TEST AND ALIGNMENT PROCEDURES

RECOMMENDED EQUIPMENT (or equivalent)

1. AC vacuum tube Voltmeter (H.P. 400D)
2. Oscilloscope
3. Volt-Ohm meter (Triplett model 630)
4. Harmonic Distortion meter (H.P. 331A)
5. Digital multimeter (Fluke 8000A)
6. Audio Oscillator (H.P. 200 CD)
7. Suitable tools, cables, etc.
8. Two 8 ohm resistive loads, compensated for L & C (min. 50W)
9. Variable power line transformer (General Radio 5A)
10. Suitable line Voltage and current monitoring meters

Note: Equipment specifications are minimum.

Set controls to following positions for test procedure. Deviate from these settings as instructed in the test procedures. Return to these settings at the beginning of each new test. All tests are to be made with 117V AC line. Unless otherwise specified, supply input to both channels and read both outputs. *Adjust balance control as necessary to maintain equal output at all frequencies.

Front Panel

Input Selector	Aux
Tone Controls	Flat (12 0'clock)
Loudness	Minimum (full CCW)
Balance	12 0'clock*
Speaker #1	On

Note: When troubleshooting defective power circuits, it is sometimes useful to switch a small line voltage lamp in series with equipment under test before applying power. The lamp will limit the current drawn, thus preventing further damage to circuit components.
The variable power line transformer is also useful to determine if additional short circuits exist, if used with a power line current and Volt meter.

AUDIO TEST PROCEDURE

TEST	INPUT	CONTROL SETTINGS	TEST EQUIPMENT	SCALE SETTINGS	MEASURE AT		READINGS	TOL.
					POSITIVE PROBE	NEGATIVE PROBE		
DC Resistance Check	None Unit "OFF"		VOM	Ohms X 1000	+ Filter cap	P807 A-416 P804 P809 A-426 P805 A-436	12K Measure	±1K
DC Resistance Check	None Unit "OFF"		VOM	Ohms X10	P807 A-416 P804 P809 A-426 P805 A-436	- Filter cap	40 ohms	±1K
B+ Supply	None Unit "ON"	Volume "Minimum" Selector "Aux."	VOM	Volts 60 DC	+ Filter cap	Chassis	26.7V DC A-416 29.5V DC A-426 38.0V DC A-436	±5%
B- Supply	None Unit "ON"	Volume "Minimum" Selector "Aux."	VOM	Volts 60 DC	Chassis	-Filter cap	-26.7V DC A-416 -29.5V DC A-426 -38.0V DC A-436	±5%
Regulated B+ Voltage	None Unit "ON"	Volume "Minimum" Selector "Aux."	VOM	Volts 60 DC	P901 Regulator/ Supply Board	Chassis	+13V DC	±10%
Output Offset Voltage	None Unit "ON"	Volume "Minimum" Selector "Aux."	VOM	12mA DC	Speaker #1 "H"	Speaker #1 "O"	±4mA	Max.
			DC Milli-Voltmeter	100mV	Speaker #1 "H"	Speaker #1 "O"	±100mV	Max.
Bias Check	None Unit "ON"	Vol. Min. Aux A-416 A-426 Adjust R809 or R834	VOM	12mA DC	"E" of Q807 "E" of Q817	"C" of Q810 "C" of Q820	Adjust pad for 0.2mA DC nominal	+100% -0
		A-436 Adjust R-808 or 833	DC milli-Voltmeter	10mV	"E" of Q807 "E" of Q817	"C" of Q810 "C" of Q820	8mV	±10%

AUDIO TEST PROCEDURE

TEST	INPUT	CONTROL SETTINGS	TEST EQUIPMENT	SCALE SETTINGS	MEASURE AT POSITIVE PROBE	MEASURE AT NEGATIVE PROBE	READINGS	TOL.
Audio Level 8 ohm	1000 Hz Aux.	Selector "Aux" Mode Switch "Mono" Volume "Maximum"	AC VTVM Scope	30V 5V/DIV	Speaker #1 "H" 8 ohm load	Speaker #1 "0" 8 ohm load	Adjust input for 12.6 Volts A-416 15.5 Volts A-426 18.3 Volts A-436 at outputs. Input level should be .15V. Output not clipped with 117V AC line.	With input ±2dB
					Repeat for Speaker ---2---			
Tape Inputs	Tape In 1000 Hz	Tape Monitor Switch "Monitor"	AC VTVM	30V	Speaker #1 "H" 8 ohm load	Speaker #1 "0" 8 ohm load	Output 12.6 Volts A-416 15.5 Volts A-426 18.3 Volts A-436 with input of .15V.	Input ±2dB
Tape Monitor Output	Aux.	Selector "Aux" Volume "Minimum"	AC VTVM	1V	Tape out	Ground	Output of 0.15V with input of 0.15V	
Mode Switch A-436 only	Aux. L	Volume "Maximum"	AC VTVM	1V	Spkr. #1 "H" Right Channel	Spkr. #1 "0" Right Channel	Output Level 0 dB	
L & R	0.025V						0 dB both channels	
L	"						0 dB both channels	
R	"						No Output	
Stereo	"						0 dB L chan. only	
Rev. Stereo	"						0 dB R chan. only	
Frequency Response Power Amp & Tone Control	Aux.	Tone Control "Flat" Volume "Maximum" Adjust balance for center	AC VTVM	1V	Speaker #1 "H" 8 ohm load	Speaker #1 "0" 8 ohm load	Adjust input for 0dB (.775V) out. (3dB down points should be below 10 Hz and above 30 kHz)	±1dB

AUDIO TEST PROCEDURE

TEST	INPUT	CONTROL SETTINGS	TEST EQUIPMENT	SCALE SETTINGS	MEASURE AT		READINGS	TOL.
					POSITIVE PROBE	NEGATIVE PROBE		
Tone Control Response	Aux. 1000 Hz	Selector "Aux." Mode Switch "Mono" Tone Control "Flat"	AC VTVM	1V	Speaker #1 "H" 8 ohm load	Speaker #1 "O" 8 ohm load	Adjust output for 0 dB (0.78V) Note: 100 Hz Bass boost 10 dB Bass cut 10 dB 10 kHz Treble Boost 10 dB Treble Cut 10 dB	±2 dB
Loudness Compensation	Aux. 1000 Hz 100 Hz 10 kHz --- Increase input 20 dB	Selector "Aux" Tone Control "Flat" Volume "11 0'clock" Loud Sw. "ON"	AC VTVM	1V	Speaker #1 "H" 8 ohm load	Speaker #1 "O" 8 ohm load	Adjust output for 0 dB. Frequency to 10 kHz; Note 3 dB increase. Frequency to 100 Hz; Note 7 dB increase	±2dB ±2dB
Crosstalk	Aux. Left Channel 1000 Hz	Selector "Aux" Tone Control "Flat" Loud. Sw. "OFF" Volume "Maximum" Mode Switch "Stereo"	AC VTVM	1V	Speaker #1 "H" 8 ohm load	Speaker #1 "O" 8 ohm load	Set output for 0 dB Read right channel output 45 dB down	Min.
Filter A-436 High Filter only on A-426	1 KHz 100 Hz 10 KHz	Selector "Aux." Mode Switch "Mono"	AC VTVM Scope	1V	Speaker #1 "H"	Speaker #1 "O"	Max. 1 dB Change @ 1 kHz Low filter -8 dB @ 100 Hz High filter -3 dB @ 10 kHz	±2 dB
Muting A-426 A-436	1 kHz	Mono	AC VTVM Scope	1V	Speaker #1 "H"	Speaker #1 "O"	Check for 20 dB attenuation in output level	±1 dB

AUDIO TEST PROCEDURE

TEST	INPUT	CONTROL SETTINGS	TEST EQUIPMENT	SCALE SETTINGS	MEASURE AT		READINGS	TOL.
					POSITIVE PROBE	NEGATIVE PROBE		
Meters A-436	Aux. 1kHz	Mono	AC VTVM	30V	Speaker #1 "H"	Speaker #1 "0"	With output level at 18.3V both channels. Amplifier in normal operating position. Check & set meters for 100% reading. Check for approx. ½ scale meter indication with 0.36V output.	±2dB
Balance Control	Aux. 1000 Hz Left Channel Right Channel	Selector "Aux" Tone Control "Flat" Loud SW. "OFF" Volume "Maximum" Mode Switch "Mono"	AC VTVM	1V	Speaker #1 "H" 8 ohm load	Speaker #1 "0" 8 ohm load	Set output for 0 dB. Rotate balance control. Note 45 dB drop in output. Check attenuation both channels. Change inputs.	Min.
Harmonic* Distortion	Aux. 20 Hz 1000 Hz 20,000 Hz (40 Hz Mod A-426)	Selector "Aux" Mode Switch "Mono" Balance "Equal output" Volume "Maximum"	AC VTVM Harmonic Distortion Analyzer	30V	Speaker #1 "H" 8 ohm load	Speaker #1 "0" 8 ohm load	Set output to 12.6V A-416 15.5V A-426 18.3V A-436 Measure Distortion.	0.5% 0.5% 0.3% THD

*Note: Power line Voltage 117 VAC ∠2.0% line THD.

