STUDER

PROFESSIONAL AUDIO EQUIPMENT

# SERVICE INFORMATION

## D820 MCH
## Modifications and Update to S/W Version 3.0

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**SI 159/93, Order No. 10.85.7350 (ED 0693)**

# SI 159/93

# D820 MCH - MODIFICATIONS AND S/W UPDATE V3.0

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3. Improvements in S/W 3.0

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7. Confirmation Sheet

IMPORTANT - **ATTENTION** - IMPORTANT

**Please return**

- **Confirmation sheet**
- **all old EPROMS/EEPROMS/GALS**

**after performing the update**

## 1. Modifications: S/W 3.0

**SUPPOSITION:**
**MACHINE HAS TO BE MODIFIED TO S/W 2.3 (21/92)**

Modification concerns:

- 1.862.655.23 CPU with
  1.862.686.23 CPU Piggy Back
- 1.862.656.23 Peripheral Interface (PIF)
- 1.862.657.25 Reference Time Board (RT)
- 1.862.659.23 System Synchronizer Board (SSTC)
- 1.862.665.22 Sound Memory
- 1.862.764.21 Capstan Control Unit
- 1.862.781.25 MP-Unit TD Control PCM MCH (old motors)
  or
- 1.862.781.30 MP-Unit TD Control PCM MCH (new motors)

- 1.328.612.22 Autolocator µP Board
- 1.328.625.22 Remote Display Panel µP Board

Modification set contains:

| | |
|---|---|
| CPU Master software (Set of 4) | 1.862.926.30 |
| PIF Main Program (TDC) | 1.862.937.22 |
| PIF Main Program (SBC) | 1.862.938.24 |
| PIF Main Program (SEC) | 1.862.939.22 |
| RT TMS Main Program H | 1.862.958.26 |
| RT TMS Main Program L | 1.862.959.26 |
| SSTC (DISSI) | 1.862.967.23 |
| SSTC (DISCA) | 1.862.968.22 |
| 56000 Program H | 1.862.890.22 |
| 56000 Program M | 1.862.891.22 |
| 56000 Program L | 1.862.892.22 |
| Capstan Control | 1.862.796.22 |
| AL Main Program | 1.328.898.22 |

- TD PCM MCH (old motors) (Set of 2) 1.862.797.26
  or
- TD PCM MCH (new motors) (Set of 2) 1.862.797.31
  (depending on request)

- RDP Part One 1.328.894.23
- RDP Part Two 1.328.895.23
  (only on request)

- New Parameter Backup Program PARABACK.EXE (Floppy Disk)

## 1.1 New Parameter Backup Program PARABACK.EXE

ATTENTION!!

Before performing the master software update, please make sure that all machine parameters are filed to disk.

Make also sure that you have the factory machine parameter disk available.
Copy the new program PARABACK.EXE to your machine parameter disk.
Delete afterwards the old version NVPARA.EXE.

Use the new program PARABACK.EXE to download the parameters when the update is performed.

**Modification** **CPU Piggy Back 1.862.686.23**

Problem:

New Master Software V3.0 (27/93).

Remedy:

- Replace **IC3 - 6** (old software number 1.862.926.23) by new software **1.862.926.30.**

**Change board index to new** 1.862.686.24 .

**Change also board index of CPU Force to new** 1.862.655.24 .

```
**********************************************************************
*                                                                    *
*  ATTENTION:                                                        *
*  Machine parameters lost after Master Software Update.             *
*  Remember backup with nv_para - program !                          *
*                                                                    *
**********************************************************************
```

Concerns machines delivered before July 1993.

Modification Peripheral IF 1.862.656.23

Problem:

New Master Software V3.0 (27/93).

Remedy:

- Replace **ICxx** (old software number 1.862.937.21) by new software **1.862.937.22.**
- Replace **IC43** (old software number 1.862.938.23) by new software **1.862.938.24.**
- Replace **IC61** (old software number 1.862.939.21) by new software **1.862.939.22.**

Change board index to new 1.862.656.24 .

Concerns machines delivered before July 1993.

**Modification** **Reference Track Board 1.862.657.25**

Problem:

New Master Software V3.0 (27/93).

