

Adjustment for IC-M402

Preparation

Connect the DC Power Supply : Voltage 13.8V, Current: More than 10A

Lock Voltage

1. Check that lock voltage (CP1) is $1.8 \pm 0.5V$ when receiving Ch.16.
2. Check that lock voltage (CP1) is $1.6 \pm 0.5V$ when transmitting Ch.16.

TX Output Power Adjustment & Check

1. Connect power meter to the ANT terminal, and set to Ch.16.
2. At High power, adjust R71 to Output power 25W.
3. Check for following range within band
High Power 24W-25W
Low Power 0.4W-1.2W

Reference Adjustment

1. Connect a frequency counter via the ATT to the ANT terminal.
2. Set C36 so that the frequency is Within 156.800 MHz $\pm 500Hz$

Modulation Adjustment & Check

1. Connect a linear detector via ATT to the ANT, and set frequency to Ch.16.
2. Set the linear detector to the following:
HPF OFF
LPF 20kHz
De-emphasis OFF
Level Meter (P-P)/2
3. Supply the following signal to the MIC terminal from the AG
45mV at 1kHz
4. Set to TX, then set the frequency deviation to $\pm 4.3kHz$ by R138 (MOD).
5. Lower the AG level so that the modulation is $\pm 3.0 kHz$,
and check that the level then is 2.3-9.0mV.

TX S/N Check

1. Connect a linear detector via ATT to the ANT, and set frequency to Ch.16.
HPF OFF
LPF 20kHz
De-emphasis OFF
Level Meter (P-P)/2.
2. When transmitting while the modulation frequency is 1 kHz,
and deviation is More than 3.5 kHz, check that the S/N is more than
40 dB during non-modulated transmit.

Checking TX Spurious

1. Connect a spectrum analyzer via the ATT to the ANT terminal and perform a non-modulated transmission.
2. Check More than that higher order spurious is within the value of more than 70 dBc (Hi power).

Checking Receive

1. Connect a signal generator and set to the following;

FREQ	156.8 MHz (Ch.16)
MOD FREQ	1kHz
DEV	±3.5 kHz
LEVEL	+10 dBu
2. Connect a distortion meter and a 4 ohm load to the external speaker.
3. Check the 12 dB SINAD value. Less than -10 dBu.
4. Check the 12 dB SINAD value in the receive band. Less than -10 dBu.

Checking AF Output

1. Set the SG output to +60 dBu in the same state as RX adjustment.
2. Set the AF volume so that the distortion meter reads 10%.
3. Check that the AF output is more than 3.5W at this point.

Checking RX S/N

1. Set the SG output to +60 dBu in the same state as RX adjustment.
2. Adjust to 50% of rated AF Output,
then check that the AF output at this point
and the AF output S/N with the modulation OFF, are more than 40dB.

Squelch Setting

1. Set the SG output to -13 dBu in the same state as RX adjustment.
2. Connect a DC voltage meter to CP2, and adjust R16 to be 1V.

Checking Howling

1. Set the SG output to +60 dBu in the same state as RX adjustment,
to non-modulation.
2. Remove the external speaker, and check for howling.

Checking DSC Decode

1. Input a test signal to the ANT terminal of
1300 Hz/Dev 2.6 kHz, and 2100 Hz/Dev 4.2 kHz, at a 50% duty cycle.
FREQ 156.525 MHz (Ch.70)
LEVEL +30 dBu
2. Connect the CP3 to an oscilloscope
and check that the wave shape is at a 50% duty cycle.

Checking DSC Encode

1. Connect a linear detector via ATT to the ANT terminal and set to Ch.70.
2. Set the linear detector to the following:
HPF OFF
LPF 20kHz
De-emphasis OFF
Level Meter (P-P)/2
3. Set the unit to Adjust Mode, and check the frequency deviation in TX.
DSC Hi 2.6 kHz±10%
DSC Low 4.2 kHz±10%
4. Prepare a unit that can receive a distress code
and check that the DSC receives the signal from the M402.