# Digital Compact Cassette Recorder 70DCC600

/00B/05B/06B

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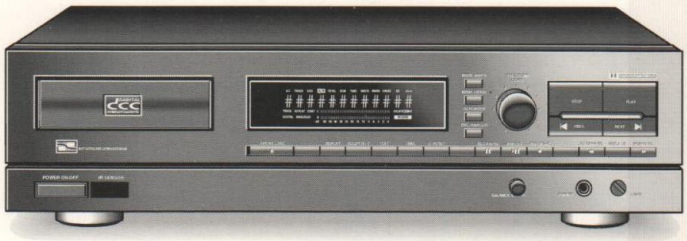

# Service Manual

DIGITAL dcc COMPACT CASSETTE

## TABLE OF CONTENTS



Published by Consumer Electronics Printed in The Netherlands  4822 725 24031

PHILIPS

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PCS 60 385

# TECHNICAL SPECIFICATIONS

## GENERAL:

| | |
|---|---|
| Power supply | : 115 / 230V ±15% switchable |
| Power consumption | : 30W max.<br>5W max. in stand by |
| Dimensions (w x h x d) | : 360 x 102 x 300mm |
| Weight | : 2,5kg |

## DIGITAL I/O:

| | |
|---|---|
| Format | : AES/EBU according IEC958 |
| Sampling frequency | : 32kHz / 44,1kHz / 48kHz ±0,1% |
| Unbalanced chinch | : 75Ω |

## ANALOG IN *(digital recording from analog input)*

| | |
|---|---|
| Sampling frequency | : 44,1kHz |
| Input sensitivity | : 150mV |
| Max. input voltage | : 2Vrms ±2dB |
| Input impedance | : 50kΩ |

## ANALOG OUT *DCC PLAYBACK (DAC performance)*

| | |
|---|---|
| Output voltage | : 2Vrms ±2dB (0dB digital level) |
| Frequency range | : 20Hz..14,5kHz at fs = 32kHz<br>20Hz..20kHz at fs = 44,1kHz<br>20Hz..22kHz at fs = 48kHz |
| Amplitude linearity | : ±0,5dB |
| Phase non-linearity | : 2° max. at 1kHz |
| Channel unbalance | : <0,5dB at 1kHz |
| Output resistance | : 200Ω |
| Outband attenuation | : 60dB above 30kHz |
| Channel separation | : 80dB at 1kHz<br>70dB at 20Hz..20kHz |
| Muting (search) | : 100dB |
| SNR | : 90dB / 93dBA typ. |
| THD + noise | : 85dB at 1kHz<br>82dB at 20Hz..20kHz |

## ANALOG OUT *DCC RECORD & PLAYBACK (ADC & DAC performance)*

| | |
|---|---|
| Output voltage | : 2Vrms ±2dB |
| Frequency range | : 20Hz..14,5kHz at fs = 32kHz<br>20Hz..20kHz at fs = 44,1kHz<br>20Hz..22kHz at fs = 48kHz |
| Amplitude linearity | : ±0,5dB |
| Phase non-linearity | : 2° max. at 1kHz |
| Channel unbalance | : <2dB |
| Output resistance | : 200Ω |
| Outband attenuation | : 60dB above 30kHz |
| Channel separation | : 80dB at 1kHz<br>70dB at 20Hz..20kHz |
| Muting (search) | : 100dB |
| SNR | : 85dB / 88dBA |
| THD + noise | : 82dB at 1kHz<br>80dB at 20Hz..20kHz |

## ANALOG OUT *ACC*

| | |
|---|---|
| Output voltage | : 0,84Vrms ±2dB (200nWb/m) |
| Amplitude linearity | : 40Hz..14kHz within 5dB<br>250Hz..10kHz within 3dB |
| Phase non-linearity | : 2° max. at 1kHz |
| Channel unbalance | : <3dB |
| Output resistance | : 200Ω |
| Channel separation | : 26dB at 1kHz<br>46dB at 20Hz..20kHz |
| Muting (search) | : 100dB |

SNR

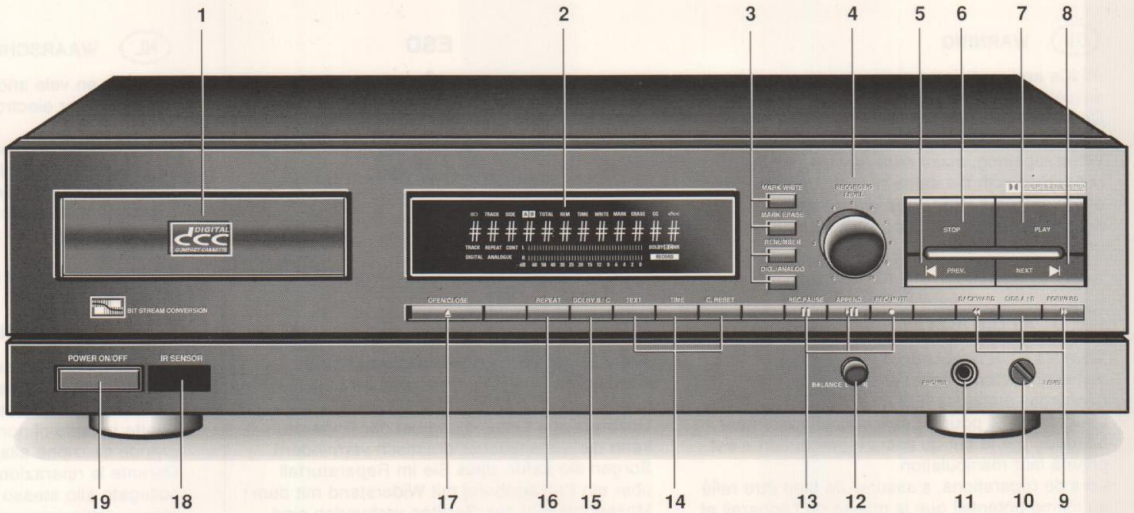
| Dolby-mode | Fe (type I) | Cr (type II) |
|---|---|---|
| Dolby off | 47dB | 50dB |
| Dolby B | 56dB | 59dB |
| Dolby C | 64dB | 67dB |

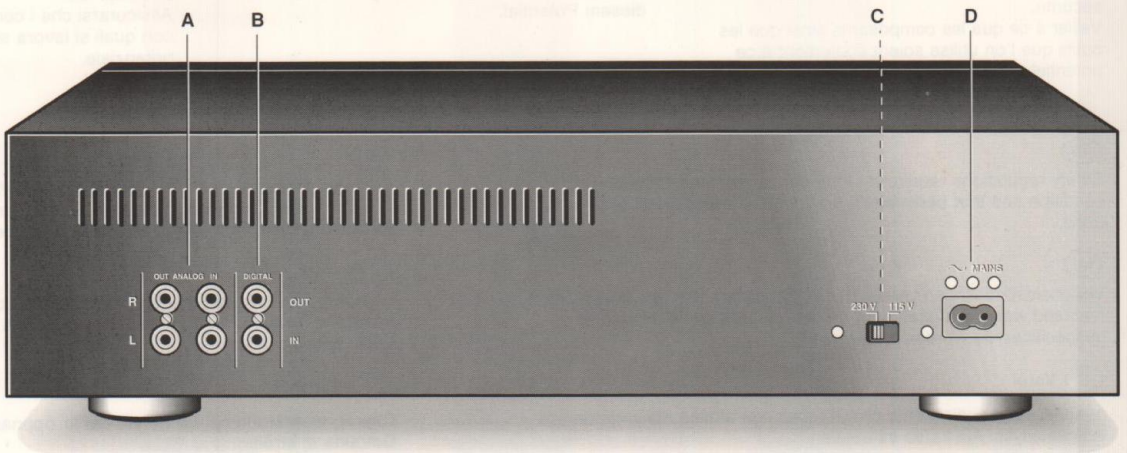
THD : <3%

## HEADPHONE OUTPUT *DCC PLAYBACK*

| | |
|---|---|
| Output voltage | : 5Vrms max. |
| Channel unbalance | : <4dB |
| Output impedance | : 140Ω |
| Load impedance | : 32 / 120 / 600Ω |
| Output power | : 27 / 44 / 27mW |
| Channel separation | : 75dB typ. at 1kHz |
| Muting (search) | : 100dB |
| SNR | : 88dB |
| THD + noise | : 82dB at 1kHz/-3dB |

# CONTROLS AND CONNECTIONS




## CONTROLS

| Indication on Recorder | | Indication in Diagram |
|---|---|---|
| 1. | Cassette Holder | |
| 2. | Display | 1400 |
| 3. | MARK WRITE | 1413 |
| | MARK ERASE | 1417 |
| | RENUMBER | 1412 |
| | DIG./ANALOG | 1409 |
| 4. | RECORDING LEVEL | 3312 |
| 5. | PREVIOUS | 1415 |
| 6. | STOP | 1404 |
| 7. | PLAY | 1402 |
| 8. | NEXT | 1414 |
| 9. | BACKWARD | 1421 |
| | SIDE A-B | 1419 |
| | FORWARD | 1416 |
| 10. | LEVEL | 3365 |
| 11. | PHONES | 1311 |
| 12. | BALANCE | 3311 |
| 13. | REC. PAUSE | 1403 |
| | APPEND | 1406 |
| | REC/MUTE | 1407 |
| 14. | TEXT | 1410 |
| | TIME | 1418 |
| | COUNTER RESET | 1411 |
| 15. | DOLBY B/C NR | 1405 |
| 16. | REPEAT | 1420 |
| 17. | OPEN/CLOSE | 1401 |
| 18. | IR SENSOR | 7410 |
| 19. | POWER ON/OFF | 1204 |

## CONNECTIONS

| Indication on Recorder | | Indication in Diagram |
|---|---|---|
| A. | ANALOG IN | 1301 |
| | ANALOG OUT | 1306 |
| B. | DIGITAL IN | 1315 |
| | DIGITAL OUT | 1315 |
| C. | VOLTAGE SELECTOR | 1203 |
| D. | MAINS | 1202 |

# WARNINGS

**(GB) WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

**ESD**

**(NL) WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**(F) ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**(D) WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD).
Unsorgfältige Behandlung bei der Reparatur kann die Lebensdauer drastisch vermindern.
Sorgen sie dafür, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

**(I) AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**(GB)**

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

**(NL)**

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

**(S)** Varo!

Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Alä katso säteeseen.

**(D)**

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

**(I)**

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago identici a quelli specificati.

**(SF)** Varning!

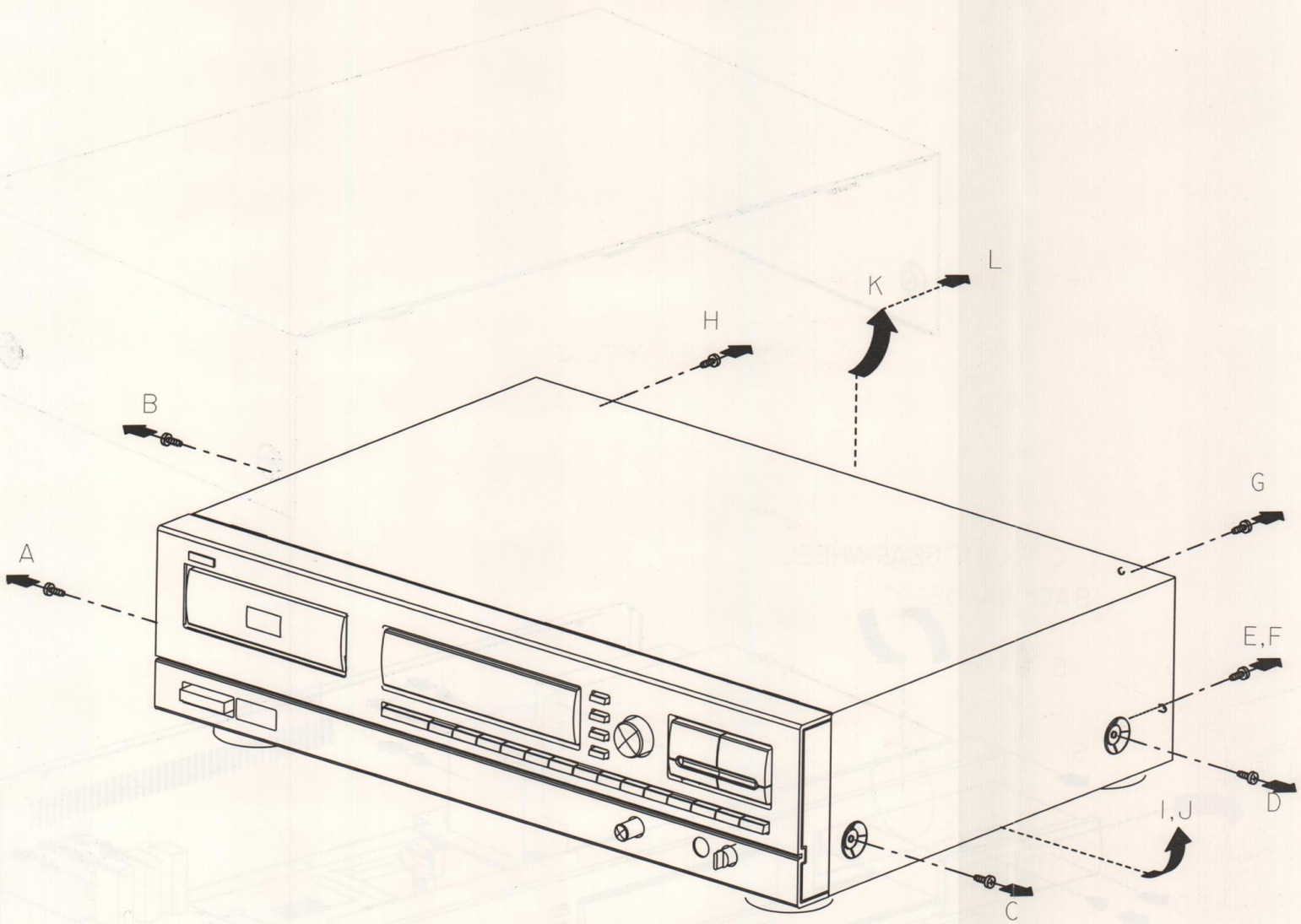
Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

**(F)**

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

## DISMANTLING INSTRUCTIONS
## DEMOUNTING COVER

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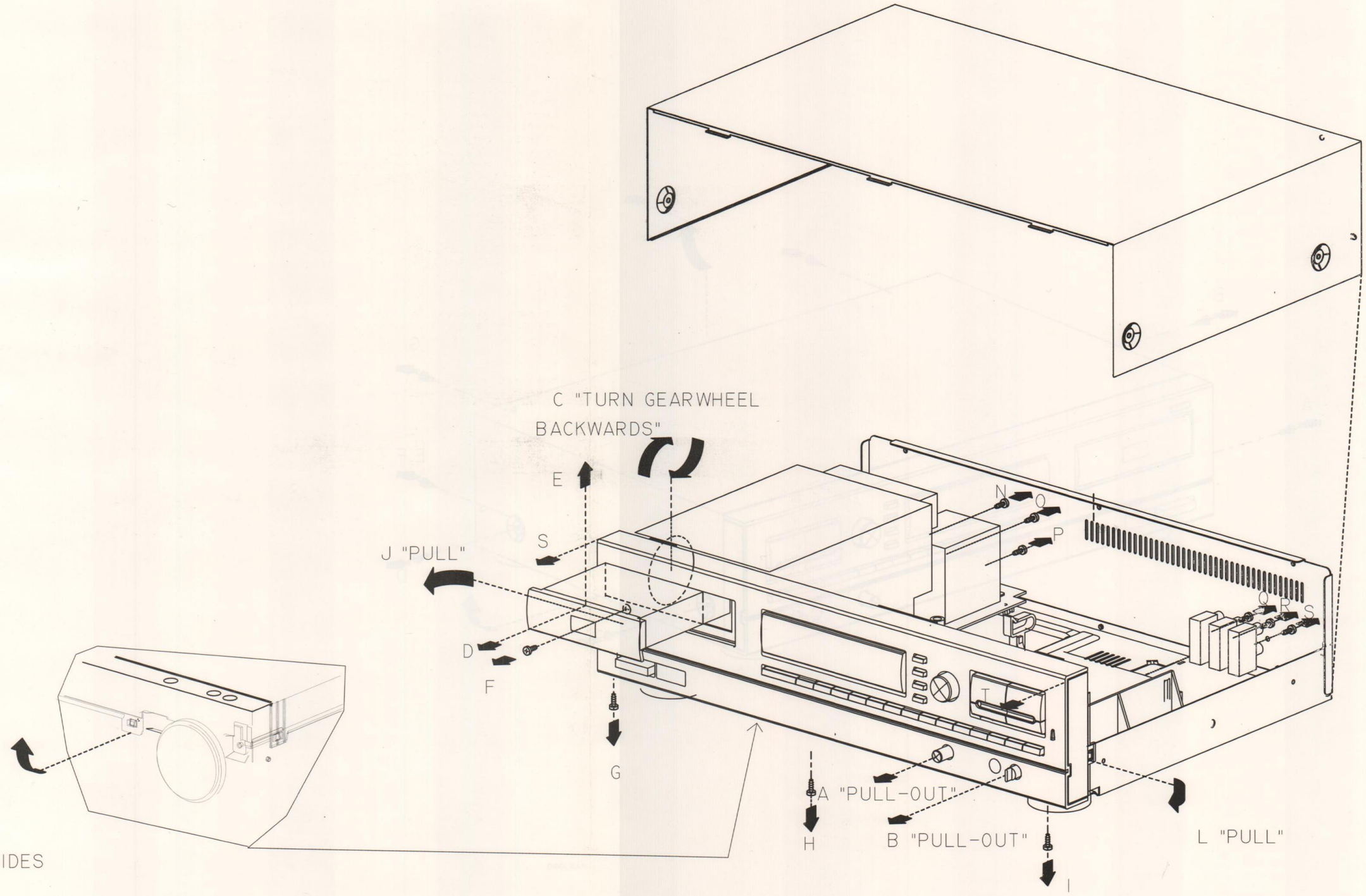
C. If the tray does not move properly you can use a screw driver



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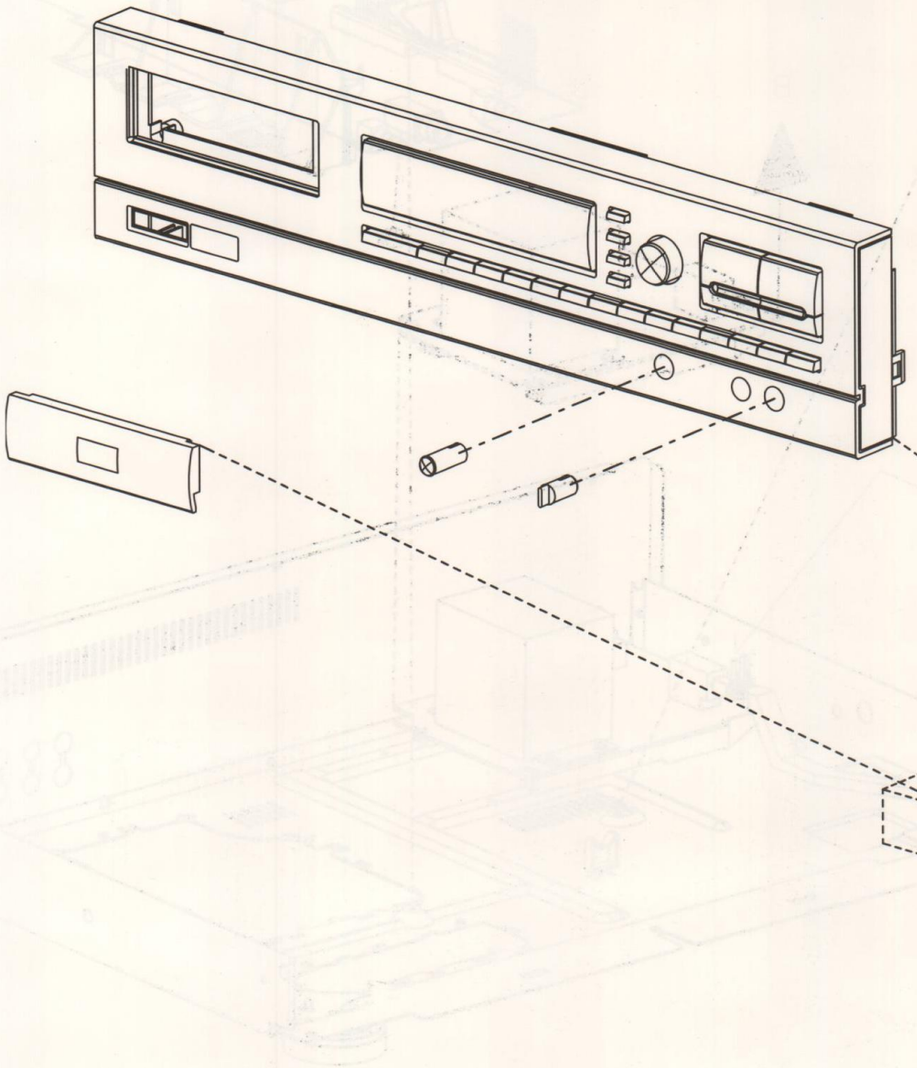
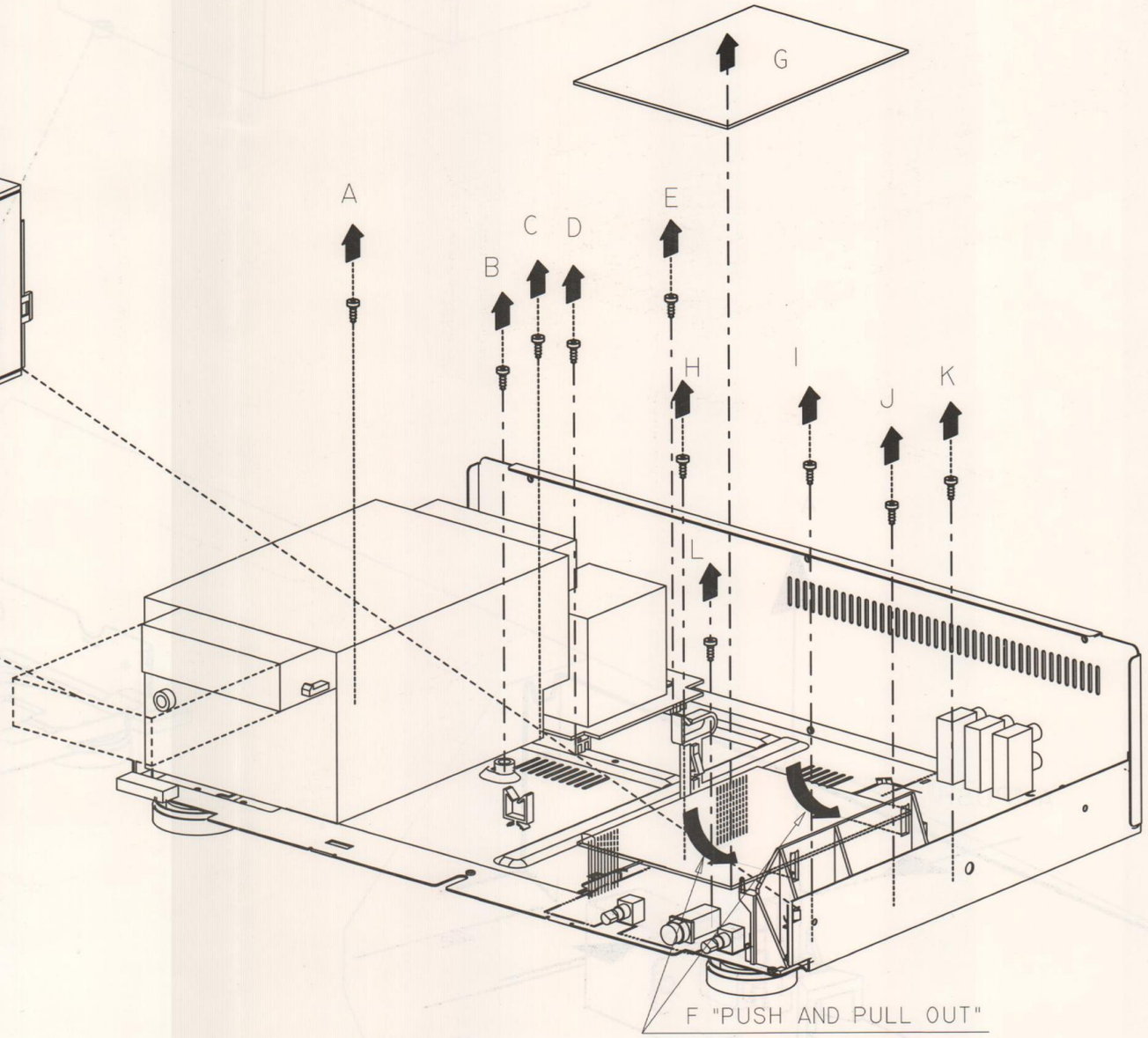
## DEMOUNTING DIGITAL BOARD



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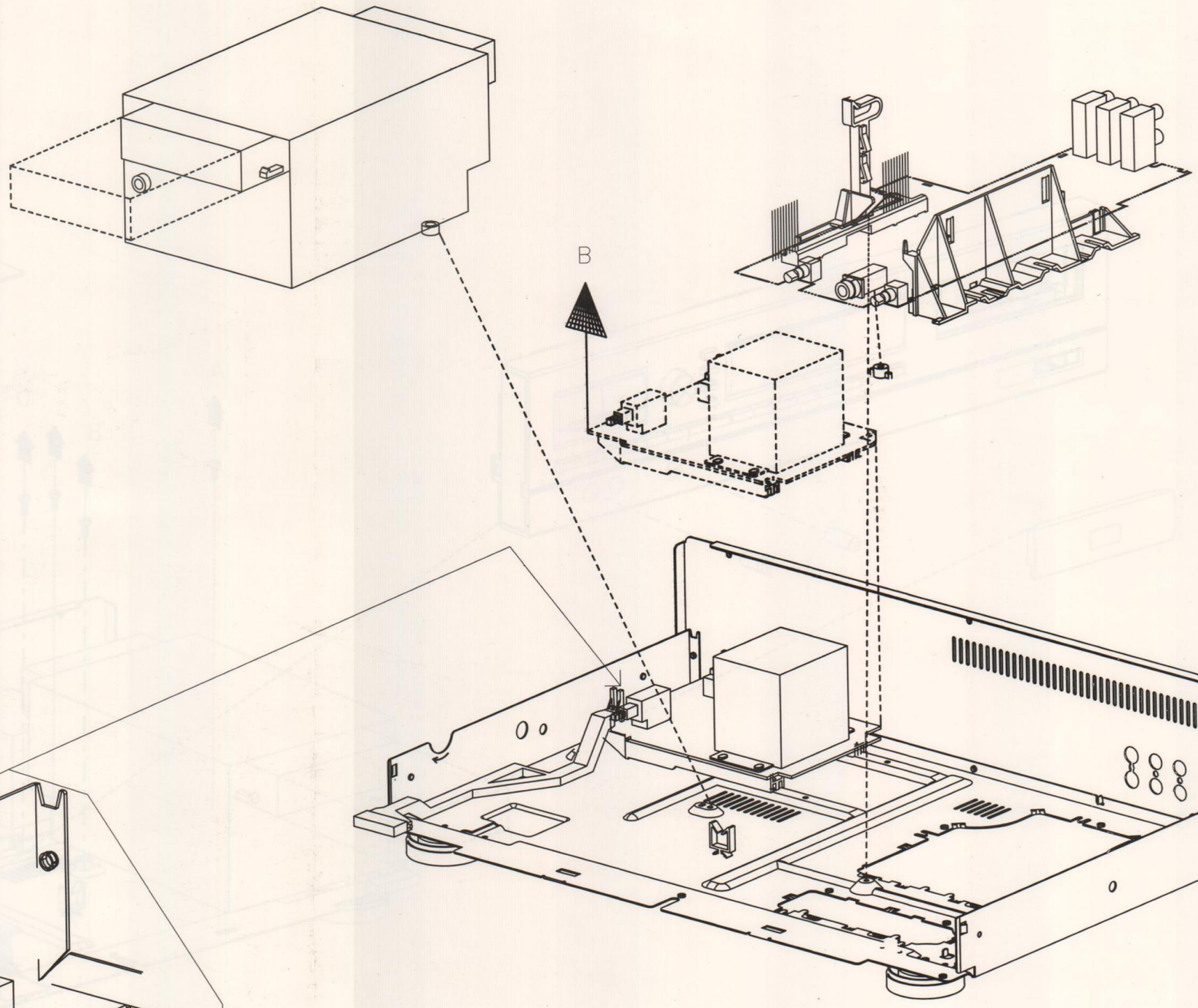
**DEMOUNTING POWER SUPPLY**
**MAIN PANEL**
**TAPE DECK**

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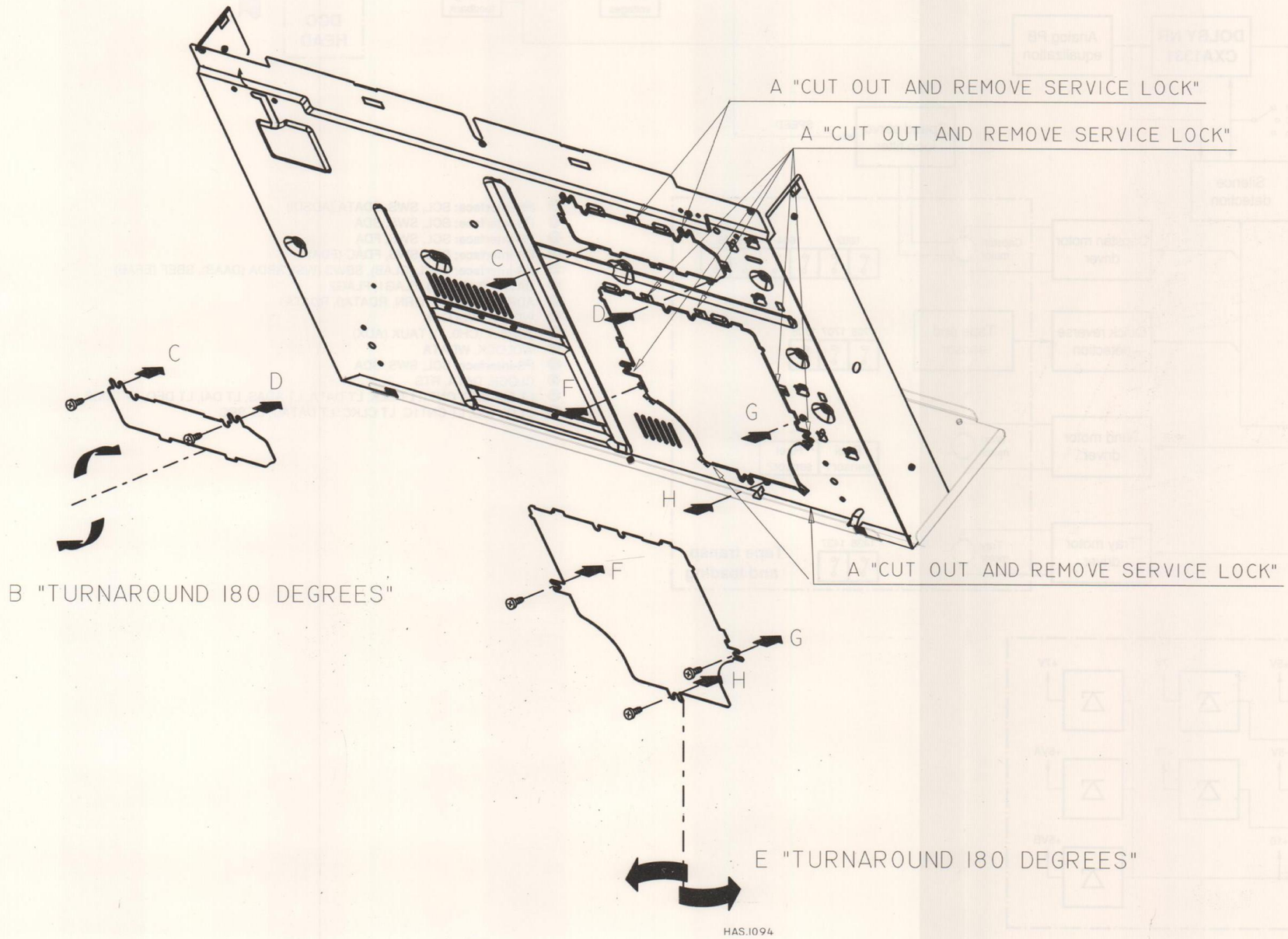
## OPENING AND CLOSING SERVICE COVER

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# BLOCKDIAGRAM




0 **I²S-interface:** SCL, SWS, SDATA (ADSDI)
1 **I²S-interface:** SCL, SWS, SDA
2 **I²S-interface:** SCL, SWS, FDA
3 **I²S-interface:** SCL, SWS, FDAC (FDA)
4 **I²S-interface:** SBCL (CLAB), SBWS (WS), SBDA (DAAB), SBEF (EFAB)
5 DATA0..7 (ED0..7), FLAG1, FLAG2
6 ADRS0..7, RASN, WRN, RDATA0, RDATA1
7 WDATA, WCLOCK
8 TCH0..7 (CH0..7), TAUX (AUX)
9 WCLOCK, WDATA
10 **I²S-interface:** SCL, SWS, SDA
11 CLOCK, DATA, RTS
12 LT CNT0, LT CNT1, LT CLK, LT DATA, LT ADAS, LT DAI, LT DEQ, LT DDSP
13 LT CNT0C, LT CNT1C, LT CLKC, LT DATAC, LT SBC

