CHANGE TO TEST MODE

A. To change the phone from Normal **Mode** to test Mode, You should enter the following keys.
  " 4 7 * 8 6 9 # 1 2 3 5 "

B. The command " 0 1 "(Suspend) is entered to start test.

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

CHANNEL SELECTION AND TX POWER OUTPUT LEVEL CONTROL

ı. AMPS

A. You should change the phone from Normal Mode to AMPS Test mode
  " 0 1 , 2 0 1 0 0 0 1 , 0 2 "

B. The command " 0 1 "(Suspend) is entered to start test.

C. You should enter the following keys.
  " 0 9 X X X X #, 0 7, 7 3 X, 7 2 X X X "
  - If you enter the command "0 9", You can select the channel
      ex) 0 9 0 3 8 3 (under-bar means channel number)
  - The command "0 7" means Carrier On (Carrier Off : ● 0 8)
  - If you enter the command "7 3", You can select power mode.
        (" 0 " : High Power Mode - above 0dBm,
         " 1 " : Low Power Mode - below 0dBm)
  - If you enter the command "7 2", You can control the power output level.
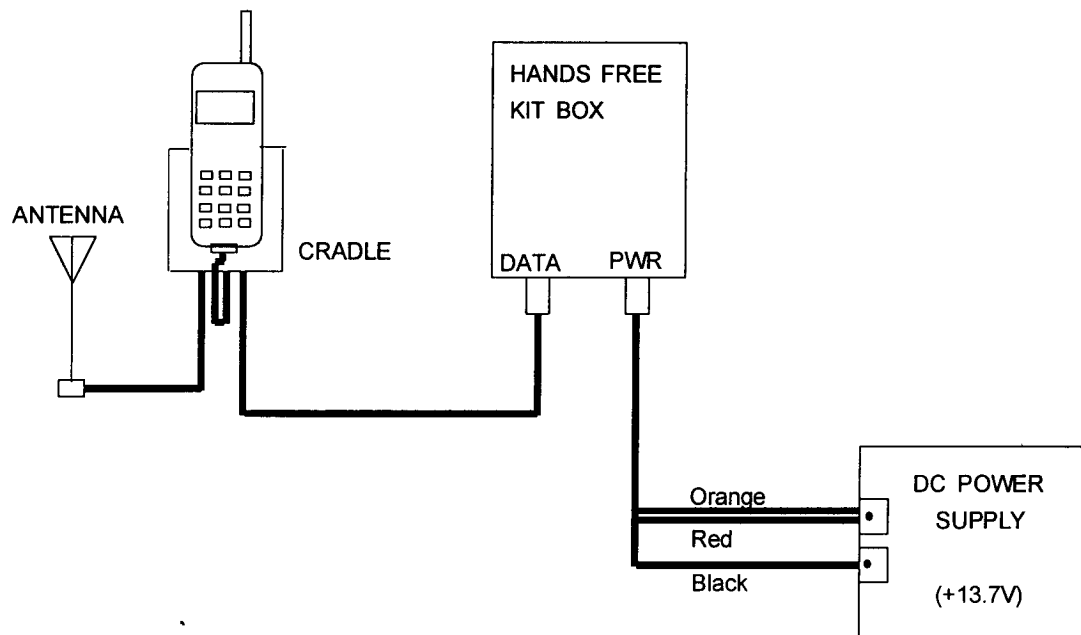   Following under-bar means AGC code. And you can control the power output level
      using [SEND] or [END] key.
       ex) 7 2 4 7 5

