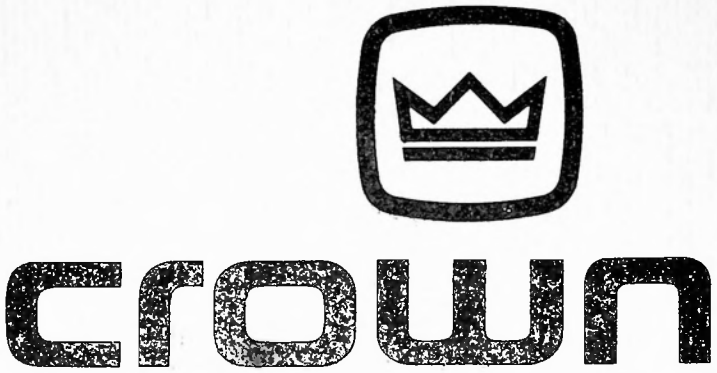


INSTRUCTION MANUAL

D-75
DUAL-CHANNEL
POWER AMPLIFIER

crown® Proof of Performance Report

D-75 Professional Power Amplifier

Serial Number

WORK ORDER: G2A489
ITEM: G41925-2
MODEL: D-75
SERIAL: 027718

Technician Alan Schrader

		Ch. 1		Ch. 2
1.	Quies. offset of less than 10mV	✓		✓
2.	1KHz 35 watts RMS minimum into 8 ohms, per channel, both channels operating, .05% total harmonic distortion	✓		✓
3.	4 ohm test	✓		✓
4.	Protection tests	✓		✓
5.	Reliability test	✓		✓
6.	20KHz 35 watts per channel minimum RMS (both channels operating) into 8 ohms 0.05% total harmonic distortion	✓		✓
7.	10KHz square wave	✓		✓
8.	Mono operation		✓	
9.	IM Distortion into 8 ohms (%) (60-7KHz 4:1) S.M.P.T.E.	.002	35W	.002
		.003	11.1W	.002
		.003	3.5W	.002
		.004	1.11W	.003
		.005	.35W	.004
		.008	111mW	.006
		.011	35mW	.010
		.018	11.1mW	.016
10.	Hum and Noise - dB below 35W into 8 ohm (20Hz-20KHz)	-110 dB		-111 dB
11.	Quies. AC power input at 120 VAC		✓	
12.	Headphone jack		✓	
13.	IOC		✓	
14.	Balanced input			

"TOTAL PERFORMANCE IS WHAT COUNTS"

Crown test and check-out procedures reflect our basic design philosophy; we believe that reliability can be engineered into a product. As such, our check-out is designed to expose and correct a problem, before it happens. This testing begins when the unit is still a pile of parts; grading and selection of components is standard. The final test-inspection is the culmination of this vigorous program, but our concern doesn't stop here. Our products are backed by an extensive field service program, and protected by a comprehensive warranty.

A word about our testing procedure is in order. All our specifications are referenced to an AC input of 120 VAC. The high current demand with high power tends to cause the line voltage to sag, or the sinusoidal waveform to distort. With a distorted waveform (or lower line voltage) the peak voltage is lowered. Since it is the peaks that charge the filter capacitors in the amplifier power supply, and thus determine the maximum power output, a line voltage problem reduces the maximum power output. Crown uses a peak equivalent AC voltmeter which measures the peaks of any waveform and converts this to an equivalent rms reading for a sinusoidal waveform. This way we can vary or regulate the line voltage, no matter how distorted the waveform, to an equivalent of a 120 VAC sinewave. We are then measuring a true maximum output power.

With regard to the precision load which we use for our testing, we realize that a resistive load is quite different than a reactive speaker. However, using readily available parts, a precision resistive load is the easiest to duplicate, with respect to obtaining consistent results. We specify that the load must be resistive, having less than 10% reactive component at any frequency up to five times the highest test frequency. The resistive value should be maintained within 1%, at all power levels.

The following discussion examines each of the test procedures listed on the facing page. This is an attempt to help you understand, in layman's terms, what the tests mean.

1. **Quiescent - Offset** - This simply assures that your amplifier's output is balanced with reference to its input. Thus the amplifier will not "bias" the program with a DC component. To meet specifications, offset must be less than 10mV.
2. **1KHz** - This test measures the power across an 8 ohm load at a frequency of 1KHz with both channels operating. This is a determination of how much power an amplifier can produce before a specified THD is reached. For the D-75 the power is 35 watts at less than .05% THD.
3. **4 Ohm Test** - This is a critical examination of the D-75's performance at impedences below that for which it is rated. We check the waveform for level (it must reach a specified voltage before clipping) purity, and stability.
4. **Protection Test** - This is a test with a 2 ohm load which determines the threshold at which the protection circuitry will activate. Sharp clipping should occur with no evidence of instability. The positive and negative limiters operate independently and therefore will not activate simultaneously.
5. **Reliability Test** - This test puts the output stages through an extremely vigorous thermal cycling. The test is a very low frequency input signal driving the output to full power across a short circuit for a predetermined period of time.
6. **20KHz** - This tests the amplifier at its rated power level. We specify that at any frequency between 1Hz and 20KHz the D-75 will produce 35 watts minimum rms (both channels operating) into an 8 ohm load, at a sum total harmonic distortion of .05% or less. We choose 20KHz as the test frequency because high frequencies produce more heat than lower frequencies. Thus, if the amplifier can safely pass the 20KHz test, it will operate safely at lower frequencies.
7. **10KHz Square Wave** - This test critically examines the amplifier's frequency response and rise time. (how fast the amplifier can follow rapid signal changes.) The Output square wave (with an 8 ohm load) should be clean and sharp, with no ringing or overshoot.
8. **Mono Operation** - This is a check for proper operation of the stereo-mono switch. A signal is applied to channel 1 input only and the mono output is observed between the two red output terminals of the amplifier.
9. **IM Distortion Test** - At Crown we feel that IM distortion testing yields a truer picture of amplifier performance than harmonic distortion testing. While a large amount of documentation supports this opinion, some of the reasons are apparent, even in layman's terms. For example, a sinusoidal waveform (used in HD testing) bears little resemblance to the complex waveform. Also, harmonic distortion is not always aurally offensive. The human ear may interpret such distortion as pleasing, but usually finds IM distortion rather obnoxious. In order to support this design philosophy, we designed and built our own IM analyzer with residual noise and distortion low enough to test our amplifiers.
10. **Hum and Noise** - This test, in plain English, tells you how small a signal can be amplified without it becoming "lost in the mud". The test is limited to the audio bandwidth of 20Hz-20KHz, with a bandpass filter. Our specification for the D-75 is: hum and noise from 20Hz-20KHz, will be at least 110dB below the full power output of 35 watts. This means that with a 35 watt output the noise will be only .0008 micro watts. (That's 8 ten billionths of a watt!)
11. **Quiescent AC power Input at 120 VAC** - This test confirms that your amplifier is not drawing excessive power while "idling". If an amplifier exhibits a tendency toward instability, or oscillation, it may draw power with no signal input. The D-75 will draw 15 watts or less at idle.
12. **Headphone jack** - The front panel dual-circuit jack is checked for continuity and proper polarity.
13. **IOC** - This tests the duration of LED illumination, also compares a scopes clipping trace to the lighting of the indicators, and assures the operation of the circuitry on both the positve and negative sides of the signal.
14. **Balanced input** - This test is to check the common mode and unity gain of your amplifier.

INSTRUCTION MANUAL

D-75

DUAL-CHANNEL
POWER AMPLIFIER

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

K80000-1

FULL THREE-YEAR WARRANTY

SUMMARY OF WARRANTY

We, CROWN INTERNATIONAL, INC., 1718 West Mishawaka Road, Elkhart, Indiana 46517 (Warrantor) warrant to you, the ORIGINAL PURCHASER AND ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of three (3) years from the date of purchase by the original purchaser (warranty period) that the product is free of defects in materials or workmanship and will meet or exceed all advertised specifications for such a product.

ITEMS EXCLUDED FROM WARRANTY

We are not responsible for product failure caused by misuse, accident or neglect. This warranty does not extend to any product on which the serial number has been defaced, altered, or removed. It does not cover damage to speakers or any other products resulting from Crown product failure. It does not cover defects or damage caused by your use of unauthorized modifications, parts, or service. It also excludes batteries and damage caused by leaky or defective batteries.

WHAT WE WILL DO

We will remedy any defect in materials or workmanship by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning component available to Crown free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at the Crown factory. We will remedy the defect and ship the product from the service center or Crown factory within a reasonable time after receipt of the defective product at the authorized service center or the Crown factory. All expenses in remedying the defect, including shipping costs in the United States, will be borne by Crown. (Purchaser must bear the expense of shipping the product between any foreign country and the port of entry in the United States and all taxes, duties, and other custom's fee for such foreign shipments).

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service not later than ninety (90) days after expiration of the warranty period. We will give you written notice of the dealer service centers to whom you may deliver the product, or we will give you an authorization to return it for factory service. All components must be shipped in a factory pack, which, if needed, may be obtained from Crown free of charge. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by us or our service center. If the repairs made by Crown or the authorized service center are not satisfactory, notify Crown or the authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN OUR PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. **SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

WARRANTY ALTERATIONS

NO PERSON HAS THE AUTHORITY TO ENLARGE, AMEND, OR MODIFY THIS WARRANTY. THE WARRANTY IS NOT EXTENDED BY THE LENGTH OF TIME WHICH YOU ARE DEPRIVED OF THE USE OF THE PRODUCT. REPAIRS AND REPLACEMENT PARTS PROVIDED UNDER THE TERMS OF THIS WARRANTY SHALL CARRY ONLY THE UNEXPIRED PORTION OF THIS WARRANTY.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. No action to enforce this Warranty shall be commenced later than ninety (90) days after expiration of the warranty period.

