

SERVICE MANUAL

The Fisher®

4020

4060

4025

474

495

674

895

**4/2-Channel
Stereo Receiver**

WORLD LEADER IN HIGH QUALITY STEREO

TABLE OF CONTENTS

REQUIRED TEST EQUIPMENT	2	TUNER SCHEMATIC (All Models)	7
HARMONIC DISTORTION CHECK	2	4060/674/895 SCHEMATICS	8, 9
FM TUNER ALIGNMENT	3	4060/674/895 PARTS LISTS	8, 9
AM TUNER ALIGNMENT	4, 5	LAMP BOARD PARTS LIST (4060 Only)	9
CHASSIS PARTS LIST (All Models)	6	4020/4025/474/495 SCHEMATICS	10,11
TUNER PARTS LIST (All Models)	7	4020/4025/474/495 PARTS LISTS	10,12

REQUIRED TEST EQUIPMENT

The following test equipment is required to test and align the Receiver:

- Line Voltage Autotransformer or Voltage Regulator
- AC DC Multimeter
- Accurately Calibrated AC Voltmeter
- Oscilloscope (Flat to 100 kHz Minimum)
- Low-Distortion Audio Sine-Wave Generator
- Harmonic Distortion Analyzer
- Four (4) Load Resistors, 8-ohms, 50 Watts (Minimum Rating)
- Low-Distortion AM-FM Signal Generator
10.7 MHz Sweep Generator
- Multiplex Generator
- 455 kHz Sweep Generator

CAUTION: This precision high-fidelity instrument should be serviced only by qualified personnel, trained in the repair of transistorized equipment and printed circuitry.

HARMONIC DISTORTION CHECK

To perform the harmonic distortion check proceed as follows:

CAUTION: Measure one channel at a time. Limit Full Power On periods to five minutes. Use a load resistor with a rating of at least 50 watts.

- (1) Set BASS and TREBLE controls flat, SELECTOR switch to AUX 1, and POWER/SPKRS switch to AC OFF.
- (2) Connect a low distortion sine wave signal generator between L AUX FRONT IN jack and chassis ground. Set the generator output at 1000 Hz, minimum output.
- (3) Connect an 8-ohm load resistor between L MAIN SPKR and COM terminals. Connect an AC VTVM,

scope, and harmonic distortion analyzer across the 8-ohm load.

- (4) Set the POWER/SPKRS switch to 2-CH. Set FRONT BALANCE (or VOLUME/BALANCE) control(s) to full LEFT position. Turn VOLUME control slowly up to maximum.
- (5a) For Models 4020/4025/474/495, adjust the generator output until the VTVM indicates 9 volts RMS. The distortion analyzer should indicate less than 1% harmonic distortion.
- (5b) For Models 4060, 674, 895, adjust the generator output until the VTVM indicates 11 volts RMS. The distortion analyzer should indicate less than 1% harmonic distortion.
6. Repeat steps 3 through 5b for RIGHT FRONT channels.

TUNER ALIGNMENT

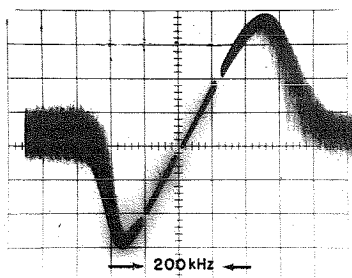
FM ALIGNMENT—FM MUTING OFF MODE to 2-CH, SELECTOR to FM, VOLUME to MIN, TAPE MONITOR OFF.

Maintain generator output as low as possible for suitable indication.

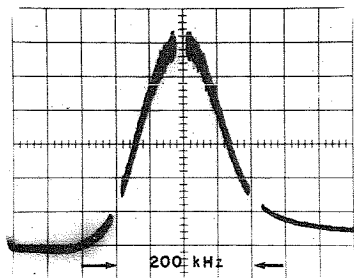
ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
<p>Note: The FM IF circuit utilizes a non-tunable ceramic filter which establishes the IF bandpass. To insure symmetrical tuning and selectivity, the IF must be aligned precisely to the center of the filter bandpass, rather than to 10.7 MHz as in conventional LC circuits.</p>				
1. IF ALIGNMENT	Connect to 10.7 MHz sweep through 2 pF capacitor and 22K resistor to TP1 (FM IN). Connect ground lead to rear of chassis. Markers are not required.	Position of non-interference.	Scope vertical input to TP2 (FM OUT). Ground lead to rear of chassis.	<p>Short FM oscillator variable capacitor (section nearest L4) with a clip lead. Detune T9 by turning core up (CCW).</p> <p>Adjust T5, T3, T2, T1, for curve as shown in photograph. Repeat as required to obtain best shape.</p> <p>Adjust T9 for best shape (widest bandpass, not for max amplitude).</p>
2. PRELIMINARY DETECTOR ALIGNMENT	Readjust generator output to 100 μ V. Reduce output amplitude as much as possible throughout this procedure.		Scope vert input through a 100K resistor to TP3 (DISCRI).	Adjust T7 top and bottom for best gain and symmetry. S-curve should appear as shown in photograph.
<p>Note: 120-ohm composition resistors in series with each lead from the RF generator match the 50-ohm output to the 300-ohm input impedance. Generator output voltage is reduced to one-half at antenna terminals. Signal voltages specified in this table are generator output levels, not antenna voltages.</p>				
3. FRONT END ALIGNMENT		Tuning knob fully CCW.		Center dial pointer on 0 and cement it in place.
4.	Connect FM RF generator through two 120-ohm resistors to FM ANT screw terminals. Set generator to position of non-interference near 90 MHz, modulate with 400 Hz to provide ± 75 kHz deviation. Output amplitude should be sufficient to provide a reading of 3 on receiver front panel meter.	Position of non-interference near 90 MHz.	Receiver front panel meter. Note: To ensure that meter is not indicating a local broadcast station connect scope for step 5, below.	<p>Adjust L4 for maximum gain.</p> <p>Adjust L2, then L7 for maximum gain.</p> <p>Repeat the two steps above as required.</p>
5.	Change generator setting to position of non-interference near 106 MHz.	Position of non-interference near 106 MHz.		<p>Adjust TC3 for maximum gain.</p> <p>Adjust TC1, then TC2, for maximum gain.</p> <p>Repeat the two steps above as required.</p>
6. FINAL DETECTOR ALIGNMENT	As above, except set to position of non-interference near 100 MHz. Set output amplitude to 1 mV (500 mV at receiver antenna terminals).	Position of non-interference near 100 MHz.	Distortion meter to RCDR OUT jack. DC VTVM through 100K resistor to TP3 (DISCRI).	<p>Adjust top core of T7 for zero point on 0.1 scale.</p> <p>Adjust bottom core of T7 for minimum distortion (should be below 1%) on distortion meter.</p>
7. FM OUTPUT	As above (100 MHz), deviation set to ± 22.5 kHz.	Position of non-interference near 100 MHz.	VTVM and scope to RCDR OUT jack.	Adjust VR1 (FM Level Adjust) for 350 mV at RCDR OUT jack.

