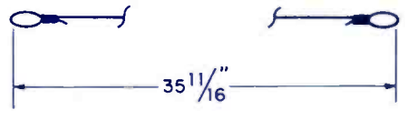




Tuner T-73 Mechanical Components



9H25U UHF Drive Cord Stringing



More Data on Reverse Side

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TV Chassis 9H25; 9H25U

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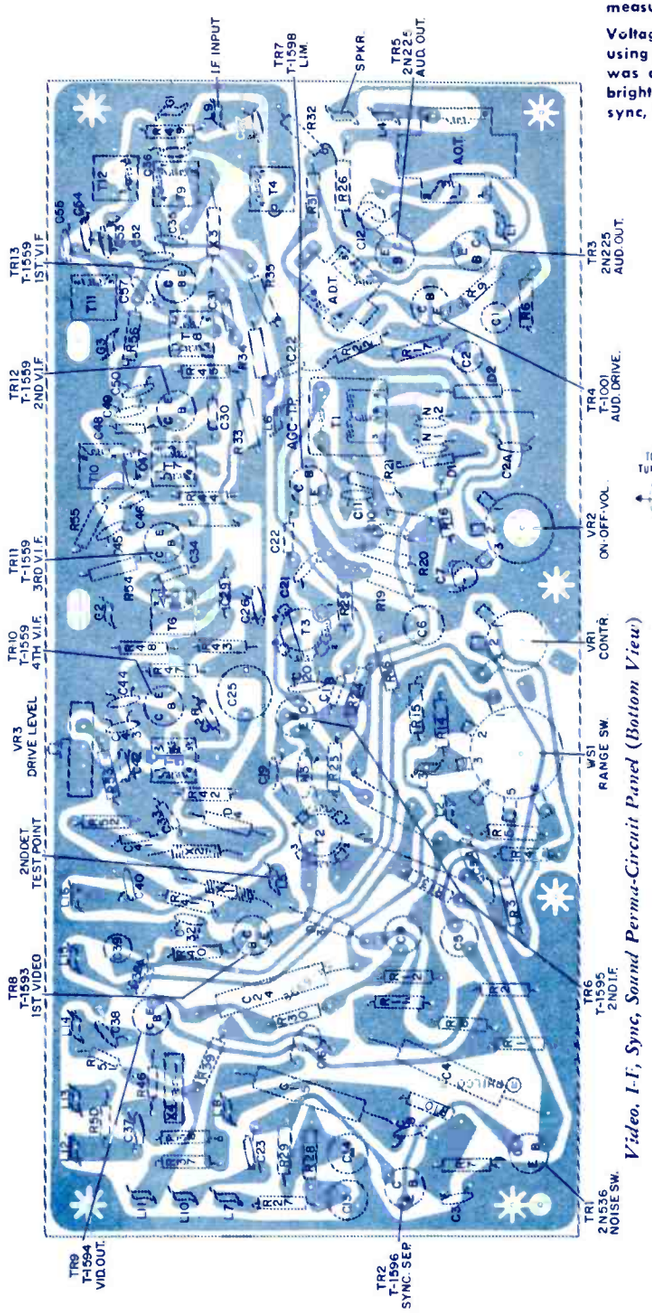
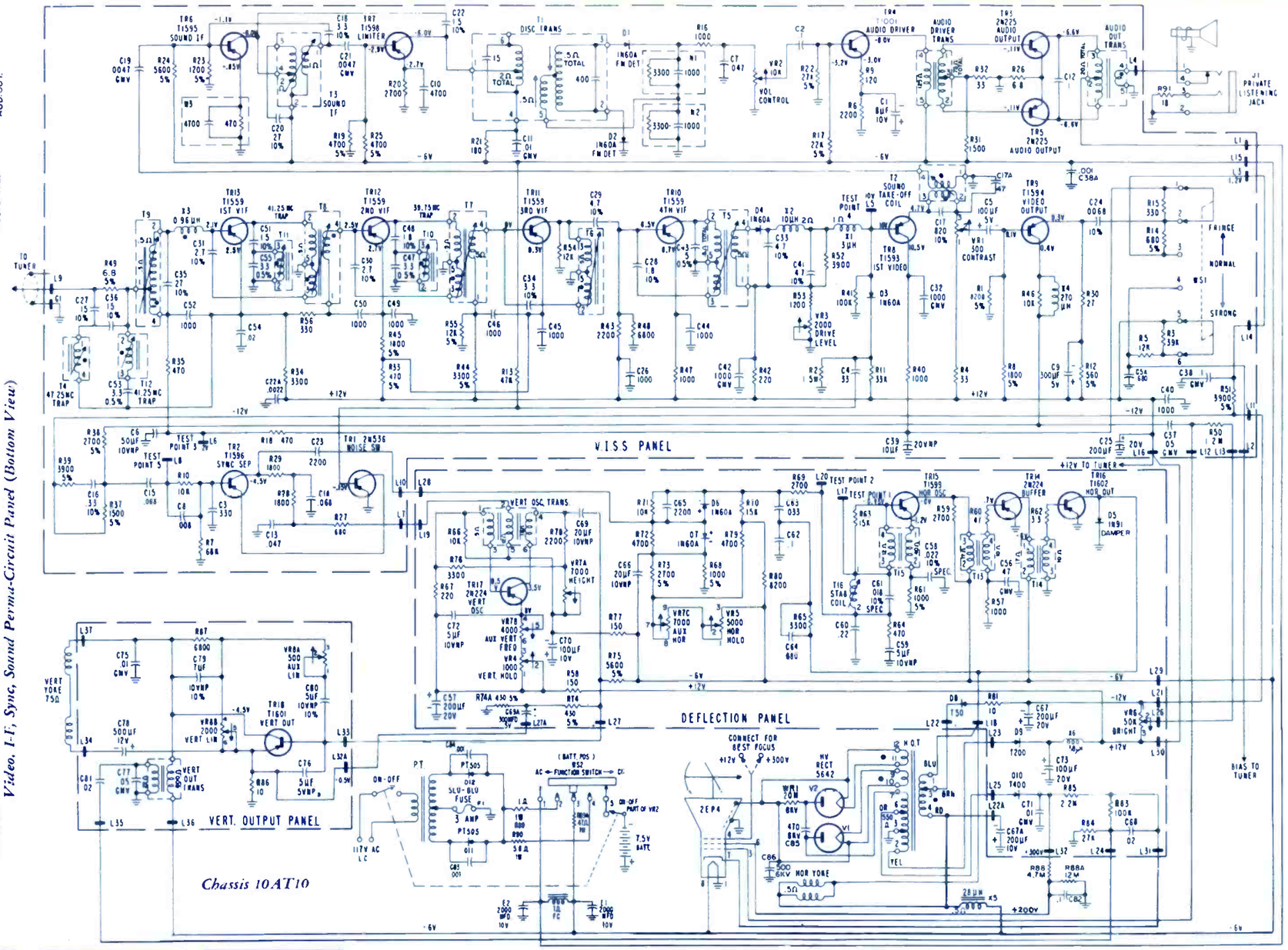
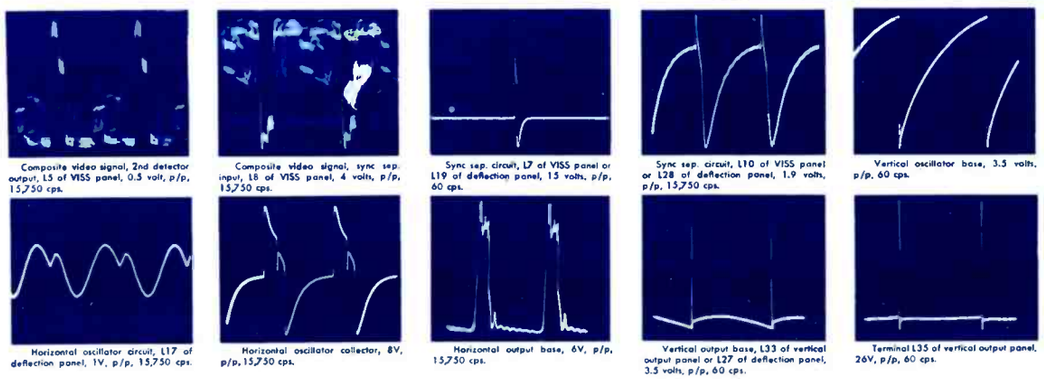
TV Portable a-c/battery
Chassis 10AT10

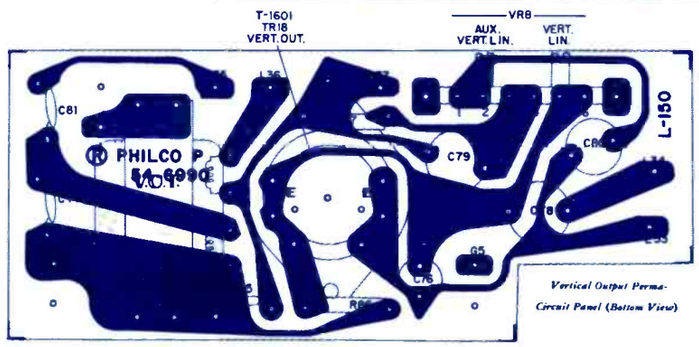
• Indicates a coil resistance of less than .5 ohms. Resistance measured with coil in circuit.

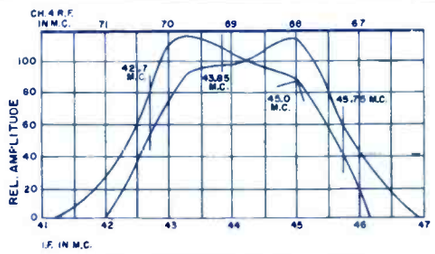
Voltages are dc from point shown to chassis. Voltages are read using a VTVM. Voltages were taken with no signal. The receiver was adjusted for a good quality picture, i.e., normal contrast, brightness, width, height, vertical lin. and sound, picture in sync, then signal is removed.





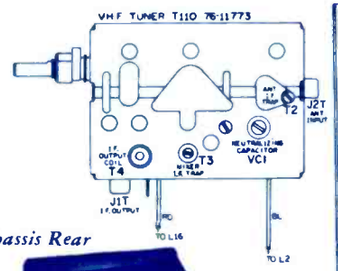




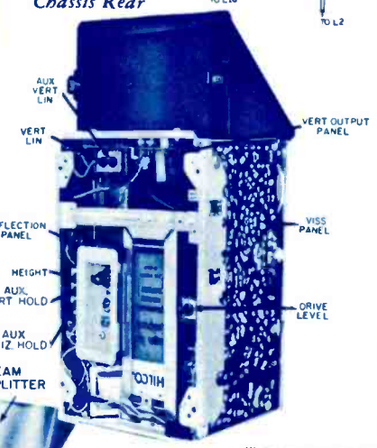


Overall R-F I-F Response Curve

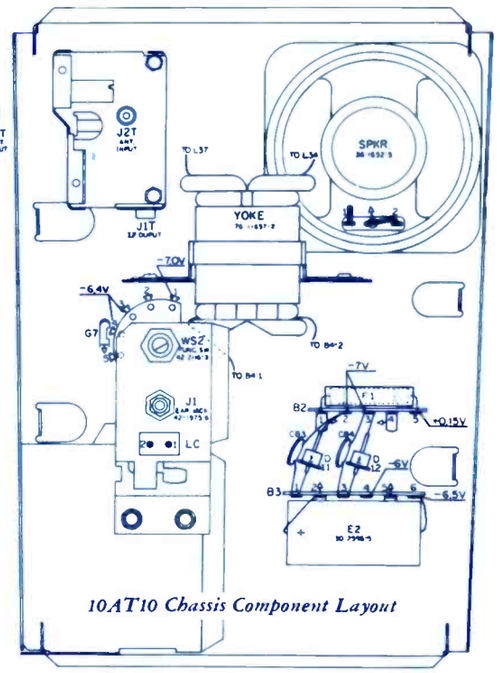
More Data on Reverse Side



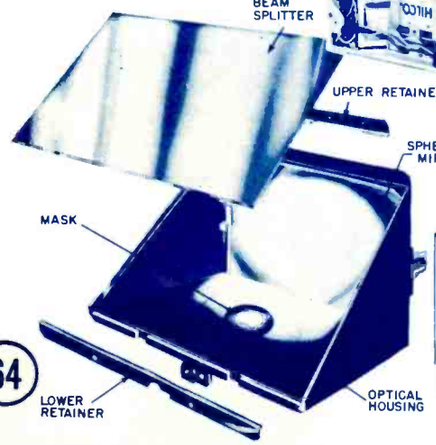
Chassis Rear

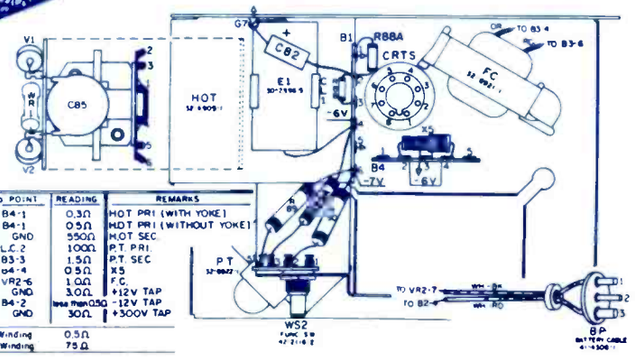


10AT10 Optical System



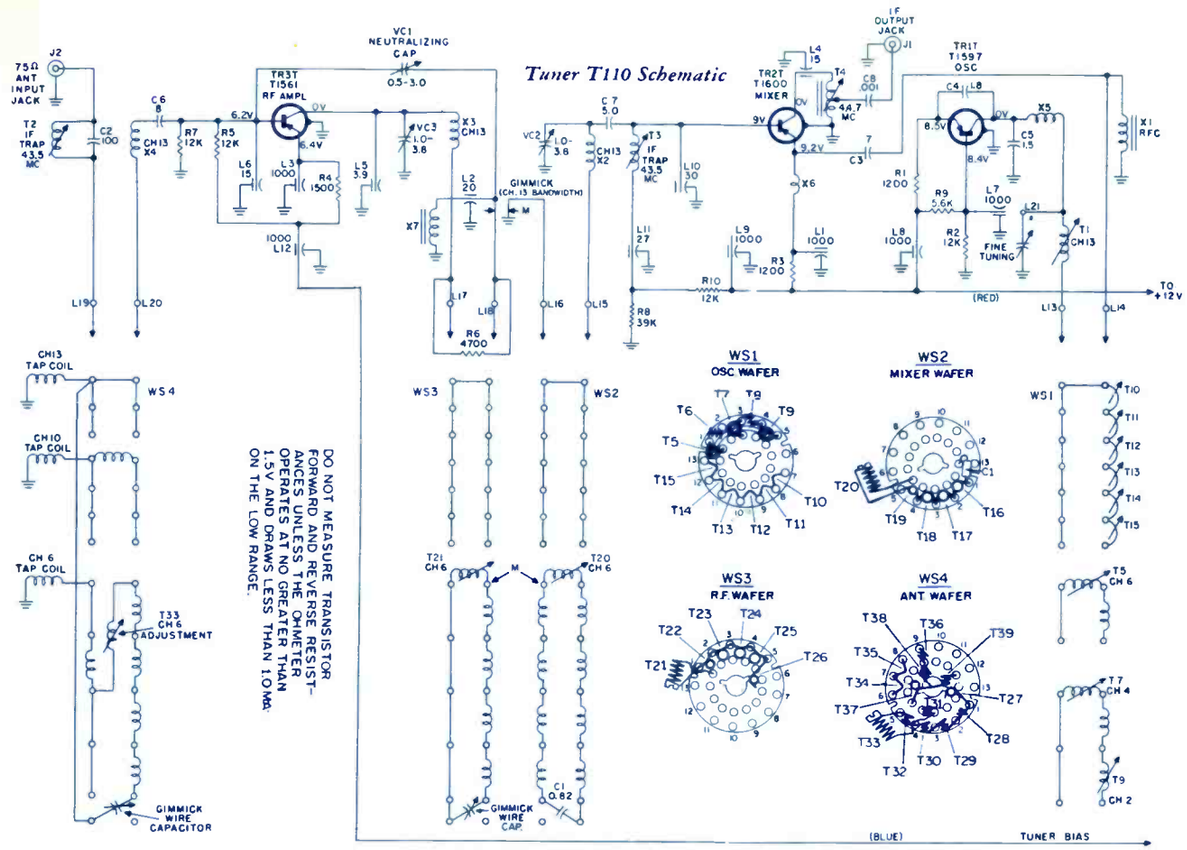
10AT10 Chassis Component Layout





POINT	TO POINT	READING	REMARKS
TR16-C	B4-1	0.3Ω	HOT PRI (WITH YOKE)
TR16-C	B4-1	0.5Ω	HOT PRI (WITHOUT YOKE)
HOT-7	GND	550Ω	HOT SEC
L.C.1	L.C.2	100Ω	P.T. PRI
B3-1	B3-3	1.5Ω	P.T. SEC
B4-2	Q4-4	0.5Ω	X5
B3-4	VR2-6	1.0Ω	F.C.
L23	GND	3.0Ω	+12V TAP
L22	B4-2	less than 0.5Ω	-12V TAP
L25	GND	50Ω	+300V TAP
Hor. Yoke Winding		0.5Ω	
Vert. Yoke Winding		75Ω	

Tuner T110 Schematic

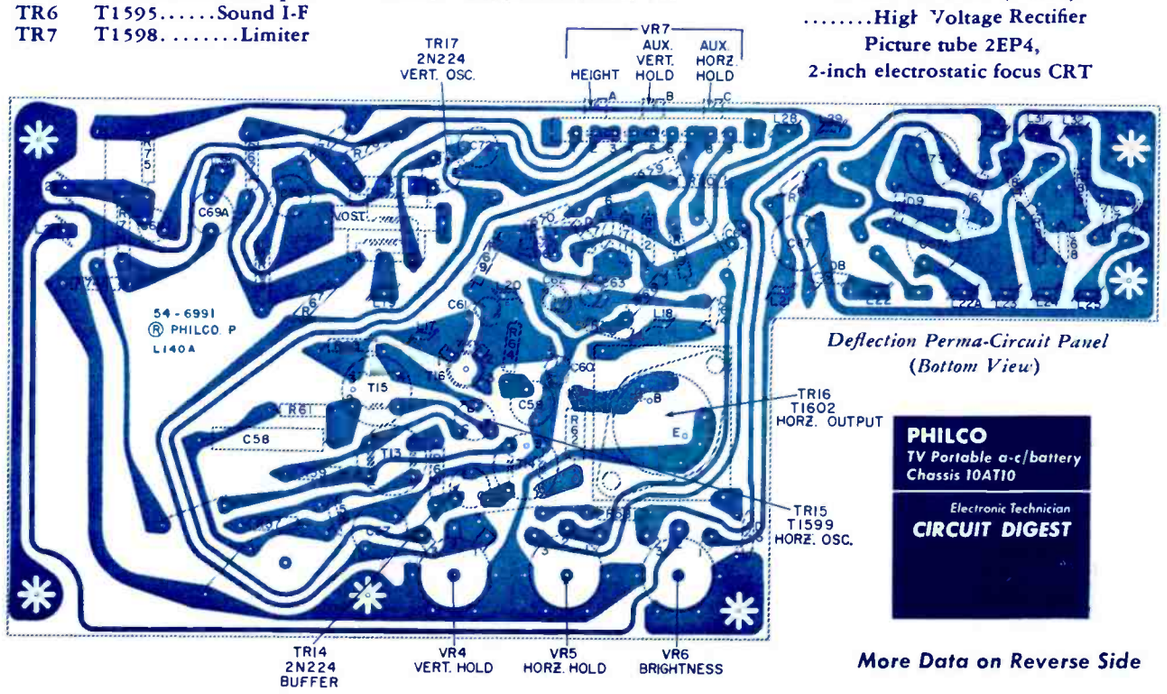


TR3T	T1561..R-F Amplifier	TR8	T1593.....1st Video
TR2T	T1600.....Mixer	TR9	T1594..Video Output
TR1T	T1597.....Oscillator	TR10	T1559.....4th VIF
TR1	2N536..Noise Switch	TR11	T1559.....3rd VIF
TR2	T1596.....Sync Sep.	TR12	T1559.....2nd VIF
TR3	2N225..Audio Output	TR13	T1559.....1st VIF
TR4	T0067...Audio Driver	TR14	2N224. Horizontal Ampl. (buffer)
TR5	2N225..Audio Output	TR15	T1599.....Horizontal Oscillator
TR6	T1595.....Sound I-F	TR16	T1602.....Horizontal Output
TR7	T1598.....Limiter	TR17	2N224. .....Vertical Oscillator
		TR18	T1601. .....Vertical Output

TRANSISTOR COMPLEMENT

TUBE COMPLEMENT

V1 and V2 5642 (2 used)
.....High Voltage Rectifier
Picture tube 2EP4,
2-inch electrostatic focus CRT



Deflection Perma-Circuit Panel (Bottom View)

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TV Portable a-c/battery
Chassis 10AT10

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More Data on Reverse Side

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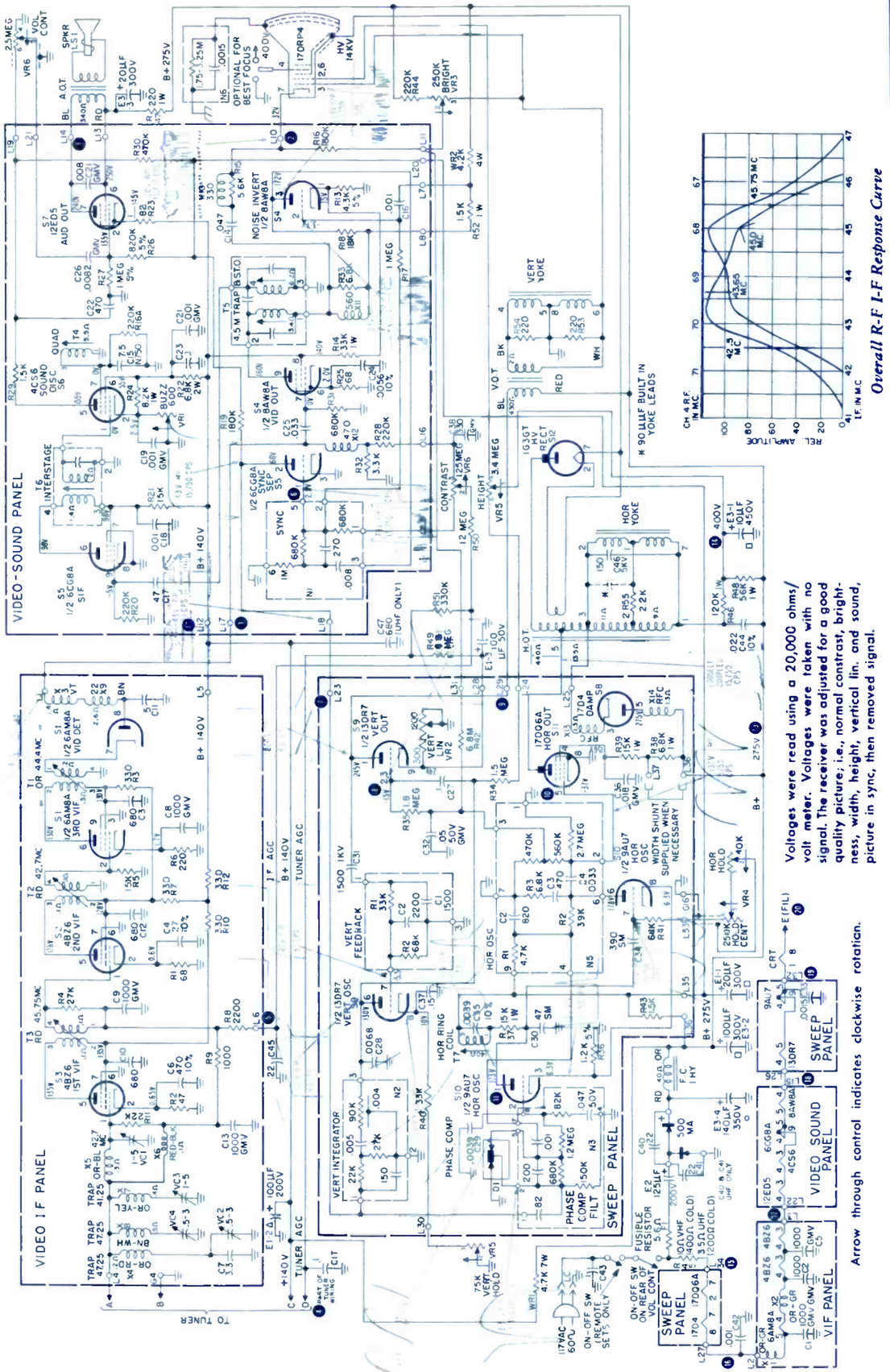
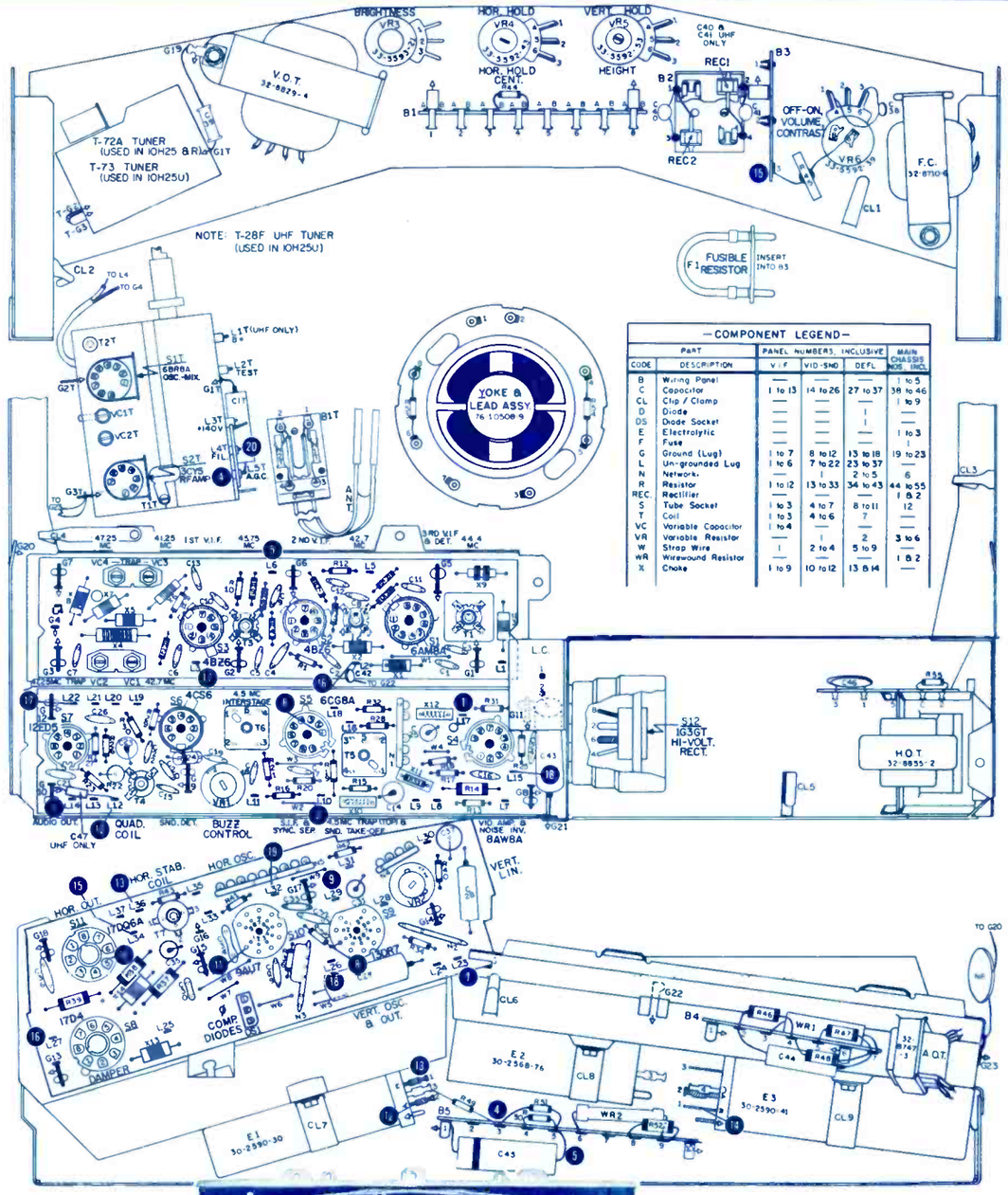


Overall R-F I-F Response Curve

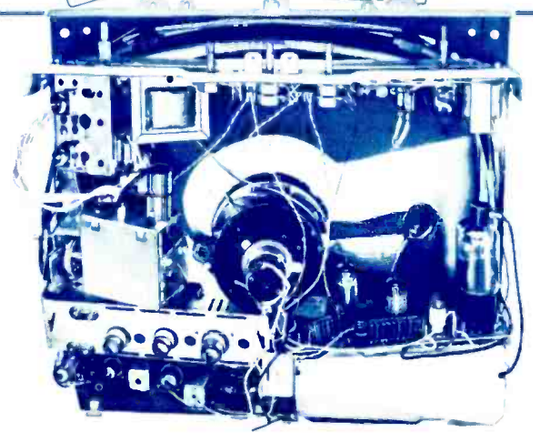
Voltages were read using a 20,000 ohms/volt meter. Voltages were taken with no signal. The receiver was adjusted for a good quality picture; i.e., normal constrast, brightness, width, height, vertical lin. and sound, picture in sync, then removed signal.



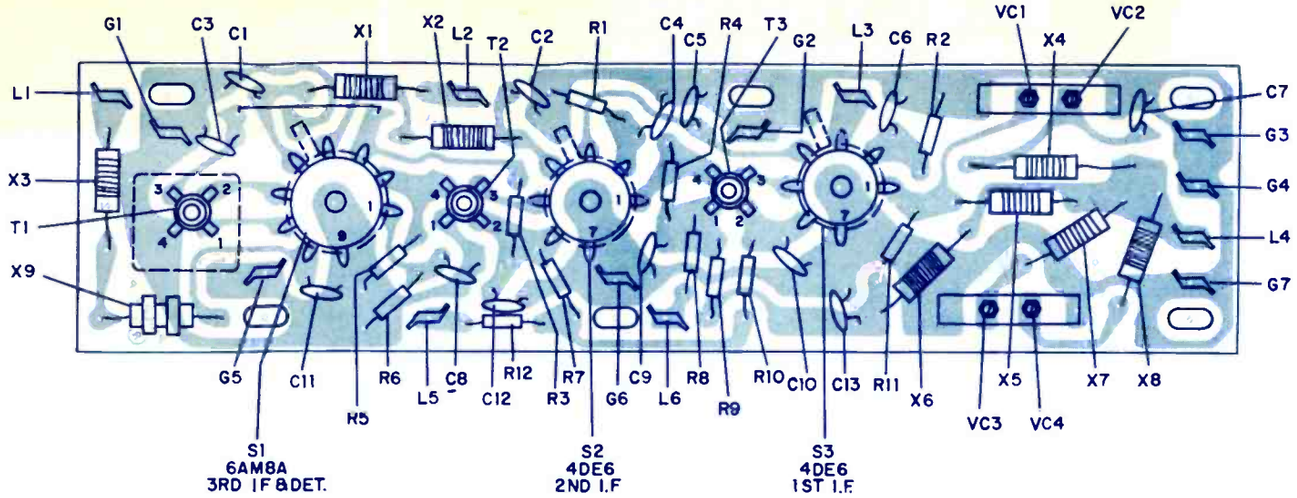
—COMPONENT LEGEND—

CODE	PART DESCRIPTION	PANEL NUMBERS, INCLUSIVE V-IF	VID-SND	DEFL	MAIN CHASSIS NOS. INCL.
B	Wiring Panel	—	—	—	1 to 5
C	Capacitor	1 to 13	14 to 26	27 to 37	38 to 46
CL	Clip / Clamp	—	—	—	1 to 9
D	Diode	—	—	1	—
DS	Diode Socket	—	—	1	—
E	Electrolytic	—	—	—	1 to 3
F	Fuse	—	—	—	1
G	Ground (Lug)	1 to 7	8 to 12	13 to 18	19 to 23
L	Un-grounded Lug	1 to 6	7 to 22	23 to 37	—
N	Network	—	1	2 to 5	6
R	Resistor	1 to 12	13 to 33	34 to 43	44 to 55
REC.	Rectifier	—	—	—	1 & 2
S	Tube Socket	1 to 3	4 to 7	8 to 11	12
T	Coil	1 to 3	4 to 6	7	—
VC	Variable Capacitor	1 to 4	—	—	—
VR	Variable Resistor	—	1	2	3 to 6
W	Strap Wire	—	2 to 4	5 to 9	—
WR	Wirewound Resistor	—	—	—	1 & 2
X	Choke	1 to 9	10 to 12	13 & 14	—

Chassis Component Layout

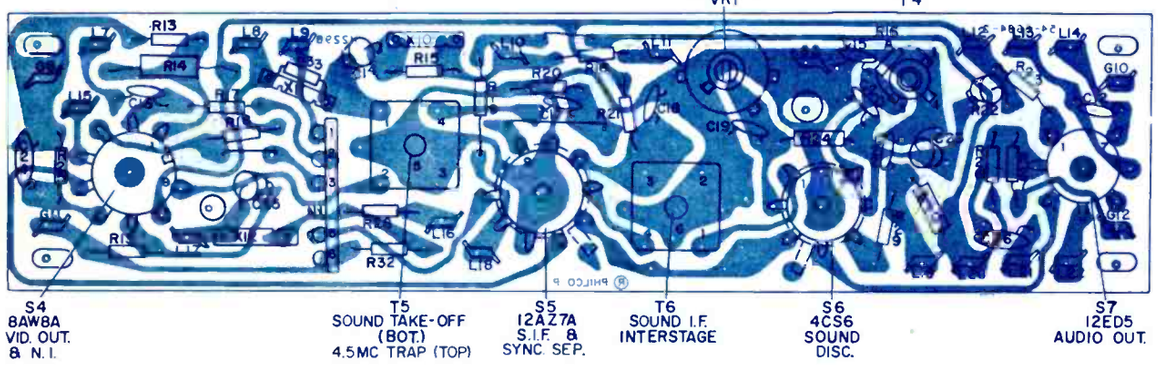


More Data on Reverse Side



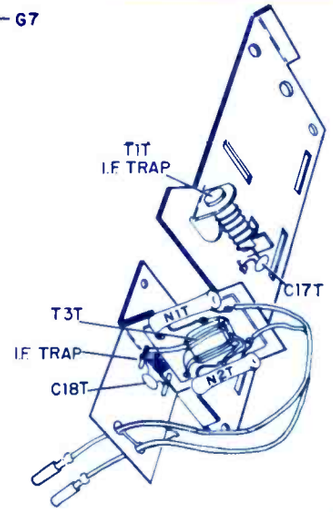
TERMINAL LUG IDENTIFICATION—I-F PANEL

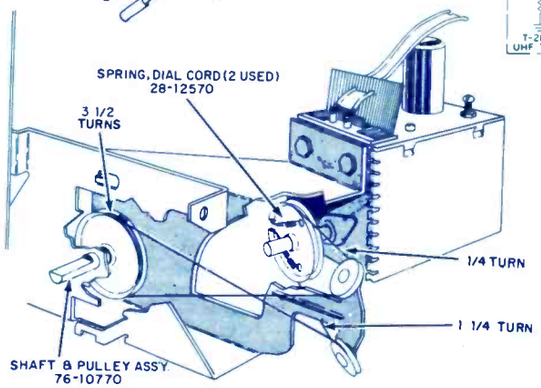
L1 Video output from video 2nd detector.
L2 Filament input from L27 of Deflection panel.
L3 Filament output to L22 of Video-Sound panel.
L4 I-F input link from tuner.
L5 140V B+.
L6 A.G.C.
G4 Shield braid of I-F link.



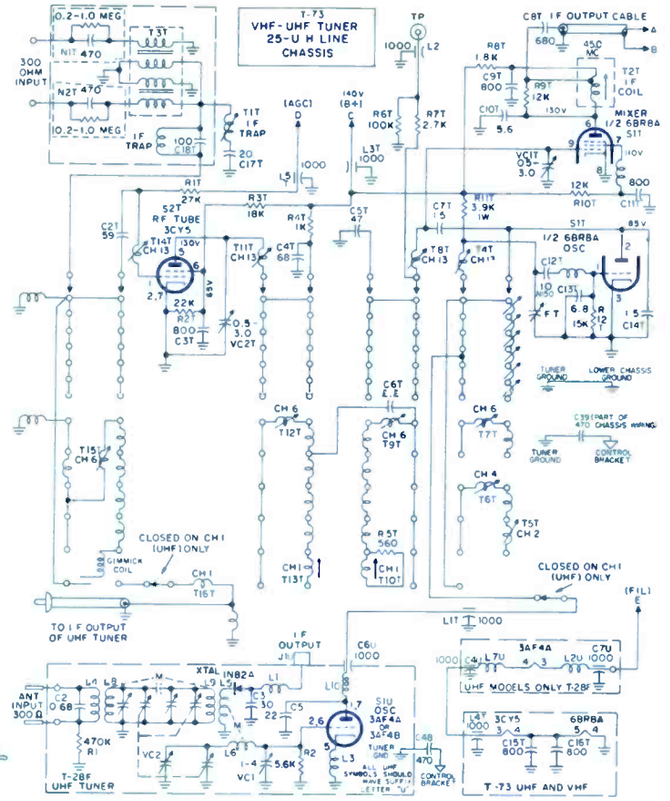
TERMINAL LUG IDENTIFICATION—VIDEO-SOUND PANEL

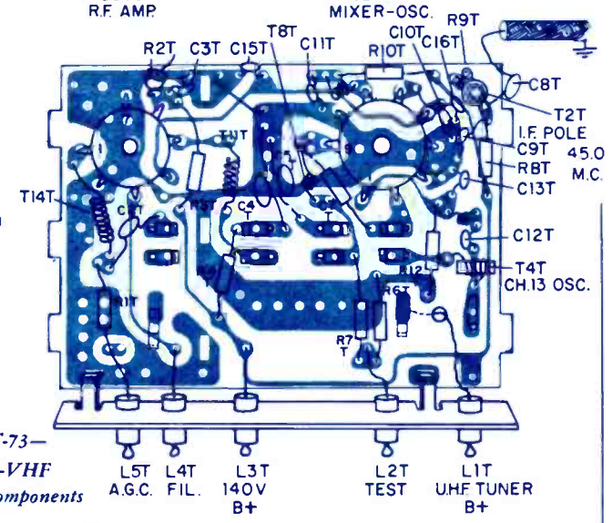
L7 Lead from noise inverter grid coupling (C16) to junction of R52 and WR2 (B5-9).
L8 Lead to video plate supply, R52, at B5-8.
L9 Lead to lug # 1 of VR6, the contrast control.
L10 Video output to CRT cathode, pin 7.
L11 Lead to arm of brightness control, VR3.
L12 140V B+ lead.
L13 Red lead of A.O.T. and B+ to audio output screen.
L14 Blue lead of A.O.T. to audio output plate.
L15 Filament lead to L26 of Sweep panel.
L16 Lead to contrast control, VR6-3.
L17 Video input from 2nd detector, L1 of V.I.F. panel.
L18 Sync output to L23 of Sweep panel.
L19 Shielded lead to top of volume control.
L20 265V B+.
L21 Shielded lead from arm of volume control.
L22 Filament lead from L3 of V.I.F. panel.





10H25U UHF Drive Cord Stringing

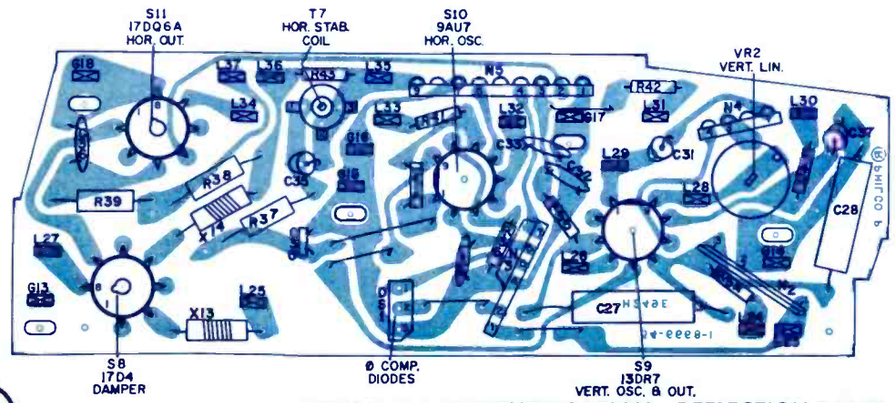




Tuner T-73— UHF-VHF Electrical Components

T-73 Components Not Shown on Layout

VC1T and VC2T omitted to simplify drawing.
C14T, R11T and T16T (UHF input coil) mounted underneath panel.
C1T, A-G-C by-pass, mounted along feed-thru strip.
C6T wires between the r-f plate and mixer grid wafers.
R5T wires across the channel 1 coil of the mixer grid wafer.



TERMINAL LUG IDENTIFICATION—DEFLECTION PANEL

L23 Sync input from Video-Sound panel (L18).
L24 Lead to top of height control, VR5-6.
L25 Lead from damper cathode to H.O.T. terminal 3 and yoke socket pin 2.
L26 Filament lead to 13DR7 pin 4 from L15 of Video-Sound panel.
L27 Filament lead from 17D4 pin 8 to V.I.F. panel lug, L2.
L28 Vertical output cathode, lead to E1-3 by-pass electrolytic.
L29 Vertical output plate, blue lead of V.O.T.
L30 Lead to top of vertical hold control, VR5-3.
L31 Vertical output bias, lead to Video-Sound panel (L11).
L32 Filament lead from pins 4 and 5 of 9AU7 to C.R.T. pin 1.
L33 Shielded lead to horizontal hold centering control, VR4-6.
L34 Filament lead from surge resistor to 17DQ6A pin 7.
L35 De-coupled B+, 265V.
L36 275 V B+.
L37 Junction of R38 and R39, width shunt when used.

More Data on Reverse Side

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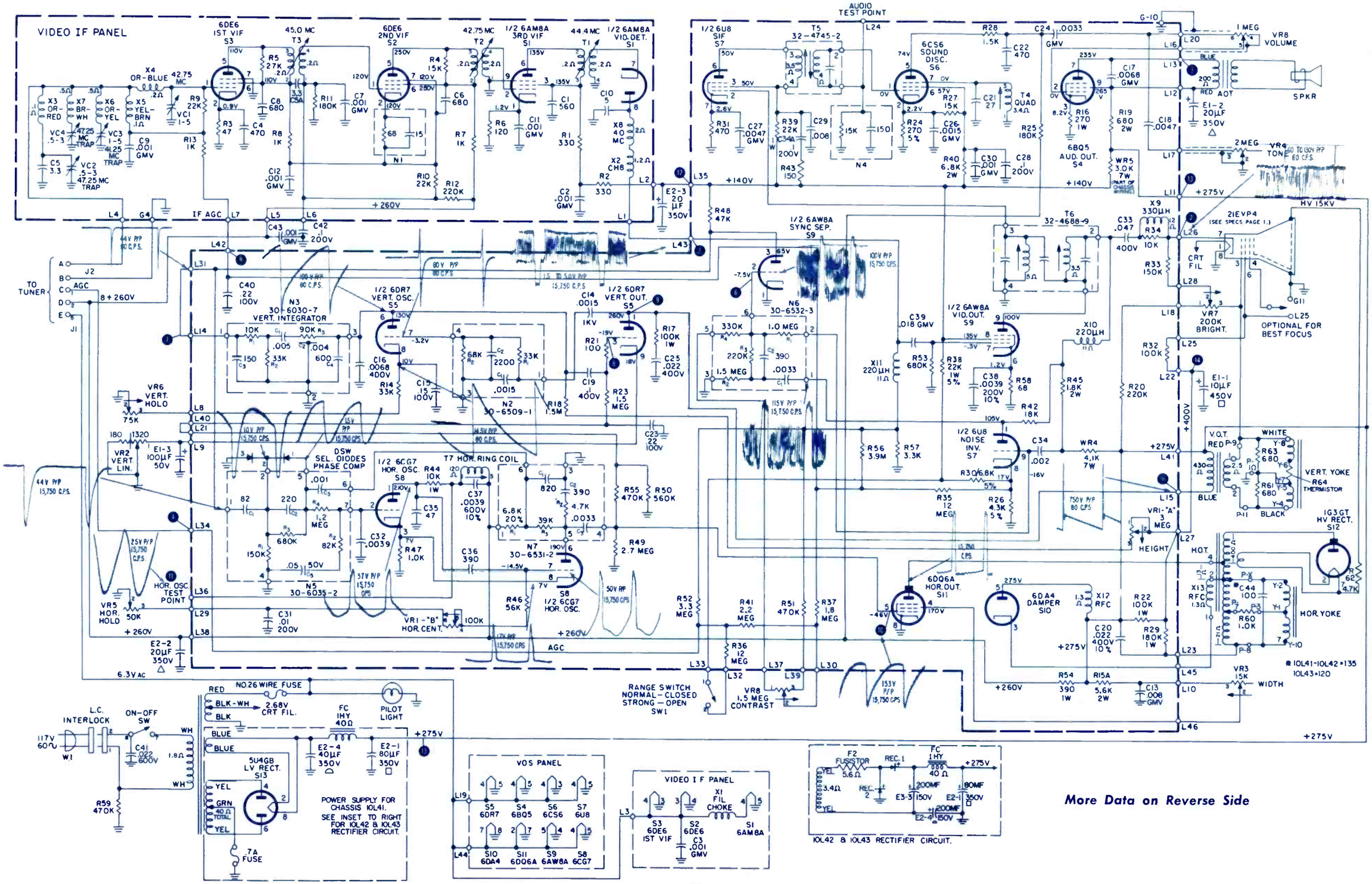
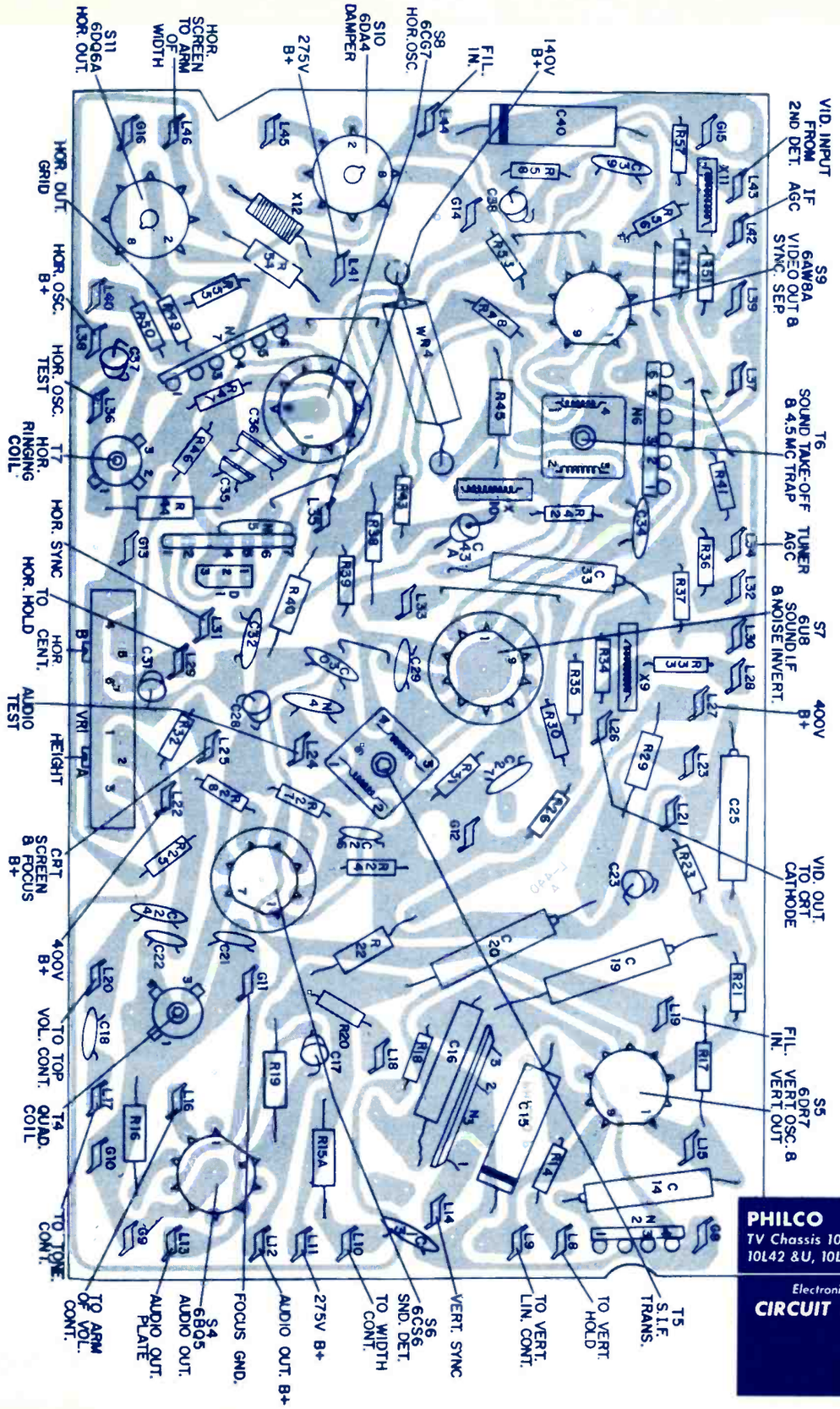
PHILCO

TV Chassis 10L41 &U, 10L42 &U, 10L43 &U



More Data on Reverse Side

10L41, 10L42, 10L43 Video-Oscillator-Sound Perma-Circuit Panel

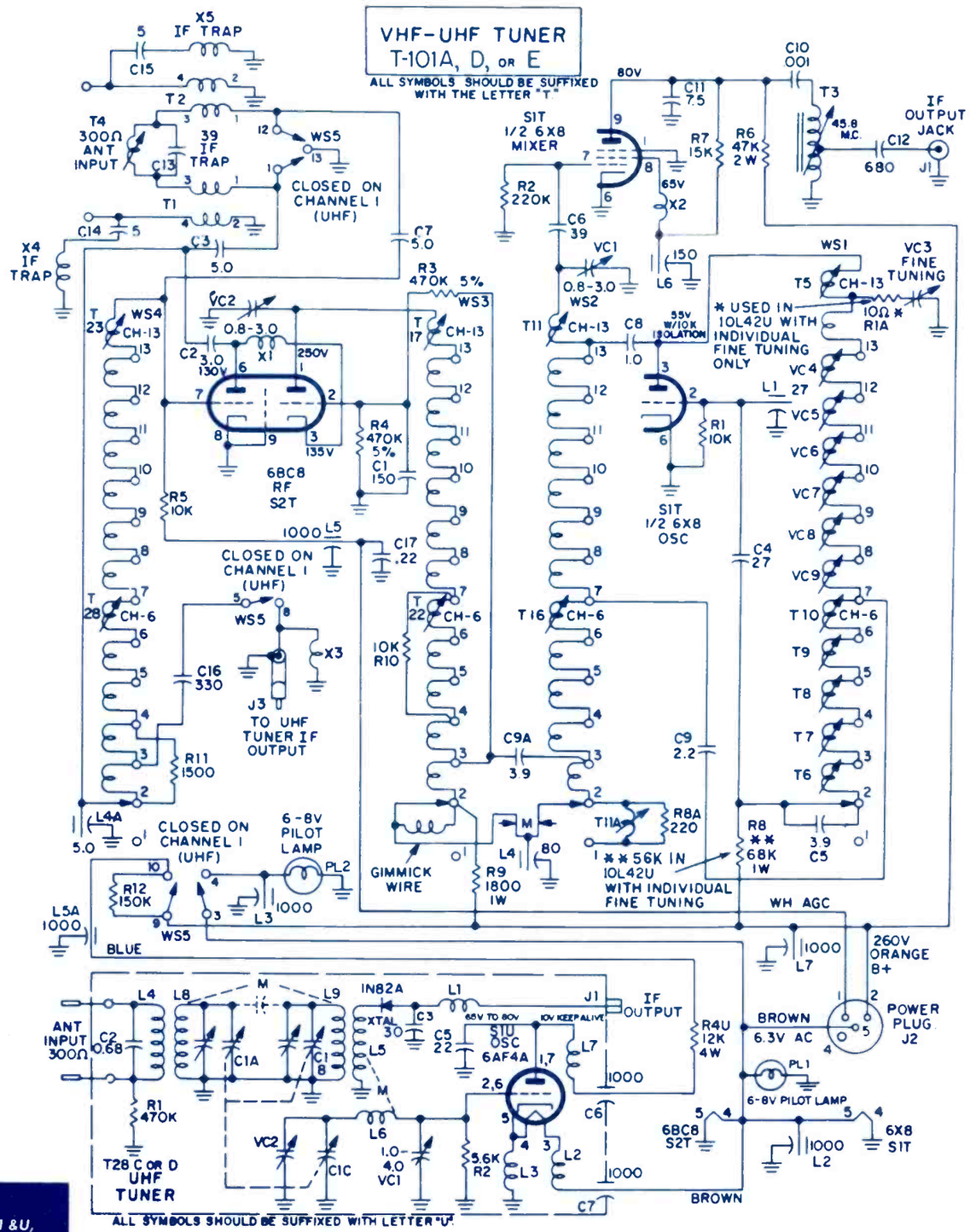


PHILCO
TV Chassis 10L41 &U, 10L42 &U, 10L43 &U

Electronic Technician
CIRCUIT DIGEST

VHF-UHF TUNER
T-101A, D, OR E

ALL SYMBOLS SHOULD BE SUFFIXED WITH THE LETTER "T"



More Data on Reverse Side

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ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

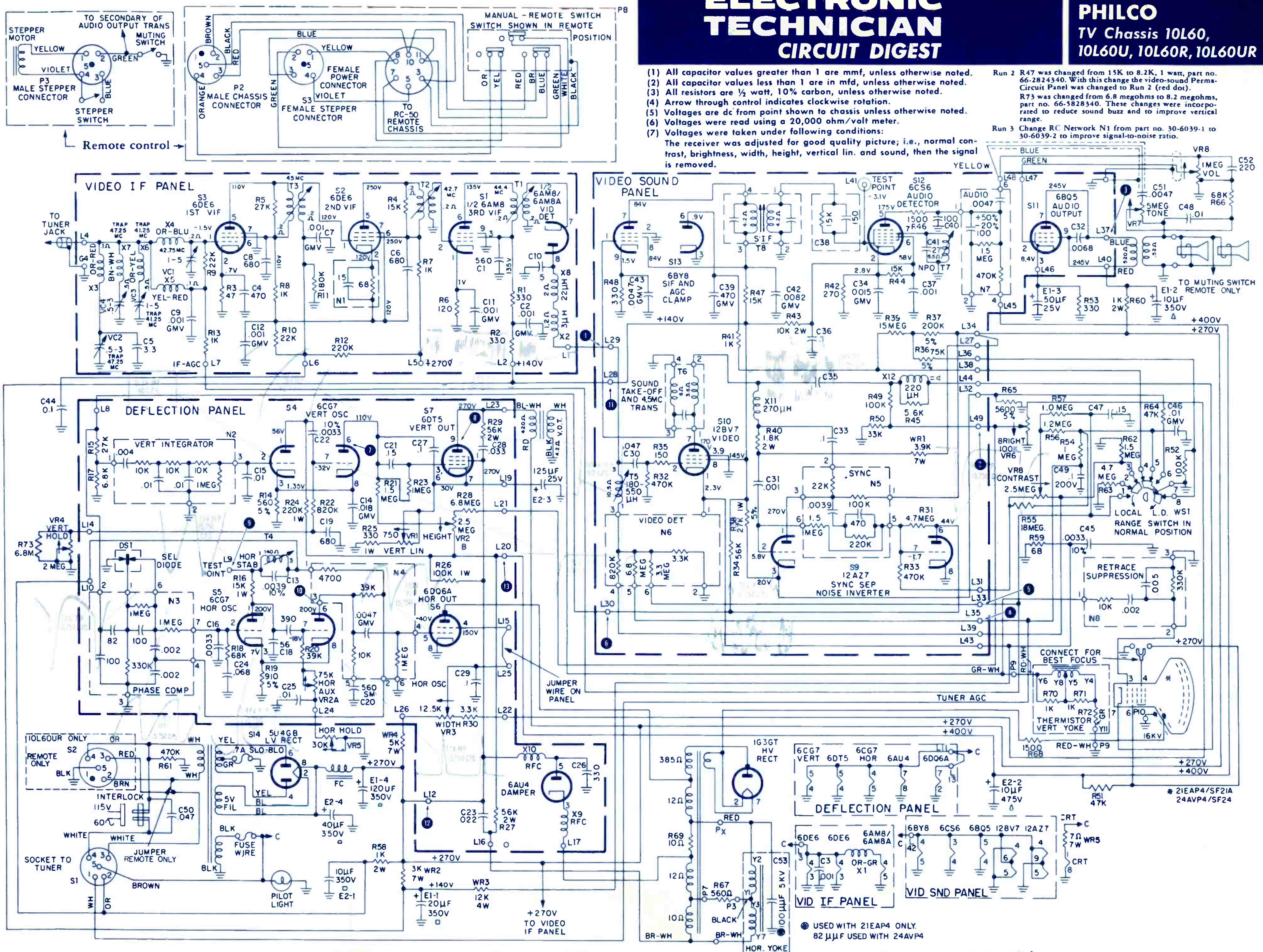
PHILCO

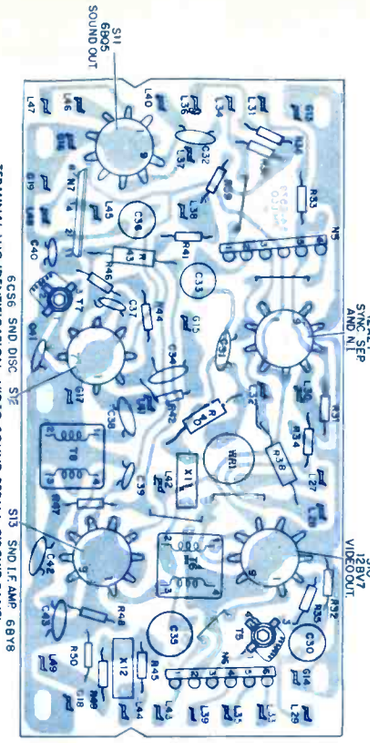
TV Chassis 10L60, 10L60U, 10L60R, 10L60UR

(1) All capacitor values greater than 1 are mmf, unless otherwise noted.
(2) All capacitor values less than 1 are in mfd, unless otherwise noted.
(3) All resistors are ½ watt, 10% carbon, unless otherwise noted.
(4) Arrow through control indicates clockwise rotation.
(5) Voltages are dc from point shown to chassis unless otherwise noted.
(6) Voltages were read using a 20,000 ohm/volt meter.
(7) Voltages were taken under following conditions: The receiver was adjusted for good quality picture; i.e., normal contrast, brightness, width, height, vertical lin. and sound, then the signal is removed.

Run 2 R47 was changed from 15K to 8.2K, 1 watt, part no. 66-2824340. With this change the video-sound Perma-Circuit Panel was changed to Run 2 (red dot).
R73 was changed from 6.8 megohms to 8.2 megohms, part no. 66-5828340. These changes were incorporated to reduce sound buzz and to improve vertical range.

