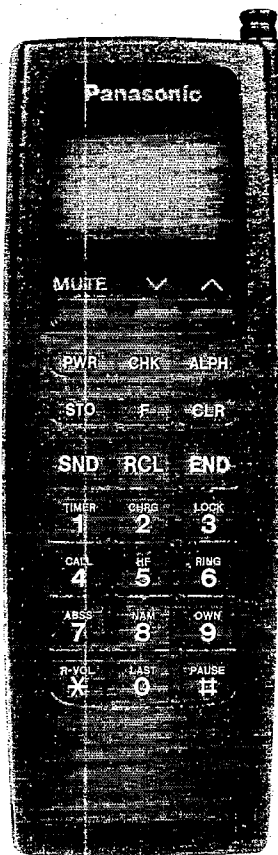


Service Manual

Handheld Portable Telephone

Handheld Unit

EB-3610



Panasonic

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I. COMPOSITION

MODEL NUMBER ASSIGNMENT

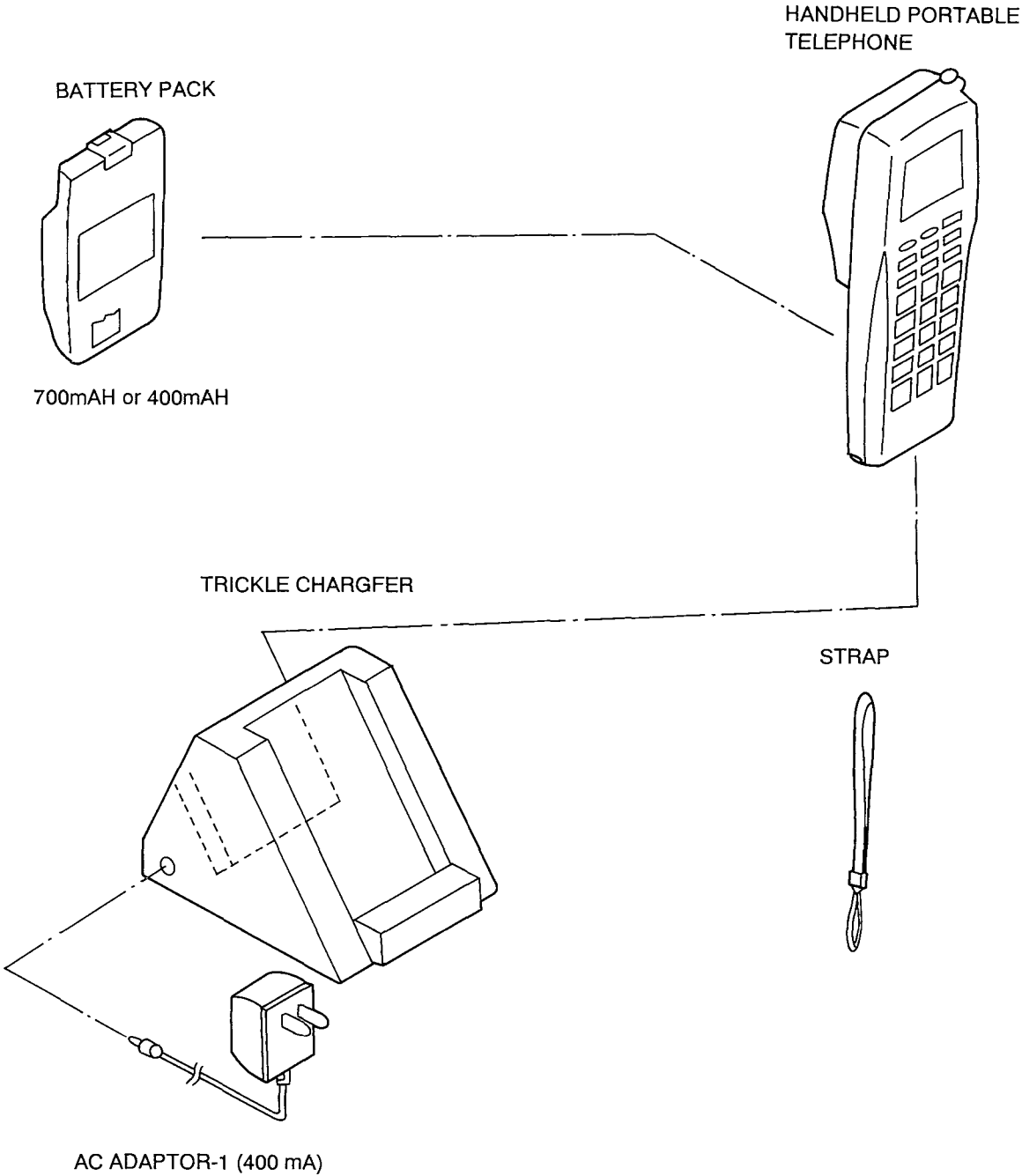
1. BASIC COMPOSITION

KIT NAME & NUMBER	KIT CONTENTS		HANDHELD USE	CAR USE
MAIN UNIT KIT EB-KJ3610	EB-3610 EB-P0369 EB-P0525 EB-P0388 EB-P0380 EB-B0376	HANDHELD UNIT BATTERY PACK(S) 400mAH BATTERY PACK(M) 700mAH TRICKLE CHARGER AC ADAPTOR-1 STRAP PACKING OPERATING INSTRUCTIONS	○	○
CAR MOUNT KIT EB-KJ0091	EB-J0383 EB-P0386 EB-M0108 EB-W0615 EB-N0001 EB-N0456 EB-W0402 EB-W0406	HANDSFREE CRADLE CHARGER/BOOSTER MICROPHONE POWER SUPPLY CABLE (5.5m) ADJUSTABLE ANGLE BRACKET MOUNTING BRACKET CHARGER CABLE (5.5m) BOOSTER CABLE (5.0m) PACKING OPERATING INSTRUCTIONS		○
RAPID CHARGER KIT EB-KJ0093	EB-P0390 EB-P0003	RAPID CHARGER AC ADAPTOR-2 PACKING OPERATING INSTRUCTIONS	○	
TRAVEL CHARGER	EB-P0377	TRAVEL CHARGER PACKING OPERATING INSTRUCTIONS	○	
DC ADAPTOR	EB-P0392	DC ADAPTOR PACKING OPERATING INSTRUCTIONS		○

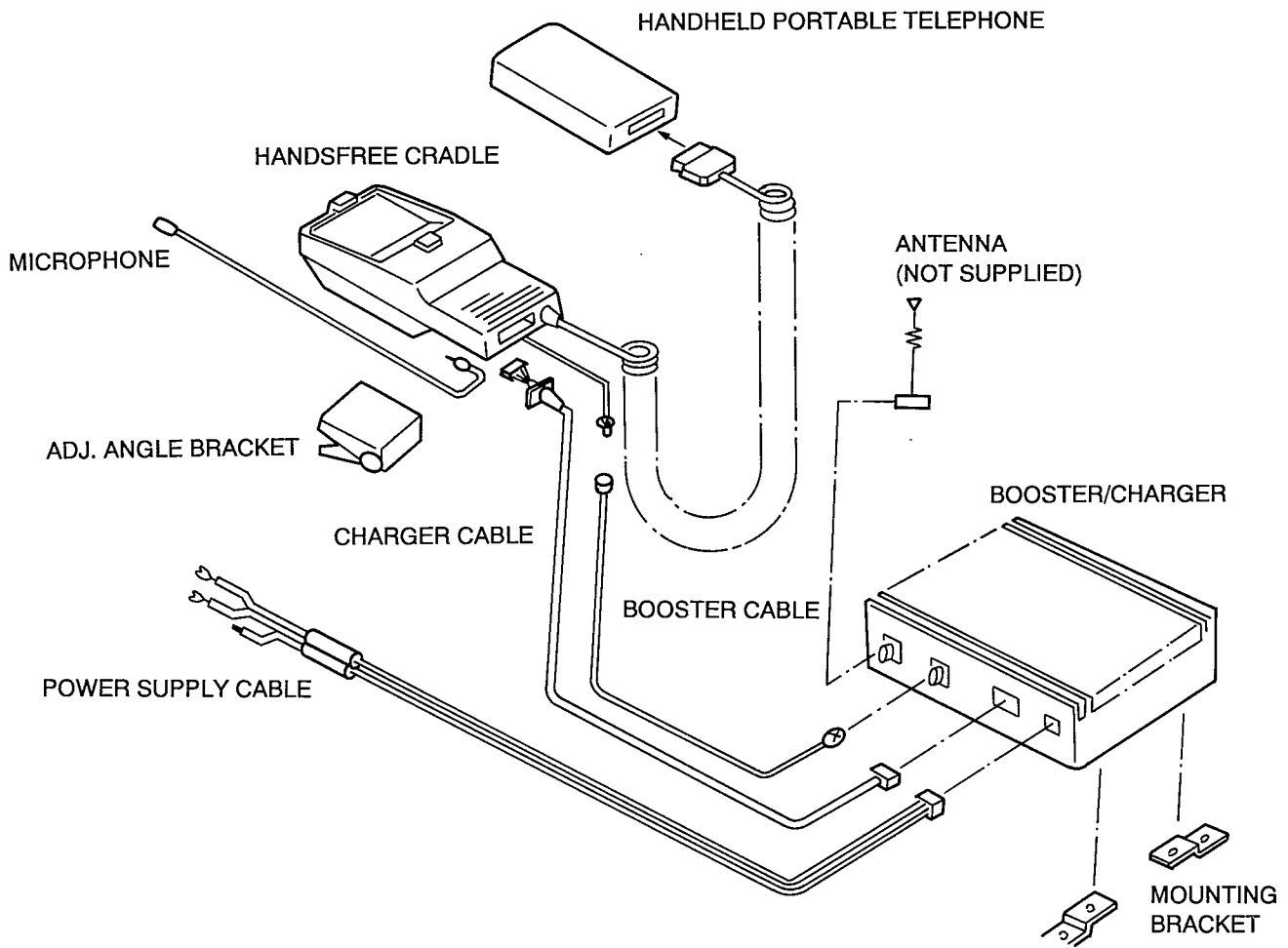
2. OPTIONAL ACCESSORIES

KIT NUMBER	KIIT CONTENTS
EB-P0369	BATTERY PACK (400mAH)
EB-P0525	BATTERY PACK (700mAH)
EB-B0374	CARRYING CASE
EB-W0407	BOOSTER CABLE (6.5 m)
EB-W0403	CHARGER CABLE (7 m)
EB-W0623	POWER SUPPLY CABLE (3 m)
EB-W0624	POWER SUPPLY CABLE (7 m)

**COMPOSITION-1
HANDHELD PORTABLE USE**

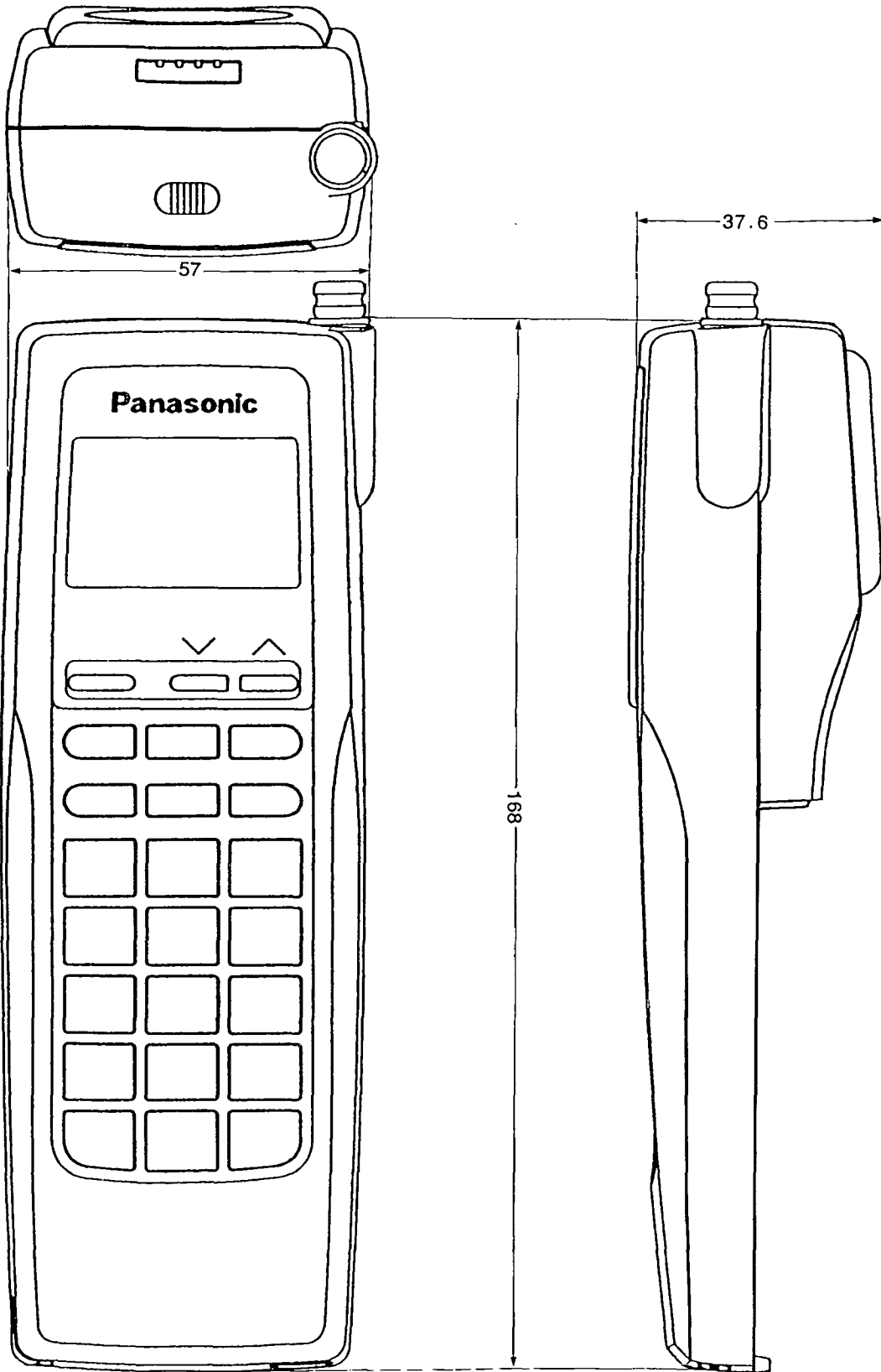


**COMPOSITION-2
HANDHELD CAR MOUNT USE**



3. APPEARANCE

HANDHELD UNIT



II. TECHNICAL DESCRIPTIONS

1. SPECIFICATIONS

1.1 Ratings

(1) Frequency range:	872MHz to 950MHz
(2) Transmit/Receive frequency separation:	45MHz
(3) RF channel spacing:	25kHz
(4) Number of RF channels:	1320 channels
(5) Antenna terminal impedance:	50 ohm
(6) RF output power:	0.6W
(7) Power source:	+6.0V DC (negative ground)
(8) Operating temperature:	-30°C to +60°C
(9) Power consumption	
Transmit:	+6V, Approx. 560mA (including Control Unit)
Receive and stand-by:	+6V, Approx. 56mA (including Control Unit)
(10) Dimensions (W x H x D):	57 mm X 168 mm X 39 mm
(11) Weight (with battery):	12.3 oz (350 g)

1.2 Characteristics

1.2.1 Transmitter

No.	Item	Characteristics		
1	Frequency Range	872.0125 MHz to 904.9875 MHz		
2	Frequency Stability	± 2.5 PPM >		
3	Channel Switching Time	Adjacent channel 20 mS > Nonadjacent channel 40 mS >		
4	Carrier Inhibiting Time	2 mS >		
5	RF Output Power	0.6W		
6	RF Output Power Control	Power Level	Attenuation	Power
		0	0 dB	27.8 dBm
		1	0 dB	27.8 dBm
		2	0 dB	27.8 dBm
		3	- 4 dB	23.7 dBm
		4	- 8 dB	19.8 dBm
		5	- 12 dB	15.8 dBm
		6	- 16 dB	11.8 dBm
7	- 20 dB	7.8 dBm		
7	RF Output Power Tolerance	+2dB > , - 4dB <		
8	RF Power Transition Time	20 mS >		
9	Carrier On-Off Time	2 mS >		
10	Modulation Deviation Limiting	± 9.5 kHz >		
11	Modulation Noise and Distortion	- 26 dB >		
12	Harmonic and Spurious Emission Conducted	- 45 dB >		
13	Transmit-Audio Filtering	400 to 2,250 Hz	± 1 dB >	
		300 Hz	+1 dB > - 3 dB >	
		2,500 Hz	+1 dB > - 2 dB >	
		3,000 Hz	+1 dB > - 6.5 dB >	
		200 Hz >	+24 dB/oct. +1 dB >	
		3,500 Hz <	- 30 dB/oct.	
14	SAT Frequency Deviation	1.7 kHz $\pm 10\%$		
15	Ham and Noise Level	- 32 dB >		

Table 1.2.1

1.2.2 Receiver

No.	Item	Characteristics
1	Frequency Range	917.0125 MHz to 949.9875 MHz
2	Distortion	- 26 dB >
3	Hum and Noise	- 32 dB >
4	RSSI Vo Voltage Vo Level	$0.5 \leq V_o \leq 2.0V$ - 113 dBm \pm 3 dB
5	Selectivity	6 dB +13.5 kHz > - 13.5 kHz < 55 dB +25 kHz < - 25 kHz >
6	Spurious Response	55 dB >
7	RF Sensitivity	- 113 dBm >
8	Receive-Audio Filtering	400 to 2,250 Hz \pm 1 dB > 360 Hz +1 dB > -2 dB > 300 Hz +1 dB > 240 Hz -6.5 dB > +1 dB > 3,000 Hz +1 dB > -3 dB > 200 Hz > +24 dB/oct. - 1.0 dB > 3,800 Hz < -36 dB +1 dB
9	Intermodulation Response	55 dB <

Table 1.2.2

2. GENERAL BLOCK DIAGRAM

The PANASONIC Handheld Portable Telephone consists of the units shown in Fig.2.1-1.

Body

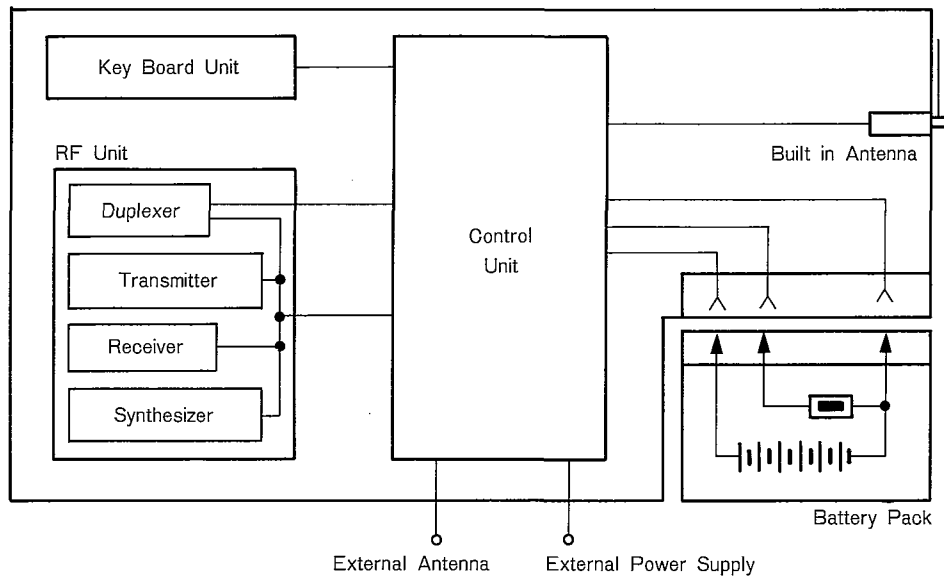


Fig. 2.1-1 Handheld Portable Telephone

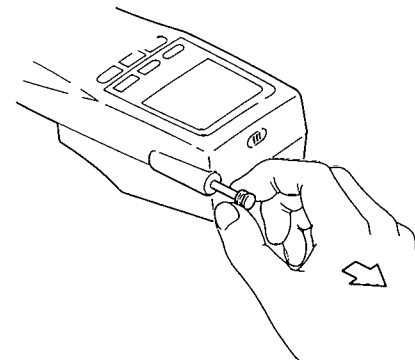
1. BEFORE USING YOUR PANASONIC PORTABLE

THINGS YOU SHOULD KNOW

1. Pressing any key on the keypad may cause a loud tone to be produced from the receiver. Do not press any key whilst the telephone is close to your ear.
2. There are special guidelines in the Highway Code regarding use of Mobile Radios, including Radio Telephones while driving. Please acquaint yourself with these guidelines and observe them at all times.
3. Switch off your telephone when in an aircraft. Use of telephones in an aircraft may be dangerous to the operation of the aircraft, may disrupt the cellular network and is illegal. Failure to observe this instruction may lead to suspension or denial of telephone service to the offender, or legal action, or both.
4. Users are advised to turn off the equipment when at a refueling point or any place where a sign is posted restricting the use of two-way radio equipment such as a construction site, blasting area, etc.
5. Do not store or carry the battery pack together with any metallic materials, i. e. accessories, keys or coins. Otherwise, it may be possible to cause short circuit and hurt the metallic materials.

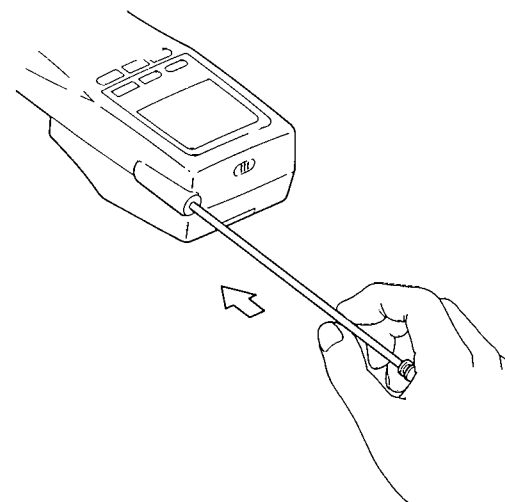
TO EXTEND THE ANTENNA

Before making/receiving a call, extend the antenna slowly holding the antenna top.

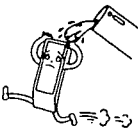
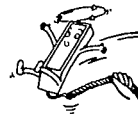
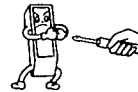


TO RETRACT THE ANTENNA

Retract the antenna slowly holding the middle part of the antenna.



DON'TS	DO'S
<p>DON'T use this equipment in an extreme environment where high temperature or high humidity exists.</p>	<p>Do use the equipment under conditions where temperature are within -30°C to $+60^{\circ}\text{C}$.</p>
<p>DON'T attempt to disassemble this equipment. There are no user-serviceable parts inside.</p>	<p>Do refer any servicing to qualified service personnel.</p>
<p>Avoid striking, shaking, subjecting to excessive vibration, or holding it by the strap.</p>	<p>Do handle the equipment with care.</p>
<p>DON'T expose this equipment to rain, or spill beverages on it.</p>	<p>Do take immediate action if the equipment becomes wet. Turn power off and refer servicing to qualified service personnel.</p>



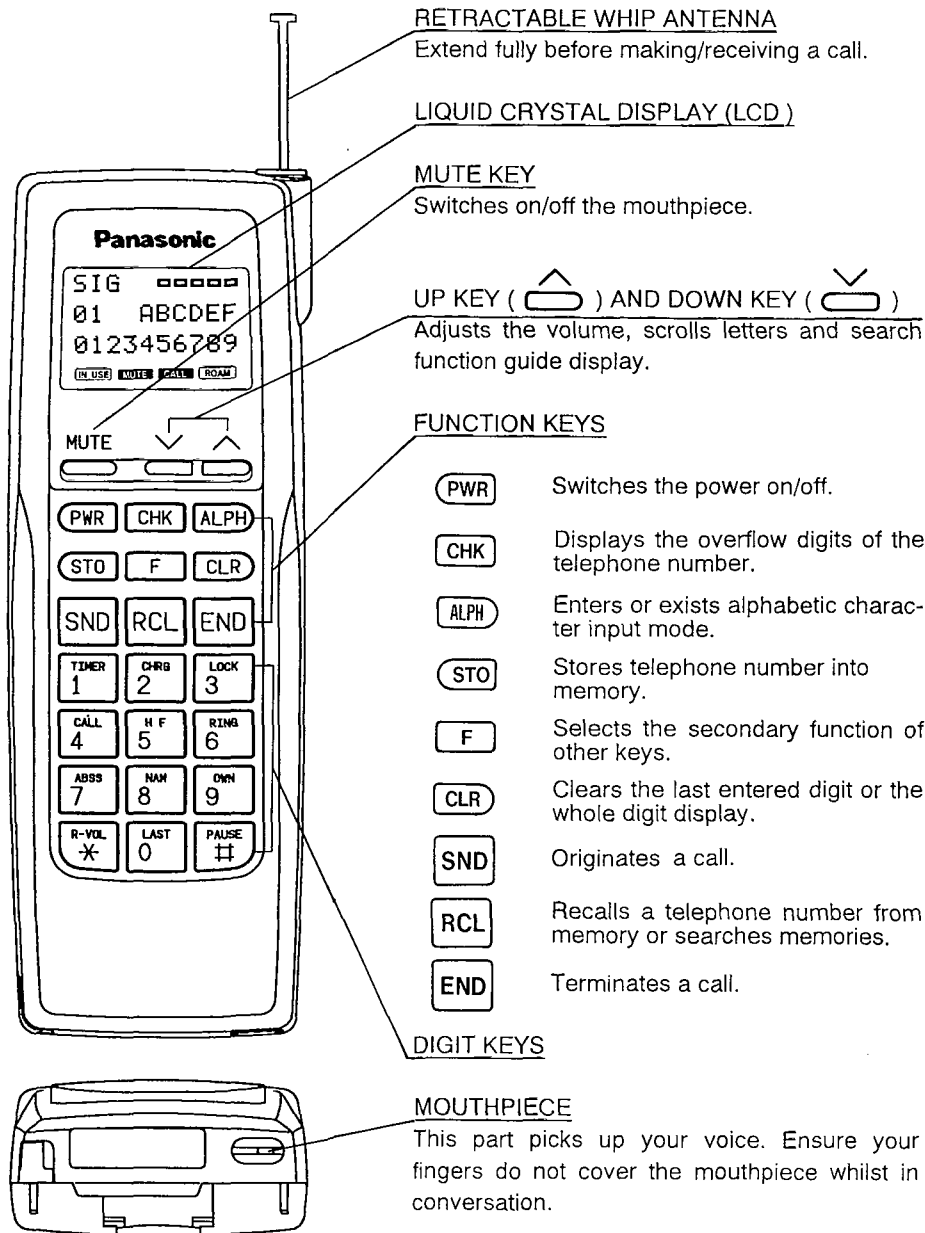
2. FEATURES

SELECTED FEATURES OF YOUR NEW PANASONIC HANDHELD PORTABLE TELEPHONE

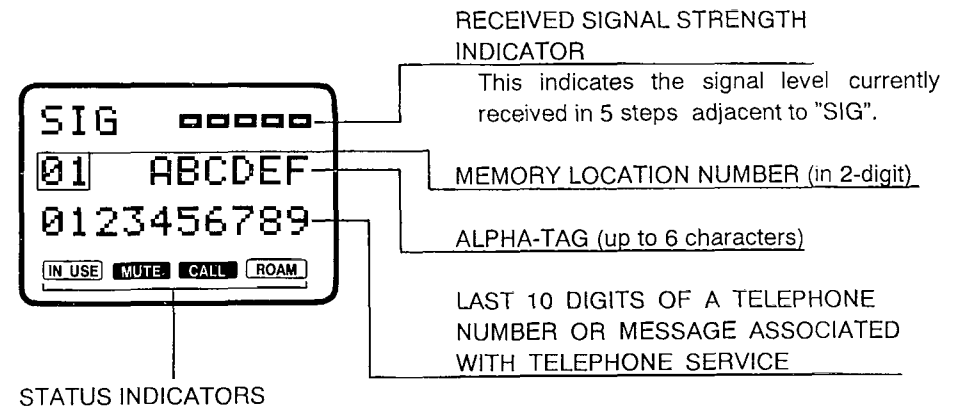
- Large 30 digits alphanumeric liquid crystal display (LCD)
- 100 memory capacity
- Any-key answer: You can answer a call by depressing any key except **PWR**
- Automatic redial: Your telephone will redial automatically when a call fails in connection.
- 16 numeric plus 6 alphanumeric characters capacity per memory location
- Initial alphanumeric character scroll of repertory memory
- Two level electric lock
- Individual timer and total timer
- Received call indicator
- Silent incoming call: Incoming call detected by display indication and backlighting flashing only – ringing tone absent.
- Function guide display: helps you choose correct key-in operation
- Two types of battery (400mAH / 700mAH) are available.
- Visible and audible low battery warning
- Compact travel charger (8 hours)

4. PORTABLE LAYOUT AND DISPLAY

PORTABLE LAYOUT



DISPLAY



IN USE

Lit when a call is in progress.

MUTE

Lit when MUTE facility is activated.
Flashes when the silent incoming call facility is activated.

CALL

Flashes when the received call indicator facility is activated.

ROAM

Lit when out of your home area but on the preferred network.
Flashes when out of your home area but on the nonpreferred network.

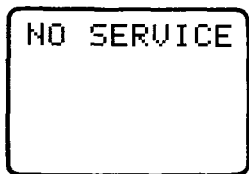
NOTE: Although it may be possible that the color of the LCD changes slightly (red or blue) or the display comes out slowly in an extreme low or high temperature, it does not indicate any fault.

5. OPERATION

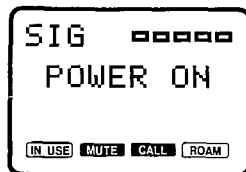
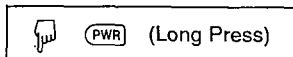
5.1 BASIC FUNCTIONS

PLEASE NOTE:

- When the power is turned on, "NO SERVICE" will be displayed usually in 5 seconds. If "NO SERVICE" continues to be indicated, the telephone is outside the radio coverage area. When you move into the coverage area, "NO SERVICE" will be replaced by the received signal strength indicator. Or, when your telephone has two selectable telephone numbers, check that your telephone number is proper for the network currently you are in.
- If "PART LOCK" or "FULL LOCK" is displayed, enter your unlock code to use your telephone normally.
- In making a telephone call, the whip antenna must be fully extended.

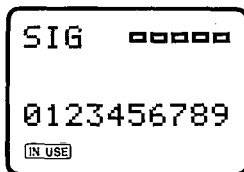
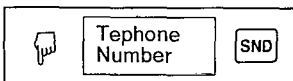


(1) SWITCHING ON/OFF



NOTE: If "OFF/ON" is displayed, switch the power off once. Then switch the power on again. Please contact your authorised dealer if "OFF/ON" does not disappear.

(2) MAKING A TELEPHONE CALL

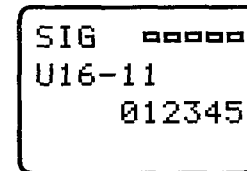


"IN USE" will be displayed.

NOTE: 1) If an intercept or reorder tone is heard in making a call press **END**.

- 2) To clear the last digit entered, briefly press **CLR**.
To clear the entire display, long-press **CLR**.

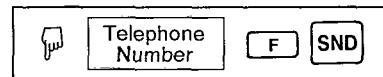
- 3) Up to 16 digits of the telephone number may be entered but only the last 10 digits will be displayed. To read the previous 6 digits, press and hold **CHK**. Releasing **CHK** will return the display to the last 10 digits dialled.



(3) AUTOMATIC REDIAL

Your telephone will redial the same number automatically if a connection fails and the reorder tone is heard.

1.



2. After finishing the reorder tone, the telephone redials every minute for a maximum of 3 attempts. When the redial is in stand-by condition, "IN USE" will flash. And while the redialing is going on, an alarm beep (redial tone) may be heard and "IN USE" may be lit. If the redial fails to connect, the reorder tone will be heard for 5 seconds and "IN USE" will start to flash again.

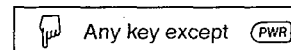
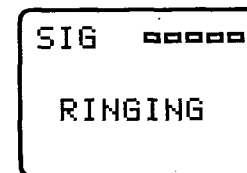
3. To stop the reorder tone, press **END** while the reorder tone is heard.

To cancel the automatic redial function, press **END** twice.

NOTE: When you lock the telephone while automatic redial function is activated, the automatic redial will be cancelled.

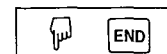
(4) RECEIVING A TELEPHONE CALL

When an incoming call is received, a ringing tone will be heard and the word "RINGING" together with the backlight will flash.



NOTE: If you do not answer the call within 65 seconds, the ringing tone and the call will automatically stop.

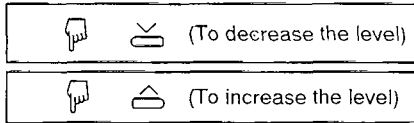
(5) TERMINATING A TELEPHONE CALL



5.2 ADDITIONAL FUNCTIONS

(1) VOLUME ADJUSTMENT

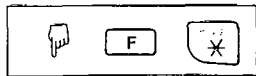
• TO ADJUST THE EARPIECE VOLUME AND KEYTONE •



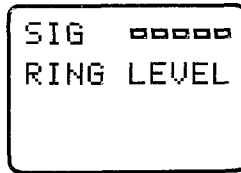
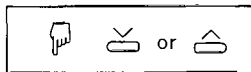
Press and hold with auto-repeat action allows 5 steps of adjustment.

- The other party's voice volume can be adjusted when in conversation.
- Keytone can be adjusted when the other party's voice, intercept tone or reorder tone is not heard from the earpiece.

• TO ADJUST THE RINGING VOLUME •



"RING LEVEL" will be displayed.



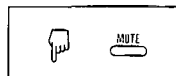
Ringing volume can be adjusted while "RING LEVEL" is displayed.

"RING LEVEL" will be cleared automatically after 5 seconds, or by any key operation except or .

- NOTE:**
- 1) Earpiece volume can be adjusted while "RING LEVEL" is not displayed.
 - 2) Once the ringing volume level is adjusted, it is held in the memory even after the power is switched off.

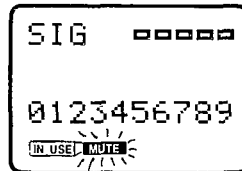
(2) MUTE

Mute facility allows you to mute the mouthpiece during a conversation.



"MUTE" will be displayed.

To cancel, depress again.

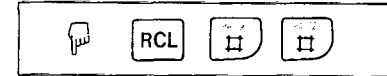


- NOTE:** If a call is terminated while MUTE is on, MUTE will automatically be cancelled.

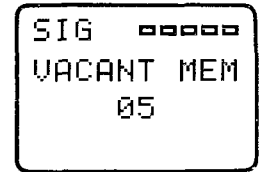
(3) VACANT MEMORY SEARCH

A maximum of 90 telephone numbers of up to 16 digits each can be stored in the speed-dial memory. You can select any memory location from 90 locations numbered 01 to 90.

