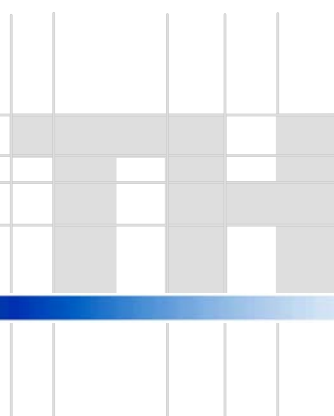
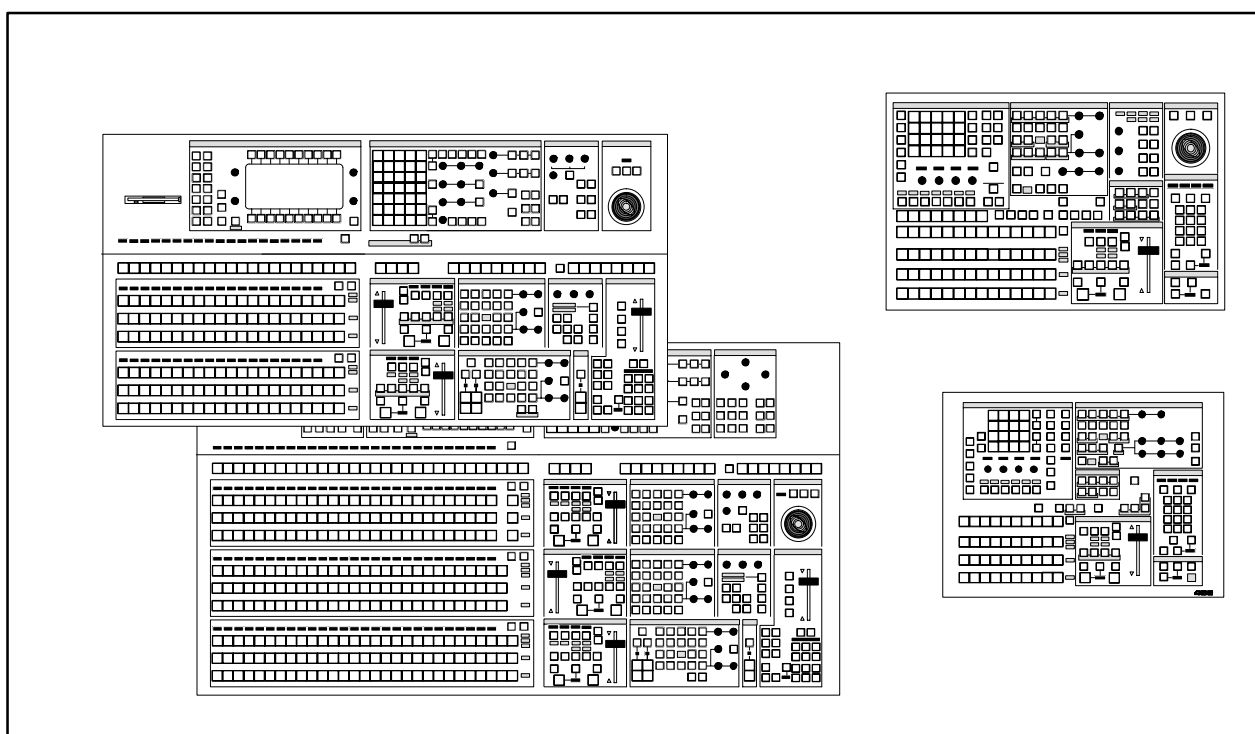


Production Switchers



DD5 / DD10 / DD20 / DD30



Planning & Installation



Published by



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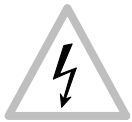
SAFETY INSTRUCTIONS

Safety regulations



The **DD** switcher is designed in conformity with the safety regulations EN60950 / VDE 0805 (protection class 1) and are in an unobjectionable condition when leaving the factory.

Information on the following pages provides important safety guidelines for Operators and Service Personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear here. Please read and follow the important safety information, noting especially those instructions related to risk of fire, electrical shock or injury to person.



Warning:

Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than contained in the manual unless you are qualified to do so.

Heavy weight

With the standard modules installed, the E Box and panels are heavy. During installation and until secured in the rack or the desk, use an appropriate lifting device to lift and support the mainframe. Failure to follow this precaution can result in injury to personnel and damage to equipment.

Installation

The equipment shall be installed in Restricted Access Areas.

The switcher is designed for operation with one-phase mains earthed neutral conductor. When setting up and connecting the switcher, connect the external earth line **always** before connecting the power line.

Thus is ensured that in case of a short-circuit between mains and case, the voltage is led to earth.

For this reason, **never** disconnect the earth line from the device while it is operated. The switcher must be only connected to an earthed socket. Check functioning of the protective conductors. It must not be live. Any discontinuity in the protective conductor may lead to a situation in which operational safety of the switcher can not longer guaranteed. Earthing has to be performed according to the regional safety regulations. When installing the lines, it is necessary to observe the national standards.

Ventilation

When mounting the switcher EBox and panel, care should be taken to allow for adequate air circulation. Detailed information you can find in the respective sections in the installation manual of the switchers. Keep the EBox door always closed during operation.

- The admissible ambient temperature range of the switcher is within +5°C and +35°C. Optimum operation is ensured at an ambient temperature of 25 °C ± 5 °C.
- Make sure that the switcher is protected against humidity and keep dry!

Mains voltage

Depending on the order of the customer, the switcher is adjusted to operate on 115V or 230V. The respective adjustment is indicated on the connector panel of the unit. Before connecting power to the switcher, make sure that the voltage adjustment in the unit corresponds with the line voltage available in the studio.

Switching-over to another line voltage has to be carried out by qualified service personnel.

Fuses

Caution – Double-pole or neutral fusing! After acting of the protective devices, parts of the equipment may remain under voltage. Each main input is protected by two primary-side fuses located on the power terminal of the switchers units (mainframe, panel). Additionally, the power supply units will be protected by internal fuses.

When replacing the fuses, make sure that a fuse link of same type and same current rating is used. Never use a mended fuse! Do not short-circuit the fuseholder!

During operation

Operate the switcher in the closed condition only, i.e. the mainframe with closed door and locked panel. There are no parts inside the unit to be adjusted by the user or parts to be exchanged.

Caution: **Opening the mainframe door or the panel desk may give access to live parts.**

In such cases, the unit has to be disconnected completely from the mains.

If, however, working on the opened mainframe or opened panel is inevitable, this has only to be done by qualified service personnel being informed about the dangers involved.

Attention! Capacitors may still carry a residual charge!

If, for example, due to a failure, safe operation of the switcher is no longer ensured, put the switcher out of operation and secure it against further use.

Do not insert or remove plug-in cards during operation.

Make sure that no parts protrude into the air conditioning holes. This might lead to contact with dangerous voltages or to damages of sensitive circuit parts.

To prevent damages in the control panel gear no drinks in top of the desk. Penetrated liquids can lead to destroying the control panel boards. Make sure that no small parts (e.g. office parenthesis) fall into the opening under the levers. This can lead to short-circuits and damages.

Connecting cables

The EMV regulations are only applicable when correctly shielded cables are used for the installation of the equipment. This applies to video cables as well as control cables. Corresponding cables can be obtained from BTS.

Run all connection cables in covered cable ducts (risk of stumbling).

For main connection, only use the supplied connection cable or a checked cable of the same type.

Batteries

The controller boards of the DD switchers contains a lithium battery, which has to be exchanged every five years. Detailed information you can find in the section *Exchange of the lithium battery* in the service manual.

Used batteries must be disposed of carefully to avoid environmental damage.

SICHERHEITSHINWEISE

Sicherheitsbestimmungen



Die DD Mischer entsprechen den Sicherheitsbestimmungen von EN60950 / VDE 0805 (Schutzklasse 1) und haben das Werk in sicherheitstechnisch einwandfreiem Zustand verlassen.

Um diesen Zustand zu erhalten und einen gefahrlosen Betrieb sicherzustellen, sind die nachfolgenden und die in den einzelnen Abschnitten des Handbuchs aufgeführten Sicherheitshinweise, insbesondere die Hinweise bezüglich Brandgefahr, elektrischer Schlag und Verletzungsgefahren, zu beachten:



Achtung:

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahren eines elektrischen Schlages (hohe Spannungen, gefährliche Energien), Brandgefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten, insbesondere wenn Gehäuseteile geöffnet werden, strikt die Angaben in der entsprechenden Anleitung zu befolgen. Andere als die angegebenen Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

Hohes Gewicht

Mit den Standard-Modulen bestückt wiegt die E-Box des DD20 / DD30 ca. 45 kg. Um Verletzungen von Personen oder Beschädigung des Gerätes zu vermeiden sind bei der Installation und Montage in einem Geräteschrank entsprechende Hebeeinrichtungen einzusetzen.

Installation

Der Mischer ist für den Einsatz in besonderen Betriebsräumen mit beschränktem/überwachten Zutritt vorgesehen.

Zur Spannungsversorgung ist ein Einphasen-Netz mit geerdetem Nulleiter notwendig. Beim Aufstellen und Anschließen des Mixers ist die Verkabelung einer externen Erdleitung **immer** vor der Verkabelung der Netzleitung vornehmen. Hiermit wird gewährleistet, daß im Falle eines Kurzschlusses zwischen Netz und Gehäuse die Spannung gegen Erde abgeleitet wird. Daher die Erdleitung **niemals** während des Betriebes vom Gerät lösen.

Der Mischer darf nur an eine geerdete Steckdose angeschlossen werden. Die Funktion des Schutzleiters ist zu überprüfen. Er darf keine Spannung führen. Jede Unterbrechung des Schutzleiters ist geeignet den Mischer gefährlich zu machen. Die Erdung muß nach den regionalen Sicherheitsbestimmungen vorgenommen werden. Bei der Leitungsinstallation sind die landesüblichen Normen zu beachten.

Belüftung

Bei der Montage der EBox und des Bedienpultes ist auf ausreichende Belüftung zu achten. Detaillierte Angaben für die Belüftung finden Sie in den entsprechenden Abschnitten des Installationshandbuchs. Die Tür der E-Box ist während des Betriebes immer geschlossen zu halten.

- Die zulässige Umgebungstemperatur beträgt +5 °C bis +35 °C. Optimaler Betrieb ist bei einer Umgebungstemperatur von 25 °C ± 5 °C gegeben.
- Feuchtigkeitseinwirkungen (hohe Luftfeuchte, Flüssigkeiten) beeinträchtigen den Betrieb!

Netzspannung

Der **Diamond digital** Mischer ist entsprechend des Kundenauftrages entweder auf den Spannungsbereich 115V oder 230V eingestellt. Die jeweilige Einstellung ist auf der Anschlußplatte entsprechend gekennzeichnet.

Vor dem Einschalten des Mixers ist diese Spannungsangabe noch einmal mit der vorhandenen Netzspannung des Studios zu überprüfen.

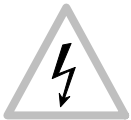
Das Umschalten der Netzspannung ist von Fachpersonal auszuführen.

Sicherungen

Achtung – Zweipolige bzw. Neutraleiter-Sicherung! Teile des Gerätes können auch nach dem Auslösen einer Sicherung unter Spannung bleiben!

Die Absicherung des Mixers erfolgt durch primärseitig angebrachte Schmelzeinsätze in den Netzanschlußeinheiten der Geräte (Bedienpult und E-Box).

Beim Auswechseln dieser Sicherungen nur eine Sicherung vom angegebenen Typ und mit gleicher Nennstromstärke als Ersatz verwenden. Das Verwenden überbrückter Sicherungen oder das Kurzschließen des Sicherungshalters ist unzulässig.

Während des Betriebs

Der Mixer ist im geschlossenen Zustand zu betreiben, d.h. E-Box-mit geschlossener Tür und Pult verriegelt. Im inneren der Geräte befinden sich keine Elemente, die vom Benutzer während des Betriebs einzustellen oder auszutauschen sind.

Achtung: *Beim Öffnen der EBox-Türen oder beim Öffnen des Pultes, können Teile zugänglich werden, die Netzspannung führen.*

In solchen Fällen ist das Gerät vorher von der Netzspannung abzutrennen.

Sind Arbeiten an der geöffneten EBox oder geöffneten Bedienpultes unvermeidlich, so darf dies nur durch eine Fachkraft durchgeführt werden, die mit den damit verbundenen Gefahren vertraut ist.

ACHTUNG! Kondensatoren können noch geladen sein!

Ist - z. B. infolge eines Schadens - ein gefahrloser Betrieb nicht mehr möglich, muß der Mixer außer Betrieb gesetzt, vom Netz abgetrennt und gegen Wiederinbetriebnahme gesichert werden.

Platinen dürfen nicht während des Betriebes aus dem Mixer herausgezogen oder eingesteckt werden.

Keine Teile in die Lüftungsöffnungen stecken! Dies kann zu Kontakt mit gefährlichen Spannungen oder zur Zerstörung von empfindlichen elektronischen Bauteilen führen.

Zum Schutz vor Störungen und Beschädigung keine Getränke auf dem Bedienpult abstellen. Das Eindringen von Flüssigkeiten kann zu Zerstörung von Platinen führen. Ebenso sollten keine kleinen Metallteile, z. B. Büroklammern, auf dem Bedienfeld ablegen. Durch die Öffnungsschlitze der Blendhebel können sie ins Gerät fallen und zu Kurzschlüssen und Zerstörungen führen.

Anschlußkabel

Die EMV-Bestimmungen werden nur eingehalten, wenn bei der Installation der Geräte vorschriftsmäßig abgeschirmte Kabel verwendet werden. Dies gilt sowohl für Video- als auch für Steuerkabel.

Entsprechende Kabel sind bei Philips BTS erhältlich.

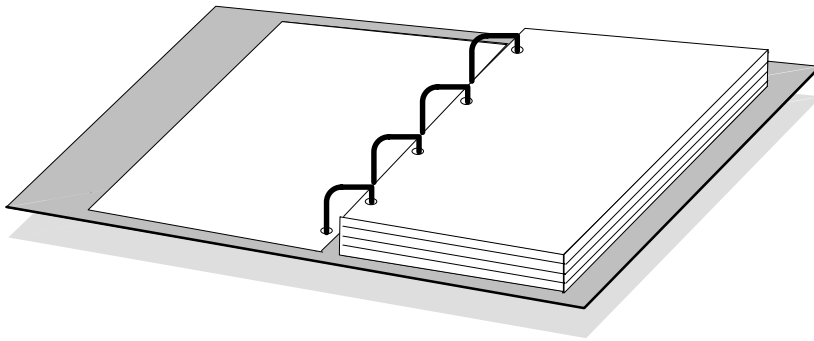
Sämtliche Anschlußkabel in abgedeckten Kabelschächten verlegen (Stolpergefahr).

Für den Netzanschluß ist nur das mitgelieferte Anschlußkabel oder ein geprüftes Kabel gleichen Typs zu verwenden

Batterien

In den Controllern in der E-Box und im Bedienpult ist je eine Lithium-Batterie eingebaut, die im Abstand von etwa 5 Jahren ausgetauscht werden muß. Siehe hierzu im Abschnitt *Austausch der Lithium-Batterie* der Bedienungsanleitung.

Die verbrauchte Batterie muß vorschriftsmäßig entsorgt werden, um Umweltschäden zu vermeiden.



ABOUT THIS MANUAL

The installation manual provides the information required for planning and initial installation of the switcher family Diamond *digital*. The manual is divided into the following sections:

- ☞ **General**, with a functional description of the switcher family, including the system architecture and the respective operational possibilities.
- ☞ **Technical data** of the individual switcher types.
- ☞ **Mounting the E-Box**, contains notes about mounting the switcher electronics into an equipment cabinet.
- ☞ **Mounting the control panels**, contains notes about mounting the control panels, and the dimensions for the table cutout.
- ☞ **Connection and startup**, contains notes and instructions for connecting the individual units as well as descriptions of all interfaces.
- ☞ **Block diagrams**, show the video paths of the switcher basic types as well as a typical system configuration with integration into a digital studio.

FURTHER INFORMATION

In addition to this installation manual, the following manuals are also provided for the switcher family:

- ☞ **Operation manual DD5**
- ☞ **Operation manual DD10**
- ☞ **Operation manual DD20**
- ☞ **Operation manual DD30**
- ☞ **Service manual DD5 / DD10 / DD20 / DD30**

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1. GENERAL

1.1 UNIT FAMILY

The *Diamond digital* of BTS provides a new family of video effects switchers in the serial 4:2:2 digital standard for studio and OB van applications. Due to their universal control surfaces, the switchers can be used for broadcast as well as for post production.

The switcher family comprises small switchers and modularly designed larger switchers in different expansion phases designed as a modular system using equal p.c. boards and a uniform case.

The unit family comprises the following versions:

4:2:2 micro switcher *Diamond digital* DD5 0 211 902 000

12 inputs
1 mixing level with 1 keyer
1 downstream keyer

4:2:2 compact switcher *Diamond digital* DD10 0 211 902 100

16 inputs
1 mixing level with 2 keyers
1 downstream keyer

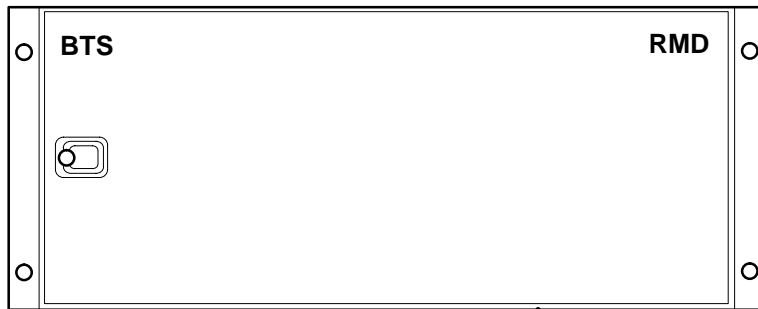
4:2:2 production switcher *Diamond digital* DD20 0 211 902 200

32 inputs
1 mixing level with 2 keyers
preset/program stage with
2 downstream keyers

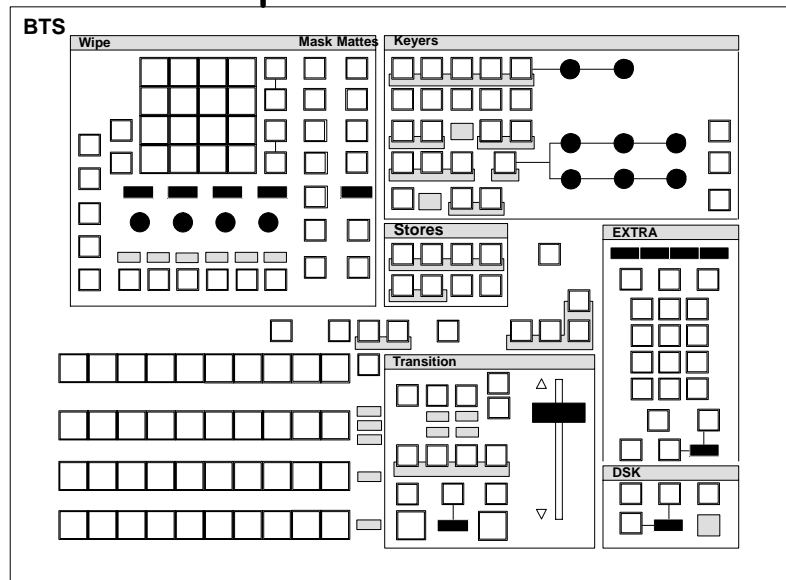
4:2:2 production switcher *Diamond digital* DD30 0 211 902 300

32 inputs
2 mixing levels with 2 keyers
preset/program stage with
2 downstream keyers

System configuration 4:2:2 compact switcher *Diamond digital DD5*

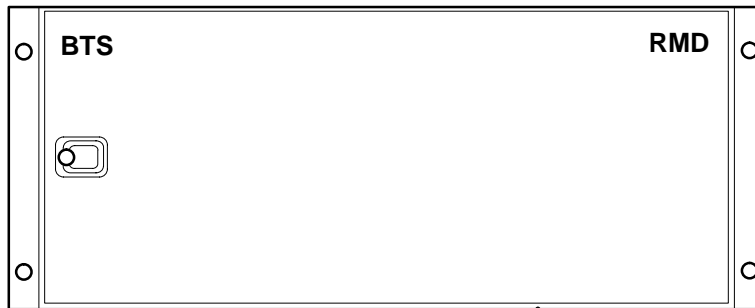


RMD 5 Electronics box

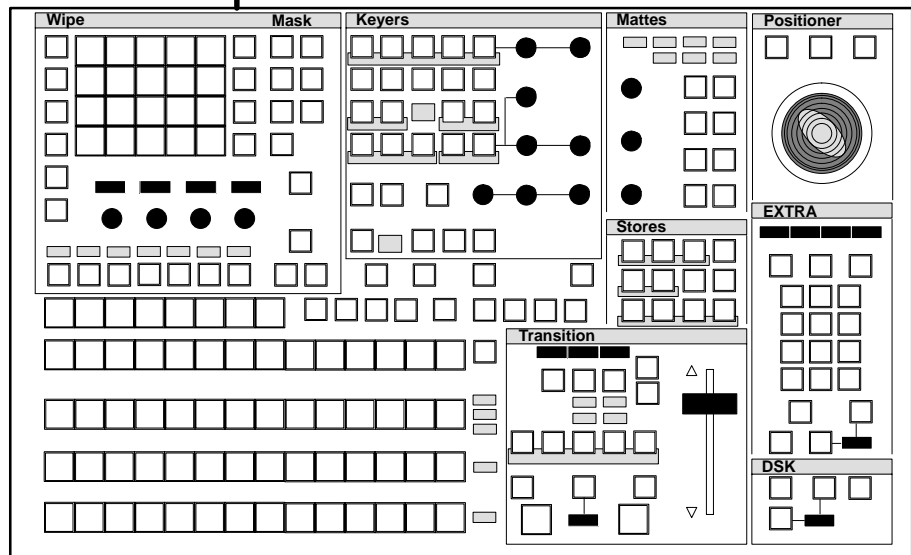


RPD 5 Control panel

System configuration 4:2:2 compact switcher *Diamond digital DD10*

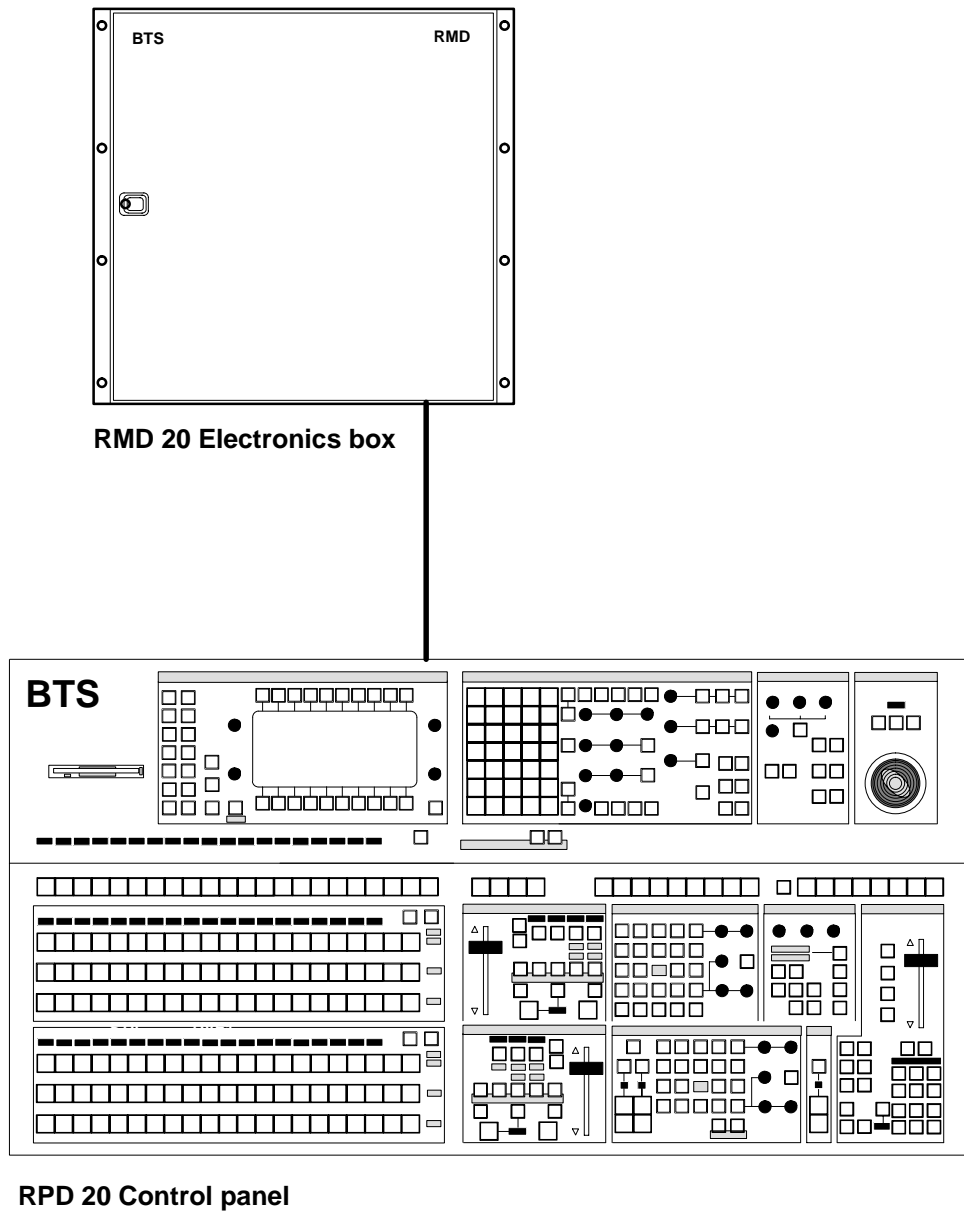


RMD 10 Electronics box

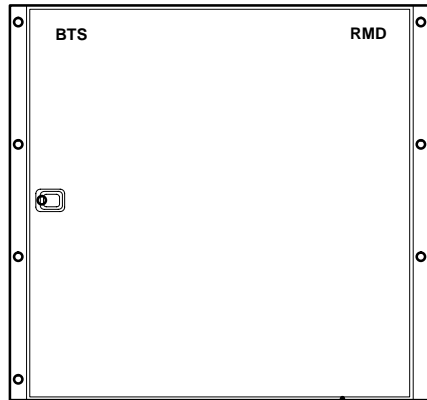


RPD 10 Control panel

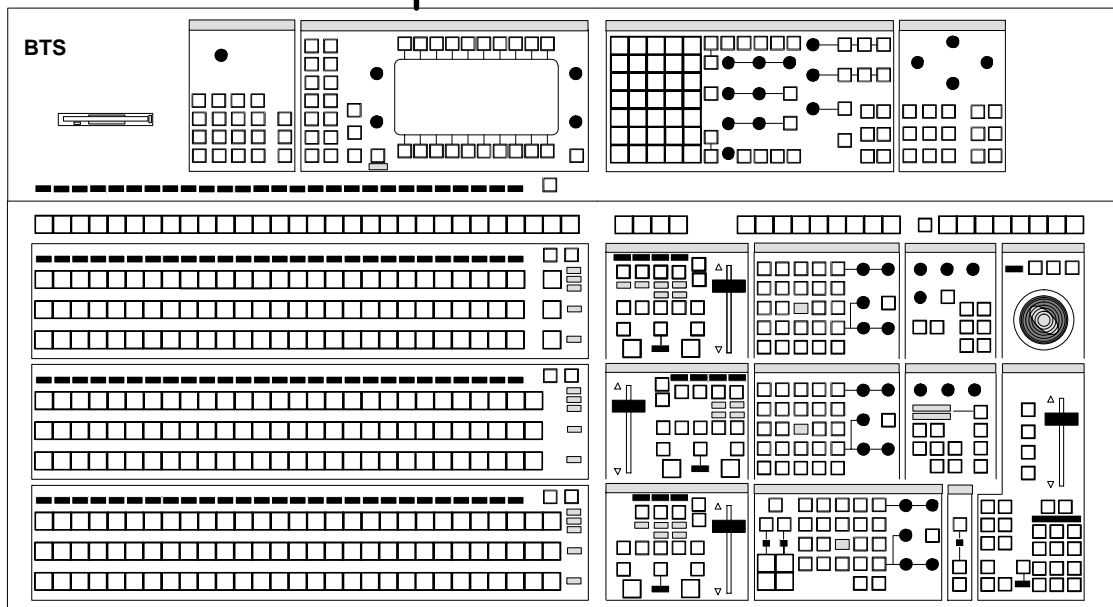
System configuration 4:2:2 production switcher *Diamond digital DD20*



System configuration 4:2:2 production switcher *Diamond digital DD30*

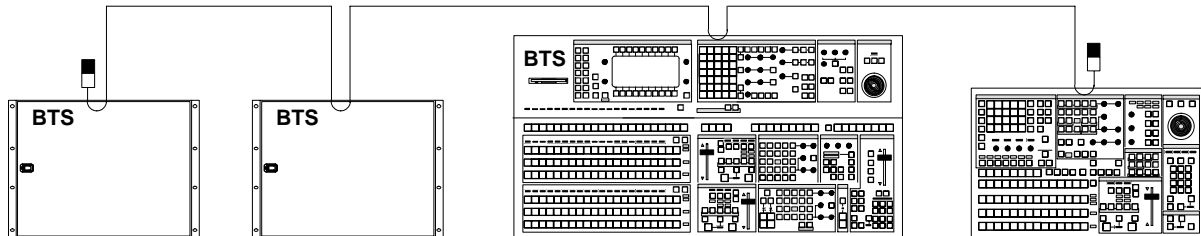


RMD 30 Electronics box



RPD 30 Control panel

Example of a system configuration



Diamond digital system with several electronics boxes and control panels

1.2 SWITCHER ARCHITECTURE

The switchers are set up as A/B mixers in the background (BGND) with 1 or 2 overlaid key layers for each mixing level. The next transition principle is consistently realized and includes also the downstream key stage.

The mixing levels and the preset/program stage/downstream keyers are set up with the same p.c. cards and do not differ in their hardwares.

For post-production, the mixing level of the switchers DD20 and DD30 can be switched over to the layer mode. In this case, 2 keyers are available for chroma or luminance key and 2 keyers for wipe signals.

The preview facilities (AUTO PREVIEW, TRANSITION PREVIEW) for preparing the next contributions in the mixing levels are realized.

Integration of an external DVE unit into the signal path of the switcher is possible. In this case, the signal path of the mixing level can be separated, the video signal can be fed out to the DVE and the signal manipulated by the DVE can be looped again into the signal path.

1.3 TV STANDARDS

The switcher processes without hardware modifications digital serial video signals with the aspect ratios 4:3 and 16:9 (270 Mbits/s) in the standards 625 lines/50 Hz 2:1 interlaced and 525 lines/60 Hz 2:1 interlaced.

1.4 CONNECTION FACILITIES

1.4.1 INPUTS

The switcher exclusively disposes of serial digital video inputs which, depending on the application, can be used without restrictions, either as background, key or fill signal in all mixing levels (including the downstream keyer).

As a standard feature of the switcher, 12 (DD5), 16 (DD10), 24 (DD20) and 32 (DD30) inputs are provided.

The inputs are internally terminated and can process video signals in the format 4:3 or 16:9 (270 Mbits/s) in the standards 525/60 2:1 or 625/50 2:1 (no mixed forms). All inputs are provided with an equalizer for compensating cable lengths of max. 150 m.

Furthermore, all inputs are provided with an automatic delay time correction which can compensate delay inequalities referred to the blackburst input in the range of $\pm 1/4$ line.

Asynchronous signals or inputs not connected, are detected and indicated.

For synchronization of the switcher in the studio, a loop-through reference input for an analog blackburst signal is provided.

1.4.2 MATTE GENERATORS

For background designing, 2 central matte generators are provided in the switchers DD20 and DD30, which can be optionally used as background, key or fill signal. For the types DD5 and DD10, only one central matte is available.

As a standard feature, in addition to plain mattes, extremely soft color floating effects between two optional colors or black or white are possible in H or V direction or diagonally. Position and angle of the diagonal can be varied in steps of 2 degrees.

Alternatively, color or brightness floating can be determined by the signal from a wipe generator of mixing level ME1.

Optionally, a memory can be assigned to the matte generators, which stores wipe or key signals, thus enabling complex color and brightness floating effects.

1.4.3 VIDEO OUTPUTS

The switcher is provided with the following video outputs:

- 4 program outputs
- 1 clean-feed output (before or between DSK, switchable)
- 1 output for second DSK preview in PP stage
- 3 program outputs for each mixing level

For preview purposes, the following outputs are available:

- 1 preview output for each mixing level, mask signal and wipe pattern signal can be additively connected with the video signal.
- 1 preset output for preset/program stage, mask signal and wipe pattern signal can be additively connected with the video signal.

All outputs are delay-compensated. The digital horizontal and vertical blanking intervals are transparent for the background signal. For the case of routing switcher changeovers in the vertical blanking interval, the lines 6 and 319 are faded to black.

1.4.4 FURTHER OUTPUTS

For special applications (integration of a DVE, preview of sources, measuring purposes), the switcher is provided (standard feature) with 5 (DD10) or 5 to 11 (optional for DD20 and 30) serial AUX outputs which can be optionally connected with the following signals:

- all inputs
- all central mattes
- PGM: ME 1-2, PP, DSK (depending on the expansion phase)
- PVW: ME 1-2, PP, DSK (depending on the expansion phase)
- the signals of the frame stores (4:2:2)
- DVE output; for background/fill per ME, selectable
- DVE output for key per ME, selectable

Selection is made on the control panel or the external AUX control units.

1.4.5 REMOTES

The following interfaces are provided:

- 3 serial interfaces RS 422 for edit, DVE, external routing switchers.
- 1 serial interface; RS 423 (ES-BUS) or RS 422, switchable.
- 8 universal interface inputs (general-purpose interface, GPI) and 8 GPI outputs.
- For red tally, one potential-free contact is provided per source. Furthermore, the individual mixing levels are indicated.
- Tally input

1.5 MIXING STAGES

For background designing (BGND), a mixing stage (Mix, Add, Wipe with border) is available for each mixing level (ME).

The mix and key stages are set up in a cascaded way and are provided with tapplings for coupling in and out signals for a DVE unit. Re-entry of the mixing levels is possible.

The preset/program stage (PP) at the output of the switcher is identically designed with regard to the mixing stage. Thus, for post-production purposes, a full mixing level is available.

A separate channel is available for preview in the mixing levels, which is supplied with equal input signals. Different control signals enable to preview the next contribution (AUTO PREVIEW) or to make a transition without affecting the program signal (TRANSITION PREVIEW).

1.5.1 INPUTS/OUTPUTS

As inputs, all video inputs, the signal of a preceding or succeeding mix/key stage, the signal of a frame store and the central mattes are available for each mixing stage.

Additionally, a wipe border matte generator for the border of the wipe generator is provided for each mixing stage.

As outputs, program signal and preview signal are available to the user. In the preset/program stage, a clean-feed output signal is additionally available, which can be optionally tapped off after the preset/program stage or after the downstream keyer.

1.5.2 AMPLITUDE MIX

Transition between two input signals (MIX) is possible by hard cut (CUT), automatic fading (AUTO), automatic transition (EXTRA) or manually with the fader (FADE). For transition, different fading characteristics (linear, gamma, etc.) are possible. Transition via a black signal (BLACK PRESET) can also be performed. For additive mixing (ADD), the output level can be more than 100% and is internally limited.

1.5.3 PATTERN MIX (WIPE)

Pattern mix of two optional input signals is made with a control signal supplied by the wipe generator.

Optionally, a second wipe generator (from DD10) can be inserted per mixing level (example: WIPE in PATTERN KEY).

Additionally, the result of this manipulation can be provided with a border which can be filled with a wipe border matte. A special signal of the wipe generator (Wiper-Wash™), enables color wash effects of the border being coupled with the wipe pattern.

The border can be switched into the video signal (CUT), the transparency (OPACITY) is selectable.

Switcher DD20/30 enables in conjunction with the mask store option to provide the wipe border with a shadow.

1.5.4 DIGITAL VIDEO EFFECTS (DVE)

Pattern mix of a video signal supplied by the DVE. The DVE additionally supplies a key signal of the transformed DVE video signal. The procedure of the DVE is coupled with the fader (manual or automatic transition).

1.5.5 WIPE BORDER MATTE GENERATOR

Beside the central matte generators, an additional matte generator is provided for coloring the borders of the wipe generators. Beside unicolored mattes, extremely soft color floating effects (softness 20 - 80 %) between two optional colors or black or white are possible in H or V direction or diagonally. Position and angle of the diagonal can be varied in steps (2°). Furthermore, color floating can be varied by a signal from the wipe generator).

1.5.6 LAYER MODE

For post-production, the layer mode (DD20 and DD30 only) enables to change the background mixing stage into two independent key stages. The signals of the wipe generators or the DVE can be used as control signals.

1.6 KEY STAGES

1 or 2 key stages with border facilities are available in the individual mixing levels for effects background designing or for caption insertion (chroma key), (lum key or linear key). The priority can be changed (OVER).

The key stages are placed after the background mixing stage, set up in a cascaded way and provided with taps for coupling in and out a signal for a DVE unit.

The downstream keyer (DSK) at the output of the switcher is identically designed with regard to the key stages (2 key stages).

After the key stages, a facility is provided for fade to black (FTB). In DD5 and DD10 which do not dispose of a preset/program stage, only 1 downstream keyer is available for luminance or linear key.

For preview, a separate channel is available in the key stages, which can be connected with equal input signals but different control signals. It is possible to preview the next contribution (AUTO PREVIEW) or to make a transition without affecting the program signal (TRANSITION PREVIEW).

For post-production, the layer mode permits to use the keyers as layers (DD20 and DD30 only). The layers can be interchanged.

1.6.1 INPUTS/OUTPUTS

As key and fill signals, each keyer can dispose of more than 2 buses, and the DVE bus of all inputs, the stores for video and key signals, and the central mattes. In addition, own matte generators for fill and border are provided for each keyer.

For the downstream keyer in switcher DD5 or DD10, a bus with all inputs and the signal of a matte generator are available as a fill signal.

Generation of the key signal is possible for each keyer from all inputs (SELF-KEY). As internal key sources, wipe and mask signals are available. It is also possible to feed a key signal modified by the DVE, into the key signal path (DVE LOOP).

In the setup mode, a key signal can be assigned to each fill signal, which has to be switched together with selection of fill (couple). This assignment can optionally be cancelled (split) in order to select another key signal.

As outputs, key or combined key signals, the signal of the key/mask store are available to the user via the AUX outputs. For preview purposes, the mask signal can also be additively connected with the preview signal.

1.6.2 KEY VERSIONS

Chroma key

As a standard feature, a **linear** chroma key with foreground desaturation and background transition is realized.

Adjustment of the key parameters can be made automatically (for blue as key color without measuring window, for other colors with measuring window) and can be corrected manually.

The key signal can be also inverted (KEY INVERT).

The transparency (OPACITY) of each keyer can be adjusted separately.

Luminance key/linear key

The key generator enables a luminance key. The signal can be bordered by means of the borderliner.

It is possible to key on all luminance values (CLIP). The rise time (SOFTNESS) of the signal can be steepened. The key signal can be inverted (KEY INVERT).

The LINEAR KEY mode allows the use of key and fill signals (on black background) from external sources, e.g. caption generators. The rise times of the signals cannot be varied in this case.

The key can be faded into the video signal (MIX), switched (CUT) or faded over by means of a wipe generator (WIPE). The transparency (OPACITY) of each keyer can be adjusted separately.

1.6.3 MASK GENERATORS

For restricting the key signal to defined picture areas, a masking generator is provided for each key generator. Furthermore, the mask signal can be used as a key signal.

As a standard feature, a square mask is available for each keyer. Alternatively, one of the wipe generators of the associated mixing level can be used as a mask generator.

A key/mask store is available, which offers beside storage of key or pattern signals in conjunction with the wipe generator, a paint mode for generating optional patterns (from DD10).

The effect of the mask on the video signals can be switched over (forced foreground/background) and is invertible.

1.6.4 MATTE GENERATORS, BORDER MATTE GENERATORS

For coloring (fill) characters generated by luminance or linear key, and the associated borders, a matte generator and a border matte generator are provided for each keyer.

Beside unicolored mattes, the matte generator allows extremely soft color floating effects (softness 20-80 %) between two optional colors or black or white in H or V direction or diagonally. Position and angle of the diagonals can be varied in steps.

1.6.5 BORDERLINERS

For bordering caption signals generated by chroma luminance or linear key, a borderliner is realized for each keyer. Two borderliners at maximum for DD10.

As a standard feature, the following border types are provided:

- H, 2H border
- OUTLINE H, 2H
- DROPSHADOW H, 2H, 3H, 4H
- SLANTED SHADOW H, 2H, 3H, 4H

positionable in steps over or under the caption.

As a fill signal for the border, a border matte generator is available.

The border can be switched into the video signal (CUT), transparency (OPACITY) is adjustable.

The key/mask store option enables switcher DD20 and DD30 to generate a freely positionable shadow whose transparency can be adjusted.

1.7 SPECIAL EFFECTS GENERATORS

1.7.1 WIPE GENERATORS

As a standard feature, a wipe generator is available in each mixing level (preset/program stage as an option), which can be freely assigned to background transition (BGND) and/or to one or both keyers.

The wipe generator supplies the signal for transition (PATTERN) and a border signal (BORDER). As additional application, the signal of the wipe generator can serve as a key source (PATTERN KEY) or can be used for modulating the floating of a matte of a central matte generator.

Optionally, each mixing level can be extended by a second wipe generator freely assignable to the keyers.

The wipe pattern can be switched (WIPE) into the video signal, the pattern size is adjusted with the fader or by automatic transition (AUTO). The transparency of the signal can be adjusted.

The border can be switched into the video signal (CUT), the transparency is adjustable.

In addition, the wipe generator generates a signal which can control color floating in the border.

As wipes, the following patterns are available:

- Rolling wipes (horizontal, vertical cut)
- Geometric patterns (square, circle)
- Rotary wipes
- Fan/wiper effects (fan blade, clock wipes)
- Combination transitions (square + clock)
- Matrix wipes (mosaic)
- Matrix combination transitions (corner cut + mosaic)

For the basic functions, a series of possible variations is available, such as alteration of the aspect ratio (RATIO), rotation of the wipe (ROTATION) and multiplication of the wipe (MULTI).

The wipe edges can be varied via an adjustable softness and additionally be modulated with defined functions (e.g. sine) in H and V direction.

A wipe pattern positioning at any place by means of a trackball or a mouse is possible if appropriate patterns are available.

1.7.2 FRAME STORE

As an option (from DD20), the switcher can be extended by a frame store which can process video and key signals separately. For storage, all those signals are available which can also be selected at the AUX outputs. The outputs of the frame store are available as primary inputs.

