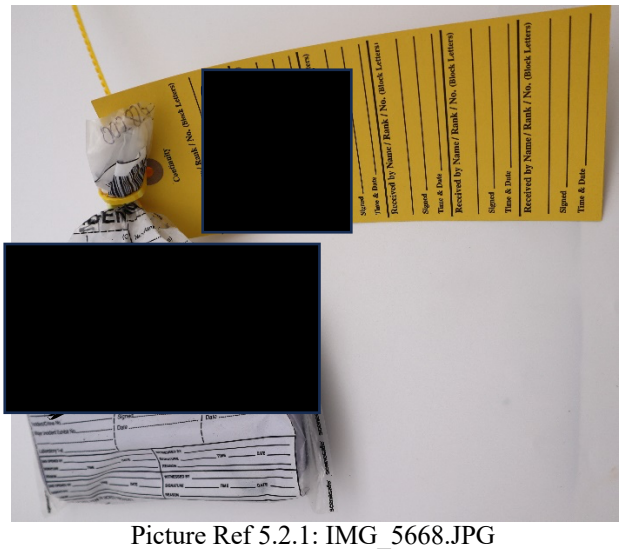
1.0. Streamlined Forensic Report: SFR01 ForensicCase954

2.0. Case Details			
Relates To:	XXX Police	**Forensic Service Provider**	Data Clinic Ltd.
Property Reference Number:		**Crime/Incident Reference**	XXX
Property Received Date:	03/01/2025	**Socrates Number:**	XXX
Case Reference:	ForensicCaseXXX	**Report Number:**	SFR1 [Version 1.0]
Exhibit Reference:	XXX	**Client Lab Reference:**	N/A
Exhibit Tag Reference:	XXX	**Principal Engineer:**	**Chris Parry**

3.0. Content Tables

4.0.	**Property on Arrival**
4.1	Property:
4.1.1	XXX Police MG21B
4.1.2	Continuity Label
4.2.	**Documents Submitted to GMP**
4.2.1.	SFR1: ForensicCase954 [Version 1.0]
4.3.1	**Exhibit:** XXX

5.0. Exhibits	
5.1. Property upon arrival: Exhibit:	 Picture Ref 5.1: IMG_5668.JPG
5.2 Description: Make: Apple Model: iPhone 11 IMEI: Other: SIM card affixed to rear:	 Picture Ref 5.2.1: IMG_5668.JPG  Picture Ref 5.2.2: IMG_5671.JPG

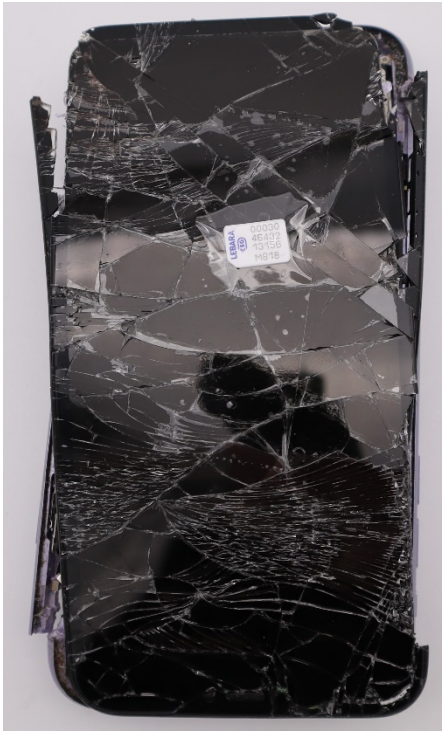
6. Work Record:

6.1 Exhibit Repair

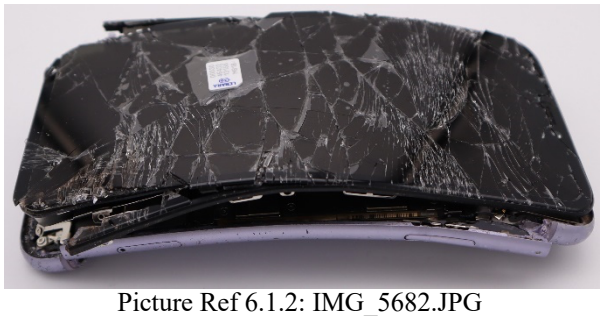
Exhibit: XXX

Exhibit was badly damaged and bent. Logic board removed and it was also bent (Picture Ref 6.1.1 – 6.1.6)

