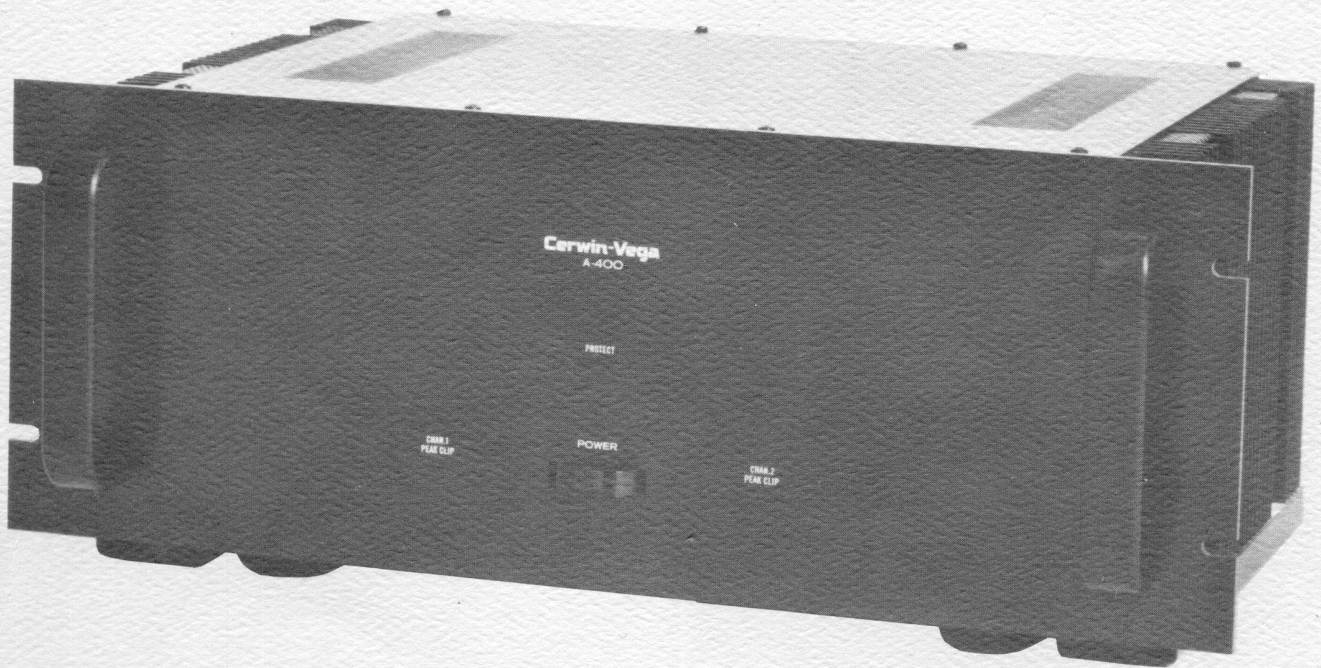




Cerwin-Vega!

MODEL A-400 POWER AMPLIFIER



SERVICE MANUAL LIBRARY:

Received _____

Tape Recorder Specialists, Inc.
Audio/CD/VTR Service Bldg.
216 East Washington
Ann Arbor, MI 48108

MANUAL BANK: Audio & Professional
Sound Systems,

SERVICE MANUAL

TABLE OF CONTENTS

Specifications	1
Before Starting - Required Test Equipment	2-3
Circuit Description	4-5
Block Diagram	6
Alignment Points and PCB Location	7
Bias and DC Offset	8
Operational Test Procedure	9
Troubleshooting Flowchart - Protection Circuit Problems	10-11
Troubleshooting Flowchart - Output Stage Problems	12
Chassis Assembly	13
Composite Chassis Schematic	14-15
Assy. 11102 drive PCB assy.	16
Assy. 11102 drive PCB schematic	17
Assy. 11103 output PCB assy.	18
Assy. 11103 output PCB schematic	19
Assy. 11104 protect PCB assy.	20
Assy. 11104 protect PCB schematic	21
Assy. 11105 input PCB assy.	22
Assy. 11105 input PCB schematic	23
Assy. 11108 LED PCB assy.	24
Assy. 11108 LED PCB schematic	25
Service Addendums and Modifications	26-27
Parts Lists	28-45

A-400 SPECIFICATIONS

Minimum continuous power output per channel 20Hz-20kHz, 8 Ω both channels driven.	225w
Minimum continuous power output per channel 20Hz-20kHz at 4 Ω , both channels driven.	350w
THD 20Hz-20kHz between 0.25w and full power, 8 Ω	.03%
THD 20Hz-20kHz between 0.25w and full power, 4 Ω	.05%
IM distortion, (SMPTE) from 0.25w to full power, 8 Ω	.03%
Signal to noise (ref. rated output, "A" weighting).	113dB
IHF noise. (ref. OdBW, "A" weighting)	-90dB
Power bandwidth (IHF)	7Hz-100kHz
Slew rate v/ μ sec	80
Damping factor ref. 50Hz, 8 Ω	250
Input impedance	10k Ω
Input sensitivity (ref. full output)	1.4v
IHF sensitivity (ref. OdBW)	.094v
Input connection	phono (RCA) or 1/4" phono
Output connection	Dual binding post (5-way)
Fan cooling	yes
Power requirements idle/ full power	125w/1200w
Weight (net)	45 lbs./20.4kg
Dimensions (W,H,D,)	19" x 7" x 14" 48.2cm x 17.8cm x 35.6cm

The above specifications are subject to change without prior notice.

Required Test Equipment

BEFORE STARTING

Cerwin-Vega amps are professional, high power amplifiers that absolutely require proper test equipment and qualified service personnel. In order to perform basic amplifier testing and repair you must have the following equipment:

1. Digital multimeter or VTVM
2. Oscilloscope, preferably with dual trace.
3. AC current meter
 0-15 amp range
 DC current meter
4. AC variac 20 amp, 0-120% output
5. High power (250w) load resistors which can provide the following precision, noninductive load resistances.
 2 Ω , 1kW min.
 4 Ω , 1kW min.
 8 Ω , 500W min.
6. Signal generator with 10v sine wave output or, if distortion measurements are to be made, a high quality distortion analyzer with very low residual distortion (.002%) is required (such as the Sound Technology 1700 Series).

NOTE

Read the product owner's manual thoroughly if in doubt about operation.

This service manual is intended as a guide, not a Bible. We have made every effort to insure its accuracy; however, an error in the manual or a change in the amplifier assembly is always possible. If you feel you are fighting an impossible problem or have a question, call Cerwin-Vega's Technical Services Department.

Note to Reading Schematics -

All voltages are DC, no load, no signal, unless otherwise specified.

When replacing transistors, be sure to match the beta codes.

Resistors are 1/2w, 5% carbon film unless otherwise specified.

Cap values are in μf , unless otherwise specified.

Capacitor tolerance coding on parts list is as follows:

J = 5%

K = 10%

M = 20%

P = Guaranteed minimum value

Z = +80%, -20%

A-400 CIRCUIT DESCRIPTION

DRIVE CIRCUITRY

Q202/Q203 and Q204/Q206 make up a dual differential first stage which provides the initial voltage gain. This stage operates from a +24v supply (zeners CR205 and CR212). Q201 and Q205 act as level shifters to drive the class A stage, Q209 and Q210. Drivers Q211 and Q212 provide further current gain for the output stage.

Electronic current limiting is provided by Q213 and Q214, and associated components. When the voltage across any emitter resistors in the output stage (i.e., output current) becomes excessive, Q213 or Q214 turns on, clamping the base of the driver to the output rail, preventing further current drive.

OUTPUT STAGE

The output sections consist of paralleled output devices Q601 through Q608, which provide final output drive. Q301 and Q302, and related components form a bias compensation network. Q301, mounted behind the circuit board directly against the output heat sink, senses temperature and adjusts the idling current (back in the class A stage) accordingly. This provides optimum thermal stability and performance.

PROTECTION CIRCUIT

The protect circuitry is designed to protect the amplifier and speakers under potentially harmful conditions. These conditions and their sense mechanisms are described first:

- 1.) Excessive current flow, oscillations, etc. will cause

simultaneous current flow in negative and positive output legs.^o Q401/Q402 and Q403/Q404 form a pair of discrete "and" gates which sense this current across output emitter resistors. When either gate is turned on, level shifters Q405/Q406 or Q408/Q409 cause Q407 or Q410 to turn on. This shunts pin 2 of the 555 timer (U401) to ground, triggering it.

2.) Sustained DC voltage at the output - the output of Ch1 and Ch2 is summed and integrated by R403, R404, and C402. A positive offset will turn on Q412, a negative offset turns on the Q413/Q414 pair. Either action has the same effect on the 555 trigger, via CR404 and R444.

3.) Loss of AC power or very low line voltages are prevented from causing dangerous or annoying transients by Q411. A loss of rectified AC (via CR402) will turn on Q411, again triggering the 555, via CR404 and R444.

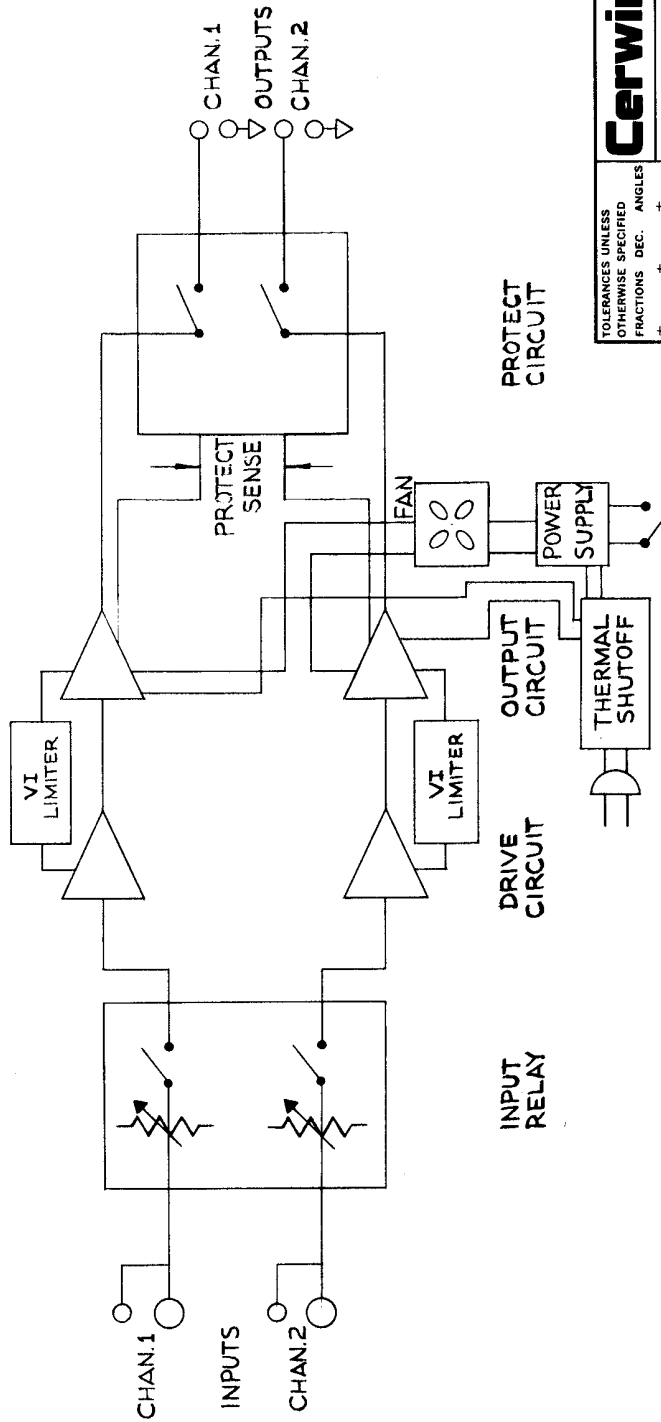
When the timer is triggered, pin 3 is driven high for one timing cycle, approximately seven (7) seconds. (Note that the timer will not attempt to reset until the fault condition is removed and pin 2 is high.) During this time, the protect LED is illuminated and Q415 shuts off, de-energizing K401 and K501 (output and input connections). This essentially disconnects the amplifier from all related equipment. When the fault is removed, the timer resets and the relays reconnect.