The following manipulations are possible in the frame store:

- Variation of the position H and/or V
- NAM
- ADD

2. TECHNICAL DATA

2.1 MICRO SWITCHER *DIAMOND DIGITAL DD5*

2.1.1 INPUTS

- 12 vid. sig. and/or key sig. BNC, serial component CCIR 656
- Input level 0.8 V_{pp} ± 10%, 75 ohms,
DC 0 ± 0.5 V
- Quantization 10 bits
- Common mode noise 2.5 V_{pp} DC - 1 kHz
- Return loss 5 - 270 Mbits > 10 db
- Autophasing range 52 μs
- Asynchronous signals switchable
- Reference signal 2 BNC, 0.3 V sync, blackburst or CCVS
75 ohms, DC 0 ± 0.1 V, can be looped through
up to 7 MHz > 30 db
- Return loss reference

2.1.2 OUTPUTS

- 4 program video signals BNC, serial component CCIR 656
- 1 clean video signal BNC, serial component CCIR 656
- 1 preset video signal BNC, serial component CCIR 656
- 1 auxiliary bus BNC, serial component CCIR 656
- 1 DVE video BNC, serial component CCIR 656
- 1 DVE key BNC, serial component CCIR 656
- Output level 0.8 V_{pp} ± 10%, 75 ohms, DC 0 ± 0.5 V
- Quantization 10 bits or 8 bits rounded, switchable
- Return loss 5 - 270 Mbits > 10 db

2.1.3 VIDEO SYSTEM DATA

- Standards, interlaced 525/60 or 625/50, switchable
- Data rate 270 Mbits/s
- Aspect ratio 4:3 or 16:9 (270 Mbits/s), switchable
- Signal processing video 4:2:2 in conformity with CCIR 601
- Sampling frequency lum. 13.5 MHz
- Sampling frequency chrom. 6.75 MHz
- Quantization video 10 bits
- Overall delay input/
program output < 1 line
- Blanking horizontal transparent for background signal
- Blanking vertical transparent for background signal
except for lines 6 and 319 (625L/50 Hz)
or 10 and 273 (525L/60 Hz)

2.1.4 INTERFACE DATA

- 8 tally inputs	2 D-sub socket 9-pin TTL internal pull-up, control with dry contact
- 12 + 5 tally outputs	2 D-sub connector 50-pin 1 potential-free contact 24 V, 1 A for sources (12) contact 24 V, 1 A with common root for monitor (5),
- 8 GPI inputs, 8 GPI outputs	D-sub socket 25-pin inputs: TTL with optocoupler, control with dry contact, outputs: potential-free contact 24 V, 1 A
- 3 serial ports (E-box) 1 serial port (E-box)	D-sub socket 9-pin, RS 422, D-sub socket 9-pin, RS 422 or RS 232, switchable
- Service port (E-box)	D-sub socket 9-pin, RS 232C
- Remote (E-box)	1 BNC (remote), cheapernet, 50 ohms, 150 m, with repeater max. 2.5 km, can be looped through with a T-junction
- Remote (control panel)	1 BNC (remote), cheapernet, 50 ohms, 150 m, with repeater max. 2.5 km, can be looped through with a T-junction
- 1 serial port (control panel) 1 mouse port (control panel)	D-sub socket 9-pin, RS 422, D-sub connector 9-pin, RS 232C
- Service port (control panel)	D-sub socket 9-pin, RS 232C, optionally mouse or service, switchable

2.1.5 POWER SUPPLY

- Line voltage	AC 115 or 230 V +15/- 20 %, switchable
- Line frequency	50/60 Hz \pm 5 %
- Current consumption E-box	115V: 3.9 A, 230V: 2 A
- Current consumption panel	115V: 0.5 A, 230V: 0.25 A
- Cut-in current	< 16 A, < 100 A transient
- Fuses	Panel: 2 x 6,3 A slow-blow (IEC127 type) Ebox: 2 x 10 A slow-blow (IEC127 type) Manufacturer: Wickmann, Schurter
- Power connection	Appliance inputs IEC 320 type, VDE 0625 Part 1
- Safety regulations	VDE 0805/5.90 (EN 60950)
- Power cords	HAR cord H05VV-F1,0 2.5m
- US power cords	Panel: SJT 2.5m 3x AWG18 EBox: SJT 3m 3x AWG18

2.1.6 ENVIRONMENTAL DATA

- Storage temp. E-box	- 20 °C - + 70 °C
- Storage temp. contr. pan.	0 °C - + 70 °C (32° - 158 °F)
- Operating temp. E-box	+ 5 °C - +35 °C
For operation within specs	+ 10 °C - +30 °C
Op. temp. control panel	+ 5 °C - +35 °C
- Ventilation E-box	140 m ³ /h
- Relative humidity	≤ 80 % non-condensing
- Electromagn. compatibility (EMC)	EN 55022, Class B FCC (47CFR) PART 15 Subp J Class A IEC 801-3, 3 V/m
- ESD	IEC 801-2, 8 kV

2.1.7 MECHANICAL DATA

- Dimensions E-box	212(h) x 483(w) x 470(d) mm, (19", 5 RU) 1 RU under the electronics box has to be left free for ventilation and slide-in rails
- Dimensions contr. panel	373(h) x 482(w) x 97.5(d) mm
- Cutout meas. contr. panel	449 x 358 mm
- Ventilation E-box	Suction port: left side panel Blow-out port: rear top
- Weight E-box	20 kg
- Weight control panel	7 kg
- Mechanical stress	vibration IEC 68-2-6, shock IEC 68-2-29 tilt fall IEC 68-2-31,
- Color E-box	dark mushroom, Philips 10709/G8
- Color control panel	ultra dark grey, Philips 10714/G8

2.2 COMPACT SWITCHER *DIAMOND DIGITAL DD10*

2.2.1 INPUTS

- 16 video signals and/or key signals BNC, serial component CCIR 656
- Input level 0.8 V_{pp} ± 10%, 75 ohms, DC 0 ± 0.5 V
- Quantization 10 bits
- Common mode noise 2.5 V_{pp} DC - 1 kHz
- Return loss 5 - 270 Mbits > 10 db
- Autophasing range 52 μs
- Asynchronous signals switchable
- Reference signal 2 BNC, 0.3 V sync, blackburst or CCVS
75 ohms, DC 0 ± 0.1 V, can be looped through
- Return loss reference up to 7 MHz > 30 db

2.2.2 OUTPUTS

- 4 program video signals BNC, serial component CCIR 656
- 1 clean video signal BNC, serial component CCIR 656
- 1 preset video signal BNC, serial component CCIR 656
- 3 auxiliary buses BNC, serial component CCIR 656
- 1 DVE video BNC, serial component CCIR 656
- 1 DVE key BNC, serial component CCIR 656
- Output level 0.8 V_{pp} ± 10%, 75 ohms, DC 0 ± 0.5 V
- Quantization 10 bits or 8 bits rounded, switchable
- Return loss 5 - 270 Mbits > 10 db

2.2.3 VIDEO SYSTEM DATA

- Standards, interlaced 525/60 or 625/50, switchable
- Data rate 270 Mbits/s
- Aspect ratio 4:3 or 16:9 (270 Mbits/s), switchable
- Signal processing video 4:2:2 in conformity with CCIR 601
- Sampling frequency lum. 13.5 MHz
- Sampling frequency chrom. 6.75 MHz
- Quantization video 10 bits
- Overall delay input/
program output < 1 line
- Blanking horizontal transparent for background signal
- Blanking vertical transparent for background signal
except for lines 6 and 319 (625L/50 Hz)
or 10 and 273 (525L/60 Hz)

2.2.4 INTERFACE DATA

- 8 tally inputs
2 D-sub socket 9-pin
TTL internal pull-up,
control with dry contact
- 16 + 7 tally outputs
2 D-sub connector 50-pin
1 potential-free contact 24 V, 1 A for
sources (16)
contact 24 V, 1 A with common root for
monitor (7),
- 8 GPI inputs, 8 GPI outputs
D-sub socket 25-pin
inputs: TTL with optocoupler,
control with dry contact,
outputs: potential-free contact 24 V, 1 A
- 3 serial ports (E-box)
1 serial port (E-box)
D-sub socket 9-pin, RS 422,
D-sub socket 9-pin, RS 422 or RS 232,
switchable
- Service port (E-box)
Remote (E-box)
D-sub socket 9-pin, RS 232C
1 BNC (remote), cheapernet,
50 ohms, 150 m,
with repeater max. 2.5 km,
can be looped through with a T-junction
- Remote (control panel)
1 BNC (remote), cheapernet,
50 ohms, 150 m,
with repeater max. 2.5 km,
can be looped through with a T-junction
- 1 serial port (control panel)
1 mouse port (control panel)
D-sub socket 9-pin, RS 422,
D-sub connector 9-pin, RS 232C
- Service port (control panel)
D-sub socket 9-pin, RS 232C,
optionally mouse or service,
switchable

2.2.5 POWER SUPPLY

- Line voltage
AC 115 or 230 V +15/- 20 %, switchable
- Line frequency
50/60 Hz \pm 5 %
- Current consumption E-box
115V: 3.9 A, 230V: 2 A
- Current consumption panel
115V: 0.5 A, 230V: 0.25 A
- Cut-in current
< 16 A, < 100 A transient
- Fuses
Panel: 2 x 6,3 A slow-blow (IEC127 type)
Ebox: 2 x 10 A slow-blow (IEC127 type)
Manufacturer: Wickmann, Schurter
- Power connection
Appliance inputs IEC 320 type,
VDE 0625 Part 1
- Safety regulations
VDE 805/5.90 (EN 60950)
- Power cords
HAR cord H05VV-F1,0 2.5m
- US power cords
Panel: SJT 2.5m 3x AWG18
EBox: SJT 3m 3x AWG18

2.2.6 ENVIRONMENTAL DATA

- Storage temperature E-box	- 20 °C - + 70 °C
- Storage temp. control panel	0 °C - + 70 °C (32° - 158 °F)
- Operating temp. E-box	+ 5 °C - +35 °C
For operation within specs	+ 10 °C - +30 °C
Op. temp. control panel	+ 5 °C - +35 °C
- Ventilation E-box	140 m ³ /h
- Relative humidity	≤ 80 % non-condensing
- Electromagn. compatibility (EMC)	EN 55022, Class B FCC (47CFR) PART 15 Subp J Class A IEC 801-3, 3 V/m IEC 801-2, 8 kV
- ESD	

2.2.7 MECHANICAL DATA

- Dimensions E-box	212(h) x 483(w) x 470(d) mm, (19", 5 RU) 1 RU under the electronics box has to be left free for ventilation and slide-in rails
- Dimensions control panel	385(h) x 640(w) x 97.5(d) mm
- Cutout meas. control panel	620 x 363 mm
- Ventilation E-box	Suction port: left side panel Blow-out port: rear top
- Weight E-box	20 kg
- Weight control panel	9.5 kg
- Mechanical stress	vibration IEC 68-2-6, shock IEC 68-2-29 tilt fall IEC 68-2-31,
- Color E-box	dark mushroom, Philips 10709/G8
- Color control panel	ultra dark grey, Philips 10714/G8

2.3 PRODUCTION SWITCHER *DIAMOND DIGITAL DD20*

2.3.1 INPUTS

- 32 video signals and/or key signals BNC, serial component CCIR 656
- Input level 0.8 V_{pp} ± 10%, 75 ohms, DC 0 ± 0.5 V
- Quantization 10 bits
- Common mode noise 2.5 V_{pp} DC - 1 kHz
- Return loss 5 - 270 Mbits > 10 db
- Autophasing range 32 μs
- Asynchronous signals switchable
- Reference signal 2 BNC, 0.3 V sync, blackburst or CCVS 75 ohms, DC 0 ± 0.1 V, can be looped through
- Return loss reference up to 7 MHz > 30 db

2.3.2 OUTPUTS

- 4 program video signals BNC, serial component CCIR 656
- 3 program video signals per ME BNC, serial component CCIR 656
- 1 clean video signal BNC, serial component CCIR 656
- 1 preset video signal BNC, serial component CCIR 656
- 1 preview video signal per ME BNC, serial component CCIR 656
- 3 - 5 auxiliary buses BNC, serial component CCIR 656
- 1 - 2 DVE video BNC, serial component CCIR 656
- 1 - 2 DVE key BNC, serial component CCIR 656
- Output level 0.8 V_{pp} ± 10%, 75 ohms, DC 0 ± 0.5 V
- Quantization 10 bits or 8 bits rounded, switchable
- Return loss 5 - 270 Mbits > 10 db

2.3.3 VIDEO SYSTEM DATA

- Standards, interlaced 525/60 or 625/50, switchable
- Data rate 270 Mbits/s
- Aspect ratio 4:3 or 16:9 (270 Mbits/s), switchable
- Signal processing video 4:2:2 in conformity with CCIR 601
- Sampling frequency lum. 13.5 MHz
- Sampling frequency chrom. 6.75 MHz
- Quantization video 10 bits
- Overall delay input/program output < 1 line
- Blanking horizontal transparent for background signal
- Blanking vertical transparent for background signal except for lines 6 and 319 (625L/50 Hz) or 10 and 273 (525L/60 Hz)

2.3.4 INTERFACE DATA

- 16 tally inputs	2 D-sub socket 9-pin TTL internal pull-up, control with dry contact
- 32 + 12 tally outputs	2 D-sub connector 50-pin 1 potential-free contact 24 V, 1 A for sources (32) contact 24 V, 1 A with common root for monitor (12)
- 8 GPI inputs, 8 GPI outputs	D-sub socket 25-pin inputs: TTL with optocoupler, control with dry contact, outputs: potential-free contact 24 V, 1 A
- 3 serial ports (E-box) 1 serial port (E-box)	D-sub socket 9-pin, RS 422, D-sub socket 9-pin, RS 422 or RS 232, switchable
- Service port (E-box) Remote (E-box)	D-sub socket 9-pin, RS 232C 1 BNC (remote), cheapernet, 50 ohms, 150 m, with repeater max. 2.5 km, can be looped through with a T-junction
- Remote (control panel)	1 BNC (remote), cheapernet, 50 ohms, 150 m, with repeater max. 2,5 km, can be looped through with a T-junction
- 1 serial port (control panel) 1 mouse port (control panel)	D-sub socket 9-pin, RS 422, D-sub connector 9-pin, RS 232C
- Service port (control panel)	D-sub socket 9-pin, RS 232C, optionally mouse or service, switchable

2.3.5 POWER SUPPLY

- Line voltage E-box	AC 230 V +15/- 20 %,
- Line voltage panel	AC 115 or 230 V +15/- 20 %, switchable
- Line frequency	50/60 Hz \pm 5 %
- Current consumption E-box	5.5 A
- Current consumption panel	115V: 1.8 A, 230V: 0.9 A
- Cut-in current	< 16 A, < 100 A transient
- Fuses	Panel: 2 x 6,3 A slow-blow (IEC127 type) Ebox: 2 x 10 A slow-blow (IEC127 type) Manufacturer: Wickmann, Schurter
- Power connection	Appliance inputs IEC 320 type, VDE 0625 Part 1
- Safety regulations	VDE 805/5.90 (EN 60950) Leakage current >3.5 mA Additional earth connection essential before connecting.
- Power cords	HAR cord H05VV-F1,0 2.5m
- US power cords	Panel: SJT 2.5m 3x AWG18 EBox: SJT 3m 3x AWG18

2.3.6 ENVIRONMENTAL DATA

– Storage temperature E-box	- 20 °C - + 70 °C
– Storage temperature E-box	0 °C - + 70 °C (32° - 158 °F)
– Operating temp. E-box	+ 5 °C - +35 °C
For operation within specs	+ 10 °C - +30 °C
Op. temp. control panel	+ 5 °C - +35 °C
– Ventilation E-box	430 m ³ /h
– Relative humidity	≤ 80 % non-condensing
– Electromagn. compatibility (EMC)	EN 55022, Class B FCC (47CFR) PART 15 Subp J Class A IEC 801-3, 3 V/m
– ESD	IEC 801-2, 8 kV

2.3.7 MECHANICAL DATA

– Dimensions E-box	533(h) x 483(w) x 470(d) mm, (19", 12 RU) 1 RU under the electronics box has to be left free for ventilation and slide-in rails
– Dimensions control panel	551(h) x 1187(w) x 99(d) mm
– Cutout measures contr. pan.	525(l) x 1164(w)
– Ventilation	Suction port: left side panel Blow-out port: rear top
– Weight E-box	40 kg
– Weight control panel	26 kg
– Mechanical stress	vibration IEC 68-2-6, shock IEC 68-2-29 tilt fall IEC 68-2-31,
Color E-box	dark mushroom, Philips 10709/G8
– Color control panel	ultra dark grey, Philips 10714/G8

2.4 PRODUCTION SWITCHER DD30

2.4.1 INPUTS

- 32 video signals and/or key signals BNC, serial component CCIR 656
- Input level 0.8 Vpp \pm 10%, 75 ohms, DC 0 \pm 0.5 V
- Quantization 10 bits
- Common mode noise 2.5 Vpp DC - 1 kHz
- Return loss 5 - 270 Mbits > 10 db
- Autophasing range 32 μ s
- Asynchronous signals switchable
- Reference signal 2 BNC, 0.3 V sync, blackburst or CCVS 75 ohms, DC 0 \pm 0.1 V, can be looped through
- Return loss reference up to 7 MHz > 30 db

2.4.2 OUTPUTS

- 4 program video signals BNC, serial component CCIR 656
- 3 program vid. sig. per ME BNC, serial component CCIR 656
- 1 clean video signal BNC, serial component CCIR 656
- 1 preset video signal BNC, serial component CCIR 656
- 1 preview vid. sig. per ME BNC, serial component CCIR 656
- 3 - 5 auxiliary buses BNC, serial component CCIR 656
- 1 - 2 DVE video BNC, serial component CCIR 656
- 1 - 2 DVE key BNC, serial component CCIR 656
- Output level 0.8 Vpp \pm 10%, 75 ohms, DC 0 \pm 0.5 V
- Quantization 10 bits or 8 bits rounded, switchable
- Return loss 5 - 270 Mbits > 10 db

2.4.3 VIDEO SYSTEM DATA

- Standards, interlaced 525/60 or 625/50, switchable
- Data rate 270 Mbits/s
- Aspect ratio 4:3 or 16:9 (270 Mbits/s), switchable
- Signal processing video 4:2:2 in conformity with CCIR 601
- Sampling frequency lum. 13.5 MHz
- Sampling frequency chrom. 6.75 MHz
- Quantization video 10 bits
- Overall delay input/program output < 1 line
- Blanking horizontal transparent for background signal
- Blanking vertical transparent for background signal except for lines 6 and 319 (625L/50 Hz) or 10 and 273 (525L/60 Hz)

2.4.4 INTERFACE DATA

– 16 tally inputs	2 D-sub socket 9-pin TTL internal pull-up, control with dry contact
– 32 + 13 tally outputs	2 D-sub connector 50-pin 1 potential-free contact 24 V, 1 A for sources (32) contact 24 V, 1A with common root for monitor (12)
– 8 GPI inputs, 8 GPI outputs	D-sub socket 25-pin inputs: TTL with optocoupler, control with dry contact, outputs: potential-free contact 24 V, 1 A
– 3 serial ports (E-box) 1 serial port (E-box)	D-sub socket 9-pin, RS 422, D-sub socket 9-pin, RS 422 or RS 232, switchable
– Service port (E-box) Remote (E-box)	D-sub socket 9-pin, RS 232C 1 BNC (remote), cheapernet, 50 ohms, 150 m, with repeater max. 2.5 km, can be looped through with a T-junction
– Remote (control panel)	1 BNC (remote), cheapernet, 50 ohms, 150 m, with repeater max. 2.5 km, can be looped through with a T-junction
– 1 serial port (contr. pan.) 1 mouse port (contr. pan.) – Service port (control pan.)	D-sub socket 9-pin, RS 422, D-sub connector 9-pin, RS 232C D-sub socket 9-pin, RS 232C, optionally mouse or service, switchable

2.4.5 POWER SUPPLY

– Line voltage E-box	AC 230 V +15/– 20 %,
– Line voltage	AC 115 or 230 V +15/– 20 %, switchable
– Line frequency	50/60 Hz ± 5 %
– Current consumption E-box	5.5 A
– Current consumption panel	115V: 2.2 A, 230V: 1.1 A
– Cut-in current	< 16 A, < 100 A transient
– Fuses	Panel: 2 x 6,3 A slow-blow (IEC127 type) Ebox: 2 x 10 A slow-blow (IEC127 type) Manufacturer: Wickmann, Schurter
– Power connection	Appliance inputs IEC 320 type, VDE 0625 Part 1
– Safety regulations	VDE 805/5.90 (EN 60950) Leakage current >3.5 mA Additional earth connection essential before connecting.
– Power cords	HAR cord H05VV–F1,0 2.5m
– US power cords	Panel: SJT 2.5m 3x AWG18 EBox: SJT 3m 3x AWG18

2.4.6 ENVIRONMENTAL DATA

- Storage temperature E-box	- 20 °C - + 70 °C
- Storage control panel E-box	0 °C - + 70 °C (32° - 158 °F)
- Operating temp. E-box	+ 5 °C - +35 °C
For operation within specs	+ 10 °C - +30 °C
Op. temp. control panel	+ 5 °C - +35 °C
- Ventilation E-box	430 m ³ /h
- Relative humidity	≤ 80 % non-condensing
- Electromagn. compatibility (EMC)	EN 55022, Class B FCC (47CFR) PART 15 Subp J Class A IEC 801-3, 3 V/m IEC 801-2, 8 kV
- ESD	

2.4.7 MECHANICAL DATA

- Dimensions E-box	533(h) x 483(w) x 470(d) mm, (19", 12 RU) 1 RU under the electronics box has to be left free for ventilation and slide-in rails
- Dimensions control panel	687(h) x 1350(w) x 99(d) mm
- Cutout measures contr. pan.	1327(l) x 661(w) mm
- Ventilation	Suction port: left side panel Blow-out port: rear top
- Weight E-box	41 kg
- Weight control panel	33 kg
- Mechanical stress	vibration IEC 68-2-6, shock IEC 68-2-29 tilt fall IEC 68-2-31,
- Color E-box	dark mushroom, Philips 10709/G8
- Color control panel	ultra dark grey, Philips 10714/G8

3. MOUNTING THE ELECTRONICS BOX

Your equipment may be shipped in several different boxes, depending upon order size and configuration.

Check the contents of each box against the packing list to ensure your order is complete. If equipment is missing or damaged, contact the shipping company immediately.

The electronics boxes of the switchers DD5, DD10, DD20 and DD30 are located in a closed 19-inch frame which houses the individual plug-in cards of the video and control electronics as well as the power supply units.

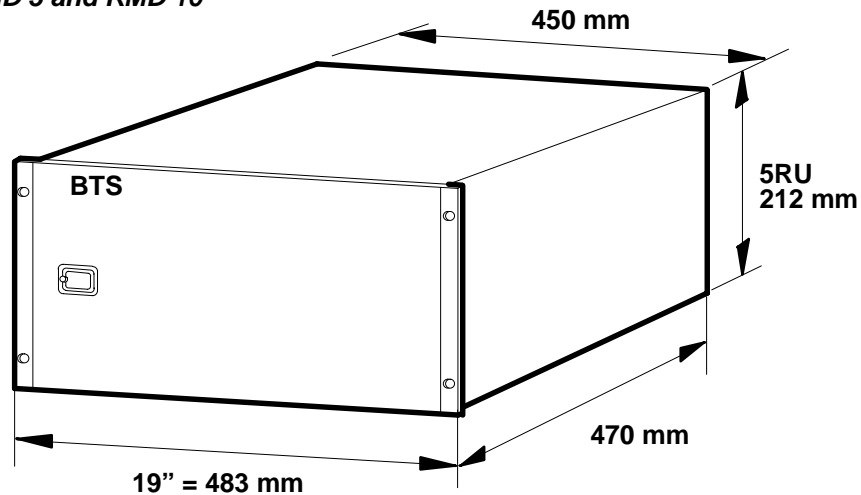
ATTENTION:



The device is orderly used when the electronics box is firmly incorporated into an equipment cabinet in a studio or O.B. van and is connected to earth! According to VDE, mobile application is not admissible.

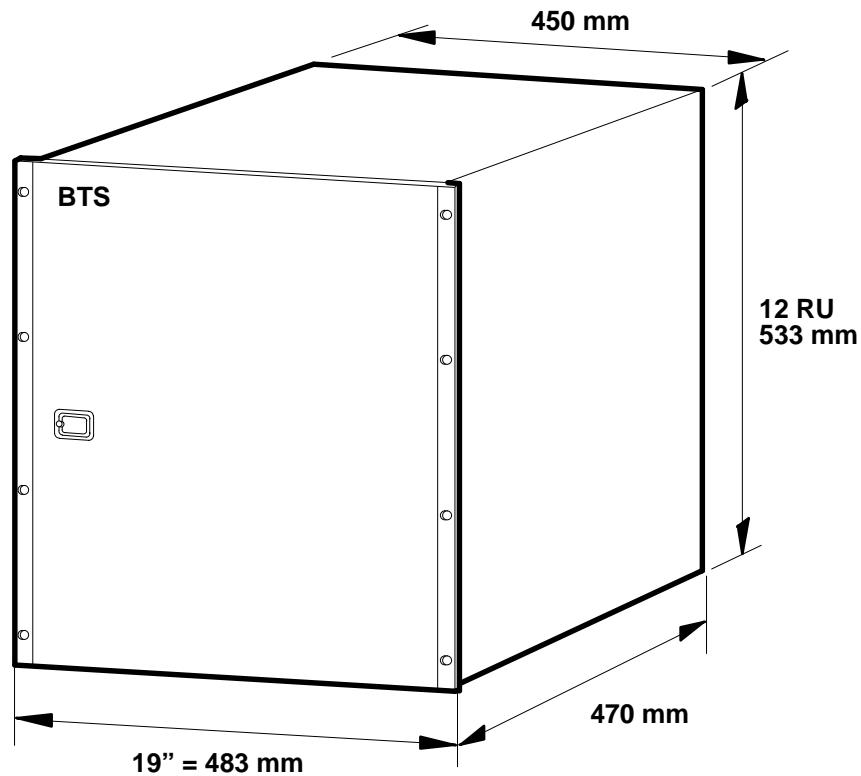
3.1 MECHANICAL MEASUREMENTS

Electronics box for RMD 5 and RMD 10



WARNING

With the standard modules installed, the DD10 mainframe weighs 41 kg (44 lbs). During installation and until secured in the rack, use an appropriate lifting device to lift and support the mainframe. Failure to follow this precaution can result in injury to personnel and damage to equipment.

Electronics box for RMD 20 and RMD 30**WARNING**

With the standard modules installed, the DD30 mainframe weights 41 kg (91 lbs). During installation and until secured in the rack, use an appropriate lifting device to lift and support the mainframe. Failure to follow this precaution can result in injury to personnel and damage to equipment.

3.2 INSTALLATION IN A 19-INCH CABINET

For installation, BTS optionally provides a 19-inch cabinet of the series G 3 SK 62969 with the associated mounting accessories. When using cabinets of other manufacturers, observe the respective mounting instructions.

3.3 INSTALLATION IN A DIN CABINET

For installation in a DIN cabinet, adapter pieces of the respective cabinet manufacturer have to be mounted on both sides of the lateral fastening flanges. The electronics box is mounted into the cabinet by means of the 19-inch fastening flanges located at both sides. For weight relief, it is necessary to mount 2 slide rails into the cabinet.

3.4 VENTILATION

The ambient temperature during operation must not fall below + 5 °C or exceed + 40 °C. Optimum operation is ensured at an ambient temperature of 30 °C \pm 5 °C (see the Technical Data).

For ventilation of the electronics box, blowers are provided in the upper part.

RMD 5 and RMD 10	1 blower
RMD 20 and RMD 30	3 blowers

These blowers serve to support air circulation in the unit and to lead the heated air into the room.

For RMD 20 and RMD 30, air supply is made from the bottom, for RMD 5 and RMD 10 from the left side. The heated air is blown by the blowers into the rear part of the cabinet.

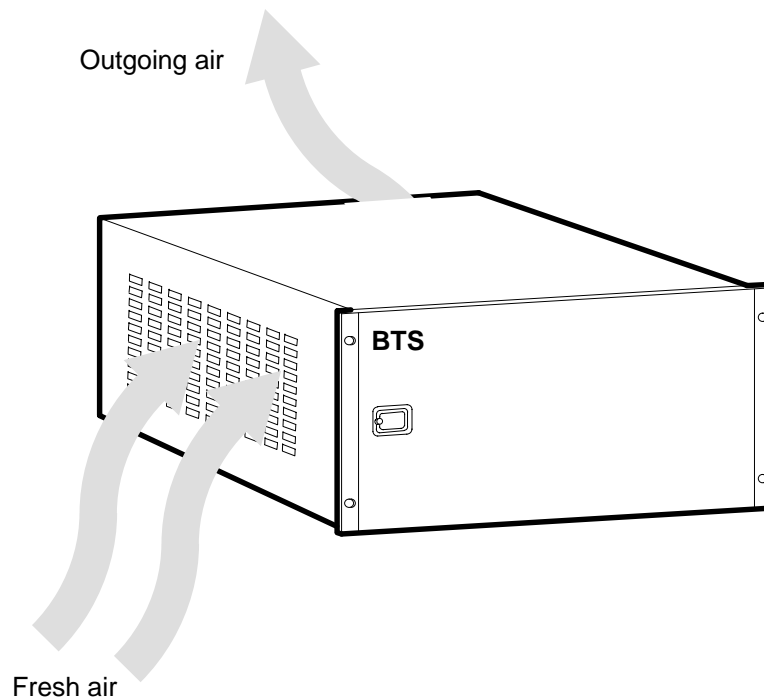
In order to ensure continuous air circulation, make sure that the air slots in the bottom of the electronics box are not covered when mounting the electronics box. This is ensured when leaving space enough underneath the electronics box.

For this reason, it is recommended to provide for air circulation a space of 2 rack units (2RU) in the equipment cabinet underneath the electronics box.

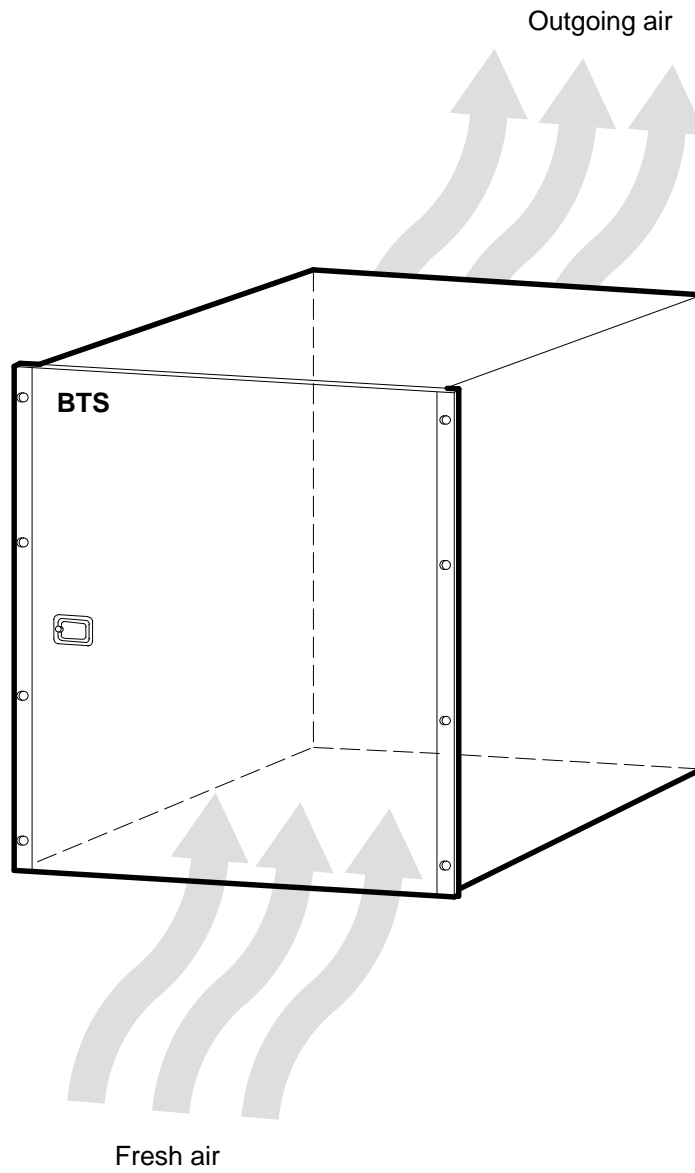


Minimum space underneath the frame has to be 1RU (for ventilation and sliding rails)!

Air circulation electronics box RMD 5 and RMD 10



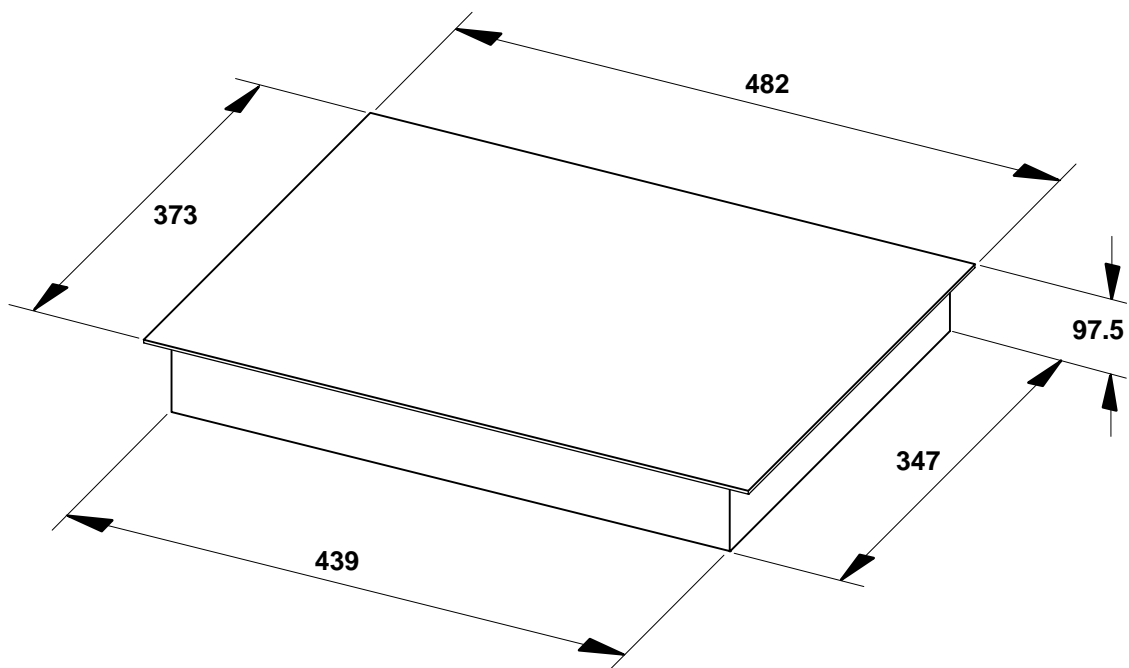
Air circulation electronics box RMD 20 and RMD 30



4. MOUNTING THE CONTROL PANELS

4.1 DIMENSIONS OF CONTROL PANEL RPD 5

The figure below shows all mechanical measurements of the RPD 5 control panel being relevant for installation in a master control desk. The size of the desk cutout is also indicated.



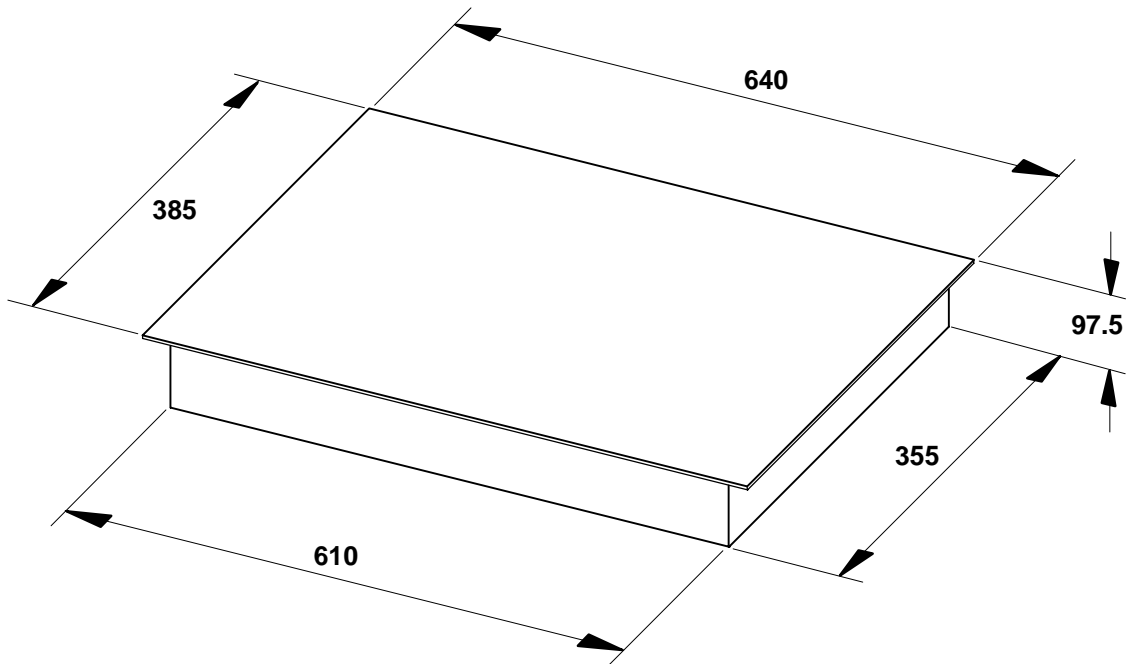
Measures in mm



Desk cutout: 449 x 358 mm

4.2 DIMENSIONS OF CONTROL PANEL RPD 10

The figure below shows all mechanical measurements of the RPD10 control panel being relevant for installation in a master control desk. The size of the desk cutout is also indicated.

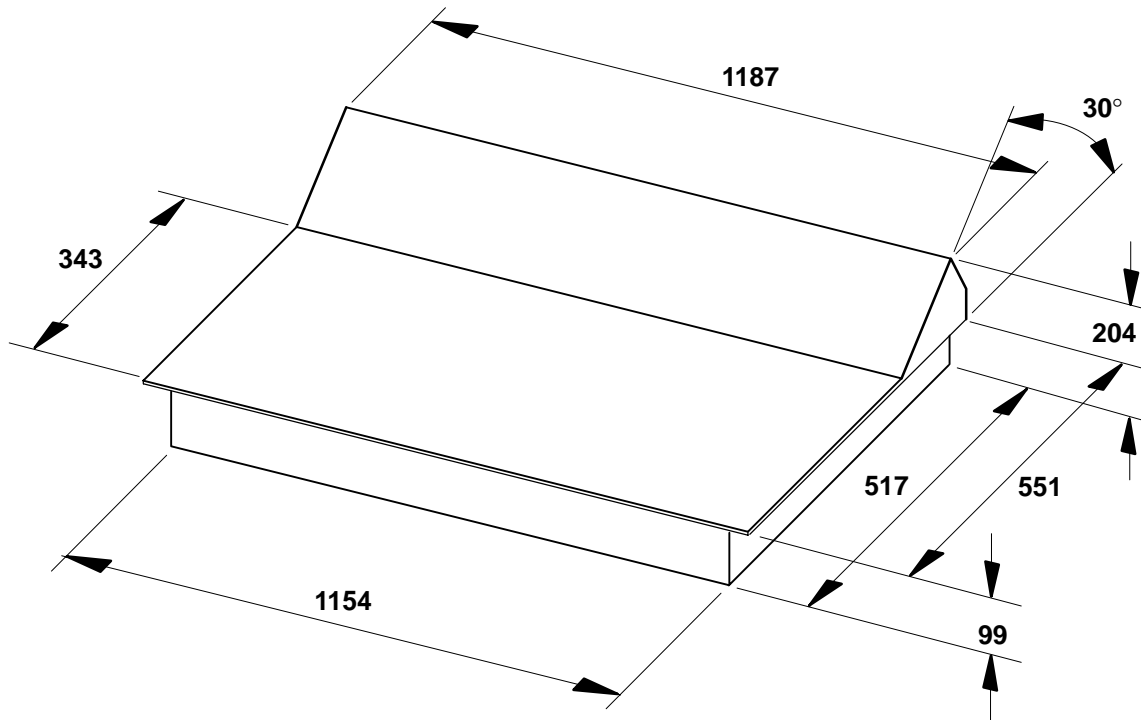


Measures in mm

 **Desk cutout: 620 x 363 mm**

4.3 DIMENSIONS OF CONTROL PANEL RPD 20

The figure below shows all mechanical measurements of the RPD 20 control panel being relevant for installation in a master control desk. The size of the desk cutout is also indicated.



Measures in mm



Desk cutout: 1164 x 525 mm

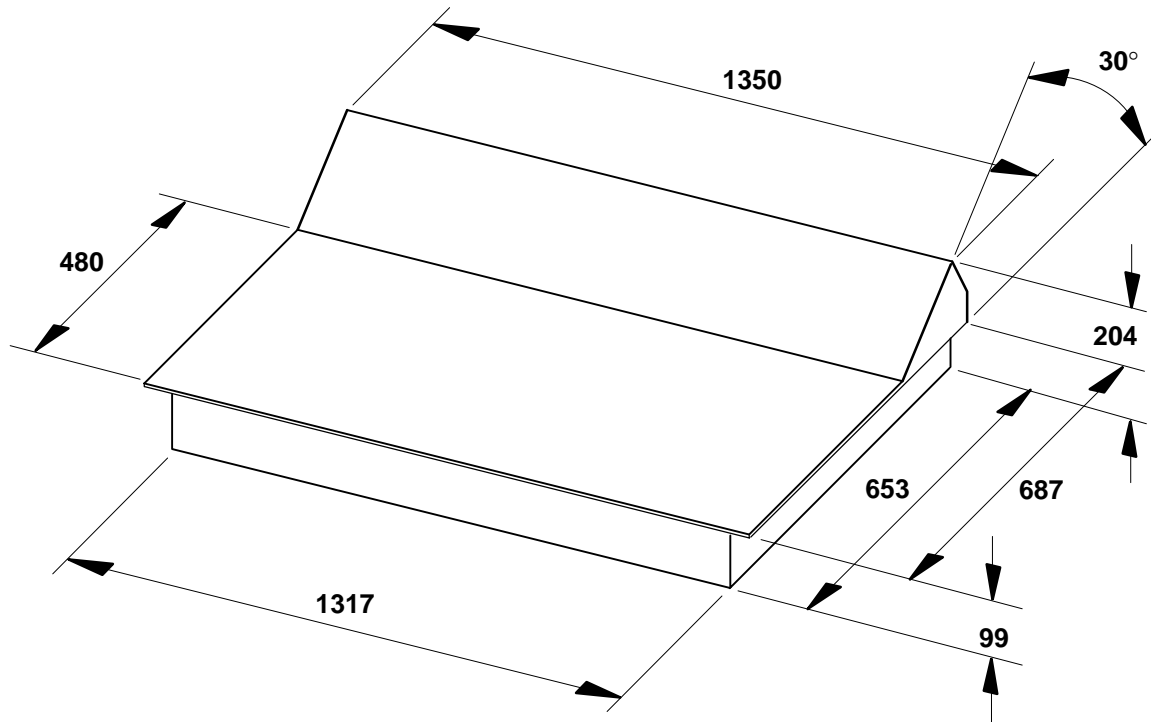


WARNING

With the standard modules installed, the DD20 control panel weighs 26 kg (57 lbs). During installation and until secured in the desk, use an appropriate lifting device to lift and support the panel. Failure to follow this precaution can result in injury to personnel and damage to equipment.

4.4 DIMENSIONS OF CONTROL PANEL RPD 30

The figure below shows all mechanical measurements of the RPD 30 control panel being relevant for installation in a master control desk. The size of the desk cutout is also indicated.



Measures in mm



Desk cutout: 1327 x 661 mm



WARNING

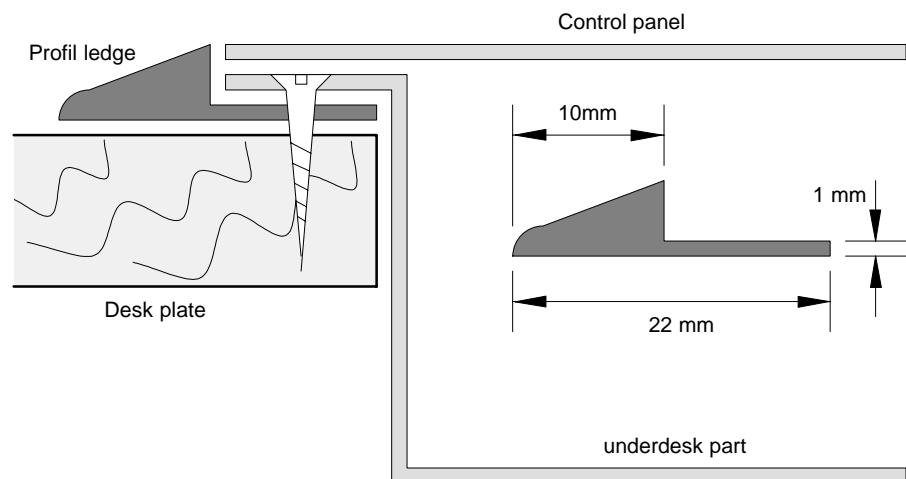
With the standard modules installed, the DD30 control panel weights 33 kg (73 lbs). During installation and until secured in the desk, use an appropriate lifting device to lift and support the panel. Failure to follow this precaution can result in injury to personnel and damage to equipment.

