CLIO SERVICE MANUAL

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VADEM

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Document Control Sheet

Change Record

Rev	ECO #	Description	Date	Approved
A		Initial draft		
B	C00088	Updated diagnostics	11/20/98	
C	C00162	Update diagnostics, TOO	02/1/99	
D		Update spare kits, add photo section, remove FRU list, add standing service order, modify final test diagnostic	5/18/99	

Conventions

This manual uses several notational conventions to present information of special importance:

WARNING: WARNINGS INDICATE ITEMS WHICH, IF NOT PAID STRICT ATTENTION TO, COULD POSSIBLY CAUSE PHYSICAL INJURY AND/OR DAMAGE TO EQUIPMENT.

NOTE: Notes detail important things to keep in mind. No personal injury or equipment damage will occur due to disregarding a note.

Lists of items, points to consider, or procedures that do not need to be performed in a specific order appear in bullet format:

- Item 1
- Item 2

Procedures that must be followed in a specific order appear in numbered steps:

1. Perform this step first
2. Perform this step second

Specific keyboard keys are depicted in square brackets and are capitalized, for example: [ESC]. If more than one key should be pressed simultaneously, the notation will appear as [KEY1]+[KEY 2], for example [ALT]+[F4].

NOTE: The notation [tap] may appear in this document. It signifies a stylus or finger tapping a touch screen.

Buttons and knobs are depicted in round brackets and are capitalized and italicized, for example: {*RESET*}.

Code appears in 8 point Courier font, for example:
`\\HKEY\CURRENT_USER`

Screen prompts are displayed in bold Courier font, for example:

`Start`

Items you must type appear in standard Courier font, for example:

```
cd\letters\business\legal [ENTER]
```

Table of Contents

Introduction

This document describes warranty and other repair of the PV-6000 platform. This document was obtained by extracting information from the Vadem document “Clio Specification”. Likewise, sections from this document may be extracted to form portions of other documents.

Audience

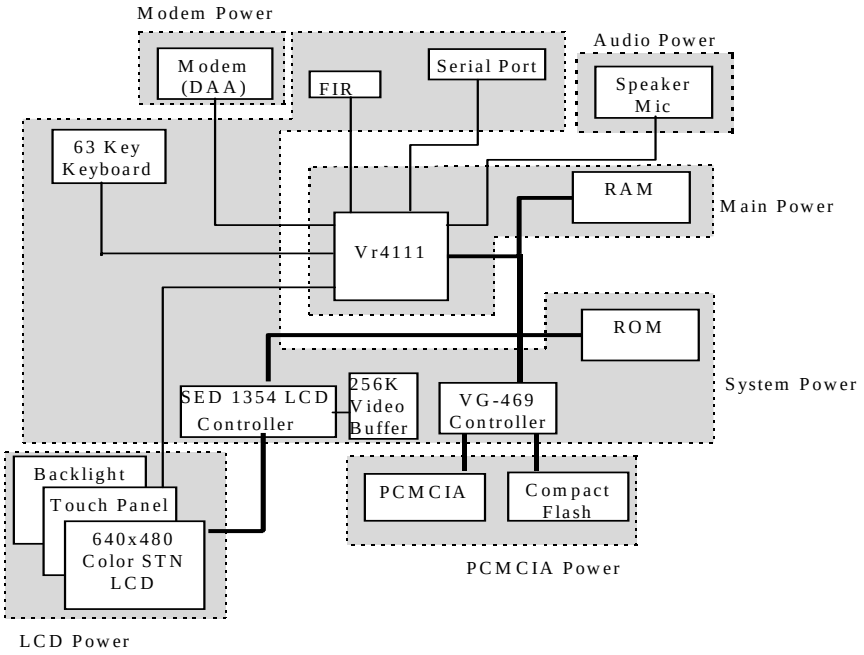
The audience for this document is primarily Vadem authorized Clio service centers and/or other external parties as deemed fit by Vadem management.

1. THEORY OF OPERATION

This chapter provides detailed descriptions of CLIO components and their architecture, layout, and function.

1.1. BLOCK DIAGRAM

CLIO hardware is laid out as follows:



1.2. CPU

The CLIO uses the VR4111 MIPS CPU running at various speeds depending on how it is configured. Refer to the following table:

CLKSEL [2 . . 0]	CPU Core Freq.	BUSCLK Freq.
000	49.1MHz	6.13
001	62.1MHz	5.17
010	65.4MHz	5.45
011	69.3MHz	5.77
100*	78.5MHz	6.54

CLKSEL [2 . . 0]	CPU Core Freq.	BUSCLK Freq.
101	84.1MHz	7.01
110	90.6MHz	5.67
111	98.1MHz	6.13

*=standard CLIO setup

1.3. MEMORY

CLIO contains two memory modules: one each ROM and RAM.

1.3.1. ROM

CLIO supports a single custom ROM module which can house 24MB or 32MB of Mask ROM or 8MB or 16MB of Flash ROM. The ROM module mounts on the main board in a user-friendly fashion, and is distinguishable from the RAM module due to its offset connectors. ROM's run on 3.3V.

The ROM types used are as follows:

- Flash ROM: 32 Mbit, 32 bit wide, 3.3V/5V, 60ns/120ns
- Mask ROM: 64 Mbit, 32 bit wide, 3.3V, page mode, 100ns/30ns

To upgrade the ROM module, use the following procedure:

1. Backup or synchronize CLIO by docking the unit and using H/PC Explorer tools.
2. Remove main battery and AC power.
3. Remove and discard the old ROM set.
4. Install the new ROM set.
5. Replace battery and (optionally) AC power.
6. Perform a hard reset.
7. Power on unit.
8. Restore from backup.

1.3.2. RAM

CLIO supports a single custom RAM module which can house 16MB or 32MB of EDO RAM. The RAM module mounts on the main board in a user-friendly fashion. The RAM type used is 64Mbit EDO RAM, 16 bits wide, 3.3V, 60ns, self-refresh.

To upgrade the RAM module, use the following procedure:

1. Backup or synchronize CLIO by docking the unit and using H/PC Explorer tools.

2. Remove main battery and AC power.
3. Remove and discard the old RAM set.
4. Install the new RAM set.
5. Replace batteries and (optionally) AC power.
6. Perform a hard reset.
7. Power on unit.
8. Restore from backup or synchronize.

1.4. MEMORY MODULE ACCESS DOOR

The user may upgrade the CLIO's RAM and ROM modules if necessary. Memory modules are accessible via a single access door in the bottom of the CLIO.

The door locks down using a single screw and the user can use a screwdriver to release it. A micro-switch senses when the door is opened. This prevents the user from exchanging any of the memory modules while the unit is still on. This micro-switch places the CLIO in 'hibernate' mode.

There is a warning label inside the door warning the user that RAM contents will be lost if the user fails to back up data before removing the RAM or ROM module. The label instructs the user to remove the main battery and AC power before replacing either the RAM or ROM module.

1.5. PC CARD (PCMCIA)

CLIO supports one PC Card Type I or Type II card. The PC Card slot supports Off, 3.3 and 5V for Vcc and Off. CLIO only supports ATA Flash cards, since support is not included for 12V. The PC Card slot supports the following memory cards:

- SRAM Card: These use the DOS FAT file system, and are limited to 64Mb maximum.
- ATA Flash Card: These cards also use the DOS FAT system; their maximum size is the IDE Limit.

See section 1.23 for details on the types of cards supported by the PC Card slot.

1.6. COMPACT FLASH

CLIO contains one Compact Flash slot. The slot is only accessible by removing both the battery door and main battery. The main purpose of the Compact Flash slot is to add secondary storage for continuous use. The internal placement of the Compact Flash slot does not facilitate frequent swapping of the Compact Flash card between the CLIO and other devices (like a digital still camera).

Compact Flash is supported via a single PC Card/Compact Flash driver for the VG-469 PCMCIA Controller which supports two PCMCIA slots. The Compact Flash slot is configured to appear as a PCMCIA slot to the VG-469.

The Compact Flash slot will support Off and 3.3V and 5V for Vcc. There is no Vpp for Compact Flash. Compact Flash supports ATA Flash cards using the DOS FAT file system. These cards may be any size up to the IDE Limit.

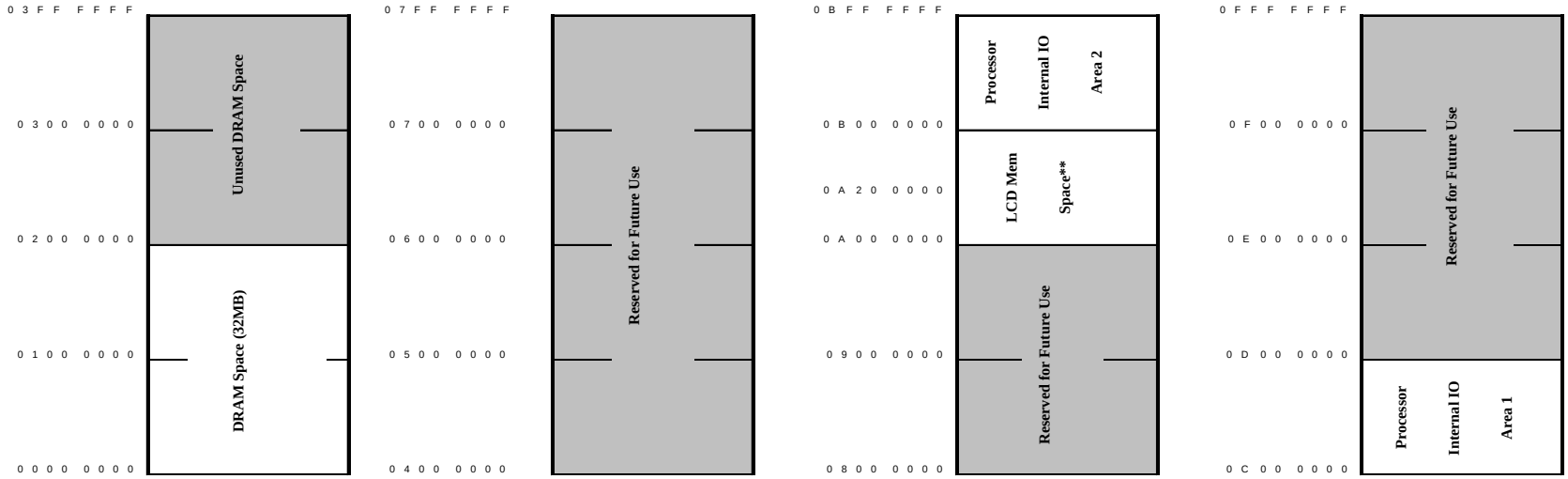
NOTE: The Compact Flash does not support the "Compact Flash Type II" specification that Microsoft is expected to propose. The anticipated specification (no final version has been proposed) cannot be supported because of its increased thickness (5mm vs. the standard 3.3mm). It is also expected that the slot could not support wireless one-way pager cards (the main reason for the new specification) because it is not an externally exposed slot.

1.7. EEPROM

CLIO contains a 2K serial EEPROM. This is an internal feature used by Vadem engineering to store system and user data. Data stored in the EEPROM is not accessible by any software application unless the application has been developed by or in partnership with Vadem engineering. Possible data to be stored include serial number, manufacturing and system information, encryption keys, registry information, and internet access information.

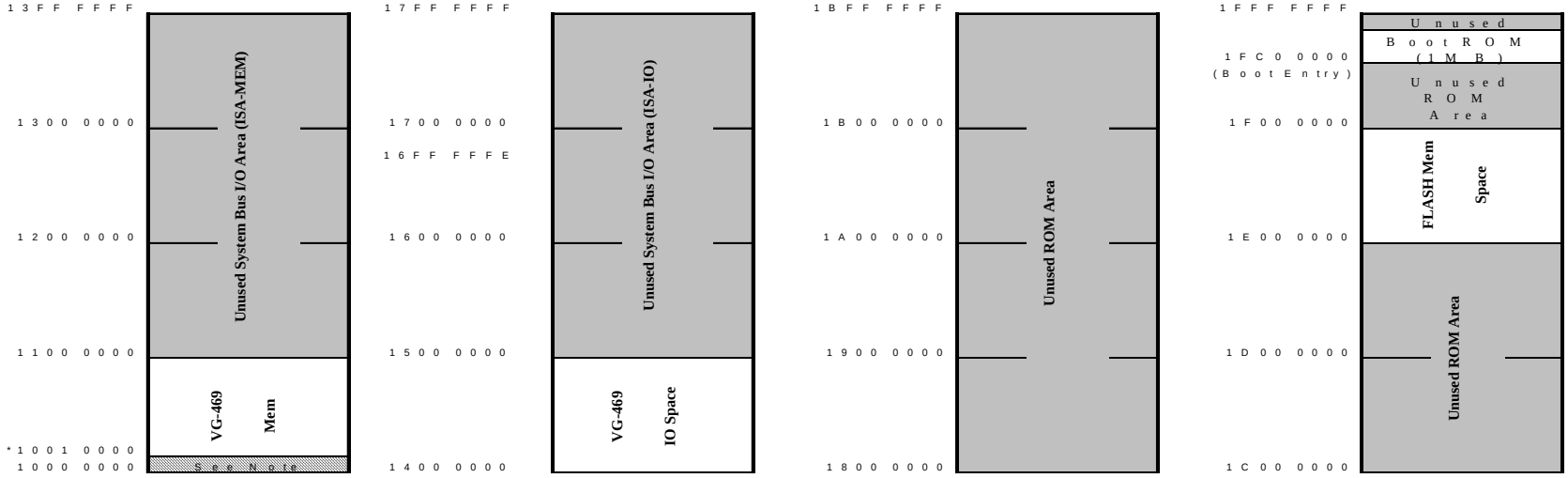
1.8. PHYSICAL MEMORY MAP

Please refer to the following page for the CLIO memory map diagram:



** LCD Memory Space is divided into S-MOS (Epson 1354) Registers and Video Frame Buffer
S-MOS Registers 0x0A200 0000 - 0x0A3F FFFF
Video Frame Buffer 0x0A00 0000 - 0x0A1F FFFF

Note: When using debugger, write/read address
Add 0xA000 0000 to Physicaladdress for Unached, No TLB
Add 0x8000 0000 to Physicaladdress for Cached, No TLB
(We only use 32-bit mode)



* Note: The VG-469 does not allow system memory mapping in the range of 1000 0000 - 1000 FFFF

1.9. DISPLAY

CLIO has a 9.4" 640 x 480 DSTN display. CLIO supports 256 colors via the S-MOS SED 1354 LCD controller (8-bit color, 3-3-2 fixed palette). The display has 32 levels of contrast control and 8 levels of brightness control, which the user will be able to adjust using the keyboard as follows:

- Increase Contrast: [ALT] + [>]
- Reduce Contrast: [ALT] + [<]
- Increase Brightness: [ALT] + [+]
- Reduce Brightness: [ALT] + [-]

1.10. TOUCH PANEL AND STYLUS

CLIO includes a resistive touch panel for directly manipulating the user interface using a plastic stylus. The touch panel should have a sampling rate, accuracy, and sensitivity sufficient to support tapping, drag and drop operations, drawing applications, and handwriting recognition applications.

The touch panel must also support the AutoHide Activation Area, a 2.5mm (min.) buffer between the outermost pixel of the LCD and the case frame in which the touch screen is enclosed. This region is employed by the user to activate the Windows Taskbar while it is in AutoHide mode. Please refer to the Jupiter Specification for details.

1.10.1. CALIBRATION

The user must be able to calibrate the touch panel. The calibration process allows the user to select a series of targets to fine-tune the accuracy of the touch panel.

Calibration occurs during the initial setup after a full reset of the CLIO unit. The user can re-calibrate at any time by using the Stylus control panel or by pressing [CTRL] + [ALT] + [=].

1.10.2. CONTROL PANEL SUPPORT

CLIO fully supports the Stylus control panel, which allows the user to re-calibrate the touch panel or to fine-tune the speed at which double-taps are recognized.

The Volume & Sounds control panel is also supported which allows the user to choose loud, soft, or no tap sound when the stylus touches the screen.

1.10.3. STYLUS

CLIO includes a plastic stylus for use with the touch screen and mounting points to store the stylus on the unit. The stylus mounts at the base of the screen so that the user can get to the stylus whether CLIO is in clamshell mode or tablet mode.

1.11. KEYBOARD

The keyboard has the following characteristics:

- 63 keys
- 2.5mm travel
- 16.5mm keycap center to keycap center
- keycap center size < 16mm
- 8.0 mm maximum keyboard assembly thickness

1.11.1. KEYBOARD REQUIREMENTS

The CLIO keyboard is a custom 63-key U.S. English keyboard, which must meet the following requirements. Please refer to the document '*Jupiter Hardware Overview*' for further guidelines:

- Chording keys ([SHIFT], [CTRL], [ALT], etc..) may be held down while simultaneously pressing any other key on the keyboard.
- The Windows CE shell and applications depend on [CTRL], [SHIFT], and [ALT] being able to chord with any key on the keyboard.
- The keyboard must support optional key repeat. The user may turn auto-repeat on and off via software control.
- The keyboard must support separate key-down and key-up events.
- The keyboard should support audio feedback on key down events.
- Minimum of 2-key rollover for all keys must be supported.
- Chording keys must always support a minimum of 3-key rollover in order to support double-chording, such as [CTRL] + [SHIFT] + [character].
- The keyboard must not preclude Microsoft Windows 95 sticky-keys functionality.
- In order to use the  key, Vadem must provide Microsoft with a signed copy of the Microsoft Windows Logo Key License Agreement. For pre-Jupiter CLIO shipments, this key may be assigned to be the FN key.

1.11.2. KEYS AND CHORDING COMBINATIONS

Unchorded Key	Right Shift	Left Shift	Ctrl	Right Alt	Left Alt
Left Alt	Chording	Chording	Chording	Chording	----
Right Alt	Chording	Chording	Chording	----	Chording
Ctrl	Chording	Chording	----	Chording	Chording
Left Shift	Chording	----	Chording	Chording	Chording
Right Shift	----	Chording	Chording	Chording	Chording
LC Alphabetic	Uppercase	Uppercase	App Specific	App Specific*	App Specific*
1	!	!	App Specific	Unicode Characters	Unicode Characters
2	@	@	App Specific	Unicode Characters	Unicode Characters
3	#	#	App Specific	Unicode Characters	Unicode Characters
4	$	$	App Specific	Unicode Characters	Unicode Characters
5	%	%	App Specific	Unicode Characters	Unicode Characters
6	^	^	App Specific	Unicode Characters	Unicode Characters
7	&	&	App Specific	Unicode Characters	Unicode Characters
8	*	*	App Specific	Unicode Characters	Unicode Characters
9	(	(	App Specific	Unicode Characters	Unicode Characters
0	)	)	App Specific	Unicode Characters	Unicode Characters
‘	“	“	App Specific	App Specific	App Specific
.	>	>	App Specific	Contrast +	Contrast +
,	<	<	App Specific	Contrast -	Contrast -
;	:	:	App Specific	App Specific	App Specific
=	+	+	App Specific	Brightness +	Brightness +
-	_	_	App Specific	Brightness -	Brightness -
[	{	{	App Specific	App Specific	App Specific
]	}	}	App Specific	App Specific	App Specific
\	|	|	App Specific	App Specific	App Specific
`	~	~	App Specific	App Specific	App Specific

Unchorded Key	Right Shift	Left Shift	Ctrl	Right Alt	Left Alt
/	?	?	App Specific	App Specific	App Specific
Esc	App Specific	App Specific	App Specific	App Specific	App Specific
Backspace	Delete	Delete	App Specific	App Specific	App Specific
→	App Specific	App Specific	App Specific	End	End
←	App Specific	App Specific	App Specific	Home	Home
↑	App Specific	App Specific	App Specific	Page Up	Page Up
↓	App Specific	App Specific	App Specific	Page Down	Page Down
Enter	App Specific	App Specific	App Specific	App Specific	App Specific
Spacebar	App Specific	App Specific	App Specific	App Specific	App Specific
Tab	Back Tab	Back Tab	App Specific	App Specific	App Specific

Except Alt-H, which is reserved for launching Help associated to the window with focus.

1.11.3. KEYBOARD LAYOUT

The following table depicts the approximate CLIO keyboard layout:

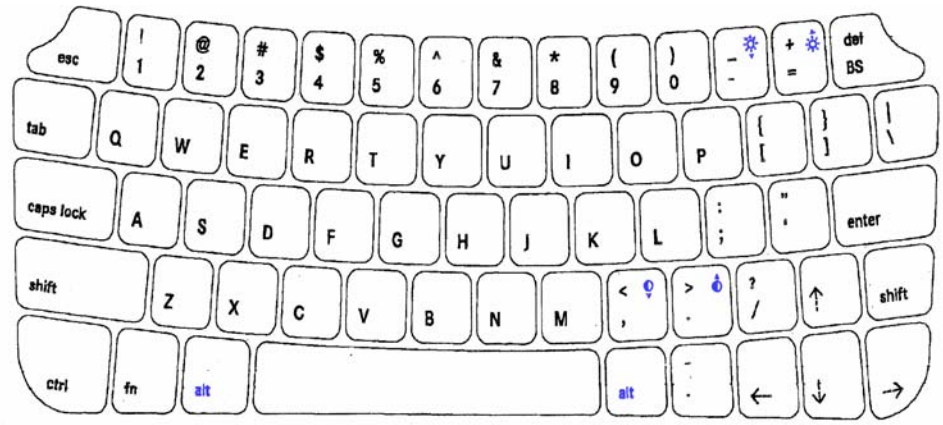
ESC	! 1	@ 2	# 3	$ 4	% 5	^ 6	& 7	* 8	(9	) 0	**Brt -** _ -	**Brt +** + =	DEL BS
TAB	Q	W	E	R	T	Y	U	I	O	P	{ [	}]	| \
CAPS LOCK	A	S	D	F	G	H	J	K	L	: ;	" '	ENTER	
SHIFT	Z	X	C	V	B	N	M	**Cnt -** < ,	**Cnt +** > .	? /	**PgUp** ↑	SHIFT	
CTRL		ALT	SPACE						FN	~ `	**Home** ←	**PgDn** ↓	**End** →

NOTES:

- Second [ALT] key (right side of space bar) may be used for Windows Menu key, if required for Jupiter class devices.
- The key will be the [FN] key for pre-Jupiter devices (dedicated).
- The [ALT] key label and Alt-chording key labels should appear in a different color than the rest of the keyboard labels to reinforce the connection between the [ALT] key and the chording combinations.

1.11.4. KEYBOARD MECHANICAL DRAWING

Following is a representative drawing of the actual CLIO keyboard layout. Note that the actual keyboard might vary slightly (the right [ALT] key is currently labeled [FN]:



1.11.5. CONTROL PANELS SUPPORT

The keyboard driver must support the Keyboard and Volume & Sounds controls panels. The Keyboard control panel allows the user to enable/disable key repeating, to set the delay before the first key repeat and to set the key repeat rate. The Volume & Sounds control panel allows the user to choose loud, soft or no key clicks when keyboard keys are pressed.

1.12. POWER

CLIO is designed to be the ultimate in portability. Thus, long battery life is key. CLIO can run continuously for 12-16 hours between charges of its rechargeable main battery pack and can run/charge via an AC Adapter. This provides the typical user with several days' use between charges.

CLIO has three power modes: active, standby, and hibernate. Active mode is when the unit is on and the CPU is not idle. Standby mode is when the unit is on but the CPU is idle. This can occur, for example, between keystrokes while the user is typing in a word processor. From the user's frame of reference, there is no difference between active and standby modes. Hibernate mode is when the unit draws the least amount of power. The screen is off and, as far as the user is concerned, the unit is off.

1.12.1. AC

An AC Adapter providing 9 volts DC at 1.1 amperes can power CLIO. The AC Adapter attaches to the side of the CLIO via a standard barrel-style connector. The AC Adapter provides power to both run the CLIO unit and charge the main and backup batteries. CLIO supports the use of two separate types of adapters:

- U.S. AC Adapter (110V)

- ❖ international AC Adapter (100-240V).

The AC Adapters are both as small and lightweight as possible.

1.12.2. MAIN BATTERY

CLIO uses a custom 4-cell lithium ion rechargeable battery pack providing 19.3Wh (2,700mAH). The battery cycle life is 80% capacity after 500 charges.

1.12.3. BACKUP BATTERY

The Backup Battery supports relatively short periods of time when there is no power supplied to the unit. This can occur when the user is swapping main batteries or when the main battery is dead. In order to preserve memory contents, the unit should remain in hibernate mode when power is supplied only by the backup battery.

CLIO uses a rechargeable lithium coin cell backup battery. This battery provides 50mAh. The unit cannot run using the backup battery alone. The backup battery only serves to preserve memory contents.

1.12.4. CHARGING INDICATOR

CLIO has an LED to indicate battery charging, and battery charged. The LED is located in the front of the unit so that it is visible whether the unit is open or closed. The Charging Indicator has two color states: Green and Orange. It is housed within the Notification Switch (see section 1.20.1) so that the user can press the switch to turn off the low battery warning.

Charging Indicator	CLIO State	User Action	Charging Indicator After Action
Off	Not charging Battery at >10%		
Orange Solid	Charging, not fully charged		
Green Solid	Charging, fully charged		

1.13. ON/OFF SWITCH

The *{ON/OFF}* switch is an indented momentary push-button switch used to toggle the CLIO on and off. This switch is placed on the screen half of the unit so it is accessible in either clamshell or tablet mode. It is indented to prevent inadvertent power on/off.

1.13.1. RESET SWITCH

The *{RESET}* switch is a momentary push-button switch mounted on the main PCB accessible to the user via a small hole in the plastic case by using the stylus. The user is unable to access the *{RESET}* switch without deliberate action. A soft reset (pressing

{*RESET*} does not erase saved data. A hard reset {*RESET*}+{*MEMORY ERASE*} erases all memory contents.

1.14. AUTO-HIBERNATE

If the user enables this feature in the Power Manager Control Panel applet, the CLIO unit will automatically enter hibernate mode whenever the case is closed and the screen is hidden (e.g. not in tablet mode). Other on/off options can be configured in the Power control panel.

1.14.1. POWER CONTROL PANEL SUPPORT

CLIO supports the Power control panel, which allows the user to check the status of the main and backup battery and to configure the power usage settings.

The Power control panel supports the following features:

- Main battery Gauge/Charging Status: 0-100% level E-F battery gauge. Also indicates if battery is charging.
- Main Battery Estimated Life: Estimated remaining charge in hours and minutes, in one minute intervals
- Backup Battery Power: A three state status of the backup battery indicating Good, Low or Very Low

Power On/Off Options	Possible values	Default Setting
Touch screen to power on	selected, not selected	not selected
Power on when opening case	SELECTED, NOT SELECTED	not selected
Hibernate* after X minutes	1, 3, 5, 10, not selected	5
Don't hibernate* if on AC power	selected, not selected	not selected

NOTE: The control panel will use the term "suspend" instead of "hibernate", to maintain consistency with Windows CE standard control panels.

1.15. HINGE MECHANISM

1.15.1. LATCH

CLIO's lid does not have a latch, but instead uses a new mechanism where the screen and the system are be kept closed by the force of the hinge. Similar to the Motorola Startac phone, the hinge has a detent at the 80% closed position and snaps the LCD and the system together. The weighting of the hinge is such that under normal screen viewing positions, the weighting is lighter.

1.15.2. COVER CLOSED / TABLET SWITCHES

1.15.2.1. OVERVIEW

CLIO includes the cover closed and tablet switches to enhance the user's experience when using the CLIO. These magnetic switches are not activated by the user, but automatically activated when opening/closing the unit and manipulating the hinge.

These switches allow the CLIO's software to take appropriate actions based on the state/position of the CLIO's LCD screen. These actions might include automatically powering on or off the unit when the cover is opened or closed, automatically "popping-up" a virtual keyboard, or handwriting recognition window when the CLIO is put into Tablet mode.

1.15.2.2. COVER CLOSED SWITCH

The cover-closed switch indicates whether the portion of the case containing the LCD panel (referred to here as the cover or lid) is in a closed or open position. Due to the CLIO's unique hinge design, the lid can be closed such that the face of the LCD is against the keyboard as in a traditional laptop computer or flipped over so the LCD panel is exposed on the outside of the case (Tablet mode). The Cover Closed Switch indicates when the LCD panel is parallel to the bottom of the case with the LCD screen facing the keyboard.

1.15.2.3. TABLET SWITCH

The tablet switch indicates when the LCD is facing up (i.e. facing the outside of the case).

1.16. CLIO CONFIGURATIONS

The following describes various CLIO states based upon combinations of switch settings. These represent static conditions. The next sections describe the dynamic interaction between these conditions.

1.16.1. USER OPTIONS

The user can control the behavior of the Cover Closed and Tablet Mode switches using the CLIO Control Panel applet. Data from this applet is stored in the registry and is accessed by the drivers servicing the Cover Closed and Tablet Mode switches.

1.16.2. POWER ON OPTIONS

There are two sets of power on options. The first controls the behavior when the cover is opened and closed in Laptop mode. The other controls the power when the cover is opened and closed from Tablet mode.

Cover Power Options	DESCRIPTION
Automatic	Opening the cover turns ON system power
Manual	Opening the cover does not affect the system power

NOTE: Closing the cover will turn OFF system power if the user has enabled that feature using the Power Manager Control Panel applet. If the user does not enable this feature,

CLIO will suspend after the set amount of time (also customizable using the Power Manager Control Panel applet).

Tablet Power Options	Description
Automatic	If power is OFF, transitioning from Closed to Laptop mode will turn ON system power. Laptop mode to Tablet mode has no effect.
Manual	Going from Closed mode to Laptop mode and vise-versa does not affect system power

1.17. TABLET MODE ACTIONS

The tablet mode options allow the user to control what application (if any) gets invoked when the screen is placed in tablet mode. The default is to enable the CIC virtual keyboard and Jot handwriting recognition application when the unit is placed in tablet mode.