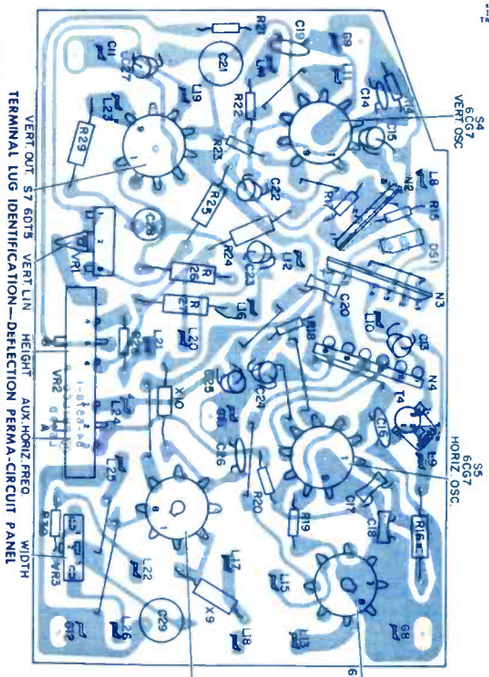
Run 3 Change RC Network N1 from part no. 30-6039-1 to 30-6039-2 to improve signal-to-noise ratio.





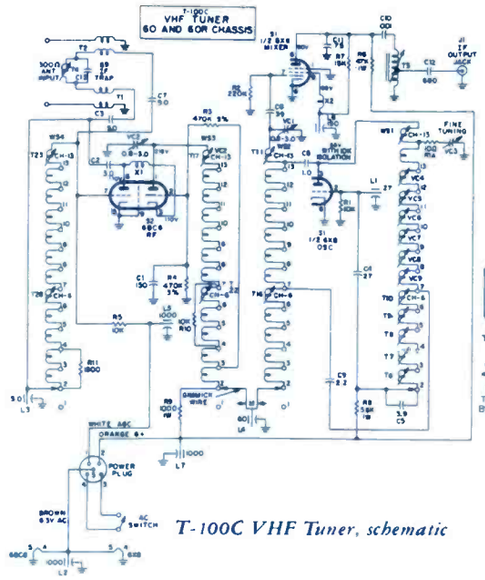
TERMINAL LUG IDENTIFICATION—VIDEO-SOUND PERMA-CIRCUIT PANEL

L27 To L34 on Video-Sound Perma-Circuit Panel and terminal 1 of board B2.
L28 To terminal 2 of board B2.
L29 To L1 on Video I-F Perma-Circuit Panel. (2nd detector test point.)
L30 To L6 on Deflection Perma-Circuit Panel.
L31 To terminal 5 of terminal board B4.
L32 To terminal 1 of terminal board B7.
L33 To terminal 6 of terminal board B4.
L34 To L30.
L35 To L39.
L36 To terminal 3 of terminal board B2.
L37 To A.O.T. (blue lead).
L38 To terminal 4 of range switch WS1.
L39 To terminal 3 of range switch WS1 and to terminal 3 of contrast control VR8.
L40 Sound plate. (red lead) and terminal 1 of capacitor E2.
L41 Not used.
L42 To terminal 5 of terminal board B4.
L43 To terminal 5 of terminal board B2.
L44 To pin 7 of crt socket.
L45 To terminal 2 of capacitor E2.
L46 To terminal 3 of capacitor E1.
L47 To terminal 5 of volume control VR6.
L48 To terminal 4 of tone control VR7 and terminal 6 of volume control VR8.
L49 To terminal 6 of terminal board B2.
To L21 of Deflection Perma-Circuit Panel.

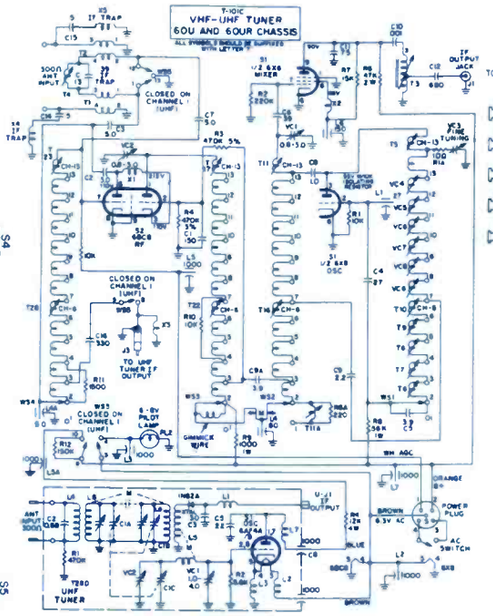


TERMINAL LUG IDENTIFICATION—DEFLECTION PERMA-CIRCUIT PANEL

L8 To L30 on Video-Sound Perma-Circuit Panel.
L9 Test point, horizontal oscillator.
L10 To terminal 1 of capacitor E2.
L11 To terminal 4 of terminal board B4.
L12 To terminal 7 of terminal board B4.
L13 To terminal 3 of terminal board B4.
L14 To terminal 1 of vertical hold control, VR4.
L15 To L25.
L16 To H.O.T., low side.
L17 To H.O.T.
L18 Not used.
L19 To terminal 3 of capacitor E2.
L20 To terminal 2 of capacitor E2.
L21 To L49 on Video-Sound Perma-Circuit Panel and terminal 2 of brightness control, VR6.
L22 To terminal 1 of brightness control, VR6.
L23 To V.O.T.
L24 To terminal 3 of horizontal hold, VR5.
L25 To L15.
L26 To terminal 4 of terminal board B2.

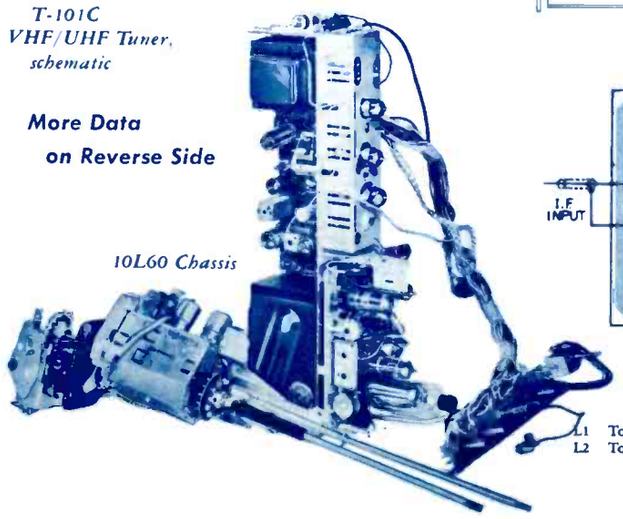


T-100C VHF Tuner, schematic

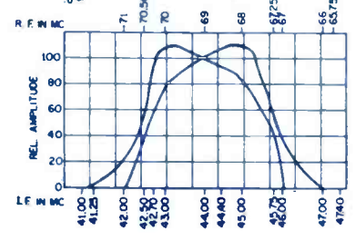


T-101C VHF/UHF Tuner, schematic

More Data on Reverse Side



10L60 Chassis



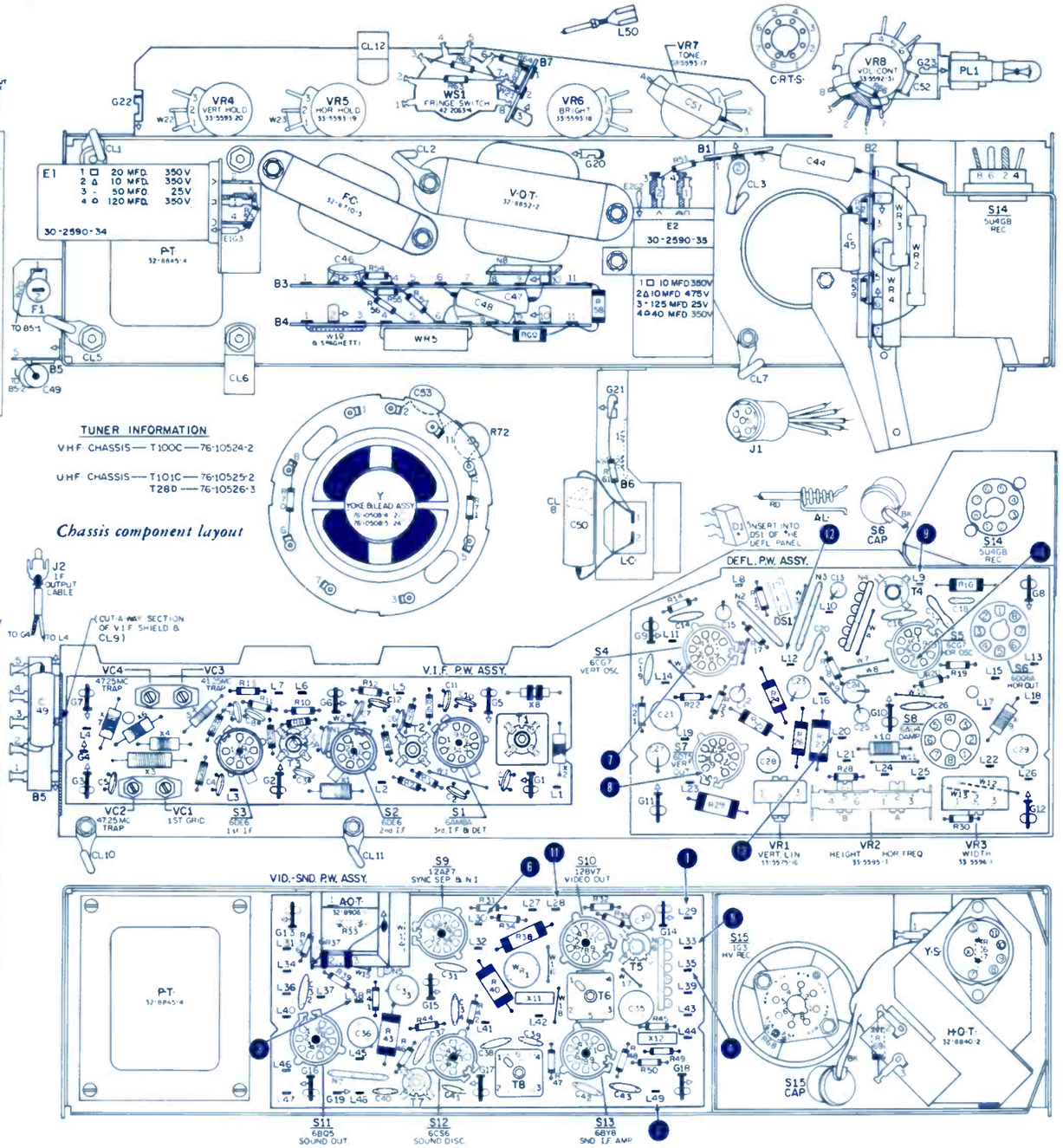
Overall r-f, i-f response curve

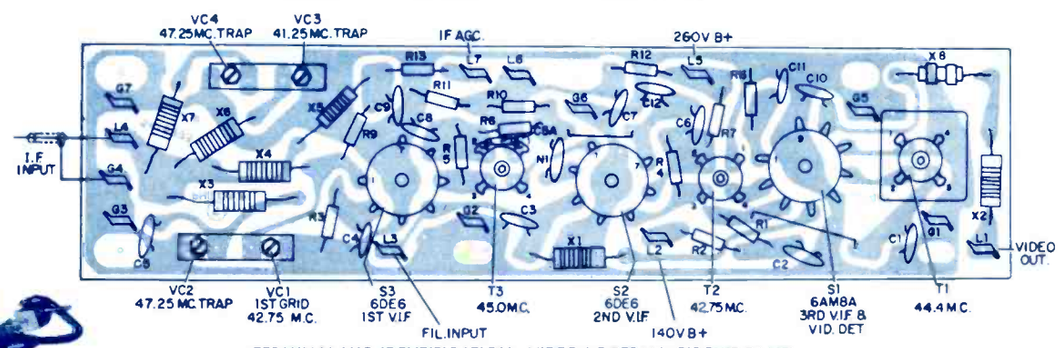
TUNER INFORMATION

VHF CHASSIS — T100C — 76-10524-2

UHF CHASSIS — T101C — 76-10525-2
T280 — 76-10526-3

Chassis component layout





TERMINAL LUG IDENTIFICATION—VIDEO I-F PERMA-CIRCUIT PANEL

L1 To L29 on Video-Sound Perma-Circuit Panel
L2 To terminal 1 of capacitor E1
L3 To terminal 3 of terminal board B5
L4 To tuner plug
L5 To terminal 4 of capacitor E1
J6 To terminal 3 of terminal board B1
L7 To terminal 6 of terminal board B4

PHILCO
TV Chassis 10L60, 10L60U, 10L60R, 10L60UR

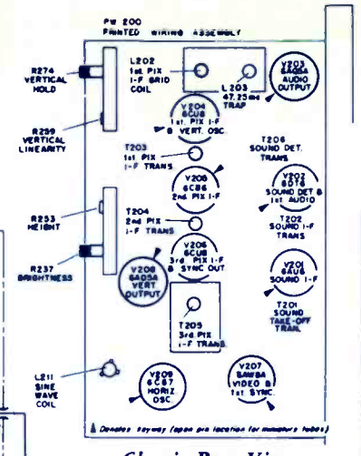
Electronic Technician
CIRCUIT DIGEST

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

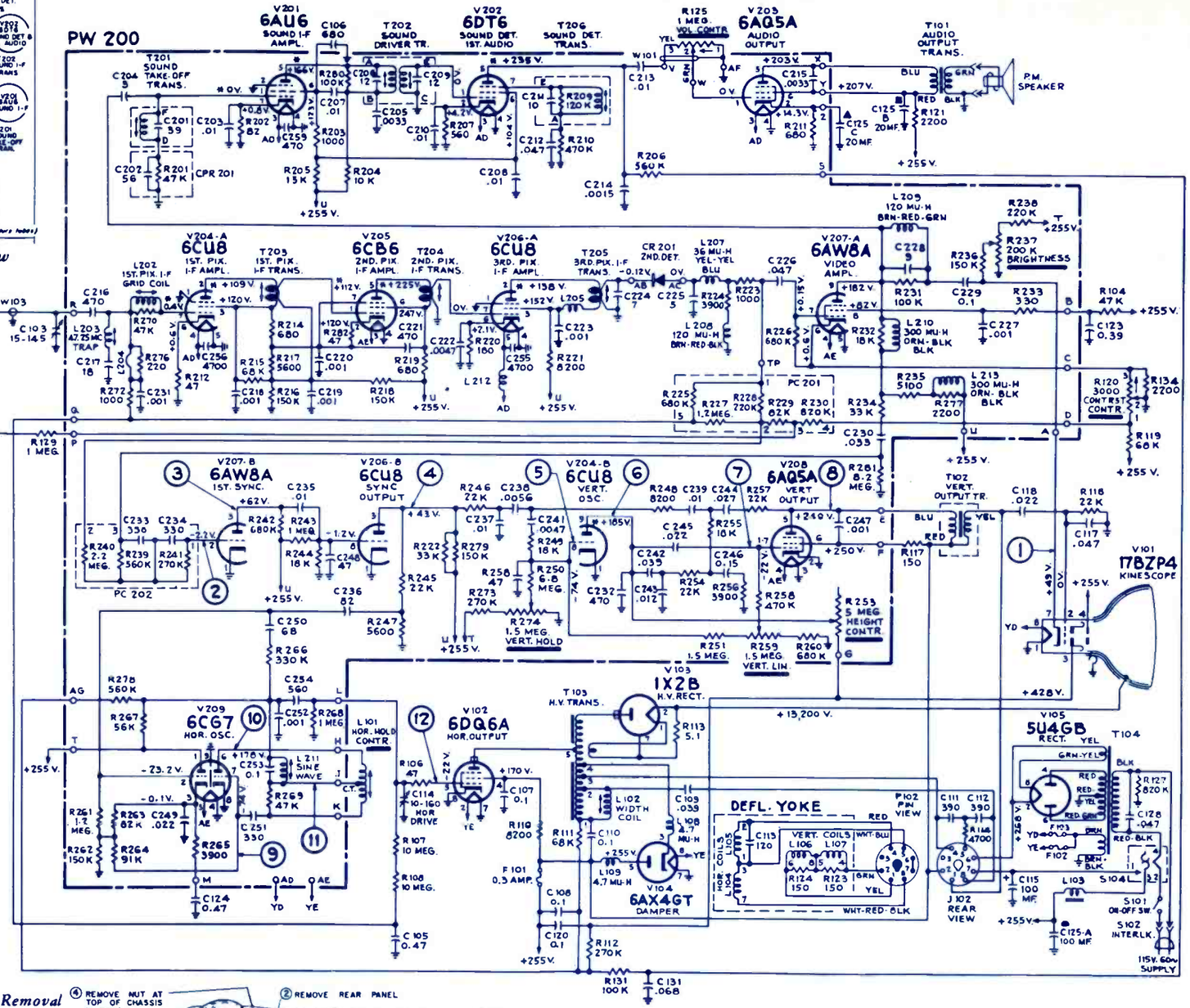
RCA
TV Chassis KCS118C, D

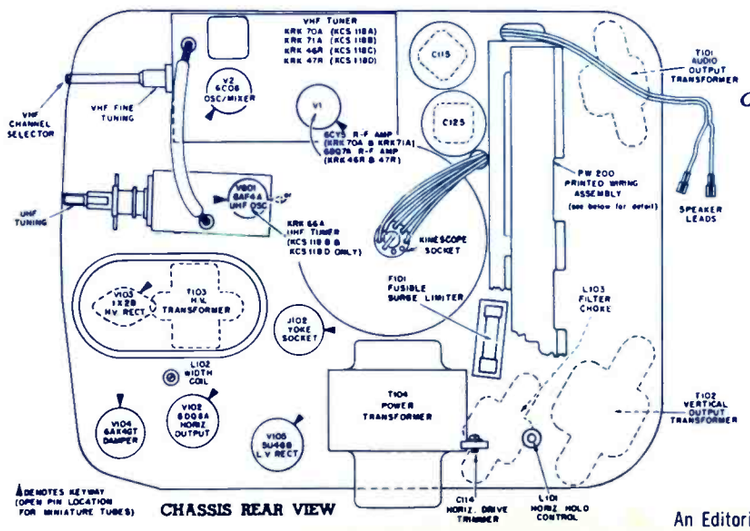
All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

*Measured with 1 megohm ½ watt resistor in series with meter probe.

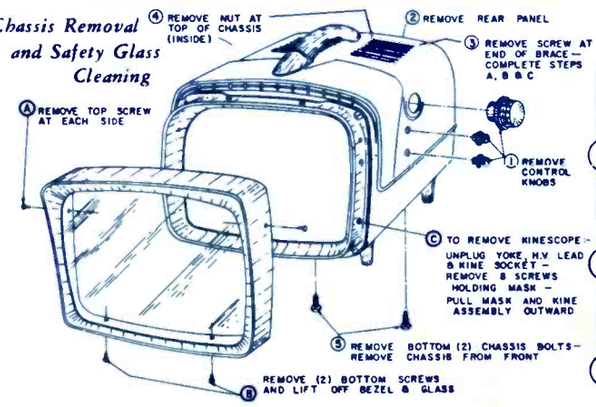


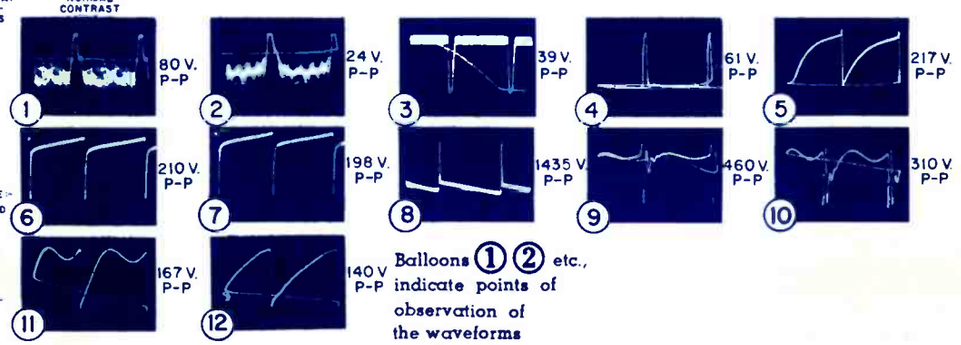
Chassis Rear View





Chassis Removal and Safety Glass Cleaning





Balloons (1) (2) etc., indicate points of observation of the waveforms on schematic.

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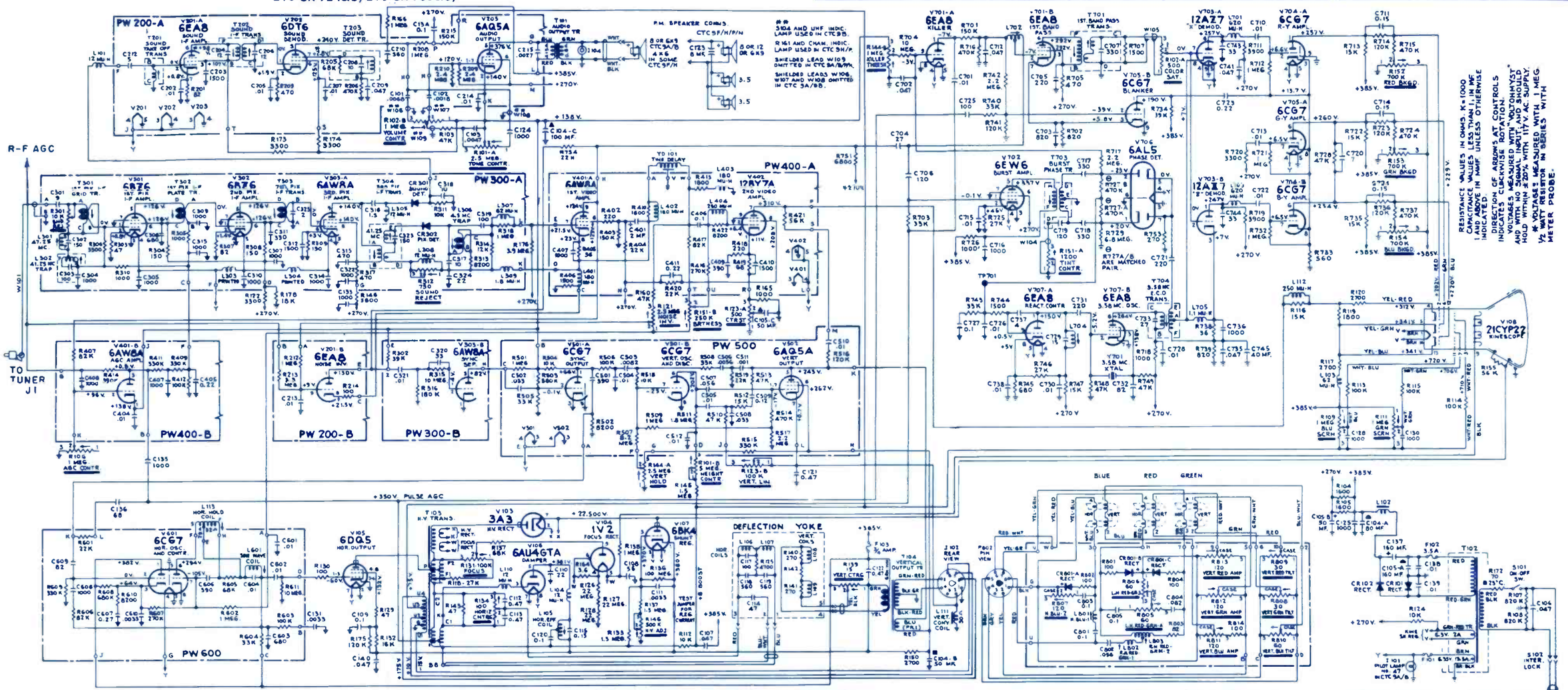
★★★★ ELECTRONIC TECHNICIAN
COLOR CIRCUIT DIGEST

RCA
TV Color Chassis CTC9A, B, F, H, N & P

Models 210-CK-855&U, 210-CK-856&U, 210-CK-857&U, 210-CK-885&U, 210-CK-886&U, 210-CK-889&U, 210-CK-905&U, 210-CK-906&U, 210-CK-907&U, 210-CK-920&U, 210-CK-924&U, 210-CK-935&U, 210-CK-936&U, 210-CKR-940&U, 210-CKR-946&U, 210-CT-822&U, 210-CT-835&U, 210-CT-836&U, 210-CT-837&U, 210-CTR-845, 210-CTR-847



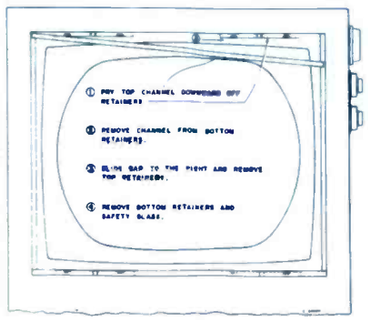
KINESCOPE AND SAFETY GLASS CLEANING

The safety glass may be removed from the front of the cabinet to allow for cleaning of the kinescope faceplate and the rear of the safety glass if required.

All models have a "U" shaped channel in front of the top edge of the safety glass and also at the bottom edge. Pry off the top and bottom channels starting at the extreme ends.

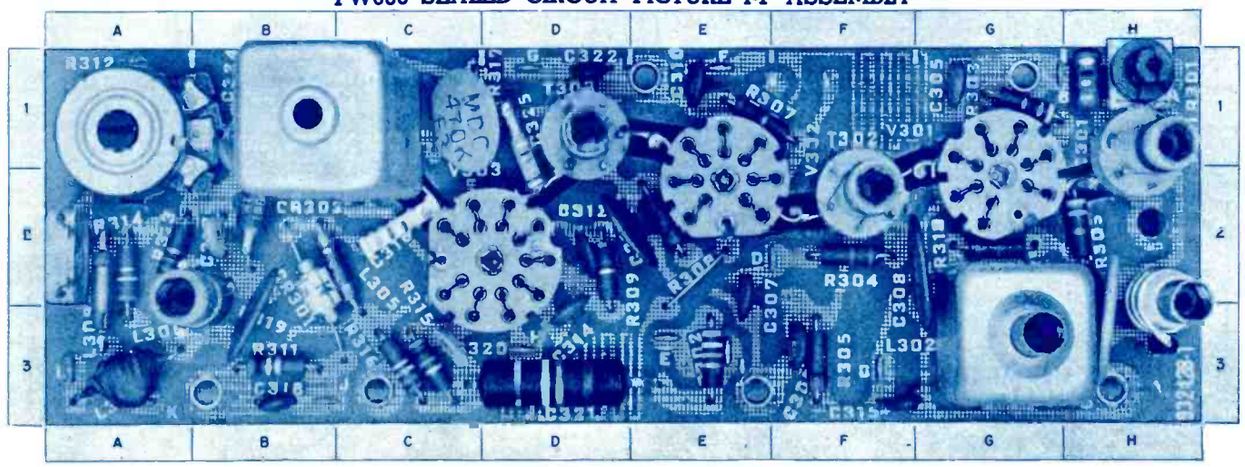
Insert the blade of a small screwdriver in one of the vertical slots in the middle of a retainer at the top of the safety glass. Slide the bar to the right to release the retainer. Refer to Figure 18.

The kinescope faceplate and safety window should be cleaned with a soft cloth and water only.



-Safety Glass Removal

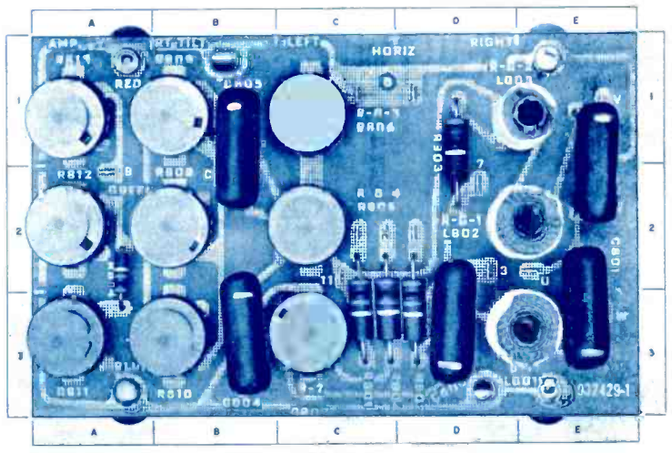
PW300 SEALED CIRCUIT PICTURE I-F ASSEMBLY



PW300 COMPONENT LOCATION GUIDE

C301	H1	C310	E1	C318	B3	CR301	B2	L304	B3	R304	F2	R312	A1	T302	F2
C302	H3	C311	E2	C319	B3	CR302	B2	L307	A3	R305	F3	R313	A2	T303	D1
C303	G3	C312	D2	C320	C3			L308	A2	R306	H2	R314	A2	T304	C1
C304	G3	C313	C1	C321	D3	L301	H3	L309	A2	R307	E1	R315	C3		
C305	G1	C314	D2	C322	D1	L302	G3			R308	D2	R316	C3		
C307	E3	C315	F3	C324	B1	L303	F1	R301	H1	R309	D2	R317	C1		
C308	G2	C316	C2	C325	D1	L304	D3	R302	E3	R310	G2				
C309	F3	C317	B2			L305	C2	R303	G1	R311	B3	T301	H1		

PW800 SEALED CIRCUIT CONVERGENCE ASSEMBLY

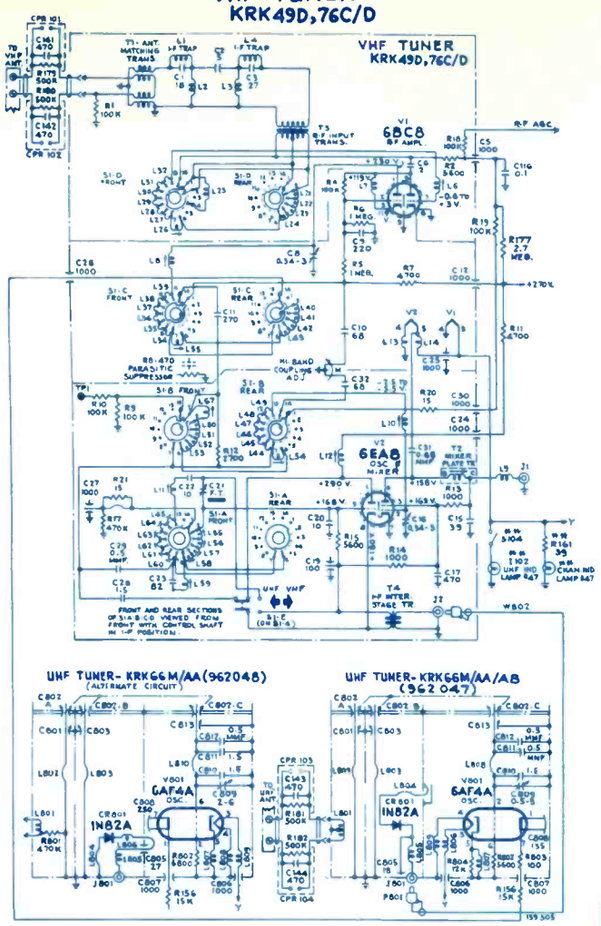


PW800 COMPONENT GUIDE

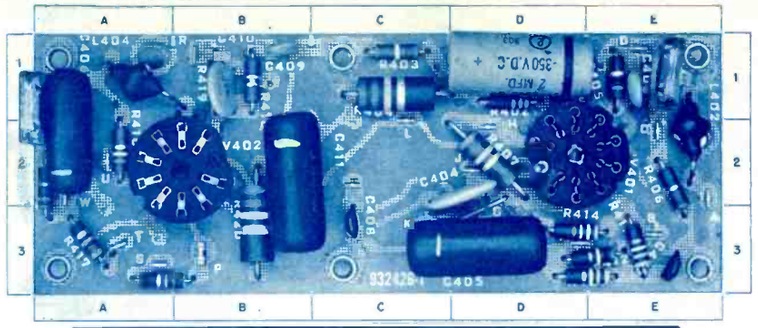
C801	E3	L802	D2	R807	C3
C802	E1	L803	D1	R808	B2
C803	D3	R801	C3	R809	B1
C804	B3	R802	D3	R810	B3
C805	B1	R803	D1	R811	A3
C806	C2	R804	C3	R812	A2
L801	D3	R805	C2	R813	A1
		R806	C1	R814	A2

ELECTRONIC TECHNICIAN, INC. ☆ 480 Lexington Ave., New York 17, N.Y.

VHF TUNER KRK49D,76C/D

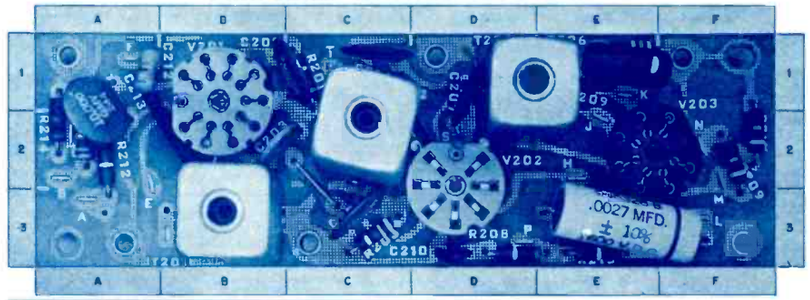


PW400 SEALED CIRCUIT VIDEO & AGC ASSEMBLY



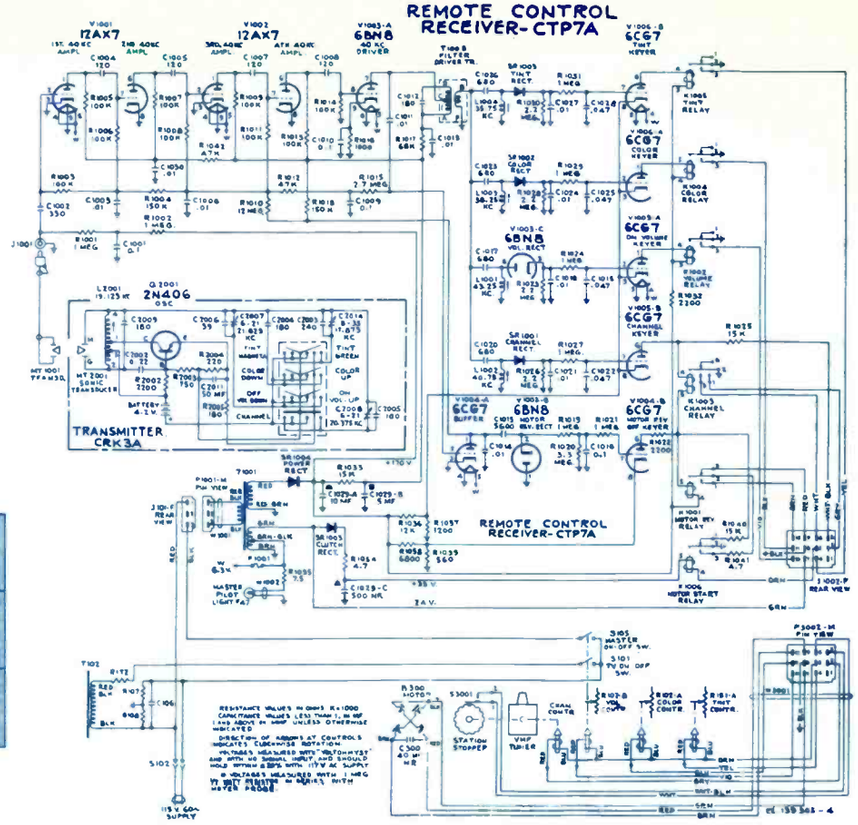
C401	D1	C407	E3	L401	E1	R402	D1	R407	D2	R413	A2	R419	B1
C402	E1	C408	C3	L402	E2	R403	C1	R409	E3	R414	D3	R420	B3
C404	D2	C409	B1	L403	A1	R404	C1	R410	E2	R416	A2	R421	A3
C405	D3	C410	B1	L404	A1	R405	E1	R411	E3	R417	A3	R422	A1
C406	A2	C411	C2			R406	E2	R412	E3	R418	B1		

PW200 SEALED CIRCUIT SOUND ASSEMBLY

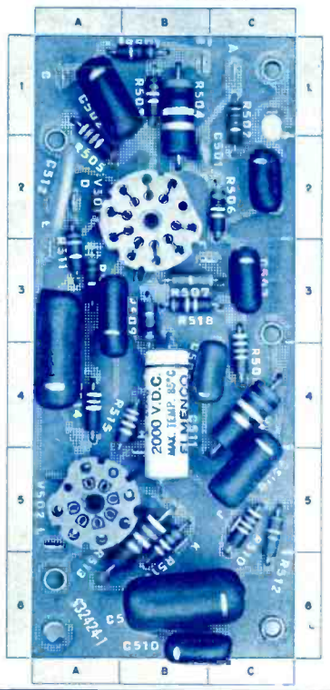


C202	C1	C209	F1	C214	C1	R203	C3	R210	F2	R215	E3	T203	D1
C203	B2	C210	D3	C215	E3	R206	E1	R212	A2				
C205	C3	C212	B1			R208	D3	R213	A2	T201	B3		
C207	D1	C213	A1	R201	C1	R209	F2	R214	A2	T202	C2		

REMOTE CONTROL RECEIVER- CTP7A

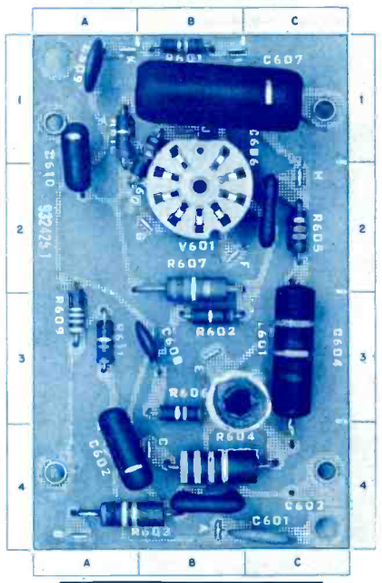


PW500 SEALED CIRCUIT VERTICAL & SYNC ASSEMBLY



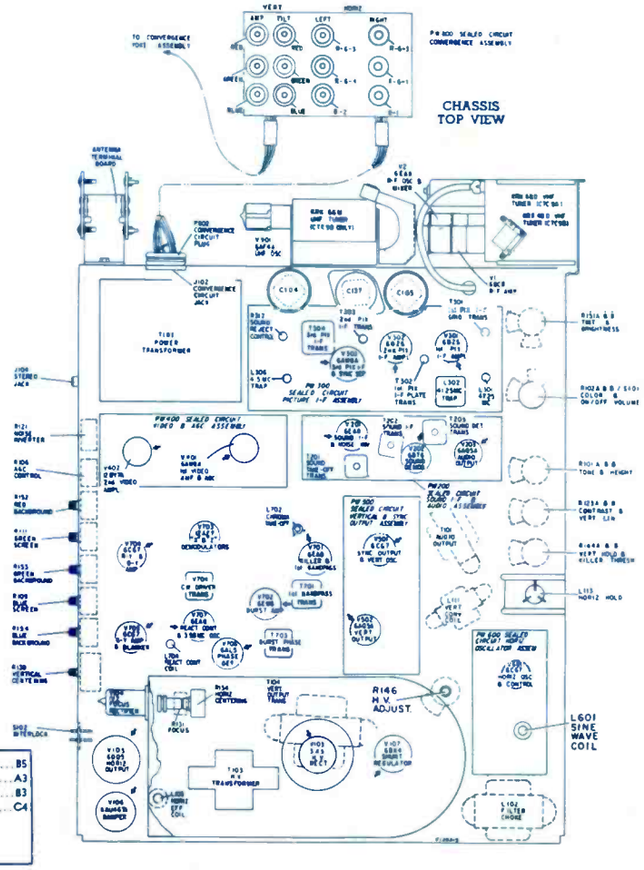
C501	B2	C508	C5	R502	C1	R509	B3	R516	B5		
C502	A1	C509	B4	R503	B1	R510	C5	R517	A3		
C503	C3	C510	B4	R504	B1	R511	A3	R518	B3		
C504	C2	C511	B4	R505	A2	R512	C5	R519	C4		
C505	A3	C512	A2	R506	C2	R513	B5				
C506	C4			R507	B3	R514	A4				
C507	A3	R501	B1	R508	C4	R515	B4				

PW600 SEALED CIRCUIT HORIZONTAL OSCILLATOR & CONTROL ASSEMBLY



C601	C4	C610	A2	R605	C2
C602	A4			R606	B3
C603	C4	L601	B3	R607	B3
C604	C3			R608	B1
C606	C2	R601	B1	R609	A3
C607	B1	R602	B1	R610	A1
C608	B3	R603	A4	R611	A3
C609	A1	R604	B4		

CHASSIS TOP VIEW



RCA
TV Color Chassis CTC9A, B, F, H, N & P

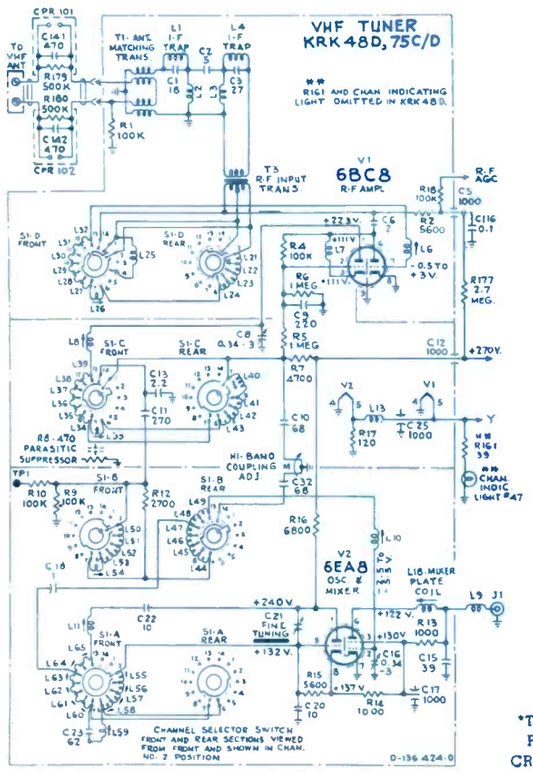
Electronic Technician
CIRCUIT DIGEST

CHASSIS DESIGNATIONS

CHASSIS	TUNERS	MODEL NOS.
CTC9A	KRK48D	210-CK-855-6 & 7
		210-CT-822
CTC9B	KRK49D	210-CK-855U-6U & 7U
	KRK66M	210-CT-822U
CTC9F	KRK75C	210-CK-885-6 & 9
		210-CK-905-6 & 7
		210-CK-920 & 4
		210-CK-935 & 6
		210-CT-835-6 & 7
CTC9H	KRK76C	210-CK-885U-6U & 9U
	KRK66AA	210-CK-905U-6U & 7U
		210-CK-920U & 4U
		210-CK-935U & 6U
		210-CT-835U-6U & 7U
CTC9N	KRK75D	*210-CKR-940 & 6
		*210-CTR-845 & 7
CTC9P	KRK76D	*210-CKR-940U & 6U
	KRK66AB	

*These Models also incorporate a CTP7A Remote Control Receiver Chassis and a CRK3A Remote Control Transmitter Assembly.

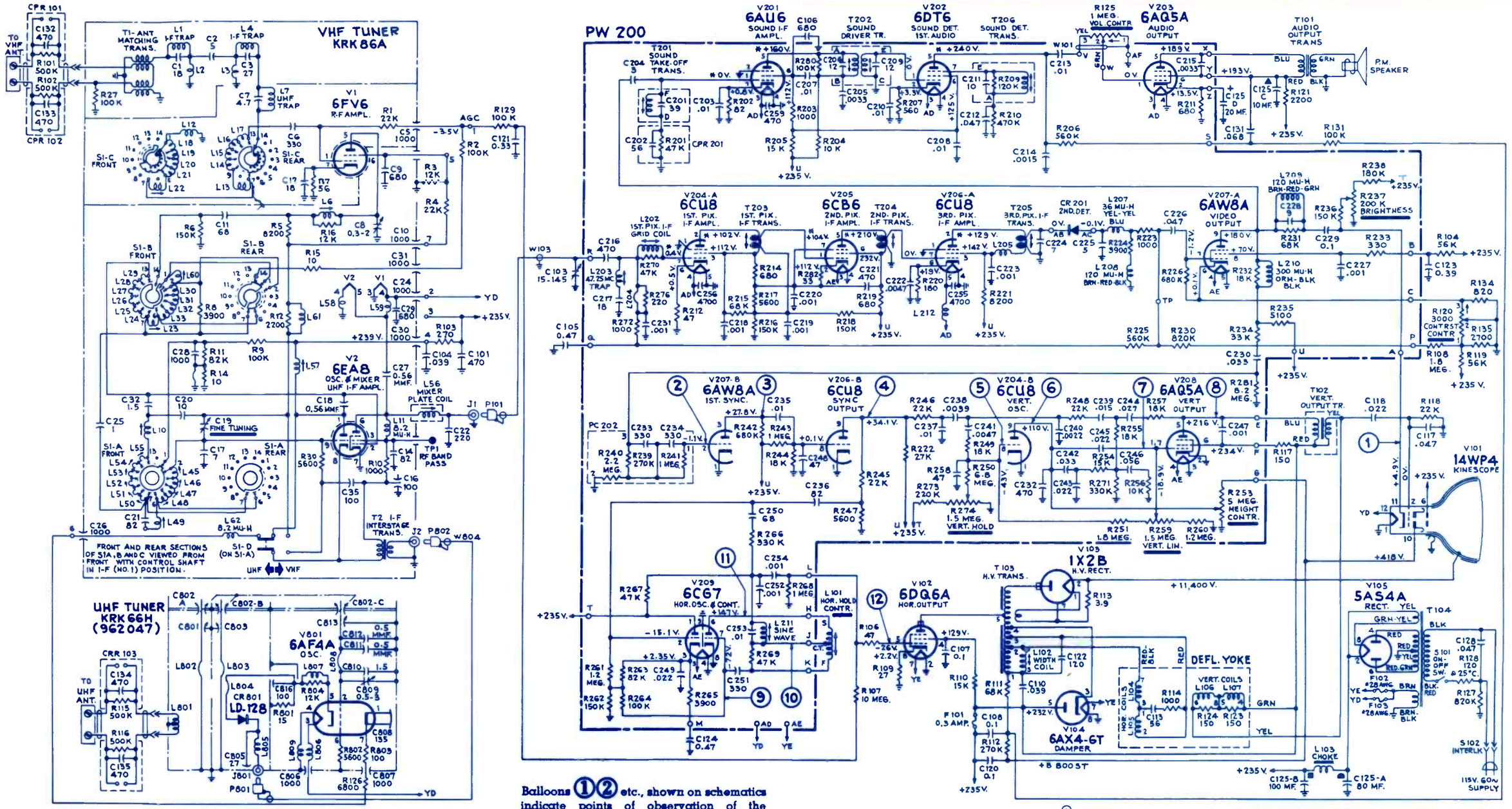
VHF TUNER KRK48D,75C/D



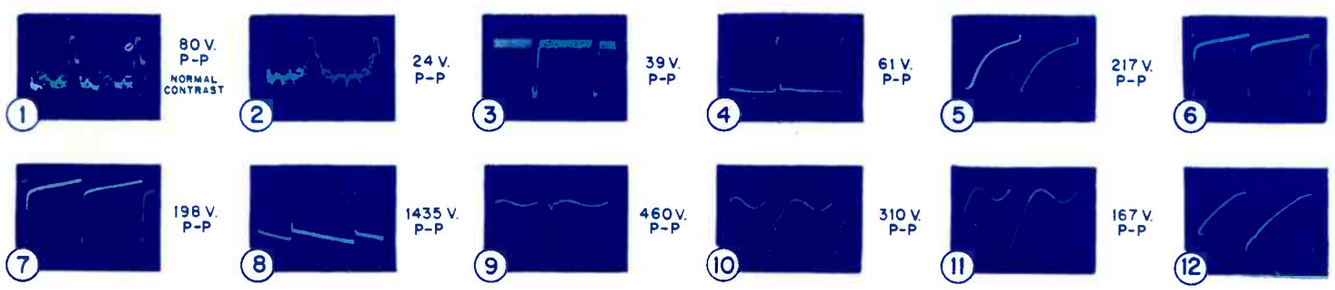
RCA
TV Chassis
KCS120E, KCS120F
Models 140-P-012 & U, 140-P-020 & U, 140-P-023 & U, 140-P-024 & U

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

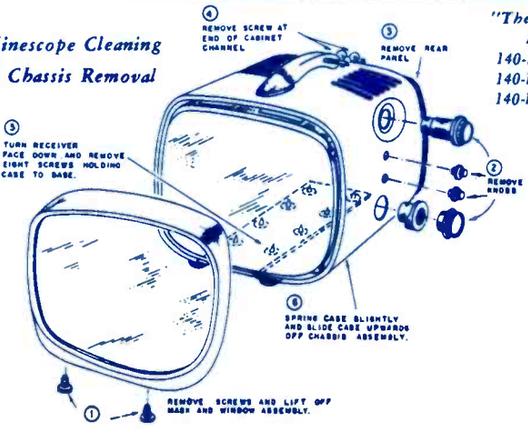
*Measured with 1 megohm, ½ watt resistor in series with meter probe.



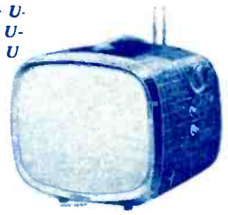
Balloons ① ② etc., shown on schematics indicate points of observation of the waveforms shown



Kinescope Cleaning and Chassis Removal



"The ENVOY"
Models
140-P-020 & U-
140-P-023 & U-
140-P-024 & U



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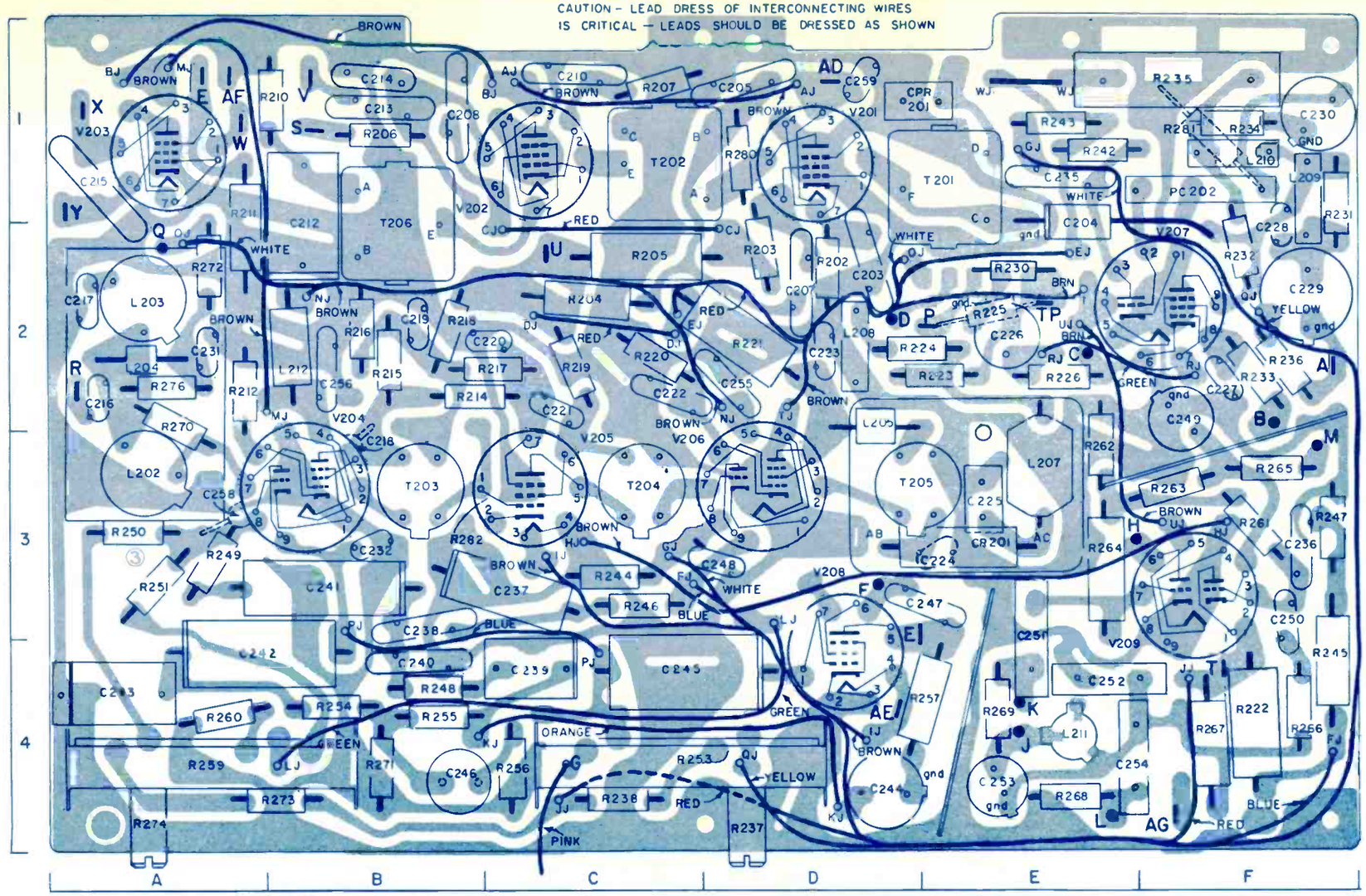
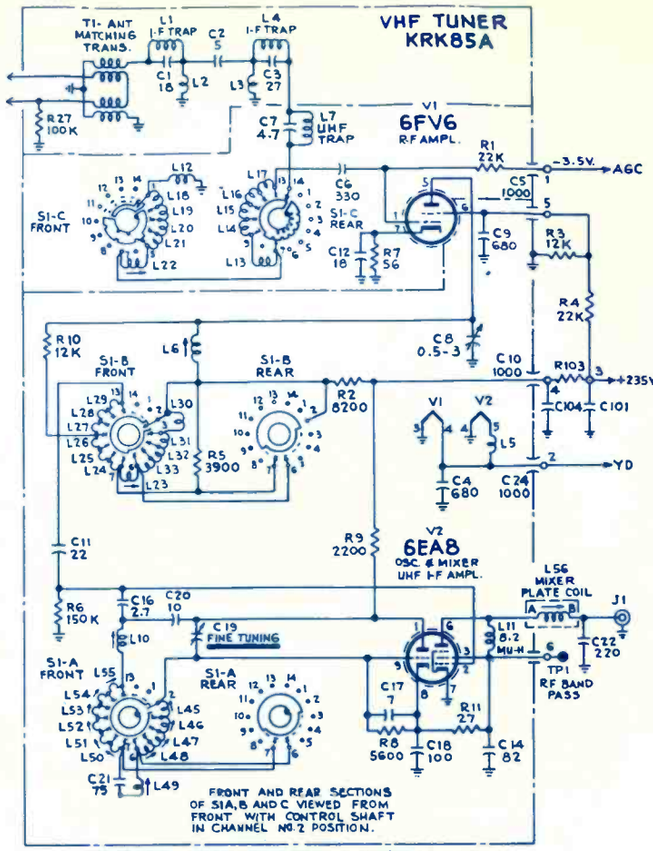
CAUTION – LEAD DRESS OF INTERCONNECTING WIRES IS CRITICAL – LEADS SHOULD BE DRESSED AS SHOWN





KRK85A VHF TUNER SCHEMATIC FOR KCS120E CHASSIS

KCS120E & KCS120F SECURITY SEALED CIRCUIT COMPONENT LOCATION GUIDE

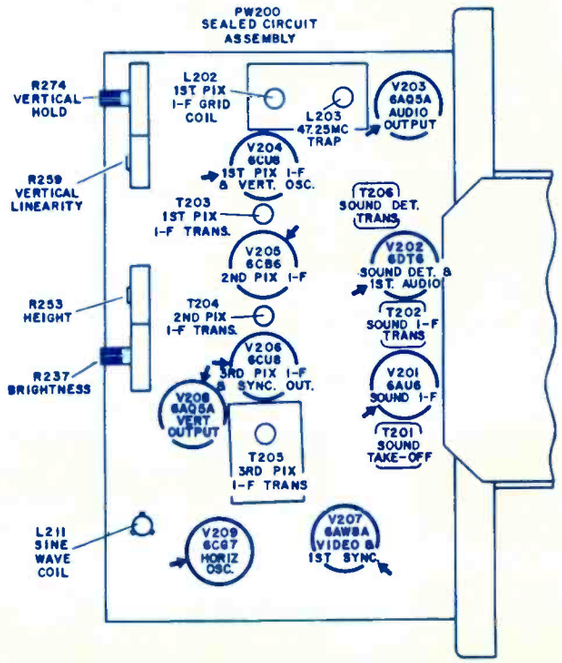
C203 ...D2	C220 ...C2	C236 ...F3	C250 ...F3	L202 ...A3
C204 ...E2	C221 ...C2	C237 ...C3	C251 ...E4	L203 ...A2
C205 ...D1	C222 ...C2	C238 ...B3	C252 ...E4	L204 ...A2
C207 ...D2	C223 ...D2	C239 ...C4	C253 ...E4	L205 ...D2
C208 ...B1	C224 ...E3	C240 ...B4	C254 ...E4	L207 ...E3
C210 ...C1	C225 ...E3	C241 ...B3	C255 ...D2	L208 ...D2
C212 ...B1	C226 ...E2	C242 ...A4	C256 ...B2	L209 ...F1
C213 ...B1	C227 ...F2	C243 ...A4	C258 ...A3	L210 ...F1
C214 ...B1	C228 ...F2	C244 ...D4	C259 ...D1	L211 ...E4
C215 ...A1	C229 ...F2	C245 ...C4		L212 ...B2
C216 ...A2	C230 ...F1	C246 ...B4	CPR201 .E1	
C217 ...A2	C231 ...A2	C247 ...E3		PC201 ..E2
C218 ...B2	C232 ...B3	C248 ...D3		PC202 ..F1
C219 ...B2	C235 ...E1	C249 ...F2	CR201 ..E3	

R202 ...D2	R220 ...C2	R237 ...D4	R256 ...C4	R271 ...B4
R203 ...D2	R221 ...D2	R238 ...C4	R257 ...E4	R272 ...A2
R204 ...C2	R222 ...F4	R242 ...E1	R259 ...A4	R273 ...B4
R205 ...C2	R223 ...E2	R243 ...E1	R260 ...A4	R276 ...A2
R206 ...B1	R224 ...D2	R244 ...C3	R261 ...F3	R280 ...D1
R207 ...C1	R225 ...E2	R245 ...F4	R262 ...E3	R281 ...F1
R210 ...B1	R226 ...E2	R246 ...C3	R263 ...F3	R282 ...C3
R211 ...A1	R230 ...E2	R247 ...F3	R264 ...E3	
R212 ...A2	R231 ...F1	R248 ...B4	R265 ...F3	T201 ...E1
R214, R215,	R232 ...F2	R249 ...A3	R266 ...F4	T202 ...C1
R216 ...B2	R233 ...F2	R250 ...A3	R267 ...F4	T203 ...B3
R217 ...C2	R234 ...F1	R251 ...A3	R268 ...E4	T204 ...C3
R218 ...B2	R235 ...F1	R254 ...B4	R269 ...E4	T205 ...D3
R219 ...C2	R236 ...F2	R255 ...B4	R270 ...A2	T206 ...B2

RCA
TV Chassis
KCS120E, KCS120F

Electronic Technician
CIRCUIT DIGEST

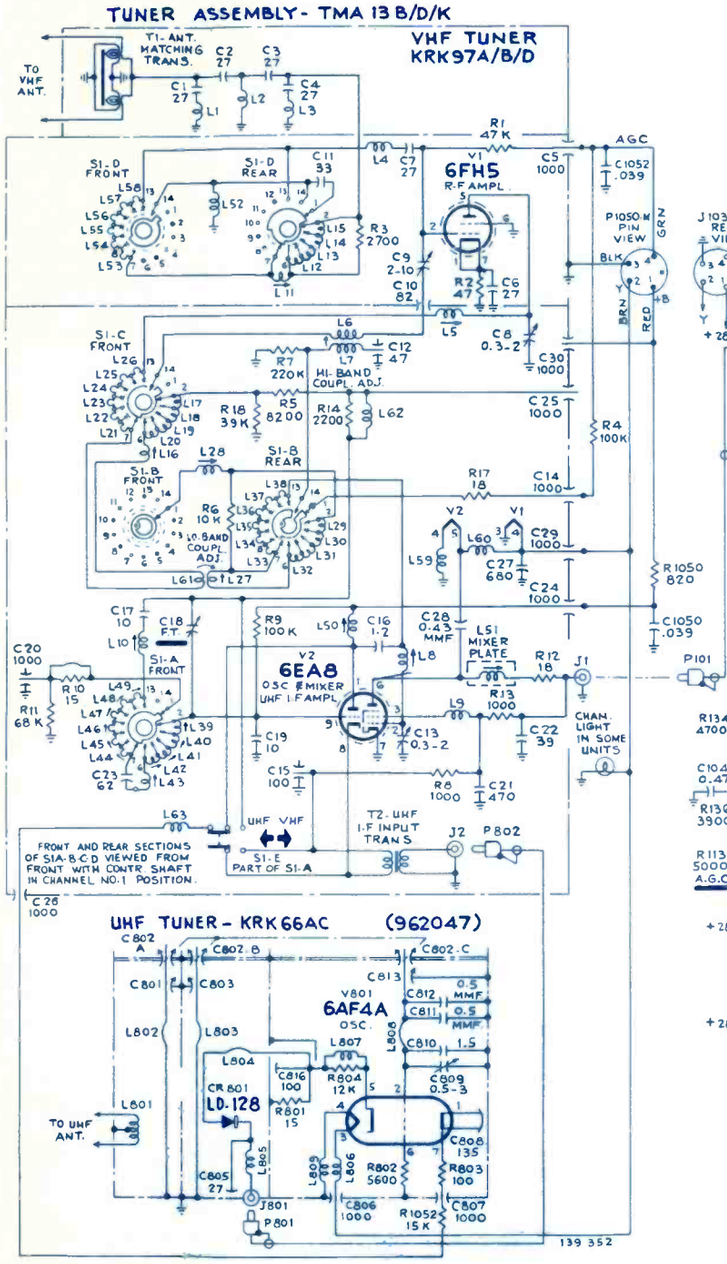
CHASSIS REAR VIEW



DENOTES KEYWAY (OPEN PIN LOCATION FOR MINIATURE TUBES)

TUNER ASSEMBLY - TMA 13 B/D/K

VHF TUNER KRK97A/B/D

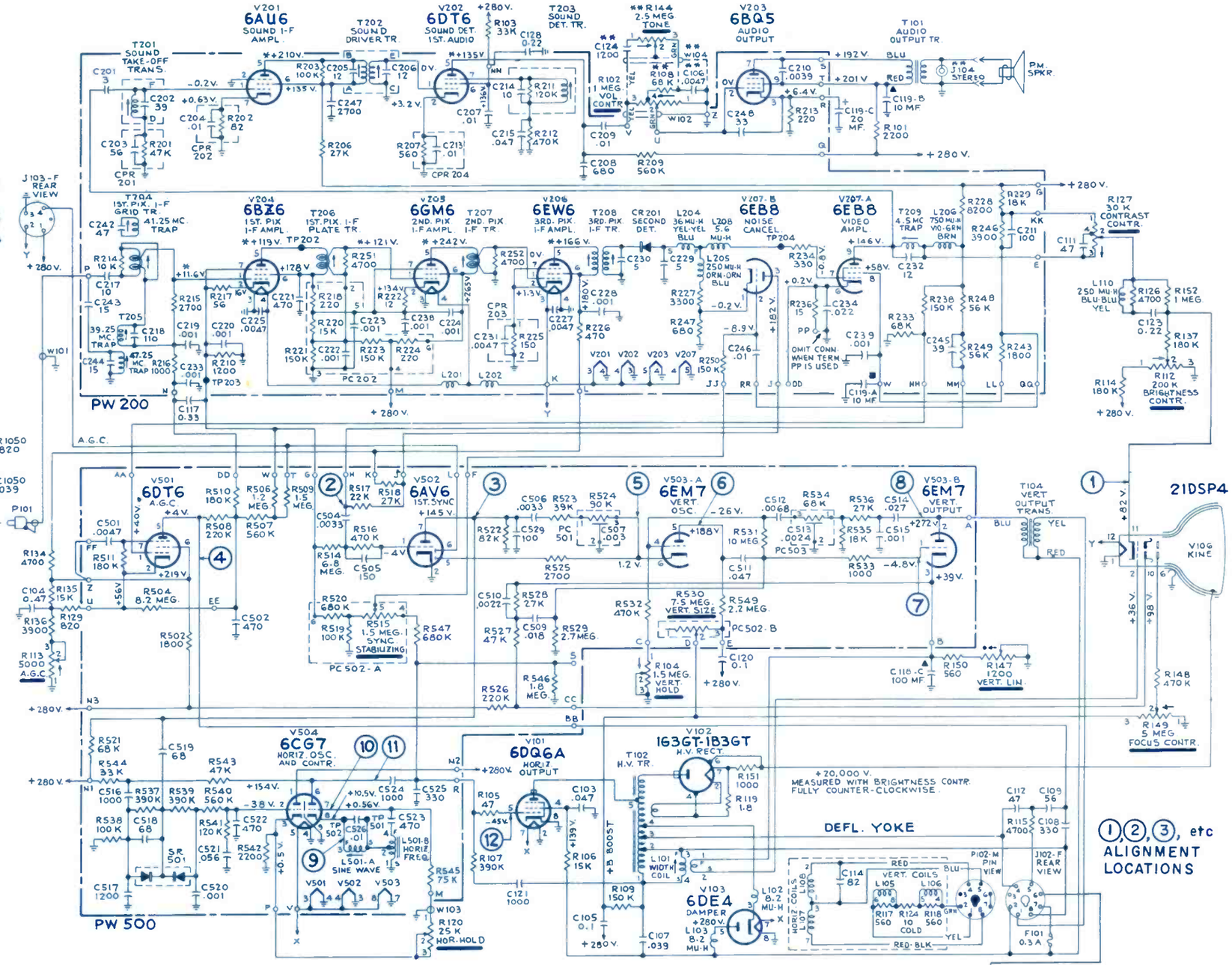


UHF TUNER - KRK 66AC (962047)

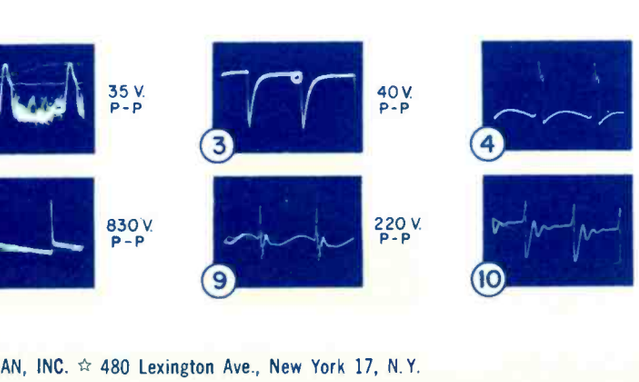
* VOLTAGES MEASURED WITH 1 MEG. ½ WATT RESISTOR IN SERIES WITH METER PROBE.

