

COMMANDER II VHF LINEAR AMPLIFIER



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I M P O R T A N T

Your Commander II has been equipped with a recently developed high "Q" piston type tuning capacitor. This enhancement will provide more output power.

The tuning procedure is the same as outlined in the owner's manual. However, the reduction mechanism on the tuning control requires multiple turns to tune from 144 Mhz to 148 Mhz. As a result, the pointer indicating the position of the tuning control has been eliminated. The direction still remains the same (clockwise for higher and counterclockwise for lower). When tuning keep turning the tuning control until a peak in output power is indicated on an external wattmeter.

The installation of this piston tuning capacitor provides for a more rugged and reliable amplifier including the capability to operate into an extremely high VSWR. Also, the power output ratings have been increased. These new output power ratings are:

1. FM/RTTY..... 450 watts
2. CW..... 650 watts
3. SSB.....1,000 watts

Refer to page seven. The plate voltage is no longer delayed. When the ON/OFF switch is turned to the on position, the plate voltage will immediately read approximately 2,650 volts no load. The time delay is still operative. A two minute warmup cycle must elapse before the amplifier is ready for operation. This will be indicated when the green power lamp comes on.

We have also extensively redesigned the Commander II. The control and bias circuit has been completely changed. In addition, we have eliminated the HIGH/LOW switch located on the front panel.

We are in the process of creating the new instruction manual and schematic diagram. We will send them to you upon completion. If you have any questions, please call us using our toll free customer service number 1-800-736-0443. Thank you.

SPECIFICATIONS

COMMANDER II VHF LINEAR POWER AMPLIFIER

FREQUENCY RANGE — 144-148 MHz

MODES — USB, LSB, RTTY, FM, CW

POWER REQUIREMENTS — 117/234VAC WITH 234VAC RECOMMENDED

RF DRIVE POWER — 10-15 WATTS NOMINAL 25 WATTS MAXIMUM (15 WATTS FM OR RTTY)

RF OUTPUT — 15+ DB GAIN OR OVER 650 WATTS (400 WATTS FM OR RTTY)

INPUT IMPEDENCE — 50 OHMS

OUTPUT IMPEDENCE — 50 OHMS NOMINAL

ANTENNA LOAD — 2:1 MAXIMUM

HARMONIC SUPPRESSION DOWN 60DB @ RATED OUTPUT

INTERMODULATION DISTORTION DOWN 30DB MINIMUM

WEIGHT — 56 lbs.

CABINET SIZE — 14 $\frac{1}{4}$ " x 14 $\frac{3}{4}$ " x 6"

TUBE — 3CX800A7 CERAMIC/METAL TRIODE

PRESSURIZED CHASSIS FORCED AIR COOLING

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INTRODUCTION

The Commander II is a Grounded Grid class Ab2 Linear Power Amplifier that operates on the Amateur 2 meter band.

A 3CX800A7 External Anode Triode with forced air cooling and modern stripline circuitry, insure efficient and conservative operation.

Reduced ratio (6 to 1) vernier drives on all tuning controls allow smooth and easy tuneup.

Front panel input tuning control allowing a higher input circuit "Q" for excellent linearity and a low input SWR to exciter all across the 2 meter band.

Automatic delay circuit for proper cathode conditioning before RF drive can be applied, extending tube life. A 50ohm resistor in the Plate Supply positive lead and a 200ohm resistor in the negative lead help protect the tube in the event of an arc.

The Commander II features a full compliment of control and metering functions including a dual Plate Voltage Switch (high/low on front panel) allowing reduced Plate Voltage for high duty cycle modes and closer in SSB or CW contacts.

A Dual Primary Power Transformer allows 117vac or 234vac operation.

!! WARNING !!
CONTACT WITH VOLTAGES
IN THIS AMPLIFIER CAN BE
!!! FATAL !!!

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UNPACKING INSTRUCTIONS

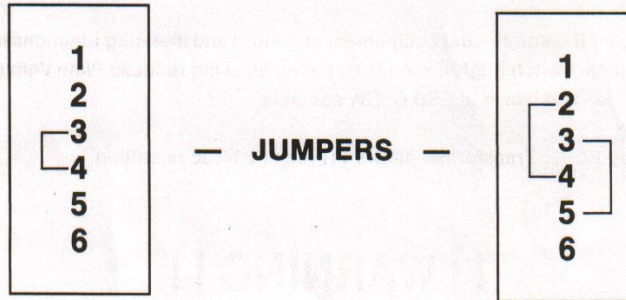
Carefully remove your Commander II from its shipping carton making sure there is no damage evident from shipping. If there is any damage, notify the delivering shipper immediately, fully describing the damage.

Complete the enclosed warranty card and mail to Manufacturer.

Do not destroy the packing material, since it may be reusable later, should you require factory service, or need to transport the Amplifier for any other reason.

234 VOLT OPERATION

117 VOLT OPERATION



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CAUTIONS

Do not attempt any type of service or repair on this Amplifier without first removing from AC power and allowing at **LEAST 1 HOUR (60 MINUTES) FOR HIGH VOLTAGE CAPACITORS TO BLEED OFF!**

Make no attempt to put this Amplifier in service with the top or bottom covers removed. **CONTACT WITH VOLTAGES IN THIS CABINET CAN BE FATAL!**

Never attempt operation without first connecting an appropriate antenna (2:1 SWR Max.) or a 50ohm load with sufficient rating or **SERIOUS DAMAGE TO AMPLIFIER MAY RESULT.**

Never operate with more than 25watts drive in SSB/CW or 15watts drive in any other mode.

