



# POWER AMPLIFIER SERVICE MANUAL

## CE Series CE 4000

Some models may be exported under the name *Amcron*®

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<b>CAUTION</b>	<b>AVIS</b>
TO PREVENT ELECTRIC SHOCK DO NOT REMOVE TOP OR BOTTOM COVERS. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL. DISCONNECT POWER CORD BEFORE REMOVING REAR INPUT MODULE TO ACCESS GAIN SWITCH.	À PRÉVENIR LE CHOC ÉLECTRIQUE N'ENLEVEZ PAS LES COUVERTURES. RIEN DES PARTIES UTILES À L'INTÉRIEUR. DÉBRANCHER LA BORNE AVANT D'OUVRIER LA MODULE EN ARRIÈRE.



<b>WARNING</b> TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE!
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The lightning bolt triangle is used to alert the user to the risk of electric shock.



The exclamation point triangle is used to alert the user to important operating or maintenance instructions.

## Revision History

<b>Revision Number</b>	<b>Date</b>	<b>Comments</b>
Rev. A	05-2001	Initial Printing
Rev. B	11-2002	Added missing parts list on Page 5-76. Updated area code and mailing address on Pages 1, 2 and 7. Updated sections 3.2.4, 4.3.3, 4.3.9, 4.4.5, 4.6.1, 4.6.8, 4.7.2, 4.7.3, Figure 4.16. Added notes to pages 5-39, 5-73, 5-97.



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# 1 Introduction

## 1.1 Introduction

This manual contains complete service information on the *Crown*® CE 4000 power amplifier. It is designed to be used in conjunction with the *CE 4000 Reference Manual*; however, some important information is duplicated in this Service Manual in case the *CE 4000 Reference Manual* is not readily available.



**NOTE: THE INFORMATION IN THIS MANUAL IS INTENDED FOR USE BY AN EXPERIENCED TECHNICIAN ONLY!**

## 1.2 The CE 4000 Amplifier

The Crown CE 4000 is a compact audio amplifier designed for professional use, providing high-power amplification from 20 Hz–20 kHz with minimum distortion. The CE 4000 features Crown's patented, award-winning BCA® (Balanced Current Amplifier) engineering, for superior power output, increased efficiency, legendary Crown sound and extraordinary reliability. Crown's enhanced, switch-mode power supply with power factor correction allows the amplifier to be used worldwide without changing power supply components or settings. Other features include selectable on-board high-and low-pass filter sets, SST (System Solution Topologies) module compatibility, and a choice of dual output connectors:

Speakon® plus 5-way barrier block, 5-way barrier block plus binding strip, or dual Speakon.

## 1.3 Scope

This Service Manual is intended to apply to all versions of the CE 4000 amplifier. The Parts Listings include parts specific for the US version and the European version. For parts specific only to other versions contact the Crown Technical Support Group for help in finding part numbers.

## 1.4 Warranty

Each Reference Manual contains basic policies as related to the customer. In addition, it should be stated that this service documentation is meant to be used only by properly trained personnel. Because most Crown products carry a 3-Year Full Warranty (including round trip shipping within the United States), all warranty service should be referred to the Crown Factory or Authorized Warranty Service Center. See the applicable Reference Manual for warranty details. To find the location of the nearest Authorized Warranty Service Center or to obtain instructions for receiving Crown Factory Service, please contact the Crown Technical Support Group (within North America), or your Crown/Amcron Importer (outside North America). If you are an Authorized Warranty Service Center and have questions regarding the warranty of a product, please contact the Field Service Manager or the Technical Support Group.

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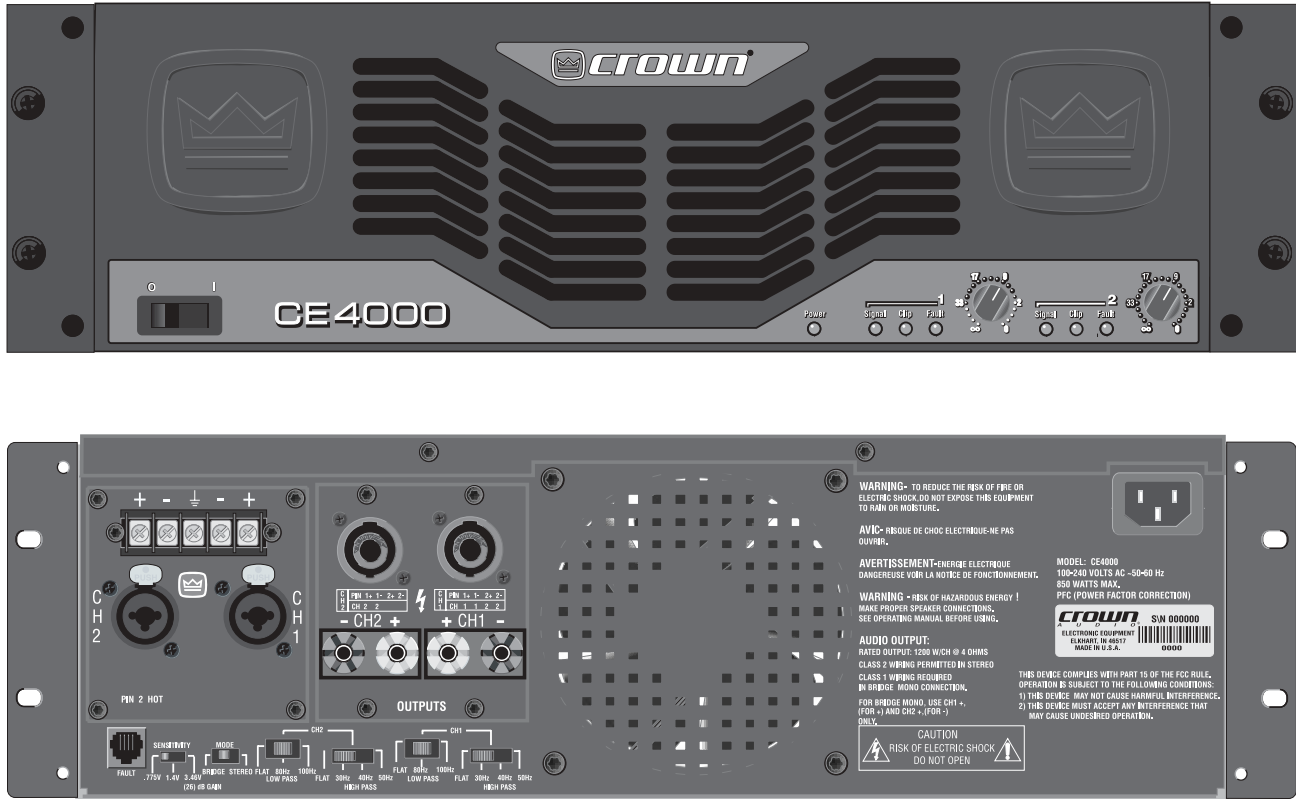


Figure 1.1 CE 4000 Front and Rear Views



## 2 Specifications

Note: All measurements are in Stereo mode with 8-ohm loads and an input sensitivity of 26-dB gain at 1-kHz rated power unless otherwise specified.

### Power

#### Output Power:

<b>CE 4000 Power Chart</b>	
Maximum power @ 1 kHz with 0.5% THD	
2 ohm Dual	<b>1800W<sup>1</sup></b>
4 ohm Dual	<b>1200W</b>
8 ohm Dual	<b>600W</b>
4 ohm Bridge-Mono	<b>3600W</b>
8 ohm Bridge-Mono	<b>2400W</b>
1. $\geq$ 200-V line voltage.	

**Load Impedance:** Safe with all types of loads. Rated for 2, 4 and 8 ohms in Stereo mode, 4 and 8 ohms in Bridge-Mono mode.

#### Voltage Gain to 1-kHz, 8-ohm rated output:

39.0-dB gain at 0.775-volt sensitivity;  
33.8-dB gain at 1.4-volt sensitivity;  
26-dB gain at 3.46-volt sensitivity.

**Required AC Mains:** 50/60Hz, 100-240VAC ( $\pm$ 10%).

#### AC Line Current,

100 Volts: 8.5 A;  
120 Volts: 7.1 A;  
230-240 Volts: 3.7 A;

At Idle: Amp draws no more than 155 watts.

**AC Line Connector:** 15A IEC Connector with Country

Specific Cord and Plug.

Inrush Current\*: 50.86 A.

### Performance

**Frequency Response:**  $\pm$ 0.25 dB from 20 Hz to 20 kHz at 1 watt (See Figure 2.1).

**Phase Response:**  $\pm$ 15 degrees deviation from linear phase from 20 Hz to 20 kHz at 1 watt.

**Signal to Noise Ratio, A-Weighted, 20 Hz to 20 kHz:** Better than 100 dB below rated 1-kHz power;

\* Per EN 55103-1: 1996 Annex B and Annex F. Highest reading from a sample of 10 random readings.

\*\* Measured using binding-post output connectors.

**Total Harmonic Distortion (THD):** 1-kHz rated power, 0.5% or less THD.

**Intermodulation Distortion (IMD):** (60 Hz and 7 kHz at 4:1) Less than 0.5% at rated power to 30 dB below rated power at 8 ohms.

**Damping Factor:** Greater than 700 from 10 Hz to 400 Hz.\*\*

**Crosstalk:** Better than 50 dB below rated power, 20 Hz to 20 kHz.

**Common Mode Rejection (CMR):** Better than 70 dB from 20 Hz to 1 kHz.

**DC Output Offset (Shorted Input):**  $\pm$ 10 mV.

### Controls & Connectors

**Level:** A 31-step detented rotary level control for each channel located on the front panel.

**Power:** An on/off rocker switch located on the front panel.

**Mode:** Turn power off before switching. A two-position switch located on the back panel below the input connectors which, when turned to stereo, operates the amplifier as two independent channels. When "Bridge-Mono" mode is selected, the amplifier bridges the two output channels for twice the output voltage.

**Sensitivity:** A three-position switch located on the back panel next to the Mode switch. Switchable among 0.775 volts or 1.4 volts for full output into an 8-ohm load (default setting), or 3.46 volts for a fixed voltage gain of 26 dB.

**Fault Jack:** A back-panel RJ-11 jack that may be remotely monitored to signal amplifier Fault condition. An LED or other signalling device (not supplied) may be used.

#### Filter Switches:

**Low Pass:** A three-position switch for each channel located on the back panel below the input and output modules. Switchable among settings for Flat, 80 Hz and 100 Hz. Filter rolloff is 24-dB per octave.

**High Pass:** A four-position switch for each channel located on the back panel below the input and output modules. Switchable among settings for Flat, 30 Hz, 40 Hz and 50 Hz. Filter rolloff is 18-dB per octave.

### Indicators

**Signal:** A green LED for each channel which flashes when a very low-level signal ( $>$ -40 dBm) is present at input. May be used for troubleshooting cable runs.

**Clip:** A red LED for each channel which turns on when distortion becomes audible in the amplifier output.

**Fault:** Normally off, this red indicator will blink under five different conditions:

1. When the amplifier is first powered up, until the unit is ready for operation.
2. If the heatsinks reach a temperature above normal working limits.
3. If the transformer thermal protection circuit is activated.
4. If amplifier output wires develop a short-circuit.
5. If the amplifier output stage becomes non-operational.
6. If there is a problem elsewhere in the amplifier.

This circuit may be monitored remotely by plugging a simple switching circuit using an LED or other signaling device into the back-panel RJ-11 (Fault) jack. Under some conditions, the output of the amplifier will be muted.

**Power:** A green LED that turns on when the amplifier has been turned on and has power.

**Input/Output**

**Input Connector (standard module):** One Neutrik® Combo connector for each channel which features a balanced ¼-inch (6.35-mm) phone jack and a 3-pin female XLR connector, in parallel with a barrier strip termination.

**Input Stage:** Input is electronically balanced and employs precision 1% resistors.

**Input Impedance:** Nominally 20 k ohms, balanced. Nominally 10 k ohms, unbalanced.

**Input Sensitivity:** 0.775 volts or 1.4 volts for standard 1-kHz power, or fixed 26-dB gain.

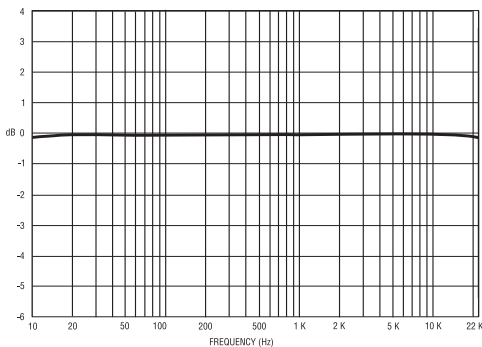


Figure 2.1 Typical Frequency Response

**Output Connectors:** Three options available: Four (4) Neutrik® Speakon® NL4MP (mates with NL4FC) output connectors; (2) 5-way binding posts in parallel with two (2) Speakon® connectors; or barrier strip outputs in parallel with two (2) 5-way binding posts.

**Output Signal,**

**Stereo:** Unbalanced, two-channel;

**Bridge-Mono:** Balanced, single-channel. Channel 1 controls are active; Channel 2 should be turned down.

**Wiring Configuration:** (see Figure: 2.2).

**Protection**

CE 4000 amplifiers are protected against shorted, open or mismatched loads; overloaded power supplies; excessive temperature, chain destruction phenomena, input overload damage and high-frequency blowups. They also protect loudspeakers from input/output DC, large or dangerous DC offsets and turn-on/turn-off transients.

**Construction**

Rugged steel chassis is formed into a durable package any stagehand could love. Coated with environmentally friendly powder for long life and ease of maintenance.

**Cooling:** Three-speed proportional speed fan.

**Dimensions:** EIA Standard 19-inch rack mount width (EIA RS-310-B), 5.25-inch (13.34-cm) height and 16.25-inch (36.56-cm) depth with additional 1-inch rear rack ears.

**Weight:** The CE 4000 net weight is 33.3 pounds (15.1 kg). Shipping weight is 39.3 pounds.

OUTPUT ASSIGNMENT			
PIN	CH	PIN	CH
1+	2	1+	1
1-	2	1-	1
2+		2+	2
2-		2-	2
CH-2		CH-1	

Figure 2.2 Output Pin Assignments

## 3 Theory of Operation



**WARNING:** All voltages on the primary side of the flyback or bridge isolation transformers are not referenced to ground. They are referenced to the mains. When measuring these voltages with mains voltage applied, always use an isolation transformer to provide the mains voltage (and tie SMPSREF to signal ground) or use an isolated differential probe.

### 3.1 Audio Signal Path

For the sake of simplicity, only channel one of the audio signal path is described.

#### 3.1.1 Input Stage

Signal is presented to the CE4000 through one of three connectors when using the standard input module. Each channel is outfitted with a balanced XLR / phone jack, and a barrier strip. These connectors are wired in parallel, which allows daisy chaining when needed. The incoming shield is tied to ground through an 82-Ohm resistor (R607) in parallel with a 0.1uF cap (C605) for the purpose of inhibiting ground loop circulating currents and RFI protection. The signal is then converted from balanced to unbalanced in the Balanced Input Stage where it receives further RFI protection. Input impedance is 20k Ohm balanced and 10k Ohm unbalanced. Signal then flows into the Variable Gain Stage where the front panel level controls are allowed to affect the gain.

The CE4000 amplifier comes with three input sensitivity selections: 0.775V, 1.4V, and fixed 26dB gain set by a switch on the Bridge/Fault/Gain (BFG) PWA. With the gain switch (S1) in the 0.775V position, R6 sets the gain while in the 1.4V position R5 in parallel with R6 set the gain. In the 26dB position, R4 in parallel with R6 set the gain. The signal is then put under the control of a full-time compressor circuit comprised of a symmetrical window detector, a buffer amplifier, and the gating op-amp which uses several small components to set the compressor's attack and decay characteristics. These components are found on the large main PWA. The actual compressing is accomplished by an opto-isolator (U1) on the BFG PWA that affects the gain in the signal path.

The signal then is passed through a series of switchable filters that allow the signal to be low pass

and high pass filtered at various frequencies. The switches are located at the back panel. The low pass filter is a fourth-order Linkwitz-Riley type and the high pass filter is a third-order Butterworth type. These switches (S3 for the low pass and S5 for the high pass) and their necessary circuitry are found on the BFG PWA.

Inherent in all PWM amplifiers is a rise in gain at higher frequencies. Because of this, a 32 kHz 7th-order Gaussian low pass filter has been included in the input stage of the CE4000 (on the main PWA). The Gaussian filter-type is unique in that it has minimal ringing and excellent phase response so even a high-order filter such as this one does not adversely affect the sonic excellence of the product. U111-A, -B, -C and -D comprise this filter while U110-B and R178 form the gain calibration stage for this 7th order filter.

#### 3.1.2 Error Amplifier

The signal next enters the main amplifier error amp (U100-C) where it is mixed with a small portion of the output voltage and current in such a way as to control the amplifier's overall output performance. From the error amplifier, the signal is divided and fed to the modulator. Since the modulator circuit is balanced, the drive signal for the positive modulator is inverted by U100-D.

#### 3.1.3 Modulator

U101 and U103 are high-speed differential comparators. U101 is the positive comparator and U103 is the negative comparator. The comparator section has two outputs: inverting and non-inverting. The output is therefore balanced. The audio signal is applied to the inverting input of both differential comparators (with the positive modulator receiving the audio 180 degrees out of phase from the negative modulator). The 250 kHz triangle wave (described below) is applied to the non-inverting input of both differential comparators. With no audio signal, the bipolar triangle wave is therefore compared to a zero-volt signal and this results in a 250 kHz square wave pulse train that is passed to the NAND gate section of the differential comparator.

Each NAND gate has two inputs: the modulated signal from the high speed comparator section and the current limiter detect signal from U106-A. In the event of over-current, the current limiter signal is shut off disabling the NAND gates. This results in no

pulses exiting the comparators long enough to keep the current at an acceptable level.

If there is no current-limiting action, the balanced output of U101 forms the positive portion of the output waveform ( $V_p$ ). The output of U103 is also balanced and forms the negative portion of the output waveform ( $V_n$ ). These two balanced signal lines are routed to the output stage drivers, U119 and U123. If an audio signal is present at the inputs of the modulators, the triangle wave will be compared to a varying signal at the comparators and the outputs of the NAND gates will be a 250 kHz pulse train in which the widths of the pulses vary with the audio amplitude.

This operation is described as Pulse Width Modulation (PWM), as used in the BCA amplifier.

### 3.1.4 Triangle Generator

The 250 kHz triangle wave has its origins from the 4MHz generator (clock generation is described in the power supply section). After U224-A divides the 500kHz square wave down to 250 kHz, U105 converts the signal from a 0V-5V square wave to a -5V to +5V triangle wave that is extremely accurate. R171, C159, C153, C154, R168, and R169 provide the feedback loop to the linear IC U105. The potentiometer R170 allows the triangle wave to be DC offset in order to change the overlap/underlap characteristics of the output stage. Overlap/underlap is analogous to the bias adjustment made in linear output stages but it does not require a temperature sense to prevent thermal runaway. The output of U105 is routed to the non-inverting inputs of the modulators.

A note on the triangle generator for channel two: Before the frequency is divided down by two, the 500 kHz clock is inverted by U106-B. This effectively shifts the channel two triangle wave 90 degrees from that of channel one.

### 3.1.5 Output

The PWM modulated 250 kHz signals exit the modulators and enter the output stage via optocouplers U119 ( $V_p$ ) and U123 ( $V_n$ ). These optocouplers give electrical isolation from the low voltage circuitry to the high voltage output circuitry. The output of U119 and U123 are then sent to the output MOSFET drivers.

U120 and U121 are dual inverting high-speed drivers designed to interface low current digital circuitry (U119 and U123) with power MOSFETs (also abbreviated FETs). U120 and U121 are used to drive the gates of the output FETs (Q106-Q113).

In order to produce gate drive power to the drivers, a floating supply is generated for the  $V_p$  side. This supply uses U124-A and U124-B to divide the 500kHz clock down to 125 kHz. The half-bridge driver U22 uses this 125 kHz clock to control the high-side and low-side FETs in the dual FET IC U23 so that the output of U23 is alternately connected to +15VPS and ground. The rate of current rise is kept in control by the inductance of transformer T101. The end result is that the output of U23 is a square wave of 15V amplitude and approximately 50% duty cycle that is used as the primary excitation for the transformers. The transformer provides the required isolation and the secondary AC is converted back to DC by diodes D131 and D132 and filter capacitors C316-C319. The  $V_n$  side receives gate driver power from the flyback PWA (see below) and this power is referenced to the -Vcc rail.

We pause now for a qualitative description of output stage operation (refer to Figure 4.1). All parts to the left of "lout" are positive or "p" side parts and all parts to the right of "lout" are negative or "n" side parts. The switches Swp and Swn are analogous to the FETs. Quiescent operation will be considered first. At the start of a switching cycle Swp and Swn are both turned on. Current flows from +Vcc, through Swp, through Lp, through Ln, through Swn, and down to -Vcc. The current rises at a controlled rate in the Lp and Ln inductors (see the current diagram to the right in Figure 4.1). Halfway through the cycle, the switches turn off but the inductors have reached a certain current flow (the peaks on the diagram) and now must continue pushing current in the same direction. The current continues to flow in the same direction through the inductors but comes through the diodes because the switches are open. Specifically, current flows from -Vcc through D1, through Lp, through Ln, through D2, and to +Vcc while ramping down. At quiescent, the Lp and Ln currents cancel so the net voltage developed at lout across the capacitor is zero. For positive voltage output, Swp is left on longer than Swn and for a negative output voltage, the opposite occurs. Note that for any output voltage, the "on" time of both switches will overlap, even if one is on longer than the other.

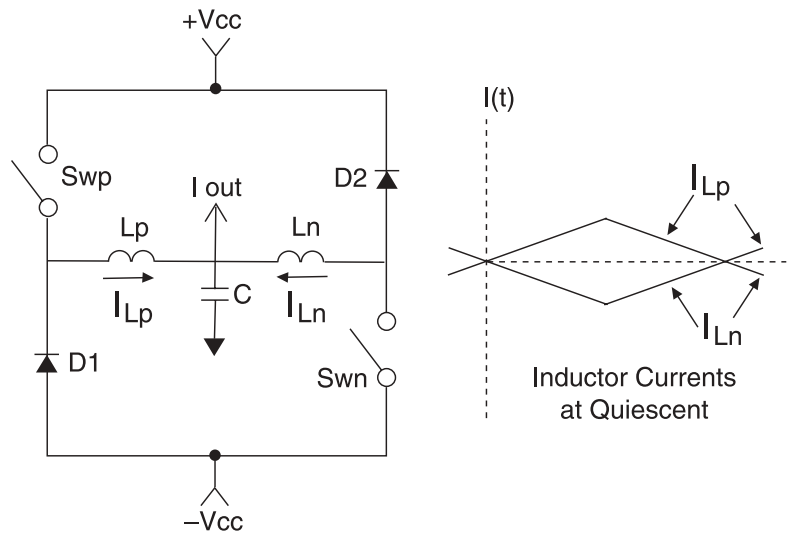


Figure 4.1 BCA Operation

Now back to the description of output circuit flow: after the FETs, the signal is then routed to the BCA filter inductors ( $L_p$  and  $L_n$ ) and the current sense resistors (R383/R361 and R384/R362). The combining point (B1) is then sent to the Output Filter.

With no audio modulation, the PWM pulse train that is sent to the gates of each set of FETs is the same and the duty cycle is approximately 50%. This means that for no audio input, the positive FETs (Q106, Q107, Q110 and Q111) turn on and off at the same time as the negative FETs (Q108, Q109, Q112, Q113). As mentioned before, the  $L_p$  and  $L_n$  inductors control the rate of rise of the current during this time so that this does not act like a short during the couple of microseconds that they are on. The time that the FETs are on ramps current up in the inductors which stores energy in them. This energy is released through the diodes (D140-D143) when the FETs are turned off. The  $V_p$  and  $V_n$  nodes swing between  $-V_{cc}$  and  $+V_{cc}$  with a duty cycle of approximately 50%.

Operating the output stage in this way causes the current in the  $L_p$  and  $L_n$  inductors to completely cancel at the B1 node. This drastically reduces the filtering requirements necessary after the output stage.

If an audio signal is present at the input of the amplifier, the widths of the pulses at  $V_p$  and  $V_n$  change but the amplitude of the pulses stays at  $2 * V_{cc}$ . Positive audio signals will cause the positive side of the output stage to be on more than 50%

of the time while the negative side will be on less than 50% of the time. The total “on-time” will add to approximately 100%. Also, the on-time of the two polarities will overlap so that when the negative side is on, the positive side is also. For negative-going signals, the action is reversed (swap positive and negative). The result at the summing junction B1 is an amplified version of the input signal, with some noise superimposed on it. The B1 signal is then routed to the Output Filter.

### 3.1.6 Output Filter

The output filter is made up of three individual filters: a 250 kHz filter (L101/C128), a 500 kHz filter (L102/C131/C397), and a final 250 kHz filter (L104/C136-C139). The signal passes through these three filters to eliminate both residual 500 kHz and 250 kHz signals. The audio signal is then connected to the output PWA through buss bars.

## 3.2 Protection and Control Circuitry

### 3.2.1 Current Monitor

Audio output current levels are monitored by the use of transformer T100. A small primary winding is in series with the output current and the secondary develops a voltage across R140 proportional to the output current of the amplifier. This output current information is used for two purposes:

1. Negative feedback
2. Current feedback information for the modulators.

### 3.2.2 Current Limiter

To prevent excessive output current, the CE4000 amplifier incorporates a current limiting protection circuit. The current sense resistors (R383/R361 and R384/R362) in series with the Lp and Ln inductors sense the output current. The voltage dropped across these two resistors is sent back to U108-A and U108-B. D109, R163, and R165 set the voltage reference for U108-B. D109, R164, and R167 set the voltage reference for U108-A. Due to the circuit configuration, only the reference at U108-5 will show a voltage and it is set to 0.48VDC referenced to node B1 with no signal input.

The outputs of the comparators are normally open but since these two outputs are connected together and to U107-2 and through R161 to B1+15V, the level sits at one diode drop above B1 or +0.6VDC. Pin 3 of U107 is tied to B1. The output of U107 is inverting so normally the output is low. U106-A inverts the output and is used to turn the modulators on and off. Overall, if the outputs of U108 go low, the output of U106-A goes low to turn off the modulators U101 and U103.

The second input to U106-A is from the protection circuitry and is used to turn off the modulators (U101 and U103) for various reasons (see Section 4.2.4).

### 3.2.3 Display Circuitry

Just after the input signal is converted from balanced to unbalanced, it is routed to the signal detection circuit. With a signal approximately 45-dB below that required for full output, the Signal LED will illuminate. Note that this LED will indicate whether signal is present at the amplifier but not whether it is being output from the amplifier.

The compressor circuit is initiated by either the Input-Output Comparator (IOC) circuit or by the Thermal Limit Control (TLC) circuit. The IOC circuit, composed of Q100, Q101, R121-R126, and D105-D106, uses the error signal from the error amplifier (U100-C). If the error amplifier is unable to correct for non-linear behavior in the amplifier, the error amplifier (U100-C) will generate a voltage spike of approximately  $\pm 7V$ . The IOC circuit clamps that voltage to the  $\pm 7V$  limit (normally it would go to the op-amp's rails) and also generates a voltage greater than the window of  $\pm 0.3V$  that is detected by U117-C and U117-B. Depending on the polarity, U117-C or U117-B will go low during an IOC event. If this happens, U125-D goes high

and Q103 turns on. Q103 turns on the compressor opto (located on the BFG PWA) which compresses the input signal and reduces the peak voltage the amplifier is required to produce. U125-D going high will activate the "Clip" LED, but only if the IOC condition occurs long enough to be audible. C312 and R413 set the conditions at which the "Clip" LED illuminates. Details of the generation of the TLC signal are discussed in the next section.

The "Fault" LED indicates any condition when there is a reason for the modulators to be turned off. When activated, the Fault LED will flash at approximately 3Hz.

The "Enable" LED is turned on by the presence of the +15V supply (see Section 4.3.3).

### 3.2.4 Control Circuitry

After the low and high voltage rails are powered up and stable, the C354 timing capacitor, along with U114-C and associated circuitry holds the enable line (the net is called "Timing Cap 1") low for approximately four seconds. If Timing Cap 1 is low, U115-A stays low which causes Q115 to be high. This is input to U106-A that is inverted on the output and holds the modulators off.

Several detectors affect the status of Timing Cap 1. U114-A, along with scaling resistors R309 and R310 pull the line low if +Vcc rises beyond a safe limit. In a like fashion, U213-A, R315, and R316 look at the -Vcc rail. U213-B with scaling resistors R320 and R319 determine if the high voltage rails are high enough to ensure proper operation. If a large amount of high frequency energy is being produced by the output stage (such as during a shorted load condition), U114-B with scaling resistors R311 and R312 and time delay cap C176 will pull Timing Cap 1 low. If the airflow is blocked or severely clogged and even the fan on high speed can not keep the amplifier cool, U115-D will pull Timing Cap 1 low. If Timing Cap 1 goes low, it also turns on Q1 on the BFG PWA, which causes U5's transistor to not conduct. U5 is connected to pins 2 and 5 of the modular jack J3 that allows for remote sensing of the amplifier's operating condition.

Special Negative Temperature Coefficient (NTC) resistors are attached to three heatsinks and the power transformer to tell the amplifier if action needs to be taken to reduce the temperature. RT1 and RT2

are attached to the amplifier output heatsinks (one per channel). R711 is attached to the primary side power supply heatsink and R713 is attached to the power transformer. The NTC sensors feed the fan control circuit. Normally, the fan runs at very low speed and R325, R42, R508, R509, R333, R334, and R86 limit the voltage applied to the fan. For medium speed, Q105 conducts, shorting out R333, R334, and R86. For high speed, Q104 also conducts which shorts out the other dropping resistors.

“TLC” is a feature that allows the amplifier to decrease the amount of power it is dissipating if the power devices or transformer are climbing towards an unsafe temperature. This circuit uses the NTC-derived voltage to control a varying power limiter. This circuit only comes into play if forcing the fan into high speed is not enough to keep the unit at a safe temperature. The TEMP IN signal is delivered to U125-A's non-inverting input while a reference voltage is sent to its inverting input. U125-A scales and inverts the temperature signal while U125-B inverts this new signal. U112-B and U112-C compare the temperature information to the input signal amplitude. Normally, the output of U112-B&C is open collector but if limiting is required, this output is forced low and is sent to the compressor circuit as TLC 1.

The NTC voltages controlled by R339, R74, R712, and R714 respectively are diode-OR'd to U115-D. U115-D compares this voltage to a reference formed by R337 and R336 to determine if, as a last line of defense, Timing Cap 1 should be pulled low until the amplifier cools off.

In the rare event that DC is produced by the output stage, U113-C and U113-D form a window detector whose output goes low in that condition. This signal is latched on permanently by U113-A and U113-B and R304. This signal, which is high for a fault condition, is sent to U115-4 and will also turn off the modulators. To reset this latch, the power must be cycled to the amplifier.

## 3.3 Power Supply Operation

### 3.3.1 Power Entry and Filtering

AC power enters the amplifier through a power cord equipped with an IEC (unpluggable) connector. It then passes through the EMI filter to remove switching noise caused by the amplifier and power supply. The parts on the primary side of the power distribution circuitry (including those on the EMI PWA) have all

met stringent regulatory safety requirements and, if they fail, must be replaced by the correct part as called out in the PWA documentation.

### 3.3.2 Fuse

In the rare event that a power supply failure draws excessive current from the mains and the power supply itself cannot reduce the current by shutting down the controllers, a fuse will blow on the EMI filter PWA. This fuse is accessible through a slot in the filter shield and is the same value regardless of the mains voltage that the amplifier is used with. Always replace the fuse with the same type and rating!

### 3.3.3 Low-Voltage Supplies (Flyback)

Several things happen in parallel when the power switch is first turned on. The line current flows through PTCs R1 and R2 to prevent high inrush currents. The current is then rectified by D1 and flows through L1 and D2 to charge energy reserve caps C1 and C6. As soon as sufficient voltage is detected at the “Vbulk” node, the low voltage “flyback PWA” supply starts running. It is a buck supply that self-starts by free running (not synchronized to any clock) at about 80 kHz. This supply produces all of the required low voltage supplies except the Vp gate drive power mentioned above in the “Output” section. All of the secondary supplies are isolated from the primary by a transformer. After the low voltage supplies are up and running, the clock circuitry runs and generates a synchronizing signal for the flyback PWA that overrides the free-running circuit and forces the flyback to run at 125 kHz.

### 3.3.4 Turn-On Control Circuitry

As mentioned in the previous section, while C1 and C6 are being charged through the PTCs, Q11 is held off and C47 charges up in approximately two seconds. U10-A's output then goes high which turns Q8 on forcing U13-B's output high which turns on the relay via Q9 and shorts out the PTCs and allows full line voltage to get to C1 and C6. As Q8 is turning on, Q3 turns off causing C24 to discharge through R9 and, after about 15mS, forces U13-A's output low which turns Q14 and Q15 off. When Q14 and Q15 are on, they ground the soft-start pins of controllers U2 and U4 and this prevents them from running.

Three conditions can prevent the node at U10-A's output from going high. U24-A will hold this node low through D45 if there is a fault detected by the audio output stage or if the power supply detects an

overcurrent condition. The circuit of U24-A and U24-B will latch if either of these conditions is detected. U11-B will hold the node low if U11-A detects a low line voltage condition (about 60VAC) such as a brownout.

### 3.3.5 PFC Boost Stage

After the relay closes and the soft-start pins are opened, the PFC controller, U2, starts to run. The GDRV pin (20) on U2 controls gate drivers U9 and U26 which drive the gates of Q1 and Q2 in a boost mode configuration. Several inputs to the controller affect its operation. The controller uses feedback from the "V BULK" node, compensated by R24, C314, and C14 and fed into U2-13 and U2-14 to maintain approximately 400VDC at this node. The feedback loop is quite slow, in the "10's of Hz" range, unlike that of a power amplifier, and so depends on the large energy reserve capacitors to supply impulsive power but overall, the voltage is regulated to 400VDC regardless of the line voltage or the load current. Note that 400VDC is higher than the highest expected peak line voltage so the PFC stage is always boosting to a known voltage. The PFC controller also looks at the incoming "RECT AC+" voltage and makes sure that the current the boost stage draws is in phase and shaped like the voltage. This makes the amplifier look like a resistor to the AC mains, and allows it to pass certain regulatory requirements. Pin U2-3 looks at the incoming line voltage to make sure it is within safe limits and if not, shuts down the FETs. R36 sets the current limit of the PFC stage to approximately 47Amps peak. Using all of these inputs, U2 causes the boost stage to take small amounts of current from the line 62,500 times each second.

### 3.3.6 Bridge Isolation Stage

The 400VDC is then "bucked" down to the ground referenced rails (+Vcc and -Vcc) needed by the audio amplifier. Controller U4, through gate drivers U17, U31, U29, and U32 and transformers T2 and T3, turns Q4 and Q7 on at the same time, then turns Q4 and Q7 off and Q5 and Q6 on at the same time, causing T1 to convert voltage and current to its secondary. This process is repeated so that any two of the four FETs are on about 85% of the time. U4 runs at 125kHz (the 250kHz sync signal is divided down within the IC). Diodes D3-D6 and capacitors C7-C8 rectify the secondary AC to DC. Transformer T1 provides isolation between primary (mains) and secondary (ground referenced) power for safety. Controller U4 is called a "Phase-Shifted Bridge Controller" because as its soft-start pin is released and U4-19 climbs in voltage (U4-19 is a current source), the controller slowly allows the power transfer to ramp up by phase-shifting the power FETs properly. This stage is referred to as a "buck" stage (as mentioned previously), an "isolation" stage for its transformer action, and a "bridge" stage since the four FETs form a full bridge topology.

The AC primary current travelling through the transformer is also passed through a small current transformer in order to sense the current. This AC signal is passed through diodes D9-D10 and D12-D13 and cap C26 to convert it to DC. If the bridge current is high and remains high for several seconds (such as when the amplifier is producing high voltage, high current sine waves), the average power limiter will tell the audio amplifier to invoke the compressor and slowly reduce the power output. The DC signal from C26 is also compared to a reference in the Over Current Detect Circuit and will latch both U2 and U4 off if currents above 50-55 Amps are detected in the bridge primary. The power to the amplifier must be cycled to reset this latch.



## 4 Maintenance

### 4.1 Where to Begin

Effective repair involves three basic steps:

- 1) Determine the symptom(s) of the problem
- 2) Identify the cause(s) of the symptom(s)
- 3) Repair the unit to eliminate the cause(s).

To determine the symptoms, you will want to get as much information from the user as possible. Get as much information as you can about the system and how the amplifier is used. There is always the possibility that the problem will show up only if used in a specific way.

Once you have all the information about the symptom(s), it is time to inspect the amplifier. A careful visual inspection is valuable for most problems, which you may encounter. To inspect the inside of the amplifier remove the cover as described in Section 4.3.1.

Begin the inspection by looking for anything, which appears abnormal, like loose connectors, broken wires and burnt or visibly damaged components. Inspect the printed circuit assemblies for broken traces and loose connections. Be thorough. The time you spend visually inspecting the amp is time well spent.

### 4.2 Surface Mount Technology

CE Series amplifiers use surface mount technology in their design. There are several advantages to using surface mount technology (SMT), including; (1) surface mount devices (SMDs) are much smaller, and are mounted to the surface of the board, so more components can be placed on the board. (2) Components can be attached to both sides of the board, allowing the board size to be reduced. (3) SMT boards are lighter and provide better electrical performance and signal speed.

Of course, there are also things to watch out for with SMT. (1) The placement of the components on the board, not through a hole, makes the components and the solder joint more susceptible to damage. (2) Rework of SMDs can often require specialized tools, equipment, or training. (3) SMDs are very small and can be difficult to handle, see, and identify.

Remember that on the CE-Series amplifiers, the SMDs on the bottom side of the main module are GLUED. Take care not to damage components while trying to remove them from the surface of the module.

### 4.3 Disassembly for Inspection & Service

The extent of disassembly required will depend upon the extent of inspection and service required.

**Note: To avoid the risk of electric shock, turn off and unplug the amplifier from the ac power outlet before disassembly or reassembly is attempted.**



#### 4.3.1 Top Cover Removal

To remove the cover of the amplifier you will need a #15 torx bit (TX15). After the cover is removed, and before any internal cables are disconnected, **discharge the supplies**. See Section 4.3.2.

1. Turn the amplifier on its bottom on your workbench. The only access to the inside of the amplifier is the top cover.
2. Using the TX15 bit, Loosen the 8 screws around the perimeter of the cover.
3. The cover lifts up and back after the screws are removed.

#### 4.3.2 Power Supply Discharge

Before any connectors and PWAs (Printed Wire Assemblies, or circuit boards) are removed, the Power Supplies need to be discharged. Follow these simple steps.

