STUDER

V-Eight Recorder

Operating and Service Instructions

1. Operating Instructions

2. Service Manual

3. Circuit Diagrams / V-Eight 20 Bit Tape Recorder

4. Circuit Diagrams / V-Eight Remote Cockpit

Prepared and edited by
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Technical Documentation
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CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

ATTENTION
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

ACHTUNG
GEFAHR: ELEKTRISCHER SCHLAG
NICHT ÖFFNEN

To reduce the risk of electric shock, do not remove covers (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.
Afin de prévenir un choc électrique, ne pas enlever les couvercles (où l'arrière) de l'appareil. Il ne se trouve à l'intérieur aucune pièce pouvant être réparée par l'usager.
Um die Gefahr eines elektrischen Schlages zu vermeiden, entfernen Sie keine Abdeckungen (oder Rückwand). Überlassen Sie die Wartung und Reparatur dem qualifizierten Fachpersonal.

This symbol is intended to alert the user to presence of uninsulated "**dangerous voltage**" within the apparatus that may be of sufficient magnitude to constitute a risk of electric shock to a person.
Ce symbole indique à l'utilisateur qu'il existent à l'intérieur de l'appareil des "**tensions dangereuses**". Ces tensions élevées entrainent un risque de choc électrique en cas de contact.
Dieses Symbol deutet dem Anwender an, dass im Geräteinnern die Gefahr der Berührung von "**gefährlicher Spannung**" besteht. Die Grösse der Spannung kann zu einem elektrischen Schlag führen.

This symbol is intended to alert the user to the presence of **important instructions** for operating and maintenance in the enclosed documentation.
Ce symbole indique à l'utilisateur que la documentation jointe contient **d'importantes instructions** concernant le fonctionnement et la maintenance.
Dieses Symbol deutet dem Anwender an, dass die beigelegte Dokumentation **wichtige Hinweise** für Betrieb und Wartung beinhaltet.

CAUTION: Lithium battery. Danger of explosion by incorrect handling. Replace by battery of the same make and type only.

ATTENTION: Pile au lithium. Danger d'explosion en cas de manipulation incorrecte. Ne remplacer que par un modèle de même type.

ACHTUNG: Explosionsgefahr bei unsachgemässem Auswechseln der Lithiumbatterie. Nur durch den selben Typ ersetzen.

ADVARSEL: Lithiumbatterei. Eksplosinsfare. Udskinftning ma kun foretages af en sagkyndig of som beskrevet i servicemanualen (DK).

FIRST AID

(in case of electric shock)

1. Separate the person as quickly as possible from the electric power source:
- by switching off the equipment
- or by unplugging or disconnecting the mains cable
- pushing the person away from the power source by using dry insulating material (such as wood or plastic).
- After having sustained an electric shock, always consult a doctor.

PREMIERS SECOURS

(en cas d'électrocution)

1. Si la personne est dans l'impossibilité de se libérer:
- Couper l'interrupteur principal
- Couper le courant
- Repousser la personne de l'appareil à l'aide d'un objet en matière non conductrice (matière plastique ou bois)
- Après une électrocution, consulter un médecin.

ERSTE HILFE

(bei Stromunfällen)

1. Bei einem Stromunfall die betroffene Person so rasch wie möglich vom Strom trennen:
- Durch Ausschalten des Gerätes
- Ziehen oder Unterbrechen der Netzzuleitung
- Betroffene Person mit isoliertem Material (Holz, Kunststoff) von der Gefahrenquelle wegstossen
- Nach einem Stromunfall sollte immer ein Arzt aufgesucht werden.

WARNING!

DO NOT TOUCH THE PERSON OR HIS CLOTHING BEFORE THE POWER IS TURNED OFF, OTHERWISE YOU STAND THE RISK OF SUSTAINING AN ELECTRIC SHOCK AS WELL!

2. If the person is unconscious:
- check the pulse,
- reanimate the person if respiration is poor,
- lay the body down, turn it to one side, call for a doctor immediately.

ATTENTION!

NE JAMAIS TOUCHER UNE PERSONNE QUI EST SOUS TENSION, SOUS PEINE DE SUBIR EGALEMENT UNE ELECTROCUTION.

2. En cas de perte de connaissance de la personne électrocutée:
- Controller le pouls
- Si nécessaire, pratiquer la respiration artificielle
- Placer l'accidenté sur le flanc et consulter un médecin.

ACHTUNG!

EINE UNTER SPANNUNG STEHENDE PERSON DARF NICHT BERÜHRT WERDEN. SIE KÖNNEN DABEI SELBST ELEKTRISIERT WERDEN!

2. Bei Bewusstlosigkeit des Verunfallten:
- Puls kontrollieren,
- bei ausgesetzter Atmung künstlich beatmen,
- Seitenlagerung des Verunfallten vornehmen und Arzt verständigen.

Installation, Betrieb und Entsorgung

Vor der Installation des Gerätes müssen die hier aufgeführten und auch die weiter in dieser Anleitung mit ⚠ bezeichneten Hinweise gelesen und während der Installation und des Betriebes beachtet werden.
Das Gerät und sein Zubehör ist auf allfällige Transportschäden zu untersuchen.
Ein Gerät, das mechanische Beschädigung aufweist oder in welches Flüssigkeit oder Gegenstände eingedrungen sind, darf nicht ans Netz angeschlossen oder muss sofort durch Ziehen des Netzsteckers vom Netz getrennt werden. Das Öffnen und Instandsetzen des Gerätes darf nur von Fachpersonal unter Einhaltung der geltenden Vorschriften durchgeführt werden.

Falls dem Gerät kein konfektioniertes Netzkabel beiliegt, muss dieses durch eine Fachperson unter Verwendung der mitgelieferten Kabel-Gerätedose IEC320/C13 oder IEC320/C19 und unter Berücksichtigung der einschlägigen, im geweiligen Lande geltenden Bestimmungen angefertigt werden; siehe Bild unten.
Vor Anschluss des Netzkabels an die Netzsteckdose muss überprüft werden, ob die Stromversorgungs- und Anschlusswerte des Gerätes (Netzspannung, Netzfrequenz) innerhalb der erlaubten Toleranzen liegen. Die im Gerät eingesetzten Sicherungen müssen den am Gerät angebrachten Angaben entsprechen.
Ein Gerät mit einem dreipoligen Gerätestecker (Gerät der Schutzklasse I) muss an eine dreipolige Netzsteckdose angeschlossen und somit das Gerätegehäuse mit dem Schutzleiter der Netzinstallation verbunden werden (Für Dänemark gelten Starkstrombestimmungen, Abschnitt 107).

Installation, Operation, Disposal

Before you install the equipment, please read and adhere to the following recommendations and all sections of these instructions marked with ⚠ .

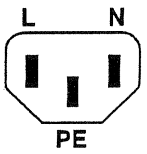
Check the equipment for any transport damage.

A unit that is mechanically damaged or which has been penetrated by liquids or foreign objects must not be connected to the AC power outlet or must be immediately disconnected by unplugging the power cable. Repairs must only be performed by trained personnel in accordance with the applicable regulations.

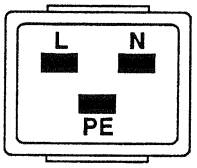
Should the equipment be delivered without a matching mains cable, the latter has to be prepared by a trained person using the attached female plug (IEC320/C13 or IEC320/C19) with respect to the applicable regulations in your country - see diagram below.

Before connecting the equipment to the AC power outlet, check that the local line voltage matches the equipment rating (voltage, frequency) within the admissible tolerance. The equipment fuses must be rated in accordance with the specifications on the equipment.

Equipment supplied with a 3-pole appliance inlet (equipment conforming to protection class I) must be connected to a 3-pole AC power outlet so that the equipment cabinet is connected to the protective earth conductor of the AC supply (for Denmark the Heavy Current Regulations, Section 107, are applicable).



IEC 320 / C13



IEC 320 / C19

Female plug (IEC320), view from contact side:

L ..... live; brown	National American Standard: black
N ..... neutral; blue	white
PE ..... protective earth; green and yellow	green

Connecteur femelle (IEC320), vue de la face aux contacts:

L.....phase, brun	Standard National Américain: noir
N.....neutre, bleu	blanc
PE....terre protective; vert et jaune	vert

Ansicht auf Steckkontakte der Kabel-Gerätesteckdose (IEC320):

L.....Polleiter, braun	USA-Standard: schwarz
N.....Neutralleiter, hellblau	weiss
PE....Schutzleiter, gelb/grün	grün

Bei der Installation des Gerätes muss *vermieden* werden, dass:
- das Gerät Regen, Feuchtigkeit, direkter Sonneneinstrahlung oder übermässiger Wärmestrahlung von Wärmequellen (Heizgeräte, Heizungen, Spotlampen) ausgesetzt wird
- die für den Betrieb des Gerätes benötigte Luftzirkulation beeinträchtigt und dadurch die zulässige maximale Lufttemperatur der Geräteumgebung überschritten wird (Wärmestau)
- die Belüftungsöffnungen des Gerätes blockiert oder abgedeckt werden.

Das Gerät und seine Verpackung darf nur sachgerecht entsorgt werden. Alle Teile des Gerätes, die gefährliche Stoffe (z.B. Quecksilber, Cadmium) enthalten, müssen als Sondermüll behandelt werden.
Verbrauchte Batterien und Akkus müssen dem Hersteller zur Entsorgung zurückgegeben oder entsprechend den spezifischen Bestimmungen Ihres Landes fachgerecht entsorgt werden.

Wartung und Reparatur

Durch Entfernen von Gehäuseteilen, Abschirmungen etc. werden stromführende Teile freigelegt. Aus diesem Grund müssen u.a. die folgenden Grundsätze beachtet werden:
Eingriffe in das Gerät dürfen nur von Fachpersonal unter Einhaltung der geltenden Vorschriften vorgenommen werden.
Vor Entfernen von Gehäuseteilen muss das Gerät ausgeschaltet und vom Netz getrennt werden.
Bei geöffnetem, vom Netz getrenntem Gerät dürfen Teile mit gefährlichen Ladungen (z. B. Kondensatoren, Bildröhren) erst nach kontrollierter Entladung, heiße Bauteile (Leistungshalbleiter, Kühlkörper etc.) erst nach deren Abkühlen berührt werden.

Bei Wartungsarbeiten am geöffneten, unter Netzspannung stehenden Gerät dürfen blanke Schaltungsteile und metallene Halbleitergehäuse weder direkt noch mit einem nichtisolierten Werkzeug berührt werden.
Zusätzliche Gefahren bestehen bei unsachgemässer Handhabung besonderer Komponenten:
- *Explosionsgefahr* bei Lithiumzellen, Elektrolyt-Kondensatoren und Leistungshalbleitern
- *Implosionsgefahr* bei evakuierten Anzeigeeinheiten
- *Strahlungsgefahr* bei Lasereinheiten (nichtionisierend), Bildröhren (ionisierend)
- *Verätzungsgefahr* bei Anzeigeeinheiten (LCD) und Komponenten mit flüssigem Elektrolyt.

Solche Komponenten dürfen nur von ausgebildetem Fachpersonal mit den vorgeschriebenen Schutzmitteln (u.a. Schutzbrille, Handschuhe) gehandhabt werden.

The equipment installation *must satisfy* the following requirements:
- Protection against rain, humidity, direct solar irradiation or strong thermal radiation from heat sources (heaters, radiators, spotlights).
- Unobstructed air circulation so that the maximum air temperature in the equipment environment will not be exceeded (no heat accumulation).
- Ventilation louvers of the equipment must not be blocked or covered.

Equipment and packing materials should ultimately be disposed of according with the applicable regulations. Parts of the equipment that contain hazardous substances (e.g. mercury, cadmium) must be treated as toxic waste.
Weak batteries or exhausted rechargeable batteries must be returned to the manufacturer for competent disposal or must be disposed of in accordance with the environmental protection regulations applicable for your country.

Maintenance and Repair

The removal of housing parts, shields, etc. exposes energized parts. For this reason the following precautions should be observed:
Maintenance should only be performed by trained personnel in accordance with the applicable regulations. The equipment should be switched off and disconnected from the AC power outlet before any housing parts are removed.
Even after the equipment has been disconnected from the power, parts with hazardous charges (e.g. capacitors, picture tubes) should only be touched after they have been properly discharged. Hot components (power semiconductors, heat sinks, etc.) should only be touched after they have cooled off.

If maintenance is performed on a unit that is opened and switched on, no uninsulated circuit components and metallic semiconductor housings should be touched neither with your bare hands nor with uninsulated tools. Certain components pose additional hazards:

- *Explosion hazard* from lithium batteries, electrolytic capacitors and power semiconductors
- *Implosion hazard* from evacuated display units
- *Radiation hazard* from laser units (non-ionizing), picture tubes (ionizing)
- *Caustic effect* of display units (LCD) and such components containig liquid electrolyte.

Such components should only be handled by trained personnel who are properly protected (e.g. safety goggles, gloves).

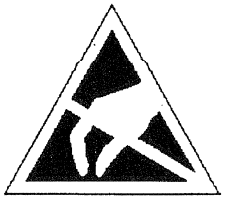
Für Wartung und Reparatur der sicherheitsrelevanten Teile des Gerätes darf nur Ersatzmaterial nach Herstellerspezifikation verwendet werden.

Das Gerät muss ordnungsgemäss und regelmässig gewartet und somit in sicherem Zustand erhalten werden. Bei ungenügender Wartung oder bei Änderungen der sicherheitsrelevanten Teile des Gerätes erlischt die entsprechende Produktehaftung des Herstellers.

For maintenance work and repair on components that influence the equipment safety, only replacement material conforming to the manufacturer's specifications may be used.

The equipment should be properly serviced in regular intervals and be maintained in safe operating condition. If the equipment is not properly maintained or if any modifications are made to components that influence safety, the manufacturer's product liability gets void.

Elektrostatische Entladung (ESD) bei Wartung und Reparatur



ATTENTION: Observe precautions for handling devices sensitive to electrostatic discharge!

ATTENTION: Respecter les précautions d'usage concernant la manipulation de composants sensibles à l'électricité statique!

ACHTUNG: Vorsichtsmassnahmen bei Handhabung elektrostatisch entladungsgefährdeter Bauelemente beachten!

Viele ICs und andere Halbleiter sind empfindlich gegen elektrostatische Entladung (ESD). Unfachgerechte Behandlung von Baugruppen mit solchen Komponenten bei Wartung und Reparatur kann deren Lebensdauer drastisch vermindern.
Bei der Handhabung der ESD-empfindlichen Komponenten sind u.a. folgende Regeln zu beachten:

- ESD-empfindliche Komponenten dürfen ausschliesslich in dafür bestimmten und bezeichneten Verpackungen gelagert und transportiert werden.
- Unverpackte, ESD-empfindliche Komponenten dürfen nur in dafür eingerichteten Schutzzonen (EPA, z.B. Gebiet für Feldservice, Reparatur- oder Serviceplatz) gehandhabt und nur von Personen berührt werden, die durch ein Handgelenkband mit Seriewiderstand mit dem Massepotential des Reparatur- oder Serviceplatzes verbunden sind. Das gewartete Gerät wie auch Werkzeug, Hilfsmittel, EPA-taugliche (elektrisch halbleitende) Arbeits-, Ablage- und Bodenmatten müssen ebenfalls mit diesem Potential verbunden sein.
- Die Anschlüsse der ESD-empfindlichen Komponenten dürfen unkontrolliert weder mit elektrostatisch aufladbaren (Gefahr von Spannungsdurchschlag), noch mit metallischen Oberflächen (Schockentladungsgefahr) in Berührung kommen.
- Um undefinierte transiente Beanspruchung der Komponenten und deren eventuelle Beschädigung durch unerlaubte Spannung oder Ausgleichsströme zu vermeiden, dürfen elektrische Verbindungen nur am abgeschalteten Gerät und nach dem Abbau allfälliger Kondensatorladungen hergestellt oder getrennt werden.

Electrostatic Discharge (ESD) during Maintenance and Repair

Many ICs and semiconductors are sensitive to electrostatic discharge (ESD). The life of components containing such elements can be drastically reduced by improper handling during maintenance and repair work.

Please observe the following rules when handling ESD sensitive components:

- ESD sensitive components should only be stored and transported in the packing material specifically provided for this purpose.
- Unpacked ESD sensitive components should only be handled in ESD protected areas (EPA, e.g. area for field service, repair or service bench) and only be touched by persons who wear a wristlet that is connected to the ground potential of the repair or service bench by a series resistor. The equipment to be repaired or serviced and all tools, aids, as well as electrically semiconducting work, storage and floor mats should also be connected to this ground potential.
- The terminals of ESD sensitive components must not come in uncontrolled contact with electrostatically chargeable (voltage puncture) or metallic surfaces (discharge shock hazard).
- To prevent undefined transient stress of the components and possible damage due to inadmissible voltages or compensation currents, electrical connections should only be established or separated when the equipment is switched off and after any capacitor charges have decayed.

SMD-Bauelemente

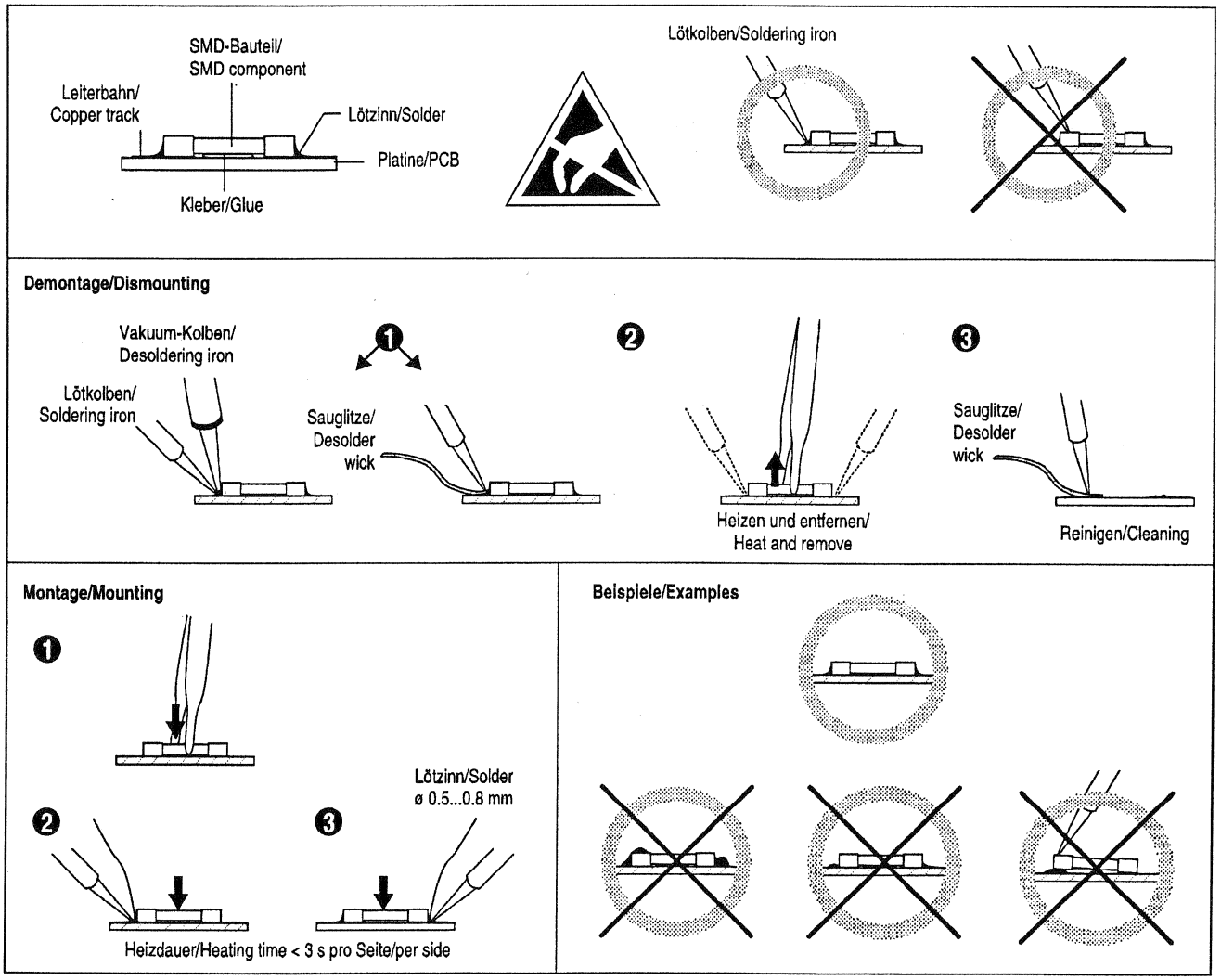
Der Austausch von SMD-Bauelementen ist ausschliesslich geübten Fachleuten vorbehalten. Für verwüstete Platinen können keine Ersatzansprüche geltend gemacht werden. Beispiele für korrekte und falsche SMD-Lötverbindungen in der Abbildung weiter unten.

Bei Studer werden keine handelsüblichen SMD-Teile bewirtschaftet. Für Reparaturen sind die notwendigen Bauteile lokal zu beschaffen. Die Spezifikationen von Spezialbauteilen finden Sie in der Serviceanleitung.

SMD Components

SMDs should only be replaced by skilled specialists. No warranty claims will be accepted for circuit boards that have been ruined. Proper and improper SMD soldering joints are depicted below.

Studer does not keep any commercially available SMDs in stock. For repair the corresponding devices should be purchased locally. The specifications of special components can be found in the service manual.



Störstrahlung und Störfestigkeit

Das Gerät entspricht den Schutzanforderungen auf dem Gebiet der elektromagnetischen Phänomene, die u.a. in den Richtlinien 89/336/EWG und FCC, Part 15, aufgeführt sind :

1. Die vom Gerät erzeugten elektromagnetischen Aussendungen sind soweit begrenzt, dass ein bestimmungsgemässer Betrieb anderer Geräte und Systeme möglich ist.
2. Das Gerät weist eine angemessene Festigkeit gegen elektromagnetische Störungen auf, so dass sein bestimmungsgemässer Betrieb möglich ist.

Das Gerät wurde getestet und erfüllt die Bedingungen der im Kapitel „Technische Daten" aufgeführten EMV-Standards. Die Limiten dieser Standards gewährleisten mit einer angemessenen Wahrscheinlichkeit sowohl einen Schutz der Umgebung wie auch entsprechende Störfestigkeit des Gerätes. Eine absolute Garantie, dass keine unerlaubte elektromagnetische Beeinträchtigung während des Gerätebetriebes entsteht, ist jedoch nicht gegeben.

Um die Wahrscheinlichkeit solcher Beeinträchtigung weitgehend auszuschliessen, sind u.a. folgende Massnahmen zu beachten:

- Installieren Sie das Gerät gemäss den Angaben in der Bedienungsanleitung, und verwenden Sie das mitgelieferte Zubehör.
- Verwenden Sie im System und in der Umgebung, in denen das Gerät eingesetzt ist, nur Komponenten (Anlagen, Geräte), die ihrerseits die Anforderungen der obenerwähnten Standards erfüllen.
- Sehen Sie ein Erdungskonzept des Systems vor, das sowohl die Sicherheitsanforderungen (die Erdung der Geräte gemäss Schutzklasse I mit einem Schutzleiter muss gewährleistet sein), wie auch die EMV-Belange berücksichtigt. Bei der Entscheidung zwischen stern- oder flächenförmiger bzw. kombinierter Erdung sind Vor- und Nachteile gegeneinander abzuwägen.
- Benutzen Sie abgeschirmte Kabel, wo vorgesehen. Achten Sie auf einwandfreie, grossflächige, korrosionsbeständige Verbindung der Abschirmung zum entsprechenden Steckeranschluss bzw. zum -gehäuse. Beachten Sie, dass eine nur an einem Ende angeschlossene Kabelabschirmung als Sende- bzw. Empfangsantenne wirken kann (z.B. bei wirksamer Kabellänge von 5 m oberhalb von 10 MHz), und dass die Flanken digitaler Kommunikationssignale hochfrequente Aussendungen verursachen (z.B. LS- oder HC-Logik bis 30 MHz).
- Vermeiden Sie Bildung von Masseschleifen oder vermindern Sie deren unerwünschte Auswirkung, indem Sie deren Fläche möglichst klein halten und den darin fliessenden Strom durch Einfügen einer Impedanz (z.B. Gleichtaktdrossel) reduzieren.

Electromagnetic Compatibility

The equipment conforms to the protection requirements relevant to electromagnetic phenomena that are listed in the guidelines 89/336/EC and FCC, part 15.

1. The electromagnetic interference generated by the equipment is limited in such a way that other equipment and systems can be operated normally.
2. The equipment is adequately protected against electromagnetic interference so that it can operate correctly.

The unit has been tested and conforms to the EMC standards applicable to residential, commercial and light industry, as listed in the section „Technical Data". The limits of these standards reasonably ensure protection of the environment and corresponding noise immunity of the equipment. However, it is not absolutely warranted that the equipment will not be adversely affected by electromagnetic interference during operation.

To minimize the probability of electromagnetic interference as far as possible, the following recommendations should be followed:

- Install the equipment in accordance with the operating instructions. Use the supplied accessories.
- In the system and in the vicinity where the equipment is installed, use only components (systems, equipment) that also fulfill the above EMC standards.
- Use a system grounding concept that satisfies the safety requirements (protection class I equipment must be connected with a protective ground conductor) that also takes into consideration the EMC requirements. When deciding between radial, surface or combined grounding, the advantages and disadvantages should be carefully evaluated in each case.
- Use shielded cables where shielding is specified. The connection of the shield to the corresponding connector terminal or housing should have a large surface and be corrosion-proof. Please note that a cable shield connected only single-ended can act as a transmitting or receiving antenna (e.g. with an effective cable length of 5 m, the frequency is above 10 MHz) and that the edges of the digital communication signals cause high-frequency radiation (e.g. LS or HC logic up to 30 MHz).
- Avoid ground loops or reduce their adverse effects by keeping the loop surface as small as possible, and reduce the noise current flowing through the loop by inserting an additional impedance (e.g. common-mode rejection choke).

Class A Equipment - FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution:
Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment. Also refer to relevant information in this manual.

CE-Konformitätserklärung

Der Hersteller,

Studer Professional Audio AG,
CH-8105 Regensdorf,

erklärt in eigener Verantwortung, dass das Produkt

Studer V-Eight, Digital 8-Channel Recorder (ab Serie-Nr. 1001),

auf das sich diese Erklärung bezieht, entsprechend den Bestimmungen der EU-Richtlinien und Ergänzungen

- Elektromagnetische Verträglichkeit (EMV):
  89/336/EWG + 92/31/EWG + 93/68/EWG
- Niederspannung:
  73/23/EWG + 93/68/EWG

mit den folgenden Normen und normativen Dokumenten übereinstimmt:

- Sicherheit:
  Schutzklasse 1, EN 60950: 1992 + A1/A2: 1993
- EMV:
  EN 55103-1/-2: 1996, elektromagnetische Umgebungen E2 und E4.

Regensdorf, 11. August 1998

B. Hochstrasser, Geschäftsleiter

P. Fiala, Leiter QS

CE Declaration of Conformity

The manufacturer,

Studer Professional Audio AG,
CH-8105 Regensdorf,

declares under his sole responsibility that the product

Studer V-Eight, Digital 8-Channel Recorder (on from serial No. 1001),

to which this declaration relates, according to following regulations of EU directives and amendments

- Electromagnetic Compatibility (EMC):
  89/336/EEC + 92/31/EEC + 93/68/EEC
- Low Voltage (LVD):
  73/23/EEC + 93/68/EEC

is in conformity with the following standards or other normative documents:

- Safety:
  Class 1, EN 60950: 1992 + A1/A2: 1993
- EMC:
  EN 55103-1/-2: 1996, electromagnetic environments E2 and E4.

Regensdorf, August 11, 1998

B. Hochstrasser, Managing director

P. Fiala, Manager QA

1 V-Eight Major Feature Update, Software Versions V2.00 and up

1.1 RS-422 (Sony 9-pin) Slave Operation

The ONLINE SOURCE page in the UTILITY menu now has the "RS-422" parameter added to its choice of online control source settings. Two new utility pages have also been added to facilitate RS-422 slave track-arming operations. When ONLINE SOURCE is set to RS-422, the V-Eight will recognize standard Sony 9-pin control commands. The V-Eight is optimized for BVU-950 emulation.

The way RS-422 Edit Preset commands record-arm V-Eight tracks is determined by the RS-422 Track Arm and RS-422 Mapping settings. These Utility pages are defined as follows:

1.1.1 RS-422 Track Arm: On/Off

When on, the V-Eight will respond to RS-422 Edit Preset commands by record-arming V-Eight tracks according to the mapping page setting. When off, local track-arming from the V-Eight front panel is allowed, i.e., Edit Preset commands are ignored. Local track-arming is recommended when slave V-Eights (ID2 and above) must be record-enabled, or when ID1 record-arming that does not follow the assigned RS-422 Mapping scheme is desirable.

1.1.2 RS-422 Mapping: 1-2, OddEvn, (Local)

This parameter sets the mapping for 2-track (BVU-950) Edit Preset commands. When set to 1-2, an A1 or A2 track-arm command will record-arm V-Eight tracks 1 or 2, respectively. No mapping to other V-Eight tracks will occur. When OddEvn (Odd/Even) is selected, an A1 track-arm command will record-arm tracks 1, 3, 5, and 7 (the odd channels) and an A2 track-arm command will record-arm tracks 2, 4, 6, and 8 (the even channels). If an RS-422 controller can force an emulation type other than SONY BVU-950 (e.g. Sony DVR-10 or Fostex RD-8) for the purposes of using A1-A4 (4 track Edit Preset) or Da1-Da8 (8 track Edit Preset) arming with the V-Eight, the map setting will be ignored. This, for example, will allow an A1 or A2 track-arm command from a DVR-10 (a VTR with 4 audio tracks) to record-arm track 1 or track 2 of the V-Eight without mapping, i.e. V-Eight tracks 3 and 4 can be record-armed independently with an A3 or A4 Edit Preset command regardless of the map setting.

If RS-422 Track Arm is off, "(Local)" is indicated in place of the mapping selection and editing is not allowed. When Track map is turned on again, the previously selected RS-422 mapping selection is reverted to, and editing is allowed.

1.2 ID1 Offline with the Cockpit Remote

When the Cockpit remote is connected to multiple V-Eight recorders, the ID1 master can now be taken offline. ID1 maintains clock and serial control over all slaves (excluding 32-bit ABS time code). Using a Cockpit remote, when ID1 is offline, its transport remains idle while the Cockpit remote transport controls operate the next slave being online (known as the pseudo-master). Without a Cockpit remote connected, an offline ID1 V-Eight transport will continue to operate normally and control slaves being online.

1.2.1 Cockpit Remote Tape and Reference Counter Indications when ID1 is Offline

The Cockpit remote's display shows the pseudo-master's ABS and Tape TC values on the Tape and Reference Counters, respectively. The Cockpit remote's Reference Counter will *not* show the pseudo-master's SMPTE In, Locate Point, Internal Generator, or SMPTE Offset values.

1.2.2 Storing Locate Points when ID1 is Offline

When updating locate points (e.g. pressing **SET LOCATE** on the Cockpit remote), ID1 locate points are overwritten based on the pseudo-master's tape position. For example, pressing **COPY LOCATE** on the Cockpit remote will write ID2's tape position into ID1's currently selected locate address.
The following scenarios suggest operation when ID1 is offline:

V-Eight master and two slaves (ID1 → ID2 → ID3):

ID1 offline

- With ID1 offline, the system will function normally. Transport operations performed on ID1 will control online slaves (32-bit ABS time code is transmitted). The only difference is that ID1 will ignore any remote online source input.

Cockpit remote with V-Eight master and two slaves (Cockpit remote → ID1 → ID2 → ID3):

ID1 offline

- The first online unit becomes the pseudo-master. The pseudo-master will operate like a master in regards to all transport functions, including Rollback, Replay, Loc Before Play, Mute Until Lock, etc.
- The Cockpit remote will reflect ID1 parameters with the following exceptions: Tape Counter, Reference Counter – Tape TC only, and transport status. The Cockpit remote will reflect the pseudo-master status in these cases.
- All track-enable selections and track groups along with All Input, All Safe, and All Clear functions initiated from the Cockpit remote will be ignored by ID1. The "Machine Offline" message is temporarily displayed when a track selection is attempted (similar to what occurs when trying to record or input-enable an offline ID2 or greater unit).

- There is no independent use of the ID1 front panel functions other than Eject and Online functions.
- Tape Offset:
  a) Tape Offset is enabled, ID2's tape offset value is non-zero and user tries to take ID1 offline: ID1 offline is not allowed and "ID2 Tape Offset Not Zero" is temporarily displayed.
  b) ID1 is offline, ID2's tape offset value is non-zero and the user tries to enable Tape Offset: Tape Offset enable is not allowed and "ID2 Tape Offset Not Zero" is temporarily displayed.
- When ID1 is put back online, all slaves will stop. Cockpit remote and slave memory is updated to be consistent with ID1 parameters.

All machines offline

If no machines are online, then the Cockpit remote will display "No Machines Online" when any action is attempted.

Special notes when operating a Cockpit remote with ID1 offline

No SMPTE Chase

SMPTE Chase remains a function of the ID1 machine. ID1's SMPTE Chase parameter settings are reflected on the Cockpit remote display even when ID1 is offline. When ID1 is offline, SMPTE Chase for the pseudo-master and remaining slaves is not permitted.

Internal generator operation

ID1's internal generator parameter settings are reflected on the Cockpit remote display even when ID1 is offline. The pseudo-master's internal generator will operate, but its output is subject to its own internal generator parameter settings (which may differ from the ID1 settings). Therefore, in most situations, time code generation should remain a function of the ID1 machine.

1.3 Tape TC Detection in Fast Wind Modes

Detecting discontinuous and non-contiguous Tape TC in fast wind modes has been implemented. The V-Eight will recognize TC track time code discontinuities and time code gaps in fast wind modes, i.e., when chasing time code or during a locate, scan, search, fast forward, or rewind). In addition, when Rew/Fwd TC Out is on, time code accurate with the TC Track will be present at the V-Eight's Time Code and MIDI Outputs in fast wind modes.

Please note that for speeds less than nominal play speed, the Tape TC is extrapolated from the last valid reading.

Note the following exceptions when using tapes previously formatted with v1.xx software:

- When a version 1.xx formatted tape has TC recorded to it using version 1.xx software, time code discontinuities and non-contiguities in fast wind will *not* be recognized. In this case, the V-Eight will extrapolate time code values when in wind modes (based on the last valid tape tc detected in Play or Record mode).
- When a version 1.xx formatted tape has tape TC recorded to it using version 2.xx software, time code discontinuities will be detected in wind modes. However, time code values will be extrapolated when a section of tape without time code (non-contiguous time code) is encountered while winding. Once **PLAY** or **RECORD** is pressed, the actual tape TC value (if present and different) will be detected and properly displayed.

1.4 Tape TC in the Tape Counter

When the Tape Counter selection is SMPTE, the display is now based upon the chase reference selection:

a) When the chase reference is ABS Time, the display shows the ABS Time plus SMPTE Offset value, as before.

b) When the chase reference is TapeTC, the display now shows the Tape TC plus SMPTE Offset value.

When Tape TC is selected as a chase reference and no Tape TC is detected on tape, the Tape Counter will indicate "no tAPE tc" when in SMPTE mode.

1.5 "Fixed" Mode Time Code Generation: "TC Start Ref: Fixed"

The internal generator's TC start reference parameter can now be set to "Fixed". When in Fixed mode, the start offset does not update to the last generated value when time code generation stops, as is the case with User Set mode. Fixed mode will maintain the same start offset value after generation stops, i.e., the start offset value remains fixed, therefore, every time generation is restarted, time code output will always begin with the same start offset value.

1.6 Digital Scrubbing: "Dig Scan: On/Off, *nn* dB"

A Digital Scan page has been added to the Utility pages. This allows the user to have control over digital audio output when in jog/shuttle mode. The output may be attenuated in 6 dB increments (0...–42 dB).

Note the following when using Aux Track routing:

a) Aux routing playback through the "AUX" selected channels is defeated when Digital Scan mode is enabled.

b) Cue and review scanning will always output audio at –6 dB regardless of the DigScan status and the attenuation setting.

2 OTHER CHANGES

2.1 I/O Card as the Digital Source

a) The "D" indicators in the Meter Display are now always illuminated continuously when the Digital Source is I/O Card, and the Clock Source is from a source other than I/O Card (even when the selected clock source is not present).

b) When the Digital Source is set to I/O Card, there are some limitations on the routing. Basically, the AES/EBU and analog input share the routing, i.e., they are one in the same. What this means is that when the Dig Source = I/O Card, only I/O Card routing (1/2 → 3/4, 5/6, 7/8; 1-4 → 5-8; or 1-8 → 1-8) is allowed. The analog input routing will not be editable and will follow (i.e., be the same as) the I/O Card routing. If control of analog input routing is desired, the digital source cannot be I/O Card. Also, note that if the user wants to mix the I/O Card and analog inputs, Input Routing mode *must* be set to 1-to-1.

2.2 SMPTE Chase with the Stop Button

If currently chasing SMPTE, pressing the Stop button will now stop the tape *and* disable SMPTE Chase.

2.3 Tape TC Updating when in Input Mode

When the TC track is input-enabled, the SMPTE rate will not automatically change when transitioning from an area of tape with no tape TC into tape TC.

2.4 Vari-Speed and Pull-Up/Down

When the V-Eight is set for a pull-up/down, changing the pitch mode to VARI (by pressing **PITCH MODE** or by entering a non-zero vari-speed value) now disables the pull-up/down. Likewise, when the V-Eight is in vari-speed, enabling pull-up/down returns the V-Eight to FIXED pitch mode operation.

2.5 MIDI Thru

"Soft" MIDI Thru (automatically echoing non-F0 commands) is now defeated in order to accommodate a MIDI closed loop more effectively.

2.6 New Utility Page Order

The Utility menu page order in version 2.00 has changed as follows:

Utility pages			
1	Dig Out	14	Mute Until Lock
2	Online Source	15	Dynamic Punch
3	RS-422 Track Arm	16	Track Groups
4	RS-422 Mapping	17	RMD Error LEDs
5	Online Control	18	Dig Scan
6	One-Button Record	19	Save data to tape?
7	Input Monitor	20	Load data from tape?
8	Unthread Timeout	21	Tape Type
9	TC Output Level	22	ID status
10	Rew/Fwd TC Out	23	User Bits
11	XFade Time*	24	Error Rate
12	Search Enable	25	Front Panel
13	Loc(ate) Before Play	26	Main

2.7 Cockpit Remote Display Changes

1. Machine-specific Utility pages 21 (Tape Type), 23 (User Bits), 24 (Error Rate), 25 (Front Panel), and 26 (Main) now indicate "See Local" in the Cockpit remote display.
2. When the master V-Eight (ID1) parks at a locate point before other slaves have completed the locate, the Cockpit remote now continues to indicate a locate in progress by flashing the **LOC** or **ZERO LOCATE** keys. The **STOP** key is also illuminated continuously to indicate that the master is stopped.
3. The Cockpit remote now displays the more general "Select digital src trks" message when routing digital input, since a system can have several V-Eights with various digital input sources.

CONTENTS

1 GENERAL

The Studer V-Eight is an 8-track digital tape recorder that records on S-VHS videotape cassettes. It is compatible with the ADAT format used with several other digital recorders (Alesis ADAT, ADAT XT, LX20, M20, and XT20; Fostex RD-8 and CX-8; and Panasonic MDA-1).

1.1 V-Eight highlights

- Direct-drive full-servo S-VHS transport, designed for continuous shuttling and heavy-duty professional use
- Two available bit resolutions: 16-bit standard ADAT Type I, and 20-bit ADAT Type II
- 24-bit A/D and D/A converters
- Built-in monitor mixer
- Studer "Night Design"
- High-quality transformer-balanced line inputs
- +4 dBu balanced XLR and ELCO (block) connectors
- Selectable 16-bit dithered output for transfer to 16-bit systems
- JOG/SHTL wheel for fast navigation
- Analog AUX track for superb scrub and JOG monitoring
- ADAT, SMPTE, video and word clock synchronization capabilities
- Dedicated SMPTE track
- Two custom vacuum fluorescent displays
- Extensive error reporting capability via "QUALITY" indicator.

1.2 Setup and basics

1.2.1 Utilization for the purpose intended

The Studer V-Eight Digital 8-Channel Recorder is designed for professional use. It is presumed that the unit is operated only by trained personnel; servicing must be performed by qualified experts.

The electrical connections may be connected only to the appropriate voltages and signals specified in this manual. Please consult the "Safety and EMC" section at the very beginning of this manual.

1.2.2 Unpacking and inspection

Please retain the V-Eight's shipping carton which is designed to protect the unit during shipping, in the unlikely event that you need to return the V-Eight for servicing. Some carriers have restrictions on shipping electronic equipment without the original packing.

The shipping carton contains:

- V-Eight with the same serial number shown on shipping carton
- Power plug
- This instruction manual
- Blank S-VHS cassette

1.2.3 AC power hookup

There is no need to select a specific mains voltage because the V-Eight can be operated on mains voltages from 100 through 240 V_{AC}.

Danger! *Repair work may only be performed by a trained service technician. The primary fuse must be replaced by a spare fuse of exactly the same type. The V-Eight must not be opened by the user because of the risk of a severe electric shock hazard!*

Mains cable: The supplied female IEC 320/C13 mains cable socket has to be connected to an appropriate mains cable by a trained technician with respect to your local regulations. Refer to the "Installation, Operation, and Waste disposal" section at the beginning of this manual.

1 Make sure the V-Eight is turned off. It's good practice not to turn on the unit until all other cables are hooked up.

2 *Before plugging in the AC power, you must check for proper ground connection. The ground connection is an important safety feature designed to keep the chassis of electronic devices at ground potential.* Unfortunately, the presence of a third ground pin does not always indicate a properly grounded outlet; check this with an AC line tester. If the outlet is not grounded, consult with a licensed electrician.

3 Plug the power cord's female end into the V-Eight's **Mains ~ 100-240 V** connector, and the male (plug) end into any AC power source from 100...240 V, 50 or 60 Hz.

Note: Studer cannot be responsible for problems caused by using the V-Eight or any associated equipment with improper AC wiring.

1.2.4 Line conditioners and protectors

Although the V-Eight tolerates typical voltage variations, the AC line voltage may contain spikes or transients that can possibly stress your gear and, over time, cause a failure. There are three main ways to protect against this, listed in ascending order of cost and complexity:

Line spike/surge protectors Relatively inexpensive; these help protect against strong surges and spikes (they usually need to be replaced after enduring an extremely strong spike).

Line filters These generally combine spike/surge protection with filters that remove some line noise (dimmer hash, transients from other appliances, etc.).

UPS An uninterruptible power supply is the best option; it provides power even if the AC power line fails completely. Intended for computer applications, a UPS allows an orderly shutdown in the event of a power outage. Furthermore, the isolation it provides from the power line minimizes all forms of interference – spikes, noise, etc.

1.2.5 About audio cables

The connections between the V-Eight and your studio are your music's lifeline. Use only high quality, low-capacitance, shielded cables with a stranded (not solid) internal conductor and low-resistance shield. Although quality cables cost more, they can make a difference.

When routing cables:

- Do not bundle audio cables with AC power cords.
- Avoid running audio cables near sources of electromagnetic interference such as transformers, monitors, computers, etc.
- Do not place cables where they can be stepped on. Stepping on a cable may not cause immediate damage, but it can compress the insulation between the center conductor and shield (degrading performance) or reduce the cable's reliability.
- Avoid twisting the cable or making sharp, right-angle turns.
- Never unplug a cable by pulling on the wire itself. Always unplug by firmly grasping the plug's body, and pulling directly outward.

1.2.6 Basic audio hookup

When connecting audio cables and/or turning power on and off, turn off all devices in your system and turn down your monitor system's volume controls.

The V-Eight provides ten pairs of XLR connectors (eight pairs for audio in/out, one pair for the auxiliary analog channel, and one pair for SMPTE time code). The nine sets connect to your mixer's tape or line inputs. An additional multipin ELCO connector, wired in parallel with the 8 XLR audio pairs, can connect to a "snake" that goes to your mixer. Several manufacturers make ADAT/V-Eight-specific cables that break out the ELCO connector into individual INs and OUTs.

1.2.7 Use the right tape

Use only premium quality, name brand S-VHS cassettes (such as Quantegy 489 DM Digital Mastering Audio Tape, Maxell XR-S Black, JVC XZ, Sony DASV, BASF Digital Master 938, Apogee AA-40, HHB ADAT45, or TDK SP Super Pro). The cassette shell, hubs, rollers and tape guides in S-VHS cassettes are precision devices that properly handle and protect the tape within them.

Caution: Do not use standard VHS cassettes. While they may appear to function properly at first, their less-than-premium formulation will decrease the reliability of your recording. They may also shed oxide and leave behind a coating of dirt that will interfere with future recordings, even if you switch back to premium quality tape. Defective tape may even clog the head, requiring service. Trust your work only to premium quality S-VHS tape.

1.2.8 Preparing the tape prior to use

Fast-forward and rewind new tapes at least once from end to end before attempting to record on or to format them. This important step "unpacks" the tape properly, and leads to a far more reliable operation (this is also recommended practice for DAT tapes).

1.2.9 Eject the tape properly

After a session, eject the tape and put it in a protective case.

Do not:

- Leave the tape in the V-Eight when power is off;
- Leave the tape halfway ejected in the well. Always remove completely after ejection;
- Eject in the middle of recorded material. Malfunctions that could possibly damage the tape are statistically most likely to occur when inserting or ejecting a tape, so always eject where nothing is recorded.

1.2.10 Backup

Accidents can happen – so, like computer floppy disks and hard disks, backup your V-Eight tapes to another V-Eight or ADAT using the fiber optic digital connector (refer to section 15.2 for step-by-step instructions on backing up V-Eight tapes).

1.2.11 Operating environment

Mount the V-Eight in an equipment rack (requires 4 rack spaces), or place it on a table or shelf. Studer advises against tilting the recorder; keep it in horizontal position. Also remember that heat shortens the life of electronic equipment.

Please observe the following:

- The V-Eight is designed to perform properly over a range of ambient temperatures from +10°...+40° C (50°...104° F), in up to 80 % non-condensing humidity. These are not absolute limits, but Studer cannot guarantee that the V-Eight will meet its published specs or remain reliable if operated outside of these ranges.
- Always allow adequate ventilation behind the V-Eight. Do not seal any enclosure that holds the V-Eight.
- It is not necessary to leave an empty rack space above or below the V-Eight.
- You will need to remove the screw-on feet from the bottom of the V-Eight if any equipment will be mounted directly below it.

1.2.12 Avoid electromagnetic interference

Like all tape machines, the V-Eight uses magnetic tape that can be sensitive to electromagnetic interference. Generally this is not a problem, but avoid mounting the V-Eight next to devices that generate strong magnetic fields such as power amplifiers, monitors and video display devices, loudspeakers, etc., and always treat your tapes with care. In particular, avoid excess heat or cold, dust, and humidity.

1.3 Options and accessories

Item	Order no.
AES/EBU interface option	20.864.170.00
Rack rail system	20.864.890.00
Cockpit remote control (incl. remote cable 15 m: 20.864.526.00)	20.864.530.00
Remote Level Display (RLD; incl. rack mount kit: 1.864.550.04/ ...550.05)	20.864.550.00
Remote stand (stand, mounting screws, Allen key)	20.328.193.00
RLD stand-alone side panels (side panels, Allen key)	20.864.550.03
RLD + Cockpit side panels (side panels, "RLD to Cockpit" cable 20 cm: 1.864.530.00, Allen key)	20.864.550.11
Cockpit cable, 15 m (parallel + RJ 45 to 9-pin)	1.864.526.00
RLD cable, 15 m (RJ 45 to RJ 45)	18.755.162.44
RLD to Cockpit cable, 15 m (9-pin male to 9-pin female)	1.864.522.00
RLD to Cockpit cable, 20 cm (9-pin male to 9-pin female)	1.864.530.00
ADAT sync cable, 3 m (9-pin to 9-pin)	1.864.521.00
ADAT sync cable, 30 cm (9-pin to 9-pin)	1.864.520.00
ADAT optical interface cable, 1 m (TosLink to TosLink)	10.325.010.00
ADAT optical interface cable, 5 m (TosLink to TosLink)	10.325.011.00

1.4 Technical specifications (subject to change as technological progress may warrant)

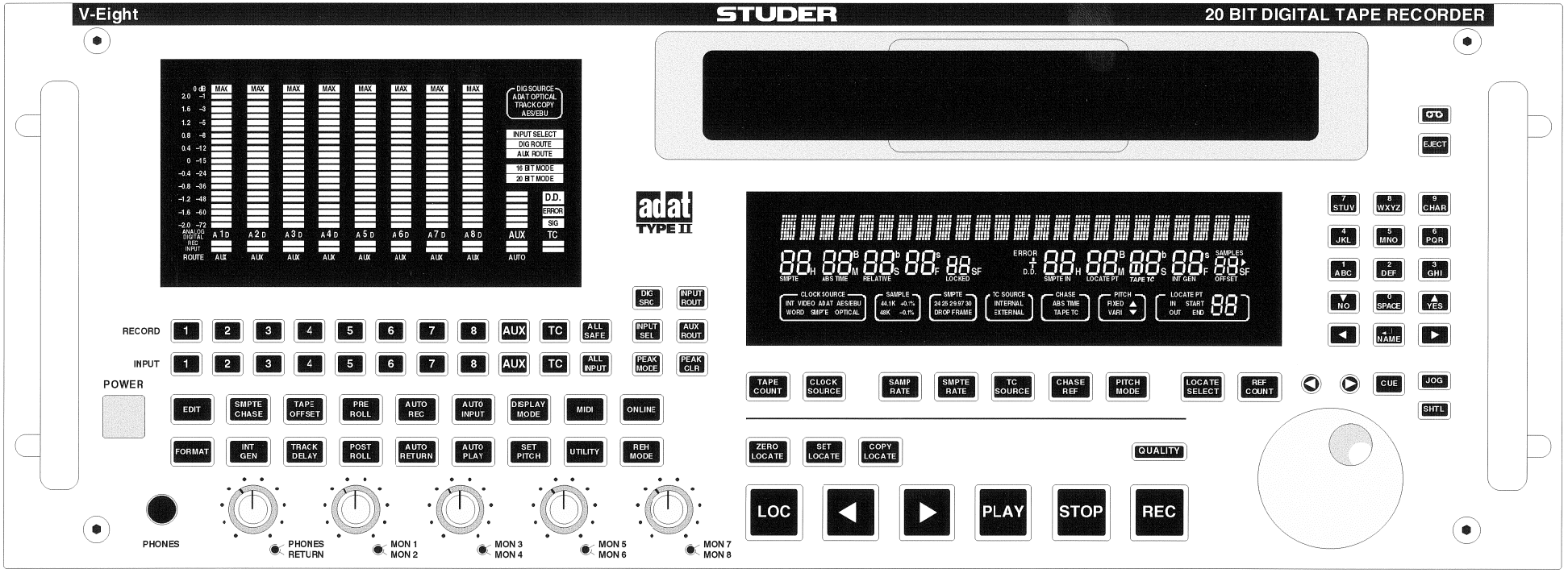
(Measurement conditions: A/D...D/A, 20 Hz...20 kHz, f_s = 48 kHz)

Recording format:		ADAT Type II
Number of tracks:		Digital audio: 8; analog AUX track: 1; SMPTE TC: 1
Sampling rate:		48/44.1 kHz
Varispeed:		+5.94 %/–15.91 % @ 48 kHz
Wind time:		approx. 35 s for a 42 min tape
Quantization/word length:		linear, 16/20 bit selectable
Frequency response:		20 Hz...20 kHz, ±0.3 dB
THD+N:	A/D:	< –92 dB_{FS} (@ –1 dB_{FS}/1 kHz); < –100 dB_{FS} (@ –30 dB_{FS}/20 Hz...20 kHz)
	D/A:	< –92 dB_{FS} (@ –1 dB_{FS}/1 kHz); < –100 dB_{FS} (@ –30 dB_{FS}/20 Hz...20 kHz)
Dynamic range:	A/D:	> 100 dB
	D/A:	> 100 dB
Crosstalk attenuation:		> 100 dB (@ 1 kHz, between any channels)
TC generator:		SMPTE standard, 24; 25; 29.97 D; 29.97 ND; 30 D; 30 ND frames/s
Analog inputs:	Audio tracks:	Transformer-balanced/floating, impedance > 10 kΩ, Input level: adjustable, +6...+26 dBu, XLR3f
	Aux tracks:	Electronically balanced, impedance > 10 kΩ
	Monitor return:	Electronically balanced, XLR3f
Analog outputs:	Audio tracks:	Electronically balanced, impedance < 50 Ω, Output level: adjustable, +6 dBu...+26 dBu, XLR3m
	Monitor, Send:	Electronically balanced, XLR3m
	Phones:	6.3 mm TRS socket
Digital inputs:	ADAT:	Optical fibre link
	AES/EBU:	Transformer-balanced/floating, XLR3f, 4 × 2 channels (optional)
Digital outputs:	ADAT:	Optical fibre link
	AES/EBU:	Transformer-balanced/floating, XLR3m, 4 × 2 channels (optional)
Clock inputs:	Word clock:	TTL level, BNC
	ADAT sync:	9-pin D-type, f
	Video sync:	In/out with loop-through, BNC, 75 Ω termination switchable
	AES/EBU:	With optional AES/EBU interface only; any AES/EBU input channel can be selected as clock source.
Clock outputs:	Word clock:	TTL level, BNC
	ADAT sync:	9-pin D-type, f
TC in/out:		(SMPTE standard), XLR3f (in); XLR3m (out)
Control ports:	Punch in/out:	6.3 mm TRS socket
	LRC remote:	6.3 mm TRS socket (LRC not manufactured by Studer)
	MIDI:	In/out machine control
	Meter out:	For RLD Remote Level Display, RJ 45
	RS-422:	Sony 9-pin compatible
	Parallel Remote:	Parallel remote control for ◀, ▶, STOP, PLAY, REC, LOC, ZERO LOCATE, and CHASE functions
	ADAT sync:	In/out, 9-pin D-type, f
Power supply:		100...240 V_{AC}, 50...60 Hz
Power consumption:		< 100 W
Operating temperature:		+5...+40° C
Humidity:		Class F
Dimensions:	Rack mounting:	442 × 176 mm (w × h) (4U)
	Over all:	483 × 185 × 393 mm (w × h × d)

STUDER V-Eight Digital 8-Channel Recorder

2 CONTROL AND CONNECTOR BASICS

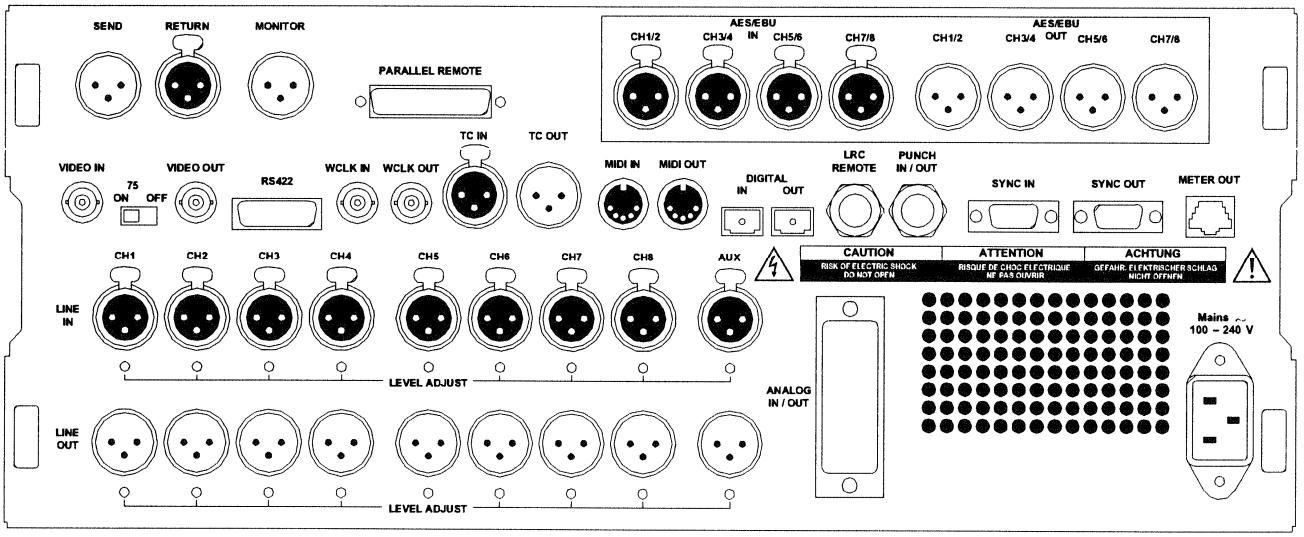
2.1 Front panel



The front panel includes:

- S-VHS cassette door and **EJECT** key
- Main vacuum fluorescent display (toward the center) with two sets of 10-character seven-segment readouts. The left readout shows the current tape location. The right readout shows information such as incoming SMPTE time, locate address, current offset, etc. A 24-character alpha-numeric display above the seven-segment displays shows edit locate points, Pre-/Post-roll times, pitch value, and various messages.
- Nine function keys (below the main display)
- Five transport keys
- Three locate-related keys
- **QUALITY** indication light
- **REH MODE** rehearse key
- **JOG/SHTL** wheel and **CUE** key
- 15-key numeric keypad for data entry
- 17 editing keys
- Secondary vacuum fluorescent display with level meters for the eight audio channels and the auxiliary track, the time code track signal, overload ("MAX") indicators, track "INPUT" and "REC" indicators, and input selection and routing indicators.
- 22 track enable and track record keys
- Six routing, source selection, and metering keys
- **ONLINE** key
- Four dual-concentric potentiometers **MON 1...8** for mixer gain control of each of the eight channels
- Dual-concentric potentiometer **PHONES/RETURN** for phones level and return gain control
- 6.3-mm (TRS) **PHONES** socket
- Recessed **POWER** pushbutton.

2.2 Rear panel



PUNCH IN/OUT

This 6.3 mm jack socket allows footswitch-controlled punch-in and punch-out. Use a momentary footswitch, either normally-open or normally-closed; the V-Eight senses the type on power-up and calibrates itself.

LRC REMOTE

This 6.3 mm jack socket accepts a momentary footswitch (normally-closed or normally-open) to allow foot-controlled locate functions. It also accepts the LRC remote control manufactured by Alesis (refer to section 14) for remote access of transport functions.

Note: If using a normally-open footswitch, the footswitch and LRC remote control can be interchanged or even used simultaneously using a Y-cord, without restarting the V-Eight (i.e., powering down and up again). However, if using a normally-closed footswitch, the V-Eight unit should be restarted after switching from footswitch to remote control, and vice-versa.

LINE IN / LINE OUT

18 XLR connectors carry the +4 dBu balanced analog inputs and outputs. There are 9 input and output channels (**CH1...8** plus **AUX**). The channel 1...8 inputs and outputs are also accessible through a multi-pin ELCO connector (**ANALOG IN/OUT**), which is wired in parallel with the XLR inputs and outputs. All XLR connectors are wired with pin 2 "hot", in accordance with IEC standards.
The trimmer potentiometers below each of the audio input and output connectors allows alignment of the corresponding channel in a range of +6 dBu to +26 dBu. These potentiometers are factory-aligned and should not be readjusted unless specifically required (refer to section 15.8).

TC IN / TC OUT

The time code input and output use balanced XLR connectors for use with standard SMPTE/EBU time code systems. Time code input allows the V-Eight to be slaved to an external device; time code output provides timing reference to an external device.

WCLK IN / WCLK OUT

These are BNC connector, TTL-level word clock inputs and outputs. A master word clock signal, which the V-Eight can provide, allows synchronizing the audio data stream for all digital audio devices in a system. If a master word clock signal already exists, the V-Eight can sync to it.

DIGITAL IN / DIGITAL OUT

The optical input and output are TOSlink industry-standard digital audio interfaces carrying 8 digital audio channels with up to 24 bits of resolution on a single fiber-optic cable. The standard cable is a 1 mm dia. plastic fiber with TOSlink connectors. Cables of two different lengths are available from your Studer distributor (1 m: order no. 10.325.010.00; 5 m: 10.325.011.00). Applications include digitally dubbing from one deck to another, interfacing with hard disk recording systems and synthesizers, and feeding translators that change the ADAT optical format to other formats.

VIDEO IN / VIDEO OUT

The BNC connector video input (with 75 Ω termination switch) accepts composite video as well as black burst video inputs.

SYNC IN / SYNC OUT

These 9-pin female D-type connectors synchronize multiple ADATs together to single-sample accuracy. Computer interface cards with ADAT sync, such as the ADAT PC-R, allow transferring ADAT data to and from a computer for editing with single-sample accuracy. Interface cards without ADAT sync allow transferring ADAT data with 1/4 frame accuracy via MIDI time code.

MIDI IN / MIDI OUT

These 5-pin female DIN connectors can output and/or receive MIDI Machine Control commands, save and load SYSEX dumps defining the V-Eight status, and allow for software updates via MIDI SYSEX files, and output MTC (MIDI time code) when selected.

RS422

This 9-pin female D-type connector connects to a video editor or other controller supporting the Sony 9-pin protocol. This feature will not be operational until the V-Eight V2.0 software release is available.

METER OUT

This RJ-45 connector connects to an optional remote controller like the Studer Cockpit Remote and/or an optional RLD (remote level display). This connector carries only control signals but no power supply.

MONITOR / SEND / RETURN

The standard balanced XLR connectors provide the following line in and line out signals:

MONITOR: This signal contains the eight tracks provided by the mixer only.

SEND: This signal contains the eight tracks provided by the mixer plus the return signal.

RETURN: This connector accepts a balanced line signal from an other V-Eight mixer output or a signal from an external source.

Mains ~ 100-240 V

The IEC320/C14, grounded appliance inlet accepts AC voltages from 100...240 V, eliminating the need for a voltage selector.

PARALLEL REMOTE

This 25-pin D-type connector can receive transport commands for Locate, Rewind, Fast Forward, Zero Locate, Stop, Play,Chase, Record. In addition to the commands you will find open collector contacts for confirmation of commands (max. 50 mA) as well as a supply voltage used for supplying the Cockpit remote control and the RLD remote level display.

Pin assignment:

Pin	Function	Pin	Function
1	GND	14	Acknowledgement REWIND
2	N.C.	15	Acknowledgement PLAY
3	Acknowledgement FAST FWD	16	Acknowledgement STOP
4	GND	17	GND
5	Command ZERO LOCATE	18	Command LOCATE
6	Command CHASE	19	Command RECORD
7	Acknowledgement CHASE	20	Command REWIND
8	Acknowledgement LOCATE	21	Command FAST FWD
9	Acknowledgement RECORD	22	Command PLAY
10	Acknowledgement ZERO LOCATE	23	Command STOP
11	N.C.	24	+22 V supply
12	N.C.	25	+22 V supply
13	N.C.		

3 EDITING THE OPERATING PARAMETERS

3.1 The keypad

The keypad block contains keys for editing the various parameters that control the V-Eight's features.

3.1.1 0...9

Use the ten numeric keys to enter number parameter values and letters for names. When editing a parameter value, pressing a key enters its associated number. When editing a name, pressing a key cycles through the letters indicated on the key (e.g., pressing 7 repeatedly cycles through 7, s, t, u, v, 7, s, t, etc.).

3.1.2 ▲/YES

- Increments parameter values, as well as scrolls up through a list of parameter values. Holding this key for 2 or more seconds increases the speed at which the values increment. After 7 seconds, this speed increases again.
- Enters "Yes" in response to yes/no queries
- In a sign (polarity) field, selects the positive (+) sign
- In a name field, changes lower case letters to UPPER CASE

3.1.3 ▼/NO

- Decrements parameter values, as well as scrolls down through a list of parameter values. Holding this key for 2 or more seconds increases the speed at which the values decrement. After 7 seconds, this speed increases again.
- Enters "No" in response to yes/no queries
- In a sign (polarity) field, selects the negative (–) sign
- In a name field, changes UPPER CASE letters to lower case

3.1.4 ◀ Cursor

When editing, this key positions the cursor (a single underline character) under the next field to the left. It will, however, not move across page boundaries.

3.1.5 ▶ Cursor

When editing, this key positions the cursor (a single underline character) under the next field to the right. It will, however, not move across page boundaries.

3.1.6 ↵/NAME

This key has two main uses:

- Speed up numeric entry by eliminating the need for "leading zeroes". For example, the varispeed setting is a 3-digit value. Instead of having to key in something like 0 - 0 - 9, you can simply press **9** followed by **↵/NAME**.
- Edit locate point names. When the locate time is the currently selected field, pressing the **↵/NAME** key positions the cursor at the first character of the name. The ◀ and ▶ cursor keys now select individual characters within the name field or other displayed fields; use the keypad keys to change the character. For upper case, use **▲/YES**. For lower case, use **▼/NO**.
  To exit the name field, press **↵/NAME** again.

Using the default name list instead of entering characters individually: Holding **↵/NAME** while using the **▲/YES** or **▼/NO** keys scrolls through a default set of 16 generic names (e.g., Verse 1, Chorus, Bridge, etc.). This list may be customized for your working style.

To customize the default set of names:

1 Select the default name to be changed
2 Edit it
3 To store the new name in the default name list, hold the **↵/NAME** key and press the **REC** key.

3.1.7 Selecting pages

Most keys have at least one associated page, which contains one or more parameters. If there are multiple pages, the main display's left side shows the current page number; repeatedly pressing the associated key cycles through the pages.

Shortcut: To access a particular page directly, hold the associated key and use the keypad to enter the desired single-digit page number.

Functions with double-digit page numbers (e.g., the Utility function) have a different access procedure. Hold the current function key and press the two digits within 3 seconds of each other. To select a single digit page number (1...9), press and hold the current function key and either:

- Enter 0, then the digit; or
- Press the single digit, then the **↵/NAME** key. If the **↵/NAME** key is not pressed within 3 seconds, the display reverts to its previous state.

3.1.8 Selecting page parameters

To select the desired parameter for editing in multi-parameter pages, position the cursor with the ◀ or ▶ cursor keys under the parameter value's rightmost digit.

3.1.9 Entering parameter values

Entering complete values: Use the numeric keypad and enter the most significant digit first. Enter all of a field's digits to complete the entry. The cursor automatically advances through the fileds.

In-/decrement a value by one: Use the **▲/YES** and **▼/NO** keys. Holding the **▲/YES** or **▼/NO** key for more than 2 seconds increments (or decrements) the value continuously. The value above the cursor will be changed. If the value goes beyond a boundary (e.g. increasing from 59 s to 00 s), the next field will be computed automatically; in this example, the minute field will be increased by one.

3.2 The EDIT key

The **EDIT** key toggles the V-Eight in and out of Edit Mode. Enabling **EDIT** mode (key illuminated) allows editing parameter values for the functions grouped with the **EDIT** key: **TRACK DELAY**, **TAPE OFFSET**, **SMPTE CHASE**, **INT GEN**, **FORMAT**, **PRE ROLL**, **POST ROLL**, **AUTO RETURN**, and **AUTO REC**. While EDIT is on, only the currently selected function's key is illuminated. However, the V-Eight retains the current on/off status of all keys, and these become visible again after exiting edit mode.

Note: Don't be confused! Editing a function does not turn it on. For example, while editing the Post-roll value, the **POST ROLL** switch will be illuminated, but if the light goes out when you leave **EDIT** mode, the Post-roll function is not yet active.

If the **EDIT** key is not illuminated, pressing the various keys toggles these functions on and off.

Example: If you've used the **EDIT** key to edit the amount of tape offset and the **EDIT** key is dark, turning on the **TAPE OFFSET** key enables the programmed amount of offset.

Pressing the **DISPLAY MODE**, **SET PITCH**, or **UTILITY** key will also exit **EDIT** mode and enter the Display, Pitch, or Utility pages, respectively.

3.3 Editing conventions

- The rightmost 7-segment display shows locate times in hours, minutes, seconds, frames, subframes and samples. *Subframes* equal 1/100th of a frame and range from 0...99. The number of *samples* per subframe depends on the tape counter and sample rate settings. If the tape counter is in ABS time mode, there are always 15 samples per subframe at 48 kHz, and 14 per subframe at 44.1 kHz. If the counter is in SMPTE time code mode and the sample rate is 48 kHz, the *sample steps* range from 0...5 for 30 frames/s, 0...15 or 16 for 29.97 frames/s, 0...18 for 25 frames/s, and 0...19 for 24 frames/s.
- An illuminated arrow above the subframe ("SF") indicator indicates that there is a non-zero sample value. To access the samples field, press the ▶ cursor key while the subframe field is selected. This selects a second page that shows only the sample value.
- When editing any tape address, the cursor steps in fields (hours, minutes, seconds, frames, subframes, and samples) instead of stepping every digit.
- When editing any tape address, entering digits with the keypad automatically advances the cursor or selected field (using the **▲/YES** or **▼/NO** keys does not advance the field)
- When editing a field in the 7-segment display, the digit(s) of the field being selected (and ready to be edited) will flash.

4 TAPE FORMATTING

Formatting is essential for the ADAT system. It creates a sample-accurate time reference (i.e., it is accurate to 1/48,000th of a second when recording at 48 kHz) on each tape, in addition to block ID codes, linear control track, and other essential markers. This provides tight synchronization – far better than SMPTE sync – between ADAT-compatible devices, as well as precision tape counter readings, and intelligent autolocate functions.

The format process first records 15 seconds of leader (the display shows "LEAd"), followed by two minutes of data (the display shows "dAtA"), then ABS time code (starting at 00:00:00.00 and continuing to the end of the tape).

Caution: Formatting a tape erases all material on all tracks. Always check that the tape is either blank or contains unwanted material before formatting.

You can either:

- Format a tape completely before recording (recommended);
- Format while you are recording, for as long as needed;
- Extend the format of an incompletely formatted tape.

Before formatting a blank tape, you must select:

- The sample rate (44.1 or 48 kHz);
- The word length (20-bit for Type II tapes, or 16-bit for compatibility with Type I ADAT and ADAT-XT tapes).

Quality indicator: While formatting, the QUALITY indicator may be flashing or even be continuously on, because no recording exists on the tape. It will be working correctly only when playing back a formatted tape.

4.1 Sample rate selection

Select between 44.1 kHz (CD/consumer standard) or 48 kHz (DAT/professional standard). Here are some general hints:

- If mixing the tape through a digital mixer for a CD master, use 44.1 kHz to avoid sample rate conversion.
- If mixing the tape through an analog mixer, use 48 kHz for slightly better high-frequency response.
- If you plan to transfer V-Eight tracks over to a hard disk system for editing, note that audio recorded at 48 kHz requires about 10% more storage capacity than the equivalent audio recorded at 44.1 kHz.

The following sample rate selection procedure assumes that CLOCK SOURCE is set to "INT" (internal).

Operation	You press...	You see...
Select sample rate	**SAMP RATE** key	"SAMPLE" indicator toggles between "44.1k" or "48k" (default) with each **SAMP RATE** key press

Changing sample rates: The sample rate selected during the format process does not have to be used during playback or recording of that particular tape; the ADAT format always allows you to override the default sample rate from the tape. When loading a formatted tape, the sample rate will automatically switch to the tape's original settings. You may change the sample rate setting to playback or record with a different sample rate, but the sample rate indicator will flash to indicate that it is not at the original setting. Changing the sample rate directly affects the pitch and speed of any audio recorded. When extending a format, the sample rate will automatically assume the existing format's values. There is no way to format a tape with a "44.1" marker on one section and a "48" marker on another.

4.2 Word length selection

Select 20 bits unless you want compatibility with older (Type-I format) ADAT tapes.

Operation	You press...	You see...
Initiate word length selection	**EDIT** key, then **FORMAT** key	Display says "Format Data Type" and 16 or 20 bits
Select word length	**▲/YES** or **▼/NO** cursor key so that the display shows...	The desired word length (16 or 20)

4.3 Format a new tape

Use only S-VHS blank tapes formulated specifically for Super-VHS video or digital audio applications. *Never use standard VHS tapes.*

"Exercise" the tape: Before formatting, fast-forward the tape to the end and rewind it, to even out the tape pack and sweep any contaminants off the tape.

Operation	You press...	You see...
Insert blank tape	the Tape gently into tape chamber; the machine will "grab" the tape	Display shows "noFO", **FORMAT** key flashes
Enable formatting	**FORMAT** key (with **EDIT** key off)	All track **RECORD** enable keys and the "REC" indicators turn on
Initiate formatting	Hold **REC** then press **PLAY**	Display message advises you of formatting progress

What happens between initiating formatting and the actual process of formatting depends on the current tape status.

Tape status	The V-Eight...
Unformatted, at start of tape	Begins formatting immediately
Unformatted, partway through tape	Rewinds, then begins formatting
While rewinding from current position, goes from unformatted to previously formatted portion	Disables formatting to avoid re-formatting a partially formatted tape. Either extend the format from this point on, or for a complete format, rewind, then initiate formatting
Formatted, in Leader or Data section of tape	Rewinds, then begins formatting
Formatted, in Audio section of tape	Extends format after entering record (refer to section 4.5 for information on extending a format)

4.4 Record tracks while formatting

The procedure is similar to standard formatting, except:

- Record-enable (section 5.4) any tracks to be recorded by pressing the ~~appropriate track~~ **RECORD** enable keys prior to pressing the **FORMAT** key.
- No audio will be recorded before the counter shows 00:00:00.00 ABS time.

4.5 Extend a partially formatted tape

The procedure is similar to standard formatting, except:

- Make sure the tape is located *at least 20 seconds before the end of a previously formatted section* before attempting to extend the format.
- Regardless of the current sample rate and word length, these will change automatically to match the original format.
- After pressing the **FORMAT** key, hold the **PLAY**, then press **REC**. Formatting will start when a lock is established.

Note: The above assumes the tape is somewhere after time 00:00:00.00. If the tape to be extended is in the leader or data sections (i.e., prior to ABS time 0:00:00.00), entering Format mode automatically rewinds the tape to the beginning and starts reformatting. While rewinding, the display shows "FO" ("format over") and the ◀ rewind key will flash to remind you that the V-Eight must format over from the tape's beginning.

4.6 Stop formatting

When the tape reaches the end, formatting stops automatically and the tape will then go into stop.

To stop formatting prior to the end of the tape, press **STOP**. You *cannot* simply punch-out by pressing **PLAY**.

4.7 Certify tape

After formatting, consider playing the tape through to the end to check for a suitably low error count (refer to section 13.20), *thus verifying the tape's integrity.*

4.8 Reformatting

Caution! Do not stop in the middle of re-formatting over a previously formatted tape. When the tape transitions from the newly-formatted section to the previously-formatted section, there will be timing discontinuities, and you will not be able to record anything over the transition. Either re-format the entire tape from beginning to end, or rewind a bit and extend the existing format.

4.9 Lock out formatting (safe mode)

You may lock out the format option to prevent accidental formatting. This remains in effect, even if you insert different tapes, until the setting is changed. To lock out formatting:

Operation	You press...	You see...
Select safe function	**EDIT** key, then **FORMAT** key until display shows page 2 (Format Safe)	Display indicates: "Format Safe: On" or "Format Safe: Off", depending on the current status
Select format safe status	**▲/YES** or **▼/NO** cursor key to select On or Off respectively	Selected format safe status

4.10 Bulk erasing

You can bulk-erase V-Eight tapes with a video tape eraser. Of course, they must be re-formatted afterwards.

4.11 Recording a "benchmark" tape

Studer recommends that you format and record a new tape with any signal, such as a test tone, in one single pass with no overdubs during the first week of operation; check the error rate of this tape (refer to section 13.20) and note the error information on the cassette shell. Store the tape in a safe, dry location and don't use it for any other purpose. Such a "benchmark" tape is useful to determine if the error correction rate is increasing over time because the heads need to be cleaned, or if a tape is defective.

5 TRACK RECORD ENABLING AND MONITORING

5.1 Track basics

The V-Eight can record a total of 10 tracks:

- *Eight digital audio tracks.* These record standard audio signals, either from the analog inputs, from optional AES/EBU inputs, or from the ADAT optical Interface.
- *One analog AUX track.* This track records audio information from the AUX input, along with any of the eight audio tracks routed to the AUX track. This provides quality scrubbing (which is difficult to do solely in the digital domain) and the ability to hear audio from the AUX output during rewind, fast forward, and autolocate operations. During cue operation the AUX track can be routed to any of the 8 standard audio track outputs (refer to 6.5).
- *One time code track.* This track records only time code information, and stores this data digitally on tape. It receives its input from the **TC IN** connector if "TC SOURCE" is set to EXTERNAL (section 11.3), or from the internal time code generator if "TC SOURCE" is set to "INTERNAL".

SMPTE vs. ABS time code: The ADAT ABS time reference is separate from this SMPTE time code track, and is written in a subcode of the tape automatically as part of the format operation covered in section 4.

To record, a track must first be record-enabled (refer to section 5.4; the track **RECORD** enable key and the "REC" indicator will flash).
You typically press the **PLAY** and **REC** transport keys to allow track-enabled tracks to begin recording, although you can also use a foot-switch (section 8.6.5) and/or program automatic punch-in points (sections 8.8.1 and 8.8.3). During recording, the corresponding track **RECORD** enable keys and the "REC" indicators are illuminated continuously.

5.2 Track INPUT enable

An input-enabled track monitors the associated input signal. There is one illuminated track **INPUT** enable key for each track (10 total). The track **INPUT** enable key toggles between monitoring the input signal or monitoring the tape.

Operation	You press...	You see...
Enable track input (monitors input signal)	The track **INPUT** enable key	Track **INPUT** enable key is illuminated
Disable track input (monitors tape signal)	The track **INPUT** enable key	Track **INPUT** enable key is dark

5.3 AUTO INPUT key

This key determines whether or not a record-enabled track (audio or AUX) will monitor from input or tape automatically, depending on the recording context. Disabling Auto Input is preferred for recording basic tracks, while Auto Input is usually enabled during overdubbing and punching.

What the tracks monitor if...	Auto Input is Off	Auto Input is On
Record-enabled tracks monitor the...	Input signal	Input while recording or stopped, tape while playing
Non-record-enabled tracks monitor the...	Tape	Tape while playing or recording, input signal when stopped

5.4 Track RECORD enable

Pressing a track's **RECORD** enable key allows it to record when the V-Eight is in Record mode.

Any number of channels can punch-in or punch-out simultaneously, and any channel or channels can punch-in or punch-out while other channels are in record.

Operation	You press...	You see...
Record enable a track	The track **RECORD** enable key	The track **RECORD** enable key and the "REC" indicator flashes, then is illuminated continuously while recording
Turn off record enable for a track	The track **RECORD** enable key	The track **RECORD** enable key and the "REC" indicator is dark
Punch-in using track **RECORD** enable key	While in record mode and the tape is running, press track **RECORD** enable key	**RECORD** enable key is illuminated continuously
Punch-out using track **RECORD** enable key	While recording, press track **RECORD** enable key	**RECORD** enable key is dark

If you press **PLAY** and **REC** with no tracks record-enabled, the **REC** key will flash, indicating "record pending" mode. When the **REC** key is illuminated (or flashing in **REH MODE**; refer to section 8.7), pressing individual track **RECORD** enable keys can punch individual tracks in or out independently. The **REC** key will remain illuminated (or flashing in **REH MODE**) until you punch-out of record, usually by pressing **PLAY** or any other transport key.

5.5 Safety mode (ALL SAFE)

To prevent any accidental recording, pressing **ALL SAFE** places all tracks (channels 1...8 plus AUX and TC) into a safe (non-record-ready) mode. This is particularly useful when mixing.

Operation	You press...	You see...
Place all tracks into a safe (non-recordable) mode	**ALL SAFE**	All track **RECORD** enable keys and auto-enabled track **INPUT** enable keys turn off
Exit safe mode	**ALL SAFE**	All track **RECORD** enable keys, and auto-enabled track **INPUT** enable keys return to their status prior to pressing **ALL SAFE**

5.6 Monitor inputs (ALL INPUT)

Pressing **ALL INPUT** sets all tracks except the TC track to monitor the input signal, regardless of the record-ready/auto-input status (section 5.3). Tape playback cannot be heard while All Input is on. While enabled, the track **INPUT** enable keys will have no effect. This is useful for live recording situations.

Operation	You press...	You see...
Have all tracks (except TC) monitor the input signal	**ALL INPUT**	All track "INPUT" enable indicators (except TC) are illuminated continuously
Exit All Input mode	**ALL INPUT**	All track "INPUT" enable indicators return to their status prior to pressing **ALL INPUT**

This function can also be used while **ALL SAFE** is on.

6 DIGITAL/ANALOG TRACK SELECTION AND ROUTING

6.1 Digital source

When using digital inputs, this function selects one of two or three digital input options. The "AES/EBU" option will appear in the display only if an AES/EBU card (such as the optional Studer EC-1 AES/EBU interface) is installed in the machine. Settings are retained in memory.

Operation	You press...	You see...
Select "DIG SOURCE": "ADAT OPTICAL" (default)	The **DIG SRC** key until you see...	"ADAT OPTICAL" in the "DIG SOURCE" block
Select "DIG SOURCE": "TRACK COPY"	The **DIG SRC** key until you see...	"TRACK COPY" in the "DIG SOURCE" block
Select "DIG SOURCE": "AES/EBU" as the digital input	The **DIG SRC** key until you see...	"AES/EBU" in the "DIG SOURCE" block

For more information on Track Copy, refer to section 6.4.2.

6.2 Input select

Note: If the Digital Source has been set to "TRACK COPY", you cannot enter Input Select mode. In track copy mode, only internal tape tracks may be recorded.

Inputs can come from digital or analog signal sources. Use **INPUT SEL** to select digital or analog inputs as the signal source for each adjacent track pair (1/2, 3/4, 5/6, 7/8). In addition, all tracks may be set to receive analog or digital.

If no track keys are pressed within 10 seconds of entering Input Select mode, the V-Eight automatically exits.

Operation	You press...	You see...
Enter Input Select mode	The **INPUT SEL** key	"INPUT" indicator flashes
Select analog or digital input source	Either track **INPUT** enable key of a stereo pair to toggle between analog or digital source for the track pair	"A/D" indicators at the base of the level meter bargraphs indicate analog or digital input, respectively
Select all channels for digital input	The **ALL INPUT** key	"A/D" indicators all show "D"
Select all channels for analog input (default)	The **ALL SAFE** key	"A/D" indicators all show "A"
Exit Input Select mode	The **INPUT SEL** key	**INPUT SEL** key is dark to confirm the exit

If no digital input signal is detected, the "D" indicators for the channel(s) without a digital signal will flash until a valid signal is present.

6.3 Track output selection

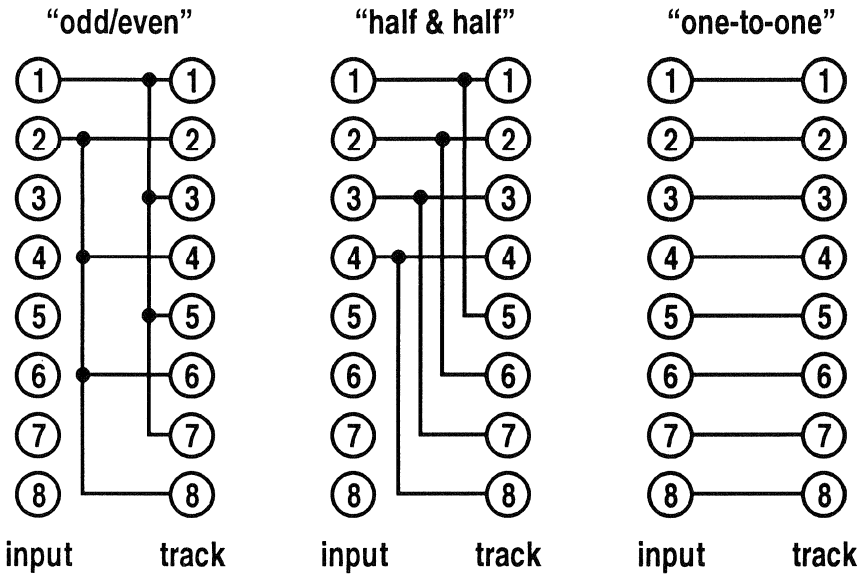
It is not necessary to select an output destination. Audio data always appear simultaneously at the analog, ADAT optical, and optional AES/EBU outputs, at the same-numbered output they were recorded on.

6.4 Input signal routing (analog and digital)

The **INPUT ROUT** key selects how the V-Eight's analog and digital inputs are routed to the 8 tape channels. If no track **INPUT** enable keys are pressed within 10 seconds after entering Input Route Mode, the V-Eight automatically exits.

Operation	You press...	You see...
Enter Analog Routing page (available only if at least one track pair's input has been set to "A" using Input Select mode)	The **INPUT ROUT** key	Every track's "A" indicator is illuminated, display indicates: "Select Analog Input Trk"
Select Analog Routing	**INPUT** enable keys 1 or 2 to select Odd/Even; 3 or 4 to select Half & Half; 5, 6, 7, or 8 to select One-to-One (default; see diagram below)	Odd/Even lights tracks 1 & 2, Half & Half lights tracks 1...4, One-to-One lights tracks 1...8
Enter Digital Routing page (available only if at least one track pair's input has been set to "D" using Input Select mode)	The **INPUT ROUT** key again (or press twice if not already in Input Route mode)	Every track's "D" indicator is illuminated, display indicates: "Select Dig Source Tracks"
Select Digital Routing	Refer to section 6.4.2	Refer to section 6.4.2
Exit Input Routing mode	Press the **INPUT ROUT** key until the "INPUT ROUTE" indicator is dark	Channel indicators and track **INPUT** enable keys return to their normal status

6.4.1 Analog input routing



The three analog routing modes accommodate 2-, 4-, or 8-bus mixing consoles. With two busses, connect them to inputs 1 and 2. With four busses, connect them to inputs 1...4. With 8 busses, 8 direct outputs or a patch bay, connect each of them to its like-numbered V-Eight input. The analog routing choices are:

- Odd/Even: Press either the track **INPUT** enable key 1 or 2. Input 1 feeds channels 1, 3, 5, 7, and Input 2 feeds channels 2, 4, 6, 8. To record on an odd-numbered track, route the signal(s) to bus #1 (or left). To record onto an even-numbered track, route the signal(s) to bus #2 (or right). By simply putting the desired track into record, the proper signal will get there, even though it is not connected directly to the track's **LINE IN** connector.
- Half & Half: Press either the track **INPUT** enable key 3 or 4. Input 1 feeds channels 1 and 5; input 2 feeds channels 2 and 6; input 3 feeds channels 3 and 7; input 4 feeds channels 4 and 8). To record on track 1 or 5, route the signal(s) to bus #1. Likewise, to record on track 2 or 6, route the signal(s) to bus #2, and so on.
- One-to-one: Press either the track **INPUT** enable key 5, 6, 7, or 8 in Input Routing mode. This is the power-on default, where each input feeds its corresponding channel. To record on track 1, send the signal to mixer bus 1, to record on track 2 send the signal to mixer bus 2, etc. This is also the recommended mode when feeding the V-Eight from a mixer channels' direct outs.

Alternate method: In Input Routing mode for analog inputs, the **ALL SAFE** key selects the odd/even configuration and the **ALL INPUT** key selects one-to-one.

6.4.2 Digital input routing

The "DIG SOURCE" setting (section 6.1) influences the digital input routing. This feature allows to record incoming digital data on any desired track, without manually re-patching.

"DIG SOURCE = ADAT OPTICAL":

Any of the 8 incoming optical channels may be individually selected or de-selected with the track **INPUT** enable keys while in Digital Routing mode.

- An illuminated track **INPUT** enable key indicates that the incoming ADAT optical channel is a digital source.
- If a track **INPUT** enable key is dark, that means the incoming ADAT optical channel will be skipped as a source.
- Pressing the **ALL INPUT** key selects all eight channels as optical sources (this is the normal state).
- Pressing **ALL SAFE** turns off all channels, which results in a one-to-one routing (just as if all 8 channels were selected as sources). **ALL SAFE** simply "clears the slate" for additional digital source channel selections.

"DIG SOURCE = AES/EBU": Because AES/EBU is a two-channel digital format, only channel pairs (1-2, 1-4, or 1-8) may be selected or de-selected. Pressing the **ALL INPUT** key selects all channels. As with "ADAT OPTICAL", an illuminated track **INPUT** enable key indicates that the channel is a digital source.

"DIG SOURCE = TRACK COPY":

Any of the 8 channels, to a maximum of 4 total, may be individually selected or de-selected. An illuminated track **INPUT** enable key indicates that the channel is a track copy source, i.e., the selected channels are the internal source channels selectable for digital track bouncing within a single V-Eight.
Pressing **ALL INPUT** selects the channels 1...4 a track copy sources.

- No more than 4 tracks may be copied within a single machine, so if 4 source tracks are already selected, one must be de-selected before you can select another track.
- A digital source track cannot be record-enabled in "TRACK COPY" mode; when trying, the indication "Source cannot equal dest" appears.
- When copying tracks, any track delays (section 11.9) will be in effect.
- **ALL SAFE** deselects any track copy source channels.

6.4.3 Record-enabling the destination tracks

In Digital Routing mode, inputs need not be routed to same-numbered tracks only. Any selected digital source input can be re-routed to any record-enabled destination tape track, in ascending order.

Example: If ADAT OPTICAL source inputs 1 and 5 are selected using Input Routing, and tracks 3 and 4 have digital sources ("D" is displayed) and are record-enabled, then incoming digital audio on optical input channel 1 goes to track 3, and incoming digital audio on optical input channel 5 feeds track 4.

If more destination tracks are enabled than there are source inputs, the source inputs will repeat (cycle).
Note that this technique allows copying a single incoming signal to multiple tracks.

Example: If in the previous example tracks 7 and 8 were record-enabled as well (together with tracks 3 and 4), audio from input 1 would go to tracks 3 and 7, and incoming audio from input 5 would feed tracks 4 and 8.

If all 8 source tracks are selected, then no digital routing occurs as this gives a one-to-one relationship (the power-on default).

Example: If all eight ADAT optical sources are selected, and tracks 3 and 4 are record-enabled, they will receive digital audio from ADAT optical channels 3 and 4 respectively.

The track copy function works the same way. If DIG SOURCE is set to "TRACK COPY" and tracks 7 and 8 are the only tracks selected in Input Routing mode, track 7 will be copied onto the lowest-numbered, armed track, and track 8 will be copied onto the next higher armed track. For example, if tracks 2, 4, 5, and 6 are armed, track 7's data will be copied onto tracks 2 and 5, and track 8's data onto tracks 4 and 6.

6.5 AUX routing

The analog AUX track of the V-Eight is a unique feature having a special application in cue mode, because it allows to hear audio even at extremely low speeds for cueing. The AUX ROUTing feature allows automatically mixing other tracks for recording onto the AUX track.

The back panel AUX Input is permanently routed to the AUX track. The **AUX ROUT** key selects whether additional inputs will also feed the AUX track (e.g., if tracks 1 and 6 are routed to the AUX track, then the AUX track will record tracks 1, 6, *and* the AUX Input). You can route any track or group of tracks to the AUX track. If no track **INPUT** enable keys are pressed within 10 seconds of entering AUX routing mode, the V-Eight automatically exits this mode.

It is also possible to automatically record of whatever tracks are currently armed onto the AUX track, so the AUX track always contains the last overdub only. This is called "AUTO" mode.

Operation	You press...	You see...
Enter AUX routing mode	The **AUX ROUT** key	"ROUTE AUX" indicator flashes
Select AUX tracks manually	The track **INPUT** enable keys of the desired channels	"ROUTE AUX" indicator (below level meter bargraph for each selected track input) is illuminated
Select AUX tracks automatically (this directs all record-enabled tracks to the AUX track)	**AUX INPUT** enable key (to the right of track **INPUT** enable keys)	An illuminated "AUTO" indicator below the AUX track's bargraph. Any individual "ROUTE AUX" indicators disappear
Exit AUX routing mode	The **AUX ROUT** key, or wait 10 seconds without pressing any keys	"ROUTE AUX" indicators are dark; channel indicators and track select keys return to their normal status

Notes: The routing to the AUX track changes only upon entering Record mode. Thus, even with Auto Routing enabled, the current manual or previous auto routing remains in effect until the AUX track goes into record mode.

When in **JOG/SHTL** mode (section 8.4), the AUX output routing always follows the input routing. Example: If tracks 1 and 5 are routed to the AUX track, then the AUX track output (which sums tracks 1 and 5 and feeds them to the AUX Out) will appear on both outputs 1 and 5, unless tracks 1 and 5 are selected as inputs. This makes it unnecessary to keep a channel on the console dedicated to the AUX output.

If you turn off Auto mode (press **AUX ROUT**, then press the **AUX INPUT** enable key), the AUX routing tracks do not return to what had been selected manually prior to automatic AUX selection; they will show the tracks last armed and recorded.

7 METERING

With digital recording, it is very important not to exceed the available headroom (and with 20 bits to play with, you have so much dynamic range that there's no need to press it). The V-Eight provides three different metering modes to make it easier to avoid overloads.

7.1 Meter mode selection

The **PEAK MODE** key cycles through three different meter modes:

No Peak Hold: Meter levels reflect the current input signal levels.

Momentary Peak Hold (default): Although the meter reflects the current input signal, the meter also retains the peak level briefly. This is useful if the signal to be recorded has short transients, which you might miss seeing when they occur.

Continuous Peak Hold: The meter also reflects the current input signal, but retains the highest peak until cleared. Thus, if you can't monitor a track continuously during the recording process, you can look at the meter after the recording is over to see the highest recorded peak.

As you cycle through these options, the main display briefly shows the selected mode.

7.1.1 Clearing peaks

With continuous peak hold, you will eventually want to clear the peak level indicators. Press **PEAK CLR** to reset the meters on all 8 channels simultaneously.

7.2 Meter setup

The level meter scaling, headroom, decay time, and peak hold time are all adjustable using the Display menus. The **DISPLAY MODE** key is located in the lower right group of keys below the track **INPUT** enable keys.

Scaling: Determines whether the meter range is –72...0 dB_{FS} (Normal/default) or –2.0...+2.0 dB_{rel} (Fine); in the "Fine" level meter mode, the 0 dB_{rel} reading corresponds to a level of 0 dB_{FS} minus the selected headroom.

Headroom: Sets the headroom amount for the "Fine" level meter mode (but does not affect the normal mode) by letting you specify what value the 0 dB_{rel} marking represents. The value ranges from 2...22 dB, in 1 dB steps (default = 15 dB).

Decay: Sets the time for a meter segment to turn off after the signal goes below that level, with a range of 1...99. Each step represents 5 ms, with higher numbers standing for longer decay time. The maximum decay setting of 99 means that a segment will hold for 500 ms. Default setting = 10.

Peak hold time: Sets how long peaks will be held when the meters are in momentary Peak Hold mode, with a range of 1...99. Each step represents 250 ms, with higher numbers standing for peak hold time. The maximum decay setting of 99 means that a peak will hold for 24.75 s after the level has fallen. Default setting = 8.

Operation	You press...	You see...
Enter level meter scaling setup	**DISPLAY MODE** key	Display indicates: "VU Meter Scale"
Edit level meter scaling	**▲/YES** or **▼/NO** keys	Display shows Normal or Fine scaling
Enter level meter headroom page	**DISPLAY MODE** key again	Display indicates: "Fine Headroom"
Edit level meter headroom	Keypad or **▲/YES** or **▼/NO** keys to select the headroom amount	Display shows amount of Fine headroom in dB
Enter level meter decay page	**DISPLAY MODE** key again	Display indicates: "VU Decay"
Edit level meter decay	Keypad or **▲/YES** or **▼/NO** keys to select the amount of decay	Display shows amount of meter decay time
Enter VU peak hold page	**DISPLAY MODE** key again	Display indicates: "VU Peak Hold"
Edit VU peak hold	Keypad or **▲/YES** or **▼/NO** keys to select the peak hold time	Display shows amount of peak hold time

8 TRANSPORT CONTROLS AND BASIC RECORDING

The transport keys include ◀ rewind, ▶ fast forward, **STOP**, **PLAY**, **REC**, and **EJECT**; the transport movement may also be controlled by the JOG/SHTL wheel or various built-in automatic features.