4.5 FASTENING

For fastening the control panels RPD 5, RPD 10, RPD 20 and RPD 30 in the master control desk, bores are provided in the frame of the lower control panel part. The respective lower control panel part can be fastened with countersunk wood screws with a diameter of 4 mm. The length of the screw depends on the plate thickness of the master control desk. A set with mounting parts is included in the delivery of the switcher.

4.6 PROFILE SET

For the different control panels of the switcher family, black anodized profile ledges are available as an accessory, to compensate the different heights between desk plate and control panel.



When mounting, slide the profile ledge under the edge of the underdesk part. The ledges are screwed together with the underdesk part into the desk plate. When upgrading the switcher types DD5 and DD10, two holes each have to be bored in the right and left (DD10) or front and rear (DD5) edge of the underdesk part for fastening the profile ledges. The holes have to be countersunk to enable fastening the underdesk part with countersunk screws.

The following profile sets are available:

Switcher	Number of profiles	Type	Order No.
DD5	links, rechts, vorne, hinten	RC 1885	2 351 670 010
DD10	links, rechts, vorne, hinten	RC 1861	2 351 660 010
DD20	links, rechts, vorne	RC 2008	2 351 680 010
DD20M	links, rechts, vorne, hinten	RC 2062	2 351 720 010
DD30	links, rechts, vorne	RC 1842	2 351 690 010

4.7 VENTILATION



During operation, the ambient temperature in the desk must not fall below 5 °C and not exceed 35 °C.

For supply air and exhaust air, ventilation slots are provided in the lower control panel part. In order to ensure continuous air circulation, make sure that the ventilation slots are not covered when mounting the control panel!

The control panel must not be mounted into closed desks!

5. CONNECTION AND STARTUP

5.1 CONNECTING POWER AND EARTH LINES

The units of the switcher family *Diamond digital* have been completely checked in the factory and are in conformity with the safety regulation EN60950 (VDE0805) when leaving the factory.

The respective switcher electronics (E-box) is located in a 19-inch case, suitable for being installed in a DIN or 19-inch cabinet.

When mounting into a cabinet, care should be taken to allow for adequate horizontal air circulation. The maximum ambient temperature must not exceed +40 °C during operation.

PERMANENT EARTH CONNECTION



Due to their high leakage currents (>3.5 mA), the electronics boxes DD20 and DD30 **must** be permanently connected with the earth terminal of the equipment cabinet. For this purpose, the connector panel is provided with a separate earth cable (green/yellow, 4 mm²) with a length of 2.80 m.

Make the earth connections always **before** applying mains power!

For this purpose, the connector panel also carries the following warning note:

BTS Broadcast Television Systems GmbH
HIGH LEAKAGE CURRENT
EARTH CONNECTION
ESSENTIAL BEFORE
CONNECTING SUPPLY

POWER CONNECTION



Prior to connecting the switcher components to the line voltage make sure that the power supplies of control panel and electronics box are adjusted to the corresponding primary voltage. The factory-adjusted voltage is indicated on the respective connector panel (E-box, control panel) where also the type label is fastened.

Note for installing DD20 and DD30:

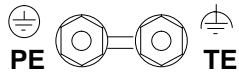
When operating within the line voltage range of 115V, mains-caused undervoltages may effect an increased current consumption and as a consequence an activation of the preceding fuses!

For this reason, the electronics boxes of the mixers DD20 and DD30 must be only operated at a line voltage of 230V. When leaving the factory, the power supply units are adjusted to the respective voltage and marked accordingly.

For switching over to another line voltage, see the corresponding section in this manual.

In order to be able to make quickly deadly the mixer in the case of malfunction, the mains cabling of the mixer must be interruptable and at any time accessible.

EARTHING REQUIREMENTS



The *Diamond digital* switcher family is provided with two separate screw terminals for protective and video earth, located at the rear, which are short-circuited by a jumper when being delivered. The PE terminal (protective earth) is internally connected with the PE contact of the power cable.

The following earthing methods are possible:

1. Connect the central ground wires of the studio to the terminal screw PE. The jumper between the terminal screws PE and TE must not be broken. The cross section of the protective wire should be greater than that of the neutral wire N of the power cable, however, should be 2.5 mm² at least (in accordance with VDE 0800/part 2, table 1). In case of need, e.g. in studios with separate protective and technical earth systems, the jumper can be broken. In this case, the central functional earth potential (video earth) has to be additionally applied to the TE terminal screw. This earth potential should have functional protective and noiseless earth qualities (FPE) as stated in VDE regulation 0800/part 2. Cross-section as above mentioned. A low impedance interconnection of both earth conductors must be provided at the central studio earthing point or at the earth bus.
2. In case of non-stationary application, earthing is ensured by the leading protective earth contact of the AC power connector. The power cable, however, must be plugged into a wall socket whose PE contact is connected to protective earth potential. The effect of the protective earth connection must not be cancelled through the use of an extension cable without protective earth conductor nor must its function be disabled in any other way!
The jumper across the PE and TE terminals must not be broken. When the jumper is broken, the central functional earth (see item 1) has to be connected to the TE terminal screw. This earth connection must be made before connecting the AC power cable.
In case of TN-C power systems (without protective earth and with neutral earthing for protection purpose), it is necessary to observe VDE 0100 T.410 (IEC 364-4-41, IEC 364-4-47), VDE 0100 T.540 (IEC 364-5-54) or the applicable national regulations.

Any disconnection or break of the protective earth conductor inside or outside the unit may entail that, in the event of a failure, the operational safety of the unit will no longer be ensured.



Any disconnection, demounting or break of the protective earth conductor inside or outside the unit may entail that, in the event of a failure, the operational safety of the unit will no longer be ensured.

FUSES



Caution

Double-pole or neutral fusing. After operation of the protective device, parts of the equipment that remain under voltage might represent a hazard during servicing.

5.2 CHANGING THE SUPPLY VOLTAGE

The power supplies of the different control panel types and the associated electronics frames are designed for the supply voltage ranges of

115V AC +15/-20% and 230V AC +15/-20%

When leaving the factory, the power supplies are normally adjusted to operate on 230V. The factory-adjusted voltage is indicated on the connector panel of the unit. Should it be required to operate with another supply voltage, modify all power supplies in the respective control panel and associated E-box.

The modification has to be carried out from a qualified service personal.

Unit	Power Supply	Order No
Panel RPD 5	RC 1882	0 351 670 300
Panel RPD 10	RC 1824	0 351 692 500
	or RC 1832	0 351 693 900
Panel RPD 20	RC 1824	0 351 692 500
	or RC 1831	0 351 693 200
	or RC 1832	0 351 693 900
Panel RPD 30	RC 1824	0 351 692 500
	or RC 1831	0 351 693 200
	or RC 1832	0 351 693 900
E-Box RMD 5	RC 1929	0 212 183 000
E-Box RMD 10	RC 1929	0 212 183 000
E-Box RMD 20	5x RC 1926	0 212 182 700
E-Box RMD 30	5x RC 1926	0 212 182 700

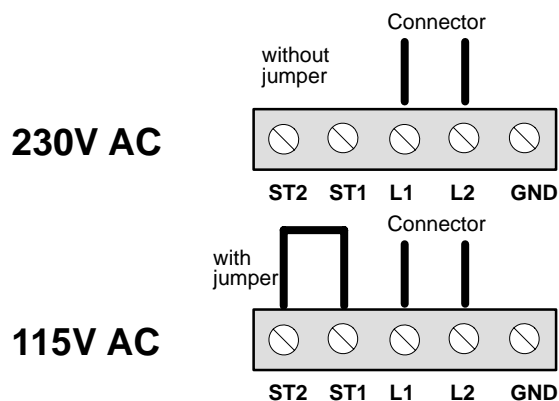
Modification



In spite of the different power supply types, modification is equal for all units and has to be carried out as follows:

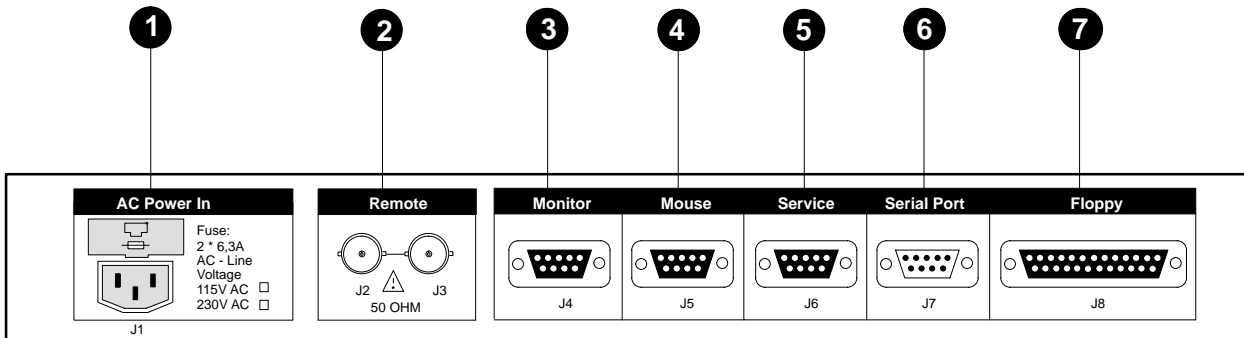
1. Switch off the control panel or E-box and disconnect it from power.
2. Open the door of the E-box or tilt up the desk cover of the control panel.
3. E-box: Unlock the power supply in the frame and pull it out of the frame.

Control panel: Mounting can be carried out in the built-in state.



4. Re-place the power supply into the frame and lock it.
5. Connect it to power and switch the unit on.
6. Correct the power indication on the connector panel.

5.3 CONTROL DESK CONNECTOR PANEL



⚠ Attention: 50 Ohm cheapernet cable only!

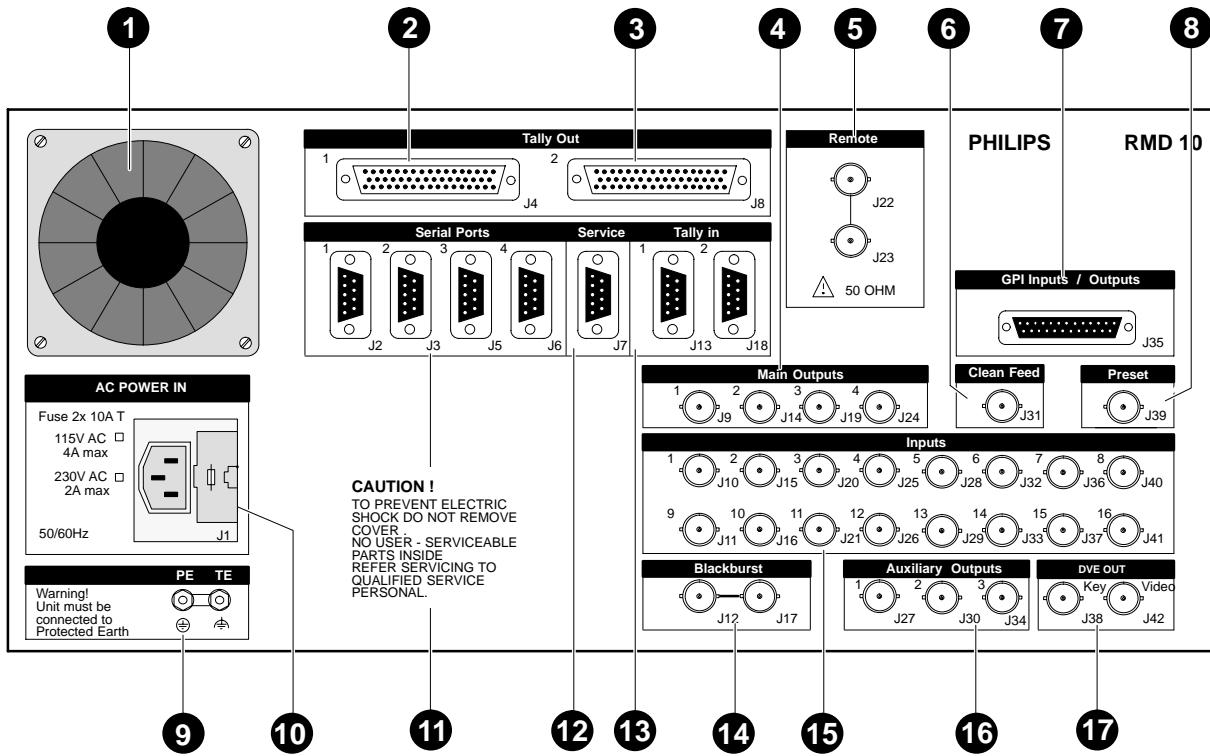
Item No:	Socket / Connector Description	Socket type Connector type	Function
1	J1 AC POWER IN	IEC-320, CEE-22	<p>Convenience outlet for power supply to the control panel. The convenience outlet contains a mains filter as well as the two unit fuses. Fuse rating: 2 x 6,3A slow-blow. The factory-adjusted supply voltage is indicated.</p> <p>Caution Double-pole or neutral fusing. After operation of the protective device, parts of the equipment that remain under voltage might represent a hazard during servicing.</p>
2	J2, J3 REMOTE	BNC / 50-ohms	<p>(Loop-through/50-Ω) cheapernet connector for connection between control panel and E-box or further control units in the network. For further information see the section "Cheapernet Specifications".</p> <p>Note:</p> <p>In the latest version, only jack J2 is equipped. For interconnection the signals a BNC-T-plug is included.</p>
3	J4 MONITOR	9-pin D-type female	<p>TTL interface for connecting an EGA data monitor. The monitor serves for display of the switcher menu if the control panel is not provided with a display (DD5 and DD10 only). The monitor type suitable for use, depends on the controller of the control panel:</p> <ul style="list-style-type: none"> – Controller RY1821: EGA monitor – Controller RY1822: VGA monitor <p>For further information see the section "Connecting a Monitor".</p>

Item No.:	Socket / Connector Description	Socket type Connector type	Function
4	J5 MOUSE	9-pin D-type male	RS-232C interface for connecting a mouse (Logitech Series 9). The interface uses the same port as the interface SERVICE. The functions are mutually exclusive. Connecting a mouse, automatically switches to mouse mode. Further information is contained in the section "Connecting a Mouse".
5	J6 SERVICE	9-pin D-type female	RS-232 interface for connecting a diagnosis computer or external mass memory (personal computer). The interface uses the same port as the MOUSE interface. The functions are mutually exclusive.
6	J7 SERIAL PORT	9-pin D-type female	RS-422 interface (MPK bus) for connecting an the Under Monitor Displays UMD or the Aux Bus control panels.
7	J8 FLOPPY	25-pin D-type female	Connector socket for external floppy disk drive.

Detailed information regarding the connector and socket assignment can be found in the section "Pin Assignments".

5.4 E-BOX CONNECTOR PANEL RMD 5 / 10

⚠ Attention: 50 Ohm cheapernet cable only!

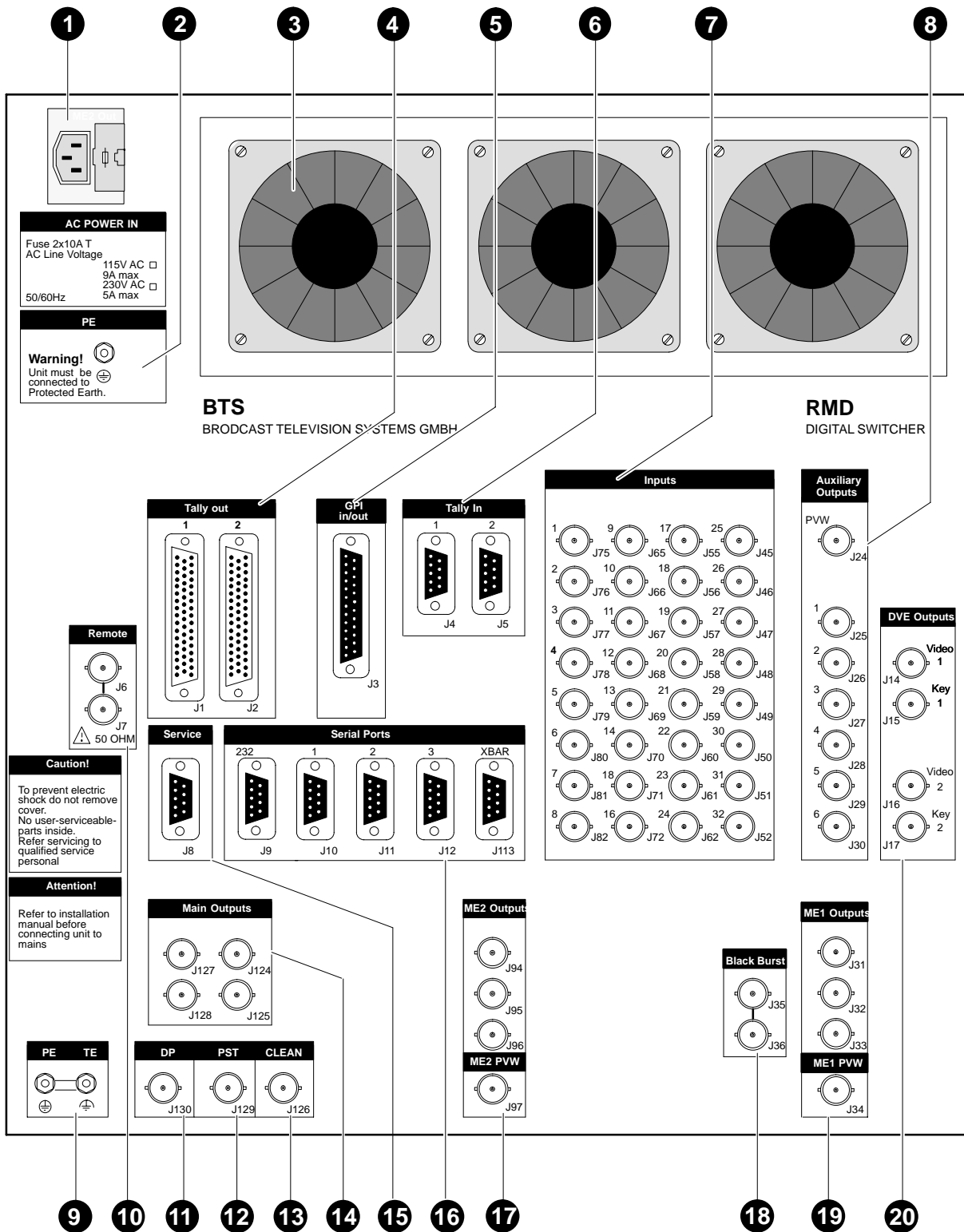


Item No.:	Socket / Connector Description	Socket type Connector type	Function
1			Unit blower
2	J4 TALLY OUT 1	50-pin D-type male	Tally output sockets for indicating the picture sources 1 ...16.
3	J8 TALLY OUT 2	50-pin D-type male	Tally output sockets for indicating the picture monitors assigned to the diverse outputs.
4	J9, J14, J19, J24 MAIN OUTPUT 1..4	BNC / Serial Comp CCIR 656	Main outputs of the production switcher.
5	J22, J23 REMOTE	BNC / 50 ohms	Cheapernet connector for connection between E-box and control panel or further control units in the network. For further information see the section "Cheapernet Specifications". Note: In the latest version, only jack J23 is equipped. For interconnection the signals a BNC-T-plug is included.
6	J31 CLEAN FEED	BNC / Serial Comp CCIR 656	Switcher output without considering the DSK level.
7	J35 GPI INPUT/OUTPUT	25-pin D-type female	General-purpose interface connector with 8 input channels and 8 output channels.
8	J39 PRESET	BNC / Serial Comp CCIR 656	Switcher preview output supplies the current signal of the preset row.
9	TE / PE	M4 threaded pins	Terminal screws for unit earthing PE protective earth TE technical earth When leaving the factory, both terminal screws are shorted with a jumper.
10	J1 AC POWER IN	IEC-320, CEE-22	Convenience outlet for power supply to the E-box. The convenience outlet contains a mains filter as well as the two unit fuses. Fuse rating: 2 x 10A slow-blow. The factory-adjusted supply voltage is indicated. Caution Double-pole or neutral fusing. After operation of the protective device, parts of the equipment that remain under voltage might represent a hazard during servicing.

Item No.:	Socket / Connector Description	Socket type Connector type	Function
11	J2, J3, J5, J6 SERIAL PORTS 1..4	9-pin D-type female	Port 1: RS-422/RS-232 interface can be switched over Port 2, Port 3: RS-422 interface. Port 4: RS-232 interface Uses the same port of the controller as port1. For this reason, the functions are mutually exclusive.
12	J7 SERVICE	9-pin D-type female	RS-232 interface for connecting a diagnosis computer
13	J13, J18 TALLY IN 1 / 2	9-pin D-type female	Tally input sockets for supplying the tally information of succeeding units.
14	J12, J17 BLACKBURST	BNC / 75 ohms	Loop-through sync input for analog blackburst signal.
15	J10, J11, J15, J16, J20, J21, J25, J26, J28, J29, J32, J33, J36, J37, J40, J41 INPUTS	BNC / Serial Comp CCIR 656	1 ... 16 switcher main inputs.
16	J27 J30 J34 AUXILIARY OUTPUTS	BNC / Serial Comp CCIR 656	1 ... 3 additional switcher outputs via which external and internal video signals can be supplied.
17	J42 DVE OUT VIDEO J38 DVE OUT KEY	BNC / Serial Comp CCIR 656	Video and key outputs for integration of a DVE into the signal path of the switcher. Feedback of the manipulated signals is made via the 16 standard inputs of the switcher.

Detailed information regarding the connector and socket assignment can be found in the section "Pin Assignments".

5.5 E-BOX CONNECTOR PANEL RMD 20 / 30



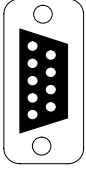
⚠ Attention: 50 Ohm cheapernet cable only!

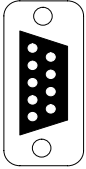
Item No.:	Socket / Connector Description	Socket type Connector type	Function
1	AC POWER IN	IEC-320, CEE-22	<p>Convenience outlet for power supply to the E-box. The convenience outlet contains a mains filter as well as the two unit fuses. Fuse rating: 2 x 10A slow-blow The factory-adjusted supply voltage is indicated.</p> <p>Caution Double-pole or neutral fusing. After operation of the protective device, parts of the equipment that remain under voltage might represent a hazard during servicing.</p>
2	PE	M6 threaded pins	Terminal screw for unit earthing PE protective earth See section 5.1 "Connecting Power and Earth Lines".
3			3 unit blowers
4	J1, J2 TALLY OUT 1 / 2	50-pin D-type male	Tally output sockets (1) for indicating the picture sources 1 ... 32. Tally output sockets (2) for indicating the picture monitors assigned to the diverse outputs.
5	J3 GPI INPUT/OUTPUT	25-pin D-type female	General-purpose interface connector with 8 input channels and 8 output channels.
6	J4, J5 TALLY IN 1 / 2	9-pin D-type female	Tally input sockets for supplying the tally information of succeeding units.
7	J45-J52, J55-J62 J65-J72, J75-J82 INPUTS	BNC / Serial Comp CCIR 656	32 switcher main inputs.
8	J24-J30 AUXILIARY OUTPUTS	BNC / Serial Comp CCIR 656	1 ... 6 additional switcher outputs via which external and internal video signals can be supplied.
9	PE/TE	M4 threaded pins	Terminal screws for technical earth (TE) and protective earth (PE). TE technical earth PE protective earth
10	J6, J7 REMOTE	BNC / 50 Ohm IEEE 802.3	<p>Cheapernet connector for connection between E-box and control panel or further control units in the network. For further information see the section "Cheapernet Specifications".</p> <p>Note: In the latest version, only jack J23 is equipped. For interconnection the signals a BNC-T-plug is included.</p>

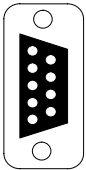
Item No.:	Socket / Connector Description	Socket type Connector type	Function
11	J130 DP	BNC / Serial Comp CCIR 656	Preview output for the second downstream keyer.
12	J129 PST	BNC / Serial Comp CCIR 656	Switcher preview output supplies the current signal of the preset row.
13	J126 CLEAN FEED	BNC / Serial Comp CCIR 656	Switcher output without considering the DSK level.
14	J124, J125, J127-J128 MAIN OUTPUT 1..4	BNC / Serial Comp CCIR 656	Main switcher outputs.
15	J8 SERVICE	9-pin D-type female	RS-232 interface for connecting a diagnosis computer.
16	J9-J12, J113 SERIAL PORTS 232 SERIAL PORTS 1..3 SERIAL PORT XBAR	9-pin D-type female	Port 1: RS-422/RS-232 interface can be switched over Port 2, port 3: RS-422 interface. Port 232: RS-232 interface Uses the same port of the controller as port1. For this reason, the functions are mutually exclusive. Port XBAR: RS-422 interface for connecting an external crossbar. See the section "XBAR interface for DD20 and DD30"
17	J94-J96 ME2 OUT 1..3 J97 ME2 PVW	BNC / 75 ohms	3 x output sockets of mixing level ME2. 1 x preview output of mixing level ME2.
18	J35, J36 BLACKBURST	BNC / 75 ohms	Loop-through sync input for analog blackburst signal.
19	J31-J33 ME1 OUT 1..3 J34 ME1 PVW	BNC / 75 ohms	3 x output sockets of mixing level ME1. 1 x preview output of mixing level ME1.
20	J14, J15 ME2 OUT 1..3 J97 ME2 PVW	BNC / Serial Comp CCIR 656	Video and key outputs for integrating a DVE into the signal path of the mixing levels ME1 and ME2. The manipulated signals are fed back via the 32 standard inputs of the switcher.

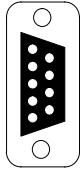
Detailed information regarding the connector and socket assignment can be found in the section "Pin Assignments".

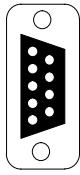
5.6 PIN ASSIGNMENTS

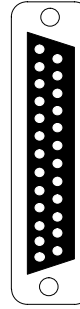
PORT RS-232	Pin	Signal
 <p>9-pin D-type female</p>	1	GND (Chassis)
	2	TxD
	3	RxD
	4	RTS
	5	CTS
	6	-
	7	GND
	8	-
	9	-

PORT RS-422	Pin	Signal	
		Bus Contr	Tributary
 <p>9-pin D-type female</p>	1	GND	GND
	2	RxA	TxA
	3	TxB	RxB
	4	GND	GND
	5	-	-
	6	GND	GND
	7	RxB	TxB
	8	TxA	RxA
	9	GND	GND

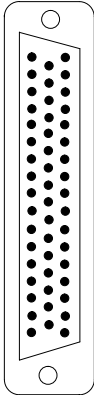
SERVICE / RS-232	Pin	Signal
 <p>9-pin D-type female</p>	1	-
	2	TxD
	3	RxD
	4	-
	5	GND
	6	-
	7	EXTRES
	8	-
	9	TEST

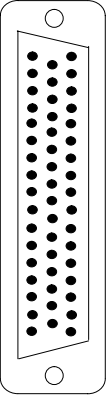
TALLY IN 1	Pin	Signal	DD5	DD10	DD20	DD30	DD20M
 <p>9-pin D-type female</p>	1	MAIN=PP	–	–	X	X	X
	2	READY	X	X	X	X	X
	3	ME1	X	X	X	X	–
	4	ME2	–	–	–	X	–
	5	AUX1	X	X	X	X	X
	6	AUX2	–	X	X	X	X
	7	AUX3	–	X	X	X	X
	8	AUX4	–	–	X	X	X
	9	GND	X	X	X	X	X


TALLY IN 2	Pin	Signal	DD5	DD10	DD20	DD30	DD20M
 <p>9-pin D-type female</p>	1	DVE1 (Video)	X	X	X	X	–
	2	DVE2 (Video)	–	–	X	X	–
	3	PVW	–	–	X	X	X
	4	CLEAN	X	X	X	X	X
	5	AUX5	–	–	X	X	X
	6	AUX6	–	–	X	X	–
	7	DVE1 (Key)	X	X	X	X	–
	8	DVE2 (Key)	–	–	X	X	–
	9	GND	X	X	X	X	X

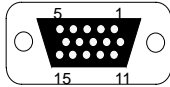
GPI IN / OUT	Pin	Signal
 <p>25-pin D-type female</p>	1	GPI OUT1
	2	GPI OUT2
	3	GPI OUT3
	4	GPI OUT4
	5	GPI OUT5
	6	GPI OUT6
	7	GPI OUT7
	8	GPI OUT8
	9	GPI OUT COMMON
	10	GPI IN 1 (cathode)
	11	GPI IN 1 (anode)
	12	GPI IN 2 (cathode)
	13	GPI IN 2 (anode)
	14	GPI IN 3 (cathode)
	15	GPI IN 3 (anode)
	16	GPI IN 4 (cathode)
	17	GPI IN 4 (anode)
	18	GPI IN 5 (cathode)
	19	GPI IN 5 (anode)
	20	GPI IN 6 (cathode)
	21	GPI IN 6 (anode)
	22	GPI IN 7 (cathode)
	23	GPI IN 7 (anode)
	24	GPI IN 8 (cathode)
	25	GPI IN 8 (anode)

x = relevant – = nicht relevant

TALLY OUT 1	Pin	Signal	DD5	DD10	DD20	DD30	DD20M
 <p>50-pin D-type male</p>	1	Quelle 1a	x	x	x	x	x
	2	Quelle 1b	x	x	x	x	x
	3	Quelle 2a	x	x	x	x	x
	4	Quelle 2b	x	x	x	x	x
	5	Quelle 3a	x	x	x	x	x
	6	Quelle 3b	x	x	x	x	x
	7	Quelle 4a	x	x	x	x	x
	8	Quelle 4b	x	x	x	x	x
	9	Quelle 5a	x	x	x	x	x
	10	Quelle 5b	x	x	x	x	x
	11	Quelle 6a	x	x	x	x	x
	12	Quelle 6b	x	x	x	x	x
	13	Quelle 7a	x	x	x	x	x
	14	Quelle 7b	x	x	x	x	x
	15	Quelle 8a	x	x	x	x	x
	16	Quelle 8b	x	x	x	x	x
	17	Quelle 9a	x	x	x	x	x
	18	Quelle 9b	x	x	x	x	x
	19	Quelle 10a	x	x	x	x	x
	20	Quelle 10b	x	x	x	x	x
	21	Quelle 11a	x	x	x	x	x
	22	Quelle 11b	x	x	x	x	x
	23	Quelle 12a	x	x	x	x	x
	24	Quelle 12b	x	x	x	x	x
	25	Quelle 13a	–	x	x	x	x
	26	Quelle 13b	–	x	x	x	x
	27	Quelle 14a	–	x	x	x	x
	28	Quelle 14b	–	x	x	x	x
	29	Quelle 15a	–	x	x	x	x
	30	Quelle 15b	–	x	x	x	x
	31	Quelle 16a	–	x	x	x	x
	32	Quelle 16b	–	x	x	x	x
	33	Quelle 17a	–	–	x	x	x
	34	Quelle 17b	–	–	x	x	x
	35	Quelle 18a	–	–	x	x	x
	36	Quelle 18b	–	–	x	x	x
	37	Quelle 19a	–	–	x	x	x
	38	Quelle 19b	–	–	x	x	x
	39	Quelle 20a	–	–	x	x	x
	40	Quelle 20b	–	–	x	x	x
	41	Quelle 21a	–	–	x	x	x
	42	Quelle 21b	–	–	x	x	x
	43	Quelle 22a	–	–	x	x	x
	44	Quelle 22b	–	–	x	x	x
	45	Quelle 23a	–	–	x	x	x
	46	Quelle 23b	–	–	x	x	x
	47	Quelle 24a	–	–	x	x	x
	48	Quelle 24b	–	–	x	x	x
	49						
	50						

TALLY OUT 2	Pin	Signal	DD5	DD10	DD20	DD30	DD20 M	
 <p>50-pin D-type male</p>	1	Quelle 25a	-	-	X	X	X	
	2	Quelle 25b	-	-	X	X	X	
	3	Quelle 26a	-	-	X	X	X	
	4	Quelle 26b	-	-	X	X	X	
	5	Quelle 27a	-	-	X	X	X	
	6	Quelle 27b	-	-	X	X	X	
	7	Quelle 28a	-	-	X	X	X	
	8	Quelle 28b	-	-	X	X	X	
	9	Quelle 29a	-	-	X	X	X	
	10	Quelle 29b	-	-	X	X	X	
	11	Quelle 30a	-	-	X	X	X	
	12	Quelle 30b	-	-	X	X	X	
	13	Quelle 31a	-	-	X	X	X	
	14	Quelle 31b	-	-	X	X	X	
	15	Quelle 32a	-	-	X	X	X	
	16	Quelle 32b	-	-	X	X	X	
	17	-						
	18	-						
	19	-						
	20	-						
	21	-						
	22	-						
			(Common)					
	23	ME1 (48)	X	X	X	X	-	
	24	ME2 (49)	-	-	-	X	-	
	25	MAIN=PP (47)	-	-	X	X	X	
	26	CLEAN (50)	X	X	X	X	X	
	27	PRESET (47)	X	X	X	X	X	
	28	AUX1 (47)	X	X	X	X	X	
	29	AUX2 (47)	-	X	X	X	X	
	30	AUX3 (47)	-	X	X	X	X	
	31	AUX4 (47)	-	-	X	X	X	
	32	AUX5 (49)	-	-	X	X	X	
	33	AUX6 (49)	-	-	X	X	X	
	34	DVE1(Video) (50)	-	-	X	X	-	
	35	DVE2(Video) (50)	-	-	X	X	-	
	36	PVW (49)	-	-	X	X	X	
	37	DSK1 (50)	-	-	X	X	X	
	38	DSK2 (50)	-	-	X	X	X	
	39	-						
	40	-						
	41	-						
	42	-						
	43	-						
	44	-						
	45	-						
	46	-						
	47	Common 25,27-31,						
	48	Common 23						
	49	Common 24,32,33,36						
50	Common 26,34,35,37,38							

MONITOR (EGA) J4 / RY1821	Pin	Signal
 <p>9-pin D-type female</p>	1 2 3 4 5 6 7 8 9	Masse Rot LSB Rot MSB Grün MSB Blau MSB Grün LSB Blau LSB H SYNC (aktiv low) V SYNC (aktiv high)

MONITOR (VGA) J4 / RY1822	Pin	Signal
 <p>15-pin D-type female</p>	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Red (analog 0.7Vpp/75 Ohm) Green (analog 0.7Vpp/75 Ohm) Blue (analog 0.7Vpp/75 Ohm) – – Red GND Green GND Blue GND – Sync GND – – H-Sync (TTL) V-Sync (TTL) –

The interface at the control panel emulates the PC VGA standard.

5.7 CONNECTING AN MENU MONITOR

5.7.1 EGA MONITOR WITH PANEL CONTROLLER RY1821

For supporting the operational and servicing possibilities, an EGA monitor can be connected to the control panel of the switcher types DD5 and DD10. The switcher types DD20 and DD30 are not provided with this connection facility. BTS recommends to connect an EGA monitor available at the market for personal computer with TTL input.

The following type have been tested:

- EIZO Flexscan 9060s

Monitor type

The interface at the control panel emulates the PC EGA standard. The following data have to be considered:

Resolution:	640 x 350
Picture frequency:	60 Hz
Line frequency:	21.80 kHz
Pixel clock:	16.00 MHz (PC: 16.26 MHz)
Colors:	64
Input:	TTL

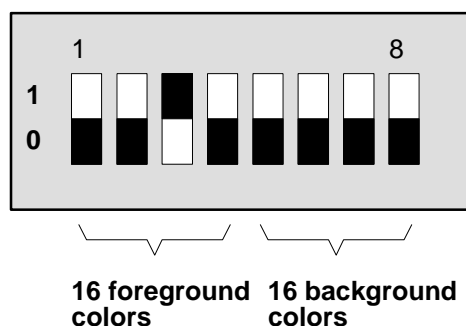
Of the 350 possible lines, only 200 are utilized on the monitor. This corresponds to the display aspect ratio of the switcher types DD20 and DD30. The remainder of the picture becomes black.

Connection

The monitor has to be connected to the Monitor socket J4 on the connector panel of the control desk.

Color adjustment

Color display on the monitor can be varied and consequently matched to the visual impression of the operator. Color adjustment can be made with the 8-step DIP switch T4 on the control panel controller RY 1821.



The switches 1...4 select one of 16 possible foreground colors, the switches 5...8 one of 16 possible background colors. The colors have been selected in such a way that adjustment with identical foreground and background colors is not possible.

The cursor is always displayed in white.

5.7.2 CONTROL PANEL CONTROLLER RY1822 WITH VGA INTERFACE

The RY1821 control panel controller has been modified and now features a VGA (video graphics adapter) interface. The VGA interface replaces the EGA interface and serves for the connection of VGA monitors as external menu monitors for switchers of the *DD5* and *DD10* type.

The modified controller is designated RY1822 and can be ordered under no. 0351 692 300. Its other functions correspond to that of the RY1821 controller.

The following description contains amendments of the **Planning and Installation** manual. The sections

- 5.7 System messages and settings
- 5.9 Connection of a monitor

are changed as follows:



Display setup DIP switch T4

The T4 dip switch on the RY1822 controller permits the selection of four different modes of operation.

Switch	Position ON = 1 OFF= 2	Description
1..3	000 001 010 011 100 101 110 111	1-of-8 colour combinations (foreground / background / cursor): amber / black / grey, transparent amber / black / grey, dominant beige / black / grey, transparent beige / black / grey, dominant yellow / black / grey, transparent yellow / black / grey, dominant green / black / red, dominant grey / black / white, transparent
4, 5		not used
6...7	00 01 10 11	Menu monitor modes (1): 640 x 480 640 x 350 reserved reserved
8	0 1	Switching between EL/CRT mode (1): EL-display mode (DD20/DD30) Menu monitor mode (DD5/DD10)

(1) If switch 8 is OFF (EL mode), the position of switch 6, 7 is **don't care**.

Display formats

Mode:	640 dot x 480 line	640 dot x 350 line
Pixel clock:	25.175 MHz	25.175 MHz
Vert. scan. freq.:	59.941 Hz	70.08 Hz
Hor. scan. freq.:	31.468 kHz	31.468 kHz
Interlace:	none	none
Sync. polarity:	H-negative; V-negative	H-negative; V-negative

5.8 CONNECTING A PC MOUSE

Socket **J5, Mouse** of the control panel enables connection of a PC mouse with serial interface which is operated from the same serial channel as the service terminal interface at socket J6 of the connector panel.

After installation, the service interface has to be activated for this operating mode with the 8-step DIP switch T8 (Setup) on controller RY 1821/RY1822:

Switch 1: Position ON = Mouse active
 Position OFF = Service terminal active

With "mouse active", LED G6 on the control panel ccontroller RY 1821/ RY 1822 will light.

The mouse has to be microsoft-compatible.

Recommendation: Original Microsoft mouse

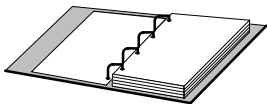
6. INITIAL INSTALLATION

6.1 INSTALLATION CHECKLIST

Note

The installation checklist comprises the procedures for installation and initial installation described in this manual. It is recommended to install the devices with the aid of the instructions below.

Please note that the line voltage is only applied when you are expressly requested in the checklist to do so.



- After having thoroughly unpacked the equipment and checked the packings for mains cables and other small parts, check the delivery with regard to damages caused by transport. If you note a damage, immediately inform the forwarding agent.

Using the packing slip make sure that the delivery is complete.

- Before starting installation, read the enclosed installation instructions and become familiar with the safety instructions.
 - Mount the control panel into a desk.
 - Mount the electronics box into an equipment cabinet.
 - Check the plug-in cards in the E-box with regard to correct position in the support frame and make sure that the plug-in cards are locked.
 - Set the switches and jumpers to the required operating position.
 - Establish the earth connection.
 - Make sure that the line voltage is conform with the voltage adjusted in the delivered equipment. If required, change it over to the corresponding line voltage.
 - Set the service power switch on control panel and E-box to position **ON**.
 - Establish Cheapernet cabling between control panel and E-box. Connect the video input and output cables as well as the other control cables.
- ATTENTION** Cheapernet has to be terminated with a 50-Ω resistor!
- Connect the mains cable to the central mains distribution of the studio and switch on power.
 - Check the operational functions of the switcher.
 - Adjust timing.

6.2 POWERUP OF THE SWITCHER

Note

The switchers are not provided with a central power switch. Switching on and off is made via the central mains distribution of the studio or the equipment cabinet!

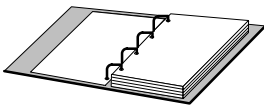
For service works, the switcher control panel contains on the power supply board of the E-box one switch each for switching the line voltage.

Switching on

After having switched on the line voltage, a self-test is carried out in the **electronics box** and **control panel controller**.

The correct functioning of controller RY 1917 is indicated by a running light in the two LED rows.

Functioning of the power supply is indicated by the "green" LEDs. For each main line of the voltage distribution in the support frame, a separate LED is available.



If one of the status LEDs lights "red", the switch for the VCO adjustment is not in the OPERATE position. If the LED rows of the controller indicate a defined error code, please see the section "Diagnosis" in the service manual.

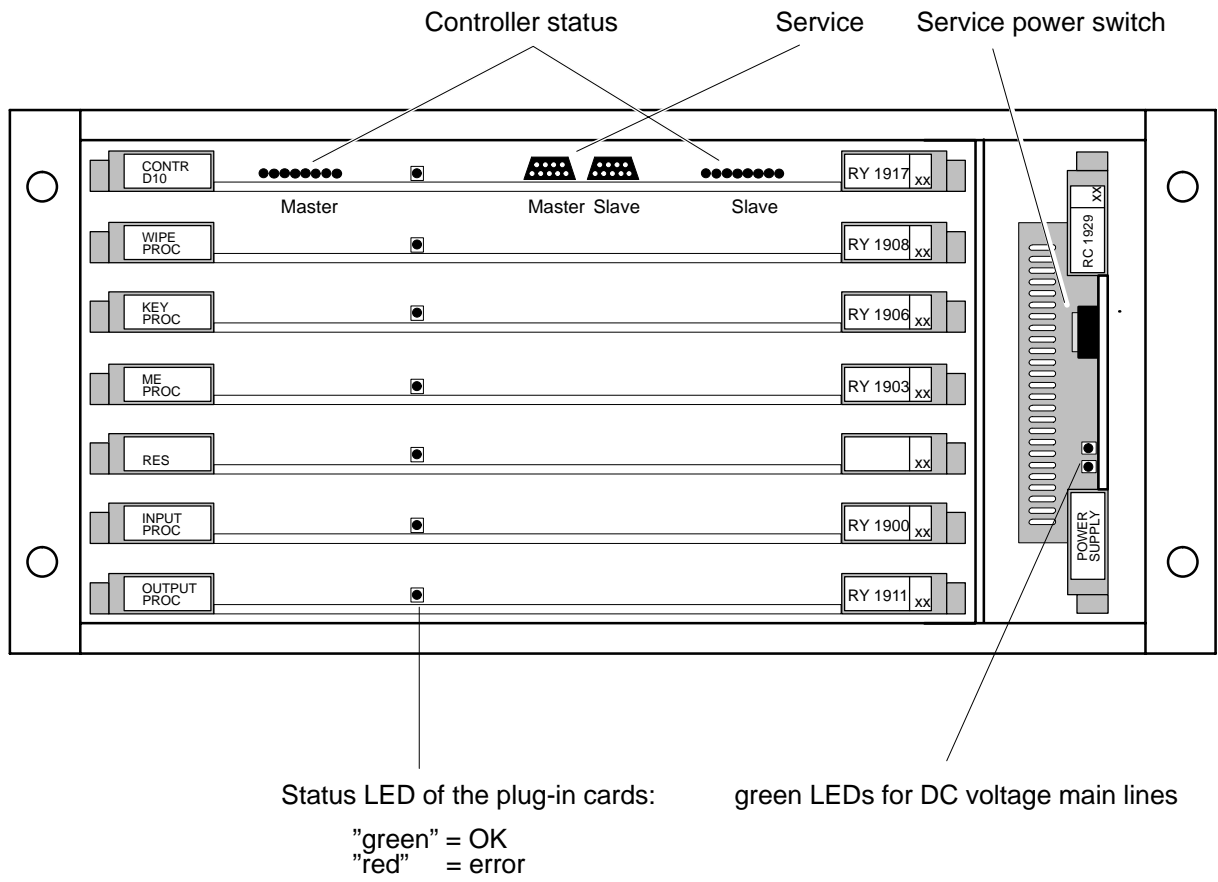
In the **control panel**, all key lamps are lit temporarily. Subsequently, the control panel returns to the operational state achieved before switching out.