1. Make sure the amplifier is unplugged from the AC power source.
2. Locate L6 and L9 on the Main PWA (see Figure 4.3).



#### WARNING

**Amplifier components are ESD sensitive. When servicing the amplifier, the technician must have approved ESD protection. Proper grounding straps and test equipment are required. Failure to use proper protection will result in component failure.**



#### WARNING

**Before unplugging or plugging in any connectors or wires in the amplifier, discharge the power supplies. See section 4.3.2 for instructions. Failure to do so will result in circuit failure.**

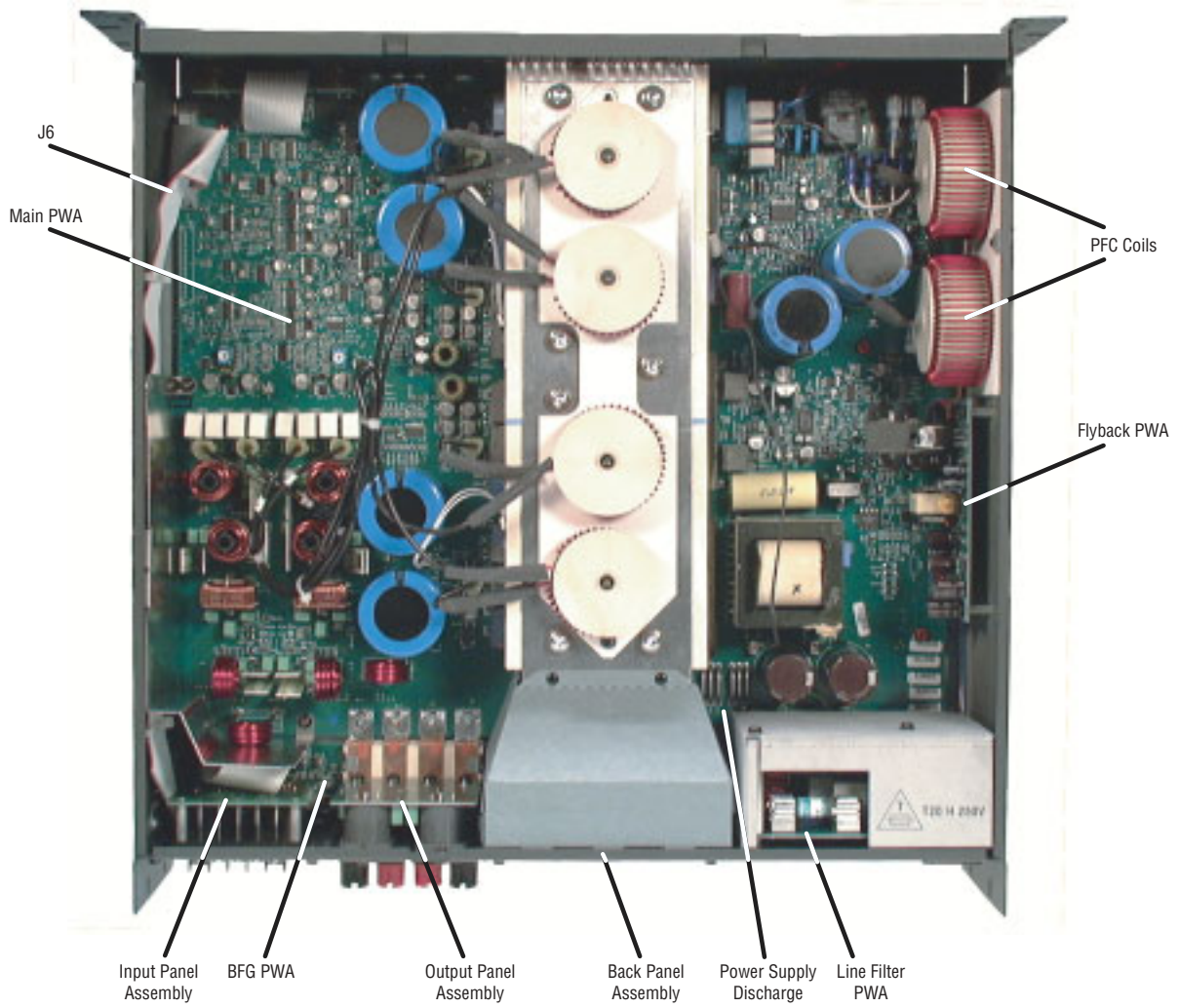


Figure 4.1 CE 4000 Top View A

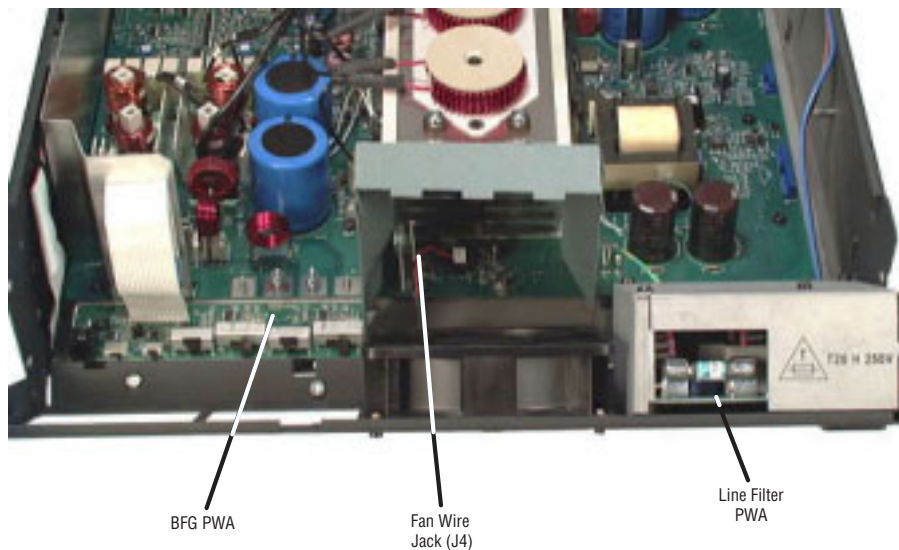


Figure 4.2 CE 4000 Top View B

3. Connect a 600 Ohm 10 watt resistor from L6 to L9. Be careful not to touch the leads with your fingers, as  $\pm 100V$  could be present at this point.
4. Wait 30 seconds before removing the resistor.

**Caution: the ten-watt resistor will become hot as the power supplies discharge.**

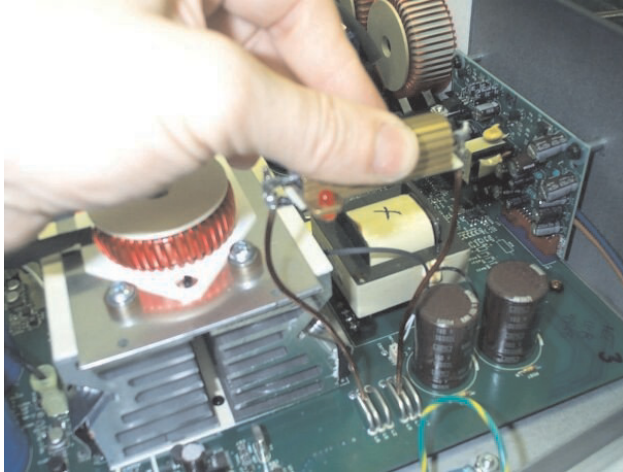


Figure 4.3 Power Supply Discharge

#### 4.3.3 Flyback Supply PWA Removal

1. **Follow the instructions in Section 4.3.2. Supply discharge is necessary to avoid circuit damage.**
2. Remove the two screws and two plastic washers securing the Flyback PWA to the Chassis (see Figure 4.4).
3. Release the retention latches on the connectors located at the bottom of the Flyback PWA.
4. Lift the Flyback PWA straight up and out of the chassis.

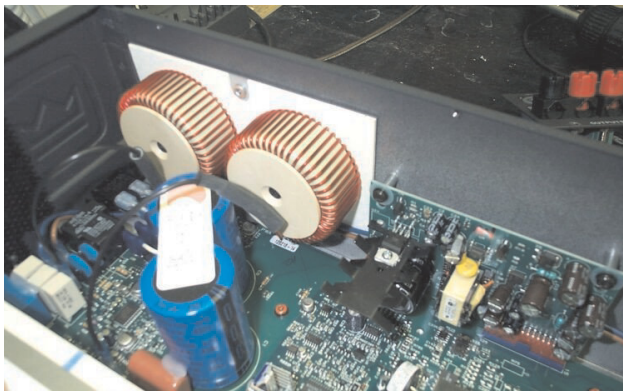


Figure 4.4 Flyback PWA and PFC Coils

#### 4.3.4 Input Module (SST) Removal

1. Remove the four Phillips-head screws that secure the SST to the chassis.
2. Gently slide the SST out to expose the ribbon cable connector.
3. Release the retention latch and disconnect the ribbon cable from the SST Module and finish by removing the SST from the chassis.

#### 4.3.5 Output Panel Removal

1. Remove the four nuts on the Main PWA that hold the output buss bars to the Main PWA (see Figure 4.5).
2. Remove the four T15 screws that secure the output panel to the back panel.
3. Slide the output panel up and out of the back of the amplifier.

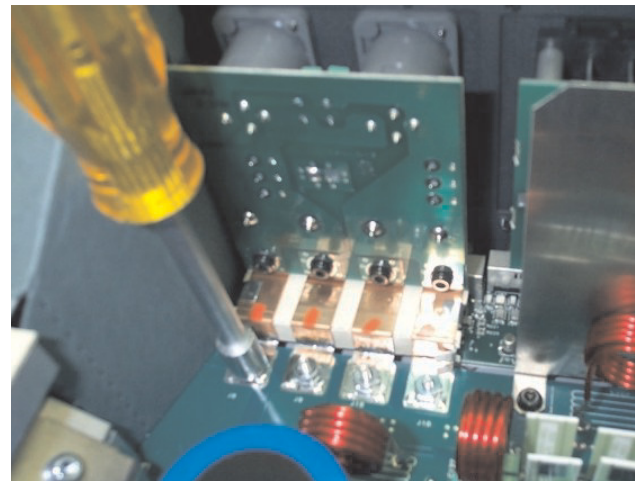


Figure 4.5 Output Bus Bars

#### 4.3.6 Back Panel Assembly Removal

The back panel assembly is removed to access the BFG, Main and Filter PWAs.

1. **Follow the instructions in Section 4.3.2. Supply discharge is necessary to avoid circuit damage.**
2. Remove the SST module (Section 4.3.4).
3. Remove the output panel (Section 4.3.5).
4. Disconnect the Brown and Blue primary wires from the Main PWA. Slide both wires out from underneath Flyback PWA.
5. Remove the 8 Flathead T15 screws on the side and bottom of chassis that secure the back panel to the chassis. Slide the back panel partially out and away from the amplifier, then unplug the fan wires from the Main PWA at J4 (see Figure 4.3).



6. Disconnect the safety ground wire attaching the back panel to the chassis.

7. Pull the back panel assembly the rest of the way out of the back of the amplifier.

#### 4.3.7 Line Filter PWA Removal

1. Remove the back panel assembly (see Section 4.3.6).

2. Remove the four T15 screws that secure the shield.

3. Disconnect the faston connectors before removing the PWA.

4. Remove the four standoffs that hold the Line Filter PWA to the back panel assembly.

5. Remove the Line Filter PWA.

#### 4.3.8 BFG PWA Removal

1. Remove the back panel assembly (see Section 4.3.6).

2. Remove the T15 flathead screw that holds the metal cable shield to the chassis.

3. Remove the two T15 screws that hold the shield to the Main PWA.

4. Remove the metal shield out of the chassis.

5. Disconnect the ribbon cable from the Main PWA at J6. (see Figure 4.2)

6. Remove the tie-wraps securing the ribbon cables.

7. Remove the two T15 screws securing the BFG PWA to the chassis.

8. Lift the BFG PWA straight up from the chassis.

#### 4.3.9 Main PWA Removal

1. Remove the FlyBack PWA (see Section 4.3.3).

2. Remove the back panel assembly (see Section 4.3.6).

3. Disconnect the PFC coils and remove them from the side panel of the chassis.

4. Remove the T15 flathead screw that holds the metal cable shield to the chassis.

5. Remove the two T15 screws that hold the shield to the Main PWA.

6. Remove the metal shield out of the chassis.

7. Remove the knobs from the front panel.

8. Remove the nuts that secure the level controls to the front panel.

9. Slide the level controls into the chassis.

10. Remove the air shroud from the Main PWA heatsink.

11. Unplug the power switch wires at J26, J27, J28 and J29 on the Main PWA.

12. Remove the seven screws that secure the heatsink assembly and coil assembly to the chassis.

13. Remove the seven orange- or blue-painted screws that secure the Main PWA assembly to the chassis.

14. Holding the heatsinks, lift and slide the Main PWA straight up and backwards out of the chassis.

## 4.4 Troubleshooting

As mentioned earlier, the three steps to effective repair are: Determine the symptoms; identify the cause of the symptoms; repair the unit to eliminate the cause.

Please troubleshoot based on the order listed below.

### 4.4.1 Troubleshooting Flyback Power Supply.

1. Nulls off the error amplifier output of channel 1 by placing a jumper between TP100 and TP104 (Jumper 1 in Figure 4.6).

2. Nulls off the error amplifier output of channel 2 by placing a jumper between TP200 and TP204 (Jumper 2 in Figure 4.6).

3. Defeat Undervoltage protection circuitry on BCA side by pulling TP248 to +15V (TP254) (Jumper 3

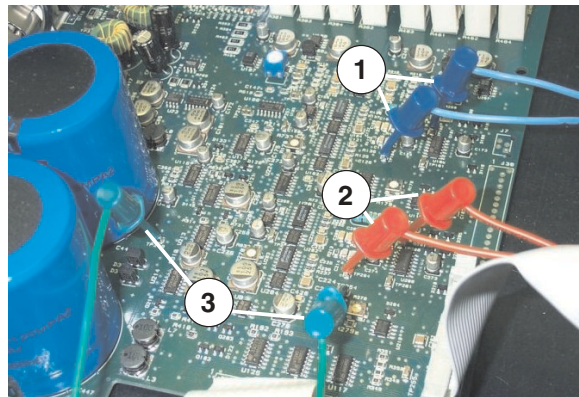


Figure 4.6 Shorting Jumpers

in Figure 4.6).

4. Defeat Brown-out effect protection circuitry by pulling TP249 to +15V (TP-6) with a jumper, as shown

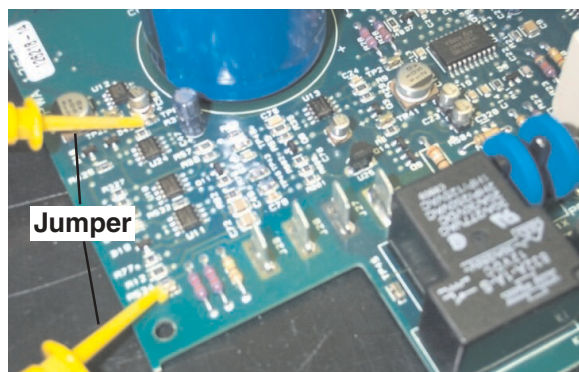


Figure 4.7 Brown-Out Jumper

5. Connect half wave rectified AC power flyback and power it up **through an isolation transformer** as shown in Figure 4.



**Warning: NOT using an isolation transformer in Step 5 can result in test equipment damage.**

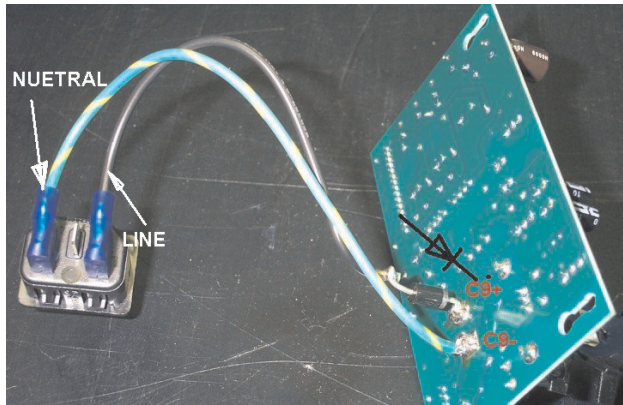


Figure 4.8 Half-Wave Rectified Flyback

6. Using a multimeter check DC supplies on power supply side. Confirm TP6, TP7 and TP8 = +15V, TP46 = +7.5V, TP252 = 19.0V, U2 pin 11 = 5.1V, and TP256 and U14 pin 1 = 5.0V. All measurements should be made with respect to SMPS reference (TP2).

7. Using a multimeter check DC supplies on audio side. Confirm TP254 is +15V, TP255 is -15V and TP257 is 5.0V. All measurements should be made with respect to AGND (TP-105).

**4.4.2 Troubleshooting Trianglewave Generator and BCA Output Stage.**

1. Using an oscilloscope check audio side triangle waveforms at TP102 with respect to TP105 (see Figure 4.9).

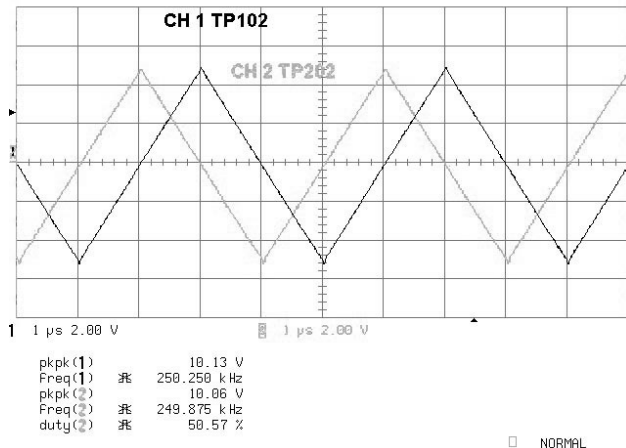


Figure 4.9 Output Signal of Triangle-Wave Generator

2. Using an oscilloscope check audio side triangle waveforms at TP202 with respect to TP205 (see Figure 4.9).

3. Using an oscilloscope check BCA output stage gate switching (see Figure 4.10). Probe at each gate drive resistor.

R360 for Q107 and Q110 (Figure 4.10) while R357 for Q108 and Q111 (Figure 4.11) of Vp Channel 1.

R365 for Q108 and Q112 (Figure 4.10) while R368 for Q109 and Q113 (Figure 4.11) of Vn Channel 1.

R460 for Q207 and Q210 (Figure 4.10) while R457 for Q208 and Q211 (Figure 4.11) of Vp Channel 2.

R465 for Q208 and Q212 (Figure 4.10) while R468 for Q209 and Q213 (Figure 4.11) of Vn Channel 2.

A total of four measurements for each channel, 2 for each Vp and Vn sides.

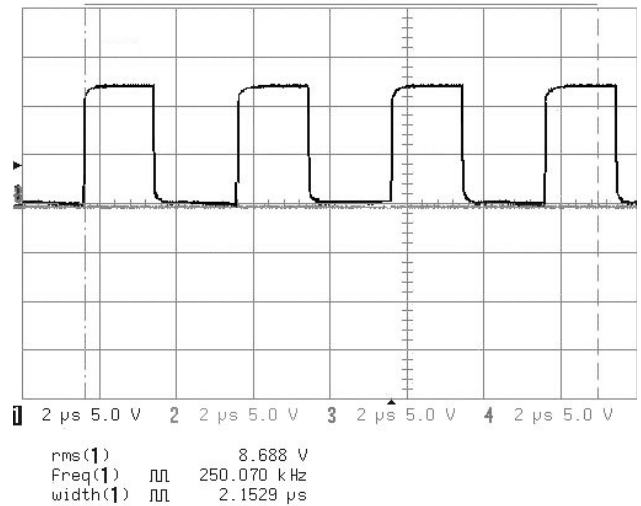


Figure 4.10 Gate Switching, View A

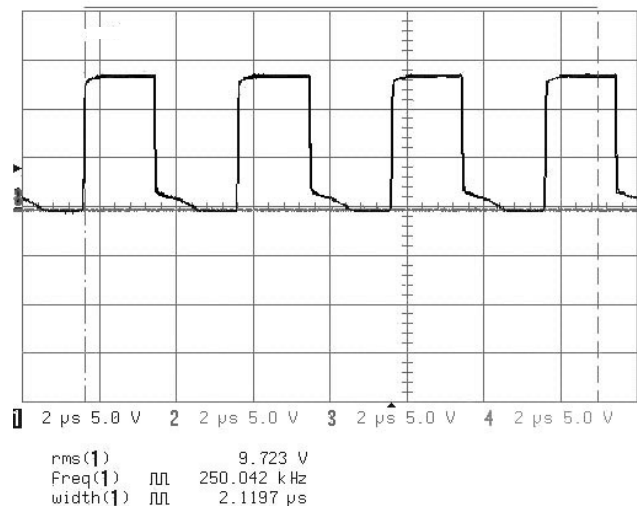


Figure 4.11 Gate Switching, View B

### 4.4.3 Troubleshooting Power Supply, PFC PWA and Full Bridge DC to DC Converter

1. Using an oscilloscope check power supply clocks at TP-253 and TP-12, as shown in Figure 4.12. All measurements are with respect to SMPS reference.

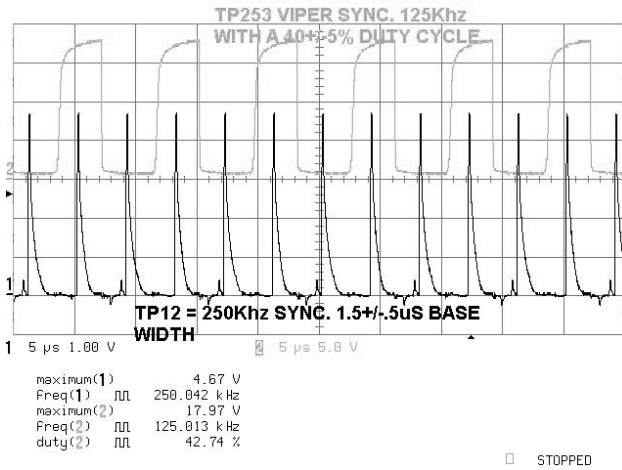


Figure 4.12 Power Supply Clock

2. Place jumper between J28 and J29 to simulate front panel switch on.
3. Remove/ bypass boost inductor L1 and using an external power supply apply 4VDC at J23.
4. Using an oscilloscope check PFC gate switching at TP-5 with respect to TP-2, as shown in Figure 4.13.

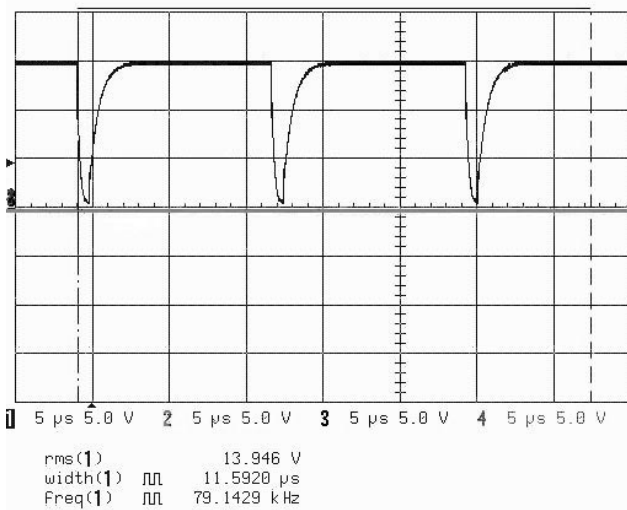


Figure 4.13 PFC Gate Switching at 4VDC

5. Using an external power supply apply 60VDC to J23 and verify that the frequency changes, as shown in Figure 4.14.

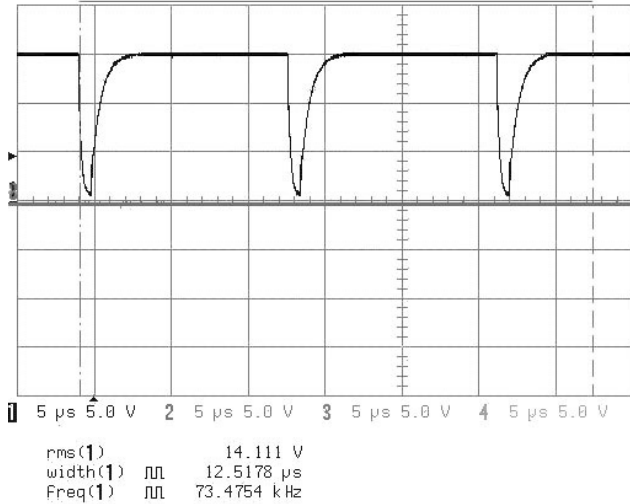


Figure 4.14 PFC Gate Switching at 60VDC

6. Using an oscilloscope check gate switching of the Full Bridge DC to DC Converter, as shown in Figure 4.15. Verify the phase shift at startup. Probe at TP-27, TP-29, TP-30 and TP-31. All measurements are with respect to SMPS reference.

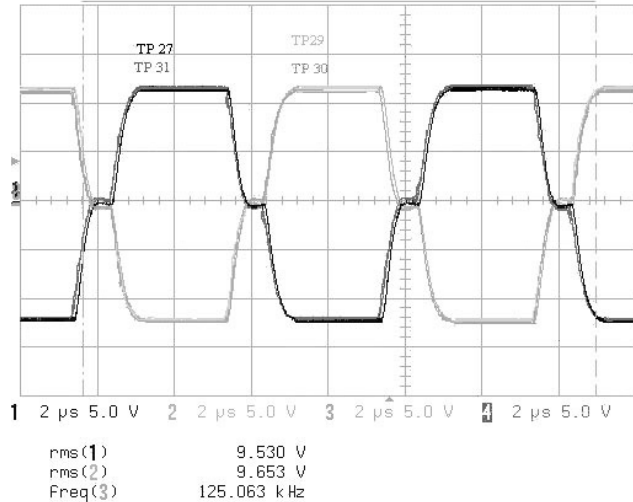


Figure 4.15 Full-Bridge DC to DC Converter Gate Switching

### 4.4.4 Identifying Symptoms

Why was the amplifier brought in for repair? Can you get it to malfunction again? Some problems can be intermittent and difficult to find.

Once you have identified and verified the symptoms, you can look for helpful information in Section 4.4.5 as to where the cause of the problem is located.

If you don't observe anything wrong with the amplifier, tactfully inquire how the owner used it and try to determine if it was misused or some other component in their system could have been at fault. Remember that the protection circuits in this amplifier will protect loudspeakers from problems caused upstream from the amplifier (DC protect).

If you lack sufficient information about the problem, and there aren't any obvious problems with the amplifier, skip to Section 4.6, the Electrical Checkout Procedures.

#### 4.4.5 Identifying and Repairing the Cause

The first step in identifying the cause of the problem is always a visual inspection. Once the top cover is removed, and the supplies are discharged, look for loose connectors, broken wires, loose hardware, burnt components, or bad solder joints on the PC boards. Check both sides of the board.

Once the visual inspection is complete you may power up the unit. The best way to positively locate which PWA is at fault is to have a working PWA of each type on hand and plug them into the amplifier one at a time to see when the problem goes away.

The following Symptoms and Causes may help you determine which corrective action to take. We realize that this list is limited. Please read through the Theory chapter in this manual to better understand the function of each PWA. This will help you come to your own conclusion as to the location of the problem.

#### **Amp does not appear to power up. No Enable LED.**

First, check the power supply fuse (located on the Line Filter PWA). Check for faulty switch or faulty inductor connection in the EMI and Filter module. Also, make sure the AC line voltage is correct for the amplifier you are working on. Severely low AC line voltage could cause the amp to not power up. If both check out, then the amplifier is in a fault mode. Viper could be dead. The most likely trouble area is the Flyback PWA.

#### **The Fault LEDs on one or both channels are flashing.**

1. The Fault LEDs normally flash during turn-on delay. Wait for six seconds to see if the LED stops flashing.
2. One or more of the power supplies are out of tolerance or missing. Replace or troubleshoot the Flyback PWA. If this does not correct the problem, check for the 400 V Vboost by measuring from TP251 to TP50. If it is low, then troubleshoot the PFC boost stage. If 400 V is o.k., check the  $\pm V_{ccs}$  at L6 and L9. They should measure approximately 105 VDC to

ground. If  $V_{cc}$  is low or missing, troubleshoot the Full Bridge DC to DC converter stage.

3.  $\pm 15$  V supply is too low. Check the Flyback PWA.
4. DC is present on the Channel 1 or Channel 2 output terminals, usually caused by a bad MOSFET or diode in the amplifier's output stage.
5. The channel one heatsink is too hot. Verify the heatsink temperature is less than 80°C. The output heatsinks should be at earth ground. The SMPS reference heatsink is above ground, so **do not touch amplifier ground and the SMPS reference heatsink at the same time.**
6. The overvoltage sensor has been tripped. Measure the  $\pm V_{ccs}$  at L6 and L9. They should read less than 120 VDC referenced to ground.
7. Transformer T1 has exceeded its thermal limit. Replace T1. Replace R713.

#### **Signal LED is off and the Clip LED is on for either channel.**

1. Troubleshoot the appropriate channel. A Clip LED on generally means an output stage failure.

#### **Signal LED is on and the Clip LED is on for either channel.**

1. The amplifier channel is clipping. Reduce the input signal level
2. A short is present at the output. Check the output wiring.

#### **Output sounds distorted. Clip LED is off.**

1. The input stage is being overdriven. Reduce the input signal level.
2. There is a problem in the Input PWA. Replace or troubleshoot the Input PWA.

#### **Amplifier does not meet Output Power specification.**

1. The amplifier has reached thermal limits. Check for proper fan operation.
2. PFC boost stage is not functioning properly. Check for 400 VDC at TP-251 with respect to TP-50. Troubleshoot PFC boost stage if measurement is nonconforming.

#### **Amplifier does not meet Frequency Response specification.**

1. Make sure the output voltage does not exceed 45Vrms.
2. Check back panel filter switch positions.
3. Check BFG PWA highpass and lowpass circuitry.
4. Possible problem in the 32-kHz 7th-order Gaussian filter. Readjust R178 and R278 for channel 1 and 2

filter. Readjust R178 and R278 for channel 1 and 2 respectively to get the frequency response in spec. Troubleshoot and repair filter as necessary.

**Amplifier does not meet Voltage Gain specification.**

1. The gain of the amplifier is determined by the BFG PWA. Check the optocoupler for proper operation or replace the BFG PWA.
2. Check residual resistance of gain level potentiometers.

**Amplifier does not meet DC Output Offset specification.**

1. Possible problem on the Main PWA, and is likely

a faulty U100/200 or a faulty MOSFET or diode in the output stage. Troubleshoot and repair as necessary.

2. Input PWA might be passing input signal DC components. Check for short capacitors in the Input PWA.

**4.5 Required Test Equipment**

Due to the complex circuitry utilized the CE 4000 amplifier, special calibration procedures and the correct test equipment are necessary to insure original factory specifications are achieved.

Figure 4.16 is list of test equipment needed to successfully service the amplifier. Recommended models are those used by Crown.

Device	Requirements	Recommended Model
Oscilloscope	500 MHz or greater	LeCroy 9354A
Distortion Analyzer	THD and IM measurements	Audio Precision ATS-1
DC Power Supplies	105 VDC with I-Limiting and 12-15 VDC with I-Limiting	Leader 760-3D (Qty. 2) Leader 18-3D
Function Generator		Hewlett-Packard HP 33120A
AC/DC volt meter	dB reading capability	Hewlett-Packard HP 34401A
Dummy Loads	8 ohm, 600 watt, 4 ohm, 1,200 watt, and 2 ohm, 1,800 watt	
Isolation Transformer	1:1 Primary to Secondary Turn Ratio	

**Alternate oscilloscope choices: Tektronix TDS360 and HP HP54610B. The latter is a 500 MHz scope, which is needed to test newer BCA power supplies.**

*Figure 4.16 Required Test Equipment*



## 4.6 Electrical Checkout Procedures

The test procedures in this section are used to verify the operation of the amplifier. You may, however, find these tests helpful in troubleshooting a problem if the problem is not easily identified.

All tests assume that AC power is from 100-240 VAC  $\pm 10\%$ .

During each test, it is assumed that the following conditions are set on the amplifier unless otherwise noted:

- Level controls fully clockwise.
- Bridge Output switch off.
- Input Sensitivity of both channels set at 26 dB.
- Filter settings in the back panel are set to FLAT.

### 4.6.1 Quiescent AC Power Draw

**Spec:** 130 watts maximum quiescent.

**Procedure:** With no load connected to the amplifier, turn on the amplifier. Measure AC power draw. It should be less than 130 watts.

### 4.6.2 Gain Switches

**Spec:** 0.775V, 1.4 V, 26 dB

**Procedure:** No Load. With the level controls at full gain and the input sensitivity switches set to 1.4 V, inject a 1 kHz, 0.775 Vrms, into each channel. At the output of each channel measure 38.3 Vrms,  $\pm 3.8$  Vrms. Switch the Input Sensitivity switches to 26 dB. At the output of each channel measure 15.5 Vrms,  $\pm 0.5$  Vrms. Switch the Input Sensitivity switches to 0.775 V, At the output of each channel measure 69.3 Vrms,  $\pm 6.9$  Vrms.

### 4.6.3 Bridge Mono Operation

**Spec:** Same voltage out both channels, channel 2 out of phase.

**Procedure:** No load. Switch the Bridge Mono switch on and inject a 1 kHz sine wave into channel 1 only. Monitor both outputs of the amplifier. They should be the same voltage and 180 degrees out of phase with each other. Remove the signal and turn the Bridge Mono switch off.

### 4.6.4 Frequency Response

**Spec:**  $\pm 0.25$  dB from 20 Hz to 20 kHz.

**Procedure:** Load the channel under test to 4 ohms. Inject a 0.1Vrms, 1kHz sine wave into the input. Measure the output voltage. It should be 2.0 Vrms. This is now your 1 kHz reference voltage. Switch the frequency to 20 Hz and verify that the input voltage is still 0.1 Vrms. Measure the output voltage. It should be the same as the 1 kHz reference voltage  $\pm 0.25$  dB. Switch the frequency to 20 kHz and verify that the input voltage is still 0.1 Vrms. Measure the

output voltage and compare it to the 1 kHz reference voltage. Tolerance is  $\pm 0.25$  dB. Remove the load and signal. Note: Many oscillators need a frequency check at 20 kHz.

### 4.6.5 Short Circuit Test

**Spec:** Amplifier will protect itself

**Procedure:** Inject a 1kHz, 1Vrms sine wave into the input of channel 1. Short the output of channel 1 to ground for 10 seconds. The amplifier should cycle into fault mode. Every four to six seconds the Clip LEDs will flash, indicating that it is checking to see if the short is still there. Remove the short and perform the test on channel 2.

### 4.6.6 Output Power

**Spec:** Each channel

600 watts into 8 ohms

1,200 watts into 4 ohms

1,800 watts into 2 ohms (at  $\geq 200$ V line voltage).

**Spec:** less than 0.5% THD.

**Procedure 8 ohm:** Load the channel under test to 8 ohms. Inject a 1kHz sine wave and bring the level up until the output reaches 0.5% THD. Measure at least 69.3 Vrms at the output.

**Procedure 4 ohm:** Load the channel under test to 4 ohms. Inject a 1kHz sine wave and bring the level up until the output reaches 0.5% THD. Measure at least 69.3 Vrms at the output.

**Procedure 2 ohm:** When testing 2-ohm power at line voltages under 200 VAC, test one channel at a time. Load the channel under test to 2 ohms. Inject a 1kHz sine wave and bring the level up until the output reaches 0.5% THD. Measure at least 60.0 Vrms at the output.

### 4.6.7 Intermodulation Distortion

**Spec:** Less than 0.5% from 0 dB to -30 dB.

**Procedure:** Load the channel under test to 8 ohms. Inject a SMPTE standard IM signal (60 Hz and 7 kHz mixed at 4:1). Adjust the output voltage for a peak equivalent voltage of 69.3 volts. This is your 0-dB reference. Measure less than 0.5% IMD from 0 dB to -30 dB in 5- dB steps.

### 4.6.8 Signal to Noise Ratio

**Spec:** Greater than 100 dB below rated 8 ohm power, A weighted.

**Procedure:** Load the channel under test to 8 ohms. Terminate the input with 600 ohms. Verify that the gain switch is set at 26 dB and level control is at full volume. Measure less than 550  $\mu$ Vrms at the output using an A-weighted filter.

**4.6.9 Crosstalk at 20 kHz**

**Spec:** Greater than 50 dB.

**Procedure:** Load each channel to 8 ohms. Verify that both gain switches are set at 26 dB and both level controls are at full volume. Inject a 2.0 Vrms, 20 kHz, sine wave into channel 1 and terminate channel 2 with 600 ohms. Measure less than 126.5 mV at the output of channel 2. Now remove the signal from channel one and inject it into channel 2. Terminate channel 1 with 600 ohms. Measure less than 126.5 mV at the output of channel 1.

**4.6.10 Post Test Settings**

After completion of testing, if all tests are satisfactory, the amplifier controls should be returned to the positions required by the customer. If the conditions are unknown or unspecified, the factory settings are as follows:

- Gain switches set to 1.4 V
- Bridge Mono switch turned off
- Level controls set fully counterclockwise
- Power switch turned off
- All filter switches set to the flat position

**4.7 Calibrations**

**4.7.1 Gaussian Filter Calibration**

**Procedure 1:** Obtain a multimeter with decibel measurement capabilities. Set the multimeter to dB measurement mode. Insert a 1 kHz signal into the input and measure at pin 14 of U111D. Reset the meter to 0 dB using the 1 kHz signal as a reference signal. Increase the signal generator frequency to 20 kHz, leaving the output level unchanged. While measuring pin 14 of U111D adjust R178 for a reduction of level by 2.6 dB (readout should be -2.6 dB).

**Procedure 2:** Obtain a multimeter with decibel measurement capabilities. Set the meter to dB measurement mode. Insert a 1 kHz signal into the input and measure at the speaker output (no load). Reset the meter to 0 dB using the 1 kHz signal as a reference signal. Increase the signal generator frequency to 12.5 kHz, leaving the output level unchanged. Adjust R178 for a meter reading of 0 db. This second test method is an alternative to the first and should give the desired results: a flat frequency response throughout the audio bandwidth.

**4.7.2 Overlap Correction and Adjustment**

**Conditions:**

- Amplifier output assembly MUST be room temperature (72 degrees F/21 degrees C)
- No input signal
- No load

**Procedure:** Monitor TP37 found on the Main PWA. Center oscilloscope to view lower right portion of waveform (see Figure 4.17). Adjust R170 for the sharpest-possible squarewave rising edges, with a transition curve less than 10.0V. Figure 4.18 shows a correct transition curve, Figure 4.19 shows “underlap” (under adjustment), where the transition curve exceeds 10.0V. Figure 4.20 shows “overlap” (over adjustment), where the transition curve is not “smooth.”

Repeat for channel 2, monitoring TP244 and adjusting R270.

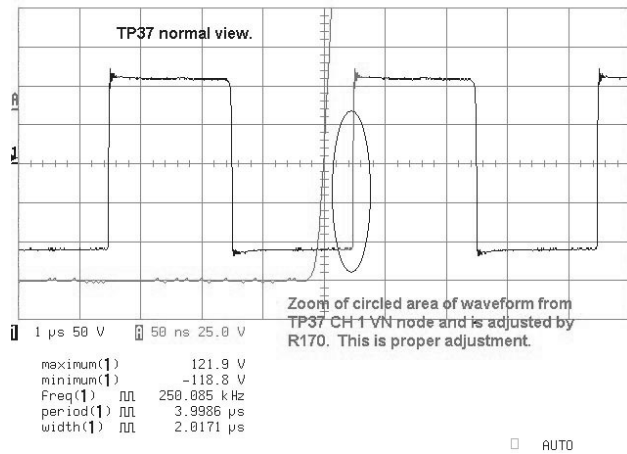


Figure 4.17 Overlap Adjustment

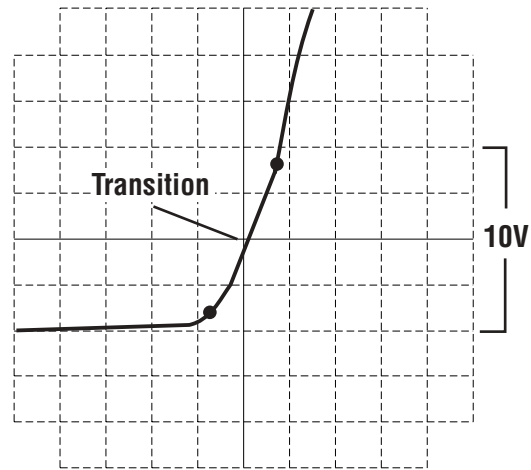


Figure 4.18 Correct Overlap Adjustment (Less than 10V)

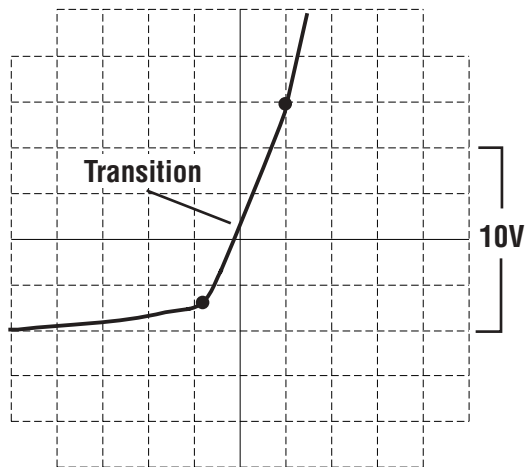


Figure 4.19 Underlap  
(Greater than 10V)

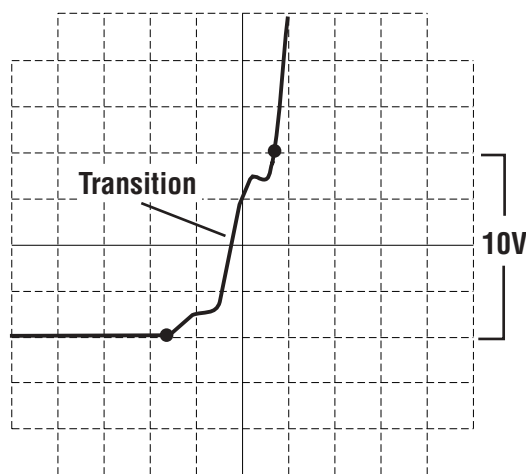


Figure 4.20 Excessive Overlap  
(No Smooth Transition)

#### 4.7.3 Current Sensing Calibration

Drive and test one channel at a time.

1. Connect output to 8 Ohms load and apply 1kHz Sinewave input signal.
2. Adjust output gain level until output voltage measures 40Vrms on one channel.
3. Adjust R160 while observing TP-10 for channel 1 in order to achieve 1.0Vrms +/-10mVrms (see Figure 4.21).
4. Repeat the adjustment on R260 while observing TP-245 for channel 2.