# Description of signal names

| *Signal name* | *Signal flow* | *Function* | *Explanation* |
|---|---|---|---|
| 128Fs | SBC → n.c. | clock | Clock output from SBC, 128 x sampling frequency. |
| 256Fs | SBC ↔ DAI<br>SBC → SBF<br>SBC → ADC<br>SBC → DAC<br>SBC → ADAS | system clock | Master clock signal (256 x sampling frequency) for SBF, DAI, ADC, DAC and ADAS. Is generated by SBC with exception of the mode Digital Record. In that case the DAI is the MASTER and supplies 256Fs on MSTCK pin. See also MSTCK.<br>Fs=32 kHz for DAB, DSR or BS (digital audio broadcast).<br>Fs = 44.1 kHz for CD and DCC.<br>Fs=48 kHz for professional recording and DAT. |
| ADRS0<br>ADRS1<br>ADRS2<br>ADRS3<br>ADRS4<br>ADRS5<br>ADRS6<br>ADRS7 | DDSP → DRAM | address lines | 8 address lines to DRAM to locate an address for writing data into or reading data from memory. |
| ADSDI | ADC → DAI | analog/digital serial data input | DAI input for serial data from AD convertor (see also S-DATA). |
| ADSEL | DAI → gnd | control line | Serial data output source selection |
| ANA L<br>ANA R | read amp → analog Pb equalization | signal line | Analog signal left (right) channel playback analog compact cassette. |
| ASL | DAI → +5V | control line | Audio sample length selection |
| ATT | SBC → DAC | attenuation | Data input for DAC to set his attenuation register. |
| ATTDAC | SBC → DAC | attenuate DAC | Control line (output from SBC) connected to DAC attenuation input. |
| AUX | DEQ → DDSP | auxiliary channel output | Sliced output from DEQ of auxiliary channel data (bit rate 12 kb/s) routed to DDSP input TAUX. |
| AUXENV | DEQ → Main µP | auxiliary envelope | Digital representation of the AUX signal and monitors during DCC search mode the start of a track. |
| AZCHK | DDSP → test pin | azimuth check | Monitors the azimuth of channels 0 and 7 (output of DDSP). |
| BIASA<br>BIASD | DEQ → high<br>DEQ → low | control line<br>control line | Bias current for internal A/D converter of DEQ2<br>Bias current for internal A/D converter of DEQ2 |
| CAP A<br>CAP B | Capstan motor → speed control | control line | Via connection points A and B of capstan motor the reference of the integrated speed control is controlled by the additional external speed control. |
| CAPSTAN | Main µP → 7359 | control line | Low output level switches the capstan motor on. |
| CASN | DDSP → DRAM | control line | Column address strobe for DRAM |
| CH0<br>CH1<br>CH2<br>CH3<br>CH4<br>CH5<br>CH6<br>CH7 | DEQ → DDSP | channel n | DEQ channel n output to DDSP inputs TCH0..TCH7. |
| CHROME | RE Deck electronic → Analog Pb equalization | control line | Indication if a chrome analog cassette is inserted. Chrome Cassette is high level. |

| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| CKACO | DAI → n.c. | Testpin | Frequency accuracy check output. (1=frequency deviation > 0,14% = error condition) |
| CLAB | ERCO ↔ SBC | $I^2S$ bit clock | Bit clock I/O from ERCO directly connected to SBC I/O SBCL pin (see also SBCL). |
| CLOCK | Main µP → Front µP | clock | Clock frequency for data transfer. |
| CLK22 | SBC → n.c. | 22.5792 MHz clock output | |
| CLK24 | SBC → DDSP<br>SBC → DEQ<br>SBC → ADAS | 24.576 MHz master clock | Master clock from SBC to DDSP, ADAS and DEQ to determine the length of tape frame and inter frame gap. In case of a digital recording this clock is not synchronous with the sampling frequency and its related frequencies, coming from the DAI (see also F24). |
| DAAB | ERCO ↔ SBC | serial data ($I^2S$) | Bidirectional $I^2S$ serial data line between ERCO and SBC (see also SBDA). |
| DATA | Front µP ↔ Main µP | data line | Communication line Front µP - Main µP. |
| DATA0<br>DATA1<br>DATA2<br>DATA3<br>DATA4<br>DATA5<br>DATA6<br>DATA7 | ERCO ↔ DDSP | data line n | Parallel data lines for symbol transfer between ERCO and DDSP. DDSP is the master.<br>See also ED0 ... ED7. |
| DCC RESET | Main µP → ADAS<br>Main µP → DAI<br>Main µP → DDSP | control line | Reset output for Main µP for digital board. |
| DEEMDAC | SBC ↔ DAC | deemphasize DAC | Control line for DAC |
| DET1<br>DET2 | sensor tape counter →<br>Main and Front µP | Indication of reel movement | Signals enable the µP:<br>- to detect if both reels move - tape end indication<br>- source for tape counter<br>- to calculate speed while WIND and REWIND<br>- position of tape |
| DIGEYE | DEQ → test pin | digital eye output | Serial data output signal to obtain digital eye pattern to test equalization performance of the channels. See also VAL. |
| DIG OFF | MUTE circuit → DAI | control line | Mutes the DAI during switch on/off the set additional to the analog outputs. |
| DMUTE | Main µP → read amp | control line | Mutes the digital part of the read amplifier when playing analog cassettes. |
| EASY LINK | | Easy link bus | Easy link bus enables to control the set via another set (e.g. amplifier).<br>Easy link command to/from internal µP to external set. |
| EL in<br>EL out | Easy link interface ↔ Front µP | | |
| EL switch | easy link indication →<br>Front µP | control line | Indication for Front µP if set is equipped with Easy link input. |
| ED0<br>ED1<br>ED2<br>ED3<br>ED4<br>ED5<br>ED6<br>ED7 | DDSP ↔ ERCO | Erco data line | Bidirectional parallel databus between DDSP and ERCO.<br>See also DATA0 ... DATA7. |



| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| EFAB | ERCO → SBC | Error flag | $I^2S$ error flag directly connected to SBC input SBEF to give the error status of bytes being transferred during data playback (see also SBEF). |
| F24 | DDSP ← SBC<br>DEQ ← SBC | 24.576 MHz master clock | Master clock from SBC to DDSP and DEQ to determine the length of tape frame and inter frame gap. In case of a digital recording this clock is not synchron with the sampling frequency and its related frequencies, coming from the DAI (see also CLK24). |
| FAST | Main µP → wind motor driver | control line | High output level switches +12V supply to the motor bridge in order to obtain high speed. |
| FDA | SBF ↔ ADAS<br>SBC ↔ ADAS | filtered data | Bidirectional serial data line between SBF and ADAS respectively SBC and ADAS.<br><br>Data transfer in $I^2S$ format, carrying 32 sub-band channels digital audio data (see also FDAF and FDAC). Each SWS period 2x18 bits data are transferred. |
| FDAC | ADAS ↔ SBC | filtered data | Filtered data transfer between ADAS and SBC (see also FDA). |
| FDAF | ADAS ↔ SBF | filtered data | Filtered data transfer between ADAS and SBF (see also FDA). |
| FDIR | SBC → SBF<br>SBC → ADAS | direction control | Control line output from SBC to SBF and ADAS to indicate the mode of operation. FDIR=1; decoding mode (sub-band synthesis)<br>FDIR=0; encoding mode (sub-band analysis). |
| FLAG1<br>FLAG2 | ERCO ↔ DDSP | data bus flag | Data lines for symbol transfers between ERCO and DDSP. DDSP acts as the master (see also ED8 and ED9). |
| FLAGI | DAI → gnd | error flag | Error flag input |
| FLAGO | DAI → n.c. | error flag | Error flag output |
| FRESET | SBC → SBF<br>SBC → ADAS | filter reset | Reset output from SBC to cause a general reset for SBF and ADAS. |
| FSYNC | SBC → SBF<br>SBC → ADAS | filter synchro-nization | At filter sync, with a repetition rate of Fs/32, the transfer of the 2x32 sub-band samples is started. Fsync ensures each SBF is synchronized with the SBC to permit only transfer of sub-band 0 data during FSYNC. |
| HRESET | mute circuit → Front µP | control line | Switches Front µP on/off. Via mute circuit there is detected if the set is switched on or off. Via the HRESET line the front µP gets this info |
| ICLAMP | write amp → 1706 | clamp circuit output | During the periods, when the head elements are not selected, the write current is directed through the external resistor connected to ICLAMP. |
| IFL | DDSP → ERCO | imposed flag | During the ERCO encoding mode the IFL line from DDSP is used to force the symbol currently transferred to the ERCO to become a parity symbol during ERCO encoding. |
| IIS | DAI → +5V | control line | $I^2S$ Bus format selection (1=$I^2S$ Bus, 0=non $I^2S$ Bus format) |
| IMSTART | DAI → Main µP | information message start | Control line from DAI to main µP to indicate the start of a message transfer. |

| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| IN0<br>IN1<br>IN2<br>IN3<br>IN4<br>IN5<br>IN6<br>IN7 | Head → read amp | data lines | Head signals of main data channels 0-7 |
| INAUX | Head → read amp | data line | Head signal of auxiliary data. |
| INHERCO | DDSP → ERCO | inhibit ERCO | Control line output of DDSP to inhibit the ERCO for settings transfer. These settings determine whether the ERCO should encode or decode (see also SETINH). |
| INL | Head → read amp | analog data line | Analog input signals from DCC head |
| INMFL | read amp → | feedback line | Magnetic feedback amplifier input left |
| INMFR | read amp → | feedback line | Magnetic feedback amplifier input right |
| INR | Head → read amp | analog data line | Analog input signals from DCC head |
| INTL | DAC → L-ch | integrator left | Analog output of the DAC (outputs from the left positive and negative switched-capacitor integrator) to the left channel amplifier stage. |
| INTR | DAC → R-ch | integrator right | Analog output of the DAC (outputs from the right positive and negative switched-capacitor integrator) to the right channel amplifier stage. |
| IOSC1 | ERCO ← SBC | input oscillator | Oscillator input for ERCO coming from the sub-band coder SBMCLK output. The nominal frequency is 6.144 MHz. See also SBMCLK. |
| IRQU | DAI → µP | information request microprocessor | Control line to indicate the main microprocessor information can be read. |
| $I^2S$-bus | | inter IC sound | 3-line serial bus consisting of a line for two time-multiplexed audio data channels, a word select line for indication of the channel being transmitted (left or right) and a clock line. The lines are called SD, WS and SCK. The device which generates the SCK and WS is the master. See also SCK, SWS and SDA. |
| L-IN | Relay 1307 → ADC | signal line | Analog signal input left channel for ADC from recording amplifier or dolby IC selected by relay 1307. |
| L-OUT | DAC → line out amp | signal line | Analog signal output left channel of DAC. |
| LABEL | DEQ → µP | label | Search mode label detection output of DEQ signals that a label is found in the AUX-channel. When DCC player is in search mode, the tape speed increases. LABEL information is encoded throughout its length. To examine the length of a label, the tape speed must be known. In search mode DEQ assesses the speed of labelled tapes. The microprocessor obtains this information via the LT-interface. |
| LEVEL | Main µP → silence detection | control line | Control signal to adapt the silence detection circuit to the tape speed. (High speed during search, Normal speed in Rec mode.) |
| L/R | ADC ← | L/R clock input | Word clock input for the ADC |
| LRCKPOL | DAI → gnd | control line | polarity of LRCK selection |



| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| LT-Bus | µP → DAI<br>µP → ADAS<br>µP → DEQ<br>µP → DDSP | | LT-interface is used for the system control of the digital panel. The LT-interface consists of clock-, data-, control- and enable lines. |
| LTC-Bus<br>LTCLKC<br>LTCNT0C<br>LTCNT1C<br>LTDATAC<br>LTSBC | ADAS → SBC | | LTC-interface is mainly used for transfer of allocation information from ADAS to SBC. (Encoding mode) The LTC-interface consists of clock-, data-, control- and enable lines. |
| LTCLK | µP → DAI<br>µP → ADAS<br>µP → DEQ<br>µP → DDSP | LT-clock | Bit clock line for the LT-interface. Main microprocessor supplies the bit clock and acts as master whilst the other devices perform as slaves. |
| LTCLKC | | LTC-clock | Bit clock line for the LTC-interface. Main microprocessor supplies the bit clock and acts as master whilst the other devices perform as slaves. |
| LTCNT0<br>LTCNT1 | µP → DAI<br>µP → ADAS<br>µP → DEQ<br>µP → DDSP | LT control lines | Control lines of the LT-interface output from main microprocessor. LTCNTn determine the type of transfer to occur across the LTDATA serial data line to/from microprocessor. |
| LTDATA | µP → DAI<br>µP → ADAS<br>µP → DEQ<br>µP → DDSP | LT data | Bidirectional serial data line of the LT-interface from/to microprocessor. Direction of data transfer is dependant on the information on LTCNT0 and LTCNT1. |
| LTEN<br>LT-ADAS | µP → ADAS | LT enable ADAS | Activates the LT-interface of the ADAS in case LTENA =1. |
| LTEN<br>LT-DAI | µP → DAI | LT enable DAI | Activates the LT-interface of the DAI in case LTEN (on DAI) =1. |
| LTEN<br>LT-DDSP | µP → DDSP | LT enable DDSP | Activates the LT-interface of the DDSP in case LTEN (on DDSP) =1. |
| LTENDEQ<br>LT-DEQ | µP → DEQ | LT enable DEQ | Activates the LT-interface of the DEQ in case LTENDEQ =1. |
| MAG | Main µP → solenoid control circuit | control line | Low output pulse switches the solenoid. |
| MCLK | DDSP → ERCO | master clock | MCLK line of the DDSP provides the 6.144 MHz master clock signal and is connected to the MCLK input of the ERCO. This clock (128 x Fs) is used for the symbols transfer between DDSP and ERCO. |
| MFL1<br>MFL2 | read amp ← head | | feedback amplifier output left |
| MFR1<br>MFR2 | read amp ← head | | feedback amplifier output right |
| MODE0<br>MODE1 | DAI ← gnd | mode selection input | Control lines from to select the operation mode of the DAI. DAI operates in µP mode when both lines are at '0' level. |
| MPCL | DDSP → ERCO | clock phase reference | The MPCL output of the DDSP provides the 3.072 MHz (64 x Fs) clock phase reference signal which is connected to the MPCL input of the ERCO. |
| MSBF | DAI → +5V | control line | 1 = **M**ost **S**ignificant **B**it **F**irst<br>0 = Least Significant Bit First |
| MSTCK | DAI ↔ 256Fs | master clock | Bidirectional master clock line. Dependant on CKSEL settings the master clock is at 128Fs or 256Fs. See also |

| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| | | | 256Fs. |
| MUTE1 | DAI ← µP | mute audio | Control line from microprocessor to mute the digital audio interface. The audio output of the DAI is kept zero when the PLL is not locked in the reception mode (see also UNLOCK). |
| MUTE | Main µP → mute circuit | control line | Control line from the µP to mute the audio outputs. |
| | DAC ← SBC | mute | Input line. See also MUTEDAC. |
| MUTEDAC | SBC → DAC | mute DAC | control output line of SBC for D/A convertor. |
| MUXAUX | read amp → | data line | multiplexed auxiliary data |
| NER0<br>NER1<br>NER2 | ERCO → test connector | number of erasures | The NERx outputs produce an indication of the number of erasures encountered in the code word currently being processed. |
| NFR | DAI → DAI | ext. resistor | Output of level converter |
| NODONE | ADAS → +5V | control line | |
| OERDCB | DDSP → ERCO | output enable for ERCO | Indication for the ERCO to output data on the data bus lines (DATA1..DATA7, FLAG1 and FLAG2). |
| OUT0<br>OUT1<br>OUT2<br>OUT3<br>OUT4<br>OUT5<br>OUT6<br>OUT7<br>OUTAUX | read amp → n.c. | output | parallel output of read IC. |
| OUTL<br>OUTR | read amp → | output line | Analog out of read IC. |
| PD1<br>PD2 | DAI → VCO | phase detector | Phase detector output from DAI for the charge pump of the VCO. The VCO locks to incoming frequencies on digital input. When locked the DAI supplies the 256Fs master clock. |
| PLAY MAG | Solenoid control →<br>RE Deck electronic | control line | Connection to the solenoid on the RE deck. Low pulse is solenoid on. |
| PRGSTAT | DDSP → n.c. | program status | DDSP program status output. |
| PWRDWN | | | |



| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| QA<br>QB<br>QC<br>QD<br>QE<br>QF<br>QG<br>QH<br>QI<br>QJ | write amp → head | data line | Signal for write heads |
| QU. REV | tape end sensor → quick reverse detection → Main µP | control line | At tape end of a digital compact cassette the reflecting foil causes a HIGH pulse out of the light barrier. The quick reverse detection circuit works as a Schmitt trigger in order to suppress disturbances. The output pulse controls the main µP. If a valid pulse is detected the main µP switches the tap transport to reverse operation immediately in order to overjump the non magnetic transparent leader tape of the cassette. |
| R-IN | Relay 1307 → ADC | signal line | Analog signal input right channel for ADC from recording amplifier or dolby IC selected by relay 1307. |
| R-OUT | DAC → line out amp | signal line | Analog signal output right channel of DAC. |
| RASN | DDSP → DRAM | row address strobe negative | row address strobe for DRAM. |
| RDATA0<br>RDATA1<br>RDATA2<br>RDATA3 | DDSP ↔ DRAM | RAM data bus | Bidirectional data bus between DDSP and DRAM. On DRAM IC these lines are called DQ1..DQ4. |
| RDCLCK | DEQ → read amp | read clock | Data clock (3,072 MHz) for the read amplifier. The data of 8 data channels and 1 aux channel is transferred during 10 RDCLK periods. |
| RDMUX | read amp → DEQ | read multiplex | Read multiplexer output from read amplifier to DEQ. See also VIN. |
| RDSYNC | DEQ → read amp | read synchron-ization | Control output of DEQ to read amplifier to synchronize the read amplifier multiplexer and the DEQ demultiplexer. |
| READB | DDSP → ERCO | read enable | Read enable for ERCO. When active the ERCO reads data from DDSP on data bus ED0..ED9. |
| REF1<br>REF2<br>REF3<br>REF4 | read amp ← | reference | Reference voltage input of read amplifier. |
| REFCK | DAI ← gnd | clock input | Reference clock for frequency accuracy check (normal 9,408 MHz). Not used in our set. |
| REFN<br>REFP | DEQ ← | reference | Lower reference voltage for internal ADC.<br>Upper reference voltage for internal ADC |
| RESET | Main µP → ADAS<br>Main µP → DDSP<br>Main µP → DAI | control line | Reset. |
| RESETC | DDSP → ERCO | reset erco | Control output from DDSP to ERCO to reset ERCO. |
| RESOL0<br>RESOL1 | ADAS ← +5V<br>ADAS ← gnd | control line | Resolution selection.<br>10 = 18 bit selected |
| REWIND | Main µP → wind motor driver | control line | Control signal to switch the driver bridge of the wind motor to the desired function. High output level is rewind mode. |

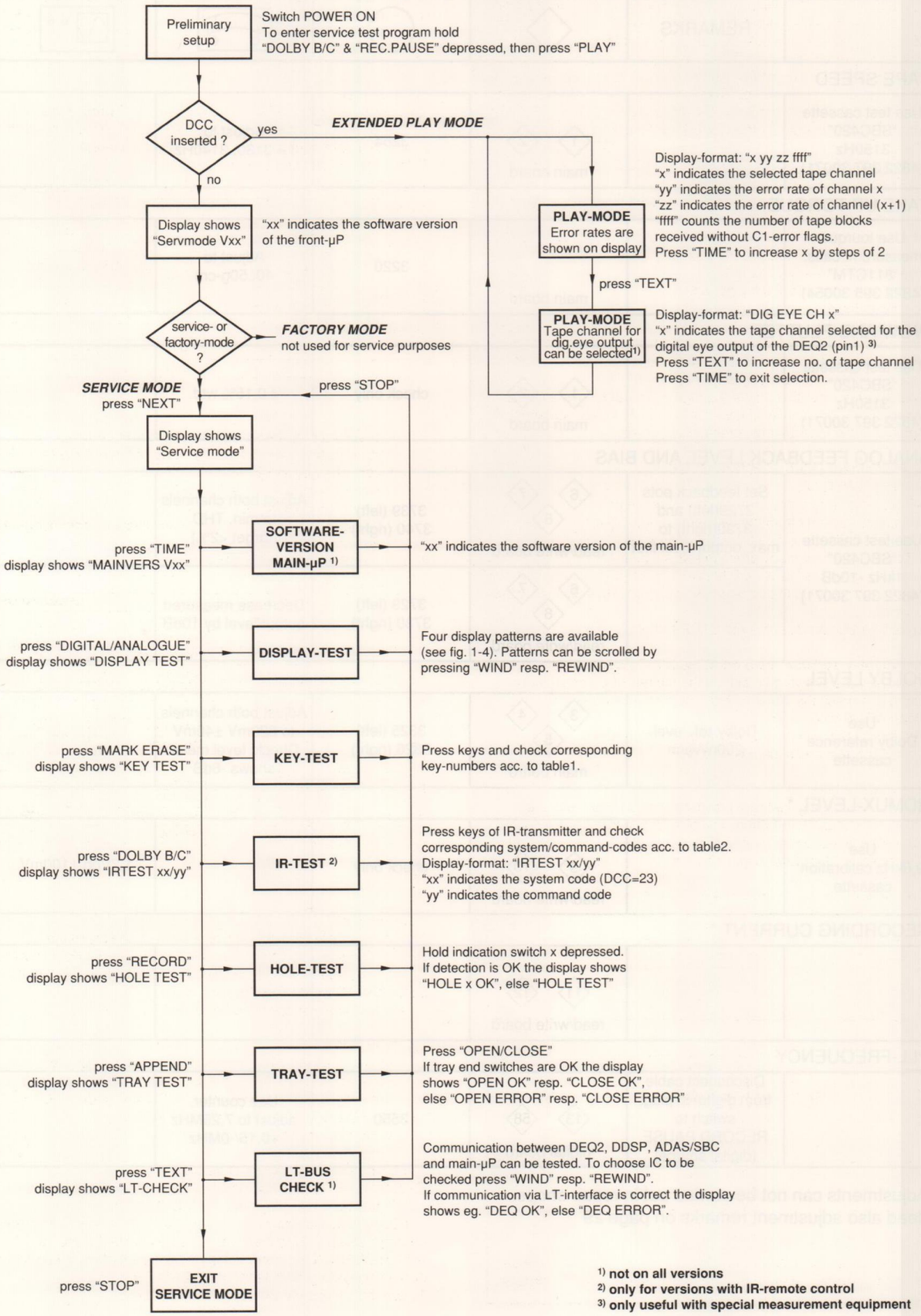
| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| ROEN | DDSP → DRAM | output enable | Output enable for DRAM. |
| RTS | Main µP ← Front µP | control line | Request to send |
| RSENSE | write amp ← | sense line | feedback voltage |
| RX1 | DAI ← COAX in | receive data | IEC format digital audio data input for coaxial input. (min 200mVpp) |
| RX2 | DAI ← OPT in | receive data | IEC format digital audio data input for optical input. (logical CMOS levels) |
| RXCKI | DAI ← VCO | receive clock input | Input for VCO frequency (256Fs). |
| RXCKO | DAI → VCO | receive clock output | Output for VCO frequency (256Fs). |
| RXSEL | DAI ← +5V | receiving mode selection | Selection between reception inputs RX1 and RX2. (1 = RX1) |
| SBCL | SBC ↔ ERCO | sub-band clock | SBCL line is part of the S(ub)-B(and)-$I^2S$ interface and provides the bit clock. See also CLAB. |
| SBDA | SBC ↔ ERCO | sub-band data | Sub-band $I^2S$ interface line for serial data transfer between SBC and ERCO. |
| SBDIR | SBC ← DDSP | sub-band direction | Control line from DDSP to SBC to indicate the direction of the data flow between ERCO and SBC on SBDA line. See also SBPLB. |
| SBEF | SBC ← ERCO | sub band error flag | $I^2S$ error flag to give the error status of bytes being transferred during data playback to the SBC (see also EFAB). |
| SBMCLK | SBC → ERCO | sub-band master clock | Master clock (6.144 MHz) for ERCO (see also IOSC) |
| SBPLB | DDSP → SBC | sub-band direction | Control line from DDSP to SBC to indicate the direction of the data flow between ERCO and SBC on SBDA line. See also SBDIR. |
| SBWS | SBC ↔ ERCO<br>SBC → DDSP | sub-band word select | The SBWS signal indicates the channel of the sample (either left or right) and is equal to the sampling frequency Fs. On the ERCO and DDSP devices the signal is called WS (see also WS). |
| SCL | SBC → SBF<br>SBC → ADAS<br>SBC ↔ DAI<br>DAI → $I^2S$ adaption of ADC | serial clock | Bit clock for the $I^2S$-interface. Clock frequency is 64x sampling frequency.<br>See also BCKI and SCLK. |
| SDO | DAI → n.c. | serial data output | Serial data output for digital audio data bus. |
| SDA | DAI ↔ SBF<br>DAI → DAC<br>ADC → DAI | serial data | Serial data line of $I^2S$-bus. The data line carries digital audio (broad band data) according $I^2S$-format. Two samples (left- and right channel) are transferred during one SWS-period. The ADC outputs broad band data via its SDATA pin, the DAI receives data on its ADSDI pin and outputs data on SDA, the DAC on SDI1 and SDI2. |
| SDATA | ADC → DAI | serial data | Serial data output of AD convertor which is transferred to DAI data input ADSDI (see also ADSDI). |
| SEARCH | DDSP ← DEQ | control line | search level detection input |



| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| SELERFI | DDSP → ERCO | select ERCO/FIFO | Control line output of DDSP to determine the nature of data transferred to ERCO. If SELERFI=1 the transfers are to and from the error correction section. If SELERFI=0 transfers are to and from $I^2S$-interface section of the ERCO device. |
| SENSRES | | | Pin for external resistor. |
| SETDAT | ERCO ← DDSP | settings data register | Data settings line for the settings register of the ERCO. SETDAT determines the operational mode of the ERCO device. See also SETERCO. |
| SETERCO | DDSP → ERCO | set ERCO | Output of DDSP to transfer control settings of the ERCO (see also SETDAT). These settings determine whether ERCO should encode or decode and it also designates the direction of data transfer for the $I^2S$-interface. |
| SETINH | ERCO ← DDSP | settings inhibit | When SETINH is active the ERCO can receive settings data (via SETDAT line) from DDSP for its operation mode (see also INHERCO, SETDAT and SETERCO). |
| SETPIN1<br>SETPIN2 | DDSP → | control line | Port expander output pins of DDSP. See also RESET SBC |
| SETSY | DAI ← SBC | settings sync | DAI latches new settings in internal register when SETSY is active. SETSY is sent by SBC which takes care for external clock source synchronization (see also SYNCDAI). |
| SILENCE | silence detection → Main µP | control line | Indication for main µP that pause has been detected. |
| SH0<br>SH1 | DEQ ← gnd | control line | Selection of desired 8bit window of internal ADC of DEQ2. |
| SPEED | DDSP → speed control circuit | speed control | Pulse width modulated control output of DDSP for phase regulating the speed of the capstan in the tape deck (tape speed). |
| SRESET | Front µP → Main µP | reset | Software reset. |
| STARTSEG | DDSP → µP | start segment | STARTSEG indicates the start of a new segment. The STARTSEG output from the DDSP is used as a timing reference for transfer of SYSINFO and AUX information between the microprocessor and the DDSP. |
| STBY | Front µP → power supply | control line | Switches +5V power supply off and subsequently +12V, -12V and -5V. |
| STMPB | DDSP → ERCO | start error correction program | STMPB initiates the execution of the error correction program, to begin processing a new code word and causes activation of the new settings for both $I^2S$-interface and the ERCO. |
| STOP | RE Deck electronic → Main µP | control line | Indicates if the head support is in play or stop position. Stop position is high level |
| SWS | SBC → ADAS<br>SBC → SBF<br>SBC ↔ DAI<br>SBC → $I^2S$ Adaptor | word select | Word select line (at sampling frequency) for $I^2S$ interface. SBC acts as the master with the exception of the mode digital recording. In that case DAI is the master.<br>SWS of the SBC is connected to SWS of the DAI, to SWS of the $I^2S$ Adaptor and to SWS of the DAC. |
| SYNCDAI | SBC → DAI<br>Main µP → DAI | synchronize DAI | With SYNCDAY (identical with SETSY) the settings for the DAI are latched. These settings are transferred via the LT-bus.<br>Prepared for future use. |
| TCH0 | DDSP ← DEQ | channel input | Parallel input lines of DDSP receiving sliced (digital) |

| Signal name | Signal flow | Function | Explanation |
|---|---|---|---|
| TCH1<br>TCH2<br>TCH3<br>TCH4<br>TCH5<br>TCH6<br>TCH7<br>TCHAUX | | | information of DEQ (see also AUX and CH0..CH7). |
| TX | DAI → digital out | transmit data | Digital data output of DAI according IEC format. |
| UNLOCK | DAI → n.c. | unlock VCO | UNLOCK indicates that VCO frequency is locked/unlocked to received data. |
| URDA | DDSP → SBC | unreliable data | Only during playback URDA indicates that, regardless of all other flag information, all main data, system information or AUX data is unusable. URDA occurs during a mode change from data recording to playback or if the DDSP must re-synchronize with the tape signals. |
| USYNCI | DAI ← µP | sync input | Indicates the start of a new data frame when in transparent mode. |
| USYNCO | DAI → | sync output | Indicates start of a new data frame when in reception mode. |
| VAL | DEQ → test pin | validation data | Validation signal output for data bits. To test equalization performance it is possible to output the equalized channels. The DEQ has for this purpose two digital outputs present: DIGEYE and VAL (see also DIGEYE). |
| VIN | DEQ ← read amp | voltage input | DEQ inputs via VIN time multiplexed data from read amplifier. See also RDMUX. |
| VIRGIN | DEQ → DDSP | virgin detection | Control output of DEQ to inform the microprocessor if a blank tape is inserted. See also SEARCH. |
| WCLCK | write amp ← DDSP | write clock | Clock signal for the write amplifier as timing reference (f = 3.072MHz). See also WCLOCK. |
| WCLOCK | DDSP → write amp | write clock | Write clock for write amplifier coming from DDSP. See also WCLK. |
| WDATA | DDSP → write amp | write data | Serial data signal of the 8 main channels and AUX channel, directed to the write amplifier. |
| WIND | Main µP → wind motor driver | control line | Control signal to switch the driver bridge of the wind motor to the desired function. High level in FastForward and in Play mode. |
| +WIND<br>-WIND | Wind motor driver → wind motor | supply line | Connection to terminal of wind motor. |
| WRN | DDSP → DRAM | write enable | Write enable of the DRAM. |
| WS | ERCO ↔ SBC<br>DDSP ← SBC | word select | $I^2S$-interface word selection I/O line.<br>Is connected to SBWS pin of SBC. See also SBWS. |
| X22IN<br>X22OUT | SBC ←<br>SBC → | crystal input<br>crystal output | 22,5792 MHz |
| X24IN<br>X24OUT | SBC ←<br>SBC → | crystal input<br>crystal output | 24,576 MHz |
| XTAL1<br>XTAL2 | DAC ← 256Fs<br>DAC → n.c. | | |
| XSYS | DAC → n.c. | | buffered output from crystal oscillator. |

# SERVICE TEST PROGRAM - FLOW CHART




1) **not on all versions**
2) **only for versions with IR-remote control**
3) **only useful with special measurement equipment**



# SERVICE TEST PROGRAM – DESCRIPTIONS

## 1. General

The test program is equipped with a service modes, a factory mode and an extended playback-mode. The service mode includes tests for display, detection of hole switches, IR-remote control and keys. The factory mode is a special test program, which is used in the production process of the front board, but not useful for service purposes. In the extended playback-mode the error rates (C1 error flags from DDSP) are shown on the display. Also the tape channel for the digital eye output of the DEQ2 (pin1) can be selected.

## 2. Preliminary setup EXTENDED PLAYMODE

– Switch POWER ON
– Follow "start-up procedure" as described on page 27
– Insert a DCC
– Hold DOLBY B/C & REC.PAUSE depressed, then press PLAY
The set is now in the extended playmode, music will be audible.
The display shows "x yy zz ffff".
"x" indicates the selected tape channel
"yy" indicates the error rate of channel x
"zz" indicates the error rate of channel (x+1)
"ffff" counts the number of tape blocks received without C1-error flags. The counter will be resetted with every C1-error.
Press TIME to increase x by steps of 2.
To select the tape channel for the digital eye output of the DEQ2 press TEXT. The display shows "DIG EYE CH x". To increase the number of the tape channel press TIME, again.

## 3. Preliminary setup SERVICE MODE

– Turn POWER ON
– Follow "start-up procedure" as described on page 27
– Remove cassette from the cassette compartment
– Hold DOLBY B/C & REC.PAUSE depressed, then press PLAY
– To enter servicemode1 press the NEXT-button.
The display shows "SERVICE MODE". The available tests can now be entered pressing the corresponding buttons (see also flow chart, page 25).
To exit service mode press the STOP-button.

### 3.1. Display software version of main-µP (not on all versions)

To display the software version of the main-µP fulfil preliminary setup and press the TIME-button. The display shows "MAINVERS Vxx".
"xx" indicates the software version of the main-µP.
To exit this test press the STOP-button.

