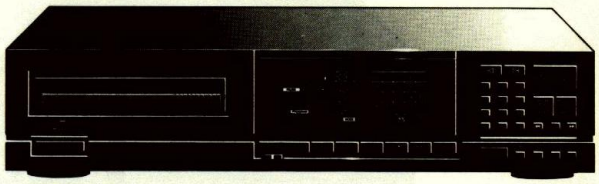
Compact disc player CDD882/00R

Service
Service
Service



43 587 B11

Remote control is available under codeno. 4822 218 10235

Service Manual

COMPACT disc DIGITAL AUDIO

CONTENTS

(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.

(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.

(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.

CLASS 1 LASER PRODUCT

3122 110 03420

Documentation Technique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Serviçic

PHILIPS

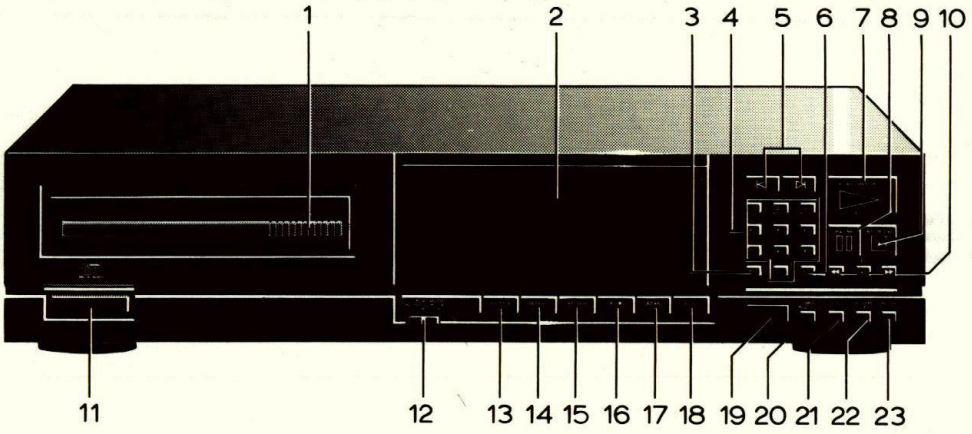
"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

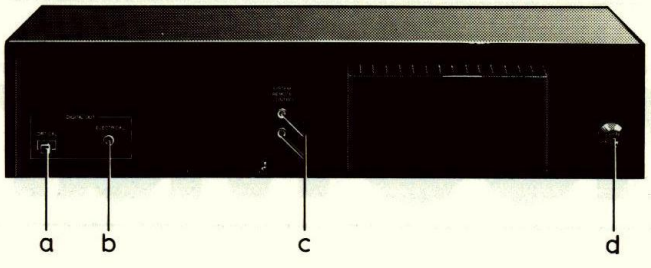
Subject to modification
4822 725 22272
Printed in The Netherlands

PHILIPS

Published by Service Consumer Electronics

CS 19 559





44 020 B11

CONTROL BUTTONS

Front of player

1 Disc tray on which the OPEN button is situated; the tray closes when the front is pressed briefly.
2 Display: gives information about the number of tracks on the disc, the playing time, the state of play at any given moment and about the special functions of the player. It also indicates when no disc has been inserted or when you make a mistake in operating the player.
3 CLEAR button: for cancelling mistakes when compiling a program, for deleting an item from a program or for erasing a favourite selection.
4 1-0 digit buttons: for moving on to a particular position on the disc or for compiling a program.
5 ⏮ TRACK ⏭ buttons: for selecting a previous or a later track, both before and during play and when programming.
6 STORE button: for storing details when compiling a program.
7 PLAY/REPLAY button: for starting play (PLAY) and returning to the beginning of a track (REPLAY).
8 PAUSE button: for holding play at the start of a track or passage, or interrupting play.
9 STOP/CM button: for stopping play: press twice to erase a program from the temporary memory (CM = Clear Memory).
10 ◀◀ SEARCH ▶▶ buttons: for fast forwards or backwards search for a particular passage. When used in conjunction with FAST, the search speed is increased and the sound switched off.
11 ON/OFF button: for switching the player on and off The blue lights above the button and on the right-hand side serve as on/off indicators.
12 PLAY MODE switch with three positions: NORM, COPY and AUTO.
13 SHUFFLE button: for playing the tracks on a disc or in a program in random order.
14 REPEAT button: for repeating a disc or program.
15 TIME button: for selecting which time information you want to appear on the display: "REM TOTAL"-the total remaining playing time ("REM" = remaining), "REM TRACK"-the remaining playing time of the current track, or "TRACK LAP"-the elapsed playing time of the current track ("LAP" = elapsed).
16 A → B button: for setting the start and stop point of a continuous play loop.
17 SCAN button: for automatically playing the beginning of each track on the disc.
18 FTS button: for activating the Favourite Track Selection circuit.
19 IR receiver: for receiving infrared signals from the remote control handset.
20 TIMER ON/OFF: for making the player automatically begin playing when a timer is used. If there is an FTS program of the disc in the memory then this will be played.
21 SELECT button: for selecting the SELECT setting to enter data when searching or programming.
22 PROGRAM PLAY button: permits direct selection and play (PLAY) or direct programming (PROGRAM) of tracks.
23 REVIEW button: for reviewing and checking a program. The contents of the program are displayed one by one.

Rear of player

a OPTICAL: output for digital signal processing via an optical cable.
b ELECTRICAL: output for digital signal processing or future applications such as CD-I
c SYSTEM REMOTE CONTROL IN/OUT: connection for external signal receiver for the remote control or for the remote control system of a HiFi system.
d FUSE (fuse holder): contains the main fuse for the player. If this should become defective, a new fuse of the same type must be used.

TECHNICAL DATA

Typical Audio Performance
- Number of Channels: 2
- Wow and Flutter: quartz crystal precision
- Error Correction System: Cross Interleaved Reed Solomon Code (CIRC)

Optical Readout System
- Laser: semi-conductor AlGaAs
- Wavelength: 780 nm

Signal Format
- Sampling Frequency: 44.1 kHz
- Quantization: 16 bit linear/channel

Power Supply
- Mains Voltage: see type plate at rear of player
- Mains Frequencies: 50 and 60 Hz
- Power Consumption: 40 W approx.
- Safety Requirements: IEC

Cabinet, general
- Material/finish: metal and polystyrene with decorative trim
- Dimensions (w × h × d): 462 × 104 × 363 mm
- Weight: 10 kg approx.