TUNER ALIGNMENT (CONT'D)

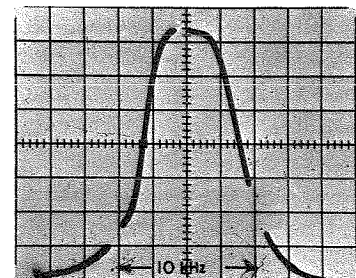
ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
8. SIGNAL STRENGTH (0-5) METER ADJUSTMENT	As above; set amplitude of generator output to 1 Millivolt.	Position of non-interference near 100 MHz.	Receiver Signal Strength (0-5) Meter.	Adjust VR5 (FM Meter Drive Adjust) so the front panel meter reads 4.
9. CENTER CHANNEL METER ADJUSTMENT (4060 only)			Receiver Center Channel (Arrows) Meter.	Slowly tune receiver above, then below generator signal. Needle should go from center (on signal) to right (above signal), then to left (below signal). Meter should remain centered when not near signal. If meter does not perform as described above, repeat steps 2 through 6 to produce properly shaped curves in IFs and Detector, as shown in photographs.
10. MUTING LEVEL ADJUSTMENT	Same except generator output set to 16 μ V.		VTVM and scope to RCDR OUT jack.	Set MUTING ON-OFF switch on receiver front panel to ON. Adjust VR6 (Muting Adjust) until generator output signal overcomes MUTING (until signal shows on scope).
11. STEREO SEPARATION			Move VTVM and scope to TP5 (19 kHz) and GND. Move VTVM and scope to TP6 (38 kHz).	Set VR2 (Separation adjust) to the middle of its rotation. Adjust L6 and L9 (19 kHz) for maximum output. Adjust L7 for maximum.
12.	Change amplitude of 19 kHz modulation to 8%, and modulate with 400 Hz. Main signal (Left) amplitude should be sufficient to produce 42 kHz deviation.		Scope and VTVM to Right RCDR OUT jack.	Adjust L9 for maximum output. If L9 requires more than $\frac{1}{2}$ turn, readjust L6, then L9 several times, to get best settings for maximum. Adjust VR2 for minimum.
13.	As above, except 19 kHz amplitude to produce 3.75 kHz deviation.		Move scope and VTVM to Left RCDR OUT jack.	Adjust VR7 so the STEREO-BEACON just lights. Reduce amplitude of modulation until the STEREOBEACON just goes out. Note the amount of deviation. Increase the deviation until the light comes ON again. The STEREOBEACON should light and go out between 3 and 4.



FM DETECTOR



FM IF



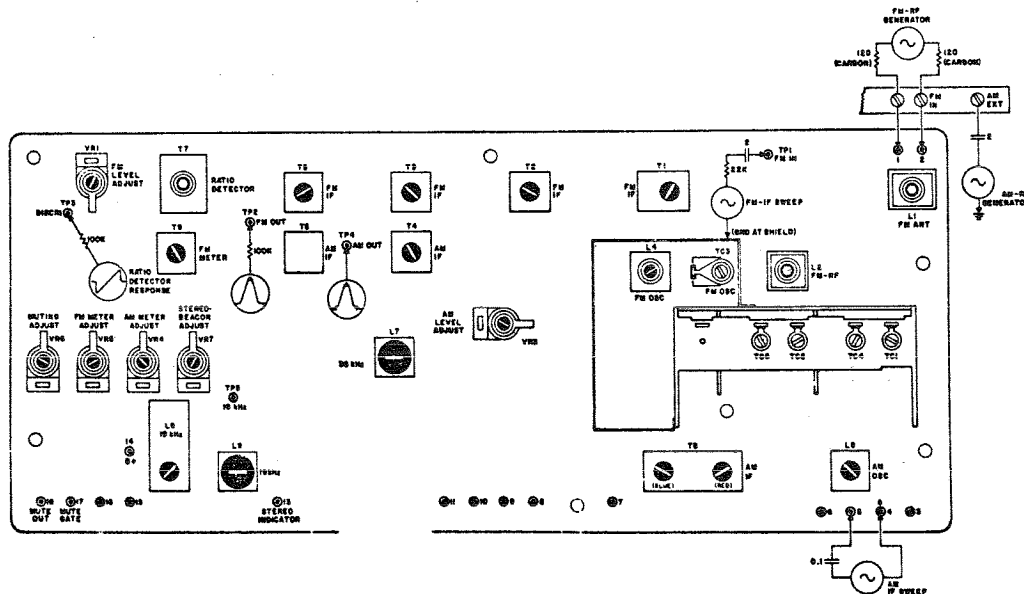
AM IF

TUNER ALIGNMENT (CONT'D)

AM ALIGNMENT—SAME FRONT PANEL SETTINGS as FM ALIGNMENT EXCEPT SELECTOR SET to AM

Maintain generator output as low as possible for suitable indication.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. AM IF	Connect 445 kHz sweep generator to AM EXT ANT terminals. Note: After each adjustment reduce generator output as required to keep front panel meter near 2.5.	Position of non-interference.	Scope vertical input to TP4 (AM OUT).	Adjust T8 for maximum gain. Adjust T4 for maximum gain. Repeat above two steps as required.
2. AM RF	Connect RMAM generator to antenna terminals and set output position of non-interference near 550 kHz, modulated 30% with 1 kHz audio, amplitude 5 mV.	Position of non-interference near 550 kHz.	Scope and VTVM to RCDR OUT jack.	Adjust L8 (AM Osc) for maximum.
3.	Change the RF output frequency to position of non-interference near 1,600 kHz.	Position of non-interference near 1,600 kHz.		Adjust TC5 for maximum.
4.	Reset the output frequency to position of non-interference near 600 kHz.	Position of non-interference near 600 kHz.		Repeat steps 2 and 3, above for maximum at both 600 and 1,400 kHz.
5.	Reset output to 1,600 kHz.	Position of non-interference near 1,400 kHz.		Remove tape from ferrite antenna case and adjust slide for maximum gain signal. Repeat steps 4 and 5.
6. AM OUTPUT	Reset generator output to position of non-interference near 1,000 kHz, amplitude 5 mV.	Position of non-interference near 1,000 kHz.		Adjust VR3 (AM Output) for 315 mV.
7. AM SIGNAL STRENGTH METER (0-5) ADJUSTMENT.	Reset generator output to position of non-interference near 1,000 kHz, amplitude 5 mV.	Position of non-interference near 1,000 kHz.	Receiver Signal Strength (0-5) meter.	Adjust VR4 (AM Meter Adjust) so that signal meter reads 4.



