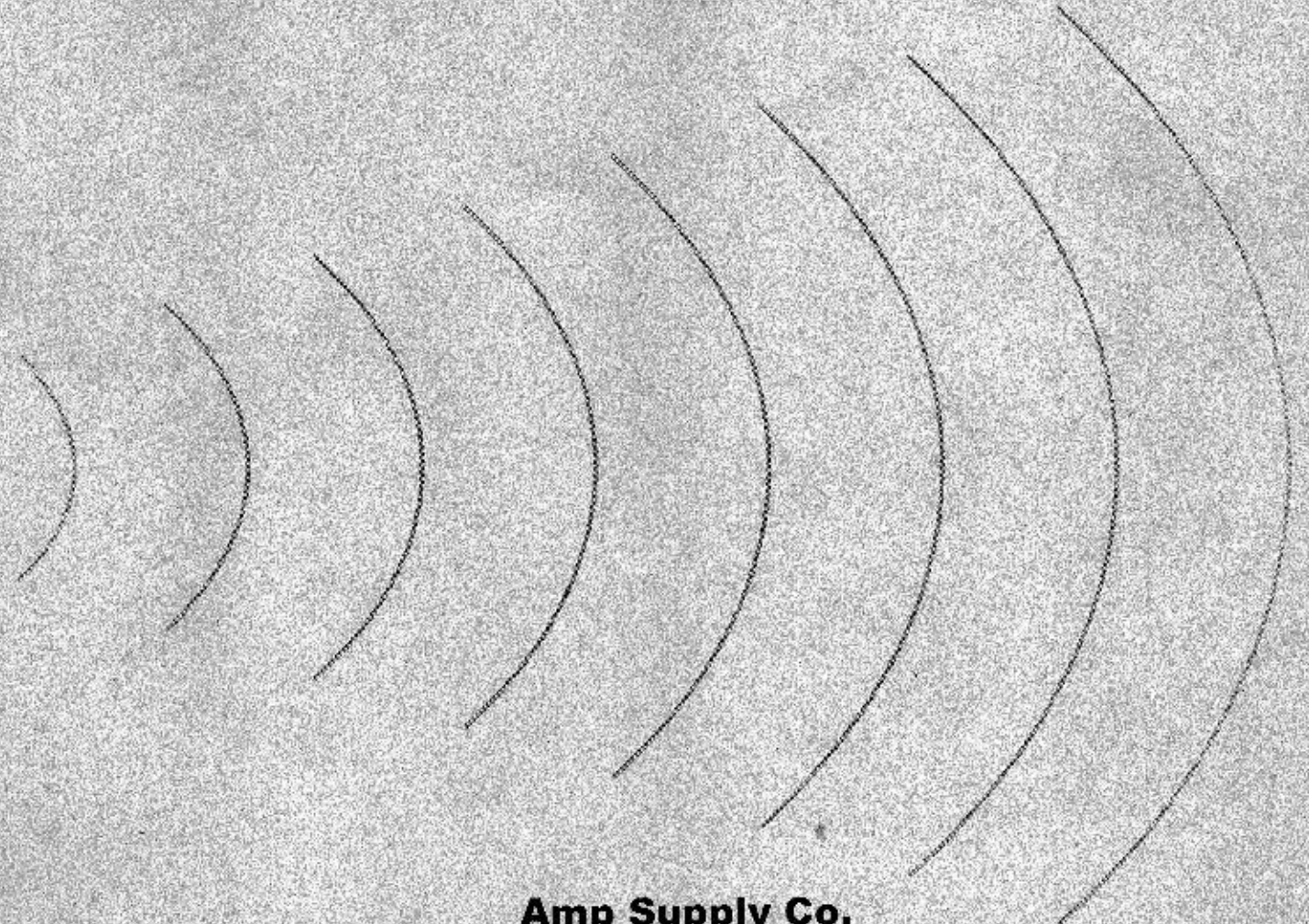


Amp Supply Co.

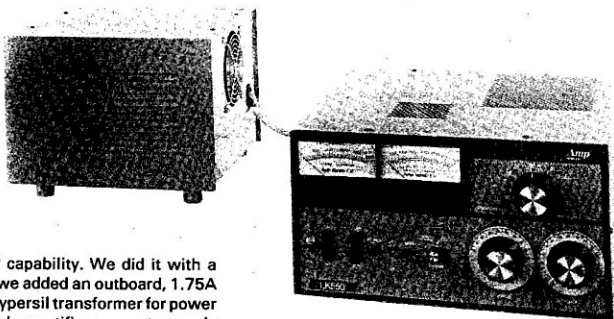
**LK-400/500/550 SERIES
LINEAR AMPLIFIERS
INSTRUCTION MANUAL**



**Amp Supply Co.
6307 Chapel Hill Rd.
Raleigh, NC 27607**

Meet The New Contest-Proven Heavyweight The Amp Supply LK550! THREE 3-500Z's and Outboard Plate Supply

In the tradition of our other great 3-500Z amplifiers, the engineers at Amp Supply decided to go that extra mile. Here's a powerhouse that'll handle all the rigors of contests and DXing, yet loaf along for your favorite ragchew... the LK550!



LEGAL LIMIT RELIABILITY

You wanted a solid, dependable amp with 1500 watt PEP capability. We did it with a three-tube, 3-500Z deck. And, we added an outboard, 1.75A plate supply with a Peter Dahl hypersil transformer for power you can count on. A full wave bridge rectifier, computer-grade filter capacitors and separate filament transformer round out the picture. It all adds up to a conservative design that will open the band for you every time, and do it effortlessly.

QUALITY ENGINEERING

We've cooled the tube deck with a quiet, two-speed fan. QSY with the sure feel of a Centralab bandswitch. QSK is a breeze with the Jennings vacuum relay. Solid, quality components are everywhere you look —just as you'd expect from the value leader in amplifiers —Amp Supply!

AMP SUPPLY'S ALO AUTOMATIC LOCK OUT CIRCUIT

The LK550 comes equipped with our famous ALO Circuit, too. You want protection from accidental mistuning or overcurrent on the 3-500Z's. The Amp Supply ALO gives that advantage and **immediately** drops the amplifier off-line if these conditions occur!

THE LK550-NT NO-TUNE-UP MODEL

Are you a contester or DXer? You know that every second counts. And, the LK550-NT is just the machine for you. You optimize the output network for each of the five traditional ham bands. You QSY — the LK550-NT does the rest. Instantly!

LK550 SPECIFICATIONS

- Frequency Range:** 1.8-21.5MHz Amateur Bands.
Export Model covers 12 or 10 meters.
- Drive Power:** 100W nominal.
- RF Output:** SSB 1.5kW+ PEP. CW 1.5 kW Average.
RTTY/SSTV/AM 1.5 kW.
- Harmonic Suppression:** -50dB, minimum.
- IMD:** -33dB, minimum.
- Circuit Type:** Class AB2 Grounded Grid.
- Emission:** SSB, CW, RTTY, SSTV, AM.
- Duty Cycle:** Continuous duty in all modes at specified output.
- Output Circuit:** Pi-Network (silver-plated tubing HF coil).
- Power Requirements:** 230VAC, 20 Amperes.
- Dimensions:** LK550 RF Deck: 8" H x 14" W x 16" D.
Pac-5 Power Pac: 12" W x 9-3/8" H x 12" D.
- UPS Shippable in three cartons.**
- Warranty:** Two Years on amplifier, excluding tubes.

**Amp
Supply Co.**

6307 Chapel Hill Road
Raleigh, North Carolina 27607
Telephone: (919) 851-7388
FAX: (919) 851-8139
TELEX: 980131 WDMR

1988
PRICE LIST

ADD 44 SHIPPING/HANDLING in Continental USA only. Major credit cards, Cashiers' Checks, Personal Checks accepted. Personal checks, must allow 18 days to clear. NC Residents add 5% sales tax.

ORDER TOLL-FREE: 1-800-346-5701**AMPLIFIERS**

	LK800-A	1500+++ Watt Output Amplifier: QSK, Three 3CX800 Eimac Tubes; 2400 Watts of Dissipation; Hypersil Transformer in External Pac	\$2995.00
	LK800-NT	No Tune Up Version of LK800-A	\$3195.00
NEW	LK550	1500+ Watt Out Amp. W/Three 3-500Z Tubes & External Pac	\$1895.00
	LK550-NT	No Tune Up Version of LK550	\$2250.00
NEW	LK500-ZC	Update of LK500-ZB, 1500 Watt Output Amplifier with full QSK and the new ALO Auto Lockout, Hypersil Transformer	NOW \$1295.00
	LK500-NTC	No Tune Up Version of LK500-ZC	NOW \$1595.00
NEW	LK500-ZC W/O QSK	Same as LK500-ZC without QSK Vacuum Relay	\$1199.00
NEW	LK450	Full QSK Single 3-500Z Amplifier	\$ 899.50
	LK450-NT	No Tune Up Version of LK450	\$1099.50
	LA-1000-A	1200 Watt Input PEP, 1 KW CW Input Portable Amplifier	\$ 499.50
	PAC 5	External Optional Power Pac for 500 Series Amplifiers	\$ 449.50
		PLUG & PLAY HARNESS — Specify your transceiver	\$ 9.95

Note: Export Amps — Ten meters — add \$27.50 for Tune Models, add \$47.50 for No Tune Models

NEW	TR-1 Series	Mono-Band Transceivers — 80, 40, 15 or 10 Meters	\$ 329.50
-----	-------------	--	-----------