Remedy:

- Replace **IC48** (old software number 1.862.958.25) by new software **1.862.958.26.**
- Replace **IC67** (old software number 1.862.959.25) by new software **1.862.959.26.**

**Change board index to new 1.862.657.26 .**

Concerns machines delivered before July 1993.

**Modification** SSTC Board 1.862.659.23

Problem:

New Master Software V3.0 (27/93).

Remedy:

- Replace **IC40** (old software number 1.862.967.22) by new software **1.862.967.23.**
- Replace **IC50** (old software number 1.862.968.21) by new software **1.862.968.22.**

**Change board index to new** 1.862.659.24 .

Concerns machines delivered before July 1993.

**Modification** Sound Memory 1.862.665.22

Problem:

New Master software V3.0 (27/93).

Remedy:

- Replace **IC05** (old software number 1.862.892.21) by new software **1.862.892.22.**
- Replace **IC17** (old software number 1.862.891.21) by new software **1.862.891.22.**
- Replace **IC30** (old software number 1.862.890.21) by new software **1.862.890.22.**

**Change board index to new** 1.862.665.23 .

Concerns machines delivered before July 1993.

**Modification** Capstan Control Unit 1.862.764.21

Problem:

New Master Software V3.0 (27/93).

Remedy:

- Replace **IC17** (old software number 1.862.796.21) by new software **1.862.796.22.**

**Change board index to new** 1.862.764.22 .

Concerns machines delivered before July 1993.

**Modification MP Unit Tape Deck Control 1.862.781.25**

Problem:

New Master Software V3.0 (27/93).

Remedy:

- Replace **IC16 and 18** (old software number 1.862.797.25) by new software **1.862.797.26.**

  **Attention: Modification for old spooling motors !!**
  **Concerns not upgraded tape decks only !**

**Change board index to new 1.862.781.26 .**

Concerns machines delivered before May 1992 without factory-delivered upgraded tape deck or without modification kit 1.862.086.00.

**Modification MP Unit Tape Deck Control 1.862.781.30**

Problem:

New Master Software V3.0 (27/93).

Remedy:

- Replace **IC16 and 18** (old software number 1.862.797.30) by new software 1.862.797.31.

  **Attention: Modification for new spooling motors !!**
  **Concerns upgraded tape decks only !**

**Change board index to new 1.862.781.31 .**

Concerns machines delivered before July 1993 with factory-delivered upgraded tape deck or with modification kit 1.862.086.00.

**Modification** **Autolocator uP-Board** **1.328.612.22**

Problem:

New Master software V3.0 (27/93).

Remedy:

- Replace **IC4** (old software number 1.328.898.21) by new software 1.328.898.22.

**Change board index to new** 1.328.612.23 .

**Mark also index "23" on bottom of case.**

Concerns machines delivered before July 1993.

**Modification** **Remote Display Panel uP** **1.328.625.22**

Problem:

New Master Software V3.0 (27/93).

Remedy:

- Replace **IC28** (old software number 1.328.894.22) by new software **1.328.894.23.**
- Replace **IC29** (old software number 1.328.895.22) by new software **1.328.895.23.**

**Change board index to new** 1.328.625.23 .

**Mark also index "23" on backside of case.**

Concerns Remote Display Panels delivered before July 1993.

## 2. Modifications: Hardware

Modification concerns:

- 1.820.768.84 Tape Deck Display Driver

Board Status:

You will find attached in chapter 5 a status control sheet. Please check your machine for correspondence.

Please inform STI on the confirmation sheet about any differences.

**Modification** Tape Deck Disp. Driver 1.820.768.84

Problem:

Incorrect initialisation of Parallel Remote port.

Cause:

