# OPERATOR'S MANUAL LA-1000A Ppos. Switch

# PORTABLE KILOWATT SSB or CW QSK AMPLIFIER



# Amp Supply Co.

### IMPORTANT NOTICE

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PC-1 thru PC-4 have been eliminated on all current models LA-1000 A and LA-1000 NT. This owners manual shows these parts in the schematic and in interior photograph.

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#### DANGER

This electronic equipment operates at high voltages and frequencies. Therefore, contacting the internal parts of this amplifier, the power supply cable, the antenna or other dangerous parts can cause serious or fatal injuries.

Only persons knowledgeable and qualified with this electrical equipment and the hazards involved should install, operate, or service this unit and associated accessories.

#### INTRODUCTION

#### General

The LA-1000A is a compact 1200 w PEP linear amplifier covering the 15 through 160 meter amateur radio bands. This rugged unit can also operate at 700 w CW and 500 w RTTY and SSTV.

This quality amplifier uses four 6MJ6 power tubes connected in a grounded-grid configuration. It will work into a wide range of antenna impedances, from 50 to 70 ohms with SWR or 2:1 or less. For impedances outside this range, an Amp Supply AT-1200 Antenna Tuner is recommended. The LA-1000A also features a self-contained power supply and a meter for indicating plate current and voltage.

The unit will operate from 117 vac or 230 vac by jumper reconnection, 50/60 Hz.

Please read and understand this manual before putting your new LA-1000A on the air.

#### SPECIFICATIONS

Frequency Coverage:

80 40 30	meter meter meter	band band band		3.5 7.0 10.1	to to to	2.5 MHz 4.5 MHz 7.3 MHz 10.15 MHz position)
20 15	meter meter	band band	-	14.0 21.0	to to	14.350 MHz 21.450 MHz 30 MHz

\* This band supplied only on amplifiers shipped outside the U.S.A. A modification kit may be purchased from Amp Supply for a nominal fee and a copy of your amateur license.

Power Requirements: 234 volts, 7.5 amp, 50/60 Hz; or 117 volts, 15 amp, 50/60 Hz.

Plate Power Input: SSB: 1200 w PEP CW: 700 w RTTY and SSTV: 400 w

QSK:

Full break-in CW.

Drive Power: Typically 100 w PEP; 150 w maximum.

Input Impedance: 50 ohms tuned input, low-pass, pi-network type.

Output Impedance: Adjustable pi-network matches 50 to 70 ohm with SWR of 2:1 or less. Harmonic Radiation: less than -40 dB.

Intermodulation Distortion Products: In excess of -30 dB below PEP.

#### Tubes:

Four 6MJ6, included with amplifier.

Dimensions:

11-in. high x 5-in. high x 9-3/4-in. deep.

Weight:

24 pounds.

#### **UNPACKING**

Carefully unpack the LA-1000A and examine the contents for any evidence of shipping damage. If any damage is discovered, notify the transportation company that delivered the equipment. Be sure to keep the carton and packing material for examination by the transportation company.

We suggest you keep the carton and packing even it no shipping damage occurs. The original carton may be useful for repacking the equipment for storage or returning the LA-1000A to the factory if service is ever required.

Remove the 12 screws holding the top cover in place. Remove the packing material located over the tubes and under the tuned input PC board. Assure all tubes are seated in their sockets.

Replace the top cover with the vent holes near the rear.

#### DANGER

Do NOT operate this amplifier outside of its cabinet or with any part of the cabinet removed. The unit, when operating, contains dangerous voltages, and contact with these voltages can be fatal.

#### INSTALLATION

#### WARNING

For proper operation of the cooling system, the LA-1000A must be placed on a flat, smooth surface. Do NOT operate on a surface such as carpeting as this will impead the air flow through the cooling holes located in the bottom of the chassis. Without this proper cooling, the unit can be damaged and cause possible electrical shock.

#### DANGER

Do NOT connect power to the unit until all internal connections are completed, the cabinet cover has been replaced, and all external connections have been completed as described in this manual. Failure to follow these practices can result in serious or fatal injury. The LA-1000A is factory wired to operate from 117 vac. If 234 vac operation is desired, and this input power will provide the best performance, rewire the power transformer primary connection as shown in below. The terminal strip is located in front of the power transformer on the chassis, Page 4.

NOTE: Remove the undesired jumper before installing the new jumper.