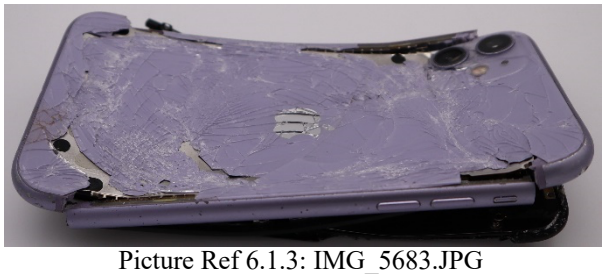
Repair Image Record



Picture Ref 6.1.1: IMG_5681.JPG

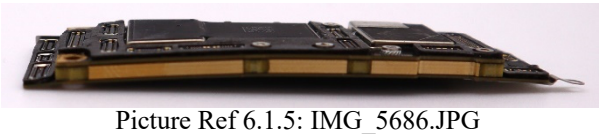


Picture Ref 6.1.2: IMG_5682.JPG



Picture Ref 6.1.3: IMG_5683.JPG

Picture Ref 6.1.4: IMG_5685.JPG



Picture Ref 6.1.5: IMG_5686.JPG

Picture Ref 6.1.6: IMG_5837.JPG

6.2 Exhibit Repair

Exhibit: XXX

Result of Repair:

Initial inspection did not identify any main power rail shorts but did identify several disconnections between the upper AP (application protocol) and lower RF (radio frequency) logic board. Whilst they may not have prevented the device from booting it would have resulted in the phone rebooting every 3 minutes preventing any data acquisition.

The iPhone 11 will boot on just the top AP logic board but will reboot every 3 mins because mic2 (sensor) is connected to the RF bottom board and is a required component. The logic boards were so badly bent leaving no way to solder the AP board to the lower RF logic board.

A decision was taken to attempt a full CPU/NAND and logic EEPROM swap.

Approval was requested on the 16/01/2025. Authorisation was provided on the 20/01/2025.

Repair Image Record

Picture Ref 6.2.1: IMG_5844.JPG

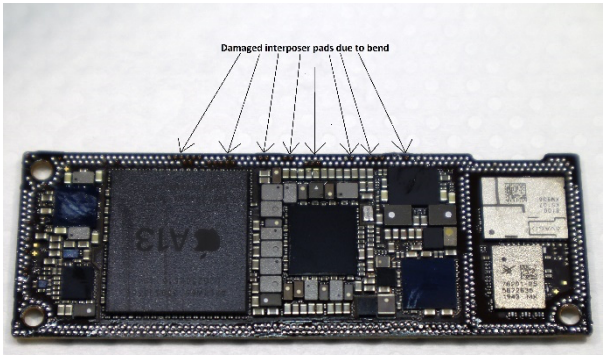
The exhibit logic board AP and RF boards were separated. This was completed using an iHeater, iPhone 11 module and appropriate heat setting (Picture Ref 6.2.1). This allowed access to the CPU and identified the damaged interposer with ripped/disconnected connections (Picture Ref 6.2.2 & 6.2.3). These damaged pads would have certainly caused instability, overheating or a 3-minute reboot issue.

The CPU and NAND appeared in good condition and the process could move forward.

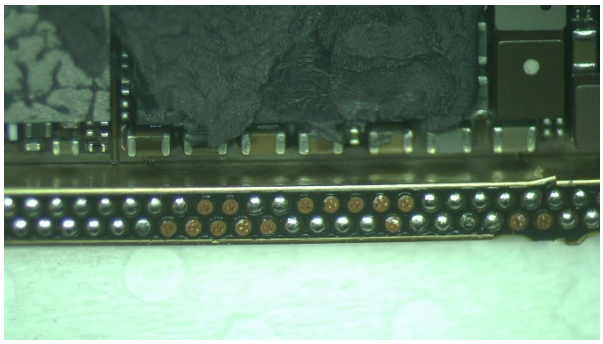
A known good logic board was sourced (Picture Ref 6.2.4) and prepared for a CPU/NAND transfer. This was completed by separating the AP from the RF logic board allowing access to the CPU. This was completed once again by using an iHeater, iPhone 11 module and appropriate heat setting.