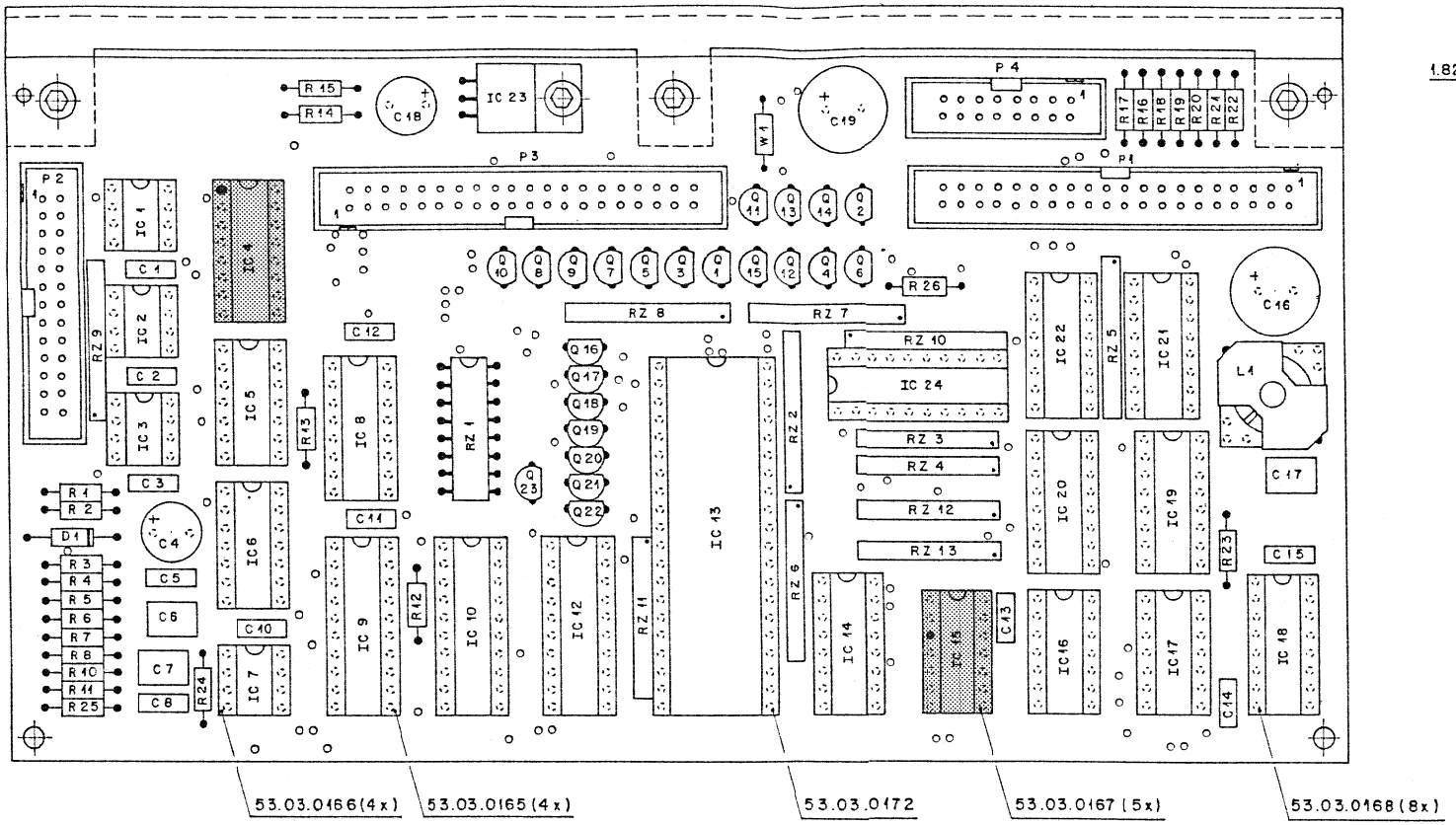
Chip reset delayed.

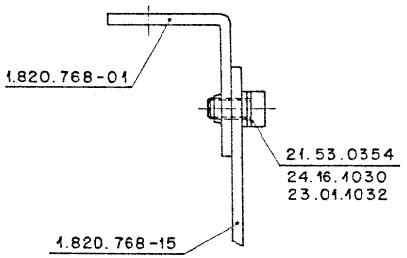
Remedy:

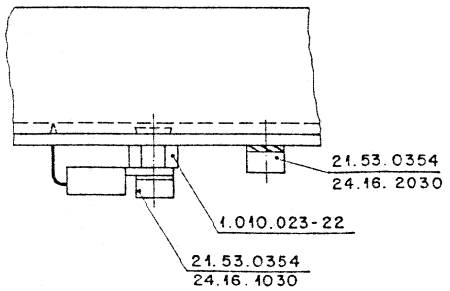
Connect IC04, pin 1 to IC15 (HC14), pin 3. (Schematic, mark "M").

