

UHF FM TRANSCEIVER  
**TK-3230**  
 SERVICE MANUAL  
**ADDENDUM**

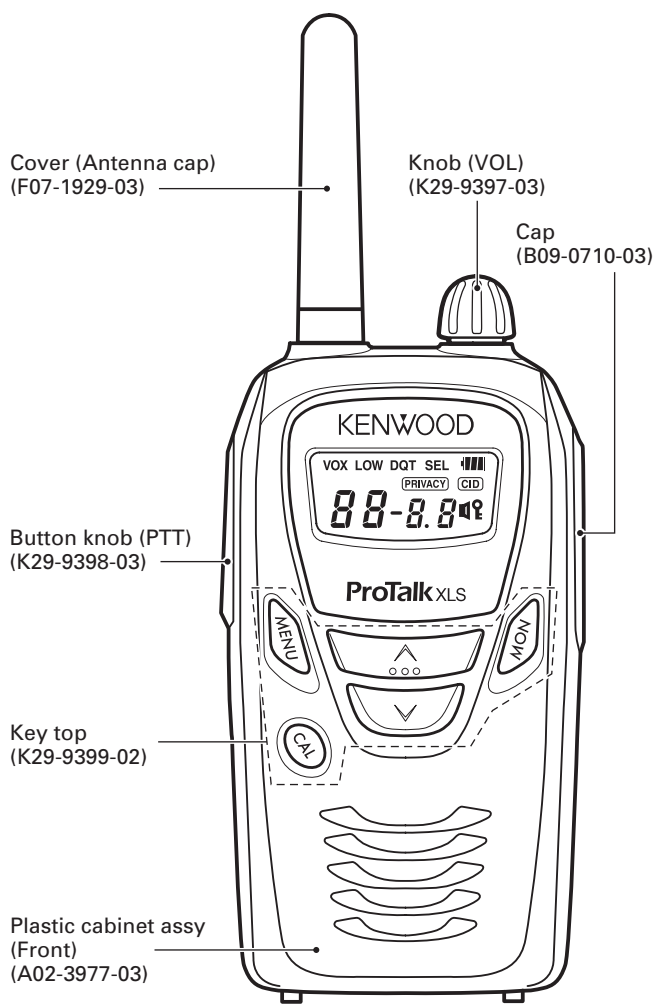
**KENWOOD**

Kenwood Corporation

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This TK-3230 (B51-8806-00) service manual corrects adjustment items in the TK-3230 (B51-8792-00) service manual.

Please use this TK-3230 (B51-8806-00) service manual in place of the adjustment items in the TK-3230 (B51-8792-00) service manual.



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## ADJUSTMENT

### Required Test Equipment

#### 1. Stabilized Power Supply

- 1) The supply voltage can be changed between 0V and 10V, and the current is 3A or more
- 2) The standard voltage is 3.8V

#### 2. DC Ammeter

- 1) Class 1 ammeter (17 ranges and other features).
- 2) The full scale can be set to either 300mA or 3A.
- 3) A cable of less internal loss must be used.

#### 3. Frequency Counter (f. counter)

- 1) Frequencies of up to 1GHz or so can be measured.
- 2) The sensitivity can be changed to 500MHz or below, and measurements are highly stable and accurate (0.2ppm or so).

#### 4. Power Meter

- 1) Measurable frequency : Up to 600MHz
- 2) Impedance : 50Ω, unbalanced
- 3) Measuring range : Full scale of 3W or so
- 4) A standard cable (5D2W 1m) must be used.

#### 5. RF Voltmeter (RF V.M)

- 1) Measurable frequency : Up to 600MHz or so

#### 6. Linear Detector

- 1) Measurable frequency : Up to 600MHz or so
- 2) Characteristics are flat, and CN is 60dB or more

#### 7. Digital Voltmeter

- 1) Voltage range : FS=10V or so
- 2) Input resistance : 1MΩ or more

#### 8. Oscilloscope

- 1) Measuring range : DC to 30MHz
- 2) Provides highly accurate measurements for 5 to 25MHz.

#### 9. AF Voltmeter (AF V.M)

- 1) Measurable frequency : 50Hz to 1MHz
- 2) Maximum sensitivity : 1mV or more

#### 10. Standard Signal Generator (SSG)

- 1) Maximum frequency : 600MHz or more
- 2) Output : -133dBm/0.05μV to 7dBm/501mV
- 3) Output impedance : 50Ω

#### 11. Dummy Load

- 1) 8Ω, 1W or more

#### 12. AF Generator (AG)

- 1) Frequency range : 100Hz to 100kHz
- 2) Output : 0.5mV to 1V

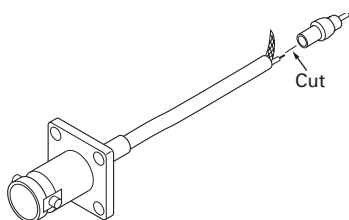
#### 13. Distortion Meter

- 1) Measurable frequency : 30Hz to 100kHz
- 2) Input level : 50mV to 10Vrms

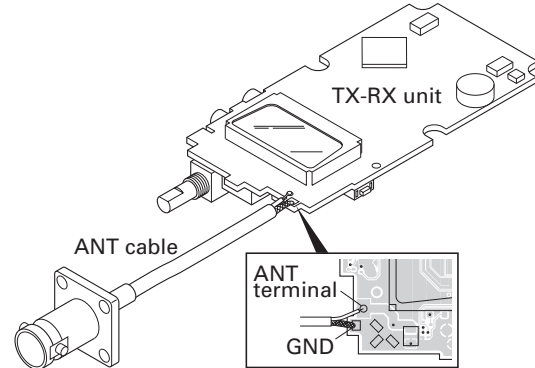
### Service Jig

#### ■ ANT cable (E30-3418-08)

Modify the cable as shown below.