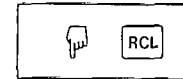
1. Be sure that "PART LOCK" or "FULL LOCK" is not displayed.
2. To find the vacant memory location,



The first vacant memory location will be displayed.



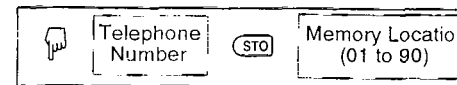
3. To find the next vacant memory location,



4. To end the vacant memory search, press any key except and .

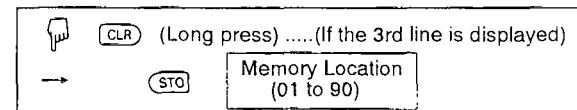
- NOTE:**
- 1) If there is no memory location number displayed, it means that there is no vacant memory location available.
 - 2) Special memory locations 91 to 99 will also be displayed by vacant memory search, but these locations can only be used for the Pause Dial function.

(4) STORING A TELEPHONE NUMBER



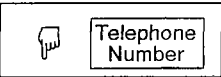
We recommend that you note stored numbers in the SPEED DIAL MEMORY INDEX.

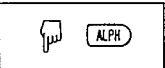
• TO DELETE THE EXISTING MEMORY •

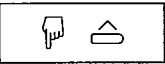




(5) ALPHA TAGGING A STORED NUMBER

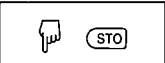
You can also store an alpha tag with the telephone number into a memory location. (Up to 6 letters can be stored.)

1. 

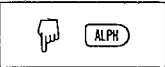
2. 

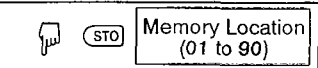
3. Cursor "█" will appear. 

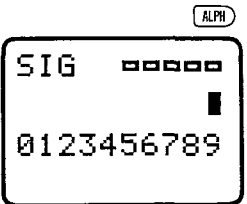
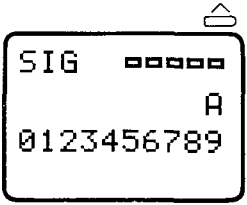
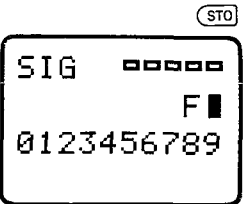
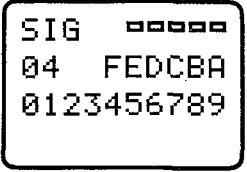
Cursor "█" will disappear and "A" will be displayed. You can scroll through the alphabet by pressing  or  until the letter you are seeking appears.

4. 

The letter will be memorised and cursor "█" will be displayed again. Repeat steps 3 and 4.

5. If you have finished entering letters, 

6. Cursor "█" will disappear. 







- NOTE:**
- 1) If you enter more than 6 letters, the first letter will disappear.
 - 2) Use **CLR** to clear an incorrect input.
 - 3) You may enter digits (0 to 9), * and # directly from the keypad instead of letters to the 2nd line. In this case, it is not necessary to press **STO** after entering each digit.
 - 4) Memory location 00 is for permanent memory programmed only by your dealer.

(6) SCRATCH PAD FACILITY

This function allows you to use the LCD as a scratch pad. You can store a telephone number (up to 32 digits) and letters (up to 6 characters) into the memory during conversation.

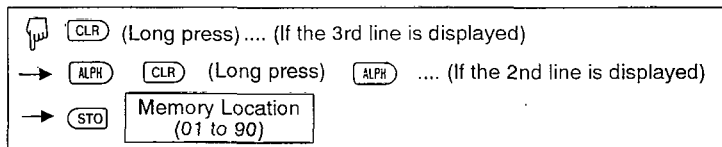
1. Be sure that "PART LOCK" or "FULL LOCK" is not displayed.

2. 

DTMF tone will be heard and the number will appear on the display. Scratch pad digits may be stored into memory location 01 to 99 for later use.

3. 

• TO DELETE THE EXISTING MEMORY WITH ALPHA-TAG •

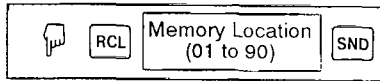


Or, any number and letters existing in a memory location will be replaced automatically when a new number and letters are entered into the same memory location.

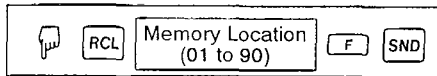
(7) RECALLING TELEPHONE NUMBERS

a) SPEED DIALING

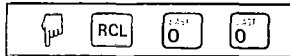
1. Be sure that **"FULL LOCK"** is not displayed.
2. To make a call by recalling a telephone number from memory location 01 to 90,



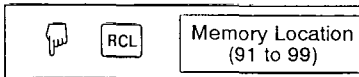
NOTE: 1) To make a call using automatic redial function,



- 2) To recall the permanent memory contents,



- 3) To recall the pause dial memory contents, be sure that **"PART LOCK"** or **"FULL LOCK"** is not displayed.



- 4) If you depress **CLR** briefly when the memory contents are displayed, the last digit of the 3rd line will be cleared. Long depression of **CLR** will clear the 2nd and 3rd lines completely.
- 5) If the contents of memory recalled are lost or corrupted, the 2nd and/or 3rd lines of display will show "0" and start to flash to indicate it.

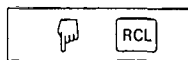
b) SCROLL SPEED DIAL MEMORY

1. Be sure that **"PART LOCK"** or **"FULL LOCK"** is not displayed.



The memory contents will be displayed.

3. To scroll through the memory locations,

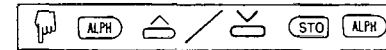


NOTE: 1) Use **CHK** to read the overflow telephone number.

- 2) If **RCL** is pressed when the contents of memory location 99 is displayed, then memory location 01 will be displayed.
- 3) If **"PART LOCK"** is displayed, you can scroll memory location 01 to 90 only.

c) SCROLL BY THE INITIAL OF ALPHABET NAME TAG

1. Be sure that **"FULL LOCK"** is not displayed.
2. Display the initial of the alpha tag, which you wish to recall on the 2nd line, follow the operation described in 5.2 (5) ALPHA TAGGING A STORED NUMBER.

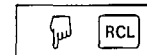


Or, enter digits (0 to 9), * or # directly from the keypad.



The first memory contents, which hold the name tag beginning with the letter or digit you have recalled, will be displayed.

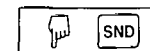
4. To display the next memory contents whose name tag begins with the same letter or digit,



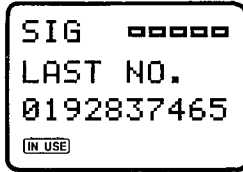
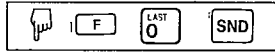
NOTE: 1) If no name has been memorised with the initial you enter, nothing will be displayed on the 2nd and 3rd lines.
 2) If **"PART LOCK"** is displayed, you can scroll only memory locations 01 to 90.

d) LAST NUMBER REDIAL

1. Be sure that **"FULL LOCK"** is not displayed.
2. If the last dialled telephone number is still on the display,



3. If not, to make a call by recalling the last dialled telephone number,

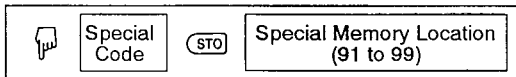


NOTE: You can recall the last dialled telephone number even after the keypad has been used for another purpose (e.g. storing numbers) or if the power has been switched off.

(8) PAUSE DIAL

Pause dial may be used to access functions such as voice mail retrieval and other services outside the cellular network. This function enables you to transmit the sequence of numbers stored in separate memory locations 00 to 90 by easy operation.

a) TO PROGRAMME FOR PAUSE DIAL



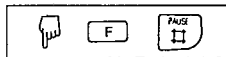
A special code must be formatted as follows:

X X P X X P X X P X X

“X X” is 2-digit memory location number (00 to 99).

“P” is a pause which must be put in between 2 “X X”s.

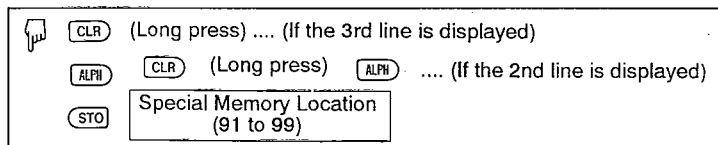
To input “P”,



Up to 10 “XX”s can be combined with “P”, and the last input must not be “P” but be “XX”.

NOTE: You can also store a combination of letters with special code in a special memory location for Pause Dial.

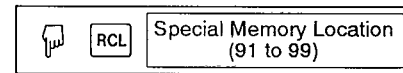
• TO DELETE THE EXISTING SPECIAL MEMORY FOR PAUSE DIAL •



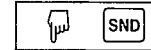
NOTE: If you attempt to programme special codes with the wrong format into a special memory, the 2nd and 3rd lines of the display will flash to indicate an error input.

b) TRANSMITTING PAUSE-DIALLED NUMBERS

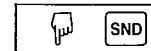
1. To recall a special code programmed in a special memory location,



2. To make a call to the number stored in the first programmed memory location,

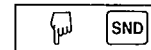


3. To send DTMF tones corresponding to the digit stored in the memory of the second number in the pause dial programmed sequence,



You may hear DTMF tone.

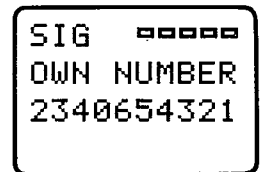
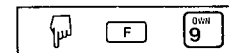
4. To send DTMF tones corresponding to the digit stored in the memory of the third, fourth, , tenth number in the pause dial programmed sequence,



If the number of “X X” in a special code you recalled is N, you can press **SND** up to N times.

- NOTE:** 1) If you attempt to store pause dial sequences into memory locations 01 to 90, the 2nd and 3rd lines of the display will flash to indicate an input error.
 2) If the contents of memory which should be transmitted by **SND** are lost or corrupted, the 2nd and 3rd lines of display will flash.
 3) If “PART LOCK” or “FULL LOCK” is displayed, both programming for and recalling from pause dial are not possible.

(9) OWN NUMBER DISPLAY



Your own telephone number will be displayed in the following format, consisting of 10 digits.

2 3 4 + 2, 0, or 4 + X X X X X X

Code for U.K. 2 (Code for Cellnet) Your telephone number
 0, 4 (Code for Vodafone)

(10) INDICATOR TONES

1. **WAKE-UP TONE:** A half second tone which sounds when the power of the telephone is switched on.
2. **KEYTONE:** A dual tone which sounds when a numbered key is pressed. (Each numbered key has a different tone, known as DTMF.)
3. **CONFIRMATION TONE:** A single tone which sounds when a function key is pressed.
4. **RINGING TONE:** A one second dual tone burst repeated at 4 second intervals which sounds when an incoming call is awaiting your answer.
5. **INTERCEPT TONE:** A rapid alternating high/low tone which sounds when a call origination is rejected because of an error in operating the telephone or because the system has detected an error or is otherwise unable to accept the call.
6. **REORDER TONE:** A rapid dual tone every 1/4 second which sounds when the system cannot accept the call and suggests redialling, when a call is terminated by the other party, or a call is dropped in weak signal condition.
7. **LOW BATTERY WARNING TONE:** A one second high tone burst repeated at 6 second intervals which sounds when the battery requires recharging.

(11) BACKLIGHTING FOR KEYPAD AND DISPLAY

When you turn the power on or when you depress any key, the keypad and the display will be illuminated for 10 seconds.

When 10 seconds have passed, the light will be turned off automatically for battery saving.

PLEASE NOTE:

You can transmit instructions to activate facilities such as call waiting and conference calls, to your network during a call. Make a key operation according to subscriber information booklet or contact your dealer.

5.3 ADVANCED FUNCTIONS

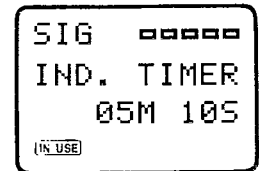
These functions may not be available on your telephone unless programmed by your authorised dealer.

Please contact your dealer for further details.

(1) TIMER

• INDIVIDUAL CALL LENGTH TIMER •

1. To read the talk time of the last call completed,

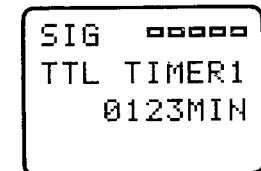


- “M” represents minutes (00M to 99M) and
“S” represents seconds (00S to 59S).
2. This operation also enables you to read the talk time of the call in progress, and the display will be updated every 10 seconds.
 3. To return to the normal display mode, depress any key except **[PWR]**

• TOTAL TIMER •

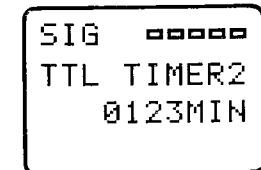
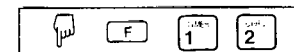
There are two types of total timer; the first total timer, which can not be reset, and the second total timer, which can be reset by key operation.

1. FIRST TOTAL TIMER



- “MIN” represents minutes(0000MIN to 9999MIN).
Once 9999 minutes have been reached, the display will start again at 0000MIN.

2. SECOND TOTAL TIMER



- Then, to reset the second total timer,



“0000MIN” will be displayed. This operation is valid only while the second total timer is displayed.

3. To return to the normal display mode, depress any key except **[PWR]**

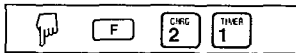
NOTE: You can select total timer for making/receiving calls or total timer only for making calls. Please contact your dealer.

(2) CALL CHARGE METERING

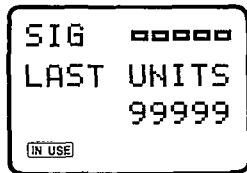
The call charge metering facility gives an accurate readout of the numbers of units used for the last call made and a cumulative total of units used. This facility will only function if special charging signals are provided by the network and should be specified at the time of ordering. The call charge metering facility is an accurate estimation of call charges but will not be identical to the network billing because of slight discrepancies in call duration timings due to radio propagation and other unavoidable factors.

The call charge metering facility only operates if the network service which may be by subscription) is provided for a particular mobile terminal. Where applicable, calls will be dropped if the network service is provided and the facility is not enabled within the equipment. For full details of this facility, please refer to your authorised dealer.

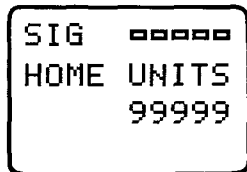
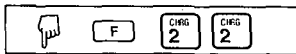
• TO DISPLAY THE CALL CHARGE UNITS FOR THE LAST CALL •



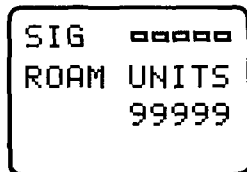
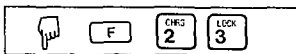
This operation also allows the call charge units for the call in progress to be displayed and updates the display every 10 seconds.



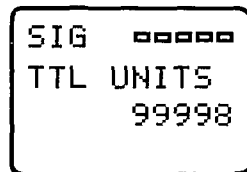
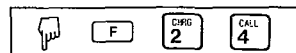
• TO DISPLAY THE CALL CHARGE UNITS FOR ALL CALLS MADE ON THE PREFERRED NETWORK •



• TO DISPLAY THE CALL CHARGE UNITS FOR ALL CALLS MADE ON THE NON-PREFERRED NETWORK •

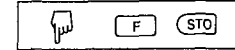


• TO DISPLAY THE CALL CHARGE UNITS FOR ALL CALLS MADE BOTH ON THE PREFERRED AND NON-PREFERRED NETWORKS •



NOTE: 1) Call charge metering for all calls cannot be reset. Once 9999 units have been reached, the display will start again at ZERO.

2) If the selected call charge metering display flashes on and off, it indicates that the call charge metering memory may be corrupted. To restore the display,

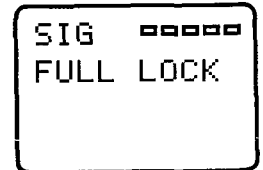
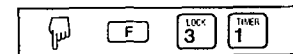


(3) LOCK

Lock function prevents unauthorised use of your telephone in your absence. Two types of lock, FULL LOCK and PARTIAL LOCK, are available.

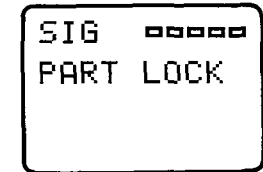
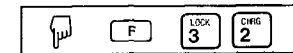
• FULL LOCK •

Making any call is inhibited. Receiving a call is always permitted.



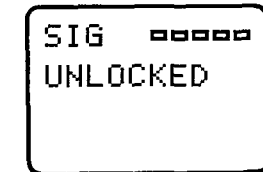
• PARTIAL LOCK •

Calls by recalling telephone numbers from memory location 00 to 90 and by the redial of the last call from memory location is permitted. Receiving call is always permitted.



• TO UNLOCK •

To unlock, enter your unlock code. You may specify a two-to-four digit number as your unlock code upon delivery of your telephone.

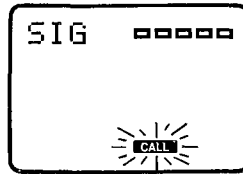
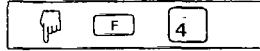


NOTE: 1) The lock state will be maintained even if the power has been shut off.
2) **AUTOMATIC LOCK:** Your telephone will be automatically fully locked every time you turn the power on if the automatic lock function has been programmed by your dealer.
3) Please remember your unlock code and do not write it in an obvious place.

(4) RECEIVED CALL INDICATOR

This function informs you of an unanswered incoming call in your absence by the "CALLED" message.

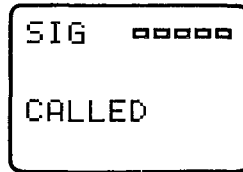
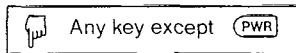
1. To activate this function,



"CALL" will start to flash.

2. When an incoming call is received, a ringing tone will be heard, the word "RINGING" and the backlight of the display will flash.
3. If 65 seconds have passed, and the other party terminates the call, or the call is dropped due to fading situation before you answer the call, the ringing tone and the flashing "RINGING" message and backlight of the display will automatically stop. The word "CALLED" will then be displayed.

4. To clear the "CALLED" message,



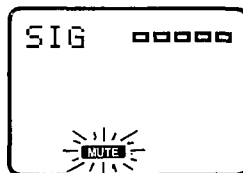
NOTE: The "CALLED" message will remain on the display even if you switch your telephone off.

(5) RINGING TONE CANCEL AND SILENT INCOMING CALL

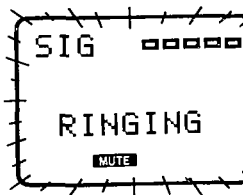
This function cancels the ringing tone and informs you of an incoming call only by the flashing of "RINGING" message and the backlight.

1. 

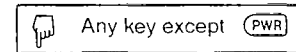
"MUTE" will start to flash to indicate that the ringing tone has been cancelled.




2. When an incoming call is received, the word "RINGING" and the backlight will start to flash.



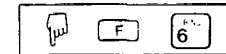
3. To answer the call,



"MUTE" will stop flashing.

4. To terminate the call, press  "MUTE" will start to flash again.

• TO RESTORE THE RINGING TONE •



"MUTE" will disappear.

NOTE: Whether this function is activated or not, the word "RINGING" and the backlight will flash whenever an incoming call is received.

(6) ROAMING AND A/B SYSTEM SELECTION

The cellular mobile telephone system to which you have registered is known as the preferred network. In the future, it may be possible to use your telephone on the other system, known as the non-preferred network. This facility, known as roaming, may be programmed into your telephone when available by your authorised dealer.

If the telephone is programmed for both roaming and A/B system selection, you are able to select the network you require using the key operation. The display "SYS A" and "SYS B" show which network has been selected. (VODAFONE is SYS A, CELLNET is SYS B).

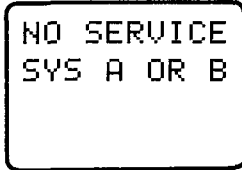
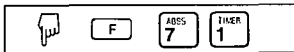
NOTE: When your telephone locks into non-preferred system, generally you will not have service unless you are registered or have made a roaming agreement with the non-preferred system. It is possible to register your telephone to both systems using the two selectable telephone number function programmed by your dealer.

Your telephone has three roaming modes.

- NORMAL MODE
- SYSTEM A ONLY MODE
- SYSTEM B ONLY MODE

1. When you turn the power on, the SYSTEM A ONLY MODE or the SYSTEM B ONLY MODE is automatically selected based on the preferred network.

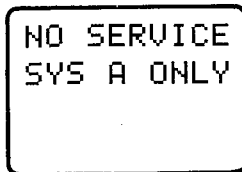
2. NORMAL MODE



If the telephone is within the service area of the preferred system the telephone will continue to use that system.

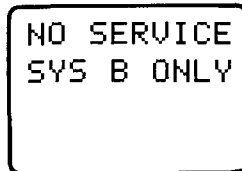
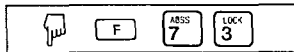
If not, the telephone will automatically check if it is inside the service area on the non-preferred system, and if so, it will use the non-preferred system. After a period of time the telephone will check to see if it is now in the service area of the preferred system, and if so, it will return to that network.

3. SYSTEM A ONLY MODE



The telephone can be used only on system A. Network service may not be available on the non-preferred system if your telephone has not been registered with system A.

4. SYSTEM B ONLY MODE



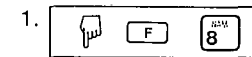
The telephone can be used only on system B. Network service may not be available on the non-preferred system if your telephone has not been registered with system B.

- NOTE:** 1) If you do not select any of three modes, the normal mode will be automatically selected when you turn the power on.
- 2) Roaming and A/B system selection might not yet be available on the U.K. Network. Please contact your dealer for their availabilities.
- 3) When you make a key operation (F ABS 7 TIMER 1 to F ABS 7 LOCK 3), "NO SERVICE" message will be displayed. After a few seconds, when the telephone is ready to be operated on that system, "NO SERVICE" will disappear.

(7) TWO SELECTABLE TELEPHONE NUMBERS

This function allows you to have two different telephone numbers, one on each network.

• TO SELECT THE SECOND TELEPHONE NUMBER •



The second telephone number will be displayed.

- 2 Wait until "NO SERVICE" disappears, then you can use your telephone with the second telephone number.
3. To return to the original telephone number, repeat the same key operation and wait until "NO SERVICE" disappears.

NOTE: You can receive a call only if the caller dials the telephone number you have currently selected.

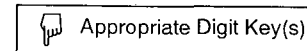
(8) DTMF TONES

Each digit key has a different tone, which is known as DTMF (Dual Tone Multi Frequency) tone.

NOTE: Digit keys are to , and .

• TO SEND DTMF TONE DURING CONVERSATION •

This function may be used to access functions such as long distance access code, voice mail retrieval and other services outside the cellular network.



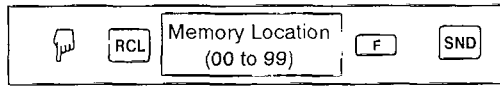
NOTE: DTMF tones may not be sent manually by pressing keys if the memory contents are displayed or an alphabet input mode is selected.

• DTMF INTERVAL •

When this function is programmed, the DTMF tone is generated as long as the digit key is being pressed.

• TO SEND DTMF TONES FROM MEMORY DURING CONVERSATION •

You can send DTMF tones from a memory location 00 to 99 during conversation.



- NOTE:** 1) If you make this key operation while not in conversation, automatic redial function will be activated.
- 2) After you depress **RCL** **MEMORY LOCATION (00 to 99)**, you can change the telephone number by pressing any digit keys without sending the DTMF tones.
Press **F** **SND** after you have changed the telephone number.

(9) LAST NUMBER MEMORY BEGINNING WITH * OR # _____
(SYSTEM STATUS DISPLAY)

To display the last number memory beginning with * or #,



(10) DIALLED DIGIT RESTRICTION _____

This function restricts the maximum number of dialling digits. For instance, if the maximum number of dialling digits is set to seven, you cannot make a call to telephone number exceeding seven digits. Please discuss this option with your authorised dealer.

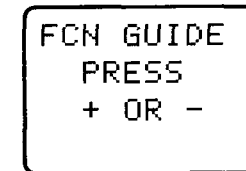
NOTE: Long distance calls can be disabled by this function.

(11) FUNCTION GUIDE DISPLAY _____

You can scroll through the menu for available functions.

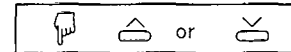


The display will be as follows:

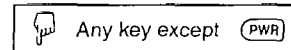



("+" means key, and "-" means key.)

2. To scroll forwards or backwards through the function guide display,



3. To end the function guide display search,



The display will change in the following order by pressing 

Second Line
Third Line

F 0
LAST NO.

F 1 0
IND. TIMER

F 1 1
TTL TIMER1

F 1 2
TTL TIMER2

F 2 1
LAST UNITS

F 2 2
HOME UNITS

F 2 3
ROAM UNITS

F 2 4
TTL UNITS

F 3 1
FULL LOCK

F 3 2
PART LOCK

F 4
RCVD CALL

F 5
HANDSFREE

F 6
MUTE RING

F 7 1
SYS A OR B

F 7 2
SYS A ONLY

F 7 3
SYS B ONLY

F 8
SWITCH NAM

F 9
OWN NUMBER

F *
RING LEVEL

F #
PAUSE DIAL

F ALPH
MONITOR

F STO
NO BLINK

F F
FCN GUIDE

F CLR
CLR TIMER2

F SND
AUTOREDIAL

F SND
SEND DTMF

F RCL
SYS STATUS

RCL # #
VACANT MEM

- 21 -

NOTE: Some of the above display may not appear if they are not programmed into your telephone. On function guide, "F5 HANDSFREE" will be emitted only while IN CAR option is used.

6. BATTERY CHARGING USING TRICKLE CHARGER

6.1 BEFORE OPERATING

(1) CAUTION FOR BATTERY USAGE

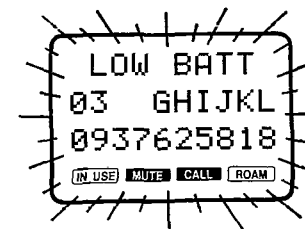
- DO NOT expose the battery to high temperatures or humidity.
- DO NOT dispose of the battery in fire.
- DO NOT short-circuit the negative and positive terminals.
- DO NOT drop or subject the battery to strong physical shocks.
- DO NOT attempt to force the battery.
- Charge the battery in a well-ventilated place between +5°C to +40°C .
- New or extremely flat battery must be fully charged. If the battery is not normally fully charged, the battery capacity decreases gradually. (MEMORY EFFECT)
- If you do not use the telephone for a long time, remove the battery from the telephone and be sure to fully charge it at least once every two months.

(2) CAUTION FOR TRICKLE CHARGER USAGE

- To reduce risk or injury, charge only the specified battery, and be sure to use the trickle charger with the specified AC ADAPTOR-1.
- Locate the cord so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress. If the trickle charger has received a sharp blow, been dropped, or damaged in any way, do not use the trickle charger and take it to a qualified service centre.
- Do not remove screws. There are no user-serviceable parts inside.
- Disconnect the AC plug from the AC power outlet when not in use.
- After charging, take out the battery or the telephone with the battery from the trickle charger. Do not charge the battery for more than 24 hours.

(3) LOW BATTERY WARNING

1. When the battery is almost discharged, the Low Battery Warning Tone will be heard, the "LOW BATT" message will be displayed, and the whole display will start to flash.



2. Turn the power off to prevent further discharge of the battery.
3. If you have a fully-charged spare battery, replace the discharged battery by the spare battery. If not, charge the battery.

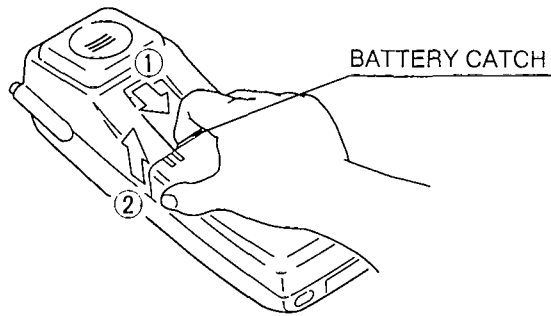
- NOTE:**
- 1) You can continue your call in progress if you replace the battery quickly (in about 4 seconds) when the low battery warning tone sounds.
 - 2) Further use of the discharged battery may cause the power to turn off automatically, or may cause the telephone not to operate properly.
 - 3) A spare battery pack is recommended.

6.2 BATTERY REPLACEMENT

Turn the telephone over with the battery side up.

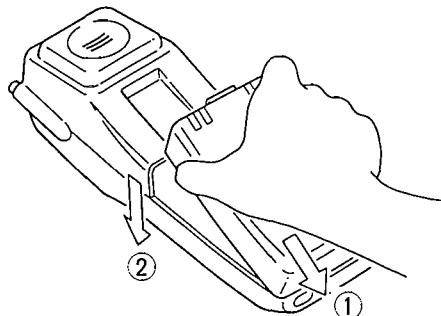
(1) BATTERY REMOVAL

1. Press down the battery catch.
2. Lift the battery off the telephone.



(2) BATTERY INSERTION

1. Hook the battery in the telephone at the bottom.
2. Push down the battery towards the body of the telephone. It will click into place.



6.3 BATTERY CHARGING

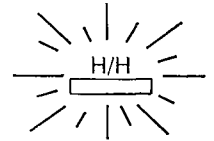
There are two battery slots in the trickle charger: BATTERY SLOT-1 and BATTERY SLOT-2.

You can charge two batteries simultaneously using both battery slots.

1. Insert the AC plug of the AC adaptor-1 into the main AC power outlet.
2. Connect the DC plug into the power connector of the trickle charger.
3. Insert the battery itself or the telephone with the battery to the battery slot-1 or/and 2.
Charging will automatically commence.

● BATTERY SLOT-1 (TRICKLE CHARGING) ●

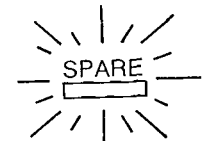
- 1) The battery itself or the telephone with the battery (when the power is off) can be charged in approximately 8 hours.
- 2) When you insert the telephone with the battery into the battery slot-1 and when the telephone is in stand-by mode, the trickle charger will supply electric current to the telephone and prevent battery discharging.
- 3) The LED indicator-1 is being illuminated whilst the battery is in the battery slot-1.



● BATTERY SLOT-2 (TRICKLE CHARGING) ●

The battery itself can be charged in approximately 8 hours.

The LED indicator-2 is being illuminated whilst the battery is in the battery slot-2.



	TYPE OF BATTERY	400mAH	700mAH
CONDITION			
STAND-BY MODE (approximately)		7 hours	16 hours
TALK TIME (approximately)		40 minutes	90 minutes

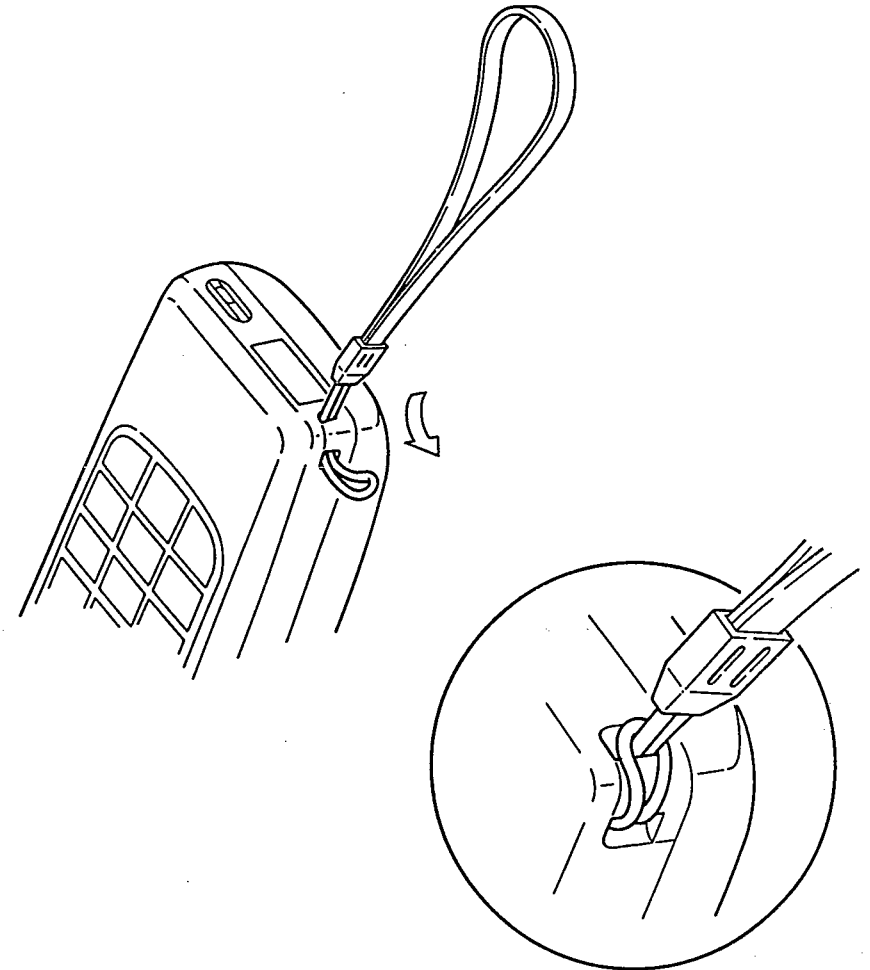
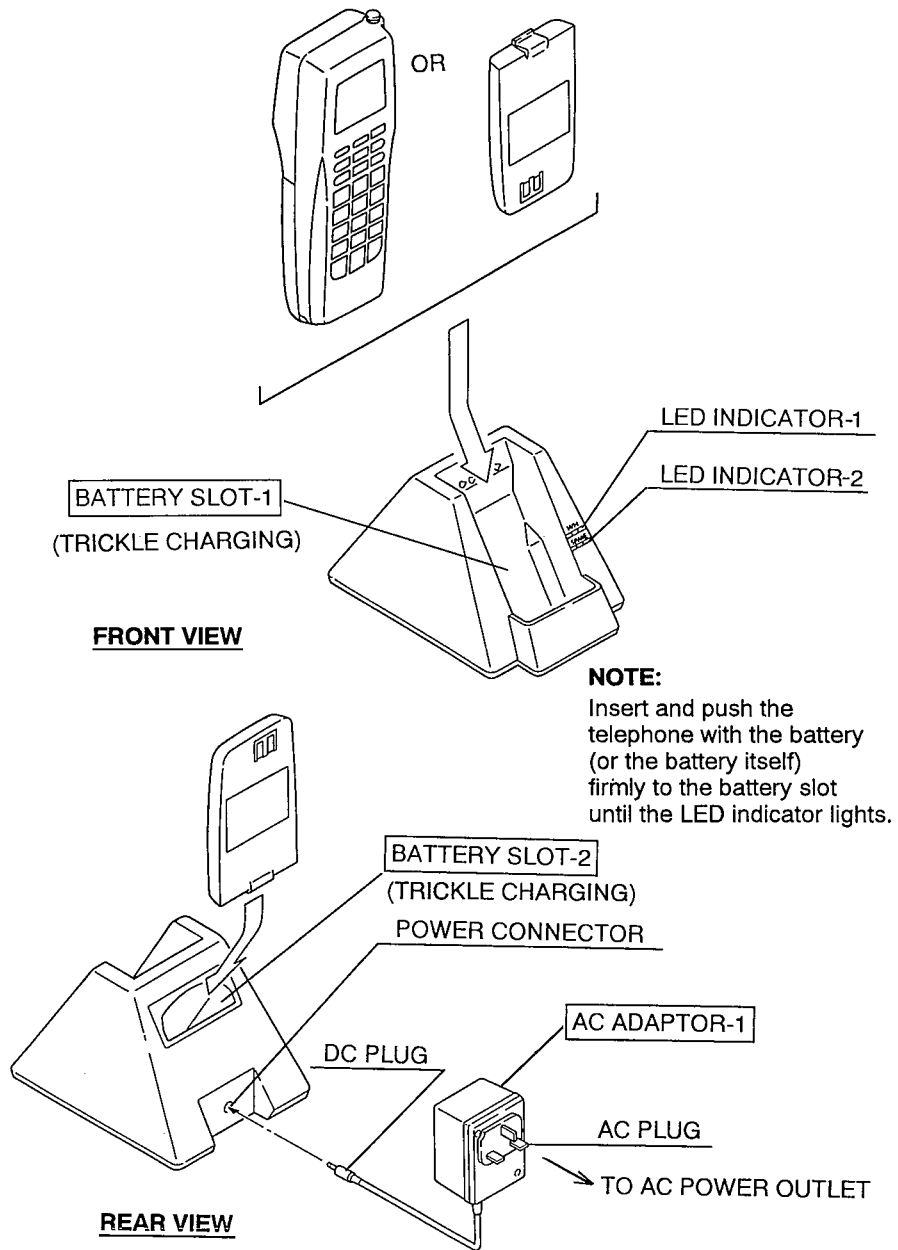
TABLE: BATTERY DURATION TIME

NOTE: When your battery's duration becomes deteriorate, repeat excessive charge (double of the specified charging time) and complete discharge for 2 or 3 times.