CROWN INTERNATIONAL, INC.
1718 West Mishawaka Road, Elkhart, Indiana 46517

THIS STATEMENT OF WARRANTY SUPERSEDES ALL OTHERS CONTAINED IN THIS MANUAL.

12/81

crown

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.

Crown International
1718 W. Mishawaka Rd.
Elkhart, Indiana 46517
Ph: (219) 294-5571

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.

crown

D-75

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

SECTION 1
GENERAL INFORMATION

1.1 Introduction

The purpose of this manual is to acquaint you with the operational characteristics and maintenance of the CROWN D-75 power amplifier. (Fig. 1.1) Even though the manual is divided for quick reference, a careful reading of the entire manual will ensure maximum performance and enjoyment. We suggest that at this time you read the CROWN warranty located inside the title page. Adherence to the requirements and conditions set forth in the warranty will help to assure your satisfaction with the CROWN D-75 power amplifier.

Fig. 1.1 D-75

1.2 Purpose of Equipment

The D-75 is a compact, audio power-amplifier designed for the professional as well as the hi-fi enthusiast. Providing medium-power amplification from 20Hz-20KHz with minimum distortion, the unit features balanced inputs, signal presence and IOC indicators, monophonic capability and a means for isolating electrical ground from chassis ground.

1.3 Unpacking

Inspect the unit for any damage incurred in transit. The D-75 was carefully inspected, tested and left the factory unmarred. Notify the transportation company immediately if any damage is found. Only the consignee may initiate a claim with the carrier for damage during shipment. However, CROWN will cooperate fully in such an event. Be sure to save the carton as evidence of damage for the shipper's inspection.

CROWN recommends that you save the packing materials even if the unit arrives in perfect condition. They will prove valuable in preventing damage should there be occasion to transport or ship the unit. Both the carton and the internal pack are specifically designed for protection during transit. DO NOT SHIP THE UNIT WITHOUT THIS FACTORY PACK!

1.4 Units and Accessories Supplied

The D-75 comes complete with instruction manual and:

- 2 - pin to phone cables
- 4 - mounting screws and washers
- 1 - Hi Fi kit which includes:
  - 2 - dual banana plugs
  - 2 - fuses and fuseholders
  - 2 - wire nuts
- 1 - proof of performance sheet
- 2 - tapered locknuts
- 4 - self-stick feet

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 SERVICABLE 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.

1.6 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.
Acoustic or Mechanical Feedback:	An annoying low frequency interference created when vibrations from loudspeakers are picked up by the cartridge and amplified by the sound system. Physically separating loudspeakers and record-playing equipment will solve the problem.
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)
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 eliminate crossover distortion.
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 measurable output of one channel with the opposite channel's input shorted.
Corner Frequency:	A frequency at which the 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 maximum output.
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 frequencies. The band below the crossover frequency is fed the woofer loudspeaker while the high frequency band is fed to the tweeter. Also called dividing network and loudspeaker dividing network.
Crosstalk:	Signal leakage from one channel into another.
Damping:	Controlling of vibrations, response, or resonances which if unchecked would cause distortion.

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 to three decibels (dB) is about the smallest change in sound perceptible to the ear.
Distortion:	Unwanted noise, or sounds which didn't exist in the studio when the original recording was made. Harmonic distortion disturbs the original relationship between a tone and other tones naturally related to it. Intermodulation distortion (IM) introduces new tones caused by mixing of two or more original tones. Phase distortion, or non-linear phase shift, disturbs the natural timing sequence between a tone and its related overtones. Transient distortion are expressed in percentages; phase distortion in degrees; transient distortion is usually judged from oscilloscope patterns, but is best measured as phase distortion.
Dynamic Range:	The difference between the most and the least intense levels in a sound system.
Equalization:	Frequency manipulation to meet the requirements of recording, and an inverse manipulation on playback to get uniform response. Also known as compensation.
Flutter:	Rapid variation in the speed of a turntable or tape transport. When pronounced, flutter causes a wavering of musical pitch.
Frequency Response:	This term indicates any amplitude variations in the 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 signal.
Headroom:	Stated in dB, headroom is the difference between the average sound levels and the peak levels in a program.
Hertz:	As in cycles-per-second, not rental agency.
IHF 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.
Input Sensitivity:	The input voltage required to drive an amplifier to its fullest rated output.

SECTION 2.
SPECIFICATIONS/PERFORMANCE

2.1 General Specifications

Hum and Noise:	From 20Hz - 20K Hz the hum and noise level is below 175 microvolts and 106dB below the rated output.
Phase Response:	+10°, - 15° 20Hz - 20KHz at 1 watt
Input Impedance:	(XLR balanced) 20,000 ohms ±30% (XLR unbalanced) 10,000 ohms ±30% (phone jack unbalanced) 25,000 ohms ±30%
Amplifier Output Protection:	Total protection against shorted, mismatched or open outputs. Volt-ampere limiting circuitry acts instantaneously with no annoying thumps or cutouts.
Overall Protection:	AC line fused. The controlled slewing rate of the voltage amplifiers protects the overall amplifier against RF burnout. Input overload protection is furnished by an internal resistance at the amplifier's inputs.
DC Output Offset:	(shorted input) ±10 millivolts.
Turn On:	Instantaneous, with minimum bass thumps and no program delay.
Circuit:	A total of 42 transistors, 18 signal diodes, 2 zener diodes, 4 rectifiers and 3 linear IC (dual op-amp) are utilized in a wideband multiple feedback loop design.
Power Supply:	A specially designed low profile transformer, two regulated supplies for complete isolation and stability plus computer grade filter capacitors serve to power the D-75.
Power Requirements:	AC voltages of 100, 120, 200, 220, and 240 volts ± 10% at a line-frequency between 50 and 400Hz may be used.
Power Consumption:	15 watts while at idle, 120 watts at the full rated output.
Heat Sinking:	The entire amplifier is used as a heat sink. Front-panel extrusion acts as a heat sink along with the chassis covers.
Chassis:	Aluminum-chassis construction for maximum heat conduction and minimum weight.
Controls:	Two input-level controls and a power switch on the front panel. A mono-stereo switch, located next to the input jacks, on the rear panel.

Indicators:	2 IOC indicators (red) 2 signal-presence indicators (green) 1 power indicator (amber)
Connectors, Input:	Cannon 3 pin audio connector in which pin 2 is positive, (for a positive output signal) or ¼" phone jack.
Ground Link:	A means for isolating or uniting chassis-ground from or with electrical ground is provided on the rear panel. The grounds are always connected internally by 2.7 ohms.
Output:	Color-coded binding posts with a ¼" stereo earphone jack on the front panel.
Dimensions:	19" long, 9" deep, and 1¾" high (8½" deep from mounting surface.) A 19" Western Electric standard rack-mounting system is utilized.
Weight:	10 pounds net weight.
Finish:	Satinized aluminum front panel with gray suede Lexan insert.

2.2 Monaural Specifications

Output Power (8 ohms):	95 watts minimum RMS into an 8 ohm load over a bandwidth of 20Hz-20KHz at a rated RMS sum total harmonic distortion of 0.05% of the fundamental output voltage.
Output Power (16 ohm):	70 watts minimum RMS into a 16 ohm load over a bandwidth of 20Hz-20KHz at a rated RMS sum total harmonic distortion of 0.05% of the fundamental output voltage.
Frequency Response:	±0.2dB 20Hz-20KHz, 1 watt, 16 ohms. ±1dB 6Hz-50KHz, 1 watt, 16 ohms.
1KHz Power:	80 watts RMS into 16 ohms; 110 watts RMS into 8 ohms, (0.1% Total Harmonic Distortion)
Harmonic Distortion:	Less than 0.001% from 20Hz-400Hz and increasing linearly to 0.05% at 20KHz at 70 watts into 16 ohms.
I.M. Distortion:	Less than 0.05% from 0.01 watts to 0.25 watts, and less than 0.01% from 0.25 watts to 70 watts into 16 ohms.
Slewing Rate:	12 volts per microsecond.
Damping Factor:	Greater than 400, DC-400Hz into 16 ohms.
Output Impedance:	Less than 30 milliohms in series with less than 6 microhenries.
Load Impedance:	Rated for 8 and 16 ohm usage, safely drives any load including completely reactive loads.
Voltage Gain:	41.2 ±2% (or 32.3 ±0.2dB) at maximum gain.
Input Sensitivity:	.812 volts ±2% for **70 watts into 16 ohms.**
Output Signal:	Balanced, single channel. Channel 1 controls are active, Channel 2 is inactive, but **not** cut out.

Input Sensitivity:	.812 volts ±2% for **35 watts into 8 ohms.**
Output Signal:	Unbalanced, dual channel.