No Reference

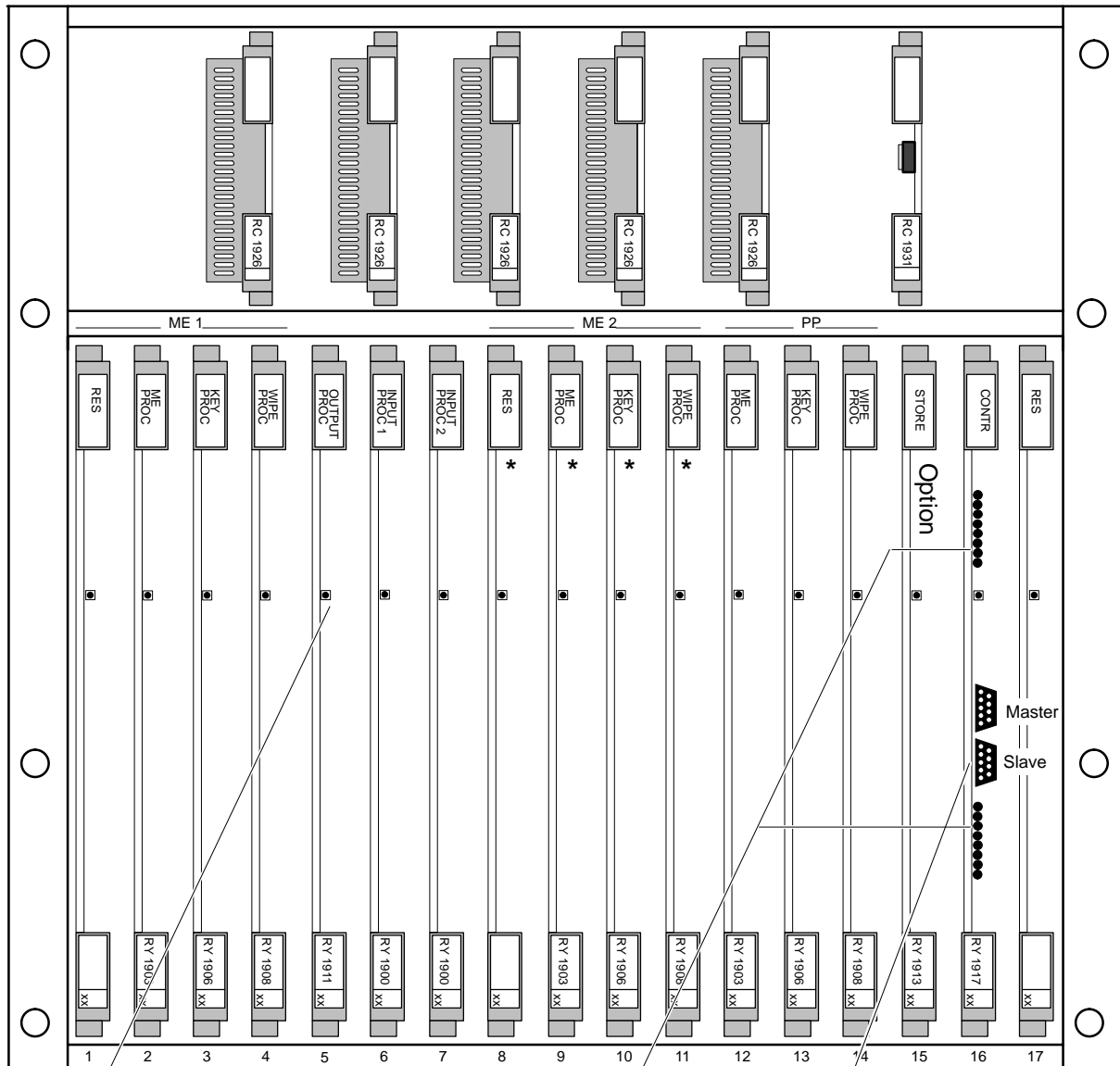
If the LED "No Reference" on the plug-in cards RY 1911, RY 1912 and RY 1914 is lit red, make sure that the switcher receives an external reference signal and press the **RESET** key.

The status LEDs are switched off when switching on or performing a RESET. After run of a diagnosis, the LEDs are lit to indicate correctly operating p.c. boards.

Status LEDs electronics box RMD 10



Status LEDs electronics box RMD 30



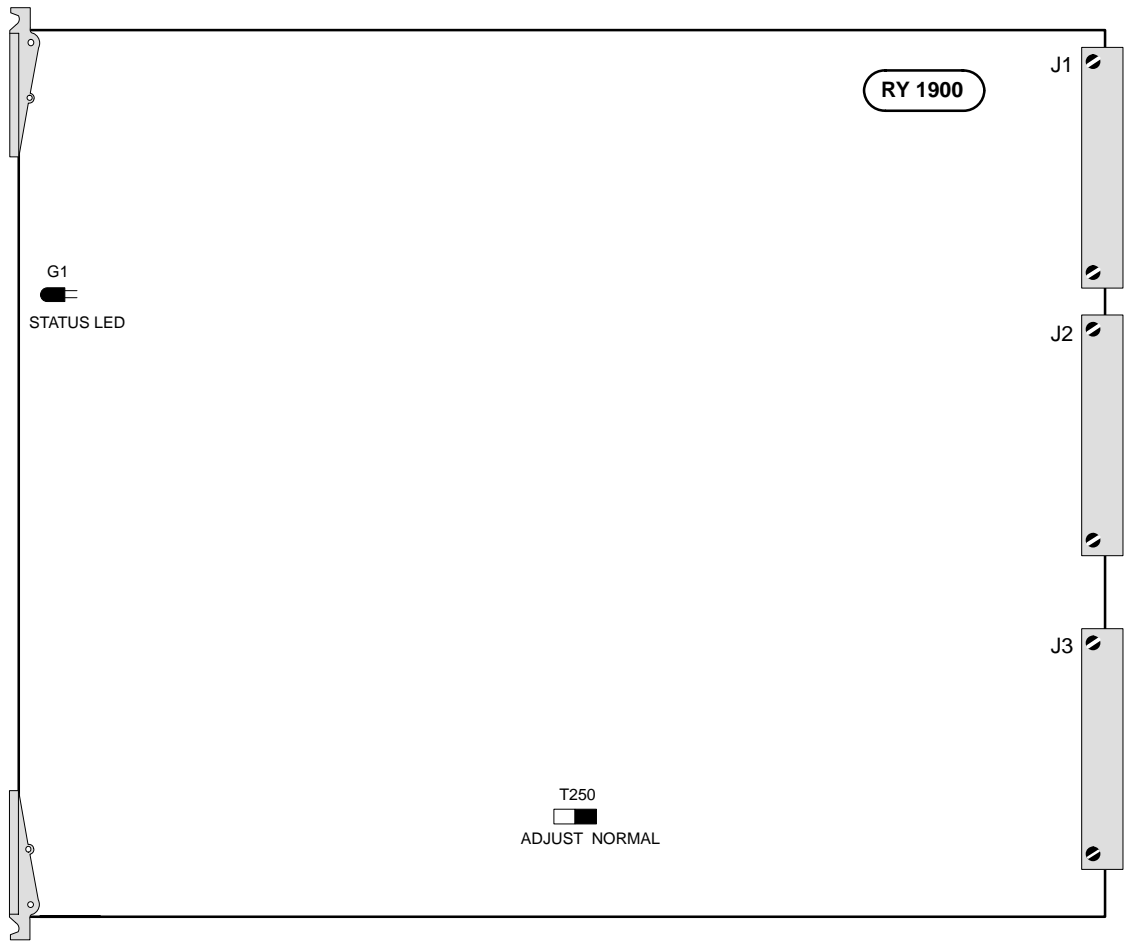
Status LED of the plug-in cards
 "green" = OK
 "red" = error

Controller status

Service

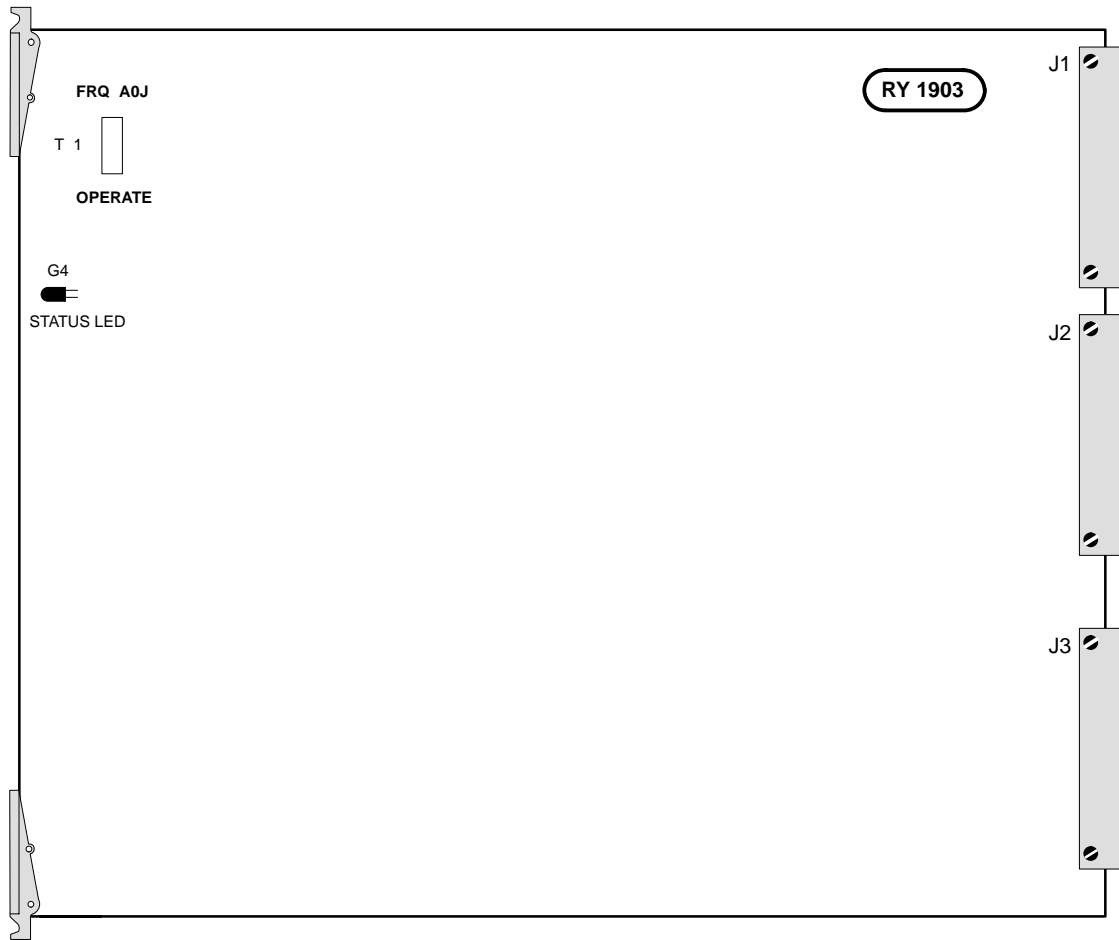
* = inserted on RMD30 only

6.3 INPUT PROCESSOR RY 1900



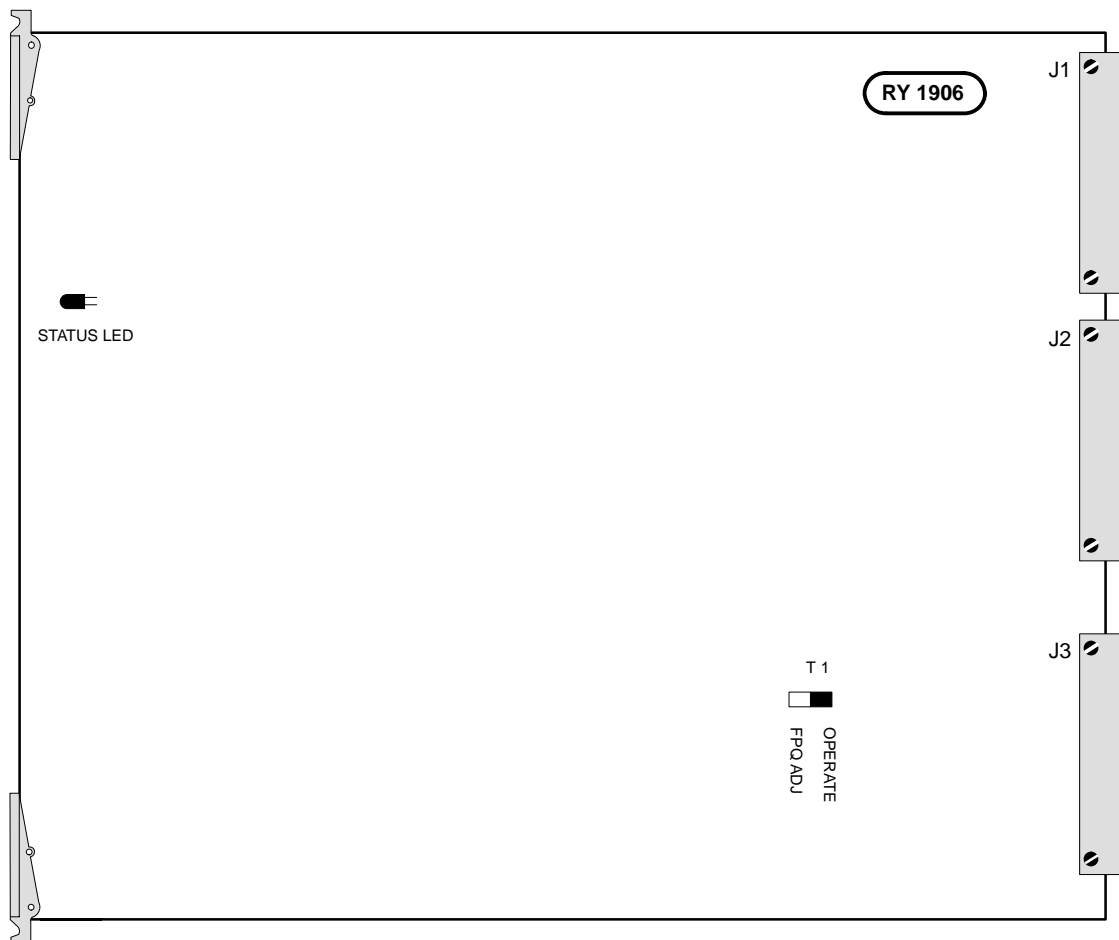
Pos	Function	Factory adjust.
G1	Two-colored LED display RED: Interface modules in adjust mode GREEN: P.c. board operate correctly	NORMAL
T250	Service switch for adjusting the center frequency of the VCOs of the serializers/deserializers	

6.4 ME PROCESSOR RY 1903



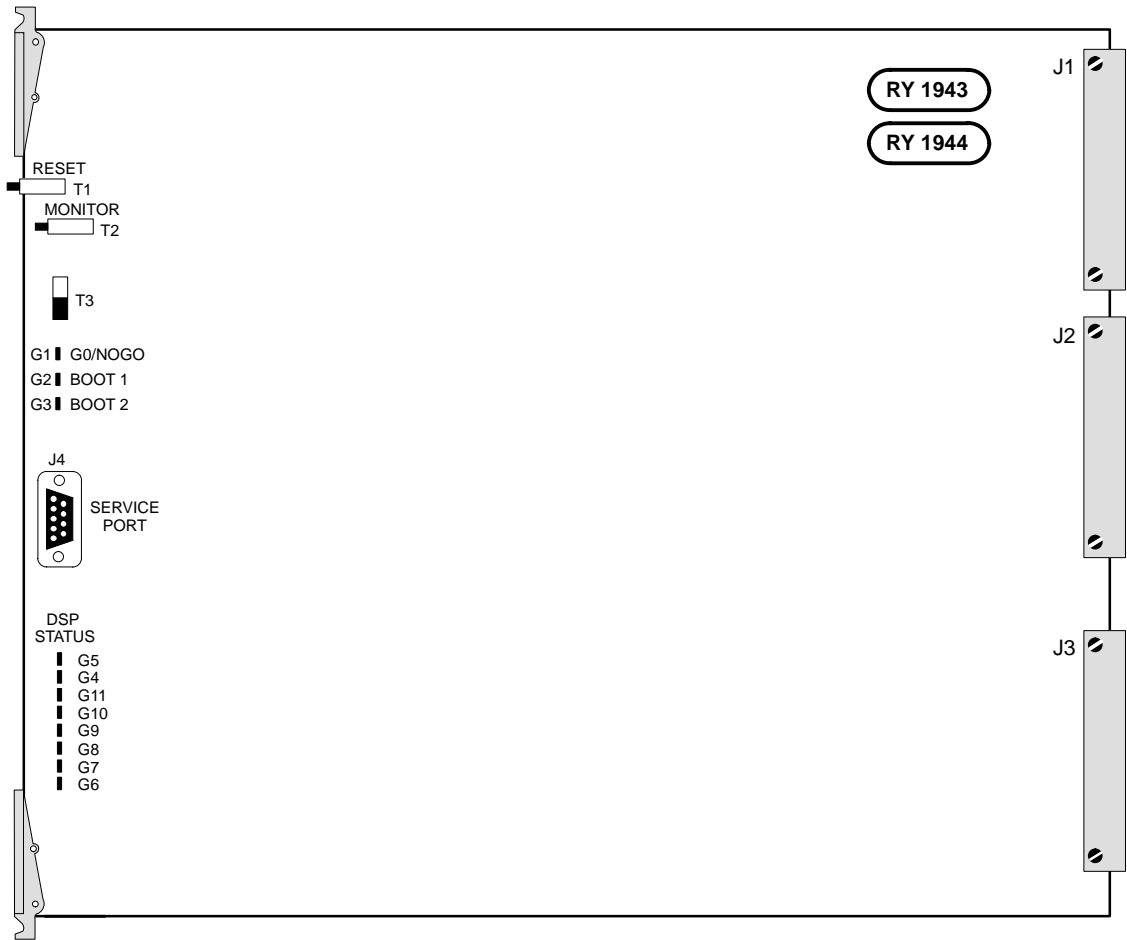
Pos.	Function	Factory adjustment
T 1	Service switch for adjusting the VCOs in the interface module for serial data FRQ ADJ: VCO in the free-running mode OPERATE: VCO in the operate mode	OPERATE
G 4	Two-colored LED display RED: Interface modules in adjust mode GREEN: P.c. board operate correctly	

6.5 KEY PROCESSOR I RY 1906



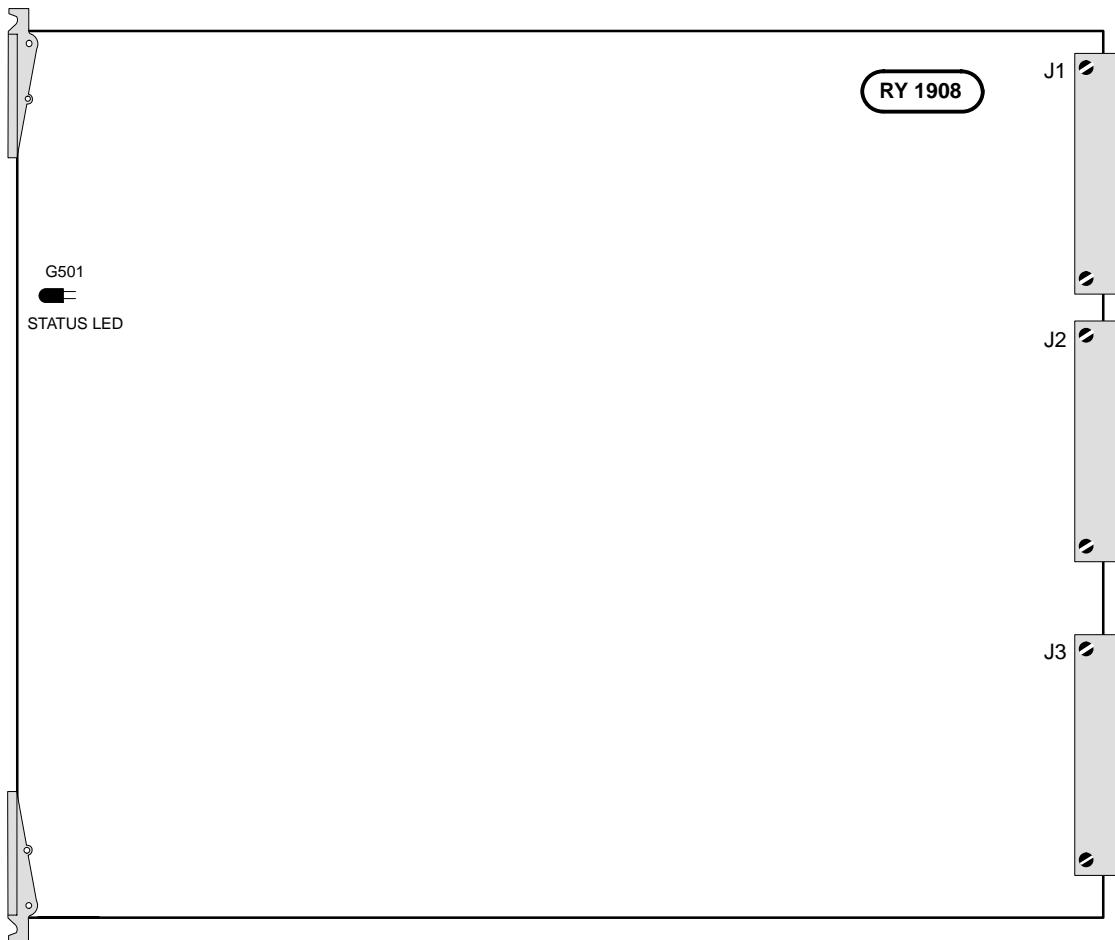
Pos.	Function	Factory adjust.
T 1	Service switch for adjusting the VCOs in the interface module for serial data FRQ ADJ: VCO in the free-running mode OPERATE: VCO in the operate mode	OPERATE
G4	Two-colored LED display RED: Interface modules in adjust mode GREEN: P.c. board operate correctly	

KEY-PROCESSOR II RY1943/RY 1944



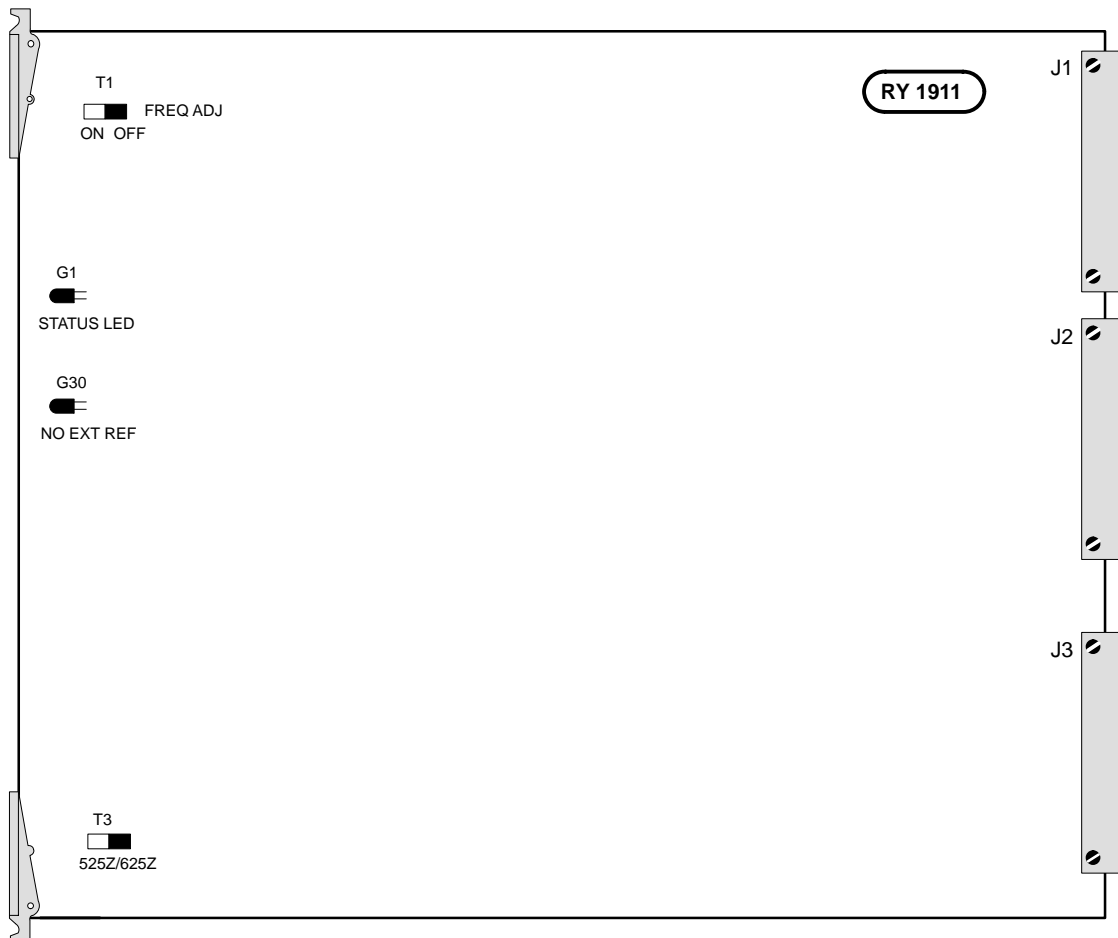
Pos.	Function	Factory adjust.
T1	Reset for DSP	
T2	Monitor button for loading the boot program (for service personnel only)	
T3	Service switch for adjusting the VCOs in the interface module for serial data FRQ ADJ: VCO in free running OPERATE: VCO in operation mode	OPERATE
G1	RED: Interface modules in the adjustment mode GREEN:P.c. board works properly	
G2	GREEN:DSP boot program was loaded successfully RED: Loading or error	
G3	GREEN:DSP main program was loaded successfully RED: Loading or error	
J4	Terminal interface for DSP (for service personnel only)	
G4-G11	LED row for DSP status Initializing phase: State of initialization Operational phase: Activity of the DSP (runing light)	

6.6 WIPE PROCESSOR RY 1908



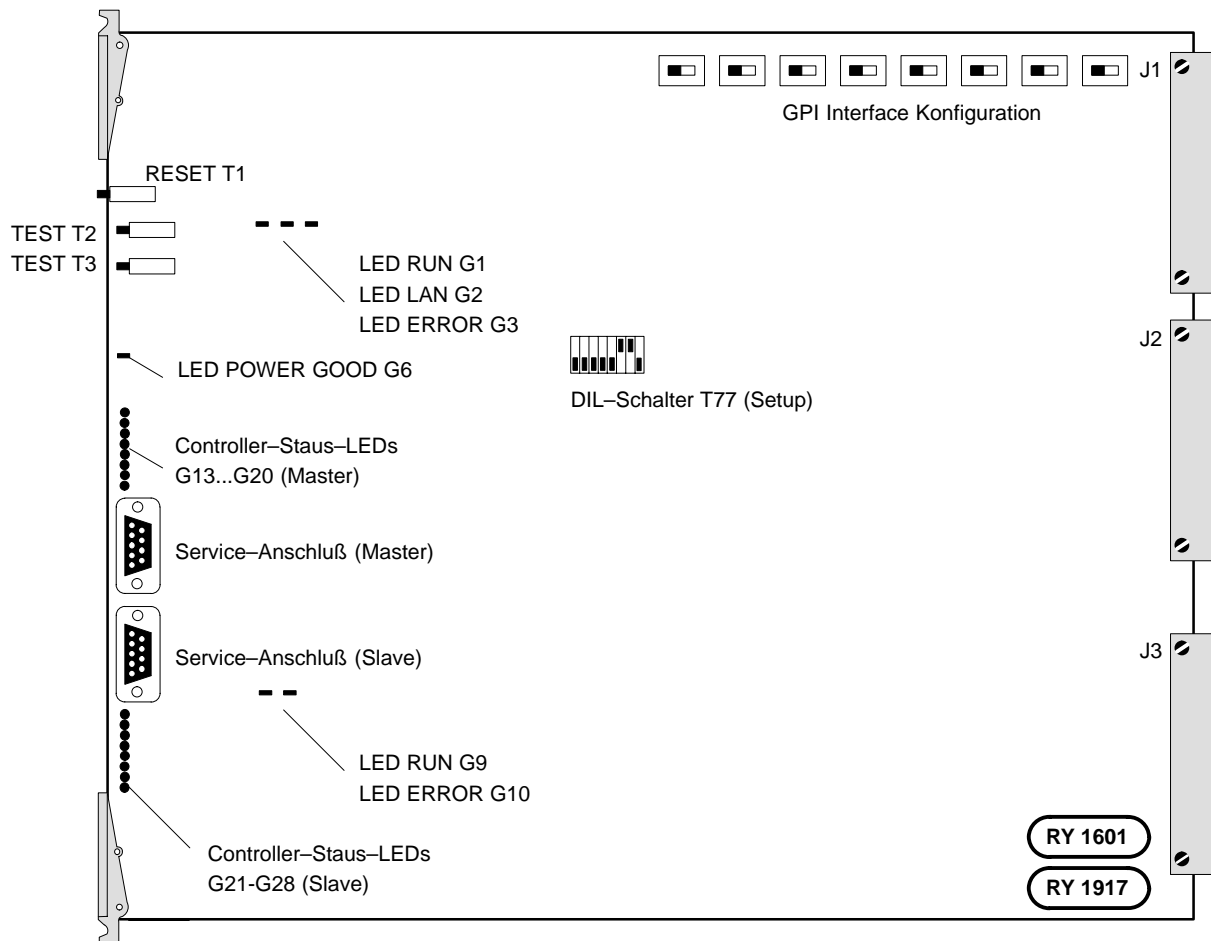
Pos.	Function	Factory adjust.
G501	Two-colored LED display RED: Interface modules in adjust mode GREEN: P.c. board operate correctly	OPERATE

6.7 OUTPUT PROCESSOR RY 1911



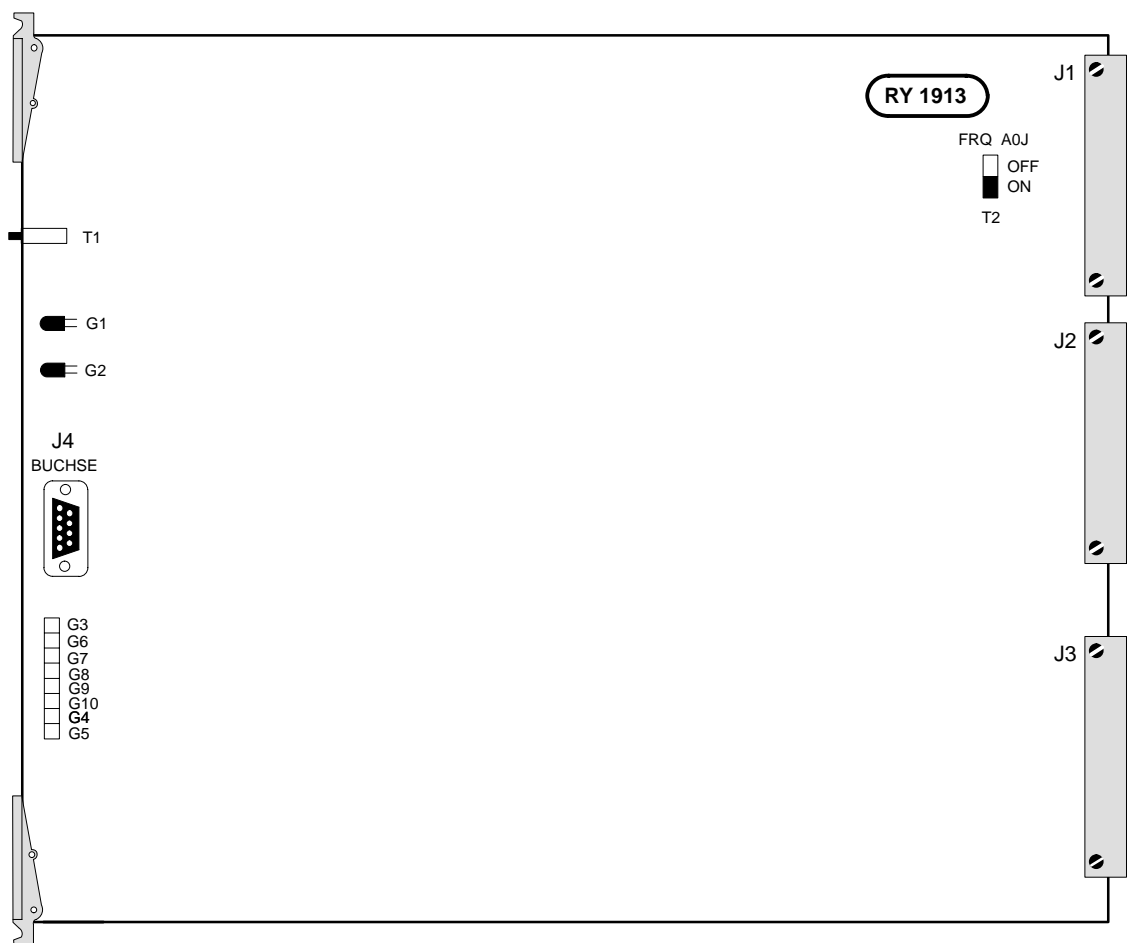
Pos.	Function	Factory adjust.
T1	Service switch for adjusting the center frequency of the VCOs of the serializers, deserializers.	FREQ ADJ OFF
T3	Standard selector switch for 525-line operation and 625-line operation. The switch should be only operated with the supply voltage switched off. Before switching on, apply a reference signal of the corresponding standard.	Depending on the delivery country

6.8 CONTROLLER RY 1917



Pos.	Function	Factory adjust.
<p>The adjustments are described in detail in section 5.7.</p>		

6.9 STORE RY 1913



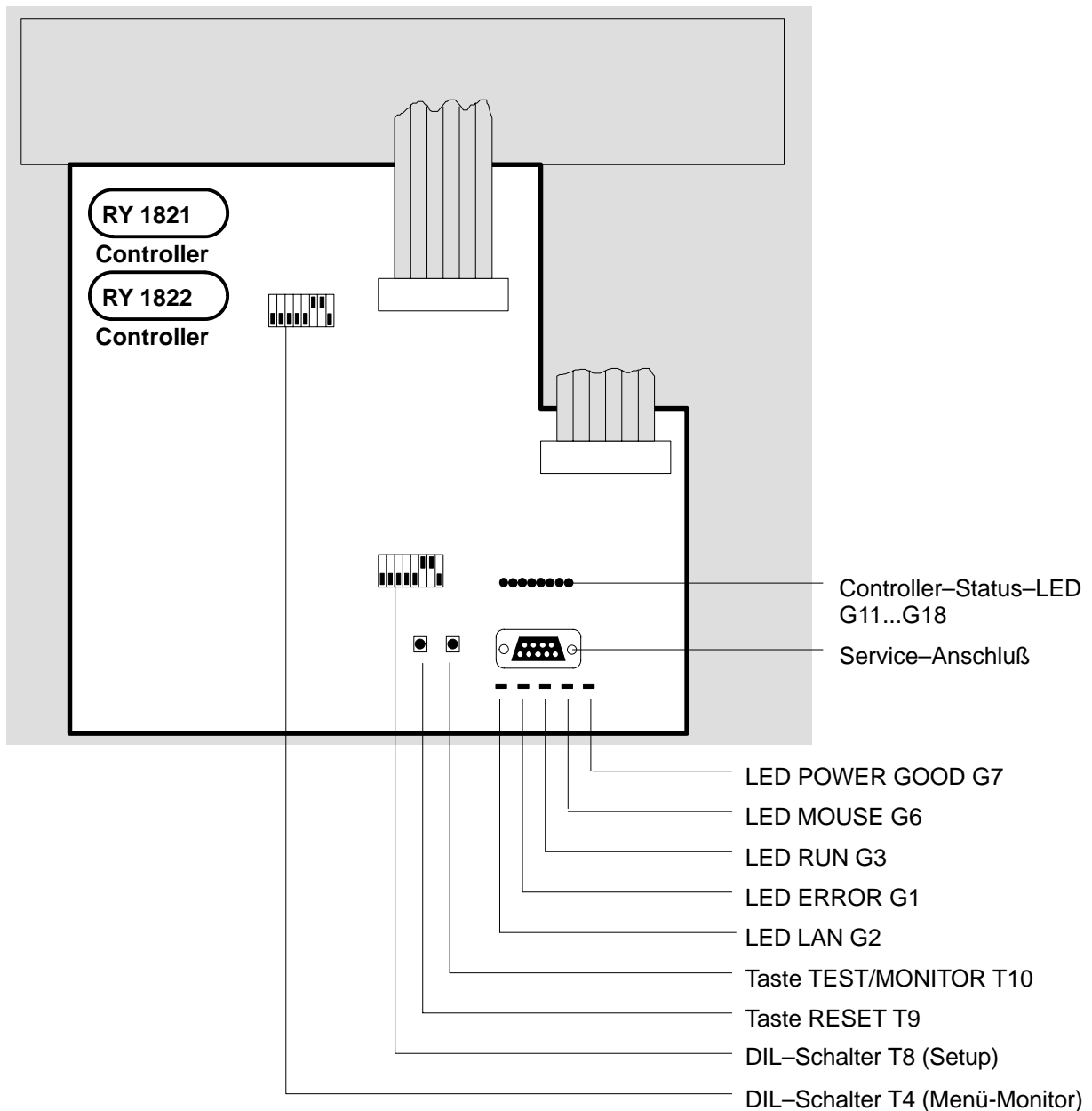
Pos.	Function	Factory adjust.
T1	DSP reset	—
T2	Service switch for adjusting the center frequency of the VCOs of the serializers, deserializers.	
G1	Green LED display DSP OK	
G2	Two-colored LED display RED: Interface modules in adjust mode GREEN: P.c. board operate correctly	
G3-G10	DSP status indicator	
J4	9-pin D-Sub socket for terminal interface	

6.10 SYSTEM MESSAGES AND ADJUSTMENTS

The controller boards in the control panels and E-boxes of the individual switchers contain a series of system and status indicators as well as adjusting facilities for configuring the switcher.

6.10.1 CONTROL PANEL CONTROLLER RY 1821/ RY 1822

The control panels of the switcher family are equipped with controller RY 1821 or RY 1822. The p.c. board is provided with a microcomputer and some required switches, keys as well as diverse LEDs and a status indicator. All indicating and adjusting elements are accordingly labelled on the board.



- Key RESET** Microcomputer reset.
- Key TEST/MONITOR** If this key is pressed when releasing the reset key, the microcomputer does not enter the normal operating program but the so-called "Monitor" mode.
This is a minimal system which is operative in the EPROMs. For the duration the microcomputer is in the monitor mode, the red Error LED will flash.
This mode is intended for BTS-internal use only.
- DIL switch SETUP** Switch T8 for adjustment of device type and configuration. The respective switch position is only inquired after a reset, i.e. a change of the switch position becomes only effective after a reset.
The switch position can also be inquired at the service terminal with the program selection "V" (software version).

The switches have the following functions:

Switch	Position On = 1 Off = 0	Meaning
1	0 1	Service terminal active Mouse active
2...4	000 001 010 011 100 101 110 111	Device type of panel: DD30 panel DD10 panel DD20 panel DD5 panel unused unused unused unused
5...6		unused
7	0 1	Standard hardware Prototype hardware (BTS only)
8		unused

- LED POWER GOOD** Voltage monitoring, lights as soon as the 5V supply voltage is high enough. Below this threshold, the microcomputer is permanently kept in the reset mode.
- LED RUN** "Lamp of life" of the microcomputer, is switched on with each bus cycle of CPU or LAN coprocessor. If this LED does not light, there will be a fatal error (no bus activities).
- LED ERROR** Blinks in the monitor mode (see above, BTS-internal use). Error indication is made with the LED row STATUS.
- LED LAN** Network activity indicator, is switched on with each LAN coprocessor cycle. The LED serves the qualitative judgement of the line load.

DIL switch **MONITOR** Switch T4 for adjusting the screen color of the menu monitor (EGA or VGA).
See the section "Connecting a menu monitor".

LED row **STATUS** Status indicator (G11...G18) of the power-up test.
See the section "Error Diagnosis" in the service manual.

LED	Test
G11	RAM-Test
G12	Service-Term (DUART 1 Channel B)
G13	INT3-Test
G14	EPROM-Test
G15	DUART 1 Channel A, DUART 2 Channel A + B
G16	INT2-Test
G17	Hardware I/O
G18	unused

At the beginning of the test, all used LEDs are lit. After having passed the test, the associated LED is switched off. Switching-off is made from the left to the right. This, however, is hardly perceptible when powering up, since the tests – except for the RAM and EPROM checks – are very fast.

If a certain test failed, the LED G18, stays lighted. An exception is the lowest LED which indicates during normal operation the error "NO CHEAPER NET COMMUNICATION" in addition to the running light.

When all tests have been passed, a kind of running light appears on the LED row. This shows immediately whether the controller operates in the normal mode.

The running light is operated by the microcomputer only if it is not occupied with something more important.

Thus, the speed of the running light allows a qualitative judgement of the the computer activity.

6.10.2 E-BOX CONTROLLER RY 1601/ RY 1917

The electronics boxes of the switcher family are equipped with controller RY 1601 or RY 1917. The p.c. boards are provided with two independent microcomputers (master and slave) and some required switches, keys as well as diverse LEDs and a status indicator. All indicating and adjusting elements are accordingly labelled on the board.

Key **RESET** (T1) Microcomputer reset. Simultaneous resetting of the master and slave computers.

Key **TEST** (Master T2)

Key **TEST** (Slave T3) If these keys are pressed when releasing the reset key, the microcomputer does not enter the normal operating program but the so-called "Monitor" mode.

This is a minimal system which is operative in the EPROMs. For the duration the microcomputer is in the monitor mode, the red Error LED will flash.

This mode is intended for BTS-internal use only.

DIL switch **SETUP**

Switch T77 for adjustment of device type and configuration. The respective switch position is only inquired after a reset, i.e. a change of the switch position becomes only effective after a reset.

The switch position can also be inquired at the service terminal with the program selection "V" (software version).

