GIANT ELECTRONICS LTD.

ALIGNMENT PROCEDURE

For Cobra model CB 29 LX LE (Giant: 29-LX)

MODEL: CB 29 LX LE

REVISION: V01

DATE : 2010-6-22

PREPARED BY:

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Total page: 5 pages

CB 29-LX ALIGNMENT INSTRUCTION

1.0 TEST CONDITION:

1.1. STANDARD DC POWER:	EXT.DC	13.8VDC
1.2. MEASUREMENT CHANNEL:	CB	CH19 / WX CH5
1.3. STANDARD AUDIO LOADING:	CB	8 Ω
1.4. ANTENNA IMPEDANCE:	CB	50 Ω
1.5. STANDARD REF. MODULATION:	CB	30% (AM) / WX +/- 3KHz (FM)
1.6. STANDARD REF. AUDIO OUTPUT:	CB	0.5W

1.7. FREQUENCY TABLE:

CB Section: WX Section:

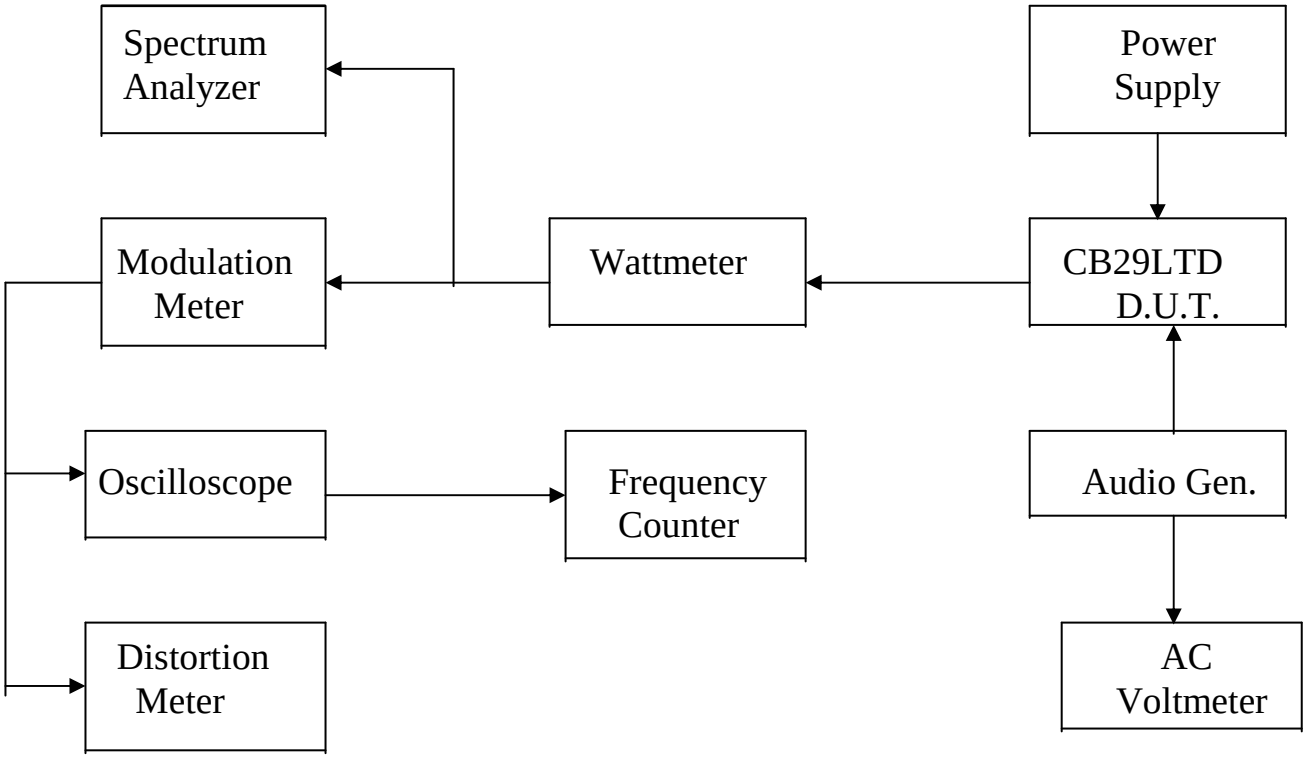
CH NO.	FREQ. (MHz)
1	26.965
2	26.975
3	26.985
4	27.005
5	27.015
6	27.025
7	27.035
8	27.055
9	27.065
10	27.075
11	27.085
12	27.105
13	27.115
14	27.125
15	27.135
16	27.155
17	27.165
18	27.175
19	27.185
20	27.205
21	27.215
22	27.225
23	27.255
24	27.235
25	27.245
26	27.265
27	27.275
28	27.285
29	27.295
30	27.305
31	27.315
32	27.325
33	27.335
34	27.345
35	27.355
36	27.365
37	27.375
38	27.385
39	27.395
40	27.405