1.17.1. IMPLEMENTATION

This section describes specific implementation details and presents the specific drivers that support the above functions as well as defines the registry entries associated with the Cover Closed and Tablet Mode switch handling.

1.17.1.1. POWER ON CONSIDERATIONS IN TABLET TO LAPTOP MODE

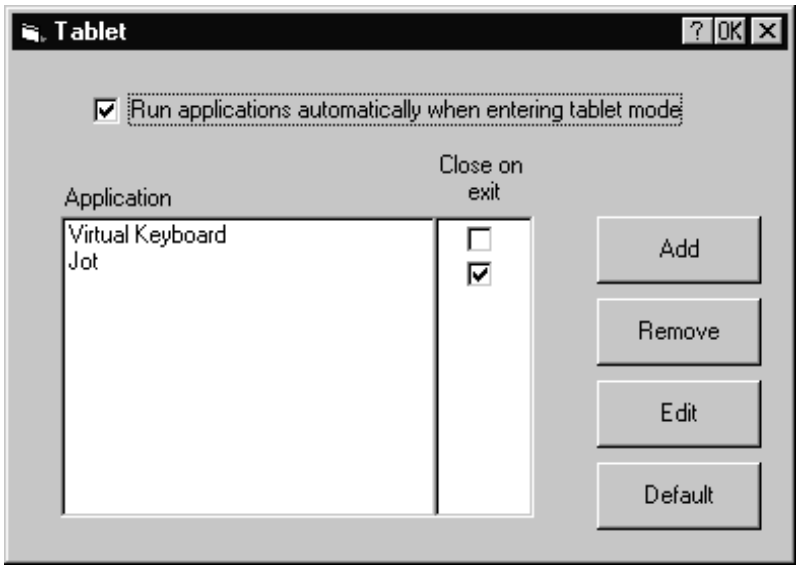
One of the user options for the Cover Closed switch is to not affect the power state when going from Tablet Mode to Laptop Mode. Implementation of this feature requires some special support in the driver.

In the CLIO hardware, the Cover Closed Switch is tied to a Vr4111 power event pin; the act of lifting the cover from tablet mode sets a power-on interrupt, which the Vr4111 services. If power was OFF to the CLIO and the user had selected the Manual option for the Tablet Power Option (see section 1.16.2), then the power should remain OFF. In order to do this, the driver servicing the Cover Closed Switch (or the call to the driver that turns on System Power) checks for this condition and immediately turns OFF the system power prior to enabling the display. This will give the impression to the user that the power never really turned on, even though it did.

There is one tricky part to implementing the above. When the user lifts the cover from Tablet mode to Laptop mode, the Tablet Mode switch will go inactive. Therefore, the driver cannot check the Tablet Mode switch to know if the cover is being opened from the Closed Laptop Mode or from the Tablet Mode. To solve this, the routine handling the Tablet Mode switch records the Tablet Switch state whenever it changes. Basically, this driver is implemented as a state machine.

1.17.1.2. CONTROL PANEL SUPPORT

The Tablet Control Panel applet allows the user to change the default application(s) invoked when the CLIO enters Tablet mode or to turn off of auto-invoke feature entirely.



NOTE: The production screen may vary from the format shown above. The functionality remains identical.

1.18. COMMUNICATIONS

CLIO supports several means of communications, detailed below:

1.18.1. INTERNAL SOFTWARE MODEM

CLIO contains a built-in software based modem, and will be able to run SoftModem version 2.0 with support for up to V.34 (33.6Kbps) connections.

CLIO should be user upgradeable to SoftModem version 3.0 (when it becomes available) supporting up to V.PCM (56K) connections. However, this cannot be determined until the software is available and tested.

The Softmodem should appear as an internal modem on COM5.

1.18.2. RJ11 CONNECTOR

To support the internal software modem, the CLIO has a standard RJ11 connector on the side of the unit.

1.18.3. SERIAL/DOCKING CONNECTOR

CLIO has a standard RS232 serial port used for standard serial peripherals and by the dock accessories. The port is mapped to the Vr4111's COM1 and accessed via a slim serial connector or the CLIO Travel Dock or Desk Dock. The user can adapt the custom connector to a standard DB9 connector via an adapter cable or one of the dock accessories. If necessary, the user can adapt DB9 to DB25 through a standard adapter.

The custom serial connector serves two purposes: First, its slim profile is required to maintain the overall thinness of the CLIO unit. Second, the connector has additional pins, which the dock accessories use to support dock specific features. See section 1.21 for details.

1.18.4. SERIAL/DOCKING CONNECTOR PINOUTS

Pin	FUNCTION	Comments
1	RI	RS232 Standard
2	DTR	
3	CTS	
4	TXD	
5	RTS	
6	RXD	
7	DSR	
8	DCD	
9	UNIT_DOCKED0_N	1 undocked state, 3 docked states to identify dock types.
10	UNIT_DOCKED1_N	
11	Notify LED	To inform user that a notification event has occurred.
12	BATT_CHARGED	To inform dock that battery is fully charged
13	Notification Button	To allow the user to service (acknowledge) the notification event.
14	9VDC IN	To provide power to CLIO when docked.
15	GND	
16	GND	
17	Connects Chassis GROUND	
18	Connects Chassis GROUND	

1.19. INFRARED

CLIO's hardware supports Fast Infrared (FIR), up to 4.0 Mbits/sec. Presently, however, the IR software supports only lower speeds.

1.19.1. FIR WINDOW

A window is provided for the FIR module, located on the side of the CLIO unit.

1.20. NOTIFICATION

The CLIO unit can notify the user about important events like alarms, appointments, and reminders through a notification LED. The user can easily shut off notifications by pressing the Notification switch located on the front edge of the CLIO unit.

1.20.1. NOTIFICATION SWITCH

The notification switch is used to turn off audible alarms as well as extinguish the LED indicator. The notification switch is a momentary push-button switch and must be accessible when the lid of the CLIO is closed. The switch will be located on the front of the unit.

1.20.2. NOTIFICATION LED

The notification LED is visible to the user at all times, whether the LCD lid is opened or closed. A light pipe type design is used, and the indicator is located in the front of the unit. The notification LED is housed within the Notification Switch so that it is obvious to the user how to turn off the notification. The Notification LED is Red.

Windows CE allows a user to choose to be notified by sound, a popup window, or a flashing light. If the user chooses flashing light, the notification LED will begin blinking when the notification occurs. The user can shut off notification LED by pressing the notification switch.

Alternatively, the user can shut off the notification LED using the notification icon in the taskbar, a standard Windows CE function.

1.21. DOCKING

Key to the CLIO's design is its ability to easily dock and synchronize with a desktop PC.

1.21.1. TRAVEL DOCK

The Travel Dock is designed to be lightweight and small enough to be used when traveling. The Travel Dock allows the user to connect to the serial port of the PC, begin synchronization, and begin recharging CLIO all in one step. The Travel Dock is also designed to be a low cost option for purchasing a second docking station for user who travels between work and home.

The Travel Dock clips to the side of the CLIO and connects via the serial/docking connector and provides power simultaneously. In this way, the Travel Dock connects to CLIO in one step. Attaching the Travel Dock initiates synchronization and begins recharging the CLIO battery.

The other end of the Travel Dock has a DB9 connector and the same AC Adapter connector used by the CLIO. Typically, the user will connect the DB9 connector to a null modem serial cable to the PC and the AC Adapter connector to the same AC Adapter used by the CLIO. The user can then dock/undock easily at any time.

When traveling, the Travel Dock can be used to establish a docking station in a hotel room or second office. The traveler will also carry the Travel Dock for its use as a DB9 adapter for serial peripherals.

1.22. AUDIO

1.22.1. SPEAKER

CLIO contains a speaker used for alarms and playing .wav files. CLIO's case provides holes for allowing airflow to the speaker. The speaker is exposed when the lid is closed so that audible alarms are not muffled.

1.22.2. MICROPHONE

A small microphone is included with the CLIO. The location of the microphone allows easy pickup of the user's voice during normal use with the LCD lid open.

1.22.3. CONTROL PANEL SUPPORT

CLIO must fully support the Volume & Sounds control panel.

1.23. PC CARD EXPANSION SLOT

CLIO supports one PC Card type II card. The PC Card connector and slot are mounted on the side of the CLIO.

The PC Card slot supports 3.3V and 5V cards and provides up to 350mA peak power at 5V.

Per Microsoft, the PC Card slot also provides support for powered PC Cards while in Hibernate mode, in order to support cards such as pager cards that must be able to receive messages when CLIO is in hibernate mode. This functionality is programmable so that only cards requiring power when CLIO is in Hibernate mode are actually drawing it from the CLIO.

A dummy PC Card will be shipped with the system so that it can prevent dust from getting into the PC Card slot/connector.

The PC Card slot supports the following memory cards:

Card Type	ıat	Maximum Size
SRAM Card	FAT file system	64MB
ATA Flash Cards	FAT file system	IDE Limit

1.23.1. SUPPORTED PC CARDS

CLIO supports the following PC Cards:

PC Card Type	PC Card Manufacturer	PC Card Model
Miscellaneous	Socket Communications	Page Card

PC Card Type	PC Card Manufacturer	PC Card Model
Miscellaneous	Socket Communications	Serial I/O
Modem/Analog	Apex Data	Mobile Plus V.34.33.6Kbps modem
Modem/Analog	Compaq	288 Fax modem
Modem/Analog	Compaq	Speedpaq 288 Telephony Modem
Modem/Analog	EXP	Datafax 1414
Modem/Analog	EXP	Thinfax 1414LXM
Modem/Analog	Hayes Microprocessor	Optima 14.4+FAX for PCMCIA
Modem/Analog	Hayes Microprocessor	Optima 28.8+FAX for PCMCIA
Modem/Analog	Microcom	TravelCard 28.8P
Modem/Analog	Microcom	TravelCard FAST 28.8P
Modem/Analog	Motorola	Montana 33.6
Modem/Analog	Motorola	SecurID V.34
Modem/Analog	Practical Peripherals	ProClass (PC144T2)
Modem/Analog	Practical Peripherals	ProClass (PC288T2)
Modem/Analog	Simple Technology	33.6 Communicator
Modem/Analog	US Robotics/Megahertz	PC Card Modem (XJ1144)
Modem/Analog	US Robotics/Megahertz	PC Card Modem (XJ2288)

PC Card Type	PC Card Manufacturer	PC Card Model
Modem/Analog	US Robotics/Megahertz	SP1336
Modem/Analog	US Robotics/Megahertz	Sportster 14.4 PC Card Fax/Modem
Modem/Analog	US Robotics/Megahertz	Sportster 28.8 V.34 PC Card Fax/Modem
Modem/Analog	US Robotics/Megahertz	XJ/C1336
Modem/Analog	Xircom	CreditCard Modem 28.8
Modem/Analog	Xircom	CreditCard Modem 33.6
Storage/Flash Memory	MagicRAM	Turbo Flash Memory
Storage/Flash Memory	PNY Electronics	VersaCard P-CF004-PA
Storage/Flash Memory	PNY Electronics	VersaCard P-CF008-PA
Storage/Flash Memory	PNY Electronics	VersaCard P-CF015-PA
Storage/Flash Memory	SanDisk	10Mb FlashDisk
Storage/Flash Memory	SanDisk	20Mb FlashDisk
Storage/Flash Memory	SanDisk	CompactFlash 10Mb
Storage/Flash Memory	SanDisk	CompactFlash 15Mb
Storage/Flash Memory	SanDisk	CompactFlash 2Mb
Storage/Flash Memory	SanDisk	CompactFlash 4Mb
Storage/Flash Memory	SanDisk	CompactFlash 6Mb

PC Card Type	PC Card Manufacturer	PC Card Model
Storage/Flash Memory	SanDisk	CompactFlash 8Mb
Storage/Flash Memory	Simple Technology	PCMCIA ATA Flash 12Mb
Storage/Flash Memory	Simple Technology	PCMCIA ATA Flash 4Mb
Storage/Flash Memory	Simple Technology	PCMCIA ATA Flash 8Mb
Storage/Flash Memory	Verbatim	20Mb

1.24. REAL TIME CLOCK

The NEC VR4111 contains an integrated real-time clock.

2. CLIO PHOTOGRAPHS

This section contains a series of photographs depicting the CLIO's external and internal components. Each component is numbered. A description of each component appears in Section Three, below. Additionally, each service procedure references parts by both name and number so as to have a ready visual reference.

photo 1 – Battery Removal

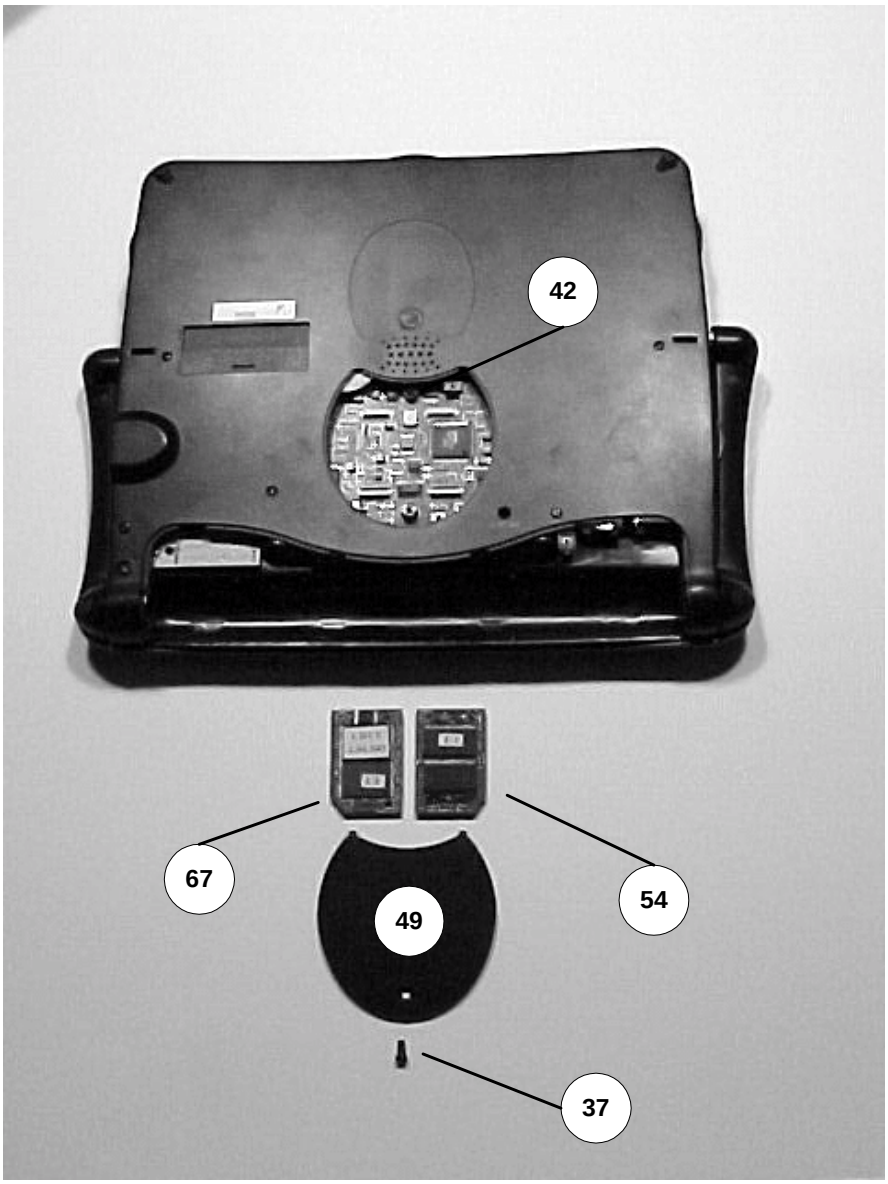


photo 2 – ROM/RAM Door Removal

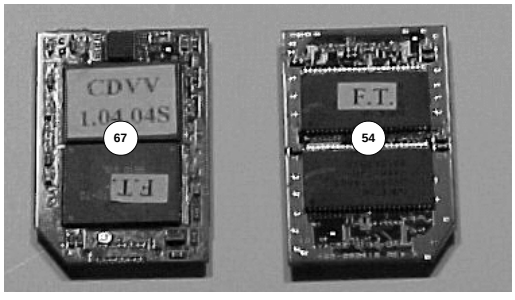


photo 3 - ROM/RAM Modules

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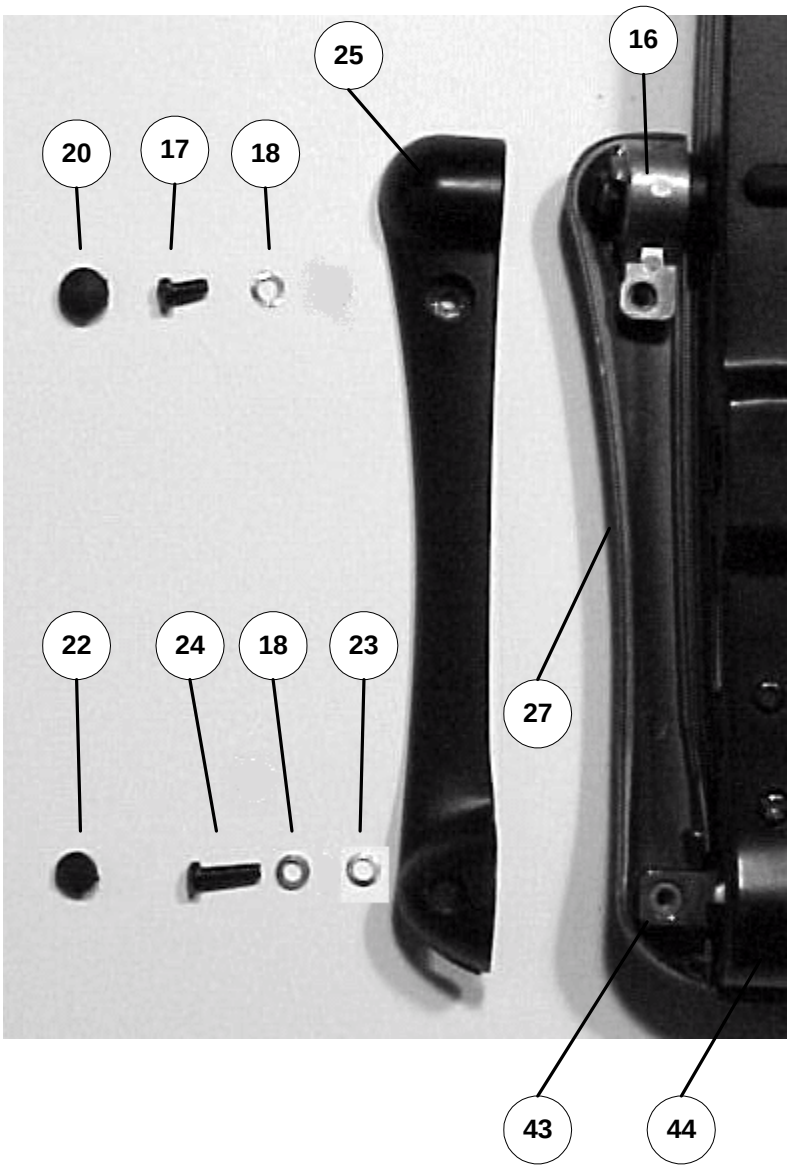