 D. After enter the command "9 2" and control the Tx Power Output Level to be each power level step
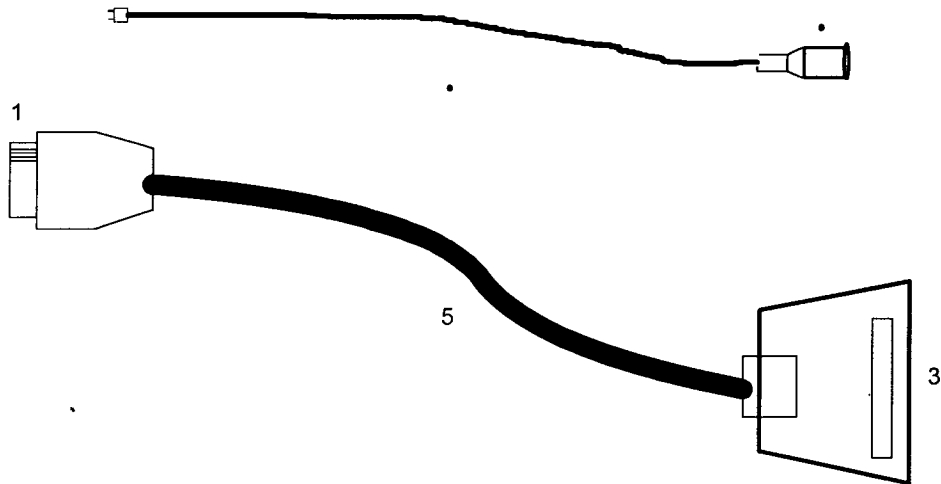   using [SEND] or [END] key , press "OK" key to store Data in EEPROM.

LEVEL	LCD Display	TX OUPUT POWER	STORE
2	TXpwr[02]	+26dBm +0.2 I-4dB	OK
3	TXpwr[03]	+24dBm +2 /-4dB	OK
4	TXpwr[04]	+20dBm +2 I-4dB	OK
5	TXpwr[05]	+16dBm +2 /-4dB	OK
6	TXpwr[06]	+12dBm +2 /-4dB	OK
7	TXpwr[07]	+8dBm +2 /-4dB	OK

CONFIGURATION OF TEST (HANDS-FREE)

ANTENNA

CRADLE

HANDS FREE
KIT BOX

DATA   PWR

Orange

Red

Black

DC POWER
SUPPLY

(+13.7V)

TEST CABLE DESCRIPTION FOR SPH-T100

1. TEST CABLE

2. TEST CABLE CONNECTIONS

1	PLUG CONNECT TO SPH-T100
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

```
  15  17  19  21  23  25
14••16••18••20••22••24••
┌•••••••••••••••••••••••┐
└•••••••••••••••••••••••┘
••                  ••12••
1 2 3 4 5 6 7 8 9 10 11  13
```
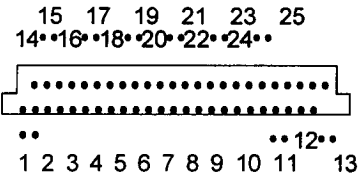
4. CONVERSION TABLE OF FREQUENCY vs CHANNEL

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

AMPS MODE

TEST ITEM	STEP	PROCEDURE
1. PREPARE	a	Connect the test equipment
	b	Enter the test mode: press [4 7 . 8 6 9 # 1 2 3 5] Select AMPS mode: Press in test mode [2 0 1 0 0 0 1]
	c	If you press a wrong key, press [#] key and then enter new command.
	d	To exit the test mode at any time : press [0 2]
2. RF POWER	a	Set the channel 383 : Press [0 9 0 3 8 3] (Ch number must be 4 digits)
	b	Turn the carrier on, and set the power level 2 : press [0 7, 7 3 0 #, 1 0 2 #]
	c	Measure the RF Power Output : + 26 dBm +0.2/ 4 dB Note 1 : In case of using the antenna cable, must compensate for the cable loss(1.4dB). Note 2 : To prevent from damaging the hhp, must measure by calibrated test equipment. <u>Warning !</u> Adjustments without calibrated equipment can result in excessive heat and will void the warranty.
	d	Power level control mode is [I 0 X] Adjust power level by using [SEND] or [END]key, and store. : press [9 2]
	e	Then measure the power output for each level by pressing [OK] or [••] at every step
	f	Then turn carrier off : press [0 8]
3. TX FREQUENCY	a	Set the channel 383 : press [0 9 0 3 8 3]
	b	Turn the carrier on : press (0 7]
	c	Measure the tx frequency : 836.490MHz . * 2.5ppm (••2090Hz)
	d	Turn the carrier off : press [0 8]