** R108, R144, C106, C124, J104 AND W104 OMITTED IN SOME UNITS.

PW 200



PW 500



(1), (2), (3), etc ALIGNMENT LOCATIONS

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RCA
TV Chassis
KCS 131 Series

Electronic Technician
CIRCUIT DIGEST

Safety Glass Removal—21" Models

1—REMOVE SCREWS HOLDING TOP GLASS RETAINER.
2—TILT TOP OF GLASS OUTWARD. LIFT UP AND OUT OF BOTTOM CHANNEL.

V102 1G36T/1B3GT H.V. RECT.
T102 H.V. TRANS.
T103 POWER TRANS.
KINESCOPE ANODE LEAD

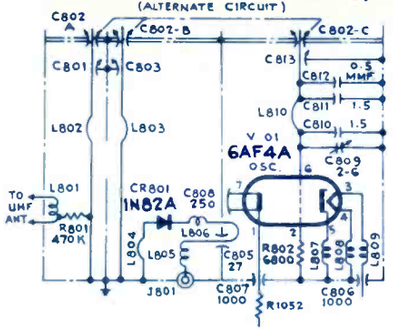
CHASSIS REAR VIEW

DENOTES KEY OR OPEN PIN LOCATION

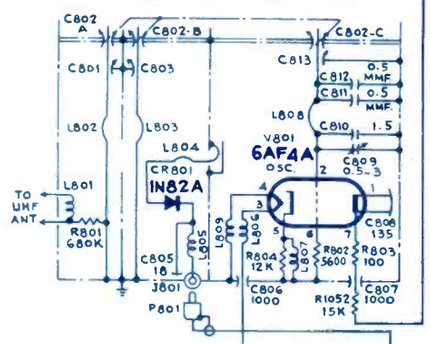
F101 SURGE LIMITER
R149 FOCUS CONTROL
T104 VERT. OUTPUT TRANSFORMER
J104 STEREO JACK
L104 FILTER CHOKE
R113 AGC CONTROL
R147 VERT. LIN. CONTROL
R139 VERT. SIZE CONTROL
R134 SYNC STAB CONTROL
V303 6EM7 VERT. OSC. & OUTPUT
V501 6DT6 AGC
V502 6AV6 1st SYNC.
L501 SINE WAVE COIL
TP502
TP501
V504 6CG7 HORIZ. OSC. & CONTROL
J103 TUNER POWER PLUG
TERM. "N" I-F AGC
T204 1st PIX I-F GRID TRANS
T206 1st PIX I-F TRANS.
T207 2nd PIX I-F TRANS.
V204 6BZ6 1st PIX I-F AMP.
V205 6EM6 2nd PIX I-F AMP.
V206 6EW6 3rd PIX I-F AMP
PIN 1 V206 GRID
TP202
BOTTOM
TOP
V202 6DT6 SOUND DET. & 1st AUDIO
V208 6EB8 SOUND I-F AMP
V203 6BQ5 AUDIO OUTPUT
T205 39.25 & 47.25 MC TRAPS
V207 6EB8 VIDEO AMP & NOISE CANCEL.
T201 SOUND TAKE-OFF TRANS.
T208 3rd PIX I-F TRANS
TP204 2nd DET. OUTPUT
C118
C119
T202 SOUND DRIVER TRANS.
T203 SOUND DET. TRANSFORMER
T209 4.5 MC. TRAP.
KRS 24C REMOVE CONTROL AMPLIFIER CHASSIS (KCS132M&A ONLY)

V101 6DQ6A HOR. OUTPUT
V103
5DE4 (KCS131 CHASSIS SERIES) 5AU4GTA (KCS132 CHASSIS SERIES)
L101 WIDTH COIL
J102 YOKE SOCKET
V104 5U4GB RECTIFIER
F101 SURGE LIMITER

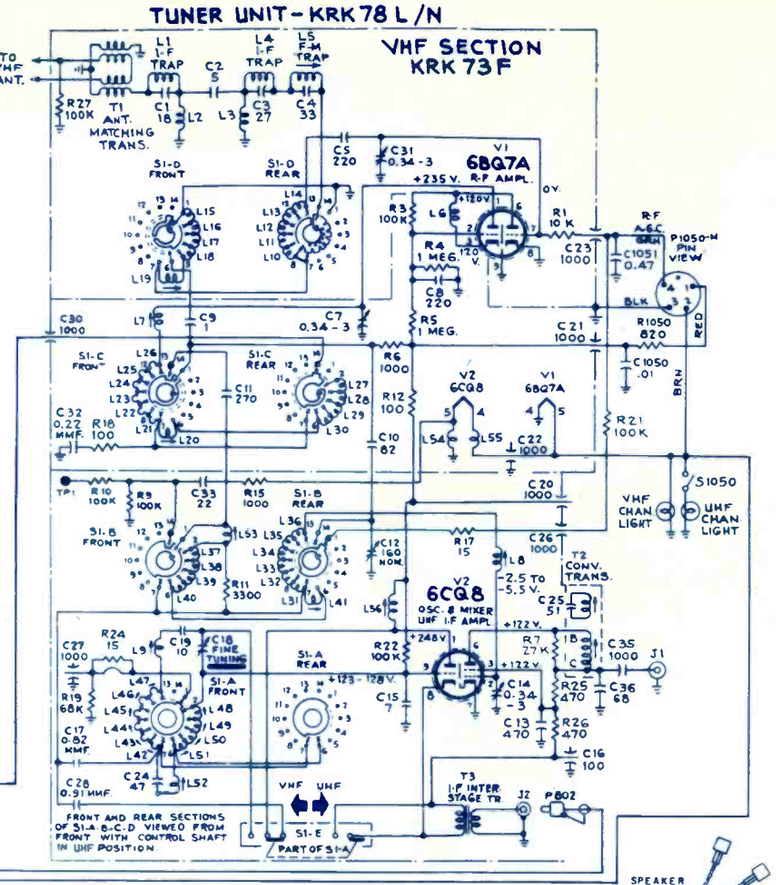
UHF TUNER - KRK66A (962048)
(ALTERNATE CIRCUIT)

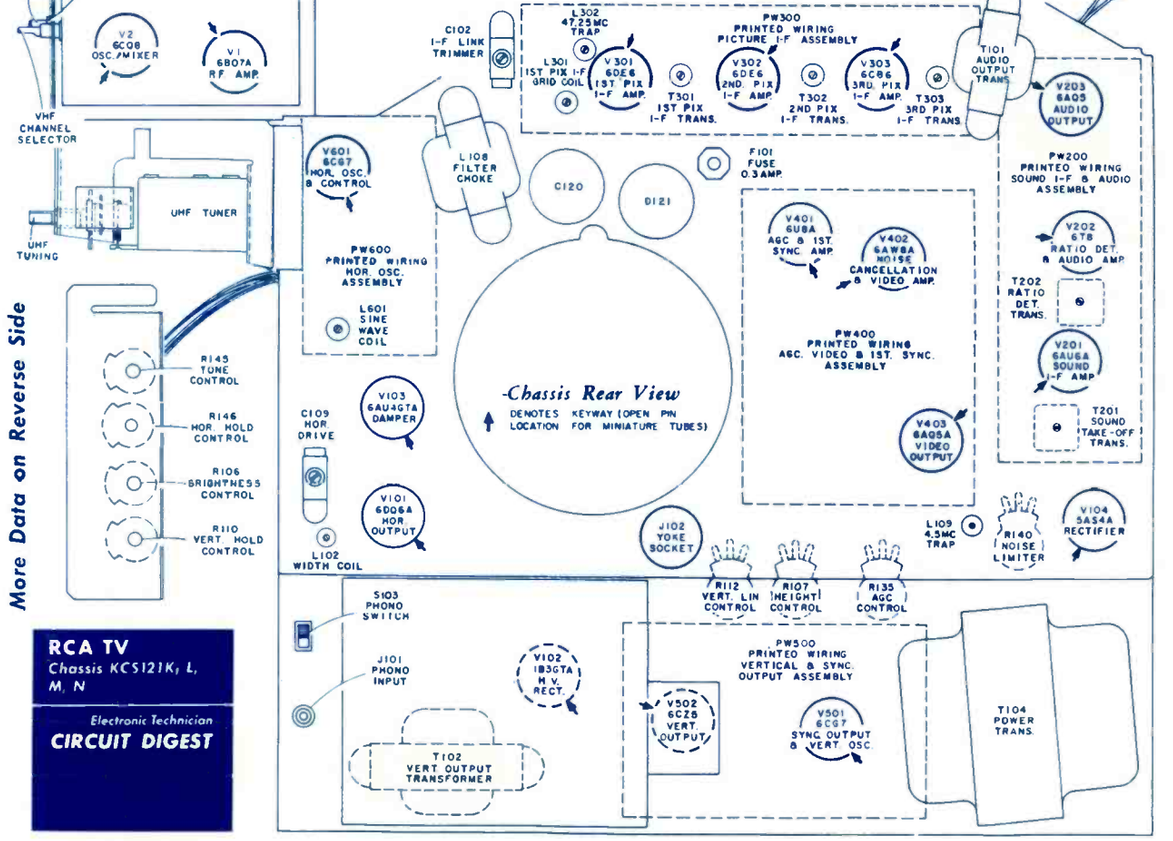


UHF TUNER - KRK66A (962047)



TUNER UNIT - KRK78 L/N





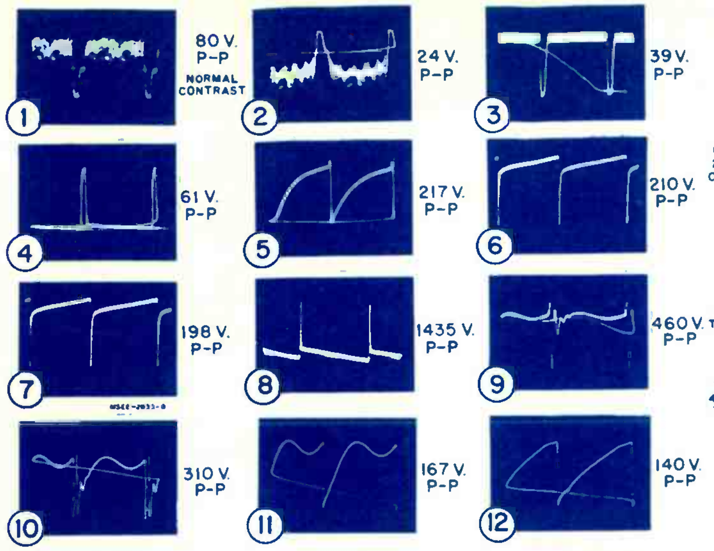
More Data on Reverse Side

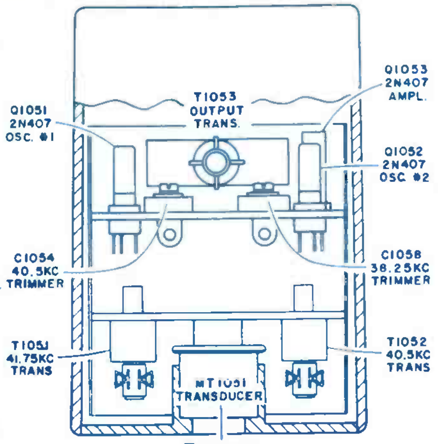
RCA TV
Chassis KCS121K, L, M, N

Electronic Technician
CIRCUIT DIGEST

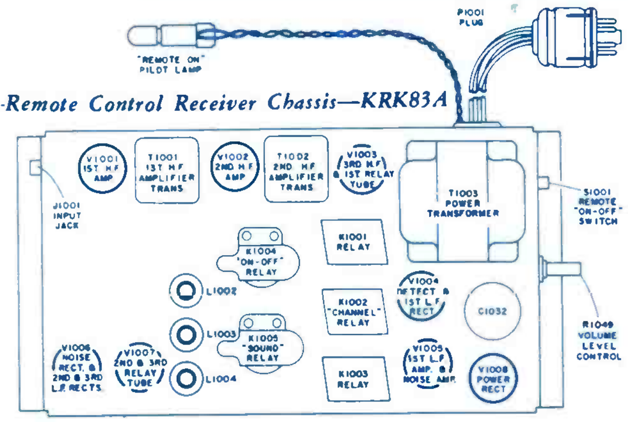
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

RCA TV
Chassis KCS121K, L, M, N

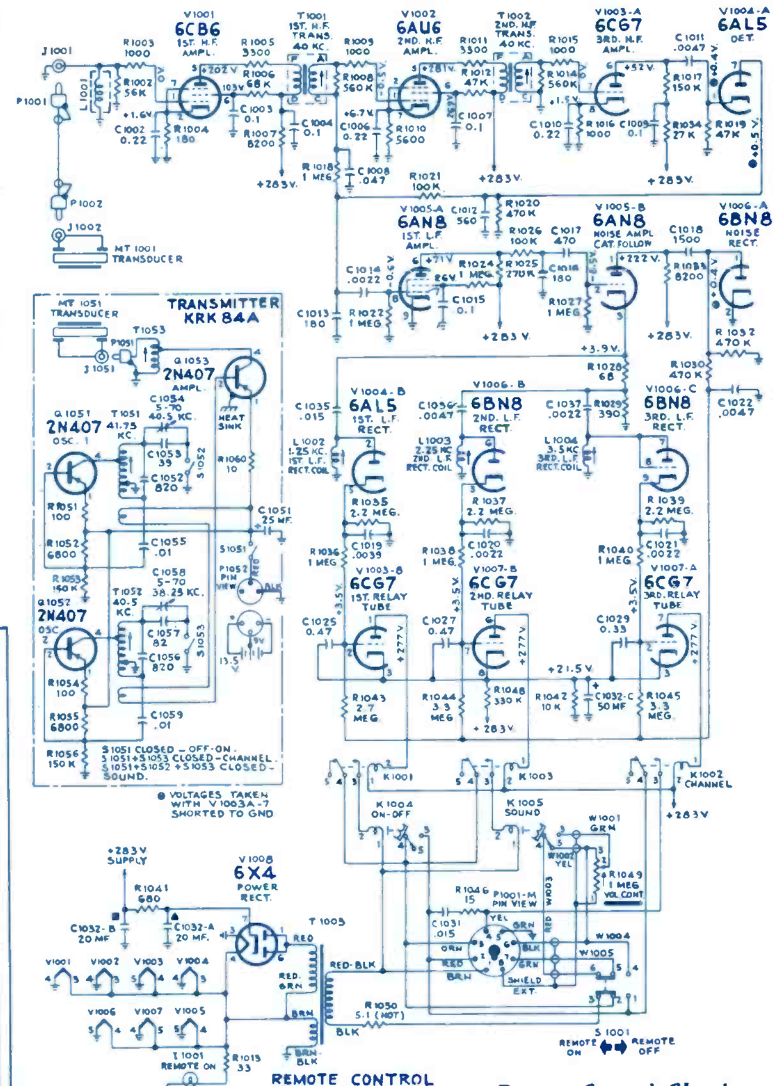




-Remote Control Transmitter Chassis—KRK84A

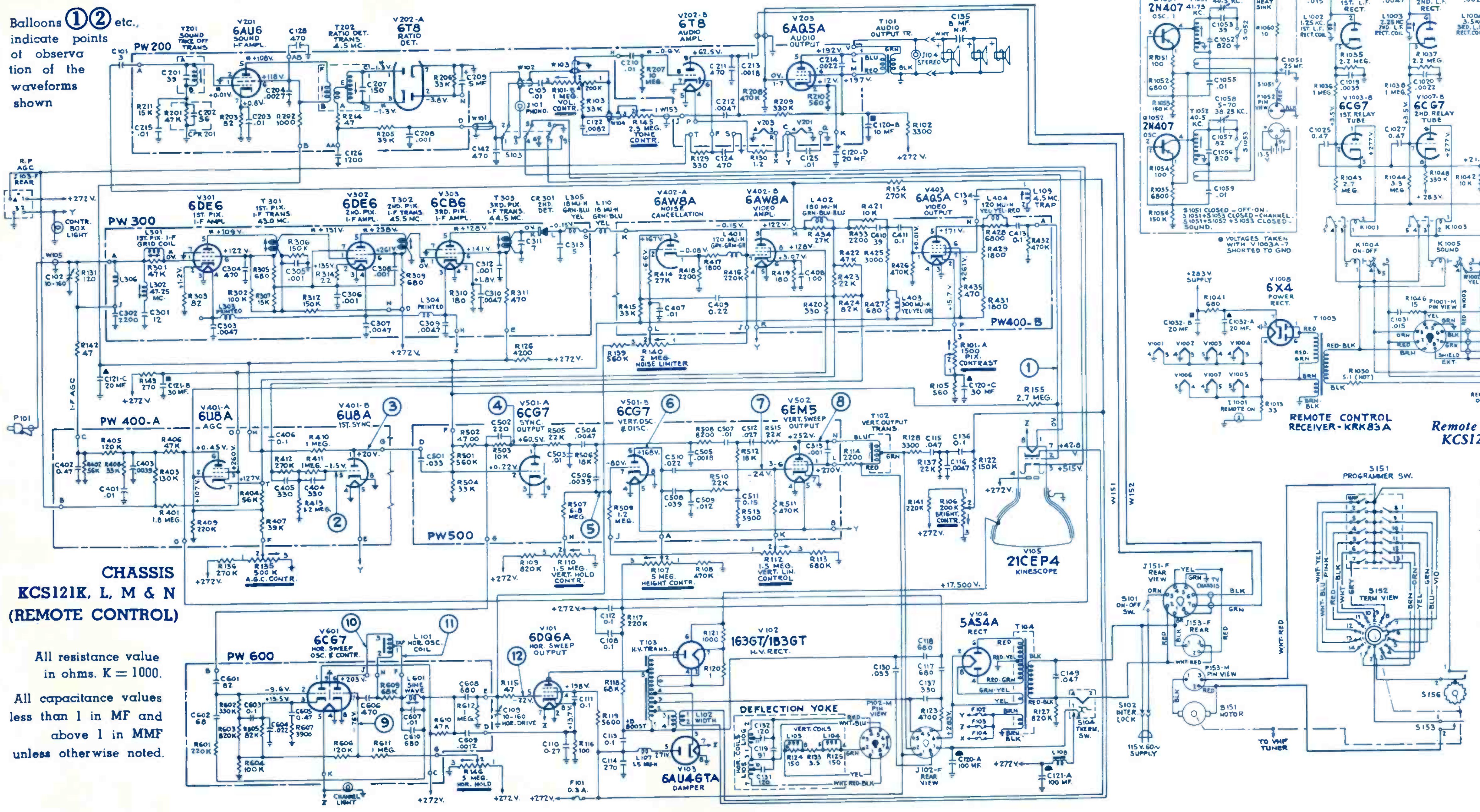


-Remote Control Receiver Chassis—KRK83A



Remote Control Chassis KCS121K, L, M & N

Balloons ①② etc., indicate points of observa tion of the waveforms shown



CHASSIS KCS121K, L, M & N (REMOTE CONTROL)

All resistance value in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

All voltages measured with "VoltOhmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

*Measured with 1 megohm, ½ watt resistor in series with meter probe.

Model 21-RD-9675-6, 21-RD-9677, 21-RD-9675U-6U, 21-RD-9877U, 21-RD-9690, 21-RD-9699, 21-RD-9690U, 21-RD-9699U

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More Data on Reverse Side

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

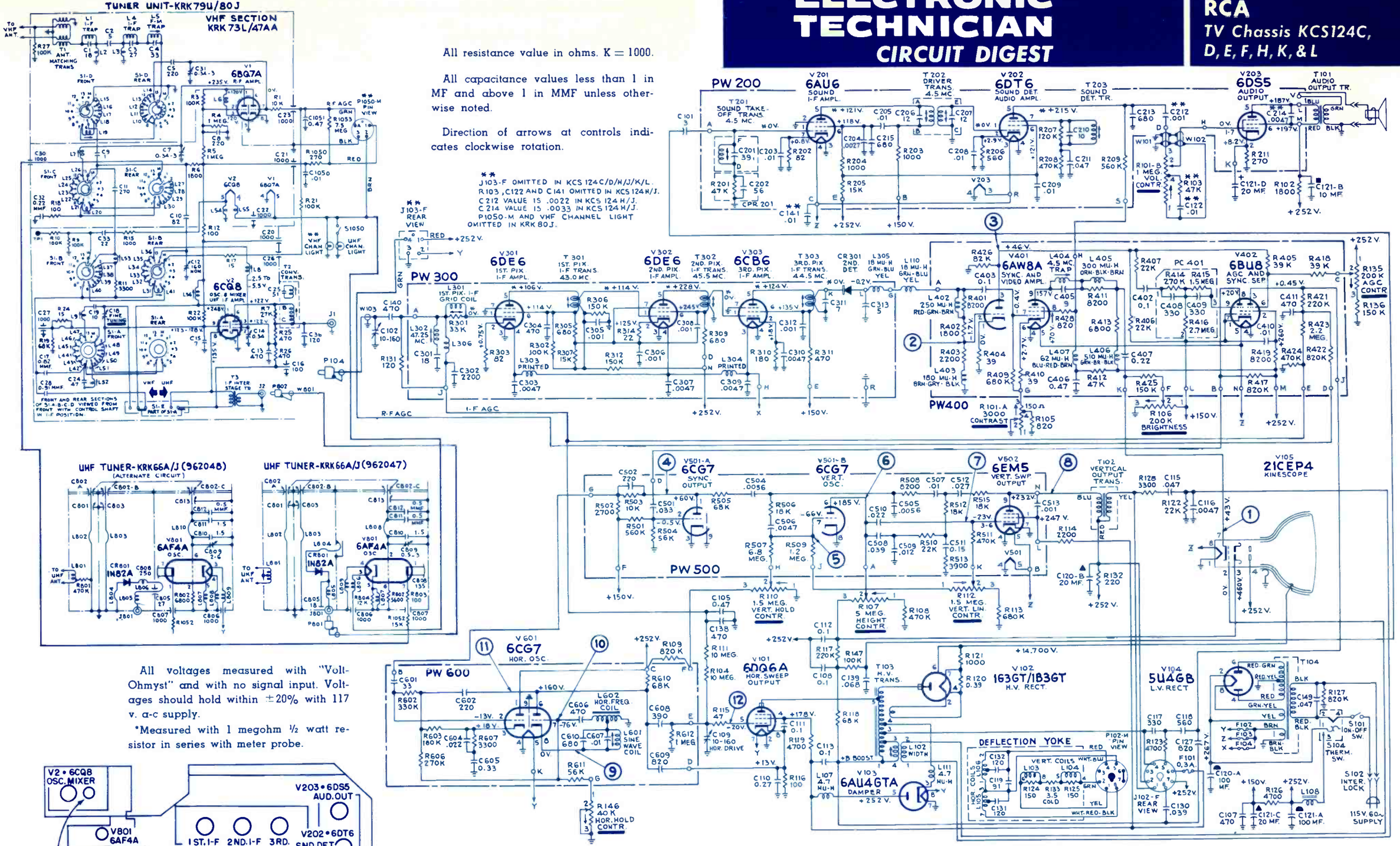
RCA
TV Chassis KCS124C, D, E, F, H, K, & L

All resistance value in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

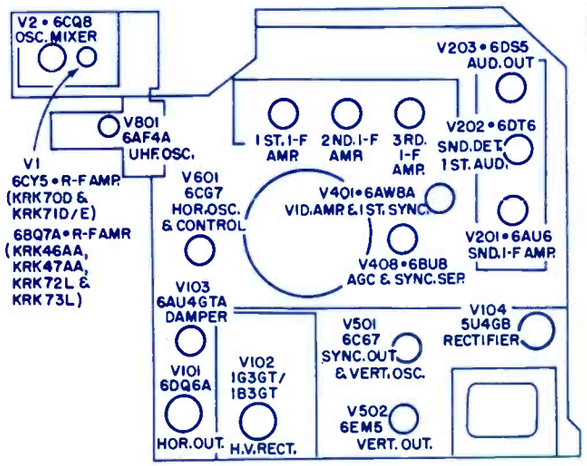
Direction of arrows at controls indicates clockwise rotation.

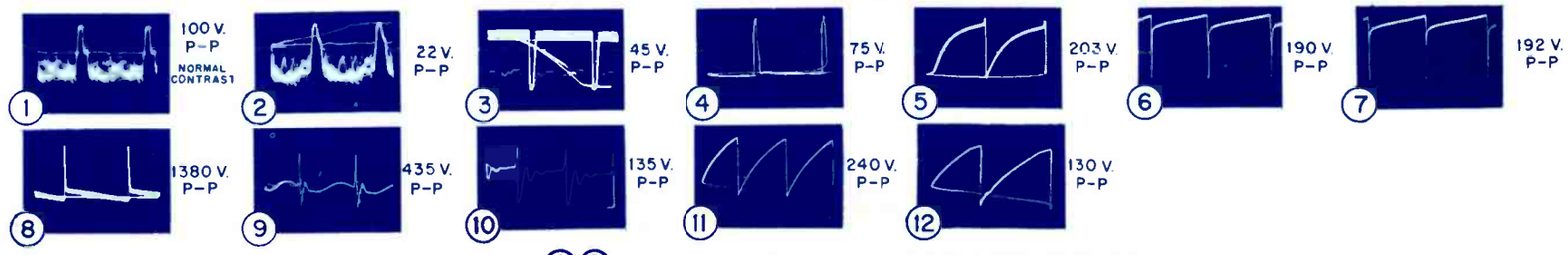
** J103-F OMITTED IN KCS 124C/D/H/J/K/L. R103, C122 AND C141 OMITTED IN KCS 124H/J. C212 VALUE IS .0022 IN KCS 124H/J. C214 VALUE IS .0033 IN KCS 124H/J. P1050-M AND VHF CHANNEL LIGHT OMITTED IN KRK 80J.



All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

*Measured with 1 megohm ½ watt resistor in series with meter probe.





Balloons ① ② etc., shown on schematic above, indicate points of observation of the waveforms shown at the right.

Models 21-T-9122, 25, 27, & U;
21-T-9265, 66, 67, 75, 76, 77, & U;
21-T-9345, 47, & U

RCA
TV Chassis 128A, B, C, E, F, H, J, M, U, AA, AB

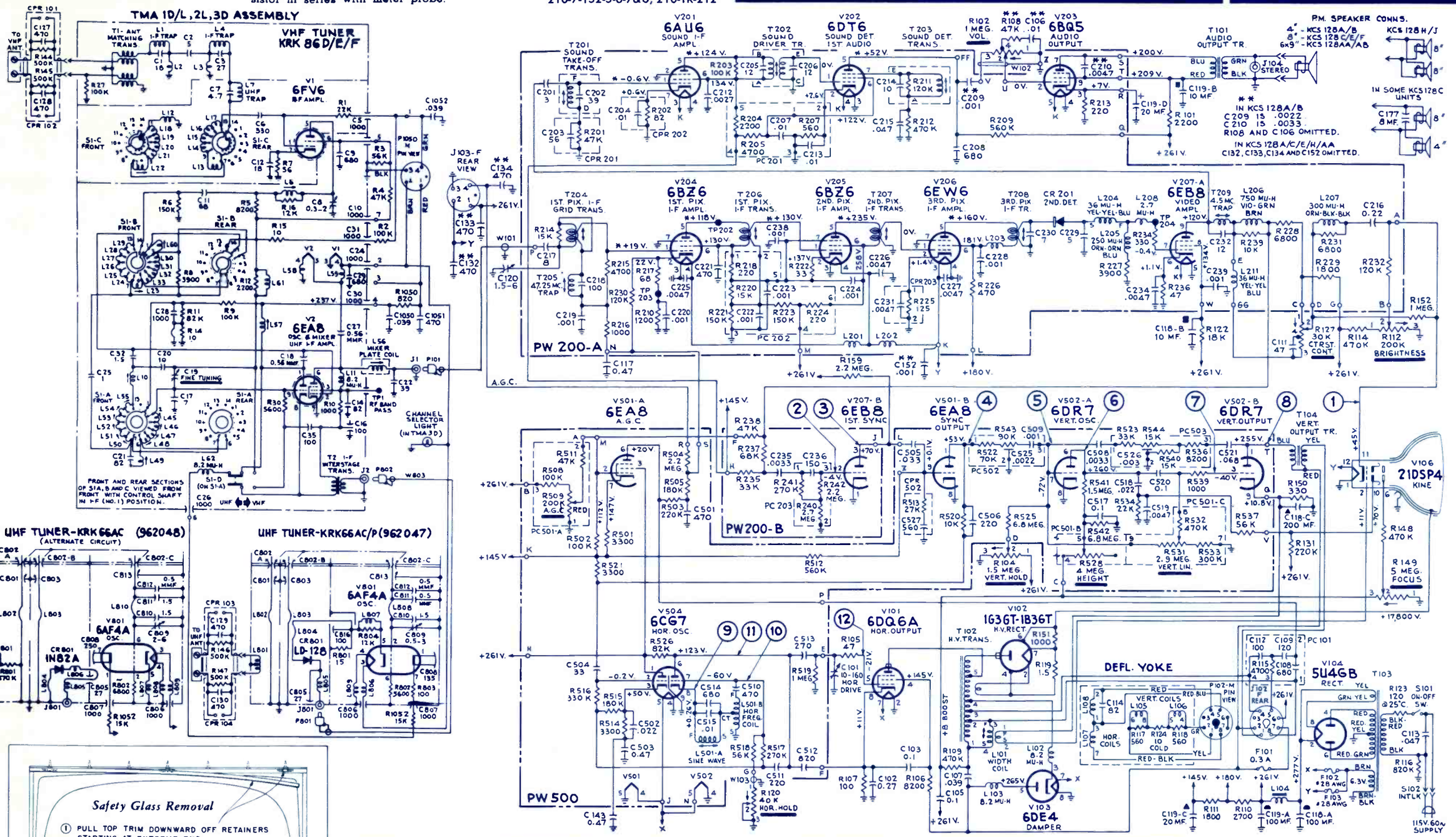
All resistance value in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

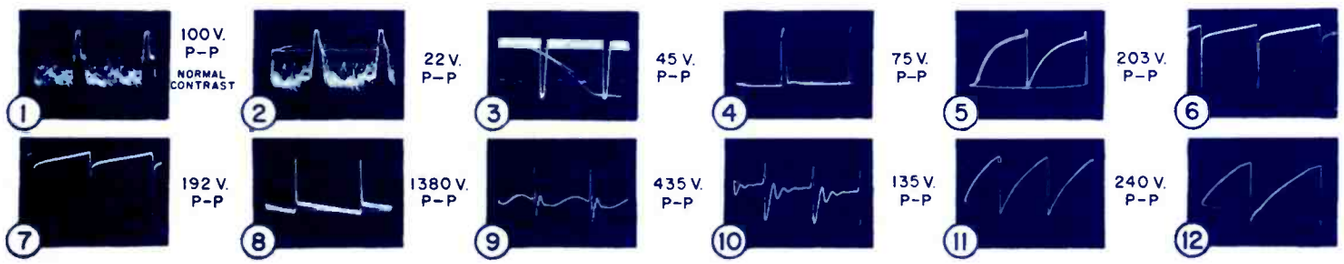
*Measured with 1 megohm, ½ watt resistor in series with meter probe.

Models 210-K-295&U, 210-K-296, 210-K-297&U, 210-K-299, 210-K-335-6-7&U, 210-K-356&7, 210-K-390&4, 210-K-415-6-7&U, 210-KR-435&6, 210-KR-455-6-7, 210-7-152-5-6-7&U, 210-TR-212



Safety Glass Removal

1. PULL TOP TRIM DOWNWARD OFF RETAINERS STARTING AT EXTREME END.
2. REMOVE SCREWS HOLDING GLASS AND TRIM RETAINERS.
3. TILT TOP OF GLASS OUTWARD AND LIFT UP AND OUT OFF BOTTOM CHANNEL.



Balloons (1) (2) etc., shown on schematics indicate points of observation of the waveforms shown below the individual schematic.

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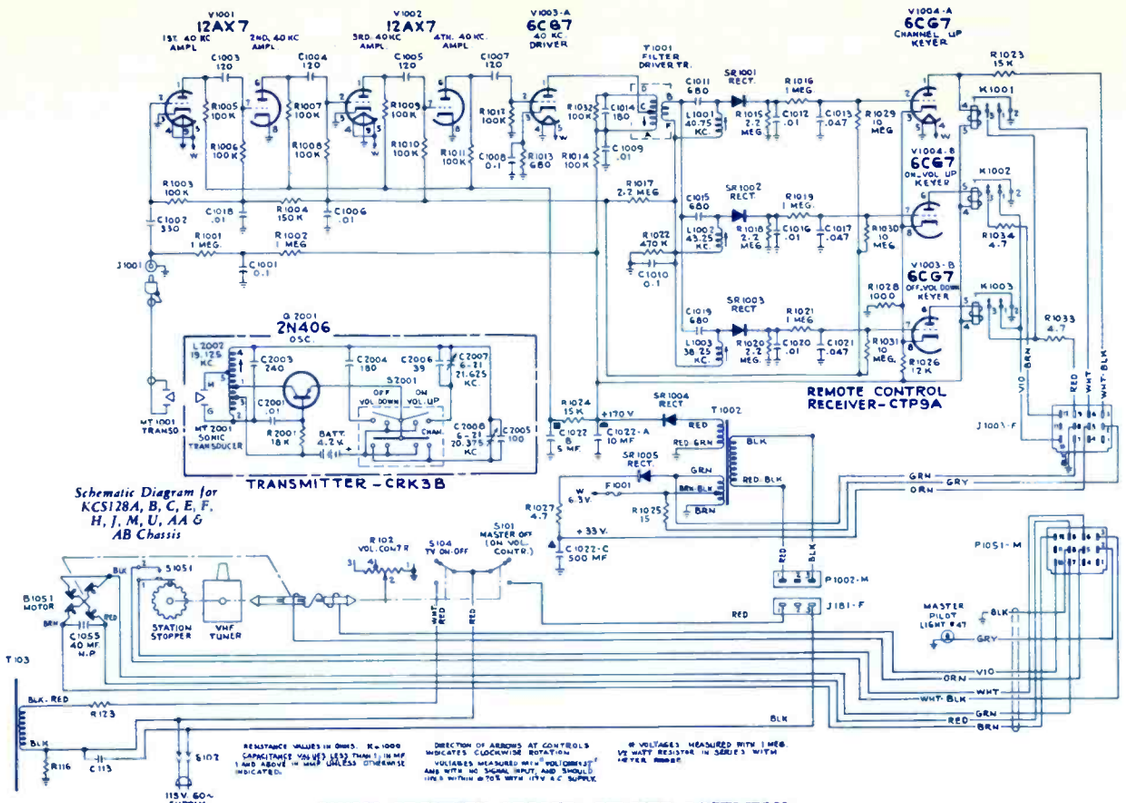
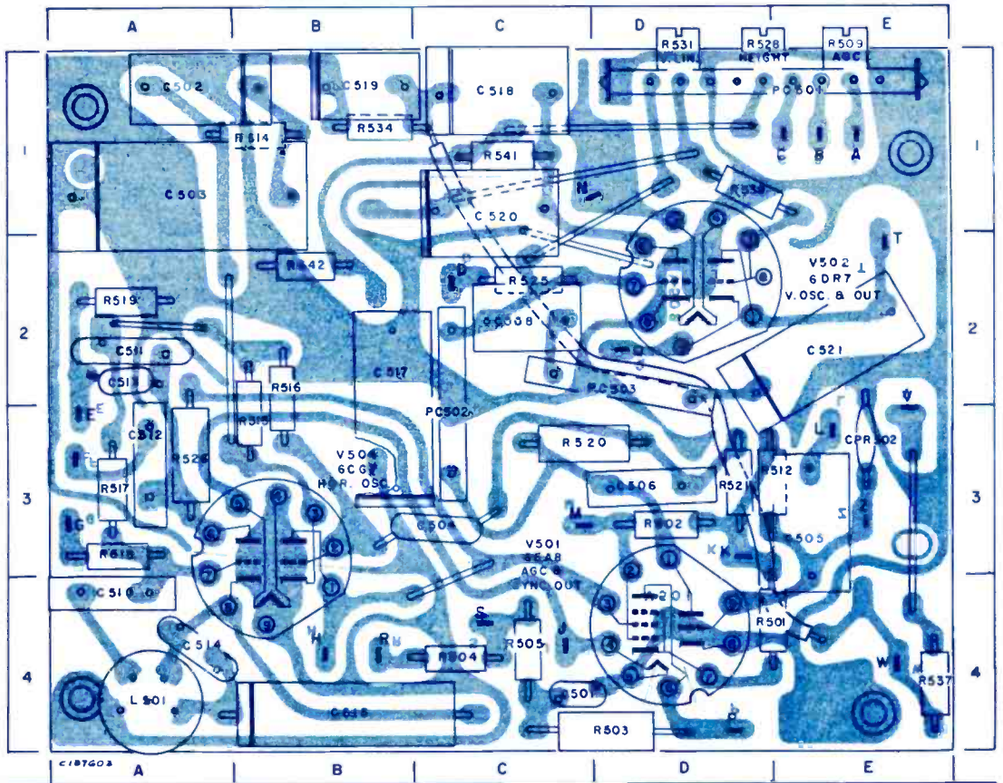
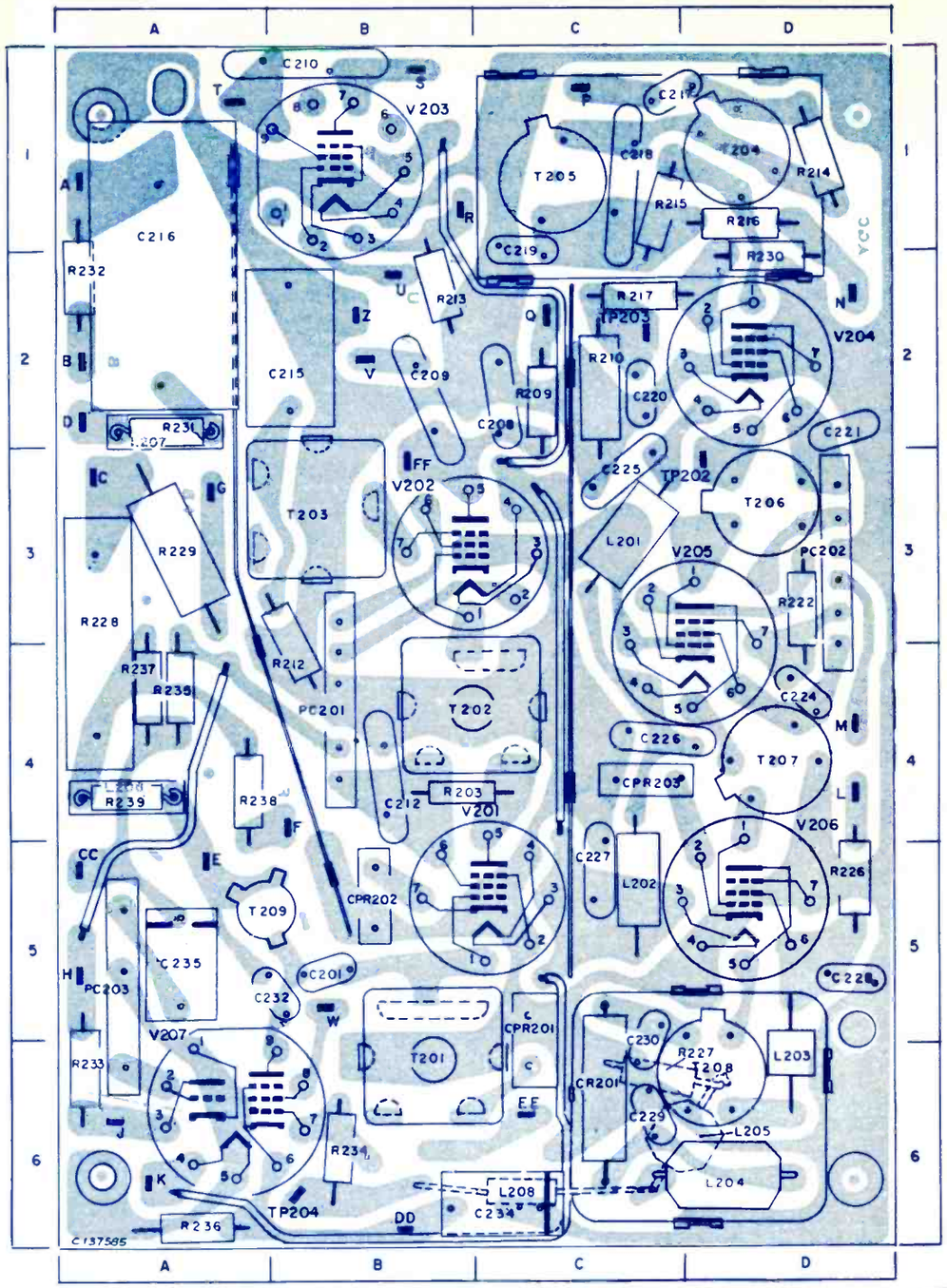


PW500 SECURITY SEALED CIRCUIT ASSEMBLY



C501 . . . . C4	C508 . . . . C2	C515 . . . . B4	CPR502 . . E3	PC503 . . . . D2	R505 . . . . C4	R518 . . . . A3	R534 . . . . B1
C502 . . . . A1	C510 . . . . A4	C517 . . . . B2			R512 . . . . D3	R519 . . . . A2	R537 . . . . E4
C503 . . . . A1	C511 . . . . A2	C518 . . . . C1	L501 . . . . A4	R501 . . . . D4	R514 . . . . B1	R520 . . . . C3	R539 . . . . D1
C504 . . . . C3	C512 . . . . A3	C519 . . . . B1		R502 . . . . D3	R515 . . . . B3	R521 . . . . D3	R541 . . . . C1
C505 . . . . E3	C513 . . . . A2	C520 . . . . C1	PC501 . . . D1	R503 . . . . D4	R516 . . . . B2	R525 . . . . C2	R542 . . . . B2
C506 . . . . D3	C514 . . . . A4	C521 . . . . E2	PC502 . . . C3	R504 . . . . C4	R517 . . . . A3	R526 . . . . A3	

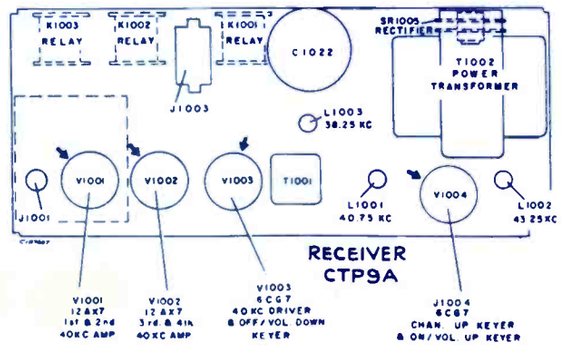


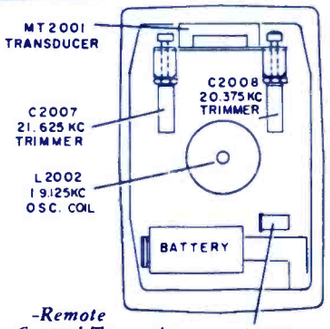
PW200 COMPONENT LOCATION GUIDE

C201 . . . . B5	C232 . . . . B5	R203 . . . . B4	R237, R238,
C208 . . . . C2	C234 . . . . C6	R209 . . . . C2	R239 . . . . A4
C209 . . . . B2	C235 . . . . A5	R210 . . . . C2	R243 . . . . B2
C210 . . . . B1	C238 . . . . D3	R212 . . . . B3	
C212 . . . . B4	C239 . . . . A6	R213 . . . . B2	T201 . . . . B6
C215 . . . . B2		R214 . . . . D1	T202 . . . . C4
C216 . . . . A1	CPR201 . . C5	R215 . . . . C1	T203 . . . . B3
C217 . . . . C1	CPR202 . . B5	R216 . . . . D1	T204 . . . . D1
C218 . . . . C1	CPR203 . . C4	R217 . . . . C2	T205 . . . . C1
C219 . . . . C1		R222 . . . . D3	T206 . . . . D3
C220 . . . . C2	CR201 . . . C6	R226 . . . . D5	T207 . . . . D4
C221 . . . . D2		R227 . . . . C6	T208 . . . . D6
C224 . . . . D4	L201 . . . . C3	R228 . . . . A4	T209 . . . . A5
C225 . . . . C3	L202 . . . . C5	R229 . . . . A3	
C226 . . . . C4	L203 . . . . D6	R230 . . . . D1	
C227 . . . . C5	L204 . . . . D6	R231 . . . . A2	
C228 . . . . D5	L205 . . . . D6	R232 . . . . A2	
C229 . . . . C6	L206 . . . . A4	R234 . . . . B6	
C230 . . . . C5	L207 . . . . A2	R235 . . . . A4	
C232 . . . . B5	L208 . . . . C6	R236 . . . . A6	
C234 . . . . C6		R237, R238,	
C235 . . . . A5	PC201 . . B4	R239 . . . . A4	
C238 . . . . D3	PC202 . . D3	R243 . . . . B2	
C239 . . . . A6	PC203 . . A5		
	R203 . . . . B4	T201 . . . . B6	
CPR201 . . C5	R209 . . . . C2	T202 . . . . C4	
CPR202 . . B5	R210 . . . . C2	T203 . . . . B3	
CPR203 . . C4	R212 . . . . B3	T204 . . . . D1	
	R213 . . . . B2	T205 . . . . C1	
CR201 . . . C6	R214 . . . . D1	T206 . . . . D3	
	R215 . . . . C1	T207 . . . . D4	
L201 . . . . C3	R216 . . . . D1	T208 . . . . D6	
L202 . . . . C5	R217 . . . . C2	T209 . . . . A5	
L203 . . . . D6	R222 . . . . D3		
L204 . . . . D6	R226 . . . . D5		
L205 . . . . D6	R227 . . . . C6		
L206 . . . . A4	R228 . . . . A4		
L207 . . . . A2	R229 . . . . A3		
L208 . . . . C6	R230 . . . . D1		
	R231 . . . . A2		
PC201 . . B4	R232 . . . . A2		
PC202 . . D3	R234 . . . . B6		
PC203 . . A5	R235 . . . . A4		
	R236 . . . . A6		

RCA
TV Chassis 128A, B, C, E, F, H, J, M, U, AA, AB

Electronic Technician
CIRCUIT DIGEST





-Remote Control Transmitter Chassis—CRK3B (3 Button)

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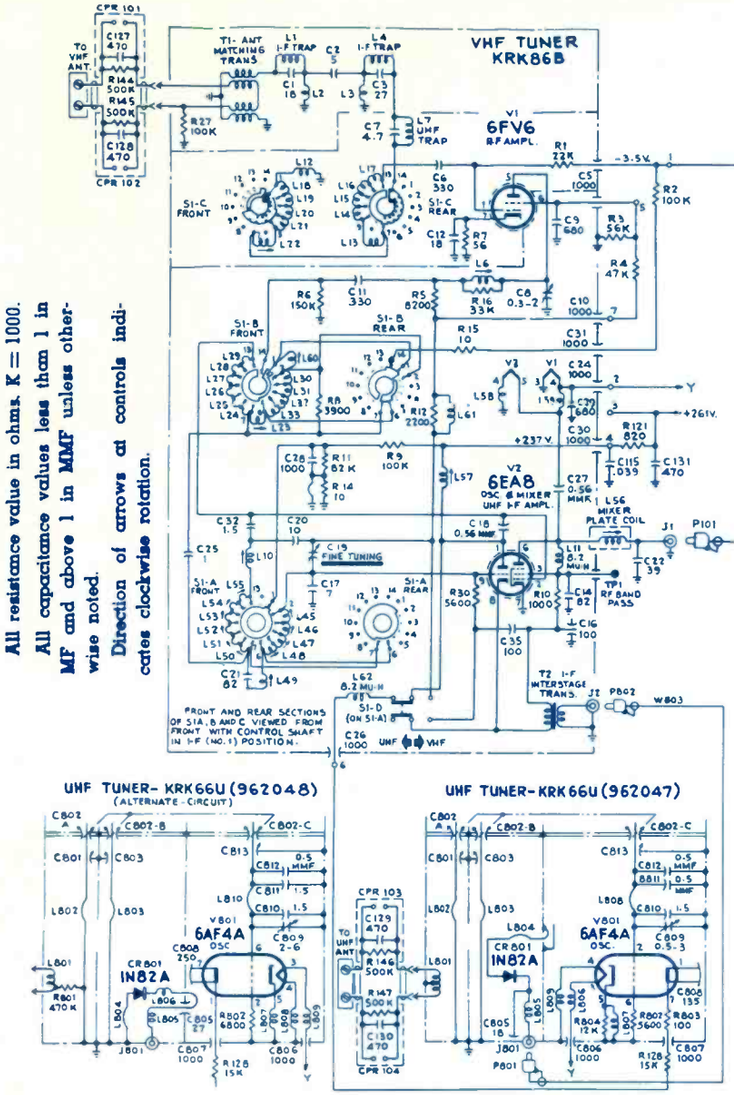
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

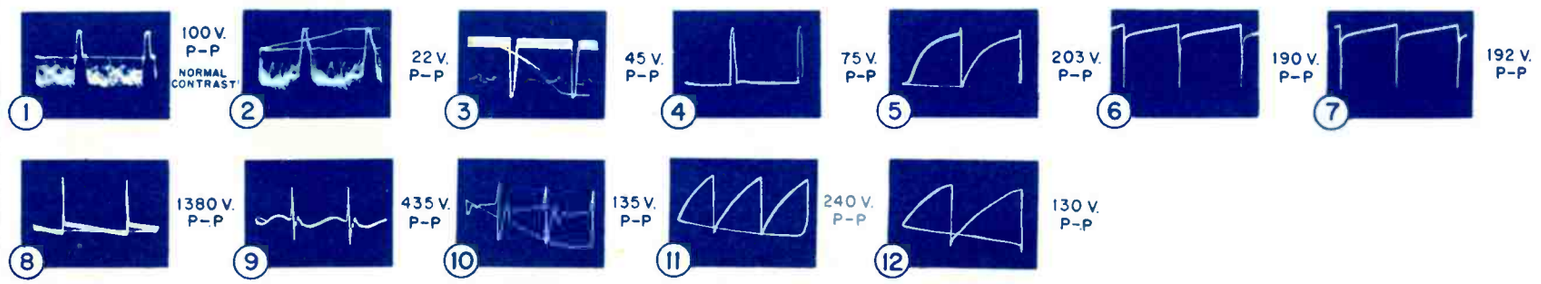
RCA
TV Chassis KCS126A & B

Models 170-P-048, 170-P-049, 170-P-060,
170-P-061, 170-P-063, 170-P-064;
170-P-048U, 170-P-049U,
170-P-060U, 170-P-061U,
170-P-063U, 170-P-064U

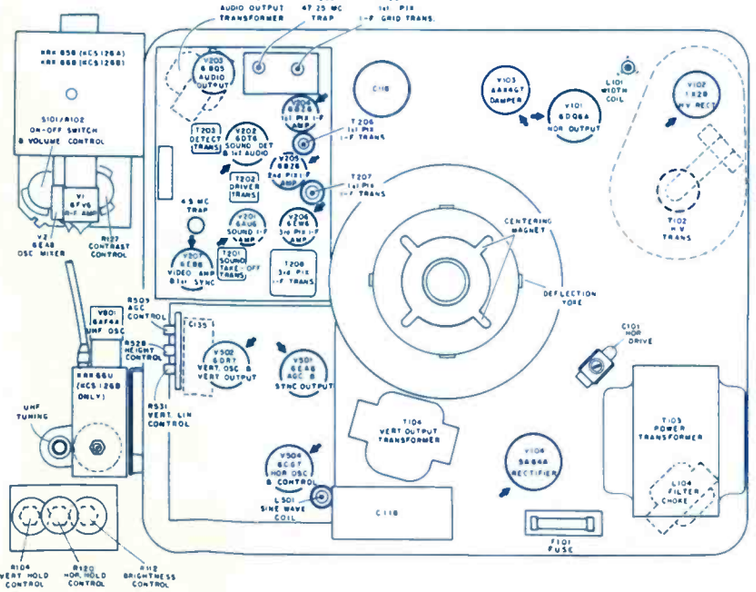
All resistance value in ohms. K = 1000.
All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.
Direction of arrows at controls indicates clockwise rotation.