photo 4 – Left Hinge Arm Disassembly

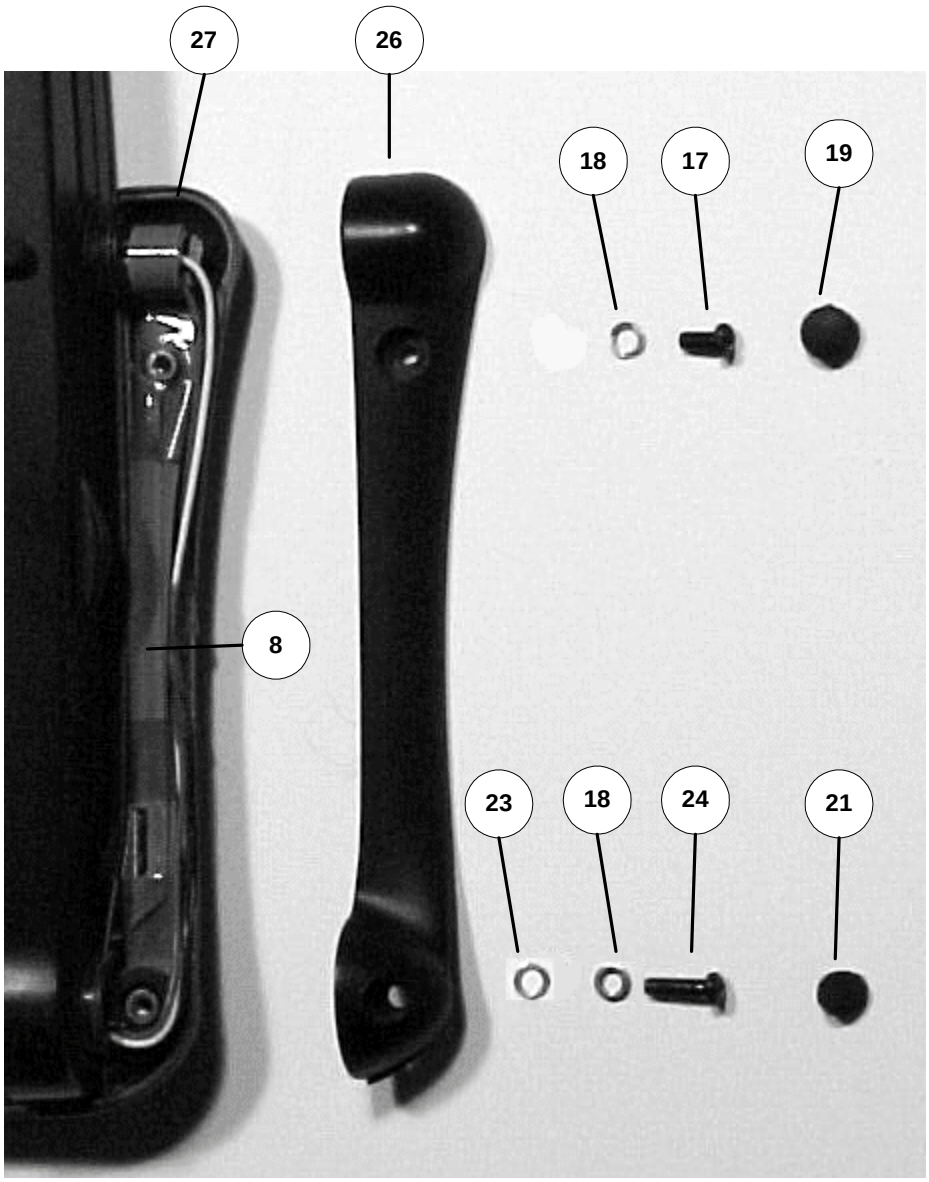


photo 5 - Right Arm Disassembly

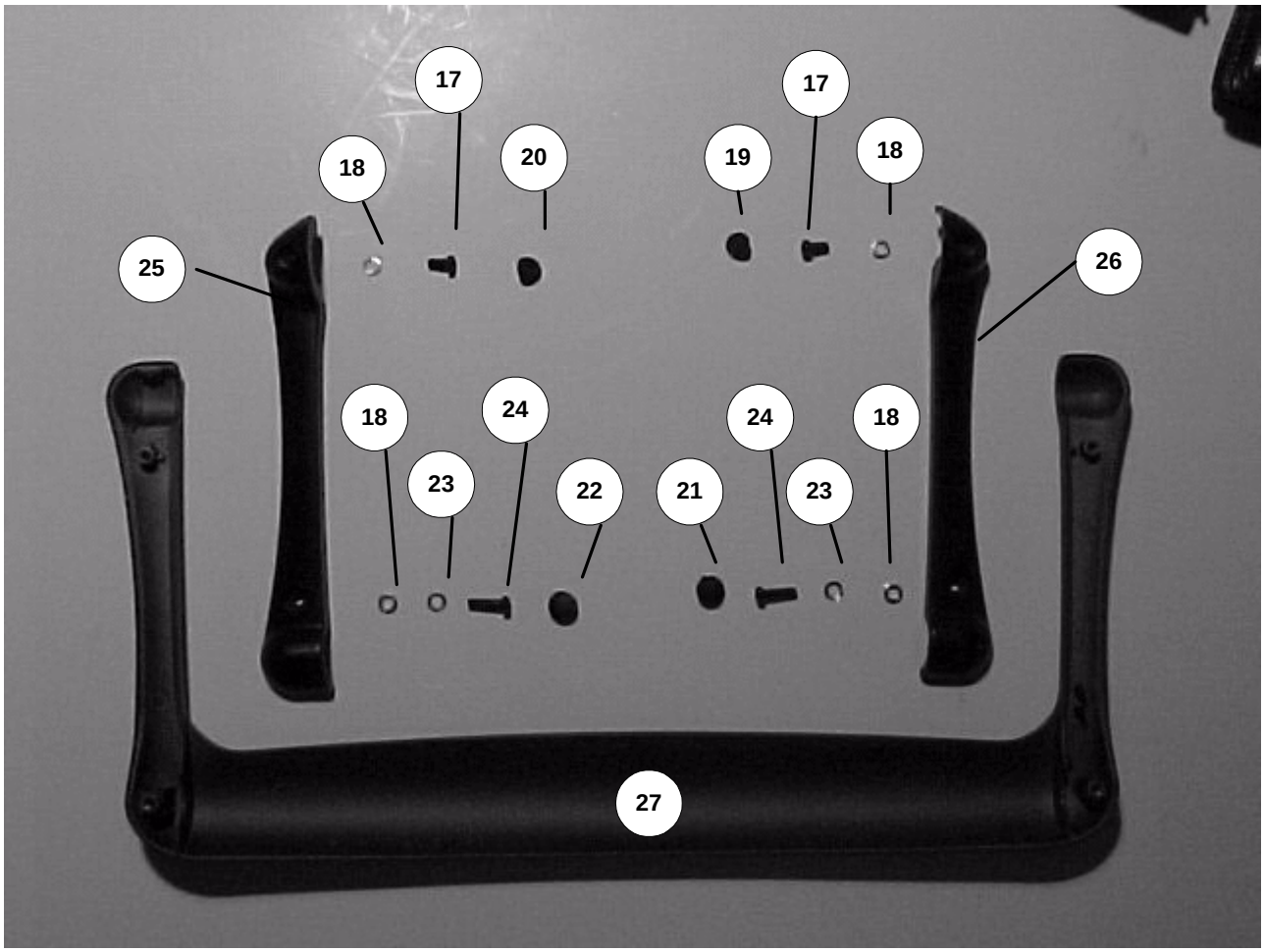


photo 6 – Hinge Arms

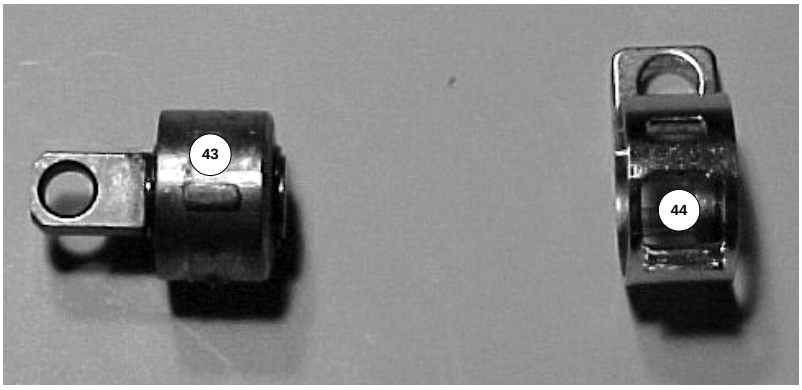


photo 7 - Lower Hinge & Bracket

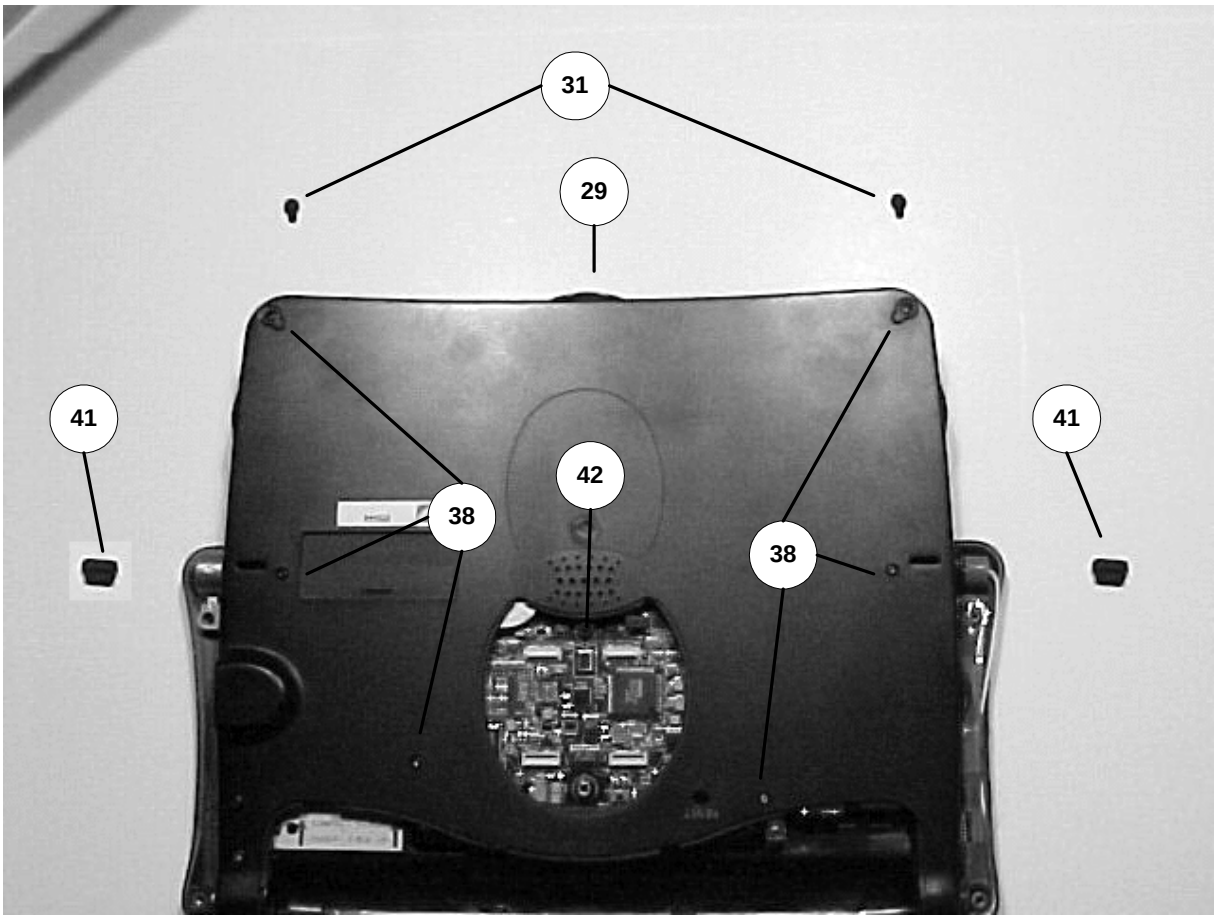


photo 8 - Bottom Exterior

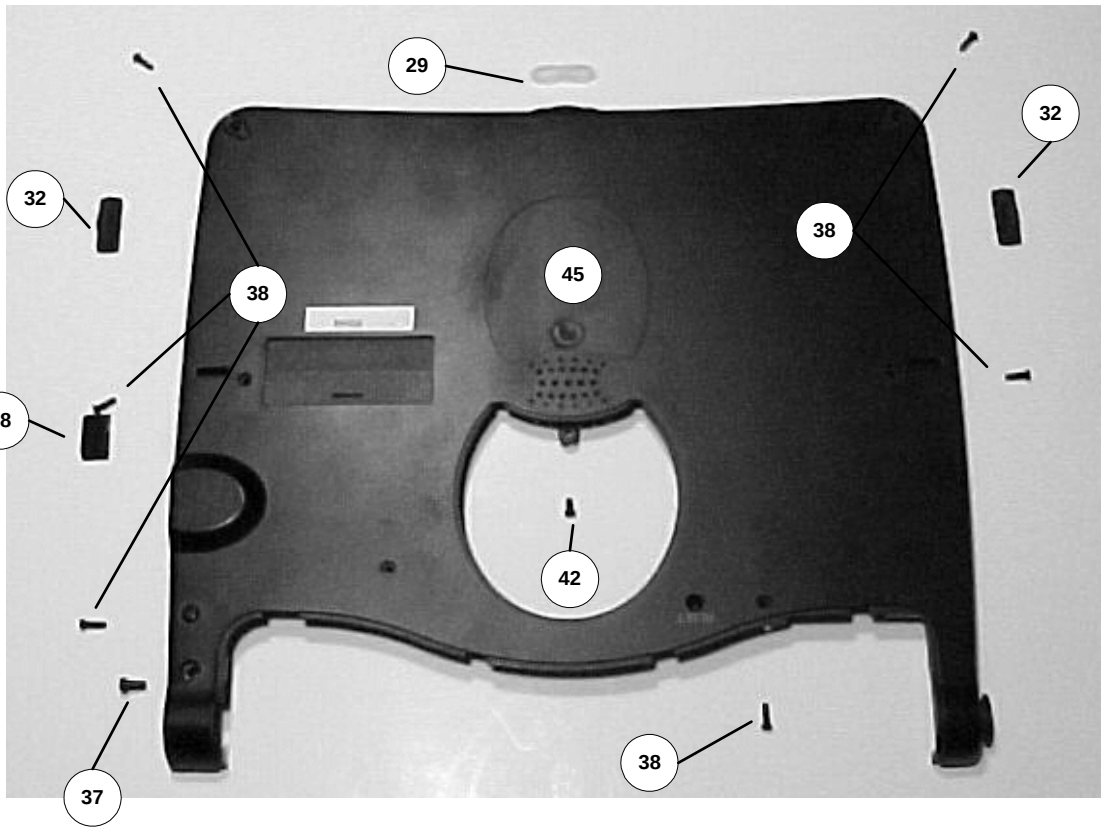


photo 9 - Keyboard Bottom Screws & misc.