PEAK CLIP CIRCUITS

Zener CR410 provides a voltage reference approximately 10v below Vcc at the bases of Q416 and Q417. When positive peaks from either channel exceed this threshold, the transistor turns on. Note that the indicators are connected after the output relay, preventing an indication when in the protect mode.

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

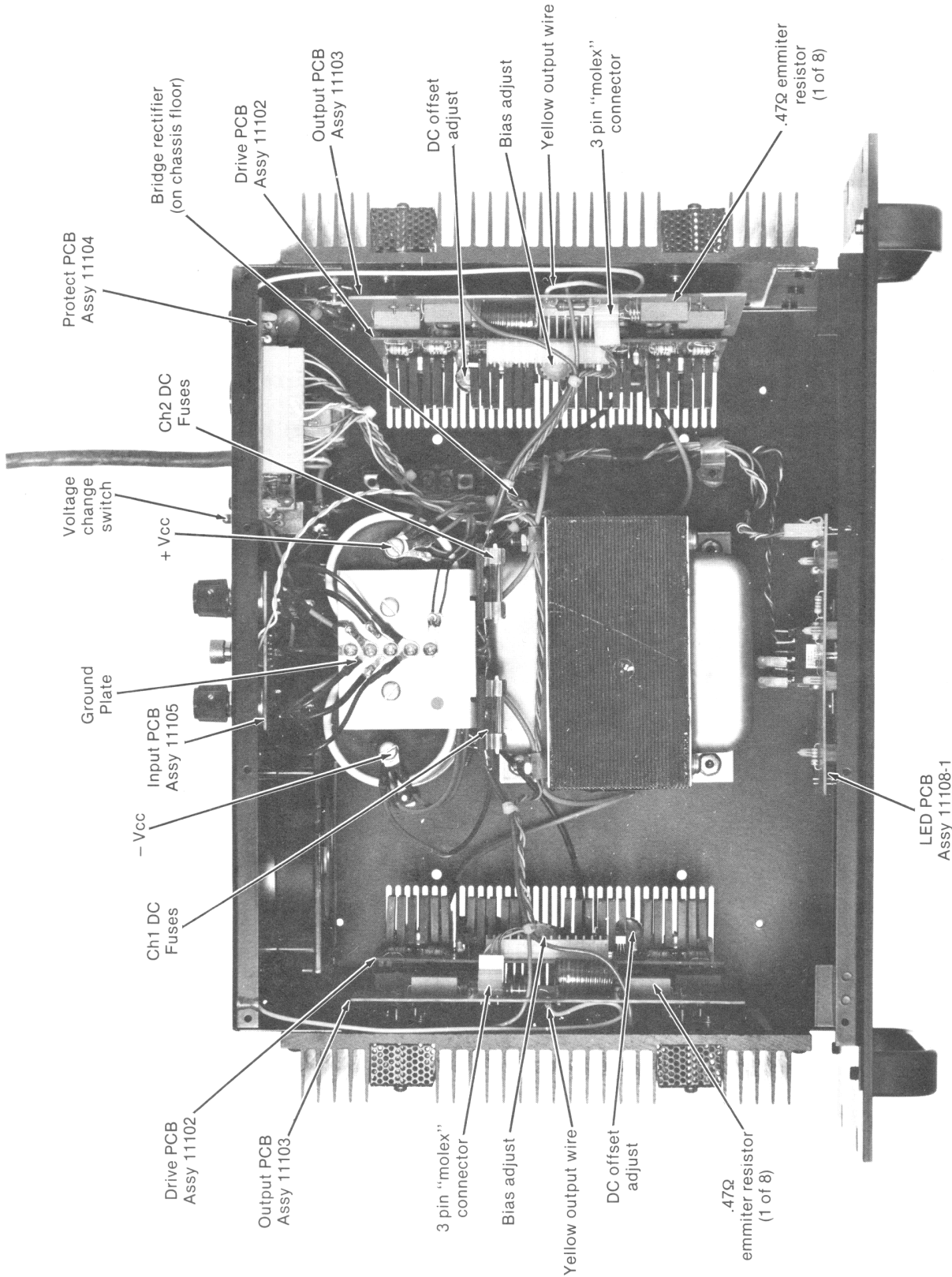


(6)

TOLERANCES UNLESS OTHERWISE SPECIFIED		FRACTIONS DEC. ANGLES	
±	±	±	±
APPROVALS	DATE	DRAWING NO.	
DRAWN <i>RAL</i>	11-1	SIZE	B
CHECKED <i>SM</i>	11-20-77	SCALE	
DO NOT SCALE DRAWING			SHEET

Cerwin-Vega, Inc.

A400 BLOCK DIAGRAM



A-400 ALIGNMENT POINTS AND PCB LOCATION

A-400 Bias and DC Offset Adjustment

The bias and offset adjustments are preset at the factory to strict tolerances, and should not drift or require re-adjustment. However, if any transistors on the drive board have been replaced, these procedures should be followed. These measurements should be performed with no signal and no load.

Setting bias - To check the bias connect a DC voltmeter between the output and the VI sense buss. These points can be found on the yellow and red wires which exit the output board on the 3 pin molex plug. If necessary, adjust R246, a thumbwheel pot directly below the 15-pin drive board connector, to obtain a reading between 22mv-28mv (.022v-.028v). Note: when the amplifier is first turned on "cold", these readings may be lower. *CAUTION: The 15-pin connector has high DC voltages on the exposed pins. Use care to avoid them.

DC offset null - To check the DC offset, connect a DC voltmeter between circuit ground and the yellow wire soldered to the top of the output board. If necessary, adjust R203, a thumbwheel pot at the bottom left of the drive board, to obtain a reading within about 10mv of zero (-.01v+.01v). CAUTION: The finned heat sinks on adjacent driver transistors have high voltage potentials between them. A better method involves using a small screwdriver with an insulated shaft and handle, and inserting it into the rear adjustment slot on R203.

* Before making any adjustments, let the amplifier warm up by operating it into a load at low power (1-10 watts) for a few minutes.

Operational Test Procedure - Initial "Common Sense" Trouble Shooting

A. Remove the top cover and visually inspect the unit. Look for burnt components or open internal fuses, loose wiring connectors, screw connections, etc. If an intermittent problem is suspected, remove the drive boards and protect board and carefully examine all solder connections and foil patterns for breaks.

B. Basic Voltage Checks:

Note: Unless otherwise stated, all measurements made with 120 vac line, with no signal, and no load.

1. Check the positive and negative supply voltages at the supply capacitors. They should be + and - 82 vdc $\pm 5\%$, and positive and negative supplies should be within 1 volt of each other.

2. Check bias and DC offset in each channel, adjust if necessary (See bias and DC offset procedures).

3. Verify VI limiter operation by connecting a 2Ω load to the output terminals. With a 1kHz signal generator, slowly increase the signal until, at approximately 34vrms out the positive and negative wave tops will clip symmetrically. Be sure that the AC line voltage is maintained at 120v. If the above description isn't observed, stop the test and repair the VI limiter circuit.

4. Verify full power output. Into 8Ω -42.4 vrms. Into 4Ω -37.4 vrms.

5. If a distortion analyzer is available, the distortion may also be checked.

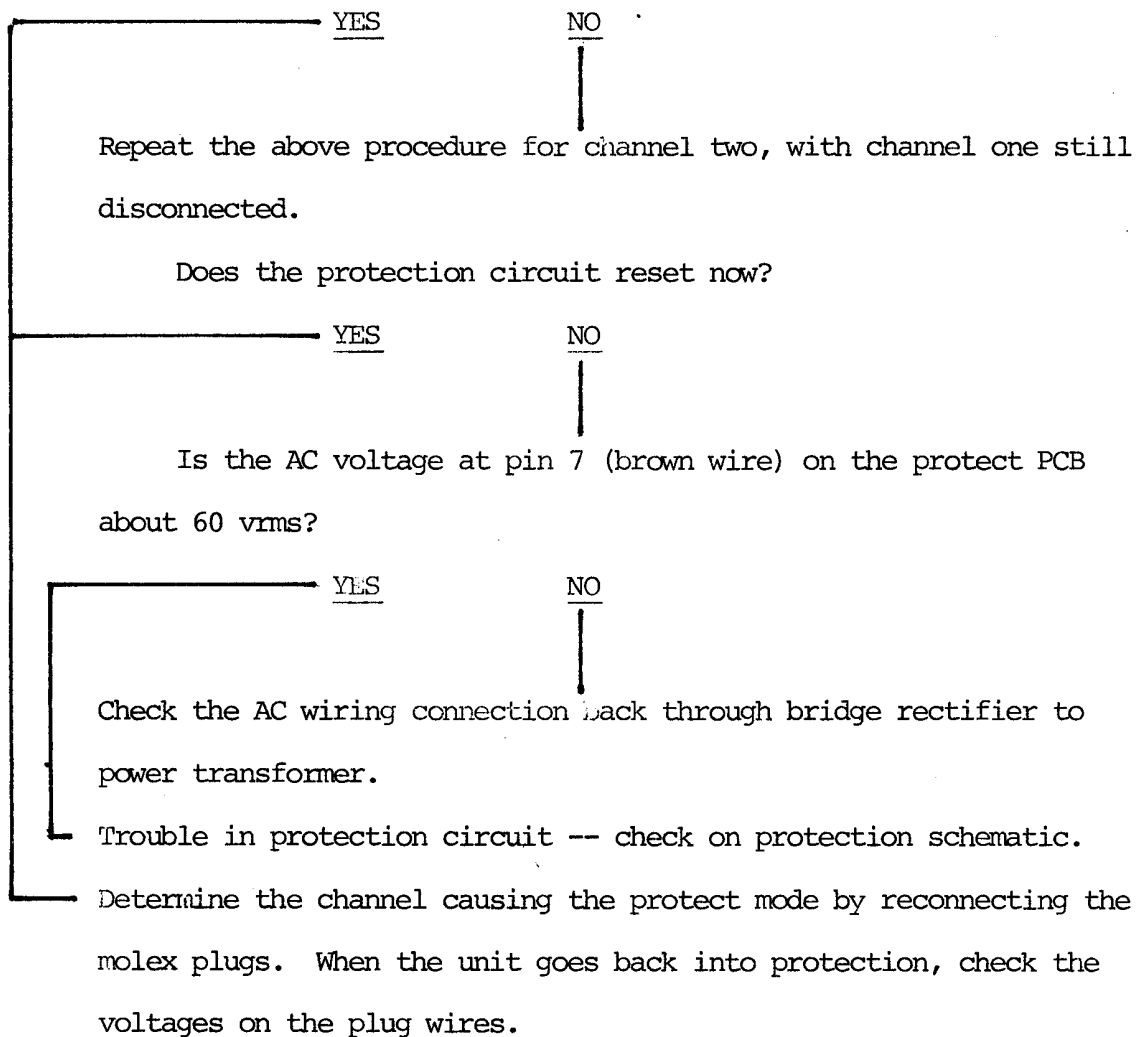
6. Recheck the bias and offset while the unit is warm. It should remain relatively stable.