8.1 About the tape counter

The tape counter located on the right side of the right-hand display shows the current tape location. The **TAPE COUNT** key selects the counter mode (the 10-digit location counter is situated above the **TAPE COUNT** key). Pressing the key cycles through three different modes.

ABS TIME: References the current tape location to the proprietary, sample-accurate ADAT time code formatted into each ADAT tape.

RELATIVE: References the current tape location to the relative zero location. The relative zero point is set by entering an absolute time value into the LOC 00 address. That value is subtracted from the absolute time code value when the tape counter display is in "RELATIVE" mode.

SMPTE: References the current tape location to SMPTE (i.e., ABS TIME + any SMPTE offset, as described in section 11.6.1).

Note: This is not necessarily the SMPTE time code printed onto the TC track. That code is displayed in the reference counter on the left side of the display.

8.2 Stop

Press to stop the tape transport (**STOP** key is illuminated continuously). The tape stops moving, but remains threaded around the head drum. The tape will unthread (i.e. disengage from the head drum) automatically if no transport movement occurs during a user-definable timeout period (default = 4 minutes; refer to section 13.9). **STOP** flashes. To re-thread the tape, press **STOP** again (it is illuminated continuously). Note that entering **PLAY** from the unthreaded mode takes slightly longer than when the tape is already threaded, due to the time required to wrap the tape around the head drum.

8.3 Play

How **PLAY** affects tape motion depends on the tape's status:

If the tape is...	Pressing PLAY causes...	You see...
Stopped	Playback	**PLAY** key is illuminated continuously
Playing	No change (playback continues)	**PLAY** key is illuminated continuously
Formatting	No change (formatting continues)	**PLAY** key is illuminated continuously
Locating	Playback after the locate is complete	**PLAY** key flashes during locate, then stays illuminated when locate is complete
Locating	Pressing **PLAY** twice stops autolocate and begins playback	**PLAY** key is illuminated continuously
Recording	Punch-out, and enter play mode	**PLAY** key is illuminated continuously

8.3.1 PLAY key and sync status

When the V-Eight is playing and in sync, the "LOCKED" indicator (under the last field of the tape counter) is illuminated continuously.
If the V-Eight loses sync while playing (either as a master or as a slave), the "LOCKED" indicator will be dark).

8.3.2 QUALITY indicator

The **QUALITY** indicator located above the **REC** key indicates CRC rate errors during playback. Slight flashing now and again can be considered as normal.

If its intensity or flashing rate increases, you have an indication that the cassette in use is loosing quality, or that the heads of your unit are contaminated. To check for contamination, simply take your benchmark tape you have prepared previously (refer to section 4.11). If you still are experiencing a lot of activity of the **QUALITY** indicator while playing back this tape, it is likely that the heads need to be cleaned. Have them cleaned by a knowledgable technician, or, as a temporary fix, use an approved dry cleaning tape only.

Note: *It is better to be safe than sorry! Once the CRC rate raises above 8 sync block errors, dropouts can happen, and your recording may be damaged. (For error indication also refer to section 13.20).*

8.4 JOG/SHTL wheel and CUE

The **JOG/SHTL** wheel provides convenient access to capstan-engaged rewind, fast forward, and "scrub" functions (in scrub mode, audio normally comes from the analog AUX track). In master/slave situations, the master's **JOG/SHTL** wheel controls the slaves, regardless of the slave's physical wheel position.
Pressing the JOG/SHTL wheel selects between the two modes, as displayed with the **JOG** and **SHTL** indicators at the right of the **CUE** key. The **CUE** key works with the **JOG/SHTL** wheel, as described toward the end of this section.

8.4.1 JOG mode

JOG advances or rewinds the tape at a rate proportional to the speed of wheel rotation. This allows you to move the tape as if you were "rocking the reels" on an analog tape recorder.

Action...	Result...	You see...
Turn wheel clockwise	Tape moves forward at a rate proportional to rotation speed (1/8 x...1 x play speed)	**CUE** and **PLAY** keys, and ▶ indicator above wheel are illuminated
Turn wheel counterclockwise	Tape moves in reverse at a rate proportional to rotation speed (1/8 x...1 x play speed)	**CUE** and **PLAY** keys, and ◀ indicator above wheel are illuminated

8.4.2 SHTL mode

SHTL advances or rewinds the tape at a rate proportional to the degree of wheel rotation. The greater the degree of rotation from the center detent, the faster the rate.

Action...	Result...	You see...
Turn wheel clockwise	Tape moves forward at a rate determined by amount of rotation (from 1/4 x...16 x play speed)	**CUE** and **PLAY** keys, and ▶ indicator above wheel are illuminated
Turn wheel counterclockwise	Tape moves in reverse at a rate determined by amount of rotation (from 1/4 x...16 x play speed)	**CUE** and **PLAY** keys, and ◀ indicator above wheel are illuminated
Press illuminated **CUE** key while in **SHTL** mode	Transport goes into play	**CUE** and **STOP** keys are dark, **PLAY** remains illuminated

8.4.3 CUE key

The **CUE** key toggles transport control between the **JOG/SHTL** wheel (**CUE** key illuminated) and the transport keys (**CUE** key dark), making it easy to go in and out of Play mode while using the **JOG** or **SHTL** function to locate a specific piece of audio.

Action...	Result...	You see...
Press illuminated **CUE** key (disable) while in **JOG** or **SHTL** mode	Transport goes into Play	**CUE** and **STOP** keys are dark, **PLAY** remains illuminated
Press dark **CUE** key while in **JOG** or **SHTL** mode (enable CUE mode)	Transport enters JOG/SHTL mode: If in **JOG** mode, stops; if in **SHTL** mode, moves in the direction and speed indicated	**CUE** and **STOP** keys are illuminated, **PLAY** remains illuminated. ◀ or ▶ indicators may be illuminated in **SHTL** mode

CUE mode can either be initiated automatically simply by moving the **JOG/SHTL** wheel, or initiated by pressing the **CUE** key only, according to the settings on page 10 in the Utility menu (section 13.10).

8.4.4 Cue master

This function (available only in the ID01 master V-Eight in a system) accommodates situations where you want to use **JOG** on a machine that is not the master (e.g., to find a particular point on the tape of a slave machine only). In this case, you don't want the slave V-Eight to follow the master, but instead, to act as a "temporary locate master" so all machines (including the ID01 master) park where the designated cue master machine parks after a **JOG** or **SHTL** operation. The default cue master machine is ID01. Cue master status is not retained when power goes off.

To set which online V-Eight controls the parking address for all other V-Eights in a system:

1. Press and hold **CUE** for 2 seconds to enter Cue Master Edit mode. The display shows "Cue Master: n" (n = 1...8 or All).
2. While continuing to hold **CUE**, use the numeric keypad keys (1...8, 0) or**▲/YES** or **▼/NO** keys to select a cue master (default is 1). Releasing the **CUE** key exits the edit mode without changing the CUE mode status.

Selecting a machine other than ID01 as a cue master and activating cue mode (Jogging or Shuttling) causes the display to indicate momentarily "Machine n Cue Master" (n = 1...8) or "No Cue Master" when "All" is selected. If you pause a cue, ID01 will query the cue master, update ID01's tape counter, and locate all connected machines to the position of the designated cue master.
When cue master equals "All", ID01 will not send a locate command to the slaves. All decks will remain parked after a cue.
Releasing the **CUE** key exits Cue Master Edit mode, and the V-Eight reverts to the display prior to selecting the cue master.

Note: ID01 must remain online, and the user must observe the time code display when actively jogging or shuttling; because when a slave is the cue master, the master's tape counter display will only reflect ID01's tape position until cue mode is paused and ID01 has located to the cue master's tape position.

8.5 Other transport keys

You press...	If tape is stopped	If tape is moving	You see...
EJECT	Tape ejects	Tape stops prior to ejection	Tape exits cassette well, **EJECT** key is illuminated
EJECT on Master deck (ID 01)	Master and slave tapes eject	Tape stops prior to ejection	Tape exits master and slave cassette wells, **EJECT** key is illuminated
Hold **PEAK CLR** while pressing **EJECT**	Master tape only ejects, MMC Stop command is sent to slaves	Master tape ejects, MMC Stop command is sent to slaves	Tape exits master cassette well, **EJECT** key is illuminated
◀ rewind	Tape begins rewinding at 16 x play speed, then accelerates to 85 x play speed	Same	◀ rewind key is illuminated continuously
◀ + **PLAY** (Review mode)	Tape rewinds at 3 x real time and plays pieces of audio	Same, except if recording, punches out first	**PLAY** key is illuminated continuously, ◀ rewind key flashes
▶ fast forward	Tape fast forwards at 16 x play speed, then acce-lerates to 85 x play speed	Same	▶ fast forward key is illuminated continuously
▶ + PLAY (Cue mode)	Tape fast forwards at 3 x real time and plays pieces of audio	Same, except if recording, punches out first	**PLAY** key is illuminated continuously, ▶ fast forward key flashes

To end a Cue or Review operation, press **PLAY**, **STOP**, ◀ rewind, ▶ fast forward, or **CUE**.

8.6 RECord

This key's operation operates depends on whether ONE-BUTTON RECORD (section 13.4) is enabled or disabled.

	You press...	Tape stopped:	Tape moving:	You see...
If ONE-BUTTON RECORD is enabled...	**REC**, and while holding, press **PLAY**	Recording begins	Recording begins	**REC** key is illuminated
If ONE-BUTTON RECORD is disabled...	**REC**	Recording begins	No change in existing status	If recording, **REC** key is illuminated

If the **FORMAT** key is illuminated, entering record mode will format the tape (refer to section 4 on formatting).

8.6.1 Punching into record

There are five ways to punch into record while the tape is playing.

- Hold **REC**, then press **PLAY** at the punch-in point, or vice versa.
- With ONE-BUTTON RECORD enabled, press **REC** at the punch-in point.
- Use the track **RECORD** enable keys for enabled source inputs. If no tracks are record-enabled and you press **PLAY** and **REC**, the **REC** key will flash to indicate Record mode is pending. At the punch-in point, press the appropriate track **RECORD** enable keys (dynamic punch, section 13.13, must be enabled for this function to work).
- Use a footswitch (section 8.6.5).
- Program Auto Record (section 8.8).

8.6.2 Punching out of record

There are five ways to punch-out of record.

- Press **STOP**. The transport punches out of record, then stops.
- Press and hold **REC**, then press **PLAY**.
- Press **PLAY**.
- Use the footswitch (section 8.6.5).
- Turn off a track's **RECORD** enable key (dynamic punch, section 13.13, must be enabled for this function to work).

8.6.3 Record write-protection

S-VHS cassettes have a write-protect tab on the side of the tape opposite the "door" that, when removed to create a small "window", prevents recording. The V-Eight senses the write-protect tab status. If the tape is write-protected, an attempt to enter record mode causes the display to show "ERROR - Write Protected", and the V-Eight will not allow recording to take place. The transport will remain in or enter play mode instead.

8.6.4 Override write-protection

It is possible to record on a tape that has been write-protected without resorting to the usual tactic of taping-over the tab:

Operation...	You press...	You see...
Enable write-protect override	Press and hold **PEAK CLR**, then press **REC** key	Display indicates: "Write Protect Override"
Disable write-protect override	Press and hold **PEAK CLR**, then press **REC** key	Display indicates: "Write Protect Enabled"

8.6.5 Recording with a footswitch

If any tracks are record-enabled and the tape is playing, pressing the punch footswitch is equivalent to pressing **REC** and **PLAY**.

If the V-Eight is already recording, pressing the punch footswitch exits Record mode but the transport continues to play.

If you plug in a footswitch while the V-Eight is on, turn the V-Eight off and then on again so the machine can sense whether the momentary footswitch is a normally-open or normally-closed type.

Note: Footswitch-controlled recording also works in conjunction with Rehearse mode (section 8.7) and Auto Record mode (section 8.8).

8.7 Rehearse mode

Rehearse mode allows checking punch point accuracy without actually entering Record mode. Record-enabled tracks will switch from tape monitor to input monitor at the punch-in point, and back to tape monitor at the punch-out point.

Operation	You press...	You see...
Enable Rehearse mode	**REH MODE** key	**REH MODE** key is illuminated, **REC** key flashes while rehearsing the punch
Disable Rehearse mode	**REH MODE** key	**REH MODE** key is dark

8.8 Auto record

In auto record mode, you can program punch-in and -out points. Pressing **PLAY** and **REC** prior to the punch-in point causes the V-Eight to automatically punch in and out at the programmed points.

You first must set auto-punch points, then enable the function. The auto-punch-in and -out points default to autolocate points 98 and 99, respectively. These points automatically store the locations of the last manual punch-in and punch-out, so anytime you have gone into REC manually you can repeat that punch exactly using auto record mode, if desired.

Note: If the auto-punch-out location address is lower than the punch-in address, the **AUTO REC** function is disabled (key is dark), and attempting to enable this function causes an error message in the display.

8.8.1 Setting auto record punch points

To edit the auto record in and out points (as displayed in the right side of the main display), follow the steps below.

Operation	You press...	You see...
Display punch-in or -out point	EDIT key followed by the **AUTO REC** key (**AUTO REC** toggles between displaying punch-in and punch-out points)	Display shows the punch-in or punch-out point
Select specific location as punch-in or punch-out point	▲/**YES** or ▼/**NO** keys	Display shows a new punch-in or punch-out point
Edit punch-in or punch-out point	◀ and ▶ cursor keys, then enter numbers (keypad, ▲/**YES** or ▼/**NO** keys, COPY LOCATE) in the appropriate fields	Field to be edited flashing, then replaced by your entry
Disable punch-out point	Both ▲/**YES** and ▼/**NO** keys simultaneously (cursor must not be in a time field)	Display shows "Out Pt Disabled"
Exit Auto Record setup	Press **EDIT** key	Display returns to normal

8.8.2 Enable auto record

To enable and disable auto punch, make sure the machine is not in Edit mode (if necessary, press the **EDIT** key so that it is dark).

Operation	You press...	You see...
Enable Auto Record	**AUTO REC** key	**AUTO REC** key is illuminated
Disable Auto Record	**AUTO REC** key	**AUTO REC** key is dark
Use Auto Record	Press **PLAY** and **REC** prior to the punch-in point	**RECORD** enable keys are illuminated continuously during punched region

Note: If the currently selected locate number equals the punch-in locate number, then the "IN" label is illuminated in the "LOCATE PT" block. Similarly, if the currently selected locate number equals the punch-out locate number, then the "OUT" label is illuminated in the "LOCATE PT" block.

8.8.3 Set auto punch points "on-the-fly"

Whenever you punch-in/-out manually (as opposed to auto-record), the default auto-punch points assume the times of the manual punch points, and stores them in locate memories 98 and 99.

Note: This is not the case if punching is enabled/disabled with the track **RECORD** enable keys.

9 AUTOLOCATOR

The V-Eight can automatically locate to specific points on the tape. Its built-in memory contains 100 different locate points, complete with 8-character names. Locate points are used not only for convenience, but in several other functions of the V-EIGHT such as Auto Record and Tape Offset. These points are saved in the memory of the V-Eight even when power is turned off, and may even be saved to the data header of each tape or to a MIDI file.

The **LOC** key itself is with the transport keys, left of the ◀ rewind key. The currently selected point is shown in the "LOCATE PT" block in the lower right corner of the main display. Normally, the upper line of the display shows the locate number and name.

Note: Most V-Eight users find it convenient to leave the display in locate select mode, and the reference counter in locate point mode. If one of the keys **DISPLAY MODE**, **MIDI**, **SET PITCH**, or **UTILITY** is pressed, the corresponding function will take over the top line of the main display, and the key is illuminated. Press **LOCATE SELECT** to return the display to its normal status.

The "LOCATE PT" display uses the ADAT's ABS time as a reference, not the SMPTE time code track. It can, however, display locate points in either SMPTE, ABS TIME, or RELATIVE modes. If the tape counter (lower left counter in the main display) is in SMPTE mode, it uses the fixed SMPTE offset set in the SMPTE Chase menu to calculate its value. If the tape counter is in relative mode, it will subtract the Locate 00 number to calculate its value.

9.1 Entering, selecting, and editing locate points

9.1.1 SET LOCATE

Pressing the **SET LOCATE** key at any time stores the current tape location (rounded to the nearest subframe) into the next memory location for later recall. If the locate point is currently 00, the first press of **SET LOCATE** stores the current ABS time to locate point 01 (shown in the display lower right). The next locate point is 02, the next 03, and so on up to a maximum of 97. Any previous locate address, but not its name, will be overwritten when using **SET LOCATE**. The "LOCATE PT" block also indicates whether the locate point is one of four special locate points ("IN", "OUT", "START", or "END").

Note: **SET LOCATE** will not increment to points 98 and 99, as these are reserved for manually set punch points. You must select these points with the **▲/YES** or **▼/NO** cursor keys to update them with the **SET LOCATE** function.

9.1.2 COPY LOCATE

Pressing **COPY LOCATE** stores the current tape location from the tape counter to the locate point the number of which is currently indicated in the "LOCATE PT" block; this function is useful for grabbing locate points "on the fly", as well as for manual auto-punch and loop points. Unlike **SET LOCATE**, doing this does not increment to the next locate point number. You must increment manually.

To select and edit locate points:

Operation	You press...	You see...
Copy Tape Location to memory	**COPY LOCATE** key	Tape counter time (display left side) is copied to the "LOCATE PT" display on the display's right side (reference counter)
Store Locate Point	**SET LOCATE** key	"LOCATE PT" display shows the current tape time; the "LOCATE PT" block shows the locate point number
Select Locate Point	**LOCATE SELECT** key, then **▲/YES** or **▼/NO** keys or number keys to select the desired locate point	Locate Select display shows the locate point number and name; the "LOCATE PT" block shows the locate point number; Reference counter (if in "Locate PT mode") shows the locate point time.
Edit Locate Point	**SET LOCATE** key, then press ◀ or ▶ cursor to select the field to be edited (it will flash). Use **▲/YES** or **▼/NO** keys, or number key to enter the new value	"LOCATE PT" display shows the locate point time; the "LOCATE PT" block shows the locate point number
Edit Locate Name	**SET LOCATE** key, then **↵/NAME** key. Enter the name.	The "LOCATE PT" block shows the locate point number
Go to Locate Point	After selecting the desired Locate Point (using Select Locate mode), press **LOC**.	The ◀ or ▶ wind key flashes to indicate the direction of the cue. The **LOC** key stays illuminated until the tape reaches its destination.
Locate to Zero *	**ZERO LOCATE** key	The ◀ or ▶ wind key flashes to indicate the direction of the cue. **ZERO LOCATE** stays illuminated until the tape reaches its destination.
* Whether the time display is "ABS TIME" (Absolute) or "SMPTE", the zero point is always at ABS 00:00:00:00 (the beginning of the audio section, just after the leader)		

9.2 Deferred play and record

To automatically enter play mode after locating, press **PLAY** before a locate completes. To cancel while tape is moving, press **STOP**, ◀ or ▶ wind, or **CUE**.

To automatically enter record mode after locating, press **PLAY** and **REC** before a locate completes. To cancel while tape is moving, press **PLAY**, **STOP**, ◀ or ▶ wind, or **CUE**.

9.3 Play-after-locate (auto play)

To always enter play mode after completing a locate, press **AUTO PLAY** (key is illuminated). This key can be pressed at any time. To cancel, press **STOP** or some other transport control before the locate is complete.

9.4 Loop between start and end locate points (auto return)

You can set up "loop points" (start and end locate points; refer to section 9.1), and program the V-Eight to automatically return to the start locate point after reaching the end locate point. This works during play or record. The start and end locate points are chosen from the possible 100 locate points in memory, and default to locate points 01 and 02 respectively.

To enable auto return, press the **AUTO RETURN** key at any point (stopped, playing, or recording) as long as the tape is before the end point. Enabling auto return when the tape is past the end point has no effect.

If the end point is reached while recording, the V-Eight will punch-out before rewinding to the start point.

Turning off **AUTO RETURN** while it's returning to the start point initiates normal rewind mode.

9.4.1 Setting loop start and end points

To edit the start and end locate points, follow the steps below:

Operation	You press...	You see...
Show start locate point	**EDIT** key followed by the **AUTO RETURN** key	Display shows start point location
Select start locate point	▲/**YES** or ▼/**NO** keys, or number keys	Display shows new start point location
Edit start locate point	▶ cursor key, then enter numbers (keypad, ▲/**YES** or ▼/**NO** keys) in the appropriate fields, or use **COPY LOCATE**	Field to be edited flashing, then replaced by your entry
Display end locate point	**AUTO RETURN** key again (toggles between start and end points)	Display shows end point location
Select end locate point	▲/**YES** or ▼/**NO** keys, or number keys	Display shows new end point location
Edit end locate point	▶ cursor key, then enter numbers (keypad, ▲/**YES** or ▼/**NO** keys) in the appropriate fields, or use **COPY LOCATE**	Field to be edited flashing, then replaced by your entry

Loop count feature: For continuous looping of a section, **AUTO RETURN** and **AUTO PLAY** are both turned on. Hold **PEAK CLR** while pressing **AUTO RETURN** to temporarily display the current loop

count. To preserve the tape from accidental wear, the V-Eight will automatically exit **AUTO PLAY** mode after 100 continuous loops of **AUTO RETURN**.

9.5 Set pre-roll

For rehearsal or recording, it's often important to hear a few seconds of music prior to an entry point. Setting a pre-roll time locates the tape prior to any locate point by the specified amount (0...25 seconds; default is 5 seconds). Setting pre-roll = 0 causes the tape to locate to the cue point (same as disabling pre-roll).
Pre-roll also works when looping between two points.

Operation	You press...	You see...
Display Pre-roll time	**EDIT** key followed by the **PRE ROLL** key	Display shows existing Pre-roll time
Edit Pre-roll time	Enter time with numeric keypad or **▲/YES** or **▼/NO** keys	Display shows new Pre-roll time
Leave Pre-roll edit mode	Press **EDIT** key again	**EDIT** key is dark, **PRE ROLL** key returns to its previous status

9.6 Set post-roll

For rehearsal or recording in auto record mode, setting a post-roll time causes the tape to go beyond the punch-out point by the specified post-roll time prior to stopping (0...25 seconds; default is 5 seconds). Setting post-roll = 0 causes the tape to locate to the cue point (same as disabling post-roll).
Post-roll also affects the time when looping between two points.

Operation	You press...	You see...
Display Post-roll time	**EDIT** key followed by the **POST ROLL** key	Display shows existing Post-roll time
Edit Post-roll time	Enter time with numeric keypad or **▲/YES** or **▼/NO** keys	Display shows new Post-roll time
Leave Post-roll edit mode	Press **EDIT** key again	**EDIT** key is dark, **POST ROLL** key returns to its previous status

Tip: If you have to do a number of takes/overdubs at the same locations, use **AUTO RETURN** and **AUTO REC** together. Set the loop start point to the punch-in point, and the loop end point to the punch-out point. Setting a pre-roll and a post-roll allows the V-Eight to be in sync before the punch, allowing the talent to hear their cues.

9.7 Footswitch-controlled locate

If the transport is playing, pressing the locate/play footswitch locates the transport to the auto return locate point, then press **STOP** or **PLAY**, depending on the setting of the **AUTO PLAY** key (section 9.3).

Pressing the locate/play footswitch while the tape is locating initiates stop.

Note: If the transport is stopped, pressing the locate/play footswitch initiates play.

10 VARISPEED

Varispeed changes the sampling rate to change the audio signal's pitch. This feature only applies when clock source is set to INT (internal). Pitch mode is automatically set to "FIXED" whenever the V-Eight is being controlled by an external unit (e.g. if SMPTE CHASE is on).

The varispeed range is –300...+100 cents (–15.91%...+5.95%) at a base 48 kHz sample rate and –200...+200 cents (–10.91%...+12.25%) at a base 44.1 kHz sample rate. This allows a total range from approximately 39.3 kHz (–200 cents @ 44.1 kHz) to 50.9 kHz (+100 cents @ 48 kHz). Note that pitch changes affect all slave machines. Varispeed settings are retained in memory.

Operation	You press...	You see...
Enter Varispeed Edit mode	**SET PITCH** key	Display shows amount of varispeed change in cents and as a percentage
Set varispeed amount	Enter amount with numeric keypad or **▲/YES** or **▼/NO** keys. If set to 000, the **▲/▼** keys select "+" or "–" before entering a number. If any other value, the **▲/▼** keys increment or decrement the value.	Display shows amount of varispeed change
Enable varispeed	Press **PITCH MODE** key until...	"VARI" in the "PITCH" block
Disable varispeed	Press **PITCH MODE** key until...	"FIXED" in the "PITCH" block

Note: In Varispeed mode, the tape time will not show the true elapsed (i.e., "clock on the wall") durations.

Synchronization warning: Any time code being sent from the V-Eight will be sped up or slowed down when using varispeed mode. This may cause synchronization problems in other equipment that is slaved to the V-Eight. If you're using SMPTE time code synchronization anywhere in your project, use varispeed with great caution.

11 SMPTE, SYNC, AND OFFSET FUNCTIONS

The keys described in sections 11.1...11.5 are located under the main (right-hand) display.

The keys described in sections 11.6...11.9 are part of the **EDIT** key group below the meter display and the track **INPUT** enable keys.

11.1 Clock source

The **CLOCK SOURCE** key cycles through up to seven different clock selections:

- INTERNAL (V-Eight internal clock)
- VIDEO
- ADAT (if the unit sees a valid 9-pin ADAT sync-in connection)
- WORD clock
- Optional I/O card (if one is installed in the back-panel expansion slot)
- SMPTE
- OPTICAL

Note: Setting the clock to "INT" on a slave V-Eight automatically selects its ADAT clock option. Also, selecting any source other than "INT" when no valid clock is available automatically switches the V-Eight to "INT" clock, and flashes the currently selected indicator in the "CLOCK SOURCE" block until the V-Eight senses a valid clock.

11.2 SMPTE rate

The **SMPTE RATE** key cycles through six different SMPTE frame rates and types displayed in the "SMPTE" block; this affects *both* SMPTE time code input and V-Eight SMPTE time code output. It is not possible to receive and transmit different frame rates simultaneously.

- 24 Film
- 25 PAL video
- 29.97 NTSC color video
- 29.97 DROP FRAME NTSC color video, drop frame
- 30 American monochrome video, most audio applications
- 30 DROP FRAME American monochrome video, drop frame

When receiving SMPTE time code, input and output frame rates are set to the incoming frame rate (displayed in the "SMPTE" block). 29.97 and 30 frames/sec are not identified automatically due to possible source speed variations, and must be set manually.

Frame rates when receiving video are adjusted automatically, as follows:

Clock Source is set to...	Incoming video is...	Frame rate...
Video	NTSC	can select 29.97 or 29.97 drop frame
Video	PAL/SECAM	is set to 25 fps

11.3 Time code source

The **TC SOURCE** key selects either:

- The time code generated by the V-Eight, with the start time set in the Internal Gen pages (Internal mode)
- An external SMPTE source (External mode)

11.3.1 Internal

Time code generated by the V-Eight appears at the **TC OUT** connector. The internal generator generates SMPTE/EBU time code according to several parameters that are set in Int Gen Edit mode. Code may be generated only when the transport is moving or when it is stopped. The numbers of the time code being generated may be referenced to tape in several ways, or set independently by the user.

TC Input key: In any case, the internal generator of the V-EIGHT will only start issuing code when the TC INPUT enable key below the TC track meter is activated. *As long as "TC SOURCE" is set to "INTERNAL", the internal generator (and not the rear panel TC IN connector) is considered the "input" source for this key.*

When the TC track is not in Input mode and is playing back, the time code output comes from the TC track on the tape, if there is one.

For example, Int Gen always generates time code when the Internal Generator TC Start Ref parameter is set to "User Set", Free Run", and the TC INPUT enable key is illuminated. Setting this parameter to ABS time generates time code only if there is a valid, ADAT-formatted tape in the transport. Setting this parameter to "TC Track" generates time code only if there is valid time code recorded on the TC track of the tape.

With the TC track in Input mode, the time code start point and internal generator functions vary, as shown below:

TC Track Mode	Int Gen Start Ref	Intern Gen status	Internal Gen will...	How time code starts
EXTERNAL	N/A	Disabled	N/A	Input time code passes through to the output
INTERNAL	ABS Time	Enabled	Run immediately (in Free Run mode) or when tape is moving (in Play/Rec mode)	Time code starts from the ABS time + internal generator ABS offset
INTERNAL	User Set	Enabled	Run immediately (in Free Run mode) or when tape is moving (in Play/Rec mode)	Time code starts from the specified time
INTERNAL	TC track	Enabled	Run immediately (in Free Run mode) or when tape is moving (in Play/Rec mode)	Internal generator time code starts from the TC track.

Caution: If the TC track is put into record mode when the internal generator is disabled and the TC track is in Input mode, the TC track will record no time code and will erase any previous TC track time code.

11.4 Chase reference

The **CHASE REF** key selects between two chase (synchronization) reference options. The tape time code playback mode automatically follows the incoming time code frame rate.

- With ABS Time mode, the V-Eight will chase incoming SMPTE based on its absolute time reference (the standard ADAT format time code).
- With Tape TC mode, the time code track recorded on tape provides the reference for locking to incoming SMPTE. If there is no time code on tape, the tape will not chase incoming SMPTE.

Note: In both cases, when synchronizing to optical or word clocks, the time code must be synchronous to the sample rate (this will always be the case if synchronizing to absolute time; if synchronizing to tape time code, the TC track must be synchronous to the clock). For the V-Eight to lock, you must also make sure that the incoming time code is synchronous to the incoming word clock.

11.5 Reference counter

The **REF COUNT** key cycles through the reference counter display options (this display is above the Reference Counter key). The selected display option (just below the display digits) shows one of the following times:

SMPTE IN	Incoming time code
LOCATE PT	2-digit locate address shown in the "LOCATE PT" block
TAPE TC	TC track time code
INT GEN	Internal generator time code
OFFSET	Tape or chase offset

11.6 SMPTE chase

The **SMPTE CHASE** key toggles Chase mode on and off. When enabled (**SMPTE CHASE** key is illuminated), the V-Eight chases (follows) any external SMPTE time code input.

To display or edit the chase parameters, press the **EDIT** key then the **SMPTE CHASE** key. There are 4 pages of parameters. Pressing the **SMPTE CHASE** key cycles through the 4 pages.

11.6.1 SET SMPTE OFFSET VALUE (page 1)

You may specify a SMPTE offset (up to ±24 hours) that is added to or subtracted from the time code reference (either ABS TIME or TAPE time code).

Example: If you add an offset of 00:01:00:00 (1 minute), the V-Eight interprets an incoming SMPTE time of 00:05:30:00 as 00:06:30:00, and the SMPTE tape counter display shows 00:06:30:00.

Note: To edit the Samples field, select the Subframes field, then press the ▶ cursor key (for more on subframes, refer to section 3.3).

Operation	You press...	You see...
Select field to edit	◀ or ▶ cursor keys to scroll to desired field	Selected field flashes
Change sign (+ to add offset, – to subtract)	▲/YES or ▼/NO keys	Flashing sign changes from + to –
Change numeric field value	Enter two-digit number from keypad (leading zeroes must be entered) or use ▲/YES or ▼/NO keys	Field to be edited flashes, then is replaced by your entry
Exit SMPTE Offset setup	EDIT key, or any other Edit Group key	Display leaves SMPTE Offset function

11.6.2 CHS MODE (Set SMPTE chase mode, page 2)

There are two chase modes: *Frame-Lock* (default) and *Lock/Release* (i.e. lock and release to clock). Chase must be enabled.

The ▼/NO cursor key or the keypad key 0 selects Frame-Lock. With Frame-Lock mode, the V-Eight will relocate to incoming time code if it does not match the current tape location.
The ▲/YES cursor key or any keypad key greater than 0 selects Lock/Release. In Lock/Release, the V-Eight references the incoming time code location to establish a lock. Once locked, it ignores the time code data and follows the selected external clock source to maintain lock.

Lock/Release definition: In Lock/Release, if the incoming time code stops for more than the flywheel amount (section 11.6.3), is running but not advancing its frame numbers, starts counting frames backwards, or begins to advance at a non-play speed, the V-Eight will stop playing and attempt to chase to the time code location. If the time code is advancing forward but has a discontinuity, the V-Eight will continue to play without attempting to chase to the new time code location. Lock-and-release mode is a more "forgiving" mode in different time code applications, where the master has dropouts or jumps from one type to another.

11.6.3 FLYWHEEL (Set flywheel duration, page 3)

This parameter selects the maximum number of invalid or missing time code frames that will be ignored (up to 150). In Frame-Lock chase mode, the V-Eight keeps playing for the flywheel time as if valid time code was present, then chases when valid time code data reappears. In

Lock/Release chase mode, FLYWHEEL sets the amount of time that the V-Eight will continue to play in the absence of incoming time code before stopping the tape.

Use the **▲/YES** or **▼/NO** keys, or enter a 3-digit number with the keypad (leading zeroes must be entered).

11.6.4 PARK AHEAD (page 4)

The V-Eight can park the tape ahead of the last valid time code input, up to 59:29 (seconds/frames). Default is 00:00 (tape does not park ahead).

The Park Ahead parameter is available to reduce lock-up times in situations where the master TC source drops out or drifts for a few seconds as it stops or starts (e.g. when a VTR disengages).

Operation	You press...	You see...
Select field to edit	◀ or ▶ cursor keys to scroll to desired field	Cursor under selected field
Change numeric field value	Enter two-digit number from keypad (leading zeroes must be entered) or use **▲/YES** or **▼/NO** keys	Your entry replaces current field value
Exit Park Ahead setup	**EDIT** key or any other Edit Group key	Display leaves Park Ahead function

11.7 Internal generator

The **INT GEN** key turns the internal time code generator on and off ("TC SOURCE" must be set to "INTERNAL"; refer to section 11.3). Setting "TC SOURCE" to "EXTERNAL" automatically turns off the **INT GEN** function. If you press **INT GEN** when "TC SOURCE" is "EXTERNAL", the display will read "TC source not internal".

In any case, the V-Eight's internal generator will only start issueing code if the TC **INPUT** enable key below the TC level meter is illuminated.

If **SMPTE CHASE** is enabled, "TC SOURCE" is "INTERNAL", and the time code track is in Input mode, then the time code output will be the Chase reference (ABS TIME or TAPE TC) plus any SMPTE Offset. If **SMPTE CHASE** is disabled, "TC SOURCE" is "INTERNAL", and the time code track is in Input mode, then the time code output is selected on the following pages.

Note: If "TC SOURCE" is "INTERNAL", the time code track is in record mode, and the internal generator is off, then any previously-recorded time code will be erased.

11.7.1 GEN MODE (Generator mode, page 1)

In Free Run mode, enabling/disabling **INT GEN** respectively starts/stops the internal generator. In Play/Rec mode, enabling **INT GEN** causes the internal generator to run only while playing or recording. Disabling **INT GEN** always stops the internal generator.

The **▼/NO** key or keypad key **0** selects Play/Rec (default).
The **▲/YES** key or any keypad key greater than 0 selects Free Run.

11.7.2 TC START REF (Time code start reference, page 2)

This page sets the internal generator's starting reference. Use the **▲/YES** or **▼/NO** keys to select one of three options, or use the keypad numbers given below.

- With ABS Time (keypad **0**), the internal generator's start address is the current ABS address plus any ABS offset (set on page 3). The generator outputs time code based on the V-Eight's absolute time track.

Note: For time code to appear at the rear panel time code output, the time code track must be input-enabled, the generator must be running, and a formatted tape must be loaded.

- With TC Track (keypad **1**), the current TC track time code becomes the internal generator's start address. The generator will continue generating the same format code as on the time code track when the input is enabled and the generator is running. If no code exists on tape, no time code will be output or recorded; the display temporarily shows "TC Reference not present" if you try to turn the internal generator on.
- With User Set (any keypad number **2...9**), the generator will output time code that is synchronous to the absolute time, but starting at an arbitrary address as defined in the next page. The time code will only be generated while the time code track is input enabled. The generator retains the address at which it was stopped, and continues when re-started. In other words, whenever the generator is running with a user-set TC start reference, it updates the user-set start number.

11.7.3 ABS/start offset (page 3)

This page shows "ABS" if page 2 is set to ABS Time, and "START" if page 2 is set to User Set.

If the Internal Generator is set to ABS Time, you can enter an offset for the time code output compared to the ABS time.

If the Internal Generator is set to User Set, you can enter a new generator start time. The display shows the current generator location when last stopped in User Set mode.

If the generator is running, this page will show the previous start value, but the cursor will not be displayed as the start time cannot be edited while the generator is running.

How to edit the ABS/Start offset value:

Operation	You press...	You see...
Select field to edit	◀ or ▶ cursor keys to scroll to desired field	Cursor under selected field
Change numeric field value	Enter two-digit number from keypad (leading zeroes must be entered) or use ▲/YES or ▼/NO keys	Your entry replaces current field value
Exit ABS/Start setup	**EDIT** key or any other Edit Group key	Display leaves ABS/Start function

11.7.4 USER BITS (page 4, or page 3 if the page 2 value is TC track)

This page allows entering 8 hex characters (0...F) into the user bits.

Operation	You press...	You see...
Select digit to edit	◀ or ▶ cursor keys to scroll to desired field	Cursor under selected digit
Change digit value	Use ▲/YES or ▼/NO keys or enter digit from keypad (the **1** key cycles through 1-A-B-C, the **2** key cycles through 2-D-E-F)	Your entry replaces current digit
Exit User Bits setup	**EDIT** key or any other Edit Group key	Display leaves User Bits function

11.8 Tape offset

This function is intended for offsetting individual V-Eights or ADATs from each other within a multi-ADAT system only, not for setting an offset from an external SMPTE time code master. For setting a SMPTE offset, refer to section 11.6.1.

This offsets (shifts in time) the master ADAT (ID01) compared to the slave ADATs, or individual slaves compared to the master. The offset can be referenced to ABS time code or between two locate points.

An offset-enabled slave is offset by the specified amount from the master machine. With offset enabled on the master, it is offset by the specified amount from all slave units (i.e., all slaves are offset by the negative amount compared to the master unit).

In Edit Tape Offest mode the **▲/YES** or **▼/NO** keys select between (ABS) time code and location.

If OFFSET MODE = Time Code , the reference counter displays the offset amount (up to ±24 hours) in hours, minutes, seconds, frames, and subframes. To edit the "SAMPLES" field, select the subframes ("SF") field with the ▶ cursor key, then press the ▶ cursor key once again.

Operation	You press...	You see...
Change sign (+ to add offset, – to subtract)	▲/YES or ▼/NO keys	Flashing sign changes from "+" to "–"
Select time code field to edit	◀ or ▶ cursor keys to scroll to desired field	Selected field flashes
Change numeric field value	Enter two-digit number from keypad (leading zeroes must be entered) or use ▲/YES or ▼/NO keys	Field to be edited flashes, then is replaced by your entry, cursor goes to next field to the right
Exit Tape Offset setup	EDIT key or any other Edit Group key	Display leaves Tape Offset function

If OFFSET MODE = Locate, the reference counter displays the two locate points that define the offset as "aa...bb", where aa and bb are locate numbers ranging from 00...99. They both default to 00 on power-on, since identical locate points result in no offset. Setting Locate aa before or after Locate bb creates a positive or negative offset, respectively (offset = locate bb – locate aa). To see the actual offset time, change the mode to time code (select with ▼/NO), and the time code display will show the offset amount.

Operation	You press...	You see...
Select 1st Locate point	▶ cursor key to scroll to Locate 1 field	Selected field flashes
Change numeric field value	Enter two-digit number from keypad (leading zeroes must be entered) or use ▲/YES or ▼/NO keys	Field to be edited flashes, then is replaced by your entry
Select 2nd Locate point	▶ cursor key to scroll to Locate 2 field	Selected field flashes
Change numeric field value	Enter two-digit number from keypad (leading zeroes must be entered) or use ▲/YES or ▼/NO keys	Field to be edited flashes, then is replaced by your entry
Check time of offset (Optional)	TAPE OFFSET key	Cursor jumps to Offset mode line
Change offset readout to time code	▼/NO key	Offset mode changes to time code, display shows offset time in H:M:S:F:SF
Exit Tape Offset setup	EDIT key or any other Edit Group key	Display leaves Tape Offset function

Note: ABS has priority over Locate settings. In other words, if you select a Locate offset, then go to the ABS display to see the time offset, then change the ABS setting, the machine will follow the ABS setting.

11.9 Track delay

Example:

The **TRACK DELAY** key allows offsetting individual tracks in time. Delaying a snare part slightly compared to other drums can give a more "laid back" feel.

Maximum delay time is 170.0 ms at 48 kHz and 185.0 ms at 44.1 kHz, adjustable in 0.1 ms steps (0...8160 samples). The delay time displayed is accurate only while playing at normal pitch (48 kHz or 44.1 kHz), and will not compensate for pitch changes or external clock variations.

How to change the delay for individual tracks:

Operation	You press...	You see...
Select track to edit	**TRACK DELAY** key to cycle through the 8 tracks, or press track INPUT enable key	"Track #" in "Trk # Delay" line changes, cursor appears under matching track meter
Select Delay Time display (ms or samples)	▶ cursor key	Cursor appears under "ms"
Change Delay Time display (ms or samples)	▲/**YES** or ▼/**NO** keys	"ms" or "smp" in "Trk # Delay" line
Select Delay time for editing	Use ◀ or ▶ cursor keys to place cursor under numeric field	Cursor parks under rightmost digit
Change Delay time	Use ▲/**YES** or ▼/**NO** keys or enter 4-digit number (leading zeroes required)	Entry replaces field to be edited, meter shows rough bar graph of delay time
Exit Track Delay setup	**EDIT** key or any other Edit Group key	Display leaves Track Delay function

How to change the delay for several track groups at once:

Operation	You press...	You see...
Select tracks to edit	Press track **INPUT** enable key for one track to be delayed and while holding it, press track **INPUT** enable keys for other tracks to be delayed. The **ALL INPUT** key selects all tracks.	"Trk # Delay" line changes name to "Group Delay"
Select Delay Time display (ms or samples)	▶ cursor key	Cursor appears under "ms"
Change Delay Time display (ms or samples)	▲/**YES** or ▼/**NO** keys	"ms" or "smp" in "Group Delay" line
Select Delay time for editing	Use ◀ or ▶ cursor keys to place cursor under numeric field	Cursor parks under rightmost digit
Change delay time	Use ▲/**YES** or ▼/**NO** keys or enter 4-digit number (leading zeroes required)	Entry replaces field to be edited, meter shows rough bar graph of delay time
Exit Track Delay setup	**EDIT** key or any other Edit Group key	Display leaves Track Delay function

12 MIDI FUNCTIONS

There are seven pages of MIDI functions. Pressing the **MIDI** key cycles through the pages in order.

12.1 MIDI DEVICE (page 1)

Selects the V-Eight's device ID (1...127 or All) so that MIDI machine control systems with multiple V-Eights can address them. Selecting "All" means that the V-Eights respond to all incoming MIDI messages. Default ID = 000.

Use the ▲/**YES** or ▼/**NO** keys or number keys to enter the desired ID. To enter "All", scroll past 127, or enter any number greater than 127.

12.2 MMC OUTPUT (page 2)

Enables or disables the V-Eight from transmitting MIDI Machine Control commands via the MIDI output.
Default is Off.

Use the ▲/**YES** or ▼/**NO** keys to select On or Off.

12.3 MTC FOLLOW GEN (page 3)

Sets whether MIDI time code (MTC) will be generated simultaneously with SMPTE.
Default is Off.

Use the ▲/**YES** or ▼/**NO** keys to select on or off.

12.4 Send Sysex Dump? (page 4)

Sends the current setup information (as MIDI system exclusive data) via the MIDI Out port. Setup information includes all data currently in the unit, such as locate point names and addresses, track delays, tape offsets, etc. Sending a Sysex dump to the input of another V-Eight gives it the same setup as the transmitting V-Eight. This data can also be saved to a storage device (e.g. a sequencer program) to store specific setups for later recall.

Action to perform...	Display shows...
With page 4 selected, press ▲/YES	"Sending Sysex Dump"
Wait for dump to end	Initial page 4 display

12.5 Receive sysex dump? (page 5)

Receives setup information (as MIDI system exclusive data) via the MIDI In port. This could come from another V-Eight or a data storage device.

Action to perform...	Display shows...
With page 5 selected, press ▲/YES	"Rdy to Recv Sysex Dump"
Initiate dump from the transmitting device	"Receiving Sysex Dump"
Wait for dump to end	"Sysex Receive Complete" briefly when dump is complete

Note: The current setup does not update unless a complete dump is received. If the reception is interrupted, the display shows "Received Incomplete Dump" until any other key is pressed.

12.6 Send Software? (page 6)

This function sends the current operating system software via the MIDI Out port, typically to another V-Eight to update its operating system, or to a data storage device for backup. The tape must be ejected prior to sending software. This operation will take about 12...15 minutes.

There is the option to send either the "code block" or "boot block." Most software updates will involve the code block and leave the boot block untouched. Major software updates may require sending the boot block, as would replacing corrupted boot block software.

Action to perform...	Display shows...
With page 6 selected, press ▲/YES	"Send code (or boot) block?"
Select code or boot block to be sent with ▼/NO	"Send code block?" or "Send boot block?" (whichever has been selected)
Press ▲/YES	"Press ↵/NAME to confirm or ▼/NO to exit"
Initiate send by pressing ↵/NAME (or press ▼/NO to cancel)	"xx% completed"
Wait for software to be transmitted	
Exit by pressing any EDIT or keypad key	Whatever is associated with the key you pressed

Note: To cancel a transmission, hold the **STOP** key and press **EJECT** (the message "Program send aborted" appears). Be careful – cancelling a send may leave a receiving unit non-functional.

12.7 Load Software? (page 7)

This page allows updating the V-Eight operating system via data received at the MIDI In port, typically from another V-Eight or a data storage device. The tape must be ejected prior to loading software. This operation will take about 12...15 minutes.

There is the option to load either the "code block" or "boot block." Most software updates will involve the code block and leave the boot block untouched. Major software updates may require receiving the boot block, as would replacing corrupted boot block software.

Action to perform...	Display shows...
With page 7 selected, press ▲/YES	"Program code (or boot) block?"
Select code or boot block to be received with ▼/NO	"Program code block?" or "Program boot block?" (whichever has been selected)
Press ▲/YES	"Code (or Boot) seg will be erasedPress ENTER to confirm or press NO to exit" (alternating)
Initiate receive by pressing ↵/NAME (or press ▼/NO to cancel)	
Initiate send at transmitting device (if this is a V-Eight, refer to section 12.6)	"Please Wait – Updating"
Wait for load operation to end	"Software Updated" (after 4 seconds, the message changes to "Restarting", and the machine automatically restarts)

Caution: *If the V-Eight loads an incomplete update or incorrect data, this display will show an error message. Since the currently loaded software could be corrupted and cause fatal errors, it is necessary to successfully load the software before proceeding.*
Do never attempt to use a V-Eight with a corrupted operating system. Use the procedure according to section 12.6 to save a backup of the previous V-Eight software before loading new software, in case the file was corrupted during the transmission.
For more information on V-Eight software, refer to section 15.6.

13 UTILITY MENU

There are 22 pages of Utility functions. Pressing the **UTILITY** key cycles through the pages in order.

Shortcut: For jumping directly to a particular page, hold **UTILITY** and enter the desired page number from the keyboard; for accessing pages 01...09 use leading zeroes.

13.1 DIG OUT (page 1)

Selects the digital output format and resolution for tapes formatted in 20-bit mode (there is no choice of digital output with 16-bit tapes).

Procedure: Use the **▲/YES** or **▼/NO** keys (or keypad keys **0**...**4**) to select among the following:

"20-bit" (default) All 20 bits of audio are available at the optical and the (optional) AES/EBU outputs.

"16 dithered" The digital audio signal from a 20-bit tape or a digital input source is dithered down (using the 4 least-significant bits of the 20-bit signal) to a 16-bit signal which is available at the optical and the (optional) AES/EBU outputs. *This is the preferred 16-bit mode.*

"16-bit" This simply truncates the 4 least-significant bits from a 20-bit tape or digital input source and sends this 16-bit signal to the optical and the (optional) AES/EBU outputs.

"Dig Thru" The digital audio input from an optical or AES/EBU source goes directly to the optical or the (optional) AES/EBU output. The source word length is unchanged.

13.2 ONLINE SOURCE (page 2)

Sets the control source when Online mode (section 13.2.1) is enabled.

Procedure: Use the **▲/YES** or **▼/NO** keys (or keypad keys **0...2**) to select among the following:

"ADAT" (default) Receives control commands from the ADAT 9-pin Sync In connector.

"MIDI" Receives MIDI Machine Control commands from the MIDI In port.

"RS422" Receives commands from the RS422 port (for SW version 2.0 and above).

Note: MIDI does not need to be selected to receive Sysex and software dumps (sections 12.5 and 12.7).

13.2.1 ONLINE key

The **ONLINE** key determines whether the V-Eight will respond to control commands from the source specified in Online Source (section 13.2). Regardless of the Online status and source, the machine will continue to monitor and pass commands back and forth on its sync port. **ONLINE** cannot be switched off on a lone V-Eight machine.

When enabled (**ONLINE** key is illuminated), the machine responds to commands from the selected Online Source. Local control may be allowed or ignored, as set on Utility page 3 (section 13.3).

When disabled (**ONLINE** key is dark), the machine ignores commands from the selected Online Source.

Note: Certain user parameters cannot be edited when a machine is online, and only some parameters may be edited regardless of online status. The relevant parameters are duplicated and stored in 2 groups. One group is used when the machine is online, and the other when the machine is offline.

13.2.2 Independent slave mode

A slave machine will always respond to front panel transport key presses (subject to the local/remote setting on Utility page 3, section 13.3), regardless of whether it is online or offline.

13.3 ONLINE CTRL (page 3)

Selects whether local control is also available if a remote control source is selected.

Procedure: Use the **▲/YES** or **▼/NO** keys (or keypad keys 0 and 1) to select between the following:

"Local/Rem" (default) Receives control commands from front panel and LRC as well as from the selected online source.

"Remote" Allows control only from the selected remote source. There is no local control from any front-panel key other than to disable the Online function.

13.4 ONE-BUTTON RECORD (page 4)

With ONE-BUTTON RECORD Off, it is necessary to press both **PLAY** and **REC** keys to initiate recording. With ONE-BUTTON RECORD On, simply pressing **REC** initiates recording.

Procedure: Use the **▲/YES** or **▼/NO** keys to turn ONE-BUTTON RECORD On or Off.

13.5 INPUT MONITOR (page 5)

Determines whether the analog input is monitored directly from the inputs, or through the A/D and D/A converters.

Procedure: Use the **▲/YES** or **▼/NO** keys to select between the following:

"ADC/DAC" (default) The analog input is monitored after going through the A/D and D/A converters. Monitoring through the converters adds a slight delay (approx. 600 µs), but accurately reflects any changes to the signal that occur from the conversion process.

"Direct" The analog input is monitored directly from the inputs without going through digital conversion.

13.6 XFADE TIME (page 6)

Sets the crossfade time when the V-Eight transitions from Play to Record or from Record to Play. With 48 kHz sample rate, the crossfade values range from 5.4 ms to 1.365 seconds. At 44.1 kHz, the crossfade values range from 5.8 ms to 1.486 seconds. Default is 10 ms.

Procedure: Use the **▲/YES** or **▼/NO** keys to cycle through the 32 crossfade times.

Note: When punching in to the middle of a low-frequency tone, too short a crossfade time may cause a click!

13.7 TC OUTPUT LEVEL (page 7)

Adjusts the time code output level from 0.1...3.0 V_{pp} in 0.1 V increments.

Procedure: Use the **▲/YES** or **▼/NO** keys to increment/decrement in 0.1 V increments, or enter a two-digit number directly with the keypad. Leading zeroes must be entered (e.g., for a 0.5 V output, first enter **0**, then **5**).

13.8 RWD/FWD TC OUT (page 8)

The V-Eight can output SMPTE and MTC any time the tape is moving (▶, **CUE**, ◀, **JOG**, **SHTL**, etc.) if this option is enabled. When off, time code is transmitted only in Play mode. Default is off.

Procedure: Use the ▲/**YES** or ▼/**NO** keys to turn RWD/FWD TC OUT On or Off.

Note: Turn this function off if your system (mixer automation, computer sequencer etc.) acts strangely when you fast wind the V-Eight; it probably can't understand the fast bursts of time code and "gets lost". Turn this function on for faster locating of slave machines in code-only master systems.

13.9 UNTHREAD TIMEOUT (page 9)

Sets how long the transport must be idle (from 1...20 min) before the tape is unthreaded from the head drum. Shorter times trade off less head and tape wear for less convenience, as it takes slightly longer to go into play or record mode from stop if the tape is unthreaded. Default is 4 minutes.

Procedure: Use the ▲/**YES** or ▼/**NO** keys to increment/decrement in 1 min increments, or enter the two-digit number directly with the keypad. Leading zeroes must be entered (e.g., for a 3 min timeout, first enter **0** then **3**). If both numbers are not entered within 3 seconds, the display reverts to the previous setting.

13.10 CUE ENABLE (page 10)

Determines how to enable cue mode (**JOG/SHTL** wheel is active).

Procedure: Use the ▲/**YES** or ▼/**NO** keys to select between the following:

"Normal" (default) Moving the **JOG/SHTL** wheel or pressing the **CUE** key (it is illuminated continuously) automatically enables cue mode.

"Button" You must press the **CUE** key to enable the **JOG/SHTL** wheel.

13.11 LOC BEFORE PLAY (page 11)

When On (default), the master V-Eight will not play until all ADAT slaves have located to the master's tape location. When Off, initiating **PLAY** causes the master V-Eight to play immediately. Any ADAT slaves that are not at the master tape's location "catch up" while the master plays. This parameter is relevant only if ADAT slaves are online with tapes inserted.

Procedure: Use the ▲/**YES** or ▼/**NO** keys to select between On and Off.

13.12 MUTE UNTIL LOCK (page 12)

When On, V-Eight masters and slaves will mute the DACs until all V-Eights have locked. When Off (default), audio may be output from individual V-Eights prior to all machines establishing a lock.

Procedure: Use the **▲/YES** or **▼/NO** keys to select between On and Off.

13.13 DYNAMIC PUNCH (page 13)

When On and Record mode is pending (section 8.6.1), pressing any track **RECORD** enable key toggles between recording and playback. When Off, punching cannot be accomplished on a per-track basis using the track **RECORD** enable keys. All tracks must be armed before record mode is entered.

Procedure: Use the **▲/YES** or **▼/NO** keys to select between On and Off.

13.14 TRACK GROUPS (page 14)

This feature applies only if the V-Eight is connected to an optional Cockpit Remote control unit.
When Off, Cockpit Remote Track Groups are ignored (i.e. no Track Groups can be recalled from the Cockpit Remote). This prevents accidental group recording or erasing when using a Cockpit Remote. When On, Cockpit Remote Track Groups affect the V-Eights controlled by the Cockpit Remote and can therefore be recalled.

Procedure: Use the **▲/YES** or **▼/NO** keys to select between On and Off.

13.15 Save data to tape? (page 15)

Saves the table of contents (TOC) data, such as location points and names, tape offsets, track delays, etc., to the tape's data section. This operation will take about 2 minutes.

Procedure: Press **▲/YES** to save data (the **▼/NO** key has no effect). The tape rewinds immediately to the beginning while the display shows "Preparing to Save". The display then shows "Saving tape data". After saving, the screen reverts to "Save data to tape".

13.16 Load data from tape? (page 16)

Loads the table of contents (TOC) data from tape into the V-Eight.

Procedure: Press ▲/**YES** to load data (the ▼/**NO** key has no effect). The tape rewinds immediately to the lead and data sections, while the display shows "Preparing to Load". The display then shows "Loading tape data". After loading, the screen reverts to "Load data from tape".

13.17 TAPE (page 17)

Shows the length of an inserted tape (ST60, 120, 160, or 180) together with the PAL equivalent (SE90, 180, 240, 260). If no tape is inserted, the display shows "(Type unknown)".

This screen is display-only. There are no adjustable parameters, because the V-Eight automatically computes the tape length when the tape is inserted (i.e. "Calibrating", ... "Standby").

13.18 ID (page 18)

Shows the V-Eight device ID number. If the V-Eight is a master (ID01), the display will also indicate the number of V-Eights slaved to the master (up to 15).

This screen is display-only. There are no adjustable parameters.

13.19 USER BITS (page 19)

This page allows viewing user bits of the tape time code track, of the incoming SMPTE, or the internal generator.
When the time code track plays back, the display will be continually updated by the user bits data being read off tape.
If this page is entered while not in Play mode, it will display the last valid user bits read from tape.
If no time code user bits have ever been read from the current tape, or the tape is playing but there is no current time code track, the display reads "(no tc trk)".

This screen is display-only. There are no adjustable parameters.

13.20 ERROR RATE (page 20)

During playback or record, this screen shows the number of sync block errors per 14 drum revolutions (280 ms), from 0000...6720 (maximum number of errors possible). In any mode other than Play or Record, the display reads "----". Sync block errors are normally 100% corrected by the ADAT's error correction circuitry, but this display acts as a kind of early warning system. Errors of a properly-functioning V-Eight and tape typically fall in the 0000-0008 range. All errors are corrected, unless the "ERROR" indicator flashes in the main display between the tape counter and the reference counter; this typically happens when sync block errors are in the 25-100 range or above. Errors in the hundreds or thousands indicate severe problems with the tape or with the heads.
If the error rate increases significantly during the course of working with a tape, check performance with a benchmark or known good tape to see if the tape itself or dirty heads are at fault. If the tape is dropping out, clone the tape immediately to another V-Eight. If the heads are dirty, get them cleaned by a knowledgable technician, or, as a temporary fix, use an approved dry cleaning tape only.

This screen is display-only. There are no adjustable parameters.

13.21 FRONT PANEL (page 21)

This screen shows the current front panel software version. If you need to call technical support, make a note of this number before calling.

This screen is display-only. There are no adjustable parameters.

13.22 Code (page 22)

Displays the version and date of the V-Eight's operating system software. If you need to call technical support, make a note of this data before calling.

This screen is display-only. There are no adjustable parameters.

14 THE LRC REMOTE CONTROL

Note: Studer does not manufacture an LRC remote control; however, the LRC manufactured by Alesis is 100% compatible and will function as described below.

The hand-held LRC remote provides the following functions:

- Transport functions: ◀ or ▶ wind, **STOP**, **PLAY**, and **REC**.
- Autolocate functions: **LOC1**, **LOC2**, **LOC3**, **LOC4**, **SET LOCATE**, and **AUTO LOOP.**
- Track functions: **AUTO REC** and **REH MODE**.

These functions are the same as can be accessed from the front panel controls.

The **AUTO LOOP** key, which does not exist on the V-Eight's front panel, toggles both **AUTO PLAY** and **AUTO RETURN** functions on and off simultaneously with one key press.

Note: To enable the **AUTO PLAY** function by itself without the **AUTO RETURN** function (i.e. without looping), initiate a deferred play with the **PLAY** key – that is, press any of the **LOC1...LOC4** keys, followed by the **PLAY** key.

To use the LRC, plug it into the LRC REMOTE connector. If connected to the master V-Eight in a multiple-ADAT system, the LRC can control the entire chain of V-Eights.

15 TUTORIALS AND APPLICATION

This section gives guidance for entire procedures, assuming the basic familiarity with how the controls and menus work from the previous sections.

15.1 Multiple V-Eight operation

15.1.1 Overview

Because the V-Eight is ADAT-compatible, it can work together with up to 16 other ADAT-family machines to provide a total of 128 tracks.

ADAT machines have a sync bus that provides timing information and commands for all ADATs in a system. When linking multiple ADATs together, the first machine in the chain is the "master", and the rest are "slaves." Each slave locks to the master and synchronizes to the master machine's time reference.

Using the 8-channel ADAT optical Interface, you can also bounce tracks between machines in the digital domain. The result is a perfect copy (ideal for safety backups and archives) synchronized to the original with single-sample accuracy.

15.1.2 Synchronizing machines

Synchronization requires a dual male, 9-pin D-type connector cable for each slave to be synchronized. We recommend that you use Studer cables which are available in two different lengths: 30 cm (order no. 1.864.520.00) and 3 m (order no. 1.864.521.00). Other cables may cause erratic sync performance.

- To connect the bus (**POWER** *must be off!*), patch one 9-pin D-type connector cable from the master sync out to the slave sync in. A slave in a multiple machine system will automatically detect a master and enter slave mode. With more slaves, connect the slave 2 sync out to the slave 3 sync in, slave 3 sync out to slave 4 sync in, etc.
- Power on the machines from first to last, starting with the machine that features the special Cockpit Remote power supply cable (order no. 1.864.526.00; 15 m).
- After connecting multiple V-Eights and/or ADATS together and turning them on, the master's display will show "ID01" (identifying itself as the number 1 machine in the system). The second machine will display ID02, the third ID03, and so on. The ID order is automatically assigned according to how the cables are hooked up.

If a slave does not display an ID number on power-up, then it does not see anything connected to the **SYNC IN** connector. Check the cables and connections.

To check a machine's ID, go to Utility page 18.

15.1.3 Automatic ID renumbering

Machines in a multiple ADAT system will renumber their IDs if more V-Eights or ADATs are connected later. Suppose that machine 1 is the master, and machines 2 and 3 are slaves in a 3-ADAT system. If you turn on only machines 2 and 3, machine 1 will not be active, so machine 2 decides it's the master (ID01) and machine 3 the only slave (ID02). If you then turn on machine 1, the machines will renumber themselves so that machine 1 becomes the master (ID01), and machines 2 and 3 become the slaves (ID02 and 03, respectively).
Sync signals cannot pass through a machine that is turned off. For example, if machines 1 and 3 are turned on but machine 2 is turned off, machine 3 will not slave to machine 1 because the sync signal cannot pass through machine 2.

15.1.4 Master/slave interaction

Pressing any of the Transport, **AUTO REC**, **AUTO INPUT**, **PITCH MODE**, **ALL INPUT**, or **LOCATE** keys automatically triggers the same functions on the slave machine(s).
To minimize confusion, we recommend initiating all operations from the master, including transport control functions. When you press **PLAY** on the master, the slave(s) will locate to the same time code point and begin playing once sync is achieved.

Pressing **EJECT** on the master ejects all slaves' tapes as well. To eject only the master's tape, press and hold **PEAK CLR**, then press **EJECT** on the master.

When recording or punching-in on the slaves, initiate recording on the master but do not record-enable any master tracks (unless, of course, you need to record tracks on the master). Any record-enabled slave tracks will go into record, while the master will simply play. This is why track **RECORD** enable is an independent function for each slave.

There are two other functions where the slave(s) act independently:

- Formatting is initiated independently on each slave, however, simultaneous formatting on all slaves is possible.
- Digital Input is independent for the slave(s) as you may want to record via the analog inputs on some machines and the digital inputs on others.

15.1.5 Achieving lock

In a multiple-ADAT system, the slaves will "chase" the master (if the slaves' **SMPTE CHASE** keys are illuminated), and they can only enter record once they are locked. Audio will not appear at an ADAT's output until it is locked, as shown by an illuminated "LOCKED" indicator. For the fastest chase-lock performance in a multi-ADAT system, use the Locate points to go to different points on the tape, if possible.

15.1.6 Independent slave mode

Example: If the master V-Eight is stopped, each slave functions independently. Press **PLAY** on one of the slaves and it will play, but the other slaves and the master will not respond. However, any time you press **PLAY** on the master or initiate any transport function, it will take over and control all the slaves.

15.1.7 Formatting multiple tapes

Formatting works similarly to formatting on a single ADAT, however, there are some considerations unique to formatting multiple tapes. For more information on formatting, refer to section 4.

Master format enabled, complete format:

If the master's **FORMAT** key is illuminated, performing a complete start-to-finish format, and the slave tape is not already formatted:

- If the slave's **FORMAT** key is illuminated, the slave rewinds to the start of the tape and does a complete format along with the master.
- If the slave's **FORMAT** key is dark, the slave rewinds to the start of the tape and plays, but the TIME counter reads "noFO" (no format) while flashing the **FORMAT** key.

If the master's **FORMAT** key is illuminated, performing a complete start-to-finish format, and the slave tape is already formatted:

- If the slave's **FORMAT** key is illuminated, the slave rewinds to the start of the tape and does a complete format.
- If the slave's **FORMAT** key is dark, the slave rewinds to the start of the tape and plays in sync along with the master.

Any record-enabled channels will start recording at time 0:00:00.00.

Master format enabled, format extend:

If the master's **FORMAT** key is illuminated, you are extending the format, and the slave tape is not formatted, the slave plays, but its time counter reads "noFo" (no format) while flashing its **FORMAT** key.

If the master's **FORMAT** key is illuminated, you are extending the format, and the slave tape is formatted:

- If the slave's **FORMAT** key is illuminated, the slave autolocates to the same time as the master, then format extension begins along with the master.
- If the slave's **FORMAT** key is dark, the slave autolocates to the same time as the master and plays or records in sync.

To properly extend the format, the master and slaves should be playing in sync (i.e. the "LOCKED" indicator is illuminated) before punching into format record.

Master format disabled:

If the master's **FORMAT** key is dark, you initiate record anywhere on the tape, and the slave's **FORMAT** key is dark:

- If the slave tape is unformatted, the slave plays, but the Time counter reads "noFo" (no format) while flashing the **FORMAT** key.
- If the slave tape is formatted, the slave autolocates to the same time as the master and plays or records in sync.

To properly punch-in, the master and slave should be in sync before punching. Otherwise, the master will punch-in immediately, but the slaves won't punch-in until sync is achieved.

Master format disabled, format extend:

If the master initiates recording from the audio portion of the tape and the slave's **FORMAT** key is illuminated:

- If the slave tape is unformatted, the slave plays, but the Time counter reads "noFo" (no format) while flashing the **FORMAT** key.
- If the slave tape is formatted, the slave autolocates to the same time as the master, then format extension begins.

If the master initiates recording from the start of the tape and the slave's **FORMAT** key is illuminated, start-to-finish formatting begins regardless of whether the slave tape is formatted or not.

15.2 Digital backups

You can create safety copies of V-Eight tapes by copying all eight tracks to another V-Eight (or ADAT-compatible machine) via the digital bus.

It is recommended to create a backup whenever you have irreplacable material on tape.

Synchronizing two machines via the 9-pin sync bus allows for making sample-accurate copies, referred to the internal time code. *This is preferred.* Without the sync connection, you can simply start recording on the slave and play back from the master. This faithfully copies the audio information, but in all likelihood there will be a timing offset between the two tapes.

Here's the procedure for creating a backup tape:

Action	You do...	You see...
Synchronize the master and slave	Connect a male/male, 9-pin D-type connector cable between the master Sync Out and the slave Sync In	The master becomes ID 01 and the slave ID 02 on power-up
Establish digital audio connection	Connect a fiber optic cable between the master optical DIGITAL OUT and the slave Optical DIGITAL IN	No visible change on machine
Load machines with tapes	Insert the tape to be backed up into the master, and a blank or formatted tape into the slave	"EJECT" indicators are dark
• To make a 20-bit backup, both machines must be Type II with tapes formatted in 20-bit mode. • If the tape is unformatted, put the slave into Format mode (refer to section 4). If the tape is partially formatted, the slave tape needs to have its format extended (refer to section 4.5). • For safety's sake, write-protect the tape to be copied by sliding open or breaking off the tape's write protect tab.		
Return both machines to a common start point	Press the **ZERO LOCATE** key	Both Time counters read 0:00:00.00
Enable optical inputs	Select "DIG SOURCE": "ADAT OPTICAL" on both the master and slave V-Eight	"DIG SOURCE" block shows "ADAT OPTICAL"
Enable all slave tracks for recording	Press all slave track **RECORD** enable keys	The track RECORD enable keys and the "REC" indicators for all slave tracks will flash.
Be sure that the track **RECORD** enable keys are switched off for tracks 1...8 of the master V-Eight		
Initiate tape cloning	Press both **PLAY** and **REC** on the master	Both machines start, track **RECORD** enable keys and the "REC" indicators on slave machine are illuminated continuously
End backup	Press **STOP** on the master after backup is complete	Both machines stop

15.2.1 Dealing with damaged tape

If a tape is in very bad condition, it may be difficult to copy it from the master to a slave. If there are so many errors that the V-Eight momentarily loses sync during playback, all slaves will be taken out of record automatically. In this case, put the new tape into the master, the damaged tape in the slave, and copy from the slave to the master.

15.2.2 Making a 16-bit copy from a 20-bit master

With over 100,000 ADAT 16-bit Type I machines in use, you may neeed to trade tapes with someone who owns an older machine. You can still work with the V-Eight in 20-bit Type II mode, and make Type I "clones" for use in older machines. You can also use an older Type I machine as a slave to a V-Eight, using the same procedures and hookup listed earlier in this chapter.

It is recommended to create 16-bit "clone" tapes using *dithering*, a process that provides better apparent resolution than standard 16-bit copies (however, do not add dither if the material will be re-dithered later on). The process is the same as making a standard backup, except that you select a dithered 16-bit output from the master, as described in section 13.1.

15.3 Recording digital audio from other sources

Recording digital audio onto the V-Eight from a source other than an ADAT-compatible device requires a digital audio interface, like the Otari UFC-24 or Kurzweil DMTi, or inserting an optional Studer EC-1 AES/EBU interface into the V-Eight's rear-panel expansion slot. These convert other digital audio formats to the ADAT optical format. The Studer EC-1 card can also output audio recorded into a hard disk editing program as ADAT optical format-compatible signals.

When recording digital audio into the V-Eight from another ADAT-family device in a multiple ADAT system, the V-Eight recording the audio is already synchronized with the other machines because all slave machines are automatically set to External Clock mode. They follow the master precisely.

When recording digital audio from some other source, the V-Eight must synchronize its clock to the incoming digital audio. How this is done depends on whether you are using a single V-Eight or a multiple ADAT system. We will assume the incoming digital audio is being carried by an ADAT optical interface cable, perhaps from a Studer EC-1 card.

With a single V-Eight, connect the incoming optical out (e.g., from the Studer EC-1 card) to the V-Eight's optical DIGITAL IN using a single fiber optic connector. Press the V-Eight's **CLOCK SOURCE** key, and set its "CLOCK SOURCE" to "OPTICAL". The V-Eight will synchronize to the clock information present in the optical digital out.

In a multiple ADAT system, you have two choices: synchronize the digital audio source to the ADAT system (as described above for a single ADAT), or sync the ADAT system to the digital audio source.

If the source does not have a clock input (i.e., it cannot sync to an external clock), you need to select the latter option. Connect the optical DIGITAL OUT to the master ADAT's optical in, whose optical out already connects to the next slave, and so on. Set the master's "CLOCK SOURCE" to "ADAT" or to "I/O card" when using the AES/EBU interface. If no digital audio clock is detected, the master V-Eight will continue using its own internal clock. When the master receives digital audio (and therefore, a digital clock), the master V-Eight will sync to the incoming digital clock.

15.3.1 Digital clock considerations

Switching between the V-Eight's two internal clock sample rates (48 kHz and 44.1 kHz), changes the reference used for computing tape location. Therefore, the same tape location will appear to have two different time addresses depending on the selected sample rate.

Since the V-Eight cannot detect an external clock's sample rate, you need to select the reference base the V-Eight should use to calculate tape position while syncing to the digital clock. Select either "48k" or "44.1k" with the **SAMP RATE** key.

If you hear clicks in the audio after recording from a digital source, either the Clock Source is set incorrectly, or there is some other timing problem. Most commonly, clock problems are the result of trying to use SMPTE chase and receive digital input simultaneously, where the digital source itself is not chasing the same SMPTE or clock reference as the V-Eight, or the SMPTE isn't referenced to digital clock. There must be one, and only one clock source in a multi-machine system.

15.4 Combining V-Eights and ADATs

15.4.1 V-Eight transport speed

The V-Eight's transport speed is much higher in engaged mode than the one of the original ADAT. Because of this and other unique features, make the V-Eight the master (ID01), and any ADAT(s) should be the slave(s).
When locating, the V-Eight will locate to a specific tape position, stop, and wait for the ADAT(s) to catch up. Therefore, until you need more than 8 tracks, don't put any tape(s) into the slave unit(s) so that the V-Eight won't have to wait for the slave(s) to locate.

15.4.2 Sample rate vs. pitch control

The V-Eight's **SAMP RATE** function, which allows choosing between 48 kHz or 44.1 kHz sampling rates, was not directly available on the original ADAT. This function also allows selecting a digital clock for applications involving the recording of digital audio from a non-ADAT source.

The V-Eight writes sample rate information when formatting a tape, so that it automatically knows a formatted tape's sample rate (even though either rate may be used).

Example: When playing back a tape formatted at 48 kHz with the sample rate set to 44.1 kHz, the "44.1k" indicator will flash, to indicate that you are using 44.1 kHz but it isn't the original sample rate used when the tape was formatted. The same happens when you play back a tape formatted using 44.1 kHz with the sample rate set to 48 kHz; the "48k" indicator will flash.

The V-Eight Pitch Control supplements the sample rate selection. With the original ADAT, you had to pitch down a tape to play back at a 44.1 kHz sample rate. If you play back a tape that was formatted on an original ADAT, it will not have any sample rate information written on it. The V-Eight will automatically select the 48 kHz setting. If you had been pitching-down such a tape to play at 44.1 kHz, you must press the **SAMP RATE** key to manually change the V-Eight's sample rate to 44.1 kHz.

15.4.3 Input monitoring

The original ADAT was designed so that when monitoring a track's input signal, you heard the actual analog input – the signal did not pass through the A/D and D/A converters. There was an advanced feature, accessed by holding **SET LOCATE** and pressing **ALL INPUT**, that allowed monitoring after the converters. This allowed hearing exactly

how the signal would sound when played back from tape.
The V-Eight monitors the input signals through the converters at all times (unless overridden as described in section 8.6.4). This creates a slight delay as the digital audio passes through the converters' buffers. If you were to listen to both the original signal on your mixer and the tape return of the same signal coming back from the V-Eight, the V-Eight's delay would cause some phase cancellation when combined with the original signal. Therefore, it is important that you either monitor the original signal or the tape's input signal on your mixer, but not both.

Polarity differences:

The original ADAT inverted the polarity of the signal being recorded on tape, then flipped polarity again before going to the **LINE OUT** connectors. As a result, the output was the same polarity as the input, so no phase problems were possible when using a single ADAT or a multiple ADAT system.

However, neither the digital input nor the digital output was inverted. Therefore, if one transfers the ADAT's digital audio data to a DAT machine or hard disk recording system (using the AI-1 or a similar digital interface), the audio output from the other device would likely be out of phase with the ADAT, since it probably does not invert the analog signal after its D/A converters. Although this in itself will usually not be a problem, it may cause some confusion if multiple correlated audio signals are combined from multiple sources since there is a possibility that signals could become out of phase.

To prevent this from occurring, with the V-Eight the polarity remains constant from the analog to digital and back to the analog domain. Like the original ADAT, the result from one machine, or multiples of the same machine, is the same: The input to output phase is correct. However, if two cloned tapes (copied digitally either with ADATs, V-Eights, or both) are played back in sync on both an ADAT and a V-Eight, the outputs of the two machines will be out of phase relative to each other. Since it does not usually serve any practical purpose to play the same signal from two different tapes with two different model machines simultaneously, this should not present a problem for you. This design improvement is only mentioned here to explain this possible situation should you happen to experience it.

Possible problem:

Let's say you had been using a multiple ADAT system and you recorded a stereo signal across two machines (a stereo drum recording on tracks 8 and 9), where there is a common element to each track (i.e. center signal). If you replace one of these machines with a V-Eight, the result would be that the track being played back on the V-Eight will be out of phase from the track played on the ADAT, canceling the center signal.

Possible solutions:

- Use a phase switch on your mixer (if your mixing board provides this) to invert the phase of the problem track to compensate.
- Wire your patchbay to reverse the input and output polarity of the V-Eights in the system, but use standard cables on the ADATs in the

system. This is recommended only for studios where master tapes will be exchanged between units or sent out of house.

- Digitally bounce one of the stereo tracks to the other ADAT so that both sides play back from the same machine.
- Most importantly, plan recording sessions so that stereo tracks reside on the same physical tape in a multiple ADAT system.

Note: If you overdub over an older ADAT tape in a V-Eight, that track will now be in phase.

15.5 Setting up inputs

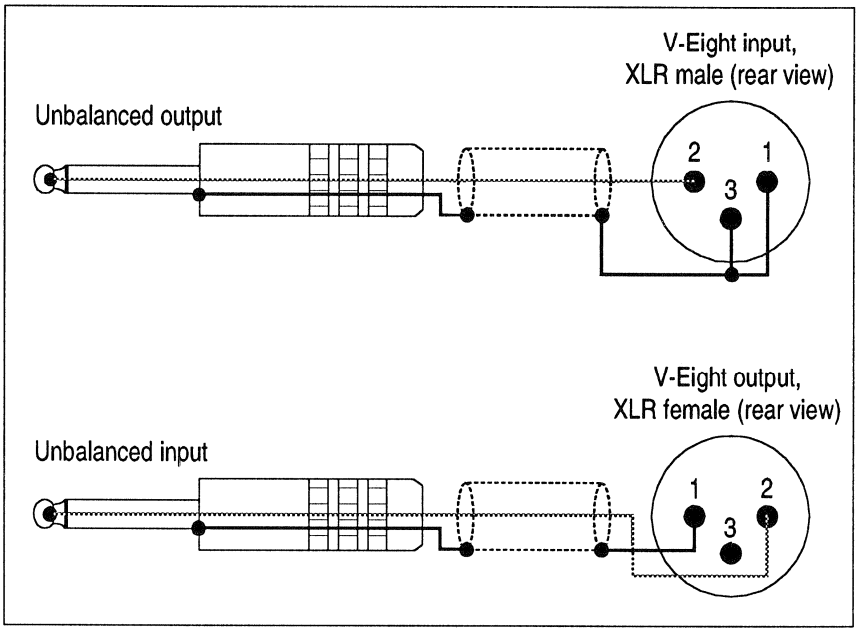
The V-Eight offers unparalleled flexibility in terms of setting up inputs for recording: signals can come from analog sources, digital sources (ADAT optical or from an optional Studer EC-1 AES/EBU interface), or a combination of the two. As a result, it is important to understand the proper procedure for selecting the right sources for the right inputs. The following gives an overview of the process; for more details, refer to section 6.

1. If you are going to be using any digital sources, specify "ADAT OPTICAL" or "AES/EBU" using the **DIG SRC** key.
2. Decide which track pairs will accept analog inputs, and which will accept digital inputs. To do this, first press the **INPUT SEL** key. Each press of one of a track pair's track **INPUT** enable keys toggles between analog and digital (from the digital source selected in step 1). A small "D" or "A" indicator is illuminated under the level meters to show the selected input source.
3. Set up the input routing for the analog signals by pressing the **INPUT ROUT** key. This function determines which inputs go to which tracks. For more details, refer to section 6.4.1.
4. Set up the input routing for the digital signals. Press the **INPUT ROUT** key twice (or only one more time if you are already in the analog routing page). There can be a simple one-to-one correspondence (e.g., input 1 goes to track 1, input 2 goes to track 2, etc.), or tracks can be reassigned.
5. To reassign tracks, when in the digital routing page, press the track **INPUT** enable keys for the desired digital source tracks. When you record-enable tracks, the lowest-numbered source track will be assigned to the lowest-numbered record enabled track; the next-lowest-numbered source track will be assigned to the next lowest-numbered record enabled track; and so on.

Your inputs are now set up to record from the desired source tracks.

15.6 Unbalanced input and output signals

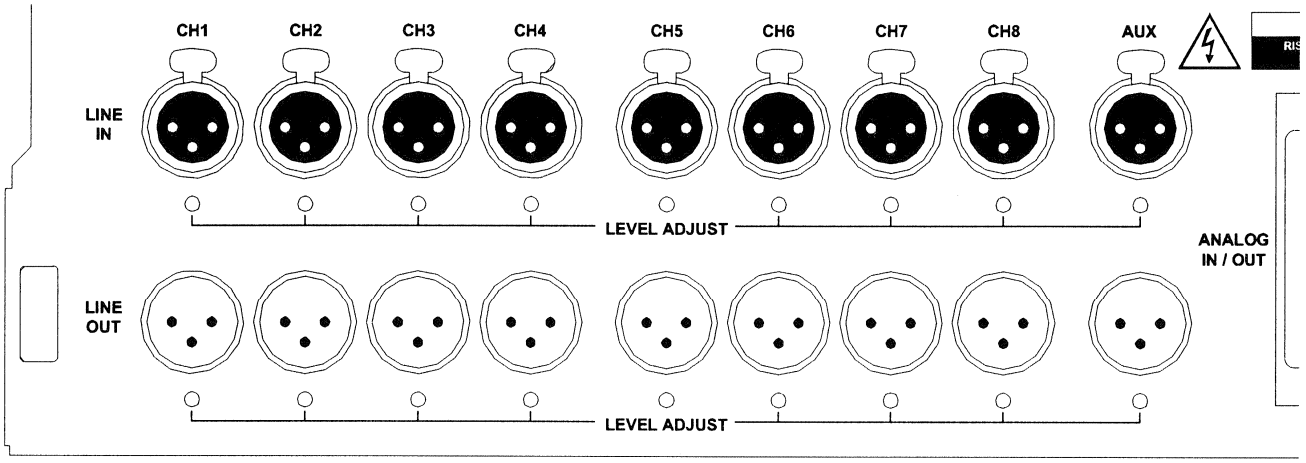
It is possible to use unbalanced signals with the V-Eight, however you will need adapters like the following:



Note: It is probable that unbalanced lines will not have enough level to drive the V-Eight, and will require additional amplification, or the input trimmer potentiometers of your V-Eight must be adjusted to accommodate lower levels. The standard factory setting is +19 dBu = 0 dB_{FS} (just before clipping). A mixer with a standard output of +4 dBu at 0 VU should light "–15 dB" on the V-Eight's meters (refer to the next section for adjustments).

15.7 Line in and out level setting

Each line input and output including the AUX channel has its own trimmer potentiometer being accessible from the rear panel. Each trimmer potentiometer is located next to the corresponding XLR connector. These trimmer potentiometers are factory-set to +15 dBu for 0 dB_{FS}; they have to be adjusted only if the input sensitivity and/or the output level of your V-Eight must be matched to the operating environment.The setting range is from +6...+26 dBu.



Alignment procedure:

- Set the inputs to "ANALOG".
- Switch to **INPUT**.
- Select display mode "VU Meter scale: fine dB" (refer to section 7, "metering").
- Verify the selected headroom value in display mode.
- Connect an analog, balanced audio generator to the line input to be adjusted. Level: Desired line level for full-scale modulation, minus the selected headroom.

Example: If a level of +20 dBu for 0 dB_{FS} is desired, and headroom is set to 12 dB, the generator level must be set to +8 dBu.

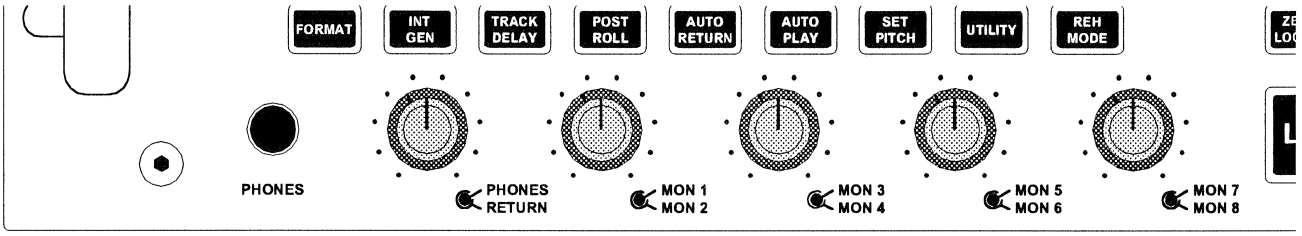
- Adjust for a level meter reading of 0 dB with the LEVEL ADJUST trimmer potentiometer located directly below the line input connector to be adjusted.
- Connect an audio voltmeter to the corresponding line output.
- Adjust to the same level as has been set on the generator.

If a digital audio generator and a digital audio analyzer are additionally available, these settings can be performed directly, without using the internal level meter display.

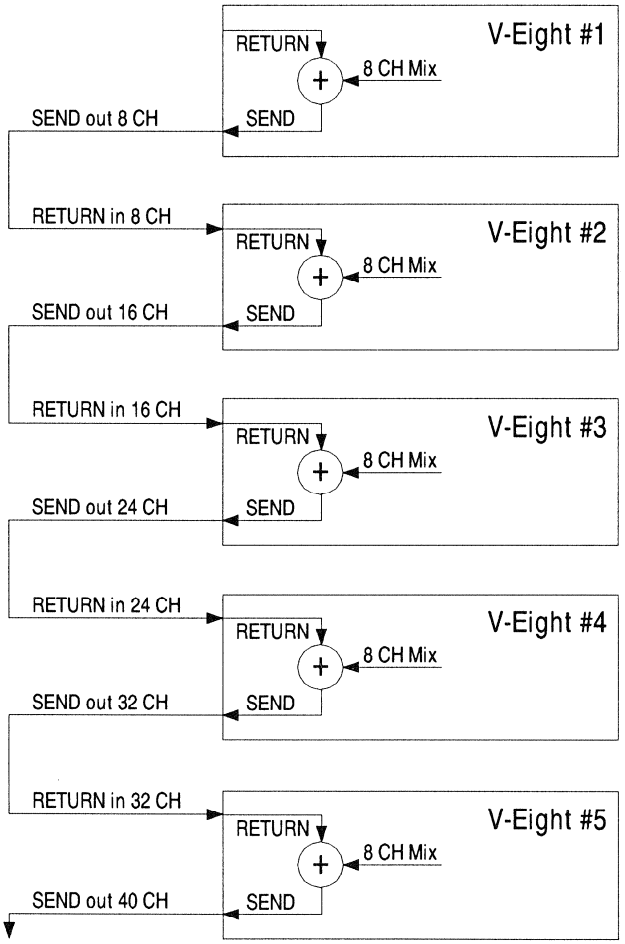
15.8 Monitor mixer

The **MON 1...MON 8** dual-concentric potentiometers on the front panel are used to set the monitor mix level for each audio channel. This mono mix appears on the **PHONES** output, which has its own level control on the fifth dual-concentric potentiometer. Simultaneously, the mix is fed to the two rear-panel XLRs labelled **MONITOR** and **SEND**.

The **MONITOR** output contains only the machine's own mix, while the **SEND** output contains the machine's own mix together with the signal fed to the **RETURN** connector; the level of this signal can be adjusted by means of the **RETURN** potentiometer.



In practical use, you will daisy-chain the **SEND** outputs and the **RETURN** inputs, as is illustrated below. In this way you can monitor the channels mixed from all machines at the outputs of the last unit.



15.9 Updating software

The V-Eight accepts software updates via MIDI. This allows Studer to offer improvements and changes to the operating system without the unit to be professionally serviced.

The fastest way to update the software is to go to the Studer web site (http://www.studer.ch). Go to the "Software" section, and locate the area containing V-Eight software updates.

Files are in standard MIDI file format, and can be downloaded directly as MIDI files, or as *.hqx (binary encoded) files. Usually downloading MIDI files is the easiest method. However, if you have experienced problems in the past when downloading MIDI files, the *.hqx types might be a better option. You may have to install an hqx decoder for Windows. WinZip will also work. Mac users can use Stuffit to decode *.hqx files.

After downloading, import the file into a MIDI sequencer or other device capable of playing back MIDI files. It should be able to handle fairly long sysex dumps.

Before plugging the MIDI cable from your MIDI sequencer to the V-Eight MIDI in, first check the output with a MIDI activity indicator. You want to make sure that your MIDI device is indeed capable of transmitting the data before trying to load it into the V-Eight. Loading incomplete or corrupted data into the V-Eight could require a trip to the repair shop. As a precaution you may wish to save the existing V-Eight software in your unit to a MIDI file as a backup, in case there is something wrong with the downloaded version. Once you verify that your MIDI device is sending data, proceed.

For example, if you import the file into Cakewalk™, a dialog box appears that says "File has System Exclusive auto send banks. Send them now?" Click on yes. With Mac sequencers, you may need to press **PLAY** after importing the sequence, or use the Freeloader™ utility, to start transmitting the Sysex (this will take about 12...15 minutes).

Software updating has been tested with Cakewalk™ on the PC and Cubase™, Vision™, and StudioVision™ on the Mac. Other programs are likely to work as well; testing will continue after the release of the V-Eight, and results will be posted on the web site.

If you do not have access to the web or to MIDI sequencers, contact your Studer dealer about alternate ways to update your software. A simple MIDI connection from an other V-Eight with the new software can update your unit in less than 15 minutes.

16 V-EIGHT SMPTE SYNCHRONIZATION OVERVIEW

This section is an overview of the V-Eight's SMPTE time code features, in addition to the basics covered in section 11. Before you design a synchronization system, and particularly if you have not used time code before, please read this section carefully. It is impossible for any manual to cover all the possible combinations of synchronizers, decks, automated mixing consoles, sequencers, and video editors; but a solid understanding of synchronization principles will help you to be successful no matter what equipment you plan to combine with the V-Eight.

16.1 Synchronization basics

When machines are *synchronized,* they move together at exactly the same speed, passing through corresponding locations. To do this, there must be some kind of time marker recorded continuously on each machine, along with the audio and video tracks. One machine must be designated the *master* or controlling machine, and others are considered *slaves.* Each slave machine must have the intelligence to compare the incoming time signal from the master machine to its own location, and speed up, slow down, or locate to match the master's position. When it's doing this, this is called *chase* mode.

16.1.1 Master or slave?

The V-Eight may be used as master or slave because of its built-in time code synchronizer. When it's a master, you command the entire recording system by using the transport controls on the V-Eight (or on the Cockpit remote). The V-Eight's TC OUT connector will issue SMPTE time code (depending on the parameters you set) to video or other audio decks. If they are also equipped with synchronizers and are in chase mode, they will follow the V-Eight system's lead.

When the V-Eight is used as a slave, it receives time code from the master (a video deck, hard disc recorder, or edit controller) and moves to match it, depending on the V-Eight's time code and SMPTE chase parameters. On a slightly higher level, it may also receive direct commands (play, rewind, record etc.) from a controller via MIDI machine control or (when 2.0 software becomes available) via the RS422 port.

16.1.2 Digital timing requirements

In addition to SMPTE time code synchronization, digital audio recording has its own synchronization needs. When recording from a digital source (either ADAT optical or the optional Studer EC-1 AES/EBU interface), the V-Eight's speed must match the flow of digits as they come in. This can lead to certain problems that analog recorders did not face.

For example, suppose you have the V-Eight in SMPTE chase mode, following time code and video clock from a VCR. You want to record a sound effect from a CD player digitally into the AES/EBU card at a certain cue. But at the cue, when you press PLAY on the CD player, you notice clicks and pops in the audio. What happened?

The CD player's digital clock is uncontrolled. The V-Eight normally would automatically synchronize to an incoming digital signal, but in this case it's following the video deck which is travelling at its own speed. Since a slave cannot follow two masters, the slight timing discontinuities appear as clicks and pops as samples are lost. Depending on your equipment, there may be several ways to solve this problem; but in any case the solution will involve the "One-Clock" principle described below.

16.2 The "One-Clock" principle

To prevent synchronization problems, every piece of equipment in the system must ultimately refer to the same clock. There may be only one master at a time, and all others must follow it. If different types of clock are required by different pieces of equipment, all slave clocks must be derived from or synchronized to one master clock. For example, there must be exactly one frame of video for every SMPTE time code frame, and exactly the right number of digital samples for each frame.

If you violate the "One-Clock" principle in your system design or operation, the consequences will range from the severe (ticks and pops in the audio, sudden fast-forwards or jumping out of record) to the less obvious (an increasing drift in the lock between different machines as they travel).

16.2.1 House sync

For a system to operate smoothly, you need all your audio gear taking "sonic pictures" and your video gear taking pictures at the same rate. Professional video houses achieve this by having a *black burst* or *house sync* generator with a clean, steady, wow-and-flutter-free video signal distributed to all VCRs in a building. Several companies make these kinds of generators, and for complex systems a unified video/word clock/AES black generator (such as MOTU's Digital Timepiece™) may be the best solution. Depending on your system, you would connect the house sync signal to the V-Eight's VIDEO IN or WCLK IN connectors.

16.2.2 "Gen-locked" time code

A solid and steady video or digital reference by itself is not enough, because only SMPTE time code carries the actual data of hours, minutes, seconds, and frames required for a chase-lock system. *A common mistake is to generate "wild" time code being not referenced to the video or digital signal.* In other words, your time code generator must start its frame message at the exact same time when the video signal is starting its scan of the frame, and the first sample of the digital audio is going to the converters.

Just because it's time code doesn't mean it's going at the same rate as everything else in the system. By common standards, it may seem right, but even small errors add up when you divide each second into 48,000 slices. This brings to light another important principle: Understanding the difference between *location references* and *clock references.*

16.3 Reference counters vs. clock sources

A wristwatch indicates the passage of time in two ways. One is the face of the watch giving the information of hours, minutes, and seconds. The other is the "ticking" of the watch several times per second. Conceivably, you could always know what the time is by looking at the face of the watch one time, then counting how many ticks had elapsed. In video, the "ticking" is provided by the edge of the video fields (approximately 60 per second), and in digital audio by the number of samples (48,000 per second).

When locking the V-Eight to video or to another digital recorder, it's important to understand the distinction between the location reference and the reference clock. The row of keys below the V-Eight's main display allow you to set these two clocks independently from each other, because they have slightly different functions.

16.3.1 Location reference

Location reference describes the actual position (or *tape location)* of each device. This is usually determined by the SMPTE time code coming from each machine being synchronized. Unlike reference clock, location reference always knows exactly where it is, because the time reference information (hours, minutes, seconds, frames) is embedded in the code.

The ADAT format used in the V-Eight has two different location references recorded on tape:

1. *ABS time* is the sample-accurate time code written on every formatted ADAT tape. Every ADAT machine can read ABS time, which counts the number of minutes and seconds from the head of the tape, starting at –00:05 (after 15 seconds of lead and 2 minutes of data), continuing to about 40 minutes at the end of a typical ST-120 tape. There is *never* a break or interruption in the ABS time of a properly-formatted ADAT tape, and it *always* starts at zero. It is the ABS time which is transmitted via the ADAT SYNC link to all ADATs in a multi-ADAT system, so they can sync to the ID01 ADAT.
2. *TC track* is a read/write SMPTE time code track recorded in a subcode area separate from the ABS time. The TC track is only readable in ADAT machines with TC track capability (currently, the Studer V-Eight, the Alesis M20, and the Fostex RD-8). Unlike ABS time, the TC track can be blank, have interruptions, start at any hour/minute/second/frame desired, and/or be *discontinuous* (i.e., jump in values) if it was recorded that way. In a typical multi-ADAT system connected via the ADAT SYNC link, only the lead (ID01) V-Eight uses its TC track as a location reference. The ADAT slaves (ID02 or higher) do not know the master's SMPTE time; they only know the ABS time and chase to that. The V-Eight allows you to select either of these references as a chase reference or as a tape counter at any time.

16.3.2 Reference clock

Reference clock is the "heartbeat" of your studio. It is a constant, steady "ticking" without any other information, connected to all synchronizer systems in your studio. Black burst video and word clock are both forms of reference clock. Reference clock has no regard for time code position, but instead is concerned only with making everything travel at exactly the same speed. In a digital audio-to-video synchronization system, all elements (the SMPTE time code, the digital sample rate, and the video frame rate) must advance in lock-step with each other.

Another illustration of the need for reference clock comes from the video world. In order to make clean edits between several video recorders, all video sources must display their pictures at the same rate, with the frame edges occurring at exactly the same time. If each VCR were left to run freely on its own, the transports would move at slightly different rates, the respective pictures wouldn't line up, and we'd see a black bar (the vertical interval) roll through the picture every time an edit was made. By referencing all VCRs to house sync, they all start each frame simultaneously.

In a typical 3-deck video editing situation, note that the location references are usually intentionally different, but all reference clocks are unified: A shot at 02:30:44:00 may be followed by a segment whose location is 14:02:00:15 (and so on), but the master deck recording video and the two slave decks sending video all start their pictures at the top of the video screen simultaneously.