**Change board index to new** 1.820.768.85.

Concerns machines delivered before July 1993.



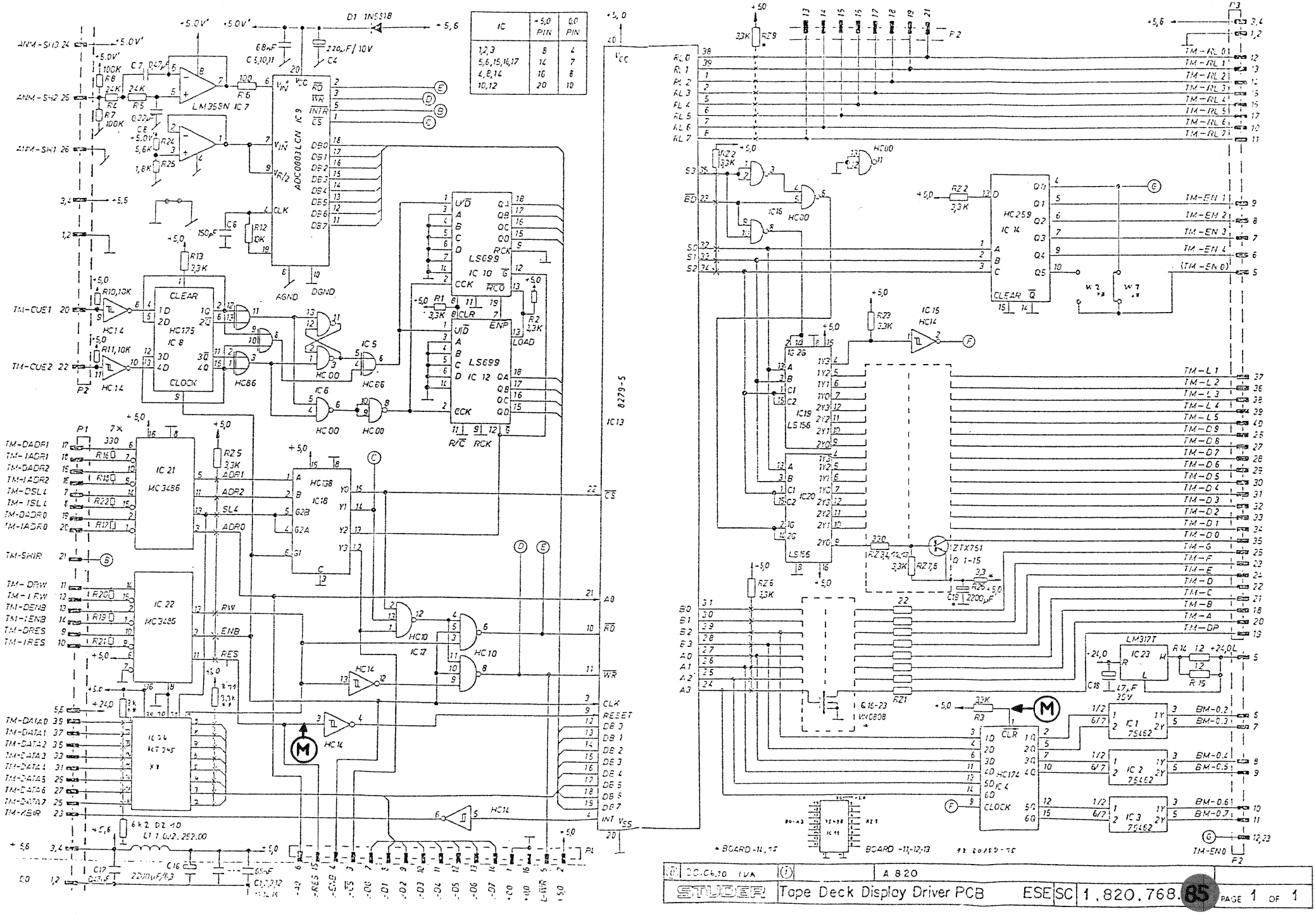

Nr. Etikette / ESE-Warnschild
aufgeklebt nach Fabrikationsmuster.