CHASSIS PARTS LIST

Ref. Des.	Description	Part Number	Ref. Des.	Description	Part Number
	Cabinet (4020/4025)	9403023	S5	POWER/SPKRS switch (4060/674/895)	2617351
	Cabinet (474/495)	9403022	T 1	Power Transformer (4020/4025/474/495)	2217731
	Cabinet (4060)	9403919	T1	Power Transformer (4060)	2217711
	Cabinet (674/895)	9403025	T1	Power Transformer (674/895)	2217741
	Washer, square, for cabinet assembly	4370451	C001	Capacitor, ceramic, 4700 pF	0243873
	Screw, for above	4504582	C002	Capacitor, electrolytic, 2200 UF, 63V	0250131
	Front Panel (4020)	3242773	C005	Capacitor, electrolytic, 100 UF, 50V	1252831
	Front Panel (4025)	3242777	R001	Resistor, 2.7 M	0139005
	Front Panel (474)	3242771	R003, 004	Resistor, 470, 1/2W (PHONES)	0134369
	Front Panel (495)	3242721	F001	Fuse, 2 A, 125V, (POWER, 4020/4025/474/495)	FL51313-13
	Front Panel (4060)	3242921	F001	Fuse, 2.5 A, 125V (POWER 4060/674/895)	FL51313-28
	Front Panel (674)	3242922	F002	Fuse, 3 A, 125V, pigtail slo blow (Lamp ckt.)	FL51313-14
	Front Panel (895)	3280791	F003	Fuse, 2 A, 125V (OUTPUT)	FL51313-29
	Dial Glass (4020/4025)	3198692		Fuseholder	2727241
	Dial Glass (474/495)	3198691		Jack, PHONES	2677061
	Dial Glass (4060)	3198871		Antenna, AM, Ferrite, incl. mtg. bracket	2757126
	Dial Glass (674/895)	3198671		Terminal Strip, Antenna	2687353
	Knob, Tuning (4020/4025/4060)	3280791		Terminal Strip, Speakers	2687321
	Knob, Tuning (474/495/674/895)	3280795		Terminal Strip, I/O, 6 RCA jacks	2677131
	Knob, SELECTOR, MODE, (4020/4025/4060)	3280802		Terminal Strip, I/O, 8 RCA jacks	2677161
	Knob, SELECTOR, MODE, (474/495/674/895)	3290906		Terminal Strip, DISC OUT jack	2677181
	Knob, VOLUME, BALANCE, FRONT (4020/4025/4060)	3218722		AC Outlet	2657211
	Knob, VOLUME, BALANCE, FRONT (474/495/674/895)	3218752		Line cord	2740241
	Knob, VOLUME, BALANCE, REAR (4020/4025/4060)	3281751		Spring, meter retaining (4020/4025/474/495)	3337103
	Knob, VOLUME, BALANCE, REAR (474/495/674/895)	3281723		Pulley, dial cord (metal, 3-1/2") (4020/4025/474/495)	3346045
	Pushbutton, LOUDNESS, MUTING (4020/4025/4060)	EK20046-3		Spring, for above	4564711
	Pushbutton, LOUDNESS, (474/495/674/895)	EK20046-4		Spring, tuning backlash assembly (4060/674/895)	0662084
	Tuning Shaft assembly (4020/4025/474/495)	4561482		Lamp Chassis, less lamps (4020/4025/474/495)	2518786
	Tuning Shaft assembly (674/895)	4381051		Lamp Chassis, less lamps (674/895)	3918751
	Tuning Shaft Assembly (4060)	4566071		Lamp Board, less lamps (4060)	3918729
	Dial Pointer (4020/4025/474/495)	3386671	Printed Circuit Boards Complete (incl. components)		
I9	Dial Pointer, w/lamp (4060/674/895)	3386441		Tuner (4020/4025/474/495)	2519198
I9	Lamp, only for above	2767094		Tuner (4060/674/895)	2519196
M101	Tuning Meter (4020/4025)	2577122		Preamp/Control/SQ (4020/4025/474/495)	2519662
M101	Tuning Meter (474/495)	25577129		Preamp/Control (674/895)	2519631
M101	Tuning Meter (4060/674/895)	2787302		SQ (674/895)	2519641
M102	Center Channel Meter (4060)	2787301		Preamp/Control/SQ (4060)	2579531
I5-8, I10	Lamp, Dial and Meter, fuse type, 6.3V, 250 mA	2767201		Power Supply/Amp (4020/4025)	2519523
	Lamp, STEREOBEACON, 8V, 30 mA	2767333		Power Supply/Amp (474/495)	2519661
I1-4	Lamp, MON, 2-CH, SQ, 4-CH, 6.3V, 65 mA	2767116		Power Supply/Amp (4060)	2519521
	Lamp holder (rubber)	2720022		Power Supply/Amp (674/895)	2519522
S7	POWER/SPKRS switch (4020/4025/474/495)	2617352			

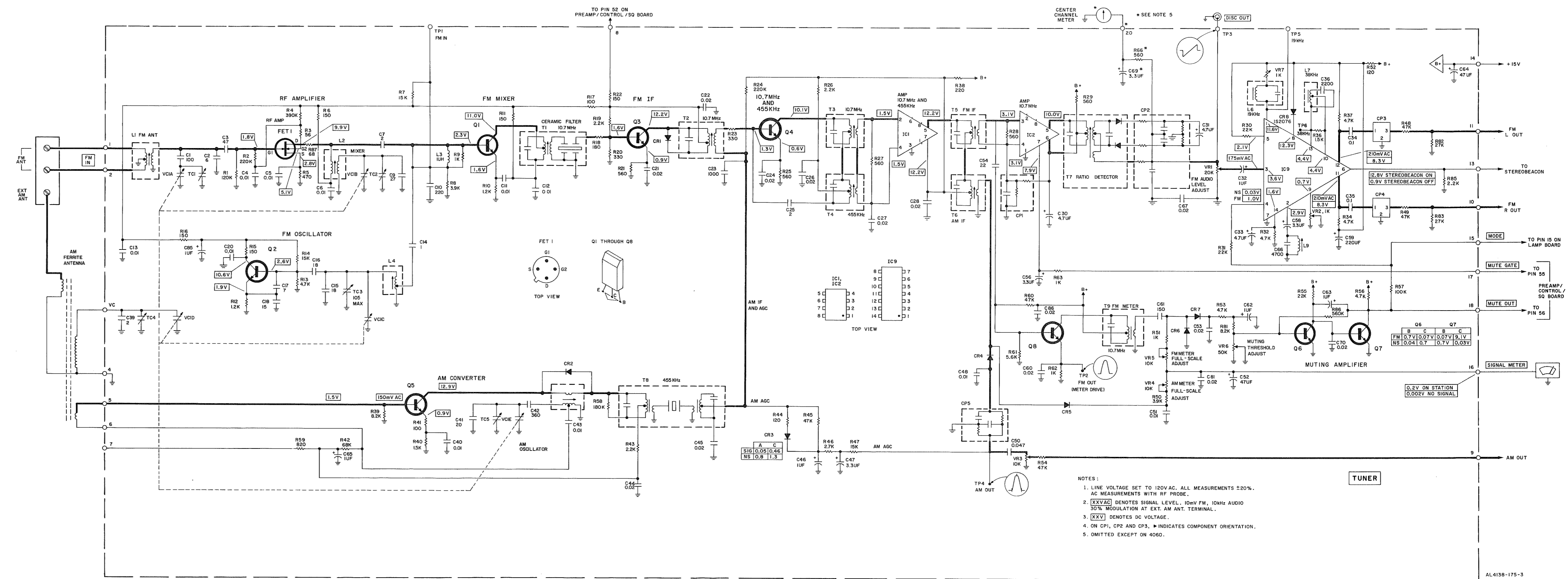
Note: Chassis mounted components may also be listed on the parts list of the circuit with which they function electrically.

