Icom

IC PS-125

Service Manual

Authors: Lawrence Young, K4LXV, Dick Knol PA3DUV

Brief operational description Of the Icom PS-125 power supply

A. Primary DC supply

1. AC input voltage is applied through the AC switch, to input fuse F-1 and filters IF1, IF2, and associated capacitors C1-5, C24 & C25, through R-2 to the primary rectifier array D-1. Triac Q-1 which is connected across R-2 conducts once the switching supply starts, thus limiting the voltage drop across R-2. A movable jumper from D-1 to the junction of C-9 & C-10 configures the primary supply for 110 volt operation only. **For 220 volt operation this jumper is not connected.** The +310 volt DC output voltage of D1 is connected through L2, & D2 to series connected electrolytic capacitors C-9 & C-10 which filter the DC output voltage of D-1.

B. Switching supply

1. The output of the primary 310V DC supply is now applied to series connected power FETs Q4 & Q5 and the primary of high frequency transformer T-1. The gates of Q4 & Q5 are driven by Switch mode controller IC, HC-1. Upon initial power application, Q4 or Q5 will conduct first, thus causing an ac output voltage on all secondary windings of T-1. The voltage of T-1 pins 7 & 8 is rectified by D-8, regulated by D-9 & Q-6 and applied to HC-1 pin 12(vcc) to operate HC-1. The voltage from T-1 pins 9 &10 is rectified by D23, & filtered by C40 to supply voltage for all IC's and transistors except HC-1. HC-1 now begins operating and alternately drives Q4 & Q5 at a high AC frequency.

C. Secondary DC supply

1. T-1 secondary windings pins 12 & 13, 16 & 17, 14 & 15, 10 &11 and fast recovery diodes B 11,12, & 13,14, along with electrolytic capacitors C31,32,33.34.& 35 form the 25 amp 13.8 volt DC output supply. The output is applied to the output terminals through L-12 & L-13.
2. The 13.8Volt DC output is sensed via R-58 to the base of Q-11, the collector of which drives opto- isolator PC-1. Adjustment of VR-11adjusts the base voltage of Q-11 thus establishing via HC-1, the power supply DC output voltage.
3. IC-11 pins 1, 2, & 3 sense the voltage drop across R-31 & R-32 via VR-12 and R-44, to establish via the adjustment of VR-12, the maximum output current limit.
4. Zener diode D-26, Q13, R-48, R-49, PC-2 and associated components detect an over voltage condition of the 13.8 volt supply output.
5. IC-11, pins 5,6, & 7, Q-14 & associated components sense temperature rise inside the supply and turn on the fan as appropriate.

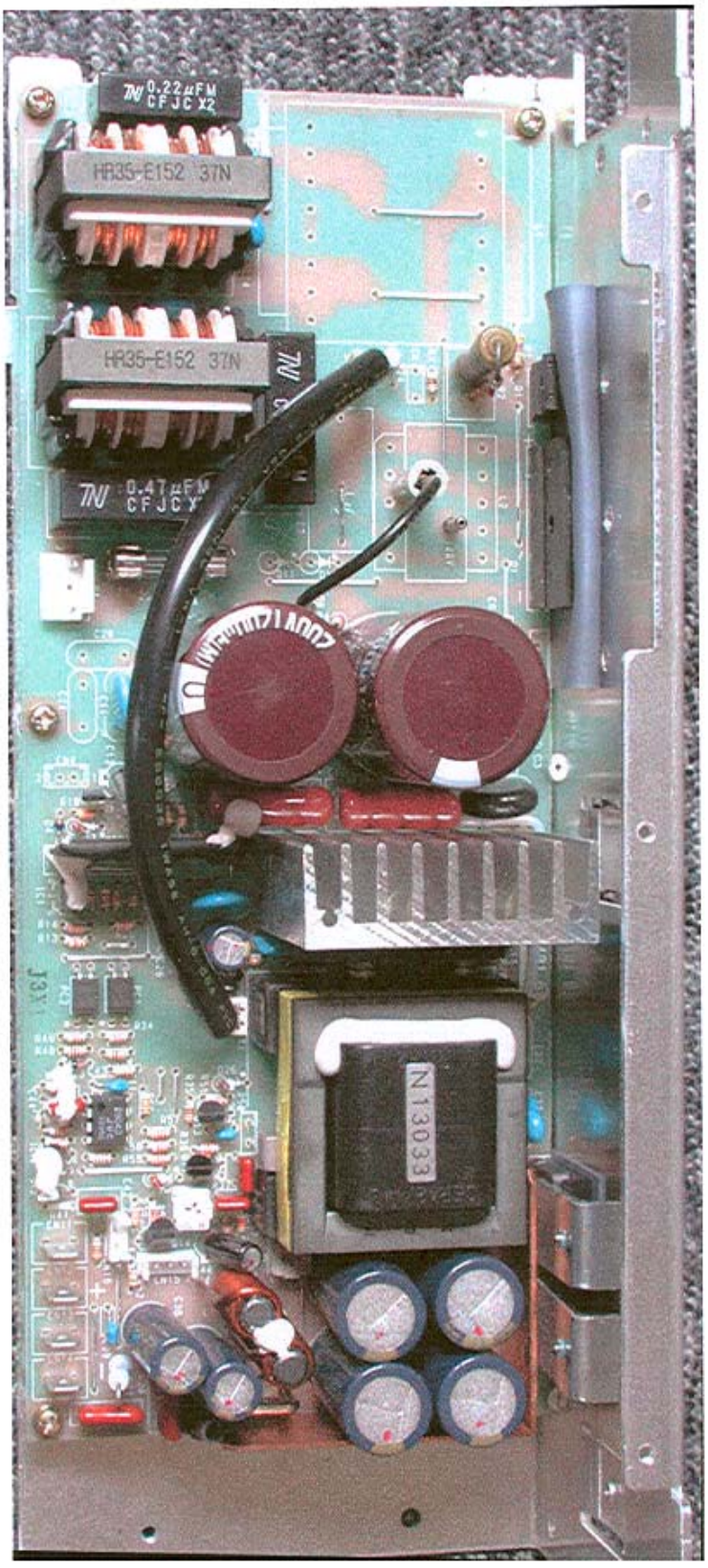
Authors: Lawrence Young, K4LXV, Dick Knol PA3DUV

