VIDEO I-F SYSTEM

CHASSIS VK 124

For all practical purposes except as listed below, chassis VK 124 is essentially the same as chassis VK 12. Refer to VK 12 manual for technical information not listed here.

The video I-F system employs stagger-tuned stages consisting of a 6AG5, V3, modulator, four 6AG5's, V4, V5, V30 and V6, 1st, 2nd, 3rd, and 4th I-F and a 1N34, V7, video crystal detector.

The converted Pix carrier is 26.2 Mc and is adjusted to conform to RMA standards to be 6db down the slope of the video I-F passband from the average top level. When adjusted correctly, the passband extends from 26.2 Mc to a point 3db down at 22.5 Mc. (See Fig. 1). Traps are provided in the video I-F system to properly attenuate the accompanying and adjacent sound carrier frequencies at 21.7 Mc and 27.7 Mc, respectively. The 21.7 Mc traps are located in the modulator I-F transformer, T1, and 1st video I-F transformer, T2. The 27.7 Mc adjacent sound traps are located in the 3rd, 4th, and 5th video I-F transformers, T19, T3, and T4. The 21.7 Mc traps and the 27.7 Mc traps provide a 40 to 50 db attenuation. All traps are tuned from the top of the chassis while all signal circuits are tuned from the bottom.

To align the video I-F, connect the video I-F sweep generator to the modulator, V3, grid through a coupling capacitor. Set the sweep to cover 19 to 30 Mc and provide markers at 21.7, 22.5, 26.2 and 27.7 Mc. Connect the oscilloscope to the high side of resistor, R24, in the circuit of the video detector, V7. Adjust contrast control for - 5.0 volts. If the response curbe obtained on the oscilloscope is appreciably different from that shown in Fig. 1, the tuning slugs of transformers T1, T2, T19, T3 and T4 should be adjusted from the underside of the chassis. The low-frequency skirt of the response curve is principally affected by T1; the high-frequency skirt by T3. The flatness of the central region is determined by T2, T19 and T4.

The sound traps should be adjusted by the single frequency method rather than by attempting to use the sweep generator. A 400-cycle AM signal set at exactly 21.7 Mc is fed to the modulator and the trap slugs of T1 and T2 tuned fro minimum output at the video detector. Similarly the traps of T19, T3 and T4 are tuned for minimum output using a 27.7 Mc signal. After these traps are tuned, the cathode trap T5 of V6 should be adjusted using the sweep generator. The correct adjustment of T5 will be recognized by observing the greatest reduction in amplitude of the peak normally produced slightly below 21.7 Mc.

If T5 is tuned to frequencies above 21.7 Mc, it may cause the video I-F amplifier to oscillate. This is normal and will stop when the cathode trap is tuned to the correct frequency.

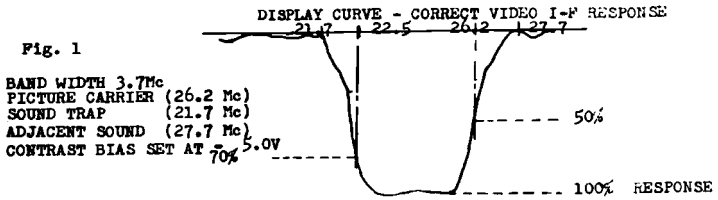


Fig. 1

HI-VOLTAGE

The R.F. Power supply is contained on a separate, completely shielded chassis mounted on the shelf of the receiver adjacent to the 15AP4. Its filament and "B" voltage are obtained from the main chassis through plug P5. The supply consists of an R.F. oscillator, operating at about 350 KC, and transformer SA 322, which steps up the voltage before applying it to the 1B3 rectifier. A one turn coil coupled to SA 322 provides the filament voltage for the 1B3. The 2nd anode voltage of the set is 13. KV at no load and is adjusted by means of a trimmer, C134, located at the rear of the chassis. The meter used to read the 2nd anode voltage should have at least 500 megohms resistance. Increasing the capacity of the trimmer C134 (clockwise rotation) raises the voltage while decreasing the trimmer lowers the voltage. This adjustment should never be made without using a voltmeter to read the output voltage and will require no adjustment in any given installation providing the factory adjustment has not been disturbed. Never expose this assembly to dust, grease, etc., otherwise at the voltages used, leakage will develop and failure of the supply will occur.