TUNER PARTS LIST

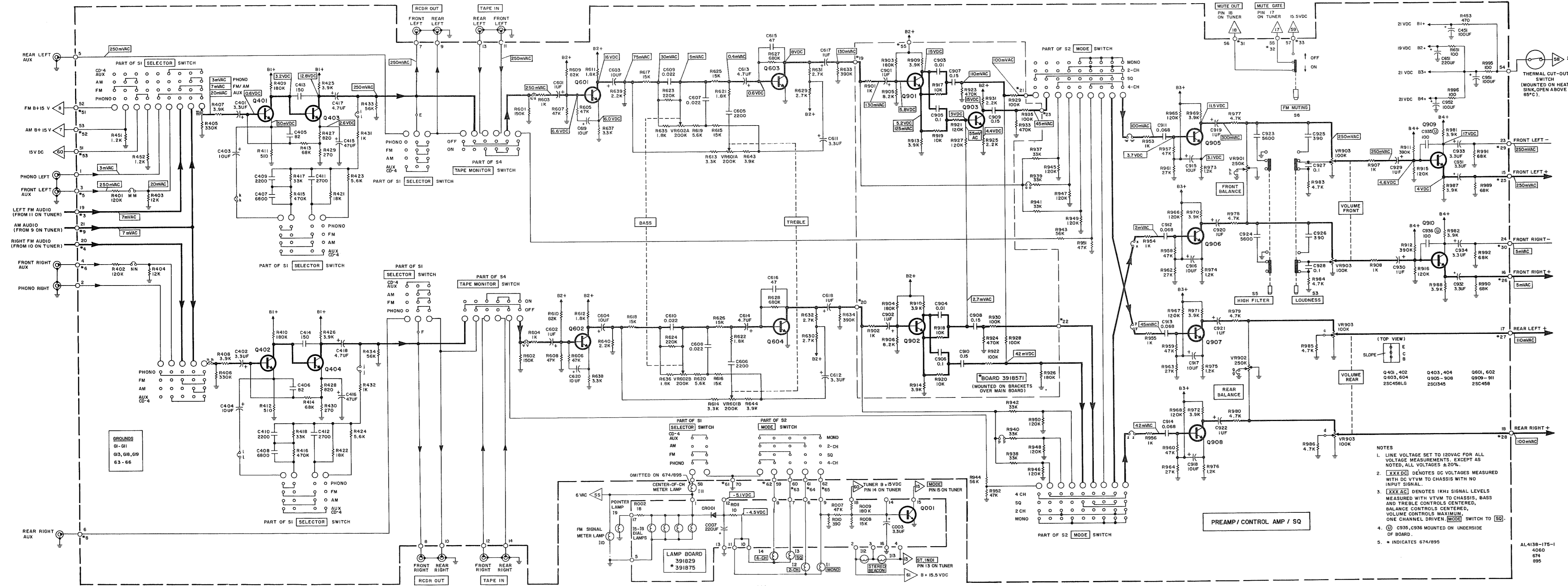
Ref. Des.	Description	Part Number	Ref. Des.	Description	Part Number
C1	Ceramic, 100 pF	0248724	Q1	Transistor, NPN, 2SC535 (B)	0573510
C2	Ceramic, 6 pF	0246416	Q2	Transistor, NPN, 2SC461 (B)	0573507
C3	Ceramic, 47 pF	0248676	Q3, 4, 8	Transistor, NPN, 2SC460 (B)	0573486
C4, 5, 6, 11, 12, 13, 20	Ceramic, 0.01 uF	1245017	Q5	Transistor, NPN, 2SC454 (B)	0573491
C7, 25, 39	Ceramic, 2 pF	0248632	Q6, 7	Transistor, NPN, 2SC458 (C)	2320063
C9	Ceramic, 27 pF	0246450	R1	120K	0114283
C10	Ceramic, 220 pF	0248362	R2, 24	220K	0114289
C14, 85	Ceramic, 1 pF	0248631	R3	56	0114059
C15, 16	Ceramic, 18 pF	0248176	R4	390K	0114295
C17	Ceramic, 7 pF	0246417	R5	470	0114147
C18	Ceramic, 15 pF	0246444	R6, 11, 15,	150	0114135
C21, 22, 24, 26, 27, 28, 44, 45, 53, 60, 67, 70, 81, 86	Ceramic, 0.02 uF	1245018	R7, 14, 47	15K	0114205
C23	Mylar, 1000 pF	1274011	R8, 50	3.9K	0114175
C30, 31, 33	Electrolytic, 4.7 uF, 50V	1252815	R9, 51, 62,	1K	0114161
C32, 46, 62, 63, 65, 85	Electrolytic, 1 uF, 50V	1252811	R10, 12	1.2K	0114163
C34, 35	Mylar, 0.1 uF	1276011	R13, 32, 34,	4.7K	0114177
C36	Polystyrene, 2200 pF	0228343	R17, 41	100	114131
C40, 43, 48, 51	Mylar, 0.01 uF	1275011	R18	180	RC07BF181J
C41	Ceramic, 20 pF	0248667	R19, 26, 43,	2.2K	0114169
C42	Polystyrene, 360 pF	0228324	R20, 23	330	0114143
C47, 56, 58, 69	Electrolytic, 3.3 uF, 50V	1252813	R21, 25, 27,	560	0114149
C50	Mylar, 0.047 uF	1275015	R28, 29, 66	22K	0114209
C52, 64	Electrolytic, 47 uF, 16V	1252525	R30, 31, 55	1.5K	0114165
C54	Ceramic, 22 pF	0248668	R36, 40	1.5K	0114139
C59	Electrolytic, 220 uF, 16V	1252532	R38	220	114183
C61	Ceramic, 150 pF	0248728	R39, 81	8.2K	114183
C66	Polystyrene, 4700 pF	0221513	R42	68K	0114221
CP1	Encapsulated Circuit, Filter	0186022	R44, 52	120	0114133
CP2	Encapsulated Circuit, Filter	0186041	R45, 48, 49,	47K	0114217
CP3, 4	Encapsulated Circuit, Deemphasis Network	0186051	R46	2.7K	0114171
CP5	Encapsulated Circuit, Audio filter	0186031	R47	100K	0114281
CR1, 2, 3, 8	Diode, IS2076	2337011	R57	180K	0114287
CR4, 5	Diode, IN34A	0575022	R58	820	0114153
CR6, 7	Diode, IN60P	0575019	R59	820	0114179
FET 1	FET, 3SK45	2327431	R61	5.6K	0114211
IC1	Integrated Circuit, 10.7/455, HA1201	2327312	R82, 83	27K	RC07BF564J
IC2	Integrated Circuit, 10.7, HA1202	2327411	R86	560K	0114213
IC9	Integrated Circuit, MPX, HA115W	2327422	R87	33K	0114213
L1	FM Antenna, Coil	2134411	T1	Ceramic Filter, 10.7 MHz	2154172
L2	FM Rf, Coil	2134419	T2, 5	Transformer, 10.7 MHz	0322203
L3	Choke, 1 uH	2227081	T3	Transformer, 10.7 MHz	2154199
L4	FM Oscillator, Coil	2134416	T4	Transformer, 455 kHz	2154161
L6	19 kHz, Coil	2134392	T6	Transformer, 455 kHz	2154122
L7	38 kHz, Coil	2134373	T7	Ratio Detector	2140242
L8	AM Oscillator, Coil	2134431	T8	Transformer, 455 kHz	2154183
L9	19 kHz, Coil	2134371	T9	Transformer, FM Meter	2140155
			TC3	Capacitor, Trimmer, 105 uH	0283121
			VC1	Capacitor, Gang, FM/AM	0281169
			VR1	Resistor, Variable, 20K	0151281
			VR2, 7	Resistor, Variable, 1K	0151282
			VR3, 4, 5	Resistor, Variable, 10K	0151224
			VR6	Resistor, Variable, 50K	0151225