6.4 ACCESSORIES

STRAP ATTACHMENT

Attach the wrist strap as shown in following diagram:



7. BEFORE CALLING SERVICE PERSONNEL

Please check the following notes before calling service personnel.

SYMPTOM: NO POWER

Make sure that the battery is installed properly and it has been fully charged using the specified battery charger.

SYMPTOM: "NO SERVICE" INDICATION

Try moving to a different area.

Depending on the terrain, the signal may be blocked in the so-called dead spots.

Check the antenna.

Or check that your telephone number is proper for the network currently you are in.

IV. NAM PROGRAMMING AND SERIAL NUMBER

1. Number Assignment Module (NAM)

1.1 Overview

Two kinds of NAM information can be stored in the equipment. One is called NAM 1, and the other is called NAM 2. NAM 1 must be always written at first, and then NAM 2 will be written if a user wants to have 2 NAMs.

If NAM 1 is not written correctly, the equipment enters the NAM virgin mode. In this mode, the equipment can not execute the call processing.

And also if NAM 1 is not written correctly, NAM 2 cannot be written. Only when NAM 1 is written correctly, NAM 2 can be written.

NAM 2 has the same items as NAM 1. Common values among two NAMs are used for some items, and independent values among two NAMs are used for other items.

If both NAMs are written correctly, the function of 2 selectable telephone number is enabled. Even if NAM 1 is written correctly and NAM 2 is not written, the equipment executes call processing normally. The NAM is included in the EEPROM.

1.2 Information included in NAM

The NAM stores the following information in the format given in Table 1.1. (C) or (I) shown following each item means 'common among NAM 1 and NAM 2' and 'independent in each NAM' respectively.

- **Home Traffic Area Identification (AIDH) (I)**

The AIDH is a 15-bit number that is used by the equipment to make the Home/Roam decision.

- **Local Use Mark (L.U.) (C)**

This 1-bit mark when set to '1' indicates that the equipment is optioned for local control function.

- **Mobile Identification Number (MIN 1 and MIN 2) (I)**

The MIN (consisting of MIN 1 and MIN 2) is a 34-bit number that identifies the equipment. (See APPENDIX 1.2)

- **Station Class Mark (SCM) (C)**

The SCM is a 5-bit number that identifies that type of the equipment.

Station Class Marks

Power Class	(Nominal ERP)	SCM-p
Class 1	(10 dBW)	XXX00
Class 2	(6 dBW)	XXX01
Class 3	(2 dBW)	XXX10
Class 4	(-2 dBW)	XXX11
Station Types		
PBSM	Disabled	XX0XX
PBSM	Enabled	XX1XX
Equipped for 600 channels		01XXX
Equipped for 1000 channels		00XXX
Equipped for 1320 channels		10XXX
Reserved for future use		11XXX

The PBSM is an abbreviation of Panasonic Battery Saving Mode.

The SCM of this model is '10111'.

- **First Paging Channel in Home Area (FPCH) (I)**

The FPCH is an 11-bit number of the first control channel used for paging mobile station when it is in its home area.

- **Access Overload Class (ACCOLC) (I)**

The ACCOLC is a 4-bit number used to identify which overload class field controls access attempt.

- **Preferred System Mark (PS) (I)**

This 1-bit mark when set to '1' identifies that the preferred system of the equipment is System A; otherwise, the preferred system is System B, Vodafone is System A. Cellnet is System B.

- **Group Identification Mark (GIM) (1)**

The GIM is a 4-bit number indicating how many bits of the AIDH, starting with the least significant bit, comprise the Group Identification. The GIM is always '0011'.

- **Lock Combination (LOCK Digit 1–4) (C)**

This 4 x 4 bit number represents the sequence of four decimal digits that is used in unlocking the equipment.

Unlock code is programmed as follows:

(No Electric Lock)

ADDRESS	D7	D6	D5	D4	D3	D2	D1	D0
0F	0	0	0	0	0	0	0	0
1F	0	0	0	0	0	0	0	0

(2 digits Unlock Code)

ADDRESS	D7	D6	D5	D4	D3	D2	D1	D0
0F	Lock Digit 1				Lock Digit 2			
10	0	0	0	0	0	0	0	0

(3 digits Unlock Code)

ADDRESS	D7	D6	D5	D4	D3	D2	D1	D0
0F	Lock Digit 1				Lock Digit 2			
10	Lock Digit 3				0	0	0	0

(4 digits Unlock Code)

ADDRESS	D7	D6	D5	D4	D3	D2	D1	D0
0F	Lock Digit 1				Lock Digit 2			
10	Lock Digit 3				Lock Digit 4			

Digit code programmed in the NAM is as follows:

DIGIT CODE			
Digit	Code	Digit	Code
1	0001	8	1000
2	0010	9	1001
3	0011	0	1010
4	0100	*	1011
5	0101	#	1100
6	0110	Null	0000
7	0111		

- **Full Lock Mark (FLCK) (C)**

This 1-bit mark when set to '1' indicates that the equipment is optioned for full lock. Unlock code is programmed in LOCK Digit 1-4.

- **Partial Lock Mark (PLCK) (C)**

This 1-bit mark when set to '1' indicates that the equipment is optioned for partial lock. Unlock code is programmed in LOCK Digit 1-4.

- **Silent Incoming Call Mark (SIC) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned for silent incoming call.
- **Received Call Indicator Mark (RXI) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned for received call indicator.
- **A/B System Select Mark (ABSS) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned for selecting A/B system from the key pad.
- **Inter-system Roaming Inhibit Mark (IRI) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned to prevent changing the serving-system status to correspond to the non preferred system.
- **Home System Only Mark (HSO) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned for inhibiting the origination when the equipment is out of home area.
- **DTMF Interval Mark (DTI) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned and that the equipment send DTMF as long as a key is pressed.
- **Automatic Lock Mark (ATL) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned for automatic lock.
- **Built-In Monitor Mark (BIM) (C)**
This 1-bit mark when set to '1' indicates to allow status information to be displayed on the LCD.
- **Individual Call Length Timer Mark (ICLT) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned for display of the individual call elapsed time.
- **Total Call Length Timer No.1 Mark (TCLT1) (C)**
This 1-bit mark when set to '1' indicates that the equipment has the option for display of a total elapsed timer which cannot be reset by a user.
- **Total Call Length Timer No.2 Mark (TCLT2) (C)**
This 1-bit mark when set to '1' indicates that the equipment has the option for display of a total elapsed timer which can be reset by a user.
- **Total Time Addition (TTA) (C)**
This 1-bit mark when set to '1' indicates that the total elapsed time is for both originating and receiving calls.
- **Call Charge Unit Mark (CCU) (C)**
This 1-bit mark when set to '1' indicates that the equipment is optioned for computation of call charges.
- **Dial Limit (DLMT) (C)**
This DLMT is a 4-bit number indicating the permitted dial digit number when the equipment is optioned for dial digit restriction.
When DLMT is set to all zeros, it indicates that the equipment is not optioned for dial digit restriction.
- **EX Mark (C)**
This 1-bit mark when set to '1' indicates that home equipment must send both MIN 1 and MIN 2 when accessing the system.

- **Speed Dial Memory (SPDM Digit 1–12) (C)**

This 12 x 4 bit number represents the number speed dial memory of 12-decimal digits.

Digit code programmed in the NAM is the same as unlock code.

Examples of program in the NAM is as follows:

(Dial number 0635-33251)

ADDRESS	D7	D6	D5	D4	D3	D2	D1	D0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	1	0	1	0
1A	0	1	1	0	0	0	1	1
1B	0	1	0	1	0	0	1	1
1C	0	0	1	1	0	0	1	0
1D	0	1	0	1	0	0	0	1

(Dial number 531-1231)

ADDRESS	D7	D6	D5	D4	D3	D2	D1	D0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
1A	0	0	0	0	0	1	0	1
1B	0	0	1	1	0	0	0	1
1C	0	0	0	1	0	0	1	0
1D	0	0	1	1	0	0	0	1

- **NAM Checksum Adjustment and NAM Checksum (I)**

The checksum value and checksum adjustment value is used in testing the NAM.

The NAM checksum is '01010101' and the NAM checksum adjustment is selected such that the sequential sum of all NAM locations, including checksum and checksum adjustment is all zeros.

Table 1.1 NAM FORMAT

ADDRESS	D7	D6	D5	D4	D3	D2	D1	D0
00	0	AIDH (14-8)						
01	AIDH (7-0)							
02	L.U.	0	0	0	0	0	0	EX
03	0	0	MIN 2 (33-28)					
04	MIN 2 (27-24)				0	0	0	0
05	0	0	0	0	MIN 1 (23-20)			
06	MIN 1 (19-12)							
07	MIN 1 (11-4)							
08	MIN 1 (3-0)				0	0	0	0
09	0	0	0	SCM (4-0)				
0A	0	0	0	0	0	EPCH (10-8)		
0B	FPCH (7-0)							
0C	0	0	0	0	ACCOLC (3-0)			
0D	0	0	0	0	0	0	0	PS
0E	0	0	0	0	GIM (3-0)			
0F	LOCK Digit 1				LOCK Digit 2			
10	LOCK Digit 3				LOCK Digit 4			
11	0	0	0	0	0	0	0	SIC
12	0	0	0	0	0	0	0	0
13	0	BIM	ATL	0	CCU	ABSS	IRI	HSO
14	RXI	DTI	FLCK	PLCK	TTA	TCLT1	TCLT2	ICLT
15	0	0	0	0	DLMT (3-0)			
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	SPDM Digit 1				SPDM Digit 2			
19	SPDM Digit 3				SPDM Digit 4			
1A	SPDM Digit 5				SPDM Digit 6			
1B	SPDM Digit 7				SPDM Digit 8			
1C	SPDM Digit 9				SPDM Digit 10			
1D	SPDM Digit 11				SPDM Digit 12			
1E	NAM CHECKSUM ADJUSTMENT							
1F	NAM CHECKSUM							

APPENDIX 1.1

A 34-bit binary Mobile Identification Number (MIN) is derived from the 10-digit International Mobile Station Identity (IMSI). The IMSI comprises a 4-digit Mobile Network Identification Code (MNIC) and a 6-digit Mobile Station Identification Number (MSIN) - (CCITT Study Group II-Contribution No.167 'Identification and numbering of Land Mobile Stations' refers). The MIN is derived by the following procedure.

- (1) The first three digits (3-digit Mobile Country Code—MCC) are mapped into 10 bits (corresponding to MIN2-p) by the following coding algorithm:
 - (a) Represent the 3-digit field as D1 D2 D3 with the digit 0 having the value 10.
 - (b) Compute $100 \times D1 + 10 \times D2 + D3 - 111$.
 - (c) Convert the result in step (b) to binary by a standard decimal-to-binary conversion (see table below).
- (2) The next digit (the public Land Mobile Network (PLMN) or 'system' code) should be mapped into the 4 most significant bits of MIN1-p by a Binary-Coded-Decimal (BCD) Conversion, as specified in the table below.
- (3) The last six digits (Mobile Station Identification Number) are mapped into the 20 least significant bits of NIN1-p in the following way.
 - (a) The most significant digits are mapped into 10 bits by the coding algorithm as described in (1).
 - (b) The 3 least significant digits are mapped into 10 bits by the coding algorithm as described in (1).

DECIMAL-TO-BINARY CONVERSION

FOURTH DIGIT BCD MAPPING PROCEDURE

DECIMAL-TO-BINARY CONVERSION		FOURTH DIGIT BCD MAPPING PROCEDURE	
Decimal Number	Binary Number	Thousands Digit	Binary Sequence
		1	0001
1	000000001	2	0010
2	000000010	3	0011
3	000000011	4	0100
4	000000100	5	0101
.		6	0110
.		7	0111
.		8	1000
998	1111100110	9	1001
999	1111100111	0.	1010

1.3 Write NAM from Keypad

Before NAM programming can be performed, it is necessary to obtain one (or two) assigned telephone number and system parameter information. Refer to Appendix 1.2 in the rear of this section, and consult your Cellular system provider to obtain this information.

(1) Equipment you will need

- 1) Password Adaptor: Part Number EB-X0754

(2) **Electrical Connections**

- 1) Do not remove the battery from the handheld portable equipment.
- 2) Attach the password adaptor to the handheld portable equipment.

(3) **NAM Programming**

When the password adaptor is connected, the power of the equipment is automatically turned on. In order to write NAM from the keypad, complete the following steps in proper order.

	Keypad Entry	Display Results	Remarks
1)	Enter: *0000#	MAINT MODE	Password
2)	Enter: *1 <SND >	NAM1 MODE	Select NAM1 Writing mode

The entire NAM1 data is contained in thirteen (13) consecutive memory locations. You can alter any location by entering the digits through the keypad, followed by (STO)XX to save it to memory (Note: XX = memory location number 01 to 13). Use (RCL)XX to review the current contents of a memory location. Enter the data into 13 memory location by referring to Table 1.3.1 below. Each time the (STO) command is executed, the memory location number and the abbreviated name of item will be displayed to indicate acceptance of the parameter. If "ERROR" is displayed, check the memory location number and the parameter, reenter the correct data, and store again.

Table 1.3.1 NAM Data Table

No.	Item	Remarks
01	Area Identification (AIDH)	See Appendix 1.2
02	Telephone Number (OWNDL)	Equipment telephone number (10 digit) See Appendix 1.2
03	Preferred System Mark (PRESYS)	1 = A (Vodafone System) 0 = B (Cellnet System)
04	First Paging Channel (FPCH)	See Appendix 1.2
05	Access Overload Class (ACCOLC)	See Appendix 1.2
06	Group ID Mark (GIM)	See Appendix 1.2
07	Dial Limit (DLMT)	0 = No Limit (16 digit dialing) 1 through 15 is digit dialing limit.
08	Station Class Mark (SCM)	Must be set 23
09	Speed Dial Memory (SPDL)	12 digits permanently stored number
10	Lock Code (LOCK)	Any combination of digits, 2 to 4 in length

11	Function Byte 1 (FCN 1)	<p>See Appendix 1.2</p> <p>This location is comprised of eight (8) digits.</p> <p>For each item: 1 = yes, 0 = no unless otherwise indicated.</p> <p>A total of 8 digits must be entered.</p> <p>Digit No.8 is entered first while No.1 is last.</p> <p>Digit No.1 will be shown on the right of the display.</p>
	D8 Local Use	See Appendix 1.2
	D7 EX Mark	See Appendix 1.2
	D6 Reserved	Set to "0".
	D5 Reserved	Set to "0".
	D4 Silent Incoming Call	Y/N
	D3 Reserved	Set to "0".
	D2 Reserved	Set to "0".
	D1 Reserved	Set to "0".
<hr/>		
12	Function Byte 2 (FCN 2)	<p>See Appendix 1.2</p>
	D8 Reserved	Set to "0".
	D7 Built-In Monitor	Set to "0", 1 = testing only
	D6 Automatic Lock	Y/N
	D5 Reserved	Set to "0".
	D4 Call Charge Metering	Y/N
	D3 A/B System Select	Only one of D3, D2, D1 is set to 1,
	D2 Intersystem Roaming Inhibit	or all of them are set to 0's.
	D1 Home System Only	In the current stage, (D3, D2, D1) should be set to (0, 1, 0).
<hr/>		
13	Function Byte 3 (FCN 3)	<p>See Appendix 1.2</p>
	D8 Received Call Indicator	Y/N
	D7 DTMF Interval	0 = 95 ms, 1 = During Key Depression
	D6 Full Lock	Y/N
	D5 Partial Lock	Y/N
	D4 Total Time Addition	0 = Outgoing Call Only 1 = Both Outgoing and Incoming
	D3 Total Call Length Timer No.1	Y/N
	D2 Total Call Length Timer No.2	Y/N
	D1 Individual Call Length Timer	Y/N

After all the NAM1 data has been entered, issue the "WRITE" NAM Command to commit the data to permanent memory.

	Keypad Entry	Display Results	Remarks
3)	Enter: <STO> **	MAINT MODE	To "WRITE" NAM1

If "ERROR" is displayed, reenter the "WRITE" NAM Command again.
When you want to write NAM2, execute step 4). Otherwise, execute step 6).

	Keypad Entry	Display Results	Remarks
4)	Enter: * 2 <SND >	NAM2 MODE	Select NAM2 Writing Mode

Enter (RCL)XX (XX = memory location number 01 to 06) to review the current contents of NAM2 and enter (STO) XX (XX = 01 to 06) to write each item into NAM2.

The memory location number 07 to 13 cannot be reviewed or written, since these items are common among NAM1 and NAM2.

Enter the data into 6 memory locations (i.e. 01 to 06) by referring to Table 1.3.1 above.

After all the NAM2 data has been entered, issue the "WRITE" NAM Command to commit the data to permanent memory.

	Keypad Entry	Display Results	Remarks
5)	Enter: <STO> **	MAINT MODE	To "WRITE" NAM2
6)	Enter: <END > or Enter: * 4 <SND >	POWER ON	Return To Normal Mode

Table 1.3.2 Command Summary

MODE	COMMAND	OPERATION	DESCRIPTION
NORMAL	PASSWORD	*0000#	Enter the Maintenance Mode
MAINTENANCE	NAM1 NAM2 TERPWM	*1 SND *2 SND *4 SND	Enter NAM1 Mode. Enter NAM2 Mode. Return to Normal Mode.
NAM1 OR NAM2	----	RCL 01 to 13 STO 01 to 13 STO**	(01 to 06 for NAM2) (01 to 06 for NAM2) Return to Maintenance Mode w/writing NAM.
	----	STO##	Return to Maintenance Mode w/o writing NAM.
		CHK	Display the Upper Digits.
MAINTENANCE NAM1 OR NAM2		END F CLR	Return to Normal Mode. Display the Current Mode. Clear the Last Digit or Clear Whole Display.

(4) NAM Programming Example

The NAM data to be written is shown below. All numbers are shown in decimal.

< NAM1 >

Item	Value
1. Home Area Identification	2051
2. Telephone Number	(234)-0-123456
3. Preferred System	1 (A: Vodafone System)
4. First Paging Channel	23
5. Access Overload Class	5
6. Group ID Mark	3
7. Dial Limit	0 (No Limit)
8. Station Class Mark	23
9. Speed Dial Memory	(0753)-73181
10. Lock Code	1234
11. Function byte 1	00001000
Breakdown:	
Local Use	0
Ex Mark	0
Reserved	0
Reserved	0
Silent Incoming Call	1
Reserved	0
Reserved	0
Reserved	0
12. Function Byte 2	00101010
Breakdown:	
Reserved	0
Built-In Monitor	0
Automatic Lock	1
Reserved	0
Call Charge in Units	1
A/B System Select	0
Inter-system Roaming Inhibit	1
Home System Only	0
13. Function Byte 3	11111111
Breakdown:	
Received Call Indicator	1
DTMF Interval	1
Full Lock	1
Partial Lock	1
Total Time Addition	1
Total Call Length Timer No.1	1
Total Call Length Timer No.2	1
Individual Call Length Timer	1

< NAM2 >

Item	Value
1. Home Area Identification	3848
2. Telephone Number	(234)-2-123456
3. Preferred System	0 (B: Cellnet System)
4. First Paging Channel	323
5. Access Overload Class	6
6. Group ID Mark	0

Programming example continued

Keypad Entry	Display Results	Remarks
*0000#	MAINT MODE	Password
*1 < SND >	NAM1 MODE	Select NAM1 Writing Mode
2051 < STO > 01	01 AIDH 2051	Set Area ID.
2340123456 < STO > 02	02 OWNDL 2340123456	Set Tel. No.
1 < STO > 03	03 PRESYS 1	Set Preferred System
23 < STO >	04 FPCH 23	Set First Paging Channel
5 < STO > 05	05 ACCLOC 5	Set Overload Class.
3 < STO > 06	06 GIM 3	Set Group ID.
0 < STO > 07	07 DLMT 0	Set Dial Limit.
23 < STO > 08	08 SCM 23	Set Station Class Mark.
075373181 < STO > 09	09 SPDL 075373181	Set Speed Dial Memory.
1234 < STO > 10	10 LOCK 1234	Set Lock Code.
00001000 < STO > 11	11 FCN 1 00001000	Set Function Byte 1.
00101010 < STO > 12	12 FCN 2 00101010	Set Function Byte 2.
11111111 < STO > 13	13 FCN 3 11111111	Set Function Byte 3.
< STO > **	MAINT MODE	Write NAM1 to memory.
*2 < SND >	NAM 2 MODE	Select NAM2 Writing Mode.
3848 < STO > 01	01 AIDH 3848	Set Area ID.
2342123456 < STO > 02	02 OWNDL 2342123456	Set Tel. No.
0 < STO > 03	03 PRESYS 0	Set Preferred System.
323 < STO > 04	04 FPCH 323	Set First Paging Channel.
6 < STO > 05	05 ACCLOC 6	Set Overload Class
0 < STO > 06	06 GIM 0	Set Group ID.
< STO > **	MAINT MODE	Write NAM2 into memory.
< STO >	POWER ON	Return to Normal Mode.

cf. Before entering < STO > **, it is better to review each item by entering < RCL > XX (XX = 01 to 13 for NAM1, 01 to 06 for NAM2). - 35 -

APPENDIX 1.2 (1/2)

No.	Item Name	Abbrev.	Valid Numbers		Remarks
			A (VODAFONE SYSTEM)	B (CELLNET SYSTEM)	
1	Home Area Identification	AIDH	2051 (All of UK)	3600	Home area system No.
2	Telephone No.	OWNDL	234 0XXXXXX or 234 4XXXXXX 6 digits * NAM FORMAT 2340 or 2344 and 2342 are unused to identify the network within the equipment and not the 0836 or 0860 STD codes for cellular radio.	234 2XXXXXX 6 digits	
4	First Paging Ch.	FPCH	23	323	
5	Access Overload Class Mark	ACCOLC	2nd last digit of Telephone No. Example 234 0 123456 ACCOLC = 5	Last digit of Telephone No. Example 234 2 123456 ACCOLC = 6	
6	Group ID Mark	GIM	3	0	

NOTE: Information for "HANDSFREE" is not required, as the telephone adjusts electronically and automatically when a handsfree cradle is fitted.

APPENDIX 1.2 (2/2)

No.	Item Name	Abbrev.	Valid Numbers		PANASONIC STANDARD	
			A (VODAFONE SYSTEM)	B (CELLNET SYSTEM)		
11	Fcn 1	D8 Local Use	LU	0	0	0
		D7 EX Mark	EX	0	0	0
		D6* Reserved		0	0	0
		D5* Reserved	E.E.	0	0	0
		D4* Silent Incoming Call	SIC	Option 1 or 0	Option 1 or 0	1
		D3* Reserved		0	0	0
		D2* Reserved		0	0	0
		D1* Reserved		0	0	0
12	Fcn 2	D8* Reserved		0	0	0
		D7* Built-in Monitor	BIM	(1 = Testing only) 0	(1 = Testing only) 0	0
		D6 Automatic Lock	ATL	Option 1 or 0	Option 1 or 0	1 or 0
		D5* Reserved		0	0	0
		D4* Call Change Metering	CCU	Option 1 or 0	Option 1 or 0	1
		D3 A/B System Select	ABSS	0	0	0
		D2 Intersystem Roaming Inhibit	IRI	1	1	1
		D1 Home System only	HSO	0	0	0
13	Fcn 3	D8 Received Call-Indicator	RXI	Option 1 or 0	Option 1 or 0	1
		D7 DTMF Interval	DTI	Option 1 or 0	Option 1 or 0	1
		D6 Full Lock	FLCK	Option 1 or 0	Option 1 or 0	1
		D5 Partial Lock	PLCK	Option 1 or 0	Option 1 or 0	1
		D4 Total Time Addition	TTA	Option 1 or 0	Option 1 or 0	0
		D3 Total Call Length Timer No.1	TCLT1	Option 1 or 0	Option 1 or 0	1
		D2 Total Call Length Timer No.1	TCLT2	Option 1 or 0	Option 1 or 0	1
		D1 Individual Call Length Timer	ICLT	Option 1 or 0	Option 1 or 0	1

1.4 Write NAM from an External Test Set

In order to enter the Access EEPROM mode, the AEEM command must be input. Under this condition, the following commands can be input to read or write NAM.

In order to exit the Access EEPROM mode, the RESTART (MONITOR) command must be input.

No.	Command Name	OP Code	Number of additional data bytes	Number of returned data bytes	Function
1	AEEM	E1	0	0	Terminate the normal mode, enter the Access EEPROM mode, and await further commands.
2	RESTART (MONITOR)	E4	0	0	Terminate the Access EEPROM mode and enter the normal mode. When the normal mode is entered, restart the call processing by entering the DC power start-up process.
3	INAM 1	21	0	0	Initialize NAM 1 (Set 32 bytes in NAM1 to FFH)
4	RNAM 1	22	0	32	Read 32 bytes in NAM 1 from the EEPROM and send 32 bytes to the test set.
5	WNAM 1	24	32	0	Write 32 bytes data following the command received from the test set into NAM 1 area in the EEPROM.
6	INAM 2	2B	0	0	Initialize NAM 2 (Set 32 bytes in NAM 2 to FFH).
7	RNAM 2	2C	0	32	Read 32 bytes in NAM 2 from the EEPROM and send 32 bytes to the test set.
8	WNAM 2	2E	32	0	Write 32 bytes data following the command received from the test set into NAM 2 areas in the EEPROM.

(NOTE)

1. When the number of returned data bytes is 0, the ACK command (F1H) (or NAK command (F2H) or no command if in error) will be returned to the test set.
2. When the test set sends WNAM 2 command, NAM 1 must be already written, and 32 bytes data following the command must be set as follows:
The bytes corresponding the common items among NAM 1 and NAM 2 must be set to 0s. (Refer to the following table.)

ADDRESS	COMMON OR INDEPENDENT	ADDRESS	COMMON OR INDEPENDENT
00	I	10	C
01	I	11	C
02	C	12	C
03	I	13	C
04	I	14	C
05	I	15	C
06	I	16	C
07	I	17	C
08	I	18	C
09	C	19	C
0A	I	1A	C
0B	I	1B	C
0C	I	1C	C
0D	I	1D	C
0E	I	1E	I
0F	C	1F	— (55H)

C : Common among 2 NAMs
I : Independent in each NAM

Table 1.4 Common or Independent Bytes among 2 NAMs

2. Serial Number

The Serial Number (SN) is a 32-bit binary number, and is unique to the particular mobile equipment, and stored in the EEPROM.

Manufacturer's Code 0 5	Equipment Code 6 11	Reserved 0000 12 . . . 15	Equipment Serial Number 16 31
--------------------------------------	----------------------------------	---------------------------------	--

READING THE SERIAL NUMBER

The serial number is composed of four items of information called "fields". The first field is called the "manufacture's code", the second is called the "equipment code", the third is reserved, and the fourth is called the "serial number" field. The manufacturers code for this model is 15. The equipment code is 07 or 08. The serial number field is 5 digit serial number. The serial number is assembled as follows:

$$\frac{\text{Manuf. code}}{15} + \frac{\text{Equip. code}}{07 \text{ or } 08} + \frac{\text{Reserved}}{00} + \frac{\text{SN\# Field}}{\text{XXXXX}}$$

The complete serial number to be reported to the Cellular System provider is then 150700XXXXX or 150800XXXXX (decimal), which is corresponding to the name plate. Refer to SEND SN command described in V. Test Commands Repertory concerning the key operation for reading the serial number.

3. ESN Exchanger (EY-178)

When the handheld portable telephone is switched on and OFF/ON 04 is displayed (or nothing is displayed) on the Liquid Crystal Display, the Control Unit is (or may be) defective and should be replaced.

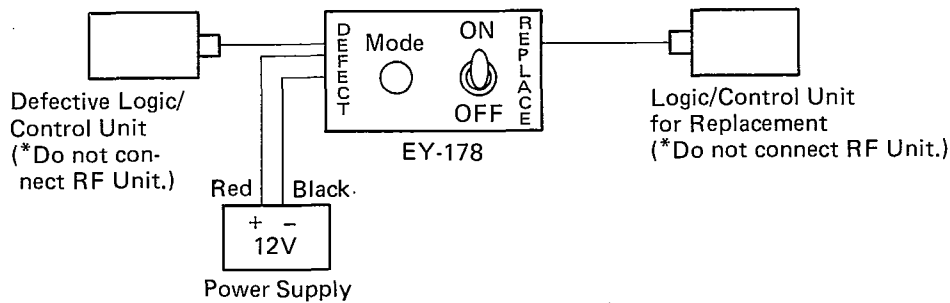
In order to replace the defective control unit with a spare unit, the serial number in the Spare Logic Control Unit must be exchanged with the defective control unit. The following procedure should be followed to exchange the serial numbers in those two units.

(NOTE)

When the serial numbers in two units are successfully exchanged, the NAMs in both units are deleted. Therefore, it's advised to read and write down the NAM contents in the defective handheld portable equipment so that you can reprogram the phone after the ESN exchange.

Be sure to check both NAM 1 and NAM 2.

- 1) Insert a copy of the supplied EPROM labeled "ESN10" into the control unit removed from the defective phone, and a replacement control unit.
- 2) Connect the ESN exchanger (EY-178) to both control units and the power supply, as shown below.



Turn on the switch of the power supply.

- 3) Switch on the power on the ESN exchanger (EY-178), and wait a few seconds for the mode indicator to light.
- 4) A constantly lit mode light indicates the serial numbers have been exchanged and both NAMs have been deleted.

Remove the EPROM "ESN10" from the replacement control unit and insert the EPROM that was originally in the defective unit. Install the replacement control unit into the phone and enter the NAM data (See NAM programming procedures). Test the handheld phone to verify normal performance.

- 5) If the LED (MODE indicator) starts blinking, the serial number could not be exchanged, i.e. the defective control unit is damaged so that the serial number in the unit cannot be read correctly. In this case, the defective unit must be returned to the authorized service center.
- 6) If the LED (MODE indicator) goes off after a short (1/2 second) indication, it shows that the replacement control unit is defective. In this case, use another spare unit and try the above procedure mentioned above again.

Mode Indicator	Cause
ON	ESN is exchanged.
BLINK	Original unit defective, cannot exchange ESN.
OFF (after 1/2 second ON)	Spare unit is damaged and cannot exchange ESN.

V. TEST COMMAND REPERTORY

1. Test Interface

The handheld portable equipment can be tested by using the test command input from the keyboard or from an external test set. The main CPU in the handheld portable equipment receives the test commands through the serial interface described previously from the keyboard or from an external test set, and performs the tests.

1.1 Test Commands For Built In Test

In order to enter the test mode, the following key operation are required.

- 1) Input *00000# (PASSWORD) connecting the password adaptor to the handheld portable telephone.

Then 'MAINT MODE' is displayed on the LCD.

- 2) INPUT *3SND (SUSPEND command), and then 'TEST MODE' is displayed on the LCD.

Under this connection, the test commands listed below can be input.

In order to exit the test mode, input 00SND (RESTART command) and then *4SND or input END .