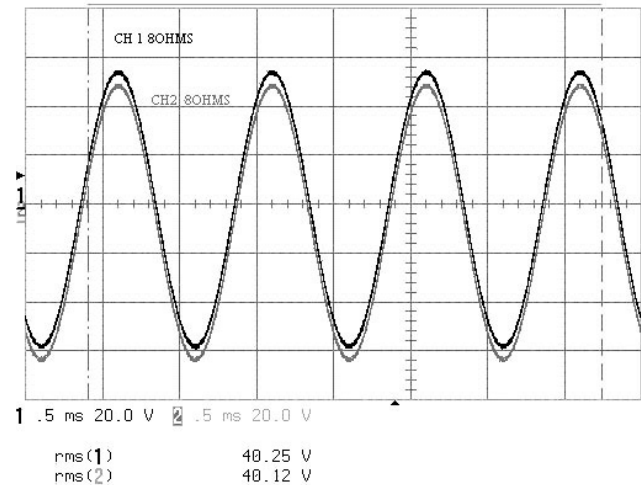


Figure 4.21 Current Sensing Calibration

#### 4.7.4 Output Filter Calibration

Output Filter Calibration is **NOT** field adjustable and should not need adjustment. If you suspect the slugs ( L101, L102 for Channel 1 while L201 and L201 for Channel 2) have been moved, the amplifier should be sent to CROWN Factory Service for proper adjustment.





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## 5 Parts

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### 5.1 General Information

Replacement parts for this Crown amplifier can be ordered from the Crown Parts Department.

**PART PRICES AND AVAILABILITY ARE SUBJECT TO CHANGE WITHOUT NOTICE.**

### 5.2 Ordering and Receiving Parts

When ordering parts, be sure to give the product model, and include a description and part number from the parts listing. Price quotes are available on request.

#### 5.2.1 Terms

Normal terms are prepaid. Net-30 Days applies to only those having pre-established accounts with Crown. The Crown Parts Department does accept Visa or Master Card. If prepaying, the order must be packed and weighed before a total bill can be

established, after which an amount due will be issued and shipment made upon receipt of payment. New parts returned for credit are subject to a restocking fee, and authorization from the Crown Parts Department must be obtained before returning parts for credit.

#### 5.2.2 Shipment

Shipment will normally be made via UPS, or best other method unless you specify otherwise. Shipments are made to and from Elkhart, Indiana USA, only. Established accounts with Crown will receive shipment freight prepaid and will be billed. All others will receive shipment on a C.O.D. or prepayment (check or credit card) basis.

### 5.3 Mechanical Parts

This section includes a mechanical part list for this product. All serviceable parts and assemblies will have a Crown Part Number (CPN) listed in this chapter. The parts listed are current as of the date printed. Crown reserves the right to modify and improve its products for the benefit of its customers.

### **Crown Customer Service**

Technical Support Group  
Factory Service  
Parts Department

*Mailing Address:* P.O. Box 1000, Elkhart IN 46515

*Shipping Address:* Plant 2 S. W.  
1718 W. Mishawaka Rd., Elkhart IN 46517

Phone: (219) 294-8200

Toll Free: (800) 342-6939

Fax: (219) 294-8301

<http://www.crownaudio.com>



### 5.3.1 CE4000 Amplifier Assembly

Refer to Figure 5.1 for Exploded View

Item	Quantity	Description	Part # (CPN)
28	1	ASM, CE4000 BACK PANEL	See section 5.2.2
27	1	ASM, CE4000 POWER SWITCH	See section 5.2.8
26	1	COVER, CE4000 TOP PC	126223-4
25	3	4" CABLE TIE	C 1811-1-6
24	1	8-32 HEX NUT W/BELLE	A11056-2
23	2	TIE, 5.625" CABLE	127330-1
22	1	SUB-FRONT, CE4000 FP PC	130526-1
21	7	CAP, CE400 PEM STANDOFF	128119-2
20	1	PWA, CE4000 MAIN	See section 5.4
19	1	INDUCTOR,PFC	127399-6
18	1	PWA, CE4000 FLYBACK	See section 5.4
17	2	RIVET, CE4000 INS RET PLASTIC	128130-1
16	2	INSULATOR, CE4000 HS NOMEX	126923-4
15	1	COILS, CE4000 L/PLN MATCHED	127401-3
14	7	WASHER, CE4000 HEATSINK SHLDR	128120-1
13	7	#10 BELLVILLE WASHER SS	A10098-4
12	7	MSCREW, 10-32 X 3.50 TORX PNHD Z	128345-1
11	2	RIVET, CE4000 FAN PLENUM SNAP	127777-1
10	1	PLENUM, CE4000 FAN	127473-3
9	4	6-32 HEX NUT W/BELLE	A11056-1
8	16	SCREW, #6 X .250 MACH TORX PNHD	103436-70604
7	2	.5 X .136 X .02 NYLON WASHER	A10101-5
6	1	SHEILD, CE4000 MAIN BD RBN AP	128218-7
5	1	PWA, CE4000 BFG	See section 5.4
4	16	SEMS, 6-32 X .31 TORX PNHD STAR	103433-70605
3	10	8-32 X .31 SERR FLTHD T15 BZ	102156-1
2	2	KNOB, D350	D 8959-5
1	1	CHASSIS, CE4000 WELD/AP/PC	126222-11 ASM, NUMBER: 127390-4

**NOTES:**

- 1) THESE 8 SCREWS ARE USED TO FASTEN INPUT AND OUTPUT MODULES TO BACK PANEL.
- 2) THESE 4 NUTS ARE USED TO FASTEN OUTPUT MODULE BUSS BARS TO MAIN PWA.
- 3) SLIDE CABLE TIES (ITEM 25) THRU LANCES IN CHASSIS, PLACE RIBBON CABLE (PART OF ITEM 5) AGAINST CHASSIS SIDE PANEL BETWEEN LANCES, THEN SECURE CABLE TIES AROUND RIBBON CABLE.

**RECOMMENDED ASSEMBLY TORQUES**

ITEM NO.	C.P.N.	TORQUE SETTINGS
3	102156-1	12-14 IN LBS.
4	103433-70605	16-18 IN LBS.
8	103436-70604	10-12 IN LBS.
9	A11056-1	10-12 IN LBS.
12	128345-1	16-18 IN LBS
24	A11056-2	10-12 INLBS

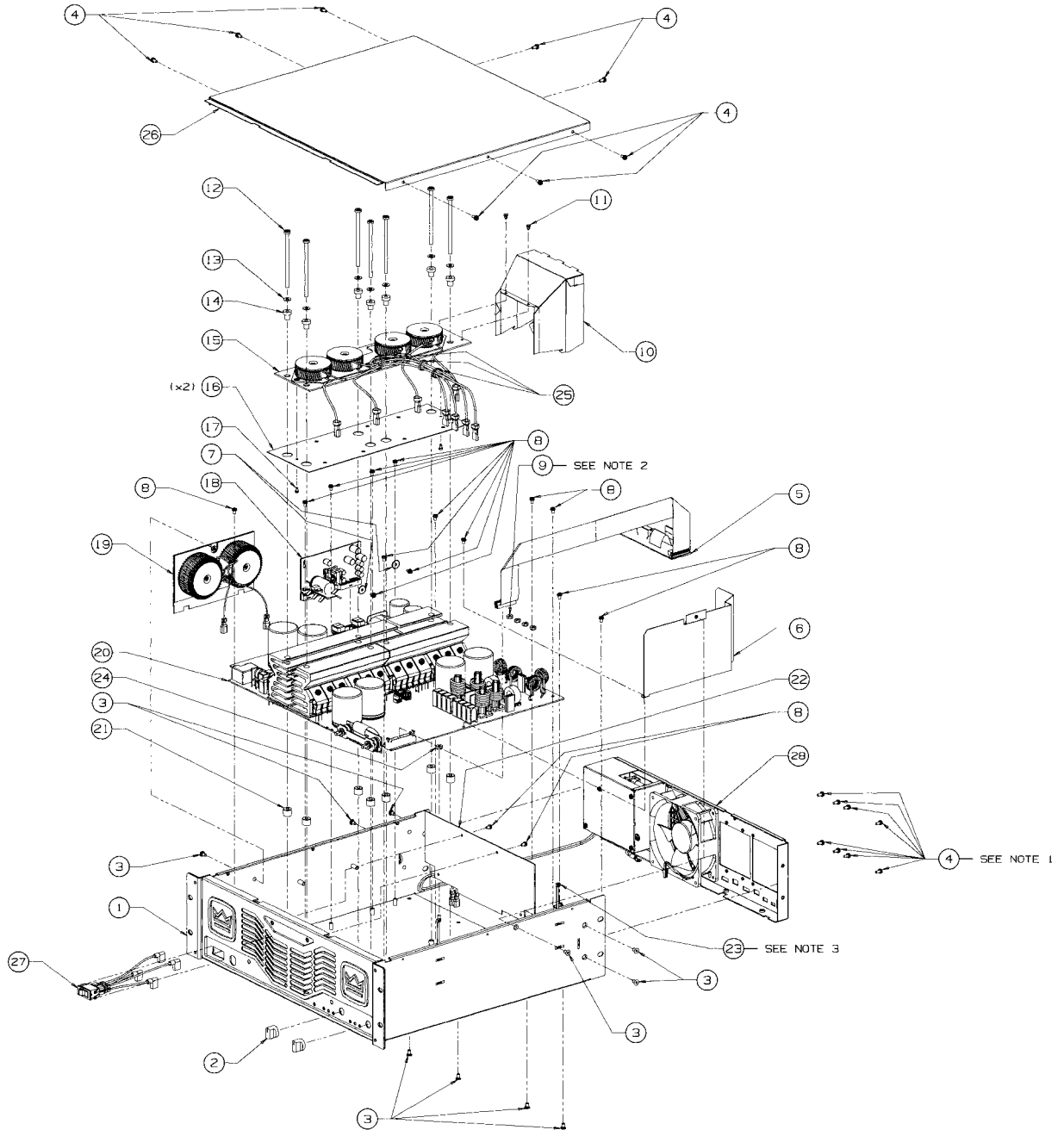


Figure 5.1 Amplifier Assembly (Exploded View)

### 5.3.2 Back Panel Assembly

Refer to Figure 5.2 for Exploded View

Item	Quantity	Description	Part # (CPN)
13	1	LABEL, VDE EARTH GROUND	D 7037-1
12	2	8-32 HEX NUT W/BELLE	A11056-2
11	1	WIRE, 14 GRN/YEL RING X 6.0 X RING	A11544-G060G
10	1	SHIELD, CE400EMI FILTER	128229-7
9	1	WIRE, 14 BLU FAST X 21 X FLAG	A11386-HZ10M
8	1	WIRE, 14 BRN FAST X 21 X FLAG	103448-A210M
7	4	STAND, 6-32 X 1.9375 HEX MALE/FEM	A12095-12
6	1	PWA, CE EMI FILTER	See section 5.4
5	1	WIRE, 14 GRN/YEL RING X 6.0 X FLAG	A11544-GO60M
4	1	IEC SNAP IN 15A UL/10A VDE	102650-1
3	8	SCREW, 6-32 X .250 MACH TORX PNHD	103436-70604
2	1	FAN, 120 X 120 X 38mm 12VDC 140CFM	126992-2
1	1	PANEL, CE4000 BACK AP/PC/PP	127227-12 ASM. NUMBER: 130251-2

**NOTES:**

1) CONNECT ITEM 8 TO "J9" & ITEM 9 TO "J10"  
ON ITEM 6 PWA PRIOR TO ASSEMBLING ITEM  
10.

**RECOMMENDED ASSEMBLY TORQUES**

ITEM NO.	C.P.N.	TORQUE SETTINGS
3	103436-70604	13-15 IN LBS.
12	A11056-2	10-12 IN LBS.

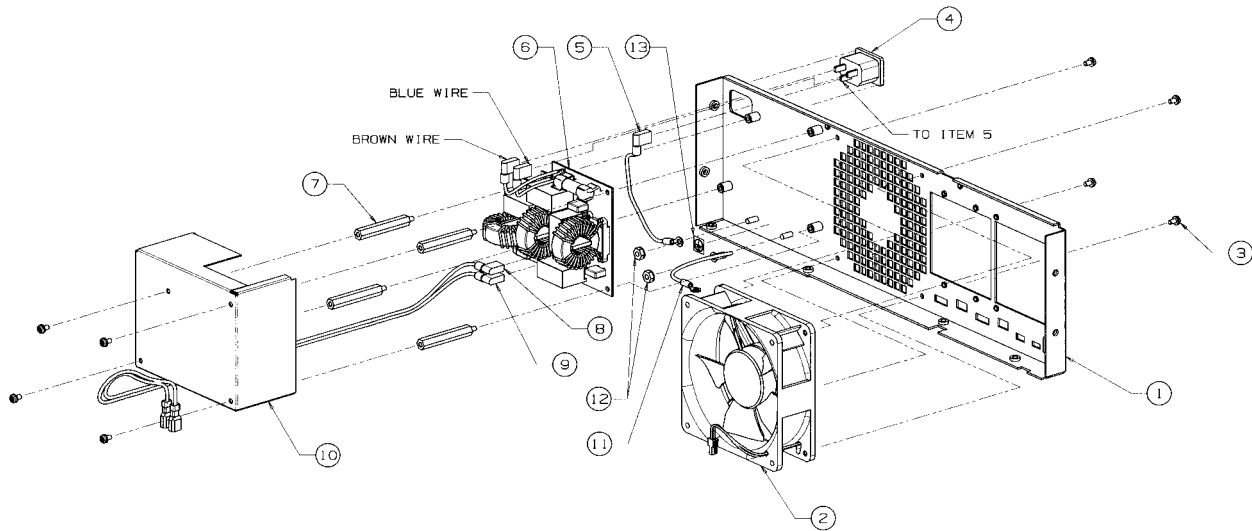


Figure 5.2 CE4000 Back Panel Assembly (Exploded View)



### 5.3.3 CE4000 PS Primary Heatsink Assembly

Refer to Figure 5.3 for Exploded View

Item	Quantity	Description	Part # (CPN)
11	X	TYPE 340HEATSINK COMPOUND	S2162-6
10	1	SHIM, CE4000 BRIDGE RECTIFIER	128246-1
9	9	8-32 X .312 TORX PNP SEM	103415-10805
8	2	CLIP, CE40002 FINGER	127182-1
7	1	CLIP, CE4000 2 FINGER	127552-1
6	4	MOSFET, 0.11 OHM 500V	126738-1
5	1	DIODE, 30A 600V HYPERFAST	127457-1
4	2	MOSFET, 0.08 OHM 500V TO-247	127456-1
3	1	RECT, 50A 600V PC MNT BRIDGE	125427-1
2	2.5	WAFER, 3.000 X .90X.04 CERAMIC	127204-1
1	1	EXTRU, CE4000L-FR HS MACHINED	127976-3 ASM. NUMBER: 128009-1

**RECOMMENDED ASSEMBLY TORQUES**

ITEM NO.	C.P.N.	TORQUE SETTINGS
9	103415-10805	22-24 IN LBS.

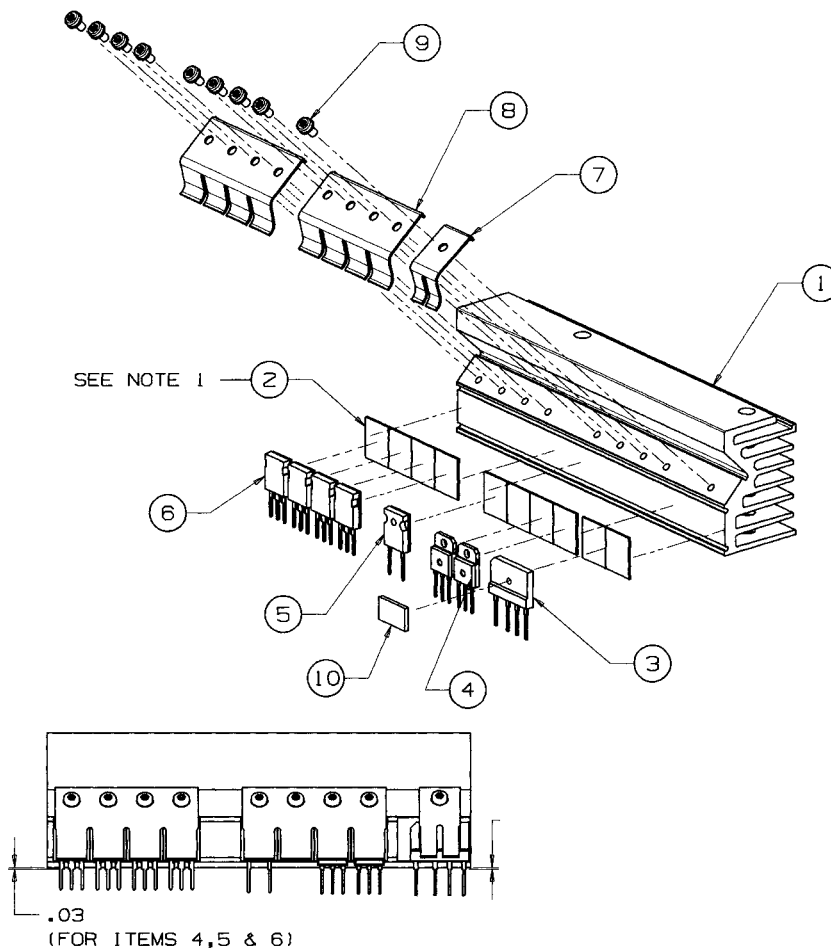


Figure 5.3 CE4000 PS Primary Heatsink Assembly (Exploded View)

### 5.3.4 CE4000 PS Diode Heatsink Assembly

Refer to Figure 5.4 for Exploded View

Item	Quantity	Description	Part # (CPN)
6	X	TYPE 340HEATSINK COMPOUND	S2162-6
5	4	8-32 X .312 TORX PNP SEM	103415-10805
4	1	CLIP, CE4000 4 FINGER SS .040	127182-1
3	4	DIODE, 30A 600V HYPERFAST	127457-1
2	1	WAFER, 3.00 X.90 X .04 CERAMIC	127204-1
1	1	EXTRU,CE4000 L-RR HS MACHINED	127977-3 ASM. NUMBER: 128010-1

**RECOMMENDED ASSEMBLY TORQUES**  
**ITEM NO. C.P.N. TORQUE SETTINGS**

5 103415-10805 22-24 IN LBS.

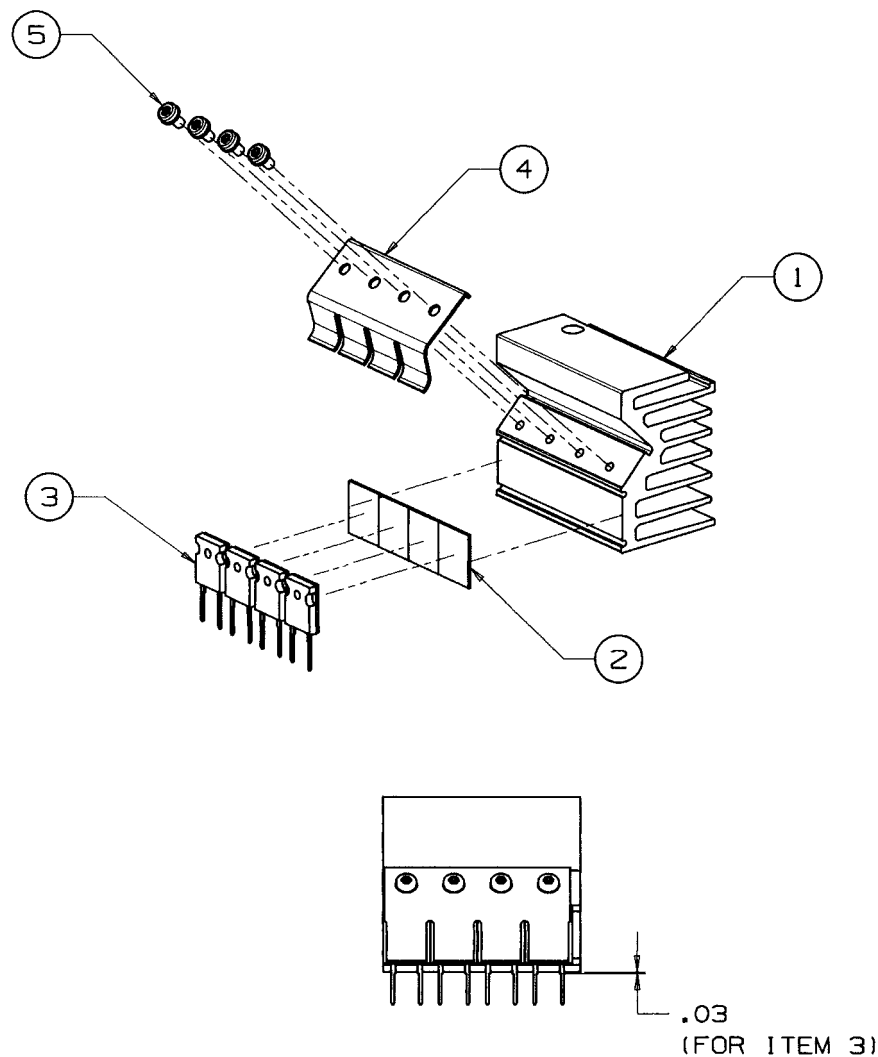


Figure 5.4 CE4000 PS Diode Heatsink Assembly (Exploded View)

### 5.3.5 CE4000 PS Output Heatsink Assembly

Refer to Figure 5.5 for Exploded View

Item	Quantity	Description	Part # (CPN)
7	X	TYPE 340HEATSINK COMPOUND	S2162-6
6	6	8-32 X .312 TORX PNP SEM	103415-10805
5	6	CLIP, CE4000 2 FINGER	127552-1
4	4	DIODE, 300V ULTRAFAST APT15D30K	D9053-6
3	8	MOSFET, 250V 16A MTP16N25E	C10207-6
2	2	WAFER, 2.7000 X .90 X .04 CERAMIC	127564-1
1	1	EXTRU, CE4000 R-HALF HS MACHINED	127978-3 ASM. NUMBER: 128011-3

**RECOMMENDED ASSEMBLY TORQUES**

ITEM NO.	C.P.N.	TORQUE SETTINGS
6	103415-10805	22-24 IN LBS.

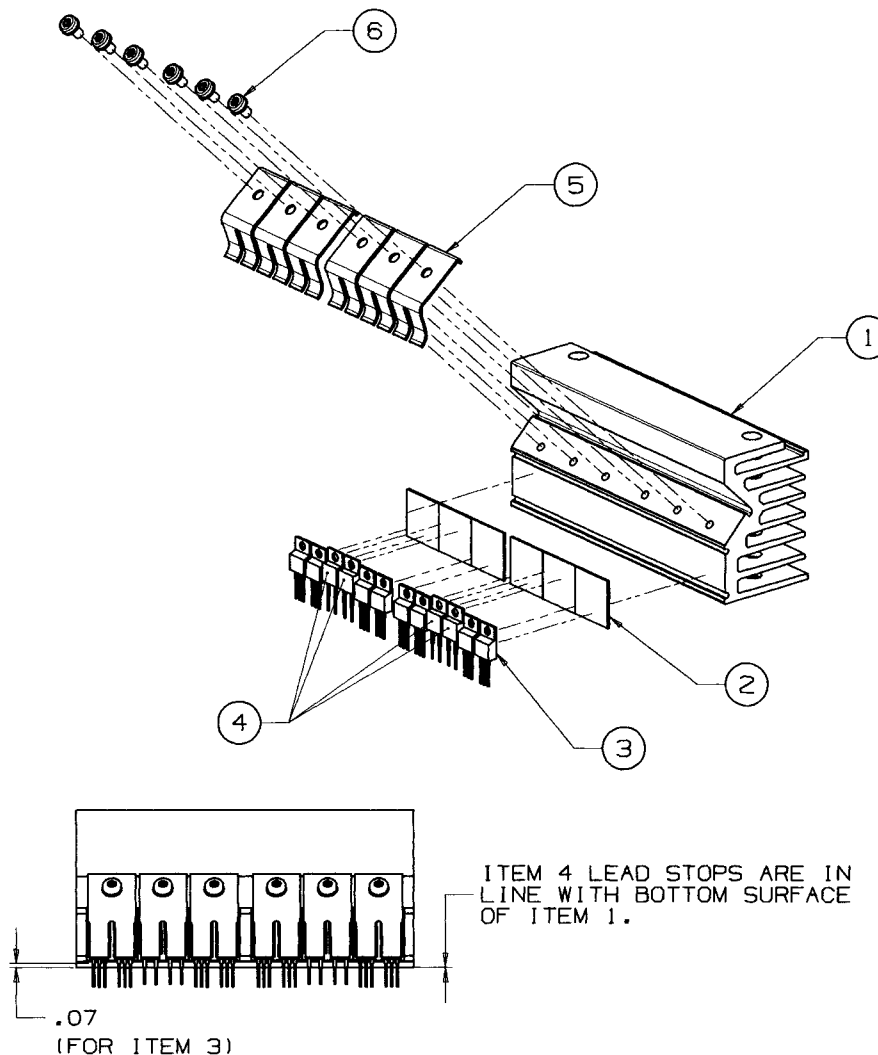


Figure 5.5 CE4000 PS Output Heatsink Assembly (Exploded View)

### 5.3.6 CE4000 Standard Input Assembly

Refer to Figure 5.6 for Exploded View

Item	Quantity	Description	Part # (CPN)
3	4	SCREW, #4 X .5 PNHD PH AB BZ	A10111-70408
2	1	PWA, CE INPUT EC	See section 5.4
1	1	PANEL, CE INPUT CHARCOAL	126787-5 ASM. NUMBER: 127049-1

**RECOMMENDED ASSEMBLY TORQUES**

ITEM NO.	C.P.N.	TORQUE SETTINGS
3	A10111-70408	4-5 IN LBS.
2 (REF)	103435-70608	13-15 IN LBS.

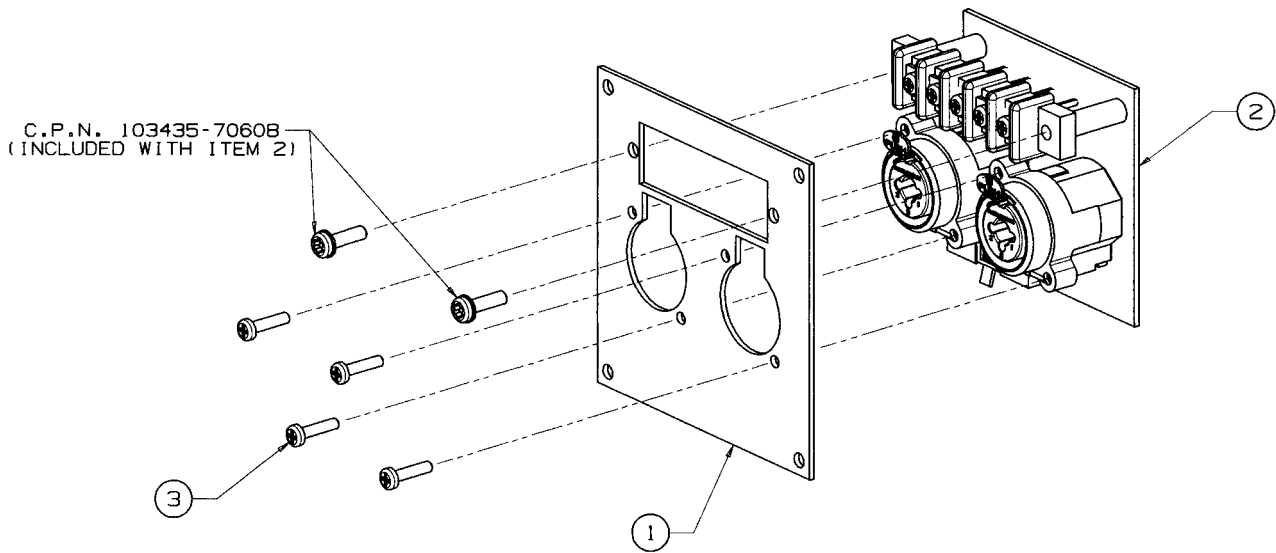


Figure 5.6 CE4000 Standard Input Assembly (Exploded View)

### 5.3.7 CE4000 Standard Domestic Output Assembly

Refer to Figure 5.7 for Exploded View

Item	Quantity	Description	Part # (CPN)
5	4	SCREW, 6-32 X .250 MACH TORX PNHD	103436-70604
4	1	SHEILD, CE4000 OTPT BUSS BAR	128203-1
3	1	INSULATOR, CE4000 OTPTBUSS BAR	128202-1
2	4	BAR, CE4000 OUTPUT BUSS AP	127672-2
1	1	PWA, CE4000 SPEAKON/BDG POST OTPT	See section 5.4
			ASM. NUMBER: 127831-1

**RECOMMENDED ASSEMBLY TORQUES**

ITEM NO.	C.P.N.	TORQUE SETTINGS
5	103436-70604	13-15 IN LBS

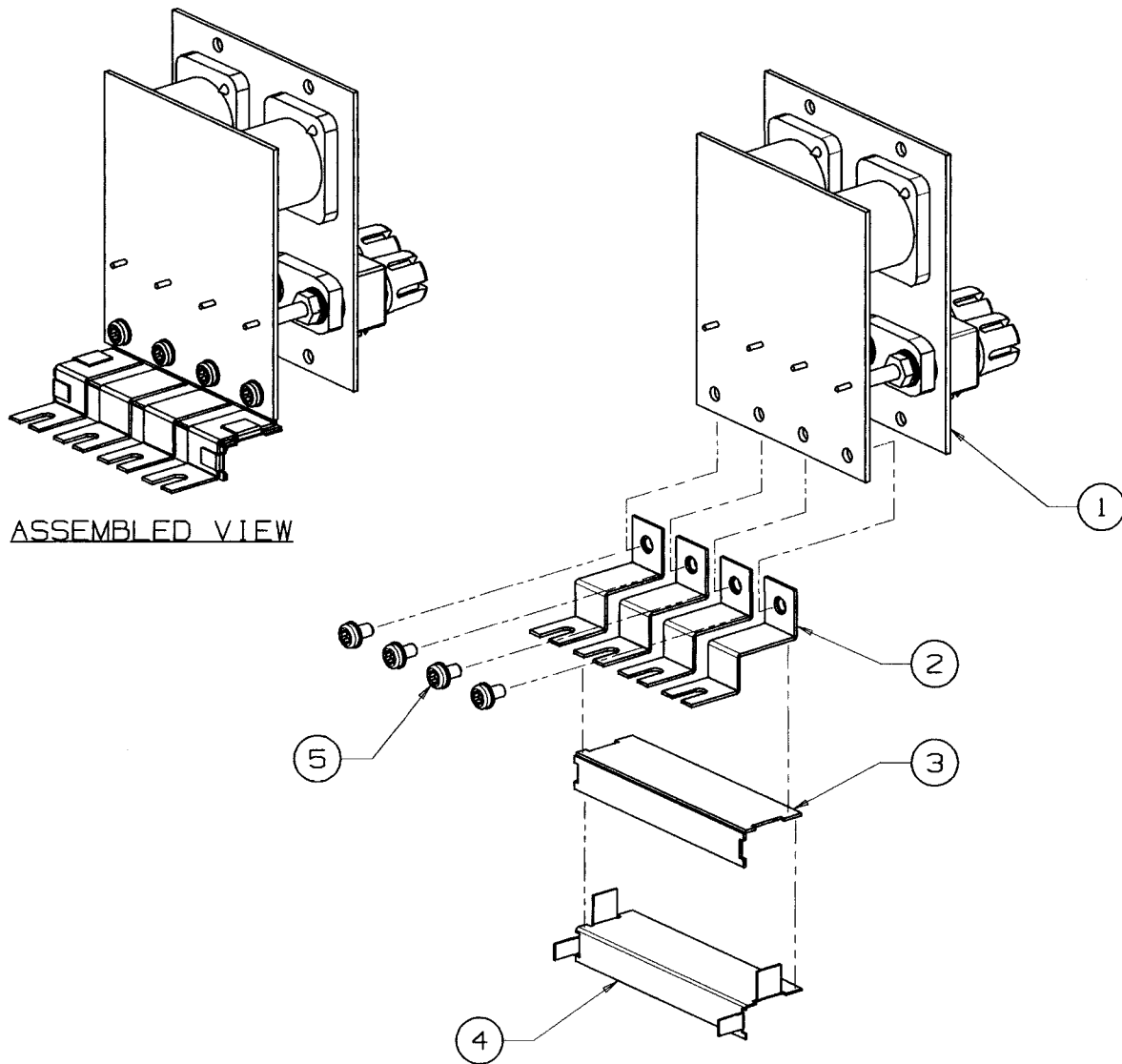


Figure 5.7 CE4000 Standard Domestic Output Assembly (Exploded View)

### 5.3.8 CE4000 Power Switch Assembly

Refer to Figure 5.8 for Exploded View

Item	Quantity	Description	Part # (CPN)
3	2	WIRE, 16 WHT FAST X 4 X FLAG	A11518-K040P
2	2	WIRE, 16 BLK FAST X 4 X FLAG	A11608-EO30R
1	1	SWITCH, ROCKER PNL MNT DPST 16A	127455-1
			ASM. NUMBER: 128425-1

**NOTES:**

- 1) MARKINGS 1, 1D, 2, 2D ARE IDENTIFIED ON SWITCH HOUSING.
- 2) J26, J27, J28, J29 ARE CORRESPONDING LOCATIONS ON PWA.

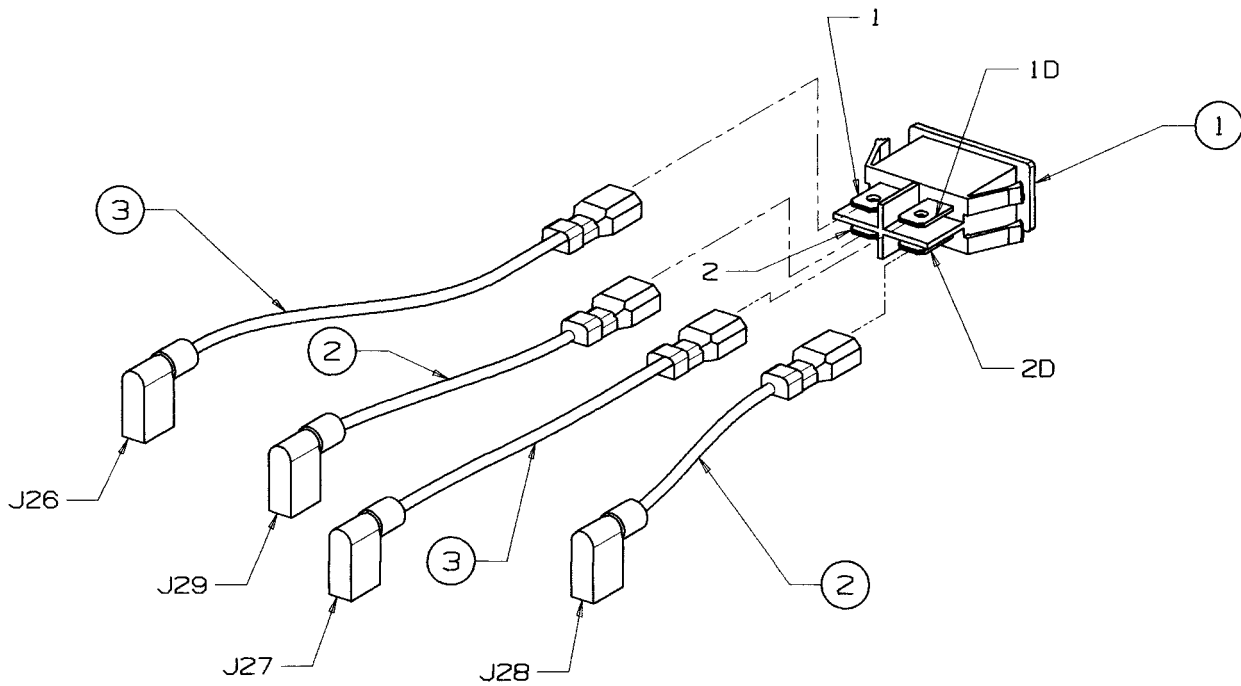


Figure 5.8 CE4000 Power Switch Assembly (Exploded View)

## 5.4 Circuit Board Parts

This section includes electrical parts lists for this product. All serviceable parts and assemblies will have a Crown Part Number (CPN) listed in this section. The parts listed are current as of the date printed. Crown reserves the right to modify and improve its products for the benefit of its customers. Please note: where reference designations are listed as "installed on next assembly," the CPN (Crown Part Number) for the associated part may be found in Section 6.2, Mechanical Parts.

### 5.4.1 Circuit Board and Schematic Part Numbers

The schematics referenced and provided are representative only. There may be slight variations between amplifier to amplifier. These schematics are intended to be used for troubleshooting purposes only.

Note on circuit board designations: Crown circuit boards are referenced with a PWA and/or PWB part number. PWA stands for Printed Wire Assembly. This is the completed circuit board with all components assembled. PWB stands for Printed Wire Board. This is the circuit board only, without components.

#### CE4000 MAIN

PWA NUMBER: 126218-13

Drawing Sheet:

41

42

PWA NUMBER: 126218-14

Drawing Sheet:

41

42

#### CE4000 BFG

PWA NUMBER: 126828-7

PWA NUMBER: 126828-12 (REV.2)

PWA NUMBER: 126828-12 (REV.A)

#### CE4000 INPUT CE

PWA NUMBER: 126883-4

Drawing Sheet:

4

#### CE4000 FLYBACK

PWA NUMBER: 127027-6

#### CE4000 POT BOARD

PWA NUMBER: 127563-3

#### CE 4K SPEAKON/BDG POST OTPT

PWA NUMBER: 127820-3

Drawing Sheet: 5

#### CE4000 EMI FILTER

PWA NUMBER: 128243-6



REVISION HISTORY						
E.C.N.	REV	DESCRIPTION	DATE	APPROVED		
				DWN	CHK	CM
00N0568	A	RELEASE FOR PRODUCTION	06-16-00	JAW	JM	CB TAS

UNLESS OTHERWISE SPECIFIED, THIS PRINTED WIRING ASSEMBLY SHALL MEET THE SPECIFICATION DESCRIBED IN IPC-A-610\_ CLASS 2 STANDARDS.

NOTES:

1. PRINTED WIRING BOARD PART NUMBER 126583-B.
2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.
3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAPS.
4. THE PRINTED WIRING ASSEMBLY PART NUMBER FOR THIS ASSEMBLY SHALL BE MARKED ON THE PRINTED WIRING BOARD AND SHALL BE PERMANENT.
5. REMOVE SOLDER OR PREVENT SOLDER FROM ACCUMULATING IN HOLES INDICATED ON COMPONENT MAP.
6. MAP LOCATIONS DENOTED BY AN ASTERISK (\*), INDICATE COMPONENTS MOUNTED ON THE BOTTOM SIDE OF THE PRINTED WIRING BOARD.
7. THE VENT HOLE ON TOP OF THE RELAY K1 MUST BE OPENED AFTER THE CLEANING PROCESS, BY EITHER REMOVING THE SEALING TAPE OR CUTTING OFF THE CIRCULAR TAB WITH AN "EXACTO" KNIFE OR SIMILAR CUTTING TOOL. WARNING, THIS STEP MUST BE DONE AFTER THE CLEANING PROCESS NOT BEFORE!! WATER OR CLEANING SOLVENTS ENTERING THE RELAY VENT HOLE WILL DAMAGE THE RELAY.
8. APPLY HOT MELT ADHESIVE(125647-1) FOR SUPPORT TO THE FOLLOWING COMPONENTS: C2,C700,R42,R142,R143,R149,R150,R242,R243,R249,R250,R325,R363,R364,R463, AND R464. ADHESIVE MUST HAVE A MINIMUM CONTACT AREA OF 1/4" X 1/2" ON BOTH THE DESIGNATED PART AND EITHER THE PWB OR ANY ADJACENT SOLID COMPONENT.
9. ATTACH R713 TO THE SIDE OF T1 WITH LOCTITE ADHESIVE(125482-1) AND ACTIVATOR(125483-1). NO MORE THAN 0.1" GAP ALLOWED BETWEEN BODY OF R713 AND SIDE OF T1. ANY GAP MUST BE FILLED WITH ADHESIVE (NO AIR BETWEEN R713 & T1).
10. THIS PWA MUST MEET ALL SPECIFICATIONS AS LISTED IN 128315 SPECS, CE4000 MAIN PWA.
11. ADD 1/4" SQ. PIECE OF KAPTON TAPE(S 6285-1) UNDER R260 AS SHOWN.

**CAUTION**

STATIC CAN DAMAGE COMPONENTS!