Do not place the Commander II in Repeater Operation without first contacting Manufacturer for appropriate modification.

Never operate Amplifier using an extension cord.

Never cover the top of Amplifier cabinet with books, papers or other equipment as **OVER-HEATING MAY RESULT.**

**IF ANY PROBLEM OCCURS NOT EASILY CORRECTED IN FIELD
PLEASE CONTACT MANUFACTURER FOR ASSISTANCE.**

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INSTALLATION PREPARATION

The Commander II is factory wired for operation from a 117VAC line. For 234VAC operation remove the power network cover on rear of Amplifier and install appropriate jumper(s) (SEE ILLUSTRATION IN THIS MANUAL) discard existing 117v plug and install proper 234v plug to mate with your receptacle.

Location of your Commander II requires that no equipment be placed directly above it, as air expelled from tube exhaust can be quite hot! Allow at least 3 inches clearance on either side of unit between other equipment. The use of the supplied bail on bottom of chassis improves air flow.

The Commander II requires a contact closure or keying circuit capable of sinking 150ma. of positive voltage (12v open circuit) to ground. Read the manual supplied with your Transceiver to find the proper external connections. On some Transceivers, this is not provided and an alternate circuit will be required. Always use shielded cable for these connections.

Connect a good quality thru-line wattmeter between the Amplifier output jack and Antenna or Dummy Load using RG8 or better coax. (MICRO 8U IS NOT SUITABLE HERE!)

Connect the exciter RF output to Amplifier input using 50ohm coax. (MICRO 8U FINE HERE.)

Connect as short a ground lead as possible from a good EARTH GROUND to the units rear panel ground terminal.

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OPERATING PROCEDURE

After reading this manual and completing Installation/Preparation Instructions.

Position the Commander II front panel controls as follows:

ON/OFF - OFF

OPERATE/STANDBY - STANDBY

HIGH/LOW - LOW

METER SWITCH - VP (PLATE VOLTAGE)

INPUT - CENTER OF RANGE

LOAD - FULLY LOADED (9 ON SCALE)

TUNE - CENTER OF RANGE

After presetting these controls, switch ON/OFF switch to ON position. At this time you will hear the blower running, but no indication of plate voltage on meter.

When the green power light comes on and an indication of plate voltage on meter (approx. 1750 volts) unit is now ready for operation. This will take a little over 2 minutes (automatic delay).

Switch meter switch to IP (plate current) position.

Switch OPERATE/STANDBY switch to OPERATE and key exciter with no RF applied. Red transmit light should come on along with a slight indication of plate current on meter.

Apply a small amount of drive (about 5 watts) and adjust INPUT control for a rise in plate current.

Next adjust TUNE control for maximum output as indicated on an external wattmeter. Do not adjust LOAD at this time.

Complete these adjustments as quickly as possible.

Now place the HIGH/LOW switch in HIGH position (approx. 2650 volts) on meter in VP position.

Again key exciter and apply full drive (25 watts maximum) and very quickly adjust TUNE, INPUT, and LOAD for maximum output. If these adjustments take more than 60 seconds, remove drive, wait 60 seconds and repeat.

Switch meter to IG (grid current) position, apply drive and quickly adjust LOAD control for minimum grid current. Observe the 60 second limit for keydown time under full output conditions. NOTE! Using excitors with 10-15 watts max output, adjust load control for maximum output.

Return meter switch to IP position and your Commander II is ready for SSB or CW on the air operation.

For FM and other modes, or operation in LOW plate voltage position, limit drive to 15 watts maximum.

Normal SSB operation is indicated by plate current readings on voice peaks of approximately 1/2 to 2/3 of keydown value.

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COMMANDER II — PARTS LISTS

RESISTORS:

R1	50ohm 50watt
R2	200ohm 10watt
R3	10Kohm 5watt
R4	.5ohm 2watt
R5	5ohm 2watt
R6	150Kohm 2watt
R7	1.6meg ½watt
R8, R9, R10	1meg 2watt
R11-R16	150Kohm 2watt

CAPACITORS:

C1, C2	1000uf 16v
C3-C8	150uf 550v
C9	15pf 16v
C10	20pf s-mica
C11	20pf Variable
C12	24pf Variable
C13	10pf Variable
C14	.005uf 5Kv
C15	100pf 5Kv
C16-C27	.01uf 1Kv
C28, 29	.01/p 1Kv
C30-C36	.001/.01uf Bypass

YSU
103M
1KV
KCK

INDUCTORS:

L1	Plate Line
L2	Output Link
L3, L4	Input Tune
RFC-1	Plate Choke
RFC-2	Filament Choke
RFC-3	1uf Choke

DIODES:

D1, D2	1N4001
D3, D4	1N4002
D5-D16	M4G5
D17	8.2v 50watt Zener

SWITCHES:

SW-1	Interlock
SW2-SW4	STDP Toggle
RY-1, RY-2	2PDT 12v
FY-3	Opt. Coaxial

MISC:

V1	3CX800 Ceramic Tube
T1	Plate & Control XFMR
T2	Filament XFMR
IC1	CA555CE
PL-1	IDI 12v green
PL-2	IDI 12v red
B1	50 CFM Blower
J1, J2, J3	S0239
J4, J5	RCA Female
J6	PL259
J7	RCA Male
F1	20A/117v-12A/234v
F2	1.5A

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