*Measured with 1 megohm, ½ watt resistor in series with meter probe.



Balloons ① ② etc., indicate points of observation of waveforms



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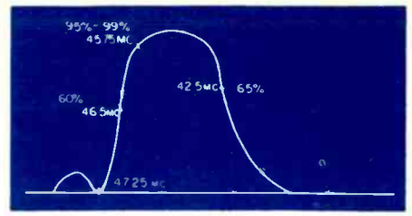
RCA, Canada
TV Chassis CT2138

Models 21T351, 21TC290, 292

Model 21TC290 "The Lockwood"
CT2138B



ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

SYLVANIA
TV Chassis 1-541, 1-547, 1-548, 1-549, 1-550

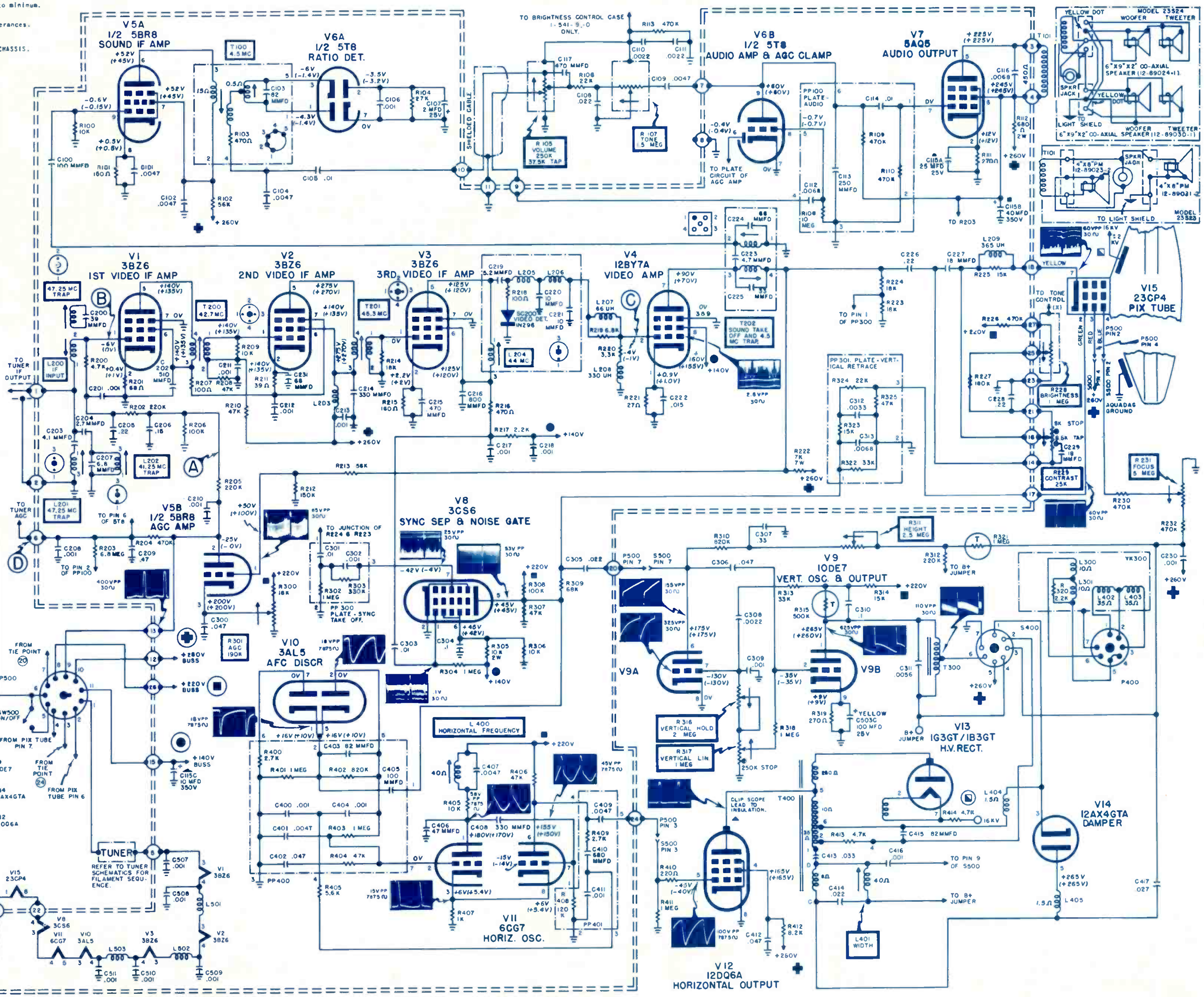
Models 23S23, 23S24

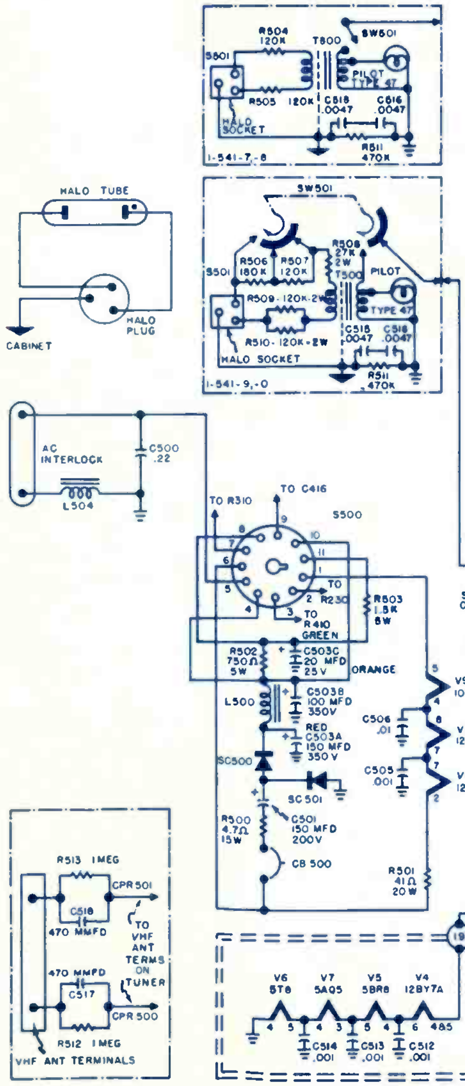
VOLTAGE MEASUREMENT CONDITIONS UNLESS OTHERWISE SPECIFIED.

1. Voltages measured to chassis using VTVM.
2. AC power source 117V. 60 cycle line.
3. Voltage readings in brackets taken with no signal input: channel selector set to a free channel. Antenna disconnected. Antenna terminals shorted together and grounded to chassis.
4. Voltage readings not in brackets taken with a strong signal input: tuner set to strong local station developing approximately 6 volts on IF AGC Buss test point (A) (junction of R205 and R206).
5. Contrast control set to maximum. Brightness control set to minimum.
6. Voltage values shown are average readings. Variations may be observed due to normal production tolerances.

USE POWER LINE ISOLATION TRANSFORMER WHEN SERVICING THE CHASSIS.

MODEL 23S23





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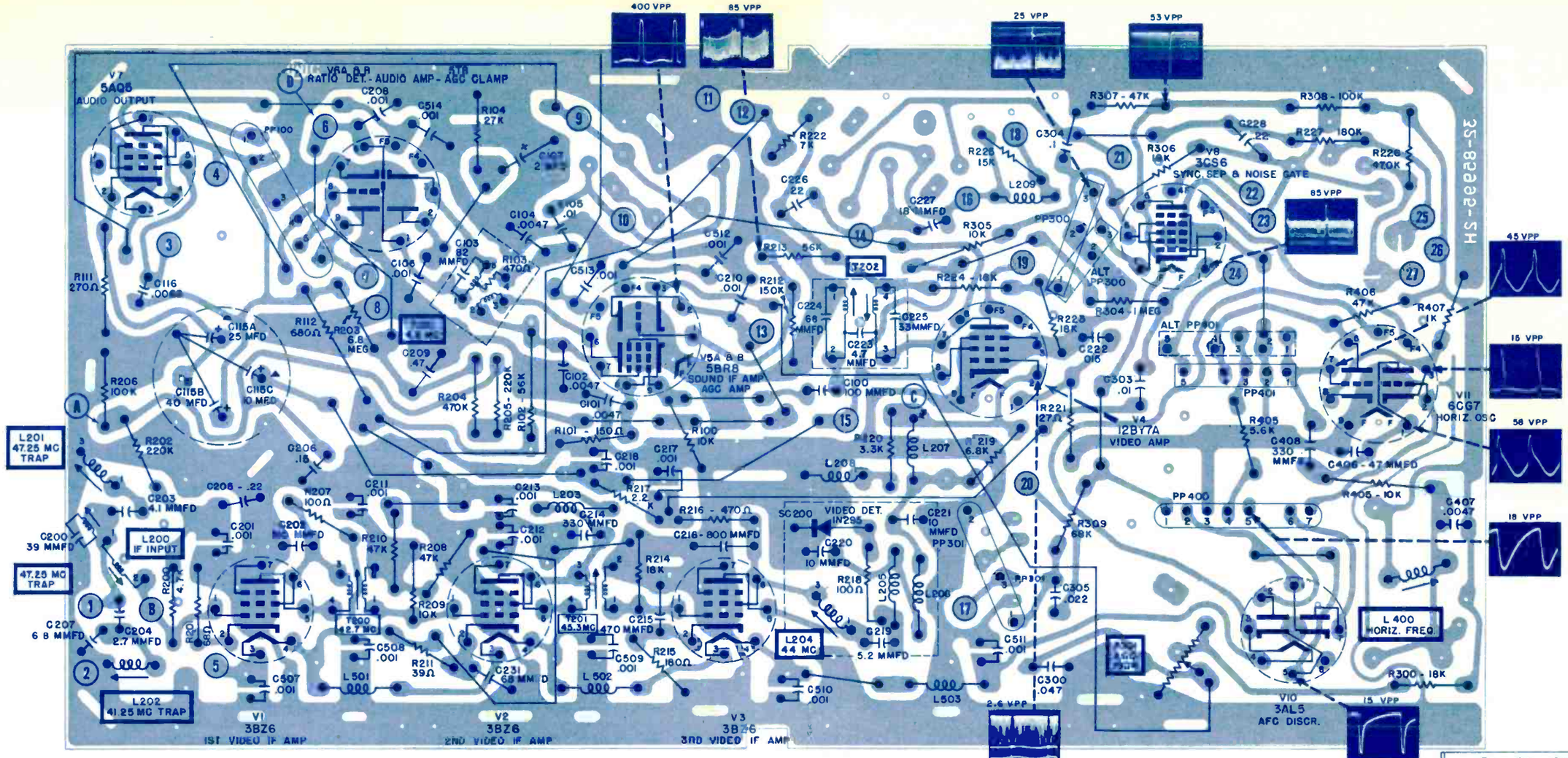
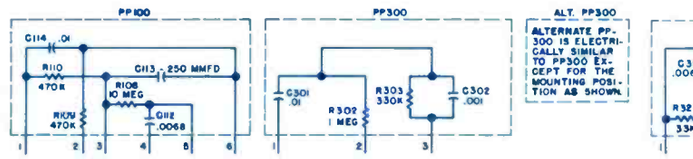
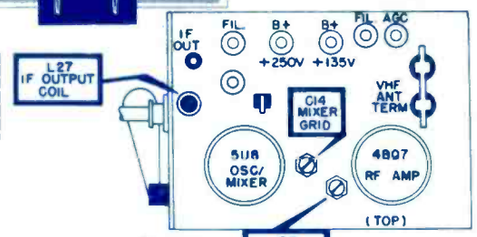
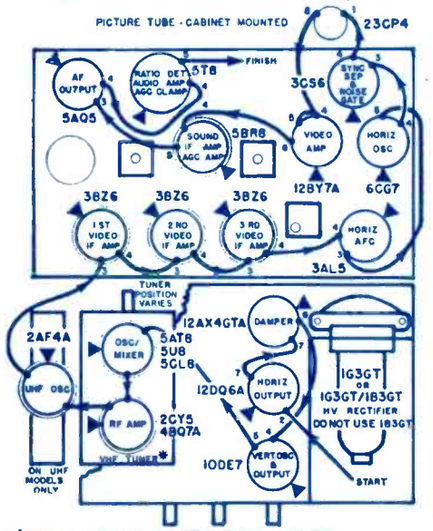
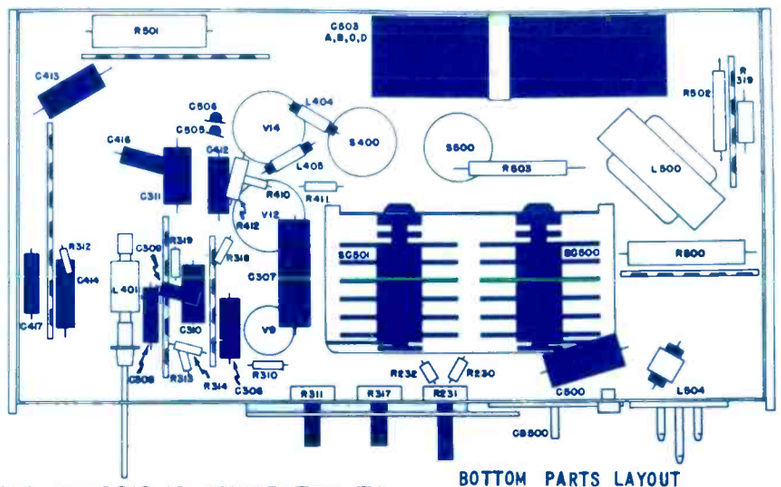




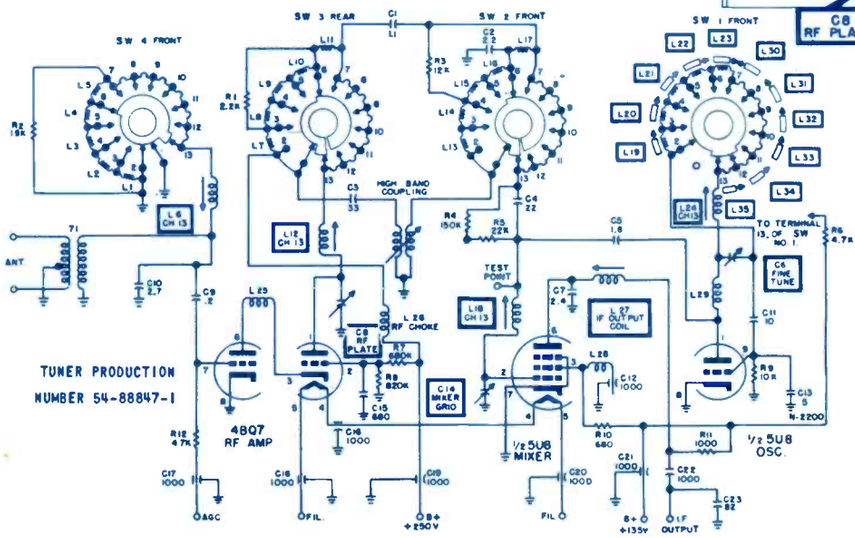


TUBE LAYOUT AND FILAMENT SEQUENCE



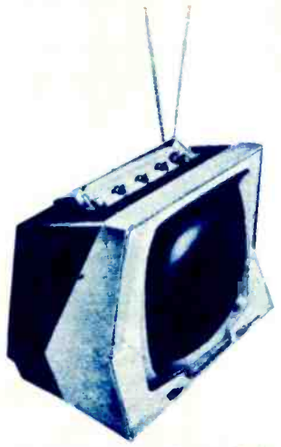


THIS CHASSIS IS CONNECTED TO ONE SIDE OF THE AC LINE.



ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

SYLVANIA
TV Chassis 1-543-1-2



Models 17D203, 17D303 Series

VOLTAGE MEASUREMENT CONDITIONS UNLESS OTHERWISE SPECIFIED:

1. Voltage measured to chassis using Sylvania Polymeter (VTVM).
2. AC power source 117V. 60 cycle line.
3. Voltage readings in brackets taken with no signal input; channel selector set to free channel. Antenna disconnected. Antenna terminals shorted together and grounded to chassis.
4. Voltage readings not in brackets taken with a strong signal input; tuner set to strong local station developing approximately -20V. on IF AGC bus (junction of R-203 & R-205).
5. Contrast control set to maximum. Brightness control set to minimum.
6. Voltage values shown are average readings. Variations may be observed due to normal production tolerances.

SPECIAL VOLTAGE MEASUREMENT CONDITIONS:

Picture tube anode voltage measured with VTVM high voltage probe at line voltage of 117V. under conditions of normal signal. No brightness and correct scan size.

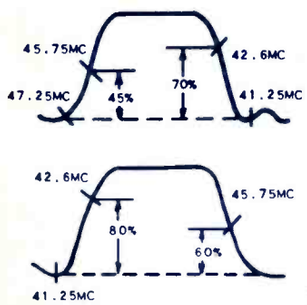
▲ High peak voltage of short duration may damage meter used for this measurement.

WAVEFORM MEASUREMENT CONDITIONS:

1. Channel selector set to strong channel.
2. Contrast control set for signal of 60V. PP at yellow lead of picture tube.
3. Waveforms measured with respect to chassis using Sylvania type 605 oscilloscope. (Other type oscilloscopes may alter waveform shapes or amplitudes).
4. The terms "30V~" or "7875~" refer to scope sweep frequency used.

GENERAL SCHEMATIC NOTES

1. Voltage sources are indicated by encircled symbols; corresponding symbols without circles indicate voltage tie points. Actual output of +160V. supply may vary from 130V. to +180V. depending on incoming signal strength.
2. Average resistances of coils and transformers are shown and are measured with component connected in circuit.
3. Encircled numbers on edge of printed circuit indicate tie points corresponding with those shown on parts layout of top board.
4. All capacitors are rated in microfarads unless otherwise specified.
5. Coil and transformer terminal views are shown as seen from bottom.
6. Arrows on controls indicate direction of clockwise rotation.



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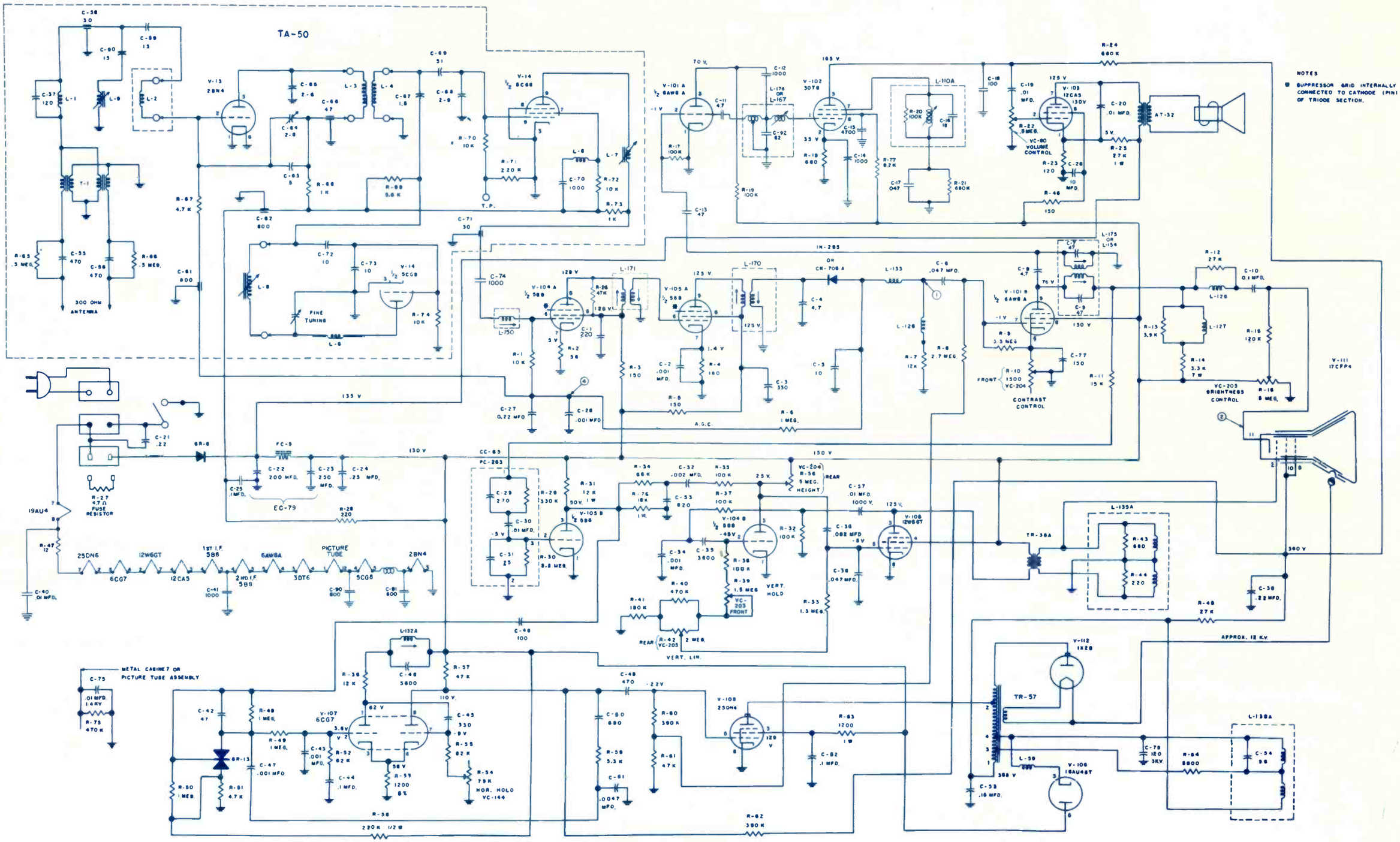
TRAV-LER
TV Chassis 1150-59



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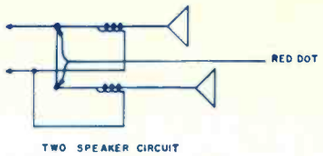
TRAVLER
Chassis 1051-19



TA-51 TUNER

NOTE:
* REFER TO YOKE PLUG AND SOCKET PIN NO'S.

VOLTAGE MEASUREMENT CONDITIONS
1. LINE VOLTAGE: 117 VOLTS AC.
2. DC VOLTAGES MEASURED WITH A VTVM FROM CHASSIS TO SOCKET TERMINALS.
3. ANTENNA REMOVED AND TERMINALS SHORTED TOGETHER.
4. SET THE TUNER ON AN UNUSED CHANNEL.
5. SET CONTRAST CONTROL FULLY CLOCKWISE WITH THE RANGE AND A.G.C CONTROLS SET FULLY COUNTERCLOCKWISE.

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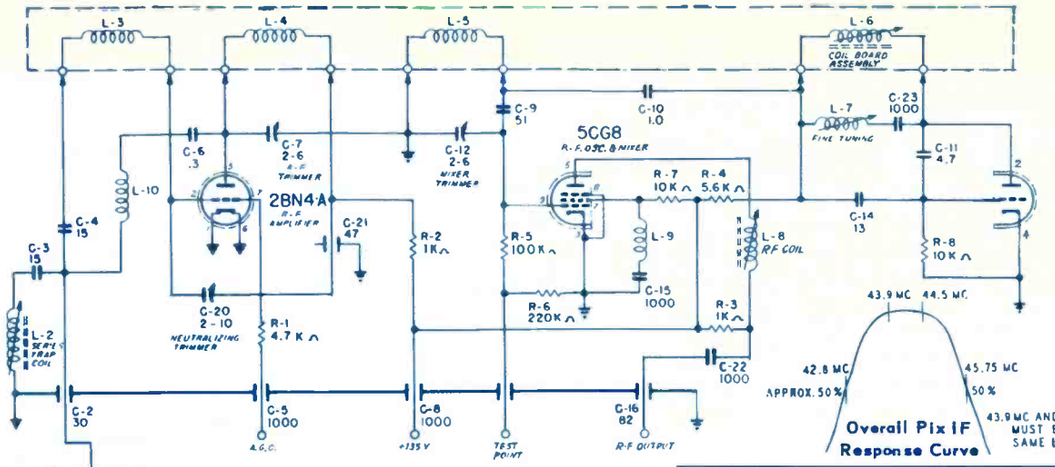
TRUETONE
TV Chassis 2DC3030A

25A1179 TUNER ALIGNMENT STANDARD COIL PART NO. FDNS-107



SCHEMATIC IS DIVIDED INTO FOUR SECTIONS WITH EACH SECTION HAVING ITS OWN SERIES OF REFERENCE NUMBERS.

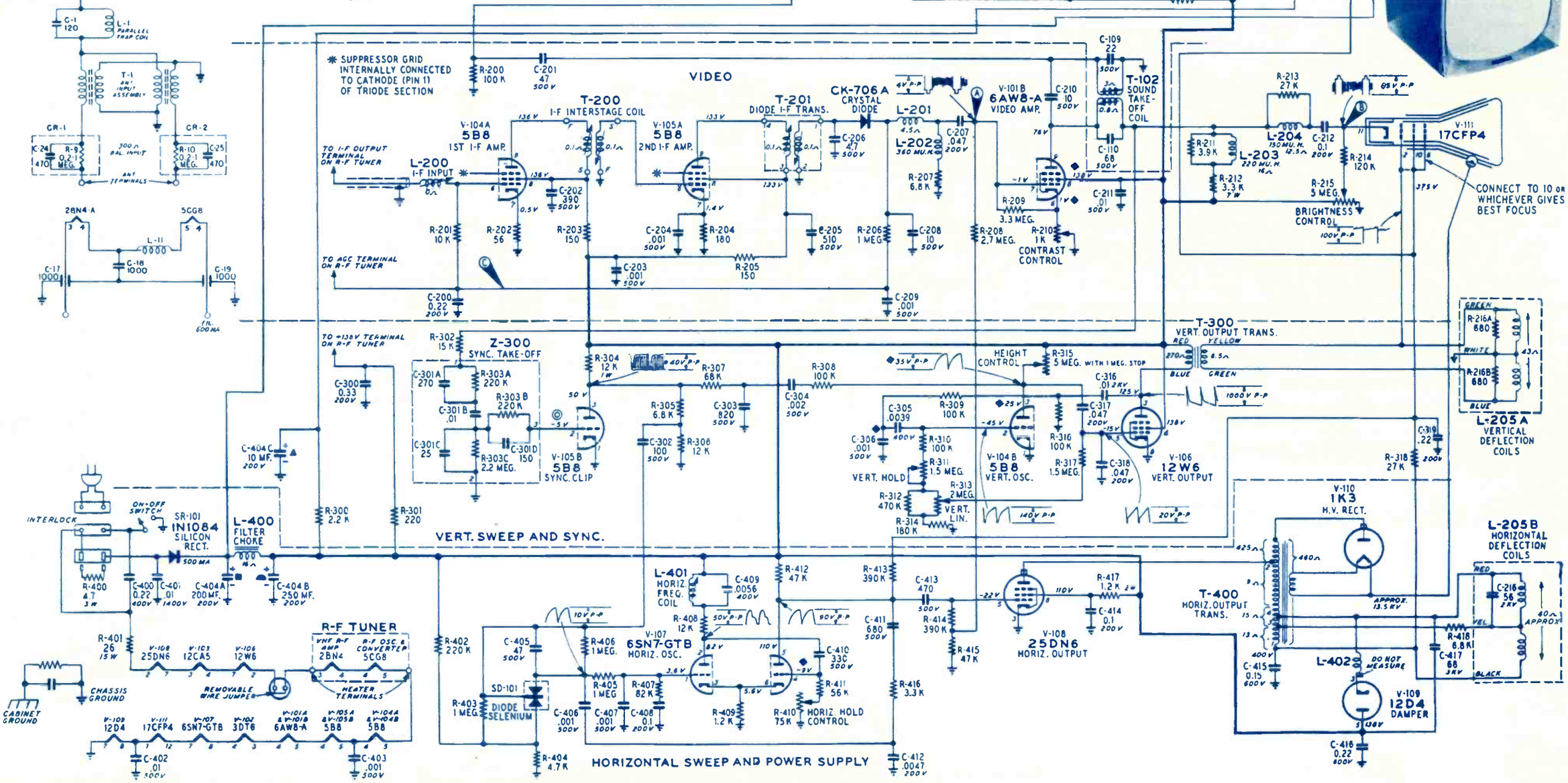
ALL CAPACITANCE VALUES LESS THAN 1.0 IN MMF. AND ABOVE 1.0 IN MF UNLESS OTHERWISE NOTED.

◆ VARIES WITH SETTING OF THE ASSOCIATED CONTROLS.

ALL RESISTANCE VALUES IN OHMS AND ½ WATT UNLESS OTHERWISE NOTED. K=1000

▲ ■ ● INDICATES MULTIPLE SECTION CAPACITOR.

◎ VOLTAGE VARIES WITH SIGNAL LEVEL.



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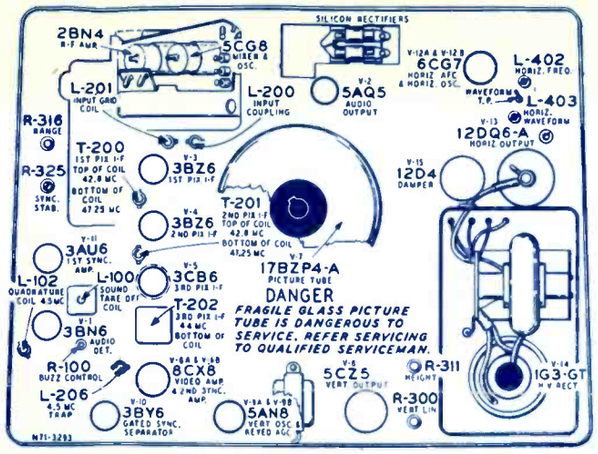
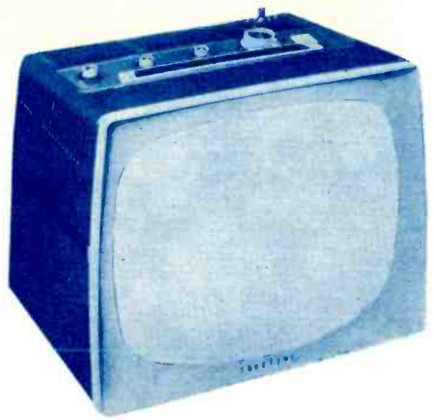


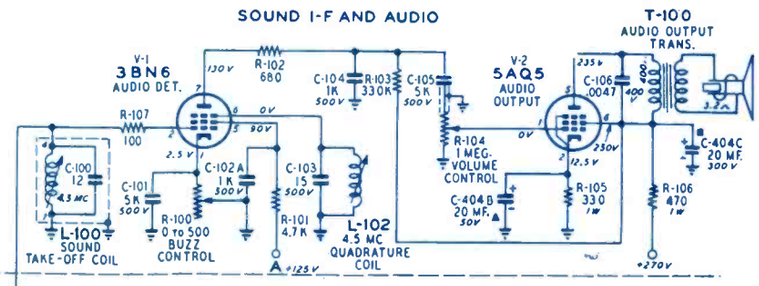
Chassis Tube Layout & Trimmer

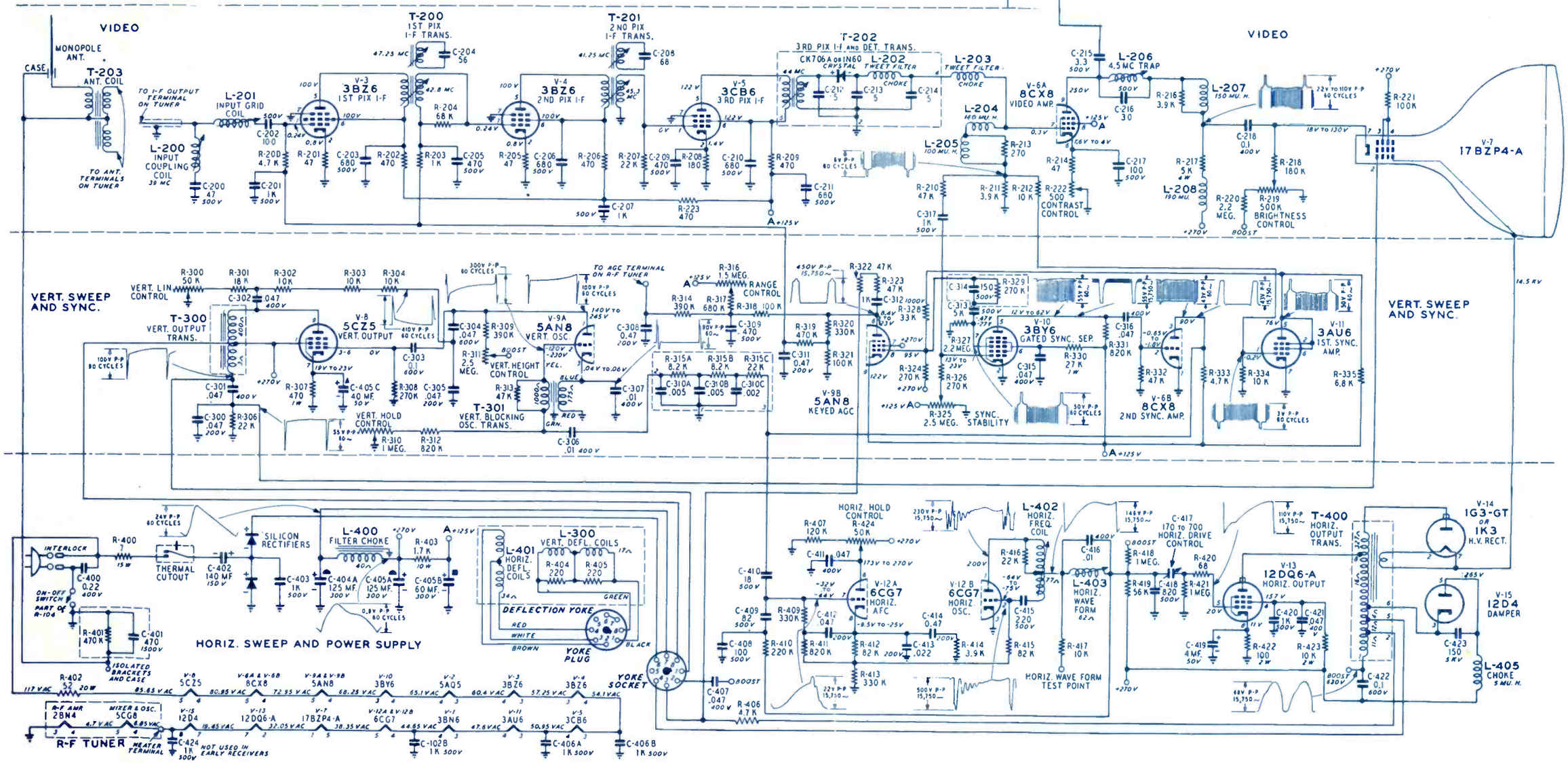


All resistance values in OHMS and 1/2 watt unless otherwise specified.

All capacitance values less than 1.0 in MF. and above 1.0 in MMF. unless otherwise noted.

Coil resistance values less than 1.0 OHM are not shown.



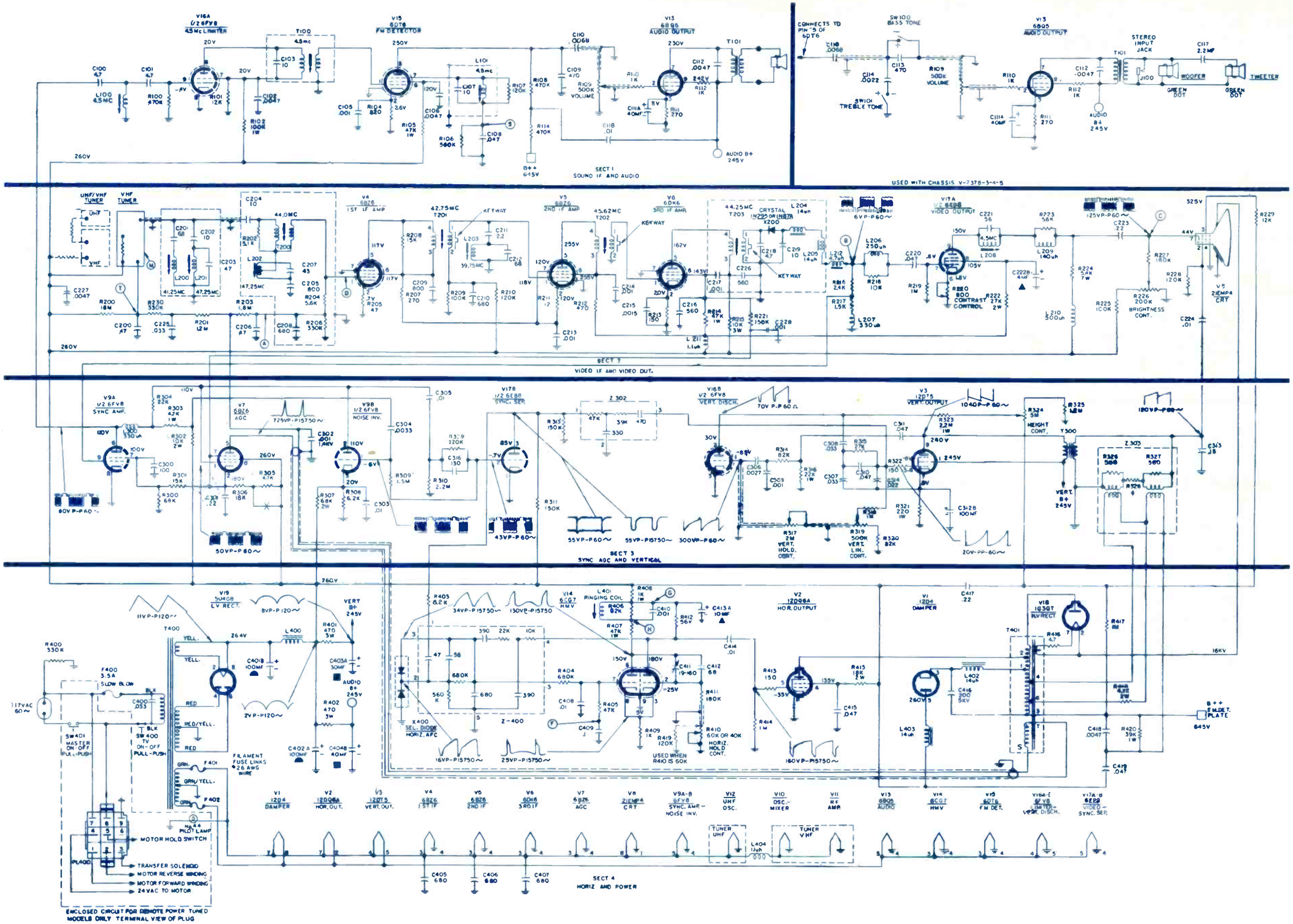


TEST POINTS

(A)	AGC for IF	(D)	1st IF input	(G) }	Ringing coil	(S)	Quad coil
(B)	Video detector	(F)	Horiz. MV	(H) }		(T)	AGC for tuner
(C)	CRT cathode						

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

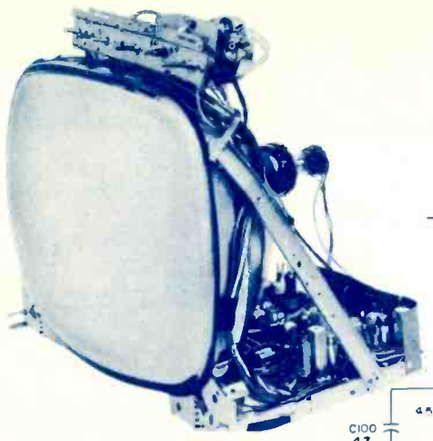
WESTINGHOUSE
TV Chassis
V-2378-1&3

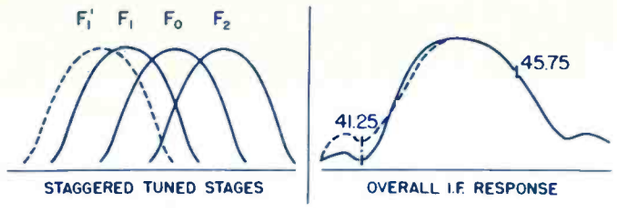


ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

WESTINGHOUSE
TV Chassis V2375-1, -2

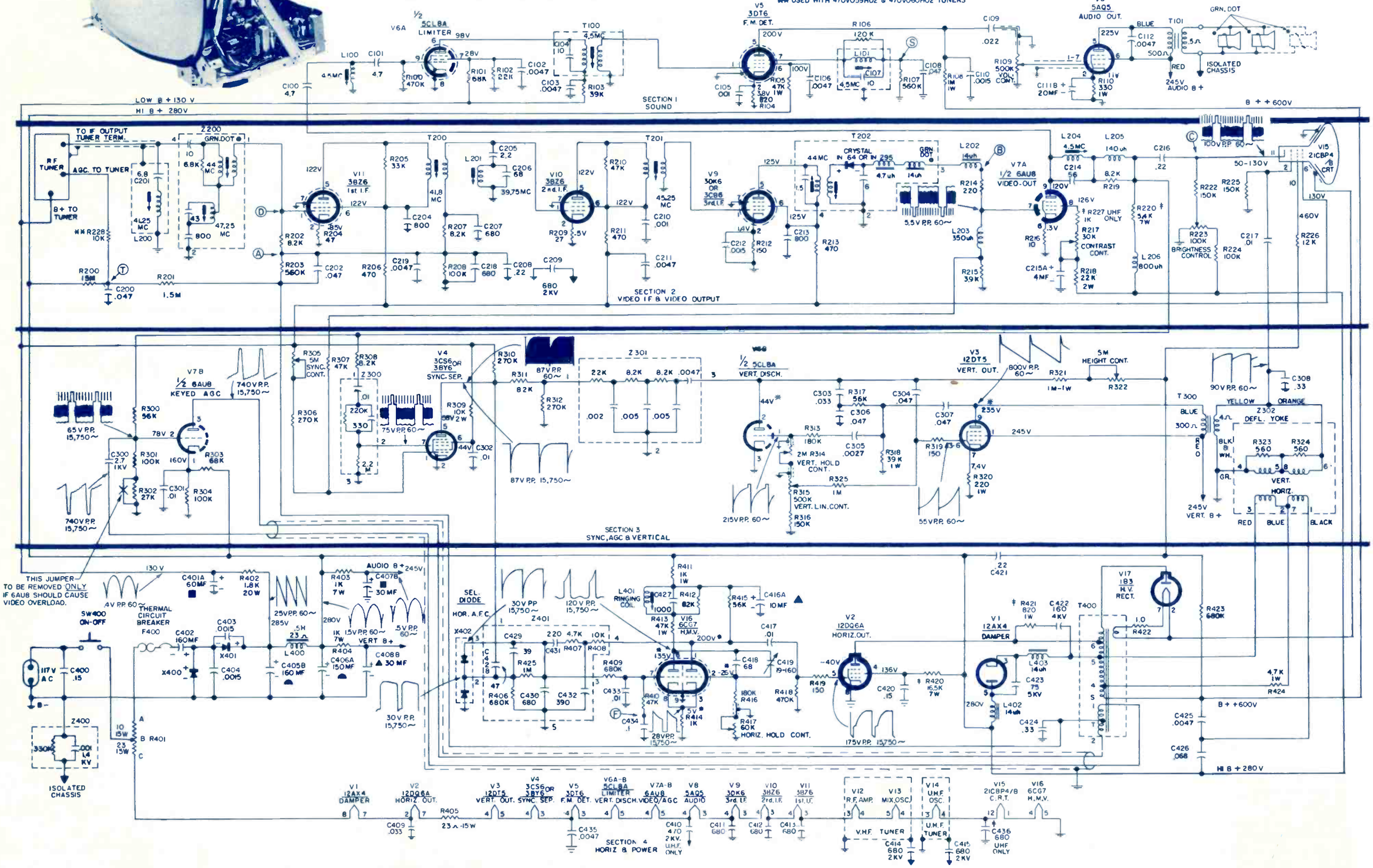
Models H21K272, 273, 274, 275, 276
H21KU272, 273, 274, 275, 276





Shifting IF curves showing theory of operation.

D.C. VOLTAGES MEASURED FROM B-, NO APPLIED SIGNAL, USING V.T.V.M.
ALL PEAK TO PEAK WAVE FORMS TAKEN WITH CONTROLS ADJUSTED FOR 100 V P-P AT TEST POINT C.
* INDICATES VOLTAGE FOR NORMAL PICTURE
** USED WITH 470V059H02 & 470V060H02 TUNERS



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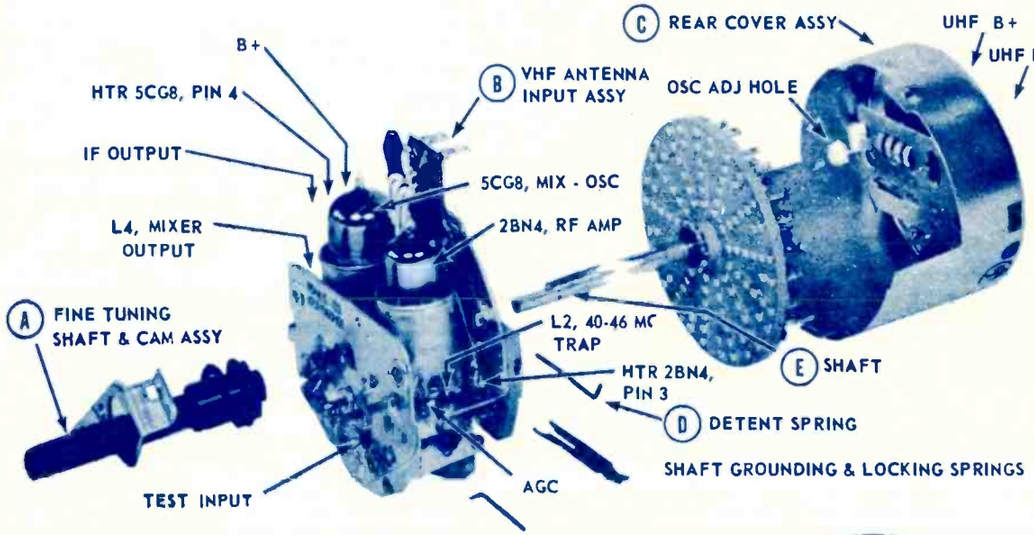
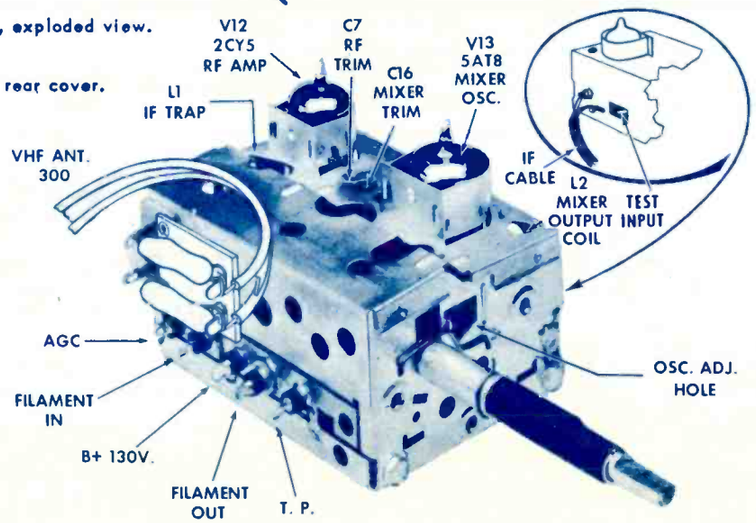


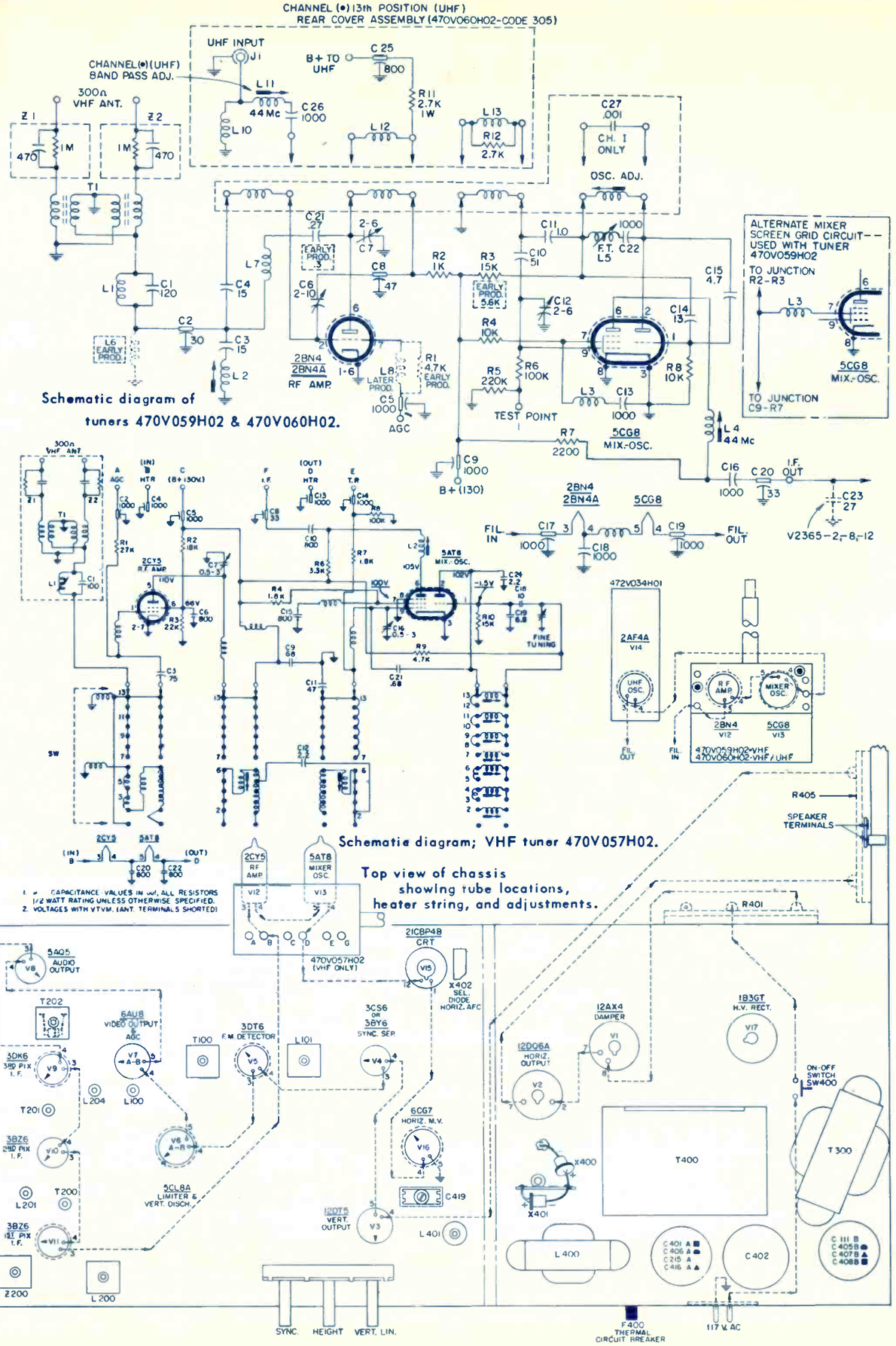
470V060H02 tuner, exploded view.
470V059H02 same
except for rear cover.



More Data on Reverse Side

VHF tuner
470V057H02
(Mark VI).

WESTINGHOUSE
TV-Chassis V2375-1, -2
Electronic-Technician
CIRCUIT DIGEST



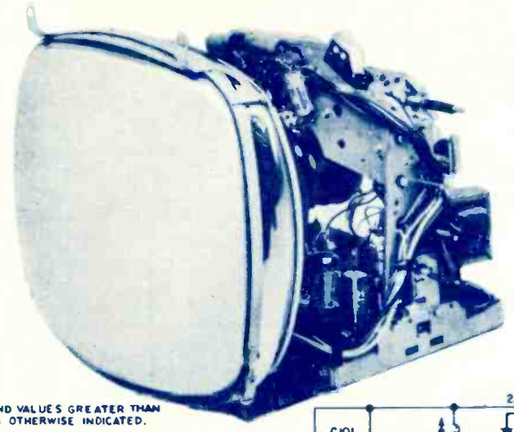
Schematic diagram of
tuners 470V059H02 & 470V060H02.

Schematic diagram; VHF tuner 470V057H02.

Top view of chassis
showing tube locations,
heater string, and adjustments.

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

WESTINGHOUSE
TV Chassis
V2365-11, V2365-12



Models H-17C287, 288, 289, 290, 291;
H-17CU287, 288, 289, 290, 291

NOTES:

1. DC VOLTAGES MEASURED WITH VTVM FROM POINTS INDICATED TO B- ANT. TERMINALS SHORTED.
2. PEAK TO PEAK WAVE FORMS WERE TAKEN WITH CONTRAST CONT. SET FOR A 2.5 VOLT PEAK TO PEAK SIGNAL AT THE CRT CATHODE. ALL OTHER CONTROLS SET FOR NORMAL PICTURES.
3. ALL CAPACITANCE VALUES LESS THAN 1 ARE IN MFD AND VALUES GREATER THAN 1 ARE IN MMFD, WHILE ALL RESISTORS ARE 1/2 W UNLESS OTHERWISE INDICATED.
4. # INDICATES VOLTAGES TAKEN WITH PICTURE ADJUSTED FOR NORMAL RASTER.
5. TV PHONO SWITCH ACTUATED BY PICTURE CONTROL. (R219)
6. TV PHONO SWITCH SHOWN IN TV POSITION.
7. A MONAURAL CARTRIDGE IS NORMALLY SUPPLIED; THE STEREO CARTRIDGE WILL BE A FIELD INSTALLATION.
8. ON CHASSIS V2365-11-12 USE 17CFP4 CRT & ON CHASSIS V2365-13-14 USE 17AVP4A CRT.
9. C 228: 18 MMF WITH 470V057H02 & 470V058H02 TUNERS.
   27 MMF WITH 470V059H02 & 470V060H02 TUNERS.

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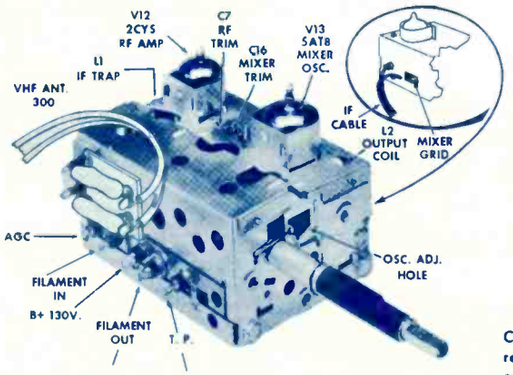
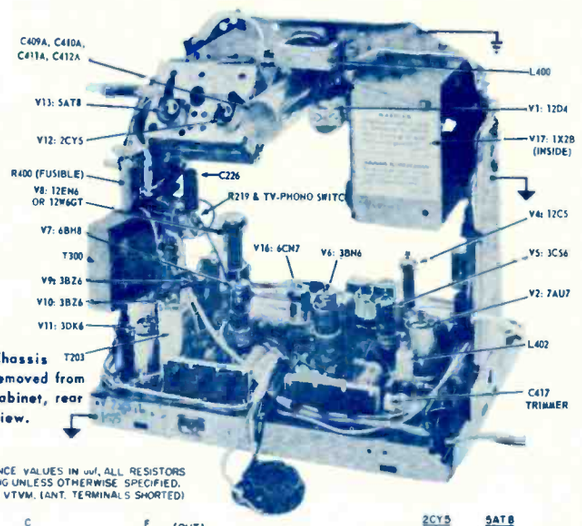
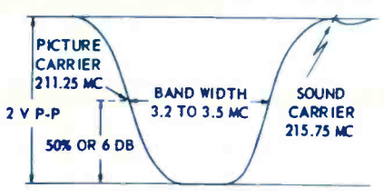
More Data on Reverse Side



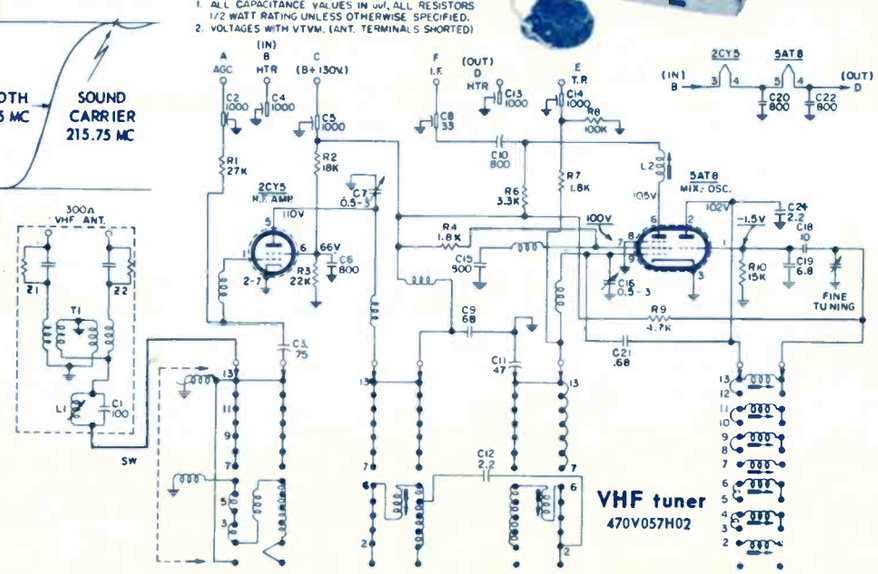
VHF tuner 470V057H02 (Mark VI)



Chassis removed from cabinet, rear view.



Overall response.