**DO NOT HANDLE**

UNLESS WRIST STRAP IS WORN

**INACTIVE**

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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">DISTRIBUTION</th> <th style="width: 10%;">DWN</th> <th style="width: 10%;">JAW</th> <th style="width: 10%;">06-16-00</th> </tr> <tr> <td>K</td> <td>CHK</td> <td>JM</td> <td>6-16-00</td> </tr> <tr> <td>FILENAME</td> <td>CM</td> <td>CB</td> <td>6/19/00</td> </tr> <tr> <td>126218-13_A_01.PCB</td> <td>PE</td> <td>TAS</td> <td>6-19-00</td> </tr> </table>	DISTRIBUTION	DWN	JAW	06-16-00	K	CHK	JM	6-16-00	FILENAME	CM	CB	6/19/00	126218-13_A_01.PCB	PE	TAS	6-19-00	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;"> <p><b>CROWN</b> INTERNATIONAL, INC.</p> </td> <td style="width: 70%;">                 1718 W. MISHAWAKA RD.                  ELKHART IN, 46517                  PHONE (219)294-8008                  WWW.CROWNINTL.COM             </td> </tr> <tr> <td colspan="2" style="text-align: center; padding: 10px;">                 TITLE  <h2 style="margin: 0;">PWA, CE4000 MAIN</h2> </td> </tr> <tr> <td style="width: 10%;">SIZE</td> <td style="width: 10%;">DWG NO.</td> <td style="width: 50%; text-align: center;">126218-13</td> <td style="width: 10%;">REV</td> <td style="width: 10%; text-align: center;">A</td> </tr> <tr> <td>DO NOT SCALE DRAWING</td> <td>SCALE NONE</td> <td>PROJ NO. MD425D8</td> <td colspan="2" style="text-align: right;">SHEET SHEET 1 OF 48</td> </tr> </table>	<p><b>CROWN</b> INTERNATIONAL, INC.</p>	1718 W. MISHAWAKA RD. ELKHART IN, 46517 PHONE (219)294-8008 WWW.CROWNINTL.COM	TITLE <h2 style="margin: 0;">PWA, CE4000 MAIN</h2>		SIZE	DWG NO.	126218-13	REV	A	DO NOT SCALE DRAWING	SCALE NONE	PROJ NO. MD425D8	SHEET SHEET 1 OF 48	
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PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
C48	C 7091-9	.33 UF 50V Z5U CHIP CAP	A 3
C49	103191-1	0.47UF 50V Z5U 1210 T/R	B 3
C50	126542-1	2.2UF 50V 5.5MM HIGH SMD	A 4
C51	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 8*
C52	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 8*
C53	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	M 8
C54	126630-1	CAP. 470UF 25V RAD ELECT	I 13
C56	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1*
C57	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1*
C58	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1*
C59	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 1*
C60	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1
C61	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1
C62	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	C 8*
C63	A11427-334J6	.33UF 50V 5% CHIP X7R 1210	H 14
C64	125508-1	10UF 50V 20% SMT AL ELECT T/R	G 14
C65	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	G 14
C66	102438-560K2	56PF 200V 10% NPO 0805 T/R	H 14
C67	102438-560K2	56PF 200V 10% NPO 0805 T/R	H 13
C68	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	H 14
C69	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	D 5
C70	126542-1	2.2UF 50V 5.5MM HIGH SMD	C 7
C71	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 9*
C72	103191-1	0.47UF 50V Z5U 1210 T/R	B 3
C73	126551-1	100UF 25V 5.5MM HIGH SMD	A 4
C74	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 7*
C75	A11427-473K5	.047UF 50V CHIP CAPACITOR X7R	B 3
C76	126542-1	2.2UF 50V 5.5MM HIGH SMD	C 3
C78	A11427-102K2	.001UF 50V 10% X7R CER CHIP	B 3
C79	126551-1	100UF 25V 5.5MM HIGH SMD	E 7
C80	126551-1	100UF 25V 5.5MM HIGH SMD	E 8
C81	126551-1	100UF 25V 5.5MM HIGH SMD	O 1
C82	126551-1	100UF 25V 5.5MM HIGH SMD	M 5
C83	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 6*
C84	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 6*
C85	126551-1	100UF 25V 5.5MM HIGH SMD	L 5
C86	126551-1	100UF 25V 5.5MM HIGH SMD	L 6
C87	C10516-0	470. UF 10V 20% LOW ESR RDL T/R	L 6
C88	C10516-0	470. UF 10V 20% LOW ESR RDL T/R	L 7
C89	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	B 7
C90	103191-1	0.47UF 50V Z5U 1210 T/R	N 3*
C91	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 5
C92	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 3*
C93	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	C 3*
C94	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 3*
C95	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 3*
C96	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 3*

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 12 OF 48





PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C144	A11427-473K5	.047UF 50V CHIP CAPACITOR X7R	A 4*
C145	A11427-334J6	.33UF 50V 5% CHIP X7R 1210	N 6
C146	A11427-103K5	0.01UF 50V 10% X7R SMD 1206	N 6
C147	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 6
C148	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 7*
C149	130561-1	10UF 25V 20% ALUM ELEC SMT T/R	M 7
C150	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 7*
C151	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	M 7*
C152	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	N 7*
C153	C 6995-2	022UF 100V CHIP CAPACITOR X7R	N 6*
C154	A11369-221J5	220PF 50V 5% NPO 1206 SMD	N 6*
C155	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 6*
C156	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 6*
C157	126539-1	10UF 16V 5.5MM HIGH SMD	N 6
C158	126539-1	10UF 16V 5.5MM HIGH SMD	N 6
C159	A11369-221K2	220.PF 50V 10% NPO MLC 0805	N 6
C160	127684-1	.0047UF 5% 16V 0805 FILM SMT	O 4*
C161	127684-1	.0047UF 5% 16V 0805 FILM SMT	O 4*
C162	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	O 5*
C163	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 5*
C164	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	O 5*
C165	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 5*
C166	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	O 5*
C167	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	N 5*
C168	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 5*
C169	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	N 5*
C170	126623-1	47UF 16V 6.3X5.5MM 20% SMT	O 5
C171	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	L 3*
C172	126539-1	10UF 16V 5.5MM HIGH SMD	M 6
C173	126539-1	10UF 16V 5.5MM HIGH SMD	P 5
C174	126539-1	10UF 16V 5.5MM HIGH SMD	O 5
C175	126543-1	2.2UF 50V 5.5MM HIGH NP SMD	N 5
C176	103191-1	0.47UF 50V Z5U 1210 T/R	M 4*
C177	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 3*
C178		OPEN	L 8
C179	A11427-104J5	0.10UF 50V 5% X7R 1206 T/R	N 2*
C180	126551-1	100UF 25V 5.5MM HIGH SMD	N 3
C181	126551-1	100UF 25V 5.5MM HIGH SMD	M 5
C182	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C183	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C184	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 11*
C185	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C186	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 8
C187	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 8
C188	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 8*
C189	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 8*
C190	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	N 9

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE	PROJ. NO.	SHEET
NONE	MD425D0	14 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C191	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	N 9
C192	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	N 9
C193	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 11*
C194	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 11*
C195	126551-1	100UF 25V 5.5MM HIGH SMD	K 12
C196	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 11
C197	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 12
C198	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 6*
C199	A11369-471K5	470PF 50V 10% CHIP NPO 1206	P 6*
C200	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	O 13
C201		OPEN	P 3*
C202	103191-1	0.47UF 50V Z5U 1210 T/R	P 3
C203	102438-101K2	100PF 200V NPO 0805 T/R	O 4
C204	102438-221F2	220PF 200V 1% NPO 0805	O 4
C205	102438-102J6	1000PF 200V 5% 1210 NPO	O 4*
C206	103430-331K2	330PF 250V 10% NPO 0805 T/R	O 4*
C207	102438-221F2	220PF 200V 1% NPO 0805	P 4
C208	A11427-473K5	.047UF 50V CHIP CAPACITOR X7R	O 4
C209	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	O 4
C210	A11369-120K2	12PF 50V 10% NPO 0805 T/R	P 3*
C211	A11369-120K2	12PF 50V 10% NPO 0805 T/R	O 4*
C212	A11369-471F2	470.PF 50V 1% NPO MLC 0805	O 4*
C213	A11369-101J2	100 PF 50V 5% NPO MLC 0805 T/R	O 4*
C214	A11369-332F5	3300.PF 50V 1% NPO MLC 1206	O 4
C215	A11369-332F5	3300.PF 50V 1% NPO MLC 1206	P 4*
C216	A11369-120K2	12PF 50V 10% NPO 0805 T/R	P 4*
C217	A11369-120K2	12PF 50V 10% NPO 0805 T/R	P 4*
C218	A11369-470K2	47PF 50V 10% NPO 0805 T/R	N 4*
C219	A11369-470K2	47PF 50V 10% NPO 0805 T/R	N 3*
C220	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 4
C221	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 4
C222	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 4*
C223	103191-1	0.47UF 50V Z5U 1210 T/R	O 4
C224	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 3
C225	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 4
C226	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 3*
C227	103191-1	0.47UF 50V Z5U 1210 T/R	O 3
C228	C10466-8	.22UF 50V 5% MTL FILM RDL T/A	P 9
C229	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	P 10
C230	A11427-103K5	0.01UF 50V 10% X7R SMD 1206	O 7
C231	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	P 10
C232	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	P 12
C233	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	P 12
C234	A11427-224J5	0.22UF 50V 5% X7R 1206 T/R	O 12
C235	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	O 12
C236	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	O 13
C237	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	O 13

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 15 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C238	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	P 13
C239	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	P 13
C240	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	O 13
C241	126542-1	2.2UF 50V 5.5MM HIGH SMD	C 8
C242	126542-1	2.2UF 50V 5.5MM HIGH SMD	D 8
C245	A11427-334J6	.33UF 50V 5% CHIP X7R 1210	O 6
C246	A11427-103K5	0.01UF 50V 10% X7R SMD 1206	O 6
C247	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5
C248	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 7*
C249	130561-1	10UF 25V 20% ALUM ELEC SMT T/R	O 7
C250	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 7*
C251	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	O 7*
C252	A11369-102K5	1000PF 50V 10% NPD 1206 SMD	P 7*
C253	C 6995-2	022UF 100V CHIP CAPACITOR X7R	N 4*
C254	A11369-221J5	220PF 50V 5% NPO 1206 SMD	N 4*
C255	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 4*
C256	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 4*
C257	126539-1	10UF 16V 5.5MM HIGH SMD	N 4
C258	126539-1	10UF 16V 5.5MM HIGH SMD	N 4
C259	A11369-221K2	220.PF 50V 10% NPO MLC 0805	N 4
C260	127684-1	.0047UF 5% 16V 0805 FILM SMT	O 3*
C261	127684-1	.0047UF 5% 16V 0805 FILM SMT	O 3*
C262	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	O 3*
C263	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 3*
C264	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	O 3*
C265	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 3*
C266	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	O 3*
C267	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	N 3*
C268	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 3*
C269	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	N 3*
C270	126623-1	47UF 16V 6.3X5.5MM 20% SMT	O 3
C271	A11369-471K5	470PF 50V 10% CHIP NPO 1206	P 4*
C272	126539-1	10UF 16V 5.5MM HIGH SMD	N 5
C273	126539-1	10UF 16V 5.5MM HIGH SMD	P 4
C274	126539-1	10UF 16V 5.5MM HIGH SMD	O 4
C275	126543-1	2.2UF 50V 5.5MM HIGH NP SMD	N 4
C276	103191-1	0.47UF 50V 25U 1210 T/R	M 2*
C277	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 3*
C278		OPEN	N 3*
C279	A11427-184J5	0.18UF 50V 5% X7R 1206 T/R	N 2*
C281	126623-1	47UF 16V 6.3X5.5MM 20% SMT	B 7
C282	A11369-471K5	470PF 50V 10% CHIP NPO 1206	O 4
C283	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 8*
C284	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 7*
C285	126551-1	100UF 25V 5.5MM HIGH SMD	N 3
C286	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 4
C287	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 5

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE	NONE	PROJ NO. MD425D0
SHEET 16 OF 48		



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C288	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 5*
C289	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 5*
C290	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	O 9
C291	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	O 9
C292	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	O 9
C293	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 2*
C294	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 2*
C295	126551-1	100UF 25V 5.5MM HIGH SMD	K 2
C296	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 2
C297	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 2
C298	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 7
C299	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 4*
C300	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	L 3*
C301	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 7*
C302	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 4*
C303	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 4*
C304		OPEN	A 10
C305		OPEN	B 10
C306	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 7
C307	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	H 14
C308	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 8
C309	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 8
C310	125508-1	10UF 50V 20% SMT AL ELECT T/R	M 3
C313	126542-1	2.2UF 50V 5.5MM HIGH SMD	M 9
C314	A11427-103K5	0.01UF 50V 10% X7R SMD 1206	D 3*
C315	A11369-471K5	470PF 50V 10% CHIP NPO 1206	O 5
C316	126551-1	100UF 25V 5.5MM HIGH SMD	K 8
C317	126551-1	100UF 25V 5.5MM HIGH SMD	K 8
C318	126551-1	100UF 25V 5.5MM HIGH SMD	K 8
C319	126551-1	100UF 25V 5.5MM HIGH SMD	K 8
C320	126539-1	10UF 16V 5.5MM HIGH SMD	D 3
C321	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 7
C322	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 8
C323	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 5*
C324	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 5
C325	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 5*
C326	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 5*
C327	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 5*
C328	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 5*
C329	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C330	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C332	126539-1	10UF 16V 5.5MM HIGH SMD	D 8
C333	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	C 3*
C334	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	C 7*
C335	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	C 3*
C336	126539-1	10UF 16V 5.5MM HIGH SMD	M 5
C337	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	A 10

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 17 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
C338	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 9
C339	A11427-224J5	0.22UF 50V 5% X7R 1206 T/R	N 2*
C340	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 4*
C341	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 4*
C342	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5*
C343	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5*
C344	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C345	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C346	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C347	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C348	C10325-6	2200.PF 250VAC 20% FILM Y2	C 11
C349	126539-1	10UF 16V 5.5MM HIGH SMD	M 4
C350	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 6*
C351	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 6*
C352	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 6*
C353	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C354	126551-1	100UF 25V 5.5MM HIGH SMD	N 4
C355	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 2*
C356	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5
C357	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5
C358	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 9*
C360	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 9*
C361	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 9*
C363	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	H 7*
C365	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 7*
C366	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 12*
C367	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 12*
C369	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 10*
C371	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 10*
C372	127483-1	6300UF 125V 9A LOW ESL 5 PIN	L 10
C373	127483-1	6300UF 125V 9A LOW ESL 5 PIN	L 12
C374	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 9*
C375	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 7*
C377	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	H 12*
C378	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 10*
C380	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 8*
C382	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 9*
C384	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 11*
C386	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 12*
C387	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 9
C388	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 9
C390	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 11
C391	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 11
C397	A10434-103JD	.01UF 250V 5%MTL POLY FILM T/A	N 10
C398	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	O 5*
C400	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 5*
C401	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 4*

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 18 OF 48





PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
C403	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 6*
C404	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	H 6*
C407	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 2*
C408	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 1*
C409	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 3*
C410	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 3*
C413	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 4*
C414	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 6*
C416	126551-1	100UF 25V 5.5MM HIGH SMD	K 6
C417	126551-1	100UF 25V 5.5MM HIGH SMD	K 6
C418	126551-1	100UF 25V 5.5MM HIGH SMD	K 6
C419	126551-1	100UF 25V 5.5MM HIGH SMD	K 6
C421	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 6
C422	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 4
C423	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 4*
C424	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 4*
C425	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 3*
C426	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 3
C427	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 3*
C428	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 3*
C429	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 3*
C430	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 3*
C431	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 4*
C432	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 4*
C435	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	H 2*
C436	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 3*
C437	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 4*
C438	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 5*
C440	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 1*
C441	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 3*
C446	127483-1	6300UF 125V 9A LOW ESL 5 PIN	L 4
C447	127483-1	6300UF 125V 9A LOW ESL 5 PIN	L 2
C449	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 5
C453	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 5
C454	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 3
C455	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 3
C497	A10434-103JD	.01UF 250V 5%MTL POLY FILM T/A	O 10
C498	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	O 3*
C500	103191-1	0.47UF 50V Z5U 1210 T/R	N 1
C501	103191-1	0.47UF 50V Z5U 1210 T/R	O 1
C502	A11369-221K2	220.PF 50V 10% NPO MLC 0805	N 1
C600	103191-1	0.47UF 50V Z5U 1210 T/R	N 1
C601	103191-1	0.47UF 50V Z5U 1210 T/R	O 1
C602	A11369-221K2	220.PF 50V 10% NPO MLC 0805	N 1
C700	C 7099-2	0.47UF 250VAC 50-400HZ RFI CAP	E 1
C701	A11427-102K2	.001UF 50V 10% X7R CER CHIP	B 8*
C702		OPEN	C 8*

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE	NONE	PROJ NO. MD425D0
		SHEET 19 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
D1		INSTALLED ON PREVIOUS ASSEMBLY	F 1
D2		INSTALLED ON PREVIOUS ASSEMBLY	F 5
D3		INSTALLED ON PREVIOUS ASSEMBLY	F 11
D4		INSTALLED ON PREVIOUS ASSEMBLY	F 10
D5		INSTALLED ON PREVIOUS ASSEMBLY	F 12
D6		INSTALLED ON PREVIOUS ASSEMBLY	F 12
D7	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	D 4
D8	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	D 3
D9	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D10	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D11	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	E 4
D12	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D13	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D14	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 3*
D15	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 8
D16		OPEN	B 11
D17		OPEN	A 8
D18	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	A 4
D19	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	A 3
D22	125255-1	DIODE, ULTRAFASST 200V 1A SMA	H 14
D24	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 1
D25	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 1
D26	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D27	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	B 9
D33	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	C 2
D34	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	L 6
D35	125593-1	DIODE, SCHOTTKY 40V 1A SMA	L 6
D36	125593-1	DIODE, SCHOTTKY 40V 1A SMA	L 7
D37	C 9929-B	TL431ACL P ADJ PREC RFNC T/A	M 3
D38	C 9929-B	TL431ACL P ADJ PREC RFNC T/A	M 3
D43	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 10
D44	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 7
D45	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	A 4
D100	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 13
D101	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 13
D102	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 12
D103	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 12
D104	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	P 5
D105	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 6
D106	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 6
D107	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	N 5*
D109	C 9929-B	TL431ACL P ADJ PREC RFNC T/A	N 7
D110	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 5
D120	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 5
D121	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 5
D122	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 2
D123	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 7

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 20 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
D124	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 8
D125	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 8
D126	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 8
D127	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 8
D128	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 5
D129	125620-1	DIODE, FAST RECOVERY 400V 1A	N 10
D130	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 8
D131	125593-1	DIODE, SCHOTTKY 40V 1A SMA	K 7
D132	125593-1	DIODE, SCHOTTKY 40V 1A SMA	K 7
D133	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 5
D134	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 11
D138		OPEN	J 8
D139		OPEN	J 9
D140		INSTALLED ON PREVIOUS ASSEMBLY	J 9
D141		INSTALLED ON PREVIOUS ASSEMBLY	J 8
D142		INSTALLED ON PREVIOUS ASSEMBLY	J 11
D143		INSTALLED ON PREVIOUS ASSEMBLY	J 11
D144		OPEN	J 11
D145		OPEN	J 11
D146	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 4
D200	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 13
D201	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 13
D202	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 12
D203	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 12
D204	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	P 3
D205	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 4
D206	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 4
D207	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	N 4*
D209	C 9929-8	TL431ACL P ADJ PREC RFNC T/A	P 7
D210	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 3
D222	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 2
D223	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 7
D229	125620-1	DIODE, FAST RECOVERY 400V 1A	P 10
D231	125593-1	DIODE, SCHOTTKY 40V 1A SMA	K 6
D232	125593-1	DIODE, SCHOTTKY 40V 1A SMA	K 6
D238		OPEN	J 6
D239		OPEN	J 5
D240		INSTALLED ON PREVIOUS ASSEMBLY	J 5
D241		INSTALLED ON PREVIOUS ASSEMBLY	J 5
D242		INSTALLED ON PREVIOUS ASSEMBLY	J 2
D243		INSTALLED ON PREVIOUS ASSEMBLY	J 3
D244		OPEN	J 2
D245		OPEN	J 3
D246	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 3
D500		OPEN	N 1
D600		OPEN	O 1
D700	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 8

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE	NONE	PROJ NO. MD425D0
		SHEET 21 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
Q104	126616-1	XSISTOR, 100V 2A DRLNGTN DPAK	I 13
Q105	126616-1	XSISTOR, 100V 2A DRLNGTN DPAK	I 14
Q106		INSTALLED ON PREVIOUS ASSEMBLY	J 9
Q107		INSTALLED ON PREVIOUS ASSEMBLY	J 8
Q108		INSTALLED ON PREVIOUS ASSEMBLY	J 12
Q109		INSTALLED ON PREVIOUS ASSEMBLY	J 11
Q110		INSTALLED ON PREVIOUS ASSEMBLY	J 7
Q111		INSTALLED ON PREVIOUS ASSEMBLY	J 9
Q112		INSTALLED ON PREVIOUS ASSEMBLY	J 12
Q113		INSTALLED ON PREVIOUS ASSEMBLY	J 10
Q115	C 7448-1	MMBT3904 CHIP NPN	M 4
Q200	C 7448-1	MMBT3904 CHIP NPN	P 4
Q201	125798-1	TRANSISTOR,MMBT3906LTI PNP SMT	P 4
Q203	C 7448-1	MMBT3904 CHIP NPN	N 2
Q206		INSTALLED ON PREVIOUS ASSEMBLY	J 5
Q207		INSTALLED ON PREVIOUS ASSEMBLY	J 6
Q208		INSTALLED ON PREVIOUS ASSEMBLY	J 2
Q209		INSTALLED ON PREVIOUS ASSEMBLY	J 3
Q210		INSTALLED ON PREVIOUS ASSEMBLY	J 6
Q211		INSTALLED ON PREVIOUS ASSEMBLY	J 4
Q212		INSTALLED ON PREVIOUS ASSEMBLY	J 1
Q213		INSTALLED ON PREVIOUS ASSEMBLY	J 3
Q215	C 7448-1	MMBT3904 CHIP NPN	M 3
Q500	C 7448-1	MMBT3904 CHIP NPN	L 1
Q501	C 7448-1	MMBT3904 CHIP NPN	L 1
Q600	C 7448-1	MMBT3904 CHIP NPN	N 1
Q601	C 7448-1	MMBT3904 CHIP NPN	O 1
Q700	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	B 9
Q701	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	A 9
Q702	C 9258-2	BS170RLRM N-MOSFET 60V T/A	B 9
Q703	125798-1	TRANSISTOR,MMBT3906LTI PNP SMT	D 4
R1	101103-1	PTC, 6.0 OHM 265V	D 2
R2	101103-1	PTC, 6.0 OHM 265V	C 2
R3	C10450-2	.04 OHM 5W 3% WW VERT MNT	E 1
R4	C10450-2	.04 OHM 5W 3% WW VERT MNT	E 2
R5	C10450-2	.04 OHM 5W 3% WW VERT MNT	E 2
R6	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 3
R7	A11368-10521	10.5K .10W 1% MF 0805	E 3*
R8	A11368-10521	10.5K .10W 1% MF 0805	E 4*
R9	A11368-27432	274K .125W 1% CHIP RES T/R	C 3
R10	A11368-10521	10.5K .10W 1% MF 0805	E 7*
R11	A11368-10521	10.5K .10W 1% MF 0805	E 7*
R12	A11368-24332	243KOHM .125W 1% CHIP RES T/R	A 3
R13	A11368-10521	10.5K .10W 1% MF 0805	E 9*
R14	A11368-10521	10.5K .10W 1% MF 0805	E 8*
R15	A11368-30112	3.01KOHM .125W 1% CHIP RES T/R	B 8
R16		OPEN	B 10

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD42500	SHEET 24 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
D701	C 8369-8	1N747A 3.6V 5% ZENER .5W T/A	C 9
E1	102476-1	LED, SMT R/A GREEN	L 1
E2	102477-1	LED, SMT R/A RED	L 1
E3	102477-1	LED, SMT R/A RED	M 1
E4	102476-1	LED, SMT R/A GREEN	K 1
E5	102476-1	LED, SMT R/A GREEN	N 1
E6	102477-1	LED, SMT R/A RED	O 1
E7	102477-1	LED, SMT R/A RED	O 1
FB1	100868-1	FERRITE, 70 OHM 25% 1206 SMT	D 7*
FB2	100868-1	FERRITE, 70 OHM 25% 1206 SMT	E 4*
FB3	100868-1	FERRITE, 70 OHM 25% 1206 SMT	A 4*
HS1	C 9918-1	TQ220 VERT CLIP-ON HEATSINK	D 7
HS2	128009-1	ASM, CE3000 PS PRIMARY HS	F 1
HS3	128010-1	ASM, CE3000 PS DIODE HS	F 10
HS4	128011-1	ASM, CE3000 BCA OUTPUT HS	H 7
HS5	128011-1	ASM, CE3000 BCA OUTPUT HS	H 1
J1	101031-1	.250 FASTON, AUTO INSERTABLE	D 1
J2	101031-1	.250 FASTON, AUTO INSERTABLE	D 1
J3	101031-1	.250 FASTON, AUTO INSERTABLE	K 8
J4	101571-1	HDR, 2 POS .1 CTR MTA SHRD	H 14
J5	127563-3	PWA, CE4000 POT BOARD	O 2
J6	130640-1	HEADER, 3M LATCH 26 PIN .1X.1	O 2
J7		OPEN	Q 6
J8		OPEN	K 14
J9	A10020-34	6-32 X .375 PCB CAPTIVE STUD	K 14
J11	101031-1	.250 FASTON, AUTO INSERTABLE	M 8
J12	101031-1	.250 FASTON, AUTO INSERTABLE	N 8
J13	101031-1	.250 FASTON, AUTO INSERTABLE	K 11
J14	101031-1	.250 FASTON, AUTO INSERTABLE	K 5
J15	101031-1	.250 FASTON, AUTO INSERTABLE	O 8
J16	101031-1	.250 FASTON, AUTO INSERTABLE	P 8
J17	101031-1	.250 FASTON, AUTO INSERTABLE	K 2
J18		OPEN	M 14
J19	A10020-34	6-32 X .375 PCB CAPTIVE STUD	L 14
J20		OPEN	M 1
J21		OPEN	O 1
J22	101031-1	.250 FASTON, AUTO INSERTABLE	E 4
J23	101031-1	.250 FASTON, AUTO INSERTABLE	D 2
J24	127030-1	CONN, 7 PIN RECEPTACLE	A 7
J25	127031-1	CONN, 15 PIN RECEPTACLE	A 10
J26	101031-1	.250 FASTON, AUTO INSERTABLE	C 2
J27	101031-1	.250 FASTON, AUTO INSERTABLE	B 2
J28	101031-1	.250 FASTON, AUTO INSERTABLE	B 2
J29	101031-1	.250 FASTON, AUTO INSERTABLE	B 2
J30		OPEN	Q 5
K1	128135-1	RELAY, 30A 250V 12VCOIL PCB MT	C 2
L1	127988-1	CHOKER, 10UH <math>\phi</math>.10HM SMT .3" DIA	I 13

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 22 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
R17	A11371-5R12	5.10HM 0.125W 5% 1206 T/R	E 7*
R18	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	D 4
R19	A10266-5141	510. KOHM .25W 5% CF T/R	D 2
R1X	C 8982-8	TO-220 XSISTOR HOLDER, PLASTIC	D 2
R20	A10266-5141	510. KOHM .25W 5% CF T/R	E 3
R21	A11368-15831	158KOHM .1W 1% 0805 T/R	E 3
R22	A10265-45331	453 KOHM .25W 1% MF T/R	D 2
R23	A10265-45331	453 KOHM .25W 1% MF T/R	E 3
R24	A11368-12132	121KOHM .125W 1% CHIP RES T/R	D 3*
R25	A10265-68131	681KOHM .25W 1% MF T/R	D 4
R26	A10265-68131	681KOHM .25W 1% MF T/R	D 4
R27	A10265-39231	392 KOHM .25W 1% MF T/R	C 4
R28	A10265-39231	392 KOHM .25W 1% MF T/R	C 4
R29	A11368-33R21	33.2 OHM 1% 0805 RES T/R	C 3
R2X	C 8982-8	TO-220 XSISTOR HOLDER, PLASTIC	C 2
R30	A11368-16221	16.2KOHM .1W 1% 0805 T/R	D 4*
R31	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 4*
R32	A11368-10R03	10 OHM 0.25W 1% 1210 T/R	E 4
R33	A11368-1R004	1 OHM 0.5W 1% 2010 T/R	E 3*
R34	A11368-1R004	1 OHM 0.5W 1% 2010 T/R	E 4*
R35	A11368-27432	274K .125W 1% CHIP RES T/R	B 3
R36	A11368-37401	374. OHM 1/10W 1% SMD 0805 T/R	D 4*
R37	A11371-1002	10.0HM 1/BW 5% SMD 1206 T/R	D 4
R38	A11368-40212	4.02KOHM .125W 1% CHIP RES T/R	D 4*
R39	A11368-57621	57.6KOHM 0.1W 1% 0805 T/R	D 4*
R40	A11368-40212	4.02KOHM .125W 1% CHIP RES T/R	D 4
R41	A11368-20021	20.KOHM .1W 1% CHIP 0805	D 3
R42	126564-1	300HM 10W 5% VERT THICK FILM	I 14
R43	A11368-10001	100 OHM 1% 0805 RES T/R	M 6*
R44	A11371-5R12	5.10HM 0.125W 5% 1206 T/R	E 7*
R45	A11371-5R12	5.10HM 0.125W 5% 1206 T/R	E 8*
R46	A11371-5R12	5.10HM 0.125W 5% 1206 T/R	E 9*
R47	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 8
R48	A11371-3005	30 OHM 1W 5% 2512 T/R	B 9
R49	A11368-82511	8.25KOHM .1W 1% CHIP 0805	B 8
R50	A11368-12131	121KOHM, 0.10W 1% CHIP 0805	C 8*
R51	A11368-90921	90.9K, 0.10W 1% MF 0805	C 8
R52	A11368-15421	15.4K 1/10W 1% SMD 0805 T/R	C 8
R53	A11368-15421	15.4K 1/10W 1% SMD 0805 T/R	C 7
R54	A11371-3005	30 OHM 1W 5% 2512 T/R	C 8
R55	A11368-33R21	33.2 OHM 1% 0805 RES T/R	B 3
R56	A11368-10021	10K 1/10W 1% SMD 0805 T/R	B 3*
R57	A11368-27432	274K .125W 1% CHIP RES T/R	B 4
R58	A11368-33R21	33.2 OHM 1% 0805 RES T/R	B 3
R59	A11368-10001	100 OHM 1% 0805 RES T/R	D 8
R60	A11368-1R001	1 OHM .1W 1% 0805 T/R	D 8
R61	A11368-33R21	33.2 OHM 1% 0805 RES T/R	B 3*

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	25 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
R62	A11368-20031	200K 0.1W 1% SMD CHIP 0805	A 8
R63	A11368-10001	100 OHM 1% 0805 RES T/R	M 2*
R65	A11368-68131	681KOHM .1W 1% 0805 T/R	B 7
R66	A11368-10011	1.KOHM .1W 1% CHIP 0805	B 7
R67	A11368-39212	3.92 KOHM, 1% MF .125W 1206	M 7*
R68	A11368-39212	3.92 KOHM, 1% MF .125W 1206	N 7*
R69	A11368-39212	3.92 KOHM, 1% MF .125W 1206	O 7*
R70	A11368-39212	3.92 KOHM, 1% MF .125W 1206	P 7*
R71	A11368-10001	100 OHM 1% 0805 RES T/R	M 6*
R72	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 4
R73	A11368-10041	1M OHM .1W 1% CHIP 0805	A 3
R74	A11368-60411	6.04KOHM .1W 1% 0805 T/R	L 3*
R75		OPEN	A 11
R76	A11368-10021	10K 1/10W 1% SMD 0805 T/R	B 3
R77	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 3
R78	A10265-12731	127 KOHM .25W 1 MF T/R	A 2
R79	A10265-12731	127 KOHM .25W 1 MF T/R	A 2
R80	A11371-8211	820 OHM .1W 5% 0805 T/R	D 4
R81	A11368-18202	182 OHM .125W 1% 1206 T/R	B 7
R82	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	B 3
R83	A10266-3902	39.0 OHM .5W 5% CF T/R	C 2
R84	A11368-71531	715K 0.1W 1% 0805 T/R	L 8
R85	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	B 8
R86	A11371-3905	39 OHM 1W 5% 2512 T/R	I 14*
R87	A11371-1052	1. MOHM .125W 5% CHIP RES T/R	H 13
R88	A11368-51111	5.11KOHM .1W 1% 0805 T/R	H 13
R90	A11368-39231	392 KOHM .1W 1% 0805 T/R	O 1*
R91	A11368-10011	1.KOHM .1W 1% CHIP 0805	B 10
R92	A11368-49901	499 OHM .1W 1% 0805 T/R	B 7
R93	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R94	A11368-10011	1.KOHM .1W 1% CHIP 0805	C 7*
R95	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 7
R98	A11368-30101	301 OHM .1W 1% 0805 T/R	A 4*
R99	A11368-49921	49.9KOHM .1W 1% CHIP 0805	B 4
R100	A11368-39224	39.2K 0.5W 1% 2010 T/R	N 13
R101	A11368-17811	1.78K 0.1W 1% 0805 SMD T/R	P 5*
R102	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 5*
R103	A11368-11021	11K 0.1W 1% 0805 T/R	P 5*
R104	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 5*
R105	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 5*
R106	A11368-20011	2.0K, 0.10W 1% MF 0805	P 5*
R107	A11368-23221	23.2KOHM .1W 1% 0805 T/R	O 6*
R108	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	P 6
R109	A11368-75011	7.50K .10W 1% CHIP 0805	O 6
R110	A11368-23201	2320HM .1W 1% 0805 T/R	N 7
R111	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 6*
R112	A11368-10011	1.KOHM .1W 1% CHIP 0805	O 6

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SIZE A	DWG NO. 126218-13	REV A
SCALE NONE	PROJ NO. MD425D0	SHEET 26 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
R62	A11368-20031	200K 0.1W 1% SMD CHIP 0805	A 8
R63	A11368-10001	100 OHM 1% 0805 RES T/R	M 2*
R65	A11368-60131	681KOHM .1W 1% 0805 T/R	B 7
R66	A11368-10011	1.KOHM .1W 1% CHIP 0805	B 7
R67	A11368-39212	3.92 KOHM, 1% MF .125W 1206	M 7*
R68	A11368-39212	3.92 KOHM, 1% MF .125W 1206	N 7*
R69	A11368-39212	3.92 KOHM, 1% MF .125W 1206	O 7*
R70	A11368-39212	3.92 KOHM, 1% MF .125W 1206	P 7*
R71	A11368-10001	100 OHM 1% 0805 RES T/R	M 6*
R72	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 4
R73	A11368-10041	1M OHM .1W 1% CHIP 0805	A 3
R74	A11368-60411	6.04KOHM .1W 1% 0805 T/R	L 3*
R75		OPEN	A 11
R76	A11368-10021	10K 1/10W 1% SMD 0805 T/R	B 3
R77	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 3
R78	A10265-12731	127 KOHM .25W 1 MF T/R	A 2
R79	A10265-12731	127 KOHM .25W 1 MF T/R	A 2
R80	A11371-8211	820 OHM .1W 5% 0805 T/R	D 4
R81	A11368-10202	182 OHM .125W 1% 1206 T/R	B 7
R82	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	B 3
R83	A10266-3902	39.0 OHM .5W 5% CF T/R	C 2
R84	A11368-71531	715K 0.1W 1% 0805 T/R	L 8
R85	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	B 8
R86	A11371-3905	39 OHM 1W 5% 2512 T/R	I 14*
R87	A11371-1052	1. MOHM .125W 5% CHIP RES T/R	H 13
R88	A11368-51111	5.11KOHM .1W 1% 0805 T/R	H 13
R90	A11368-39231	392 KOHM .1W 1% 0805 T/R	O 1*
R91	A11368-10011	1.KOHM .1W 1% CHIP 0805	B 10
R92	A11368-49901	499 OHM .1W 1% 0805 T/R	B 7
R93	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R94	A11368-10011	1.KOHM .1W 1% CHIP 0805	C 7*
R95	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 7
R98	A11368-30101	301 OHM .1W 1% 0805 T/R	A 4*
R99	A11368-49921	49.9KOHM .1W 1% CHIP 0805	B 4
R100	A11368-39224	39.2K 0.5W 1% 2010 T/R	N 13
R101	A11368-17811	1.78K 0.1W 1% 0805 SMD T/R	P 5*
R102	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 5*
R103	A11368-11021	11K 0.1W 1% 0805 T/R	P 5*
R104	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 5*
R105	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 5*
R106	A11368-20011	2.0K, 0.10W 1% MF 0805	P 5*
R107	A11368-23221	23.2KOHM .1W 1% 0805 T/R	O 6*
R108	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	P 6
R109	A11368-75011	7.50K .10W 1% CHIP 0805	O 6
R110	A11368-23201	2320HM .1W 1% 0805 T/R	N 7
R111	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 6*
R112	A11368-10011	1.KOHM .1W 1% CHIP 0805	O 6

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 26 OF 48





PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R113	A11368-10011	1.KOHM .1W 1% CHIP 0805	O 5
R114	A11368-20011	2.0K. 0.10W 1% MF 0805	N 6
R115	127682-1	4.99K 0.1% 1206 THIN FILM T/R	P 5*
R116	127682-1	4.99K 0.1% 1206 THIN FILM T/R	P 5*
R117	127682-1	4.99K 0.1% 1206 THIN FILM T/R	O 6*
R118	A11368-48711	4.87K OHM .10W 1% 0805	O 5*
R119	A11368-84511	8.45K 0.1W 1% 0805 T/R	O 5*
R120	A11368-84511	8.45K 0.1W 1% 0805 T/R	O 5*
R121	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 6*
R122	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 6*
R123	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 6*
R124	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 6*
R125	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*
R126	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*
R127	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*
R128	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 1*
R129	A11368-11011	RES, 1.1KOHM .1W 1% 0805	O 6*
R130	A11368-11011	RES, 1.1KOHM .1W 1% 0805	O 5*
R131	A11368-20011	2.0K. 0.10W 1% MF 0805	O 5*
R132	A11368-11011	RES, 1.1KOHM .1W 1% 0805	O 5*
R133	A11368-11011	RES, 1.1KOHM .1W 1% 0805	O 6*
R134	A11368-20011	2.0K. 0.10W 1% MF 0805	O 6*
R135	A11368-10001	100 OHM 1% 0805 RES T/R	O 5
R136	A11368-10001	100 OHM 1% 0805 RES T/R	O 5
R137	A11368-10001	100 OHM 1% 0805 RES T/R	O 6
R138	A11368-10001	100 OHM 1% 0805 RES T/R	O 6
R139	A11368-33R21	33.2 OHM 1% 0805 RES T/R	N 7
R140	A11368-1R004	1 OHM 0.5W 1% 2010 T/R	N 7
R141	A11368-10711	1.07KOHM .1W 1% 0805 T/R	N 6
R142	126538-1	18 OHM 5W5% VERT THICK FILM	M 11
R143	126538-1	18 OHM 5W5% VERT THICK FILM	M 11
R144	A11371-1105	11 OHM 1W 5% 2512 T/R	M 12*
R145	A11371-1105	11 OHM 1W 5% 2512 T/R	M 13*
R146	A11371-1105	11 OHM 1W 5% 2512 T/R	N 13*
R147	A11371-1105	11 OHM 1W 5% 2512 T/R	N 12*
R148	A11368-10013	1K 0.25W 1% 1210 T/R	M 12
R149	126538-1	18 OHM 5W5% VERT THICK FILM	N 13
R150	126538-1	18 OHM 5W5% VERT THICK FILM	N 13
R151	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 2*
R152		OPEN	N 12
R153		OPEN	N 12
R154	A11368-15031	150K 1/10W 1% SMD 0805 T/R	N 6
R155	A11368-10001	100 OHM 1% 0805 RES T/R	N 6
R156	A11368-20031	200K 0.1W 1% SMD CHIP 0805	N 6
R157	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 6
R158	A11368-12741	1.27MOHM .1W 1% 0805 T/R	N 6
R159	A11368-51111	5.11K 1/10W 1% SMD 0805 T/R	N 7