| | | | | |
|---|---|---|---|---|
| Werkstoff: Norm-Nr. / DIN-Bez. / Abmessung | Oberfläche: Güte / Beh. | | Änderung | ③ ② ① |
| Zugehörige Unterlagen: PL | Freimasstoleranz: ± | Maßstab: 2:1 | Ausgabe: 14.12.89 | ⓪ |
| Ersatz für: | Ersetzt durch: | | Kopie für: | |

STUDER REGENSDORF ZÜRICH

Benennung: TAPE DECK DISPLAY DRIVER ESE

Nummer: 1.820.768-85


IC | +5,0 PIN | 0,0 PIN
1,2,3 | 8 | 4
5,6,15,16,17 | 14 | 7
4,8,14 | 16 | 8
10,12 | 20 | 10
D1 1N5818
LM358N IC 7
ADC0801LCN IC 9
HC175 IC 8
LS699 IC 10
LS699 IC 12
HC138 IC 18
MC3486 IC 21
MC3486 IC 22
HCT 245 IC 24
HC259 IC 14
LS 156 IC 19
LS 156 IC 20
HC174 IC 4
75462 IC 1
75462 IC 2
75462 IC 3
LM317T IC 23
8279-5 IC 13
TM-CUE1
TM-CUE2
TM-DADR1
TM-IADR1
TM-DADR2
TM-IADR2
TM-DSL1
TM-ISL1
TM-DADR0
TM-IADR0
TM-SHIR
TM-DRW
TM-IRW
TM-DENB
TM-IENB
TM-DRES
TM-IRES
TM-DATA0
TM-DATA1
TM-DATA2
TM-DATA3
TM-DATA4
TM-DATA5
TM-DATA6
TM-DATA7
TM-KEIR
TM-L1
TM-L2
TM-L3
TM-L4
TM-L5
TM-D9
TM-D8
TM-D7
TM-D6
TM-D5
TM-D4
TM-D3
TM-D2
TM-D1
TM-D0
TM-G
TM-F
TM-E
TM-D
TM-C
TM-B
TM-A
TM-DP
TM-EN1
TM-EN2
TM-EN3
TM-EN4
(TM-EN0)
BM-0.2
BM-0.3
BM-0.4
BM-0.5
BM-0.6
BM-0.7
TM-ENO
BOARD -11,-12,-13
BOARD -14,-15
A 820
Tape Deck Display Driver PCB
ESE SC 1.820.768.85
PAGE 1 OF 1

## 3. Improvements in S/W 3.0

Besides several corrections the following improvements have been implemented in Version 3.0:

**3.0 New parameter backup program "PARABACK"**
A new parameter backup program replaces the old "NVPARA". Entering the tape deck "Edit"-Mode after a parameter download is corrected and a better adaptation to D820-24 files is implemented.

**3.1 Record Mute**
The Record Mute function is now implemented (see manual).

**3.2 Hold**
The Hold function on the primary keypad is now implemented.

**3.3 Edit Wait/Edit Lock**
The synchronizer edit functions are now implemented (see manual).

**3.4 AOR**
The Automatic Offset Retention function (cp. Store Offset on TLS) is now implemented (see manual).

**3.5 Synchronizer Park Window**
Foe optimum perforamnce of the internal synchronizer a park offset can be programmed in the status tree (see manual).

**3.6 Synchronizer Offset**
The synchronizer offset is now programable from -9.59.59.999 to +14.00.00.000 minutes

**3.7 Synchronizer Slow Lock**
The Slow Lock function is now implemented. When activated and synchronizer reference is set to TC, code jumps of less than 1s are corrected without muting ("slow varispeeding", see TLS).

**3.8 Chase Sync Performance**
The chase sync performance of the internal synchronizer has been improved by a new control algorithm.

**3.9 RT Synchronization**
The synchronization on RT reference is now implemented. This allows the RT synchronization between two D820 MCH's ("DASH-sync").

**3.10 Tape Guard**
The Tape Guard function is now selectable (on/off).
Two Tape Guard Modes (A/B) are now selectable in the menu tree.
Tape Guard override at tape end is now also possible with the appropriate "wind"-keys.

### 3.11 Tape A/B
The selection of the tape type is now possible in the menu tree.
Tape A = Ampex 467
Tape B = Sony Digital, 3M "275"

### 3.12 Master Tallies
The Master Tallies are now fully implemented.

### 3.13 Programable Autolocator User Keys
Two User Keys on the Autolocator are programable with key-macros (see manual).