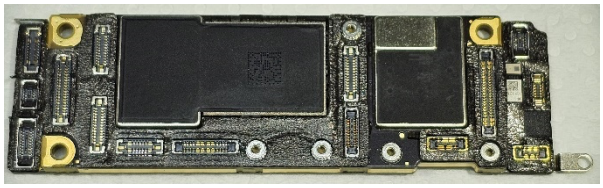
A specialist CNC machine was utilised to remove the CPU (Picture Ref 6.2.5) and NAND (Picture Ref 6.2.6). Using a CNC ensured the cleanest removal method (Picture Ref 6.2.7 & 6.2.8), eliminated heat from damaging further surrounding IC's and components. The CNC used for this procedure was a JCID-EM02 and the iPhone 11 CNC module.

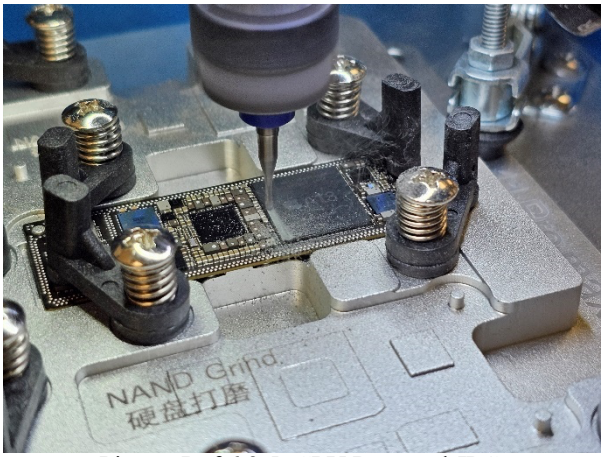
The logic EEPROM was also removed using a hand grinding tool ready for donor IC.