TEST ITEM	STEP	PROCEDURE
4. VOICE DEVIATION	a	Set the channel 383 : [0 9 0 3 8 3]
	b	Send the RF power, and set TX audio unmute :press [0 7, 4 6, 4 5, 1 4]
	c	Turn the carrier on, and set the power level 2
	d	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 : ••12kHz less)
	e	To adjust the peak deviation, (••) Press [6 3] and use the [SEND] or [END] key (••) Store the peak deviation : press [OK]
	f	Set the audio generator output to 1kHz, 100Vrms.
	g	Measure the TX voice deviation by using the HPF of 50Hz and the LPF of 15kHz. (spec : ••2.9 kHz ••10%)
	h	To adjust the compressor off deviation : press [45], and use [SEND] or [END] key. (spec : ••2.9 kHz ••0.2 kHz)
	i	Store the compressor off deviation : press [OK]
	j	To adjust the compressor on deviation : press [44],and use [SEND] or [END] key. (spec ; ••2.9 kHz ••0.2 kHz)
	k	Store the compressor on deviation : press [OK]
	l	Turn the carrier off, and TX mute : [0 8, 1 3]
5. ST DEVIATION	a	Set the channel 383 : press [0 9 0 3 8 3]
	b	Turn the carrier on, and set the power level 2
	c	Set ST : press [1 6]
	d	Measure the TX ST deviation by using the HPF of 20Hz and the LPF of 15kHz. (spec : ••8 kHz 10%)
	e	To adjust the deviation ; press [66], and use [SEND] or [END] key.
	f	Store the deviation code in EEPROM : press [OK]
	g	Turn the ST and the carrier off : press [1 7, 0 8]

• • • • •• • •	• • • •	• • • • • • • • •
6. SAT DEVIATION	a	Set the channel 383 : [0 9 0 3 8 3]
	b	Turn the carrier on, and set the power level 2
	c	Set the Voice State and SAT on : press [4 6, 3 2 1 #]
	d	Measure the TX SAT deviation by using the HPF of 20 Hz and the BPF of 6 kHz. (spec : ••2kHz ••10%)
	e	To adjust the deviation within specification : press [64], and use [SEND] or [END] key.
	f	Store the deviation code in EEPROM: press [OK]
	g	Turn the SAT and the carrier off : press [3 3, 0 8]
7. WBD DEVIATION	a	Set the channel and carrier on : [0 9 0 3 8 3, 0 7]
	b	WBD on : [3 4]
	c	Measure the WBD deviation by using the HPF of 20 Hz and the LPF of 99 kHz. (spec : •• 8 kHz ••10%)
	d	To adjust the WBD deviation : press [6 5], and use [SEND] or [END] key.
	e	Store the deviation code in EEPROM : press [OK]
	f	Turn the carrier off : press [0 8]
8. RX AUDIO ₊	a	Set the equipment as below. RF frequency : 881.49 MHz Input RF level : - 80 dBm Modulation frequency : 1 kHz Frequency deviation : 8 kHz
	b	Set the channel 383 and the Voice State : press [0 9 0 3 8 3, 4 6]
	c	Set the RX audio unmute : press [1 2]
	d	Set compandor on : press [4 4]
	e	Adjust the expandor on audio level : press [6 1] Use [SEND] or [END] key.
	f	Store the expandor on audio level :press [OK]
	g	Finish the test and exit test mode : press [0 2]