117 vac Connection

234 vac Connection

Power Transformer connections for operation on 117 or 234 vac.

When the LA-1000A is operated on 117 vac, number 12 wire should connect the outlet to the fuse box. This wire size is required to prevent a significant voltage drop.

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The QSk is not connected at the factory. If you wish to use the amplifier for QSK, locate the 3-lug terminal strip between the fan and the relay. (See the figure below.) ATTACH a jumper as shown.



Position the LA-1000A so the rear is at least 1 inch from a wall and the bottom of the unit is clear of all obstructions. This will assure adequate air circulation.

Connect a wattmeter and a 50-ohm load to the RF OUT connector using RG-8U, 52-ohm coaxial cable, or its equivalent.



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#### CAUTION

Never attempt to operate the LA-1000A without first connecting it to an antenna or 50-ohm dummy load of sufficient power handling capacity or serious damage may result.

Connect the LA-1000A RLY connector to your exciter using shielded cable. The LA-1000A requires a closed contact for keying. Consult your exciter manual for proper connection.

Connect the LA-1000A RF IN connector to the exciter RF output using a 52-ohm coax, RG58 or its equivalent.

Connect a good earth ground to the LA-1000A GND connector. For best protection, the ground lead should be as short as possible.

Assure the proper jumpers are installed for the ac power operating voltage (Page 3) and the cover is replaced; then plug in the ac power cord.

#### OPERATION

#### Front Panel Controls

PWR -- opens and closes the incoming ac power to the power supply transformer.

OPT-STY -- selects operate or standby modes. In OPT the RF IN jack is connected through the LA-1000A amplifier section and the amplified signal is fed to the RF OUT jack. In STY, the RF IN is connected directly to RF OUT such as when the transceiver is in a receive mode.

MTR -- switches the meter to indicate plate voltage (V) or plate current (1).

BAND -- selects the operating frequency range. The panel legend indicates the lowest frequency within each band. (Use the 7 MHz position for both the 30 and 40 meter bands.)

PLATE -- tunes the tank circuit for optimum conditions by adjusting a variable capacitor.

LOAD -- adjusts a second variable capacitor to match the plate tank circuit impedance to the antenna or dummy load impedance.

#### CAUTION

Before applying power, assure the amplifier cover is in place and secured with all the screws, and assure all connections are completed according to the previous sections of this manual.

Then, plug the unit into a power source with the voltage for which the transformer is connected.

Turn the PWR switch to the ON position.

Switch the OPT-STY switch to the STY position.

Allow 3 minutes for warm-up before applying drive power to the LA-1000A.

Set the MTR switch to V (volts). The plate voltage meter should read approximately 1200 vdc.

Set your exciter to the Tune or CW mode as stated in your exciter manual.

Reduce the CW output using the carrier or CW level control on your exciter. Unkey your exciter.

NOTE: Never keep the LA-1000A keyed at full continuous output for longer than 15 seconds without allowing equal cool-down time.

Switch the OPT-STY switch to OPT position.

Reset the LA-1000A MTR switch to the I (current) position. Key your exciter and begin to increase the CW carrier level until the meter reads approximately 300 ma. Quickly turn the TUNE and LOAD controls for maximum output on your wattmeter. Continue to increase your exciter output until you reach approximately 600 ma (.6 a x 1166 v = 700 watts dc input.) Quickly adjust the TUNE and LOAD for maximum output of this level. To operate SSB, tune the LA-1000A as stated above. When fully tuned in CW, simply change your exciter to SSB. No further adjustments to the LA-1000A are required.

To operate on the new 30-meter band, place the LA-1000A band selector on the 7 MHz position.

#### THEORY OF OPERATION

After the LA-1000A has been installed according to the instructions, and power is applied, S1 is used for initial turn on. AC is applied to T1, the main power transformer, and to the fan, B1. The three secondary windings of the transformer produce filament voltage (6.3 v), relay control voltage (12 v), and HV. The 12-v dc is developed by a half-wave rectifier. When power is applied, meter lamp X1 and LED 1 (internal part of S1) will light.

Closing S2 applies 12 v to the relays (RL1-5) in the ATI-6 tuned input, the QSK module, the XMT lamp (X2) and the LED 2 (internal part of S2).