Disc
- Diameter: 120 mm
- Thickness: 1.2 mm
- Direction of Rotation (seen from reading side): anti-clockwise
- Scanning Velocity: 1.2-1.4 m/s
- Rotation Speed: 500-200 rpm
- Playing Time (theoretical): 74 min (stereo)
- Track Pitch: 1.6 µm

The right is reserved to change data if necessary

This Compact Disc player complies with the radio interference requirements as laid down in EEC (European Economic Community) regulations.

(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 gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(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.

SERVICE TOOLS

Audio signals disc 1	4822 397 30185
Disc without errors (test disc 5)+ disc with DO errors, (test disc 5A) black spots and fingerprints	4822 397 30096
Disc 65 min 1kHz without pause	4822 397 30155
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (5p)	4822 321 21273
Service cable (14p)	4822 321 21598
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676
Glass disc	4822 395 90204

(GB)

Compose a service Disc hold-down in the following way

- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers below.
- Enlarge the diameter of the innermost ring slightly with the hind part of a pencil or ballpoint, so that it jams onto the turntable with sufficient force.
- If the jamming force decreases after certain time of use, the diameter has to be enlarged with a pencil or ballpoint again.

(F)

Press-disque d'appoint

Procéder comme suit:
- Se servir d'un presse-disque code 4822 462 50383.
- Avec une petite pin ce pointue pratiques des entailles dans l'anneau central.
- A l'aide du dos d'un crayon ou d'un stylo à bille élargin le diamètre de l'anneau central pour qu'il appuye suffisamment sur le plateau tournant.
- Si la force de pression s'affaiblit après un certain temps, procéder de nouvear avec le dos du crayon à l'élargissement de l'anneau.

(I)

Premidisco di servizio

Confezionare un premidisco come segue:
- Usare un premidisco codice 4822 462 50383.
- Per mezzo di una pinzetta tagliente puaticase incizioni nell'annello centrale.
- Con l'aiuto del dorso di una mattita o una biro, allargare il diametro dell'annello centrale in modo che premi bene sul piatto girevole.
- Se la forza di pressione di minuisce doppo un certo tempo, allargare di nuovo per mezzo della matita.

(D)

Ein Service-Plattenniederhalter

Ein Service-Plattennierderhalter ist wie folgt anzufertigen:
- Einen separaten Plattenniederhalter, Code-Nr. 4822 462 50383, nehmen.
- Mit einer kleinen scharfen Zange am Innenring Einschneiden.
- Mit der Rückseite eines Bleistifts oder Kugelschreibers den Durchmesser des Innerrings ein wenig vergrössern, und zwar derart, dass er mit ausreichender Kraft die Platte mit dem Plattenteller verklemmt.

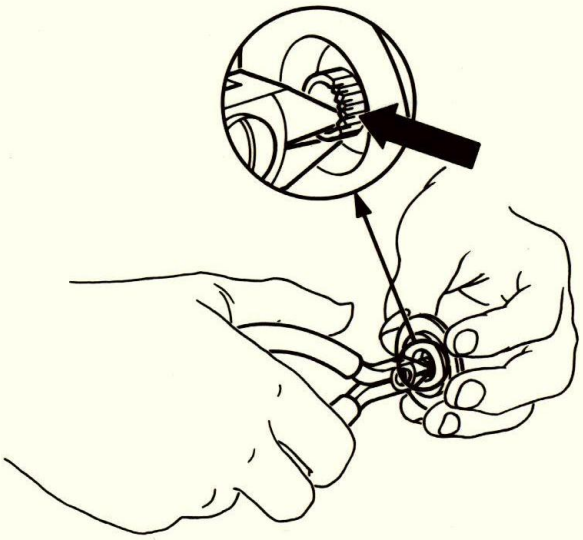
Wenn die DKlemmkraft nach Benutzung wieder abnimmt, ist der Durchmesser mit einem Bleistift oder Kugelschreiber wieder zu vergrössern.

(NL)

Maak als volgt een aparte plaat aandrukker:

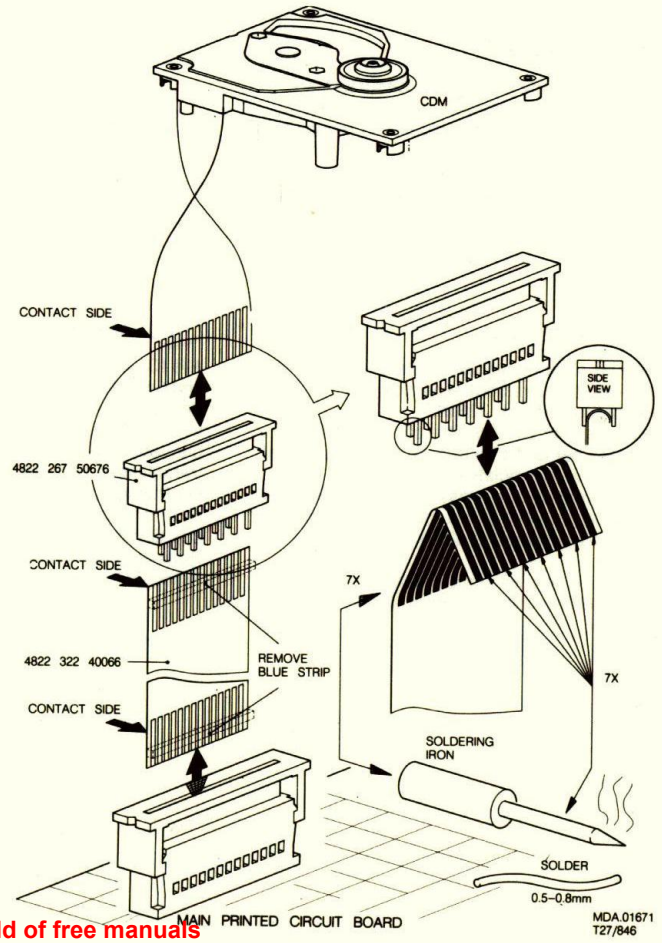
- Neem een losse plaat aandrukker codenr. 4822 462 50383.
- Knip met een kleine scherpe tang in op de binnenste ring.
- Maak met de achterkånt van een potlood of ballpoint de diameter van de binnenste iets groter, zodanig dat deze met voldoende kracht op de draaitafel klemt.
- Indien de klemdracht na gebruik weer minderr wordt, dan de diameter met potlood of pen weer groter maken.