### 3.2. Display test

To enter the display test fulfil preliminary setup and press the DIGITAL/ANALOGUE-button. The display shows "DISPLAY TEST". Four display test pattern are available (see fig. 1-4). The patterns can be scrolled forward resp. backward by pressing the WIND- resp. REWIND-button.
To exit the display test press the STOP-button.

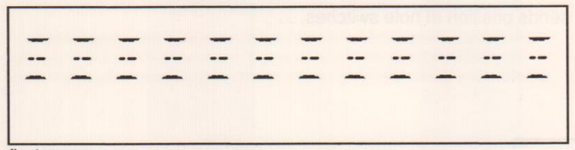


fig.1

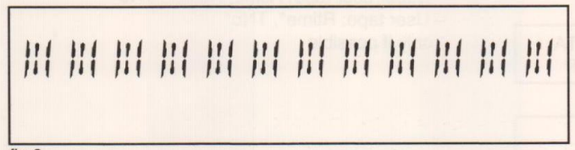


fig.2

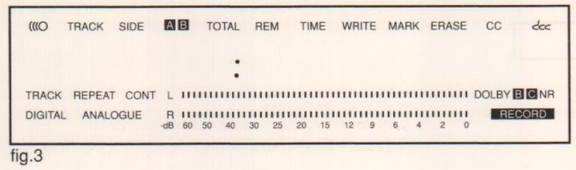


fig.3

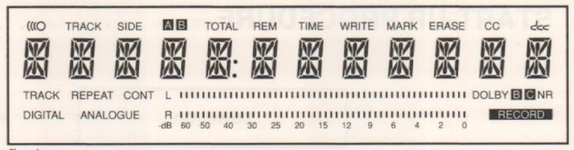


fig.4

### 3.3. Key test

To enter the key test fulfil preliminary setup and press the MARK ERASE-button. The display shows "KEY TEST". Press keys and check their corresponding key-numbers acc. to table1.
To exit the key test press the STOP-button.

| KEY | KEY NUMBER | KEY | KEY NUMBER |
|---|---|---|---|
| RENUMBER | 01 | RECORD | 27 |
| OPEN/CLOSE | 03 | DOLBY B/C | 33 |
| WRITE MARK | 05 | BACKWARD | 35 |
| PREVIOUS | 09 | CD SYNCHRO | 37 |
| APPEND | 11 | REPEAT | 39 |
| DIGITAL/ANALOGUE | 17 | SIDE A/B | 41 |
| FORWARD | 19 | RECORD/PAUSE | 43 |
| ERASE MARK | 21 | TEXT | 65 |
| PLAY | 23 | TIME | 67 |
| NEXT | 25 | RESET | 73 |

table1

### 3.4. IR-test (only for versions with IR-remote control)

To enter the IR-test fulfil preliminary setup and press the DOLBY B/C-button. The display shows "IRTEST xx/yy".
"xx" indicates the system code (DCC=23)
"yy" indicates the command code
Press keys and check their corresponding system / command-code acc. to table2.
To exit the IR-test press the STOP-button.

| SYSTEM-CODE 23 (DCC) | | | |
|---|---|---|---|
| KEY | COMMAND-CODE | KEY | COMMAND-CODE |
| 0 | 00 | PREVIOUS | 33 |
| 1 | 01 | RECORD MUTE | 42 |
| 2 | 02 | OPEN/CLOSE | 45 |
| 3 | 03 | SIDE A/B | 47 |
| 4 | 04 | RECORD PAUSE | 48 |
| 5 | 05 | RESET | 49 |
| 6 | 06 | BACKWARD | 50 |
| 7 | 07 | FORWARD | 52 |
| 8 | 08 | PLAY | 53 |
| 9 | 09 | STOP | 54 |
| TEXT | 11 | RECORD | 55 |
| STAND BY | 12 | MARK WRITE | 114 |
| REPEAT | 28 | APPEND | 117 |
| NEXT | 32 | TIME | 122 |

table2

### 3.5. Hole test

To enter the hole test fulfil preliminary setup and press the RECORD-button. The display shows "HOLE TEST". Hold indication switch x depressed and check display. If detection is OK the display shows "HOLE x OK", else "HOLE TEST".
To exit the hole test press the STOP-button.

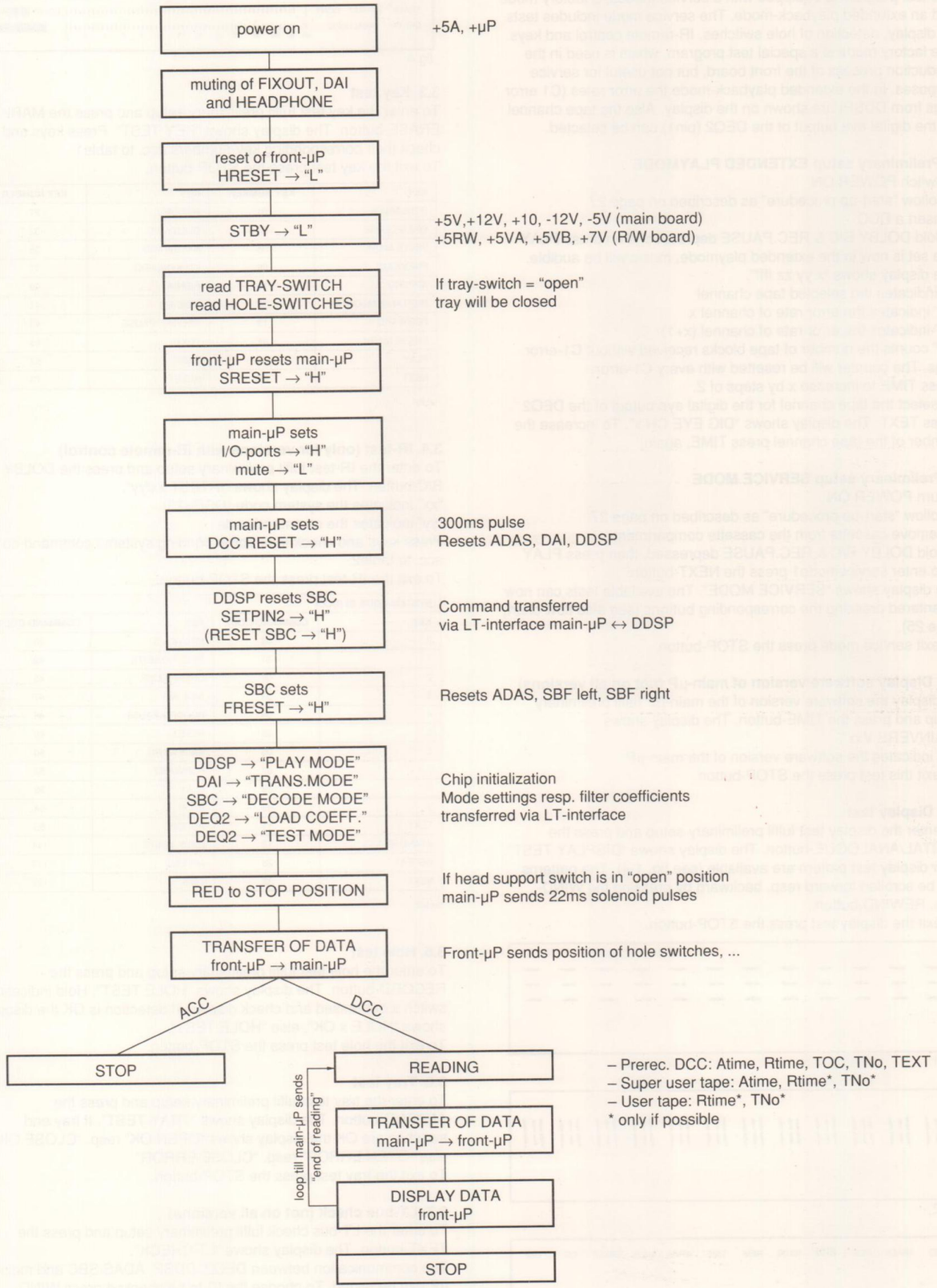
### 3.6. Tray test

To enter the tray test fulfil preliminary setup and press the APPEND-button. The display shows "TRAY TEST". If tray end switches are OK the display shows "OPEN OK" resp. "CLOSE OK", else "OPEN ERROR" resp. "CLOSE ERROR".
To exit the tray test press the STOP-button.

### 3.7. LT-bus check (not on all versions)

To enter the LT-bus check fulfil preliminary setup and press the TEXT-button. The display shows "LT-CHECK".
The communication between DEQ2, DDSP, ADAS/SBC and main-µP can be tested. To choose the IC to be checked press WIND resp. REWIND. If the communication via LT-interface is correct the display shows e.g. "DEQ OK", else "DEQ ERROR".
To exit the LT-bus check press the STOP-button.

## START-UP PROCEDURE




## ADJUSTMENT TABLE

| | REMARKS | ◇ | ↻ | meter | scope |
|---|---|---|---|---|---|
| **TAPE SPEED** | | | | | |
| Use test cassette "SBC420" 3150Hz (4822 397 30071) | | ◇1 ◇2 main board | 3264 | Adjust to f = 3130..3140Hz | |
| **TAKE UP TORQUE** | | | | | |
| Use tourque measurem. cass. "811CTM" (4822 395 30054) | | main board | 3220 | Adjust to 40..50g-cm | |
| **WOW AND FLUTTER** | | | | | |
| Use test cassette "SBC420" 3150Hz (4822 397 30071) | | ◇1 ◇2 main board | check only | < 0,15% wtd. | |
| **ANALOG FEEDBACK LEVEL AND BIAS** | | | | | |
| Use test cassette "SBC420" 1kHz -10dB (4822 397 30071) | Set feedback pots 3729(left) and 3730(right) to max. output level first | ◇6 ◇7 ◇8 read/write board | 3739 (left) 3740 (right) | Adjust both channels to min. THD (target <2%) | |
| | | ◇6 ◇7 ◇8 read/write board | 3729 (left) 3730 (right) | Decrease measured output level by 10dB | |
| **DOLBY LEVEL** | | | | | |
| Use Dolby reference cassette | Dolby ref. level 200nWb/m | ◇3 ◇4 ◇5 main board | 3325 (left) 3326 (right) | Adjust both channels to 620mV ±40mV Check: level meter shows -6dB | |
| **RDMUX-LEVEL *** | | | | | |
| Use 9,6kHz calibration cassette | | ◇9 ◇10 read/write board | check only | | 1,2Vpp ±100mV |
| **RECORDING CURRENT *** | | | | | |
| | | ◇11 ◇12 read/write board | | | |
| **PLL-FREQUENCY** | | | | | |
| | Disconnect cable from digital-in plug, switch to RECORD PAUSE (digital source) | ◇13 ◇58 digital board | 3550 | Use counter, adjust to 7,25MHz +0,15/-0MHz | |

* Adjustments can not be carried out in repair shops.
Read also adjustment remarks on page 29

# SERVICE REMARKS

## DCC-head

The heads used in the DCC-system are called "thin film head" and made by repeating 20 times or more of multiple evaporations and spatterings as in fabricating ICs.
Accordingly, the heads have different features and characteristics from those of coil winding type heads used in conventional analog cassette tape decks:

- The playback head uses a magnetic resistive element (MRH)
- The MRH needs magnetic bias to obtain its maximum output. So, a bias conductor which is equivalent to a coil to develop the magnetic bias is installed.
- Moreover, the analog playback head needs a magnetic feedback to increase linearity. This is realized by giving a magnetic field proportional to the MR-element output from a bias conductor.

For terminals and structure of the DCC-head see page 50, circuit diagram read/write board.

## Handling DCC-heads

**Caution:** The heads are susceptible to electrostatic voltage higher than 150VDC. The heads are protected from external electrostatic charging by connecting the head flexible cables to the read/write board. When disconnecting the cables, always place the deck on a bench with required electrostatic discharging measures taken and wear an electrostatic discharging band. Moreover, always mount the short-clip on the flexible cables removed.

The heads are also susceptible to strong external magnetic field and the analog output may be affected. Do not use a head demagnetizer, etc.

***WARNING***
***DO NOT USE A DEMAGNETIZER CASSETTE !***

## Adjustment remark - recording current

For each head, a recommended recording current exists individually (120..180mA). If this value is not adjusted correctly, the RDMUX value does not match between a self recorded tape and prerecorded tape. Moreover, if a recording is made at a deep layer with a high value, the previous records can not be erased when an overwrite recording is made at that area later. As a consequence the error rate will be increased at that area.

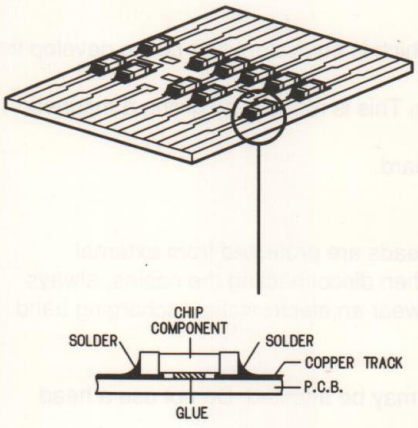
**The adjustment of the recording current requires an accuracy of ±0,2dB – a very close tolerance which can not be realized without special adjustment jigs.**
**Therefore: When the DCC-head or the write-amplifier has to be replaced exchange the whole loading-assy (4822 691 20833). The loading assy, delivered, is adjusted by the factory. Only adjustments which have to be carried out on the main-board have to be done in the repair shop (tape speed, take-up torque, dolby level).**

# SERVICE TOOLS

| | |
|---|---|
| **TORX screwdriver set** "SBC163" | 4822 395 50145 |
| Universal analog **test cassette $CrO_2$** "SBC419" | 4822 397 30069 |
| Universal analog **test cassette Fe** "SBC420" | 4822 397 30071 |
| **9,6kHz calibration cassette** (prerecorded DCC) | 4822 397 30264 |
| **Audio performance test cassette** (prerecorded DCC) | 4822 397 30255 |
| **General purpose test cassette** (prerecorded DCC) | 4822 397 30256 |
| **Torque measurement cassette** "811CTM" | 4822 395 30054 |
| **Tape guide gauge** "ABEX THG-801" | 4822 310 50108 |
| **Head mounting support** (see page 58) | 4822 403 70846 |