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425DB	SHEET 27 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
R160	C10540-0	10.KOHM TOP ADJUST TRIMMER T/R	M 6
R161	A11368-20011	2.0K. 0.10W 1% MF 0805	M 7*
R162	A11368-30111	3.01K 1/10W 1% SMD 0805 T/R	M 7*
R163	A11368-47511	4.75KOHM 0.10W 1% CHIP 0805	M 7*
R164	A11368-56211	5.62KOHM .1W 1% 0805 T/R	N 7*
R165	A11368-10011	1.KOHM .1W 1% CHIP 0805	N 7*
R166	A11368-10011	1.KOHM .1W 1% CHIP 0805	M 7*
R167	A11368-10011	1.KOHM .1W 1% CHIP 0805	N 7*
R168	A11368-44221	44.2K 0.1W 1% 0805 T/R	N 6*
R169	A11368-26111	2.61K 0.1W 1% 0805 T/R	N 6*
R170	C 9779-7	100KOHM 4MM CERMET TRIM SMT TR	N 5
R171	A11368-10031	100.KOHM .1W 1% CHIP 0805	N 6*
R172	A11368-10001	100 OHM 1% 0805 RES T/R	N 6*
R173	A11368-10001	100 OHM 1% 0805 RES T/R	N 6*
R174	A11368-10531	105KOHM .1W 1% 0805 T/R	O 4*
R175	A11368-19111	1.91KOHM .1W 1% 0805 T/R	O 4*
R176	A11368-19111	1.91KOHM .1W 1% 0805 T/R	O 5*
R177	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 5*
R178	C 9777-1	1 KOHM 4MM CERMET TRIM SMT T/R	O 5
R179	A11368-13011	1.3KOHM .1W 1% 0805 T/R	O 5
R180	A11368-25511	2.55KOHM .1W 1% 0805 T/R	O 5*
R181	A11368-15011	1.5K 1/10W 1% SMD 0805 T/R	O 5*
R182	A11368-16221	16.2KOHM .1W 1% 0805 T/R	O 5*
R183	A11368-22111	2.21KOHM .1W 1% CHIP 0805	O 5*
R184	A11368-82511	8.25KOHM .1W 1% 0805	O 5*
R185	A11368-42211	4.22KOHM .1W 1% 0805 T/R	O 5*
R186	A11368-25511	2.55KOHM .1W 1% 0805 T/R	O 5*
R187	A11368-60411	6.04KOHM .1W 1% 0805 T/R	O 5*
R188	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*
R189	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*
R190	A11371-1842	180.KOHM .125W 5% CHIP RES T/R	N 2*
R191	A11368-39231	392 KOHM .1W 1% 0805 T/R	N 2*
R192	A11368-10021	10K 1/10W 1% SMD 0805 T/R	N 2
R193	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 2
R194	A11368-20021	20.KOHM .1W 1% CHIP 0805	P 5*
R195	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 6*
R196	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 6*
R197	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 6*
R198	A11368-71531	715K 0.1W 1% 0805 T/R	N 12
R199	A11368-10031	100.KOHM .1W 1% CHIP 0805	M 5*
R200	A11368-39224	39.2K 0.5W 1% 2010 T/R	O 13
R201	A11368-17811	1.78K 0.1W 1% 0805 SMD T/R	P 3*
R202	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 3*
R203	A11368-11021	11K 0.1W 1% 0805 T/R	P 3*
R204	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 3*
R205	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 3*
R206	A11368-20011	2.0K. 0.10W 1% MF 0805	P 3*

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	28 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R207	A11368-23221	23.2KOHM .1W 1% 0805 T/R	O 3*
R208	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	P 4
R209	A11368-75011	7.50K .10W 1% CHIP 0805	O 4
R210	A11368-23201	2320HM .1W 1% 0805 T/R	O 7
R211	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 4*
R212	A11368-10011	1.KOHM .1W 1% CHIP 0805	O 4
R213	A11368-10011	1.KOHM .1W 1% CHIP 0805	O 4
R214	A11368-20011	2.0K, 0.10W 1% MF 0805	N 5
R215	127682-1	4.99K 0.1% 1206 THIN FILM T/R	P 3*
R216	127682-1	4.99K 0.1% 1206 THIN FILM T/R	P 3*
R217	127682-1	4.99K 0.1% 1206 THIN FILM T/R	O 4*
R218	A11368-48711	4.87K OHM .10W 1% 0805	O 4*
R219	A11368-84511	8.45K 0.1W 1% 0805 T/R	O 4*
R220	A11368-84511	8.45K 0.1W 1% 0805 T/R	O 3*
R221	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 4*
R222	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 4*
R223	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 4*
R224	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 4*
R225	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R226	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R227	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R229	A11368-11011	RES. 1.1KOHM .1W 1% 0805	O 4*
R230	A11368-11011	RES. 1.1KOHM .1W 1% 0805	O 4*
R231	A11368-20011	2.0K, 0.10W 1% MF 0805	O 4*
R232	A11368-11011	RES. 1.1KOHM .1W 1% 0805	O 4*
R233	A11368-11011	RES. 1.1KOHM .1W 1% 0805	O 3*
R234	A11368-20011	2.0K, 0.10W 1% MF 0805	O 3*
R235	A11368-10001	100 OHM 1% 0805 RES T/R	O 4
R236	A11368-10001	100 OHM 1% 0805 RES T/R	O 4
R237	A11368-10001	100 OHM 1% 0805 RES T/R	O 3
R238	A11368-10001	100 OHM 1% 0805 RES T/R	O 3
R239	A11368-33R21	33.2 OHM 1% 0805 RES T/R	O 7
R240	A11368-1R004	1 OHM 0.5W 1% 2010 T/R	O 7
R241	A11368-10711	1.07KOHM .1W 1% 0805 T/R	O 6
R242	126538-1	18 OHM 5W5% VERT THICK FILM	P 11
R243	126538-1	18 OHM 5W5% VERT THICK FILM	P 11
R244	A11371-1105	11 OHM 1W 5% 2512 T/R	O 12*
R245	A11371-1105	11 OHM 1W 5% 2512 T/R	O 13*
R246	A11371-1105	11 OHM 1W 5% 2512 T/R	P 13*
R247	A11371-1105	11 OHM 1W 5% 2512 T/R	P 12*
R248	A11368-10013	1K 0.25W 1% 1210 T/R	O 12
R249	126538-1	18 OHM 5W5% VERT THICK FILM	O 13
R250	126538-1	18 OHM 5W5% VERT THICK FILM	O 13
R252		OPEN	O 12
R253		OPEN	O 12
R254	A11368-15031	150K 1/10W 1% SMD 0805 T/R	O 6
R255	A11368-10001	100 OHM 1% 0805 RES T/R	O 6

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SIZE	DWG NO.	126218-13	REV
A			A
SCALE	NONE	PROJ NO. MD42500	SHEET 29 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R256	A11368-20031	200K 0.1W 1% SMD CHIP 0805	O 6
R257	A11368-20021	20.KOHM .1W 1% CHIP 0805	O 6
R258	A11368-12741	1.27MOHM .1W 1% 0805 T/R	O 6
R259	A11368-51111	5.11K 1/10W 1% SMD 0805 T/R	O 7
R260	C10540-0	10.KOHM TOP ADJUST TRIMMER T/R	P 6
R261	A11368-20011	2.0K. 0.10W 1% MF 0805	P 7*
R262	A11368-30111	3.01K 1/10W 1% SMD 0805 T/R	O 7*
R263	A11368-47511	4.75KOHM 0.10W 1% CHIP 0805	O 7*
R264	A11368-56211	5.62KOHM .1W 1% 0805 T/R	P 7*
R265	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 7*
R266	A11368-10011	1.KOHM .1W 1% CHIP 0805	O 7*
R267	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 7*
R268	A11368-44221	44.2K 0.1W 1% 0805 T/R	N 4*
R269	A11368-26111	2.61K 0.1W 1% 0805 T/R	N 4*
R270	C 9779-7	100KOHM 4MM CERMET TRIM SMT TR	N 3
R271	A11368-10031	100.KOHM .1W 1% CHIP 0805	N 4*
R272	A11368-10001	100 OHM 1% 0805 RES T/R	N 4*
R273	A11368-10001	100 OHM 1% 0805 RES T/R	N 4*
R274	A11368-10531	105KOHM .1W 1% 0805 T/R	O 3*
R275	A11368-19111	1.91KOHM .1W 1% 0805 T/R	O 3*
R276	A11368-19111	1.91KOHM .1W 1% 0805 T/R	O 3*
R277	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 3*
R278	C 9777-1	1 KOHM 4MM CERMET TRIM SMT T/R	O 3
R279	A11368-13011	1.3KOHM .1W 1% 0805 T/R	O 3
R280	A11368-25511	2.55KOHM .1W 1% 0805 T/R	O 3*
R281	A11368-15011	1.5K 1/10W 1% SMD 0805 T/R	O 3*
R282	A11368-16221	16.2KOHM .1W 1% 0805 T/R	O 3*
R283	A11368-22111	2.21KOHM .1W 1% CHIP 0805	O 3*
R284	A11368-82511	8.25KOHM .1W 1% CHIP 0805	O 3*
R285	A11368-42211	4.22KOHM .1W 1% 0805 T/R	O 3*
R286	A11368-25511	2.55KOHM .1W 1% 0805 T/R	O 3*
R287	A11368-60411	6.04KOHM .1W 1% 0805 T/R	O 3*
R288	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R289	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R290	A11368-49921	49.9KOHM .1W 1% CHIP 0805	O 1
R291	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R292	A11371-6814	680 OHM .5W 5% 2010 T/R	M 1
R293	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R294	A11368-20021	20.KOHM .1W 1% CHIP 0805	P 3*
R295	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 4*
R296	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 4*
R297	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 4*
R298	A11368-71531	715K 0.1W 1% 0805 T/R	O 12
R299	A11368-10031	100.KOHM .1W 1% CHIP 0805	N 3*
R300	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	L 3*
R301		OPEN	P 5*
R302	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	L 3*

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 30 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R303	A11368-61902	619 OHM .125W 1% CHIP RES T/R	M 5*
R304	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	M 5*
R305	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	M 5*
R307	A11368-49921	49.9KOHM .1W 1% CHIP 0805	O 1
R308	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R309	A11368-75023	75K OHM .25W 1% 1210	M 4*
R310	A11368-13011	1.3KOHM .1W 1% 0805 T/R	M 4*
R311	A11368-33223	33.2KOHM 0.25W 1% 1210 T/R	M 4*
R312	A11368-82521	82.5K 0.10W 1%CHIP 0805	M 4*
R313	A11368-39231	392 KOHM .1W 1% 0805 T/R	O 1*
R314	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	M 4
R315	A11368-75023	75K OHM .25W 1% 1210	M 3*
R316	A11368-13011	1.3KOHM .1W 1% 0805 T/R	M 3*
R317	A11371-3041	300.KOHM .1W 5% CHIP 0805	L 8
R318	A11368-30121	30.1K. 0.10W 1% MF 0805	L 8
R319	A11368-63411	6.34K 0.10W 1% CHIP 0805	M 3*
R320	A11368-75023	75K OHM .25W 1% 1210	M 4*
R321	A11368-10021	10K 1/10W 1% SMD 0805 T/R	L 8
R322	A11368-11021	11K 0.1W 1% 0805 T/R	L 8
R323	A11368-20031	200K 0.1W 1% SMD CHIP 0805	L 8
R324	A11368-56211	5.62KOHM .1W 1% 0805 T/R	I 13
R325	126564-1	300HM 10W 5% VERT THICK FILM	I 14
R326	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 4
R327	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 3
R328		OPEN	M 8
R329	A11368-10021	10K 1/10W 1% SMD 0805 T/R	L 8
R330	A11368-20031	200K 0.1W 1% SMD CHIP 0805	L 8
R331	A11368-84511	8.45K 0.1W 1% 0805 T/R	L 8
R332	A11368-56211	5.62KOHM .1W 1% 0805 T/R	I 13
R333	A11371-3905	39 OHM 1W 5% 2512 T/R	I 14*
R334	A11371-3905	39 OHM 1W 5% 2512 T/R	I 14*
R335	A11368-20031	200K 0.1W 1% SMD CHIP 0805	L 8
R336	A11368-19621	19.6K OHM .1W 1% 0805 T/R	L 8
R337	A11368-10021	10K 1/10W 1% SMD 0805 T/R	L 8
R338	A11368-75011	7.50K .10W 1% CHIP 0805	B 8
R339	A11368-60411	6.04KOHM .1W 1% 0805 T/R	L 11*
R340	A11368-10031	100.KOHM .1W 1% CHIP 0805	M 4*
R341	A11368-10011	1.KOHM .1W 1% CHIP 0805	N 4*
R342	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 4*
R343	A11368-61901	619.OHM 1/10W 1% SMD 0805 T/R	N 2*
R344	A11368-10041	1M OHM .1W 1% CHIP 0805	N 2*
R345	A11368-90921	90.9K. 0.10W 1% MF 0805	N 2*
R346	A11371-5141	510.KOHM .1W 5% CHIP 0805	N 2*
R347	A11368-33231	332K 0.1W 1% 0805 T/R	O 2*
R348	A11368-22111	2.21KOHM .1W 1% CHIP 0805	P 2
R349	A11368-14031	140KOHM .1W 1% 0805 T/R	P 2
R350	A11368-22111	2.21KOHM .1W 1% CHIP 0805	P 2

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE	NONE	PROJ NO. MD42500
		SHEET 31 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
R351	A11368-14031	140KOHM .1W 1% 0805 T/R	P 2
R352	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	K 9
R353	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	K 9
R354	A11368-10011	1.KOHM .1W 1% CHIP 0805	K 9
R355	A11371-3005	30 OHM 1W 5% 2512 T/R	K 8*
R356	A11371-3005	30 OHM 1W 5% 2512 T/R	K 8*
R357	A11371-1104	RES 11.0 OHM .5W SMT	J 9
R358	A11371-3005	30 OHM 1W 5% 2512 T/R	K 9*
R359	A11371-3005	30 OHM 1W 5% 2512 T/R	K 9*
R360	A11371-1104	RES 11.0 OHM .5W SMT	J 8
R361	126901-1	RES. .02 OHM 5W 3% VERTICAL	M 8
R362	126901-1	RES. .02 OHM 5W 3% VERTICAL	N 8
R363	126564-1	300HM 10W 5% VERT THICK FILM	N 10
R364	126564-1	300HM 10W 5% VERT THICK FILM	N 9
R365	A11371-1104	RES 11.0 OHM .5W SMT	J 12
R366	A11371-3005	30 OHM 1W 5% 2512 T/R	K 12*
R367	A11371-3005	30 OHM 1W 5% 2512 T/R	K 12*
R368	A11371-1104	RES 11.0 OHM .5W SMT	J 10
R369	A11371-3005	30 OHM 1W 5% 2512 T/R	K 11*
R370	A11371-3005	30 OHM 1W 5% 2512 T/R	K 11*
R371	A11368-10011	1.KOHM .1W 1% CHIP 0805	K 11
R372	A11371-1104	RES 11.0 OHM .5W SMT	K 12
R373	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	K 11
R374	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	K 11
R375	125539-1	1 OHM 0.25W 5% 1206	H 9*
R376	125539-1	1 OHM 0.25W 5% 1206	H 7*
R377	125539-1	1 OHM 0.25W 5% 1206	H 12*
R378	125539-1	1 OHM 0.25W 5% 1206	H 10*
R379	125539-1	1 OHM 0.25W 5% 1206	H 9*
R380	125539-1	1 OHM 0.25W 5% 1206	H 12*
R381	125539-1	1 OHM 0.25W 5% 1206	H 8*
R382	125539-1	1 OHM 0.25W 5% 1206	H 11*
R383	126901-1	RES. .02 OHM 5W 3% VERTICAL	M 8
R384	126901-1	RES. .02 OHM 5W 3% VERTICAL	N 8
R385	A11368-10041	1M OHM .1W 1% CHIP 0805	N 6*
R386	A11368-10031	100.KOHM .1W 1% CHIP 0805	N 6*
R387	A11371-1104	RES 11.0 OHM .5W SMT	J 7
R388		OPEN	P 5*
R389	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	N 6*
R390	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	N 6*
R391	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	N 5*
R392	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	N 5*
R393	A11371-1104	RES 11.0 OHM .5W SMT	M 7
R394	A11371-1104	RES 11.0 OHM .5W SMT	M 7
R395	A11368-10021	10K 1/10W 1% SMD 0805 T/R	N 6*
R396	A11368-44221	44.2K 0.1W 1% 0805 T/R	P 5*
R397	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 32 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R398	A11368-28011	2.00KOHM .10W 1% MF 0805	P 5*
R399	A11368-23221	23.2KOHM .1W 1% 0805 T/R	O 5*
R400	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 1*
R401	A11371-6814	680 OHM .5W 5% 2010 T/R	O 1
R403	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 8
R404	A11368-20021	20.KOHM .1W 1% CHIP 0805	A 7
R405	A11368-10031	100.KOHM .1W 1% CHIP 0805	A 8
R407	A11368-15013	1.5KOHM .25W 1% 1210 T/R	K 1
R408	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 4*
R409		OPEN	B 9
R410	A11368-49901	499 OHM .1W 1% 0805 T/R	N 2
R411	A11368-33223	33.2KOHM 0.25W 1% 1210 T/R	M 2*
R412	A11368-82521	82.5K 0.10W 1%CHIP 0805	M 2*
R414	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	M 2
R415		OPEN	P 4*
R417	A11371-3041	300.KOHM .1W 5% CHIP 0805	M 3*
R418	A11368-30121	30.1K, 0.10W 1% MF 0805	N 3*
R419	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 8
R420	A11368-20011	2.0K, 0.10W 1% MF 0805	B 8
R422		OPEN	P 4*
R424	A11368-22621	22.6K OHM .1W 1% 0805 T/R	D 4
R425	A11368-49921	49.9KOHM .1W 1% CHIP 0805	A 4
R426		OPEN	A 10
R427		OPEN	B 10
R428		OPEN	B 10
R429		OPEN	B 10
R430		OPEN	B 11
R431		OPEN	B 11
R432		OPEN	B 11
R433		OPEN	B 11
R434	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 7
R435	A11368-20011	2.0K, 0.10W 1% MF 0805	A 7
R436	A11368-49901	499 OHM .1W 1% 0805 T/R	O 2
R437	A11368-10001	100 OHM 1% 0805 RES T/R	C 3*
R438	A11368-10001	100 OHM 1% 0805 RES T/R	D 3*
R439	A11368-10001	100 OHM 1% 0805 RES T/R	C 7*
R440	A11368-10031	100.KOHM .1W 1% CHIP 0805	M 3*
R441	A11368-10011	1.KOHM .1W 1% CHIP 0805	N 3*
R442	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 3*
R443	A11368-10041	1M OHM .1W 1% CHIP 0805	N 2*
R444	A11368-61901	619.OHM 1/10W 1% SMD 0805 T/R	N 2*
R445	A11368-90921	90.9K, 0.10W 1% MF 0805	N 2*
R446	A11371-5141	510.KOHM .1W 5% CHIP 0805	N 2*
R447	A11368-33231	332K 0.1W 1% 0805 T/R	O 2*
R448	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 7
R449	A11368-42211	4.22KOHM .1W 1% 0805 T/R	C 8
R450	A11368-10011	1.KOHM .1W 1% CHIP 0805	C 8

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 33 OF 48













PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
TP12	127064-1	TEST POINT, SMT 1206	C 7
TP13	127064-1	TEST POINT, SMT 1206	D 8
TP14	127064-1	TEST POINT, SMT 1206	E 8
TP15	127064-1	TEST POINT, SMT 1206	E 7
TP16	127064-1	TEST POINT, SMT 1206	D 9
TP17	127064-1	TEST POINT, SMT 1206	E 8
TP27	127064-1	TEST POINT, SMT 1206	E 7
TP28	127064-1	TEST POINT, SMT 1206	E 7
TP29	127064-1	TEST POINT, SMT 1206	E 7
TP30	127064-1	TEST POINT, SMT 1206	E 9
TP31	127064-1	TEST POINT, SMT 1206	E 8
TP32	127064-1	TEST POINT, SMT 1206	E 8
TP33	127064-1	TEST POINT, SMT 1206	B 7
TP34	127064-1	TEST POINT, SMT 1206	C 7
TP35	127064-1	TEST POINT, SMT 1206	C 7
TP36	127064-1	TEST POINT, SMT 1206	C 8
TP37	127064-1	TEST POINT, SMT 1206	J 7
TP38	127064-1	TEST POINT, SMT 1206	K 11
TP39	127064-1	TEST POINT, SMT 1206	A 3
TP40	127064-1	TEST POINT, SMT 1206	B 3
TP41	127064-1	TEST POINT, SMT 1206	C 3
TP43	127064-1	TEST POINT, SMT 1206	B 3
TP45	127064-1	TEST POINT, SMT 1206	B 2
TP46	127064-1	TEST POINT, SMT 1206	B 3
TP47	127064-1	TEST POINT, SMT 1206	H 13
TP48	127064-1	TEST POINT, SMT 1206	B 11
TP49	127064-1	TEST POINT, SMT 1206	A 8
TP50	127064-1	TEST POINT, SMT 1206	E 8
TP91	127064-1	TEST POINT, SMT 1206	B 8
TP100	127064-1	TEST POINT, SMT 1206	P 6
TP101	127064-1	TEST POINT, SMT 1206	P 5
TP102	127064-1	TEST POINT, SMT 1206	N 6
TP103	127064-1	TEST POINT, SMT 1206	M 10
TP104	127064-1	TEST POINT, SMT 1206	O 5
TP105	127064-1	TEST POINT, SMT 1206	P 6
TP143	127064-1	TEST POINT, SMT 1206	A 8
TP162	127064-1	TEST POINT, SMT 1206	B 9
TP200	127064-1	TEST POINT, SMT 1206	P 4
TP201	127064-1	TEST POINT, SMT 1206	P 3
TP202	127064-1	TEST POINT, SMT 1206	N 4
TP203	127064-1	TEST POINT, SMT 1206	P 10
TP204	127064-1	TEST POINT, SMT 1206	O 3
TP205	127064-1	TEST POINT, SMT 1206	P 4
TP243	127064-1	TEST POINT, SMT 1206	K 2
TP244	127064-1	TEST POINT, SMT 1206	J 7
TP245	127064-1	TEST POINT, SMT 1206	O 6
TP247	127064-1	TEST POINT, SMT 1206	M 6
TP248	127064-1	TEST POINT, SMT 1206	M 3

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SIZE A	DWG NO. 126218-13	REV A
SCALE NONE	PROJ NO. MD425D0	SHEET 38 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
TP249	127064-1	TEST POINT, SMT 1206	A 2
TP251	127064-1	TEST POINT, SMT 1206	B 6
TP252	127064-1	TEST POINT, SMT 1206	A 4
TP253	127064-1	TEST POINT, SMT 1206	C 8
TP254	127064-1	TEST POINT, SMT 1206	O 3
TP255	127064-1	TEST POINT, SMT 1206	P 2
TP256	127064-1	TEST POINT, SMT 1206	C 7
TP257	127064-1	TEST POINT, SMT 1206	N 5
U1	C 9038-8	COMPARATOR, QUAD LM339D SO-14	N 1
U2	128279-1	IC, SGSL4981B PFC CONTROL	D 3
U3	C 8262-5	MC33078D LOW NOISE DUAL OP AMP	O 1
U4	126681-1	IC, PWN CONT PHASE SHIFT	D 8
U5	C 9929-8	TL431ACL P ADJ PREC RFNC T/A	C 8
U6	125868-1	OP AMP TL074CD SMT	O 6
U7	126559-1	COMPARATOR, LM393 SO-8 DUAL	B 7
U8	126561-1	REG. +5V LOW POWER SO-8	N 3
U9	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 3
U10	126559-1	COMPARATOR, LM393 SO-8 DUAL	A 3
U11	126559-1	COMPARATOR, LM393 SO-8 DUAL	A 3
U12	126633-1	REGULATOR, 15V SO-8	A 4
U13	126559-1	COMPARATOR, LM393 SO-8 DUAL	C 3
U14	126561-1	REG. +5V LOW POWER SO-8	G 14
U15	126653-1	SGL 2 INPUT NOR GATE SOT-23-5	H 14
U16	125867-1	MC74HC4024D 7 STAGE COUNTER SM	H 13
U17	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 7
U18	128383-1	OPTO HCNW2211 IEC65 COMPLIANT	B 10
U19	126561-1	REG. +5V LOW POWER SO-8	C 7
U20	128382-1	OPTO SFH615A-2 IEC65 COMPLIANT	A 10
U21	126559-1	COMPARATOR, LM393 SO-8 DUAL	A 9
U22	125541-1	DRVR, 600V IR2104 HALF BRIDGE	L 6
U23	126553-1	IC, 20V 0.135OHM SOB DUAL NMOS	L 6
U24	126559-1	COMPARATOR, LM393 SO-8 DUAL	A 4
U25	C 9929-8	TL431ACL P ADJ PREC RFNC T/A	C 3
U26	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 3
U27	126633-1	REGULATOR, 15V SO-8	E 4
U28	C 5095-2	MC7815CT +15V. REG	D 7
U29	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 9
U30	128382-1	OPTO SFH615A-2 IEC65 COMPLIANT	A 9
U31	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 7
U32	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 8
U33		OPEN	A 10
U34		OPEN	B 10
U35	C10344-7	74HC74AD DUAL D FLIP FLOP SOIC	C 7
U36	128382-1	OPTO SFH615A-2 IEC65 COMPLIANT	A 10
U37	126559-1	COMPARATOR, LM393 SO-8 DUAL	D 8
U99	C 9038-8	COMPARATOR, QUAD LM339D SO-14	B 8
U100	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	P 5
U101	126548-1	COMPARATOR, LM361 HI SPD SO-14	N 5

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE NONE	PROJ NO. MD425D0	SHEET 39 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
U102	126561-1	REG. +5V LOW POWER SO-8	N 5
U103	126548-1	COMPARATOR, LM361 HI SPD SO-14	N 6
U104	126561-1	REG. +5V LOW POWER SO-8	N 6
U105	125869-1	OP AMP LM318M SMT	N 6
U106	126540-1	IC, QUAD 2 INPUT NOR GATE SO-14	M 6
U107	125545-1	HCPL0601 HI SPEED OPTO	M 7
U108	126559-1	COMPARATOR, LM393 SO-8 DUAL	N 7
U110	C 8262-5	MC33078D LOW NOISE DUAL OP AMP	P 5
U111	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	O 5
U112	C 9038-8	COMPARATOR, QUAD LM339D SO-14	O 2
U113	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 5
U114	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 4
U115	C 9038-8	COMPARATOR, QUAD LM339D SO-14	L 8
U116	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 4
U117	C 9038-8	COMPARATOR, QUAD LM339D SO-14	O 2
U118	126561-1	REG. +5V LOW POWER SO-8	K 8
U119	125546-1	HCPL0611 HI SPEED OPTO	K 9
U120	125544-1	MC34151D HISP DUAL MOSFET DVR	J 9
U121	125544-1	MC34151D HISP DUAL MOSFET DVR	J 11
U122	126561-1	REG. +5V LOW POWER SO-8	K 11
U123	125545-1	HCPL0601 HI SPEED OPTO	K 11
U124	C10344-7	74HC74AD DUAL D FLIP FLOP SOIC	L 6
U125	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	N 2
U200	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	P 4
U201	126548-1	COMPARATOR, LM361 HI SPD SO-14	N 4
U202	126561-1	REG. +5V LOW POWER SO-8	N 4
U203	126548-1	COMPARATOR, LM361 HI SPD SO-14	N 3
U204	126561-1	REG. +5V LOW POWER SO-8	N 3
U205	125869-1	OP AMP LM318M SMT	N 4
U207	125545-1	HCPL0601 HI SPEED OPTO	P 7
U208	126559-1	COMPARATOR, LM393 SO-8 DUAL	P 7
U210	C 8262-5	MC33078D LOW NOISE DUAL OP AMP	P 3
U211	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	O 3
U213	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 4
U214	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 3
U218	126561-1	REG. +5V LOW POWER SO-8	K 4
U219	125546-1	HCPL0611 HI SPEED OPTO	K 5
U220	125544-1	MC34151D HISP DUAL MOSFET DVR	J 5
U221	125544-1	MC34151D HISP DUAL MOSFET DVR	J 3
U222	126561-1	REG. +5V LOW POWER SO-8	K 2
U223	125545-1	HCPL0601 HI SPEED OPTO	K 3
U224	C10344-7	74HC74AD DUAL D FLIP FLOP SOIC	N 5
Y1	C10476-7	CRYSTAL, 4 MHZ HC49U SERIES	G 13
1	126583-8	PWB, CE4000 MAIN	
3	103415-10805	SCREW, 8-32X.312 TORX PNHD SEM	
4	126923-4	INSULATOR, CE4K HEATSINK NDMEX	
5	128130-1	RIVET, CE4000 INS RET PLASTIC	

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SIZE	DWG NO.	REV
A	126218-13	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	40 OF 48

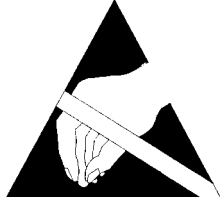



**CE4000 MAIN** PWA NUMBER: 126218-13  
DRAWING SHEET: 41



**CE4000 MAIN** PWA NUMBER: 126218-13  
DRAWING SHEET: 41



REVISION HISTORY						
E. C. N.	REV	DESCRIPTION	DATE	APPROVED		
				DWN	CHK	CM
00N0838	A	RELEASE FOR PRODUCTION	10-02-00	KBZ	<i>[Signature]</i>	<i>[Signature]</i>
<p>UNLESS OTHERWISE SPECIFIED, THIS PRINTED WIRING ASSEMBLY SHALL MEET THE SPECIFICATION DESCRIBED IN IPC-A-610_ CLASS 2 STANDARDS.</p> <p>NOTES:</p> <ol style="list-style-type: none"> <li>1. PRINTED WIRING BOARD PART NUMBER 126583-8.</li> <li>2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.</li> <li>3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAPS.</li> <li>4. THE PRINTED WIRING ASSEMBLY PART NUMBER FOR THIS ASSEMBLY SHALL BE MARKED ON THE PRINTED WIRING BOARD AND SHALL BE PERMANENT.</li> <li>5. REMOVE SOLDER OR PREVENT SOLDER FROM ACCUMULATING IN HOLES INDICATED ON COMPONENT MAP.</li> <li>6. MAP LOCATIONS DENOTED BY AN ASTERISK (*), INDICATE COMPONENTS MOUNTED ON THE BOTTOM SIDE OF THE PRINTED WIRING BOARD.</li> <li>7. THE VENT HOLE ON TOP OF THE RELAY K1 MUST BE OPENED AFTER THE CLEANING PROCESS, BY EITHER REMOVING THE SEALING TAPE OR CUTTING OFF THE CIRCULAR TAB WITH AN "EXACTO" KNIFE OR SIMILAR CUTTING TOOL. WARNING, THIS STEP MUST BE DONE AFTER THE CLEANING PROCESS NOT BEFORE!! WATER OR CLEANING SOLVENTS ENTERING THE RELAY VENT HOLE WILL DAMAGE THE RELAY.</li> <li>8. APPLY HOT MELT ADHESIVE(125647-1) FOR SUPPORT TO THE FOLLOWING COMPONENTS: C2,C700,R42,R142,R143,R149,R150,R242,R243,R249,R250,R325,R363,R364,R463, AND R464. ADHESIVE MUST HAVE A MINIMUM CONTACT AREA OF 1/4" X 1/2" ON BOTH THE DESIGNATED PART AND EITHER THE PWB OR ANY ADJACENT SOLID COMPONENT.</li> <li>9. ATTACH R713 TO THE SIDE OF T1 WITH LOCTITE ADHESIVE(125482-1) AND ACTIVATOR(125483-1). NO MORE THAN 0.1" GAP ALLOWED BETWEEN BODY OF R713 AND SIDE OF T1. ANY GAP MUST BE FILLED WITH ADHESIVE (NO AIR BETWEEN R713 &amp; T1).</li> <li>10. THIS PWA MUST MEET ALL SPECIFICATIONS AS LISTED IN 128315 SPECS. CE4000 MAIN PWA.</li> <li>11. ADD 1/4" SQ. PIECE OF KAPTON TAPE(S 6285-1) UNDER R260 AS SHOWN.</li> </ol>						
				<p><b>CAUTION</b></p> <p>STATIC CAN DAMAGE COMPONENTS!</p> <p><b>DO NOT HANDLE</b></p> <p>UNLESS WRIST STRAP IS WORN</p>		
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<p>DISTRIBUTION</p> <p>K</p>		<p>DWN</p> <p>CHK</p>	<p>KBZ</p> <p><i>[Signature]</i></p>	<p>10-02-00</p> <p><i>[Signature]</i></p>	 <p><b>CROWN</b> INTERNATIONAL, INC.</p> <p>1718 W. MISHAWAKA RD. ELKHART IN. 46517 PHONE (219)294-8000 WWW.CROWNINTL.COM</p>	
<p>FILENAME</p> <p>126218-14_A_01.PCB</p>		<p>CM</p> <p>PE</p>	<p><i>[Signature]</i></p> <p><i>[Signature]</i></p>	<p>10/3/00</p> <p>10/3/00</p>		
<p>TOLERANCE UNLESS OTHERWISE SPECIFIED</p> <p>.00 = ±.02"</p> <p>.000 = ±.010"</p> <p>DRILLS = ±.003"</p>				<p>TITLE</p> <p>PWA, CE4000 MAIN</p>		
<p>DO NOT SCALE DRAWING</p>				<p>SIZE</p> <p>A</p>	<p>DWG NO.</p> <p>126218-14</p>	<p>REV</p> <p>A</p>
<p>SCALE NONE</p>			<p>PROJ NO. MD42500</p>	<p>SHEET SHEET 1 OF 48</p>		



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C1	127046-1	CAP, 940UF 450V HIGH RIPPLE	D 6
C2	C10094-8	1.5UF 630V 5% RADIAL POLY CAP	E 5
C3	126542-1	2.2UF 50V 5.5MM HIGH SMD	D 8
C4	126542-1	2.2UF 50V 5.5MM HIGH SMD	E 4
C5		OPEN	B 10
C6	127046-1	CAP, 940UF 450V HIGH RIPPLE	B 4
C7	127047-1	CAP, 820UF 150V HIGH RIPPLE	D 13
C8	127047-1	CAP, 820UF 150V HIGH RIPPLE	C 13
C9	A11427-334J6	.33UF 50V 5% CHIP X7R 1210	E 3
C10	A11427-334J6	.33UF 50V 5% CHIP X7R 1210	D 4
C11	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	D 4*
C12	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	D 3*
C13	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	D 3
C14	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	D 3
C15	A11369-221J5	220PF 50V 5% NPO 1206 SMD	M 6*
C16	126551-1	100UF 25V 5.5MM HIGH SMD	C 3
C17	C10090-6	4.7UF 400V 10% AXIAL FILM	D 9
C18	126551-1	100UF 25V 5.5MM HIGH SMD	D 7
C19	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	D 3
C20	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	D 3*
C21	A11369-561F2	560PF 50V 1% NPO MLC 0805	D 4
C22	A11369-152J2	1500PF 50V 5% NPO MLC 0805 T/R	D 3
C23	126539-1	10UF 16V 5.5MM HIGH SMD	D 3
C24	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	C 4
C25	C 7091-9	.33 UF 50V Z5U CHIP CAP	D 4*
C26	A11427-102K2	.001UF 50V 10% X7R CER CHIP	C 8
C27	C 4253-8	4.7UF 63V 20% VERT ELECT T/R	E 4
C28	C 8268-2	220UF 35V 20% VERT	B 8
C29	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 8*
C30	126551-1	100UF 25V 5.5MM HIGH SMD	M 7
C31	126551-1	100UF 25V 5.5MM HIGH SMD	N 7
C32	126551-1	100UF 25V 5.5MM HIGH SMD	O 7
C33	A11369-222K5	2200PF 50V 10% CHIP NPO 1206	C 8*
C34	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	B 3
C35	A11369-471K2	470PF 50V 10% NPO 0805 T/R	C 8
C36	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	D 8
C37	126551-1	100UF 25V 5.5MM HIGH SMD	D 8
C38	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	D 8
C39	126539-1	10UF 16V 5.5MM HIGH SMD	D 8
C40		OPEN	A 7
C41	126551-1	100UF 25V 5.5MM HIGH SMD	P 7
C42	A11369-101J2	100 PF 50V 5% NPO MLC 0805 T/R	M 6*
C43	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	C 9*
C44	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	A 8
C45	126551-1	100UF 25V 5.5MM HIGH SMD	E 4
C46	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 9*
C47	C 9465-3	10UF 50V 20% VERT ELECT T/A	B 4

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 11 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
C48	C 7091-9	.33 UF 50V Z5U CHIP CAP	A 3
C49	103191-1	0.47UF 50V Z5U 1210 T/R	B 3
C50	126542-1	2.2UF 50V 5.5MM HIGH SMD	A 4
C51	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 8*
C52	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 8*
C53	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	M 8
C54	126630-1	CAP. 470UF 25V RAD ELECT	I 13
C56	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1*
C57	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1*
C58	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1*
C59	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 1*
C60	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1
C61	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 1
C62	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	C 8*
C63	A11427-334J6	.33UF 50V 5% CHIP X7R 1210	H 14
C64	125508-1	10UF 50V 20% SMT AL ELECT T/R	G 14
C65	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	G 14
C66	102438-560K2	56PF 200V 10% NPO 0805 T/R	H 14
C67	102438-560K2	56PF 200V 10% NPO 0805 T/R	H 13
C68	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	H 14
C69	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	D 5
C70	126542-1	2.2UF 50V 5.5MM HIGH SMD	C 7
C71	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 9*
C72	103191-1	0.47UF 50V Z5U 1210 T/R	B 3
C73	126551-1	100UF 25V 5.5MM HIGH SMD	A 4
C74	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 7*
C75	A11427-473K5	.047UF 50V CHIP CAPACITOR X7R	B 3
C76	126542-1	2.2UF 50V 5.5MM HIGH SMD	C 3
C78	A11427-102K2	.001UF 50V 10% X7R CER CHIP	B 3
C79	126551-1	100UF 25V 5.5MM HIGH SMD	E 7
C80	126551-1	100UF 25V 5.5MM HIGH SMD	E 8
C81	126551-1	100UF 25V 5.5MM HIGH SMD	O 1
C82	126551-1	100UF 25V 5.5MM HIGH SMD	M 5
C83	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 6*
C84	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 6*
C85	126551-1	100UF 25V 5.5MM HIGH SMD	L 5
C86	126551-1	100UF 25V 5.5MM HIGH SMD	L 6
C87	C10516-0	470. UF 10V 20% LOW ESR RDL T/R	L 6
C88	C10516-0	470. UF 10V 20% LOW ESR RDL T/R	L 7
C89	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	B 7
C90	103191-1	0.47UF 50V Z5U 1210 T/R	N 3*
C91	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 5
C92	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 3*
C93	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	C 3*
C94	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 3*
C95	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 3*
C96	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 3*

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 12 OF 48





PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C144	A11427-473K5	.047UF 50V CHIP CAPACITOR X7R	A 4*
C145	A11427-334J6	.33UF 50V 5% CHIP X7R 1210	N 6
C146	A11427-103K5	0.01UF 50V 10% X7R SMD 1206	N 6
C147	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 6
C148	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 7*
C149	130561-1	10UF 25V 20% ALUM ELEC SMT T/R	M 7
C150	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 7*
C151	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	M 7*
C152	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	N 7*
C153	C 6995-2	022UF 100V CHIP CAPACITOR X7R	N 6*
C154	A11369-221J5	220PF 50V 5% NPO 1206 SMD	N 6*
C155	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 6*
C156	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 6*
C157	126539-1	10UF 16V 5.5MM HIGH SMD	N 6
C158	126539-1	10UF 16V 5.5MM HIGH SMD	N 6
C159	A11369-221K2	220.PF 50V 10% NPO MLC 0805	N 6
C160	127684-1	.0047UF 5% 16V 0805 FILM SMT	O 4*
C161	127684-1	.0047UF 5% 16V 0805 FILM SMT	O 4*
C162	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	O 5*
C163	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 5*
C164	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	O 5*
C165	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 5*
C166	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	O 5*
C167	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	N 5*
C168	A11369-221J5	220PF 50V 5% NPO 1206 SMD	O 5*
C169	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	N 5*
C170	126623-1	47UF 16V 6.3X5.5MM 20% SMT	O 5
C171	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	L 3*
C172	126539-1	10UF 16V 5.5MM HIGH SMD	M 6
C173	126539-1	10UF 16V 5.5MM HIGH SMD	P 5
C174	126539-1	10UF 16V 5.5MM HIGH SMD	O 5
C175	126543-1	2.2UF 50V 5.5MM HIGH NP SMD	N 5
C176	103191-1	0.47UF 50V Z5U 1210 T/R	M 4*
C177	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 3*
C178		OPEN	L 8
C179	A11427-184J5	0.18UF 50V 5% X7R 1206 T/R	N 2*
C180	126551-1	100UF 25V 5.5MM HIGH SMD	N 3
C181	126551-1	100UF 25V 5.5MM HIGH SMD	M 5
C182	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C183	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C184	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 11*
C185	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C186	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 8
C187	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 8
C188	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 8*
C189	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 8*
C190	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	N 9