SERVICE DISC-HOLDDOWN

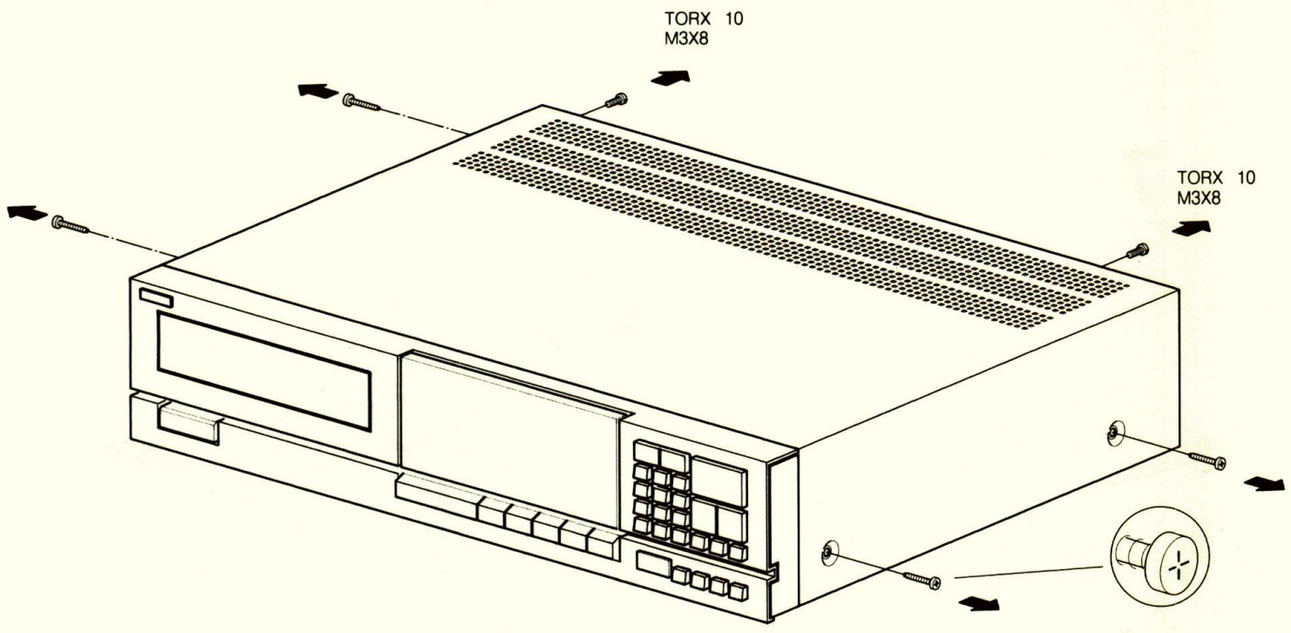


42 565 A12

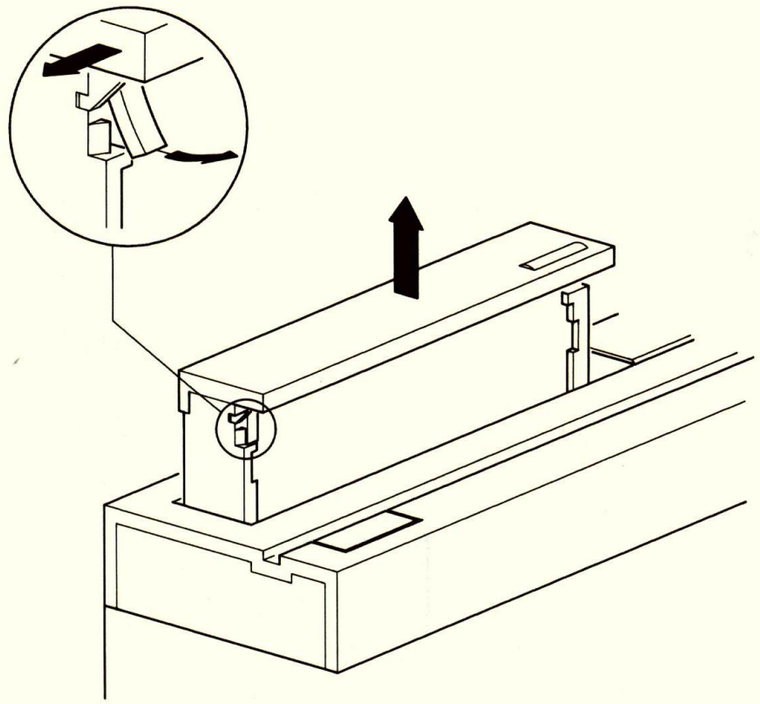
EXTENSION CABLE



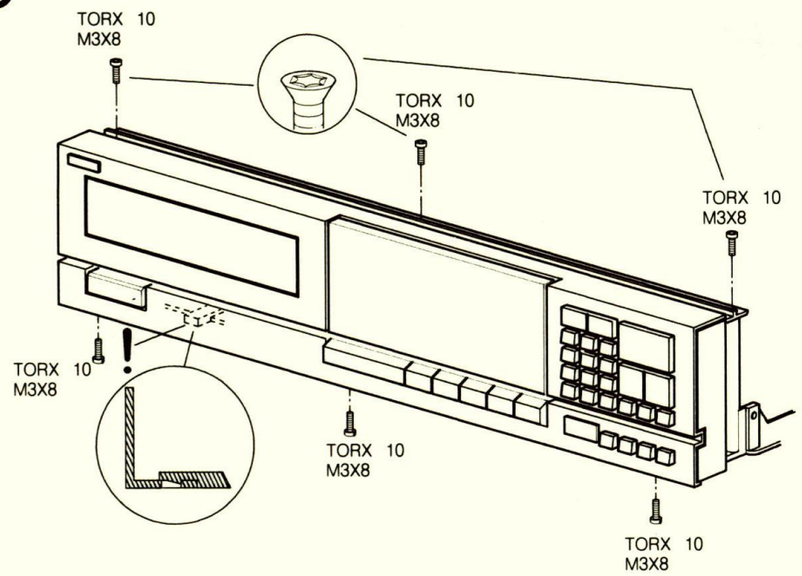