This introduces another concept important to successful and flexible synchronization: The *offset.*

16.4 Offsets in the V-Eight

An offset is an intentional difference in location between decks. In the simplest situations, offsets are not required: When it's 2 o'clock on the master, it's 2 o'clock on all the slaves. But more often, tapes were recorded at different times, in a different order, and now must be edited together at a particular sync point.

In the V-Eight, there are two different chase references which may provide time code: ABS time and tape time code (SMPTE). Most of the time, these two codes will not match numerically (although they should advance at exactly the same rate). You may use offsets to transform any ABS or SMPTE location to any time code desired, depending on the needs of your project.

Example: While ABS time always begins at 00:00:00 on every ADAT tape, it is customary for SMPTE time code to start not earlier than 00:58:00:00. You can set the ABS offset so that the internal generator will issue SMPTE time code at 58 minutes after midnight at the actual ABS location zero.

There are three different places to set offsets in a V-Eight system: SMPTE chase offset, internal generator ABS offset, and tape offset.

16.4.1 SMPTE chase offset

This is set in the first page of Edit SMPTE chase mode (see section 11.6.1).

The SMPTE chase offset is used to offset the V-Eight from incoming time code. It is added to the ABS time to equal the SMPTE tape counter display. If the V-Eight is slaving to an external time code source, the SMPTE chase offset will be added to the chase reference (either ABS or tape TC) to offset the V-Eight from the incoming master time code.

Example: If the SMPTE chase offset is 4 hours, the chase reference is ABS time, and **TC SOURCE** is "EXTERNAL", when the SMPTE IN reference counter is 04:30:15, the V-Eight will chase to ABS location 00:30:15.

Note: The tape counter SMPTE display is always based on ABS time plus the SMPTE chase offset, even when the CHASE reference is set to "Tape TC". This may lead to confusion in applications where tape TC was recorded without reference to the ABS time for some reason. But despite the "SMPTE display" not matching the incoming time code, it does synchronize and chase to the tape TC plus the SMPTE offset. To avoid confusion, set **TAPE COUNT** to "ABS".

16.4.2 Internal generator ABS offset

This is set in the ABS/start offset menu, pages 2 and 3 (see section 11.7.3).

This is used when you want to issue time code from the V-Eight based on the ABS time plus an offset, usually to record on the TC track of the V-Eight and/or an external recorder. This is most often used when pre-striping tapes, or when the V-Eight is a master in a system.

Example: If the ABS offset in INT GEN is set to 12:00:00, and the **INT GEN** and the **TC INPUT** enable keys are illuminated, the V-Eight will generate SMPTE time code starting at 12:00:00 at ABS time 00:00:00. To see this clearly, set **TAPE COUNT** to "ABS TIME" and **REF COUNT** to "INT GEN".

When you rewind or fast forward the V-Eight in this mode, it will not issue time code from the internal generator unless you enter play mode again (at which point the INT GEN display will immediately "catch up" to the ABS time plus the offset).

16.4.3 Tape offset

The tape offset function in the V-Eight, as in all ADATs before it, is designed for offsetting one ADAT from another, usually for the purposes of digital copying one section of tape to a different location. In a multi-ADAT system, **TAPE OFFSET** allows any ADAT to be ahead of or behind the master time location. *But the* **TAPE OFFSET** *key cannot be used for setting an offset from incoming SMPTE time code, which is set in the first page of the SMPTE chase menu.* Tape offset in SMPTE chase mode is exclusively for offsetting slaves from the master (ID01) ADAT.

If you press **TAPE OFFSET** on the top ID01 ADAT, it turns on **TAPE OFFSET** on all ADAT slaves, too, and sends them a message setting their tape offsets so they will be ahead of or behind the master ADAT by the specified amount. This overwrites the slaves' tape offsets, no matter what they were previously.

If the tape offset of a slave ADAT (ID02 and above) is turned on, only that particular machine will be offset. Each slave may have its own tape offset (but, as noted above, if you turn the master machine's **TAPE OFFSET** on, the slaves' offset values will be overwritten).

If the master ADAT is in SMPTE chase mode and has a tape offset, this will *not* affect the relationship between the master ADAT and the incoming time code *(effective with V1.01 software.)* Any ADAT slaves below the master will be offset from the master, and from incoming time code, by the specified amount.

Example: If the top V-Eight is in SMPTE chase mode with ABS as the chase reference, a SMPTE offset of –1 hour, and a tape offset of –10 minutes, incoming time code of one hour will cause the master to chase to 01:00:00 SMPTE time (00:00 ABS time). The slave V-Eights or ADATs will be at 01:10:00 SMPTE time (10:00 ABS time), as long as their **TAPE OFFSET** keys are illuminated.

If a slave ADAT is offset to a point outside the tape range (for example, if the master is at a point that puts the slave at the lead section at the beginning of its tape), the message "Tape Offset Standby" will appear. When the master advances to a point where the slave is past 00:00:00 ABS time, audio will start automatically.

16.5 SMPTE time code rates and types

SMPTE time code is the universal standard for transmitting location reference in audio and video systems. SMPTE is primarily a location reference, though it may also be used as a reference clock if necessary, because its signal is sent on a pulse-width modulated audio tone. It transmits time as hours, minutes, seconds, and frames; by looking at the tone, it may be divided into *subframes*. The V-Eight can read and generate SMPTE time code in any one of several formats.

The Society of Motion Picture and Television Engineers (SMPTE) agreed on several code rates to accommodate the needs of film and television work all around the world, which already had different television standards. The frame rate of television in the US was originally 30 frames per second (fps) for black-and-white transmission, which slowed for technical reasons to 29.97 fps at the advent of color television (i.e., the NTSC standard). The standard television frame rate in Europe and many other parts of the world using the PAL/SECAM standard is 25 fps, and the standard film rate is 24 fps worldwide. When transferring between American television and film (the *telecine* process), slight 0.1% variations on the frame rate are necessary in some situations. This is called *"pull-up"* and *"pull-down"*.

16.5.1 Drop frame

In addition to the different SMPTE rates, there is a need to number or count the frames differently in NTSC systems. The two slightly different speeds (29.97 vs. 30 fps) leads to a problem: If the SMPTE time code numbers 29.97 frames as if there are 30 per second, a progressive error occurs. After half an hour, the SMPTE reader will show "00:29:58:06" instead of "00:30:00:00" – almost two seconds short of real time. By using the "drop frame" frame counting feature of SMPTE time code, certain numbers in the frame sequence are skipped so that real time and SMPTE time agree. Note that this is only a numbering convention: Frames are not actually lost, they are just counted differently. An analogy is when we add February 29 to our calendars during leap years to keep our counting of days in sync with the seasons of the year.

SMPTE time code carries a bit identifying the code as drop or non-drop code, so all receivers will know the counting method being used. If you are trying to locate to a particular frame (i.e., the 00 or 01 frames at the start of most minutes) and it "doesn't exist", this is because the code is drop frame.

Tip: Drop-frame code is typically used with the 29.97 fps rate, and non-drop with the 30 fps rate. Most music projects use 30 non-drop if they're not syncing to NTSC television. The use of non-standard codes (29.97 non-drop, and 30 drop frame) should be limited to special circumstances.

Check with the other people on your project to find out the best rate to use.

16.5.2 Auto-detection of SMPTE rates

When the V-Eight is set to synchronize to an external SMPTE source, it will automatically detect if the incoming time code rate is 24 or 25 fps. It will also automatically detect if the incoming code is drop frame or not.

But since the speed difference between 29.97 and 30 fps is small (only 0.1%), the V-Eight will default to the 30 fps rate. *If your project is supposed to run at 29.97 fps, manually set it to that using the* **SMPTE RATE** *key.* Otherwise, your audio tracks will run slightly faster or slower, changing the pitch from what you intended.

Note: *All tapes should be clearly labelled with the time code type, speed, and start time. This will save you time and avoid confusion.*

The most challenging synchronization projects are those that cross media boundaries. For example, a project may be shot on film (24 fps), transferred to NTSC video for editing (29.97 drop frame), and transferred to PAL video (25 fps) for overdubbing in Europe. If you're involved in such a project, make sure that those in charge have experience with such transfers and have specified exactly what they require. Film-to-video transfers involving digital audio need special pull-up and pull-down sample rates. In every case, the principle of "One-Clock" applies to avoid weird pitch and tempo changes and falling out of sync.

16.5.3 VITC (Vertical Interval Time Code)

SMPTE time code can be written in the vertical interval between frames of a video signal; this is called VITC. The advantage of VITC is that the video deck exactly knows what frame it is sitting on, even when it is in pause mode, or it is moving at too slow a speed to read its standard LTC (longitudinal time code track).

The V-Eight does not have the necessary electronics to read VITC appearing at its VIDEO IN connector. In most cases, VITC-encoded tapes are also striped with SMPTE on a linear track, which should be plugged into the TC IN connector of the V-Eight. If the tape only has VITC, obtain an interface (such as Mark of the Unicorn's Video Time Piece™) capable of converting it to a standard audio SMPTE signal for plugging into the V-Eight.

16.5.4 MTC (MIDI Time Code)

The V-Eight can also generate MTC (MIDI Time Code), used for MIDI sequencers and computers; this is essentially the SMPTE message, broken up into four parts and sent in packets over a MIDI line. Unlike the analog SMPTE signal, MTC is not carried on a signal that can provide a clock reference; it is sent on an interrupt basis between the other messages of the MIDI signal such as note on/off, aftertouch, pitch bend, etc.

For this reason, a digital audio system like the V-Eight cannot "slave to MTC" in a true phase-lock manner. MTC is not stable enough a timing reference to derive a 48 kHz digital clock from.

On the other hand, the normal use of MTC is to provide a location reference to machines that don't need that timing clock, such as computer sequencers and automated mixing consoles. Even in these cases, standard analog SMPTE time code will often provide a more stable, jitter-free time base than MTC. Consult the manuals for your other equipment for more information.

17 TIME CODE TUTORIAL

17.1 Generating time code onto a VCR

The first step in time code operations is to record time code onto a master and to make sure the slaves can read it. If you're starting from scratch (i.e., no one is providing you with a video tape already striped with time code), and you simply want to use the V-Eight as a time code generator without simultaneously having it chase video, follow this procedure:

1. Press **EDIT**, then **INT GEN.** The display may read "1 GEN MODE:...". If not, press **INT GEN** again until it does.
2. Press **▲/YES** until the display reads "1 GEN MODE: Free Run".
3. Press **INT GEN** again. The display will read "2 TC START REF:...". Press **▲/YES** or **▼/NO** until it says "User Set".

Alternative: If you want to generate time code several times from the same starting point, you may set the "2 TC START REF:..." to "ABS". Unlike the "User Set" position, this will keep the same starting point if a tape is in the V-Eight and the transport is stopped.

4. Press **INT GEN** again. The display reads "3 START: XX:XX:XX:XX", where "X..." stands for the last number generated in "User Set" mode. Using the numeric keys, enter the number you want the time code to start at. Optionally, you may press **INT GEN** again and enter the User Bits following the procedure described in section 11.7.4 (often, this is set to the month, day, and year the tape is being made).
5. Connect the TC OUT connector of the V-Eight to the input of the VCR (or of the analog audio recorder) you want to record time code on. Usually, this is on audio track 2 of a VCR, or on the highest track of an analog multitrack machine.
   If it is a VCR, run a video output from the VCR to the VIDEO IN of the V-Eight. This will be used as a clock source for the V-Eight so that the time code generated is "gen-locked", i.e., in sync with the actual video frames. If no other video units are connected, set the 75 Ω termination switch below the connector to ON. Set the **CLOCK SOURCE** to "VIDEO".

Black burst generator: For best results, use a video black burst generator connected to both the V-Eight's and the VCR's reference inputs instead of using the VCR's own video signal.

6. Press **EDIT** to leave edit mode; the key will be dark.
7. Set the desired SMPTE rate and type (24, 25, 29.97, or 30 fps, drop or non-drop).
8. Press **REF COUNT** until "INT GEN" is shown in the display. Press **INT GEN** and then the **TC INPUT** enable key until they are illuminated.
   At this point, the V-Eight is generating time code. You can see the right display counter count the time, and the V-Eight's TC meter is illuminated ("SIG"). Check the meter of the VCR for a good level (usually between –5 and 0 dB). The VCR will normally have its own input level

control. If not, adjust the V-Eight's TC output level using the **UTILITY** menu (see section 13.7).

9. Press **INT GEN** or the **TC INPUT** enable key to stop the time code generator.

From this point on, the variations of INT GEN should be easy to be explored. Using different options in the steps 2, 3, and 4 above, you could generate time code that's in lock-step with the ABS time of the V-Eight, that starts from the TC track reference, or only generates time code when the V-Eight itself has a tape inserted and is running.

17.2 Synchronizing without a TC track

Now that you have a master tape striped with time code, let's get the V-Eight to chase and lock to the master tape. The built-in ABS time code of the V-Eight may be used as a chase reference, without having to pre-stripe a tape's TC track. ABS time is the sample-accurate time code written onto each ADAT tape during the formatting process. It is used as the ultimate time reference for the system. This is the time shown in the 4-digit display of any ADAT ever built.

Using ABS as the chase reference is particularly useful in live recording, when you don't have time to pre-stripe a tape. You can even synchronize while formatting, which is a unique advantage of the ADAT format.

The ADAT's internal time code is more accurate than conventional SMPTE time code. The V-Eight can translate this ABS time into any speed or type of SMPTE time code, in order to synchronize with non-ADAT masters or slaves. Since ABS time covers only a 40...60-minute span, and SMPTE covers a 24-hour day, the V-Eight was designed so that it can translate any point of ADAT's ABS time to any desired point on the 24-hour SMPTE/EBU time code clock.

If you use the default settings of the V-Eight, the zero point of every ADAT tape will translate to "midnight" (00 hours, 00 minutes, 00 seconds, 00 frames) SMPTE code. If you need to change this "zero-to-zero" relationship between the ADAT's ABS time and incoming/outgoing SMPTE time code, you change either the INT GEN ABS offset or the SMPTE chase offset.

Set SMPTE offset, frame-lock or lock & release, flywheel, park ahead.
Chase = Abs time.
TC SOURCE = "EXTERNAL".
CLOCK SOURCE = "VIDEO" (or "WORD", or "OPTICAL", etc.).
Make connections of SMPTE and clock source.
Set **REF COUNT** to SMPTE IN, **TAPE COUNT** to ABS or SMPTE.

17.3 Recording a time code track

The most stable and trouble-free method of synchronization for any SMPTE time code system is to pre-stripe all tapes with generator-locked time code first, then perform any transfers, recordings, and editing operations. If all time codes equal the same number, with no offsets, and are of the same SMPTE rate and type (drop or non-drop), and tapes are striped completely from head to tail, this is the easiest and most foolproof system.

Make sure you record time code using the sample rate intended for the project! In a digital audio recorder like the V-Eight, there is a direct relationship between the speed of time code and the sample rate. Time code recorded at 48 kHz will play back slow if the word clock rate coming in is 44.1 kHz when the tape is synchronized, preventing it from locking properly.

17.3.1 Recording SMPTE from ABS time

As explained in section 17.1, you can always generate SMPTE time code referenced to the ADAT's internal ABS time, even if there is no time code on the TC track. However, if you send that tape out of your facility, they must set their INT GEN ABS offset settings to the same as yours before synchronizing. By recording the ABS time with offset onto the TC track, they merely have to set their chase reference to "TAPE TC", and the time code will be the same as you used.

A benefit of having the TC track related directly to the ABS track is that all locate points will be numerically related, causing a minimum of confusion. In addition, if the project requires a different type or rate of time code for some reason later, it can easily be regenerated using the INT GEN feature.

1. Press **EDIT**, then **INT GEN** until the display reads "1 GEN MODE: Play/Rec".
2. Press **INT GEN** again. The display will read "2 TC START REF:...". Press **▲/YES** or **▼/NO** until it says "ABS time".
3. Press **INT GEN** again. The display reads "3 ABS: XX:XX:XX:XX" where "X..." stands for the last number entered in this page. Using the numeric keys, enter the number you want to correspond to zero ABS time. Optionally, you may press **INT GEN** again and enter the user bits following the procedure in section 11.7.4 (often, this is set to the month, day and year the tape is being made).

Tip: In most typical video applications, programs start on the hour, with a two-minute preroll at the head of the tape. Set the ABS Offset to 00:58:00:00 in most cases. This will make "1 o'clock" equal ABS time 00h 02m 00s 00f 00sf (i.e. two minutes from the zero point). Often each reel of a program will have a different hour marker; the two-minutes-before-the-hour convention usually still applies.

4. Leave **EDIT** mode, turn on **INT GEN**, and arm the TC track.
5. Set the V-Eight's clock source to "INT". Set **SAMP RATE** to either "44.1k" or "48k". "44.1k" is used to conserve space on hard disk systems and if the project will be mixed digitally to CD without requiring a sample rate conversion. "48k" is the better choice if the project will be mixed on an analog desk.
6. Set the SMPTE rate and type (24, 25, 29.97, or 30 fps, drop or non-drop).
7. Press **REF COUNT** until "TAPE TC" is shown in the right numeric display. This isn't a required step, but it's good practice.
8. Press **PLAY** and **REC**.

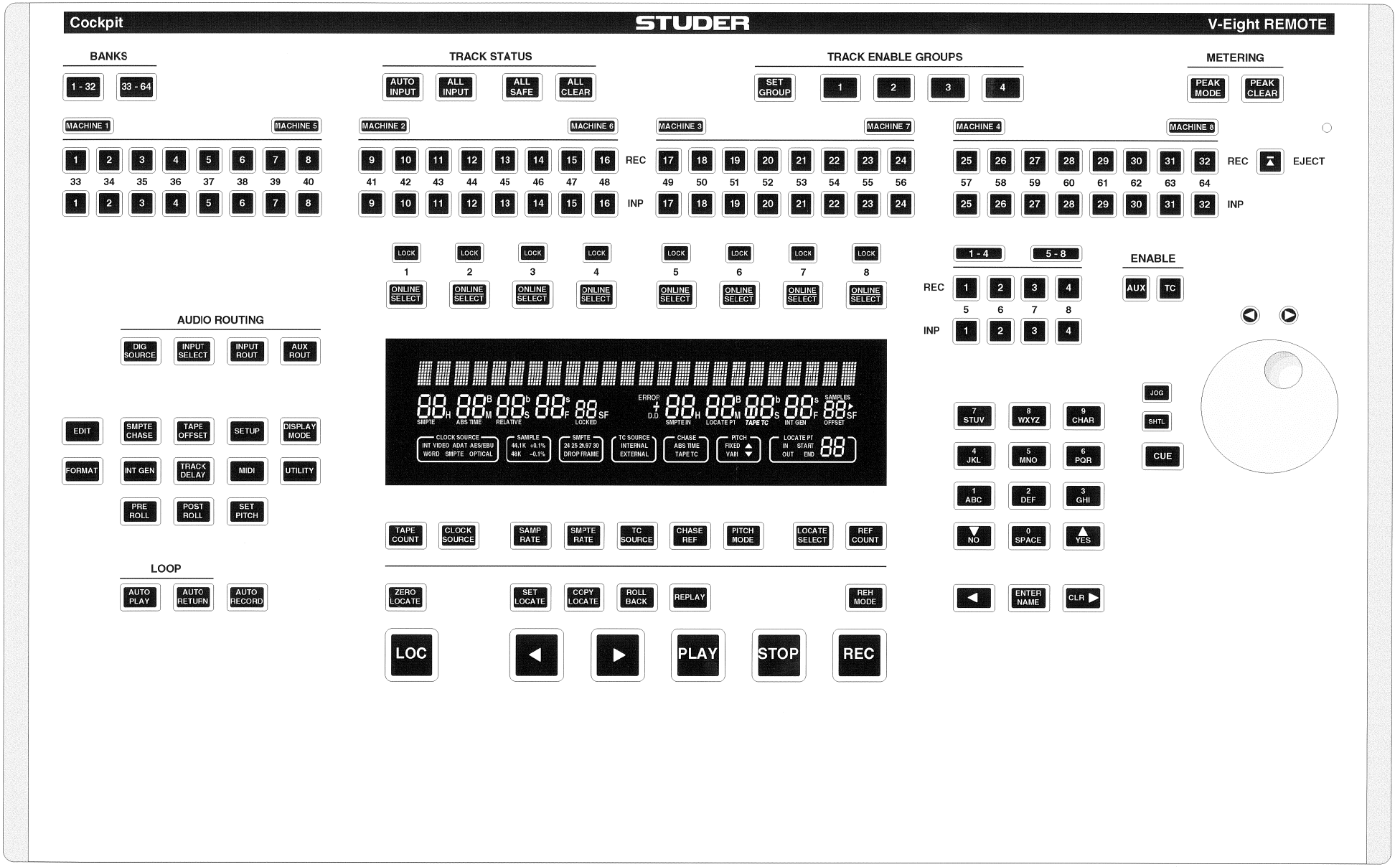
At this point, the V-Eight is recording time code of the specified type and number onto the TC track, at the specified sample rate and speed.

Notes: Time code cannot be recorded on the LEAD and DATA sections of the tape. *If the tape is before ABS time 00h 00m 00s, no time code will be recorded, even though the INT GEN will count properly through those sections.*

SMPTE time code coming from an analog deck or VCR is not recommended as a reference clock for the V-Eight because it usually has too much wow-and-flutter to be multiplied into a stable 48 kHz sample clock. Use "INT", "VIDEO", or "WORD" clock as clock source if available, and the SMPTE signal as a clock source only if it's extremely stable (e.g. from an external hardware generator or a digital source).

STUDER V-Eight Digital 8-Channel Recorder

18 COCKPIT REMOTE CONTROL



The Cockpit (Controller/Autolocator Desktop Interface) remote control is a centralized control surface designed exclusively for controlling up to eight V-Eight digital multitrack tape recorders. The Cockpit essentially duplicates the front panel of the master V-Eight (identified as ID01), and adds controls specific to multi-machine applications.

Most of the Cockpit controls operate bi-directionally. Example: On pressing a track **REC** enable key on a V-Eight being controlled by the Cockpit, the corresponding Cockpit track **REC** enable key will be illuminated, and vice versa. However, it is recommended performing all commands directly from the Cockpit unless a machine is in offline status and therefore operates independently of the Cockpit.

In general, Cockpit keys initiate the same functions as like-named keys on the master V-Eight. For example, pressing **STOP** on the Cockpit is equivalent to pressing **STOP** on the master V-Eight. Therefore, this section covers only the aspects unique to the Cockpit.

18.1 Connection and power-up

The master V-Eight connects to the Cockpit via a special Cockpit cable. All other slave ADATs connect to the system via the optical and 9-pin cables, as described in section 15.1.

If you are also using the Remote Level Display (RLD), the RLD is connected to the master V-Eight via the special Cockpit cable. The Cockpit is then connected to the RLD with an "RLD to Cockpit" cable (available legths: 20 cm or 15 m).
When using multiple V-Eights, two of them connect to the RLD via special cockpit cables, each of the other V-Eights only feeds data to the RLD. The Cockpit, again, is connected to the RLD with an "RLD to Cockpit" cable.
More information on this subject can be found in section 19 or in the individual RLD operating manual.

When powering up, turn on the master V-Eight first, then all slave V-Eights. The Cockpit and RLD will power up together with the master V-Eight

18.2 Bank selection and track enables

The Cockpit has track **REC** and **INP** enable keys for eight V-Eights, arranged in two groups of four. There are also four sets of track **REC** and **INP** enable keys for the AUX and TC tracks. Two keys, **AUX** and **TC**, select between AUX or TC tracks for input and record enabling.

Note: If tracks are enabled on a "background" track enable bank or an AUX/TC group, the appropriate BANKS **1-32** or **33-64** select key flashes.) All these keys are illuminated when active.

The BANKS **1-32** or **33-64** select keys determine whether the track **REC** and track **INP** enable keys control the V-Eight units 1...4, or 5...8. With BANKS **1-32** selected, the four groups of keys control inputs 1...8, 9...16, 17...24, and 25...32. The four sets of **AUX/TC** keys control the V-Eight units 1...4.
With BANKS **33-64** selected, the four groups of keys control inputs 33...40, 41...48, 49...56, and 57...64. The four sets of **AUX/TC** keys control the V-Eight units 5...8.

When changing the bank, the indicator above the track **REC** enable keys will change from **MACHINE 1** to **5**, from **MACHINE 2** to **6**, from **MACHINE 3** to **7**, and from **MACHINE 4** to **8**. If you have an RLD attached to the system, a large indication light in the center of the display will show "32-64".
These indicators help you to have a better overview of the bank you are using currently.

Note: If a machine with **REC** or **INP** enabled tracks goes offline, the Cockpit still indicates the track enable status; however, this status cannot be changed until the unit goes online again.

18.3 Power-up defaults

On power-up:

- The BANKS **1-32** key is illuminated.
- The **ONLINE** key for every connected V-Eight is illuminated; offline V-Eights are set to **ONLINE** when the ID01 machine detects the Cockpit.
- The ENABLE **AUX** key is illuminated.
- The two **JOG** and **SHTL** cue mode indicators always indicate the Cockpit's **CUE/SHTL** wheel operating mode, not that of any online machines. If the Cockpit's wheel is set to **SHTL** and the master V-Eight's wheel is set to **JOG**, then **SHTL** is indicated on the Cockpit, and **JOG** will flash on the master V-Eight.
- The Cockpit defaults to indicating the status of the machine with ID01, as well as the **REC/INP** enable status and **ONLINE/SELECT** status for every machine shown on the Cockpit front panel.

On ID01 power-down, the display reverts to the "Studer Cockpit" start-up message.

18.4 Machine selection and status

18.4.1 ONLINE/SELECT keys (1...8)

Each **ONLINE/SELECT** key toggles the online status of the corresponding V-Eight. An illuminated key indicates an online V-Eight. If an online unit becomes disconnected (e.g., because of a communications error, a disconnected sync cable, a power off, etc.) while this key is on, this unit's key turns off and the display shows "Last Slave Unresponsive" before re-establishing the status of the remaining series of slave machines.

Notes: If a V-Eight is recording, it cannot be toggled offline.
If a V-Eight is in play, rewind, fast forward, or locate mode, putting it offline stops the tape transport.
Pressing an **ONLINE/SELECT** key for an unconnected V-Eight yields a "Machine Not Present" prompt until communication is re-established.
If the Cockpit is in a mode or parameter page using the **ONLINE/SELECT** keys as edit select keys, a machine cannot be set to online or offline. After exiting edit mode, the **ONLINE/SELECT** keys default to indicating the system's online status (no keys flashing).
To find out how many V-Eights are connected, Utility page 16 (ID status) displays "nn ADAT(s) connected" (nn = 01...16).

18.4.2 Machine edit select

The **ONLINE/SELECT** keys can also select a single machine for editing the following parameters: Format, tape offset, and track delay.

Select a machine for editing:
- Enter the mode or edit page for the parameter to be edited;
- Press the **ONLINE/SELECT** key for the machine the parameter(s) of which will be edited.

Only one machine can be selected for editing at a time; its corresponding **ONLINE/SELECT** key will flash. The **ONLINE/SELECT** keys for any other machines being online will be illuminated continuously. If a slave is offline, it cannot be selected for editing.

Machine edit select reverts to ID01 if the master machine is turned off and on again.

Example: If the ID03 machine was selected for editing and the ID01 machine is turned off, when ID01 is powered back up and you return to one of the appropriate edit pages, ID01 will be selected for editing instead of the ID03 machine.

When operating from a Cockpit, the master V-Eight controls the following functions for online slaves:

- Track status group
- Locate 0
- Locate
- Tape counter
- Metering group
- Locate select
- Rewind
- Clock source
- SMPTE chase
- Rollback
- Fast forward
- Sample rate
- Pre-roll
- Replay
- Stop
- SMPTE rate
- Post-roll
- Rehearse
- Play
- Time code source
- Auto record
- Record
- Chase reference
- Auto return
- Pitch mode
- Auto play
- Eject
- Locate select
- Display
- Reference counter
- Varispeed
- MIDI
- Utility

18.4.3 Editing parameters of offline machines

If a unit is offline, machine edit select is not available. Furthermore, if any offline machine parameters are changed, the Cockpit will not recognize the changes when this machine goes online again.

18.4.4 LOCK indicators

The dedicated indicators for eight V-Eights indicate lock status during play and record modes as follows:

LOCK on = the corresponding V-Eight is sync-locked

LOCK flashing = the corresponding V-Eight has lost lock at some point, but it remains in play mode. The indicator *remains* flashing even if the unit regains lock to make sure you know lock was lost.

LOCK off = the corresponding V-Eight is stopped or in a fast wind mode (including locate).

The "LOCKED" indicator in the Cockpit's display is illuminated when *all* V-Eights being online and in play or record mode have locked.

The "ERROR" indicator in the Cockpit's display is illuminated when any online V-Eight has an interpolation error.

18.5 Master remote function keys

18.5.1 ROLL BACK

This locates back by a user-defined amount, starting from the ABS tape time at the moment the **ROLL BACK** key was pressed (even during a locate). Example: defining a 10 second rollback moves the tape from 10:00 to 09:50 upon pressing **ROLL BACK**.

During a rollback, the **ROLL BACK** key is illuminated and the ◀ rewind key flashes. The **LOC** key remains dark.

The following table shows how to edit the rollback time:

Action	You press	You see
Initiate rollback time edit	Press and hold **EDIT**, then press **ROLL BACK**	The **EDIT** key is illuminated. Any other edit group key light turns off
Adjust rollback time	The numeric keypad or **▲/YES** or **▼/NO** keys edit the field. The default is 10 sec	The display shows the rollback time as "nnsec", where nn is 00...59 seconds
Exit rollback time edit	Another edit parameter key (e.g., **SMPTE CHASE**), or the **EDIT** key again	The **EDIT** key turns off if it is pressed again. The display returns to the previously selected page

Notes: Play can be deferred during a rollback, which will follow the same "Locate Before Play: On/Off" rules as a normal locate.
Multiple **ROLL BACK** key presses do not accumulate (e.g., pressing **ROLL BACK** once for a 25 second rollback, then pressing **ROLL BACK** again before the V-Eight has located, does *not* produce a 50 second rollback).
While in the Edit Roll Back page, the **ROLL BACK** key will remain active for executing a rollback.

The rollback time is retained in memory even if the ID01 machine is turned off.
A rollback cannot be executed when an online machine is in record mode.

18.5.2 REPLAY

This locates back to the location where play mode was initiated last. This location cannot be edited, it corresponds to the tape position at which a key was pressed to initiate play.

After initiating replay, the **REPLAY** key is illuminated and the ◀ or ▶ wind key flashes. The **LOC** key remains dark.

Notes: Pressing **PLAY** updates the replay location register, even when machines are playing, except when pressing **PLAY** to punch out of record mode.
In record mode, using the **PLAY** key to punch out (not the **REC** key) does not update the replay location register.
When in one-key record mode, and not in play mode already, pressing **REC** to punch in updates the replay location register.
Play can be deferred during a replay operation, so replay will follow the same "Locate Before Play: On/Off" rules as a normal locate operation.
Pressing **REPLAY** during a locate operation ends the locate and initiates replay mode.
The replay address is volatile, so turning the ID01 machine off then on again returns the replay address to its default value (i.e. 00:00:00:00.00, ABS time).

18.5.3 TRACK ENABLE GROUPS

You may store and recall four different groups of track enable settings as follows:

Action	You press	You see
Select track enables that will make up a group	Desired track **INP** and track **REC** enable keys	Corresponding track **INP** and track **REC** enable keys are illuminated or flashing
Store a Group	...and hold the **SET GROUP** key, then press one of the TRACK ENABLE GROUP keys (**1...4**)	The display shows "Track Group n Stored," where n is the TRACK ENABLE GROUP key you selected
Recall a group	The desired TRACK ENABLE GROUP key (**1...4**)	**INP** and **REC** enable keys associated with the group are illuminated or flashing

Group settings are volatile, so turning the ID01 machine off and then on again clears all the group settings.

18.5.4 ALL CLEAR

This key clears all track **REC** and **INP** enabled tracks, including TC and AUX enables, unless **ALL INPUT** is enabled. In this case, **ALL CLEAR** disables only **REC** enabled tracks (leaving those tracks in input mode). As the TC track is not subject to **ALL INPUT** enable, pressing **ALL CLEAR** disables a **REC** or **INP** enabled TC track.

18.5.5 SETUP

This function can recall any of 10 stored (namable) setups at any time (except when recording or chasing SMPTE) for each of the following master (ID01) V-Eight functions:

- SMPTE chase
- Internal generator
- Clock source
- Sample rate
- SMPTE rate
- TC source
- Chase reference.

When pressing **SETUP** the key will be illuminated, and the display indicates "Setup nn," where nn = 01...10. The cursor remains under the setup number; to move to the name field, press ↵/**NAME**. Edit the name (up to eight characters) with the keypad and cursor keys.

Changing any of the setup parameters automatically edits and updates the setup. Setups are part of the V-Eight MIDI sysex dump, and may be saved and loaded.

To exit the setup page, press any of the other parameter keys (e.g. **LOCATE SELECT**, **DISPLAY MODE**, **SET PITCH**, etc.).

18.5.6 EJECT

As with professional VCRs, the **EJECT** key is illuminated only when all online V-Eights have no tape inserted. Only those V-Eights that are online will eject the tape upon pressing the Cockpit's **EJECT** key. If any machine is in record mode, the **EJECT** key will be ignored by all connected online units.

18.6 AUDIO ROUTING keys

INPUT SELECT, **INPUT ROUT**, and **AUX ROUT** configurations use the track **INP** enable keys for setup. Pressing any audio routing function key causes the track **INP** enable keys of online V-Eights to indicate and perform the route editing.

18.6.1 DIG SOURCE

Pressing the **DIG SOURCE** key once causes it to be illuminated, and the display indicates "Dig Source = aaaaaaaa", where "aaaaaaaa" = "OptLoop" or "Local". With "Local" selected, pressing the **DIG SOURCE** key a second time opens a second page that says "Dig Source n = bbbbbbbb." The "n" field selects the machine to be edited; n = 1...8 (indicating online machines only). The "bbbbbbbb" field selects the machine's digital source: "Optical", "Trk Copy", or "I/O Card" (provided that an I/O card is installed inside the unit). In "Local" mode, pressing the **DIG SOURCE** key multiple times toggles between the digital source mode and the digital source selection pages. When the digital source mode is "OptLoop" (optical loop), the digital source selection page is not available.

"OptLoop" mode defaults to setting the digital out mode for all online slave V-Eights to "Dig Thru" (refer to section 13.1). This allows for convenient digital audio routing between V-Eights when selecting digital source tracks in the input routing setup ("Track Copy" and "I/O Card" are not available in "OptLoop" mode).

When a track is selected as a digital source track under input routing, the associated V-Eight will automatically change its digital output setting (Utility Page 1) to 20-bit. All other V-Eights will configure to "Dig Thru" mode. Only one V-Eight can be a digital source machine. When the digital source mode is changed to "Local", returning to "OptLoop" mode resets the digital source track machine to ID01. When in "OptLoop" mode using **INPUT SELECT** is not allowed since all inputs must remain digital while in "OptLoop".

In "Local" mode, each V-Eight's **DIG SOURCE** selection can be set independently, but the source clock(s) must still be synchronous with the master V-Eight, since it controls the slaves' sample clocks. "Optical", "Track Copy", and "I/O Card" (if present) modes are available.

If a V-Eight is offline, that machine's Digital Source page will be skipped. Example: With ID03 offline and four other connected V-Eights online, the cycle would indicate 1, 2, 4, 5, 1, 2, 4, etc. Entering a high-level parameter page (e.g., pressing the **LOCATE SELECT** key) exits the Digital Source page.

18.6.2 INPUT SELECT

This key flashes for 10 seconds when the mode is active; the display says "Use track input switches." If you don't press any track **INP** enable keys during this time (or if there is any 10-second period during input selection when no keys are pressed), the function times out, then reverts to the page exited previously. The Cockpit's track **INP** enable keys will light to indicate digital input, and turn off to indicate analog input (as confirmed by the display on corresponding V-Eights). When the selected input is digital and no clock reference is detected, the associated track **INP** enable key flashes until it receives a valid clock.

18.6.3 INPUT ROUT

This key flashes for 10 seconds when the mode is active. If you don't press any track **INP** enable keys during this time (or if there is any 10-second period during input route selection when no keys are pressed), the function times out, then reverts to the page exited previously.

If all inputs are set to "analog", press **INPUT ROUTE** once to select analog routing; use the track **INP** enable keys to choose the type of routing, as with the V-Eight. When in analog input routing mode, the display indicates "Select analog input tracks." The track **INP** enable keys are illuminated for selected tracks.

If all inputs are set to digital, press **INPUT ROUTE** a second time to select digital routing, and use the track **INP** enable keys to select individual tracks. When in digital routing mode, the display indicates "Select dig [Optical, Trk Copy, I/O Card] Src Tracks." The track **INP** enable keys are illuminated for selected source tracks.

If the inputs are mixed between analog and digital, the digital routing page will appear first. Press the **INPUT ROUTE** key a second time to select analog routing. The track **INP** enable keys will update to reflect the selected routing mode.

18.6.4 AUX ROUT

This key flashes for 10 seconds when the mode is active, then reverts to the page exited previously. If you don't press any track **INP** enable keys during this time (or if there is any 10-second period during input route selection when no keys are pressed), the function times out, then reverts to the page exited previously.

The display indicates "Select individual tracks or select AUX track for automated routing." Use the track **INP** enable keys to select the channels that will be recorded to the associated machine's AUX track

when its AUX track is recording. A track **INP** enable key is illuminated when that channel is selected as an input to the associated machine's AUX channel.

For automated AUX routing, press the desired machine's AUX track **INP** enable key. The AUX track **INP** enable key is illuminated when enabling automated AUX routing for that machine, and the machine's corresponding track **INP** enable keys will turn dark.

Selecting **ALL SAFE** while in manual AUX routing mode disables AUX routing; selecting **ALL INPUT** sets all connected online channels for AUX routing. **ALL SAFE** and **ALL INPUT** have no corresponding function when auto AUX routing is selected.

18.7 Special control

18.7.1 Cue master mode

This function accommodates situations where you want to use the **JOG/SHTL** function on a machine that is not the master (e.g., to find a particular point on the tape of that machine only). In this case, you don't want the non-master machine to follow the master, but instead, to act as a "temporary locate master" so all machines (including the ID01 master) park where the designated cue master machine parks after a jog or shuttle operation.

To set which online machine controls the parking address for all machines:

- Press and hold **CUE** for 2 seconds to enter cue master edit mode (releasing the **CUE** key before 2 seconds toggles in/out of cue mode). The display shows "Search Master: Machine n" (n = 1 – 8 or NoneAll).
- While holding **CUE**, use the numeric keypad keys (**1**...**8**, **0**) or the **▲/YES** or **▼/NO** keys to select a cue master. Releasing the **CUE** key exits the edit mode without changing the cue mode status.

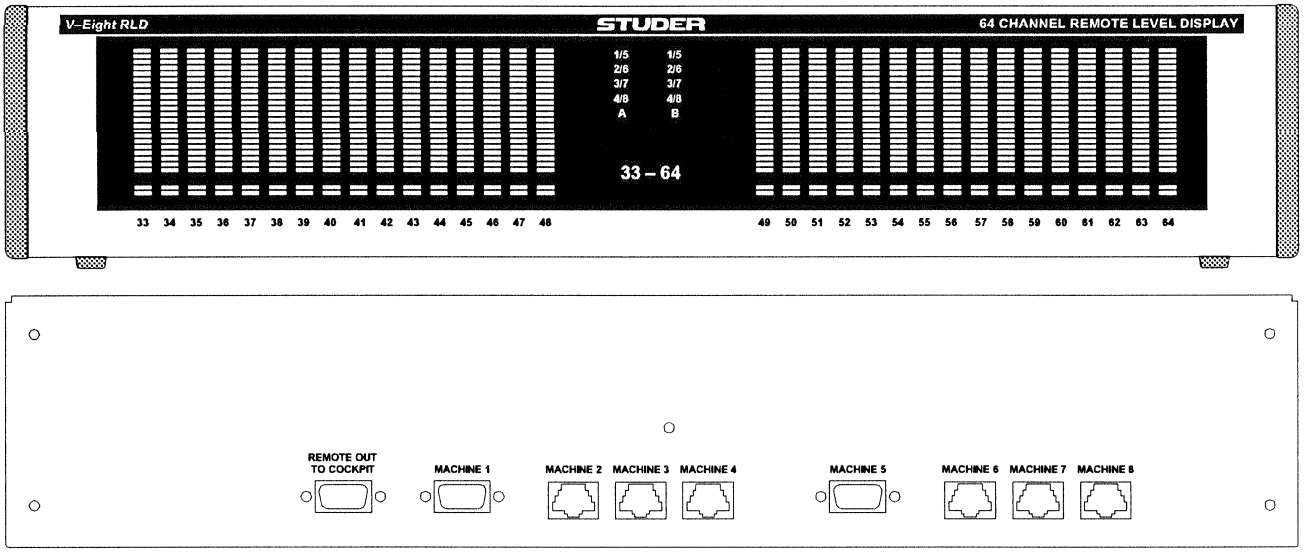
Selecting a machine other than ID01 as a cue master and activating **CUE** mode (Jogging or Shuttling) causes the display to indicate momentarily "Machine n Cue Master" (with n = 1...8) or "No Cue Master" when "NoneAll" is selected. If you pause a cue, ID01 will query the cue master, update ID01's tape counter, and locate all connected machines to the position of the designated cue master.

When cue master equals "NoneAll", ID01 will not send a locate command to the slaves. All decks will remain parked after a cue. Upon exiting cue mode, pressing **PLAY** will follow the locate-before-play rule (assuming "Locate Before Play" is on). The default cue master is machine 1, and the selection is not retained through an ID01 power-cycle.

Releasing the **CUE** key exits cue master edit mode, and the Cockpit reverts to displaying the page exited previously (with the exceptions of the AUX routing group). If a routing group mode is active, holding the **CUE** key for 2 seconds will automatically exit any of the routing modes (excluding "Digital Source") and enter cue master edit mode.

Note that ID01 must remain online, and the user must observe the time code display when actively jogging or shuttling, because when a slave is the cue master, the master's tape motion will offer a rough indication of the cue master machine's position until cue mode is paused.

19 REMOTE LEVEL DISPLAY (RLD)



The RLD is a remote level meter display designed for the Studer V-Eight. It provides 64 channels of peak metering for up to eight V-Eights. It will duplicate the meter ballistics of each V-Eight's front panel meter display settings. In addition, the RLD has eight LEDs providing fundamental feedback of the error status of each connected V-Eight. It can be used in a standard 19" rack, together with the Cockpit remote control, or as a standalone unit.

19.1 Main functions

Peak meters: Levels for 64 V-Eight tracks are displayed using a 22-segment meter for each track. There are no scale markings on the RLD's display, but the range is from –72 to 0 dB_{FS} (identical to the V-Eight's front panel meters). For setting the meter parameters refer to section 7.2.

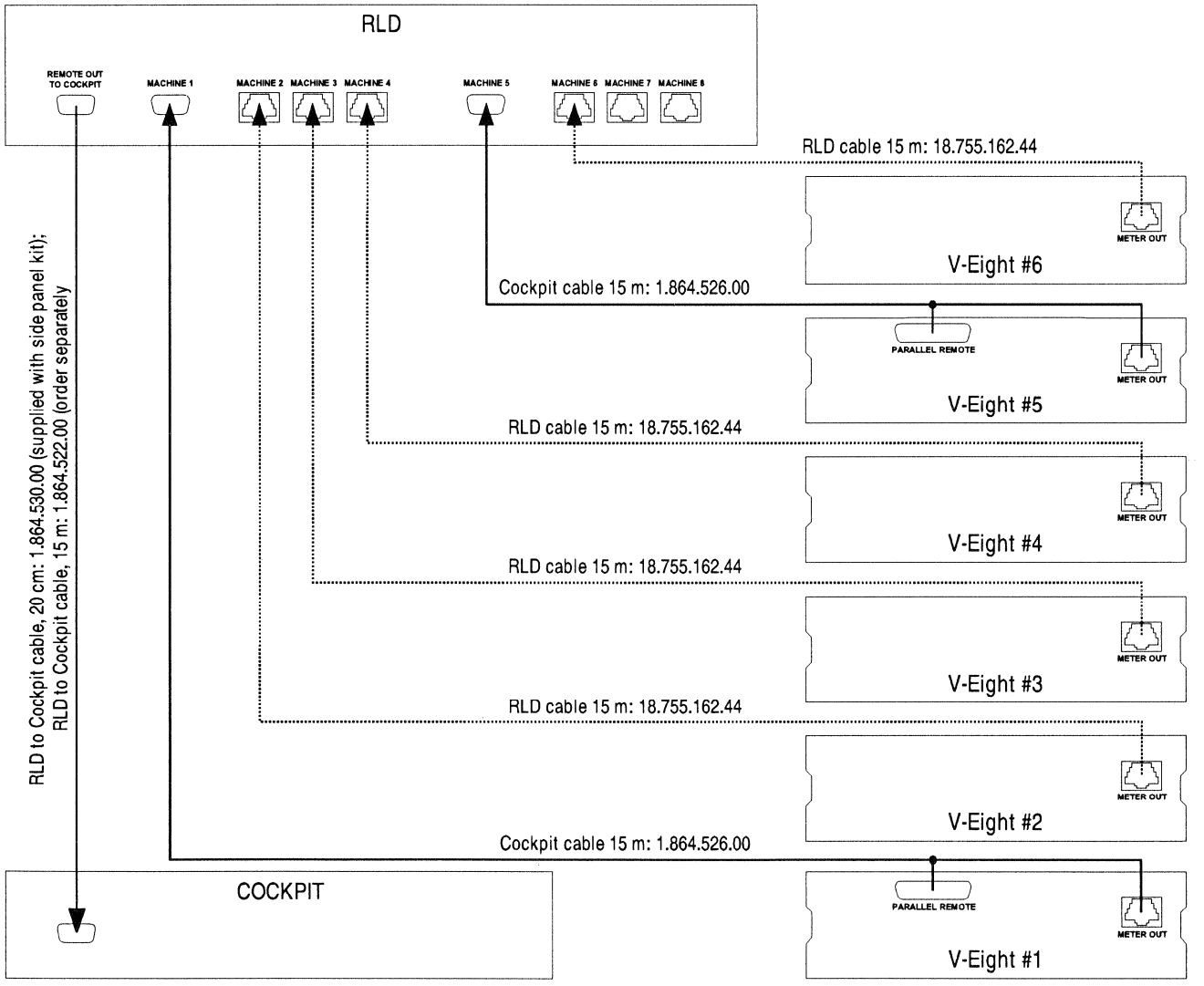
Status LEDs: The RLD can have up to 8 V-Eights connected. Four yellow and four red LEDs are provided, labelled "1/2", "3/4", "5/6", and "7/8". When a transport or system error occurs, the red LED indicator for the erring machine (one of the two numbers, depending on the bank you are in) will flash until it is reset by pressing the **PEAK CLEAR** key on either the Cockpit remote or the front panel of the offending V-Eight. The yellow LED indicator is illuminated each time an interpolation error is detected (following the specification for the V-Eight's "ERROR" indicator in its counter display).

19.2 Hook-up

For establishing any connection, the units must be powered off! Only use the special cables available from your Studer distributor.
You will need different cables, depending on if you use the sidepanel kit to combine the two units, or if you have the RLD as a stand-alone unit in a distance from the Cockpit.

RLD and Cockpit combined: If you use the side panel kit to combine Cockpit and RLD, you will find a 20 cm, 9-pin female/male "RLD to Cockpit" cable with the kit. You connect the 15 m "Cockpit" cable (order no. 1.864.526.00) directly from the V-Eight to the RLD; this cable supplies the power for the RLD. Now you connect the 20 cm long cable from the RLD to the Cockpit. This cable will supply the Cockpit with power.
If you are using several V-Eights in your system, connect the units 2...4 to the RLD with the RJ-45 terminated category 5 ("RLD") cables (order no. 18.755 162.44); these cables are used for data transfer to the RLD only. If you have more than four V-Eights in your system, connect the fifth machine to the RLD with an additional "Cockpit" cable, as mentioned above, in order to supply additional power to the RLD. Any further machines (6...8) again connect with "RLD" cables for data transfer to the RLD.

RLD free-standing, w. Cockpit: In this configuration you proceed as described above, except that you will have to use a 15 m, 9-pin "RLD to Cockpit" cable (order no. 1.864.522.00) between the RLD and the Cockpit instead of the 20 cm cable.



19.3 Basic operation

Power-up: The RLD is powered up together with the V-Eight connected to the RLD. The track number indicators at the bottom of each meter will be illuminated with the appropriate track number (tracks 1-32). If V-Eights are connected, the track **RECORD** and **INPUT** enable status of each V-Eight will be reflected in the RLD's display. The meter ballistics set on the master V-Eight are duplicated in the display as well.

Status LEDs: The RLD has four yellow and and four red LED indicators labeled "1/2", "3/4", "5/6", and "7/8" which correspond to the MACHINE 1...8 connectors on the RLD's rear panel. The yellow LED indicator turns on when the corresponding V-Eight reports an interpolation error. The red LED indicator flashes when any general V-Eight transport or system error occurs, and continues flashing even after the error condition has passed. To "clear" the flashing red LED indicator(s) press **PEAK CLEAR** on the corresponding V-Eight(s) or the Cockpit.

Preface

This document is intended to assist the service technician in the operation, maintenance and repair of the V-Eight Digital Multitrack Recorder. Together with the V-Eight Reference Manual, this document provides a complete description of the functionality and serviceability of the V-Eight. Any comments or suggestions you may have pertaining to the document are welcome and encouraged.

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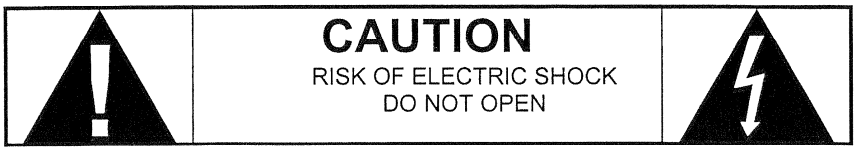
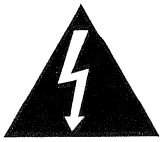
TO REDUCE THE RISK OF ELECTRIC SHOCK OR FIRE, DO NOT EXPOSE THIS PRODUCT TO WATER OR MOISTURE.





The arrowhead symbol on a lightning flash inside a triangle is intended to alert the user to the presence of un-insulated "dangerous voltage" within the enclosed product which may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point inside a triangle is intended to alert the user to the presence of important operating, maintenance and servicing instructions in the literature which accompanies the product.

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CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same type or equivalent type recommended by the equipment manufacturer.
Battery Manufacturer: Panasonic/Matsushita
Type: BR2325
Rating 3V, 5mA

Uwaga
Wystepuje ryzyko eksplozji jezeli bateria zostanie wymieniona w nieodpowiedni sposób.
Wymieniac tylko uzywajac tego samego typu, lub zamiennika rekomendowanego przez producenta.
Producent Bateri:Panasonic/Matsushita
Typ: BR2325 3V, 5 Ma

배터리를 잘못 설치하시면 파열될수있습니다. 배터리를 교체하실때는 반드시 제조회사에서 추천하는 동일한 종류, 또는 유사한 종류의 배터리를 사용하십시오.

배터리 생산원: **Panasonic/Matsushita**
종류: **BR2325**
기준: **3V 5mA**

VARNING!
Explosionsrisk om felaktigt batteri installeras.
Ers"tt endast med batteri av
samma eller motsvarande batterityp som rekomenderas av enhetens tillverkare.
Batteritillverkare: Panasonic/Matsushita
Typ: BR2325 Data: 3V, 5mA

Safety Suggestions

Carefully read the applicable items of the operating instructions and these safety suggestions before using this product. Use extra care to follow the warnings written on the product itself and in the operating instructions. Keep the operating instructions and safety suggestions for reference in the future.

1. Power Source. The product should only be connected to a power supply which is described either in the operating instructions or in markings on the product.

2. Power Cord Protection. AC power supply cords should be placed such that no one is likely to step on the cords and such that nothing will be placed on or against them.

3. Periods of Non-use. If the product is not used for any significant period of time, the product's AC power supply cord should be unplugged from the AC outlet.

4. Foreign Objects and Liquids. Take care not to allow liquids to spill or objects to fall into any openings of the product.

5. Water or Moisture. The product should not be used near any water or in moisture.

6. Heat. Do not place the product near heat sources such as stoves, heat registers, radiators or other heat producing equipment.

7. Ventilation. When installing the product, make sure that the product has adequate ventilation. Improperly ventilating the product may cause overheating, which may damage the product.

8. Mounting. The product should only be used with a rack which the manufacturer recommends. The combination of the product and rack should be moved carefully. Quick movements, excessive force or uneven surfaces may overturn the combination which may damage the product and rack combination.

9. Cleaning. The product should only be cleaned as the manufacturer recommends.

10. Service. The user should only attempt the limited service or upkeep specifically described in the operating instructions for the user. For any other service required, the product should be taken to an authorized service center as described in the operating instructions.

11. Damage to the Product. Qualified service personnel should service the unit in certain situations including without limitation when:
    a. Liquid has spilled or objects have fallen into the product,
    b. The product is exposed to water or excessive moisture,
    c. The AC power supply plug or cord is damaged,
    d. The product shows an inappropriate change in performance or does not operate normally, or
    e. The enclosure of the product has been damaged.

Table Of Contents

Figures and Tables

1 V-Eight Hidden Functions and Service Utilities

There are several hidden functions embedded within the V-Eight which provide information and shortcuts during normal operation. The following subchapters detail these shortcuts.

1.1 Power-On Key Combinations

Holding the following key combinations during Power Up:

Effect:

Will allow access to hidden services basically. Note that you should continue holding the certain keys until the VFD displays "LOCATE 00" or else you are not able to access the hidden services or UTILITY pages above page 26 respectively.

ALL SAFE This mode starts the unit in safe mode/unsafe mode respectively. A message "Safe Mode Inactive" or "Save mode Active" will appear togglewise doing this procedure. Recognize that "Save Mode Inactive" should be displayed briefly during Power Up to access hidden service pages done by next combination.

Effect:

Will allow access to certain hidden services if "Safe Mode Inactive" is true. Access is enabled to UTILITY pages above page 26 now.

EDIT This combination with ALL SAFE also enables Load Boot Segment software and so on. Nothing is displayed to indicate, that this mode has been properly entered. If message "Safe Mode Active" appears during Power Up, go back to "ALL SAFE" first and redo procedure.

PLAY and **REC**ord Performs a user reset which initializes all parameters to their default values. The display will show "Initializing..."

Record 1 and **7** Accesses test mode. Refer to the V-Eight Test Document for further details.

LOCate Accesses frontpanel test mode. Refer to the V-Eight Test Document for further details.

1.2 Miscellaneous Key Combinations

Accessing hidden functions (independent of "Save Mode Inactive") involves holding the **PEAK CLR** key in combination with the following keys:

STOP Displays drum head hours.

EJECT When invoked on the master unit, only the master tape is ejected (eject command not sent to slaves).

RECord This allows the user to record on a write-protected tape. It toggles between "OVERRIDE WRITE PROTECT" which allows recording regardless of the write-protect tab status, and "SENSE WRITE PROTECT" which only allows recording if the write-protect tab is intact. Note that this function can only be toggled if a tape is loaded and is reset to sense the write-protect tab whenever a tape is ejected.

AUTO RETURN Displays the number of continuous auto-loops.

1.3 Advanced Functions

Although not technically hidden functions, the following are some more advanced features that may not be obvious:

- Holding **STOP** button for at least 3 seconds will force the tape to unthread.
- Double-clicking the **Fast Forward** or **Rewind** button will cause the tape wind at the fastest possible speed.
- Holding **CUE** for at least 3 seconds will allow editing of the Search Master. Refer to the user manual for further details.
- (Cockpit only) Holding **EDIT** while pressing **ROLLBACK** will allow editing of the Rollback time. Refer to the Cockpit user manual for further details.
- While in a locate name field, pressing Up or Down while holding **NAME** will scroll through a list of 16 default names. To customize a name in this list, Edit the name, then hold **NAME** and press **REC**ord. The list of user-defined names will be retained through a power-cycle and will resort back to the default names with a user reset.
- Holding **SAMPLE RATE** and pressing **Up, Down**, or **0** will allow Pull Up, Pull Down or No Pull Up/Down, respectively. Refer to the user manual for further details.

NOTES:

1.4 Utility Pages

There are 26 (37) pages of Utility functions. Pressing the Utility key cycles through the pages in order. To jump directly to a particular page, hold Utility down and enter the page number form the keypad, using leading zeroes to access pages 01-09

Standard Utility Menu

1	DIG OUT:	Selects the digital output format and resolution
2	ONLINE SOURCE:	Sets control source when Online mode
3	RS-422 Track Arm:	Sets track arming (Edit Preset) commands via RS 422
4	RS-422 Mapping:	Sets grouping all odd ch's to track 1 and all even to track 2
5	ONLINE CTRL:	Chooses whether local control is also avail. in Remote Mode
6	ONE-BUTTON RECORD:	Selects One-Button Record mode / RECord and PLAY button
7	INPUT MONITOR:	Determines analog input monitored path
8	UNTHREAT TIMEOUT:	Sets idle time before the tape is unthreaded
9	TC OUTPUT LEVEL:	Time code output level setting (0.1...3.0V)
10	REW/FFD TC OUT:	Chooses whether to output TC in wind modes or not
11	X-FADE TIME:	Sets crossfade time (5.4ms...1.365sec)
12	SEARCH ENABLE:	Determines how to enable Cue mode
13	LOC BEFORE PLAY:	Selects whether master waits for slaves before starting in PLAY
14	MUTE UNTIL LOCK:	Selects whether to unmute only if all slaves are locked
15	DYNAMIC PUNCH:	Sets mode of track record enable buttons
16	TRACK GROUPS:	Allows to recall Cockpit track groups
17	RLD Error LEDs:	Sets on/off red and yellow Cockpit-Interpolation LEDs
18	Dig Scan:	AUX track or digital signal is fed to XLR out in jog/shuttle mode
19	Save data to tape?	Saves the Table of Contents data to the tape's data section
20	Load data from tape?	Loads the Table of Contents data from tape into the V-EIGHT
21	Tape	Shows the length of an inserted tape
22	ID nn	Shows the V-EIGHT device ID number specified by nn
23	USER BITS:	Allows viewing user bits of the selected SMPTE TC source
24	ERRER RATE:	Shows actual sync block errors during Record or Play mode
25	FRONT PANEL: vn.nn	Shows current front panel (key pad/display) software version
26	MAIN: vn.nn mm/dd/yy	Main Software Version/Revision and date (Code Block)

Service Pages (See Power-On Key Combinations !)

27	BOOT: vx.xx mm/dd/yy	Boot Software Revision (Boot Block)
28	Auto Loop Limit: nnnn	Set loop count figure, default is 50 until STOP
29	Timecode Display:	Used w. SMPTE in/out connected during SMPTE Self test
30	Capstan Spd Disp:	This is just a go/no go test for the motors
31	Test Wind Mode:	Tape is traveling with continuous winding speed if REW/FF
32	C=-nnn S=-nnn T=-nnn	Capstan, Supply and Take up Motor settings
33	Skip +nnn Tracks?	Part of the track skipping test. (see Q.C. procedure)
34	Calibrate ADCs?	Allows precise calibration of the AD Converters (see Q.C.)
35	ADC @ 01 = nnn	For beta test software use only.
36	DRUM MOTOR	Sets drum motor on/off if tape is ejected
37	PG Delay Value = nnnn	Enables PG Delay Offset adjust in Millisecond steps

1.5 V-Eight Self Test Summary

Pressing **RECORD1** and **RECORD7** during power-on will place the V-Eight in the Self Test mode, which assist the service technician in calibration and troubleshooting problems. For details refer to chapter 2.

```
1    Checksum Test
2    RAM Test
3    RJ-45 I/O Test
4    MIDI I/O Test
5    (ADAT) Sync I/O Test
6    RS-422 I/O Test
7    LRC/Footswitch Test
8    Word Clock I/O Test
9    Video Sync Test
10   SMPTE I/O Test
11   (Digital) Optical(I/O)Test
12   Motor Test
13   End Sensors Test
14   Deck Sensors Test
15   Tension Sensor Test
16   Drum Head Hours > NNNN
17   Power-on Hours > NNNN
```

Note: After replace e.g. transport or general serviced the V-Eight, you should reset Head- and Drum-Hours. To Reset or Set "`16 Drum Head Hours = NNNN`" and "`17 Power On Hours = NNNN`" a Hardware connector is needed to access this pages. Refer to Appendix B 2 Update Drum Hours and Power On Hours

2 V-Eight Self Tests

The V-Eight contains several self test routines which assist the service technician in troubleshooting problems. Moreover, some of these routines aid in the proper calibration of the unit. The paragraphs below detail the specific functions for each self test and all of the self test information is summarized in chapter 1.4 Utility Pages. It is noted out, that **1.1 Power-On Key Combinations** should be well comprehended before enter 2.1.

2.1 Description of Main Self Test Routines

Be sure equipment is in mode "Safe mode Inactive" else you are not able enter into this routines. Pressing **RECORD1** and **RECORD7** during power-on will place the V-Eight in the Self Test mode. While holding these keys, the display will briefly show "`Studer V-Eight`" before entering the self test menu. Once in this mode, the service technician can choose any or all of the self tests required to check specific V-Eight functions. To scroll the various tests offered, use the Δ/Yes or ∇/No keys.
To conduct the test displayed, press the **PLAY** button. Some tests exit immediately on completion. Others require pressing the **EJECT** (or in some cases **REC**ord and **EJECT**) key in order to exit the current test and return to the main menu,. To exit the Self Test mode completely, simply press the **EJECT** key while the unit is in its Self Test main menu. Failed Tests can also be exited by pressing **EJECT**.
Please note that several of the tests require a "loopback" connector be plugged in to the appropriate I/O ports before initiating the test. It's usually best to install all of these connectors before initiating any of the self test routines (the exception being the ADAT Sync Cable). Pinouts for the special connectors needed are provided in the individual test descriptions.
A description of all the tests performed by the V-Eight while in its Self Test mode are listed below.

1 Checksum Test V-Eight Display: "`1: Checksum Test`"

This test checks for the correct Flash ROM boot and code segment checksums. The V-Eight logically "counts" the values of all addresses in the segment and compares that count to the correct value for the current software version.

When initiated the display will briefly show "`Checking Boot Block...`", followed by "`Checking Code Block`", and finally "`Checksum Test Passed`" . The test then immediately exits to the main test menu.

The V-Eight displays "`Checksum Test Failed`" whenever the unit fails its Checksum self test.

2 RAM Test V-Eight Display: "`2: RAM Test`"

This is a test of the RAM integrity. The V-Eight writes bit patterns into RAM and compares these values to those which are read back from RAM.

When initiated display will briefly show "`RAM Test In Progress`", followed by "`RAM Test Passed`". The test then immediately exits to the main test menu.

The V-Eight displays "`RAM Test Failed`" whenever the unit fails its RAM self test.

3 RJ-45 I/O Test V-Eight Display: "`3: RJ-45 I/O Test`"

This test requires a Special RJ-45 Loopback Connector. Connect RJ-45 pin 1 to 3 and pin 2 to 6 (Pins 4 and 5 not used).

This is a test of the RJ-45 I/O system integrity. The V-Eight writes bit patterns to the RJ-45 output and compares these values to those which are read back from the RJ-45 Input.

When initiated display will briefly show "`Testing RJ-45 I/O ...`", followed by "`RJ-45 I/O Test Passed`". The test then immediately exits to the main test menu.

The V-Eight displays "`Failed RJ-45 I/O Test`" whenever the unit fails its RJ-45 I/O self test.

4 MIDI I/O Test V-Eight Display: "`4: MIDI I/O Test`"

This test requires a MIDI Cable connected between MIDI IN and MIDI OUT.

This is a test of the MIDI I/O system integrity. The V-Eight writes bit patterns to the MIDI output and compares these values to those which are read back from the MIDI input.

When initiated display will briefly show "`Testing MIDI I/O ...`", followed by "`MIDI I/O Test Passed`". The test then immediately exits to the main test menu.

The V-Eight displays "Failed MIDI I/O Test" whenever the unit fails this self test.

5 ADAT Sync I/O Test

V-Eight Display: "5: Sync I/O Test"

This test requires an ADAT Sync Cable connected between Sync IN and Sync OUT. This cable should be installed just prior to, and removed just following this test. Not removing the cable may cause the unit to act strangely.

This is a test of the ADAT Sync I/O system integrity. This test checks the serial output of the "Sync Out" port and the serial input of the "Sync In" port. This test also checks the 48 kHz clock as well as timecode send and receive functions.

When initiated display will briefly show "SyncIn <-> SyncOut", followed by "SyncIn Test Passed". The test then immediately exits to the main test menu.

The V-Eight displays "SyncOut -> SyncIn Failed" whenever the unit fails this self test.

6 RS-422 I/O Test

V-Eight Display: "6: RS-422 I/O Test"

This test requires a Special RS-422 Loopback Connector. Connect RS-422 pin 7 to 3 and pin 2 to 8. (Pins 1, 4, 5, 6 and 9 not used).

This is a test of the RS-422 I/O system integrity. The V-Eight writes bit patterns to the RS-422 output and compares these values to those which are read back from the RS-422 input.

When initiated display will briefly show "Testing RS-422 I/O ...", followed by "RS-422 I/O Test Passed". The test then immediately exits to the main test menu.

The V-Eight displays "Failed MIDI I/O Test" whenever the unit fails this self test.

7 LRC/Footswitch Test

V-Eight Display: "7: LRC/Footswitch Test"

This is a test of the LRC/Footswitch system integrity. The V-Eight reads the values of the LRC/Footswitch jacks and displays the current value of the last switch activated. Table 1 shows the display values and their corresponding switch.

Pressing **EJECT** exits the test.

Display	Function	Display	Function	Display	Function
01	Foot switch 1	LRC value=08	Punch In	LRC value=15	Play
02	Foot switch 2	LRC value=09	Punch Out	LRC value=16	Stop
LRC value=03	Rehearse	LRC value=10	Set Locate	LRC value=17	Rewind
LRC value=04	Auto Record	LRC value=11	Play/Stop	LRC value=18	F Fwd
LRC value=05	Loop End	LRC value=12	Play/Rewind	LRC value=19	Record
LRC value=06	Loop Start	LRC value=13	Play/F Fwd		
LRC value=07	Auto Loop	LRC value=14	Play/Record		

Table 1 - LRC Self Test VFD Displays

8 Word Clock I/O Test

V-Eight Display: "8: Word Clock Test"

This test requires a BNC Cable connected between Word Clock IN and Word Clock OUT.

This is a test of the Word Clock I/O system integrity. The V-Eight sends a 48KHz signal to the Word Clock output and compares it to the signal read back from the Word Clock input.

When initiated display will briefly (5-6 seconds) show "Word Clock Test", followed by "Word Clock Passed". The test then immediately exits to the main test menu.

The V-Eight displays "No Word Clock" whenever the unit fails this self test.

9 Video Sync Test

V-Eight Display: "`9: Video Sync Test`"

This test requires the use of a VCR with a composite output.

Tests the functionality of the V-Eight Video Input Port. To conduct this test, the operator must connect a VCR to the V-Eight via the VIDEO SYNC IN jack on the back of the V-Eight. During this test, the V-Eight is checking for the presence of a video signal on the VIDEO SYNC IN jack. Some VCRs constantly output a video signal. However, if this is not the case with the VCR being used during this test, simply insert a tape with a video signal into the VCR and press **PLAY**. Depending on the type of video signal present, the display will show the appropriate message. For NTSC video signals, the display shows "Video Status: NTSC". For PAL or SECAM video signals, the display will show "Video Status: **PAL/SECAM"**.

When no video sync signal is detected the display shows "Video Status: No Video".

To exit this test at any time, press **EJECT**.

10 SMPTE I/O Test

V-Eight Display: "`10: SMPTE Test`"

This test requires an XLR Cable connected between Timecode IN and Timecode OUT.

This is a test of the SMPTE I/O system integrity. The V-Eight sends clock information to the Timecode output and display it to the signal read back from the SMPTE Input.

When initiated, the test causes the display to briefly read "SMPTEOut <-> SMPTEIn" and two sets of timecode are displayed beneath it. If everything is working correctly, the display on the right (SMPTE Out) should read the same as the display on the left (SMPTE In). Note that there is a very slight delay between the Output and Input that may or may not be noticeable during test.

To exit this test at any time, press **EJECT**.

11 Digital Optical I/O Test

V-Eight Display: "`11: Optical Test`"

This test requires a Fiber Optic Cable connected between ADAT Optical IN and ADAT Optical OUT.

This is a test of the Digital I/O system integrity. The V-Eight sends a bit-stream to the ADAT Optical output and compares it to the signal read back from the ADAT Optical input.

When initiated display will briefly show "Optical Test", followed by "Optical Clock Passed".

The test then immediately exits to the main test menu.

The V-Eight displays "No Optical Clock" whenever the unit fails this self test.

Please Note: The following tests require a working knowledge of the transport and it's functions. As such they should only be attempted by trained service personal.

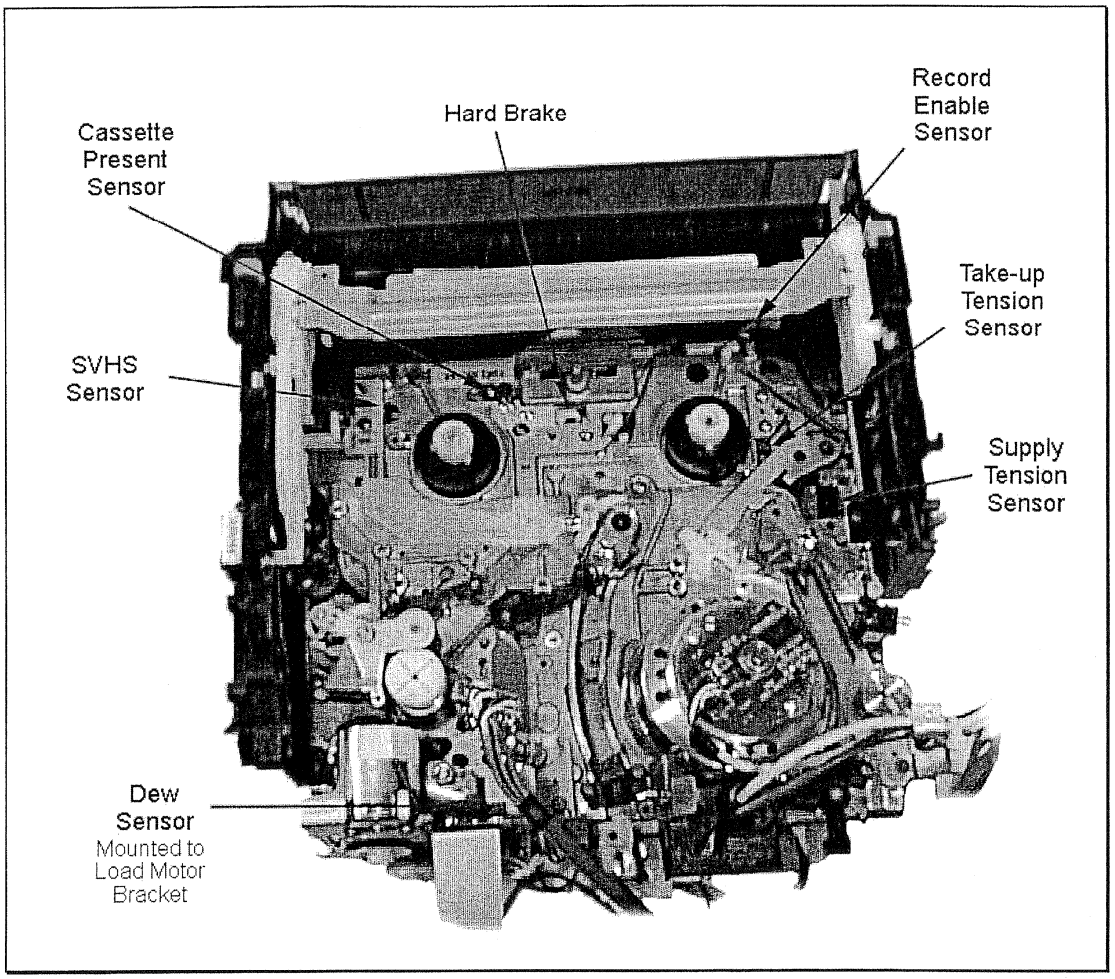


Figure 1 - Transport Sensor Locations

12 Motor Test

V-Eight Display: "12: Motor Test"

This test requires that the Reel Hard brake be disengaged prior to initiating the test. (It is the white plastic lever located towards the front of the unit, between the Take-up and supply reels). This is accomplished by pressing the lever towards the front of the unit. (See Figure 1)

Once the test is initiated the display will show briefly:

"Lift Brakes Off Reels"	A reminder to release the hard brake.
"Testing Capstan Motor"	Supply and Take-up reels start turning.
"Testing Drum Motor"	Head Drum begins turning.
"Turning On Load Motor"	Load Motor begins turning.
"Capstan solenoid Engaged"	Solenoid Engages accompanied by an audible "Click"

Note that this test also checks Cap FG, Cap Dir, TackeupTach, Supply Tach, and Drum FG.

Each turning motor should be visually verified and the solenoid can be verified either visually or audibly.

The test then immediately exits to the main test menu.

13 End Sensors Test V-Eight Display: "13: End Sensors Test"

This test automatically verifies the functionality of End Sensors.

Once the test is initiated the display briefly shows "End Sensor Pass" and immediately exits to the main test menu.

The V-Eight displays "End Sensor Fail" whenever the unit fails this self test.

14 Deck Sensors Test V-Eight Display: "14: Deck Sensors Test"

This is a test of the decks on board sense switches. Within about 30 seconds after the test is initiated, each of the four Deck sensor switches must pressed once. As each switch is activated, it's function will be shown in the display. The Sensors tested are listed below: (refer to Figure 1 for the location of these sensors).

Cassette Present Sensor
SVHS sensor
Record Enable sensor
Dew sensor

If all four switches are not activated within 30 seconds, the test times out and the display shows "Deck sensor error". Figure 1 shows the location of these sensors.

15 Tension Sensor Test V-Eight Display: "15: Tension Sensors Test"

This is a test verifies the functionality of the optical tension sensors. After initiating the test, the display shows "Tension Sensors= XXX YYY" where XXX is the current value of the supply tension sensor, and YYY shows the current value of the take up sensor. Normally these values will show 4 or 5. Inserting an opaque object (a slip of paper is sufficient) into the appropriate sensor, and verify that the value jumps to a number between 240 to 255.

Pressing **EJECT** exits the test.

16 Drum Hours V-Eight Display: "16: Drum Hrs=XXXX"

This is not a intrinsically test, but simply displays the total number of hours the Drum Head has been in use. This value should be noted for inclusion in the appropriate paperwork. In case you have changed the transport, use Service Key to set or reset Drum Hours respectively (fully applicable for SW v2.0 and above only). See B 2

17 Power on Hours Test V-Eight Display: "17: Power-On Hrs=XXXX"

This is not a intrinsically test, but simply displays the total number of hours the unit has been powered on. This value should be noted for inclusion in the appropriate paperwork. In case you have serviced the V-Eight completely, use M20 Service Key to reset Power on Hours (applicable for SW v2.0 and above only). See B 2

Note: The Service Key is a Hardware Dongle. Refer to Table 3 - Necessary Tools and Equipment

Remember: Equipment is still in mode "Unsafe Mode Active". To leave this mode switch power OFF and hold **ALL SAFE** key during power up until VFD is reading "Locate 00". The equipment is in "Safe Mode Active" now. TEST: Switch Off V-Eight. Holding the **EDIT** key while power up. If display has briefly show "Safe Mode Active" the V-Eight is in proper mode now.

2.2 Description of Front Panel Self Tests

To initiate the front panel self test menu hold `LOCate` while applying power. Note that since that the front panel contains it's own microprocessor, the front panel can be tested without being attached to a full functioning unit. The only required element is power.

Use the ∇/**No** and/or Δ/**Yes** keys to select which test is to be run.
Press **PLAY** to start the test.
Pressing **EJECT** exits completed tests or aborts failed tests.

0: EPROM Test	Performs a checksum test of the front panel EPROM. The display will indicate either pass or fail.
1: RAM Test	Performs a bit level test of all front panel processor SRAM memory locations. The display will indicate either Checksum Test Passed or Checksum Test Failed.
2: VFD1 Test	All Segments of VFD1 light up. Pressing PLAY again causes each GRID line to light in turn.
3: VFD2 Test	All Segments of VFD2 light up. Pressing PLAY again causes each GRID line to light in turn.
4: LED Test	All status LEDs turn on simultaneously (recognize some LEDs are back lighted). Pressing PLAY continues the test by lighting each LED in turn. The test concludes automatically after all LEDs have been sequenced.
5: Switch Test	Press all front panel buttons (except power). Press `RECord` and `EJECT` simultaneously to finish. If the test passes it exits immediately to the test menu. If the test fails the display will show "`Not all switches tested`" and continue with test (Note that any further presses of `RECord` and `EJECT` immediately exit the test).

Pressing the following keys will show:

`Cue`	→	`Search`
`Zero Locate`	→	`Locate 0`
`Display Mode`	→	`Display`
`Set Pitch`	→	`Varispeed`
`Reh Mode`	→	`Rehearse`

3 Troubleshooting

3.1 General Troubleshooting

While this manual assumes that the reader has a fundamental understanding of electronics and basic troubleshooting techniques, a review of some of the techniques used by our staff may help.

- Visual Inspection - A short visual inspection of the unit under test will often yield results without the need of complex signal analysis (burnt, or loose components are a dead giveaway).
- Self Test - Studer products that utilize microprocessor control contain built in test software which exercises many of the units' primary circuit functions. Self test should always be done following any repair to ensure basic functionality.
- Environmental Testing - Applying heat and cold (heat gun/freeze spray) will often reveal thermally intermittent components (Clock crystals, IC's, and capacitors are particularly prone to this type of failure).
- Burn in Testing - Leaving a unit running overnight often reveals intermittent failures such as capacitors that begin to leak excess current after a significant amount of time.
- Cable Checks - Wiggling cables can reveal intermittent failures such as loose cables or poorly soldered headers. Remember to check power supply cables as well.
- Flexing the PC Board - Poor solder joints and broken traces can often be found by carefully pressing the PC Board in various areas.
- Tapping Components - Sometimes tapping on a component (particularly crystals) will cause it to fail.
- Power Down/up - Turning the unit off and back on rapidly several times may reveal odd reset and/or power supply failures.
- Reset Threshold - A Variac (variable transformer) can be used to check reset threshold levels. This can be particularly useful in helping customers with low line problems.
- Compressors - Using a compressor/limiter is often helpful when attempting to solve low level noise problems, as well as assisting with DAC adjustments.
- Sweep Tests - Sweep generators are very useful in checking the frequency response envelopes of anti-aliasing filters.
- Piggybacking - Piggybacking ICs is particularly useful when troubleshooting large sections of logic. This is especially true when working with older units.
- After interruption of downlaoding boot soft ware, it maybe useful to clear battery supplied RAM if equipment is OFF!! by short circuit SRAM_VCC ground or chassis by a short piece of wire onto Main Board (e.g. cathode of D13 to GND).

3.2 Troubleshooting Hints

Complaint:	Explanation:	Solution:
EATS TAPE		
Eats tape in play	Dirty helical groove on lower drum	Clean groove
	Drum not spinning	Replace drum or driver
	Clocked to unstable SMPTE	Use stable word clock source
	Pinch roller assembly damaged	Replace pinch roller assembly.
	Sticky hard brake	Clean hard brake solenoid
	Deck misaligned	Realign deck
Eats tape in rewind	Pinch roller gap too narrow	Replace pinch roller assembly
Slams to beginning of tape	Can't detect tape leader	Check end sensor, replace if bad.
		Check emitter, replace if bad
Slams to end of tape	Can't detect tape leader	Check end sensor, replace if bad
		Check emitter, replace if bad
ERROR ICON		
Error Icon on steady Time Code Invalid	Dirty heads	Clean heads
	Dirty tape path	Clean tape path
	Faulty RP2	Troubleshoot and replace as necessary
	Faulty rotor	Troubleshoot and replace as necessary
	Faulty cludge	Troubleshoot and repair as necessary
Error Icon flashing	Dirty heads	Clean heads
	Dirty tape path	Clean tape path
	Faulty RP2	Troubleshoot and replace as necessary
	Faulty rotor	Troubleshoot and replace as necessary
	Faulty cludge	Troubleshoot and repair as necessary
Error Icon during pitch up	Drum voltage too low	Perform modification described in Appendix A1
	Faulty Servo ASIC	Troubleshoot and replace as necessary
	Faulty Drum Driver	Troubleshoot and replace as necessary
	Faulty Regulator	Troubleshoot and replace as necessary
ERROR RATE		
"Err7"	Clogged Head	Clean heads
	Damaged ReadPre 1	Check data pin, replace Read Preamp Board if necessary (see transport)
High error rate	Dirty heads	Clean heads
	Misaligned deck	Check alignment
	Scratched or broken heads	Check heads
	Corrupt	Check Tape7 mod
	Dirty tape path	Clean tape path
	Faulty rotor	Troubleshoot and replace as necessary
	Faulty cludge	Troubleshoot and repair as necessary
Punch in errors	Low data amplitude	Troubleshoot and repair as necessary
Errors during Aux Record	Bias Osc interfering with tape data	Perform modification described in Appendix A1

Complaint:	Explanation:	Solution:
TRANSPORT NOISE		
Noisy drum	Rotor out of alignment	Replace headstack assembly
	Cables touching headstack assembly	Move cables
Noisy Supply Reel	Tach sensor too close to rim of motor	Repair as necessary
Noisy Takeup Reel	Tach sensor too close to rim of motor	Repair as necessary
LRC		
LRC not detected correctly	LRC out of tolerance	Replace LRC
I/O		
Word Clock output not detected	Low output drive	Update to Index 81 I/O board 1.864.135.81
Word Clock input not detected	Low input signal	Update to Index 81 I/O board 1.864.135.81
	Bipolar input signal	Update to Index 81 I/O board 1.864.135.81
Self Tests		
RS422 loopback test fail	Broken solder joints	Resolder connector or update I/O board 1.864.135.00 to Index 81
Tension sensor stuck	Bad tension sensor	Replace tension sensor
	Bad emitter	Replace emitter
Miscellaneous.		
Missing PG high or low	Dirty head	Clean heads
	Cold or Bad solder joint around RP1 or PR2	Troubleshoot and repair as necessary
	Faulty RP1	Troubleshoot and replace as necessary
	Broken head	Troubleshoot and replace Headstack if necessary
Low data amplitude	Dirty heads	Clean heads
	Faulty RP1, RP2	Troubleshoot and replace as necessary
Collapsing data amplitude	Faulty RP2	Troubleshoot and replace as necessary
Won't load tape	Bad cable, connector	Check deck cables
	Cable not properly seated	Reseat deck cables
NoFo in Play	Bad Q1 on servo PCB	Troubleshoot and replace as necessary
PG Delay not set	Discharged battery	Check battery with 1kΩ resistor load connected in parallel to the battery
	Elevated current consumption	Check Q4 on Main Board PCB 1.864.120.XX

3.3 Troubleshooting Specific Error Codes

Error Message	Error Definition	Known Issue or Further Explanation	Possible Solution
NO CAPSTAN FGs ERROR 1	No capstan tach pulses are detected when changing capstan speeds	Low CapFG signal	Reseat Capstan Cable
			Perform modification described in Appendix A1
			Check CapFG sensor gap
Track Skip timeout error	Track skipping not completed within 6 seconds	Corrupt SRAM	Initialize unit
CAP SERVO CNTR TIMEOUT 1	Capstan speed feedback from servo chip is not in range after 2 seconds	Outdated software	Update software
ERROR: EjectSem1 Timeout	Problem with cassette present sensor , load switch, or load motor	Bad or unseated sensor cable	Check cable
		Slipped gear	Check alignment
ERROR: EjectSem2 Timeout	Problem with cassette present sensor, load switch, or load motor	Bad or unseated sensor cable	Check cable
		Slipped gear	Check alignment
ERROR: EjectSem3 Timeout	Problem with load switch or load motor	Bad or unseated sensor cable	Check cable
		Slipped gear	Check alignment
ERROR: DEW SENSOR ACTIVE	Dew sensor is active when loading	Dew Sensor or cable could be unseated or bad	Check Dew Sensor and cable
ERROR: TAPE DOWN TIMEOUT	During load, load switch didn't get to proper state within 2 seconds	Load mechanism not working	Check belt, clutch
CALIBRATION ERROR 4	Problem when calibrating takeup reel, sticky hard brakes		Clean hard brake solenoid
CALIBRATION ERROR 9	Capstan speed feedback from servo chip is not in range, sticky hard brakes		Clean hard brake solenoid
END SENSOR ERROR	When the sensors are in an illogical state, the tape will be ejected	Caused by object interrupting optical path between emitter and end sensor	Remove offending object
		Caused by photo flash	Remove offending object
DEW SENSOR TRIGGERED	When the dew sensor is activated, the tape will be ejected		Allow moisture to evaporate
		Dew Sensor or cable could be unseated or bad	Check Dew Sensor and cable
SUPPLY REEL ERROR	When no supply motor tachs are detected, the tape will be ejected		Check Gap of supply motor - Hallsensor, adjust Gap of Hall-Sensors by a piece of paper 80gr/m² (0.11mm +0.02mm)
		Capstan stalled in 1/8x speed because no CapFG	Check CapFG, C55 on Motor Driver Board
		Hard brakes stuck on	Clean hard brake solenoid
TAKEUP REEL ERROR	When no takeup motor tachs are detected, the tape will be ejected		Check Gap of take up motor - Hallsensor
		Capstan stalled in 1/8x speed because no CapFG	Check CapFG, C55 on Motor Driver Board
CAPSTAN ERROR	When no capstan motor tachs are detected, the tape will be ejected		Perform modification described in Appendix A1
		Hard brakes stuck on	Clean hard brake solenoid
ERROR: Address Error	Machines have different Soft Ware Versions.	If V-Eight is running SW1.10, it must be the master if slave is running with SW2.03. It will finish booting and will stop working.	All machines have to be updated by same Soft Ware Version 2.0 or higher.

3.4 Test Points and Required Tools

Test Point	Silkscreen Name	Schematic Signal	Function	Range
T8	AUD48K	AUD_48K	48K Word Clock Input	
T9	EXT48K	EXT_48K	48K Word Clock Output	
T1, T2, T4, T10, T19, T27	GND	GND	Ground	
T14	DRUM PG	DRUM_PG	Head Drum Phase Generator output	
T15	CAPFG	CAP_FG	Capstan Frequency Generator output	
T18	FFTENS	FF_TENS	Fast Forward tension level	
T17	RWTENS	REW_TENS	Rewind Tension Level	
T18	SLICE	SLICE	Slice output	
T20	DATA	READIN	READIN	
T21	PG DELAY	PG_DELAY	PG Delay	
T22	RDVCO	RDVCO	Read VCO	
T23	WRVCO	WRVCO	Write VCO	
T24	LINTRACK	LIN_TRK	Linear track	
T25	SUPPLY TACH	SUPPLY_TACH	Supply hub tachometer	
T26	TAKEUP TACH	TAKE_UP_TACH	Takeup hub tachometer	
T5	DRUMFG	DRUM_FG	Head Drum Frequency Generator output	
T7	SVCO	SMPVCO	Sample VCO	
T6	DVCO	DIGVCO	Digital VCO output	
T11	TBC	TBC	Time Base Code	
T12	ERR	ERROR	Error output	
T13	LDBEG	LD_BEG	Load Begin	

Table 2 - Main PCB Test Points

Tool or Equipment Type	Where Used
1 BNC Cable	Word Clock Self Test
1 RJ-45 Loopback Cable	RJ-45 Self Test (See Chapter 2.1 for details.) RJ45 8pin 1 to 3 and pin 2 to 6 connected
1 RS-422 Loopback Cable	RS-422 Self Test (See Chapter 2.1 for details.) D9 male pin 7 to 3 and pin 2 to 8 connected
1 Alignment Tape	Deck Alignment (e.g. PG delay...)
1 Fiber Optic Cable "TOSLink"	Optical Bus Self Test
1 XLR Cable	SMPTE Self Test
MIDI Cable	MIDI Self Test, Load Software
1 Conical Screw Driver	Deck Alignment
#1 and #2 Phillips Screw Driver	Assembly/Disassembly
Screwdriver for Allen Key Nr. 2 (2mm)	Assembly/Disassembly
Screwdriver for Allen Key Nr. 2.5 (2.5mm)	Assembly/Disassembly
Screwdriver for Allen Key Nr. 3 (3mm)	Assembly/Disassembly
Fine adjust Screw Driver	FG Sensor Gap Adjustment
1 C-Clip removal Pliers	Assembly/Disassembly
1 P2/P3 Post tool	Deck Alignment
1 Capstan tool (large Flat Screwdriver)	Deck Alignment
1 0.15mm Feeler Gauge	Deck Alignment
1 Oscilloscope	Deck Alignment
1 Digital-Multimeter	Battery Check
1 Video Black Burst Generator or VCR w/composite out.	Video Sync Self Test
Signal Generator	Testing and ADA Adjustment
1 V-Eight LRC	LRC Self Test
1 Cockpit (Remote Control)	Remote Control / Self Test
1 ADAT Sync Cable	ADAT System Sync Self Test
1 Overwrite Tape	Overwrite Test
1 Calibration Tape	Peak Meter Calibration Test Tape (1000 Hz sinewave recorded at -15.00 dBFS on all eight digital channels)
1 Small Flat Blade Screw Driver	VU Meter Calibration
Alcohol (98% or better Isopropyl)	Head/Tape Path Cleaning
Lint Free Cloth (Tech Wipes)	Head/Tape Path Cleaning
Morlytone Grease (Black)	Deck Maintenance (Metal Parts)
S.C.R. Grease (White)	Deck Maintenance (Plastic Parts)
High Quality Oil	Capstan
Sys-Ex Librarian	Software Installation

Table 3 - Necessary Tools and Equipment

4 Service and Repair Procedures

4.1 Prerequisites and Opening Equipment

Note: Remove mains cable from outlet before open the equipment.

- Unconnect all cables to and from the equipment. Remove V-Eight from rack and use a suitable table or surface. Remove top- and bottom cover by disassembling all 12 Allan key screws (four each at the left- and the right-hand side, two each onto the top- and bottom side) and remove covers. Now you can see the Main Board (left hand side), the I/O Board and the transport, (right hand side), if the equipment is in front of you. In case the Option AES/EBU is built in, you should see the AES/EBU unit above the Main Board. Complete these checks prior to the start of the QC Test Procedure. For all following procedures the equipment is connected to mains and powered on if not stated otherwise.

- To check following items, switch off the V-Eight.

✓ Verify that all hardware modifications (if any) have been completed for the unit under test. Refer to Appendix A or B respectively for a list of any modifications.

✍ Record the serial number of the V-Eight being tested on the data sheet provided.

- Clean the tape guidance path, capstan and pinch roller. The drum head normally need not to be cleaned. The drum head may break very easily if no careful treatment is applied to them!
- Press and hold **RECORD1** and **RECORD7** while applying Power to the V-Eight to enter the Self Test mode.
- Press the Δ/**Yes** key on the numeric keypad until the VFD displays "`16: Drum Head Hrs = XXXX`" (where XXXX indicates the Drum Hours). Record the number of Drum Hours displayed on the data sheet.
- Press the Δ/**Yes** key on the numeric keypad until the VFD displays "`17: Power-On Hrs = XXXX`" (where XXXX indicates the Power-On Hours). Record the number of Power-On Hours displayed on the data sheet.
- Power down the V-Eight.
- Press and hold the **EDIT** key , **REC**ord and **PLAY** buttons while applying Power to the V-Eight in order to both initialize the unit (all Locate addresses will be cleared - refer to Operating Instruction Manual → Utility menu Save data to tape?) allow UTILITY pages greater than page 26 to be displayed. Note that you should continue holding the **EDIT** key until the VFD displays "`LOCATE 00`" or else you may not be able to access the UTILITY pages above page 26. If UTILITY pages above 26 are not accessible, please repeat this step until UTLITY pages above page 26 can be accessed (refer to 1.1 Power-On Key Combinations).
- Press **UTILITY** repeatedly (or press and hold **UTILITY** while pressing 2 then 5 on the numeric keypad) until the display reads "25 FRONT PANEL: VX.XX" (where X.XX indicates the installed) and record the version of the Front Panel software installed in the unit on the data sheet.
- Press **UTILITY** once and verify that the display reads "26 MAIN VX.XX mm/dd/yy" (where X.XX indicates the installed revision and mm/dd/yy indicates the release date of the software version) and record the version of the Main software installed in the unit on the data sheet too.
- Press **UTILITY** once and verify that the display reads "27 BOOT VX.XX mm/dd/yy" (where X.XX indicates the installed revision and mm/dd/yy indicates the release date of the software version) and record the version of the Boot segment software installed in the unit on the data sheet.
- Verify that the latest software (UTILITY pages "25" and "26") has been installed into the unit under test. Refer to Appendix B 1 for instructions on Upgrading Software Via MIDI.
- Power down the V-Eight.

4.2 Replacement of V-Eight Transport

- **Front panel must be removed first:** Power down the V-Eight.

1. Open top and bottom cover if not already done (see chapter 4.1).
2. Disconnect the two flat ribbon cables at the bottom side (Monitor/Mixer PCB see Figure 2) first and three cables at the top (one ribbon cable to the Parallel Remote Connector Board to back panel, one multiwire cable J17 and a single wire [orange colored, ERR] to the Main Board). The frontpanel is unwired now.
3. Remove the frontpanel by removing all four Allen key screws from the front side. In case the rack handle are mount, remove further four screws from handle (back side access).
4. Take care to the power switch cap and the remaining flat ribbon cable when removing the frontpanel against you. The power switch cap will unfit its own by removing the front panel.

- **Transport:**

5. Disconnect following cables to the drive, which are accessible from the top (refer to Figure 2 see Main Board):
6. The **READ** connector and **WRITE** connector.
7. The **LTC** connector, the **ERASE**- and **AUDIO** -connector.
8. All Connectors are rewired from top side. Next remove Bottom side connectors.

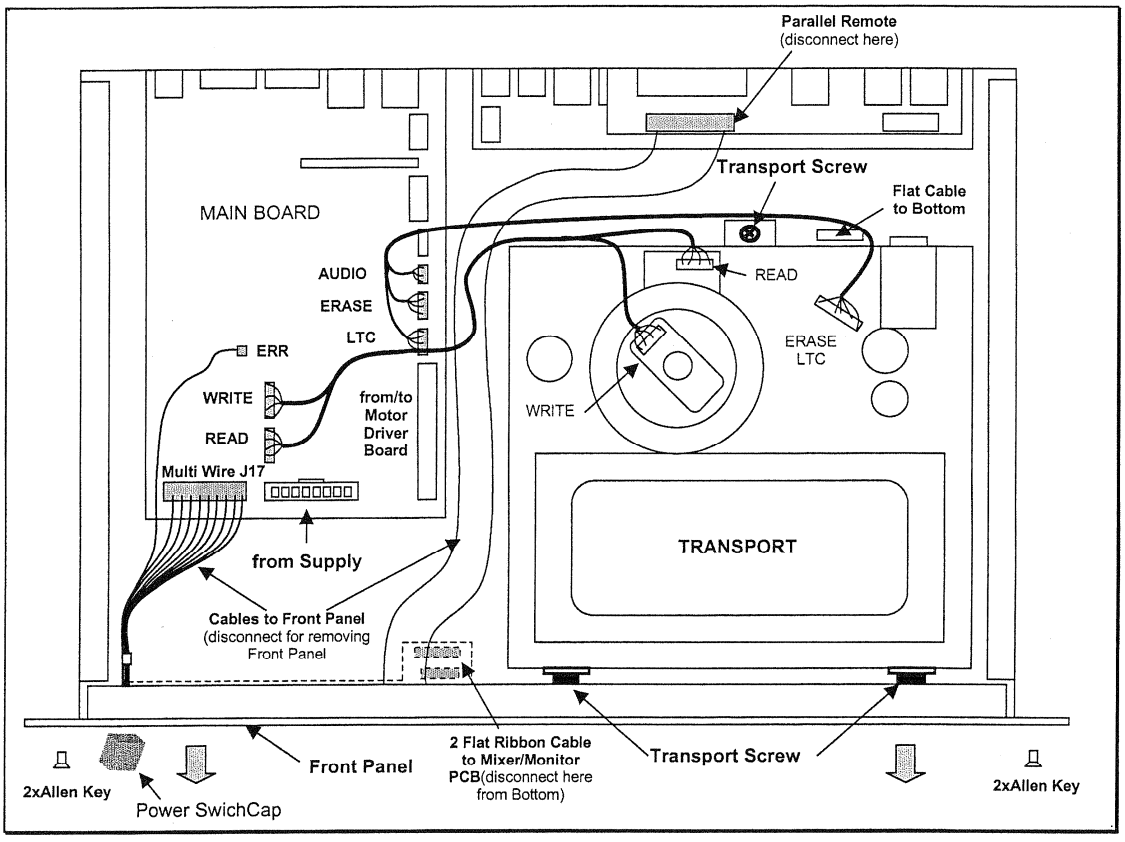


Figure 2 - Cable and Connector Placement (top side access)

- Disconnect following cables from the transport, which are accessible from the bottom side of the machine (refer to Figure 3 see Motor Driver Board):

1. The Capstan Motor connector J2 and Cap Solenoid connector J6.
2. The Linear Track connector J3 and Drum Motor connector J5.
3. The End Sensor connector J4 and Flat Cable of Load Motor connector J1.
4. The Flat Cable of Take Up Motor connector J9 and Flat Cable of Reel Sensor connector J10.
5. The Flat Cable of Supply Motor connector J11.