TUNERS

	AT-1200	700 Watt PEP Output Antenna Tuner with SWR Bridge, Antenna Selector Switch; Matches LA-1000 Series Amps	\$ 229.50
	AT-3000	3 KW, Roller Inductor, Dual Wattmeter Tuner	\$ 499.50
	MAT-1500	Commercial Weatherproof Outdoor Remote Antenna Tuner; 1500 Watt Output Tuner	\$ 899.50

WIRE ANTENNAS, COAX SWITCHES, BALUNS

	Super Switch II	Commercial 5 KW Remote Controlled Antenna Switch; Vacuum Relays	\$ 679.50
	G5RV	10-80 Meter Antenna with Matching Transformer — Deluxe	SALE \$ 49.50
	All Band Doublet	160-10 Meters, 470 Balanced Line with Porcelain Center	\$ 39.50
	BL-3A	1:1 Impedance Balun; 3000 Watt CW 1.8-30MHz	\$ 39.50
	BL-1500	9:1 Transformer Balun; 470 Ohm Line to 50 Ohm	\$ 39.50
	D-8010	Parallel Dipole for 10-80 Meters with Balun and Rope	\$ 39.50
	D-4010	Parallel Dipole for 40-10 Meters with Balun and Rope	\$ 34.95
	AEX-1	33' Self-Supporting Vertical for 40 Meters	\$ 89.50
	SAS-1	Deluxe Sloper Antenna System with Matching Transformer 30, 40, 80 and 160 Meters	\$ 99.50
	LSW-1	Loop Sky Walker Antenna	\$ 49.50

Table of Contents

Section	Title	Page
1.0	Introduction	1
1.1	Product Description	1
1.2	Specifications	2
1.2.1	Common Specifications	2
1.2.2	Unique Specifications	4
1.3	Front Panel Controls	6
1.4	Rear Apron Features	7
2.0	Installation	9
2.1	Introduction	9
2.2	Unpacking	9
2.3	Warranty	9
2.4	Installation	9
2.4.1	Tube Installation	10
2.5	Amplifier Placement	10
2.6	Power Requirements	10
2.7	Amplifier Installation	12
2.8	Cable Installation	13
2.9	Ground Requirements	15
2.10	Antenna Requirements	15
3.0	Tuning	16
3.1	Tuning Procedure	16
4.0	Amplifier Care	20
4.1	Introduction	20
4.2	Cleaning Amplifier Compartment	20
4.3	Tube Replacement	20
4.4	Troubleshooting	22
4.5	Factory Service	22
Appendix A	Warnings and Cautions	A-1
Appendix B	Schematic Diagrams	B-1

List of Figures

Figure	Title	Page
2.6.1	AC Line Hook-Up	11
2.6.2	Jumper Plugs	12
2.8.1	LK 400/500 Cable Installation	14
B-1	ALO Meter Board	B-2
B-2	Meter Board	B-4
B-3	QSK Board	B-6
B-4	Power Supply	B-8
B-5	LK 450 Schematic	B-9
B-6	LK 500 Schematic	B-10
B-7	LK 550 Schematic	B-11
B-8	LK 450 No Tune Up RF Circuit	B-12
B-9	LK 500 No Tune Up RF Circuit	B-13
B-10	LK 550 No Tune Up RF Circuit	B-14

List of Tables

Table	Title	Page
3-1	Tuning Charts	18
4-1	MARS Expanded Frequency Chart	21
4-2	Troubleshooting Chart	23

SECTION 1 INTRODUCTION

1.1 Product Description

The Amp Supply LK 400/500 series linear power amplifiers are compact 160-15 meter MF/HF amplifiers of modern design. The series provides the amateur operator with a choice of power output levels and features consistent with their specific operating requirements. Each LK 400/500 series amplifier uses the powerful 3-500Z triode tube(s) in a grounded grid configuration Class AB₂. The LK 400/500 series amplifiers are high performance pieces of equipment and are engineered conservatively with American components and ingenuity.

Every LK 400/500 series MF/HF linear amplifier is field tested at its specified power input level and duty cycle and should require a minimum of maintenance through years of operation. Additionally, each LK 400/500 series amplifier will operate many MARS frequencies without modification (see MARS expanded coverage chart). A quiet, efficient cooling system maintains the RF deck and power supply chamber temperature ensuring long service life. For 1986, all LK 500 series linear amplifiers feature the new ALO (Automatic Lock Out) circuit which senses unacceptable plate/grid currents and voltages or improper amplifier tuning and stops amplifier operation.

Tuning the amplifier is a simple procedure, since each unit is designed for long-term stability in virtually any operating situation. Tuned input and standard relay switching circuitry makes the LK 400/500 series compatible with any available solid state or tube transceiver or transmitter. Despite their straight-forward design and minimal user required adjustment, the LK 400/500 series linear amplifiers are sophisticated electronic instruments. Therefore, if the unit is operated outside the parameters outlined in this owner's manual, damage may result. Please read this manual carefully before putting your new Amp Supply LK 400/500 series linear amplifier on the air.

The following definitions are applicable to this manual. These definitions must be followed explicitly. See Appendix A for a complete list of cautions and warnings.

WARNING
HAZARD PRESENTS PERSONAL INJURY OR DEATH

CAUTION
EQUIPMENT DAMAGE MAY OCCUR BUT NOT PERSONAL INJURY

NOTE
Proper performance of the amplifier cannot be ensured if disregarded

1.2 Specifications

The following subsections describe the LK 400/500 series amplifiers specifications.

1.2.1 Common Specifications

Physical dimensions and functional characteristics of the LK 400/500 series amplifiers are contained in this listing. Specifications are subject to change without notice or obligation.

DIMENSIONS:	9" H x 15" W x 15" D
FREQUENCY COVERAGE:	Ham Bands 160 through 15 meters*. Non-amateur frequencies between 1.8-4.0 and 6.5-24 mhz may be covered by adjustment made by a qualified electronics technician.
CIRCUIT TYPE:	Class AB ₂ grounded grid.
EMISSION TYPES:	RTTY, SSTV, AM, CW, SSB
INPUT IMPEDANCE:	50 Ohms - tuned input for each band

OUTPUT IMPEDANCE:	Adjustable PI-network matches 50 ohm load with SWR not to exceed 2:1
INTERMODULATION DISTORTION PRODUCTS:	In excess of -33 dB below PEP
HARMONIC SUPPRESSION:	In excess of -50 dB below PEP
FREQUENCY OPTIONS:	See Appendix A for MARS expanded frequency coverage
AVAILABLE OPTIONS:	<ul style="list-style-type: none"> - AT 3000 matching 3KW tuner - Ten meter mod kit for licensed U.S. Amateurs - Export model, factory built 10 meter board - Plug and Play Cable (specify your radio) - LK500 series only: <ul style="list-style-type: none"> - no QSK - no-tune version - PAC-5: Utilizing a Peter Dahl 1.75 AMP CCS Hypersil transformer which allows continuous duty, all modes, allows 24 hours a day operation (standard with LK 550). - LK 450: ALO circuit

1.2.2 Unique Specifications

LK450

TUBE COMPLEMENT:	(1) 3-500Z triode
TYPICAL OUTPUT:	1000 Watts SSB, 800 Watts CW, 600 Watts SSTV, RTTY and 300 Watts AM
PLATE VOLTAGE:	RTTY, SSTV, AM, CW, SSB, 3.2 KV DC no load
DRIVE REQUIREMENTS FOR TYPICAL OUTPUT:	85 Watts PEP SSB 80 Watts CW, 50 Watts SSTV RTTY
DUTY CYCLE:	Amateur continuous duty on all modes at specified output
POWER REQUIREMENTS:	117 Volts 50/60 Hz @ 20 Amps or 234 Volts 50/60 Hz @ 10 Amps, unit factory wired for 117V
WEIGHT:	Shipping Net 46 lbs ; operating net 41 lbs Shipped in two boxes

LK500 Series

TUBE COMPLEMENT:	(2) 3-500Z TRIODES
TYPICAL OUTPUT:	1500 Watts on SSB, 1200 Watts on CW and 900 Watts on SSTV, RTTY and 600 Watts AM
PLATE VOLTAGE:	RTTY, SSTV AM, CW, SSB 3.2 KV DC no load
DRIVE REQUIREMENTS FOR TYPICAL OUTPUT:	100 Watts PEP SSB 100 Watts CW, 60 Watts SSTV, RTTY
DUTY CYCLE:	Amateur continuous duty in all modes at specified output.

POWER REQUIREMENT:	117 Volts 50/60 25 Amps or 234 Volts 50/60 Hz 12.5 Amps
WEIGHT:	Shipping net 59 lbs; 2 boxes; Operating Net 54 lbs
AUTOMATIC LOCK OUT:	Safely interrupts amplifier operations when unacceptable antenna currents and/or voltages are encountered, or when the amplifier is improperly tuned
POWER TRANSFORMER:	1.2 Amp ICAS Peter Dahl Hypersil.

LK550 Series

TUBE COMPLEMENT:	(3) 3-500Z triodes
TYPICAL OUTPUT:	1500 Watts SSB, CW, SSTV, RTTY, 900 Watts AM
PLATE VOLTAGE:	RTTY, SSTV, AM, CW, SSB 3.2 KV DC no load
DRIVE REQUIREMENTS FOR TYPICAL OUTPUT:	100 Watts all modes
DUTY CYCLE:	Continuous duty all modes at specified output, 24 hours a day
POWER REQUIREMENTS:	234 Volts 50/60 Hz 25 Amps only
WEIGHT:	Shipping Net 110 lbs; 3 boxes Operating Net 103 lbs; RF Deck 38 lbs; transformer 65 lbs; tubes 7 lbs.
AUTOMATIC LOCK OUT:	Safely interrupts amplifier operations when unacceptable antenna currents and/or voltages are encountered, or when the amplifier is improperly tuned.
POWER TRANSFORMER:	1.75 Amp CCS Peter Dahl Hypersil in separate enclosure with a forced air cooling system.