PS-125 parts list

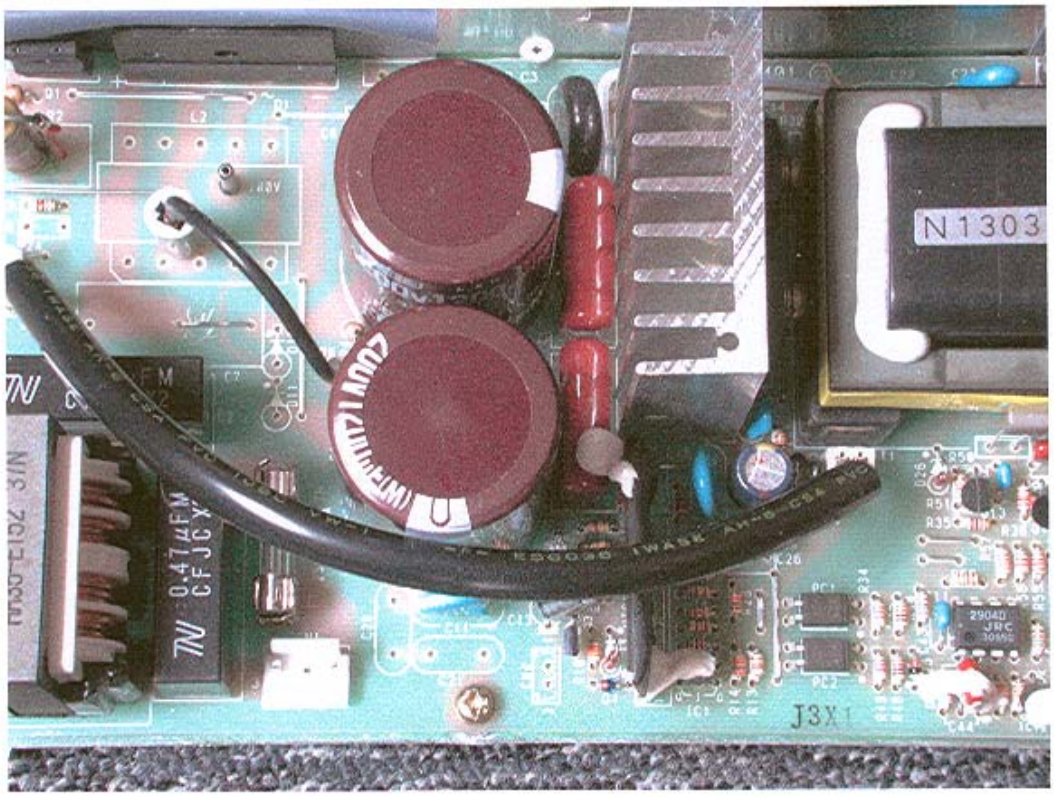
Item	Description	Qty ea.
Q1	TM1641S-L Triac	1
Q2	2SC4002 NPN transistor	1
Q3, 12	DTC 114E digital transistor	2
Q4, 5	FS22SM-9 Power Mosfet transistor	2
Q6	2SC3246	1
Q13	2SA733 pnp transistor	1
Q11,14	2SC945 npn transistor	2
HC-1	WB 2013A switching controller IC	1
IC 1	S80745	1
IC 11	LM2904 dip op amp	1
IC 12	431-	1
PC 1, PC 2	PS2561 opto isolators	2
D1	RBV1506 Bridge rectifier	1
D2,3,25,26	15 volt ½ w zener diode	4
D4,5,6	Iss 270A diode	3
D10,11	Diode	2
D23	CRA91-D2 diode	1
D24	7 volt zener diode	1
B11,12,13,14	D2ZKC060N04 fast recovery power diode	2
Fuse F1	10A (120V) 5A (230V)	1
R2	6.5 ohm power resistor with build in fuse	1