The high-voltage section consists of eight diodes in a bridge circuit. Each diode (D3-10) is rated at 3-amp, 1000-piv and is in parallel with a 0.01-uf capacitor (C11-18) for transient protection. For filtering, 3, 125-uf, 500-v capacitors (C21-23) are used in series. Each has a 100K-ohm 2-w bleeder resistor (R4-6) in parallel.

#### RF OPERATION

When S2 is in the OPT mode, 12 v is applied to the tuned input relays, the QSK module and the transmitter light. The band switch selects a ground path for one of the tuned input relays, allowing the proper section to be placed in series with the RF path. When the exciter is keyed, it provides a closed circuit for the transmitter lamp and the QSK module. The QSK module, in turn, keys the antenna relay RL-1.

RF from the exciter flows into J1, through the proper input circuit, through C4, to the cathodes of tubes V1-V4. Diode D2 provides bias for the tubes.

A safety fuse is installed in your new LA-1000A amplifier. The fuse is in series with the zener diode. This will prevent a diode failure in the event the tube would flash. New vacuum tubes occasionally will flash over. With the new fuse installed, if this should happen, the zener is protected. The fuse is located on the chassis just behind the power transformer. The value of this fuse is 1 amp fast blow. An indication of a blown fuse is zero plate current in the transmit mode. Simply remove the top cover and replace the defective fuse. Thank you for purchasing your new LA 1000A.

PC 1-4 are parasitic chokes. The RF comes from the tubes, through C25 to the tank circuit L1, L2, C26, C27. The tank is tuned for maximum transfer of RF to the antenna through J3. RFC 3 protects the antenna from dc potential.

#### MAINTENANCE

When operated according to the instructions in this manual, your LA-1000A should require very little, if any, maintenance. The 6MJ6 tubes will provide thousands of hours of service. Deterioration of a tube will generally be indicated by a change in idling current or inability to draw normal plate current, or both characteristics.

In the grounded-grid circuit used in the LA-1000A, it is not necessary to match the 6MJ6 tubes.

Should you desire factory servicing for your LA-1000A, it may be returned to Amp Supply Company for checking and alignment. Any repairs will be made on a time and material basis.

Be sure to insert packing materials above the tubes and under the tuned input PC board. Also, it is recommended that the unit be shipped in the original shipping carton.

Please write or call the factory for authorization before returning your unit.

Renewal parts may be obtained from the factory for a nominal cost. Parts, listed on Page 8, should be ordered by designation, description, your amplifier serial number, and state that the parts are for an LA-1000A Amplifier.



Drawing Symbol	Description	Drawing Symbol	Description
B1 C1-19 C20	Blower •01uf 1 Kv 1000uf 25 v	RFC1 RFC2 RFC3	Cathode choke Plate choke 2.5 mH
C21-23 C24 C25	125uf 500 v .001uf 5 Kv .001uf 7.5 Kv	R1, R2 R4-7 R8 R9, R10	1K 1/4 w 100K 2 w •4 ohm 1% Factory selected
C26 C27 C28-29 C30	250 pf variable 1100 pf variable 200 pf 5 Kv	RL1 S1, S2 S3	TPDT 12 v DC SPST Toggle SPDT Rotary
C31-32 D1, D3-10 D2	1500 pf Dm 19 220 pf Dm 19 3A 1000 piv 1N3321	S4 T1 X1 X2	Band Switch Power Tranformer Meter Lamp 12 v Xmit Lamp 12 v
F1 F2 J1, J2	15 A Fuse (10A - 220 v) 1 A fuse S0239 Connector	V1-4	6MJ6 Tubes
J3, J4 L1 L2	RCA Connector Tank Coil (30 MHz - 14 MHz) Tank Coil (1.8 MHz - 14		<u>ATI-6</u>
LED1, LED2	MHz)	C1-10 C11-18	Trimmer Capacitor Factory Selected Padding Caps
M1 PC1-PC4	S1, S2 Plate meter Parasttic choke	L1-L5 RL1-5	Input Coils DPST - 12 v dc

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Amp Supply Company warrants to the original purchaser that this product shall be free from defects in material (except tubes and RF output transistors) or workmanship for ONE (1) year from the date of original purchase.

During the warranty period, the Amp Supply Company or an authorized Amp Supply Company service facility will provide free of charge both parts (except tubes and RF output transistors) and labor necessary to correct defects in material or workmanship.