AUDIO TEST PROCEDURE

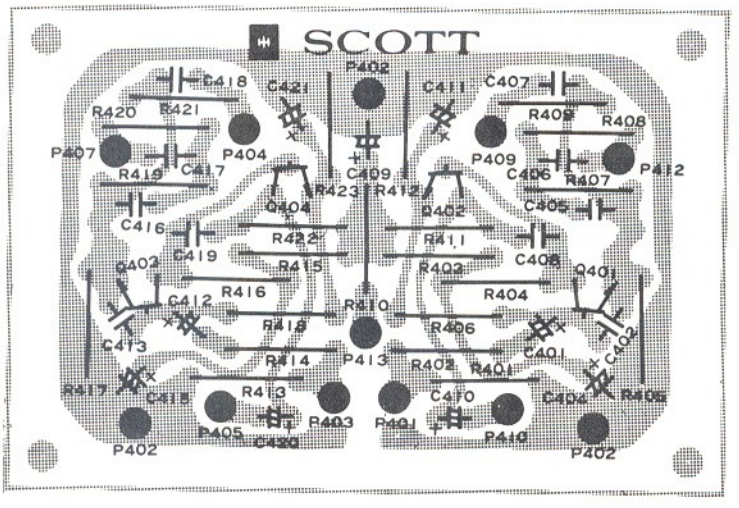
TEST	INPUT	CONTROL SETTINGS	TEST EQUIPMENT	SCALE SETTINGS	MEASURE AT POSITIVE PROBE	MEASURE AT NEGATIVE PROBE	READINGS	TOL.
Damping Factor	Aux. 1000 Hz	Selector "Aux" Mode Switch "Mono" Balance "Center" Volume "Maximum"	AC VTVM	10V	Speaker #1 "H" 8 ohm load	Speaker #1 "0" 8 ohm load	Set output to 8 volts, all models. Remove load & note increase in level of both channels. Max. 0.5dB	
Main AMP input (A-426 A-436)	Remove Jumper Link, Plug input to M. A. in.	N.A.	AC VTVM	1V	Speaker #1 "H"	Speaker #1 "0"	Note reduction in level 12dB Replace link	±1dB
Head Phone output	Aux. 1000 Hz	Aux. Mono	AC VTVM	1V			Note level 26dB below speaker level.	±2dB