All resistors are Deposited Film, 5%, %W unless otherwise noted.
K = Kilohm

TUNER SCHEMATIC (All Models)



PREAMPLIFIER/CONTROL / SQ



Ref. Des.	Description	Part Number	Ref. Des.	Description	Part Number
C401, 402,	Electrolytic, 3.3 uF, 50V	1252813	R413, 414,	68K	0114221
611, 612,			989 thru		
931 thru 934					
C403, 404,	Electrolytic, 10 uF, 25V	1252621	R415, 416,	470K	0114297
603, 604,			923, 924,		
619, 620,			933		
915 thru 918					
C405, 406	Ceramic, 82 pF	0248722	R417, 418,	33K	0114267
C407, 408	Mylar, 6800 pF	1274016	937 thru		
C409, 410,	Mylar, 2200 pF	1274013	942		
605, 606			R423, 424,	5.6K	0114179
611, 612			619, 620		
C411, 412	Mylar, 2700 pF	1274014	R427, 428	820	0114153
C413, 414	Ceramic, 150 pF	0248728	R429, 430	270	0114141
C415, 416	Electrolytic, 47 uF, 16V	1252525	R431, 432,	1K	0114161
C417, 418,			603, 604,		
901, 902,			901, 902,		
C451, 951	Electrolytic, 100 uF, 50V	1252831	907, 908,		
952			953 thru		
C601, 602,	Electrolytic, 1 uF, 50V	CE22342-2	956		
R433, 434,			R433, 434,	56K	0114219
943, 944			943, 944		
R451, 452,			919, 920,	1.2K	0114163
921, 922,			921, 922,		
929, 930			929, 930		
C607 thru	Mylar, 0.022 uF	1275013	R453	470	0114147
610			R601, 602	150K	0114285
C615, 616	Ceramic, 47 pF	0248676	R605 thru	47K	0114217
C651	Electrolytic, 2200 uF, 50V	0252861	608, 951,		
C903, 904	Mylar, 0.01 uF	1275011	952, 957		
C905, 906,	Mylar, 0.1 uF	1276011	thru 960		
927, 928					
C907 thru	Mylar, 0.015 uF	1276012	R609, 610,	82K	0114223
910			R611, 612,	1.8K	0114167
C911 thru	Mylar, 0.068 uF	1275016	621, 622,		
914			635, 636		
C923, 924	Mylar, 5600 pF	1274035	R613, 614,	3.3K	0114173
C925, 926	Polystyrene, 390 pF	0228325	637, 638		
R615 thru			R615 thru	15K	0114205
C935, 936	Ceramic, 100 pF	0248724	618, 625,		
Q401, 402	Transistor, NPN, 2SC4581G (D)	2327254	626, 637,		
638			638		
Q403, 404,	Transistor, NPN, 2SC1345 (E)	2327363	R623, 624	220K	0114289
905 thru			R627, 628	680K	0114301
908			R629 thru	27K	0114171
Q601, 602,	Transistor, NPN, 2SC458 (C)	2320063	632		
901, 902,			R633, 634,	390K	0114295
903, 909,			911, 912		
910			R639, 640	2.2K	0114169
Q603, 604	Transistor, NPN, 2SC4581G (C)	2320073	925, 931		
R003 thru	Composition, 470	0134369	R905, 906	8.2K	114183
006			R947 thru	70K	0114201
R401, 402,	120K	0114283	920		
R403, 404			R922, 928,	100K	0114281
R405, 406			915, 916,		
R407, 408,			921, 927,		
R945 thru			935		
950, 955			R961 thru	27K	RC07BF27J
964			964		
R977 thru			968	4.7K	0114177
R403, 404	12K	0114203	980, 983,		
R405, 406	330K	0114293	thru 986		
R407, 408,	3.9K	0114175			
R995, 996	100				
S1, 2	Switch, SELECTOR, MODE	0114131			
S3 thru 6	Switch, TAPE MONITOR, LOUDNESS, FM MUTING, HIGH FILTER	2637491			
VR601A, B,	Potentiometer, dual, 200K	0151710			
602A, B					
VR901, 902	Potentiometer, 250K	0151706			
VR903	Potentiometer, 100K	0155252			
R409, 410,	180K	0114287			
903, 904,					
926					
R411, 412	510	0114148			

All resistors are Deposited Film, 5%, 1/2W unless otherwise noted.
K = Kilohm

4060/674/895 PARTS LIST

(CONTINUED)

LAMP BOARD (4060 Only)

Ref. Des.	Description	Part Number	Ref. Des.	Description	Part Number
C003	Electrolytic, 3.3 uF, 50V	1252813	R007	47K	0114217
C007	Electrolytic, 220 uF, 10V	0252332	R008	15K	0114205
CR001	Diode, IS2076 (1-2)	2337011	R009	180K	0114287
Q001	Transistor, NPN, 2SC458 (C)	2320063	R010	390	0114145
R002	18	1114047	R011	10	1114041