1



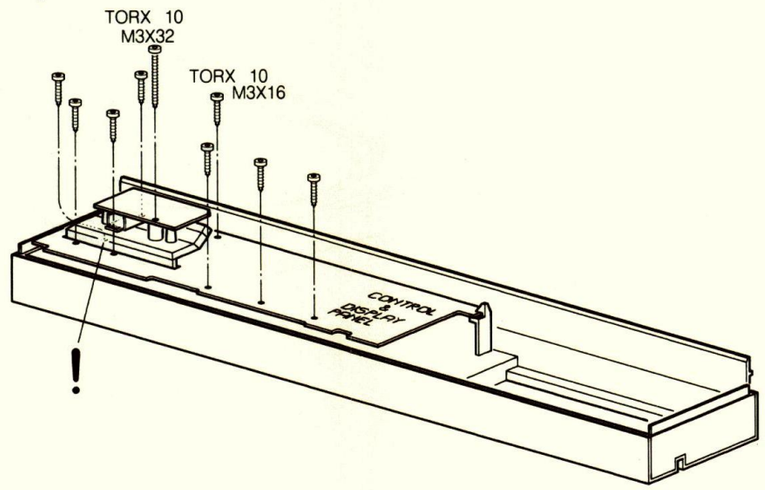
2



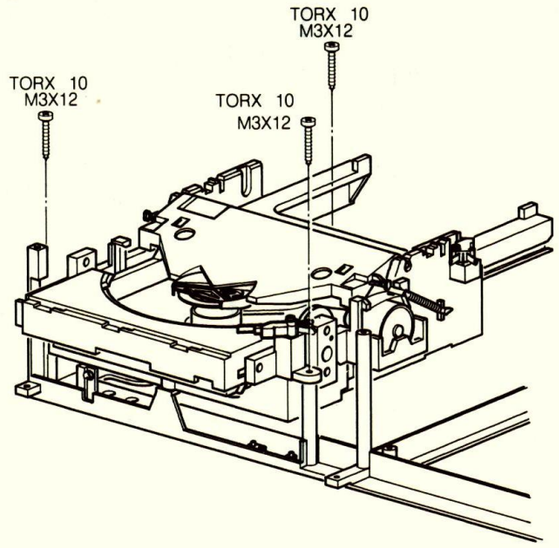
3



4



5

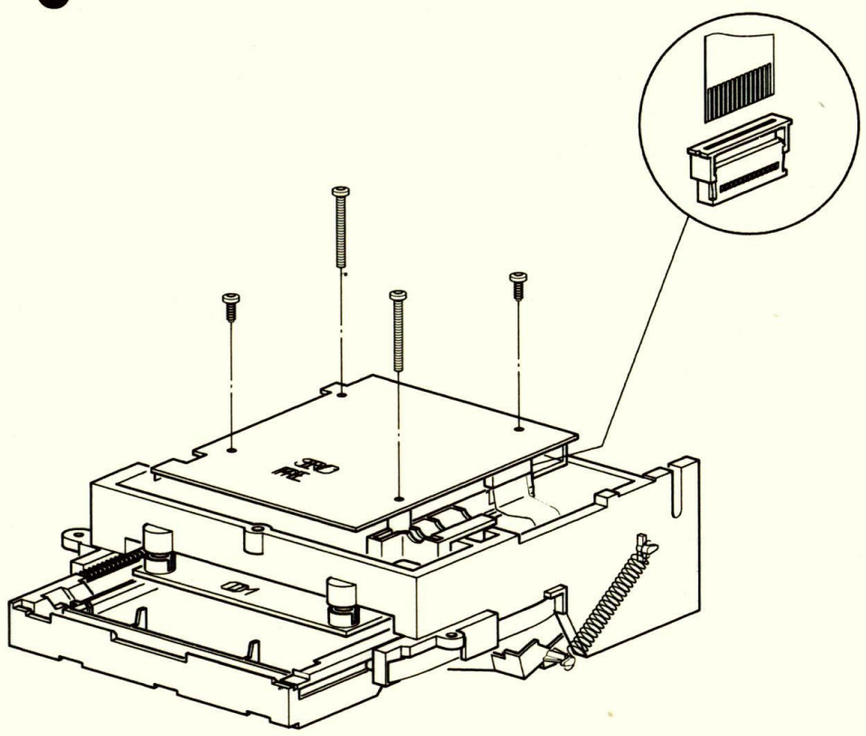


MDA.01668