A-400 Protection Circuit Problems

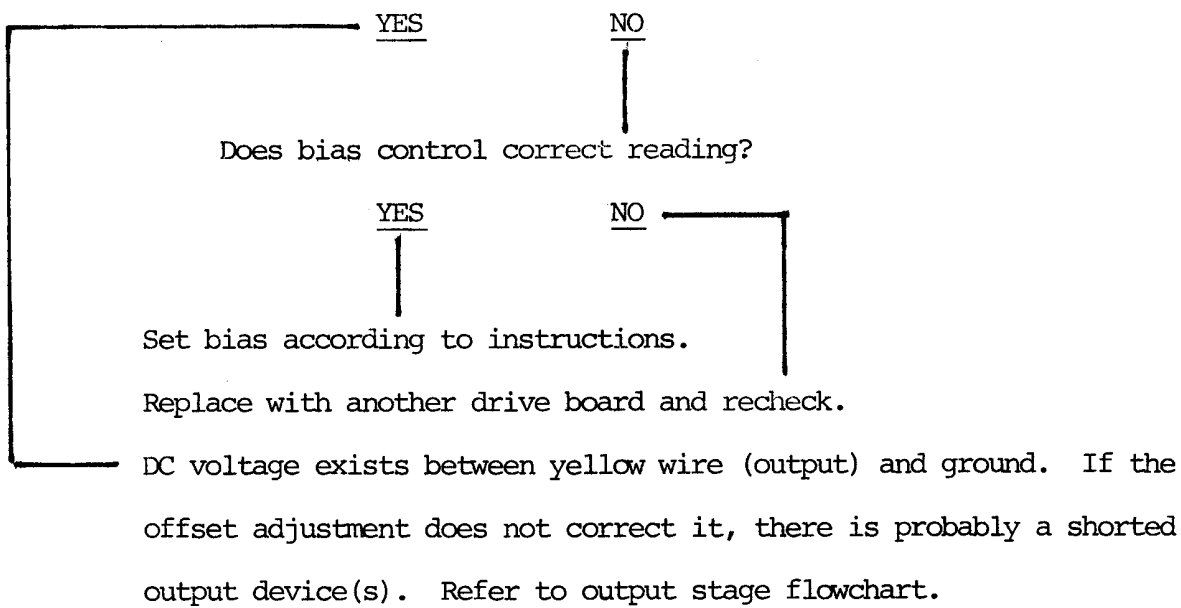
Protection stays in "Protect" mode:

Disconnect the 3 pin connector from the channel one output board and wait about 15 seconds.

Does the protection circuit reset?



Between violet and red -- about 50 mydc (.04v-.06v)?



Output Stage Problems A-400

Is there DC output or are DC fuses blown?

YES

Blown DC fuses are usually caused by a short in the output stage.

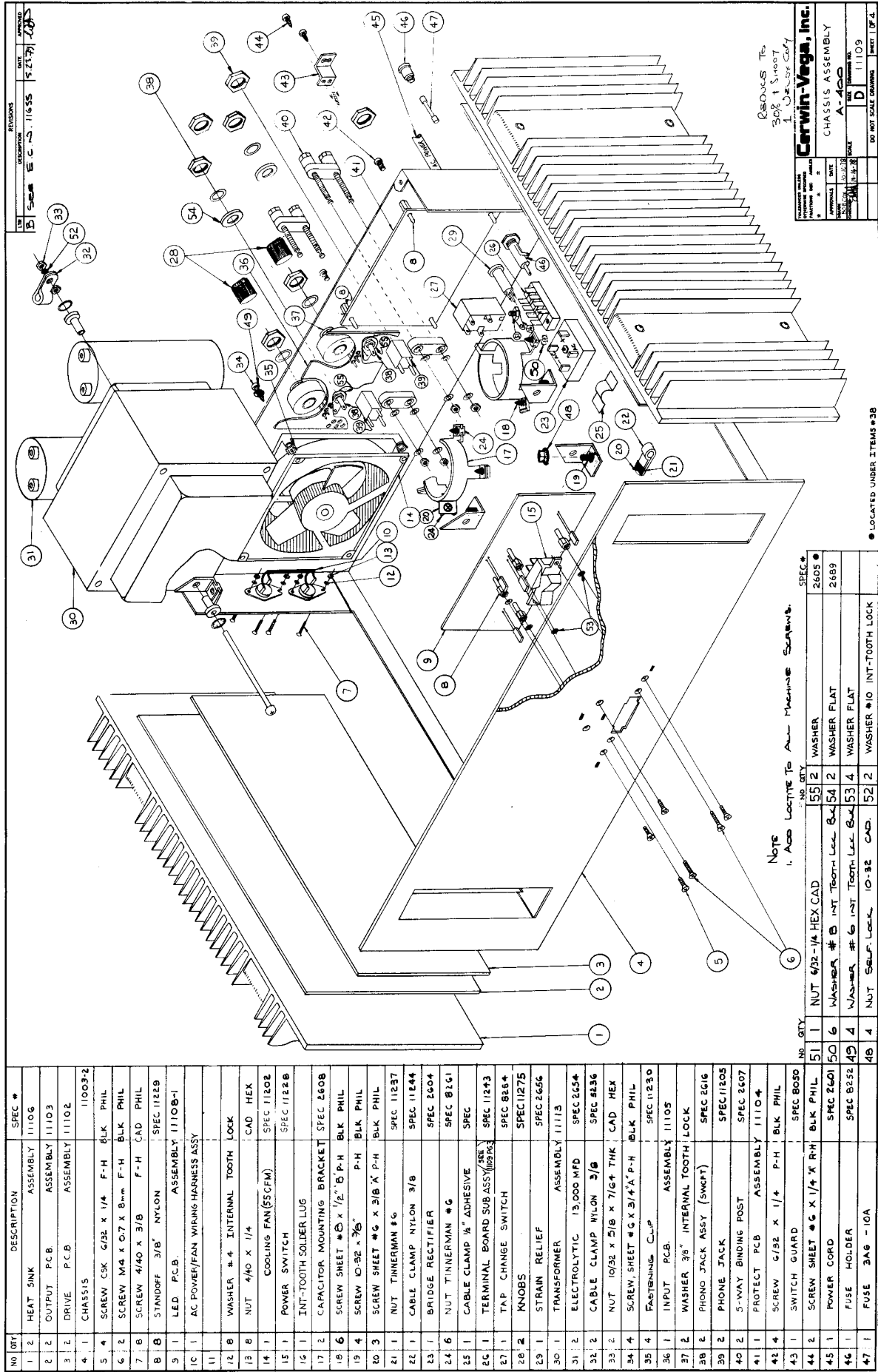
1. The output protection relay must be bypassed by moving the two outside yellow wires onto the inside terminals. These are the 4 faston connectors at the bottom of the protect board. REMEMBER TO RECONNECT THE TERMINALS TO THEIR ORIGINAL POSITIONS AFTER SERVICING!!!
2. It is also necessary to connect an eight or four ohm load resistor (500 watt) to the outputs.
3. Remove the drive board from the output assembly.
4. Connect a DC current meter (0-5 amps) across the open DC fuse terminals at transformer. Turn up the variac slowly and monitor the DC current. Does it stay at zero?

NO

YES

Drive board or bias network (Q301, Q302, etc.) is defective. Replace board and check voltage between pins 7 and 9 -- should be approximately 2.35 volts. If bias control can not bring it into this range, try another drive board. If it doesn't work, bias network. (Q203, Q301 or related components) are defective.

Check voltages across $.47\Omega$ emitter resistors -- any reading indicates a bad output device in the positive or negative legs. Remove any devices which show emitter current.



2500CS TS
30% T SHOOT
1.0250 CAD

REV	DATE	APPROVED
15	11/6/95	152191-205
DESCRIPTION		
CHASSIS ASSEMBLY		
A-400		
D		
DO NOT SCALE DRAWING		

NO	QTY	DESCRIPTION	SPEC #
1	2	HEAT SINK ASSEMBLY	11106
2	2	OUTPUT PCB ASSEMBLY	11103
3	2	DRIVE PCB ASSEMBLY	11102
4	1	CHASSIS	110032
5	4	SCREW CSK G/32 X 1/4 F-H BLK PHIL	
6	2	SCREW M4 X 0.7 X 8mm F-H BLK PHIL	
7	8	SCREW 4/40 X 3/8 F-H CAD PHIL	
8	8	STANDOFF 3/8" NYLON	SPEC 11229
9	1	LED PCB ASSEMBLY	1110B-1
10	1	AC POWER/FAN WIRING HARNESS ASSY	
11	1		
12	8	WASHER #4 INTERNAL TOOTH LOCK	
13	8	NUT 4/40 X 1/4 CAD HEX	
14	1	COOLING FAN (SCFM)	SPEC 11202
15	1	POWER SWITCH	SPEC 11228
16	1	INT-TOOTH SOLDER LUG	
17	2	CAPACITOR MOUNTING BRACKET	SPEC 260B
18	6	SCREW SHEET #8 X 1/2" P-H BLK PHIL	
19	4	SCREW 10-32 X 3/8 P-H BLK PHIL	
20	3	SCREW SHEET #6 X 3/8 X P-H BLK PHIL	
21	1	NUT TINNEMAN #6	SPEC 11237
22	1	CABLE CLAMP NYLON 3/8	SPEC 11244
23	1	BRIDGE RECTIFIER	SPEC 2604
24	6	NUT TINNEMAN #6	SPEC 8161
25	1	CABLE CLAMP 1/2" ADHESIVE	SPEC
26	1	TERMINAL BOARD SUB ASSY	SPEC 11243
27	1	TAP CHANGE SWITCH	SPEC 8284
28	2	KNOBS	SPEC 11275
29	1	STRAIN RELIEF	SPEC 2656
30	1	TRANSFORMER ASSEMBLY	11113
31	2	ELECTROLYTIC 13,000 MFD	SPEC 2654
32	2	CABLE CLAMP NYLON 3/8	SPEC 8236
33	2	NUT 10/32 X 5/8 X 7/64 THK CAD HEX	
34	4	SCREW SHEET #6 X 3/4 P-H BLK PHIL	
35	4	FASTENING CLIP	SPEC 11230
36	1	INPUT PCB ASSEMBLY	11105
37	2	WASHER 3/8" INTERNAL TOOTH LOCK	
38	2	PHONE JACK ASSY (SWGFT)	SPEC 2616
39	2	PHONE JACK	SPEC 11205
40	2	5-WAY BINDING POST	SPEC 2607
41	1	PROTECT PCB ASSEMBLY	11104
42	4	SCREW G/32 X 1/4 P-H BLK PHIL	
43	1	SWITCH GUARD	SPEC 8050
44	2	SCREW SHEET #6 X 1/4 X RH BLK PHIL	
45	1	POWER CORD	SPEC 2601
46	1	FUSE HOLDER	SPEC 8252
47	1	FUSE 3AB - 10A	

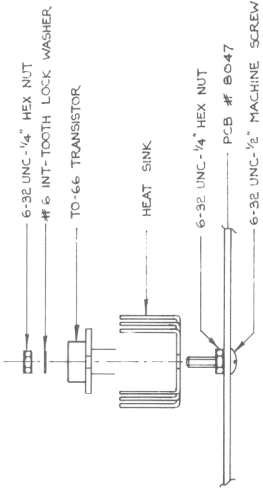
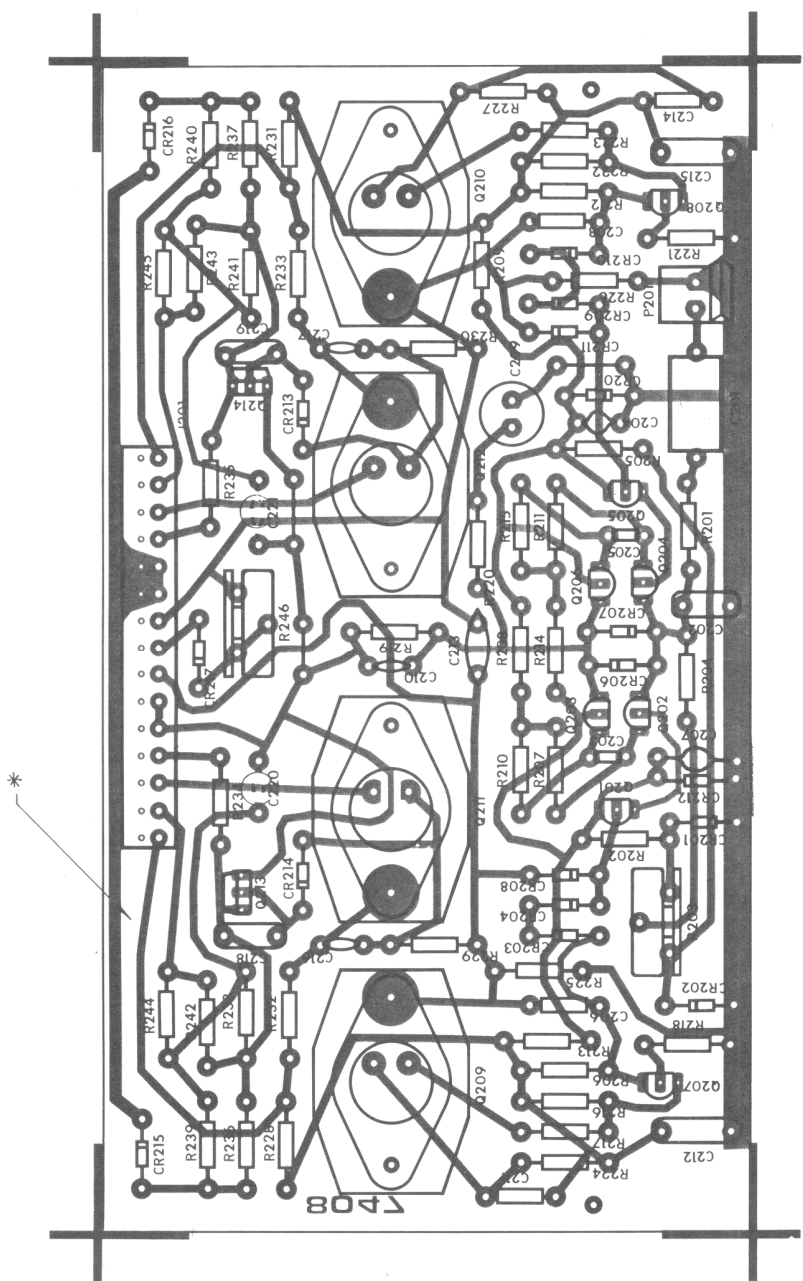
Note: 1. Add Locking To All Machine Screws.