2.3 Stereo Specifications

Output Power (4 ohm):	45 watts per channel minimum RMS (both channels operating) into a 4 ohm load over a bandwidth of 20Hz-20KHz at a rated RMS sum total harmonic distortion of 0.05% of the fundamental output voltage.
Output Power (8 ohm):	35 watts per channel minimum RMS (both channels operating) into an 8 ohm load over a bandwidth of 20Hz-20KHz at a rated RMS sum total harmonic distortion of .05% of the fundamental output voltage.
Frequency Response:	±0.1dB 20Hz-20KHz at 1 watt into 8 ohms; ±1.2dB 5Hz-100KHz at 1 watt into 8 ohms.
1KHz Power:	40 watts RMS into 8 ohms, per channel, both channels operating, 0.1% total harmonic distortion; 55 watts RMS into 4 ohms, per channel, both channels operating, 0.1% total harmonic distortion.
Harmonic Distortion:	Less than 0.001% from 20Hz-400Hz, and increasing linearly to 0.05% at 20KHz at 35 watts RMS per channel into 8 ohms.
I.M. Distortion (60Hz-7KHz 4:1):	Less than 0.05% from 0.01 watts to 0.25 watts, and less than 0.01% from 0.25 watts to 35 watts into 8 ohms per channel.
Slewing Rate:	6 volts per microsecond.
Damping Factor:	Greater than 400, DC-400Hz into 8 ohms.
Output Impedance:	Less than 15 milliohms in series with less than 3 microhenries.
Load Impedance:	Rated for 8 and 4 ohm usage; safely drives any load including completely reactive loads.
Voltage Gain:	20.6 ± 2% or 26.3 ± .02dB at maximum gain.

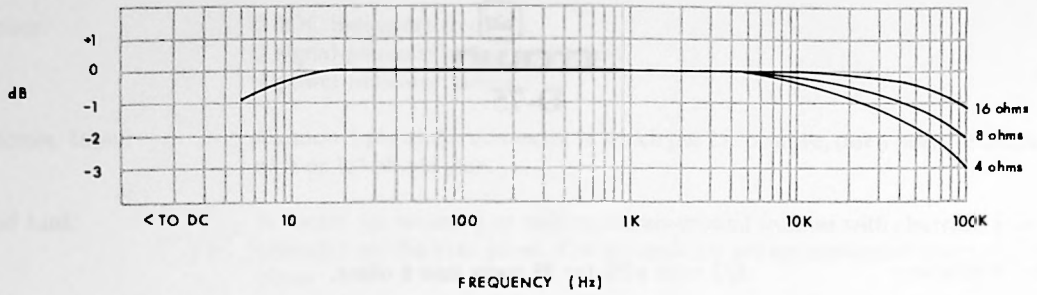


Fig. 2.1 Nominal Frequency Response

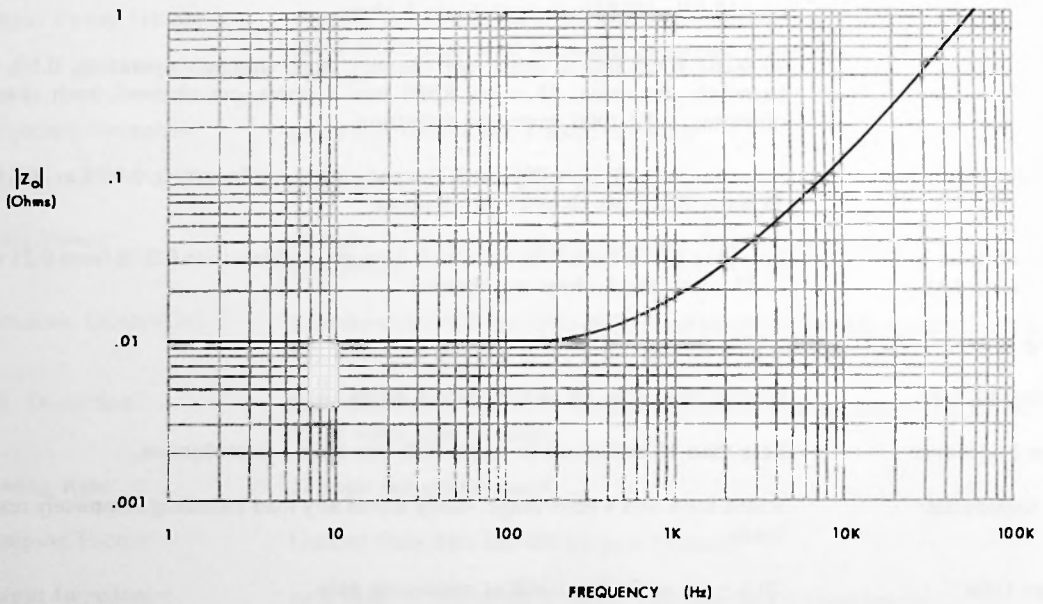


Fig. 2.2 Nominal Output Impedance (Z_O)

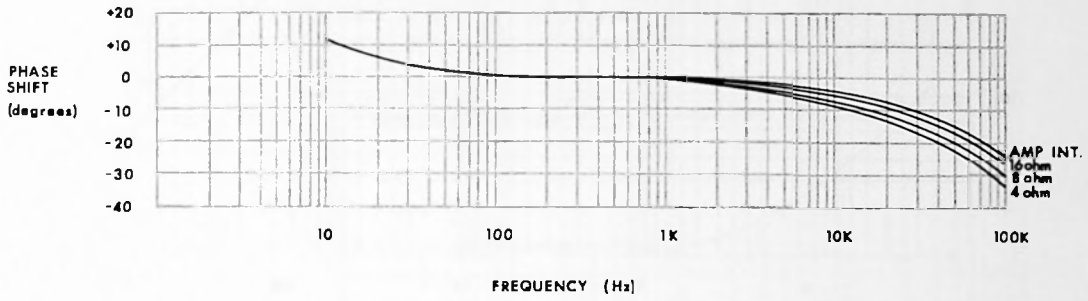


Fig. 2.3 Nominal Phase Response

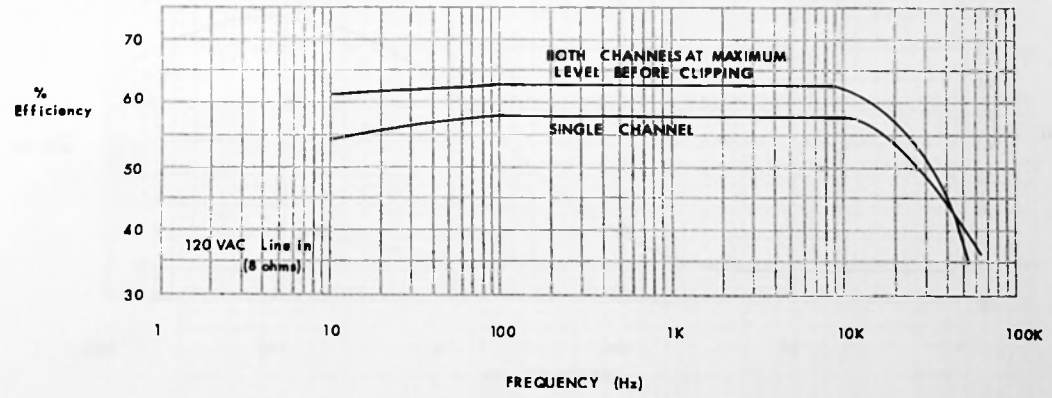


Fig. 2.4 Nominal Power Efficiency (8 ohms)

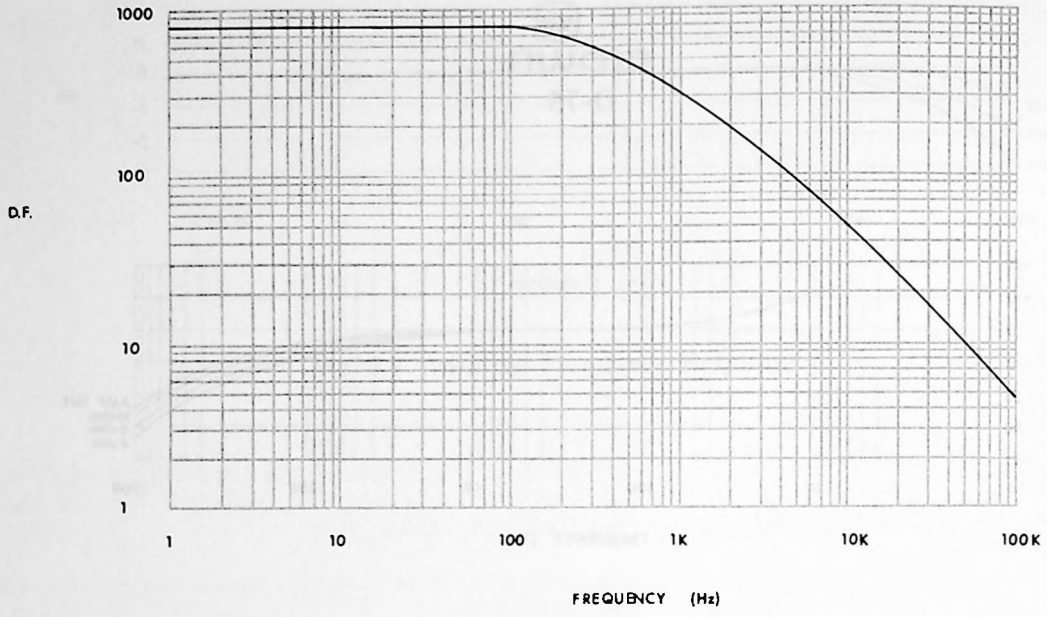


Fig. 2.5 Nominal Damping Factor (8 ohms)