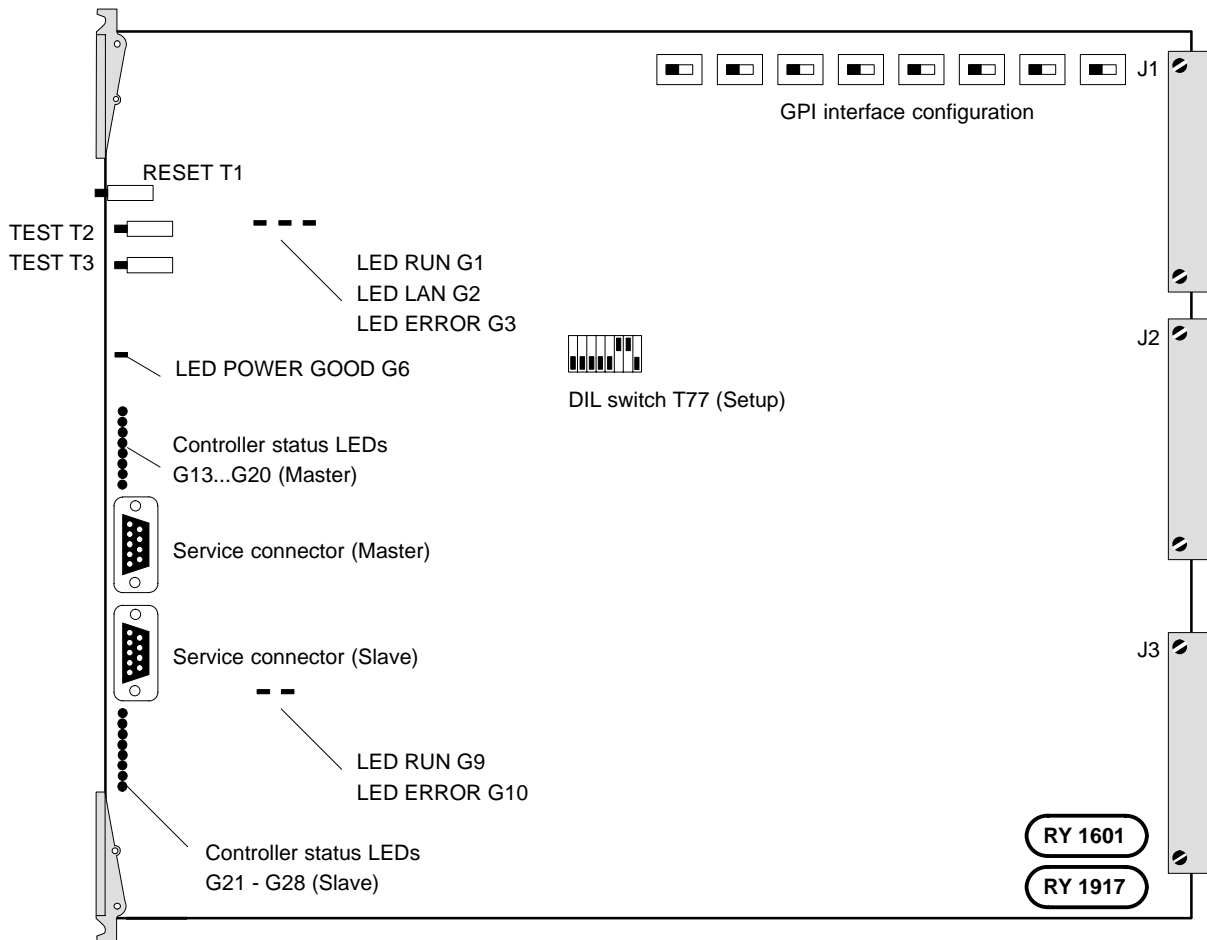
The switches have the following functions:

Switch	Position On = 1 Off = 0	Meaning
1		unused
2...4	000 001 010 011 100 101 110 111	Device type of box: DD30 box DD10 box DD20 box DD5 box unused unused unused unused
5...8		unused

LED **POWER GOOD** Voltage monitoring, lights as soon as the 5V supply voltage of the p.c. board is high enough. Below this threshold, both microcomputers are permanently kept in the reset mode.

LED **RUN** (Master G1)

LED **RUN** (Slave G9) "Lamp of life" of the microcomputer, is switched on with each bus cycle of CPU or LAN coprocessor. If these LEDs do not light, there will be a fatal error (no bus activities).



Indicating and adjusting elements on the controller p.c. boards RY 1601 and RY 1917

LED ERROR	(Master G3)
LED ERROR	(Slave G10)
	Blinks in the monitor mode (see above, BTS-internal use). Error indication is made with the LED row STATUS.
LED LAN (G2)	Network activity indicator, is switched on with each LAN coprocessor cycle. The LED serves the qualitative judgement of the line load.
LED row STATUS	(Master G13...G20) (Slave G21...G28)
	Status indicator of the power-up test. See the section "Error Diagnosis" in the service manual.

LED	Test
G13/G21	RAM-Test
G14/G22	Service-Term (DUART 1 Channel B)
G15/G23	INT3-Test
G16/G24	EPROM-Test
G17/G25	DUART 1 Channel A, DUART 2 Channel A + B
G18/G26	INT2-Test
G19/G27	Hardware I/O
G20/G28	unused

At the beginning of the test, all used LEDs are lit. After having passed the test, the associated LED is switched off. Switching-off is made from the left to the right. This, however, is hardly perceptible when powering up, since the tests – except for the RAM and EPROM checks – are very fast.

If a certain test failed, the LED stays lighted. An exception is the lowest LED which indicates during normal operation the error "NO CHEAP-ERNET COMMUNICATION" in addition to the running light.

When all tests have been passed, a kind of running light appears on the LED row. This shows immediately whether the controller operates in the normal mode.

The running light is operated by the microcomputer only if it is not occupied with something more important.

Thus, the speed of the running light allows a qualitative judgement of the the computer activity.

GPI Configuration

The sliding switches T47, T48, T49, T56, T57, T58, T67 and T68 on the p.c. boards RY 1601 and RY 1917 are assigned to the GPI inputs 1...8 (general-purpose inputs). These inputs are provided with optocouplers. The switches enable to match the inputs to different control concepts:

Switch in position "1" (position "left")

A simple connection between the two connectors activates the corresponding input. This kind of control is suitable for a connection to a relay contact or to an open-collector output.

Attention: In this case, both lines are connected with the circuit ground. When connecting to an open-collector output, there is no ground potential isolation between the switcher electronics and controlling devices.

Since the circuit ground is led out of the device, the cabling has to be shielded for this kind of control. Non-shielded cables may cause EMC and/or ESD problems!

Switch in position "2" (position "right")

The optocoupler-internal LED is made available at the two connectors (including 1kOhm drop resistor). For this kind of control, a ground potential isolation is provided; the controlling device, however, has to impress a current upon the LED, i.e. a simple contact is not suited in this case.

Due to the ground potential isolation, the cabling is less critical for this kind of control.

6.10.3 FADER CONNECTOR PANEL RC 1855

The faders in the control panels are each provided with connector panel RC 1855 which establishes the connection to controller RY 1821. A 4-step DIP switch (T1) on the connector panel determines the input channel of the 12-bit A/D converter.

On each of these connector panels, exactly one switch has to be set to ON, the other switches have to be switched off!

Assignment is as follows::

Switch no.	1 : ME1
	2 : ME2
	3 : PP
	4 : EXTRA

The faders in the control panels DD5 and DD10 have to be configured for "ME1".

The three faders in the DD20 control panel have to be configured for "ME1", "PP" and "EXTRA"

6.10.4 TIMING / GENLOCK ALIGNMENT

When source signals are fed into the switcher, it must be ensured that the time difference between the sources is not outside the operating range of the internal switcher autophasers (DD5/DD10 = 52 μ s, DD20/DD30 = 32 μ s). The output signals of the sources must correspond to the timing customary in operation. For instance, no EE picture in a VTR, PB-Ref on CCVS etc.

The switcher's Genlock Phase can be adjusted to the fed reference signal in the range of -1 line to + 2 lines.

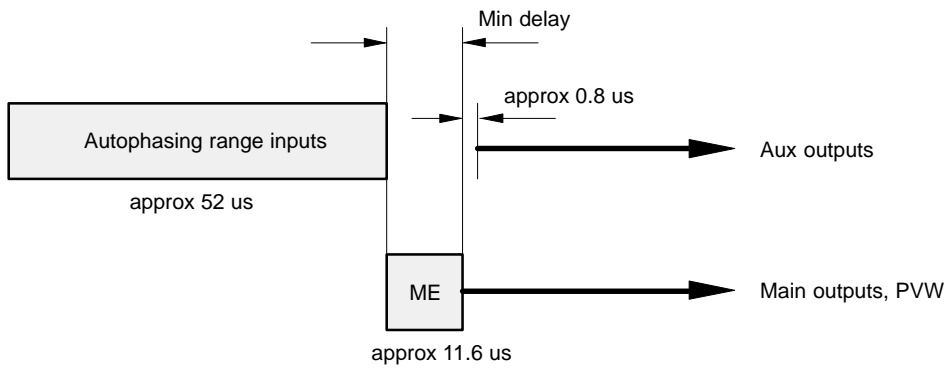
Note: During Genlock Phase adjustment **Key Memory** should be disabled to avoid a change-over of the key mode in the selection of the sources.

For the Genlock Phase adjustment proceed as follows:

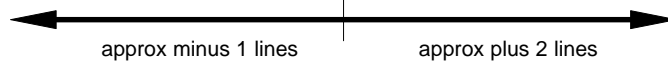
1. **DD5/DD10:** Switch Keyer1 (or Keyer2) to Luminance Key.
Select key bus for key fill and key source.

DD20/DD30: Switch Keyer1 or Keyer2 of ME1 to Luminance Key.
Select key bus for key fill and key source.
2. Select first source on key bus.
3. Select menu option Genlock Phase in the SETUP menu.
4. Set Genlock Phase of the switcher to "0" in the Setup and then increase until the red/green signal (asynchronous) of the selected key bus stops flashing. Maintain and observe the adjusted status for a short time to make sure that no running-in occurs.
Then increase the value slightly to provide for a safe margin to the critical threshold.
5. Switch through all applied sources on the key bus in the same way and verify. Determine the highest value of the Genlock Phase adjustment and maintain this value as final setup setting.

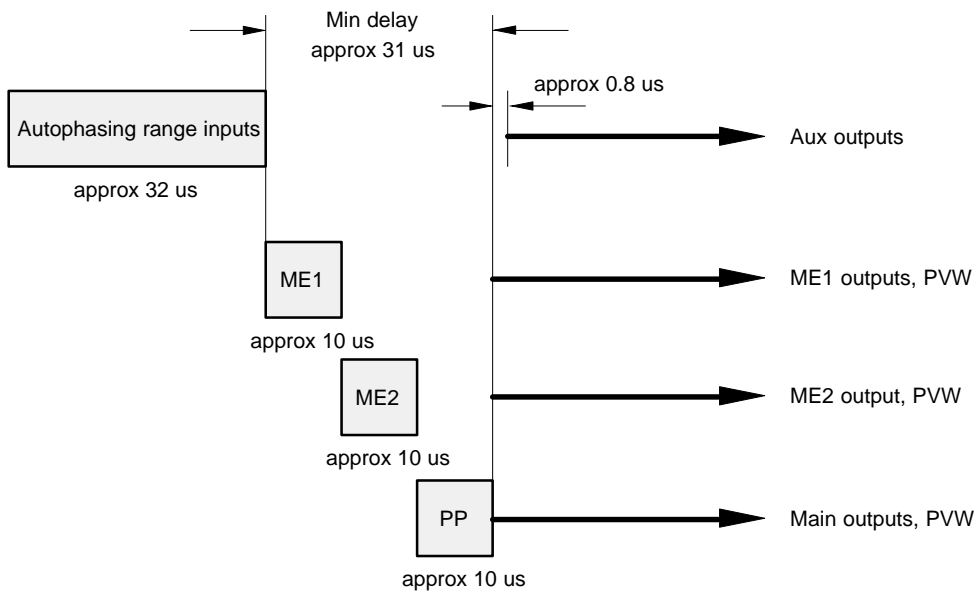
Timing reference diagram for DD5 and DD10



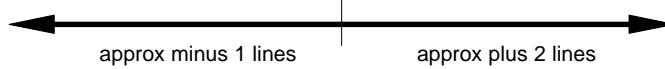
Total timing position of DD5 and DD10 in respect to reference blackburst:



Timing reference diagram for DD20 and DD30



Total timing position of DD20 and DD30 in respect to reference blackburst:

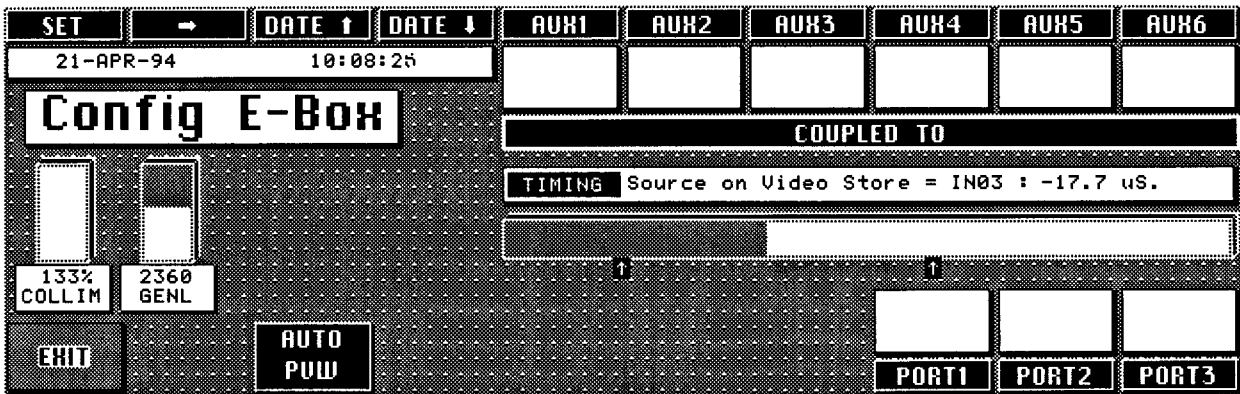


6.10.5 GENLOCK ADJUSTMENT WITH MENU

From software version "G", the mixers include the possibility to perform the genlock adjustment of the individual input sources in **Installation** menu **Config E-Box**.

When adjusting the genlock phase, **all** sources have to be successively checked for their timing by switching up on the bus **Video store**.

To adjust the genlock phase, select the softkey **Config E-Box** in the **Install** menu. The following display is represented:

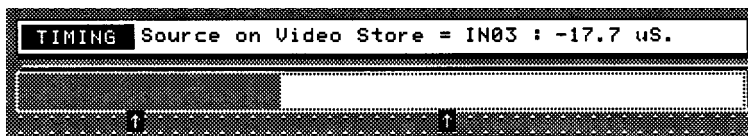


With controller **Genlock**, the phase relation of the mixer can be shifted by -1 line up to +2 lines in comparison with the genlock reference signal.

The display **TIMING** serves for checking the timing of the sources.

The bar diagram arranged horizontally under the **TIMING** field displays the timing of the source to the mixer that is selected on bus **Video store**.

The display can give the following informations:



Input signal IN03 lies 17.7 μs before the earliest mixer input.



No input signal in the selected input.



Input signal does not lie in area of the auto phasers.

The header line **TIMING** displays the source selected on bus **Video store** with the defined source name with the current status (e.g. **IN03: no signal**).

The bar diagram under the header line displays the timing of the sources in the area of the auto phaser. Both arrows mark the area in which the phase relation of the sources can correctly be set for all mixer buses. In the correct timing range, the bar is light. A dark bar indicates that the source does not lie in the valid area. This can also happen when the display is between the arrows!

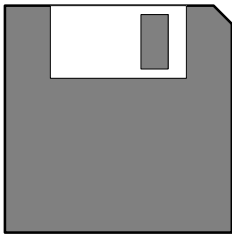
Attention:

At DD5 and DD10, the mode of representation of the menu monitor can be changed (e.g. to inverse representation) by means of switch T4 on the control panel controller. Thus the bar colors and also all other softkeys can be displayed in the menu in an inverted way.

The right arrow marks the earliest mixer input (latest timing of the sources). The left arrow marks the earliest timing of the sources.

When adjusting the genlock phase, switching procedures in the genlock effect again a running in of the H phase. This is indicated in the bar diagram as bounces. In this case, the run-in procedure has to be waited for.

6.11 DIAMOND DIGITAL – SOFTWARE UPDATE



The enclosed two 3.5-inch disks contains files with the latest software (*.LOC) for the individual processors in the switcher and some utility files for the installation procedure.

The files are:

Disk 1:	INSTALL.EXE	– Software for loading the updates
	MSKERMIT.EXE	– Terminal emulation program
	MSKERMIT.INI	– Configuration file for MSKERMIT
Disk 2:	Fxxxxx.LOC	– Software for control panel controller
	Sxxxxx.LOC	– Software for slave controller E-box
	Mxxxxx.LOC	– Software for master controller E-box
	README.TXT	– Software information

Copy all files into a subdirectory on the harddisc because INSTALL.EXE creates temporary files.

E.g. **COPY A:*. * C:\DS0011\REL_G**
or **COPY B:*. * C:\DS0011\REL_G**

Important note

Please read first the software information before starting the software update. It might be possible that you are requested to make a backup of the RAM files, using the Disk menu in order to avoid data loss of your own presettings.

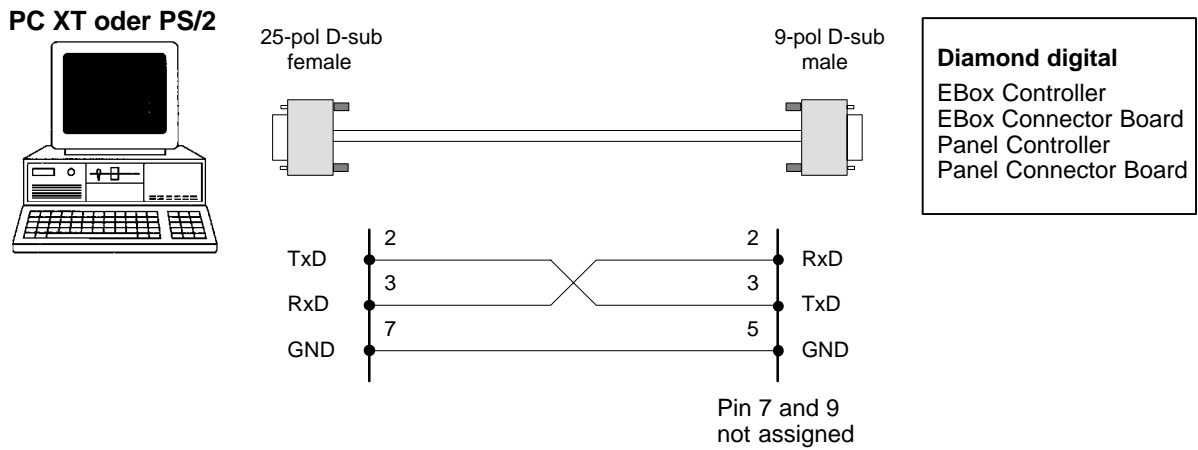
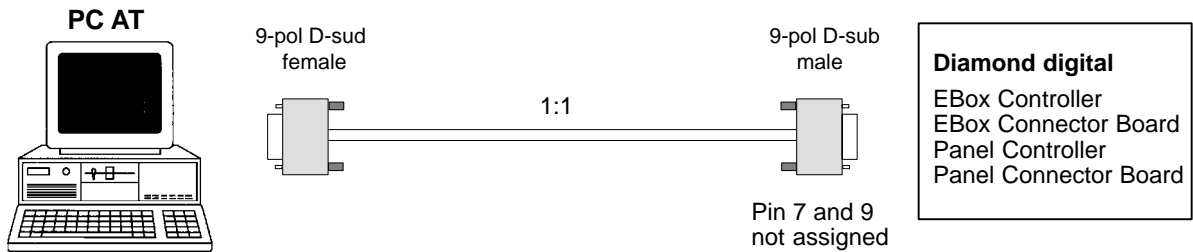
6.11.1 PRECONDITIONS

Loading the software into panel controller and E-box controller requires the following equipment:

- Personal computer IBM or compatible with 3.5-inch HD disk drive
- RS-232 interface 9-pin D-type
- Cable between PC and the respective controllers in the switchers (connection see below). In most cases COM 1, when using COM 2, MSKERMIT.INI has to be matched.

Change **SET PORT 1** to **SET PORT 2** using

EDIT MSKERMIT.INI

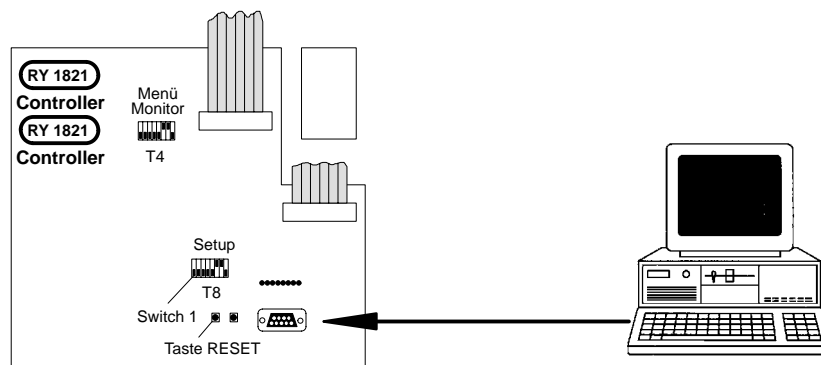


6.11.2 CONNECTION AT THE CONTROL PANEL

Connection at the control panel can be either made at socket **J6 SERVICE** on the connector panel or directly at the **SERVICE** socket of controller RY 1821. If a mouse is installed at the control panel, it has to be disconnected for the duration of the software update, and the Setup switch T8 on controller RY 1821 has to be set to "Service Terminal active."

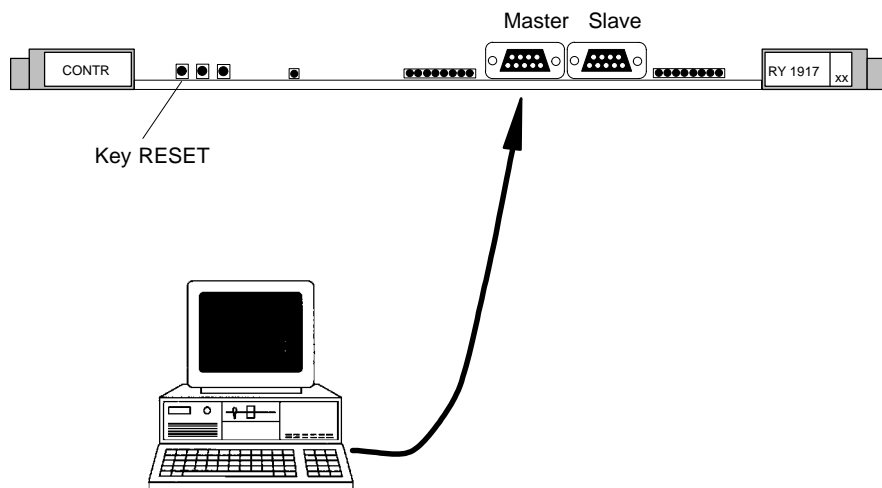
T8 Switch 1 = OFF

Subsequently, press the **RESET** key on the controller so that the setting is read again.



6.11.3 CONNECTION AT THE E-BOX

Connection at the E-box can be optionally made at the **SERVICE** socket on the connector panel or at the socket **SERVICE TERMINAL MASTER** located on the front panel of controller RY 1917.

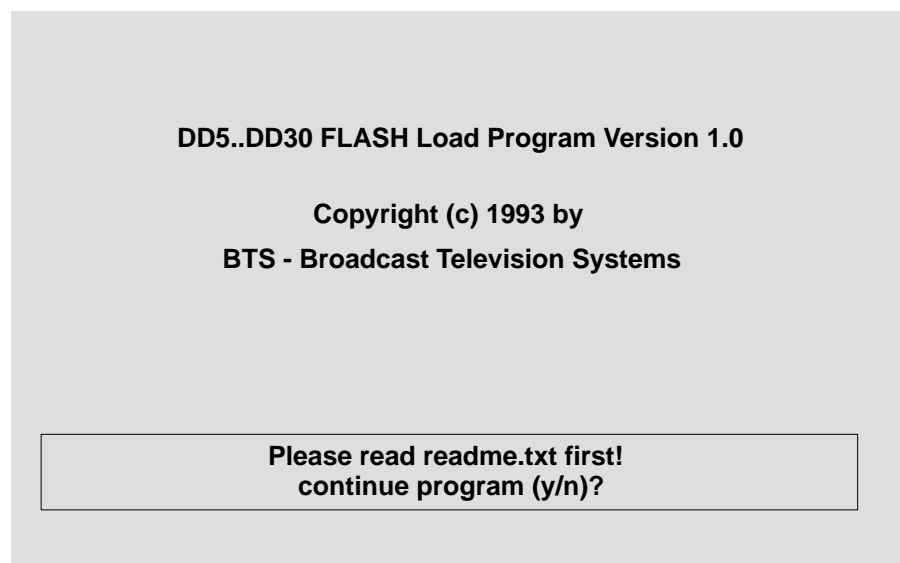


6.11.4 LOADING THE SOFTWARE

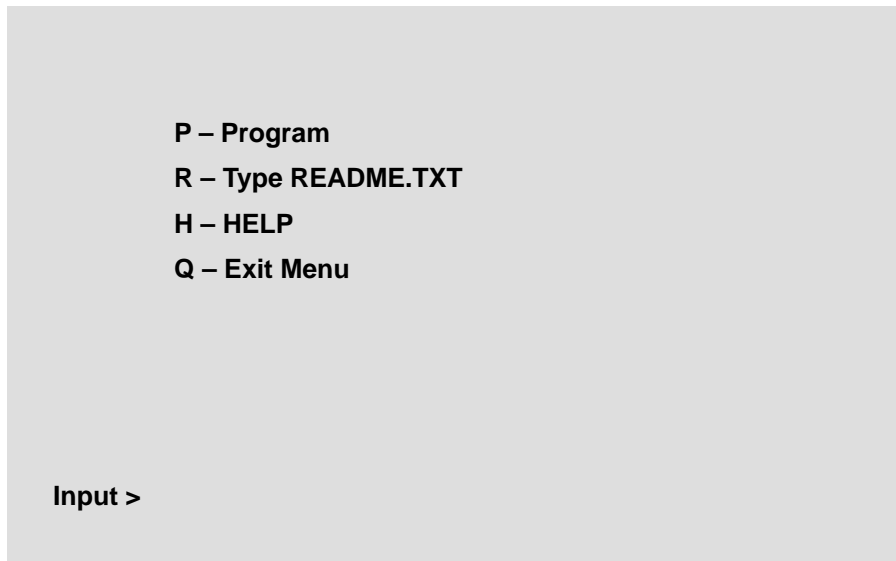
Please read in the service information "Readme.txt" on your update disk whether you are requested to erase the FLASH EPROMS before starting the load procedure of the new software. See section 7.

The following procedure has to be carried out **three times**, i.e. successively for each individual file of the disk in the sequence Panel, E-Box Master , E-Box Slave.

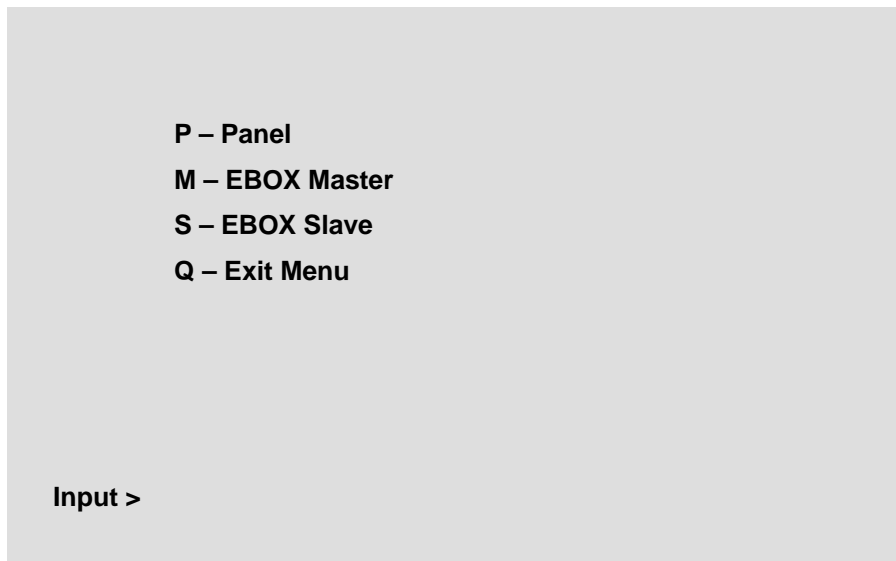
- Connect the respective controller with the PC.
- Switch on the PC and start the load program by running **install.exe** on your harddisc.
The screen displays the menu below which enables you to stop or continue the program procedure.



- When continuing the load program, the next menu will be displayed and enables you to recall the software information **readme.txt** also directly. Help can be demanded via the **HELP** menu.



- When continuing the program, the following menu will be displayed, enabling you to select whether update has to be made for Panel, E-Box Master or E-Box Slave.



- If you have been requested in the service information **readme.txt** on the update disk to erase the RAM files, you have now to recall the Service menu of the switcher. See section 5.

If you have been requested in the service information **readme.txt** on the update disk to enter again the option code number of your switcher after having succeeded loading the new software, you have also to recall the Service menu. See section 6.

6.11.5 CLEARING THE RAM FILES

The following steps have to be carried out only if requested by the software information **readme.txt** on the update disk.

- Recall the **MSKERMIT** program and establish with "C" <Enter> connection to the switcher controller.
The screen displays again the respective Service menu.

```

D30 Service Menu
-----

device: DD-PANEL
user: COMMON

software version [V]
integrated error diagnosis [I]
DICMAC direct control and memory access [D]
halt normal operation [H]
KERMIT file transfer [K]
change KERMIT user [U]
change device name [N]
show network [S]
install options [O]

* |

Integrated Error Diagnosis
-----

display diagnostic messages [D]
interactive tests [I]
clear RAM-files [C]
BTS personnel only [B]
exit [E]

* C

do you really want to loose memory contents ?( ALL / Query / No )
* ALL
select individual file with Y/N:

ACCESS ? cleared
ASSIGN ? cleared
CONF-EB ? cleared
CONF-PA ? cleared
COUPLE ? cleared
IDENT ? cleared
MACRO-PA ? cleared
PATT-USR ? cleared
SEL-EBOX ? cleared
STATE-EB ? cleared
STATE-PA ? cleared
SYSTEM ? cleared

```

-Note: The figure shows the procedure by means of the control panel. For the E-box it is the same procedure.
When performing the step **CLEAR RAM FILES**, it might be possible that you are requested to clear only individual files. In this case, do not use **ALL** but **QUERY**.

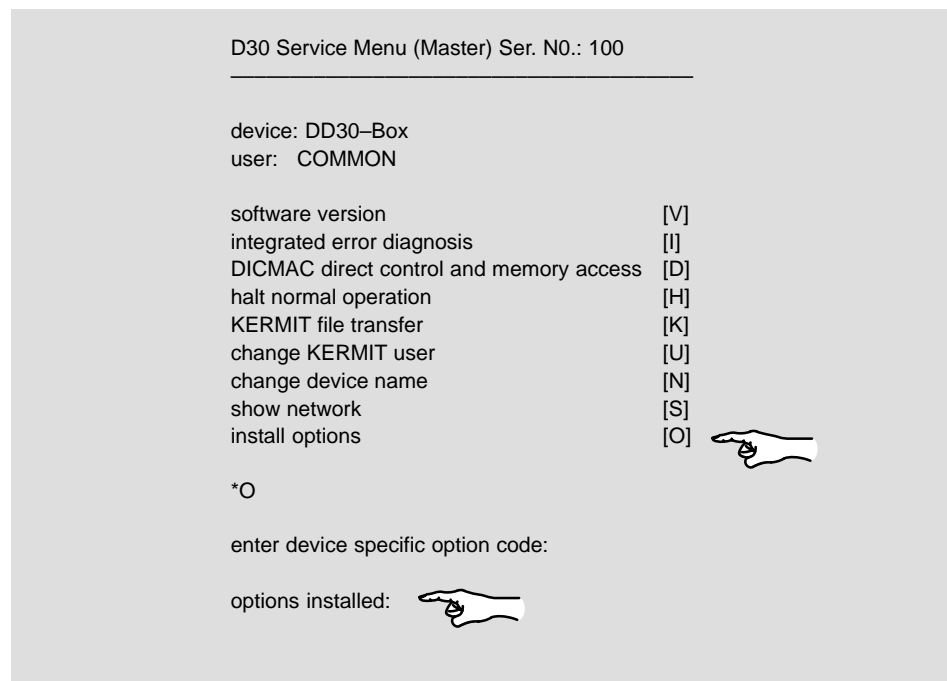
- After having cleared the RAM files, the system performs an automatic restart. Subsequently, the screen displays the superior Service menu.

6.11.6 ENTERING THE OPTION CODE

The following steps have to be carried out only if requested in the software information **readme.txt** on the update disk.

Recall the **MSKERMIT** program and establish with "**C**" <Enter> connection to the switcher controller.

The screen displays the respective Service menu.



Entering a "0" enables you to inquire the options already installed. The customized code is contained in the **Test Certificate** which is enclosed by the manufacturer in the switcher delivery.

6.11.7 ERASING THE FLASH EPROMS

The following steps have to be carried out only if the software information **readme.txt** on the update disk requests to erase the FLASH EPROMs before installing the new software version.

- Establish the connection between PC and service socket SLAVE on controller RY 1917.
- Recall the **MSKERMIT** program and establish with "**C**" <Enter> the connection to the switcher controller.
- Permanently press the **2TERM** key on the front panel of controller RY 1917 and shortly press the **RESET** key. After releasing the **2TERM** key, the PC screen displays the letter "**W**".
- Press the **RETURN** key using the PC keyboard and subsequently enter the letter "**T**".
- The PC screen displays a menu with the menu function:

ERASE FLASH-EPROMS (F)

- Using the PC keyboard, enter the letter "**F**". The erase procedure is started.
- After having terminated the erase procedure, press the **RESET** key.

For loading the new software, pull the cable from the slave socket and start the procedure as described in section 2.

If **LOAD MY PANEL** is confirmed, the selfloading procedure is started.

The selfloading procedure comprises a test and a loading procedure that are executed successively. In the test procedure (approx. 5 minutes) the date on the floppy disk are verified for safety purposes. This is signalled by a cyclical beep sound.

The loading procedure (approx. 5 minutes) is signalled by a cyclical long beep sound and the "running" of the controller status LEDs.

The loading procedure is completed when the control panel executes a RESTART.

Starting **LOAD FOREIGN DEVICE**

If the control panel is already in the application, a foreign device loading procedure can be started in the SETUP menu (EXTRA panel).

Note: *It is assumed that only the device to receive the software is active in the Cheapernet. Switch off all devices that are not involved before the foreign device loading procedure is started and press the reset button on the control panel controller afterwards.*

Setup Menu option

LOAD SOFTWARE: >

In the subloop the following foreign devices can be selected:

LOAD E-BOX MASTER
LOAD E-BOX SLAVE
LOAD OTHER PANEL

If one of the submenu options is confirmed, the foreign loading procedure is started. As described above, the loading operating itself comprises a testing and a loading procedure that are executed successively. In this case both procedures are signalled with a rotating activity indication in the EXTRA display. The EXTRA display will also show any error messages.

The loading procedure is completed when the newly loaded device executes a RESTART. In the control panel the EXTRA display shows the submenu option executed last together with the indication **DONE**.

Floppy disk contents

In line with the BTS designation conventions for LOC files, only files with the following names can be loaded in the switcher:

Control panel	F*.LOC
E-box master	M*.LOC
E-box slave	S*.LOC

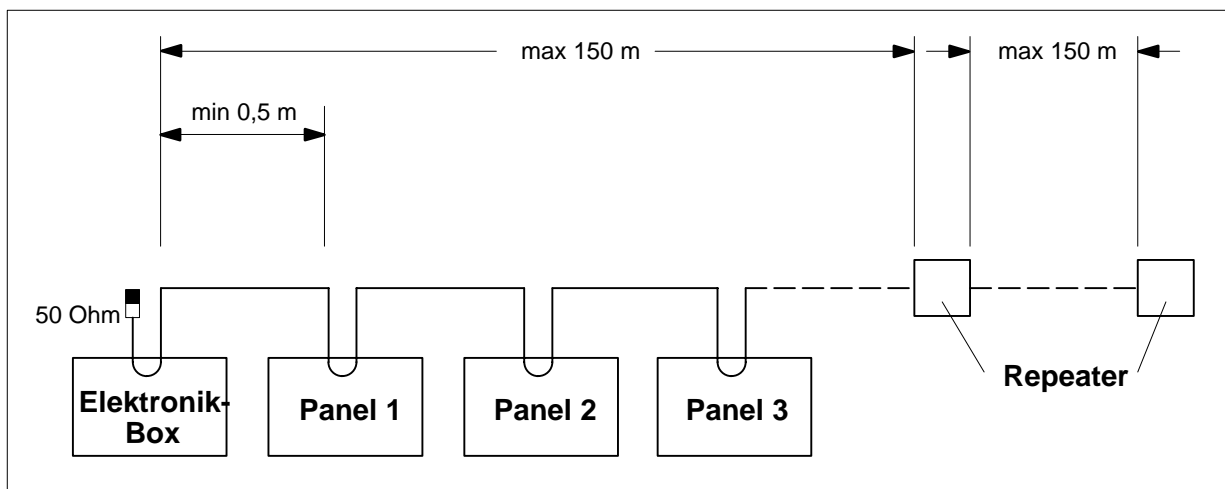
All LOC files must be in the root directory of the floppy. In this operation only the first three LOC files on a floppy can be loaded.

7. DESCRIPTION OF THE INTERFACES

7.1 CHEAPERNET SPECIFICATION

For operation of the *Diamond digital* family, diverse control panels designed for different applications can be connected and operated via a coax line. Distribution of the control functions of the different panels and their access rights to the hardware of the switcher is made on the control panel via the ACCESS menu.

The applied coax connection features the following characteristics:



- Cheapernet connection cable Kv 770 (50-ohms coax)
- Cabling is also possible with T-connector
- Maximum length per segment = 150 m,
- Minimum length per segment = 0.5 m
- Longer distances are possible with a repeater, i.e. each repeater provides a further segment with an extension of up to 150 m
- 10 units per segment at maximum
- End units **must** be terminated with a 50-ohms terminating plug.

Interconnection cables

HF coax cable, length	Order number
1 m	0 782 740 100
2 m	0 782 740 600
5 m	0 782 740 300
10 m	0 782 740 200
20 m	0 782 740 400
30 m	0 782 740 700
80 m	0 782 740 500
Terminating plug 50 ohms	3 130 602 055

7.2 ROUTER INTERFACE WITH BTS–ASCII–PROTOCOL

7.2.1 GENERAL

The RS–422 router interface permits the control of external BTS crossbars such as **Mars**, **Venus** or **TVS**.

The following applications are conceivable:

- Switching of an emergency crossbar
- Connection to upstream crossbars
- External Aux buses

An external crossbar can be controlled from the switcher if the crossbar features a corresponding controller such as:

Mars:	CE–300 controller
Venus:	SC–400 controller
TVS:	CE–2200 controller

Control is also possible with the BTS control system **Jupiter** provided this is equipped with the VM–3000 controller.

In addition, the corresponding video and control wiring must be provided. The ROUTER INTERFACE protocol for the XBAR port is loaded by the switcher as a standard and need not be selected separately.

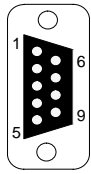
The following pages contain more detailed information on wiring and control. The instruction set for the BTS–ASCII protocol is defined in **BCS–3000 ASCII computer interface protocol documentation**.

The transfer of the source mnemonic codes from upstream crossbars to the switcher does not belong to the router interface but is possible with the IDENT XBAR protocol which can be selected in the CONFIG PANEL installation sub–menu.

7.2.2 INTERFACES

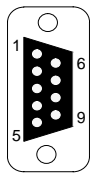
Interface XBAR
Diamond digital
EBox DD20 / DD30

The interface assignment corresponds to an ES-bus-bus controller.

Diamond digital XBAR RS 422	Pin	Signal
 <p>9 pin D-type female</p>	1	Frame GND
	2	RxA
	3	TxB
	4	Receive common
	5	–
	6	Transmit common
	7	RxB
	8	TxA
	9	Frame GND

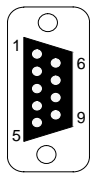
Interface
Jupiter / VM-3000
Mars / CE-300
Venus / SC-400

The interface assignment corresponds to an ES-bus-bus controller.

Jupiter, Mars, Venus RS 422	Pin	Signal
 <p>9 pin D-type female</p>	1	Frame GND
	2	RxA
	3	TxB
	4	Receive common
	5	–
	6	Transmit common
	7	RxB
	8	TxA
	9	Frame GND

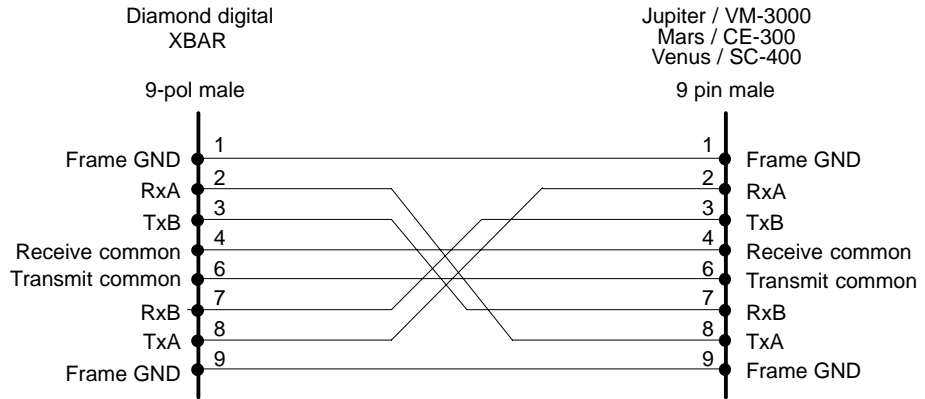
Interface
TVS

The interface assignment corresponds to an ES-bus tributary.

TVS RS 422	Pin	Signal
 <p>9 pin D-type female</p>	1	Frame GND
	2	TxA
	3	RxB
	4	Receive common
	5	–
	6	Transmit common
	7	TxB
	8	RxA
	9	Frame GND

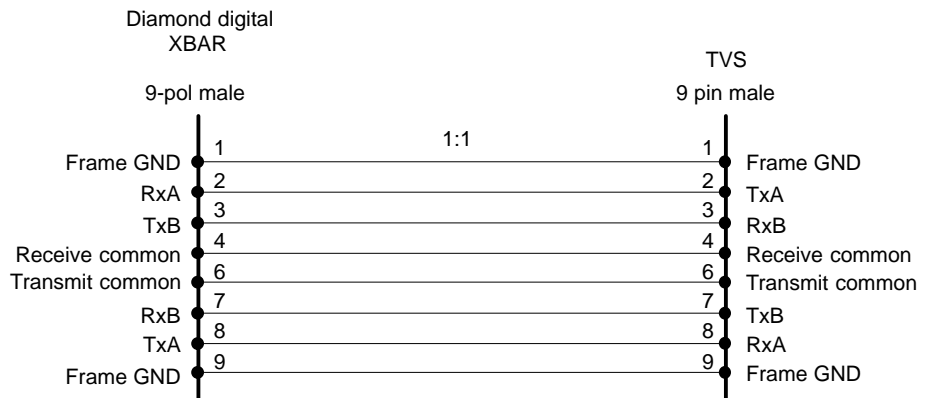
7.2.3 CONNECTION CABLES

Connection cable
Diamond – Jupiter
Diamond – Mars
Diamond – Venus



BTS connection cable S0909-197
 Order no.: 0 979 033 197

Connection cable
Diamond – TVS



BTS connection cable S0909-117
 Order no.: 0 978 033 117

Attention:

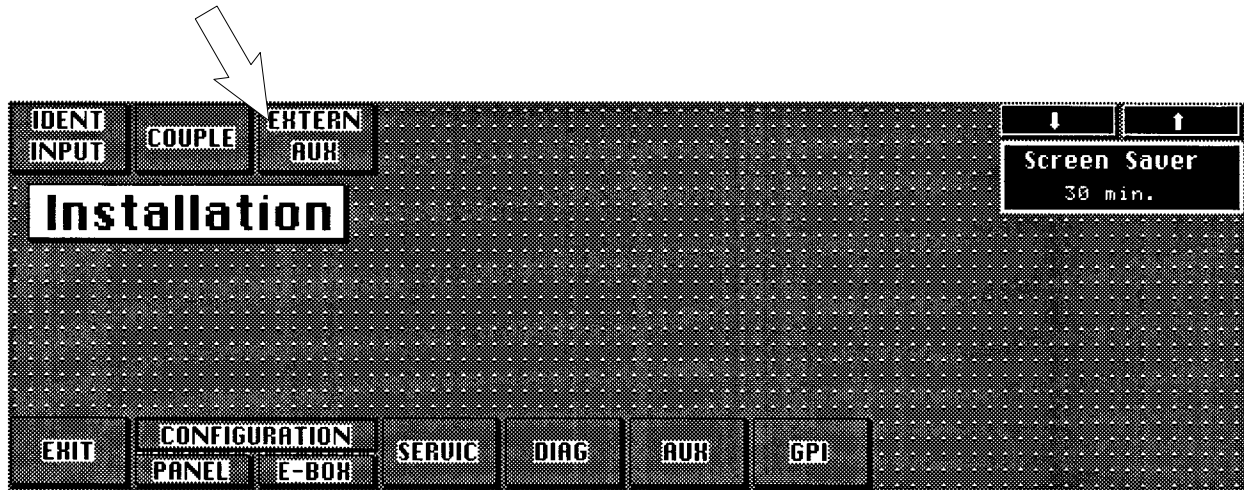
The EMC regulations require the use of properly shielded cables in the installation of the device or the system.