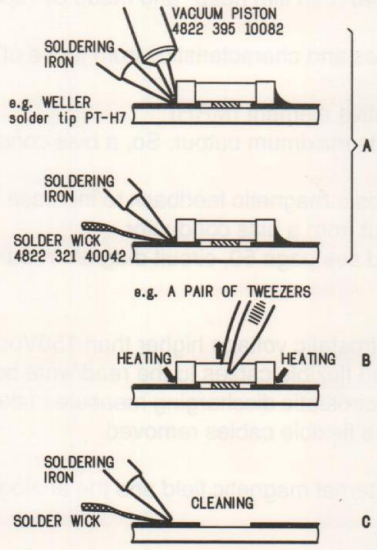
# HANDLING CHIP COMPONENTS

## GENERAL

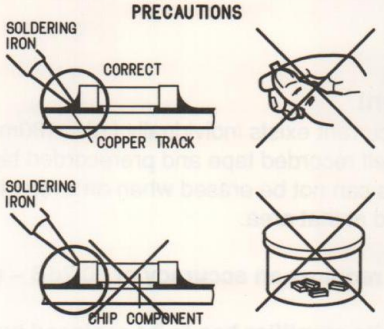



SERVICE PACKAGE

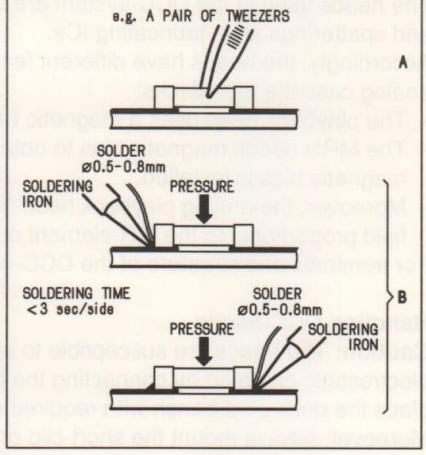
## DISMOUNTING



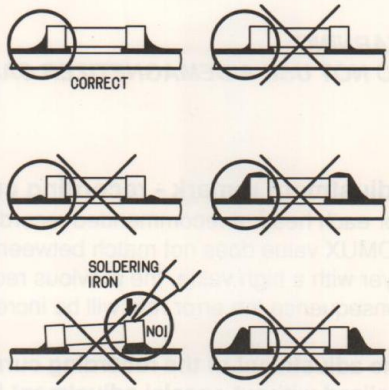

## PRECAUTIONS



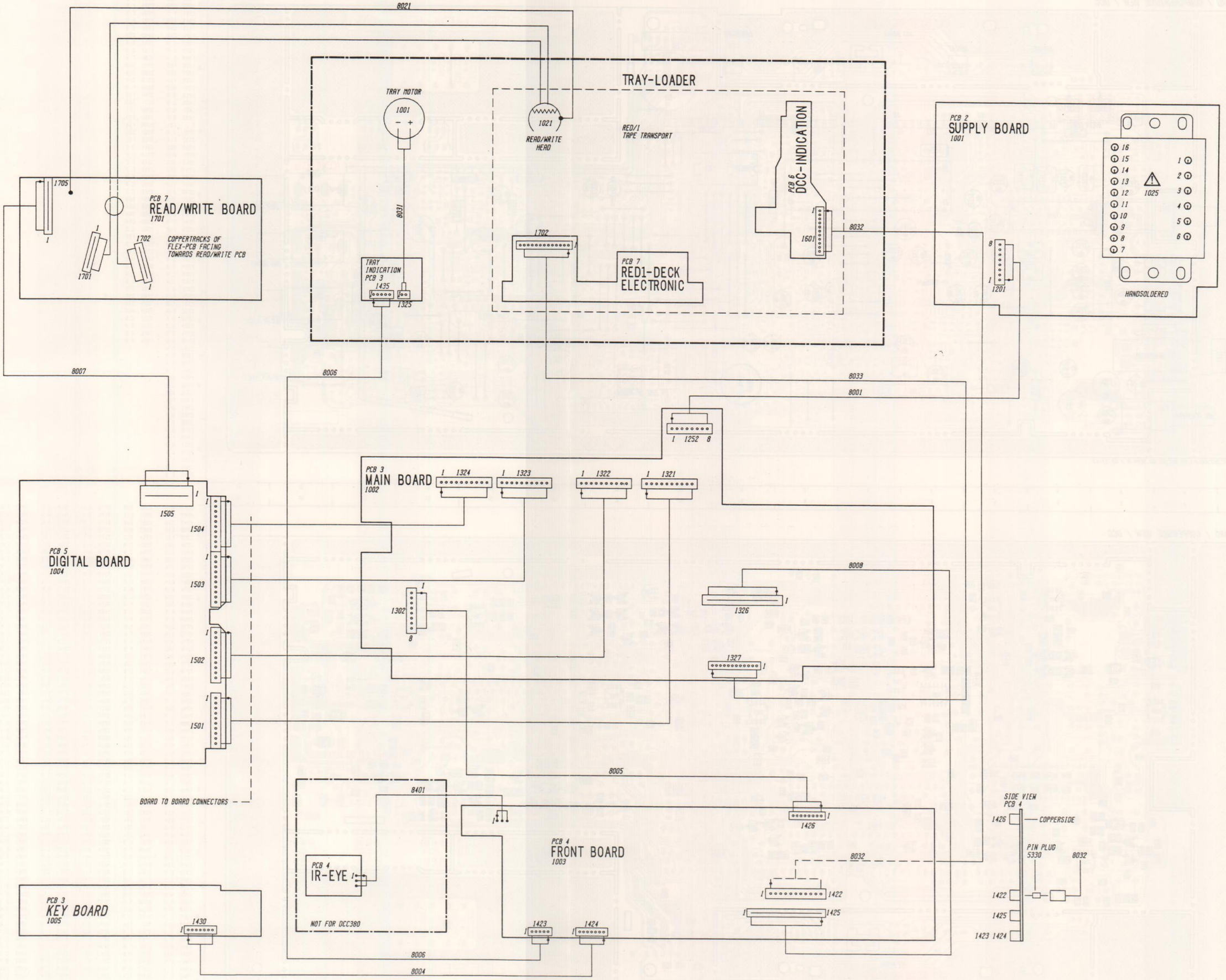

## MOUNTING




## EXAMPLES

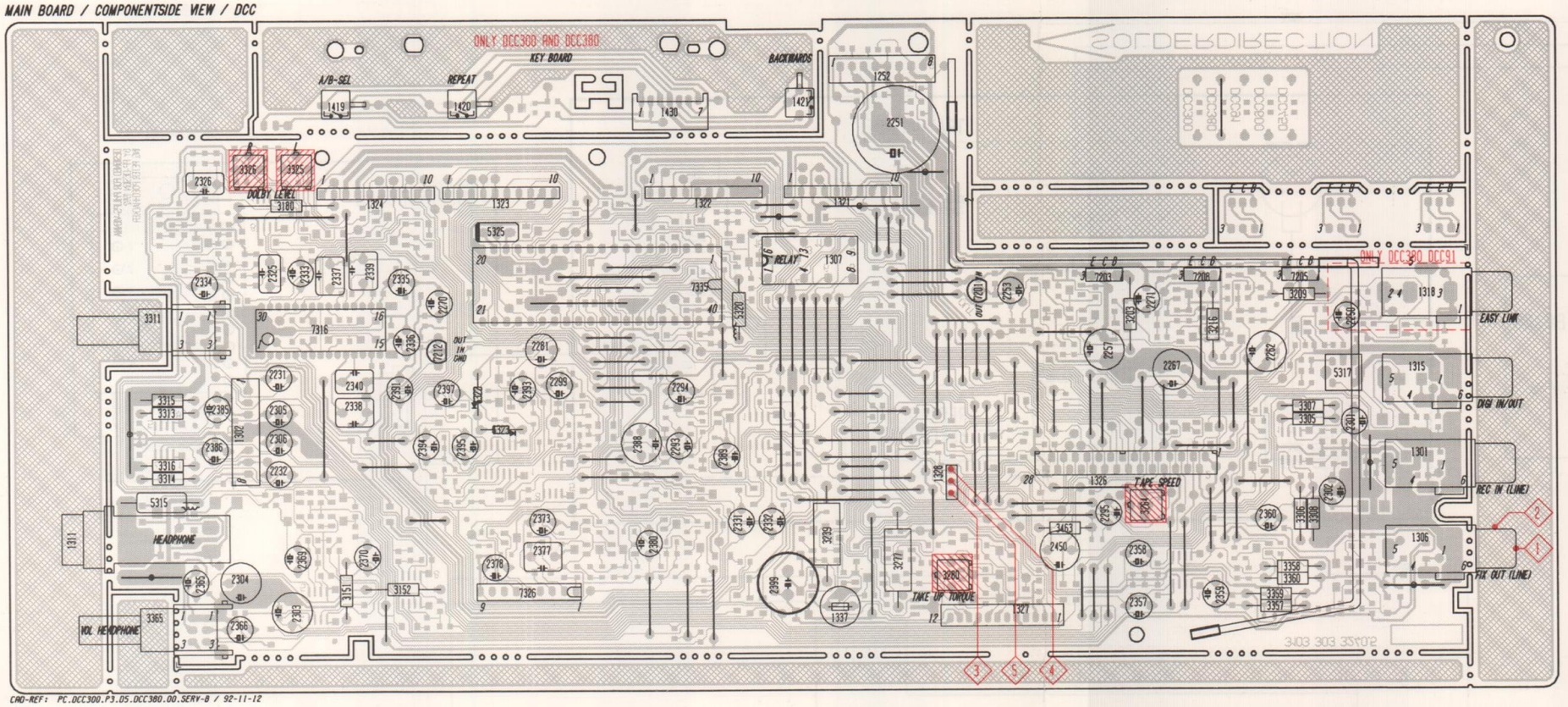


# WIRING DIAGRAM



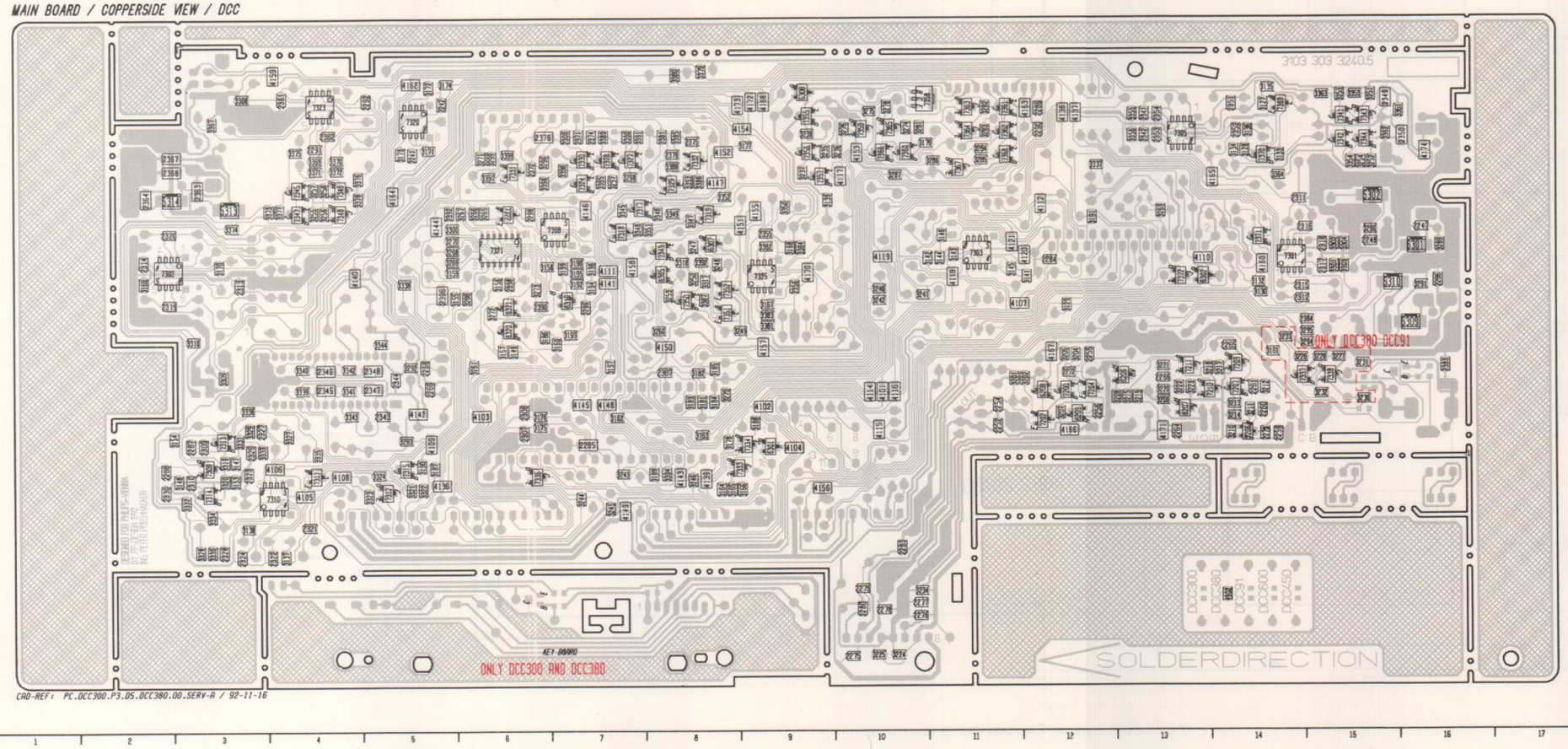

IF NOT OTHERWISE STATED ALL PCB'S SHOWN FROM THE COMPONENT-SIDE

## MAIN BOARD / COMPONENTSIDE VIEW / DCC

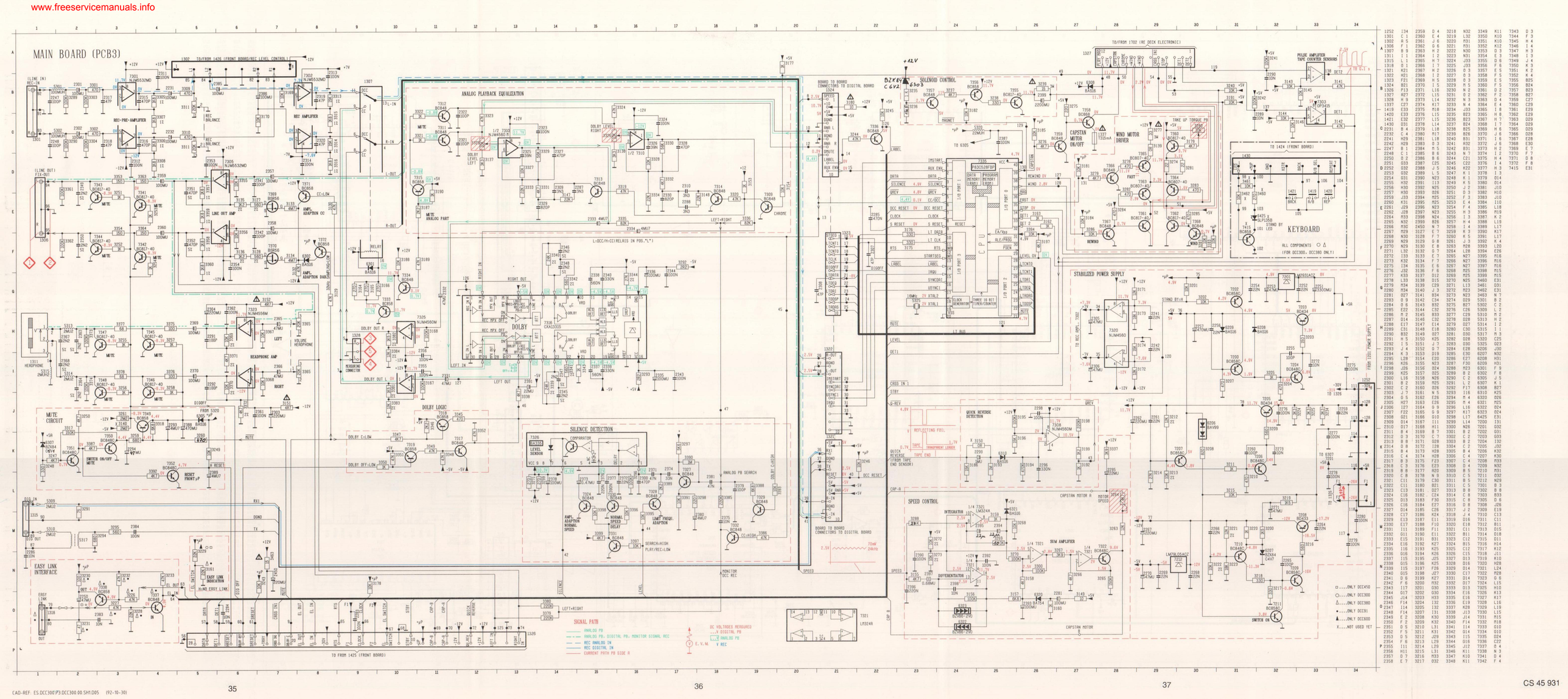


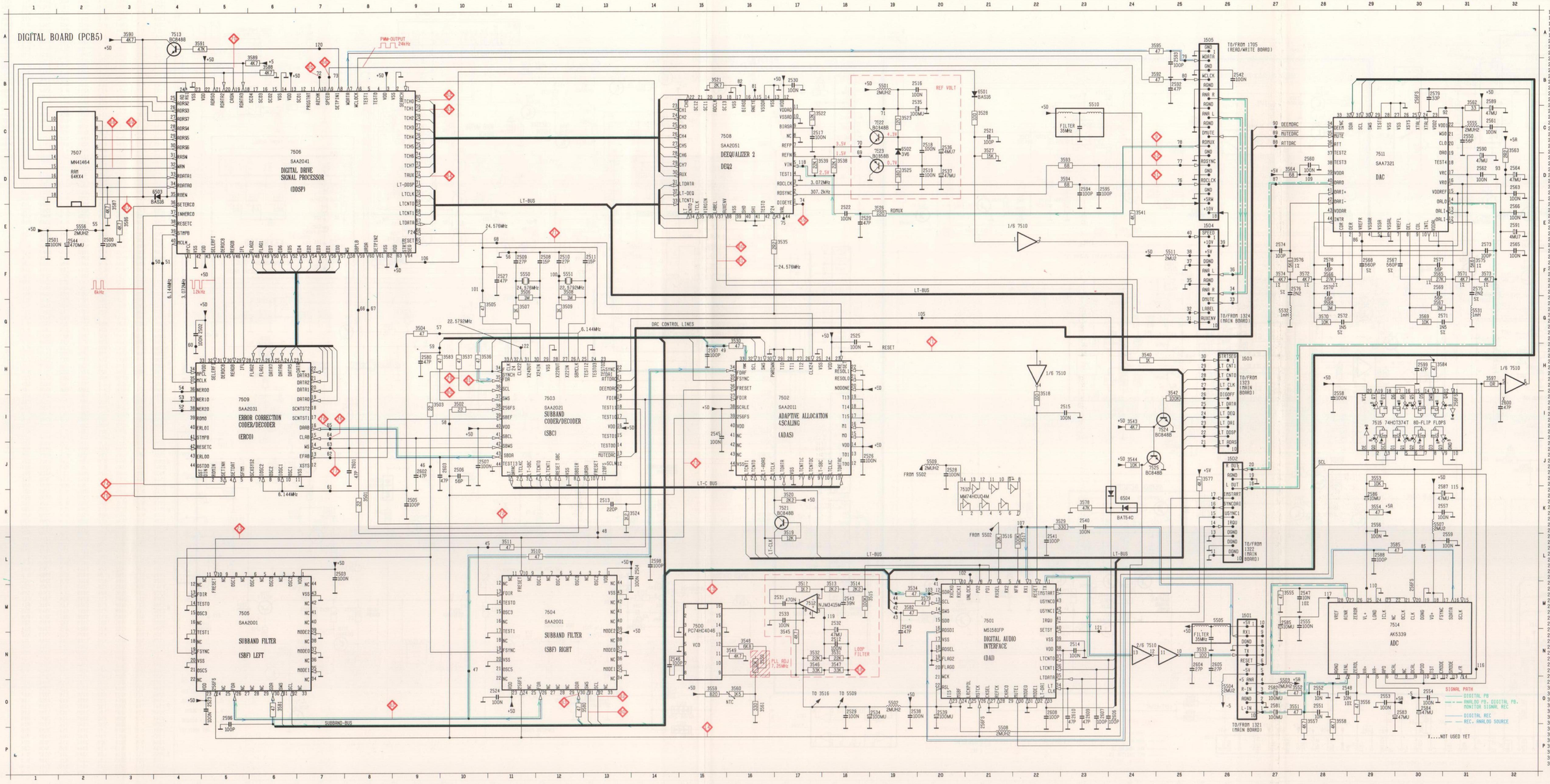

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1252 | B10 | 2388 | E 7 | | | | | | | | | | | | |
| 1301 | F16 | 2389 | F 8 | | | | | | | | | | | | |
| 1302 | E 3 | 2391 | E 5 | | | | | | | | | | | | |
| 1306 | F16 | 2393 | E 6 | | | | | | | | | | | | |
| 1307 | C10 | 2394 | E 5 | | | | | | | | | | | | |
| 1311 | F 1 | 2395 | E 6 | | | | | | | | | | | | |
| 1315 | E16 | 2397 | E 5 | | | | | | | | | | | | |
| 1318 | D16 | 2399 | G 9 | | | | | | | | | | | | |
| 1321 | C10 | 2450 | G12 | | | | | | | | | | | | |
| 1322 | C 8 | 3151 | G 4 | | | | | | | | | | | | |
| 1323 | C 6 | 3152 | G 5 | | | | | | | | | | | | |
| 1324 | C 5 | 3180 | C 4 | | | | | | | | | | | | |
| 1326 | F12 | 3203 | D13 | | | | | | | | | | | | |
| 1327 | G12 | 3209 | D14 | | | | | | | | | | | | |
| 1328 | F11 | 3216 | D14 | | | | | | | | | | | | |
| 1337 | G10 | 3239 | F 9 | | | | | | | | | | | | |
| 1419 | B 4 | 3264 | F13 | | | | | | | | | | | | |
| 1420 | B 6 | 3277 | G10 | | | | | | | | | | | | |
| 1421 | B 9 | 3280 | G11 | | | | | | | | | | | | |
| 1430 | B 8 | 3305 | E15 | | | | | | | | | | | | |
| 2 | C11 | 3306 | F14 | | | | | | | | | | | | |
| 2231 | E 4 | 3307 | E15 | | | | | | | | | | | | |
| 2232 | F 4 | 3308 | F15 | | | | | | | | | | | | |
| 2250 | D15 | 3311 | D 2 | | | | | | | | | | | | |
| 2251 | B10 | 3313 | E 2 | | | | | | | | | | | | |
| 2253 | D11 | 3314 | F 2 | | | | | | | | | | | | |
| 2257 | D12 | 3315 | E 2 | | | | | | | | | | | | |
| 2262 | D14 | 3316 | F 2 | | | | | | | | | | | | |
| 2267 | E13 | 3325 | C 4 | | | | | | | | | | | | |
| 2270 | D 5 | 3326 | C 3 | | | | | | | | | | | | |
| 2271 | D13 | 3357 | G14 | | | | | | | | | | | | |
| 2281 | D 6 | 3358 | G14 | | | | | | | | | | | | |
| 2293 | E 8 | 3359 | G14 | | | | | | | | | | | | |
| 2294 | E 8 | 3360 | G14 | | | | | | | | | | | | |
| 2295 | F12 | 3365 | G 2 | | | | | | | | | | | | |
| 2299 | E 7 | 3463 | F12 | | | | | | | | | | | | |
| 2301 | E15 | 5315 | F 2 | | | | | | | | | | | | |
| 2302 | F15 | 5317 | E15 | | | | | | | | | | | | |
| 2303 | G 4 | 5320 | D 9 | | | | | | | | | | | | |
| 2304 | G 3 | 5325 | C 6 | | | | | | | | | | | | |
| 2305 | E 4 | 6322 | E 6 | | | | | | | | | | | | |
| 2306 | E 4 | 6323 | E 6 | | | | | | | | | | | | |
| 2325 | D 4 | 7201 | D11 | | | | | | | | | | | | |
| 2326 | C 3 | 7203 | D12 | | | | | | | | | | | | |
| 2331 | F 9 | 7205 | D14 | | | | | | | | | | | | |
| 2332 | F 9 | 7208 | D13 | | | | | | | | | | | | |
| 2333 | D 4 | 7212 | D 5 | | | | | | | | | | | | |
| 2334 | D 3 | 7316 | D 4 | | | | | | | | | | | | |
| 2335 | D 5 | 7326 | G 6 | | | | | | | | | | | | |
| 2336 | D 5 | 7335 | D 8 | | | | | | | | | | | | |
| 2337 | D 4 | | | | | | | | | | | | | | |
| 2338 | E 4 | | | | | | | | | | | | | | |
| 2339 | D 5 | | | | | | | | | | | | | | |
| 2340 | E 4 | | | | | | | | | | | | | | |
| 2357 | G13 | | | | | | | | | | | | | | |
| 2358 | G13 | | | | | | | | | | | | | | |
| 2359 | G14 | | | | | | | | | | | | | | |
| 2360 | F14 | | | | | | | | | | | | | | |
| 2365 | D 3 | | | | | | | | | | | | | | |
| 2366 | D 3 | | | | | | | | | | | | | | |
| 2369 | D 4 | | | | | | | | | | | | | | |
| 2370 | D 5 | | | | | | | | | | | | | | |
| 2373 | F 6 | | | | | | | | | | | | | | |
| 2377 | G 6 | | | | | | | | | | | | | | |
| 2378 | G 6 | | | | | | | | | | | | | | |
| 2380 | F 8 | | | | | | | | | | | | | | |
| 2385 | E 3 | | | | | | | | | | | | | | |
| 2386 | E 3 | | | | | | | | | | | | | | |

## MAIN BOARD / COPPERSIDE VIEW / DCC



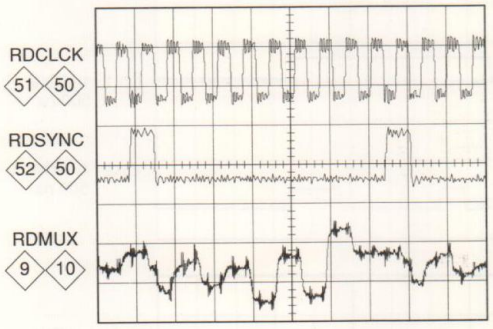

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2241 | B 5 | 2350 | B16 | 3173 | B 5 | 3248 | D 8 | 3332 | F 3 | 4107 | D11 | 6320 | D 6 | 7369 | B14 |
| 2242 | B 5 | 2351 | B14 | 3174 | B 5 | 3249 | D 9 | 3333 | F 3 | 4108 | F 4 | 6321 | D 6 | 7370 | B14 |
| 2247 | C16 | 2352 | B14 | 3175 | E 6 | 3250 | D 8 | 3334 | F 3 | 4109 | E 5 | 7200 | E12 | 7371 | C14 |
| 2248 | C15 | 2353 | B13 | 3176 | E 6 | 3251 | B15 | 3335 | F 4 | 4110 | D13 | 7202 | E12 | 7372 | D13 |
| 2252 | E11 | 2354 | B13 | 3177 | B 9 | 3252 | C15 | 3336 | E 3 | 4111 | D 7 | 7204 | E12 | | |
| 2254 | E11 | 2355 | C 9 | 3178 | E 8 | 3253 | B15 | 3337 | C12 | 4112 | C12 | 7206 | E14 | | |
| 2255 | E12 | 2356 | D 9 | 3179 | B11 | 3254 | C15 | 3338 | D 5 | 4114 | E10 | 7207 | E14 | | |
| 2256 | E12 | 2361 | B 4 | 3181 | E 8 | 3255 | C 4 | 3339 | E 4 | 4115 | E10 | 7209 | E14 | | |
| 2259 | E14 | 2362 | B 4 | 3182 | E 8 | 3256 | C 4 | 3340 | E 4 | 4116 | E10 | 7210 | E14 | | |
| 2260 | E14 | 2363 | C 3 | 3183 | E 8 | 3257 | C 4 | 3341 | E 4 | 4117 | C10 | 7211 | E13 | | |
| 2261 | E14 | 2364 | C 2 | 3184 | E 8 | 3258 | C 4 | 3342 | E 4 | 4118 | D11 | 7301 | D14 | | |
| 2264 | E13 | 2367 | B 3 | 3185 | E 8 | 3259 | D 8 | 3343 | E 4 | 4119 | C10 | 7302 | D 2 | | |
| 2265 | D14 | 2368 | C 3 | 3186 | D 6 | 3260 | D 8 | 3344 | D 5 | 4120 | C12 | 7303 | C11 | | |
| 2266 | E13 | 2371 | B 7 | 3187 | F 5 | 3261 | E 8 | 3345 | C 7 | 4121 | C11 | 7305 | B13 | | |
| 2268 | E 5 | 2372 | C 6 | 3188 | E 9 | 3263 | C13 | 3346 | C 7 | 4136 | F 5 | 7308 | C 7 | | |
| 2269 | E 5 | 2374 | B 7 | 3189 | F 8 | 3265 | C 6 | 3347 | C 8 | 4137 | B12 | 7309 | F 3 | | |
| 2272 | E12 | 2375 | B 8 | 3190 | F 5 | 3266 | C 6 | 3348 | C 8 | 4138 | B12 | 7310 | F 4 | | |
| 2273 | E14 | 2376 | B 6 | 3191 | C12 | 3267 | C 6 | 3349 | C 8 | 4139 | F 8 | 7311 | F 4 | | |
| 2275 | H10 | 2379 | B 8 | 3192 | D 7 | 3268 | C 5 | 3350 | C 9 | 4140 | D 4 | 7312 | F 5 | | |
| 2276 | G10 | 2381 | B 8 | 3193 | D 7 | 3269 | D 5 | 3351 | C 8 | 4141 | D 7 | 7313 | E 3 | | |
| 2277 | G10 | 2383 | E16 | 3194 | D 7 | 3270 | C 5 | 3352 | C 8 | 4142 | E 5 | 7314 | F 3 | | |
| 2278 | G10 | 2384 | D15 | 3195 | D 7 | 3271 | B 6 | 3353 | B15 | 4143 | F 8 | 7315 | F 5 | | |
| 2279 | G10 | 2387 | E 8 | 3196 | D 7 | 3272 | D 6 | 3354 | C15 | 4144 | C 5 | 7317 | C 7 | | |
| 2280 | G10 | 2390 | D 6 | 3197 | E 7 | 3273 | D 6 | 3355 | B13 | 4145 | E 7 | 7318 | C 7 | | |
| 2283 | G10 | 2392 | C 5 | 3198 | D 7 | 3274 | B10 | 3356 | B13 | 4146 | C 7 | 7319 | C 8 | | |
| 2284 | D12 | 2396 | D 5 | 3199 | D 7 | 3275 | B10 | 3361 | B16 | 4147 | C 8 | 7320 | B 5 | | |
| 2285 | E 7 | 2398 | D 6 | 3200 | E13 | 3276 | B10 | 3362 | B15 | 4148 | E 7 | 7321 | C 6 | | |
| 2286 | D16 | 3127 | B14 | 3201 | E11 | 3278 | B10 | 3363 | B15 | 4149 | F 7 | 7322 | C 6 | | |
| 2287 | E 3 | 3128 | B14 | 3202 | E12 | 3279 | E 8 | 3364 | C14 | 4150 | D 8 | 7323 | B 4 | | |
| 2288 | F 2 | 3129 | D12 | 3204 | E12 | 3281 | B10 | 3367 | B 3 | 4151 | C 9 | 7324 | C 7 | | |
| 2289 | B12 | 3130 | D14 | 3205 | E12 | 3282 | B11 | 3368 | B 3 | 4152 | B 8 | 7325 | D 9 | | |
| 2290 | B12 | 3132 | D14 | 3207 | E12 | 3283 | B11 | 3369 | B 4 | 4153 | B10 | 7327 | B 7 | | |
| 2291 | B 4 | 3133 | B14 | 3208 | E13 | 3284 | B11 | 3370 | B 4 | 4154 | B 9 | 7328 | B 7 | | |
| 2292 | B 5 | 3134 | B14 | 3210 | E14 | 3285 | B11 | 3371 | C 4 | 4155 | C 9 | 7329 | C 8 | | |
| 2296 | D 7 | 3135 | B14 | 3211 | E14 | 3286 | B11 | 3372 | C 4 | 4156 | F 9 | 7330 | B 7 | | |
| 2298 | C 6 | 3136 | B14 | 3212 | E14 | 3287 | C10 | 3373 | C 4 | 4157 | D 9 | 7331 | C 6 | | |
| 2300 | B 7 | 3137 | G 4 | 3213 | E14 | 3288 | D 6 | 3374 | C 3 | 4158 | D 7 | 7332 | B 8 | | |
| 2307 | E 6 | 3138 | F 3 | 3214 | E14 | 3289 | C16 | 3375 | B 4 | 4159 | B 4 | 7333 | F 9 | | |
| 2308 | E 6 | 3139 | C 9 | 3215 | E13 | 3290 | C15 | 3376 | C 4 | 4160 | D14 | 7334 | E 9 | | |
| 2309 | E 3 | 3141 | D12 | 3217 | E14 | 3291 | D16 | 3377 | C 4 | 4162 | B 5 | 7336 | F 6 | | |
| 2310 | F 3 | 3142 | D11 | 3218 | E13 | 3292 | E 5 | 3378 | C 4 | 4163 | B12 | 7337 | E14 | | |
| 2311 | C14 | 3143 | C11 | 3219 | E13 | 3293 | E 5 | 3379 | B 8 | 4164 | C 5 | 7338 | E15 | | |
| 2312 | D14 | 3144 | D11 | 3220 | E13 | 3294 | D15 | 3380 | B 8 | 4165 | C14 | 7341 | B15 | | |
| 2313 | D 3 | 3145 | D11 | 3221 | E13 | 3295 | D15 | 3381 | D 9 | 4166 | E12 | 7342 | B15 | | |
| 2314 | D 2 | 3146 | C11 | 3222 | E13 | 3296 | B 6 | 3382 | C 9 | 4167 | E12 | 7343 | B15 | | |
| 2315 | D14 | 3147 | F 3 | 3223 | E13 | 3297 | C 7 | 3383 | D 9 | 4168 | B 9 | 7344 | B15 | | |
| 2316 | C15 | 3148 | F 3 | 3224 | H10 | 3298 | C 7 | 3384 | C 9 | 4170 | D 9 | 7345 | C 4 | | |
| 2317 | D15 | 3149 | D 6 | 3225 | H10 | 3299 | B 6 | 3385 | B 8 | 4171 | E13 | 7346 | C 4 | | |
| 2318 | C15 | 3153 | F 3 | 3226 | E14 | 3300 | C 5 | 3386 | C 8 | 4172 | B 9 | 7347 | C 4 | | |
| 2319 | D 2 | 3154 | E 3 | 3227 | E15 | 3301 | D15 | 3387 | D 8 | 4173 | B 9 | 7348 | C 4 | | |
| 2320 | C 2 | 3155 | D 6 | 3228 | E15 | 3302 | C15 | 3388 | C 8 | 4174 | B16 | 7349 | C 8 | | |
| 2321 | F 4 | 3156 | D 6 | 3230 | E15 | 3303 | D15 | 3389 | B 7 | 4902 | G14 | 7350 | D 8 | | |
| 2322 | G 4 | 3157 | D 6 | 3231 | E15 | 3304 | C15 | 3390 | B 7 | 5302 | C15 | 7351 | D 8 | | |
| 2323 | F 3 | 3158 | D 6 | 3232 | E15 | 3309 | E 3 | 3391 | B 7 | 5309 | D16 | 7352 | D 8 | | |
| 2324 | G 3 | 3159 | D 5 | 3233 | D14 | 3310 | D 3 | 3392 | D 8 | 5310 | D15 | 7355 | B 9 | | |
| 2327 | E 3 | 3160 | D 7 | 3234 | G10 | 3317 | D 8 | 3393 | C 8 | 5313 | C 3 | 7356 | B 9 | | |
| 2328 | G 3 | 3161 | E14 | 3235 | B 9 | 3318 | D 8 | 3394 | F 8 | 5314 | C 3 | 7357 | C 9 | | |
| 2329 | F 3 | 3162 | E 7 | 3236 | B10 | 3319 | F 3 | 3395 | C 7 | 6206 | E13 | 7358 | B11 | | |
| 2330 | F 2 | 3163 | E 8 | 3237 | C 9 | 3320 | F 3 | 3396 | C 7 | 6207 | E13 | 7359 | B10 | | |
| 2341 | B13 | 3164 | F 8 | 3238 | B 9 | 3321 | F 5 | 3397 | C 6 | 6208 | E12 | 7360 | B10 | | |
| 2342 | B13 | 3165 | F 8 | 3240 | D10 | 3322 | F 5 | 3398 | C 6 | 6209 | E12 | 7361 | B11 | | |
| 2343 | E 5 | 3166 | F 9 | 3241 | D10 | 3323 | F 5 | 3399 | B 6 | 6301 | C16 | 7362 | B11 | | |
| 2344 | E 5 | 3167 | D 9 | 3242 | D10 | 3324 | F 5 | 4101 | E10 | 6301 | E 9 | 7363 | B11 | | |
| 2345 | E 4 | 3168 | C 9 | 3243 | F 7 | 3327 | E 4 | 4102 | E 9 | 6302 | D13 | 7364 | B11 | | |
| 2346 | E 4 | 3169 | D 2 | 3244 | F 7 | 3328 | G 3 | 4103 | E 6 | 6305 | D 8 | 7365 | B10 | | |
| 2347 | E 5 | 3170 | D 3 | 3245 | F 7 | 3329 | E 3 | 4104 | F 9 | 6307 | C 8 | 7366 | B10 | | |
| 2348 | E 5 | 3171 | B 5 | 3246 | F 8 | 3330 | G 3 | 4105 | F 4 | 6308 | B 9 | 7367 | C11 | | |
| 2349 | B15 | 3172 | B 5 | 3247 | C 8 | 3331 | E 3 | 4106 | F 4 | 6310 | D 7 | 7368 | B11 | | |

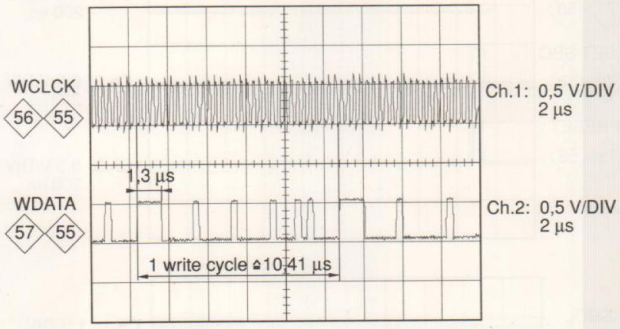




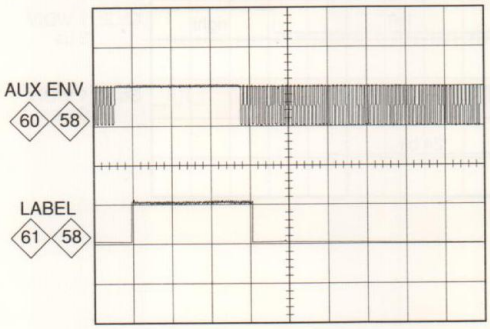
## MEASUREMENTS ON DIGITAL BOARD PCB5

Note: All measurements carried out with digital oscilloscope and probe 10:1

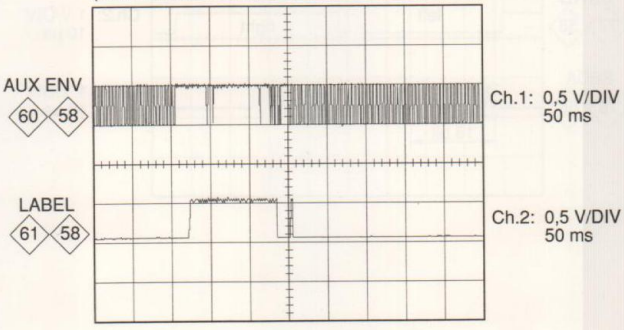


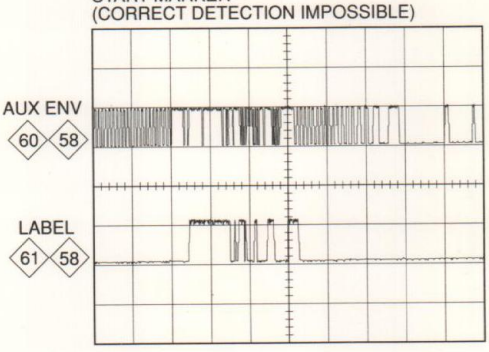

START MARKER (IDEAL)

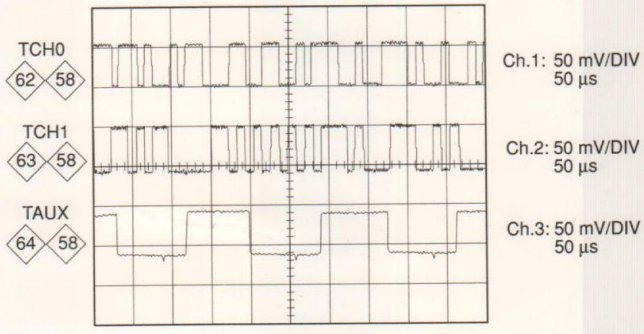


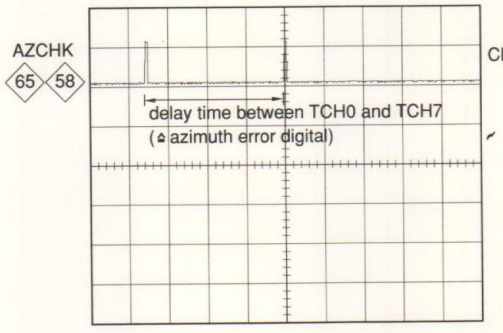

START MARKER
(DETECTION POSSIBLE BUT NOT RELIABLE)

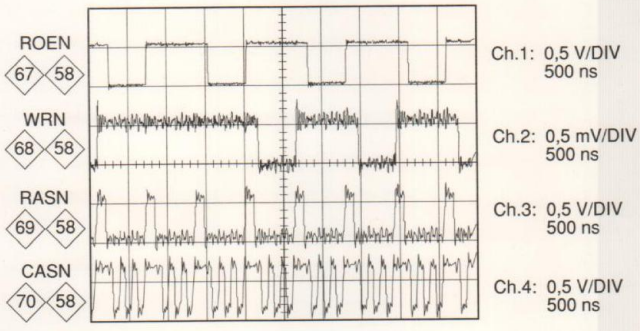



START MARKER
(CORRECT DETECTION IMPOSSIBLE)

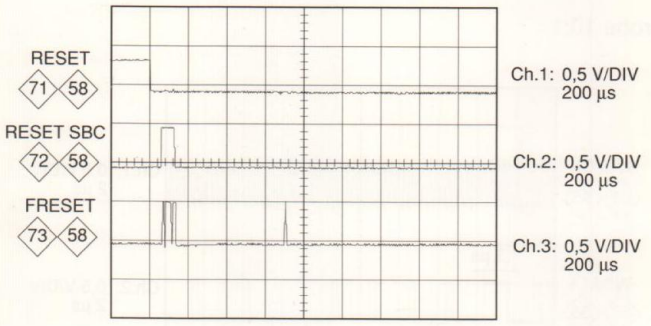


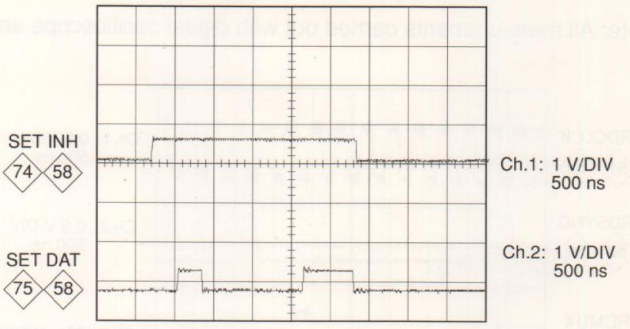



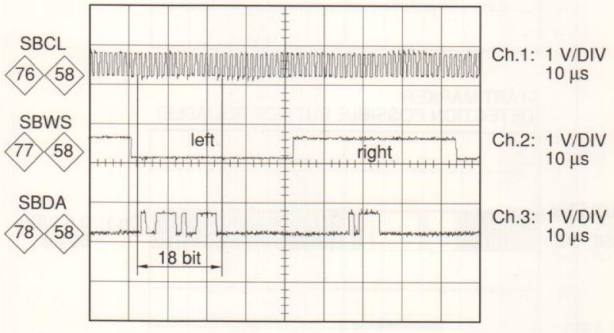



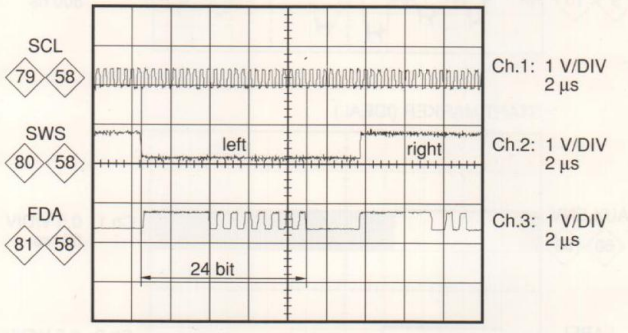



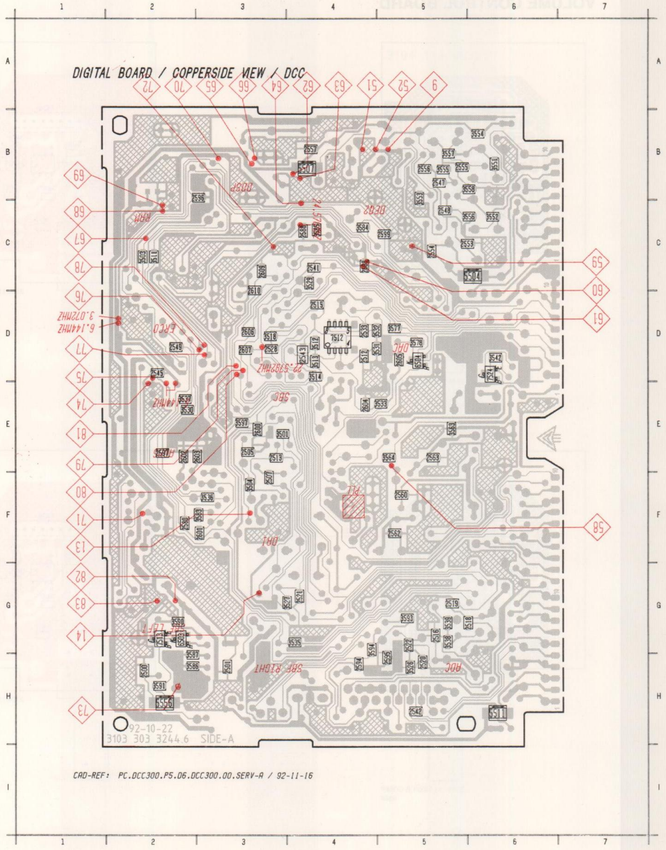
## MEASUREMENTS ON DIGITAL BOARD PCB5 (CONTINUED)

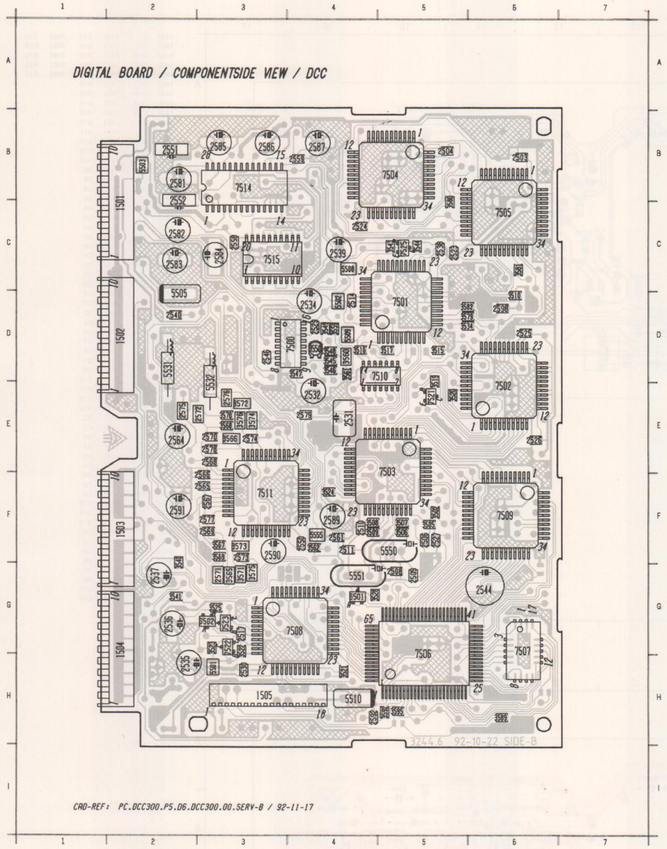


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2505 E 3
2507 F 3
2512 D 4
2513 E 3
2515 D 4
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2519 G 5
2520 H 5
2521 D 4
2522 G 5
2528 D 3
2533 D 4
2541 C 4
2542 H 5
2543 D 4
2545 D 2
2547 B 5
2548 C 5
2549 D 2
2553 C 6
2554 C 5
2555 B 5
2556 B 5
2557 B 4
2560 F 5
2562 F 5
2563 E 5
2580 F 2
2588 C 4
2594 H 4
2595 H 5
2596 B 3
2597 E 2
2599 C 5
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2601 F 3
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2604 E 4
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2607 D 3
2608 C 4
2609 C 3
2610 C 3
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3531 D 4
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3533 E 5
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3538 G 5
3539 G 5
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3554 B 6
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3556 C 6
3557 B 5
3558 B 6
3563 E 5
3564 E 5
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3578 D 5
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3584 C 4
3585 C 4
3586 H 2
3587 H 2
3590 G 2
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3594 G 4
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7524 D 6

1501 C 2
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6502 G 3
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7501 D 5
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7507 G 6
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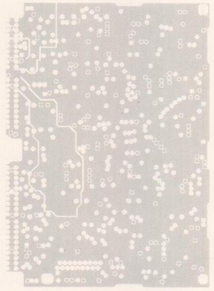
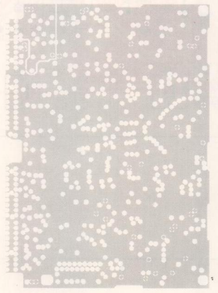
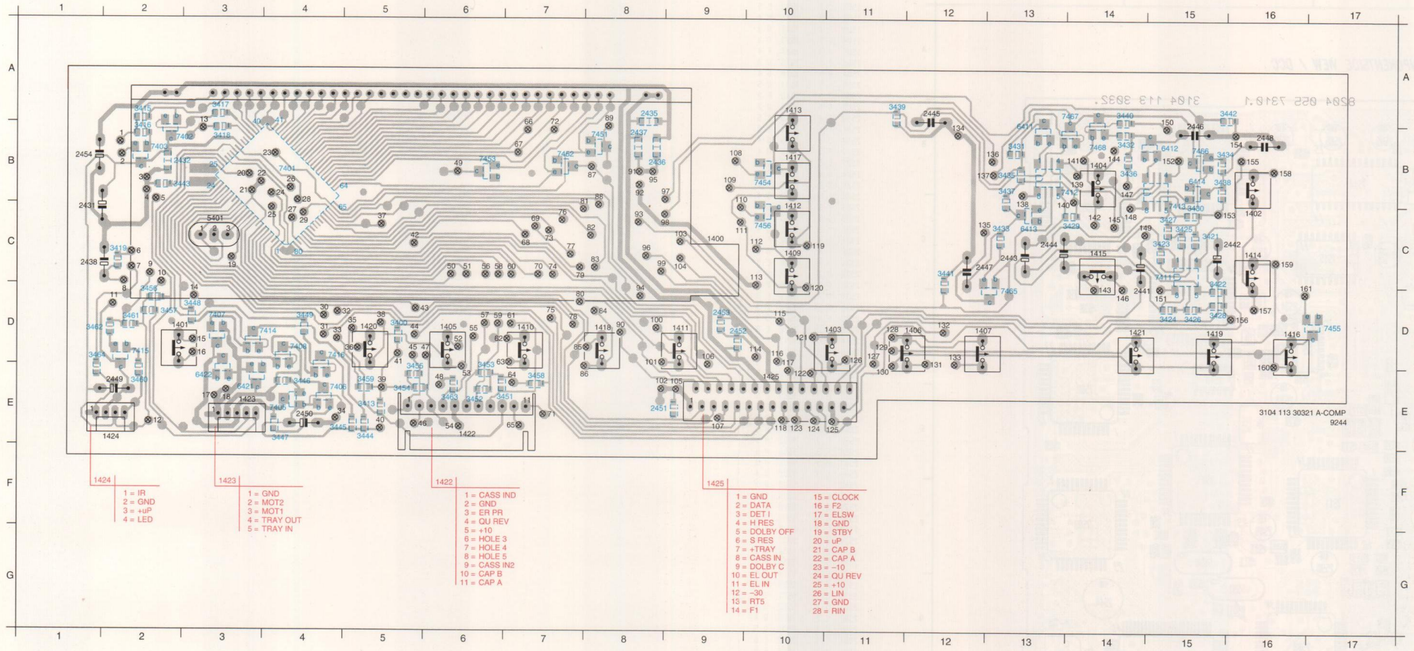
**MIDDLE LAYER PATTERN1 / COMPONENTSIDE VIEW CONNECTED TO GND**