NO	QTY	DESCRIPTION	SPEC #
51	1	NUT 6/32-1/4 HEX CAD	2605
52	2	WASHER	2689
53	2	WASHER #8 INT TOOTH LOCK	
54	2	WASHER #6 INT TOOTH LOCK	
55	4	WASHER #10 INT-TOOTH LOCK	
56	4	NUT SELF-LOCK 10-32 CAD	

LOCATED UNDER ITEMS #38

REVISIONS	DATE	APPROVED
15	11/6/95	152191-205
DESCRIPTION		
CHASSIS ASSEMBLY		
A-400		
D		
DO NOT SCALE DRAWING		

REVISIONS		DATE	APPROVED
LTR	DESCRIPTION		



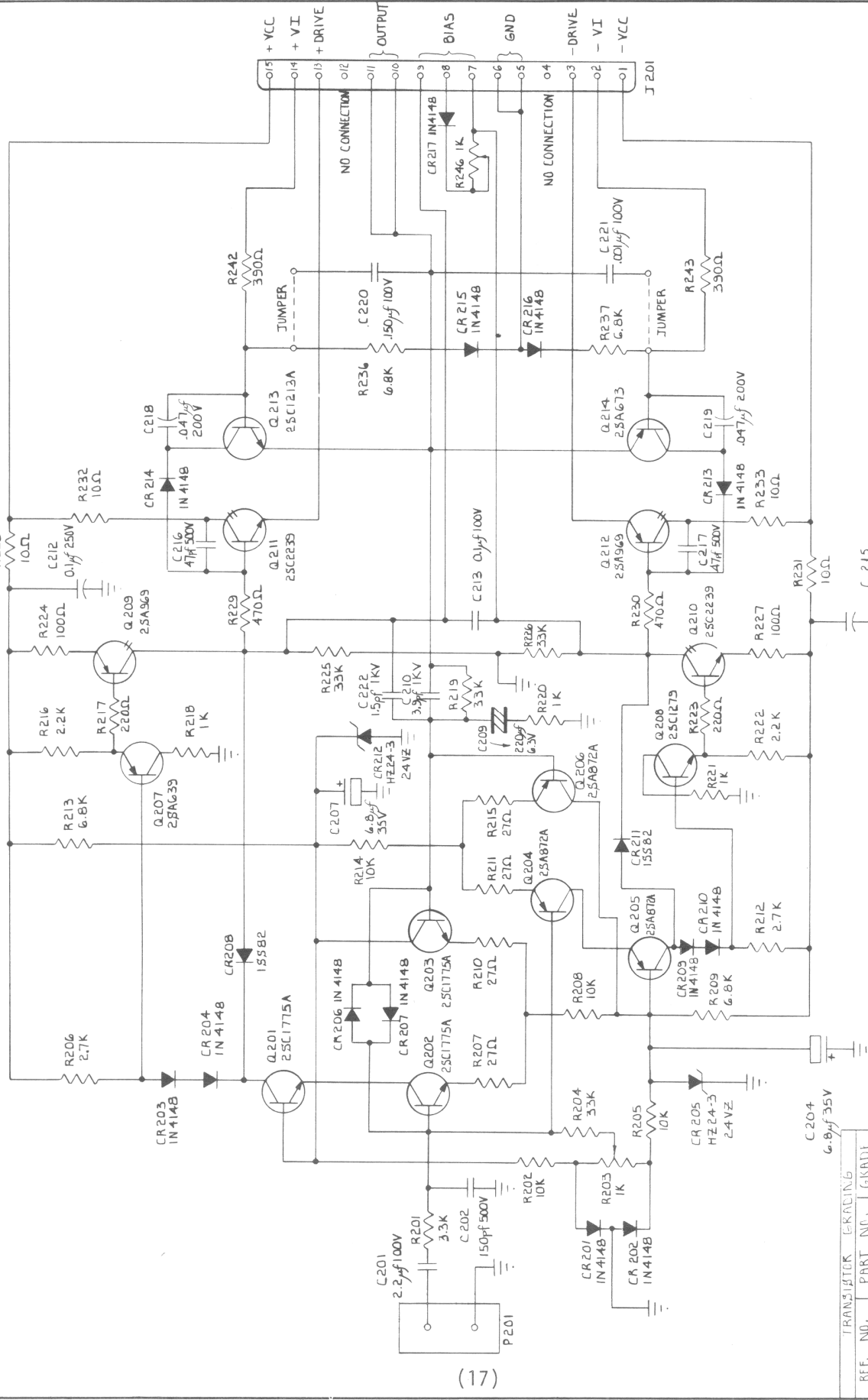
NOTES UNLESS OTHERWISE STATED.
 1. IDENTIFY ASSEMBLY IN THIS AREA * ON COMPONENT
 SIDE OF PCB USING NON-CONDUCTIVE STICKER.
 2. MOUNT FOUR (4) TO-66 TRANSISTORS AS SHOWN
 IN DETAIL VIEW.

TOLERANCES UNLESS OTHERWISE SPECIFIED		FRACTIONS DEC ANGLES	
APPROVALS	DATE	SCALE	DO NOT SCALE DRAWING
DESIGNED BY D. E. 116	DATE	SCALE	DO NOT SCALE DRAWING
CHECKED BY E. J. 116	DATE	SCALE	DO NOT SCALE DRAWING
DRAWING NO. C 8102		SHEET 1 of 1	

Cerwin-Vega, inc.

DRIVE PCB ASSEMBLY

REVISIONS		DATE	APPROVED
LTR	DESCRIPTION		
B	ADDED COMPONENT VALUES	1-25-74	B.G.K.



(17)

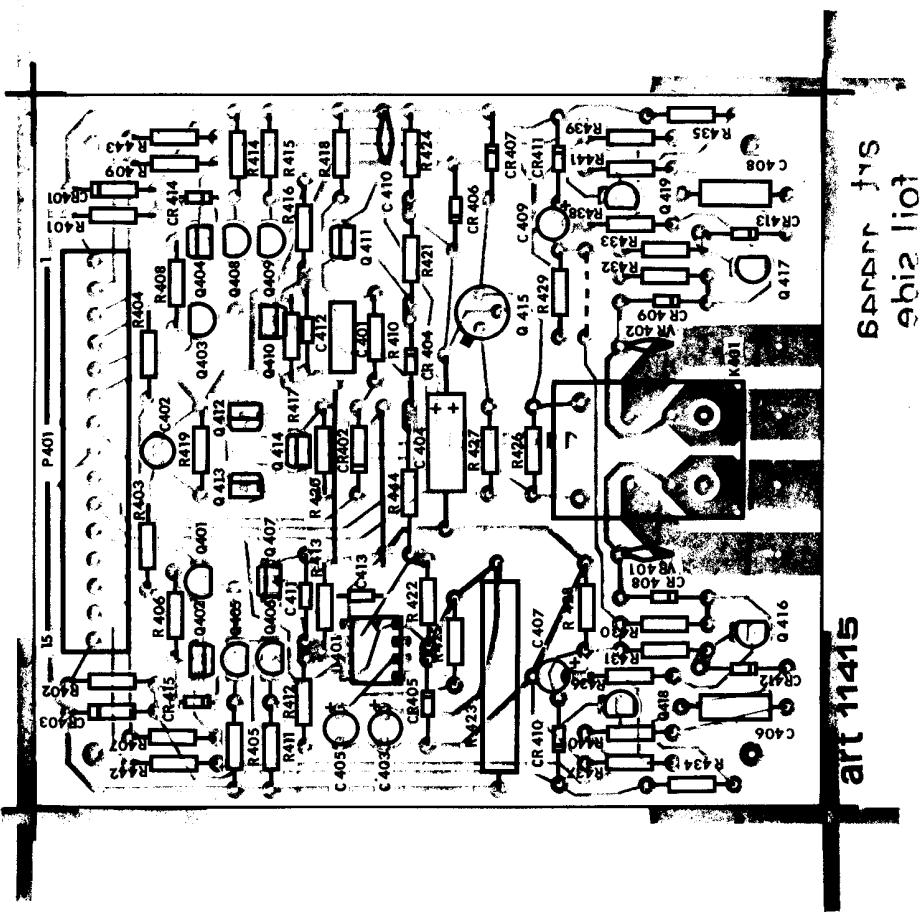
TOLERANCES UNLESS OTHERWISE SPECIFIED		FRACTIONS DEC ANGLES	
APPROVALS	DATE	APPROVALS	DATE
DESIGNED BY	1-25-74	CHECKED BY	3-17-74
DRAWN BY	3-17-74	SCALE	C
SCHEMATIC ASSY 8102		SIZE DRAWING NO	
A 400 DRIVE BOARD		C 11306	
DO NOT SCALE DRAWING		SHEET	

NOTES:

1. ALL RESISTORS 1/4W 5% UNLESS SPECIFIED OTHERWISE
2. ALL RESISTORS EXP. 250V UNLESS OTHERWISE SPECIFIED
3. 25A872A GRADE C PARTS MUST BE PAIRED WITH 25C1275 GRADE F
4. 25A872A GRADE P PARTS MUST BE PAIRED WITH 25C1275 GRADE E
5. ALL EXCEPTED PARTS MUST BE PAIRED WITH 25C1275 GRADE E

