

# MA-10,000

## MACRO-TECH® SERIES



**C**rown engineers, long known for their achievements, have built an amplifier so powerful it defines a new class: Stadium Amplifier. The Macro-Tech® 10,000 is an ultra-high-powered, precision mono amplifier. It drives the large sound reinforcement systems found in auditoriums, stadiums, sports arenas—wherever enormous power is required.

Because one MA-10,000 can deliver over 150 volts and 180 amps, a rack of MA-10,000s can replace fifteen or more racks of less powerful amplifiers. That means less cost, less maintenance, less wasted space, higher efficiency and greater reliability.

As you might expect, an amplifier designed to deliver such astounding performance does not use conventional circuitry. Massive high-current copper conductors, called BUSSBARs, are used to construct a premium amplifier which contains the superior features you expect from our Macro-Tech line. Eighty rugged 250-watt output transistors are used along with eight 150-watt driver devices to generate this phenomenal amount of uncolored power. All parts, including spares, are burn-in tested and graded to ensure consistent operation.

Patented ODEP™ (Output Device Emulator Protection) circuits utilize an onboard analog computer to simulate output transistor conditions to protect the amplifier against overheating and overload. Specially designed, high-efficiency "H" wells for heatsinks and forced-air cooling give reliability. Patented *grounded bridge* circuits provide exceptionally high headroom—allowing extreme voltage swings without putting output transistors in distortion-causing series configurations. And P.I.P.® (Plug-In Panel) compatibility enables you to customize the amp with one of our many input modules.

Whether you need to drive a thunderous stack of subwoofers or a 400-plus speaker distribution system, the MA-10,000 has what it takes.

### Specifications

#### Feature Summary

**Adjustable Input Sensitivity:** Factory set to 1.55 V (balanced). Adjustable from 0.9 to 2.88 V for rated output.

**Function 1 & 2 ODEP Support:** Provides ODEP protection (function 1) to keep amplifier running under adverse conditions without risk of damage. Provides valuable information (function 2) about the reserve energy status via its P.I.P. compatibility.

**Input Filters:** Selectable 15 Hz and 12 kHz high-pass, band-pass and low-pass input filters are standard features.

**Distortion Indicator:** Advanced IOC® (Input/Output Comparator) alerts the user in the unlikely event that distortion of any kind exceeds 0.05%.

**Visual Impedance Matching:** Output voltage and output current indicators help the user visualize optimum impedance match.

**Monstrous Power:** More than one amplifier can be interlocked to increase output voltage or current.

**Efficient Cooling:** Four high-efficiency "H" section heat sinks with four 100 CFM fans (2.8 cubic meters/minute) and air intakes at both sides of the amplifier provide excellent cooling in a small space.

**No-Fault Warranty:** A 3-year standard "No-Fault" warranty<sup>1</sup> which may be extended for an additional three years. Includes round-trip shipping.

**Optional:** LCD Output Meter, located on the front panel, shows the output voltage or current. Also available: Pivoting rack-mount slides for easy access in a standard equipment rack.

#### Performance

Note: The following performance measurements were made while driving a 4 ohm load.

**Frequency Response:** ±0.25 dB from 20 Hz to 20 kHz at 1 watt.

**Phase Response:** +10° -45° from 10 Hz to 20 kHz at 1 watt.

**Signal to Noise Ratio:** 105 dB (A-weighted) at full output and 36.4 dB gain.

**Total Harmonic Distortion (THD):** <0.1% from 50 Hz to 4.5 kHz and increasing linearly to 0.9% at 50 kHz at 2,190 W.

**Intermodulation Distortion (IMD):** <0.05% from 2.19 to 2,190 W at 36.4 dB gain.

**Slew Rate:** >40 V per msec.

**Damping Factor:** >1000 from 10 Hz to 400 Hz.

#### Power

##### Output Power

Note: Single-cycle tone burst power at 1 kHz with <0.05% THD.

7,695 W into 0.5 ohm. 10,560 W into 0.85 ohm. 9,395 into 1 ohm.

**Load Impedance:** Designed to drive very low impedance loads (<1.0 ohm). Safe with all types of loads, even reactive ones. Works excellently with "constant voltage" distributed systems.

**Required AC Mains:** 47 to 63 Hz, 3-phase, 208 VAC.

**AC Line Connector:** Standard NEMA twist-lock 3-phase male connector on rear panel.

#### Controls

**Power:** Three-phase breaker, located on the rear panel, connects/disconnects the amplifier from the AC mains.

**Ready-Standby:** A two-position switch, located on the front panel, enables/disables the output circuitry.

**Level:** A locking control, located on the front panel, adjusts the gain.

**I-V:** An optional two-position switch, located on the front panel, sets the optional output meter to display current or voltage.

**200-20:** An optional two-position switch, located on the front panel, sets the range of the optional output meter.

**Peak-RMS:** An optional two-position switch, located on the front panel, selects the display mode of the optional output meter.