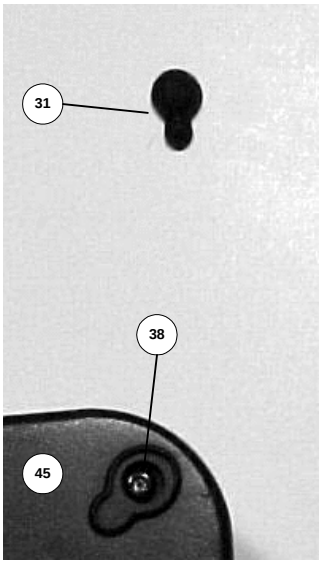


photo 10 - Lower Keyboard Housing Feet

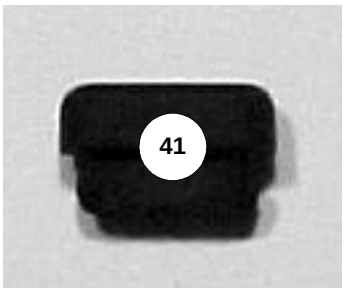


photo 11 – Foot Support

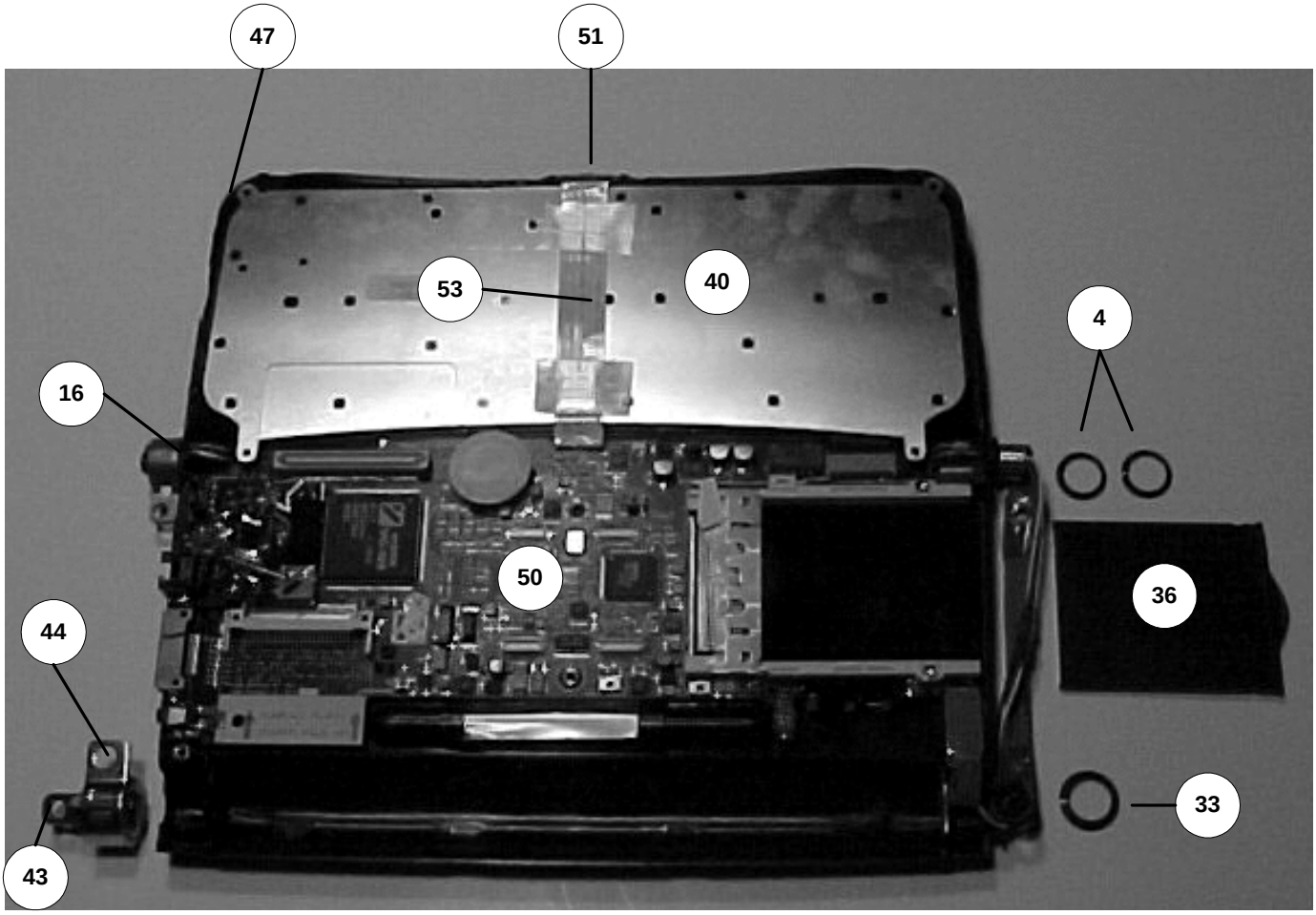


photo 12 – Lower Housing Removed

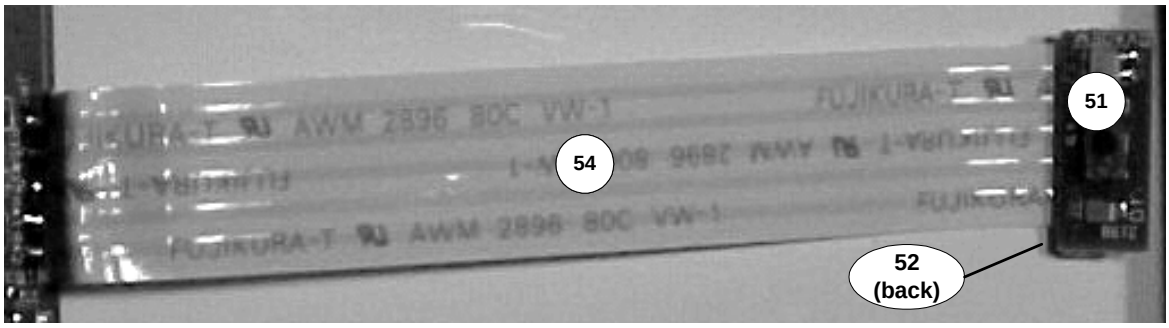


photo 13 – Notification PWB & Cable

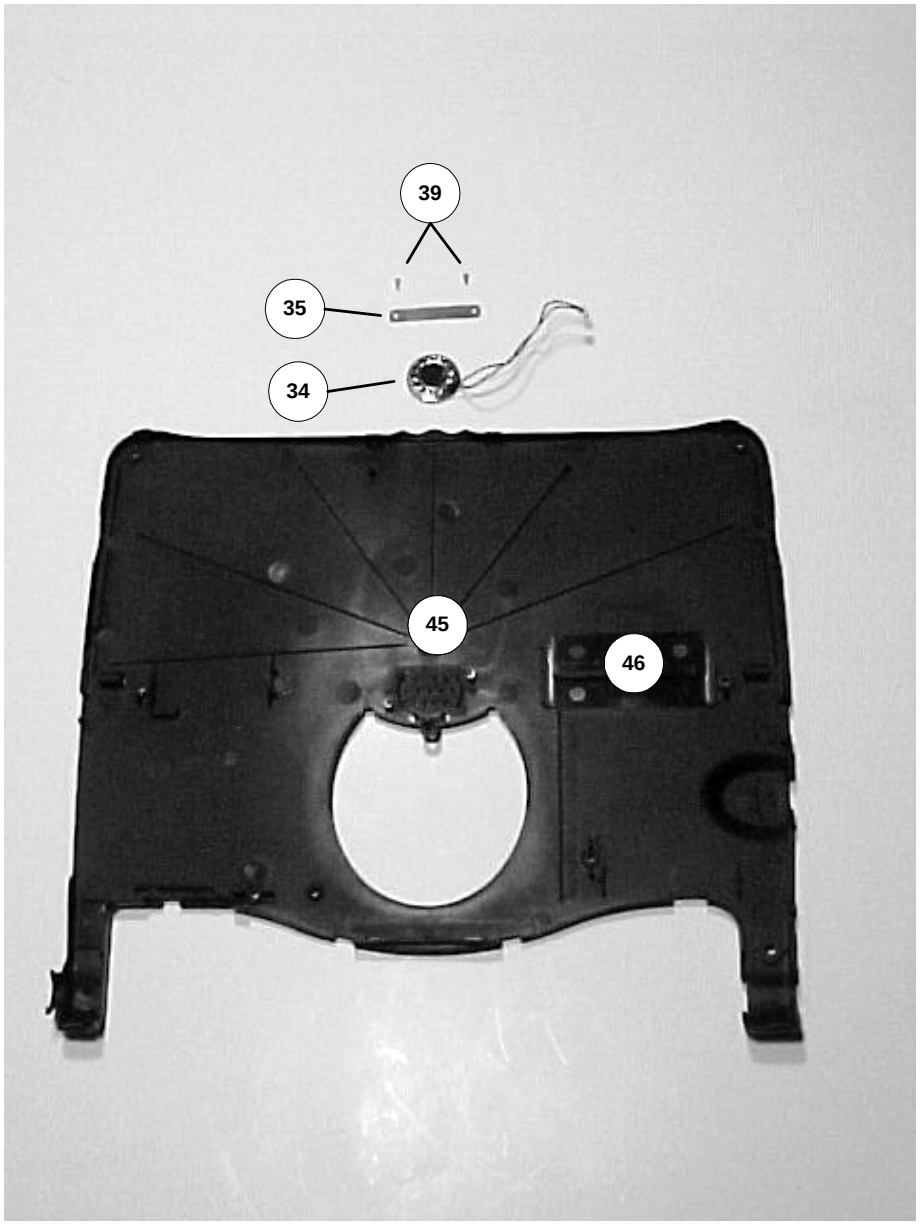


photo 14 - Inside Keyboard Lower Housing

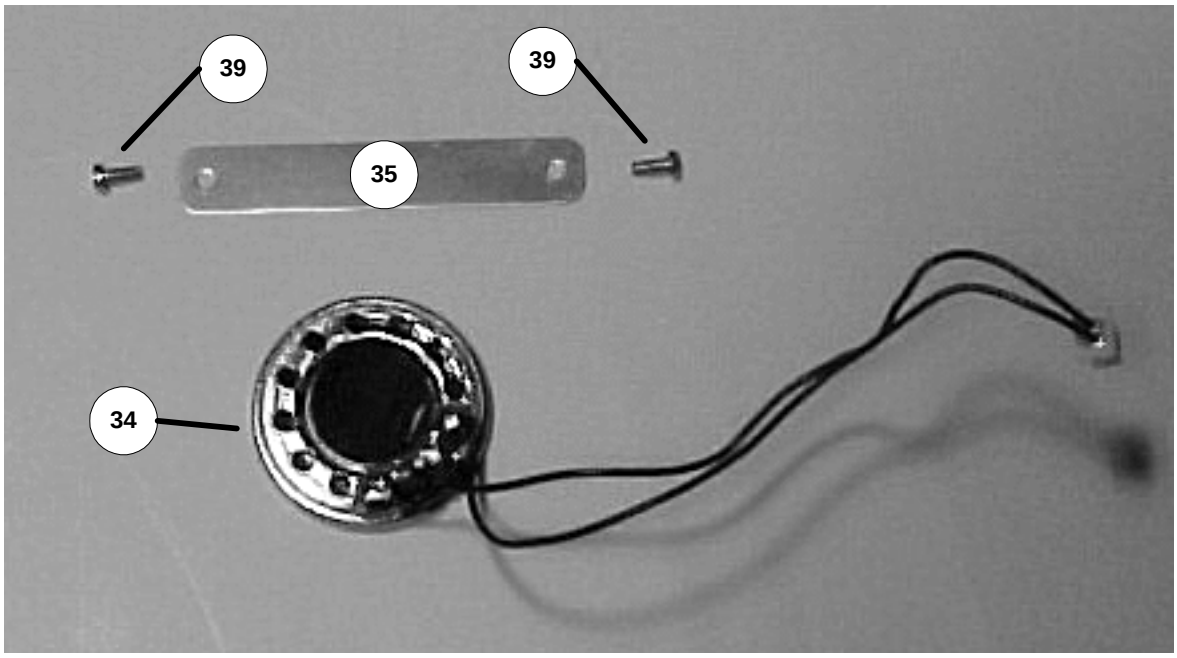


photo 15 - Speaker Detail

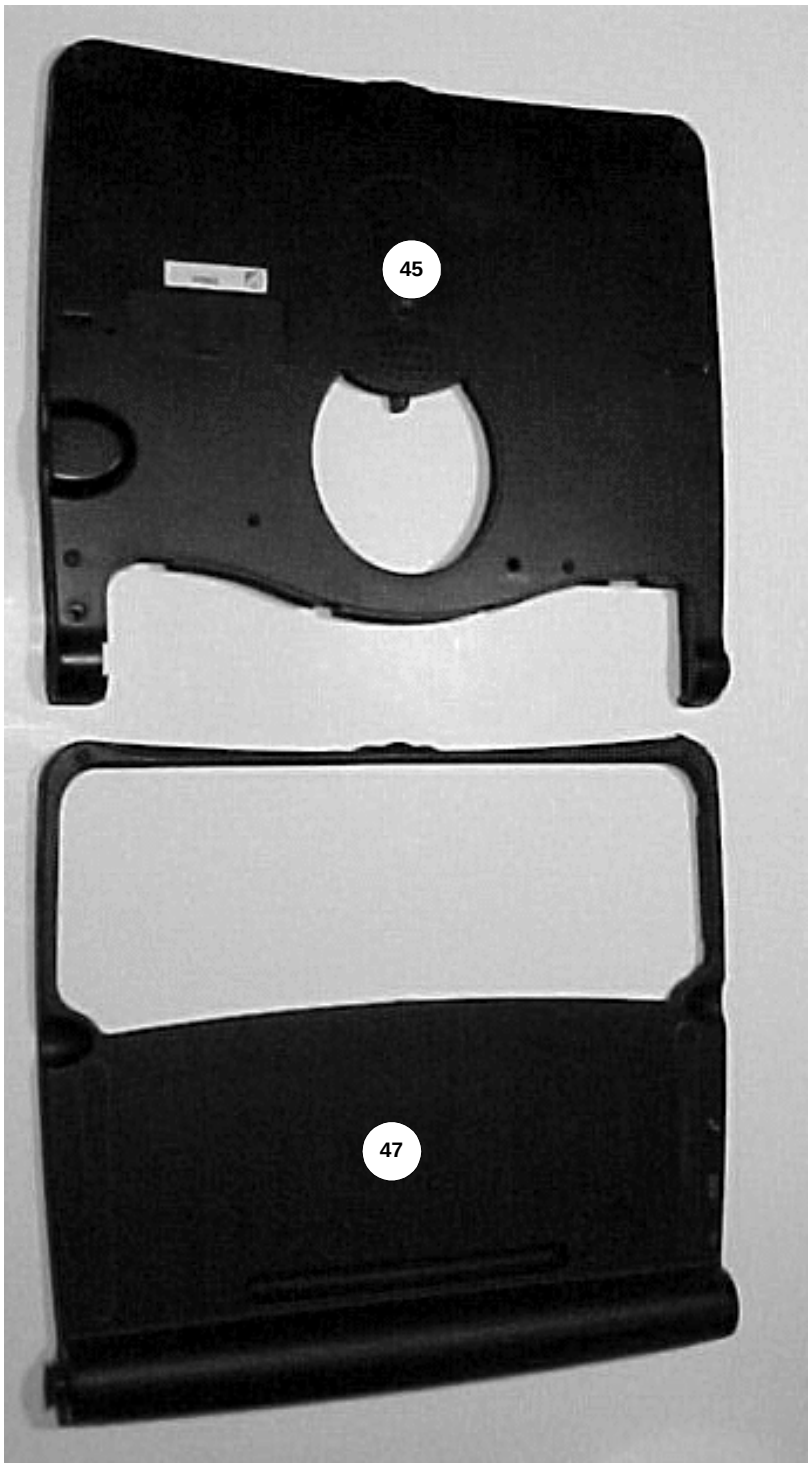


photo 16 – Keyboard Housings

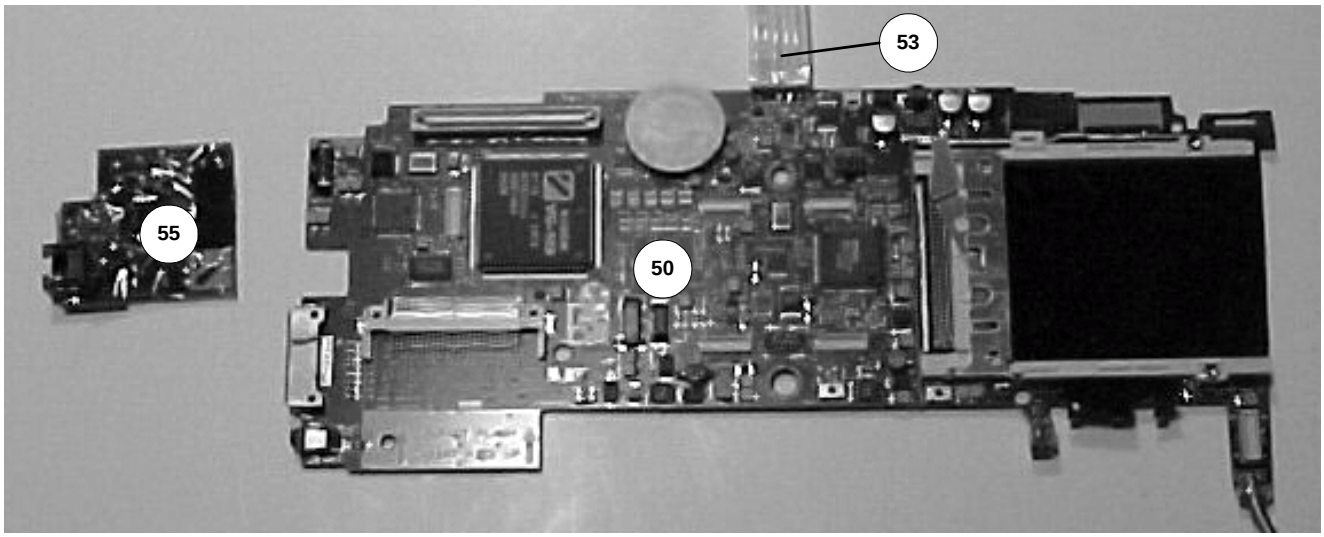


photo 17 – Motherboard & DAA Board

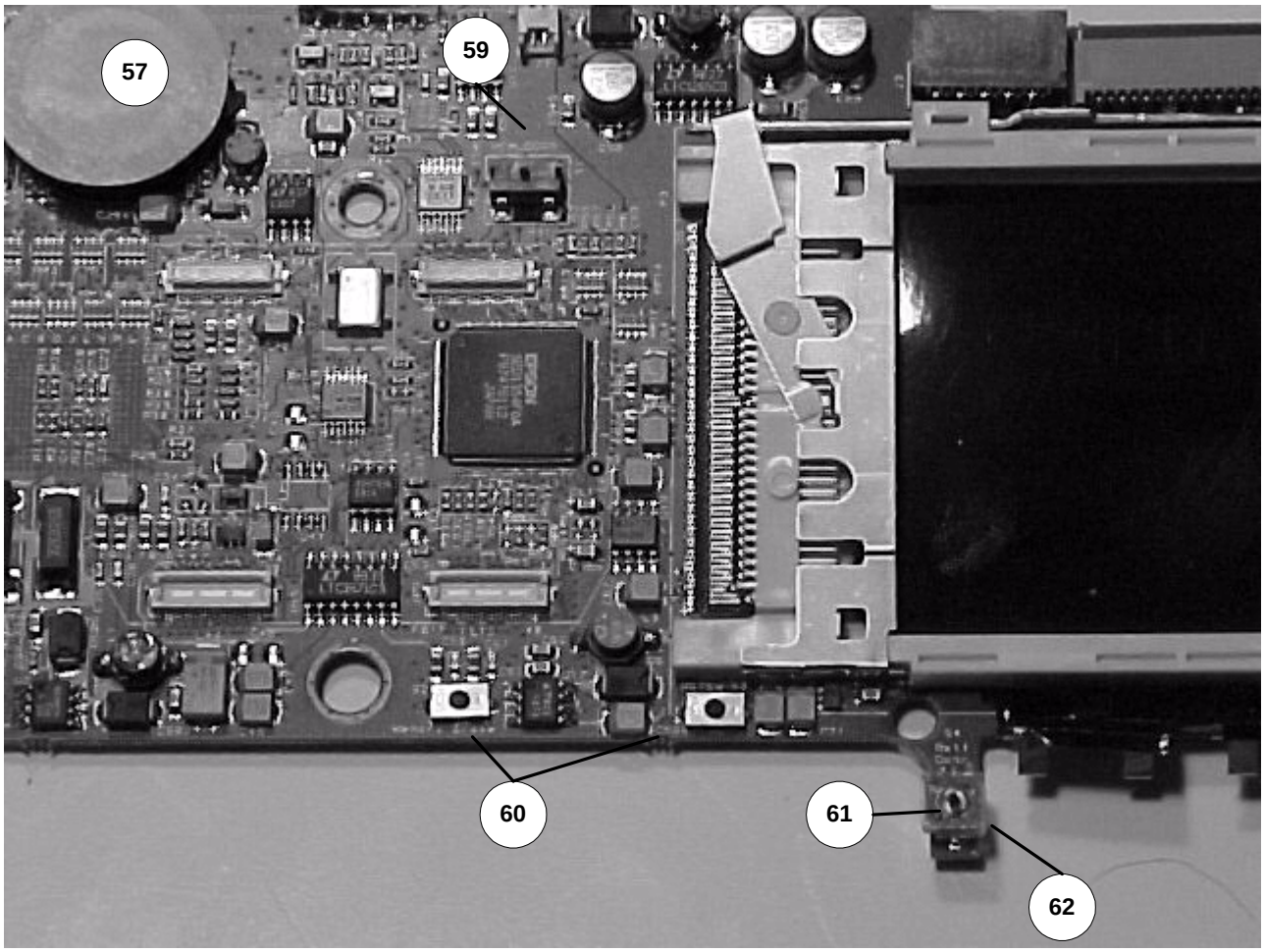


photo 18 – Motherboard Switches

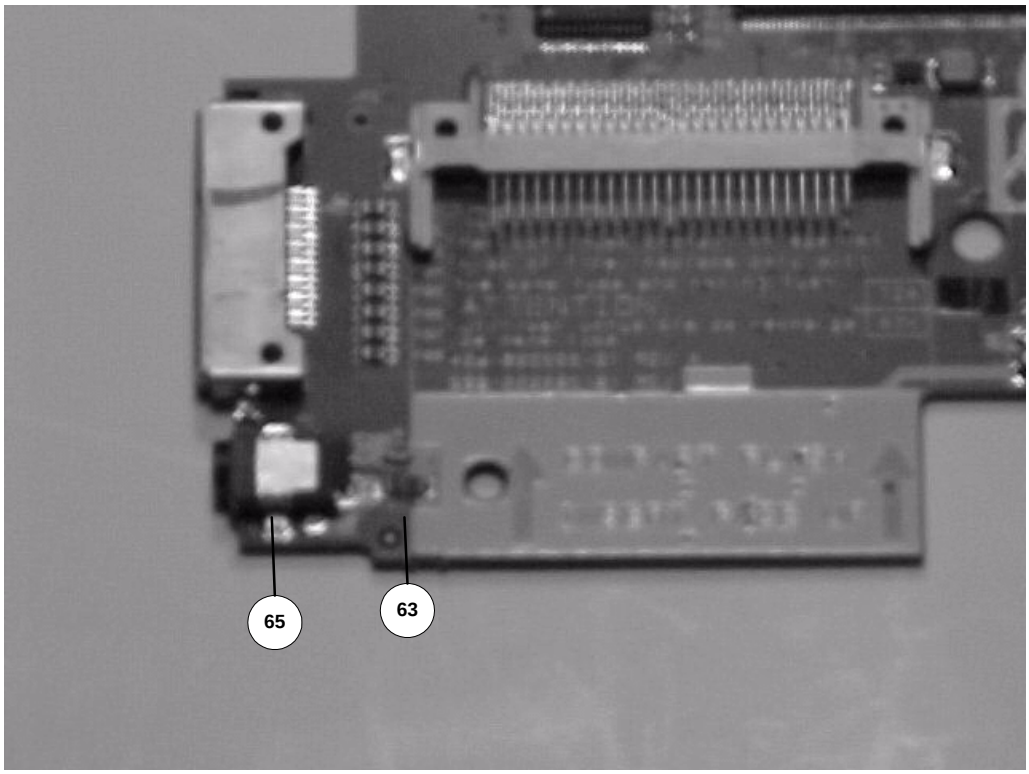


photo 19 - Fuse & DC Connector

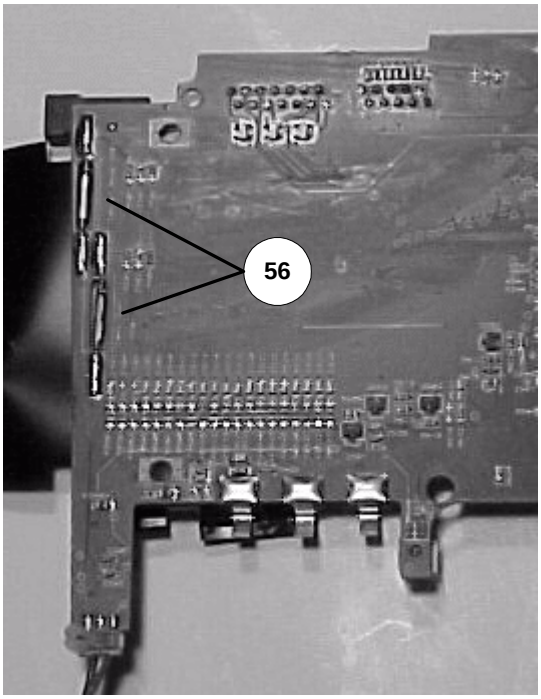


photo 20 - Reed Switches

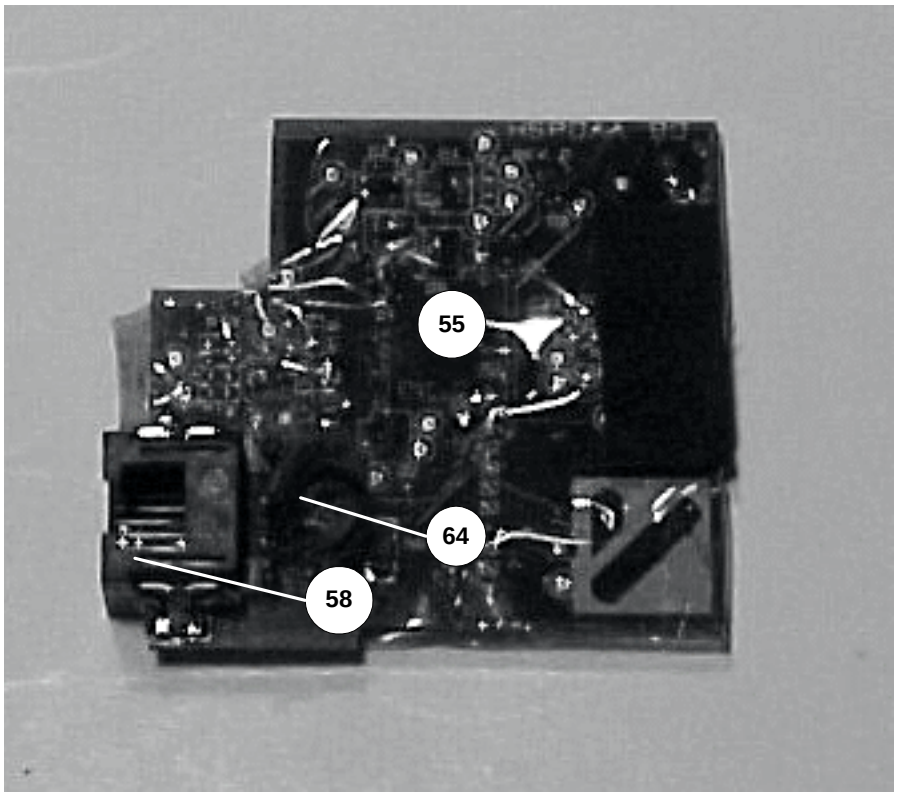


photo 21 - DAA Board

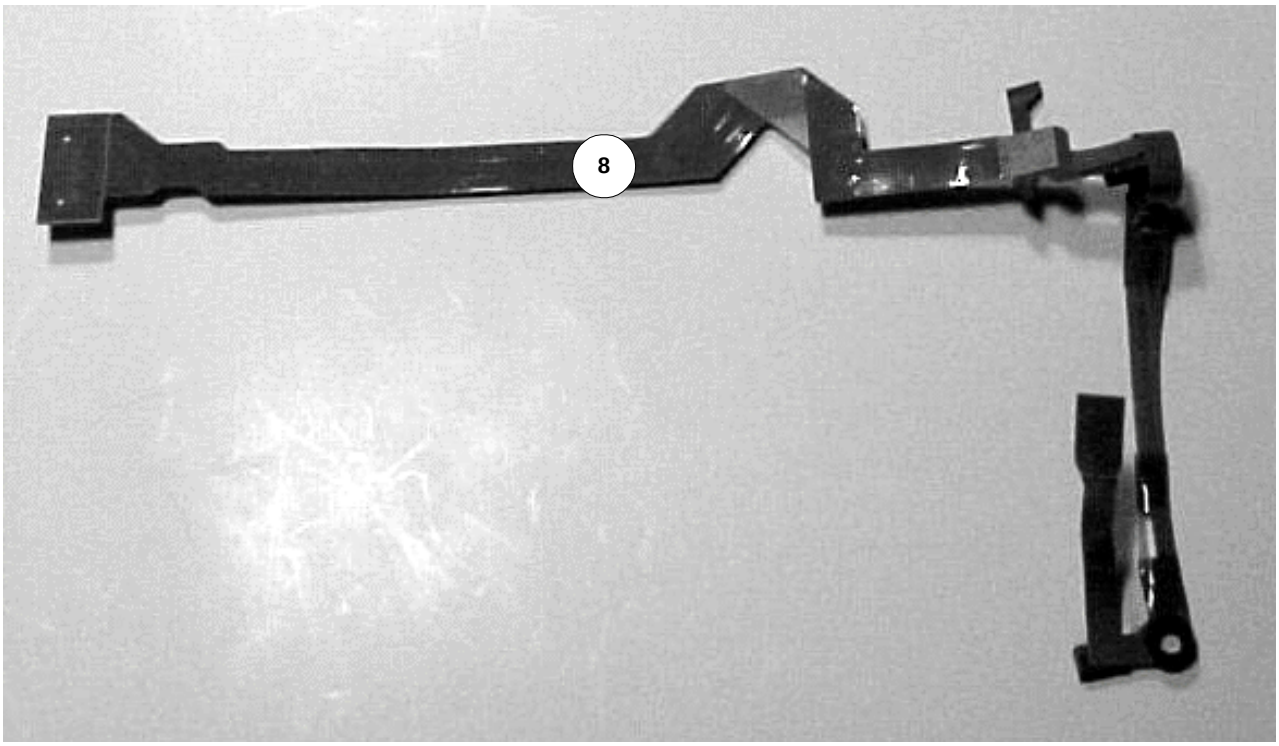


photo 22- Flex Circuit

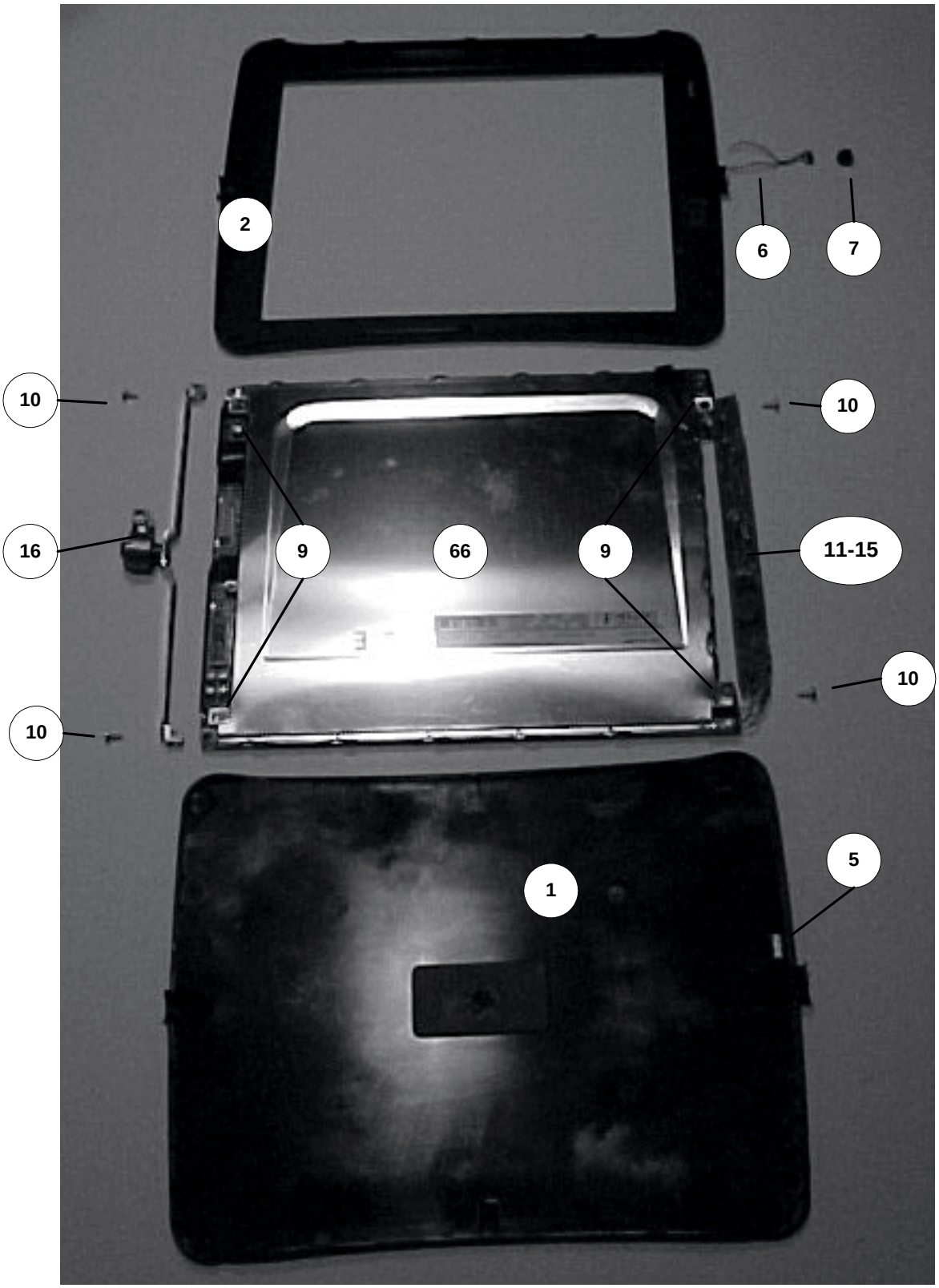


photo 23 - LCD Assembly

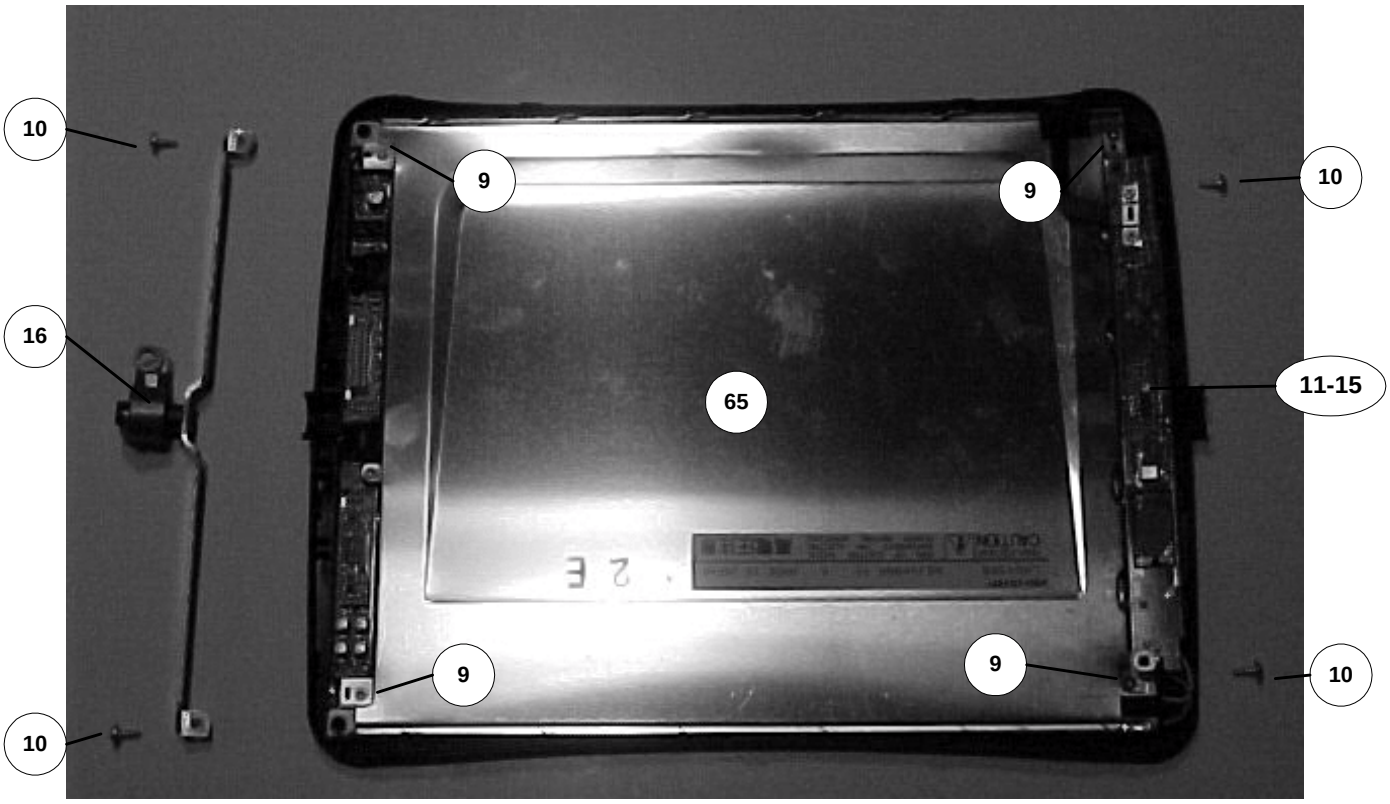


photo 24 – LCD Screen Assembly w/Hinge

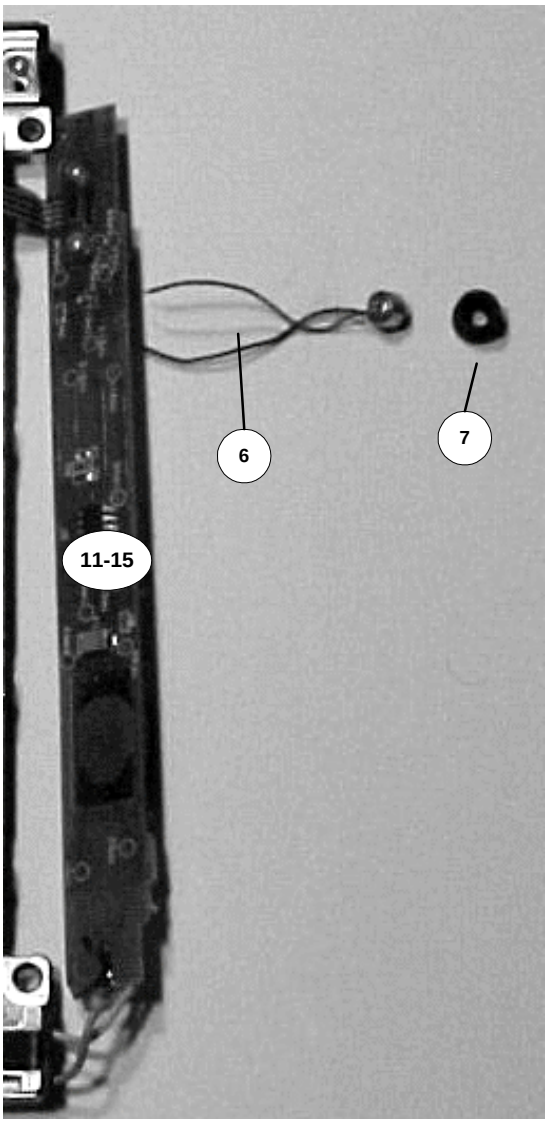


photo 25 - Inverter PWB Assembly w/Microphone

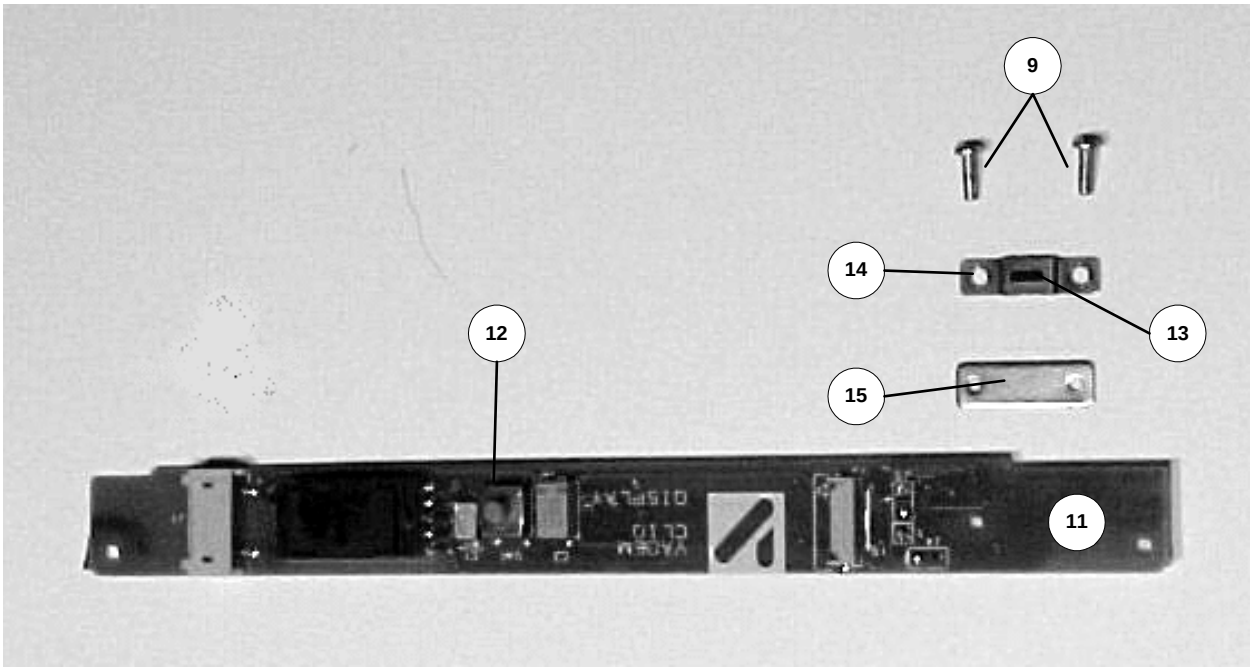


photo 26 - Inverter PWB Parts

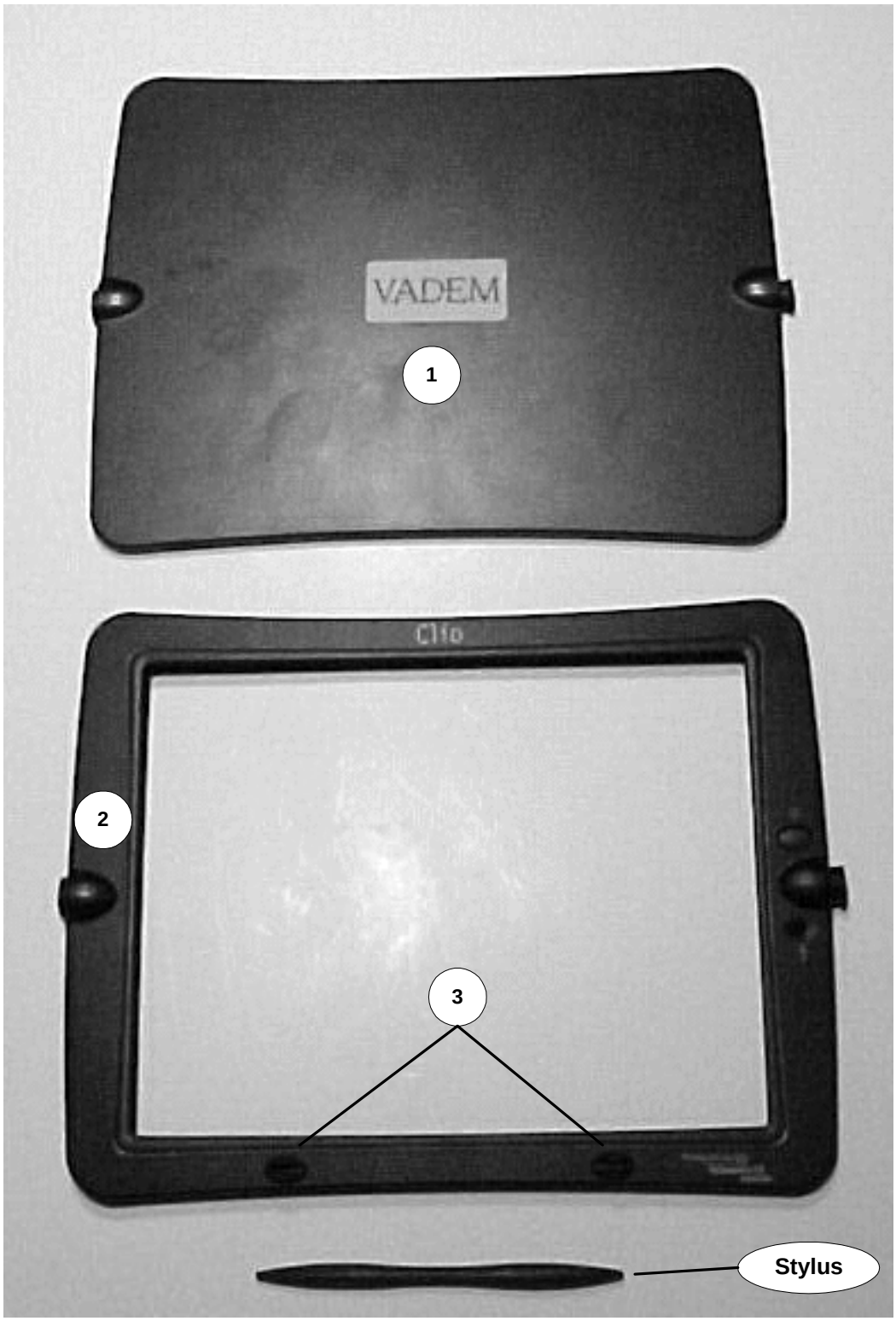


photo 27 - LCD Plastics

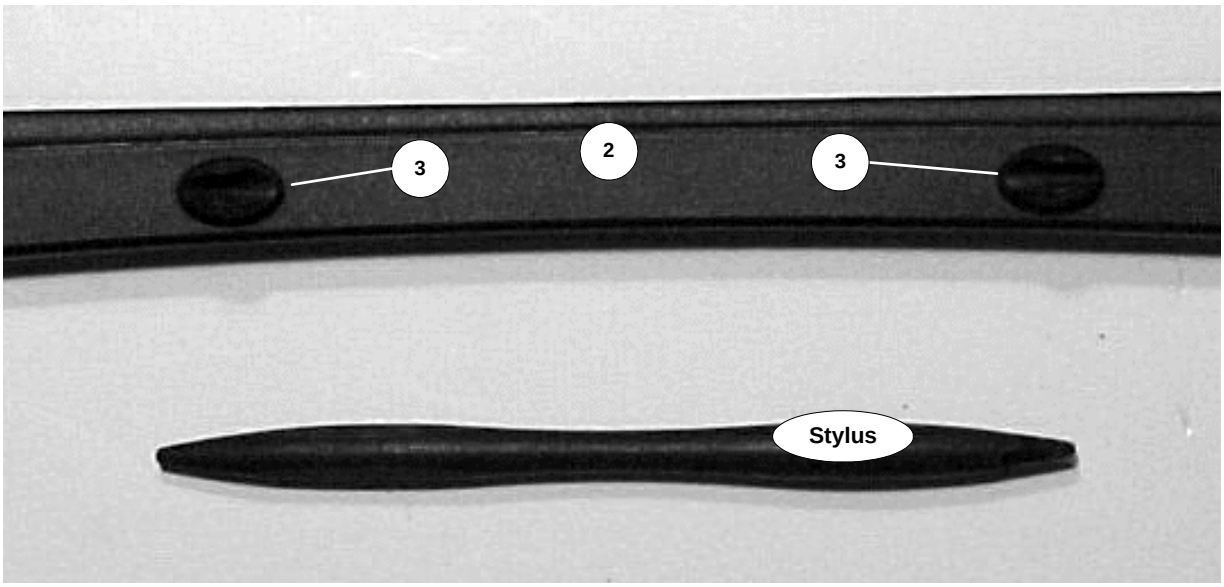


photo 28 - Stylus Clips Detail

photo 29 - Display Bumpers, Scratch Protectors

3. SPARE PARTS KITS

This chapter contains a list of spare parts kits. When ordering parts, please order them by kit number. Shaded rows in the table denote spare parts kits. The table lists the contents of each kit.

The table is arranged as follows:

- Gray rows indicate spare parts kits. Each kit contains one or more parts. The contents of each kit appear beneath the gray bar for that kit.
- White rows indicate parts comprising a kit.

Table columns are as follows:

- Part Number: lists spare parts kits part numbers
- Sk Desc.: lists spare parts kit names
- Incl: lists part numbers for parts within a spare parts kit
- Rev: part revision code, if any
- Part Desc.: description of parts within spare parts kits
- #: Refer to the photographs in Chapter Two. The numbered items in the photographs correspond to parts tabulated in the table and vice-versa.
- Quan.: quantity of each part included in the given spare parts kit list

The list of kits begins on the next page.

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
660-000737-01	SK, DISPLAY ENCLOSURE BACK					
		200-000008-02	A	DISPLAY ENCLOSURE BACK, CLIO	**1**	1
660-000739-01	SK, DISPLAY ENCLOSURE BEZEL					
		200-000116-02	A	DISPLAY ENCLOSURE BEZEL, CLIO	**2**	1
660-000741-01	SK, PEN CLIP					
		200-00123	A1	PEN CLIP	**3**	20
660-000742-01	SK, BUSHING, DISPLAY					
		200-000125	A1	BUSHING, DISPLAY	**4**	10
660-000743-01	SK, MAGNET, REED SWITCH					
		113-00265	1	MAGNET, REED SWITCH ACTUATOR 3X10X1.5MM	**5**	20
660-000744-01	SK, MICROPHONE/CONDENSER					
		114-000002	0	MICROPHONE,CONDENSER 6.0X3.4MM WITH WIRE	**6**	5
		200-000264	A1	MICROPHONE BOOT	**7**	5
600-000745-01	SK, FLEX CABLE ASSY.					
		116-000525-01	A	CABLE, FLEX ASSY.	**8**	1
660-000746-01	SK, SCREW M2.0X6.0 PHILLIPS					

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
		122-000266	0	SCREW, M2.0X6.0 PHILLIPS, CHEESE HEAD, WHITE ZINC (for motherboard & LCD case)	**9**	20
660-000747-01	SK, SCREW K2.2X6.5PT. PHILLIPS					
		122-000267	O	SCREW, K2.2X6.5PT. PHILLIPS WASHER HEAD, WHITE ZINC (for LCD case)	**10**	20
660-000748-01	SK, ASSY. BACK LIGHT					
		600-000002	2.23	ASSY. BACK LIGHT INVERTER PCB	**11**	5
		200-000118	A1	ON/OFF BUTTON	**12**	5
		200-000129	A1	TOUCH TABLET FLEX CIRCUIT GASKET	**13**	5
		201-000133	A1	CLAMP, UPPER TOUCH TABLET CIRCUIT	**14**	5

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
		201-00134	A1	CLAMP, LOWER TOUCH TABLET CIRCUIT6	**15**	5
660-000749-01	SK, HINGE, ARM-DISPLAY					
		124-000500-01	obs	HINGE, ARM, DISPLAY, DETENTING	**16**	1
660-000750-01	SK, SCREW, M3.0X6.0 PHILLIPS					
		122-000268	0	SCREW, M3.0X6.0 PHILLIPS AND SLOTTED COMBINATION PAN HEAD BLACK ZINC	**17**	20
660-000751-01	SK, WASHER, 3 WAVE SPRING					
		122-000009	0	WASHER, 3 WAVE SPRING 3.3X5.5X0.28	**18**	20
660-000752-01	SK, COSMETIC PLUG, FRONT RIGHT					
		200-000014	A1	COSMETIC PLUG, FRONT RIGHT	**19**	20
660-000753-01	SK, COSMETIC PLUG, FRONT LEFT					
		200-000015	A1	COSMETIC PLUG, FRONT LEFT	**20**	20
660-000754-01	SK, COSMETIC PLUG, RIGHT REAR					

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
		200-000016	A1	COSMETIC PLUG, REAR RIGHT	**21**	20
660-000755-01	SK, COSMETIC PLUG, LEFT REAR					
		200-000017	A1	COSMETIC PLUG, REAR LEFT	**22**	20
660-000756-01	SK, WASHER, 1.2MM					
		122-000546-01	A	WASHER, 1.2MM	**23**	20
660-000757-01	SK, SCREW, M3X10					
		122-000547-01	A	SCREW, M3X10	**24**	20
660-000758-01	SK, ARM, LOWER LEFT					
		200-000013-02	A	ARM, LOWER LEFT SIDE, CLIO	**25**	5
660-000759-01	SK, ARM, LOWER RIGHT					
		200-000012-02	A	ARM, LOWER RIGHT SIDE, CLIO	**26**	5
660-000760-01	SK, ARM, UPPER					
		201-000132-02	A	ARM, UPPER, CLIO	**27**	1
660-000764-01	IR LENS, VADEM					
		200-000003	A1	IR LENS	**28**	20
660-000765-01	SK, NOTIFICATION BUTTON					
		200-000122	A1	NOTIFICATION BUTTON	**29**	29
660-000766-01	SK, DISPLAY BUMPER					

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
		200-000126	A1	DISPLAY BUMPER	**30**	10
660-000767-01	SK, FOOT					
		200-000127	A1	FOOT	**31**	20
660-000768-01	SK, BASE SIDE GRIP					
		200-000128	A1	BASE SIDE GRIP	**32**	20
660-000769-01	SK, BUSHING, BASE					
		200-000124	A1	BUSHING, BASE	**33**	20
660-000770-01	SK, SPEAKER, 32OHM, 20MM DIA.					
		114-000001	0	SPEAKER, 32OHM, 20MM DIA.	**34**	5
660-000771-01	SK, SPEAKER RETAINING BRACKET					
		201-000135	A1	SPEAKER RETAINING BRACKET	**35**	10
660-000772-01	SK, PCMCIA DUMMY CARD					
		200-000117	A1	PCMCIA DUMMY CARD	**36**	10
660-000773-01	SK, SCREW, M3.0X6.0 PHILLIPS					
		122-000268	0	SCREW, M3.0X6.0 PHILLIPS AND SLOTTED COMBINATION PANHEAD, BLACK ZINC	**37**	20
660-000774-01	SK, SCREW, K2.2X7.0					

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
		122-000269	0	SCREW, K2.2X6.0 PT. T-6 TORX PAN HEAD, BLACK ZINC	**38**	20
660-000775-01	SK, SCREW K1.5X3.5					
	1	122-000270	0	SCREW, K1.5X3.5 PT. PHILLIPS PAN HEAD, WHITE ZINC	**39**	20
660-000776-01	SK, KEYBOARD, CUSTOM					
		123-000000	A	KEYBOARD, CUSTOM 63 KEYS, BLACK	**40**	1
660-000777-01	SK, FOOT SUPPORT					
		200-000020	A1	FOOT SUPPORT	**41**	20
660-000779-01	SK, SCREW K2.2X4.5 PT.					
		122-000265	0	SCREW, K2.2X4.5 PT. PHILLIPS PAN HEAD, BLACK ZINC	**42**	20
660-000780-01	SK, HINGE, BASE ARM DETENTING					
		124-000502-01	A1	HINGE, BASE ARM DETENTING	**43**	10
		201-000271	A1	HINGE, BASE BRACKET	**44**	10
660-000781-01	SK, BASE, ENCLOSURE BOTTOM					
		200-000001-02	A	BASE, ENCLOSURE BOTTOM, CLIO	**45**	5

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
		200-000004-02		EXPANSION DOOR	**46**	5
660-000782-01	SK, BASE, ENCLOSURE TOP					
		200-000002-02	A	BASE, ENCLOSURE TOP, CLIO	**47**	5
660-000783-01	BATTERY DOOR, VADEM					
		200-000005-02		BATTERY DOOR, VADEM	**48**	5
660-000784-01	SK, RAM/ROM DOOR					
		200-000009-02	A	RAM/ROM DOOR, CLIO	**49**	5
660-000789-01	SK, ASSY., PCB MOTHERBOARD					
		600-000685-01	C	ASSY., PCB MOTHERBOARD (F-PRIME)	**50**	1
660-000790-01	SK, ASSY., NOTIFICATION					
		600-000006	1.02	ASSY., NOTIFICATION BOARD	**51**	5
		128-000575-01	A1	INSULATOR, NOTIFICATION PCA	**52**	5
		116-000010	0	FLEX CABLE 2.54 PITCH 5 CONDUCTORS, LENGTH 100MM	**53**	5
660-000791-01	SK, ASSY., PCB DRAM 16MB.					