1.3 Front Panel Features

(place photo of front panel)

AC-ON Illuminated ROCKER SWITCH - Turns power on and off.

XMIT-STBY ROCKER SWITCH - Turns the amp from standby to operate mode. Operate mode enables a green LED.

BAND-SWITCH - Selects desired bands.

HI/LO AIR SWITCH - Provides higher volume cooling air for extended operation.

XMIT - Red LED

PLATE AND LOAD KNOBS - Tuning adjusts Pi-Network capacitors in tank circuit for proper resonance and loading on all bands.

PLATE CURRENT METER - Continuously monitors plate current of 3-500Z tube(s).

GRID-VOLT METER - By use of the meter switch can monitor plate volts (0-3500 V or grid current 0-350 mA.

ALO LED - Enabled when unacceptable plate/grid currents and/or voltages are encountered or improper amplifier tuning exists .

1.4 Rear Apron Features

(place photo of rear apron here)

RF-IN - For connecting to exciter RF output to the amplifier.

RF-OUT - For connecting the LK400/500 series linear amplifier to an antenna.

RLY - For connecting to exciter auxiliary jack to activate T/R Relay in the LK400/500 series amplifiers.

KEY IN - QSK ONLY - station key, must be a bug, hand key or a keyer with a Reed Relay.

KEY OUT - QSK ONLY - hooks to the KEY-IN jack on a QSK transceiver.

QSK VOX SWITCH - place in the QSK position when operating QSK CW.

GROUND LUG - Attach to a good earth ground.

FUSES - 2 holders provided to protect each leg of the AC line.

SERIAL NUMBER - Located on the model type identification sticker.

AC LINE CORD - Connect to proper power requirements only.

PAC-5 PLUG - LK550/LK500 w/optional PAC-5 only. Connects the PAC-5 power transformer to LK550/LK500.

CAUTION

NEVER REMOVE /INSERT PLUG WHEN UNIT IS ON OR WHEN THE RF
DECK AC LINE CORD IS CONNECTED TO AN AC POWER SOURCE

SECTION 2 INSTALLATION

2.1 Introduction

This section describes the unpacking and installation procedures for the LK 400/500 series amplifiers.

WARNING

**MAKE NO ATTEMPT TO PUT THE AMPLIFIER IN SERVICE
OUTSIDE OF THE CABINET—CONTACT WITH VOLTAGE
IN THE AMPLIFIER CAN BE FATAL!!!**

2.2 Unpacking

All shipping containers have been specially designed to protect their contents and special care has been taken to prevent damage under normal shipping conditions. Mishandling should be evident upon inspection of the shipping container. If damage is found after visual inspection, take care not to destroy the evidence. If necessary, document the damage with photographs and contact the transport carrier immediately.

Carefully remove your new LK400/500 series linear amplifier from its packing carton, and examine it closely for signs of shipping damage. It is recommended to save all original packing cartons to protect your amplifier from damage should you wish to store it or ship it for after-sales service.

2.3 Warranty

Fill out the enclosed warranty registration card and return to Amp Supply within 10 days of original purchase. Keep your original sales slip with the packing cartons should you ever need it for reference.

2.4 Installation

The following subsections describe the installation procedures for the LK 400/500 series amplifiers.

2.4.1 Tube Installation

CAUTION

ENSURE TUBES ARE INSTALLED PRIOR TO
APPLYING POWER TO THE AMPLIFIER

Carefully remove the tubes from their boxes. Carefully move the parasitic chokes in the tube compartment out of the way and install tubes. When tightening down the plate cap(s), only tighten screws snug--overtightening may damage tube(s). Remove packing from under the tuned input board.

2.5 Amplifier Placement

In general, the location of your new amplifier is not critical. However, certain considerations must be given to ensure optimum performance. Avoid extremely hot locations such as near radiators or other heating units. Keep the top of the amplifier case clear of books, papers, or other equipment to protect against overheating. Do not place the amplifiers closer than 2 1/2 inches from a wall.

CAUTION

OBSTRUCTION OF THE SIDES OF THE AMPLIFIER CASE
AND THE BLOWER AIR INLET MAY RESULT IN
AMPLIFIER TUBE(S) OVERHEATING

2.6 Power Requirements

Refer to your amplifier series unique specifications for proper power requirements and Figure 2.6.1 for AC line hook-up.

WARNING

NEVER OPERATE ANY AMPLIFIER
USING AN EXTENSION CORD

The LK400/500 series is shipped from the factory with jumpers connected to operate on 234 VAC (except LK 450). It is highly recommended that your

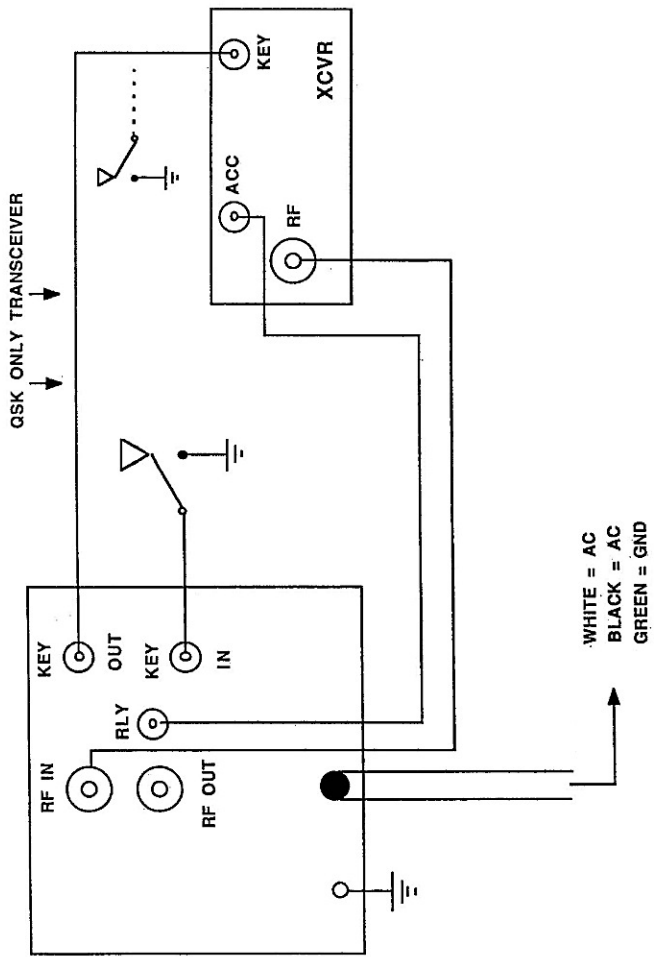


Figure 2.6.1 AC Line Hook-Up

amplifier be operated from its own 234 - 20 A (or greater) circuit. If a 117 V circuit is all that is available, it should be fused for 30 A with circuit conductors not less than #10. No other equipment should be operated from this 117V circuit. A jumper plug is provided with the amplifier to convert to 117V service.

W A R N I N G

**COMPLETELY REMOVE POWER FROM YOUR AMPLIFIER
AND ALLOW 30 MINUTES FOR THE HIGH VOLTAGE CAPACITORS
TO DISCHARGE THROUGH BLEEDER RESISTORS
BEFORE ATTEMPTING TO CHANGE JUMPER CONNECTIONS
ON BACK OF AMPLIFIER.**

Figures 2.6.2 illustrates the jumper connections located in the left rear corner of the chassis for both 117V and 234V operation. The jumpers must be connected as shown or severe damage to your amplifier components may result. Remove existing jumper before installing the new ones.

(place photos of jumper plugs here)

Figure 2.6.2 Jumper Plugs

2.7 Amplifier Installation

After the tubes have been installed, install the top cover and secure with a few screws to finger tight. Connect your amplifier to your power source. Set the amplifier controls as follows:

AC/ON - OFF
XMIT/STBY - STBY
METER - VOLTS

Turn the unit on. Plate voltage should read between 3000-3300 Volts DC. Turn the unit off.

2.8 Cable Installation (See Figure 2.8.1)

- a. Using a 6 ft. length, connect a 52-Ohm coaxial cable (RG-8U or equivalent) between your transmitter's RF OUTPUT to the LK400/500 series RF INPUT connector.
- b. Using another short length of coaxial cable, (RG-8U or equivalent,) connect the LK400/500 series RF OUTPUT connector to a suitable watt meter.
- c. Using the necessary length of coaxial cable, (RG-8U or equivalent) connect the wattmeter output connection to your antenna system.
- d. Select an appropriate length of shielded cable and install an RCA connector on one end and the appropriate connector for your transceiver at the other end.
- e. Install the shielded cable between your transmitter accessory contacts on the transmitter rear apron and the RLY plug on the rear apron of your LK400/500 series linear amplifier. These should be normally open contacts in your transmitter which close when you desire to transmit and are capable of 100mA.
- f. See your exciter operators manual for details.

2.9 Ground Requirements

For best results your amplifier should be attached to a good earth ground by as short in length, and as large as possible wide diameter ground strap. A ground post is provided on the rear apron for this purpose. It is always a good idea to connect the chassis of all associated equipment together and ground them at one point to avoid ground loops. We recommend that all of the equipment in your station be connected together and grounded at the antenna tuner.