This applies for both video and control cables.

Suitable cables can be ordered from BTS. Please indicate the desired cable length when ordering.

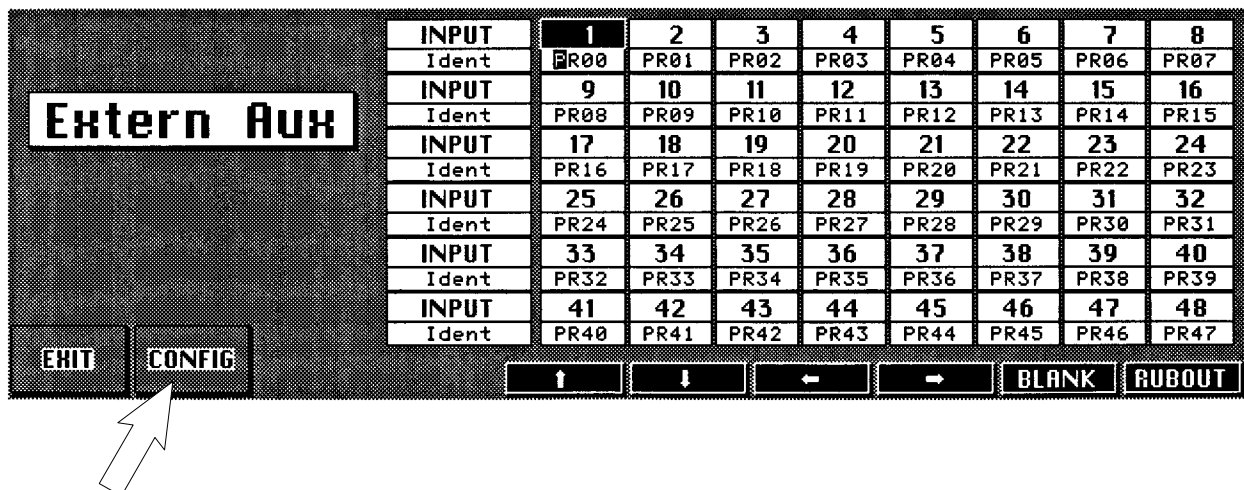
7.2.4 MENU SETTINGS

In order to adapt the system to the desired environment and to configure it for external crossbars, several menus are available in the switcher. The EXTERN AUX menu is selected by pressing the **EXTERN AUX** softkey in the INSTALLATION menu.



The EXTERN AUX menu serves as a reference table for the source designations of the signals on the external crossbar. Standard sources have the designation **PRxx** (PreRouter xx). The source designations entered in this table are indicated in the displays above the **Aux** key bank when one of the six external crossbar outputs is selected.

The table can be edited with the cursor softkeys, the alphabetical keyboard and the numeric keypad which permits entering user specific source designations.



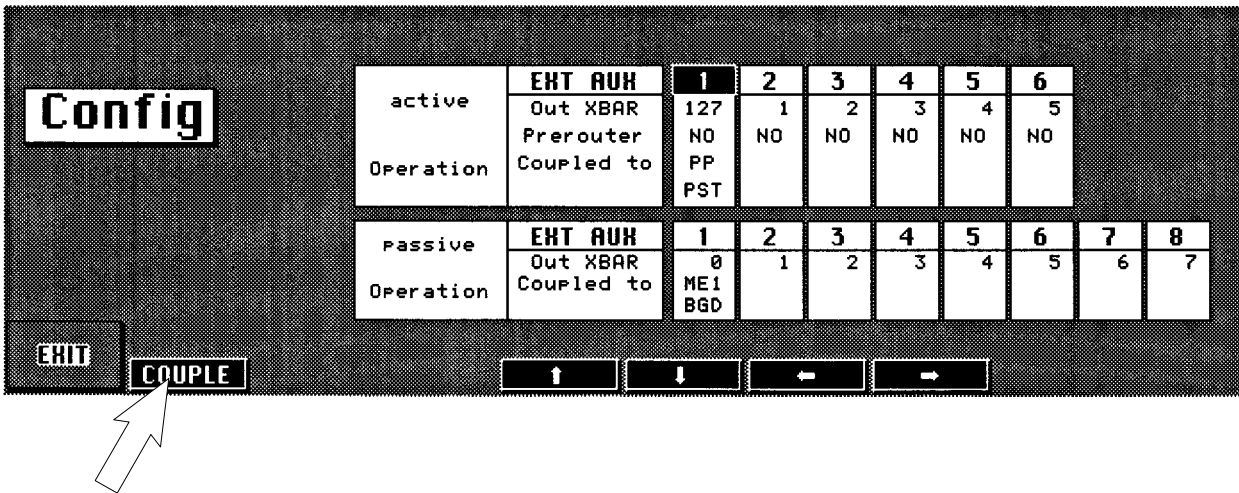
Press the **EXIT** softkey to return to the higher-order INSTALLATION menu. Press the **CONFIG** softkey to select a further menu for the entry of the configuration parameters.

The **CONFIG** menu permits setting the configuration parameters for external crossbars.

The menu is divided into two parts.

active operation active crossbar control
 In this case an external crossbar output (max. 6) can be switched immediately upstream of the switcher operation. Operation of the external crossbar as with Aux bus. The delegation to external buses is made with the **EXT AUX** key.

passive operation passive crossbar control
 In this case an external crossbar output (max. 6) is coupled to one of the internal crossbar buses of the switcher.

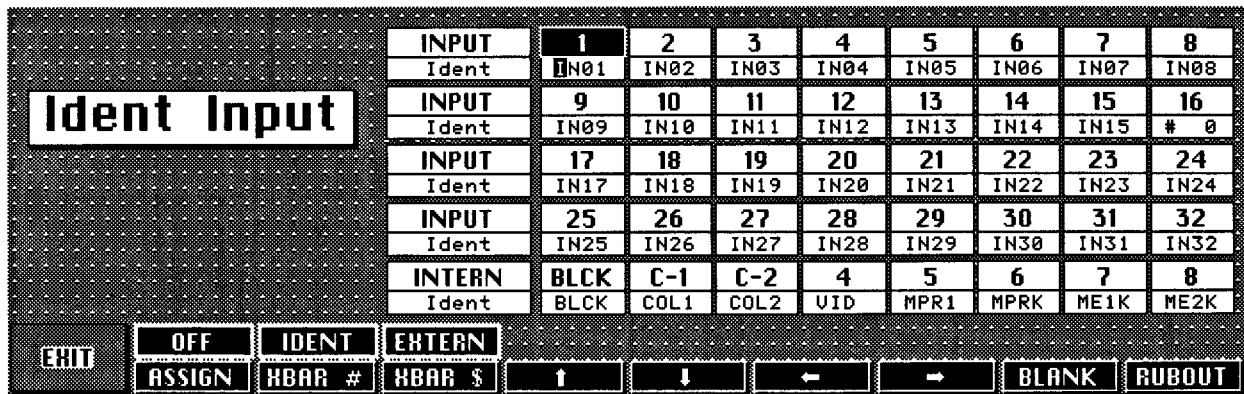


The **OUT XBAR** line permits entering the desired output number of the external crossbar to be switched by the external Aux bus. Admissible output numbers are 0 ... 127.

The **Prerouter** line serves to indicate with "Yes/No" if the corresponding output of the external crossbar is selected as source in the IDENT INPUT menu. For further details please refer to **Ident Input menu**.

The **Coupled to** line permits entering an internal switcher bus. In this case the external crossbar is coupled to an internal switcher bus. Repeated pressing of the **COUPLE** softkey scrolls through the various buses available in the switcher.

Note: In active operation and enabled "coupling" only the external crossbar is coupled. The direct switching of sources on the external crossbar with separate crossbar control panel does not have any effect on the internal switcher buses.



XBAR-Ident:

The source mnemonic codes from upstream crossbars can be transferred to the switcher using the IDENT XBAR protocol. For this purpose a corresponding control cable must be provided in addition to the video cable between switcher E-box and external crossbar (*TVS, Mars, Venus*) and the protocol for the relevant port must be selected in the CONFIG EBOX menu. For further details please refer to Supplement 3 *TVS Interface*.

The mnemonic code transfer is enabled with the **IDENT XBAR#** softkey in the IDENT INPUT menu.

For this purpose the desired switcher input must be selected with the cursor. By pressing the **IDENT XBAR#** softkey a "#" appears in the **Ident** line of the selected source. The desired output number of the external crossbar can be entered with the numeric keypad.

Extern XBAR:

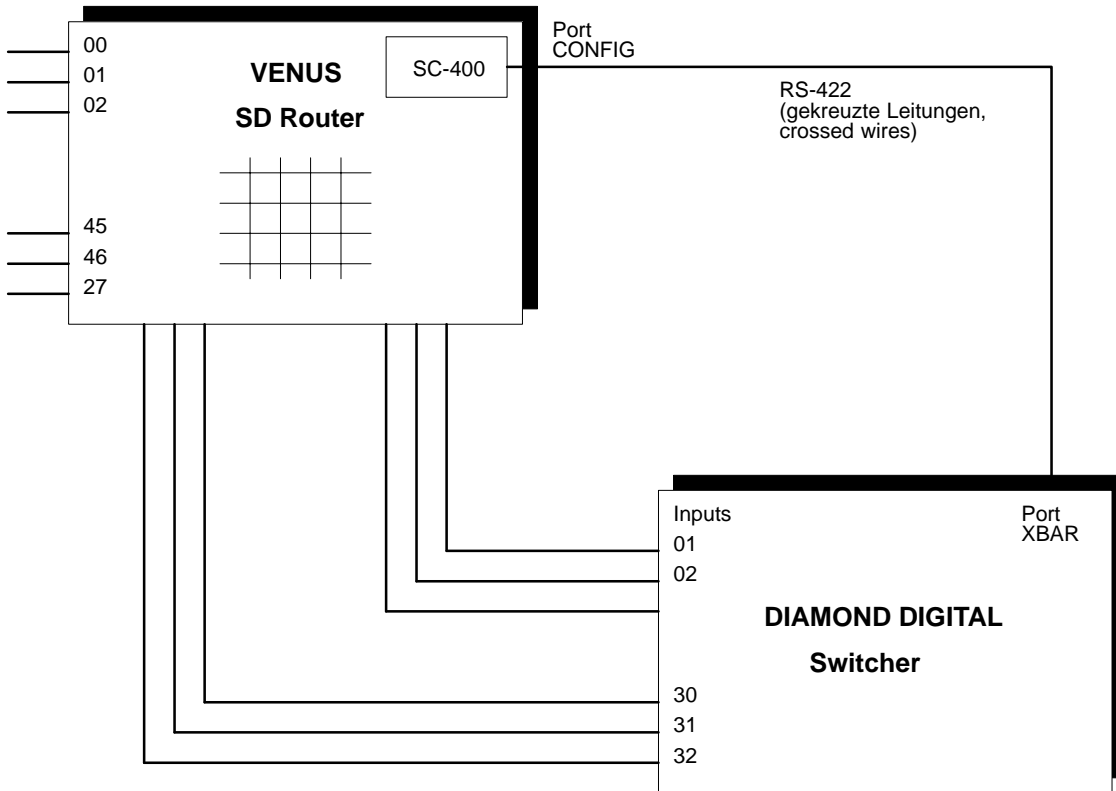
Which external Aux bus is to be assigned to the switcher inputs can be determined with the **EXTERN XBAR\$** softkey.

For this purpose the desired switcher input must be selected with the cursor. By pressing the **EXTERN XBAR\$** softkey a "\$" appears in the **Ident** line of the selected source. The desired output number of the external Aux bus can be entered with the numeric keypad. A "YES" is entered automatically for this Aux bus in the **Prerouter** line.

In order to delete an **IDENT XBAR** or **EXTERN XBAR** entry, move the cursor into the entry field to be cleared, press the **IDENT XBAR** or **EXTERN XBAR** softkey and press **Clear** (in the numeric keypad).

After this operation the default input name appears in the entry field.

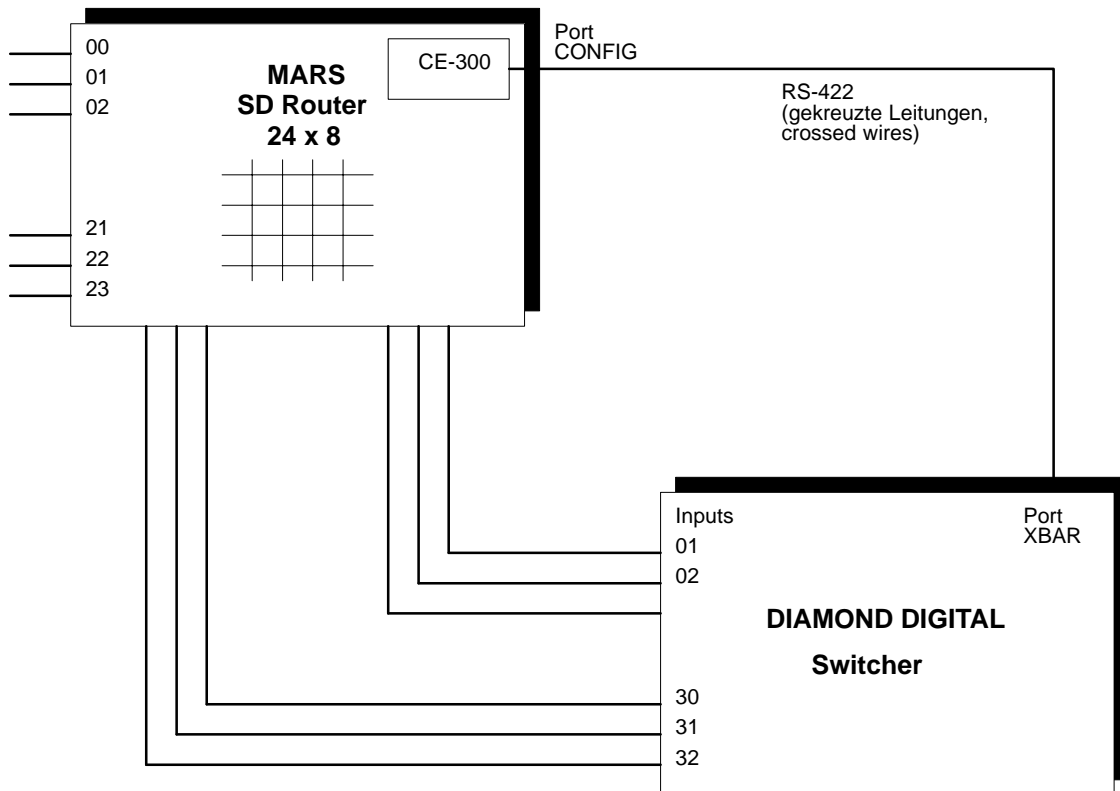
Basic diagram for pre-routing



Hinweis: Keine Tally-Signalisierung über den Pre-Router

Note: No tally lighting via pre-router

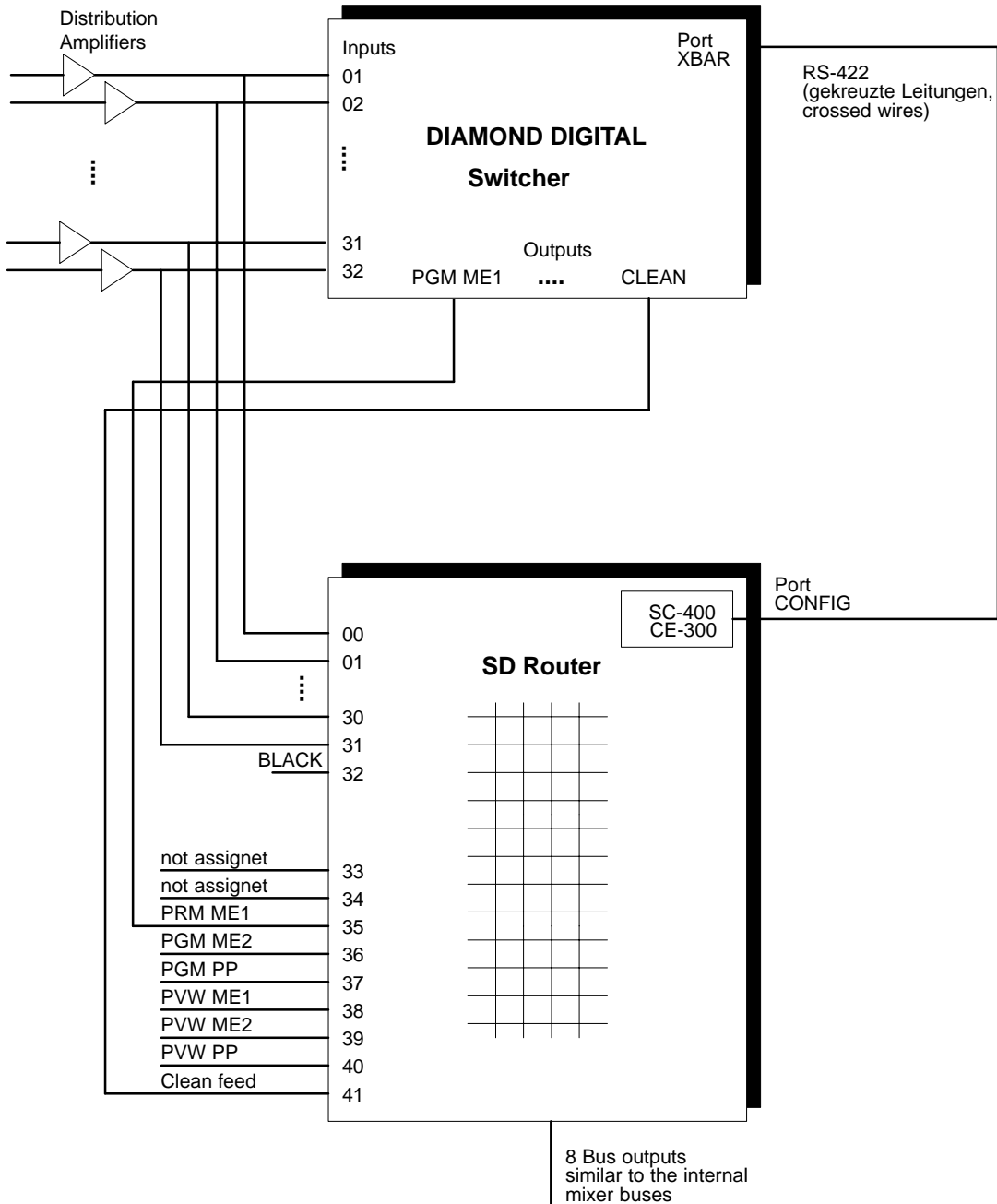
Basic diagram for pre-routing



Hinweis: Keine Tally-Signalisierung über den Pre-Router

Note: No tally lighting via pre-router

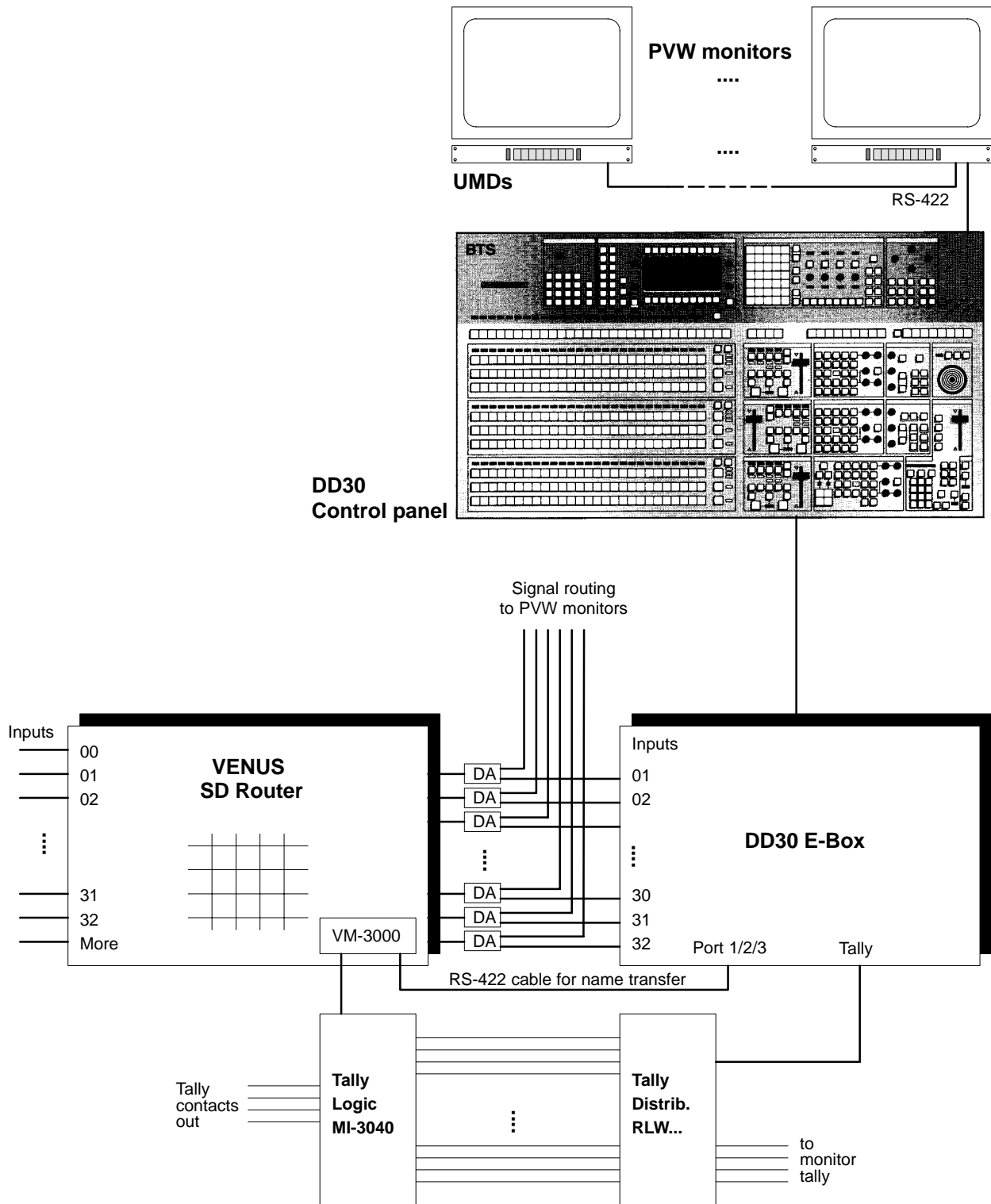
Basic diagram for parallel routing



Hinweis: Keine Tally-Signalisierung über den Parallel-Pouter

Note: No tally lighting via parallel-router

Online name transfer from routing system into DD production switcher



Note: The MI-3040 is hooked-up directly to the VM-3000 by a 9-pin serial cable and its relays and opto-isolators are defined by software in the configuration editor.

7.3 IDENT XBAR INTERFACE

If a **TVS** or **Venus** preselection matrix or a Philips **Jupiter** control system is connected to the **DD20** and **DD30** production switchers, the IDENT XBAR protocol may be used to transmit the abbreviated names of the sources corresponding to the current switcher status from the matrix to the switcher. The current source name is then indicated in the displays (option) of the source selection keys.

Installation

The installation of this mode of operation is made in the **IDENT INPUT** installation menu. The cursor must be moved to the table position of the input linked with XBAR output. Then the **XBAR** softkey must be selected in the menu and the number of the corresponding XBAR output must be entered with the numeric keypad.

In the **CONFIG E-BOX** installation menu, the **IDENT XBAR** protocol must be selected for the port that is linked e.g. to the TVS controller interface CI-2000. The controller interface CI-2000 is in turn linked by party line to the TVS matrix and the TVS panel.

Note: The controller interface CI-2000 must have the corresponding software. For the Jupiter control system a VM board or a SI board is available as interface.

In order to clear a XBAR entry in the **IDENT INPUT** menu, proceed as follows: move cursor into the corresponding field, press **XBAR** again and then clear the entry by pressing **CLEAR** in the numeric keypad.

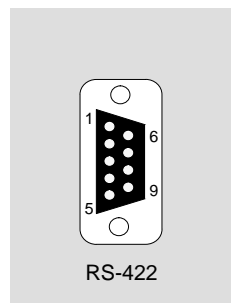
XBAR Protocol

For the three serial ports of the switcher electronics the XBAR Ident protocol is available. The protocol serves to transmit mnemonic codes to the switcher at a rate of

38.4 kBaud, 8 databits, even parity, 1 stop bit.

The transmission can be made from any computer system with a serial interface. The serial interface must correspond to the RS-422 standard.

In this mode the switcher operates as tributary, the port (9 pin D-sub, female) of the switcher is assigned as follows:



Pin 1, 9	Frame ground
Pin 2	Transmit A
Pin 3	Receive B
Pin 4	Receive common
Pin 5	not connected
Pin 6	Transmit common
Pin 7	Transmit B
Pin 8	Receive A

The mnemonic codes are transmitted in the following binary form:

10010101 aaaaaaaaa 0ccccccc 0ccccccc 0ccccccc 0ccccccc

"a" corresponds to the XBAR output number entered during the installation in the IDENT INPUT Menu and "c" correspond to the ASCII coded characters of the mnemonic codes to be transmitted.

During the start-up phase the switcher sends a INIT REQUEST (hex BE). This informs the host that the switcher had been switched off and may have lost data or that the data may not be current. The host must respond by sending all mnemonic codes again.

During the normal operation the switcher sends "I AM DIAMOND" (hex BF) at regular intervals (every 3 seconds). If the host is switched on, it should answer by sending all mnemonic codes until the switcher sends this message for the first time. The subsequent regularly arriving messages may be ignored. They may be used in the host to check that the connection is still alive.

7.4 AUX PANEL AND UNDER MONITOR DISPLAY INSTALLATION

For the switchers *DD5*, *DD10*, *DD20* and *DD30*, two types of AUX panels are available. Type *CP-300* with 24 source selection keys and six bus delegation keys, and type *CP-330* with 48 source selection keys and six bus delegation keys.

In addition to the AUX panels, two types of status displays (UMDs) can be connected to the same control bus. Type RP 1 UMD includes a display with eight characters and type RP 2 UMD includes two displays with eight characters.

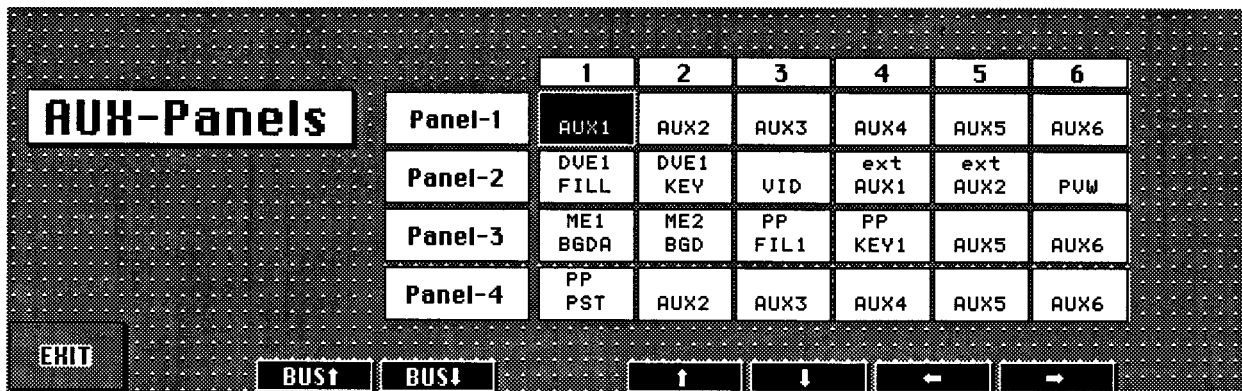
Since maximally 32 devices can be operated at the MPK bus, the number of the connectable UMDs depends on the number of the installed AUX panels.

$$\text{Number of UMD} = 32 - \text{number of AUX panels}$$

AUX delegation

The bus delegation keys can be assigned in menu AUX Panels to all buses. For this purpose, the mixer types *DD5* and *DD10* require the connection of a menu monitor.

As default, the bus delegation keys are assigned to the AUX buses AUX1 to AUX6. Not all of the smaller mixer types have these buses.



**AUX assignment
for internal busse**

The assignment of the video signals to the keys of the AUX control panels *CP-330* and *CP-300* cannot be changed, however, it depends on the electronics box selected at the control panel. For *DD20* and *DD30*, **only** *CP-330* (with 48 source selection keys) should be used, in order to be able to select all signals. For *DD10* and *DD5*, both panels can be used. The lower row of *CP-300* (keys 24 .. 47) has the same assignment as the upper one.

Key	DD20 and DD30 Input or internal signal	Key	DD5 and DD10 Input or internal signal
0	Black	0	Black
1	IN 01	1	IN 01
↓	↓	↓	↓
32	IN 32	16	IN 16
33	COL1	17	COL
34	COL2	18	VIDEO STORE
35	VIDEO STORE	19	CLEAN
36	MONT PROC 1	20	PVW
37	MONT PROC 2	21	PGM
38	ME1	22	Black
39	ME2	23	Black
40	PP (= PGM)	24	Black
41	PVW ME1	25	IN 01
42	PVW ME2	↓	↓
43	PVW PP	40	IN 16
44	ME1 KEY	41	COL
45	ME2 KEY	42	VIDEO STORE
46	CLEAN	43	CLEAN
47	Black	44	PVW
		45	PGM
		46	Black
		47	Black

**AUX assignment
for external
AUX busses**

In case of delegation the AUX panels to external crossbars (Ext Aux 1...6) the following assignment is valid:

Key	Signal
0	Input 0 of external crossbar
1	Input 1 of external crossbar
⋮	⋮
47	Input 47 of external crossbar

Installation

Each master control panel RPD-xx allows connection of up to **four** AUX panels to the serial port (RS-422). Previously, the address has to be adjusted at each AUX panel, adjusting at each of the four AUX panels another address.

Proceed as follows:

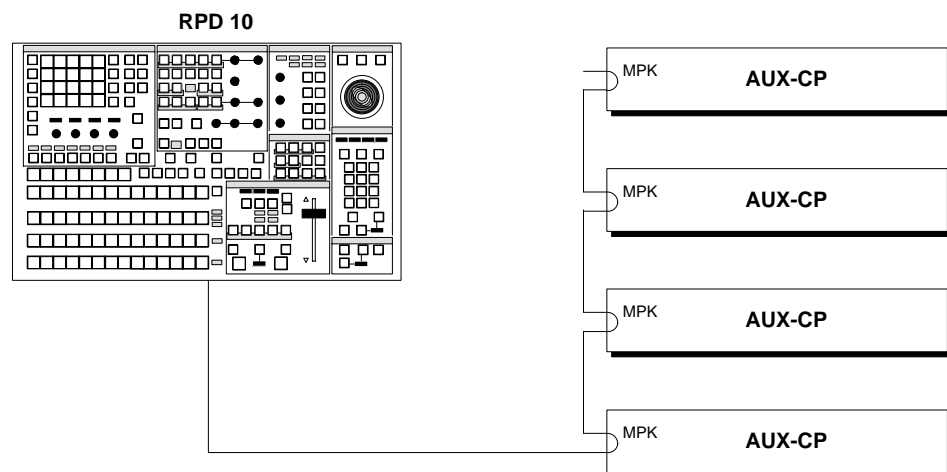
1. Remove on the rear of the panel the small cover cap, revealing a DIP switch module with 8 switches.
2. Adjust the DIP switches 1 to 8 as follows:
(0 means switch OFF = downwards, 1 means switch ON = upwards)

Schalter	1	2	3	4	5	6	7	8	
1. Panel	0	0	0	0	0	0	0	1	Is applicable up to software DS0011F
2. Panel	1	0	0	0	0	0	0	1	
3. Panel	0	1	0	0	0	0	0	1	
4. Panel	1	1	0	0	0	0	0	1	

From software version "DS0011G" which replaces the under-monitor displays, the switches have to be set as follows:

Schalter	1	2	3	4	5	6	7	8
1. Panel	0	0	0	0	1	1	1	1
2. Panel	1	0	0	0	1	1	1	1
3. Panel	0	1	0	0	1	1	1	1
4. Panel	1	1	0	0	1	1	1	1

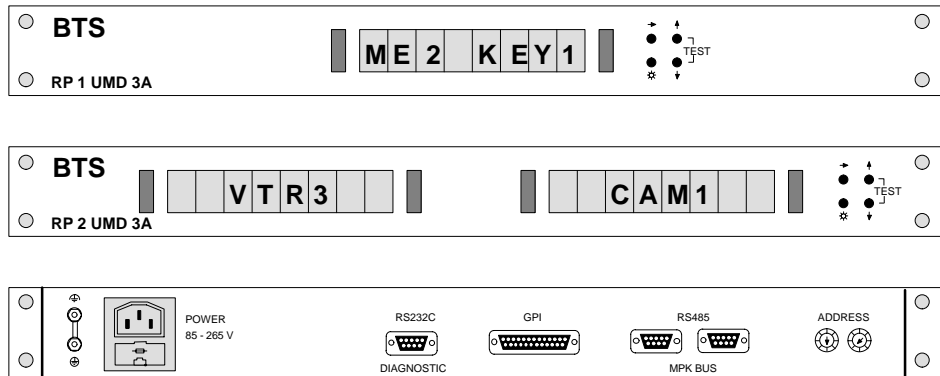
3. Fasten the cover cap.
4. Connect the panels among each other and with the serial port of the master control panel. For this purpose, a 9-wire cable with 9-pin Sub-D connectors is required (connected) by means of which the sockets MPK of the AUX panels and the serial port of the master control panel are connected.



5. Apply 5V DC to the AUX panels.
6. Select the protocol **AUX / UMD** in the SETUP of the master control panel at PORTP.

7.5 CONNECTION OF THE STATUS DISPLAYS RP 1/2 UMD

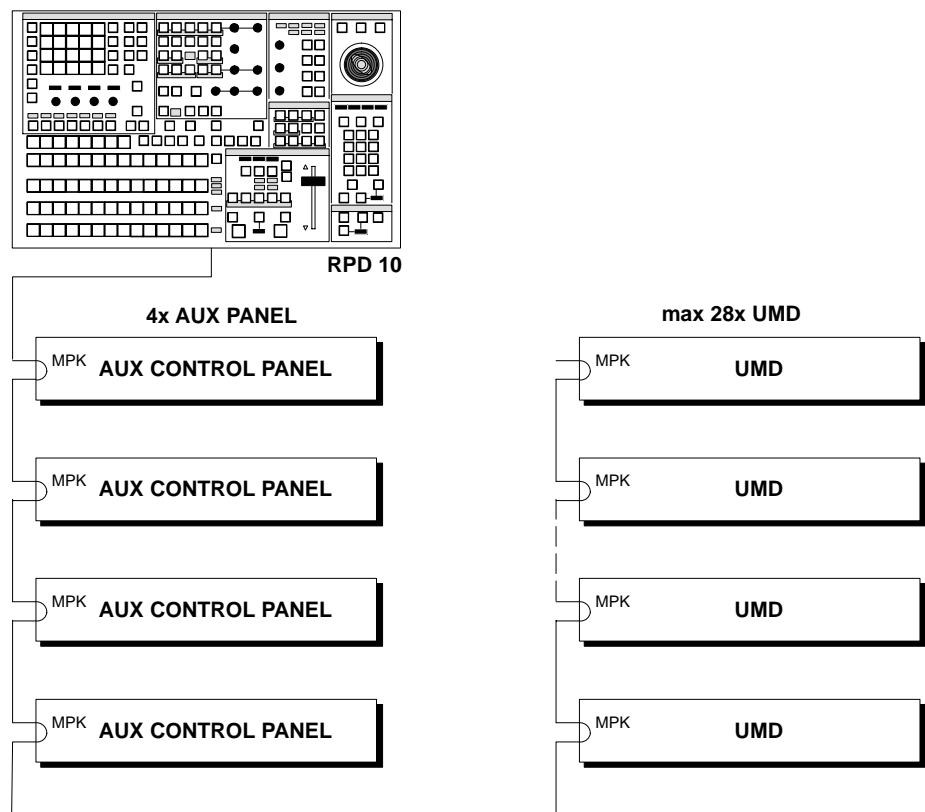
In addition to the AUX panels, status displays (UMDs) can be connected to the MPK bus. Since maximally 32 devices can be operated at the MPK bus, the number of the connectable UMDs depends on the number of the connected AUX panels.



Connection to the MPK bus is made in the same way as for the AUX panels. Power supply can be universally with line voltages of 85 V ... 265 V AC. The respective use of the UMDs can be adjusted with the two rotary switches **ADDRESS** on the terminal panel.

Each rotary switch has the hexadecimal range 0 ... F. See the table below.

$$\text{Number of UMD} = 32 - \text{Number of AUX-Panel}$$



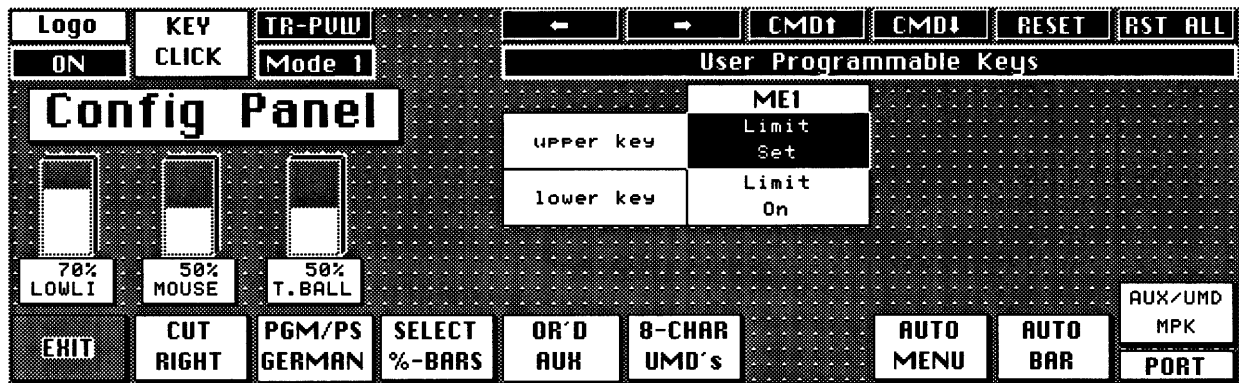
In this application, the following addresses are used:

Address		Display	Display	Note
H	L	Left display RP 2 UMD	Display RP 1 UMD right display RP 2 UMD	
0	0	–	Input 1	1)
0	1	Input 1	Input 2	
0	2	Input 2	Input 3	
	↓	↓	↓	
0	F	Input 15	Input 16	
1	0	Input 16	Input 17	
	↓	↓	↓	
1	F	Input 31	Input 32	
2	2	–	Output ME1	2)
2	3	Output ME1	Output ME2	
2	4	Output ME2	Output MAIN	
2	5	–	PVW ME1	3)
2	6	PVW ME1	PVW ME2	
2	7	PVW ME2	PVW PP=PST=MAIN PVW	
2	8	PVW PP	CLEAN FEED	4)
2	9	CLEAN FEED	PVW BUS	5)
2	A	PVW BUS	Output DP	6)
2	B	–	AUX1	7)
2	C	AUX1	AUX2	
2	D	AUX2	AUX3	
2	E	AUX3	AUX4	
2	F	AUX4	AUX5	
3	0	AUX5	AUX6	
3	1	DVE1 KEY	DVE1 VIDEO	8)
3	2	DVE1 VIDEO	DVE1 KEY	
3	3	DVE2 KEY	DVE2 VIDEO	
3	4	DVE2 VIDEO	DVE2 KEY	

Attention: Other addresses are not admitted. Each address must be adjusted at one UMD only!

The presentation on the display is mostly made with 4 characters. At the UMDs for CLEAN FEED and for the DVEs, alternatively an 8-character display can be selected.

Adjustment is made via the softkey "8-CHAR UMD's" in the menu **Config Panel** of the mixer.



Softkey "8-CHAR UMD's"

Notes to the address adjustment:

- 1) The displays for the 32 inputs show the 4-digit source name.
- 2) The displays for the three outputs can show the following:
 - a) The source name of the input being visible in the output picture, if it is the only picture component,
 - b) "...", when a mixed picture is at the output,
 - c) "FTB", when the output has been faded to black with the fade-to-black function.
- 3) The displays for the PVW ME1 / ME2 / PP Preview can show the following:
 - a) "PROG", when no Preview is selected,
 - b) "AKAx", when the cursor for Auto-Chroma-Key-Adjustment is selected,
 - c) the states of the next transition keys are displayed with graphical symbols (on/off).

e.g. " _■_■ "

In this case: **NXT BGD A = off,**
NXT BGD B = on,
NXT KEY 1 = off,
NXT KEY 2 = on

This preview mode is displayed when Look-Ahead-Preview is switched on.

- d) "TRAN", when Transition Preview is selected.
- e) "KEYx", when Key Preview is selected (Video: Key to background)
- f) "keyx", when Key Preview is selected (Video: pure key signal (SW))
- g) "MSKx", when Mask Preview is selected
- h) 4-digit source name of the DSK2, when PP-Preview = DUAL or CASC is selected.

x = 1 or 2 for ME1,
 4 or 5 for ME2
 7 or 8 for PP

- 4) The Clean Feed display shows in the 4-character mode "**CLEA**" and in the 8-character mode "**CLEAN FD**".
- 5) The display of the Preview AUX output shows the 4-digit source name of the selected input.
- 6) The display of the DP output shows the 4-digit source name of the selected DSK1 input when PP-Preview = DUAL or CASC.
In the other cases: "####" (no meaning).
- 7) The displays for the 6 AUX outputs show the 4-digit source name of the selected input.
- 8) The displays for the 4 DVE outputs can show the following:
 - a) The 4-digit source name of the selected input
 - b) "**1PST**", "**1PGM**", "**1 K1**", "**1 K2**", "**2PST**", "**2PGM**", "**2 K2**", "**PPST**", "**PPGM**", "**P K1**", "**P K2**" for the selected ME output in the 4-character mode.
 - c) "**ME1 PST**", "**ME1 PGM**", "**ME1 KEY1**", "**ME1 KEY2**", "**ME2 PST**", "**ME2 PGM**", "**ME2 KEY1**", "**ME2 KEY2**", "**PP PST**", "**PP PGM**", "**PP KEY1**", "**PP KEY2**" for the selected ME output in the 8-character mode.