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
		600-000419	1.02	ASSY., PCB DRAM BOARD 16MB, OFFSET CONNECTORS	**54**	1
660-000792-01	SK, ASSY., DAA BOARD					
		600-000543-01	B	ASSY., DAA BOARD	**55**	5
660-000794-01	SK, SWITCH, REED SENSITIVE					
		113-000205	0	SWITCH, REED SENSITIVE 10-15	**56**	20
660-000795-01	SK, BATTERY, COIN CELL					
		120-000198	0	BATTERY, COIN CELL	**57**	5
660-000796-01	SK, CONNECTOR, RJ-11					
		121-000002	1	CONNECTOR, RJ-11 JACK, HIROSE	**58**	5
660-000797-01	SK, SWITCH, CHIP PUSH SPST					
		113-000003	0	SWITCH, CHIP PUSH, SPST	**59**	10
660-000798-01	SK, SWITCH, TACK MOMENTARY					
		113-000002	0	SWITCH, TACT MOMENT. NORMAL OPEN, J TYPE	**60**	10
660-000799-01	SK, SWITCH, DETECTOR					

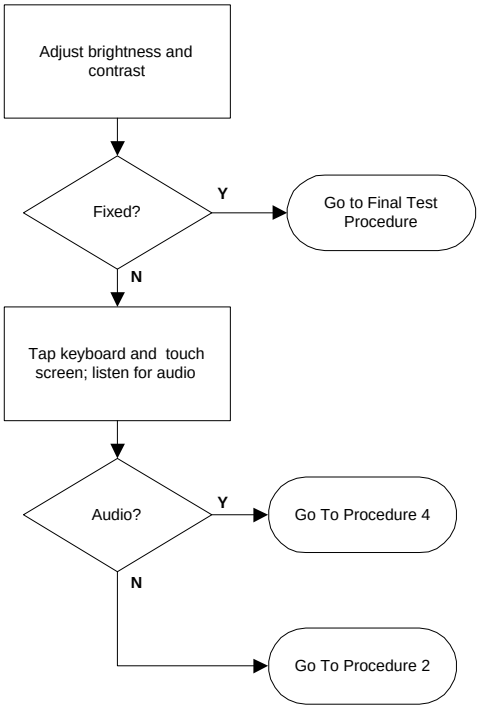
PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
		113-000009	0	SWITCH, DETECTOR, ALPS, SPST, PUSH ON/OFF	**61**	10
		122-000647-01	A	SWITCH SHIELD	**62**	10
660-000800-01	SK, FUSE, FAST-ACTING					
		118-000001	0	FUSE, FAST-ACTING	**63**	10
660-000801-01	SK, FUSE, SLOW-BLOW					
		118-000606-01	1	FUSE, SLOW-BLOW, THIN FILM	**64**	10
660-000802-01	SK, CONNECTOR, DC POWER					
		121-00010	0	CONNECTOR, DC POWER, 1-PIN	**65**	10
660-000868-01	DISPLAY, LCD W/TOUCH PANEL, 640X480, COLOR, VADEM					
		115-000478-00		LCD DISPLAY	**66**	1
660-000912-01	MASK ROM ASSY., 24MB, VADEM					
		600-000609-01		MASK ROM BOARD ASSEMBLY, 24MB.	**67**	5
660-001063-01	PHONE, CABLE, VADEM					
		116-000261		CABLE, PHONE, 6', RJ-11 TO RJ-11	**NS**	20

PART NUMBER	SK. DESC.	INCL.	REV.	PART DESC.	#	QUAN:
660-001066-01	RUBBER CUSHION, SCRATCH PROTECTOR					
		127-000496-01		SCRATCH PROTECTOR	**68**	20
660-0001134-01	SPACER SUPPORT, LCD					
		200-001120-01		SPACER SUPPORT, LCD	**NS**	20

4. CLIO DIAGNOSTICS

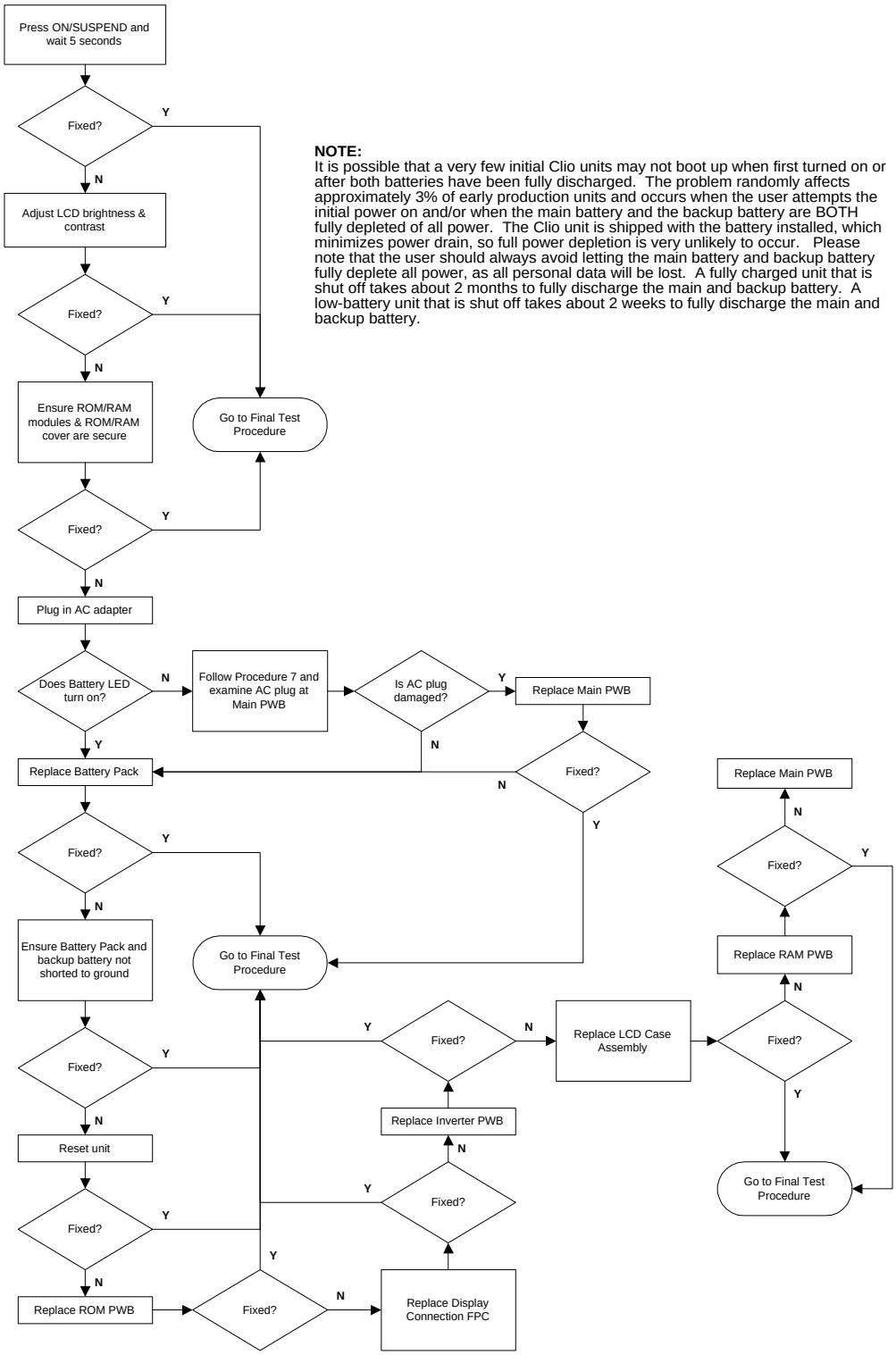
This chapter details diagnostic procedures to be followed when a CLIO unit is returned for service due to a specific complaint. Each procedure is laid out as a flow chart.

4.1. CLIO POWERS ON – DISPLAY ABSENT (PROCEDURE 1)



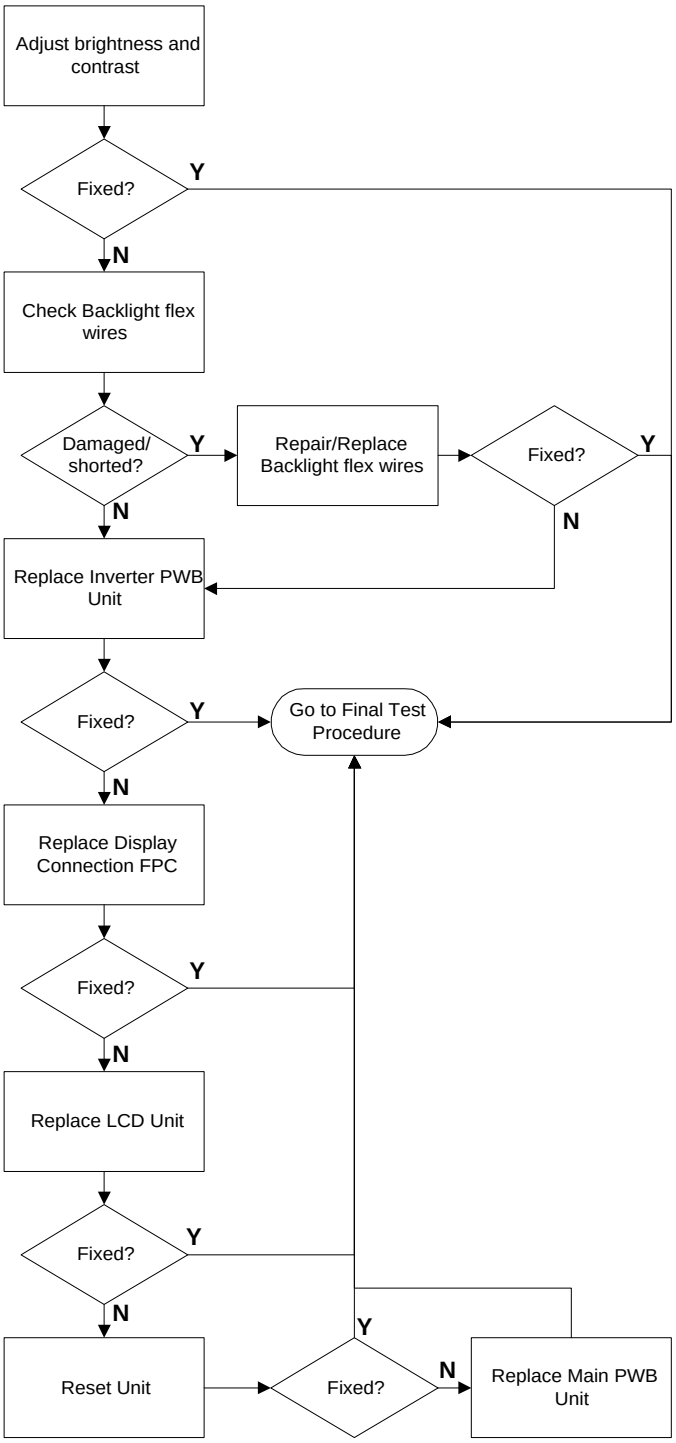
4.2. CLIO POWERS ON THEN SHUTS OFF (PROCEDURE 2)

4.3. CLIO DOES NOT POWER ON (PROCEDURE 3)

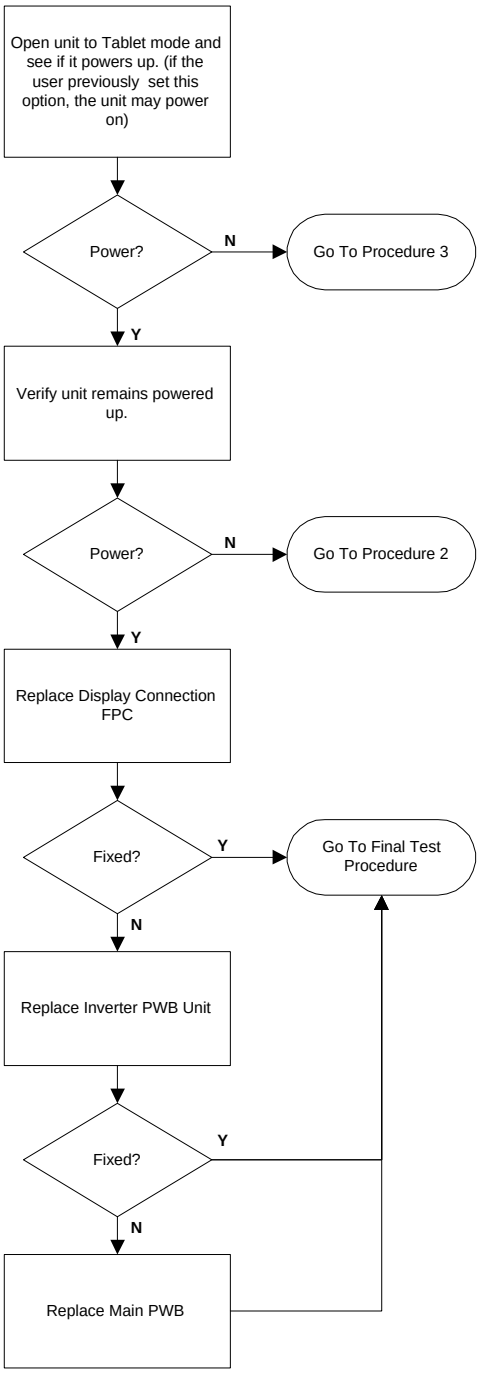


NOTE:
It is possible that a very few initial Clio units may not boot up when first turned on or after both batteries have been fully discharged. The problem randomly affects approximately 3% of early production units and occurs when the user attempts the initial power on and/or when the main battery and the backup battery are BOTH fully depleted of all power. The Clio unit is shipped with the battery installed, which minimizes power drain, so full power depletion is very unlikely to occur. Please note that the user should always avoid letting the main battery and backup battery fully deplete all power, as all personal data will be lost. A fully charged unit that is shut off takes about 2 months to fully discharge the main and backup battery. A low-battery unit that is shut off takes about 2 weeks to fully discharge the main and backup battery.

4.4. CLIO SCREEN DIM OR ABNORMAL (PROCEDURE 4)

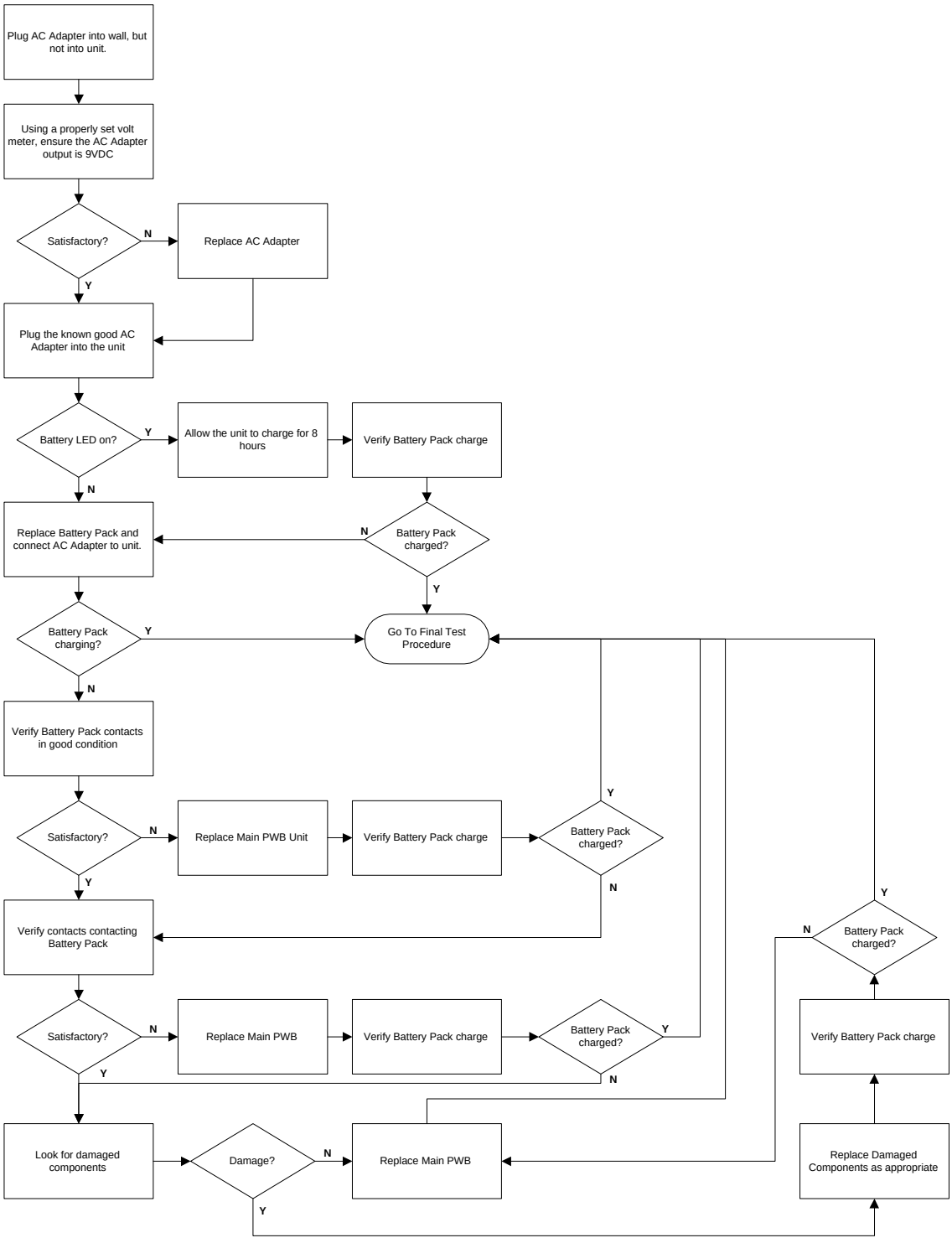


4.5. ON/SUSPEND BUTTON INOPERATIVE (PROCEDURE 5)

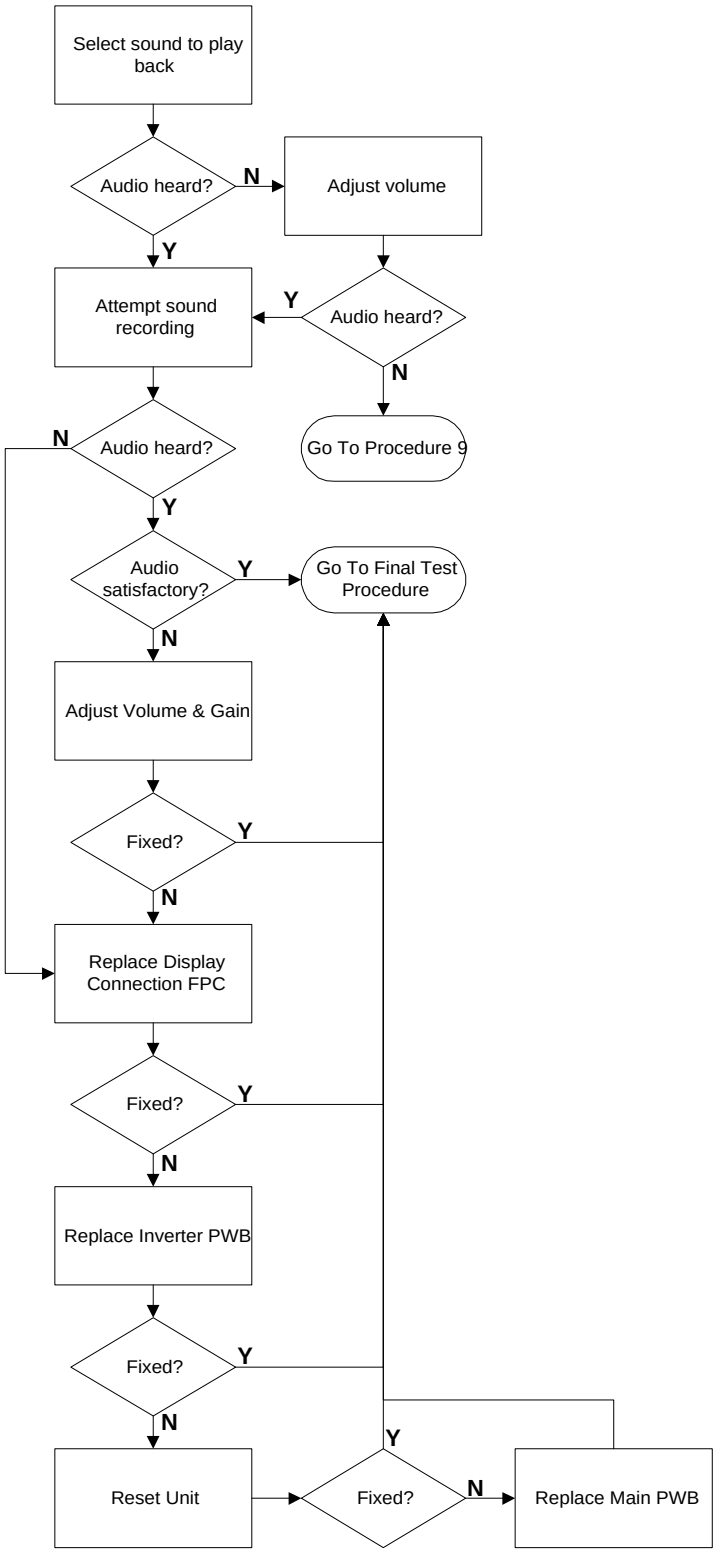


4.6. BATTERY CANNOT HOLD CHARGE (PROCEDURE 6)

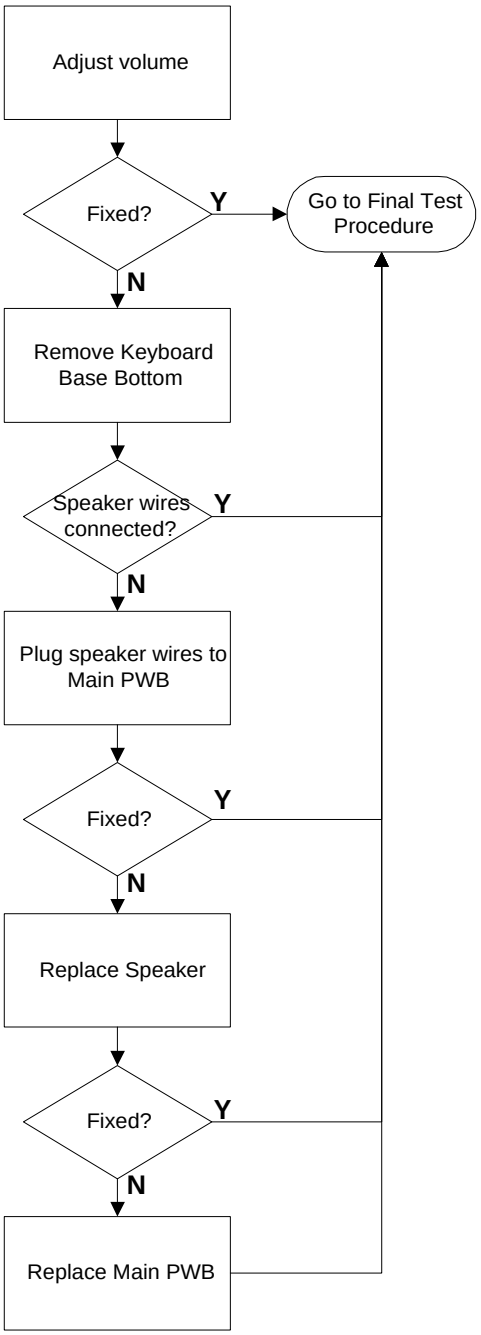
4.7. A/C ADAPTER NOT CHARGING BATTERIES (PROCEDURE 7)



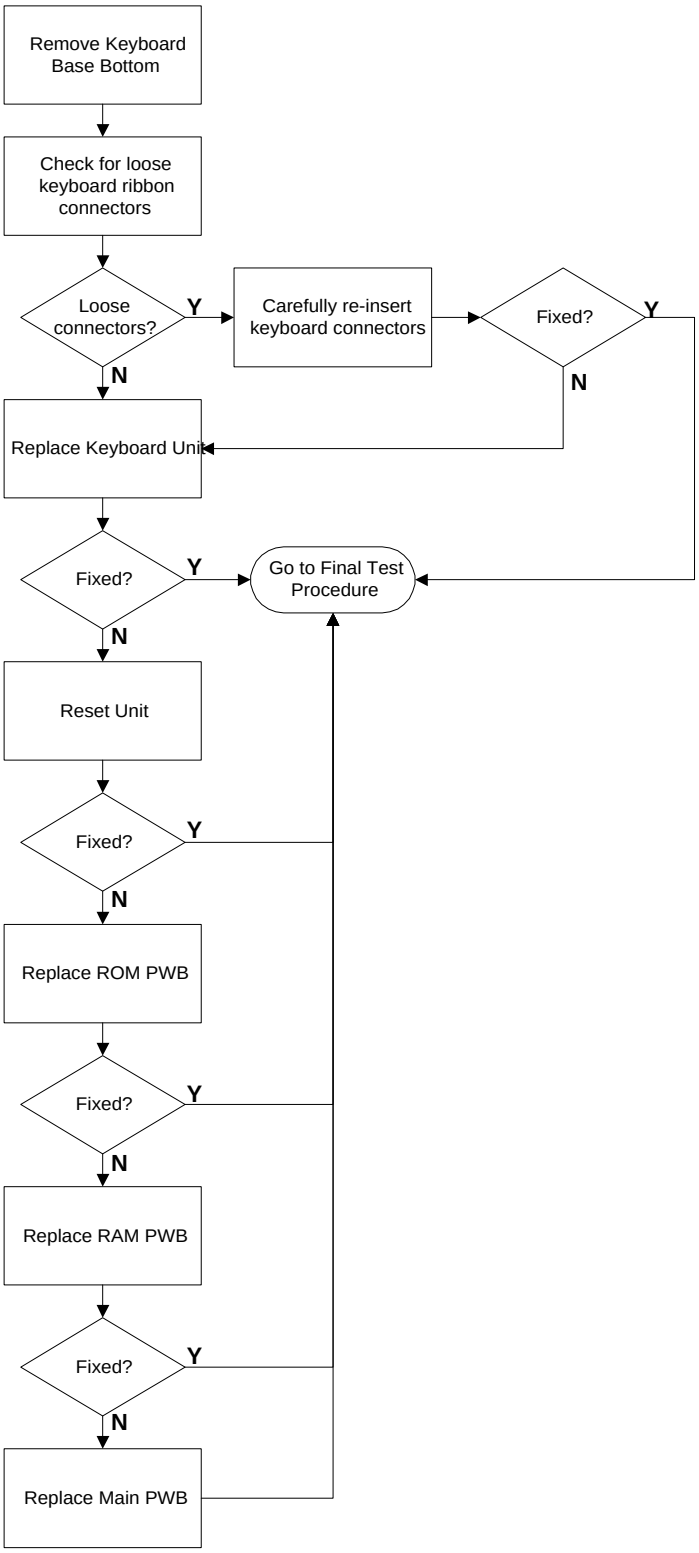
4.8. CANNOT RECORD AUDIO (PROCEDURE 8)