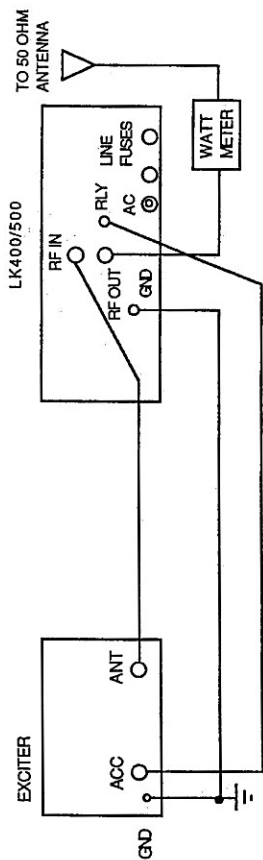


Figure 2.8.1 Cable Installation

NOTE

If QSK is available and desired, refer to Figure 2.6.1 to connect the cables. Make cables as specified in step 8.d Cable Installation.

2.10 Antenna Requirements

Your LK400/500 series linear amplifier has been designed for use with antennas resonant at the operation frequency and having approximate impedances within the limits of 30 to 75 Ohms.

The nominal output impedance of the amplifier is 50 Ohms and the SWR of this load should never exceed 2:1. Although there are many types of antennas which will meet these requirements, the simplest is a one-half (1/2) wave dipole center fed with 52 Ohm coax. For a detailed discussion on antennas, we suggest referring to an appropriate antenna book.

Most practical antennas exhibit an SWR range over a complete amateur band that exceeds 2:1. For this reason we recommend using an antenna matching network which will allow your LK400/500 series linear amplifier to work into a 50 Ohm resistive load for maximum power transfer into the antenna. The new AT3000 by Amp Supply Co. is a perfect companion tuner for the LK400/500 series of amplifiers.

CAUTION

NEVER ATTEMPT TO OPERATE THE LK400/500 SERIES WITHOUT FIRST CONNECTING THE UNIT TO AN ANTENNA OR 50 OHM DUMMY LOAD OF SUFFICIENT POWER HANDLING CAPACITY OR SERIOUS DAMAGE MAY RESULT

This completes installation of your new LK400/500 series linear amplifier from Amp Supply Co.

SECTION 3 TUNING

3.1 Tuning Procedure

This section describes the tuning procedure for the LK400/500 series linear amplifiers. Follow all steps carefully to insure optimum performance of your amplifier. Read all tuning steps before actually tuning your amplifier.

CAUTION

THIS UNIT IS SHIPPED READY FOR 234 VAC OPERATION (EXCEPT LK450).
REFER TO INSTALLATION INSTRUCTIONS FOR 117V OPERATIONS

1. Set the BANDSWITCH to the desired band. If your amplifier is model LK450/500/550NTC, go to step 4, otherwise proceed on to step 2.
2. Set the LOAD control on number shown on tuning chart.
3. Set the TUNE control on number shown on tuning chart.
4. Set the ON/AC control to ON.
5. Select the correct antenna for the band selected. Insure antenna VSWR is acceptable before proceeding.
6. Set the XMIT/STBY control to XMIT. If your amplifier is model LK500NTC, go to step 7, otherwise proceed to step 8. The green LED indicates the amplifier is in the Ready To Operate mode.
7. Set Meter switch to grid current (this is read on Plate Voltage/Grid Current Meter).
8. Insert a small amount of exciter drive until the plate current begins to rise to approximately 400mA. If your amplifier is model LK450/500/550NTC, go to step 16, otherwise proceed to step 9.

9. Rotate the TUNE control for maximum output on your station watt meter.
10. Alternate between TUNE and LOAD for maximum output.
1 KW input (Plate Voltage x Plate Current = Power Input)
Example: Plate Current = 400mA
Plate Voltage = 2500 VDC
.4 x 2500 V = 1000 Watts Input
11. Increase drive power. Repeat steps 8 through 10 until you obtain maximum power output.
12. During tune up alternately monitor Grid and Plate Current.
13. Grid current can be reduced by slightly decreasing the Load control. Turn control to right, clockwise.
14. ALWAYS TUNE FOR MAXIMUM OUTPUT!
15. TUNE FOR MAXIMUM OUTPUT AT ALL TIMES!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
16. Increase drive from the exciter until a further increase in exciter drive does not increase amplifier output power.
17. When station watt meter shows maximum amplifier power output, return the exciter to receive mode. Select the desired exciter operating mode and you are ready to operate with your new amp.
18. When your station watt meter indicates maximum amplifier power output, return the exciter to receive mode. Select the desired transmitter operating mode and you are ready to operate with your new amp.

Table 3-1
Tuning Charts (see enclosed charts)

<u>LK450</u>	<u>BAND</u>	<u>LOAD</u>	<u>TUNE</u>
	160	X	X
	80	X	X
	40	X	X
	20	X	X
	15	X	X
	10	-	-

<u>LK550</u>	<u>BAND</u>	<u>LOAD</u>	<u>TUNE</u>
	160	65	68
	80	52	90
	40	58	31
	20	44	22
	15	32	9
	10	-	-

<u>LK500</u>	<u>BAND</u>	<u>LOAD</u>	<u>TUNE</u>
	160	X	X
	80	X	X
	40	X	X
	20	X	X
	15	X	X
	10	-	-

CAUTION

OBSERVE CURRENT LIMITATIONS FOR NORMAL OPERATION

Plate Current . . . not to exceed 950 MA. in full tune-up*

Grid Current . . . under tune up, RTTY, or SSTV, never to exceed 350 mA.

. . . on SSB voice peaks should average less than 250 mA while operating.

. . . on CW between 100 and 250 mA, depending on sending speed.**

* LK550 will not exceed 1400 mA

** LK550 will exceed 400 mA

TUNE-UP NOTES

SECTION 4 AMPLIFIER CARE

4.1 Introduction

This section provides instructions on the care and cleaning of the LK 400/500 series amplifiers.

WARNING

**EXTREME CARE MUST BE TAKEN WHENEVER MAKING
ANY ADJUSTMENTS INSIDE ANY LINEAR AMPLIFIER**

4.2 Cleaning Amplifier Compartment

After completely disconnecting your amplifier from the power source, wait 30 minutes so all electrolytic capacitors have discharged through their bleeder resistors. The top cover can then be safely removed by taking out the top and side row of screws.

Since the amplifier compartment is forced-air cooled, it will collect particles of dust which must be periodically removed. The frequency of cleaning will be governed by how many hours the amplifier is operated, and by operating environment cleanliness. When the blower blade accumulates a large amount of dust, the amplifier should be cleaned. The best way to clean the amplifier is to remove the top cover and blow the dust out with compressed air. If compressed air is not available, a soft-bristled one-inch paint brush can be used to brush the amplifier clean.

CAUTION

**DO NOT BLOW AIR DIRECTLY INTO THE FAN BLADES.
USE A BRUSH IN CLEANING THE BLADES OF THE FAN**

4.3 Tube Replacement

If it becomes necessary to replace the tubes in the amplifier the same brand should be used. A new tube kit is available from Amp Supply Co.

**Table 4-1
Mars Expanded Frequency Coverage**

FREQUENCY	BAND SELECT	PLATE	LOAD
7.500	7.0	38	39
8.033	7.0	30	30
11.539	14.0	47	95
12.050	14.0	42	86
13.644	14.0	29	61
13.485	14.0	30	61
13.827	14.0	28	58
13.975	14.0	28	55
14.385	14.0	24	53
14.443	14.0	24	53
14.820	14.0	22	42
14.935	14.0	21	46
16.300	21.0	42	70
20.680	21.0	19	45
20.937	21.0	18	43
20.998	21.0	18	43
27.963*	AUX	15	30
27.975*	AUX	15	29

*NOTE: With 10 meters installed.

4.4 Trouble Shooting

Careful consideration has been given to the design of the LK400/500 series to keep maintenance problems to a minimum. However, it is possible that some problem will arise which cannot be cured by tube substitution. If this occurs, a chart of frequent problems and typical cures has been included. Please refer to Table 4-1, trouble shooting guide. After checking all suggested remedies without any success, we suggest that you contact our customer service department, to describe your problem in detail. Include full information concerning external connections, control settings, antenna and associated equipment. Be sure to indicate the serial number of your amplifier as specified on the rear apron. Do not return equipment to the factory without prior authorization.

4.5 Factory Service

Obtain a return authorization from the customer service department. Amp Supply Co. will assume no responsibility if the transportation company refuses to pay a damage claim due to improper packing or lack of insurance. Remove the tubes prior to shipping and store the tubes in a separate carton. Do not return the tubes.

Table 4-2
TROUBLE SHOOTING CHART

<u>SYMPTOM</u>	<u>CAUSE</u>	<u>REMEDY</u>
Amplifier will not power up	Not connected to a live AC circuit	Insure amplifier is plugged into a live, appropriate power source
	Blown AC line fuse	Remove Amplifier from Ac power source and Inspect and replace blow fuse with an identical type fuse. Connect Amplifier to AC power source. If fuse fails again contact Amp Supply Co.
Amplifier will not transmit	Stand by/operate switch in standby	Place switch in XMIT position (green LED should light)
	Relay control cable has open connection	Check for continuity center to center, shield to shield. Replace cable as necessary Re-do RCA phono plugs
	Very high VSWR	Normal operation for ALO equipped amplifiers Stops amplifier operation when high antenna currents and voltages are encountered. Ensure a resonant antenna is selected for the frequency being used

**Table 4-2
TROUBLE SHOOTING CHART(CONT'D)**

<u>SYMPTOM</u>	<u>CAUSE</u>	<u>REMEDY</u>
	Improper tuning	Normal operation for ALO equipped amplifiers, the ALO stops amplifier operation when the amplifier is mistuned. Place exciter in receiver mode. Consult the tuning chart applicable to your model type and preset the load and tune controls as specified then tune the amplifier as directed in the tuning procedure
	RF input/output cables reversed	Refer to figure 2.8.1 for details
	QSK control lines incorrect	Refer to figure 2.6.1 for correct connection
	Low/No Drive	Transmitter has no output Wrong band selected on transmitter
	QSK/VOX switch in QSK position	Place QSK/VOX switch on the apron to VOX position
	Low power output	Band switch in wrong position Preset tune and load controls not preset correctly One or more 3-500Z tubes weak or defective

Table 4-2
TROUBLE SHOOTING CHART(CONT'D)

<u>SYMPTOM</u>	<u>CASE</u>	<u>REMEDY</u>
Amplifier always in transmit mode	Relay Control cable is shorted	Check center to shield for continuity: Re-do Relay Control cable
Amp will not load		Bandswitch in wrong place Wrong antenna selected XMIT/STBY switch in STBY

APPENDIX A
WARNINGS AND CAUTIONS

WARNINGS

Make no attempt to put the amplifier in service outside of the cabinet. Contact with high voltages found in the amplifier can be fatal.

