Modification Recommended
Internal Only Document
Service Note

Supersedes:
MSOX3024A-05

MSOX3024A – Oscilloscope, 200MHz, 4 Channels + 16 Digital Channels

Serial Numbers: MY00000000-MY55139999 / SG00000000-SG55139999

The Problem: NAND memory corruption can cause a scope to not fully boot – user may see the scope's splash screen with cycling keyboard LEDs, or the scope may continuously power cycle. The current repair process requires replacement of the scope's core unit or the acquisition board with no parts or labor costs to the customer. Under no circumstances is the labor to exceed 90 minutes including calibration.

The purpose of this service note is to clarify Keysight's repair policy for scopes which fail to boot due to a NAND memory corruption.

Parts Required: None

ADMINISTRATIVE INFORMATION

ACTION CATEGORY:	X ON SPECIFIED FAILURE [[]] AGREEABLE TIME	STANDARDS LABOR: 1.5 Hours			
LOCATION CATEGORY:	[[]] CUSTOMER INSTALLABLE [[]] ON-SITE (active On-site contract required) X SERVICE CENTER [[]] CHANNEL PARTNERS	SERVICE INVENTORY:	[[]] RETURN [[]] SCRAP [[]] SEE TEXT	USED PARTS:	X RETURN [[]] SCRAP [[]] SEE TEXT
AVAILABILITY: PRODUCT'S SUPPORT LIFE		NO CHARGE AVAILABLE UNTIL: 31-Oct-2019			
	X Calibration Required [[]] Calibration NOT Required	PRODUCT LINE: 1A AUTHOR: DMB			

ADDITIONAL INFORMATION:

Situation: Under certain circumstances, an X2000A or X3000A series oscilloscope may experience a corruption in the NAND memory. This becomes evident when a scope fails to boot up fully. The scope powers up, but the screen remains blank and the keyboard LEDs begin to flash in sequence. Another sign of the memory corruption is continual rebooting. In both situations, the scope's operating system has booted, but the scope application has not. While we have seen too many scopes fail in this manner, it is important to remember that this has affected a relatively small number of scopes overall.
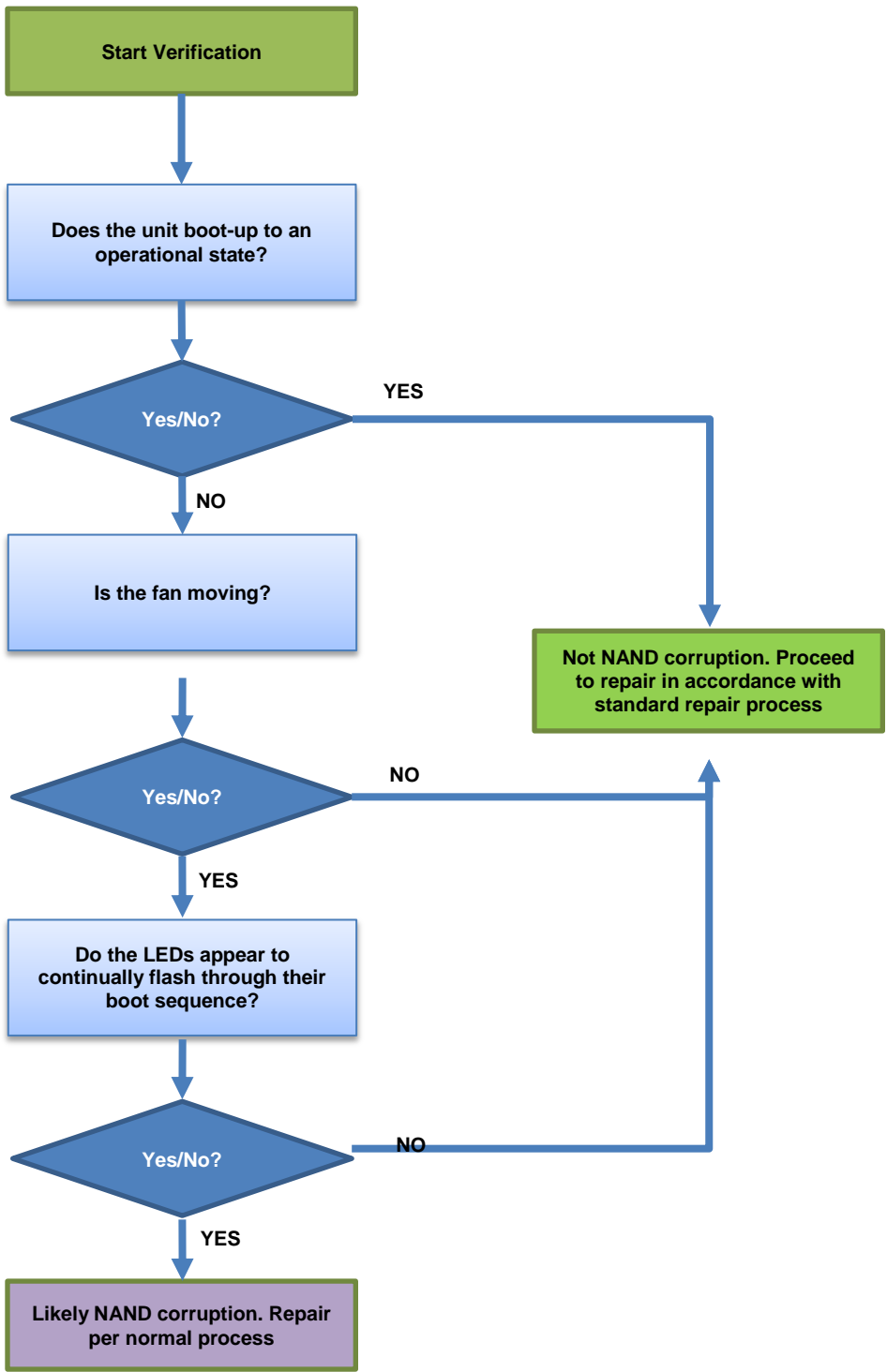
Action: The normal repair process includes exchanging the main scope unit which, since March of 2015, is built and refurbished with firmware version 2.39 or higher. Versions 2.39 and higher include a self-recovery mode through which a customer can recover a locked scope without having to send it for repair. This firmware update re-formats the memory to eliminate a corruption condition. Firmware version 2.40 and higher include new NAND memory drivers and an enhanced NAND memory access algorithm that will greatly reduce the possibility of a corruption event.

