

TEN - TEC

**OPERATOR'S
MANUAL**

JUPITER

MODEL 538

HF Transceiver

TABLE OF CONTENTS

Photos 1 and 2 JUPITER Front and Rear Views	i	
Photos 3 and 4 JUPITER Top and Bottom Views	ii	
Specifications	iii	
Introduction	v	
Unpacking	vi	
Accessories	vi	
1	INSTALLATION	
1.1	Power Supply	1-1
1.2	Antenna	1-1
1.3	External Speaker	1-1
1.4	Front Panel Connections & Indicators	1-2
1.4.1	Phones	1-2
1.4.2	Key Line Out	1-2
1.4.3	MIC	1-2
1.4.4	RX Led	1-2
1.4.5	TX Led	1-3
1.4.6	ALC Led	1-3
1.5	Rear Panel Connections	1-3
1.5.1	50 Ohm Antenna	1-3
1.5.2	GND	1-3
1.5.3	DC POWER	1-3
1.5.4	FUSE	1-3
1.5.5	ACCESSORY JACK	1-3
1.5.6	TX EN / TX OUT	1-3
1.5.7	EXT T/R	1-4
1.5.8	AUX +13.5V	1-4
1.5.9	REMOTE	1-4
1.5.10	SERIAL INTERFACE	
1.5.11	SPARE	1-4
1.5.12	ACC-2 JACK	1-4
2	GETTING STARTED	
2.1	Introduction	2-1
2.2	Powering Jupiter for the First Time	2-1
2.3	Initial Radio Settings	2-1
2.4	A Brief Tour of the Front Panel Controls	2-1
2.4.1	Left Edge	2-1
2.4.2	Second Column	2-1
2.4.3	Top Row	2-3
2.4.4	Middle Row	2-3
2.4.5	Bottom Row	2-4
2.4.6	Cluster Above Tuning Knob	2-5
2.4.7	LOCK Button	2-5
2.4.8	RIT & XIT Buttons	2-6
2.4.9	Mode Selection	2-6

2.4.10	VFO Operation	2-6
2.4.11	Split Operation Example	2-6
2.4.12	Reverse-Split Example	2-6
2.5	Receiver Operation	
2.5.1	RECEIVE FILTER SELECTION	2-7
2.5.2	PASSBAND TUNING (PBT)	2-7
2.5.3	AUDIO (AF) AND RF GAIN CONTROLS	2-7
2.5.4	AUTOMATIC GAIN CONTROL (AGC)	2-7
2.5.5	NR (DSP NOISE REDUCTION)	2-7
2.5.6	AN (AUTOMATIC NOTCH)	2-7
2.5.7	S METER	2-8
2.5.8	SQUELCH	2-8
2.5.9	RF ATTENUATOR	2-8
2.5.10	LOCK	2-8
2.6	Transmitter and Transceiver Operation	
2.6.1	CW OPERATION TUNE	2-8
2.6.2	PUSH to TALK USB/LSB OPERATION	2-8
2.6.3	MONITOR	2-8
2.6.4	DIGITAL MODE OPERATION	2-9
2.6.5	FM OPERATION	2-9
2.6.6	CONTROL SUMMARY	2-9

3. DETAILED OPERATING INSTRUCTIONS

3.1	Introduction	3-1
3.2	Jupiter's Menu Screen	3-1
3.3	Transmitter Settings	3-1
3.3.1	TRANSMITTER ON/OFF	3-1
3.3.2	TRANSMITTER METER	3-1
3.3.3	OUTPUT POWER	3-1
3.4	CW Settings	3-2
3.4.1	TX Enable Keying Loop	3-2
3.4.2	CW QSK Delay	3-2
3.4.3	CW Keyer	3-2
3.4.4	Keyer Speed	3-2
3.4.5	CW Weighting	3-2
3.4.6	Sidetone Volume	3-2
3.4.7	Sidetone Frequency	3-2
3.4.8	SPOT Volume	3-2
3.5	SSB and Digital Mode Settings	3-3
3.5.1	Transmitter Filter Bandwidth	3-3
3.5.2	Microphone Gain	3-3
3.5.3	VOX Controls	3-3
3.5.4	VOX Gain	3-3
3.5.5	VOX Delay	3-4
3.5.6	Anti-VOX	3-4
3.5.7	Monitor Volume	3-4
3.5.8	Microphone/Speaker vs. Accessory Input/Output	3-4
3.6	Sweep Function	3-4

