# TECHNICAL NOTE

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## Distributed to : As Required

## SD series MIXERS
## OPERATION OF AUTOMATIC RECOVERY SOFTWARE SYSTEMS

The SD series has a comprehensive system to deal with various type of failures both internal and external. This system was developed for the D series mixers and developed for SD series.  Refer to Technical Bulletin 94 for details of the older D series, and Soundtracs systems.

The following does not apply to S series mixers.

These systems allow the mixer control computer to be restarted without loss of audio, provided power is not lost. In the event of power loss, when the mixer is re-powered the mixer will start to pass audio within a few seconds.

The main operating system is protected from damage and has accelerated starting due to a special (tamper-proof) fixed hibernation system called Ready-On. This is detailed in TN 199.

### Normal session recovery at start up
In a proper shut down the mixer writes its current state in a file called startup.ses to HDD, so the system saves how it was at that time. When the system boots it reads this startup file so the mixer returns as it was at switch off.

This function can be selectively disabled on the options page (save and load startup session buttons) but in the case of disabling save on exit, at the expense of automatic recovery.

Every time a session is loaded (and therefore also at a cold start) or a session saved, a duplicate backup session file is written called _session.ses. Note this occurs a few seconds after the session is loaded or saved. This also occurs after a file transfer to a mirrored engine. This is deleted and replaced by startup.ses at a proper shut down.

### Session recovery after a failure
In the event of incorrect shut down of the system, typically due to a power failure, the mixer loads and goes back to the session as last saved, last loaded or as last start-up in that order of priority. This is achieved as follows.

At start up after any stoppage other than a correct shut down procedure, the system will see the remaining _session.ses. If this is present (even if there a startup.ses as well) it will start from this in preference to the startup.ses
If loading from this recovery session, a special "last session exited abnormally" window will show at start up i.e. reporting an incorrect shut down. This then returns the mixer to the last saved condition. If neither session is present, the mixer will start in with the factory default "empty" session.

In SD series V600+ an additional feature was added to provide for a timed "Auto save" under console options. This overwrites (replaces) the _session.ses file at intervals (typically 10 minutes) as set in the options page, to ensure recovery goes to a more recent version of the session.

### Audio recovery
The section of the control computer (NVRAM) continuously (frame by frame) stores engine parameters. In the event of power loss, when the mixer is re-powered the mixer will start to pass audio within a few

seconds, by reading these saved parameters before the main operating system and appropriate session is loaded.

If there is no startup file but a _session is present, this will be loaded and the operator will see "recovering last session" not the usual loading "startup session".

The NVRAM is then read for engine settings (at the last frame the engine was running) and this is fired snapshot-like into backup session just loaded, to bring it up to date.

It is the last NVRAM contents (saved frame by frame) that starts the audio engine before the rest of the mixer at a cold start. The audio should match the point at which shut down occurred.

It will noted from above that in the event of a PC failure (so called "crash") e.g. Windows repeating error, if the PC is reset WITHOUT turning off power, the system will not loose audio and can be restarted. The PC can restarted by the hardware reset button on the engine.

In most cases there will be no loss of audio and the control system will restart and return to nearly the previous state, typically the set up last saved by the operator.

Note if the PC is reset, the system should have a power off restart as soon as possible.

This reset allows the mixer control computer to be restarted without loss of audio, provided power is not lost.
In the event of power loss, when the mixer is re-powered, the mixer will start to pass audio within a few seconds, before the main operating system is loaded.

If power is lost, the EOS should not be affected. The system will reboot without scandisk or other delay.

**Bypassing recovery files (if damaged) or for factory default**

It will be noted that if startup.ses or _session.ses are damaged in such a way they cause a software error, the system will always fail at startup. This is not the same as a damaged Windows installation. The most common reason for this is to cut power prematurely whilst the startup.ses is being written causing it to be incomplete and garbled.

It is possible restart bypassing the normal mixer startup procedure. Cold start the mixer, or press the reset button and press the keyboard "shift" key (either one) only during the boot up. The point at which this is pressed varies with mixer model, due the order in which parts such as graphics interfaces boot.

SD7
Press and hold shift after the screens have completed their individual boot sequence *immediately* at the point where the Windows desktop appears but before the mixer program starts. This can be done on only 1 engine at time. It is acceptable as the engines boot to press the engine selector 1 time to select the required engine as the screens perform their individual boot sequence

SD8, SD9, SD10, SD11
Press shift repeatedly (tap it many times) as the white left to right start progress bar appears and whilst the mixer starts.

SD5
Press and hold shift after the screens have completed their individual boot sequence, gone blank for a few seconds and then *immediately* at the point where the Windows desktop appears but before the mixer program starts.

This will bypass the mixer automatic start and go to a new session recovery page, preventing the loading of a possibly faulty file.

Timing is a critical here. If it does not start as expected, try again, pressing the key more precisely. Note the precise timing varies from model to model (SD7, 8, 9 etc.) and if too early may stop other functions working (temporarily until restart).

A page with 3 choices will appear.
       No recovery and reset defaults
       Return to latest startup
       Recover latest session
Choose "no recovery and reset defaults" option. Assuming the mixer has started OK at this point close down normally and restart, to ensure all files are overwritten with a clean startup.