Since this is a known issue, service center personnel should not spend time troubleshooting non-booting scopes. If a customer reports that the scope is not booting and the LEDs are flashing, or that the scope continually reboots, please simply exchange the scope's core. If he customer does not fully describe a non-boot, please call the customer to verify the behaviors described in the diagram on Page 3.

We are working on ways to encourage all scope owners to apply the latest firmware to their scopes as this will prevent NAND-related service orders and lead to happier customers. If a scope experiences a NAND corruption before the firmware is updated to v2.39 or higher, the scope will still have to be repaired.

Action:

- All scopes requiring repair due to NAND memory corruption are to be repaired with no parts or labor cost to the customer regardless of warranty status.
- All scopes requiring repair due to issues not related to the NAND memory will be repaired per normal process – normal warranty conditions apply.
- Under no circumstances will the repair/exchange labor time for these scopes exceed 90 minutes, including calibration.

```
                    ┌──────────────────────────┐
                    │    Start Verification     │
                    └──────────────────────────┘
                                 │
                                 ▼
                    ┌──────────────────────────┐
                    │  Does the unit boot-up to  │
                    │    an operational state?   │
                    └──────────────────────────┘
                                 │
                                 ▼
                          ◇ Yes/No? ◇ ──────── YES ────────┐
                                 │                          │
                                NO                          │
                                 │                          ▼
                    ┌──────────────────────────┐   ┌──────────────────────────┐
                    │     Is the fan moving?     │   │  Not NAND corruption.      │
                    └──────────────────────────┘   │  Proceed to repair in       │
                                 │                  │  accordance with standard   │
                                 ▼                  │  repair process             │
                          ◇ Yes/No? ◇ ─── NO ──────┤
                                 │                  │
                                YES                 │
                                 │                  │
                    ┌──────────────────────────┐   │
                    │   Do the LEDs appear to    │   │
                    │ continually flash through  │   │
                    │    their boot sequence?    │   │
                    └──────────────────────────┘   │
                                 │                  │
                                 ▼                  │
                          ◇ Yes/No? ◇ ─── NO ──────┘
                                 │
                                YES
                                 │
                    ┌──────────────────────────┐
                    │  Likely NAND corruption.   │
                    │   Repair per normal process │
                    └──────────────────────────┘
```

Revision History:

Date	Service Note Revision	Author	Reason for Change
04 Dec 2014	05	David Bottorff	Original note
22 July 2015	05A	David Bottorff	Template changed. Clarifications added.