- All necessary connectors are removed now. Next, remove two Allen key screws from front side and one Phillips screw from top side respectively.

Cables of V-Eight Transport (bottom view)

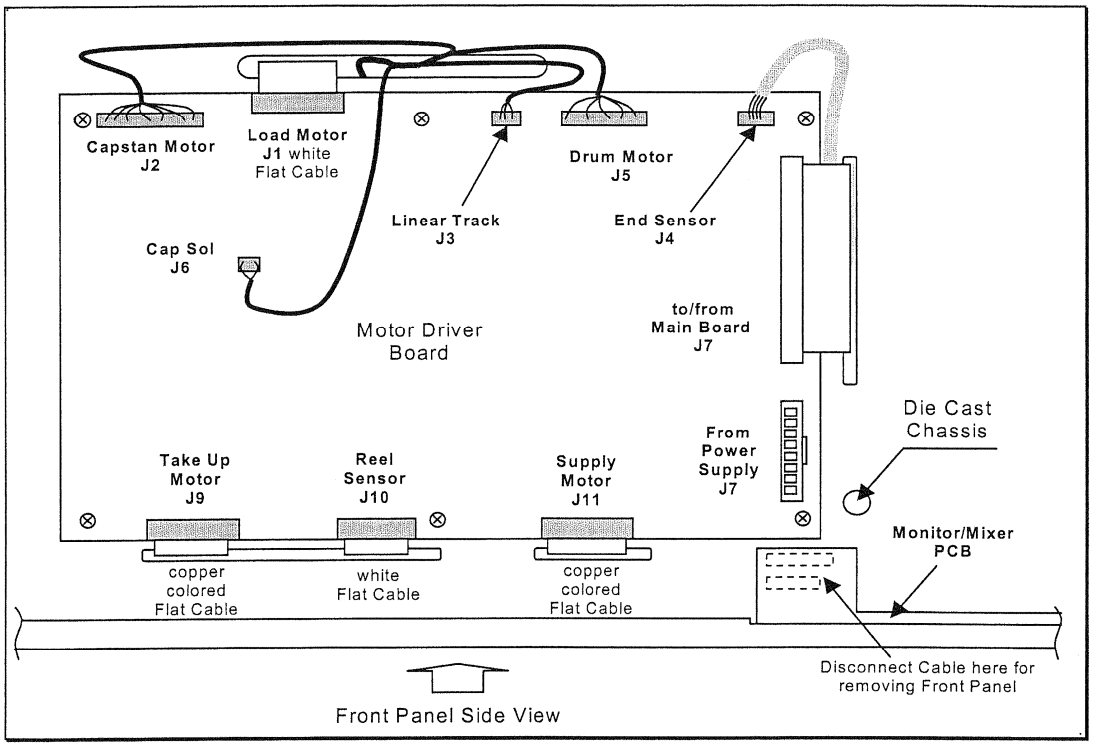


Figure 3 - Cable and Connector Placement (Motor Driver Board)

- Remove transport carefully now. Take care about the flat cables conducting trough the certain openings of the die cast chassis. Do not touch drum heads unintentionally.
- Install the new drive in reverse order and refit all cables. The **three** transport screws must be treated by Lock tite ® (use 243 blue).

- Press and hold the **EDIT** key while applying Power to the V-Eight. Note that you should continue holding the **EDIT** key until the VFD displays Locate 00 or else you may not be able to access the UTILITY page 37. If you can not access UTILITY pages above page 26, then repeat this step until UTLITY pages above page 26 can be accessed (refer to 1.1 Power-On Key Combinations).
- Press **UTILITY** repeatedly (or press and hold **UTILITY** while pressing 3 then 7 on the numeric keypad) until the display reads "37 PG Delay nnnn".
- Please enter by keypad the calibration value for PG-Delay into V-Eight. Find this value to be entered on a label at the top left side of the drive (e.g. PG 5810). This is the factory adjusted value.
- Power down the V-Eight.
- Press and hold **REC**ord and **PLAY** buttons while applying Power to the V-Eight in order to reinitialize the V-Eight (all Locate will be cleared - refer to Operating Instruction Manual → Utility menu Save data to tape?).
- Follow procedure to reset Drum Hours (see B2 Update Drum Hours and Power On Hours [section ②]).

✍ Record the new PG-Delay on the data sheet.

4.3 Adjustment of Capstan FG Sensor Gap

Note: Exercise this calibration needs a fine adjust screwdriver.

The FG Sensor is part of the capstan motor and is accessible from bottom side of the transport

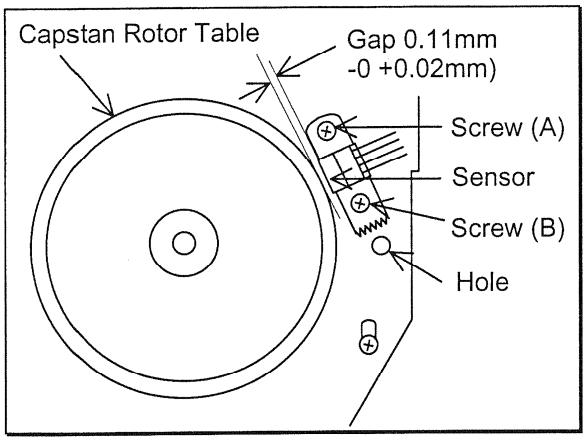


Figure 4 - FG Sensor Gap Adjustment (Bottom View)

- Unlock screw (A) and (B) in a way you are just able moving the Sensor body. Be sure the screw (A) is still a bit tighter than (B).
- Set fine adjust screw driver into the hole on the Capstan Stator unit.
- Adjust the gap between FG Sensor and the Capstan Rotor Table to given gap width by the screw driver (see Figure 4). In case you haven't a certain gap gauge, you can use a portion of paper 80gr/m² (0.11mm) instead. The Sensor may never touch the Sensor during a full revolution.
- After this procedure, tighten screw (A) carefully before tighten (B).
- Check gap again and for never touching the Sensor during a full revolution.

4.4 Capstan Driver Check and Alignment

Note: Exercise extreme caution when conducting this test. Due to the fact that this test allows values to be written directly to the motor drivers, conducting this test improperly could result in the destruction of the motor drivers.

- Press and hold the **EDIT** key while applying Power to the V-Eight. Note that you should continue holding the **EDIT** key until the VFD displays Locate 00 or else you may not be able to access the UTILITY pages above page 26. If you can not access UTILITY pages above page 26, then repeat this step until UTLITY pages above page 26 can be accessed (refer to 1.1 Power-On Key Combinations).
- Press **UTILITY** repeatedly (or press and hold **UTILITY** while pressing 3 then 2 on the numeric keypad) until the display reads "32 C=-000 S=-000 T=-000". Changing the number in the display (with the numeric keypad) and pressing **ENTER** causes to currently displayed value to be written to the Capstan motor, Supply motor, and/or Take-up motor respectively. The -/+ sign determines the motors direction. **Always return the values to 000 before changing motor direction**. Failure to do so will usually result in damage to the drivers and/or motors.
- Adjust the Capstan setting to C=+050
- With a large flat head screwdriver, turn the capstan adjust (large white nut just above the capstan) counter-clockwise until the capstan starts to rub on the windings (you should hear an audible "grinding")
- Turn the nut clockwise ¼ turn.
- Reset the capstan motor value to C=+000.

✍ Record the Capstan Driver Check on the data sheet.

4.5 Tape Path Alignment

NOTE: The technician should be comfortable with V-Eight Tape Path Alignment before proceeding. Although there is no "perfect way" of aligning the V-Eight headstack, the procedure below is the closest we can get to developing a "universal" procedure.

ALSO NOTE: If the technician is familiar with the tape path alignment of other similar equipment (e.g. Video Equipment), he may notice that the tape path alignment chores listed below are much simpler than the procedures for other recorders. This is mainly due to the nature of the transport used in the V-Eight. It is felt that the V-Eight transport does not require adjustment of the Linear Head, Tension, Brake Torque nor the Envelope Recovery Test every time the unit is serviced. Studer recommends to use a normal tape (and not the Alignment tape) to adjust tape travel.

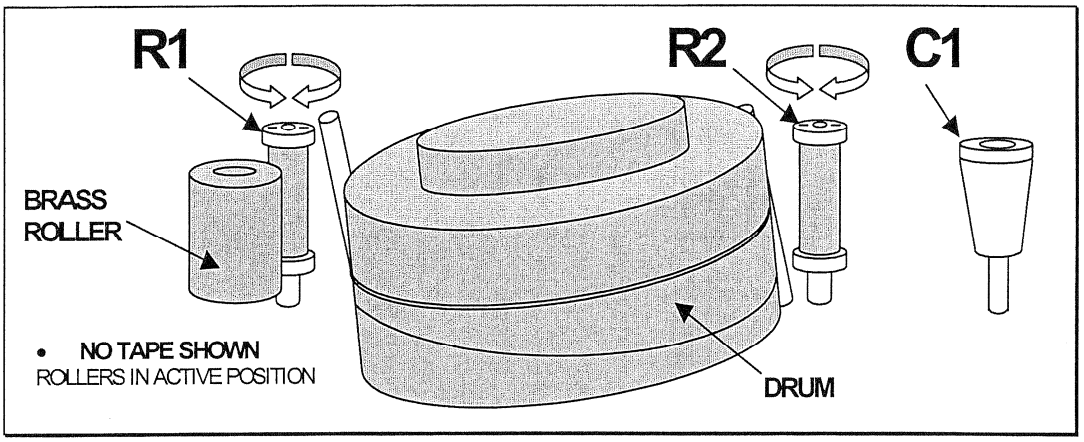


Figure 5 - Tape Travel Rollers R1, R2 and C1

- Set Up Oscilloscope 1ms Main Sweep.
- Set PG-Delay to 5900 in case of "virgin" transport.
- If not already inserted in the unit, insert the Alignment Tape into the V-Eight
- Press **PLAY**
- ✓ Visually check that the Alignment Tape is aligned on the helical groove of the lower drum correctly. If not, adjust the R1 and/or R2 rollers (see Figure 5) until the tape is aligned along the helical groove.
- ✓ Look at the envelope on the scope. If necessary, move the R1 and R2 Incline Posts to the left or right until the envelope is flat and steady. Note: R1 controls the begin of envelope's shape, R2 controls the tail of envelope's shape.
- Turn the conical screw C1 until the envelope amplitude is maximized. Then, adjust the P1 and/or P2 rollers to flatten out the envelope.
- Press **STOP**.
- Press **EJECT** and remove the Alignment Tape.

✍ Record this test on the data sheet.

4.6 Battery Backup Check

With the V-Eight powered down, check the battery B1 voltage level. The battery is placed on the Main Board. Check voltage at Cathode of D13 (marked side of diode) to GND or chassis. You should read 2.7 trough 3.1V by your measuring equipment with no further load. To get a true measurement under load, make a second measurement from battery's +Pole (top side) to GND or chassis. Add a 1kΩ load resistor in parallel circuit to the battery, during this act. You should read at least 2.5V now. Measurements below this range likely indicate a weak or dead battery. Remove resistor and also measure the voltage across R74. The measurement should be in the range of (1mV) 0.1µA trough (50mV) 5µA. Measurements above this range indicate either faulty SRAM(s) or a short circuit of SRAM_VCC or SRAM_CE through any alternative path back to ground.

✍ Record the results of the battery backup check on the data sheet.

4.7 PG Delay Offset Setup

- Press **UTILITY** repeatedly (or press and hold **UTILITY** while pressing 3 then 7 on the numeric keypad) until the display reads "37 PG Delay nnnn", where nnnn indicates the PG Delay value in Milliseconds. Ignore QUALITY display for this procedure.

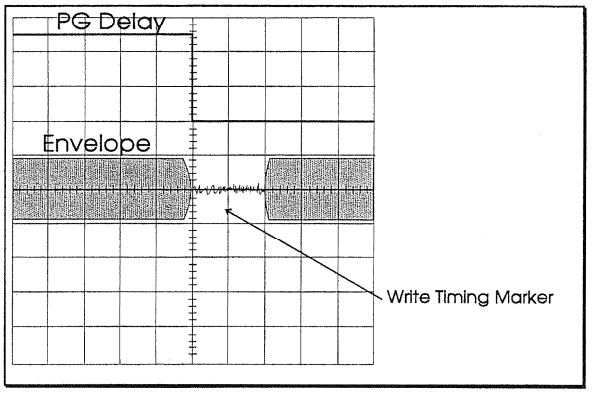
NOTE: If the Headstack was not replaced during the repair of the unit under test, skip following step ①. Proceed directly to step ②.

✓ Oscilloscope Set Up :

Channel1 (as Trigger Source)	**Channel 2**
Place probe on the PGDELAY Test Point of the Main PCB.	Place a probe on the DATA Test Point on the Main PCB.(READIN T20 onto SC)
Set to 1 ms/Div.	Set to 100 Millivolts/Div.
Set to 2 V/Div.	
Use DC Coupling.	Use AC Coupling

① Insert the Alignment Tape into the V-Eight and press **PLAY**.

- Use the „B Delay" function of the oscilloscope to „zoom in" on the transition of PG High to PG Low.
- Press and hold the ∇/**No** and/or Δ/**Yes** keys to move the write timing marker until it is positioned on the falling edge of the PG Delay pulse (see Figure 6). It is also possible to enter a value using the numeric keypad.
- **Note:** Increasing PG value, the envelope (gap increases) moves to left hand side related to the falling edge of PG-Delay.
- Press **STOP**



✍ Record the PG Delay value entered on the data sheet.

- Proceed to next test (chapter 4.8).

Figure 6- Write Timing Marker

② If the Headstack was not replaced during the course of this repair, verify that the number displayed on the VFD is the same as the number recorded on the „setup" sticker located on the left (or right) hand side of the transport (silver covered label e.g.PG5652). Use the ∇/**No** and/or Δ/**Yes** keys to achieve this result.

✍ Record the PG Delay value entered on the data sheet.

NOTES:

4.8 Error Rate Check

This procedure will monitor the error rate within the V-Eight and verify that it falls within specification.

✓ Oscilloscope Set Up :

Channel 1	Channel 2	Trigger Source
Place a probe on the DATA Test Point on the Main PCB Set to 100 Millivolts/Div. Use AC Coupling	Place a probe on the ERR Test Point on the Main PCB (remove 1pin Conn. temporarily). Set to 5 Volts/Div. Use DC Coupling	Place probe on the PGDELAY Test Point of the Main PCB. Set to 2 ms/Div. Use DC Coupling. Use AUTO Mode

- Insert the Overwrite Tape into the V-Eight and press **PLAY**.
- Set Locate 00 by **SET LOCATE** and keep holding key during enter 00 on the key pad.
- Press the **LOCATE SELECT** key on the front panel.

✓ Put all tracks into "Record Ready" by pressing **RECORD 1** through **RECORD 8**. Verify that all channel RECORD LEDs are lit exclusive AUX or TC.

- Press the **FORMAT** key on the front panel, then press **REC**ord and **PLAY** simultaneously.
- While the tape is formatting, press the **SET LOCATE** key. This locate point will be automatically stored as LOCATE 01.
- Note that the locate point entered in the previous step will be displayed on the right hand side of the VFD. This locate point should be used as a reference in order to determine the length of time elapsed since the **SET LOCATE** key was pressed in the previous step. After formatting the tape for 30 seconds, press **SET LOCATE** again. This locate point will be automatically stored as LOCATE 02.
- Press **STOP**.
- Press **AUTO RETURN** and **AUTO PLAY** to ON (Lit). Then press **▽/NO** once, and finally **LOCATE**.
- Press **UTILITY** repeatedly (or press and hold **UTILITY** while pressing 2 then 4 on the numeric keypad) until the display reads "24 Error Rate XXXX", where XXXX indicates the number of Sync Block Errors per 14 drum revolutions. The maximum error rate is 6720.

  Note: The red Error Icon indicates that an incorrigible error has occurred. When this happens, the V-Eight interpolates the data or, in severe cases, mutes the audio. The Error Rate display "QUALITY" is an error indicator "in advance" and shows accumulated tape drop outs. This display will bright higher the drop outs have became higher counts.

✓ Verify that the error count displayed on the VFD is never greater than 20 for the entire length of tape formatted.

- After the tape rewinds and begins playing over the portion of tape formatted, punch in and out of record several times (press **PLAY** and **REC**ord to punch in - press **PLAY** to punch out).

✓ Verify that the error count displayed on the VFD does not significantly increase when punching in and out of record.

✓ Verify that the error count displayed on the VFD is never greater than 20 for the entire length of tape formatted.

- Let the tape rewind once more and begin playing over the portion of tape formatted.

✓ Verify that the error rate count displayed on the VFD is never greater than 20 for the entire length of tape formatted.

✓ Verify that the amount of raw errors displayed on the scope indicates a similar amount of errors as the number of errors displayed on the VFD. (This is only to verify that the Error Counter display on the VFD is functioning correctly).

- Press **EJECT** and remove the Overwrite tape.
- Press **AUTOPLAY** (The AUTOPLAY LED should no longer be lit).
- Press **AUTO RETURN** (The AUTO RETURN LED should no longer be lit).
- Press the **LOCATE SELECT** key.

✍ Record the results of this test on the data sheet.

4.9 Peak Meter Calibration

✓ Put all tracks into "Input" Mode by pressing INPUT 1 through INPUT 8. Verify that all channel INPUT LEDs are lit.

- To adjust the input level Peak Meters, inject a +15dBu, 1KHz signal into the appropriate channel input.
- Adjust each input potentiometer so that the corresponding Peak Meter indicates 0dB. Note that these potentiometers can be found below of the Input Connectors located at the backside of the V-Eight machine.

✓ Take all tracks out of "Input" Mode by pressing INPUT 1 through INPUT 8. Verify that all channel INPUT LEDs are no longer lit.

- Insert the Calibration Tape into the V-Eight and press **PLAY**.
- Adjust the appropriate output potentiometer so that the output level is +0dBu. Note that these potentiometers can be found at the bottom of the Output Connectors located at the backside of the V-Eight machine.
- Press **EJECT** and remove the Calibration Tape.

✍ Record the results of this test on the data sheet.

4.10 16 Bit Audio Test

The audio test will verify that audio is being passed properly through the V-Eight.

- Connect the V-Eight to the audio system used by the Service Center.
- Configure the V-Eight for one of the following analog input schemes:
  – 2 Input Mode (Press **INPUT ROUTING** and then press **RECORD 1**)
  – 4 Input Mode (Press **INPUT ROUTING** and then press **RECORD 3**)
  – 8 Input Mode (Press **INPUT ROUTING** and then press **RECORD 5**)

  NOTE: The mode you select should depend on the amount of analog inputs you have emanating from your audio system. Most likely, you will input audio from a stereo source (like a CD player). In this case, select 2 Input Mode. For more details on the Analog Input options available in the unit, refer to the "Input Select" section of the V-Eight reference manual.
- Insert a 16 bit formatted tape into the V-Eight
- Press **SET LOCATE**.
- Place all 8 channels in record ready by pressing the **RECORD 1** through **RECORD 8** keys. Verify that the RECORD 1 through RECORD 8 LEDs are lit. Also verify that the INPUT 1 through INPUT 8 LEDs are lit.
- Begin playing the audio source material

✓ Verify that the audio source is being received by the V-Eight by observing the VFD.

- Press **PLAY** and then press **PLAY** and **REC**ord simultaneously.
- Record at least 30 seconds of audio on the V-Eight.
- Press **STOP** and then **LOCATE**.
- Press **PLAY** and listen to the audio just recorded.

✓ Verify the following for each Output channel :

- Audio is heard
- No distortion is present
- The playback level is the same as the recorded level

- Press **EJECT** and remove the tape.

✍ Record the results of this test on the data sheet.

4.11 20 Bit Audio Test

NOTE: This test assumes that you have already configured the V-Eight to the audio system used at the service center. If not , refer to your Audio Test Manual for details on how to configure your audio system to meet the requirements of this test

- Insert a 20 bit formatted tape into the V-Eight
- Press **SET LOCATE**.
- Press **▽/NO** once.
- ✓ Place all 8 channels in record ready by pressing the **RECORD 1** through **RECORD 8** keys. Verify that the RECORD 1 through RECORD 8 LEDs are lit. Also verify that the INPUT 1 through INPUT 8 LEDs are lit.
- Begin playing the audio source material
- ✓ Verify that the audio source is being received by the V-Eight by observing the VFD.
- Press **PLAY** and then press **PLAY** and **REC**ord simultaneously.
- Record at least 30 seconds of audio on the V-Eight.
- Press **STOP** and then **LOCATE**.
- Press **PLAY** and listen to the audio just recorded.
- ✓ Verify the following for each Output channel:
  - Audio is heard
  - No distortion is present
  - The playback level is the same as the recorded level
- Press **EJECT** and remove the tape.
- Power down the V-Eight.

✍ Record the results of this test on the data sheet.

4.12 Loop Test

This test verifies that tape damage is not occurring in the V-Eight. A portion of tape is looped 100 times and then checked on an oscilloscope for errors or problems relating to envelope amplitude.

Part 1 - Looping

- Press and hold the **EDIT** key , **REC**ord and **PLAY** buttons while applying Power to the V-Eight in order to both initialize the unit (all Locate addresses will be cleared - refer to Operating Instruction Manual → Utility menu Save data to tape?) allow UTILITY pages greater than page 26 to be displayed. Note that you should continue holding the **EDIT** key until the VFD displays "`LOCATE 00`" or else you may not be able to access the UTILITY pages above page 26. If UTILITY pages above 26 are not accessible, please repeat this step until UTLITY pages above page 26 can be accessed (refer to 1.1 Power-On Key Combinations).
- Press **UTILITY** repeatedly (or press and hold **UTILITY** while pressing **2** then **8** on the numeric keypad) until the display reads "`28 Auto Loop Limit: 9999`"
- Using the numeric keypad, Press **0 1 0 0** to set the machine up to run 100 loops.
- Press the **LOCATE/SELECT** key to return the VFD to the Locate mode display.

- Insert a non-formatted tape into the V-Eight.

  Note: The portion of tape used for this test must never have been played in any other V-Eight. If using an existing tape, locate the tape to a non-formatted portion.
- Press **FORMAT**.
- Press **PLAY** and **REC**ord.
- While the tape is formatting, press **SET LOCATE**. This locate point will be automatically stored as LOCATE 01.

  Note: The Set Locate entered in the previous step will be displayed on the right hand side of the VFD. This locate point should be used as a reference in order to determine the length of time elapsed since the **SET LOCATE** key was pressed in the previous step. After formatting the tape for 30 seconds, press **SET LOCATE** again. This locate point will be automatically stored as LOCATE 02.
- Let the tape continue to format for another 5 to 10 seconds.
- Press **STOP**.
- Press **AUTO RETURN** and **AUTO PLAY** to *ON (Lit)*. Then press **▽/NO** on the numeric keypad (to return the display to LOACTE 01), and finally press **LOC**ate.
- The tape will now loop over the 30 second portion of tape just formatted. The V-Eight will loop this portion 100 times and then stop. This usually takes about 45 minutes to complete this test.

✓ Oscilloscope Set Up refer to 4.7.

- Press **UTILITY** repeatedly (or press and hold **UTILITY** while pressing **2** then **4** on the numeric keypad) until the display reads "`24 Error Rate XXXX`", where XXXX indicates the number of Sync Block Errors per 14 drum revolutions. The maximum error rate is 6720.

  Note: The red Error Icon indicates that an incorrigible error has occurred. When this happens, the V-Eight interpolates the data or, in severe cases, mutes the audio. The Error Rate display "QUALITY" and the red Error Icon are not directly related to each other. The "QUALITY" display will show cumulated tape drop outs and will bright higher the drop outs have increased. It is possible to get Sync Block Errors that are correctable. In this case the Error Icon will not be indicated.

- Push **PLAY** on the V-Eight

✓ ① Verify that the error rate count displayed on the VFD is never greater than 20 for the entire length of tape formatted.

✓ ② Verify that the envelope does not contain "drop outs" when errors are observed on the VFD.

✓ ③ Verify that the envelope amplitude does not decay over the loop period.

- If any part of steps ① through ③ is not verified, the unit fails its loop test.
- Press **EJECT** and remove the tape.
- Power down the V-Eight.
- Press and hold **REC**ord and **PLAY** buttons while applying Power to the V-Eight in order to reinitialize the V-Eight (all Locate will be cleared - refer to Operating Instruction Manual → Utility menu Save data to tape?).
- Power down the V-Eight.

✍ Record the results of this test on the data sheet.

4.13 V-Eight Self Tests

- Press and hold **RECORD1** and **RECORD7** while applying Power to the V-Eight (be sure you are NOT reading "`Safe Mode Active`" if so refer to 1.1 Power-On Key Combinations)

✓ Verify that the unit passes all main Self Tests as outlined in chapter 2.

- Power down the V-Eight.
- Press and hold **LOC**ate button while applying Power to the V-Eight

✓ Verify that the unit passes all Front Panel Self Tests as outlined in chapter 2.

- Power down the V-Eight.

✍ Record the results of the Self Tests on the data sheet.

5 Spare Parts

5.1 Mechanical Parts

Position	Quantity	Order-Nr.	Part Name Specifications
V-Eight			
01	5	42.01.1000	Inner Knob 11 mm ∅, dark gray
02	5	42.01.1040	Outer Knob 15 mm ∅, gray
03	1	1.866.500.08	Shuttle Knob Eloxal
04	1	1.010.042.55	Power Switch Cap 13*13mm gray
05	1	55.03.0285	Power On/Off Switch 4A/3.2A 250V
06	1	1.864.010.01-V	Front Panel Plate Eloxal (complete mount)
07	1	1.864.010.04	Bottom Cover (without feed)
08	1	1.864.010.06	Top Cover
09	1	1.864.030.00-V	Transport / S-VHS Drive Complete
10	1	1.864.010.12	Blind Cover AES/EBU (rear side)
11	2	1.864.010.30	↳Telescope Drawer Rail, Rack Mount
12	4	1.864.010.31	↳Mount Angle L-Type
13	1	1.864.010.32	↳Mounting Hardware
14	1	20.864.890.00	Telescope Drawer Kit (all ↳ pos in common)
15	1	1.864.001.00	Mechanical Mount Devices Complete
16	2	1.864.010.40	Rack Handle single
17	4	21.53.2607	Allen Key Screw M5*12 for Rack Handle
18	1	1.864.021.03	Fan 9-96-0003 ALE
19	1	1.864.890.00	Rack Mount Drawer Mechanism Complete
20	1	10.149.001.00	ELCO Connector 56pin Wired Type
21	1	1.864.145.01	Keyboard Conductive Plastic, 46 keys
22	1	1.864.145.02	Keyboard Conductive Plastic, 35 keys
Cockpit			
01	1	1.866.500.08	Shuttle Knob Eloxal
02	1	1.864.500.04	Sidecover Cockpit only, Left
03	1	1.864.500.05	Sidecover Cockpit only, Right
04	2	1.864.550.03	Sidecover RLD (square shaped)
05	1	1.864.550.11	Sidecover Cockpit with RLD mount, Left
06	1	1.864.500.12	Sidecover Cockpit with RLD mount, Right
07	1	1.864.500.01-V	Front Panel Plate Eloxal (complete mount)
08	1	1.864.510.05	Keyboard Conductive Plastic, 62 keys
09	1	1.864.510.06	Keyboard Conductive Plastic, 70 keys
10	1	1.864.510.07	Keyboard Conductive Plastic, 21 keys
11	1	1.864.510.08	Shuttle < > Display (diffused piece)

5.2 Complete Boards

Position	Quantity	Order-Nr.	Part Name Specifications
V-Eight			
23	1	1.864.023.00-V	Power Supply Board
24	1	1.864.120.21-V	Main Board PCB
25	1	1.864.125.20-V	Motor Driver Board
26	1	1.864.127.81	Connector ELCO PCB
27	1	1.864.130.81-V	Monitor Board, ESE
28	1	1.864.132.00-V	Monitor I/O Board
29	1	1.864.135.81	I/O Board
30	1	1.864.140.21	Keyboard Driver, ESE
31	1	1.864.145.00	Keyboard, ESE
32	1	1.864.150.00	AD Board, ESE
33	1	1.864.160.82	DA Board, ESE
34	1	1.864.170.00	AES/EBU Board, ESE
35	1	20.864.170.00	AES/EBU Board, ESE (1.864.175.00 included)

Position	Quantity	Order-Nr.	Part Name	Specifications
Cockpit				
12	1	20.864.500.00	Cockpit complete	
13	1	1.864.510.00	Remote Keyboard, ESE	
14	1	20.864.550.00	Remote Level Display complete	
15	1	1.864.515.20-V	Remote Control, ESE	
16	1	1.864.550.00-V	Remote Level Display, ESE	
17	1	1.864.555.21-V	Remote Level Board, ESE	
18	1	1.864.556.00-V	Level Display, ESE	
19	1	1.864.557.00-V	LED Display, ESE	

5.3 Cables

Position	Quantity	Order-Nr.	Part Name	Specifications
V-Eight				
36	1	1.864.520.00	Sync Cable V-EIGHT 0.3m	
37	1	1.864.521.00	Sync Cable V-EIGHT 3.0m	
38	1	10.325.010.00	ADAT Optical IF Cable (TOS Link) 1m	
39	1	10.325.011.00	ADAT Optical IF Cable (TOS Link) 5m	
40	1	1.864.175.00	AES/EBU Flex Connector Cable	
Cockpit				
20	1	1.864.526.00	Main Remote Cable to Cockpit 15m	
21	1	1.864.522.00	Cable RLDisplay to Cockpit 15m D9-Pole	
22	1	1.864.530.00	Cable RLDisplay to Cockpit 0.2m D9-Pole	
23	1	18.755.162.44	Remote Cable RLDisplay 15m RJ45	

5.4 Miscellaneous and Software

Position	Quantity	Order-Nr.	Part Name	Specifications
V-Eight				
41	1	20.864.990.00	Upgrade Main Board -20 to -21Kit (V2.0)	
42	1	1.864.901.20	SW 140 Keyboard Driver	
43	1	1.864.910.20	SW 515 Remote	
44	1	1.864.915.21	SW 555 Remote Level	
45	1	98.00.2406	Screw Driver for Allen Keys, 2.5mm	

V-Eight Recorder Exploded View

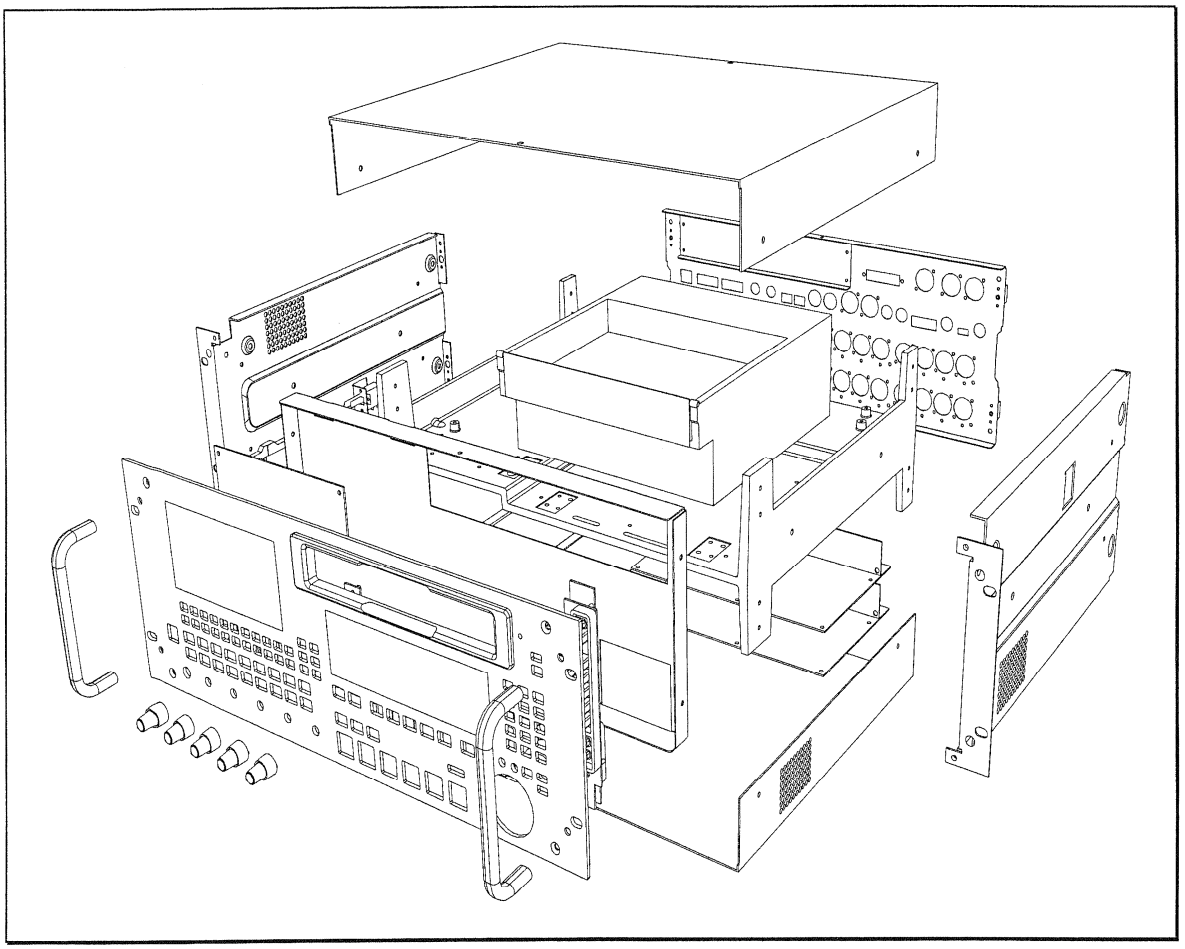


Figure 7- Mechanical Explode Viev

NOTES:

APPENDIX A
Hardware History

1.864.022.00 Shuttle Aggregate — 6-00-0002

Index -00	First Production Release	S/N 1001

1.864.023.00 Power Supply Board — 7-40-0014

Index -00	First Production Release	S/N 1001

1.864.030.00-V S-VHS Drive — 9-96-0030

Index -00	First Production Release	S/N 1001

1.864.031.00 Read Preamp Board (onto S-VHS Drive) — 9-40-1282-A

Index -00	First Production Release	S/N 1001

1.864.120.21 Main Board — 9-79-1249-B

Index -20 B	First Production Release	S/N 1001
Revision C	Improvement of PLL Stability - R41 24k replaced with 12k, R38 24k replaced with 56k	new
Upgrade to -21	Upgrade from Index 20 to 21 (including V2.0 Software) Reduction of System Clock Jitters - R41 24k replaced with 12k, R38 24k replaced with 56k - U9 SMPTE FPGA Rev24 replaced with Rev27 (2-33-0007) - M1 Crystal 6.144 MHz replaced with 7.056 MHz (7-01-0020)	new

1.864.125.20 Motor Driver Board — 9-79-1203-B

Index -20 A	First Production Release	S/N 1001
Revision B	Elimination of Interpolation Errors in Varispeed, Improved Protection - Add 1N4148 to U23 between ground terminal and ground plane	-
	Improvement of gain - Change R63 and R64 from 10.0K to 4.7K (0-15-0472).	-

1.864.127.00 Connector ELCO — 9-79-1278-A

Index -00	First Production Release	S/N 1001
Revision A	Prevention of PCB warping due to screw length - Replace 4-40x3/8 with 4-40x5/16	
Upgrade to -81	Upgrade from Index 00 to 81 Improving of EMC figures - Add two copper strips and wires	04.02.99

1.864.130.81 Monitor Board

Index -81	First Production Release	S/N 1001

1.864.132.00 Monitor I/O

Index -00	First Production Release	S/N 1001

1.864.135.00 I/O Board 9-79-1279-B

Index -00	First Production Release (Alesis Board 9-79-1279-B)	S/N 1001
	PCB tracks double sided (Alesis Board 9-79-1279-C)	
Upgrade to -81	requires replacement of board (Alesis Rev -D) - Improved word clock handling with additional buffer - resistor removed from MIDI in circuit	S/N 1200

1.864.140.21 Keyboard Driver incl. SW140 1.864.901.20

Index -20 A	First Production Release	S/N 1001
Index -21	new layout, identical with release -20 A	
Revision B	Error Rate : muted in REC, less sensitive 7-Oct-98	S/N 1218

1.864.145.00 Keyboard

index -00	First Production Release	S/N 1001

1.864.150.00 AD Board

Index -00 A	First Production Release	S/N 1001

1.864.160.82 DA Board

Index -81	First Production Release	S/N 1001
Revision A	Improved Bit-Clock quality - R15 33E (0E) new 24bit D/A Converters	10-Jun-98 new
Revision B	Correct Initialization of D/A Converter - additional Q VP0808, resistor 1M	24-Sep-98
Upgrade to -82	Upgrade from Index 81 to 82 New 24bit Converters	10-Nov.98 S/N 1250

1.864.170.00 AES/EBU Board

Index -00	First Production Release	S/N 1001

A 2 Cockpit (Remote)

1.864.510.00 Remote Keyboard

Index -00	First Production Release	S/N 101

1.864.515.20 Remote Control incl. SW 515 1.864.910.20

Index -20	First Production Release	S/N 101

A 3 Remote Level Display

1.864.555.21 Remote Level Board incl. SW 555 1.864.915.21

Index -20	First Production Release - with SW 1.864.915.20	S/N 101
Upgrade to -21	Switching and Display Intensity - R121 100k (10k), new C57 22uF - R45-46 56E (470E) - new SW 1.864.915.21	7-Oct-98 S/N 125

1.864.556.00 Level Display (see SC of Remote Level Board)

Index -00	First Production Release	S/N 101

1.864.557.00 LED Display (see SC of Remote Level Board)

Index -00	First Production Release	S/N 101

APPENDIX B
Software Upgrades

Caution:

Before loading software into your V-Eight, always save "backup" of the existing software in the V-Eight to your computer sequencer or data storage device. This will safeguards against any mishaps that could occur during the software loading process (i.e. corrupted MIDI file, equipment failure, ect.)

B 1 Upgrading Software Via MIDI

These procedures will require a MIDI Sys-Ex Librarian (Such as a computer sequencer). The use of another V-Eight as the source device is discussed in this Appendix B 1.3
NOTE: Unless you did not enter "`Unsafe Mode Inactive`" you will not be able to go into menu Load Software! Refer to 1.1 Power-On Key Combinations (menu - **All Safe** and menu - **Edit**).

B 1.1 Load a new BOOT Segment

Connect a MIDI cable from the MIDI OUT of the MIDI device to the MIDI IN of the V-Eight. Be sure the display **does not** show "`Save Mode Active`" during next procedure. Holding the **EDIT** key while power up. If display has unexpectedly show "`Safe Mode Active`" please refer 1.1 Power-On Key Combinations again. If you have properly processed this treatment, you are able to send or receive Boot Code Segment now.

- Press **MIDI** repeatedly (or press and hold **MIDI** while pressing **7**) until the display reads "`7 Load Software`".
- Press Δ/**Yes** once. The display reads "`Program code block?`"
- Press ∇/**No** once. The display reads: "`Program boot block?`" (**Note** that the ∇/**No** key toggles between Boot or Code Segment).
- Press Δ/**Yes** once. The display reads alternately: "`Boot segment will be erased.`" and "`Press ENTER to confirm or press NO to exit`" respectively.
- Press **ENTER**. The display briefly reads "`Erasing Boot Segment`" and then "`Ready to receive new software`".
- Send the new boot segment code file from the MIDI device. The display will read "`Updating Software...`" while this is in progress.

The V-Eight will automatically reboot following a successful Boot Segment transfer.

Please Note : If the Boot Block should have been erased by mistake, it is still possible to download data from an external MIDI source. Insert a Jumper to Position J8 in the Main Board, restart the V-Eight and start sending the new boot segment code file. DON'T FORGET TO REMOVE JUMPER AFTER SUCCESSFUL LOAD.

Remember: Equipment is still in mode "Unsafe Mode Active". To leave this mode switch power OFF and hold **ALL SAFE** key during power up until VFD is reading "`Locate 00`". The equipment is in "Safe Mode Active" now. TEST: Switch Off V-Eight. Holding the **EDIT** key while power up. If display has briefly show "`Safe Mode Active`" the V-Eight is in desired mode.

B 1.2 Load new CODE Software.

Connect a MIDI cable from the MIDI OUT of the MIDI device to the MIDI IN of the V-Eight. In some applications the "MIDI OUT" (source) may be a PC with accurate Soft Loader program and the code software is existing in MIDI file format.

- Press **MIDI** repeatedly (or press and hold **MIDI** while pressing **7** on keypad) until the display reads "`7 Load Software?`".
- Press **Δ/Yes** once the display reads "`Code seg will be erased.`" then "`Press ENTER to confirm`" / "`or press NO to exit.`" respectively.
- Press **ENTER**. The display briefly reads "`Erasing Code Segment`" and then after a while display will show "`Ready to receive new software`".
- Send the new code segment code file from the MIDI device. The display will read "`Updating Software...`" while this is in progress. This takes several minutes.
- After loading SW, you have to check/enter PG delay (refer to PG Delay Offset Setup).

The V-Eight will automatically reboot following a successful Code Segment transfer.

Remember: Equipment is still in mode "Unsafe Mode Active". To leave this mode switch power OFF and hold **ALL SAFE** key during power up until VFD is reading "`Locate 00`". The equipment is in "Safe Mode Active" now. TEST: Switch Off V-Eight. Holding the **EDIT** key while power up. If display has briefly show "`Safe Mode Active`" the V-Eight is in desired mode.

B 1.3 Using A Second V-Eight As A Source

Use the preceding procedures to prepare the destination V-Eight using the MIDI OUT of the source V-Eight.

NOTE: Unless you did not enter "`Unsafe Mode Active`" you will not be able to go into menu Send Software. Refer to 1 V-Eight Hidden Functions and Service Utilities menu - ***All Safe*** and menu - ***Edit.***

- On the source V-Eight press **MIDI** repeatedly (or press and hold **MIDI** while pressing **6** on keypad) until the display reads "`6 Send Software?`"
- Press **Δ/Yes** once the display reads "`Press ENTER to confirm`" / "`or Press NO to exit.`" respectively.
- Press **ENTER** once the display reads "`0% completed`". The display will indicate the progress of the transfer as a percentage of the total.

B 2 Update Drum Hours and Power On Hours

Please Note: Software version 2.00 and above is required to use the M20 Service Key. This Hardware key is need to set the Drum Hours. To access all Hours settings, machine **must be in** "`Safe Mode Inactive`" and powered up by pressing **EDIT** key simultaneously (refer to 1.1 Power-On Key Combinations !).

① Instructions to use the Service key.

- Switch Power-Off
- Insert "M20 Service Key" into **SYNC OUT** connector at the rear side of the V-Eight
- Switch Power-On machine in EDIT mode as described above
- Press **UTILITY** repeatedly until display shows "`38 Power On Hours = nnnn`" repeatedly (or press and hold **UTILITY** while pressing 3 then 8 on the numeric keypad)
- Enter new value with the numeric keypad
- Press **UTILITY** repeatedly until display shows "`39 Drum Head Hours = nnnn`" repeatedly (or press and hold **UTILITY** while pressing 3 then 9 on the numeric keypad)
- Enter new value with the numeric keypad

② If you change the transport, you only have to reset the drum hours (resets Power On Hours simultaneously). To do this, you can reset drum hours by using the D9 male connector. Refer for pin out to Table 3 - Necessary Tools and Equipment.

Instructions to use the D9 male connector.

- Switch Power-Off
- Insert "D9 male connector" into **RS422** connector at the rear side of the V-Eight
- Press **FORMAT** key AND **REC**ord key simultaneously during Power-On.
- Display is reading "Studer V-Eight" and after a while "Reset Drum Hours and Power-On".

Remember: Equipment is still in mode "Unsafe Mode Active". To leave this mode switch power OFF and hold **ALL SAFE** key during power up until VFD is reading "`Locate 00`". The equipment is in "Safe Mode Active" now. TEST: Switch Off V-Eight. Holding the **EDIT** key while power up. If display has briefly show "`Safe Mode Active`" the V-Eight is in proper mode now.

Software V-Eight Recorder

Code V1.10 (Boot V1.01) (Frontpanel V1.00=1.864.901.20 [SW 140])

	First Production Release	01-Jul-1998 S/N 1001

Code V2.0 (Boot V1.01) (Frontpanel V1.00=1.864.901.20 [SW 140])

Upgrade to	Version 2.0 Release - requires Main Board -21	10-Nov-1998

Code V2.03 (Boot V1.01) (Frontpanel V1.00=1.864.901.20 [SW 140])

Upgrade to	Version 2.03 Release	Jan-1999

Software Cockpit (Remote)

Remote SW 515 (Remote 1.864.910.20=[SW 515])

	First Production Release	01-Jul-1998 S/N 101

Remote Level SW 555 (Remote Level 1.864.915.20=[SW 555])

	First Production Release	01-Jul-1998 S/N 101

Remote Level SW 555 (Remote Level 1.864.915.21=[SW 555])

	Upgrade Release -20 to 21	01-Aug-1998 S/N 125

APPENDIX C
Repair Sheet

C1 V-Eight REPAIR SHEET for Service (Copy this sheet and use copy as repair sheet)

UNIT S/N: V-Eight:		PG Delay Value:		Service Tech:	Labor Hrs:
Last Service Date	[/ /]	Repair Date:	[/ /]	Drum Head Hours:	Power On Hours:
Boot Seg. Received:	[/ /]	Code Seg. Received:	[/ /]	Frontpanel SW Received	[/ /]
Boot Seg. Installed:	[/ /]	Code Seg. Installed:	[/ /]	Frontpanel SW Installed:	[/ /]

HARDWARE MODIFICATIONS (CHECK EACH UNIT SERVICED) SEE SERVICE MANUAL APPENDIX B FOR DETAILS)				
Motor Driver Board	INSTALL 1.864.125.20 Rev -B	Swapped	Installed	Required
	U23 IC / 4148 DIODE between pin to GND and GND		Installed	Required
	R63, R64 REISTORS 4.7K (were 10K)		Installed	Required
Connect. ELCO Board	Install Connector ELCO 1.864.127.81, replace 4-40x3/8 with 4-40x5/16 Screws		Installed	Required
I / O Board	Install 1.864.135.81 Rev-D	Swapped	Installed	Required
Main Board	Install Main Board 1.864.120.21	Swapped	Installed	Required
	Rep Kit V-Eight V2.0 2.864.990.00 consist of 4 Items:		Installed	Required
	U 9 SMPTE FPGA REV 27		Installed	Required
	M1 CRYSTAL 7.056 MHz		Installed	Required
	R41 Resistor 12K OHM 1208 SMD		Installed	Required
	R38 Resistor 56K OHM 1208 SMD		Installed	Required
	C17 Tantalum Capacitor 10uF 6.3 V (not included in Rep Kit V-Eight)		Installed	Required
	C80,C81,C83,C84 Capacitors 100 pF (not included in Rep Kit V-Eight)		Installed	Required

Additional Notes, Comments
o Mark if additional comments on back

QC TEST PROCEDURE (Complete for each unit)		
CLEAN TAPE PATH		OK
Battery Check 2.6 MIN with load	Value V	rework
SERVICE CHECKS		
Capstan FG Sensor Gap	OK	adjusted
Capstan Driver / Alignment	OK	adjusted
Tape Path Alignment	OK	adjusted
PG Delay Offset	OK	adjusted
Error Rate Check	pass	rework
Peak Meter Calibrate	OK	adjusted
16 Bit Audio Test	pass	rework
20 Bit Audio Test	pass	rework
Loop Test Normal	pass	rework
SELF TESTS :		
Main Tests (P.U. Rec1+Rec7)	pass	rework
Frontpanel Tests (P.U. Loc)	pass	rework
BURN IN LOOP N/A 5hr 24hr	pass	rework
SOFT RESET	OK	
Miscellaneous		

PARTS/COMPONENTS REPLACED

PART NUMBER	PART DESCRIPTION	QTY	PART NUMBER	PART DESCRIPTION	QTY

APPENDIX D
V-Eight Circuit Description

D1 V-Eight Circuit Description

D 1.1 Mainboard 1.864.120

The Mainboard holds the main processor, several serial interfaces, clock generation, audio recording and playback circuits, time code circuits, AUX track recording and playback circuits, as well as the supply for the VF display's filament.
Main processor U18 has two SRAM units U14 and U26 as working memory, and U11 as program memory. An update can be performed via a MIDI interface. Both RAM units are battery-buffered. For MIDI and RS422 connections the processor's internal serial interfaces are used. The front processor as well as the Remote/Meter Bridge are connected via a dual external UART U2.
The clocks for internal and external synchronization are generated in the FPGA U9. Here, the different clock sources are collected and converted to a 4.8 MHz clock in a PLL circuit.
In addition, the SMPTE reader/generator is integrated, with U5 and U6 as input and output drivers.
Audio data are recorded on tape in an interlaced fashion with the addition of several check codes, in order to allow correcting or concealing read errors by means of error correction or interpolation. These computations are performed in the Tape ASIC U30. The RAM units U29, 32, and 33 are used as temporary buffers for the audio data.
In play mode, the data read by the head drum are boosted by U35, and U38 is used for data and clock regeneration.
With the "AUSY4" ASIC U15, the different audio input formats of the A/D converter, the optical interface, and the AES/EBU inputs are processed for the "Tape" ASIC, and the playback data are prepared for the different audio output formats.
Driver U41 and transformer XFMR1 produce the heating voltage for the VF display's filament on the Keyboard Driver.
The longitudinal AUX track used for recording a mix of any audio channels is recorded at one edge of the tape. The recording electronics operates with an oscillator for the bias and erase currents. The record/playback head is switched between recording and playback with relay DK1. Playback amplifier is built around U28, and U23 switches from Input to Repro and vice versa. U31 and transistors Q7 through 10 are used for recording, U37 and U36 for playback of the linear time code.

D 1.2 I/O Board 1.864.135

The I/O Board holds the output driver stages and the receiver inputs of the RS422 and MIDI interfaces, the Word Clock, the SMPTE time code and the optical audio interface. In addition, the sync separator for video sync, which regenerates the frame change pulses, is implemented there.

D 1.3 Motor Driver Board 1.864.125

The Motor Servo Board contains the capstan, head drum, and spooling motor drivers as well as different auxiliary circuits.
The capstan motor is hall-effect commutated. With two pulse sensors, separated by 90°, and U5, 14...19, rotation speed and rotation direction is detected. The linear Sync track holds one pulse per drum revolution and serves for position control. The Main Board's main processor computes the control data with the help of the "Servo" ASIC; these data are converted by the "Servo" ASIC to a PWM signal and fed to the driver U13.
The drum motor is driven by U3. The hall-effect generator output signal is processed to a speed (FG) and a position signal (PG) using U2 and U17. The motor control is performed again by the main processor with the assistance of the "Servo" ASIC.
Both spooling motors are hall-effect commutated, too, and send their tacho signals to the main processor via U14.
The take-up motor speed is controlled and its driver U22 receives a PWM signal generated by the "Servo" ASIC. The supply motor is controlled using the sensor lever position measured by the main processor and via the "Servo" ASIC. The load motor is a simple DC motor, the actual position of load mechanism is controlled by the "Cassette Well Sensor".

D 1.4 Keyboard Driver 1.864.140

Processor IC 26 on the Keyboard Driver is used for keyboard polling and for driving the displays and the LED control lamps. Communication with the main processor is established via a serial interface integrated within the processor. IC3 and IC4 form a part of the keyboard matrix. The remaining three rows of the keyboard are polled directly by pins 4...6 of port 1. The VF display anodes are controlled by the high-voltage drivers IC30 and IC25 which receive their input data from the parallel-to-serial converters IC23 and 13. The grids are driven by latches and discrete high-voltage drivers from the processor data bus. All machine status information is sent to the LEDs via latches as well.
Photo transistor PQ1, IC 31, and transistors Q108 and 109 form a brightness control for all LEDs depending on the ambient light.
On the parallel remote connector, all signals for LED lamps are buffered by open-collector stages. The remote control input signals operate CMOS switches which are circuited directly in parallel with the keyboard pushbutton contacts.
The shuttle wheel is directly connected to the interrupt inputs of the front processor.

D 1.5 Keyboard 1.864.145

The Keyboard is equipped with conductive plastic push buttons. The single push button contacts are located within a matrix being polled by the keyboard processor on the Keyboard Driver Board. The LED control lamps are driven by the keyboard processor via the parallel data bus with the help of latches.

D 1.6 AD Board 1.864.150

For optimum common-mode rejection all analog audio inputs except the AUX input are equipped with balancing transformers. Input sensitivity can be adjusted in a +6.through.+26 dBu range for full-scale modulation. The A/D converters have a 24 bit resolution which is reduced depending on the selected recording mode to 16 or 20 bit using dithering and/or noise shaping.
Signal ADCCAL is used for converter calibration.
For avoiding the time delay of the A/D and D/A converters in the input position of the monitor switch, the audio input signal can also be sent to the output as it is.

D 1.7 DA Board 1.864.160

Undesired RF portions are removed from the D/A converter output signals using a 2nd order low-pass filter. The following switch selects which channels are recorded to the AUX channel, and which of them are connected to the outputs during playback. Furthermore, the switchover to the direct input signal (without passing through the A/D and D/A converters) is performed here. After a level setting stage (+6...+26 dBu for full-scale modulation) the signals are electronically balanced. The relays in parallel to the outputs suppress clicking noises when powering the unit on or off; they are triggered from the delayed RESET signal.
The AUX signal, too, is output via an electronically balanced output stage. Switchover of the analog switches is controlled by the main processor via the shift registers IC 2...4.

D 1.8 Monitor Board 1.864.130

On the Monitor Board, all eight audio channels can be mixed with an external signal (from a second unit) and fed to the headphones and monitor outputs.

D 1.9 AES/EBU Board 1.864.170

The AES/EBU Board contains four AES/EBU receivers IC1...4, and transmitters IC5...8. The digital output signals are all electrically separated via transformers. Communication to the main processor is established through the parallel data bus. The Chip Select signals are generated by IC10. The processor can ask the board type using IC11.

D 1.10 Remote Keyboard 1.864.510

The Remote Keyboard carries the rubber mat pushbuttons, all LED control lamps as well as all driver circuitry. The single pushbutton contacts are located within a matrix, with IC18 as a row switch, and IC19, 20 as well as with four additional discrete lines connected directly to the processor on the Remote Control Board. The LED control lamps are driven from the parallel data bus with the help of latches. Address selection is performed with IC21 and 22.

D 1.11 Remote Control 1.864.515

Processor IC10 communicates with the V-Eight via an RS422 connection. IC13 is used as program memory, IC11 as work memory. IC6 is a bi-directional buffer in order to increase the data bus driving power.
The fluorescent display is driven by two high-voltage drivers IC4 and 9 for the segments and via the latches IC17...19 and with a discrete high-voltage stage for the grids. IC4 and 9 receive their data via the shift registers IC5 and 8.
Transformer T1 and transistors Q55 and 56 generate the 40 V anode voltage and the filament voltage for the fluorescent display.
The 5 V supply voltage is regulated with IC12.
A brightness control for the LEDs is implemented with IC15 and transistors Q53 and 54. IC14 is used as address decoder.
The shuttle wheel is directly connected to the interrupt inputs of the processor.

APPENDIX E
V-Eight Error Codes

E1 V-Eight Error Codes

Tables 4 through 15 are a list of all the error codes which are displayed on the V-Eight front panel. Along with the error code is an explanation of what the error means. This section also includes an explanation into the reasons for these errors during normal operation of the V-Eight as well as recommended solutions.

Transport Error Messages:	Explanation:
"CAPSTAN CONSTANTS ERROR"	Default case when loading capstan constants
"CAP PWM TO SERVO SWITCH"	When capstan is not off when switching to servo control
"NO CAPSTAN FGs ERROR 1"	No capstan tacho pulses are detected when changing capstan speeds
"NO CAPSTAN FGs ERROR 3"	No capstan tacho pulses are detected when changing capstan speeds
"NO CAPSTAN FGs IN JOG"	No capstan tacho pulses are detected when in jog
"NOISY CAPSTAN FG"	Capstan tacho pulse period is outside acceptable range
"CAP CAN'T GET TO SPEED 1"	Capstan can't get to target speed within 5 seconds when slowing down
"CAP CAN'T GET TO SPEED 2"	Capstan can't get to target speed within 5 seconds when speeding up
"CAP SERVO COUNTR TIMEOUT"	Capstan speed feedback from servo chip is not in range after 2 sec.
"RAMP CAP ILLEGAL CASE 1"	If capstan not off and current direction is not the same as the desired direction
"RAMP CAP ILLEGAL CASE 2"	If capstan target speed is not a servo defined speed
"RAMP CAP ILLEGAL CASE 3"	When capstan is not off when switching to servo control
"RAMP CAP ILLEGAL CASE 4"	If capstan target speed is illegal

Table 4 - Capstan State Transition Errors

Transport Error Messages:	Explanation:
"ERROR: NO DRUM FGs"	No drum tacho pulses are detected when drum is turned on
"DRUM STARTUP ERROR 0"	Drum is already turned full on when servo lock is attempted
"DRUM STARTUP ERROR 1"	Drum jitters for more than 5 seconds when starting up
"DRUM STARTUP ERROR 2"	Drum not at target speed (measured with µP) within 5 seconds
"DRUM STARTUP ERROR 3"	Drum not at target speed (measured with servo chip) within 5 seconds
"DRUM STARTUP ERROR 4"	Drum speed feedback from servo chip is not stable within 2 seconds

Table 5 - Drum State Transition Errors

Transport Error Messages:	Explanation:
"QuarterToPlay ERROR"	If current speed is assumed to be 1/4x when actually not
"Track Skip timeout error"	Track skipping not completed within 6 seconds
"CAP SERVO CNTR TIMEOUT 1"	Capstan speed feedback from servo chip is not in range after 2 sec.
"ERROR: StopPoint default"	Default case when calculating play stop point

Table 6 - Play State Errors

Transport Error Messages:	Explanation:
"BRAKING TIMEOUT ERROR 1"	If capstan direction bit does not flip within 2 seconds of braking
"BRAKING TIMEOUT ERROR 2"	If a capstan disengaged stop exceeds 3 seconds
"Default case StopTape"	Error with value passed to stop tape

Table 7 - Braking Errors

Transport Error Messages:	Explanation:
"ERR: SLAVE CAN'T LOCATE"	If master cannot confirm a slave has successfully located before a play if locate before play is enabled OR after a locate if auto play is enabled or a play is pending
"ERR: SLAVE CAN'T REPLAY"	If master cannot confirm a slave has successfully located after a replay if auto play is enabled or a play is pending
"SLAVE CAN'T ROLLBACK"	If master cannot confirm a slave has successfully located after a rollback if auto play is enabled or a play is pending
"INVALID LOCATE CONDITION"	Invalid result from capstan engaged wind when locating

Table 8 - Locate Errors

Transport Error Messages:	Explanation:
"FORWARD TIMEOUT ERROR 1"	Slowdown time from capstan disengaged fast wind to capstan engaged wind exceeds 3 sec
"REWIND TIMEOUT ERROR 1"	Slowdown time from capstan disengaged fast wind to capstan engaged wind exceeds 3 sec
"INVALID FWD CONDITION 1"	Invalid result of capstan engaged slower wind
"INVALID REW CONDITION 1"	Invalid result of capstan engaged slower wind
"INVALID FWD CONDITION 2"	If a destination is reached during a capstan engaged wind
"INVALID REW CONDITION 2"	If a destination is reached during a capstan engaged wind
"INVALID FWD CONDITION 3"	If a destination is reached during a capstan disengaged fast wind
"INVALID REW CONDITION 3"	If a destination is reached during a capstan disengaged fast wind

Table 9 - Wind State Errors

Transport Error Messages:	Explanation:
"DECK INIT ERROR"	Error in deck mode switch when initializing deck mode
"DECK MODE ERROR"	Error in deck mode switch during deck monitoring
"DECK MODE TIMEOUT ERROR"	Deck does not reach destination mode within 2 seconds
"UnthreadSem TIMEOUT ERROR"	During load, deck didn't reach unthreaded within 2 seconds
"ERROR: EjectSem1 Timeout"	Problem with cassette present sensor , load switch, or load motor
"ERROR: EjectSem2 Timeout"	Problem with cassette present sensor, load switch, or load motor
"ERROR: EjectSem3 Timeout"	Problem with load switch or load motor
"END OF TAPE SENSOR ERROR"	After threading tape, end of tape sensor still active after rewinding
"ERROR: DEW SENSOR ACTIVE"	Dew sensor is active when loading
"ERROR: TAPE DOWN TIMEOUT"	During load, load switch didn't get to proper state within 2 seconds

Table 10 - Deck State Transition Errors

Calibration Error Messages:	Explanation:
"CALIBRATION ERROR 1"	Tape type determined when not at play speed
"CALIBRATION ERROR 2"	Problem in getting tape to necessary speed to allow calibration
"CALIBRATION ERROR 3"	Problem in getting tape to necessary speed to allow calibration
"CALIBRATION ERROR 4"	Problem when calibrating takeup reel
"CALIBRATION ERROR 5"	Supply tach can't use timer resource
"CALIBRATION ERROR 6"	Trying to calibrate an unformatted tape
"CALIBRATION ERROR 7"	Beginning of tape sensor error
"CALIBRATION ERROR 8"	No supply tachs present for calibration
"CALIBRATION ERROR 9"	Capstan speed feedback from servo chip is not in range
"CALIBRATION ERROR 10"	Clock source changed during calibration
"CALIBRATION ERROR 11"	Local timecode value out of range for large hub tape
"CALIBRATION ERROR 12"	Local timecode value out of range for small hub tape
"CALIBRATION ERROR 13"	Error in result of hub size calculation

Table 11 - Calibration Errors

Transport Error Messages:	Explanation:
"SUPPLY CAN'T USE TIMER 2"	Takes longer than 3 seconds for supply tach to use timer resource
"TAKEUP CAN'T USE TIMER 2"	Takes longer than 3 seconds for takeup tach to use timer resource
"LT CAN'T USE TIMER 2"	Takes longer than 3 seconds for linear track to use timer resource
"CAPSTAN CAN'T USE TIMER 2"	Takes longer than 3 seconds for capstan tach to use timer resource
"DRUM CAN'T USE TIMER 2"	Takes longer than 3 seconds for drum tach to use timer resource
"GET TIMER 2 NOW ERROR"	Error with value passed to grab timer
"Search Master is Offline"	If search master is off-line
"Err: Search Master Poll"	If master (ID1) gets no response from search master within 2 sec.
"ERROR - Dew detected"	When the dew sensor is active when a record enter is performed
"ERROR - Write Protected"	When a record to a write protected tape is attempted
"Beyond Auto-Punch Region"	If a record strobe is performed beyond auto punch out point when auto-record is enabled

Table 12 - Other Errors

Transport Error Messages:	Explanation:
"END SENSOR ERROR"	When the sensors are in an illogical state, the tape will be ejected
"DEW SENSOR TRIGGERED"	When the dew sensor is activated, the tape will be ejected
"SUPPLY REEL ERROR"	When no supply motor tachs are detected, the tape will be ejected
"TAKEUP REEL ERROR"	When no takeup motor tachs are detected, the tape will be ejected
"CAPSTAN ERROR"	When no capstan motor tachs are detected, the tape will be ejected
"DRUM SPEED ERROR"	When the drum period is out of range, the tape will unthread and the drum will attempt to re-servo

Table 13 - Background Error Monitoring

Warnings.:	Explanation:
"Tape Offset Standby"	If slave with offset wants to chase to negative timecode
"WARNING - Non SVHS Tape"	When a non-SVHS tape is punched in on
"SVHS TAPES RECOMMENDED"	When a non-SVHS tape is inserted
"TAPE WRITE PROTECTED"	Tape cannot be recorded on when a write protected tape (i.e. the write protect tap is removed) is inserted
"LOCATE OUT OF RANGE"	When a locate destination is beyond the end of tape
"LOCATION OUT OF RANGE"	When a locate destination is beyond the end of tape
"ADAT clock out of range"	When ADAT clock is present but outside acceptable frequency range
"Word clock out of range"	When word clock is present but outside acceptable frequency range
"Audio clock out of range"	When audio clock is present but outside acceptable frequency range
"SMPTE clock out of range"	When SMPTE clock is present but outside accept. frequency range
"Video clock out of range"	When video clock is present but outside acceptable frequency range
"Calibrating ... Standby"	Software is determining what type of tape was inserted
"Timecode invalid"	Tape is formatted but timecode cannot be read
"Error no tape tc"	Combined with upper msg., poor signal from head - clean drum heads

Table 14 - Warning Messages

Processor Error Messages:	Explanation:
"Instruction error"	The microprocessor attempted to execute an illegal instruction code.
"Address error"	The microprocessor attempted to access data outside the normal range of the V-Eight address map.
"Crossfade error"	An error was detected during

Table 15 - Microprocessor Errors

SCHEMATA / CIRCUIT DIAGRAMS

V-Eight 20 Bit Tape Recorder

Main Board 1.864.120.20

Main Board 1.864.120.21

I/O Board 1.864.135.00

I/O Board 1.864.135.81

Motor Driver Board 1.864.125.20

Read Pre-Amplifier Circuit 1.864.031.00

Keyboard Driver 1.864.140.21

Keyboard 1.864.145.00

AD Board 1.864.150.00

DA Board 1.864.160.81

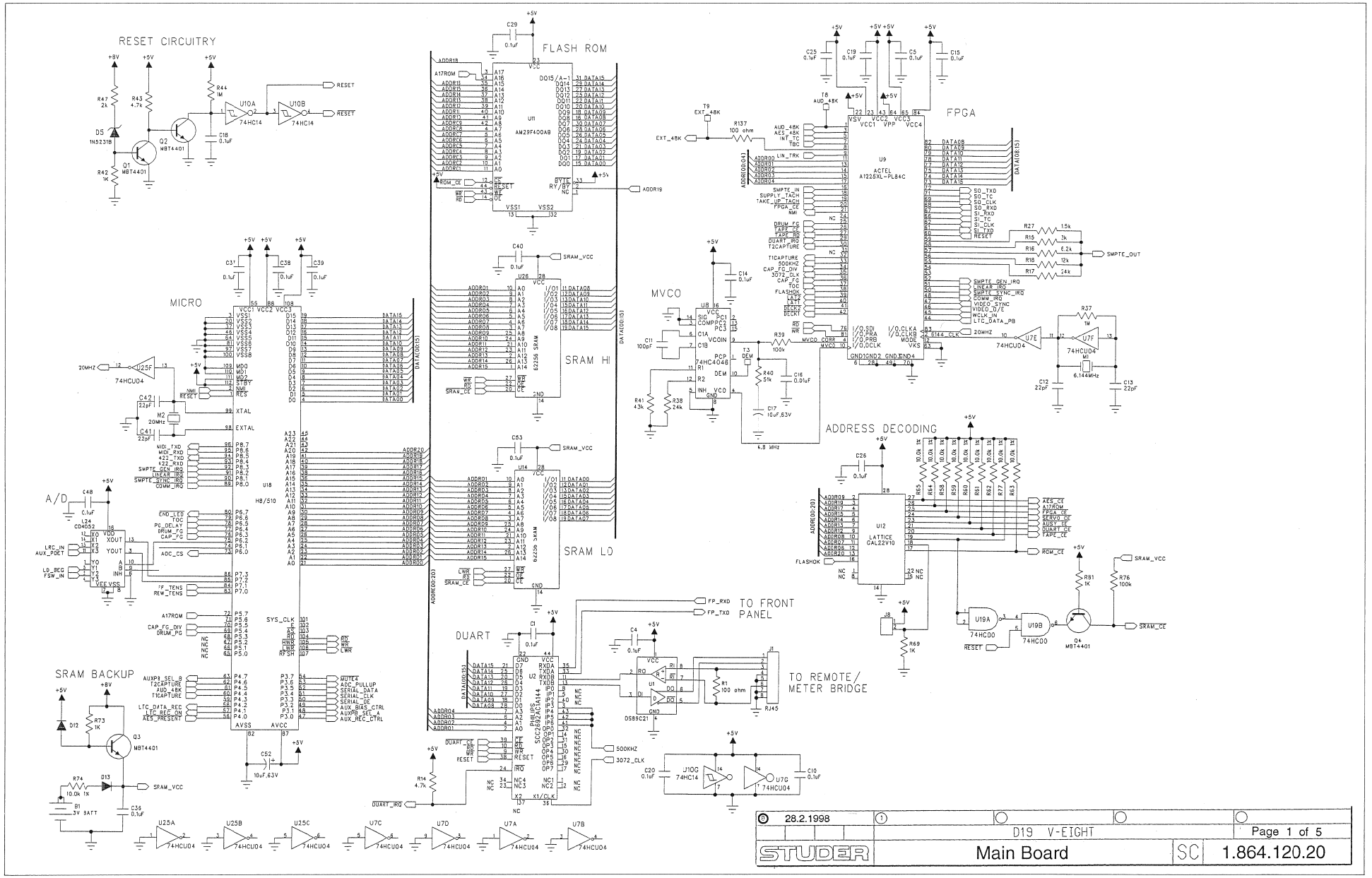
DA Board 1.864.160.82

Monitor Board 1.864.130.81

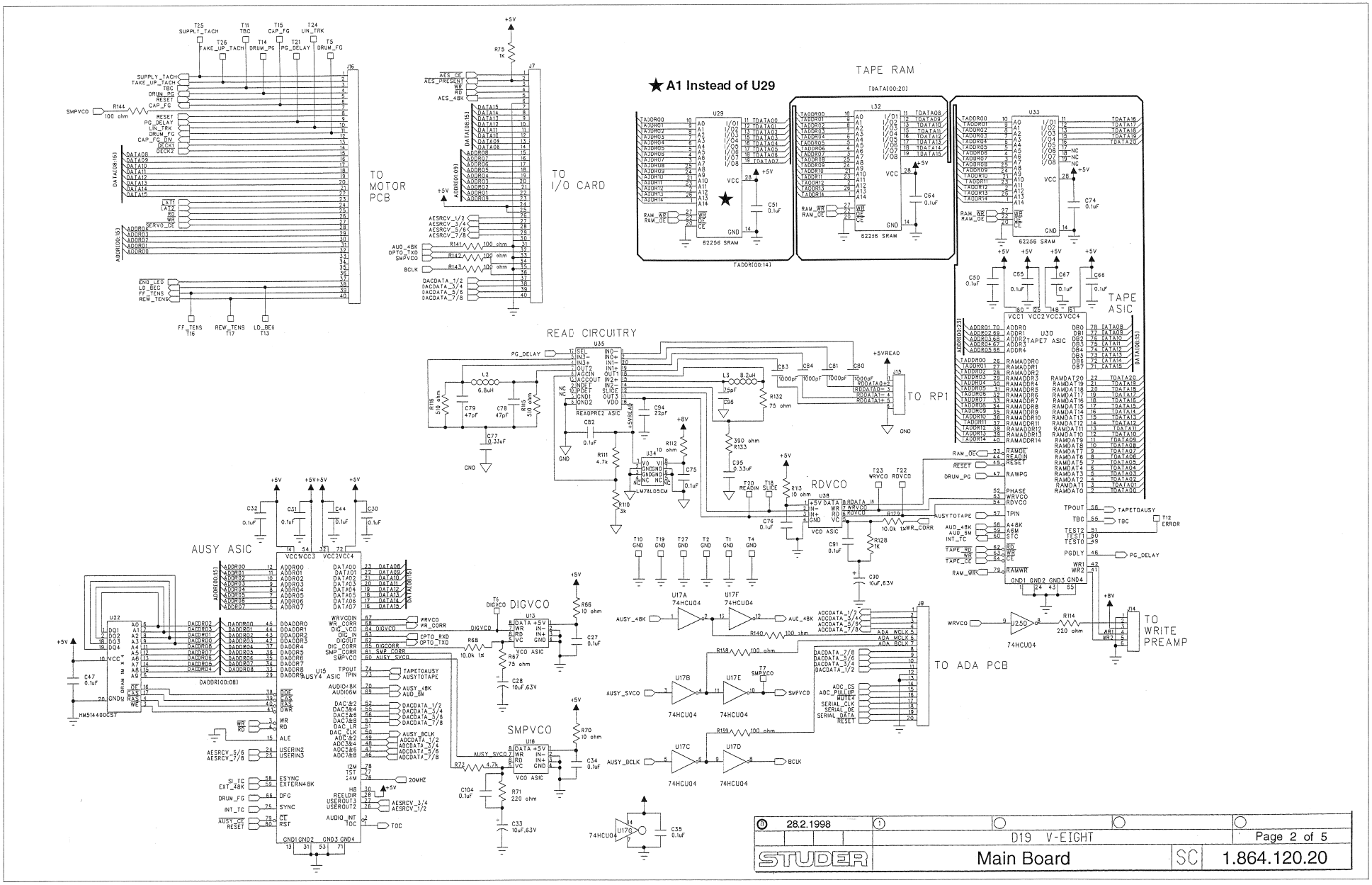
Connector ELCO Board 1.864.127.00

Option
AES/EBU Board 1.864.170.00

Main Board 1.864.120.20



Main Board 1.864.120.20



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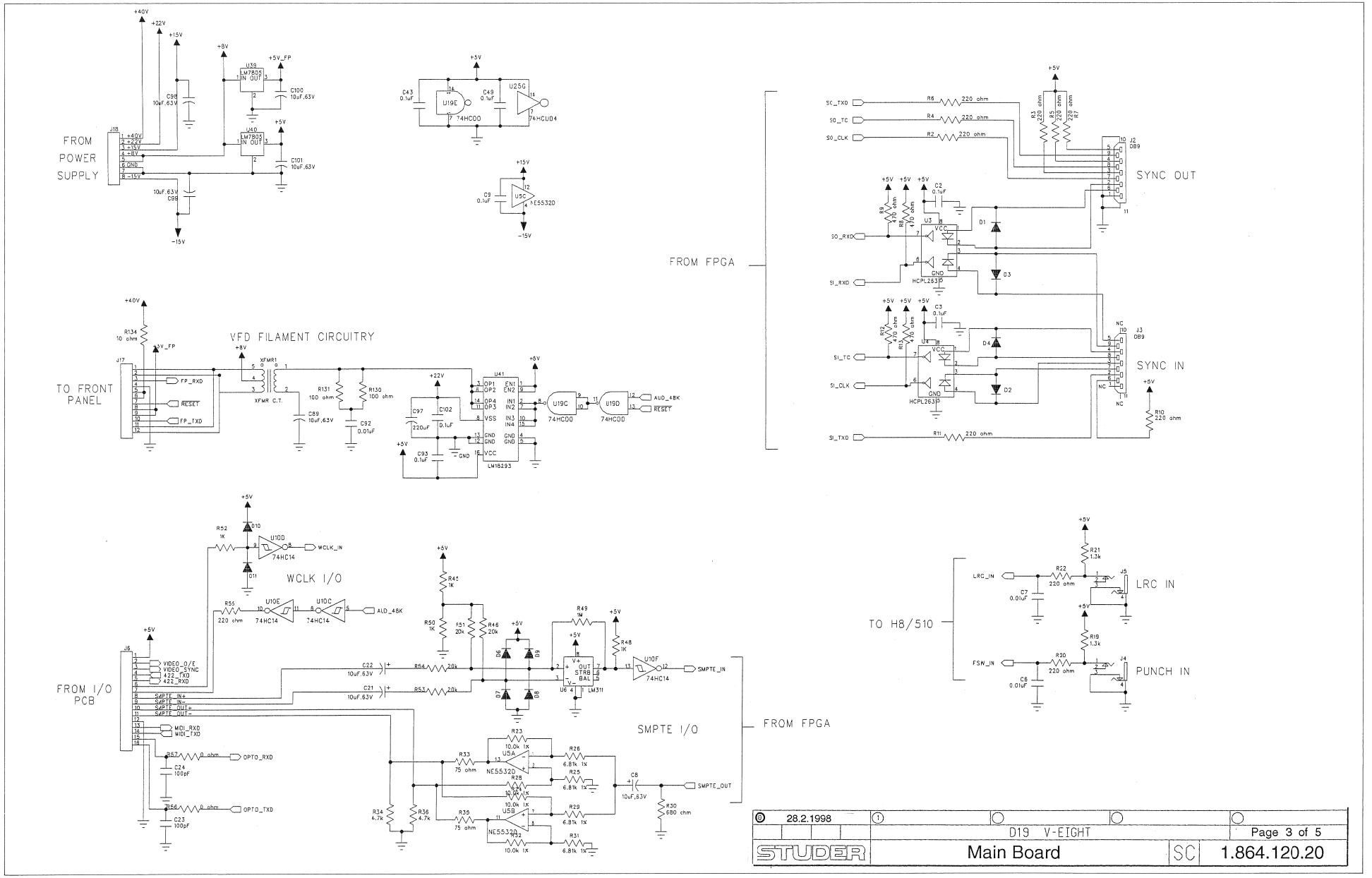
STUDER	D19 V-EIGHT		Page 2 of 5
	Main Board	SC	1.864.120.20

Main Board 1.864.120.20



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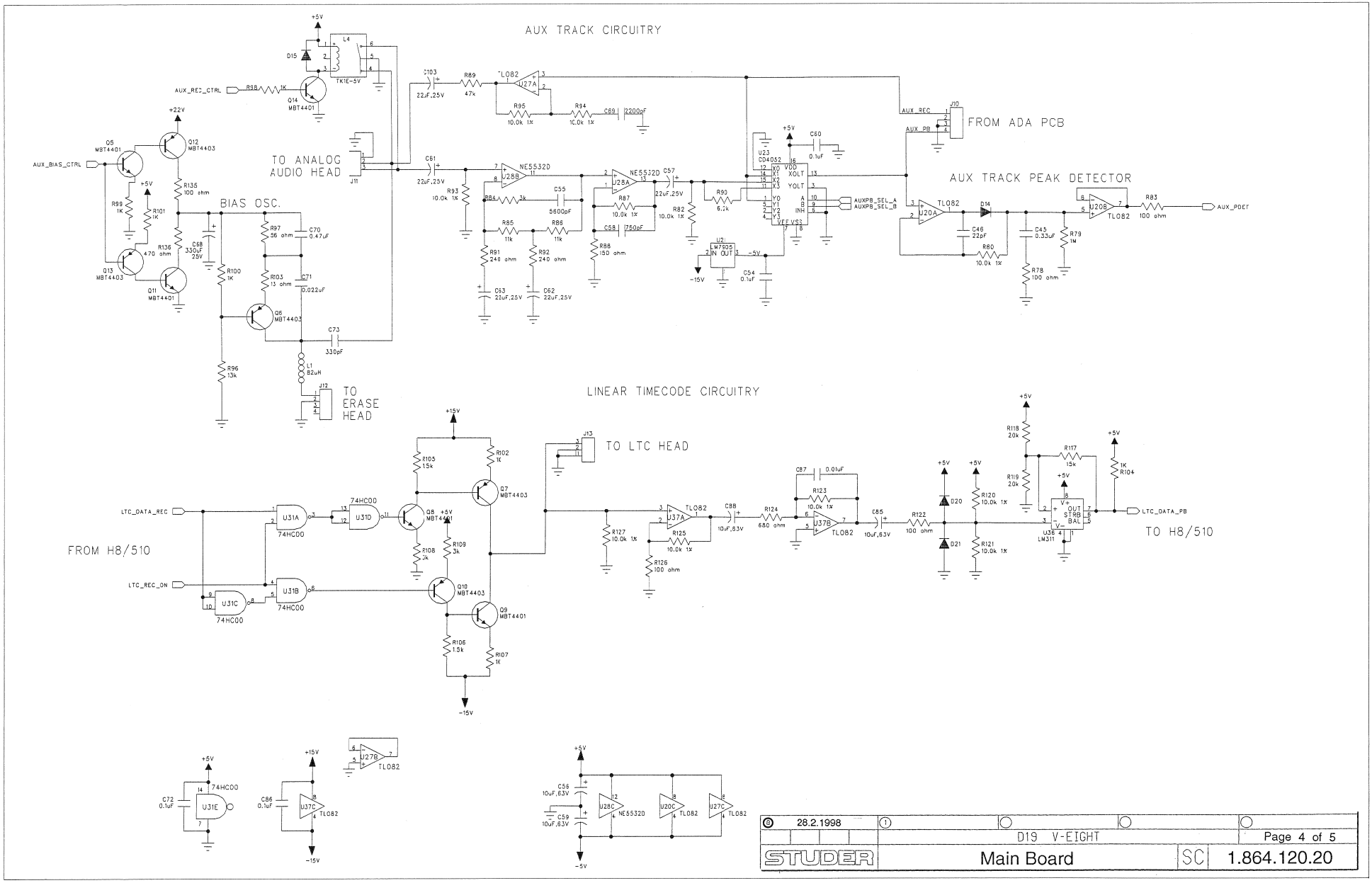

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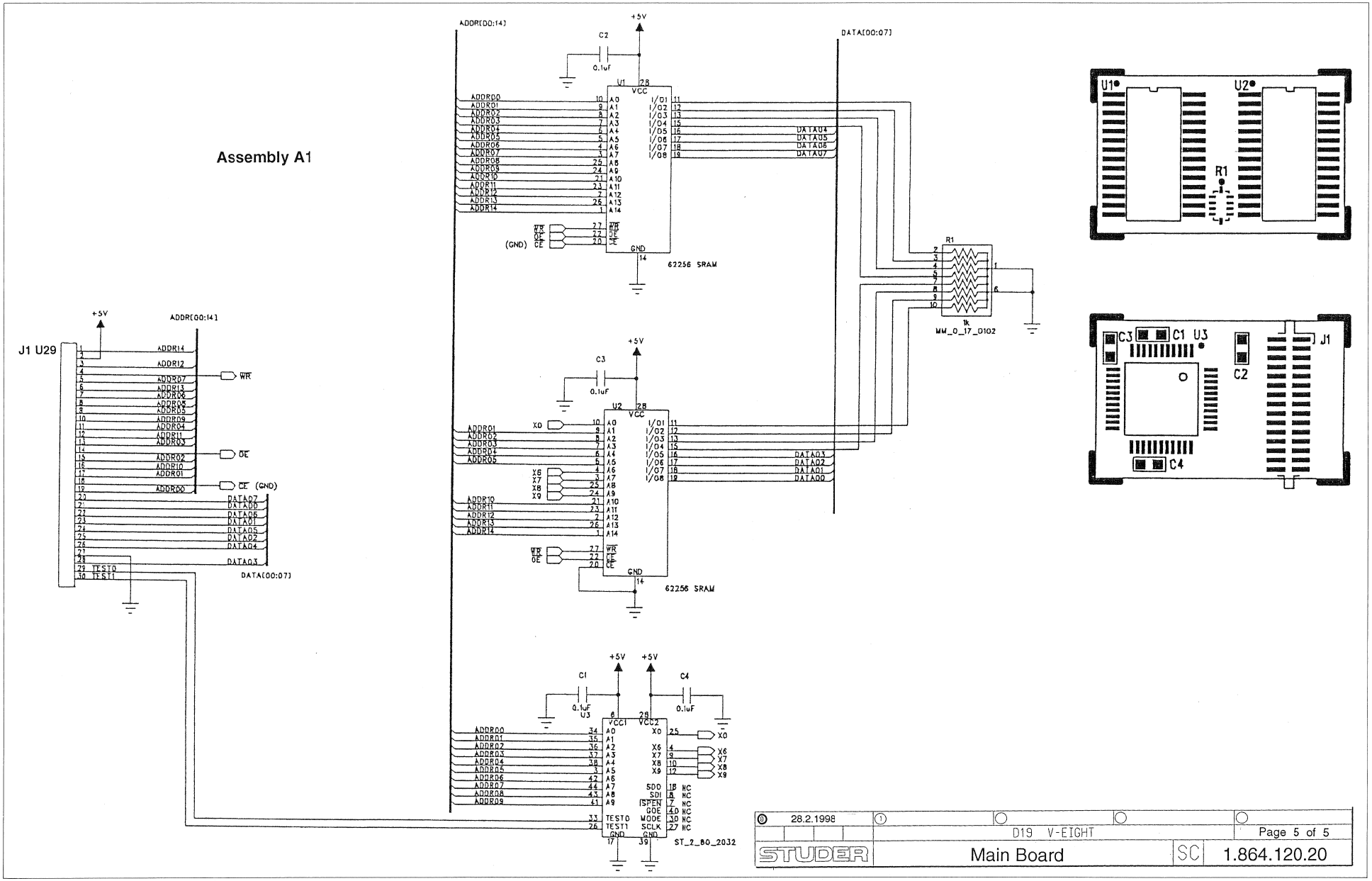
STUDER	D19 V-EIGHT	SC	1.864.120.20
	Main Board		

Main Board 1.864.120.20

Assembly A1



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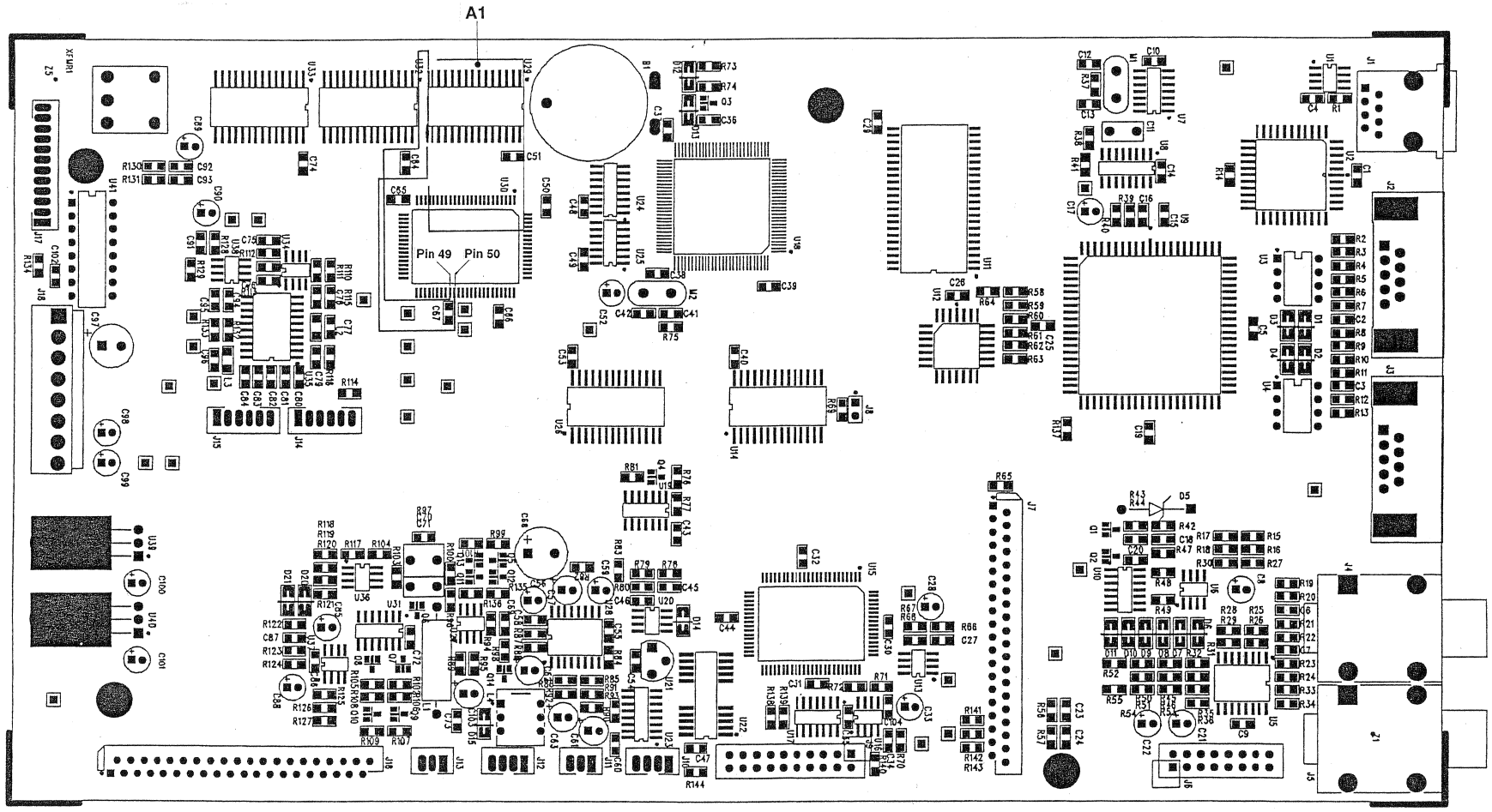
STUDER	Main Board	SC	1.864.120.20

Main Board 1.864.120.20



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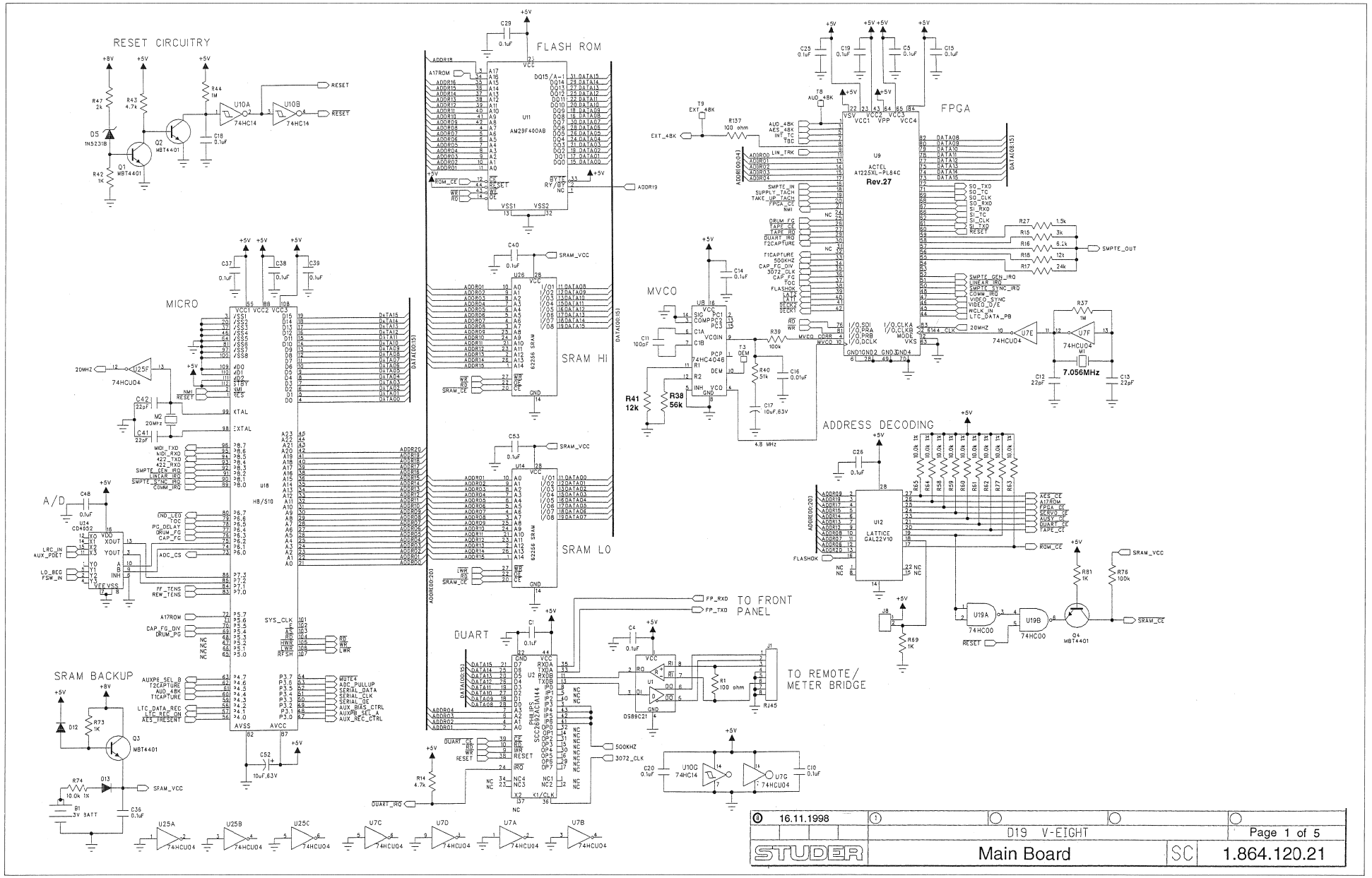
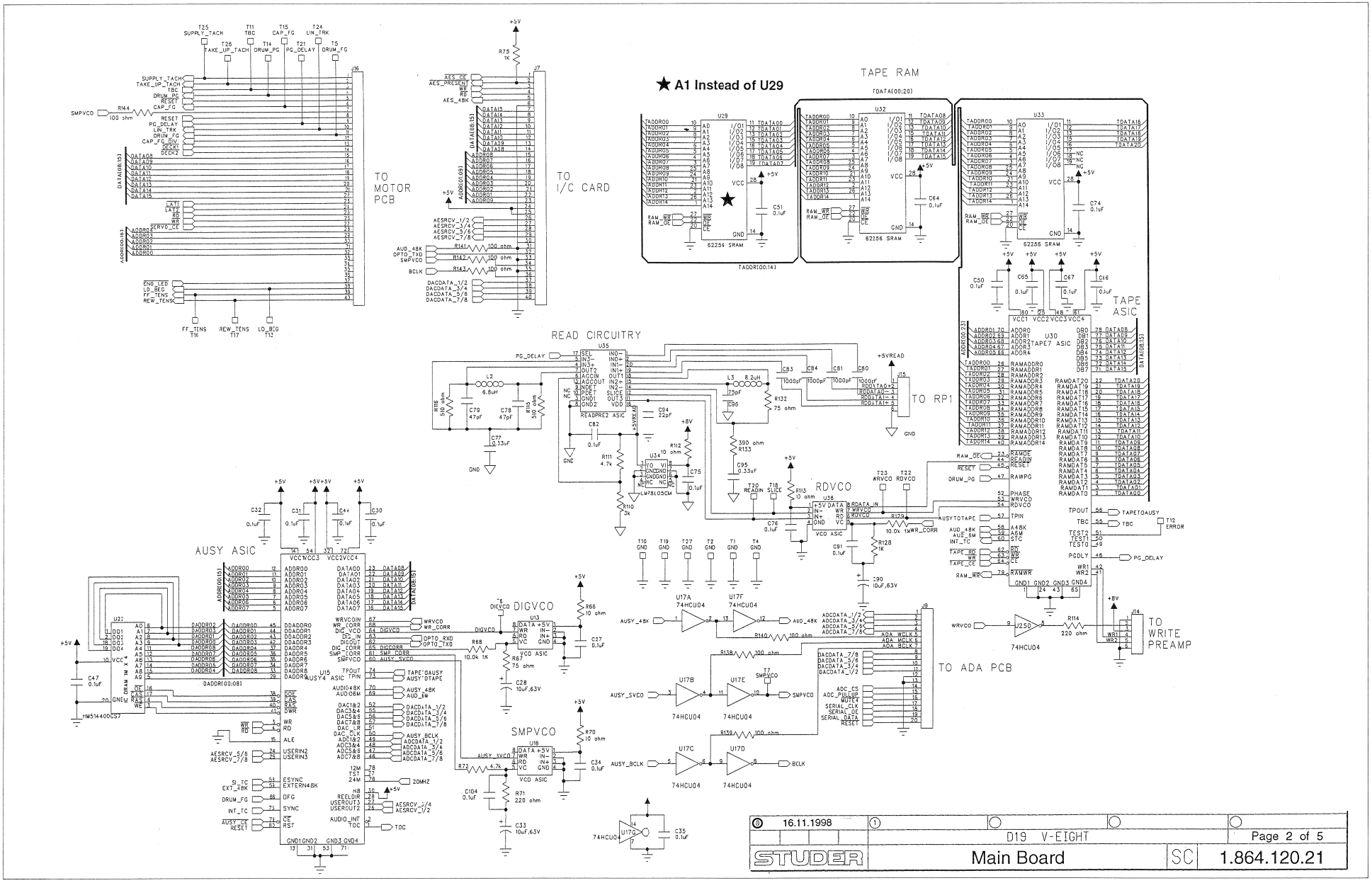
Main Board 1.864.120.21