**MIDDLE LAYER PATTERN2 / COMPONENTSIDE VIEW CONNECTED TO +5D**



## CONTROL AND DISPLAY BOARD




| | | | | | |
|---|---|---|---|---|---|
| 1400 | C9 | 3429 | C13 | 7456 | C10 |
| 1401 | D2 | 3430 | C15 | 7465 | D13 |
| 1402 | B16 | 3431 | B13 | 7466 | B15 |
| 1403 | D10 | 3432 | B14 | 7467 | A13 |
| 1404 | B14 | 3433 | C13 | 7468 | B14 |
| 1405 | D6 | 3434 | B15 | | |
| 1406 | D11 | 3435 | B13 | | |
| 1407 | D12 | 3436 | B14 | | |
| 1409 | C10 | 3437 | B13 | | |
| 1410 | D7 | 3438 | B15 | | |
| 1411 | D9 | 3439 | A11 | | |
| 1412 | C10 | 3440 | A14 | | |
| 1413 | A10 | 3441 | C12 | | |
| 1414 | C16 | 3442 | A15 | | |
| 1415 | C14 | 3443 | B2 | | |
| 1416 | D16 | 3444 | E5 | | |
| 1417 | B10 | 3445 | E4 | | |
| 1418 | D8 | 3446 | E4 | | |
| 1419 | D15 | 3447 | E4 | | |
| 1420 | D5 | 3448 | D3 | | |
| 1421 | D14 | 3449 | D4 | | |
| 1422 | E6 | 3451 | E6 | | |
| 1423 | E3 | 3452 | E6 | | |
| 1424 | E2 | 3453 | E6 | | |
| 1425 | E10 | 3454 | E5 | | |
| 2431 | C1 | 3455 | E5 | | |
| 2432 | B2 | 3456 | D2 | | |
| 2435 | A8 | 3457 | D2 | | |
| 2436 | B8 | 3458 | E7 | | |
| 2437 | B8 | 3459 | E5 | | |
| 2438 | C1 | 3460 | E2 | | |
| 2441 | D14 | 3461 | D2 | | |
| 2442 | C15 | 3462 | D1 | | |
| 2443 | C13 | 3463 | E6 | | |
| 2444 | C13 | 3464 | D1 | | |
| 2445 | A12 | 5401 | C3 | | |
| 2446 | B15 | 6411 | B13 | | |
| 2447 | C12 | 6412 | B15 | | |
| 2448 | B16 | 6413 | C13 | | |
| 2449 | E2 | 6414 | B15 | | |
| 2450 | E4 | 6421 | E3 | | |
| 2451 | E8 | 6422 | E3 | | |
| 2452 | D9 | 7401 | B4 | | |
| 2453 | D9 | 7402 | B2 | | |
| 2454 | B1 | 7403 | B2 | | |
| 3400 | D5 | 7405 | E4 | | |
| 3413 | E5 | 7406 | E4 | | |
| 3415 | A2 | 7407 | D3 | | |
| 3416 | B2 | 7408 | D4 | | |
| 3417 | A3 | 7411 | C15 | | |
| 3418 | B3 | 7412 | B14 | | |
| 3419 | C2 | 7413 | B14 | | |
| 3421 | C15 | 7414 | D3 | | |
| 3422 | C15 | 7415 | D2 | | |
| 3423 | C15 | 7416 | D4 | | |
| 3424 | D15 | 7451 | B8 | | |
| 3425 | C15 | 7452 | B7 | | |
| 3426 | D15 | 7453 | B6 | | |
| 3427 | C15 | 7454 | B10 | | |
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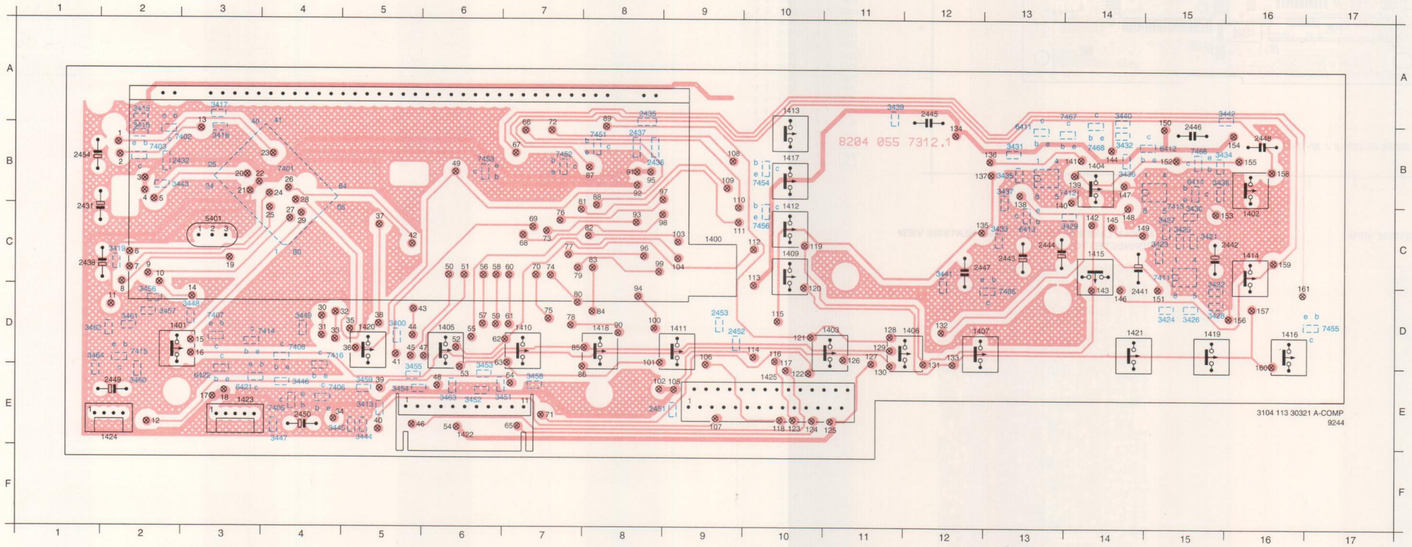
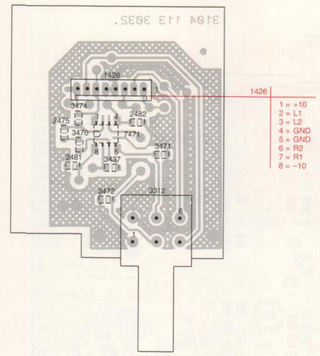
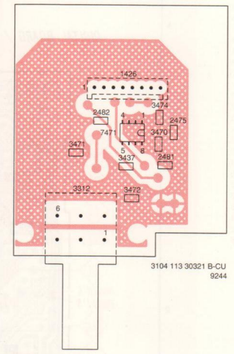


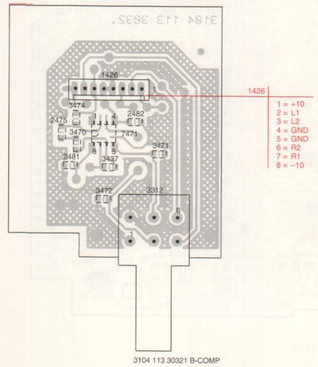


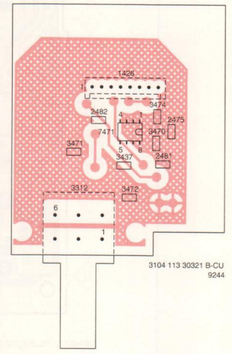

45

## VOLUME CONTROL BOARD

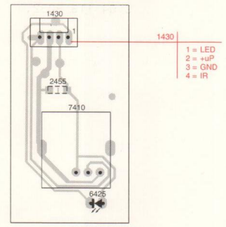


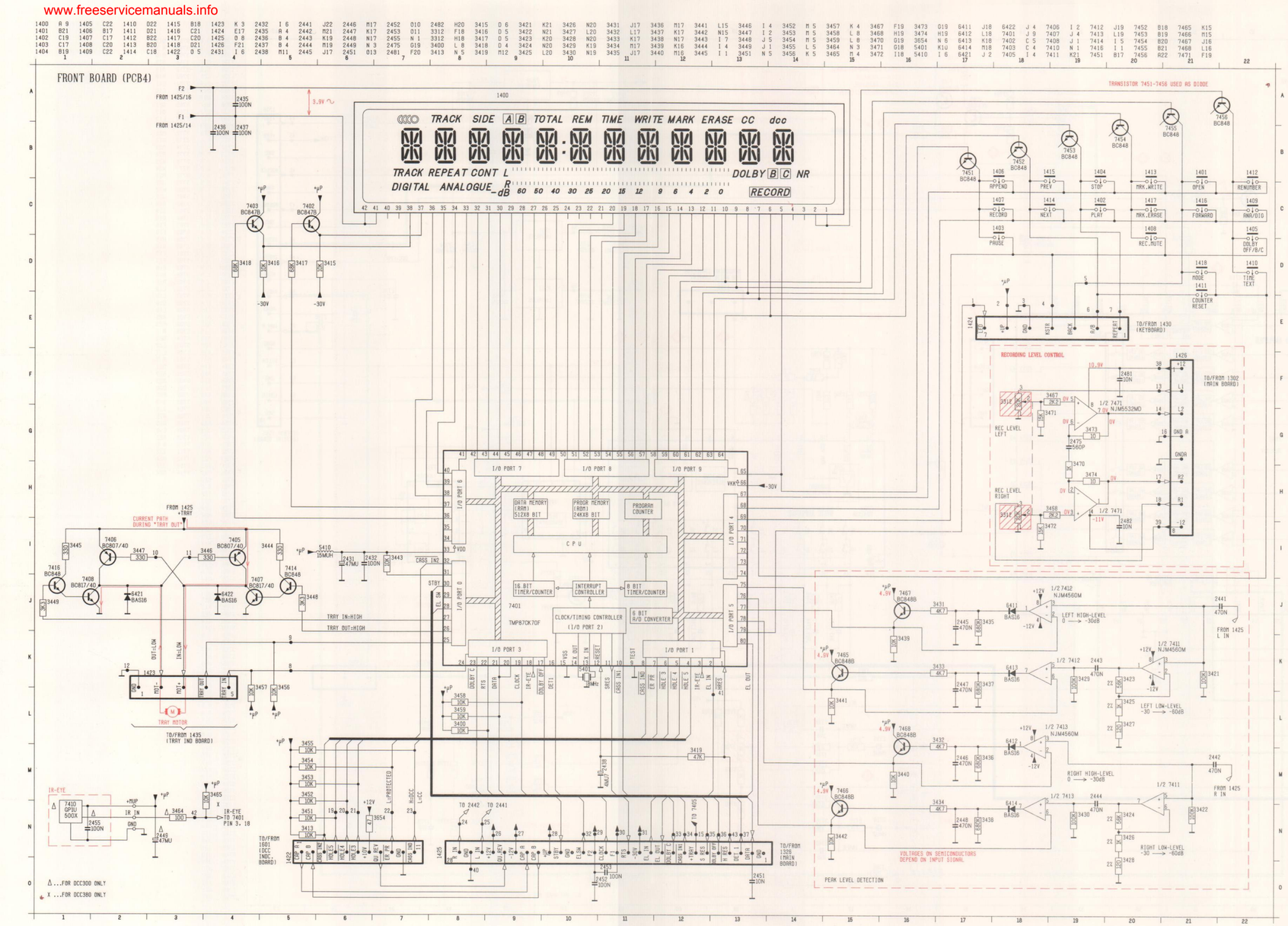




## I.R. BOARD



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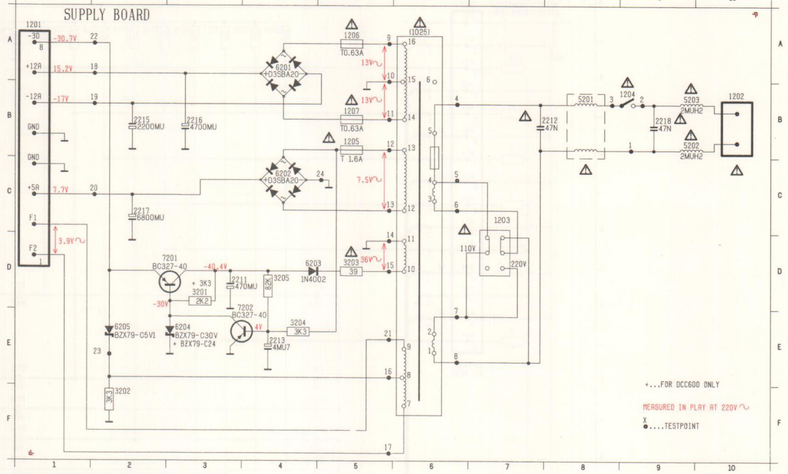


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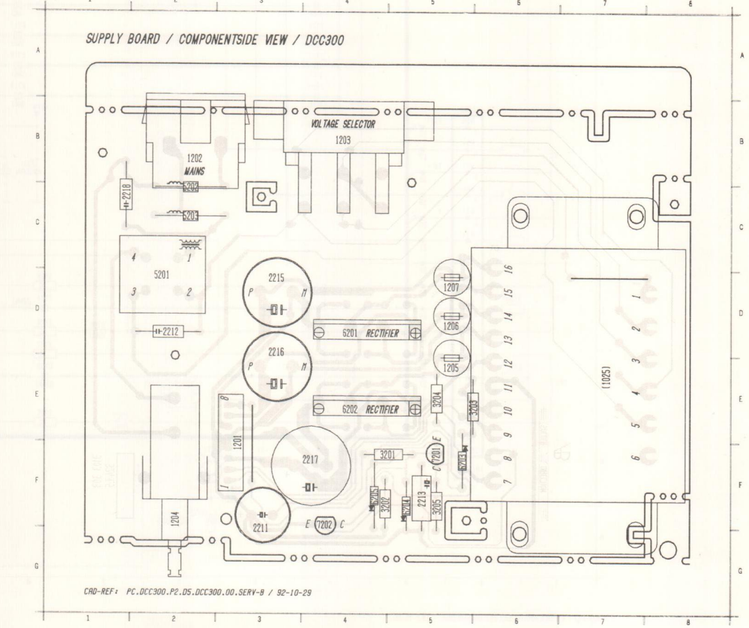


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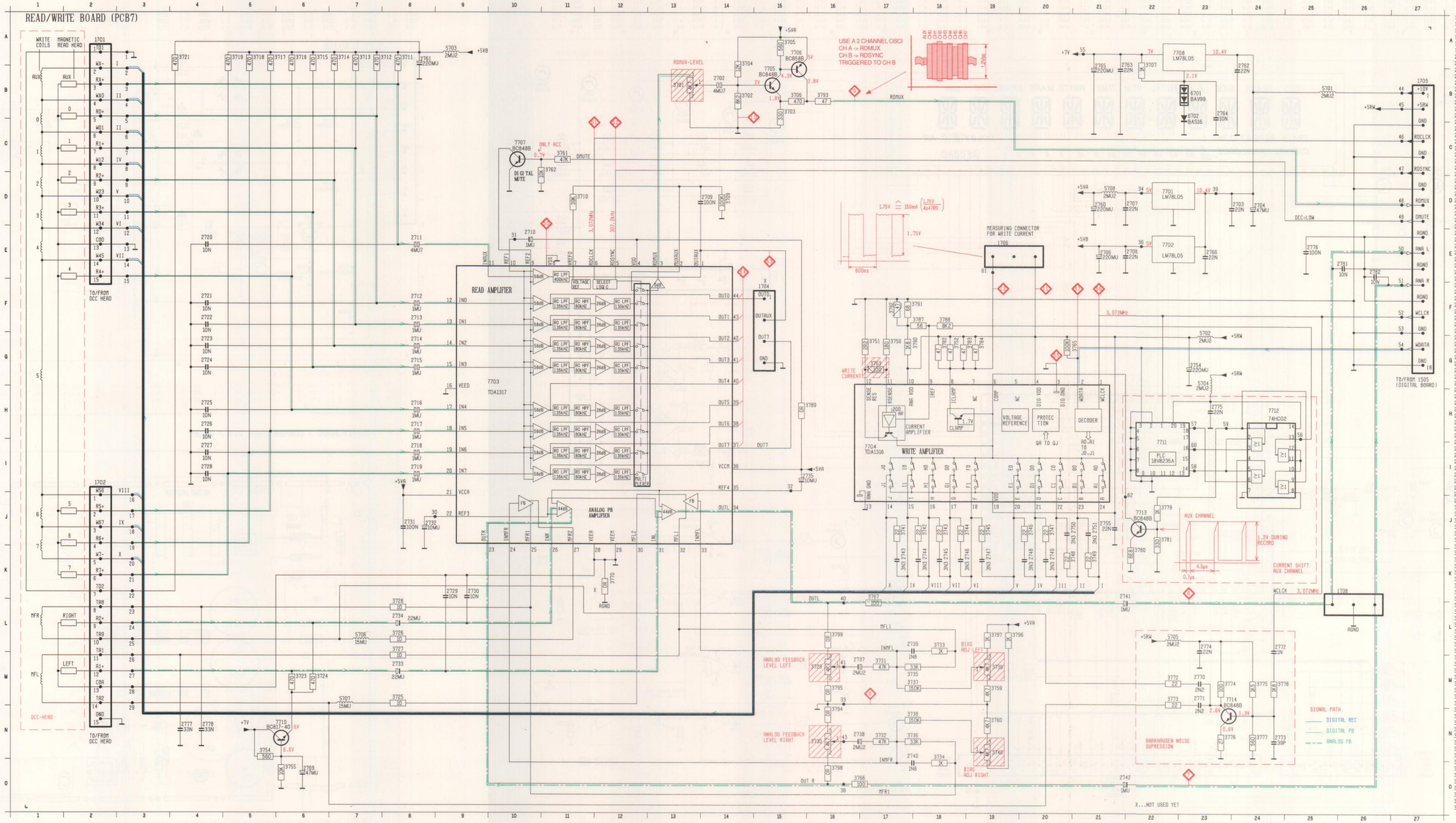
CS 45 937




CAD-REF: ES.DCC300.P7.DCC300.00.SH1.D06 (92-11-11)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2703 | A 4 | 3723 | D 2 | 7710 | D 3 | 1701 | E 3 |
| 2708 | F 2 | 3724 | D 2 | 7712 | F 4 | 1702 | D 4 |
| 2709 | B 3 | 3725 | C 2 | 7713 | F 3 | 1705 | E 2 |
| 2720 | C 4 | 3726 | C 2 | 7714 | D 2 | 1706 | G 3 |
| 2721 | C 4 | 3727 | C 2 | | | 2702 | A 3 |
| 2722 | B 4 | 3728 | C 2 | | | 2704 | F 2 |
| 2723 | B 4 | 3731 | B 2 | | | 2706 | F 4 |
| 2724 | C 4 | 3732 | B 2 | | | 2710 | B 2 |
| 2725 | C 4 | 3733 | A 2 | | | 2711 | C 2 |
| 2726 | C 4 | 3734 | B 2 | | | 2712 | C 2 |
| 2727 | C 4 | 3735 | B 2 | | | 2713 | B 2 |
| 2728 | C 3 | 3736 | C 2 | | | 2714 | B 2 |
| 2729 | D 2 | 3737 | A 2 | | | 2715 | C 2 |
| 2730 | D 2 | 3738 | B 2 | | | 2716 | C 2 |
| 2731 | B 3 | 3741 | E 2 | | | 2717 | C 2 |
| 2739 | B 2 | 3742 | E 2 | | | 2718 | C 2 |
| 2740 | B 3 | 3743 | E 2 | | | 2719 | C 3 |
| 2743 | E 2 | 3744 | E 2 | | | 2732 | C 3 |
| 2744 | E 2 | 3745 | E 3 | | | 2733 | C 4 |
| 2745 | E 2 | 3746 | E 3 | | | 2734 | C 4 |
| 2746 | E 2 | 3747 | E 3 | | | 2735 | A 3 |
| 2747 | E 3 | 3748 | E 3 | | | 2737 | A 3 |
| 2748 | E 3 | 3749 | E 3 | | | 2738 | B 4 |
| 2749 | E 3 | 3752 | F 2 | | | 2741 | C 3 |
| 2750 | E 3 | 3754 | D 3 | | | 2742 | C 3 |
| 2751 | E 3 | 3755 | D 3 | | | 2754 | F 3 |
| 2755 | F 3 | 3759 | A 2 | | | 2760 | B 2 |
| 2762 | F 2 | 3760 | B 2 | | | 2761 | E 2 |
| 2763 | F 2 | 3761 | B 4 | | | 2765 | F 4 |
| 2764 | F 2 | 3762 | B 4 | | | 2769 | D 3 |
| 2766 | G 2 | 3772 | C 2 | | | 3701 | A 2 |
| 2770 | D 2 | 3773 | C 2 | | | 3729 | A 3 |
| 2771 | D 2 | 3774 | C 2 | | | 3730 | B 3 |
| 2772 | E 4 | 3775 | C 2 | | | 3739 | A 4 |
| 2773 | F 3 | 3776 | D 2 | | | 3740 | B 4 |
| 2774 | C 2 | 3777 | C 2 | | | 3751 | F 4 |
| 2775 | F 4 | 3778 | F 4 | | | 3756 | F 4 |
| 2776 | E 3 | 3779 | F 3 | | | 3763 | F 3 |
| 2777 | C 3 | 3780 | F 3 | | | 3765 | F 3 |
| 2778 | C 2 | 3781 | F 3 | | | 3789 | A 2 |
| 3702 | A 4 | 3782 | F 2 | | | 3792 | B 4 |
| 3703 | A 4 | 3783 | F 2 | | | 3796 | A 4 |
| 3704 | A 4 | 3784 | G 2 | | | 3797 | A 4 |
| 3705 | A 4 | 3787 | F 3 | | | 3799 | A 3 |
| 3706 | A 4 | 3788 | F 4 | | | 5701 | G 2 |
| 3707 | F 2 | 3790 | F 2 | | | 5702 | F 2 |
| 3709 | B 3 | 3791 | F 2 | | | 5704 | F 2 |
| 3710 | B 3 | 3793 | B 4 | | | 5705 | C 4 |
| 3711 | D 3 | 3794 | B 3 | | | 5708 | B 2 |
| 3712 | D 3 | 3795 | A 3 | | | 7701 | A 2 |
| 3713 | D 3 | 3798 | B 3 | | | 7702 | F 4 |
| 3714 | D 3 | 5703 | E 2 | | | 7703 | B 3 |
| 3715 | D 3 | 5706 | C 3 | | | 7704 | F 3 |
| 3716 | D 2 | 5707 | D 3 | | | 7708 | F 4 |
| 3717 | D 2 | 6701 | F 2 | | | 7711 | F 2 |
| 3718 | D 2 | 6702 | F 2 | | | | |
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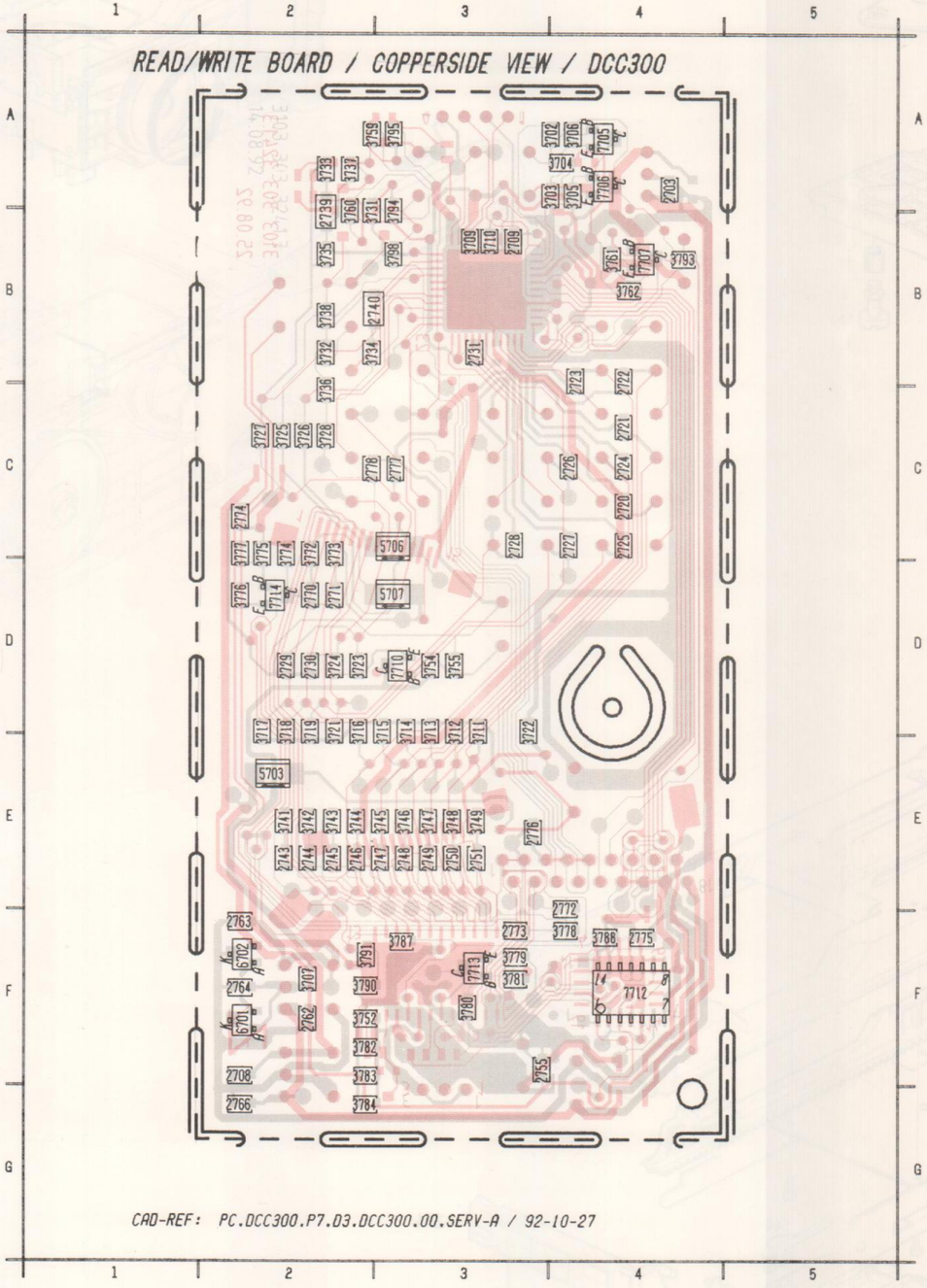
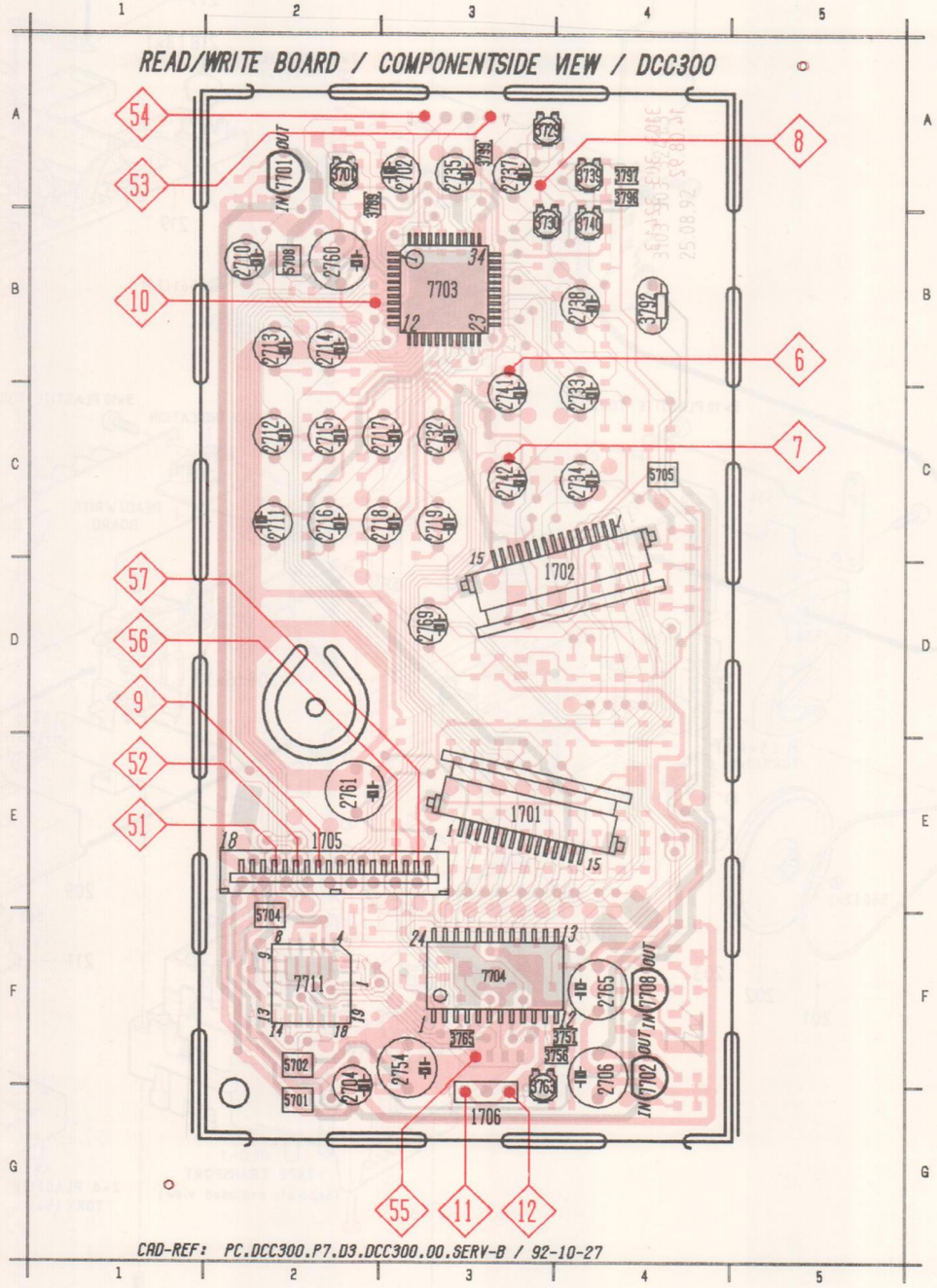
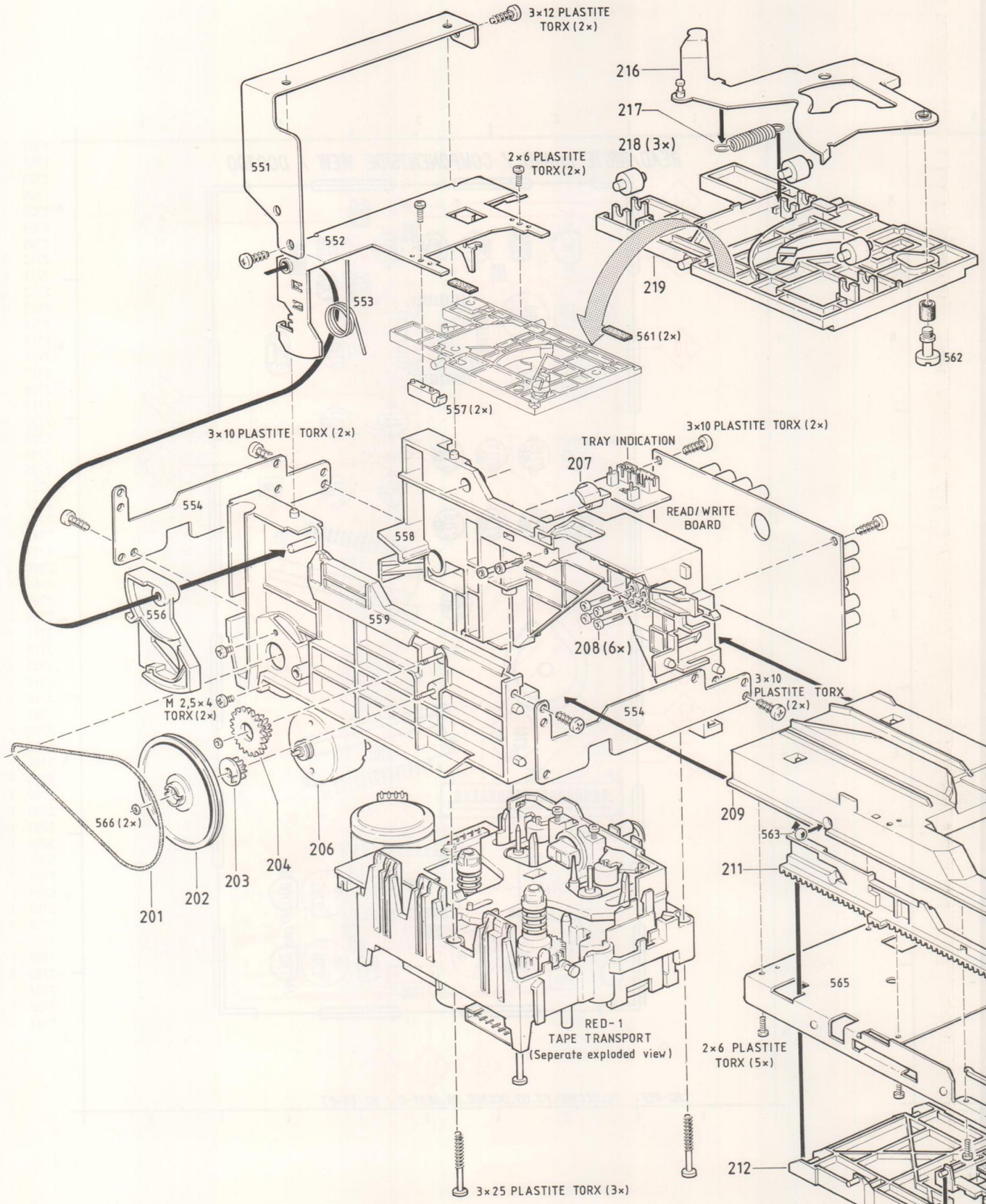
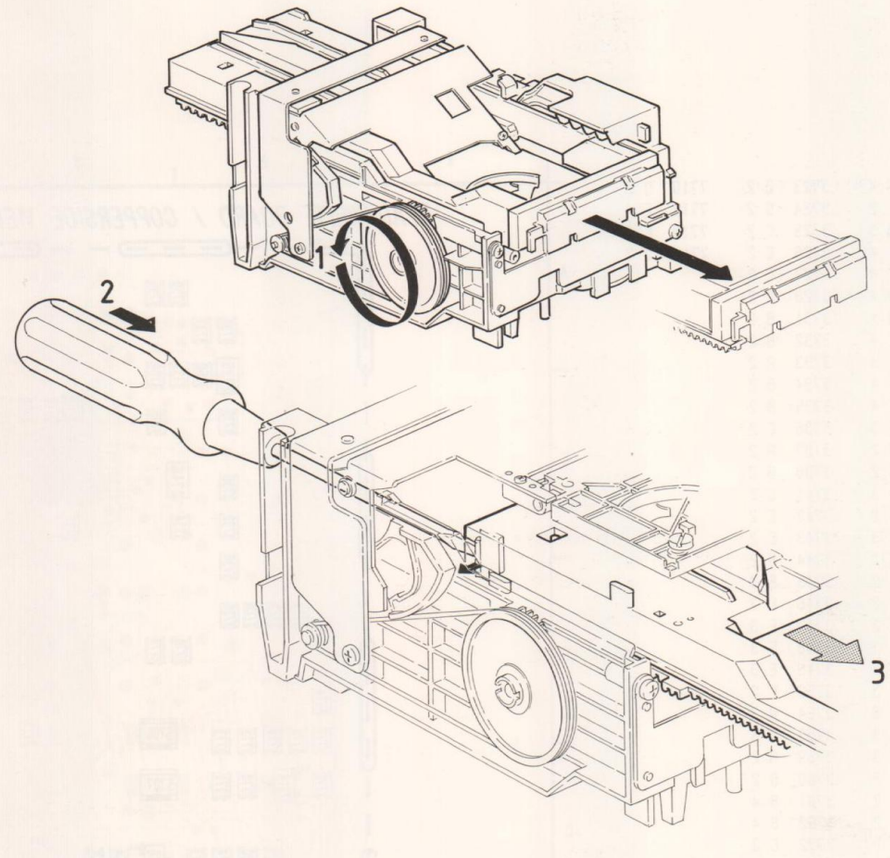