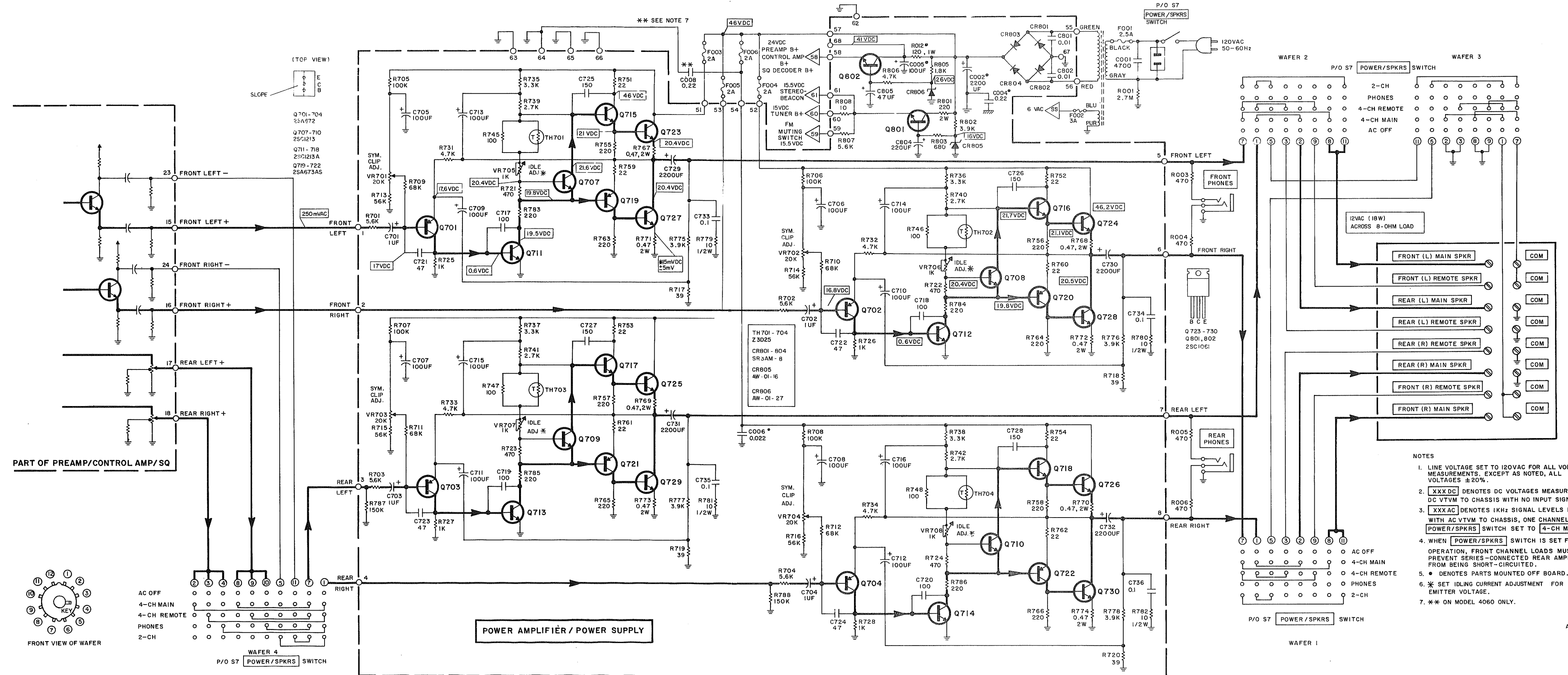
All resistors are Deposited Film, 5%, 1/4W unless otherwise noted.
K = Kilohm

POWER AMPLIFIER

Ref. Des.	Description	Part Number	Ref. Des.	Description	Part Number
C002	Electrolytic, 2200 uF, 35V	0250137	R717 thru 720	39	0114055
C004	Ceramic, 0.22 uF	0276011	R721 thru 724	39	0114145
C005	Electrolytic, 100 uF, 50V	0252831	R725 thru 728	1K	0114161
C701 thru 704	Electrolytic, 1 uF	0252861	R731 thru 734, 806	4.7K	0114177
C705 thru 716	Electrolytic, 100 uF, 50V	1252831	R735 thru 738	3.3K	0114173
C717 thru 720	Ceramic, 100 pF	0248724	R739 thru 742	2.7K	0114171
C721 thru 724	Ceramic, 47 pF	0248676	R745 thru 748	100	RC078F101J
C725 thru 728	Ceramic, 150 pF	0248728	R751 thru 754, 759, thru 762	22	0114049
C729 thru 732	Electrolytic, 2200 uF, 35V	1252742	R755 thru 758, 763 thru 766, 783 thru 786	220	0114139
C733 thru 736	Mylar, 0.01 uF	1276011	R767 thru 770, 771 thru 774	Wirewound, 0.47, 2W	RP3WR47K
C801, 802	Ceramic, 0.01 uF	0245408	R775 thru 778	3.9K	0114175
C804	Electrolytic, 220 uF, 25V	1252632	R779 thru 782, 808	10, 1/4W	0134289
C805	Electrolytic, 4.7 uF, 50V	1252825	R787, 788	150K	0138205
CR801 thru 804	Diode, SR3AM-8	2337111	R801	Metal Oxide Fixed Film, 220, 2W	0119525
CR805	Diode, Zener, AW01-16	2337065	R802	3.9K, 1/4W	0134380
CR806	Diode, Zener, AW01-27	2327079	R803	680, 1/4W	0134371
Q701 thru 704	Transistor, PNP, 2SA672 (C)	2327263	R805	1.8K, 1/4W (C)	0134376
Q707 thru 710	Transistor, NPN, 2SC1213 (C)	2327333	TH701 thru 704	Thermistor, 23D25	0676041
Q711 thru 718	Transistor, NPN, 2SC1213A (C)	2327293	R701, 012	Potentiometer, 20K	0151281
Q719 thru 722	Transistor, NPN, 2SA673A (C)	2327387	R703, 704	Variable, 1K	0151282
Q723 thru 730, 801, 802	Transistor, NPN, 2SC1061 (C) Q	2327153	RS200W121J		
R001, 012	120, 2W	0114169	VR701 thru 704		
R701, 702, 807	5.6K	0138129	VR705, 706		
R703, 704	2.2K	0114281			
R705 thru 708	100K	0114221			
R709 thru 712	68K	0114219			
R713 thru 716	56K				