Main Board 1.864.120.21



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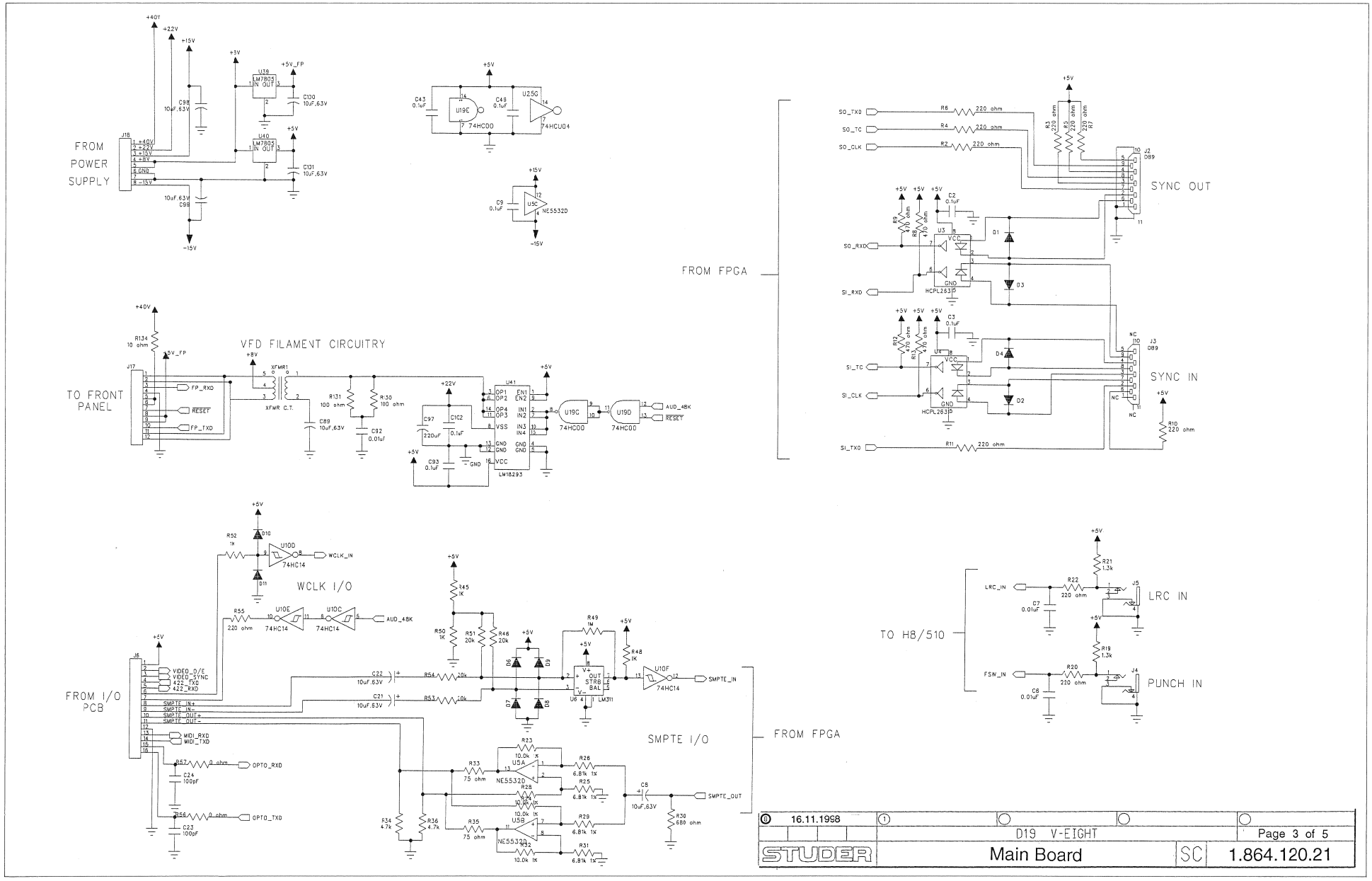
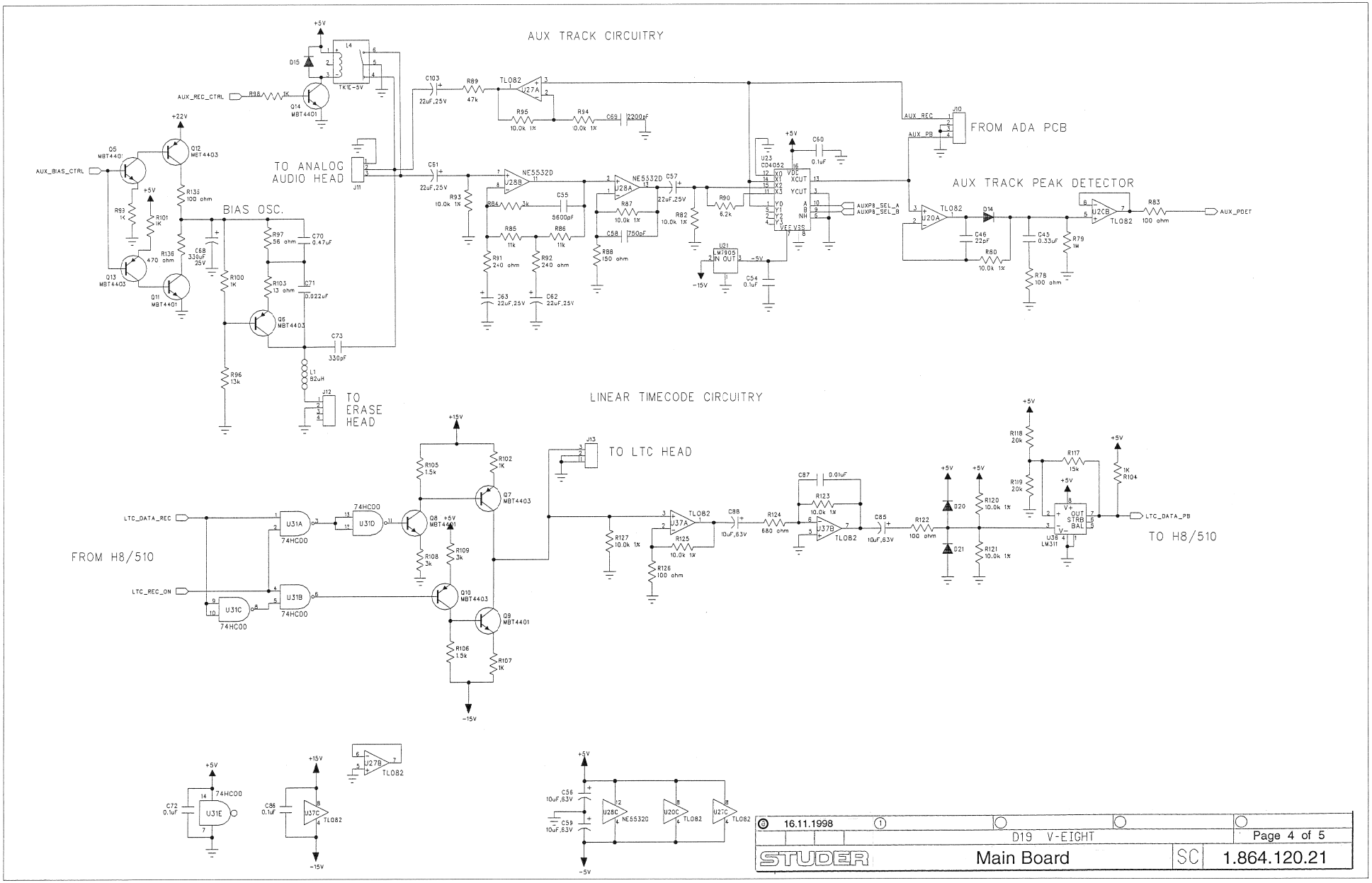
STUDER	Main Board	SC	1.864.120.21

Main Board 1.864.120.21



Main Board 1.864.120.21



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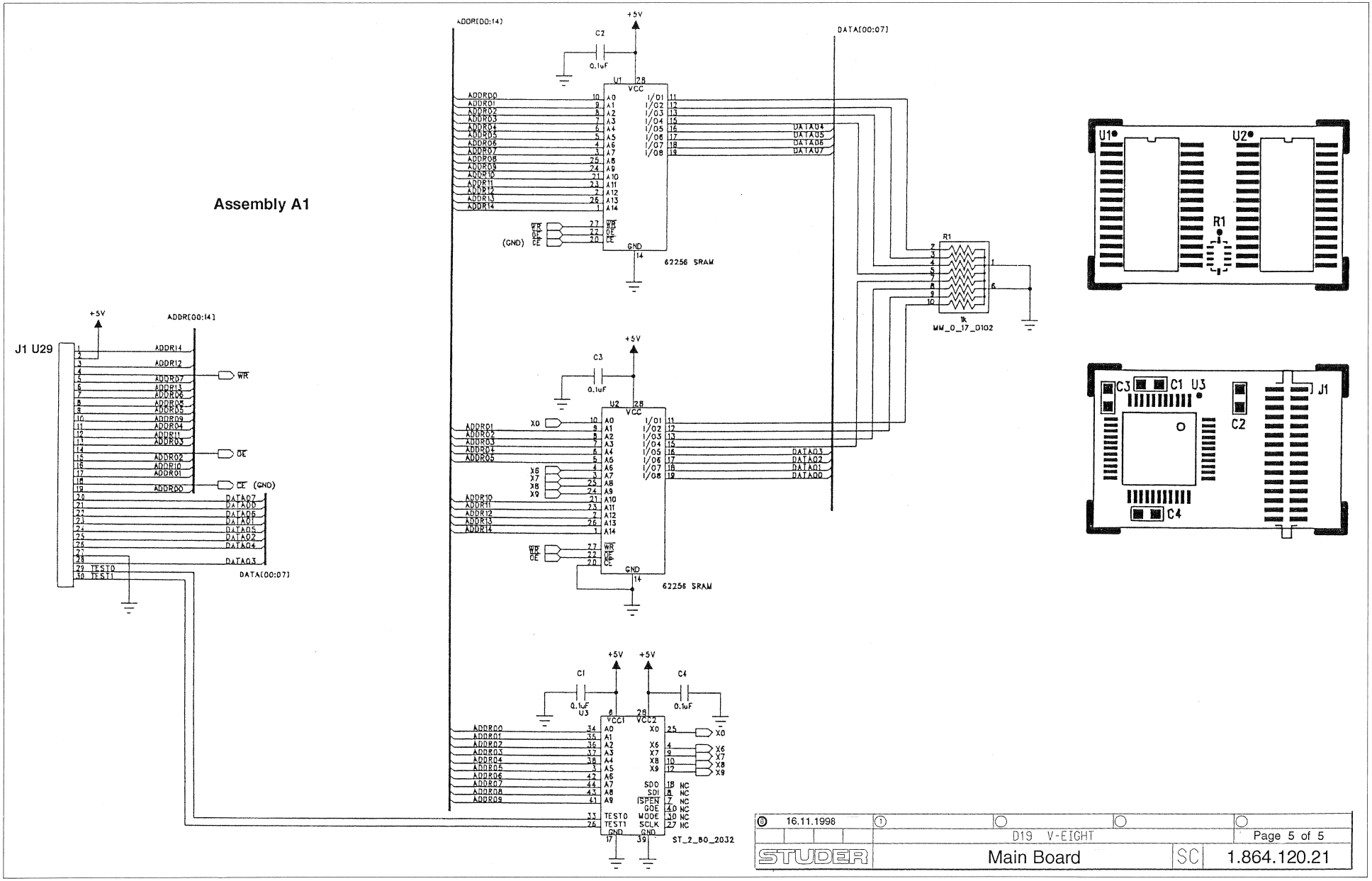
	D19 V-EIGHT		Page 4 of 5
STUDER	Main Board	SC	1.864.120.21

Main Board 1.864.120.21

Assembly A1



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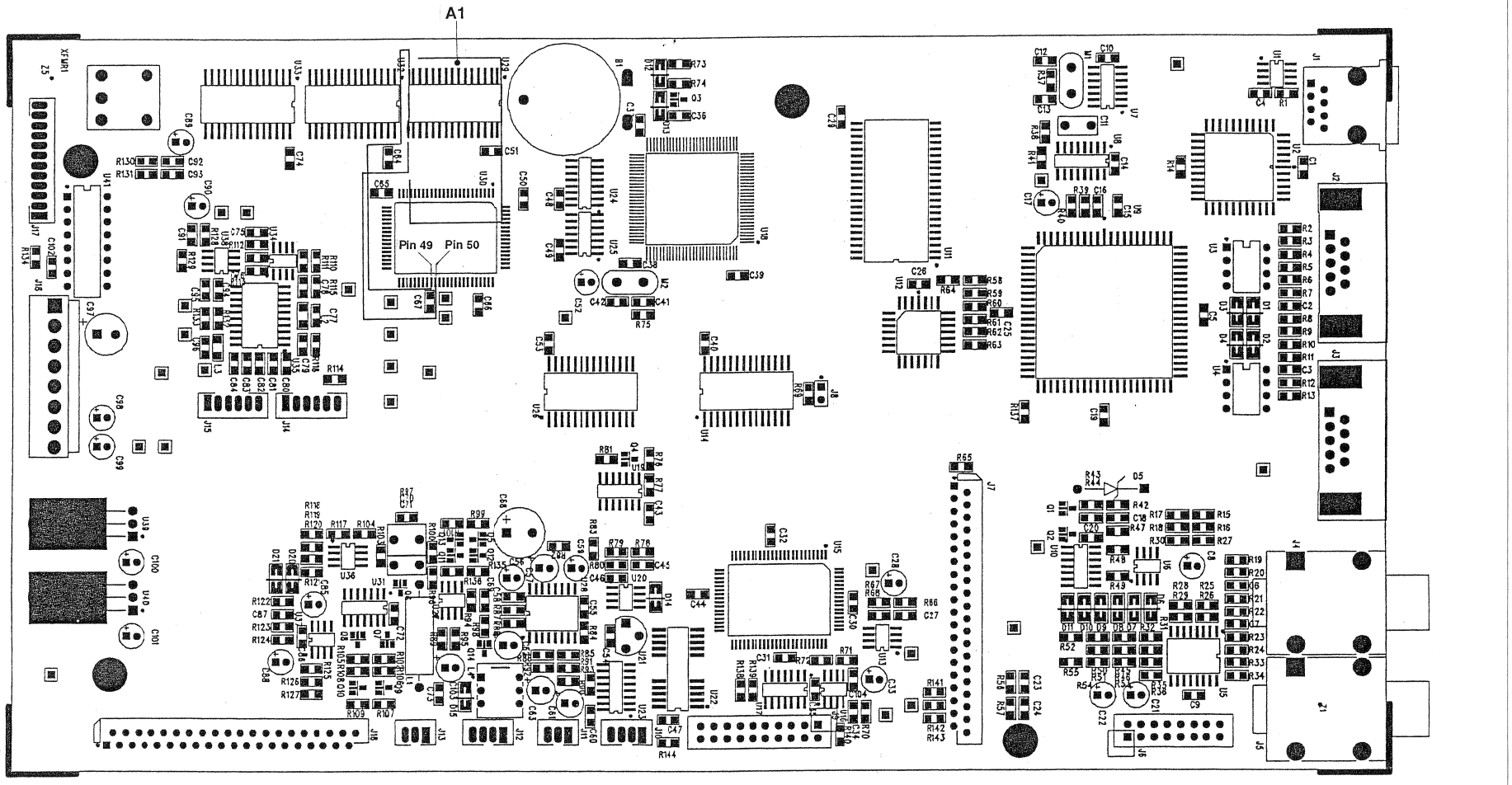
		D19 V-EIGHT		Page 5 of 5
STUDER	Main Board	SC	1.864.120.21	

Main Board 1.864.120.21



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Edition Ausgabe	16.11.98				0
	Date Datum	Visa Gez.	Checked Gepr.	Sects Ges.	Index

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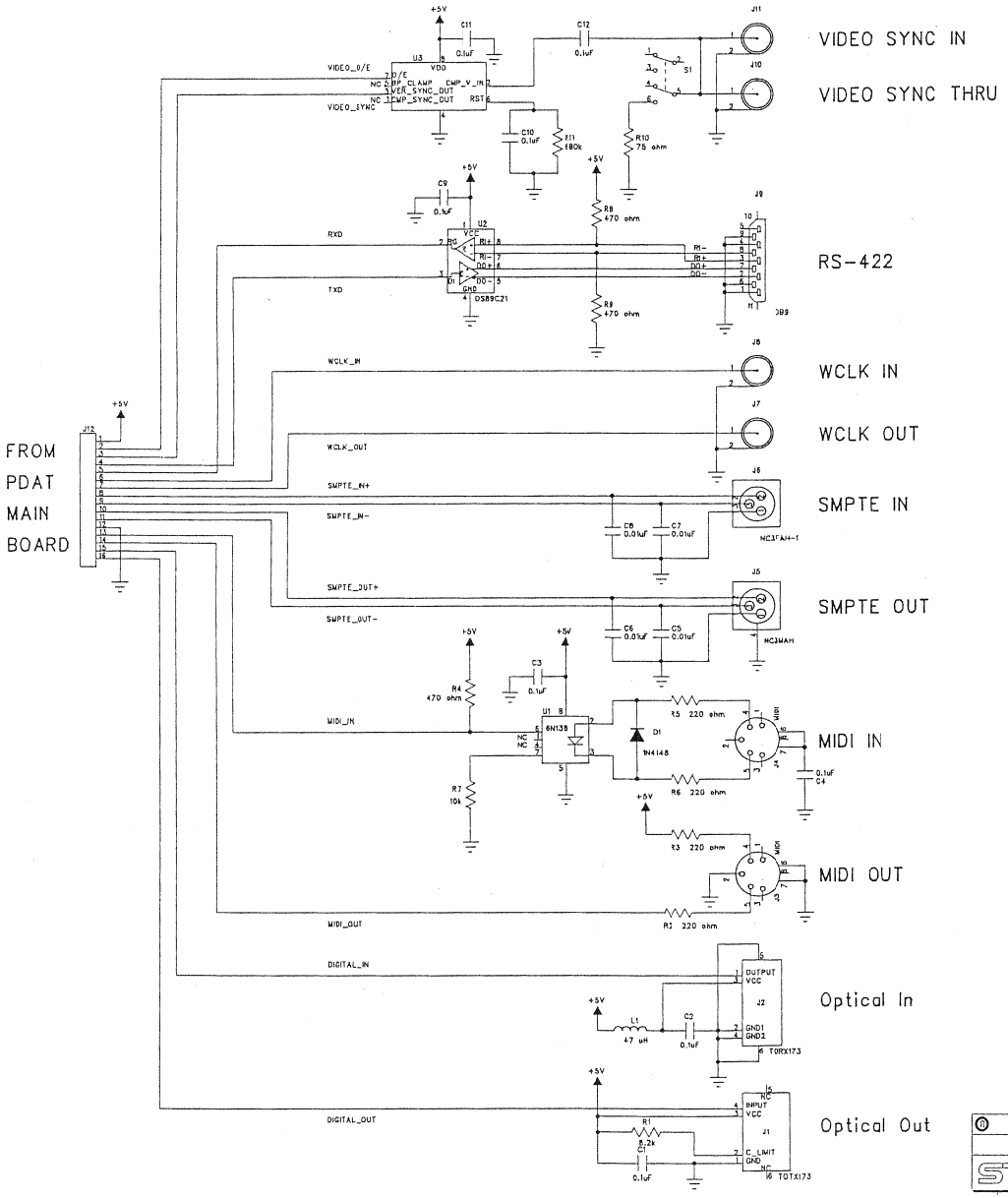
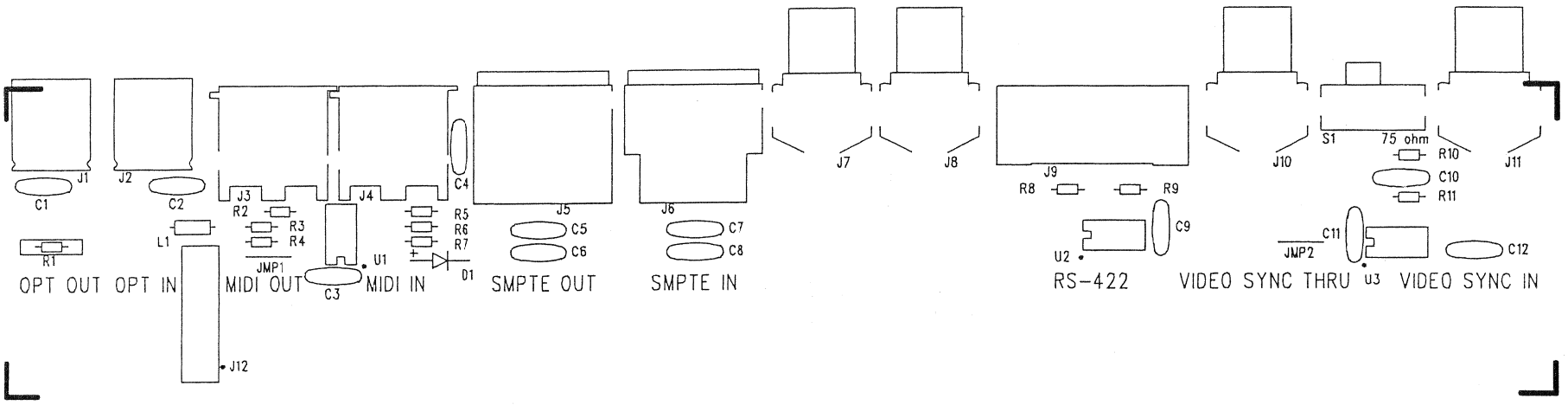
STUDER REGENSDORF — Description Benennung: Main Board — Number Nummer: 1.864.120.21

I/O Board 1.864.135.00



5.2.1998			Page 1 of 1
	D19 V-EIGHT		
STUDER	I/O Board	SC	1.864.135.00

I/O Board 1.864.135.00



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	.	.	.	.	2
	.	.	.	.	1
Edition Ausgabe	5.2.98				0
	Date Datum	Visa Gez.	Dessin Oper	Soon Ges.	Index

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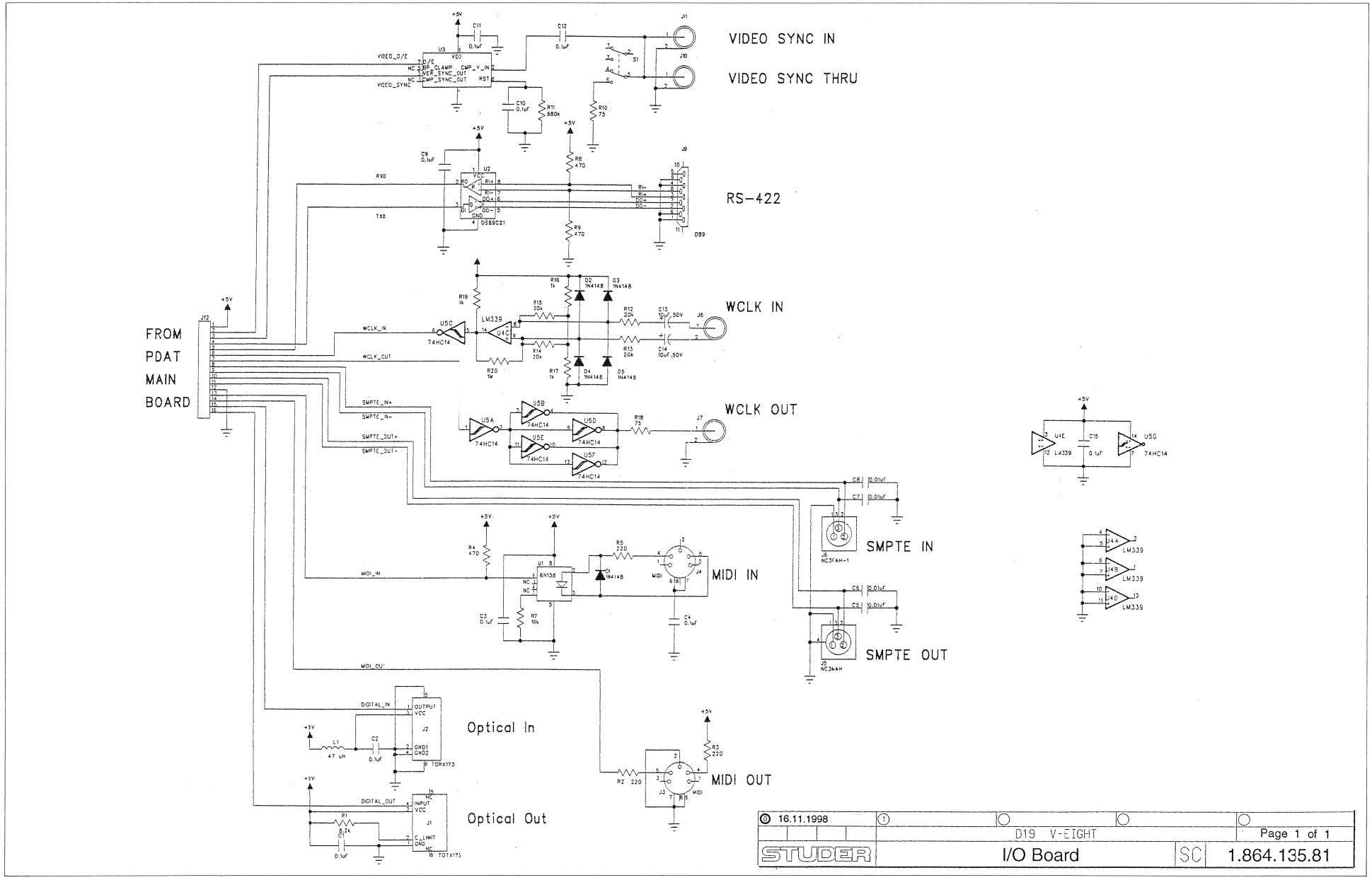
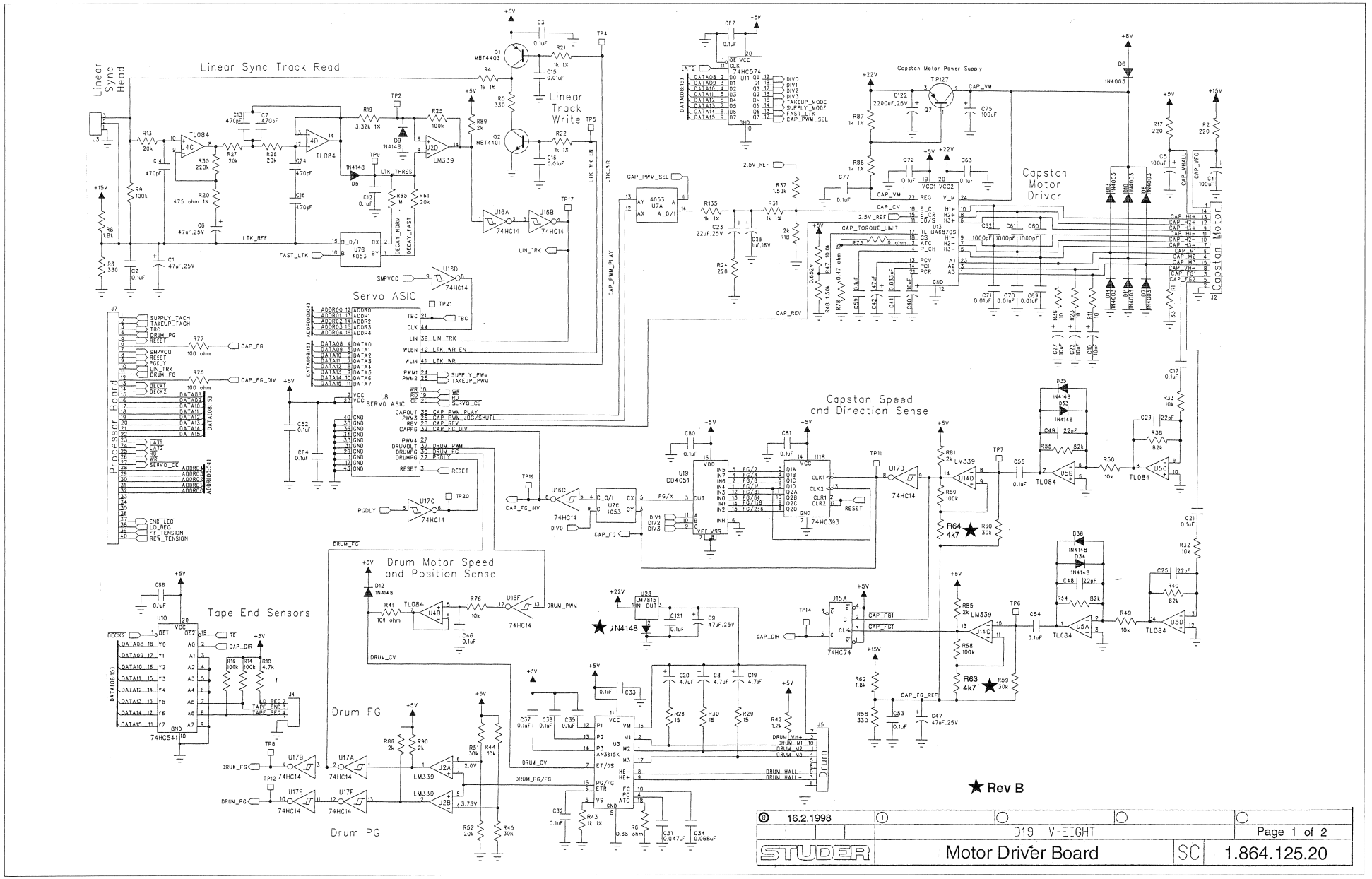
Kopie fuer:

STUDER REGENSDORF	I/O Board	1.864.135.00

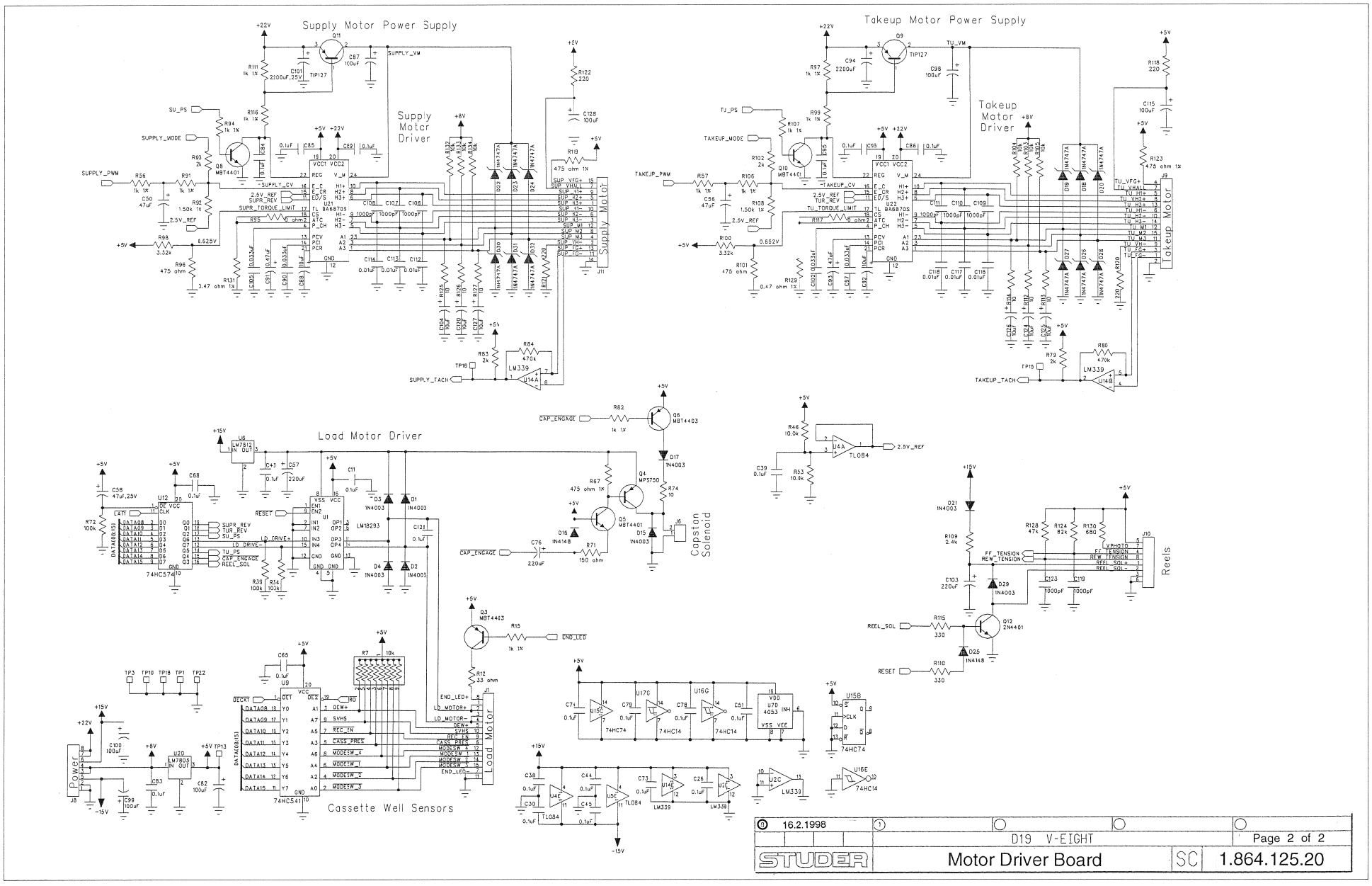
I/O Board 1.864.135.81



Motor Driver Board 1.864.125.20

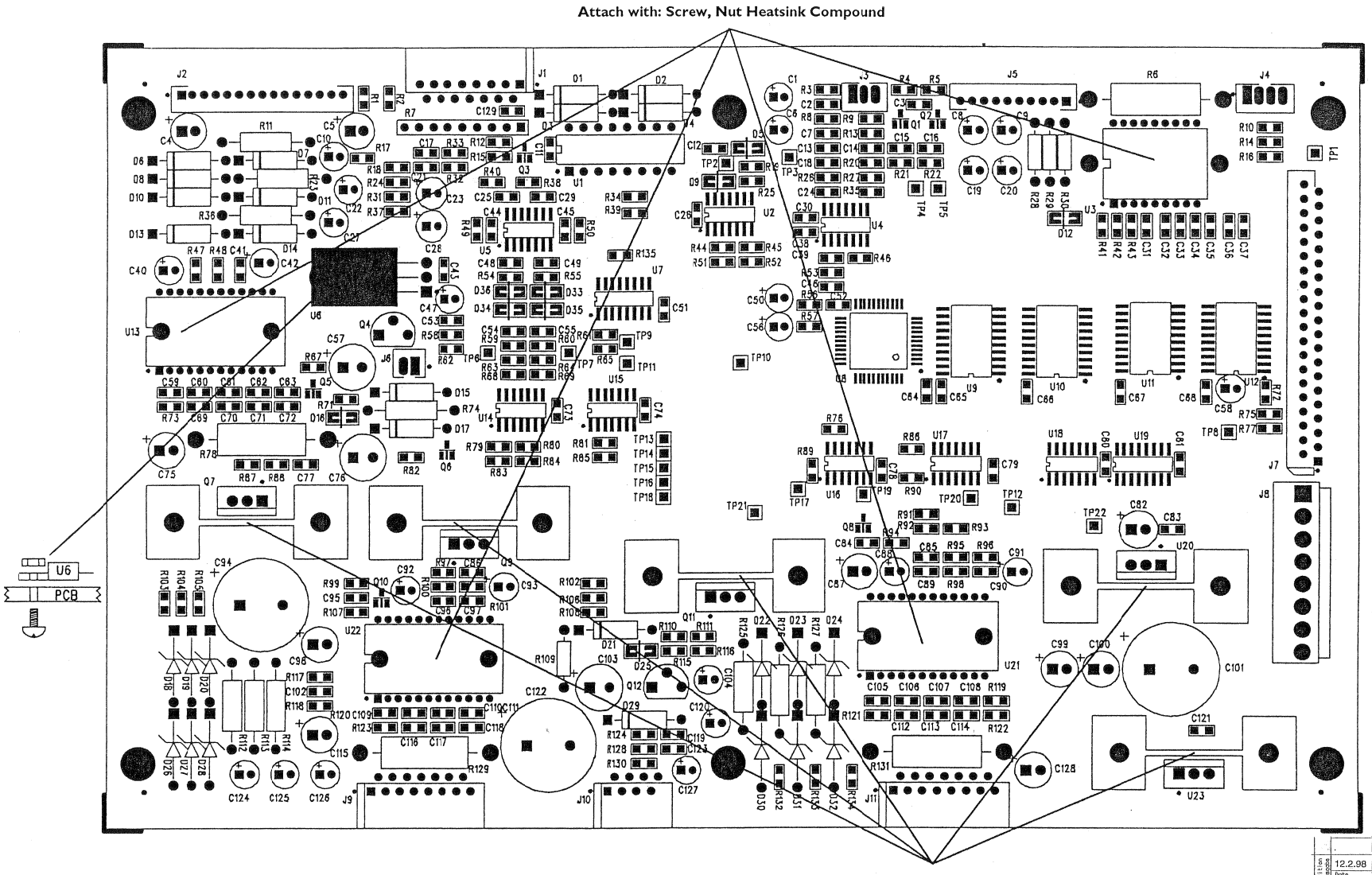


Motor Driver Board 1.864.125.20

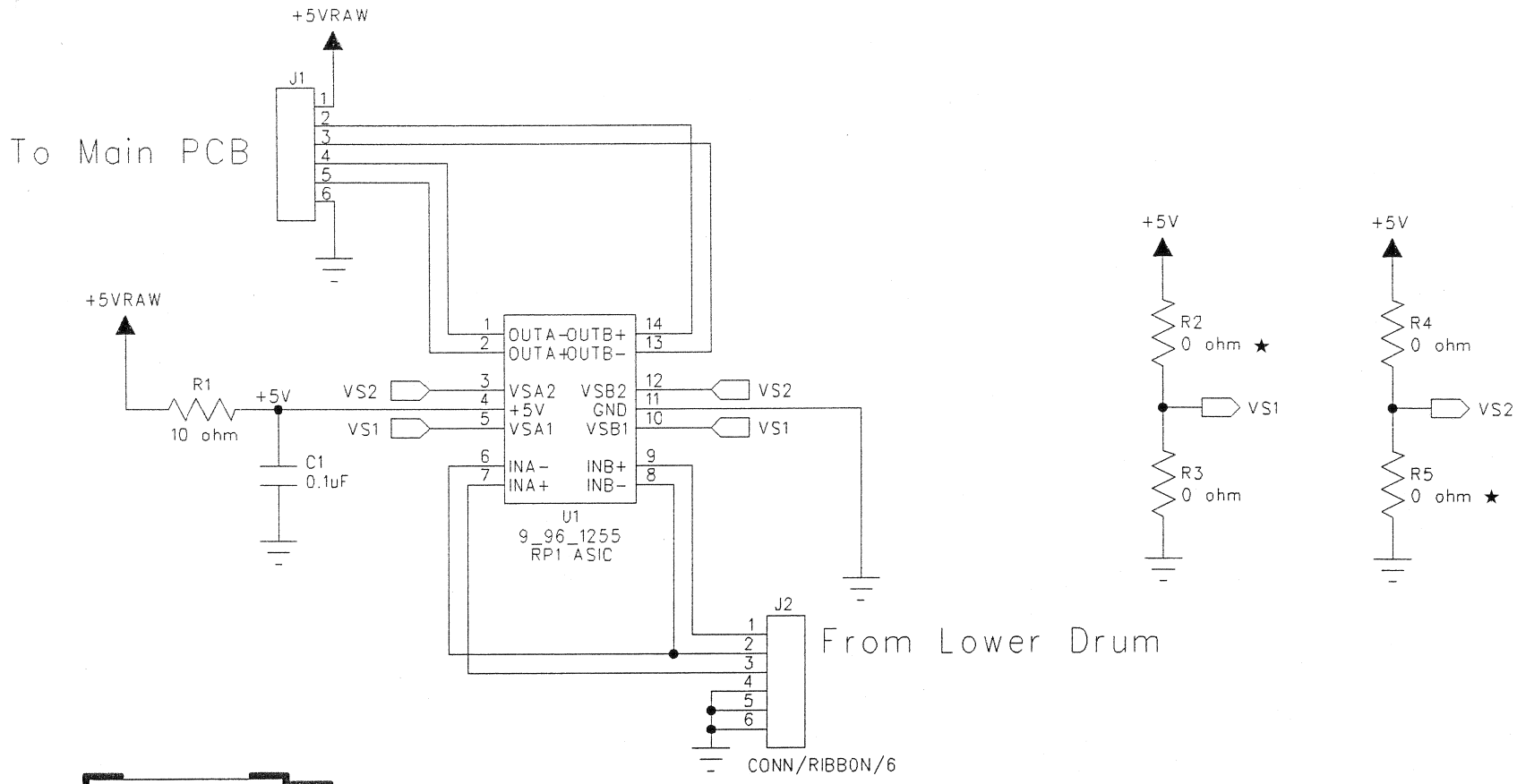


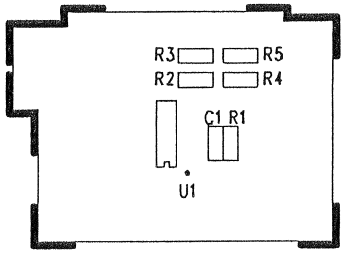
16.2.1998			Page 2 of 2
STUDER	D19 V-EIGHT		
	Motor Driver Board	SC	1.864.125.20

Motor Driver Board 1.864.125.20



Read Pre-Amplifier Circuit 1.864.031.00 (Located on Tape Transport 1.864.030.00)



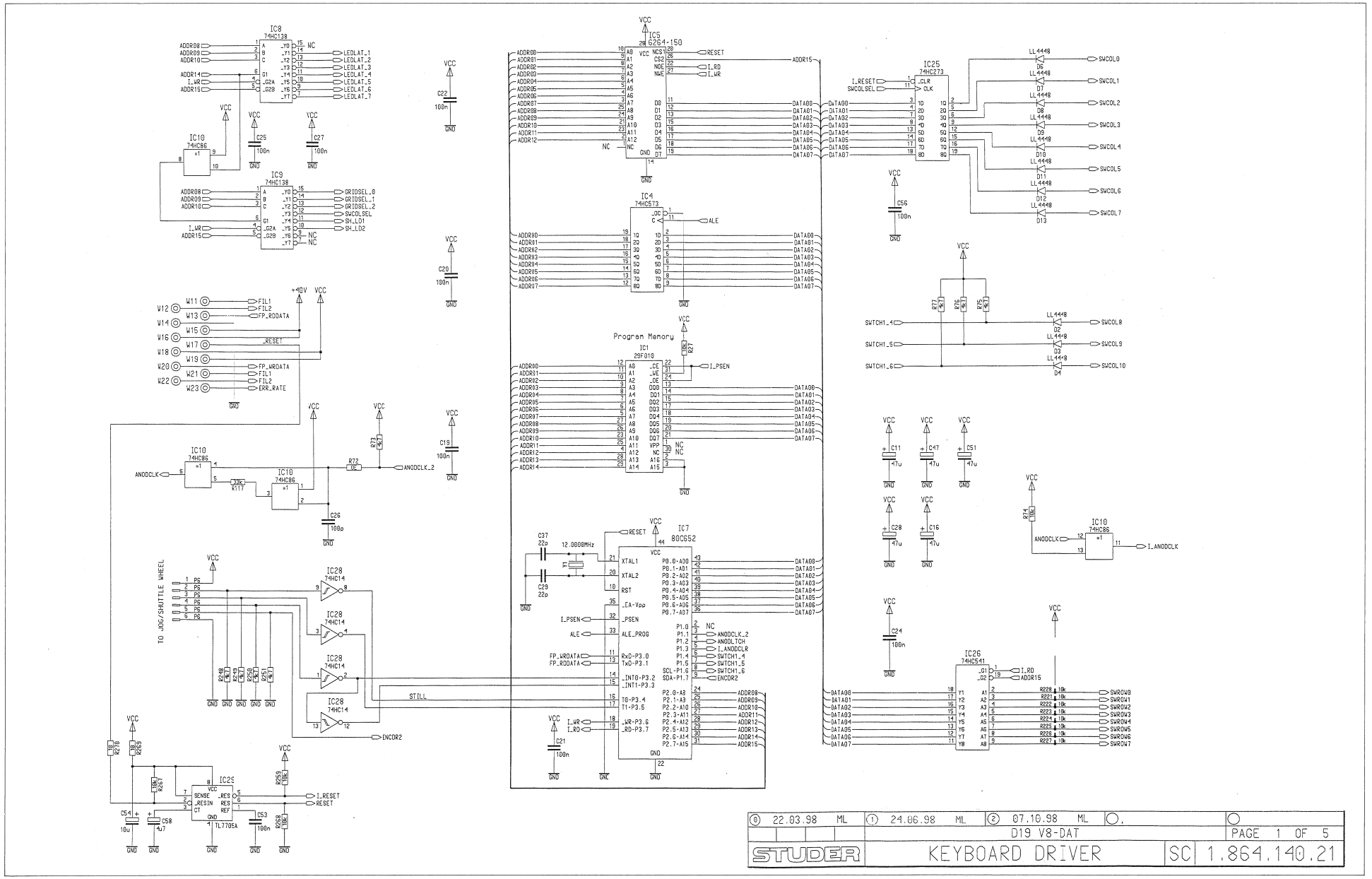


Assembly notes:
1. Leave R2 and R5 open.
Do not stuff R2 and R5

★ Assemble with R2 and R5 as opens – Delete from B.O.M.

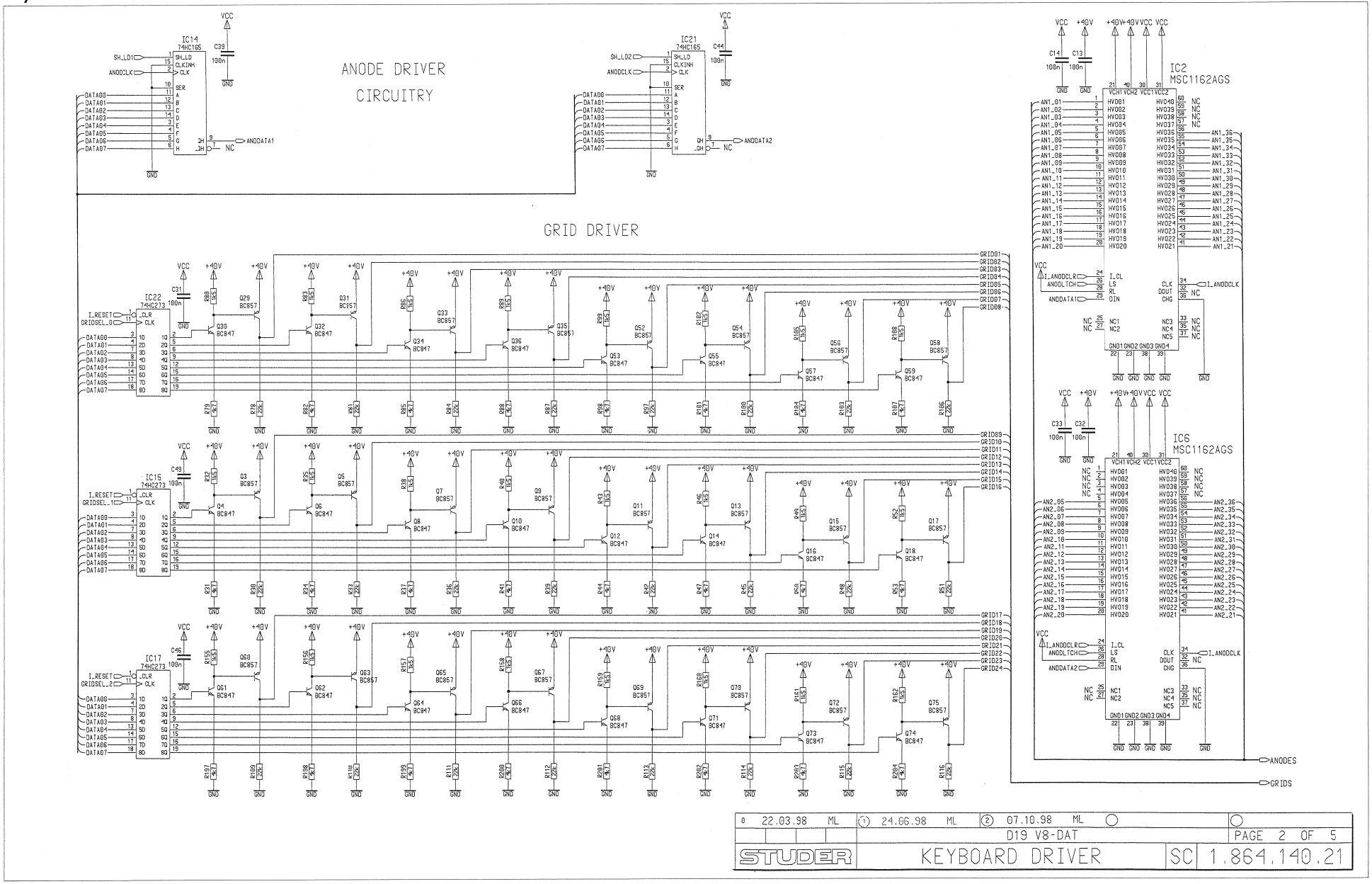
26.9.1997				
	D19 V-EIGHT			Page 1 of 1
STUDER	Read Pre-Amplifier Circuit	SC	1.864.031.00	

Keyboard Driver 1.864.140.21



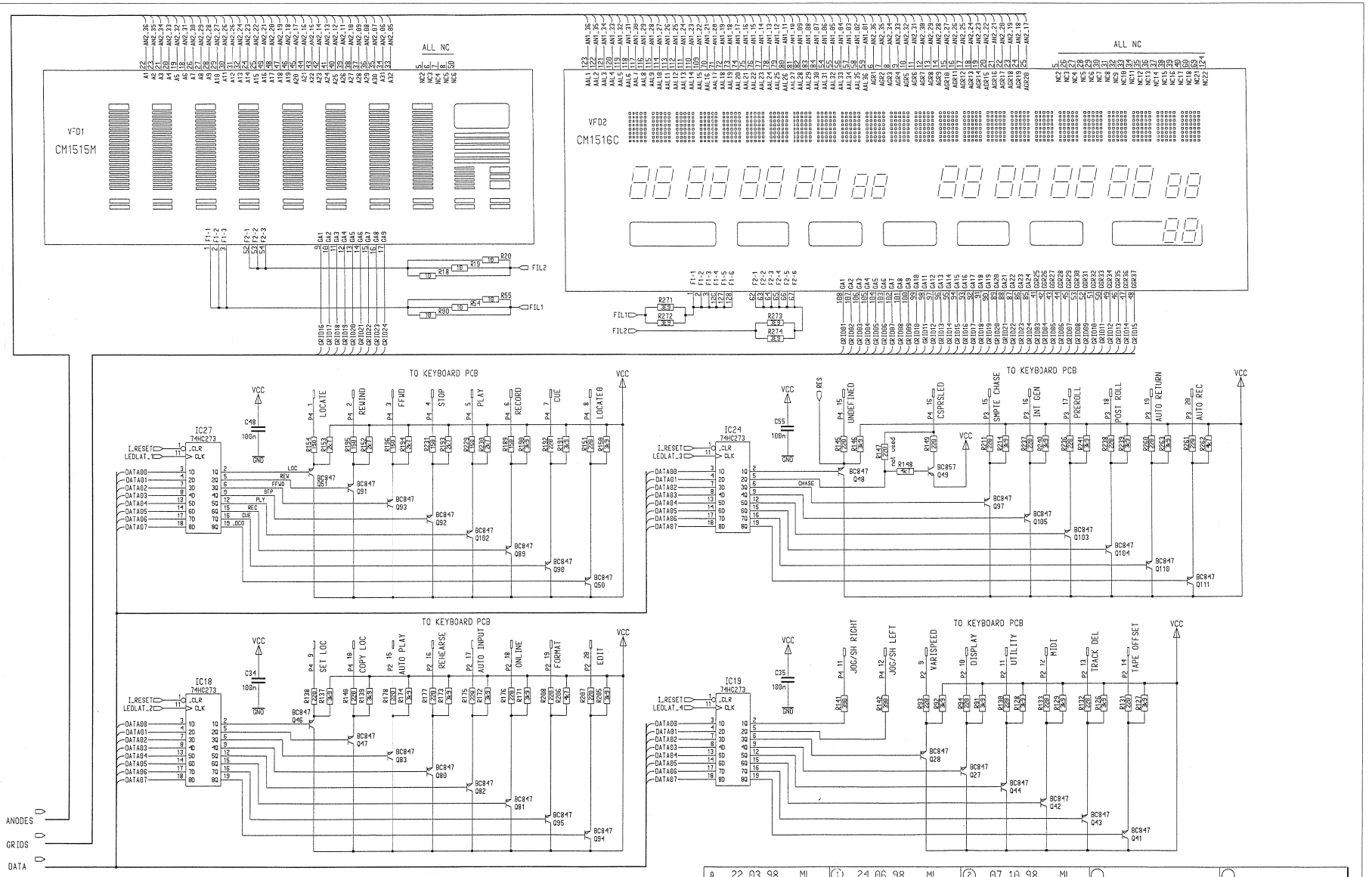
⓪ 22.03.98 ML	① 24.06.98 ML	② 07.10.98 ML	○,	○
		D19 V8-DAT		PAGE 1 OF 5
STUDER	KEYBOARD DRIVER		SC	1.864.140.21

Keyboard Driver 1.864.140.21



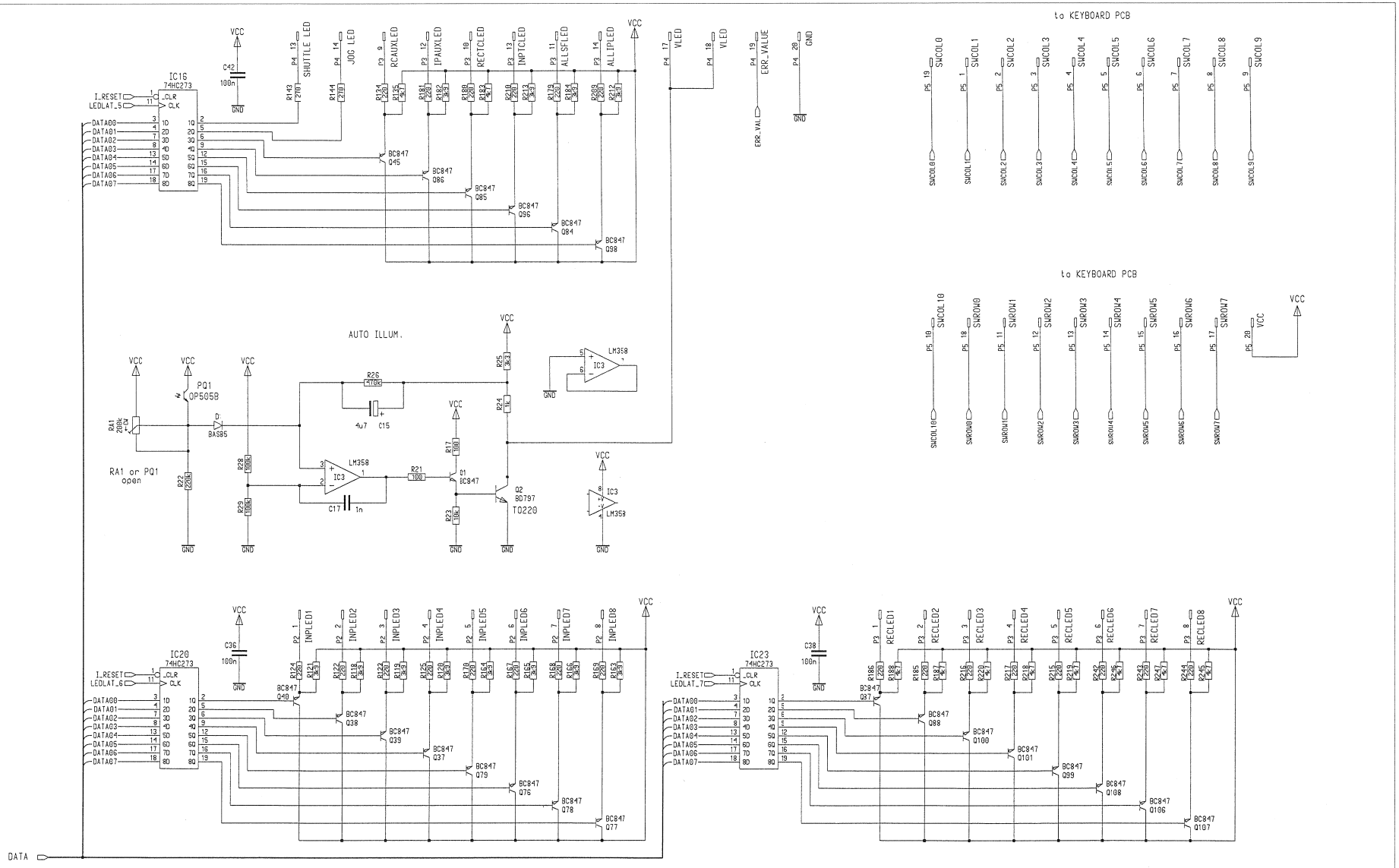
0	22.03.98	ML	1	24.06.98	ML	2 07.10.98 ML	PAGE 2 OF 5
						D19 V8-DAT	
STUDER						KEYBOARD DRIVER	SC 1.864.140.21

Keyboard Driver 1.864.140.21



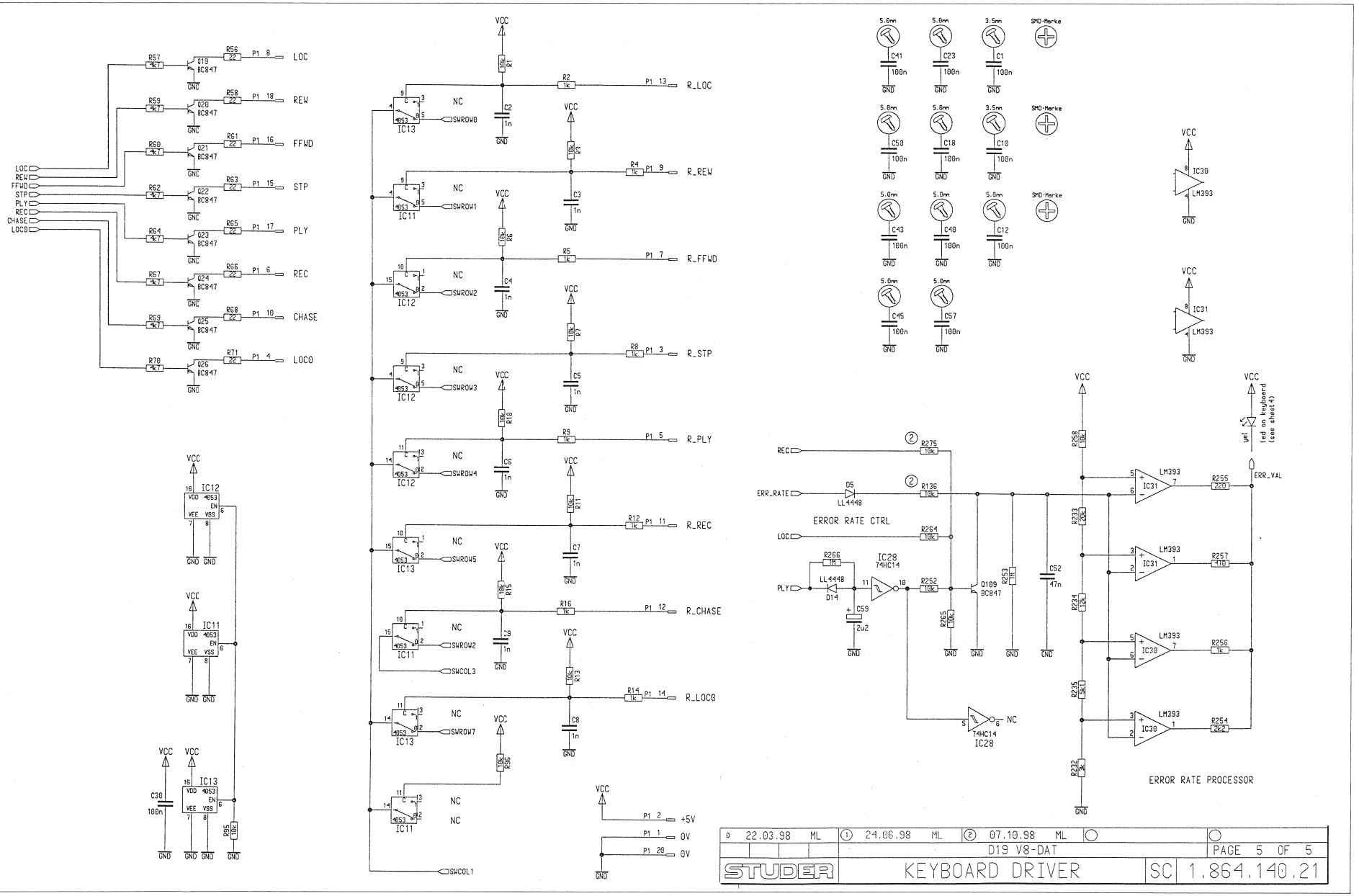
0 22.03.98 ML	1 24.06.98 ML	2 07.10.98 ML			
		D19 V8-DAT			PAGE 3 OF 5
STUDER	KEYBOARD DRIVER			SC	1.864.140.21

Keyboard Driver 1.864.140.21



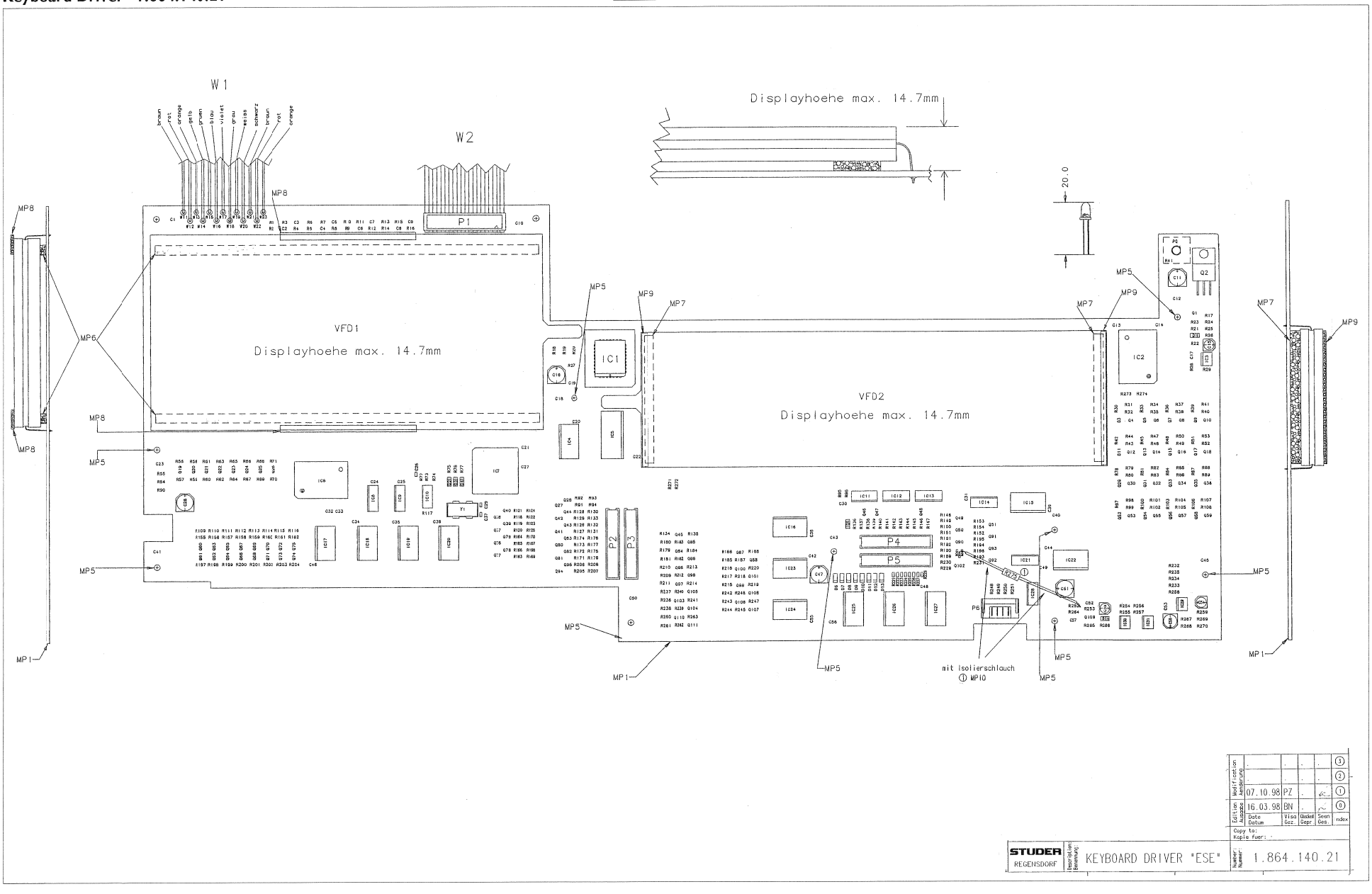
0	22.03.98	ML	1 24.06.98	ML	2 07.10.98	ML	
					D19 V8-DAT		PAGE 4 OF 5
STUDER			KEYBOARD DRIVER			SC	1.864.140.21

Keyboard Driver 1.864.140.21



0 22.03.98 ML	1 24.06.98 ML	2 07.10.98 ML			
		D19 V8-DAT			PAGE 5 OF 5
STUDER	KEYBOARD DRIVER		SC	1.864.140.21	

Keyboard Driver 1.864.140.21



Keyboard Driver 1.864.140.21

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 2	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 3	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 4	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 5	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 6	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 7	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 8	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 9	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 10	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 11	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 12	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 13	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 14	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 15	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 16	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 17	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 18	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 19	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 20	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 21	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 22	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 23	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 24	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 25	59.60.3337		100n	CER 50V, 10%, X7R, 0805
1	C 26	not used		100p	CER 50V, 5%, C0G, 0603
0	C 27	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 28	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 29	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 30	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 31	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 32	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 33	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 34	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 35	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 36	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 37	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 38	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 39	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 40	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 41	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 42	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 43	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 44	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 45	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 46	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 47	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 48	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 49	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 50	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 51	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 52	59.60.3333		47n	CER 50V, 10%, X7R, 0805
0	C 53	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 54	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 55	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 56	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 57	59.60.3337		100n	CER 50V, 10%, X7R, 0805
1	C 58	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 59	59.68.0129		2u2	C-EL 50V, 4.0*5.7
0	D 1	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 2	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 3	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 4	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 5	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 6	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 7	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 8	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 9	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 10	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 11	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 12	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 13	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 14	50.60.8001		4448	200mA 75V 4ns SOD 80
0	IC 1	1.864.901.20			SW 140 Keyboard (50.63.1303)
0	IC 2	50.62.0005		MSC1162AG	High volt. VFD grid driver
0	IC 3	50.61.0202		LM358	Op-Amp single supply
0	IC 4	50.62.1573		74HC573	Octal D-type latch
0	IC 5	50.63.1502		6264	SRAM 8K*8, 120ns
0	IC 6	50.62.0005		MSC1162AG	High volt. VFD grid driver
0	IC 7	50.63.0009		80C652	MPU 8bit
0	IC 8	50.62.1138		74HC138	3 to 8 line decoder
0	IC 9	50.62.1138		74HC138	3 to 8 line decoder
0	IC 10	50.62.1086		74HC 86	Quad 2input EXOR
0	IC 11	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 12	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 13	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 14	50.62.1165		74HC165	8bit shift register
0	IC 15	50.62.1273		74HC273	Octal D-FF with reset
0	IC 16	50.62.1273		74HC273	Octal D-FF with reset
0	IC 17	50.62.1273		74HC273	Octal D-FF with reset
0	IC 18	50.62.1273		74HC273	Octal D-FF with reset
0	IC 19	50.62.1273		74HC273	Octal D-FF with reset

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	IC 20	50.62.1273		74HC273	Octal D-FF with reset
0	IC 21	50.62.1165		74HC165	8bit shift register
0	IC 22	50.62.1273		74HC273	Octal D-FF with reset
0	IC 23	50.62.1273		74HC273	Octal D-FF with reset
0	IC 24	50.62.1273		74HC273	Octal D-FF with reset
0	IC 25	50.62.1273		74HC273	Octal D-FF with reset
0	IC 26	50.62.1541		74HC541	Octal buffer line driver/recei
0	IC 27	50.62.1273		74HC273	Octal D-FF with reset
0	IC 28	50.62.1014		74HC 14	Hey Schmitt trigger inverter
0	IC 29	50.63.2001		7705B	Reset Generator
0	IC 30	50.61.9001		LM393	Dual voltage comp. SO 8
0	IC 31	50.61.9001		LM393	Dual voltage comp. SO 8
0	MP 1	1.864.140.12			Keyboard Driver PCB
0	MP 2	1.864.140.10			NR.-ETIKETTE 5 * 20
0	MP 3	43.01.0108		Label	ESE-WARNSCHILD
0	MP 4	28.21.2407			ROHRNIETE,DIN D 3.0* 5.0
0	MP 5	1.010.507.27	9 pcs		NIETHUELSE L 6.0 * 6.0/3.5
0	MP 6	65.99.0191	2 pcs		SCHAUMST.KLEBBAND SW, 6* 0.48
					145mm bzw. nach Muster (0.48x6.0mm Band)
0	MP 7	65.99.0160	2 pcs		SCHAUMST.KLEBBAND GR, 3*12
					48.0mm bzw. nach Muster (3.0x12.0mm Band)
0	MP 8	65.99.0187	4 pcs		SCHAUMST.KLEBBAND SW, 1* 8
					10.0mm bzw. nach Muster (1.0x8.0mm Band)
0	MP 9	65.99.0187	2 pcs		SCHAUMST.KLEBBAND SW, 1* 8
					45.0mm bzw. nach Muster (1.0x8.0mm Band)
2	MP 10	65.99.0111	2 pcs		PTFE-SCHLAUCH SPEZ .89*0.152
					(2x 24mm lang)
0	P 2	54.14.5520		20p	PCB-Buchse gerade
0	P 3	54.14.5520		20p	PCB-Buchse gerade
0	P 4	54.14.5520		20p	PCB-Buchse gerade
0	P 5	54.14.5520		20p	PCB-Buchse gerade
0	P 6	54.99.0341		6p	PCB winkel
0	PQ 1	50.04.2145		OP505B	QP OP 505 B,
0	Q 1	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 2	50.03.0344		MJE15028	MJE 15 028 NPN
0	Q 3	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 4	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 5	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 6	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 7	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 8	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 9	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 10	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 11	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 12	50.60.0001		BC847B	NPN 45V 100mA SOT 23
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0	Q 15	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 16	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 17	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 18	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 19	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 20	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 21	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 22	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 23	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 24	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 25	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 26	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 27	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 28	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 29	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 30	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 31	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 32	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 33	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 34	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 35	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 36	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 37	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 38	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 39	50.60.0001		BC847B	NPN 45V 100mA SOT 23
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0	Q 41	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 42	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 43	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 44	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 45	50.60.0001		BC847B	NPN 45V 100mA SOT 23
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0	Q 49	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 50	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 51	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 52	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 53	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 54	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 55	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 56	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 57	50.60.0001		BC847B	NPN 45V 100mA SOT 23

Keyboard Driver 1.864.140.21

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	Q 58	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 59	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 60	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 61	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 62	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 63	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 64	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 65	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 66	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 67	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 68	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 69	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 70	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 71	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 72	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 73	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 74	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 75	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 76	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 77	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 78	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 79	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 80	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 81	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 82	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 83	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 84	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 85	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 86	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 87	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 88	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 89	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 90	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 91	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 92	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 93	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 94	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 95	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 96	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 97	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 98	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 99	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 100	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 101	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 102	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 103	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 104	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 105	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 106	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 107	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 108	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 109	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 110	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 111	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	R 1	57.60.1103		10K	MF, 1%, 0204, E24
0	R 2	57.60.1102		1K	MF, 1%, 0204, E24
0	R 3	57.60.1103		10K	MF, 1%, 0204, E24
0	R 4	57.60.1102		1K	MF, 1%, 0204, E24
0	R 5	57.60.1102		1K	MF, 1%, 0204, E24
0	R 6	57.60.1103		10K	MF, 1%, 0204, E24
0	R 7	57.60.1103		10K	MF, 1%, 0204, E24
0	R 8	57.60.1102		1K	MF, 1%, 0204, E24
0	R 9	57.60.1102		1K	MF, 1%, 0204, E24
0	R 10	57.60.1103		10K	MF, 1%, 0204, E24
0	R 11	57.60.1103		10K	MF, 1%, 0204, E24
0	R 12	57.60.1102		1K	MF, 1%, 0204, E24
0	R 13	57.60.1103		10K	MF, 1%, 0204, E24
0	R 14	57.60.1102		1K	MF, 1%, 0204, E24
0	R 15	57.60.1103		10K	MF, 1%, 0204, E24
0	R 16	57.60.1102		1K	MF, 1%, 0204, E24
0	R 17	57.60.1101		100R	MF, 1%, 0204, E24
0	R 18	57.60.1100		10R	MF, 1%, 0204, E24
0	R 19	57.60.1100		10R	MF, 1%, 0204, E24
0	R 20	57.60.1100		10R	MF, 1%, 0204, E24
0	R 21	57.60.1101		100R	MF, 1%, 0204, E24
0	R 22	57.60.1224		220K	MF, 1%, 0204, E24
0	R 23	57.60.1103		10K	MF, 1%, 0204, E24
0	R 24	57.60.1102		1K	MF, 1%, 0204, E24
0	R 25	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 26	57.60.1474		470K	MF, 1%, 0204, E24
0	R 27	57.60.1103		10K	MF, 1%, 0204, E24
0	R 28	57.60.1104		100K	MF, 1%, 0204, E24
0	R 29	57.60.1104		100K	MF, 1%, 0204, E24
0	R 30	57.60.1223		22K	MF, 1%, 0204, E24
0	R 31	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 32	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 33	57.60.1223		22K	MF, 1%, 0204, E24
0	R 34	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 35	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 36	57.60.1223		22K	MF, 1%, 0204, E24
0	R 37	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 38	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 39	57.60.1223		22K	MF, 1%, 0204, E24
0	R 40	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 41	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 42	57.60.1223		22K	MF, 1%, 0204, E24
0	R 43	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 44	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 45	57.60.1223		22K	MF, 1%, 0204, E24
0	R 46	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 47	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 48	57.60.1223		22K	MF, 1%, 0204, E24
0	R 49	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 50	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 51	57.60.1223		22K	MF, 1%, 0204, E24
0	R 52	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 53	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 54	57.60.1100		10R	MF, 1%, 0204, E24
0	R 55	57.60.1100		10R	MF, 1%, 0204, E24
0	R 56	57.60.1220		22R	MF, 1%, 0204, E24
0	R 57	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 58	57.60.1220		22R	MF, 1%, 0204, E24
0	R 59	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 60	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 61	57.60.1220		22R	MF, 1%, 0204, E24
0	R 62	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 63	57.60.1220		22R	MF, 1%, 0204, E24
0	R 64	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 65	57.60.1220		22R	MF, 1%, 0204, E24
0	R 66	57.60.1220		22R	MF, 1%, 0204, E24
0	R 67	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 68	57.60.1220		22R	MF, 1%, 0204, E24
0	R 69	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 70	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 71	57.60.1220		22R	MF, 1%, 0204, E24
1	R 72	57.60.1000		0R0	MF, 0204
0	R 73	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 74	57.60.1103		10K	MF, 1%, 0204, E24
0	R 75	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 76	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 77	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 78	57.60.1223		22K	MF, 1%, 0204, E24
0	R 79	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 80	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 81	57.60.1223		22K	MF, 1%, 0204, E24
0	R 82	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 83	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 84	57.60.1223		22K	MF, 1%, 0204, E24
0	R 85	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 86	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 87	57.60.1223		22K	MF, 1%, 0204, E24
0	R 88	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 89	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 90	57.60.1100		10R	MF, 1%, 0204, E24
0	R 91	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 92	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 93	57.60.1221		220R	MF, 1%, 0204, E24
0	R 94	57.60.1221		220R	MF, 1%, 0204, E24
0	R 95	57.60.1103		10K	MF, 1%, 0204, E24
0	R 96	57.60.1103		10K	MF, 1%, 0204, E24
0	R 97	57.60.1223		22K	MF, 1%, 0204, E24
0	R 98	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 99	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 100	57.60.1223		22K	MF, 1%, 0204, E24
0	R 101	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 102	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 103	57.60.1223		22K	MF, 1%, 0204, E24
0	R 104	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 105	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 106	57.60.1223		22K	MF, 1%, 0204, E24
0	R 107	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 108	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 109	57.60.1223		22K	MF, 1%, 0204, E24
0	R 110	57.60.1223		22K	MF, 1%, 0204, E24
0	R 111	57.60.1223		22K	MF, 1%, 0204, E24
0	R 112	57.60.1223		22K	MF, 1%, 0204, E24
0	R 113	57.60.1223		22K	MF, 1%, 0204, E24
0	R 114	57.60.1223		22K	MF, 1%, 0204, E24
0	R 115	57.60.1223		22K	MF, 1%, 0204, E24
0	R 116	57.60.1223		22K	MF, 1%, 0204, E24
1	R 117	57.60.1333		33K	MF, 1%, 0204, E24
0	R 118	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 119	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 120	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 121	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 122	57.60.1221		220R	MF, 1%, 0204, E24
0	R 123	57.60.1221		220R	MF, 1%, 0204, E24
0	R 124	57.60.1221		220R	MF, 1%, 0204, E24
0	R 125	57.60.1221		220R	MF, 1%, 0204, E24
0	R 126	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 127	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 128	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 129	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 130	57.60.1221		220R	MF, 1%, 0204, E24
0	R 131	57.60.1221		220R	MF, 1%, 0204, E24
0	R 132	57.60.1221		220R	MF, 1%, 0204, E24
0	R 133	57.60.1221		220R	MF, 1%, 0204, E24

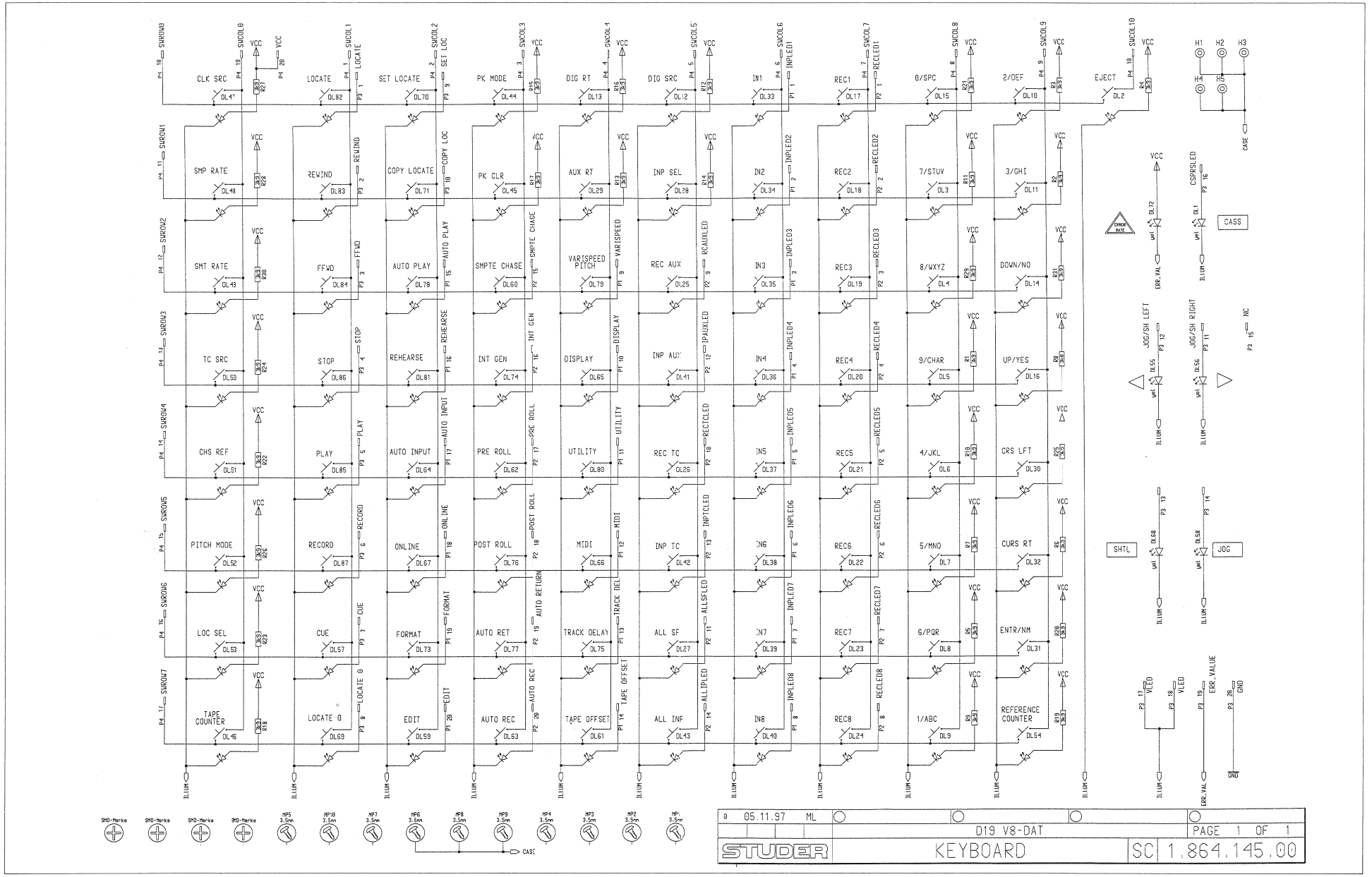
Keyboard Driver 1.864.140.21

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 134	57.60.1221		220R	MF, 1%, 0204, E24
0	R 135	57.60.1472		4K7	MF, 1%, 0204, E24
2	R 136	57.60.1104		100K	MF, 1%, 0204, E24
0	R 137	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 138	57.60.1221		220R	MF, 1%, 0204, E24
0	R 139	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 140	57.60.1221		220R	MF, 1%, 0204, E24
0	R 141	57.60.1391		390R	MF, 1%, 0204, E24
0	R 142	57.60.1391		390R	MF, 1%, 0204, E24
0	R 143	57.60.1271		270R	MF, 1%, 0204, E24
0	R 144	57.60.1271		270R	MF, 1%, 0204, E24
0	R 145	57.60.1221		220R	MF, 1%, 0204, E24
0	R 146	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 147	not used		220R	MF, 1%, 0204, E24
0	R 148	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 149	57.60.1221		220R	MF, 1%, 0204, E24
0	R 150	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 151	57.60.1221		220R	MF, 1%, 0204, E24
0	R 152	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 153	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 154	57.60.1151		150R	MF, 1%, 0204, E24
0	R 155	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 156	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 157	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 158	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 159	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 160	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 161	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 162	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 163	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 164	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 165	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 166	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 167	57.60.1221		220R	MF, 1%, 0204, E24
0	R 168	57.60.1221		220R	MF, 1%, 0204, E24
0	R 169	57.60.1221		220R	MF, 1%, 0204, E24
0	R 170	57.60.1221		220R	MF, 1%, 0204, E24
0	R 171	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 172	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 173	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 174	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 175	57.60.1221		220R	MF, 1%, 0204, E24
0	R 176	57.60.1221		220R	MF, 1%, 0204, E24
0	R 177	57.60.1221		220R	MF, 1%, 0204, E24
0	R 178	57.60.1221		220R	MF, 1%, 0204, E24
0	R 179	57.60.1221		220R	MF, 1%, 0204, E24
0	R 180	57.60.1221		220R	MF, 1%, 0204, E24
0	R 181	57.60.1221		220R	MF, 1%, 0204, E24
0	R 182	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 183	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 184	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 185	57.60.1221		220R	MF, 1%, 0204, E24
0	R 186	57.60.1221		220R	MF, 1%, 0204, E24
0	R 187	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 188	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 189	57.60.1151		150R	MF, 1%, 0204, E24
0	R 190	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 191	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 192	57.60.1221		220R	MF, 1%, 0204, E24
0	R 193	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 194	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 195	57.60.1151		150R	MF, 1%, 0204, E24
0	R 196	57.60.1151		150R	MF, 1%, 0204, E24
0	R 197	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 198	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 199	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 200	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 201	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 202	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 203	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 204	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 205	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 206	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 207	57.60.1221		220R	MF, 1%, 0204, E24
0	R 208	57.60.1221		220R	MF, 1%, 0204, E24
0	R 209	57.60.1221		220R	MF, 1%, 0204, E24
0	R 210	57.60.1221		220R	MF, 1%, 0204, E24
0	R 211	57.60.1221		220R	MF, 1%, 0204, E24
0	R 212	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 213	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 214	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 215	57.60.1221		220R	MF, 1%, 0204, E24
0	R 216	57.60.1221		220R	MF, 1%, 0204, E24
0	R 217	57.60.1221		220R	MF, 1%, 0204, E24
0	R 218	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 219	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 220	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 221	57.69.1097		10k	CF 5% 0603
0	R 222	57.69.1097		10k	CF 5% 0603
0	R 223	57.69.1097		10k	CF 5% 0603
0	R 224	57.69.1097		10k	CF 5% 0603
0	R 225	57.69.1097		10k	CF 5% 0603
0	R 226	57.69.1097		10k	CF 5% 0603
0	R 227	57.69.1097		10k	CF 5% 0603
0	R 228	57.69.1097		10k	CF 5% 0603
0	R 229	57.60.1151		150R	MF, 1%, 0204, E24
0	R 230	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 231	57.60.1151		150R	MF, 1%, 0204, E24
0	R 232	57.60.1302		3K0	MF, 1%, 0204, E24
0	R 233	57.60.1203		20K	MF, 1%, 0204, E24
0	R 234	57.60.1123		12K	MF, 1%, 0204, E24
0	R 235	57.60.1512		5K1	MF, 1%, 0204, E24
0	R 236	57.60.1221		220R	MF, 1%, 0204, E24
0	R 237	57.60.1221		220R	MF, 1%, 0204, E24
0	R 238	57.60.1221		220R	MF, 1%, 0204, E24
0	R 239	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 240	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 241	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 242	57.60.1221		220R	MF, 1%, 0204, E24
0	R 243	57.60.1221		220R	MF, 1%, 0204, E24
0	R 244	57.60.1221		220R	MF, 1%, 0204, E24
0	R 245	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 246	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 247	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 248	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 249	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 250	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 251	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 252	57.60.1103		10K	MF, 1%, 0204, E24
0	R 253	57.60.1105		1M	MF, 1%, 0204, E24
0	R 254	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 255	57.60.1221		220R	MF, 1%, 0204, E24
0	R 256	57.60.1102		1K	MF, 1%, 0204, E24
0	R 257	57.60.1471		470R	MF, 1%, 0204, E24
0	R 258	57.60.1103		10K	MF, 1%, 0204, E24
0	R 259	57.60.1103		10K	MF, 1%, 0204, E24
0	R 260	57.60.1221		220R	MF, 1%, 0204, E24
0	R 261	57.60.1221		220R	MF, 1%, 0204, E24
0	R 262	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 263	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 264	57.60.1103		10K	MF, 1%, 0204, E24
0	R 265	57.60.1103		10K	MF, 1%, 0204, E24
0	R 266	57.60.1105		1M	MF, 1%, 0204, E24
0	R 267	57.60.1103		10K	MF, 1%, 0204, E24
0	R 268	57.60.1103		10K	MF, 1%, 0204, E24
0	R 269	57.60.1100		10R	MF, 1%, 0204, E24
0	R 270	57.60.1100		10R	MF, 1%, 0204, E24
0	R 271	57.60.1399		3R9	MF, 1%, 0204, E24
0	R 272	57.60.1399		3R9	MF, 1%, 0204, E24
0	R 273	57.60.1399		3R9	MF, 1%, 0204, E24
0	R 274	57.60.1399		3R9	MF, 1%, 0204, E24
2	R 275	57.11.3103		10k	MF, 1%, 0207
0	RA 1	not used		200k	Cermet, 10%, 0.5W, horizontal
0	VFD 1	1.864.140.01			Meter Display
0	VFD 2	1.864.140.02			Alphanumeric Display
0	W 1	1.864.140.93			LL Keyboard Driver
0	W 2	1.023.392.45			FLACHKABEL 20 POL. 0,45M
0	XIC 1	53.03.2232		PLCC32p	PLCC-Socket 32p
0	XPQ 1	53.03.0218		1p	single-in-line
0	XPQ 2	53.03.0218		1p	single-in-line
0	Y 1	89.60.1003		12.000MHz	SMD Quartz

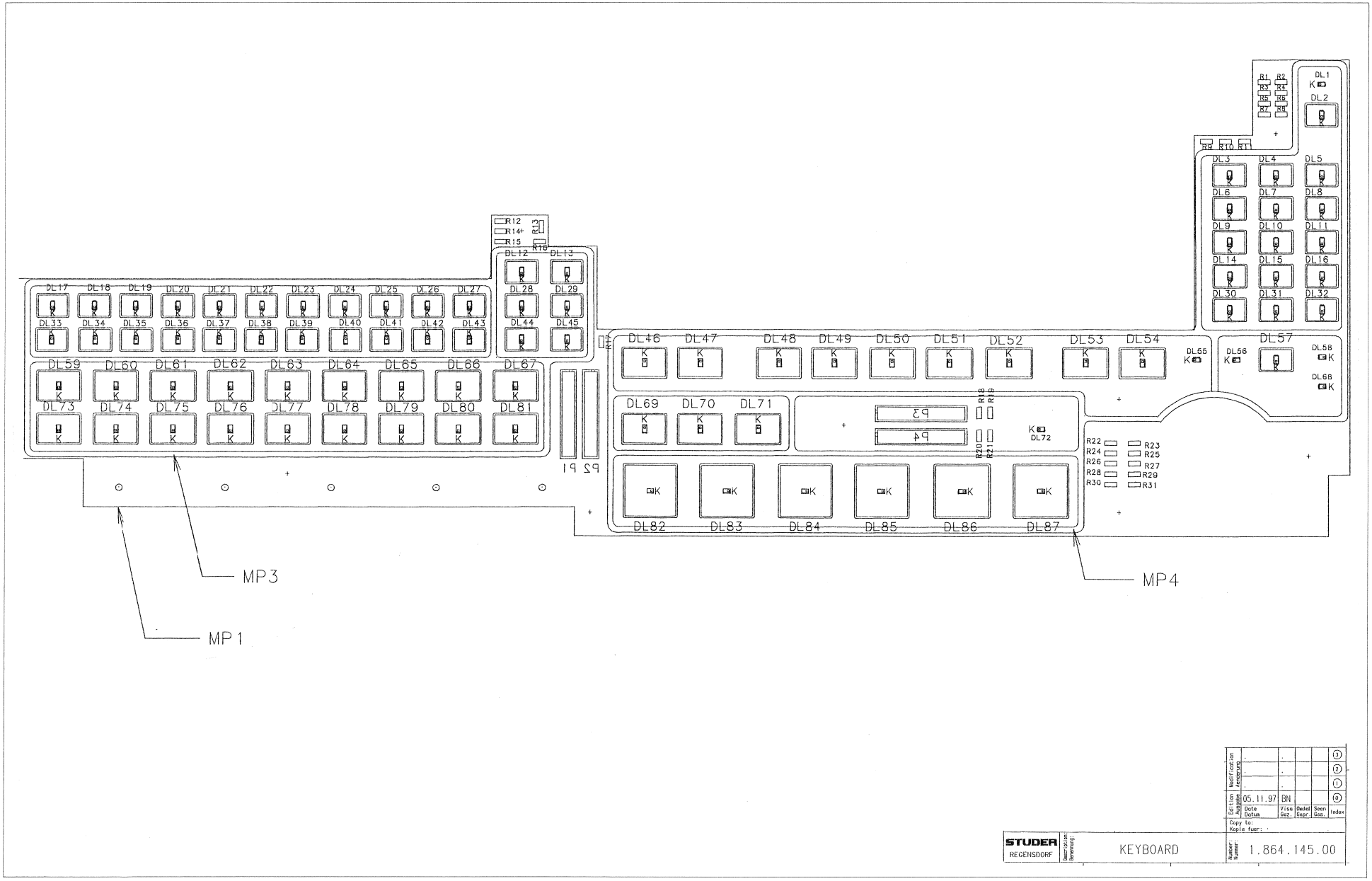
End of List

Comments

Keyboard 1.864.145.00



Keyboard 1.864.145.00



Keyboard 1.864.145.00

Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
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0	DL 2	50.60.9402		yel	SMD LED yellow
0	DL 3	50.60.9402		yel	SMD LED yellow
0	DL 4	50.60.9402		yel	SMD LED yellow
0	DL 5	50.60.9402		yel	SMD LED yellow
0	DL 6	50.60.9402		yel	SMD LED yellow
0	DL 7	50.60.9402		yel	SMD LED yellow
0	DL 8	50.60.9402		yel	SMD LED yellow
0	DL 9	50.60.9402		yel	SMD LED yellow
0	DL 10	50.60.9402		yel	SMD LED yellow
0	DL 11	50.60.9402		yel	SMD LED yellow
0	DL 12	50.60.9402		yel	SMD LED yellow
0	DL 13	50.60.9402		yel	SMD LED yellow
0	DL 14	50.60.9402		yel	SMD LED yellow
0	DL 15	50.60.9402		yel	SMD LED yellow
0	DL 16	50.60.9402		yel	SMD LED yellow
0	DL 17	50.60.9401		red	SMD LED superred
0	DL 18	50.60.9401		red	SMD LED superred
0	DL 19	50.60.9401		red	SMD LED superred
0	DL 20	50.60.9401		red	SMD LED superred
0	DL 21	50.60.9401		red	SMD LED superred
0	DL 22	50.60.9401		red	SMD LED superred
0	DL 23	50.60.9401		red	SMD LED superred
0	DL 24	50.60.9401		red	SMD LED superred
0	DL 25	50.60.9401		red	SMD LED superred
0	DL 26	50.60.9401		red	SMD LED superred
0	DL 27	50.60.9402		yel	SMD LED yellow
0	DL 28	50.60.9402		yel	SMD LED yellow
0	DL 29	50.60.9402		yel	SMD LED yellow
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0	DL 56	50.60.9402		yel	SMD LED yellow
0	DL 57	50.60.9402		yel	SMD LED yellow
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0	DL 60	50.60.9402		yel	SMD LED yellow
0	DL 61	50.60.9402		yel	SMD LED yellow
0	DL 62	50.60.9402		yel	SMD LED yellow
0	DL 63	50.60.9401		red	SMD LED superred
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0	DL 69	50.60.9402		yel	SMD LED yellow
0	DL 70	50.60.9402		yel	SMD LED yellow
0	DL 71	50.60.9402		yel	SMD LED yellow
0	DL 72	50.60.9402		yel	SMD LED yellow
0	DL 73	50.60.9401		red	SMD LED superred
0	DL 74	50.60.9402		yel	SMD LED yellow
0	DL 75	50.60.9402		yel	SMD LED yellow
0	DL 76	50.60.9402		yel	SMD LED yellow
0	DL 77	50.60.9402		yel	SMD LED yellow
0	DL 78	50.60.9402		yel	SMD LED yellow
0	DL 79	50.60.9402		yel	SMD LED yellow
0	DL 80	50.60.9402		yel	SMD LED yellow
0	DL 81	50.60.9402		yel	SMD LED yellow
0	DL 82	50.60.9402		yel	SMD LED yellow
0	DL 83	50.60.9402		yel	SMD LED yellow
0	DL 84	50.60.9402		yel	SMD LED yellow
0	DL 85	50.60.9402		yel	SMD LED yellow
0	DL 86	50.60.9402		yel	SMD LED yellow
0	DL 87	50.60.9401		red	SMD LED superred

Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
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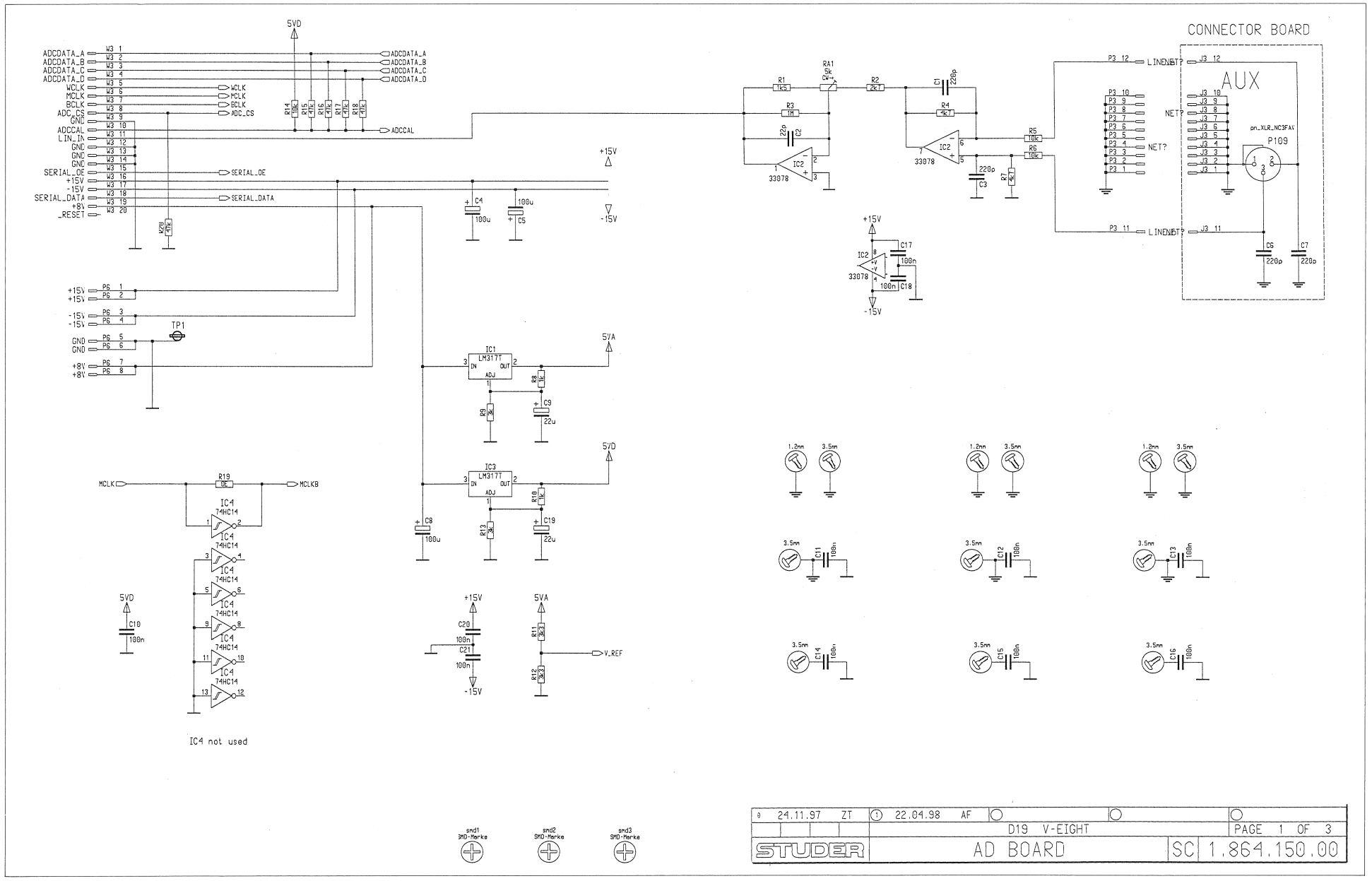
0	MP 2	1.864.145.10			NR.ETIKETTE 5X20
0	MP 3	1.864.145.01			KONTAKTMATTE 46 TASTEN
0	MP 4	1.864.145.02			KONTAKTMATTE 35 TASTEN 5 ANZ.
0	P 1	54.14.5590		20p	PCB-Stecker gerade
0	P 2	54.14.5590		20p	PCB-Stecker gerade
0	P 3	54.14.5590		20p	PCB-Stecker gerade
0	P 4	54.14.5590		20p	PCB-Stecker gerade
0	R 1	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 2	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 3	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 4	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 5	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 6	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 7	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 8	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 9	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 10	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 11	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 12	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 13	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 14	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 15	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 16	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 17	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 18	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 19	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 20	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 21	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 22	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 23	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 24	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 25	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 26	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 27	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 28	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 29	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 30	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 31	57.60.1392		3K9	MF, 1%, 0204, E24

End of List

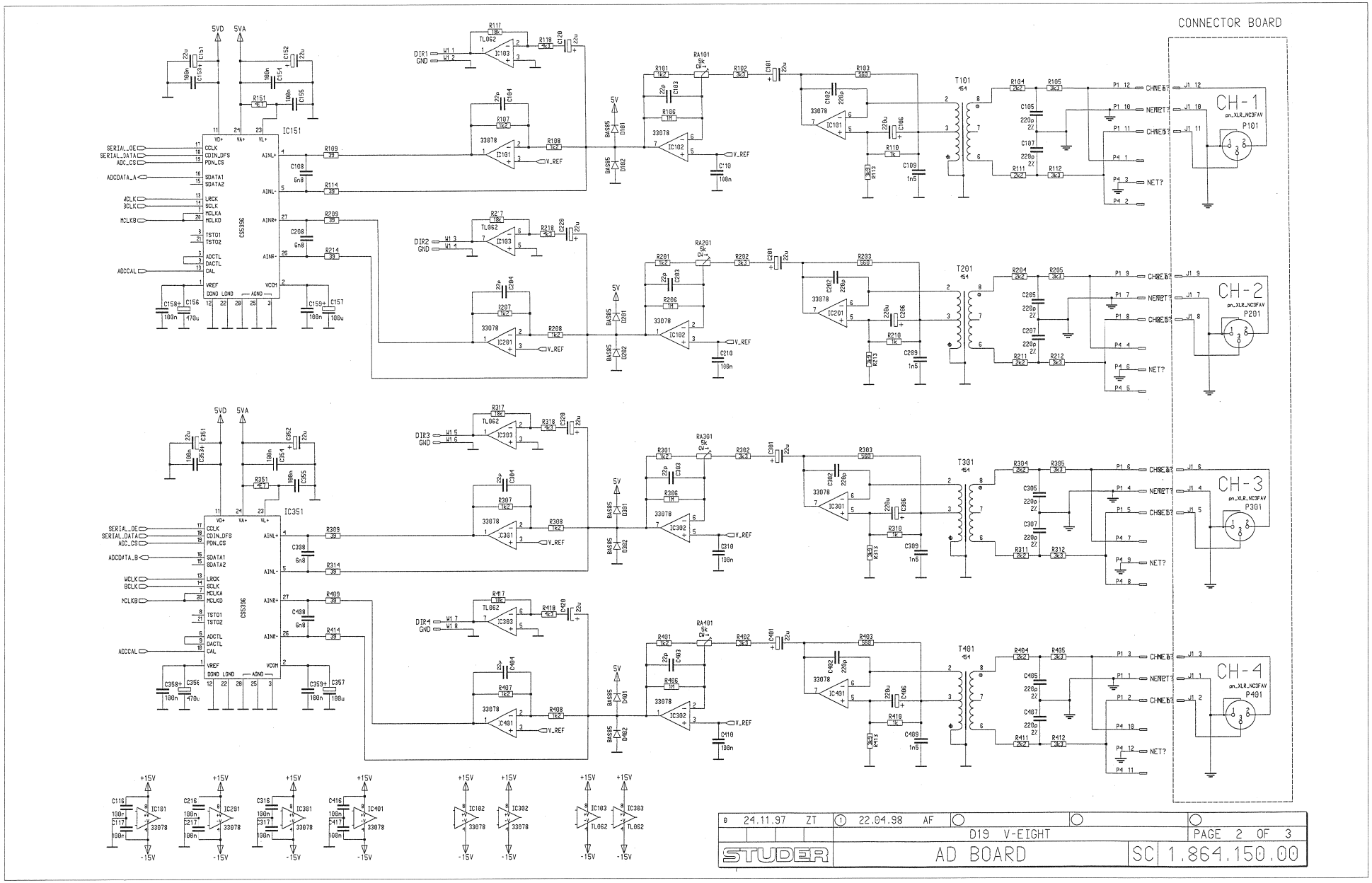
Comments:

AD Board 1.864.150.00



0 24.11.97 ZT	1 22.04.98 AF			
	D19 V-EIGHT			PAGE 1 OF 3
STUDER	AD BOARD		SC	1.864.150.00

AD Board 1.864.150.00



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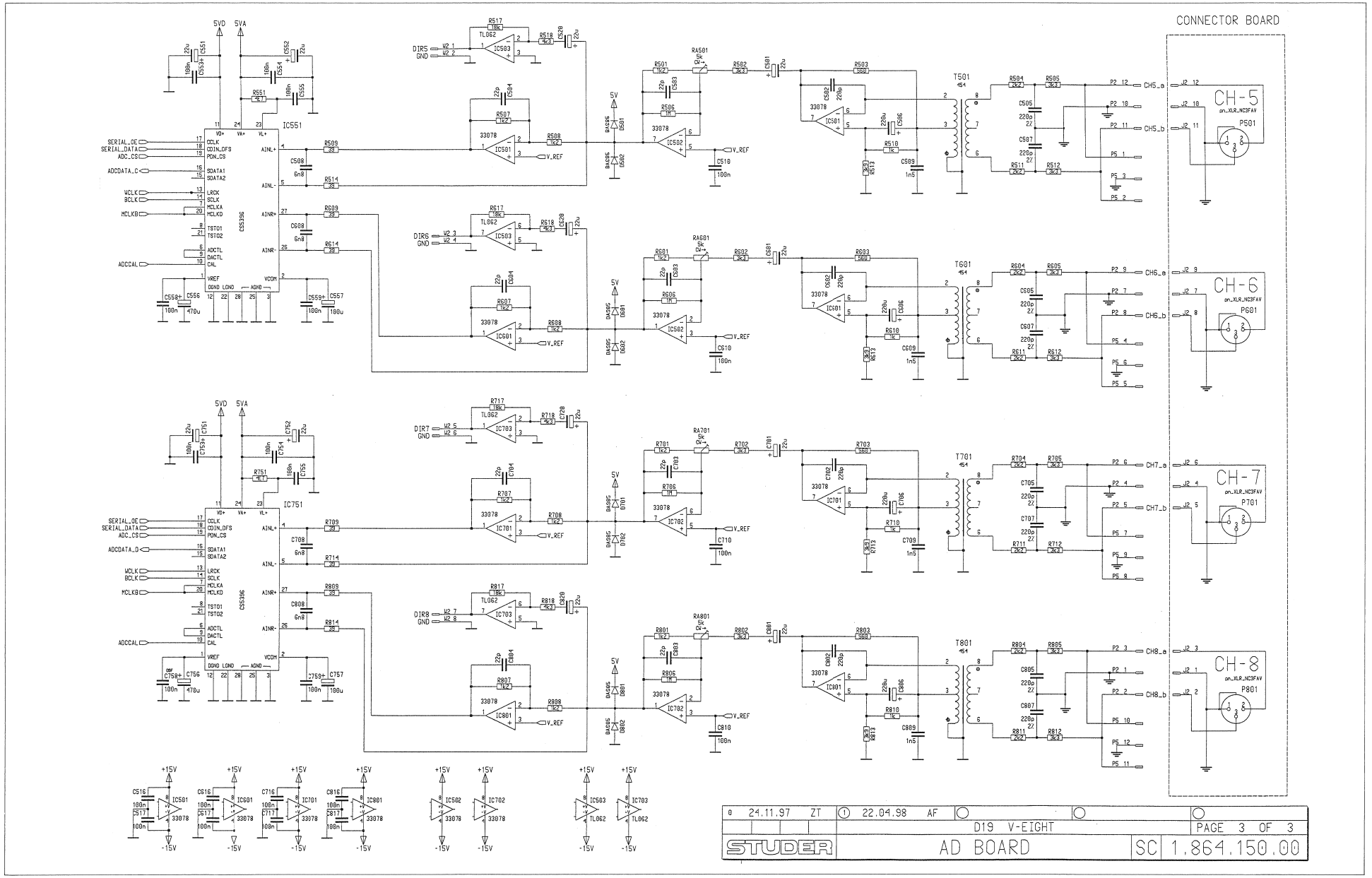
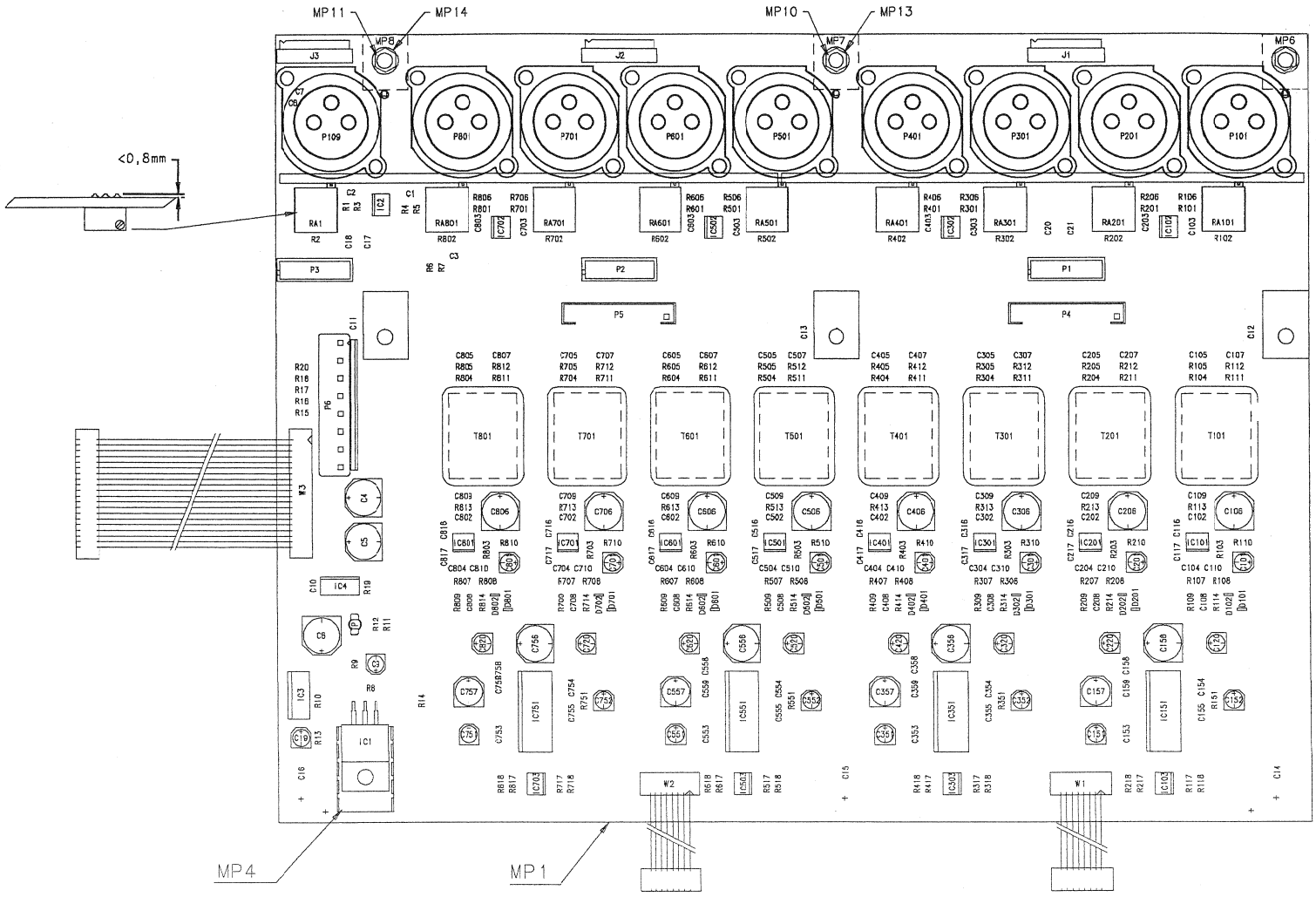


AD Board 1.864.150.00



Edition Ausgabe	Modification Aenderung				1
					2
					3
24.11.97	ZT				4
Date Datum		Visa Gez.	Checked Gepr.	Seen Ges.	Index

Copy to: Kopie fuer:

STUDER REGENSDORF	Description Benennung: AD BOARD "ESE"	Number Nummer: 1.864.150.00

AD Board 1.864.150.00

Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 2	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 3	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 4	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 5	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 6	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 7	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 8	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 9	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 10	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 11	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 12	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 13	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 14	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 15	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 16	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 17	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 18	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 19	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 20	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 21	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 101	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 102	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 103	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 104	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 105	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 106	59.68.0031		220u	C-EL 6V, 8.0*6.3
0	C 107	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 108	59.63.1123		6n8	PPS 50V, 2%, 1206
0	C 109	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 110	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 116	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 117	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 120	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 151	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 152	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 153	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 154	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 155	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 156	59.68.0033		470u	C-EL 6V, 8.0*10.7
0	C 157	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 158	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 159	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 201	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 202	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 203	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 204	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 205	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 206	59.68.0031		220u	C-EL 6V, 8.0*6.3
0	C 207	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 208	59.63.1123		6n8	PPS 50V, 2%, 1206
0	C 209	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 210	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 216	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 217	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 220	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 301	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 302	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 303	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 304	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 305	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 306	59.68.0031		220u	C-EL 6V, 8.0*6.3
0	C 307	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 308	59.63.1123		6n8	PPS 50V, 2%, 1206
0	C 309	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 310	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 316	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 317	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 320	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 351	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 352	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 353	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 354	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 355	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 356	59.68.0033		470u	C-EL 6V, 8.0*10.7
0	C 357	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 358	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 359	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 401	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 402	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 403	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 404	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 405	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 406	59.68.0031		220u	C-EL 6V, 8.0*6.3
0	C 407	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 408	59.63.1123		6n8	PPS 50V, 2%, 1206

Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 409	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 410	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 416	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 417	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 420	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 501	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 502	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 503	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 504	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 505	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 506	59.68.0031		220u	C-EL 6V, 8.0*6.3
0	C 507	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 508	59.63.1123		6n8	PPS 50V, 2%, 1206
0	C 509	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 510	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 516	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 517	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 520	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 551	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 552	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 553	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 554	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 555	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 556	59.68.0033		470u	C-EL 6V, 8.0*10.7
0	C 557	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 558	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 559	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 601	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 602	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 603	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 604	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 605	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 606	59.68.0031		220u	C-EL 6V, 8.0*6.3
0	C 607	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 608	59.63.1123		6n8	PPS 50V, 2%, 1206
0	C 609	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 610	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 616	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 617	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 620	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 701	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 702	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 703	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 704	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 705	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 706	59.68.0031		220u	C-EL 6V, 8.0*6.3
0	C 707	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 708	59.63.1123		6n8	PPS 50V, 2%, 1206
0	C 709	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 710	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 716	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 717	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 720	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 751	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 752	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 753	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 754	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 755	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 756	59.68.0033		470u	C-EL 6V, 8.0*10.7
0	C 757	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 758	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 759	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 801	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	C 802	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 803	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 804	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 805	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 806	59.68.0031		220u	C-EL 6V, 8.0*6.3
0	C 807	59.63.1105		220p	PPS 50V, 2%, 0805
0	C 808	59.63.1123		6n8	PPS 50V, 2%, 1206
0	C 809	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 810	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 816	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 817	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 820	59.68.0025		22u	C-EL 6V, 4.0*5.7
0	D 101	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 102	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 201	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 202	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 301	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 302	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 401	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 402	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 501	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 502	50.60.8101		BAS85	200mA 30V Schottky SOD 80

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Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	D 601	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 602	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 701	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 702	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 801	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 802	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	IC 1	50.10.0104		LM317SP	IC LM 317 SP, ..T,
0	IC 2	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 3	50.10.0104		LM317SP	IC LM 317 SP, ..T,
0	IC 4	not used		74HC 14	74 HC 14
0	IC 101	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 102	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 103	50.61.0201		TL062	Dual FET Op-Amp ,A
0	IC 151	50.61.8104		CS5396	A/D Converter 24bit Ste SO28
0	IC 201	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 301	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 302	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 303	50.61.0201		TL062	Dual FET Op-Amp ,A
0	IC 351	50.61.8104		CS5396	A/D Converter 24bit Ste SO28
0	IC 401	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 501	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 502	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 503	50.61.0201		TL062	Dual FET Op-Amp ,A
0	IC 551	50.61.8104		CS5396	A/D Converter 24bit Ste SO28
0	IC 601	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 701	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 702	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 703	50.61.0201		TL062	Dual FET Op-Amp ,A
0	IC 751	50.61.8104		CS5396	A/D Converter 24bit Ste SO28
0	IC 801	50.61.0204		MC33078	IC MC 33078 P ,A
0	J 1	54.14.5532		12p	PCB-Buchse winkel
0	J 2	54.14.5532		12p	PCB-Buchse winkel
0	J 3	54.14.5532		12p	PCB-Buchse winkel
0	MP 1	1.864.150.11			AD Board PCB
0	MP 2	1.864.150.10			NR.-ETIKETTE 5 * 20
0	MP 3	43.01.0108		Label	ESE-WARNSCHILD
0	MP 4	50.20.3004			Kühlkörper, TO 220, horizontal
0	MP 5	1.022.400.03	8 pcs		ISOLATION
0	MP 6	1.726.780.01	mp		HALTER
0	MP 7	1.726.780.01	mp		HALTER
0	MP 8	1.726.780.01	mp		HALTER
0	MP 9	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 10	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 11	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 12	21.53.9354		M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	MP 13	21.53.9354		M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	MP 14	21.53.9354		M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	P 1	54.14.5582		12p	PCB-Stecker gerade
0	P 2	54.14.5582		12p	PCB-Stecker gerade
0	P 3	54.14.5582		12p	PCB-Stecker gerade
0	P 4	54.99.0345		12p	12 pol STECKER gerade
0	P 5	54.99.0345		12p	12 pol STECKER gerade
0	P 6	54.12.0608		8p	Stecker, Power-Pin
0	P 101	54.21.2212		3p	XLR PCB gerade
0	P 109	54.21.2212		3p	XLR PCB gerade
0	P 201	54.21.2212		3p	XLR PCB gerade
0	P 301	54.21.2212		3p	XLR PCB gerade
0	P 401	54.21.2212		3p	XLR PCB gerade
0	P 501	54.21.2212		3p	XLR PCB gerade
0	P 601	54.21.2212		3p	XLR PCB gerade
0	P 701	54.21.2212		3p	XLR PCB gerade
0	P 801	54.21.2212		3p	XLR PCB gerade
0	R 1	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 2	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 3	57.60.1105		1M	MF, 1%, 0204, E24
0	R 4	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 5	57.60.1103		10K	MF, 1%, 0204, E24
0	R 6	57.60.1103		10K	MF, 1%, 0204, E24
0	R 7	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 8	57.60.1102		1K	MF, 1%, 0204, E24
0	R 9	57.60.1302		3K0	MF, 1%, 0204, E24
0	R 10	57.60.1102		1K	MF, 1%, 0204, E24
0	R 11	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 12	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 13	57.60.1302		3K0	MF, 1%, 0204, E24
0	R 14	57.60.1103		10K	MF, 1%, 0204, E24
0	R 15	57.60.1473		47K	MF, 1%, 0204, E24
0	R 16	57.60.1473		47K	MF, 1%, 0204, E24
0	R 17	57.60.1473		47K	MF, 1%, 0204, E24
0	R 18	57.60.1473		47K	MF, 1%, 0204, E24
0	R 19	57.60.1000		0R0	MF, 0204
0	R 20	57.60.1473		47K	MF, 1%, 0204, E24
0	R 101	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 102	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 103	57.60.1561		560R	MF, 1%, 0204, E24
0	R 104	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 105	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 106	57.60.1105		1M	MF, 1%, 0204, E24
0	R 107	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 108	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 109	57.60.1390		39R	MF, 1%, 0204, E24
0	R 110	57.60.1102		1K	MF, 1%, 0204, E24
0	R 111	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 112	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 113	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 114	57.60.1390		39R	MF, 1%, 0204, E24
0	R 117	57.60.1183		18K	MF, 1%, 0204, E24
1	R 118	57.60.1432		4K3	MF, 1%, 0204, E24
0	R 151	57.60.1479		4R7	MF, 1%, 0204, E24
0	R 201	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 202	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 203	57.60.1561		560R	MF, 1%, 0204, E24
0	R 204	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 205	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 206	57.60.1105		1M	MF, 1%, 0204, E24
0	R 207	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 208	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 209	57.60.1390		39R	MF, 1%, 0204, E24
0	R 210	57.60.1102		1K	MF, 1%, 0204, E24
0	R 211	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 212	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 213	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 214	57.60.1390		39R	MF, 1%, 0204, E24
0	R 217	57.60.1183		18K	MF, 1%, 0204, E24
1	R 218	57.60.1432		4K3	MF, 1%, 0204, E24
0	R 301	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 302	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 303	57.60.1561		560R	MF, 1%, 0204, E24
0	R 304	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 305	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 306	57.60.1105		1M	MF, 1%, 0204, E24
0	R 307	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 308	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 309	57.60.1390		39R	MF, 1%, 0204, E24
0	R 310	57.60.1102		1K	MF, 1%, 0204, E24
0	R 311	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 312	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 313	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 314	57.60.1390		39R	MF, 1%, 0204, E24
0	R 317	57.60.1183		18K	MF, 1%, 0204, E24
1	R 318	57.60.1432		4K3	MF, 1%, 0204, E24
0	R 351	57.60.1479		4R7	MF, 1%, 0204, E24
0	R 401	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 402	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 403	57.60.1561		560R	MF, 1%, 0204, E24
0	R 404	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 405	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 406	57.60.1105		1M	MF, 1%, 0204, E24
0	R 407	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 408	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 409	57.60.1390		39R	MF, 1%, 0204, E24
0	R 410	57.60.1102		1K	MF, 1%, 0204, E24
0	R 411	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 412	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 413	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 414	57.60.1390		39R	MF, 1%, 0204, E24
0	R 417	57.60.1183		18K	MF, 1%, 0204, E24
1	R 418	57.60.1432		4K3	MF, 1%, 0204, E24
0	R 501	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 502	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 503	57.60.1561		560R	MF, 1%, 0204, E24
0	R 504	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 505	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 506	57.60.1105		1M	MF, 1%, 0204, E24
0	R 507	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 508	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 509	57.60.1390		39R	MF, 1%, 0204, E24
0	R 510	57.60.1102		1K	MF, 1%, 0204, E24
0	R 511	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 512	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 513	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 514	57.60.1390		39R	MF, 1%, 0204, E24
0	R 517	57.60.1183		18K	MF, 1%, 0204, E24
1	R 518	57.60.1432		4K3	MF, 1%, 0204, E24
0	R 551	57.60.1479		4R7	MF, 1%, 0204, E24

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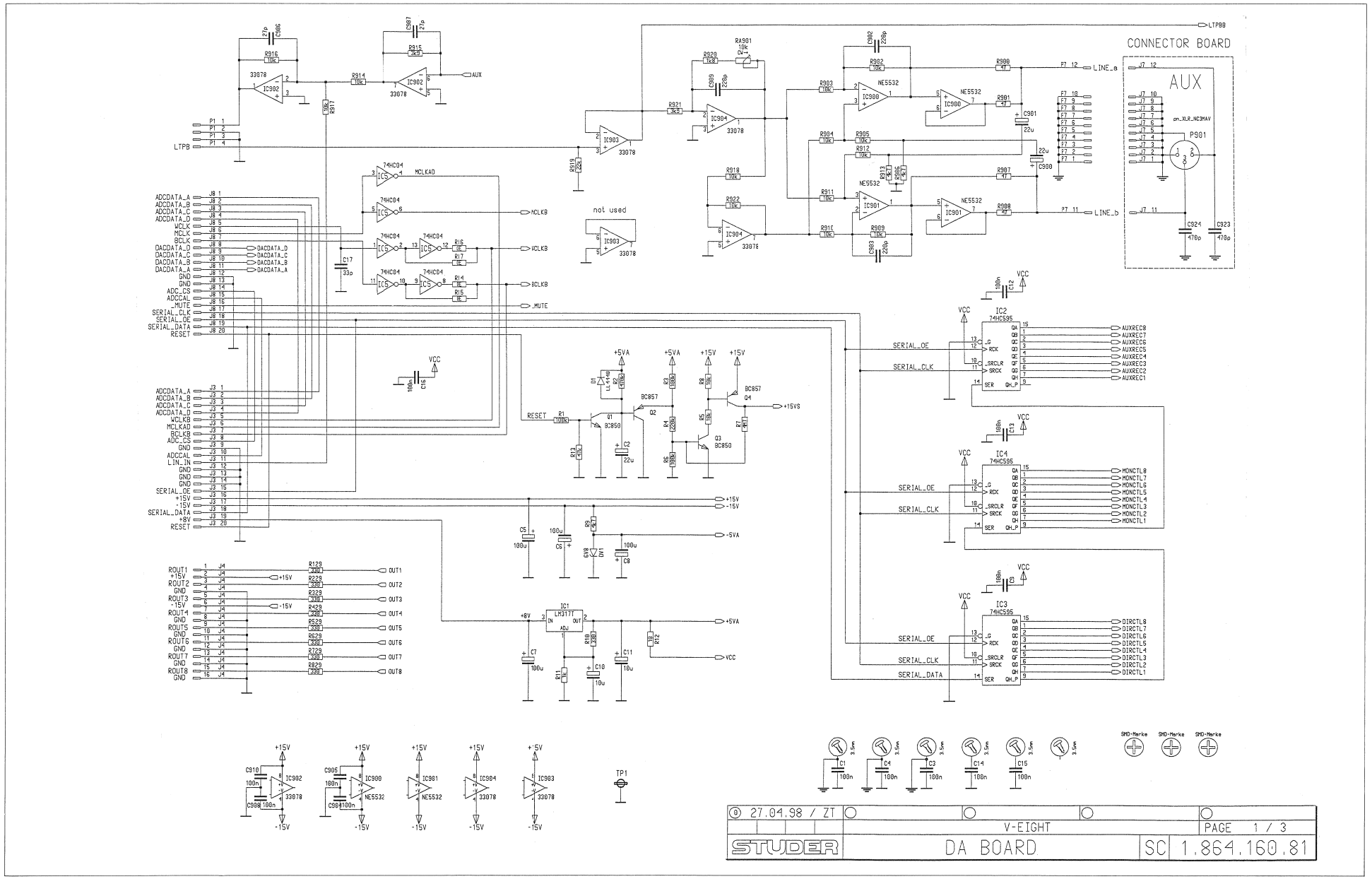
Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 601	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 602	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 603	57.60.1561		560R	MF, 1%, 0204, E24
0	R 604	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 605	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 606	57.60.1105		1M	MF, 1%, 0204, E24
0	R 607	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 608	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 609	57.60.1390		39R	MF, 1%, 0204, E24
0	R 610	57.60.1102		1K	MF, 1%, 0204, E24
0	R 611	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 612	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 613	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 614	57.60.1390		39R	MF, 1%, 0204, E24
0	R 617	57.60.1183		18K	MF, 1%, 0204, E24
1	R 618	57.60.1432		4K3	MF, 1%, 0204, E24
0	R 701	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 702	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 703	57.60.1561		560R	MF, 1%, 0204, E24
0	R 704	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 705	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 706	57.60.1105		1M	MF, 1%, 0204, E24
0	R 707	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 708	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 709	57.60.1390		39R	MF, 1%, 0204, E24
0	R 710	57.60.1102		1K	MF, 1%, 0204, E24
0	R 711	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 712	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 713	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 714	57.60.1390		39R	MF, 1%, 0204, E24
0	R 717	57.60.1183		18K	MF, 1%, 0204, E24
1	R 718	57.60.1432		4K3	MF, 1%, 0204, E24
0	R 751	57.60.1479		4R7	MF, 1%, 0204, E24
0	R 801	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 802	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 803	57.60.1561		560R	MF, 1%, 0204, E24
0	R 804	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 805	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 806	57.60.1105		1M	MF, 1%, 0204, E24
0	R 807	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 808	57.60.1122		1K2	MF, 1%, 0204, E24
0	R 809	57.60.1390		39R	MF, 1%, 0204, E24
0	R 810	57.60.1102		1K	MF, 1%, 0204, E24
0	R 811	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 812	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 813	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 814	57.60.1390		39R	MF, 1%, 0204, E24
0	R 817	57.60.1183		18K	MF, 1%, 0204, E24
1	R 818	57.60.1432		4K3	MF, 1%, 0204, E24
0	RA 1	58.05.2502		5k	10%, 0.5W, Cermet
0	RA 101	58.05.2502		5k	10%, 0.5W, Cermet
0	RA 201	58.05.2502		5k	10%, 0.5W, Cermet
0	RA 301	58.05.2502		5k	10%, 0.5W, Cermet
0	RA 401	58.05.2502		5k	10%, 0.5W, Cermet
0	RA 501	58.05.2502		5k	10%, 0.5W, Cermet
0	RA 601	58.05.2502		5k	10%, 0.5W, Cermet
0	RA 701	58.05.2502		5k	10%, 0.5W, Cermet
0	RA 801	58.05.2502		5k	10%, 0.5W, Cermet
0	T 101	1.022.454.00		1:0.175	EINGANGSTRAFO 1:0,175
0	T 201	1.022.454.00		1:0.175	EINGANGSTRAFO 1:0,175
0	T 301	1.022.454.00		1:0.175	EINGANGSTRAFO 1:0,175
0	T 401	1.022.454.00		1:0.175	EINGANGSTRAFO 1:0,175
0	T 501	1.022.454.00		1:0.175	EINGANGSTRAFO 1:0,175
0	T 601	1.022.454.00		1:0.175	EINGANGSTRAFO 1:0,175
0	T 701	1.022.454.00		1:0.175	EINGANGSTRAFO 1:0,175
0	T 801	1.022.454.00		1:0.175	EINGANGSTRAFO 1:0,175
0	TP 1	54.33.6010			P FLACH, 2.8*0.8,GERADE,LOSE
0	W 1	1.023.390.10			FLACHKABEL 8 POL. 0,1M
0	W 2	1.023.390.10			FLACHKABEL 8 POL. 0,1M
0	W 3	1.023.392.11			FLACHKABEL 20 POL. 0,10M

End of List

Comments

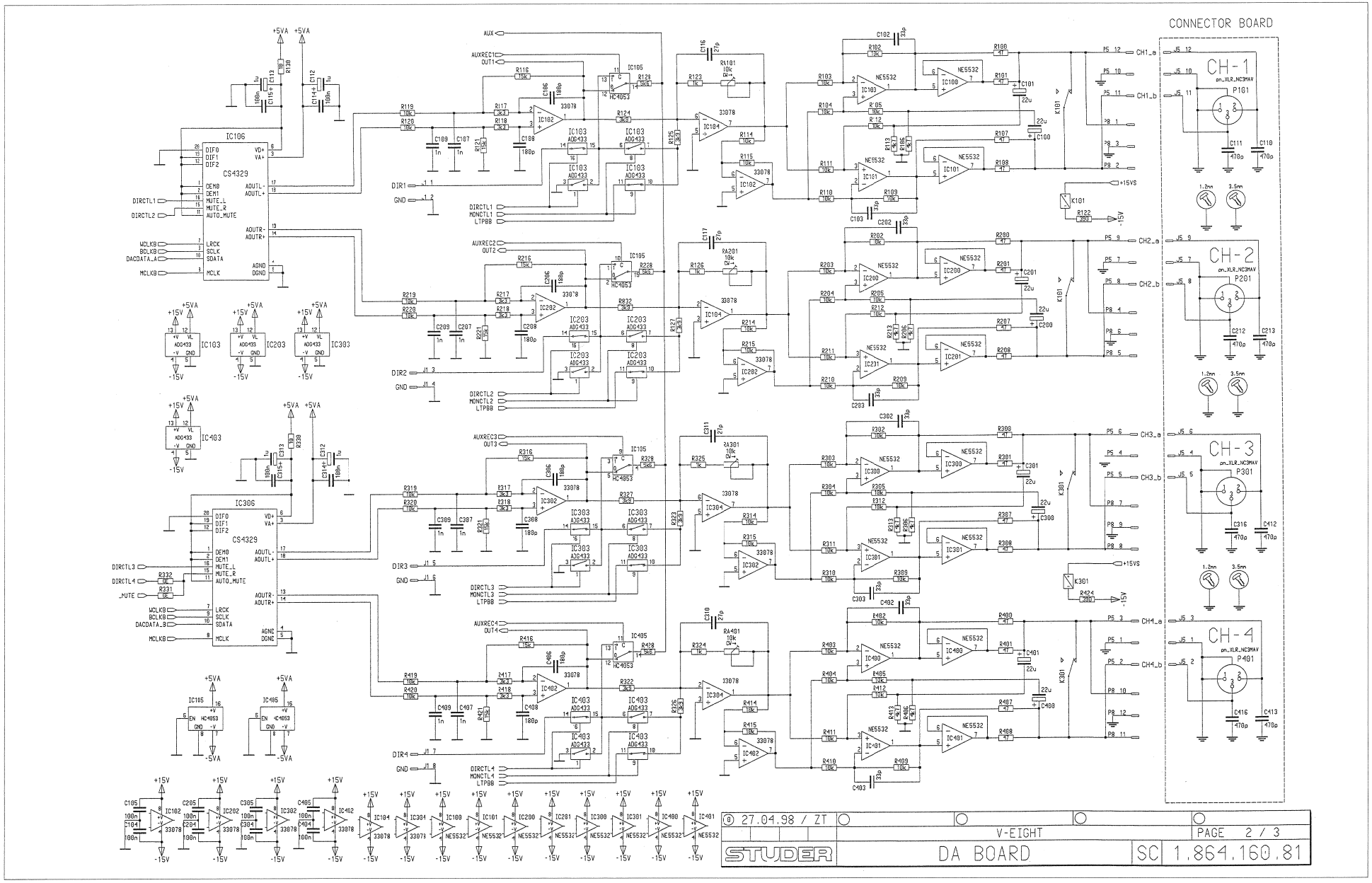
(1) 22.04.1998 Adaption of gain:
57.60.1432 R118, R218, R318, R418, R518, R618, R718, R818

DA Board 1.864.160.81



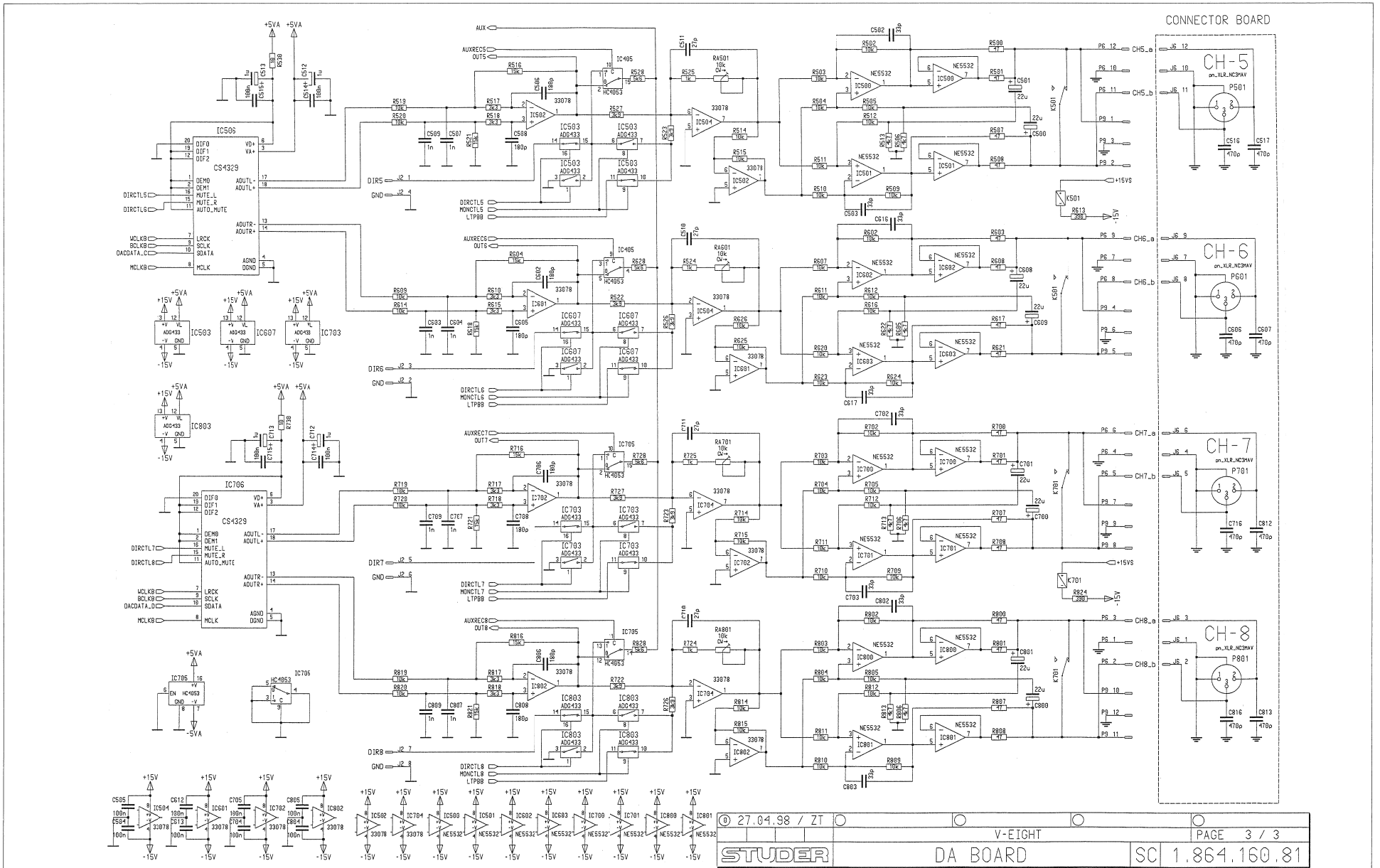
STUDER

DA Board 1.864.160.81

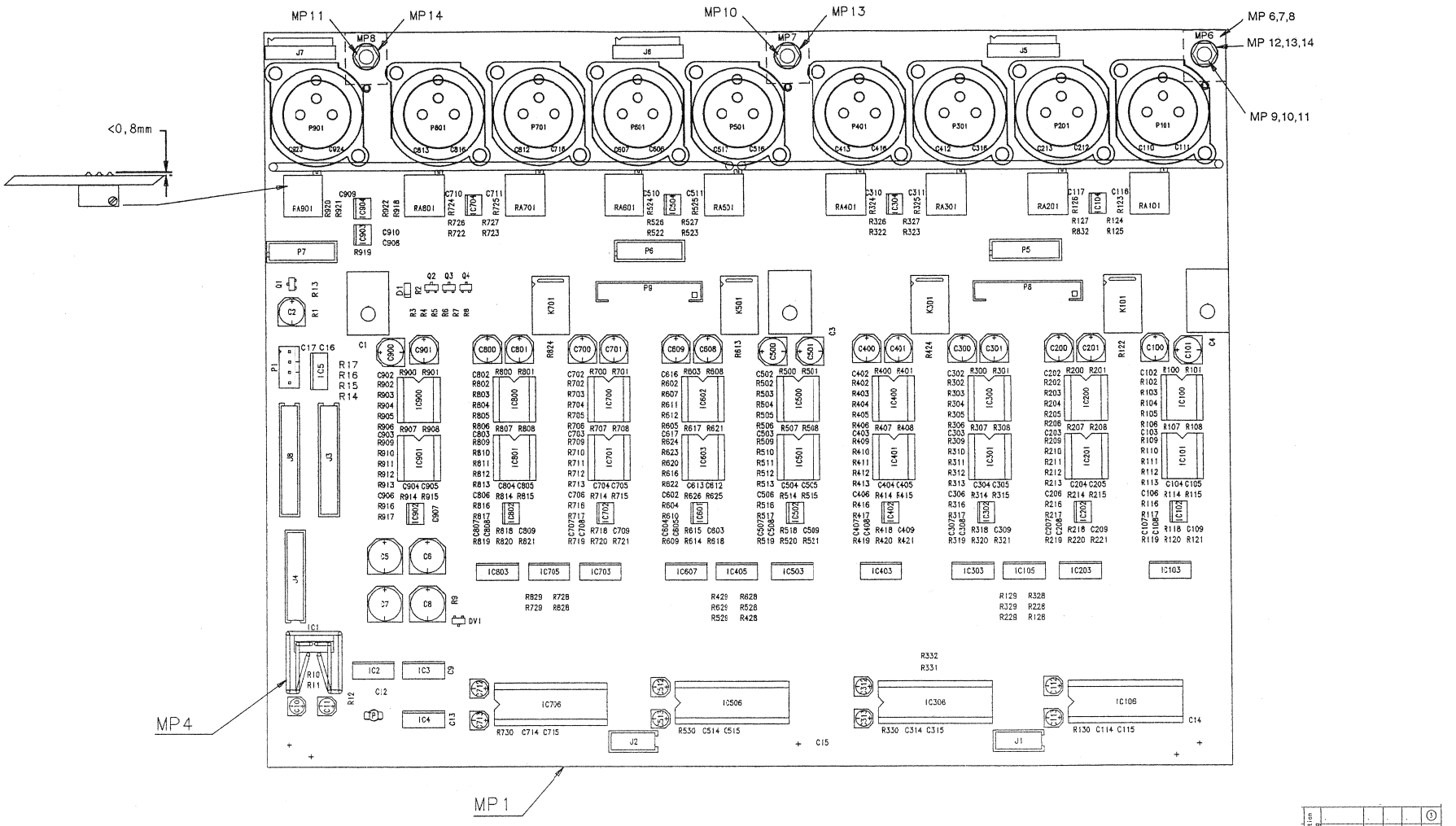


0 27.04.98 / ZT			
STUDER	V-EIGHT		PAGE 2 / 3
	DA BOARD	SC	1.864.160.81

DA Board 1.864.160.81



DA Board 1.864.160.81



Modification / Änderung					
					3
					2
					1
Edition / Ausgabe	18.03.98	ZT			0
	Date / Datum	Visa / Gez.	Checked / Gepr.	Seen / Ges.	Index

Copy to:
Kopie fuer:

STUDER REGENSDORF — Description / Benennung: DA BOARD "ESE" — Number / Nummer: 1.864.160.81

DA Board 1.864.160.81

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 2	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 3	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 4	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 5	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 6	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 7	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 8	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 9	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 10	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 11	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 12	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 13	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 14	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 15	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 16	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 17	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 100	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 101	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 102	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 103	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 104	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 105	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 106	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 107	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 108	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 109	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 110	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 111	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 112	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 113	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 114	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 115	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 116	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 117	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 200	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 201	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 202	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 203	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 204	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 205	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 206	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 207	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 208	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 209	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 212	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 213	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 300	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 301	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 302	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 303	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 304	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 305	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 306	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 307	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 308	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 309	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 310	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 311	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 312	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 313	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 314	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 315	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 316	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 400	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 401	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 402	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 403	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 404	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 405	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 406	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 407	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 408	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 409	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 412	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 413	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 416	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 500	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 501	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 502	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 503	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 504	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 505	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 506	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 507	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 508	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 509	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 510	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 511	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 512	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 513	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 514	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 515	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 516	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 517	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 602	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 603	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 604	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 605	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 606	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 607	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 608	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 609	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 612	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 613	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 616	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 617	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 700	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 701	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 702	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 703	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 704	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 705	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 706	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 707	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 708	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 709	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 710	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 711	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 712	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 713	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 714	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 715	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 716	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 800	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 801	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 802	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 803	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 804	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 805	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 806	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 807	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 808	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 809	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 812	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 813	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 816	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 900	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 901	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 902	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 903	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 904	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 905	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 906	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 907	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 908	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 909	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 910	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 923	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 924	59.63.1109		470p	PPS 50V, 2%, 0805
0	D 1	50.60.8001		4448	200mA 75V 4ns SOD 80
0	DV 1	50.60.9013		6V8	5%, 0.2W, SOT 23
0	IC 1	50.10.0104		LM317SP	IC LM 317 SP, ..T,
0	IC 2	50.62.1595		74HC595	74 HC 595
0	IC 3	50.62.1595		74HC595	74 HC 595
0	IC 4	50.62.1595		74HC595	74 HC 595
0	IC 5	50.62.1004		74HC 04	74 HC 04
0	IC 100	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 101	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 102	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 103	50.61.8202		ADG433	Quad SPST SO 16 ,A
0	IC 104	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 105	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 106	50.19.0114		D/A Conv	IC CS 4329-KP,
0	IC 200	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A

DA Board 1.864.160.81

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	IC 201	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 202	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 203	50.61.8202		ADG433	Quad SPST SO 16 ,A
0	IC 300	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 301	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 302	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 303	50.61.8202		ADG433	Quad SPST SO 16 ,A
0	IC 304	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 306	50.19.0114		D/A Conv	IC CS 4329-KP,
0	IC 400	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 401	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 402	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 403	50.61.8202		ADG433	Quad SPST SO 16 ,A
0	IC 405	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 500	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 501	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 502	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 503	50.61.8202		ADG433	Quad SPST SO 16 ,A
0	IC 504	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 506	50.19.0114		D/A Conv	IC CS 4329-KP,
0	IC 601	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 602	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 603	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 607	50.61.8202		ADG433	Quad SPST SO 16 ,A
0	IC 700	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 701	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 702	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 703	50.61.8202		ADG433	Quad SPST SO 16 ,A
0	IC 704	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 705	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 706	50.19.0114		D/A Conv	IC CS 4329-KP,
0	IC 800	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 801	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 802	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 803	50.61.8202		ADG433	Quad SPST SO 16 ,A
0	IC 900	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 901	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 902	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 903	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 904	50.61.0204		MC33078	IC MC 33078 P ,A
0	J 1	54.14.5508		8p	PCB-Buchse gerade
0	J 2	54.14.5508		8p	PCB-Buchse gerade
0	J 3	54.14.5520		20p	PCB-Buchse gerade
0	J 4	54.14.5516		16p	PCB-Buchse gerade
0	J 5	54.14.5532		12p	PCB-Buchse winkel
0	J 6	54.14.5532		12p	PCB-Buchse winkel
0	J 7	54.14.5532		12p	PCB-Buchse winkel
0	J 8	54.14.5520		20p	PCB-Buchse gerade
0	K 101	56.04.0197		2u	24V 125V 2A Ag/Au
0	K 301	56.04.0197		2u	24V 125V 2A Ag/Au
0	K 501	56.04.0197		2u	24V 125V 2A Ag/Au
0	K 701	56.04.0197		2u	24V 125V 2A Ag/Au
0	MP 1	1.864.160.12			DA Board PCB
0	MP 2	1.864.160.10			NR.-ETIKETTE 5 * 20
0	MP 3	43.01.0108		Label	ESE-WARNSCHILD
0	MP 4	50.20.3011			Kühlkörper, TO 220, vertikal
0	MP 6	1.726.780.01	mp		HALTER
0	MP 7	1.726.780.01	mp		HALTER
0	MP 8	1.726.780.01	mp		HALTER
0	MP 9	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 10	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 11	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 12	21.53.9354		M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	MP 13	21.53.9354		M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	MP 14	21.53.9354		M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	P 1	54.12.0704		4p	Stecker gerade PCB
0	P 5	54.14.5582		12p	PCB-Stecker gerade
0	P 6	54.14.5582		12p	PCB-Stecker gerade
0	P 7	54.14.5582		12p	PCB-Stecker gerade
0	P 8	54.99.0345		12p	12 pol STECKER gerade
0	P 9	54.99.0345		12p	12 pol STECKER gerade
0	P 101	54.21.2221		3p	XLR PCB gerade Au metal
0	P 201	54.21.2221		3p	XLR PCB gerade Au metal
0	P 301	54.21.2221		3p	XLR PCB gerade Au metal
0	P 401	54.21.2221		3p	XLR PCB gerade Au metal
0	P 501	54.21.2221		3p	XLR PCB gerade Au metal
0	P 601	54.21.2221		3p	XLR PCB gerade Au metal
0	P 701	54.21.2221		3p	XLR PCB gerade Au metal
0	P 801	54.21.2221		3p	XLR PCB gerade Au metal
0	P 901	54.21.2221		3p	XLR PCB gerade Au metal

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	Q 1	not used		BC850C	NPN 45V 100mA SOT 23
0	Q 2	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 3	50.60.0002		BC850C	NPN 45V 100mA SOT 23
0	Q 4	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	R 1	not used		100K	MF, 1%, 0204, E24
0	R 2	57.60.1474		470K	MF, 1%, 0204, E24
0	R 3	57.60.1104		100K	MF, 1%, 0204, E24
0	R 4	57.60.1224		220K	MF, 1%, 0204, E24
0	R 5	57.60.1103		10K	MF, 1%, 0204, E24
0	R 6	57.60.1104		100K	MF, 1%, 0204, E24
0	R 7	57.60.1475		4M7	MF, 1%, 0204, E24
0	R 8	57.60.1103		10K	MF, 1%, 0204, E24
0	R 9	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 10	57.60.1331		330R	MF, 1%, 0204, E24
0	R 11	57.60.1102		1K	MF, 1%, 0204, E24
0	R 12	57.60.1100		10R	MF, 1%, 0204, E24
0	R 13	not used		47K	MF, 1%, 0204, E24
0	R 14	not used		0R0	MF, 0204
0	R 15	57.60.1000		0R0	MF, 0204
0	R 16	not used		0R0	MF, 0204
0	R 17	57.60.1000		0R0	MF, 0204
0	R 100	57.60.1470		47R	MF, 1%, 0204, E24
0	R 101	57.60.1470		47R	MF, 1%, 0204, E24
0	R 102	57.60.1103		10K	MF, 1%, 0204, E24
0	R 103	57.60.1103		10K	MF, 1%, 0204, E24
0	R 104	57.60.1103		10K	MF, 1%, 0204, E24
0	R 105	57.60.1103		10K	MF, 1%, 0204, E24
0	R 106	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 107	57.60.1470		47R	MF, 1%, 0204, E24
0	R 108	57.60.1470		47R	MF, 1%, 0204, E24
0	R 109	57.60.1103		10K	MF, 1%, 0204, E24
0	R 110	57.60.1103		10K	MF, 1%, 0204, E24
0	R 111	57.60.1103		10K	MF, 1%, 0204, E24
0	R 112	57.60.1103		10K	MF, 1%, 0204, E24
0	R 113	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 114	57.60.1103		10K	MF, 1%, 0204, E24
0	R 115	57.60.1103		10K	MF, 1%, 0204, E24
0	R 116	57.60.1153		15K	MF, 1%, 0204, E24
0	R 117	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 118	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 119	57.60.1103		10K	MF, 1%, 0204, E24
0	R 120	57.60.1103		10K	MF, 1%, 0204, E24
0	R 121	57.60.1153		15K	MF, 1%, 0204, E24
0	R 122	57.60.1391		390R	MF, 1%, 0204, E24
0	R 123	57.60.1102		1K	MF, 1%, 0204, E24
0	R 124	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 125	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 126	57.60.1102		1K	MF, 1%, 0204, E24
0	R 127	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 128	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 129	57.60.1331		330R	MF, 1%, 0204, E24
0	R 130	57.60.1100		10R	MF, 1%, 0204, E24
0	R 200	57.60.1470		47R	MF, 1%, 0204, E24
0	R 201	57.60.1470		47R	MF, 1%, 0204, E24
0	R 202	57.60.1103		10K	MF, 1%, 0204, E24
0	R 203	57.60.1103		10K	MF, 1%, 0204, E24
0	R 204	57.60.1103		10K	MF, 1%, 0204, E24
0	R 205	57.60.1103		10K	MF, 1%, 0204, E24
0	R 206	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 207	57.60.1470		47R	MF, 1%, 0204, E24
0	R 208	57.60.1470		47R	MF, 1%, 0204, E24
0	R 209	57.60.1103		10K	MF, 1%, 0204, E24
0	R 210	57.60.1103		10K	MF, 1%, 0204, E24
0	R 211	57.60.1103		10K	MF, 1%, 0204, E24
0	R 212	57.60.1103		10K	MF, 1%, 0204, E24
0	R 213	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 214	57.60.1103		10K	MF, 1%, 0204, E24
0	R 215	57.60.1103		10K	MF, 1%, 0204, E24
0	R 216	57.60.1153		15K	MF, 1%, 0204, E24
0	R 217	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 218	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 219	57.60.1103		10K	MF, 1%, 0204, E24
0	R 220	57.60.1103		10K	MF, 1%, 0204, E24
0	R 221	57.60.1153		15K	MF, 1%, 0204, E24
0	R 228	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 229	57.60.1331		330R	MF, 1%, 0204, E24
0	R 300	57.60.1470		47R	MF, 1%, 0204, E24
0	R 301	57.60.1470		47R	MF, 1%, 0204, E24
0	R 302	57.60.1103		10K	MF, 1%, 0204, E24
0	R 303	57.60.1103		10K	MF, 1%, 0204, E24
0	R 304	57.60.1103		10K	MF, 1%, 0204, E24
0	R 305	57.60.1103		10K	MF, 1%, 0204, E24
0	R 306	57.60.1472		4K7	MF, 1%, 0204, E24

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Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 307	57.60.1470		47R	MF, 1%, 0204, E24
0	R 308	57.60.1470		47R	MF, 1%, 0204, E24
0	R 309	57.60.1103		10K	MF, 1%, 0204, E24
0	R 310	57.60.1103		10K	MF, 1%, 0204, E24
0	R 311	57.60.1103		10K	MF, 1%, 0204, E24
0	R 312	57.60.1103		10K	MF, 1%, 0204, E24
0	R 313	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 314	57.60.1103		10K	MF, 1%, 0204, E24
0	R 315	57.60.1103		10K	MF, 1%, 0204, E24
0	R 316	57.60.1153		15K	MF, 1%, 0204, E24
0	R 317	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 318	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 319	57.60.1103		10K	MF, 1%, 0204, E24
0	R 320	57.60.1103		10K	MF, 1%, 0204, E24
0	R 321	57.60.1153		15K	MF, 1%, 0204, E24
0	R 322	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 323	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 324	57.60.1102		1K	MF, 1%, 0204, E24
0	R 325	57.60.1102		1K	MF, 1%, 0204, E24
0	R 326	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 327	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 328	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 329	57.60.1331		330R	MF, 1%, 0204, E24
0	R 330	57.60.1100		10R	MF, 1%, 0204, E24
0	R 331	not used		0R0	MF, 0204
0	R 332	57.60.1000		0R0	MF, 0204
0	R 400	57.60.1470		47R	MF, 1%, 0204, E24
0	R 401	57.60.1470		47R	MF, 1%, 0204, E24
0	R 402	57.60.1103		10K	MF, 1%, 0204, E24
0	R 403	57.60.1103		10K	MF, 1%, 0204, E24
0	R 404	57.60.1103		10K	MF, 1%, 0204, E24
0	R 405	57.60.1103		10K	MF, 1%, 0204, E24
0	R 406	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 407	57.60.1470		47R	MF, 1%, 0204, E24
0	R 408	57.60.1470		47R	MF, 1%, 0204, E24
0	R 409	57.60.1103		10K	MF, 1%, 0204, E24
0	R 410	57.60.1103		10K	MF, 1%, 0204, E24
0	R 411	57.60.1103		10K	MF, 1%, 0204, E24
0	R 412	57.60.1103		10K	MF, 1%, 0204, E24
0	R 413	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 414	57.60.1103		10K	MF, 1%, 0204, E24
0	R 415	57.60.1103		10K	MF, 1%, 0204, E24
0	R 416	57.60.1153		15K	MF, 1%, 0204, E24
0	R 417	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 418	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 419	57.60.1103		10K	MF, 1%, 0204, E24
0	R 420	57.60.1103		10K	MF, 1%, 0204, E24
0	R 421	57.60.1153		15K	MF, 1%, 0204, E24
0	R 424	57.60.1391		390R	MF, 1%, 0204, E24
0	R 428	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 429	57.60.1331		330R	MF, 1%, 0204, E24
0	R 500	57.60.1470		47R	MF, 1%, 0204, E24
0	R 501	57.60.1470		47R	MF, 1%, 0204, E24
0	R 502	57.60.1103		10K	MF, 1%, 0204, E24
0	R 503	57.60.1103		10K	MF, 1%, 0204, E24
0	R 504	57.60.1103		10K	MF, 1%, 0204, E24
0	R 505	57.60.1103		10K	MF, 1%, 0204, E24
0	R 506	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 507	57.60.1470		47R	MF, 1%, 0204, E24
0	R 508	57.60.1470		47R	MF, 1%, 0204, E24
0	R 509	57.60.1103		10K	MF, 1%, 0204, E24
0	R 510	57.60.1103		10K	MF, 1%, 0204, E24
0	R 511	57.60.1103		10K	MF, 1%, 0204, E24
0	R 512	57.60.1103		10K	MF, 1%, 0204, E24
0	R 513	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 514	57.60.1103		10K	MF, 1%, 0204, E24
0	R 515	57.60.1103		10K	MF, 1%, 0204, E24
0	R 516	57.60.1153		15K	MF, 1%, 0204, E24
0	R 517	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 518	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 519	57.60.1103		10K	MF, 1%, 0204, E24
0	R 520	57.60.1103		10K	MF, 1%, 0204, E24
0	R 521	57.60.1153		15K	MF, 1%, 0204, E24
0	R 522	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 523	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 524	57.60.1102		1K	MF, 1%, 0204, E24
0	R 525	57.60.1102		1K	MF, 1%, 0204, E24
0	R 526	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 527	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 528	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 529	57.60.1331		330R	MF, 1%, 0204, E24
0	R 530	57.60.1100		10R	MF, 1%, 0204, E24
0	R 602	57.60.1103		10K	MF, 1%, 0204, E24
0	R 603	57.60.1470		47R	MF, 1%, 0204, E24
0	R 604	57.60.1153		15K	MF, 1%, 0204, E24
0	R 605	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 607	57.60.1103		10K	MF, 1%, 0204, E24
0	R 608	57.60.1470		47R	MF, 1%, 0204, E24
0	R 609	57.60.1103		10K	MF, 1%, 0204, E24
0	R 610	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 611	57.60.1103		10K	MF, 1%, 0204, E24
0	R 612	57.60.1103		10K	MF, 1%, 0204, E24
0	R 613	57.60.1391		390R	MF, 1%, 0204, E24
0	R 614	57.60.1103		10K	MF, 1%, 0204, E24
0	R 615	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 616	57.60.1103		10K	MF, 1%, 0204, E24
0	R 617	57.60.1470		47R	MF, 1%, 0204, E24
0	R 618	57.60.1153		15K	MF, 1%, 0204, E24
0	R 620	57.60.1103		10K	MF, 1%, 0204, E24
0	R 621	57.60.1470		47R	MF, 1%, 0204, E24
0	R 622	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 623	57.60.1103		10K	MF, 1%, 0204, E24
0	R 624	57.60.1103		10K	MF, 1%, 0204, E24
0	R 625	57.60.1103		10K	MF, 1%, 0204, E24
0	R 626	57.60.1103		10K	MF, 1%, 0204, E24
0	R 628	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 629	57.60.1331		330R	MF, 1%, 0204, E24
0	R 700	57.60.1470		47R	MF, 1%, 0204, E24
0	R 701	57.60.1470		47R	MF, 1%, 0204, E24
0	R 702	57.60.1103		10K	MF, 1%, 0204, E24
0	R 703	57.60.1103		10K	MF, 1%, 0204, E24
0	R 704	57.60.1103		10K	MF, 1%, 0204, E24
0	R 705	57.60.1103		10K	MF, 1%, 0204, E24
0	R 706	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 707	57.60.1470		47R	MF, 1%, 0204, E24
0	R 708	57.60.1470		47R	MF, 1%, 0204, E24
0	R 709	57.60.1103		10K	MF, 1%, 0204, E24
0	R 710	57.60.1103		10K	MF, 1%, 0204, E24
0	R 711	57.60.1103		10K	MF, 1%, 0204, E24
0	R 712	57.60.1103		10K	MF, 1%, 0204, E24
0	R 713	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 714	57.60.1103		10K	MF, 1%, 0204, E24
0	R 715	57.60.1103		10K	MF, 1%, 0204, E24
0	R 716	57.60.1153		15K	MF, 1%, 0204, E24
0	R 717	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 718	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 719	57.60.1103		10K	MF, 1%, 0204, E24
0	R 720	57.60.1103		10K	MF, 1%, 0204, E24
0	R 721	57.60.1153		15K	MF, 1%, 0204, E24
0	R 722	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 723	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 724	57.60.1102		1K	MF, 1%, 0204, E24
0	R 725	57.60.1102		1K	MF, 1%, 0204, E24
0	R 726	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 727	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 728	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 729	57.60.1331		330R	MF, 1%, 0204, E24
0	R 730	57.60.1100		10R	MF, 1%, 0204, E24
0	R 800	57.60.1470		47R	MF, 1%, 0204, E24
0	R 801	57.60.1470		47R	MF, 1%, 0204, E24
0	R 802	57.60.1103		10K	MF, 1%, 0204, E24
0	R 803	57.60.1103		10K	MF, 1%, 0204, E24
0	R 804	57.60.1103		10K	MF, 1%, 0204, E24
0	R 805	57.60.1103		10K	MF, 1%, 0204, E24
0	R 806	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 807	57.60.1470		47R	MF, 1%, 0204, E24
0	R 808	57.60.1470		47R	MF, 1%, 0204, E24
0	R 809	57.60.1103		10K	MF, 1%, 0204, E24
0	R 810	57.60.1103		10K	MF, 1%, 0204, E24
0	R 811	57.60.1103		10K	MF, 1%, 0204, E24
0	R 812	57.60.1103		10K	MF, 1%, 0204, E24
0	R 813	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 814	57.60.1103		10K	MF, 1%, 0204, E24
0	R 815	57.60.1103		10K	MF, 1%, 0204, E24
0	R 816	57.60.1153		15K	MF, 1%, 0204, E24
0	R 817	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 818	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 819	57.60.1103		10K	MF, 1%, 0204, E24
0	R 820	57.60.1103		10K	MF, 1%, 0204, E24
0	R 821	57.60.1153		15K	MF, 1%, 0204, E24
0	R 824	57.60.1391		390R	MF, 1%, 0204, E24
0	R 828	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 829	57.60.1331		330R	MF, 1%, 0204, E24
0	R 832	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 900	57.60.1470		47R	MF, 1%, 0204, E24
0	R 901	57.60.1470		47R	MF, 1%, 0204, E24

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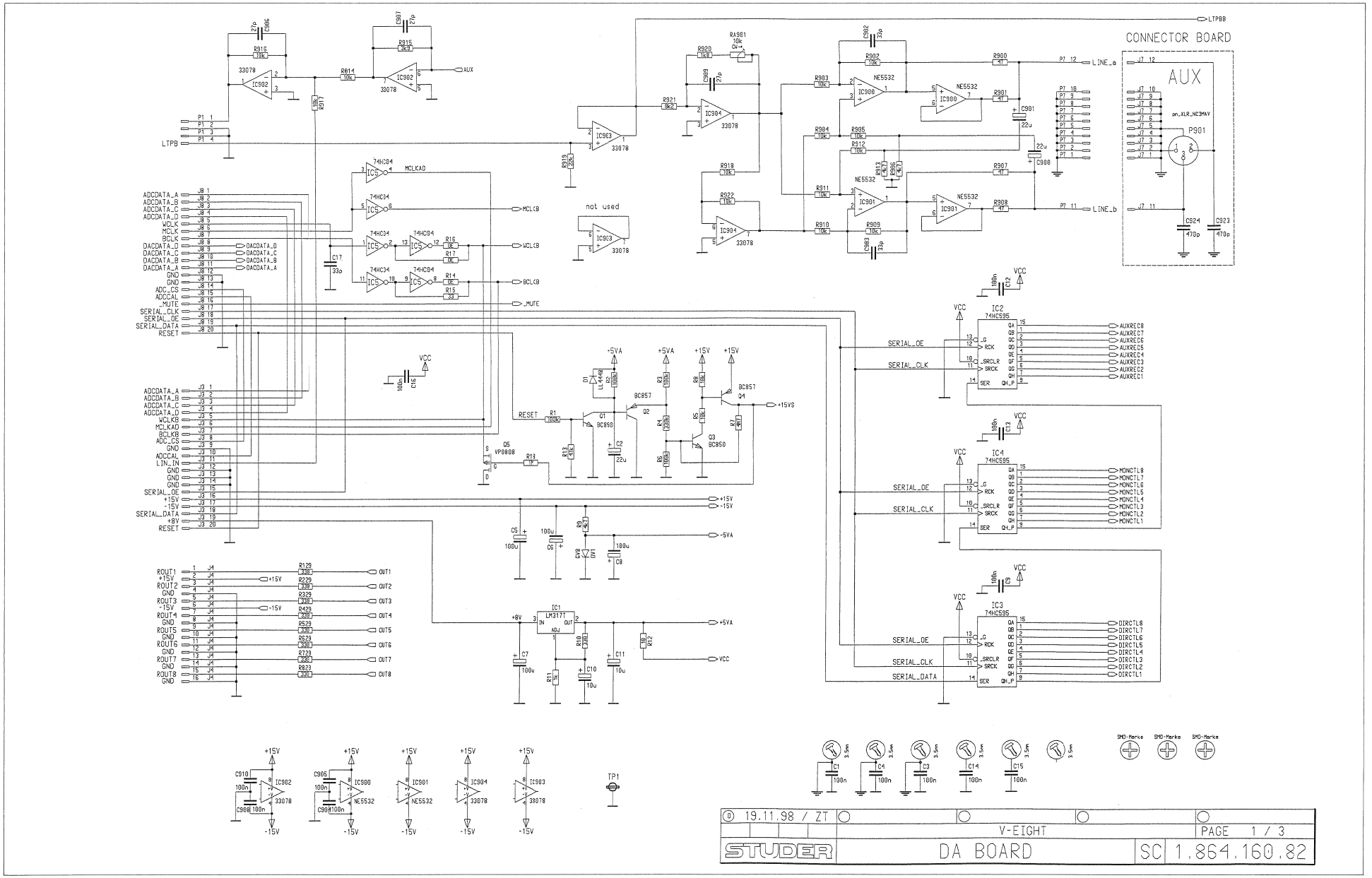
Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 902	57.60.1103		10K	MF, 1%, 0204, E24
0	R 903	57.60.1103		10K	MF, 1%, 0204, E24
0	R 904	57.60.1103		10K	MF, 1%, 0204, E24
0	R 905	57.60.1103		10K	MF, 1%, 0204, E24
0	R 906	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 907	57.60.1470		47R	MF, 1%, 0204, E24
0	R 908	57.60.1470		47R	MF, 1%, 0204, E24
0	R 909	57.60.1103		10K	MF, 1%, 0204, E24
0	R 910	57.60.1103		10K	MF, 1%, 0204, E24
0	R 911	57.60.1103		10K	MF, 1%, 0204, E24
0	R 912	57.60.1103		10K	MF, 1%, 0204, E24
0	R 913	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 914	57.60.1103		10K	MF, 1%, 0204, E24
0	R 915	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 916	57.60.1103		10K	MF, 1%, 0204, E24
0	R 917	57.60.1103		10K	MF, 1%, 0204, E24
0	R 918	57.60.1103		10K	MF, 1%, 0204, E24
0	R 919	57.60.1223		22K	MF, 1%, 0204, E24
0	R 920	57.60.1182		1K8	MF, 1%, 0204, E24
0	R 921	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 922	57.60.1103		10K	MF, 1%, 0204, E24
0	RA 101	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 201	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 301	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 401	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 501	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 601	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 701	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 801	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 901	58.05.2103		10k	10%, 0.5W, Cermet
0	TP 1	54.02.0320		1p	Flatpin, 2.8*0.8mm

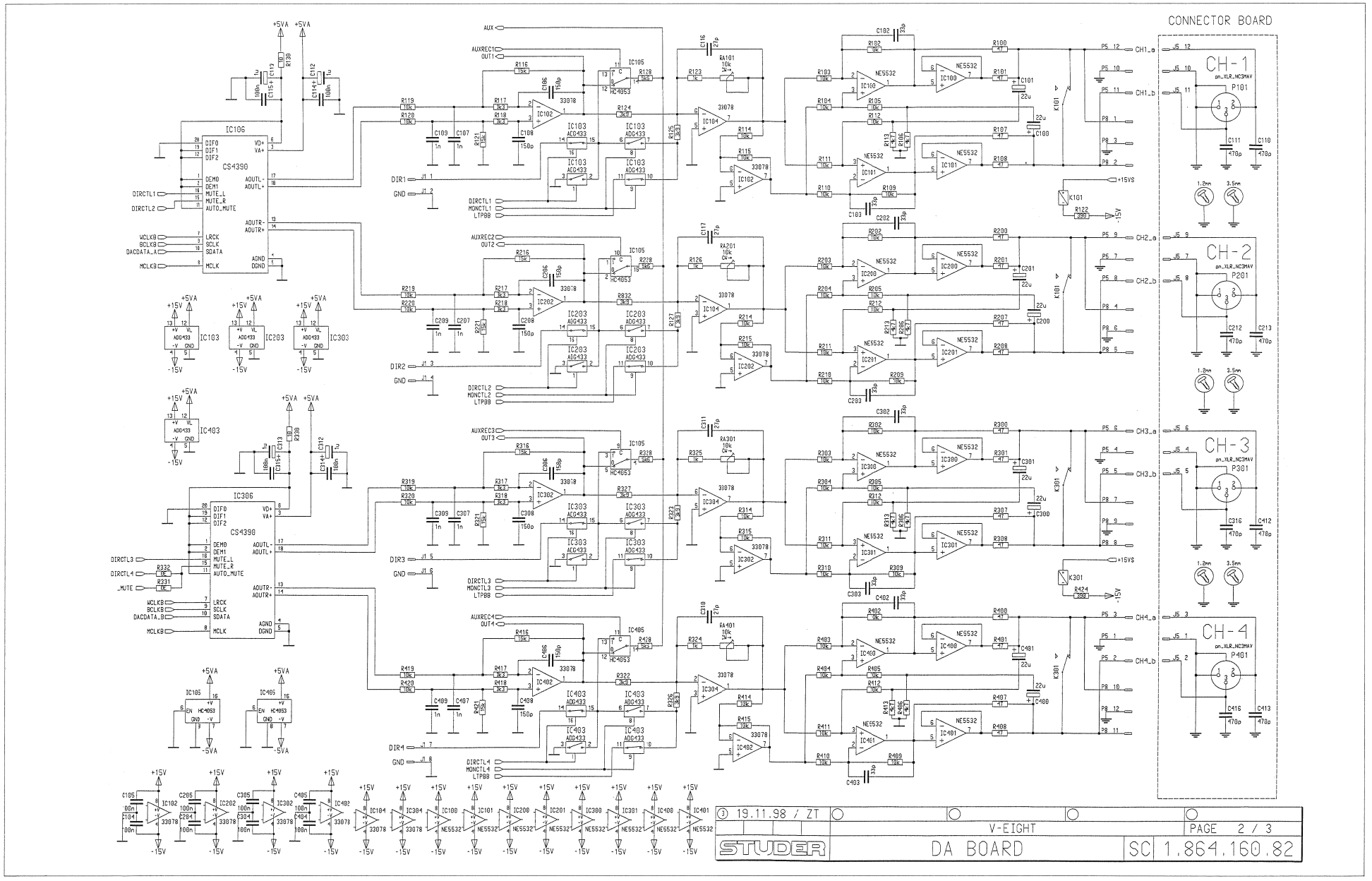
End of List

Comments

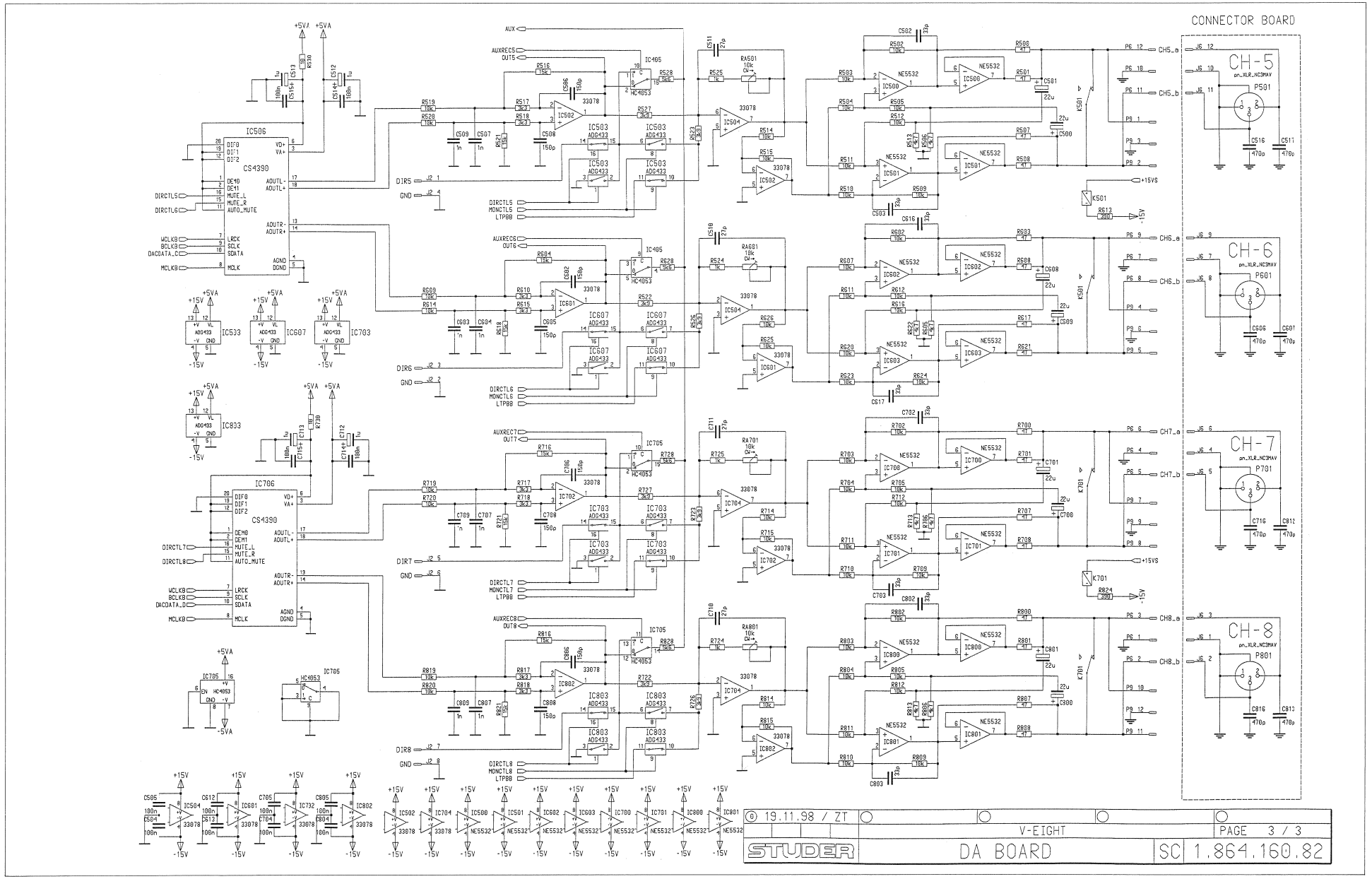
DA Board 1.864.160.82



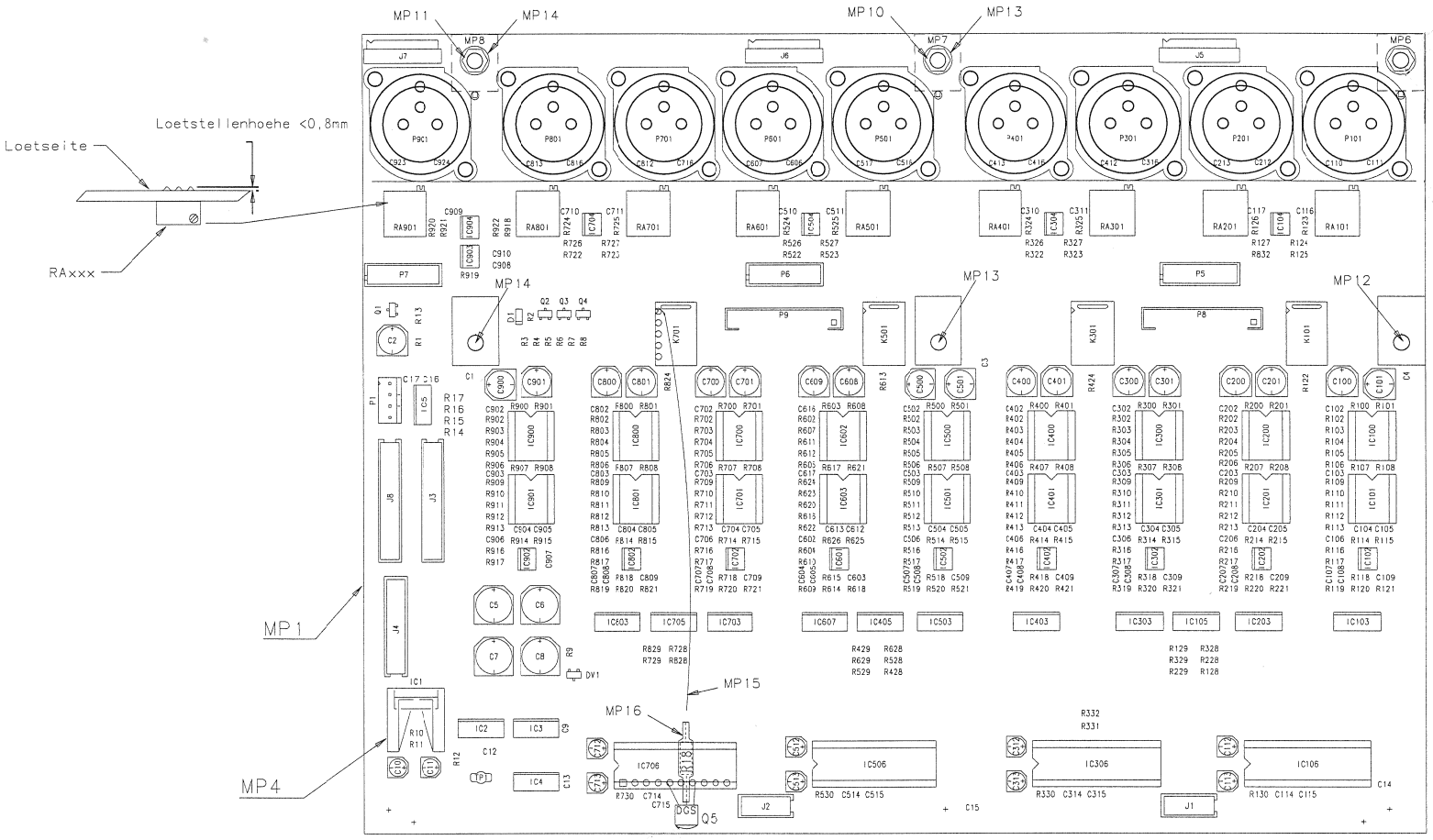
DA Board 1.864.160.82



DA Board 1.864.160.82



DA Board 1.864.160.82



Edition Ausgabe	Modification Aenderung				
19.11.98	ZT				
Date Datum	Visa Gez.	Checked Gepr.	Seen Ges.	Index	

Copy to: Kopie fuer:

STUDER REGENSDORF	Description: Bezeichnung:	DA BOARD "ESE"	Number: Nummer: 1.864.160.82

DA Board 1.864.160.82

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 2	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 3	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 4	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 5	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 6	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 7	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 8	59.68.0115		100u	C-EL 35V, 8.0*10.7
0	C 9	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 10	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 11	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 12	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 13	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 14	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 15	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 16	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 17	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 100	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 101	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 102	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 103	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 104	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 105	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 106	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 107	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 108	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 109	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 110	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 111	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 112	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 113	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 114	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 115	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 116	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 117	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 200	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 201	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 202	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 203	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 204	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 205	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 206	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 207	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 208	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 209	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 212	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 213	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 300	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 301	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 302	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 303	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 304	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 305	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 306	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 307	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 308	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 309	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 310	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 311	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 312	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 313	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 314	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 315	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 316	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 400	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 401	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 402	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 403	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 404	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 405	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 406	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 407	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 408	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 409	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 412	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 413	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 416	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 500	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 501	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 502	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 503	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 504	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 505	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 506	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 507	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 508	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 509	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 510	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 511	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 512	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 513	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 514	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 515	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 516	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 517	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 602	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 603	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 604	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 605	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 606	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 607	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 608	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 609	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 612	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 613	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 616	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 617	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 700	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 701	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 702	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 703	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 704	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 705	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 706	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 707	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 708	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 709	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 710	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 711	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 712	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 713	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 714	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 715	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 716	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 800	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 801	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 802	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 803	59.60.2237		33p	CER 50V, 5%, C0G, 0603
0	C 804	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 805	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 806	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 807	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 808	59.60.2355		180p	CER 50V, 5%, C0G, 0805
0	C 809	59.63.1113		1n0	PPS 50V, 2%, 0805
0	C 812	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 813	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 816	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 900	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 901	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 902	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 903	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 904	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 905	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 906	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 907	59.60.2235		27p	CER 50V, 5%, C0G, 0603
0	C 908	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 909	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 910	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 923	59.63.1109		470p	PPS 50V, 2%, 0805
0	C 924	59.63.1109		470p	PPS 50V, 2%, 0805
0	D 1	50.60.8001		4448	200mA 75V 4ns SOD 80
0	DV 1	50.60.9013		6V8	5%, 0.2W, SOT 23
0	IC 1	50.10.0104		LM317SP	IC LM 317 SP, ..T.
0	IC 2	50.62.1595		74HC595	8bit shift/output register
0	IC 3	50.62.1595		74HC595	8bit shift/output register
0	IC 4	50.62.1595		74HC595	8bit shift/output register
0	IC 5	50.62.1004		74HC 04	Hex inverter
0	IC 100	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 101	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 102	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 103	50.61.8202		ADG433	Quad SPST SO 16
0	IC 104	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 105	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 106	50.19.0116		CS4390	D/A Converter 24bit stereo
0	IC 200	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 201	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 202	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 203	50.61.8202		ADG433	Quad SPST SO 16
0	IC 300	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 301	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 302	50.61.0204		MC33078	Dual Op-Amp low noise

DA Board 1.864.160.82

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	IC 303	50.61.8202		ADG433	Quad SPST SO 16
0	IC 304	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 306	50.19.0116		CS4390	D/A Converter 24bit stereo
0	IC 400	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 401	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 402	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 403	50.61.8202		ADG433	Quad SPST SO 16
0	IC 405	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 500	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 501	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 502	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 503	50.61.8202		ADG433	Quad SPST SO 16
0	IC 504	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 506	50.19.0116		CS4390	D/A Converter 24bit stereo
0	IC 601	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 602	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 603	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 607	50.61.8202		ADG433	Quad SPST SO 16
0	IC 700	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 701	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 702	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 703	50.61.8202		ADG433	Quad SPST SO 16
0	IC 704	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 705	50.62.8053		HC4053	Tripple 2ch analog mux/demux
0	IC 706	50.19.0116		CS4390	D/A Converter 24bit stereo
0	IC 800	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 801	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 802	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 803	50.61.8202		ADG433	Quad SPST SO 16
0	IC 900	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 901	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 902	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 903	50.61.0204		MC33078	Dual Op-Amp low noise
0	IC 904	50.61.0204		MC33078	Dual Op-Amp low noise
0	J 1	54.14.5508		8p	PCB-Buchse gerade
0	J 2	54.14.5508		8p	PCB-Buchse gerade
0	J 3	54.14.5520		20p	PCB-Buchse gerade
0	J 4	54.14.5516		16p	PCB-Buchse gerade
0	J 5	54.14.5532		12p	PCB-Buchse winkel
0	J 6	54.14.5532		12p	PCB-Buchse winkel
0	J 7	54.14.5532		12p	PCB-Buchse winkel
0	J 8	54.14.5520		20p	PCB-Buchse gerade
0	K 101	56.04.0197		2u	24V 125V 2A Ag/Au
0	K 301	56.04.0197		2u	24V 125V 2A Ag/Au
0	K 501	56.04.0197		2u	24V 125V 2A Ag/Au
0	K 701	56.04.0197		2u	24V 125V 2A Ag/Au
0	MP 1	1.864.160.12			DA Board PCB
0	MP 2	1.864.160.10			NR.-ETIKETTE 5 * 20
0	MP 3	43.01.0108		Label	ESE-WARNSCHILD
0	MP 4	50.20.3011			Kühlkörper, TO 220, vertikal
0	MP 6	1.726.780.01	mp		HALTER
0	MP 7	1.726.780.01	mp		HALTER
0	MP 8	1.726.780.01	mp		HALTER
0	MP 9	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 10	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 11	1.010.052.27			MUTTERBOLZEN M 3 * 24
0	MP 12	21.53.9354	2 pcs	M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	MP 13	21.53.9354	2 pcs	M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	MP 14	21.53.9354	2 pcs	M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	MP 15	1.010.115.64			WIRE WRAP DRAHT D .255 L=150
0	MP 16	65.04.1056			SCHRUMPFSCHLAUCH BL. D 2.4
0	P 1	54.12.0704		4p	Stecker gerade PCB
0	P 5	54.14.5582		12p	PCB-Stecker gerade
0	P 6	54.14.5582		12p	PCB-Stecker gerade
0	P 7	54.14.5582		12p	PCB-Stecker gerade
0	P 8	54.99.0345		12p	12 pol STECKER gerade
0	P 9	54.99.0345		12p	12 pol STECKER gerade
0	P 101	54.21.2221		3p	XLR PCB gerade Au metal
0	P 201	54.21.2221		3p	XLR PCB gerade Au metal
0	P 301	54.21.2221		3p	XLR PCB gerade Au metal
0	P 401	54.21.2221		3p	XLR PCB gerade Au metal
0	P 501	54.21.2221		3p	XLR PCB gerade Au metal
0	P 601	54.21.2221		3p	XLR PCB gerade Au metal
0	P 701	54.21.2221		3p	XLR PCB gerade Au metal
0	P 801	54.21.2221		3p	XLR PCB gerade Au metal
0	P 901	54.21.2221		3p	XLR PCB gerade Au metal
0	Q 1	not used		BC850C	NPN 45V 100mA SOT 23
0	Q 2	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 3	50.60.0002		BC850C	NPN 45V 100mA SOT 23
0	Q 4	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 5	50.43.1554			Q VP 0808 M ,A

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 1	not used		100K	MF, 1%, 0204, E24
0	R 2	57.60.1474		470K	MF, 1%, 0204, E24
0	R 3	57.60.1104		100K	MF, 1%, 0204, E24
0	R 4	57.60.1224		220K	MF, 1%, 0204, E24
0	R 5	57.60.1103		10K	MF, 1%, 0204, E24
0	R 6	57.60.1104		100K	MF, 1%, 0204, E24
0	R 7	57.60.1475		4M7	MF, 1%, 0204, E24
0	R 8	57.60.1103		10K	MF, 1%, 0204, E24
0	R 9	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 10	57.60.1331		330R	MF, 1%, 0204, E24
0	R 11	57.60.1102		1K	MF, 1%, 0204, E24
0	R 12	57.60.1100		10R	MF, 1%, 0204, E24
0	R 13	not used		47K	MF, 1%, 0204, E24
0	R 14	not used		0R0	MF, 0204
0	R 15	57.60.1330		33R	MF, 1%, 0204, E24
0	R 16	not used		0R0	MF, 0204
0	R 17	57.60.1000		0R0	MF, 0204
0	R 18	57.11.3105		1M0	MF, 1%, 0207
0	R 100	57.60.1470		47R	MF, 1%, 0204, E24
0	R 101	57.60.1470		47R	MF, 1%, 0204, E24
0	R 102	57.60.1103		10K	MF, 1%, 0204, E24
0	R 103	57.60.1103		10K	MF, 1%, 0204, E24
0	R 104	57.60.1103		10K	MF, 1%, 0204, E24
0	R 105	57.60.1103		10K	MF, 1%, 0204, E24
0	R 106	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 107	57.60.1470		47R	MF, 1%, 0204, E24
0	R 108	57.60.1470		47R	MF, 1%, 0204, E24
0	R 109	57.60.1103		10K	MF, 1%, 0204, E24
0	R 110	57.60.1103		10K	MF, 1%, 0204, E24
0	R 111	57.60.1103		10K	MF, 1%, 0204, E24
0	R 112	57.60.1103		10K	MF, 1%, 0204, E24
0	R 113	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 114	57.60.1103		10K	MF, 1%, 0204, E24
0	R 115	57.60.1103		10K	MF, 1%, 0204, E24
0	R 116	57.60.1153		15K	MF, 1%, 0204, E24
0	R 117	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 118	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 119	57.60.1103		10K	MF, 1%, 0204, E24
0	R 120	57.60.1103		10K	MF, 1%, 0204, E24
0	R 121	57.60.1153		15K	MF, 1%, 0204, E24
0	R 122	57.60.1391		390R	MF, 1%, 0204, E24
0	R 123	57.60.1102		1K	MF, 1%, 0204, E24
0	R 124	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 125	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 126	57.60.1102		1K	MF, 1%, 0204, E24
0	R 127	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 128	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 129	57.60.1331		330R	MF, 1%, 0204, E24
0	R 130	57.60.1100		10R	MF, 1%, 0204, E24
0	R 200	57.60.1470		47R	MF, 1%, 0204, E24
0	R 201	57.60.1470		47R	MF, 1%, 0204, E24
0	R 202	57.60.1103		10K	MF, 1%, 0204, E24
0	R 203	57.60.1103		10K	MF, 1%, 0204, E24
0	R 204	57.60.1103		10K	MF, 1%, 0204, E24
0	R 205	57.60.1103		10K	MF, 1%, 0204, E24
0	R 206	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 207	57.60.1470		47R	MF, 1%, 0204, E24
0	R 208	57.60.1470		47R	MF, 1%, 0204, E24
0	R 209	57.60.1103		10K	MF, 1%, 0204, E24
0	R 210	57.60.1103		10K	MF, 1%, 0204, E24
0	R 211	57.60.1103		10K	MF, 1%, 0204, E24
0	R 212	57.60.1103		10K	MF, 1%, 0204, E24
0	R 213	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 214	57.60.1103		10K	MF, 1%, 0204, E24
0	R 215	57.60.1103		10K	MF, 1%, 0204, E24
0	R 216	57.60.1153		15K	MF, 1%, 0204, E24
0	R 217	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 218	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 219	57.60.1103		10K	MF, 1%, 0204, E24
0	R 220	57.60.1103		10K	MF, 1%, 0204, E24
0	R 221	57.60.1153		15K	MF, 1%, 0204, E24
0	R 228	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 229	57.60.1331		330R	MF, 1%, 0204, E24
0	R 300	57.60.1470		47R	MF, 1%, 0204, E24
0	R 301	57.60.1470		47R	MF, 1%, 0204, E24
0	R 302	57.60.1103		10K	MF, 1%, 0204, E24
0	R 303	57.60.1103		10K	MF, 1%, 0204, E24
0	R 304	57.60.1103		10K	MF, 1%, 0204, E24
0	R 305	57.60.1103		10K	MF, 1%, 0204, E24
0	R 306	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 307	57.60.1470		47R	MF, 1%, 0204, E24
0	R 308	57.60.1470		47R	MF, 1%, 0204, E24
0	R 309	57.60.1103		10K	MF, 1%, 0204, E24
0	R 310	57.60.1103		10K	MF, 1%, 0204, E24
0	R 311	57.60.1103		10K	MF, 1%, 0204, E24
0	R 312	57.60.1103		10K	MF, 1%, 0204, E24
0	R 313	57.60.1472		4K7	MF, 1%, 0204, E24