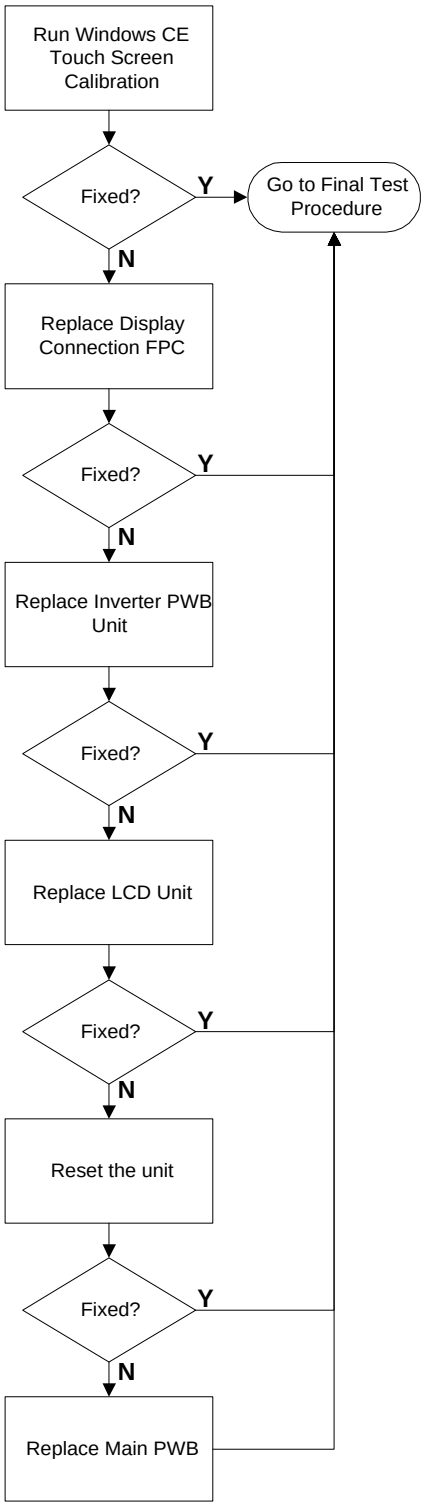
4.9. NO AUDIO PLAYBACK (PROCEDURE 9)



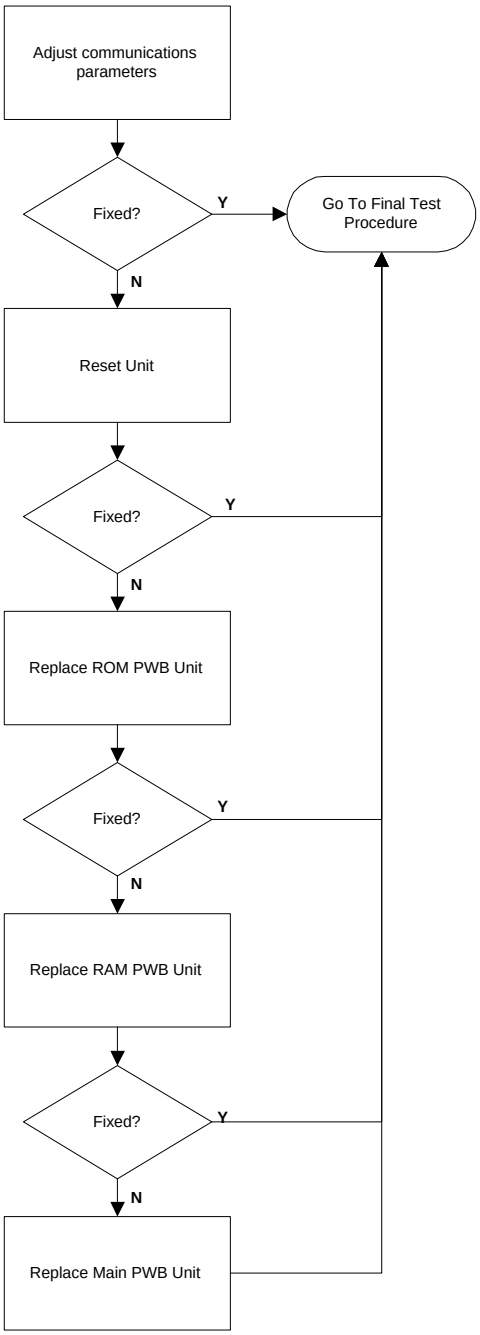
4.10. KEYBOARD INOPERATIVE (PROCEDURE 10)



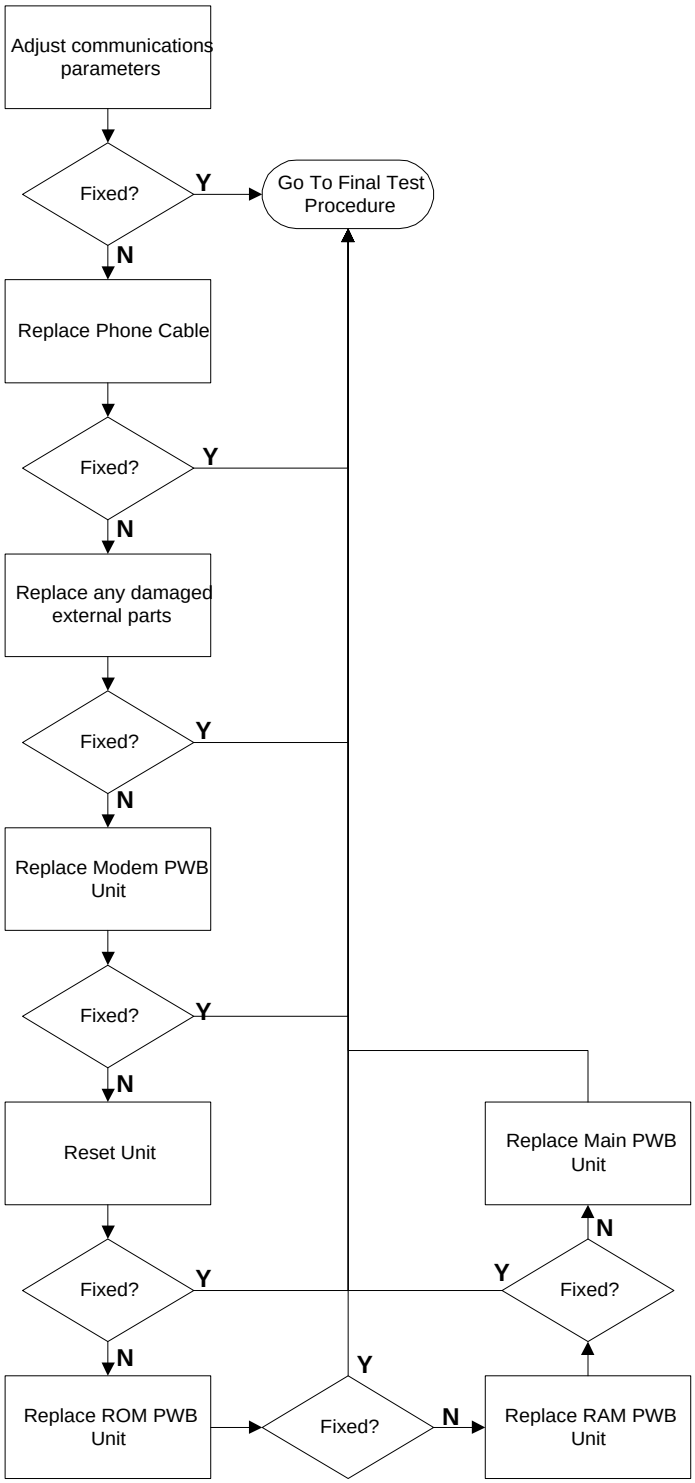
4.11. TOUCH SCREEN INOPERATIVE (PROCEDURE 11)



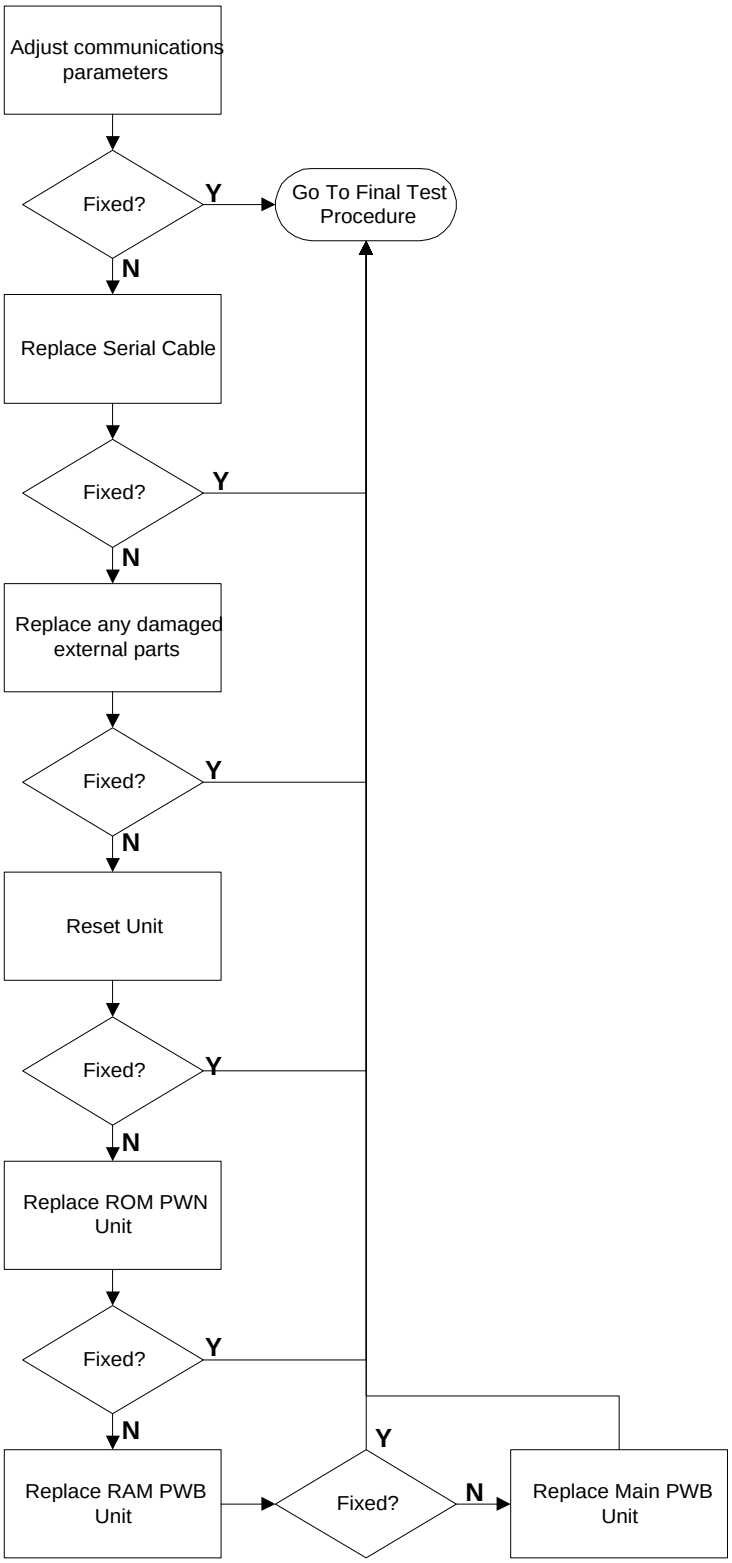
4.12. INFRARED INOPERATIVE (PROCEDURE 12)



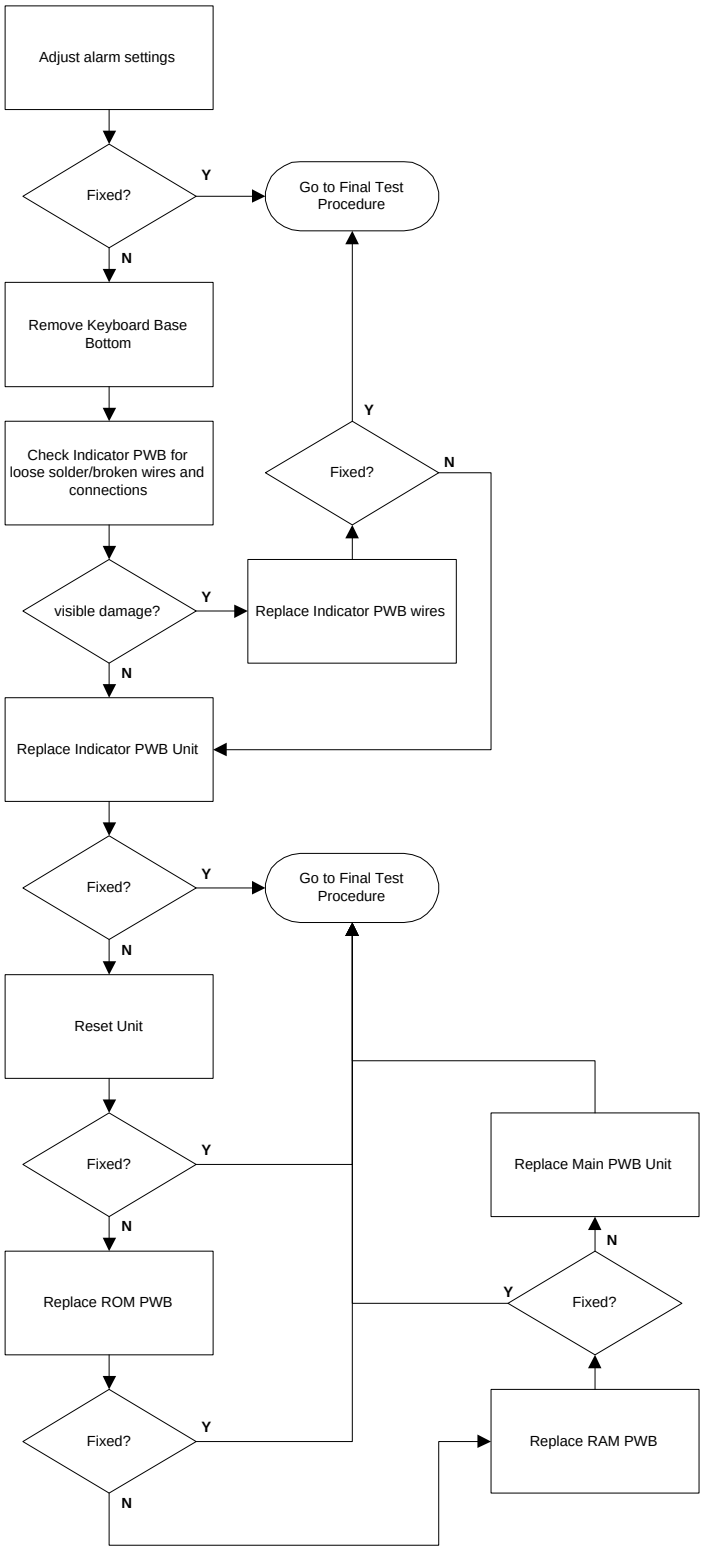
4.13. MODEM INOPERATIVE (PROCEDURE 13)



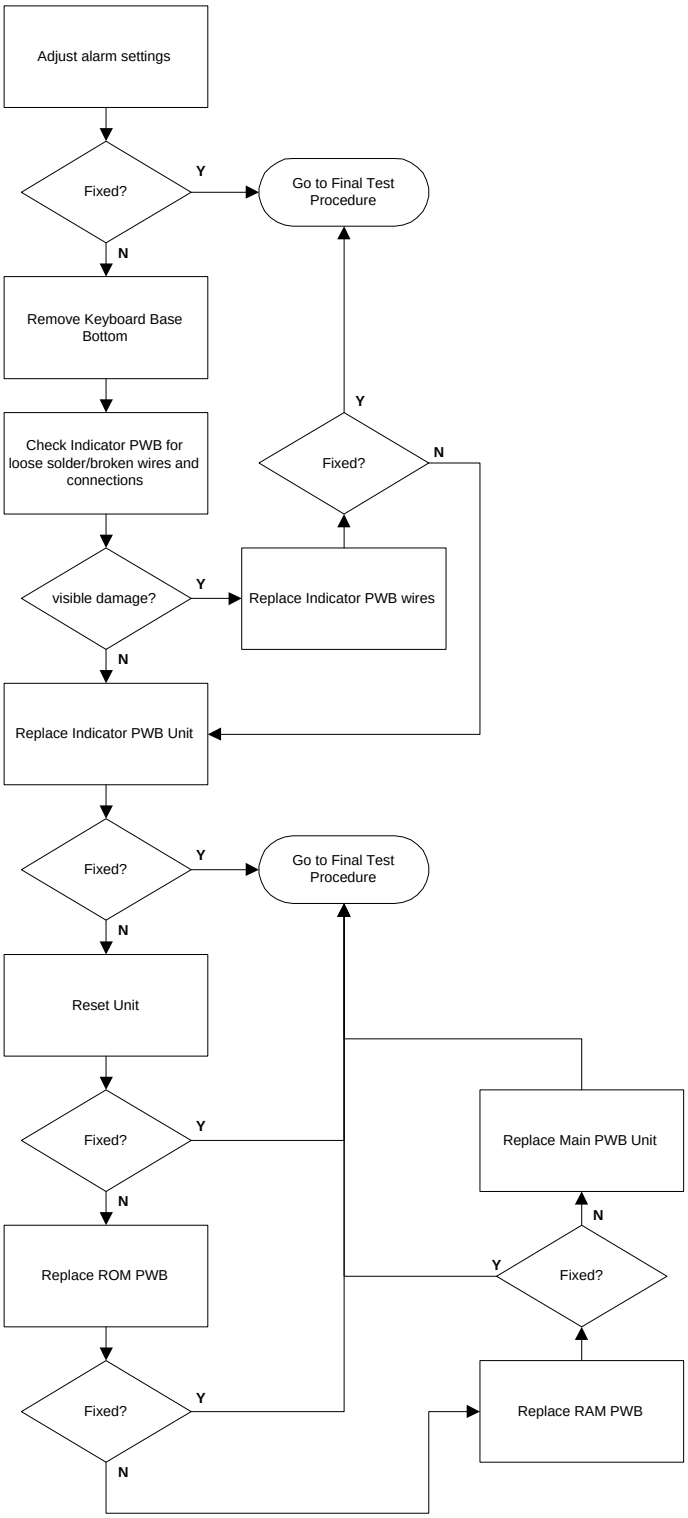
4.14. SERIAL PORT INOPERATIVE (PROCEDURE 14)



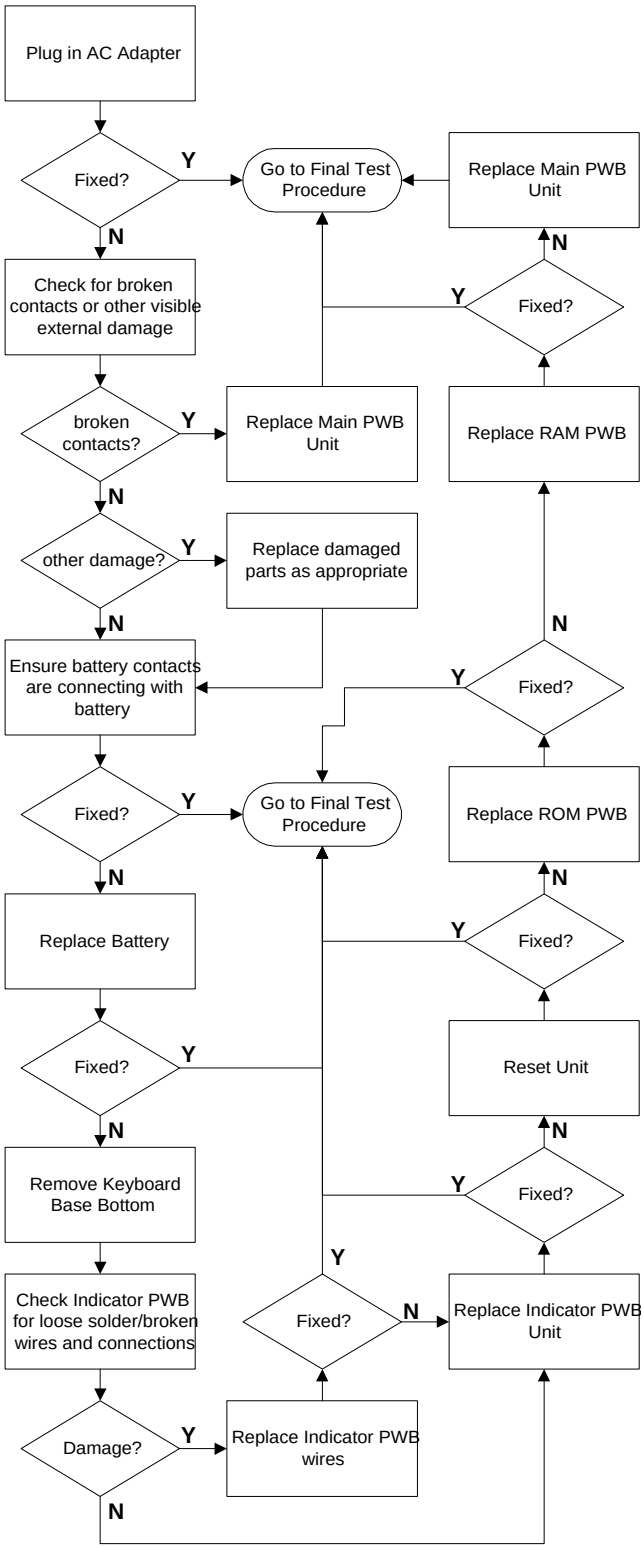
4.15. NOTIFICATION LED INOPERATIVE (PROCEDURE 15)



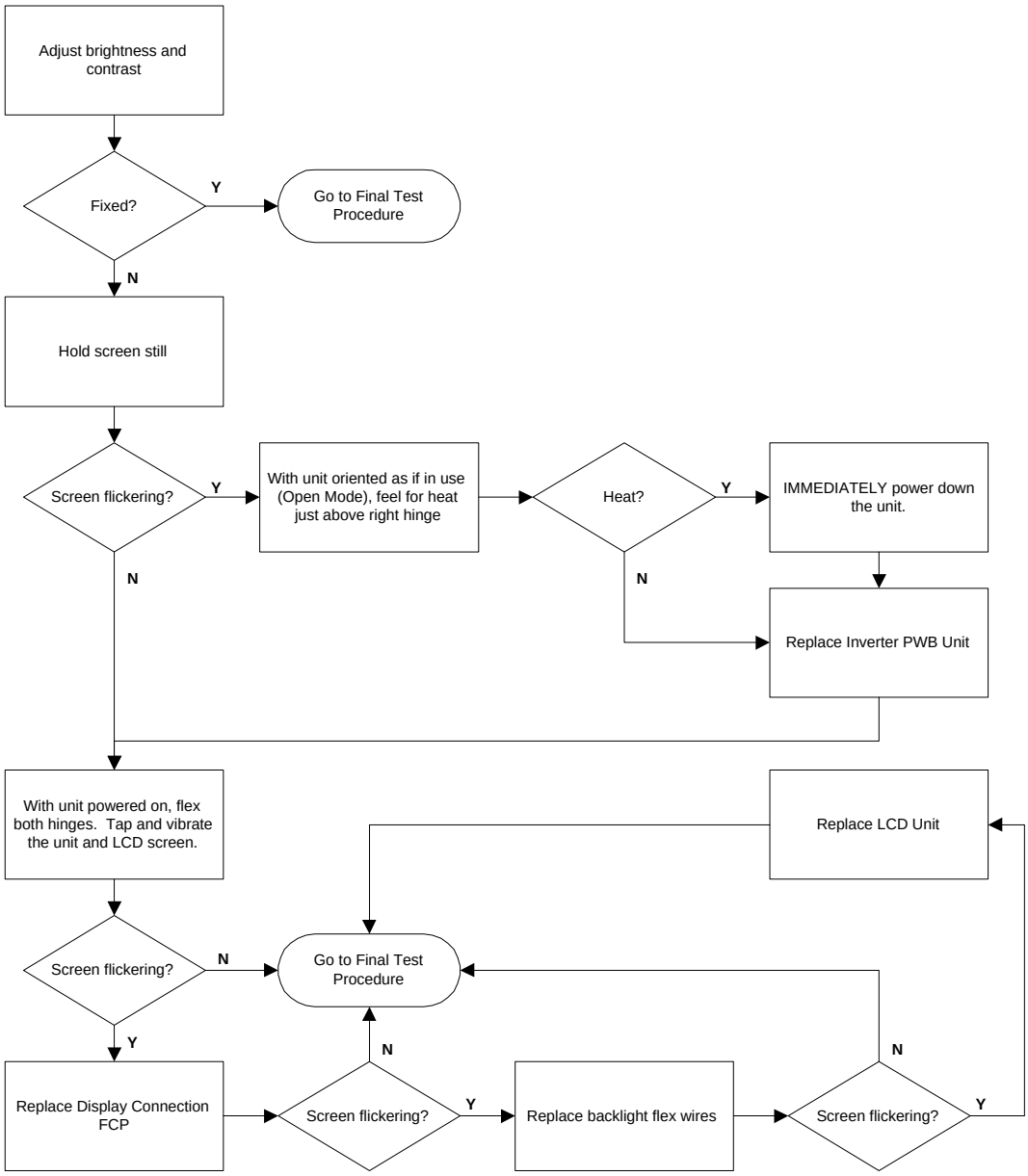
4.16. NOTIFY BUTTON INOPERATIVE (PROCEDURE 16)



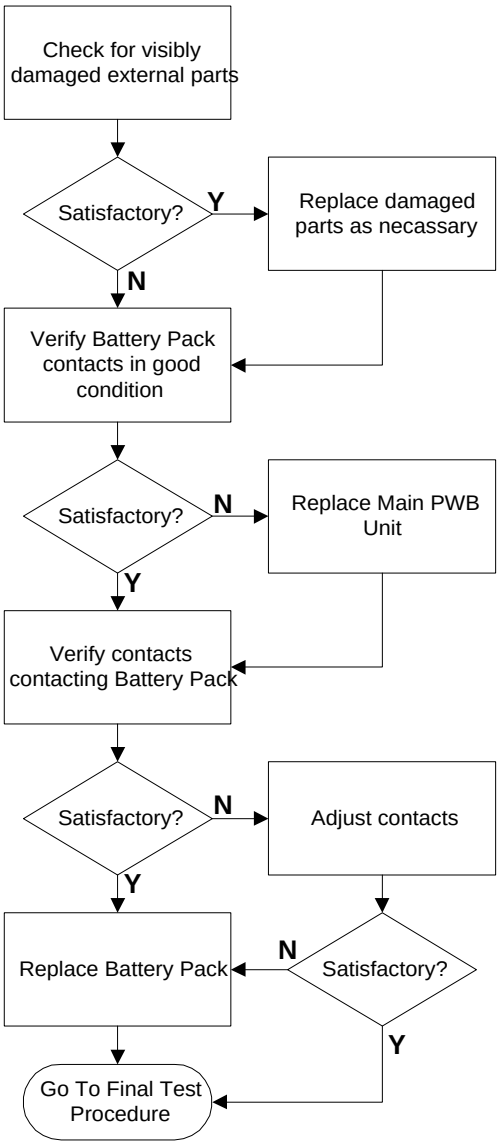
4.17. BATTERY LED NOT LIGHTING (PROCEDURE 17)