Never operate any amplifier from an extension cord.

Completely remove power from your amplifier and allow 30 minutes for the high voltage capacitors to discharge through bleeder resistors before attempting to change jumper connections on back of amplifier.

CAUTIONS

Never remove/insert plug when unit is on or when the RF deck AC line cord is connected to an AC power source.

Ensure tubes are installed prior to applying power to the amplifier.

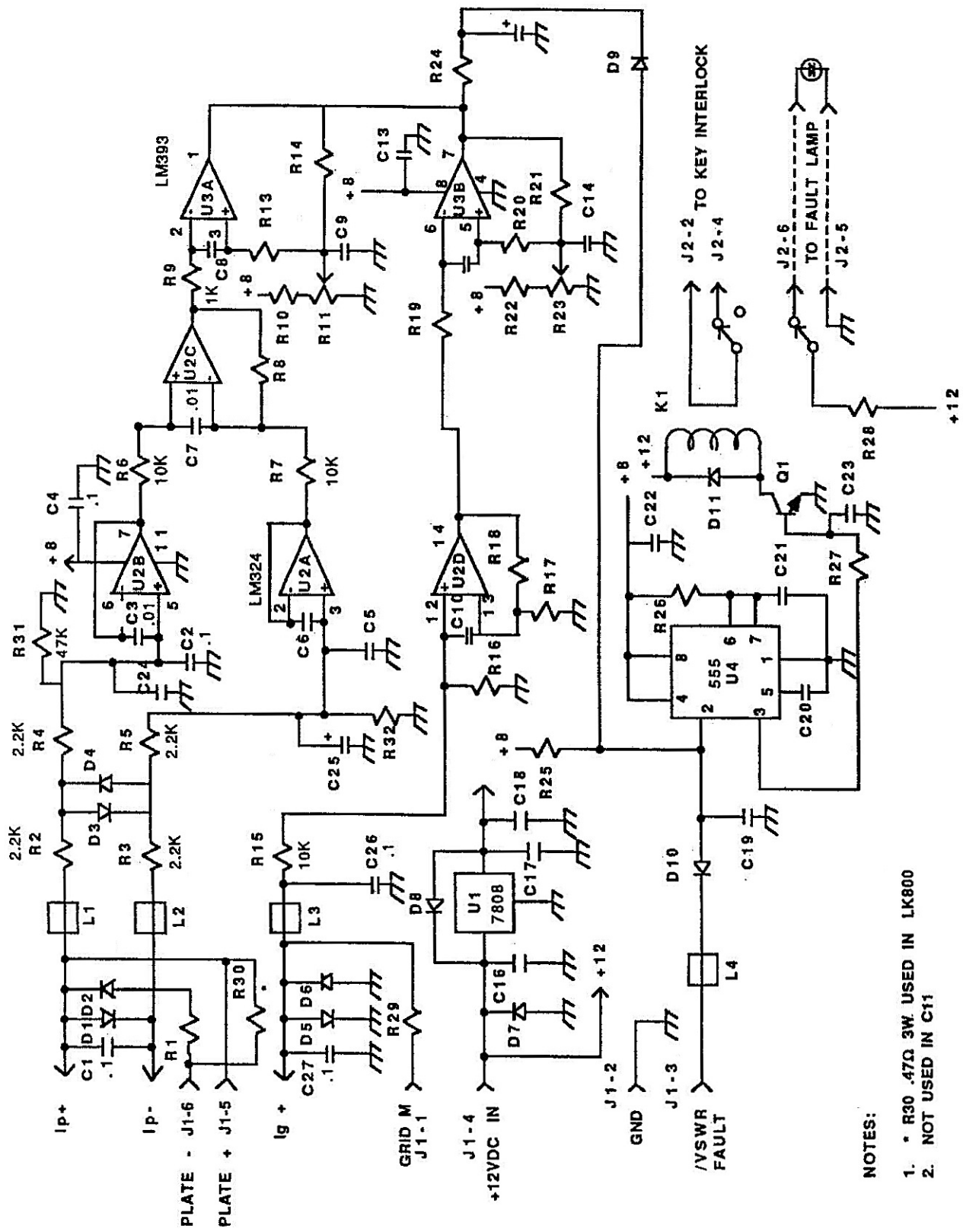
Obstruction of the sides of the amplifier/case and the blower air inlet may result in amplifier tube(s) over heating.

The unit is shipped ready for 234VAC operation. Refer to installation instructions for 117V operations.

Observe current limitations for normal operations.

Do not blow air directly into fan blades. Use a brush in cleaning the blades of the fan.

APPENDIX B
SCHEMATIC DIAGRAMS



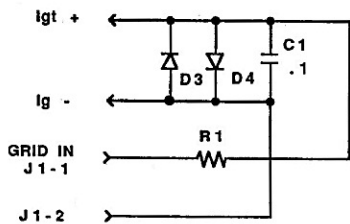
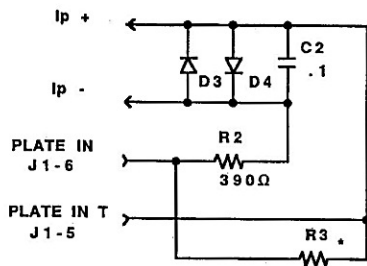
NOTES:

1. * R30 .47Ω 3W USED IN LK800
2. NOT USED IN C11

FIGURE B-1 ALO METER BOARD

ALO METER BOARD BILL OF MATERIALS

<u>QTY</u>	<u>DESCRIPTION</u>	<u>REF. DESIG.</u>
2	6 PIN PC MOUNT MOLEX CONN.	J1,2
1	7808 8 VOLT REGULATOR IC	U1
1	LM324 OP AMP	U2
1	LM 393 COMPARATOR	U3
1	NE555 TIMER	U4
4	1N5408 DIODE	D1,2,5,6
7	1N4148	D3,4,7-11
1	2N2222A TRANSISTOR	Q1
1	AROMAT D2SEM RELAY	K1
2	200 OHM 1/2 WATT POT VERT MT.	R11,23
4	HIGH MU FERRITE BEADS CN20	L1-4
1	390 OHM 1/4 W 5% RESISTOR	R1
4	2.2K OHM 1/4 W 5% RES	R2-5
9	10K OHM 1/4 W 5% RES	R6-8,12,12,15 17,20,25
3	1K OHM 1/4 W 5% RES	R9,19,28
1	15K OHM 1/4 W 5% RES	R10
2	1 MEG OHM 1/4 W 5% RES	R14,21
4	47K OHM 1/4 W 5% RES	R16,18,31,32
1	1.4K OHM 1/4 W 5% RES	R22
1	2K OHM 1/4 W 5% RES	R24
1	220K OHM 1/4 W 5% RES	R26
1	330 OHM 1/4 W 5% RES	R27
1	OHM 1/4 W 5% RES	R29
1	.47 OHM 3 WATT 5% RES	R30 *IN LK800 ONLY*
12	0.1uF 63 V CAP	C1,2,4,5,9,13,14 16,17,19,22,23
8	0.01uF 63 V CAP	C3,6,7,8,10,12,18 20
4	10uF 25V ELECTROLYTIC	C15,21,24,25



*R3 USED IN LK800 .47Ω/3W

FIGURE B-2 METER BOARD

METER BOARD BILL OF MATERIALS

<u>QTY</u>	<u>DESCRIPTION</u>	<u>REF. DESIG.</u>
4	1N5408 DIODE	D1-4
2	0.1 uF 63V CAP	C1,2
1	OHM 1/4W 5% RES	R1
1	390 OHM 1/4W 5% RES	R2
1	.47 OHM 3W 5% RES	R3 *LK800 ONLY*
1	6 PIN PC MT MOLEX	J1

QSK BOARD BILL OF MATERIALS

<u>QTY</u>	<u>DESCRIPTION</u>	<u>REF. DESIG.</u>
4	0.01 uF 63V CAP	C1,4,5,8
1	1000 uF 50V ELE.	C2
1	1.0 uF 25V ELE.	C6
1	0.1 uF 63V CAP	C7
1	200 OHM 1/2W RES	R1
1	2.0 KOHM 1/4W RES	R2
1	4.7 KOHM 1/4W RES	R3
1	200 KOHM 1/4W RES	R4
1	330 KOHM 1/4W RES	R5
1	100 KOHM 2W RES	R6
4	1N4001 DIODE	CR1,5,6,7
1	1N5408 DIODE	CR2
1	1N270 DIODE	
1	1N4742 12V ZENER	CR4
1	2N2222A TRANSISTOR	Q2
1	NE555 IC	U1
3	AROMAT D2SE RELAY	K1-3
2	RIGHT ANGLE MTG BRKTS AND HDWE	
1	JENNINGS VACUUM RELAY	K4