Solder the ANT cable to the ANT terminal on the TX-RX unit.



#### ■ Battery jig (W05-1365-00)

Connect the power cable properly between the battery jig installed in the transceiver and the power supply, and be sure output voltage and the power supply polarity prior to switching the power supply ON, otherwise over voltage and reverse connection may damage the transceiver, or the power supply or both.

**Note:** When using the battery jig, you must measure the voltage at the terminals of the battery jig. Otherwise, a slight voltage drop may occur within the power cable, between the power supply and the battery jig, especially while the transceiver transmits.

### Test Signaling

No.	Receive	Transmit
1	None	None
2	None	100Hz Square Wave
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 250.3Hz	QT 250.3Hz
6	DQT D023N	DQT D023N
7	DQT D754I	DQT D754I
8	MSK Code (100-1000)	MSK Code (100-1000)
9	None	MSK (1010...)

### Test Frequency

No.	Receive (MHz)	Transmit (MHz)
1 (Low)	460.05000	460.10000
2 (High)	469.95000	469.90000
3	460.00000	460.00000
4	460.20000	460.20000
5	460.40000	460.40000
6	460.60000	460.60000

### Adjustment Frequency List


CH	Receive (MHz)	Transmit (MHz)
Center	465.05000	465.00000
Frequency Shift 6.25kHz	-	465.00625
Frequency Shift 5.kHz	-	465.00500

## ADJUSTMENT

## Common Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) Set battery jig Battery terminal: 3.8V							
2. VCO lock voltage (Test mode)	1) CH: TX high PTT: ON	Digital voltmeter	TX-RX	LV	TX-RX	TC1	1.85V	±0.05V
	2) CH: RX high						Check	2.4V or less
	3) CH: RX low							0.4V or more
	4) CH: TX low PTT: ON							

## Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency adjustment	1) PC tune CH: TX center PTT: ON	f. counter		ANT Jig cable SP/MIC jack		PC key	Adjust to the center frequency.	Within ±100Hz
2. Frequency shift 6.25kHz	1) PC tune CH: TX 460.00625MHz PTT: ON						Adjust to the desired frequency.	Within ±100Hz
3. Frequency shift 5kHz	1) PC tune CH: TX 460.005MHz PTT: ON							
4. High transmit power	1) PC tune CH: TX center	Power meter DC ammeter					Adjust it to 1.5W	±0.1W Less than 1.6A
	2) Test mode CH: TX low, high PTT: ON						Check	1.15~1.85W Less than 1.6A
5. Low transmit power	1) PC tune CH: TX center PTT: ON					PC key	Adjust it to 0.55W	±0.1W Less than 0.9A
	2) Test mode CH: TX low, high PTT: ON						Check	300~800mW Less than 0.9A
6. DQT balance	1) Test mode CH: TX low SIG: TX 100Hz square wave Linear detector filter LPF: 3kHz PTT: ON	Linear detector Oscilloscope			TX-RX	VR300	Adjust the waveform to square wave.	