LOW VOLTAGE POWER SUPPLY

The filament and "B" voltage required for the chassis is derived from two power supplies both of which are used for television while only T19 is used for the other services. In the television position the set draws 320 watts, while for all other services it draws 120 watts. For complete volt-ampere characteristic refer to chart.

Power supply T20 supplies filament voltage to the video I.F. tubes, video tubes, synchronizing and scanning tubes, 15AP4 picture tube and the R.F. power supply.

Power supply T19 supplies filament and "B" voltage to all other tubes.

The service switch is used to turn off T20 when in any position other than television.

CHASSIS VK-15-16

For all practical purposes except as listed below, chassis VK 15-16 is essentially the same as chassis VK 12. Refer to VK 12 manual and schematic diagram VK 15-16 for technical information not listed here.

VIDEO I-F SYSTEM

The video I-F system employs stagger-tuned stages consisting of a 6AG5, V3, modulator, four 6AG5's, V4, V5, V6 and V7, 1st, 2nd, 3rd and 4th video I-F and a 1N34, V8 video crystal detector.

The converted Pix carrier is 26.2 Mc and is adjusted to conform to RMA standards to be 6db down the slope of the video I-F passband from the average top level. When adjusted correctly, the pass band extends from 26.2 Mc to a point 3db down at 22.5 Mc. (See Fig. 1) Traps are provided in the video I-F system to properly attenuate the accompanying and adjacent sound carrier frequencies at 21.7 Mc and 27.7 Mc, respectively. The 21.7 Mc traps are located in the modulator I-F transformer, T1, and 1st video I-F transformer, T2. The 27.7 Mc adjacent sound traps are located in the 3rd, 4th and 5th video I-F transformers, T3, T4 and 5. The 21.7 Mc traps and the 27.7 Mc traps provide a 40 to 50 db attenuation. All traps are tuned from the top of the chassis while all signal circuits are tuned from the bottom.

To align the video I-F, connect the video I-F sweep generator to the modulator, V3, grid through a coupling capacitor. Set the sweep to cover 19 to 30 Mc and provide markers at 21.7, 22.5, 26.2 and 27.7 Mc. Connect the oscilloscope to the high side of resistor, R29, in the circuit of the video detector, V8. Adjust contrast control for - 5.0 volts. If the response curve obtained on the oscilloscope is appreciably different from that shown in Fig. 1, the tuning slugs of transformers T1, T2, T3, T4 and T5 should be adjusted from the underside of the chassis. The low-frequency skirt of the response curve is principally affected by T1; the high-frequency skirt by T4. The flatness of the central region is determined by T2, T3, and T5.

The sound traps should be adjusted by the single frequency method rather than by attempting to use the sweep generator. A 400-cycle AM signal set at exactly 21.7 Mc is fed to the modulator and the trap slugs of T1 and T2 tuned for minimum output at the video detector. Similarly the traps of T3, T4 and 5 are tuned for minimum output using a 27.7 Mc signal. After these traps are tuned, the cathode trap T6 of V7 should be adjusted using the sweep generator. The correct adjustment of T6 will be recognized by observing the greatest reduction in amplitude of the peak normally produced slightly below 21.7 Mc.

If T6 is tuned to frequencies above 21.7 Mc, it may cause the video I-F amplifier to oscillate. This is normal and will stop when the cathode trap is tuned to the correct frequency.

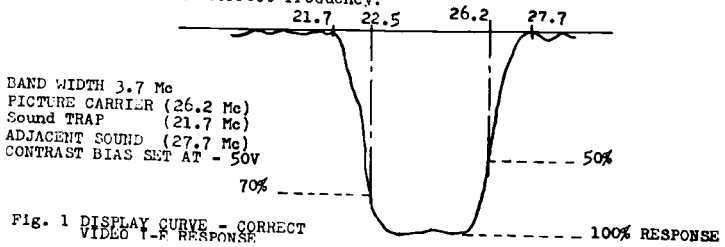


Fig. 1 DISPLAY CURVE - CORRECT VIDEO I-F RESPONSE

VK-1516

VOLT - AMPERE CHARACTERISTICS.

CONSTANTS: WNBT test pattern adjusted for 12-3/4" by 9-1/2" picture with good linearity and focus.
"Contrast" control set for extreme CW position, approx. -3.2V.
"Brightness" control turned to extreme CCW position. (Picture tube darkened.)

All D.C. voltages measured to chassis with 1000 ohms-per-volt D.C. voltmeter, except B- and grid voltage measurements which are made with a V.T.V.M. (Voltohmyst).