TEST COMMANDS REPERTORY FOR BUILT IN TEST (1/6)

No.	Command Name	Key Operation	Function
1	RESTART	<p> 0 0S</p> <p> can be omitted. S means SND.</p>	<p>Terminate the test mode, and enter the maintenance mode.</p> <p>If *4(SND) is entered after this command is entered, then enter the normal mode. When the normal mode is entered, restart the call processing by entering the DC power start-up process.</p>
2	INIT	0 1S	<p>Initialize the equipment to the following state:</p> <ol style="list-style-type: none"> 1. Carrier off 2. Attenuation-0 dB 3. Receive-Audio muted 4. Transmit-audio muted 5. Signalling Tone off 6. SAT off 7. DTMF and Audio tones off 8. Compandor on 9. TXPLL circuit power off
3	CARRIER ON/OFF	0 2S	<p>Turn the transmitter on when the current carrier status is off, and turn the transmitter off when the current carrier status is on.</p>
4	LOAD-SYNTH	<p> 0 3S</p> <p> x x x x S</p> <p>xxxx: Channel Number (0000 to 0600 or 1329 to 2047)</p>	<p>Set the RX-synthesizer to the channel specified by the data following the command.</p>
5	SET ATTN	<p> 0 4SxS</p> <p>x: Power Level (0 to 7)</p>	<p>Set the RF power attenuation to the value specified in the data following the command.</p>
6	RXMUTE/ RXUNMUTE	0 5S	<p>Mute the receive-audio signal when the receive-audio signal is unmuted currently, and unmute the receive-audio signal when the receive-audio signal is muted currently.</p>
7	TXMUTE/ TXUNMUTE	0 6S	<p>Mute the transmit-audio signal when the transmit-audio signal is unmuted currently, and unmute the transmit-audio signal when the transmit-audio signal is muted currently.</p>

TEST COMMANDS REPERTORY FOR BUILT IN TEST (2/6)

No.	Command Name	Key Operation	Function						
8	ST ON/OFF	0 7 S	Transmit a continuous Signalling Tone when the current ST status is off. Stop transmission of the Signalling Tone when the current ST status is on. While the ST status is on, Carrier on/off, SAT on/off, ST on/off, INIT, Restart, or Status Command can be input.						
9	SETUP	0 8 S	Transmit a 5-word Reverse Control Channel message. The Digital Color Code shall be 11 and each of the 5 words shall consist of the following 48-bit data pattern (repeated 5 times): FF, 00, AA, 55, CC, 33. No channel scan, busy-idle determination, or BCH encoding is to be performed. (There may or may not be Forward Control Channel Data present.) The equipment shall turn on the carrier at the start of transmission and turn off the carrier at the termination.						
10	VOICE	0 9 S	Transmit a 2-word Reverse Voice Channel message. Each of the 2-words shall consist of the same 48-bit data pattern specified for the SETUP command. The equipment shall turn on the carrier at the start of transmission and turn off the carrier at the termination.						
11	INVM	1 0 S	Initialize non-volatile memory. Set non-volatile memory to zeros except Lock State, NVM Test Pattern. Set Lock State to active (locked), set NVM Test Pattern to FF, 00, AA, 55, CC, 33.						
12	SEND SN	1 1 S	Display the serial number on the 2nd and 3rd lines of the LCD formatted as follows. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>2nd Line</td> <td>SEND - SN</td> <td>A1</td> </tr> <tr> <td>3rd Line</td> <td>A0 B1 B0 C1 C0 D4 D3 D2 D1 D0</td> <td></td> </tr> </table> <p>A1 ... D0 Decimal Coded Representaton of the serial number</p> <p>A Field 1 B Field 2 C Field 3 D Field 4</p>	2nd Line	SEND - SN	A1	3rd Line	A0 B1 B0 C1 C0 D4 D3 D2 D1 D0	
2nd Line	SEND - SN	A1							
3rd Line	A0 B1 B0 C1 C0 D4 D3 D2 D1 D0								

TEST COMMANDS REPERTORY FOR BUILT IN TEST (3/6)

No.	Command Name	Key Operation	Function																										
13	SAT ON/OFF	<p align="center">①②③(x)⑤</p> <table border="1" data-bbox="550 331 818 524"> <thead> <tr> <th>x</th> <th>SAT Frequency</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>5970 Hz</td> </tr> <tr> <td>1</td> <td>6900 Hz</td> </tr> <tr> <td>2</td> <td>6030 Hz</td> </tr> <tr> <td>3</td> <td>OFF</td> </tr> </tbody> </table>	x	SAT Frequency	0	5970 Hz	1	6900 Hz	2	6030 Hz	3	OFF	<p>When the value of the data following the command is 0, 1 or 2, turn the SAT transponder on and start to detect and filter the RX SAT. The current condition of RX SAT can be monitored by STATUS command. When the value of the data following the command is 3, turn the SAT transponder off and stop detecting and filtering the RX SAT.</p>																
x	SAT Frequency																												
0	5970 Hz																												
1	6900 Hz																												
2	6030 Hz																												
3	OFF																												
14	DTMF ON	<p align="center">①③⑤(x)⑤</p> <p>x: Label of key</p> <table border="1" data-bbox="537 775 935 1223"> <thead> <tr> <th>Label of Key</th> <th>Assigned Frequency</th> </tr> </thead> <tbody> <tr><td>1</td><td>1209 Hz and 697 Hz</td></tr> <tr><td>2</td><td>1336 Hz and 697 Hz</td></tr> <tr><td>3</td><td>1477 Hz and 697 Hz</td></tr> <tr><td>4</td><td>1209 Hz and 770 Hz</td></tr> <tr><td>5</td><td>1336 Hz and 770 Hz</td></tr> <tr><td>6</td><td>1477 Hz and 770 Hz</td></tr> <tr><td>7</td><td>1209 Hz and 852 Hz</td></tr> <tr><td>8</td><td>1336 Hz and 852 Hz</td></tr> <tr><td>9</td><td>1477 Hz and 852 Hz</td></tr> <tr><td>*</td><td>1209 Hz and 941 Hz</td></tr> <tr><td>0</td><td>1336 Hz and 941 Hz</td></tr> <tr><td>#</td><td>1477 Hz and 941 Hz</td></tr> </tbody> </table>	Label of Key	Assigned Frequency	1	1209 Hz and 697 Hz	2	1336 Hz and 697 Hz	3	1477 Hz and 697 Hz	4	1209 Hz and 770 Hz	5	1336 Hz and 770 Hz	6	1477 Hz and 770 Hz	7	1209 Hz and 852 Hz	8	1336 Hz and 852 Hz	9	1477 Hz and 852 Hz	*	1209 Hz and 941 Hz	0	1336 Hz and 941 Hz	#	1477 Hz and 941 Hz	<p>Activate the DTMF generator with the tones associated with the keycode given in the data following the command.</p> <p>Apply DTMF signals to the modulator and DTMF side tone to the receive-audio line with the audio path set to receive path.</p>
Label of Key	Assigned Frequency																												
1	1209 Hz and 697 Hz																												
2	1336 Hz and 697 Hz																												
3	1477 Hz and 697 Hz																												
4	1209 Hz and 770 Hz																												
5	1336 Hz and 770 Hz																												
6	1477 Hz and 770 Hz																												
7	1209 Hz and 852 Hz																												
8	1336 Hz and 852 Hz																												
9	1477 Hz and 852 Hz																												
*	1209 Hz and 941 Hz																												
0	1336 Hz and 941 Hz																												
#	1477 Hz and 941 Hz																												
15	DTMF OFF	<p align="center">①④⑤</p>	<p>Deactivate the DTMF generator.</p>																										
16	ST-DTMF	<p align="center">①⑤⑤(x)⑤</p> <p>x: Label of key</p> <table border="1" data-bbox="537 1570 938 1921"> <thead> <tr> <th>Label of Key</th> <th>Assigned Frequency</th> </tr> </thead> <tbody> <tr><td>0</td><td>OFF</td></tr> <tr><td>1</td><td>697 Hz</td></tr> <tr><td>2</td><td>770 Hz</td></tr> <tr><td>3</td><td>852 Hz</td></tr> <tr><td>4</td><td>941 Hz</td></tr> <tr><td>5</td><td>1150 Hz</td></tr> <tr><td>6</td><td>1209 Hz</td></tr> <tr><td>7</td><td>1336 Hz</td></tr> <tr><td>8</td><td>1477 Hz</td></tr> </tbody> </table>	Label of Key	Assigned Frequency	0	OFF	1	697 Hz	2	770 Hz	3	852 Hz	4	941 Hz	5	1150 Hz	6	1209 Hz	7	1336 Hz	8	1477 Hz	<p>Activate the single DTMF generator with the tone associated with the keycode given in the data following the command. Apply ST-DTMF signals to the modulator and ST-DTMF side tone to the receive-audio line with the audio path set to receive path.</p>						
Label of Key	Assigned Frequency																												
0	OFF																												
1	697 Hz																												
2	770 Hz																												
3	852 Hz																												
4	941 Hz																												
5	1150 Hz																												
6	1209 Hz																												
7	1336 Hz																												
8	1477 Hz																												

TEST COMMANDS REPERTORY FOR BUILT IN TEST (4/6)

No.	Command Name	Key Operation	Function				
17	MES-RSSI	①⑥⑤	<p>Display the RSSI value on the 2nd and the 3rd lines of the LCD formatted as follows:</p> <table border="1" data-bbox="919 434 1437 618"> <tr> <td data-bbox="919 434 1018 524">2nd Line</td> <td data-bbox="1018 434 1437 524">M E S - R S S I</td> </tr> <tr> <td data-bbox="919 524 1018 618">3rd Line</td> <td data-bbox="1018 524 1437 618">R3 R2 R1 R0</td> </tr> </table> <p>R3 ... R0 RSSI bits (binary coded representation of received signal strength)</p>	2nd Line	M E S - R S S I	3rd Line	R3 R2 R1 R0
2nd Line	M E S - R S S I						
3rd Line	R3 R2 R1 R0						
18	ZERO-CDATA	①⑦⑤	<p>Transmit continuous 5-word Reverse Control Channel messages. The digital colour code shall be 10 and each of the 5 words shall be all zeros.</p> <p>Subsequent reception of an INIT command shall terminate the transmission. The equipment shall turn the carrier on at the start of transmission. While transmitting ZERO-CDATA, the INIT, RESTART, or STATUS Command can be input.</p>				
19	COMP ON/OFF	①⑧⑤	<p>Turn the compandor on when the compandor is off currently. Turn the compandor off when the compandor is on currently.</p>				

TEST COMMANDS REPERTORY FOR BUILT IN TEST (5/6)

No.	Command Name	Key Operation	Function																								
20	VERSION	① ⑨ ⑤	<p>Display the software version on the 2nd and the 3rd lines of the LCD formatted as follows:</p> <table border="1" data-bbox="903 311 1402 448"> <tr> <td data-bbox="903 311 1026 371">2nd line</td> <td colspan="5" data-bbox="1026 311 1402 371">VERSION</td> </tr> <tr> <td data-bbox="903 371 1026 448">3rd line</td> <td data-bbox="1026 371 1102 448">X₄</td> <td data-bbox="1102 371 1179 448">X₃</td> <td data-bbox="1179 371 1256 448">X₂</td> <td data-bbox="1256 371 1332 448">X₁</td> <td data-bbox="1332 371 1402 448">X₀</td> </tr> </table> <p>X₄ X₀ : 5 character software version</p> <p>X₄, X₃ : 'K F' X₂ : 'A' to 'Z' X₁, X₀ : '00' to '99'</p>	2nd line	VERSION					3rd line	X ₄	X ₃	X ₂	X ₁	X ₀												
2nd line	VERSION																										
3rd line	X ₄	X ₃	X ₂	X ₁	X ₀																						
21	STATUS	② ① ⑤	<p>Display the equipment status on the 2nd and the 3rd lines of the LCD formatted as follows:</p> <table border="1" data-bbox="903 887 1418 1048"> <tr> <td data-bbox="903 887 970 965">2nd Line</td> <td data-bbox="970 887 1046 965">W</td> <td data-bbox="1046 887 1123 965">S</td> <td data-bbox="1123 887 1200 965">C</td> <td data-bbox="1200 887 1276 965">P</td> <td data-bbox="1276 887 1353 965">C</td> <td data-bbox="1353 887 1418 965">H</td> </tr> <tr> <td data-bbox="903 965 970 1048">3rd Line</td> <td colspan="6" data-bbox="970 965 1418 1048">WS SAT- CARR - PL CH3 CH2 CH1 CH0</td> </tr> </table> <p>WS Word synchronization (1 = WS acquired)</p> <p>SAT RX-SAT Frequency is encoded as follows:</p> <table border="1" data-bbox="1043 1240 1362 1442"> <thead> <tr> <th data-bbox="1043 1240 1126 1290">SAT</th> <th data-bbox="1126 1240 1362 1290">Frequency</th> </tr> </thead> <tbody> <tr> <td data-bbox="1043 1290 1126 1326">0</td> <td data-bbox="1126 1290 1362 1326">5970 Hz</td> </tr> <tr> <td data-bbox="1043 1326 1126 1361">1</td> <td data-bbox="1126 1326 1362 1361">6000 Hz</td> </tr> <tr> <td data-bbox="1043 1361 1126 1397">2</td> <td data-bbox="1126 1361 1362 1397">6030 Hz</td> </tr> <tr> <td data-bbox="1043 1397 1126 1442">3</td> <td data-bbox="1126 1397 1362 1442">No Valid SAT</td> </tr> </tbody> </table> <p>CARR Carrier (1 = On)</p> <p>PL Power level (decimal value corresponding to the current Power Level 0 – 7)</p> <p>CH3 ...CH0 Channel Number (decimal value corresponding to the current channel number 00000 – 0600, 1329 – 2047)</p>	2nd Line	W	S	C	P	C	H	3rd Line	WS SAT- CARR - PL CH3 CH2 CH1 CH0						SAT	Frequency	0	5970 Hz	1	6000 Hz	2	6030 Hz	3	No Valid SAT
2nd Line	W	S	C	P	C	H																					
3rd Line	WS SAT- CARR - PL CH3 CH2 CH1 CH0																										
SAT	Frequency																										
0	5970 Hz																										
1	6000 Hz																										
2	6030 Hz																										
3	No Valid SAT																										

TEST COMMANDS REPERTORY FOR BUILT IN TEST (6/6)

No.	Command Name	Key Operation	Function				
22	DISP-ERCODE	② ① Ⓢ	<p>Display the error codes of the failures that the equipment has ever detected in the normal operation before on the 2nd and the 3rd line of the LCD formatted as follows:</p> <table border="1"> <tr> <td>2nd Line</td> <td>ERROR DISP</td> </tr> <tr> <td>3rd Line</td> <td>04 10 11</td> </tr> </table> <p>The example above represents that the sub CPU error (error code 04), the carrier on/off error (error code 10) and the PLL unlock (error code 11) have ever been detected.</p>	2nd Line	ERROR DISP	3rd Line	04 10 11
2nd Line	ERROR DISP						
3rd Line	04 10 11						
23	CLEAR-ERCODE	② ② Ⓢ	<p>Clear the error information of the failures that the equipment has ever detected and then display as follows:</p> <table border="1"> <tr> <td>2nd Line</td> <td>ERROR DISP</td> </tr> <tr> <td>3rd Line</td> <td></td> </tr> </table>	2nd Line	ERROR DISP	3rd Line	
2nd Line	ERROR DISP						
3rd Line							
24	MIC MUTE ON/OFF	MUTE	<p>Mute the microphone (i.e. set the audio path to Receiver path) when the microphone is unmuted currently.</p> <p>Unmute the microphone (i.e. set the audio path to Handset path) when the microphone is muted currently.</p>				

(Note) This command is available only in the handheld portable use.

3.2 Error Codes And Their Effects

In case the Handheld Portable Telephone shows any of the error codes mentioned in Error Code Table (see below) or shows nothing on the LCD after being switched on, refer to the applicable trouble condition.

ERROR CODE TABLE

CODE	TROUBLE CONTENTS	WHERE THE ERROR IS OR ACTION TO BE TAKEN
OFF/ON 01	EPROM SUMCHECK	EPROM
OFF/ON 02	INTERNAL RAM	*SEE NOTE BELOW
OFF/ON 03	EXTERNAL RAM	*SEE NOTE BELOW
OFF/ON 04	SUB CPU CONTROL UNIT	REPLACE CONTROL UNIT BY EY-178
OFF/ON 05 – OFF/ON 09	RESERVED	-----
OFF/ON 10	CARRIER CONTROL	RF UNIT
OFF/ON 11	PLL UNIT	RF UNIT
OFF/ON 20	NAM VIRGIN OR NAM SUMCHECK	NAM WRITE
OFF/ON 21	SNROM	*SEE NOTE BELOW
NO INDICATION	LOGIC CIRCUIT DAMAGE	*SEE NOTE BELOW

Note: If the Handheld Portable Telephone shows "OFF/ON 02", "OFF/ON 03", "OFF/ON 21" or no indication on the LCD after being switched on, send the complete telephone to the Panasonic repair depot according to the procedure in your country.

3.2.1 Test Commands for An External Tester

In order to enter the test mode, the SUSPEND Ccommand must be input. Under this condition, the test commands listed can be input.

In order to exit the test mode, the RESTART (MINITOR) command must be input. (See page 42.)

VI. ADJUSTMENT AND SERVICE GUIDE

1. BEFORE ADJUSTMENT

1.1 Test Equipment

The following test equipment, repair cables and connectors are need for adjustment.

(Test Equipment)

In-line wattmeter or Digital Power Meter, RF Sampler, Volt Meter, Spectrum Analyzer, Modulation Analyzer, Signal Generator, RC Oscillator, DC Power Supply and Oscilloscope.

Note: Instead of equipment shown above, Cellular Radio Test System can be used.

(Repair cables and Connectors)

Part No.	Description	Fig.	Ref.	Page
2KA5082A or 1KA5212A	Antenna Wrench	1	①	51
M17000	RF Cable Remover	3	②	52
EY-181	Cable (RF-Logic)	5	③	52
EY-179	Measuring Adaptor	3	⑥	57
MM121390	RF Adaptor	—	—	58

Table 1 Repair Cable and Connector

2. SERVICE AND BOARD REPLACEMENT

Before opening the EB-3610 Handheld portable telephone, please note the following cautions:

- When removing the control unit, do not remove the copper shield which covers the key pad.
- Remove the antenna using the antenna wrench.
- Remove the antenna reflector after opening.
- Always keep RF shielding in place.
- Use the cable pulling tool to remove the RF connector.
- Be sure to disconnect the key pad ribbon cable before removing the control unit.
- Do not apply force to the antenna connector.
- Static Charge can damage the control board.

2.1 Opening the Unit

- 1) Remove the battery.
- 2) Pull the antenna all the way out until it stops.
- 3) Remove the 3 screws in the cover.
- 4) Remove the cover by pulling ① and pushing ② and ③ as following Fig. 2.

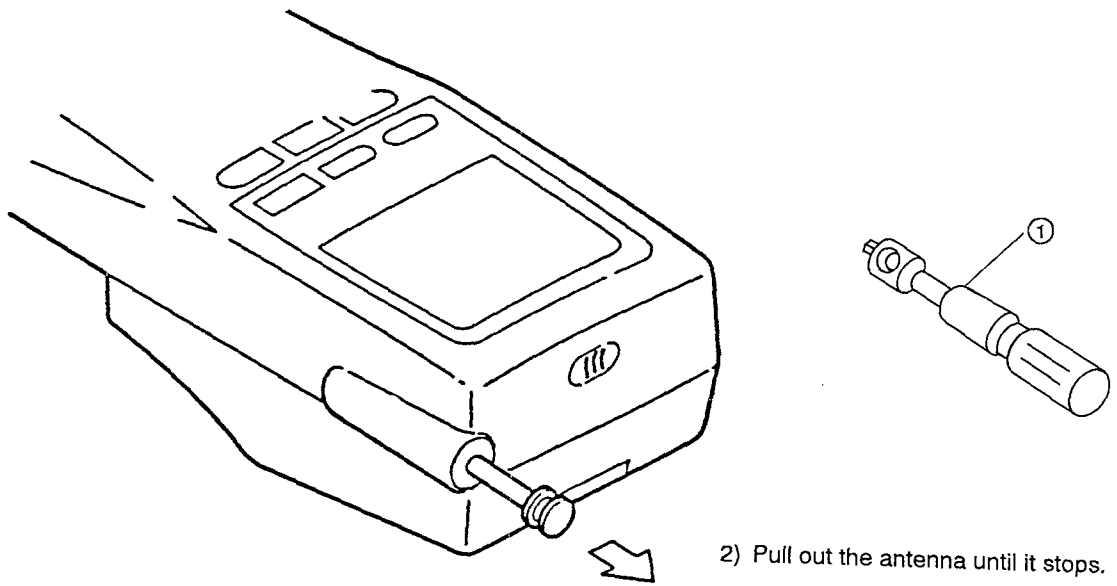


Fig. 1

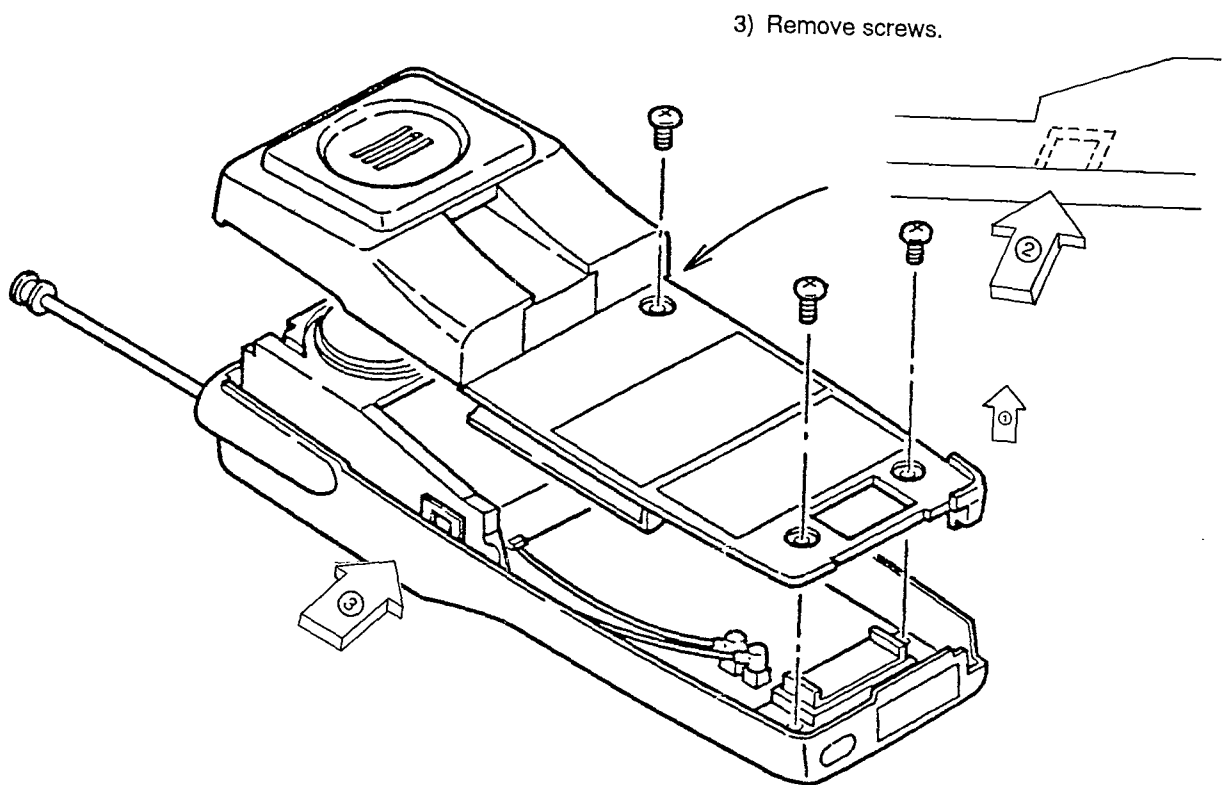


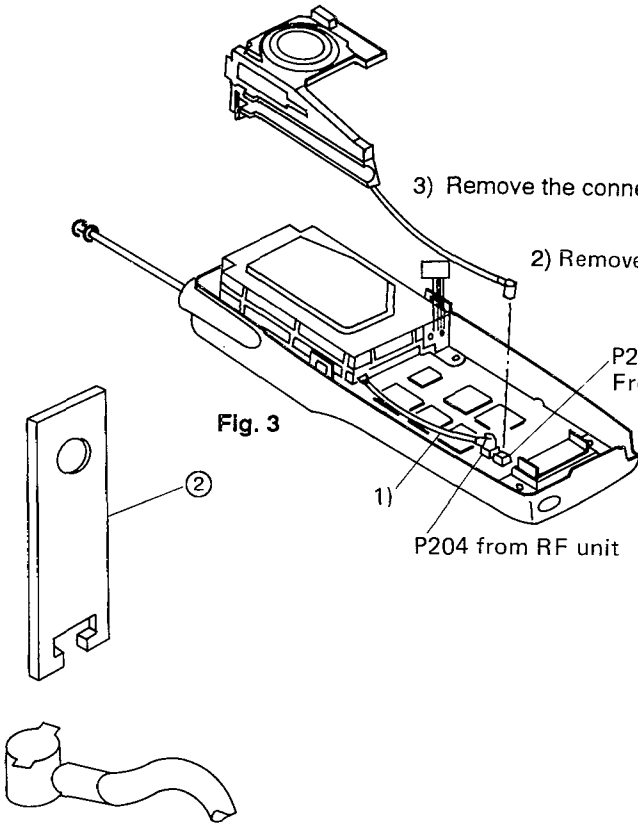
Fig. 2

2.2 Removal of RF Board

Read all directions before attempting the procedure.

- 1) First remove the cable from the RF unit by using the tool M17000 or Small Needle Nose Pliers then remove metal ground clip (See 2.4 step 9).
- 2) Remove the Receiver cable by using the tool M17000 or Small Needle Nose Pliers.
- 3) Remove the Receiver unit by pulling it outward and remove the connector.
- 4) Remove the 2 screws from the metal bracket.
- 5) Gently pull the RF board from the control unit connector.

- 3) Remove the Receiver unit.



- 3) Remove the connectors.

- 2) Remove the receiver cable.

- 4) Remove screws.

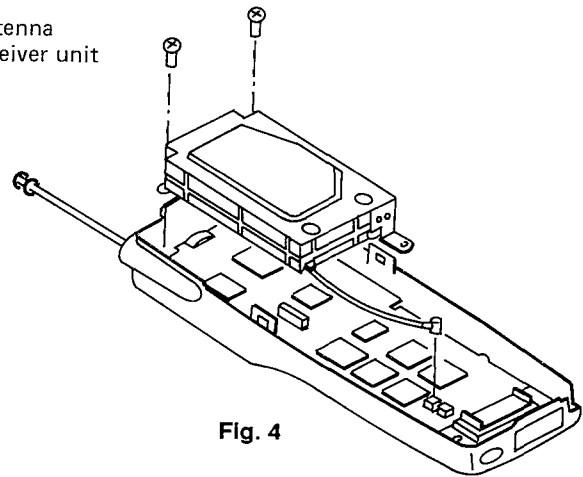


Fig. 4

For SERVICE

- (6) Connect the RF unit to the Control unit with the extension cable EY-181.

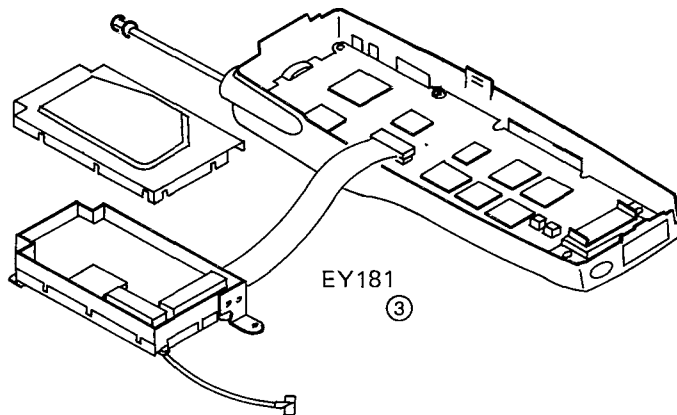


Fig. 5

2.3 Removal of the Logic Board

Read all directions before attempting this procedure.

- 1) Remove 1 screw from the Logic Board.
- 2) Remove the Microphone Holder by pulling it outward.
- 3) Carefully lift up the Logic Board by pulling it outward.
Try not to disturb the Keypad Assembly.

If the conductive rubber connector comes out of place, carefully put it back into the position shown below, use plastic tweezers, avoid touching the connector area with your fingers.

See 2.4 for detail.

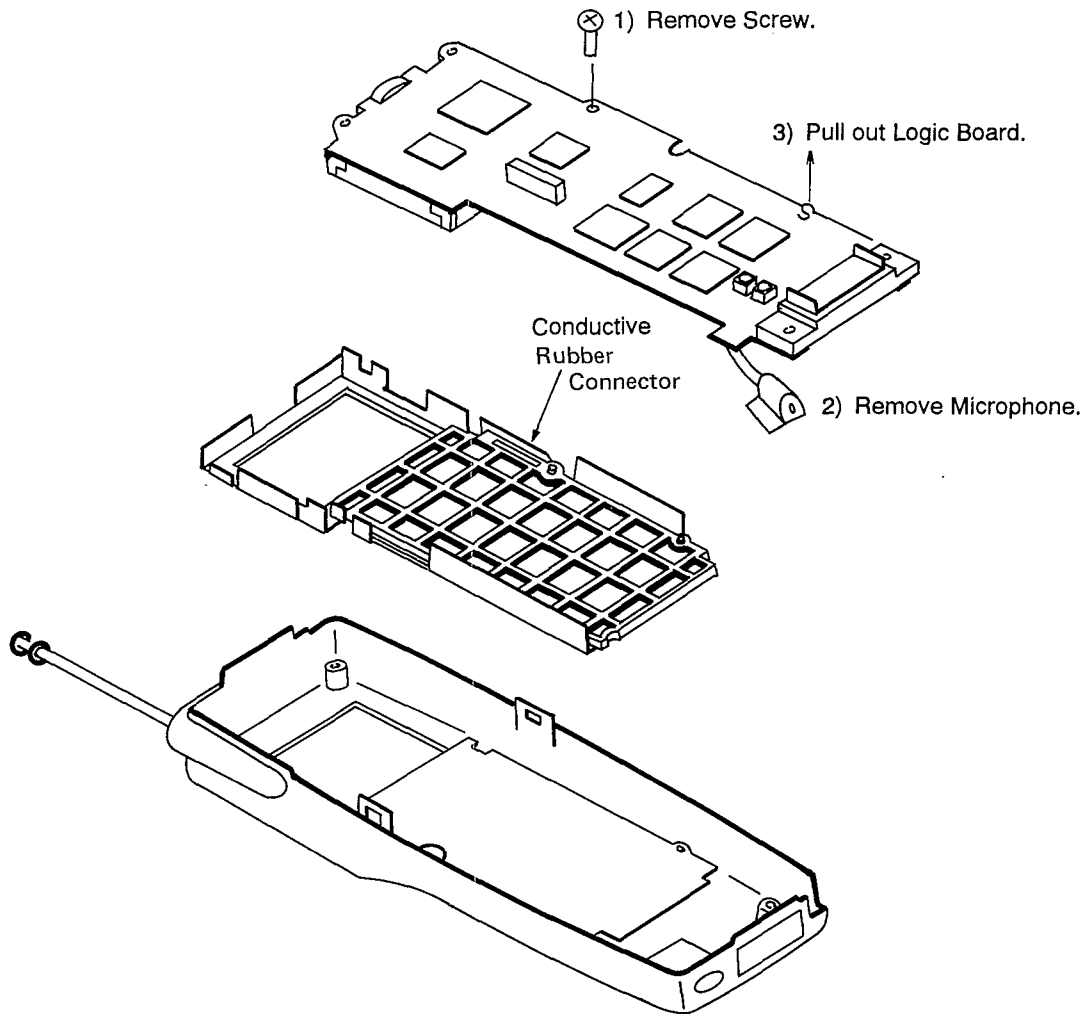


Fig. 6

2.4 Reassembly

From the keypad Refer to Fig. 1.

1. Install the keypad (A) into the front cover. Press the keypad fingers down to make sure that all of the keys are completely inserted into the front cover.
2. Install the keyswitch assembly (B). The contact fingers must be positioned as indicated, the keyswitch must be installed so that it is flat against the keypad (A).
3. Install the shield (C) into place, be careful not to bend the shield. It should be flat against the keyswitch (B).
4. Install the plastic insulator (D). Make certain that the two alignment pins (E) are going through the shield (C) into the small holes in the keyswitch (B).
5. Using plastic tweezers, carefully pick up the conductive elastomer connector (F) and place it into position into the plastic insulator (D) as indicated.

NOTE: Do not touch the connector with your fingers, moisture and skin oils can contaminate this connector and may adversely affect its electrical properties.

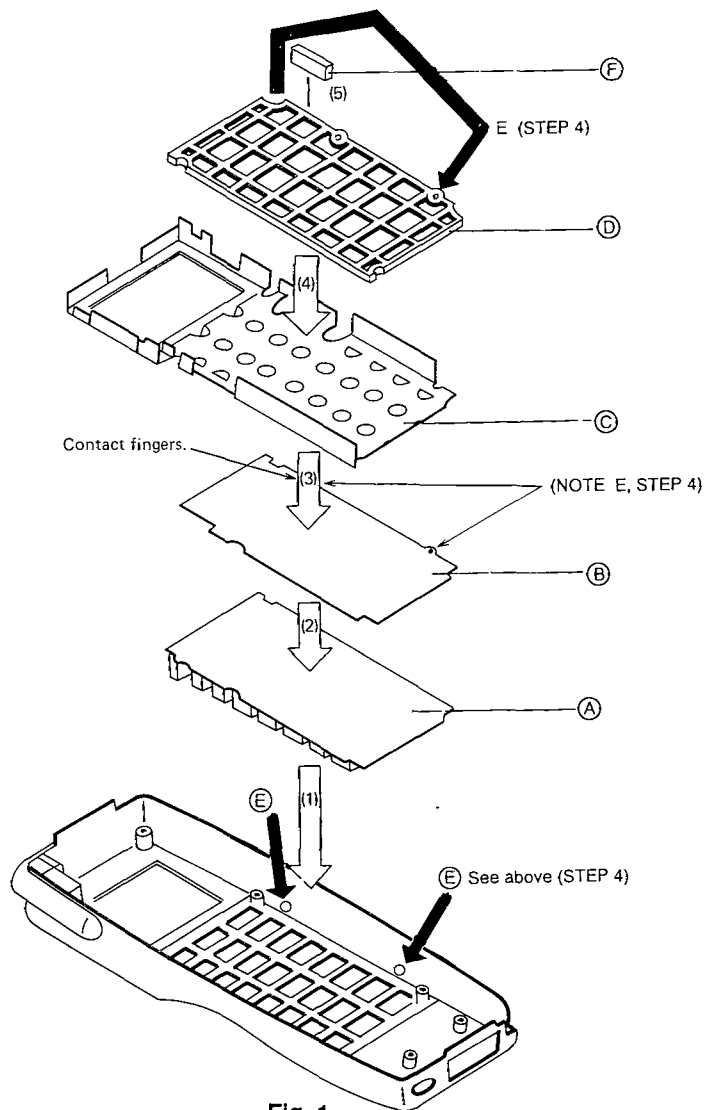
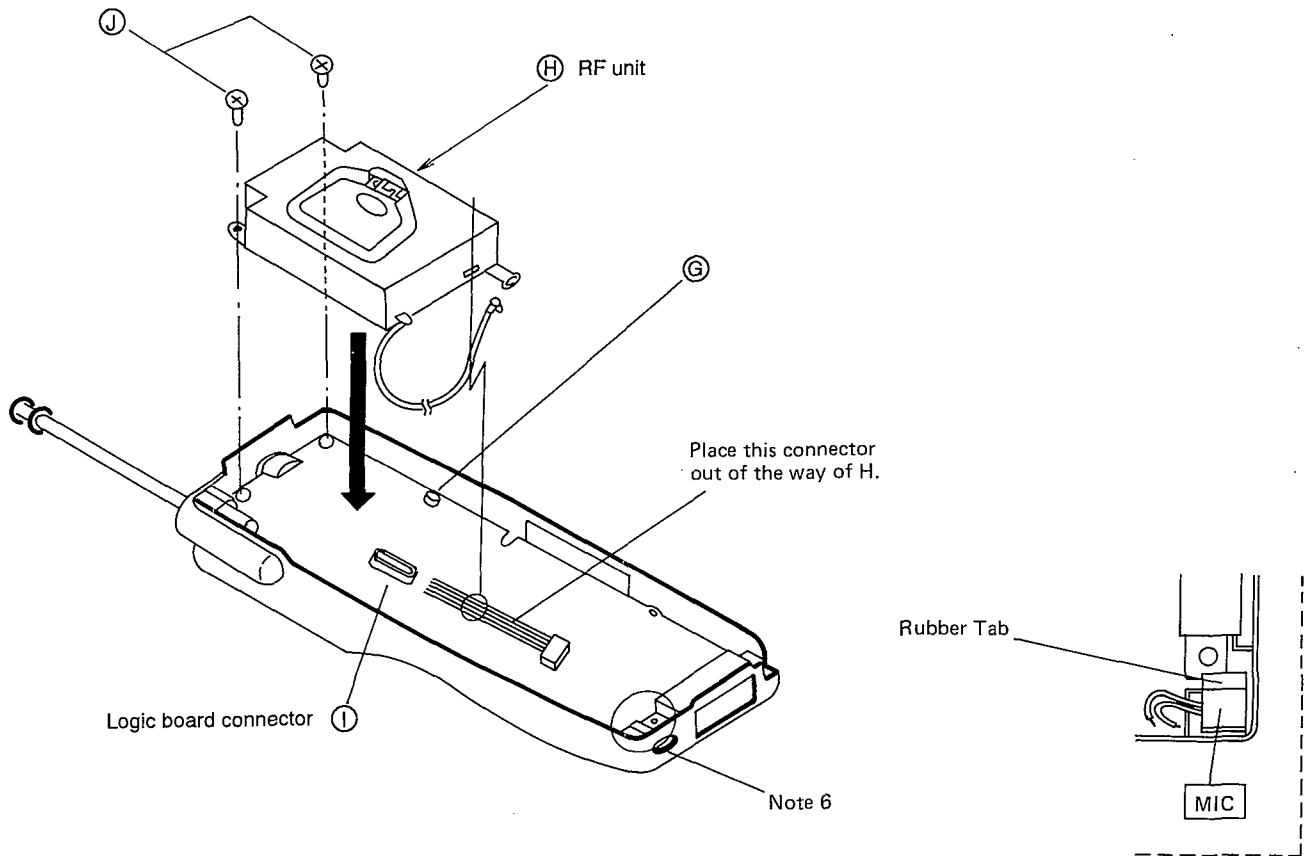


Fig. 1

From the Logic Board Refer to Fig. 2 on the following steps:

6. Place the logic board on top of the cover assembly. Make certain that it is flat against the previously installed components. If not, repeat steps 1 — 5 to make certain that none of the pieces are binding. Place the screw into position (G). Use a P1 screwdriver to secure the Logic PCB do not overtighten. Place the microphone into position, the rubber tab should face the bottom connector.
7. Put the RF unit (H) on top of the Logic Board as indicated. The RF unit connector must mate with the Logic Board Connector (I). Carefully press down the RF unit until this connector is engaged. Using tweezers or needle nose pliers place both screws (J) into the positions indicated. Tighten with a P1 screwdriver. Be careful not to overtighten.