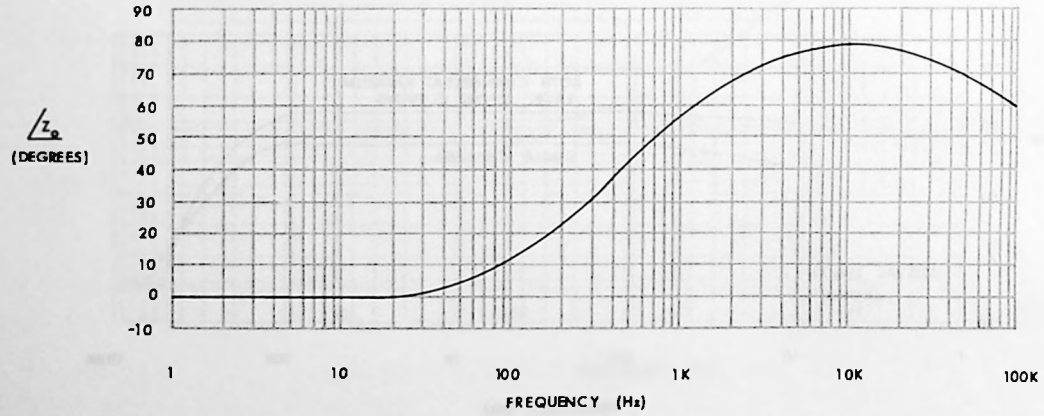


Fig. 2.6 Nominal Output Phase Angle

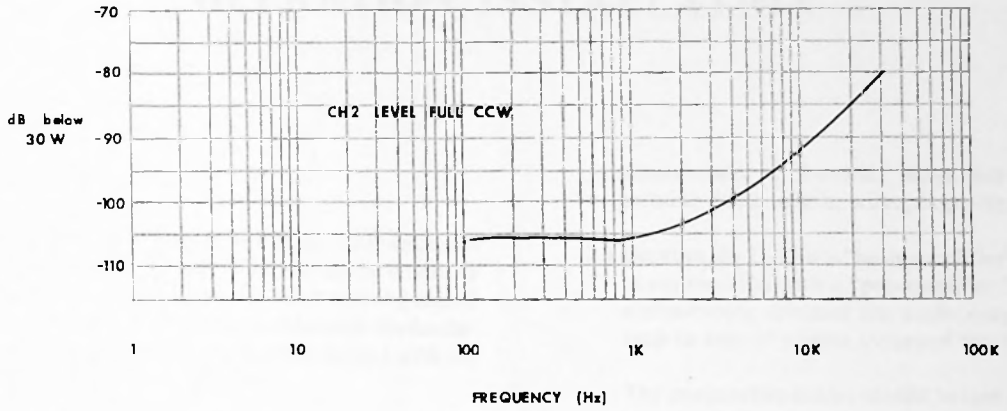


Fig. 2.7 Nominal Crosstalk

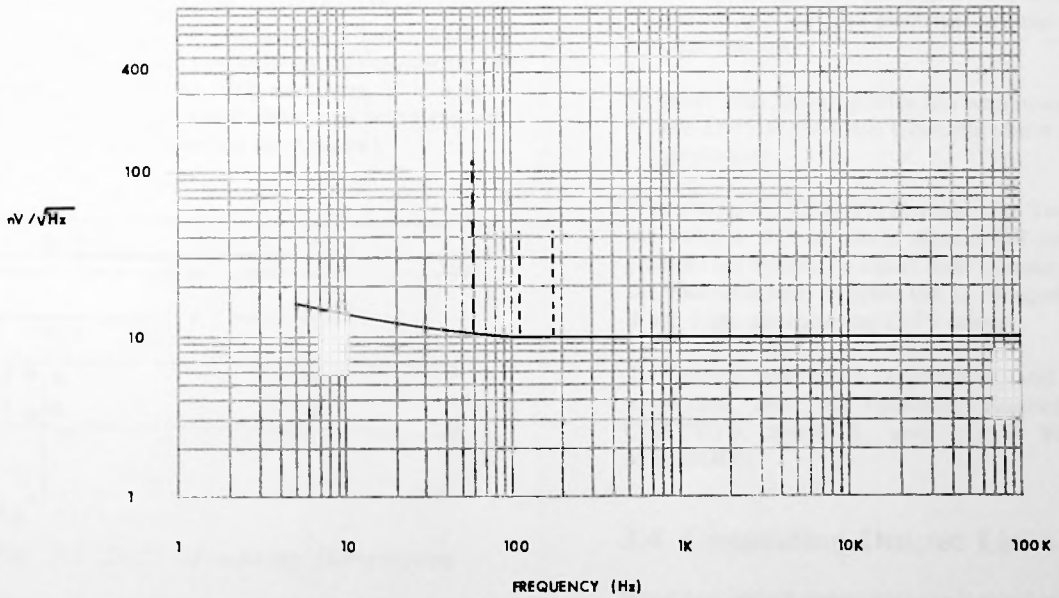


Fig. 2.8 Nominal Noise Spectrum

SECTION 3.
OPERATION/INSTALLATION

3.1 General

In this section, we hope to give you some basic information as to how your new power amplifier can be mounted and installed as an integral part of your existing sound system. Also in this section, we'll run through the fundamental operating procedures to familiarize you with the controls and indicators on the D-75.

3.2 Installation

Angle brackets have been supplied for rack mounting the D-75 into a CROWN custom walnut cabinet, a standard Western Electric rack-style cabinet or a cabinet of your own design.

Sufficient ventilation must be provided for the unit to prevent it from overheating. Applications requiring long, sustained signals at high power-levels may require the use of a cooling fan. When rack mounting, it is a good practice to allow a 1¾" space above and below the unit. (See Figure 3.1 for mounting dimensions.)

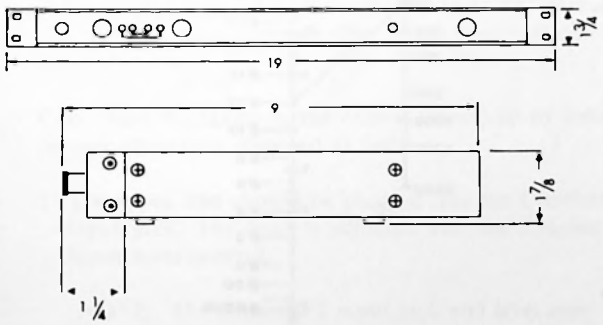


Fig. 3.1 D-75 Mounting Dimensions

3.3 Normal "Stereo" Installation

1.) Two conductor speaker cables must be connected to the output dual binding posts using terminal lugs, tinned ends, or "banana" plugs. See Fig. 3.3 to determine cable length, wire gauge, etc.

2.) Because the D-75 is a "basic amplifier" it must be used in conjunction with a "pre-amplifier." Using shielded audio-cables, connect the main outputs of the preamp to the ¼" phono inputs of the D-75.

The conjunctive cables should be tied in parallel along their entire length using the accessory cable ties.

3.) U/L requirements prefer a 3-wire AC power connector; however, proper connection to a switched outlet on the preamplifier requires the use of a 3-2 wire adapter.

4.) Removing the strap from between the two grounding screws on the rear panel provides isolation between chassis ground and electrical ground through a 2.7 ohm resistor.

5.) After your preamplifier has been turned on, advance the D-75 Input-Gain Controls about ½ open (150° clockwise).

When using the CROWN Straight Line Two preamplifier, the volume should attain almost full rotation (2 to 4 o'clock) for loudest "concert hall" volume. If at 3 o'clock the volume is low, increase the D-75 input gain controls, if too high, decrease the D-75 gains.

To assure maximum enjoyment and full speaker protection, read the following detailed sections on OUTPUTS, INPUTS, and LOAD PROTECTION METHODS.

3.4 Connecting Output Lines

Input and output connectors are located on the chassis as shown in Fig. 3.2.

It is always wise to remove power from the unit and turn the input level controls off while making connections,

Fig. 3.2 D-75 Rear Panel

especially if the load is a loudspeaker system. This will eliminate any chance of loud blasts. CROWN is not liable for damage incurred at any transducer to its being overpowered! The use of speaker fuses is recommended.

Before making connections, it is recommended that the operator familiarize himself with the amplifier's protective system. See Section 3.8. Section 3.9 entitled "Operating Precautions" should also be read.

Because the output wire gauge and length raises the resultant source impedance or lowers the Damping Factor by adding series resistance, the nomograph (Fig. 3.3) is provided for wire selection. For dynamic, moving-coil loudspeakers, the value R_L should preferably be that measured by an ohmmeter across the voice coil, rather than the manufacturer's rating. For electrostatic speakers and such, the manufacturer's rated impedance should be used for R_L.

If the load (matching transformer, inductance, or full-range electrostatic speaker system) appears as a short-circuit at low frequencies, a large non-polarized capacitor (paralleled with a resistor) should be placed in series with the load.

For electrostatic speakers (if the manufacturer has not provided a capacitor) an external non-polar capacitor of 590-708 mfd and 4 ohm power resistor should be placed in series with the Positive (+) speaker lead. This will prevent large low frequency currents from damaging the electrostatic transformer or from unnecessarily activating the D-75's protective system. An effective test to determine if such parts are needed is to measure the DC resistance between the output terminals with an ohmmeter. If the resistance is less than 3 ohms, the parts should be added as shown schematically in Fig. 3.4.

When selecting connectors for the load (speaker) end of the output lines, the following general precautions apply (with all power connectors):

1. A male plug, carrying signal, must not be on the far end of the line where it can be exposed, giving rise to both shock and short-circuit hazards.