DA Board 1.864.160.82

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 314	57.60.1103		10K	MF, 1%, 0204, E24
0	R 315	57.60.1103		10K	MF, 1%, 0204, E24
0	R 316	57.60.1153		15K	MF, 1%, 0204, E24
0	R 317	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 318	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 319	57.60.1103		10K	MF, 1%, 0204, E24
0	R 320	57.60.1103		10K	MF, 1%, 0204, E24
0	R 321	57.60.1153		15K	MF, 1%, 0204, E24
0	R 322	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 323	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 324	57.60.1102		1K	MF, 1%, 0204, E24
0	R 325	57.60.1102		1K	MF, 1%, 0204, E24
0	R 326	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 327	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 328	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 329	57.60.1331		330R	MF, 1%, 0204, E24
0	R 330	57.60.1100		10R	MF, 1%, 0204, E24
0	R 331	not used		0R0	MF, 0204
0	R 332	57.60.1000		0R0	MF, 0204
0	R 400	57.60.1470		47R	MF, 1%, 0204, E24
0	R 401	57.60.1470		47R	MF, 1%, 0204, E24
0	R 402	57.60.1103		10K	MF, 1%, 0204, E24
0	R 403	57.60.1103		10K	MF, 1%, 0204, E24
0	R 404	57.60.1103		10K	MF, 1%, 0204, E24
0	R 405	57.60.1103		10K	MF, 1%, 0204, E24
0	R 406	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 407	57.60.1470		47R	MF, 1%, 0204, E24
0	R 408	57.60.1470		47R	MF, 1%, 0204, E24
0	R 409	57.60.1103		10K	MF, 1%, 0204, E24
0	R 410	57.60.1103		10K	MF, 1%, 0204, E24
0	R 411	57.60.1103		10K	MF, 1%, 0204, E24
0	R 412	57.60.1103		10K	MF, 1%, 0204, E24
0	R 413	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 414	57.60.1103		10K	MF, 1%, 0204, E24
0	R 415	57.60.1103		10K	MF, 1%, 0204, E24
0	R 416	57.60.1153		15K	MF, 1%, 0204, E24
0	R 417	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 418	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 419	57.60.1103		10K	MF, 1%, 0204, E24
0	R 420	57.60.1103		10K	MF, 1%, 0204, E24
0	R 421	57.60.1153		15K	MF, 1%, 0204, E24
0	R 424	57.60.1391		390R	MF, 1%, 0204, E24
0	R 428	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 429	57.60.1331		330R	MF, 1%, 0204, E24
0	R 500	57.60.1470		47R	MF, 1%, 0204, E24
0	R 501	57.60.1470		47R	MF, 1%, 0204, E24
0	R 502	57.60.1103		10K	MF, 1%, 0204, E24
0	R 503	57.60.1103		10K	MF, 1%, 0204, E24
0	R 504	57.60.1103		10K	MF, 1%, 0204, E24
0	R 505	57.60.1103		10K	MF, 1%, 0204, E24
0	R 506	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 507	57.60.1470		47R	MF, 1%, 0204, E24
0	R 508	57.60.1470		47R	MF, 1%, 0204, E24
0	R 509	57.60.1103		10K	MF, 1%, 0204, E24
0	R 510	57.60.1103		10K	MF, 1%, 0204, E24
0	R 511	57.60.1103		10K	MF, 1%, 0204, E24
0	R 512	57.60.1103		10K	MF, 1%, 0204, E24
0	R 513	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 514	57.60.1103		10K	MF, 1%, 0204, E24
0	R 515	57.60.1103		10K	MF, 1%, 0204, E24
0	R 516	57.60.1153		15K	MF, 1%, 0204, E24
0	R 517	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 518	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 519	57.60.1103		10K	MF, 1%, 0204, E24
0	R 520	57.60.1103		10K	MF, 1%, 0204, E24
0	R 521	57.60.1153		15K	MF, 1%, 0204, E24
0	R 522	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 523	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 524	57.60.1102		1K	MF, 1%, 0204, E24
0	R 525	57.60.1102		1K	MF, 1%, 0204, E24
0	R 526	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 527	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 528	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 529	57.60.1331		330R	MF, 1%, 0204, E24
0	R 530	57.60.1100		10R	MF, 1%, 0204, E24
0	R 602	57.60.1103		10K	MF, 1%, 0204, E24
0	R 603	57.60.1470		47R	MF, 1%, 0204, E24
0	R 604	57.60.1153		15K	MF, 1%, 0204, E24
0	R 605	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 607	57.60.1103		10K	MF, 1%, 0204, E24
0	R 608	57.60.1470		47R	MF, 1%, 0204, E24
0	R 609	57.60.1103		10K	MF, 1%, 0204, E24
0	R 610	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 611	57.60.1103		10K	MF, 1%, 0204, E24
0	R 612	57.60.1103		10K	MF, 1%, 0204, E24
0	R 613	57.60.1391		390R	MF, 1%, 0204, E24
0	R 614	57.60.1103		10K	MF, 1%, 0204, E24

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 615	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 616	57.60.1103		10K	MF, 1%, 0204, E24
0	R 617	57.60.1470		47R	MF, 1%, 0204, E24
0	R 618	57.60.1153		15K	MF, 1%, 0204, E24
0	R 620	57.60.1103		10K	MF, 1%, 0204, E24
0	R 621	57.60.1470		47R	MF, 1%, 0204, E24
0	R 622	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 623	57.60.1103		10K	MF, 1%, 0204, E24
0	R 624	57.60.1103		10K	MF, 1%, 0204, E24
0	R 625	57.60.1103		10K	MF, 1%, 0204, E24
0	R 626	57.60.1103		10K	MF, 1%, 0204, E24
0	R 628	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 629	57.60.1331		330R	MF, 1%, 0204, E24
0	R 700	57.60.1470		47R	MF, 1%, 0204, E24
0	R 701	57.60.1470		47R	MF, 1%, 0204, E24
0	R 702	57.60.1103		10K	MF, 1%, 0204, E24
0	R 703	57.60.1103		10K	MF, 1%, 0204, E24
0	R 704	57.60.1103		10K	MF, 1%, 0204, E24
0	R 705	57.60.1103		10K	MF, 1%, 0204, E24
0	R 706	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 707	57.60.1470		47R	MF, 1%, 0204, E24
0	R 708	57.60.1470		47R	MF, 1%, 0204, E24
0	R 709	57.60.1103		10K	MF, 1%, 0204, E24
0	R 710	57.60.1103		10K	MF, 1%, 0204, E24
0	R 711	57.60.1103		10K	MF, 1%, 0204, E24
0	R 712	57.60.1103		10K	MF, 1%, 0204, E24
0	R 713	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 714	57.60.1103		10K	MF, 1%, 0204, E24
0	R 715	57.60.1103		10K	MF, 1%, 0204, E24
0	R 716	57.60.1153		15K	MF, 1%, 0204, E24
0	R 717	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 718	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 719	57.60.1103		10K	MF, 1%, 0204, E24
0	R 720	57.60.1103		10K	MF, 1%, 0204, E24
0	R 721	57.60.1153		15K	MF, 1%, 0204, E24
0	R 722	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 723	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 724	57.60.1102		1K	MF, 1%, 0204, E24
0	R 725	57.60.1102		1K	MF, 1%, 0204, E24
0	R 726	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 727	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 728	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 729	57.60.1331		330R	MF, 1%, 0204, E24
0	R 730	57.60.1100		10R	MF, 1%, 0204, E24
0	R 800	57.60.1470		47R	MF, 1%, 0204, E24
0	R 801	57.60.1470		47R	MF, 1%, 0204, E24
0	R 802	57.60.1103		10K	MF, 1%, 0204, E24
0	R 803	57.60.1103		10K	MF, 1%, 0204, E24
0	R 804	57.60.1103		10K	MF, 1%, 0204, E24
0	R 805	57.60.1103		10K	MF, 1%, 0204, E24
0	R 806	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 807	57.60.1470		47R	MF, 1%, 0204, E24
0	R 808	57.60.1470		47R	MF, 1%, 0204, E24
0	R 809	57.60.1103		10K	MF, 1%, 0204, E24
0	R 810	57.60.1103		10K	MF, 1%, 0204, E24
0	R 811	57.60.1103		10K	MF, 1%, 0204, E24
0	R 812	57.60.1103		10K	MF, 1%, 0204, E24
0	R 813	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 814	57.60.1103		10K	MF, 1%, 0204, E24
0	R 815	57.60.1103		10K	MF, 1%, 0204, E24
0	R 816	57.60.1153		15K	MF, 1%, 0204, E24
0	R 817	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 818	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 819	57.60.1103		10K	MF, 1%, 0204, E24
0	R 820	57.60.1103		10K	MF, 1%, 0204, E24
0	R 821	57.60.1153		15K	MF, 1%, 0204, E24
0	R 824	57.60.1391		390R	MF, 1%, 0204, E24
0	R 828	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 829	57.60.1331		330R	MF, 1%, 0204, E24
0	R 832	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 900	57.60.1470		47R	MF, 1%, 0204, E24
0	R 901	57.60.1470		47R	MF, 1%, 0204, E24
0	R 902	57.60.1103		10K	MF, 1%, 0204, E24
0	R 903	57.60.1103		10K	MF, 1%, 0204, E24
0	R 904	57.60.1103		10K	MF, 1%, 0204, E24
0	R 905	57.60.1103		10K	MF, 1%, 0204, E24
0	R 906	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 907	57.60.1470		47R	MF, 1%, 0204, E24
0	R 908	57.60.1470		47R	MF, 1%, 0204, E24
0	R 909	57.60.1103		10K	MF, 1%, 0204, E24
0	R 910	57.60.1103		10K	MF, 1%, 0204, E24
0	R 911	57.60.1103		10K	MF, 1%, 0204, E24

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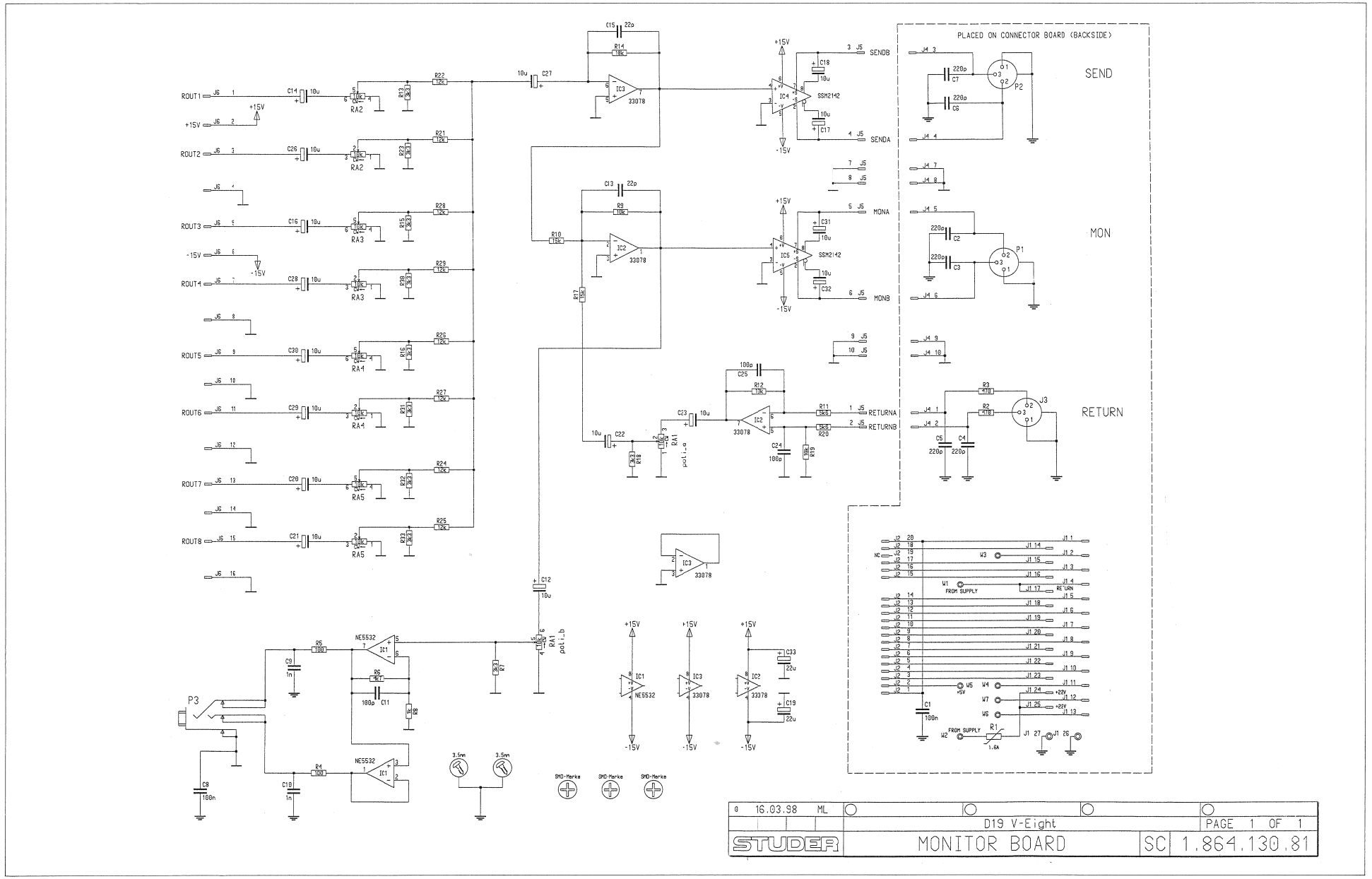
Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 912	57.60.1103		10K	MF, 1%, 0204, E24
0	R 913	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 914	57.60.1103		10K	MF, 1%, 0204, E24
0	R 915	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 916	57.60.1103		10K	MF, 1%, 0204, E24
0	R 917	57.60.1103		10K	MF, 1%, 0204, E24
0	R 918	57.60.1103		10K	MF, 1%, 0204, E24
0	R 919	57.60.1223		22K	MF, 1%, 0204, E24
0	R 920	57.60.1182		1K8	MF, 1%, 0204, E24
0	R 921	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 922	57.60.1103		10K	MF, 1%, 0204, E24
0	RA 101	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 201	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 301	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 401	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 501	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 601	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 701	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 801	58.05.2103		10k	10%, 0.5W, Cermet
0	RA 901	58.05.2103		10k	10%, 0.5W, Cermet
0	TP 1	54.02.0320		1p	PCB-Flachst 2.8*0.8, gerade

End of List

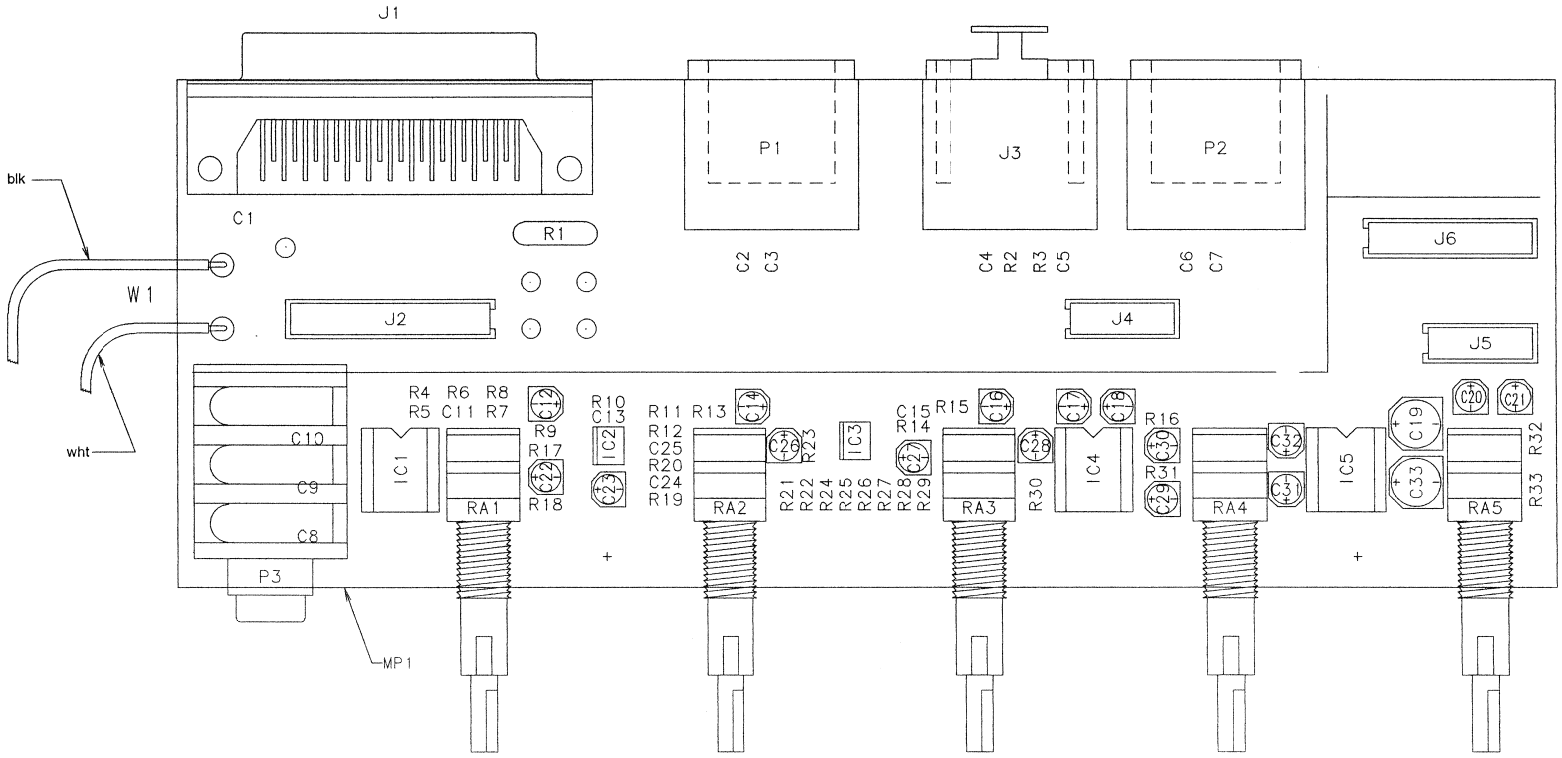
Comments

(0) Additional:Q5,R18,MP15,MP16.
New D/A Converter 24Bit.

Monitor Board 1.864.130.81



Monitor Board 1.864.130.81



Modification / Aenderung					
Edition / Ausgabe	16.03.98	BN			
	Date / Datum	Visa / Gez.	Dessin / Gepr.	Geom / Ges.	Index

Copy to: / Kopie fuer:

STUDER REGENSDORF	Description / Benennung: MONITOR BOARD	Number / Nummer: 1.864.130.81

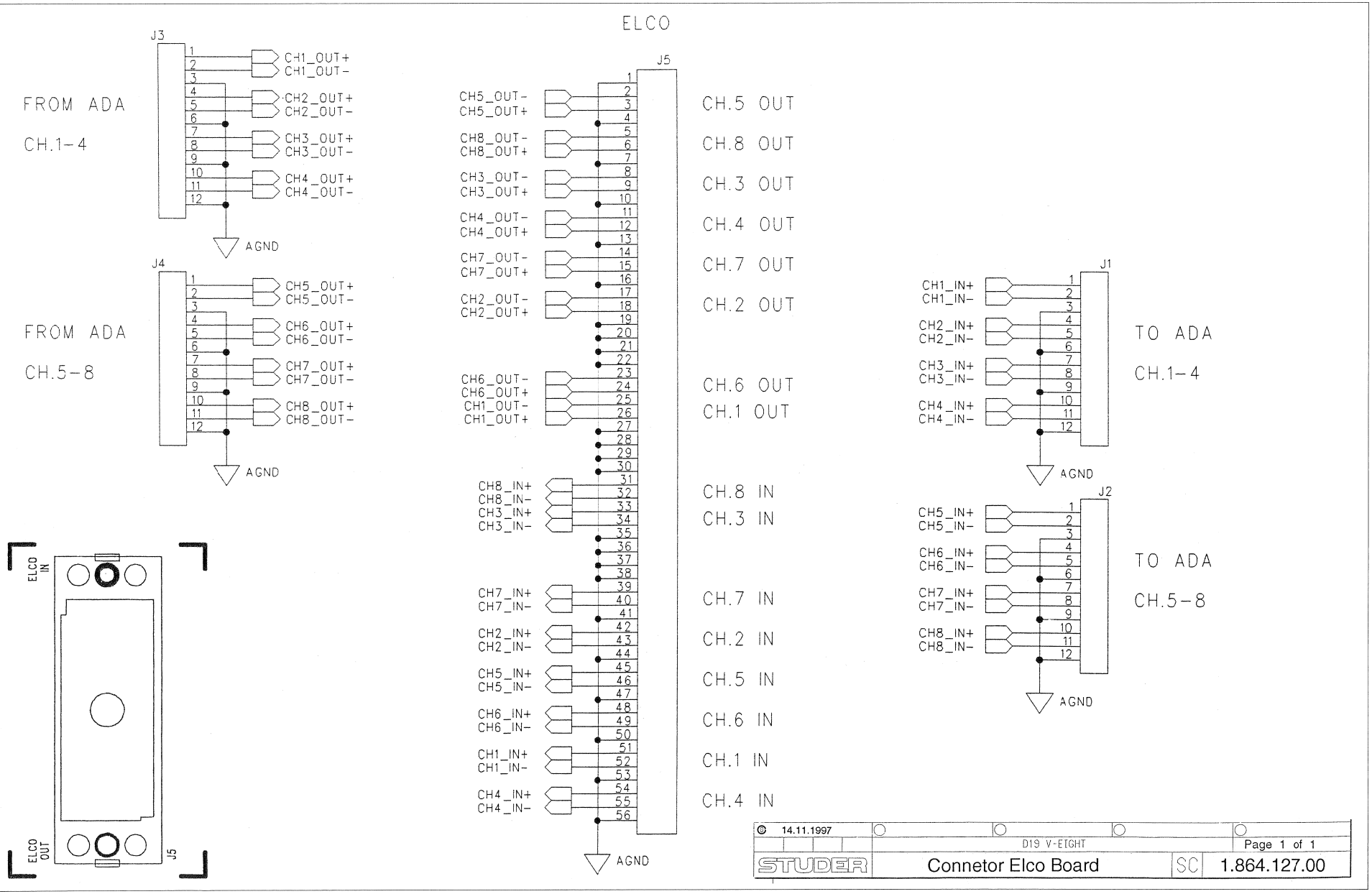
Monitor Board 1.864.130.81

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 2	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 3	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 4	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 5	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 6	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 7	59.60.2257		220p	CER 50V, 5%, C0G, 0603
0	C 8	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 9	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 10	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 11	59.60.2249		100p	CER 50V, 5%, C0G, 0603
0	C 12	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 13	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 14	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 15	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 16	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 17	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 18	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 19	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 20	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 21	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 22	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 23	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 24	59.60.2249		100p	CER 50V, 5%, C0G, 0603
0	C 25	59.60.2249		100p	CER 50V, 5%, C0G, 0603
0	C 26	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 27	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 28	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 29	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 30	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 31	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 32	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 33	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	IC 1	50.09.0106		5532AN	IC NE 5532 AN, NE 5532 AN, ,A
0	IC 2	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 3	50.61.0204		MC33078	IC MC 33078 P ,A
0	IC 4	50.09.0124		2142	IC SSM 2142 P
0	IC 5	50.09.0124		2142	IC SSM 2142 P
0	J 1	54.13.0073		25p	D-Sub, PCB, Winkel
0	J 2	54.14.5520		20p	PCB-Buchse gerade
0	J 3	54.21.2207		3p	XLR PCB Winkel lock
0	J 4	54.14.5510		10p	PCB-Buchse gerade
0	J 5	54.14.5510		10p	PCB-Buchse gerade
0	J 6	54.14.5516		16p	PCB-Buchse gerade
0	MP 1	1.864.130.12			Monitor Board PCB
0	MP 2	43.01.0108		Label	ESE-WARNSCHILD
0	MP 3	1.864.130.10			NR.-ETIKETTE 5 * 20
0	MP 4	1.864.132.10			NR.-ETIKETTE 5 * 20
0	P 1	54.21.2202		3p	XLR PCB Winkel
0	P 2	54.21.2202		3p	XLR PCB Winkel
0	P 3	54.24.0123			J JACK-SOCKET, 6.3MM, PCB
0	R 1	57.92.7053		1.6A	POLY- PTC, 30V
0	R 2	57.60.1471		470R	MF, 1%, 0204, E24
0	R 3	57.60.1471		470R	MF, 1%, 0204, E24
0	R 4	57.60.1101		100R	MF, 1%, 0204, E24
0	R 5	57.60.1101		100R	MF, 1%, 0204, E24
0	R 6	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 7	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 8	57.60.1102		1K	MF, 1%, 0204, E24
0	R 9	57.60.1103		10K	MF, 1%, 0204, E24
0	R 10	57.60.1153		15K	MF, 1%, 0204, E24
0	R 11	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 12	57.60.1103		10K	MF, 1%, 0204, E24
0	R 13	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 14	57.60.1183		18K	MF, 1%, 0204, E24
0	R 15	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 16	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 17	57.60.1153		15K	MF, 1%, 0204, E24
0	R 18	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 19	57.60.1103		10K	MF, 1%, 0204, E24
0	R 20	57.60.1562		5K6	MF, 1%, 0204, E24
0	R 21	57.60.1123		12K	MF, 1%, 0204, E24
0	R 22	57.60.1123		12K	MF, 1%, 0204, E24
0	R 23	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 24	57.60.1123		12K	MF, 1%, 0204, E24
0	R 25	57.60.1123		12K	MF, 1%, 0204, E24
0	R 26	57.60.1123		12K	MF, 1%, 0204, E24
0	R 27	57.60.1123		12K	MF, 1%, 0204, E24
0	R 28	57.60.1123		12K	MF, 1%, 0204, E24
0	R 29	57.60.1123		12K	MF, 1%, 0204, E24
0	R 30	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 31	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 32	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 33	57.60.1332		3K3	MF, 1%, 0204, E24
0	RA 1	58.20.6703		2*10k lin	2*R, Doppelachse
0	RA 2	58.20.6703		2*10k lin	2*R, Doppelachse
0	RA 3	58.20.6703		2*10k lin	2*R, Doppelachse
0	RA 4	58.20.6703		2*10k lin	2*R, Doppelachse
0	RA 5	58.20.6703		2*10k lin	2*R, Doppelachse
0	W 1	1.864.130.93			LL Monitor Board
0	W 11	not used		1p	Rast-Lötkontakt d 1.3
0	W 12	not used		1p	Rast-Lötkontakt d 1.3
0	W 13	not used		1p	Rast-Lötkontakt d 1.3
0	W 14	not used		1p	Rast-Lötkontakt d 1.3
0	W 15	not used		1p	Rast-Lötkontakt d 1.3
0	XIC 1	53.03.0166		8p	DIL 0.3", löt, gerade
0	XIC 4	53.03.0166		8p	DIL 0.3", löt, gerade
0	XIC 5	53.03.0166		8p	DIL 0.3", löt, gerade

End of List

Comments

Connector Elco Board 1.864.127.00



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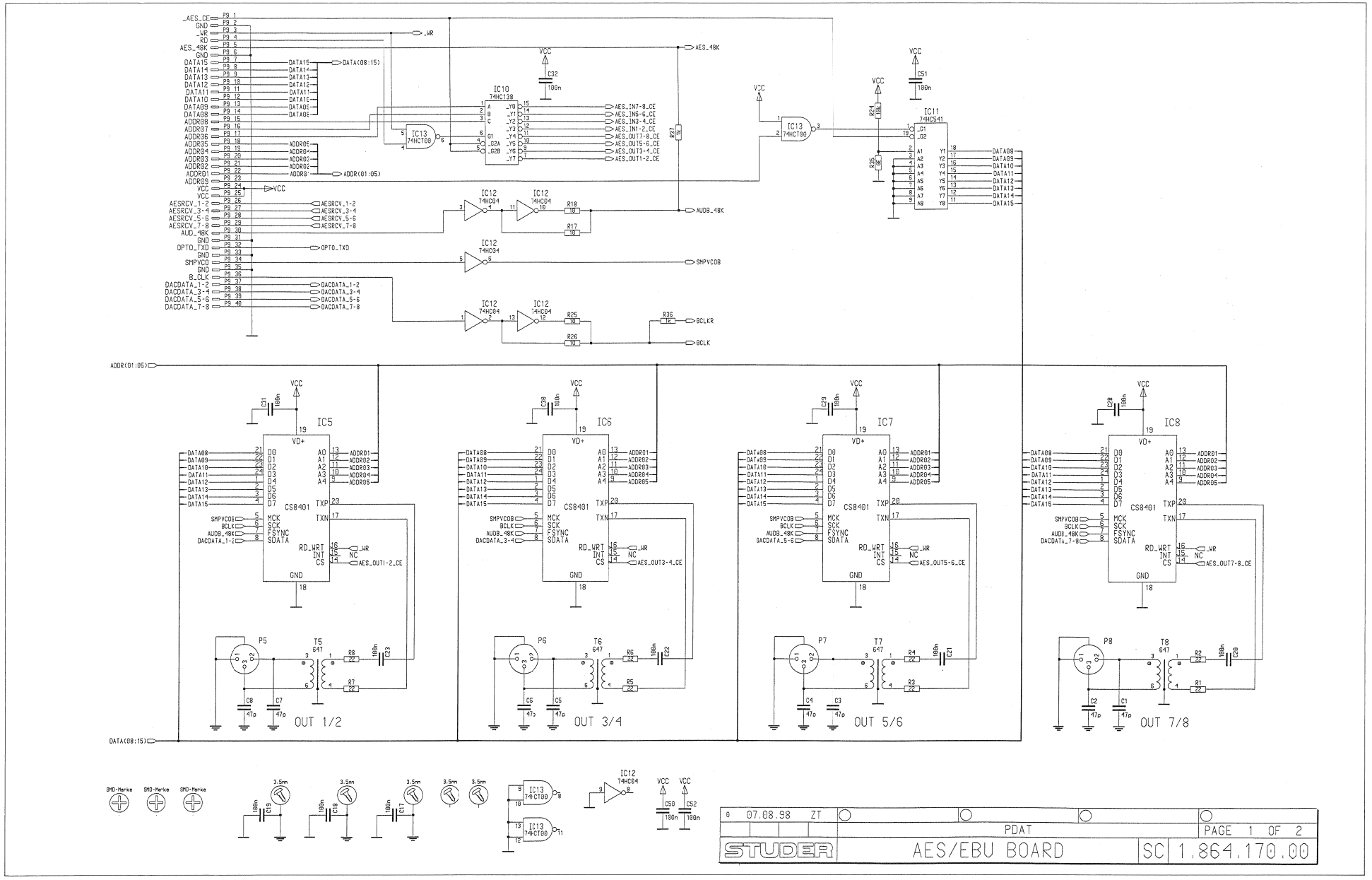

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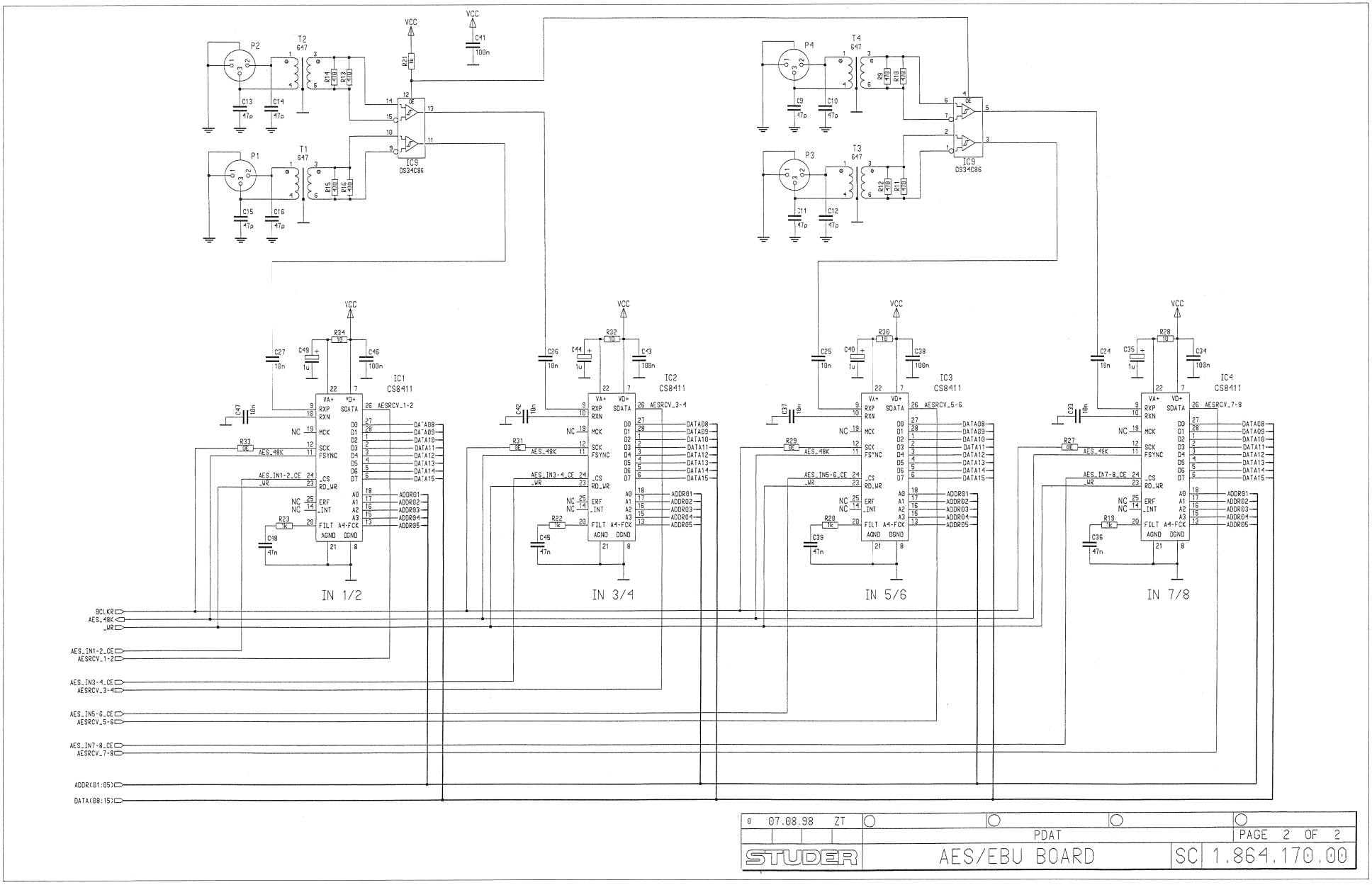
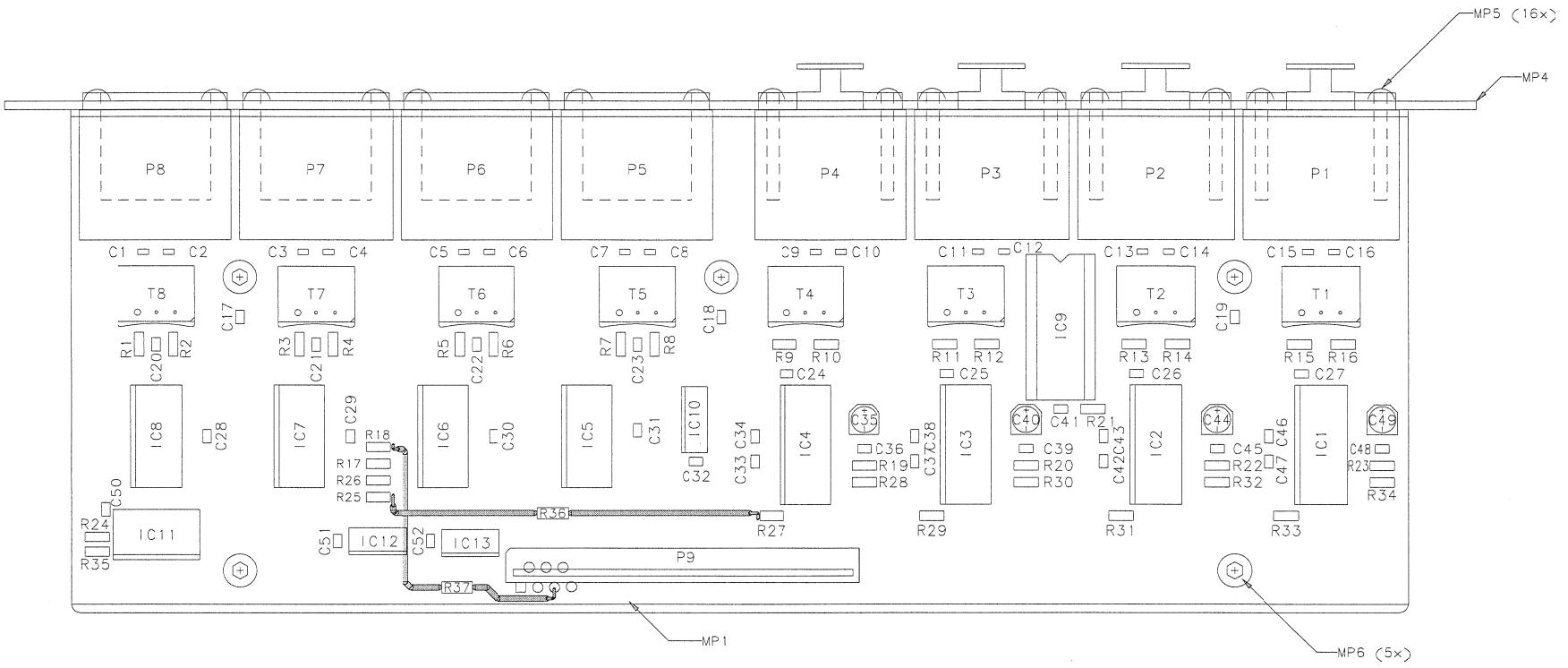


AES/EBU Board 1.864.170.00



Edition / Ausgabe	Modification / Aenderung	Index
07.08.98	ZI	0

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STUDER REGENSDORF — Description / Bezeichnung: AES/EBU BOARD — Number / Nummer: 1.864.170.00

AES/EBU Board 1.864.170.00

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 2	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 3	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 4	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 5	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 6	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 7	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 8	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 9	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 10	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 11	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 12	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 13	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 14	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 15	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 16	59.60.2241		47p	CER 50V, 5%, C0G, 0603
0	C 17	not used		100n	CER 50V, 10%, X7R, 0805
0	C 18	not used		100n	CER 50V, 10%, X7R, 0805
0	C 19	not used		100n	CER 50V, 10%, X7R, 0805
0	C 20	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 21	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 22	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 23	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 24	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 25	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 26	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 27	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 28	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 29	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 30	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 31	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 32	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 33	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 34	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 35	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 36	59.60.3333		47n	CER 50V, 10%, X7R, 0805
0	C 37	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 38	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 39	59.60.3333		47n	CER 50V, 10%, X7R, 0805
0	C 40	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 41	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 42	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 43	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 44	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 45	59.60.3333		47n	CER 50V, 10%, X7R, 0805
0	C 46	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 47	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 48	59.60.3333		47n	CER 50V, 10%, X7R, 0805
0	C 49	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 50	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 51	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 52	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	IC 1	50.62.0912		CS8411A	Dig audio interface receiver
0	IC 2	50.62.0912		CS8411A	Dig audio interface receiver
0	IC 3	50.62.0912		CS8411A	Dig audio interface receiver
0	IC 4	50.62.0912		CS8411A	Dig audio interface receiver
0	IC 5	50.62.0911		CS8401A	Dig audio interface transmitt
0	IC 6	50.62.0911		CS8401A	Dig audio interface transmitt
0	IC 7	50.62.0911		CS8401A	Dig audio interface transmitt
0	IC 8	50.62.0911		CS8401A	Dig audio interface transmitt
0	IC 9	50.15.0128		34C86	IC DS 34 C 86 TN, NC34C86P ,A
0	IC 10	50.62.1138		74HC138	3 to 8 line decoder
0	IC 11	50.62.1541		74HC541	Octal buffer line driver/recei
0	IC 12	50.62.1004		74HC 04	Hex inverter
0	IC 13	50.62.3000		74HCT 00	Quad 2Input NAND
0	MP 1	1.864.170.11			AES/EBU PCB
0	MP 2	43.01.0108		Label	ESE-WARNSCHILD
0	MP 3	1.864.170.10			NR.-ETIKETTE 5 * 20
0	MP 4	1.864.010.14			Blende AES/EBU
0	MP 5	20.24.8734	16 pcs	2.9*6	L -Formschr,K-Torx, Zn bl
0	MP 6	21.53.9354	5 pcs	M3*6	Z-Schraube Inbus-Ripp Zn gb ch
0	P 1	54.21.2207		3p	XLR PCB Winkel lock
0	P 2	54.21.2207		3p	XLR PCB Winkel lock
0	P 3	54.21.2207		3p	XLR PCB Winkel lock
0	P 4	54.21.2207		3p	XLR PCB Winkel lock
0	P 5	54.21.2202		3p	XLR PCB Winkel
0	P 6	54.21.2232		3p	XLR PCB Winkel
0	P 7	54.21.2232		3p	XLR PCB Winkel
0	P 8	54.21.2232		3p	XLR PCB Winkel
0	P 9	54.10.4090		40p	Flex gerade, PCB

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
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0	R 2	57.60.1220		22R	MF, 1%, 0204, E24
0	R 3	57.60.1220		22R	MF, 1%, 0204, E24
0	R 4	57.60.1220		22R	MF, 1%, 0204, E24
0	R 5	57.60.1220		22R	MF, 1%, 0204, E24
0	R 6	57.60.1220		22R	MF, 1%, 0204, E24
0	R 7	57.60.1220		22R	MF, 1%, 0204, E24
0	R 8	57.60.1220		22R	MF, 1%, 0204, E24
0	R 9	57.60.1471		470R	MF, 1%, 0204, E24
0	R 10	57.60.1471		470R	MF, 1%, 0204, E24
0	R 11	57.60.1471		470R	MF, 1%, 0204, E24
0	R 12	57.60.1471		470R	MF, 1%, 0204, E24
0	R 13	57.60.1471		470R	MF, 1%, 0204, E24
0	R 14	57.60.1471		470R	MF, 1%, 0204, E24
0	R 15	57.60.1471		470R	MF, 1%, 0204, E24
0	R 16	57.60.1471		470R	MF, 1%, 0204, E24
0	R 17	not used		10R	MF, 1%, 0204, E24
0	R 18	57.60.1100		10R	MF, 1%, 0204, E24
0	R 19	57.60.1102		1K	MF, 1%, 0204, E24
0	R 20	57.60.1102		1K	MF, 1%, 0204, E24
0	R 21	57.60.1102		1K	MF, 1%, 0204, E24
0	R 22	57.60.1102		1K	MF, 1%, 0204, E24
0	R 23	57.60.1102		1K	MF, 1%, 0204, E24
0	R 24	57.60.1103		10K	MF, 1%, 0204, E24
0	R 25	57.60.1100		10R	MF, 1%, 0204, E24
0	R 26	not used		10R	MF, 1%, 0204, E24
0	R 27	57.60.1000		0R0	MF, 0204
0	R 28	57.60.1100		10R	MF, 1%, 0204, E24
0	R 29	57.60.1000		0R0	MF, 0204
0	R 30	57.60.1100		10R	MF, 1%, 0204, E24
0	R 31	57.60.1000		0R0	MF, 0204
0	R 32	57.60.1100		10R	MF, 1%, 0204, E24
0	R 33	57.60.1000		0R0	MF, 0204
0	R 34	57.60.1100		10R	MF, 1%, 0204, E24
0	R 35	57.60.1000		0R0	MF, 0204
0	R 36	57.10.1102		1k0	MF, 1%, 0204
0	R 37	57.10.1102		1k0	MF, 1%, 0204
0	T 1	1.022.647.00		1:1.4	OUTPUT TRAFO AES/EBU
0	T 2	1.022.647.00		1:1.4	OUTPUT TRAFO AES/EBU
0	T 3	1.022.647.00		1:1.4	OUTPUT TRAFO AES/EBU
0	T 4	1.022.647.00		1:1.4	OUTPUT TRAFO AES/EBU
0	T 5	1.022.647.00		1:1.4	OUTPUT TRAFO AES/EBU
0	T 6	1.022.647.00		1:1.4	OUTPUT TRAFO AES/EBU
0	T 7	1.022.647.00		1:1.4	OUTPUT TRAFO AES/EBU
0	T 8	1.022.647.00		1:1.4	OUTPUT TRAFO AES/EBU

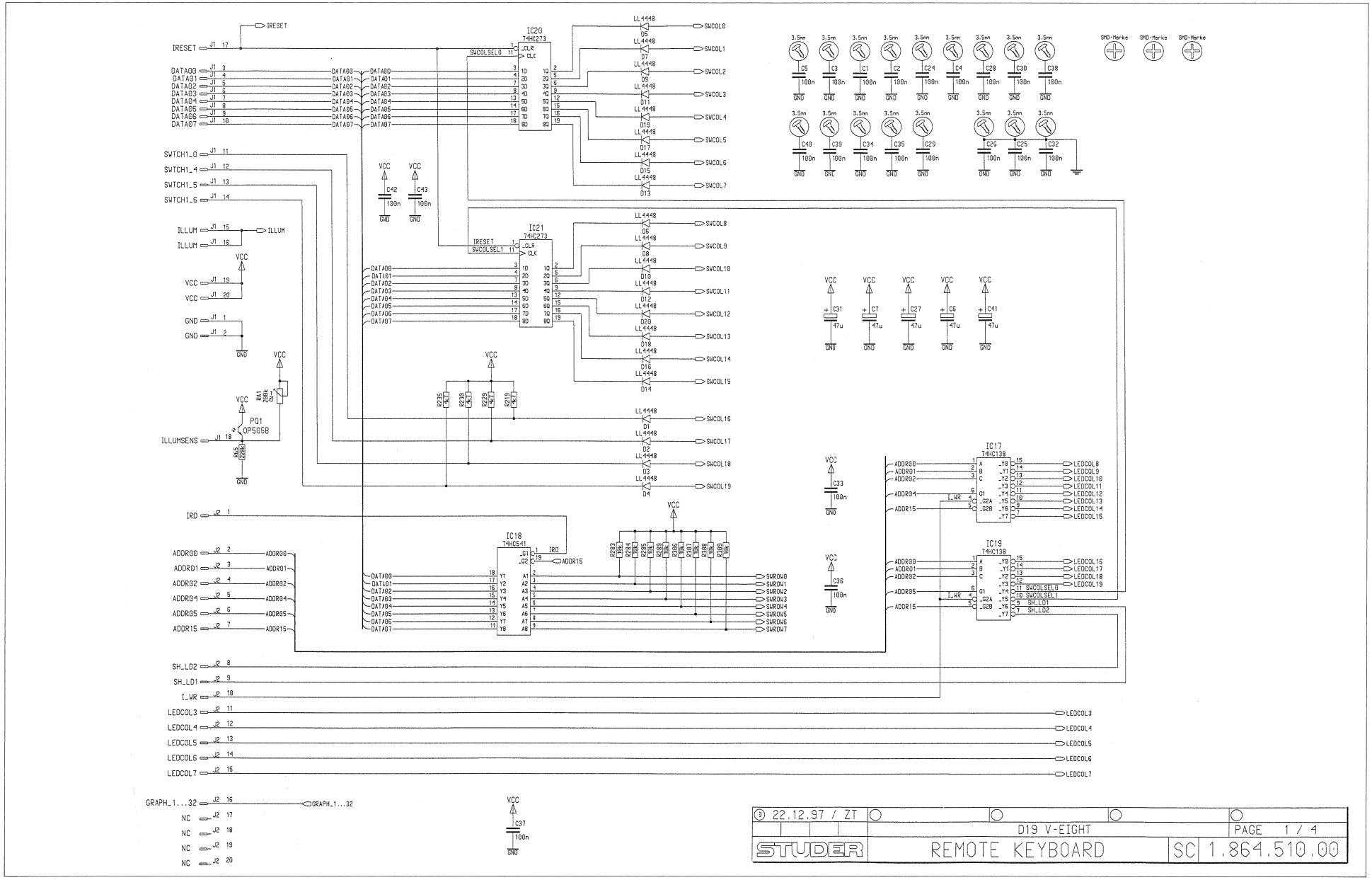
End of List

Comments

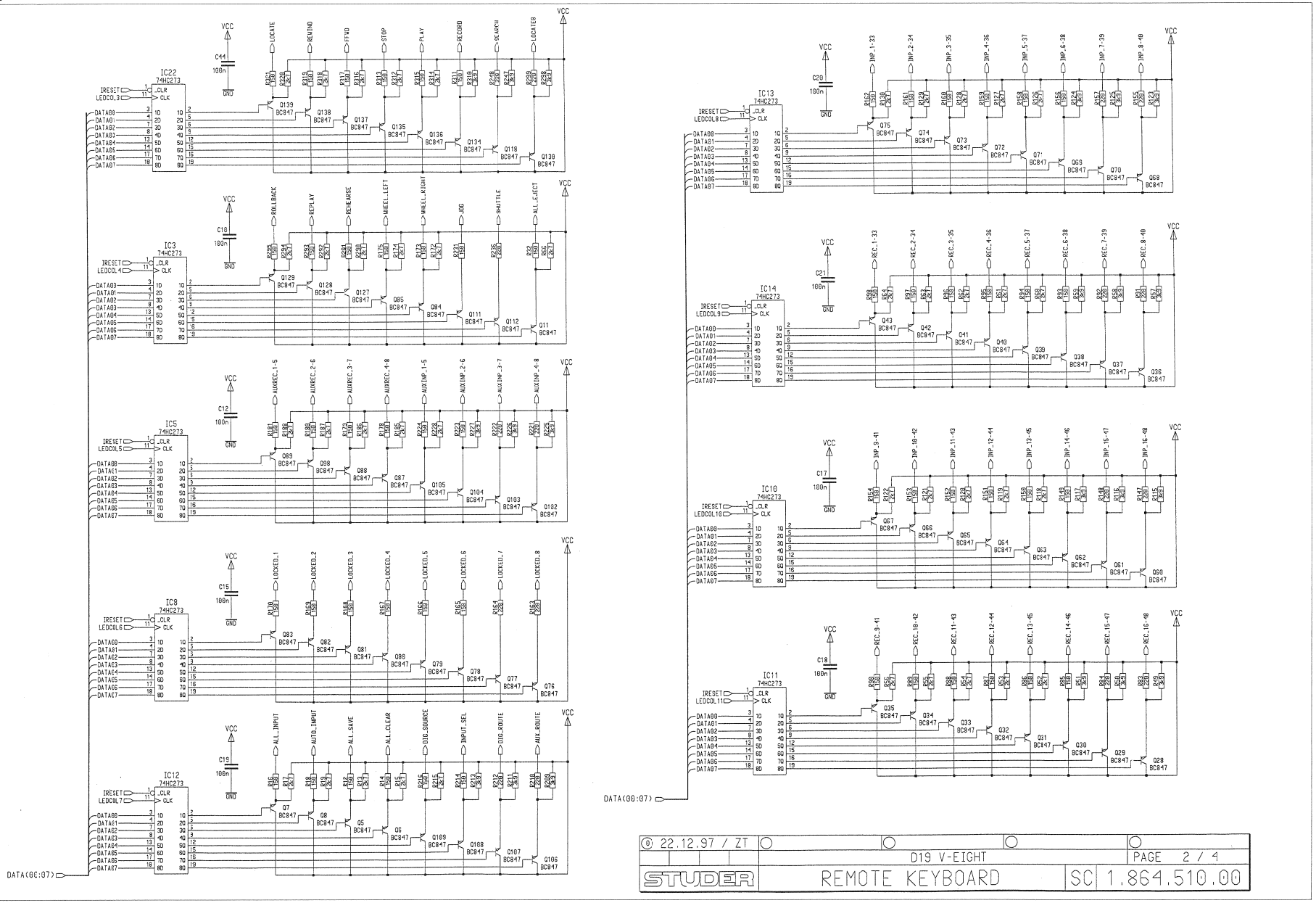
SCHEMATA / CIRCUIT DIAGRAMS

V-Eight Remote Cockpit

Remote Keyboard 1.864.510.00



Remote Keyboard 1.864.510.00



ⓐ 22.12.97 / ZT				
	D19 V-EIGHT			PAGE 2 / 4
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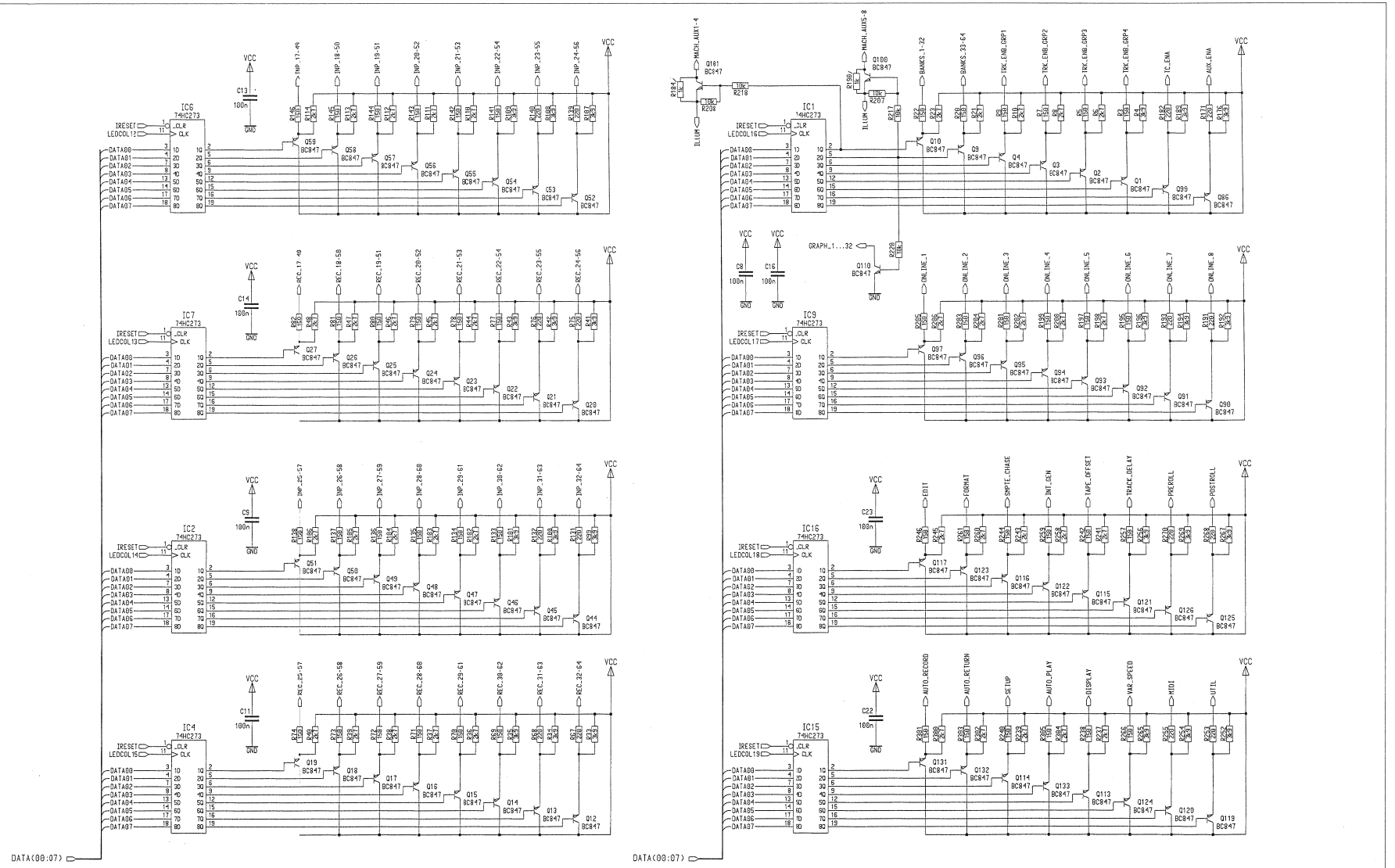
Remote Keyboard 1.864.510.00



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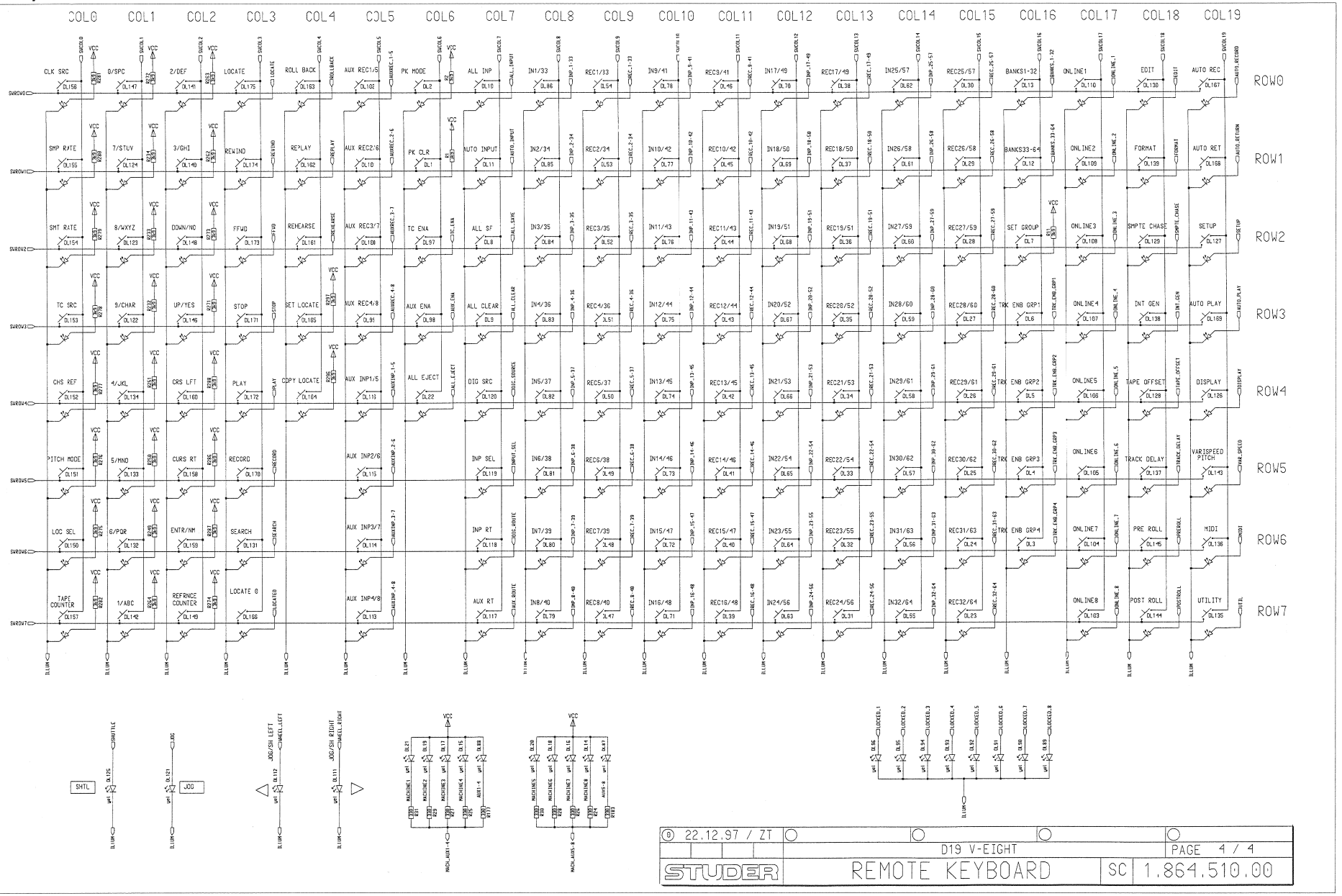
Remote Keyboard 1.864.510.00



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	D19 V-EIGHT		
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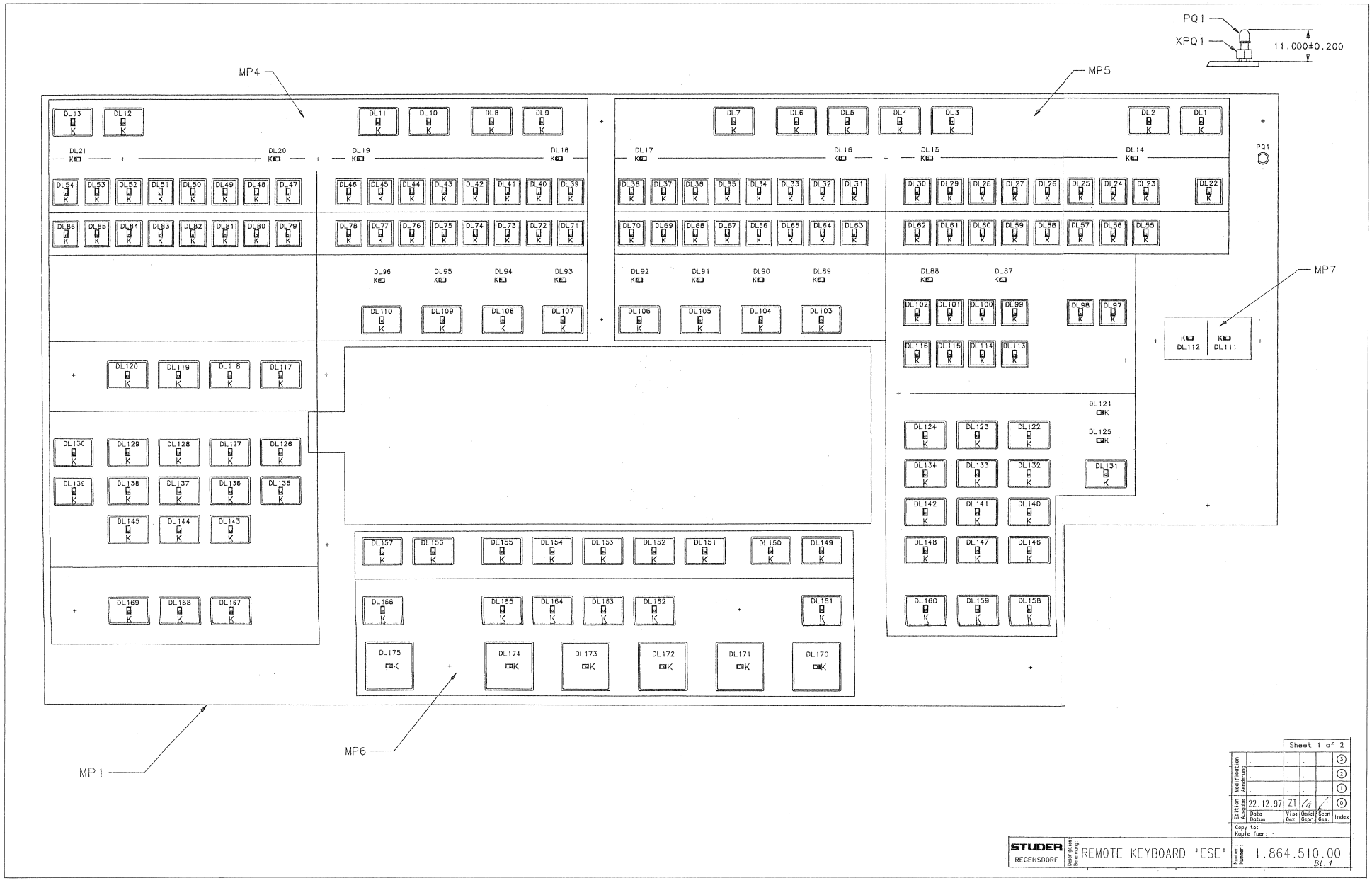
Remote Keyboard 1.864.510.00



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		.	.	.	1
22.12.97	ZT				0
Date Datum	Visa Gez	Checked Gepr	Seen Ges.	Index	

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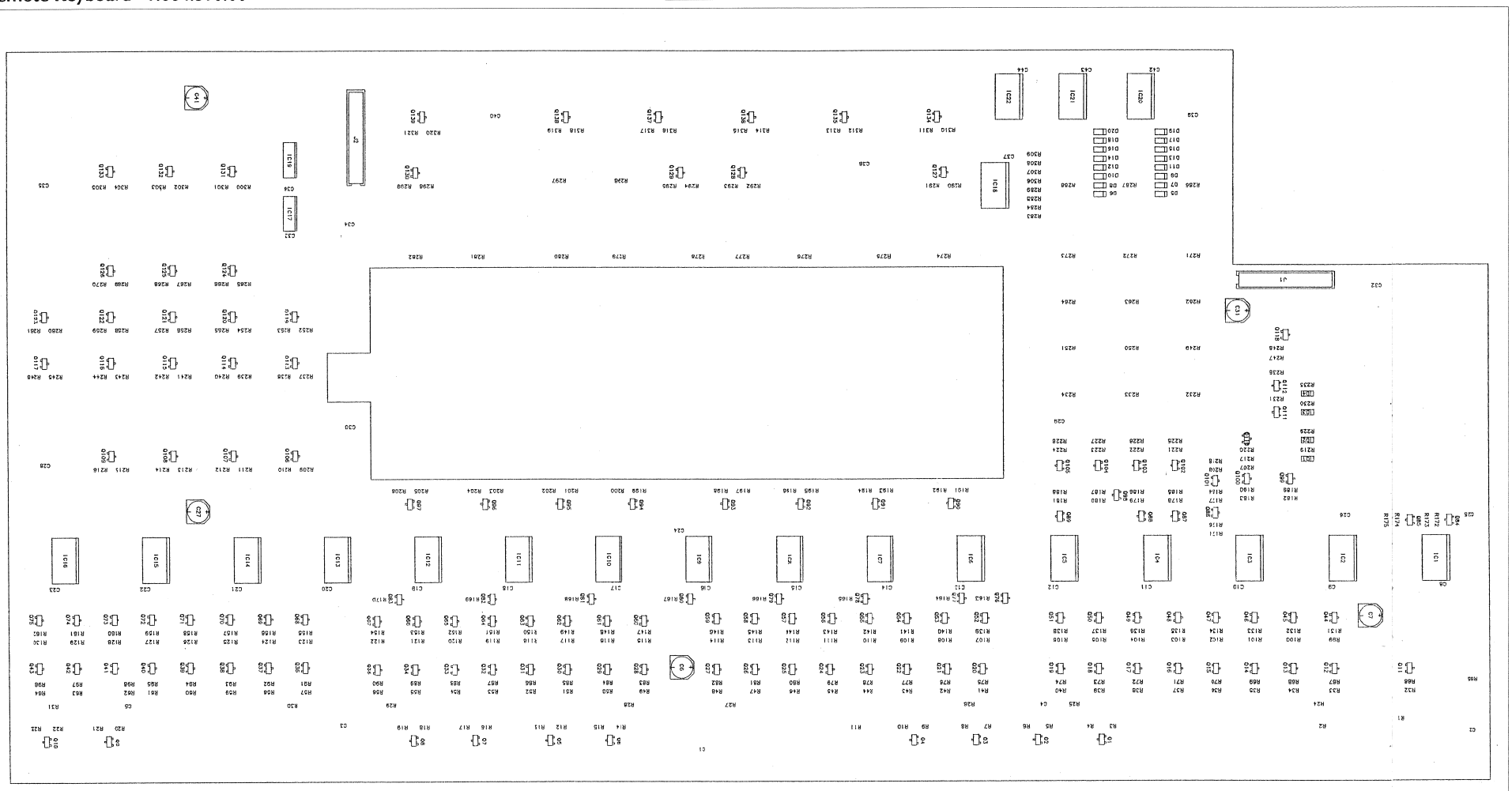
Remote Keyboard 1.864.510.00



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Edition Ausgabe	22.12.97	ZT		B
	Date Datum	Visa Gez.	Checked Kontr.	Seen Ges.	Index

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STUDER REGENSDORF	Description: Benennung: REMOTE KEYBOARD "ESE"	Number: Nummer: 1.864.510.00 Bl.2

Remote Keyboard 1.864.510.00

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 2	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 3	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 4	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 5	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 6	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 7	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 8	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 9	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 10	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 11	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 12	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 13	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 14	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 15	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 16	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 17	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 18	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 19	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 20	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 21	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 22	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 23	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 24	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 25	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 26	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 27	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 28	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 29	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 30	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 31	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 32	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 33	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 34	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 35	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 36	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 37	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 38	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 39	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 40	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 41	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 42	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 43	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 44	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	D 1	50.60.8001		4448	D LL 4448 SOD 80
0	D 2	50.60.8001		4448	D LL 4448 SOD 80
0	D 3	50.60.8001		4448	D LL 4448 SOD 80
0	D 4	50.60.8001		4448	D LL 4448 SOD 80
0	D 5	50.60.8001		4448	D LL 4448 SOD 80
0	D 6	50.60.8001		4448	D LL 4448 SOD 80
0	D 7	50.60.8001		4448	D LL 4448 SOD 80
0	D 8	50.60.8001		4448	D LL 4448 SOD 80
0	D 9	50.60.8001		4448	D LL 4448 SOD 80
0	D 10	50.60.8001		4448	D LL 4448 SOD 80
0	D 11	50.60.8001		4448	D LL 4448 SOD 80
0	D 12	50.60.8001		4448	D LL 4448 SOD 80
0	D 13	50.60.8001		4448	D LL 4448 SOD 80
0	D 14	50.60.8001		4448	D LL 4448 SOD 80
0	D 15	50.60.8001		4448	D LL 4448 SOD 80
0	D 16	50.60.8001		4448	D LL 4448 SOD 80
0	D 17	50.60.8001		4448	D LL 4448 SOD 80
0	D 18	50.60.8001		4448	D LL 4448 SOD 80
0	D 19	50.60.8001		4448	D LL 4448 SOD 80
0	D 20	50.60.8001		4448	D LL 4448 SOD 80
0	DL 1	50.60.9402		yel	SMD LED yellow
0	DL 2	50.60.9402		yel	SMD LED yellow
0	DL 3	50.60.9402		yel	SMD LED yellow
0	DL 4	50.60.9402		yel	SMD LED yellow
0	DL 5	50.60.9402		yel	SMD LED yellow
0	DL 6	50.60.9402		yel	SMD LED yellow
0	DL 7	50.60.9402		yel	SMD LED yellow
0	DL 8	50.60.9402		yel	SMD LED yellow
0	DL 9	50.60.9402		yel	SMD LED yellow
0	DL 10	50.60.9402		yel	SMD LED yellow
0	DL 11	50.60.9402		yel	SMD LED yellow
0	DL 12	50.60.9402		yel	SMD LED yellow
0	DL 13	50.60.9402		yel	SMD LED yellow
0	DL 14	50.60.9402		yel	SMD LED yellow
0	DL 15	50.60.9402		yel	SMD LED yellow
0	DL 16	50.60.9402		yel	SMD LED yellow
0	DL 17	50.60.9402		yel	SMD LED yellow
0	DL 18	50.60.9402		yel	SMD LED yellow
0	DL 19	50.60.9402		yel	SMD LED yellow
0	DL 20	50.60.9402		yel	SMD LED yellow
0	DL 21	50.60.9402		yel	SMD LED yellow
0	DL 22	50.60.9402		yel	SMD LED yellow
0	DL 23	50.60.9401		red	SMD LED superred
0	DL 24	50.60.9401		red	SMD LED superred
0	DL 25	50.60.9401		red	SMD LED superred
0	DL 26	50.60.9401		red	SMD LED superred
0	DL 27	50.60.9401		red	SMD LED superred
0	DL 28	50.60.9401		red	SMD LED superred
0	DL 29	50.60.9401		red	SMD LED superred
0	DL 30	50.60.9401		red	SMD LED superred
0	DL 31	50.60.9401		red	SMD LED superred
0	DL 32	50.60.9401		red	SMD LED superred
0	DL 33	50.60.9401		red	SMD LED superred
0	DL 34	50.60.9401		red	SMD LED superred
0	DL 35	50.60.9401		red	SMD LED superred
0	DL 36	50.60.9401		red	SMD LED superred
0	DL 37	50.60.9401		red	SMD LED superred
0	DL 38	50.60.9401		red	SMD LED superred
0	DL 39	50.60.9401		red	SMD LED superred
0	DL 40	50.60.9401		red	SMD LED superred
0	DL 41	50.60.9401		red	SMD LED superred
0	DL 42	50.60.9401		red	SMD LED superred
0	DL 43	50.60.9401		red	SMD LED superred
0	DL 44	50.60.9401		red	SMD LED superred
0	DL 45	50.60.9401		red	SMD LED superred
0	DL 46	50.60.9401		red	SMD LED superred
0	DL 47	50.60.9401		red	SMD LED superred
0	DL 48	50.60.9401		red	SMD LED superred
0	DL 49	50.60.9401		red	SMD LED superred
0	DL 50	50.60.9401		red	SMD LED superred
0	DL 51	50.60.9401		red	SMD LED superred
0	DL 52	50.60.9401		red	SMD LED superred
0	DL 53	50.60.9401		red	SMD LED superred
0	DL 54	50.60.9401		red	SMD LED superred
0	DL 55	50.60.9402		yel	SMD LED yellow
0	DL 56	50.60.9402		yel	SMD LED yellow
0	DL 57	50.60.9402		yel	SMD LED yellow
0	DL 58	50.60.9402		yel	SMD LED yellow
0	DL 59	50.60.9402		yel	SMD LED yellow
0	DL 60	50.60.9402		yel	SMD LED yellow
0	DL 61	50.60.9402		yel	SMD LED yellow
0	DL 62	50.60.9402		yel	SMD LED yellow
0	DL 63	50.60.9402		yel	SMD LED yellow
0	DL 64	50.60.9402		yel	SMD LED yellow
0	DL 65	50.60.9402		yel	SMD LED yellow
0	DL 66	50.60.9402		yel	SMD LED yellow
0	DL 67	50.60.9402		yel	SMD LED yellow
0	DL 68	50.60.9402		yel	SMD LED yellow
0	DL 69	50.60.9402		yel	SMD LED yellow
0	DL 70	50.60.9402		yel	SMD LED yellow
0	DL 71	50.60.9402		yel	SMD LED yellow
0	DL 72	50.60.9402		yel	SMD LED yellow
0	DL 73	50.60.9402		yel	SMD LED yellow
0	DL 74	50.60.9402		yel	SMD LED yellow
0	DL 75	50.60.9402		yel	SMD LED yellow
0	DL 76	50.60.9402		yel	SMD LED yellow
0	DL 77	50.60.9402		yel	SMD LED yellow
0	DL 78	50.60.9402		yel	SMD LED yellow
0	DL 79	50.60.9402		yel	SMD LED yellow
0	DL 80	50.60.9402		yel	SMD LED yellow
0	DL 81	50.60.9402		yel	SMD LED yellow
0	DL 82	50.60.9402		yel	SMD LED yellow
0	DL 83	50.60.9402		yel	SMD LED yellow
0	DL 84	50.60.9402		yel	SMD LED yellow
0	DL 85	50.60.9402		yel	SMD LED yellow
0	DL 86	50.60.9402		yel	SMD LED yellow
0	DL 87	50.60.9402		yel	SMD LED yellow
0	DL 88	50.60.9402		yel	SMD LED yellow
0	DL 89	50.60.9402		yel	SMD LED yellow
0	DL 90	50.60.9402		yel	SMD LED yellow
0	DL 91	50.60.9402		yel	SMD LED yellow
0	DL 92	50.60.9402		yel	SMD LED yellow
0	DL 93	50.60.9402		yel	SMD LED yellow
0	DL 94	50.60.9402		yel	SMD LED yellow
0	DL 95	50.60.9402		yel	SMD LED yellow
0	DL 96	50.60.9402		yel	SMD LED yellow
0	DL 97	50.60.9402		yel	SMD LED yellow
0	DL 98	50.60.9402		yel	SMD LED yellow
0	DL 99	50.60.9401		red	SMD LED superred
0	DL 100	50.60.9401		red	SMD LED superred
0	DL 101	50.60.9401		red	SMD LED superred
0	DL 102	50.60.9401		red	SMD LED superred
0	DL 103	50.60.9402		yel	SMD LED yellow
0	DL 104	50.60.9402		yel	SMD LED yellow
0	DL 105	50.60.9402		yel	SMD LED yellow
0	DL 106	50.60.9402		yel	SMD LED yellow
0	DL 107	50.60.9402		yel	SMD LED yellow
0	DL 108	50.60.9402		yel	SMD LED yellow
0	DL 109	50.60.9402		yel	SMD LED yellow
0	DL 110	50.60.9402		yel	SMD LED yellow
0	DL 111	50.60.9402		yel	SMD LED yellow
0	DL 112	50.60.9402		yel	SMD LED yellow

Remote Keyboard 1.864.510.00

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	DL 113	50.60.9402		yel	SMD LED yellow
0	DL 114	50.60.9402		yel	SMD LED yellow
0	DL 115	50.60.9402		yel	SMD LED yellow
0	DL 116	50.60.9402		yel	SMD LED yellow
0	DL 117	50.60.9402		yel	SMD LED yellow
0	DL 118	50.60.9402		yel	SMD LED yellow
0	DL 119	50.60.9402		yel	SMD LED yellow
0	DL 120	50.60.9402		yel	SMD LED yellow
0	DL 121	50.60.9402		yel	SMD LED yellow
0	DL 122	50.60.9402		yel	SMD LED yellow
0	DL 123	50.60.9402		yel	SMD LED yellow
0	DL 124	50.60.9402		yel	SMD LED yellow
0	DL 125	50.60.9402		yel	SMD LED yellow
0	DL 126	50.60.9402		yel	SMD LED yellow
0	DL 127	50.60.9402		yel	SMD LED yellow
0	DL 128	50.60.9402		yel	SMD LED yellow
0	DL 129	50.60.9402		yel	SMD LED yellow
0	DL 130	50.60.9402		yel	SMD LED yellow
0	DL 131	50.60.9402		yel	SMD LED yellow
0	DL 132	50.60.9402		yel	SMD LED yellow
0	DL 133	50.60.9402		yel	SMD LED yellow
0	DL 134	50.60.9402		yel	SMD LED yellow
0	DL 135	50.60.9402		yel	SMD LED yellow
0	DL 136	50.60.9402		yel	SMD LED yellow
0	DL 137	50.60.9402		yel	SMD LED yellow
0	DL 138	50.60.9402		yel	SMD LED yellow
0	DL 139	50.60.9401		red	SMD LED superred
0	DL 140	50.60.9402		yel	SMD LED yellow
0	DL 141	50.60.9402		yel	SMD LED yellow
0	DL 142	50.60.9402		yel	SMD LED yellow
0	DL 143	50.60.9402		yel	SMD LED yellow
0	DL 144	50.60.9402		yel	SMD LED yellow
0	DL 145	50.60.9402		yel	SMD LED yellow
0	DL 146	50.60.9402		yel	SMD LED yellow
0	DL 147	50.60.9402		yel	SMD LED yellow
0	DL 148	50.60.9402		yel	SMD LED yellow
0	DL 149	50.60.9402		yel	SMD LED yellow
0	DL 150	50.60.9402		yel	SMD LED yellow
0	DL 151	50.60.9402		yel	SMD LED yellow
0	DL 152	50.60.9402		yel	SMD LED yellow
0	DL 153	50.60.9402		yel	SMD LED yellow
0	DL 154	50.60.9402		yel	SMD LED yellow
0	DL 155	50.60.9402		yel	SMD LED yellow
0	DL 156	50.60.9402		yel	SMD LED yellow
0	DL 157	50.60.9402		yel	SMD LED yellow
0	DL 158	50.60.9402		yel	SMD LED yellow
0	DL 159	50.60.9402		yel	SMD LED yellow
0	DL 160	50.60.9402		yel	SMD LED yellow
0	DL 161	50.60.9402		yel	SMD LED yellow
0	DL 162	50.60.9402		yel	SMD LED yellow
0	DL 163	50.60.9402		yel	SMD LED yellow
0	DL 164	50.60.9402		yel	SMD LED yellow
0	DL 165	50.60.9402		yel	SMD LED yellow
0	DL 166	50.60.9402		yel	SMD LED yellow
0	DL 167	50.60.9401		red	SMD LED superred
0	DL 168	50.60.9402		yel	SMD LED yellow
0	DL 169	50.60.9402		yel	SMD LED yellow
0	DL 170	50.60.9401		red	SMD LED superred
0	DL 171	50.60.9402		yel	SMD LED yellow
0	DL 172	50.60.9402		yel	SMD LED yellow
0	DL 173	50.60.9402		yel	SMD LED yellow
0	DL 174	50.60.9402		yel	SMD LED yellow
0	DL 175	50.60.9402		yel	SMD LED yellow
0	IC 1	50.62.1273		74HC273	74 HC 273
0	IC 2	50.62.1273		74HC273	74 HC 273
0	IC 3	50.62.1273		74HC273	74 HC 273
0	IC 4	50.62.1273		74HC273	74 HC 273
0	IC 5	50.62.1273		74HC273	74 HC 273
0	IC 6	50.62.1273		74HC273	74 HC 273
0	IC 7	50.62.1273		74HC273	74 HC 273
0	IC 8	50.62.1273		74HC273	74 HC 273
0	IC 9	50.62.1273		74HC273	74 HC 273
0	IC 10	50.62.1273		74HC273	74 HC 273
0	IC 11	50.62.1273		74HC273	74 HC 273
0	IC 12	50.62.1273		74HC273	74 HC 273
0	IC 13	50.62.1273		74HC273	74 HC 273
0	IC 14	50.62.1273		74HC273	74 HC 273
0	IC 15	50.62.1273		74HC273	74 HC 273
0	IC 16	50.62.1273		74HC273	74 HC 273
0	IC 17	50.62.1138		74HC138	74 HC 138
0	IC 18	50.62.1541		74HC541	74 HC 541
0	IC 19	50.62.1138		74HC138	74 HC 138
0	IC 20	50.62.1273		74HC273	74 HC 273
0	IC 21	50.62.1273		74HC273	74 HC 273
0	IC 22	50.62.1273		74HC273	74 HC 273
0	J 1	54.14.5520		20p	PCB-Buchse gerade
0	J 2	54.14.5520		20p	PCB-Buchse gerade

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	MP 1	1.864.510.11			Remote Keyboard PCB
0	MP 2	1.864.510.10			NR.-ETIKETTE 5 * 20
0	MP 3	43.01.0108		Label	ESE-WARNSCHILD
0	MP 4	1.864.510.05			KONTAKTMATTE 62 TASTEN,8 ANZ.
0	MP 5	1.864.510.06			KONTAKTMATTE 70 TASTEN,12 ANZ.
0	MP 6	1.864.510.07			KONTAKTMATTE 21 TASTEN
0	MP 7	1.864.510.08			ANZEIGEMATTE
0	PQ 1	50.04.2145		OP505B	QP OP 505 B,
0	Q 1	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 2	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 3	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 4	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 5	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 6	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 7	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 8	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 9	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 10	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 11	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 12	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 13	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 14	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 15	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 16	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 17	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 18	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 19	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 20	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 21	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 22	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 23	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 24	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 25	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 26	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 27	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 28	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 29	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 30	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 31	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 32	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 33	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 34	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 35	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 36	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 37	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 38	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 39	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 40	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 41	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 42	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 43	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 44	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 45	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 46	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 47	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 48	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 49	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 50	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 51	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 52	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 53	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 54	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 55	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 56	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 57	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 58	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 59	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 60	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 61	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 62	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 63	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 64	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 65	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 66	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 67	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 68	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 69	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 70	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 71	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 72	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 73	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 74	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 75	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 76	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 77	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 78	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 79	50.60.0001		BC847B	Q BC 847 B, SOT 23

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Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	Q 80	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 81	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 82	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 83	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 84	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 85	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 86	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 87	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 88	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 89	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 90	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 91	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 92	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 93	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 94	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 95	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 96	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 97	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 98	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 99	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 100	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 101	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 102	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 103	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 104	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 105	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 106	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 107	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 108	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 109	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 110	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 111	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 112	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 113	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 114	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 115	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 116	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 117	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 118	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 119	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 120	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 121	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 122	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 123	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 124	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 125	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 126	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 127	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 128	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 129	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 130	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 131	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 132	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 133	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 134	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 135	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 136	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 137	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 138	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	Q 139	50.60.0001		BC847B	Q BC 847 B, SOT 23
0	R 1	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 2	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 3	57.60.1151		150R	MF, 1%, 0204, E24
0	R 4	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 5	57.60.1151		150R	MF, 1%, 0204, E24
0	R 6	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 7	57.60.1151		150R	MF, 1%, 0204, E24
0	R 8	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 9	57.60.1151		150R	MF, 1%, 0204, E24
0	R 10	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 11	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 12	57.60.1151		150R	MF, 1%, 0204, E24
0	R 13	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 14	57.60.1151		150R	MF, 1%, 0204, E24
0	R 15	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 16	57.60.1151		150R	MF, 1%, 0204, E24
0	R 17	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 18	57.60.1151		150R	MF, 1%, 0204, E24
0	R 19	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 20	57.60.1151		150R	MF, 1%, 0204, E24
0	R 21	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 22	57.60.1151		150R	MF, 1%, 0204, E24
0	R 23	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 24	57.60.1331		330R	MF, 1%, 0204, E24
0	R 25	57.60.1331		330R	MF, 1%, 0204, E24
0	R 26	57.60.1331		330R	MF, 1%, 0204, E24
0	R 27	57.60.1331		330R	MF, 1%, 0204, E24
0	R 28	57.60.1331		330R	MF, 1%, 0204, E24
0	R 29	57.60.1331		330R	MF, 1%, 0204, E24
0	R 30	57.60.1331		330R	MF, 1%, 0204, E24
0	R 31	57.60.1331		330R	MF, 1%, 0204, E24
0	R 32	57.60.1151		150R	MF, 1%, 0204, E24
0	R 33	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 34	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 35	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 36	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 37	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 38	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 39	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 40	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 41	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 42	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 43	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 44	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 45	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 46	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 47	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 48	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 49	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 50	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 51	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 52	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 53	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 54	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 55	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 56	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 57	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 58	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 59	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 60	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 61	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 62	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 63	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 64	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 65	57.60.1224		220K	MF, 1%, 0204, E24
0	R 66	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 67	57.60.1221		220R	MF, 1%, 0204, E24
0	R 68	57.60.1221		220R	MF, 1%, 0204, E24
0	R 69	57.60.1151		150R	MF, 1%, 0204, E24
0	R 70	57.60.1151		150R	MF, 1%, 0204, E24
0	R 71	57.60.1151		150R	MF, 1%, 0204, E24
0	R 72	57.60.1151		150R	MF, 1%, 0204, E24
0	R 73	57.60.1151		150R	MF, 1%, 0204, E24
0	R 74	57.60.1151		150R	MF, 1%, 0204, E24
0	R 75	57.60.1221		220R	MF, 1%, 0204, E24
0	R 76	57.60.1221		220R	MF, 1%, 0204, E24
0	R 77	57.60.1151		150R	MF, 1%, 0204, E24
0	R 78	57.60.1151		150R	MF, 1%, 0204, E24
0	R 79	57.60.1151		150R	MF, 1%, 0204, E24
0	R 80	57.60.1151		150R	MF, 1%, 0204, E24
0	R 81	57.60.1151		150R	MF, 1%, 0204, E24
0	R 82	57.60.1151		150R	MF, 1%, 0204, E24
0	R 83	57.60.1221		220R	MF, 1%, 0204, E24
0	R 84	57.60.1221		220R	MF, 1%, 0204, E24
0	R 85	57.60.1151		150R	MF, 1%, 0204, E24
0	R 86	57.60.1151		150R	MF, 1%, 0204, E24
0	R 87	57.60.1151		150R	MF, 1%, 0204, E24
0	R 88	57.60.1151		150R	MF, 1%, 0204, E24
0	R 89	57.60.1151		150R	MF, 1%, 0204, E24
0	R 90	57.60.1151		150R	MF, 1%, 0204, E24
0	R 91	57.60.1221		220R	MF, 1%, 0204, E24
0	R 92	57.60.1221		220R	MF, 1%, 0204, E24
0	R 93	57.60.1151		150R	MF, 1%, 0204, E24
0	R 94	57.60.1151		150R	MF, 1%, 0204, E24
0	R 95	57.60.1151		150R	MF, 1%, 0204, E24
0	R 96	57.60.1151		150R	MF, 1%, 0204, E24
0	R 97	57.60.1151		150R	MF, 1%, 0204, E24
0	R 98	57.60.1151		150R	MF, 1%, 0204, E24
0	R 99	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 100	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 101	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 102	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 103	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 104	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 105	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 106	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 107	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 108	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 109	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 110	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 111	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 112	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 113	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 114	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 115	57.60.1392		3K9	MF, 1%, 0204, E24

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Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 116	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 117	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 118	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 119	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 120	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 121	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 122	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 123	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 124	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 125	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 126	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 127	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 128	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 129	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 130	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 131	57.60.1221		220R	MF, 1%, 0204, E24
0	R 132	57.60.1221		220R	MF, 1%, 0204, E24
0	R 133	57.60.1151		150R	MF, 1%, 0204, E24
0	R 134	57.60.1151		150R	MF, 1%, 0204, E24
0	R 135	57.60.1151		150R	MF, 1%, 0204, E24
0	R 136	57.60.1151		150R	MF, 1%, 0204, E24
0	R 137	57.60.1151		150R	MF, 1%, 0204, E24
0	R 138	57.60.1151		150R	MF, 1%, 0204, E24
0	R 139	57.60.1221		220R	MF, 1%, 0204, E24
0	R 140	57.60.1221		220R	MF, 1%, 0204, E24
0	R 141	57.60.1151		150R	MF, 1%, 0204, E24
0	R 142	57.60.1151		150R	MF, 1%, 0204, E24
0	R 143	57.60.1151		150R	MF, 1%, 0204, E24
0	R 144	57.60.1151		150R	MF, 1%, 0204, E24
0	R 145	57.60.1151		150R	MF, 1%, 0204, E24
0	R 146	57.60.1151		150R	MF, 1%, 0204, E24
0	R 147	57.60.1221		220R	MF, 1%, 0204, E24
0	R 148	57.60.1221		220R	MF, 1%, 0204, E24
0	R 149	57.60.1151		150R	MF, 1%, 0204, E24
0	R 150	57.60.1151		150R	MF, 1%, 0204, E24
0	R 151	57.60.1151		150R	MF, 1%, 0204, E24
0	R 152	57.60.1151		150R	MF, 1%, 0204, E24
0	R 153	57.60.1151		150R	MF, 1%, 0204, E24
0	R 154	57.60.1151		150R	MF, 1%, 0204, E24
0	R 155	57.60.1221		220R	MF, 1%, 0204, E24
0	R 156	57.60.1151		150R	MF, 1%, 0204, E24
0	R 157	57.60.1221		220R	MF, 1%, 0204, E24
0	R 158	57.60.1151		150R	MF, 1%, 0204, E24
0	R 159	57.60.1151		150R	MF, 1%, 0204, E24
0	R 160	57.60.1151		150R	MF, 1%, 0204, E24
0	R 161	57.60.1151		150R	MF, 1%, 0204, E24
0	R 162	57.60.1151		150R	MF, 1%, 0204, E24
0	R 163	57.60.1221		220R	MF, 1%, 0204, E24
0	R 164	57.60.1221		220R	MF, 1%, 0204, E24
0	R 165	57.60.1151		150R	MF, 1%, 0204, E24
0	R 166	57.60.1151		150R	MF, 1%, 0204, E24
0	R 167	57.60.1151		150R	MF, 1%, 0204, E24
0	R 168	57.60.1151		150R	MF, 1%, 0204, E24
0	R 169	57.60.1151		150R	MF, 1%, 0204, E24
0	R 170	57.60.1151		150R	MF, 1%, 0204, E24
0	R 171	57.60.1221		220R	MF, 1%, 0204, E24
0	R 172	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 173	57.60.1151		150R	MF, 1%, 0204, E24
0	R 174	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 175	57.60.1151		150R	MF, 1%, 0204, E24
0	R 176	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 177	57.60.1331		330R	MF, 1%, 0204, E24
0	R 178	57.60.1151		150R	MF, 1%, 0204, E24
0	R 179	57.60.1151		150R	MF, 1%, 0204, E24
0	R 180	57.60.1151		150R	MF, 1%, 0204, E24
0	R 181	57.60.1151		150R	MF, 1%, 0204, E24
0	R 182	57.60.1221		220R	MF, 1%, 0204, E24
0	R 183	57.60.1331		330R	MF, 1%, 0204, E24
0	R 184	not used		1K	MF, 1%, 0204, E24
0	R 185	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 186	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 187	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 188	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 189	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 190	not used		1K	MF, 1%, 0204, E24
0	R 191	57.60.1221		220R	MF, 1%, 0204, E24
0	R 192	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 193	57.60.1221		220R	MF, 1%, 0204, E24
0	R 194	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 195	57.60.1151		150R	MF, 1%, 0204, E24
0	R 196	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 197	57.60.1151		150R	MF, 1%, 0204, E24
0	R 198	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 199	57.60.1151		150R	MF, 1%, 0204, E24
0	R 200	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 201	57.60.1151		150R	MF, 1%, 0204, E24
0	R 202	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 203	57.60.1151		150R	MF, 1%, 0204, E24
0	R 204	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 205	57.60.1151		150R	MF, 1%, 0204, E24
0	R 206	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 207	57.60.1103		10K	MF, 1%, 0204, E24
0	R 208	57.60.1103		10K	MF, 1%, 0204, E24
0	R 209	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 210	57.60.1221		220R	MF, 1%, 0204, E24
0	R 211	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 212	57.60.1221		220R	MF, 1%, 0204, E24
0	R 213	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 214	57.60.1151		150R	MF, 1%, 0204, E24
0	R 215	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 216	57.60.1151		150R	MF, 1%, 0204, E24
0	R 217	57.60.1103		10K	MF, 1%, 0204, E24
0	R 218	57.60.1103		10K	MF, 1%, 0204, E24
0	R 219	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 220	57.60.1103		10K	MF, 1%, 0204, E24
0	R 221	57.60.1221		220R	MF, 1%, 0204, E24
0	R 222	57.60.1221		220R	MF, 1%, 0204, E24
0	R 223	57.60.1151		150R	MF, 1%, 0204, E24
0	R 224	57.60.1151		150R	MF, 1%, 0204, E24
0	R 225	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 226	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 227	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 228	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 229	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 230	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 231	57.60.1151		150R	MF, 1%, 0204, E24
0	R 232	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 233	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 234	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 235	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 236	57.60.1221		220R	MF, 1%, 0204, E24
0	R 237	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 238	57.60.1151		150R	MF, 1%, 0204, E24
0	R 239	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 240	57.60.1151		150R	MF, 1%, 0204, E24
0	R 241	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 242	57.60.1151		150R	MF, 1%, 0204, E24
0	R 243	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 244	57.60.1151		150R	MF, 1%, 0204, E24
0	R 245	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 246	57.60.1151		150R	MF, 1%, 0204, E24
0	R 247	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 248	57.60.1221		220R	MF, 1%, 0204, E24
0	R 249	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 250	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 251	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 252	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 253	57.60.1221		220R	MF, 1%, 0204, E24
0	R 254	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 255	57.60.1221		220R	MF, 1%, 0204, E24
0	R 256	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 257	57.60.1151		150R	MF, 1%, 0204, E24
0	R 258	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 259	57.60.1151		150R	MF, 1%, 0204, E24
0	R 260	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 261	57.60.1151		150R	MF, 1%, 0204, E24
0	R 262	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 263	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 264	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 265	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 266	57.60.1151		150R	MF, 1%, 0204, E24
0	R 267	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 268	57.60.1221		220R	MF, 1%, 0204, E24
0	R 269	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 270	57.60.1221		220R	MF, 1%, 0204, E24
0	R 271	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 272	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 273	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 274	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 275	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 276	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 277	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 278	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 279	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 280	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 281	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 282	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 283	57.60.1103		10K	MF, 1%, 0204, E24
0	R 284	57.60.1103		10K	MF, 1%, 0204, E24
0	R 285	57.60.1103		10K	MF, 1%, 0204, E24
0	R 286	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 287	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 288	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 289	57.60.1103		10K	MF, 1%, 0204, E24
0	R 290	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 291	57.60.1151		150R	MF, 1%, 0204, E24
0	R 292	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 293	57.60.1151		150R	MF, 1%, 0204, E24

