



INSTRUCTION MANUAL

STRAIGHT LINE TWO STEREO PREAMPLIFIER

CROWN INTERNATIONAL, INC. 1718 W. MISHAWAKA RD. ELKHART, INDIANA 46517



The information furnished in this manual does not include all of the details of design, production, or variations of the equipment. It does not cover all the possible contingencies which may arise during operation, installation, or maintenance. Should special problems arise, or further information be desired, please contact the Crown International Customer Services Department.

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WARNING

**TO PREVENT SHOCK OR FIRE HAZARD DO NOT EXPOSE TO
RAIN OR MOISTURE!**

CAUTION

**TO PREVENT ELECTRIC SHOCK DO NOT USE THIS
(POLARIZED) PLUG WITH AN EXTENSION CORD,
RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES
CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.**

ATTENTION

**POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS
UTILISER CETTE FICHE POLARISEE AVEC UN
PROLONGATEUR. UNE PRISE DE COURANT OU UNE AUTRIE
SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE
INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A
DECOUVERT.**

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SECTION 1

GENERAL INFORMATION

1.1 Introduction/Purpose of Equipment

The Crown® Straight Line Two is a versatile control preamplifier designed to interface a power amplifier (the Crown Power Line Two, Three and Four are suggested mates) with various signal sources in a high quality audio system. To familiarize yourself with its many features, we recommend studying this manual thoroughly. We also suggest at this time that you pay special attention to the Crown warranty and become familiar with its requirements and conditions. This will help to assure your total satisfaction with the Straight Line Two (Fig. 1.1).

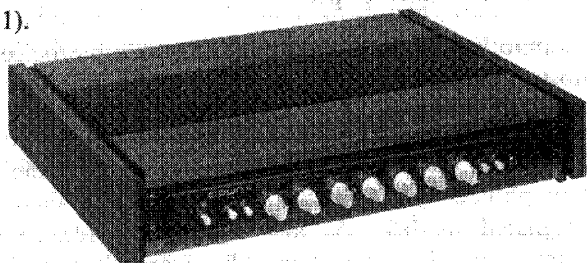


Fig. 1.1 Straight Line Two

1.2 Features

Above and beyond its Crown preamp counterparts, the Straight Line Two exhibits ultra-low harmonic and intermodulation distortion as well as excellent signal to noise ratio characteristics.

A 1¼" high package design, requires less rack space requirements per feature than most other preamplifiers.

Automatic mute circuitry provides total elimination of all thumps or pops that may occur upon initial powering of a sound system and during shutdown.

Level, Treble and Bass controls are detented with thirty-one positions to allow exact "resetability" and more accurate control. The Balance control is center detented for precise separation of left and right channel information.

Front panel pushbuttons, control not only the "off/on" status of the unit, but also six other important features. A low Filter for removing sub-sonic frequencies is provided along with an exclusive Crown designed Rumble circuit. At any time low frequency rumble is produced from such a device as a turntable, a yellow light will illuminate indicating that potentially harmful or annoying low frequency information exists at the output and that there is a need to activate the low Filter to eliminate these frequencies.

To enhance the sound quality at very low listening levels, a Loudness function is provided. This feature emphasizes the bass-end of the audio band (the portion usually lost at low volume).

If an over-all flat response is desired at the output, Tone Activate should remain in the out or "not depressed" position, removing functional power of the Bass and Treble controls. As an additional aid, a yellow Activate light indicates the Tone control's operating status (active/inactive).

Tape monitor loops are available for two tape decks along with Tape Copying facilities.

A Mode switch provides four output signal variations: Stereo, Mono, Reverse and Mute.

Six AC accessory outlets located on the rear panel, provide power for additional system equipment.

A front panel monitor jack is supplied for use with high impedance headsets as well as for use as an additional output source (ie. for driving amplifier, recording from, etc.).

A separate Phono section with pin jack inputs, optimizes phono preamplifier performance along with individual adjustable gain.

Red Overload and green Signal Presence indicators assist in determining signal level at critical circuit points to help avoid distortion.

1.3 Service Policies

Due to the sophisticated circuitry of your unit, only qualified, fully trained technicians should be allowed to service it. Please observe the following label on the unit:

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT OPEN. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO A QUALIFIED TECHNICIAN.

For service, return the unit to the factory in the original packing or in replacement packing obtainable from the Crown factory. For warranty service, the unit must be returned to the factory or an approved service station (Amcron customers consult your local representative). In either case, fill out and enclose the Service Information form located at the rear of this manual. This will help to ensure a speedy and effective response.

Crown will pay shipping costs (in the U.S.) for warranty service upon receiving copies of all shipping receipts.

Before returning your unit to the factory for service, authorization should be obtained from the Crown Technical Service Department. All shipments should be sent UPS or truck freight (insured). The factory will then return your serviced unit by one of the above methods.

Upon receipt of the warranty registration card from your dealer, Crown will register your unit on our computer warranty file.