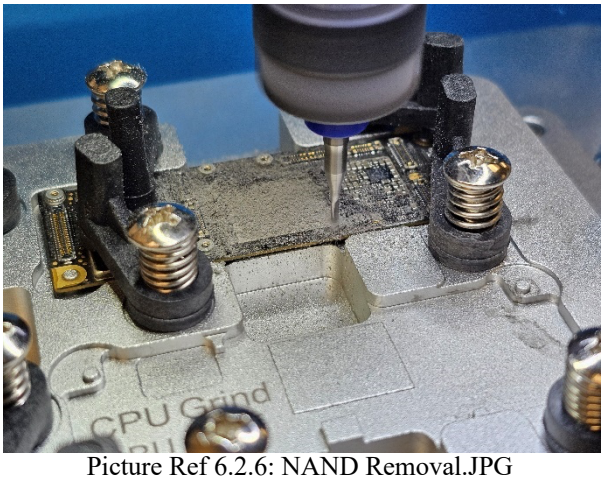
Picture Ref 6.2.2: IMG_5846_Edited.JPG


Picture Ref 6.2.3: Damaged Pads Closeup.JPG

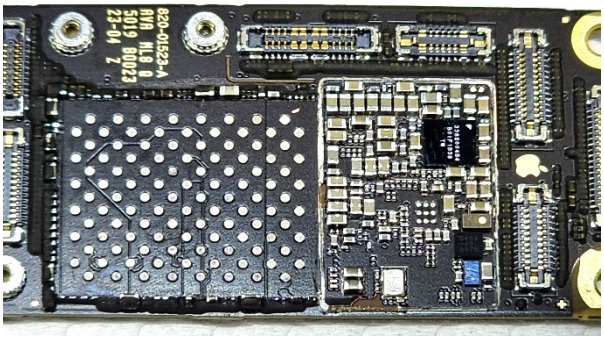

Picture Ref 6.2.4: Donor Logic Board.JPG



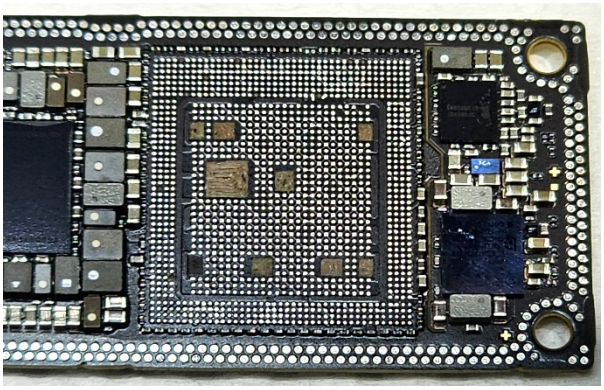
Picture Ref 6.2.5: CPU Removal.JPG



Picture Ref 6.2.6: NAND Removal.JPG



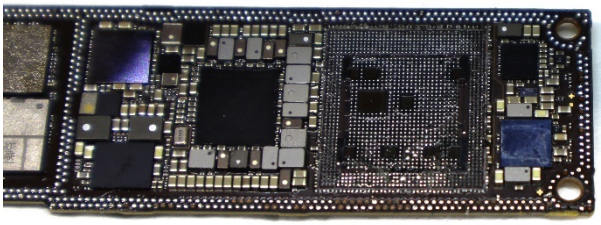
Picture Ref 6.2.7: NAND Removal Post CNC.JPG



Picture Ref 6.2.8: CPU Removal Post CNC.JPG

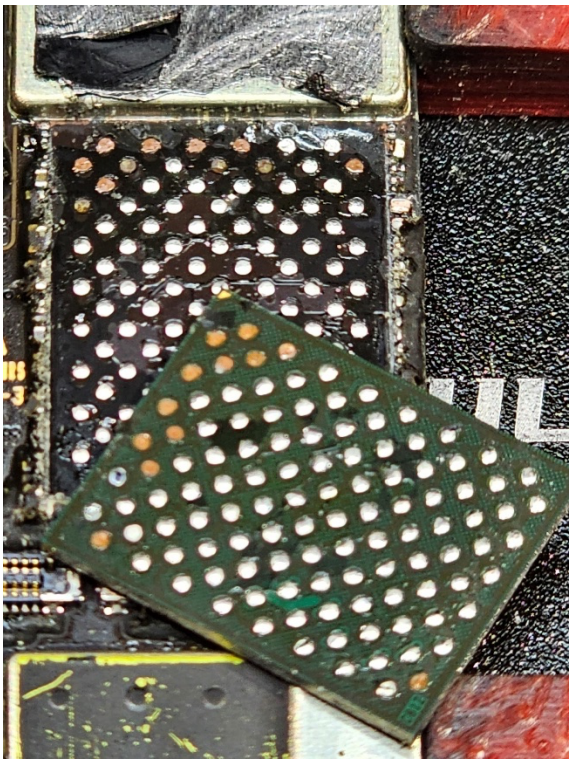
The exhibit CPU was then carefully removed from the damaged logic board using heat (Picture Ref 6.2.9 & 6.2.10). The CPU looked in good condition with no visible damage observed. The CPU has a covering of black underfill which required careful removal.