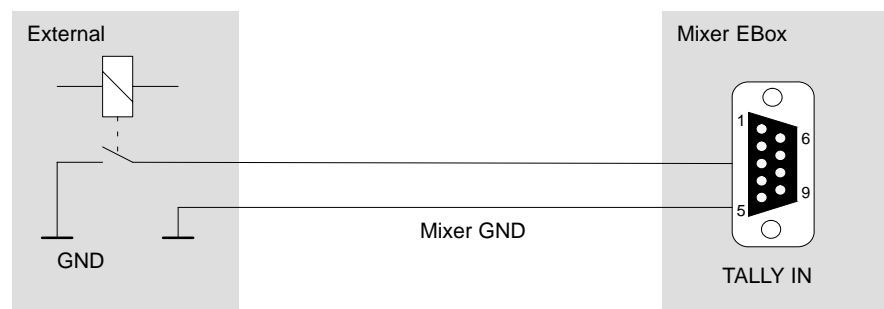
7.6 TALLY AND GPI INTERFACE

The following supplement contains the specifications of the TALLY and GPI interfaces of the mixers DD5, DD10, DD20 and DD30. You find the pin position of the TALLY and GPI sockets on the terminal panel of the respective mixer in the installation manual. You will find a circuit diagram of the tally distributor RC1940 as an appendix to this supplement.

Tally inputs

The tally inputs are controlled by connecting the respective input to ground. Control can be made by a relay contact, a switch or by an open collector output.

Example:



Connection specification TALLY IN (TTL interface):

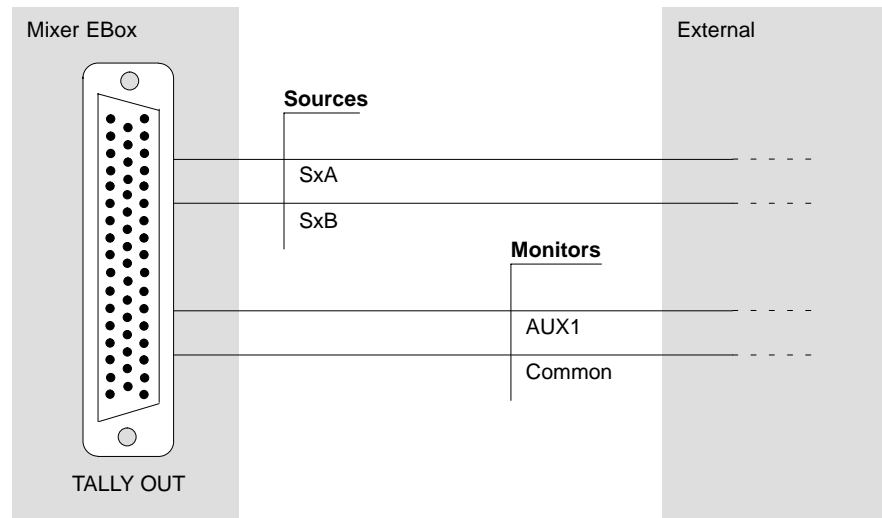
(absolutely max.)

DC input Voltage	V_I	- 2V ... +7V
Input High Voltage	V_{IH}	≥ 2 V or open
Input Low Voltage	V_{IL}	$\leq 0,8$ V
Input Current High	I_{IH}	internal pull-up 10kOhm
Input Current Low dyn	I_{IL}	≤ 6 mA
Input Current Low stat	I_{IL}	≤ 1 mA

TALLY and GPI Outputs

The TALLY and GPI outputs are laid out as relay contacts which are controlled via open collector drivers.

Example:



Connection specification TALLY OUT and GPI OUT:

(absolute max.)

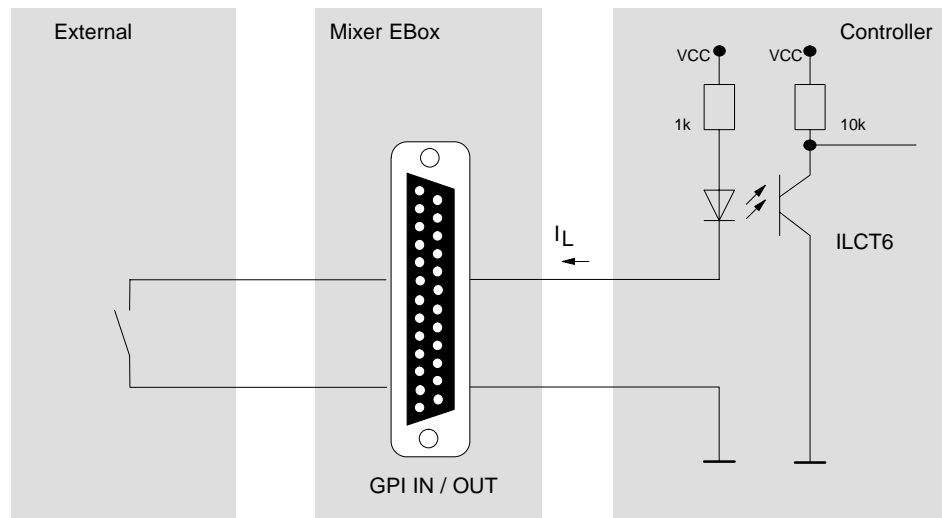
Switching current	max. 1 A
Switching voltage DC	max. 24 V

**GPI input
(non isolated)**

The switches T47, T48, T49, T56, T57, T58, T67 and T68 on the EBox controller RY1917 or RY1601 enable defining the mode of operation for the GPI inputs.

Position "1" (to the left) is intended for the following application:

A simple connection between the two connectors activates the corresponding input. This kind of control is suited for the connection to a relay contact or also to an open collector output. Please note that in this case, one of the two leads is connected with the circuit ground. Therefore, when connecting to an open collector output, no ground potential isolation is between mixer and controlling device.



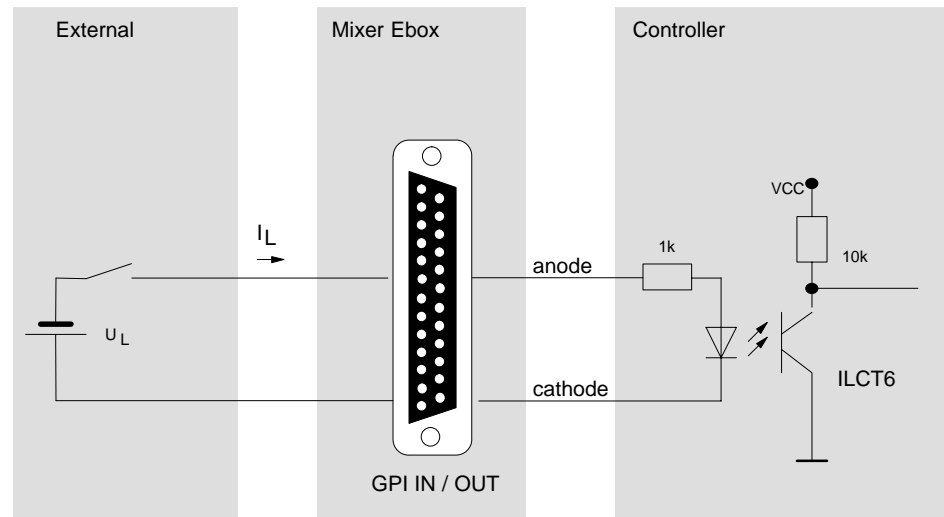
$$I_L \text{ max.} = \leq 4 \text{ mA}$$

GPI input (isolated)

The switches T47, T48, T49, T56, T57, T58, T67 and T68 on the EBox controller RY1917 or RY1601 enable defining the mode of operation for the GPI inputs.

Position "2" (to the right) is intended for the following application:

At the two connectors, the opto coupler internal LED is made available (including drop resistor 1kOhm). With this type of control, a ground potential isolation is between mixer and controlling device. However, the controlling device has to imprint a current in the LED i.e. a simple contact is not suited in this case.



U_L min	3 V
U_L typ	5 V
U_L max. one	24 V
I_L ($U_L=5V$)	4 mA
I_L ($U_L=24V$)	24 mA

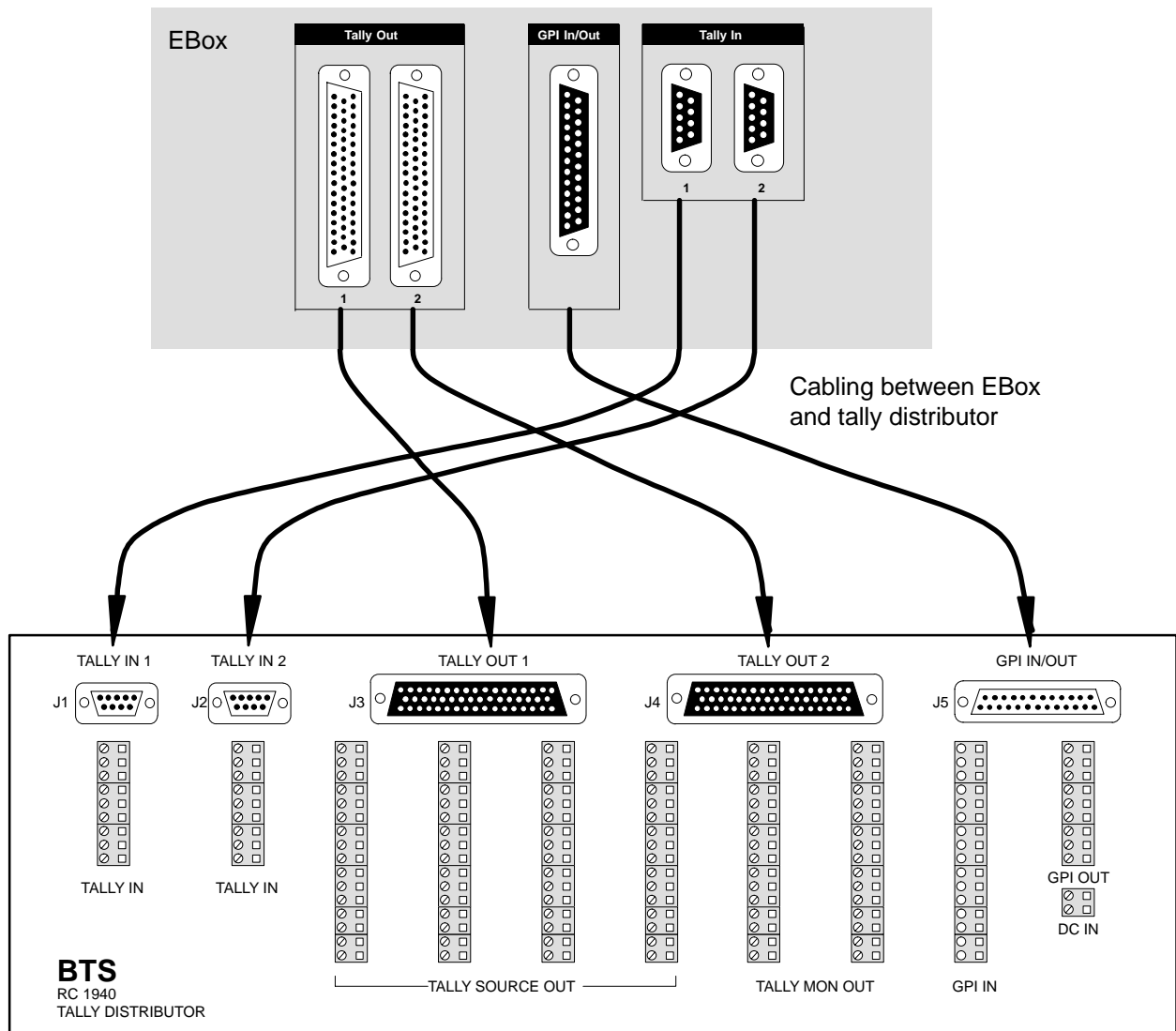
Tally distributor

As an accessory, the tally distributor RC1959 is available for the mixer making available all inputs and outputs for TALLY and GPI on connector blocks. For this purpose, the tally distributor can be mounted in the rear of the equipment cabinet and is connected with five connector cables to the TALLY / GPI connectors of the Ebox terminal panel. The Tally distributor consists of distribution board RC1940 and the five connector cables. The cable length is 2 m. Therefore, the distributor can be mounted at a free position within the equipment cabinet. If, depending on the projection, long cable lengths are required, make sure it is to be that protected cables are used. The pin assignment is 1:1.

BTS cable with variable length:

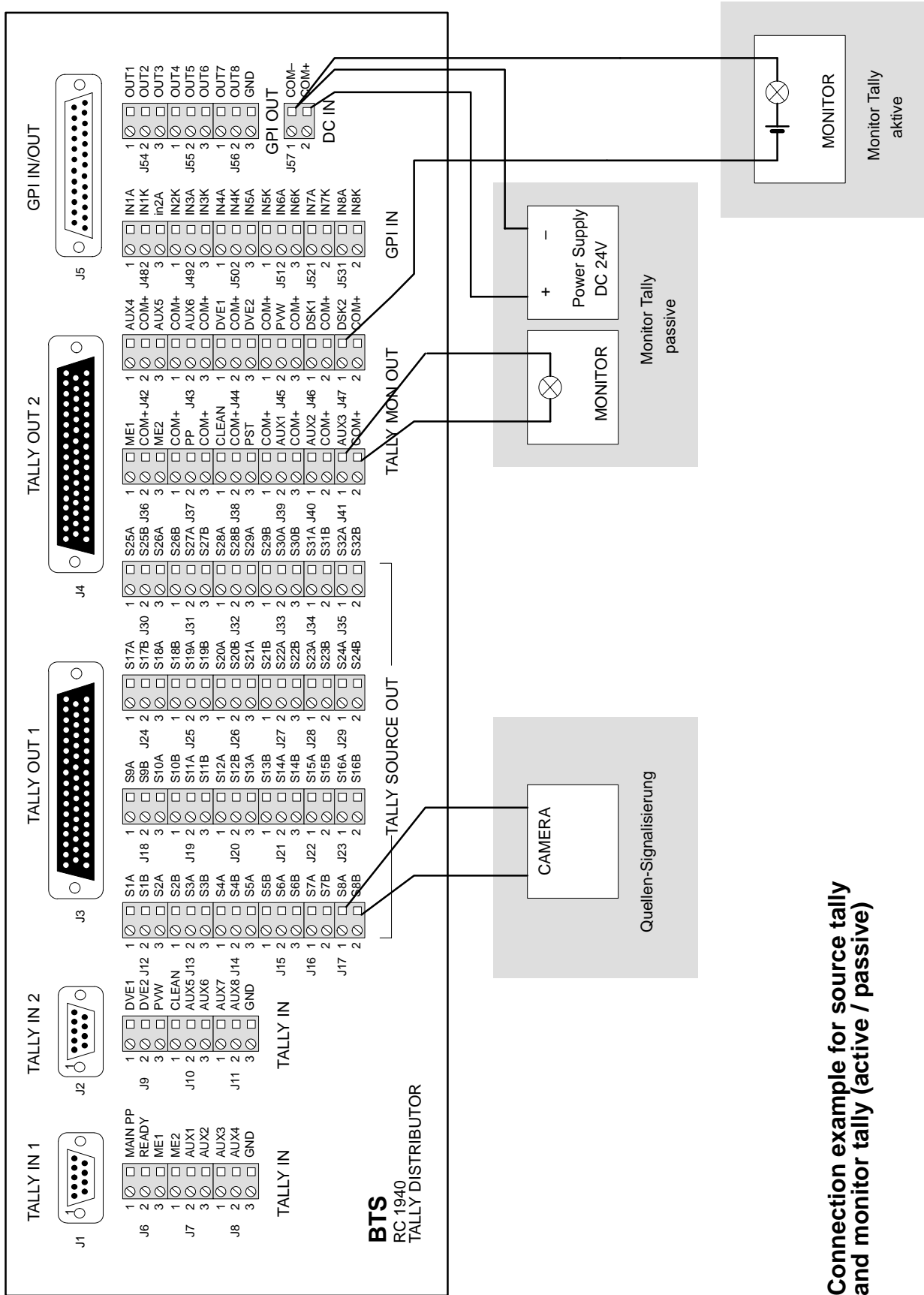
Cable	Type	Order number
50-pin plug/hub	S5050-001	0 979 093 001
25-pin plug/hub	S2525-001	0 979 063 001
9-pin plug/hub	S0909-001	0 979 033 001

When ordering, indicate the cable length.



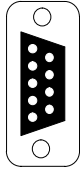
The connector blocks are combined to functional groups labelled accordingly:

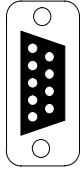
TALLY IN
TALLY SOURCE OUT
TALLY MON OUT
GPI IN
GPI OUT



Connection example for source tally and monitor tally (active / passive)

7.7 FUNCTION OF TALLY IN CONNECTORS

TALLY IN 1	Pin	Signal DD busses	DD5	DD10	DD20	DD30	DD20M
 9-pin D-type female	1	MAIN=PP	–	–	X	X	X
	2	READY	X	X	X	X	X
	3	ME1	X	X	X	X	–
	4	ME2	–	–	–	X	–
	5	AUX1	X	X	X	X	X
	6	AUX2	–	X	X	X	X
	7	AUX3	–	X	X	X	X
	8	AUX4	–	–	X	X	X
	9	GND	X	X	X	X	X

TALLY IN 2	Pin	Signal DD busses	DD5	DD10	DD20	DD30	DD20M
 9-pin D-type female	1	DVE1 (Video)	X	X	X	X	–
	2	DVE2 (Video)	–	–	X	X	–
	3	PVW	–	–	X	X	X
	4	CLEAN	X	X	X	X	X
	5	AUX5	–	–	X	X	X
	6	AUX6	–	–	X	X	–
	7	DVE1 (Key)	X	X	X	X	–
	8	DVE2 (Key)	–	–	X	X	–
	9	GND	X	X	X	X	X

Note

1. The mixers DD5 and DD10 have ME=MAIN OUT. For this reason, the studio tally has to be switched to ME1!
For the mixers DD20, DD30 and DD20M, the studio tally has to be switched to PP!
2. Signal READY open (not connected to ground):

Via the TALLY OUT connectors, the mixer tallies the picture sources being involved in the output picture of the mixer.

Signal READY connected to ground:

Tallying the picture source depends on whether the sources are involved in the output picture of the studio. For this reason, apply via the diverse TALLY IN connectors (see the table above) in connection with a studio tally distributor, an information to the mixer saying which one of the mixer output buses is involved in the studio output picture.

If no tally information is applied, the picture sources connected to the mixer, are also **not** tallied with "On Air" – independent of the mixer state.

8. DVE AND EDITORS

8.1 TECHNICAL SETUP AND WIRING

Video connection of the DVE device The DVE device is connected at the "DVE Key" and "DVE Fill" outputs of the switcher.
If the DVE device is not equipped with a "Flying Key" channel, only the "Fill" connection is required.
Connect the key and fill outputs of the DVE device as inputs to the switcher.

Assignment of video sources in the switcher The inputs to which the DVE fill and key signals are connected are selected in the switcher setup.
This setting will be required for the FX Loop mode.

Control connection of the DVE device Connect the DVE device and the switcher via their remote control ports. In most cases this is done using a 9 pin 1:1 D-type cable and the RS-422 interface.
For this purpose the ports 1, 2 and 3 are provided at the switcher.
Each of these ports may be used for the connection of a DVE device. The desired port is set in the switcher setup.

Exception: The DVE types A53D and A57 may only be connected at port 1 using RS-232 interface.

Designation of the sockets on the terminal boards

	DD5/DD10	DD20/DD30
Port 1 RS-232	J6 Serial Port 4	J9 Serial Port 232
Port 1 RS-422	J2 Serial Port 1	J10 Serial Port 1
Port 2 RS-422	J3 Serial Port 2	J11 Serial Port 2
Port 3 RS-422	J5 Serial Port 3	J12 Serial Port 3
Cross-bar control	–	J13 Serial Port XBAR

The switch-over between port 1 with RS-232 and port 1 with RS-422 is made with the selection of the corresponding DVE protocol.

Assignment of the protocol in the switcher Select the corresponding DVE protocol (for the port at which the DVE device is connected). A general DVE type is "VTR protocol".

8.2 PREPARATIONS AT THE DVE DEVICE

- Sequence generation** DVE sequences for full transitions must start with a full-format, undistorted and correctly positioned picture and must end with a picture that is no longer visible. Based on our experience with various DVEs, we do not recommend programming DVE switching functions such as Freeze, GPI trigger, etc. into a DVE sequence that is to be used as transition from the switcher. Such functions are often not recalled when the transition is executed. Presumably this is a result of the key frame interpolation in the DVE. In no case the error should be localized in the DVE. Effects including switching functions can only be run perfectly in original speed.
- Sequence selection** Recall DVE sequences that are to be controlled from the switcher and load them into the snapshot registers of the DVE.
- Scaling** For most DVE devices a scaling of the DVE sequence to a certain time will be required in order to coordinate the movement of the switcher fader with the start and the end of the DVE sequence.
- Remote control** Switch DVE device to Remote Control and/or enable the remote control.

8.3 DEVICE SPECIFIC NOTES

8.3.1 PINNACLE PRIZM

Connection cable: Standard RS-422 cable

DD switcher setup and installation: Serial port: Port 1 or port 2 or port 3
Protocol in switcher setup: DVE PRIZM

DVE setups and installations: Enable RS-422 VTR.

For DVE effect generation please note: Scaling to 30 seconds
(problem with DVEator as a result of limited storage capacity).

Possible functions: Sequence selection from DD switcher.
Sequence run with DD fader.

Particularities:

- Stored events (Freeze, GPI trigger, etc.) may be lost during recalling.
- At present the DVE Aux buses cannot be remote controlled.

Pinnacle (2 channel):

- Each DVE requires its own port at the switcher. This is easy to understand as each DVE can also be used as single-channel DVE.
- The switcher cannot control both ports synchronously. Synchronous control is possible with the controls at the DVEs. With the switcher synchronous control is only possible with one wipe with EXTRA (1 ME controls only the DVE without video function).
- The digital Pinnacle version does not permit a transition to a background.

8.3.2 ABEKAS A 57 WITH VTR PROTOCOL

Connection cable: Standard RS-422 cable

DD switcher setup and installation: Serial port: Port 1 or port 2 or port 3
Protocol in switcher setup: DVE VTR

DVE setups and installations: Select Sony protocol.
Set Edit Offset to one minute.
Enable remote control on A 57 control unit.

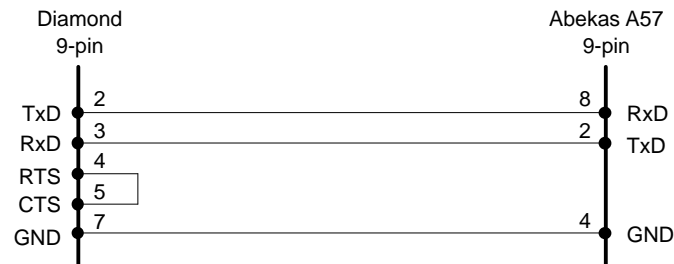
For DVE effect generation please note: Set run time (wipe duration in time menu) to 30 seconds.

Possible functions: Sequence run with switcher fader.

Impossible functions: Sequence selection.

8.3.3 ABEKAS A57 WITH RS232 PROTOCOL

Connection cable:



Note: Do not use this cable with the DD35!

DD switcher setup and installation:

Serial port: RS-232 interface
 – DD5/DD10 = port4
 – DD20/DD30 = port 232
 Protocol in switcher setup: DVE A53D

DVE setups and installations:

Port Aux B.
 Select RS-232 protocol for port Aux B.
 Set header 2 on address port to RS-232 (Techn. Guide A57, Fig. 36)
 Set into Slave control

For DVE effect generation please note:

No scaling required.

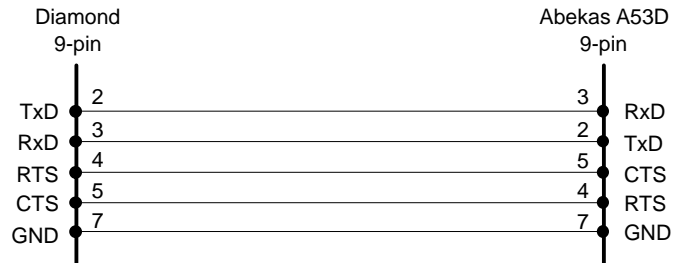
Possible functions:

Sequence selection from switcher.
 Sequence run with switcher fader.

Particularities:

Only possible with 9600 Baud.

8.3.4 ABEKAS A53D

Connection cable:**DD switcher setup and installation:**

Serial port: RS-232 interface
 – DD5/DD10 = port4
 – DD20/DD30 = port 232

Protocol in switcher setup: DVE A53D

DVE setups and installations:

Enable remote control on A53D control unit.

For DVE effect generation please note:

No scaling required.

Possible functions:

Sequence selection from switcher.
 Sequence run with switcher fader.

Particularities:

Only possible with 9600 Baud.

8.3.5 QUESTECH CHARISMA

Connection cable: RS-422 cable with male and female connector (assignment 1:1)

DDswitcher setup and installation: Serial port: Port 1 or port 2 or port 3
Protocol in switcher setup: DVE CHARIS

DVE setups and installations: Set Charisma remote protocol to BVW 75.

For DVE effect generation please note: No scaling required. Scaling is made in Charisma after effect selection from the switcher.
Very long sequences may require very much computing time, i.e. long waiting period from effect selection until effect transition becomes possible.

Possible functions: Sequence selection.
Sequence run with switcher fader.

For older Charisma software versions the sequence selection from the switcher must be confirmed on the main control panel.

8.3.6 GVG DPM 700

For the GVG DPM-700, the switcher provides two protocols for different purposes. The protocols are:

1. Selection and control of DVE effects: protocol **DVE DPM**
2. Control of aux buses by the DPN: protocol **DVE DPM-AUX**

Tests showed that the DPM does not enable the operator to operate both functionalities at the same time without disturbances.

8.3.6.1 Selection and controls of effects

Connection cable: Standard cable RS-422

DD switcher setup and installation: Serial port: Port1 or port2 or port3
Protocol in switcher setup: DVE DPM

DVE setups and installations: Port: ACCESSORY port
Protocol: Model 100 protocol
On **all** other ports, select **SONY** protocol
Enables: Editor has to be enabled with control by the switcher.

Note when creating DVE effects: The effects have to be scaled to 30 seconds.

Possible functions: Effects selection is possible from the switcher.
Effects control is possible with the fader lever.
Effects control is possible by means of Auto Transition.

Special features: With manual effects control from the switcher it may happen that contributions stored in the DVE effect (e.g. Freeze on/off, E-MEM-Recall etc.) are not reproduced (the associated key frame is not exactly selected).
When on the other DPM ports, the SONY protocol is not selected, an unobjectionable functioning cannot be ensured.
The tests are made with the DPM-700 Software Panel/Comm/Trans Version 2.4A.

8.3.6.2 Control of aux buses

Connection cable: Standard cable RS-422

DD switcher setup and installation: Serial port: Port1 or port2 or port3
 Protocol in switcher setup: DVE DPM-AUX
 Enables: Key **Edit Enable** has to be active.

DVE setups and installations: Port: SLAVE/MODEL100 port
 Protocol: 200-1 or 200-2 protocol
 Select in the Router menu AUX1, 2, 3 or 4 according to the table below:

Select video signal from the switcher	as router
DVE1	AUX1
DVE2	AUX2
AUX3	AUX3
AUX4	AUX4

Functions: When switching the buses indicated above, the switcher transmits the coupling point information to the DPM. The DPM keeps in mind this coupling point to that side of the transformed picture being now visible. By 180° rotation of the picture and selection of another coupling point, the latter is stored to the other side. When the DVE now turns the picture, the DVE transmits commands to the switcher in order that the switcher switches over the coupling point in time to transmit the "other" side to the DVE.

Special features: The tests are made with the DPM-700 Software Panel/Comm/Trans Version 2.4A.

8.3.7 AMPEX ADO 100 / 500 / 1000

Not tested with *DD switchers*. The interaction was tested with the R132ME analogue switcher. As the same protocol is used, no problems are anticipated.

Connection cable: Standard RS-422 cable

DD switcher setup and installation: Serial port: Port 1 or port 2 or port 3
Protocol in switcher setup: DVE ADO

DVE setups and installations: Select AVC protocol.

For DVE effect generation please note: No scaling required.

Possible functions: Sequence selection.
Sequence run with switcher fader.

Particularities: At present the DVE Aux buses cannot be remote controlled.

8.4 DVE CONTROL

Operating modes

DVE devices that are linked to the DD switchers in terms of signals and control can be used in various modes.

1. FX Loop

In this mode, the video and key signals to the DVE device are switched automatically and the sequences of the DVE device are controlled with the fader in the Transition panel. The DVE device permits transitions of the background and of keyers that are controlled in the same way as wipe transitions. In this mode, Loop and DVE transition are enabled.

2. FX Loop without fader

In this mode, the video and key signals to the DVE device are switched manually. The control of the sequences is made with the DVE digipot in the Wipe panel, which in this mode is switched over to DVE operation. This mode permits integrating particularly static DVE effects into a picture, e.g. smaller pictures at a fixed position. In this mode, Loop is enabled and DVE transition is disabled.

3. DVE effects without FX Loop

In this mode, all signals applied to the switcher as well as the internal signals from the key levels may be selected as DVE input signals. The DVE sequence control is made with the DVE digipot in the Wipe panel, which in this mode is switched over to DVE operation. The DVE effect is faded-in at any key level of the switcher. In this mode, Loop and DVE transition are disabled.

4. In modes 2 and 3, the DVE device may also be directly controlled by an external editor instead of the digipot. For this no control link exists between switcher and DVE.

Assignment for DD20 and DD30

Required for mode 1 only.

As two DVE devices may be connected to the switchers, the DVE(s) must be assigned to the switching levels MEx/PP. One DVE may be assigned to several MEs.

If only one DVE is connected, this must be assigned as well. It may be assigned to any ME and the PP stage. Any assignment will remain stored until the assignment is changed. Before the assignment, a port for the DVE must be defined by port number and port protocol in the **Setup**.

Assignment is made as follows:

- Hold down the **DVE** transition key in the Transition panel of the respective ME and
- Press **DVE1** or **DVE2** of the Aux bus delegation to assign the DVE device to the respective ME.

Note: Each DVE (DVE1 or DVE2) may only be selected as type of transition in one ME for one picture component.

Effect selection

After Remote has been enabled in the DVE, the desired DVE sequence is selected with the wipe effect keys in the Wipe panel of the switcher. DD5 and DD10 are switched over to DVE operation by disabling the functions (keys) **Wipe1**, **Wipe2** or **Mask**. Below one of the digipots **DVE** is displayed.

The wipe keys of a **DD20** switcher correspond to the DVE snapshot numbers 1-15 or, when the **2nd** key is actuated, to the snapshots 16 - 30.

The **DD5** switcher features less keys for the wipe or sequence selection.

The selectable sequence numbers are as follows:

- | | | |
|---------------|--------------|-----------------|
| 1. bank 1 - 4 | 2. bank 6- 9 | 3. bank 11 - 14 |
|---------------|--------------|-----------------|

with the **2nd** key

- | | | |
|-----------------|-----------------|-----------------|
| 1. bank 16 - 19 | 2. bank 21 - 24 | 3. bank 26 - 29 |
|-----------------|-----------------|-----------------|

In the **DD20** and **DD30** switchers, the Wipe panel is switched over to DVE operation control with the **DVE1** or **DVE2** delegation keys. Below one of the digipots **DVE** is displayed.

Mode 1 FX Loop

If the **DVE** transition type key is actuated, DVE is selected as transition for a picture component. In this case the assigned DVE device is controlled automatically and the video and key signal is switched to the DVE device for the respective picture component. The Loop mode is enabled automatically.

Note: In order to assign the DVE transition mode to a different picture component, a different transition type, e.g. Mix or Wipe must be selected for the original picture component. If DVE transition is selected, it is not possible to change the transition component as is usual e.g. with the Mix or Wipe transition.

It is particularly important to monitor this particularity when working with a DD5 switcher as there are no displays above the keys for picture component.

If DVE is used as background transition, it is possible to select whether the signal is to be switched to the DVE from the Background or the Preset bus. This selection permits a determination of the type of transition.

Key **Preset ON**: *new picture comes in*
 Key **BGD* ON**: *old picture goes out*

* With some devices this key is designated **PGM**.

If the function (key) **Loop** is disabled, only the DVE key signal is switched to the DVE, not the video signal. This way, a DVE effect may also be used as wipe effect without manipulating the video signal.

In this mode 1 (FX Loop), the DVE is only switched into the signal path during the transition.

Note: It is possible to deviate from the automatically switched video and key signals and to switch other signals. However, this may result in partly peculiar pictures.

Mode 2 FX Loop without fader

Select the **DVE** key (DVE1 or DVE2 in case of DD20; DD30) on the Aux bus delegation bank.

Disable **DVE** transition in the Transition panel (if enabled).

Select the picture component to be switched to the DVE (**Key 1**, **Key 2**).

Enable **Loop**, i.e. switch DVE into the video path.

*Note: For DD20, DD30:
 In exceptional operating states the keys in the "to DVE only" field may fail to respond. For the selection of a picture component, one of the keys **ME1**, **ME2** or **PP** must be held down.*

The **DVE** digipot in the Wipe panel permits running the DVE effect. As it is difficult to achieve a continuous sequence with the digipot, this operation can only be recommended for a static DVE positioning. A uniform movement can, however, be realized with an EXTRA timeline. The picture component manipulated with the DVE can be faded with **Wipe** or **Mix** in the Transition panel.

*Note: Function Loop ON DVE in video path for the picture component
 Function Loop OFF DVE not in video path for the picture component*

Mode 3
DVE effects
without FX Loop

Select the **DVE** key (DVE1 or DVE2 in case of *DD20*; *DD30*) on the Aux bus delegation bank.

Disable **Loop**.

Disable **DVE** transition in the Transition panel (if enabled).

In this mode, the following signals can be switched to the DVE:

- all signals of the Aux bus; if a coupled key signal exists, this is sent to the DVE as key signal.
- video signals and – if existing – the pertaining key signal from the respective switching level.

If only a video signal and no key signal exists, 100 % white is sent to the DVE as key signal.

If the DVE delegation key is held down, any signal may be selected as key signal.

8.5 EDITORS WITH GVG-200 o/e-PROTOCOL

CMX-OMNI	BTS protocol in preparation
ACCOM-AXIAL	BTS protocol in preparation
AMPEX-ACE 100	
AMPEX-MICRO ACE	
GVG-VPE ...	
PALTEX ...	(GVG 200 e) tested with <i>R132ME switcher</i>
VIDEO MEDIA	
SONY-BVE 9000	
SONY-BVE 9100	
SONY-BVE 2000	
BTS-BBE-2000	

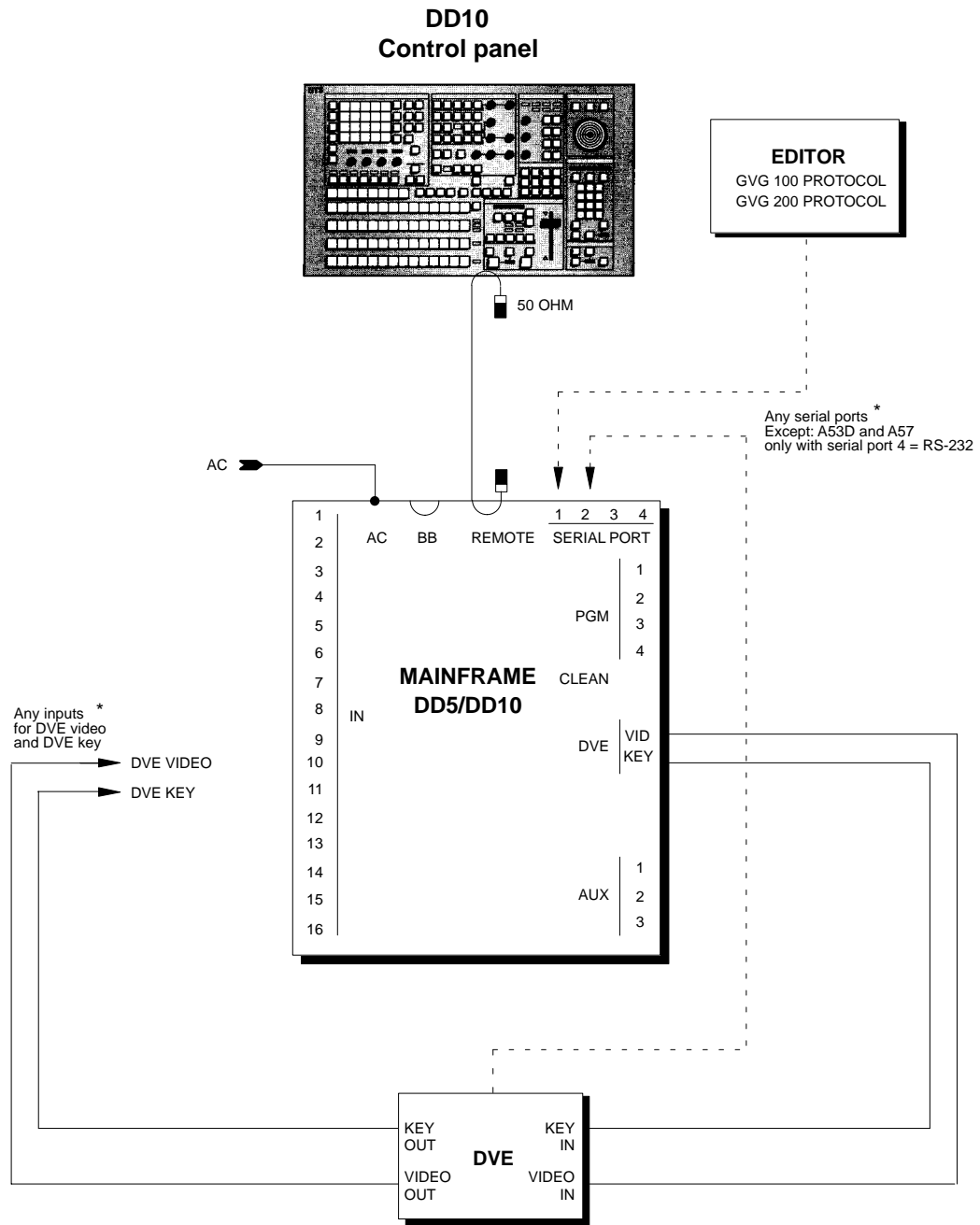
8.6 EDITORS WITH GVG-100 PROTOCOL ONLY

SONY-BVE-900
SONY-BVE-910
AMPEX-ACE 25

8.7 PORT PROTOCOLS IN THE DD SWITCHERS

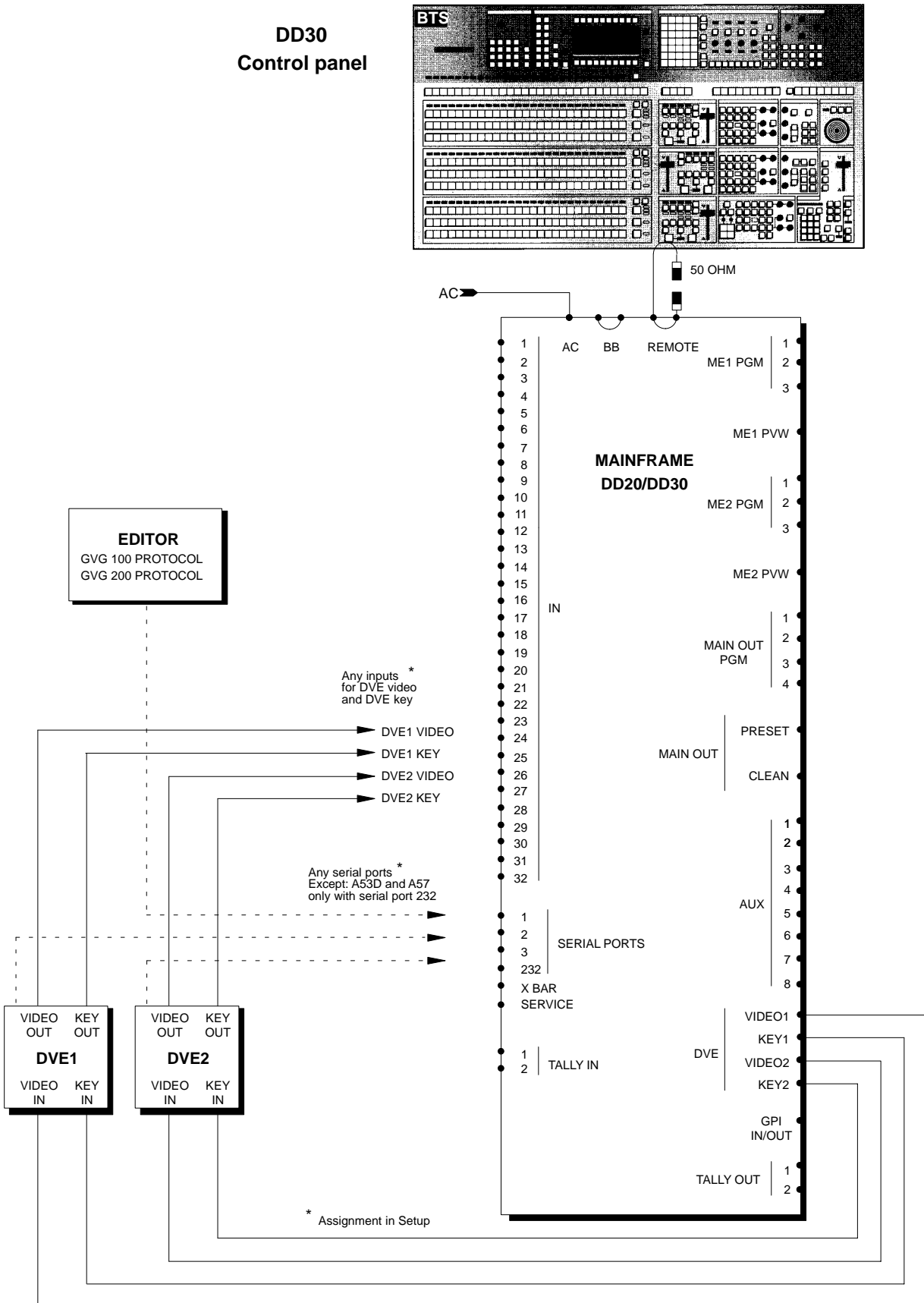
	to DVE	from editor	note
GVG 200 o		x	38.4 kBaud, odd, parity
Audio Mast			to SES audio switcher for <i>DD20M</i>
DVE A53 D	x only port 1 RS-232		see chapter 1 Technical setup and wiring
DVE prizm	x		
DVE ADO	x		
GVG 100 ME1		x	
GVG 100 ME2		x	
Ident Xbar			from BTS control system
DVE Charis	x		
DVE VTR	x		Sony VTR protocol
GVG 200 e		x	38.4 kBaud, even, parity
Autom SAST			BTS station automation master control (bidirectional for <i>DD20M</i>)
Auto ICS			BTS control
DVE DPM	x		as yet not working together
DPM-AUX	x from and to DPM		

8.8 SYSTEM INTEGRATION DD5 / DD10



* Assignment in Setup

8.9 SYSTEM INTEGRATION DD20 / DD30



9. PORT PROTOCOLS GVG-200 EMULATION

The *Diamond digital* switcher can be controlled by an editing system via the RS-422 interfaces of the switcher electronics (E-box).

Control is made by means of the GVG-200 protocol which can be emulated by the *Diamond digital* switcher.

The following description explains how the *Diamond digital* switcher interprets commands from an editing system.

For connecting an editing system, one of the three RS-422 interfaces of the E-box has to be switched to GVG-200 emulation. See the operation manual of the *Diamond digital* switcher, section CONFIG E-BOX MENU.

In order to make all Diamond inputs available under the GVG-200 emulation which allows only input numbers from 1 to 20, the edit interface uses the assignment of the input keys of that panel which possesses the edit port exclusively. It is absolutely necessary that the allocation of the port is exclusive to that panel from which the assignment shall be taken, because different panels can have different key assignments and of course the edit interface can use only one of them.

If the MATRIX TVS protocol is used on another port of the *Diamond digital* switcher electronics, the panel has to own this port exclusively too. Please note that an edit decision list will result in different edits if the assignment of inputs, used in that list, has been changed.

