

## TV \_\_\_\_\_ Service Manual



### **Chassis D5**

DVD Combo TV

### **Davio 14**

TVD 37-2401 Text

GBC3200

### **Elegance 21 Flat**

TVD 55-2401/5 Top

GBC3300



Zusätzlich erforderliche Unterlagen für den Komplettservice  
Additionally required Service Documents for the Complete Service

**Service  
Manual**

**Sicherheit  
Safety**

Materialnr./Part No.  
720108000001

Materialnummer/Part Number 720100488000

Änderungen vorbehalten/Subject to alteration

H-S43 0105

<http://www.grundig.com>

Es gelten die Vorschriften und Sicherheitshinweise gemäß dem Service Manual "Sicherheit", Materialnummer 720108000001, sowie zusätzlich die eventuell abweichenden, landesspezifischen Vorschriften!



The regulations and safety instructions shall be valid as provided by the "Safety" Service Manual, part number 720108000001, as well as the respective national deviations.

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## Allgemeiner Teil

### Allgemeine Hinweise

**Vor dem Öffnen des Gehäuses den Netzstecker ziehen!**

**Achtung: ESD-Vorschriften beachten** 

#### Leitungsverlegung

Bevor Sie die Leitungen und insbesondere die Masseleitungen lösen, muss die Leitungsverlegung zu den einzelnen Baugruppen beachtet werden.

Nach erfolgter Reparatur ist es notwendig, die Leitungsführung wieder in den werkseitigen Zustand zu versetzen um evtl. spätere Ausfälle oder Störungen zu vermeiden.

#### Durchführen von Messungen

Bei Messungen mit dem Oszilloskop an Halbleitern sollten Sie nur Tastköpfe mit 10:1 - Teiler verwenden. Außerdem ist zu beachten, dass nach vorheriger Messung mit AC-Kopplung der Koppelkondensator des Oszilloskops aufgeladen sein kann. Durch die Entladung über das Messobjekt können Bauteile beschädigt werden.

#### Messwerte und Oszillogramme

Bei den in den Schaltplänen und Oszillogrammen angegebenen Messwerten handelt es sich um Näherungswerte!

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## General Section

### General Notes

**Before opening the cabinet disconnect the mains plug!**

**Attention: Observe the ESD safety regulations** 

#### Wiring

Before disconnecting any leads and especially the earth connecting leads observe the way they are routed to the individual assemblies. On completion of the repairs the leads must be laid out as originally fitted at the factory to avoid later failures or disturbances.

#### Carrying out Measurements

When making measurements on semi-conductors with an oscilloscope, ensure that the test probe is set to 10:1 dividing factor. If the previous measurement was made on AC input, please note that the coupling capacitor in the oscilloscope will be charged. Discharge via the item being checked can damage the components.

#### Measured Values and Oscillograms

The measured values given in the circuit diagrams and oscillograms are approximates!

## Technische Daten / Technical Data

|                                             | <b>Davio 14<br/>TVD 37-2401 Text<br/>UV2</b>                                                         | <b>Davio 14<br/>TVD 37-2501 FR/Text</b>                                                              | <b>Elegance 21<br/>TVD 55-2401/5 Top<br/>UV3</b>                                                     | <b>Elegance 21<br/>TVD 55-2501 FR/Top</b>                                                            |
|---------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Order Number                                | GBC3200                                                                                              | GBC5900                                                                                              | GBC3300                                                                                              | GBC6000                                                                                              |
| EAN                                         | 40 13833-59703 2                                                                                     | 40 13833-59798 8                                                                                     | 40 13833-59104 9                                                                                     | 40 13833-59799 5                                                                                     |
| Colour                                      | procon silver                                                                                        | procon silver                                                                                        | procon silver                                                                                        | procon silver                                                                                        |
| Destination                                 | D, NL, DK, N, FIN, S,<br>E, P, ROW                                                                   | F                                                                                                    | D, I, NL, DK, N, FIN,<br>S, E, P, ROW                                                                | F                                                                                                    |
| User manual languages                       | D, GB, NL, DK, N, S,<br>FIN, E, P                                                                    | F                                                                                                    | D, GB, I, NL, DK, N,<br>S, FIN, E, P                                                                 | F                                                                                                    |
| Sound                                       | MONO                                                                                                 | MONO                                                                                                 | STEREO                                                                                               | STEREO                                                                                               |
| Remote Control                              | RC 45 C / TP 165 C                                                                                   | RC 45 C / TP 165 C                                                                                   | RC 45 C / TP 165 C                                                                                   | RC 45 C / TP 165 C                                                                                   |
| <b>PICTURE</b>                              |                                                                                                      |                                                                                                      |                                                                                                      |                                                                                                      |
| Size / Type                                 | 37 cm (14"), FST,<br>(4:3)                                                                           | 37 cm (14"), FST,<br>(4:3)                                                                           | 55 cm (21"), FST,<br>(4:3)                                                                           | 55 cm (21"), FST,<br>(4:3)                                                                           |
| Real flat / Super flat                      | \                                                                                                    | \                                                                                                    | [ / \                                                                                                | [ / \                                                                                                |
| Deflection                                  | 90°                                                                                                  | 90°                                                                                                  | 90°                                                                                                  | 90°                                                                                                  |
| 100 Hz Picture-/32 kHz line frequency       | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Flicker free scanning (full frame memory)   | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Digital Color Transition Improv. (DCTI)     | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Digital Combfilter                          | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Digital Luminance Transition Improv. (DLTI) | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Picture Noise Reduction                     | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| SVM (Scan Velocity Moduladion)              | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Dynamic Focus                               | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Preset picture modes                        | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Tilt                                        | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Picture Formats                             | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| PIP (2 Tuner)                               | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Multifold Tuner scan (Mosaic Picture)       | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| PAT: Split screen (PICTURE + TEXT)          | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| PAP: Double Window (PICTURE + PICTURE)      | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| P <sup>2</sup> AT: Double window + TXT      | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| POP: PICTURE on PICTURE                     | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Picture freezing                            | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Zoom with point function                    | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Auto 16:9 selection via Scart               | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Automatic Color Standard Detection          | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Sharpness control                           | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Blue Background                             | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| <b>CHASSIS</b>                              |                                                                                                      |                                                                                                      |                                                                                                      |                                                                                                      |
| TV-Chassis                                  | D5 (50 Hz) 90°                                                                                       | D5 (50 Hz) 90°                                                                                       | D5 (50 Hz) 90°                                                                                       | D5 (50 Hz) 90°                                                                                       |
| Tuner                                       | PLL frequency<br>synthesizer tuning                                                                  | PLL frequency<br>synthesizer tuning                                                                  | PLL frequency<br>synthesizer tuning                                                                  | PLL frequency<br>synthesizer tuning                                                                  |
| µ-Processor                                 | Philips UOC OM836x                                                                                   | Philips UOC OM836x                                                                                   | Philips UOC OM836x                                                                                   | Philips UOC OM836x                                                                                   |
| Keyboard                                    | 10 keys; TV/DVD,<br>menue, prog/vol,<br>plus, minus, eject,<br>play/pause, stop,<br>skip-fw, skip-bw | 10 keys; TV/DVD,<br>menue, prog/vol,<br>plus, minus, eject,<br>play/pause, stop,<br>skip-fw, skip-bw | 10 keys; TV/DVD,<br>menue, prog/vol,<br>plus, minus, eject,<br>play/pause, stop,<br>skip-fw, skip-bw | 10 keys; TV/DVD,<br>menue, prog/vol,<br>plus, minus, eject,<br>play/pause, stop,<br>skip-fw, skip-bw |
| <b>ELECTRONIC</b>                           |                                                                                                      |                                                                                                      |                                                                                                      |                                                                                                      |
| Stand by indicator                          | red LED                                                                                              | red LED                                                                                              | red LED                                                                                              | red LED                                                                                              |
| Manual & autom. labeling of prog.           | 5 character                                                                                          | 5 character                                                                                          | 5 character                                                                                          | 5 character                                                                                          |
| Programable off timer                       | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Programable on timer                        | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Intelligent channel search (Zapping funct.) | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Program Edit                                | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Intelligent Programme Switch                | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Auto switch off                             | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Program memory TV/AV (opt.)                 | 100/AV                                                                                               | 100/AV                                                                                               | 100/AV                                                                                               | 100/AV                                                                                               |
| Teletext/Fasttext/Toptext                   | 1 page / \ / \                                                                                       | 1 page / \ / \                                                                                       | \ / \ / 7 pages                                                                                      | \ / \ / 7 pages                                                                                      |
| Teletext options                            | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Teletext SWAP                               | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Childlock                                   | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Menue languages OSD                         | 7 languages:<br>D, GB, F, I, E, P, NL                                                                | 7 languages:<br>D, GB, F, I, E, P, NL                                                                | 7 languages:<br>D, GB, F, I, E, P, NL                                                                | 7 languages:<br>D, GB, F, I, E, P, NL                                                                |
| SWAP (Recall function)                      | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Service mode                                | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Hotel mode                                  | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| <b>TUNING</b>                               |                                                                                                      |                                                                                                      |                                                                                                      |                                                                                                      |
| Autom. Tuning System with country selection | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Frequency Based Auto Search                 | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |
| Automatic Micro-search                      | [                                                                                                    | [                                                                                                    | [                                                                                                    | [                                                                                                    |
| Automatic Programming                       | \                                                                                                    | \                                                                                                    | \                                                                                                    | \                                                                                                    |

|                                     | <b>Davio 14</b><br><b>TVD 37-2401 Text</b><br><b>UV2</b>   | <b>Davio 14</b><br><b>TVD 37-2501 FR/Text</b>              | <b>Elegance 21</b><br><b>TVD 55-2401/5 Top</b><br><b>UV3</b> | <b>Elegance 21</b><br><b>TVD 55-2501 FR/Top</b>            |
|-------------------------------------|------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------|
| Manual fine tuning                  | [                                                          | [                                                          | [                                                            | [                                                          |
| Direct chanal selection             | [                                                          | [                                                          | [                                                            | [                                                          |
| PAL/BG                              | [                                                          | [                                                          | [                                                            | [                                                          |
| SECAM/L'/L                          | \                                                          | [                                                          | \                                                            | [                                                          |
| NTSC-Playback via Scart (3,58/4,43) | [                                                          | [                                                          | [                                                            | [                                                          |
| Cable TV / Hyperband (S1-S41)       | [                                                          | [                                                          | [                                                            | [                                                          |
| <b>AUDIO</b>                        |                                                            |                                                            |                                                              |                                                            |
| Mono/Stereo/Nicam                   | [ / \ / \                                                  | [ / \ / \                                                  | [ / [ / [                                                    | [ / [ / [                                                  |
| AV Stereo                           | [                                                          | [                                                          | [                                                            | [                                                          |
| Virtual Dolby                       | \                                                          | \                                                          | \                                                            | \                                                          |
| Subwoofer                           | \                                                          | \                                                          | \                                                            | \                                                          |
| Dynamic Bass                        | \                                                          | \                                                          | \                                                            | \                                                          |
| DSP (Digital Sound Processor)       | \                                                          | \                                                          | \                                                            | \                                                          |
| Balance Adjustment                  | \                                                          | \                                                          | \                                                            | \                                                          |
| AVL (Audio Volume Level)            | [                                                          | [                                                          | [                                                            | [                                                          |
| PIP listening via Headphone jack    | \                                                          | \                                                          | \                                                            | \                                                          |
| Equalizer                           | \                                                          | \                                                          | \                                                            | \                                                          |
| Space Sound Effect                  | \                                                          | \                                                          | \                                                            | \                                                          |
| Audio mode                          | \                                                          | \                                                          | \                                                            | \                                                          |
| Audio amplifier without extern LS   | 2 x 5 W (RMS)                                              | 2 x 5 W (RMS)                                              | 2 x 8 W (RMS)                                                | 2 x 8 W (RMS)                                              |
| Tweeter (2 way speaker system)      | \                                                          | \                                                          | \                                                            | \                                                          |
| <b>DVD</b>                          |                                                            |                                                            |                                                              |                                                            |
| 4:3 / 16:9 / letterbox format       | [                                                          | [                                                          | [ / [ / [                                                    | [ / [ / [                                                  |
| Dolby Digital                       | [                                                          | [                                                          | [                                                            | [                                                          |
| Disc formats:                       |                                                            |                                                            |                                                              |                                                            |
| DVD R/RW (+/-)                      | [                                                          | [                                                          | [                                                            | [                                                          |
| CD-R                                | [                                                          | [                                                          | [                                                            | [                                                          |
| CD-RW                               | [                                                          | [                                                          | [                                                            | [                                                          |
| Media formats:                      |                                                            |                                                            |                                                              |                                                            |
| DVD-Video                           | [                                                          | [                                                          | [                                                            | [                                                          |
| VCD                                 | [                                                          | [                                                          | [                                                            | [                                                          |
| SVC                                 | [                                                          | [                                                          | [                                                            | [                                                          |
| CD-Audio                            | [                                                          | [                                                          | [                                                            | [                                                          |
| CD-ROM                              | JPEG, MP3 playback                                         | JPEG, MP3 playback                                         | JPEG, MP3 playback                                           | JPEG, MP3 playback                                         |
| Freeze / Zoom                       | [ / [                                                      | [ / [                                                      | [ / [                                                        | [ / [                                                      |
| Coaxial / Optical audio out         | [ / \                                                      | [ / \                                                      | [ / \                                                        | [ / \                                                      |
| Region Code                         | Factory setting: RC 2                                      | Factory setting: RC 2                                      | Factory setting: RC 2                                        | Factory setting: RC 2                                      |
| <b>POWER SUPPLY / CABINET</b>       |                                                            |                                                            |                                                              |                                                            |
| Power voltage                       | 230V~, 50/60 Hz                                            | 230V~, 50/60 Hz                                            | 230V~, 50/60 Hz                                              | 230V~, 50/60 Hz                                            |
| Power switch                        | [                                                          | [                                                          | [                                                            | [                                                          |
| Power consumption                   | 55 W, standby 2 W in accordance to IEC 62087-2002          | 55 W, standby 2 W in accordance to IEC 62087-2002          | 73 W, standby 2 W in accordance to IEC 62087-2002            | 73 W, standby 2 W in accordance to IEC 62087-2002          |
| Cabinet (WxHxD, cm) / Weight        | 39,1 x 39,5 x 38,2 cm approx. 12,3 kg                      | 39,1 x 39,5 x 38,2 cm approx. 12,3 kg                      | 61,1 x 46,4 x 52,6 cm approx. 24,6 kg                        | 61,1 x 46,4 x 52,6 cm approx. 24,6 kg                      |
| <b>FRONT PANEL CONNECTIONS</b>      |                                                            |                                                            |                                                              |                                                            |
| Headphones                          | [ , position lateral                                       | [ , position lateral                                       | [ , position lateral                                         | [ , position lateral                                       |
| Cinch-AV socket                     | 3 x Cinch - Video in, Audio L/R in (position lateral)      | 3 x Cinch - Video in, Audio L/R in (position lateral)      | 3 x Cinch - Video in, Audio L/R in (position lateral)        | 3 x Cinch - Video in, Audio L/R in (position lateral)      |
| S-Video                             | \                                                          | \                                                          | \                                                            | \                                                          |
| <b>REAR PANEL CONNECTIONS</b>       |                                                            |                                                            |                                                              |                                                            |
| Euro-AV-Socket AV1                  | CVBS in-/output, RGB input                                 | CVBS in-/output, RGB input                                 | CVBS in-/output, RGB input                                   | CVBS in-/output, RGB input                                 |
| Euro-AV Socket AV2                  | \                                                          | \                                                          | CVBS in-/output, S-Video input                               | CVBS in-/output, S-Video input                             |
| Euro-AV Socket AV3                  | \                                                          | \                                                          | \                                                            | \                                                          |
| S-Video                             | \                                                          | \                                                          | \                                                            | \                                                          |
| Digital Audio out                   | Yes, coaxial                                               | Yes, coaxial                                               | Yes, coaxial                                                 | Yes, coaxial                                               |
| Audio out                           | \                                                          | \                                                          | \                                                            | \                                                          |
| Antenna for terrestrial reception   | 1 x Coaxial-socket for TV-tuner-in, according to DIN 45325 | 1 x Coaxial-socket for TV-tuner-in, according to DIN 45325 | 1 x Coaxial-socket for TV-tuner-in, according to DIN 45325   | 1 x Coaxial-socket for TV-tuner-in, according to DIN 45325 |
| Power supply plug                   | \                                                          | \                                                          | \                                                            | \                                                          |
| <b>SUPPLIED ACCESSORIES</b>         |                                                            |                                                            |                                                              |                                                            |
| Remote control (incl. battery)      | [                                                          | [                                                          | [                                                            | [                                                          |
| Power cord                          | \ / fix mounted                                            | \ / fix mounted                                            | \ / fix mounted                                              | \ / fix mounted                                            |
| Telescopic antenna                  | [                                                          | [                                                          | \                                                            | \                                                          |
| Instruction manual                  | [                                                          | [                                                          | [                                                            | [                                                          |
| Warranty info                       | [                                                          | [                                                          | [                                                            | [                                                          |

## Service- und Sonderfunktionen

**Service Mode aktivieren:** Taste "i" (Hauptmenü) drücken → Service Code "8500" eingeben.

**Service Mode beenden:** Taste "TXT" drücken.

### 1. Grundeinstellwerte

Folgende Tabelle zeigt alle typenbezogenen Grundeinstellungen im Service Mode. Alle mit \* gekennzeichneten Werte müssen zusätzlich nach Abgleich (Seite 2-1) eingestellt werden.