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 14 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
C191	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	N 9
C192	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	N 9
<b>C193</b>	<b>103430-151K2</b>	<b>150PF 250V 10% NPO 0805 T/R</b>	<b>K 11*</b>
C194	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 11*
C195	126551-1	100UF 25V 5.5MM HIGH SMD	K 12
C196	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 11
C197	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 12
C198	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 6*
C199	A11369-471K5	470PF 50V 10% CHIP NPO 1206	P 6*
C200	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	O 13
C201		OPEN	P 3*
C202	103191-1	0.47UF 50V Z5U 1210 T/R	P 3
C203	102438-101K2	100PF 200V NPO 0805 T/R	O 4
C204	102438-221F2	220PF 200V 1% NPO 0805	O 4
C205	102438-102J6	1000PF 200V 5% 1210 NPO	O 4*
C206	103430-331K2	330PF 250V 10% NPO 0805 T/R	O 4*
C207	102438-221F2	220PF 200V 1% NPO 0805	P 4
C208	A11427-473K5	.047UF 50V CHIP CAPACITOR X7R	O 4
C209	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	O 4
C210	A11369-120K2	12PF 50V 10% NPO 0805 T/R	P 3*
C211	A11369-120K2	12PF 50V 10% NPO 0805 T/R	O 4*
C212	A11369-471F2	470.PF 50V 1% NPO MLC 0805	O 4*
C213	A11369-101J2	100 PF 50V 5% NPO MLC 0805 T/R	O 4*
C214	A11369-332F5	3300.PF 50V 1% NPO MLC 1206	O 4
C215	A11369-332F5	3300.PF 50V 1% NPO MLC 1206	P 4*
C216	A11369-120K2	12PF 50V 10% NPO 0805 T/R	P 4*
C217	A11369-120K2	12PF 50V 10% NPO 0805 T/R	P 4*
C218	A11369-470K2	47PF 50V 10% NPO 0805 T/R	N 4*
C219	A11369-470K2	47PF 50V 10% NPO 0805 T/R	N 3*
C220	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 4
C221	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 4
C222	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 4*
C223	103191-1	0.47UF 50V Z5U 1210 T/R	O 4
C224	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 3
C225	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 4
C226	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 3*
C227	103191-1	0.47UF 50V Z5U 1210 T/R	O 3
C228	C10466-B	.22UF 50V 5% MTL FILM RDL T/A	P 9
C229	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	P 10
C230	A11427-103K5	0.01UF 50V 10% X7R SMD 1206	O 7
C231	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	P 10
C232	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	P 12
C233	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	P 12
C234	A11427-224J5	0.22UF 50V 5% X7R 1206 T/R	O 12
C235	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	O 12
C236	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	O 13
C237	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	O 13

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	NONE	PROJ NO. MD425D0
SHEET 15 OF 48		





PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C288	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 5*
C289	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 5*
C290	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	O 9
C291	A10434-104JD	.1UF 250V 5% MTL POLY FILM T/A	O 9
C292	A10434-473JD	.047UF 250VDC 5% MET POLY T/A	O 9
C293	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 2*
C294	103430-151K2	150PF 250V 10% NPO 0805 T/R	K 2*
C295	126551-1	100UF 25V 5.5MM HIGH SMD	K 2
C296	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 2
C297	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 2
C298	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 7
C299	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 4*
C300	A11369-102K5	1000PF 50V 10% NPO 1206 SMD	L 3*
C301	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	E 7*
C302	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 4*
C303	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 4*
C304		OPEN	A 10
C305		OPEN	B 10
C306	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 7
C307	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	H 14
C308	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 8
C309	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 8
C310	125508-1	10UF 50V 20% SMT AL ELECT T/R	M 3
C313	126542-1	2.2UF 50V 5.5MM HIGH SMD	M 9
C314	A11427-103K5	0.01UF 50V 10% X7R SMD 1206	D 3*
C315	A11369-471K5	470PF 50V 10% CHIP NPO 1206	O 5
C316	126551-1	100UF 25V 5.5MM HIGH SMD	K 8
C317	126551-1	100UF 25V 5.5MM HIGH SMD	K 8
C318	126551-1	100UF 25V 5.5MM HIGH SMD	K 8
C319	126551-1	100UF 25V 5.5MM HIGH SMD	K 8
C320	126539-1	10UF 16V 5.5MM HIGH SMD	D 3
C321	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 7
C322	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 8
C323	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 5*
C324	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 5
C325	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 5*
C326	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 5*
C327	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 5*
C328	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 5*
C329	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C330	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C332	126539-1	10UF 16V 5.5MM HIGH SMD	D 8
C333	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	C 3*
C334	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	C 7*
C335	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	C 3*
C336	126539-1	10UF 16V 5.5MM HIGH SMD	M 5
C337	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	A 10

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	NONE	PROJ NO. MD425D0
SHEET 17 OF 48		







PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
C338	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 9
C339	A11427-224J5	0.22UF 50V 5% X7R 1206 T/R	N 2*
C340	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 4*
C341	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 4*
C342	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5*
C343	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5*
C344	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C345	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C346	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C347	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	L 8
C348	C10325-6	2200.PF 250VAC 20% FILM Y2	C 11
C349	126539-1	10UF 16V 5.5MM HIGH SMD	M 4
C350	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 6*
C351	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 6*
C352	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 6*
C353	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 2*
C354	126551-1	100UF 25V 5.5MM HIGH SMD	N 4
C355	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	N 2*
C356	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5
C357	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 5
C358	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 9*
C360	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 9*
C361	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 9*
C363	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	H 7*
C365	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 7*
C366	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 12*
C367	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 12*
C369	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 10*
C371	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 10*
C372	127483-1	6300UF 125V 9A LOW ESL 5 PIN	L 10
C373	127483-1	6300UF 125V 9A LOW ESL 5 PIN	L 12
C374	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 9*
C375	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 7*
C377	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	H 12*
C378	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 10*
C380	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 8*
C382	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 9*
C384	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 11*
C386	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 12*
C387	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 9
C388	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 9
C390	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 11
C391	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 11
C397	A10434-103JD	.01UF 250V 5%MTL POLY FILM T/A	N 10
C398	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	O 5*
C400	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 5*
C401	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 4*

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	18 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C403	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 6*
C404	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	H 6*
C407	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 2*
C408	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 1*
C409	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 3*
C410	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 3*
C413	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 4*
C414	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 6*
C416	126551-1	100UF 25V 5.5MM HIGH SMD	K 6
C417	126551-1	100UF 25V 5.5MM HIGH SMD	K 6
C418	126551-1	100UF 25V 5.5MM HIGH SMD	K 6
C419	126551-1	100UF 25V 5.5MM HIGH SMD	K 6
C421	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 6
C422	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	K 4
C423	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 4*
C424	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 4*
C425	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 3*
C426	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	O 3
C427	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 3*
C428	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	P 3*
C429	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 3*
C430	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 3*
C431	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 4*
C432	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	M 4*
C435	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	H 2*
C436	130636-103J5	0.01UF 500V 5% X7R 1206 T/R	I 3*
C437	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 4*
C438	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 5*
C440	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 1*
C441	130636-104K6	0.1UF 500V 10% X7R 1210 T/R	I 3*
C446	127483-1	6300UF 125V 9A LOW ESL 5 PIN	L 4
C447	127483-1	6300UF 125V 9A LOW ESL 5 PIN	L 2
C449	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 5
C453	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 5
C454	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 3
C455	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	J 3
C497	A10434-103JD	.01UF 250V 5%MTL POLY FILM T/A	O 10
C498	A11427-104J2	.1UF 50V 5% X7R 0805 T/R	O 3*
C500	103191-1	0.47UF 50V Z5U 1210 T/R	N 1
C501	103191-1	0.47UF 50V Z5U 1210 T/R	O 1
C502	A11369-221K2	220.PF 50V 10% NPO MLC 0805	N 1
C600	103191-1	0.47UF 50V Z5U 1210 T/R	N 1
C601	103191-1	0.47UF 50V Z5U 1210 T/R	O 1
C602	A11369-221K2	220.PF 50V 10% NPO MLC 0805	N 1
C700	C 7099-2	0.47UF 250VAC 50-400HZ RFI CAP	E 1
C701	A11427-102K2	.001UF 50V 10% X7R CER CHIP	B B*
C702		OPEN	C B*

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	NONE	PROJ. NO. MD425D0
SHEET 19 OF 48		



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
D1		INSTALLED ON PREVIOUS ASSEMBLY	F 1
D2		INSTALLED ON PREVIOUS ASSEMBLY	F 5
D3		INSTALLED ON PREVIOUS ASSEMBLY	F 11
D4		INSTALLED ON PREVIOUS ASSEMBLY	F 10
D5		INSTALLED ON PREVIOUS ASSEMBLY	F 12
D6		INSTALLED ON PREVIOUS ASSEMBLY	F 12
D7	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	D 4
D8	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	D 3
D9	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D10	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D11	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	E 4
D12	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D13	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D14	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 3*
D15	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 8
D16		OPEN	B 11
D17		OPEN	A 8
D18	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	A 4
D19	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	A 3
D22	125255-1	DIODE, ULTRAFAST 200V 1A SMA	H 14
D24	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 1
D25	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 1
D26	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 9
D27	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	B 9
D33	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	C 2
D34	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	L 6
D35	125593-1	DIODE, SCHOTTKY 40V 1A SMA	L 6
D36	125593-1	DIODE, SCHOTTKY 40V 1A SMA	L 7
D37	C 9929-8	TL431ACL P ADJ PREC RFNC T/A	M 3
D38	C 9929-8	TL431ACL P ADJ PREC RFNC T/A	M 3
D43	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 10
D44	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 7
D45	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	A 4
D100	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 13
D101	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 13
D102	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 12
D103	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 12
D104	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	P 5
D105	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 6
D106	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 6
D107	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	N 5*
D109	C 9929-8	TL431ACL P ADJ PREC RFNC T/A	N 7
D110	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 5
D120	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 5
D121	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 5
D122	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 2
D123	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 7

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 20 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
D124	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 8
D125	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 8
D126	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 8
D127	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 8
D128	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 5
D129	125620-1	DIODE, FAST RECOVERY 400V 1A	N 10
D130	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 8
D131	125593-1	DIODE, SCHOTTKY 40V 1A SMA	K 7
D132	125593-1	DIODE, SCHOTTKY 40V 1A SMA	K 7
D133	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 5
D134	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 11
D138		OPEN	J 8
D139		OPEN	J 9
D140		INSTALLED ON PREVIOUS ASSEMBLY	J 9
D141		INSTALLED ON PREVIOUS ASSEMBLY	J 8
D142		INSTALLED ON PREVIOUS ASSEMBLY	J 11
D143		INSTALLED ON PREVIOUS ASSEMBLY	J 11
D144		OPEN	J 11
D145		OPEN	J 11
D146	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 4
D200	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 13
D201	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 13
D202	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 12
D203	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	O 12
D204	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	P 3
D205	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 4
D206	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 4
D207	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	N 4*
D209	C 9929-8	TL431ACL P ADJ PREC RFNC T/A	P 7
D210	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	P 3
D222	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	N 2
D223	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	L 7
D229	125620-1	DIODE, FAST RECOVERY 400V 1A	P 10
D231	125593-1	DIODE, SCHOTTKY 40V 1A SMA	K 6
D232	125593-1	DIODE, SCHOTTKY 40V 1A SMA	K 6
D238		OPEN	J 6
D239		OPEN	J 5
D240		INSTALLED ON PREVIOUS ASSEMBLY	J 5
D241		INSTALLED ON PREVIOUS ASSEMBLY	J 5
D242		INSTALLED ON PREVIOUS ASSEMBLY	J 2
D243		INSTALLED ON PREVIOUS ASSEMBLY	J 3
D244		OPEN	J 2
D245		OPEN	J 3
D246	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	M 3
D500		OPEN	N 1
D600		OPEN	O 1
D700	126549-1	DIODE, 30V 200MA SCHOTTKY SOT23	B 8

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425DB	SHEET 21 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
D701	C 8369-8	1N747A 3.6V 5% ZENER .5W T/A	C 9
E1	102476-1	LED, SMT R/A GREEN	L 1
E2	102477-1	LED, SMT R/A RED	L 1
E3	102477-1	LED, SMT R/A RED	M 1
E4	102476-1	LED, SMT R/A GREEN	K 1
E5	102476-1	LED, SMT R/A GREEN	N 1
E6	102477-1	LED, SMT R/A RED	O 1
E7	102477-1	LED, SMT R/A RED	O 1
FB1	100868-1	FERRITE, 70 OHM 25% 1206 SMT	D 7*
FB2	100868-1	FERRITE, 70 OHM 25% 1206 SMT	E 4*
FB3	100868-1	FERRITE, 70 OHM 25% 1206 SMT	A 4*
HS1	C 9918-1	TO220 VERT CLIP-ON HEATSINK	D 7
HS2	128009-1	ASM, CE3000 PS PRIMARY HS	F 1
HS3	128010-1	ASM, CE3000 PS DIODE HS	F 10
HS4	128011-1	ASM, CE3000 BCA OUTPUT HS	H 7
HS5	128011-1	ASM, CE3000 BCA OUTPUT HS	H 1
J1	101031-1	.250 FASTON, AUTO INSERTABLE	D 1
J2	101031-1	.250 FASTON, AUTO INSERTABLE	D 1
J3	101031-1	.250 FASTON, AUTO INSERTABLE	K 8
J4	101571-1	HDR, 2 POS .1 CTR MTA SHRD	H 14
J5	127563-3	PWA, CE4000 POT BOARD	O 2
J6	130640-1	HEADER, 3M LATCH 26 PIN .1X.1	O 2
J7		OPEN	Q 6
J8		OPEN	K 14
J9	A10020-34	6-32 X .375 PCB CAPTIVE STUD	K 14
J11	101031-1	.250 FASTON, AUTO INSERTABLE	M 8
J12	101031-1	.250 FASTON, AUTO INSERTABLE	N 8
J13	101031-1	.250 FASTON, AUTO INSERTABLE	K 11
J14	101031-1	.250 FASTON, AUTO INSERTABLE	K 5
J15	101031-1	.250 FASTON, AUTO INSERTABLE	O 8
J16	101031-1	.250 FASTON, AUTO INSERTABLE	P 8
J17	101031-1	.250 FASTON, AUTO INSERTABLE	K 2
J18		OPEN	M 14
J19	A10020-34	6-32 X .375 PCB CAPTIVE STUD	L 14
J20		OPEN	M 1
J21		OPEN	O 1
J22	101031-1	.250 FASTON, AUTO INSERTABLE	E 4
J23	101031-1	.250 FASTON, AUTO INSERTABLE	D 2
J24	127030-1	CONN, 7 PIN RECEPTACLE	A 7
J25	127031-1	CONN, 15 PIN RECEPTACLE	A 10
J26	101031-1	.250 FASTON, AUTO INSERTABLE	C 2
J27	101031-1	.250 FASTON, AUTO INSERTABLE	B 2
J28	101031-1	.250 FASTON, AUTO INSERTABLE	B 2
J29	101031-1	.250 FASTON, AUTO INSERTABLE	B 2
J30		OPEN	Q 5
K1	128135-1	RELAY, 30A 250V 12VCOIL PCB MT	C 2
L1	127988-1	CHOKE, 10UH <0.1OHM SMT .3" DIA	I 13

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	A	126218-14	A
SCALE	NONE	PROJ NO.	MD425D0
		SHEET 22 OF 48	



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
L2	128179-1	WIRE, 12AWG JUMPER 0.8"	E 13
L3	127988-1	CHOKE, 10UH <0.1OHM SMT .3" DIA	M 2
L4	127988-1	CHOKE, 10UH <0.1OHM SMT .3" DIA	L 5
L5	128179-1	WIRE, 12AWG JUMPER 0.8"	F 13
L6	128179-1	WIRE, 12AWG JUMPER 0.8"	F 13
L7	127988-1	CHOKE, 10UH <0.1OHM SMT .3" DIA	M 2
L8	127988-1	CHOKE, 10UH <0.1OHM SMT .3" DIA	L 5
L9	128179-1	WIRE, 12AWG JUMPER 0.8"	E 13
L10	128179-1	WIRE, 12AWG JUMPER 0.8"	E 13
L11	128179-1	WIRE, 12AWG JUMPER 0.8"	E 13
L100	C 5644-7	CHOKE, 33 UH 10% T/R	O 6
L101	131286-1	COIL, 2UH ADJUSTABLE	M 9
L102	131285-1	COIL, 1UH ADJUSTABLE	N 10
L103	125600-1	INDUCTOR, 1.01UH 30A AIRCORE	L 13
L104	125600-1	INDUCTOR, 1.01UH 30A AIRCORE	N 13
L105	127988-1	CHOKE, 10UH <0.1OHM SMT .3" DIA	K 12
L200	C 5644-7	CHOKE, 33 UH 10% T/R	O 4
L201	131286-1	COIL, 2UH ADJUSTABLE	P 9
L202	131285-1	COIL, 1UH ADJUSTABLE	P 10
L203	125600-1	INDUCTOR, 1.01UH 30A AIRCORE	O 14
L204	125600-1	INDUCTOR, 1.01UH 30A AIRCORE	P 13
L205	127988-1	CHOKE, 10UH <0.1OHM SMT .3" DIA	K 1
Q1		INSTALLED ON PREVIOUS ASSEMBLY	F 3
Q2		INSTALLED ON PREVIOUS ASSEMBLY	F 4
Q3	127169-1	MOSFET, P-CH 50V 150MA SOT-23	C 3
Q4		INSTALLED ON PREVIOUS ASSEMBLY	F 7
Q5		INSTALLED ON PREVIOUS ASSEMBLY	F 7
Q6		INSTALLED ON PREVIOUS ASSEMBLY	F 9
Q7		INSTALLED ON PREVIOUS ASSEMBLY	F 8
Q8	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	B 3
Q9	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	C 3
Q10	C 7448-1	MMBT3904 CHIP NPN	C 8
Q11	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	B 3
Q12	C 7448-1	MMBT3904 CHIP NPN	C 8
Q13	C 7448-1	MMBT3904 CHIP NPN	O 1
Q14	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	C 3
Q15	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	C 7
Q16	125798-1	TRANSISTOR, MMBT3906LTI PNP SMT	C 8
Q17	C 7448-1	MMBT3904 CHIP NPN	D 4
Q18	C 7448-1	MMBT3904 CHIP NPN	D 4
Q19		OPEN	D 4
Q20	C 7448-1	MMBT3904 CHIP NPN	O 1
Q21	125798-1	TRANSISTOR, MMBT3906LTI PNP SMT	B 9
Q22	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	C 8
Q100	C 7448-1	MMBT3904 CHIP NPN	P 6
Q101	125798-1	TRANSISTOR, MMBT3906LTI PNP SMT	P 6
Q103	C 7448-1	MMBT3904 CHIP NPN	N 2

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	23 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
Q104	126616-1	XSISTOR, 100V 2A DRLNGTN DPAK	I 13
Q105	126616-1	XSISTOR, 100V 2A DRLNGTN DPAK	I 14
Q106		INSTALLED ON PREVIOUS ASSEMBLY	J 9
Q107		INSTALLED ON PREVIOUS ASSEMBLY	J 8
Q108		INSTALLED ON PREVIOUS ASSEMBLY	J 12
Q109		INSTALLED ON PREVIOUS ASSEMBLY	J 11
Q110		INSTALLED ON PREVIOUS ASSEMBLY	J 7
Q111		INSTALLED ON PREVIOUS ASSEMBLY	J 9
Q112		INSTALLED ON PREVIOUS ASSEMBLY	J 12
Q113		INSTALLED ON PREVIOUS ASSEMBLY	J 10
Q115	C 7448-1	MMBT3904 CHIP NPN	M 4
Q200	C 7448-1	MMBT3904 CHIP NPN	P 4
Q201	125798-1	TRANSISTOR,MMBT3906LTI PNP SMT	P 4
Q203	C 7448-1	MMBT3904 CHIP NPN	N 2
Q206		INSTALLED ON PREVIOUS ASSEMBLY	J 5
Q207		INSTALLED ON PREVIOUS ASSEMBLY	J 6
Q208		INSTALLED ON PREVIOUS ASSEMBLY	J 2
Q209		INSTALLED ON PREVIOUS ASSEMBLY	J 3
Q210		INSTALLED ON PREVIOUS ASSEMBLY	J 6
Q211		INSTALLED ON PREVIOUS ASSEMBLY	J 4
Q212		INSTALLED ON PREVIOUS ASSEMBLY	J 1
Q213		INSTALLED ON PREVIOUS ASSEMBLY	J 3
Q215	C 7448-1	MMBT3904 CHIP NPN	M 3
Q500	C 7448-1	MMBT3904 CHIP NPN	L 1
Q501	C 7448-1	MMBT3904 CHIP NPN	L 1
Q600	C 7448-1	MMBT3904 CHIP NPN	N 1
Q601	C 7448-1	MMBT3904 CHIP NPN	O 1
Q700	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	B 9
Q701	C10421-3	FET, 60V N-CH 2N7002LT1 SOT-23	A 9
Q702	C 9258-2	BS170RLRM N-MOSFET 60V T/A	B 9
Q703	125798-1	TRANSISTOR,MMBT3906LTI PNP SMT	D 4
R1	101103-1	PTC, 6.0 OHM 265V	D 2
R2	101103-1	PTC, 6.0 OHM 265V	C 2
R3	C10450-2	.04 OHM 5W 3% WW VERT MNT	E 1
R4	C10450-2	.04 OHM 5W 3% WW VERT MNT	E 2
R5	C10450-2	.04 OHM 5W 3% WW VERT MNT	E 2
R6	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 3
R7	A11368-10521	10.5K .10W 1% MF 0805	E 3*
R8	A11368-10521	10.5K .10W 1% MF 0805	E 4*
R9	A11368-27432	274K .125W 1% CHIP RES T/R	C 3
R10	A11368-10521	10.5K .10W 1% MF 0805	E 7*
R11	A11368-10521	10.5K .10W 1% MF 0805	E 7*
R12	A11368-24332	243KOHM .125W 1% CHIP RES T/R	A 3
R13	A11368-10521	10.5K .10W 1% MF 0805	E 9*
R14	A11368-10521	10.5K .10W 1% MF 0805	E 8*
R15	A11368-30112	3.01KOHM .125W 1% CHIP RES T/R	B B
R16		OPEN	B 10

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SIZE	DWG NO.	REV	
A	126218-14	A	
SCALE NONE	PROJ NO. MD425D0	SHEET 24 OF 48	





PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R17	A11371-5R12	5.10HM 0.125W 5% 1206 T/R	E 7*
R18	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	D 4
R19	A10266-5141	510. KOHM .25W 5% CF T/R	D 2
R1X	C 8982-8	TD-220 XSISTOR HOLDER, PLASTIC	D 2
R20	A10266-5141	510. KOHM .25W 5% CF T/R	E 3
R21	A11368-15831	158KOHM .1W 1% 0805 T/R	E 3
R22	A10265-45331	453 KOHM .25W 1% MF T/R	D 2
R23	A10265-45331	453 KOHM .25W 1% MF T/R	E 3
R24	A11368-12132	121KOHM .125W 1% CHIP RES T/R	D 3*
R25	A10265-68131	681KOHM .25W 1% MF T/R	D 4
R26	A10265-68131	681KOHM .25W 1% MF T/R	D 4
R27	A10265-39231	392 KOHM .25W 1% MF T/R	C 4
R28	A10265-39231	392 KOHM .25W 1% MF T/R	C 4
R29	A11368-33R21	33.2 OHM 1% 0805 RES T/R	C 3
R2X	C 8982-8	TD-220 XSISTOR HOLDER, PLASTIC	C 2
R30	A11368-16221	16.2KOHM .1W 1% 0805 T/R	D 4*
R31	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 4*
R32	A11368-10R03	10 OHM 0.25W 1% 1210 T/R	E 4
R33	A11368-1R004	1 OHM 0.5W 1% 2010 T/R	E 3*
R34	A11368-1R004	1 OHM 0.5W 1% 2010 T/R	E 4*
R35	A11368-27432	274K .125W 1% CHIP RES T/R	B 3
R36	A11368-37401	374. OHM 1/10W 1% SMD 0805 T/R	D 4*
R37	A11371-1002	10.OHM 1/8W 5% SMD 1206 T/R	D 4
R38	A11368-40212	4.02KOHM .125W 1% CHIP RES T/R	D 4*
R39	A11368-57621	57.6KOHM 0.1W 1% 0805 T/R	D 4*
R40	A11368-40212	4.02KOHM .125W 1% CHIP RES T/R	D 4
R41	A11368-20021	20.KOHM .1W 1% CHIP 0805	D 3
R42	126564-1	300HM 10W 5% VERT THICK FILM	I 14
R43	A11368-10001	100 OHM 1% 0805 RES T/R	M 6*
R44	A11371-5R12	5.10HM 0.125W 5% 1206 T/R	E 7*
R45	A11371-5R12	5.10HM 0.125W 5% 1206 T/R	E 8*
R46	A11371-5R12	5.10HM 0.125W 5% 1206 T/R	E 9*
R47	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 8
R48	A11371-3005	30 OHM 1W 5% 2512 T/R	B 9
R49	A11368-82511	8.25KOHM .1W 1% CHIP 0805	B 8
R50	A11368-12131	121KOHM, 0.10W 1% CHIP 0805	C 8*
R51	A11368-90921	90.9K, 0.10W 1% MF 0805	C 8
R52	A11368-15421	15.4K 1/10W 1% SMD 0805 T/R	C 8
R53	A11368-15421	15.4K 1/10W 1% SMD 0805 T/R	C 7
R54	A11371-3005	30 OHM 1W 5% 2512 T/R	C 8
R55	A11368-33R21	33.2 OHM 1% 0805 RES T/R	B 3
R56	A11368-10021	10K 1/10W 1% SMD 0805 T/R	B 3*
R57	A11368-27432	274K .125W 1% CHIP RES T/R	B 4
R58	A11368-33R21	33.2 OHM 1% 0805 RES T/R	B 3
R59	A11368-10001	100 OHM 1% 0805 RES T/R	D 8
R60	A11368-1R001	1 OHM .1W 1% 0805 T/R	D 8
R61	A11368-33R21	33.2 OHM 1% 0805 RES T/R	B 3*

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	NONE	PROJ NO. MD425D0
SHEET 25 OF 48		





PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R113	A11368-10011	1.KOHM .1W 1% CHIP 0805	O 5
R114	A11368-20011	2.0K. 0.10W 1% MF 0805	N 6
R115	127682-1	4.99K 0.1% 1206 THIN FILM T/R	P 5*
R116	127682-1	4.99K 0.1% 1206 THIN FILM T/R	P 5*
R117	127682-1	4.99K 0.1% 1206 THIN FILM T/R	O 6*
R118	A11368-48711	4.87K OHM .10W 1% 0805	O 5*
R119	A11368-84511	8.45K 0.1W 1% 0805 T/R	O 5*
R120	A11368-84511	8.45K 0.1W 1% 0805 T/R	O 5*
R121	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 6*
R122	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 6*
R123	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 6*
R124	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 6*
R125	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*
R126	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*
R127	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 6*
R128	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 1*
R129	A11368-11011	RES. 1.1KOHM .1W 1% 0805	O 6*
R130	A11368-11011	RES. 1.1KOHM .1W 1% 0805	O 5*
R131	A11368-20011	2.0K. 0.10W 1% MF 0805	O 5*
R132	A11368-11011	RES. 1.1KOHM .1W 1% 0805	O 5*
R133	A11368-11011	RES. 1.1KOHM .1W 1% 0805	O 6*
R134	A11368-20011	2.0K. 0.10W 1% MF 0805	O 6*
R135	A11368-10001	100 OHM 1% 0805 RES T/R	O 5
R136	A11368-10001	100 OHM 1% 0805 RES T/R	O 5
R137	A11368-10001	100 OHM 1% 0805 RES T/R	O 6
R138	A11368-10001	100 OHM 1% 0805 RES T/R	O 6
R139	A11368-33R21	33.2 OHM 1% 0805 RES T/R	N 7
R140	A11368-1R004	1 OHM 0.5W 1% 2010 T/R	N 7
R141	A11368-10711	1.07KOHM .1W 1% 0805 T/R	N 6
R142	126538-1	18 OHM 5W5% VERT THICK FILM	M 11
R143	126538-1	18 OHM 5W5% VERT THICK FILM	M 11
R144	A11371-1105	11 OHM 1W 5% 2512 T/R	M 12*
R145	A11371-1105	11 OHM 1W 5% 2512 T/R	M 13*
R146	A11371-1105	11 OHM 1W 5% 2512 T/R	N 13*
R147	A11371-1105	11 OHM 1W 5% 2512 T/R	N 12*
R148	A11368-10013	1K 0.25W 1% 1210 T/R	M 12
R149	126538-1	18 OHM 5W5% VERT THICK FILM	N 13
R150	126538-1	18 OHM 5W5% VERT THICK FILM	N 13
R151	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 2*
R152		OPEN	N 12
R153		OPEN	N 12
R154	A11368-15031	150K 1/10W 1% SMD 0805 T/R	N 6
R155	A11368-10001	100 OHM 1% 0805 RES T/R	N 6
R156	A11368-20031	200K 0.1W 1% SMD CHIP 0805	N 6
R157	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 6
R158	A11368-12741	1.27MOHM .1W 1% 0805 T/R	N 6
R159	A11368-51111	5.11K 1/10W 1% SMD 0805 T/R	N 7

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	27 OF 48





PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R207	A11368-23221	23.2KOHM .1W 1% 0805 T/R	0 3*
R208	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	P 4
R209	A11368-75011	7.50K .10W 1% CHIP 0805	0 4
R210	A11368-23201	2320HM .1W 1% 0805 T/R	0 7
R211	127681-1	24.9K 0.5% 1206 THIN FILM T/R	0 4*
R212	A11368-10011	1.KOHM .1W 1% CHIP 0805	0 4
R213	A11368-10011	1.KOHM .1W 1% CHIP 0805	0 4
R214	A11368-20011	2.0K. 0.10W 1% MF 0805	N 5
R215	127682-1	4.99K 0.1% 1206 THIN FILM T/R	P 3*
R216	127682-1	4.99K 0.1% 1206 THIN FILM T/R	P 3*
R217	127682-1	4.99K 0.1% 1206 THIN FILM T/R	0 4*
R218	A11368-48711	4.87K OHM .10W 1% 0805	0 4*
R219	A11368-84511	8.45K 0.1W 1% 0805 T/R	0 4*
R220	A11368-84511	8.45K 0.1W 1% 0805 T/R	0 3*
R221	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 4*
R222	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 4*
R223	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 4*
R224	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 4*
R225	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R226	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R227	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R229	A11368-11011	RES. 1.1KOHM .1W 1% 0805	0 4*
R230	A11368-11011	RES. 1.1KOHM .1W 1% 0805	0 4*
R231	A11368-20011	2.0K. 0.10W 1% MF 0805	0 4*
R232	A11368-11011	RES. 1.1KOHM .1W 1% 0805	0 4*
R233	A11368-11011	RES. 1.1KOHM .1W 1% 0805	0 3*
R234	A11368-20011	2.0K. 0.10W 1% MF 0805	0 3*
R235	A11368-10001	100 OHM 1% 0805 RES T/R	0 4
R236	A11368-10001	100 OHM 1% 0805 RES T/R	0 4
R237	A11368-10001	100 OHM 1% 0805 RES T/R	0 3
R238	A11368-10001	100 OHM 1% 0805 RES T/R	0 3
R239	A11368-33R21	33.2 OHM 1% 0805 RES T/R	0 7
R240	A11368-1R004	1 OHM 0.5W 1% 2010 T/R	0 7
R241	A11368-10711	1.07KOHM .1W 1% 0805 T/R	0 6
R242	126538-1	18 OHM 5W5% VERT THICK FILM	P 11
R243	126538-1	18 OHM 5W5% VERT THICK FILM	P 11
R244	A11371-1105	11 OHM 1W 5% 2512 T/R	0 12*
R245	A11371-1105	11 OHM 1W 5% 2512 T/R	0 13*
R246	A11371-1105	11 OHM 1W 5% 2512 T/R	P 13*
R247	A11371-1105	11 OHM 1W 5% 2512 T/R	P 12*
R248	A11368-10013	1K 0.25W 1% 1210 T/R	0 12
R249	126538-1	18 OHM 5W5% VERT THICK FILM	0 13
R250	126538-1	18 OHM 5W5% VERT THICK FILM	0 13
R252		OPEN	0 12
R253		OPEN	0 12
R254	A11368-15031	150K 1/10W 1% SMD 0805 T/R	0 6
R255	A11368-10001	100 OHM 1% 0805 RES T/R	0 6

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	29 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R256	A11368-20031	200K 0.1W 1% SMD CHIP 0805	O 6
R257	A11368-20021	20.KOHM .1W 1% CHIP 0805	O 6
R258	A11368-12741	1.27MOHM .1W 1% 0805 T/R	O 6
R259	A11368-51111	5.11K 1/10W 1% SMD 0805 T/R	O 7
R260	C10540-0	10.KOHM TOP ADJUST TRIMMER T/R	P 6
R261	A11368-20011	2.0K, 0.10W 1% MF 0805	P 7*
R262	A11368-30111	3.01K 1/10W 1% SMD 0805 T/R	O 7*
R263	A11368-47511	4.75KOHM 0.10W 1% CHIP 0805	O 7*
R264	A11368-56211	5.62KOHM .1W 1% 0805 T/R	P 7*
R265	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 7*
R266	A11368-10011	1.KOHM .1W 1% CHIP 0805	O 7*
R267	A11368-10011	1.KOHM .1W 1% CHIP 0805	P 7*
R268	A11368-44221	44.2K 0.1W 1% 0805 T/R	N 4*
R269	A11368-26111	2.61K 0.1W 1% 0805 T/R	N 4*
R270	C 9779-7	100KOHM 4MM CERMET TRIM SMT TR	N 3
R271	A11368-10031	100.KOHM .1W 1% CHIP 0805	N 4*
R272	A11368-10001	100 OHM 1% 0805 RES T/R	N 4*
R273	A11368-10001	100 OHM 1% 0805 RES T/R	N 4*
R274	A11368-10531	105KOHM .1W 1% 0805 T/R	O 3*
R275	A11368-19111	1.91KOHM .1W 1% 0805 T/R	O 3*
R276	A11368-19111	1.91KOHM .1W 1% 0805 T/R	O 3*
R277	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 3*
R278	C 9777-1	1 KOHM 4MM CERMET TRIM SMT T/R	O 3
R279	A11368-13011	1.3KOHM .1W 1% 0805 T/R	O 3
R280	A11368-25511	2.55KOHM .1W 1% 0805 T/R	O 3*
R281	A11368-15011	1.5K 1/10W 1% SMD 0805 T/R	O 3*
R282	A11368-16221	16.2KOHM .1W 1% 0805 T/R	O 3*
R283	A11368-22111	2.21KOHM .1W 1% CHIP 0805	O 3*
R284	A11368-82511	8.25KOHM .1W 1% CHIP 0805	O 3*
R285	A11368-42211	4.22KOHM .1W 1% 0805 T/R	O 3*
R286	A11368-25511	2.55KOHM .1W 1% 0805 T/R	O 3*
R287	A11368-60411	6.04KOHM .1W 1% 0805 T/R	O 3*
R288	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R289	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*
R290	A11368-49921	49.9KOHM .1W 1% CHIP 0805	O 1
R291	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R292	A11371-6814	680 OHM .5W 5% 2010 T/R	M 1
R293	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R294	A11368-20021	20.KOHM .1W 1% CHIP 0805	P 3*
R295	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 4*
R296	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 4*
R297	127681-1	24.9K 0.5% 1206 THIN FILM T/R	O 4*
R298	A11368-71531	715K 0.1W 1% 0805 T/R	O 12
R299	A11368-10031	100.KOHM .1W 1% CHIP 0805	N 3*
R300	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	L 3*
R301		OPEN	P 5*
R302	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	L 3*

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	NONE	PROJ NO. MD425D0
SHEET 30 OF 48		



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R303	A11368-61902	619 OHM .125W 1% CHIP RES T/R	M 5*
R304	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	M 5*
R305	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	M 5*
R307	A11368-49921	49.9KOHM .1W 1% CHIP 0805	O 1
R308	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R309	A11368-75023	75K OHM .25W 1% 1210	M 4*
R310	A11368-13011	1.3KOHM .1W 1% 0805 T/R	M 4*
R311	A11368-33223	33.2KOHM 0.25W 1% 1210 T/R	M 4*
R312	A11368-82521	82.5K 0.10W 1%CHIP 0805	M 4*
R313	A11368-39231	392 KOHM .1W 1% 0805 T/R	O 1*
R314	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	M 4
R315	A11368-75023	75K OHM .25W 1% 1210	M 3*
R316	A11368-13011	1.3KOHM .1W 1% 0805 T/R	M 3*
R317	A11371-3041	300.KOHM .1W 5% CHIP 0805	L 8
R318	A11368-30121	30.1K. 0.10W 1% MF 0805	L 8
R319	A11368-63411	6.34K 0.10W 1% CHIP 0805	M 3*
R320	A11368-75023	75K OHM .25W 1% 1210	M 4*
R321	A11368-10021	10K 1/10W 1% SMD 0805 T/R	L 8
R322	A11368-11021	11K 0.1W 1% 0805 T/R	L 8
R323	A11368-20031	200K 0.1W 1% SMD CHIP 0805	L 8
R324	A11368-56211	5.62KOHM .1W 1% 0805 T/R	I 13
R325	126564-1	30OHM 10W 5% VERT THICK FILM	I 14
R326	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 4
R327	A11368-10021	10K 1/10W 1% SMD 0805 T/R	A 3
R328		OPEN	M 8
R329	A11368-10021	10K 1/10W 1% SMD 0805 T/R	L 8
R330	A11368-20031	200K 0.1W 1% SMD CHIP 0805	L 8
R331	A11368-84511	8.45K 0.1W 1% 0805 T/R	L 8
R332	A11368-56211	5.62KOHM .1W 1% 0805 T/R	I 13
R333	A11371-3905	39 OHM 1W 5% 2512 T/R	I 14*
R334	A11371-3905	39 OHM 1W 5% 2512 T/R	I 14*
R335	A11368-20031	200K 0.1W 1% SMD CHIP 0805	L 8
R336	A11368-19621	19.6K OHM .1W 1% 0805 T/R	L 8
R337	A11368-10021	10K 1/10W 1% SMD 0805 T/R	L 8
R338	A11368-75011	7.50K .10W 1% CHIP 0805	B 8
R339	A11368-60411	6.04KOHM .1W 1% 0805 T/R	L 11*
R340	A11368-10031	100.KOHM .1W 1% CHIP 0805	M 4*
R341	A11368-10011	1.KOHM .1W 1% CHIP 0805	N 4*
R342	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 4*
R343	A11368-61901	619.OHM 1/10W 1% SMD 0805 T/R	N 2*
R344	A11368-10041	1M OHM .1W 1% CHIP 0805	N 2*
R345	A11368-90921	90.9K. 0.10W 1% MF 0805	N 2*
R346	A11371-5141	510.KOHM .1W 5% CHIP 0805	N 2*
R347	A11368-33231	332K 0.1W 1% 0805 T/R	O 2*
R348	A11368-22111	2.21KOHM .1W 1% CHIP 0805	P 2
R349	A11368-14031	140KOHM .1W 1% 0805 T/R	P 2
R350	A11368-22111	2.21KOHM .1W 1% CHIP 0805	P 2