Picture Ref 6.2.9: IMG_5855.JPG

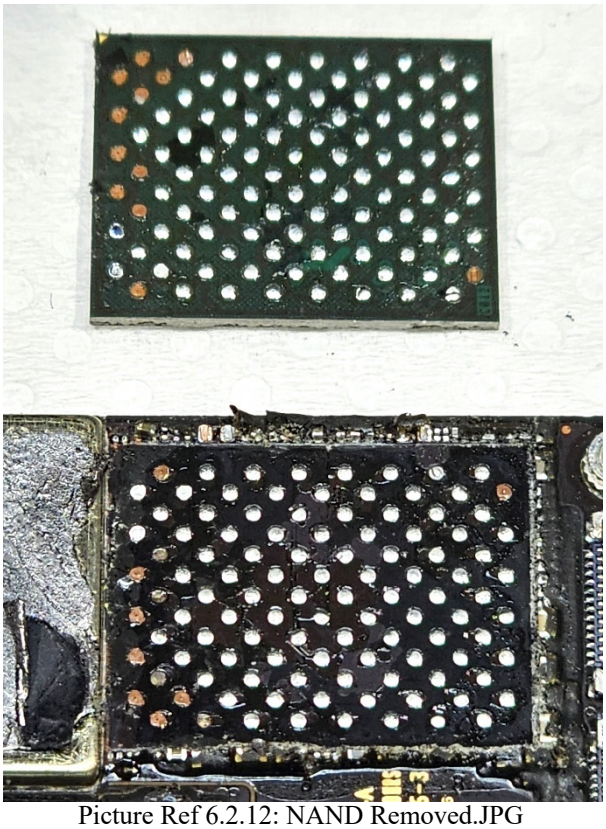


Picture Ref 6.2.10: IMG_5856.JPG

The exhibit NAND was then carefully removed from the damaged logic board using heat (Picture Ref 6.2.11 & 6.2.12). Unfortunately, unlike the CPU it was immediately clear the NAND had been partially disconnected from the logic board due to the bend in the board (Picture Ref 6.2.13) resulting in several pads being ripped from the NAND itself.

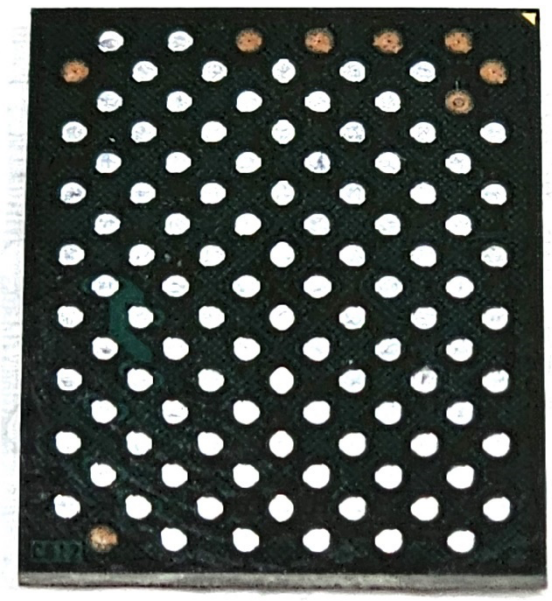


Picture Ref 6.2.11: NAND Removed.JPG



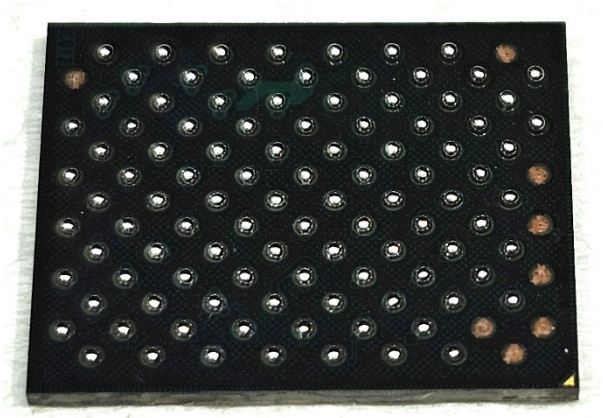
Picture Ref 6.2.12: NAND Removed.JPG

Schematics identified that out of the 8 damaged pads 7 were ground pads and not required with the remaining being a NC (no connection) pad. Thankfully, none of these 8 pads are required and therefore no repair was required to the NAND IC (Integrated circuit).