## ADJUSTMENT

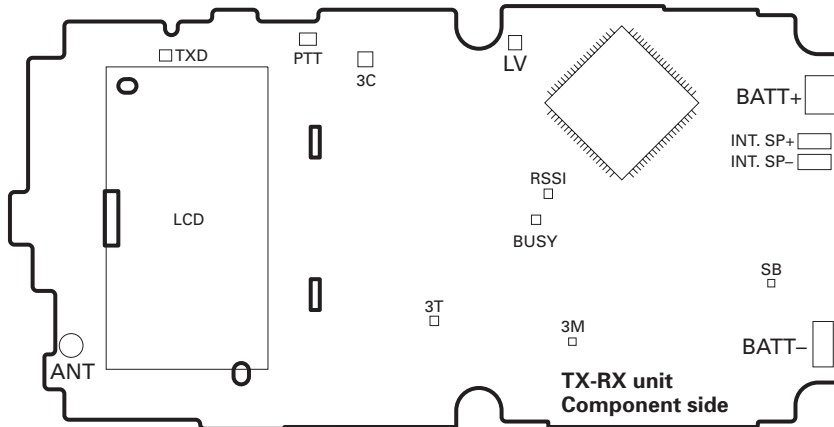
Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
7. MAX deviation (Wide)  (Narrow)	1) PC tune CH: TX center Linear detector filter LPF: 15kHz AG: 1kHz/150mV PTT: ON	Linear detector AG AF V.M		ANT Jig cable SP/MIC jack		PC key	Adjust it to 4.2kHz. ± peak whichever higher	±0.1kHz
							Adjust it to 2.1kHz. ± peak whichever higher	±0.1kHz
8. MIC sensitivity (Wide)  (Narrow)	1) Test mode CH: TX low, high Linear detector filter LPF: 15kHz AG: 1kHz/12mV PTT: ON						Check	±2.5~3.8kHz
								±1.1~1.9kHz
9. QT fine deviation	1) PC tune CH: TX center (Wide) QT: 151.4Hz Linear detector filter LPF: 3kHz PTT: ON	Linear detector				PC key	Adjust it to 0.75kHz.	±0.05kHz
	2) PC tune CH: TX center (Narrow) QT: 151.4Hz Linear detector filter LPF: 3kHz PTT: ON						Adjust it to 0.35kHz.	±0.05kHz
10. DQT fine deviation	1) PC tune CH: TX center (Wide) DQT: 023N Linear detector filter LPF: 3kHz PTT: ON						Adjust it to 0.75kHz.	±0.05kHz
	2) PC tune CH: TX center (Narrow) DQT: 023N Linear detector filter LPF: 3kHz PTT: ON						Adjust it to 0.35kHz.	±0.05kHz
11. MSK fine deviation	1) PC tune CH: TX center (Wide) MSK Linear detector filter LPF: 15kHz PTT: ON						Adjust it to 3.0kHz	±0.1kHz
	2) CH: TX center (Narrow) MSK Linear detector filter LPF: 15kHz PTT: ON						Check	±1.0~±2.0kHz
12. VOX level	1) PC tune AG: 1kHz/40mV	AG				PC key (Start)	Write	
13. Battery indicator level	1) PC tune Battery terminal: 3.19V	Digital voltmeter		Battery terminal				

## ADJUSTMENT

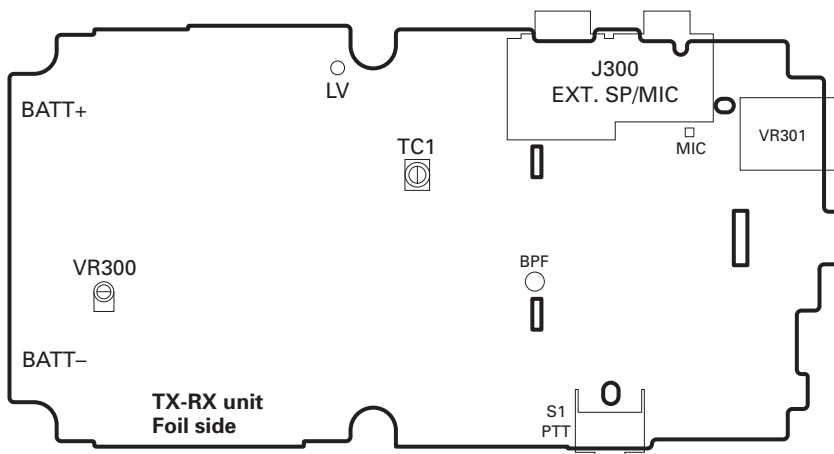
### Receiver Section

Item	Condition	Measurement			Adjustment			Specifications / Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Sensitivity (Wide)	1) Test mode CH: RX low, high SSG output: -117dBm (0.32μV) SSG MOD: 1kHz SSG DEV: ±3kHz	SSG Oscilloscope AF V.M Distortion meter		ANT Jig cable SP/MIC jack			Check	SINAD: 12dB or more
	(Narrow)							
2. Squelch level (open)	1) PC tune CH: RX center (Wide) SSG output: -121dBm SSH MOD: 1kHz SSG DEV: ±3.0kHz					PC key	Adjust to open the squelch.	
	2) PC tune CH: RX center (Narrow) SSG output: -120dBm SSH MOD: 1kHz SSG DEV: ±1.5kHz							

### Adjustment Points



BATT+/-: External power supply terminal (Fasten it with an alligator clip)



TC1: VCO lock voltage adjustment  
LV: VCO lock voltage measurement  
VR300: DQT balance adjustment

# TK-3230

## SPECIFICATIONS

### General

Frequency Range	
BRS .....	Preset 56CH
LMR .....	460 to 470MHz
Number of Channels.....	2CH (FPU: 16CH)
PLL Channel Stepping .....	6.25kHz, 5kHz
Modulation (Wide/Narrow) .....	16K0F3E/11K00F3E
RF Output Power (High/Low) .....	1.5W / 500mW
Operating Voltage .....	3.8V DC (3.4~4.2V)
Battery Life (5-5-90 Duty Cycle).....	Up to 14 hours (at KNB-46L high power)
Operating Temperature Range .....	-10°C to +60°C (+14°F to +140°F)
Frequency Stability .....	±2.5ppm
Dimensions.....	52 (W) x 103.5 (H) x 28.7 (D) mm (155.5mm (H) included antenna) (Projections not included)
Weight .....	Approx. 155g with KNB-46L battery
Standard Load	
Antenna Impedance.....	50Ω
MIC Input .....	2kΩ
AF Output .....	8Ω

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