# Exploded view Loading Assy

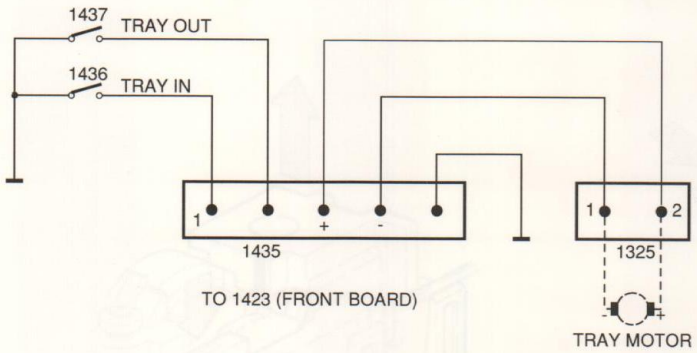


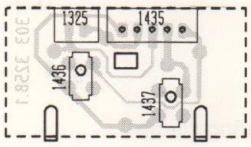
# MECHANICAL PARTS LOADING ASSY

| | | |
|---|---|---|
| | 4822 691 20833 | COMPLETE LOADING ASSY |
| 201 | 4822 358 30223 | DRIVING BELT |
| 202 | 4822 528 81495 | BELT-WHEEL |
| 203 | 4822 522 33347 | GEAR (PUSH TRAY) |
| 204 | 4822 522 33346 | GEAR |
| 206 | 4822 361 21598 | MOTOR + PULLEY |
| 207 | 4822 402 50303 | SWITCH LEVER |
| 208 | 4822 528 70809 | GUIDING WHEEL |
| 209 | 4822 443 63838 | DRAWER |
| 211 | 4822 522 20453 | TOOTH RACK |
| 212 | 4822 403 70851 | HINGE BACK |
| 213 | 4822 466 93225 | LIFTPLATE |
| 214 | 4822 403 70849 | HINGE FRONT |
| 216 | 4822 402 30169 | CATCH LEVER ASSY |
| 217 | 4822 492 33386 | SPRING CATCH LEVER |
| 218 | 4822 528 90639 | ROLLER |
| 219 | 4822 466 93226 | STABILIZER |
| 562 | 4822 502 21281 | SCREW (CATCH LEVER) |
| | 4822 502 21282 | SCREW 2 x 5 PLASTITE |
| | 4822 502 13886 | SCREW 2 x 6 PLASTITE |
| | 4822 502 21283 | SCREW M 2,5 x 4 |

## TRAY INDICATION BOARD




TRAY INDICATION BOARD / DCC300
COMPONENTSIDE VIEW




CAD-REF: PC.DCC300.PO.DI.DCC300.00.SERV-B
92-11-04

## Partslist

| | | |
|---|---|---|
| 1436 | 4822 276 12889 | SWITCH 100mA / $30V_{DC}$ |
| 1437 | 4822 276 12889 | SWITCH 100mA / $30V_{DC}$ |

# Dismantling DCC Head

For dismantling / assembling the DCC head follow picture 1 to 4.

The DCC head is very sensitiv against ESD. Therefore it´s **absoluteley necessary** to wear a wrist wrap.

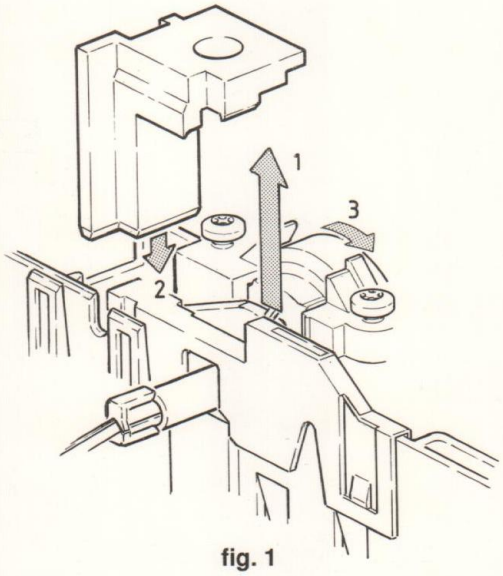



fig. 1

1.1 Remove bearing clamp (pos. 140)
1.2 Insert mounting support **(4822 403 70846)**
1.3 Turn DCC head to bring tooth segment lever (pos.65 ) in correct position. See fig. 2

2.1 Lift the DCC head
2.2 Press to remove the DCC head

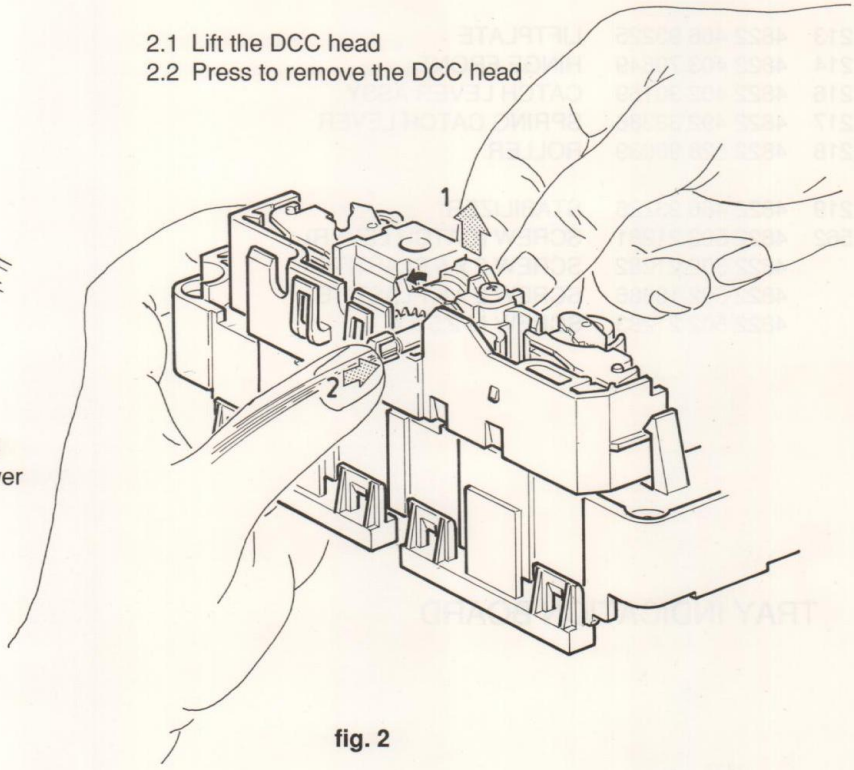



fig. 2

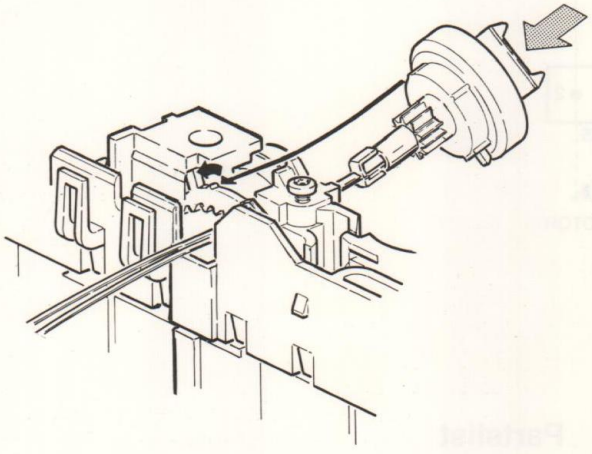


fig. 3

3.1 Check if the tooth segment lever (pos. 65) is in the correct position.
3.2 Insert DCC head so that ribs on the head align to the ribs of the tooth segment lever.

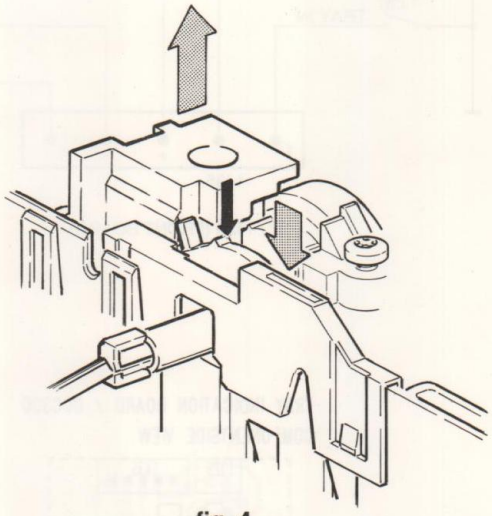
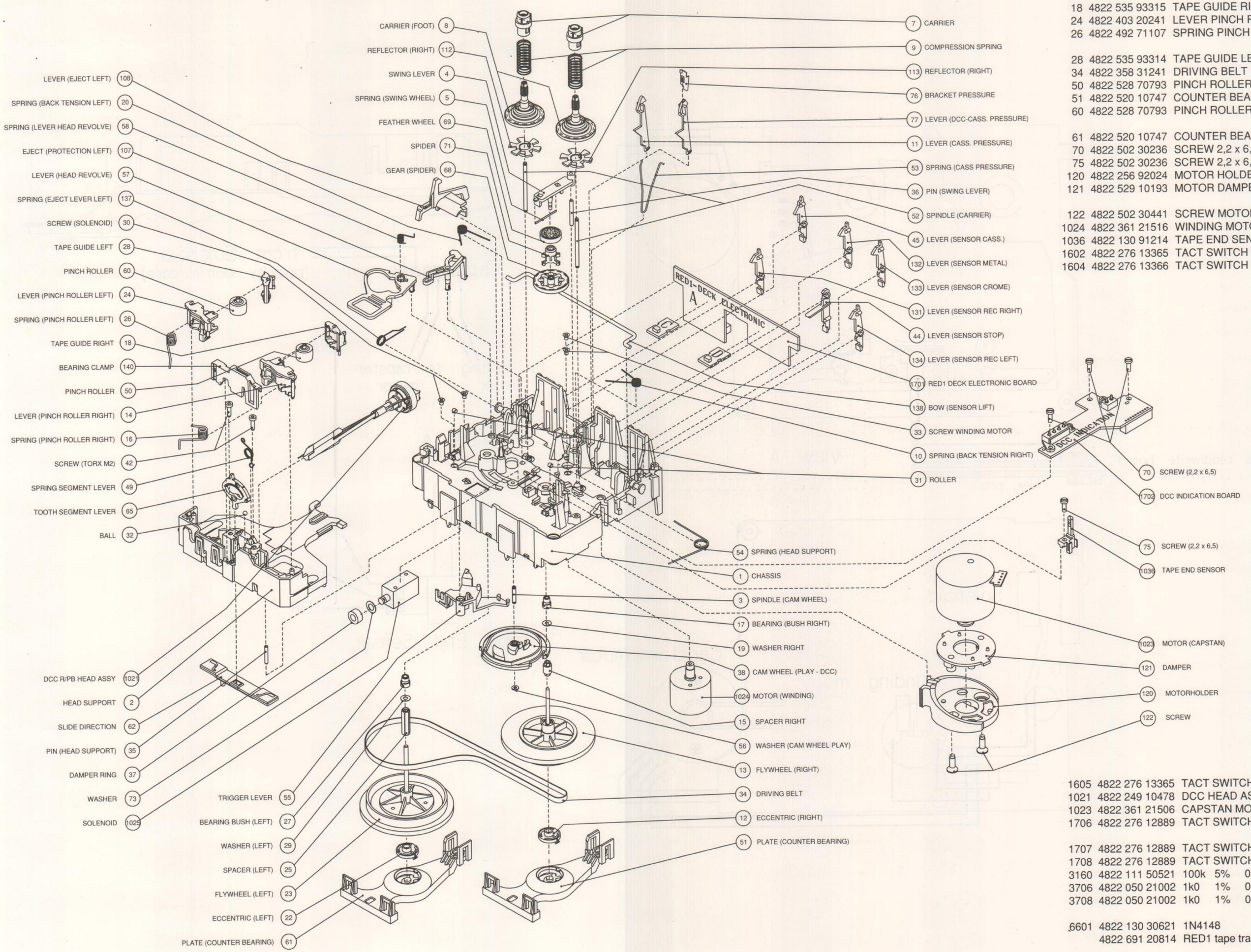


fig. 4

4.1 Insert bearing clamp
4.2 Remove mounting support

# Exploded view RED Tape Transport

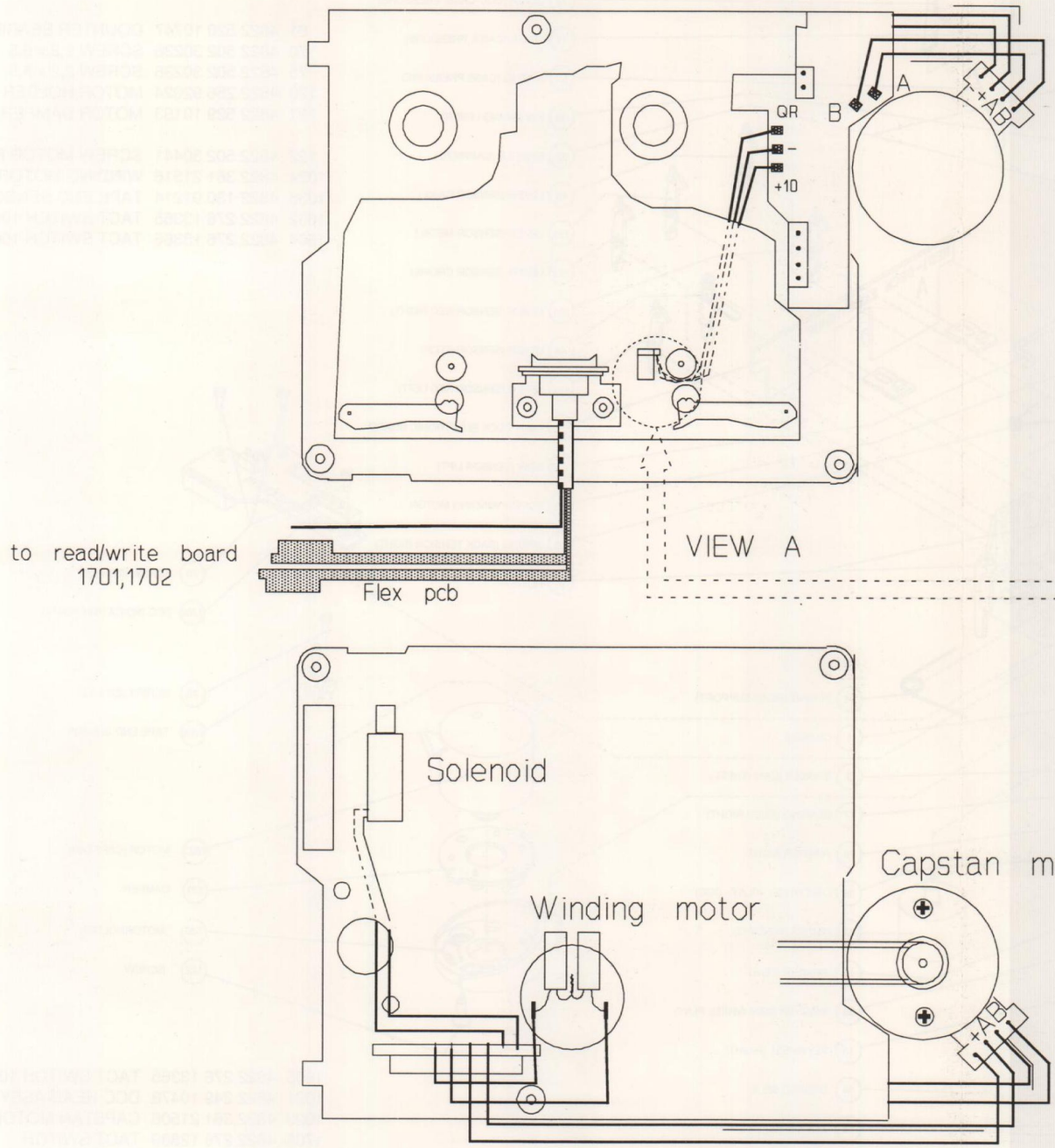


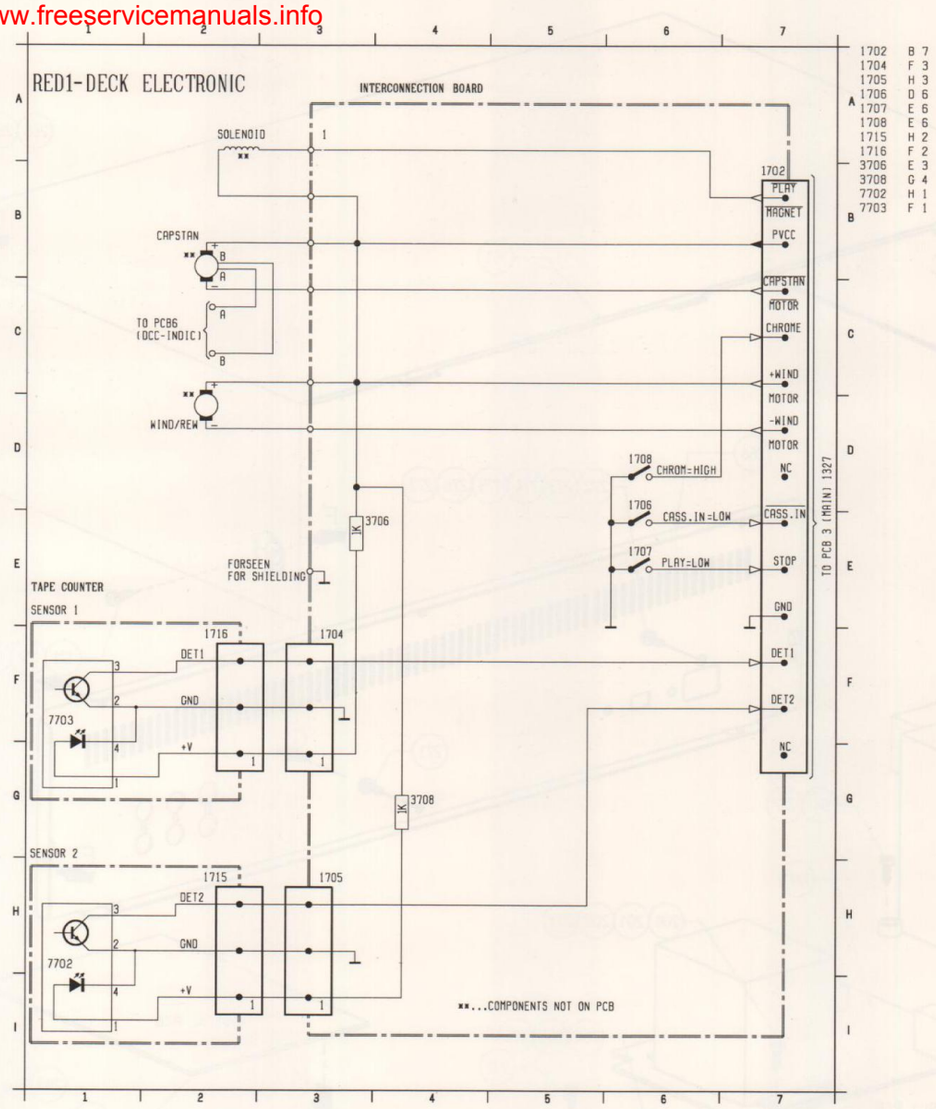


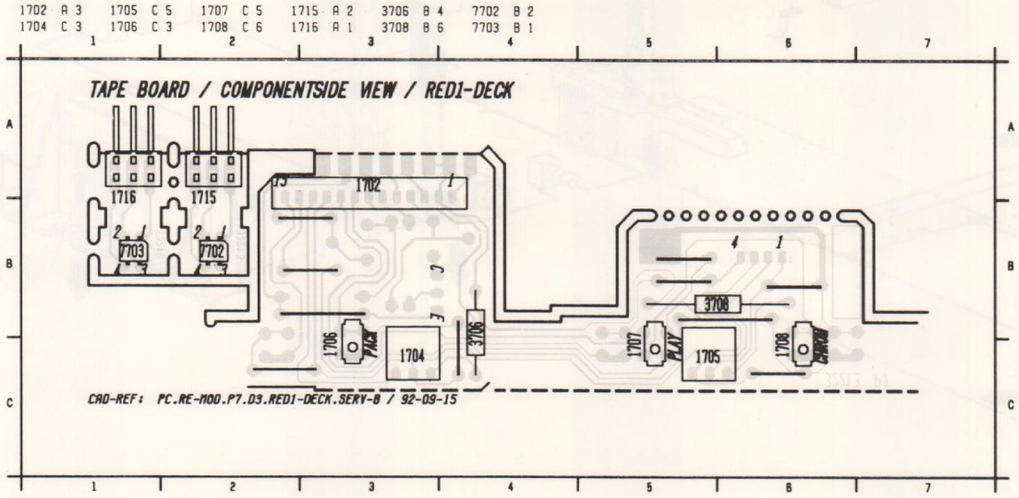

## Partslist of RED1 Tape transport

| | | |
|---|---|---|
| 14 | 4822 403 20239 | LEVER PINCH ROLLER RIGHT |
| 16 | 4822 492 71106 | SPRING PINCH ROLLER RIGHT |
| 18 | 4822 535 93315 | TAPE GUIDE RIGHT |
| 24 | 4822 403 20241 | LEVER PINCH ROLLER LEFT |
| 26 | 4822 492 71107 | SPRING PINCH ROLLER LEFT |
| 28 | 4822 535 93314 | TAPE GUIDE LEFT |
| 34 | 4822 358 31241 | DRIVING BELT |
| 50 | 4822 528 70793 | PINCH ROLLER |
| 51 | 4822 520 10747 | COUNTER BEARING PLATE RIGHT |
| 60 | 4822 528 70793 | PINCH ROLLER |
| 61 | 4822 520 10747 | COUNTER BEARING PLATE LEFT |
| 70 | 4822 502 30236 | SCREW 2,2 x 6,5 |
| 75 | 4822 502 30236 | SCREW 2,2 x 6,5 |
| 120 | 4822 256 92024 | MOTOR HOLDER |
| 121 | 4822 529 10193 | MOTOR DAMPER |
| 122 | 4822 502 30441 | SCREW MOTOR FIXATION |
| 1024 | 4822 361 21516 | WINDING MOTOR |
| 1036 | 4822 130 91214 | TAPE END SENSOR |
| 1602 | 4822 276 13365 | TACT SWITCH 10mA / 5V |
| 1604 | 4822 276 13366 | TACT SWITCH 10mA / 5V |
| 1605 | 4822 276 13365 | TACT SWITCH 10mA / 5V |
| 1021 | 4822 249 10478 | DCC HEAD ASSY |
| 1023 | 4822 361 21506 | CAPSTAN MOTOR |
| 1706 | 4822 276 12889 | TACT SWITCH |
| 1707 | 4822 276 12889 | TACT SWITCH |
| 1708 | 4822 276 12889 | TACT SWITCH |
| 3160 | 4822 111 50521 | 100k 5% 0,6W |
| 3706 | 4822 050 21002 | 1k0 1% 0,6W |
| 3708 | 4822 050 21002 | 1k0 1% 0,6W |
| 6601 | 4822 130 30621 | 1N4148 |
| | 4822 691 20814 | RED1 tape transport |

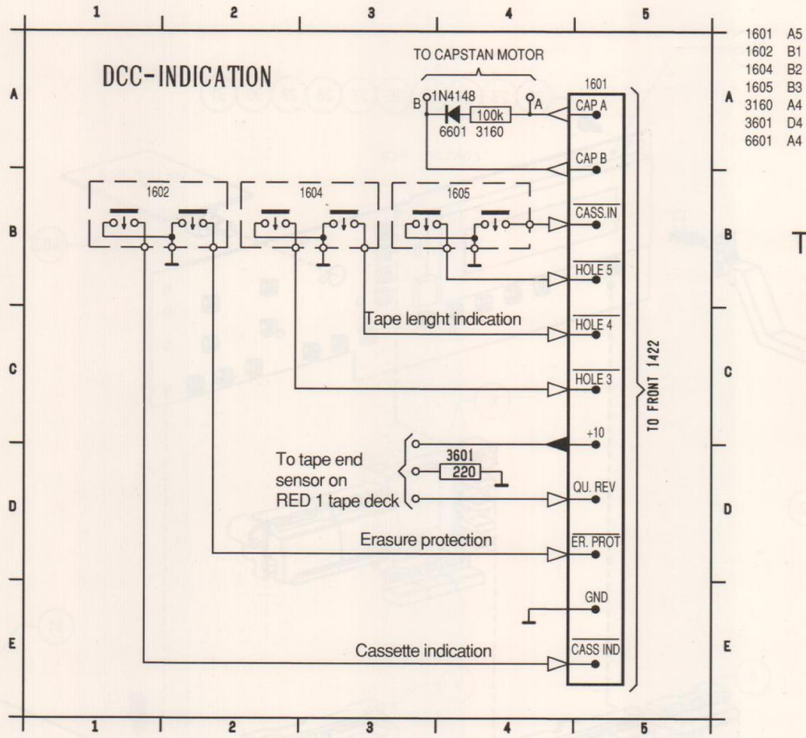
# WIRING DIAGRAM TAPE TRANSPORT





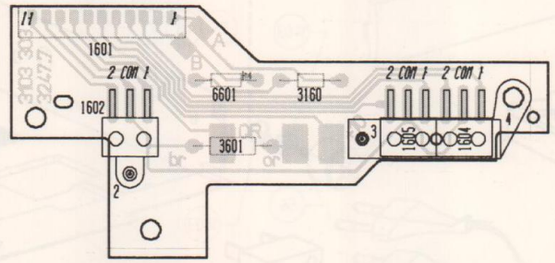


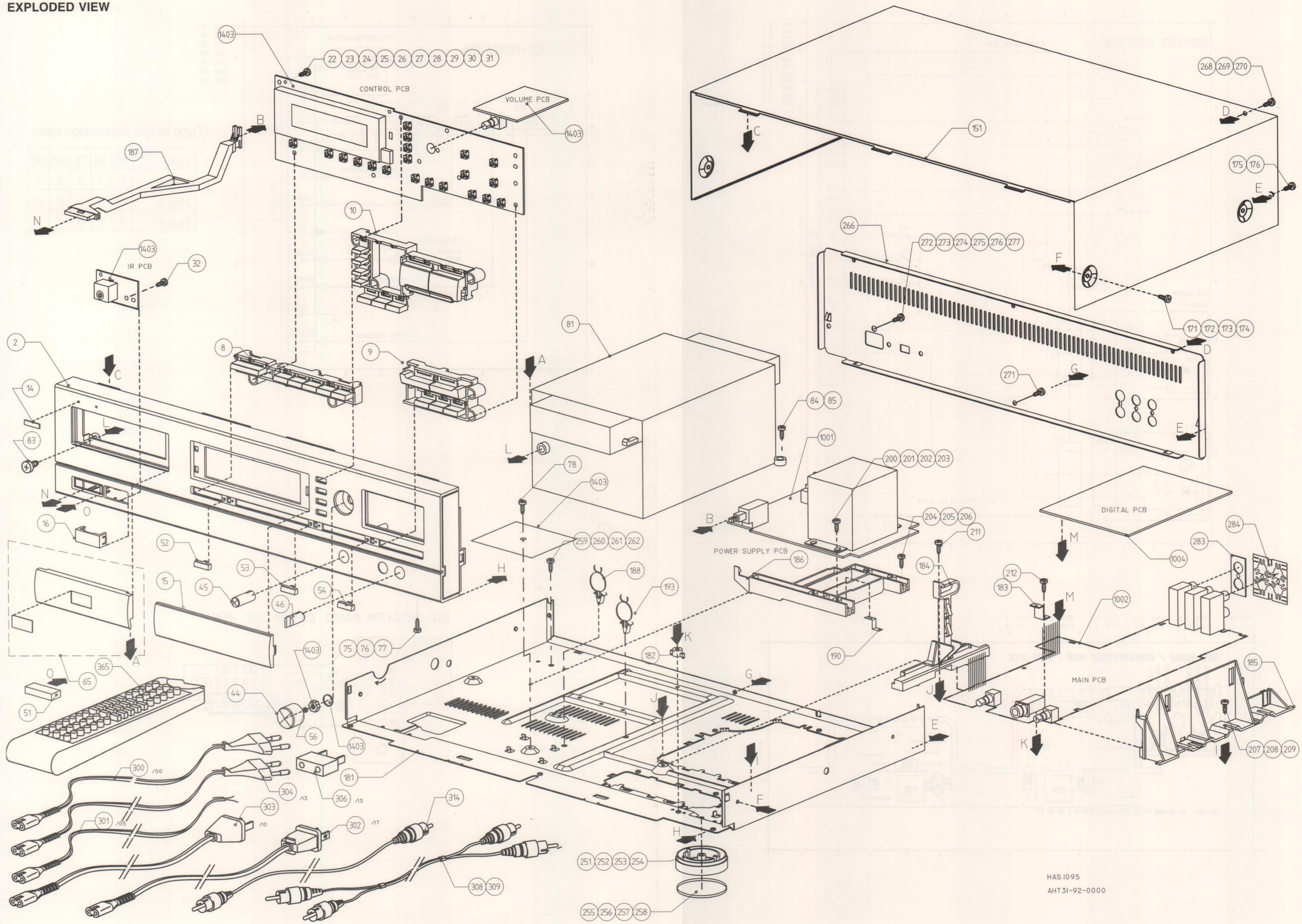

## Tape length conversion table

| Time / Hole | 45 | 60 | 75 | 105 | 120 |
|---|---|---|---|---|---|
| Hole 3 | 0 | 1 | 0 | 0 | 1 |
| Hole 4 | 0 | 0 | 1 | 0 | 0 |
| Hole 5 | 0 | 0 | 0 | 1 | 1 |