The reactions of a GVG-200 on commands in the following tables are taken from the description "MODEL 200 EDITOR PROTOCOL AND DIALECT" from GVG. In the following, "EX" always refers to the ME address byte, that is the second byte of any command/message block.

The reader is assumed to be familiar with both the GVG-100/300 protocol and the GVG-200 dialect. The hex-numbers behind the command names are the command codes for the write version of these commands. The read version should always report the real state of the switcher unless noted otherwise in the text.

Note:

The function Transfer E-MEM of the GVG-200 protocol is not assisted.

9.1 CROSSPOINT BUS COMMAND (C1 - C4)

The crosspoint numbers from 1 to 20 select the inputs and internal signals (e.g. color background 2) which are assigned to the buttons 1 - 20 on the panel.

Crosspoint numbers

- | | |
|---------|---|
| 21 | the crosspoint number selects ME1 reentry crosspoint on ME2, PP, and auxiliary buses; |
| 22 - 25 | selects Fill 1 - 4 on ME1, ME2; |
| 22 | selects ME2 on PP. |

For edit systems that accept all numbers within the range of a byte value, there is the possibility to address all inputs and internal signal sources independent of the current key assignment. To address physical inputs, 0x40 has to be added to the input, respectively to the signal number. Inputs are numbered 0x00–0x1F, 0x20 is black, 0x22 is ME1 and so on. The complete list is contained in the Diamond digital Command Set.

9.2 ANALOG CONTROL

Analog setting value (C5)

#	GVG-200	Diamond digital	EX
01H	position V	pattern positive V	EX = 1, 2, 0
02H	position H	pattern position H	
03H	border lum keyer 1	border intensity	
04H	density	not assigned	
05H	chroma keyer 1	matte chroma keyer 1	
06H	hue keyer 1	matte hue keyer 1	
07H	luminance keyer 1	matte lum keyer 1	
08H	clip keyer 2	clip level keyer 2	
09H	gain keyer 2	softness keyer 1	
0AH	clip keyer 1	clip level keyer 1	
08H	gain keyer 1	softness keyer 1	
0CH	top mask, keyer 1	top mask 1	
0DH	left mask, keyer 1	left mask 1	
0EH	right mask, keyer 1	right mask 1	
0FH	bottom mask, keyer 1	bottom mask 1	
10H	see 03H-07H and 0CH-0FH		
:			
18H			
19H	chroma, bknd	color chroma	
1AH	hue, bknd color hue		
1BH	lum, bknd	color lum	
1CH	pst ptn size	pattern size	EX = 1 (Color 1)
1DH	width	pattern border width	
1EH	aspect	pattern ratio	
1FH	softness	pattern border softness	EX = 2 (Color 2)
20H	symmetry	pattern border symmetry	
21H	rotation angle	rotation angle	
22H	rotation magnitude	rotation couple #	
23H	rotation speed	rotation speed	
24H	modulation freq	modulation speed	
25H	modulation amp	modulation amplitude	
26H	size mask	not assigned	
27H	soft mask	not assigned	
1FH-26H	shadow clip 1 - 8	not assigned	EX = 8
27H-2CH	chroma keyer 1 - 6 hue	chroma keyer 1 - 6 hue	
2DH, 2EH	chroma keyer 7 - 8 hue	not assigned	

9.3 KEY (BUTTON) COMMANDS

Key (button) command (C6 = on, C7 = off)

#	GVG-200 KEY	Diamond digital
00H	Auto trans	Start/stop auto transition
01H	Preset black mix/dsk out	DSK : Cut ME : black preset (mix and wipe)
02H	ME : trans pwv DSK : black auto trans	ME : transition (on/off) DSK : start/stop FTB auto transition
03H	WIPE or BLACK CUT	FTB : Cut ME : write on: WIPE is selected
04H	KEY 1 over	Write function on: Key Change 2-1 Write function off: Key Change 1-2
05H	KEY 2 over	Write function on: Key Change 1-2 Write function off: Key Change 2-1
06H	Key cut, Keyer 1	Write function on: Key 1, 100 % Write function off: Key 1, 0 %
07H	Mask Keyer 1 or DSK	Mask on/off key 1, key 4 or DSK
08H	Key invert (Keyer/DSK)	Key invert (keyer 1/DSK)
09H	Shadow, (Keyer 1/DSK)	Border key: drop shadow on/off
0AH	MATTE Fill, (Keyer 1/DSK)	Selects matte as fill signal of key
0BH	KEY BUS FILL, (Keyer 1/DSK)	Selects key bus for fill signals. Recall of fill signal source which has been selected before a MATTE FILL command. Works only if a crosspoint has been selected via edit interface.
0CH	KEY BUS SOURCE (Keyer 1/DSK)	Selects key bus for key source signals.
0DH	AUTO SELECT SOURCE (Keyer 1/DSK)	Activates/deactivates coupled mode.
0EH	LUM KEY, (Keyer 1/DSK)	Key mode: luminance key
0FH	MIX	Selects transition type mix.
10H	LINEAR KEY	Key mode: linear key
11H	CHROMA KEY, (Keyer 1)	Key mode: chroma key An appropriate key source must be selected before issuing this command.
12H	PRESET PTN (Keyer 1)	Sets transition mode to mix and selects wipe generator as a key source. If a wipe transition has been stopped half way, switching to mix mode will fail and the wipe generator cannot be selected as a key source.
13H	BOX mask source (Keyer 1/DSK)	Switches mask mode to rectangle and selects mask as a key source. Painted mask is lost.
14H	ME 1 WIPE mask source (Keyer 1)	Not available.
15H	MIX	Sets transition type to mix, write off has no effect.
16H	ME 2 WIPE mask source (Keyer 1)	Not available.
17H	WIPE	Sets transition type to wipe, write off has no effect.
18H	CUT	Same effect as if the CUT key is pressed on the panel. Write function off has no effect.
19H	EXT mask source (Keyer 1/DSK)	Sets mask type to external mask.
1AH	FORCED FOREGROUND (Keyer 1/DSK)	Sets key to forced foreground mode.

#	GVG-200 KEY	Diamond digital
1BH	BOX MASK INVERT (Keyer 1/DSK)	Switches mask invert on/off. Mask type is not changed, painted masks are retained. (Also external masks are inverted).
1CH	KEY CUT (Keyer 2)	Sets key 2 level to 100% resp. 0%
1DH	REV (Wipe)	Sets wipe mode to reverse/normal.
1EH	MASK (Keyer 2)	Switches mask on/off on key 2.
1FH	KEY INVERT (Keyer 2)	Invert key 2 on/off.
20H	SHADOW (Keyer 2)	Drop shadow on/off on keyer 2.
21H	MATTE Fill (Keyer 2)	Selects matte as a fill signal of key 2/5.
22H	KEY BUS FILL (Keyer 2)	Selects key bus for fill signals. Recall of fill signal source which has been selected before a MATTE FILL command. Works only if a crosspoint has been selected via the edit interface.
23H	KEY BUS SOURCE (Keyer 2)	Selects key bus for key source signals on keyer 2.
24H	AUTO SELECT SOURCE (Keyer 2)	Activates/deactivates coupled mode for key 2/5.
25H	LUM KEY (Keyer 2)	Key mode: luminance key 2.
26H	LINEAR KEY	Key mode: linear key 2.
27H	CHROMA KEY (Keyer 2)	Key mode: chroma key 2 An appropriate key source must be selected before issuing this command.
28H	PRESET PTN (Keyer 2)	When WIPE is active, PTN-Size will be ignored.
29H	BOX mask source (Keyer 2)	Switches mask mode to rectangle and selects mask as a key source (note 1). Painted mask is lost.
2AH	ME1 mask source (Keyer 2)	Not available.
2BH	ME2 WIPE mask source (Keyer 2)	Not available.
2CH	EXT mask source (Keyer 2)	Sets mask type to external mask 2
2DH	FORCED FOREGROUND (Keyer 2)	Key is set to forced foreground mode. If EX=0, DSK 2 is switched to this mode.
2EH	BOX MASK INVERT (Keyer 1/DSK)	Switches mask invert on/off. Mask type is not changed, painted masks are retained. (Also external masks are inverted).
2FH	ASPECT ON (Wipe)	Switches ratio on/off.
30H	BORDER ON (Wipe)	Switches border on/off.
31H	SOFT ON (Wipe)	Switches normal softness on/off.
32H	AUTO CENTER (Positioner)	Resets positioner to center of screen. Write off has no effect.
33H	POS ON (Positioner)	Positioner on/off.
34H	SPLIT WIPE	Not available.
35H	FLIPFLOP WIPE	Sets wipe direction to N/R.
36H	EXT mask invert	Switches mask invert on/off. (Also internal masks are inverted).
37H	WIPE mask invert	Not available.
4AH	CUT	Same effect as if the CUT key is pressed on the panel. Write function off has no effect.
5EH	NORMAL (Wipe)	Write function on: switches wipe direction REV and N/R off.
5FH	REV (Wipe)	Write function off: switches wipe direction REV and N/R on/off.

*

9.4 KEY COMMANDS

9.4.1 BORDERLINE MODE COMMAND (B0/B1)

Command B0 acts on keyer 1
Command B1 acts on keyer 2 or keyer 5.
EXT determines the mixing level.

The mode byte is interpreted as follows:

Mode Byte	Function
0	Key Border off
1	Border H
2	Border 2H
3	Border H-W
4	Border 2H-W
5	Border H-B
6	Border 2H-B
7	Drop Shadow
8	Drop Shadow
9	Drop Shadow
A	Border Soft
B	Float Shadow
C	Slant Shadow
D	Outline H
E	Outline 2H
F	Key Border off

9.4.2 KEY ACCUMULATION COMMAND (BF/C0)

Not available in current software releases.

9.5 WIPE GENERATOR COMMANDS

If any of the selected effects is not available with the current pattern, no action is taken. For instance, the selection "vertical wipe multiplication" or "rotation" for pattern number 1 is just ignored.

9.5.1 WIPE PATTERN SELECT COMMAND (C8)

The specified wipe pattern number is to be selected. There is no translation of wipe pattern numbers, so that the wipe pattern number of *the Diamond digital* has to be specified.

The wipe pattern numbers are available on lists.

9.5.2 WIPE MODULATION COMMAND (B5)

Only the lowest two bits of the mode byte are evaluated as follows:

Low Bits	Effect
00	modulation off
01	modulation on, modulation locked
10	modulation on, but not locked
11	no effect on <i>Diamond digital</i>

9.5.3 WIPE MULTIPLICATION COMMAND (B6)

The highest four bits of the mode byte select the horizontal multiplication factor, the lowest four bits the vertical multiplication. The values are interpreted as binary numbers. All values from 0 to 15 are valid. (0 is treated as 1.)

9.5.4 WIPE ROTATION COMMAND (B7)

Only the lowest two bits of the mode byte are evaluated as follows:

Low Bits	Effect
00	wipe rotation off
01	rotation on, rotation mode angle
10	rotation on, rotation mode coupled
11	rotation on, rotation mode speed

9.5.5 TRANSITION MODE COMMAND (CA)

Turns the NEXT TRANSITION on or off. The *Diamond digital* has no next transition key for PP/DSK so with EX=0 this command will not have much of an effect.

Only bits 0, 1 and 2 are relevant for the selection:

Bit 0 for next transition key 2
 Bit 1 for next transition key 1,
 Bit 2 for next transition background.

9.5.6 AUTO TRANSITION RATE COMMAND (CC, CD)

The command byte is followed by three "rate bytes" which contain the auto transition time in BCD. If the first rate byte comes with the highest bit set, the auto transition is immediately started after setting the desired rate. If this bit is zero, only the rate is set. Because only three bytes are used, the range for the rate can be 0-999 frames. The hundreds are transmitted in the first byte, followed by the tens and units digits.

9.5.7 TRANSITION KEY SELECT (FB)

This command acts in the *Diamond digital* in the same way as the AUTO (transition) key on the control panel: an auto transition is started on the switcher.

1BH: Auto Transition MES
18H: Auto Transition DSK
1FH: Auto Transition FTB

9.5.8 ALL STOP COMMAND (F2)

Stops ongoing auto transitions.
Stops ongoing EXTRA dissolves and running EXTRA sequences.

9.6 SECTION: E-MEM COMMANDS

9.6.1 E-MEM LEARN/RECALL ENABLE COMMAND (D8)

Enables or disables the execution of the simulated "learn E-MEM" and "recall E-MEM" commands. A set bit enables the execution of these commands, a zero bit disables it. Snapshot learns and recalls are always enabled upon power on.

Bit 0 corresponds to PP/DSK

Bit 1 corresponds to ME 1

Bit 2 corresponds to ME 2

Bit 8 corresponds to the remaining functions (see below)

Note that the allocation is different for the *Diamond digital* switcher. See also under "Learn E-MEM" command the table of EX values. This command has no effect on accessing the EXTRA from a panel.

9.6.2 LEARN E-MEM COMMAND (DA)

This is a write only command which performs a STORE SNAPSHOT operation on the *Diamond digital*. Which modules are stored depends on the value of the EX byte and not on the current setting within the DEFINE MEMO menu (DD20, DD30).

Table 1: EX value with stored mixing level assignment

EX	Modules stored	Same as selected with key
00	PP matrix, PP+DSK PP pattern, key+mask 7 (8 if avail.) DSK1, FTB/DSK2	PP + DSK
01	ME1-matrix, ME1 transition, ME1 matrix, key+mask 1-3	ME1
02	ME2 matrix, ME2 transition, ME2 pattern, key+mask 4-6	ME2
08	Color background 1 and 2 Aux buses 1-4	OTHER
06	performs snapshots for all four re- gions	ALL

Note that all three keyers are stored within ME snapshots and unlike the GVG store E-MEM they contain also all of the settings of the chroma keyers.

The settings of both color background generators are stored with EX=08 (OTHER) and not together with the state of PP/DSK.

For this command, only register numbers 0-29 are allowed . If the E-MEM LEARN/RECALL ENABLE command (D8) has been used to disable the storage of a region, the snapshot will not be performed.

The snapshots get special names to distinguish them from manually taken ones, but nevertheless the operator is allowed to manually recall them, to change their names or to overwrite them with new ones.

The naming follows this scheme:

The first two letters are

M1 for ME1 snapshots (EX=01)

M2 for ME2 snapshots (EX=02)

DB for PP/DSK snapshots (EX=00)

UP for "user program" (OTHER) snapshots (EX=08).

These are followed by two digits denoting the register number. The last four letters are EDSN which stands for EDit-SNAPSHOT.

If a sequence is stored onto the position (!) where the snapshot wants to reside, the store command will fail, an existing snapshot will be overwritten. The location of a snapshot taken via the edit interface is determined by the value of the EX byte and the E-MEM register number.

Details of this mapping are described below and are also shown on the pictures of menus.

Very important:

In connection with editing systems which do not use the LEARN-E-MEM command for performing snapshots, the snapshots have to be taken manually.

E-MEM reg.	EXTRA snapshot
ME1: 0	61
1	62
2	63
3	64
⋮	⋮
29	100
ME2: 0	71
⋮	⋮
29	100

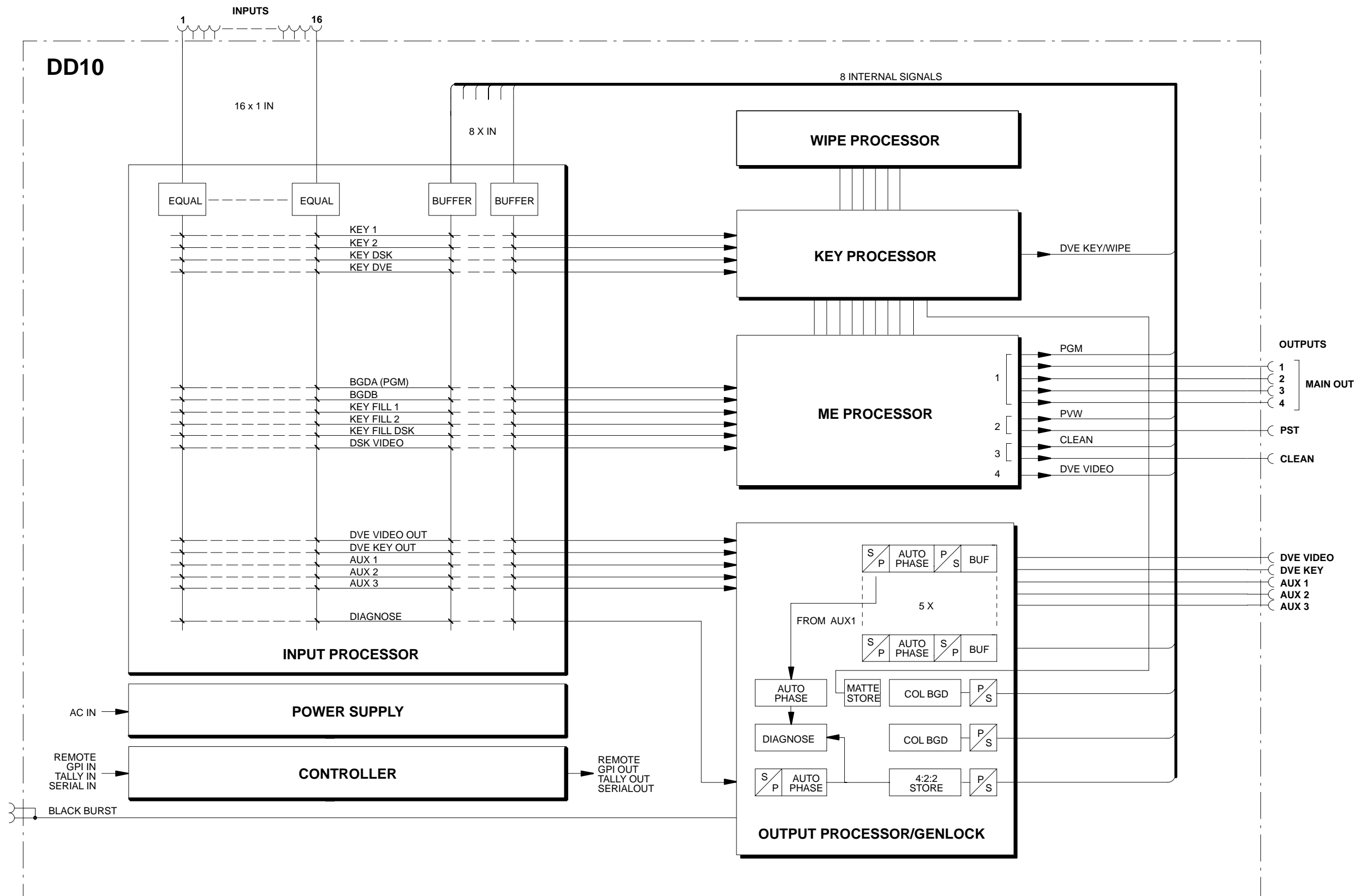
9.6.3 RECALL E-MEM COMMAND (DB)

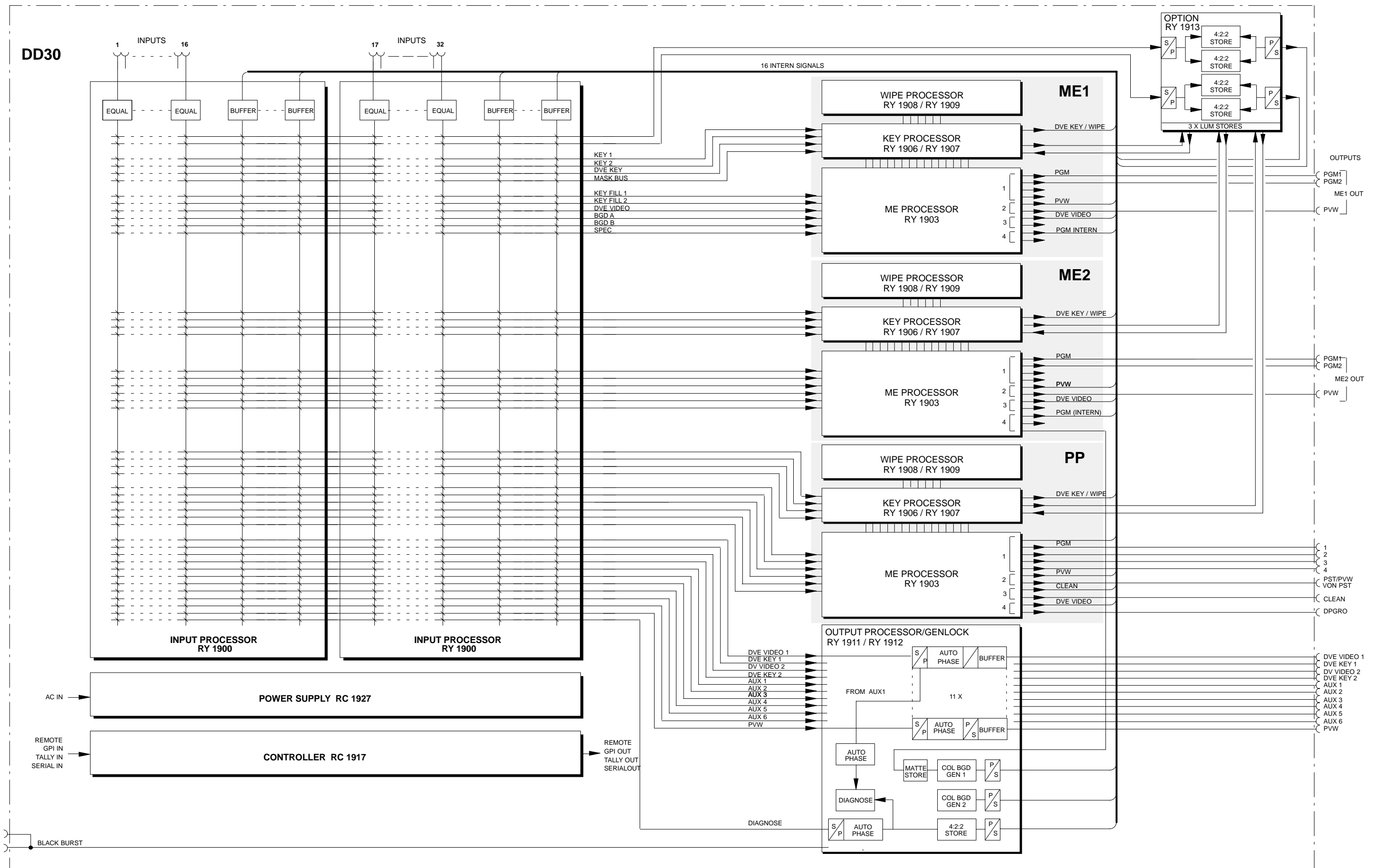
This write only command enables the user to recall snapshots stored with the LEARN E-MEM command as well as manually taken snapshots. For E-MEM 0-29, the snapshots within the menus EXTRA 2 to EXTRA 9 (EXTRA 1) as described above, are used for recall. If a sequence has been stored meanwhile onto the place where the edit interface assumes the snapshot to be recalled, the execution of this command fails.

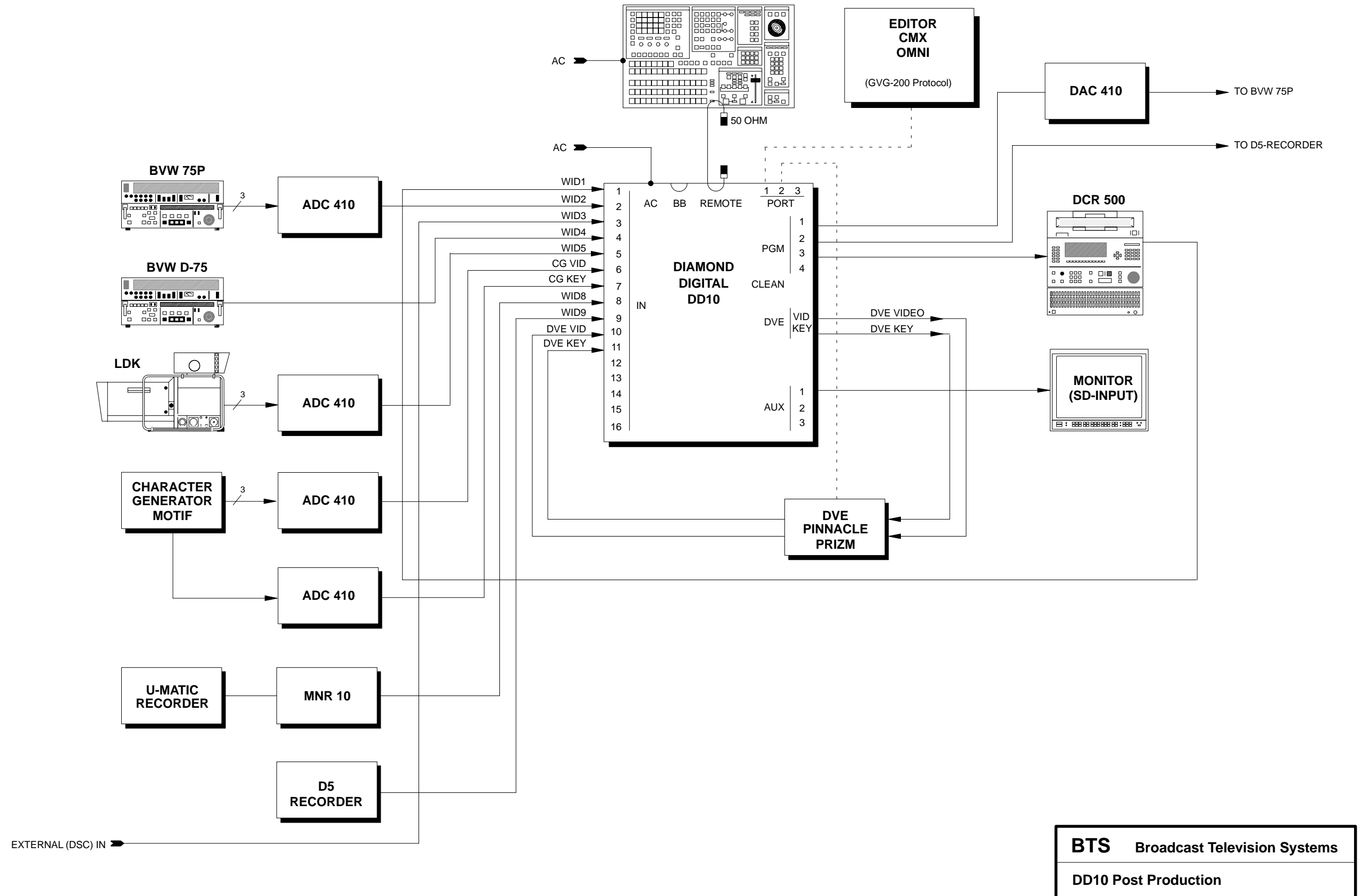
The start of sequences via the edit interface is now possible by applying the recall E-MEM command to register 30 - 39. In this case, the EX value is ignored. The table below shows the positions for timelines that can be started from an editor.

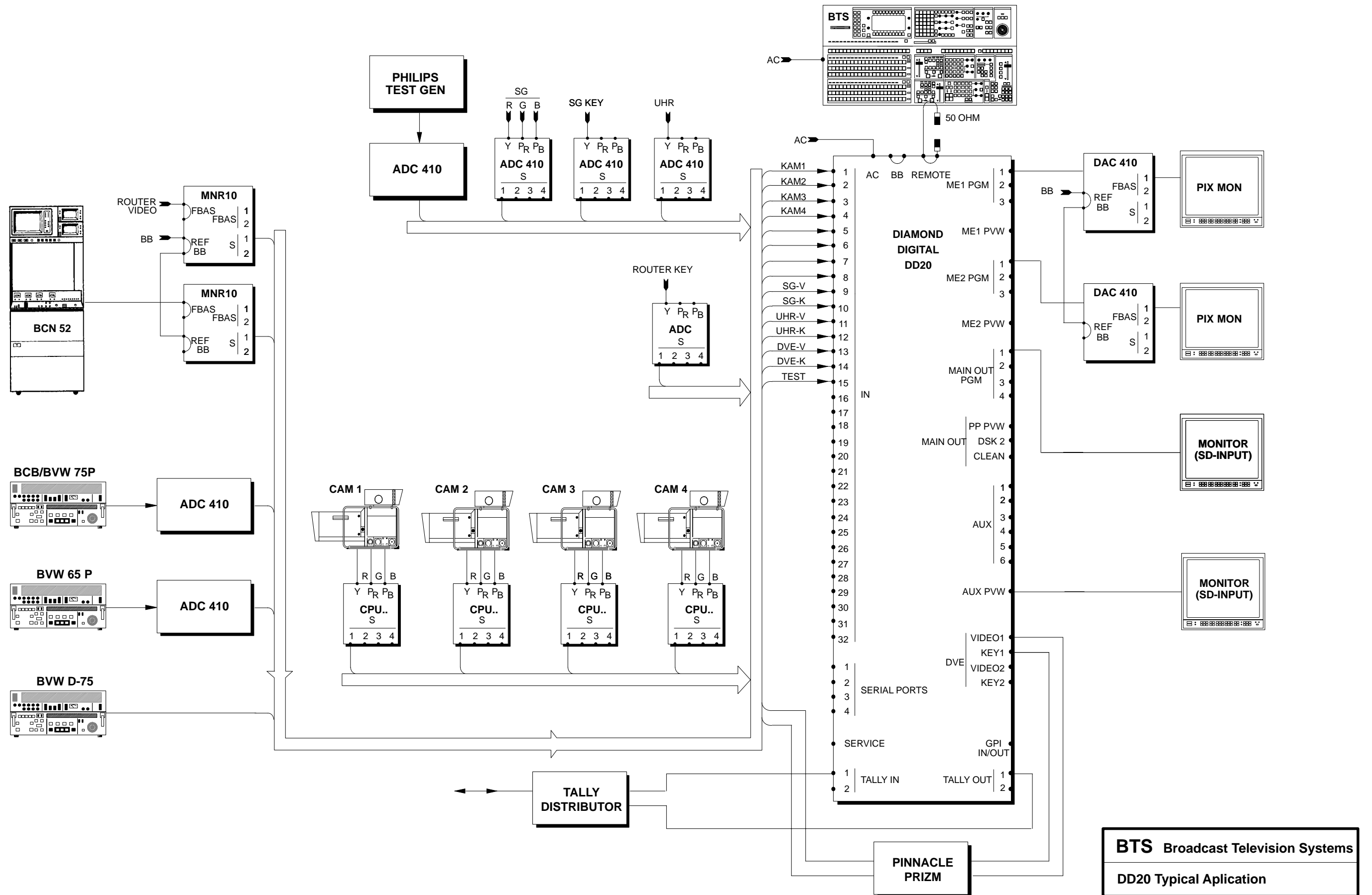
E-MEM seg no.	EXTRA no.
30	16
31	17
⋮	⋮
39	25

10. BLOCK DIAGRAMS



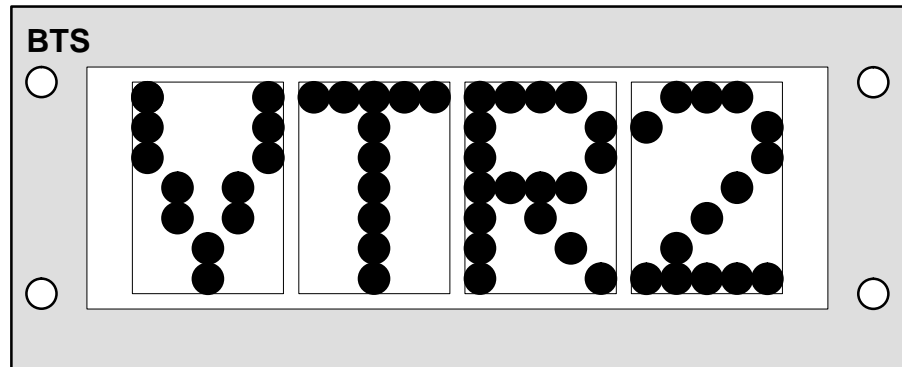






5.8. MONITOR STATUS DISPLAY FSC 3286, FSC 3287

For displaying the source names directly on the monitor stack, universal status displays with computer connection are provided for the switchers.



Control is made directly from the computer of a control panel, transferring the 4-digit source name to the respective status display, which is defined in the INPUT IDENT menu.

Mechanical dimensions:

	<u>Width</u>	<u>Height</u>	<u>Depth</u>
FCS-3286 (small display)	19"	1 RU	30 mm
FCS-3287 (large display)	19"	2 RU	30 mm

5.8.1 DISPLAY OF THE SOURCES

Source monitors:

When displaying a picture on the monitor, directly coming from one of the picture sources of the switcher, the status display shows the source name defined in the ident input menu.

VTR 2

PGM monitors: ME1 OUT, ME2 OUT, MAIN OUT

If a mixed picture, being composed of picture components from different sources, is available at the main outputs of the switcher, this is shown on the associated status display.

.....

If a picture, coming directly from a picture source, is available at these outputs, the status display shows the associated source name.

PVW monitors ME1 PVW, ME2 PVW, PP PST:

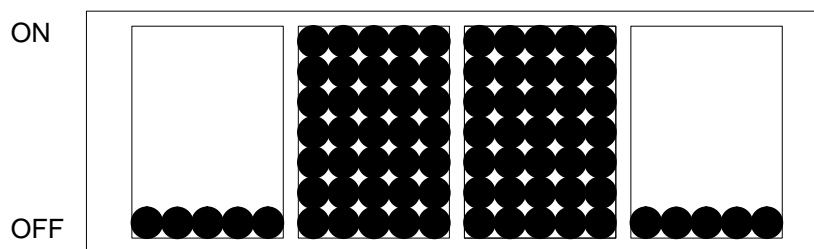
In dependence on the selected mode, the respective status display shows the following internal source names:

KEY PREVIEW
PATTERN PREVIEW
TRANSITION PREVIEW
MASKS/MASK PREVIEW
PREVIEW switched off = program
measuring window for AKA

In the AUTO PREVIEW mode, the status display shows the state of the NEXT TRANSITION key row.

The associated preview monitor shows in this mode what the mixed picture will look like after the next transition.

The next transition status is displayed as follows:



In the PP stage, the AUTO PREVIEW softkeys replace in the AUTO PREVIEW mode the NEXT TRANSITION keys in the Fader menu.

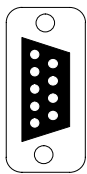
5.8.2 CONNECTION

Data connection

For control, the status display is provided with an RS-422 interface. A second RS-422 interface serves as a loop-through output in order to enable switching further status displays in series.

By means of a data cable (e. g. 9-pin 1:1 connection from BTS), the first status display can be connected to the ES-BUS socket of the control panel. This requires selection of "PORT = Mon.Ident" in the CONFIGURATION PANEL menu.


See the operation manual of the switcher.

RS-422	Pin	Signal
 9-pin D-type female	1 2 3 4 5 6 7 8 9	Frame Ground Transmit "A" Receive "B" Receive sign common Spare Transmit sign common Transmit "B" Receive "A" Frame ground

Power connection

The status display requires a regulated DC voltage of + 5 V.

The DC voltage is connected via a 3-pole pin bar on the rear of the status display.

DC POWER IN	Pin	Signal
 MAS-CON (Panduit)	1 2 3	+ 5 V Ground + 5 V

5.8.3 ADJUSTING THE DISPLAY ADDRESS

Communication between the computer in the control panel and the status display takes place in one direction only.

The computer in the control panel transmits data to the status display, containing beside a sync character and the 4 ASCII characters (source name) also an individual address. It is possible to select two monitor ident protocols:

Mon.-Ident/I: In this protocol, the displays for the switcher sources are directly assigned to the inputs, i.e. input 1 is always shown in display 1, input 2 in display 2 etc.

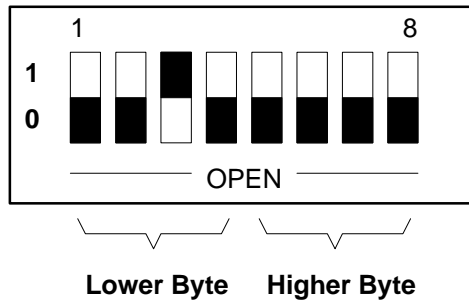
Mon.-Ident/B: In this protocol, the displays for the switcher sources are assigned to the keys on the routing switcher, i.e. the contents of the display depends on the assign table.

The address consists of a hex character and has to be adjusted on each individual status display according to the following table:

Monitor addresses:

Monitor	Hex addresses

Adjustment is made by means of the DIL switch on the rear of the status monitor according to the following scheme:



Example: Monitor address = 04H = Video In 5

10. NOTES ABOUT CONNECTION AND OPERATION FOR DVE INTEGRATION

10.1 PRESETTINGS

Video connection of the DVE	Utilize the "DVE key" and "DVE fill" outputs of the switcher to feed the DVE. If the DVE does not have a "flying key" channel, only the "fill" connection is needed. Feed the DVE key and fill outputs as inputs into the switcher. Memorize the selected inputs.
Control connection of the DVE	Connect DVE and switcher via their remote ports (in most cases RS422) with a 1:1 D-type cable, 9-pin. The appropriate DD switcher ports are the ports 1, 2, 3: any port can be selected. Exception: A53D only on port 1 because of the RS232 interface.
Assignment of the protocol	Select the appropriate DVE protocol (for the port, the DVE is connected to) within the setup of the switcher (the DVE type is indicated). A general DVE type is "VTR protocol".
Assignment of video sources	Select – within the setup of the switcher – to which the DVE fill and key signal is attached. This is needed for the FXLoop operation.

10.2 PREPARATION

Sequence selection	Recall or generate DVE sequences, that are supposed to be controlled by the switcher. Load them into the snapshot registers of the DVE.
Scaling	With most DVEs, a scaling of the DVE sequence is needed (in order to harmonize the move of the switcher fader arm with the start and the end of the DVE sequence). Scale the sequence to 30 seconds. It gives a sufficient fader resolution to avoid jerky effect movement. (30 s x 25 frames = 750 iteration values).
Remote	Set the DVE to remote control.

10.3 OPERATION

Source selection

Press the Aux Bus selection DVE on the switcher control panels and select the desired source to be manipulated via the DVE.

Note, that this DVE routing consists of a fill bus and a key bus.

The key signal is selected according to the assignment that is made within the "couple" menu of the switcher (e.g.: selection of the fill signal "Character Generator" input 1 automatically selects the key signal "Character Generator" input 2).

This can be overwritten by holding the key "DVE" bus down and selecting another key source.

Note, that the above described selection scheme is in many cases redundant:

"FXLoop" allows to operate the DVE move, as if it was a wipe effect in the background, allowing to simplify the DVE integration dramatically:

Press "DVE Loop" and the desired effect layer This determines whether the user wants to move the DVE within the background or one of the keyers:

Select the DVE feed signal (i.e. select the next DVE signal) via the ME preset bus or one of the Key Fill buses.

Selection of "Preset" or "Program" as feed signal determines whether the DVE sequence runs as it was programmed, or reverses its polarity.

Effect selection

Select the desired DVE sequence via the Wipe selection panel of the switcher (in case of DD5 and DD10, this is done by switching the selection "wipe 1, 2, mask" off, in case of DD20 and DD30, this is indicated via an LED).

Select the transition type DVE within the transition module for the desired effect layer (DD10/20/30).

Note, that the bus selection follows automatically.

Effect move

The DVE sequence can now be moved by means of the fader arm, resp. runs automatically by pressing the AUTO key.

Once the scaling is done, the sequence run time is independently selectable within the transition module (just like a wipe effect).

Note, that a DVE can always be selected by one fader only, i.e. if the DVE is selected as transition type for ME 1, it will not react within ME 2.

Note that restrictions for FXLoop apply within the DD30 in the PP stage, should this stage be utilized with independent PVW outputs.

11. NOTES FOR SPECIAL EDITORS AND DVEs

11.1 EDITORS

AMPEX ACE MICRO	GVG200 protocol Analog values are transmitted from the emitter in the GVG100 format, thus allowing only coarse adjustments with increments. GVG100 protocol Number of frames for autotransition is one too low.
AMPEX ACE 200	No information.
AMPEX ACE 25	GVG100 protocol Adaption has been made in conjunction with the Diamand analog switcher.
CMX OMNI	GVG200 protocol D10: AUX bus 4 is derivated to AUX-Bus 3. Aux bus 3 does not logically exist any more.
CMX 3500	No information.
SONY BBE 900 / BBE 910	GVG100 protocol No Init panel function
SONY BBE 2000	GVG100 protocol Not tested. Init panel function should be possible with no transfer
SONY BBE 9100	GVG200 protocol Not tested.
VIDEOMEDIA	Addresses only ME2.
ALL EDITORS	No transfer of timelines or snapshots into editor.

11.2 DVEs

PINNACLE PRIZM

Selection of sequences.
 Runtime has to be set to 30s.
 Select DVE PRIZM as port protocol within switcher setup.
 Standard RS422 cable can be used.

ABEKAS A57

VTR protocol

No sequence selection.
 Runtime (effects duration, within time menu) has to be set to 30s.
 Select DVE VTR as port protocol within switcher setup.

A57 setup

Select Sony protocol.
 Set edit offset to one minute.
 Enable remote control on A57 keyboard.

RS232 protocol

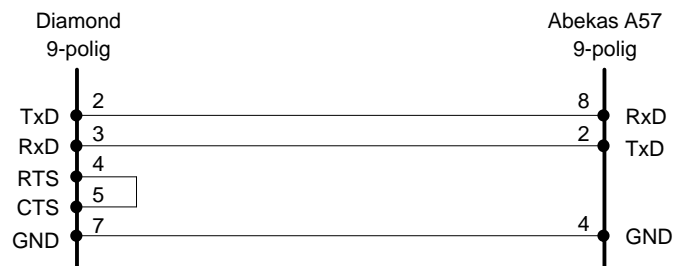
Sequence selection, fader transitions possible, no scaling necessary, runs only at 9600bps.

Select DVE A53D as port protocol within switcher setup.

Select RS232 protocol on Abekas A57 for port B.

Set header 2 on A57's address port to RS232 (see A57 technical guide, Fig. 36).

Use cable with following connections:



ABEKAS A53D

Not tested. See A57.

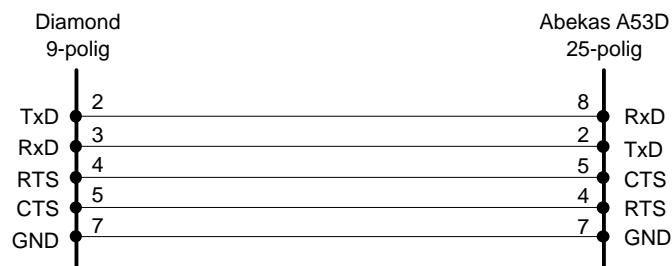
RS232 protocol

Sequence selection, fader transition possible, no scaling necessary, runs only at 9600bps.

Select DVE A53D as port protocol for PORT1 (RS232) within switcher setup.

Enable remote control on A53 keyboard.

Use cable with following connections:

**QUESTECH
CHARISMA**

Set Charisma Remote protocol to "BVW75". Select "DVE CHARIS" as port protocol within switcher setup. Runtime is set to 30s from DD10 (may fail, if runtime is stored with effect).

Problems may arise with extremely long timelines. With earlier software versions (Charisma), sequence selection from switcher had to be confirmed on local panel. A special RS422 cable with one male and one female connector and 1:1 connections has to be used.

GVG-DPM 100

No information.

GVG-DPM 700**Model-100 protocol**

Set runtime to 30s, fader play, sequence selection.

Do not stop ongoing sequences or manual transitions!

On manual sequence run from switcher as well as from local console events stored in the sequence (e.g. freeze, E-MEM-recall etc.) can be omitted.

Select protocol "DVE DPM" in the switcher setup, Model-100 protocol on DPM100/700.

Standard RS422 cable can be used.

VTR protocol

Is of no use at all.

Control panel protocol

Not implemented.

AMPEX ADO 100 No information.

AMPEX ADO 500 No information.

AMPEX ADO 1000 No information.