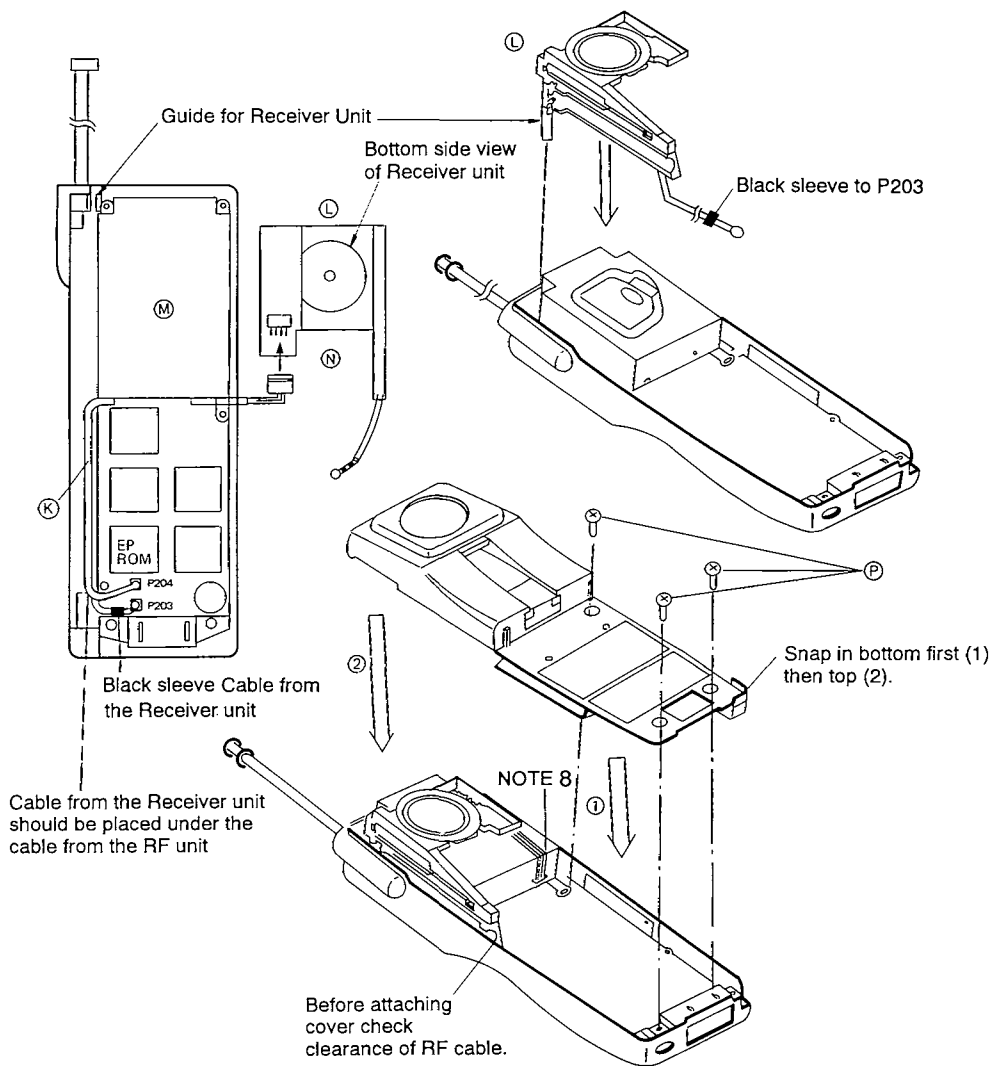
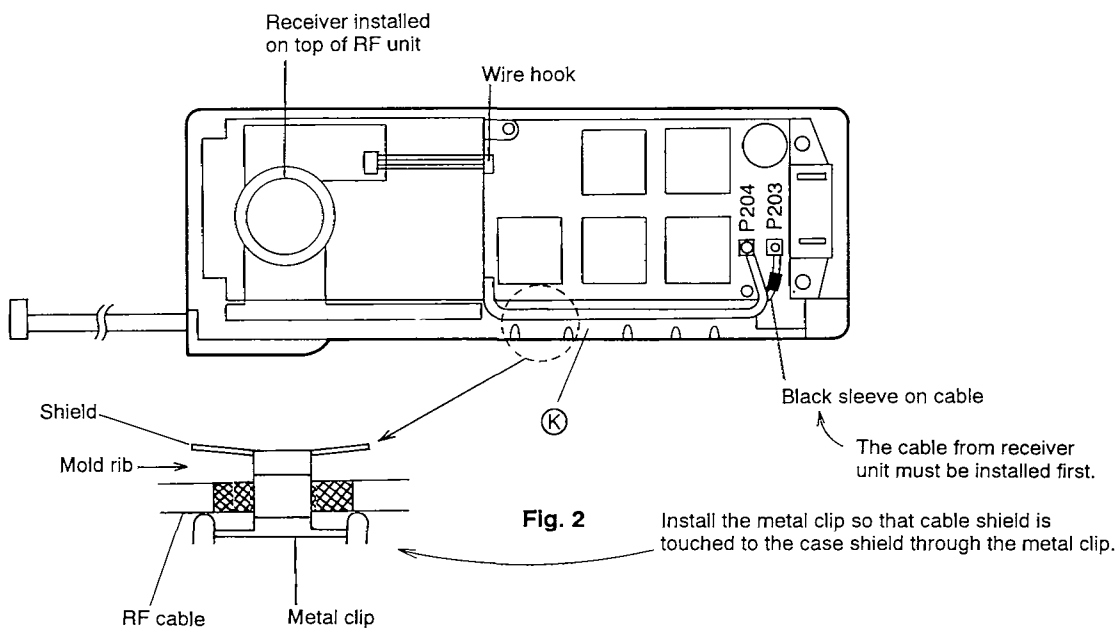


Please refer to Fig. 3 for the following steps:

8. Insert connector (N) into Receiver Earphone Unit (L). Put receiver unit on top of RF unit by positioning the guide for the Receiver unit beside antenna holder. Position wires as shown in Figure 3.
- NOTE:** It does not matter which direction this connector is installed, just make certain that all four pins are engaged.
9. First route the coaxial cable from the Receiver unit (L) using an plastic or orangewood stick, press the cable into the channel (K) insert the connector into P203 as indicated. Install ground clip (Q) to the channel (K) . Then place the coaxial cable from the RF unit (H) on Top, insert the connector into P204.
 10. Inspect the assembly before attaching the back cover, make certain that the microphone wires are away from the edge of the cover. The coaxial cables must be seated into the channel (K). If necessary dress the cable away from antenna well.
 11. Snap on the back cover. It should be even with the bottom cover. Install bottom (1) first then top (2). Fasten with 3 screws (P) as shown, do not overtighten.

12. Test the unit to follow the functional test procedure.

NOTE: If the Logic Board was replaced after having the ESN exchanged, it will be necessary to program the NAM parameters.



3. TRANSMIT TEST

3.1 Block Diagram of Measurement

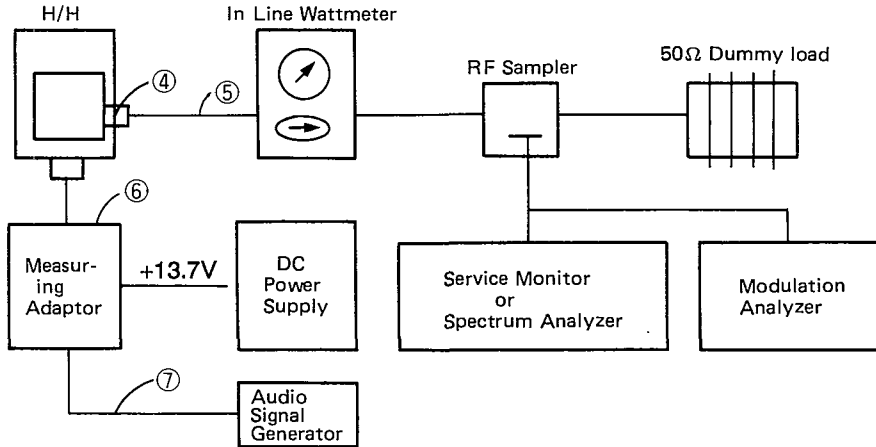


Fig. 3 Tx Measurement Block Diagram

3.2 Transmitter Output Test

- (1) Apply +13.7V Source DC. Turn on the power switch of Measuring Adaptor.
- (2) Enter the password " *0000#". The display should indicate "MAINT MODE".
- (3) Suspend the handheld portable by entering * 3 send. The display should indicate "TEST MODE".
- (4) Load the synthesizer by entering 03 send. The display should indicate "CHAN NO.? 03 *". Enter 1 send. The display should now indicate "LOAD SYNTH 03 *1".
- (5) Set the frequency of the service monitor to measure 890.0125 MHz ch 1. (Be sure that the instrument is properly set up as shown in Fig. 3.).
- (6) Set power level by entering 04 send. The display should now indicate "PWR LEVEL? 04* ". Enter 4 send. The display should now indicate "SET ATTN 04 * 4".
- (7) Activate the transmitter by entering 02 send. The display should indicate "CARR ON 02".
- (8) Adjust R328 on the RF board until the wattmeter indicates 95.5 mW(19.8 dBm \pm 0.5 dBm) power level 4.
- (9) Select PL7 by entering 04 send 7 send. The display should indicate "SET ATTN 04 * 7".
- (10) Adjust R334 on the RF board until the wattmeter indicates 6 mW (7.8 dBm \pm 0.5 dBm) power level 7.
- (11) Select power level 2, 3, 4, 5, 6 and 7 by same method, and confirm output power as shown in Table 2.

POWER LEVEL Step	NOMINAL POWER		TOLERANCE	
	dBm	m Watts	Min (m Watts)	Max (m Watts)
2	27.8	600	300	759
3	23.8	240	120	302
4	19.8	95.5	48	120
5	15.8	38.0	19	47.9
6	11.8	15.1	7.5	19.10
7	7.8	6.03	3.0	7.56

Note: The RF power level through measuring adaptor is 1 dB less than value as shown in this table.

Table 2 Transmitter Output Test Tolerance

3.3 Reference Frequency

- (1) Connect a frequency counter to W3101 (RF board) by using MM121390.
- (2) Repeat Test 3.2 (4) to (5).
- (3) Set power level by entering 04 send 7 send.
This display should now indicate "SET ATTN 04 *7".
- (4) Activate the transmitter by entering 02 send.
- (5) Read the frequency 890.0125 MHz \pm 890 Hz error is allowed at 77 ° F (25 ° C). If tolerance is not met readjustment of the 12.8 MHz TCXO Y3103 may be necessary. If the frequency is within the range do not attempt to tune it precisely onto the exact channel frequency as the TCXO was factory calibrated to operate within the \pm 2.5 ppm tolerance over very wide temperature extremes. Distributing this adjustment might make the unit operate out of tolerance under adverse operating conditions.

3.4 Adjustment of the Transmit Audio Level

- (1) Connect a 1 kHz 1.59 Vrms (4 dBV) signal from an audio signal generator to the Tx terminal (BNC connector) of Measuring Adaptor.
- (2) Repeat test 3.2 (1) to (5).
- (3) Connect a modulation analyzer to an RF terminal of Measuring Adaptor (EY-179).
- (4) Set the power level to 7. This is done by entering 04 send 7 send. The display should indicate "SET ATTN 04*7".
- (5) Activate the transmitter by entering 02 send.
- (6) Unmute the TX audio by entering 06 send. The display should indicate "TX UNMUTE". Turn off the compander by entering 18 send. The display should indicate "COMP OFF".
- (7) Adjust R232 until the deviation is \pm 8.5 kHz maximum.
At this time the output signal viewed on a deviation scope will be distorted.
- (8) Turn on the compander by entering 18 send. The display should indicate "COMP ON". Note that the output signal becomes a clear sine wave.
- (9) Decrease the input level to the TX audio terminal from the 1 kHz audio generator to 100 mVrms (- 20 dBV). Adjust R243 until the deviation is \pm 2.3 kHz.
- (10) Disconnect the 1 kHz signal to the TX audio input by entering 06 send again.
The display should indicate "TX MUTE".
- (11) Activate the ST-DTMF (941 Hz). This is done by 15 send 4 send.
The display should indicate "ST-DTME ON 15*4".
Adjust R230 until the deviation is \pm 2.0 kHz.
- (12) Turn off the ST-DTMF by entering 14 send.
- (13) Activate the ST by entering 07 send. The display should indicate "ST ON". Adjust R213 until the deviation is \pm 6.4 kHz.

- (14) Turn off the ST by entering 07 send again.
- (15) Activate the SAT by entering 12 send. The display should indicate "FREQ CODE? 12*" then enter 1 send. Adjust R211 until SAT is ± 1.7 kHz.
- (16) Turn off the transmitter by entering 02 send again.
This will turn the transmitter off.

Note: To turn SAT off enter 12 send the display indicates "FREQ CODE? 12*" then enter 3 send.

4. RECEIVER TEST

4.1 Block Diagram of Measurement

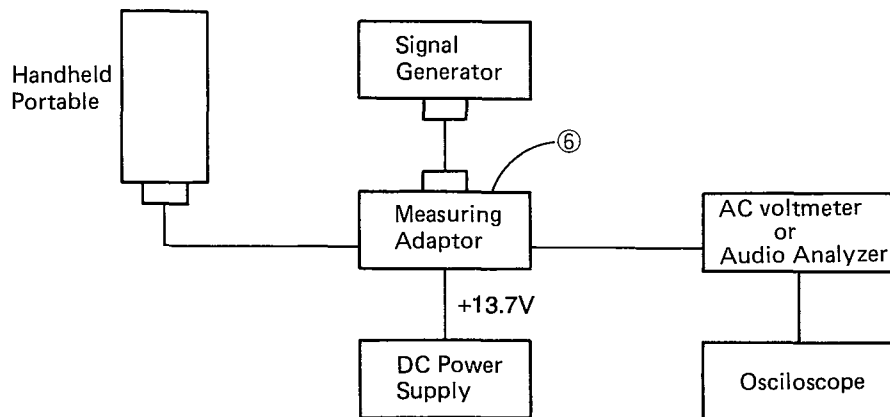


Fig. 3 Rx Measurement Block Diagram

4.2 Receiver IF and Discriminator Adjustment

- (1) Repeat test 3.2 (1) to (4).
- (2) Connect a frequency counter to TP3101.
Adjust C3127 until the frequency should read $91.5325 \text{ MHz} \pm 500\text{Hz}$.
- (3) Unmute audio by entering 05 send.
The display should indicate "RX UNMUTE 05".
- (4) Apply a $700 \mu\text{V}$ (-50 dBm) 935.0125 MHz modulated with 1 kHz tone $\pm 8 \text{ kHz}$ deviation signal from an RF signal generator to the RF connector (N connector) of Measuring Adaptor.
- (5) Connect an AC voltmeter to discriminator terminal (P301, 2 pin).
Adjust L3104 for the maximum output.
- (6) Readjust finely L3104 for the maximum possible output level with the least amount of distortion.
- (7) Set the deviation of Signal Generator to $\pm 2.3 \text{ kHz}$. Adjust R3136 until the discriminator output level is 100 mVrms (-20 dBV).
- (8) RSSI voltage test (only checking)
 - A. Connect a digital voltmeter (DVM) to the RSSI terminal (pin 7 of the P301) and apply a $0.35 \mu\text{V}$ (-116 dBm) un-modulated RF signal to the RF connector of Measuring Adaptor.
Check that the DVM reads less than 2.4V at this time.
 - B. Increase the output of the RF signal generator to 2 mV (-40 dBm) and check that the DVM reads more than 2.5V but less than 5.0V at this time.
- (9) Connect an AC voltmeter to Rx Audio terminal of (BNC connector) of Measuring Adaptor.
Check that the output level should be 70 mV to 140 mVrms ($-20 \text{ dBV} \pm 3 \text{ dB}$).
- (10) Receiver Sensitivity Test (only checking)

Set the receiver to ch 1, and unmute the audio.
Apply a calibrated RF signal modulated with a 1 kHz tone.
Set the deviations to $\pm 5.7 \text{ kHz}$ and connect a Phosphometric weighted SINAD meter to the Rx Audio terminal of Measuring Adaptor.
Verify that the RF sensitivity is at least -113 dBm for 20 dB SINAD .
(Note: Loss of measuring adaptor is approx. 1 dB .)

VII. INSTALLATION

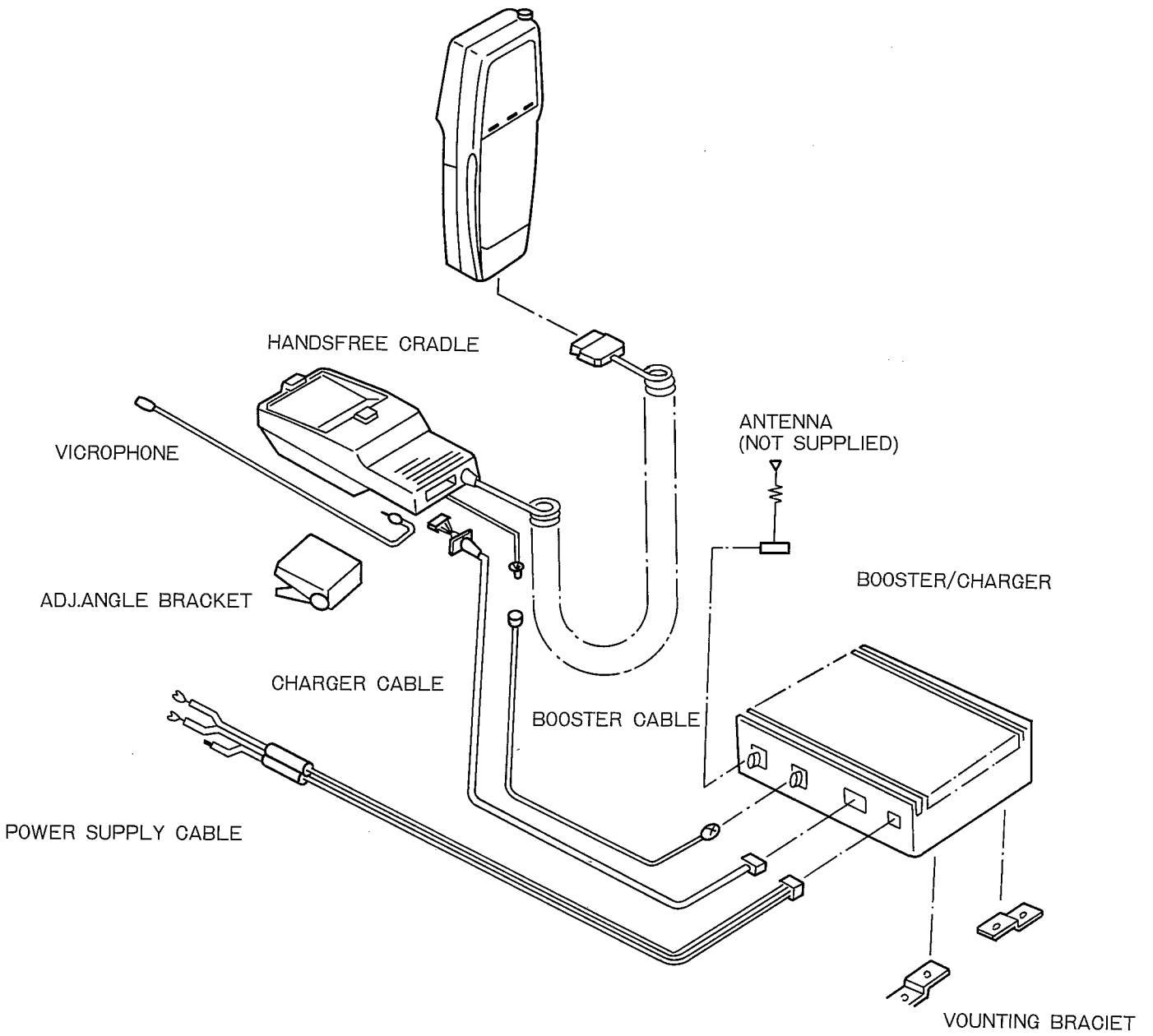
1. BOOSTER CHARGER

1.1 Selecting The Installation Position

Characteristic features and functions of EB- P0386 for its installation in the right position. Also, to assure long service life and reliability, and to facilitate maintenance, select the installation position, position with particular emphasis on the following:

- (a) Avoid direct exposure to the sunlight.
- (b) Avoid placing the unit adjacent to heat-generating components (silencers etc.).
- (c) Avoid exposure to rain or possibility of the unit getting submerged in water.
- (d) Assure that holes can be drilled easily to allow passage to mounting screws.
- (e) Avoid the rear part of the trunk most likely to sustain damages if a collision occurs with another vehicle.
- (f) Ensure easy access for maintenance.
- (g) Ensure easy connection between the connectors on the booster charger and cables.
- (h) As much as possible, avoid affecting any functions of the vehicle.
- (i) Avoid subjecting the unit to pressure or shocks due to material or people travelling in the vehicle.

The above considerations indicate that the best location for the units is the front edge of the boot in passenger cars and the cab area in trunks.



1.1.1 Wiring

Wiring for land mobile telephones involves laying of power cable, interconnecting cable. Fig. 1.2 provides an example of wiring.

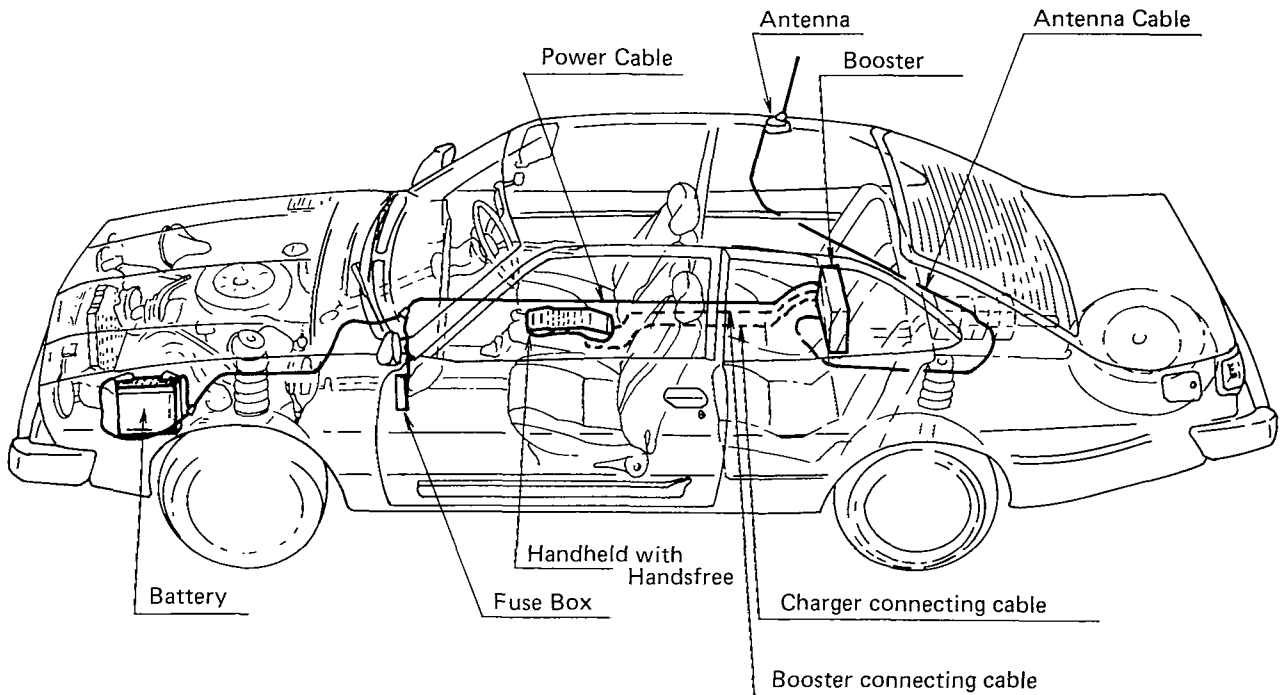


Fig. 1.2

General Cautionary Remarks

- Connect the cables and mount them to the vehicle with care to prevent their displacement and disconnection through vibration.
- Connection of the cables to the vehicle circuitry must not affect the functions of the vehicle.
- As much as possible, route the cables through the existing ducts or grooves on the floor.
- As much as possible, select existing holes in the dash board, trunk board, etc. for passage of cables.
- When laying the cables, avoid contact with moving parts like brake, axle, or clutch pedals or the seat mechanism.
- Lay the cables as far away as possible from the existing cables in the vehicle so as to avoid electric induction.
- Actual locations of units may vary according to vehicle type. Fig. 1.3 shows the other examples of wiring.
- The recommended location for the antenna is the centre of the vehicle roof. Should the antenna be installed alternative locations, the sensitivity of the mobile telephone may be deterioration markedly.
- The radio equipment shall be connected to the antenna via a non-radiating cable (e.g. coaxial).
- The antenna shall be mounted in a position such that no part of the human body will normally rest within 20 cm of any part of the antenna for more than a few minutes whilst the equipment is switched on, unless there is an intervening metallic screen (e.g. metallic roof) at least 0.3 m² in area.

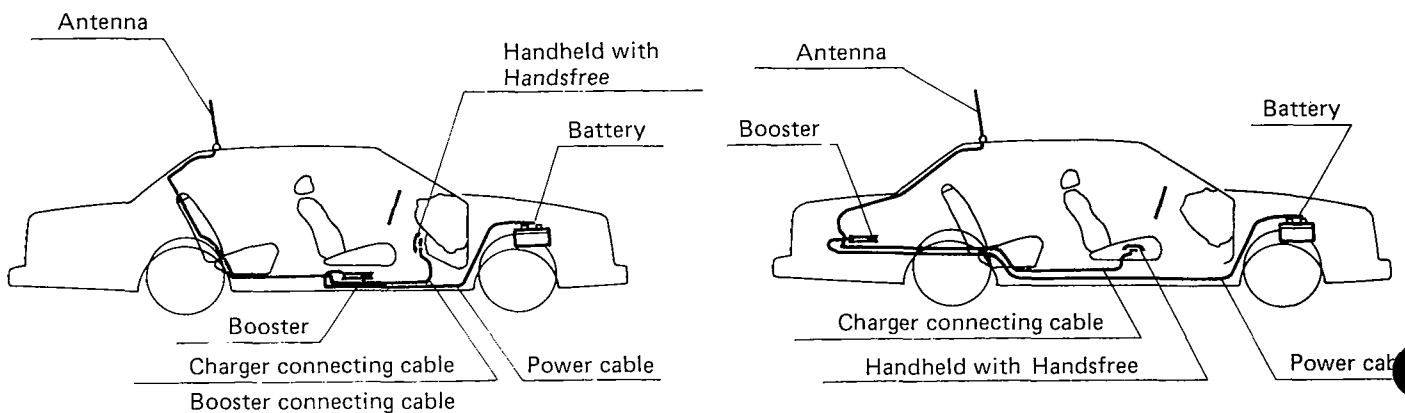


Fig. 1.3

1.2 Power Supply Cable

1.2.1 Power Cable Connection

(1) Fig. 1.4 shows the power supply cable and power control cable system

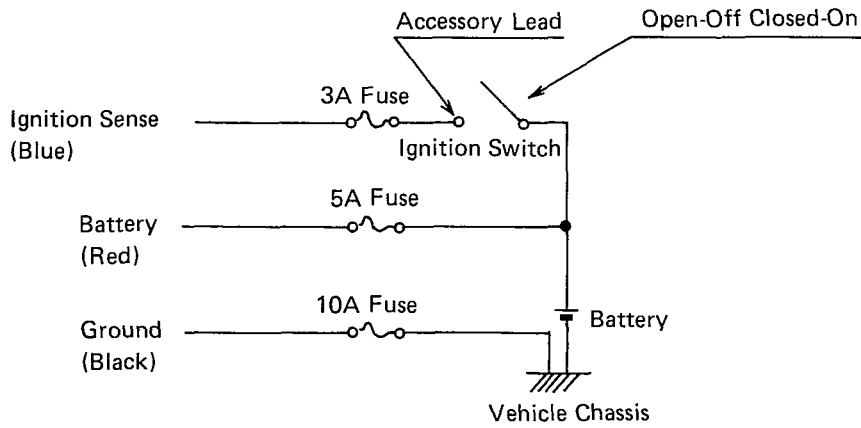


Fig. 1.4

(2) Power Cable Appearance

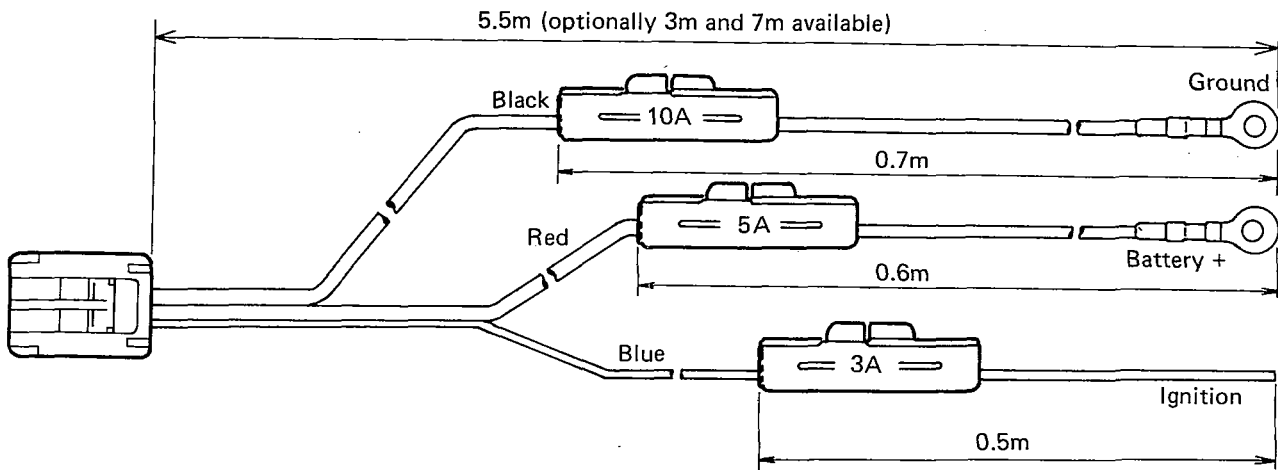


Fig. 1.5

(3) Table 1.1 shows the correspondence between the cables and the connector pins:

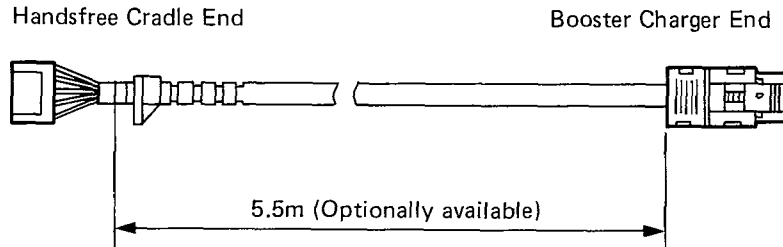
Table 1.1

Connector Pin No.	Cable Connected	Fuse Connected	Use
1	Black	10A	Ground
2	Red	5A	Battery (+)
3	Blue	3A	Ignition Sense
4			

1.2.2 Power Cable Laying

- (1) Prior to laying cable, disconnect all the wires from the negative terminal of the battery.
Reconnect the wires to the battery terminals after completion of wiring.
- (2) As much as possible, select existing holes for routing of wires through the dashboard and vehicle bulk heads.
- (3) Protect the power cable in the engine compartment with corrugated tube and mount securely inside the vehicle.
Wrap the end of the tube with vinyl tape.
- (4) The fuse holder for the power control cable must be so installed as to provide any maintenance.

1.3 Charger Cable



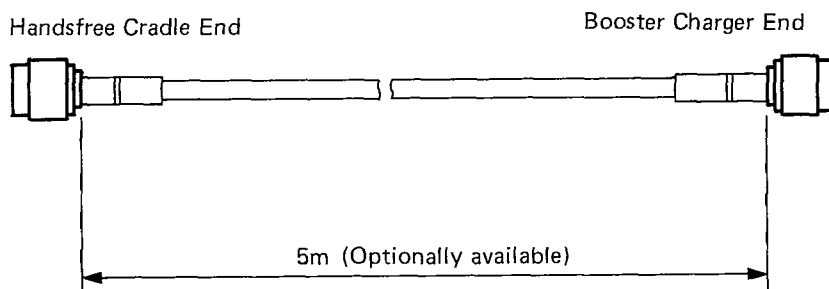
External view of charger cable

Fig. 1.5

- (1) Route the cable after taking into consideration.
 - a) The location where the booster charger and the handsfree cradle are to be installed.
 - b) The location along which the power supply cable is led to the engine compartment.
 - c) The routes and ducts already existing in the vehicle for cables.
- (2) Route the cables along existing grooves and ducts along the floor as much as possible. Where ducts or grooves are not available, select locations carefully so as to avoid their being stepped on by passengers.
- (3) Secure the charger cable at suitable locations.