VHF tuner 470V057H02

WESTINGHOUSE
TV Chassis
V2365-11, V2365-12
Electronic Technician
CIRCUIT DIGEST

WESTINGHOUSE
TV Chassis V-2378-1 through 6
Electronic Technician
CIRCUIT DIGEST

NOTES
1. DC VOLTAGES MEASURED FROM CHASSIS GROUND; NO APPLIED SIGNAL USING A VTVM.
2. ALL PEAK TO PEAK WAVEFORMS AND DC VOLTAGES TAKEN WITH ALL CONTROLS SET FOR NORMAL PICTURE.
3. ALL CAPACITANCE VALUES LESS THAN 1 ARE IN MFD AND VALUES GREATER THAN 1 ARE MMFD. ALL RESISTANCE VALUES ARE IN OHMS ½ WATT UNLESS OTHERWISE INDICATED.
* 8 OHMS COLD | OHM HOT

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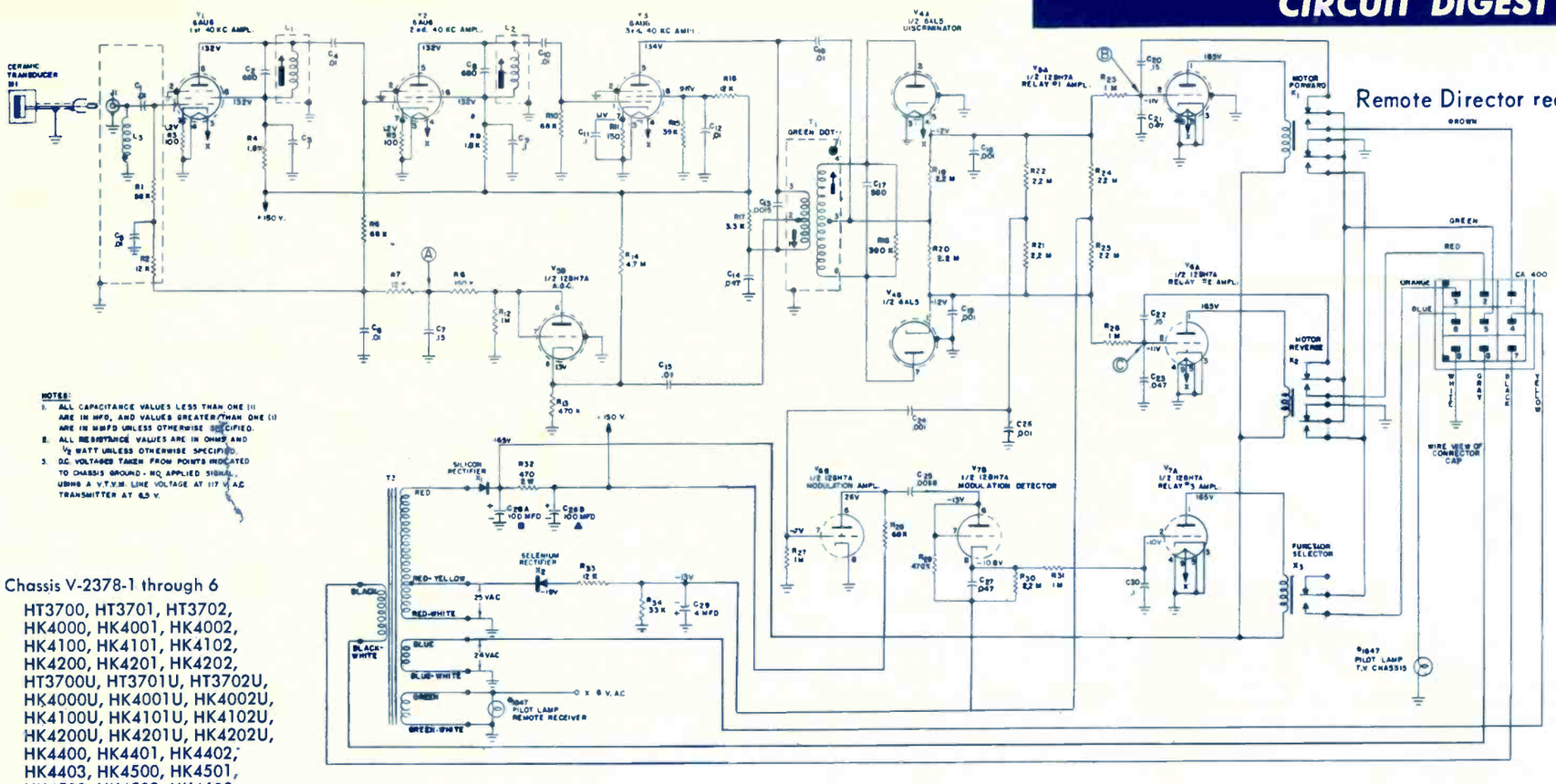
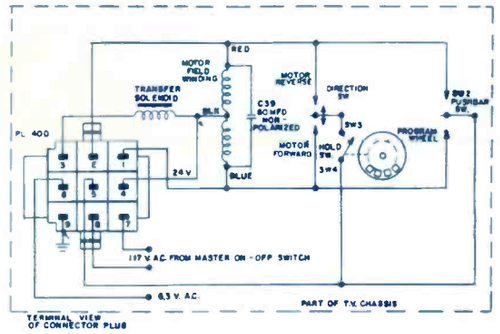


NOTES:
1. ALL CAPACITANCE VALUES LESS THAN ONE (1) ARE IN MFD, AND VALUES GREATER THAN ONE (1) ARE IN MMFD UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTANCE VALUES ARE IN OHMS AND ½ WATT UNLESS OTHERWISE SPECIFIED.
3. D.C. VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND - NO APPLIED SIGNAL; USING A V.T.V.M. LINE VOLTAGE AT 117 V. A.C. TRANSMITTER AT 6.3 V.

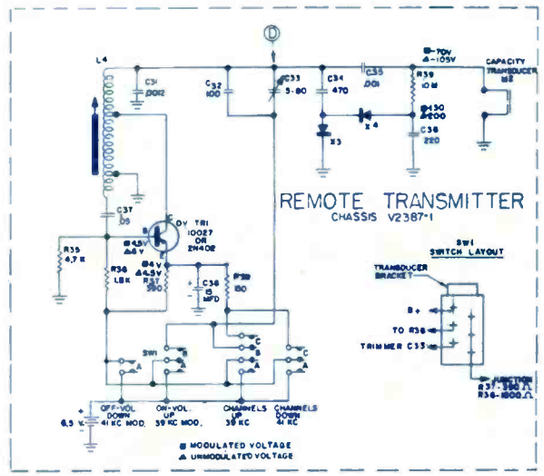
TV Chassis V-2378-1 through 6

HT3700, HT3701, HT3702,
HK4000, HK4001, HK4002,
HK4100, HK4101, HK4102,
HK4200, HK4201, HK4202,
HT3700U, HT3701U, HT3702U,
HK4000U, HK4001U, HK4002U,
HK4100U, HK4101U, HK4102U,
HK4200U, HK4201U, HK4202U,
HK4400, HK4401, HK4402,
HK4403, HK4500, HK4501,
HK4502, HK4503, HK4600,
HK4601, HK4602

Remote Director receiver (V-2386) and transmitter (V-2387).



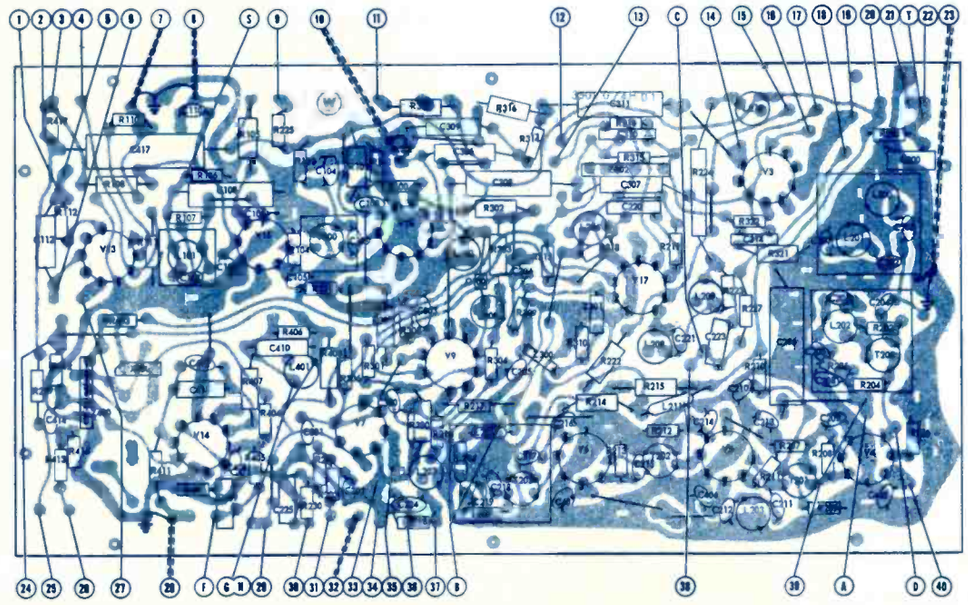
TERMINAL VIEW OF CONNECTOR PLUG



KEY TO FIGURE

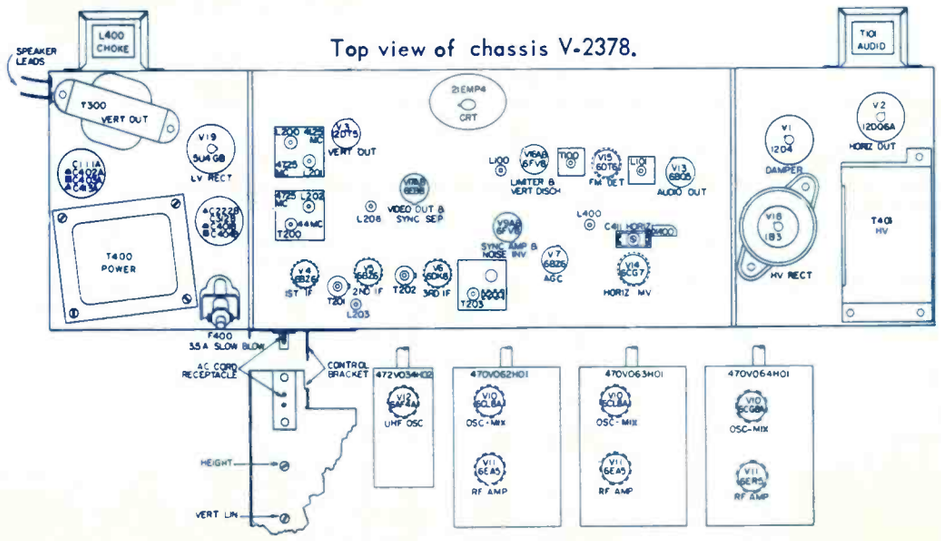
The leads identified by letters and numbers in Figure 1 connect to the following points:

1. T101 primary, connect to red wire
2. High side of HEIGHT CONTROL
3. Junction of C416 & C418
4. C111A
5. Junction of C404B & R402
6. T101 primary, connect to blue wire
7. Wiper arm of VOLUME control
8. High side of VOLUME control
9. High side of BRIGHTNESS control
10. High side of VERTICAL HOLD control
11. Arm of HEIGHT control
12. High side & wiper arm of CONTRAST control
13. Wiper arm of VERTICAL LINEARITY control
14. T300 primary, connect to plate of V3
15. C222B
16. Junction C403A & R401
17. C312B
18. Wiper arm of BRIGHTNESS control
19. Tuner filament point
20. C420A
21. Jumper to 30
22. Tuner AGC point
23. Tuner IF output point
24. C413A
25. Pin 3 of CRT
26. Pin 5 of V2
27. Pin 8 of V1
28. High side of HORIZONTAL HOLD control
29. Junction R415 and L403
30. Jumper to 21
31. Jumper to 39
32. T401, terminals T and S
33. Pin 4 of CRT
34. Pin 1 of CRT
35. Pin 8 of CRT
36. T300 secondary, connect to yellow wire
37. Pin 2 of CRT
38. Pin 7 of CRT
39. Jumper to 31
40. Junction of green filament wire from T400 and brown wire



Bottom view of See-matic PC board.

Top view of chassis V-2378.



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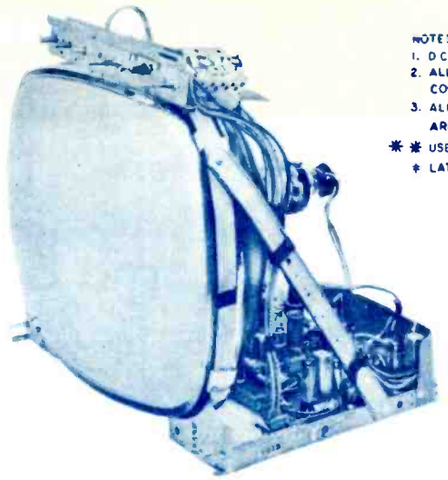
More Data on Reverse Side

WESTINGHOUSE
TV Chassis V2374-1, V2374-2



NOTES:
1. D.C. VOLTAGES MEASURED FROM B-, NO APPLIED SIGNAL, USING A VTVM.
2. ALL PEAK TO PEAK WAVEFORMS AND D.C. VOLTAGES (*) TAKEN WITH ALL CONTROLS SET FOR NORMAL PICTURE.
3. ALL CAPACITANCE VALUES LESS THAN 1 ARE IN MFD AND VALUES GREATER THAN 1 ARE IN MMFD, WHILE ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.

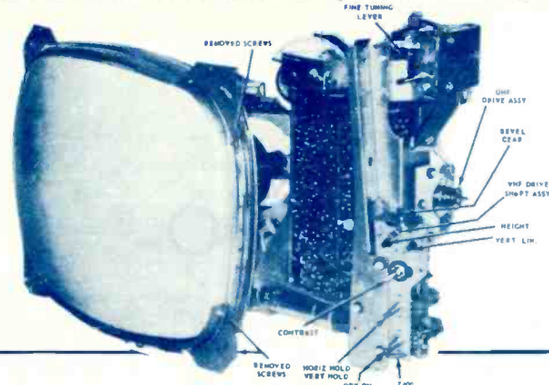
* * USED WITH TUNERS 470V059H02 AND 470V060H02.

* LATER PRODUCTION

Always use an isolation transformer between the power source and the receiver line input when servicing. After receiver repair, check resistance between the B– side of the receiver and the control mounting bracket (line cord disconnected). A resistance of less than 300,000 ohms indicates a short circuit (or leakage) to metal parts which are accessible. Remove the cause of leakage before the set is released.

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

WESTINGHOUSE
TV Chassis V-2384-1, 2384-2



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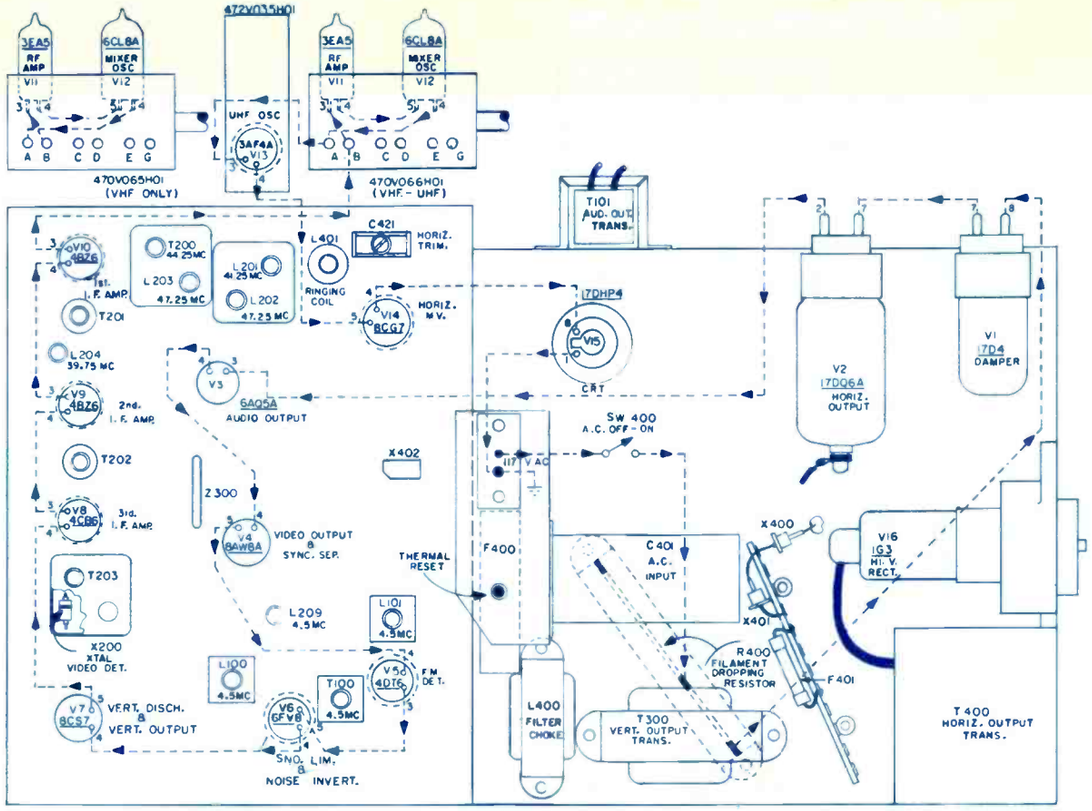
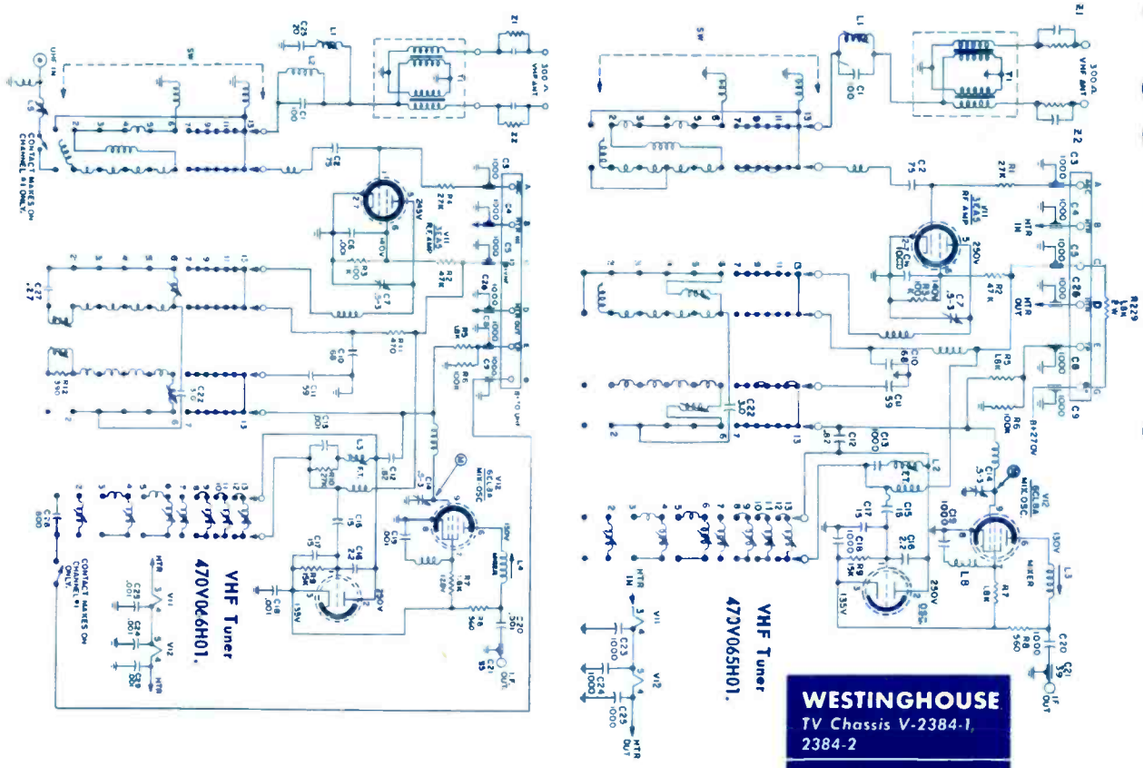
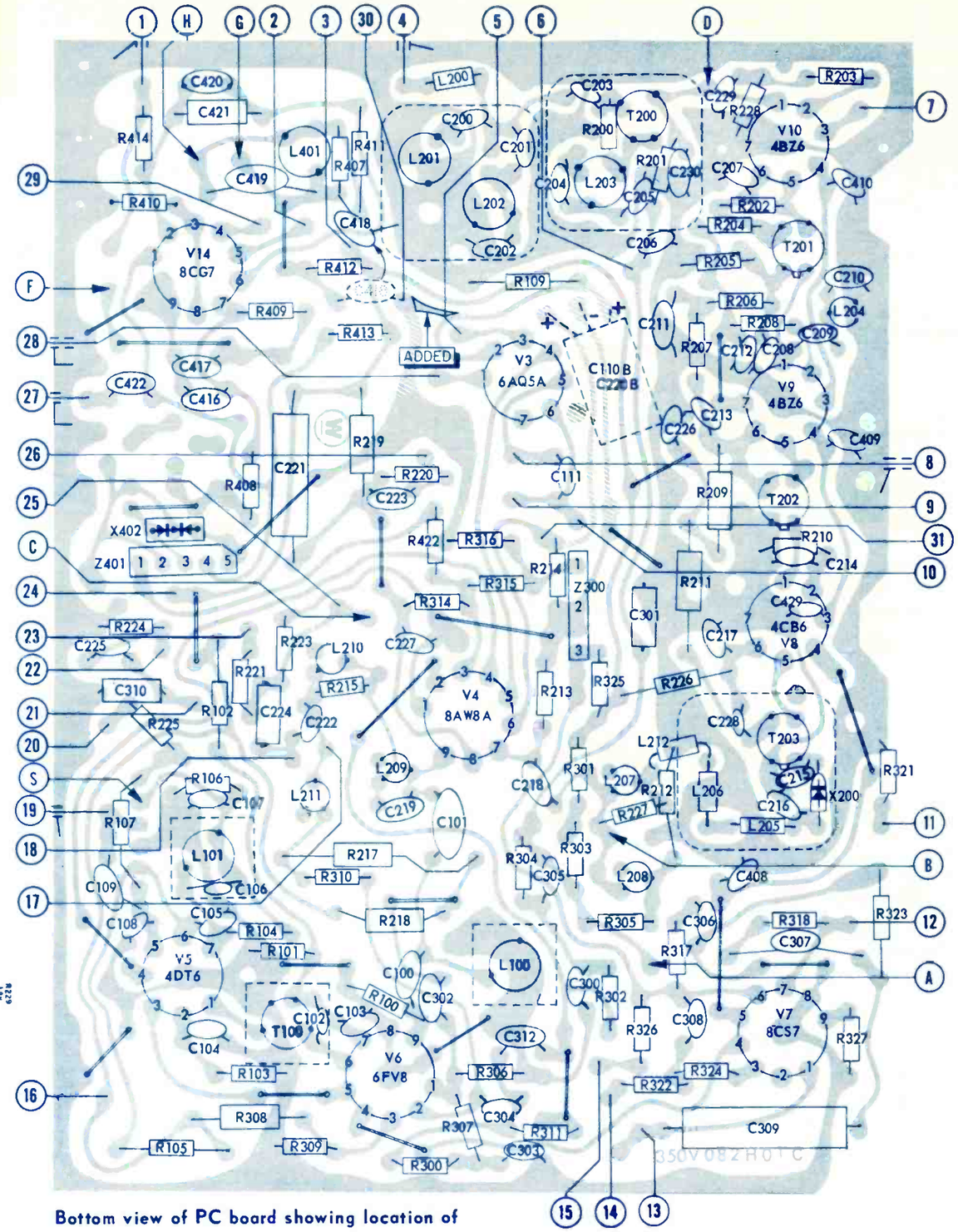


Top view of chassis.





Bottom view of PC board showing location of top components in solid outlines. Tube pin numbering is for bottom of socket.

1. Horiz Hold R415
2. Tuner filament
3. Tuner B+
4. Tuner to IF input
5. Pin 2 of 17DQ6A
6. Tuner AGC
7. Tuner filament
8. T101 primary
9. Audio B+
10. T101 primary
11. R320, Vert Lin, bottom
12. R319 Vert Hold
13. T300 Vert output
14. R320 Vert Lin Control, Arm
15. R328 Height control, arm
16. L400 Hi B+
17. R216 Contrast control, top
18. R216 Contrast control, arm
19. R108 Volume control, top
20. CRT pin #3
21. T300 Vert output
22. CRT pin #3
23. R222 Brightness control, arm
24. R222 Brightness control, top
25. CRT pin #7
26. R216 Contrast control, bottom
27. R416 grid of Horiz output
28. R108 Volume control, arm
29. CRT pin #8
30. *To C110B
31. *To C220B

* Not on early boards

TEST POINTS

A. AGC for 1st IF: also AGC for tuner
B. Video detector
C. CRT cathode
D. 1st IF input
F. Horiz MV
G. Ringing coil
H. Ringing coil
S. FM sound

WESTINGHOUSE
TV Chassis V-2384-1, 2384-2
Electronic Technician
CIRCUIT DIGEST

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ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

ZENITH
TV Chassis
16C21, 16C21Q, 16C21Z, 16C22Q, 16C23, 16C24

Models 82221Z,YZ, B2223EZ,RZ,YZ, B2245EZ1,RZ1,WZ1, C2221RY, C2223E,R,Y, C2225E,R,W, C2245E,R,W, C2246E,R,W, C2247E,R,W, C2249H,R,W, C2254E,H,R,W, C2282E,R,W, C2284H&R, C2673E,R,W, C3000E,R, C3001E,R,W, C3004E,R,W, C3006E,R,W, C3007E,R,W, C3008R, C3009E,W,Y

ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL D.C. VOLTAGES TO BE MEASURED WITH A VACUUM TUBE VOLTMETER HAVING 11 MEGOHM INPUT RESISTANCE.
ALL VOLTAGE MEASUREMENTS TO BE MADE WITH NO SIGNAL PRESENT NORMAL SETTING OF CONTROLS AND CHANNEL SELECTOR SET TO CHANNEL 2 UNLESS OTHERWISE SPECIFIED.
ALL CONDENSER VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
ALL CONDENSER CAPACITY TOLERANCE: 20% UNLESS OTHERWISE SPECIFIED.

ALL RESISTORS ARE ±20% TOLERANCE, CARBON, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
RESISTANCE MEASUREMENTS SHOWN WITH COILS DISCONNECTED FROM CIRCUIT.
COIL RESISTANCES NOT GIVEN ARE UNDER ONE OHM.
CATHODE RAY TUBE 2ND ANODE VOLTAGE TO BE MEASURED WITH ELECTROSTATIC OR 20K MIN. OHMS PER VOLT HIGH VOLTAGE METER.
ARROWS ON POTENTIOMETERS INDICATE CLOCKWISE ROTATION.

TEST POINTS:
C- DETECTOR OUTPUT
D- VIDEO OUTPUT
E- L.F. A.G.C.
F- GROUNDED FOR I.F. ALIGNMENT
G- 3RD I.F.
J- SOUND OUTPUT
P- SOUND DISC GRID

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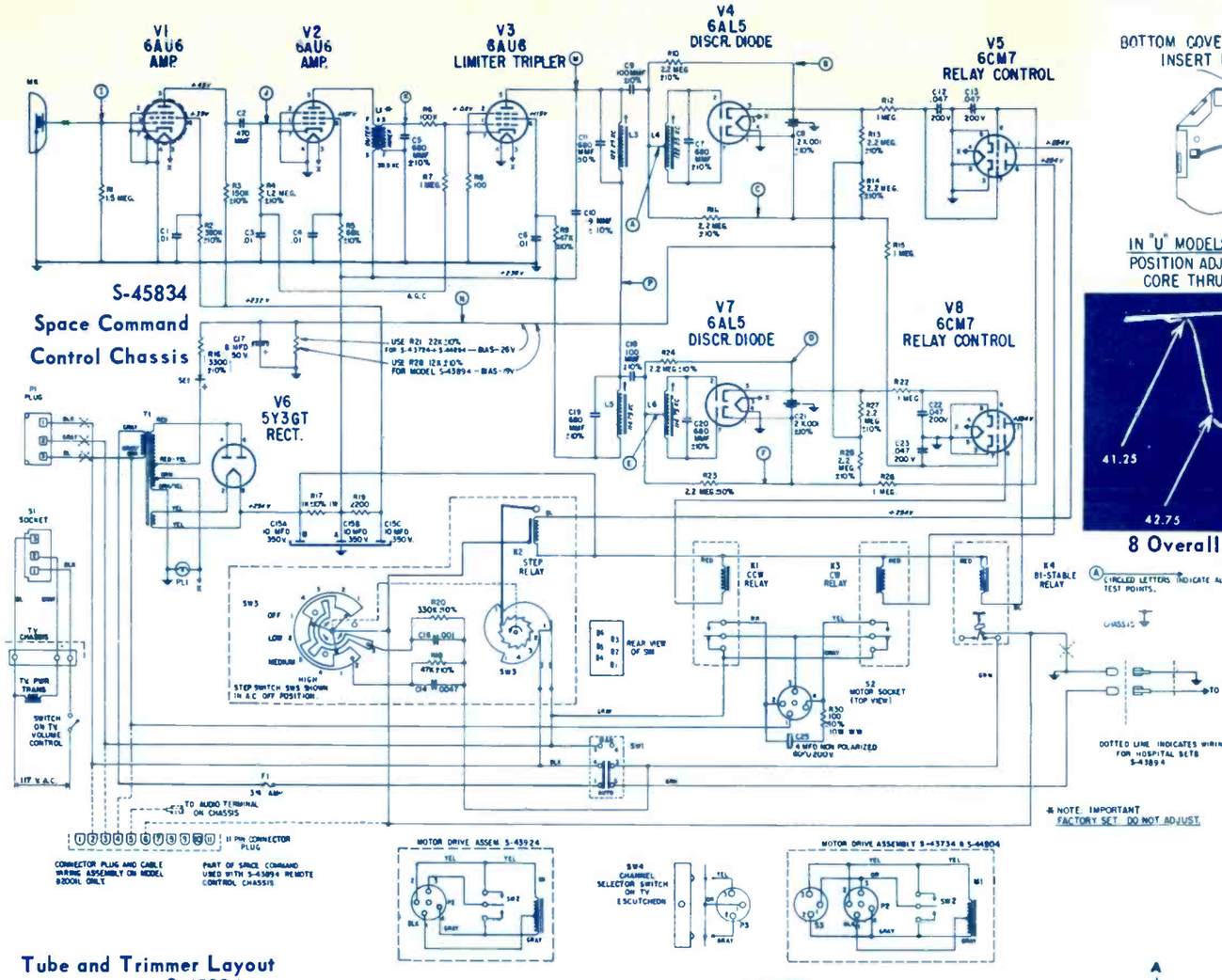
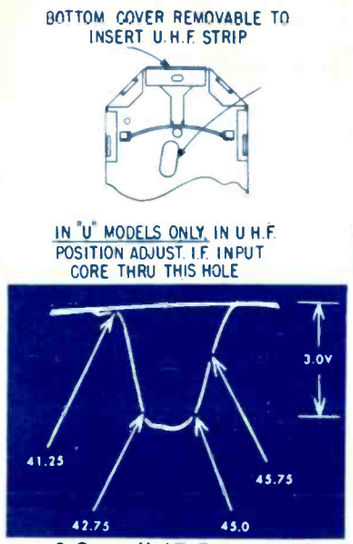
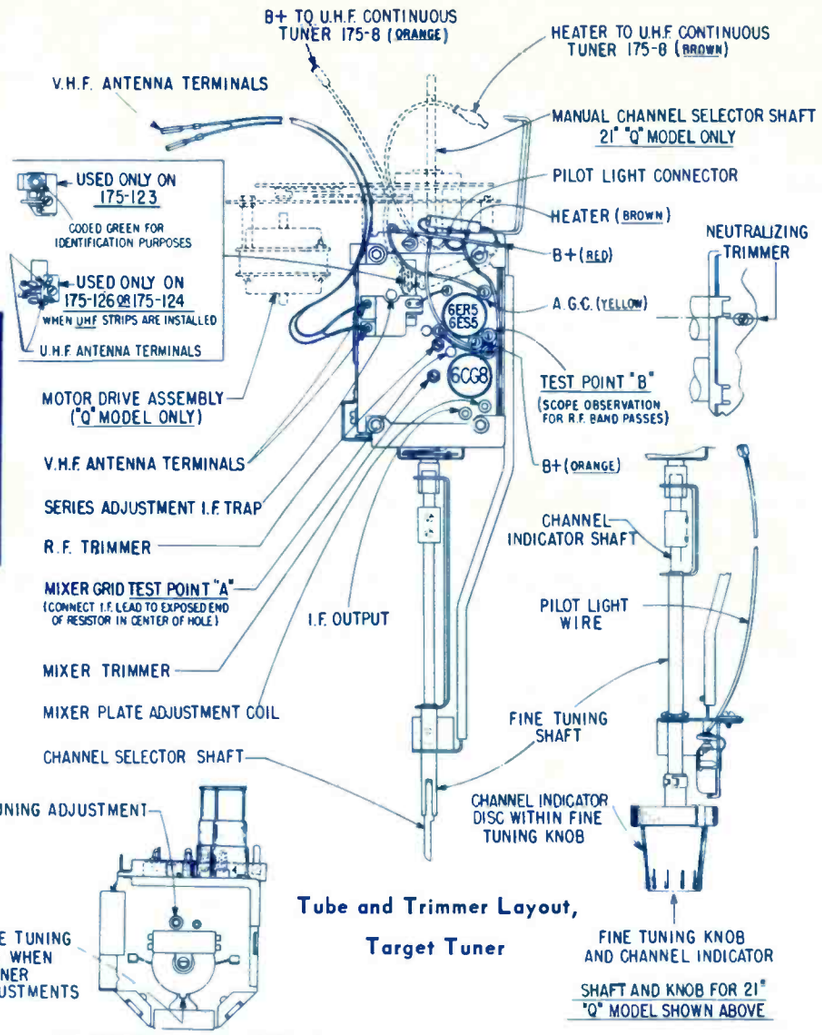
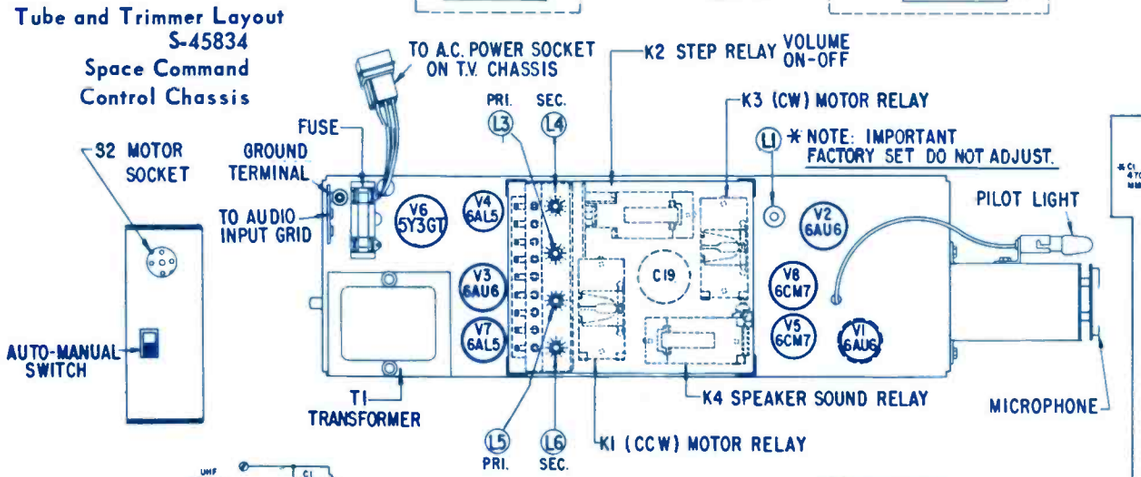


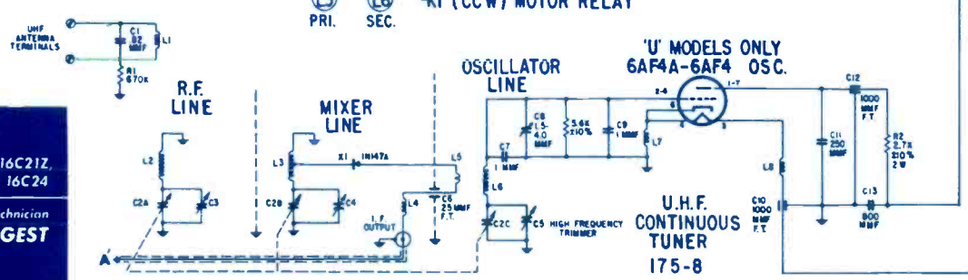


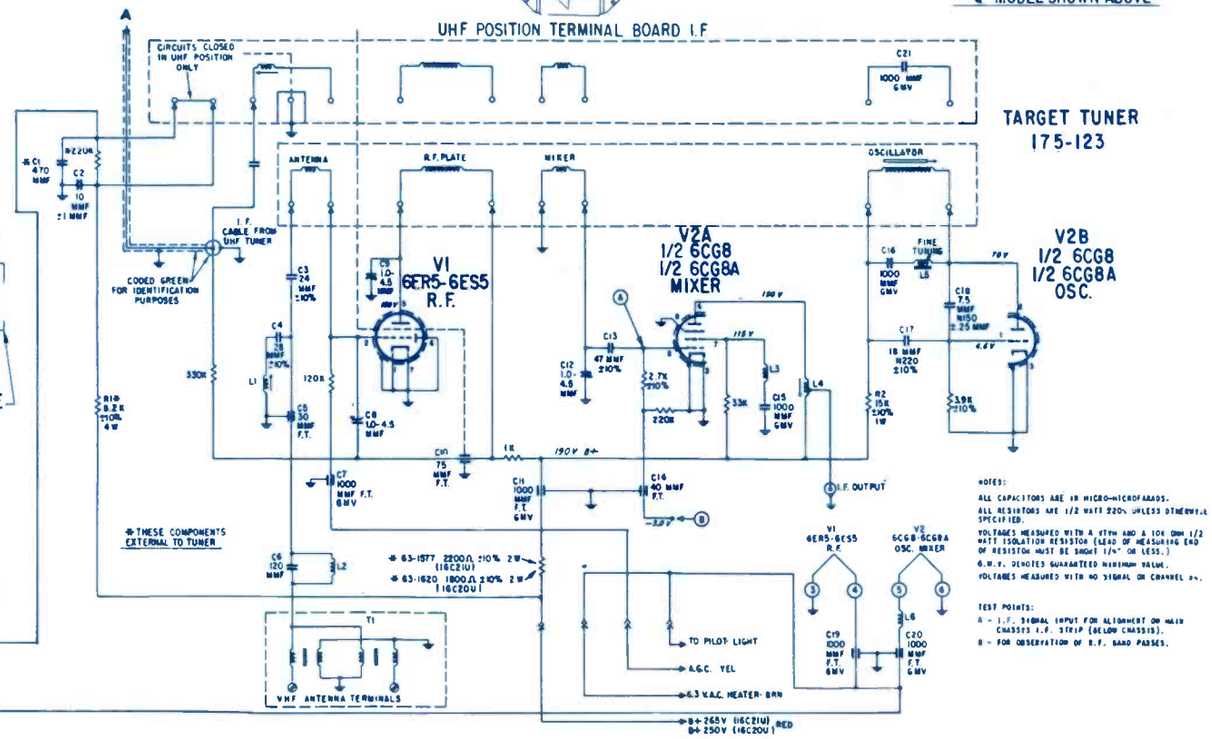


Tube and Trimmer Layout, Target Tuner

Tube and Trimmer Layout S-45834 Space Command Control Chassis



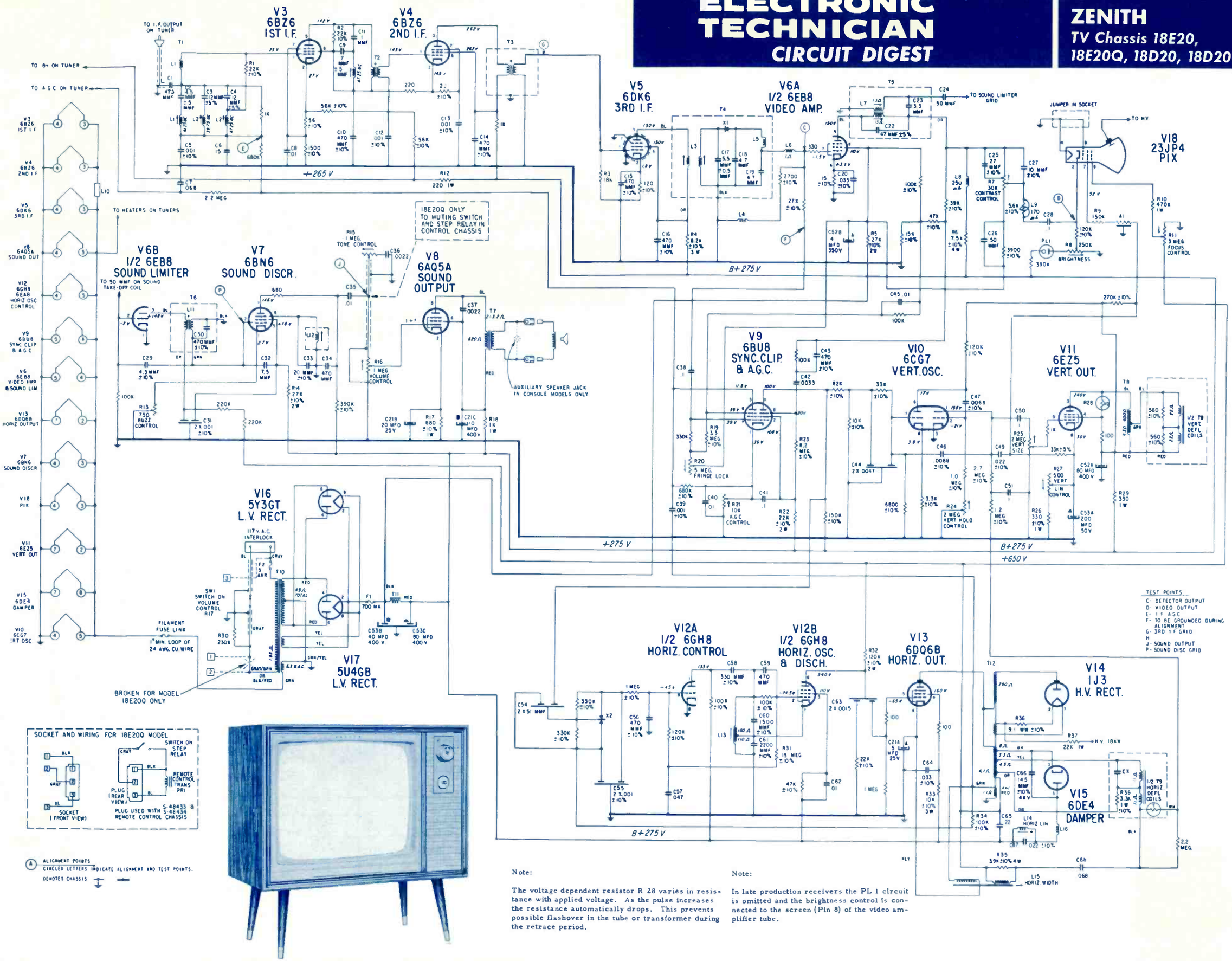




ZENITH
TV Chassis
16C21, 16C21Q, 16C21Z, 16C22Q, 16C23, 16C24
Electronic Technician
CIRCUIT DIGEST

ZENITH

TV Chassis 18E20, 18E20Q, 18D20, 18D20Q



Note:

The voltage dependent resistor R 28 varies in resistance with applied voltage. As the pulse increases the resistance automatically drops. This prevents possible flashover in the tube or transformer during the retrace period.

Note:

In late production receivers the PL 1 circuit is omitted and the brightness control is connected to the screen (Pin 8) of the video amplifier tube.

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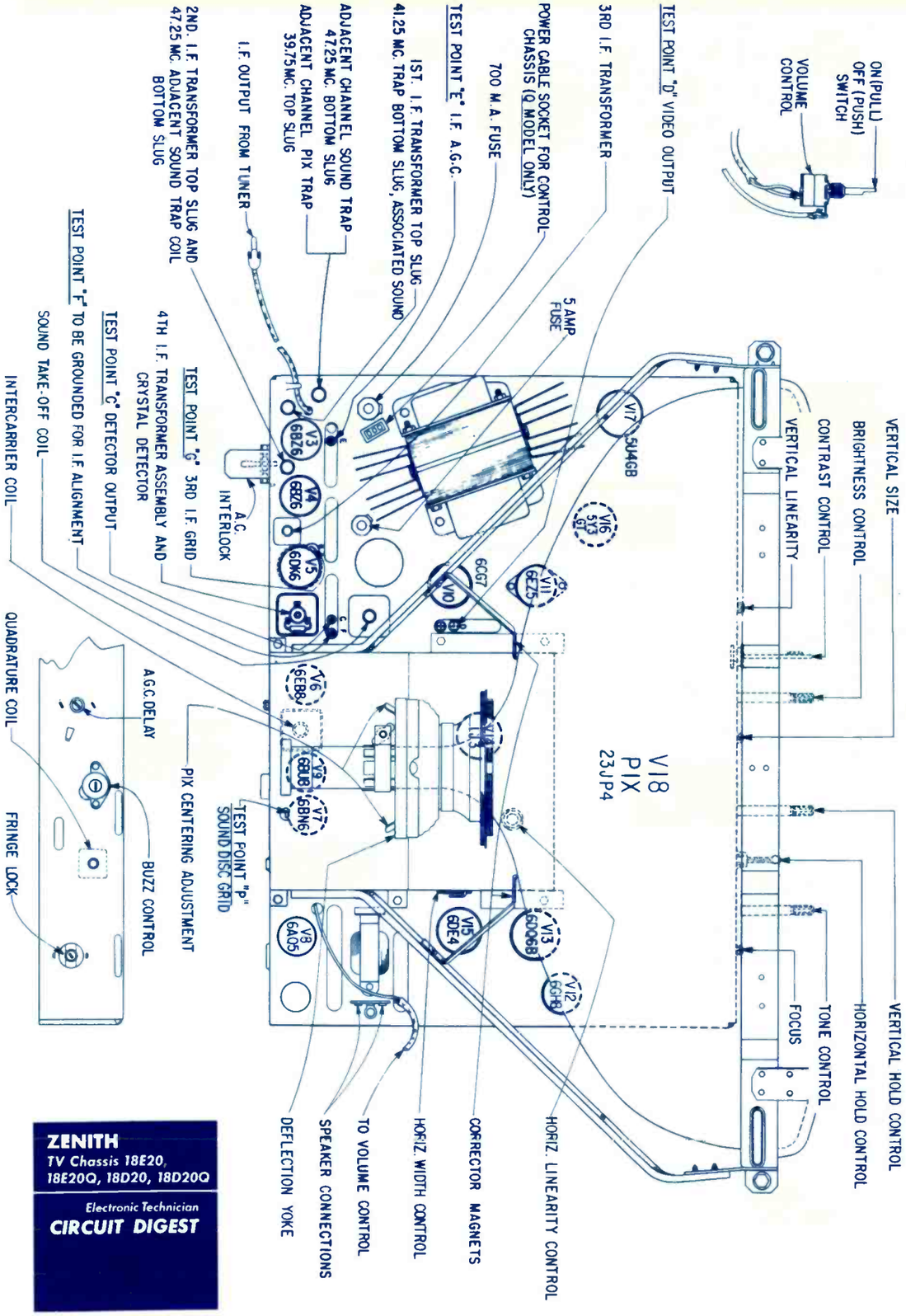
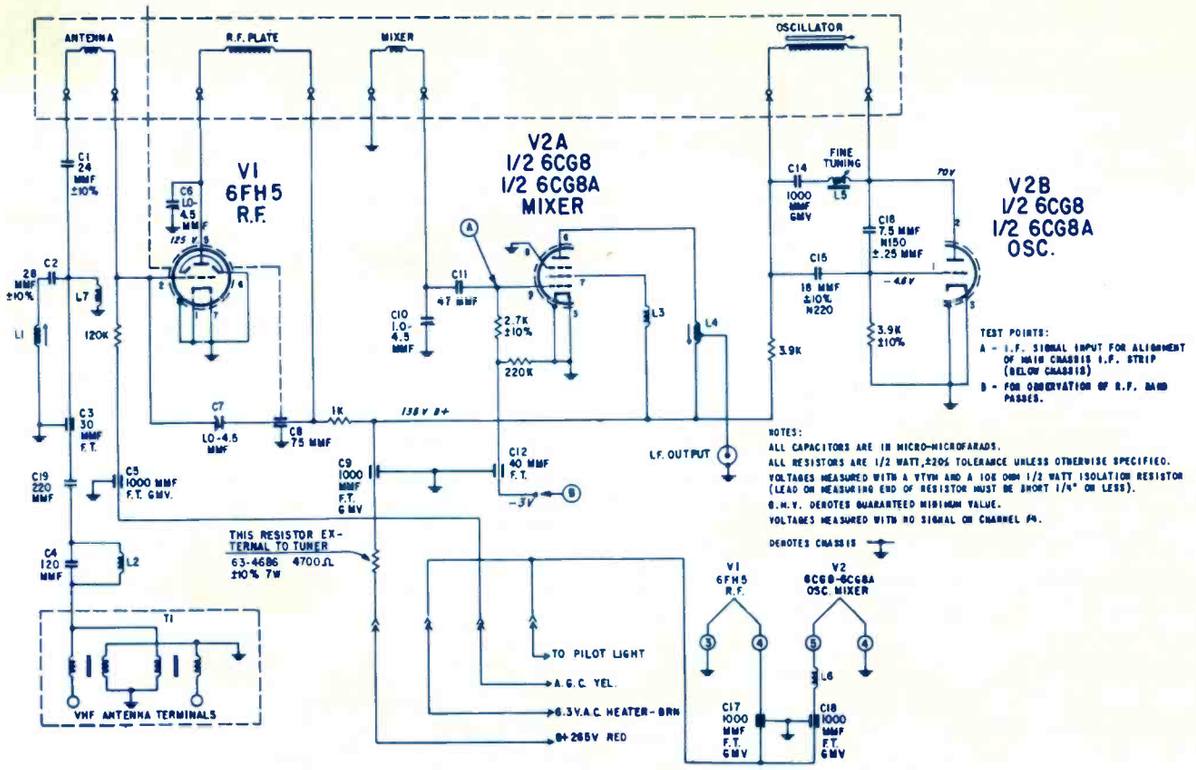
Tube and Trimmer Layout 18E20, 18E20Q, 18D20 and 18D20Q Chassis





Schematic Diagram 175-144 Target Tuner

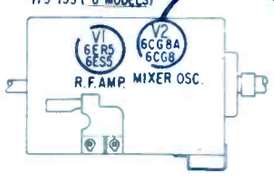
V12 6GH8

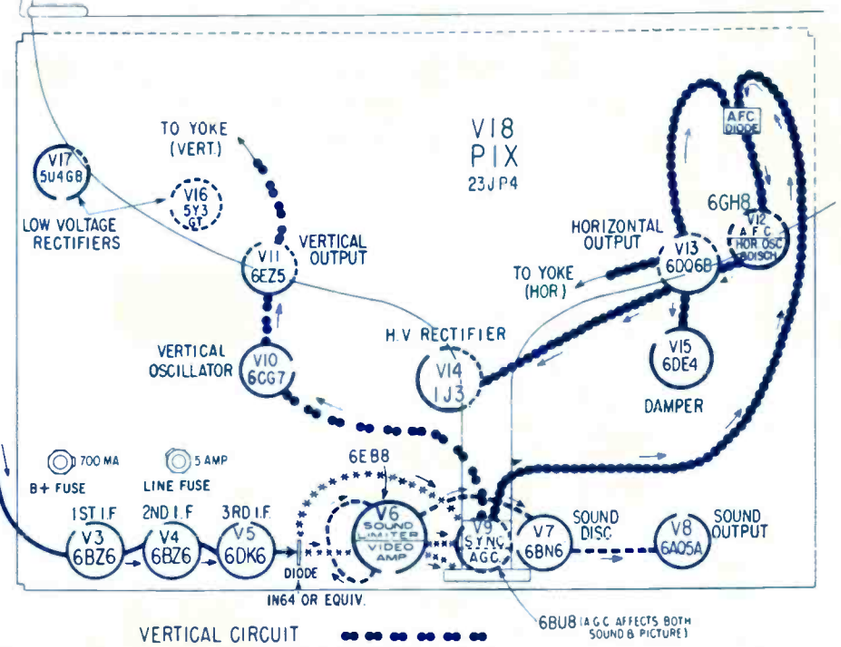
TUBE POSITIONING GUIDE (KEYWAY)

6AF4 OR 6AF4A (OSC) ("U" MODELS ONLY)

U.H.F. TUNER 175-8

TARGET TUNER 175-134
175-136 (SPACE COMMAND)
175-133 ("U" MODELS)





SOUND CIRCUIT ----------
COMPOSITE VIDEO ··········
CYCLES 60 VOLTS 117 A.C.

VERTICAL CIRCUIT - - - - - -
HORIZONTAL CIRCUIT ·····
INTERMEDIATE FREQUENCY ——
WATTS 245 (18D20, 18E20) 325 (18D20Q, 18E20Q)
AMPS 220 (18D20, 18E20) 290 (18D20Q, 18E20Q)

ZENITH
TV Chassis 18E20, 18E20Q, 18D20, 18D20Q

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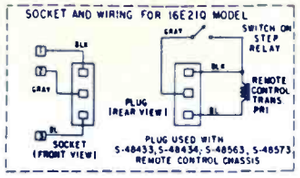
ZENITH
TV Chassis 16E21, 16E21Q, 16D21, 16D21Q

(A) ALIGNMENT POINTS
CIRCLED LETTERS INDICATE ALIGNMENT AND TEST POINTS.

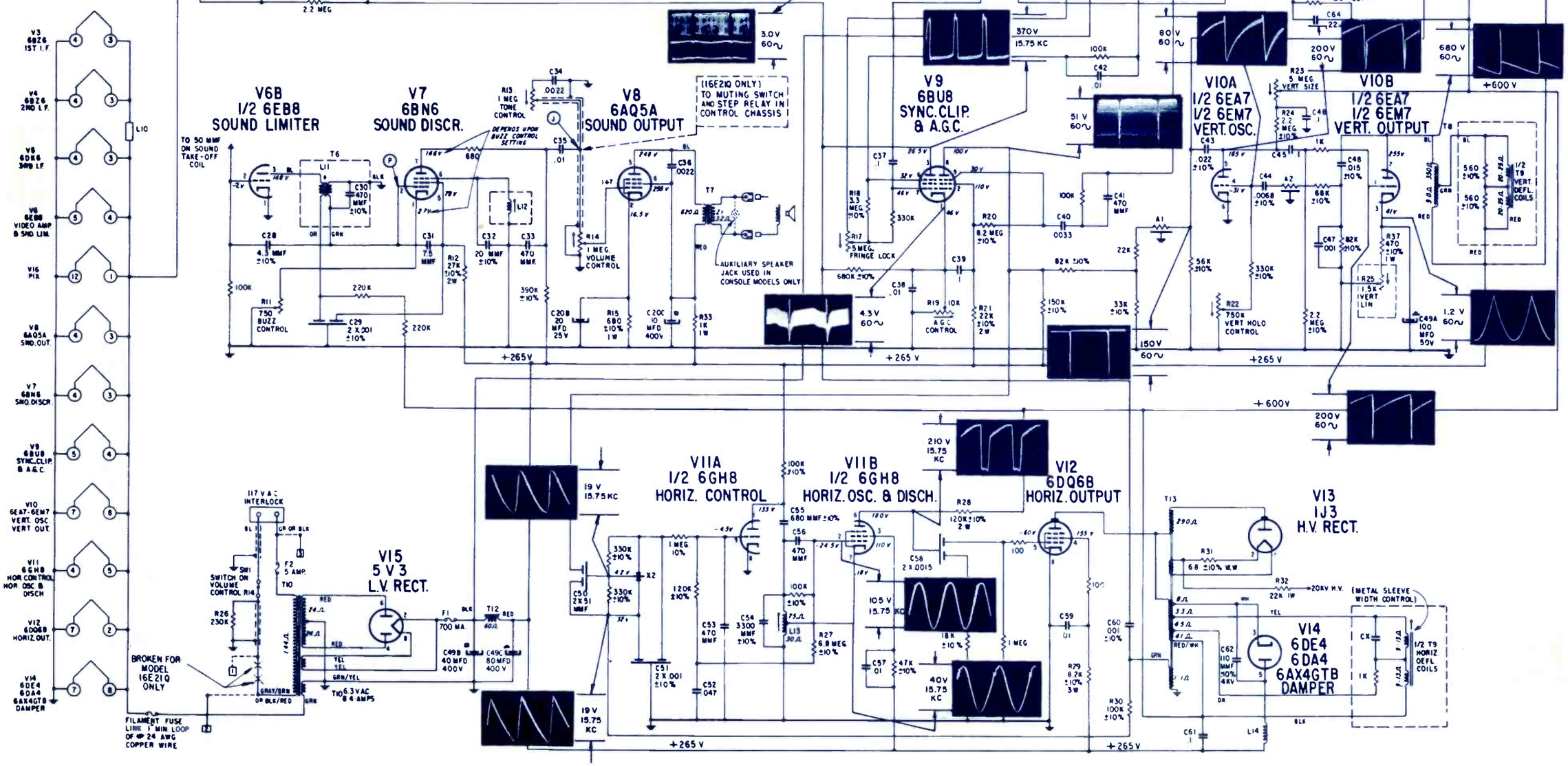
TEST POINTS:
C- DETECTOR OUTPUT
D- VIDEO OUTPUT
E- I.F. A.G.C.
F- GROUNDED FOR I.F. ALIGNMENT
G- 3RD I.F. GRID
J- SOUND OUTPUT
P- SOUND DISC GRID

SOCKET AND WIRING FOR 16E21Q MODEL



PLUG USED WITH S-48433, S-48434, S-48563, S-48573 REMOTE CONTROL CHASSIS

In late production receivers the R 34 and C 64 circuits are omitted and the brightness control is connected to the screen (Pin 8) of the Video amplifier tube.



