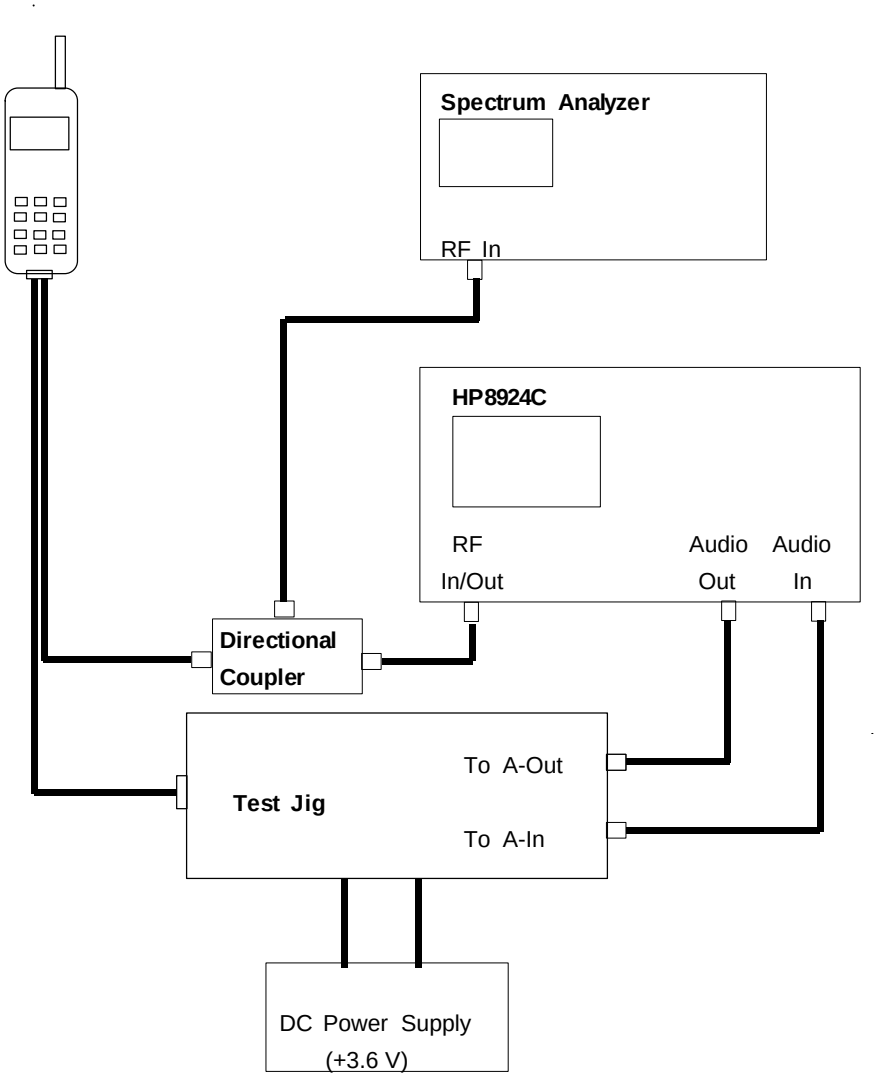
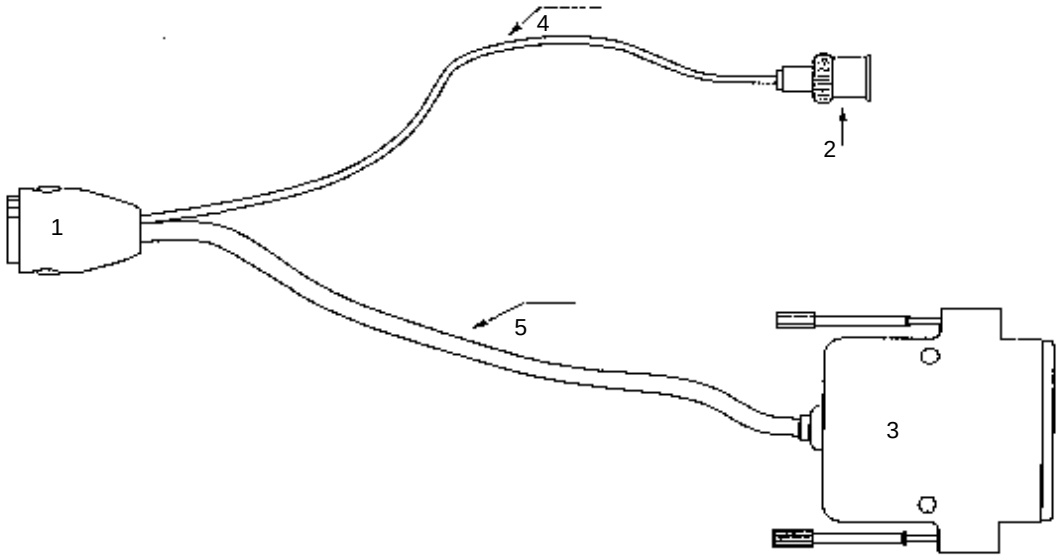
List of Equipment