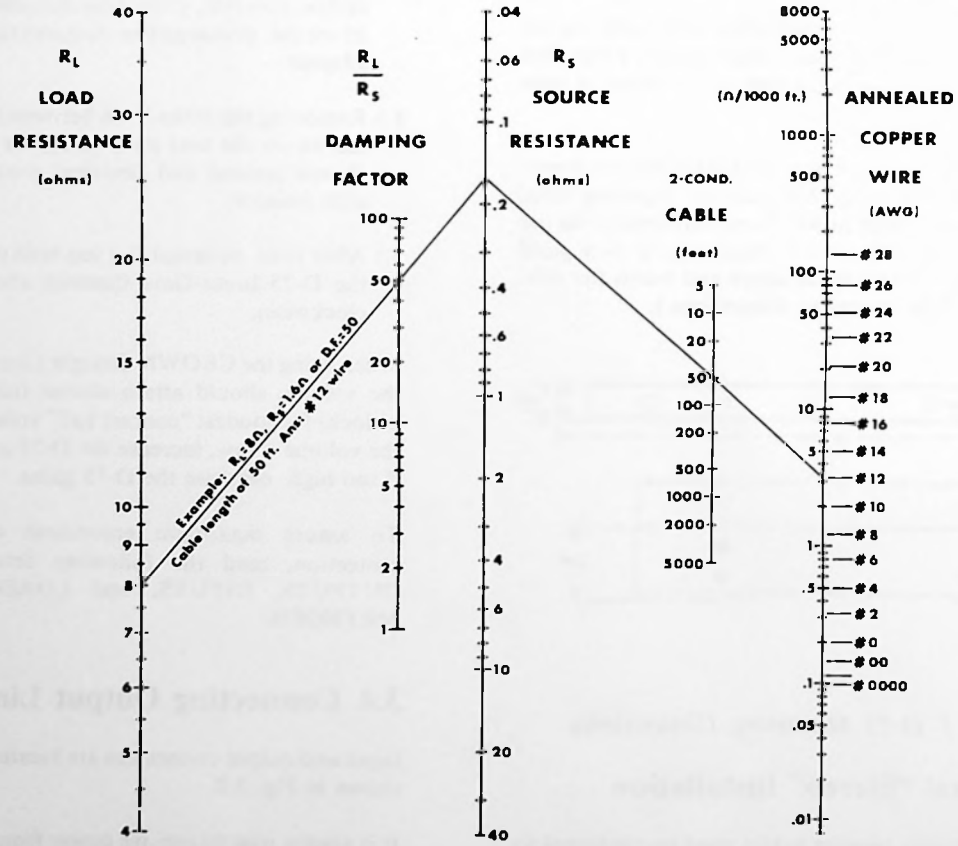


Fig. 3.3 Source Resistance and Damping Factor vs. Length and Size of Output Leads

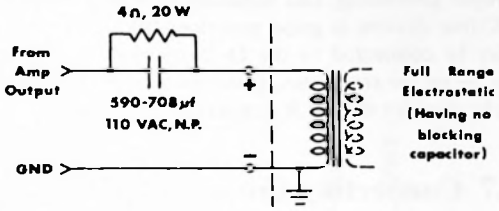


Fig. 3.4 Schematic for Full Range Electrostatic Speaker Connection

2. Connectors which might accidentally cause the two channels to be tied together during making and breaking of connection should not be used.

3. Connectors which can be plugged into AC power receptacles should never be used.

4. Connectors having low-current carrying capacity are "verboten."

5. Connectors having any tendency to short, or having shorted leads, are inadvisable.

3.5 Mono Operation

A mono-stereo switch on the rear panel adjacent to the input jacks, allows the D-75 to be operated normally (stereo) or in mono, with no internal modifications. (See Figure 3.5) When in the mono position, the input circuitry of the D-75 is changed so that the two amplifiers are "added" for mono output. (See mono specifications in Section 2.)

Care must be taken in the external hook-up to assure proper operation. Proceed as follows:

1. The input line should be plugged into the Channel 1 input jack. The level is adjusted with the Channel 1 input level control.

   NOTE: The Channel 2 input jack and level control are not defeated in the Mono mode. However, the Channel 2 input should not be used in this mode. If a Channel 2 input is added to the Channel 1 input, distortion may result. If Channel 2 input is used alone, very low power output will result. For best results, unplug the input to Channel 2 when operating Mono.

2. Connect output lines as per the following drawing Fig. 3.5. The output from the D-75 in Mono, is BALANCED and is isolated from the chassis, and from the input grounds to the D-75.

   CAUTION: Be certain that all equipment (meters, switches, etc.) connected to the Mono output lines is balanced. Both sides of the line must be totally isolated from the input grounds, to the D-75. If this is not observed, severe oscillation may result.

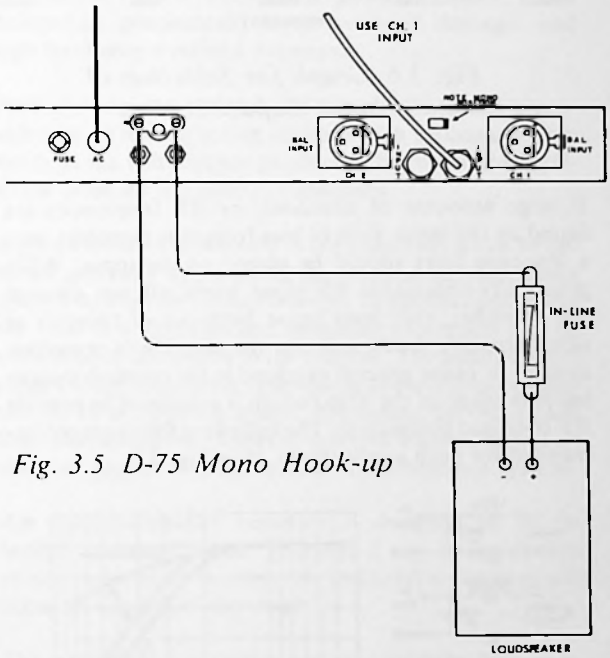


Fig. 3.5 D-75 Mono Hook-up

3.6 Connecting Input Lines

Connecting the inputs will require observance of three basic precautions: Undesirable signals to the inputs, "ground loops," and feedback from output(s) to input(s).

The D-75 has 600 ohm balanced inputs. These cannon XLR input connectors are wired with Pin 1 as ground, Pin 2 is positive (+) phase and Pin 3 is negative (-) phase.

In high-fidelity audio applications any good vacuum-tube or solid-state control center will operate successfully into the 25K ohm inputs of the D-75. Occasionally, a high-impedance output of poorly-designed preamps will be en-

countered, and/or a larger output coupling capacitor may be required (to prevent excessive low-frequency rolloff).

For loudspeaker-driving applications, the input should be free of large sub-sonic or undesired low frequencies, as they cause overheating and overloading of the loudspeaker. To remove such low frequencies, a series capacitor may be placed in the input signal line. (The graph of Fig. 3.6 indicates the effect of the size of the capacitor on the frequency response.) Only a low-leakage paper, mylar, or tantalum capacitor should be used for this purpose.

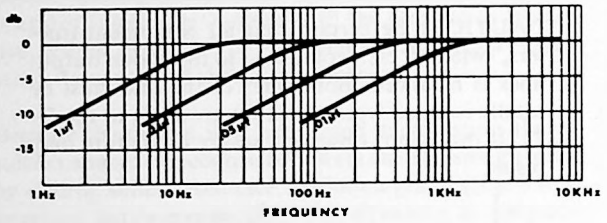


Fig. 3.6 Graph for Selection of Input Capacitor

If large amounts of ultrasonic or RF frequencies are found on the input, such as bias from tape recorders, etc., a low-pass filter should be placed on the input. While practically-obtainable RF input levels will not damage the amplifier, they may cause burn-out of tweeters or other sensitive loads, activate the amplifier's protective system, or cause general overload in the controlled-slewing-rate stage of the amp (which is employed to provide RF overload protection). The following filters are recommended for such applications. (See Fig. 3.7)

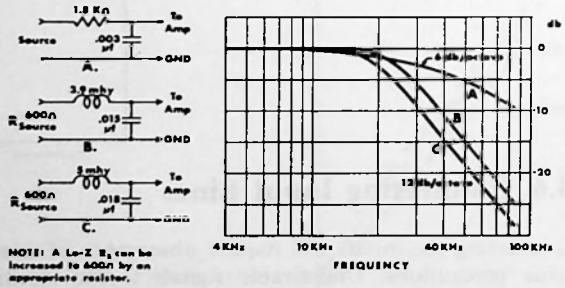


Fig. 3.7 Low-Pass Filters for Severe RF at Inputs

A second precaution is "ground loops" — electronic jargon for undesirable circulating currents flowing in a grounding system. A common form of loop (possibly resulting in hum in the output) is a pair of input cables whose area is subjected to a magnetic hum field. In practice, both cables should lie together along their length, and away from the power transformer. Tying the input and output grounds together may also form a ground loop.

A third precaution (with input and output grounds together, as in testing or metering) is feedback oscillation, from load current flowing in the loop. In industrial use, even the AC power line may provide this feedback path. Proper grounding, and isolation of inputs, of common-AC-line devices is good practice. BALANCED inputs may be connected to the D-75 through the XLR connector on the rear panel. Connecting inputs to the phone jacks disables the XLR connectors.

3.7 Connecting Power

The amplifier is furnished with a three-wire AC plug as standard equipment. Adapters are readily available commercially for adapting this to a two-wire system if necessary.