### 3.14 100 Autolocator Memories
The positive memory registers have been upgraded to the number of 100 (00 to 99). The "negative registers (-0 to -9)" remain.

### 3.15 Calculator
The calculator is now implemented (see manual).

### 3.16 RT-based Lap-counter
The lap counter is now RT-based, but resetable for accurate locates to zero (indication "c")

### 3.17 Tape Transport
The "Play-on-the-Fly"-performance has again been improved. Also available is now a "Locate-on-the-Fly".

### 3.18 Crossfade Time Setting
The setting of the crossfade time is now also possible when performing an ALOOP Record.

### 3.19 Fr/ms Trimming of TC registers
The TC resolution is now also trimmable in milliseconds.

### 3.20 Status Tree / Screw Lock
The status tree has been reorganized for easier access (new parameter order, "wrap-around" of functions removed, "wrap-around" of channel numbers allowed. The alignment parameters are now in a separate tree which can be screw-locked (see manual).

### 3.21 Group Select renamed to Ready Record
To adapt to the labeling of the A820/827 tape recorder series this function has been renamed to "Ready Record"
Ready Record ON = Group Select OFF
Ready Record OFF = Group Select ON

### 3.22 TC Register Display
The TC register display now follows the settings of trailing zeroes, i.e. it is now possible to cut off the frames display.

### 3.23 Time-Out for Recall / Store
The time-out has been removed for the mentioned functions.

**3.24 Toggling Registers**
Register access is now possible without deselecting the previously selected register (Toggle-function).

**3.25 Sound Memory Punch-out Gap**
The gap on SMEM punch-out has been corrected.

**3.26 Sound Memory Programming**
Programming of wrong channel numbers is now inhibited, clearing of destination channels sets channel status to "Safe".

**3.27 Sound Memory Channel 45**
The recording to channel 45 is now possible.

**3.28 AES/EBU synchronisation**
When using AES/EBU as a digital source the external clock reference is no longer restricted to AES/EBU. Any clock reference has to be selected manually (menu "Ext. Clock Ref.").
The user has to take care that the D820 MCH is synchronized to the same source as the digital input is.

**3.29 Selection of Record Mode**
The selection of the record mode is now also possible without loaded tape (Tape Unload).

**3.30 Rollback with Locate**
Rollback can now be activated in addition to a locate procedure (e.g. Activating Rollback does no longer overwrite the LOC command, but adds the preselected time as a pre-roll)

**3.31 Setup Function**
The setup function on the Channel Remote has been adapted to the A820/827 tape recorder series. Only the channel functions INPUT, REPRO, READY, SAFE are stored. Other functions are now removed.