1.4 Booster Cable

Refer to the charger connecting cable laying and lay the booster cable.

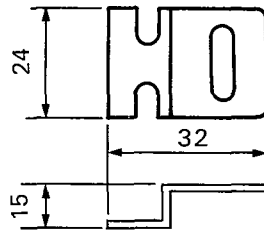


External view of booster cable

Fig. 1.7

1.5 Installation

1.5.1 Mounting Bracket Fitting



External View of mounting bracket

Fig. 1.8

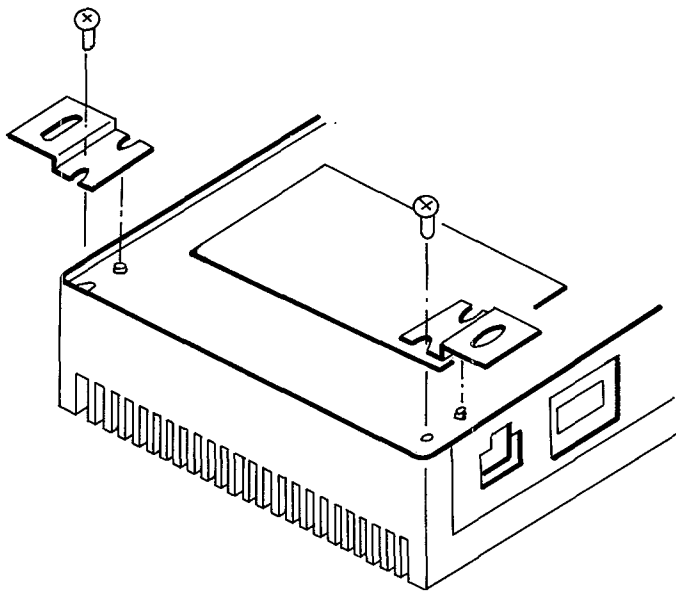


Fig. 1.9

- (1) Loose the four screws on the booster charger base and insert the mounting bracket.
- (2) Engage the hole of mounting brackets with the boss on the booster base.
- (3) Retighten the four screws.

1.5.2 Determining the Installation Position

Take into consideration the cable routing to determining the installation position.

1.5.3 Making the installation position.

- (1) Place the booster charger on the installation position and mark the four mounting position with a felt-tipped pen.
- (2) If the installation location is not even, select higher (convex) areas for the holes. Check that the locations selected for holes have nothing behind them to obstruct drilling of holes. (i.e.Fuel tank)

1.5.4 Drilling holes for mounting

- (1) Punch at the position marked for drilling.
- (2) Make four 4 mm (for plates less than 1 mm in thickness, the hole size must be reduced adequately) holes to use self-tapping screws.
- (3) Apply rust preventive on the surfaces cut.

1.5.5 Mounting

- (a) Mount the booster charger to the vehicle using M5 self-tapping screws. (Refer to Fig. 1.10.)
- (b) Apply a waterproofing agent around the screws.

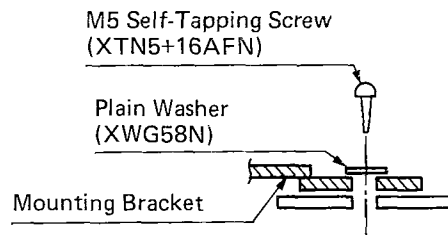


Fig. 1.10

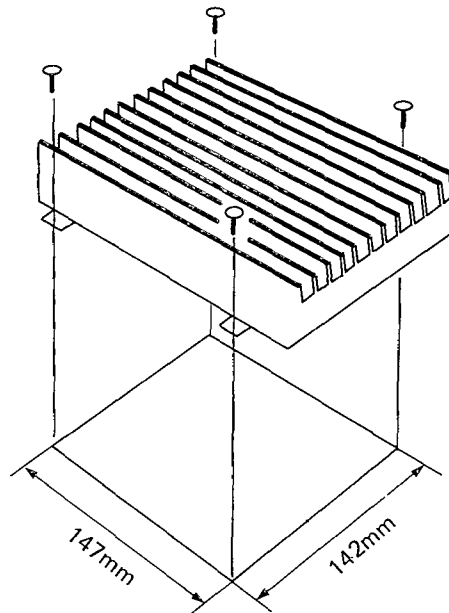


Fig. 1.11

2. HANDSFREE CRADLE

2.1 General Cautionary Remarks

When selecting the mounting position, make sure that it does not:

- (a) Obstruct operation of the vehicle.
- (b) Affect the sitting position of the passengers nor be subjected to excessive shocks.
- (c) Affect the regular passenger accommodation.
- (d) Create any difficulty in smooth operation of the unit.
- (e) Prevent securely installing the unit.
- (f) Expose the unit to direct sunlight or rain.
- (g) Affect laying cable for the unit.

From the above, the following turn out to be the best locations in a passenger car for installation:

- (a) Dash board side
 - (b) Center console box
 - (c) Center console side
- (Refer to Figure)

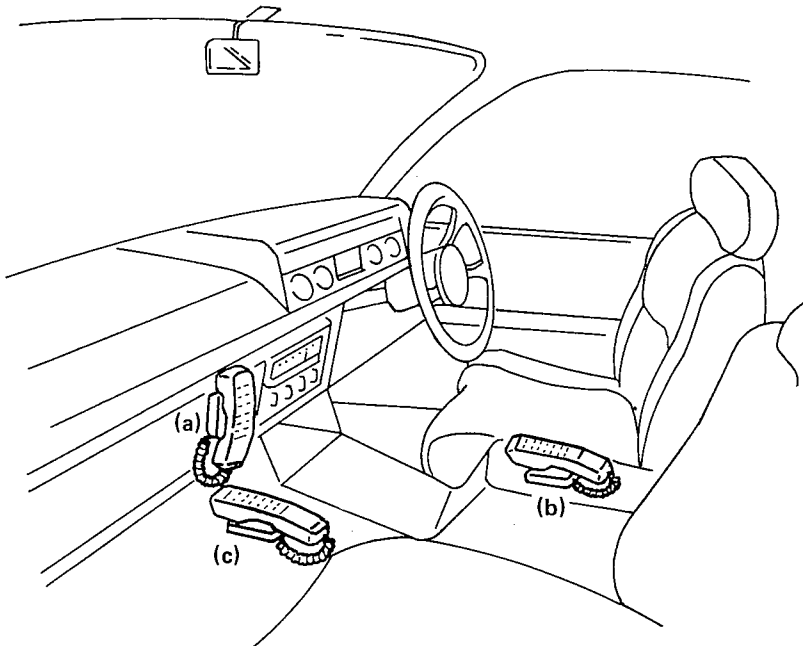


Fig. 2.1

2.2 Mounting The Handsfree Unit

The handsfree cradle can be mounted in two ways.

- Ⓐ Direct Installation, using self-tapping screws
- Ⓑ Mounting with the adjustable angle bracket

Ⓐ Direct Installation

2.2.1 Disassembling the Handsfree Cradle

- (1) Remove the M3 screw and part the cover from the case with cautiously about the connector cables.
- (2) Disconnect the speaker connector and the charging connector.

2.2.2 Marking the Installation Position

Place the case on the installation position and mark at two locations with a marker.

2.2.3 Drilling Holes for Mounting

Drill a 2 mm hole at each of the mounting locations marked if it is made of hard plastic. Diameter of the hole must be decided on the basis of the material and plate thickness at the mounting locations.

2.2.4 Mounting

Mount the case with two M4 self-tapping screws.

2.2.5 Reassembling the Handsfree Unit

- (1) Connect the speaker connector and the charging connector.
- (2) Engage the two square holes on the connector rest side of the cover with the two hooks on the case.
- (3) Make sure that the case and cover are perfectly engaged, then screw together.

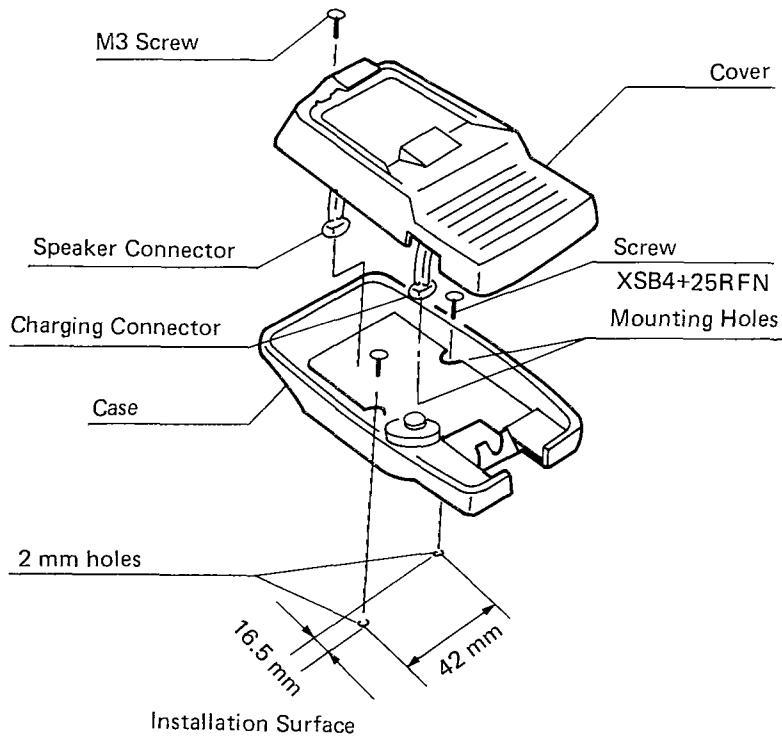


Fig. 2.2

b Installation Using the Adjustable Angle Bracket

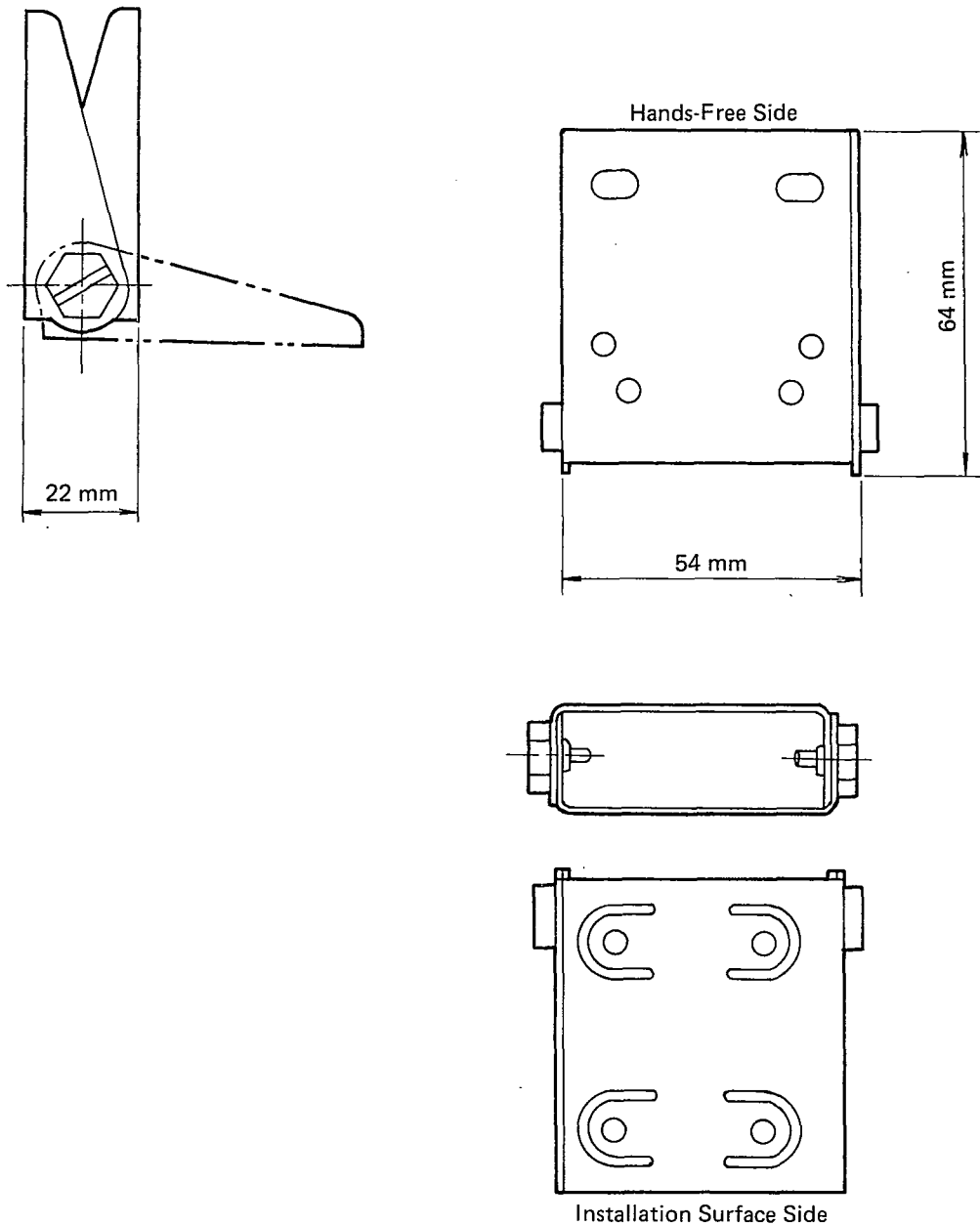


Fig. 2.3

External View of the Adjustable Angle Bracket

2.2.6 Marking the Installation Position for the Adjustable Angle Bracket

Place the adjustable angle bracket on the installation position and mark the four screw locations with a felt-tipped pen.

2.2.7 Drilling Holes for Fixing the Adjustable Angle Bracket

If the mounting location is on hard plastic, drill a 2 mm hole at each of the positions marked.

Decide the diameter of the holes on the basis of the material and plate thickness at the mounting locations.

2.2.8 Mounting the Adjustable Angle Bracket

Mount the adjustable angle bracket by means of the four self-tapping screws.

2.3 Installation of the Handsfree Microphone EB-M0003

Fig. 2.5 shows the external view of Handsfree Microphone, base and clips.

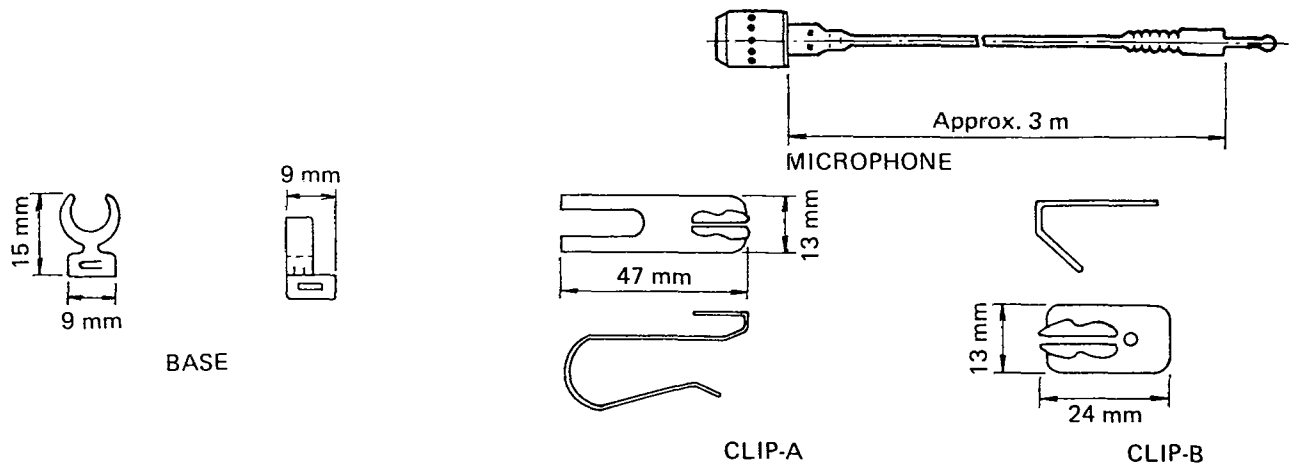


Fig. 2.5

2.3.1 Determine the Installation Position for the Handsfree Microphone

When selecting the mounting position, for the handsfree microphone, make sure that

- (1) it does not obstruct operation of the vehicle.
- (2) it does not affect the regular accommodation.
- (3) As much as possible, near from operator's mouth apart from loudspeaker.
- (4) Microphone is pointed at an operator's mouth.

2.3.2 Mounting the Handsfree Microphone Using the Clip-A

- (1) Mount the clip to the microphone by inserting the projection of the clip into the hole of microphone base, as shown in Fig. 2.5.
- (2) Mount the microphone on the sunvisor.

2.2.3 Mounting the Handsfree Microphone Using the Clip-B

- (1) Attach the adhesive pad to the clip-B.
- (2) Make 1 mm diameter hole at the mounting location.
- (3) Mount the clip using a M2.5 self-tapping screw.
- (4) Insert the projection of the clip into the hole of microphone base as shown in Fig. 2.6.

If the microphone can be fixed only with the adhesive pad, M2.5 screw is not necessary.

Note:

The projection of the clip can be inserted into any one of the four slots in the microphone base. Select the slot that will point the microphone at operator's mouth.

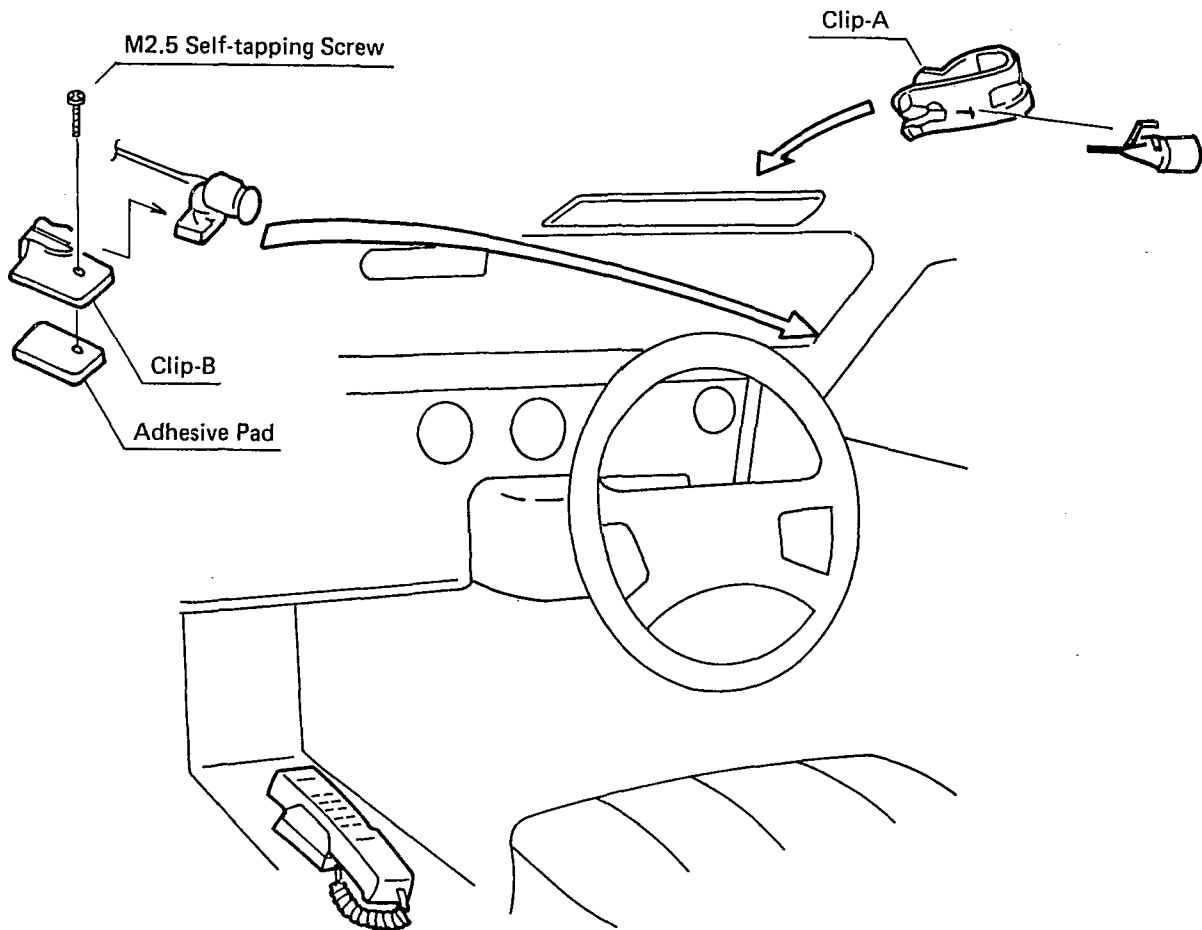
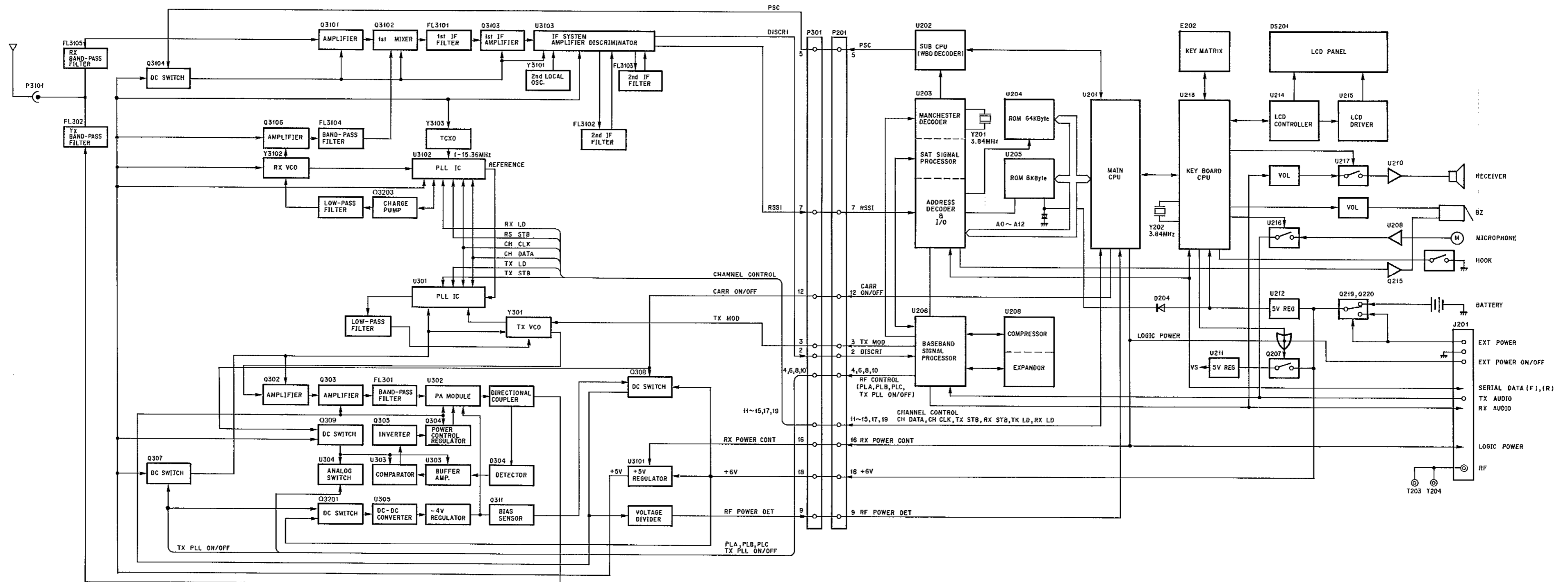


Fig. 2.6

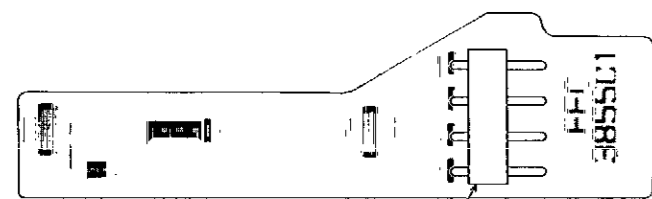
NOTE

VIII. SCHEMATIC CIRCUIT AND PARTS LOCATION

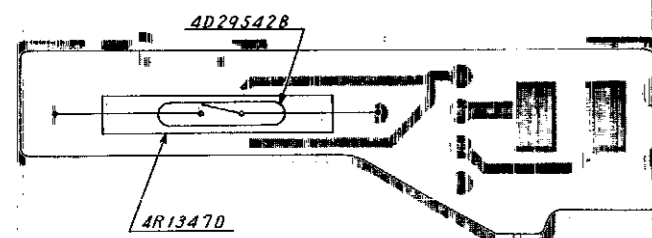
BLOCK DIAGRAM



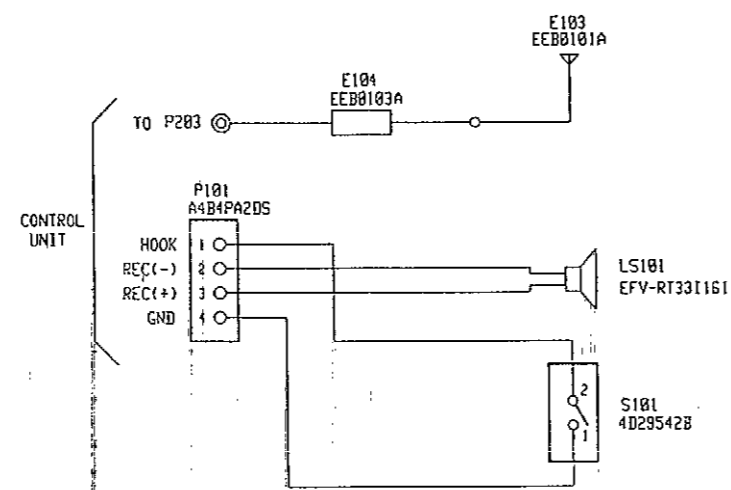
CIRCUIT DIAGRAM AND PARTS LOCATION OF BODY-1



TYPE	EB-3610 EB-3611
DWG. NAME	BODY-1 CIRCUIT BOARD DIAGRAM
DWG. NO.	EBL0333AA/C EBL0341AA/C EBL0334AA/C EBL0342AA/C

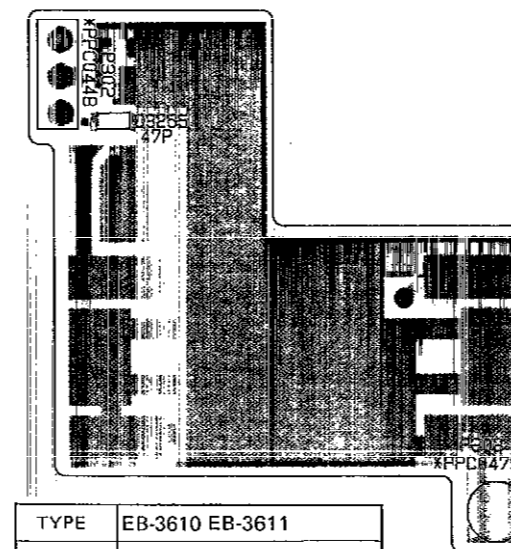


TYPE	EB-3610 EB-3611
DWG. NAME	BODY-1 CIRCUIT BOARD DIAGRAM
DWG. NO.	EBL0333AA/C EBL0341AA/C EBL0334AA/C EBL0342AA/C



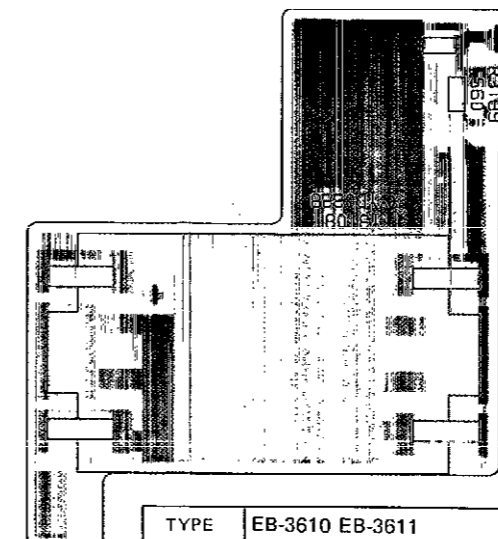
PARTS LOCATION OF RF SUB UNIT

(Component Side)



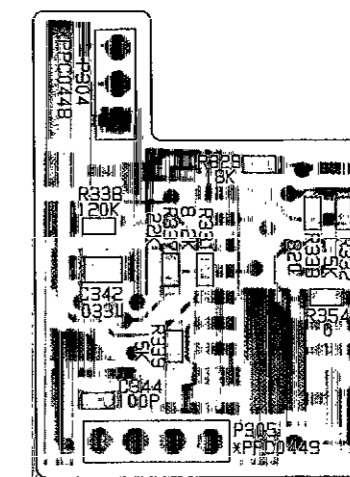
TYPE	EB-3610 EB-3611
DWG. NAME	RF SUB-1 CIRCUIT BOARD DIAGRAM
DWG. NO.	EBU0344A/C

(Soldering Side)



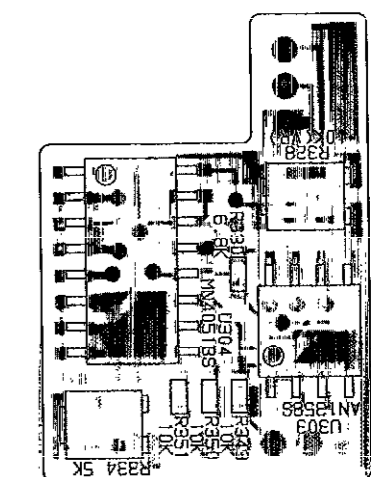
TYPE	EB-3610 EB-3611
DWG. NAME	RF SUB-1 CIRCUIT BOARD DIAGRAM
DWG. NO.	EBU0344A/C

(Component Side)



TYPE	EB-3610 EB-3611
DWG. NAME	RF SUB-2 CIRCUIT BOARD DIAGRAM
DWG. NO.	EBT0345A/C

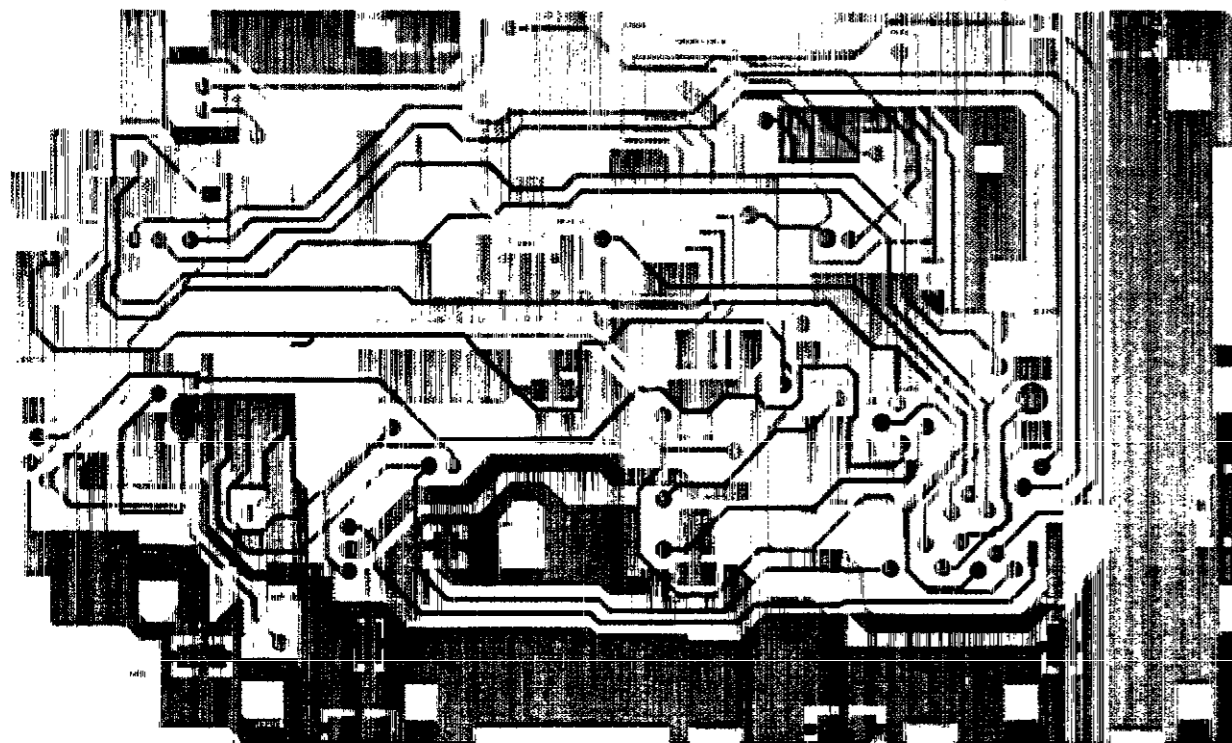
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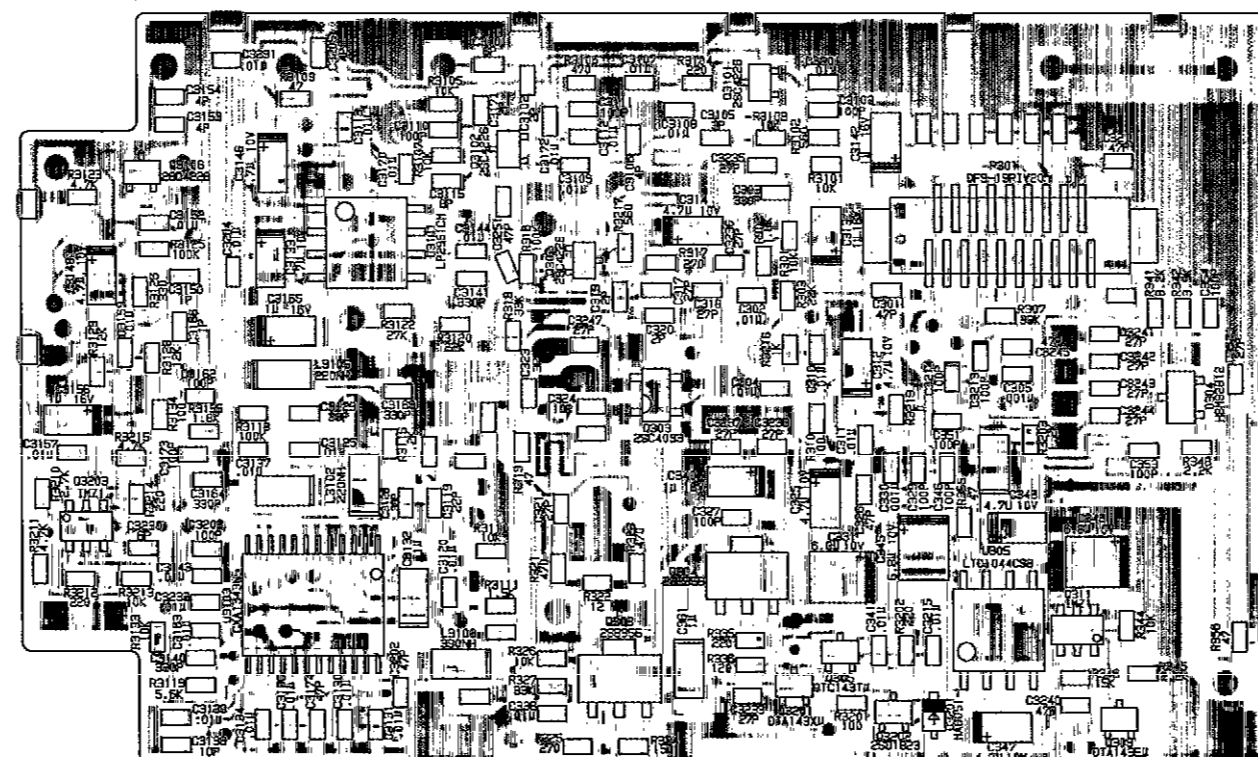
TYPE	EB-3610 EB-3611
DWG. NAME	RF SUB-2 CIRCUIT BOARD DIAGRAM
DWG. NO.	EBT0345A/C