- DC Power Supply
- Test Jig
- Test Cable
- CDMA Mobile Station Test Set HP8924C, HP83236A, CMD-80, etc
- Spectrum Analyzer(include CDMA Test Mode) HP8596E

Configuration of Test



1. TEST CABLE

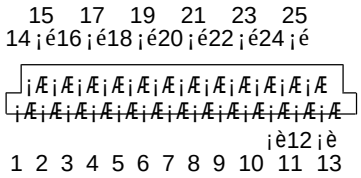


2. TEST CABLE CONNECTIONS

1	PLUG CONNECT TO SCH-411
2	BNC CONNECTOR (RF)
3	Dsub 25PIN CONNECTOR (DATA)
4	RF CABLE
5	DATA CABLE

3. Dsub 25 PIN CONNECTOR PIN DESCRIPTION (TEST CABLE 1, BACK SIDE)

DATA DESCRIPTION	Dsub CONN. PIN NO.
Vcc	4, 5, 6
GND	13, 23, 24, 25
PW ON/OFF	7
TX AUDIO	10
TX DATA	22
RX AUDIO	12
RX DATA	21
RSSI	8



4. CONVERSION TABLE OF FREQUENCY vs CHANNEL

T Y P E	CHANNEL	CONVERSION EQUATION	REMARK
TX FREQUENCY	1 ~ 799 990 ~ 1023	F=0.03 × N + 825.00 F=0.03 × (N-1023) + 825.00	N ; CH NUMBER F ; FREQUENCY
RX FREQUENCY	1 ~ 799 990 ~ 1023	F=0.03 × N + 870.00 F=0.03 × (N-1023) + 870.00	

Change to Test Mode

A. To change the phone's state from Normal Mode to Test Mode, You should enter the following keys.
" * 7 5 9 # 8 1 3 5 8 0 "

B. The command ¡°0 1" is Suspend.

C. To finish the Test Mode, You should enter the command "0 2".

* Note : Make sure to change to "Digital only" or "Analog only" mode in NAM1,
Before entering the TEST MODE. (Refer to 4. NAM Programming)

Channel Selection and Tx Power Output Level Control

1. Digital Mode (CDMA)

A. Enter to Test Mode (* 7 5 9 # 8 1 3 5 8 0).

B. "0 1" : Suspend.

C. "0 9 0 3 6 3 #" : Set to '0363' channel.

D. "0 7" : Carrier On.

E. "3 4" : Spread spectrum to 1.23MHz band width.

F. "7 1 3 8 0 #" : Output RF power level setting.
"380" means AGC level and AGC level range is from 250 to 511.

2. Analog Mode (FM)

A. Enter to Test Mode (* 7 5 9 # 8 1 3 5 8 0).

B. "0 1" : Suspend.

C. "4 6" : Vocoder initial to Analog mode.

D. "0 9 0 3 6 3 #" : Set to '0363' channel.

E. "0 7" : Carrier On.

F. "7 2 3 0 0 #" : Output RF power level setting.
"300" means AGC level and AGC level range is from 0 to 350.

G. "1 0 2" : RF Power level control, 2(0~7) means power level .

Analog Mode(FM)