3.7	Autosweep Function		3-4
3.8	Sweep Range		3-4
3.9	High Boost		3-4
3.10	Contrast		3-4
3.11	Using External Amplifiers		3-5
3.11.1	Operation With a Non-QSK Amplifier		3-5
3.11.2	Operation With a Ten-Tec QSK Amplifier		3-5
4	SCHEMATICS AND PARTS LISTS		4-1
Figure 4-1	DIAGRAM – JUPITER TRANSCEIVER	538.SCH	4-2
Figure 4-2	RF BOARD 81889	538RF.SCH	4-3
Figure 4-3	LOCAL OSC S p/o 81889	81889LO.SCH	4-4
Figure 4-4	RECEIVER1 p/o 81889	81889RX1.SCH	4-5
Figure 4-5	RECEIVER2 p/o 81889	81889RX2.SCH	4-6
Figure 4-6	TRANSMITTER1 p/o 81889	81889TX1.SCH	4-7
Figure 4-7	TRANSMITTER2 p/o 81889	81889TX2.SCH	4-8
Figure 4-8	81889 TOP VIEW COMPONENT MAP	81889TOP	4-9
Figure 4-8A	81889 BOTTOM VIEW COMPONENT MAP	81889BOT	4-10
Table 4-2	81889 BILL OF MATERIALS	81889.BOM	4-11
Figure 4-9	DSP BOARD 81886	538DSP.SCH	4-15
Figure 4-10	POWER/CONTROL p/o 81886 81886CTL.SCH		4-16
Figure 4-11	AUDIO I/O p/o 81886	81886ANG.SCH	4-17
Figure 4-12	CODEC p/o 81886	81886COD.SCH	4-18
Figure 4-13	LOGIC/DSP p/o 81886	81886CPU.SCH	4-19
Figure 4-14	PLD p/o 81886	81886PLD.SCH	4-20
Figure 4-15	81886 TOP VIEW COMPONENT MAP 81886TOP		4-21
Table 4-3	81886 BILL OF MATERIALS	81889.BOM	4-22
<i>No figure 4-16</i>			
Figure 4-17	81863: 538LOWPASS FILTER	538LPF.SCH	4-24
Table 4-4	81863 BILL OF MATERIALS	81863.BOM	4-25
Figure 4-18	81877: 538KEY PAD	538PANEL.SCH	4-27
Table 4-5	81877 BILL OF MATERIALS	81877.BOM	4-28
Table 4-5A	78213: PANEL JACKS BILL OF MATERIALS 78312.BOM		4-29
Figure 4-19	81888: REAR CONNECTORS 538REAR.SCH		4-30
Table 4-6	81888 BILL OF MATERIALS	81888.BOM	4-31
Figure 4-20	81895: JUPITER DCIN	81895.SCH	4-32
Table 4-7	81895 BILL OF MATERIALS	81895.BOM	4-33
Figure 4-21	81897: 100 WATT RF AMPLIFIER	81897.SCH	4-34
Table 4-8	81897 BILL OF MATERIALS	81897.BOM	4-35