Service Selector Switch Position	Line Voltage Volts AC	Line Current Amps. AC	Line Power Watts	R.F. Power Supply B+ Volts DC	R.F. Power Supply B drain ma DC	R.F. Power Supply 2nd Anode KV DC
TV	117	>3.0	340	360	57	13.5
FM	117	1.3	130	←	OFF	→
AM	117	1.25	128		"	
Phono	117	1.25	128		"	
TV	130	>3.0	422	397	64	15.3
Phono	130	1.5	158	←	OFF	→

LO-VOLTAGE POWER SUPPLY #1

Service Selector Switch Position	Line Voltage Volts AC	B+ at C118A Volts DC	B+ at C118B Volts DC	B+ at C119A&B Volts DC	Load Current m.a. DC	Total B- Volts DC	Tap #1 Volts DC	Tap #2 Volts DC	Heater Wdg. Grn-Grn. Leads Volts AC	Heater Wdg. Blu-Blu Leads Volts AC	V29 Fil (5U4G) Volts AC
TV	117	416	393	360	217	-10	-6.2	-2.1	6.2	6.3	5.2
FM	117	←			OFF						→
AM	117				"						
Phono	117				"						
TV	130	467	438	402	250	-11	-6.9	-2.3	6.93	7.0	5.8
Phono	130										

LO-VOLTAGE POWER SUPPLY #2

Service Selector Switch Position	Line Voltage Volts AC	B+ at C121A Volts DC	B+ at C121B Volts DC	B+ at C115B Volts DC (270w)	B+ at C120A Volts DC	B+ at C120B Volts DC (150w)	Load Current ma DC	Heater Wdg. Grn-Grn Leads Volts AC	V30 Fil(5U4G) Volts AC
TV	117	334	319	274	271	144	174	6.3	5.0
FM	117	330	313	263	271	218	187	6.3	5.0
AM	117	330	315	265	270	220	185	6.3	5.0
Phono	117	333	316	270	271	222	181	6.3	
TV	130	376	360	306	305	160	200	7.0	5.5
Phono	130	372	359	302	304	250	206	7.0	5.5

TUBE VOLTAGES

CONSTANTS: Line voltage set to 117 V. A.C.
Receiver adjusted for 12-3/4" by 9-1/2" picture.
Remove signal at antenna input terminals; "Brightness" control turned to extreme CCW position;
"Contrast" set for extreme CW position, approximately -3.2 V.