All resistors are Deposited Film, 5%, 1/4W unless otherwise noted.
K = Kilohm

4060/674/895 SCHEMATIC



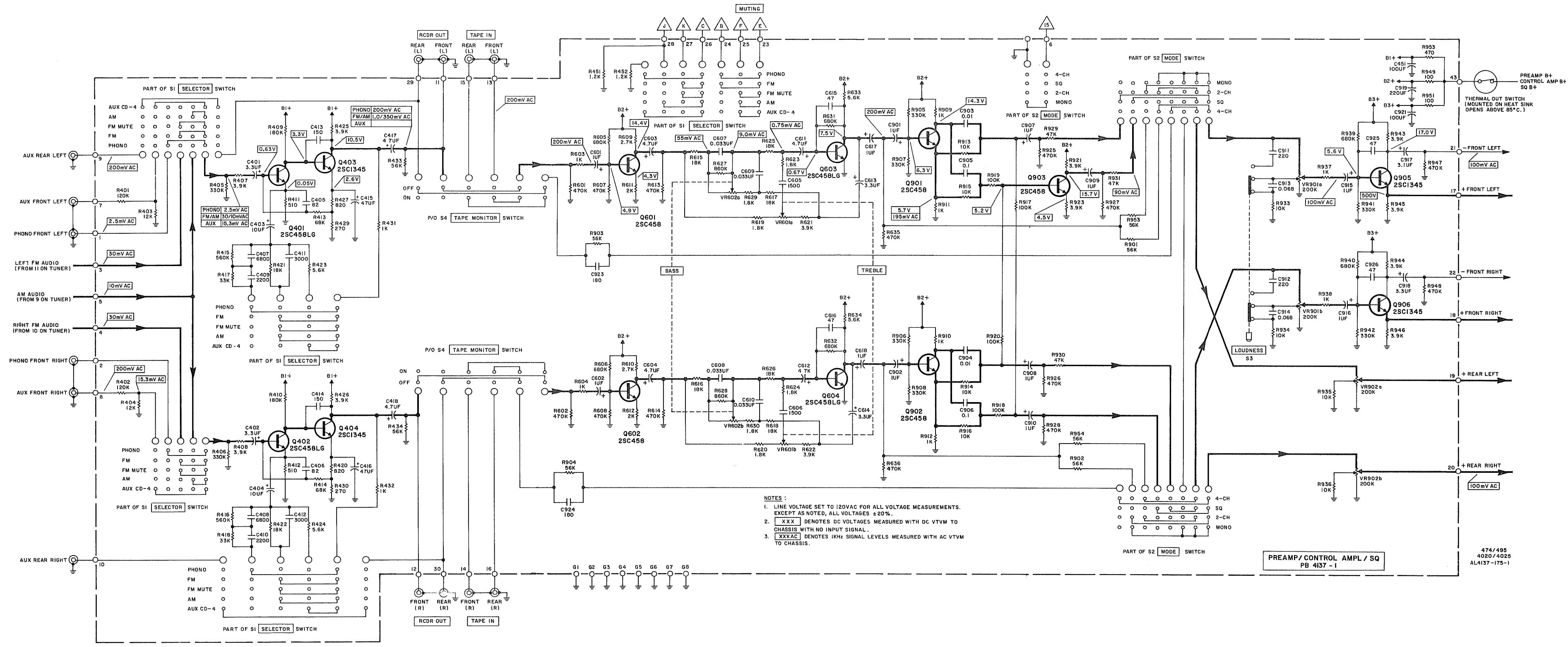
- NOTES
1. LINE VOLTAGE SET TO 120VAC FOR ALL VOLTAGE MEASUREMENTS. EXCEPT AS NOTED, ALL VOLTAGES ± 20%.
 2. [XXX DC] DENOTES DC VOLTAGES MEASURED WITH DC VTVM TO CHASSIS WITH NO INPUT SIGNAL.
 3. [XXX AC] DENOTES 1KHz SIGNAL LEVELS MEASURED WITH AC VTVM TO CHASSIS, ONE CHANNEL DRIVEN, [POWER/SPKRS] SWITCH SET TO [4-CH MAIN].
 4. WHEN [POWER/SPKRS] SWITCH IS SET FOR 2-CH OPERATION, FRONT CHANNEL LOADS MUST "FLOAT" TO PREVENT SERIES-CONNECTED REAR AMPLIFIERS FROM BEING SHORT-CIRCUITED.
 5. • DENOTES PARTS MOUNTED OFF BOARD.
 6. * SET IDLING CURRENT ADJUSTMENT FOR SPECIFIED EMITTER VOLTAGE.
 7. ** ON MODEL 4060 ONLY.

AL4138-175
4060
674
895

4020/4025/474/495 SCHEMATIC

4020/4025/474/495 PARTS LIST

PREAMPLIFIER/ CONTROL / SQ

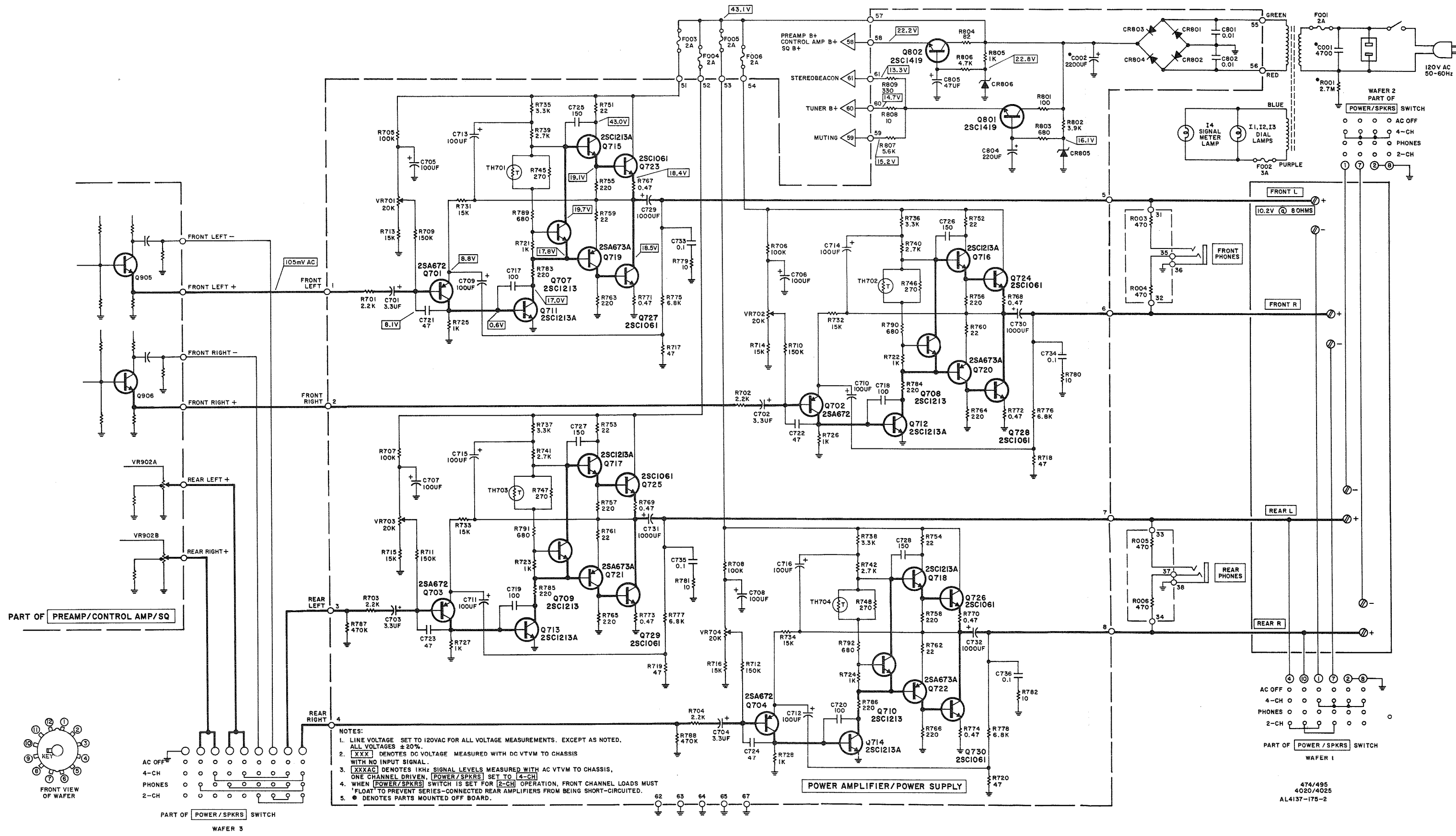


NOTES:
 1. LINE VOLTAGE SET TO 120VAC FOR ALL VOLTAGE MEASUREMENTS. EXCEPT AS NOTED, ALL VOLTAGES ±20%.
 2. XXX DENOTES DC VOLTAGES MEASURED WITH DC VTVM TO CHASSIS WITH NO INPUT SIGNAL.
 3. XXXX DENOTES 100μV SIGNAL LEVELS MEASURED WITH AC VTVM TO CHASSIS.