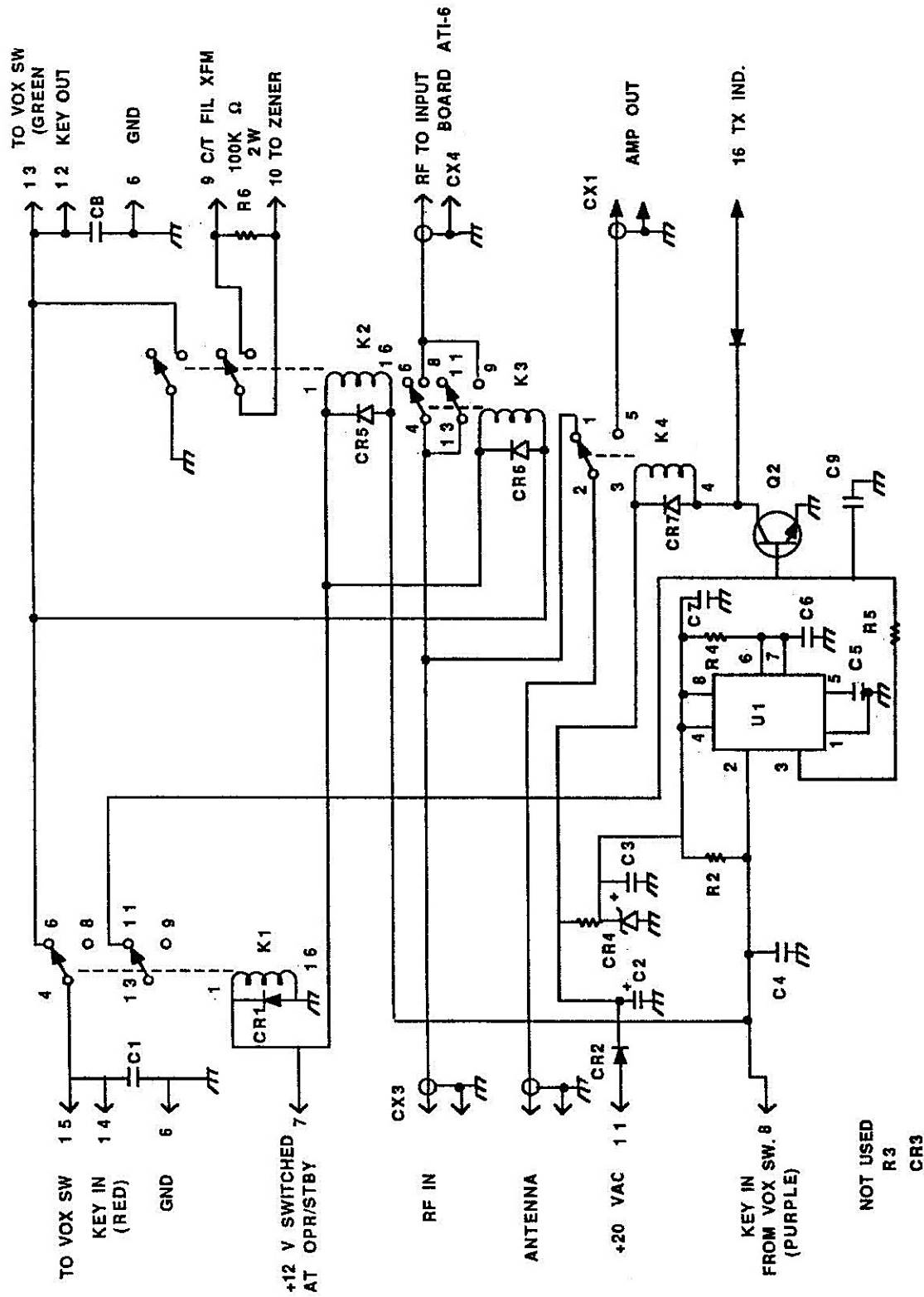


FIGURE B-3 QSK BOARD

NOT USED
R3
CR3

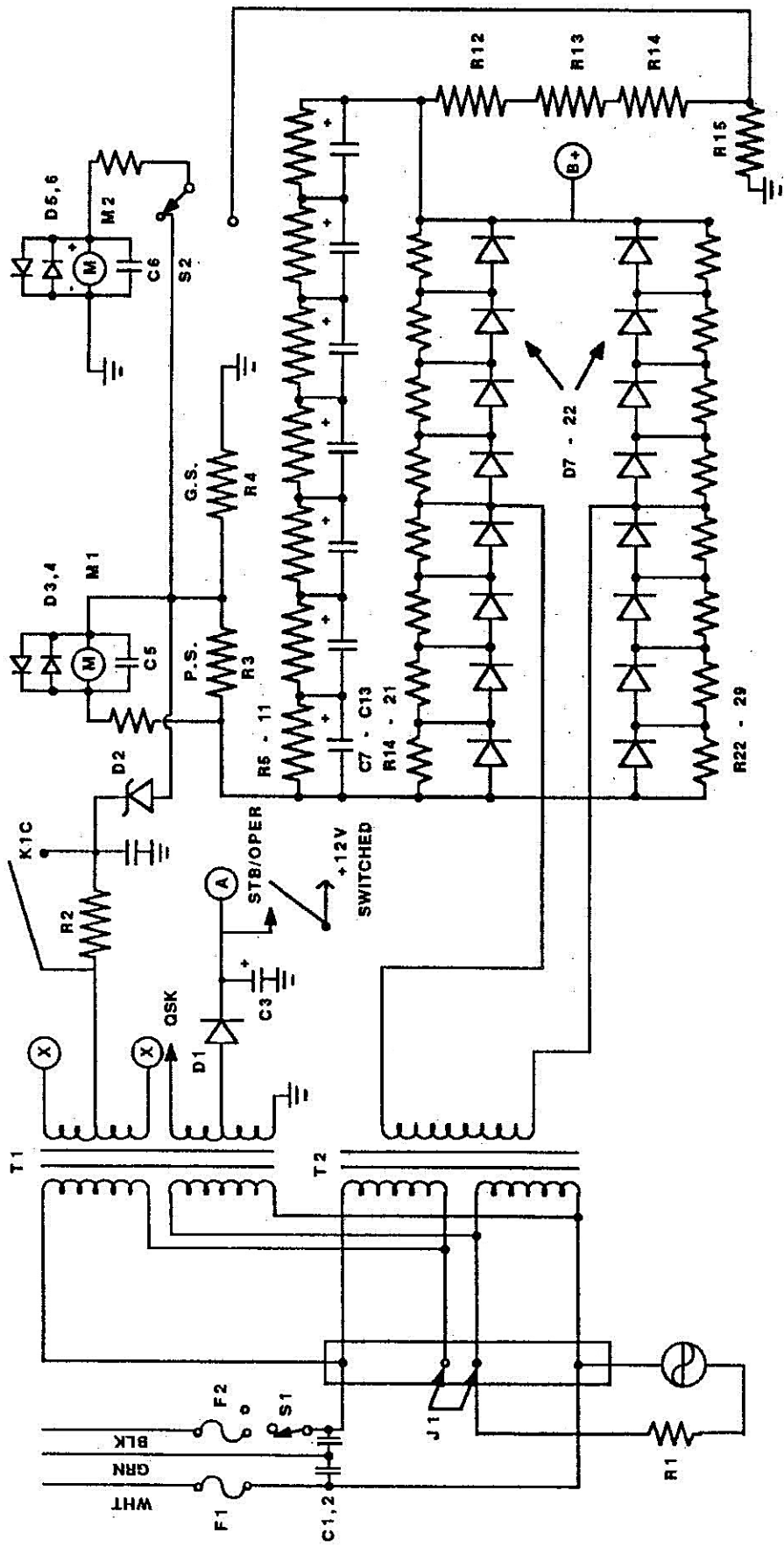
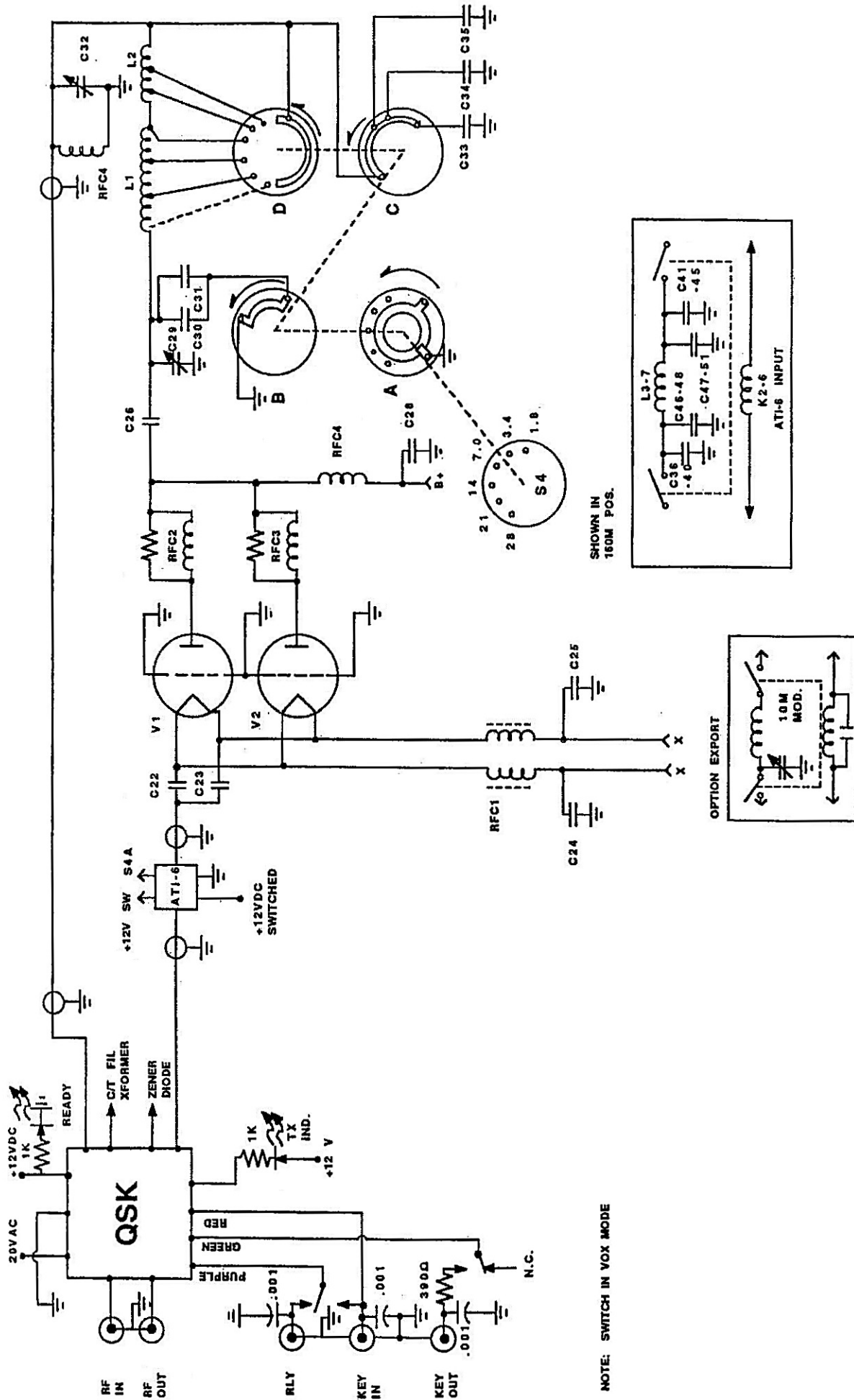