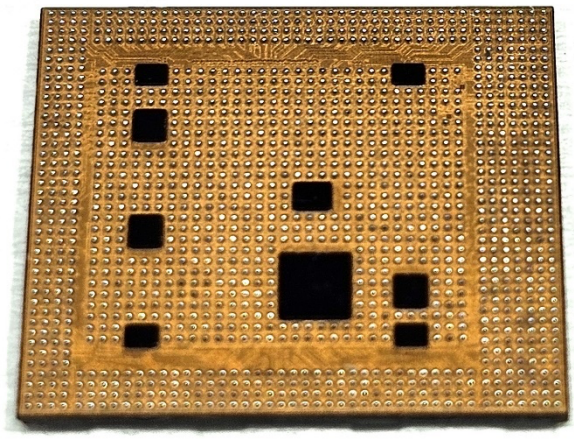
Picture Ref 6.2.13: Damaged NAND Pads.JPG

The NAND was then reballed ready for installation onto the prepared donor logic board (Picture Ref 6.2.14)

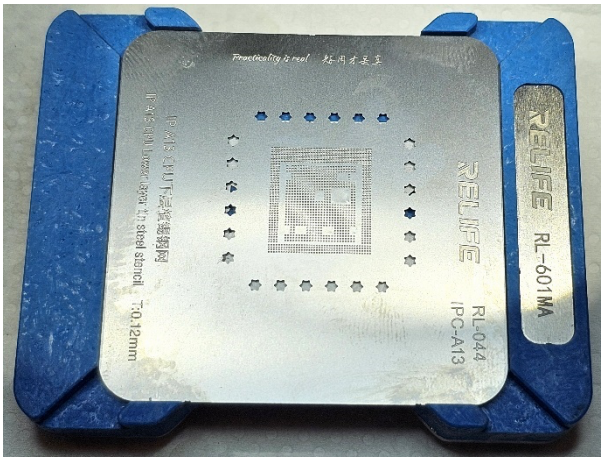


Picture Ref 6.2.14: NAND Reballed.JPG

The CPU was cleaned and reballed ready for installation onto the prepared donor board using a specialist A13 CPU stencil (Picture Ref 6.2.15 & 6.2.16).

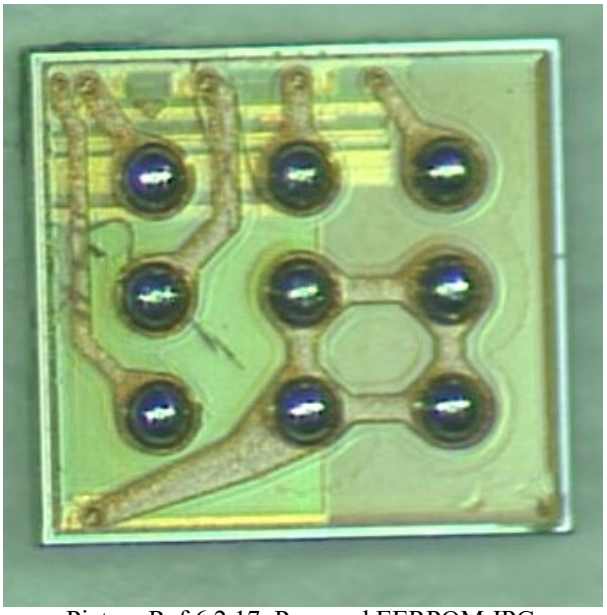


Picture Ref 6.2.15: CPU Reballed.JPG



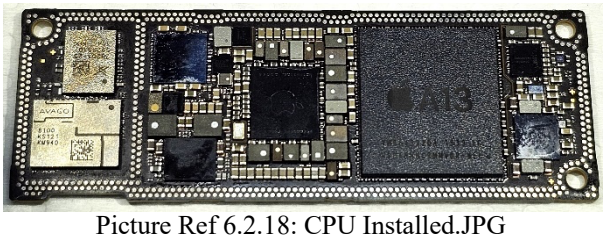
Picture Ref 6.2.16: CPU Reball with stencil.JPG

The logic EEPROM was then removed from the exhibit and reballed ready for installation onto the prepared donor logic board (Picture Ref 6.2.17)

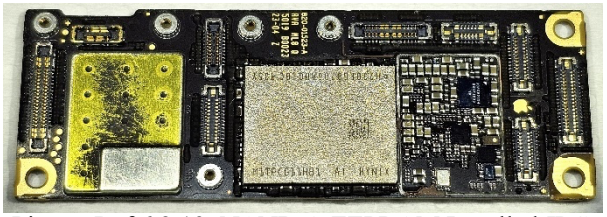


Picture Ref 6.2.17: Prepared EERPOM.JPG

CPU, NAND and logic EEPROM installed onto receiver board and before any power provided various CPU and NAND power, data and signal lines were tested. All appeared to have the correct readings and no short-circuits were identified (Picture Ref 6.2.18 & 6.2.19).