CH No.	FREQ (MHz)
1	162.550
2	162.400
3	162.475
4	162.425
5	162.450
6	162.500
7	162.525
8	161.650
9	161.775
10	163.275

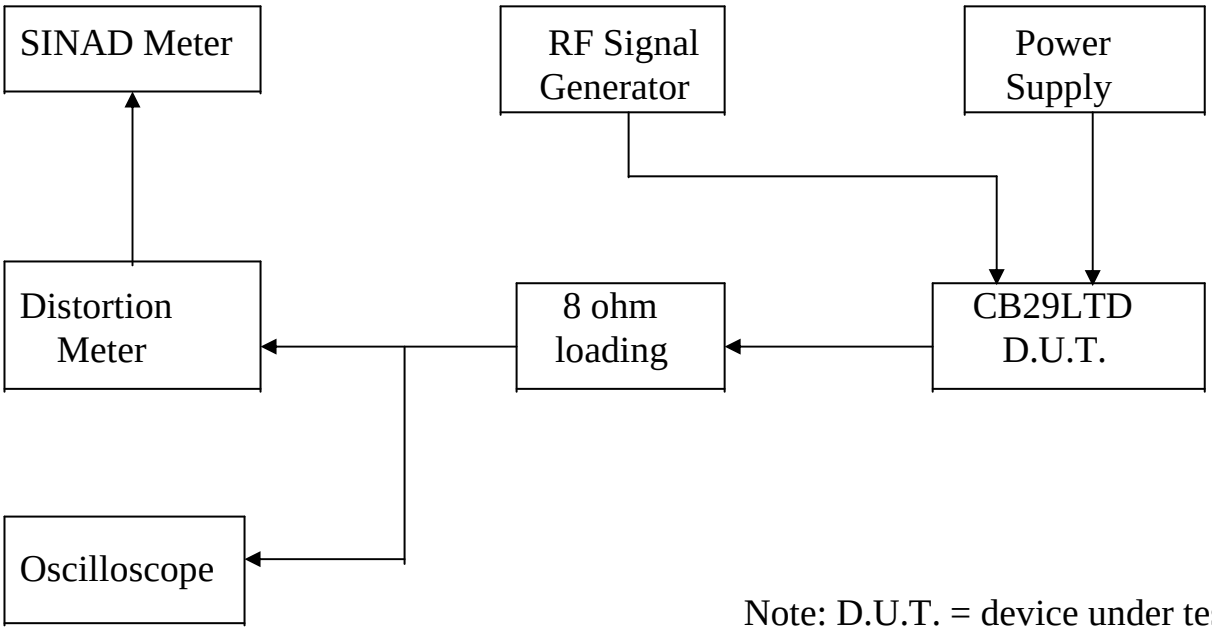
Above red color channels are the definition test model channel for alignment.

1.8. TEST EQUIPMENT SETUP AS BELOW:

A. TX test equipment setup:



B. RX test equipment setup:



Note: D.U.T. = device under test

2.0 Alignment of P.L.L. portion of CB and WX.

2.1 Equipment required:

A: Oscilloscope

B: DC voltage meter .

2.2 Alignment procedure:

TEST ITEM	TEST CONDITION & PROCEDURE	PURPOSE
1. CB TX VCO voltage @ CH40	Connect the DC volt. Meter to the junction point of R59 and R60.	Adjust **L19** to obtain approximately 3.0V ±0.2V reading.
1. CB TP3 OUTPUT @ TX mode	Connect the oscilloscope to the junction point of R6 and JP14.	Adjust **L20** for maximum output on the oscilloscope.
2. WX VCO voltage @ CH8 / CH10	Connect the DC volt. Meter to the TP601	1. Adjust L605 to obtain approx 1.5 ±0.1V @CH8 (162.650MHz) 2. Checking the CH10 the volt ≦ 3.0V

3.0 Alignment of CB receiver portion.

3.1 Equipment required:

A: Signal generator

B: AC voltmeter.

C: Oscilloscope.