## Service and Special Functions

Start of the Service Mode: Press button "i" (Main Menu) → Enter Service Code "8500".

End the Service Mode: Press button "TXT".

### 1. Basic Settings

The following table shows all type specific basic settings in the service mode. In addition all values marked with \* must be adjusted according to adjustment (page 2-1).

| SERVICE<br>P+ / P- | Menüpunkt<br>Point of Menu<br>P+ / P- | Einstellung<br>Adjustment<br>/  | Hinweis<br>Hint                                                  | DAVIO 14<br>TVD 37-2401 Text | DAVIO 14<br>TVD 37-2501 FR/Text | ELEGANCE 21 Flat<br>TVD 55-2401/5 Top | ELEGANCE 21 Flat<br>TVD 55-2501 FR/ Top |
|--------------------|---------------------------------------|---------------------------------|------------------------------------------------------------------|------------------------------|---------------------------------|---------------------------------------|-----------------------------------------|
| 0                  | TUNER                                 | PANASONIC                       | eingebauten Tuner wählen<br>select used tuner                    |                              |                                 |                                       |                                         |
|                    |                                       | PHILIPS (Thomson)               |                                                                  |                              |                                 |                                       |                                         |
|                    |                                       | SHARP                           |                                                                  |                              |                                 |                                       |                                         |
|                    |                                       | TEMIC                           |                                                                  |                              |                                 |                                       |                                         |
| 1                  | AGC                                   | siehe Abgleich / see Adjustment |                                                                  | 35                           | 35                              | 35                                    | 35                                      |
| 2                  | STD                                   | STD-BY On                       | Netzschalter-Ein → Standby<br>power switch ON → standby          |                              |                                 |                                       |                                         |
|                    |                                       | STD-BY Off                      |                                                                  | X                            | X                               | X                                     | X                                       |
| 3                  | EEPE                                  | 00                              | EEPROM-Reset                                                     | X                            | X                               | X                                     | X                                       |
|                    |                                       | 01                              |                                                                  |                              |                                 |                                       |                                         |
| 4                  | PEAK                                  | siehe Abgleich / see Adjustment | Bildschärfe / Peaking                                            | 32                           | 32                              | 32                                    | 32                                      |
| 5                  | HEAD                                  | YES                             | Kopfhörer / Headphone                                            | X                            | X                               | X                                     | X                                       |
|                    |                                       | NO                              |                                                                  |                              |                                 |                                       |                                         |
| 6                  | SCRN                                  | ON                              | benötigt für Schirmgitter-Abgleich<br>used for screen adjustment |                              |                                 |                                       |                                         |
|                    |                                       | OFF                             |                                                                  | X                            | X                               | X                                     | X                                       |
| 7                  | GRN                                   | siehe Abgleich / see Adjustment | Grün-Pegel / Green level                                         | 32*                          | 32*                             | 32*                                   | 32*                                     |
| 8                  | RED                                   | siehe Abgleich / see Adjustment | Rot-Pegel / Red level                                            | 30*                          | 30*                             | 30*                                   | 30*                                     |
| 9                  | BLUE                                  | siehe Abgleich / see Adjustment | Blau-Pegel / Blue level                                          | 30*                          | 30*                             | 30*                                   | 30*                                     |
| 10                 | BLOG                                  | siehe Abgleich / see Adjustment | Grün / Green cut off                                             | 30*                          | 30*                             | 30*                                   | 30*                                     |
| 11                 | BLOF                                  | siehe Abgleich / see Adjustment | Rot / Red cut off                                                | 36*                          | 36*                             | 36*                                   | 36*                                     |
| 12                 | YDLY                                  |                                 | Luminanz-Verzögerung / Luminance delay                           | 14                           | 14                              | 14                                    | 14                                      |
| 13                 | SAT                                   |                                 | Farbsättigung / Saturation                                       | 20                           | 20                              | 20                                    | 20                                      |
| 14                 | HUE                                   |                                 | Bildschärfe / Sharpness                                          | 32                           | 32                              | 32                                    | 32                                      |
| 15                 | CON                                   |                                 | Kontrast / Contrast                                              | 32                           | 32                              | 32                                    | 32                                      |
| 16                 | CDR                                   |                                 | Kathode-Pegel / Cathode drive level                              | 02                           | 02                              | 02                                    | 02                                      |
| 17                 | BRI                                   |                                 | Helligkeit / Brightness                                          | 32                           | 32                              | 32                                    | 32                                      |
| 18                 | EWT                                   | siehe Abgleich / see Adjustment | Ost/West Trapez / East West Trapezium                            | 28*                          | 28*                             | 28*                                   | 28*                                     |
| 19                 | EWCU                                  | siehe Abgleich / see Adjustment | Ecken oben / Upper corner                                        | 32*                          | 32*                             | 32*                                   | 32*                                     |
| 20                 | EWCL                                  | siehe Abgleich / see Adjustment | Ecken unten / Lower corner                                       | 32*                          | 32*                             | 32*                                   | 32*                                     |
| 21                 | EWPW                                  | siehe Abgleich / see Adjustment | Ost/West Parabel 4:3 / East west parabola width 4:3              | 17*                          | 17*                             | 17*                                   | 17*                                     |
| 22                 | HSHT                                  | siehe Abgleich / see Adjustment | Bildposition horizontal / Horizontal shift                       | 32*                          | 32*                             | 32*                                   | 32*                                     |
| 23                 | EWV                                   | siehe Abgleich / see Adjustment | Bildbreite / Horizontal width                                    | 60*                          | 60*                             | 60*                                   | 60*                                     |
| 24                 | VAMP                                  | siehe Abgleich / see Adjustment | Bildhöhe / Vertical amplitude                                    | 35*                          | 35*                             | 35*                                   | 35*                                     |
| 25                 | SCOR                                  | siehe Abgleich / see Adjustment | S-Korrektur / S correction                                       | 25*                          | 25*                             | 25*                                   | 25*                                     |
| 26                 | VSHT                                  | siehe Abgleich / see Adjustment | Bildposition vertikal / Vertical shift                           | 28*                          | 28*                             | 28*                                   | 28*                                     |
| 27                 | VSLP                                  | siehe Abgleich / see Adjustment | Bildmitte / Vertical slope                                       | 34*                          | 34*                             | 34*                                   | 34*                                     |
| 28                 | RGB                                   | siehe Abgleich / see Adjustment | OSD Helligkeit / Brightness                                      | 01                           | 01                              | 01                                    | 01                                      |
| 29                 | VZOM                                  | siehe Abgleich / see Adjustment | Vertikal Zoom / Vertical zoom                                    | 35*                          | 35*                             | 35*                                   | 35*                                     |
| 30                 | SSTD                                  | BG-ONLY                         |                                                                  | X                            |                                 | X                                     |                                         |
|                    |                                       | I-ONLY                          |                                                                  |                              |                                 |                                       |                                         |
|                    |                                       | BG + DK                         |                                                                  |                              |                                 |                                       |                                         |
|                    |                                       | BG + LL'                        |                                                                  |                              | X                               |                                       | X                                       |
|                    |                                       | ALL SYS.                        |                                                                  |                              |                                 |                                       |                                         |
| 31                 | STYP                                  | NICAM On                        |                                                                  |                              | X                               |                                       | X                                       |
|                    |                                       | NICAM Off                       |                                                                  | X                            |                                 | X                                     |                                         |
| 32                 | TOPTXT                                | YES                             |                                                                  | X                            | X                               | X                                     | X                                       |
|                    |                                       | NO                              |                                                                  |                              |                                 |                                       |                                         |
| 33                 | TXT table                             | WEST                            |                                                                  | X                            |                                 | X                                     |                                         |
|                    |                                       | EAST                            |                                                                  |                              | X                               |                                       | X                                       |
| 34                 | PWLT                                  |                                 | Strahlstrombegrenzung / Peak white limiting                      | 09                           | 09                              | 09                                    | 09                                      |
| 35                 | IFOF                                  |                                 | Offset ZF-Demodulator / Offset IF demodulator                    | 32                           | 32                              | 32                                    | 32                                      |
| 36                 | HPAR                                  | siehe Abgleich / see Adjustment | Schräglage vertikal / Horizontal parallelogram                   | 32*                          | 32*                             | 32*                                   | 32*                                     |
| 37                 | HBOW                                  | siehe Abgleich / see Adjustment | Horizontale Biegung / Horizontal bow                             | 32*                          | 32*                             | 32*                                   | 32*                                     |
| 38                 | HOTEL                                 | ON                              |                                                                  |                              |                                 |                                       |                                         |
|                    |                                       | OFF                             |                                                                  | X                            | X                               | X                                     | X                                       |
| 39                 | SUBWOOFER                             | YES                             |                                                                  |                              |                                 |                                       |                                         |
|                    |                                       | NO                              |                                                                  | X                            | X                               | X                                     | X                                       |

\* Mittelwert / Average Value

| SERVICE<br>P+ / P- | Menüpunkt<br>Point of Menu<br>P+ / P- | Einstellung<br>Adjustment<br>/  | Hinweis<br>Hint                                                                        | DAVIO 14<br>TVD 37-2401 Text | DAVIO 14<br>TVD 37-2501 FR/Text | ELEGANCE 21 Flat<br>TVD 55-2401/5 Top | ELEGANCE 21 Flat<br>TVD 55-2501 FR/ Top |
|--------------------|---------------------------------------|---------------------------------|----------------------------------------------------------------------------------------|------------------------------|---------------------------------|---------------------------------------|-----------------------------------------|
| 40                 | CRT                                   | 4:3<br>16:9                     |                                                                                        | X                            | X                               | X                                     | X                                       |
| 41                 | TEST                                  | siehe Abgleich / see Adjustment |                                                                                        | 35*                          | 35*                             | 35*                                   | 35*                                     |
| 42                 | AAV                                   | YES<br>NO                       | automatische AV-Umschaltung<br>automatic AV switching                                  | X                            | X                               | X                                     | X                                       |
| 43                 | PAL                                   | YES<br>NO                       | nur PAL / PAL only<br>andere Versionen / other versions                                | X                            |                                 | X                                     |                                         |
| 44                 | EWP1                                  | siehe Abgleich / see Adjustment | 16:9 Ost/West Parabel (für 4:3 Geräte)<br>16:9 East west parabola width (for 4:3 sets) | 08*                          | 08*                             | 08*                                   | 08*                                     |
| 45                 | DBAS                                  | YES<br>NO                       | Dynamik-Bass / Dynamic bass                                                            | X                            | X                               | X                                     | X                                       |
| 46                 | VOL                                   | siehe Abgleich / see Adjustment | Volume Pegel<br>Volume level                                                           | 50                           | 50                              | 50                                    | 50                                      |
| 47                 | SCART 2                               | ON<br>OFF                       | SCART - 2                                                                              | X                            | X                               | X                                     | X                                       |
| 48                 | F-AV                                  | ON<br>OFF                       | Front - AV                                                                             | X                            | X                               | X                                     | X                                       |
| 49                 | F-SVHS                                | ON<br>OFF                       | Front - SVHS                                                                           | X                            | X                               | X                                     | X                                       |
| 50                 | AV ST CURVE                           | HIGH<br>LOW                     | Ändert Linearität bei Lautstärke +/-<br>Changes linearity of volume +/-                | X                            | X                               | X                                     | X                                       |
| 51                 | NTSC                                  | YES<br>NO                       | NTSC Wiedergabe<br>NTSC Playback                                                       | X                            | X                               | X                                     | X                                       |
| 52                 | OPENNING                              | YES<br>NO                       |                                                                                        | X                            | X                               | X                                     | X                                       |

\* Mittelwert / Average Value

## 2. Programmsuchlauf (ATS)

Tasten " i " (Hauptmenü) -> P+ / P- "SUCHLAUF" -> "OK" -> P+ / P- "PROGRAMMSUCHLAUF" -> "OK" -> P+ / P- / / Land auswählen und mit "OK" Suchlauf starten.

Das automatische Sendersuchsystem stoppt bei jedem empfangswürdigen Sender (AFC und Koizidenz) und speichert automatisch die entsprechenden Senderdaten mit dem jeweiligen Standard. Danach wird der Suchlauf fortgesetzt.

Tastendruck " i " bricht den ATS-Lauf ab.

## 3. Software-Versionsnummer

Die Software-Versionsnummer wird nach Beenden des Service Modus angezeigt:

VER SD5965\_G02  
OF96  
T01031711

## 2. Autoprogram (ATS)

Buttons " i " (Main menu) -> P+ / P- "SETUP" -> "OK" -> P+ / P- "AUTOPROGRAM" -> "OK" -> P+ / P- / / select Country and start search with "OK".

The autoprogram system stops at every station of acceptable reception quality (AFC and coincidence) and stores the station data and the respective standard automatically. The system then continues searching.

Pressing the " i " button stops the ATS function.

## 3. Software Version Number

The software version number is shown after ending the service mode:

VER SD5965\_G02  
OF96  
T01031711

## Sicherheits-Hinweis

Die in den Fernsehgeräten auftretende Röntgenstrahlung entspricht den Bestimmungen der Physikalisch-Technischen Bundesanstalt vom 8. Januar 1987.

Die Hochspannung für die Bildröhre und die damit auftretende Röntgenstrahlung ist abhängig von der exakten Einstellung der Netzteilspannung +B.

Nach jeder Reparatur im Netzteil oder in der Horizontalablenkung ist die Hochspannung zu messen und gegebenenfalls einzustellen.

Schutzschaltungen im Gerät dürfen nur kurzzeitig außer Betrieb gesetzt werden, um Folgeschäden am Chassis oder an der Bildröhre zu vermeiden.

Beim Austausch der Bildröhre dürfen nur die in den Ersatzteillisten vorgeschriebenen Typen verwendet werden.

## Safety Advice

The X-radiation developing in the sets conforms to the X-radiation Regulations (January 8, 1987), issued by the Physikalisch-Technische Bundesanstalt (federal physiotecchnical institution).

The high tension for the picture tube and thus the developing X-radiation depends on the precise adjustment of the +B power supply. After every repair of the power supply unit or the horizontal deflection stage it is imperative that the EHT for the picture tube is checked and re-adjusted if necessary.

To avoid consequential damages to the chassis or the picture tube the integrated protective circuits are allowed to be put out of operation only for a short time.

When replacing the picture tube use only the types specified in the spare parts lists.

## IC Data Sheets & Specifications

### IC 101 - OM 8365

The OM8365H combine the functions of a video processor together with a  $\mu$ -Controller, US Closed Caption decoder and Teletext decoder. The Teletext decoder has an internal RAM memory for 10 page text. The ICs are intended to be used in economy television receivers with 110° picture tubes. The ICs have supply voltages of 8V and 3.3V and they are mounted in a QFP 80 envelope.