PRINTED CIRCUIT BOARD LAYOUT

PREAMP K-40131

Models

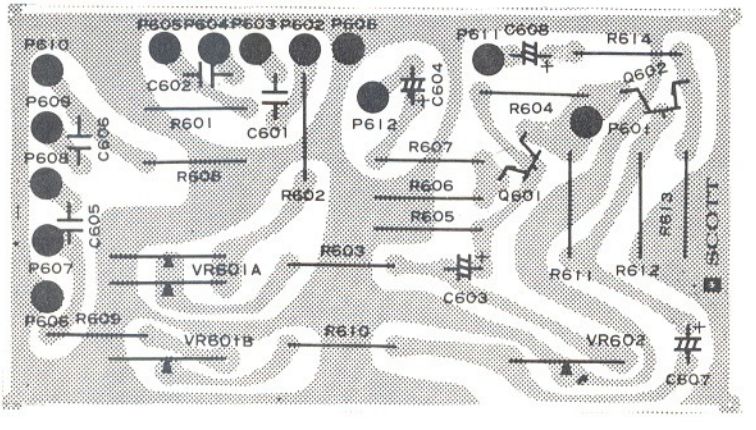
A-416
A-426
A-436



TONE CONTROL K-40138

Models

A-416
A-426

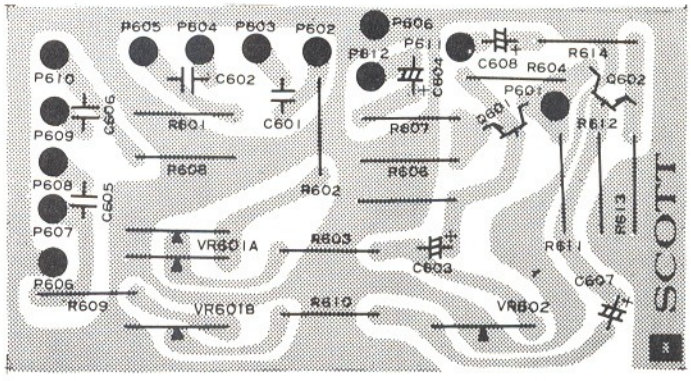


CIRCUIT BOARDS

TONE CONTROL K-40136
TONE-A

Model

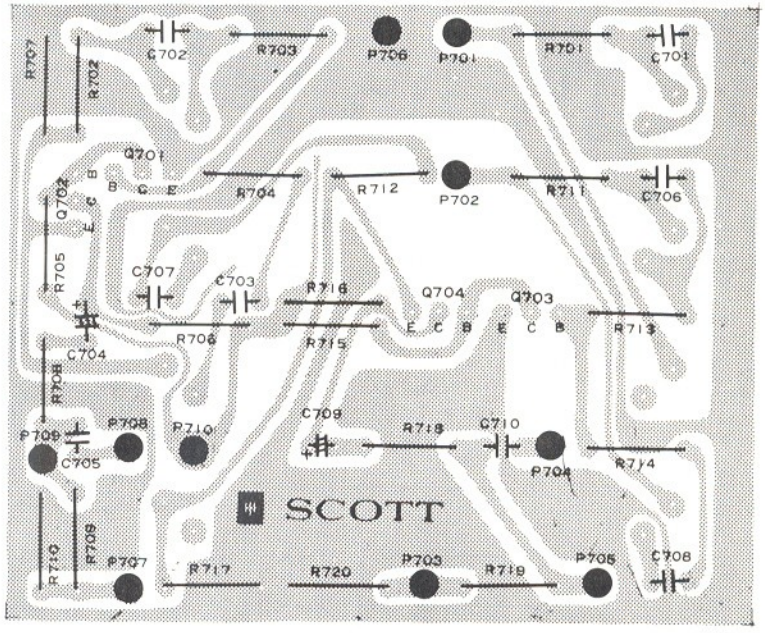
A-436

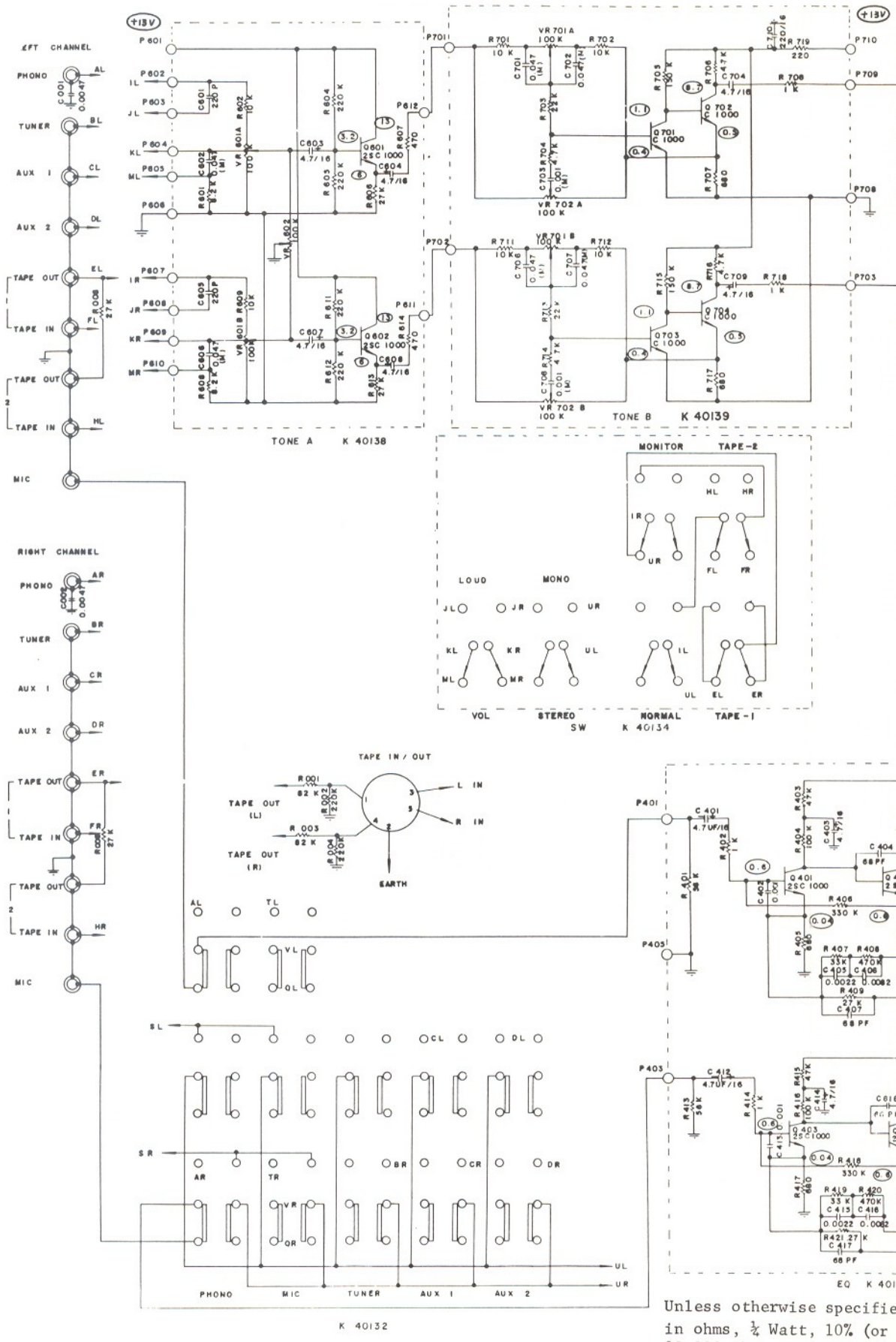


TONE CONTROL K-40137
TONE-B

Model

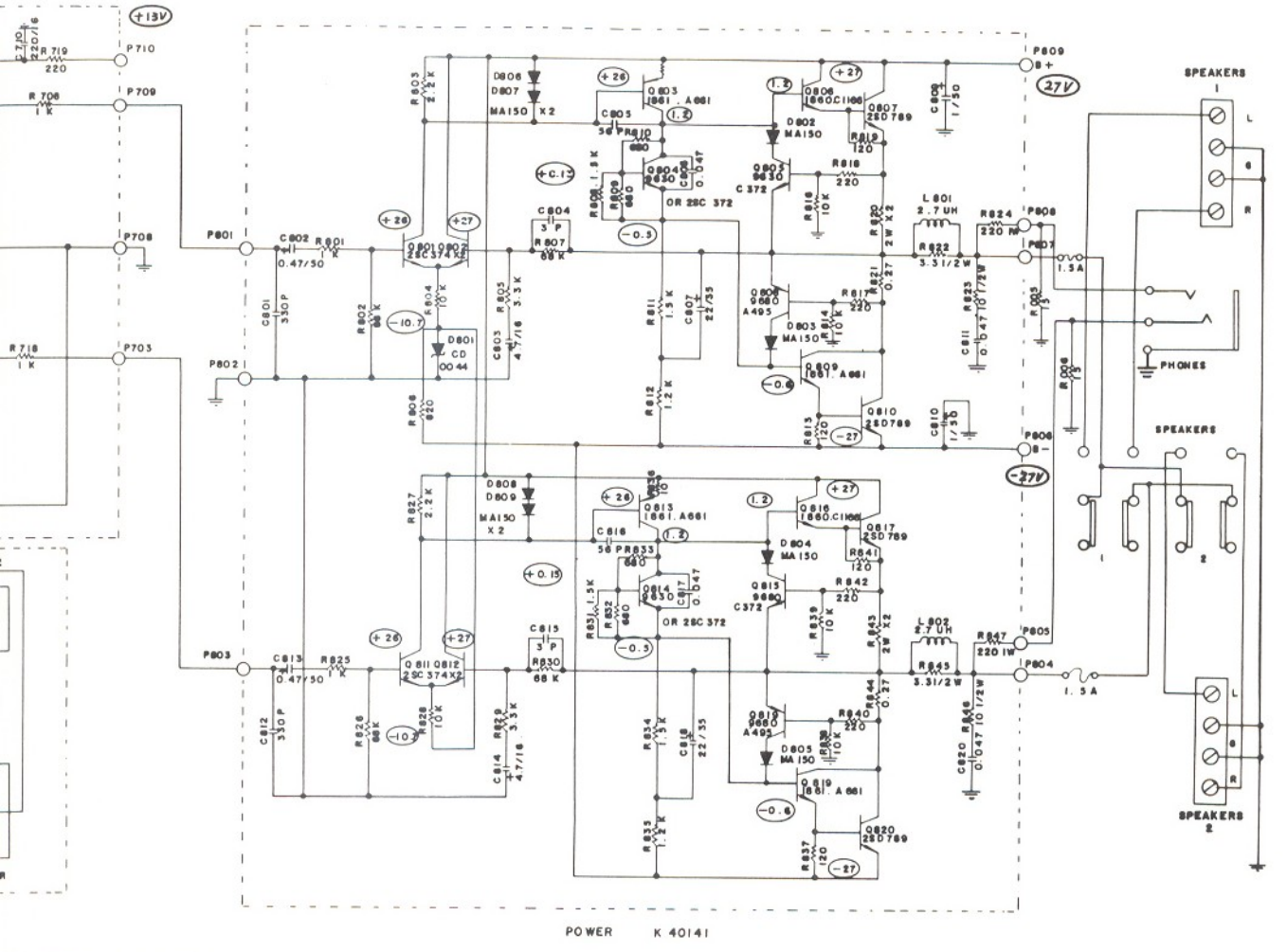
A-436



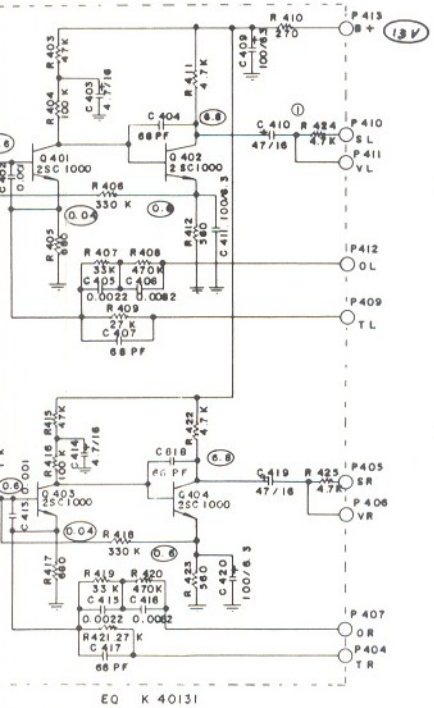