D: Dummy load (8 ohm, 5 watts, resistive.)

E: DC power supply (13.8 v. 2Amp.)

3.2 Alignment procedure:

TEST ITEM	TEST CONDITION & PROCEDURE	PURPOSE
1. AUDIO OUTPUT	1. Set channel 19. 2. Set the S.G. on 27.185MHz with 1KHz, 30% mod. and 1mV output level. 3. Set NB/OFF SW to OFF, Squelch to min. (CCW), CB/WX/PA to CB, ANL SW to CB/ANL, RF GAIN to max. Volume approximately Center.	1.Adjust **L1,2,3,4,5,6** & **7** for maximum audio output & minimum distortion on the distortion meter.
2. RX Sensitivity	1. Same as above step 1 and 3. 2. Set the S.G. on 27.185MHz with 1KHz, 30% mod. RF output level 1.0uV.	1. Adjust **L1,2,3,4,5,6** &**7** for more than 12dB to the SINAD meter. 2. Repeat as needed. 3. Set RF S.G. output level 0.4uV, the adj. **VR2** to 2V on the AC volt meter.
3. NB	1. Set NB/OFF SW to NB. 2. Set the level of S.G. to 1.0uV. 3. Noise generator to on. 4. Adjusted then revert item 1 setup.	1. Turn the volume to obtain 2V reading on AC voltmeter. 2. Adjust **L1** for minimum reading on AC volt meter.
4.Tight Squelch	1. Set Squelch volume to maximum (CW). 2. Set the level of S.G. to 1500uV. 3. Adjusted then revert item 1 setup.	1. Slowly turn **VR4** to a position that the audio output waveform at the scope just appears from no output.
5. “S-9” and +30 meter indicator.	1. Set the level of S.G. to 100uV. 2. Set the level of S.G. to 3.16mV.	1. Adjust **VR1** for “S-9” reading on The LCD meter. 2. Check the bars up to +30.
6. PA output RF Level @1mV, 30% Mod.	1. Set CB/WX/PA to PA function	1. Checking the audio output need more than 3.5W @10%THD

4. Alignment of WX receiver portion.

4.0 Equipment required:

A: Signal generator
B: AC voltmeter.
C: Oscilloscope.
D: Dummy load (8 ohm, 5 watts, resistive.)
E: DC power supply (13.8 v. 2Amp.)

4.1 Alignment procedure:

TEST ITEM	TEST CONDITION & PROCEDURE	PURPOSE
1. AUDIO OUTPUT	1. Set channel 5. RF connect to the TP4. 2. Set the S.G. on 10.7MHz with 1KHz, ±3KHz mod. and 1mV output level. 3. CB/WX/PA to WX. Volume set approximately Center.	1. Adjust **L604** for maximum 2. audio output & minimum distortion on the distortion meter.
2. RX Sensitivity	1. Set RF output connect to the TP1. 2. Set the S.G. on 162.450MHz with 1KHz, ±3KHz mod. RF output level 1.0uV.	1. Adjust **L603** & **L602** for more than 12dB to the SINAD meter. Repeat as needed.
3. Tone Decoder Sens. (Turn-on): @±4KHz	1. Set unit off, RF output @1.2uV, AF @1050Hz, RF Freq @162.450MHz	1. The unit will turn on automatically when RF signal open.