REF. NO.	TRANSISTOR	GRADING	PART NO.	GRADE
Q201	25A872A	E	25C1775A	E
Q202, Q203, Q204	25A872A	E	25A872A	E
Q205	25A872A	Q or P	25A872A	Q or P
Q206, Q207	25C1275	F or E	25C1275	F or E
Q208, Q209, Q210, Q211, Q212, Q213, Q214, Q215, Q216, Q217, Q218, Q219, Q220, Q221, Q222, Q223, Q224, Q225, Q226, Q227, Q228, Q229, Q230, Q231, Q232, Q233, Q234, Q235, Q236, Q237, Q238, Q239, Q240, Q241, Q242, Q243, Q244, Q245, Q246, Q247, Q248, Q249, Q250, Q251, Q252, Q253, Q254, Q255, Q256, Q257, Q258, Q259, Q260, Q261, Q262, Q263, Q264, Q265, Q266, Q267, Q268, Q269, Q270, Q271, Q272, Q273, Q274, Q275, Q276, Q277, Q278, Q279, Q280, Q281, Q282, Q283, Q284, Q285, Q286, Q287, Q288, Q289, Q290, Q291, Q292, Q293, Q294, Q295, Q296, Q297, Q298, Q299, Q300, Q301, Q302, Q303, Q304, Q305, Q306, Q307, Q308, Q309, Q310, Q311, Q312, Q313, Q314, Q315, Q316, Q317, Q318, Q319, Q320, Q321, Q322, Q323, Q324, Q325, Q326, Q327, Q328, Q329, Q330, Q331, Q332, Q333, Q334, Q335, Q336, Q337, Q338, Q339, Q340, Q341, Q342, Q343, Q344, Q345, Q346, Q347, Q348, Q349, Q350, Q351, Q352, Q353, Q354, Q355, Q356, Q357, Q358, Q359, Q360, Q361, Q362, Q363, Q364, Q365, Q366, Q367, Q368, Q369, Q370, Q371, Q372, Q373, Q374, Q375, Q376, Q377, Q378, Q379, Q380, Q381, Q382, Q383, Q384, Q385, Q386, Q387, Q388, Q389, Q390, Q391, Q392, Q393, Q394, Q395, Q396, Q397, Q398, Q399, Q400, Q401, Q402, Q403, Q404, Q405, Q406, Q407, Q408, Q409, Q410, Q411, Q412, Q413, Q414, Q415, Q416, Q417, Q418, Q419, Q420, Q421, Q422, Q423, Q424, Q425, Q426, Q427, Q428, Q429, Q430, Q431, Q432, Q433, Q434, Q435, Q436, Q437, Q438, Q439, Q440, Q441, Q442, Q443, Q444, Q445, Q446, Q447, Q448, Q449, Q450, Q451, Q452, Q453, Q454, Q455, Q456, Q457, Q458, Q459, Q460, Q461, Q462, Q463, Q464, Q465, Q466, Q467, Q468, Q469, Q470, Q471, Q472, Q473, Q474, Q475, Q476, Q477, Q478, Q479, Q480, Q481, Q482, Q483, Q484, Q485, Q486, Q487, Q488, Q489, Q490, Q491, Q492, Q493, Q494, Q495, Q496, Q497, Q498, Q499, Q500, Q501, Q502, Q503, Q504, Q505, Q506, Q507, Q508, Q509, Q510, Q511, Q512, Q513, Q514, Q515, Q516, Q517, Q518, Q519, Q520, Q521, Q522, Q523, Q524, Q525, Q526, Q527, Q528, Q529, Q530, Q531, Q532, Q533, Q534, Q535, Q536, Q537, Q538, Q539, Q540, Q541, Q542, Q543, Q544, Q545, Q546, Q547, Q548, Q549, Q550, Q551, Q552, Q553, Q554, Q555, Q556, Q557, Q558, Q559, Q560, Q561, Q562, Q563, Q564, Q565, Q566, Q567, Q568, Q569, Q570, Q571, Q572, Q573, Q574, Q575, Q576, Q577, Q578, Q579, Q580, Q581, Q582, Q583, Q584, Q585, Q586, Q587, Q588, Q589, Q590, Q591, Q592, Q593, Q594, Q595, Q596, Q597, Q598, Q599, Q600, Q601, Q602, Q603, Q604, Q605, Q606, Q607, Q608, Q609, Q610, Q611, Q612, Q613, Q614, Q615, Q616, Q617, Q618, Q619, Q620, Q621, Q622, Q623, Q624, Q625, Q626, Q627, Q628, Q629, Q630, Q631, Q632, Q633, Q634, Q635, Q636, Q637, Q638, Q639, Q640, Q641, Q642, Q643, Q644, Q645, Q646, Q647, Q648, Q649, Q650, Q651, Q652, Q653, Q654, Q655, Q656, Q657, Q658, Q659, Q660, Q661, Q662, Q663, Q664, Q665, Q666, Q667, Q668, Q669, Q670, Q671, Q672, Q673, Q674, Q675, Q676, Q677, Q678, Q679, Q680, Q681, Q682, Q683, Q684, Q685, Q686, Q687, Q688, Q689, Q690, Q691, Q692, Q693, Q694, Q695, Q696, Q697, Q698, Q699, Q700, Q701, Q702, Q703, Q704, Q705, Q706, Q707, Q708, Q709, Q710, Q711, Q712, Q713, Q714, Q715, Q716, Q717, Q718, Q719, Q720, Q721, Q722, Q723, Q724, Q725, Q726, Q727, Q728, Q729, Q730, Q731, Q732, Q733, Q734, Q735, Q736, Q737, Q738, Q739, Q740, Q741, Q742, Q743, Q744, Q745, Q746, Q747, Q748, Q749, Q750, Q751, Q752, Q753, Q754, Q755, Q756, Q757, Q758, Q759, Q760, Q761, Q762, Q763, Q764, Q765, Q766, Q767, Q768, Q769, Q770, Q771, Q772, Q773, Q774, Q775, Q776, Q777, Q778, Q779, Q780, Q781, Q782, Q783, Q784, Q785, Q786, Q787, Q788, Q789, Q790, Q791, Q792, Q793, Q794, Q795, Q796, Q797, Q798, Q799, Q800, Q801, Q802, Q803, Q804, Q805, Q806, Q807, Q808, Q809, Q810, Q811, Q812, Q813, Q814, Q815, Q816, Q817, Q818, Q819, Q820, Q821, Q822, Q823, Q824, Q825, Q826, Q827, Q828, Q829, Q830, Q831, Q832, Q833, Q834, Q835, Q836, Q837, Q838, Q839, Q840, Q841, Q842, Q843, Q844, Q845, Q846, Q847, Q848, Q849, Q850, Q851, Q852, Q853, Q854, Q855, Q856, Q857, Q858, Q859, Q860, Q861, Q862, Q863, Q864, Q865, Q866, Q867, Q868, Q869, Q870, Q871, Q872, Q873, Q874, Q875, Q876, Q877, Q878, Q879, Q880, Q881, Q882, Q883, Q884, Q885, Q886, Q887, Q888, Q889, Q890, Q891, Q892, Q893, Q894, Q895, Q896, Q897, Q898, Q899, Q900, Q901, Q902, Q903, Q904, Q905, Q906, Q907, Q908, Q909, Q910, Q911, Q912, Q913, Q914, Q915, Q916, Q917, Q918, Q919, Q920, Q921, Q922, Q923, Q924, Q925, Q926, Q927, Q928, Q929, Q930, Q931, Q932, Q933, Q934, Q935, Q936, Q937, Q938, Q939, Q940, Q941, Q942, Q943, Q944, Q945, Q946, Q947, Q948, Q949, Q950, Q951, Q952, Q953, Q954, Q955, Q956, Q957, Q958, Q959, Q960, Q961, Q962, Q963, Q964, Q965, Q966, Q967, Q968, Q969, Q970, Q971, Q972, Q973, Q974, Q975, Q976, Q977, Q978, Q979, Q980, Q981, Q982, Q983, Q984, Q985, Q986, Q987, Q988, Q989, Q990, Q991, Q992, Q993, Q994, Q995, Q996, Q997, Q998, Q999, Q1000				

REVISIONS		DATE	APPROVED
LTR	DESCRIPTION		



part 111415

64544 JYS
ebiz liot

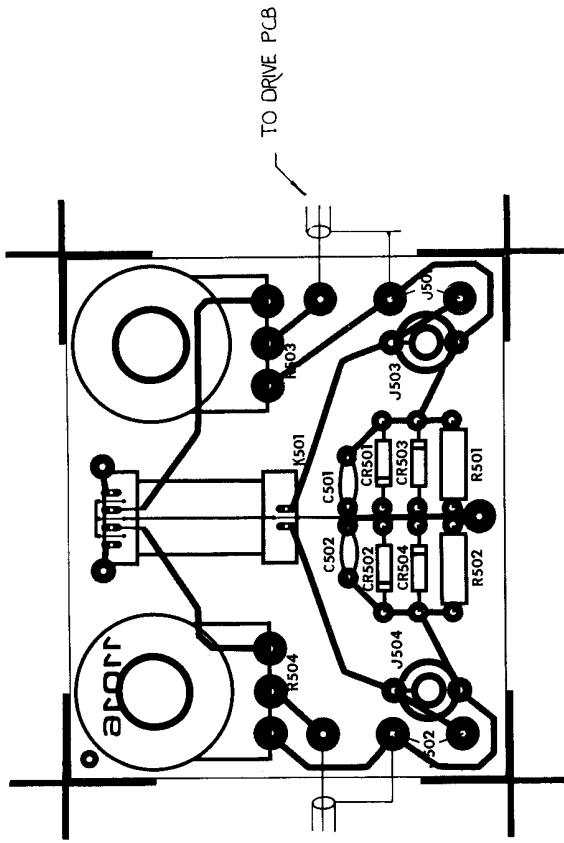
NOTE 1: Some components are omitted from both the A-400 and A-600.
 NOTE 2: Parts lists for Assembly 11104 and Assembly 7104 should be used depending upon which board is being Assembled.

TOLERANCES UNLESS SPECIFIED		DATE	
FRACTIONS DEC	ANGLES	4-11-79	
APPROVALS	CHECKED	BY	DATE
		OK	
DRAWING NO		SIZE	DRAWING NO
11104		C	11104
SCALE		DO NOT SCALE DRAWING	
		SHEET	

Cerwin-Vega, Inc.

PROTECT PCB ASSEMBLY
 A-400 A-600

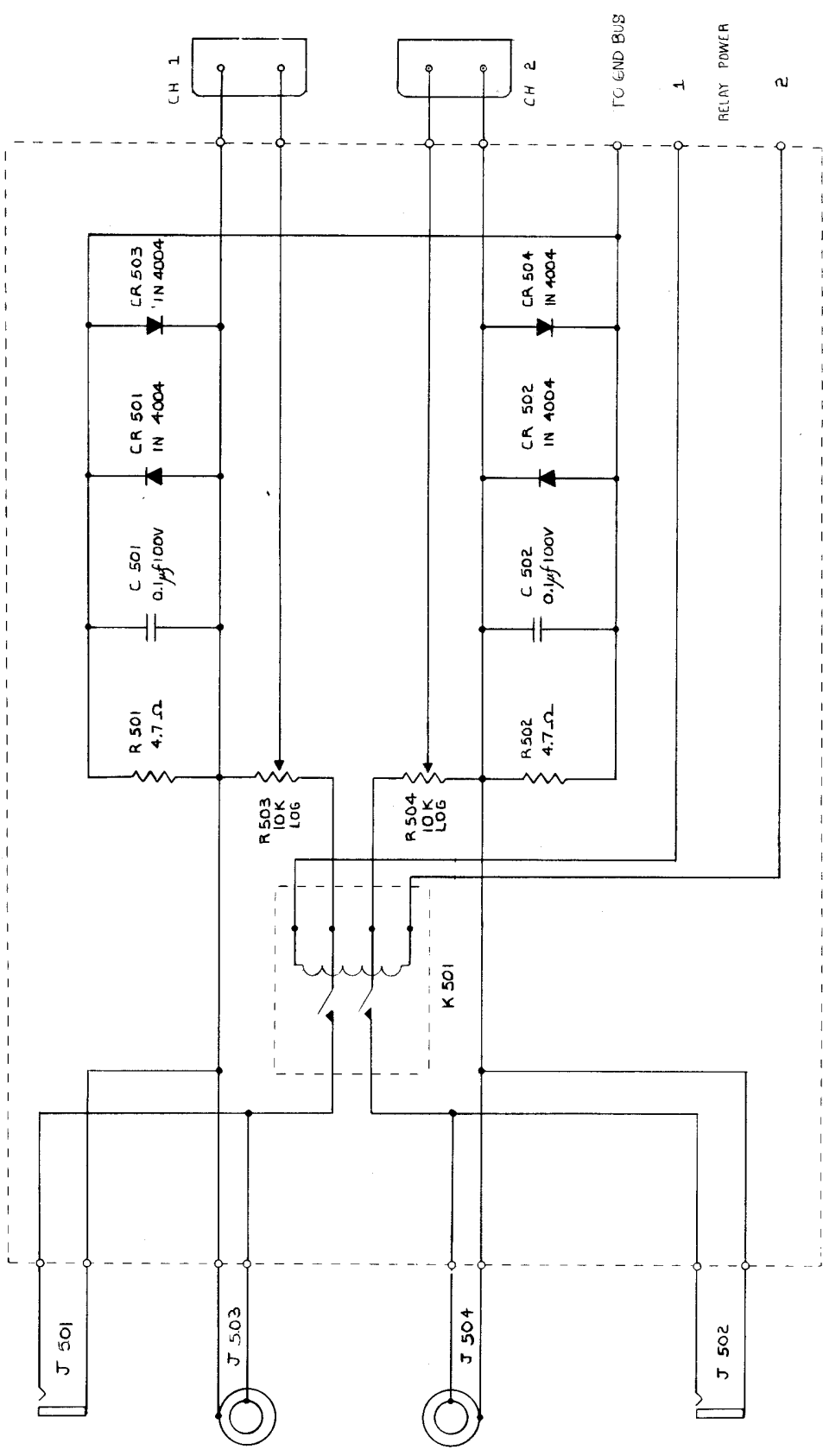
REVISIONS		DATE	APPROVED
LTR	DESCRIPTION		