Unless otherwise specifie
in ohms, ½ Watt, 10% (or
20,000 ohm per Volt VOM.

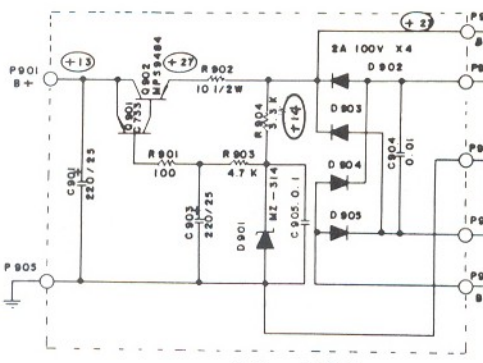
A-416 CIRCUIT DIAGRAM



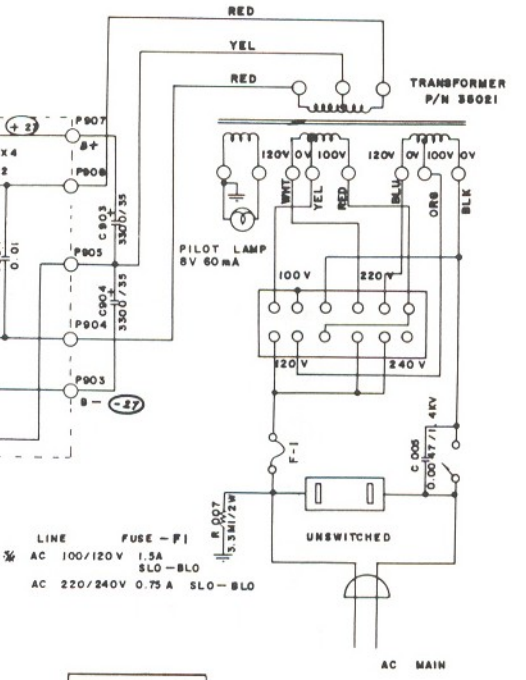
POWER K 40141



EQ K 40131



SUB K 40143



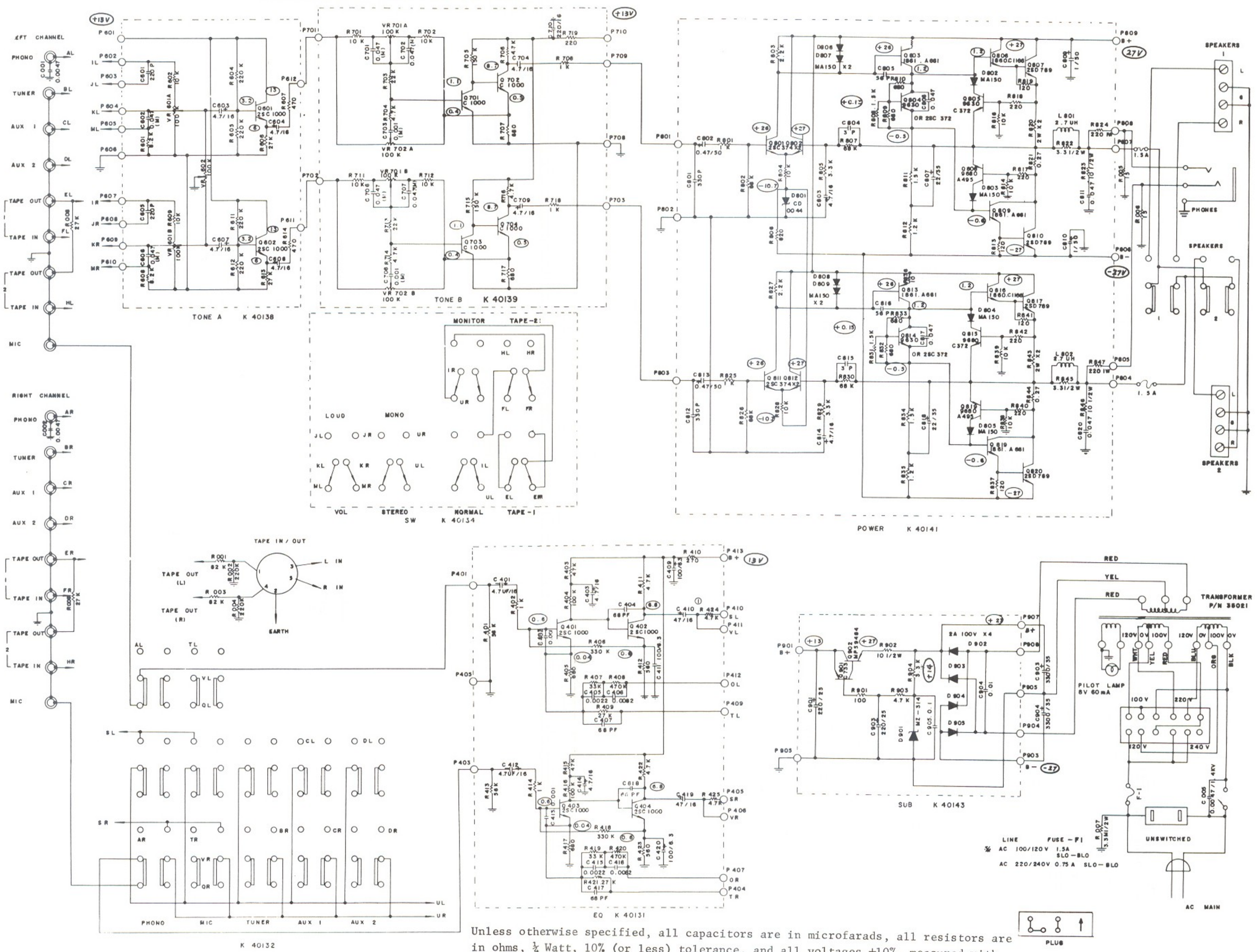
AC MAIN

PLUG

erwise specified, all capacitors are in microfarads, all resistors are
Watt, 10% (or less) tolerance, and all voltages ±10%, measured with
per Volt VOM. 117V power line.