To obtain such warranty service, the original purchaser must:

- (1) Complete and send in the Warranty Registration Card.
- (2) Notify Amp Supply Company or its nearest authorized service facility, as soon as possible after discovery of a possible defect, of:
  - (a) The model number and serial number, if any;
  - (b) The identity of the seller and the approximate date of purchase;
  - (c) A detailed description of the problem, including details on the electrical connection in associated equipment and the list of such equipment.
- (3) Deliver the product to the Amp Supply Company or the nearest authorized service facility, or ship the same in its original container or equivalent,

fully insured and shipping charges prepaid.

Correct maintenance, repair and use are important to obtain proper performance from this product. Therefore, carefully read the Instruction Manual. This warranty does not apply to any defect that Amp Supply Company determines is due to:

- Improper maintenance or repair, including the installation of parts or accessories that do not conform to the quality and specifications of the original parts.
- (2) Misuse, abuse, neglect or improper installation.

(3) Accidental or intentional damage.

All implied warranties, if any, terminate one (1) year from the date of the original purchase.

The foregoing constitutes Amp Supply Company's entire obligation with respect to this product, and the original purchaser and any user or owner shall have no other remedy and no claim for incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

This warranty gives specific legal rights and you may also have other rights which vary from state to state.

# Amp Supply Co.

208 Snow Avenue RALEIGH, NORTH CAROLINA 27602 (919) 821-5518

### AMP SUPPLY COMPANY 208 Snow Ave. Raleigh, NC 27602

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Parts List Parts .486

STOCK #	DESCRIPTION	PRICE	STOCK #	DESCRIPTION	PRICE
ELECTROL	YTIC CAPACITORS		COILS		
	25 UF 500 VOLT DC CAN TYPE	<b>\$ 11.95</b>	VAR.	TOROIDAL TUNED INPUT COILS	
0121 1	60 UF 450 VOLT DC COMPUTER GRADE , Sorev	J 12.95	· · · · · · · · · · · · · · · · · · ·	(SPEC. FREQ)	\$ 4.25
0124 2	200 UF 25V	/	0072	TANK COIL 40-160 MTR. FOR SWEEP	
0125 1	00 UF 50V	J 1.25		TUBE AMP	24.50
BLODD			0074	FTC-1 FINAL TANK COIL FOR 3-500, 4-400,	
DIODE	17777.0.4	1.35		8877,572B 2KW 160-40 MTR	37.50
0202	1KV 3A	.72	0086	FTC-2 TANK COIL 20-10 MTR #8	
0204	IN4007	.12		TINNED WIRE	6.50
0212	IN34/60/295	9.50	~0076	B&W 850A, 852 TANK COIL AND SWITCH	89.50
0208	ZENER 8.2V 50W (IN3308)	12.50	0076/0064		139.50
0206	ZENER 21V 50W (IN3321)	12.50	0082	FTC-3 10-20 MTR. COIL 3/16"	
0207	ZENER 27V 50W (IN3323)	12.50		SILVER TUBING	22.50
SWITCHES			PLATE VAR	RIABLE CAPACITORS	а 1
0552	FOR CLIPPERTON L BAND SWITCH, OR FOR		0134	A250-75 250PF 3.5KV	35.00
	572B'S, 811A AND SWEEP TUBES	59.50	0142	A225-120 225PF 4.5KV	45.00
0578	SAME AS ABOVE #551 NON-SHORTING		0132	A232-45 250PF 2.2KV	32.00
0555	1500 WATT LEGAL LIMIT BAND SWITCH		້ 0136	A500-45 500PF 2.2KV	37.00
	HEAVY DUTY SILVER CERAMIC		0174	80-APL-50-DE FOR NO-TUNE PLATE	
	(USE UP TO 4KW)	104.50		CAP 3.3KV	<b>29.00</b>
0568	BD-6 PLANETARY BALL DRIVE FOR			ARIABLE CAPACITORS	42.00
	VARICAPS, 6:1 RATIO	10.50			
0556	SPST ROCKER SWITCH — UNLIT	6.95	0130	A1100-53 1100PF 3 SECTION 1.2KW	28.50
0557	SPST ROCKER SWITCH W/NEON LITE	8.95	0140	A1000-32 1000PF 2.5KW	44.00
° <b>056</b> 0	DP ROTARY 2 TO 6 POS	6.95	0180	32-APL-105 LOADING FOR NO-TUNE AMP	29.95
0564	CERAMIC HI/LO SWITCH FOR		PLATE CHO	IKES	
	CLIPPERTON L	22.50	0080	PC500-2A USE WITH SWEEP TUBES 3 %"	18.00
0580	SPDT ROTARY — 2 POS PHRENOLIC	5.50	0056	PC-1000-2A USE WITH 3-1000 4-1000 8877 3-	
0582	2 POS TOGGLE LA ON/OFF	5.50	Vuau	5002 3CX800 ETC.	22.00
0558	2P TOGGLE OLD LA ON/OFF	5.50	0052	PC2000-2A USE WITH AMPS UP TO 5KW 6"	29.80
TUNED OU	TIDITT			5	20.00
1235	ATI-6 COMPLETE PC BOARD W/6		FILAMENT		
1200	TOROIDAL COILS, 12 TRIMMER CAPS, 6		<b>007</b> 0	FC30A 30 AMP CHOKE ON FERRITE CORE	14.50/65
	DPDT RELAYS FULLY ASSEMBLED,		PLATE CAP		
	TUNEABLE 1.8 - 30 MHZ, MATCHES ANY		0282	PC500-1 ALUMINUM HEAT SINK 3-500Z	8.95
	AMPLIFIER 64 x 34 12VDC	89.50	0282	PC811-1 USE WITH 811A, 572B ALUMINUM	12.50
			0286	PC-SWEEP USE WITH SWEEP TUBES	.90
TUBES			0200	10-SWEET USE WITH SWEET TODES	.00
0352	3-500Z TUBE — EIMAC -	109.50	SOCKETS	1	
0358	811A TUBE	24.50	0502	SC500-1 JOHNSON 122-0275-001 USE WITH	
0356	572B TUBE -	87.00		3-500, 4-400 ETC.	34.00
0366	3CX800A EIMAC	2,99.00	0506	SC811-1 SOCKET FOR 811A, 572B	3.25
•	8875 TUBES	325.00	0510 -	SC1000-1 SOCKET 3-1000, 4-1000	68.00
•	8874 TUBE	335.00	0512	SAF-500 3-500 AIR FLOW SOCKET	68.00
0360	8877 TUBE	695.00	9508	SC8877 8877 SOCKET	103.50
0354	6NH6 TUBE	13,45	0516	TR8877 8877 JUBE RING	99.50
	E SPECIAL ORDER ITEM — MANY TUBES NOT			۲. «۲۰	
LISTED BU	<b>JT AVAILABLE UPON REQUEST !!</b>				