**3.32 ALOOP < 50ms**
Autoloop Record with loops programmed of less than 50ms are now inhibited for performance reasons.

**3.33 ALOOP Record on TC address**
Inaccuracy on TC based Autoloops has been corrected.

## 4. Software Compatibility List

S/W Version 3.0, Release 27/93

| Software | IC | Release | IC-Type | Check | Identification | Hardware |
|---|---|---|---|---|---|---|
| 1.328.894.23 | 28 | 06/93 | 27128 | A68F | 625 RDP PART ONE | 1.328.625.23 |
| 1.328.895.23 | 29 | 06/93 | 27128 | 644B | 625 RDP PART TWO | 1.328.625.23 |
| 1.328.896.21 | 514 | 28/91 | 27256 | FA02 | 631 PAI MAIN PROGR. | 1.328.631.21 |
| 1.328.898.22 | 04 | 12/93 | 27256 | FF4B | 612 AL MAIN PROGRAM | 1.328.612.23 |
| 1.328.899.21 | 05 | 03/91 | 27256 | 3A03 | 602 CR MAIN PROGRAM | 1.328.602.22 |
| 1.862.796.22 | 17 | 43/92 | 27128 | D669 | CAPST. PCM MCH | 1.862.764.22 |
| 1.862.797.26 | 16 | 13/93 | 27128 | 23E7 | TD PCM MCH | 1.862.781.26 |
| 1.862.797.26 | 18 | 13/93 | 27128 | BEEB | TD PCM MCH | 1.862.781.26 |
| 1.862.797.31 | 16 | 23/93 | 27128 | 3147 | TD PCM MCH UPGR. | 1.862.781.31 |
| 1.862.797.31 | 18 | 23/93 | 27128 | C9AC | TD PCM MCH UPGR. | 1.862.781.31 |
| 1.862.825.22 | 28 | 28/91 | 27128 | EEE5 | 815 DP PART ONE | 1.862.815.22 |
| 1.862.826.22 | 29 | 28/91 | 27128 | A7E1 | 815 DP PART TWO | 1.862.815.22 |
| 1.862.890.22 | 30 | 16/93 | 28HC64 | C4F7 | 665 56000 PROGRAM H | 1.862.665.22 |
| 1.862.891.22 | 17 | 16/93 | 28HC64 | CA11 | 665 56000 PROGRAM M | 1.862.665.22 |
| 1.862.892.22 | 05 | 16/93 | 28HC64 | A386 | 665 56000 PROGRAM L | 1.862.665.22 |
| 1.862.913.21 | | 19/90 | 28HC64 | | 652 MAPRO TMS PROG H | 1.862.652.21 |
| 1.862.914.21 | | 19/90 | 28HC64 | | 652 MAPRO TMS PROG L | 1.862.652.21 |
| 1.862.924.20 | 01 | 29/90 | 27256 | 612B | 655 CPU BOOT H | 1.862.686.30 |
| 1.862.925.20 | 02 | 29/90 | 27256 | 5623 | 655 CPU BOOT L | 1.862.686.30 |
| 1.862.926.30 | 03 | 27/93 | 27011 | 63F0 | 655 CPU MAIN PR.SET | 1.862.686.30 |
| 1.862.926.30 | 04 | 27/93 | 27011 | 4803 | 655 CPU MAIN PR.SET | 1.862.686.30 |
| 1.862.926.30 | 05 | 27/93 | 27011 | 31A0 | 655 CPU MAIN PR.SET | 1.862.686.30 |
| 1.862.926.30 | 06 | 27/93 | 27011 | 3EDB | 655 CPU MAIN PR.SET | 1.862.686.30 |
| 1.862.937.22 | 35 | 17/93 | 27256 | 170B | 656 PIF MAIN PR.TDC | 1.862.656.24 |
| 1.862.938.24 | 43 | 24/93 | 27256 | 3648 | 656 PIF MAIN PR.SBC | 1.862.656.24 |
| 1.862.939.22 | 61 | 27/92 | 27256 | D4B6 | 656 PIF MAIN PR.SEC | 1.862.656.24 |
| 1.862.940.21 | 68 | 03/91 | 27256 | DDB9 | 656 PIF MAIN PR.RBC | 1.862.656.24 |
| 1.862.956.20 | 10 | 32/89 | 28L22 | | 657 RT TMS PR. PLL H | 1.862.657.26 |
| 1.862.957.20 | 18 | 32/89 | 28L22 | | 657 RT TMS PR. PLL L | 1.862.657.26 |
| 1.862.958.26 | 48 | 36/92 | 7C263 | | 657 RT TMS MAIN PR H | 1.862.657.26 |
| 1.862.959.26 | 67 | 36/92 | 7C263 | | 657 RT TMS MAIN PR L | 1.862.657.26 |
| 1.862.967.23 | 40 | 26/93 | 27128 | DD83 | 659 SSTC SIGNAL UP | 1.862.659.24 |
| 1.862.968.22 | 50 | 26/93 | 27128 | A392 | 659 SSTC CAPSTAN UP | 1.862.659.24 |
| 1.862.980.21 | 31 | 10/90 | 7C263 | | 685 TCGEN TMS PROG H | 1.862.685.21 |
| 1.862.981.21 | 32 | 10/90 | 7C263 | | 685 TCGEN TMS PROG L | 1.862.685.21 |

# D820 MCH

## STATUS CONTROL SHEET C-27/93

Due to technical progress and improvements the following boards have been modified since the introduction of the machine. The actual index state is listed below. Please check for correspondence and answer on the confirmation sheet.