#### TV-Signal Processor

- Multi-standard vision IF circuit with alignment-free PLL demodulator.
- Internal (switchable) time-constant for the IF-AGC circuit.
- The QSS and mono FM functionality are both available so that an FM/AM TV receiver can be built without the use of additional ICs
- The mono intercarrier sound circuit has a selective FM-PLL demodulator which can be switched to the different FM sound frequencies (4.5/5.5/6.0/6.5MHz). The quality of this system is such that the external band-pass filters can be omitted.
- The FM-PLL demodulator can be set to centre frequencies of 4.74/5.74MHz so that a second sound channel can be demodulated. In such an application it is necessary that an external band-pass filter is inserted.
- The vision IF and mono intercarrier sound circuit can be used for the demodulation of FM radio signals.
- Video switch with 2 external CVBS inputs and a CVBS output. One of the CVBS inputs can be used as Y/C input.
- 2 external audio inputs. The selection of the various inputs is coupled to the selection of the CVBS signals.
- Integrated chrominance trap circuit.
- Integrated luminance delay line with adjustable delay time.
- Picture improvement features with peaking (with switchable centre frequency, depeaking, variable positive/negative overshoot ratio and video dependent coring) and white stretching.
- Switchable group delay correction in the CVBS path.
- Integrated chroma band-pass filter with switchable centre frequency.
- Switchable DC transfer ratio for the luminance signal.
- Only one reference (12MHz) crystal required for the  $\mu$ -Controller, Teletext- and the colour decoder.
- Multi-standard colour decoder with automatic search system.
- Internal base-band delay line.
- Indication of the Signal-to-Noise ratio of the incoming CVBS signal.
- A linear RGB/YUV/YPBPR input with fast blanking for external RGB/YUV sources. The synchronisation circuit can be connected to the incoming Y signal. The Text/OSD signals are internally supplied from the  $\mu$ -Controller / Teletext decoder.
- RGB control circuit with 'Continuous Cathode Calibration', white point and black level off-set adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
- Contrast reduction possibility during mixed-mode of OSD and Text signals.
- Adjustable 'wide blanking' of the RGB outputs.
- Horizontal synchronization with two control loops and alignment-free horizontal oscillator.
- Vertical count-down circuit.
- Vertical driver optimized for DC-coupled vertical output stages.
- Horizontal and vertical geometry processing.
- Horizontal and vertical zoom function for 16:9 applications.
- Horizontal parallelogram and bow correction for large screen picture tubes.
- Low-power start-up of the horizontal drive circuit.

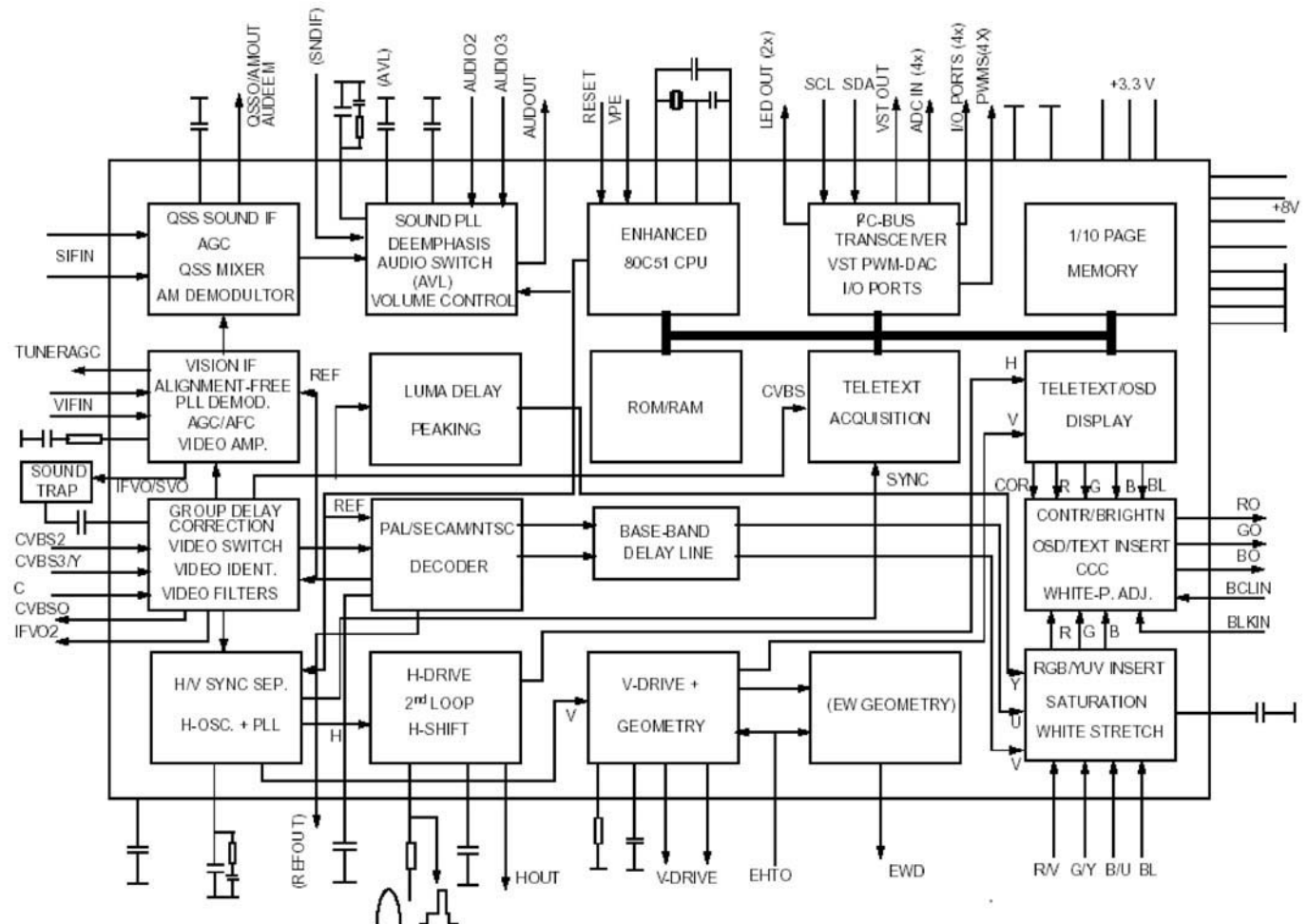
#### $\mu$ -Controller

- 80C51  $\mu$ -controller core standard instruction set and timing.
- 1  $\mu$ s machine cycle.
- 64 - 96Kx8-bit late programmed ROM.
- 12Kx8-bit DataRAM (shared between Display, Acquisition and Auxiliary RAM).
- Interrupt controller for individual enable/disable with two level priority.
- Two 16-bit Timer/Counter registers.
- One 16-bit Timer with 8-bit Pre-scaler.
- WatchDog timer.
- Auxiliary RAM page pointer.
- 16-bit Data pointer.

- Stand-by, Idle and Power Down modes.
- 14 bits PWM for Voltage Synthesis Tuning.
- 8-bit A/D converter with 4 multiplexed inputs.
- 5 PWM (6-bits) outputs for control of TV analogue signals.
- 18 general I/O ports.

#### Data Capture

- Text memory for 10 pages.
- Inventory of transmitted Teletext pages stored in the Transmitted Page Table (TPT) and Subtitle Page Table (SPT).
- Data Capture for US Closed Caption.
- Data Capture for 525/625 line WST, VPS (PDC system A) and Wide Screen Signalling (WSS) bit decoding.
- Automatic selection between 525 WST/625 WST.
- Automatic selection between 625 WST/VPS on line 16 of VBI.
- Real-time capture and decoding for WST Teletext in Hardware, to enable optimized  $\mu$ -processor throughput.
- Automatic detection of FASTEXT transmission.
- Real-time packet 26 engine in Hardware for processing accented, G2 and G3 characters.
- Signal quality detector for video and WST/VPS data types.
- Comprehensive teletext language coverage.
- Full Field and Vertical Blanking Interval (VBI) data capture of WST data Display.
- Teletext and Enhanced OSD modes.
- Features of level 1.5 WST and US Close Caption.
- Serial and Parallel Display Attributes.
- Single/Double/Quadruple Width and Height for characters.
- Scrolling of display region.
- Variable flash rate controlled by software.
- Enhanced display features including overlining, underlining and italics.
- Soft colours using CLUT with 4096 colour palette.
- Globally selectable scan lines per row (9/10/13/16) and character matrix [12x10, 12x13, 12x16 (VxH)].
- Fringing (Shadow) selectable from N-S-E-W direction.
- Fringe colour selectable.
- Meshing of defined area.
- Contrast reduction of defined area.
- Cursor.
- Special Graphics Characters with two planes, allowing four colours per character.
- 32 software redefinable On-Screen display characters.
- 4 WST Character sets (G0/G2) in single device (e.g. Latin, Cyrillic, Greek, Arabic).
- G1 Mosaic graphics, Limited G3 Line drawing characters.
- WST Character sets and Closed Caption Character set in single device.



### MSP 34x0G Multistandard Sound Processor Family

The MSP 3410G family of single-chip Multistandard Sound Processors covers the sound processing of all analog TV-Standards worldwide, as well as the NICAM digital sound standards. The full TV sound processing, starting with analog sound IF signal-in, down to processed analog AF-out, is performed on a single chip. This new generation of TV sound processing ICs now includes versions for processing the multichannel television sound (MTS) signal conforming to the standard recommended by the Broadcast Television Systems Committee (BTSC). The DBX noise reduction, or alternatively, Micronas Noise Reduction (MNR) is performed. Other processed standards are the Japanese FM-FM multiplex standard (EIA-J) and the FM Stereo Radio standard. The MSP 3410G has optimum stereo performance without any adjustments.

The MSP 3410G has built-in automatic functions:

The IC is able to detect the actual sound standard automatically (Automatic Standard Detection). Furthermore, pilot levels and identification signals can be evaluated internally with subsequent switching between mono/ stereo/bilingual; no I2C interaction is necessary (Automatic Sound Selection).

The MSP 3410G can handle very high FM deviations even in conjunction with NICAM processing.

### TDA7266S 5+5w Dual Bridge Amplifier

The TDA7266S is a dual bridge amplifier specially designed for TV and Portable Radio applications.

- Wide supply voltage range (3-18V)
- Minimum external components
  - no swr capacitor
  - no bootstrap
  - no boucherot cells
  - internally fixed gain
- Stand-by & mute functions
- Short circuit protection
- Thermal overload protection

### TDA 7442 Digitally Controlled Audio Processor

The TDA7442/42D is volume tone (bass and treble) balance (Left/ Right) processors for quality audio applications in TV and Hi-Fi systems. It reproduces surround sound by using a programmable phase shifter. Control of all the functions is accomplished by serial bus. The AC signal setting is obtained by resistor networks and switches combined with operational amplifiers. Thanks to the BIPO-LAR/CMOS Technology used, Low Distortion, Low Noise and DC stepping are obtained.

- 4 stereo inputs
- Input attenuation control in 0.5dB step
- Treble and bass control
- Two surround mode available with 4 selectable responses:
  - music
  - simulated stereo
- Two speaker attenuators:
  - 2 independent speaker controls
- In 1dB steps for balance facility
  - independent mute function
- All functions programmable via serial Bus
- 2 monitor output (only for TDA7442)

### CXA 2040AQ I2C Bus-Compatible Video Switch

The CXA2040AQ is an I2C bus-compatible 5-input, 3-output video switch for TVs.

Features

- Serial data control via I2C bus
- 5 composite video input systems
- 2 Y/C (S terminal) input systems
- 3 composite video output systems
- 1 Y/C (S terminal) output system
- Input can be selected independently for each output system.
- SYNC\_ID function for CV1 system input
- Built-in 6dB amplifier for CVOUT2 system output
- Built-in Y/C MIX circuit
- Slave address can be changed (90H/92H).
- High impedance maintained by I2C bus line (SDA, SCL) even when power is OFF.

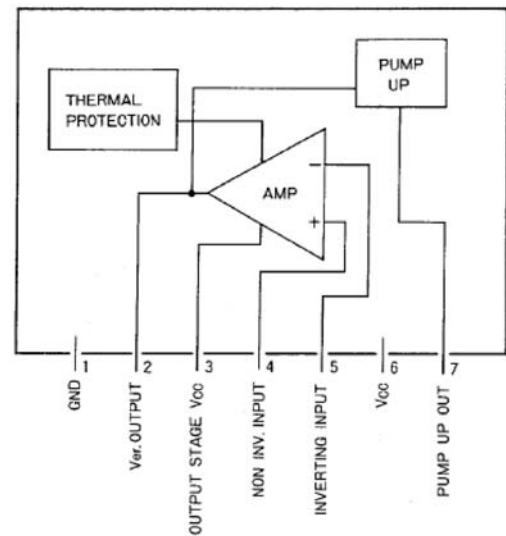
### LA7840 Vertical Deflection Output Circuit

#### Features

- Low power dissipation due to built-in pump-up circuit
- Vertical output circuit
- Thermal protection circuit built in
- Excellent crossover characteristics
- DC coupling possible

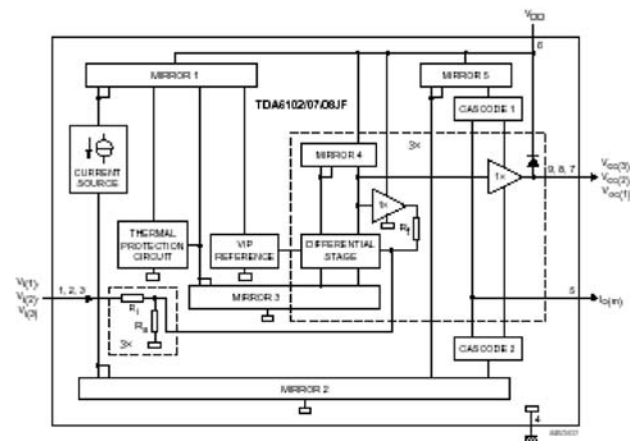
#### General Description

The LA7840 is a vertical deflection output IC for TVs and CRT displays with excellent image quality that use a BUS control system signal processing IC. This IC can drive the direct (even including a DC component) deflection yoke with the sawtooth wave output from the BUS control system signal processing IC. Because the maximum deflection current is 1.8 A-p-p, the LA7840 is suited for small and medium screen sets.



### TDA6108 Triple Video Output Amplifiers

By integrating three video amplifiers in a single IC, the TDA6108 IC provides a single IC solution for driving color TV CRTs. Each device in the TDA6108 family contains three video output amplifiers in one plastic DIL-bent-SIL 9-pin medium power (DBS9MPF) package (SOT111-1). Using high-voltage DMOS technology, this enables each of these ICs to drive the three cathodes of a color CRT directly, providing a significant reduction in the Bill of Materials for new designs. For maximum performance, the TDA610x amplifiers should be used with black-current control, enabling automatic black current stabilization and removing the need for any external alignments on the CRT board.



### TDA8601 RGB/YUV and Fast Blanking Switch

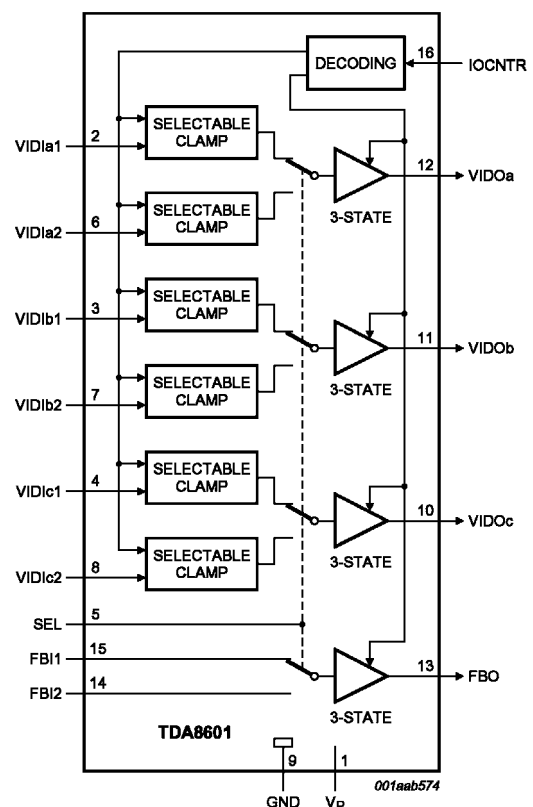
#### Features

- YUV/RGB and fast blanking switch
- 3-state output
- Selectable clamp:
  - passive (with diodes) or active clamp
- Bandwidth greater than 22MHz
- Fully ESD protected
- Latch-up free.