*DCC-INDICATOR BOARD, COPPER SIDE VIEW*



## EXPLODED VIEW




HAS.1095
AHT31-92-0000

## MECHANICAL PARTSLIST

### Partslist cabinet

| | | | |
|---|---|---|---|
| 2 | | 4822 444 40633 | FRONT ASSY |
| 8 | | 4822 410 62407 | LEFT BUTTON ASSY |
| 9 | | 4822 410 62408 | RIGHT BUTTON ASSY |
| 10 | | 4822 410 62409 | BUTTON ASSY |
| 14 | | 4822 459 10887 | WORDMARK |
| 15 | | 4822 450 62002 | WINDOW |
| 16 | | 4822 450 62003 | IR WINDOW |
| 44 | | 4822 413 41758 | LEVEL KNOB |
| 45 | | 4822 413 41759 | BALANCE KNOB |
| 46 | | 4822 413 41759 | VOLUME KNOB |
| 51 | | 4822 462 71808 | POWER CAP |
| 52 - 54 | | 4822 410 62406 | FIXED BUTTON |
| 56 | | 4822 492 63086 | FIXATION RING |
| 65 | | 4822 444 40634 | TRAY FRONT |
| 151 | | 4822 444 60897 | COVER |
| 187 | | 4822 535 93361 | POWERROD |
| 251 - 254 | | 4822 462 41715 | FOOT |
| 255 - 258 | | 4822 462 41479 | FELT |
| 272 - 277 | | 4822 502 21287 | P3 X 10 |
| 300 | ⚠ | 4822 321 10249 | MAINS CORD only /00 |
| 301 | ⚠ | 4822 321 10719 | MAINS CORD only /05 |
| 302 | ⚠ | 4822 321 10492 | MAINS CORD only /06 |
| 302 | ⚠ | 4822 321 10788 | MAINS CORD only /17 |
| 308 | | 4822 321 22832 | SBC1072 |
| 309 | | 4822 321 22832 | SBC1072 |
| 314 | | 4822 321 61452 | |
| 365 | | 4822 218 10492 | RH6923/00 |

**Not mentioned parts are only available during production period on special request.**

### Screws

| | | | | | |
|---|---|---|---|---|---|
| Taptite | M3x6: | 75, 76, 77, 78, 207, 208 209 | Plastite | M3x10: | 22, 23, 24, 25, 26, 27 28, 29, 30, 31, 32, 83 200, 201, 202, 203 |
| Taptite | M3x10: | 84, 85, 204, 205, 206 206, 211, 212 | Plastite | M3,5x8: | 259, 260, 261, 262 |
| Taptite | M3x10 + pin + washer: | 171, 172, 173, 174, 175 176, 268, 269, 270, 271 | | | |

## MAIN PANEL

### MISCELLANEOUS

| | | | |
|---|---|---|---|
| 7 | ⚠ | 4822 255 40128 | CLIP |
| 8 | ⚠ | 4822 255 40128 | CLIP |
| 9 | ⚠ | 4822 255 40128 | CLIP |
| 1307 | | 4822 280 80762 | MINI RELAY |
| 1311 | ⚠ | 4822 267 31453 | SOCKET |
| 1337 | ⚠ | 4822 071 53151 | FUSE T315mA |
| 1337 | ⚠ | 4822 253 10146 | FUSE T500mA only /17 |

### CAPACITORS

| | | |
|---|---|---|
| 2231 | 4822 124 41584 | 100µF 20% 10V |
| 2232 | 4822 124 41584 | 100µF 20% 10V |
| 2241 | 4822 122 33809 | 22nF 20% 50V |
| 2242 | 4822 122 33809 | 22nF 20% 50V |
| 2247 | 5322 122 32531 | 100pF 5% 50V |
| 2248 | 5322 122 32531 | 100pF 5% 50V |
| 2250 | 4822 124 40433 | 47µF 20% 25V |
| 2251 | 4822 124 80411 | 3300µF 20% 16V |
| 2252 | 4822 122 33809 | 22nF 20% 50V |
| 2253 | 4822 124 40433 | 47µF 20% 25V |
| 2254 | 4822 122 33809 | 22nF 20% 50V |
| 2255 | 5322 122 32531 | 100pF 5% 50V |
| 2256 | 4822 122 33809 | 22nF 20% 50V |
| 2257 | 4822 124 41997 | 470µF 20% 10V |
| 2259 | 4822 122 33809 | 22nF 20% 50V |
| 2260 | 5322 122 32531 | 100pF 5% 50V |
| 2261 | 4822 122 33809 | 22nF 20% 50V |
| 2262 | 4822 124 22263 | 220µF 20% 25V |
| 2264 | 4822 122 33809 | 22nF 20% 50V |
| 2265 | 5322 122 32531 | 100pF 5% 50V |
| 2266 | 4822 122 33809 | 22nF 20% 50V |
| 2267 | 4822 124 22263 | 220µF 20% 25V |
| 2268 | 4822 122 33809 | 22nF 20% 50V |
| 2269 | 4822 122 33809 | 22nF 20% 50V |
| 2270 | 4822 124 40433 | 47µF 20% 25V |
| 2271 | 4822 124 40433 | 47µF 20% 25V |
| 2272 | 4822 122 33177 | 10nF 20% 50V |
| 2273 | 4822 122 33177 | 10nF 20% 50V |
| 2275 | 4822 126 10002 | 100nF 20% 25V |
| 2276 | 4822 126 10002 | 100nF 20% 25V |
| 2277 | 4822 126 10002 | 100nF 20% 25V |
| 2278 | 4822 126 10002 | 100nF 20% 25V |
| 2279 | 4822 126 10002 | 100nF 20% 25V |
| 2280 | 4822 126 10002 | 100nF 20% 25V |
| 2281 ⚠ | 4822 124 41584 | 100µF 20% 10V |
| 2283 | 4822 126 10002 | 100nF 20% 25V |
| 2284 | 4822 122 33177 | 10nF 20% 50V |
| 2285 | 4822 122 33325 | 470nF +80-20% 16V |
| 2286 | 4822 122 33177 | 10nF 20% 50V |
| 2287 | 4822 122 33891 | 3,3nF 10% 63V |
| 2288 | 4822 122 33891 | 3,3nF 10% 63V |
| 2289 | 4822 122 33177 | 10nF 20% 50V |
| 2290 | 4822 122 33177 | 10nF 20% 50V |
| 2291 | 5322 122 32531 | 100pF 5% 50V |
| 2292 | 5322 122 32531 | 100pF 5% 50V |
| 2293 | 4822 124 40246 | 4,7µF 20% 63V |
| 2294 | 4822 124 41584 | 100µF 20% 10V |
| 2295 | 5322 124 41431 | 22µF 20% 35V |
| 2296 | 4822 126 12102 | 330nF +80-20% 50V |
| 2298 | 4822 126 10002 | 100nF 20% 25V |
| 2299 | 4822 124 40242 | 1µF 20% 63V |
| 2300 | 5322 122 32268 | 470pF 10% 50V |
| 2301 | 4822 124 41584 | 100µF 20% 10V |
| 2302 | 4822 124 41584 | 100µF 20% 10V |
| 2303 | 4822 124 22263 | 220µF 20% 25V |
| 2304 | 4822 124 22263 | 220µF 20% 25V |
| 2305 | 4822 124 40433 | 47µF 20% 25V |
| 2306 | 4822 124 40433 | 47µF 20% 25V |
| 2307 | 5322 122 32452 | 47pF 5% 63V |
| 2308 | 5322 122 32452 | 47pF 5% 63V |
| 2309 | 4822 122 33891 | 3,3nF 10% 63V |
| 2310 | 4822 122 33891 | 3,3nF 10% 63V |
| 2311 | 4822 126 10002 | 100nF 20% 25V |
| 2312 | 4822 126 10002 | 100nF 20% 25V |
| 2313 | 4822 126 10002 | 100nF 20% 25V |
| 2314 | 4822 126 10002 | 100nF 20% 25V |
| 2315 | 5322 122 32268 | 470pF 10% 50V |
| 2316 | 5322 122 32268 | 470pF 10% 50V |
| 2317 | 5322 122 32452 | 47pF 5% 63V |
| 2318 | 5322 122 32452 | 47pF 5% 63V |
| 2319 | 5322 122 32452 | 47pF 5% 63V |
| 2320 | 5322 122 32452 | 47pF 5% 63V |
| 2321 | 5322 122 32531 | 100pF 5% 50V |
| 2322 | 5322 122 32531 | 100pF 5% 50V |
| 2323 | 4822 126 10002 | 100nF 20% 25V |
| 2324 | 4822 126 10002 | 100nF 20% 25V |
| 2325 | 4822 121 51256 | 39nF 10% 50V |
| 2326 | 4822 121 70266 | 39nF 10% 50V |
| 2327 | 5322 122 32268 | 470pF 10% 50V |
| 2328 | 5322 122 32268 | 470pF 10% 50V |
| 2329 | 4822 122 33806 | 820pF 10% 63V |
| 2330 | 4822 122 33806 | 820pF 10% 63V |
| 2331 | 4822 124 40433 | 47µF 20% 25V |
| 2332 | 4822 124 40433 | 47µF 20% 25V |
| 2333 | 4822 124 40246 | 4,7µF 20% 63V |
| 2334 | 4822 124 40246 | 4,7µF 20% 63V |
| 2335 | 4822 124 41643 | 100µF 20% 16V |
| 2336 | 4822 124 41643 | 100µF 20% 16V |
| 2337 | 4822 121 51412 | 560nF 5% 63V |
| 2338 | 4822 121 51412 | 560nF 5% 63V |
| 2339 | 5322 121 42661 | 330nF 5% 63V |



| | | |
|---|---|---|
| 2340 | 5322 121 42661 | 330nF 5% 63V |
| 2341 | 5322 122 32531 | 100pF 5% 50V |
| 2342 | 5322 122 32531 | 100pF 5% 50V |
| 2343 | 4822 126 10002 | 100nF 20% 25V |
| 2344 | 4822 126 10002 | 100nF 20% 25V |
| 2345 | 4822 122 32999 | 2,2nF 5% NPO |
| 2346 | 4822 122 32999 | 2,2nF 5% NPO |
| 2347 | 4822 122 32999 | 2,2nF 5% NPO |
| 2348 | 4822 122 32999 | 2,2nF 5% NPO |
| 2349 | 4822 122 32999 | 2,2nF 5% NPO |
| 2350 | 4822 122 32999 | 2,2nF 5% NPO |
| 2351 | 5322 122 32268 | 470pF 10% 50V |
| 2352 | 5322 122 32268 | 470pF 10% 50V |
| 2353 | 4822 126 10002 | 100nF 20% 25V |
| 2354 | 4822 126 10002 | 100nF 20% 25V |
| 2355 | 4822 126 10002 | 100nF 20% 25V |
| 2356 | 4822 126 10002 | 100nF 20% 25V |
| 2357 | 4822 124 41584 | 100µF 20% 10V |
| 2358 | 4822 124 41584 | 100µF 20% 10V |
| 2359 | 4822 124 41643 | 100µF 20% 16V |
| 2360 | 4822 124 41643 | 100µF 20% 16V |
| 2361 | 4822 126 10002 | 100nF 20% 25V |
| 2362 | 4822 126 10002 | 100nF 20% 25V |
| 2363 | 4822 122 32999 | 2,2nF 5% NPO |
| 2364 | 4822 122 32999 | 2,2nF 5% NPO |
| 2365 | 4822 124 40433 | 47µF 20% 25V |
| 2366 | 4822 124 40433 | 47µF 20% 25V |
| 2367 | 4822 122 32999 | 2,2nF 5% NPO |
| 2368 | 4822 122 32999 | 2,2nF 5% NPO |
| 2369 | 4822 124 41643 | 100µF 20% 16V |
| 2370 | 4822 124 41643 | 100µF 20% 16V |
| 2371 | 4822 122 33797 | 47nF 20% 50V |
| 2372 | 4822 122 33809 | 22nF 20% 50V |
| 2373 | 4822 124 40239 | 0,47µF 20% 63V |
| 2374 | 4822 122 33342 | 33nF 10% 63V |
| 2375 | 4822 122 33177 | 10nF 20% 50V |
| 2376 | 4822 122 32927 | 220nF +80-20% 50V |
| 2377 | 5322 121 42502 | 390nF 5% 63V |
| 2378 | 4822 124 41643 | 100µF 20% 16V |
| 2379 | 5322 122 32531 | 100pF 5% 50V |
| 2380 | 4822 124 40246 | 4,7µF 20% 63V |
| 2381 | 4822 122 33797 | 47nF 20% 50V |
| 2383 | 5322 122 32531 | 100pF 5% 50V |
| 2384 | 4822 126 10002 | 100nF 20% 25V |
| 2385 | 4822 124 41584 | 100µF 20% 10V |
| 2386 | 4822 124 41584 | 100µF 20% 10V |
| 2387 | 4822 126 10002 | 100nF 20% 25V |
| 2388 | 4822 124 41997 | 470µF 20% 10V |
| 2389 | 4822 124 40246 | 4,7µF 20% 63V |
| 2390 | 4822 126 10002 | 100nF 20% 25V |
| 2391 | 5322 124 41431 | 22µF 20% 35V |
| 2392 | 4822 126 10002 | 100nF 20% 25V |
| 2393 ⚠ | 4822 124 41584 | 100µF 20% 10V |
| 2394 | 4822 124 40246 | 4,7µF 20% 63V |
| 2395 | 4822 124 40246 | 4,7µF 20% 63V |
| 2396 | 4822 122 32927 | 220nF +80-20% 50V |
| 2397 | 4822 124 41583 | 0,68µF 20% 25V BIP |
| 2398 | 4822 122 33177 | 10nF 20% 50V |
| 2399 | 4822 124 80409 | 2200µF 20% 16V |
| 2450 | 4822 124 22263 | 220µF 20% 25V |

### RESISTORS

| | | |
|---|---|---|
| 3127 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3128 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3129 | 4822 051 20473 | 47k 5% 0,1W |
| 3130 | 4822 051 20473 | 47k 5% 0,1W |
| 3132 | 4822 051 20473 | 47k 5% 0,1W |
| 3133 | 4822 051 20475 | 4M7 5% 0,1W |
| 3134 | 4822 051 20475 | 4M7 5% 0,1W |
| 3135 | 4822 051 20122 | 1k2 5% 0,1W |
| 3136 | 4822 051 20122 | 1k2 5% 0,1W |
| 3137 | 4822 051 20332 | 3k3 5% 0,1W |
| 3138 | 4822 051 20332 | 3k3 5% 0,1W |
| 3139 | 4822 051 20008 | 0Ω 5% 0,1W |
| 3141 | 4822 051 20473 | 47k 5% 0,1W |
| 3142 | 4822 051 20473 | 47k 5% 0,1W |
| 3143 | 4822 051 20103 | 10k 5% 0,1W |
| 3144 | 4822 051 20103 | 10k 5% 0,1W |
| 3145 | 4822 051 20103 | 10k 5% 0,1W |
| 3146 | 4822 051 20103 | 10k 5% 0,1W |
| 3147 | 4822 051 20223 | 22k 5% 0,1W |
| 3148 | 4822 051 20223 | 22k 5% 0,1W |
| 3149 | 4822 051 20109 | 10Ω 5% 0,1W |
| 3151 ⚠ | 4822 052 10478 | 4Ω7 5% 0,33W |
| 3152 ⚠ | 4822 052 10478 | 4Ω7 5% 0,33W |
| 3153 | 4822 051 10102 | 1k 2% 0,25W |
| 3154 | 4822 051 20103 | 10k 5% 0,1W |
| 3155 | 4822 051 20472 | 4k7 5% 0,1W |
| 3156 | 4822 051 20104 | 100k 5% 0,1W |
| 3157 | 4822 051 20682 | 6k8 5% 0,1W |
| 3158 | 4822 051 20472 | 4k7 5% 0,1W |
| 3159 | 4822 051 10102 | 1k 2% 0,25W |
| 3160 | 4822 051 10102 | 1k 2% 0,25W |
| 3162 | 4822 051 10102 | 1k 2% 0,25W |
| 3163 | 4822 051 10102 | 1k 2% 0,25W |
| 3164 | 4822 051 20271 | 270Ω 5% 0,1W |
| 3165 | 4822 051 20271 | 270Ω 5% 0,1W |
| 3166 | 4822 051 20271 | 270Ω 5% 0,1W |
| 3167 | 4822 051 20104 | 100k 5% 0,1W |
| 3168 | 4822 051 20104 | 100k 5% 0,1W |
| 3169 | 4822 051 20103 | 10k 5% 0,1W |
| 3170 | 4822 051 20103 | 10k 5% 0,1W |
| 3171 | 4822 051 20123 | 12k 5% 0,1W |
| 3172 | 4822 051 20123 | 12k 5% 0,1W |
| 3173 | 4822 051 20183 | 18k 5% 0,1W |
| 3174 | 4822 051 20153 | 15k 5% 0,1W |

| | | |
|---|---|---|
| 3175 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3176 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3177 | 4822 051 10102 | 1k 2% 0,25W |
| 3178 | 4822 051 20103 | 10k 5% 0,1W |
| 3179 | 4822 051 20472 | 4k7 5% 0,1W |
| 3180 ⚠ | 4822 052 10109 | 10Ω 5% 0,33W |
| 3181 | 4822 051 20103 | 10k 5% 0,1W |
| 3182 | 4822 051 20103 | 10k 5% 0,1W |
| 3183 | 4822 051 20103 | 10k 5% 0,1W |
| 3184 | 4822 051 20103 | 10k 5% 0,1W |
| 3185 | 4822 051 20103 | 10k 5% 0,1W |
| 3186 | 4822 051 20153 | 15k 5% 0,1W |
| 3187 | 4822 051 20222 | 2k2 5% 0,1W |
| 3188 | 4822 051 20103 | 10k 5% 0,1W |
| 3189 | 4822 051 20473 | 47k 5% 0,1W |
| 3190 | 4822 051 10102 | 1k 2% 0,25W |
| 3191 | 4822 051 20103 | 10k 5% 0,1W |
| 3192 | 4822 051 10102 | 1k 2% 0,25W |
| 3193 | 4822 051 20105 | 1M 5% 0,1W |
| 3194 | 4822 051 20474 | 470k 5% 0,1W |
| 3195 | 4822 051 20104 | 100k 5% 0,1W |
| 3196 | 4822 051 20153 | 15k 5% 0,1W |
| 3197 | 4822 051 20472 | 4k7 5% 0,1W |
| 3198 | 4822 051 20224 | 220k 5% 0,1W |
| 3199 | 4822 051 20122 | 1k2 5% 0,1W |
| 3200 | 4822 051 20152 | 1k5 5% 0,1W |
| 3201 | 4822 051 20103 | 10k 5% 0,1W |
| 3202 | 4822 051 20103 | 10k 5% 0,1W |
| 3203 | 4822 050 21501 | 150Ω 1% 0,6W |
| 3204 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3205 | 4822 051 10102 | 1k 2% 0,25W |
| 3207 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3208 | 4822 051 20821 | 820Ω 5% 0,1W |
| 3209 | 4822 050 25601 | 560Ω 1% 0,6W |
| 3210 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3211 | 4822 051 10102 | 1k 2% 0,25W |
| 3212 | 4822 116 83704 | 12k 2% 0,2W |
| 3213 | 4822 051 20103 | 10k 5% 0,1W |
| 3214 | 4822 051 20273 | 27k 5% 0,1W |
| 3215 | 4822 051 20103 | 10k 5% 0,1W |
| 3216 | 4822 050 25601 | 560Ω 1% 0,6W |
| 3217 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3218 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3219 | 4822 051 20152 | 1k5 5% 0,1W |
| 3220 | 4822 051 10102 | 1k 2% 0,25W |
| 3221 | 4822 116 83704 | 12k 2% 0,2W |
| 3222 | 4822 051 20103 | 10k 5% 0,1W |
| 3223 | 4822 051 20183 | 18k 5% 0,1W |
| 3224 | 4822 051 20332 | 3k3 5% 0,1W |
| 3225 | 4822 051 20332 | 3k3 5% 0,1W |
| 3229 | 4822 051 20223 | 22k 5% 0,1W |
| 3233 | 4822 051 20473 | 47k 5% 0,1W |
| 3234 | 4822 051 20332 | 3k3 5% 0,1W |
| 3235 | 4822 051 20153 | 15k 5% 0,1W |
| 3236 | 4822 051 20472 | 4k7 5% 0,1W |
| 3237 | 4822 051 20472 | 4k7 5% 0,1W |
| 3238 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3239 ⚠ | 4822 053 12159 | 15Ω 5% ,3W |
| 3240 | 4822 051 20103 | 10k 5% 0,1W |
| 3241 | 4822 051 20104 | 100k 5% 0,1W |
| 3242 | 4822 051 20104 | 100k 5% 0,1W |
| 3243 | 4822 051 20103 | 10k 5% 0,1W |
| 3244 | 4822 051 20473 | 47k 5% 0,1W |
| 3245 | 4822 051 20103 | 10k 5% 0,1W |
| 3246 | 4822 051 20103 | 10k 5% 0,1W |
| 3247 | 4822 051 20472 | 4k7 5% 0,1W |
| 3248 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3249 | 4822 051 20103 | 10k 5% 0,1W |
| 3250 | 4822 051 20472 | 4k7 5% 0,1W |
| 3251 | 4822 051 10102 | 1k 2% 0,25W |
| 3252 | 4822 051 10102 | 1k 2% 0,25W |
| 3253 | 4822 051 10102 | 1k 2% 0,25W |
| 3254 | 4822 051 10102 | 1k 2% 0,25W |
| 3255 | 4822 051 10102 | 1k 2% 0,25W |
| 3256 | 4822 051 10102 | 1k 2% 0,25W |
| 3257 | 4822 051 10102 | 1k 2% 0,25W |
| 3258 | 4822 051 10102 | 1k 2% 0,25W |
| 3259 | 4822 051 20681 | 680Ω 5% 0,1W |
| 3260 | 4822 051 20681 | 680Ω 5% 0,1W |
| 3261 | 4822 051 20225 | 2M2 5% 0,1W |
| 3263 | 4822 051 20123 | 12k 5% 0,1W |
| 3264 | 4822 100 11875 | CARBTR 4k7 25%LIN |
| 3265 | 4822 051 20154 | 150k 5% 0,1W |
| 3266 | 4822 051 20472 | 4k7 5% 0,1W |
| 3267 | 4822 051 20392 | 3k9 5% 0,1W |
| 3268 | 4822 051 20103 | 10k 5% 0,1W |
| 3269 | 4822 051 20274 | 270k 5% 0,1W |
| 3270 | 4822 051 20104 | 100k 5% 0,1W |
| 3271 | 4822 051 20271 | 270Ω 5% 0,1W |
| 3272 | 4822 051 20103 | 10k 5% 0,1W |
| 3273 | 4822 051 20103 | 10k 5% 0,1W |
| 3274 | 4822 051 20229 | 22Ω 5% 0,1W |
| 3275 | 4822 051 20221 | 220Ω 5% 0,1W |
| 3276 | 4822 051 20472 | 4k7 5% 0,1W |
| 3277 ⚠ | 4822 053 12339 | 33Ω 5% 2,5W |
| 3278 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3279 | 4822 051 20472 | 4k7 5% 0,1W |
| 3280 | 4822 100 11676 | CARBTR 10k 30%LIN |
| 3281 | 4822 051 20229 | 22Ω 5% 0,1W |
| 3282 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3283 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3284 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3285 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3286 | 4822 051 20103 | 10k 5% 0,1W |
| 3287 | 4822 051 20103 | 10k 5% 0,1W |
| 3288 | 4822 051 20683 | 68k 5% 0,1W |
| 3289 | 4822 051 20104 | 100k 5% 0,1W |
| 3290 | 4822 051 20104 | 100k 5% 0,1W |



| | | |
|---|---|---|
| 3291 | 4822 051 20759 | 75Ω 5% 0,1W |
| 3292 | 4822 051 20228 | 2Ω2 5% 0,1W |
| 3293 | 4822 051 20228 | 2Ω2 5% 0,1W |
| 3294 | 4822 051 20681 | 680Ω 5% 0,1W |
| 3295 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3296 | 4822 051 20104 | 100k 5% 0,1W |
| 3297 | 4822 051 20562 | 5k6 5% 0,1W |
| 3298 | 4822 051 20221 | 220Ω 5% 0,1W |
| 3299 | 4822 051 20271 | 270Ω 5% 0,1W |
| 3300 | 4822 051 20104 | 100k 5% 0,1W |
| 3301 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3302 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3303 | 4822 051 20104 | 100k 5% 0,1W |
| 3304 | 4822 051 20104 | 100k 5% 0,1W |
| 3305 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3306 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3307 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3308 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3309 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3310 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3311 | 4822 100 90109 | CARBPOT 2x 20k |
| 3313 ⚠ | 4822 050 21503 | 15k 1% 0,6W |
| 3314 ⚠ | 4822 050 21503 | 15k 1% 0,6W |
| 3315 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3316 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3317 | 4822 051 20154 | 150k 5% 0,1W |
| 3318 | 4822 051 20682 | 6k8 5% 0,1W |
| 3319 | 4822 051 20473 | 47k 5% 0,1W |
| 3320 | 4822 051 20473 | 47k 5% 0,1W |
| 3321 | 4822 051 10102 | 1k 2% 0,25W |
| 3322 | 4822 051 10102 | 1k 2% 0,25W |
| 3323 | 4822 051 20473 | 47k 5% 0,1W |
| 3324 | 4822 051 20473 | 47k 5% 0,1W |
| 3325 | 4822 100 11676 | CARBTR 10k 30%LIN |
| 3326 | 4822 100 11676 | CARBTR 10k 30%LIN |
| 3327 | 4822 051 20103 | 10k 5% 0,1W |
| 3328 | 4822 051 20103 | 10k 5% 0,1W |
| 3329 | 4822 051 20563 | 56k 5% 0,1W |
| 3330 | 4822 051 20563 | 56k 5% 0,1W |
| 3331 | 4822 051 20472 | 4k7 5% 0,1W |
| 3332 | 4822 051 20472 | 4k7 5% 0,1W |
| 3333 | 4822 051 20223 | 22k 5% 0,1W |
| 3334 | 4822 051 20223 | 22k 5% 0,1W |
| 3335 | 4822 051 20823 | 82k 5% 0,1W |
| 3336 | 4822 051 20823 | 82k 5% 0,1W |
| 3337 | 4822 051 20392 | 3k9 5% 0,1W |
| 3338 | 4822 051 20472 | 4k7 5% 0,1W |
| 3339 | 4822 116 83705 | 24k 2% 0,2W |
| 3340 | 4822 116 83705 | 24k 2% 0,2W |
| 3341 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3342 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3343 | 4822 051 10102 | 1k 2% 0,25W |
| 3344 | 4822 116 83084 | 27k 2% 0,2W |
| 3345 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3346 | 4822 051 20222 | 2k2 5% 0,1W |
| 3347 | 4822 051 20472 | 4k7 5% 0,1W |
| 3348 | 4822 051 20473 | 47k 5% 0,1W |
| 3349 | 4822 051 20473 | 47k 5% 0,1W |
| 3350 | 4822 051 10102 | 1k 2% 0,25W |
| 3351 | 4822 051 20473 | 47k 5% 0,1W |
| 3352 | 4822 051 20473 | 47k 5% 0,1W |
| 3353 | 4822 051 20151 | 150Ω 5% 0,1W |
| 3354 | 4822 051 20151 | 150Ω 5% 0,1W |
| 3355 | 4822 051 20103 | 10k 5% 0,1W |
| 3356 | 4822 051 20103 | 10k 5% 0,1W |
| 3357 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3358 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3359 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3360 ⚠ | 4822 050 21802 | 1k8 1% 0,6W |
| 3361 | 4822 051 20104 | 100k 5% 0,1W |
| 3362 | 4822 051 20104 | 100k 5% 0,1W |
| 3363 | 4822 051 20151 | 150Ω 5% 0,1W |
| 3364 | 4822 051 20151 | 150Ω 5% 0,1W |
| 3365 | 4822 100 90108 | CARBPOT 20k 20% |
| 3367 | 4822 051 20103 | 10k 5% 0,1W |
| 3368 | 4822 051 20103 | 10k 5% 0,1W |
| 3369 | 4822 051 20103 | 10k 5% 0,1W |
| 3370 | 4822 051 20103 | 10k 5% 0,1W |
| 3371 | 4822 051 20472 | 4k7 5% 0,1W |
| 3372 | 4822 051 20472 | 4k7 5% 0,1W |
| 3373 | 4822 051 20104 | 100k 5% 0,1W |
| 3374 | 4822 051 20104 | 100k 5% 0,1W |
| 3375 | 4822 051 20101 | 100Ω 5% 0,1W |
| 3376 | 4822 051 20101 | 100Ω 5% 0,1W |
| 3377 | 4822 051 20689 | 68Ω 5% 0,1W |
| 3378 | 4822 051 20689 | 68Ω 5% 0,1W |
| 3379 | 4822 051 20224 | 220k 5% 0,1W |
| 3380 | 4822 051 20224 | 220k 5% 0,1W |
| 3381 | 4822 051 20152 | 1k5 5% 0,1W |
| 3382 | 4822 051 20152 | 1k5 5% 0,1W |
| 3383 | 4822 116 83704 | 12k 2% 0,2W |
| 3384 | 4822 116 83704 | 12k 2% 0,2W |
| 3385 | 4822 051 20224 | 220k 5% 0,1W |
| 3386 | 4822 051 20473 | 47k 5% 0,1W |
| 3387 | 4822 051 20472 | 4k7 5% 0,1W |
| 3388 | 4822 051 20682 | 6k8 5% 0,1W |
| 3389 | 4822 051 20222 | 2k2 5% 0,1W |
| 3390 | 4822 051 20105 | 1M 5% 0,1W |
| 3391 | 4822 051 20103 | 10k 5% 0,1W |
| 3392 | 4822 051 20472 | 4k7 5% 0,1W |
| 3393 | 4822 051 20103 | 10k 5% 0,1W |
| 3394 | 4822 051 20103 | 10k 5% 0,1W |
| 3395 | 4822 051 20103 | 10k 5% 0,1W |
| 3396 | 4822 051 20103 | 10k 5% 0,1W |
| 3397 | 4822 051 20103 | 10k 5% 0,1W |
| 3398 | 4822 051 20103 | 10k 5% 0,1W |
| 3399 | 4822 051 20472 | 4k7 5% 0,1W |
| 3463 ⚠ | 4822 052 10159 | 15Ω 5% 0,33W |

| | | |
|---|---|---|
| 4101 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4102 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4103 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4104 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4105 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4106 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4107 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4108 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4109 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4110 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4111 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4112 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4114 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4115 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4116 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4117 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4118 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4119 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4120 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4121 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4136 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4137 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4138 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4139 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4140 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4141 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4142 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4143 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4144 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4145 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4146 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4147 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4148 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4149 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4150 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4151 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4152 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4153 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4154 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4155 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4156 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4157 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4158 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4159 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4160 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4162 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4163 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4164 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4165 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4166 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4167 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4168 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4170 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4171 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4172 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4173 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4174 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4901 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4902 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4903 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4904 | 4822 051 10008 | 0Ω 5% 0,25W |
| 4905 | 4822 051 10008 | 0Ω 5% 0,25W |

## COILS - CRYSTALS - RESONATORS

| | | |
|---|---|---|
| 5301 | 4822 157 62216 | COIL 100µH 2% |
| 5302 | 4822 157 62216 | COIL 100µH 2% |
| 5309 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5310 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5313 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5314 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5315 | 4822 157 60363 | SMC IND 2,2µH 5% |
| 5317 | 4822 148 80281 | DIG.OUT TRANSFORMER |
| 5320 | 4822 157 52983 | 22µH 10% |
| 5325 | 4822 242 81357 | RESONATOR 16MHz |

## DIODES

| | | |
|---|---|---|
| 6206 | 5322 130 34337 | BAV99 |
| 6207 | 5322 130 31937 | BZX84-B4V7 |
| 6208 | 5322 130 31928 | BAS16 |
| 6209 | 5322 130 31928 | BAS16 |
| 6301 | 5322 130 31928 | BAS16 |
| 6302 | 5322 130 31928 | BAS16 |
| 6305 | 5322 130 31928 | BAS16 |
| 6307 | 5322 130 31937 | BZX84-B4V7 |
| 6308 | 5322 130 31928 | BAS16 |
| 6310 | 5322 130 34331 | BAV70 |
| 6320 | 4822 130 80622 | BAT54 |
| 6321 | 5322 130 31928 | BAS16 |
| 6322 | 4822 130 81424 | BZV86-2V0 |
| 6323 | 5322 130 81424 | BZV86-2V0 |