TEST IEMT	PROCEDURE
1. PREPARE	Setup the test equipment. Make sure to check the "Analog Only" in NAM 1 "* 7 5 9 # 8 1 3 5 8 0 " : Enter to Test Mode "0 1" : Suspend "4 6" : Vocoder initial to Analog mode If you press a wrong key, press "#", then enter new command. To exit the Test Mode at any time : press [0 2].
2. RF POWER	"0 1" : Suspend. "4 6" : Vocoder initial to Analog mode. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "1 0 2" : RF Power level control, 2(0~7) means power level . Measure the Power Output Level — RF Power 0 ~ 2 — + 28 dBm +2/ -4 dB 3 — + 24 dBm +2/ -4 dB 4 — + 20 dBm +2/ -4 dB 5 — + 16 dBm +2/ -4 dB 6 — + 12 dBm +2/ -4 dB 7 — + 8 dBm +2/ -4 dB "0 8" : Carrier off. Note 1 : In case of using the antenna cable, you must compensate for the cable loss (bout 0.8dB). Note 2 : To prevent from damaging the hhp, you must measure by calibrated test equipment. Warning ! Adjustments without calibrated equipment can lead to excessive heat and will void the warranty.
3. TX FREQUENCY	"0 1" : Suspend. "4 6" : Vocoder initial to Analog mode. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. Measure the TX frequency : 835.89 MHz ¡¾2.5ppm.

TEST ITEM	PROCEDURE
4. VOICE DEVIATION	"0 1" : Suspend. "4 6" : Vocoder initial to Analog mode. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "1 4": TX Audio unmute. Set the audio generator output to 1KHz, 3.0Vrms. Measure the Tx voice deviation by using the HPF of 20Hz and the LPF of 99kHz (spec : ¡¾12KHz less).
5. ST DEVIATION	"0 1" : Suspend. "4 6" : Vocoder initial to Analog mode. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "1 6": ST on. Measure the Tx ST deviation by using the HPF of 50Hz (spec : 8 kHz ¡¾10%). "1 7": ST off.
6. SAT DEVIATION	"0 1" : Suspend. "4 6" : Vocoder initial to Analog mode. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "3 2": SAT on. Set the equipment as below. RF frequency : 880.89 MHz Input Rf level : - 80 dBm Modulation frequency : 6 KHz Frequency deviation : 2 KHz Measure the Tx SAT deviation by using the HPF of 50 Hz and the LPF of 6KHz BPF (spec : 2kHz ¡¾10%). "3 3": SAT off.

TEST ITEM	PROCEDURE
7. WBD DEVIATION	"0 1" : Suspend. "4 6" : Vocoder initial to Analog mode. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "3 4": WBD on. Measure the WBD deviation by using the HPF of 50 Hz and the LPF of 20 kHz (spec : 8 kHz ¡¾10%).
8. RX AUDIO	"0 1" : Suspend. "4 6" : Vocoder initial to Analog mode. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "1 2": RX Audio unmute. Set the equipment as below. RF frequency : 880.89 MHz Input Rf level : - 80 dBm Modulation frequency : 1 KHz Frequency deviation : ¡¾ 8 KHz Measure audio AC level.

Digital Mode(CDMA)