5	THEORY OF OPERATION	5-1
6	GLOSSARY	6-1
7	TROUBLE SHOOTING GUIDE	7-1
8	PEGASUS EMULATION MODE	8-1

Photo 1 Jupiter Front View

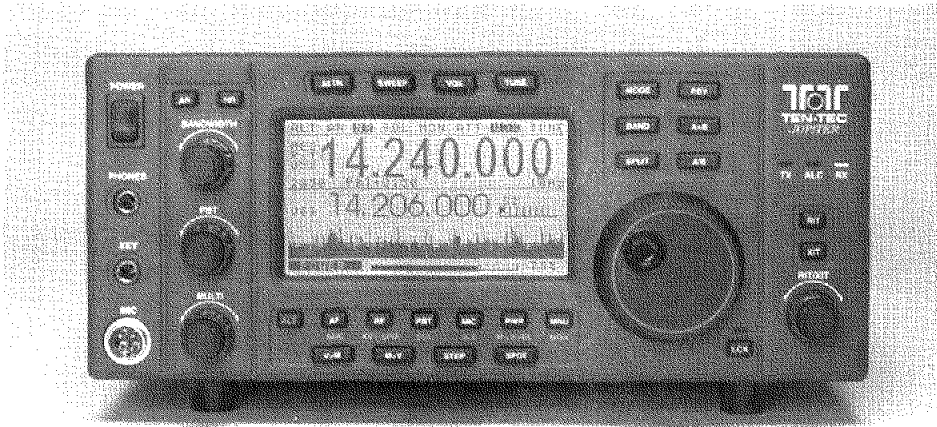


Photo 2 Jupiter Rear View

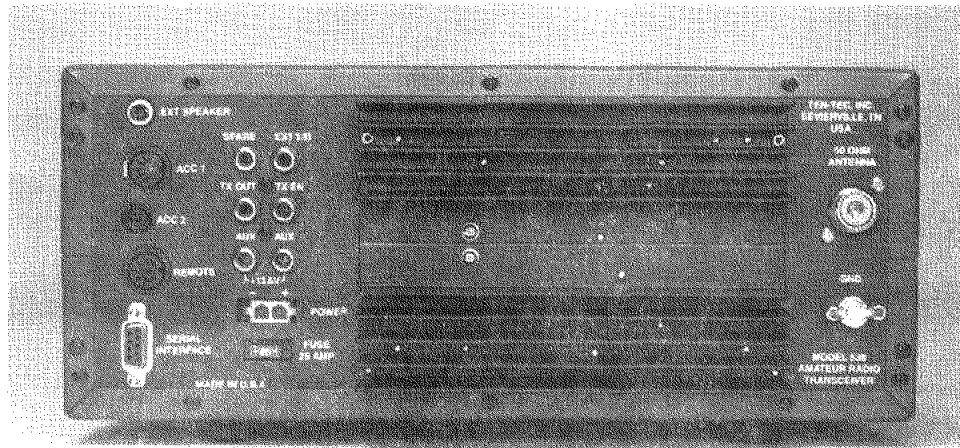


Photo 3 Jupiter Top View

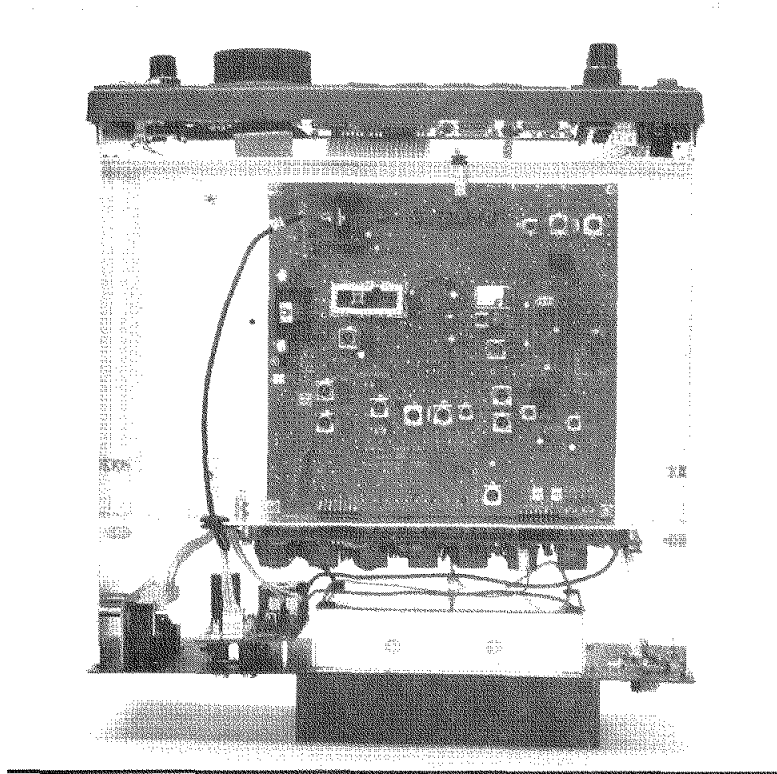
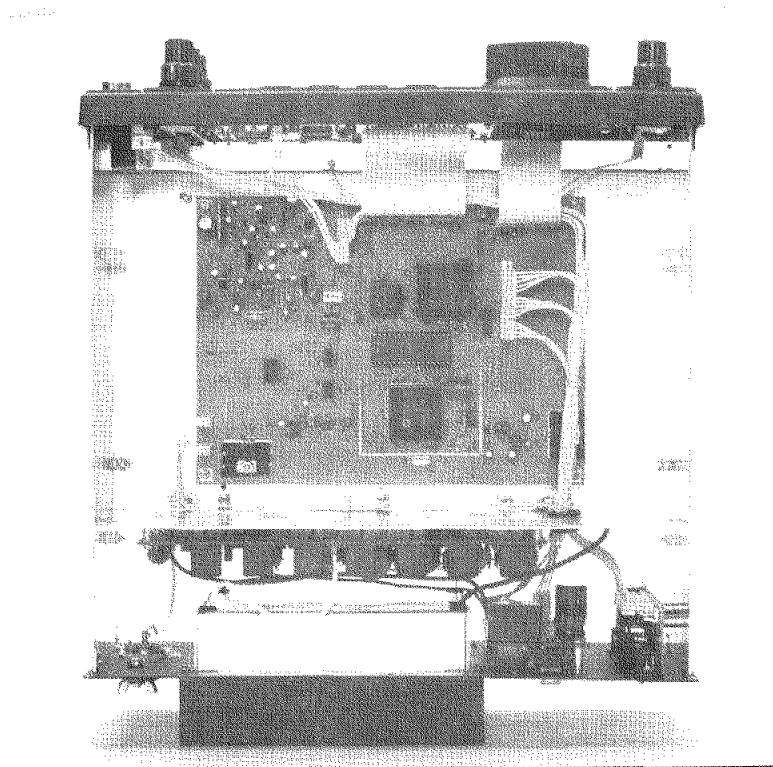


Photo 4 Jupiter Bottom View



SPECIFICATIONS

GENERAL

MODULATION	LSB, USB, CW, AFSK, FM, AM.
FREQUENCY RANGE	Receive: 100 kHz – 30 MHz. Transmit: All amateur radio frequencies: 160 through 10 m.
DISPLAY	Multi-line text and graphic Liquid Crystal Display.
VFO	Dual VFOs with SPLIT transceive option.
OFFSET TUNING	+/- 10 kHz on receive and transmit.
MEMORIES	128 internal to Jupiter. - Virtually any PC will store thousands of memories in Pegasus Emulation Mode.
FREQUENCY ACCURACY	+/- 90 Hz at 25°C at 30 MHz for 1 year.
ANTENNA IMPEDANCE	50 ohms, SWR <2:1, unbalanced .
POWER REQUIRED	12-14 VDC @1.5 A receive, 20A transmit.
CONSTRUCTION	9 epoxy glass PC boards, molded front panel, aluminum chassis, textured painted steel cover.
DIMENSIONS	HWD = 5" x 12.125" x 13" (12.7 x 30.8 x 33 cm.) Depth includes heat sink on rear panel.
WEIGHT	12 lbs. (5.45 kg.)
<u>TRANSMITTER</u>	
RF OUTPUT	5 – 100 watts, ALC stabilized.
DC INPUT	Maximum 250 watts @ 14 VDC. 100% duty cycle for up to 10 minutes. Continuous duty with user-supplied air cooling of rear panel heat sink.
MICROPHONE	4-pin front panel connector accepts 200 ohm to 50K ohm impedance microphones with 5 mV (-67 dB) output and provides DC polarizing voltage (+9 V) for electret microphones.
LINE INPUT	1 mV p-p into 47k Ohms.
T/R SWITCHING	PTT or VOX on SSB, Adjustable QSK on CW.
CW OFFSET	DSP generated: programmable 0 to 1270 Hz. Sidetone automatically matches offset.
FM DEVIATION	5 kHz peak.
METERING	Selectable: Forward power or SWR.
SSB GENERATION	DSP implementation of Weaver method SSB.