PARTS LOCATION OF RF UNIT

(LAY2 and LAY3)

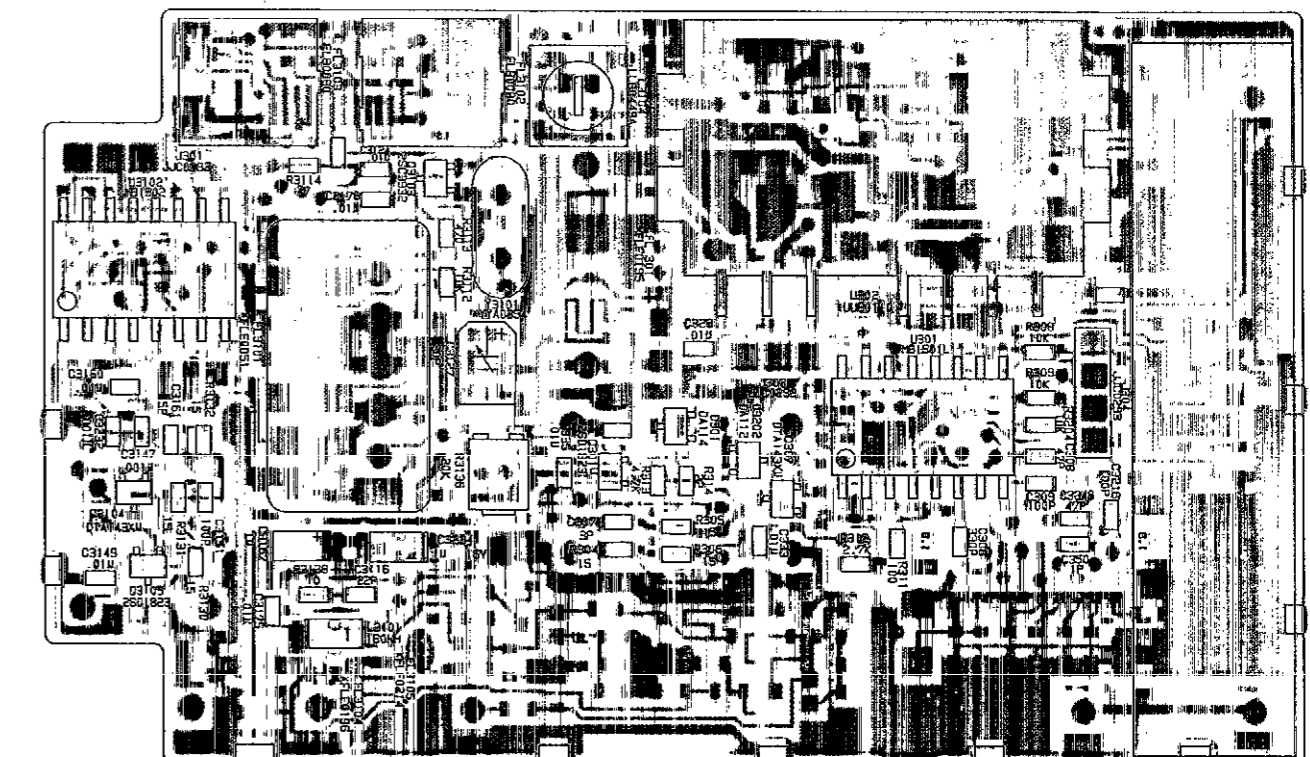


(Component Side)



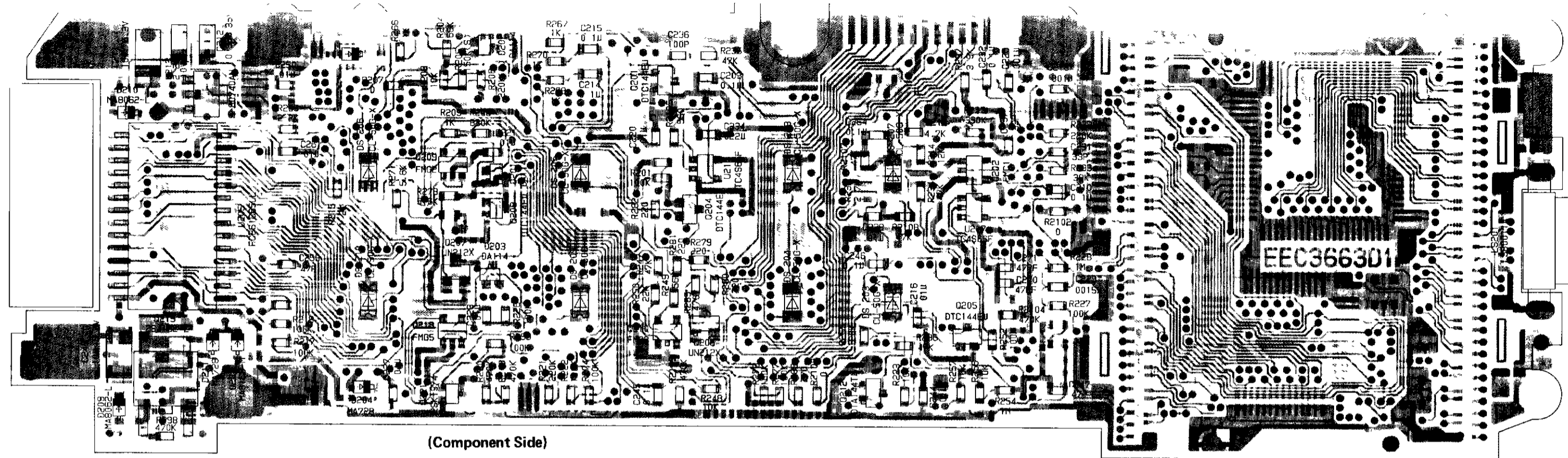
TYPE	EB-3610 EB-3611
DWG. NAME	RF UNIT CIRCUIT BOARD DIAGRAM
DWG. NO.	EBU0343AA/C

(Soldering Side)

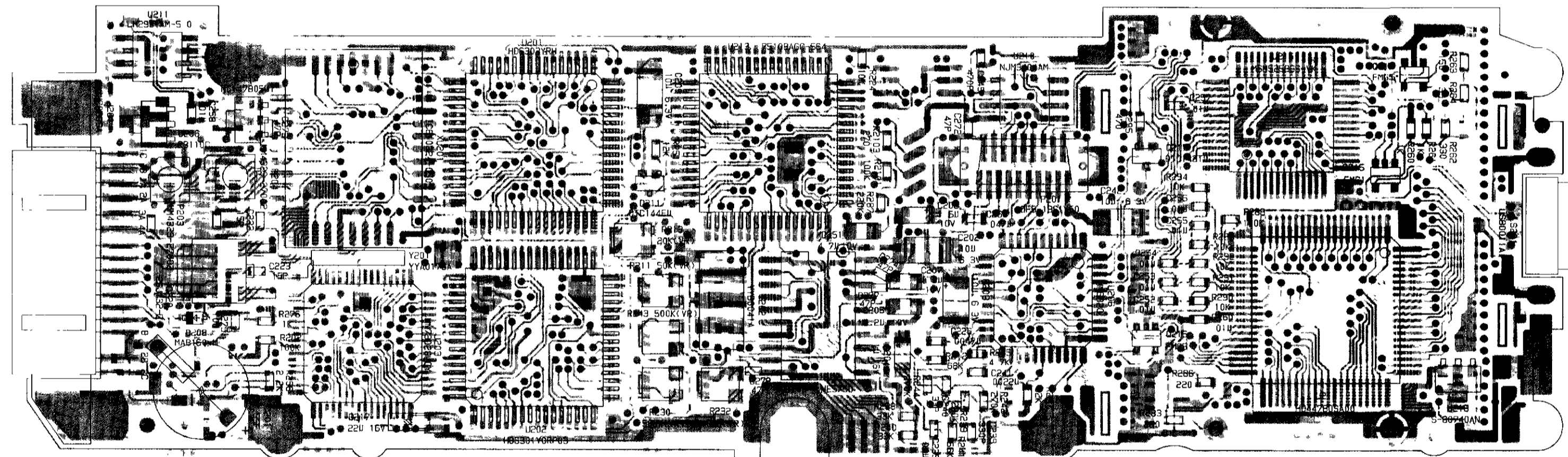


TYPE	EB-3610 EB-3611
DWG. NAME	RF UNIT CIRCUIT BOARD DIAGRAM
DWG. NO.	EBU0343AA/C

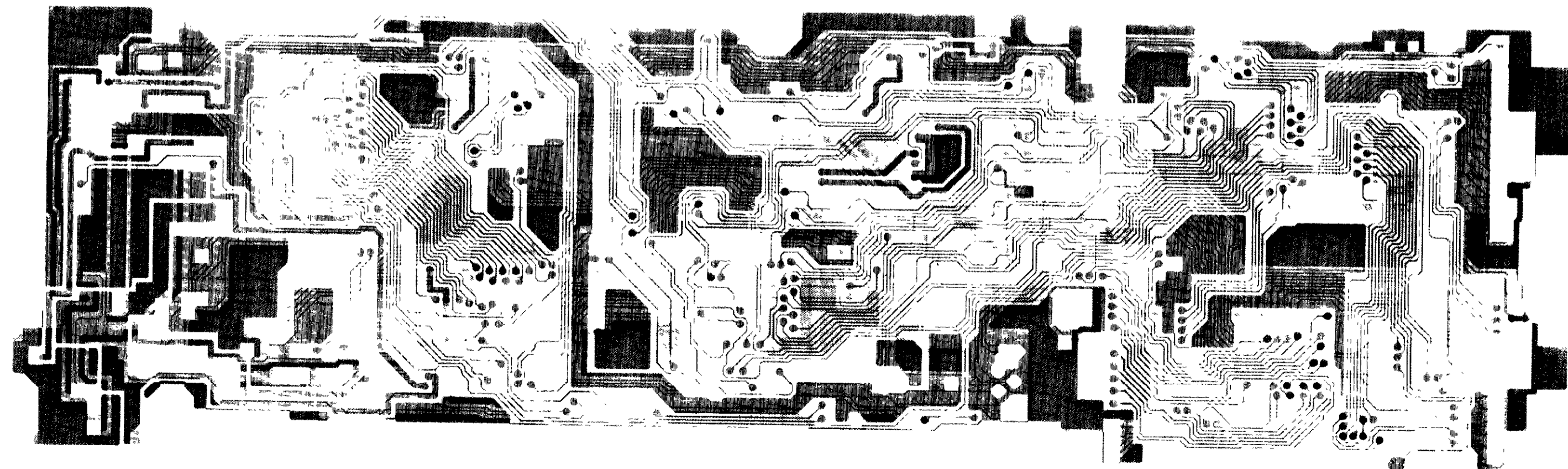
PARTS LOCATION OF CONTROL UNIT



(Component Side)

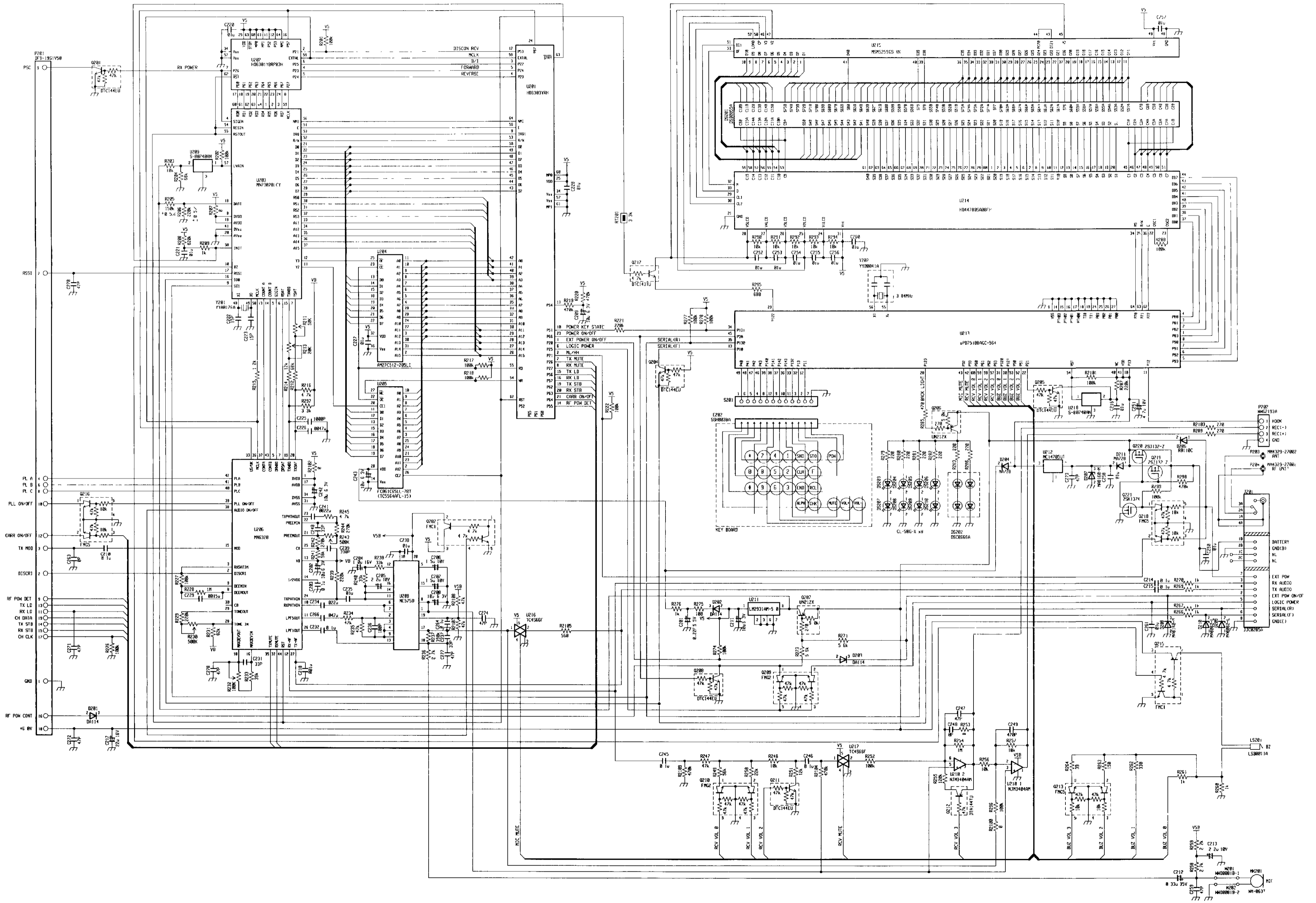


(Soldering Side)



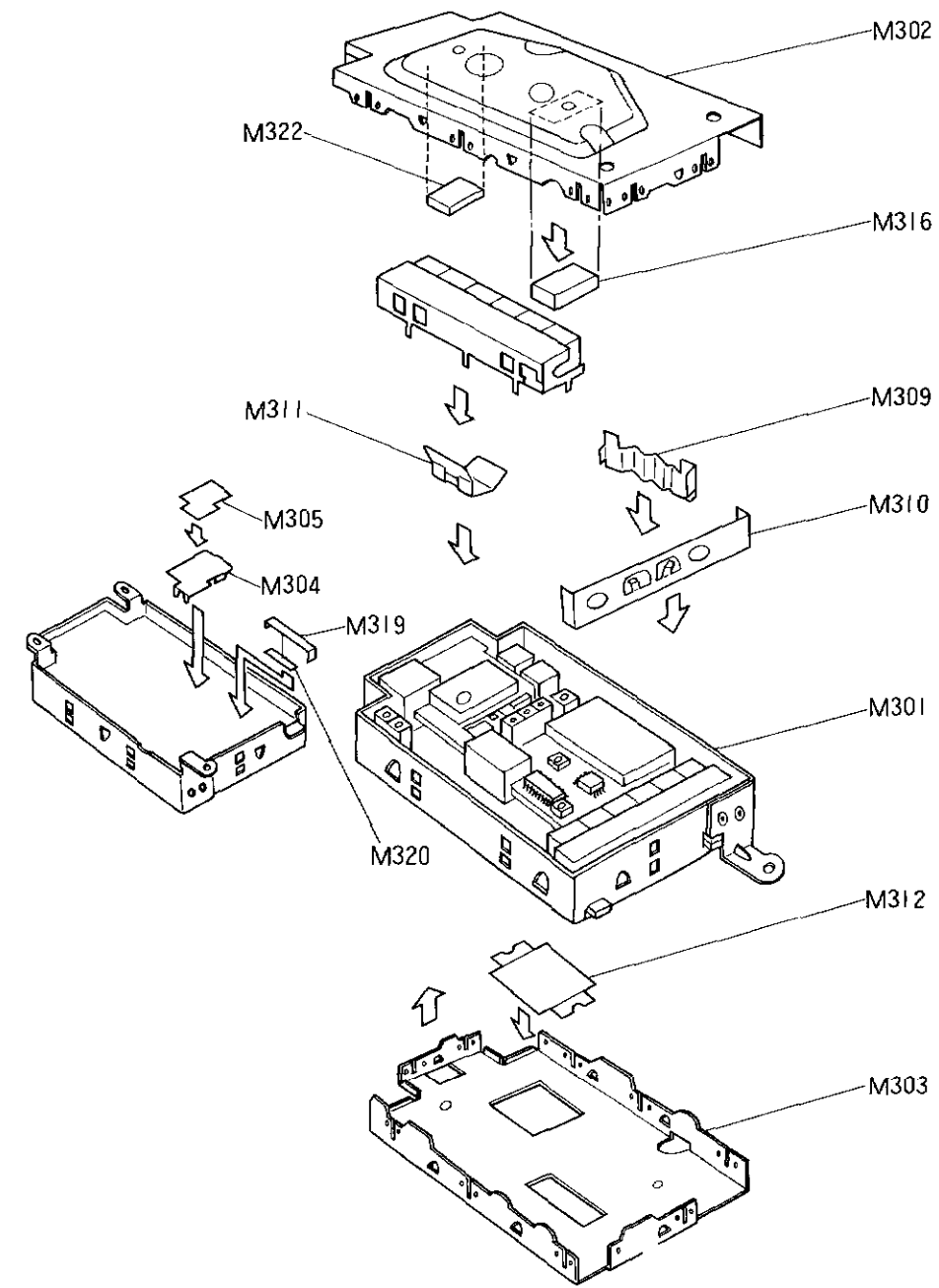
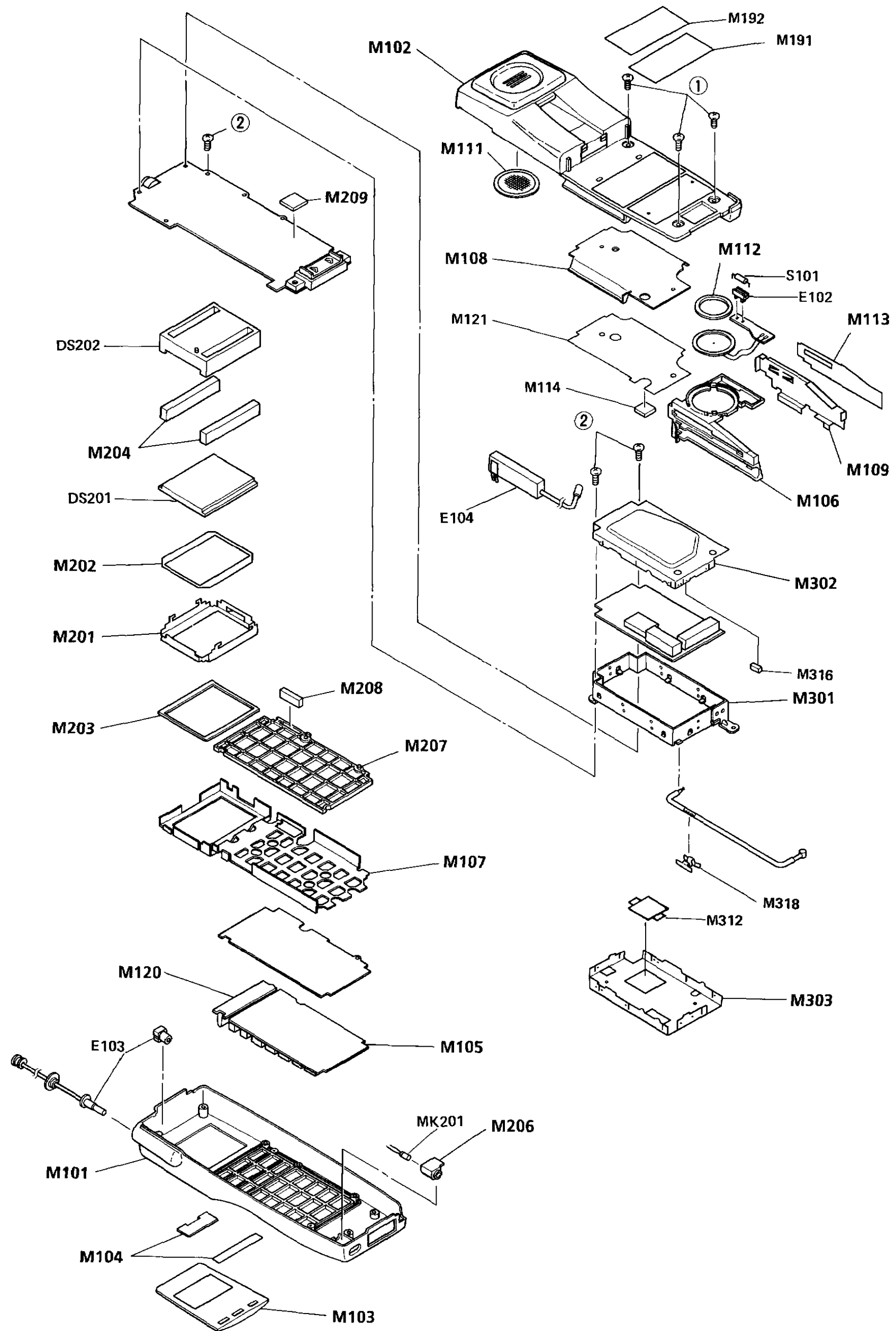
(LAY2 and LAY3)

CIRCUIT DIAGRAM OF CONTROL UNIT



IX. EXPLODED VIEW AND PACKING

1. EXPLODED VIEW MAIN UNIT

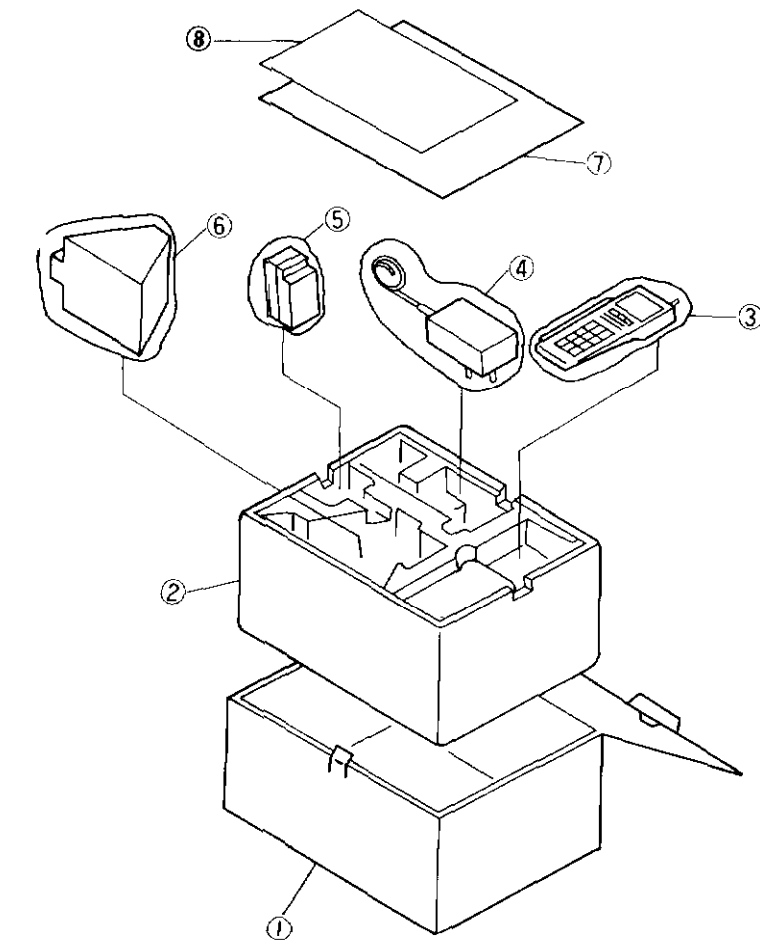


H.P. TELEPHONE-1

Ref No	Parts No	Parts Name
①	XSB2 5+7FN	Screw
②	XYN2+J6FN	Screw
M 101	5FB5392DA	Cover A
M 102	5FA5340CA	Case
M 103	5FC5210B	LCD Panel A
M 104	6ZA5378A	LCD Sheet
M 105	5BF5078BB	Key Sheet B
M 106	5FF5050C	REC Holder
M 107	1CA5766C	ANT Shield Upper
M 108	1CA5768A	ANT Shield Lower
M 109	1CA5767A	ANT Shield Side
M 111	6DA5054A	REC Net
M 112	4R13262-7	REC Cushion
M 113	6ZA5397A	Insulator Side
M 114	6ZA5375B	Insulator Lower
M 115	6ZA5417A	Stopper Sheet
M 117	5E10007A	Spacer
M 118	6ZA5428A	Spacer
M 119	6ZA5429A	Spacer
M 120	6ZA5429A	Spacer
M 121	6ZA5375B	Insulator
M 201	1B85391A	LCD Bracket
M 202	5AB5424A	LCD Cushion A
M 203	5AB5425A	LCD Cushion B
M 204	5ZA5117A	Interconnector W
M 206	5BB5059B	Mic Holder
M 207	5FG5260A	Key Case
M 208	5ZA5118A	Interconnector S
M 209	5AB5462A	Cushion
M 301	1CA5734C	Shield Frame
M 302	1CA5776B	Shield Cover Lower
M 304	1CA6006B	Shield Case
M 305	6ZA5426A	Insulator
M 309	1CA5938A	Earth Plate
M 310	1CA5936A	Earth Plate
M 311	1CA5943A	Earth Plate
M 312	5EZ5864B	Shield Film
M 316	5AB5479A	Cushion
M 318	1CA5979B	Earth Plate
M 319	1D00001A	Finger
M 320	5H10005B	Insulator
M 322	5E10037A	Cushion
M 191	7AB5617AB	Name Plate
M 192	7AC5694A	Green Label

PACKING SPEC.

①	6AA6601A
②	6AB5503A
③	6AC5048AE
④	XZB15 x 20C03
⑤	XZB10 x 16C03
⑥	XZB20 x 35C03
⑦	6AB5511A
⑧	ZZB0480



X. REPLACEMENT PARTS LIST

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
C 201	EECS5R5H224	Capacitor 5.5V 0.22F +80, - 20%	
C 202	ECST0JB106ZR	Capacitor TANTA 6.3V 10 μ F \pm 20%	
C 203	GRM0F104Z2H	Capacitor CE-CH 25V 0.1 μ F +80, - 20%	
C 204	ECST1CY105ZR	Capacitor TANTA 16V 1 μ F \pm 20%	
C 205	ECST1AY225ZR	Capacitor TANTA 10V 2.2 μ F \pm 20%	
C 206	ECST1AY155ZR	Capacitor TANTA 10V 1.5 μ F \pm 20%	
C 207	ECST1AY155ZR	Capacitor TANTA 10V 1.5 μ F \pm 20%	
C 208	ECST0JB106ZR	Capacitor TANTA 6.3V 10 μ F \pm 20%	
C 209	ECST0JB106ZR	Capacitor TANTA 6.3V 10 μ F \pm 20%	
C 210	GRM0F104Z2H	Capacitor CE-CH 25V 0.1 μ F +80, - 20%	
C 211	ECST0JB106ZR	Capacitor TANTA 6.3V 10 μ F \pm 20%	
C 212	ECST1VY334ZR	Capacitor TANTA 35V 0.33 μ F \pm 20%	
C 213	ECST1AY225ZR	Capacitor TANTA 10V 2.2 μ F \pm 20%	
C 214	GRM0F104Z2H	Capacitor CE-CH 25V 0.1 μ F +80, - 20%	
C 215	GRM0F104Z2H	Capacitor CE-CH 25V 0.1 μ F +80, - 20%	
C 216	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 217	ECEA1CKA220	Capacitor ALMI 16V 22 μ F \pm 20%	
C 218	GRM9B102K5H	Capacitor CE-CH 50V 1000pF \pm 10%	
C 219		Not Used	
C 220	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 221	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 222	GRM9CH150J5H	Capacitor CE-CH 50V 15pF \pm 10%	
C 223	GRM9CH150J5H	Capacitor CE-CH 50V 15pF \pm 10%	
C 224		Not Used	
C 225	GRM9B102K5H	Capacitor CE-CH 50V 1000pF \pm 10%	
C 226	GRM9B472K5H	Capacitor CE-CH 50V 4700pF \pm 10%	
C 227	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 228	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 229	YGM1B152K1HT	Capacitor CE-CH 50V 0.0015 μ F \pm 10%	
C 230		Not Used	
C 231	GRM9CH330J5H	Capacitor CE-CH 50V 33pF \pm 10%	
C 232	GRM0F104Z2H	Capacitor CE-CH 25V 0.1 μ F +80, - 20%	
C 233		Not Used	
C 234	GRM0B223K5H	Capacitor CE-CH 50V 22000pF \pm 10%	
C 235	GRM0B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 236	GRM9CH101J5H	Capacitor CE-CH 50V 100pF \pm 10%	
C 237	GRM9CH330J5H	Capacitor CE-CH 50V 33pF \pm 10%	
C 238	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 239	GRM9CH331J5H	Capacitor CE-CH 50V 330pF \pm 10%	
C 240	GRM9CH330J5H	Capacitor CE-CH 50V 33pF \pm 10%	

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
C 241	GRM9B222K5H	Capacitor CE-CH 50V 2200pF \pm 10%	
C 243	ECST0JB1.6ZR	Capacitor TANTA 6.3V 10 μ F \pm 20%	
C 243	ECST0JB1.6ZR	Capacitor TANTA 6.3V 10 μ F \pm 20%	
C 244	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 245	GRM0F104Z2H	Capacitor CE-CH 25V 0.1 μ F +80, - 20%	
C 246	GRM0F104Z2H	Capacitor CE-CH 25V 0.1 μ F +80, - 20%	
C 247	GRM9CH470J5H	Capacitor CE-CH 50V 47pF \pm 10%	
C 248		Not Used	
C 249	GRM9B471K5H	Capacitor CE-CH 50V 47pF \pm 10%	
C 250	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 251	ECST1CY105ZR	Capacitor TANTA 16V 1 μ F \pm 20%	
C 252	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 253	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 254	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 255	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 256	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 257	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 258	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 259	GRM9CH470J5H	Capacitor CE-CH 50V 47pF \pm 10%	
C 260	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 261	GRM9B103K2H	Capacitor CE-CH 25V 0.01 μ F \pm 10%	
C 262		Not Used	
C 263		Not Used	
C 264	GRM0F104Z2H	Capacitor CE-CH 25V 0.1 μ F +80, - 20%	
C 265		Not Used	
C 266	GRM0B473K2H	Capacitor CE-CH 25V 0.047 μ F \pm 10%	
C 267		Not Used	
C 268		Not Used	
C 269		Not Used	
C 270	GRM0CH470J5H	Capacitor CE-CH 50V 47pF \pm 10%	
C 271	GRM0CH470J5H	Capacitor CE-CH 50V 47pF \pm 10%	
C 272	GRM0CH470J5H	Capacitor CE-CH 50V 47pF \pm 10%	
C 273		Not Used	
C 274		Not Used	

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
R 201	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω	
R 202	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω	
R 203	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω	
R 204	ERJ3GEYJ683V	Resistor CA-CH 1/16W 68k Ω	
R 205	YRR0816P154D	Resistor CA-CH 1/16W 150k Ω ± 0.5%	
R 206	YRR0816P224D	Resistor CA-CH 1/16W 220k Ω ± 0.5%	
R 207	ERJ3GEY0R00V	Resistor CA-CH 1/16W 0 Ω	
R 208	ERJ3GEYJ824V	Resistor CA-CH 1/16W 820k Ω	
R 209	ERJ3GEYJ102V	Resistor CA-CH 1/16W 1k Ω	
R 210	ERJ3GEYJ223V	Not Used	
R 211	EVM7LSX00B54	Resistor CA-CH 1/16W 50k Ω B	
R 212	ERJ3GEYJ683V	Resistor CA-CH 1/16W 68k Ω ± 10%	
R 213	EVM7LSX00B24	Resistor CA-CH 1/16W 20k Ω B	
R 214	ERJ3GEYJ123V	Resistor CA-CH 1/16W 12k Ω ± 10%	
R 215	ERJ3GEYJ122V	Resistor CA-CH 1/16W 1.2k Ω ± 10%	
R 216	ERJ3GEYJ472V	Resistor CA-CH 1/16W 4.7k Ω ± 10%	
R 217	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 218	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 219	ERJ3GEYJ474V	Resistor CA-CH 1/16W 470k Ω ± 10%	
R 220	ERJ3GEYJ474V	Resistor CA-CH 1/16W 470k Ω ± 10%	
R 221	ERJ3GEYJ224V	Resistor CA-CH 1/16W 220k Ω ± 10%	
R 222	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 223	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω ± 10%	
R 224	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω ± 10%	
R 225	ERJ3GEYJ103V	Not Used	
R 226	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 227	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 228	ERJ3GEYJ105V	Resistor CA-CH 1/16W 1Mk Ω ± 10%	
R 229	ERJ3GEYJ224V	Resistor CA-CH 1/16W 220k Ω ± 10%	
R 230	EVM7LSX00B55	Resistor CA-CH 1/16W 500k Ω B	
R 231	ERJ3GEYJ823V	Resistor CA-CH 1/16W 82k Ω ± 10%	
R 232	EVM7LSX00B15	Resistor CA-CH 1/16W 100k Ω B	
R 233	ERJ3GEYJ393V	Resistor CA-CH 1/16W 39k Ω ± 10%	
R 234	ERJ3GEYJ473V	Resistor CA-CH 1/16W 47k Ω ± 10%	
R 235	ERJ3GEYJ473V	Resistor CA-CH 1/16W 47k Ω ± 10%	
R 236	ERJ3GEYJ272V	Resistor CA-CH 1/16W 2.7k Ω ± 10%	
R 237	ERJ3GEYJ394V	Resistor CA-CH 1/16W 390k Ω ± 10%	
R 238	ERJ3GEYJ333V	Resistor CA-CH 1/16W 33k Ω ± 10%	
R 239	ERJ3GEYJ224V	Resistor CA-CH 1/16W 220k Ω ± 10%	
R 240	ERJ3GEYJ333V	Resistor CA-CH 1/16W 33k Ω ± 10%	