(22)

Cerwin-Vega, inc. INPUT PCB ASSY.		DO NOT SCALE DRAWING SHEET
APPROVALS DRAWN CHECKED	DATE 10.11.78	SIZE C
DRAWING NO. 11105		SHEET

REVISIONS		DATE	APPROVED
LTR	DESCRIPTION		
B	ADD COMPONENT VALUES	3-15-79	EAH

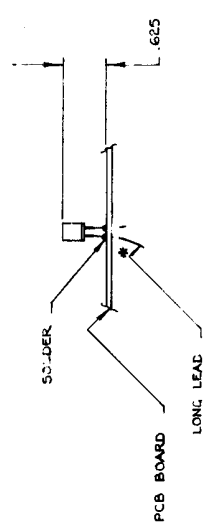
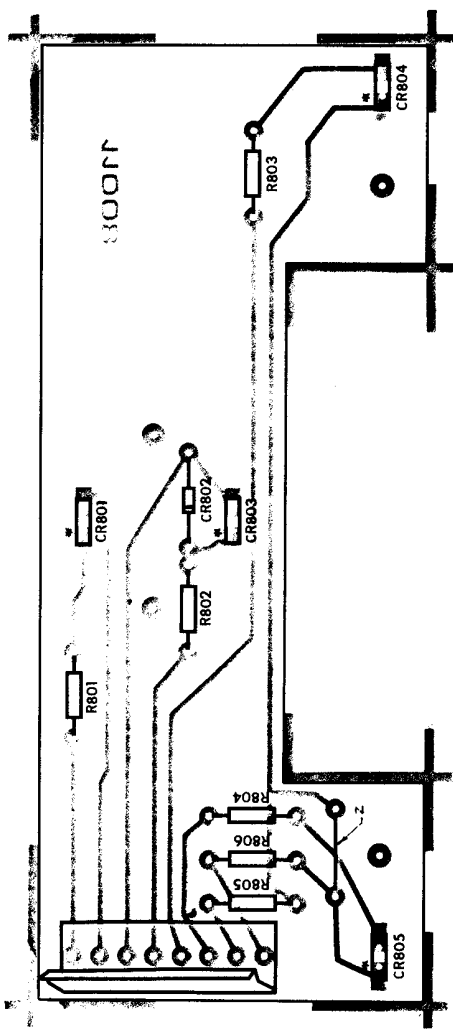


TOLERANCES UNLESS OTHERWISE SPECIFIED		FRACTIONS DEC ANGLES	
±		±	
APPROVALS	DATE	APPROVALS	DATE
DRAWN	2-2-78	DATE	2-2-78
CHECKED	2-9-78	SCALE	2-9-78
	2-15-79	SIZE	DRAWING NO.
		C	11304
		DO NOT SCALE DRAWING	SHEET

Cerwin-Vega, Inc.
 INPUT RELAY SCHEMATIC
 BOARD ASSY. 11105 (A-400)

NOTES:
 1. ALL RESISTORS 1/4W 5% UNLESS OTHERWISE SPECIFIED
 2. ALL RESISTORS EXPRESSED IN OHMS

REVISIONS		DATE	APPROVED
L.P.R.	DESCRIPTION		



NOTES
 1. LED'S TO BE ASSEMBLED AS SHOWN IN PART VIEW.
 2. * DENOTES LONG LEAD OF LED.
 3. JUMPER LEAD MARKED 2 ONLY USED FOR PT-400

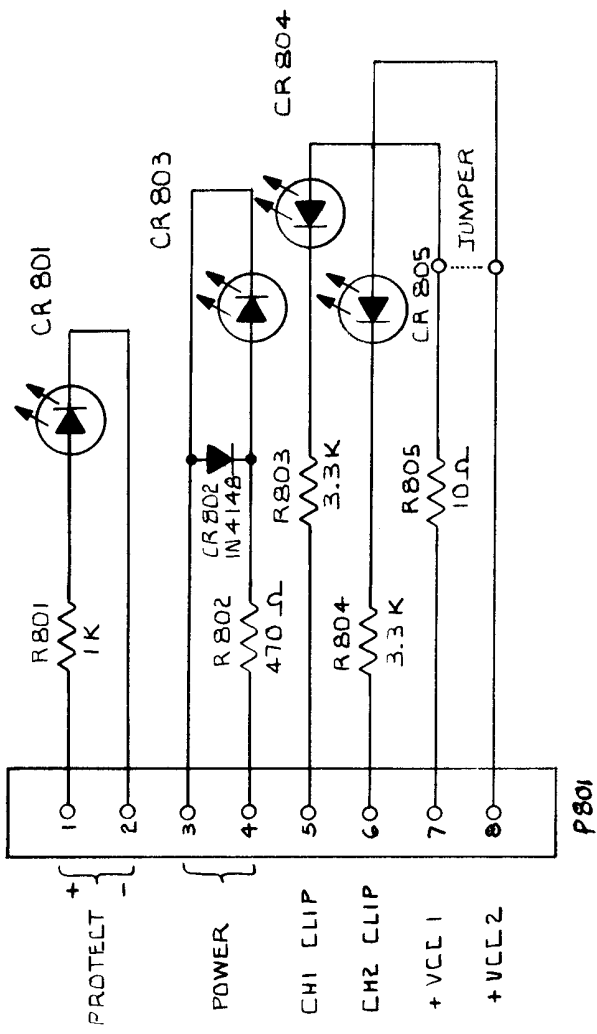
PART VIEW SHOWING LED SOLDERED TO PCB BOARD
 TYPICAL FOR ALL LED'S

TOLERANCES UNLESS OTHERWISE SPECIFIED		FRACTIONS DEC. ANGLES	
FRACTIONS DEC. ANGLES		FRACTIONS DEC. ANGLES	
APPROVALS	DATE	LED PCB ASSY	
DESIGNED BY	9-4-78	SIZE	C
CHECKED BY	9-4-78	DRAWING NO	1110B
		SCALE	
		DO NOT SCALE DRAWING	SHEET 1 of 1

Cerwin-Vega, inc.

REVISIONS		
LTR	DESCRIPTION	DATE
B	ADD COMPONENT VALUES	3.15.79

APPROVED: *[Signature]*



- CR 801 PROTECT
- CR 802 POWER
- CR 803 CH1 PEAK CLIP
- CR 804 CH2 PEAK CLIP

NOTES:
 1. ALL RESISTORS 1/2W 5%
 UNLESS OTHERWISE SPECIFIED.
 2. ALL RESISTORS EXPRESSED IN OHMS.

TOLERANCES UNLESS OTHERWISE SPECIFIED		FRACTIONS DEC. ANGLES	
±	±	±	±
APPROVALS	DATE	SCALE	
DRAWN RAB COX	11-14-78	A-100	
CHECKED <i>[Signature]</i>	12.07.78	BOARD ASSEMBLY	1102B-1
<i>[Signature]</i>	3.15.79	SIZE	B
		DRAWING NO.	11303
DO NOT SCALE DRAWING			SHEET

Cerwin-Vega, Inc.

L.E.D. PCB SCHEMATIC
 BOARD ASSEMBLY 1102B-1
 SIZE B
 DRAWING NO. 11303

Service Addendums - A-400 Protect PCB

These modifications should be made to any unit which does not have them all incorporated. One or more of these changes could apply to serial numbers as high as 791000.

1. VI relay circuit. C411 was .01uf (or nothing)
C412 was .01uf (or nothing)
R413 was 1.5k Ω
R417 was 1.5k Ω

These paralleled components should be replaced by series combinations of a 390 Ω 5%, 1/2w, and a 3.3 μ f, 35v, 20% tantalum cap. The negative end goes to ground. This change makes the VI trip point conform more closely to the safe operating area of the output devices, reducing false triggering and increasing reliability (Applies to units with S/N's below 790500).

2. 555 Timer circuit.

R444 was a jumper - is 1k Ω 5%, 1/2w. This change reduces sensitivity to false triggering from line transients. Lift one end of CR404 and install the resistor in series (Applies to units with S/N's below 790300).

3. DC offset sensitivity.

R419 was 15k Ω - is 8.2k Ω , 5%, 1/2W. This change reduces the sensitivity to DC output voltage, as when used with bass synthesizer boxes which produce an asymmetrical waveform (Applies to units with S/N's below 790500).

4. AC sense circuit.

C401 was 0.1 μ f - is 2.2 μ f, 20% non-polarized electrolytic.

This change allows a longer interruption of AC power (Applies to units with S/N's below 791000).

5. Relay resistor.

R426 was $2.7k\Omega$, $1/2w$ is $2.7k\Omega$, $1W$ (Applies to units with S/N's below 790700). This change keeps the resistor running cooler.

If a number of modifications are required during servicing, it is recommended that the entire PCB be replaced with a revised one. Contact Cerwin-Vega's Factory Service Department for replacement PCB's.

Defective devices should be replaced with ones of the same beta grade code. Before replacing the drive board, a quick check with an ohm meter should be made for a shorted driver or predriver. Check the 2SA969's and 2SC2239's between emitter, base, and collector. If they're o.k., replace the drive board, and slowly power up the unit.

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print	CV	CV		1	11113	
2		Winding Diagram		CV		1	11201	
3								
4		Bobbin		CV		1	1035	
5								
6		Wire: Magnet #15		CV		1	2712	
7		Wire: Magnet #16		CV		1	2503	
8		Wire: White/Green Stripes #22		CV		1	11211	
9		Wire: Black/white stripe #16		CV		1	11212	
10		Wire: Black #16		CV		1	11213	
11		Wire: Red/Yellow Stripe #16		CV		1	11214	
12		Wire: Red #16		CV		2	11215	
13		Wire: Brown/White Stripe #16		CV		1	11216	
14		Wire: Brown #16		CV		1	11217	
15		Nomex Paper 2.45" W. x .005"thk.	410	Dupont		3.5'	11277	
16		Nomex Paper 2.35"W. x .010"thk.	410	Dupont		11.2'	2645	
17		Fiberglass Tape	G-550	CHR		6'6"	2646	
18		Kapton Tape	K 250	CHR		8"	2647	
19		Kapton Tape	K 250	CHR		4'8"	8272	
20		Heat Shrink Tubing	PO-135 125C Fr	Markel		16"	8270	
21		Thinwall Teflon Tubing.	1500-15T	Stand+Wire		28"	8271	
22		Lamination EI-175 (Sets)		CV		173	2513	
23		End Cap - One xit		CV		1	8202	
24		End Cap - No Exit		CV		1	8203	
25		Mount Bracket (Right)		CV		2	11017	
26		Mount Bracket (left)		CV		2	11018	
27								
28		Copper Foil		CV		1	11209	
29								
30		Screw 10/32 - 3 1/2 Cad R-H Phil				4		
31		Washer #10 Int-Tooth Lock				8		
32		Nut 10/32 - 3/8" Hex 7/64 Thk. Cad				4		
33		Tinnerman Nut #10				4		
34		Shoulder Bushing #10-3/8"	C8125-10-4	Eaton		4	2659	
35		Varnish: Electrical	NY10-375GF	McNabb		8	2609	
36		Nomex 5.625"L x 2.81"W x .010"thk.	U-372 W	Sterling		10z.	2653	
37		Nomex 5.625"L x 1.81"W x .010"thk.	410	Dupont		2	11278	
38		Nomex 1.125" x 1.375" x .010"thk.	410	Dupont		1	11279	
				Dupont		2	8283	
TITLE TRANSFORMER ASSEMBLY					DWN.	BEH	ASSY.	REV
MODEL A-400					APP. <i>[Signature]</i>	3/21/79	11113	A