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 31 OF 48









PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R451	A10266-3041	300.KOHM .25W 5% CF T/R	A 2
R452	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	K 5
R453	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	K 5
R454	A11368-10011	1.KOHM .1W 1% CHIP 0805	K 5
R455	A11371-3005	30 OHM 1W 5% 2512 T/R	K 6*
R456	A11371-3005	30 OHM 1W 5% 2512 T/R	K 6*
R457	A11371-1104	RES 11.0 OHM .5W SMT	J 4
R458	A11371-3005	30 OHM 1W 5% 2512 T/R	K 5*
R459	A11371-3005	30 OHM 1W 5% 2512 T/R	K 5*
R460	A11371-1104	RES 11.0 OHM .5W SMT	J 6
R461	126901-1	RES. .02 OHM 5W 3% VERTICAL	O 8
R462	126901-1	RES. .02 OHM 5W 3% VERTICAL	P 8
R463	126564-1	300OHM 10W 5% VERT THICK FILM	O 10
R464	126564-1	300OHM 10W 5% VERT THICK FILM	O 9
R465	A11371-1104	RES 11.0 OHM .5W SMT	J 2
R466	A11371-3005	30 OHM 1W 5% 2512 T/R	K 2*
R467	A11371-3005	30 OHM 1W 5% 2512 T/R	K 2*
R468	A11371-1104	RES 11.0 OHM .5W SMT	J 3
R469	A11371-3005	30 OHM 1W 5% 2512 T/R	K 3*
R470	A11371-3005	30 OHM 1W 5% 2512 T/R	K 3*
R471	A11368-10011	1.KOHM .1W 1% CHIP 0805	K 2
R472	A11371-1104	RES 11.0 OHM .5W SMT	K 1
R473	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	K 3
R474	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	K 3
R475	125539-1	1 OHM 0.25W 5% 1206	H 5*
R476	125539-1	1 OHM 0.25W 5% 1206	H 6*
R477	125539-1	1 OHM 0.25W 5% 1206	H 2*
R478	125539-1	1 OHM 0.25W 5% 1206	H 3*
R479	125539-1	1 OHM 0.25W 5% 1206	H 4*
R480	125539-1	1 OHM 0.25W 5% 1206	H 2*
R481	125539-1	1 OHM 0.25W 5% 1206	H 5*
R482	125539-1	1 OHM 0.25W 5% 1206	H 3*
R483	126901-1	RES. .02 OHM 5W 3% VERTICAL	O 8
R484	126901-1	RES. .02 OHM 5W 3% VERTICAL	P 8
R485	A11368-10041	1M OHM .1W 1% CHIP 0805	N 4*
R486	A11368-10031	100.KOHM .1W 1% CHIP 0805	N 4*
R487	A10266-3041	300.KOHM .25W 5% CF T/R	B 6
R488	A11368-17811	1.78K 0.1W 1% 0805 SMD T/R	B 9
R489	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	N 4*
R490	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	N 3*
R491	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	N 4*
R492	A11368-75R01	75.OHM 1/10W 1% SMD 0805 T/R	N 4*
R493	A11371-1104	RES 11.0 OHM .5W SMT	M 7
R494	A11371-1104	RES 11.0 OHM .5W SMT	M 7
R495	A11368-10021	10K 1/10W 1% SMD 0805 T/R	N 4*
R496	A11368-44221	44.2K 0.1W 1% 0805 T/R	P 3*
R497	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 4*

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 34 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R498	A11368-28011	2.80KOHM .10W 1% MF 0805	P 3*
R499	A11368-23221	23.2KOHM .1W 1% 0805 T/R	D 4*
R500	A11368-49931	499KOHM .1W 1% 0805 T/R	C 8*
R501	A11371-0R02	0. OHM .125W 5% CHIP RES T/R	E 7
R502	A10266-5141	510. KOHM .25W 5% CF T/R	D 2
R503	A10266-5141	510. KOHM .25W 5% CF T/R	D 2
R504		OPEN	D 3
R505	A10266-2751	2.7 MOHM .25W 5% CF T/R	B 5
R506	A10266-2441	240. KOHM .25W 5% CF T/R	D 14
R507	A10266-2441	240. KOHM .25W 5% CF T/R	C 14
R508	A11371-3905	39 OHM 1W 5% 2512 T/R	J 14*
R509	A11371-3905	39 OHM 1W 5% 2512 T/R	J 14*
R510	A11368-20011	2.0K. 0.10W 1% MF 0805	D 4
R511	A11368-78711	7.87K OHM 0.10W 1% 0805 T/R	D 4
R512	A11371-1222	1.2KOHM 1/8W 5% SMD 1206 T/R	D 4
R513	A11368-20021	20.KOHM .1W 1% CHIP 0805	D 4
R514	A11371-1331	13KOHM .1W 5% 0805 T/R	D 4
R515	A11368-30111	3.01K 1/10W 1% SMD 0805 T/R	D 4
R516		OPEN	D 4*
R517	A11368-20021	20.KOHM .1W 1% CHIP 0805	M 4
R518	A11368-30111	3.01K 1/10W 1% SMD 0805 T/R	M 4
R519	A11368-20021	20.KOHM .1W 1% CHIP 0805	M 6
R522	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 5
R523	A11368-20021	20.KOHM .1W 1% CHIP 0805	A 9*
R524	A11368-20021	20.KOHM .1W 1% CHIP 0805	A 9*
R525	A11368-27432	274K .125W 1% CHIP RES T/R	A 9*
R526	A11368-39212	3.92 KOHM, 1% MF .125W 1206	A 9
R527	A11368-17811	1.78K 0.1W 1% 0805 SMD T/R	B 9*
R528	A11368-10011	1.KOHM .1W 1% CHIP 0805	B 9
R529	A11368-10011	1.KOHM .1W 1% CHIP 0805	B 9*
R530	A11368-30111	3.01K 1/10W 1% SMD 0805 T/R	B 9*
R531	A11368-30121	30.1K. 0.10W 1% MF 0805	C 8*
R532	A11368-10001	100 OHM 1% 0805 RES T/R	A 3
R533		OPEN	A 3*
R534	A11368-49921	49.9KOHM .1W 1% CHIP 0805	A 3
R535	A11368-20021	20.KOHM .1W 1% CHIP 0805	M 5
R536	A11368-56211	5.62KOHM .1W 1% 0805 T/R	M 5*
R537	A11368-56211	5.62KOHM .1W 1% 0805 T/R	M 5*
R538	A11368-20021	20.KOHM .1W 1% CHIP 0805	M 5
R539	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	D 8
R540	A11368-15021	15.0K. 0.10W 1% MF 0805	D 8*
R541	A11368-10021	10K 1/10W 1% SMD 0805 T/R	D 8
R542		OPEN	D 8*
R543	A11368-20031	200K 0.1W 1% SMD CHIP 0805	D 8*
R544	A11368-56211	5.62KOHM .1W 1% 0805 T/R	C 8
R545	A11368-12121	12.1KOHM .1W 1% 0805 T/R	C 8
R546	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	D 8

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 35 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R547	A11371-0R02	0. OHM .125W 5% CHIP RES T/R	E 7
R548	A11371-0R02	0. OHM .125W 5% CHIP RES T/R	E 9
R549	A11371-0R02	0. OHM .125W 5% CHIP RES T/R	E 8
R550	A11368-10021	10K 1/10W 1% SMD 0805 T/R	M 2*
R557	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 1
R558	A11368-39231	392 KOHM .1W 1% 0805 T/R	N 1*
R559	A11368-49902	499 OHM .125W 1% 1206 T/R	N 1*
R560		OPEN	N 1*
R561	A11368-20021	20.KOHM .1W 1% CHIP 0805	L 1*
R562	A11371-2724	2.7 KOHM .5W 5% 2010 T/R	L 1
R563	A11368-10021	10K 1/10W 1% SMD 0805 T/R	O 1*
R564		OPEN	N 1*
R565	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 2*
R566	A11368-20021	20.KOHM .1W 1% CHIP 0805	L 1*
R567	A11371-2724	2.7 KOHM .5W 5% 2010 T/R	L 1
R657	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 1
R658	A11368-39231	392 KOHM .1W 1% 0805 T/R	N 1*
R659	A11368-49902	499 OHM .125W 1% 1206 T/R	N 1*
R660		OPEN	N 1*
R661	A11368-20021	20.KOHM .1W 1% CHIP 0805	N 1*
R662	A11371-2724	2.7 KOHM .5W 5% 2010 T/R	N 1
R663	A11368-10021	10K 1/10W 1% SMD 0805 T/R	N 1*
R664		OPEN	O 1*
R665	A11368-20021	20.KOHM .1W 1% CHIP 0805	O 2*
R666	A11368-20021	20.KOHM .1W 1% CHIP 0805	O 1*
R667	A11371-2724	2.7 KOHM .5W 5% 2010 T/R	O 1
R700	A11368-15013	1.5KOHM .25W 1% 1210 T/R	B 9
R701	A11368-10001	100 OHM 1% 0805 RES T/R	B 8*
R702	A11371-4741	470KOHM .1W 5% CHIP 0805	B 8*
R703	A11368-12121	12.1KOHM .1W 1% 0805 T/R	B 8
R704	A11368-20031	200K 0.1W 1% SMD CHIP 0805	B 8*
R705	A11371-2023	2K OHM .25W 5% 1210 T/R	B 9
R706	A11371-2023	2K OHM .25W 5% 1210 T/R	B 9
R707	A11371-0R04	0 OHM 1/2W 5% 2010 T/R	J 8
R708	A11371-0R04	0 OHM 1/2W 5% 2010 T/R	J 9
R709	A11368-10R03	10 OHM 0.25W 1% 1210 T/R	L 6
R710	A11368-10R03	10 OHM 0.25W 1% 1210 T/R	L 6
R711	126184-3	NTC, 20K #8 PRI SEC ISO	E 13
R712	A11368-10021	10K 1/10W 1% SMD 0805 T/R	E 12
R713	127517-2	NTC, 20K J 10%	C 13
R714	A11368-48711	4.87K OHM .10W 1% 0805	C 12
R715	A11368-22131	221 KOHM .1W 1% 0805 T/R	D 3*
R716	A11368-36521	36.5K OHM 0.1W 1% 0805 T/R	D 3*
R717	A11368-35712	3.57KOHM .125W 1% CHIP RES T/R	B 6
R718	A11371-0R04	0 OHM 1/2W 5% 2010 T/R	J 12
R719	A11371-0R04	0 OHM 1/2W 5% 2010 T/R	J 11
R720	A11371-1104	RES 11.0 OHM .5W SMT	J 10
R721	A11371-1104	RES 11.0 OHM .5W SMT	J 12

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SCALE NONE	PROJ NO. MD425D0	SHEET 36 OF 48	
		REV A	



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
R722	A11371-1104	RES 11.0 OHM .5W SMT	J 9
R723	A11371-0R01	0 OHM 0.1W CHIP 0805	C 8
R724		OPEN	C 8*
R730	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 5*
R731	A11368-22111	2.21KOHM .1W 1% CHIP 0805	M 4
R732	A11368-10041	1M OHM .1W 1% CHIP 0805	N 5
R798	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 5*
R799	A11368-26721	26.7KOHM .1W 1% 0805 T/R	P 5*
R800	A11368-10021	10K 1/10W 1% SMD 0805 T/R	B 3
R801	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	B 3
R802	A11368-49911	4.99K 1/10W 1% SMD 0805 T/R	B 3
R805	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 7
R807	A11371-0R04	0 OHM 1/2W 5% 2010 T/R	J 6
R808	A11371-0R04	0 OHM 1/2W 5% 2010 T/R	J 5
R809	A11371-1104	RES 11.0 OHM .5W SMT	J 4
R810	A11371-1104	RES 11.0 OHM .5W SMT	J 6
R811	A11371-1104	RES 11.0 OHM .5W SMT	J 1
R812	A11371-1104	RES 11.0 OHM .5W SMT	J 3
R813	A11371-0R04	0 OHM 1/2W 5% 2010 T/R	J 2
R814	A11371-0R04	0 OHM 1/2W 5% 2010 T/R	J 3
R830	A11368-10031	100.KOHM .1W 1% CHIP 0805	O 3*
R831	A11368-22111	2.21KOHM .1W 1% CHIP 0805	M 2
R832	A11368-10041	1M OHM .1W 1% CHIP 0805	N 4
R889	A11368-10021	10K 1/10W 1% SMD 0805 T/R	P 3*
R899	A11368-26721	26.7KOHM .1W 1% 0805 T/R	P 3*
RT1	127518-3	NTC 20K J 10% #8 RING	K 11
RT2	127518-3	NTC 20K J 10% #8 RING	K 3
T1	126012-1	XFMR, 400V/150V CT	D 11
T2	127522-2	XFMR, 125KHZ 15V GATE DRIVE	E 7
T3	127522-2	XFMR, 125KHZ 15V GATE DRIVE	E 9
T4	126072-1	XFMR, CURRENT SENSE	C 9
T4X	101128-1	WIRE, K2 CURRENT SENSE	C 9
T100	H43628-9	XFMR D350 100:1 CURRENT SENSE	N 11
T100X	101128-1	WIRE, K2 CURRENT SENSE	N 11
T101	126863-1	XFMR, BCA GATE SUPPLY	K 7
T101X	101128-1	WIRE, K2 CURRENT SENSE	K 7
T200	H43628-9	XFMR D350 100:1 CURRENT SENSE	P 11
T201	126863-1	XFMR, BCA GATE SUPPLY	K 7
TP1	127064-1	TEST POINT, SMT 1206	N 6
TP2	127064-1	TEST POINT, SMT 1206	C 4
TP3	127064-1	TEST POINT, SMT 1206	L 8
TP5	127064-1	TEST POINT, SMT 1206	E 3
TP6	127064-1	TEST POINT, SMT 1206	A 4
TP7	127064-1	TEST POINT, SMT 1206	D 7
TP8	127064-1	TEST POINT, SMT 1206	E 4
TP9	127064-1	TEST POINT, SMT 1206	C 8
TP10	127064-1	TEST POINT, SMT 1206	N 6
TP11	127064-1	TEST POINT, SMT 1206	C 8

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 37 OF 48



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
TP12	127064-1	TEST POINT, SMT 1206	C 7
TP13	127064-1	TEST POINT, SMT 1206	D 8
TP14	127064-1	TEST POINT, SMT 1206	E 8
TP15	127064-1	TEST POINT, SMT 1206	E 7
TP16	127064-1	TEST POINT, SMT 1206	D 9
TP17	127064-1	TEST POINT, SMT 1206	E 8
TP27	127064-1	TEST POINT, SMT 1206	E 7
TP28	127064-1	TEST POINT, SMT 1206	E 7
TP29	127064-1	TEST POINT, SMT 1206	E 7
TP30	127064-1	TEST POINT, SMT 1206	E 9
TP31	127064-1	TEST POINT, SMT 1206	E 8
TP32	127064-1	TEST POINT, SMT 1206	E 8
TP33	127064-1	TEST POINT, SMT 1206	B 7
TP34	127064-1	TEST POINT, SMT 1206	C 7
TP35	127064-1	TEST POINT, SMT 1206	C 7
TP36	127064-1	TEST POINT, SMT 1206	C 8
TP37	127064-1	TEST POINT, SMT 1206	J 7
TP38	127064-1	TEST POINT, SMT 1206	K 11
TP39	127064-1	TEST POINT, SMT 1206	A 3
TP40	127064-1	TEST POINT, SMT 1206	B 3
TP41	127064-1	TEST POINT, SMT 1206	C 3
TP43	127064-1	TEST POINT, SMT 1206	B 3
TP45	127064-1	TEST POINT, SMT 1206	B 2
TP46	127064-1	TEST POINT, SMT 1206	B 3
TP47	127064-1	TEST POINT, SMT 1206	H 13
TP48	127064-1	TEST POINT, SMT 1206	B 11
TP49	127064-1	TEST POINT, SMT 1206	A 8
TP50	127064-1	TEST POINT, SMT 1206	E 8
TP91	127064-1	TEST POINT, SMT 1206	B 8
TP100	127064-1	TEST POINT, SMT 1206	P 6
TP101	127064-1	TEST POINT, SMT 1206	P 5
TP102	127064-1	TEST POINT, SMT 1206	N 6
TP103	127064-1	TEST POINT, SMT 1206	M 10
TP104	127064-1	TEST POINT, SMT 1206	O 5
TP105	127064-1	TEST POINT, SMT 1206	P 6
TP143	127064-1	TEST POINT, SMT 1206	A 8
TP162	127064-1	TEST POINT, SMT 1206	B 9
TP200	127064-1	TEST POINT, SMT 1206	P 4
TP201	127064-1	TEST POINT, SMT 1206	P 3
TP202	127064-1	TEST POINT, SMT 1206	N 4
TP203	127064-1	TEST POINT, SMT 1206	P 10
TP204	127064-1	TEST POINT, SMT 1206	O 3
TP205	127064-1	TEST POINT, SMT 1206	P 4
TP243	127064-1	TEST POINT, SMT 1206	K 2
TP244	127064-1	TEST POINT, SMT 1206	J 7
TP245	127064-1	TEST POINT, SMT 1206	O 6
TP247	127064-1	TEST POINT, SMT 1206	M 6
TP248	127064-1	TEST POINT, SMT 1206	M 3

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	38 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
TP249	127064-1	TEST POINT, SMT 1206	A 2
TP251	127064-1	TEST POINT, SMT 1206	B 6
TP252	127064-1	TEST POINT, SMT 1206	A 4
TP253	127064-1	TEST POINT, SMT 1206	C 8
TP254	127064-1	TEST POINT, SMT 1206	O 3
TP255	127064-1	TEST POINT, SMT 1206	P 2
TP256	127064-1	TEST POINT, SMT 1206	C 7
TP257	127064-1	TEST POINT, SMT 1206	N 5
U1	C 9038-8	COMPARATOR, QUAD LM339D SO-14	N 1
U2	128279-1	IC, SGSL4981B PFC CONTROL	D 3
U3	C 8262-5	MC33078D LOW NOISE DUAL OP AMP	O 1
U4	126681-1	IC, PWN CONT PHASE SHIFT	D 8
U5	C 9929-8	TL431ACLP ADJ PREC RFNC T/A	C 8
U6	125868-1	OP AMP TL074CD SMT	O 6
U7	126559-1	COMPARATOR, LM393 SO-8 DUAL	B 7
U8	126561-1	REG, +5V LOW POWER SO-8	N 3
U9	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 3
U10	126559-1	COMPARATOR, LM393 SO-8 DUAL	A 3
U11	126559-1	COMPARATOR, LM393 SO-8 DUAL	A 3
U12	126633-1	REGULATOR, 15V SO-8	A 4
U13	126559-1	COMPARATOR, LM393 SO-8 DUAL	C 3
U14	126561-1	REG, +5V LOW POWER SO-8	G 14
U15	126653-1	SGL 2 INPUT NOR GATE SOT-23-5	H 14
U16	125867-1	MC74HC4024D 7 STAGE COUNTER SM	H 13
U17	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 7
U18	128383-1	OPTO HCNW2211 IEC65 COMPLIANT	B 10
U19	126561-1	REG, +5V LOW POWER SO-8	C 7
U20	128382-1	OPTO SFH615A-2 IEC65 COMPLIANT	A 10
U21	126559-1	COMPARATOR, LM393 SO-8 DUAL	A 9
U22	125541-1	DRVR, 600V IR2104 HALF BRIDGE	L 6
U23	126553-1	IC, 20V 0.135OHM SOB DUAL NMOS	L 6
U24	126559-1	COMPARATOR, LM393 SO-8 DUAL	A 4
U25	C 9929-8	TL431ACLP ADJ PREC RFNC T/A	C 3
U26	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 3
U27	126633-1	REGULATOR, 15V SO-8	E 4
U28	C 5095-2	MC7815CT +15V, REG	D 7
U29	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 9
U30	128382-1	OPTO SFH615A-2 IEC65 COMPLIANT	A 9
U31	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 7
U32	127145-1	DVR, 1.5A DUAL SO-8 MOSFET	E 8
U33		OPEN	A 10
U34		OPEN	B 10
U35	C10344-7	74HC74AD DUAL D FLIP FLOP SOIC	C 7
U36	128382-1	OPTO SFH615A-2 IEC65 COMPLIANT	A 10
U37	126559-1	COMPARATOR, LM393 SO-8 DUAL	D 8
U99	C 9038-8	COMPARATOR, QUAD LM339D SO-14	B 8
U100	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	P 5
U101	126548-1	COMPARATOR, LM361 HI SPD SO-14	N 5

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE NONE	PROJ NO. MD425D0	SHEET 39 OF 48



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
U102	126561-1	REG. +5V LOW POWER SO-8	N 5
U103	126548-1	COMPARATOR, LM361 HI SPD SO-14	N 6
U104	126561-1	REG. +5V LOW POWER SO-8	N 6
U105	125869-1	OP AMP LM318M SMT	N 6
U106	126540-1	IC, QUAD 2 INPUT NOR GATE SO-14	M 6
U107	125545-1	HCPL0601 HI SPEED OPTO	M 7
U108	126559-1	COMPARATOR, LM393 SO-8 DUAL	N 7
U110	C 8262-5	MC33078D LOW NOISE DUAL OP AMP	P 5
U111	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	O 5
U112	C 9038-8	COMPARATOR, QUAD LM339D SO-14	O 2
U113	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 5
U114	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 4
U115	C 9038-8	COMPARATOR, QUAD LM339D SO-14	L 8
U116	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 4
U117	C 9038-8	COMPARATOR, QUAD LM339D SO-14	O 2
U118	126561-1	REG. +5V LOW POWER SO-8	K 8
U119	125546-1	HCPL0611 HI SPEED OPTO	K 9
U120	125544-1	MC34151D HISP D DUAL MOSFET DVR	J 9
U121	125544-1	MC34151D HISP D DUAL MOSFET DVR	J 11
U122	126561-1	REG. +5V LOW POWER SO-8	K 11
U123	125545-1	HCPL0601 HI SPEED OPTO	K 11
U124	C10344-7	74HC74AD DUAL D FLIP FLOP SOIC	L 6
U125	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	N 2
U200	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	P 4
U201	126548-1	COMPARATOR, LM361 HI SPD SO-14	N 4
U202	126561-1	REG. +5V LOW POWER SO-8	N 4
U203	126548-1	COMPARATOR, LM361 HI SPD SO-14	N 3
U204	126561-1	REG. +5V LOW POWER SO-8	N 3
U205	125869-1	OP AMP LM318M SMT	N 4
U207	125545-1	HCPL0601 HI SPEED OPTO	P 7
U208	126559-1	COMPARATOR, LM393 SO-8 DUAL	P 7
U210	C 8262-5	MC33078D LOW NOISE DUAL OP AMP	P 3
U211	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	O 3
U213	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 4
U214	C 9038-8	COMPARATOR, QUAD LM339D SO-14	M 3
U218	126561-1	REG. +5V LOW POWER SO-8	K 4
U219	125546-1	HCPL0611 HI SPEED OPTO	K 5
U220	125544-1	MC34151D HISP D DUAL MOSFET DVR	J 5
U221	125544-1	MC34151D HISP D DUAL MOSFET DVR	J 3
U222	126561-1	REG. +5V LOW POWER SO-8	K 2
U223	125545-1	HCPL0601 HI SPEED OPTO	K 3
U224	C10344-7	74HC74AD DUAL D FLIP FLOP SOIC	N 5
Y1	C10476-7	CRYSTAL, 4 MHZ HC49U SERIES	G 13
1	126583-8	PWB, CE4000 MAIN	
3	103415-10B05	SCREW, 8-32X.312 TORX PNHD SEM	
4	126923-4	INSULATOR, CE4K HEATSINK NOMEX	
5	128130-1	RIVET, CE4000 INS RET PLASTIC	

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SIZE	DWG NO.	REV
A	126218-14	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	40 OF 48

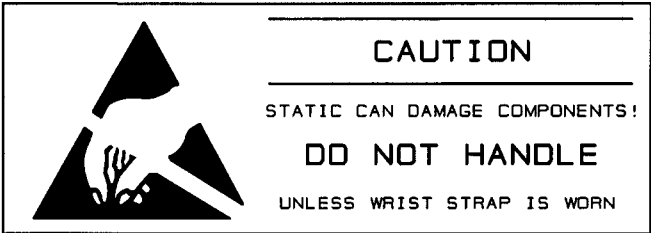





**CE4000 MAIN** PWA NUMBER: 126218-14  
DRAWING SHEET: 41



**CE4000 MAIN** PWA NUMBER: 126218-14  
DRAWING SHEET: 42

REVISION HISTORY							
E. C. N.	REV	DESCRIPTION	DATE	APPROVED			
				DWN	CHK	CM	PE
00N0563	A	RELEASE FOR PRODUCTION	06-15-00	JAW	<i>JAW</i>	<i>CB</i>	<i>EB</i>
<p>UNLESS OTHERWISE SPECIFIED, THIS PRINTED WIRING ASSEMBLY SHALL MEET THE SPECIFICATION DESCRIBED IN IPC-A-610_ CLASS 2 STANDARDS.</p> <p>NOTES:</p> <ol style="list-style-type: none"> <li>1. PRINTED WIRING BOARD PART NUMBER 126827-8.</li> <li>2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.</li> <li>3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAPS.</li> <li>4. THE PRINTED WIRING ASSEMBLY PART NUMBER FOR THIS ASSEMBLY SHALL BE MARKED ON THE PRINTED WIRING BOARD AND SHALL BE PERMANENT.</li> <li>5. MAP LOCATIONS DENOTED BY AN ASTERISK (*), INDICATE COMPONENTS MOUNTED ON THE BOTTOM SIDE OF THE PRINTED WIRING BOARD.</li> <li>6. INSTALL 102472-3 IN J2 USING POSITIONS 1 THRU 12.</li> </ol>							
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K		CHK	<i>JAW</i>	<i>6-15-00</i>			
FILENAME		CM	<i>CB</i>	<i>6/15/00</i>			
126828-7_A_01.PCB		PE	<i>EB</i>	<i>6-15-00</i>			
TOLERANCE UNLESS OTHERWISE SPECIFIED					<p>TITLE</p> <p style="font-size: 1.2em;">PWA, CE4000 BFG</p>		
.00 = ±.02" .000 = ±.010" DRILLS = ±.003"							
DO NOT SCALE DRAWING					SIZE	DWG NO.	REV
					A	126828-7	A
					SCALE	PROJ NO. MD42500	SHEET SHEET 1 OF 8



PARTS LIST			
C. P. N.	DESCRIPTION	QTY	REFERENCE DESIGNATION
A11368-10021	10K 1/10W 1% SMD 0805 T/R	17	R7, R8, R9, R10, R11, R12, R25, R26, R31, R32, R33, R34, R47, R50, R55, R57, R59
A11368-10R03	10 OHM 0.25W 1% 1210 T/R	1	R49
A11368-11321	11.3KOHM .1W 1% CHIP 0805	4	R5, R19, R29, R41
A11368-14331	143K OHM .1W 1% 0805 T/R	2	R13, R35
A11368-15011	1.5K 1/10W 1% SMD 0805 T/R	1	R48
A11368-15021	15.0K. 0.10W 1% MF 0805	2	R18, R40
A11368-15031	158KOHM .1W 1% 0805 T/R	2	R24, R46
A11368-19631	196K OHM .1W 1% 0805 T/R	2	R23, R45
A11368-20011	2.0K. 0.10W 1% MF 0805	2	R2, R27
A11368-22621	22.6K OHM .1W 1% 0805 T/R	2	R16, R38
A11368-26111	2.61K 0.1W 1% 0805 T/R	2	R4, R28
A11368-26131	261K OHM .1W 1% 0805 T/R	2	R22, R44
A11368-28722	RES 28.7K 1% SMD 1206	2	R15, R37
A11368-30101	301 OHM .1W 1% 0805 T/R	2	R52, R53
A11368-30322	RES 30.3K 1% SMD 1206	2	R14, R36
A11368-56221	56.2K OHM .1W 1% 0805 T/R	2	R17, R39
A11368-88711	8.87KOHM .1W 1% CHIP 0805	4	R6, R20, R30, R42
A11368-97631	976K OHM .1W 1% 0805 T/R	2	R21, R43
A11369-330J2	33 PF 50V 5% NPO MLC 0805	3	C2, C38, C39
A11427-103K2	.01 UF 50V 10% X7R MLC 0805	8	C30, C31, C32, C33, C34, C35, C36, C37
A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	6	C11, C12, C13, C25, C26, C27
A11427-124K5	0.12 50V 10% CHIP X7R 1206	4	C6, C10, C20, C24
A11427-154K5	0.15 50V 10% CHIPX7R 1206	4	C5, C9, C19, C23
A11427-224J5	0.22UF 50V 5% X7R 1206 T/R	4	C4, C8, C18, C22
A11427-274K5	0.27UF 50V 10% X7R 1206 T/R	4	C3, C7, C17, C21
C 7251-9	.22UF 25V CHIP CAPACITOR	2	C15, C29
C 7325-1	2PDL 2POS PC SLIDE SWITCH	1	S2
C 8262-5	MC33078D LOW NOISE DUAL OP AMP	2	U3, U4
C 9012-3	OP AMP, QUAD LO NOISE MC33079D	2	U6, U7
C 9049-5	100PF 100V CERAMIC CHIP CAP	2	C1, C16
101993-1	JACK, 6P4 COND MODULAR R/A	1	J3
102472-3	CONN, 12POS .1CTR ASSY SGL ROW	1	J2
102486-1	OPTO BJT NPN SOIC-8 CTR=100%	1	U5
102723-2	OPTOCELL ON<.5KOHM OFF >10MSSEC	2	U1, U2
125798-1	TRANSISTOR,MMBT3906LTI PNP SMT	1	Q1
126027-8	PWB, CE4000 BFG	1	1
127386-1	SWITCH, 4P3T SLIDE R/A PCB MNT	2	S3, S4
127387-1	SWITCH, 4P4T SLIDE R/A PCB MNT	2	S5, S6
127412-1	SWITCH, DP3T SLIDE R/A PCB MNT	1	S1
128180-1	2.2UF 25V +80/-20 Y5V 1206 CAP	2	C14, C28
128182-4	CABLE, 26POS AMP-3M BFG MAIN	1	J1

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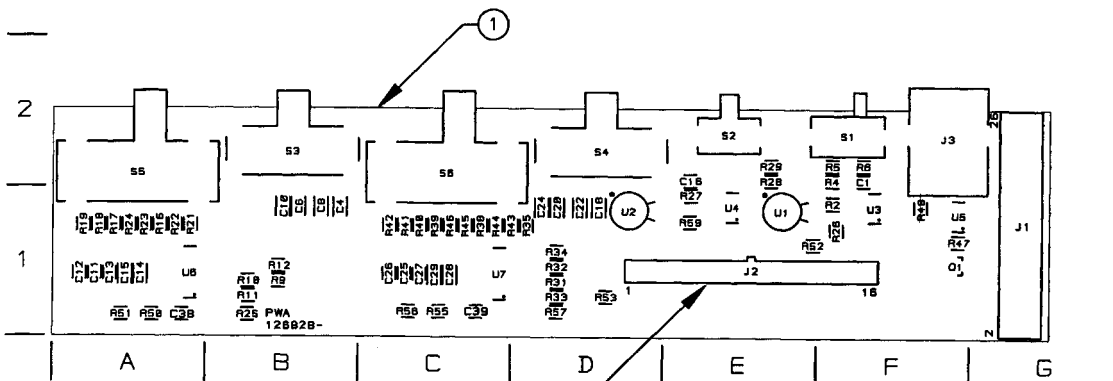
SIZE	DWG NO.	REV
A	126828-7	A
SCALE	NONE	PROJ NO. MD425D0
		SHEET 2 OF 8







COMPONENT MAP  
TOP SIDE



SEE NOTE 6

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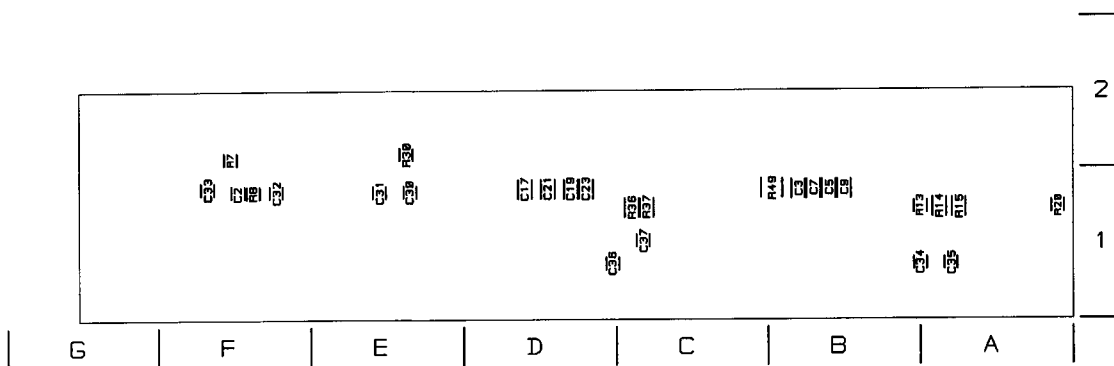
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SIZE	DWG NO.	REV
A	126828-7	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	6 OF 8



COMPONENT MAP  
BOTTOM SIDE



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SIZE A	DWG NO. 126828-7	REV A
SCALE NONE	PROJ NO. MD425D8	SHEET 7 OF 8



REVISION HISTORY							
E. C. N.	REV	DESCRIPTION	DATE	APPROVED			
				DWN	CHK	CM	PE
00N0962	A	RELEASE FOR PRODUCTION	11-16-00	JAW	KBZ	MMG	JK

UNLESS OTHERWISE SPECIFIED, THIS PRINTED WIRING ASSEMBLY SHALL MEET THE SPECIFICATION DESCRIBED IN IPC-A-610\_ CLASS 2 STANDARDS.

NOTES:

1. PRINTED WIRING BOARD PART NUMBER 126827-14.
2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.
3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAPS.
4. THE PRINTED WIRING ASSEMBLY PART NUMBER FOR THIS ASSEMBLY SHALL BE MARKED ON THE PRINTED WIRING BOARD AND SHALL BE PERMANENT.
5. MAP LOCATIONS DENOTED BY AN ASTERISK (\*), INDICATE COMPONENTS MOUNTED ON THE BOTTOM SIDE OF THE PRINTED WIRING BOARD.

**CAUTION**

STATIC CAN DAMAGE COMPONENTS!

**DO NOT HANDLE**

UNLESS WRIST STRAP IS WORN

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K	CHK	KBZ	11-17-00						
FILENAME	CM	MMG	11/21/00		TITLE				
126828-12_A_01.PCB	PE	JK	11/17/00						
TOLERANCE UNLESS OTHERWISE SPECIFIED				PWA, CE4000 BFG		SIZE DWG NO.		REV	
.00 = ±.02" .000 = ±.010" DRILLS = ±.003"									A
DO NOT SCALE DRAWING				SCALE NONE		PROJ NO. MD42500		SHEET 1 OF 8	



PARTS LIST			
C. P. N.	DESCRIPTION	QTY	REFERENCE DESIGNATION
A11368-10R01	10.0 OHM 0.10W 1% 0805 T/R	2	R131, R231
A11368-10R03	10 OHM 0.25W 1% 1210 T/R	1	R3
A11368-10021	10K 1/10W 1% SMD 0805 T/R	9	R1, R2, R4, R104, R105, R108, R204, R205, R208
A11368-11321	11.3KOHM .1W 1% CHIP 0805	4	R102, R115, R202, R215
A11368-14331	143K OHM .1W 1% 0805 T/R	2	R109, R209
A11368-15011	1.5K 1/10W 1% SMD 0805 T/R	1	R5
A11368-15021	15.0K, 0.10W 1% MF 0805	2	R114, R214
A11368-15831	158KOHM .1W 1% 0805 T/R	2	R120, R220
A11368-19631	196K OHM .1W 1% 0805 T/R	2	R119, R219
A11368-20011	2.0K, 0.10W 1% MF 0805	2	R100, R200
A11368-22621	22.6K OHM .1W 1% 0805 T/R	2	R112, R212
A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	8	R121, R124, R125, R127, R221, R224, R225, R227
A11368-26111	2.61K 0.1W 1% 0805 T/R	2	R101, R201
A11368-26131	261K OHM .1W 1% 0805 T/R	2	R118, R218
A11368-28722	RES 28.7K 1% SMD 1206	2	R111, R211
A11368-30101	301 OHM .1W 1% 0805 T/R	2	R106, R206
A11368-38322	RES 38.3K 1% SMD 1206	2	R110, R210
A11368-56221	56.2K OHM .1W 1% 0805 T/R	2	R113, R213
A11368-88711	8.87KOHM .1W 1% CHIP 0805	4	R103, R116, R203, R216
A11368-97631	976K OHM .1W 1% 0805 T/R	2	R117, R217
A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	2	C118, C218
A11369-330J2	33 PF 50V 5% NPO MLC 0805	3	C1, C101, C201
A11371-0R01	0 OHM 0.1W CHIP 0805	4	R122, R128, R222, R228
A11427-103K2	.01 UF 50V 10% X7R MLC 0805	8	C2, C3, C4, C5, C6, C7, C10, C11
C 7325-1	2POLE 2POS PC SLIDE SWITCH	1	S2
C 8262-5	MC33078D LOW NOISE DUAL OP AMP	2	U101, U201
C 9012-3	OP AMP, QUAD LO NOISE MC33079D	2	U102, U202
C 9049-5	100PF 100V CERAMIC CHIP CAP	2	C100, C200
101993-1	JACK, 6P4 COND MODULAR R/A	1	J3
102472-3	CONN, 12POS .1CTR ASSY SGL ROW	1	J2
102486-1	OPTO BJT NPN SOIC-B CTR=100%	1	U1
125798-1	TRANSISTOR, MMBT3906LTI PNP SMT	1	Q1
126827-14	PWB, CE4000 BFG	1	1
127386-1	SWITCH, 4P3T SLIDE R/A PCB MNT	2	S101, S201
127387-1	SWITCH, 4P4T SLIDE R/A PCB MNT	2	S100, S200
127412-1	SWITCH, DP3T SLIDE R/A PCB MNT	1	S1
128113-1	CAP, 0.1UF 16V FILM 1210 SMD	10	C102, C103, C104, C105, C110, C202, C203, C204, C205, C210
128182-4	CABLE, 26POS 3M BFG MAIN	1	J1
130963-1	CAP, 4.7AF 20% 16V NP ELEC SMT	2	C114, C214
130964-1	CAP, 0.082UF 5% 16V FILM 1210	4	C106, C111, C206, C211
131399-1	CAP, .047UF 16V 5% FILM SMT	4	C108, C113, C208, C213
131547-1	OPTO, DN<500 OHM OFF >50MEG10SEC	2	U100A, U200A
131576-1	CAP, .027UF 16V 5% FILM SMT	8	C107, C112, C116, C117, C207, C212, C216, C217

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SIZE A	DWG NO. 126828-12	REV A
SCALE NONE	PROJ NO. MD425D0	SHEET 2 OF 8



PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
C1	A11369-330J2	33 PF 50V 5% NPO MLC 0805	F 1*
C2	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	E 1*
C3	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	E 2*
C4	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	F 1
C5	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	F 1*
C6	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	A 1*
C7	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	A 1*
C10	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	C 1*
C11	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	C 1*
C100	C 9049-5	100PF 100V CERAMIC CHIP CAP	F 1*
C101	A11369-330J2	33 PF 50V 5% NPO MLC 0805	B 1*
C102	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	A 1
C103	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	A 1
C104	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	A 1
C105	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	C 1
C106	130964-1	CAP. 0.082UF 5% 16V FILM 1210 SMD	C 1
C107	131576-1	CAP. .027UF 16V 5% FILM SMT	B 1
C108	131399-1	CAP. .047UF 16V 5% FILM SMT	B 1
C109		OPEN	A 1*
C110	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	B 1
C111	130964-1	CAP. 0.082UF 5% 16V FILM 1210 SMD	B 1
C112	131576-1	CAP. .027UF 16V 5% FILM SMT	B 1
C113	131399-1	CAP. .047UF 16V 5% FILM SMT	B 1
C114	130963-1	CAP. 4.7AF 20% 16V NP ELEC SMT TR	D 1
C115		OPEN	A 1
C116	131576-1	CAP. .027UF 16V 5% FILM SMT	B 1
C117	131576-1	CAP. .027UF 16V 5% FILM SMT	B 1
C118	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	E 1*
C200	C 9049-5	100PF 100V CERAMIC CHIP CAP	E 1*
C201	A11369-330J2	33 PF 50V 5% NPO MLC 0805	C 1*
C202	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	C 1
C203	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	C 1
C204	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	C 1
C205	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	D 1
C206	130964-1	CAP. 0.082UF 5% 16V FILM 1210 SMD	D 1
C207	131576-1	CAP. .027UF 16V 5% FILM SMT	D 1
C208	131399-1	CAP. .047UF 16V 5% FILM SMT	D 1
C209		OPEN	C 1*
C210	128113-1	CAP. 0.1UF 16V FILM 1210 SMD	D 1
C211	130964-1	CAP. 0.082UF 5% 16V FILM 1210 SMD	D 1
C212	131576-1	CAP. .027UF 16V 5% FILM SMT	D 1
C213	131399-1	CAP. .047UF 16V 5% FILM SMT	D 1
C214	130963-1	CAP. 4.7AF 20% 16V NP ELEC SMT TR	D 1
C215		OPEN	C 1*
C216	131576-1	CAP. .027UF 16V 5% FILM SMT	D 1
C217	131576-1	CAP. .027UF 16V 5% FILM SMT	D 1
C218	A11369-102J2	.001UF 50V 5% NPO MLC 0805 T/R	E 1

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SIZE	DWG NO.	REV
A	126828-12	A
SCALE NONE	PROJ NO. MD425D0	SHEET 3 OF 8