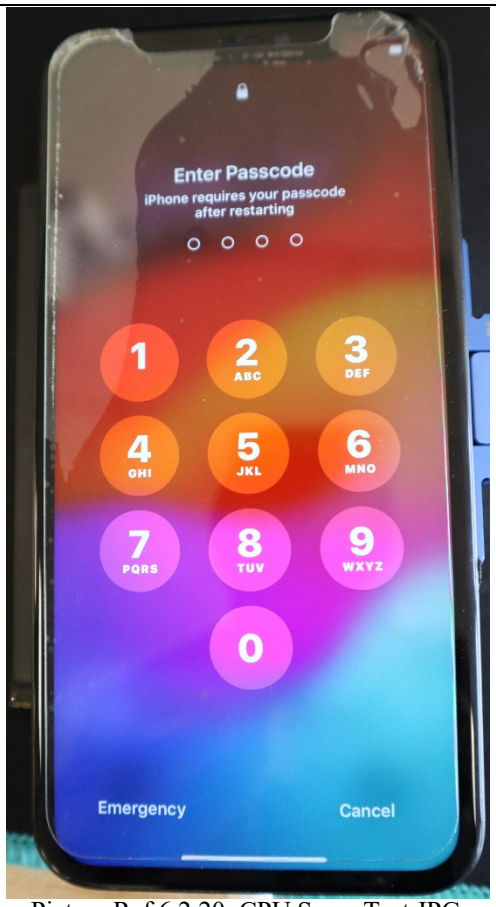
Picture Ref 6.2.18: CPU Installed.JPG



Picture Ref 6.2.19: NAND & EEPROM Installed.JPG

The AP board was then attached to donor peripheral components (screen, charging port and battery) to ensure a full boot was possible. This was completed without the RF board present, to prevent any cellular connections. The phone was prompted to boot with a USB lightning cable attached to a wall outlet to prevent any data communication. The phone booted correctly to the pin code screen identifying the CPU/NAND and EEPROM swap had been a success (Picture Ref 6.2.20)

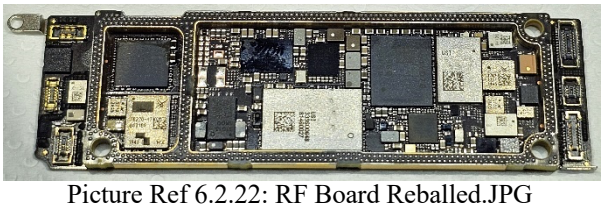
To prevent the 3-minute reboot issue the AP & RF logic board required soldering back together with the AP board being attached to the interposer attached to the RF logic board.



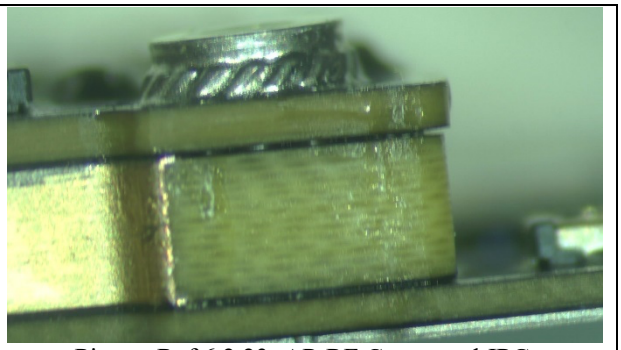
Picture Ref 6.2.20: CPU Swap Test.JPG

The RF logic board was placed into a specialist stencil (picture Ref 6.2.21) and low-melt solder paste added. Heat was then introduced to melt the solder paste and complete the reball process (Picture Ref 6.2.22).