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print		CV		1	11102	
2		Printed Circuit Board		CV		1	8047	
3		Schematic		CV		1	8302	
4								
5		Resistors						
6	R239 R240 R244					4		
7	R245	Omit				2		
8	R238 R241	Jumper		CV				
9	R228 R231 R232					4		
10	R233	Carbon Film ½w 5%						
11	R207 R210 R211					4		
12	R215	Carbon Film ½w 5%						
13	R224 R227					4		
14	R217 R223	Carbon Film ½w 5%				2		
15	R242 R243					2		
16	R229 R230 R234	Carbon Film ½w 5%				2		
17	R235	Carbon Film ½w 5%						
18	R218 R220 R221					4		
19	R216 R222	Carbon Film ½w 5%				3		
20	R206 R212					2		
21	R201	Carbon Film ½w 5%						
22	R209 R213 R236					4		
23	R237	Carbon Film ½w 5%						
24	R202 R205 R208					4		
25	R214	Carbon Film ½w 5%						
26	R219 R204 R225					4		
27	R226	Carbon Film ½w 5%						
28	R203 R246	Trim Pot	PT15-YB-1k	Piher		4	2619	
29		Capacitors				2		
30	C203 C205 C206					6		
31	C208 C211 C214	Omit				1		
32	C222	Ceramic NPO 1kV D 1.5 pf				1		
33	C210	Ceramic NPO 1kV D 3.9 pf				1		
34	C216 C217	Disc 500wV K 47 pf				2		
35	C202	Sil-Mica 500wV J 150 pf				1		
36	C220 C221	Disc 100wV M .001 uf				2		
37	C218 C219	Dip-Mylar 200wV K .047 uf				2		
TITLE DRIVE BOARD			DWN. BEH		ASSY.		REV	
MODEL A-400			APP. <i>[Signature]</i>		11102			

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
31	C213	Disc 100wV P				1		
32	C212 C215	Dip-Mylar 250wV M				2		
33	C201	Stack Foil 100wV J	B32562	Siemens		1	2867	
34	C204 C207	Tant Tag 35wV M				2		
35	C209	Elect-NP 6.3wV M	6.3 U 220NP-M	Nichicon		1	2865	
36								
37		Semiconductors						
38	CR201 CR202 CR203 CR204 CR206 CR207 CR209 CR210 CR213 CR214 CR215 CR216 CR217							
39	C 208 CR211	Diode 1N4148	1SS82	Hitachi		13	2856	
40	CR205 CR212	Diode Low Capacitance	HZ224-3	Hitachi		2	2857	
41	Q201 Q202 Q203	Zener Diode	2SC1775AE	Hitachi		2	2859	
42	Q204 Q205 Q206	Transistor NPN	2SA872AE	Hitachi		3	2840	
43	Q207	Transistor PNP	2SA639Q	NEC		3	2847	
44	Q208	Transistor NPN	2SC1279	NEC		1	2848	
45	Q209 Q212	Transistor PNP	2SA969Y	Toshiba		1	2849	
46	Q210 Q211	Transistor PNP	2SC2239Y	Toshiba		2	2850	
47	Q213	Transistor NPN	2SC1213A	Hitachi		2	2851	
48	Q214	Transistor PNP	2SA673	Hitachi		1	2852	
49						1	2853	
50		Mechanical Parts						
51	P201	Connector : Input - Male 2 Pin	09-65-1022	Molex		1	2765	
52	J201	Connector : PCB - Female 15 Pin	09-52-3152	Molex		1	2631	
53		Screw 6/32- $\frac{1}{2}$ " Cad P-H Phil				8		
54		Nut - 6/32- $\frac{1}{4}$ " Cad Hex				16		
55		Washer-Lock #6 Int-Tooth				8		
56		Heat Sink TO-66	LAD66A4CB	IERC		4	8213	
57		Mini Label				1		
					DWN. BEH	ASSY.		REV
					APP.	11102		
TITLE DRIVE BOARD			2 Required					
MODEL A-400								

Cerwin-Vega

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print		CV		1	11110	
2		Thermal Breaker	L 185	Elmwood		2	2655	
3	CB1001, CB1002	Thermal Breaker	3001-14-339	Elmwood		2	11272	
4	CB1003, CB1004	Wire: # 16 Brown		CV		1	11221	
5		Wire: # 16 Brown with White Strip		CV		1	11222	
6		Wire: # 16 Twisted Pair		CV		1	11223	
7		Wire: # 22 Brown /White Stripe		CV		1	11224	
8		Wire: # 22 Orange		CV		1	11225	
9		Wire: # 22 Org with White Stripe		CV		1	11226	
10		Wire: # 22 Twisted Pair		CV		1	11227	
11		Speedy Tys	65002	Waldom		9	2812	
12		Varistor	V150ZAI	GE		1	11274	
13								
14	VR1001							
					DWN. BEH	ASSY.	REV	
					APP. <i>SLA</i>	11110		
						1 Required		
					TITLE A.C. POWER WIRING HARNESS			
					MODEL A-400			

Cerwin-Vega

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print		CV		1	11112	
2	P1202	Connector Block 8 Pin	09-50-3081	Molex		1	11255	
3	P1203	Connector Block 15 Pin	09-50-3151	Molex		1	11256	
4		Wire: Black #22				1	11244	
5		Wire: Red #22				1	11245	
6		Wire: Black #22				1	11246	
7		Wire: Red #22				1	11247	
8		Wire: Brown #22				1	11248	
9		Wire: Orange #22				1	11249	
10		Wire: Yellow with White Stripe 22#				1	11250	
11		Wire: Yellow #22				1	11251	
12		Wire: Triad- Yellow, Violet, Red #22				1	11252	
13	P1201	Wire: Triad- Yellow, Violet, Red #22				1	11253	
14	P1201	Wire: Pair - Blue, White #22				1	11254	
15		Speedy Tys	65002	Waldom		7	2812	
16								
17								
18								
					DWN. BEH	ASSY.	REV	
TITLE PROTECT HARNESS					APP. <i>[Signature]</i> 10-13-78	11112		
MODEL A-400								
						1 Required		
Carwin-Vega								

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1.		Assembly Print		CV		1	11105	
2		Printed Circuit Board		CV		1	11016	
3		Schematic		CV		1	11304	
4		Carbon Film		CTS		2	11203	
5	R501 R502	½w 5% 4.7 ohm	DQ 7444			2		
6	R503 R504	Potentiometer				2		
7		Capacitor-Disc. 100wV "p"0.1uf				2		
8	C501 C502					4	2879	
9		Diode 1N4004				1	11204	
10	CR501 CR502		RA30312121	Electrp1		1		
11	CR503 CR504					1		
12	K501	Relay (Reed)				1		
13								
14								
15								
16								
17		Tin-Eyelet				7		
18		Wire; Twisted Pair 22 ga.				2	11219	
19	F501	Shield Wire #22 Stranded Gray				1	11269	
20	F502	Shield Wire #22 Stranded Gray				1	11270	
		Wire; Black #16	11265			1	11265	
TITLE Input PCB			DWN. BEH		ASSY.		REV	
MODEL A-400			APP. <i>[Signature]</i>		11105			

Cerwin-Vega

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print		CV		1	11103	
2		Printed Circuit Board		CV		1	11002	
3		Schematic		CV		1	11301	
4		Drive PCB Assembly		CV		1	11102	
5		Resistors						
6								
7								
8	R305 R307 R312 R313 R318 R319 R324 R325	Carbon Film ½w 5% 3.3 ohm				8		
9	R310 R311 R316 R317 R322 R323 R328 R329	Carbon Film ½w 5% 10 ohm				8		
10	R303 R304	Carbon Film ½w 5% 47 ohm				2		
11	R301	Carbon Film ½w 5% 220 ohm				1		
12	R306	Carbon Film ½w 5% 470 ohm				1		
13	R302	Carbon Film ½w 5% 1k ohm				1		
14	R332	Carbon Film 1w 5% 4.7 ohm				1		
15	R308 R309 R314 R315 R320 R321 R326 R327	Wire Wound 5w 10% .47 ohm	CP-5	Dale		8	8241	
16	R330 R331	Wire Wound 5w 10% 20 ohm	Cp-5	Dale		2	8242	
17								
18		Capacitors						
19	C303 C304	Polyester Film 250wV 10% .027uf	160.027.250C	Plessey		2	2922	
20	C301	Disc 100wV "P" .01 uf				1		
21	C302	Tant-Tag 35wV 20% 2.2 uf				1		
22								
23		Inductors						
24	L301	Air Core Coil 1.0 Micro Henry		CV		1	11257	
25								
26		Semiconductors						
27	CR301 CR302	Diode 1N4004				2	2879	
28	Q301	Transistor NPN	2SC1213	Hitachi		1	2852	
29	Q302	Transistor PNP	PN4248	Far.		1	2622	
30								
31		Mechanical Parts						
32		Connector: PCB 15 Pin Male	09-67-1154	Molex		1	2642	
		TITLE Output PCB	2 Required	DWN.	BJG	ASSY.		REV
		MODEL A-400		APP.		11103		

Cerwin-Vega

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
33		Transistor Socket	M1692	Emuden		8	8243	
34		PCB Support	CBS-8N	Richco		2	8244	
35		Connector: PCB 3 Pin Male	09-65-1032	Molex		1	8265	
36		Wire: Red Ch 1 and 2		CV		1	11206	
37		Wire: Violet Ch 1 and 2		CV		1	11208	
38		Wire: Black Ch 1)-only 1		CV		1	11210	
39		Wire: Yellow Ch 2 per assy.		CV		1	11220	
40		Wire: Yellow		CV		1	11207	
41		Compression Pad				1	8054	
42		Speedy-Tys				3	2812	
43		Jumpers				2		
44								
		TITLE Output PCB	2 Required	DWN.	BJG	ASSY.		REV
		MODEL A-400		APP.		11103		

Cerwin-Vega

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly print		CV		1	11104	
2		Printed Circuit Board		CV		1	11015	
3		Schematic		CV		1	11305	
4								
5		Resistors						
6	R429 R402	Omit				1		
7	R401	Carbon Film $\frac{1}{2}$ w 5%				1		
8	R421	Carbon Film $\frac{1}{2}$ w 5%				1		
9	R427	Carbon Film $\frac{1}{2}$ w 5%				1		
10	R445 R446	Carbon Film $\frac{1}{2}$ w 5%				2		
11	R406 R407 R408	Carbon Film $\frac{1}{2}$ w 5%				4		
12	R409	Carbon Film $\frac{1}{2}$ w 5%				4		
13	R405 R411 R414	Carbon Film $\frac{1}{2}$ w 5%				5		
14	R415 R444	Carbon Film $\frac{1}{2}$ w 5%				2		
15	R413 R417	Carbon Film $\frac{1}{2}$ w 5%				2		
16	R442 R443	Carbon Film $\frac{1}{2}$ w 5%				2		
17	R430 R431 R432	Carbon Film $\frac{1}{2}$ w 5%				4		
18	R433	Carbon Film $\frac{1}{2}$ w 5%				4		
19	R412 R416 R420	Carbon Film $\frac{1}{2}$ w 5%				10		
20	R422 R436 R437	Carbon Film $\frac{1}{2}$ w 5%				1		
21	R438 R439 R440	Carbon Film $\frac{1}{2}$ w 5%				1		
22	R441	Carbon Film $\frac{1}{2}$ w 5%				1		
23	R428	Carbon Film $\frac{1}{2}$ w 5%				1		
24	R419	Carbon Film $\frac{1}{2}$ w 5%				1		
25	R434 R435	Carbon Film $\frac{1}{2}$ w 5%				2		
26	R403 R404 R410	Carbon Film $\frac{1}{2}$ w 5%				4		
27	R424	Carbon Film $\frac{1}{2}$ w 5%				2		
28	R418 R425	Carbon Film $\frac{1}{2}$ w 5%				2		
29	R426	Carbon Film 1w 5%				1		
30	R423	Wire Wound 5w 10%				1		
31		Capacitors				1		
		Omit						
	C407 C409	Tant-Tag 35 wV 3.3 uf				2		
	C411 C412	Disc 100wV 'M' .01 mf				1		
	C413	Disc 100 wV 'P' .1 uf				1		
	C410	Elect R-L BP 50wV 'M' 2.2 mf				1		
	C401	Elect N-P 16wV 22 uf				1		
	C402							
		TITLE PROTECT PCB		DWN. BEH		ASSY.		REV
		MODEL A- 400		APP.		11104		11659
Cerwin-Vega								