T27/845

CS 19 563

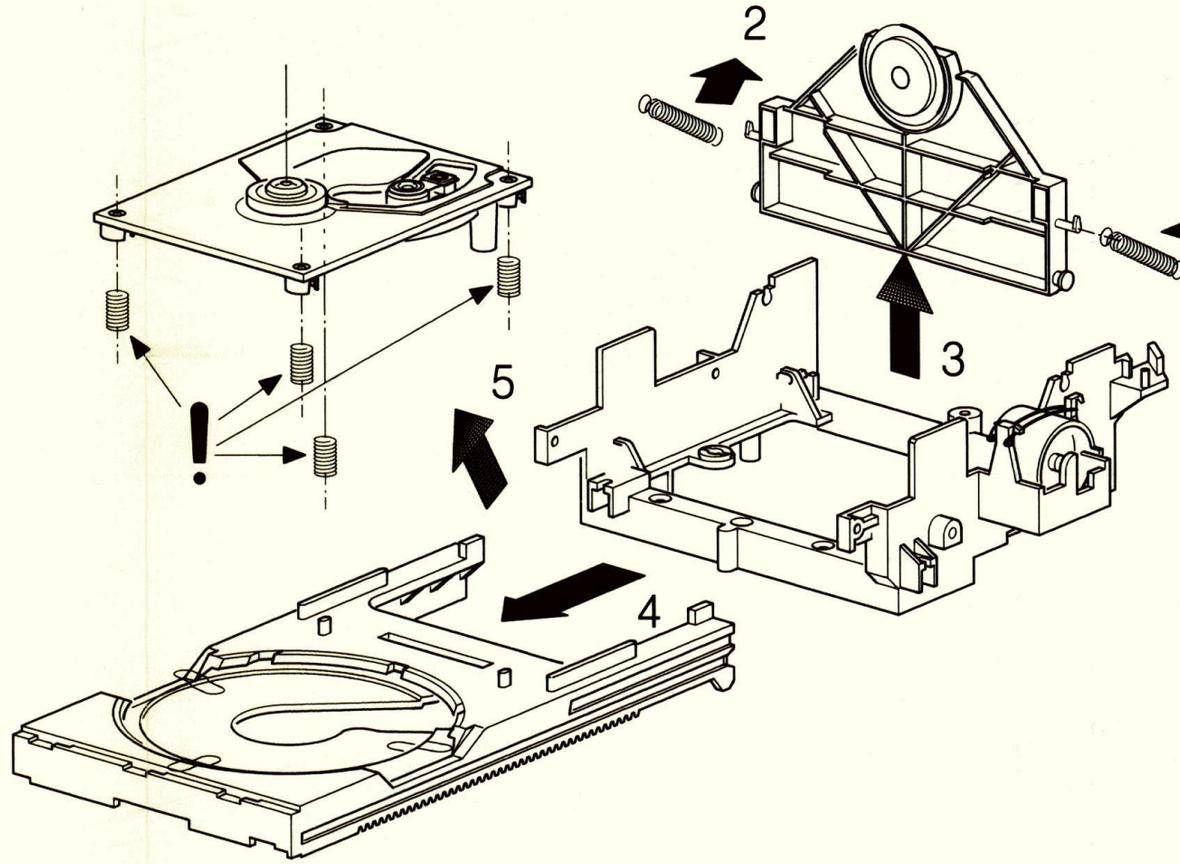
DEMOUNTING THE CDM MECHANISM

6

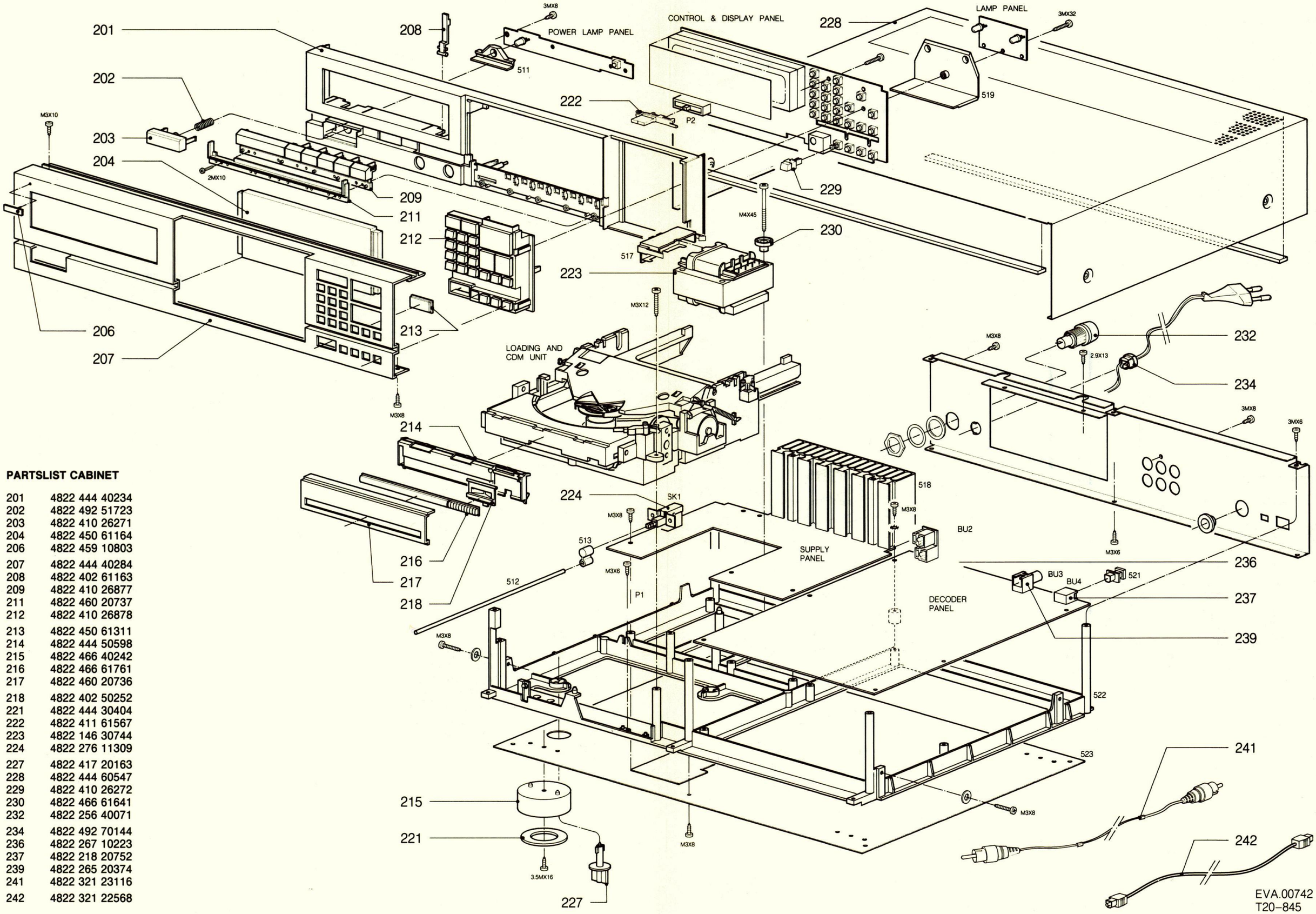


LOADING
"UP–SIDE–DOWN".