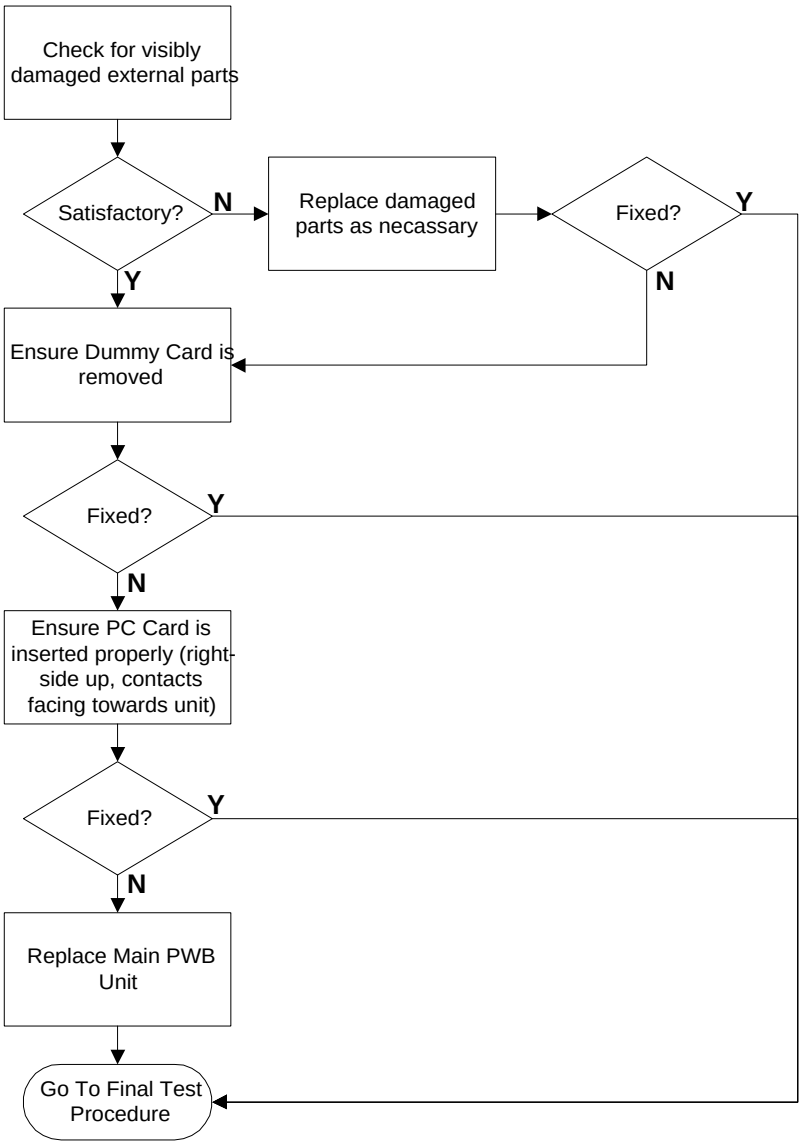
4.18. LCD SCREEN FLICKERING (PROCEDURE 18)



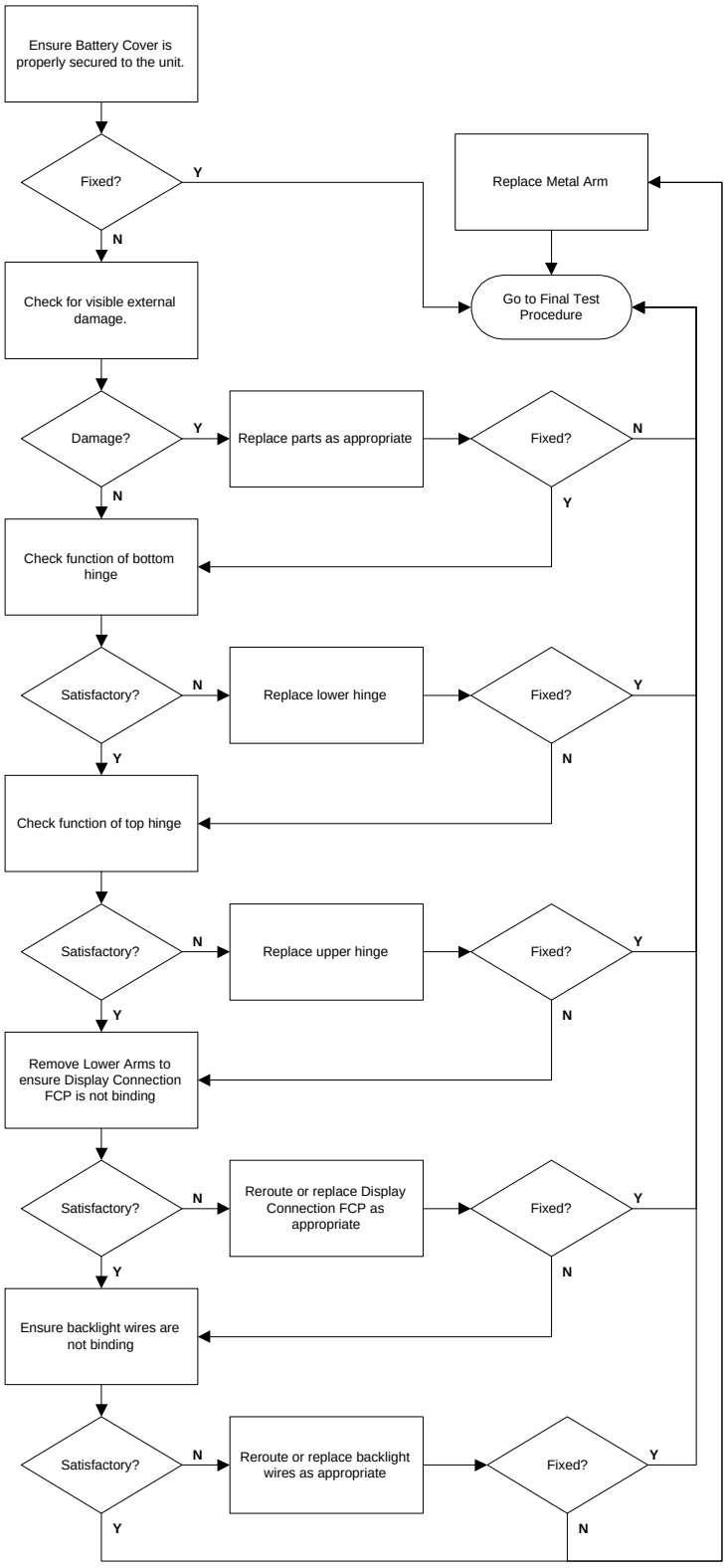
4.19. CANNOT INSERT BATTERY PACK (PROCEDURE 19)



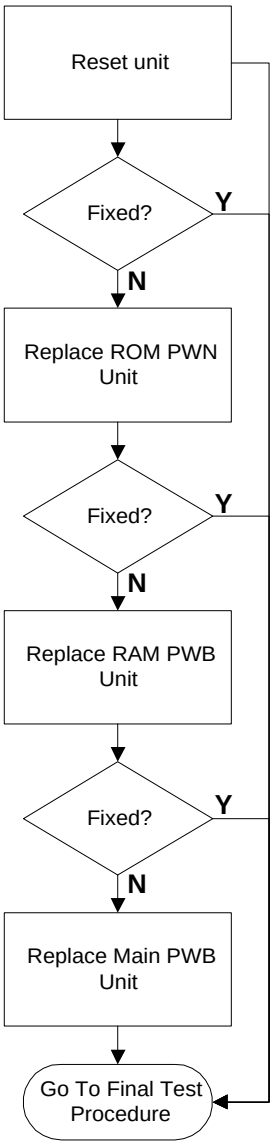
4.20. CANNOT INSERT PC CARD (PROCEDURE 20)



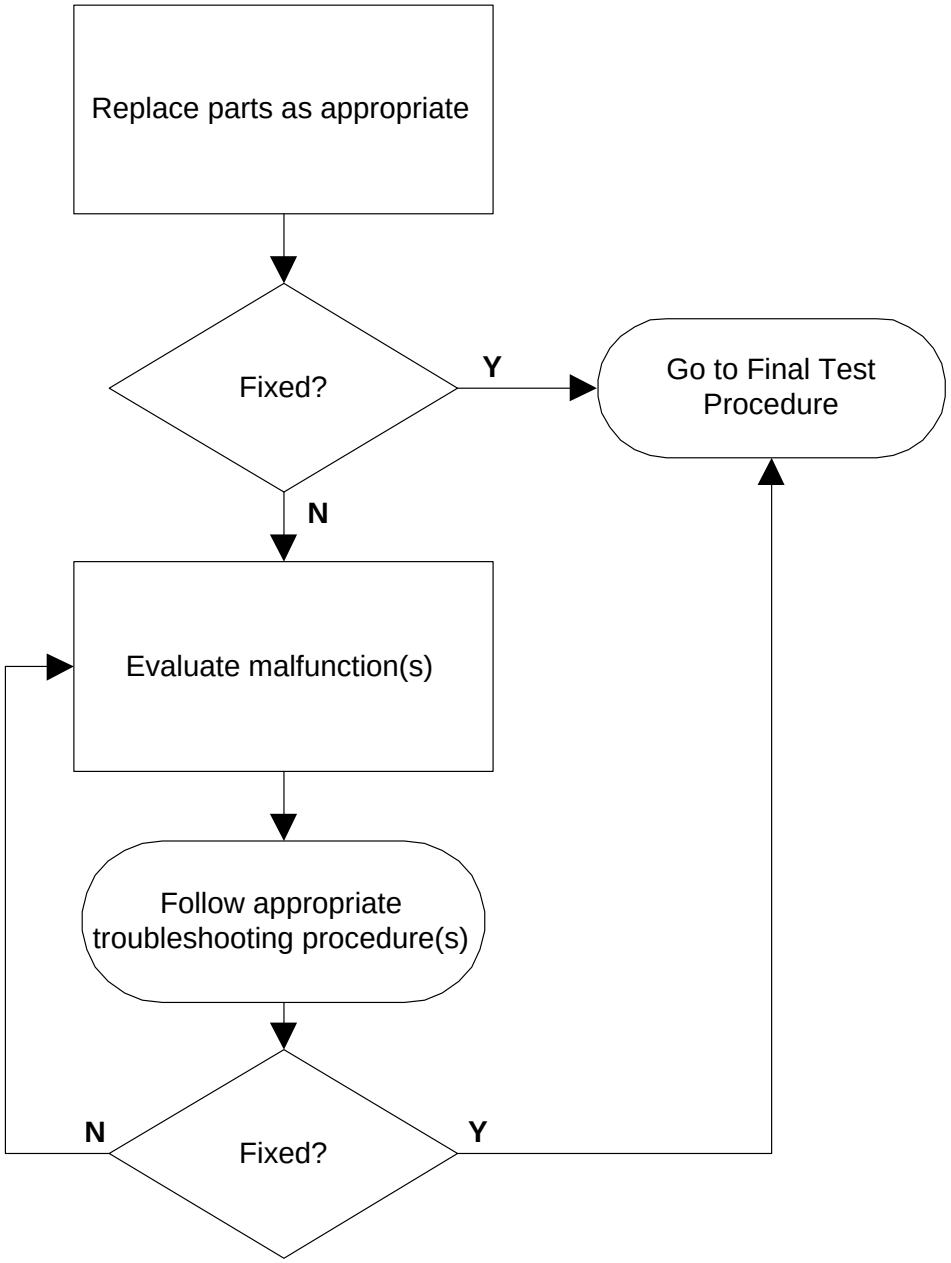
4.21. UNIT DOES NOT OPEN/CLOSE PROPERLY (PROCEDURE 21)



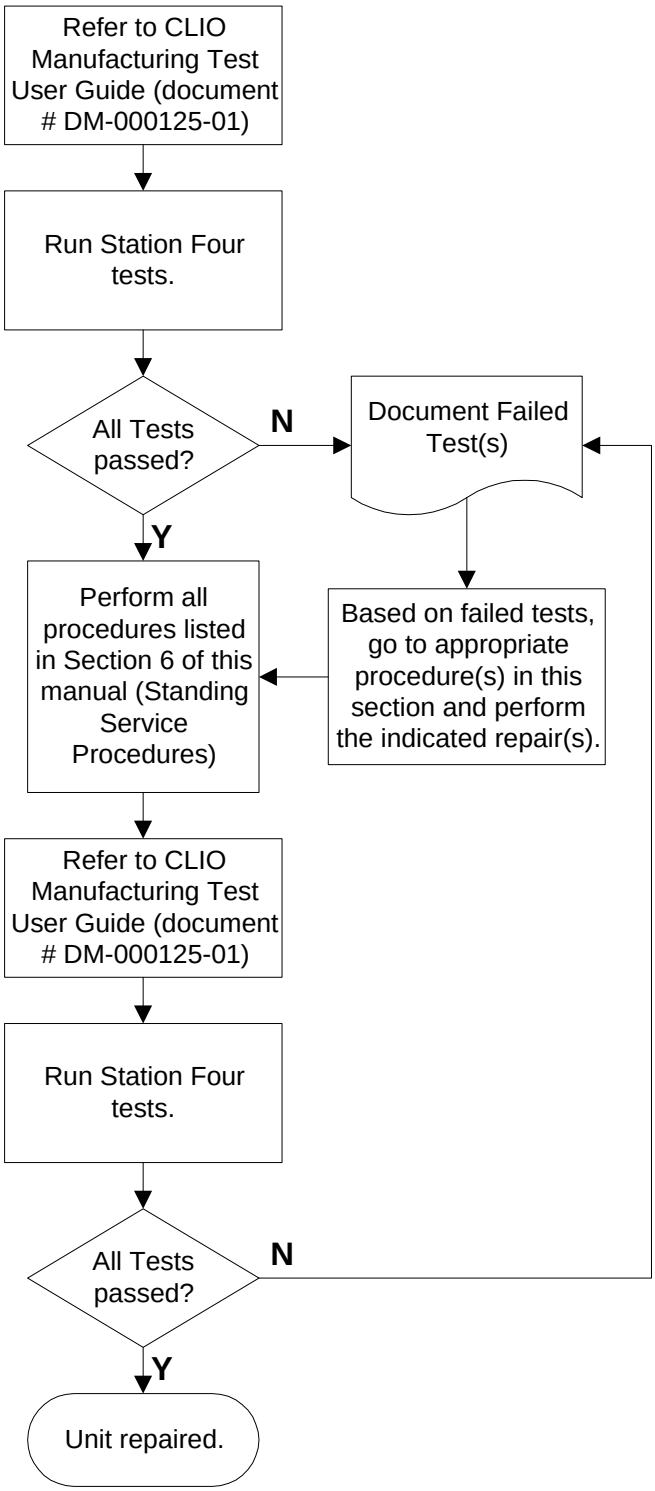
4.22. CANNOT RESET UNIT (PROCEDURE 22)



4.23. EXTERNAL DAMAGE TO UNIT (PROCEDURE 23)



4.24. FINAL TEST PROCEDURE



5. CLIO TEAR-DOWN AND REBUILD

This chapter describes how to disassemble a CLIO unit down to the Field Replacement Unit (FRU) level. This chapter also discusses assembling CLIO FRUs into a complete CLIO unit.

5.1. CLIO FIELD REPLACEMENT UNITS (FRUS)

Refer to Chapter 2 for a set of photographs of a disassembled CLIO with numbered call outs to each listed spare part. Chapter 3 contains a tabulated listing of the spare parts kits available for CLIO as well as their contents. For clarity, all numbered references refer to numbered call outs in the photographs.

5.2. REQUIRED TOOLS

- Screwdriver: Torx head, #6
- Screwdriver: Phillips head, #1
- Screwdriver: Phillips head, #2
- Screwdriver: Phillips head, miniature jewelry type
- Screwdriver: flat head, mini jeweler type
- Tweezers: miniature (or miniature needle-nose pliers)
- Soldering iron : Weller TCP/TC201 or equivalent
- Soldering iron tip: Weller PTR7 - 700F screwdriver tip, 1/16” or equivalent
- Solder: Kester #245 (0.020”) or equivalent
- Blade: X-Acto or equivalent
- Tape: 3M masking, 3/8” or equivalent
- Pliers: miniature needle-nose
- Pliers: standard slip-joint

WARNING: SOLDERING IRONS POSE POTENTIALLY SERIOUS BURN AND/OR FIRE HAZARDS, AND CAN DAMAGE SENSITIVE ELECTRONIC COMPONENTS IF USED IMPROPERLY. ADDITIONALLY, HOT OR MOLTEN SOLDER CAN CAUSE SEVERE BURNS OR DAMAGE TO SENSITIVE ELECTRONIC COMPONENTS. ALWAYS EXERCISE EXTREME CAUTION WHEN USING SOLDERING IRONS.

WARNING: SMALL SCREWDRIVER BLADES AND KNIFE BLADES ARE SHARP. ALWAYS PLACE YOUR HANDS AND FINGERS WHERE THEY WILL BE SAFE IF THE BLADE SLIPS. ADDITIONALLY, PLACE YOUR BODY SUCH THAT YOU WILL NOT BE CUT BY A SLIPPED BLADE, OR WORK THE BLADE IN A DIRECTION AWAY FROM YOUR BODY.

5.3. CLIO ORIENTATION

Except where noted, the CLIO unit being worked on should be placed on a flat level work surface. The unit should be upside-down with the hinge arms facing you (modem port on the left). For the purposes of this chapter, the term 'standard orientation' will be used.

5.4. DATA PRESERVATION

Where possible, always link the CLIO unit being worked on to a host PC and backup the CLIO data to the host PC before performing any service on the CLIO unit. This may be done using a serial connection between CLIO's serial port and a free COM port on the host PC. Use Microsoft Windows CE Services on the host PC to establish the connection and partnership between the host PC and the CLIO. Refer to either the printed or on-line help or instructions that come with the Microsoft Windows CE Services software. Once a partnership is established, synchronize all data on the CLIO to the host PC.

WARNING: ALWAYS SYNCHRONIZE A CLIO UNIT BEFORE PERFORMING ANY SERVICE ON THE UNIT. FAILURE TO DO COULD RESULT IN THE LOSS OF A CUSTOMER'S DATA.

NOTE: Depending on the reason for working on any particular CLIO unit, it may not always be possible to backup data (if any) stored on the CLIO unit. Additionally, a prior malfunction may already have resulted in data loss on the CLIO unit being serviced. Should it be impossible to preserve data stored on the CLIO unit, document the reasons for this as part of any established service write-up procedure.

5.5. CARING FOR CLIO COMPONENTS

CLIO is designed to be a sturdy unit, however it is composed of numerous components, some of which are small, fragile, or both. To protect these components from damage, always observe the following universal precautions:

- When disassembling a CLIO unit, always be sure to store all parts in such a manner that they will not be lost, confused with identical parts from a different CLIO unit, and where they will not be subject to environmental stress from temperature, humidity, spills, etc. Reminders appear throughout the parts removal procedures to 'store in a secure location'.
- Always service CLIO on a flat level work surface.
- Ensure that no components are exposed to excessive heat, cold, humidity, smoke, dust, spills, or chemicals.
- Always follow electrostatic protection protocols when servicing CLIO. These include:
  - Having a clean, properly grounded anti-static mat on your work surface at all times.
  - Wearing an appropriately grounded anti-static wrist strap when servicing CLIO.

5.6. BATTERY PACK - REMOVE AND REFIT

Please refer to photo 1 in Chapter 2.

5.6.1. BATTERY PACK REMOVAL

1. Place the CLIO unit on the work surface in standard orientation.
2. Place your thumbs under the tabs on the back of the Battery Cover (48) and lift the door up and away from you. The tabs appear as two small ridges. Store the Battery Cover (48) in a secure location.
3. Gently rotate the battery (BATTERY) towards you until the tab on the right hand side is pointing up.
4. Grasp the tab on the battery and lift the battery (BATTERY) straight up and out of the CLIO unit. Store in a secure location.

5.6.2. BATTERY PACK REFIT

1. Ensure the battery tab is facing up and to the right. The contacts should be facing away from you. Lower the battery (BATTERY) straight down into the battery well. Rotate the battery into position with the tab resting on the contacts.
2. Insert the tabs on the curved (front) side of the Battery Door (48) into the slots on the main CLIO unit. Press down on the flat side to snap the cover into place. Note that the CLIO unit will not power on unless the Battery Door (48) is properly inserted.

5.7. ROM/RAM COVER - REMOVE AND REFIT

Please refer to photos 2 and 3 in Chapter 2.

5.7.1. ROM/RAM COVER REMOVAL

1. Locate the CLIO's ROM/RAM Cover (49) in the middle of the CLIO unit (shield shaped).
2. Using a #2 Phillips screwdriver, remove the screw (37) holding the ROM/RAM Cover in place. Save the screw in a secure location.
3. Gently pry the ROM/RAM Cover (49) up and out of the CLIO unit using either a thumbnail or a flat-head jewelry screwdriver. Store in a secure location.

5.7.2. ROM/RAM COVER REFIT

1. Insert the two tabs at the top of the shield-shaped ROM/RAM Cover (49) and rotate the door down until it is flush with the main CLIO unit.
2. Secure the ROM/RAM Cover (49) using a #2 Phillips screwdriver and an M3x6 screw (37) torqued to 0.4N.M. Note that CLIO will not power up unless the ROM/RAM Cover is properly secured.

5.8. CLIO MAIN HOUSING (BOTTOM) - REMOVE AND REFIT

Please refer to photos 4-12, 14-16, and 22 in Chapter 2.

5.8.1. CLIO KEYBOARD BASE (BOTTOM) REMOVAL

1. Place the CLIO unit on a flat level work surface in standard orientation.
2. Remove the Battery Pack using the procedure described above.
3. Remove the ROM/RAM Cover using the procedure described above.
4. Insert a piece of soft cloth between the CLIO Keyboard Base Top (47) and the Display Bezel Unit (2) to avoid scratching or marring the LCD Unit (66).
5. Remove the PCMCIA Dummy Card (36) from the right side of the unit by grasping the protruding handle and sliding the Dummy Card (36) straight out. Store in a secure location.
6. Gently peel off the two rubber feet (31) located at the corners of the CLIO Keyboard Base Bottom (45) (the two corners farthest from you). Store the feet (31) in a secure location for later reuse.
7. Using either a flat headed jewelry screwdriver or the tip of an X-Acto blade, gently remove the four rubber plugs located on the CLIO lower hinge arms (19, 20, 21, 22) by inserting the implement between the caps and the hinge and carefully prying the caps loose. Store in a secure location. Removing these caps will reveal four screws.
8. Remove the four screws located in the previous step (17, 24) using a #2 Phillips head screwdriver and store in a secure location. Remove the washers (18, 23) from both hinge arms (25,26) and store in a secure location.
9. Remove the two hinge arm halves (26, 26) by lifting them straight up and away from the CLIO unit.
10. Locate the six Torx head screws (38) (two flanking the ROM/RAM Cover location, two along the left and right edges of the CLIO Keyboard Base Bottom, and two in the far corners where the rubber feet were removed).
11. Remove the six Torx head screws (38) using a #6 Torx head screwdriver.
12. Locate the Phillips screw (37) on the lower left corner.
13. Note the flex circuit (8) and wires coming out of the right side of the CLIO. These are fragile. Handle with care.
14. Note that there are slotted plastic bushings (4, 33) around the opening in the top and bottom Keyboard Base halves (45, 47)(where the flex circuits emerge). Using either a pair of tweezers or a pair of miniature needle-nose pliers, gently spread the bushing open and slide it off the Keyboard Base halves. Carefully thread the flex circuit (8) and wires through the slot in the bushing and store the bushing in a secure location.
15. Note the locations of the two rubber bumpers (32), one on each side of the CLIO, the IR Lens (28) (on the left), and the clear Indicator Lens (29) on the front of the CLIO (located in the center of the edge facing away from you).
16. Using either fingernails or a miniature jewelry screwdriver, carefully work your way around the CLIO unit and separate the Keyboard Base halves (45, 47), taking care not to

break any of the slots and tabs. It may help to grasp the Keyboard Base Bottom (45) along the strip of material between the Battery Pack bay and the ROM/RAM Cover opening and lift up gently to flex the plastic housings and make separating the Keyboard Base halves (45, 47) easier. Remove the two rubber bumpers (32) and the Indicator Lens (29) and IR Lens (28) as you come to them. Store in a secure location.

17. Once the Keyboard Base halves (45, 47) are separated, slowly lift the Keyboard Base Bottom (45) up and turn it upside-down by rotating it away from you. Use caution to avoid breaking the speaker connection or damaging CLIO's internal components.

18. Unplug the speaker wires (34) from the Main PWB Unit (50) taking care to avoid damaging the plug or delicate wires. You may also use a #1 Phillips screwdriver to remove the two screws (39) securing the Speaker (34) to the Keyboard Base Bottom (45). Store the speaker (34), screws (39), and strap (35) in a secure location.

5.8.2. CLIO MAIN HOUSING (BOTTOM) REFIT

1. Place the CLIO unit on a flat level work surface in standard orientation.

2. Gently press the speaker (34) into place on the CLIO Keyboard Base (45) inner surface and secure in place using the metal strap (35). Secure the strap using two K1.5x3.5 screws (39) and a miniature Phillips head screwdriver torqued to 0.11N.M. Plug the speaker wires into the Main PWB Unit (50).

3. Ensure that the screw holes on the Keyboard Base Bottom (45) and Main PWB Unit (50) line up with the screw holes on the Keyboard Base Top (47).

4. Rotate the Keyboard Base Bottom (45) towards you and lay it in position on top of the Keyboard Base Top (47).

5. Insert the two rubber bumpers (32) in their slots on the left and right edges of the CLIO.

6. Insert the Indicator Lens (29) into its slot in the middle of the CLIO's front edge (the side facing away from you). Insert the IR Lens (28) into its slot on the CLIO's side.

7. Gently work your way around the CLIO inserting and fastening the various tabs and slots to mate the two halves of the CLIO Keyboard Base (45). Use caution to avoid displacing the various CLIO internal components and damaging the flex circuit and wires. Make sure that the flex circuits emerge through the opening in the CLIO Main Housing (45, 47) and that they are not pinched between the two halves. It may help to use a miniature flat head screwdriver to gently flex the Keyboard Base halves (45, 47), allowing the slots and tabs to fit together more easily.

8. Using either tweezers or miniature needle-nose pliers, gently spread open the slot on the bushings (4, 33) and thread the bushings (4,33) over the flex circuit and wire (8), taking care not to damage them. Slide the bushings (4,33) into place over the openings in the CLIO Keyboard Base halves (45, 47).

9. Lay the right side lower hinge arm (26) in place, taking care to avoid pinching the flex circuit and wires (8). Fasten the arm (26) in place using one M3x6 screw (17) and spring washer (18) at the LCD Unit end and one M3x10 screw (24), spring washer (18) and washer (23) at the keyboard end of the arm. Refer to photos 5 and 6 in Chapter 2. Use a #2 Phillips head screwdriver to torque these screws to 1.0N.M each. Replace the rubber plugs (19, 21) above the screws.

10. Repeat the above step for the left side. Note that there are no flex circuits on the left side. Refer to photos 4 and 6 in Chpater 2.

11. Insert and secure the six K2.2x7 Torx screws (38) in the Keyboard Base Bottom using a #6 Torx head screwdriver torqued to 0.2N.M.
12. Insert and secure an M3x6 screw (37) in the hole in the lower left corner of the Keyboard Base Bottom using a #2 Phillips head screwdriver torqued to 0.4N.M
13. Replace the two rubber feet in the far left and right-hand corners of the Keyboard Base Bottom (31).
14. Follow the ROM/RAM Cover Refit procedure (above).
15. Follow the Battery Pack Cover procedure (above).

5.9. CLIO KEYBOARD BASE TOP - REMOVE AND REFIT

Please refer to photos 4-16, 22 in Chapter 2.

5.9.1. CLIO KEYBOARD BASE TOP REMOVAL

1. Place the CLIO unit on a flat level work surface in standard orientation.
2. Follow the Keyboard Base Bottom removal procedure, above.
3. Using tweezers or a pair of miniature needle-nosed pliers, gently lift the Indicator PWB Unit (51, 52) from its slot by lifting it straight up. The Indicator PWB Unit (51, 52) is the small PWB located in the center of the CLIO's front side (facing away from you) with the insulator attached to the back side of the board. Take care not to bend or break the delicate soldered connection between the Indicator PWB Unit (51, 52) and the ribbon cable (53) connected to it.
4. Using fingernails, reach under the left and right sides of the Keyboard Unit (40)(silver metal plate) and gently lift it approximately five millimeters to separate it from the Keyboard Base Top (47). Use extreme caution to avoid bending or breaking the Indicator PWB Unit ribbon cable (53) or the keyboard ribbon cable connectors.
5. With your right hand, grasp the keyboard assembly (40) gently but firmly. With your left hand, grasp the Main PCB Unit (50) gently but firmly. In unison, lift the two assemblies straight up and out of the Keyboard Base Top (47), taking care to avoid over-extending the two flex circuits (8). Rotate the two assemblies clockwise 90 degrees and place them on the work surface.
6. Remove the protective plastic mat from the Keyboard Base Top (47) and store it in a secure location.
7. Ensure that the Bottom Hinge (43, 44) is removed from the Keyboard Base Top (47). Refer to the Lower Hinge Remove & Refit procedure (below).
8. The Keyboard Base Top (47) may now be picked up and stored in a secure location.

5.9.2. CLIO KEYBOARD BASE TOP REFIT

1. The LCD Unit (66) should be lying on the work surface in standard orientation (screen up, *{On/Suspend}* button on the right). The Main PWB Unit (50) and Keyboard Assembly (40) should be resting on the work surface at approximately right angles to the LCD Unit (66). Both assemblies should be upside-down (keyboard assembly should have a silver

metal plate facing up; the main board should have the ROM and RAM modules facing up).

2. Ensure that the Bottom Hinge (43, 44) is in place on the Keyboard Base Top (47). Refer to the Bottom Hinge Remove & Refit procedure (below).
3. Place the protective plastic mat on the Keyboard Base Top (47), ensuring that the four holes in the mat line up with the four screw holes in the Keyboard Base Top (47).
4. Place a piece of soft cloth over the LCD Unit (66) to avoid marring or scratching the LCD Unit (66) or assembly.
5. Place the Keyboard Base Top (47) on top of the LCD Assembly in standard orientation (the large opening for the keyboard should be facing away from you and the battery well should be aligned with the bottom edge of the LCD Unit
6. Grasp the Keyboard Assembly (40)(silver metal plate) gently but firmly in your right hand. Grasp the Main PWB Unit (50) gently but firmly in your left hand. Lift both assemblies straight up in unison taking care to avoid bending or breaking the Indicator PWB Unit (51, 52, 53) and keyboard ribbon cables.
7. Rotate the two assemblies in unison 90 degrees counterclockwise, taking care to avoid overextending the flex circuits (8).
8. Lower both assemblies straight down onto the Keyboard Base Top (47). Ensure that both the Main PWB Unit (50) and Keyboard Assembly (40) line up with the screw holes in the Keyboard Base Top (47).
9. Using tweezers or a pair of miniature needle-nose pliers, gently insert the Indicator PWB Unit (51, 52) into its slot in the center of the front (facing away from you) edge of the Keyboard Base Top (47).
10. Follow the Keyboard Base Bottom refit procedure (above).