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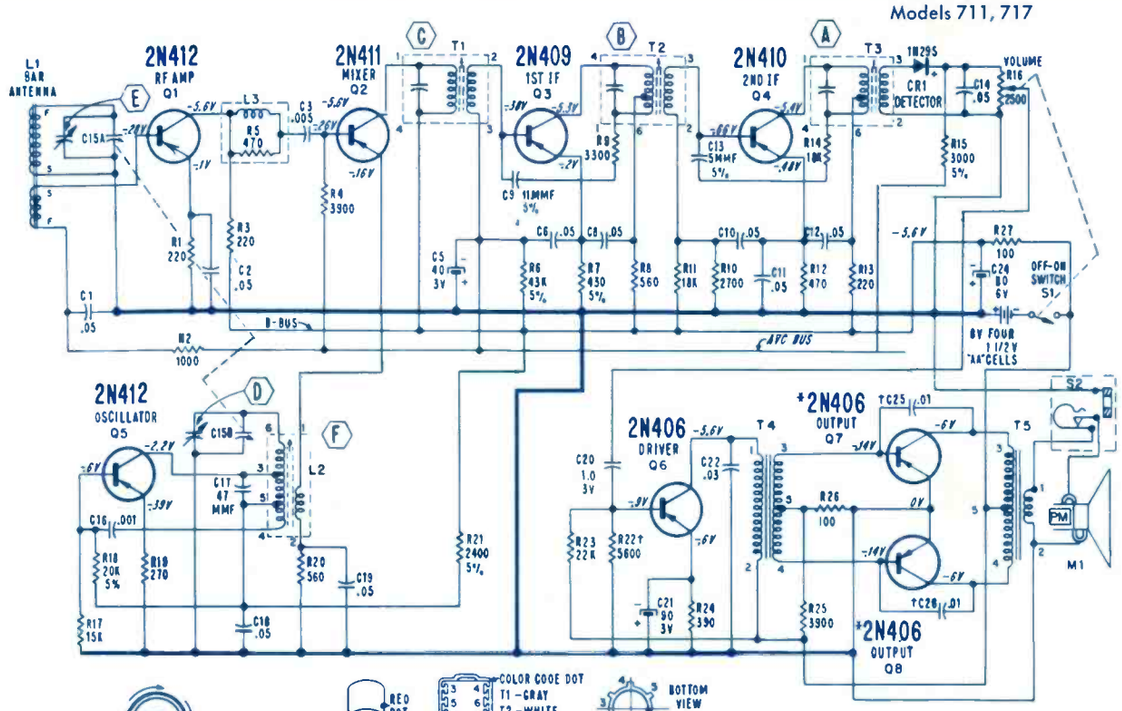
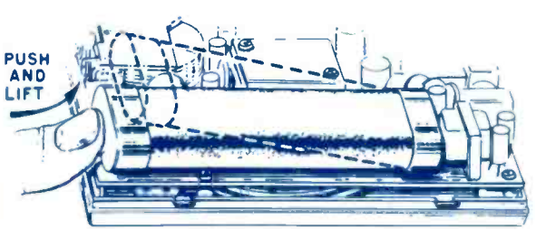
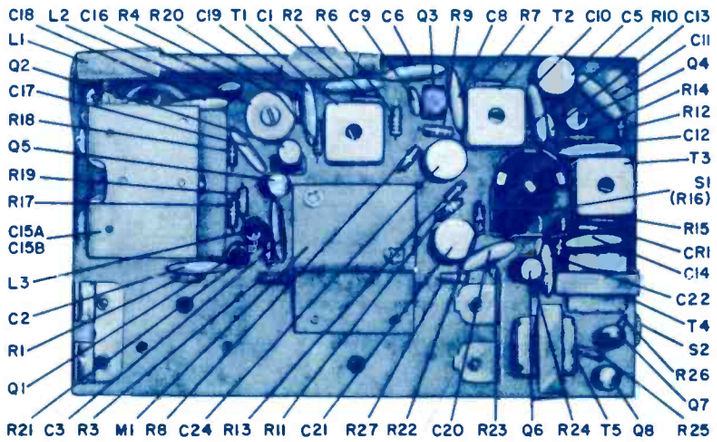
ADMIRAL
Transistor Radio
Chassis 8T1

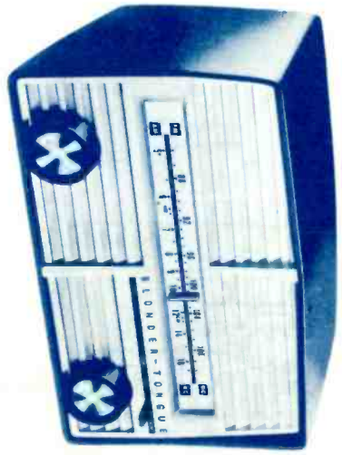
Models 711, 717

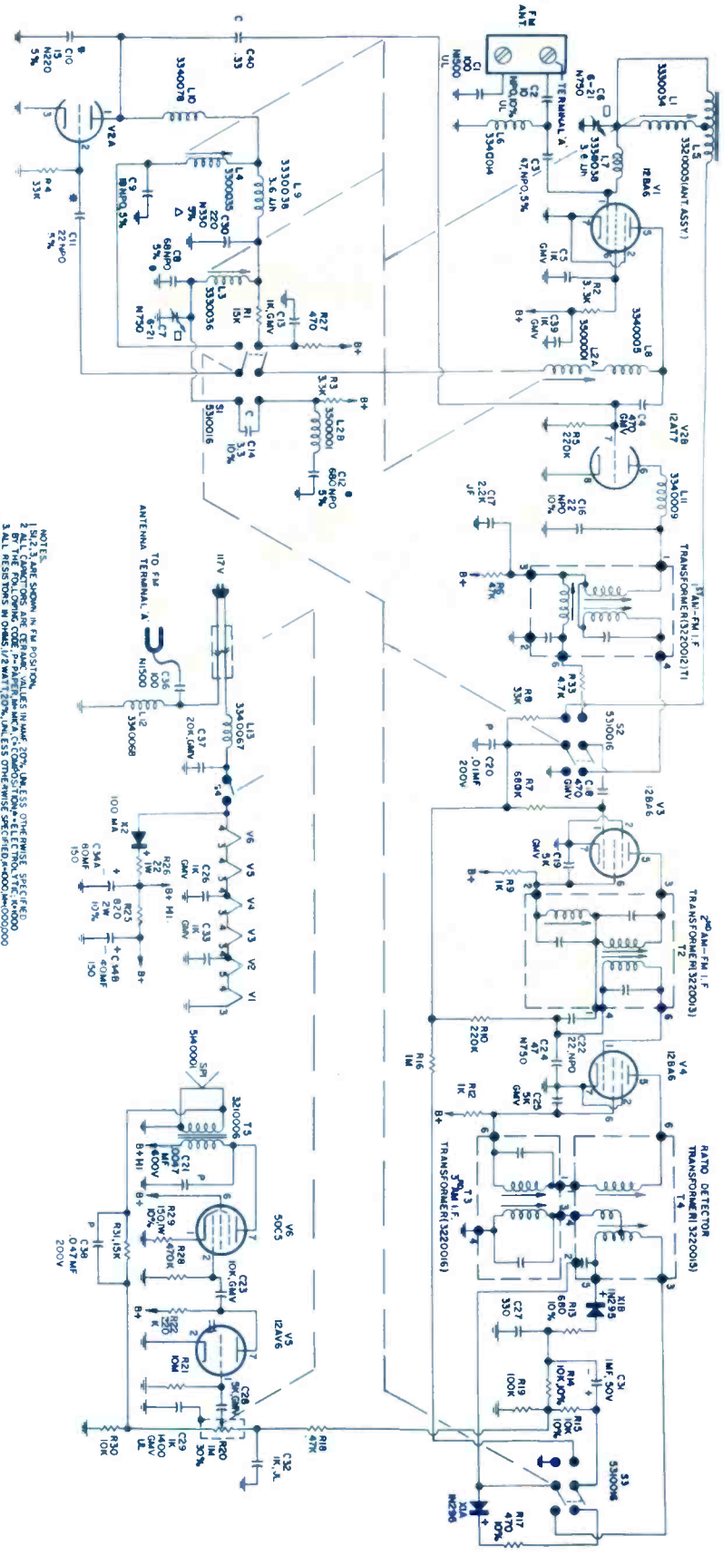




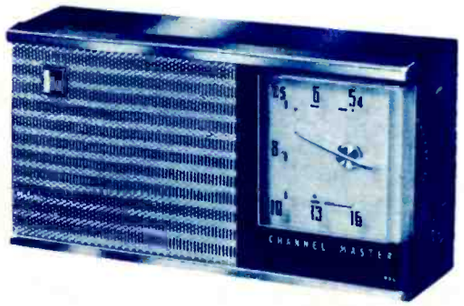


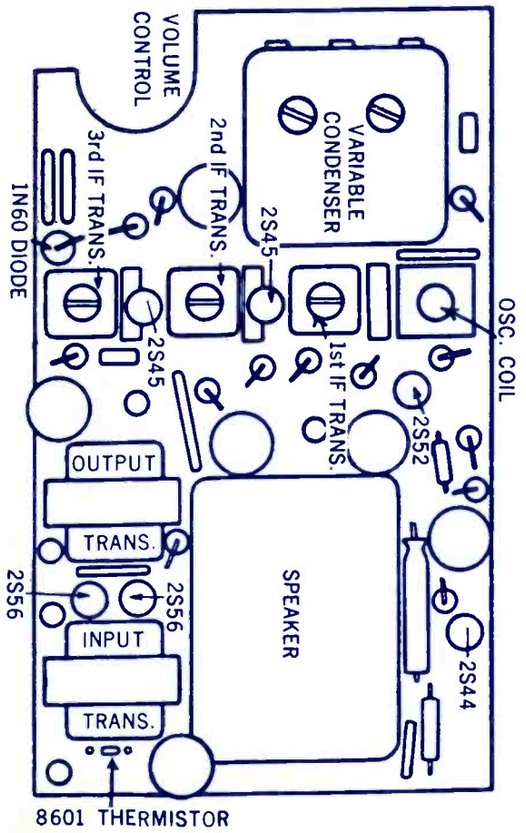
BLONDER-TONGUE
AM-FM Tuner
Model T-88

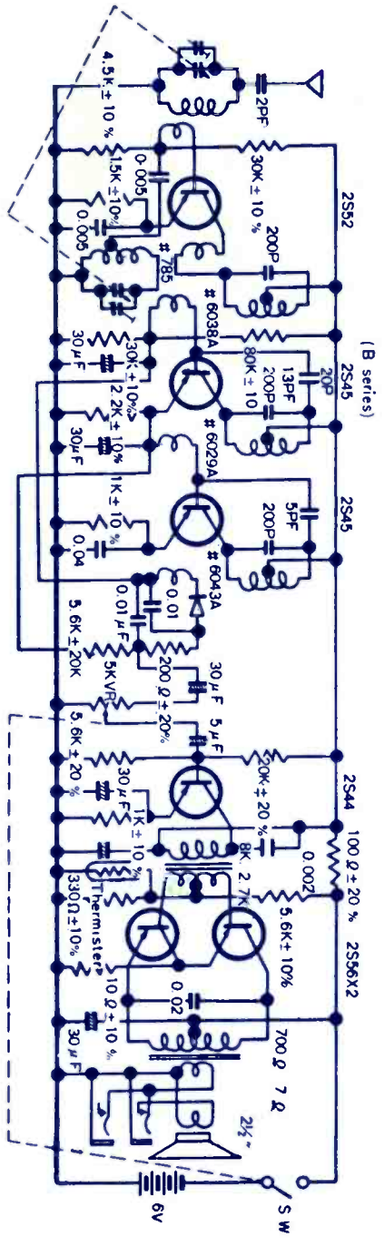




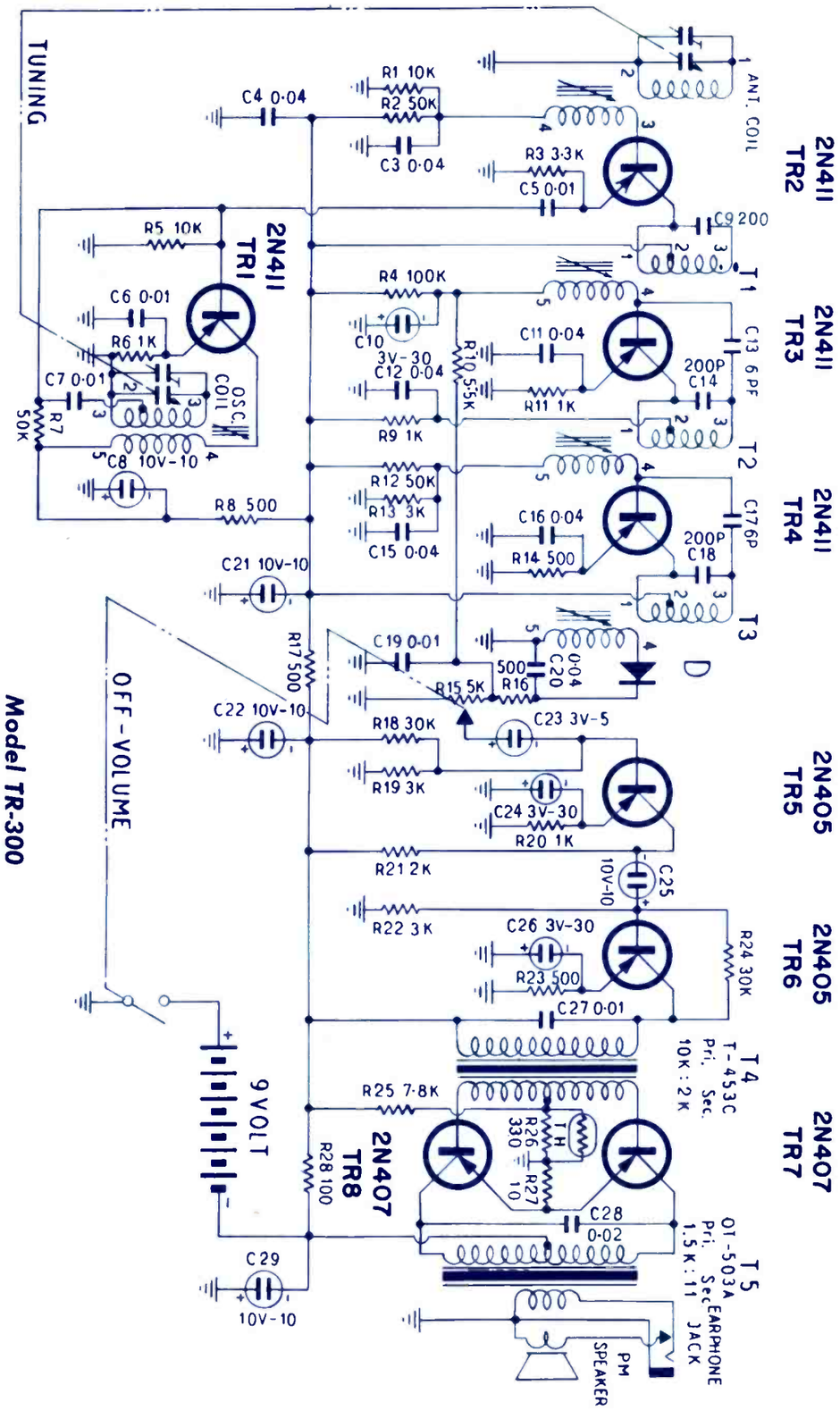
CHANNEL MASTER
Transistor Portable Radio
Model 6506



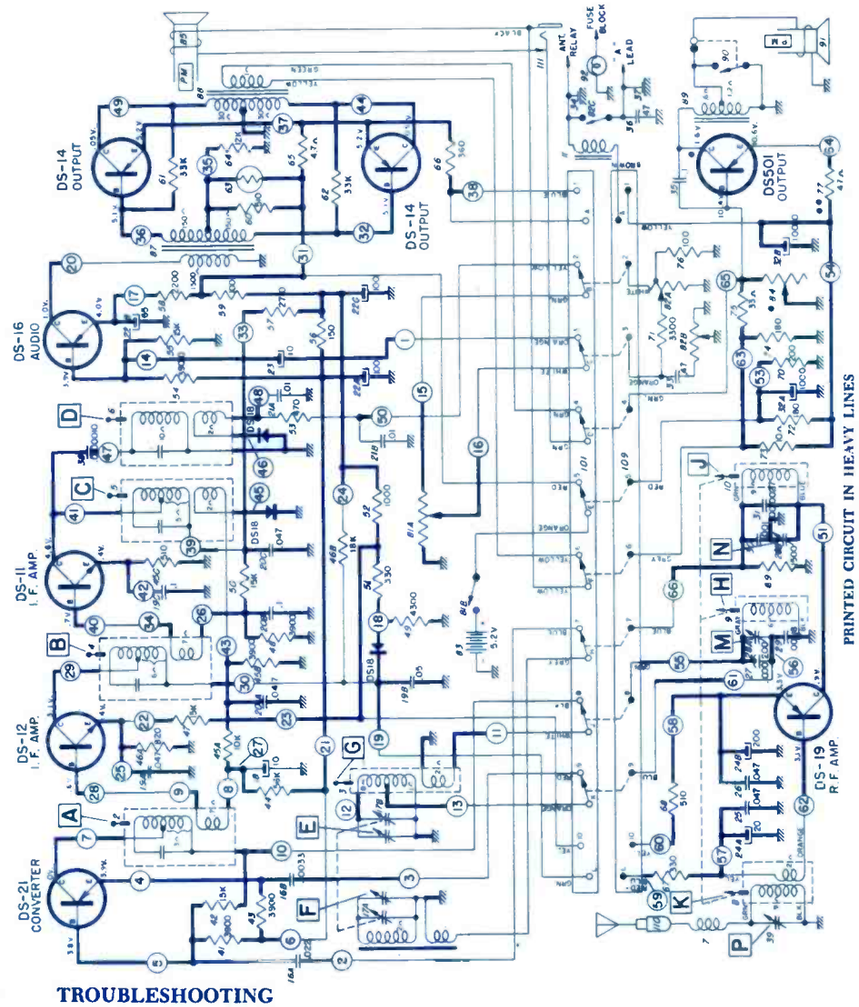


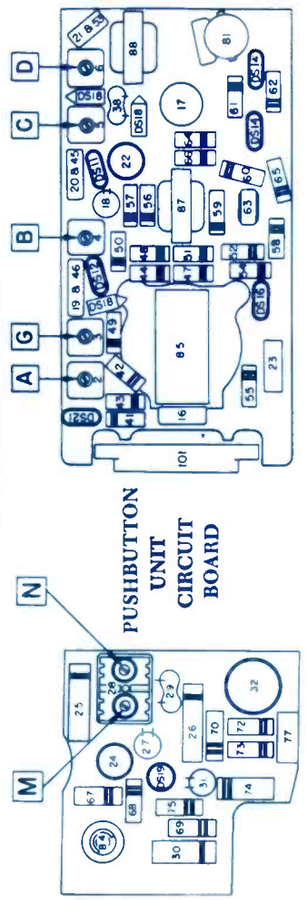


CONTINENTAL
Transistor
Portable Radio
Models TR-182, TR-300



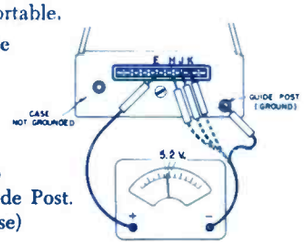
Model TR-300





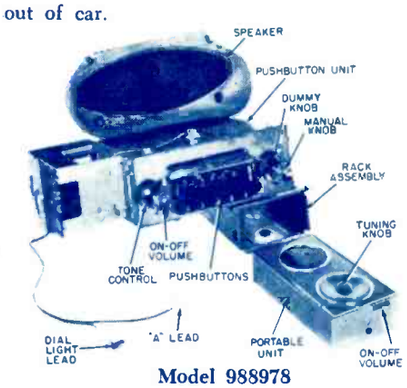
TROUBLESHOOTING

1. Isolate trouble to portable section or car unit by pulling portable section out of car.
   - A. If it fails to operate as a portable, trouble is in portable unit.
   - B. If it operates as a portable but not in the car, trouble is in car unit or car antenna.
   - C. If it operates in car but not as a portable, check batteries, portable antenna and interconnecting socket (Illus. 101).
2. Short cut procedure for checking dead portable.
   - A. Check the battery voltage with portable turned on. If less than 5 volts, replace.



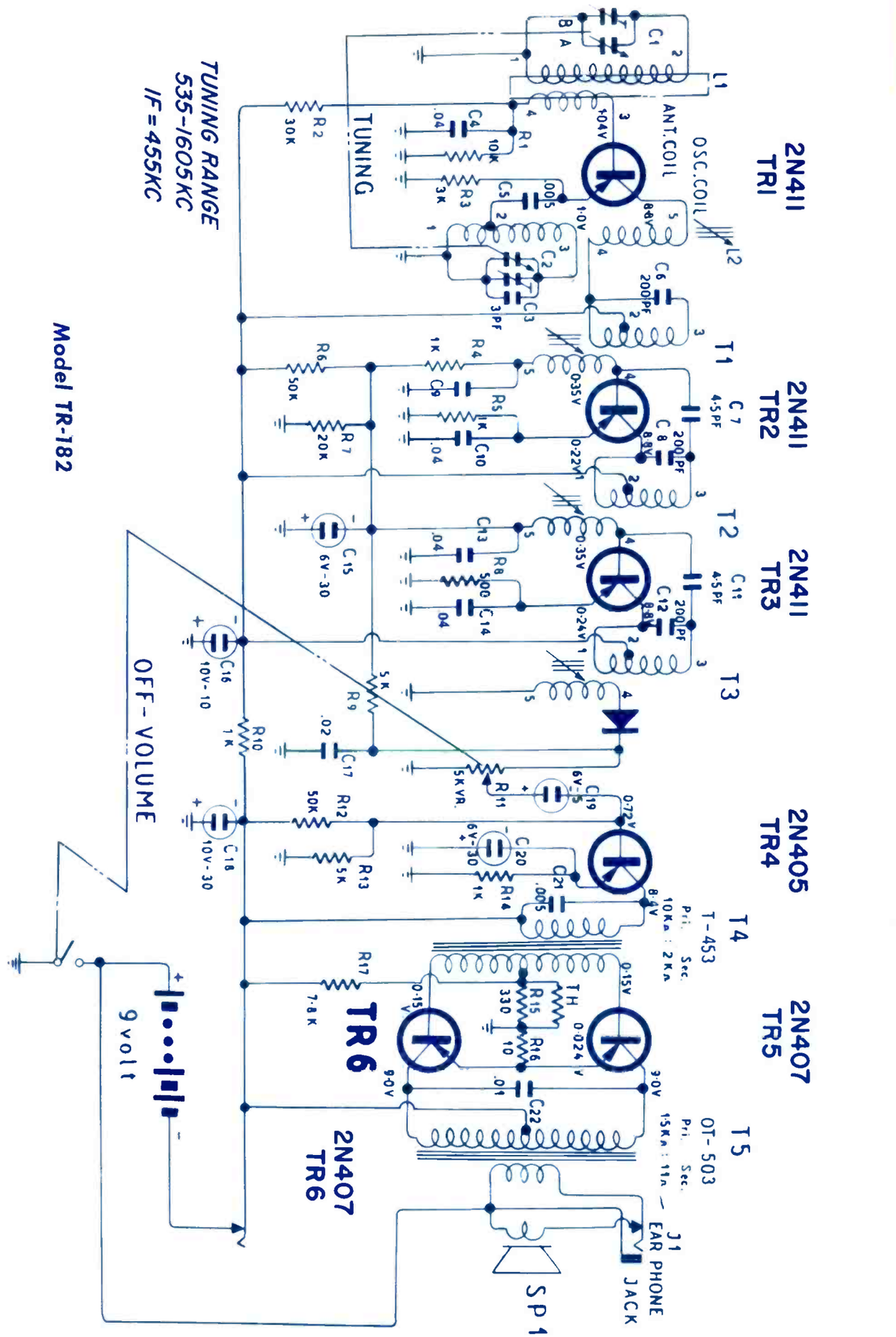
BATTERY CHECK

Positive Meter Lead	Negative Lead to
on Contact E;	H, J, K, or Guide Post. (Do not use case)



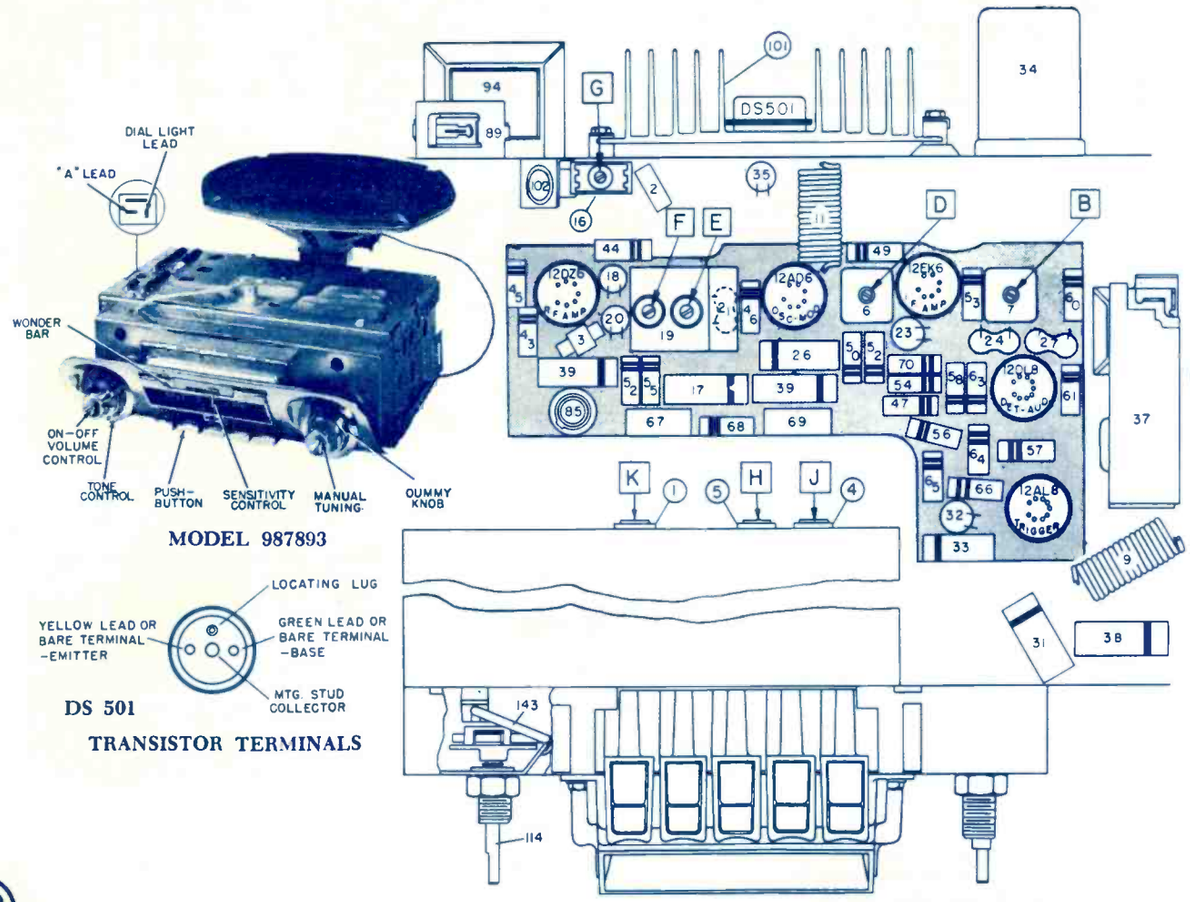
Model 988978

   - B. Turn volume maximum and short pins **B** and **E** on interconnecting socket (Illus. 101) together. If oscillation is heard, audio stages are working; if not, trouble is in audio stages.
   - C. Use click test to isolate stage (see Chart B.) Caution: Be sure to use 10 k or 12 k resistor between the click points and ground, or circuit components will be damaged.



ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

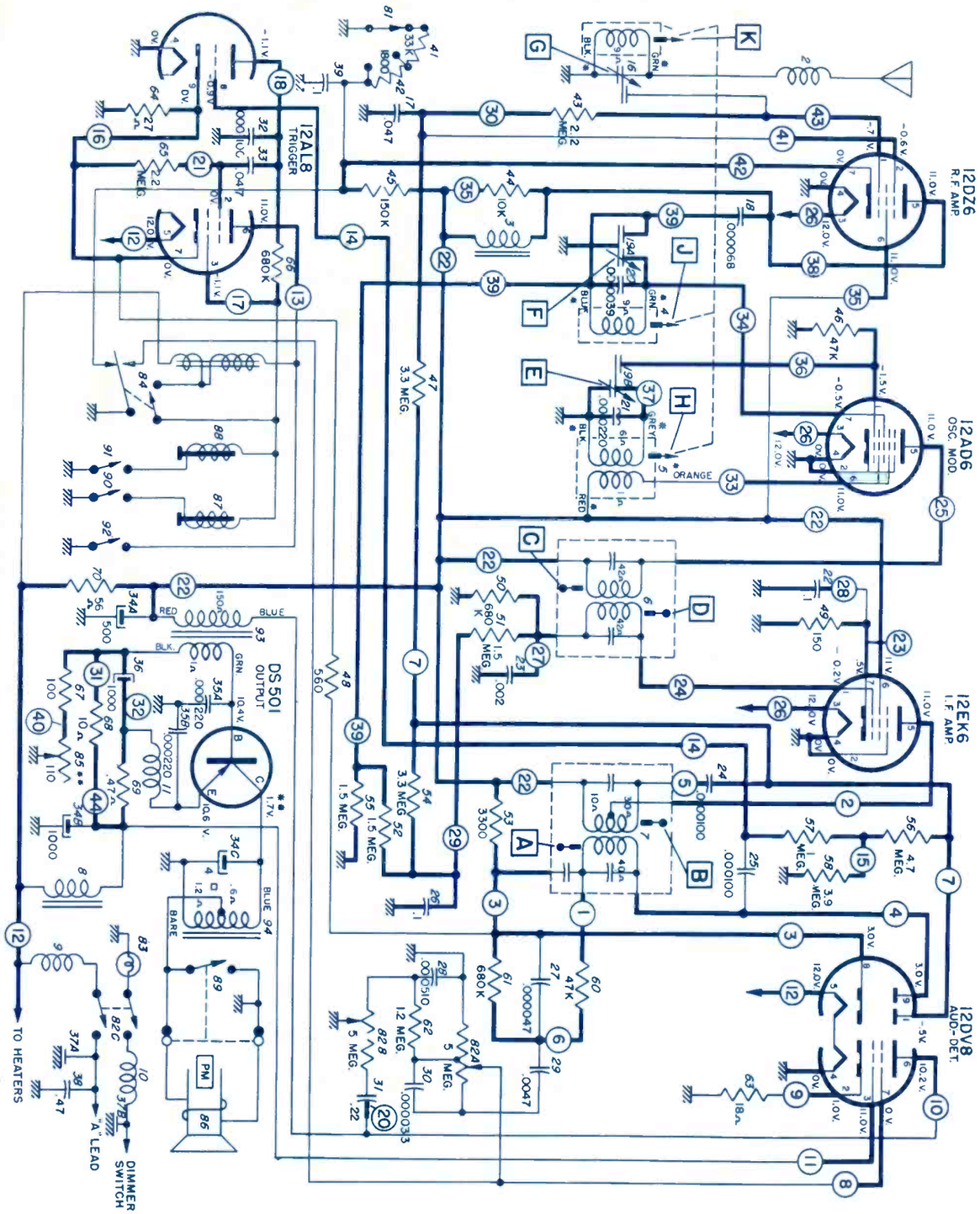
DELCO
Auto Radio
Chevrolet Model 987893



MODEL 987893

DS 501
TRANSISTOR TERMINALS

CHEVROLET MODEL 987893
PRINTED CIRCUIT SHOWN IN HEAVY LINES



IMPORTANT!

WHEN RADIO IS OPERATED ON BATTERY ELIMINATOR, THE TUNER MAY STOP SEEKING EVERY TIME A SOLENOID ENERGIZES, DUE TO VOLTAGE REGULATION.

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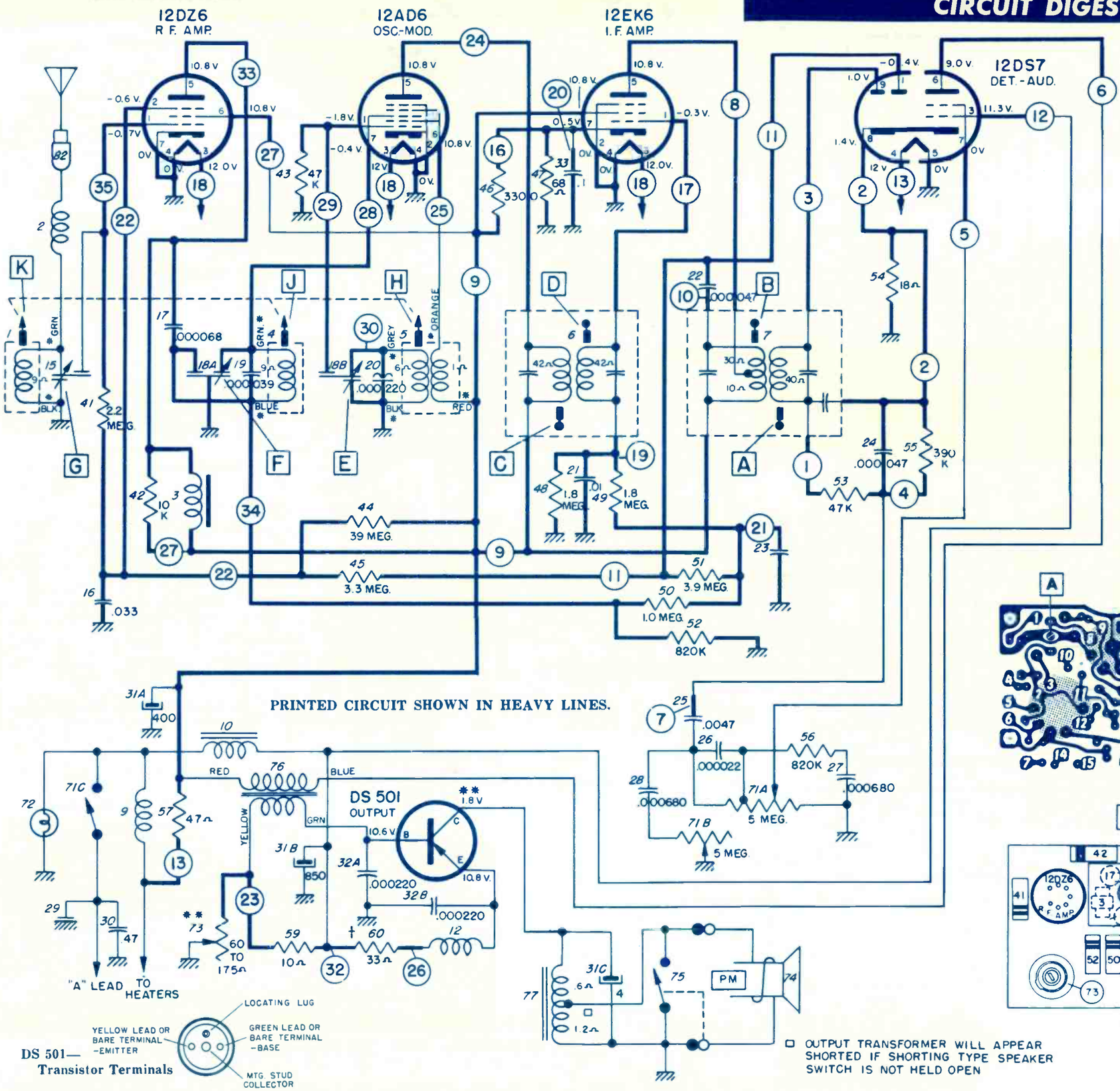
DELCO
Auto Radio
Studebaker Model AC-2978

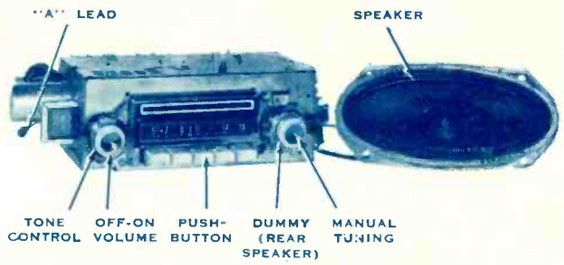
* – INDICATES LEAD FROM TUNER COIL ASS'Y.

** – BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYPE SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER

TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.

ILLUS 60 IS A FUSE RESISTOR FOR THE TRANSISTOR SERVICE WITH EXACT REPLACEMENT





MODEL AC-2978

GENERAL

MOUNTING—All 1960 Studebaker Cars.

TUBES—Four.

TRANSISTOR—One.

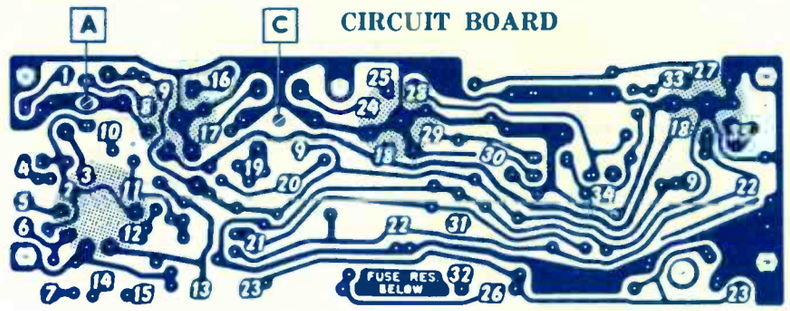
SPEAKER—4" x 8" Elliptical, Permanent Magnet.

TUNING—Manual and 5 P. B. Mechanical.

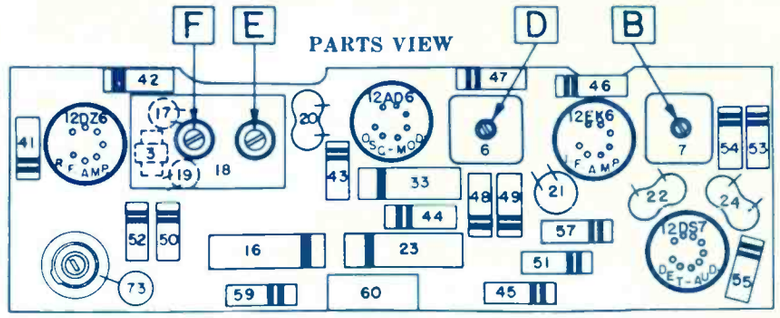
ANTENNA TRIMMER COMPENSATION—for Antennas Between 0.000050 - 0.000100 Mfd.

TUNING RANGE—540-1600 KC.

CIRCUIT BOARD



PRINTED VIEW



□ OUTPUT TRANSFORMER WILL APPEAR SHORTED IF SHORTING TYPE SPEAKER SWITCH IS NOT HELD OPEN

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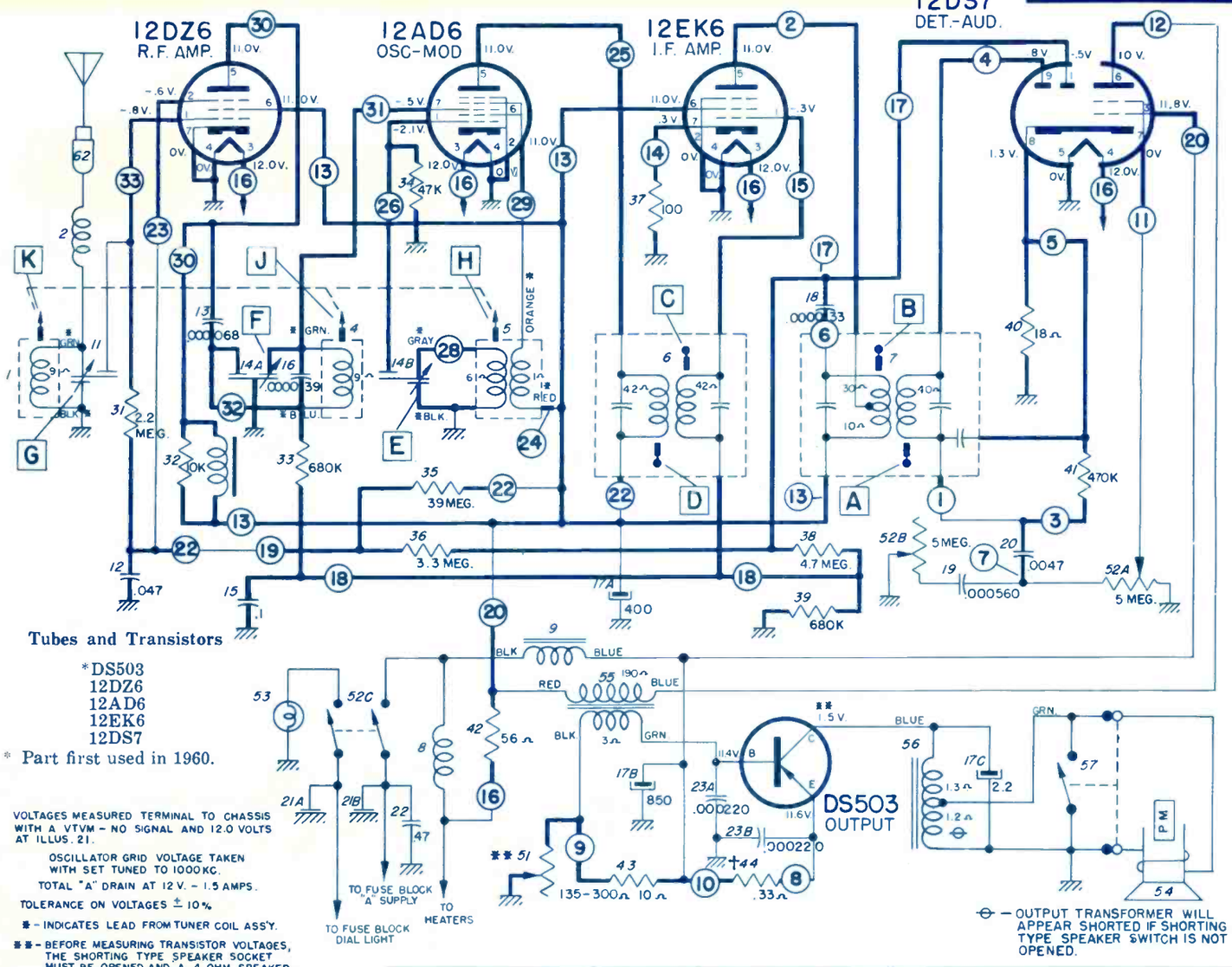
DELCO
Auto Radio
Chevrolet Corvair
Model 988062

CHEVROLET 988062—PRINTED CIRCUIT SHOWN IN HEAVY LINES.



Tubes and Transistors

*DS503
12DZ6
12AD6
12EK6
12DS7

* Part first used in 1960.

VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM – NO SIGNAL AND 12.0 VOLTS AT ILLUS. 21.

OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000 KC.

TOTAL "A" DRAIN AT 12 V. – 1.5 AMPS.

TOLERANCE ON VOLTAGES ± 10%

* – INDICATES LEAD FROM TUNER COIL ASS'Y.

** – BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYPE SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 51) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.

† – ILLUS. 44 IS A FUSE RESISTOR FOR THE TRANSISTOR.

SERVICE PARTS LIST

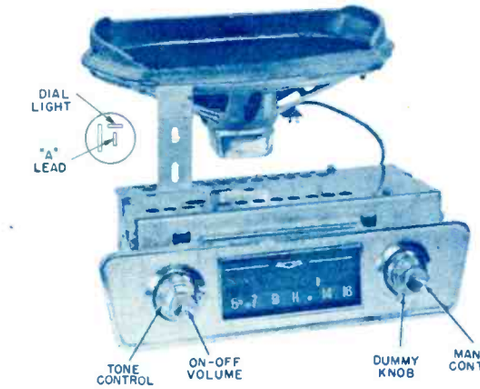
Coils

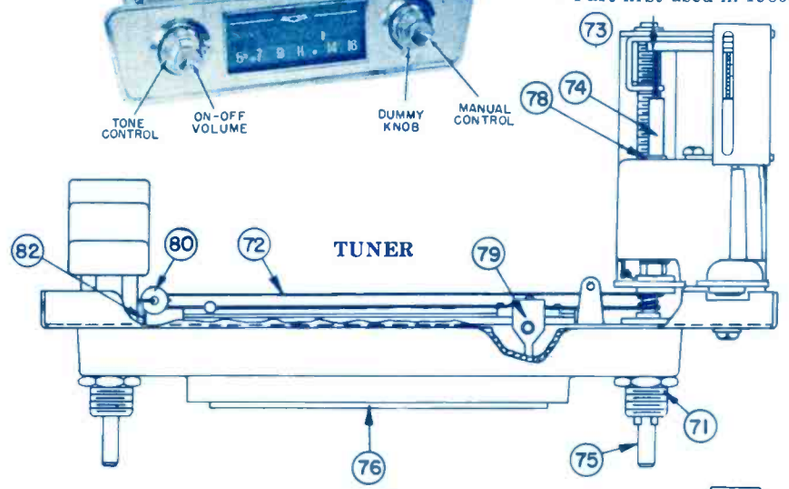
No. Illus.	Service Part No.	DESCRIPTION
1	1221138	Antenna
2	7255738	Choke, antenna series
3	7269684	Choke, R. F. plate
4	1221138	R. F.
5	1221263	Oscillator
6	1221257	1st I. F. Coil Assembly
7	1221255	2nd I. F. Coil Assembly
8	1217846	Choke, hash
9	7274342	Choke, "A" supply, input

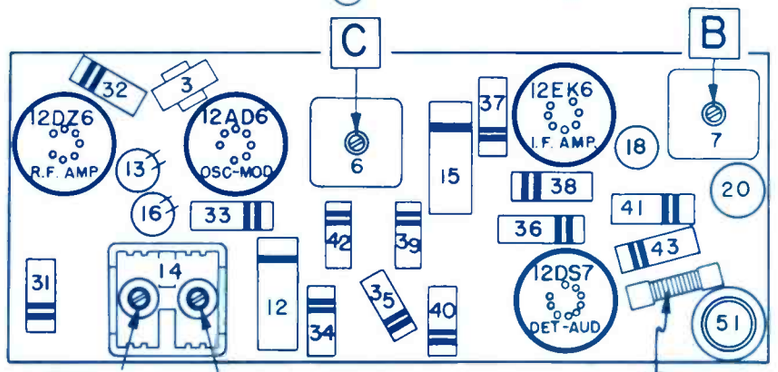
Tuner

*71	Bushing, drive shaft
72	Cord, dial
*73	Core Bar
74	Core, tuning, powdered iron
*75	Drive Shaft, manual
*76	Escutcheon Dial & Backplate
78	Grommet, ant. & R. F. coil
79	Pointer Assembly
80	Pulley, dial cord
82	Spring, dial cord

* Part first used in 1960.





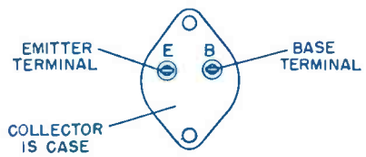


TOP VIEW

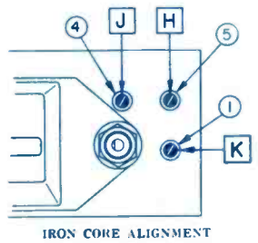
CIRCUIT BOARD

BOTTOM VIEW

STEPS	SERIES CAPACITOR OR DUMMY ANTENNA	CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	TUNE RECEIVER TO	ADJUST IN SEQUENCE FOR MAX OUTPUT
1	0.1 Mfd.	12AD6 Grid (Pin #7)	262 KC	High Frequency Stop	A, B, C, D,
2	0.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G,
3	0.000082 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K
4	0.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G



DS 503—Transistor Terminals



*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be 1⅝" from the mounting end of the coil form.

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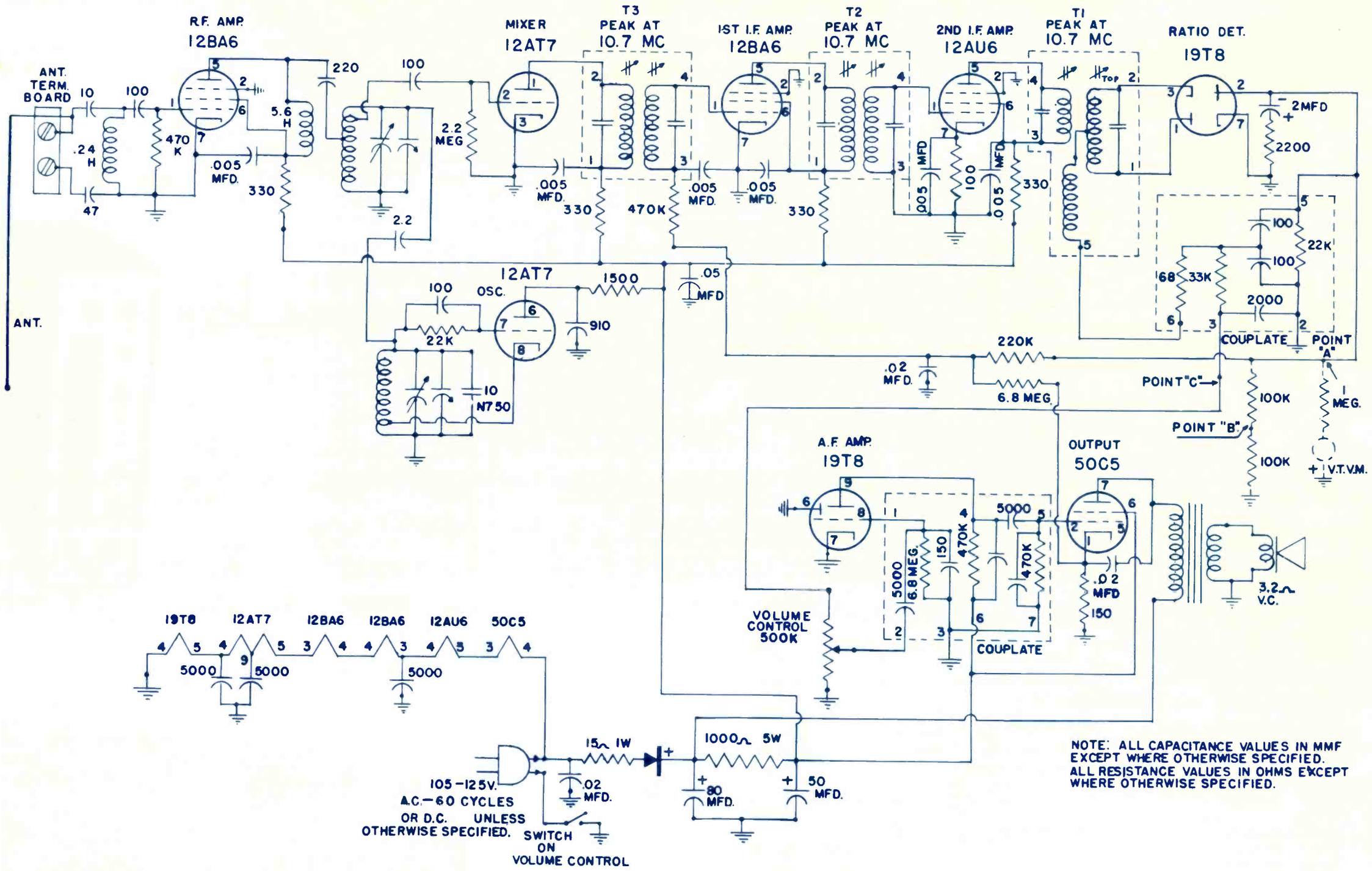
DEWALD
FM Table Radio
Model P-705



NOTE: ALL CAPACITANCE VALUES IN MMF EXCEPT WHERE OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES IN OHMS EXCEPT WHERE OTHERWISE SPECIFIED.

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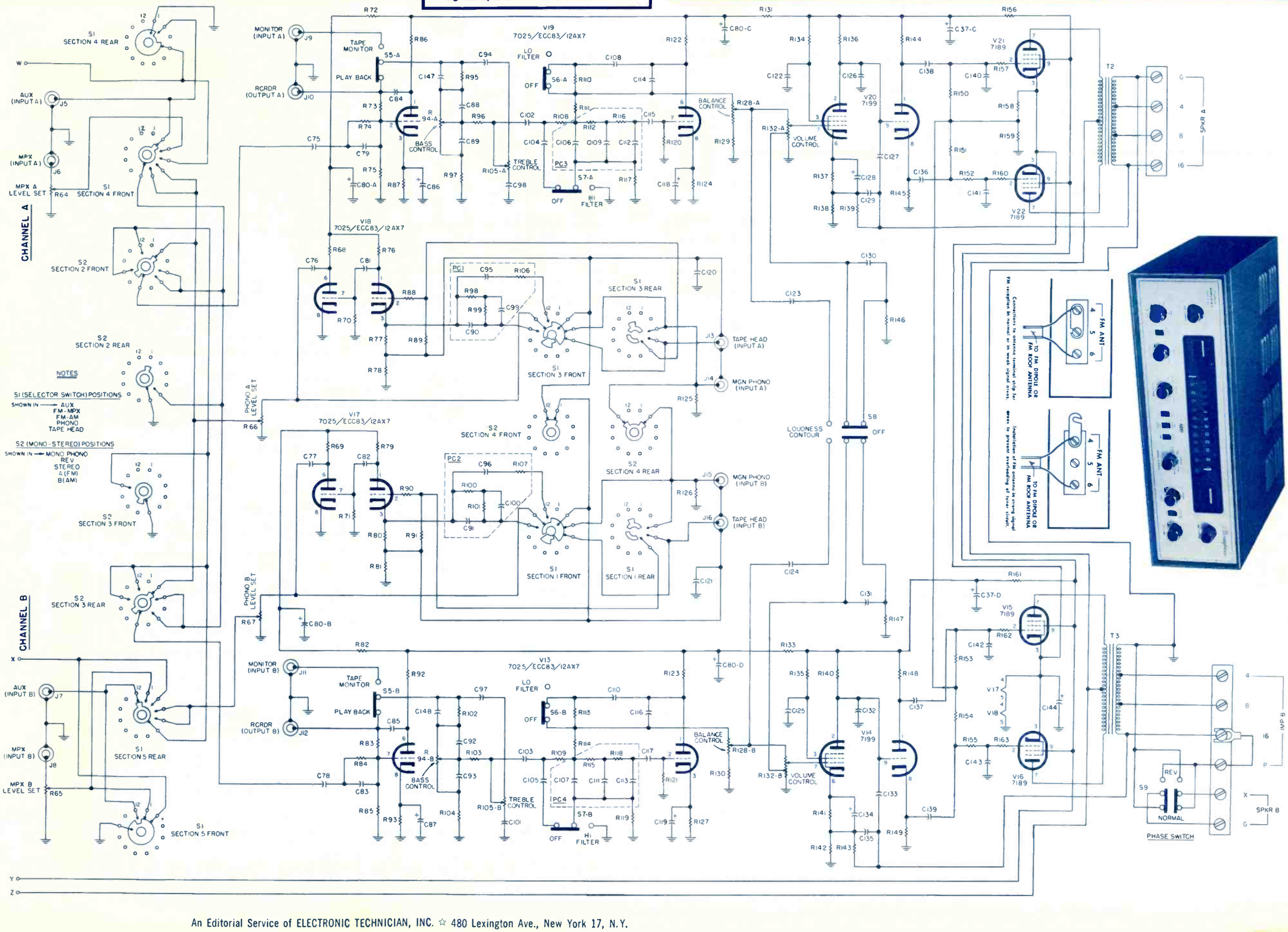
FISHER
FM-AM Stereo Receiver
Model 600

AMPLIFIER SECTION

Important! **Do not attempt to operate the *TA-600* Receiver without first connecting both speakers or otherwise loading the speaker terminals.**



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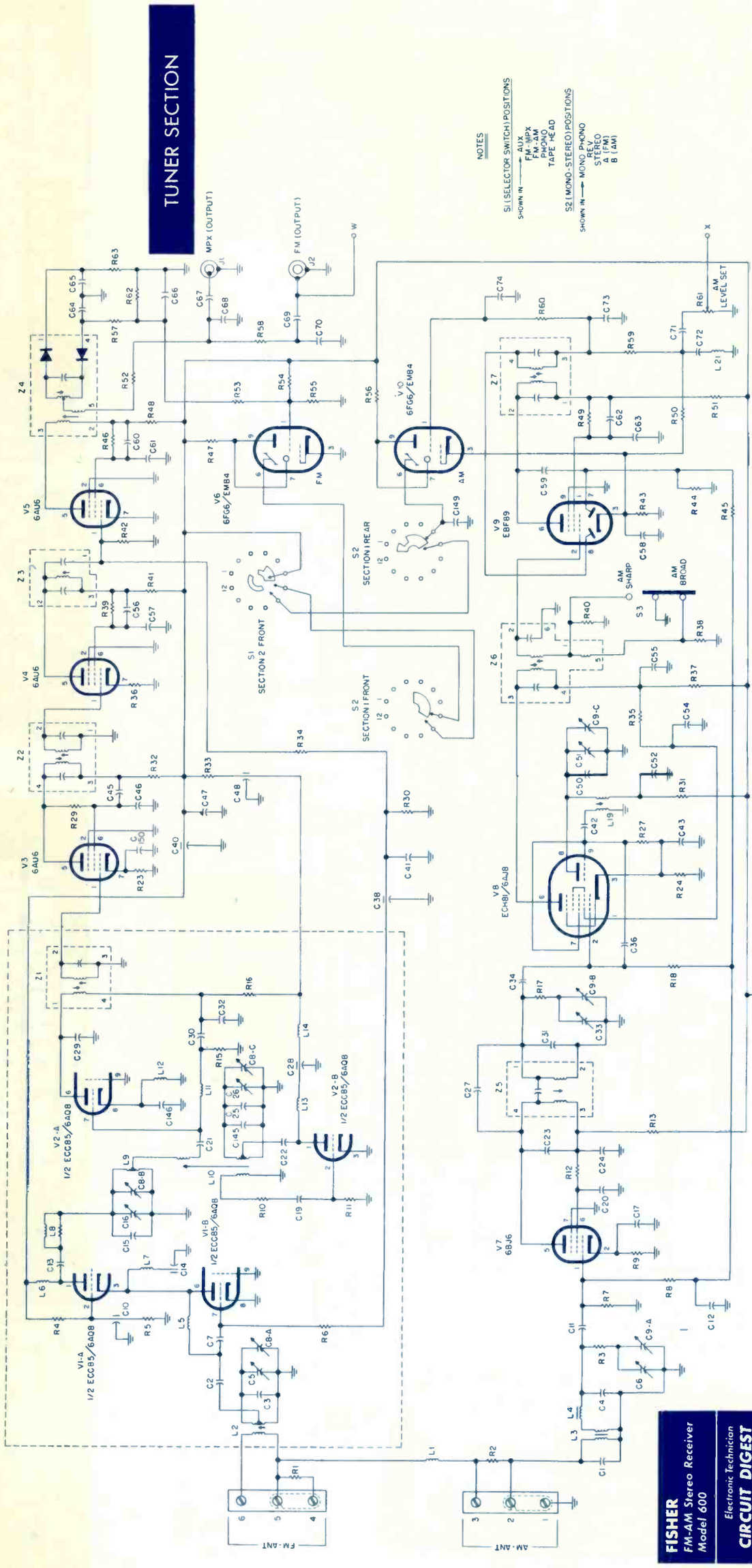
TUNER SECTION



VOLTAGE MEASUREMENTS

All readings taken with vacuum-tube voltmeter (11 meg. input resistance) with respect to chassis ground, subject to 10% normal variation unless otherwise noted. Line voltage 117 vac, level controls on rear apron at MAX., Tone controls at FLAT, Selector SW at AM-FM, Filters at OFF, AM on SHARP, Stereo-Mono SW in STEREO, Balance Control at FLAT, Volume control at MIN.