CDMA MODE

TEST ITEM	STEP	PROCEDURE
1. PREPARE	a	Connect the test equipment
	b	Enter the test mode: press [4 7 * 8 6 9 # 1 2 3 5] Select AMPS mode: Press in test mode [2 0 2 0 3 6 3]
	c	If you press a wrong key, press [#] key and then enter new command.
	d	To exit the test mode at any time : press [0 2]
2. FREQUENCY ACCURACY	a	Set the channel 363: press [0 9 0 3 6 3]
	b	Turn the carrier on and set the power level. : press [0 7, 7 3 0 #, 7 1 X X X]
	c	Measure the frequency accuracy (spec: ••300Hz)
	d	To adjust the Frequency Accuracy : press [8 9] and use [SEND] or [END] key.
	e	Store the Frequency Accuracy in EEPROM: Press [OK]
3. OCCUPIED CDMA BANDWIDTH	a	Set the channel 363: press [0 9 0 3 6 3]
	b	Turn the carrier on and set the power level. : press [0 7, 3 4, 7 3 0 #, 7 1 X X X]
	c	Measure the Band Width. (spec: 1.32MHz)
4. LIMITATIONS ON EMISSIONS	a	Set the channel 363: press [0 9 0 3 6 3]
	b	Turn the carrier on and set the power level. : press [0 7, 3 4, 7 3 0 #, 7 1 X X X]

	c	Measure the spurious at F_c••900kHz, F_c••1.98MHz, $2F_c$
		$3F_c$, $1/2F_c$
		   spec: F_c••900kHz below 42dBc/30kHz
		        F_c••1.98MHz below 54dBc/30kHz
		        Outside Receive Band 43+10log (PY)
		        PY: Mean output power in watts

5. GATED POWER & TIME	a	Set the Service option: 2
	b	Set the Data Rate: Eighth (1200bps)
	c	Registering: HHP --> HP8924C
	d	Call : HP8924C --> HHP

	e	Measure the Gated Power & Time
		   spec: Gated Power at least 20dB
		        Gated Time - Rising Time : below 7us
		                       Falling Time : below 7us
		                       Burst Time : below 1.247ms

PCS MODE

TEST ITEM	STEP	PROCEDURE
1. PREPARE	a	Connect the test equipment
	b	Enter the test mode: press [4 7 * 8 6 9 # 1 2 3 5] Select AMPS mode: Press in test mode [2 0 3 0 6 0 0]
	c	If you press a wrong key, press [#] key and then enter new command.
	d	To exit the test mode at any time : press [0 2]
2. FREQUENCY ACCURACY	a	Set the channel 363: press [0 9 0 6 0 0]
	b	Turn the carrier on and set the power level. : press [0 7, 7 3 0 #, 7 1 X X X]
	c	Measure the frequency accuracy (spec: ••300Hz)
	d	To adjust the Frequency Accuracy : press [8 9] and use [SEND] or [END] key.
	e	Store the Frequency Accuracy in EEPROM: Press [OK]
3. OCCUPIED CDMA BANDWIDTH	a	Set the channel 363: press [0 9 0 6 0 0]
	b	Turn the carrier on and set the power level. : press [0 7, 3 4, 7 3 0 #, 7 1 X X X]
	c	Measure the Band Width. (spec: 1.32MHz)
4. LIMITATIONS ON EMISSIONS	a	Set the channel 363: press [0 9 0 6 0 0]
	b	Turn the carrier on and set the power level. : press [0 7, 3 4, 7 3 0 #, 7 1 X X X]
	c	Measure the spurious at F_c••900kHz, F_c••1.98MHz, $2F_c$ $3F_c$, $1/2F_c$ spec: F_c••900kHz below 42dBc/30kHz F_c••1.98MHz below 54dBc/30kHz Outside Receive Band 43+10log (PY) PY: Mean output power in watts
5. GATED POWER & TIME	a	Set the Service option: 2
	b	Set the Data Rate: Eighth (1200bps)
	c	Registering: HHP --> HP8924C
	d	Call : HP8924C --> HHP
	e	Measure the Gated Power & Time spec: Gated Power at least 20dB Gated Time - Rising Time: below 7us Falling Time: below 7us Burst Time: below 1.247ms