H.H.Scott A-416, A-426, A-436

A-416 CIRCUIT DIAGRAM



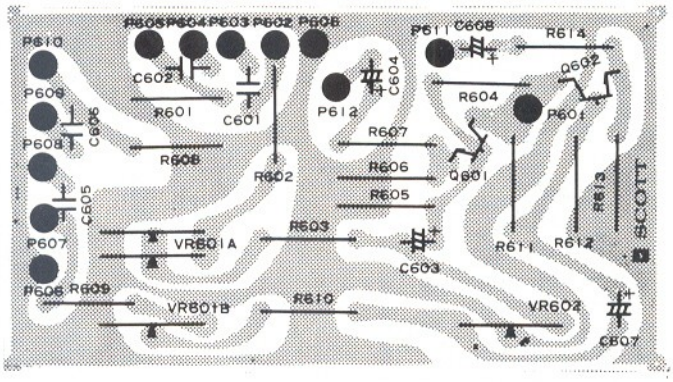
Unless otherwise specified, all capacitors are in microfarads, all resistors are in ohms, ¼ Watt, 10% (or less) tolerance, and all voltages ±10%, measured with 20,000 ohm per Volt VOM. 117V power line.

CIRCUIT BOARDS

TONE CONTROL K-40138
TONE-A

Models

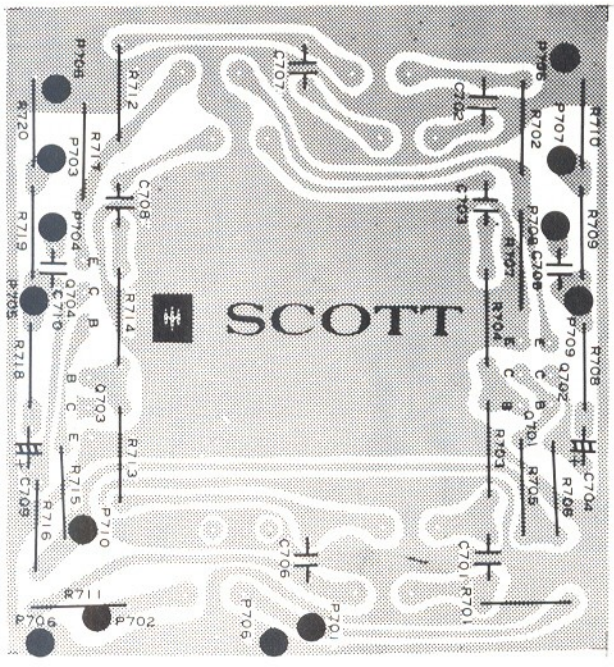
A-416
A-426



TONE CONTROL BOARD K-40139
TONE-B

Models

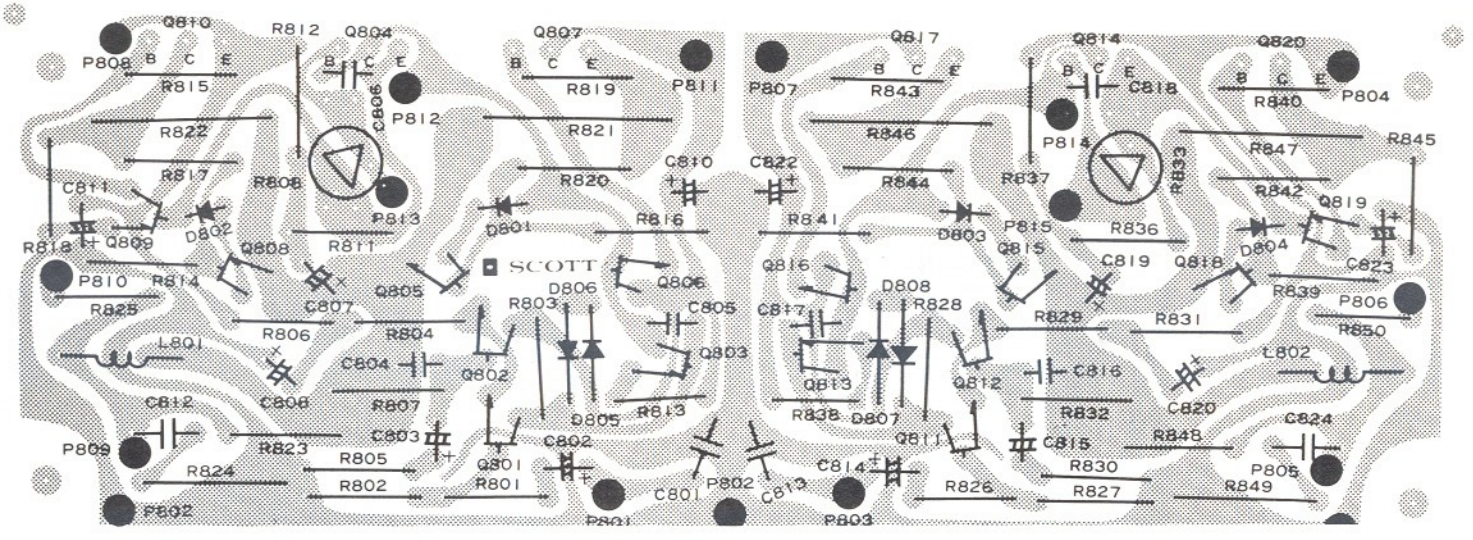
A-416