Retain your copy of the bill of sale from your Crown dealer. This is your proof of purchase.

When you need service for your unit from an authorized Crown Service Station, simply present your bill of sale. With it, the service station can promptly initiate any needed paperwork. It will save you time and effort.

The bill of sale is also your proof of ownership should you need it for insurance or legal reasons.

1.4 Glossary of Terms

A-B Test: Evaluating relative performance of two (or more) components or systems by changing quickly from one to the other. Most high fidelity dealers have A-B test facilities.

AGC: Automatic Gain Control. A type of circuit used to maintain the output volume of a receiver constant, regardless of variations in the signal strength applied to the receiver.

Attenuation: A decrease in signal magnitude from one point to another, or the process causing this decrease.

Balanced Input: A three wire input system where the voltages and currents in two of the wires are equal in magnitude but opposite in polarity with respect to ground which is the third wire. The impedance of a balanced input is usually low. (600 ohms or less)

Balun: A device used for the transformation from an unbalanced line or system to a balanced line or system, or vice versa. The term is derived from balance to unbalance transformer.

Bandpass Filter: A filter that allows transmission of alternating signals whose frequencies are between given upper and lower cutoff values, while substantially attenuating all frequencies outside this band.

Biamp: The use of independent amplifiers to feed the bass and treble portions of a loudspeaker or loudspeakers with a crossover network. The purpose is to help reduce intermodulation between bands when a system is overloaded. It also reduces the cost of implementing good, low loss precision crossover networks.

Butterworth Filter: A filter that exhibits the flattest possible response in the passband. The response rolls off smoothly into the stop band, where it approaches a constant slope of $6n$ dB/octave; where n is the number of poles in the network, i.e. a single pole is 6dB, two pole 12dB, 3 pole 18dB, etc.

Capture Ratio: The ability of a receiver to reject a weaker station whose frequency is the same as that of the desired station. This measurement will be in dB. The smaller the figure, the better the spec.

Ceramic Filter: A bandpass filter using a piezoelectric substrate material.

Channel: A channel is a complete sound path. A single channel, or monophonic system, has one channel. A stereophonic system has at least two full channels designated as left (A) and right (B). Monophonic material may be played through a stereo system; both channels will carry the same signal. Stereo material, if played on a monophonic system, mixes and emerges as a monophonic sound.

Channel Separation: Specified in dB, channel separation is the ratio of the measurable output of one channel to the unwanted output of the (undriven) opposite channel.

Clipping: The truncation of peaks of a signal due to exceeding the operating range of an electronic circuit. Normally, it refers to the result of voltage limitations in the circuit.

Corner Frequency: The frequency at which a filter goes from a condition of passing the signal unattenuated to "rolling off" or attenuating the signal according to its frequency. It is sometimes referred to as the "cutoff" frequency or the "break" frequency. It is also defined as 3dB below the unattenuated output level of the signal.

Cross Modulation: In FM signals, a type of intermodulation that occurs when the carrier of the desired signal is modulated by an undesirable signal. Each signal is of independent origin.

Crossover Frequency: The frequency at which a dividing network delivers equal power to the upper and lower frequency channels when both are terminated in specified loads.

Crossover Network: A selective network used to divide the audio frequency output of an amplifier into two or more bands of frequency. The band below the crossover frequency is fed the woofer loudspeaker while the high frequency band is fed the tweeter. Also called dividing network and loudspeaker dividing network.

Crosstalk: Signal leakage from one signal source into another.

Damping: Controlling of vibrations, response, or resonances which if unchecked, would cause coloration of the sound.

Damping Factor: A numerical indication of an amplifier's ability to decrease unwanted loudspeaker movements. Damping factor can be found by dividing the load impedance by the amplifier's output impedance.

Decibel: A numerical expression of acoustic or electrical ratios, such as the relative intensity of a sound or the relative strength of a signal. One (dB) is about the smallest change in sound perceptible to the ear.

Decoder: A matrix of logic elements that selects one or more output channels according to the combination of input signals present. Can be used in FM to recover stereo signals of a stereo encoded multiplex transmission.

De-emphasis: In FM signals, restoring the pre-emphasized (for proper transmission characteristics) signal to result in a "flat" frequency response curve.

Distortion: Unwanted noise, or sounds which didn't exist in the studio when the original recording was made. Harmonic distortion produces tones harmonically related to a single, pure tone. Intermodulation distortion (IM) introduces new tones caused by mixing of two or more original tones. Phase distortion, or non-linear phase shift, disturbs timing sequence between a tone and its related overtones. Distortion which creates new spectra are expressed in percentages and phase distortion in degrees of phase shift or seconds of group delay vs. frequency errors.

Dynamic Range: The difference between the most intense and the least intense levels in a sound system.

Equalization: Frequency response manipulation to meet the requirements of recording, and an inverse manipulation on playback to restore the original. Also known as compensation for acoustic problems of listening rooms.