**Input Sensitivity:** Variable sensitivity control is located inside.

**Input Filter:** A five-segment DIP switch, located inside, is used to set the input filter to flat, high-pass, band-pass, low-pass or mute.

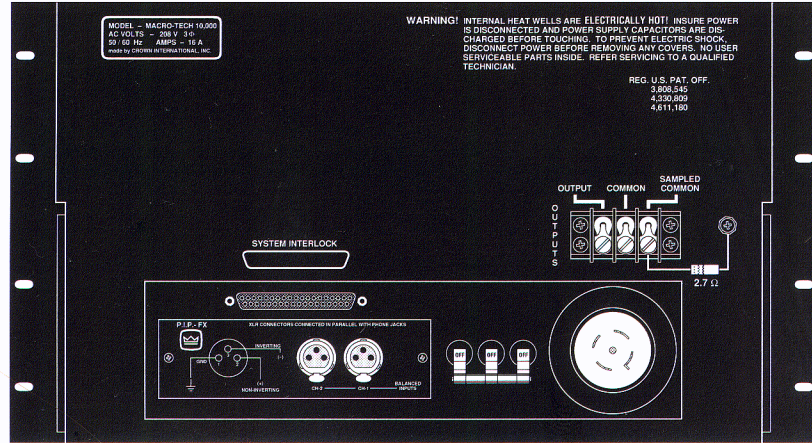
**Master-Slave:** A two-position switch, located inside, is used when interconnecting more than one amplifier.

#### Indicators

**Ready:** A green indicator is on when the unit is turned on and enabled with the Ready-Standby switch.

**Standby:** A yellow indicator is on when the unit is turned on and disabled with the Ready-Standby switch. It will also come on whenever an over-voltage, over-temp or FAULT condition causes the unit to go into STANDBY mode.

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## Architect's Specifications

The power amplifier shall be a solid-state single-channel model employing *multi-mode*® (AB+B) grounded bridge output circuitry. The output impedance shall be less than 10 milliohms in series with less than 2 microhenries. Multiple amplifiers shall be capable of interlocking in series, parallel, or combinations of series/parallel for increased power output to drive a single load. The amplifier shall contain protection circuitry which limits the drive level placed on the output devices before their known safe operating area is exceeded. This protection circuitry shall simulate the junction temperature of the output devices in order to predict how close they are to their safe operating limits. The amplifier shall contain controlled slew-rate voltage circuitry to protect it against radio frequency interference burnouts. It shall also be protected from current overload at its output stage. The slew rate of the amplifier shall be greater than 40 volts per microsecond. The amplifier shall temporarily go into a standby mode if its power transformer becomes excessively hot and shall automatically resume normal operation once it has cooled to a safe operating temperature. The amplifier shall latch into standby mode if an over-voltage or fault condition occurs. The standby mode shall be manually reset with the three-phase breaker on the back panel. Front-panel controls shall include an enable ready/standby switch and a locking input level control. Rear-mounted controls shall include a triple rocker switch circuit breaker for the three-phase AC mains. Internal controls shall include an input sensitivity control, adjustable input filter, and a master-slave switch. Front panel indicators shall include a green ready indicator, a yellow standby indicator, an amber 3-phase over-voltage indicator, a red over-temperature indicator, a red fault indicator, a yellow input-output comparator indicator which shall illuminate when distortion equals or exceeds 0.05%, and a green signal presence indicator for both voltage and current. An optional 3.5 digit LCD display shall display either the output voltage or current in two different ranges, peak or RMS. The power amplifier shall meet or exceed the following performance criteria. Input sensitivity: adjustable from 0.9 to 2.88 V for rated output. Rated Maximum Average output with less than 1.0% THD: 8,055 watts (1 kHz) into 0.5 ohms; 6,725 watts (1 kHz) into 1 ohm. Voltage gain: 36.4 dB ±0.5 dB. Hum and noise: at least 105 dB (A weighted) below full rated output power. Phase response: +10/-45 degrees from 10 Hz to 20 kHz at 1 watt. Frequency response: 20 Hz to 20 kHz, ±0.25 dB at 1 watt into 4 ohms. Damping factor: greater than 1000 from 10 to 400 Hz into 8 ohms. Intermodulation distortion (SMPTE): less than 0.05% from 2.19 watts to 2.190 watts at 36.4 dB gain into 4 ohms. Harmonic distortion at 2.190 watts into 4 ohms: less than 0.1% from 50 Hz to 4.5 kHz and increasing linearly to less than 0.9% at 50 kHz. The amplifier shall be safe when driving any kind of load—even reactive ones. The power requirements shall be three-phase 208 VAC at 47 to 63 Hz. The amplifier chassis shall be designed for flow-through ventilation and include four cooling fans. The fans shall begin operation when the amplifier equals or exceeds 122° F (50° C). The amplifier chassis shall be constructed of aluminum and reinforced with steel. It shall be finished with black splatter-coat. The front panel shall be finished with polyurethane silver. The dimensions of the amplifier shall allow for 19 inch (48.3 cm) EIA standard (RS-310-B) rack mounting. The amplifier shall be 10.5 inches (26.7 cm) tall, 17.5 inches (45.1 cm) deep behind the rack-mounting surface, and 2.5 inches (6.4 cm) in front of the rack-mounting surface. The amplifier shall weigh 128 pounds (58 kg). The amplifier shall be designated the Crown Macro-Tech 10,000.