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STOCK	# DESCRIPTION	PRICE
RELAYS		
0120 -	125 UF 500 VOLT DC CAN TYPE	<b>\$</b> 11.95
0302	125 UF 500 VOLT DC CAN TYPE RL2P1 2PDT 12VDC ANTENNA RELAY BL3P1 3PDT 12VDC ANTENNA AND	14.50
0304		
	BIAS RELAY	1650
0306	RR1 SPST REED RELAY 12 VDC PC MOUNT	7.95
0314	VACUUM RELAY JENNINGS	104.50
0310	TIME DELAY TUBE 3 MINUTES 12 VOLT	65.00
0311	TIME DELAY TUBE 3 MINUTE 6 VOLT	65.00
0313	TIME DELAY TUBE FOR MLA-2500	<u>65.00</u>
0315	TIME DELAY TUBE FOR DTR-2000 5N0/80	
0316	SOLID STATE TIME DELAY MODULE 12 VOLT	37.50
METERS	5	
0572	0-1000 MA. LK SERIES (CURRENT)	37.50
0674	0-350 MA./0-3500 VOLT DUAL SCALE	
	LK SERIES	37.50
0680	0-2000 MA. LK SERIES	37.50
0654	0-1500 VOLT/O-1000 MA. LA SERIES	37.50
0682	0-1.5 AMP PLATE CURRENT AMP SUPPLY	
	EARLY 500 SERIES	37.50
0684	0-3000 VOLT METER EARLY LK SERIES	37.50
0658	0-5000 VOLT DC PANEL METER	49.50
CERAMI	C LOADING & COUPLING CAPACITORS	
0118	CC1000 1000PF 5KV DOOR KNOB	9.95
0116	CC500 470PF 7KV CERAMIC TEFLON DISC	4.75
0112	CC100 100PF 7KV CERAMIC TEFLON	4.75
0104	1000 PF 12KV CERAMIC TEFLON DISC .00	5.75
0182	180 PF 5 KV CERAMIC DISC	3.95
ROLLER	INDUCTOR	
0078	R128 28UH CERAMIC W/SILVER ROLLER	55.00
0566	B&W3902-1 CYCLOMETER COUNTER-TUNING	69.50
TDANCE	ORMERS	
0606	LA, GLA OR SWEEP TUBE POWER XFMR	
0000	INCLUDING FILAMENT AND	
	CONTROL VOLTAGE	107.00
0620	HIPERSIL POWER TRANSFORMER	107.00
	LK 500 SERIES	230.00
0610	FILAMENT 5 VOLT CENTER TAP 30 AMP	49.50
0626	HIPERSIL INTERNAL LK-800 STYLE	230.00
0628	FILAMENT LK-800 STYLE 3CX-800'S	65.00
0632	LK-500 EXTERNAL HIPERSIL	310.00