5.10. DISPLAY TOP – REMOVE & REFIT

Please refer to photos 4-6, 22, 23, 27 in Chapter 2.

5.10.1. DISPLAY TOP – REMOVAL

1. Place the CLIO unit on a flat level work surface in standard orientation.
2. Using either a flat headed jewelry screwdriver or the tip of an X-Acto blade, gently remove the four rubber plugs (19, 20, 21, 22)(located on the CLIO hinge arms by inserting the implement between the caps and the hinge and carefully prying the plugs loose. Store in a secure location. Removing these caps will reveal four screws.
3. Remove the four screws (17, 24) located in the previous step using a #2 Phillips head screwdriver and store in a secure location. Remove the washers (18, 23) and store in a secure location.
4. Remove the two lower hinge arm halves (25, 26) by lifting them straight up and away from the CLIO unit.
5. Grasping the CLIO unit securely, turn it upside-down. The Display Bezel Top (1) will now be on top.

6. Lift the U-shaped Metal Arm straight up (27) and away from the CLIO unit and store in a safe location. You may need to use a miniature screwdriver to gently pry the Top Hinge (16) from its position on the hinge arm (27).
7. Note that the opening where the flex circuit (8) and wires emerge from the top and bottom Display Bezel halves has slotted plastic bushings (4). Using either a pair of tweezers or a pair of miniature needle-nose pliers, gently spread the bushings (4) open and slide them off the Display Bezel halves (1, 2). Carefully thread the flex circuit (8) and wires through the slot in the bushings (4) and store the bushings (4) in a secure location.
8. Using either fingernails or a miniature jewelry screwdriver, carefully work your way around the CLIO unit and separate the Display Bezel halves (1, 2), taking care not to break any of the slots and tabs. Lift the Display Top (1) straight up. Store in a secure location.

5.10.2. DISPLAY TOP – REFIT

1. To replace the Display Top (1), the CLIO unit should be oriented with the hinge side facing the technician and the LCD Unit (large silver plate) facing up.
2. Gently work your way around the CLIO inserting and fastening the various tabs and slots to mate the two halves of the Display Bezel (1, 2). Use caution to avoid damaging the flex circuit (8) and wires. Make sure that the flex circuit and wires emerge through the opening in the Display Bezels (1, 2) and that they are not pinched between the two halves.
3. Using either tweezers or miniature needle-nose pliers, gently spread open the slot on the bushings (4) and thread the bushings (4) over the flex circuit and wires, taking care not to damage the flex circuit (8) and wires. Slide the bushings (4) into place over the opening in the Display Bezels (1, 2).
4. Lay the U-shaped Metal Arm (27) into position. Grasping the CLIO unit securely, rotate it into standard orientation.
5. Lay the right side lower hinge arm in place (26), taking care to avoid pinching the flex circuit (8) and wires. Insert the washers (18, 23) in their locations as shown in photo 5. Fasten the arm (26) in place using one M3x6 (17)(display end) and one M3x10 (24)(base end) screw and a #2 Phillips head screwdriver torqued to 1.0N.M. Replace the rubber plugs (19, 21) above the screws. Repeat for the left side.

5.11. DISPLAY BEZEL – REMOVE & REFIT

Please refer to photos 4-6, 22, 23, 27 in Chapter 2.

5.11.1. DISPLAY BEZEL – REMOVAL

1. Insert a piece of soft cloth between the CLIO Keyboard Top (47) and the Display Bezel (2) to avoid scratching or marring the LCD Unit (66) or Display Bezel (2).
2. Follow the Display Top removal procedure, above.
3. Locate the four #1 Phillips head screws (10)(one near each corner of the LCD Unit).
4. Remove the four #1 Phillips head screws (10) using a #1 Phillips head screwdriver. Store in a secure location.

5. Gently rotate the Inverter PWB Unit (11) clockwise 90 degrees (to vertical) and unplug the Display Connection FPC (8)(flex circuit) cable. Move the Indicator PWB Unit (8) to the left, away from the CLIO unit. Use caution to avoid damaging the backlight flex circuit wires. Optionally, you may un-solder the backlight wires from the Inverter PWB board (11)(note the order in which the wires were soldered prior to removing them) and store the Inverter PWB Unit (11) in a secure location.
6. Carefully peel off the tape securing the orange Display Connection FPC to the back of the LCD Unit (16) and unplug the Display Connection FPC from the LCD Unit (66); move the Display Connection FPC out of the way, using caution to avoid damaging the flex circuit.
7. Grasp the Upper Hinge (16) and lift it straight up. Store in a secure location.
8. Gently lift the LCD Unit (66) straight up and store in a secure location.
9. Remove the Display Bezel (2).

5.11.2. DISPLAY BEZEL – REFIT

1. Ensure the CLIO unit is oriented properly (keyboard facing up and away from the technician).
2. Place a piece of soft cloth on top of the CLIO Keyboard Top (47) to avoid scratching or marring the LCD Unit (66) or Display Bezel (2).
3. Place the Display Bezel (2) into position on top of the CLIO Keyboard Top (47).
4. Gently lower the LCD Unit (16) into position inside the Display Bezel (2).
5. Insert the Upper Hinge (16) into position, using caution to avoid damaging the LCD Unit (66). Insert two K2.2x6.5 screws (10) into their holes and loosely fasten them using a #1 Phillips head screwdriver.
6. Lay the orange Display Connection FPC into position above the LCD Unit (66).
7. If the Inverter PWB Unit (11) was un-soldered from the backlight wires during the Display Bezel removal procedure, re-solder the backlight wires taking care to re-solder them in the same order as before their removal.
8. Place the Inverter PWB Unit (11) into position, then rotate 90 degrees clockwise (to vertical) and re-fasten the orange Display Connection FPC plug. Rotate the Inverter PWB Unit (11) back into position.
9. Insert the two remaining K2.2x6.5 screws (10) in their holes, and fasten all four screws to 0.2N.M using a #1 Phillips head screwdriver.
10. Connect the Display Connection FPC to the LCD Unit (66).
11. Tape the Display Connection FPC into place against the LCD Unit (66).
12. Follow the Display Top refit procedure, above.

5.12. LCD UNIT – REMOVE & REFIT

Please refer to photos 4-6, 22, 23, 27 in Chapter 2.

5.12.1. LCD UNIT – REMOVAL

Follow Steps 1-8 of the Display Bezel removal procedure, above.

5.12.2. LCD SCREEN – REFIT

Follow Steps 4-12 of the Display Bezel refit procedure, above.

5.13. INDICATOR PWB UNIT – REMOVE & REFIT

Please refer to photos 12, 13, 17 in Chapter 2.

5.13.1. INDICATOR PWB UNIT – REMOVAL

1. Follow the Keyboard Base Bottom removal procedure, above.
2. Using tweezers or a pair of miniature needle-nose pliers, gently grasp the Indicator PWB Unit (51, 52) and lift it straight up out of its slot.
3. Gently peel off the tape securing the Indicator PWB Unit ribbon cable (53) to the Keyboard Assembly (40). Bend the ribbon cable (53) back towards you to expose the solder connections from the ribbon cable (53) to the Indicator PWB Unit (51, 52).
4. Un-solder the ribbon cable (53) from the Indicator PWB Unit (51, 52). Store the Notification Board (51, 52) in a secure location.

5.13.2. INDICATOR PWB UNIT – REFIT

1. Solder the Indicator PWB Unit (51, 52) to the ribbon cable (53). With the Indicator PWB Unit (51, 52) facing you, the red LED on the Inverter PWB Unit (51, 52) should be on the right.
2. With the Indicator PWB Unit (51, 52) soldered in place, bend the ribbon cable (53) into position above the Keyboard Assembly (40).
3. Using tweezers or a pair of miniature needle-nose pliers, gently grasp the Indicator PWB Unit (51, 52) and insert it straight into its slot. Secure the Indicator PWB Unit ribbon cable (40) in position above the Keyboard Assembly (40) with tape.
4. Follow the Keyboard Base Bottom refit procedure, above.

5.14. INDICATOR PWB CABLE – REMOVE & REFIT

Please refer to photos 12, 13, 17 in Chapter 2.

5.14.1. INDICATOR PWB RIBBON CABLE – REMOVAL

1. Follow the Indicator PWB Unit removal procedure (above).
2. Un-solder the Indicator PWB cable (53) from the Main PWB Unit (51, 52).

5.14.2. INDICATOR PWB RIBBON CABLE – REFIT

1. Solder the ribbon cable (53) to the Main PWB Unit (51, 52).
2. Follow the Indicator PWB Unit refit procedure (above).

5.15. RAM PWB UNIT – REMOVE & REFIT

Please refer to photos 2, 3 in Chapter 2.

5.15.1. RAM PWB UNIT – REMOVAL

WARNING: THIS PROCEDURE ASSUMES THAT DATA STORED ON THE CLIO UNIT HAS BEEN SYNCHRONIZED OR HAS ALREADY BEEN CORRUPTED BEYOND RECOVERABILITY. FOLLOWING THIS PROCEDURE WITHOUT SYNCHRONIZING USABLE DATA WILL RESULT IN THE LOSS OF THAT DATA.

1. Follow the RAM/ROM Cover removal procedure, above.
2. The RAM PWB Unit (54) is on the right. Using fingernails, grasp the RAM PWB Unit (54) and lift it straight up. Store in a secure location.

5.15.2. RAM PWB UNIT – REFIT

WARNING: THIS PROCEDURE ASSUMES THAT DATA STORED ON THE CLIO UNIT HAS BEEN SYNCHRONIZED OR HAS ALREADY BEEN CORRUPTED BEYOND RECOVERABILITY. FOLLOWING THIS PROCEDURE WITHOUT SYNCHRONIZING USABLE DATA WILL RESULT IN THE LOSS OF THAT DATA.

1. Lower the RAM PWB Unit (54) into position and press into place using caution not to damage the plugs.
2. Follow the RAM/ROM Cover refit procedure, above.

5.16. ROM PWB UNIT – REMOVE & REFIT

Please refer to photos 2, 3 in Chapter 2.

5.16.1. ROM PWB UNIT – REMOVAL

WARNING: THIS PROCEDURE ASSUMES THAT DATA STORED ON THE CLIO UNIT HAS BEEN SYNCHRONIZED OR HAS ALREADY BEEN CORRUPTED BEYOND RECOVERABILITY. FOLLOWING THIS PROCEDURE WITHOUT SYNCHRONIZING USABLE DATA WILL RESULT IN THE LOSS OF THAT DATA.

1. Follow the RAM/ROM Cover removal procedure, above.
2. The ROM PWB Unit (67) is on the left. Using fingernails, grasp the ROM PWB Unit (67) and lift it straight up. Store in a secure location.

5.16.2. ROM PWB UNIT – REFIT

WARNING: THIS PROCEDURE ASSUMES THAT DATA STORED ON THE CLIO UNIT HAS BEEN SYNCHRONIZED OR HAS ALREADY BEEN CORRUPTED BEYOND RECOVERABILITY. FOLLOWING THIS PROCEDURE WITHOUT SYNCHRONIZING USABLE DATA WILL RESULT IN THE LOSS OF THAT DATA.

1. Lower the ROM PWB Unit (67) into position and press into place using caution not to damage the plugs.
2. Follow the RAM/ROM Cover refit procedure, above.

5.17. MODEM PWB UNIT - REMOVE & REFIT

Please refer to photos 12, 17, 21 in Chapter 2.

5.17.1. MODEM PWB UNIT – REMOVAL

1. Follow the Keyboard Base Bottom removal procedure, above.
2. The Modem PWB unit (55) is on the left side of the Main PWB Unit (50). Using fingernails, grasp the Modem PWB Unit (55) and lift it straight up. Store in a secure location.

5.17.2. MODEM PWB UNIT – REFIT

1. Lower the Modem PWB Unit (55) into position on the left side of the Main PWB Unit (50) and snap it into position, using caution to avoid damaging the plugs.
2. Follow the Keyboard Base Bottom refit procedure, above.

5.18. INVERTER PWB UNIT – REMOVE & REFIT

Please refer to photos 23-26 in Chapter 2.

5.18.1. INVERTER PWB UNIT – REMOVAL

1. Follow the Display Top removal procedure, above.
2. Locate the two #1 Phillips head screws (10)(one each at the top and bottom of the Backlight Board).
3. Remove the two #1 Phillips head screws (10) using a #1 Phillips head screwdriver. Store in a secure location.
4. Gently rotate the Inverter PWB Unit (11) clockwise 90 degrees (to vertical) and unplug the orange Display Connection FPC (flex circuit) cable.
5. Un-solder the backlight wires from the Inverter PWB Unit (11)(note the order in which the wires were soldered prior to removing them) and store the Inverter PWB Unit (11) in a secure location.

5.18.2. INVERTER PWB UNIT – REFIT

1. Solder the backlight wires to the Inverter PWB Unit (11), taking care to solder them in the proper order.
2. Place the Inverter PWB Unit (11) into position, then rotate 90 degrees clockwise (to vertical) and re-fasten the orange Display Connection FPC plug. Rotate the Inverter PWB Unit (11) back into position.
3. Insert the two #1 Phillips head (10)(K2.2x6.5) head screws in their holes, and torque them to 0.2N.M using a #1 Phillips head screwdriver.
4. Follow the Display Top refit procedure, above. Be sure to coil the Display connection FPC (8) twice before plugging it in if it was not pre-coiled.

5.19. DISPLAY CONNECTION FPC – REMOVE & REFIT

Please refer to photos 5, 12, 22 in Chapter 2.

5.19.1. DISPLAY CONNECTION FPC – REMOVAL

1. Follow the Display Top removal procedure, above.
2. Unplug the orange Display Connection FPC (8) from the lower right corner of the Main PWB Unit (50).
3. Follow the Display Bezel removal procedure, above.
4. Follow Steps 1-4 of the Inverter PWB Unit (11) removal procedure, above.
5. Unplug the Display Connection FPC (8) from the LCD Unit (66) and carefully peel away the tape securing the Display Connection FPC (8) to the LCD Unit (66). Store the Display Connection FPC (8) in a secure location.

5.19.2. DISPLAY CONNECTION FPC – REFIT

1. Plug the Display Connection FPC (8) into the LCD Unit (66), taking care to avoid damaging the plug.
2. Secure the flex circuit (8) in position by taping it to the LCD Unit (66).
3. Follow Steps 2-4 of the Inverter PWB Unit refit procedure, above.
4. When replacing the Display Connection FPC (8), be sure to coil it twice just outside the LCD Bezel opening if the FPC (8) did not come pre-coiled.
5. Follow the Display Top refit procedure, above.
6. Follow the Keyboard base Bottom refit procedure, above.

5.20. BOTTOM HINGE – REMOVE & REFIT

Please refer to photos 4, 7, 9, 12, in Chapter 2.

5.20.1. BOTTOM HINGE – REMOVAL

1. Follow the Keyboard Base Bottom removal procedure, above.
2. Using a pair of slip-joint pliers, carefully grasp the Bottom Hinge arm (43) protruding from the left side of the Keyboard Base Top (47). Gently rotate the hinge towards you approximately 30 degrees while applying a gentle lifting force. When the hinge (43, 44) comes loose, lift it straight up. Store in a secure location.

5.20.2. BOTTOM HINGE – REFIT

1. Grasp the Bottom Hinge (43, 44) by the rectangular hinge arm. The small metal orientation tab should be facing you with the hinge arm protruding to the left.
2. Lower the Bottom Hinge (43, 44) into the Keyboard Base Top (47) at an angle of approximately 30 degrees. Insert the orientation tab into the slot on the Housing and rotate the lower torque hinge into place.
3. Follow the Keyboard Base Bottom refit procedure, above.

5.21. TOP HINGE – REMOVE & REFIT

Please refer to photos 4, 12, 23, 24 in Chapter 2.

5.21.1. TOP HINGE – REMOVAL

1. Follow the Display Top removal procedure, above.
2. Locate the two #1 Phillips head screws (10)(one each at the top and bottom of the Top Hinge).
3. Remove the two screws (10) using a #1 Philips head screwdriver. Store in a secure location.
4. Grasp the Top Hinge (16) and lift it straight up. Store in a secure location.

5.21.2. TOP HINGE – REFIT

1. Lower the Top Hinge (16) into position on the LCD Unit (66).
2. Insert the two K2.2x6.5 screws (10) in their holes and fasten securely using a #1 Phillips head screwdriver.
3. Follow the Display Top refit procedure, above.

5.22. SPEAKER – REMOVE & REFIT

Please refer to photos 14, 15 in Chapter 2.

5.22.1. SPEAKER – REMOVAL

1. Follow the Keyboard Base Bottom removal procedure, above.
2. Carefully unplug the speaker wires (34) from the Main PWB Unit (50).

5.22.2. SPEAKER – REFIT

1. Carefully plug the speaker wires (34) into the Main PWB Unit (50).
2. Follow the Keyboard Base Bottom refit procedure, above.

5.23. KEYBOARD ASSEMBLY – REMOVE & REFIT

Please refer to photo 12 in Chapter 2.

5.23.1. KEYBOARD ASSEMBLY – REMOVAL

1. Insert a piece of soft cloth between the CLIO Keyboard Top (47) and the LCD Assembly to avoid scratching or marring the LCD Unit/Assembly.
2. Follow the Keyboard Base Bottom removal procedure, above.
3. Using tweezers or a pair of miniature needle-nose pliers, gently grasp the Indicator PWB Unit (51, 52) and lift it straight up out of its slot.
4. Gently peel off the tape securing the Indicator PWB Unit ribbon cable (53) to the Keyboard Assembly (40). Bend the ribbon cable (53) back towards you, out of the way of the Keyboard Assembly (40).
5. Grasp the left and right sides of the Keyboard Assembly (40) and carefully lift it up and out of the Keyboard Base Top (47).
6. Carefully unplug the Keyboard Assembly ribbon cables from the Main PWB Unit (50) by sliding the ribbon cables straight back (away from you) and out of the plugs. Store the Keyboard Assembly (40) in a secure location.

5.23.2. KEYBOARD ASSEMBLY – REFIT

1. With one hand, orient the keyboard (40) properly (keys down, ribbon cables towards the technician). Position the keyboard (40) at a slight angle just above its final position.
2. Lift the Main PWB (50) slightly up and out of the Keyboard Base Top (47). Lay the Keyboard Assembly (40) into position then rotate it towards you 90 degrees until the keyboard (40) is vertical. Then, carefully slide the ribbon cables into the plugs on the Main PWB Unit (50). Avoid using tools and use extreme caution to avoid damaging the ribbon cable or connector. Repeat for the right ribbon cable.
3. Rotate and lower the Keyboard Assembly (40) and Main PWB Unit (50) into position in the Keyboard Base Top (47).
4. Bend the Indicator PWB Unit ribbon cable (53) into position above the Keyboard Assembly (40).

5. Using tweezers or a pair of miniature needle-nose pliers, gently grasp the Inverter PWB Unit (51, 52) and insert it straight into its slot. Secure the Inverter PWB Unit ribbon cable (53) in position above the Keyboard Assembly (40) with tape.
6. Follow the Keyboard Base Bottom refit procedure, above.

5.24. MAIN PWB UNIT – REMOVE & REFIT

Please refer to photos 2, 3, 12, 17, 21 in Chapter 2.

5.24.1. MAIN PWB UNIT – REMOVAL

WARNING: THIS PROCEDURE ASSUMES THAT DATA STORED ON THE CLIO UNIT HAS BEEN SYNCHRONIZED OR HAS ALREADY BEEN CORRUPTED BEYOND RECOVERABILITY. FOLLOWING THIS PROCEDURE WITHOUT SYNCHRONIZING USABLE DATA WILL RESULT IN THE LOSS OF THAT DATA.

1. Follow the Keyboard Base Bottom removal procedure, above.
2. Follow Steps 3-6 of the Keyboard Assembly removal procedure, above.
3. Unplug the orange Display connection FPC (8)(flex circuit) cable from its plug on the lower right corner of the Main PWB Unit (50).
4. Un-solder the backlight wires from the Main PWB Unit (50), noting the order in which they were fastened.
5. Grasp the ROM PWB Unit (67) using fingernails and lift it straight up and away from the Main PWB Unit (50). Store in a secure location. Repeat for the RAM PWB Unit (54).
6. Grasp the Modem PWB unit (55) using fingernails and lift it straight up and away from the Main PWB Unit (50). Store in a secure location.
7. Follow the Indicator PWB removal procedure, above.
8. Follow the Indicator PWB ribbon cable removal procedure, above.
9. Follow the Speaker removal procedure, above.
10. Follow the Bottom Hinge removal procedure, above.
11. Lift the Main PWB Unit (50) straight up and away from the Keyboard Base Top (47). Store in a secure location.

5.24.2. MAIN PWB UNIT – REFIT

1. Lower the Main PWB Unit (50) into position in the Keyboard Base Top (47), taking care to line up the two holes in the middle of the Main PWB Unit (50) with the two screw mounting studs in the middle of the Keyboard Base Top (47).
2. Follow the Bottom Hinge refit procedure, above.
3. Follow the Speaker refit procedure, above.
4. Follow the Indicator PWB Unit ribbon cable refit procedure, above.
5. Follow the Indicator PWB Unit refit procedure, above.

6. Grasp the Modem PWB Unit (55) using fingernails and lower it straight down onto the Main PWB Unit (50). Use caution to avoid damaging the plugs. Snap into position.
7. Grasp the ROM PWB Unit (67) using fingernails and lower it straight down onto the Main PWB Unit (50), using caution to avoid damaging the plugs. Snap into place. Repeat for the RAM PWB Unit (54).
8. Solder the backlight wires (53) onto the Main PWB Unit (50) in the proper order.
9. Plug the orange Display Connection FPC (8)(flex circuit) cable into its plug on the lower right corner of the Main PWB Unit (50). Use caution to avoid damaging the plug. Snap into place.
10. Follow the Keyboard Assembly refit procedure, above.
11. Follow the Keyboard Base Bottom refit procedure, above.

5.25. LOWER HINGE ARMS – REMOVE & REFIT

Please refer to photos 4-6 in Chapter 2.

5.25.1. LOWER HINGE ARMS – REMOVAL

1. Place the CLIO unit on a flat level work surface in standard orientation.
2. Using either a flat headed jewelry screwdriver or the tip of an X-Acto blade, gently remove the four rubber plugs (19, 20, 21, 22) located on the CLIO Lower Arms (25, 26) by inserting the implement between the caps and the hinge and carefully prying the caps loose. Store in a secure location. Removing these plugs will reveal four screws.
3. Remove the four screws (17, 24) and the washers (18, 23) located in the previous step using a #2 Phillips head screwdriver and store in a secure location.
4. Remove the two hinge arm halves (25, 26) by lifting them straight up and away from the CLIO unit.

5.25.2. LOWER HINGE ARMS – REFIT

1. Lay the right side lower hinge arm (26) in place, taking care to avoid pinching the flex circuit (8) and wires. Replace the washers (18, 23). Fasten the arm in place using two screws (17, 24) (one each M3x6 upper, and M3x10 lower) and a #2 Phillips head screwdriver. Replace the rubber plugs (19, 21) above the screws.
2. Repeat the above step for the left side. Note that there are no flex circuits on the left side.

5.26. METAL ARM – REMOVE & REFIT

Please refer to photos 4-6 in Chapter 2.

5.26.1. METAL ARM – REMOVAL

1. Follow the Lower Hinge Arms removal procedure, above.
2. Grasp the CLIO unit and turn it upside-down.
3. Grasp the Metal Arm (27) and lift it straight up. Store in a secure location.

5.26.2. METAL ARM – REFIT

1. With the CLIO unit in standard orientation, turn it upside-down if not already positioned properly.
2. Lower the U shaped Metal Arm (27) straight down into position against the CLIO unit.
3. Turn the CLIO unit right side up (standard orientation).
4. Follow the Bottom Hinge refit procedure, above.

5.27. INDICATOR LENS – REMOVE & REFIT

Please refer to photo 9 in Chapter 2.

5.27.1. INDICATOR LENS – REMOVAL

This item is removed as part of the Keyboard Base Bottom removal procedure, above.

5.27.2. INDICATOR LENS – REFIT

This item is refitted as part of the Keyboard Base Bottom removal procedure, above.

5.28. IR LENS – REMOVE & REFIT

Please refer to photo 9 in Chapter 2.

5.28.1. IR LENS – REMOVAL

This item is removed as part of the Keyboard Base Bottom removal procedure, above.

5.28.2. IR WINDOW – REFIT

This item is refitted as part of the Keyboard Base Bottom removal procedure, above.

6. STANDING SERVICE PROCEDURES

This section contains procedures that will affect units returned for service. Implementation of these procedures may either be recommended or mandatory. These procedures reflect changes and enhancements that may affect product safety, reliability, or usability.

6.1. LCD SUPPORT PROCEDURE

NOTE: This is a recommended procedure. Install the spacer any time maintenance is performed on the LCD module.

A support spacer (P/N 200-001120-01 Rev. A) must be added to the backside of the Display Enclosure Bezel (P/N 200-000116-00 Rev. A). This will support the LCD during flex circuit (8) installation and will prevent damage tot he LCD. Installation of the spacer should be performed during maintenance procedures involving LCD module repairs.

No special tooling or equipment is required.

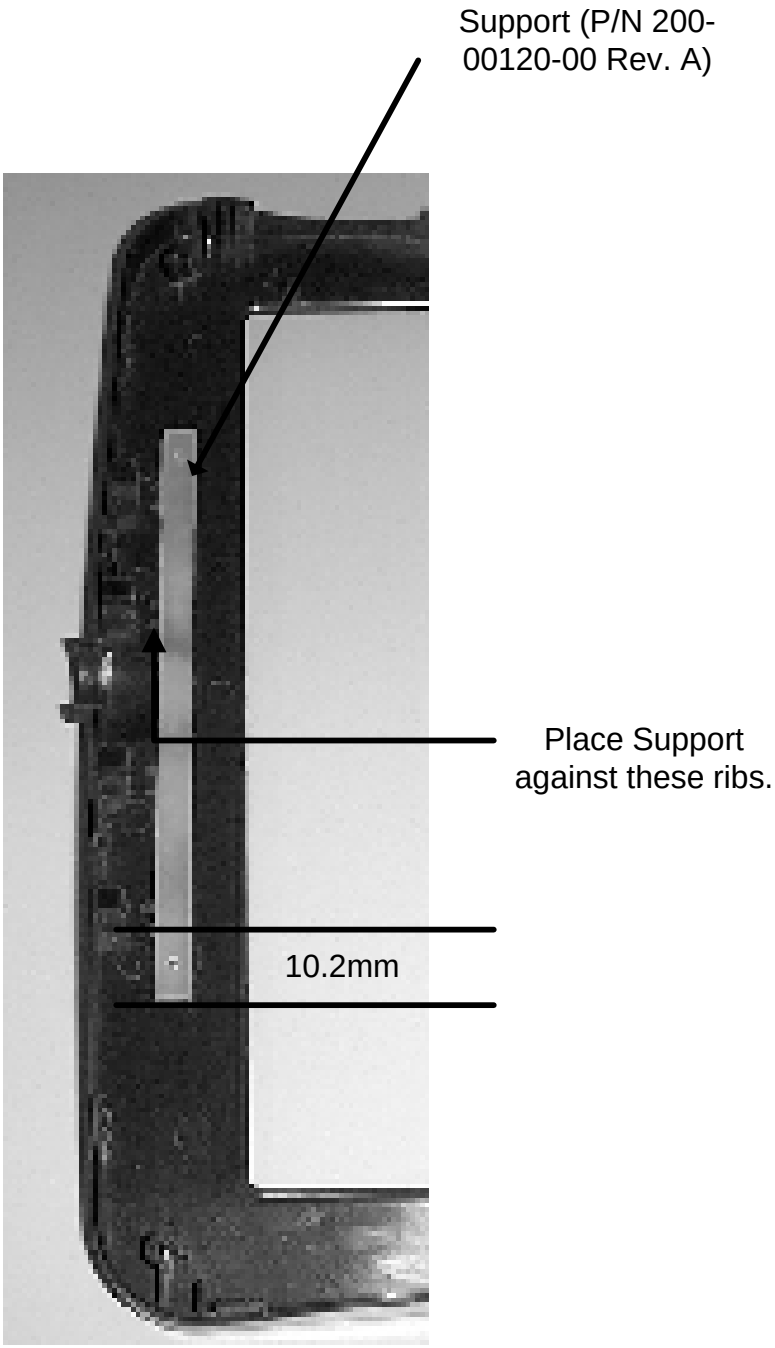
6.1.1. MATERIAL REQUIRED

- Display Enclosure Bezel (P/N 200-000116-00 Rev A): one each
- LCD Support (P/N 200-001120-01 Rev A): one each

6.1.2. PROCEDURE

Please refer to the pictures below.

1. Place Display Enclosure Bezel (2) upside-down with the hinge opening to left as shown in the picture below. Use a flat surface that has a cutout to accommodate the curved surfaces on both ends.
2. Peel off the protective liner from the back of the LCD Support. Place the LCD Support against the 8 equally spaced ribs and align the starting point of the support such that it is 10.2mm nearer to you than the first rib. Refer to the picture below.
3. Push down firmly on the LCD Support to secure it in place.



LCD Support placement

This concludes this procedure.