FIGURE B-4 POWER SUPPLY



NOTE: SWITCH IN VOX MODE

FIGURE B-6 LK500 SCHEMATIC

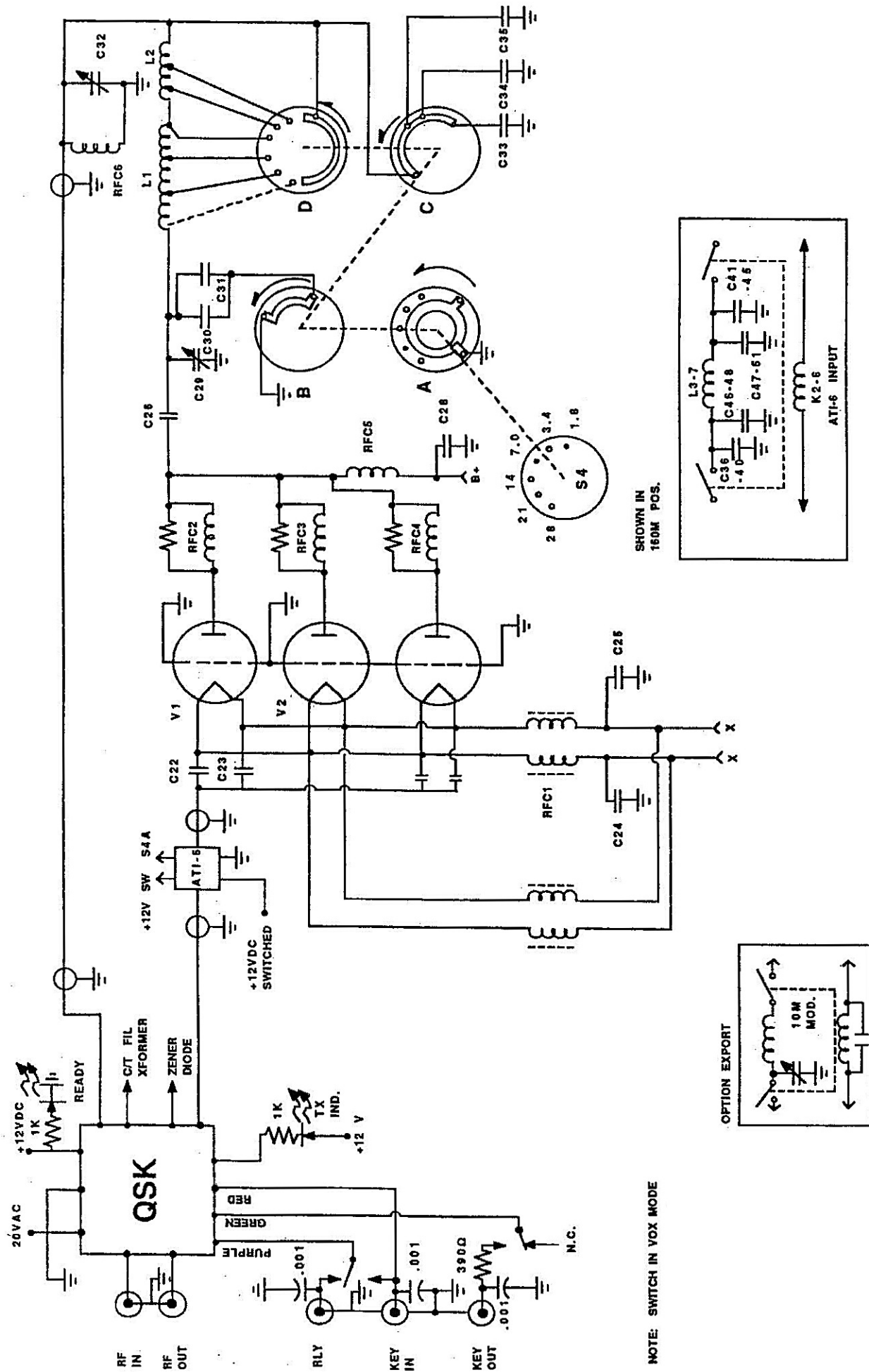


FIGURE B-7 LK550 SCHEMATIC

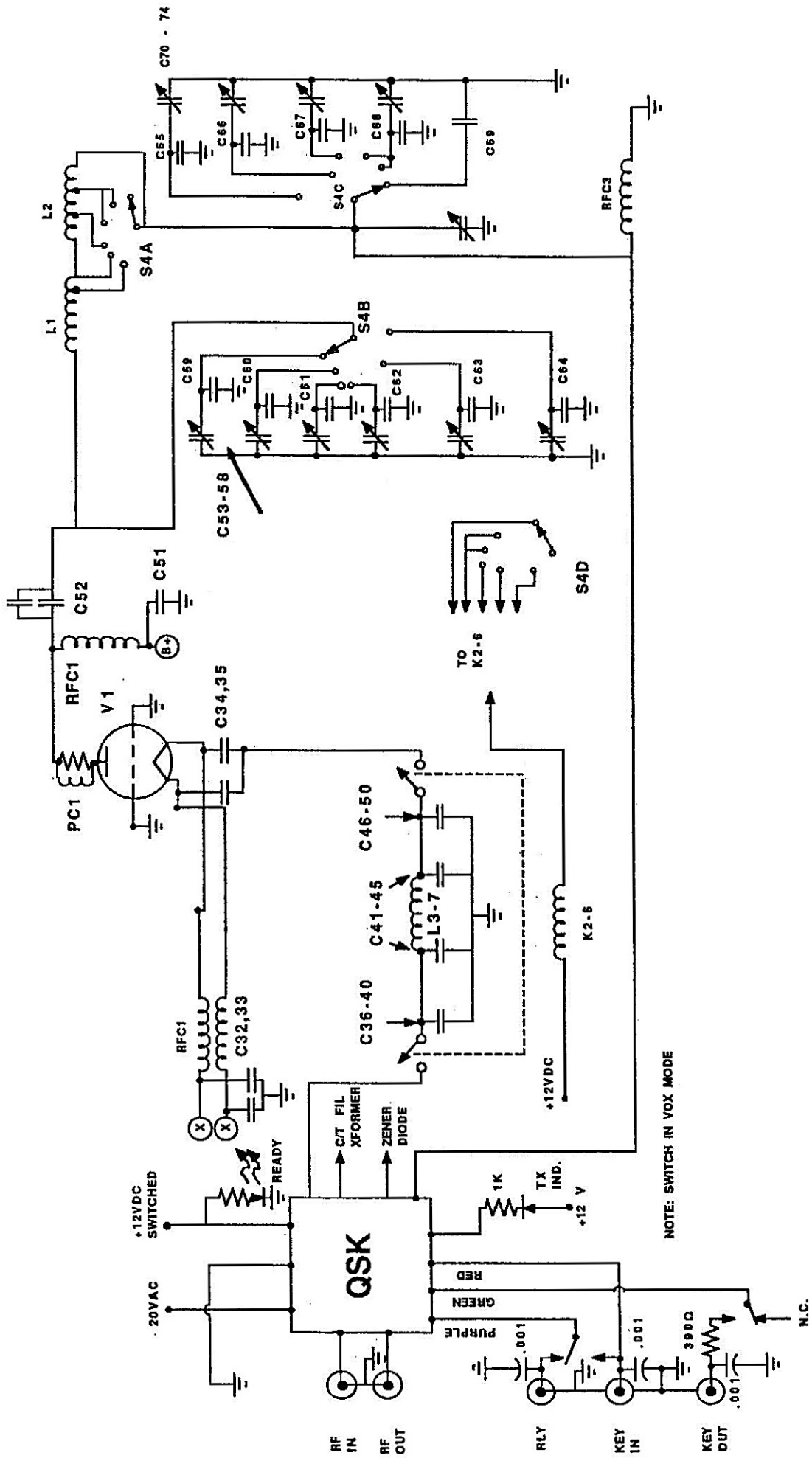


FIGURE B-8 LK450 NO TUNE UP RF CIRCUIT

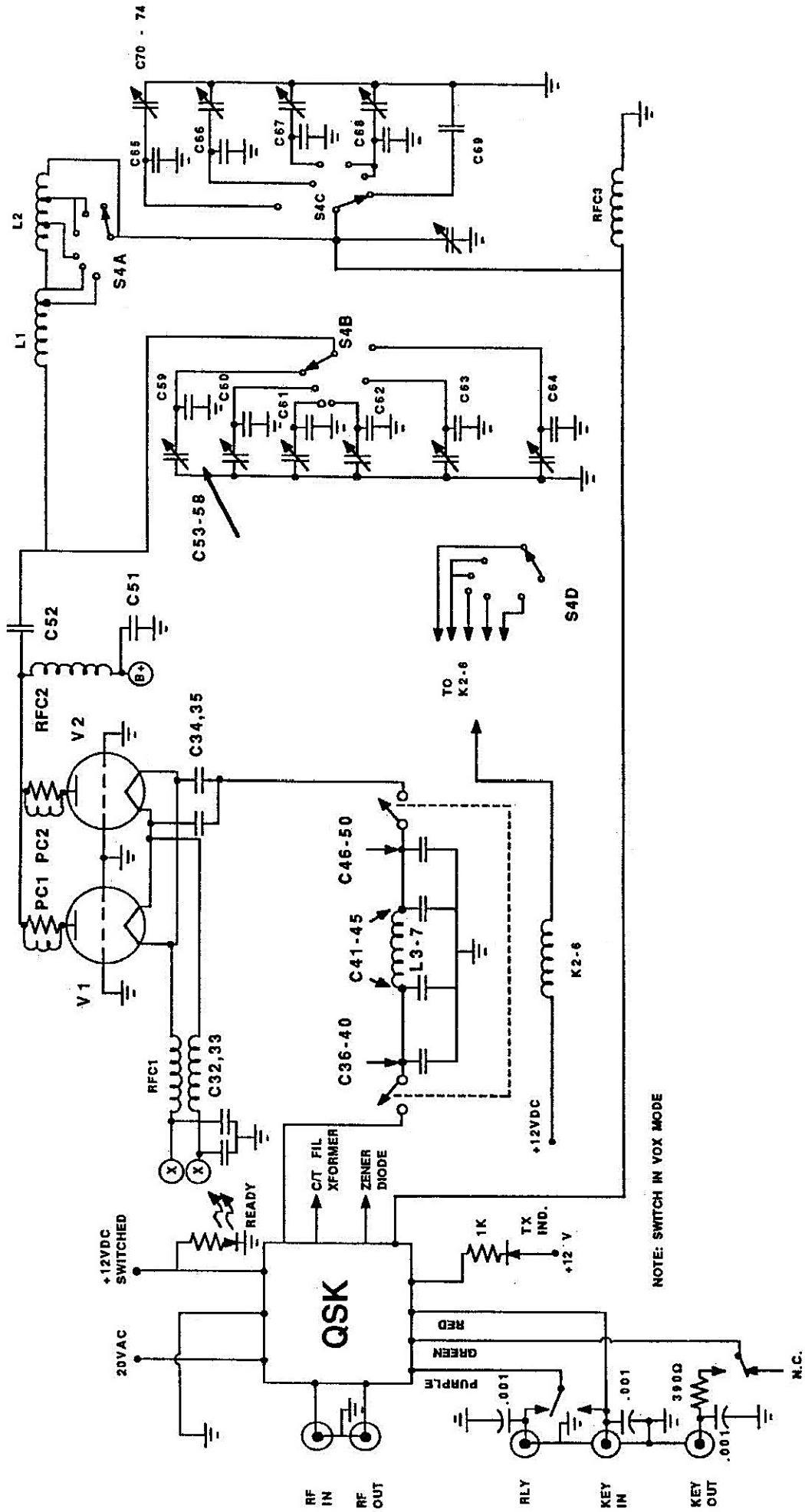


FIGURE B-9 LK500 NO TUNE UP RF CIRCUIT

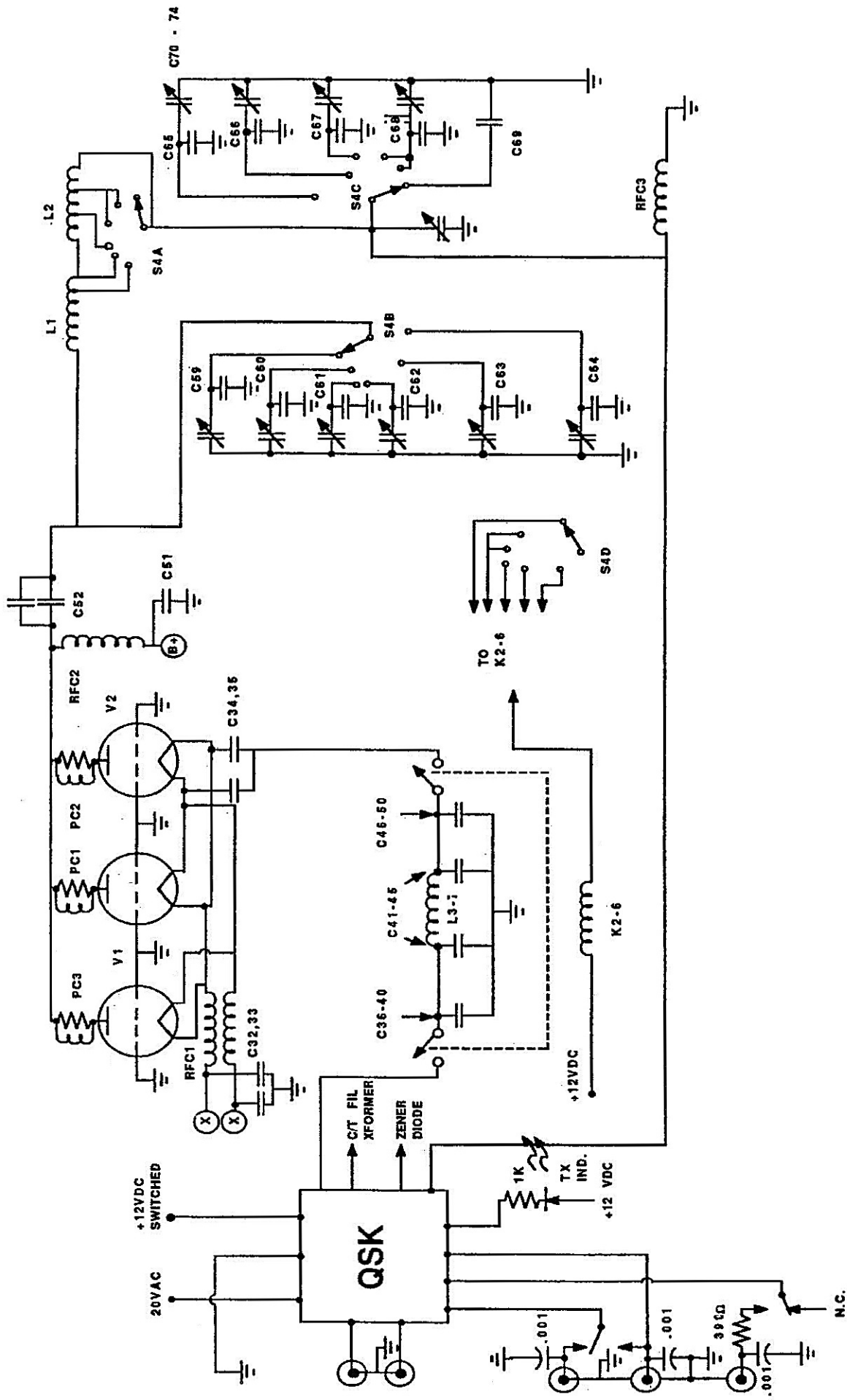
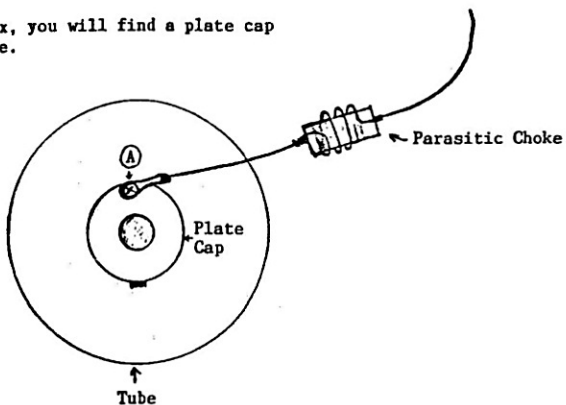


FIGURE B-10 LK550 NO TUNE UP RF CIRCUIT

TUBE PLATE
TOP ASSEMBLY INSTRUCTIONS

1. Inside the tube box, you will find a plate cap affixed on the tube.

FIG. 1.



2. Remove the screw from the top of the plate cap (A) and connect the end of the parasitic choke to the plate cap. (Refer to FIGURE 1.)

Amp Supply Co.

208 Snow Avenue • P.O. Box 147 • Raleigh, North Carolina 27602

(919) 821-5518

DATE _____

AMPLIFIER _____

SERIAL NUMBER _____

BAND

LOAD

PLATE

160

80

40

20

15

AUX

TESTED BY: _____

LIMITED WARRANTY

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 two (2) years 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 of 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 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 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 describes is due to:

- (1) 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 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.