Load (ohms)	Max Average Watts at 1.0% THD (See note 1)		Single Cycle Tone Burst Watts at <0.05% THD (See note 2)			40 mS Tone Burst Watts at <0.05% THD (See note 3)		
	700 Hz	1 kHz	20 Hz	50 Hz	1 kHz	20 Hz	50 Hz	1 kHz
4	2,525	2,525	2,020	2,100	2,835	2,000	2,100	2,370
2	4,465	4,425	3,415	3,640	5,435	3,415	3,640	4,180
1	6,770	6,725	4,835	5,330	9,395	4,775	5,330	6,255
0.85	7,360	7,175	5,110	5,735	10,560	5,110	5,665	6,785
0.5	8,395	8,055	5,400	6,150	7,695	5,310	6,150	7,585

1. A sine wave is presented to the amplifier and the output monitored for non-linear distortion. The level is increased until the THD reaches 0.1%. At this level the average power per channel is reported.
2. A single cycle of sine wave is presented to the amplifier and monitored for non-linear distortion. The average power during the burst is reported. Speakers must be able to

- withstand this level if they are to be safely used with this amplifier.
3. A 40 millisecond burst or two cycles of sine wave (whichever is of greater duration) is used and the power computed as the average power during the burst. The duty cycle of this test is 10 percent. This power level is a measure of how loud an amplifier is as perceived by the hearing process.

## Specifications, continued

**3Φ Over Voltage:** An amber indicator alerts of excessive voltage in the AC mains. It comes on when the line voltage exceeds the rated value by 10% or more and latches the unit in STANDBY mode. (The over-voltage condition must be removed and the rear-panel circuit breakers must be switched to reset the unit.)

**Over Temp:** A red indicator warns when the unit has gotten too hot and has temporarily gone into STANDBY mode. (The unit will return to READY mode after cooling down.)

**Fault:** A red indicator warns when the output circuitry has malfunctioned. In this rare event, the unit is latched in STANDBY mode for protection. Switching the unit off with the rear-panel breaker will reset the Fault circuitry if the problem is not permanent.

**IOC:** Normally off, this yellow indicator flashes in the rare event the output waveform differs from that of the input by 0.05% or more.

**VSP:** A green indicator flashes synchronously with the input voltage to show its presence. It will turn off and the IOC indicator will turn on if the voltage headroom of the amplifier is exceeded.

**ISP:** A green indicator flashes synchronously with the input current to show its presence. It will turn off and the IOC indicator will turn on if the current headroom of the amplifier is exceeded.

**Output:** An optional 3½ digit LCD meter displays the output voltage or current. The meter has two ranges and it can be set to display peak or RMS values.

### Input/Output

**Input Connector:** Balanced 3-pin female XLR connectors on standard P.I.P.-FX module.

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

**Output Connector:** Three-terminal barrier block.

**Output Impedance:** <10 milliohms in series with <2 microhenries.

### Construction

Steel-reinforced aluminum chassis with black splatter-coat. Internal modules can be easily accessed. Front panel finished with polyurethane silver.

**Dimensions:** 19 in. (48.3 cm) wide, 10.5 in. (26.7 cm) tall, 17.5 in. (45.1 cm) deep behind front mounting surface, 2.5 in. deep in front of mounting surface.

**Weight:** 128 lbs. (58 kg).

**Mounting:** Standard EIA 310 front-panel rack mounting.

\*Please contact a Crown representative for full details.

## Crown's 3-Year No-Fault Amplifier Warranty And 3+3 No-Fault Extended Warranty

Crown now offers a 3-Year No-Fault Warranty for every new Crown amplifier—an industry standard. With this unprecedented No-Fault protection, your new Crown amplifier is warranted to meet or exceed original specifications for the first three years of ownership. During this time, if your amplifier fails for any reason or does not perform to original specifications, it will be repaired or replaced at our expense. This includes parts, labor and round-trip shipping. About the only things not covered by this warranty are those losses normally covered by insurance and intentional abuse. And the coverage is transferable should you sell your amp.

That's not all; for a modest fee, Crown will extend that protection for an additional three years with our 3+3 No-Fault Extended Warranty.

See your Crown dealer for full warranty details.



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