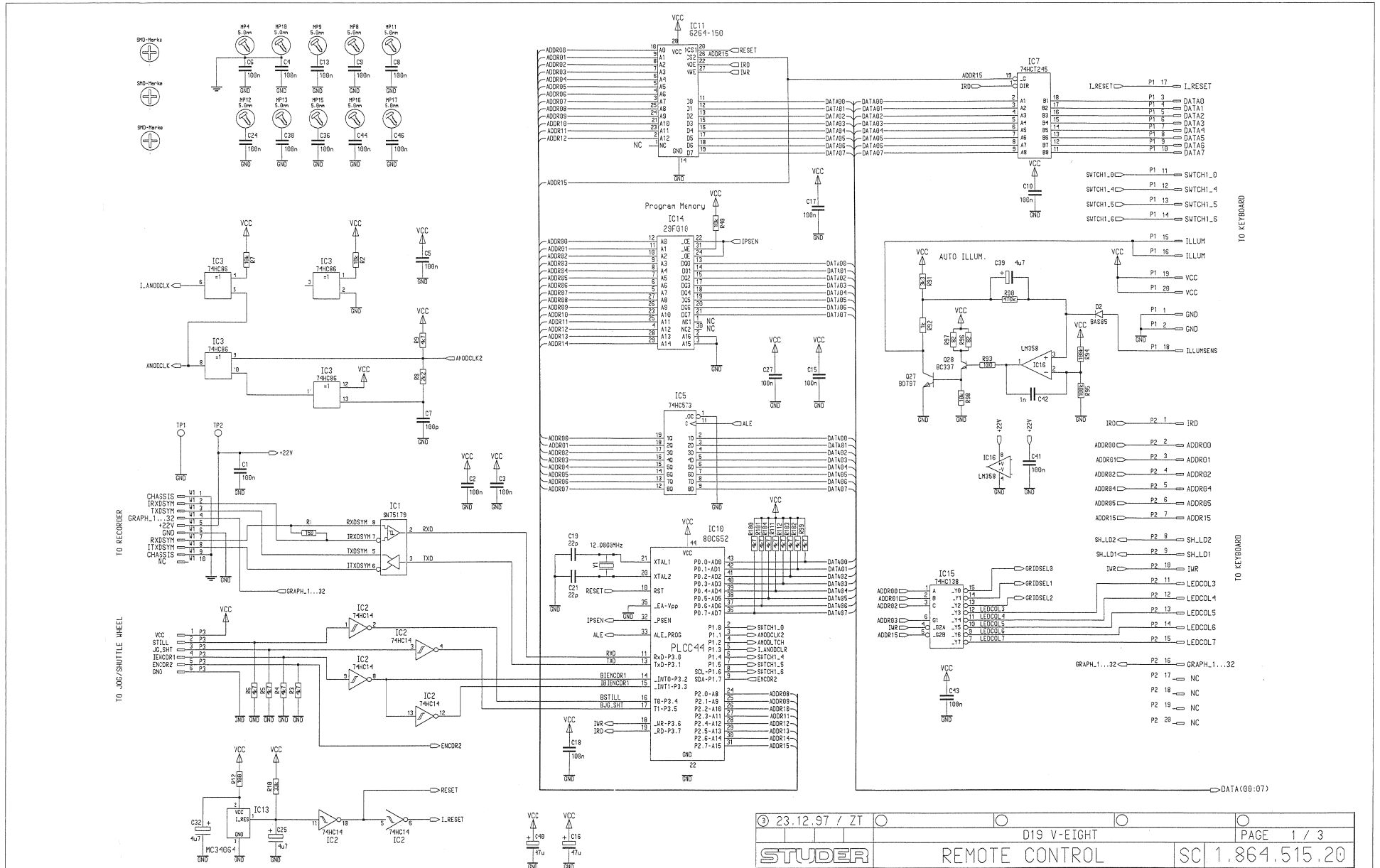
Remote Keyboard 1.864.510.00

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 294	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 295	57.60.1151		150R	MF, 1%, 0204, E24
0	R 296	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 297	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 298	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 299	57.60.1221		220R	MF, 1%, 0204, E24
0	R 300	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 301	57.60.1151		150R	MF, 1%, 0204, E24
0	R 302	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 303	57.60.1151		150R	MF, 1%, 0204, E24
0	R 304	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 305	57.60.1151		150R	MF, 1%, 0204, E24
0	R 306	57.60.1103		10K	MF, 1%, 0204, E24
0	R 307	57.60.1103		10K	MF, 1%, 0204, E24
0	R 308	57.60.1103		10K	MF, 1%, 0204, E24
0	R 309	57.60.1103		10K	MF, 1%, 0204, E24
0	R 310	57.60.1392		3K9	MF, 1%, 0204, E24
0	R 311	57.60.1151		150R	MF, 1%, 0204, E24
0	R 312	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 313	57.60.1151		150R	MF, 1%, 0204, E24
0	R 314	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 315	57.60.1151		150R	MF, 1%, 0204, E24
0	R 316	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 317	57.60.1151		150R	MF, 1%, 0204, E24
0	R 318	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 319	57.60.1151		150R	MF, 1%, 0204, E24
0	R 320	57.60.1272		2K7	MF, 1%, 0204, E24
0	R 321	57.60.1151		150R	MF, 1%, 0204, E24
0	XPQ 1	53.03.0218	2 pcs	1p	single-in-line

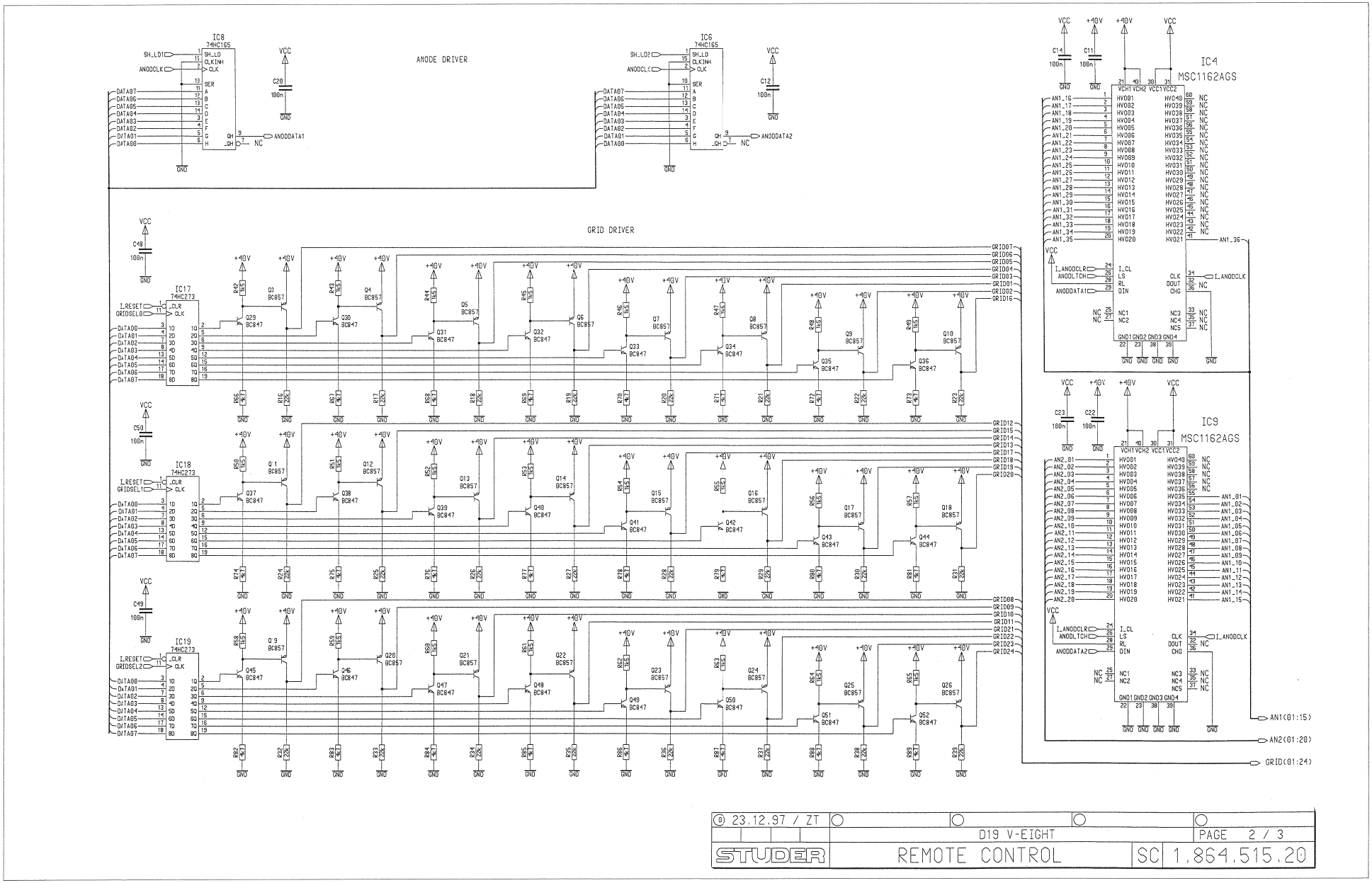
End of List

Comments

Remote Control 1.864.515.20

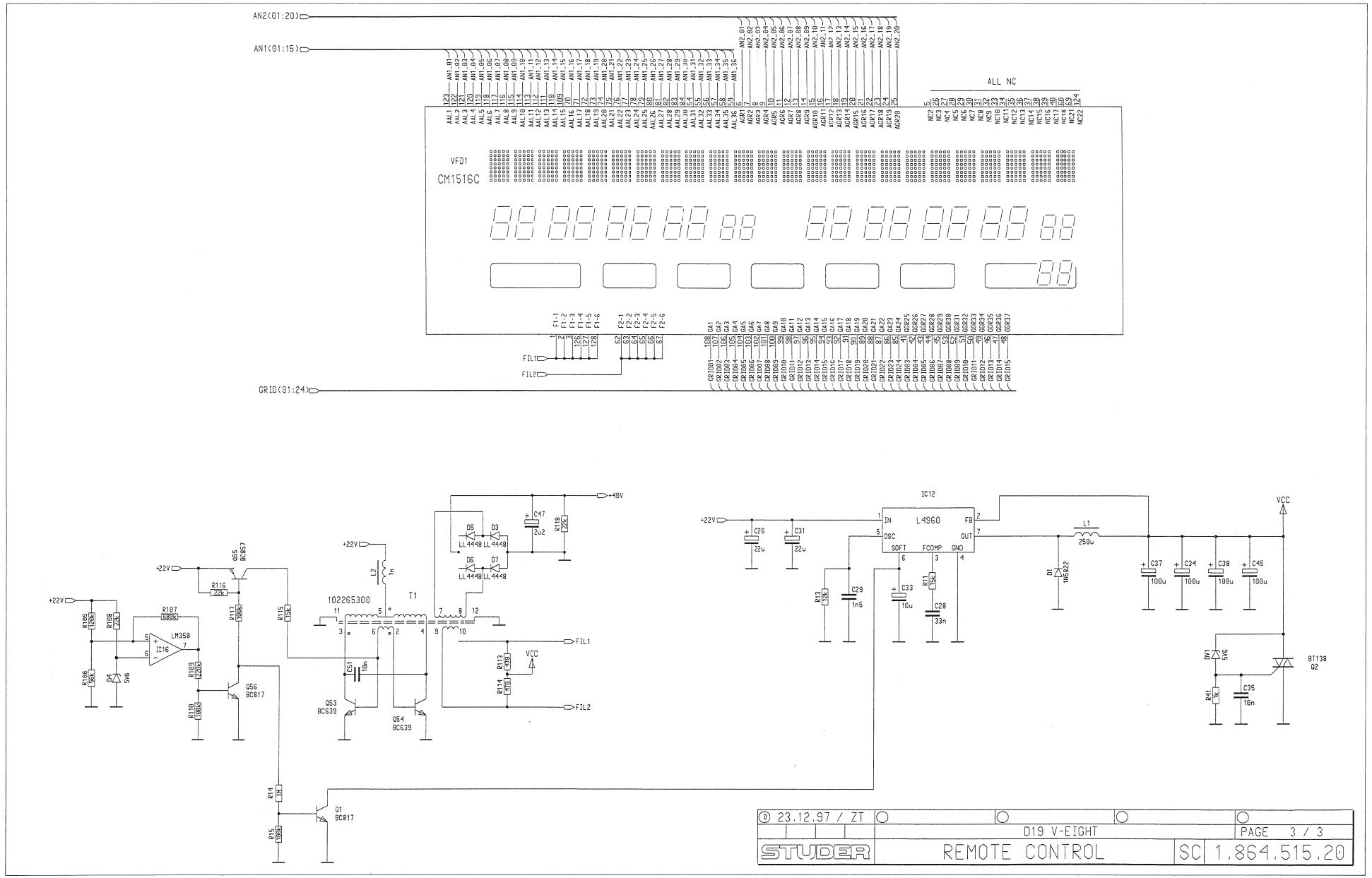


Remote Control 1.864.515.20



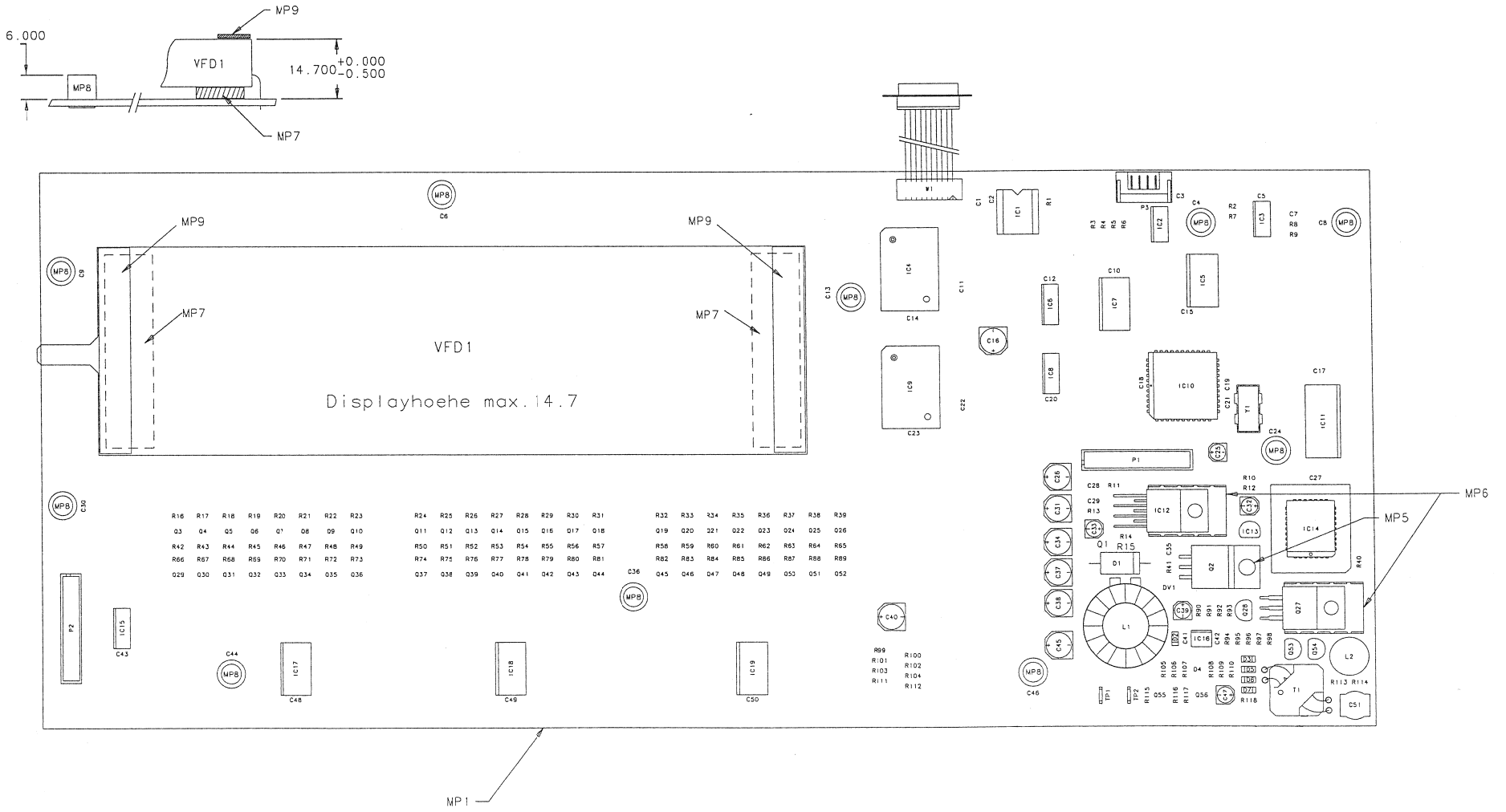
0 23.12.97 / ZT				
	D19 V-EIGHT			PAGE 2 / 3
STUDER	REMOTE CONTROL		SC	1.864.515.20

Remote Control 1.864.515.20



ⓓ 23.12.97 / ZT			
	D19 V-EIGHT		PAGE 3 / 3
STUDER	REMOTE CONTROL	SC	1.864.515.20

Remote Control 1.864.515.20



Remote Control 1.864.515.20

Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 2	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 3	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 4	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 5	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 6	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 7	59.60.2249		100p	CER 50V, 5%, C0G, 0603
0	C 8	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 9	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 10	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 11	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 12	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 13	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 14	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 15	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 16	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 17	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 18	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 19	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 20	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 21	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 22	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 23	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 24	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 25	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 26	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 27	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 28	59.60.3331		33n	CER 50V, 10%, X7R, 0805
0	C 29	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 30	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 31	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 32	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 33	59.68.0065		10u	C-EL 16V, 4.0*5.7
0	C 34	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 35	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 36	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 37	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 38	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 39	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 40	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 41	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 42	59.60.2373		1n0	CER 50V, 5%, C0G, 0805
0	C 43	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 44	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 45	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 46	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 47	59.68.0129		2u2	C-EL 50V, 4.0*5.7
0	C 48	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 49	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 50	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 51	59.05.2103		10n	PP, 2.5%, 63V
0	D 1	50.04.0519		1N5822	3A, Schottky
0	D 2	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 3	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 4	50.60.9011		5V6	5%, 0.2W, SOT 23
0	D 5	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 6	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 7	50.60.8001		4448	200mA 75V 4ns SOD 80
0	DV 1	50.60.9011		5V6	5%, 0.2W, SOT 23
0	IC 1	50.15.0126		75179B	IC SN 75179B P
0	IC 2	50.62.1014		74HC 14	74 HC 14
0	IC 3	50.62.1086		74HC 86	74 HC 86
0	IC 4	50.62.0005		MSC1162AGS	IC MSC 1162 AGS-BK ,A
0	IC 5	50.62.1573		74HC573	74 HC 573
0	IC 6	50.62.1165		74HC165	74 HC 165
0	IC 7	50.62.3245		74HCT245	.. 74 HCT 245 .
0	IC 8	50.62.1165		74HC165	74 HC 165
0	IC 9	50.62.0005		MSC1162AGS	IC MSC 1162 AGS-BK ,A
0	IC 10	50.63.0009		80C652	MPU 8bit
0	IC 11	50.63.1502		6264	SRAM 8K*8, 120ns
0	IC 12	50.10.0122		L4960	L 4960,
0	IC 13	50.11.0160			IC MC 34 064P-5,
0	IC 14	50.63.1303		29F010	Flash Memory 128K*8
0	IC 15	50.62.1138		74HC138	74 HC 138
0	IC 16	50.61.0202		LM358	IC LM 358 D ,A
0	IC 17	50.62.1273		74HC273	74 HC 273
0	IC 18	50.62.1273		74HC273	74 HC 273
0	IC 19	50.62.1273		74HC273	74 HC 273
0	L 1	62.03.0025		250uH	2A Toroid Chocke
0	L 2	62.02.3102		1mH	10%, radial RM 5
0	MP 1	1.864.515.11			Remote Control PCB
0	MP 2	1.864.515.10			NR.-ETIKETTE 5 * 20
0	MP 3	1.101.001.20		Label	TEXT-ETIK. 5*20 HARDWARE -20
0	MP 4	43.01.0108		Label	ESE-WARNSCHILD
0	MP 5	28.21.2407			ROHRNIETE,DIN D 3.0* 5.0
0	MP 6	50.20.3004	2 pcs		Kühlkörper, TO 220, horizontal
0	MP 7	65.99.0160	2 pcs		SCHAUMST.KLEBBAND GR. 3*12
0	MP 8	1.010.507.27	10 pcs		NIETHUELSE L 6.0 * 6.0/3.5
0	MP 9	65.99.0187	2 pcs		SCHAUMST.KLEBBAND SW, 1* 8
0	P 1	54.14.5590		20p	PCB-Stecker gerade
0	P 2	54.14.5590		20p	PCB-Stecker gerade
0	P 3	54.99.0341		6p	PCB winkel
0	Q 1	50.60.0050		BC817-25	NPN 45V 800mA SOT 23
0	Q 2	50.99.0106		BT138	Q BT 138 - 500 TRIAC
0	Q 3	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 4	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 5	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 6	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 7	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 8	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 9	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 10	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 11	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 12	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 13	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 14	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 15	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 16	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 17	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 18	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 19	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 20	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 21	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 22	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 23	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 24	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 25	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 26	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 27	50.03.0457		BD801	NPN, TO 220
0	Q 28	50.03.0340		BC337-25	800mA, 45V, NPN
0	Q 29	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 30	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 31	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 32	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 33	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 34	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 35	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 36	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 37	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 38	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 39	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 40	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 41	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 42	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 43	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 44	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 45	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 46	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 47	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 48	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 49	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 50	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 51	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 52	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 53	50.03.0551		BC639	BC 639
0	Q 54	50.03.0551		BC639	BC 639
0	Q 55	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 56	50.60.0050		BC817-25	NPN 45V 800mA SOT 23
0	R 1	57.60.1151		150R	MF, 1%, 0204, E24
0	R 2	57.60.1103		10K	MF, 1%, 0204, E24
0	R 3	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 4	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 5	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 6	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 7	57.60.1103		10K	MF, 1%, 0204, E24
0	R 8	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 9	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 10	57.60.1333		33K	MF, 1%, 0204, E24
0	R 11	57.60.1153		15K	MF, 1%, 0204, E24
0	R 12	57.60.1101		100R	MF, 1%, 0204, E24
0	R 13	57.60.1123		12K	MF, 1%, 0204, E24
0	R 14	57.60.1105		1M	MF, 1%, 0204, E24
0	R 15	57.60.1104		100K	MF, 1%, 0204, E24
0	R 16	57.60.1223		22K	MF, 1%, 0204, E24

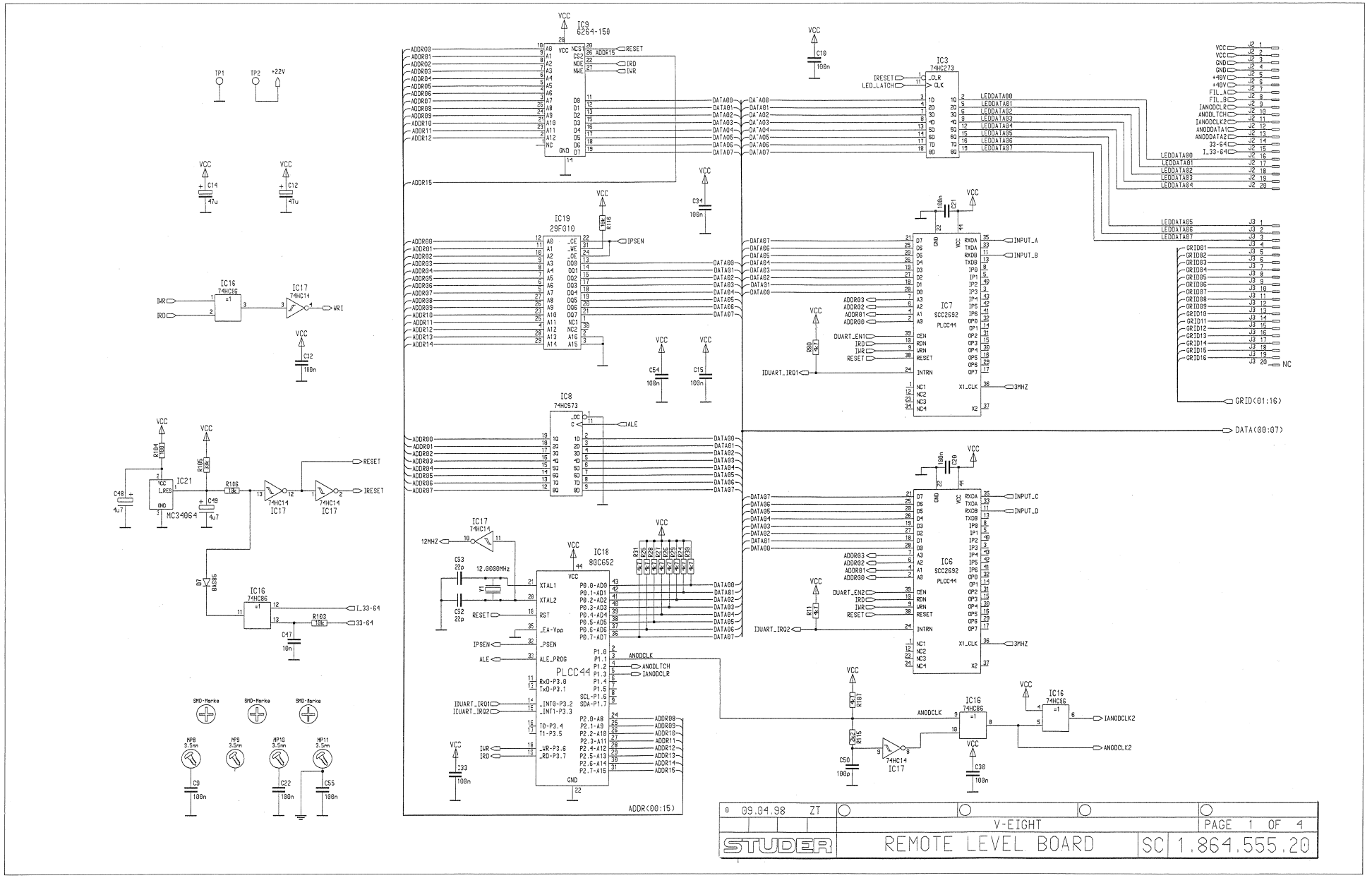
Remote Control 1.864.515.20

Idx.	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 17	57.60.1223		22K	MF, 1%, 0204, E24
0	R 18	57.60.1223		22K	MF, 1%, 0204, E24
0	R 19	57.60.1223		22K	MF, 1%, 0204, E24
0	R 20	57.60.1223		22K	MF, 1%, 0204, E24
0	R 21	57.60.1223		22K	MF, 1%, 0204, E24
0	R 22	57.60.1223		22K	MF, 1%, 0204, E24
0	R 23	57.60.1223		22K	MF, 1%, 0204, E24
0	R 24	57.60.1223		22K	MF, 1%, 0204, E24
0	R 25	57.60.1223		22K	MF, 1%, 0204, E24
0	R 26	57.60.1223		22K	MF, 1%, 0204, E24
0	R 27	57.60.1223		22K	MF, 1%, 0204, E24
0	R 28	57.60.1223		22K	MF, 1%, 0204, E24
0	R 29	57.60.1223		22K	MF, 1%, 0204, E24
0	R 30	57.60.1223		22K	MF, 1%, 0204, E24
0	R 31	57.60.1223		22K	MF, 1%, 0204, E24
0	R 32	57.60.1223		22K	MF, 1%, 0204, E24
0	R 33	57.60.1223		22K	MF, 1%, 0204, E24
0	R 34	57.60.1223		22K	MF, 1%, 0204, E24
0	R 35	57.60.1223		22K	MF, 1%, 0204, E24
0	R 36	57.60.1223		22K	MF, 1%, 0204, E24
0	R 37	57.60.1223		22K	MF, 1%, 0204, E24
0	R 38	57.60.1223		22K	MF, 1%, 0204, E24
0	R 39	57.60.1223		22K	MF, 1%, 0204, E24
0	R 40	57.60.1103		10K	MF, 1%, 0204, E24
0	R 41	57.60.1102		1K	MF, 1%, 0204, E24
0	R 42	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 43	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 44	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 45	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 46	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 47	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 48	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 49	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 50	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 51	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 52	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 53	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 54	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 55	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 56	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 57	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 58	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 59	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 60	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 61	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 62	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 63	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 64	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 65	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 66	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 67	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 68	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 69	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 70	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 71	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 72	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 73	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 74	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 75	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 76	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 77	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 78	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 79	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 80	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 81	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 82	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 83	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 84	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 85	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 86	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 87	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 88	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 89	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 90	57.60.1474		470K	MF, 1%, 0204, E24
0	R 91	57.60.1332		3K3	MF, 1%, 0204, E24
0	R 92	57.60.1102		1K	MF, 1%, 0204, E24
0	R 93	57.60.1101		100R	MF, 1%, 0204, E24
0	R 94	57.60.1104		100K	MF, 1%, 0204, E24
0	R 95	57.60.1104		100K	MF, 1%, 0204, E24
0	R 96	57.60.1820		82R	MF, 1%, 0204, E24
0	R 97	57.60.1820		82R	MF, 1%, 0204, E24
0	R 98	57.60.1103		10K	MF, 1%, 0204, E24
0	R 99	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 100	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 101	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 102	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 103	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 104	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 105	57.60.1124		120K	MF, 1%, 0204, E24
0	R 106	57.60.1563		56K	MF, 1%, 0204, E24
0	R 107	57.60.1684		680K	MF, 1%, 0204, E24
0	R 108	57.60.1223		22K	MF, 1%, 0204, E24
0	R 109	57.60.1224		220K	MF, 1%, 0204, E24
0	R 110	57.60.1104		100K	MF, 1%, 0204, E24
0	R 111	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 112	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 113	57.60.1471		470R	MF, 1%, 0204, E24
0	R 114	57.60.1471		470R	MF, 1%, 0204, E24
0	R 115	57.60.1153		15K	MF, 1%, 0204, E24
0	R 116	57.60.1223		22K	MF, 1%, 0204, E24
0	R 117	57.60.1104		100K	MF, 1%, 0204, E24
0	R 118	57.60.1223		22K	MF, 1%, 0204, E24
0	T 1	1.022.653.00			TRAFO VF-DISPLAY
0	TP 1	54.33.6010			P FLACH, 2.8*0.8,GERADE,LOSE
0	TP 2	54.33.6010			P FLACH, 2.8*0.8,GERADE,LOSE
0	VFD 1	1.864.140.02			Alphanumeric Display
0	W 1	1.023.388.32			FLACHKABEL 10 POL. 0,11M
0	XIC 14	53.03.2232		PLCC32p	PLCC-Socket 32p
0	Y 1	89.60.1003		12.000MHz	SMD Quartz

End of List

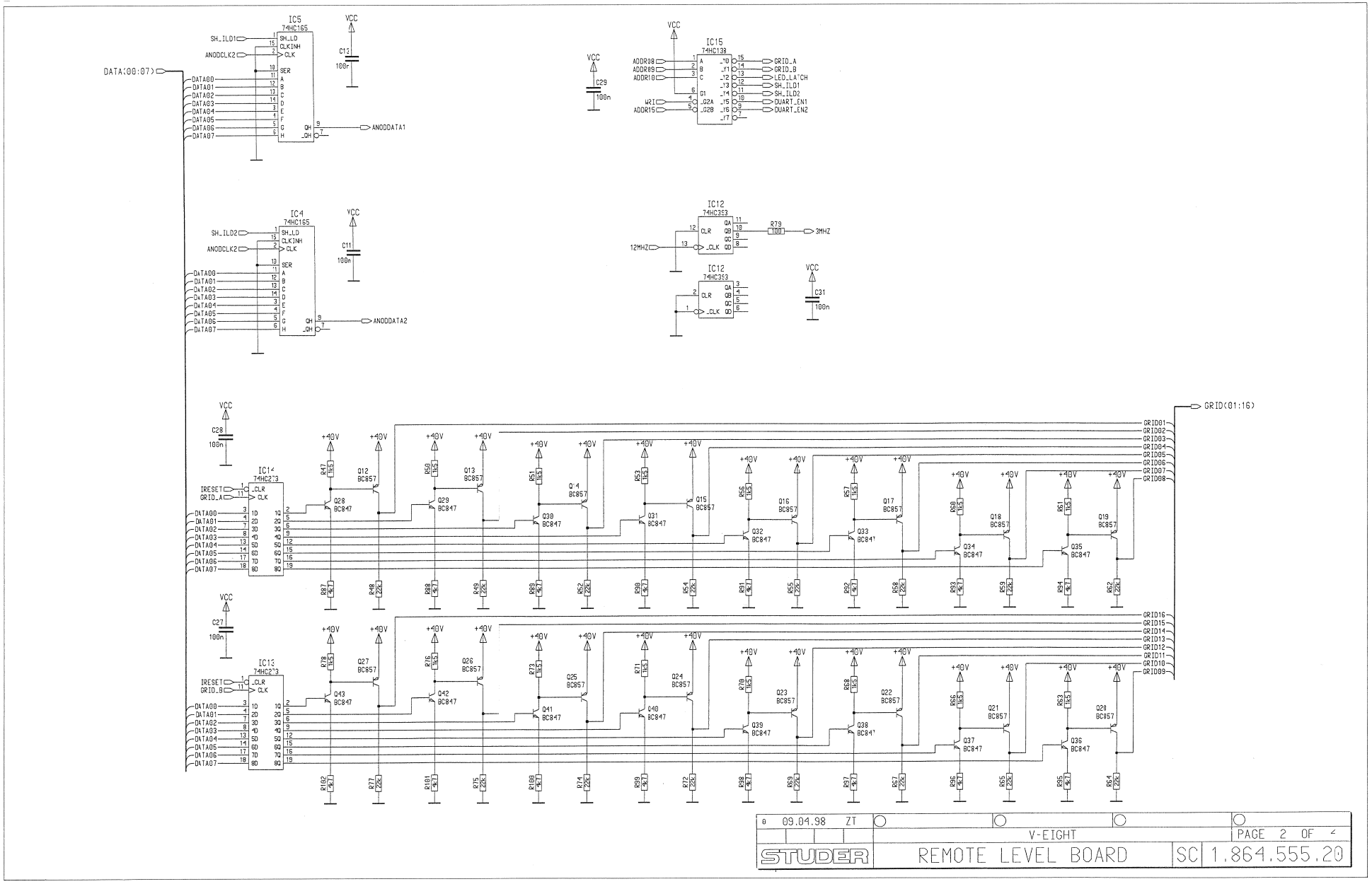
Comments

Remote Level Board 1.864.555.20

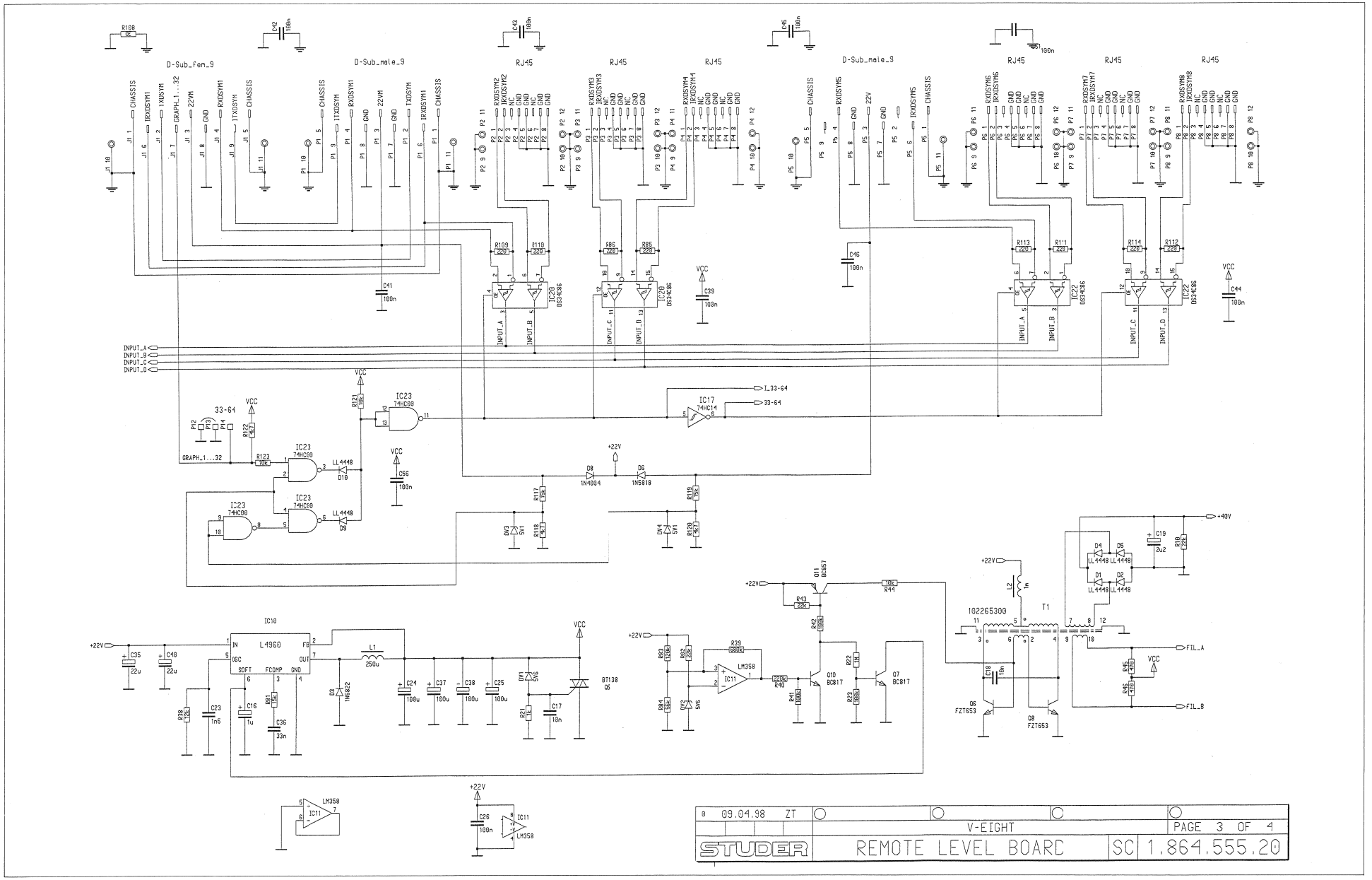


0	09.04.98	ZT		V-EIGHT	PAGE 1 OF 4
STUDER			REMOTE LEVEL BOARD	SC	1.864.555.20

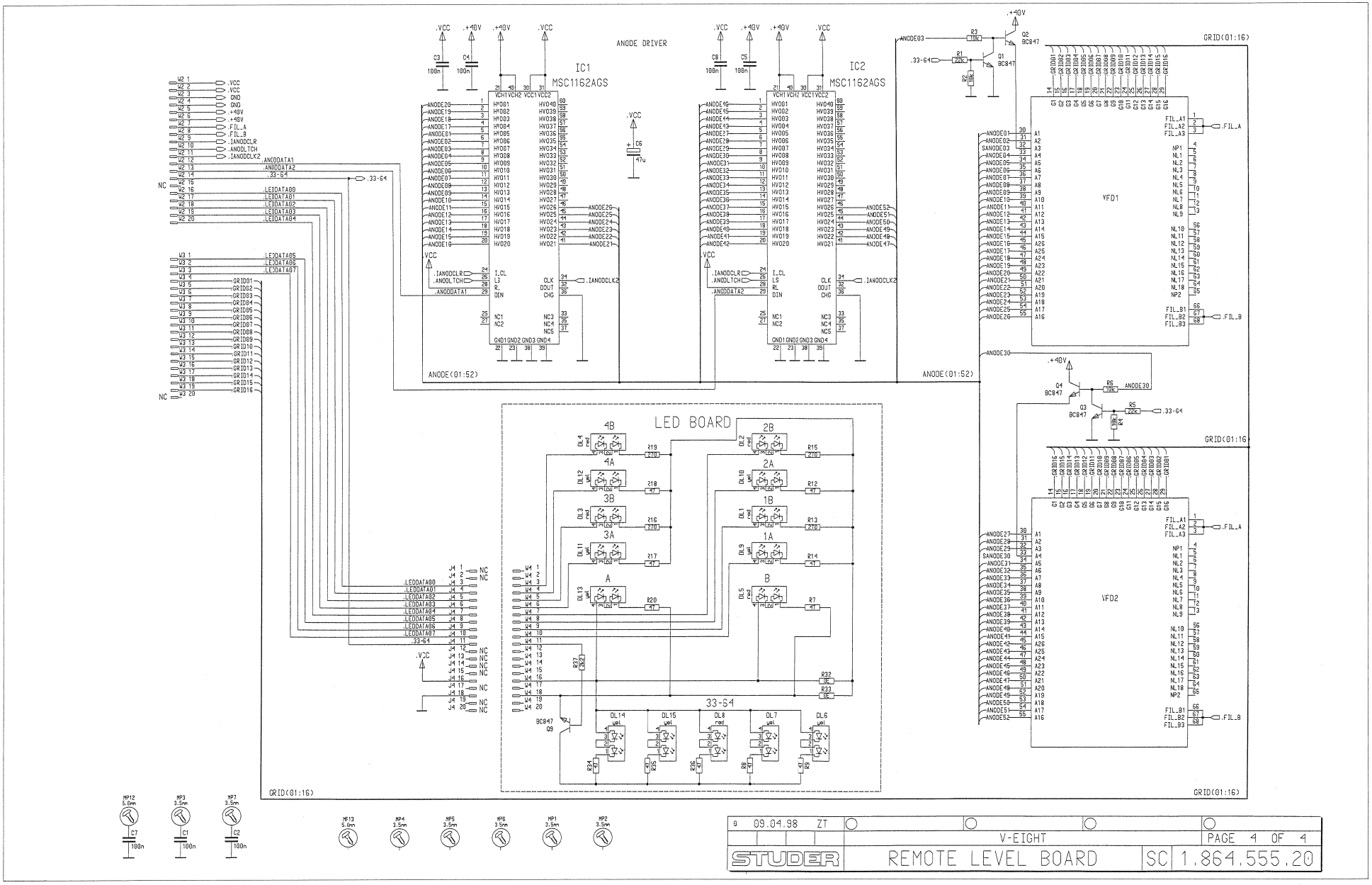
Remote Level Board 1.864.555.20



Remote Level Board 1.864.555.20

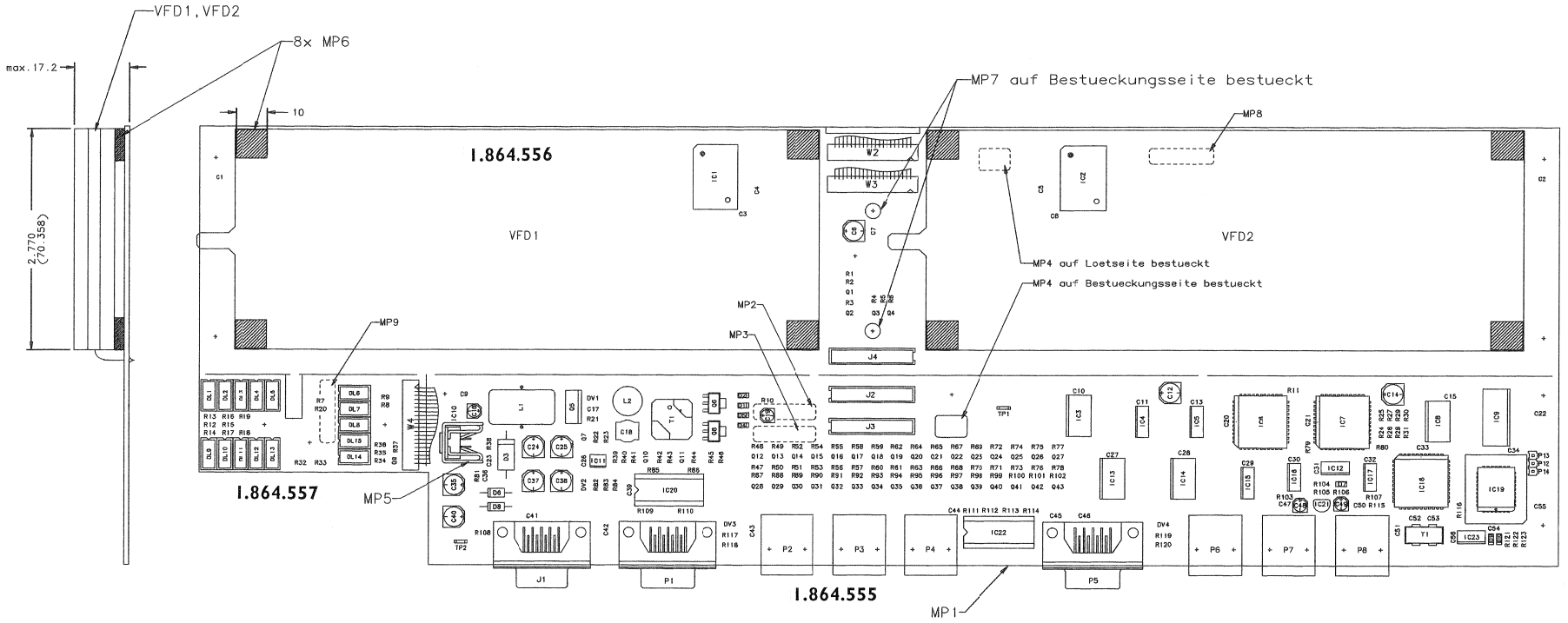


Remote Level Board 1.864.555.20



0	09.04.98	ZT	V-EIGHT	PAGE 4 OF 4
STUDER	REMOTE LEVEL BOARD		SC	1.864.555.20

Remote Level Board 1.864.555.20



Edition Ausgabe	Modification Aenderung					
		.	.	.	.	3
		.	.	.	.	2
		.	.	.	.	1
02.12.1998		ZT				0
Date Datum		Visa Gez.	Dessin Gepr.	Swiss Geo.		Index

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STUDER REGENSDORF — REMOTE LEVEL BOARD, ESE — Number/ Nummer: 1.864.555.20

Remote Level Board 1.864.555.20

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 2	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 3	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 4	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 5	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 6	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 7	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 8	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 9	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 10	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 11	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 12	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 13	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 14	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 15	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 16	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 17	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 18	59.05.2103		10n	PP, 2.5%, 63V
0	C 19	59.68.0129		2u2	C-EL 50V, 4.0*5.7
0	C 20	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 21	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 22	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 23	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 24	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 25	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 26	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 27	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 28	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 29	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 30	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 31	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 32	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 33	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 34	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 35	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 36	59.60.3331		33n	CER 50V, 10%, X7R, 0805
0	C 37	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 38	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 39	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 40	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 41	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 42	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 43	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 44	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 45	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 46	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 47	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 48	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 49	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 50	59.60.2249		100p	CER 50V, 5%, C0G, 0603
0	C 51	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 52	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 53	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 54	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 55	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 56	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	D 1	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 2	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 3	50.04.0519		1N5822	3A, Schottky
0	D 4	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 5	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 6	50.04.0512		1N5818	D 1N 5818, 1N 5819,
0	D 7	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 8	50.04.0105		1N4004	D 1 N 4004 ... 1 N 4007
0	D 9	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 10	50.60.8001		4448	200mA 75V 4ns SOD 80
0	DL 1	50.04.2605		2*red	2*LED Bar rot
0	DL 2	50.04.2605		2*red	2*LED Bar rot
0	DL 3	50.04.2605		2*red	2*LED Bar rot
0	DL 4	50.04.2605		2*red	2*LED Bar rot
0	DL 5	50.04.2604		2*yel	2*LED Bar gelb
0	DL 6	50.04.2604		2*yel	2*LED Bar gelb
0	DL 7	50.04.2604		2*yel	2*LED Bar gelb
0	DL 8	50.04.2604		2*yel	2*LED Bar gelb
0	DL 9	50.04.2604		2*yel	2*LED Bar gelb
0	DL 10	50.04.2604		2*yel	2*LED Bar gelb
0	DL 11	50.04.2604		2*yel	2*LED Bar gelb
0	DL 12	50.04.2604		2*yel	2*LED Bar gelb
0	DL 13	50.04.2604		2*yel	2*LED Bar gelb
0	DL 14	50.04.2604		2*yel	2*LED Bar gelb
0	DL 15	50.04.2604		2*yel	2*LED Bar gelb
0	DV 1	50.60.9011		5V6	5%, 0.2W, SOT 23
0	DV 2	50.60.9011		5V6	5%, 0.2W, SOT 23
0	DV 3	not used		5V1	5%, 0.2W, SOT 23
0	DV 4	not used		5V1	5%, 0.2W, SOT 23

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	IC 1	50.62.0005		MSC1162AG	High volt VFD grid driver
0	IC 2	50.62.0005		MSC1162AG	High volt VFD grid driver
0	IC 3	50.62.1273		74HC273	Octal D-FF with reset
0	IC 4	50.62.1165		74HC165	8bit shift register
0	IC 5	50.62.1165		74HC165	8bit shift register
0	IC 6	50.63.0206		SCC2692	Dual uni async receiver/transm
0	IC 7	50.63.0206		SCC2692	Dual uni async receiver/transm
0	IC 8	50.62.1573		74HC573	Octal D-type latch
0	IC 9	50.63.1502		6264	SRAM 8K*8, 120ns
0	IC 10	50.10.0122		L4960	L 4960,
0	IC 11	50.61.0202		LM358	Op-Amp single supply
0	IC 12	50.62.1393		74HC393	Dual ebit bin counter
0	IC 13	50.62.1273		74HC273	Octal D-FF with reset
0	IC 14	50.62.1273		74HC273	Octal D-FF with reset
0	IC 15	50.62.1138		74HC138	3 to 8 line decoder
0	IC 16	50.62.1086		74HC 86	Quad 2input EXOR
0	IC 17	50.62.1014		74HC 14	Hex Schmitt trigger inverter
0	IC 18	50.63.0009		80C652	MPU 8bit
0	IC 19	1.864.915.20			SW 555 Rem Level (50.63.1303)
0	IC 20	50.15.0128		34C86	IC DS 34 C 86 TN, MC34C86P ,A
0	IC 21	50.11.0160			IC MC 34 064P-5
0	IC 22	50.15.0128		34C86	IC DS 34 C 86 TN, MC34C86P ,A
0	IC 23	50.62.1000		74HC 00	Quad 2input NAND
0	J 1	54.13.0071		9p	D-Sub, FCB, Winkel
0	J 2	54.14.5620		20p	PCB-Buchse gerade
0	J 3	54.14.5620		20p	PCB-Buchse gerade
0	J 4	54.14.5620		20p	PCB-Buchse gerade
0	L 1	62.03.0025		250uH	2A Toroid Chocke
0	L 2	62.02.3102		1mH	10%, radial RM 5
0	MP 1	1.864.555.11			REMOTE LEVEL PCB
0	MP 2	1.864.555.10			NR.-ETIKETTE 5 * 20
0	MP 3	1.101.001.20		Label	TEXT-ETIK. 5*20 HARDWARE -20
0	MP 4	43.01.0108	2 pcs	Label	ESE-WARNSCHILD
0	MP 5	50.20.3011			Kühlkörper, TO 220, vertikal
0	MP 6	65.99.0167	8 pcs	Tape	POLYURH. KLEBBAND WS, 9* 3
0	MP 7	1.010.049.22	2 pcs		NIETMUTTER, M 3 * 10.0
0	MP 8	1.864.556.10			NR.-ETIKETTE 5 * 20
0	MP 9	1.864.557.10			NR.-ETIKETTE 5 * 20
0	P 1	54.13.0076		9p	D-Sub, FCB, Winkel
0	P 2	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 3	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 4	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 5	54.13.0076		9p	D-Sub, FCB, Winkel
0	P 6	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 7	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 8	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 12	not used		1p	Pin 0.63*0.63
0	P 13	not used		1p	Pin 0.63*0.63
0	P 14	not used		1p	Pin 0.63*0.63
0	Q 1	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 2	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 3	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 4	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 5	50.99.0106		BT138	Q BT 138 - 500 TRIAC
0	Q 6	50.60.0150		FZT653	NPN 100V 2.0A SOT 223
0	Q 7	50.60.0050		BC817-25	NPN 45V 800mA SOT 23
0	Q 8	50.60.0150		FZT653	NPN 100V 2.0A SOT 223
0	Q 9	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 10	50.60.0050		BC817-25	NPN 45V 800mA SOT 23
0	Q 11	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 12	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 13	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 14	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 15	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 16	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 17	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 18	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 19	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 20	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 21	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 22	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 23	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 24	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 25	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 26	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 27	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 28	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 29	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 30	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 31	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 32	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 33	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 34	50.60.0001		BC847B	NPN 45V 100mA SOT 23

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	Q 35	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 36	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 37	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 38	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 39	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 40	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 41	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 42	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 43	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	R 1	57.60.1223		22K	MF, 1%, 0204, E24
0	R 2	57.60.1103		10K	MF, 1%, 0204, E24
0	R 3	57.60.1103		10K	MF, 1%, 0204, E24
0	R 4	57.60.1103		10K	MF, 1%, 0204, E24
0	R 5	57.60.1223		22K	MF, 1%, 0204, E24
0	R 6	57.60.1103		10K	MF, 1%, 0204, E24
0	R 7	57.60.1470		47R	MF, 1%, 0204, E24
0	R 8	57.60.1470		47R	MF, 1%, 0204, E24
0	R 9	57.60.1470		47R	MF, 1%, 0204, E24
0	R 10	57.60.1223		22K	MF, 1%, 0204, E24
0	R 11	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 12	57.60.1470		47R	MF, 1%, 0204, E24
0	R 13	57.60.1271		270R	MF, 1%, 0204, E24
0	R 14	57.60.1470		47R	MF, 1%, 0204, E24
0	R 15	57.60.1271		270R	MF, 1%, 0204, E24
0	R 16	57.60.1271		270R	MF, 1%, 0204, E24
0	R 17	57.60.1470		47R	MF, 1%, 0204, E24
0	R 18	57.60.1470		47R	MF, 1%, 0204, E24
0	R 19	57.60.1271		270R	MF, 1%, 0204, E24
0	R 20	57.60.1470		47R	MF, 1%, 0204, E24
0	R 21	57.60.1102		1K	MF, 1%, 0204, E24
0	R 22	57.60.1105		1M	MF, 1%, 0204, E24
0	R 23	57.60.1104		100K	MF, 1%, 0204, E24
0	R 24	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 25	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 26	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 27	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 28	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 29	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 30	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 31	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 32	not used		0R0	MF, 0204
0	R 33	57.60.1000		0R0	MF, 0204
0	R 34	57.50.1470		47R	MF, 1%, 0204, E24
0	R 35	57.50.1470		47R	MF, 1%, 0204, E24
0	R 36	57.50.1470		47R	MF, 1%, 0204, E24
0	R 37	57.50.1222		2K2	MF, 1%, 0204, E24
0	R 38	57.50.1123		12K	MF, 1%, 0204, E24
0	R 39	57.50.1684		680K	MF, 1%, 0204, E24
0	R 40	57.50.1224		220K	MF, 1%, 0204, E24
0	R 41	57.50.1104		100K	MF, 1%, 0204, E24
0	R 42	57.50.1104		100K	MF, 1%, 0204, E24
0	R 43	57.50.1223		22K	MF, 1%, 0204, E24
0	R 44	57.50.1103		10K	MF, 1%, 0204, E24
0	R 45	57.50.1471		470R	MF, 1%, 0204, E24
0	R 46	57.50.1471		470R	MF, 1%, 0204, E24
0	R 47	57.50.1152		1K5	MF, 1%, 0204, E24
0	R 48	57.50.1223		22K	MF, 1%, 0204, E24
0	R 49	57.60.1223		22K	MF, 1%, 0204, E24
0	R 50	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 51	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 52	57.60.1223		22K	MF, 1%, 0204, E24
0	R 53	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 54	57.60.1223		22K	MF, 1%, 0204, E24
0	R 55	57.60.1223		22K	MF, 1%, 0204, E24
0	R 56	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 57	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 58	57.60.1223		22K	MF, 1%, 0204, E24
0	R 59	57.60.1223		22K	MF, 1%, 0204, E24
0	R 60	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 61	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 62	57.60.1223		22K	MF, 1%, 0204, E24
0	R 63	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 64	57.60.1223		22K	MF, 1%, 0204, E24
0	R 65	57.60.1223		22K	MF, 1%, 0204, E24
0	R 66	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 67	57.60.1223		22K	MF, 1%, 0204, E24
0	R 68	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 69	57.60.1223		22K	MF, 1%, 0204, E24
0	R 70	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 71	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 72	57.60.1223		22K	MF, 1%, 0204, E24
0	R 73	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 74	57.60.1223		22K	MF, 1%, 0204, E24
0	R 75	57.60.1223		22K	MF, 1%, 0204, E24
0	R 76	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 77	57.60.1223		22K	MF, 1%, 0204, E24

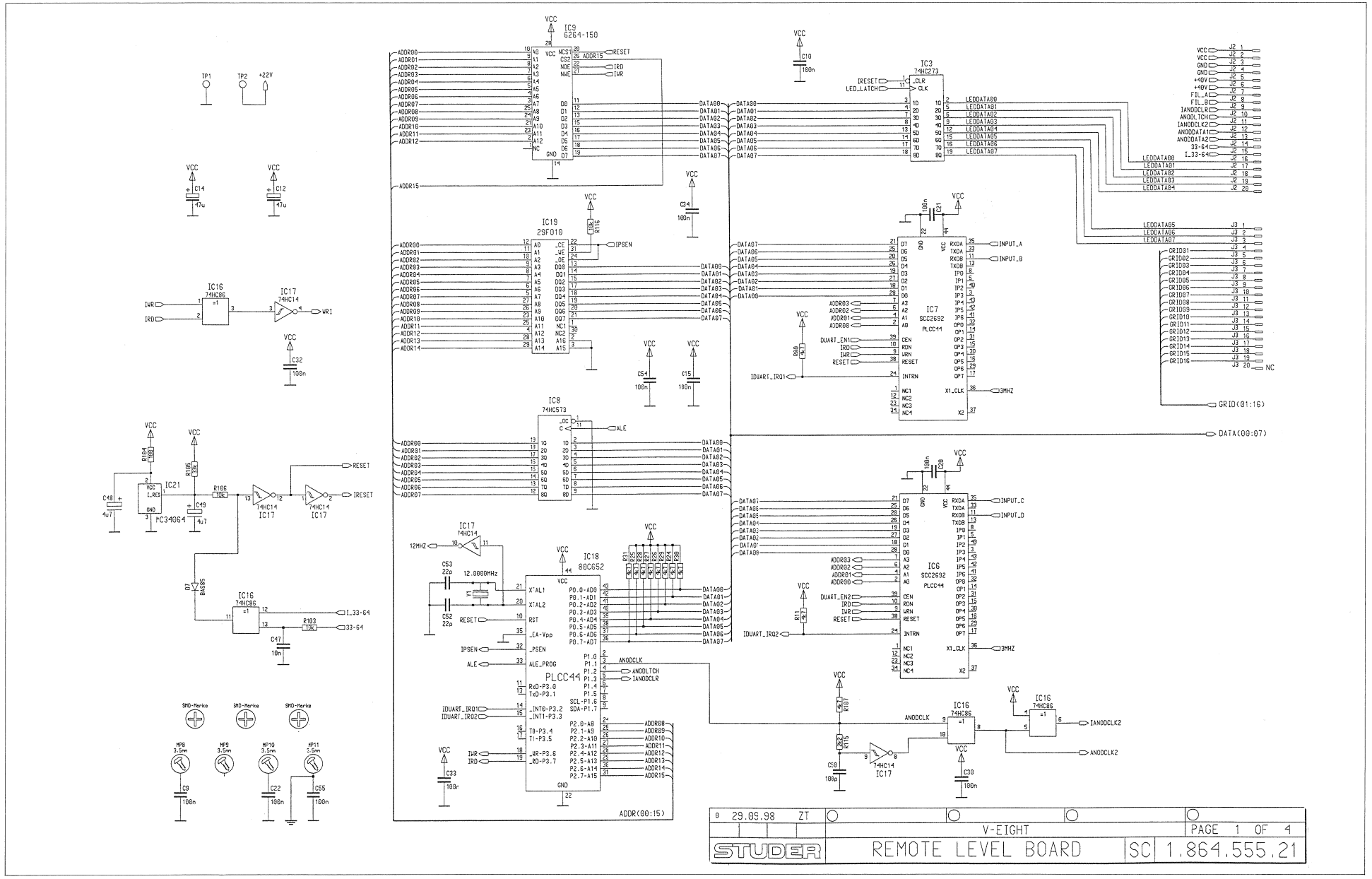
Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 78	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 79	57.60.1101		100R	MF, 1%, 0204, E24
0	R 80	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 81	57.60.1153		15K	MF, 1%, 0204, E24
0	R 82	57.60.1223		22K	MF, 1%, 0204, E24
0	R 83	57.60.1124		120K	MF, 1%, 0204, E24
0	R 84	57.60.1563		56K	MF, 1%, 0204, E24
0	R 85	57.60.1221		220R	MF, 1%, 0204, E24
0	R 86	57.60.1221		220R	MF, 1%, 0204, E24
0	R 87	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 88	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 89	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 90	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 91	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 92	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 93	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 94	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 95	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 96	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 97	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 98	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 99	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 100	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 101	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 102	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 103	57.60.1103		10K	MF, 1%, 0204, E24
0	R 104	57.60.1101		100R	MF, 1%, 0204, E24
0	R 105	57.60.1333		33K	MF, 1%, 0204, E24
0	R 106	57.60.1103		10K	MF, 1%, 0204, E24
0	R 107	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 108	57.60.1000		0R0	MF, 0204
0	R 109	57.60.1221		220R	MF, 1%, 0204, E24
0	R 110	57.60.1221		220R	MF, 1%, 0204, E24
0	R 111	57.60.1221		220R	MF, 1%, 0204, E24
0	R 112	57.60.1221		220R	MF, 1%, 0204, E24
0	R 113	57.60.1221		220R	MF, 1%, 0204, E24
0	R 114	57.60.1221		220R	MF, 1%, 0204, E24
0	R 115	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 116	57.60.1103		10K	MF, 1%, 0204, E24
0	R 117	57.60.1153		15K	MF, 1%, 0204, E24
0	R 118	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 119	57.60.1153		15K	MF, 1%, 0204, E24
0	R 120	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 121	57.60.1103		10K	MF, 1%, 0204, E24
0	R 122	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 123	57.60.1103		10K	MF, 1%, 0204, E24
0	T 1	1.022.656.00			TRAFO VF-DISPLAY
0	TP 1	54.33.6010		2.8*0.8	PCB-Flachstecker, gerade
0	TP 2	54.33.6010		2.8*0.8	PCB-Flachstecker, gerade
0	VFD 1	1.864.555.01			LEVELMETER DISPLAY
0	VFD 2	1.864.555.01			LEVELMETER DISPLAY
0	W 2	1.023.567.02		Ribbon20p	FLACHKABEL 20 POL. 0,11M
0	W 3	1.023.567.03		Ribbon20p	FLACHKABEL 20 POL. 0,125M
0	W 4	1.023.392.07			FLACHKABEL 20 POL. 0,06M
0	XIC 19	53.03.2232		32p	PLCC-Socket
0	XIC 20	53.03.0168		16p	DIL 0.3", löt, gerade
0	XIC 22	53.03.0168		16p	DIL 0.3", löt, gerade
0	Y 1	89.60.1003		12.000MHz	SMD Quartz

End of List

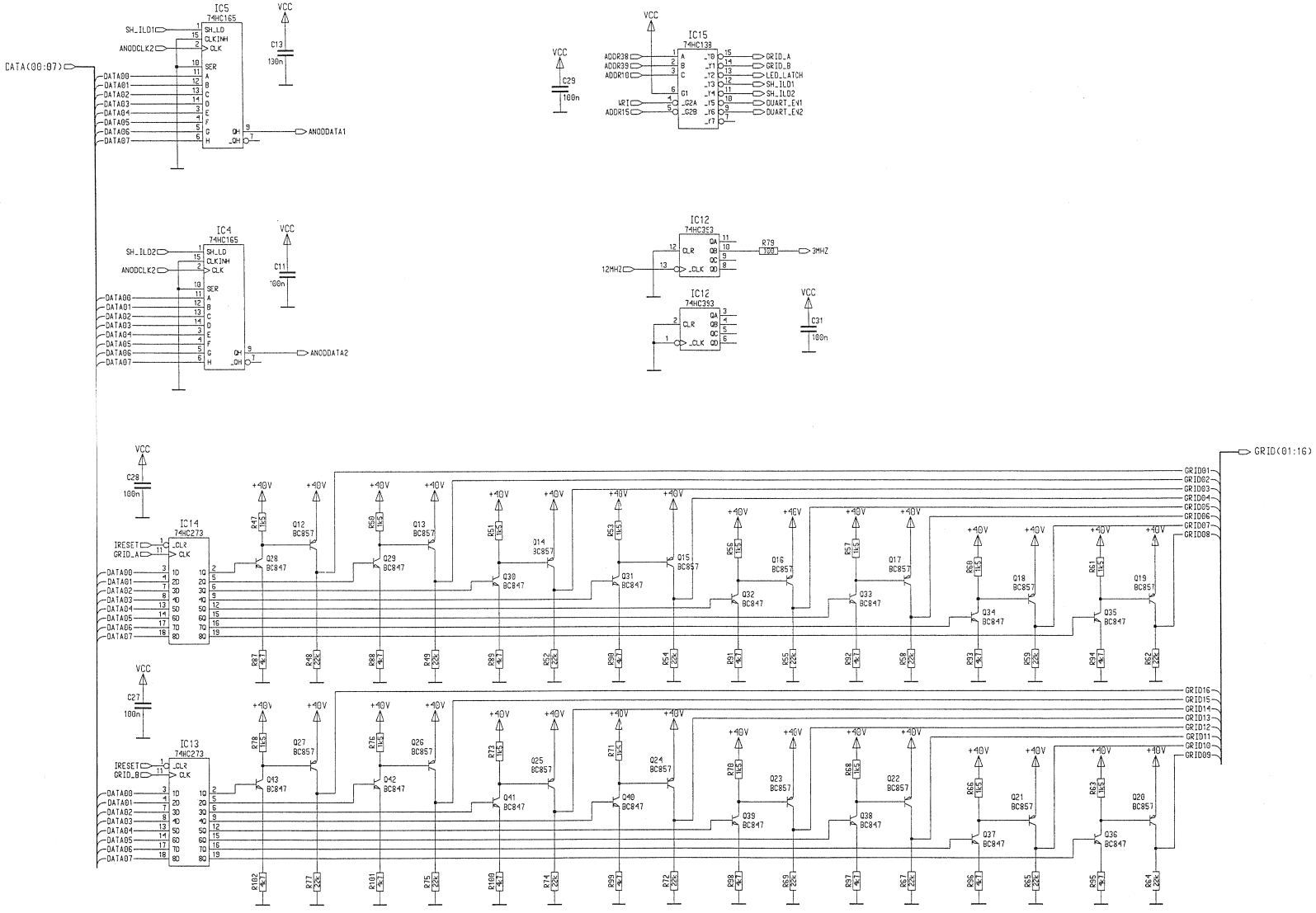
Comments

XICnn entsprechend den IC- Nummern bestueckt.

Remote Level Board 1.864.555.21

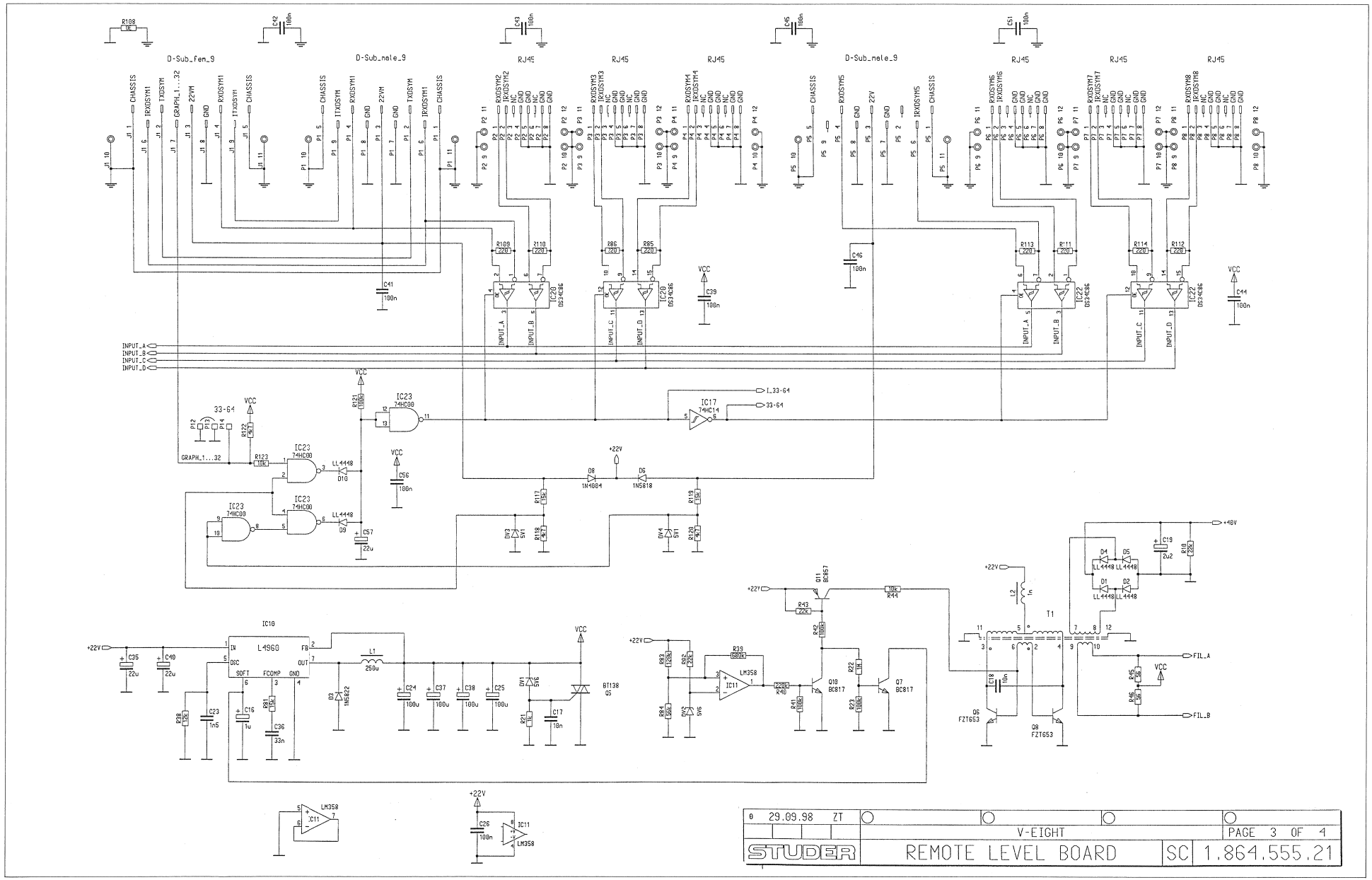


Remote Level Board 1.864.555.21



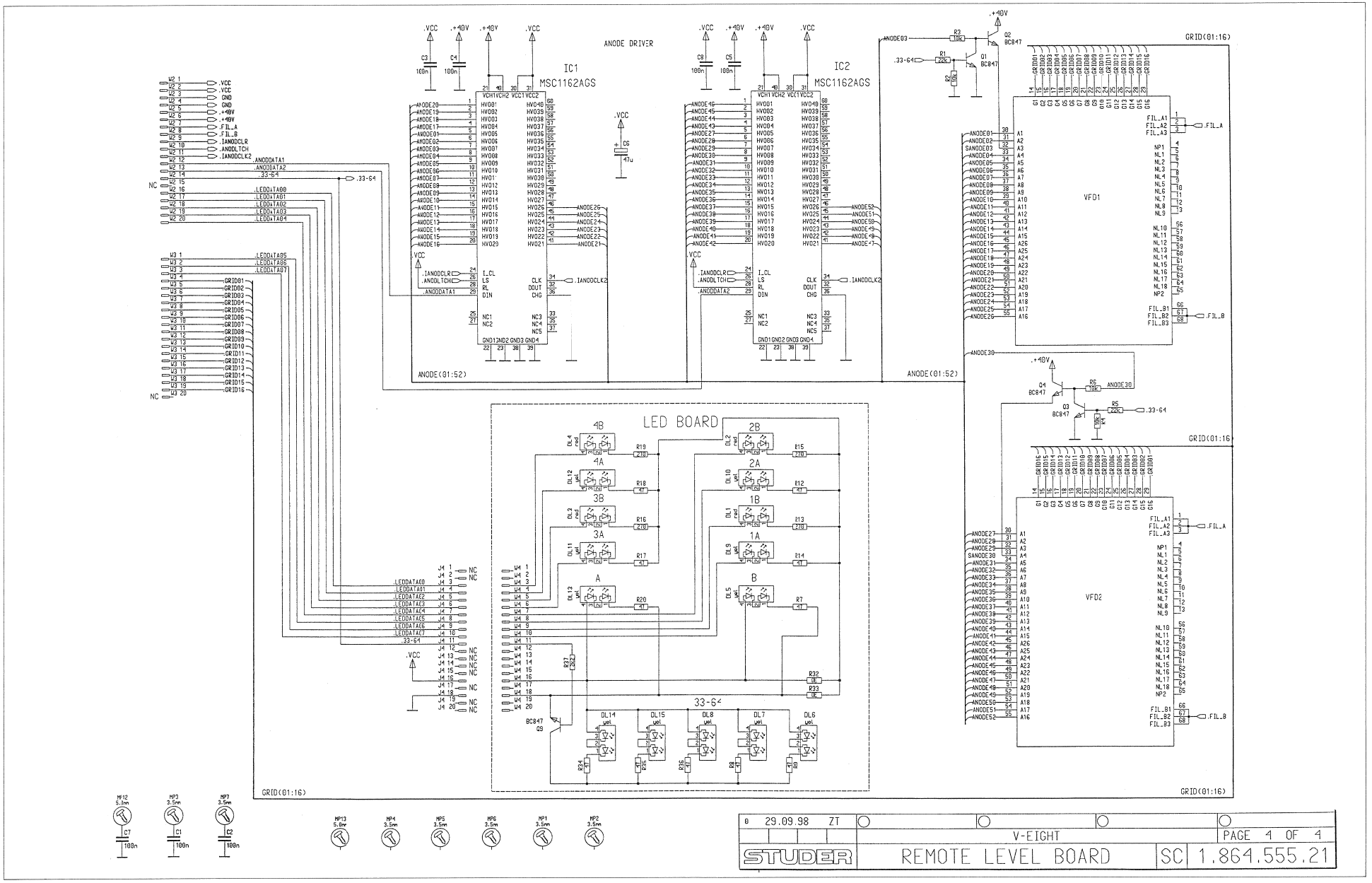
0 29.09.98 ZT				PAGE 2 OF 4
		V-EIGHT		
STUDER	REMOTE LEVEL BOARD		SC	1.864.555.21

Remote Level Board 1.864.555.21



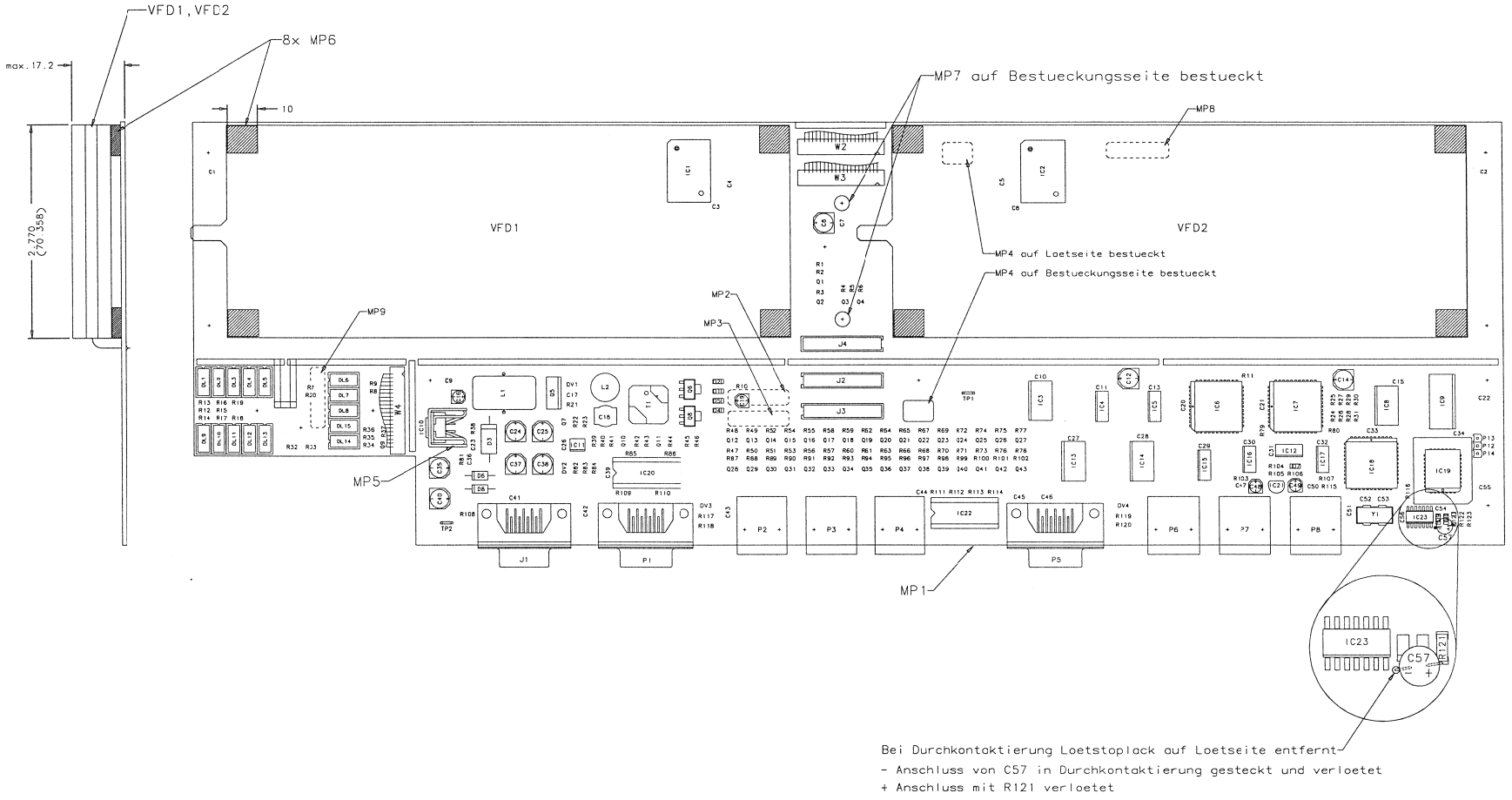
0 29.09.98 ZT				
	V-EIGHT			PAGE 3 OF 4
STUDER	REMOTE LEVEL BOARD		SC	1.864.555.21

Remote Level Board 1.864.555.21



0	29.09.98	ZT	V-EIGHT	PAGE 4 OF 4
STUDER	REMOTE LEVEL BOARD		SC	1.864.555.21

Remote Level Board 1.864.555.21



Bei Durchkontaktierung Loetstoplack auf Loetseite entfernt
- Anschluss von C57 in Durchkontaktierung gesteckt und verloetet
+ Anschluss mit R121 verloetet

Edition / Ausgabe	Modification / Aenderung				
		.	.	.	3
		.	.	.	2
		.	.	.	1
29.09.1998	ZT				0
Date / Datum		Visa / Gez.	Dekad / Oper.	Seen / Ges.	Index

Copy to: / Kopie fuer: -

STUDER REGENSDORF — Description / Benennung: REMOTE LEVEL BOARD, ESE — Number / Nummer: 1.864.555.21

Remote Level Board 1.864.555.21

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	C 1	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 2	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 3	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 4	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 5	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 6	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 7	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 8	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 9	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 10	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 11	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 12	59.68.0069		47u	C-EL 16V, 6.3*5.7
0	C 13	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 14	59.68.0059		47u	C-EL 16V, 6.3*5.7
0	C 15	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 16	59.68.0127		1u0	C-EL 50V, 4.0*5.7
0	C 17	59.60.3325		10n	CER 50V, 10%, X7R, 0805
0	C 18	59.05.2133		10n	PP, 2.5%, 63V
0	C 19	59.68.0129		2u2	C-EL 50V, 4.0*5.7
0	C 20	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 21	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 22	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 23	59.60.3315		1n5	CER 50V, 10%, X7R, 0805
0	C 24	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 25	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 26	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 27	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 28	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 29	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 30	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 31	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 32	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 33	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 34	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 35	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 36	59.60.3331		33n	CER 50V, 10%, X7R, 0805
0	C 37	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 38	59.68.0029		100u	C-EL 6V, 6.3*5.7
0	C 39	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 40	59.68.0111		22u	C-EL 35V, 6.3*5.7
0	C 41	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 42	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 43	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 44	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 45	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 46	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 47	59.60.3525		10n	CER 50V, 10%, X7R, 0805
0	C 48	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 49	59.68.0107		4u7	C-EL 35V, 4.0*5.7
0	C 50	59.60.2249		100p	CER 50V, 5%, C0G, 0603
0	C 51	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 52	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 53	59.60.2233		22p	CER 50V, 5%, C0G, 0603
0	C 54	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 55	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 56	59.60.3337		100n	CER 50V, 10%, X7R, 0805
0	C 57	59.22.5220		22u	EL 25V, 20%, RM5
0	D 1	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 2	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 3	50.04.0519		1N5822	3A, Schottky
0	D 4	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 5	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 6	50.04.0512		1N5818	D 1N 5818, 1N 5819,
0	D 7	50.60.8101		BAS85	200mA 30V Schottky SOD 80
0	D 8	50.04.0105		1N4004	D 1 N 4004 ... 1 N 4007
0	D 9	50.60.8001		4448	200mA 75V 4ns SOD 80
0	D 10	50.60.8001		4448	200mA 75V 4ns SOD 80
0	DL 1	50.04.2605		2*red	2*LED Bar rot
0	DL 2	50.04.2605		2*red	2*LED Bar rot
0	DL 3	50.04.2605		2*red	2*LED Bar rot
0	DL 4	50.04.2605		2*red	2*LED Bar rot
0	DL 5	50.04.2604		2*yel	2*LED Bar gelb
0	DL 6	50.04.2604		2*yel	2*LED Bar gelb
0	DL 7	50.04.2604		2*yel	2*LED Bar gelb
0	DL 8	50.04.2604		2*yel	2*LED Bar gelb
0	DL 9	50.04.2604		2*yel	2*LED Bar gelb
0	DL 10	50.04.2604		2*yel	2*LED Bar gelb
0	DL 11	50.04.2604		2*yel	2*LED Bar gelb
0	DL 12	50.04.2604		2*yel	2*LED Bar gelb
0	DL 13	50.04.2604		2*yel	2*LED Bar gelb
0	DL 14	50.04.2604		2*yel	2*LED Bar gelb
0	DL 15	50.04.2604		2*yel	2*LED Bar gelb
0	DV 1	50.60.9011		5V6	5%, 0.2W, SOT 23

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	DV 2	50.60.9011		5V6	5%, 0.2W, SOT 23
0	DV 3	not used		5V1	5%, 0.2W, SOT 23
0	DV 4	not used		5V1	5%, 0.2W, SOT 23
0	IC 1	50.62.0005		MSC1162AG	High volt VFD grid driver
0	IC 2	50.62.0005		MSC1162AG	High volt VFD grid driver
0	IC 3	50.62.1273		74HC273	Octal D-FF with reset
0	IC 4	50.62.1165		74HC165	8bit shift register
0	IC 5	50.62.1165		74HC165	8bit shift register
0	IC 6	50.63.0206		SCC2692	Dual uni async receiver/transm
0	IC 7	50.63.0206		SCC2692	Dual uni async receiver/transm
0	IC 8	50.62.1573		74HC573	Octal D-type latch
0	IC 9	50.63.1502		6264	SRAM 8K*8, 120ns
0	IC 10	50.10.0122		L4960	L 4960,
0	IC 11	50.61.0202		LM358	Op-Amp single supply
0	IC 12	50.62.1393		74HC393	Dual 4bit bin counter
0	IC 13	50.62.1273		74HC273	Octal D-FF with reset
0	IC 14	50.62.1273		74HC273	Octal D-FF with reset
0	IC 15	50.62.1138		74HC138	3 to 8 line decoder
0	IC 16	50.62.1086		74HC 86	Quad 2Input EXOR
0	IC 17	50.62.1014		74HC 14	Hex Schmitt trigger inverter
0	IC 18	50.63.0009		80C652	MPU 8bit
0	IC 19	1.864.915.21			SW 555 Rem Level (50.63.1303)
0	IC 20	50.15.0128		34C86	IC DS 34 C 86 TN, MC34C86P ,A
0	IC 21	50.11.0160			IC MC 34 064P-5,
0	IC 22	50.15.0128		34C86	IC DS 34 C 86 TN, MC34C86P ,A
0	IC 23	50.62.1000		74HC 00	Quad 2Input NAND
0	J 1	54.13.0071		9p	D-Sub, PCB, Winkel
0	J 2	54.14.5520		20p	PCB-Buchse gerade
0	J 3	54.14.5520		20p	PCB-Buchse gerade
0	J 4	54.14.5520		20p	PCB-Buchse gerade
0	L 1	62.03.0025		250uH	2A Toroid Chocke
0	L 2	62.02.3102		1mH	10%, radial RM 5
0	MP 1	1.864.555.11			REMOTE LEVEL PCB
0	MP 2	1.864.555.10			NR.-ETIKETTE 5 * 20
0	MP 3	1.101.001.21			TEXT-ETIK. 5*20 HARDWARE -21
0	MP 4	43.01.0108	2 pcs	Label	ESE-WARNSCHILD
0	MP 5	50.20.3011			Kühlkörper, TO 220, vertikal
0	MP 6	65.99.0167	8 pcs	Tape	POLYURH. KLEBBAND WS, 9* 3
0	MP 7	1.010.049.22	2 pcs		NIETMUTTER, M 3 * 10.0
0	MP 8	1.864.556.10			NR.-ETIKETTE 5 * 20
0	MP 9	1.864.557.10			NR.-ETIKETTE 5 * 20
0	P 1	54.13.0076		9p	D-Sub, PCB, Winkel
0	P 2	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 3	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 4	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 5	54.13.0076		9p	D-Sub, PCB, Winkel
0	P 6	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 7	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 8	54.20.1001		8p	RJ 45 Modular Jack side entry
0	P 12	not used		1p	Pin 0.63*0.63
0	P 13	not used		1p	Pin 0.63*0.63
0	P 14	not used		1p	Pin 0.63*0.63
0	Q 1	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 2	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 3	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 4	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 5	50.99.0106		BT138	Q BT 138 - 500 TRIAC
0	Q 6	50.60.0150		FZT653	NPN 100V 2.0A SOT 223
0	Q 7	50.60.0050		BC817-25	NPN 45V 800mA SOT 23
0	Q 8	50.60.0150		FZT653	NPN 100V 2.0A SOT 223
0	Q 9	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 10	50.60.0050		BC817-25	NPN 45V 800mA SOT 23
0	Q 11	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 12	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 13	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 14	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 15	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 16	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 17	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 18	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 19	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 20	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 21	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 22	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 23	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 24	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 25	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 26	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 27	50.60.1001		BC857B	PNP 45V 100mA SOT 23
0	Q 28	50.60.0001		BC847B	NPN 45V 100mA SOT 23

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	Q 29	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 30	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 31	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 32	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 33	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 34	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 35	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 36	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 37	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 38	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 39	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 40	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 41	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 42	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	Q 43	50.60.0001		BC847B	NPN 45V 100mA SOT 23
0	R 1	57.30.1223		22K	MF, 1%, 0204, E24
0	R 2	57.30.1103		10K	MF, 1%, 0204, E24
0	R 3	57.30.1103		10K	MF, 1%, 0204, E24
0	R 4	57.30.1103		10K	MF, 1%, 0204, E24
0	R 5	57.30.1223		22K	MF, 1%, 0204, E24
0	R 6	57.30.1103		10K	MF, 1%, 0204, E24
0	R 7	57.30.1470		47R	MF, 1%, 0204, E24
0	R 8	57.30.1470		47R	MF, 1%, 0204, E24
0	R 9	57.30.1470		47R	MF, 1%, 0204, E24
0	R 10	57.30.1223		22K	MF, 1%, 0204, E24
0	R 11	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 12	57.30.1470		47R	MF, 1%, 0204, E24
0	R 13	57.30.1271		270R	MF, 1%, 0204, E24
0	R 14	57.30.1470		47R	MF, 1%, 0204, E24
0	R 15	57.30.1271		270R	MF, 1%, 0204, E24
0	R 16	57.30.1271		270R	MF, 1%, 0204, E24
0	R 17	57.30.1470		47R	MF, 1%, 0204, E24
0	R 18	57.30.1470		47R	MF, 1%, 0204, E24
0	R 19	57.30.1271		270R	MF, 1%, 0204, E24
0	R 20	57.30.1470		47R	MF, 1%, 0204, E24
0	R 21	57.30.1102		1K	MF, 1%, 0204, E24
0	R 22	57.30.1105		1M	MF, 1%, 0204, E24
0	R 23	57.30.1104		100K	MF, 1%, 0204, E24
0	R 24	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 25	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 26	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 27	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 28	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 29	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 30	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 31	57.30.1472		4K7	MF, 1%, 0204, E24
0	R 32	not used		0R0	MF, 0204
0	R 33	57.30.1000		0R0	MF, 0204
0	R 34	57.30.1470		47R	MF, 1%, 0204, E24
0	R 35	57.30.1470		47R	MF, 1%, 0204, E24
0	R 36	57.30.1470		47R	MF, 1%, 0204, E24
0	R 37	57.30.1222		2K2	MF, 1%, 0204, E24
0	R 38	57.30.1123		12K	MF, 1%, 0204, E24
0	R 39	57.30.1684		680K	MF, 1%, 0204, E24
0	R 40	57.30.1224		220K	MF, 1%, 0204, E24
0	R 41	57.30.1104		100K	MF, 1%, 0204, E24
0	R 42	57.30.1104		100K	MF, 1%, 0204, E24
0	R 43	57.30.1223		22K	MF, 1%, 0204, E24
0	R 44	57.30.1103		10K	MF, 1%, 0204, E24
0	R 45	57.30.1560		56R	MF, 1%, 0204, E24
0	R 46	57.30.1560		56R	MF, 1%, 0204, E24
0	R 47	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 48	57.30.1223		22K	MF, 1%, 0204, E24
0	R 49	57.30.1223		22K	MF, 1%, 0204, E24
0	R 50	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 51	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 52	57.30.1223		22K	MF, 1%, 0204, E24
0	R 53	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 54	57.30.1223		22K	MF, 1%, 0204, E24
0	R 55	57.30.1223		22K	MF, 1%, 0204, E24
0	R 56	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 57	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 58	57.30.1223		22K	MF, 1%, 0204, E24
0	R 59	57.30.1223		22K	MF, 1%, 0204, E24
0	R 60	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 61	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 62	57.30.1223		22K	MF, 1%, 0204, E24
0	R 63	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 64	57.30.1223		22K	MF, 1%, 0204, E24
0	R 65	57.30.1223		22K	MF, 1%, 0204, E24
0	R 66	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 67	57.30.1223		22K	MF, 1%, 0204, E24
0	R 68	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 69	57.30.1223		22K	MF, 1%, 0204, E24
0	R 70	57.30.1152		1K5	MF, 1%, 0204, E24
0	R 71	57.30.1152		1K5	MF, 1%, 0204, E24

Idx	Pos.	Part No.	Qty.	Type/Val.	Description
0	R 72	57.60.1223		22K	MF, 1%, 0204, E24
0	R 73	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 74	57.60.1223		22K	MF, 1%, 0204, E24
0	R 75	57.60.1223		22K	MF, 1%, 0204, E24
0	R 76	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 77	57.60.1223		22K	MF, 1%, 0204, E24
0	R 78	57.60.1152		1K5	MF, 1%, 0204, E24
0	R 79	57.60.1101		100R	MF, 1%, 0204, E24
0	R 80	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 81	57.60.1153		15K	MF, 1%, 0204, E24
0	R 82	57.60.1223		22K	MF, 1%, 0204, E24
0	R 83	57.60.1124		120K	MF, 1%, 0204, E24
0	R 84	57.60.1563		56K	MF, 1%, 0204, E24
0	R 85	57.60.1221		220R	MF, 1%, 0204, E24
0	R 86	57.60.1221		220R	MF, 1%, 0204, E24
0	R 87	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 88	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 89	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 90	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 91	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 92	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 93	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 94	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 95	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 96	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 97	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 98	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 99	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 100	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 101	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 102	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 103	57.60.1103		10K	MF, 1%, 0204, E24
0	R 104	57.60.1101		100R	MF, 1%, 0204, E24
0	R 105	57.60.1333		33K	MF, 1%, 0204, E24
0	R 106	57.60.1103		10K	MF, 1%, 0204, E24
0	R 107	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 108	57.60.1000		0R0	MF, 0204
0	R 109	57.60.1221		220R	MF, 1%, 0204, E24
0	R 110	57.60.1221		220R	MF, 1%, 0204, E24
0	R 111	57.60.1221		220R	MF, 1%, 0204, E24
0	R 112	57.60.1221		220R	MF, 1%, 0204, E24
0	R 113	57.60.1221		220R	MF, 1%, 0204, E24
0	R 114	57.60.1221		220R	MF, 1%, 0204, E24
0	R 115	57.60.1222		2K2	MF, 1%, 0204, E24
0	R 116	57.60.1103		10K	MF, 1%, 0204, E24
0	R 117	57.60.1153		15K	MF, 1%, 0204, E24
0	R 118	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 119	57.60.1153		15K	MF, 1%, 0204, E24
0	R 120	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 121	57.60.1104		100K	MF, 1%, 0204, E24
0	R 122	57.60.1472		4K7	MF, 1%, 0204, E24
0	R 123	57.60.1103		10K	MF, 1%, 0204, E24
0	T 1	1.022.656.00			TRAFO VF-DISPLAY
0	TP 1	54.33.6010		2.8*0.8	PCB-Flachstecker, gerade
0	TP 2	54.33.6010		2.8*0.8	PCB-Flachstecker, gerade
0	VFD 1	1.864.555.01			LEVELMETER DISPLAY
0	VFD 2	1.864.555.01			LEVELMETER DISPLAY
0	W 2	1.023.567.02		Ribbon20p	FLACHKABEL 20 POL. 0,11M
0	W 3	1.023.567.03		Ribbon20p	FLACHKABEL 20 POL. 0,125M
0	W 4	1.023.567.04		Ribbon20p	FLACHKABEL 20 POL. 0,04M
0	XIC 19	53.03.2232		PLCC32p	PLCC-Socket 32p
0	XIC 20	53.03.0168		16p	DIL 0.3", löt, gerade
0	XIC 22	53.03.0168		16p	DIL 0.3", löt, gerade
0	Y 1	89.60.1003		12.000MHz	SMD Quartz

End of List

Comments

XICnn entsprechend den IC- Nummern bestueckt.