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
R 241	ERJ3GEYJ563V	Resistor CA-CH 1/16W 56k Ω ± 10%	
R 242	ERJ3GEYJ274V	Resistor CA-CH 1/16W 270k Ω ± 10%	
R 243	EVM7LSX00B55	Resistor CA-CH 1/16W 500k Ω B	
R 244	ERJ3GEYJ274V	Resistor CA-CH 1/16W 270k Ω ± 10%	
R 245	ERJ3GEYJ472V	Resistor CA-CH 1/16W 4.7k Ω ± 10%	
R 246		Not Used	
R 247	ERJ3GEYJ473V	Resistor CA-CH 1/16W 47k Ω ± 10%	
R 248	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω ± 10%	
R 249	ERJ3GEYJ563V	Resistor CA-CH 1/16W 56k Ω ± 10%	
R 250	ERJ3GEYJ223V	Resistor CA-CH 1/16W 22k Ω ± 10%	
R 251	ERJ3GEYJ123V	Resistor CA-CH 1/16W 12k Ω ± 10%	
R 252	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 253		Not Used	
R 254	ERJ3GEYJ105V	Resistor CA-CH 1/16W 1k Ω ± 10%	
R 255	ERJ3GEYJ124V	Resistor CA-CH 1/16W 120k Ω ± 10%	
R 256	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω ± 10%	
R 257	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω ± 10%	
R 258	ERJ3GEYJ222V	Resistor CA-CH 1/16W 2.2k Ω ± 10%	
R 259	ERJ3GEYJ222V	Resistor CA-CH 1/16W 2.2k Ω ± 10%	
R 260	ERJ3GEYJ102V	Resistor CA-CH 1/16W 1k Ω ± 10%	
R 261	ERJ3GEYJ102V	Resistor CA-CH 1/16W 1k Ω ± 10%	
R 262	ERJ3GEYJ331V	Resistor CA-CH 1/16W 330 Ω ± 10%	
R 263	ERJ3GEYJ151V	Resistor CA-CH 1/16W 150 Ω ± 10%	
R 264	ERJ3GEYJ390V	Resistor CA-CH 1/16W 39 Ω ± 10%	
R 265		Not Used	
R 266	ERJ3GEYJ102V	Resistor CA-CH 1/16W 1k Ω ± 10%	
R 267	ERJ3GEYJ102V	Resistor CA-CH 1/16W 1k Ω ± 10%	
R 268		Not Used	
R 269	ERJ3GEYJ102V	Resistor CA-CH 1/16W 47k Ω ± 10%	
R 270	ERJ3GEYJ102V	Resistor CA-CH 1/16W 200k Ω ± 10%	
R 271	ERJ3GEYJ562V	Resistor CA-CH 1/16W 56k Ω ± 10%	
R 272		Not Used	
R 273	ERJ3GEYJ562V	Resistor CA-CH 1/16W 5.6k Ω ± 10%	
R 274	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 275	ERJ3GEYJ101V	Resistor CA-CH 1/16W 100 Ω ± 10%	
R 276	ERJ3GEYJ102V	Resistor CA-CH 1/16W 1k Ω ± 10%	
R 277	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 278	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω ± 10%	
R 279	ERJ3GEYJ221V	Resistor CA-CH 1/16W 220 Ω ± 10%	
R 280	ERJ3GEYJ221V	Resistor CA-CH 1/16W 220 Ω ± 10%	

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
R 281	ERJ3GEYJ221V	Resistor CA-CH 1/16W 220 Ω	
R 282	ERJ3GEYJ221V	Resistor CA-CH 1/16W 220 Ω	
R 283	ERJ3GEYJ221V	Resistor CA-CH 1/16W 220 Ω	
R 284			
R 285	ERJ3GEYJ471V	Resistor CA-CH 1/16W 470 Ω	
R 286	ERJ3GEYJ221V	Resistor CA-CH 1/16W 200 Ω	
R 287	ERJ3GEYJ224V	Resistor CA-CH 1/16W 220k Ω	
R 288	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω	
R 289	ERJ3GEYJ271V	Resistor CA-CH 1/16W 270 Ω	
R 290	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω	
R 291	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω	
R 292	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω	
R 293	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω	
R 294	ERJ3GEYJ103V	Resistor CA-CH 1/16W 10k Ω	
R 295	ERJ3GEYJ471V	Resistor CA-CH 1/16W 470 Ω	
R 296	ERJ3GEYJ473V	Resistor CA-CH 1/16W 47k Ω	
R 297	ERJ3GEYJ332V	Resistor CA-CH 1/16W 3.3k Ω	
R 298	ERJ3GEYJ474V	Resistor CA-CH 1/16W 470k Ω	
R 299	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω	
R 2100	ERJ3GEYR00V	Resistor CA-CH 1/16W 0 Ω	
R 2101	ERJ3GEYJ104V	Resistor CA-CH 1/16W 100k Ω	
R 2102	ERJ3GEYJ100V	Resistor CA-CH 1/16W 10 Ω	
R 2103	ERJ3GEYJ271V	Resistor CA-CH 1/16W 270 Ω	
R 2104	ERJ3GEYJ474V	Resistor CA-CH 1/16W 470k Ω	
R 2105	ERJ3GEYJ561V	Resistor CA-CH 1/16W 560 Ω	
R 2106		Not Used	
R 2107	ERJ3GEYJ473V	Resistor CA-CH 1/16W 47k Ω	
R 2108	ERJ3GEYJ473V	Resistor CA-CH 1/16W 47k Ω	
R 2109	ERJ3GEYJ474V	Resistor CA-CH 1/16W 470k Ω	
RT 201	ERTD2FHL332S	Thermistor 400mW 3.3k Ω L	

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
U 201	YHD6303YRH	IC	
U 202	YUCMS0019	IC	
U 203	MN73028LCY	IC	
U 204	YUMAD0005	IC	
U 205	YUMNE0001	IC	
U 206	MN6320	IC	
U 208	NE575D	IC	
U 209	YS80740AND4T	IC	
U 210	NJM3404AM	IC	
U 211	LM2931AM-5.0	IC	
U 212	MC147805UTEL	IC	
U 213	YUCFJ0027	IC	
U 214	UUD0021A	IC	
U 215	MSM5259GS-VK	IC	
U 216	TC4S66FTE85L	IC	
U 217	TC4S66FTE85L	IC	
U 218	YS80740AND4T	IC	

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
Q 201	DTC144EUT106	Transistor NPN	
Q 202	YFMC1T99	Transistor	
Q 203		Not Used	
Q 204	DTC144EUT106	Transistor NPN	
Q 205	DTC144EUT106	Transistor NPN	
Q 206	UN212X	Transistor PNP	
Q 207	UN212X	Transistor PNP	
Q 208	DTC144EUT106	Transistor NPN	
Q 209	FMG2-T99	Transistor	
Q 210	FMG2-T99	Trnsistor	
Q 211	DTC144EUT106	Transistor NPN	
Q 212	DTC144EUT106	Transistor PNP	
Q 213	FMG5-T99	Functional Unit	
Q 214		Not Used	
Q 215	YFMC1T99	Transistor	
Q 216	FMG2-T99	Functional Unit	
Q 217	DTC143TUT106	Transistor 250MHz 40V 300mW	
Q 218	FMG5-T99	Transistor	
Q 219	2SJ132Z-E2	FET	
Q 220	2SJ132Z-E2	FET	
Q 221	2SK1374TX	FET	

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
D 201	Da114-T106	Diode 80V 100mA	
D 202	Da114-T106	Diode 80V 100mA	
D 203	Da114-T106	Diode 80V 100mA	
D 204	MA728	Diode	
D 205	MA8160-M	Zener	
D 206	RB110C-T101	Diode	
D 207		Not Used	
D 208	MA8160-M	Diode 16V	
D 209	MA8062-L	Zener 6.2V 200mA	
D 210	MA8062-L	Zener 6.2V 200mA	
D 211	MA728	Diode	
DS 201	DSB0055A	LCD	
DS 202	DSC0666A	LED Display	
DS 203	CL-50G-X-T	Diode 25mA 65mW	
DS 204	CL-50G-X-T	Diode 25mA 65mW	
DS 205	CL-50G-X-T	Diode 25mA 65mW	
DS206	CL-50G-X-T	Diode 25mA 65mW	
DS 207	CL-50G-X-T	Diode 25mA 65mW	
DS 208	CL-50G-X-T	Diode 25mA 65mW	
DS 209	CL-50G-X-T	Diode 25mA 65mW	
DS 210	CL-50G-X-T	Diode 25mA 65mW	

Model No.	EB-3610/3611	Name	Control Unit
Ref. No.	Part No.	Part Name & Description	Remarks
S 201	SSH0035A	Keyboard	
J 201	JJC0285A	SQ Connector/J	
LS 201	LSB0011A	Buzzer	
MK201	WM063T	Microphone Unit	
P 201	DF9-19S1V50	SQ Connector/J	
P 202		Not Used	
P 203	MM4329-27002	COAX Connector/P	
P 204	MM4329-27002	COAX Connector/P	
Y 201	YYA0176A	Crystal Resonator 3.84MHz	
Y 202	YYB0041A	Ceramic Resonator 3.84MHz	
W 201	WWD0081A1	Lead Wire	
W 202	WWD0081A2	MIC Cable Lead Wire	
W 203	WWG2193A	Cable W/Connector	
XU 201	1C61-0324050	SQ Connector/P	

Model No.	EB-3610/3611	Name	RF Unit
Ref. No.	Part No.	Part Name & Description	Remarks
C 0301	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%	
C 0302	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0303	YGM1C331J1HT	Capacitor CE-CH 50V 330pF ± 5%	
C 0304	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0305	YGM1B102K1HT	Capacitor CE-CH 50V 1nF ± 10%	
C 0306	YGM1C331J1HT	Capacitor CE-CH 50V 330pF ± 5%	
C 0307	YGM1C030C1HT	Capacitor CE-CH 50V 3pF ± 0.25pF	
C 0308	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%	
C 0309	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%	
C 0310	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0311	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0312	ECST1AY475ZR	E.Capacitor TANTA 10V 4.7 μF ± 20%	
C 0313	ECST1CY105ZR	E.Capacitor TANTA 16V 1 μF ± 20%	
C 0314	ECST1AY475ZR	E.Capacitor TANTA 10V 4.7 μF ± 20%	
C 0317	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 0318	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 0319	YGM1C020C1HT	Capacitor CE-CH 50V 2pF ± 0.25pF	
C 0320	YGM1C020C1HT	Capacitor CE-CH 50V 2pF ± 0.25pF	
C 0321	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 0322	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 0323	YGM1C030C1HT	Capacitor CE-CH 50V 3pF ± 0.25pF	
C 0324	YGM1C100D1HT	Capacitor CE-CH 50V 10pF ± 5%	
C 0325	ECST1AY475ZR	E.Capacitor TANTA 10V 4.7 μF ± 20%	
C 0326	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%	
C 0327	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%	
C 0328	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0329	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%	
C 0330	YGM1B102H1HT	Capacitor CE-CH 50V 1nF ± 10%	
C 0331	ECST1AX685ZR	E.Capacitor TANTA ± 20%	
C 0333	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0335	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0338	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0340	ECST1CY105ZR	E.Capacitor TANTA 16V 1 μF ± 20%	
C 0341	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 0345	ECST1AX685ZR	E.Capacitor TANTA ± 20%	
C 0346	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%	
C 0347	ECST1AY475ZR	E.Capacitor TANTA 10V 4.7 μF ± 20%	
C 0348	ECST1AY475ZR	E.Capacitor TANTA 10V 4.7 μF ± 20%	
C 0349	ECST1AX685ZR	E.Capacitor TANTA 10V 6.8μF ± 20%	
C 0350	YGM1C010C1HT	Capacitor CE-CH 50V 1pF ± 0.25pF	

Model No.	EB-3610/3611	Name	RF Unit	
Ref. No.	Part No.	Part Name & Description		Remarks
C 0351	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 0352	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%		
C 0353	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 0354	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 0361	YGM3F105Z1CT	Capacitor CE-CH 16V 1 μF +80%, -20%		
C 3101	YGM1C060D1HT	Capacitor CE-CH 50V 6pF ± 5%		
C 3102	YGM1C020C1HT	Capacitor CE-CH 50V 2pF ± 0.25pF		
C 3103	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3105	YGM1C030C1HT	Capacitor CE-CH 50V 3pF ± 0.25pF		
C 3106	YGM1C040C1HT	Capacitor CE-CH 50V 4pF ± 0.25pF		
C 3107	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3108	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3109	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3110	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3111	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3112	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3113	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3115	YGM1C080D1HT	Capacitor CE-CH 50V 8pF ± 5%		
C 3116	YGM1C220J1HT	Capacitor CE-CH 50V 22pF ± 5%		
C 3119	YGM1C220J1HT	Capacitor CE-CH 50V 22pF ± 5%		
C 3120	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3124	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3125	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3127	ECRJA020E12W	V. Air Capacitor 100V 20pF 4.5pF		
C 3128	YGM1C390J1HT	Capacitor CE-CH 50V 39pF ± 5%		
C 3129	YGM1C390J1HT	Capacitor CE-CH 50V 39pF ± 5%		
C 3130	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3131	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3132	YGM3F105Z1CT	Capacitor CE-CH 16V 1 μF +80%, -20%		
C 3133	ECST1AY475ZR	E.Capacitor TANTA 10V 4.7 μF ± 20%		
C 3134	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3136	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3137	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3138	YGM1C100D1HT	Capacitor CE-CH 50V 10pF ± 5%		
C 3139	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3140	YGM1C331J1HT	Capacitor CE-CH 50V 330pF ± 5%		
C 3141	YGM1C331J1HT	Capacitor CE-CH 50V 330pF ± 5%		
C 3142	ECST1CY105ZR	E.Capacitor TANTA 16V 1 μF ± 20%		
C 3143	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3144	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		

Model No.	EB-3610/3611	Name	RF Unit	
Ref. No.	Part No.	Part Name & Description		Remarks
C 3146	ECST1AY475ZR	E.Capacitor TANTA 10V 4.7 μF ± 20%		
C 3147	YGM1B102K1HT	Capacitor CE-CH 50V 1nF ± 10%		
C 3148	ECST1AY475ZR	E.Capacitor TANTA 10V 4.7 μF ± 20%		
C 3149	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3150	YGM1C010C1HT	Capacitor CE-CH 50V 1pF ± 0.25pF		
C 3151	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3152	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3153	YGM1C040C1HT	Capacitor CE-CH 50V 4pF ± 0.25pF		
C 3154	YGM1C010C1HT	Capacitor CE-CH 50V 1pF ± 0.25pF		
C 3156	ECST1CY105ZR	E.Capacitor TANTA 16V 1 μF ± 20%		
C 3157	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3159	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3160	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3161	YGM1C050C1HT	Capacitor CE-CH 50V 5pF ± 0.25pF		
C 3162	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3163	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3164	YGM1C331H1HT	Capacitor CE-CH 50V 330pF ± 5%		
C 3165	ECST1CY105ZR	E.Capacitor TANTA 16V 1 μF ± 20%		
C 3166	YGM1C010C1HT	Capacitor CE-CH 50V 1pF ± 0.25pF		
C 3167	ECST1CY105ZR	E.Capacitor TANTA 16V 1 μF ± 20%		
C 3168	YGM1C331J1HT	Capacitor CE-CH 50V 330pF ± 5%		
C 3170	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3171	YGM1C020C1HT	Capacitor CE-CH 50V 2pF ± 0.25pF		
C 3172	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3173	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3174	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%		
C 3175	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3176	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3201	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3202	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%		
C 3203	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3204	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3205	YGM1C040C1HT	Capacitor CE-CH 50V 4pF ± 0.25pF		
C 3211	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%		
C 3213	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3214	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3215	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%		
C 3216	YGM1C101J1HT	Capacitor CE-CH 50V 100pF ± 5%		
C 3217	YGM1C1R5C1HT	Capacitor CE-CH 50V 1.5pF ± 0.25pF		
C 3230	YGM1C060D1HT	Capacitor CE-CH 50V 6pF ± 5%		

Model No.	EB-3610/3611	Name	RF Unit
Ref. No.	Part No.	Part Name & Description	Remarks
C 3231	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 3232	YGM1B102K1HT	Capacitor CE-CH 50V 1nF ± 10%	
C 3233	YGM1B103K1ET	Capacitor CE-CH 25V 10nF ± 10%	
C 3234	YGM3F105Z1CT	Capacitor CE-CH 16V 1 μF +80%,-20%	
C 3235	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3236	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3237	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3238	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3239	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3240	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%	
C 3241	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3242	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3243	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3244	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3245	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%	
C 3246	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%	
C 3247	YGM1C270J1HT	Capacitor CE-CH 50V 27pF ± 5%	
C 3251	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%	
C 3253	YGM1C470J1HT	Capacitor CE-CH 50V 47pF ± 5%	
C 3254	YGM1CR75C1HT	Capacitor CE-CH 50V 0.75pF ± 0.25pF	

Model No.	EB-3610/3611	Name	RF Unit
Ref. No.	Part No.	Part Name & Description	Remarks
D 0301	YDA114T106	Diode 80V 100mA	
D 0304	YHMS2812T31	Diode 20V 250mA	
D 3201	MA8051L-TX	Zener Diode	
D 3202	YDA112T106	Diode	
E 0301	4R6635		
FL 0301	FLF0195C	Mechanical Filter 50 Ω 888.5 MHz	
FL 3101	FLE0051A	Mechanical Filter 91.9875MHz IF Filter	
FL 3102	FLB0080A	Ceramic Filter 455 KHz	
FL 3103	FLB0080A	Ceramic Filter 455 KHz	
FL 3104	FLF0196C	Mechanical Filter 50 Ω 1025.5MHz	
FL 3105	FLF0192B	Mechanical Filter 50 Ω 888.5/933.5MHz	
J 0301	JJC0292B	SQ Connector/J -	
J 0302	JJC0309A	SQ Connector/J 1Pin	
J 0303	JJC0292B	SQ Connector/J -	
J 0304	JJC0293B	SQ Connector/J	
L 3101	ELJNCR18KF	RF Coil 180NH	
L 3102	L2012DR22KT	RF Coil 0.22 μH	
L 3103	ELJNCR39KF	RF Coil 390NH	
L 3104	LLB0449A	RF Coil 455kHz Discr Coil	
L 3105	ELJFCR22MF	RF Coil 0.22 μH	
P 0301	DF9-19P1V50	SQ Connector/P 19 P	

Model No.	EB-3610/3611	Name	RF Unit
Ref. No.	Part No.	Part Name & Description	Remarks
Q 0301	2SD1823ST-TX	DISCON	
Q 0302	2SC4226T1B	-	
Q 0303	2SC4093T1B	1	
Q 0304	2SB956RS-TX	200MHz 20V 1W	
Q 0305	YDTC143TU-TX	250MHz 40V 300mW	
Q 0307	YDTA143XU-TX	250MHz 30V 200mW	
Q 0308	2SB956RS-TX	200MHz 20V 1W	
Q 0309	YDTA143EU-TX	3k Ω 2.5k Ω 100mW	
Q 0311	YIMZ1T108		
Q 3101	2SC4226T1B	-	
Q 3102	2SC4226T1B	-	
Q 3103	2SC3932TX	2GHz 20V 150mW	
Q 3104	YDTA143XU-TX	250MHz 30V 200mW	
Q 3105	2SD1823ST-TX	DISCON	
Q 3106	2SC4226T1B	-	
Q 3201	YDTA143XU-TX	250MHz 30V 200mW	
Q 3202	2SD1823ST-TX	DISCON	
Q 3203	YIMZ1T108		

Model No.	EB-3610/3611	Name	RF Unit
Ref. No.	Part No.	Part Name & Description	Remarks
R 0301	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%	
R 0302	ERJ3GEYJ182V	Resistor CA-CH 62.5mW 1.8k Ω \pm 5%	
R 0303	ERJ3GEYJ223V	Resistor CA-CH 62.5mW 22k Ω \pm 5%	
R 0304	ERJ3GEYJ150V	Resistor CA-CH 62.5mW 15 Ω \pm 5%	
R 0305	ERJ3GEYJ150V	Resistor CA-CH 62.5mW 15 Ω \pm 5%	
R 0306	ERJ3GEYJ150V	Resistor CA-CH 62.5mW 15 Ω \pm 5%	
R 0307	ERJ3GEYJ333V	Resistor CA-CH 62.5mW 33k Ω \pm 5%	
R 0308	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%	
R 0309	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%	
R 0310	ERJ3GEYJ101V	Resistor CA-CH 62.5mW 100 Ω \pm 5%	
R 0311	ERJ3GEYJ101V	Resistor CA-CH 62.5mW 100 Ω \pm 5%	
R 0312	ERJ3GEYJ272V	Resistor CA-CH 62.5mW 2.7k Ω \pm 5%	
R 0313	ERJ3GEYJ472V	Resistor CA-CH 62.5mW 4.7k Ω \pm 5%	
R 0314	ERJ3GEYJ220V	Resistor CA-CH 62.5mW 22 Ω \pm 5%	
R 0316	ERJ3GEYJ104V	Resistor CA-CH 62.5mW 100k Ω \pm 5%	
R 0317	ERJ3GEYJ271V	Resistor CA-CH 62.5mW 270 Ω \pm 5%	
R 0318	ERJ3GEYJ333V	Resistor CA-CH 62.5mW 33k Ω \pm 5%	
R 0319	ERJ3GEYJ470V	Resistor CA-CH 62.5mW 47 Ω \pm 5%	
R 0321	ERJ3GEYJ471V	Resistor CA-CH 62.5mW 470 Ω \pm 5%	
R 0322	ERJ3GEYJ120V	Resistor CA-CH 62.5mW 12 Ω \pm 5%	
R 0323	ERJ3GEYJ471V	Resistor CA-CH 62.5mW 470 Ω \pm 5%	
R 0324	ERJ3GEYJ151V	Resistor CA-CH 62.5mW 150 Ω \pm 5%	
R 0325	ERJ3GEYJ271V	Resistor CA-CH 62.5mW 270 Ω \pm 5%	
R 0326	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%	
R 0327	ERJ3GEYJ333V	Resistor CA-CH 62.5mW 33k Ω \pm 5%	
R 0335	ERJ3GEYJ221V	Resistor CA-CH 62.5mW 220 Ω \pm 5%	
R 0336	ERJ3GEYJ121V	Resistor CA-CH 62.5mW 120 Ω \pm 5%	
R 0341	ERJ3GEYJ822V	Resistor CA-CH 62.5mW 8.2k Ω \pm 5%	
R 0342	ERJ3GEYJ392V	Resistor CA-CH 62.5mW 3.9k Ω \pm 5%	
R 0343	ERJ3GEYJ470V	Resistor CA-CH 62.5mW 47 Ω \pm 5%	
R 0344	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%	
R 0345	ERJ3GEYJ222V	Resistor CA-CH 62.5mW 2.2k Ω \pm 5%	
R 0346	ERJ3GEYJ153V	Resistor CA-CH 62.5mW 15k Ω \pm 5%	
R 0348	ERJ3GEYJ222V	Resistor CA-CH 62.5mW 2.2k Ω \pm 5%	
R 0355	ERJ3GEYJ470V	Resistor CA-CH 62.5mW 47 Ω \pm 5%	
R 0356	ERJ3GEYJ470V	Resistor CA-CH 62.5mW 47 Ω \pm 5%	
R 3101	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%	
R 3102	ERJ3GEYJ561V	Resistor CA-CH 62.5mW 560 Ω \pm 5%	
R 3103	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%	
R 3104	ERJ3GEYJ221V	Resistor CA-CH 62.5mW 220 Ω \pm 5%	

Model No.	EB-3610/3611	Name	RF Unit	
Ref. No.	Part No.	Part Name & Description		Remarks
R 3105	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%		
R 3106	ERJ3GEYJ471V	Resistor CA-CH 62.5mW 470 Ω \pm 5%		
R 3107	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%		
R 3109	ERJ3GEYJ470V	Resistor CA-CH 62.5mW 47 Ω \pm 5%		
R 3110	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%		
R 3111	ERJ3GEYJ152V	Resistor CA-CH 62.5mW 1.5k Ω \pm 5%		
R 3112	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%		
R 3113	ERJ3GEYJ471V	Resistor CA-CH 62.5mW 470 Ω \pm 5%		
R 3114	ERJ3GEYJ470V	Resistor CA-CH 62.5mW 47 Ω \pm 5%		
R 3116	ERJ3GEYJ681V	Resistor CA-CH 62.5mW 680 Ω \pm 5%		
R 3118	ERJ3GEYJ104V	Resistor CA-CH 62.5mW 100k Ω \pm 5%		
R 3119	ERJ3GEYJ562V	Resistor CA-CH 62.5mW 5.6k Ω \pm 5%		
R 3120	ERJ3GEYJ223V	Resistor CA-CH 62.5mW 22k Ω \pm 5%		
R 3122	ERJ3GEYJ273V	Resistor CA-CH 62.5mW 27k Ω \pm 5%		
R 3123	ERJ3GEYJ472V	Resistor CA-CH 62.5mW 4.7k Ω \pm 5%		
R 3125	ERJ3GEYJ104V	Resistor CA-CH 62.5mW 100k Ω \pm 5%		
R 3126	ERJ3GEYJ331V	Resistor CA-CH 62.5mW 330 Ω \pm 5%		
R 3128	ERJ3GEYJ123V	Resistor CA-CH 62.5mW 12k Ω \pm 5%		
R 3129	ERJ3GEYJ123V	Resistor CA-CH 62.5mW 12k Ω \pm 5%		
R 3130	ERJ3GEYJ150V	Resistor CA-CH 62.5mW 15 Ω \pm 5%		
R 3131	ERJ3GEYJ150V	Resistor CA-CH 62.5mW 15 Ω \pm 5%		
R 3132	ERJ3GEYJ150V	Resistor CA-CH 62.5mW 15 Ω \pm 5%		
R 3133	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%		
R 3134	ERJ3GEYJ101V	Resistor CA-CH 62.5mW 100 Ω \pm 5%		
R 3135	ERJ3GEYJ182V	Resistor CA-CH 62.5mW 1.8k Ω \pm 5%		
R 3136	EVM7MSX00B24	V.Resistor CA-CH 50mW 20k Ω B		
R 3138	ERJ3GEYJ100V	Resistor CA-CH 62.5mW 10 Ω \pm 5%		
R 3201	ERJ3GEYJ101V	Resistor CA-CH 62.5mW 100 Ω \pm 5%		
R 3202	ERJ3GEYJ221V	Resistor CA-CH 62.5mW 220 Ω \pm 5%		
R 3203	ERJ3GEYJ122V	Resistor CA-CH 62.5mW 1.2k Ω \pm 5%		
R 3204	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%		
R 3205	ERSL18J102U	Resistor CA-CH 125mW 1k Ω \pm 5%		
R 3210	ERJ3GEYJ272V	Resistor CA-CH 62.5mW 2.7k Ω \pm 5%		
R 3211	ERJ3GEYJ472V	Resistor CA-CH 62.5mW 4.7k Ω \pm 5%		
R 3212	ERJ3GEYJ221V	Resistor CA-CH 62.5mW 220 Ω \pm 5%		
R 3213	ERJ3GEYJ103V	Resistor CA-CH 62.5mW 10k Ω \pm 5%		
R 3214	ERJ3GEYJ221V	Resistor CA-CH 62.5mW 220 Ω \pm 5%		
R 3215	ERJ3GEYJ472V	Resistor CA-CH 62.5mW 4.7k Ω \pm 5%		
R 3216	ERJ3GEYJ102V	Resistor CA-CH 62.5mW 1k Ω \pm 5%		
R 3217	ERJ3GEYJ561V	Resistor CA-CH 62.5mW 560 Ω \pm 5%		

Model No.	EB-3610?3611	Name	RF Unit	
Ref. No.	Part No.	Part Name & Description		Remarks
R 3219	ERJ3GEY0R00V	Resistor CA-CH 62.5mW 0 Ω		
U 0301	MB1501LFPT	IC Bipolar Linear		
U 0302	UUE0110B	Hybrid IC 872-905MHz 6V		
U 0305	YULGY0002	IC Bipolar Logic -		
U 3101	Y2951CMFL63	IC Bipolar Linear Regulator		
U 3102	YMB1502FPT	IC Bipolar Linear -		
U 3103	YCXA1343N	IC Bipolar Linear IF IC		
Y 0301	YYD0237H	Mechanical Filter 872-905MHz		
Y 3101	YYA0354A	Crystal Filter 91.5325MHz		
Y 3102	YYD0239H	Mechanical Filter 1009-1042MHz		

Model No.	EB-3610/3611	Name	RF SUB-1	
Ref. No.	Part No.	Part Name & Description		Remarks
P 0302	PPC0448B	SQ Connector/P		
p 0303	PPC0475B	SQ Connector/P	1 Pin	
R 3139	ERJ3GEYJ561V	Resistor CA-CH 62.5mW	560 Ω \pm 5%	
Y 3103	YYD0228B	Mechanical Filter	12.8MHz	

Model No.	EB-3610/3611	Name	RF SUB-2		
Ref. No.	Part No.	Part Name & Description			Remarks
C 0342	YGM2B333K1ET	Capacitor CE-CH	25V 33nF	\pm 10%	
C 0344	YGM1C101J1HT	Capacitor CE-CH	50V 100pF	\pm 5%	
C 3255	YGM1C470J1HT	Capacitor CE-CH	50V 47pF	\pm 5%	
P 0304	PPC0448B	SQ Connector/P			
P 0305	PPC0449B	SQ Connector/P			
R 0328	EVM7MSX00B14	V.Resistor CA-CH 50mW	10k Ω	B	
R 0329	ERJ3GEYJ273V	Resistor CA-CH 62.5mW	27k Ω	\pm 5%	
R 0330	ERJ3GEYJ682V	Resistor CA-CH 62.5mW	6.8k Ω	\pm 5%	
R 0331	ERJ3GEYJ822V	Resistor CA-CH 62.5mW	8.2k Ω	\pm 5%	
R 0332	ERJ3GEYJ152V	Resistor CA-CH 62.5mW	1.5k Ω	\pm 5%	
R 0333	ERJ3GEYJ821V	Resistor CA-CH 62.5mW	820 Ω	\pm 5%	
R 0334	EVM7MSX00B53	V.Resistor CA-CH 50mW	5k Ω	B	
R 0337	ERJ3GEYJ223V	Resistor CA-CH 62.5mW	22k Ω	\pm 5%	
R 0338	ERJ3GEYJ124V	Resistor CA-CH 62.5mW	120k Ω	\pm 5%	
R 0339	ERJ3GEYJ153V	Resistor CA-CH 62.5mW	15k Ω	\pm 5%	
R 0349	ERJ3GEYJ103V	Resistor CA-CH 62.5mW	10k Ω	\pm 5%	
R 0350	ERJ3GEYJ103V	Resistor CA-CH 62.5mW	10k Ω	\pm 5%	
R 0351	ERJ3GEYJ103V	Resistor CA-CH 62.5mW	10k Ω	\pm 5%	
R 0354	ERJ3GEY0R00V	Resistor CA-CH 62.5mW	0 Ω		
U 0303	AN1358S	IC Bipolar Linear	OP-AMP	8-DIP	
U 0304	MN4051BS	IC Bipolar Logic	8CH MPX/	DMPX	

Model No.	EB-3610/3611	Name	EPI-2 Body-1
Ref. No.	Part No.	Part Name & Description	Remarks
LS 101	EFV-RT33I161	Speaker	
S 101	4D29542B	REED Switch	
P 101	A4B4PA2DS	SQ Connector/J	
E 101	EEC3855C	Antenna Ant Element Match Net (UK)	
E 102	4R13470		
E 103	EEB0101A		
E 104	EEB0103A		

Model No.	KBH0341A		Name	BODY
Ref. No.	Part No.	Part Name & Description		Remarks
①	XSB2.5+7FN			
②	XYN2+J6FN			
M 101	5FB5392DA	Cover A		
M 102	5FA5340CA	Case		
M 103	5FC5210B	LCD Panel A		
M 104	6ZA5378A	LCD Sheet		
M 105	5BF5078BB	Key Sheet B		
M 106	5FF5050C	REC Holder		
M 107	1CA5766C	ANT Shield Upper		
M 108	1CA5768A	ANT Shield Lower		
M 109	1CA5767A	ANT Shield Side		
M 111	6DA5054A	REC Net		
M 112	4R13262-7	REC Cushion		
M 113	6ZA5379A	Insulator Side		
M 114	6ZA5375B	Insulator Lower		
M 115	6ZA5417A	Stopper Sheet		
M 117	5E10007A	Spacer		
M 118	6ZA5428A	Spacer		
M 119	6ZA5429A	Spacer		
M 120	6ZA5429A	Spacer		
M 121	6ZA5375B	Insulator		

Model No.	KBU0343A		Name	RF UNIT
Ref. No.	Part No.	Part Name & Description		Remarks
M 301	1CA5734C	Shield Frame		
M 302	1CA5776B	Shield Cover Lower		
M 304	1CA6006B	Shield Case		
M 305	6ZA5426A	Insulator		
M 309	1CA5938A	Earth Plate		
M 310	1CA5936A	Earth Plate		
M 311	1CA5943A	Earth Plate		
M 312	5EZ5864B	Shield Film		
M 316	5AB5479A	Cushion		
M 318	1CA5979B	Earth Plate		
M 319	1D00001A	Finger		
M 320	5H10005B	Insulator		
M 322	5E10037A	Cushion		

Model No.	KBZ0438A	Name	NAME PLATE
Ref. No.	Part No.	Part Name & Description	Remarks
M 191	7AB5617AB	Name Plate	
M 192	7AC5694A	Green Label	

Model No.	KBL0346A	Name	CONTROL
Ref. No.	Part No.	Part Name & Description	Remarks
M 201	1BB5391A	LCD Bracket	
M 202	5AB5424A	LCD Cushion A	
M 203	5AB5425A	LCD Cushion B	
M 204	5ZA5117A	Interconnector W	
M 206	5BB5059B	Mic Holder	
M 207	5FJ5260A	Key Case	
M 208	5ZA51118A	Interconnector S	
M 209	5AB5462A	Cushion	

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