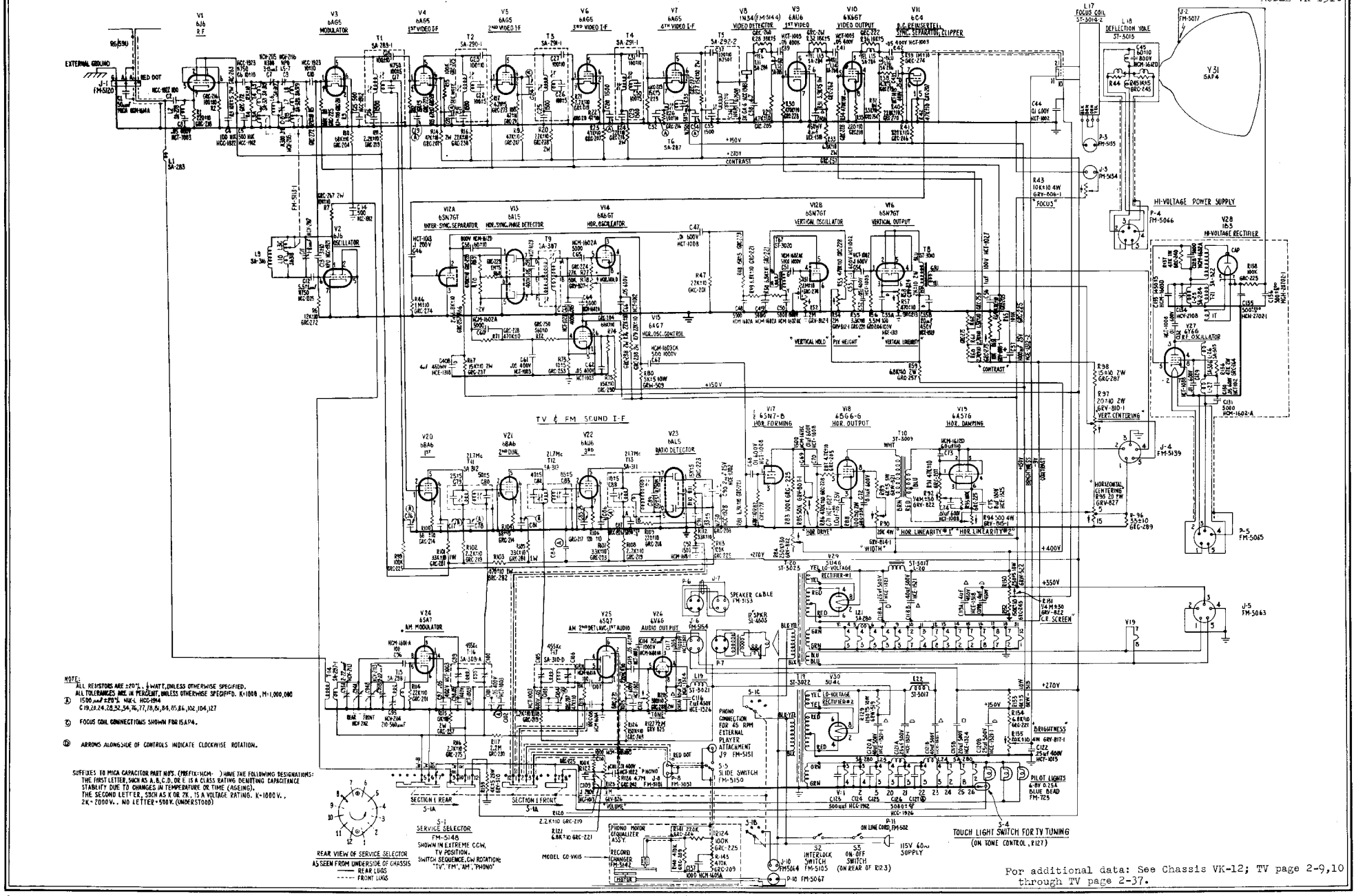
Ref. No.	Tube Type	Function	TV Plate	TV Screen	TV Cathode	TV Grid	FM Plate	FM Screen	FM Cathode	FM Grid	AM Plate	AM Screen	AM Cathode	AM Grid	PHONO Plate	PHONO Screen	PHONO Cathode	PHONO Grid
1	6J6	R.F. Amp.	1 147		7 2.4	5 0	140		2.3	0	142		2.3	0	144		2.3	0
2	6J6	Oscillator	1 113 2 0		7 0 7 0	6 -5 5 0	1 113 2 0		7 0 7 0	6 -9.6 5 0	←		OFF	→	←		OFF	→
3	6AQ8	Modulator	5 246	6 154	2 0.35	1-3.3	5 235	6 125	2 0.44	1 -1.8	5 255	6 OFF	2 0	1	5 265	OFF	2 0	
4	6AQ8	1st Video I-F	5 228	6 158	7 0.10	1-3.3	←		OFF	→	←		OFF	→	←		OFF	→
5	6AQ8	2nd Video I-F	5 122	6 197	2 0.3	1-3.3	←		OFF	→	←		OFF	→	←		OFF	→
6	6AQ8	3rd Video I-F	5 156	6 191	2 0.3	1-3.3	←		OFF	→								
7	6AQ8	4th Video I-F	5 177	6 148	7 0.77	1-3.3	←		OFF	→								
8	1N34	Video Detector			0													
9	6AD6	1st Video	5 112	6 122	7 0	1-2.1	←		OFF	→								
10	6K6GT	Video Output	3 95	4 147	8 4.2	3-6.0	←		OFF	→								
11	6C4	DC Reinserter; Sync Separator; Clipper	1/5 6.5		1 2.0	6 0	←		OFF	→								