Ref. Des.	Description	Part Number	Ref. Des.	Description	Part Number
C401, 402,	Electrolytic, 3.3 uF, 50V	1252813	R421, 422,	18K	0114207
613, 614			615, 616,		
C403, 404	Electrolytic, 10 uF, 25V	1252621	617, 618,		
C405, 406	Ceramic, 82 pF	0248727	625, 626		
C407, 408	Mylar, 6800 pF	1274016	R423, 424,	5.6K	0114179
C409, 410	Mylar, 2200 pF	1274013	633, 634		
C411, 412	Mylar, 3000 pF	1274243	R427, 428	820	0114153
C413, 414	Ceramic, 150 pF	0248728	R429, 430	270	0114141
C415, 416	Electrolytic, 47 uF, 16V	1252525	R431, 432,	1K	0114161
C417, 418,	Electrolytic, 4.7 uF, 50V	1252815	603, 604,		
603, 604,			909 thru		
912, 937,			911, 912		
C451, 921	100 uF, 50V	1252831	938		
C601, 602,	Electrolytic, 1 uF, 50V	1252811	R433, 434	56K	0114219
617, 618,			R601, 602,	470K	0114297
901, 902,			607, 608,		
907, 908,			613, 614,		
909, 910,			635, 636,		
915, 916,			925 thru		
917, 918			928, 947,		
C605, 606	Mylar, 1500 pF	1274012	948		
C607 thru	Mylar, 0.033 uF	1275014			
610			R605, 606,	680K	0114301
C615, 616,	Ceramic, 47 pF	0248676	631, 632,		
925, 926			R609, 610		
C903, 904	Mylar, 0.01 uF	1275011	R611, 612	2.7K	0114171
C905, 906	Mylar, 0.1 uF	1276011		2K	0114168
C911, 912	Mylar, 220 pF	0228319	R619, 620,	1.8K	0114167
C913, 914	Mylar, 0.068 uF	1275016	623, 624,		
C919	Electrolytic, 2200 uF	1252632	626, 630		
C923, 924	Ceramic, 180 pF	0248730			
Q401, 402	Transistor, NPN, 2SC458L (D)	2327254	R621, 622,	3.9K	0114175
Q403, 404	Transistor, NPN, 2SC1345 (E)	2327363	921, 923		
Q601, 602,	Transistor, NPN, 2SC458 (C)	2320063	R627, 628	820K	0114303
901, 902,			R901 thru	56K	0114219
903, 905,			904, 953,		
906			954		
R401, 402	120K	0114283	R913, 914,	100K	0114281
R403, 404	12K	0114203	917, 918,		
R405, 406,	330K	0114293	919, 920		
905, 906,			R915, 916,	10K	0114201
907, 908,			933, 934,		
941, 942			935, 936		
R407, 408,	3.9K	0114175	R409, 410	180K	0114287
425, 426,			R411, 412	510	0114148
921, 923,			R413, 414	68K	01144221
943, 944,			R415, 416	560K	0114299
945, 946			R417, 418	33K	0114213
R409, 410	180K	0114287			
R411, 412	510	0114148			
R413, 414	68K	01144221			
R415, 416	560K	0114299			
R417, 418	33K	0114213			

All resistors are Deposited Film, 5%, 1/4W unless otherwise noted.
 K = Kilohm

4020/4025/474/495 SCHEMATIC



NOTES:
 1. LINE VOLTAGE SET TO 120VAC FOR ALL VOLTAGE MEASUREMENTS. EXCEPT AS NOTED. ALL VOLTAGES $\pm 20\%$.
 2. [XXX] DENOTES DC VOLTAGE MEASURED WITH DC VTVM TO CHASSIS WITH NO INPUT SIGNAL.
 3. [XXXAC] DENOTES 1KHz SIGNAL LEVELS MEASURED WITH AC VTVM TO CHASSIS, ONE CHANNEL DRIVEN, [POWER/SPKRS] SET TO [4-CH].
 4. WHEN [POWER/SPKRS] SWITCH IS SET FOR [2-CH] OPERATION, FRONT CHANNEL LOADS MUST "FLOAT" TO PREVENT SERIES-CONNECTED REAR AMPLIFIERS FROM BEING SHORT-CIRCUITED.
 5. ● DENOTES PARTS MOUNTED OFF BOARD.

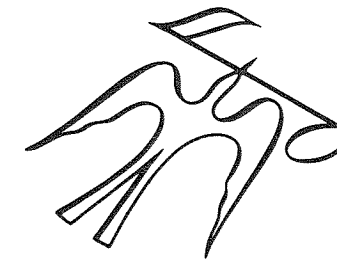
474/495
 4020/4025
 AL4137-175-2

4020/4025/474/495 PARTS LIST

POWER AMPLIFIER

Ref. Des.	Description	Part Number	Ref. Des.	Description	Part Number
C701 thru 704	Electrolytic, 3.3 uF, 50V	1252813	R721 thru 728	1K	0134373
C705 thru 716	Electrolytic, 100 uF, 50V	1252831	R735 thru 738	3.3K	0114173
C717 thru 720	Ceramic, 100 pF	0246464	R739 thru 742	2.7K	0114171
C721 thru 724	Ceramic, 47 pF	0248676	R745 thru 748	270	RC20BF271J
C725 thru 728	Ceramic, 150 pF	0248728	R751 thru 754, 759	22	0114049
C729 thru 732	Electrolytic, 1000 uF, 35V	1252741	thru 762		
C733 thru 736	Mylar, 0.1 uF	1276011	R755 thru 758, 763	220	0114139
C801, 802	Ceramic, 0.01 uF	0245408	thru 766, 783		
C804	Electrolytic, 220 uF	1252632	thru 786		
C805	Electrolytic, 47 uF	1252825	R767 thru 774	Wirewound, 0.47, 2W	RP3WR47J
CR801 thru 804	Diode, SR3AM-8	2337111	R775, 776	6.8K	0114181
CR805	Diode, Zener, AW01-16	2337065	R779 thru 782, 808	Composition, 10, 1/2W	0134289
CR806	Diode, Zener, AW01-22	2337063	R787, 788	470K	0138217
Q701 thru 704	Transistor, PNP, 2SA672 (C)	2327263	R801	Metal Oxide Fixed Film, 100, 2W	0111410
Q707 thru 710	Transistor, NPN, 2SC1213 (C)	2327333	R802	Composition, 3.9K, 1/2W	0134380
Q711 thru 718	Transistor, NPN, 2SC1213A (C)	2327293	R803	Composition, 680, 1/2W	0134371
Q719 thru 722	Transistor, PNP, 2SA673A (C)	2327283	R804	Composition, 82, 1/2W	0134300
Q723 thru 730	Transistor, NPN, 2SC1061 (C)	2327153	R805	Composition, 1K, 1/2W	0134373
Q801, 802	Transistor, NPN, 2SC1419 (C)	2327593	R806	4.7K	0114177
R701 thru 704	2.2K	0114169	R807	5.6K	0114179
R705 thru 708	100K	0114281	R809	330, 1/2W	RC20BF331J
R709 thru 712	150K	0114285	VR701 thru 704	Potentiometer, 20K	0151281
R713 thru 716, 731 thru 734	15K	0114205			
R717 thru 720	47	0114057			

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