Detail Test Item for Each Function

Model: 1031

Nov 1, 2001

Item	Test Function	Alignment Method	Equipment requirement
		PCB	
	Enter Test Mode	1. push PTT and power buttons together to enter Test-mode program	Test fixture DC supply(0~15V)
1	LCD display (open short test)	1. Press power button to turn on the unit. 2. Use normal function to check icon and segment for LCD open short test.	Test Fixture DC supply(0~15V)
2	Current Consumption a. Stand by current b. RX Save ON current c. RX Save OFF current d. TX current	1. Set to test-mode,CH-1 2. Check RX Current (a) press [LAMP] button one time to test-mode RX ON (b) Check the RX Save ON current < 50mA (c) press [LAMP] button one more time to test-mode RX OFF (d) Check the RX Save OFF current < 1mA 3. Check TX current Press PTT to TX mode Check TX talk ON current < 300mA	Test Fixture DC supply(0~15V)
3	TX VCO RX VCO	1. Set to CH-14 and press PTT switch to TX mode (a) Adjust L1 to get 1V DC at test point TP7 (b) Release PTT switch to check RX VCO DC on CH-14 2. Set to CH-1 and press PTT switch (a) check CH-1 to DC voltage (b) release PTT switch and check RX VCD DC on CH-1	Test Fixture DC supply(0~15V) Digital Multi-meter (for DC voltage test)
4	TX part a. TX power b. TX Frequency	1. Set to CH-7 and Press PTT switch to TX mode (a) Check transmit power within 17.4dBm ERP 2. Set to CH-1 and press PTT switch to TX mode (a) Adjust VC1 to get 462.5625±300Hz on CH-1 3. Set to CH-14 and press PTT switch to TX mode (a) Check the frequency around 467.7125MHz ±300Hz	Test Fixture DC supply(0~15V) RF Power Meter -LODESTAR-340
5	TX Modulation &Distortion	1. Maximum Deviation (a) Output 80 mV 1KHz audio signal to Mic input and press [PTT] switch. (b) Check maximum deviation is around 2.2KHz 2. Normal Deviation (a) Output 8 mV 1KHz audio signal Mic input and press [PTT] switch (b) Check normal deviation is around 1.5KHz 3. Check TX audio distortion < 5%	Test Fixture DC supply(0~15V) Audio Signal Generator Modulation Analyzer(1) (HP 8901B) -test function as -TX deviation -TX audio distortion
6	RX part a. RX Alignment b. RX distortion c. RX Current d. RX Sensitivity	1. Set to CH-4 2. Set RF signal generator to –50dBm with 1.5KHz modulation signal 3. Adjust T1 to get minimum distortion 4. Check audio distortion < 5% 5. Check audio output > 100mV at TP4 6. Check RX current < 70mA 7. Set RF signal generator output level to –118dBm on TP9 8. Check SINAD sensitivity ≤-118dBm/12db SINAD on TP4 9. Repeat procedure 6.4 to 6.8 action on CH-11	Test Fixture DC supply(0~15V) Shield Room(1) RF Signal Generator(1) (HP 8656B) -test function as -output RF signal -output nodulation signal Audio Analyzer(1) (HP8903B) -test function as -SINAD reading Digital Multi-meter -for RX current test