Isolating chassis ground from electrical ground is possible by removing a strap on the rear panel.

The D-75 power supply may be connected for any of five voltages. Converting from one to another can be accomplished with a soldering iron and a pair of wire cutters. Follow the table shown with the schematic, and the drawing below.

1) Remove the top cover of the D-75 (held on by 8 screws).

2) With the unit right side up, and the front panel toward you, locate the terminal strip on the front in the near right-hand corner.

3) Make the appropriate change in jumpers for the desired operating voltage. See Fig. 3.8.

4) Replace the 2 amp line fuse with a 1 amp type 3AG fuse, for all connections 200V and above.

5) Change the line cord tag to read the correct voltage.

When testing the amplifier, the line voltage must be the peak equivalent to a sinusoid of the indicated line voltage when at full load. Line regulation problems can introduce serious errors in the measurements on an amplifier.

Only a competent technician should attempt alteration of the line voltage connections.

The D-75 contains all the facilities essential for a high performance amplifier.

The input level controls are mounted on the front panel.

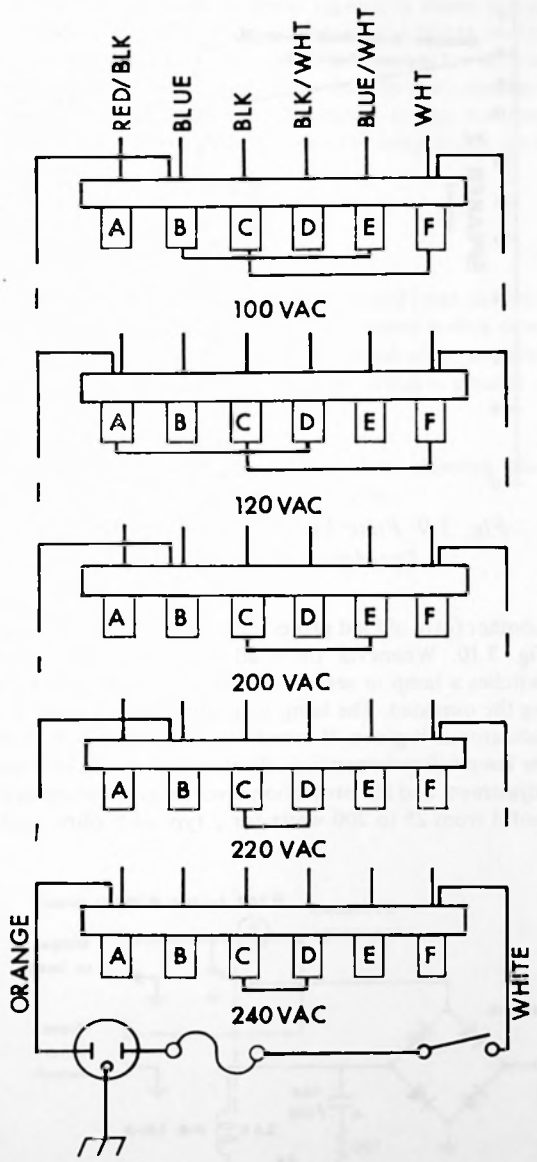


Fig. 3.8 Modifying AC Mains Voltage

Each control should be adjusted for the desired amplifier gain or output level. When the control is fully CW, the gain is 26dB as determined by precision 1% resistors in the D-75 feedback loop.

3.8 The Protection Mechanisms

The D-75 is protected against the common hazards which plague power amplifiers, including shorted, open, and mismatched loads; overloaded power supplies; chain destruction phenomena; input overload damage; and high frequency overload blowups.

Protection against shorted and mismatched loads is provided by an instant-acting limiter which instantaneously limits at the volt-ampere product to the maximum safe-stress value for the output transistors.

If a load initiates protection in the amplifier, it can be detected generally by watching the transfer characteristics of the amplifier on an oscilloscope. In applications where the load is a loudspeaker, amplifier protection will be evidenced by distortion in the speaker. The audible effect ranges from something resembling cross-overnotch distortion to a snapping sound, depending on the overall load characteristics. Speaker systems which are truly 4 ohms or greater will not initiate the protection system.

All voltage-amplifier circuitry is designed to be inherently current-limited. Thereby, if any of the devices should fail, (which is extremely unlikely) no damage will occur to the rest of the stages.

The input stage is protected against overdrive damage by a series limiting resistor should the input signal level ever become excessive.

The amplifier features a controlled slewing-rate which, coupled with the V-I limiter, protects the amplifier from blowups when fed large RF input signals.

3.9 Operating Precautions

The following are a number of operating precautions given as an aid to understanding proper and improper amplifier usage:

1. Use care in making connections, selecting signal

sources, and controlling the output level. The loudspeaker you save may be your own. CROWN is not liable for any damage done to loads due to careless amplifier usage or deliberate overpowering. For pointers on load protection, see Section 3.10.

2. Never parallel the two outputs by directly tying them together or by paralleling them with any other amp's output. Such connection does not result in increased power output. Damage incurred by such operation is not covered by the warranty.

3. Never drive a transformer-coupled device or any other device which appears as a low frequency short (less than 3 ohm) without a series isolating capacitor. Such operations may damage the device and/or needlessly activate the V-I limiting (see Fig. 3.4).

4. Do not short the ground lead of an output cable to the input signal ground as oscillations may result from forming such a ground loop.

5. Operate and fuse the amplifier only as set forth in Section 3.8.

6. Operate the amplifier from AC mains of not more than 10% above the selected line voltage and only on 50, 60 or 400Hz AC. Failing to comply with these limits will also invalidate the warranty.

7. Never connect the output to a power supply output, battery or power main. Damage incurred by such a hookup is not covered by the warranty.

8. Do not expose the amplifier to corrosive chemicals such as soft drinks, lye, salt water, etc.

9. The amplifier is not recommended for high power industrial usage at frequencies above 30KHz.

10. Tampering in the circuit by unqualified personnel or the making of unauthorized circuit modifications invalidates the warranty.

11. Do not expose the output leads to areas likely to be struck by lightning. Such an installation could invalidate the warranty.

3.10 Load Protection Methods

The most common of all protection schemes is a fuse in series with the load. The fuse may be single, fusing the overall system. Or, in the case of a multi-element speaker system, it may be multiple with one fuse on each speaker.

Fuses help to prevent damage due to prolonged overload, but provide essentially no protection against damage that may be done by large transients and such. To minimize this problem, high-speed instrument fuses such as Littlefuse 361000 series are most appropriate for such applications. For a nomograph showing fuse size vs. loudspeaker ratings refer to Fig. 3.9.

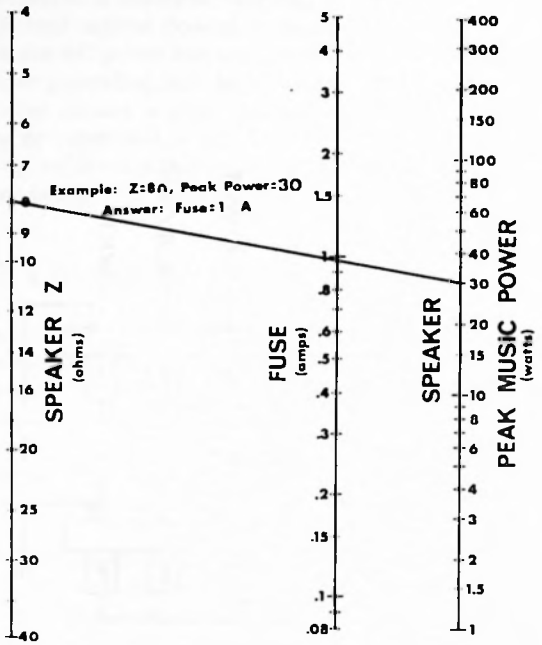


Fig. 3.9 Fuse Selector Nomograph for Loudspeaker Protection

Another form of load protector is shown schematically in Fig. 3.10. Whenever the load is over-driven, a relay switches a lamp in series with the load; smoothly relieving the overload. The lamp then doubles as an overdrive indicator as it glows. If overdrive is unreasonably severe, the lamp will serve as a fuse. By adjusting the relay tension adjustment and the protection level control, this system is useful from 25 to 200 watts for a typical 8 ohm load.

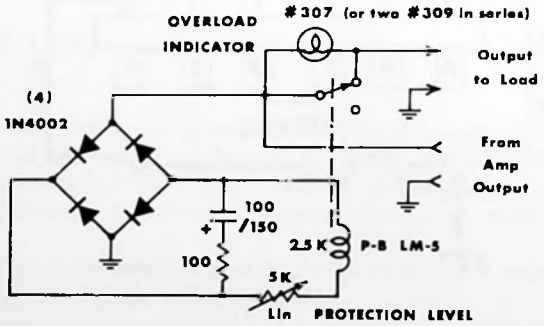


Fig. 3.10 Relay-Controlled Protector with Overload Indicator

A common problem which causes damage and irritation is the turn-on thump problem typical to many signal sources. Fig. 3.11 shows the schematic of a muter which, when inserted in the input signal line, mutes for several seconds before connecting the source to the amplifier, thereby eliminating turn-on transients. It also removes turn-off transients occurring after the relay drops open ($\approx$0.1 sec.).