A-426



POWER BOARD K-40140

Models

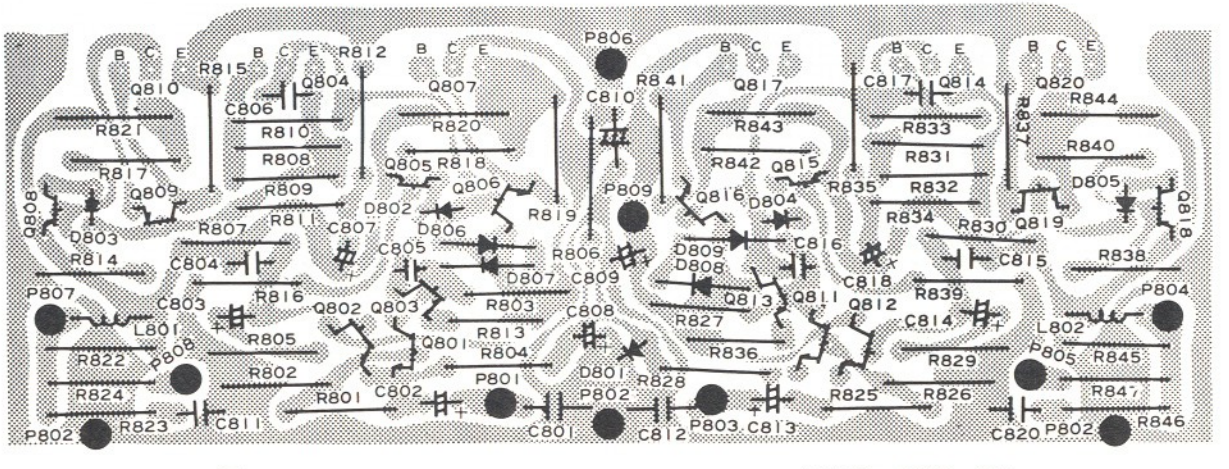
A-426
A-436

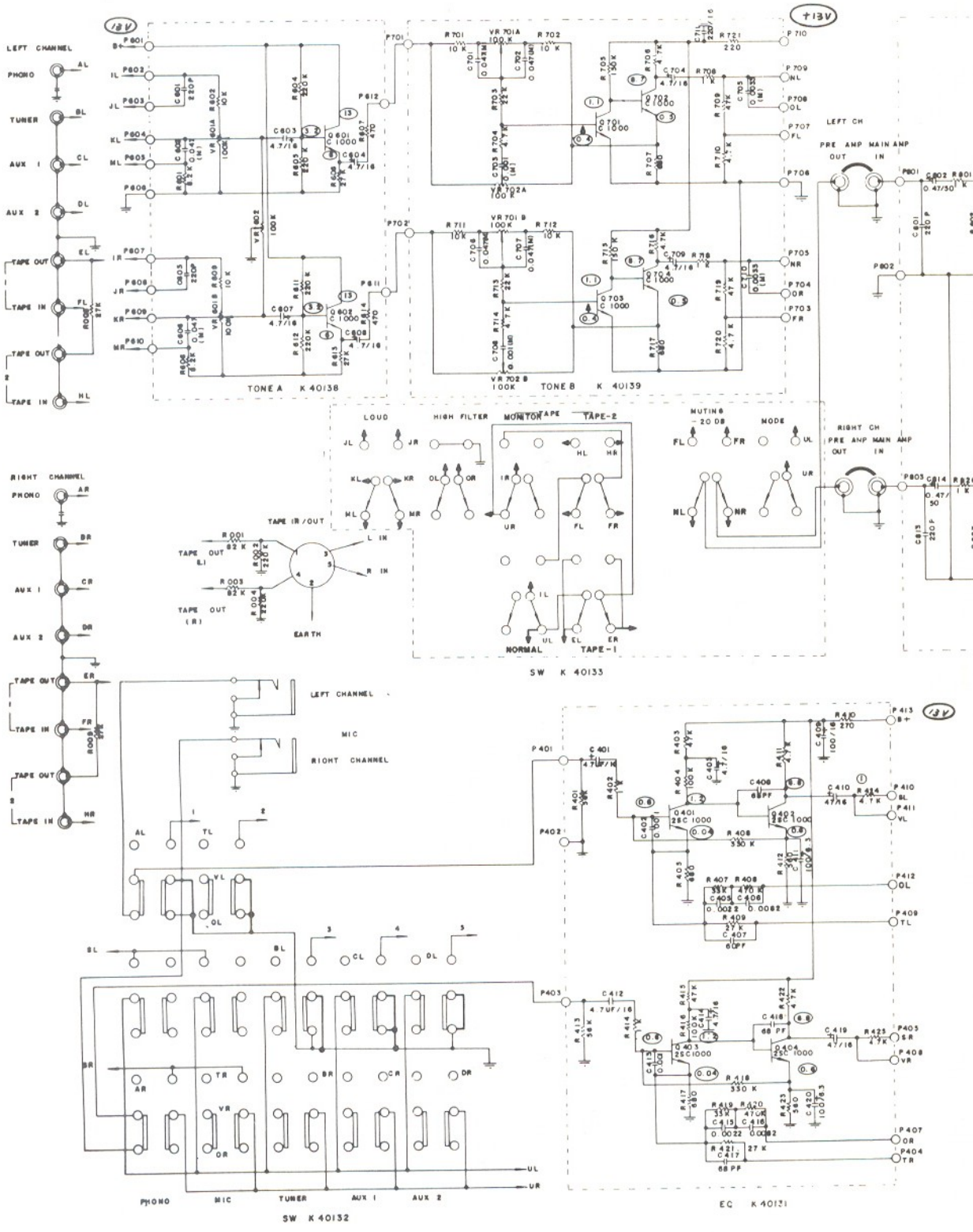


POWER BOARD K-40141

Model

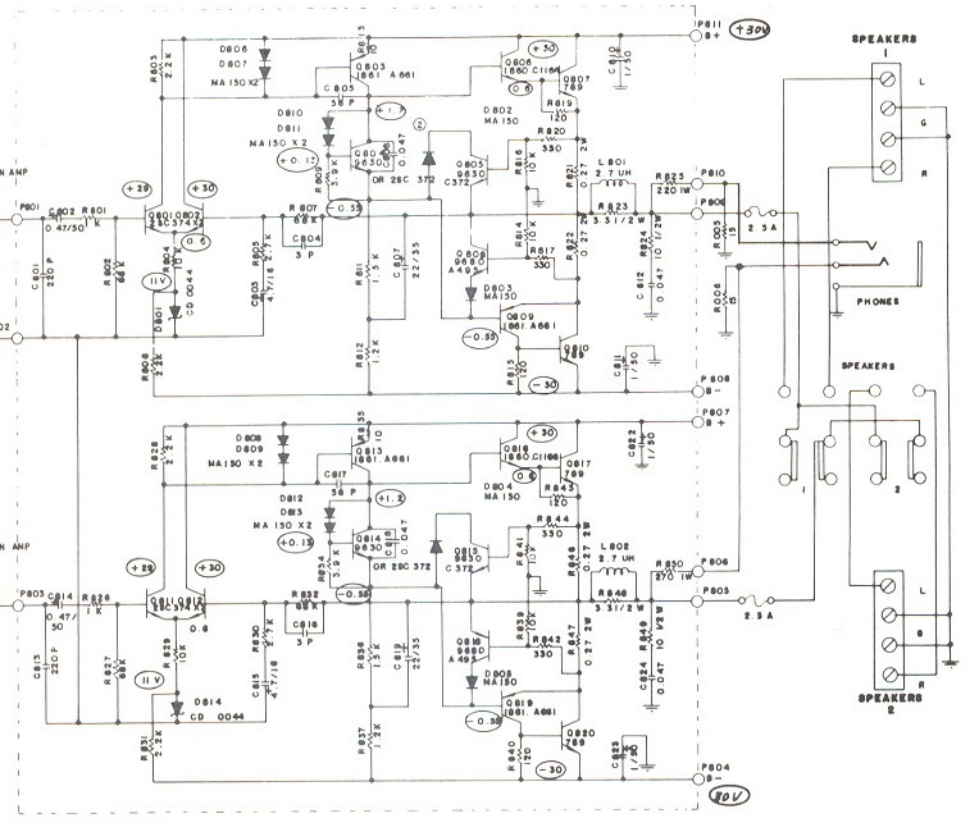
A-416

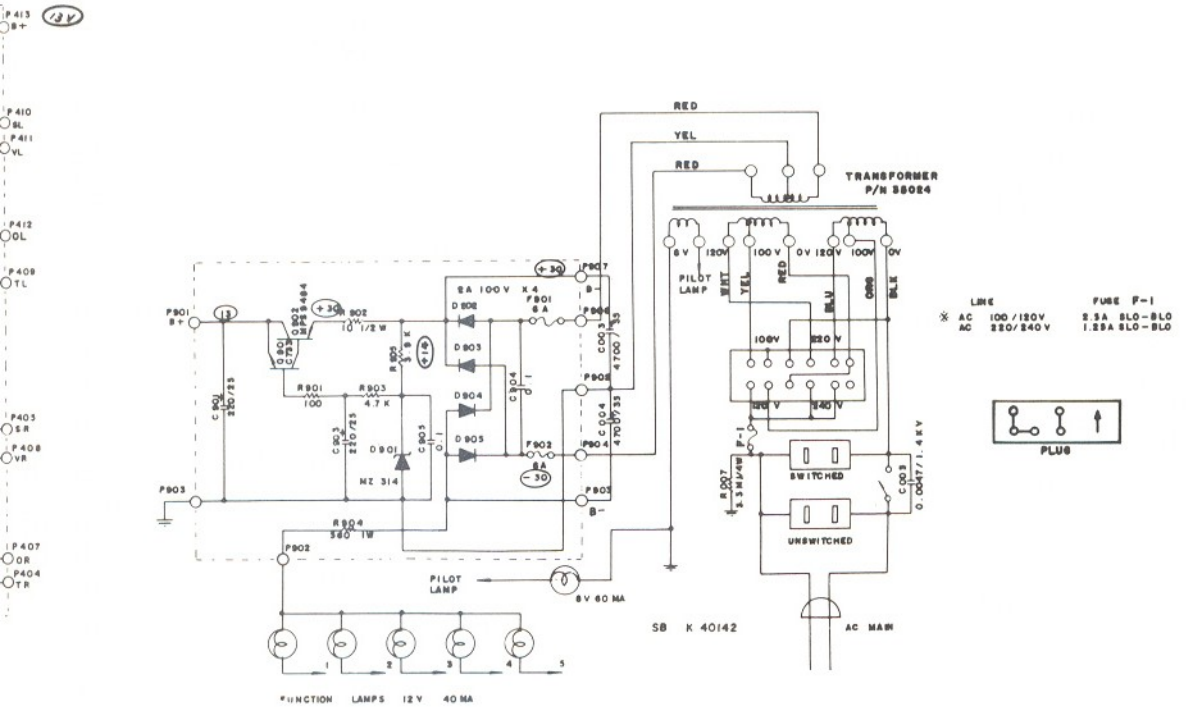




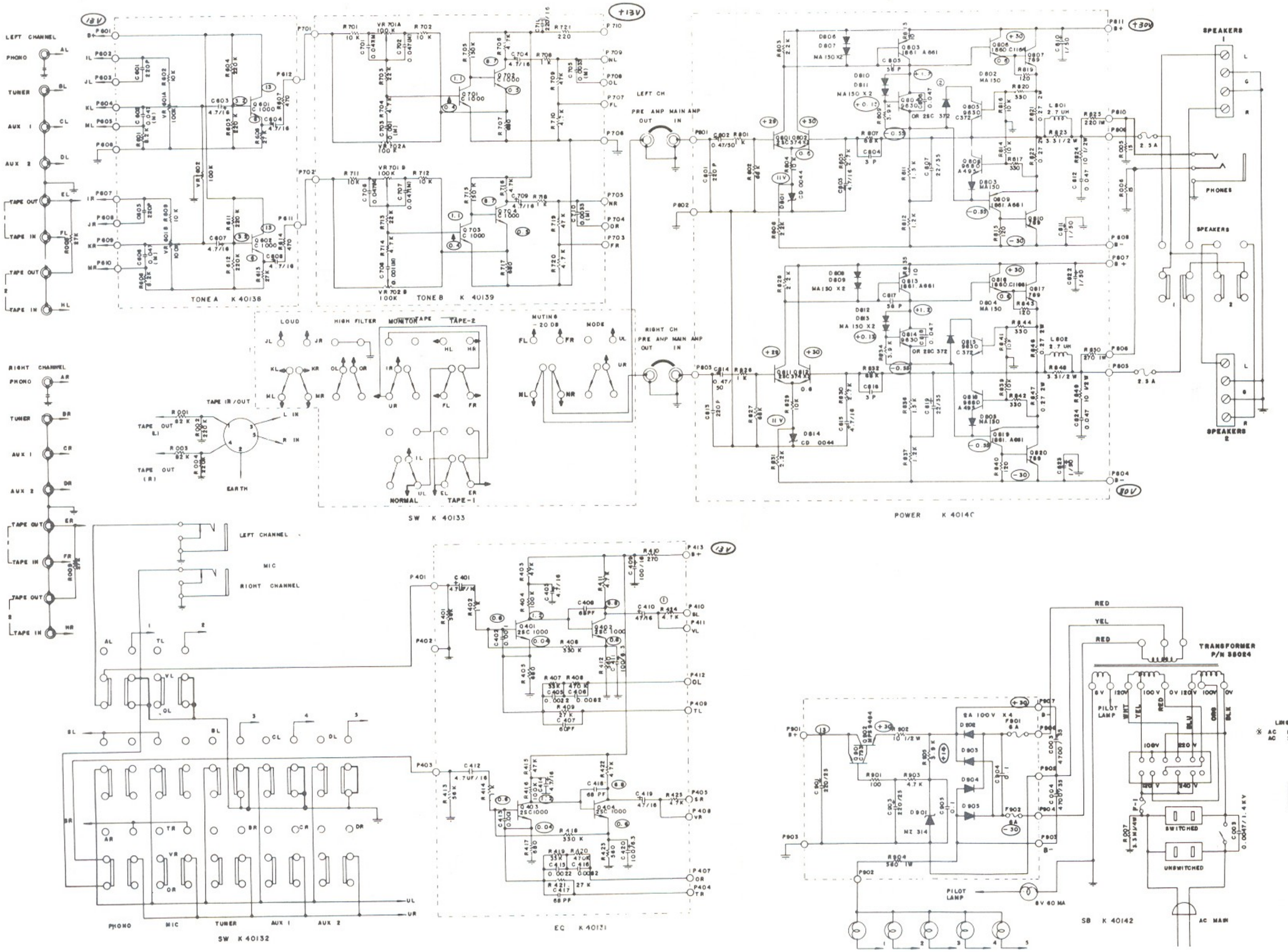
1 Unless otherwise specified, all capacitors are in microfarads, all resistors are
1 in ohms, ½ Watt, 10% (or less) tolerance, and all voltages ±10%, measured with
2 20,000 ohm per Volt VOM. 117V power line.