7



EVA.00746
845/T19



CS 19 565

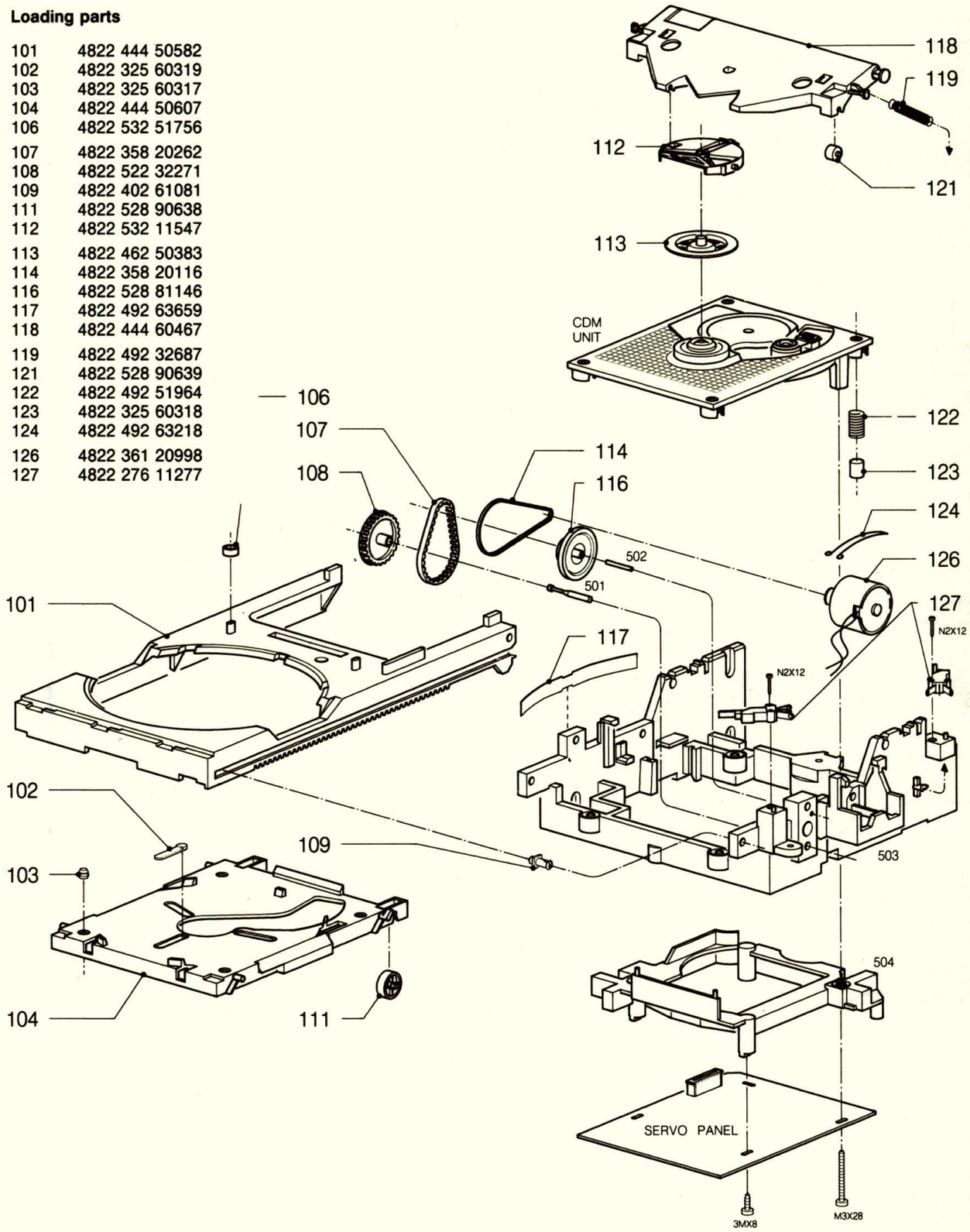
PARTSLIST CABINET

201	4822 444 40234
202	4822 492 51723
203	4822 410 26271
204	4822 450 61164
206	4822 459 10803
207	4822 444 40284
208	4822 402 61163
209	4822 410 26877
211	4822 460 20737
212	4822 410 26878
213	4822 450 61311
214	4822 444 50598
215	4822 466 40242
216	4822 466 61761
217	4822 460 20736
218	4822 402 50252
221	4822 444 30404
222	4822 411 61567
223	4822 146 30744
224	4822 276 11309
227	4822 417 20163
228	4822 444 60547
229	4822 410 26272
230	4822 466 61641
232	4822 256 40071
234	4822 492 70144
236	4822 267 10223
237	4822 218 20752
239	4822 265 20374
241	4822 321 23116
242	4822 321 22568

EXPLODED VIEW TRAY MECHANISM

Loading parts

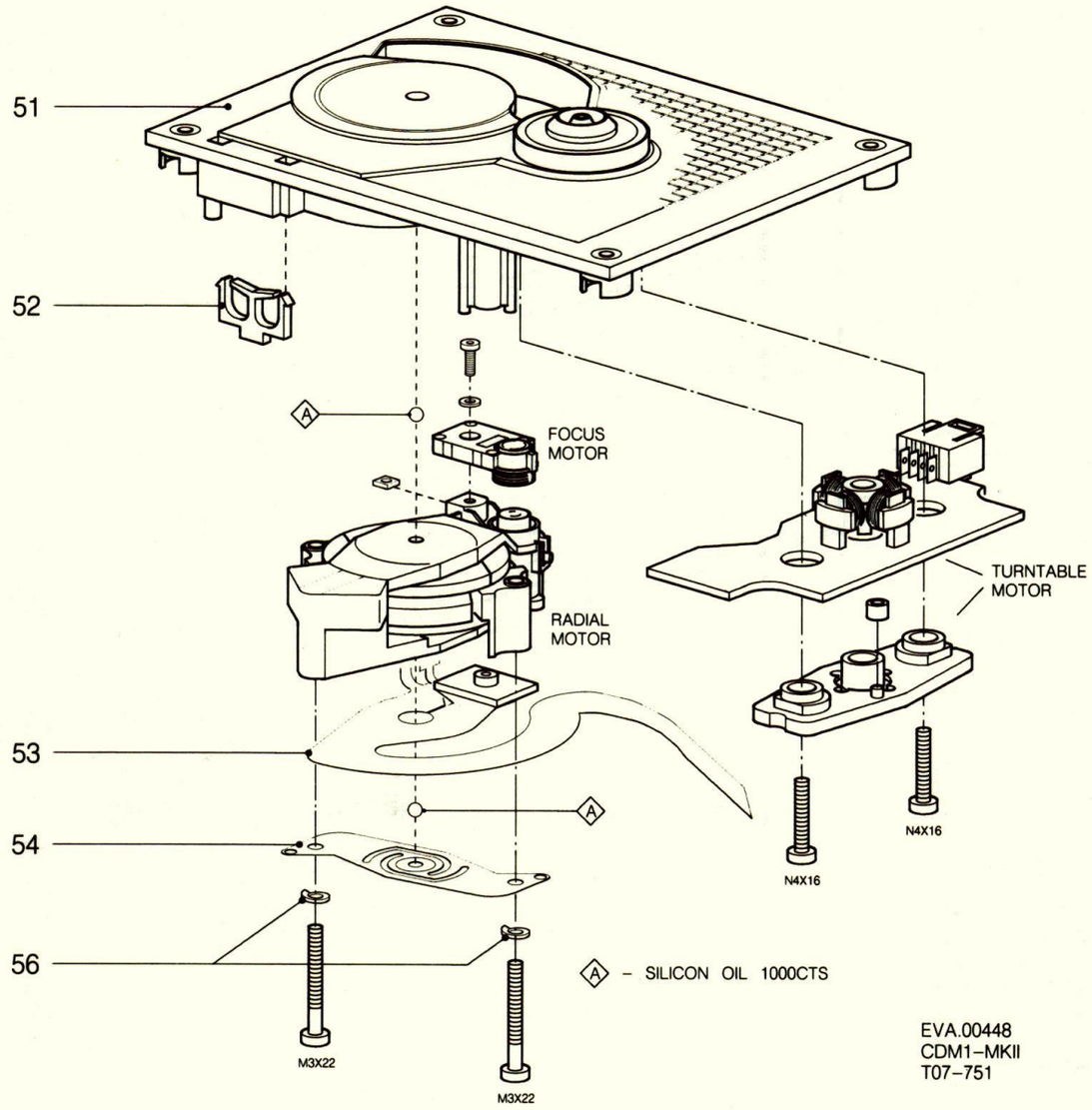
101	4822 444 50582
102	4822 325 60319
103	4822 325 60317
104	4822 444 50607
106	4822 532 51756
107	4822 358 20262
108	4822 522 32271
109	4822 402 61081
111	4822 528 90638
112	4822 532 11547
113	4822 462 50383
114	4822 358 20116
116	4822 528 81146
117	4822 492 63659
118	4822 444 60467
119	4822 492 32687
121	4822 528 90639
122	4822 492 51964
123	4822 325 60318
124	4822 492 63218
126	4822 361 20998
127	4822 276 11277