Ref. No.	Tube Type	Function	TV Plate	TV Screen	TV Cathode	TV Grid	FM Plate	FM Screen	FM Cathode	FM Grid	AM Plate	AM Screen	AM Cathode	AM Grid	PHONO Plate	PHONO Screen	PHONO Cathode	PHONO Grid
12	A6SN7GT	Inter-Synch Separator;	2 87		3 0	1-0.5	←		OFF	→								
	B	Vert. Oscillator	5 120		6 0	4 -35	←		OFF	→								
13	6AL5	Hor.Synch.	7 8.0		1 -1.7		←		OFF	→								
		Phase Det.	2 8.2		5 -2.1		←		OFF	→								
14	6Z6GT	Hor.Oscillator	3 245	4 219	8 0.32	5-26.5	←		OFF	→								
15	6AC7	Hor. Osc. Control	8 260	6 103	5 0	4 -1.8	←		OFF	→								
16	6SR7GT	Vert.Output	Cap 319		Cap 14	1/4 0	←		OFF	→								
17	6SR7GT	Hor.Forming	2 68		3 0	1 -58	←		OFF	→								
18	6BG6G	Hor.Output	Cap 388	8 275	3 13.1	5 -10	←		OFF	→								
19	6AS7G	Hor.Damping	2/5		3/6 23	1/4	←		OFF	→								
20	6BA6	1st FM I-F	5 229	6 125	7 0.85	1 0	5 227	6 107	7 0.94	1 0	5 235	6 110	7 1.0	1 0	5 240	6 109	7 1.0	1 0
21	6BA6	2nd FM I-F	5 238	6 112	7 1.15	1 0	5 233	6 110	7 1.12	1 0	5 238	6 125	7 1.05	1 0	5 243	6 115	7 1.16	1 0
22	6AU6	3rd FM I-F (Driver)	5 245	6 147	7 1.54	1 0	5 240	6 144	7 1.5	1 0	5 240	6 150	7 1.50	1 0	5 248	6 148	7 1.56	1 0
23	6AL5	Ratio Detector	1 2 2-1.5		7 0.5 5 0.6		1 0 2 0		7 0 5 0									
24	6SA7	AM Modulator	←		OFF	→	←		OFF	→	3 230	4 100	6 0	5-6.5	←		OFF	→
25	6AQ7	AM 2nd Detector;	4 0.6		3 0		4 0.65		3 0	2	4 0.5		3 0		4 0.6		3 0	
		1st Audio; AVC	6 90		3 0	2-0.6	6 90		3 0	2	6 90		3 0	2-0.5	6 90		3 0	2

Ref. No.	Tube Type	Function	TV Plate	TV Screen	TV Cathode	TV Grid	FM Plate	FM Screen	FM Cathode	FM Grid	AM Plate	AM Screen	AM Cathode	AM Grid	PHONO Plate	PHONO Screen	PHONO Cathode	PHONO Grid
26	6V6G	Audio Output	3 260	4 275	8 14	5 0	3 255	4 268	8 13.6	5 0	3 255	4 270	8 13.5	5 0	3 259	4 275	8 13.9	5 0
27	6V6G	RF Oscillator	3 350	4 120	8 0	5-36	←		OFF	→	←		OFF	→	←		OFF	→
28	1B3	Hi-Voltage Rectifier	Cap		Cap	1/4	←		OFF	→	←		OFF	→	←		OFF	→
29	5U4G	Lo-Voltage Rectifier #1	4 397*		Each 412*		←		OFF	→	←		OFF	→	←		OFF	→
			6 397*															
30	5U4G	Lo-Voltage Rectifier #2	4 314*		Each 330*		4 315*		Each 387*		4 315*		Each 389*		4 316*		Each 338*	
			6 313*				6 312*				6 314*				6 313*			
31	15AP4	Picture Tube	2nd Anode 13.5KV	10 339	11 105	2 2.1	←		OFF	→	←		OFF	→	←		OFF	→