Feedback: Sending a "part" of a system's output back to the input. Positive feedback may lead to unstable conditions such as PA system "howling" due to sound from the speakers being fed back thru the microphone and amplified again. Another form is low frequency interference created when vibrations from loudspeakers are picked up by the cartridge and amplified again. However, carefully controlled negative feedback in electronic circuits can be used to help reduce distortion and control stability.

Flutter: Rapid variation in the speed of a turntable or tape transport. Flutter causes a wavering of musical pitch.

Frequency Response: This term indicates any amplitude variations in a system output signal with respect to frequency. This measurement is made with a constant level input signal.

Gain: The ratio of an amplifier's output voltage to its input voltage.

Headroom: Stated in dB, headroom is the difference between the signal level and the limits of the sound system ie; the ratio of power available to power used.

Hertz: As in cycles-per-second, not rental agency.

High Pass/Low Pass Filter: High pass - a filter having a single transmission band extending from some critical, or cutoff, frequency other than zero, up to infinite frequency. Low pass - a filter network which passes all frequencies below a specified frequency with little or no loss but discriminates strongly against higher frequencies.

IF: An Intermediate Frequency is a frequency to which a signal wave is shifted locally as an intermediate step in FM transmission or reception.

Image Response: Response of a superheterodyne receiver to the image frequency, as compared to the response to the desired frequency.

Input Sensitivity: The input voltage required to drive an amplifier to its rated output.

IOC™: Stands for Input-Output Comparator. An extremely sensitive Crown circuit used to indicate, via a front panel LED, the fact that the operating limits of an amplifier are being exceeded resulting in output non-linearity.

LED: Light Emitting Diode. A PN junction that emits light when biased in the forward direction.

Limiter: A circuit in which the output amplitude is substantially linear with regard to the input up to a pre-determined value and substantially constant thereafter.

Load: A device that absorbs power and converts it into the desired form.

LSI: Large Scale Integration is an integrated circuit chip housing a large number of active devices.

Mixer: A device having two or more inputs, usually adjustable, and a common output, which operates to combine linearly in a desired proportion the separate input signals to produce an output signal.

Monitoring Amplifier: A power amplifier used primarily for evaluation and supervision of a program.

Multipath Delay: In FM the existence of more than one signal path between transmitter and receiver. The two signals arriving at different times causes distortion.

Music Power: This rating expresses the ability of an amplifier to handle short duration power peaks, as opposed to sustained power levels. An amplifier may only be capable of putting out 45 watts if that level is continuous, but it may be able to handle 60 watt peaks (such as might occur in a musical passage), if the peaks do not last too long.

Muting Circuit: In FM, a circuit which cuts off the receiver output when the r-f carrier reaching the first detector is at or below a pre-determined intensity.

Pre-emphasis: A process in a system designed to emphasize the magnitude of some frequency components with respect to the magnitude of others, to reduce adverse effects, such as noise, in subsequent parts of the system.

PLL: Phase Lock Loop; a circuit for synchronizing a variable local oscillator with the phase of a transmitted signal. Can be used in FM as a synthesizer circuit as well as a stereo decoder in the multiplex system.

Polar Curve: A pattern used to show the directional characteristics of antennas, microphones or speakers.

Quartz Crystal: A complete assembly, comprising a piezoelectric quartz-crystal element mounted, housed, and adjusted to the desired frequency. Such a device is commonly employed for purposes of frequency control, frequency measurement and electric wave filtering.

Rotor: A motor driven assembly which turns an antenna so that it can be aimed in the direction of best reception.

SAW Filter: Surface Acoustic Wave; commonly used as a bandpass filter. Device transmits surface acoustic waves on a piezoelectric substrate. Used in the FMI for low FM distortion.

Selectivity: In FM a measure of the extent to which a receiver is capable of differentiating between the desired signal and disturbances at other frequencies.

Sensitivity: A receiver specification indicating the smallest input signal strength required to produce an output signal whose characteristics are standardized and used as a reference.

Signal: A visible, audible or other conveyor of information.

Signal-To-Noise-Ratio: Measured in dB, signal to noise ratio is a relative term meaning the ratio between the desired output signal and the interference or noise. A typical figure would be 60dB which stands for a ratio of 1000-1.

Superheterodyne: A method of receiving radio waves in which the process of heterodyne reception is used to convert the voltage of the received wave into a voltage of an intermediate, but usually superaudible frequency, that is then detected.

Synthesizer: A Phase Lock Loop (PLL) system which constructs an oscillator signal by phase locking it to a reference times (X) the ratio of two integers (reference is usually a quartz crystal oscillator).

Triamp: The use of three separate amplifiers to drive the high, middle and low frequency sections of a speaker system.



Varactor: A two terminal semiconductor device in which the electrical characteristic of primary interest is a voltage-dependent capacitance. Used in FM tuner inputs for voltage controlled timing.

Wow: Distortion caused in sound reproduction by slow variation in speed of the turntable or tape. (See flutter.)