			TUBE SOCKET PIN NUMBER								
SYMBOL	TUBE		1	2	3	4	5	6	7	8	9
V1	ECC85 / 6AQ8	FM RF	184	90	0	0	6.3AC	90	−0.55	0	0
V2	ECC85 / 6AQ8	FM MIX / OSC	164	−1.8	0	6.3AC	0	160	−3.0	0	0
V3	6AU6	1st FM IF	0	0	6.3AC	0	180	175	0.7	–	–
V4	6AU6	2nd FM IF	0	0	6.3AC	0	180	90	0.9	–	–
V5	6AU6	Limiter 300 FM IF	−0.55	0	6.3AC	0	180	65	0	–	–
V6	EMF84 / 6FG16	FM Tuning Eye	−0.65	NC	0	6.3AC	0	180	110	NC	110
V7	6BJ6	AM RF	−0.1	0.8	6.3AC	0	175	80	0	–	–
V8	ECH81/6AQ8	AM MIX OSC	80.0	0	1.3	0	6.3	180	−5.0	110	−5.0
V9	EBF89	IF Detector	85.0	0	1.55	6.3	0	180	0	1.1	0
V10	EMF8A / 6FG6	AM Tuning Eye	1.15	NC	1.65	6.3AC	0	180	50	NC	50
V11	G234 / 5AR4	Rect	NC	FIL	NC	AC	BC	AC	NC	400	–
V12	EZ80 / 6V4	Rect	AC	NC	225	FIL	BIL	NC	AC	NC	NC
V13	7025 / ECC83 / 12AX7	Pre Amp	140	0	1.2	FIL	BIL	165	0	1.2	FIL
V14	7199	Driver Phase Inv	180	95	55	FIL	BIL	1.9	0	100	90
V15	7189	Outpost Audio	NC	11	23.5	FIL	FIL	NC	380	NC	320
V16	7189	Audio Output	NC	11	23.5	FIL	FIL	NC	380	NC	320
V17	7025 / ECC83 / 12AX7	Pre Amp	120	0	1.05	23.5	12.5	100	−0.55	0	NC
V18	7025 / ECC83 / 12AX7	Pre Amp	115	0	1.05	12	0	105	−0.65	0	NC
V19	7025 / ECC83 / 12AX7	Pre Amp	170	0	1.2	FIL	FIL	150	0	1.2	FIL
V20	7199	Driver Phase Inv.	180	95	55	FIL	FIL	1.9	0	100	95
V21	7189	Power Amp.	NC	11	23.5	FIL	FIL	NC	380	NC	320
V22	7189	Power Amp.	NC	11	23.5	FIL	FIL	NC	380	NC	320

TERMINAL SYMBOL		◗	■	▲	–
ELECTROLYTIC CAPACITOR VOLTAGE	C37	380	320	283	283
	C80	270	270	227	226
	C39	214	200	185	–

NOTES
AC=AC volts
NC=No connection

FISHER
FM-AM Stereo Receiver
Model 600

Electronic Technician
CIRCUIT DIGEST

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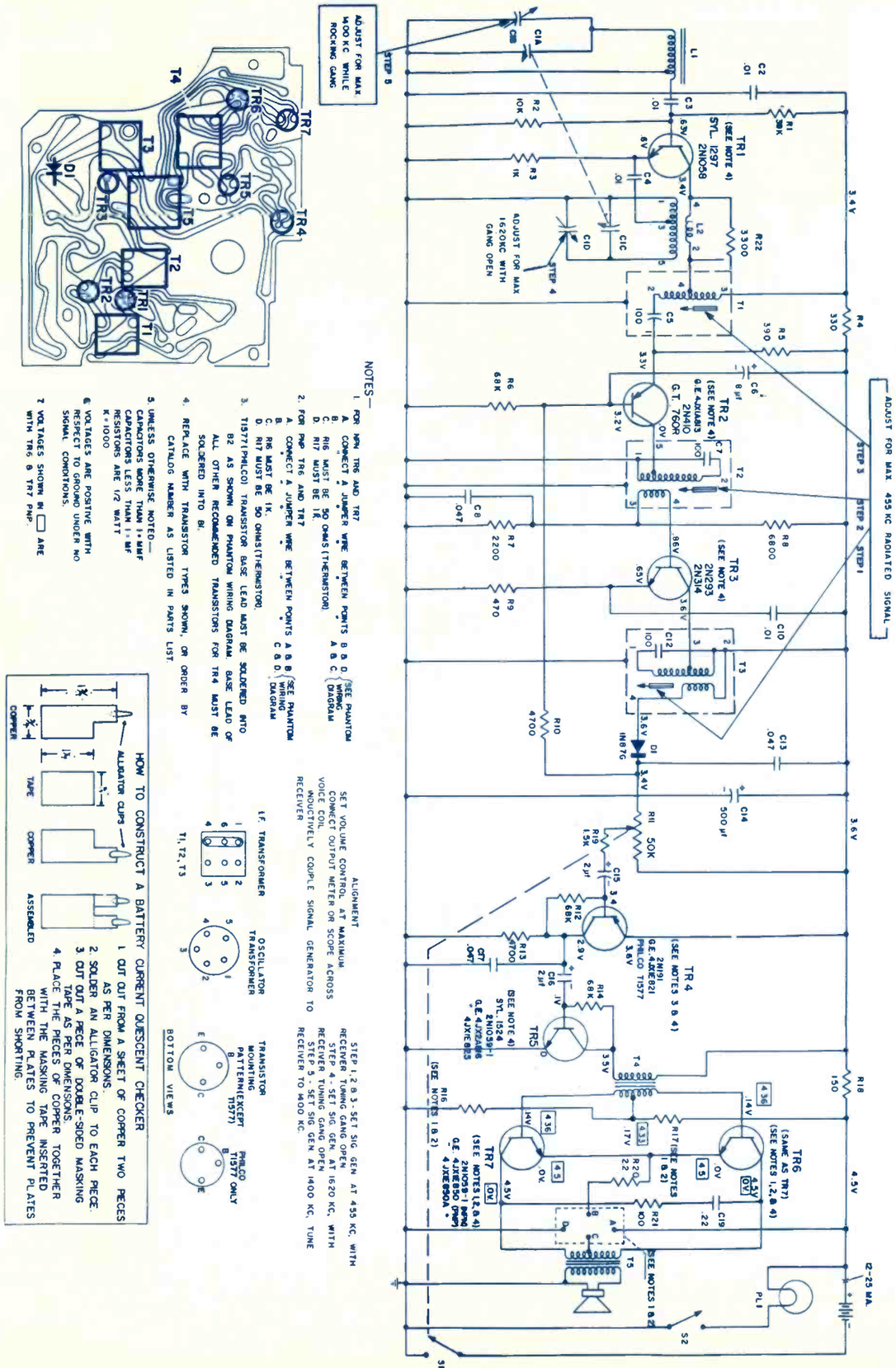
GENERAL ELECTRIC
Transistor Radio
Model P776A



NOTES—

1. FOR NPN TR6 AND TR7
   A. CONNECT A JUMPER WIRE BETWEEN POINTS B B B (SEE PHANTOM WIRING DIAGRAM)
   B. R16 MUST BE 150 OHMS (THERMISTOR)
   C. R16 MUST BE 1K.
   D. R17 MUST BE 1K.
2. FOR PNP TR6 AND TR7
   A. CONNECT A JUMPER WIRE BETWEEN POINTS A B C (SEE PHANTOM WIRING DIAGRAM)
   B. R16 MUST BE 1K.
   C. R16 MUST BE 150 OHMS (THERMISTOR).
   D. R17 MUST BE 150 OHMS (THERMISTOR).
3. T1577 (PHILCO) TRANSISTOR BASE LEAD MUST BE SOLDERED INTO B2 AS SHOWN ON PHANTOM WIRING DIAGRAM. BASE LEAD OF ALL OTHER RECOMMENDED TRANSISTORS FOR TR4 MUST BE SOLDERED INTO B1.
4. REPLACE WITH TRANSISTOR TYPES SHOWN, OR ORDER BY CATALOG NUMBER AS LISTED IN PARTS LIST.
5. UNLESS OTHERWISE NOTED—
   CAPACITORS MORE THAN 1= MMF
   CAPACITORS LESS THAN 1= MF
   RESISTORS ARE 1/2 WATT
   K = 1000
6. VOLTAGES ARE POSITIVE WITH RESPECT TO GROUND UNDER NO SIGNAL CONDITIONS.
7. VOLTAGES SHOWN IN ☐ ARE WITH TR6 & TR7 PNP.

ALIGNMENT

SET VOLUME CONTROL AT MAXIMUM. CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL. INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER

STEP 1 & 2 & 3 - SET SIG. GEN AT 455 KC. WITH RECEIVER TUNING GANG OPEN
STEP 4 - SET SIG. GEN AT 1620 KC. WITH RECEIVER TUNING GANG OPEN
STEP 5 - SET SIG GEN AT 1400 KC. TUNE RECEIVER TO 1400 KC.

L.F. TRANSFORMER

T1, T2, T3

OSCILLATOR TRANSFORMER

TRANSISTOR MOUNTING

BOTTOM VIEWS

PHILCO T1577 ONLY

BOTTOM VIEWS

HOW TO CONSTRUCT A BATTERY CURRENT QUIESCENT CHECKER

1. CUT OUT FROM A SHEET OF COPPER TWO PIECES AS PER DIMENSIONS.
2. SOLDER AN ALLIGATOR CLIP TO EACH PIECE.
3. CUT OUT A PIECE OF DOUBLE-SIDED MASKING TAPE AS PER DIMENSIONS.
4. PLACE THE PIECES OF COPPER TOGETHER WITH THE MASKING TAPE INSERTED BETWEEN PLATES TO PREVENT PLATES FROM SHORTING.

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

GENERAL ELECTRIC
Transistor Radio
Models P805, P806

TRANSISTOR CHART				
⊙ TR1	TR2	TR3	TR4	TR5
2N169	2N135	2N169	2N192	2N241A
2N212 (1297)		2N293	2N324	2N270
		2N314		2N321

⊙ When a 2N169 is used in position (TR1) resistor R1 should be 82K
When a 2N212 (1297) is used in position (TR1) resistor R1 should be 33K

TRANSISTOR MOUNTING

BOTTOM VIEWS

I.F. TRANSFORMER

T1, T2, T3

OSCILLATOR TRANSFORMER L2

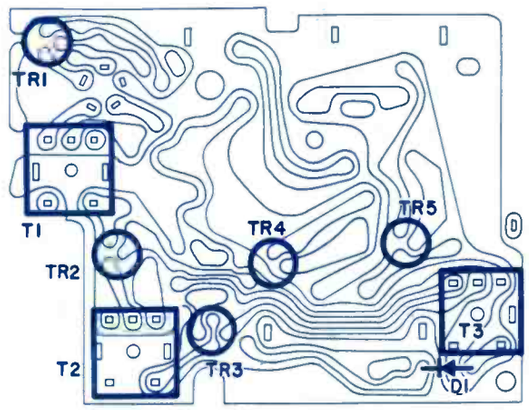
ALIGNMENT

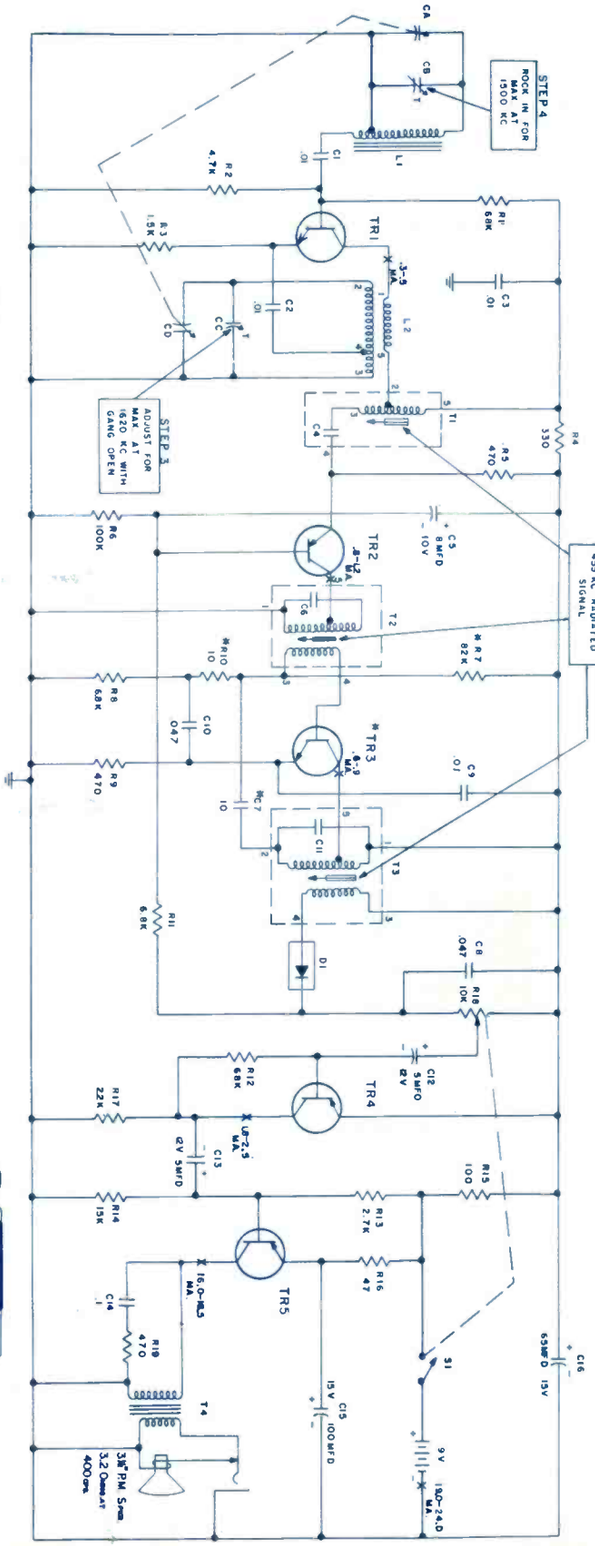
SET VOLUME CONTROL AT MAXIMUM. CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL.
INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER.
STEP 1 & 2 - SET SIG. GEN. AT 455 KC. WITH RECEIVER TUNING GANG OPEN.
STEP 3 - SET SIG GEN. AT 1620 KC. WITH RECEIVER TUNING GANG OPEN.
STEP 4 - SET SIG GEN. AT 1500 KC. TUNE RECEIVER TO 1500 KC.

*WHEN TR3 IS 2N169
R7 = 47K
C7 IS DELETED
R10 IS REPLACED BY A JUMPER

MEASURE COLLECTOR CURRENTS WITH A MILLIAMMETER INSERTED IN SERIES WITH THE CIRCUITS MARKED "X" AND ALSO BATTERY CURRENT AT POINT MARKED "x" IN BATTERY CIRCUIT.

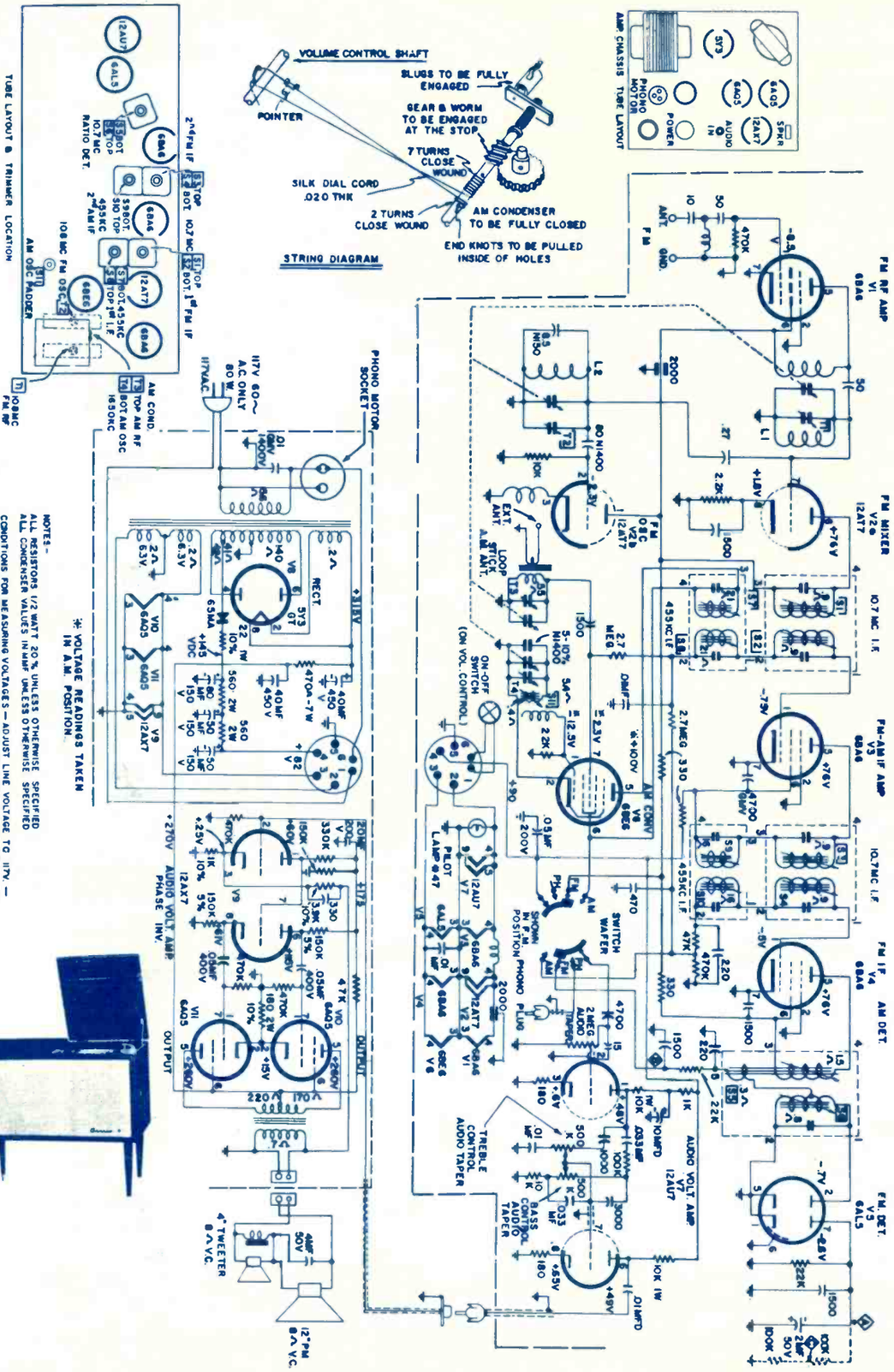
UNLESS OTHERWISE NOTED—
CAPACITORS MORE THAN 1= MMF
CAPACITORS LESS THAN 1= MF
RESISTORS ARE 1/2 WATT K = 1000





ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

GRANCO
FM-AM-Phono
Model RP-1000



NOTES –
ALL RESISTORS 1/2 WATT 20% UNLESS OTHERWISE SPECIFIED
ALL CONDENSER VALUES IN MMF UNLESS OTHERWISE SPECIFIED
CONDITIONS FOR MEASURING VOLTAGES – ADJUST LINE VOLTAGE TO 117V. – NO SIGNAL INPUT – USE VTVM – ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS GROUND BAND SWITCH IN FM POSITION

* VOLTAGE READINGS TAKEN IN A.M. POSITION

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

MAGNAVOX
Stereo Amplifier
Chassis 182

Models 1SR295H
(00-10-20 Versions)

CONTINENTAL

SPEAKER SWITCH WIRING
(USED WITH 00-10-20 VERSIONS)

SWITCH WIRING FOR INTERNAL-EXTERNAL-STEREO OPERATION

PLUG VIEWED FROM TOP
SWITCH VIEWED FROM KNOB END
SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION (INTERNAL POSITION)

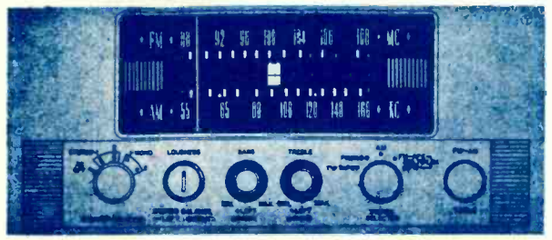
SWITCH WIRING FOR INTERNAL STEREO AND EXTERNAL STEREO OPERATION

PLUG VIEWED FROM TOP
SWITCH VIEWED FROM KNOB END
SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION (INTERNAL STEREO POSITION)

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

HOFFMAN
Stereo AM-FM Receiver
Chassis 1130

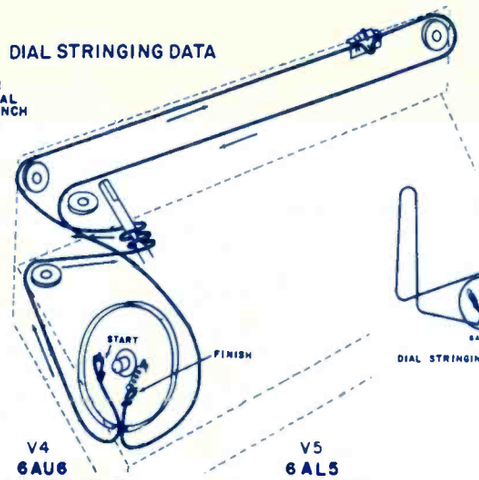
CONTROL PANEL - CHASSIS #1130



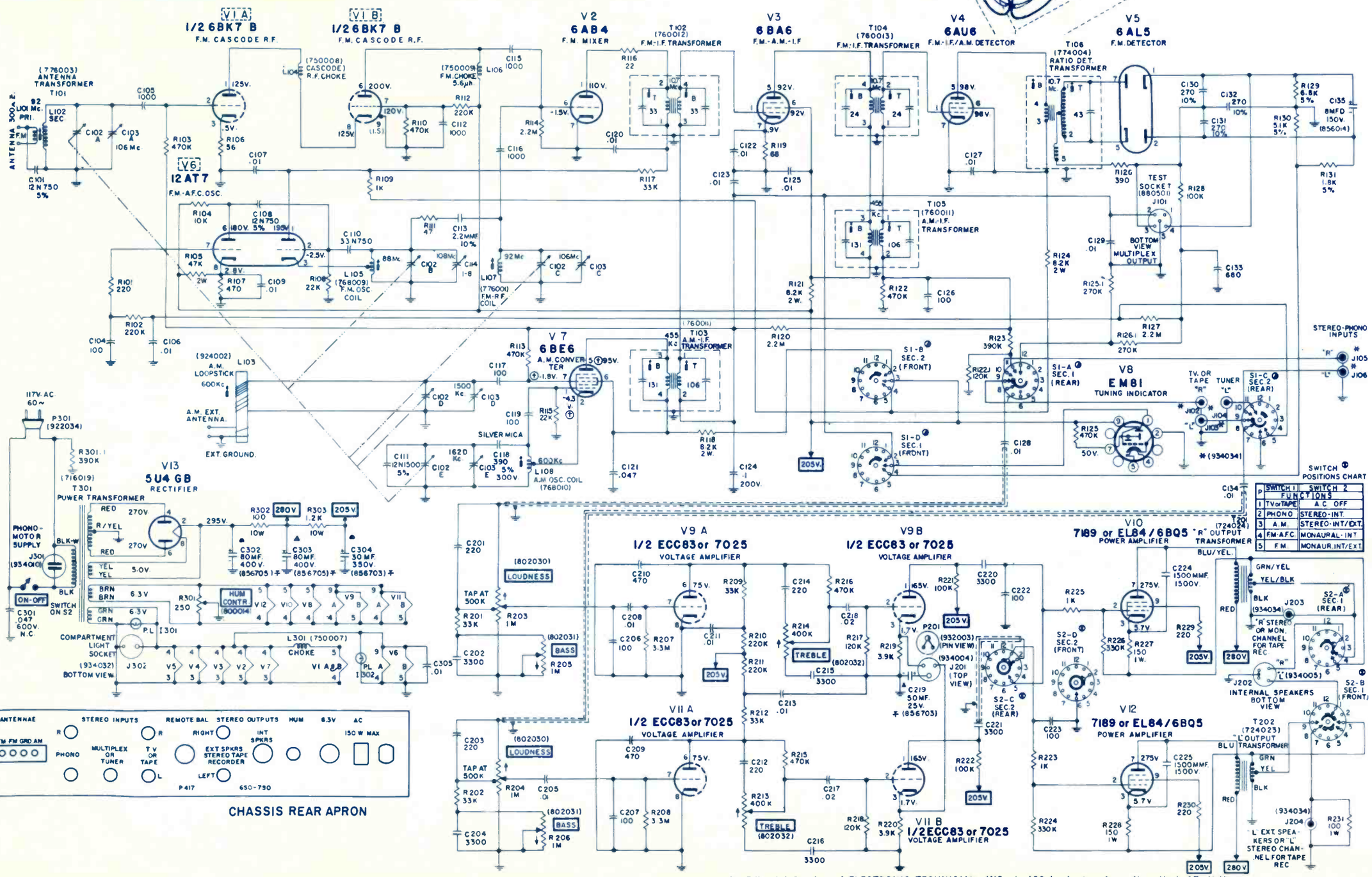
NOTES:
1. ALL CAPACITIES SHOWN AS DECIMAL FRACTIONS ARE MICROFARADS AND SHOWN AS WHOLE NUMBERS ARE MICROMICROFARADS UNLESS OTHERWISE NOTED.
2. ALL RESISTANCES AR GIVEN IN OHMS: K=1,000, M=1,000,000
3. ALL RESISTORS ARE 10% - 1/2 WATT, AND ALL CAPACITORS ARE 20% - 500 V. UNLESS OTHERWISE NOTED.
4. NUMERALS SHOWN IN PARENTHESIS (XXXXXX) INDICATE HOFFMAN PART No.
5. ------ INDICATES SHIELD, — — — INDICATES GANGED. DASHED LINE AROUND "V" NO. = EXT. TUBE SHIELD
6. ALL D.C. VOLTAGES ARE MEASURED WITH A V.T.V.M. IN "FM" POSITION AND "OFF" STATION, EXCEPT THOSE ON V7.
7. D.C. VOLTAGES ON V7 ARE MEASURED WITH A V.T.V.M. IN "AM" POSITION AND "OFF" STATION.
8. ALL SWITCHES SHOWN ARE IN MAXIMUM C.C.W. POSITION.
9. REAR KNOBS ARE FOR "R" OR RIGHT CHANNEL AND FRONT KNOBS FOR "L" OR LEFT CHANNEL.
10. S1-(902021) • TV/TAPE - PHONO - A.M. - FM/A.F.C. - F.M. SELECTOR.
    S2-(902022) • AC OFF - STEREO INT - STEREO INT/EXT - MONAURAL-INT & MONAURAL-INT/EXT. SELECTOR.
11. SWITCH CONTACTS SHOWN NOT CONNECTED ARE CONNECTED INTERNALLY.
12. C302 AND C303 - ARE IN CONTAINER PART No. 856705; C219, 304 ARE IN CONTAINER PART No. 856703.
13. TO USE STEREO BALANCE REMOTE CONTROL (P-417) INSERT ITS CONNECTOR IN PLACE OF PLUG P201 - (SOCKET J201)

DIAL STRINGING DATA

NOTE: TUNING CONDENSER FULLY MESHED. DIAL POINTER SET 1/8 INCH TO LEFT OF CENTER HORIZONTAL LINE.



DIAL STRINGING FOR FREQUENCY DISPLAY SCOPE POINTER



SWITCH POSITIONS CHART

P	SWITCH 1 FUNCTIONS	SWITCH 2 FUNCTIONS
1	TV or TAPE	A.C. OFF
2	PHONO	STEREO-INT.
3	A.M.	STEREO-INT/EXT.
4	FM-AFC	MONAURAL-INT.
5	F.M.	MONAUR. INT/EXT.

CHASSIS REAR APRON

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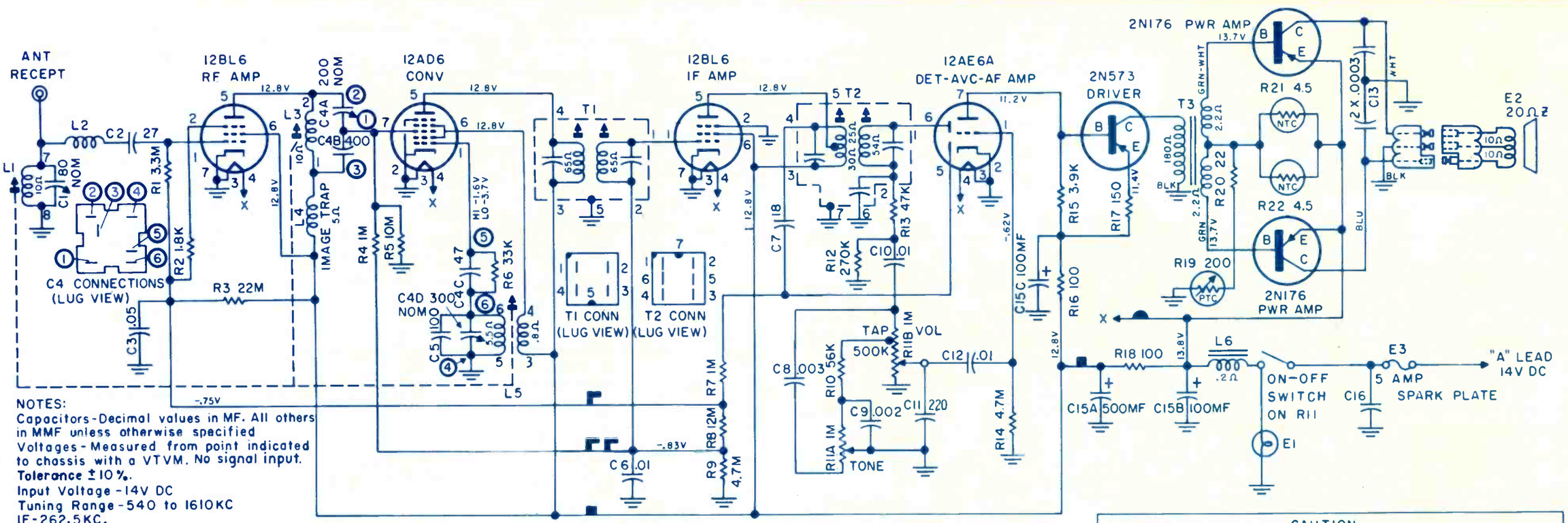
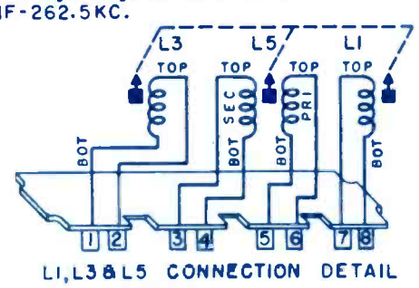
MOTOROLA
Auto Radio, transistorized Model 04MA



NOTES:
Capacitors - Decimal values in MF. All others in MMF unless otherwise specified
Voltages - Measured from point indicated to chassis with a VTVM. No signal input. Tolerance ±10%.
Input Voltage - 14V DC
Tuning Range - 540 to 1610KC
IF - 262.5KC.



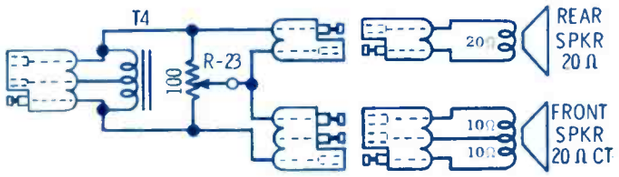
L1, L3 & L5 CONNECTION DETAIL

PLATED PANEL WIRING LEGEND
■ = B+ ▬ = FILAMENT
▛ = RF. AVC ▛ ▛ = IF. CONV AVC

TRANSISTOR CONNECTIONS (LUG VIEW)

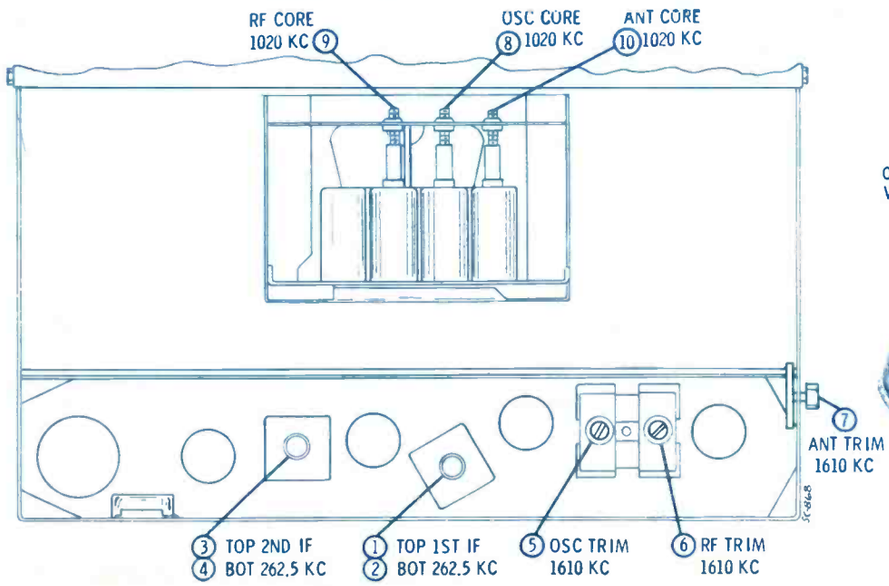
CAUTION

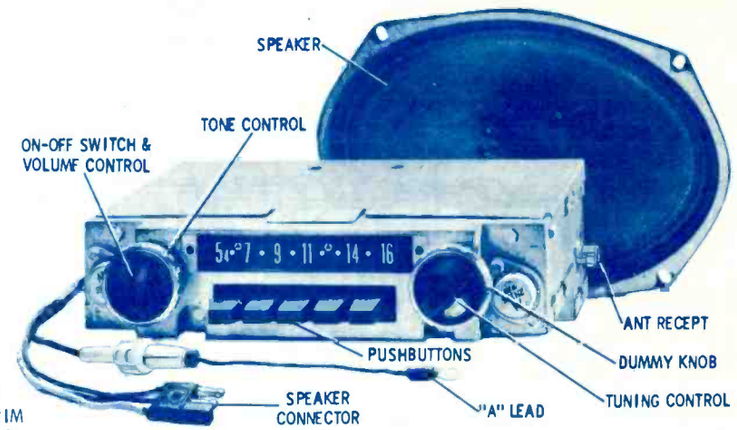
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE



AK-330 REAR SPEAKER WIRING DIAGRAM

ALIGNMENT POINTS LOCATION DETAIL





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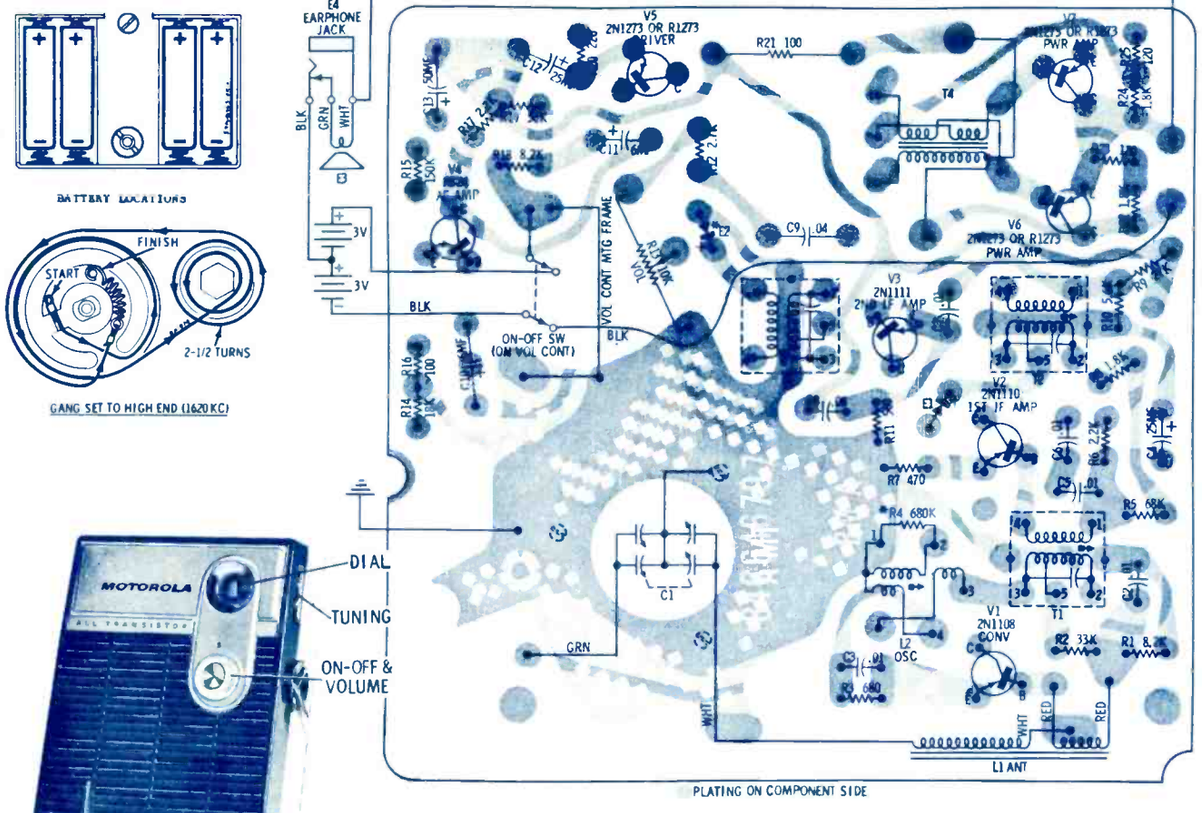
ELECTRONIC TECHNICIAN CIRCUIT DIGEST

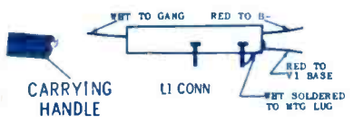
MOTOROLA
Transistor Radio
Chassis HS-797
Model X16

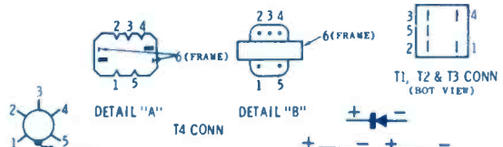
PLATED CHASSIS BOARD WIRING AS VIEWED FROM BOTTOM WITH COMPONENTS AND TOP SIDE PLATING "PHANTOMED IN" TO ALLOW CIRCUIT TRACING.



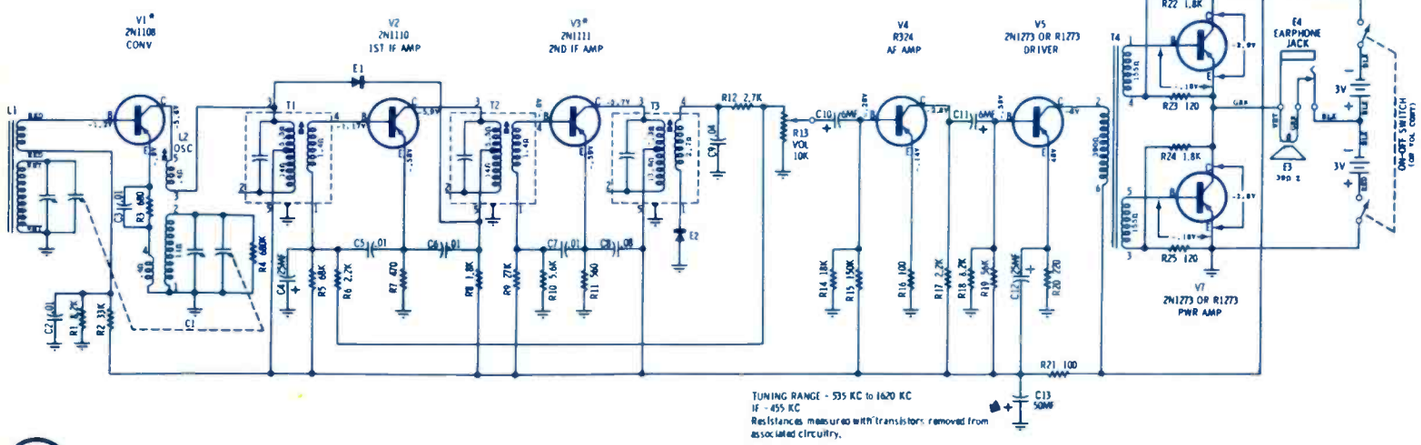
BATTERY LOCATIONS

GANG SET TO HIGH END (1620 KC)





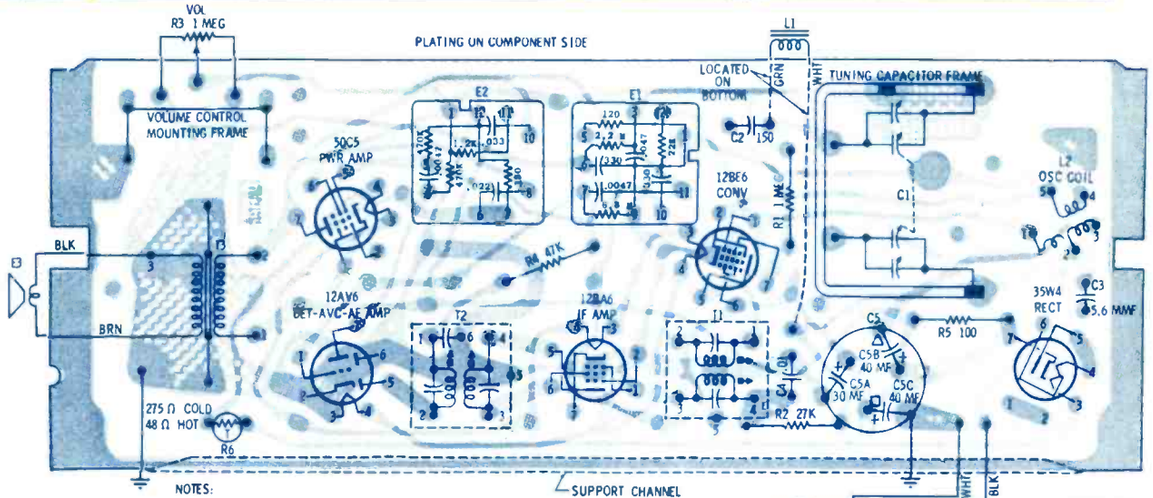
E1 & E2 DETAILS



TUNING RANGE - 535 KC to 1620 KC
IF - 455 KC
Resistances measured with transistors removed from associated circuitry.

ELECTRONIC TECHNICIAN CIRCUIT DIGEST

MOTOROLA
Home AM-Clock Radio
Chassis HS-753

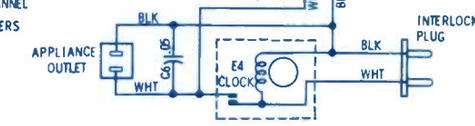


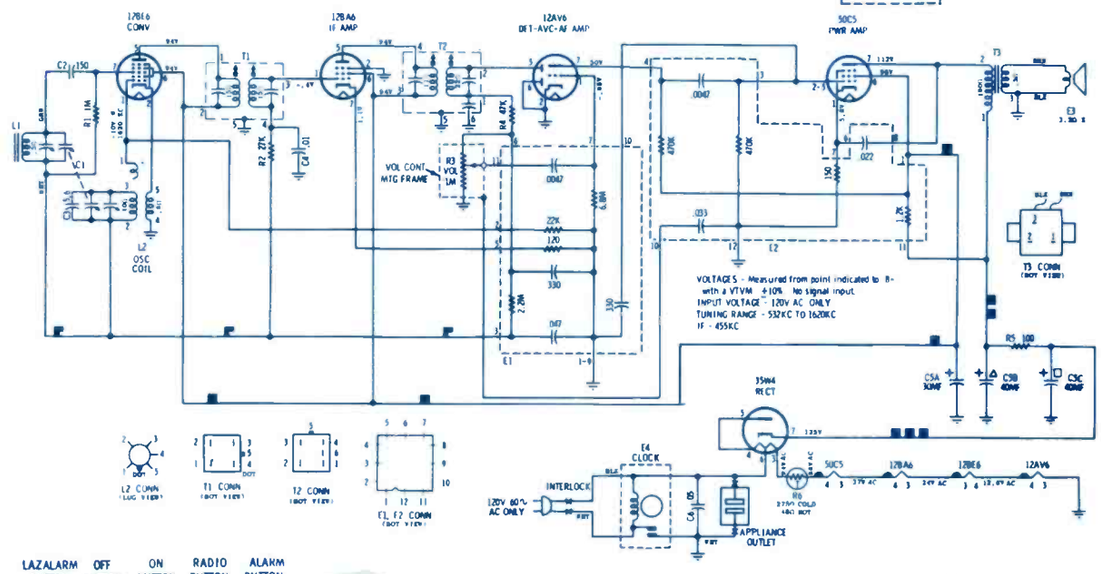
NOTES:

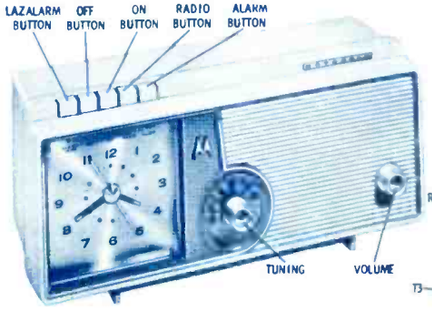
PLATED CHASSIS BOARD WIRING AS VIEWED FROM COMPONENT SIDE

CAPACITORS - DECIMAL VALUES IN MF. ALL OTHERS IN MMF UNLESS OTHERWISE SPECIFIED.

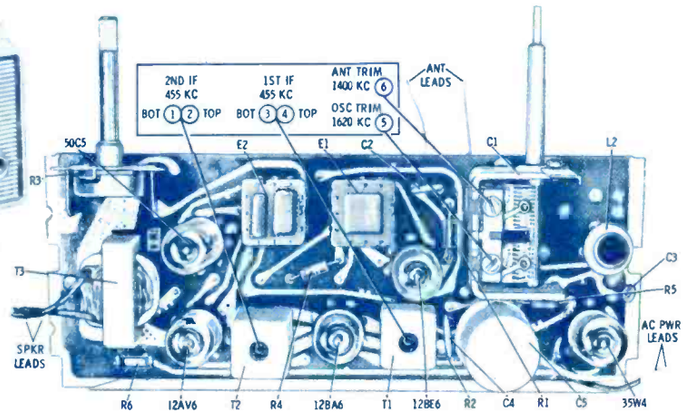
PLATED CHASSIS BOARD WIRING LEGEND
B- B+ AVC FILAMENT







Models C5G, C5S, C5W

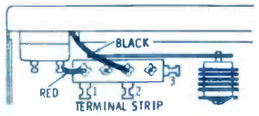


ALIGNMENT POINTS AND PARTS LOCATIONS

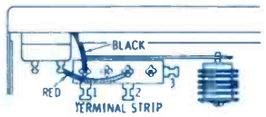
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

MOTOROLA
Transistor Auto Radio
Model 406

OPERATES FROM -
6 volt storage battery

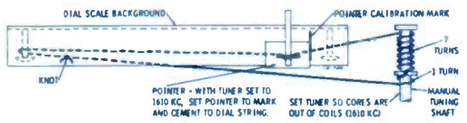


RADIO WIRING FOR CARS WITH A NEGATIVE GROUND ELECTRICAL SYSTEM - RED LEAD MUST BE SOLDERED TO TERMINAL NO. 1: BLACK LEAD TO TERMINAL NO. 2.

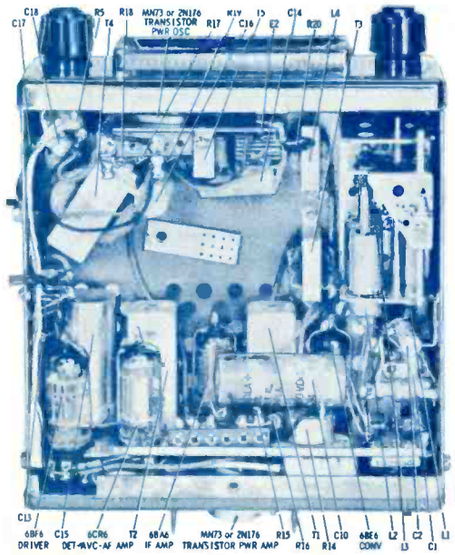


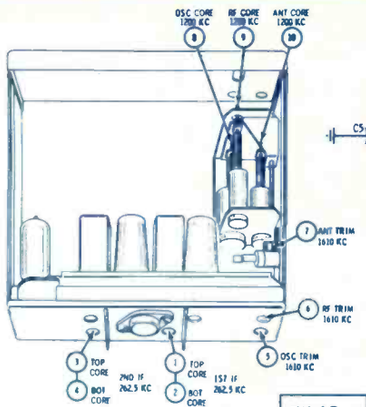
RADIO WIRING FOR CARS WITH A POSITIVE GROUND ELECTRICAL SYSTEM - BLACK LEAD MUST BE SOLDERED TO TERMINAL NO. 1; RED LEAD TO TERMINAL NO. 2.

POLARITY WIRING DETAIL

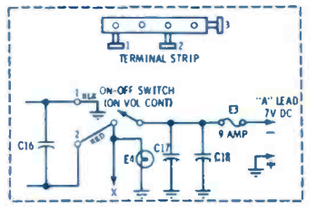


DIAL STRINGING DETAIL

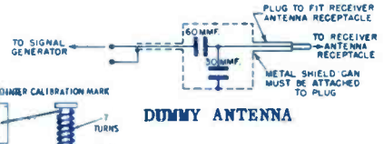




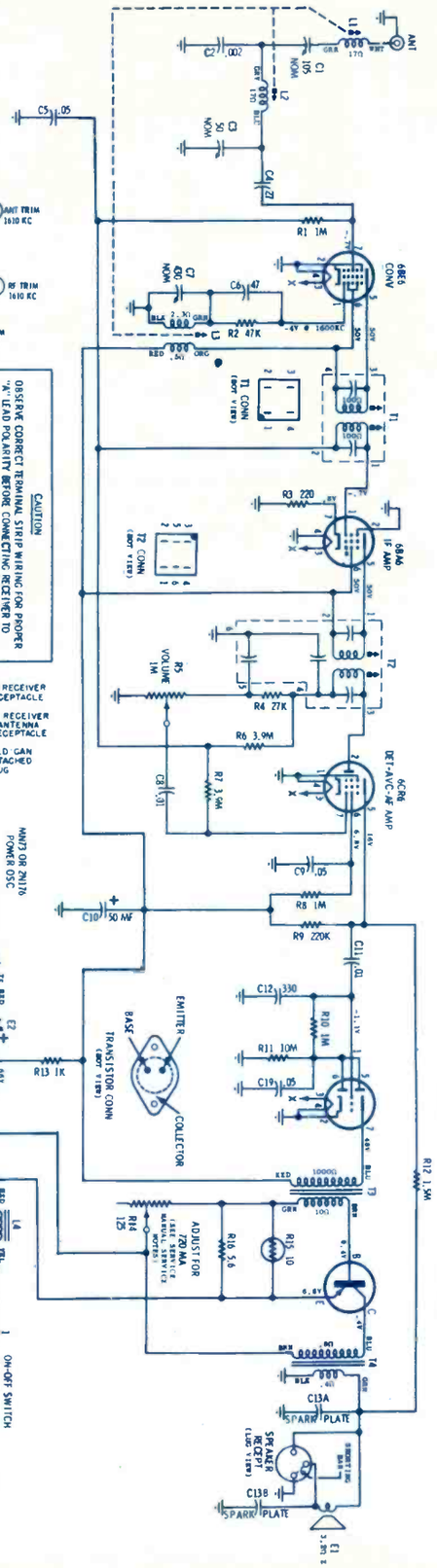
ALIGNMENT LOCATIONS



CAUTION
OBSERVE CORRECT TERMINAL STRIP WIRING FOR PROPER "A" LEAD POLARITY BEFORE CONNECTING RECEIVER TO SUPPLY SOURCE. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.



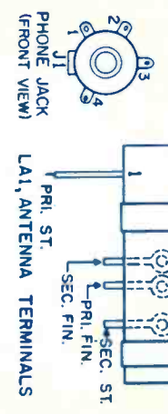
DUMMY ANTENNA



CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to B- with a VTVM.
No signal input. Tolerance ±10%.
INPUT VOLTAGE - 7V DC.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

PHILCO
Transistor Radio
Model T-50



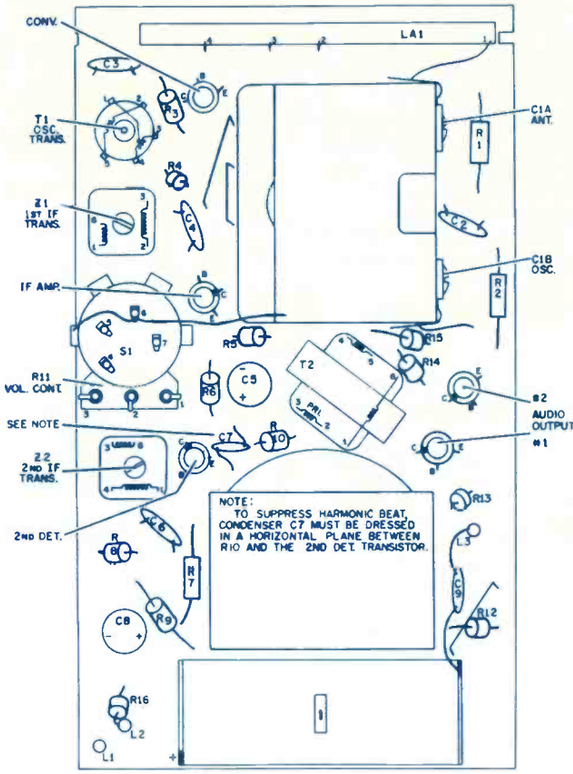
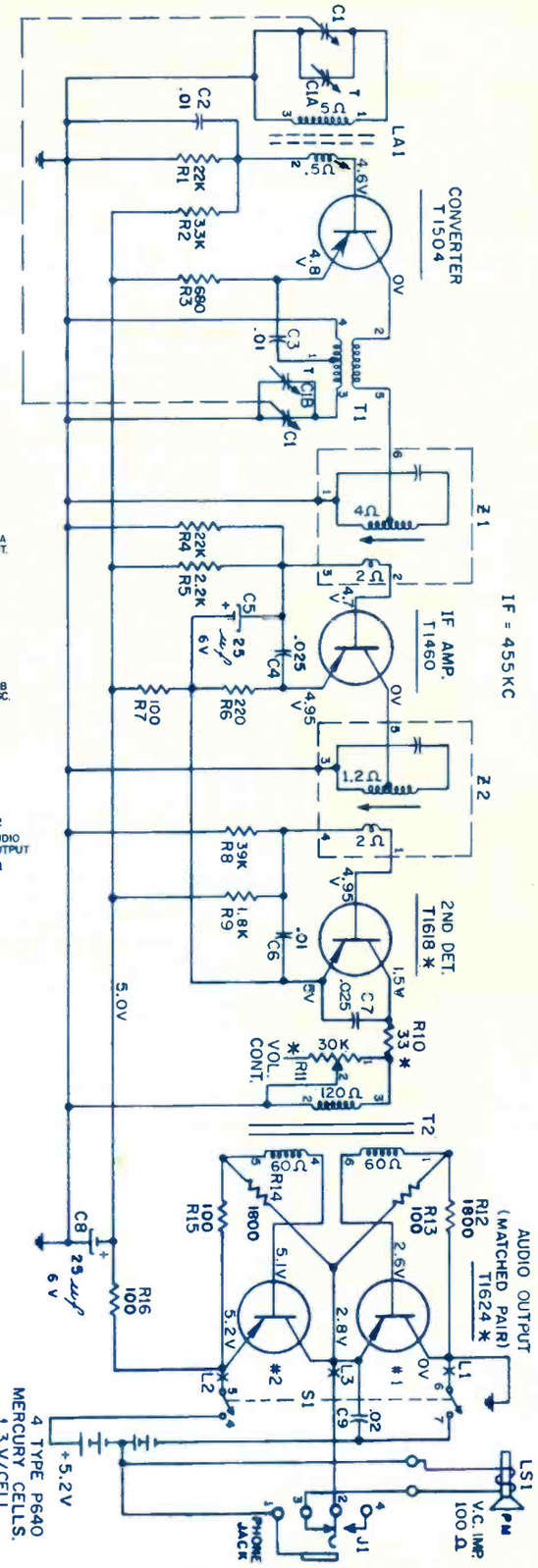


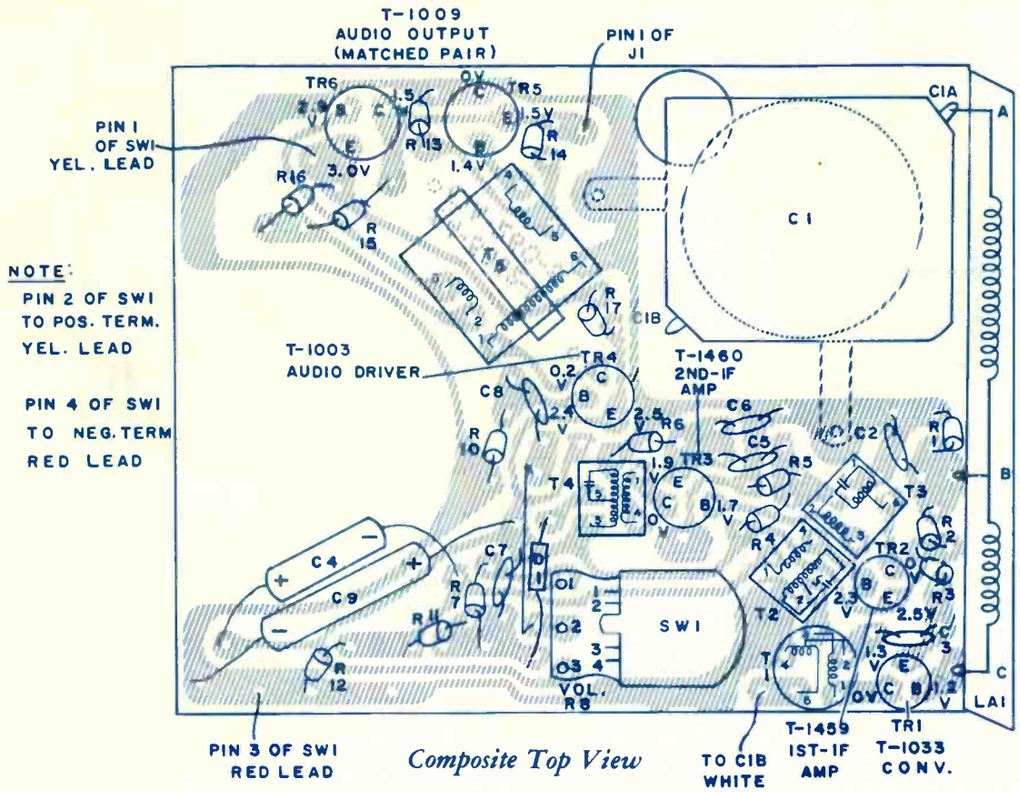
Figure 1. Printed Wiring Panel—Component Side Showing Parts Location and Alignment Points

ALL RESISTORS 1/2W, 10%, CARBON.
VOLTAGES MEASURED TO GROUND WITH A 20,000 Ω/VOLT METER UNDER NO SIGNAL CONDITION.
COIL RESISTANCES READ WITH COIL IN CIRCUIT.

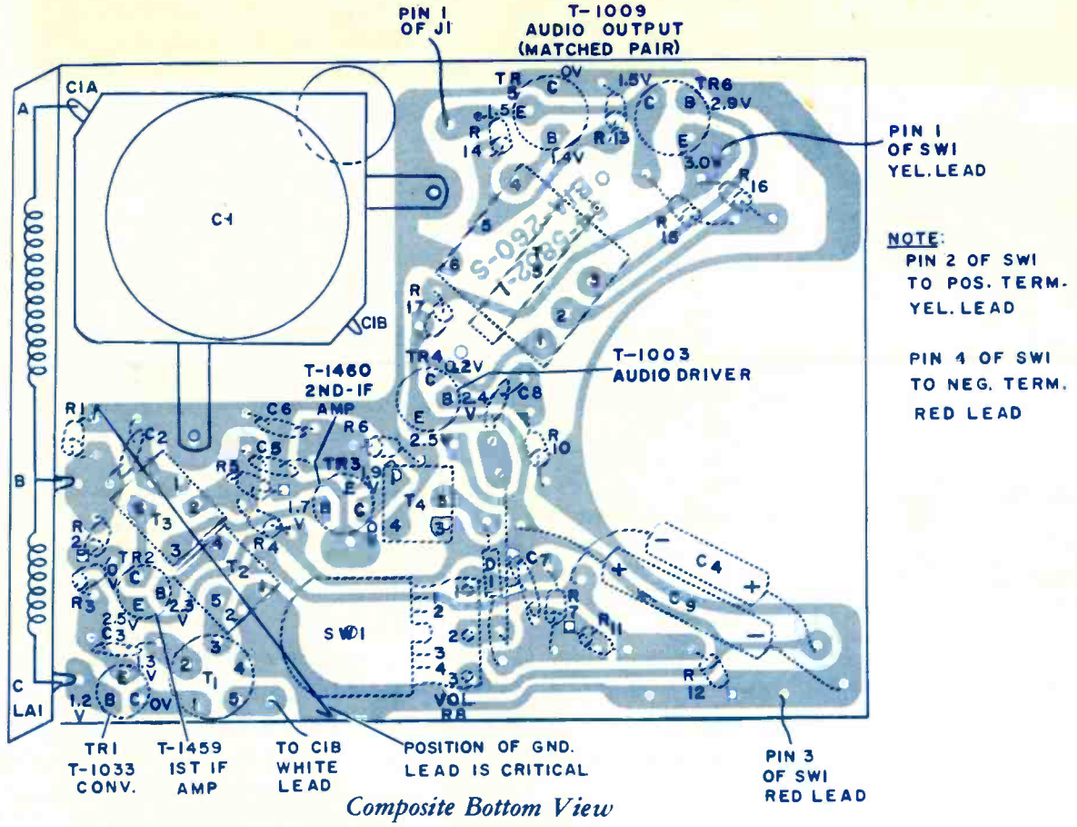
* FIRST PRODUCTION - AUDIO OUT. WAS T1009 RED DOT.
2ND DET. WAS T1460 RED DOT.
RUN 50 - R11, VOL. CONT., WAS 100K, PART # 33-5583-8.
RUN 51 - R11 CHANGED TO 30K, PART # 33-5583-8-10.
RUN 52 - R11, 30K, 33-5583-10.