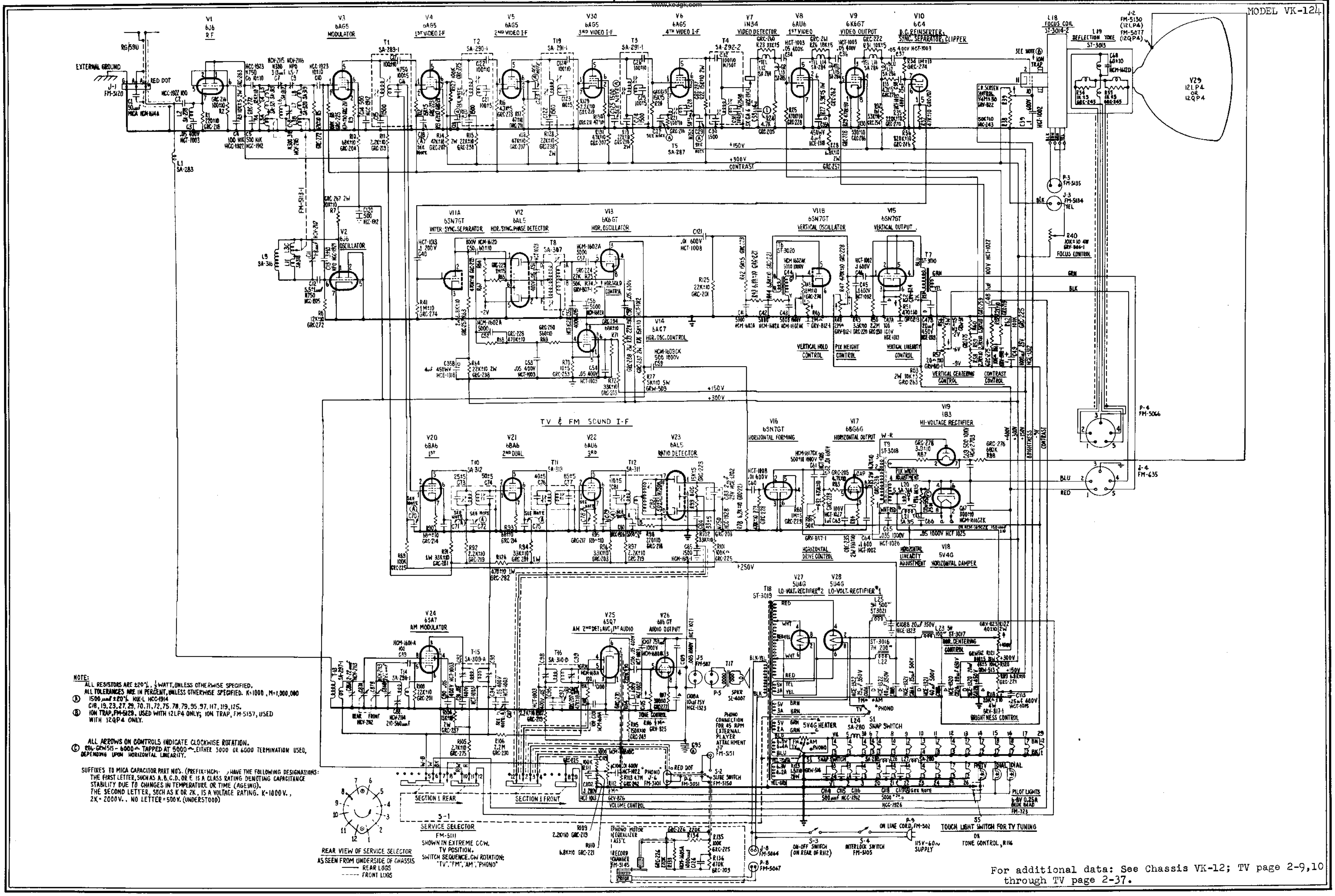
*Volts, AC

MODEL VK-1516



For additional data: See Chassis VK-12; TV page 2-9,10 through TV page 2-37.

MODEL VK-124



NOTE:
ALL RESISTORS ARE ±20%, ½ WATT, UNLESS OTHERWISE SPECIFIED.
ALL TOLERANCES ARE IN PERCENT, UNLESS OTHERWISE SPECIFIED. K=1000, M=1,000,000
Ⓐ 1500 μμf ±20% HIK-L HCC-1914
C18, 19, 23, 27, 29, 70, 71, 72, 75, 78, 79, 95, 97, 117, 119, 125.
Ⓑ ION TRAP, FM-5129, USED WITH 12LP4 ONLY; ION TRAP, FM-5137, USED WITH 12QP4 ONLY.

ALL ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION.
Ⓒ R86-GRW515-6000~ TAPPED AT 5000~. EITHER 5000 OR 6000 TERMINATION USED, DEPENDING UPON HORIZONTAL LINEARITY.

SUFFIXES TO MICA CAPACITOR PART NO'S. (PREFIX: HCM-) HAVE THE FOLLOWING DESIGNATIONS:
THE FIRST LETTER, SUCH AS A, B, C, D, OR E IS A CLASS RATING DENOTING CAPACITANCE STABILITY DUE TO CHANGES IN TEMPERATURE OR TIME (AGEING).
THE SECOND LETTER, SUCH AS K OR 2K, IS A VOLTAGE RATING. K=1000V., 2K=2000V., NO LETTER=500V. (UNDERSTOOD)

For additional data: See Chassis VK-12; TV page 2-9,10 through TV page 2-37.