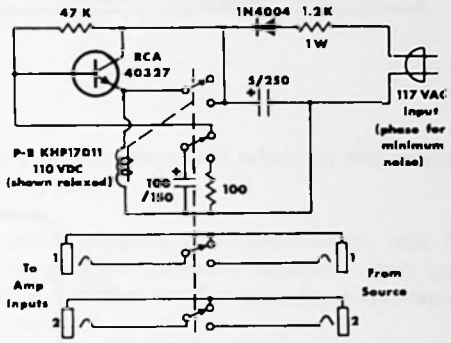


Fig. 3.11 Turn-On-Transient Muter for Load Protection

3.11 Cleaning

The CROWN D-75 has a rugged anodized front panel for life-time service. The panel can be cleaned with a moist cloth and mild detergent. Never use steel wool, scouring powder, lye solution, or any strong abrasive cleaner as these will damage the panel's finish.

The chassis should require no more cleaning than periodic dusting with a clean dry cloth.

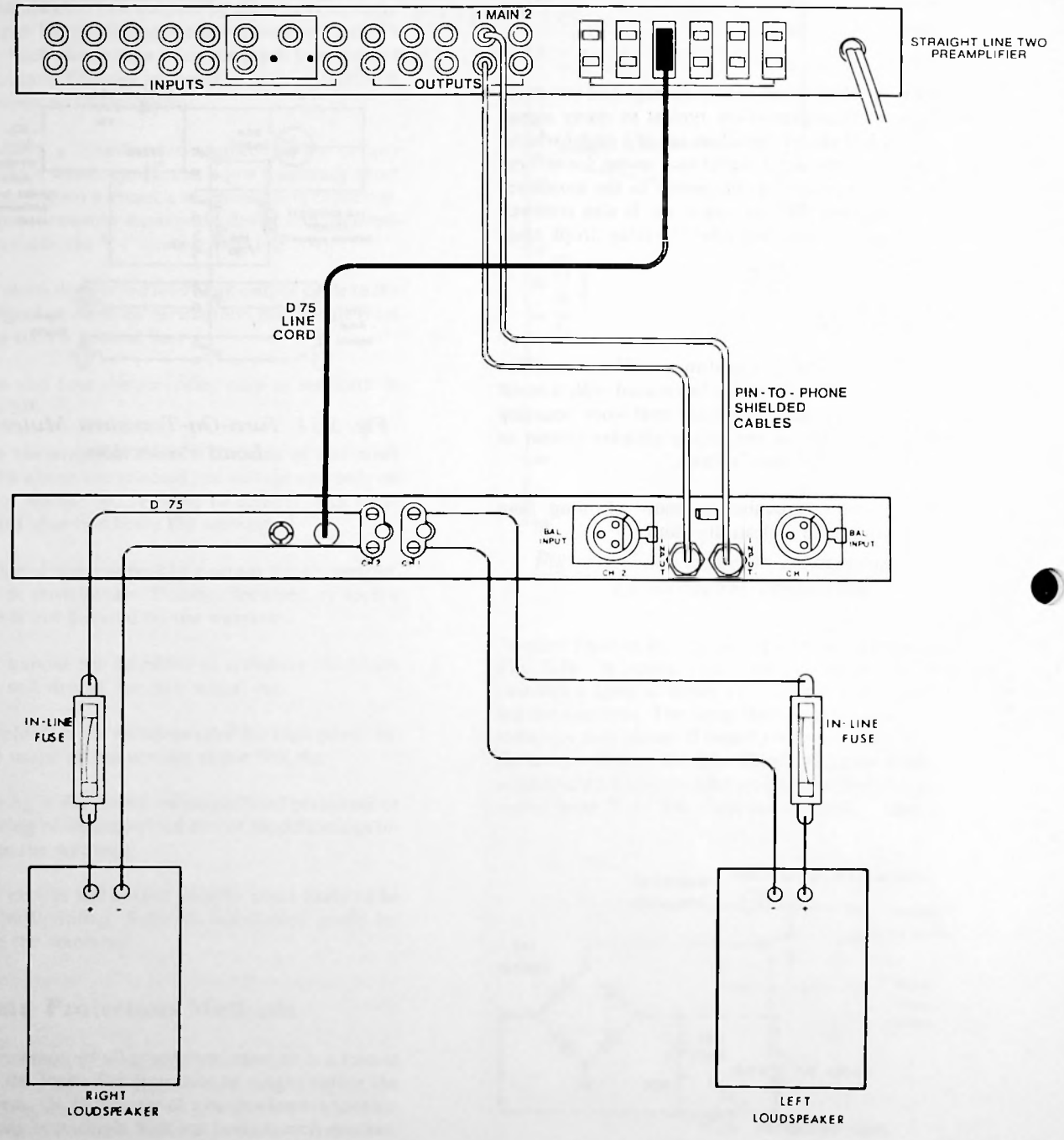


Fig. 3.12 Normal Hi-Fi Installation

SECTION 4.
PRINCIPLES OF OPERATION

4.1 General

The D-75 has two direct-coupled amplifier circuits which employ IC op amps and silicon transistors in all stages. The CROWN designed and developed circuit represents a level of quality and performance presently unequaled in the field of audio amplifier design.

4.2 Principles of Operation

The IC op amps are of a low noise type having a large gain bandwidth. The results of using them for the input voltage amplifier is that a maximum amount of feedback is applied reducing distortion to record low values. Multiple feedback loops are employed to allow a maximum of overall feedback.

The lack of noise is evidenced by a typical 20Hz-20KHz effective input noise of 1.25 microvolts which produces an effective 8 ohm output of 80 micromicro (pica) watts.

The output stage is a quasi-complimentary format employing the CROWN class AB+B technique which uses no bias current in the output transistors. The result is maximum efficiency with minimum crossover notch distortion and idling amplifier-heat. Thus there is no bias current adjustment, as the output circuit is not temperature-tolerance critical.

In the new output circuit, the driver transistors carry the bias current, while the output transistors serve only as boosters. The output transistors sense when the driver transistors are delivering significant current to the load and take over the deliver the large load currents.

The output circuit is protected by a V-I limiter which limits the drive to the output configuration whenever the output transistors are overloaded. V-I (volt-ampere) limiting is inherently superior to all other forms of protection as it directly senses the overload condition and acts instantly to relieve the overload, acting only so long as the overload exists. The result is complete freedom from program delays with reliability and maximum safe output power.

The power supply is a continuous-duty type. The main DC supplies are full-wave capacitor input type with a heavy duty bridge rectifier assembly and computer grade electrolytics.

The D-75 represents nothing short of the highest quality in both circuitry and components. It should provide a lifetime of trouble-free service for the most discriminating users.

4.3 Block Diagram Circuit Theory

When using the XLR BALANCED INPUT, two signals, 180° out of phase, will be introduced to the BALANCED INPUT circuitry. Here, the two signals are made to be in phase and are added together to become the output of the BALANCED input circuitry.

This combined signal is then fed to a stage of power amplification where it is boosted to a level of sufficient amplitude to drive an OUTPUT LOAD.

Also, a portion of the OUTPUT signal is routed to the IOC circuitry and to the SIGNAL PRESENCE circuitry.

In the IOC circuitry, the portion of the OUTPUT SIGNAL fed to this stage is compared to the signal at the input stage. Any non-linearities or discrepancies existing between these two signals will be analyzed and corrected by the sending out of a correction voltage to the proper circuit components and the IOC indicators on the front panel.

The other portion of the OUTPUT signal is fed to the SIGNAL PRESENCE circuitry. Provided the OUTPUT signal has an amplitude of at least 1 volt peak to peak, a DC voltage will be applied to the green SIGNAL PRESENCE indicators causing them to light.

The POWER SUPPLY exists to supply the proper voltages to the various circuit components within the amplifier.