EVA.00507
T07–752

CS 19 566

EXPLODED VIEW C.D. MECHANISM



EVA.00448
CDM1–MKII
T07–751

Mechanism parts

Complete unit	4822 691 20449
51	4822 361 21115
52	4822 401 10895
53	4822 323 50124
54	4822 520 10555
56	4822 530 80188
A	4822 390 80145
Ball	4822 520 40177

GB

Demounting the Rafoc unit

- Take the CD-mechanism out of the set.
- The RAFOC unit can be removed after the two fixing screws M3 x 22 have been loosened.
- Now the pivot plate, item no. 54, can be removed.
- After removing the clamping piece, item no. 52, the RAFOC unit/flexible PCB assembly can be taken out.
  Attention: when mounting the RAFOC unit, see to it that the flexible PCB reset well against the mounting plate at the height of the clamping piece (item no. 52).
  In some cases, it may be necessary to glue the flexible PCB with a fast-drying glue to prevent the RAFOC unit from rubbing against the flexible PCB.
  The glueing should be done very carefully.
- When the laser and/or the monitor diodes are defective, it will be necessary to replace the complete CDM unit.
- After mounting the RAFOC unit you should make sure that the arm runs clear over the entire disc diameter.
  This can be checked by means of a spring-pressure gauge which is held against the magnet of the focusing unit.
  The friction of the arm, measured over the entire meter reading, may not be greater than 25mN.
- A fast check of the clearance of the arm is possible in service position 0.
  For servicing positions see "trouble shooting".
- *After mounting, the angle setting should be adjusted.*

D

Ausbau der RAFOC-Einheit

- Dem gerät den CD-Mechanismus entnehmen.
- Die Rafoc-Einheit lässt sich entfernen, nachdem die zwei Befestigungsschrauben M3x22 gelöst worden sind.
- Nun lässt sich die Spurplatte Pos. 54 fortnehmen.
- Nachdem das Klemmstück Pos. 52 beseitigt worden ist, lässt sich die Zusammenstellung aus RAFOC-Einheit und Flexprint fortnehmen.
  Achtung: Beim Einbau der RAFOC-Einheit ist zu beachten, dass der Flexprint einwandfrei an der Montageplatte an der Stelle des Klemmstücks Pos. 52 anliegt. In manchen Fällen kann es notwendig sein, diesen Flexprint mit einem schnelltrocknenden Kleber zu verkleben, damit bewirkt wird, dass die RAFOC-Einheit nicht mit dem Flexprint streift.
  Das Verkleben muss mit äusserster Vorsicht erfolgen.
- Wenn der Laser und/oder die Monitordioden schadhaft sind, ist es notwendig, die gesamte CDM-Einheit auszuwechseln.
- Nach Einbau der RAFOC-Einheit ist zu veranlassen, dass der Arm am vollen Plattendurchmesser freiläuft.
  Das lässt sich überprüfen mit Hilfe einer Federwaage die beim Magnet der Fokussiereinheit angelegt wird.
  Die Armreibung darf, am vollen Ausschlag gemessen, nicht über 25 mN sein.
  Eine schnelle Armfreilaufkontrolle ist in der Servicestellung 0 möglich.
  Servicestellungen siehe "trouble shooting".
- *Nach Einbau muss die Winkeleinstellung geregelt werden.*

F

Dépose de l'unité RAFOC

- Extraire le mécanisme C.D. de l'appareil
- Après avoir enlevé les 2 vis M3 x 22, l'unité RAFOC est amovible.
- La plaquette de butée rep. 54 est à enlever.
- Après que le clip rep. 51 est enlevé, l'ensemble RAFOC et le circuit imprimé flexible sont amovibles.

Attention :
Au montage de l'unité RAFOC, faire attention que le circuit imprimé flexible est tout contre la plaque de montage à l'endroit du clip rep. 52.
Il se peut que dans certains cas, il soit nécessaire de fixer avec une colle à action rapide pour que l'unité RAFOC ne touche pas le circuit imprimé flexible.
Procéder au collage avec la plus grande minutie.