TEST ITEM	PROCEDURE
1. PREPARE	Setup the test equipment. Make sure to check the "Digital Only" in NAM 1 "* 7 5 9 # 8 1 3 5 8 0 " : Enter to Test Mode "0 1" : Suspend If you press a wrong key, press "#", then enter new command. To exit the Test Mode at any time : press [0 2].
2. FREQUENCY ACCURACY	"0 1" : Suspend. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "7 1 3 8 0 #" : Set AGC level 380. Measure the TX frequency : 835.89 MHz ¡¾300Hz.
3. OCCUPIED CDMA BAND WIDTH	"0 1" : Suspend. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "3 4" : Spread spectrum. "7 1 3 8 0 #" : Set AGC level 380. Measure the band width (spec: 1.32MHz).
4. LIMITATIONS ON EMISSIONS	"0 1" : Suspend. "0 9 0 3 6 3 #" : Set to '0363' channel. "0 7" : Carrier On. "3 4" : Spread spectrum. "7 1 3 8 0 #" : Set AGC level 380. Measure the spurious at F_c ¡¾900KHz, F_c ¡¾1.98MHz, $2F_c$ $3F_c$, $1/2F_c$. spec: F_c ¡¾900KHz below 42dBc/30KHz F_c ¡¾1.98MHz below 54dBc/30KHz Outside Receive Band 43+10log (PY) PY: Mean Output Power in watts
5. GATED POWER & TIME	Set the service option: 2. Set the data rate: Eighth (1200bps). Registering: HHP --> HP8924C. Call : HP8924C --> HHP. Measure the Gated Power & Time. spec: Gated Power at least 20dB Gated Time - Rising Time: below 6us Falling Time: below 6us Burst Time: below 1.25ms

Test Command List

NO	COMMAND NAME	Command Number	Min Value	Max Value	Display
1	T_SUSPEND_I	0	0	0	"Suspend "
2	T_RESTART_I	0	0	0	"Restart "
3					
4	T_GET_MODE_I	0	1	1	" mode"
5	T_SET_MODE_I	0	0	0	"Set mode "
6	T_WRITE_NV_I	0	0	0	"Write EEPROM"
7	T_CARRIERON_I	0	0	0	"Carrier On "
8	T_CARRIEROFF_I	0	0	0	"Carrier Off "
9	T_LOADSYN_I	4	0	1023	"Chan_____"
10	T_PWRLEVEL_I	1	0	7	"Pwr level___"
11	T_RXMUTE_I	0	0	0	"Rx mute "
12	T_RXUNMUTE_I	0	0	0	"Rx unmute "
13	T_TXMUTE_I	0	0	0	"Tx mute "
14	T_TXUNMUTE_I	0	0	0	"Tx unmute "
15					
16	T_STON_I	0	0	0	"ST on "
17	T_STOFF_I	0	0	0	"ST off "
18	T_INDEX_INCR_I	0	0	0	"Index INCR "
19	T_INDEX_DECR_I	0	0	0	"Index DECR "
20	T_LNA_ATT_VALUE_I	3	0	255	"LNA_ATT ___"
21					
22	T_SNDNAM_I	96	96	0	"Send NAM "
23	T_SNDVERSION_I	3	4	0	"Send S/W Ver"
24	T_SNDESN_I	7	8	0	"Send ESN "
25	T_BACKLIGHT_ON_I	0	0	0	"Backlight ON"
26	T_BACKLIGHT_OFF_I	0	0	0	"BacklightOFF"
27	T_LAMP_ON_I	0	0	0	"LAMP ON "
28	T_LAMP_OFF_I	0	0	0	"LAMP OFF "
29	T_REBUILD_I	0	0	0	"Build EEPROM"
30	T_PLINE_I	15	0	0	"Product Info"
31					
32	T_SATON_I	1	0	2	"SAT on_____"
33	T_SATOFF_I	0	0	0	"SAT off "
34	T_CDATA_I	0	0	0	"CDATA "
35	T_VOLUME_UP_I	0	0	0	"Value Up "
36	T_VOLUME_DOWN_I	0	0	0	"Value Down "
37					
38					
39					
40					