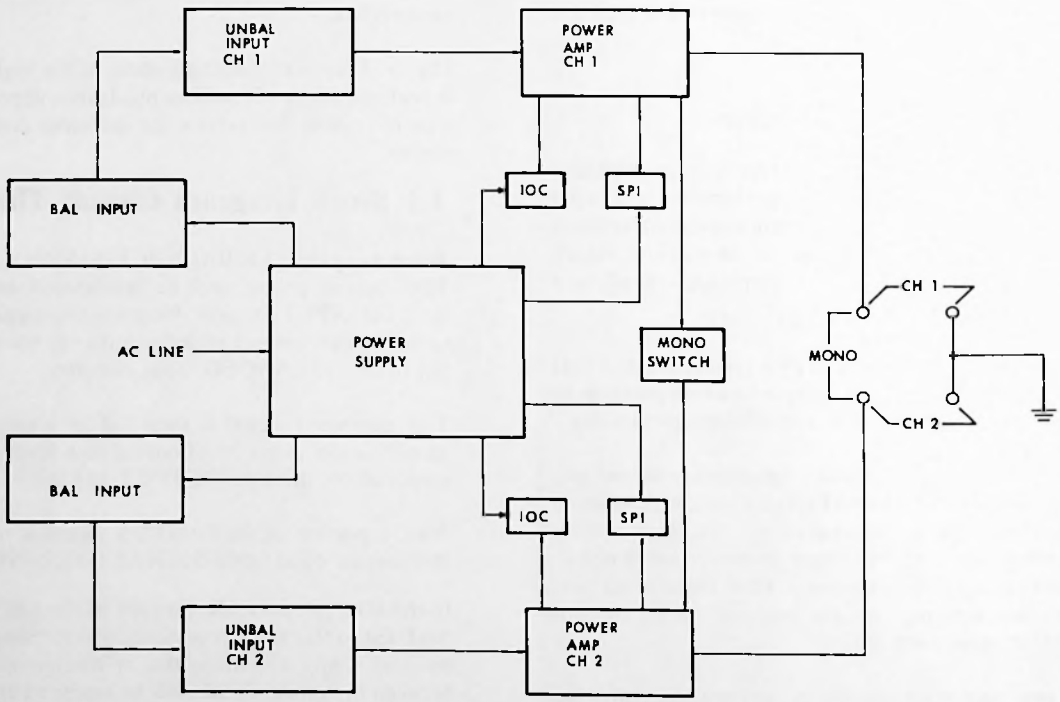
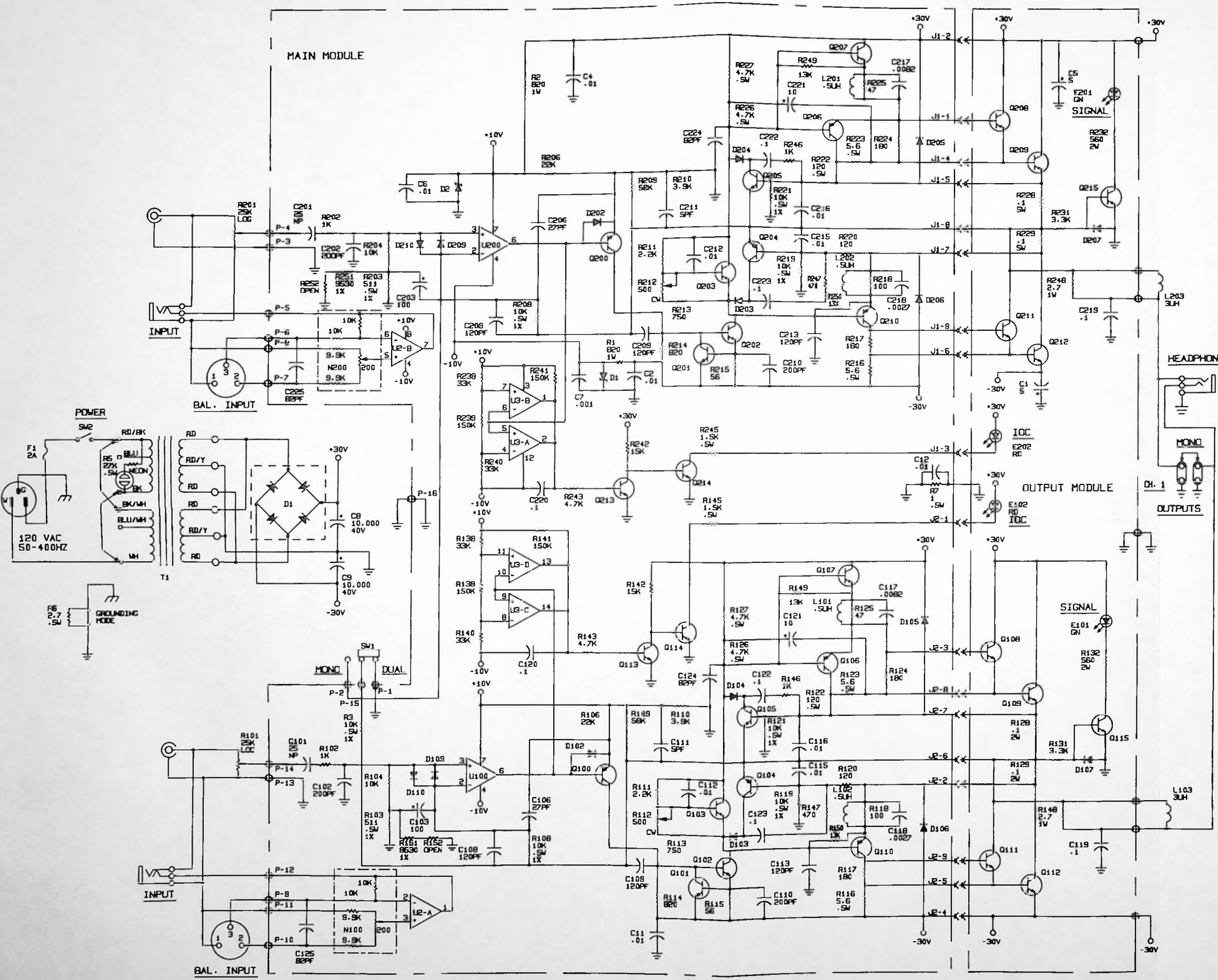


Fig. 4.1 Block Diagram

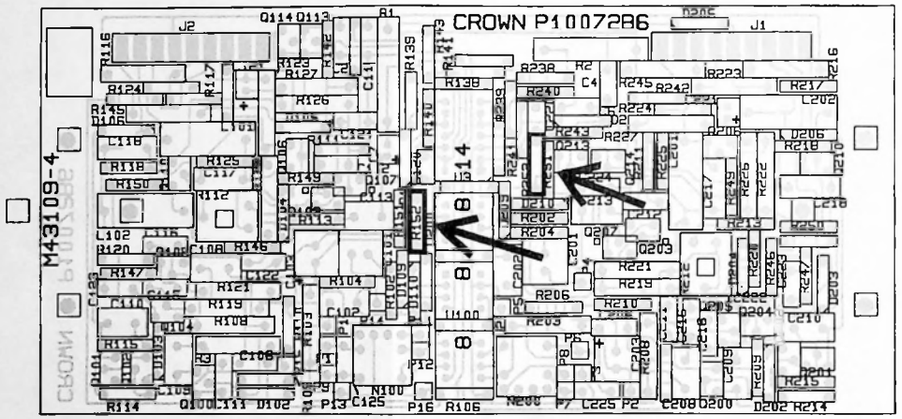


NOTE:
THIS IS A REPRESENTATIVE SCHEMATIC ONLY AND DOES NOT NECESSARILY REFLECT THE EXACT CIRCUITRY OF YOUR UNIT. PLEASE REFER TO THE RESPECTIVE SERVICE MANUAL FOR FURTHER TECHNICAL INFORMATION.

GENERAL:

- ALL RESISTORS IN OHMS, ALL CAPACITORS ARE IN MICROFARADS, UNLESS OTHERWISE NOTED.
- OUTPUT PC BOARD #9730 CONTAINS COMPONENTS FOR BOTH CH1 AND CH2, AND IT IS LOCATED ON THE FRONT PANEL HEAT SINK ASSEMBLY.
- MODEL 5507 CONTAINS BNC INPUT ONLY. MODELS 8404 AND D75 CONTAIN BALANCED AND UNBALANCED INPUT. THE BALANCED INPUT DOES NOT FUNCTION WHEN THE UNBALANCED INPUT IS USED.

D-75
J0116-4



The D-75 amplifier comes with an optional feature that increases the input sensitivity of the amplifier to allow a 0dBm (.775Vrms) input signal to drive the amplifier to full rated power. The feature is set up to be easily field implemented by either a Crown Warranty Service Station or by the user without voiding the warranty.

Modification Instructions

1. Disconnect the amplifier from AC power.
2. Remove the top cover via the six screws (three on each end of the unit). Next remove the bottom cover via the nine flat head screws holding it to the chassis. This will expose both sides of the main circuit board.
3. Solder #22 buss wire jumpers at the locations marked R152 and R252 on the main circuit board. A board layout with the jumpers locations indicated is provided for easy reference.
4. Reassemble the unit in reverse order of disassembly.

Specification Changes

Stereo Voltage Gain: 21.6 +/- 2% or 26.7dB +/- .02dB.
Monaural Voltage Gain: 43.2 +/- 2% or 32.7dB +/- .02dB.
Input Sensitivity: .775 volts +/- 2% for 35 watts into 8 ohms stereo or 70 watts into 16 ohms mono.

CROWN SHIPPING INSTRUCTIONS
FACTORY SERVICE

1. USE A STANDARD CROWN PACK

This method is the most reliable way of assuring the safe arrival of your unit to the factory. If you do not have a pack, simply call or write to the Crown Parts Department. Any other packing material, with the exception of polyurethane and wooden crates, will not be sufficient to withstand the "stress" of shipping. DO NOT USE SMALL SIZE, LOOSE PACKING MATERIAL.

2. SEND ONLY YOUR UNIT

Extensive damage will occur if the unit is shipped in any kind of cabinet (wood or metal).
ACCESSORIES ARE NOT NEEDED!
Do not send the instruction manual, power cord, cables, rack mount brackets, etc.

3. TAPE RECORDERS

Send the entire unit mounted on proper length angle iron braces.
Do not send accessories that do not pertain to the repair. Reel knobs, hub adaptors, instruction manual, power cord are not needed.
Again, please use a Crown Shipping Pack.

IF YOU HAVE ANY QUESTIONS, PLEASE CALL OR WRITE THE CROWN FACTORY SERVICE DEPARTMENT.

Detach and send in with unit.

SERVICE INFORMATION

Crown International, Inc.
1718 West Mishawaka Road
Elkhart, Indiana 46517
(219) 294-5571

Owners Name _____

Address _____

Unit Model _____ **Phone No.** _____

Serial No. _____ **Purchase Date** _____

NATURE OF PROBLEM

(Include condition under which problem occurs and what has been done to try to correct it.)

_____

_____

_____

Additional Information *(Tape Type, Speeds, etc.)* _____

_____

Other Equipment in the System

_____

_____

If warranty is expired, will the return shipment be: ☐ **Prepaid**
☐ **C.O.D.**

ENCLOSE THIS WITH UNIT
DO NOT SEND AHEAD