7	RX Audio SQ detection	1. Set to CH-7 2. Set RF signal generator to –50dBm with 1.5KHz modulation signal 3. Adjust T1 to get minimum distortion 4. Check audio output > 100mV at TP4 5. Audio Level (a) Set RF SG level to –50dBm with 1.5KHz deviation at 1KHz audio frequency (b) Adjust volume button to the position, which give an output 200mV±5mV at TP4 6. Maximum and Minimum audio output power (a) Set RF SG level to –50dBm with 1.5KHz deviation at 1KHz audio frequency (b) Adjust volume to the position, which give a maximum output with distortion 10% (c) Check the voltage at TP4 = 1V±100mV (d) Set maximum audio output to 0 dB, adjust the volume to the position, which give a minimum output (e) Check the minimum voltage –35 dB ±5 dB at TP4 7. Set to CH-4 (a) Set signal generator to –119dBm with 1.5KHz deviation, 1KHz tone (b) Adjust VR1 for 7 to 8 dB SINAD (c) Check low sensitivity side 8 to 12 dB SINAD (d) Check high sensitivity side 4 to 7 dB SINAD 8. Repeat 7.7 (a) on CH-11	Test Fixture DC supply(0~15V) Shield Room (2) RF Signal Generator(2) (HP 8656B) -test function as -output RF signal -output modulating signal Audio Analyzer(2) (HP 8903B,op 011 or 051) -test function as -audio level -distortion -audio bandwidth frequency and level measurement Oscilloscope
8	Battery Detection	1. Low battery 4.12V(speaker output beep tone and LCD flash) 2. Dead battery 3.79V	Test Fixture DC supply(0~15V) Multi-voltage output equipment (self-made)
		Casing	
1	Current Consumption	1. Press POWER to turn on the unit 2. Press POWER to turn off the unit (a) Check off mode current < 350uA 3. Set Test-mode RX (a) Check the RX SCAN ON current < 30mA (b) Check the RX SCAN OFF current < 1mA 4. TX current (a) press PTT button and check TX current	Fix unit Fixture DC supply(0~15V) Multi-Meter (for current test)
2	TX Frequency TX Power TX Audio	1. Set to CH-1 and press PTT switch to TX mode (a) Check the frequency=462.5625MHz±300Hz 2. Set to CH-14 and press PTT switch to TX mode (a) Check the frequency=467.7125MHz±300Hz 3. Check the radiated power reference to Golden Sample 4. Standard TX deviation (a) Set unit to CH-4 (b) Put checked unit on test fixture, make sure the unit mic is face to fixture speaker to get maximum pick up audio signal (c) press PTT switch to TX mode, unit can pick up the audio sound level from test fixture's speaker (d) check the normal TX deviation at a range of 1.5KHz that should compare to Golden Sample (e) check the maximum TX deviation at a range of 2.2KHz	Special Test Fixture DC supply(0~125V) Audio Signal Generator Frequency Country -HOODT CN-201A Spectrum Analyzer(1 end) (HAMEG HM5010) -test function as -radiation output power -second harmonic -third harmonic Modulation Analyzer(2 end) (HP 8901B) -test function as -TX deviation -TX audio distortion

3	Squelch Detection	1. Set unit to CH-8 2. Set the distance of 0.3 meter between antenna of signal generator and checked unit 3. The antenna of signal generator and checked unit should be parallel to get max field strength power 4. Set RF signal generator to –90dBm with 1.5KHz deviation, 1KHz tone, make sure the unit still on squelch mute status (no voice can be heard) 5. Adjust RF signal generator to –85dBm, the will change to squelch off status(voice can be heard) 6. Repeat above action on CH-7	Fix unit fixture DC supply(0~15V) Shield Room(3) RF signal generator(3) (HP 8656B) -test function as -output RF signal Telescope Antenna
4	Audio RX Path	1. Set the unit CH-4 2. Plug the dummy speaker into audio jack 3. Check the radiated sensitivity reference to the Golden Sample 4. Audio level (a) Set RF SG level to –35dBm with 0.5KHz deviation at 1KHz audio frequency (b) Select volume to the position, which give an output 100mV±5mV 5. Maximum and Minimum audio output power (a) Set RF SG level to –35dBm with 1.5KHz deviation at 1KHz audio frequency (b) Select volume to the position, which give an maximum output with distortion < 5% (1) Check the voltage on dummy speaker > 750mV (2) Check the voltage pick up from speaker (3) Compare the voltage difference between dummy speaker and speaker (c) Set maximum audio output to 0dB, adjust volume to the position, which give a minimum output (1) Check the voltage on dummy speaker > 350mV (2) Check the voltage pick up from speaker (3) Compare the voltage difference between dummy speaker and speaker	Special Test Fixture DC supply(0~15V) Shield Room(4 end) RF Signal Generator(4 end) (HP 8656B) -test function as -output RF signal -output modulation signal -audio bandwidth frequency level output Audio Analyzer(3 end) (HP8903B) -test function as -audio level -distortion -audio bandwidth frequency and level measurement Audio Amplifier (to pick op speaker 1KHz signal)
5	Battery Detection	1. Low battery 4.12V(speaker output beep tone and LCD flash) 2. Dead battery 3.79V	DC supply(0~15V) Multi-voltage output equipment(self-made)