41					
42	T_DTMFON_I	1	0	9	"DTMF on_____"
43	T_DTMFOFF_I	0	0	0	"DTMF off "
44	T_COMPANDORON_I	0	0	0	"Compand On"
45	T_COMPANDOROF_I	0	0	0	"Compand Off"
46	T_FM_VCLINE_I	0	0	0	"Voice state "
47	T_FM_AUD_GAIN_I	3	0	255	"AUD lvl_____"
48	T_VIBRATOR_ON_I	0	0	0	"Vibrator On "
49	T_VIBRATOR_OFF_I	0	0	0	"Vibrator Off"
50	T_BATT_TYPE_I	0	4	255	"Btype=___(_)"
51	T_BBA_I	1	1	9	"BBASIC_____"
52	T_HW_VERSION_I	2	2	255	"H/W : "
53	T_CARRIER_I	3	0	255	" Banner?:___"
54	T_VOC13K_I	1	0	1	"8k[1]13k[0]_"
55	T_EXT_AUDIO_I	1	0	1	"Ext.Audio? _"
56	T_LOOP_BACK_I	0	0	0	"LOOP BACK ON"
57	T_MIC_ON_I	0	0	0	"MIC unmute "
58	T_MIC_OFF_I	0	0	0	"MIC mute "
59	T_ALLPATH_I	0	0	0	"Unmute all "
60	T_FM_TX_GAIN_I	3	0	255	"Tx Gain_____"
61	T_FM_RX_GAIN_I	3	0	255	"Rx Gain_____"
62	T_DTMF_VOL_TX_I	3	0	255	"DTMF vol____"
63	T_TX_LIMITER_I	3	0	255	"TxLimit_____"
64	T_FM_SAT_LEVEL_I	3	0	255	"SAT lvl_____"
65	T_FM_FREQ_SGAIN_	3	0	255	FreqGain____
66	T_FM_ST_GAIN_I	3	0	255	"ST lvl_____"
67	T_READ_BATT_I	3	6	0	"RD Batt Val "
68	T_VBATT1_I	0	3	255	"StbyBatt____"
69	T_VBATT2_I	0	3	255	"TalkBatt____"
70	T_WRITE_BATT_I	3	0	255	"WR Batt_____"
71	T_CDMA_TXADJ_I	3	0	511	"CD TXagc____"
72	T_FM_TXADJ_I	3	0	511	"FM TXagc____"
73	T_SET_PA_R0	0	0	0	"ON PA_R0 "
74	T_OFF_PA_R0	0	0	0	"OFF PA_R0 "
75	T_READ_RSSI_I	0	3	255	"RD Rssi_____"
76	T_WRITE_RSSI_I	3	0	255	"WR Rssi_____"
77	T_READ_TEMP_I	0	3	255	"RD TEMP_____"
78	T_RXRAS_AUTO_I	0	3	255	"WrRXRAS_____"
79	T_BUZZER_ON_I	1	0	9	"Buzzer On_ "
80	T_BUZZER_OFF_I	0	0	0	"Buzzer Off "
81	T_VOC_PCMLPON_I	0	0	0	"PCM loop On "
82	T_VOC_PCMLPOFF_I	0	0	0	"PCM loop Off"
83					
84					
85	T_SPEAKER_ON_I	0	0	0	"Speaker on "
86	T_SPEAKER_OFF_I	0	0	0	"Speaker off "
87	T_FM_LOOP_TEST_I	0	0	0	"FM_LOOP_BACK"

88	T_TRK_ADJ_I	3	0	511	"TRK adj ____"
89	T_CDTRK_ADJ_I	3	0	255	"CdTk adj____"
90	T_EVRC_TEST_I	2	0	0	"EVRC CMD: __"
91					
92	T_TXRAS_ADJ_I	3	0	511	"TXRAS[ ]___"
93	T_RXRAS_ADJ_I	3	0	511	"RXRASoff:___"
94	T_HW_CHANFLAT_I	4	0	1023	"HW ChNo:____"
95	T_SW_CHANFLAT_I	4	0	1023	"SW ChNo:____"
96	T_CH_FLATNESS_I	3	0	511	"ChNo[ ]____"
97	T_FM_TX_PWR_I	3	0	511	TXpwr[ ]___
98	T_TEMP_I	4	0	1023	"TEMP[ ]____"
99	T_SAVE_VAL_I	0	0	0	"Auto Saved! "
100	T_MAX_I	0	0	0	" NULL !! "