UIT DIAGRAM

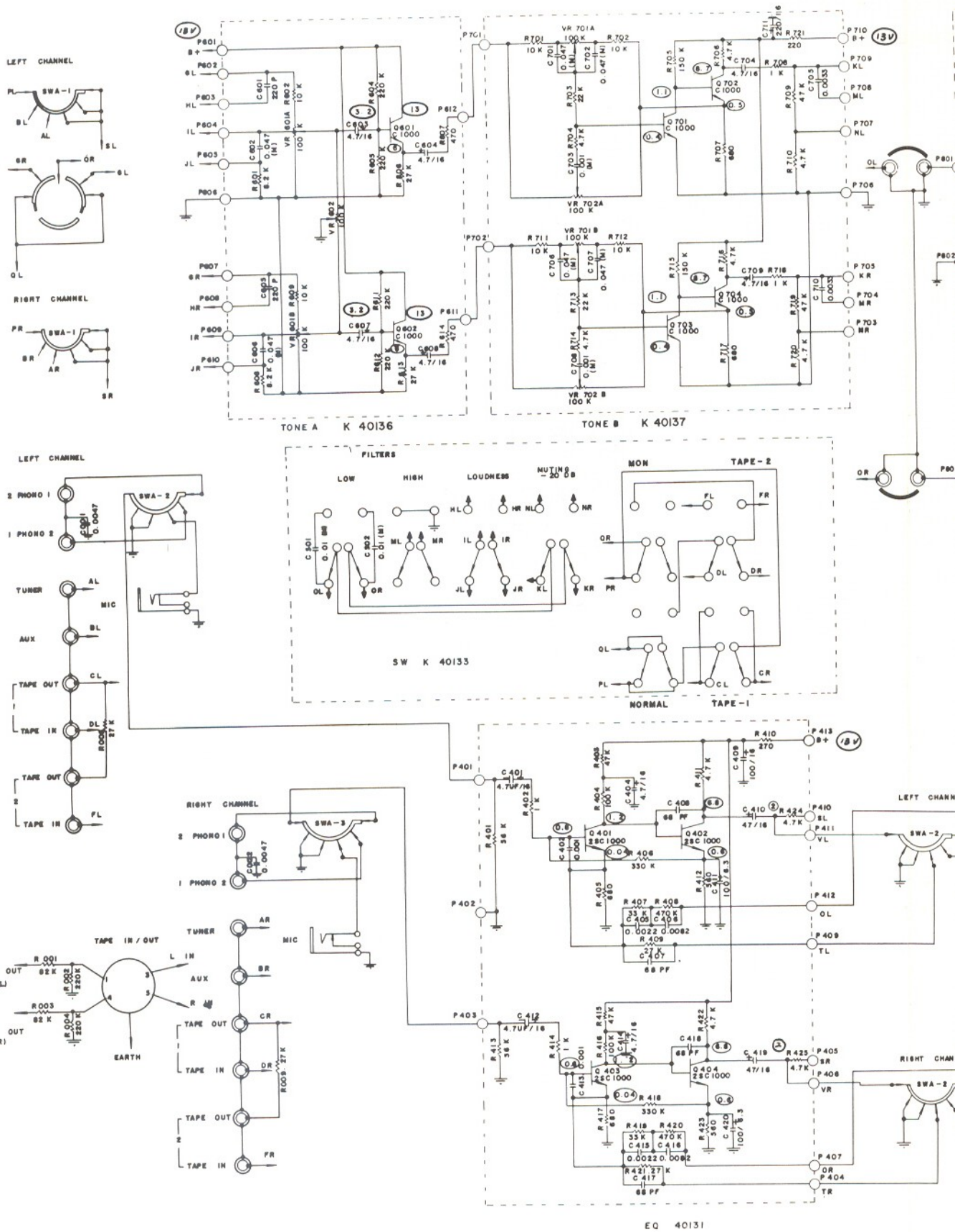

SPEAKERS
PHONES
SPEAKERS
SPEAKERS
POWER K 40140


TRANSFORMER P/N 58024
PILOT LAMP
SWITCHED
UNSWITCHED
PLUG
PILOT LAMP
SB K 40142
AC MAIN
FUNCTION LAMPS 12V 40 MA

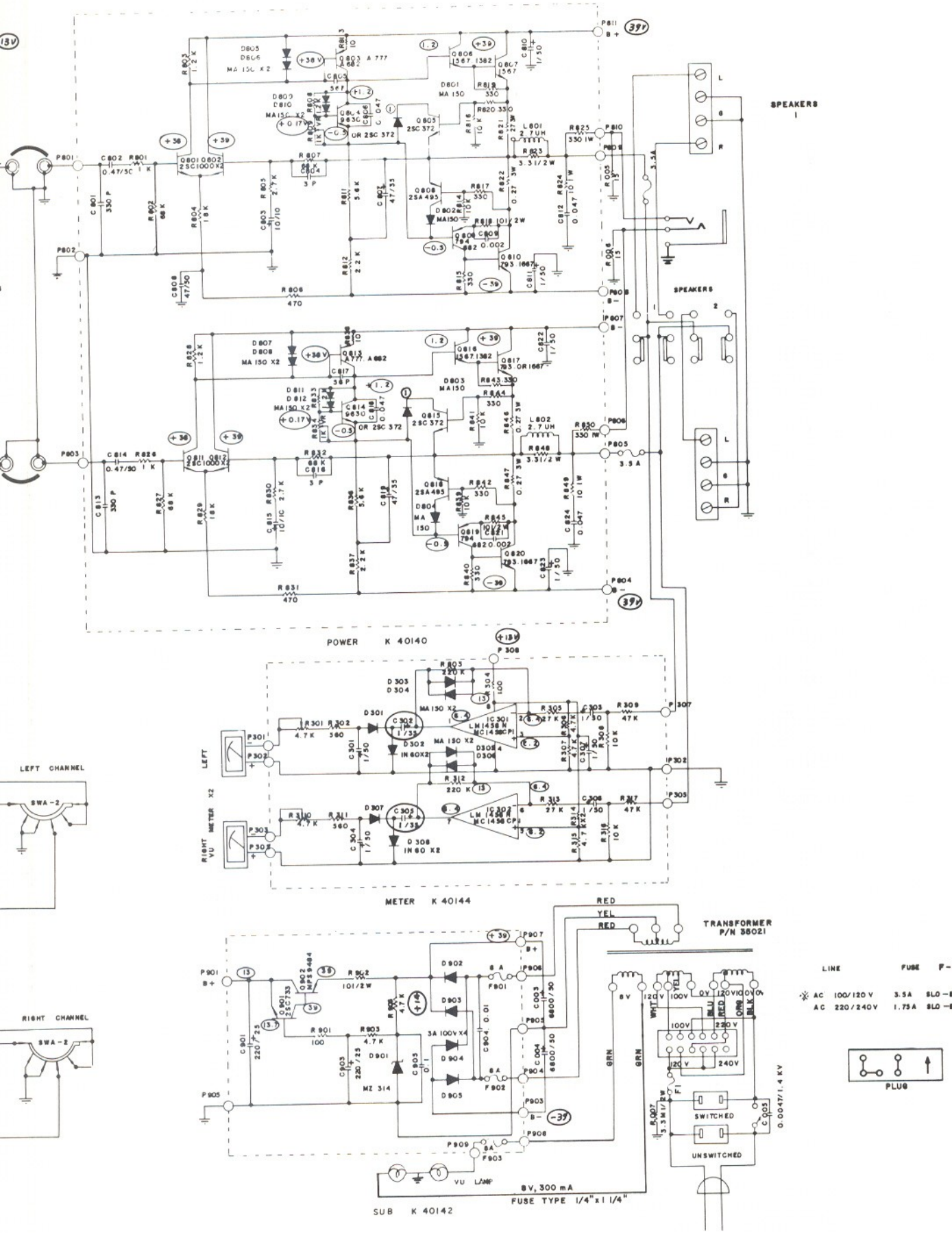
A-426 CIRCUIT DIAGRAM



Unless otherwise specified, all capacitors are in microfarads, all resistors are in ohms, ¼ Watt, 10% (or less) tolerance, and all voltages ±10%, measured with 20,000 ohm per Volt VOM. 117V power line.


LEFT CHANNEL
RIGHT CHANNEL
TONE A K 40136
TONE B K 40137
SW K 40133
FILTERS
LOW
HIGH
LOUDNESS
MUTING -20 DB
MON
TAPE-2
NORMAL
TAPE-1
TAPE IN / OUT
EARTH
EQ 40131

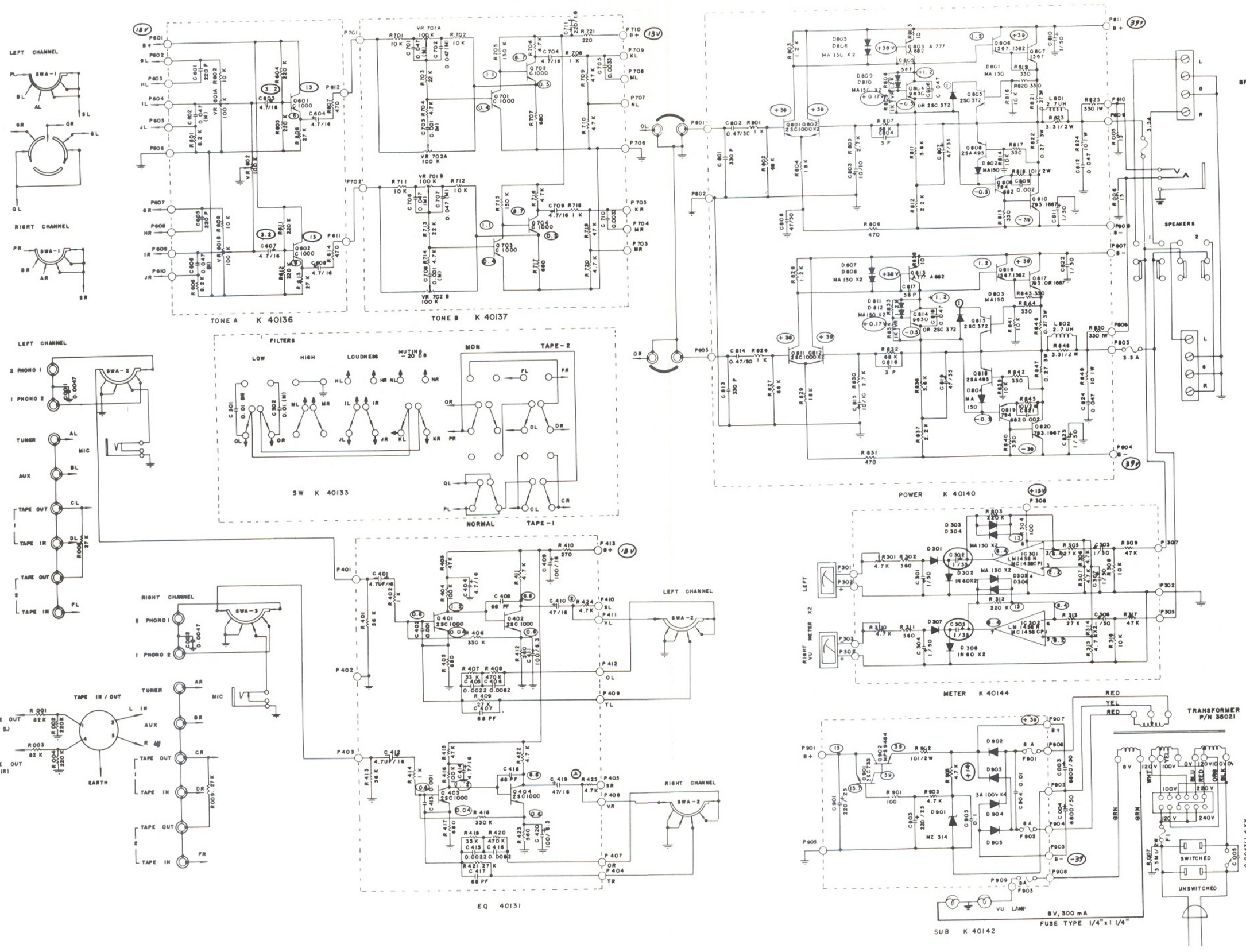
A-436 CIRCUIT DIAGRAM



Unless otherwise specified, all capacitors are in microfarads, all resistors are in ohms, ½ Watt, 10% (or less) tolerance, and all voltages ±10%, measured with 20,000 ohm per Volt VOM. 117V power line.

H.H.Scott A-416, A-426, A-436

A-436 CIRCUIT DIAGRAM



LINE	FUSE	F-1
* AC 100/120 V	3.5A	SLO-BLO
AC 220/240V	1.75A	SLO-BLO

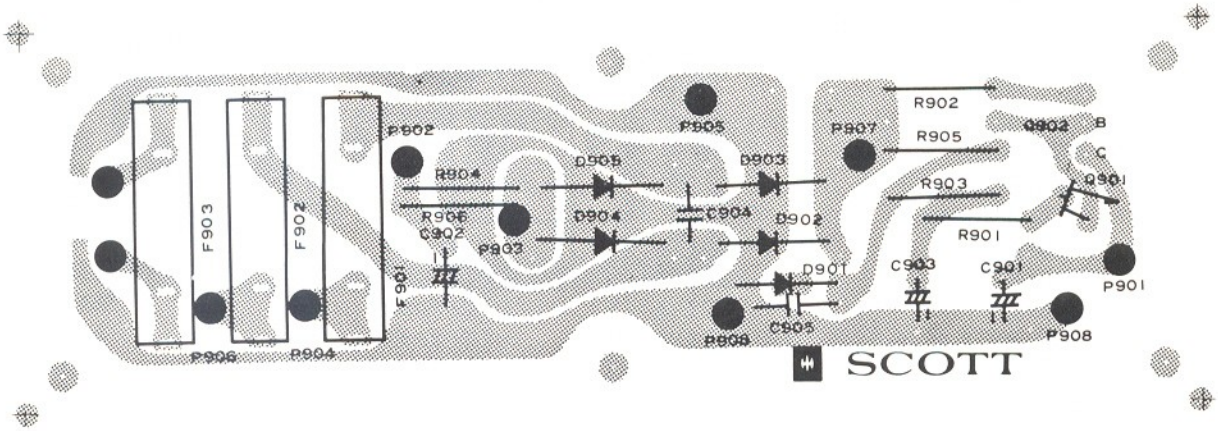
Unless otherwise specified, all capacitors are in microfarads, all resistors are in ohms, ½ Watt, 10% (or less) tolerance, and all voltages ±10%, measured with 20,000 ohm per Volt VOM. 117V power line.