#### General Description

The device is intended for switching between two RGB or YUV video sources. The outputs can be set to a high-impedance state to enable parallel connection of several devices. A HIGH level on SEL (pin 5) selects the video inputs of Channel 2. The IOCNTN control pin (pin 16) defines the 3-state outputs and clamp inputs:

- HIGH = 3-state outputs (also for test; active clamp)
- LOW = passive clamp at the video inputs (diode)
- Sandcastle: the video signal is clamped with an active clamp during the sync pulse.



## Abgleich

**Messgeräte:** Digitalvoltmeter, Farbbildgenerator.

### Servicearbeiten nach Austausch bzw. Reparatur:

- **Netzteil:** Abgleich 1, 3
- **Tuner / ZF:** Abgleich 2
- **IC401 (EEPROM):** Abgleich 2, 4...5
- **Bildröhre:** Abgleich 3...5
- **Bildrohrplatte:** Abgleich 3, 5
- **Ablenkung:** Abgleich 4

#### 1. Spannung B+

- Digitalvoltmeter: D627 Kathode
- Programm: AV
- Helligkeit auf Minimum.
- **Spannung B+** mit **VR601** entsprechend der Bildröhre einstellen:

| Bildröhre   | B+   | Bildröhre     | B+   |
|-------------|------|---------------|------|
| A33EKC01X01 | 111V | A34 KPU02XXB  | 111V |
| A33EKC02X01 | 111V | A51ERF135X80  | 130V |
| A34EAC01X06 | 111V | A51ELD032X001 | 132V |
| A34EJL02X31 | 111V |               |      |

#### 2. AGC

- Service Mode aufrufen: Taste "i" drücken → "8500" eingeben.
- **"AGC"** mit den Tasten **P+ / P-** anwählen.
- Mit den Tasten / Wert auf 35 einstellen.
- **TEST** mit den Tasten **P+ / P-** anwählen.
- Mit den Tasten / Wert auf 35 einstellen.
- Bild mit 65 dB/μV Antennenpegel auf Störungen, bzw. Kreuzmodulation kontrollieren. Gegebenenfalls Wert/e erhöhen (z.B. 40).
- Service Mode beenden: Taste **"TXT"** drücken.

#### 3. Screen

- Service Mode aufrufen: Taste "i" drücken → "8500" eingeben.
- **SCRN** mit den Tasten **P+ / P-** anwählen und mit den Tasten / auf **ON** stellen. Auf dem Bildschirm wird "BRI 00" angezeigt.
- **SCREEN** am Dioden-Splitt-Trafo TR501 so einstellen, dass "BRI 00" gerade sichtbar ist.
- Mit den Tasten / auf Bild zurückschalten (**SCRN** wird auf **OFF** zurückgesetzt).
- Service Mode beenden: Taste **"TXT"** drücken.

#### 4. Geometrie

- Geometrie-Testbild einspeisen.
- Service Mode aufrufen: Taste "i" drücken → "8500" eingeben.
- Mit den Tasten **P+ / P-** die gewünschte Bildgeometrie-Abgleichfunktion aufrufen und mit den Tasten / die Geometrie einstellen:
  - Bildmitte vertikal **VSLP**. Die untere Bildhälfte ist ausgeblendet. Den Bildinhalt so einstellen, dass die Mittellinie gerade nicht mehr sichtbar ist.
  - Zoom vertikal **VZOM**. Bei 16:9 Geräten den Wert auf 35 einstellen. Bei 4:3 Geräten **VZOM** so einstellen, dass der Kreis gerade den Rand berührt. Gegebenenfalls **VSLP** nochmals korrigieren.
  - Bildposition vertikal **VSHT**.
  - Bildlinearität vertikal **SCOR**.
  - Bildhöhe vertikal **VAMP**.
  - Bildposition horizontal **HSHT**.
  - Ost/West-Parabel 4:3 **EWPPW**.
  - Ost/West-Trapez **EWT**.
  - Ost/West-Parabel 16:9 **EWPP1**.
  - Obere Ecken **EWCU**.
  - Untere Ecken **EWCL**.
  - Bildbreite bei 4:3 Geräten **EWV**.
  - Schräglage (Parallelogramm) horizontal **HPAR**.
  - Biegung horizontal **HBOW**.
- Service Mode beenden: Taste **"TXT"** drücken.

#### 5. Weißabgleich / Cut off

- Testbild Grautreppe einspeisen.
- Service Mode aufrufen: Taste "i" drücken → "8500" eingeben.
- **GRN** mit den Tasten **P+ / P-** anwählen und mit den Tasten / auf **32** stellen.
- **RED** und **BLUE** jeweils mit den Tasten **P+ / P-** anwählen und mit den Tasten / so einstellen, dass der weiße Bildbereich **unbunt** ist. Sollte sich der Weißwert nicht einstellen lassen, Wert für **GRN** korrigieren.
- **BLOR** und **BLOG** jeweils mit den Tasten **P+ / P-** anwählen und mit den Tasten / so einstellen, dass der dunkle Bildbereich **unbunt** ist.
- Service Mode beenden: Taste **"TXT"** drücken.

## Adjustment

**Measuring instruments:** Digital voltmeter, colour video generator.

### Service works after replacement or repair of the following modules:

- **Power supply:** adjustment 1, 3
- **Tuner / IF:** adjustment 2
- **IC401 (EEPROM):** adjustment 2, 4...5
- **CRT:** adjustment 3...5
- **CRT panel:** adjustment 3, 5
- **Deflection:** adjustment 4

#### 1. Supply Voltage B+

- Digital voltmeter: D627 cathode.
- Programme: AV.
- Brightness control to minimum.
- Adjust **voltage B+** the values below the CRT with **VR601**.

| Bildröhre   | B+   | Bildröhre     | B+   |
|-------------|------|---------------|------|
| A33EKC01X01 | 111V | A34 KPU02XXB  | 111V |
| A33EKC02X01 | 111V | A51ERF135X80  | 130V |
| A34EAC01X06 | 111V | A51ELD032X001 | 132V |
| A34EJL02X31 | 111V |               |      |

#### 2. AGC

- Start the Service Mode: press button "i" → enter "8500".
- Call up **AGC** with buttons **P+ / P-**.
- Adjust the value to 35 with buttons / .
- Call up **TEST** with buttons **P+ / P-**.
- Adjust the value to 35 with buttons / .
- Check picture with 65db/μV aerial level for interferences and cross-modulation respectively. If necessary increase the values (e.g. 40).
- End the Service Mode: Press button **"TXT"**.

#### 3. Screen

- Start the Service Mode: press button "i" → enter "8500".
- Call up **SCRN** with buttons **P+ / P-** and switch **ON** with buttons / . "BRI 00" is shown on screen.
- Adjust **SCREEN** control at the FPT TR501, that "BRI 00" is just visible.
- Switch back to screen with buttons / (**SCRN** is reset to **OFF**).
- End the Service Mode: Press button **"TXT"**.

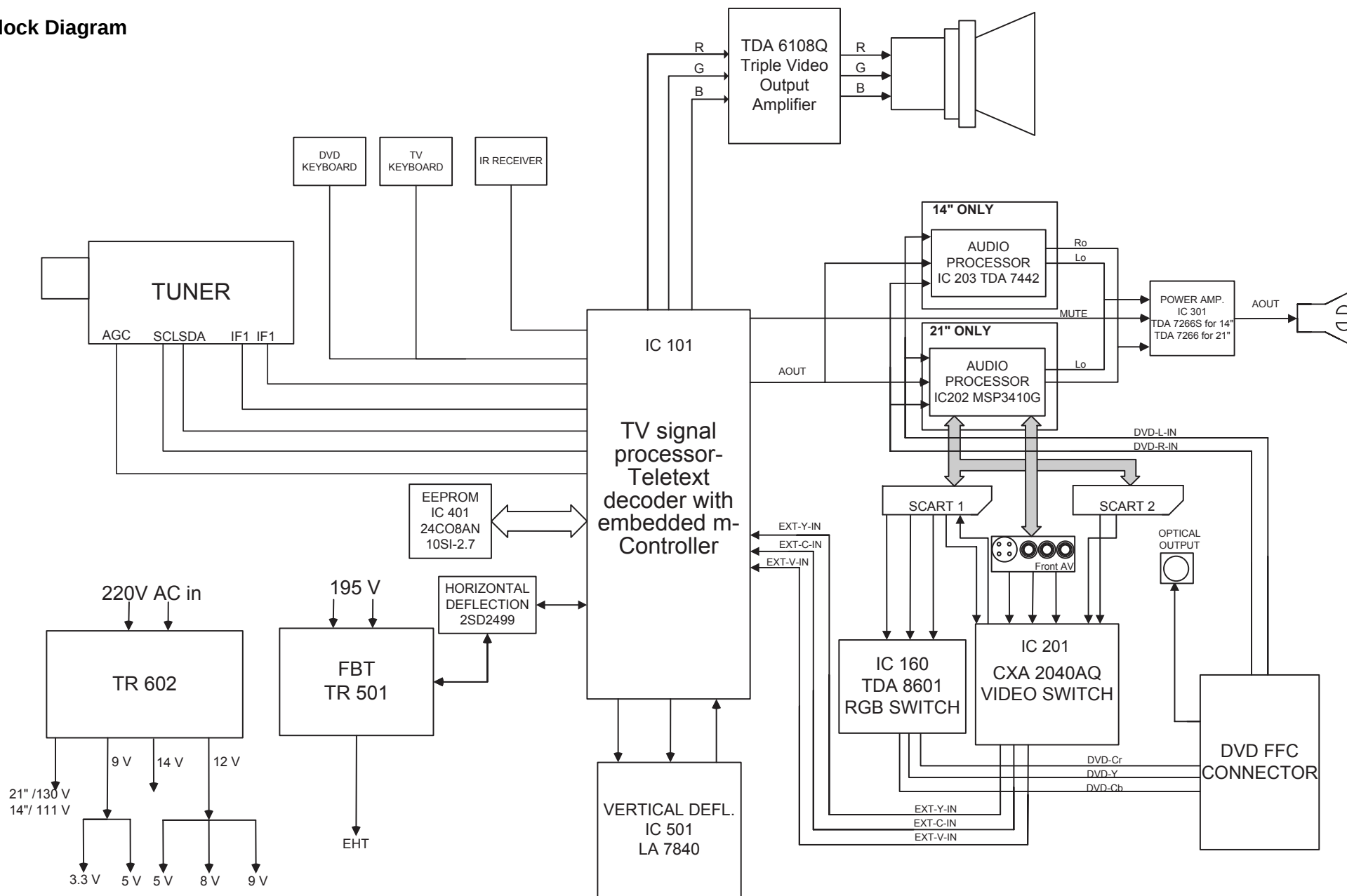
#### 4. Geometry

- Apply a geometry test pattern.
- Start the Service Mode: press button "i" → enter "8500".
- Call up the geometry function with buttons **P+ / P-** and adjust the geometry with buttons / :
  - Vertical slope **VSLP**. The lower half part of the pattern is blanked. Adjust picture so that the middle line of the pattern is cut.
  - Zoom vertical **VZOM**. For 16:9 sets, adjust the value to 35. For 4:3 sets, adjust the circle of pattern just touches to the upper and lower edges. Readjust the **VSLP** if required.
  - Vertical shift **VSHT**.
  - Vertical linearity **SCOR**.
  - Vertical amplitude **VAMP**.
  - Horizontal shift **HSHT**.
  - East west parabola width 4:3 **EWPPW**.
  - East west trapezium **EWT**.
  - East west parabola width 16:9 **EWPP1**.
  - Upper Corner **EWCU**.
  - Lower Corner **EWCL**.
  - Horizontal width for 4:3 sets **EWV**.
  - Horizontal parallelogram with **HPAR**.
  - Horizontal bow **HBOW**.
- End the Service Mode: Press button **"TXT"**.

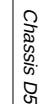
#### 5. White Balance / Cut off

- Apply a Grey Scale Test pattern.
- Start the Service Mode: press button "i" → enter "8500".
- Call up **GRN** with buttons **P+ / P-** and set it to 32 with buttons / .
- Call up **RED** and **BLUE** with buttons **P+ / P-** and adjust the values so that the white part of the picture becomes achromatic with buttons / . If white balance can not be adjusted properly change **GRN** value.
- Call up **BLOR** and **BLOG** with the buttons **P+ / P-** and adjust the values so that the dark part of the picture becomes achromatic with buttons / .
- End the Service Mode: Press button **"TXT"**.