Picture Ref 6.2.21: RF Logic Board Reball – Stencil.JPG


Picture Ref 6.2.22: RF Board Reballed.JPG

The AP board was soldered to the RF logic board using enough heat to melt only the low melt solder used on the interposer. This then fused the two boards together and reintroduced the connections between the two logic boards (Picture Ref: 6.2.23).



Picture Ref 6.2.23: AP-RF Connected.JPG

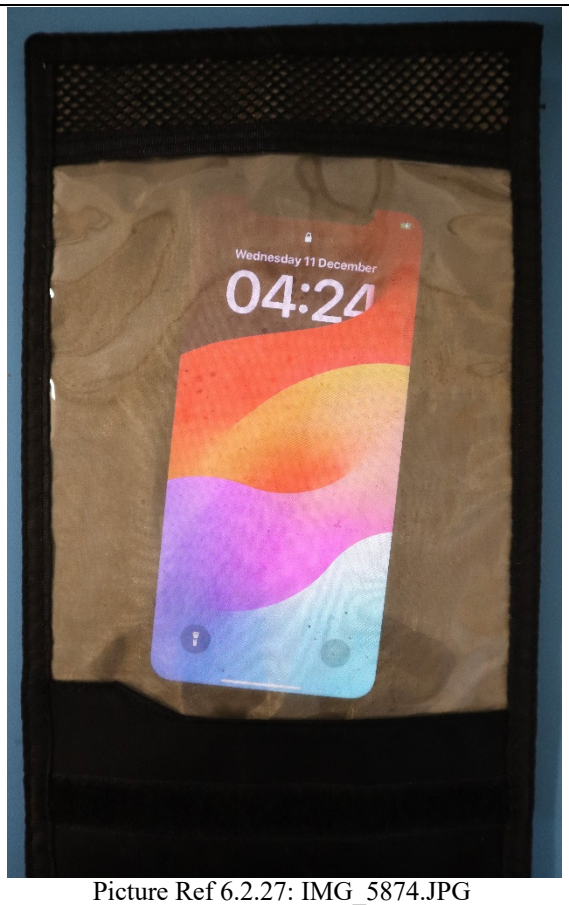
Known good components were sourced, and the Exhibit Logic Board was safely installed into new housing along with the original SIM tray to maintain correct IMEI. (Picture Ref 6.2.24 & 6.2.25).

Picture Ref 6.2.24: IMG_5876.JPG

Picture Ref 6.2.25: IMG_5880.JPG

The device draws a good level of power (no short-circuit detected), shows an increasing battery percentage (Picture Ref 6.2.26) and boots to a home screen (Picture Ref 6.2.27).

Picture Ref 6.2.26: IMG_5872.JPG

	 Picture Ref 6.2.27: IMG_5874.JPG

7.0. Validation & Risk	
7.1. Validation: Exhibit: XXX	**7.1.1. Viewing Method:** Visual
7.2. Risk The Exhibit has been powered on.	**7.2.1 Statement of Risk** A Faraday bag was used to ensure that no external network connection would be able to communicate with the Exhibit. In addition to this, the device was powered without a SIM card installed.

8.0 Property on Return

8.1 Property Return

Data Clinic Evidence Bag Barcode: XXX

Containing:

Exhibit: XXX
Previous Tag Reference Numbers: XXX
Original Continuity Label

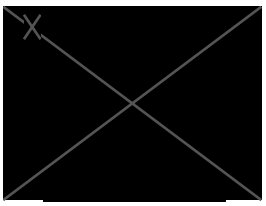
Evidence Parts:

Exhibit Reference: XXX - Original peripheral components including LCD, chassis, battery, logic boards (AP&RF), screws, cameras and SIM card

Picture Ref 8.1.1: IMG_5882.JPG

Picture Ref 8.1.2: IMG_5883.JPG

9.0 Case Work Database Record	**Location: Data Clinic Forensic Server \\Cases\ForensicCase954**

10.0. Report Approval			
Prepared by	[redacted]	**Provider**	Data Clinic Ltd.,
Signature		**Report Date:**	10/03/2025
Checked by	[redacted]	**Provider**	Data Clinic Ltd.,
Signature		**Check Date:**	