STOCE	# DESCRIPTION	PRICE
AMPLI	FIER POWER SUPPLY	
1207	APS-1 3000 VOLT POWER SUPPLY COMPLETE	
	3000VDC/1AMP PEAK, 12V DC/2AMP -	
	INCLUDES HIPERSIL TRANSFORMER	
	COMPLETE WITH ALL DIODES AND	
	COMPUTER GRADE ELECTROLYTICS	
	COMPLETELY ASSEMBLED PC BOARD	\$379.50
RESIST	ORS	
VARIO	USALL 1/2 WATT	.50
• •	ALL 2 WATT	.87
	ALL WIRE WOUND UP TO 10W	3.00
	SHUNTS	4.25
	ALL PRECISION RESISTORS UP TO 2 WATT	4.79
	100 WATT 50 OHM NON-INDUCTIVE	
	DUMMY LOAD	12.00
	275 WATT 50 OHM NON-INDUCTIVE	
	DUMMY LOAD	29.50
	PARASITIC CHOKES MADE TO ORDER	4.75
	ERS CAPS	•
0127	#426 TRIMMER 57-250 PF CAP 175 VOLT	5.25
0126	#427 TRIMMER 75-300 PF CAP 175 VOLT	5.25
CAPAC	ITORS	
0102	.01 1 KV CERAMIC DISC	.79
0144	68 PF SILVER MICA 500 VOLT	2.00
0146	150 "	2.00
0148	220 "	2.00
0150	330 "	2.00
0152	<b>68</b> 0 "	2.00
0154	820 *	2.00
0156	1000 PF SILVER MICA 1000 VOLT	2.75
0158	2400 PF SILVER MICA 1000 VOLT	2.75
0160	2500 PF SILVER MICA 1000 VOLT	2.75
CABIN	ETS AND COVERS HARDWARE INCLUDED	~
756/854	4 5" x 11" x 10" DARK GRAY	24.50
758/85	6 6" x 12" x 12" DARK GRAY	32.50
MISC.		
AMP SU	JPPLY MANUAL	5.00
DENTE	ON MANTIAL	5.00
1	sets for 800 tubis	24.00
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#### SERVICE DEPARTMENT

LK-800 EXTERNAL HIPERSIL

AMP SUPPLY WILL SERVICE ANY AMATEUR AMPLIFIER FOR A FIXED FLAT RATE OF \$89.50 PLUS PARTS AND FREIGHT

ALL TRANSFORMERS ARE SHIPPED WITH SHIPPING CHARGES ADDED

89.50

#### SHIPPING POLICY

0630

\$4.00 SHIPPING AND HANDLING CHARGE ADDED TO ALL ORDERS SHIPPED IN THE CONTIGUOUS UNITED STATES COD \$2.50 ADDED FOR COD RETURN POLICY - PRODUCT MAYBE RETURNED WITHIN TEN DAYS IF IN UNUSED AND BRAND NEW CONDITION - A 15%

305.00

**RESTOCKING CHARGE WILL BE CHARGED.** 

AMP SUPPLY CARRIES JUST ABOUT ANY AMPLIFIER OR TUNER PART NEEDED CALL OR WRITE:

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AMP SUPPLY CO. **PO BOX 147** 208 SNOW AVE. RALEIGH, NC 27602