### Block Diagram

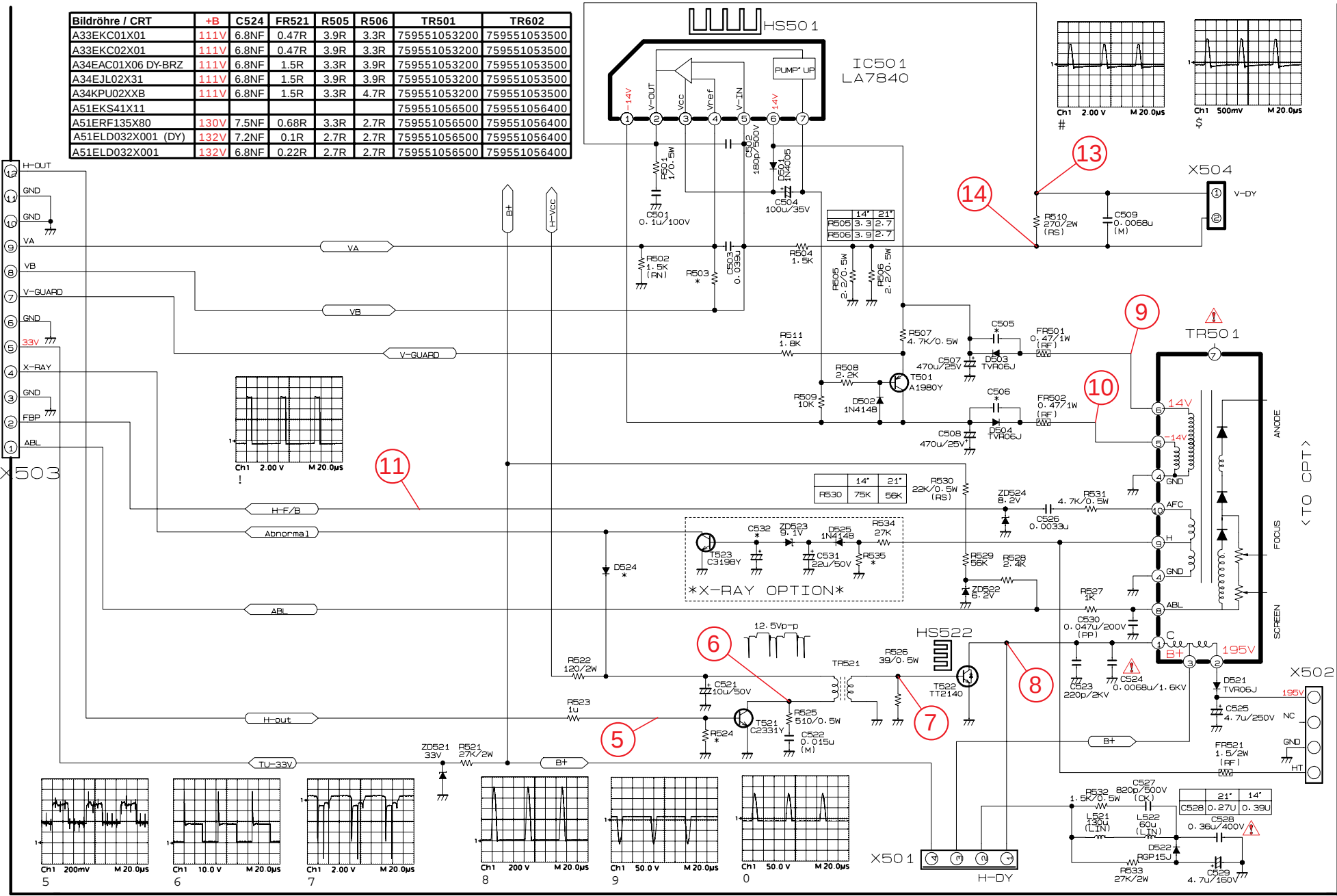


**GRUNDIG Service**

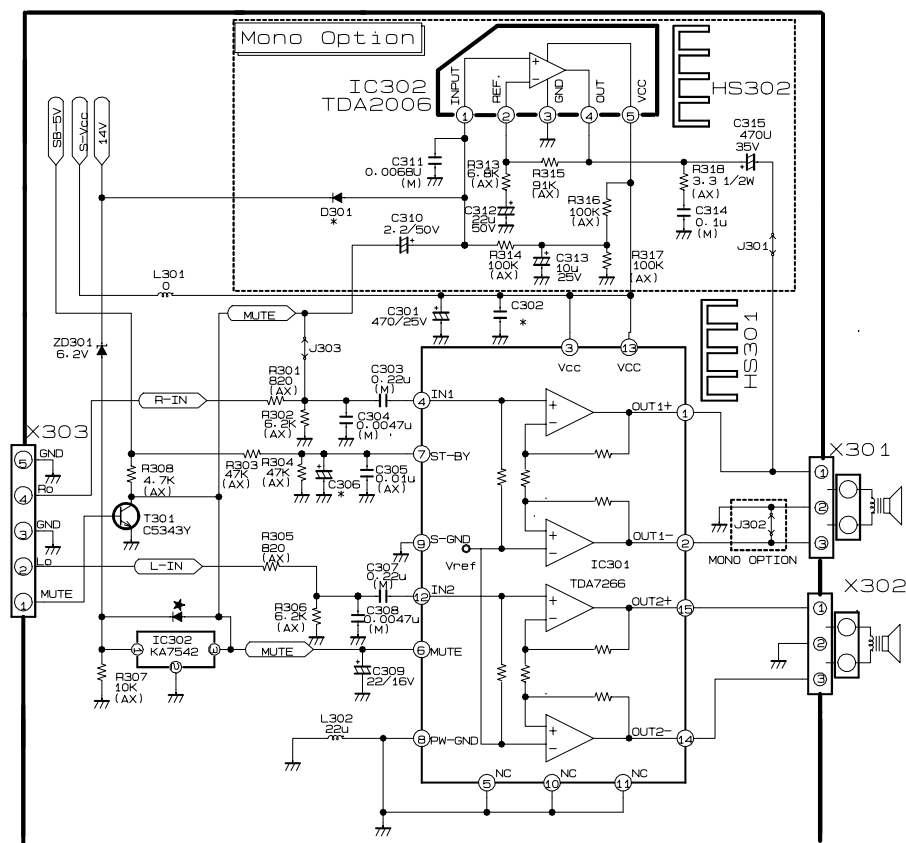


ZL6.190-03 - Ablenkung / Deflection

3 - 3



## ZL6.190-03 - NF-Endstufe, AF Amplifier

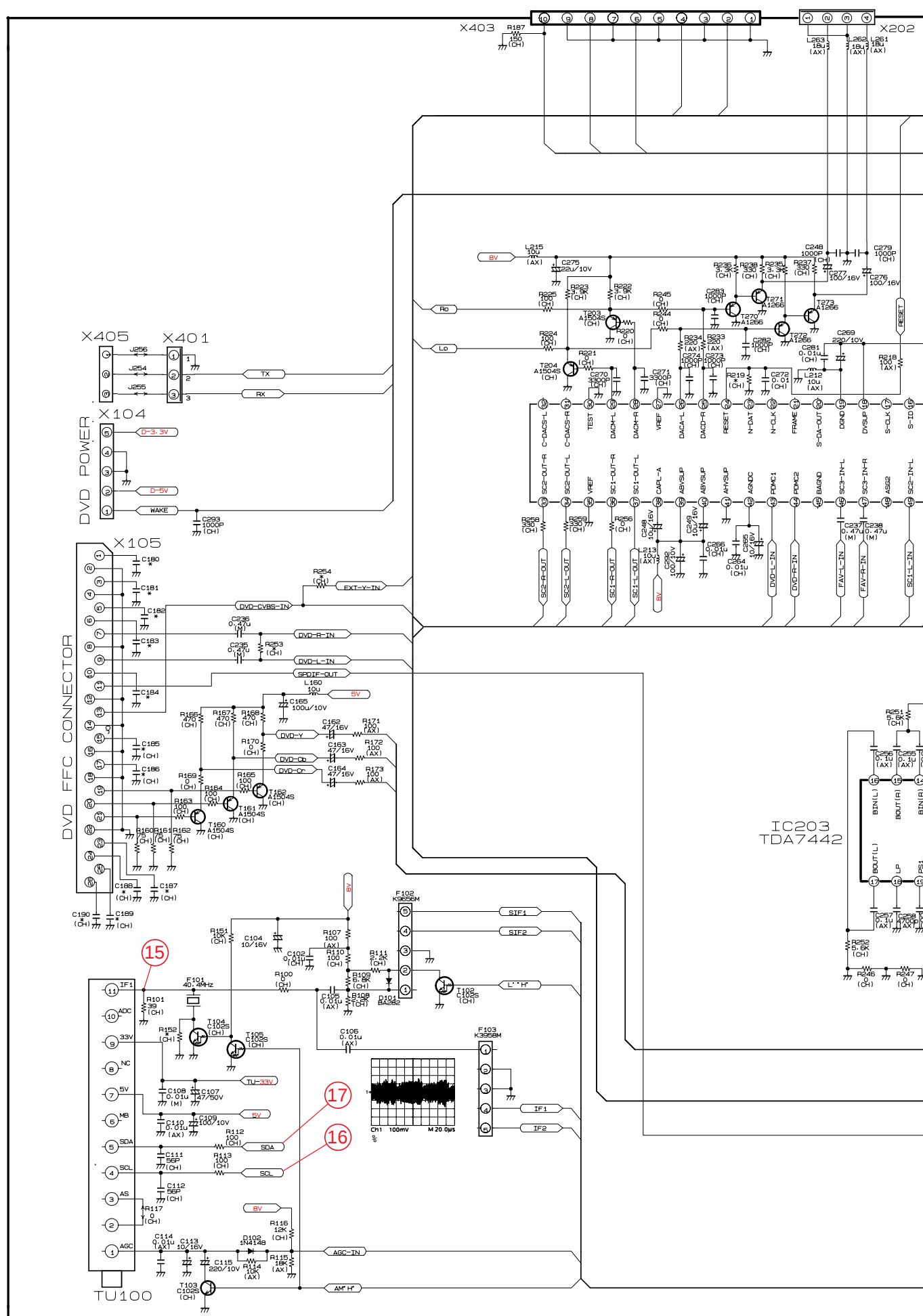


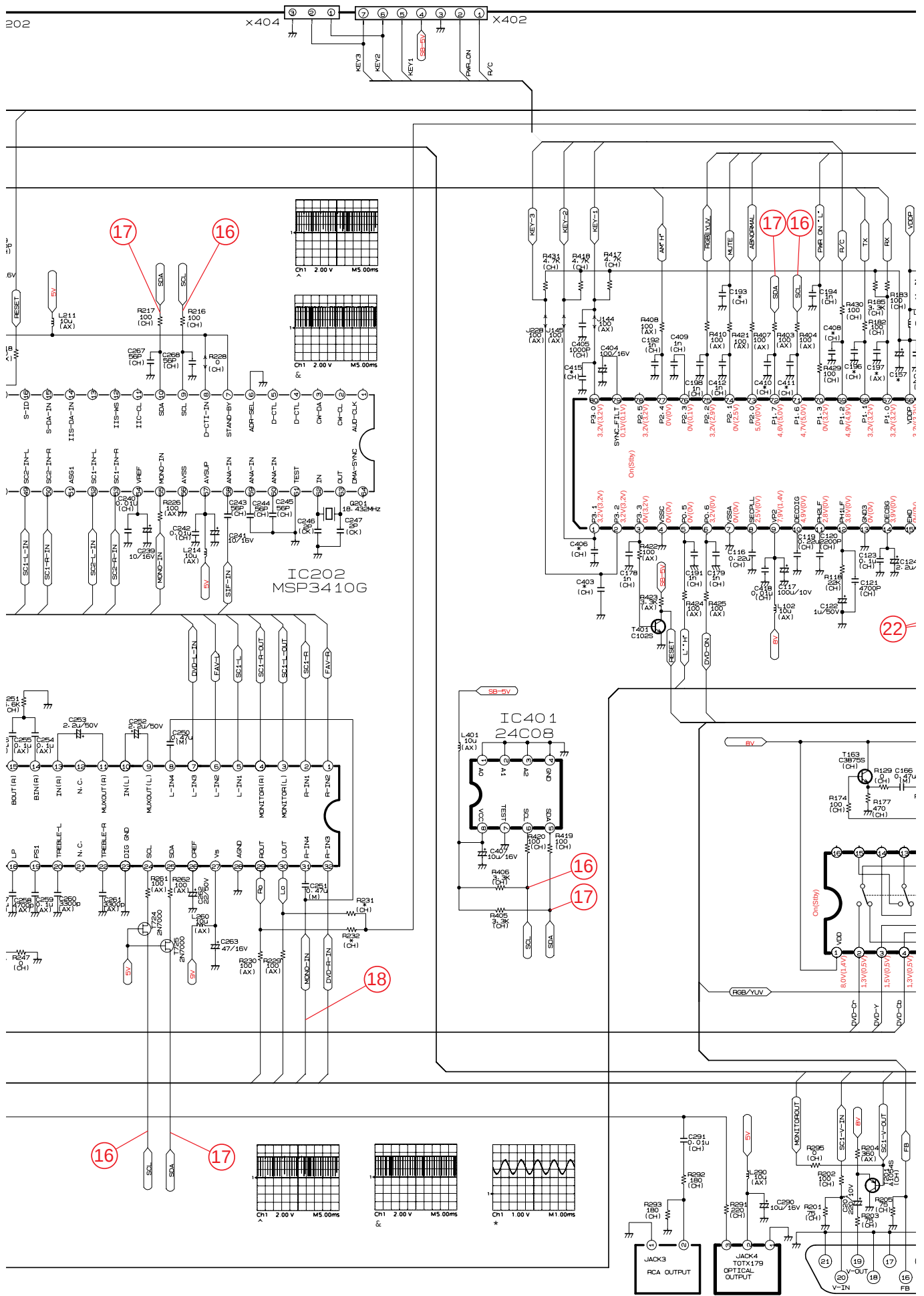
## Koordinaten für die Bauteile der Bestückungsseite (Ansicht von oben)

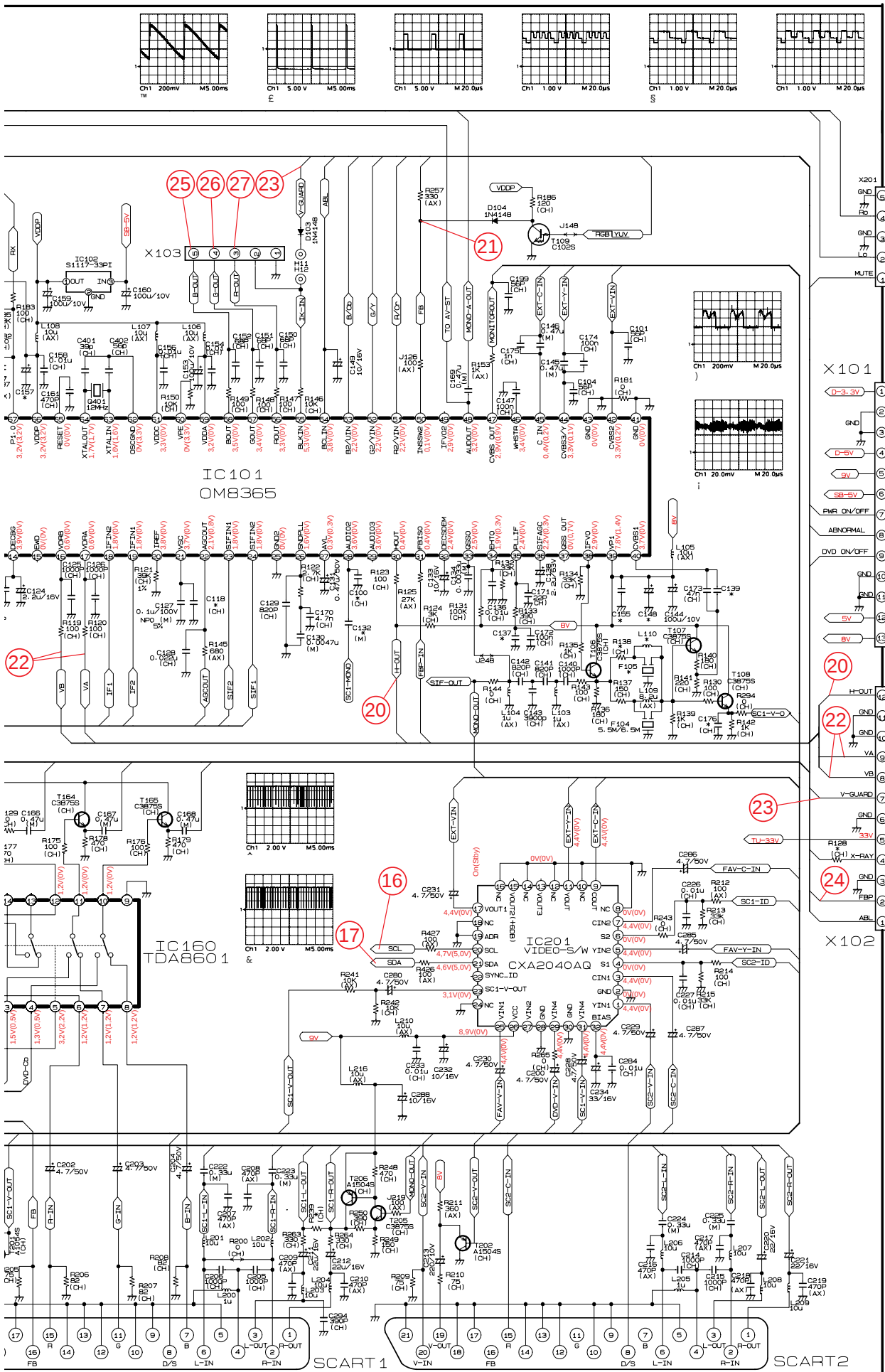
## Coordinates of the Components on the component side (top view)

| Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     |
|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|
|                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |
| C301                  | 163                         | 85  | C612                  | 74                          | 192 | D626                  | 93                          | 85  | E42                   | 170                         | 10  | R306                  | 212                         | 22  |
| C302                  | 163                         | 78  | C613                  | 78                          | 221 | D627                  | 120                         | 64  | E43                   | 195                         | 10  | R307                  | 212                         | 25  |
| C303                  | 191                         | 34  | C614                  | 68                          | 233 | D628                  | 100                         | 68  | E44                   | 30                          | 126 | R308                  | 179                         | 28  |
| C304                  | 198                         | 20  | C615                  | 109                         | 140 | D629                  | 20                          | 69  | E45                   | 54                          | 126 | R313                  | 213                         | 49  |
| C305                  | 164                         | 73  | C621                  | 29                          | 99  | D630                  | 59                          | 98  | E46                   | 30                          | 105 | R314                  | 213                         | 47  |
| C306                  | 163                         | 67  | C622                  | 46                          | 99  | D631                  | 108                         | 66  | E47                   | 45                          | 105 | R315                  | 199                         | 59  |
| C307                  | 177                         | 24  | C623                  | 10                          | 96  | D632                  | 64                          | 78  | E48                   | 136                         | 184 | R316                  | 212                         | 58  |
| C308                  | 193                         | 15  | C624                  | 10                          | 76  | D633                  | 93                          | 73  | E49                   | 144                         | 184 | R317                  | 212                         | 61  |
| C309                  | 196                         | 34  | C625                  | 10                          | 63  | D634                  | 14                          | 103 | E5                    | 33                          | 202 | R318                  | 186                         | 57  |
| C310                  | 212                         | 41  | C626                  | 77                          | 73  | DB601                 | 53                          | 155 | E6                    | 46                          | 202 | R501                  | 159                         | 140 |
| C311                  | 203                         | 43  | C627                  | 88                          | 77  | E1                    | 9                           | 237 | E7                    | 33                          | 187 | R502                  | 156                         | 127 |
| C312                  | 206                         | 54  | C628                  | 124                         | 69  | E10                   | 21                          | 169 | E8                    | 46                          | 187 | R503                  | 169                         | 125 |
| C313                  | 205                         | 67  | C629                  | 104                         | 71  | E11                   | 36                          | 169 | E9                    | 14                          | 169 | R504                  | 167                         | 138 |
| C314                  | 179                         | 70  | C630                  | 70                          | 95  | E12                   | 31                          | 141 | F601                  | 12                          | 221 | R505                  | 182                         | 142 |
| C315                  | 190                         | 60  | C631                  | 64                          | 64  | E13                   | 54                          | 137 | F621                  | 86                          | 87  | R506                  | 182                         | 146 |
| C501                  | 153                         | 156 | C632                  | 121                         | 48  | E14                   | 74                          | 146 | F622                  | 89                          | 87  | R507                  | 180                         | 107 |
| C502                  | 158                         | 104 | C633                  | 91                          | 49  | E15                   | 74                          | 156 | FB601                 | 64                          | 195 | R508                  | 171                         | 119 |
| C503                  | 182                         | 133 | C634                  | 151                         | 72  | E16                   | 85                          | 241 | FB602                 | 68                          | 195 | R509                  | 181                         | 119 |
| C504                  | 177                         | 127 | C635                  | 67                          | 27  | E17                   | 99                          | 241 | FB621                 | 124                         | 82  | R510                  | 154                         | 163 |
| C505                  | 201                         | 144 | C636                  | 35                          | 16  | E18                   | 85                          | 171 | FR501                 | 204                         | 151 | R511                  | 187                         | 94  |
| C506                  | 196                         | 144 | C637                  | 72                          | 38  | E19                   | 99                          | 171 | FR502                 | 193                         | 151 | R521                  | 187                         | 121 |
| C507                  | 200                         | 113 | C638                  | 81                          | 24  | E2                    | 24                          | 212 | FR521                 | 199                         | 151 | R522                  | 122                         | 200 |
| C508                  | 195                         | 129 | C639                  | 129                         | 89  | E20                   | 115                         | 210 | FR623                 | 104                         | 82  | R523                  | 118                         | 200 |
| C509                  | 162                         | 161 | C640                  | 141                         | 31  | E21                   | 130                         | 210 | FR624                 | 112                         | 82  | R524                  | 122                         | 215 |
| C521                  | 130                         | 217 | C641                  | 121                         | 11  | E22                   | 138                         | 210 | FR635                 | 142                         | 89  | R525                  | 117                         | 224 |
| C522                  | 122                         | 242 | C642                  | 46                          | 23  | E23                   | 134                         | 199 | FR636                 | 147                         | 89  | R526                  | 152                         | 242 |
| C523                  | 152                         | 225 | C643                  | 173                         | 87  | E24                   | 142                         | 199 | IC301                 | 178                         | 44  | R527                  | 201                         | 167 |
| C524                  | 161                         | 239 | C644                  | 112                         | 71  | E25                   | 161                         | 239 | IC302                 | 188                         | 44  | R528                  | 189                         | 158 |
| C525                  | 211                         | 170 | C645                  | 107                         | 57  | E26                   | 161                         | 232 | IC303                 | 196                         | 72  | R529                  | 189                         | 161 |
| C526                  | 217                         | 135 | D302                  | 195                         | 69  | E27                   | 161                         | 217 | IC501                 | 160                         | 126 | R530                  | 189                         | 165 |
| C527                  | 143                         | 214 | D501                  | 173                         | 137 | E28                   | 173                         | 213 | IC601                 | 74                          | 206 | R531                  | 217                         | 143 |
| C528                  | 115                         | 210 | D502                  | 174                         | 111 | E29                   | 173                         | 202 | IC621                 | 15                          | 69  | R532                  | 217                         | 199 |
| C529                  | 138                         | 169 | D503                  | 204                         | 136 | E3                    | 39                          | 212 | IC622                 | 101                         | 36  | R533                  | 216                         | 176 |
| C530                  | 210                         | 158 | D504                  | 193                         | 147 | E30                   | 177                         | 192 | IC623                 | 46                          | 49  | R534                  | 142                         | 131 |
| C531                  | 214                         | 111 | D521                  | 170                         | 241 | E31                   | 202                         | 200 | IC624                 | 32                          | 34  | R535                  | 214                         | 125 |
| C532                  | 194                         | 101 | D522                  | 129                         | 200 | E32                   | 202                         | 207 | IC625                 | 57                          | 53  | R601                  | 92                          | 176 |
| C601                  | 24                          | 212 | D524                  | 125                         | 200 | E33                   | 202                         | 213 | IC626                 | 87                          | 21  | R602                  | 96                          | 137 |
| C602                  | 36                          | 169 | D525                  | 211                         | 105 | E34                   | 82                          | 131 | IC627                 | 134                         | 83  | R603                  | 109                         | 223 |
| C603                  | 45                          | 148 | D601                  | 105                         | 150 | E35                   | 82                          | 106 | IC628                 | 109                         | 193 | R604                  | 99                          | 215 |
| C604                  | 47                          | 180 | D602                  | 100                         | 140 | E36                   | 102                         | 131 | IC629                 | 113                         | 164 | R605                  | 74                          | 241 |
| C605                  | 74                          | 156 | D603                  | 87                          | 198 | E37                   | 97                          | 106 | J301                  | 163                         | 61  | R606                  | 78                          | 217 |
| C606                  | 63                          | 227 | D621                  | 36                          | 100 | E38                   | 122                         | 131 | J302                  | 163                         | 32  | R607                  | 79                          | 171 |
| C607                  | 71                          | 179 | D622                  | 40                          | 100 | E39                   | 122                         | 106 | J303                  | 199                         | 29  | R620                  | 38                          | 81  |
| C609                  | 96                          | 206 | D623                  | 32                          | 87  | E4                    | 47                          | 212 | J304                  | 164                         | 22  | R621                  | 13                          | 83  |
| C610                  | 109                         | 231 | D624                  | 43                          | 87  | E40                   | 170                         | 78  | J305                  | 213                         | 36  | R622                  | 58                          | 80  |
| C611                  | 109                         | 236 | D625                  | 77                          | 78  | E41                   | 195                         | 78  |                       |                             |     | R623                  | 58                          | 77  |
|                       |                             |     |                       |                             |     |                       |                             |     |                       |                             |     | R624                  | 58                          | 84  |
|                       |                             |     |                       |                             |     |                       |                             |     |                       |                             |     | R625                  | 99                          | 43  |
|                       |                             |     |                       |                             |     |                       |                             |     |                       |                             |     | R626                  | 43                          | 61  |

## ZL5.190-03 - Signalverarbeitung / Signal Processing







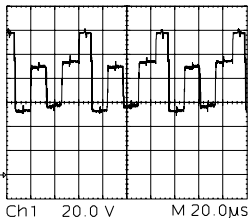
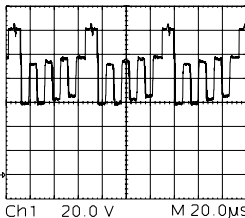
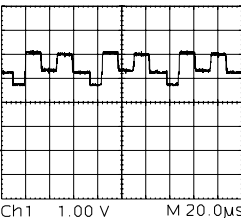
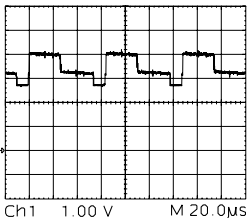
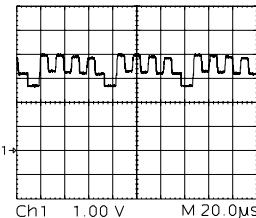
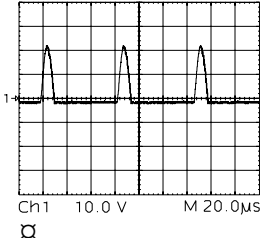
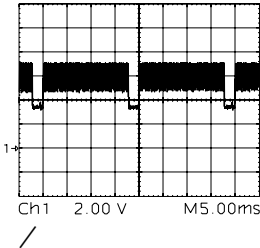
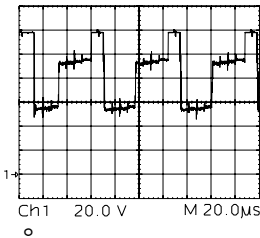
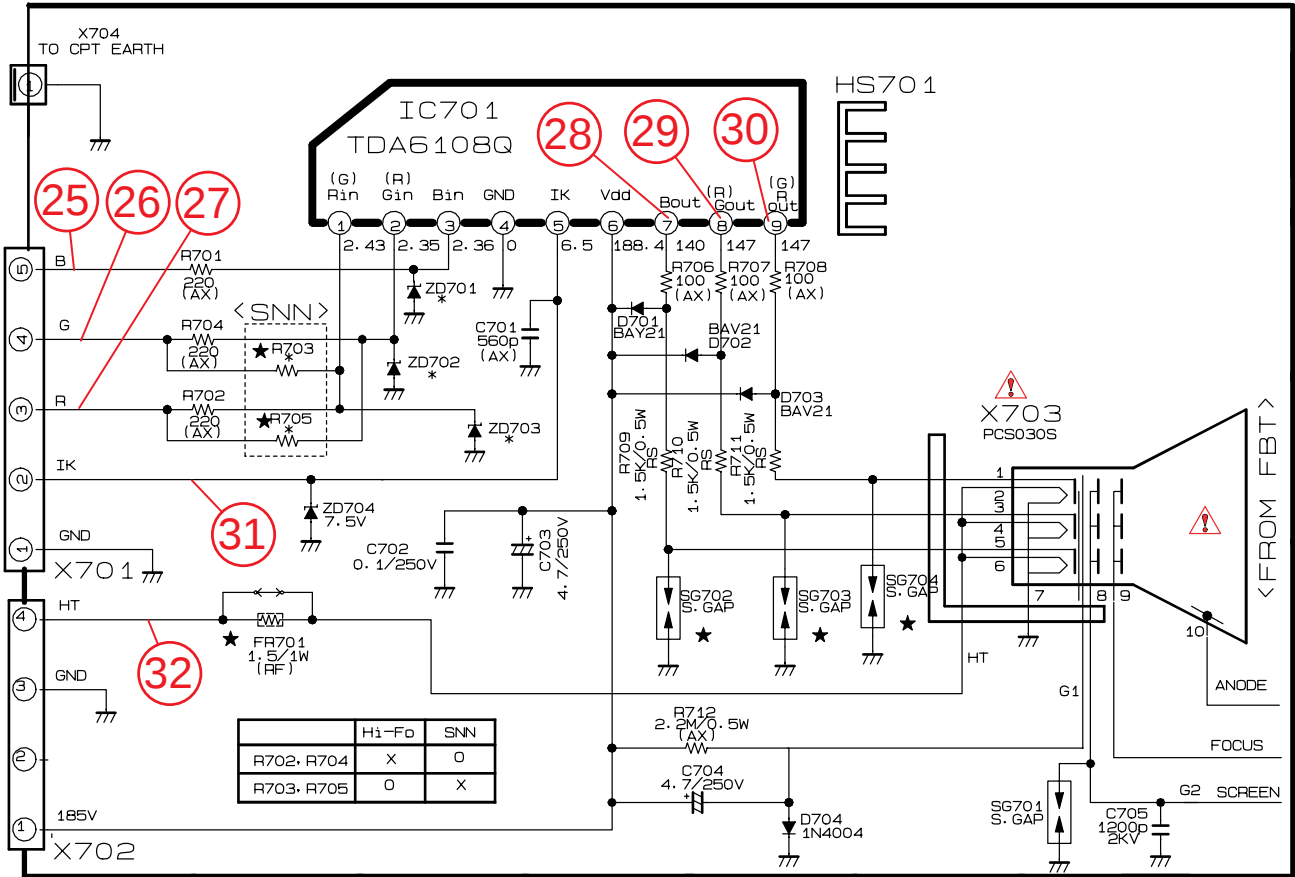
**Koordinaten für die Bauteile der Bestückungsseite (Ansicht von oben)**  
**Coordinates of the Components on the component side (top view)**

| Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     |
|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|
|                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |
| C102                  | 86                          | 228 | C225                  | 20                          | 66  | J105                  | 64                          | 219 | J171                  | 100                         | 136 | L101                  | 76                          | 231 | R406                  | 45                          | 188 |
| C105                  | 76                          | 226 | C228                  | 21                          | 203 | J106                  | 68                          | 238 | J172                  | 53                          | 110 | L102                  | 63                          | 200 | R407                  | 80                          | 168 |
| C106                  | 76                          | 222 | C229                  | 18                          | 136 | J107                  | 76                          | 236 | J173                  | 111                         | 49  | L103                  | 129                         | 204 | R409                  | 62                          | 165 |
| C107                  | 88                          | 238 | C230                  | 81                          | 93  | J108                  | 97                          | 230 | J174                  | 61                          | 85  | L104                  | 122                         | 204 | R410                  | 75                          | 169 |
| C108                  | 46                          | 219 | C231                  | 69                          | 125 | J109                  | 104                         | 233 | J175                  | 16                          | 131 | L105                  | 122                         | 215 | R421                  | 64                          | 165 |
| C109                  | 39                          | 218 | C232                  | 66                          | 116 | J110                  | 110                         | 228 | J176                  | 56                          | 111 | L106                  | 109                         | 136 | R423                  | 53                          | 178 |
| C113                  | 5                           | 218 | C234                  | 55                          | 125 | J111                  | 111                         | 213 | J177                  | 106                         | 98  | L107                  | 107                         | 136 | R424                  | 57                          | 200 |
| C114                  | 9                           | 240 | C235                  | 94                          | 86  | J112                  | 133                         | 104 | J178                  | 108                         | 98  | L108                  | 104                         | 136 | R425                  | 59                          | 200 |
| C115                  | 20                          | 218 | C236                  | 94                          | 89  | J113                  | 126                         | 215 | J179                  | 111                         | 98  | L109                  | 131                         | 187 | R426                  | 52                          | 162 |
| C116                  | 67                          | 193 | C237                  | 84                          | 77  | J114                  | 130                         | 215 | J180                  | 50                          | 110 | L110                  | 139                         | 187 | R427                  | 49                          | 162 |
| C117                  | 63                          | 192 | C238                  | 81                          | 77  | J115                  | 133                         | 215 | J181                  | 97                          | 99  | L160                  | 130                         | 43  | SCART1                | 7                           | 196 |
| C119                  | 67                          | 198 | C239                  | 70                          | 81  | J116                  | 136                         | 215 | J182                  | 100                         | 99  | L200                  | 3                           | 149 | SCART2                | 7                           | 130 |
| C120                  | 67                          | 202 | C241                  | 65                          | 81  | J117                  | 138                         | 215 | J183                  | 65                          | 137 | L201                  | 18                          | 155 |                       |                             |     |
| C121                  | 67                          | 206 | C246                  | 58                          | 79  | J118                  | 136                         | 198 | J184                  | 122                         | 123 | L202                  | 18                          | 153 | T270                  | 128                         | 30  |
| C122                  | 60                          | 219 | C247                  | 53                          | 79  | J119                  | 139                         | 198 | J185                  | 122                         | 121 | L203                  | 18                          | 165 | T271                  | 123                         | 24  |
| C123                  | 67                          | 213 | C248                  | 107                         | 77  | J120                  | 142                         | 218 | J186                  | 122                         | 118 | L204                  | 18                          | 161 | T272                  | 113                         | 29  |
| C124                  | 72                          | 218 | C249                  | 95                          | 77  | J121                  | 146                         | 218 | J187                  | 122                         | 116 | L205                  | 4                           | 79  | T273                  | 118                         | 24  |
| C127                  | 87                          | 212 | C250                  | 43                          | 36  | J122                  | 128                         | 233 | J188                  | 122                         | 113 | L206                  | 22                          | 73  | T274                  | 81                          | 18  |
| C128                  | 91                          | 212 | C251                  | 56                          | 15  | J123                  | 132                         | 170 | J190                  | 122                         | 111 | L207                  | 20                          | 73  | T275                  | 85                          | 18  |
| C129                  | 99                          | 220 | C252                  | 38                          | 36  | J124                  | 132                         | 168 | J191                  | 45                          | 150 | L208                  | 18                          | 97  |                       |                             |     |
| C130                  | 99                          | 217 | C253                  | 33                          | 41  | J125                  | 131                         | 143 | J192                  | 45                          | 147 | L209                  | 18                          | 93  | TUNER                 | 9                           | 229 |
| C131                  | 99                          | 211 | C254                  | 28                          | 36  | J126                  | 119                         | 164 | J193                  | 134                         | 116 | L210                  | 61                          | 111 | X101                  | 118                         | 240 |
| C132                  | 107                         | 225 | C255                  | 24                          | 36  | J127                  | 131                         | 146 | J194                  | 118                         | 86  | L211                  | 63                          | 41  | X102                  | 151                         | 230 |
| C133                  | 118                         | 209 | C256                  | 19                          | 26  | J128                  | 80                          | 89  | J195                  | 143                         | 25  | L212                  | 89                          | 45  | X103                  | 115                         | 160 |
| C134                  | 113                         | 204 | C257                  | 19                          | 16  | J129                  | 122                         | 136 | J196                  | 111                         | 86  | L213                  | 103                         | 86  | X104                  | 150                         | 38  |
| C137                  | 113                         | 200 | C258                  | 27                          | 9   | J130                  | 122                         | 132 | J197                  | 108                         | 86  | L214                  | 50                          | 42  | X105                  | 133                         | 97  |
| C138                  | 118                         | 196 | C259                  | 29                          | 9   | J131                  | 133                         | 108 | J198                  | 106                         | 86  | L215                  | 109                         | 44  | X201                  | 101                         | 32  |
| C139                  | 113                         | 190 | C260                  | 32                          | 9   | J132                  | 122                         | 126 | J199                  | 136                         | 56  | L216                  | 16                          | 37  | X202                  | 139                         | 35  |
| C144                  | 118                         | 223 | C261                  | 34                          | 9   | J133                  | 122                         | 128 | J200                  | 92                          | 49  | L260                  | 49                          | 10  | X401                  | 96                          | 141 |
| C145                  | 125                         | 179 | C262                  | 40                          | 11  | J134                  | 112                         | 136 | J201                  | 89                          | 49  | L261                  | 139                         | 18  | X402                  | 83                          | 131 |
| C146                  | 125                         | 176 | C263                  | 46                          | 16  | J135                  | 89                          | 124 | J202                  | 85                          | 49  | L262                  | 136                         | 18  | X403                  | 94                          | 100 |
| C147                  | 113                         | 183 | C265                  | 89                          | 82  | J136                  | 112                         | 124 | J203                  | 83                          | 49  | L263                  | 134                         | 18  | X404                  | 80                          | 125 |
| C149                  | 116                         | 165 | C269                  | 89                          | 42  | J137                  | 83                          | 139 | J204                  | 79                          | 49  | L290                  | 38                          | 48  |                       |                             |     |
| C153                  | 100                         | 160 | C275                  | 99                          | 43  | J138                  | 72                          | 145 | J205                  | 76                          | 49  | L401                  | 57                          | 178 |                       |                             |     |
| C157                  | 95                          | 153 | C276                  | 118                         | 18  | J139                  | 72                          | 148 | J206                  | 45                          | 54  |                       |                             |     |                       |                             |     |
| C159                  | 103                         | 131 | C277                  | 128                         | 18  | J140                  | 72                          | 150 | J207                  | 23                          | 15  | Q201                  | 52                          | 76  |                       |                             |     |
| C160                  | 103                         | 124 | C280                  | 49                          | 158 | J141                  | 72                          | 153 | J208                  | 81                          | 41  | Q401                  | 91                          | 174 |                       |                             |     |
| C162                  | 121                         | 81  | C285                  | 58                          | 102 | J142                  | 83                          | 137 | J209                  | 67                          | 33  | R104                  | 76                          | 233 |                       |                             |     |
| C163                  | 122                         | 58  | C286                  | 50                          | 102 | J143                  | 76                          | 161 | J210                  | 67                          | 31  | R106                  | 76                          | 228 |                       |                             |     |
| C164                  | 120                         | 68  | C287                  | 18                          | 142 | J144                  | 77                          | 168 | J211                  | 67                          | 28  | R107                  | 100                         | 233 |                       |                             |     |
| C165                  | 126                         | 48  | C288                  | 22                          | 56  | J145                  | 72                          | 168 | J212                  | 61                          | 23  | R114                  | 35                          | 241 |                       |                             |     |
| C166                  | 129                         | 165 | C289                  | 51                          | 131 | J146                  | 128                         | 87  | J213                  | 59                          | 38  | R119                  | 77                          | 212 |                       |                             |     |
| C167                  | 126                         | 165 | C290                  | 20                          | 39  | J147                  | 28                          | 131 | J214                  | 56                          | 18  | R120                  | 80                          | 212 |                       |                             |     |
| C168                  | 122                         | 165 | C292                  | 101                         | 82  | J148                  | 40                          | 193 | J215                  | 47                          | 54  | R125                  | 114                         | 222 |                       |                             |     |
| C169                  | 136                         | 111 | C401                  | 91                          | 170 | J149                  | 40                          | 186 | J216                  | 42                          | 55  | R146                  | 113                         | 170 |                       |                             |     |
| C200                  | 61                          | 125 | C402                  | 96                          | 170 | J150                  | 46                          | 162 | J217                  | 40                          | 55  | R147                  | 110                         | 170 |                       |                             |     |
| C201                  | 21                          | 193 | C404                  | 63                          | 185 | J151                  | 43                          | 162 | J218                  | 36                          | 55  | R148                  | 108                         | 170 |                       |                             |     |
| C202                  | 21                          | 185 | C407                  | 57                          | 197 | J152                  | 41                          | 162 | J219                  | 38                          | 50  | R149                  | 105                         | 170 |                       |                             |     |
| C203                  | 21                          | 178 | D101                  | 90                          | 225 | J153                  | 38                          | 162 | J220                  | 38                          | 45  | R171                  | 123                         | 87  |                       |                             |     |
| C204                  | 21                          | 172 | D102                  | 45                          | 238 | J154                  | 28                          | 139 | J221                  | 132                         | 163 | R172                  | 121                         | 87  |                       |                             |     |
| C207                  | 18                          | 148 | D103                  | 153                         | 189 | J155                  | 28                          | 136 | J222                  | 154                         | 158 | R173                  | 126                         | 87  |                       |                             |     |
| C208                  | 18                          | 150 | D104                  | 116                         | 149 | J156                  | 27                          | 127 | J223                  | 103                         | 8   | R186                  | 118                         | 124 |                       |                             |     |
| C209                  | 18                          | 168 |                       |                             |     | J157                  | 28                          | 124 | J224                  | 101                         | 8   | R204                  | 26                          | 190 |                       |                             |     |
| C210                  | 18                          | 159 | F101                  | 55                          | 219 | J158                  | 30                          | 117 | J225                  | 109                         | 8   | R211                  | 26                          | 122 |                       |                             |     |
| C211                  | 29                          | 167 | F102                  | 95                          | 218 | J159                  | 27                          | 113 | J226                  | 118                         | 35  | R212                  | 18                          | 207 |                       |                             |     |
| C212                  | 33                          | 152 | F103                  | 83                          | 218 |                       |                             |     |                       |                             |     | R218                  | 34                          | 162 |                       |                             |     |
| C213                  | 18                          | 127 | F104                  | 127                         | 194 | J160                  | 27                          | 111 | J227                  | 135                         | 48  | R226                  | 65                          | 85  |                       |                             |     |
| C216                  | 16                          | 68  | F105                  | 135                         | 194 | J161                  | 27                          | 108 | J228                  | 70                          | 168 |                       |                             |     |                       |                             |     |
| C217                  | 13                          | 68  | IC102                 | 114                         | 126 | J162                  | 27                          | 106 | J229                  | 151                         | 35  | R229                  | 98                          | 16  |                       |                             |     |
| C218                  | 18                          | 100 | IC202                 | 52                          | 53  | J163                  | 59                          | 111 | J230                  | 65                          | 139 | R230                  | 93                          | 16  |                       |                             |     |
| C219                  | 18                          | 90  | IC203                 | 51                          | 31  | J164                  | 30                          | 93  | J231                  | 113                         | 98  | R233                  | 111                         | 41  |                       |                             |     |
| C220                  | 18                          | 104 |                       |                             |     | J165                  | 30                          | 90  | J232                  | 135                         | 46  | R234                  | 110                         | 38  |                       |                             |     |
| C221                  | 18                          | 86  | J100                  | 22                          | 240 | J166                  | 30                          | 88  | J233                  | 140                         | 43  | R241                  | 38                          | 158 |                       |                             |     |
| C222                  | 18                          | 110 | J101                  | 35                          | 243 | J167                  | 30                          | 85  | J234                  | 65                          | 142 | R261                  | 78                          | 10  |                       |                             |     |
| C223                  | 18                          | 115 | J102                  | 5                           | 213 | J168                  | 30                          | 83  | J235                  | 32                          | 211 | R262                  | 75                          | 10  |                       |                             |     |
|                       |                             |     | J103                  | 53                          | 152 | J169                  | 14                          | 37  |                       |                             |     | R403                  | 53                          | 183 |                       |                             |     |
|                       |                             |     | J104                  | 33                          | 204 |                       |                             |     | JACK3                 | 7                           | 61  | R404                  | 53                          | 181 |                       |                             |     |
| C224                  | 20                          | 69  |                       |                             |     | J170                  | 18                          | 145 | JACK4                 | 9                           | 47  | R405                  | 45                          | 191 |                       |                             |     |

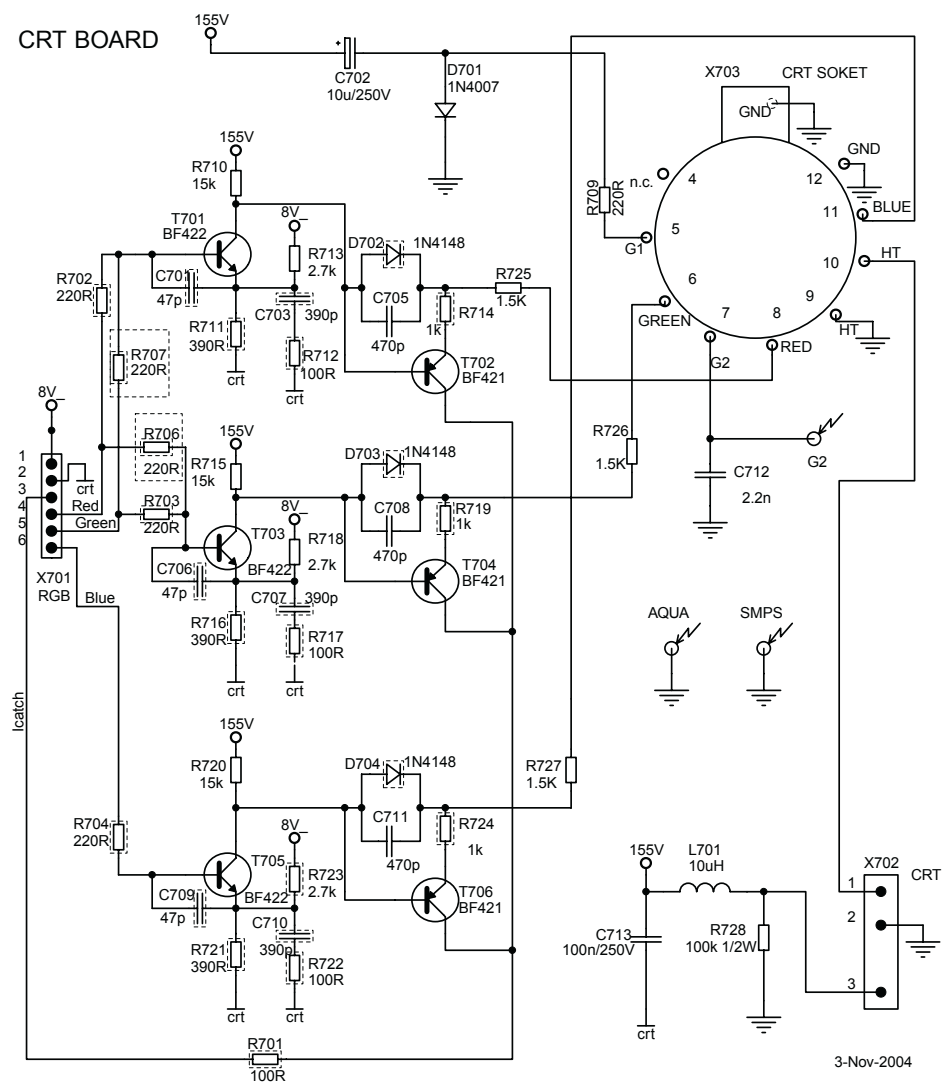
**Koordinaten für die Bauteile der Lötseite (Ansicht von unten)**  
**Coordinates of the Components on the solder side (bottom view)**

