

# IC-M502A ADJUSTMENT PROCEDURES

## 1 PREPARATION

### ■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Output voltage : 13.8 V DC Current capacity : 10 A or more	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
RF power meter (terminated type)	Measuring range : 1–50 W Frequency range : 100–300 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Standard signal generator (SSG)	Frequency range : 0.1–300 MHz Output level : 0.1 μV–32 mV (–127 to –17 dBm)
Frequency counter	Frequency range : 0.1–300 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V
		AC millivoltmeter	Measuring range : 10 mV–10 V
FM deviation meter	Frequency range : 30–300 MHz Measuring range : 0 to ±10 kHz	External speaker	Input impedance : 4 Ω Capacity : 5 W or more
DC voltmeter	Input impedance : 50 kΩ/V DC or better	Attenuator	Power attenuation : 40 or 50 dB Capacity : 50 W or more

## 2 PLL ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
LOCK VOLTAGE	1 <ul style="list-style-type: none"> <li>• Operating channel : chP2 (Frequency : 163.425 MHz)</li> <li>• Receiving</li> </ul>	MAIN	Connect a digital multi-meter or oscilloscope to check point CP2.	3.6 V	MAIN	L9
	2 <ul style="list-style-type: none"> <li>• Operating channel : chP2 (Frequency : 161.450 MHz)</li> <li>• Output power : Low</li> <li>• Transmitting</li> </ul>		Connect a digital multi-meter or oscilloscope to check point CP1.			L4
REFERENCE FREQUENCY	1 <ul style="list-style-type: none"> <li>• Operating channel : ch16</li> <li>• Output power : Low</li> <li>• Connect an RF power meter or a 50 <math>\Omega</math> dummy load to the antenna connector.</li> <li>• Transmitting</li> </ul>	Rear Panel	Loosely couple the frequency counter to the antenna connector.	156.8000 MHz	MAIN	C12

### 3 TRANSMITTER ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
OUTPUT POWER	1	<ul style="list-style-type: none"> <li>• Operating channel : ch16</li> <li>• Output power : High</li> <li>• Transmitting</li> </ul>	Rear Panel	Connect an RF power meter to the antenna connector.	23.5 W	MAIN	R114
FREQUENCY DEVIATION	1	<ul style="list-style-type: none"> <li>• Operating channel : ch16</li> <li>• Output power : Low</li> <li>• Connect an audio generator to J7 (pin 5) with an AC millivoltmeter and set as: <ul style="list-style-type: none"> <li>Frequency : 1 kHz</li> <li>Level : 30 mV</li> </ul> </li> <li>• Set an FM deviation meter as: <ul style="list-style-type: none"> <li>HPF : OFF</li> <li>LPF : 20 kHz</li> <li>De-emphasis : OFF</li> <li>Detector : (P-P)/2</li> </ul> </li> <li>• Transmitting</li> </ul>	Rear Panel	Connect an FM deviation meter to the antenna connector through an attenuator.	±4.3 kHz	MAIN	R381

## 4 RECEIVER ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
SENSITIVITY	1 <ul style="list-style-type: none"> <li>• Operating channel : ch16</li> <li>• [SQUELCH] control: Max. counterclockwise</li> <li>• Set the internal speaker OFF in the SET mode, and connect a distortion meter with a 4 Ω load to [EXT SP] receptacle.</li> <li>• Connect an SSG to the antenna connector and set as:                Frequency : 156.800 MHz                Level : 3.2 μV*                              (-97 dBm)                Modulation : 1 kHz                Deviation : ±3.5 kHz</li> <li>• Receiving</li> </ul>	MAIN	Connect a DC voltmeter to check point CP3.	Maximum voltage	MAIN	L35, L36, L38, L39
SQUELCH	1 <ul style="list-style-type: none"> <li>• Operating channel : ch16</li> <li>• [SQUELCH] control: Max. counterclockwise</li> <li>• Connect an SSG to the antenna connector and set as:                Frequency : 156.800 MHz                Level : 0.40 μV*                              (-115 dBm)                Modulation : 1 kHz                Deviation : ±3.5 kHz</li> <li>• Receiving</li> </ul>	MAIN	Connect a DC voltmeter to check point CP5.	1.15 V	MAIN	R214

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.