| | | | |
|---|---|---|---|
| A 1: | Power Supply | 1.862.620.81 | |
| B 1: | A/D Converter | 1.862.650.21 | (.20 also o.k.) |
| A 2: | D/A Converter | 1.862.651.21 | |
| A 3: | MAPRO | 1.862.652.21 | |
| **C 1:** | **CPU FORCE** | **1.862.655.30** | |
| **C 2:** | **Periphery Interface** | **1.862.656.24** | |
| **C 3:** | **Reference Track** | **1.862.657.26** | |
| **C 4:** | **Synchronizer** | **1.862.659.24** | |
| A 8: | Time Code Backbag | 1.862.685.21 | |
| B 6: | Clock Board | 1.862.660.23 | |
| A 10: | AES Interface | 1.862.664.22 | |
| **C 5:** | **Sound Memory** | **1.862.665.22** | |
| **C 6:** | **MADI Base / AES-IF Mk. 2** | **1.862.666.22** | **(.21 also o.k.)** |
| **C 7:** | **MADI Frontend** | **1.862.690.81** | |
| A 12: | DP Key Detection (Slave) | 1.862.812.81 | |
| A 13: | DP Key Detection (Master) | 1.862.814.00 | |
| A 14: | DP Microprozessor | 1.862.815.22 | |
| A 15: | Read Unit Cue Tracks | 1.862.723.81 | (.00 also o.k.) |
| B 7: | Spooling Motor Controller Upgr | 1.862.760.00 | (upgraded TD) |
| A 16: | Tape Deck Serial Interface | 1.820.763.83 | |
| **C 8:** | **Capstan Control Unit** | **1.862.764.22** | |
| **C 9:** | **MP-Unit TD Control PCM** | **1.862.781.26** | **(not upgr. TD)** |
| **C 10:** | **MP-Unit TD Control PCM Upgr.** | **1.862.781.31** | **(upgraded TD)** |
| A 19: | Switching Stabilizer ±15V | 1.820.873.82 | |
| A 20: | Parallel Remote Interface | 1.820.738.85 | |
| B 10: | Spooling Motor Controller | 1.820.760.82 | (not upgr. TD) |
| **C 11:** | **Tape Deck Display Driver** | **1.820.768.85** | |
| A 22: | Motor Tacho | 1.820.771.83 | (.81 also o.k.) |
| A 23: | Capstan Motor Drive Amplifier | 1.820.774.25 | (.24 also o.k.) |

C xx: Modifications from Status Control A-28/91 and B-21/92 to C-27/93

# 6. General Improvements

## 6.1 Tape Guide Roller "Smooth Transport"

A modification kit is available **on extra cost** for upgrading the tape deck (order no. 20.050.820.80 ).

**The upgrade is not a must.**

This kit features improved transport performance in "Play on the Fly" (direct Play-Mode without Stop-status) situations (reduces tape tension peaks).

The kit can be supplied for machines delivered before July 1993. Machines factory delivered with S/W 3.0 are standard equipped with the new tape guide roller.

As the Tape Guide Roller is a part of the headblock and a precision part for adjusted tape height, the modification needs very accurate mounting in the field.

The headblock has to be disassembled completely, the roller is delivered pre-adjusted.

## 6.2 Setup Handler

A program for Macintosh computers **only** is available on extra cost which allows an easy parameter setup, the storage of all user parameters (e.g. CUE registers) to floppy disk.

Order No. 21.862.995.00 (incl. floppy disc 3.5")

Ask for further information.

# SI 159/93

## CONFIRMATION OF PERFORMED UPDATE

D820 MCH Serial No.:

Representative organization: _____

Date: _____ Issued by: _____

**Please complete the confirmation sheet when the update has been performed. Return a copy to STI (Product Support D820 MCH). Thank you for cooperation.**

1. General Details

   Type of machine: [] 48 [] 24/48 [] 24

   Tape Deck : [] new motors [] old motors

   Head Hours : _____ hrs (see hour meter)

2. The D820 MCH is updated to S/W 3.0 (27/93)
   SI 159/93 has been performed.

   [] YES [] NO, NOT POSSIBLE BECAUSE:

   _____
   _____
   _____

3. The boards' index states correspond to the status control sheet C-27/93

   [] YES [] NO.
   FOLLOWING BOARDS NEED AN UPDATE:

   _____
   _____
   _____

4. Remarks: _____
   _____
   _____