## TRANSISTORS & IC's

| | | |
|---|---|---|
| 7200 | 4822 130 42513 | BC858C |
| 7201 | 5322 209 60749 | LM2931Z-5.0 |
| 7202 | 4822 130 42513 | BC858C |
| 7203 | 4822 130 40995 | BD434 |
| 7204 | 5322 130 42136 | BC848C |
| 7205 | 4822 130 40995 | BD434 |
| 7206 | 5322 130 42136 | BC848C |
| 7207 | 4822 130 42513 | BC858C |
| 7208 | 4822 130 40982 | BD433 |
| 7209 | 4822 130 42513 | BC858C |



| | | |
|---|---|---|
| 7210 | 5322 130 42136 | BC848C |
| 7211 | 4822 130 42513 | BC858C |
| 7212 ▲ | 4822 209 73233 | MC79L05ACP |
| 7301 | 4822 209 32002 | NJM5532MD |
| 7302 | 4822 209 32002 | NJM5532MD |
| 7303 | 4822 209 73157 | NJM3415M |
| 7305 | 4822 209 32002 | NJM5532MD |
| 7308 | 4822 209 83357 | NJM4560M |
| 7309 | 4822 130 61207 | BC848 |
| 7310 | 4822 209 83357 | NJM4560M |
| 7311 | 4822 130 61207 | BC848 |
| 7312 | 4822 130 61207 | BC848 |
| 7313 | 4822 130 61207 | BC848 |
| 7314 | 4822 130 61207 | BC848 |
| 7315 | 5322 130 42012 | BC858 |
| 7316 | 4822 209 31134 | CXA1331S |
| 7317 | 4822 130 61207 | BC848 |
| 7318 | 5322 130 42012 | BC858 |
| 7319 | 5322 130 42012 | BC858 |
| 7320 | 4822 209 83357 | NJM4560M |
| 7321 | 4822 209 31615 | LM324A |
| 7322 | 5322 130 42136 | BC848C |
| 7323 | 4822 209 31378 | NJM4556M |
| 7324 | 4822 130 61207 | BC848 |
| 7325 | 4822 209 83357 | NJM4560M |
| 7326 | 4822 209 83706 | BA335 |
| 7327 | 4822 130 61207 | BC848 |
| 7328 | 4822 130 61207 | BC848 |
| 7329 | 4822 130 61207 | BC848 |
| 7330 | 4822 130 61207 | BC848 |
| 7331 | 4822 130 61207 | BC848 |
| 7332 | 4822 130 61207 | BC848 |
| 7333 | 5322 130 42012 | BC858 |
| 7334 | 4822 130 61207 | BC848 |
| 7335 | 4822 209 32009 | P87C528EBPN |
| 7336 | 4822 130 61207 | BC848 |
| 7341 | 4822 130 42615 | BC817-40 |
| 7342 | 4822 130 42615 | BC817-40 |
| 7343 | 4822 130 42615 | BC817-40 |
| 7344 | 4822 130 42615 | BC817-40 |
| 7345 | 4822 130 42615 | BC817-40 |
| 7346 | 4822 130 42615 | BC817-40 |
| 7347 | 4822 130 42615 | BC817-40 |
| 7348 | 4822 130 42615 | BC817-40 |
| 7349 | 5322 130 42012 | BC858 |
| 7350 | 5322 130 42136 | BC848C |
| 7351 | 5322 130 42136 | BC848C |
| 7352 | 5322 130 42136 | BC848C |
| 7355 | 4822 130 42615 | BC817-40 |
| 7356 | 5322 130 42012 | BC858 |
| 7357 | 4822 130 61207 | BC848 |
| 7358 | 5322 130 61569 | BC868 |
| 7359 | 4822 130 61207 | BC848 |
| 7360 | 4822 130 42615 | BC817-40 |
| 7361 | 4822 130 42615 | BC817-40 |
| 7362 | 4822 130 42615 | BC817-40 |
| 7363 | 5322 130 60123 | BC807-40 |
| 7364 | 5322 130 60123 | BC807-40 |
| 7365 | 5322 130 60123 | BC807-40 |
| 7366 | 4822 130 61207 | BC848 |
| 7367 | 4822 130 61207 | BC848 |
| 7368 | 4822 130 61207 | BC848 |
| 7369 | 4822 130 42633 | BSR56 |
| 7370 | 4822 130 42633 | BSR56 |
| 7371 | 5322 130 42012 | BC858 |
| 7372 | 5322 130 42012 | BC858 |

## DIGITAL PANEL

### MISCELLANEOUS

| | | |
|---|---|---|
| | 4822 214 33899 | DIGITAL PCB ASSY |

### CAPACITORS

| | | |
|---|---|---|
| 2500 | 4822 126 10002 | 100nF 20% 25V |
| 2501 | 4822 126 10002 | 100nF 20% 25V |
| 2502 | 4822 126 10002 | 100nF 20% 25V |
| 2503 | 4822 126 10002 | 100nF 20% 25V |
| 2504 | 4822 126 10002 | 100nF 20% 25V |
| 2505 | 5322 122 32531 | 100pF 5% 50V |
| 2506 | 5322 122 32661 | 56pF 5% 50V |
| 2507 | 4822 126 10002 | 100nF 20% 25V |
| 2508 | 5322 122 32481 | 15pF 5% 50V |
| 2509 | 5322 122 31946 | 27pF 10% 50V |
| 2510 | 5322 122 31946 | 27pF 10% 50V |
| 2511 | 5322 122 32481 | 15pF 5% 50V |
| 2512 | 4822 126 10002 | 100nF 20% 25V |
| 2513 | 4822 122 33575 | 220pF 5%NPO 50V |
| 2514 | 4822 126 10002 | 100nF 20% 25V |
| 2515 | 4822 126 10002 | 100nF 20% 25V |
| 2516 | 4822 126 10002 | 100nF 20% 25V |
| 2517 | 4822 126 10002 | 100nF 20% 25V |
| 2518 | 4822 126 10002 | 100nF 20% 25V |
| 2519 | 4822 126 10002 | 100nF 20% 25V |
| 2520 | 5322 122 32452 | 47pF 5% 63V |
| 2521 | 5322 122 32531 | 100pF 5% 50V |
| 2522 | 4822 126 10002 | 100nF 20% 25V |
| 2523 | 4822 126 10002 | 100nF 20% 25V |
| 2524 | 4822 126 10002 | 100nF 20% 25V |
| 2525 | 4822 126 10002 | 100nF 20% 25V |
| 2526 | 4822 126 10002 | 100nF 20% 25V |
| 2527 | 5322 122 32452 | 47pF 5% 63V |
| 2528 | 4822 126 10002 | 100nF 20% 25V |
| 2529 | 4822 126 10002 | 100nF 20% 25V |
| 2530 | 4822 126 10002 | 100nF 20% 25V |
| 2531 | 4822 121 51252 | 470nF 5% 63V |
| 2532 | 4822 124 40433 | 47µF 20% 25V |
| 2533 | 4822 126 10002 | 100nF 20% 25V |
| 2534 | 4822 124 41584 | 100µF 20% 10V |
| 2535 | 4822 124 41584 | 100µF 20% 10V |
| 2536 | 4822 124 40246 | 4,7µF 20% 63V |
| 2537 | 4822 124 40433 | 47µF 20% 25V |
| 2538 | 4822 126 10002 | 100nF 20% 25V |
| 2539 | 4822 124 41584 | 100µF 20% 10V |
| 2540 | 4822 126 10002 | 100nF 20% 25V |
| 2541 | 5322 122 32531 | 100pF 5% 50V |
| 2542 | 4822 126 10002 | 100nF 20% 25V |
| 2543 | 4822 122 33608 | 39nF 10% 63V |
| 2544 | 4822 124 41997 | 470µF 20% 10V |
| 2545 | 4822 126 10002 | 100nF 20% 25V |
| 2546 | 5322 122 32531 | 100pF 5% 50V |
| 2547 | 4822 122 33177 | 10nF 20% 50V |
| 2548 | 4822 122 33177 | 10nF 20% 50V |
| 2549 | 5322 122 32452 | 47pF 5% 63V |
| 2550 | 5322 122 32661 | 56pF 5% 50V |
| 2551 | 4822 121 41857 | 10nF 5% 250V |
| 2552 | 4822 121 41857 | 10nF 5% 250V |
| 2553 | 4822 126 10002 | 100nF 20% 25V |
| 2554 | 4822 126 10002 | 100nF 20% 25V |
| 2555 | 4822 126 10002 | 100nF 20% 25V |
| 2556 | 4822 126 10002 | 100nF 20% 25V |
| 2557 | 4822 126 10002 | 100nF 20% 25V |
| 2558 | 4822 126 10002 | 100nF 20% 25V |
| 2559 | 4822 126 10002 | 100nF 20% 25V |
| 2560 | 4822 126 10002 | 100nF 20% 25V |
| 2561 | 4822 126 10002 | 100nF 20% 25V |
| 2562 | 4822 126 10002 | 100nF 20% 25V |
| 2563 | 4822 126 10002 | 100nF 20% 25V |
| 2564 | 4822 124 40433 | 47µF 20% 25V |
| 2565 | 4822 126 10002 | 100nF 20% 25V |
| 2566 | 4822 126 10002 | 100nF 20% 25V |
| 2567 | 5322 116 80853 | 560pF 5% 63V |
| 2568 | 5322 116 80853 | 560pF 5% 63V |
| 2569 | 5322 122 32661 | 56pF 5% 50V |
| 2570 | 5322 122 32661 | 56pF 5% 50V |
| 2571 | 5322 126 10328 | 1500pF 2% 63V |
| 2572 | 5322 126 10328 | 1500pF 2% 63V |
| 2573 | 5322 122 32531 | 100pF 5% 50V |
| 2574 | 5322 122 32531 | 100pF 5% 50V |
| 2575 | 4822 122 32999 | 2,2nF 5% NPO |
| 2576 | 4822 122 32999 | 2,2nF 5% NPO |
| 2577 | 5322 122 32661 | 56pF 5% 50V |
| 2578 | 5322 122 32661 | 56pF 5% 50V |
| 2579 | 5322 122 32659 | 33pF 5% 50V |
| 2580 | 5322 122 32452 | 47pF 5% 63V |
| 2581 | 4822 124 41584 | 100µF 20% 10V |
| 2582 | 4822 124 41584 | 100µF 20% 10V |
| 2583 | 4822 124 40433 | 47µF 20% 25V |
| 2584 | 4822 124 40433 | 47µF 20% 25V |
| 2585 | 4822 124 40248 | 10µF 20% 63V |
| 2586 | 4822 124 40248 | 10µF 20% 63V |
| 2587 | 4822 124 40433 | 47µF 20% 25V |
| 2588 | 5322 122 32531 | 100pF 5% 50V |
| 2589 | 4822 124 40433 | 47µF 20% 25V |
| 2590 | 4822 124 40433 | 47µF 20% 25V |
| 2591 | 4822 124 40246 | 4,7µF 20% 63V |
| 2592 | 5322 122 32452 | 47pF 5% 63V |
| 2593 | 5322 122 32531 | 100pF 5% 50V |
| 2594 | 5322 122 32531 | 100pF 5% 50V |
| 2595 | 5322 122 32531 | 100pF 5% 50V |
| 2596 | 5322 122 32531 | 100pF 5% 50V |



| | | |
|---|---|---|
| 2597 | 5322 122 32531 | 100pF 5% 50V |
| 2598 | 5322 122 32531 | 100pF 5% 50V |
| 2599 | 5322 122 32452 | 47pF 5% 63V |
| 2601 | 5322 122 32452 | 47pF 5% 63V |
| 2602 | 5322 122 32452 | 47pF 5% 63V |
| 2603 | 5322 122 32452 | 47pF 5% 63V |
| 2604 | 5322 122 31946 | 27pF 10% 50V |
| 2605 | 5322 122 31946 | 27pF 10% 50V |
| 2606 | 5322 122 32531 | 100pF 5% 50V |
| 2607 | 5322 122 32531 | 100pF 5% 50V |
| 2608 | 5322 122 32531 | 100pF 5% 50V |
| 2609 | 5322 122 32452 | 47pF 5% 63V |
| 2610 | 5322 122 32452 | 47pF 5% 63V |

### RESISTORS

| | | |
|---|---|---|
| 3501 | 4822 051 20229 | 22Ω 5% 0,1W |
| 3502 | 4822 051 20229 | 22Ω 5% 0,1W |
| 3503 | 4822 051 20229 | 22Ω 5% 0,1W |
| 3504 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3505 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3506 | 4822 051 20105 | 1M 5% 0,1W |
| 3507 | 4822 051 10102 | 1k 2% 0,25W |
| 3508 | 4822 051 20105 | 1M 5% 0,1W |
| 3509 | 4822 051 10102 | 1k 2% 0,25W |
| 3510 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3511 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3512 | 4822 051 20122 | 1k2 5% 0,1W |
| 3513 | 4822 051 20222 | 2k2 5% 0,1W |
| 3514 | 4822 051 20222 | 2k2 5% 0,1W |
| 3515 | 4822 051 20104 | 100k 5% 0,1W |
| 3516 | 4822 051 20103 | 10k 5% 0,1W |
| 3517 | 4822 051 20104 | 100k 5% 0,1W |
| 3518 | 4822 051 20101 | 100Ω 5% 0,1W |
| 3519 | 4822 051 20123 | 12k 5% 0,1W |
| 3520 | 4822 051 20222 | 2k2 5% 0,1W |
| 3521 | 4822 051 20272 | 2k7 5% 0,1W |
| 3522 | 4822 051 20123 | 12k 5% 0,1W |
| 3523 | 4822 051 20121 | 120Ω 5% 0,1W |
| 3524 | 4822 051 20122 | 1k2 5% 0,1W |
| 3525 | 4822 051 20181 | 180Ω 5% 0,1W |
| 3526 | 4822 051 20221 | 220Ω 5% 0,1W |
| 3527 | 4822 051 20153 | 15k 5% 0,1W |
| 3528 | 4822 051 20101 | 100Ω 5% 0,1W |
| 3529 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3530 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3531 | 4822 051 20223 | 22k 5% 0,1W |
| 3532 | 4822 051 20223 | 22k 5% 0,1W |
| 3533 | 4822 051 20101 | 100Ω 5% 0,1W |
| 3534 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3535 | 4822 051 20228 | 2Ω2 5% 0,1W |
| 3536 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3537 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3538 | 4822 051 20223 | 22k 5% 0,1W |
| 3539 | 4822 051 20223 | 22k 5% 0,1W |
| 3540 | 4822 051 10102 | 1k 2% 0,25W |
| 3541 | 4822 051 20472 | 4k7 5% 0,1W |
| 3542 | 4822 051 20104 | 100k 5% 0,1W |
| 3543 | 4822 051 20472 | 4k7 5% 0,1W |
| 3544 | 4822 051 20103 | 10k 5% 0,1W |
| 3545 | 4822 051 20472 | 4k7 5% 0,1W |
| 3546 | 4822 051 20333 | 33k 5% 0,1W |
| 3547 | 4822 051 20333 | 33k 5% 0,1W |
| 3548 | 4822 051 20682 | 6k8 5% 0,1W |
| 3549 | 4822 051 20472 | 4k7 5% 0,1W |
| 3550 | 4822 100 11956 | CERMTR 10k 25% |
| 3551 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3552 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3553 | 4822 051 20103 | 10k 5% 0,1W |
| 3554 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3555 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3556 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3557 | 4822 051 20472 | 4k7 5% 0,1W |
| 3558 | 4822 051 20472 | 4k7 5% 0,1W |
| 3559 | 4822 051 20821 | 820Ω 5% 0,1W |
| 3560 | 4822 116 30441 | 1k5 20% NTC |
| 3561 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3562 | 4822 051 20339 | 33Ω 5% 0,1W |
| 3563 | 4822 051 20228 | 2Ω2 5% 0,1W |
| 3564 | 4822 051 20689 | 68Ω 5% 0,1W |
| 3565 | 4822 117 10167 | 27k 1% 0,125W |
| 3566 | 4822 117 10167 | 27k 1% 0,125W |
| 3567 | 4822 051 20105 | 1M 5% 0,1W |
| 3568 | 4822 051 20105 | 1M 5% 0,1W |
| 3569 | 4822 051 20103 | 10k 5% 0,1W |
| 3570 | 4822 051 20103 | 10k 5% 0,1W |
| 3571 | 4822 117 10166 | 4k7 1% 0,125W |
| 3572 | 4822 117 10166 | 4k7 1% 0,125W |
| 3573 | 4822 117 10166 | 4k7 1% 0,125W |
| 3574 | 4822 117 10166 | 4k7 1% 0,125W |
| 3575 | 4822 117 10165 | 5k6 1% 0,125W |
| 3576 | 4822 117 10165 | 5k6 1% 0,125W |
| 3577 | 4822 051 20472 | 4k7 5% 0,1W |
| 3578 | 4822 051 20473 | 47k 5% 0,1W |
| 3579 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3580 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3581 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3582 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3583 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3584 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3585 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3586 | 4822 051 20472 | 4k7 5% 0,1W |
| 3587 | 4822 051 20472 | 4k7 5% 0,1W |
| 3588 | 4822 051 20472 | 4k7 5% 0,1W |
| 3589 | 4822 051 20472 | 4k7 5% 0,1W |
| 3590 | 4822 051 20472 | 4k7 5% 0,1W |
| 3591 | 4822 051 20473 | 47k 5% 0,1W |

| | | |
|---|---|---|
| 3592 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3593 | 4822 051 20689 | 68Ω 5% 0,1W |
| 3594 | 4822 051 20689 | 68Ω 5% 0,1W |
| 3595 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3597 | 4822 051 20008 | 0Ω 5% 0,1W |

## COILS - CRYSTALS - RESONATORS

| | | |
|---|---|---|
| 5501 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5502 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5503 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5504 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5505 | 4822 242 81361 | CER FILT 35MHz |
| 5507 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5508 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5509 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5510 | 4822 242 81361 | CER FILT 35MHz |
| 5511 | 4822 157 70299 | 2,2µH 5% |
| 5531 | 4822 157 70301 | 560µH |
| 5532 | 4822 157 70301 | 560µH |
| 5550 | 4822 242 81358 | CRYSTAL 24,576MHz |
| 5551 | 4822 242 81359 | CRYSTAL 22,579MHz |
| 5555 | 4822 157 70299 | SMC IND 2,2µH 5% |
| 5556 | 4822 157 70299 | SMC IND 2,2µH 5% |

## DIODES

| | | |
|---|---|---|
| 6501 | 5322 130 31928 | BAS16 |
| 6502 | 4822 130 83249 | BZX84-B3V6 |
| 6503 | 5322 130 31928 | BAS16 |
| 6504 | 4822 130 82594 | BAT54C |

## TRANSISTORS & IC's

| | | |
|---|---|---|
| 7500 | 4822 209 30144 | 74HC4046A |
| 7501 | 4822 209 30718 | M51581FP |
| 7502 | 4822 209 32004 | SAA2011GP |
| 7503 | 4822 209 32005 | SAA2021GP/M1A |
| 7504 | 4822 209 32003 | SAA2001GP |
| 7505 | 4822 209 32003 | SAA2001GP |
| 7506 | 4822 209 32007 | SAA2041GP |
| 7507 | 4822 209 31999 | MN41464 |
| 7508 | 4822 209 32008 | SAA2051GP |
| 7509 | 4822 209 32006 | SAA2031GP |
| 7510 | 4822 209 30704 | MC74HCU04D |
| 7511 | 4822 209 30706 | SAA7321GP/M5 |
| 7512 | 4822 209 73157 | NJM3415M |
| 7513 ▲ | 5322 130 41982 | BC848B |
| 7514 | 4822 209 31622 | AK5339 |
| 7515 | 5322 209 12479 | PC74HCT374T |
| 7521 ▲ | 5322 130 41982 | BC848B |
| 7522 ▲ | 5322 130 41982 | BC848B |
| 7523 | 5322 130 41983 | BC858B |
| 7524 ▲ | 5322 130 41982 | BC848B |
| 7525 ▲ | 5322 130 41982 | BC848B |



# CONTROL & DISPLAY PANEL

## MISCELLANEOUS

| | | |
|---|---|---|
| | 4822 256 92013 | DISPLAY HOLDER |
| | 4822 255 41276 | LED SOCKET |
| 1400 | 4822 130 91209 | DISPLAY BJ02IGAK |
| 1401 | 4822 276 13114 | TACT SWITCH |
| 1402 | 4822 276 13114 | TACT SWITCH |
| 1403 | 4822 276 13114 | TACT SWITCH |
| 1404 | 4822 276 13114 | TACT SWITCH |
| 1405 | 4822 276 13114 | TACT SWITCH |
| 1406 | 4822 276 13114 | TACT SWITCH |
| 1407 | 4822 276 13114 | TACT SWITCH |
| 1409 | 4822 276 13114 | TACT SWITCH |
| 1410 | 4822 276 13114 | TACT SWITCH |
| 1411 | 4822 276 13114 | TACT SWITCH |
| 1412 | 4822 276 13114 | TACT SWITCH |
| 1413 | 4822 276 13114 | TACT SWITCH |
| 1414 | 4822 276 13114 | TACT SWITCH |
| 1415 | 4822 276 13114 | TACT SWITCH |
| 1416 | 4822 276 13114 | TACT SWITCH |
| 1417 | 4822 276 13114 | TACT SWITCH |
| 1418 | 4822 276 13114 | TACT SWITCH |
| 1419 | 4822 276 13114 | TACT SWITCH |
| 1420 | 4822 276 13114 | TACT SWITCH |
| 1421 | 4822 276 13114 | TACT SWITCH |

## CAPACITORS

| | | |
|---|---|---|
| 2431 | 4822 124 23178 | 47µF 20% 16V |
| 2432 | 4822 122 33496 | 100nF 10% 63V |
| 2435 | 4822 122 33496 | 100nF 10% 63V |
| 2436 | 4822 122 33496 | 100nF 10% 63V |
| 2437 | 4822 122 33496 | 100nF 10% 63V |
| 2438 | 4822 124 41972 | 4,7µF 20% 50V |
| 2441 | 4822 121 51252 | 470nF 5% 63V |
| 2442 | 4822 121 51252 | 470nF 5% 63V |
| 2443 | 4822 121 51252 | 470nF 5% 63V |
| 2444 | 4822 121 51252 | 470nF 5% 63V |
| 2445 | 4822 121 51252 | 470nF 5% 63V |
| 2446 | 4822 121 51252 | 470nF 5% 63V |
| 2447 | 4822 121 51252 | 470nF 5% 63V |
| 2448 | 4822 121 51252 | 470nF 5% 63V |
| 2449 | 4822 124 23178 | 47µF 20% 16V |
| 2451 | 4822 122 33177 | 10nF 20% 50V |
| 2452 | 4822 122 33177 | 10nF 20% 50V |
| 2453 | 4822 122 33177 | 10nF 20% 50V |
| 2454 | 4822 124 41972 | 4,7µF 20% 50V |
| 2455 | 4822 122 33496 | 100nF 10% 63V |
| 2475 | 5322 122 32452 | 47pF 5% 63V |
| 2481 | 4822 122 33177 | 10nF 20% 50V |
| 2482 | 4822 122 33177 | 10nF 20% 50V |

## RESISTORS

| | | |
|---|---|---|
| 3312 | 4822 102 10459 | POTM 2x 20k |
| 3400 | 4822 051 20103 | 10k 5% 0,1W |
| 3413 | 4822 051 20103 | 10k 5% 0,1W |
| 3415 | 4822 051 20103 | 10k 5% 0,1W |
| 3416 | 4822 051 20103 | 10k 5% 0,1W |
| 3417 | 4822 051 20683 | 68k 5% 0,1W |
| 3418 | 4822 051 20683 | 68k 5% 0,1W |
| 3419 | 4822 051 20473 | 47k 5% 0,1W |
| 3421 | 4822 051 20104 | 100k 5% 0,1W |
| 3422 | 4822 051 20104 | 100k 5% 0,1W |
| 3423 | 4822 051 20563 | 56k 5% 0,1W |
| 3424 | 4822 051 20563 | 56k 5% 0,1W |
| 3425 | 4822 051 20102 | 1k 5% 0,1W |
| 3426 | 4822 051 20102 | 1k 5% 0,1W |
| 3427 | 4822 051 20121 | 120Ω 5% 0,1W |
| 3428 | 4822 051 20121 | 120Ω 5% 0,1W |
| 3429 | 4822 051 20104 | 100k 5% 0,1W |
| 3430 | 4822 051 20104 | 100k 5% 0,1W |
| 3431 | 4822 051 20472 | 4k7 5% 0,1W |
| 3432 | 4822 051 20472 | 4k7 5% 0,1W |
| 3433 | 4822 051 20472 | 4k7 5% 0,1W |
| 3434 | 4822 051 20472 | 4k7 5% 0,1W |
| 3435 | 4822 051 20684 | 680k 5% 0,1W |
| 3436 | 4822 051 20684 | 680k 5% 0,1W |
| 3437 | 4822 051 20684 | 680k 5% 0,1W |
| 3438 | 4822 051 20684 | 680k 5% 0,1W |
| 3439 | 4822 051 20103 | 10k 5% 0,1W |
| 3440 | 4822 051 20103 | 10k 5% 0,1W |
| 3441 | 4822 051 20103 | 10k 5% 0,1W |
| 3442 | 4822 051 20103 | 10k 5% 0,1W |
| 3443 | 4822 051 20103 | 10k 5% 0,1W |
| 3444 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3445 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3446 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3447 | 4822 051 20331 | 330Ω 5% 0,1W |
| 3448 | 4822 051 20332 | 3k3 5% 0,1W |
| 3449 | 4822 051 20332 | 3k3 5% 0,1W |
| 3451 | 4822 051 20103 | 10k 5% 0,1W |
| 3452 | 4822 051 20103 | 10k 5% 0,1W |
| 3453 | 4822 051 20103 | 10k 5% 0,1W |
| 3454 | 4822 051 20103 | 10k 5% 0,1W |
| 3455 | 4822 051 20103 | 10k 5% 0,1W |
| 3456 | 4822 051 20103 | 10k 5% 0,1W |
| 3457 | 4822 051 20103 | 10k 5% 0,1W |
| 3458 | 4822 051 20103 | 10k 5% 0,1W |
| 3459 | 4822 051 20103 | 10k 5% 0,1W |
| 3460 | 4822 051 20271 | 270Ω 5% 0,1W |
| 3461 | 4822 051 20103 | 10k 5% 0,1W |

| | | |
|---|---|---|
| 3462 | 4822 051 20103 | 10k 5% 0,1W |
| 3464 | 4822 051 20101 | 100Ω 5% 0,1W |
| 3470 | 4822 051 10102 | 1k 2% 0,25W |
| 3471 | 4822 051 20153 | 15k 5% 0,1W |
| 3472 | 4822 051 20153 | 15k 5% 0,1W |
| 3473 | 4822 051 20109 | 10Ω 5% 0,1W |
| 3474 | 4822 051 20109 | 10Ω 5% 0,1W |
| 3475 | 4822 051 20224 | 220k 5% 0,1W |

**COIL - RESONATOR**

| | | |
|---|---|---|
| 5401 ⚠ | 5322 242 73697 | RESONATOR 8MHz |
| 5410 | 4822 157 70298 | 15µH 5% |

**DIODES**

| | | |
|---|---|---|
| 6411 | 5322 130 31928 | BAS16 |
| 6412 | 5322 130 31928 | BAS16 |
| 6413 | 5322 130 31928 | BAS16 |
| 6414 | 5322 130 31928 | BAS16 |
| 6421 | 5322 130 31928 | BAS16 |
| 6422 | 5322 130 31928 | BAS16 |
| 6425 | 4822 130 82955 | GL3PR8 |

**TRANSISTORS & IC's**

| | | |
|---|---|---|
| 7401 | 4822 209 32001 | TMP87PM70F |
| 7402 | 4822 130 60511 | BC847B |
| 7403 | 4822 130 60511 | BC847B |
| 7405 | 5322 130 60123 | BC807-40 |
| 7406 | 5322 130 60123 | BC807-40 |
| 7407 | 4822 130 42615 | BC817-40 |
| 7408 | 4822 130 42615 | BC817-40 |
| 7410 | 4822 214 51795 | IR RECEIVER GP1U500X |
| 7411 | 4822 209 83357 | NJM4560M |
| 7412 | 4822 209 83357 | NJM4560M |
| 7413 | 4822 209 83357 | NJM4560M |
| 7414 | 4822 130 61207 | BC848 |
| 7415 | 5322 130 42012 | BC858 |
| 7416 | 4822 130 61207 | BC848 |
| 7451 | 4822 130 61207 | BC848 |
| 7452 | 4822 130 61207 | BC848 |
| 7453 | 4822 130 61207 | BC848 |
| 7454 | 4822 130 61207 | BC848 |
| 7455 | 4822 130 61207 | BC848 |
| 7456 | 4822 130 61207 | BC848 |
| 7465 | 4822 130 61207 | BC848 |
| 7466 | 4822 130 61207 | BC848 |
| 7467 | 4822 130 61207 | BC848 |
| 7468 | 4822 130 61207 | BC848 |
| 7471 | 4822 209 32002 | NJM5532MD |



## POWER SUPPLY PANEL

**MISCELLANEOUS**

| | | |
|---|---|---|
| 1202 ⚠ | 4822 265 31015 | MAINSINLET |
| 1202 ⚠ | 4822 265 31016 | MAINSINLET only /17 |
| 1203 ⚠ | 4822 272 10269 | VOLTAGE SELECTOR |
| 1204 ⚠ | 4822 276 13277 | MAINSSWITCH |
| 1205 ⚠ | 4822 071 51602 | FUSE T1,6A |
| 1205 ⚠ | 4822 253 50137 | FUSE T2,5A only /17 |
| 1206 ⚠ | 4822 071 56301 | FUSE T630mA |
| 1206 ⚠ | 4822 253 10138 | FUSE T1A only /17 |
| 1207 ⚠ | 4822 071 56301 | FUSE T630mA |
| 1207 ⚠ | 4822 253 10138 | FUSE T1A only /17 |

**CAPACITORS**

| | | |
|---|---|---|
| 2211 | 4822 124 23172 | 470µF 20% 50V |
| 2212 ⚠ | 4822 121 70087 | 47nF 10% 250V |
| 2213 | 4822 124 22031 | 4,7µF 20% 63V |
| 2215 | 4822 124 21511 | 2200µF 20% 25V |
| 2216 | 4822 124 80443 | 2200µF 20% 25V |
| 2217 | 4822 124 41591 | 6800µF 20% 16V |
| 2218 ⚠ | 4822 121 70087 | 47nF 10% 250V |

**RESISTORS**

| | | |
|---|---|---|
| 3201 | 4822 050 23302 | 3k3 1% 0,6W |
| 3202 ⚠ | 4822 050 23302 | 3k3 1% 0,6W |
| 3203 | 4822 052 10399 | 39Ω 5% 0,33W |

**COILS - TRANSFORMER**

| | | |
|---|---|---|
| 5001 ⚠ | 4822 146 31192 | MAINSTRANSF /00 /05 |
| 5001 ⚠ | 4822 146 31207 | MAINSTRANSF /06 |
| 5201 ⚠ | 4822 157 63756 | 1mH |
| 5202 | 4822 157 50963 | 2,2µH 20% |
| 5203 | 4822 157 50963 | 2,2µH 20% |

**DIODES**

| | | |
|---|---|---|
| 6201 ⚠ | 4822 130 82079 | D3SBA20 |
| 6202 ⚠ | 4822 130 82079 | D3SBA20 |
| 6203 ⚠ | 5322 130 30684 | 1N4002GP |
| 6204 | 4822 130 34398 | BZX79-C24 |
| 6205 | 4822 130 34233 | BZX79-C5V1 |

**TRANSISTOR**

| | | |
|---|---|---|
| 7201 | 4822 130 41324 | BC327-40 |

A94-359

Service
Service
**Service**

Product Service Group CE Audio

# Service Information

*Already published Service Informations:* *A93-362 (4822 725 24912)*
*A94-353 (4822 725 24934)*

## REPLACEMENT OF THE DCC-HEAD

As already stated in the service manual the DCC-head cannot be replaced without special adjustment tools. In case of defective heads or write amplifiers the complete loading assy has to be sent to Philips Consumer Service for repair and adjustment of the recording current. Loose DCC-heads are not supplied. The service codenumber of the DCC-head, published in the partslist of the RED1 tape transport (page 60), has been referred to the service code of the complete loading assembly (4822 691 20833).

## CORRECTIONS TO THE SERVICE MANUAL

- Partslist of RED1 tape transport (page 60)
  Service codenumber of capstan motor, item 1023, should read 4822 361 21646.

- Partslist of digital board PCB5 (page 76)
  Service codenumber of A/D-converter AK5339, item 7514, should read 4822 209 33849.

## SERVICE TOOLS

- Dolby testcassette MTT-150 is available under service codenumber 4822 397 30271, Dolby testcassette TCC-130 via codenumber 4822 397 30269. With one of these cassettes the Dolby adjustment can be achieved.

- The DCC cleaning cassette SBC3500 is available under service codenumber 4822 015 20646.



70DCC600

A94-353

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# Service Information

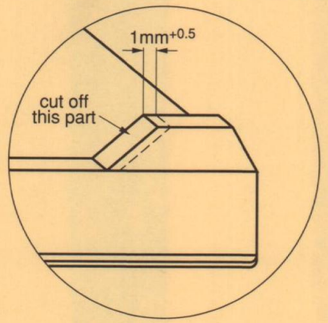
*Already published Service Informations : A93-362 (4822 725 24912)*

## SERVICE HINT

**SYMPTOM** : *When the cassette is lifted at the left side, in order to remove it from the opened tray, the cassette gets stuck behind the Philips-logo.*

**CAUSE** : The drawer (pos. 209) does not open far enough, because the tray-out switch (pos. 1437) is actuated too early.

**CURE** : The switch is opened/closed by a ridge, located at the back righthand corner of the drawer. To delay the switch actuation cut off some plastic of the ridge according to the sketch below.




**REMARK** : This modification also takes an influence on the feature “touch to close”. If too much plastic is removed the tray might already close while a cassette is inserted !
Try to find an optimal compromise.