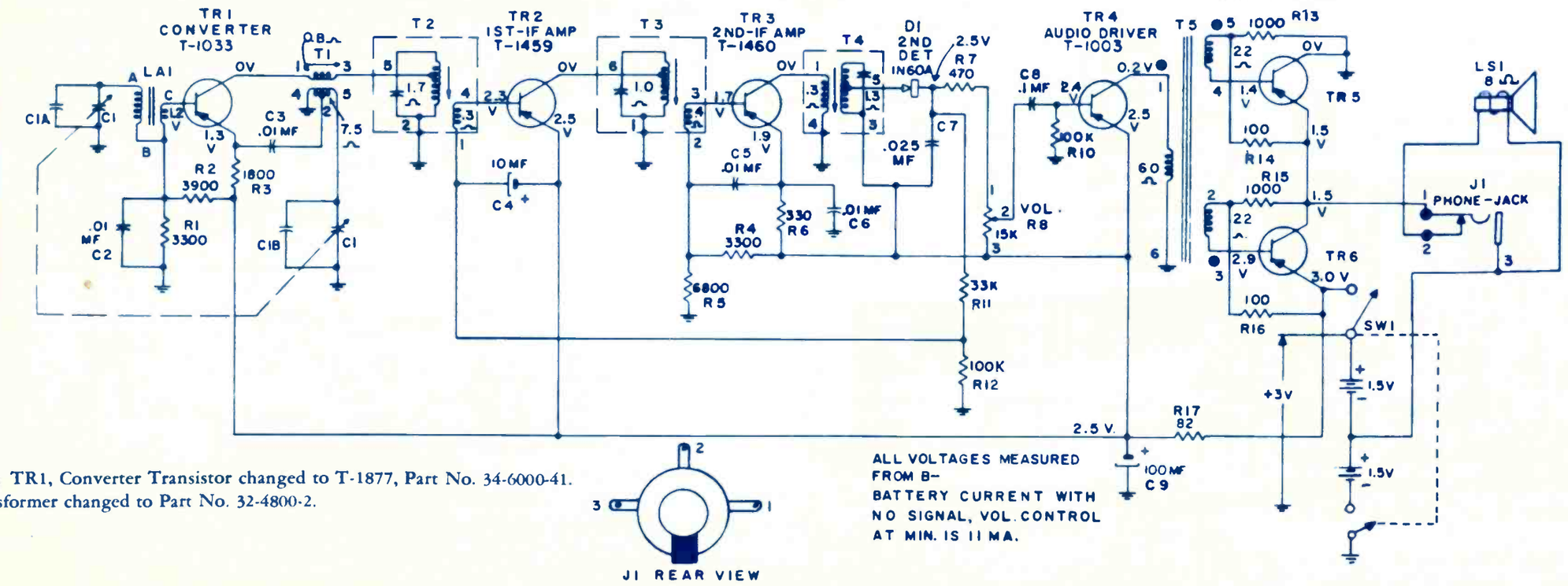
PHILCO
Transistor Portable Radio Model T-66



Composite Top View



Composite Bottom View



J1 REAR VIEW

T-66, Code 126: TR1, Converter Transistor changed to T-1877, Part No. 34-6000-41.
T2, 1st i-f Transformer changed to Part No. 32-4800-2.

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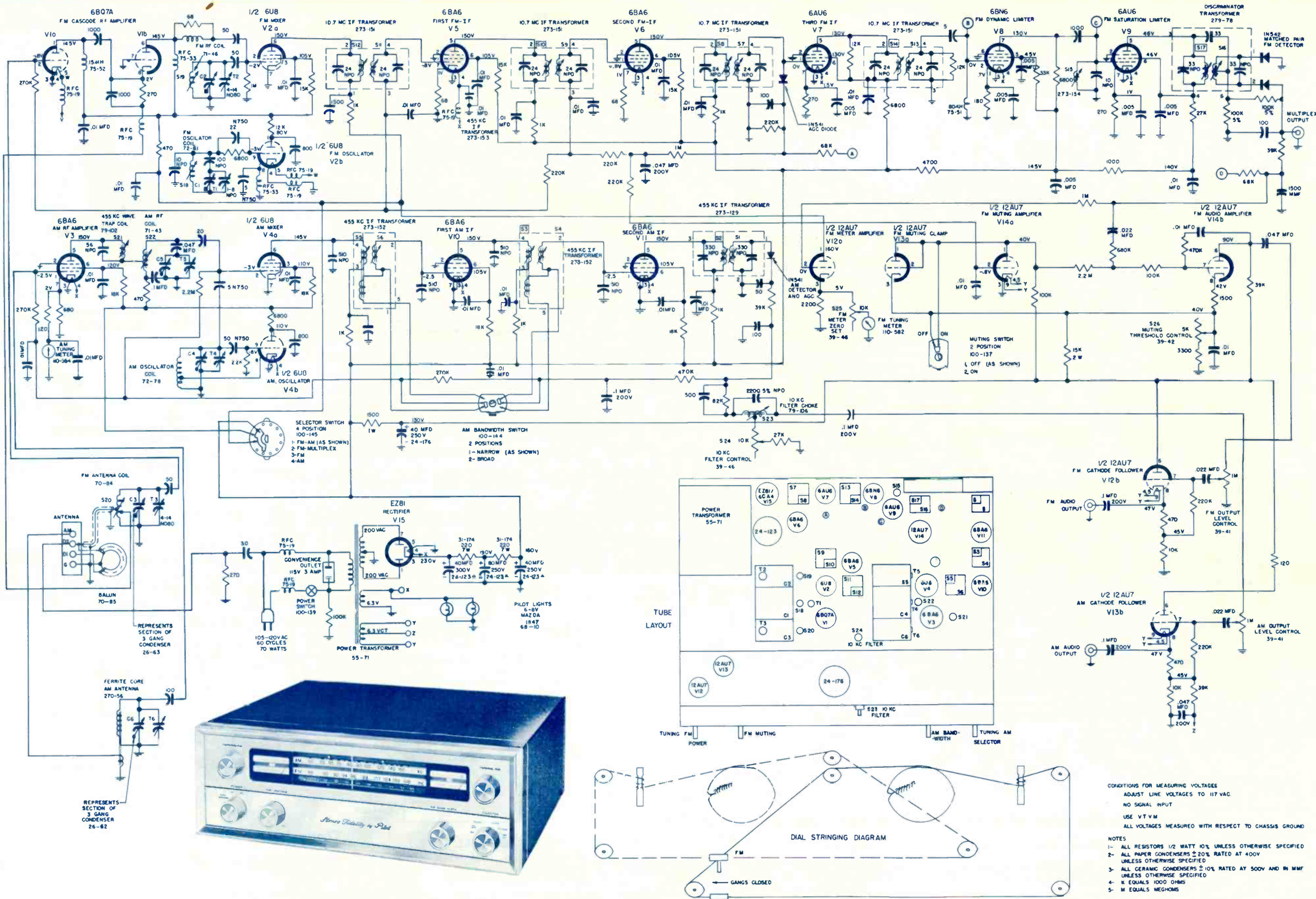
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

PILOT
Hi-Fi AM-FM Tuner
Model FA-680



CONDITIONS FOR MEASURING VOLTAGES

ADJUST LINE VOLTAGES TO 117 VAC.

NO SIGNAL INPUT

USE V.T.V.M.

ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS GROUND

NOTES

1- ALL RESISTORS 1/2 WATT 10% UNLESS OTHERWISE SPECIFIED
2- ALL PAPER CONDENSERS ± 20% RATED AT 400V UNLESS OTHERWISE SPECIFIED
3- ALL CERAMIC CONDENSERS ± 10% RATED AT 500V AND IN MMF UNLESS OTHERWISE SPECIFIED
4- K EQUALS 1000 OHMS
5- M EQUALS MEGHOMS

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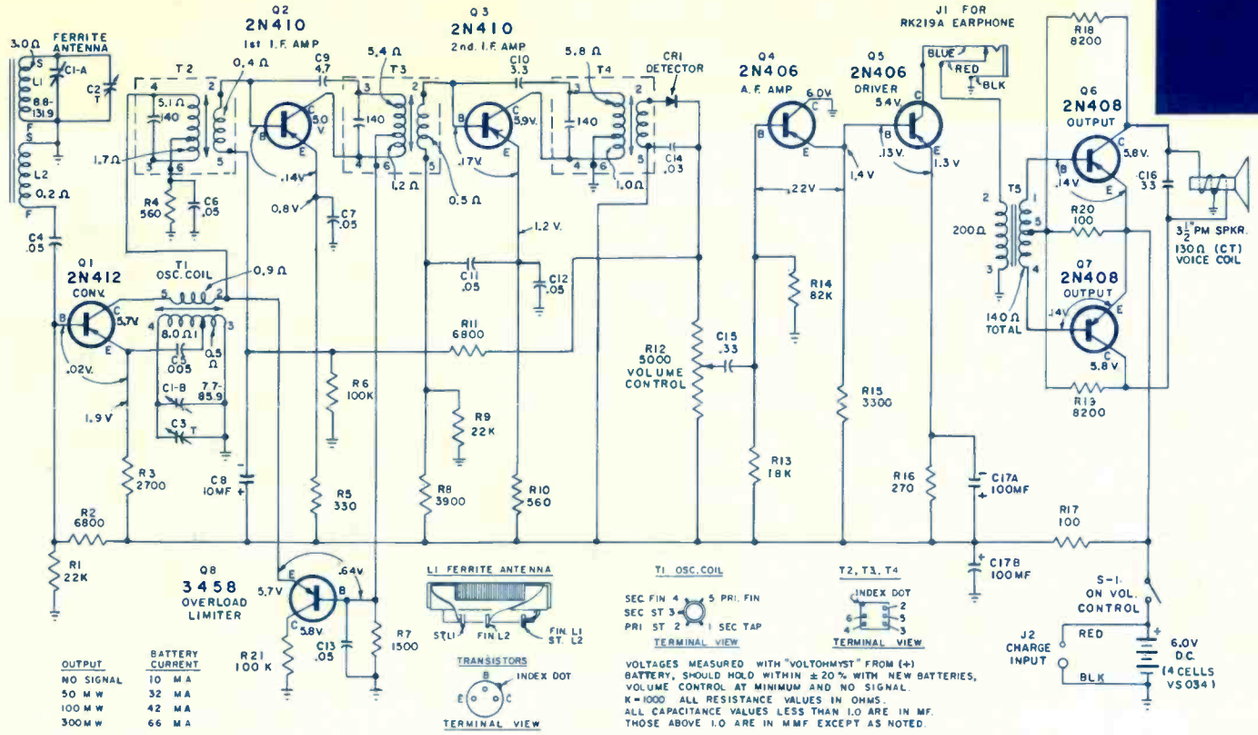
ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

RCA
Transistor Radio
1-T-4 Series

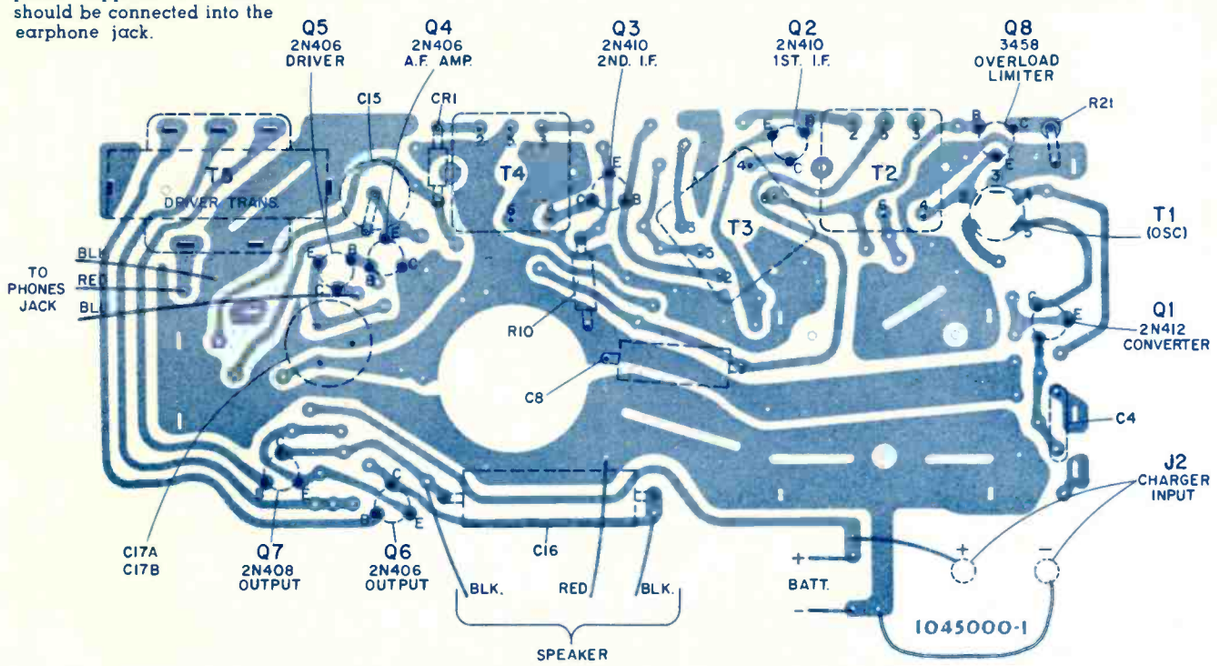


Schematic Diagram

March • 1960

EARPHONE CONNECTION

Only a high impedance earphone (approx. 2000 ohms) should be connected into the earphone jack.



Chassis Wiring and Components — View from Wiring Side

The assembly represented above is viewed from the wiring side of the board.

The printed wiring, on the **near** side of the board, is presented in "phantom" view superimposed on the component layout of the reverse side.

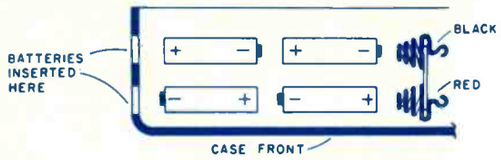
TRANSISTOR COMPLEMENT

(1)	RCA 2N412	Converter
(2)	RCA 2N410	1st I-F Amp.
(3)	RCA 2N410	2nd I-F Amp.
(4)	RCA 2N406	A.F. Amplifier
(5)	RCA 2N406	Audio Driver
(6)	RCA 2N408	Push-pull Output
(7)	RCA 2N408	Push-pull Output
(8)	RCA 3458	Overload Limiter
	Type 1N60 Crystal Diode	2nd Detector

POWER OUTPUT

Undistorted	300 milliwatts
Maximum	400 milliwatts

BATTERY INSTALLATION



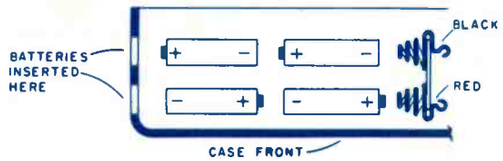
4 MERCURY CELLS – TYPE VS313

CAUTION

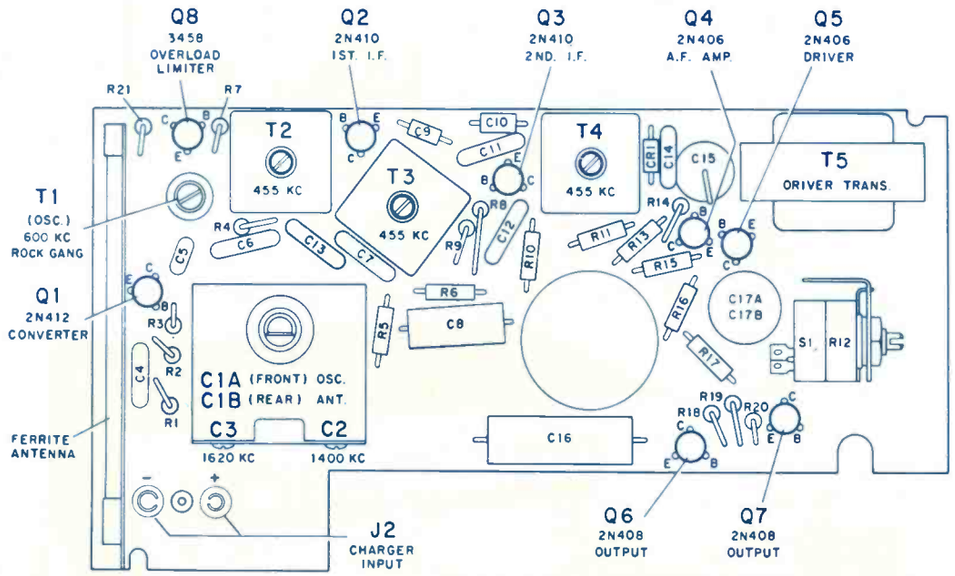
The two insulating tubes used to hold the batteries must not have reversed contacts. The long **PLASTIC LUG** of the inner contacts must fit into the **METAL GUIDE** toward the **CASE SIDE.**

The **NEGATIVE CONTACT LEAD (BLACK)** must be toward the **CASE BACK.**

1-T-4 Series — The "Hawaii"
Model 1-T-4E — Antique White
Model 1-T-4H — Light Turquoise
Model 1-T-4J — Charcoal Gray



4 PENLITE CELLS – TYPE VS034 or VS334
OR RECHARGEABLE RCB-3



Chassis Layout — View from Component Side

CHASSIS REMOVAL

Care must be used when removing the dial knob to prevent damage to the circuit board.

The knob can be removed only by first removing the three chassis mounting screws and then gently pulling the chassis assembly away from the case front. Rock the chassis while pulling on the case and chassis assembly.

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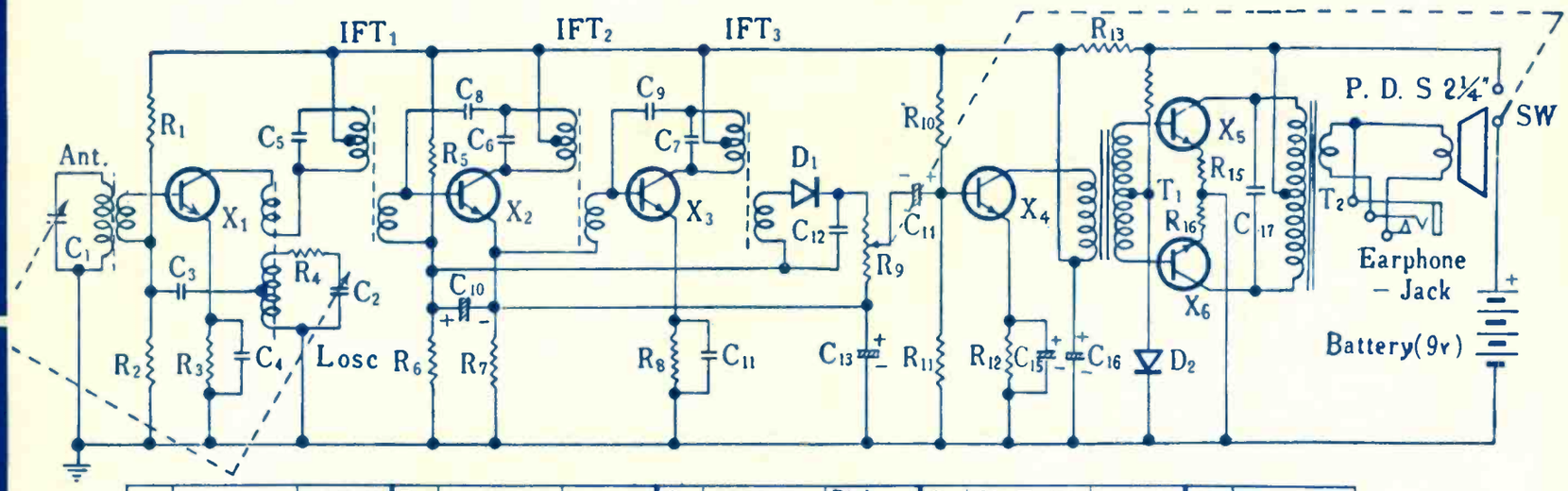
SONY, Japan Transistor Radio TR63

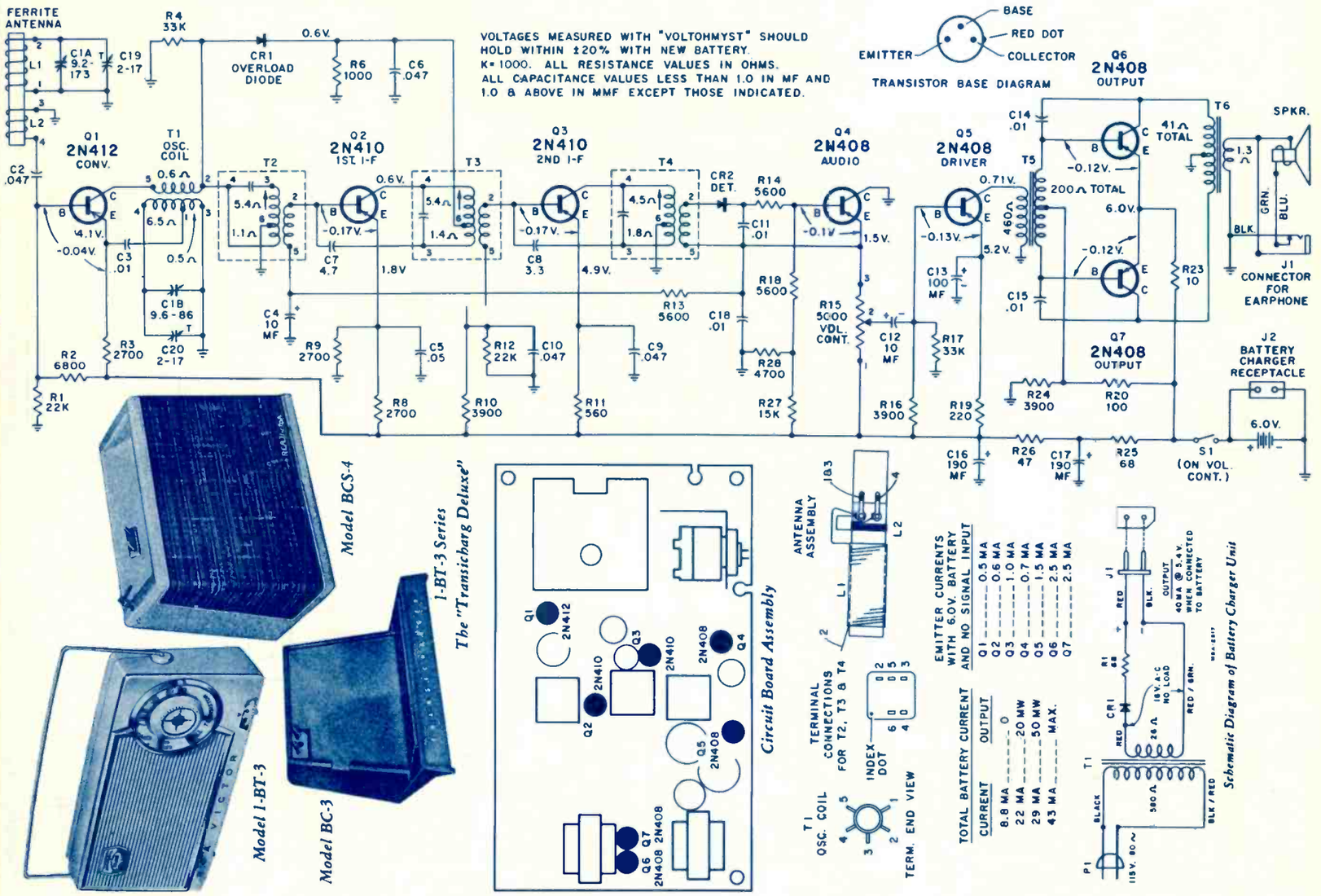


R_1	56kΩ	20%¼W	R_{12}	1.5kΩ	20%¼W	C_4	0.02μF	Disk Ceramic	C_{15}	30μF 6V	Electrolic	X_1	Conv.	
R_2	10kΩ	〃	R_{13}	220Ω	〃	C_5	200pF	Silvered Mica	C_{16}	12μF15V	Electrolic	X_2	IF_1	
R_3	1.5kΩ	〃	R_{14}	42kΩ	〃	C_6	200pF	Silvered Mica	C_{17}	0.04μF	Disk Ceramic	X_3	IF_2	
R_4	10Ω	〃	R_{15}	42Ω	10%¼W	C_7	200pF	Silvered Mica				X_4	Driver	
R_5	56kΩ	〃	R_{16}	42Ω	〃	C_8	2pF	Silvered Mica				X_5	} Power Amp.	
R_6	27kΩ	〃				C_9	2pF	Silvered Mica				X_6		
R_7	3.3kΩ	〃				C_{10}	3μF 6V	Electrolic	Ant	LA-461-6E		T_1	Input Trans.	
R_8	1.5kΩ	〃				C_{11}	0.02μF	Disk Ceramic	Losc	103–7M		T_2	Output Trans.	
R_9	5kΩ	V.R	C_1	} V. C.	Ant.	C_{12}	0.01μF	〃	IFT_1	A	455kc	D_1	Detector	
R_{10}	27kΩ	20%¼W	C_2		Osc.	C_{13}	30μF 6V	Electrolic	IFT_2	B	〃	D_2	Varistor	
R_{11}	7.5kΩ	〃	C_3	0.02μF	Disk Ceramic	C_{14}	3μF 6V	〃	IFT_3	C	〃			

U.S. EQUIVALENT TRANSISTORS TO SONY TRANSISTORS

	SONY	U.S.A.
CONVERTER	2T512	TEXAS 2N172, GE 2M168A
AF 1ST.	1T65	RCA 2N35 OR SYLVANIA
IF	2T522	TEXAS 2N145, 2N147, 2N146 (MOST SUITABLE), GE 2N169, 2N292, 2N293, 2N188A
DET. DIODE	1T22	1N34A
OUTPUT	2T65 (PAIR)	SYLVANIA 2N228

RCA Transistor Radio & Battery Charger Chassis RC-1187A



1-BT-3 Series The "Transicharg Deluxe"

Circuit Board Assembly

EMITTER CURRENTS WITH 6.0V. BATTERY AND NO SIGNAL INPUT

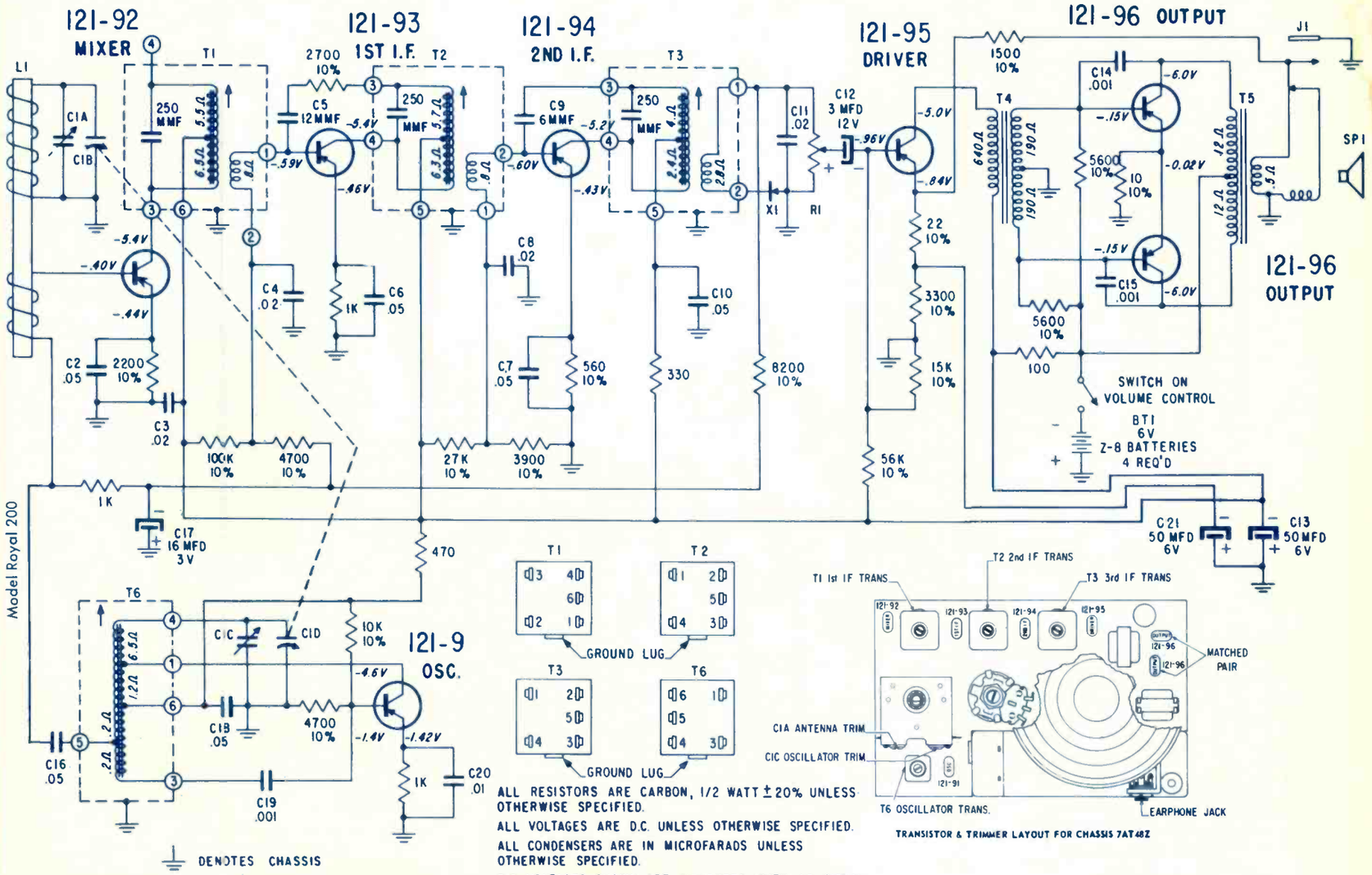
Q1	0.5 MA
Q2	0.6 MA
Q3	1.0 MA
Q4	0.7 MA
Q5	1.5 MA
Q6	2.5 MA
Q7	2.5 MA

TOTAL BATTERY CURRENT AND OUTPUT

CURRENT	OUTPUT
8.8 MA	0
22 MA	20 MW
29 MA	50 MW
43 MA	MAX.

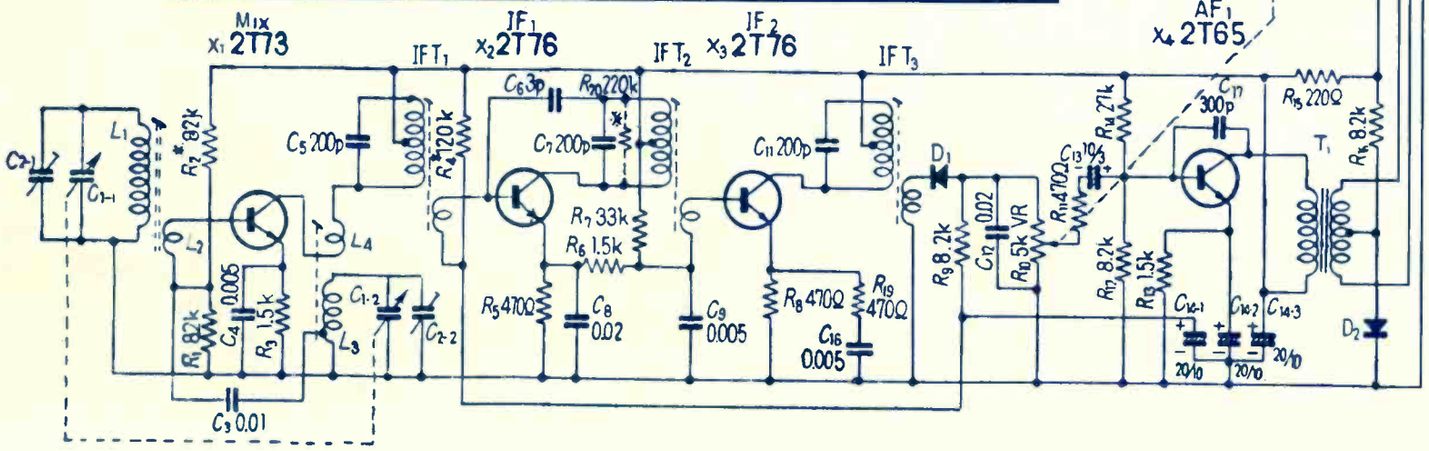
Schematic Diagram of Battery Charger Unit

ZENITH
Transistor Radio
Chassis 7AT48Z, 7AT48Z2, 7AT48Z4



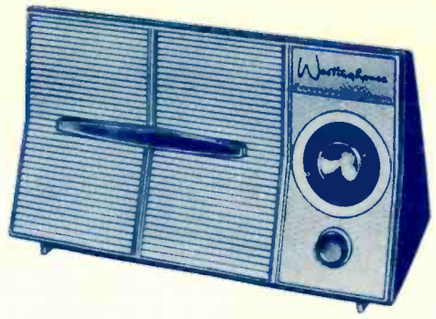
SONY
Transistor Radio Model TR-610

L_1 L_2	Ant. coil	R_5	470 Ω	C_3	0.01	μF		
L_3 L_4	Osc. coil	R_6	1.5 KΩ	C_4	0.005	μF		
I F T_1	002-AP	R_7	33 KΩ	C_5	200	pF		
I F T_2	002-BP	R_8	470 Ω	C_6	3	pF		
I.F T_3	002-CP	R_9	8.2 KΩ	C_7	200	pF		
T_1	Input Transformer	R_{10}	VR 5 KΩ	C_8	0.02	μF		
T_2	Output Transformer	R_{11}	470 Ω	C_9	0.005	μF		
J	Earphone Jack	R_{12}	8.2 KΩ	C_{10}				
S. P.	2¼" Dynamic Speaker	R_{13}	1.5 KΩ	C_{11}	200	pF		
R_1	8.2 KΩ	R_{14}	27 KΩ	C_{12}	0.02	μF		
R_2	82 KΩ adjust	R_{15}	220 Ω	C_{13}	10	μF	3	V
R_3	1.5 KΩ	R_{16}	8.2 KΩ	C_{14-1}	20	μF	10	V
R_4	120 KΩ adjust	R_{17}	22 Ω	C_{14-2}		〃		
		R_{18}	22 Ω	C_{14-3}		〃		
		R_{19}	470 Ω	C_{15}	0.04	μF		
		R_{20}	220 KΩ	C_{16}	0.005	μF		
		C_1 C_2	Tuning Condenser	C_{17}	300	pF		



ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

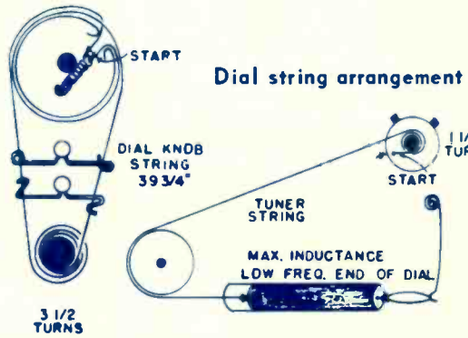
WESTINGHOUSE
FM Radio Chassis
V-2400-1
Models H-715T5, H-716T5



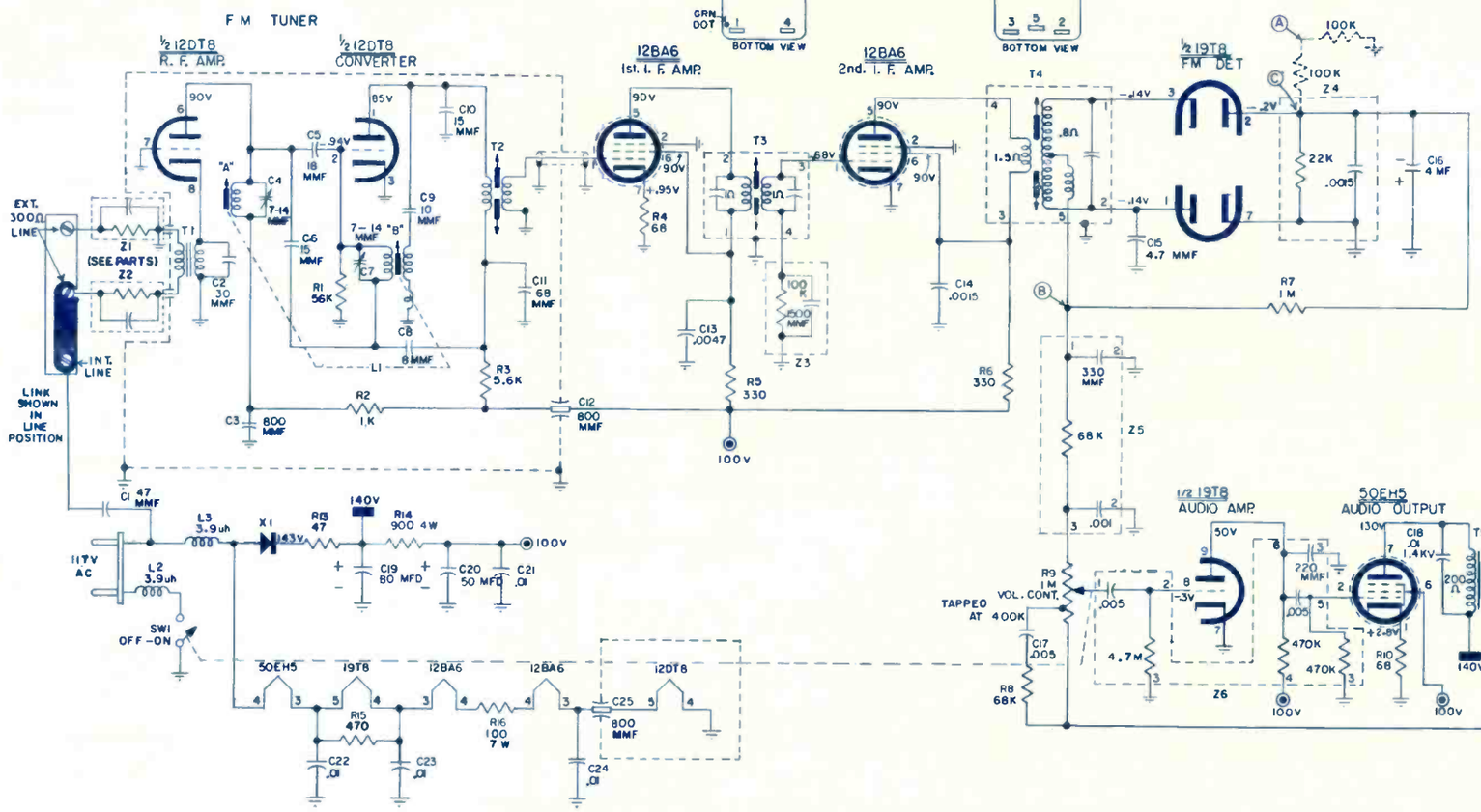
SPECIFICATIONS

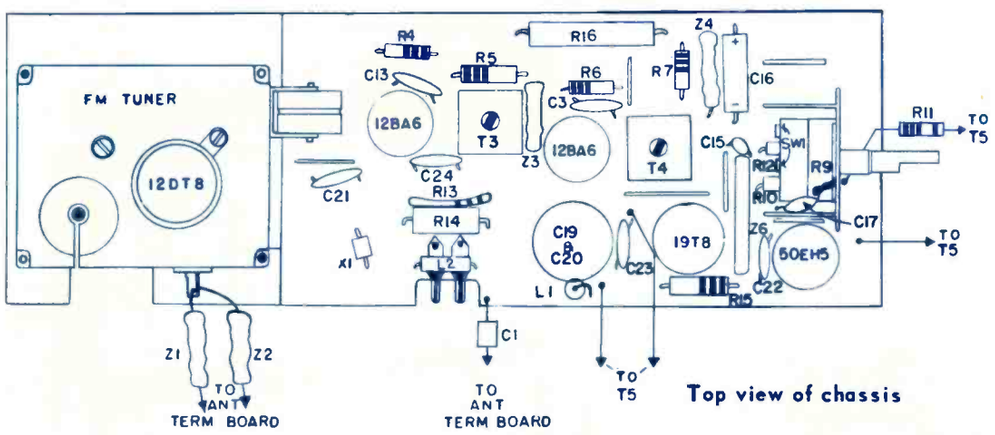
Frequency Range	88 to 108MC
Intermediate Frequency	10.7MC
Tube Complement	
12DT8	RF Amplifier-Converter
12BA6	1st IF Amplifier
12BA6	2nd IF Amplifier
19T8	Detector-Audio Amplifier
50EH5	Audio Output
Power Consumption	35 watts
Audio Power Output	
Maximum	2 watts
Undistorted	1.3 watts
Speakers	2-4" PM
Operating Voltage	105 to 120 volts 60 cycles AC

Discriminator response curve

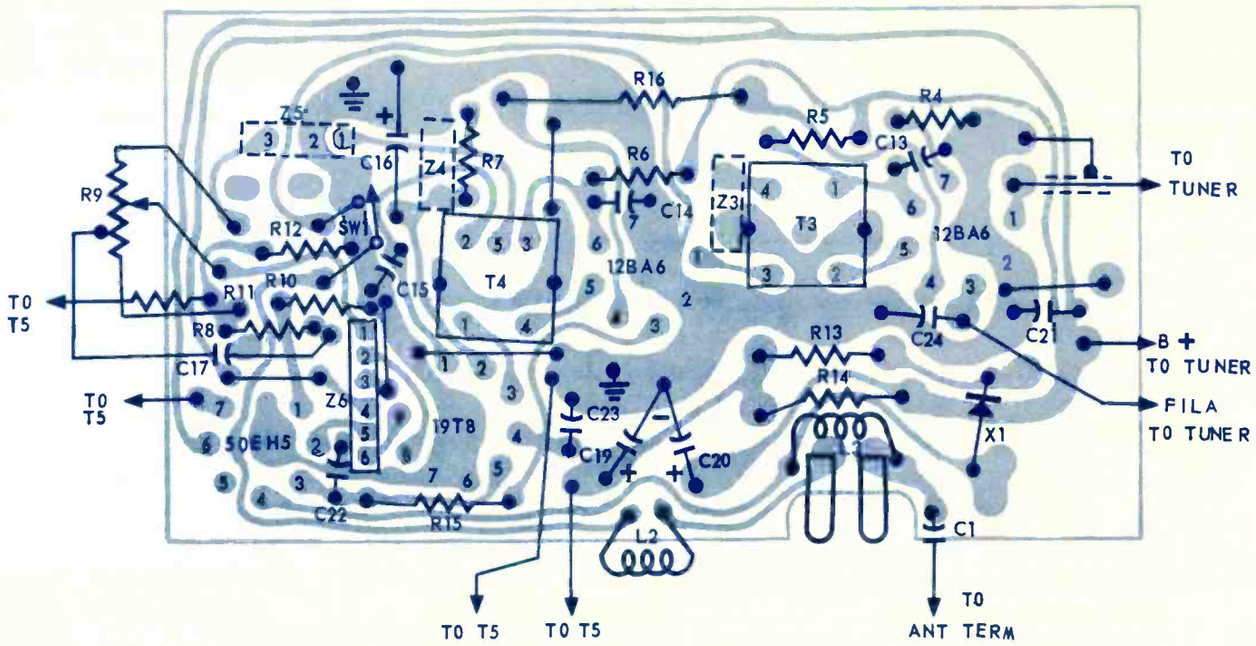


Dial string arrangement





Top view of chassis



Bottom view of printed circuit chassis with components shown symbolically

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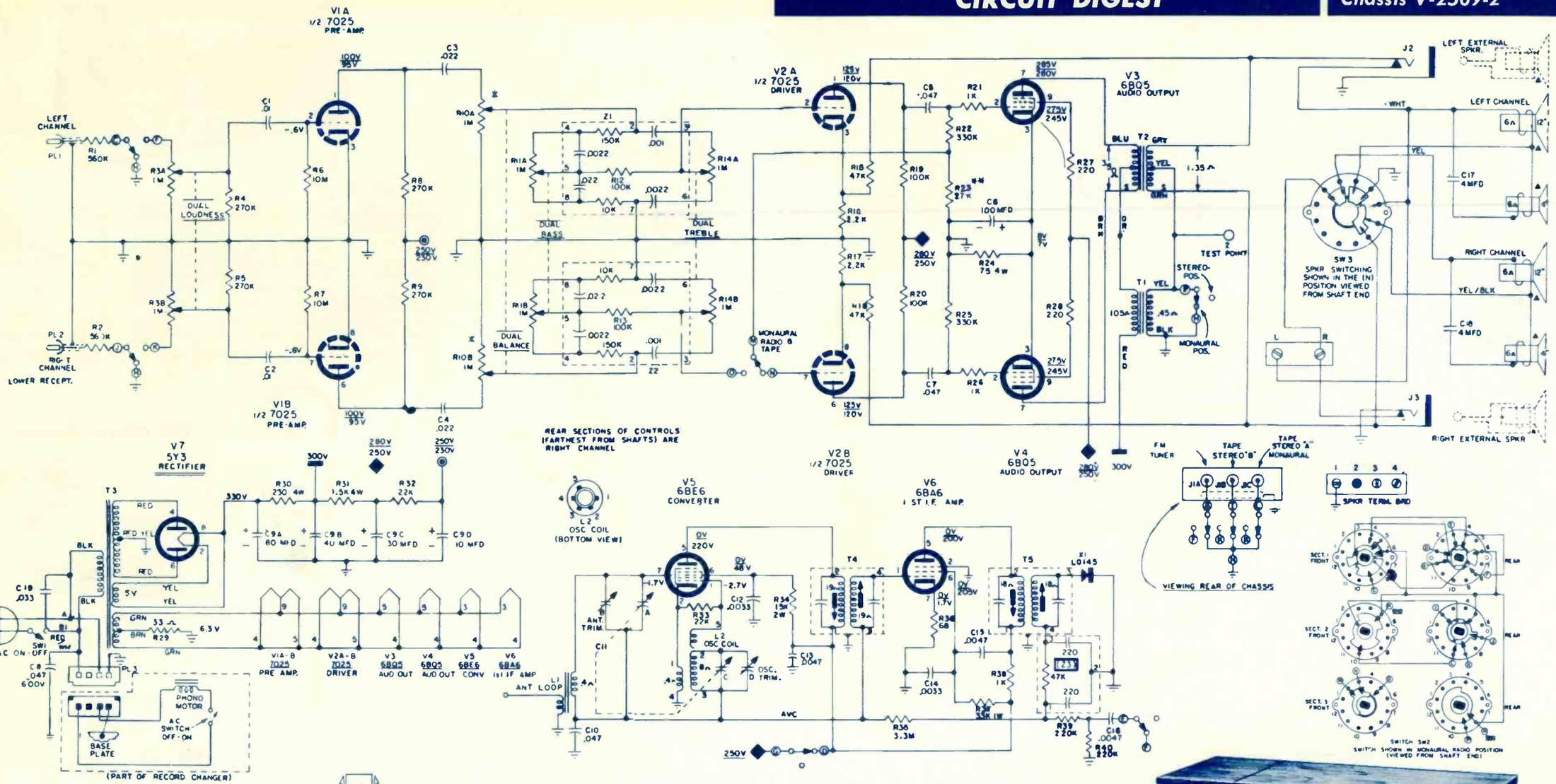
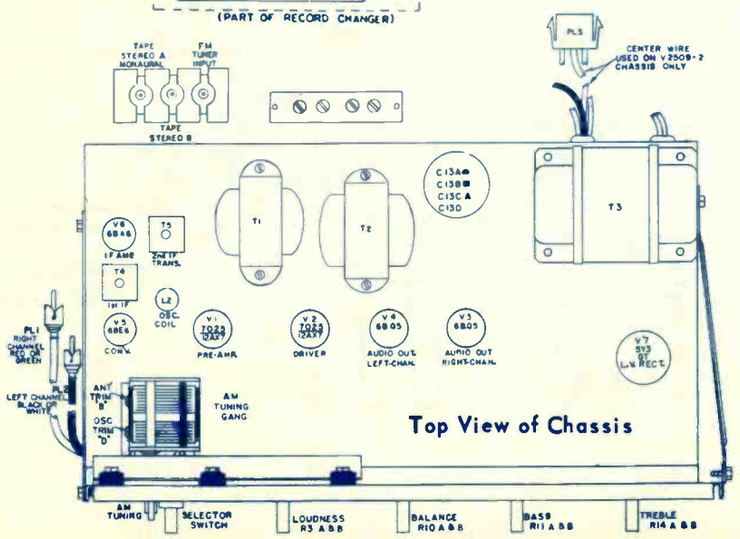
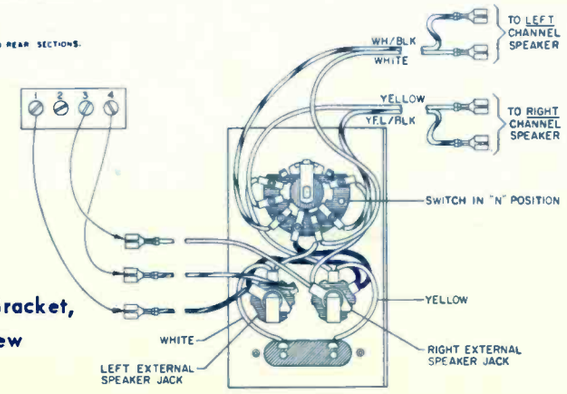
WESTINGHOUSE
Stereo Phonograph Console w/AM Radio Chassis V-2509-2





NOTES
1. ALL CAPACITANCE VALUES IN MFD & ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
2. ALL VOLTAGES ARE MEASURED FROM POINTS INDICATED TO CHASSIS GROUND USING A VTVM. LINE VOLTAGE SET AT 117 V A.C., NO SIGNAL INPUT, LOUDNESS AT MINIMUM, TUNING CAPACITOR SET AT MAXIMUM.
3. VOLTAGES SHOWN UNDERLINED ARE WITH SWITCH SW2 IN ALL POSITIONS EXCEPT RADIO.
4. ALL REFERENCES TO LEFT AND RIGHT ARE AS VIEWED FACING FRONT OF SET.
5. ★ LONLY PROD. 22K.

6. R10 IS A SPECIAL CONTROL WITH OPPOSITE TAPERS ON FRONT AND REAR SECTIONS. WESTINGHOUSE REPLACEMENT PART MUST BE USED.



Speaker Switching Bracket, Rear View

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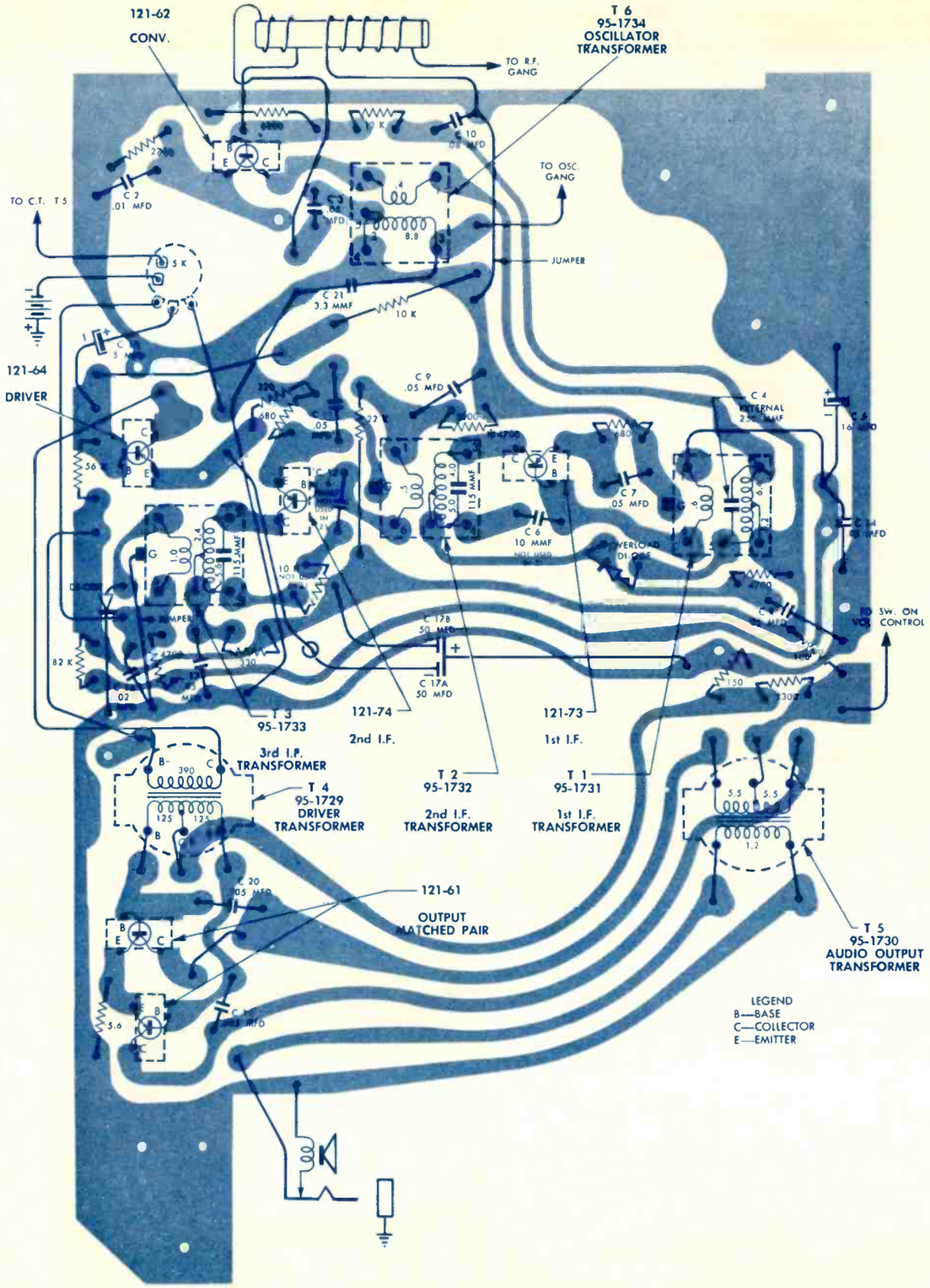
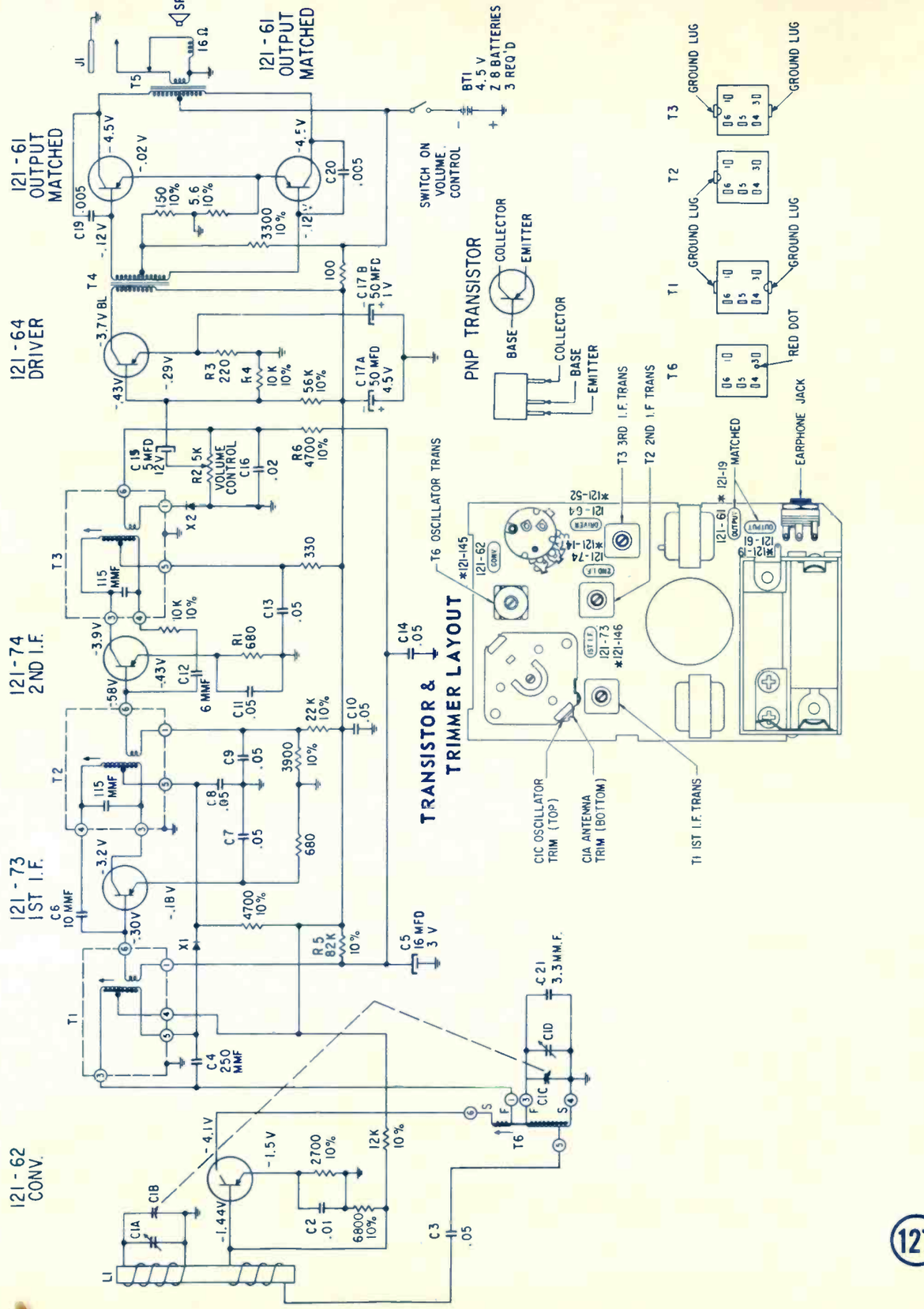


CHASSIS, WIRING AND COMPONENTS
VIEWED FROM WIRING SIDE



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Volume 4