Authors: Lawrence Young, K4LXV, Dick Knol PA3DUV

Icom IC PS-125 Service Manual



Authors: Lawrence Young, K4LXV, Dick Knol PA3DUV



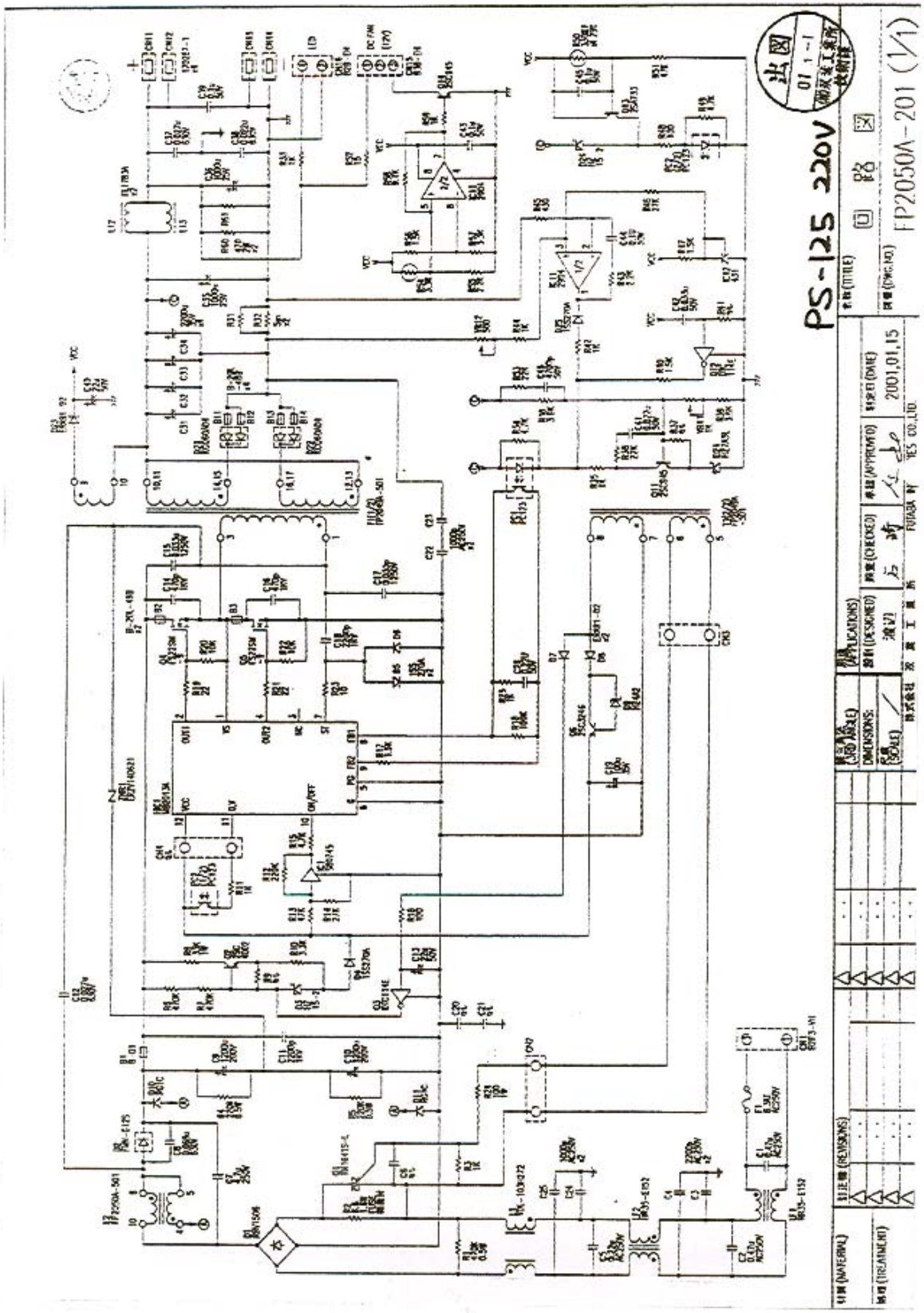
110-220 V jumper detail

Authors: Lawrence Young, K4LXV, Dick Knol PA3DUV

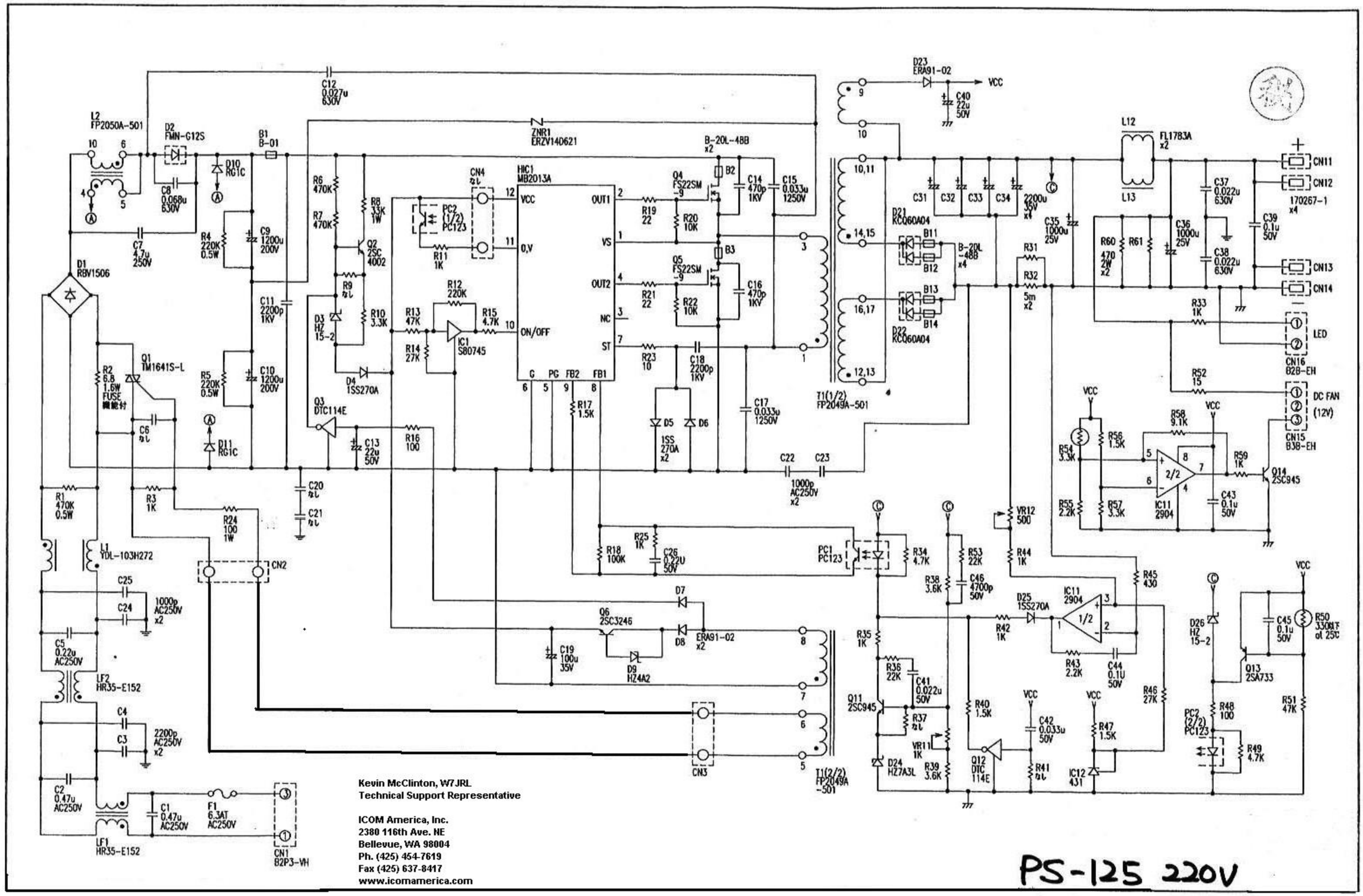
Icom IC PS-125 Service Manual

Authors: Lawrence Young, K4LXV, Dick Knol PA3DUV

Icom IC PS-125 Service Manual



Authors: Lawrence Young, K4LXV, Dick Knol PA3DUV



Kevin McClinton, W7JRL
Technical Support Representative

ICOM America, Inc.
2380 116th Ave. NE
Bellevue, WA 98004
Ph. (425) 454-7619
Fax (425) 637-8417
www.icomamerica.com

PS-125 220V