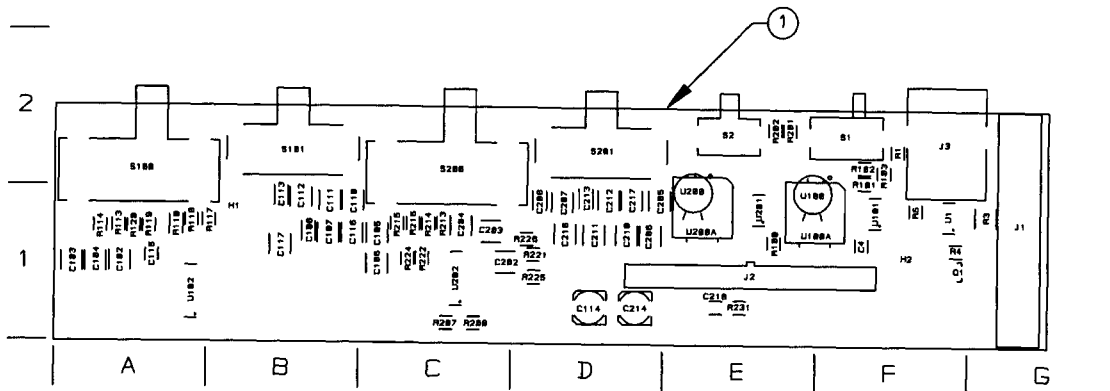
PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
R204	A11368-10021	10K 1/10W 1% SMD 0805 T/R	E 1*
R205	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 1*
R206	A11368-30101	301 OHM .1W 1% 0805 T/R	E 1*
R207		OPEN	C 1
R208	A11368-10021	10K 1/10W 1% SMD 0805 T/R	C 1
R209	A11368-14331	143K OHM .1W 1% 0805 T/R	D 1*
R210	A11368-38322	RES 38.3K 1% SMD 1206	C 1*
R211	A11368-28722	RES 28.7K 1% SMD 1206	C 1*
R212	A11368-22621	22.6K OHM .1W 1% 0805 T/R	C 1*
R213	A11368-56221	56.2K OHM .1W 1% 0805 T/R	C 1
R214	A11368-15021	15.0K, 0.1W 1% MF 0805	C 1
R215	A11368-11321	11.3KOHM .1W 1% CHIP 0805	C 1
R216	A11368-88711	8.87KOHM .1W 1% CHIP 0805	C 1
R217	A11368-97631	976K OHM .1W 1% 0805 T/R	D 1*
R218	A11368-26131	261K OHM .1W 1% 0805 T/R	C 1*
R219	A11368-19631	196K OHM .1W 1% 0805 T/R	C 1*
R220	A11368-15831	158KOHM .1W 1% 0805 T/R	C 1*
R221	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	D 1
R222	A11371-0R01	0 OHM 0.1W CHIP 0805	C 1
R223		OPEN	C 1*
R224	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	C 1
R225	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	D 1
R226		OPEN	D 1
R227	A11368-24921	24.9K 1/10W 1% SMD 0805 T/R	C 1*
R228	A11371-0R01	0 OHM 0.1W CHIP 0805	C 1*
R229		OPEN	C 1*
R230		OPEN	C 1*
R231	A11368-10R01	10.0 OHM 0.10W 1% 0805 T/R	E 1
S1	127412-1	SWITCH, DP3T SLIDE R/A PCB MNT	F 2
S2	C 7325-1	2POLE 2POS PC SLIDE SWITCH	E 2
S100	127387-1	SWITCH, 4P4T SLIDE R/A PCB MNT	A 2
S101	127386-1	SWITCH, 4P3T SLIDE R/A PCB MNT	B 2
S200	127387-1	SWITCH, 4P4T SLIDE R/A PCB MNT	C 2
S201	127386-1	SWITCH, 4P3T SLIDE R/A PCB MNT	D 2
TP2	TESTPOINT	TESTPOINT	B 1
TP3	TESTPOINT	TESTPOINT	B 1
TP4	TESTPOINT	TESTPOINT	F 2
TP5	TESTPOINT	TESTPOINT	C 1
U1	102486-1	OPTO BJT NPN SDIC-8 CTR=100%	F 1
U100		OPEN	E 1
U101	C 8262-5	MC33078D LOW NOISE DUAL OP AMP	F 1
U102	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	A 1
U200		OPEN	E 1
U201	C 8262-5	MC33078D LOW NOISE DUAL OP AMP	E 1
U202	C 9012-3	OP AMP, QUAD LO NOISE MC33079D	C 1
U100A	131547-1	OPTD, DN<500 OHM OFF >50MEG10SEC	E 1
U200A	131547-1	OPTD, DN<500 OHM OFF >50MEG10SEC	E 1
1	126827-14	PWB, CE4000 BFG	

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SIZE	DWG NO.	REV
A	126828-12	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	5 OF 8

COMPONENT MAP  
TOP SIDE



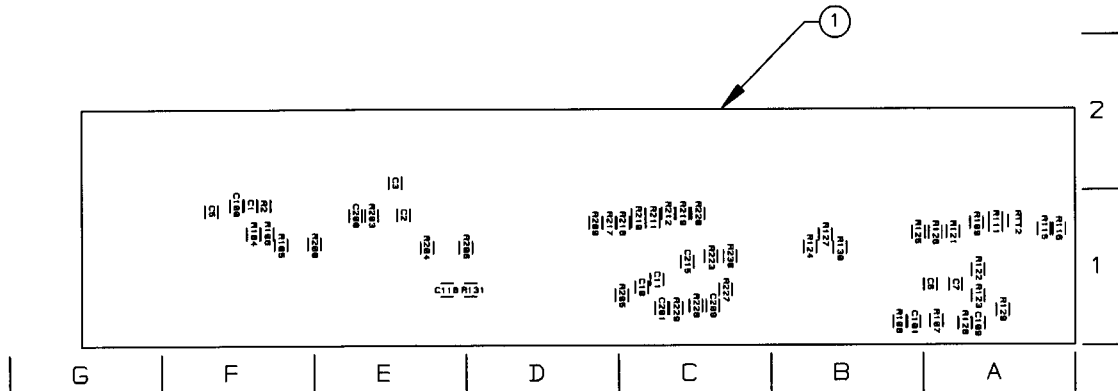
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SIZE	DWG NO.	REV
A	126828-12	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	6 OF 8



COMPONENT MAP  
BOTTOM SIDE



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SIZE	DWG NO.	REV
A	126828-12	A
SCALE	PROJ NO.	SHEET
NONE	MD425D0	7 OF 8




E. C. N.	ZONE	REV.	DESCRIPTION	DATE	BY	APPROVALS			
						CHK	CM	EE	PE
T991917		A	RELEASE FOR PRODUCTION	11/01/99	DK	JKM	SL	N/A	SS

UNLESS OTHERWISE SPECIFIED, THE FINISHED PWA SHALL MEET:  
IPC-A-610\_ CLASS 2

NOTES:

1. PWB PART NUMBER 127004-1.
2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.
3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAP.
4. SWAGE FIT HW1 & HW2 INTO PCB.
5. HAND SOLDER C510 (C 6806-1), AND C610 (C 6806-1) ACROSS BACK OF INPUT MODULE AS SHOWN, USE 1/2" KAPTON TAPE (S 6285-1) AS INSULATION BETWEEN EACH CAPACITOR AND THE BOARD.



**CAUTION**

STATIC CAN DAMAGE COMPONENTS!

**DO NOT HANDLE**

UNLESS WRIST STRAP IS WORN

<b>CROWN INTERNATIONAL INC.</b>									
PRINTS		1718 WEST MISHAWAKA ROAD ELKHART, INDIANA 46517				PHONE (219) 294-8000			
K		<b>PWA, INPUT CE</b>						TOL. UNLESS SPECIFIED	
								X.XX = ± 0.020	
								X.XXX = ± 0.010	
								DRILLS = ± 0.003	
DRAWN	DK	11/01/99	APPROVED BY:		DO NOT SCALE PRINT				
CHECKED	JKM	11-1-99	ME	N/A	SUPERSEDES				
SCALE	NONE		EE	N/A	E. C. N.				
PROJ #	MD390D0		PE	SS	11/2/99	DWG. NO.	SHEET 1 OF 5	REV	(A)
NEXT ASSEMBLY						126883-4			

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PARTS LIST			
REF DES	C. P. N.	DESCRIPTION	MAP LOC.
1	127004-1	PWB, CE INPUT	
C500	A11369-120K2	12PF 50V 10% NPO 0805 T/R	B 2
C501	A11369-120K2	12PF 50V 10% NPO 0805 T/R	B 2
C502	A11369-120K2	12PF 50V 10% NPO 0805 T/R	B 2
C503	102467-1	22UF 25V 20% RADIAL T/R	B 1
C504	102438-221K2	220PF 200V 10% NPO 0805	B 2
C505	A11427-104K2	0.1UF 50V 1% CHIP 0805	B 2
C506	A11427-104K2	0.1UF 50V 1% CHIP 0805	B 2
C509		OPEN	
C510	C 6806-1	0.01 MF 100V AXIAL CER T/R	C 1
C600	A11369-120K2	12PF 50V 10% NPO 0805 T/R	B 2
C601	A11369-120K2	12PF 50V 10% NPO 0805 T/R	A 2
C602	A11369-120K2	12PF 50V 10% NPO 0805 T/R	B 2
C603	102467-1	22UF 25V 20% RADIAL T/R	B 1
C604	102438-221K2	220PF 200V 10% NPO 0805	B 2
C605	A11427-104K2	0.1UF 50V 1% CHIP 0805	A 2
C608	A11371-1501	15 OHM 0.10W 5% CHIP	A 1
C609		OPEN	
C610	C 6806-1	0.01 MF 100V AXIAL CER T/R	A 1
HW1	102579-1	STAND. BROACHED 6-32 X .75	A 3
HW2	102579-1	STAND. BROACHED 6-32 X .75	C 3
HW3	103435-70608	SCREW, 6-32X.5 TORX PNHD SEM	A 3
HW4	103435-70608	SCREW, 6-32X.5 TORX PNHD SEM	C 3
J500	126929-1	CONN., 1/4" XLR, PCB VERT.	B 2
J502	102471-2	HDR, 12POS. 2.5MM RT ANG KEYED	A 1
J600	126929-1	CONN., 1/4" XLR, PCB VERT.	A 2
R500	A11368-10021	10. KOHM .1W 1% CHIP 0805	C 2
R501	A11368-10021	10. KOHM .1W 1% CHIP 0805	B 2
R502	A11368-10021	10. KOHM .1W 1% CHIP 0805	B 2
R503	A11368-10021	10. KOHM .1W 1% CHIP 0805	B 2
R504	A11368-20011	2.0 KOHM .1W 1% CHIP 0805	B 2
R506	A11368-20011	2.0 KOHM .1W 1% CHIP 0805	B 2
R508		OPEN	
R600	A11368-10021	10. KOHM .1W 1% CHIP 0805	A 2
R601	A11368-10021	10. KOHM .1W 1% CHIP 0805	A 2
R602	A11368-10021	10. KOHM .1W 1% CHIP 0805	B 2
R603	A11368-10021	10. KOHM .1W 1% CHIP 0805	B 2
R604	A11368-20011	2.0 KOHM .1W 1% CHIP 0805	A 2
R605	A11371-1501	15 OHM 0.10W 5% CHIP	C 1
R606	A11368-20011	2.0 KOHM .1W 1% CHIP 0805	A 2
R607	A11371-8205	82 OHM 1W 5% SMD 2512	A 2
R608		OPEN	
R609	A11371-1501	15 OHM 0.10W 5% CHIP	C 1
TB1	102475-1	BLOCK, 5POS., TERMINAL	A 3
U500	C 9012-3	OP AMP, QUAD MC33079D	B 2

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	PROJ.	MD390D8	DWG. NO. 126883-4
			SHEET 3 OF 5
			REV (A)





REVISION HISTORY							
E.C.N.	REV	DESCRIPTION	DATE	APPROVED			
				DWN	CHK	CM	PE
00N0523	A	RELEASE FOR PRODUCTION	05-30-00	JG	SLM	CB	[Signature]

UNLESS OTHERWISE SPECIFIED, THIS PRINTED WIRING ASSEMBLY SHALL MEET THE SPECIFICATION DESCRIBED IN IPC-A-610\_ CLASS 2 STANDARDS.

NOTES:

1. PRINTED WIRING BOARD PART NUMBER 127026-3.
2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.
3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAP.
4. THE PRINTED WIRING ASSEMBLY PART NUMBER FOR THIS ASSEMBLY SHALL BE MARKED ON THE PRINTED WIRING BOARD AND SHALL BE PERMANENT.
5. APPLY HEATSINK COMPOUND (CPN 52162-6) BETWEEN U2 AND HEATSINK (U2X).
6. SCREW(HW1) IS TO BE TORQUED TO 8-10 IN-LBS.
7. THIS PWA MUST MEET ALL SPECIFICATIONS AS LISTED IN 131062 SPECS. CE4000 FLYBACK PWA.

**CAUTION**

STATIC CAN DAMAGE COMPONENTS!

**DO NOT HANDLE**

UNLESS WRIST STRAP IS WORN

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K	CHK	SLM	5-31-00		
FILENAME	CM	CB	6/1/00		
127027-6_A_01.PCB	PE	[Signature]	5-31-00		
TOLERANCE UNLESS OTHERWISE SPECIFIED .00 = ±.02" .000 = ±.010" DRILLS = ±.003"				TITLE <p style="text-align: center;">PWA, CE4000 FLYBACK</p>	
DO NOT SCALE DRAWING				SIZE	DWG NO.
				A	127027-6
				SCALE	PROJ NO.
				NONE	MD42500
				SHEET	1 OF 6
				REV	A



PARTS LIST			
REF DES	C.P.N.	DESCRIPTION	MAP LOC.
1	127026-3	PWB, CE4000 FLYBACK	
C1	A11427-103K2	.01 UF 50V 10% X7R MLC 0805	B 3
C2	125855-1	47UF 50V 2.5MM L/S VERT CAP	B 3
C3	126631-1	CAP, 220UF 25V RAD ELECT	B 3
C4	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	B 3
C5	A10432-151KF	150PF 630VDC 10% PROP CAP T/A	A 2
C6	A11369-152J2	1500PF 50V 5% NPO MLC 0805 T/R	A 3
C7	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	A 3
C8	A11427-104K2	.1UF 50V CHIP CAP 10% 0805 X7R	C 3
C9	127032-1	CAP, 56UF 450V HIGH RIPPLE	B 1
C10	126632-1	CAP, 2200PF CER DISK Y RATED	C 2
C11	126630-1	CAP, 470UF 25V RAD ELECT	D 3
C12	126630-1	CAP, 470UF 25V RAD ELECT	D 2
C13	126630-1	CAP, 470UF 25V RAD ELECT	E 2
C14	126631-1	CAP, 220UF 25V RAD ELECT	E 2
C15	126631-1	CAP, 220UF 25V RAD ELECT	E 1
C16	126631-1	CAP, 220UF 25V RAD ELECT	E 2
C17	126631-1	CAP, 220UF 25V RAD ELECT	C 2
C18	125855-1	47UF 50V 2.5MM L/S VERT CAP	D 2
C19	126631-1	CAP, 220UF 25V RAD ELECT	C 1
C20	125855-1	47UF 50V 2.5MM L/S VERT CAP	D 1
C21	126631-1	CAP, 220UF 25V RAD ELECT	C 1
C22	125855-1	47UF 50V 2.5MM L/S VERT CAP	C 1
C23	A11427-473K5	.047UF 50V CHIP CAPACITOR X7R	B 3
C24	125855-1	47UF 50V 2.5MM L/S VERT CAP	B 3
D1	C 9283-0	DIODE, MMBD4148/914 SOT-23 SMT	B 3
D2	126620-1	DIODE, 600V 1A SMB ULTRAFAST	A 1
D3	126620-1	DIODE, 600V 1A SMB ULTRAFAST	B 1
D4	126621-1	DIODE, 180V 3W SMB ZENER	B 1
D5	126618-1	DIODE, 200V 2A ULTRAFAST SMB	B 2
D6	127361-1	DIODE, FAST RCYV 200V 4A DPAK	D 3
D7	126619-1	DIODE, 200V 4A SMC ULTRAFAST	C 2
D8	125255-1	DIODE, ULTRAFAST 200V 1A SMA	C 2
D9	125255-1	DIODE, ULTRAFAST 200V 1A SMA	C 1
D10	126618-1	DIODE, 200V 2A ULTRAFAST SMB	B 1
HW1	A10086-10406	4-40 X .37 RDHR A S MSCR Z	A 2
HW2	A10094-2	#4 INT STAR LOCKWASHER	A 2
HW3	A10102-3	4 X 40 HEX NUT	A 2
J1	127028-1	CONN, 7 PIN SHROUDED HDR	A 1
J2	127029-1	CONN, 15 PIN SHROUDED HDR	C 1
L1	126648-1	CHOKER, 1UH 920MA AXIAL	D 2
L2	126496-1	CHOKER, 10UH 500MA AXIAL	D 3
L3	126496-1	CHOKER, 10UH 500MA AXIAL	D 1
L4	126496-1	CHOKER, 10UH 500MA AXIAL	D 2
L5	126496-1	CHOKER, 10UH 500MA AXIAL	D 1
L6	126496-1	CHOKER, 10UH 500MA AXIAL	C 1
R1	A11368-10001	100 OHM 1% 0805 RES T/R	A 3
R2	A11368-20R02	20 OHM .125W 1% 1206 T/R	A 3
R3	A11368-22111	2.21KOHM .1W 1% CHIP 0805	B 3

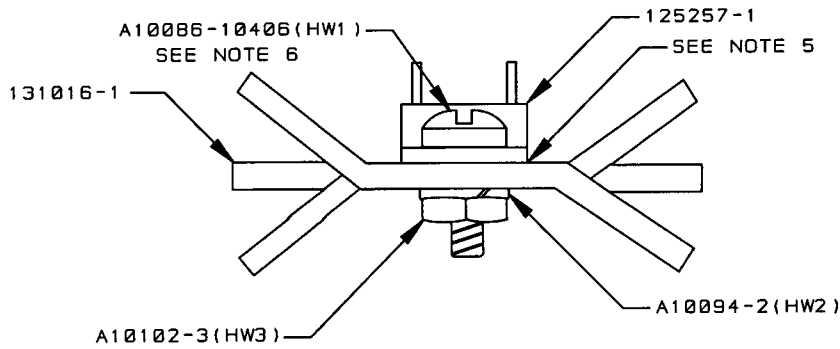
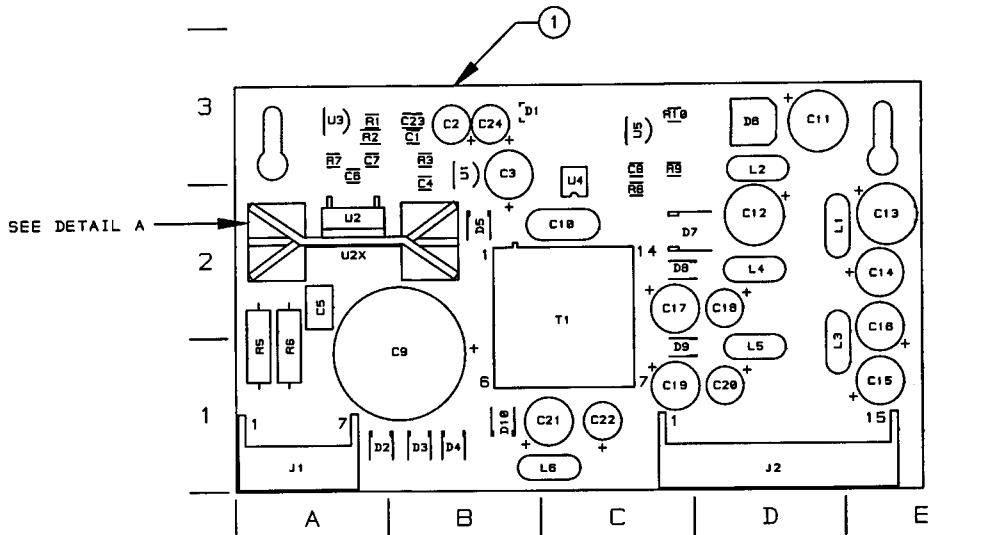
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SIZE	DWG NO.	REV
A	127027-6	A
SCALE NONE	PROJ NO. MD42500	SHEET 3 OF 6



### COMPONENT MAP TOP SIDE



### DETAIL A

SCALE: 2:1

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SIZE A	DWG NO. 127027-6	REV A
SCALE NONE	PROJ NO. MD425D0	SHEET 5 OF 6




E.C.N.	ZONE	REV.	DESCRIPTION	DATE	BY	APPROVALS			
						CHK	CM	EE	PE
00N0028		A	RELEASE TO PRODUCTION	01/14/00	JG	JLM	DSV	NJA	PE

UNLESS OTHERWISE SPECIFIED, THIS PRINTED WIRING ASSEMBLY SHALL MEET THE SPECIFICATION DESCRIBED IN IPC-A-610\_ CLASS 2 STANDARDS.

NOTES:

1. PRINTED WIRING BOARD PART NUMBER 127562-3.
2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.
3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAP.
4. THE PRINTED WIRING ASSEMBLY PART NUMBER FOR THIS ASSEMBLY SHALL BE MARKED ON THE PRINTED WIRING BOARD AND SHALL BE PERMANENT.
5. PART 1 OF THE COMPONENT MAP SHOWS ONLY THE PWB MOUNTED COMPONENTS. PART 2 SHOWS THE ASSEMBLY OF THE POT LOCATOR (127784-2).



**CAUTION**

STATIC CAN DAMAGE COMPONENTS!

**DO NOT HANDLE**

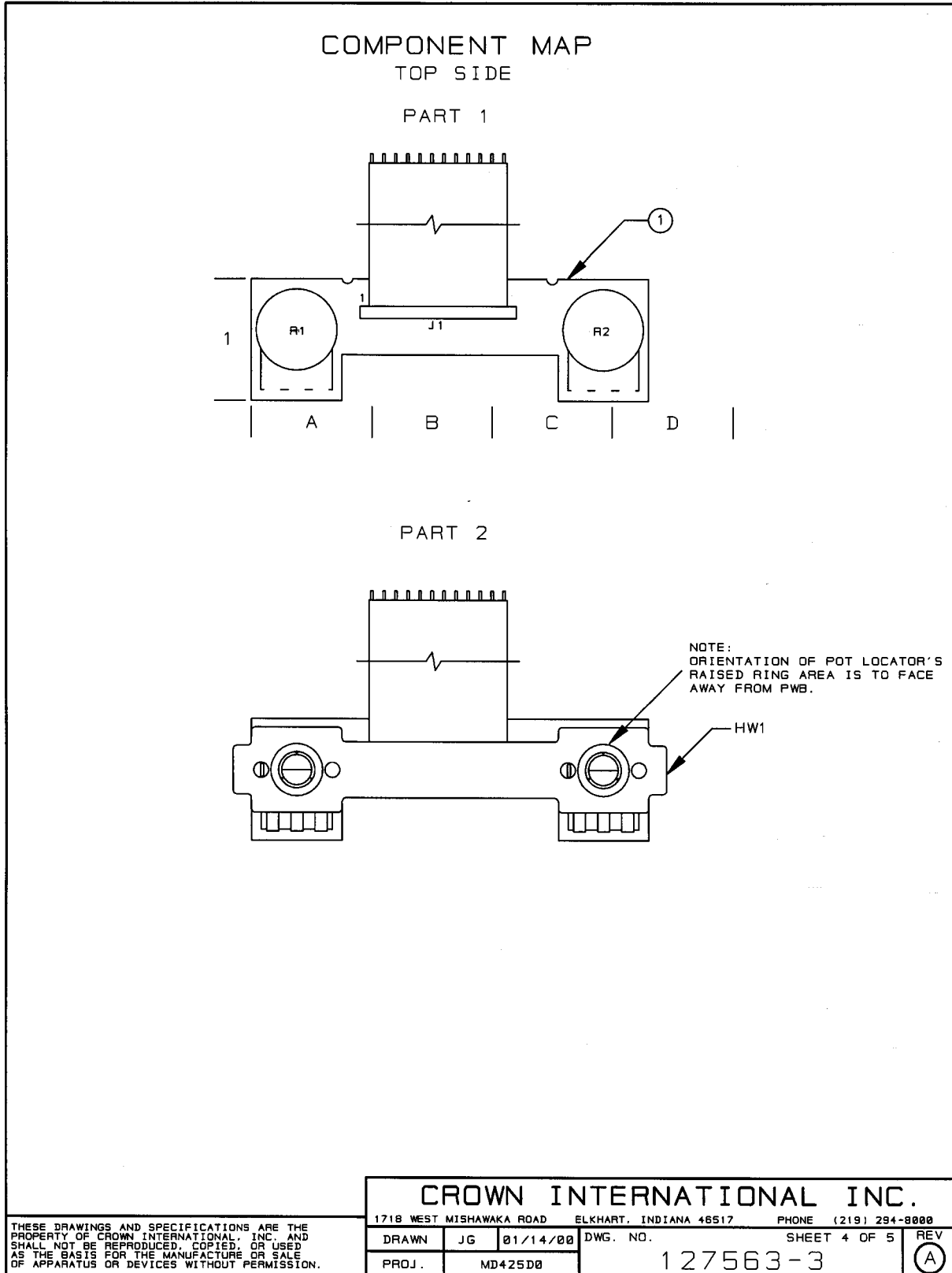
UNLESS WRIST STRAP IS WORN

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<b>CROWN INTERNATIONAL INC.</b>	
1718 WEST MISHAWAKA ROAD ELKHART, INDIANA 46517	PHONE (219) 294-8000
PRINTS TO	<b>PWA, CE4000 POT BOARD</b>
<b>K</b>	TOL. UNLESS SPECIFIED X.XX = ± 0.020 X.XXX = ± 0.010 DRILLS = ± 0.003
DRAWN	APPROVED BY:
CHECKED	SUPERSEDES
SCALE	E.C.N.
PROJ #	C.P.N. SHEET 1 OF 5
NEXT ASSEMBLY	REV
JG 01-19-00	ME DSV 1-19-00
NONE	EE NJA
MD425D0	PE [Signature] 1-19-00
127563-3	(A)





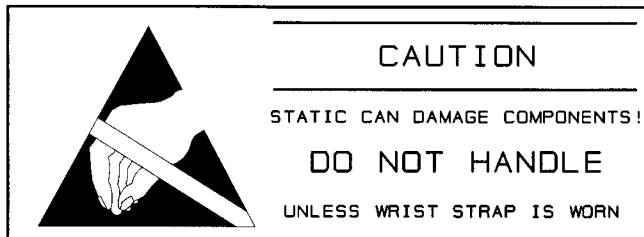


REVISION HISTORY							
E. C. N.	REV	DESCRIPTION	DATE	APPROVED			
				DWN	CHK	CM	PE
00N0393	A	RELEASE FOR PRODUCTION	04/26/00	JG	JAW	CB	SA

UNLESS OTHERWISE SPECIFIED, THIS PRINTED WIRING ASSEMBLY SHALL MEET THE SPECIFICATION DESCRIBED IN IPC-A-610 CLASS 2 STANDARDS.

**NOTES:**


1. PRINTED WIRING BOARD PART NUMBER 127819-2
2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.
3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAPS.
4. THE PRINTED WIRING ASSEMBLY PART NUMBER FOR THIS ASSEMBLY SHALL BE MARKED ON THE PRINTED WIRING BOARD AND SHALL BE PERMANENT.
5. REMOVE SOLDER OR PREVENT SOLDER FROM ACCUMULATING IN HOLES INDICATED ON COMPONENT MAP.
6. "PART 1" ON THE COMPONENT MAP SHOWS THE PLACEMENT OF THE SPEAKON CONNECTORS. "PART 2" SHOWS THE ASSEMBLY OF THE DUAL BINDING POSTS TO THE OUTPUT PANEL AND THE ASSEMBLY OF THE OUTPUT PANEL/DUAL BINDING POSTS TO THE SPEAKON CONNECTORS.
7. OUTPUT PANEL SCREWS (103175-1) ARE TO BE TORQUED TO 4-5 IN. POUNDS
8. BINDING POST NUTS ARE TO BE TORQUED TO 12-14 IN-LBS.



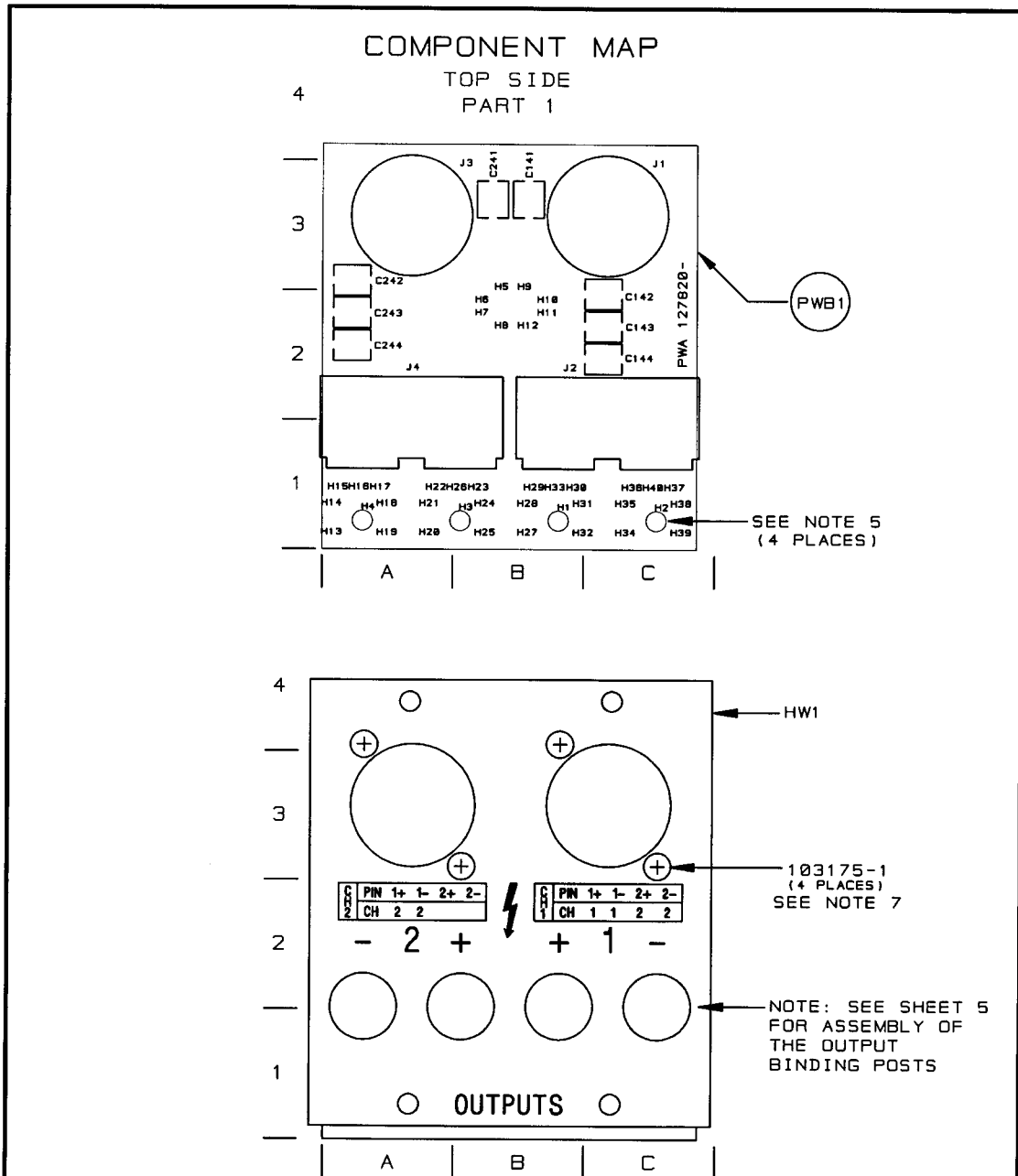
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DISTRIBUTION		DWN	JG	04/26/00	 <b>CROWN</b> INTERNATIONAL, INC. 1718 W. MISHAWAKA RD. ELKHART IN. 46517 PHONE (219)294-8000 WWW.CROWNINTL.COM
K		CHK	JAW	04/27/00	
FILENAME		CM	CB	4/27/00	
127820-3_A_01.PCB		PE	SA	4-27-00	
TOLERANCE UNLESS OTHERWISE SPECIFIED					TITLE
.00 - ± .02" .000 - ± .010" DRILLS - ± .003"					PWA, CE4K SPEAKON/BDG POST OTPT
DO NOT SCALE DRAWING		SIZE	DWG NO.		REV
		A	127820-3		A
		SCALE	PROJ NO.	SHEET 1 OF 6	
		NONE	MD425D0		



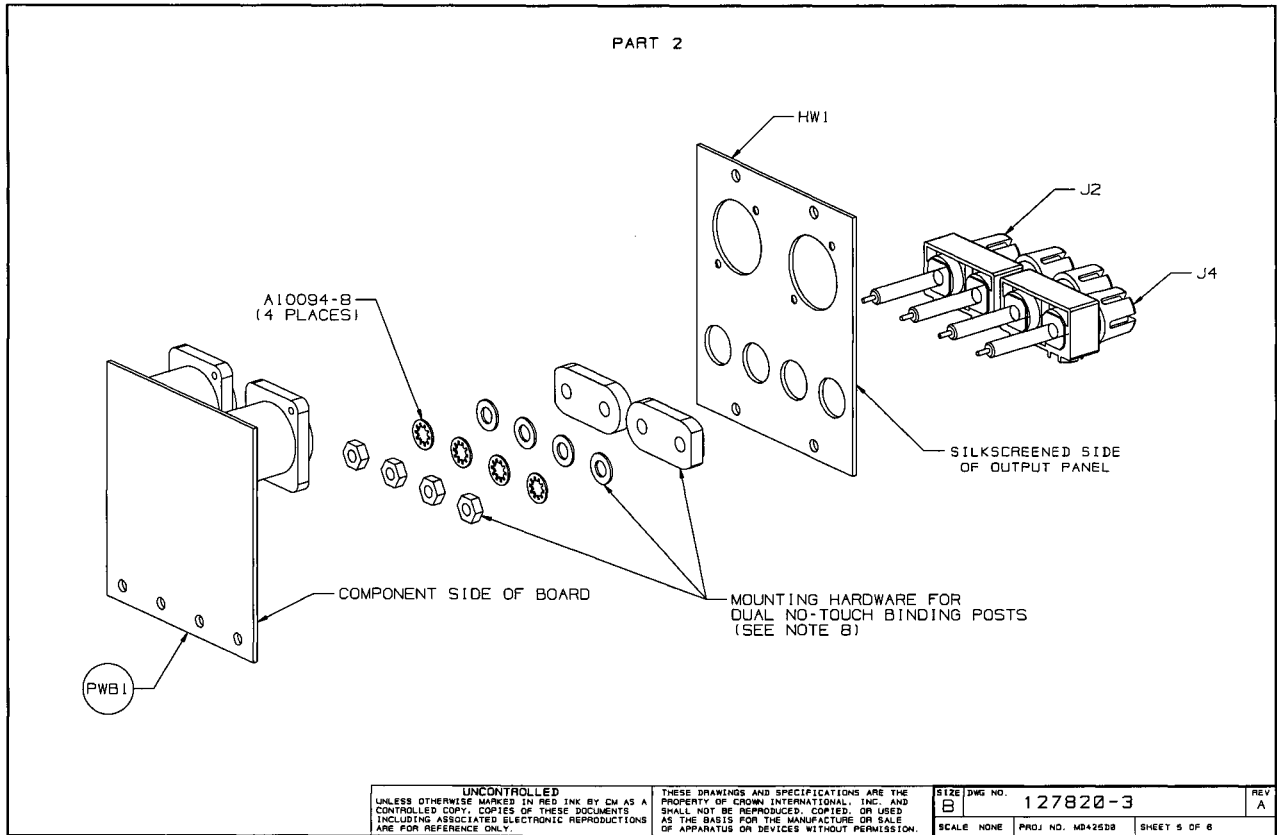


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SIZE	DWG NO.	127820-3	REV
A			A
SCALE	NONE	PROJ NO.	MD425D0
		SHEET	4 OF 6

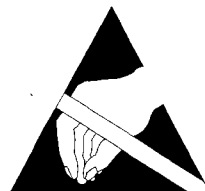


REVISION HISTORY							
E.C.N.	REV	DESCRIPTION	DATE	APPROVED			
				DWN	CHK	CM	PE
00N0527	A	RELEASE TO PRODUCTION	05-30-00	JG	Jaw	CB	JG

UNLESS OTHERWISE SPECIFIED, THIS PRINTED WIRING ASSEMBLY SHALL MEET THE SPECIFICATION DESCRIBED IN IPC-A-610\_ CLASS 2 STANDARDS.

NOTES:

1. PRINTED WIRING BOARD PART NUMBER 128242-3.
2. ALL LEADS SHALL BE TRIMMED TO 0.093" OR LESS.
3. POSITION COMPONENTS AS SHOWN ON COMPONENT MAPS.
4. THE PRINTED WIRING ASSEMBLY PART NUMBER FOR THIS ASSEMBLY SHALL BE MARKED ON THE PRINTED WIRING BOARD AND SHALL BE PERMANENT.
5. F1 (A10285-29) IS TO BE INSTALLED AFTER WAVE SOLDERING.




**CAUTION**

STATIC CAN DAMAGE COMPONENTS!

**DO NOT HANDLE**

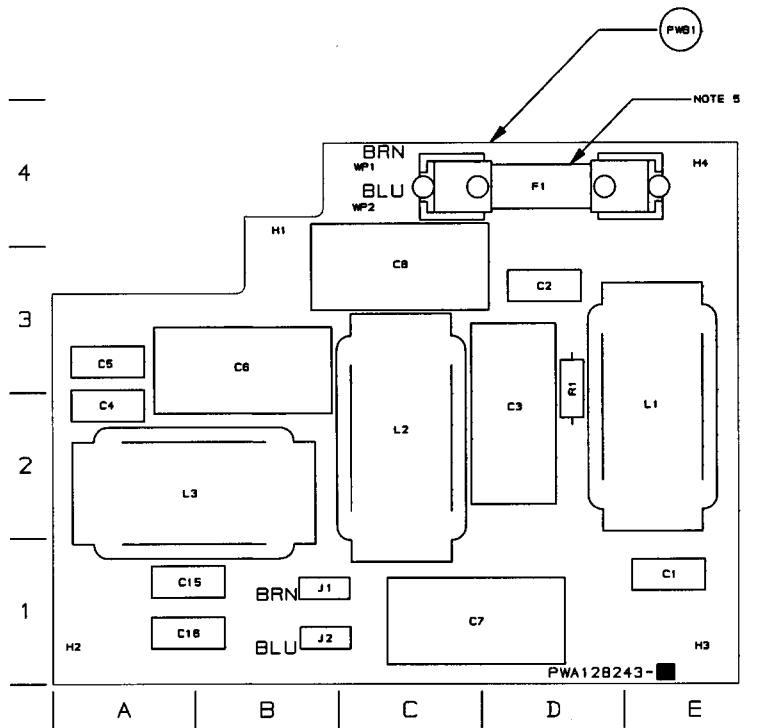
UNLESS WRIST STRAP IS WORN

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DISTRIBUTION	DWN	CHK	PE				
K		Jaw	CB	05/31/00	128243-6_A_01.PCB		
TOLERANCE UNLESS OTHERWISE SPECIFIED				TITLE			
.00 = ±.02"				PWA, EMI FILTER			
.000 = ±.010"							
DRILLS = ±.003"							
DO NOT SCALE DRAWING		SIZE	DWG NO.	REV			
		A	128243-6	A			
		SCALE	PROJ NO.	SHEET			
		NONE	MD425D0	1 OF 5			





COMPONENT MAP  
TOP SIDE



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SIZE A	DWG NO. 128243-6	REV A
SCALE NONE	PROJ NO. MD425D0	SHEET 4 OF 5



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## 6 Schematics

The schematics provided are representative only. There may be slight variations between amplifier to amplifier. These schematics are intended to be used for troubleshooting purposes only.

### CE4000 MAIN

PWA NUMBER: 126218-13

Schematic Sheet:

43  
44  
45  
46  
47  
48

PWA NUMBER: 126218-14

Schematic Sheet:

43  
44  
45  
46  
47  
48

PWA NUMBER: 126218-16

Schematic Sheet:

1  
2  
3  
4  
5  
6  
7  
8

### CE4000 BFG

PWA NUMBER: 126828-7 (REV.A)

Schematic Sheet:

8

PWA NUMBER: 126828-12 (REV.A)

Schematic Sheet:

8

PWA NUMBER: 126828-13 (REV.A)

Schematic Sheet:

9

### CE4000 INPUT CE

PWA NUMBER: 126883-4

Schematic Sheet:

5

### CE4000 FLYBACK

PWA NUMBER: 127027-6

Schematic Sheet:

6

### CE4000 POT BOARD

PWA NUMBER: 127563-3

Schematic Sheet:

5

PWA NUMBER: 127563-4 (REV.A)

Schematic Sheet:

5

### CE 4K SPEAKON/BDG POST OTPT

PWA NUMBER: 127820-3

Schematic Sheet:

6

### CE4000 EMI FILTER

PWA NUMBER: 128243-6

Schematic Sheet:

5



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