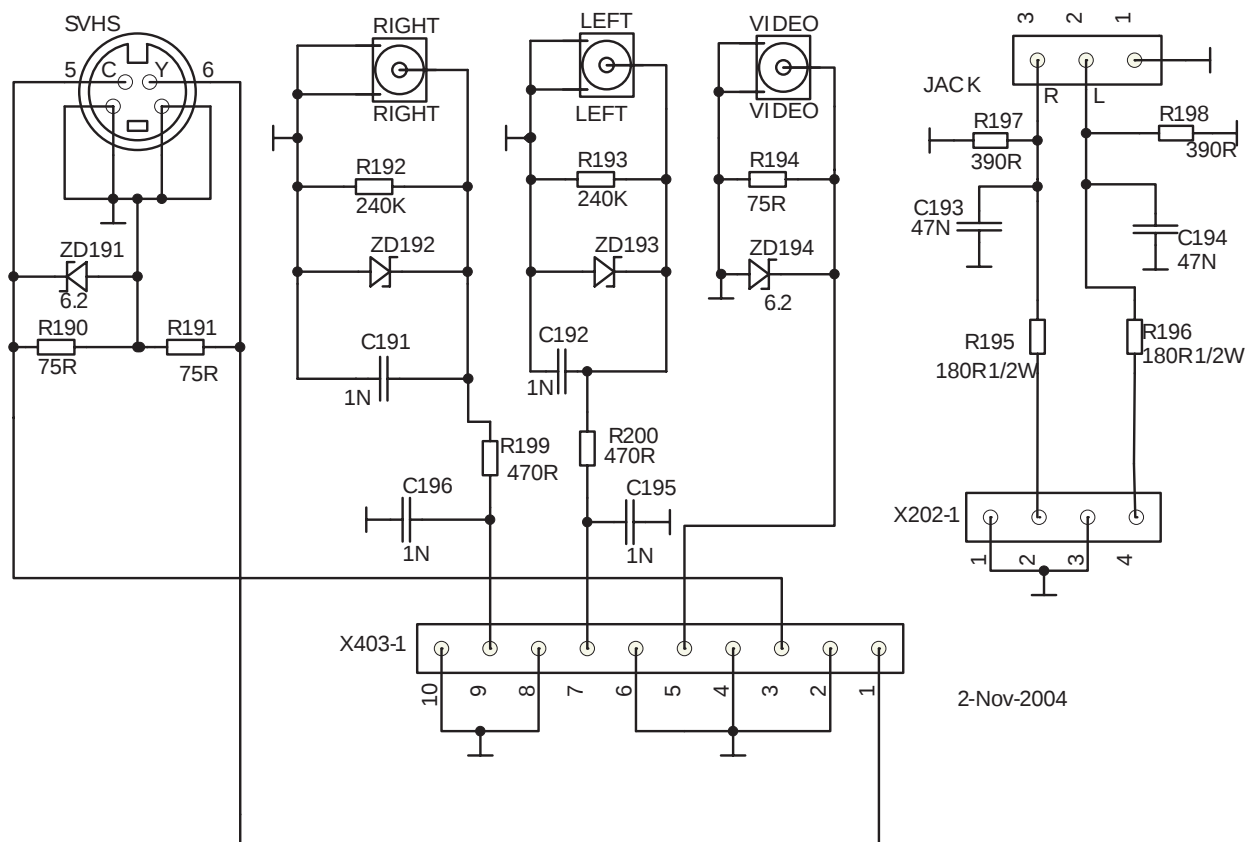
| Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     | Pos.-Nr./<br>Pos. No. | Koordinaten/<br>Coordinates |     |
|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|-----------------------|-----------------------------|-----|
|                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |                       | X                           | Y   |
| C101                  | 70                          | 225 | C279                  | 141                         | 21  | R132                  | 117                         | 213 | R200                  | 10                          | 157 | R251                  | 26                          | 45  |
| C110                  | 32                          | 225 | C281                  | 82                          | 56  | R133                  | 108                         | 200 | R201                  | 15                          | 200 | R252                  | 16                          | 27  |
| C111                  | 27                          | 225 | C282                  | 117                         | 32  | R134                  | 116                         | 198 | R202                  | 18                          | 200 | R253                  | 89                          | 86  |
| C112                  | 22                          | 225 | C283                  | 124                         | 32  | R135                  | 121                         | 198 | R203                  | 16                          | 194 | R254                  | 118                         | 105 |
| C125                  | 78                          | 209 | C284                  | 55                          | 136 | R136                  | 124                         | 201 | R205                  | 16                          | 189 | R291                  | 14                          | 47  |
| C126                  | 78                          | 207 | C291                  | 14                          | 50  | R137                  | 129                         | 198 | R206                  | 16                          | 184 | R292                  | 14                          | 53  |
| C135                  | 133                         | 192 | C403                  | 66                          | 186 | R138                  | 132                         | 198 | R207                  | 16                          | 177 | R293                  | 14                          | 56  |
| C136                  | 120                         | 213 | C405                  | 88                          | 127 | R139                  | 135                         | 185 | R208                  | 16                          | 170 | R294                  | 42                          | 119 |
| C140                  | 133                         | 204 | C406                  | 66                          | 183 | R140                  | 123                         | 188 | R209                  | 20                          | 139 | R295                  | 42                          | 124 |
| C141                  | 128                         | 201 | C408                  | 102                         | 127 | R141                  | 123                         | 191 | R210                  | 17                          | 124 | R408                  | 59                          | 186 |
| C142                  | 125                         | 204 | C418                  | 75                          | 195 | R142                  | 139                         | 184 | R213                  | 23                          | 210 | R417                  | 77                          | 164 |
| C143                  | 125                         | 207 |                       |                             |     | R143                  | 133                         | 202 | R214                  | 10                          | 145 | R418                  | 75                          | 164 |
| C150                  | 110                         | 156 | IC101                 | 93                          | 190 | R144                  | 125                         | 209 | R215                  | 15                          | 145 | R419                  | 45                          | 199 |
| C151                  | 108                         | 156 | IC160                 | 124                         | 146 | R145                  | 55                          | 240 | R216                  | 66                          | 37  | R420                  | 45                          | 196 |
| C152                  | 105                         | 156 | IC201                 | 53                          | 144 | R150                  | 102                         | 167 | R217                  | 68                          | 37  | R422                  | 37                          | 185 |
|                       |                             |     | IC401                 | 50                          | 200 |                       |                             |     |                       |                             |     |                       |                             |     |
| C154                  | 102                         | 171 |                       |                             |     | R151                  | 50                          | 211 | R219                  | 90                          | 56  | R429                  | 83                          | 169 |
| C156                  | 102                         | 164 | R100                  | 72                          | 222 | R160                  | 126                         | 69  | R220                  | 101                         | 48  | R430                  | 98                          | 128 |
| C158                  | 98                          | 155 | R101                  | 49                          | 226 | R161                  | 136                         | 63  | R221                  | 104                         | 48  | R431                  | 72                          | 165 |
| C161                  | 92                          | 156 | R102                  | 67                          | 225 | R162                  | 126                         | 82  | R222                  | 106                         | 36  |                       |                             |     |
| C205                  | 13                          | 152 | R103                  | 73                          | 233 | R163                  | 126                         | 66  | R223                  | 106                         | 39  | T101                  | 71                          | 229 |
|                       |                             |     | R105                  | 67                          | 229 |                       |                             |     |                       |                             |     | T102                  | 100                         | 228 |
| C206                  | 10                          | 152 |                       |                             |     | R164                  | 133                         | 63  | R224                  | 96                          | 35  | T103                  | 18                          | 214 |
| C214                  | 12                          | 85  | R108                  | 97                          | 222 | R165                  | 126                         | 80  | R225                  | 93                          | 35  | T104                  | 51                          | 214 |
| C215                  | 12                          | 82  | R109                  | 91                          | 228 | R166                  | 126                         | 56  | R227                  | 63                          | 105 | T105                  | 46                          | 214 |
| C226                  | 26                          | 210 | R110                  | 89                          | 228 | R167                  | 132                         | 55  | R228                  | 64                          | 48  |                       |                             |     |
| C227                  | 13                          | 145 | R111                  | 94                          | 228 | R168                  | 122                         | 71  | R231                  | 96                          | 16  | T106                  | 125                         | 198 |
|                       |                             |     | R112                  | 26                          | 219 |                       |                             |     |                       |                             |     | T107                  | 126                         | 185 |
| C233                  | 63                          | 119 |                       |                             |     | R169                  | 126                         | 59  | R232                  | 91                          | 16  | T108                  | 138                         | 179 |
| C240                  | 68                          | 78  | R113                  | 24                          | 219 | R170                  | 126                         | 73  | R235                  | 116                         | 27  | T109                  | 119                         | 138 |
| C242                  | 65                          | 68  | R115                  | 51                          | 241 | R174                  | 131                         | 153 | R236                  | 126                         | 27  | T160                  | 126                         | 63  |
| C243                  | 62                          | 75  | R116                  | 55                          | 242 | R175                  | 126                         | 153 | R237                  | 117                         | 21  |                       |                             |     |
| C244                  | 61                          | 68  | R117                  | 16                          | 225 | R176                  | 120                         | 153 | R238                  | 124                         | 21  | T161                  | 131                         | 59  |
|                       |                             |     | R118                  | 68                          | 209 |                       |                             |     |                       |                             |     | T162                  | 126                         | 76  |
| C245                  | 59                          | 68  |                       |                             |     | R177                  | 129                         | 153 | R239                  | 38                          | 70  | T163                  | 130                         | 158 |
| C264                  | 92                          | 79  | R121                  | 87                          | 207 | R178                  | 123                         | 153 | R240                  | 87                          | 39  | T164                  | 126                         | 158 |
| C266                  | 97                          | 68  | R122                  | 102                         | 215 | R179                  | 118                         | 153 | R242                  | 47                          | 155 | T165                  | 121                         | 158 |
| C267                  | 68                          | 56  | R123                  | 104                         | 205 | R180                  | 79                          | 202 | R243                  | 45                          | 143 |                       |                             |     |
| C268                  | 66                          | 56  | R124                  | 114                         | 217 | R181                  | 118                         | 187 | R244                  | 106                         | 33  | T201                  | 24                          | 197 |
|                       |                             |     | R126                  | 69                          | 195 |                       |                             |     |                       |                             |     | T202                  | 22                          | 123 |
| C270                  | 106                         | 48  |                       |                             |     | R182                  | 93                          | 142 | R245                  | 106                         | 31  | T203                  | 101                         | 36  |
| C271                  | 99                          | 48  | R127                  | 123                         | 193 | R183                  | 93                          | 145 | R246                  | 43                          | 28  | T204                  | 101                         | 40  |
| C272                  | 92                          | 56  | R128                  | 147                         | 227 | R184                  | 115                         | 206 | R247                  | 40                          | 26  | T205                  | 30                          | 51  |
| C273                  | 95                          | 56  | R129                  | 129                         | 161 | R185                  | 89                          | 156 | R248                  | 26                          | 56  |                       |                             |     |
| C274                  | 98                          | 56  | R130                  | 135                         | 183 |                       |                             |     | R249                  | 26                          | 52  | T206                  | 30                          | 56  |
|                       |                             |     | R131                  | 114                         | 213 | R187                  | 55                          | 103 |                       |                             |     | T401                  | 40                          | 190 |
| C278                  | 131                         | 21  |                       |                             |     | R188                  | 89                          | 221 | R250                  | 33                          | 55  |                       |                             |     |

ZL5.194 - Bildrohrplatte / CRT Board

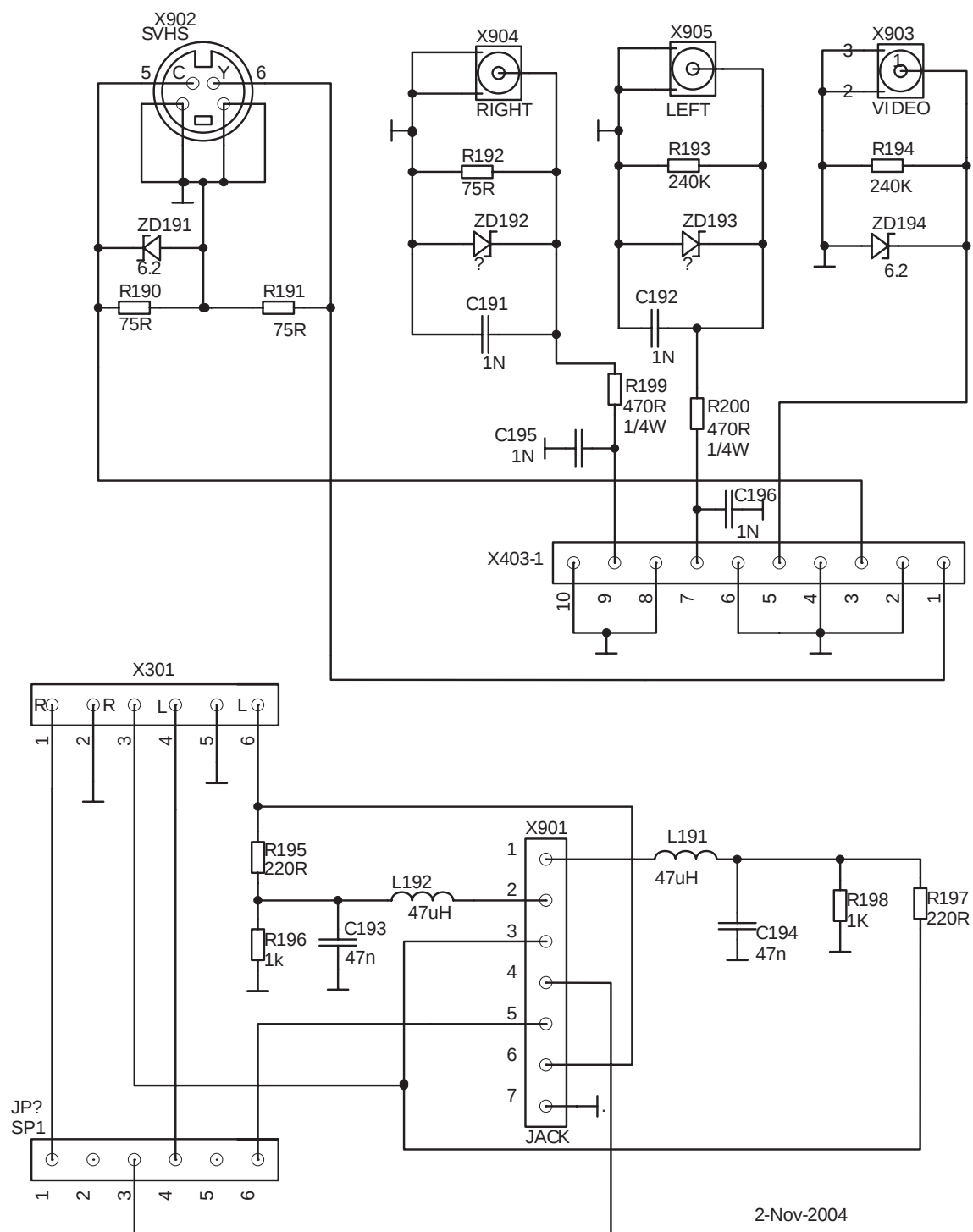


## ZL6.194 - Bildrohrplatte / CRT Board



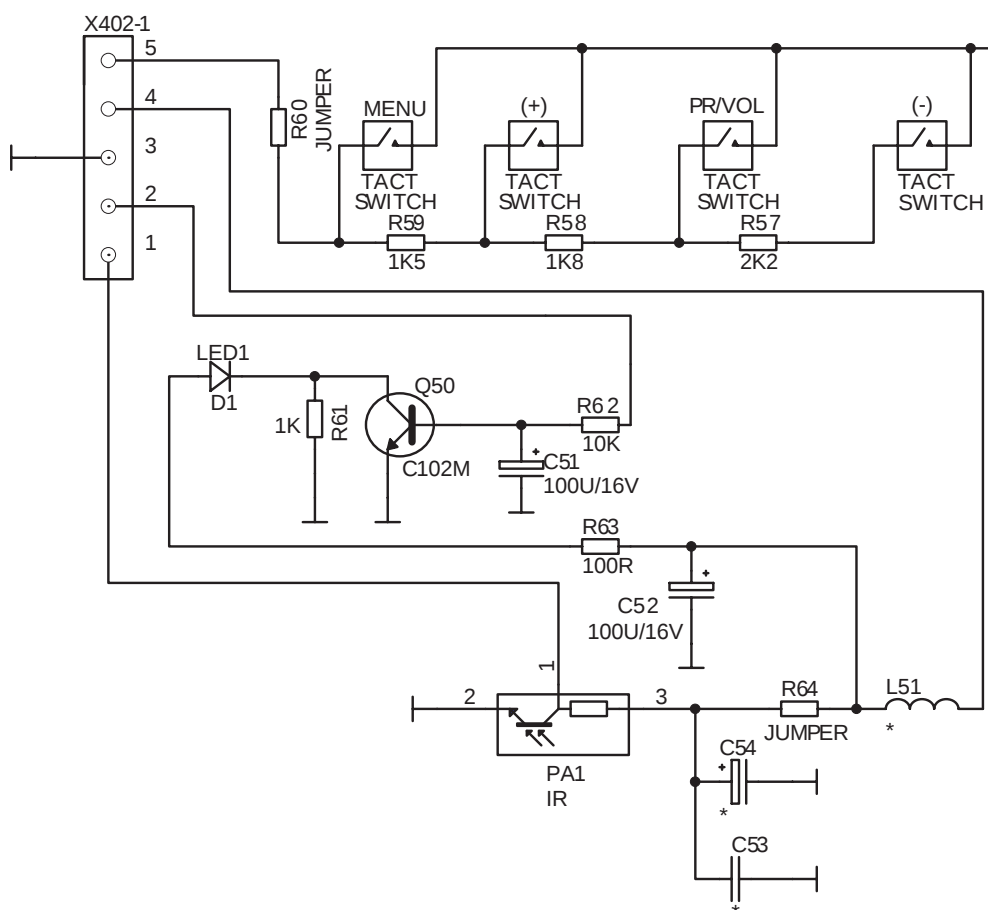
**ZL5.192-01 - AV-Platte / AV Board**

## ZL6.192-02 - AV-Platte / AV Board

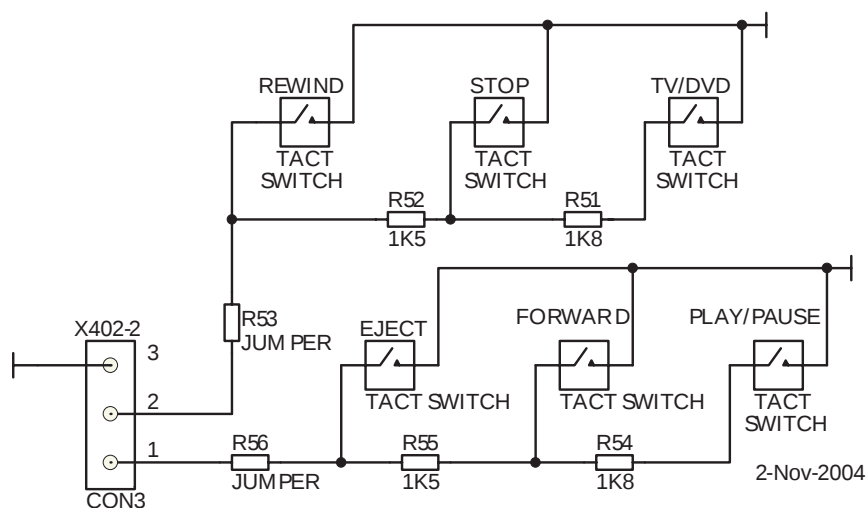


2-Nov-2004

## ZL5.191 - Bedienplatte / Keyboard



## ZL5.195 - Bedienplatte / Keyboard



2-Nov-2004

## ZL6.191 - Bedienplatte / Keyboard