5. Alignment of Transmitter portion.

5.1 Equipment Required:

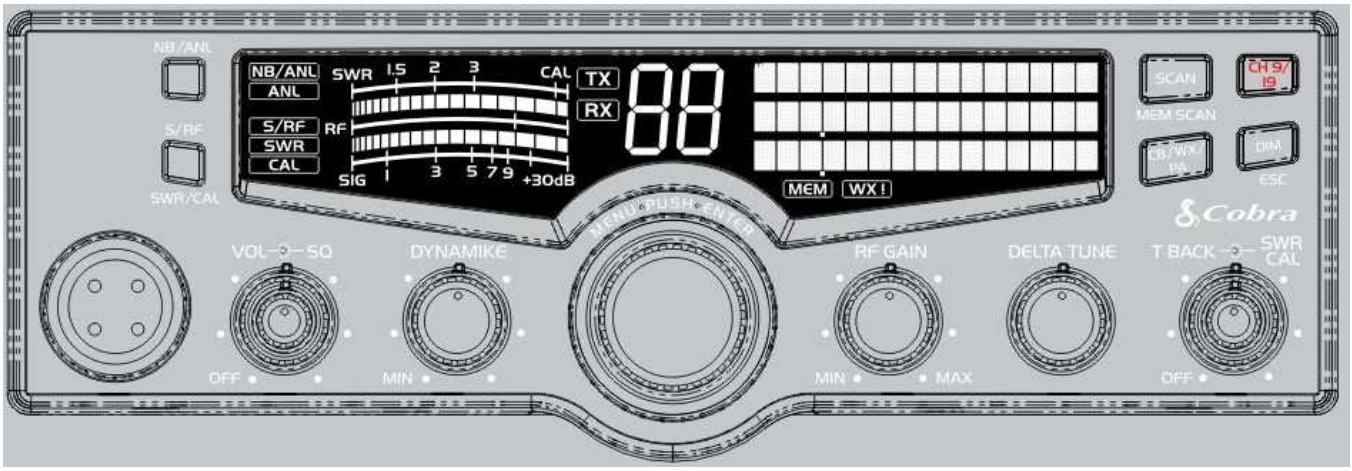
A: VTVM (full scale: 1V DC with RF probe).
B: RF power meter.
C: Spectrum analyzers.
D: Frequency counter.
E: DC power supply. (13.8VDC / 3AMPs)
F: 50 ohm load and attenuator.
G: Oscilloscope.
H: AF generator.

5.2 Alignment procedure:

TEST ITEM	TEST CONDITION & PROCEDURE	PURPOSE
1. TP4 output	1. Connect the oscilloscope to the TP4. 2. Set TX mode , Channel 19.	Adjust **L20, 21, 17** for maximum output on the oscilloscope.
2. TX power	1. Set TX Channel 19.	1. Adjust **L17,14** for maximum output on the RF power meter. 2. Turn **L14** to obtain 4.0W on the RF meter reading.
3. TX carrier frequency	1. Set TX Channel 19.	1. Adjust **L24** to obtain 27.185MHz on the frequency counter.
4. Second harmonic	1. Set TX Channel 19.	1. Adjust **L11** for a min. 2nd harmonic (54MHz) output on the Spectrum anal.
5. "P4" indicator	1. Set TX Channel 19.	1. Adjust **VR5** for "P4" display at the TX Signal meter of the LCD meter.
6. Modulation	1. Set TX Channel 19. 2. AF GEN. Output 30mV.	1. Adjust **VR4** for 90% on the modulation Meter.
7. Talk-back	1. Set unit in TX mode with 90% Mod.	1. The speaker can be heard the tone when Talkback turn on.

5. LCD & Backlight Checking

5.1 There are four colors in the backlighting operation, they are Red, Green, Blue and Amber.
5.2 The LCD drawing as following display in dot matrix and icons.
5.3 Please refer to the next procedure of item 6 let the UUT into the test mode to checking the LCD and backlight performance.



6. Test Mode Operating Method

6.1 Press and hold the key of "**CB/WX/PA**" and "**Enter**" at the same time then turn the DC power on to enter the test mode for CB and WX channel.
6.2 In CB mode, turn the channel selector by clockwise for CH1 (26.965MHz) – CH19 (27.185MHz) – CH22 (27.225MHz) – CH40 (27.405MHz).
6.3 In WX mode, turn the channel selector by clockwise for CH8 (161.650MHz) – CH5 (162.450MHz) – CH10 (163.275MHz).
6.4 Press the "**NB/ANL**" key for LCD display scanning
6.5 Press the "**SWR/CAL**" key for backlight Amber color turn on; Press the "**MEM SCAN**" key for backlight RED color turn on; Press the "**CH9/19**" key for backlight Green color turn on; Press the "**DIM/ESC**" key for backlight Blue color turn on.

7. Radio Check

7.1 Battery Check: In radio check menu mode, select "1ST Test" – Battery Level.
BATTERY VOLTAGE
PASS: 11.2VDC – 15.5VDC
FAIL HIGH: 15.5V – 16.5V
FAIL LOW: 10V – 11.2V
7.2 RF Power Check: In radio check menu mode, select "2nd Test" – RF POWER OUTPUT.
RF POWER OUTPUT
PASS: TX Power more than 3.0W @50 ohm loading
FAIL: TX Power less than 3.0W @50 ohm loading
7.3 Antenna Mismatch Warning Check: In radio check menu mode, select "3rd Test" – CHECK ANTENNA.
PASS: @50 ohm dummy loaded
FAIL: Antenna open or Shorted.