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
32	C403 C405	Tant-Tag 35wV 6.8 uf				2		
33	C404	Elect. 16wV 47 uf				1		
34	C406 C408	Elect. 100wV 2.2 uf				2	11236	
35		Semiconductors						
36		Omit						
37	CR411	Jumper				2		
38	CR401 CR403							
39	CR407 CR408							
40	CR409	Diode 1N4004				3	2879	
	CR402 CR404							
	CR412 CR413							
	CR414 CR415							
41	CR405	Diode 1N4148				6	2856	
42	CR406	Diode Zener 1N4744				1	2885	
43	CR410	Diode Zener 1N5242				1	2882	
44	U401	Diode Zener 1N5240B				1	11239	
45	Q401 Q403 Q418	555 Timer	NE 555	Signetics		1	11240	
	Q419	Transistor	2SC1279S	NEC		4	2849	
46	Q402 Q404 Q407							
	Q410 Q411 Q412							
	Q413	Transistor	2SC1213 AC	Hitachi		7	2852	
47	Q405 Q406 Q408							
	Q409 Q416 Q417							
48	Q414	Transistor	2SA639Q	NEC		6	2848	
49	Q415	Transistor	2SA673D	Hitachi		1	2853	
50		Transistor	CV009	CV		1	2623	
51	K401	Relay 48 VDC	HL2P48 VDC	Arrow Ma		1	11241	
52	P401	15 Pin Male Connector W/Latch	09-65-1151	Molex		1	11242	
53		Double .250" Male Faston Terminals	41480	Amp		4	11231	
54		Eyelets				4		
55	VR401 VR402	Varistor	V 120ZA6	GE		2	11273	
					DWN. BEH		REV	
TITLE PROTECT PCB					APP.		ASSY.	
MODEL A-400					11104		11658	

Cerwin-Vega

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print		CV		1	11108-1	
2		Printed Circuit Board		CV		1	11008B	
3		Schematic		CV		1	11303	
4		Omit						
5	R806	Carbon Film ½w 5% 10 ohm				1		
6	R805	Carbon Film ½w 5% 470 ohm				1		
7	R802	Carbon Film ½w 5% 1.0K ohm				1		
8	R801	Carbon Film ½w 5% 3.3k ohm				2		
9	R803 R804	Semiconductors						
10		Diode				1	2856	
11	CR802	1N4148						
12	CR801, CR803 CR804, CR805	LED Indicators Jumper	GL-9PR2	Sharp		4	8251	
13		8 Pin Male Connector With Latch	09-65-1081	Molex		1	11232	
14						1		
					DWN. BEH	ASSY.	REV	
					APP. <i>[Signature]</i>	11108-1		
Cerwin-Vega		TITLE LED P.C.B.						
		MODEL A-400						

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE																											
1		Assembly Print		CV		1	11109																												
2		Chassis Schematic		CV		1	11302																												
3																																			
4		Assembly Drive Board PCB		CV		2	11102																												
5		Assembly Output PCB		CV		1	11103																												
6		Assembly Protect PCB		CV		1	11104																												
7		Assembly Input Relay PCB		CV		1	11105																												
8		Assembly Heat Sink		CV		2	11106																												
9		Assembly L.E.D. PCB		CV		1	11108																												
10		Assembly Transformer		CV		1	11113																												
11		Assembly Ground Plate		CV		1	11114																												
12																																			
13		Chassis		CV		1	11003-2																												
14		Fan Screen 8 Mesh	27 ga. City Wire	Cloth		1	11014																												
15	C901 C902	Electrolytic	13000 MFD	Sangamo		2	2654																												
16		Power Cord	04929	Carol		1	2601																												
17	CR901	Bridge Rectifier	J 775	Solitron		1	2604																												
18	S901	Power Switch	JA 2002	SMK		1	11228																												
19	S902	Tap Change Switch	2GL50-73	Carling		1	8254																												
20		Switch Guard		CV		1	8050																												
21		Binding Post (5way)	BF30-2-BRC	Superior		2	2607																												
22		Binding Post (Ground)	110	Smith		1	8257																												
23	B901	Fan (Blower)	WS2107 FL	IMC		1	11202																												
24		Fuse Holder	SN-2059	SMK		1	8252																												
25	F901	Fuse 3 AG-10A				1																													
26	J501 J502	Jack - Phone	S-G-7717	SMK		2	11205																												
27	J503 J504	Jack - Phono	350 IFR	Swcft		2	2616																												
28																																			
29		Strain Relief	SR6N3-4	Heyco		1	2656																												
30		Capacitor Mounting Bracket	115058-14	Sangamo		2	2608																												
31	RT901 RT902	Thermistor	Amatex S.G. 7	Amatex		2	11238																												
32		Speedy Tys	65002	Waldom		7	2812																												
33		Cable Clamp Nylon	8911	Smith		2	5236																												
34		Cable Clamp Nylon	8914	Smith		1	11234																												
35		Cable Clamp 1/2" Adhesive		Richco		1																													
36		Standoff 3/8"Nylon	TCBS-6N	Richco		8	11229																												
37		Terminal Board	203104-MT-NL4A3	Magnum		1	11243																												
38		.250 Faston Terminals	H44143	Amp		4																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;"></td> <td style="width:10%;"></td> <td style="width:10%;"></td> <td style="width:10%;"></td> <td style="width:10%;"></td> <td style="width:10%;"></td> <td style="width:10%;"></td> <td style="width:10%;"></td> <td style="width:10%;"></td> </tr> <tr> <td colspan="4">TITLE CHASSIS</td> <td>DWN.</td> <td>BEH</td> <td colspan="3">ASSY.</td> </tr> <tr> <td colspan="4">MODEL A-400</td> <td>APP.</td> <td><i>SAH</i></td> <td>12-19-78</td> <td>11109</td> <td>A</td> </tr> </table>																		TITLE CHASSIS				DWN.	BEH	ASSY.			MODEL A-400				APP.	<i>SAH</i>	12-19-78	11109	A
TITLE CHASSIS				DWN.	BEH	ASSY.																													
MODEL A-400				APP.	<i>SAH</i>	12-19-78	11109	A																											

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
39		Screw 90° CSK M4x0.7x8mm Blk F-H Phil				2		
40		Screw CSK 6/32 x 1/4" F-H Blk Phil				4		
41		Screw 6/32 x 1/4" R-H Blk Phil				4		
42		Screw 6/32 x 5/8" P-H Blk Phil				3		
43		Screw 6/32 x 5/8" P-H Phil Zinc				1		
44		Screw 4/40 x 3/8" F-H Cad				8		
45		Screw Sheet #6x3/4" 'A' P-H BLK Phil				4		
46		Screw Sheet #6x1/2" R-H Blk Phil				2		
47		Screw Sheet #6x3/8" 'A' P-H Blk Phil				3		
48		Screw 10-32 3/8 P-H Blk Phil				4		
49		Nut 4-40 x 1/4" Hex Cad				8		
50		Nut 6-32 x 1/4" Hex Cad				2		
51		Nut 10-32 x 5/8" Hex Cad 7/64" Th.				2		
52		Nut Tinnerman #6	C8092-632-4	Eaton		6	8261	
53		Nut Tinnerman #6	A8092-632-4	Eaton		1	11237	
54		Fastening Clip	PN-512-011	IMC		4	11230	
55		Washer #10 Int.-Tooth Lock				2		
56		Washer #4 Int.-Tooth Lock				8		
57		Washer #6 Int.-Tooth Lock Black				4		
58		Washer 3/8"O.D. Int.-Tooth Lock				2		
59		Washer Flat	2678	Smith		2	2689	
60		Washer Shoulder	2158	Smith		2	2605	
61		Solder Lug #6 Int.-Tooth				1		
62		Knobs	1903-1L	KurzKasch		2	11275	
63		Wire: Yellow #16		CV		1	11258	
64		Wire: Yellow #16		CV		1	11259	
65		Wire: Red #16		CV		1	11260	
66		Wire: Viloet #16		CV		1	11263	
67		Wire: Black #16		CV		2	11264	
68		Wire: Black #16		CV		1	11266	
69		Wire: Brown #16		CV		1	11267	
70		Wire: Black #16		CV		1	11268	
71		Loctite				A.R.		
72		Nut Self-Lock 10-32 Cad				4		
73		Screw Sheet #8-.500 B PH. Blk Phil				6		
74		Washer #8 Int.-Tooth Lock Black				6		
				DWN.	BJG	ASSY.		REV
Carwin-Vega				APP.		11109		A

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print		CV		1	11107	
2		Front Panel		CV		1	11005-1	
3		Handle , Rack	VPC-99	Vemaline		2	11218	
4		Screw 8/32- . 5				4		
5		Blk Hex						
6								
					DWN. BEH	ASSY.		REV
					APP. <i>SDM</i> 9-28-78	11107		
Cerwin-Vega		TITLE	FRONT PANEL					
		MODEL	A-400					

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print		CV		1	11114	
2		Ground Plate		CV		1	11009	
3								
4		Fuse 3AG-10A				4		
5	F1401- F1404	Fuse Block	403	N. Tel-Tr.		2	11271	
6								
7		Screw UNC 6/32- $\frac{1}{2}$ " P-H Cad Phil				5		
8		Screw #6 x 5/16" P-H Blk Phil				4		
9								
10		Wire : red #16				2	11261	
11		Wire : violet #16				2	11262	
12								
13								
		TITLE GROUND PLATE ASSEMBLY	1 Required	DWN. BEH			ASSY.	REV
		MODEL A-400		APP. <i>[Signature]</i>			11114	
		Cerwin-Vega						

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Assembly Print		CV		1	11106	
2		Assembly 11103		CV		1		
3		Semiconductors						
4								
5	Q601 Q603 Q605	Transistor NPN	25C1586	Sanken		4	2855	
6	Q602 Q604 Q606	Transistor PNP	25A909	Sanken		4	2854	
7	Q608							
8		Mechanical Parts						
9		Heat Sink		CV		1	11001	
10		Transistor Cover		CV		2	11006	
11		Standoff	8218-A-0632	Amaton		2	8247	
12		Standoff	9741-ss-0632	Amaton		2	8266	
13		Screw M3 x0.5-15mm P-H Phil.				16		
14		Screw 6/32 UNC- .375"L Blk PH Phil				4		
15		Screw 6/32 UNC-1½"L Blk Phil Zinc				2		
16		Screw 8-32 -.500 Blk Phil PH				6		
17		Washer #4 Int.-Tooth Lock				16		
18		Washer #6 Int.-Tooth Lock Black				4		
19		Washer #6 Int.-Tooth Lock Zinc				4		
20		Washer #8 Int.-Tooth Lock Black				6		
21		Transistor Insulator DM-101k		McNabb		8	2611	
22		Heat Sink Compound				A.R.	2675	
			2 Required	DWN.	BJG	ASSY.		REV
				APP.		11106		A
Cerwin-Vega			TITLE Heat Sink					
			MODEL A-400					

ITEM	REF DISGN	DESCRIPTION	MFGR PART #	MFGR	PART/STOCK #	QTY	SPEC. #	PRICE
1		Completed Amplifier		CV		1	11101	
2		Shipping Carton		CV		1	11501	
3		Owners Manual		CV		1		
4		Plastic Bag		CV		1		
5		Chassis Cover		CV		1	11004	
6		Rubber Feet		RUBBERCRAFT		4	2660	
7		Fan Deflector		CV		2	11013	
8		Nylon Clasps		Richlok		4	11233	
9		Sheet Screw #8- $\frac{1}{2}$ "A" P-H Phil Zinc				4		
10		Sheet Screw #6- $\frac{1}{4}$ "A" Blk P-H Phil Zinc				8		
11								
12								
TITLE FINAL ASSEMBLY			DWN. BEH		ASSY.		REV	
MODEL A-400			APP. <i>[Signature]</i>		11101			
Carwin-Vega								

Cerwin-Vega reserves the right to make changes in product design and specifications at any time.



Cerwin-Vega! 12250 Montague Street,
Arleta, California 91331 (213) 896-0777

© Cerwin-Vega! Inc.