CIRCUIT BOARDS

POWER SUPPLY BOARD K-40142

Models

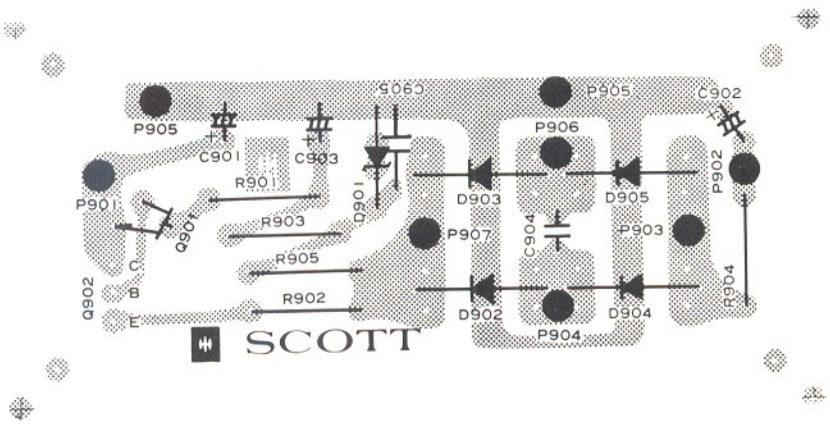
A-426
A-436



POWER SUPPLY BOARD K-40143

Model

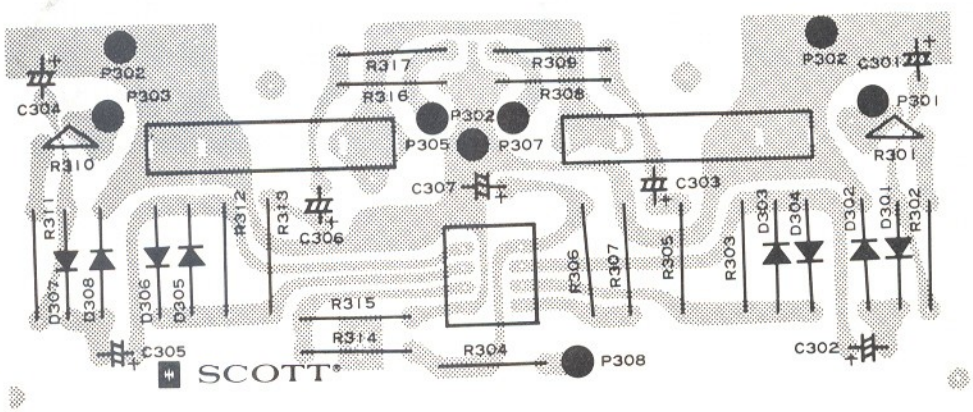
A-416



LOG METER BOARD K-40144

Model

A-436

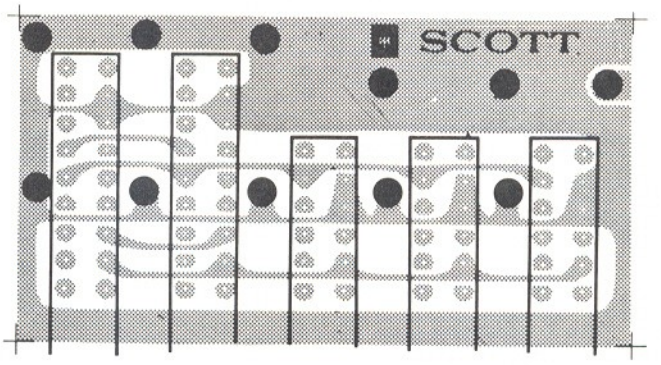


CIRCUIT BOARDS

SWITCH BOARD K-40132

Models

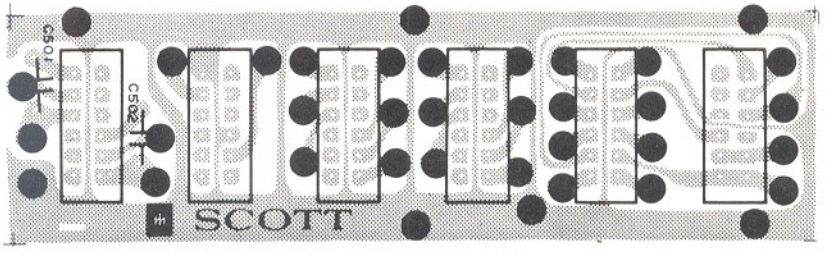
A-416
A-426



SWITCH BOARD K-40133

Models

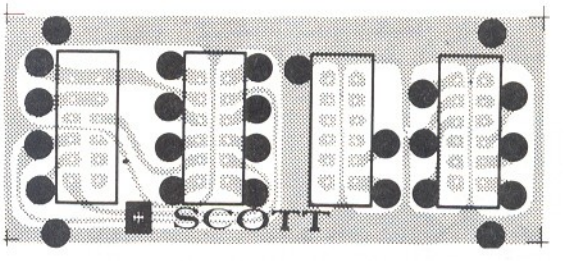
A-426
A-436



SWITCH BOARD K-40134

Models

A-416
A-426
A-436



H. H. S. PART NUMBER	DESCRIPTION		USAGE
011-1004-030	Filter Capacitor	6800/50V	A-436
011-1004-031	Filter Capacitor	4700/35V	A-426
011-1004-032	Filter Capacitor	3300/35V	A-416
012-1020-004	Diode	1N 60	A-436
012-1021-001	Diode	1N4148, MA162, MA150	A-416/26/36
012-1023-002	Diode, Zener	13V	A-416/26/36
012-1023-009	Diode, Zener	CD0044	A-416/26
012-1024-001	Diode, Rectifier	2A 100V	A-416/26
012-1024-013	Diode, Rectifier	3A 100V	A-436
013-1031-005	Fuse, Slo-Blo	.7A/250V	A-416
013-1031-008	Fuse, Slo-Blo	1.25A/250V	A-426
013-1031-009	Fuse, Slo-Blo	1.5A/125V	A-416
013-1031-011	Fuse, Slo-Blo	2.5A/125V	A-426
013-1031-018	Fuse, Fast-Blo	2.5A/125V	A-426
013-1031-024	Fuse, Fast-Blo	1.5A/125V	A-416
013-1031-026	Fuse, Fast-Blo	8A/125V	A-436
013-1031-027	Fuse, Fast-Blo	3.5A/125V	A-436
013-1031-028	Fuse, Slo-Blo	3.5A/125V	A-436
013-1031-029	Fuse, Slo-Blo	1.75A/250V	A-436
013-1031-030	Fuse, Fast-Blo	6A/125V	A-426
015-1061-014	Phone Jack		A-416/26/36
015-1061-015	Mic Jack		A-426/36
017-1095-036	Meter, VU		A-436
018-1100-178	Knob, Volume		A-416/26/36
018-1100-179	Knob, Control		A-416/26/36
018-1100-180	Knob, Pushbutton		A-416/26/36
018-1100-181	Knob, Function, Black		A-416/26/36
018-1100-182	Knob, Slide		A-416/26/36
018-1102-157	Front Panel		A-426
018-1102-158	Front Panel		A-436
018-1102-159	Front Panel		A-416
020-1110-052	Transistor	2SC 733	A-416/26/36
020-1110-053	Transistor	2SC 372, 9630	A-416/26/36
020-1110-054	Transistor	2SC 374	A-416/26
020-1110-055	Transistor	2SA 495, 9680	A-416/26/36
020-1110-056	Transistor	2SA 1861, 661	A-426/16
020-1110-057	Transistor	2SC 1166, 1860	A-416/26
020-1110-058	Transistor	2SC 1000	A-416/26/36
020-1110-059	Transistor	MPS 9484	A-416/26
020-1111-047	Transistor	2SA 682	A-436
020-1111-048	Transistor	2SC 1382, 1567	A-436
020-1111-049	Transistor	2SC 793, 1667	A-436
020-1111-050	Transistor	2SC 789	A-416/26
020-1114-030	Integrated Circuit	LM1458N, MC1458CP1	A-436
021-1125-135	Pot, Slide	100K 2 Gang	A-416/26
021-1125-136	Pot, Slide	100K 1 Gang	A-436
021-1125-137	Pot, Balance	100K	A-416/26/36
021-1125-138	Pot, Volume	100K	A-426/36
021-1125-139	Pot, Volume	100K	A-416

PARTS LIST

H. S. PART NUMBER	DESCRIPTION	USAGE
023-1136-013	Switch, Lever 4P2T	A-416/26/36
023-1137-080	Switch, Rotary, Selector	A-436
023-1137-081	Switch, Rotary, Mode	A-436
023-1138-052	Switch, Pushbutton, Power	A-416/26/36
023-1138-053	Switch, Pushbutton, Spkr.	A-416
023-1138-054	Switch, Pushbutton, Selector	A-416/26
023-1138-055	Switch, Pushbutton, Spkr.	A-426/36
024-1140-072	Transformer	A-436
024-1140-073	Transformer	A-426
024-1140-074	Transformer	A-416
030-1187-032	Terminal, Speaker	A-416/26/36
030-1187-033	Terminal, Ground Assy.	A-416/26/36
030-1189-027	Lamp, Fuse Type 8V 0.3mA	A-436
030-1189-028	Lamp, Lead Type 8V 60mA	A-416/26
030-1189-029	Lamp, Lead Type 12V 40mA	A-426
030-1192-010	Fuse Holder	A-416/26/36
031-1200-008	Feet, Rubber	A-416/26/36
031-1201-014	Jewel, Lamp Cap	A-416/26
032-1251-184	Cover, Bottom	A-426/36
032-1251-185	Cover, Top	A-426/36
032-1251-186	Cover, Bottom	A-416
032-1251-187	Cover, Top	A-416
036-1280-004	Handle	A-436
100-1333-036	Pre Amp Board Assy.	A-416/26/36
100-1334-023	Tone "A" Board Assy.	A-436
100-1334-024	Tone "B" Board Assy.	A-436
100-1334-025	Tone "A" Board Assy.	A-426
100-1334-026	Tone "A" Board Assy.	A-416
100-1334-027	Tone "B" Board Assy.	A-416/26
100-1335-018	Driver Amp Board Assy.	A-436
100-1335-019	Meter Drive Board Assy.	A-436
100-1335-020	Driver Amp Board Assy.	A-426
100-1335-021	Driver Amp Board Assy.	A-416
100-1340-034	Power Supply Board Assy.	A-436
100-1340-035	Power Supply Board Assy.	A-426
100-1340-036	Power Supply Board Assy.	A-416
100-1352-025	Lever Switch Board Assy.	A-436
100-1352-026	Lever Switch Board Assy.	A-426
100-1352-027	Lever Switch Board Assy.	A-416
100-1352-028	Speaker Switch Board Assy.	A-426/36
100-1352-029	Selector Switch Board Assy.	A-416/26