- Si le laser ou les diodes de moniteur tombent en panne, il faut remplacer l'unité CDM.
- Dès que l'unité RAFOC a été montée il faut s'assurer que la bras se meut librement sur tout le diamètre du disque.
  Ce que l'on vérifiera à l'aide d'un dynamomètre que l'on placera contre l'aimant de l'unité de focalisation.
  La friction du bras, mesurée sur toute la course ne doit pas dépasser 25 mN.
- Un contrôle rapide de la marche libre du bras peut être effectué en position service ''0''.
  Consulter méthode de mesure détaillé du décodeur; "trouble shooting."
- *Le réglage angulaire est à refaire après montage.*

I

Smontaggio dell'unità RAFOC

- Togliere dall'apparecchio il meccanismo CD.
- L'unità RAFOC può essere rimossa dopo aver allentato le due viti di fissaggio M3x22.
- Ora la piastra articolata, posizione 54, può essere rimossa.
- Dopo aver tolto la parte di fissaggio, posizione 52, l'unità RAFOC/insieme del PCB flessibile può essere tolta.
  Attenzione: Rimontando l'unità RAFOC, assicurarsi che il PCB flessibile si appoggi bene contro la piastra di montaggio all'altezza della parte di fissaggio (pos. 52).
  In alcuni casi, può essere necessario incollare il PCB flessibile con una colla ad azione rapida, al fine di evitare che l'unità RAFOC stessa strofini contro il PCB flessibile.
  L'incollatura deve essere eseguita molto attentamente.
- Quando il laser e/o i diodi monitor sono difettosi, sarà necessario sostituire tutta l'unità CDM.
- Dopo il montaggio dell'unità RAFOC, assicurarsi che il braccio scorra libero sull'intero diametro del disco.
  Ciò può essere controllato con un dinamometro mantenuto contro il magnete dell'unità di focalizzazione.
  La frizione del braccio, misurata sull'intera scala di lettura, non deve essere maggiore di 25 mN.
- Un rapido controllo del gioco del braccio è possibile in posizione di servizio 0.
  Riferirsi al "trouble shooting".
- *Procedere di nuovo alla regolazione angolare dopo montaggio.*

NL

Demontage van de RAFOC-unit

- Neem het C.D.-mechanisme uit het apparaat.
- De Rafoc-unit kan worden verwijderd nadat de twee bevestigingsschroeven M3x22 zijn weggenomen.
- Nu kan de taatsplaat pos. 54 weggenomen worden.
- Nadat het klemstuk pos. 52 verwijderd is kan de samenstelling RAFOC-unit en flexprint weggenomen worden.
  Let op: Bij de montage van de RAFOC-unit dient er op gelet te worden dat de flexprint goed aanligt tegen de montageplaat ter plaatse van het klemstuk pos. 52.
  In sommige gevallen kan het noodzakelijk zijn om deze flexprint met een sneldrogende lijm vast te lijmen om ervoor te zorgen dat de RAFOC-unit niet aanloopt op de flexprint.
  Het lijmen dient uiterst voorzichtig te gebeuren.
- Wanneer de laser en/of de monitordiodes defekt zijn is het noodzakelijk het complete CDM uit te wisselen.
- Na montage van de RAFOC-unit dient ervoor gezorgd te worden dat de arm over de hele plaatdiameter vrijloopt.
  Dit kan gekontroleerd worden met behulp van een veerdrukmeter welke wordt aangelegd bij de magneet van de focusunit.
  De wrijving van de arm mag, gemeten over de hele uitslag niet groter zijn dan 25 mN.
- Een snelle kontrole van de vrijloop van de arm is in servicepositie 0 mogelijk (voor serviceposities zie "trouble shooting".)
- *Na montage moet de hoekinstelling worden afgeregeld*

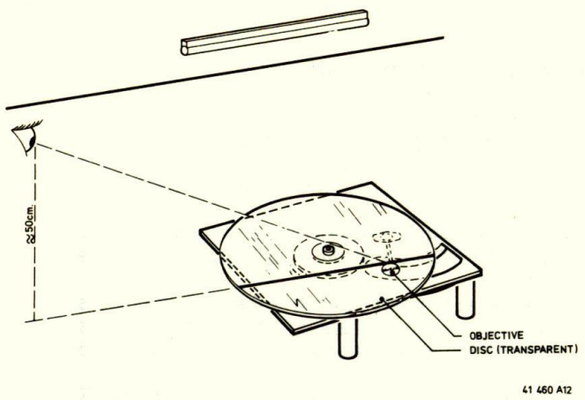


Fig. 1

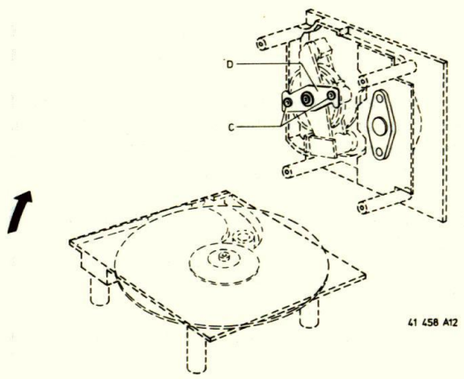


Fig. 2

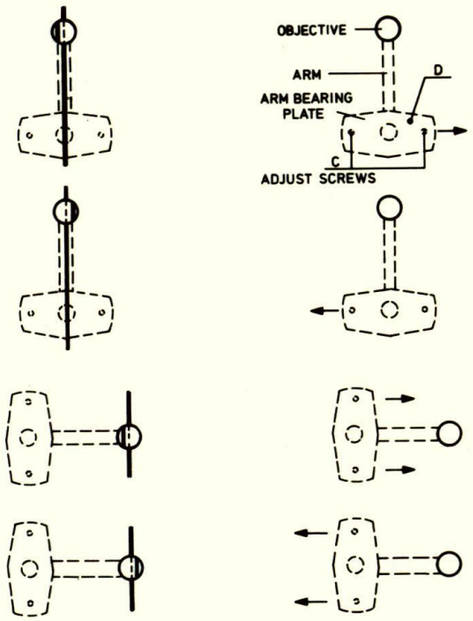


Fig. 3

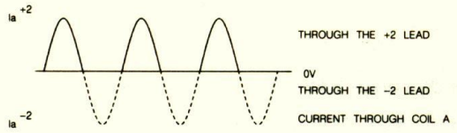


FIG.1

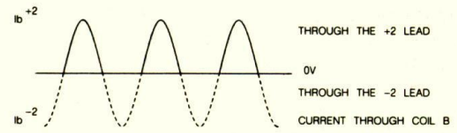


FIG.2

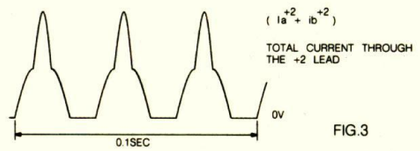


FIG.3

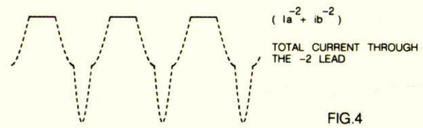


FIG.4

MDA.00336
T32-646

Fig. 4

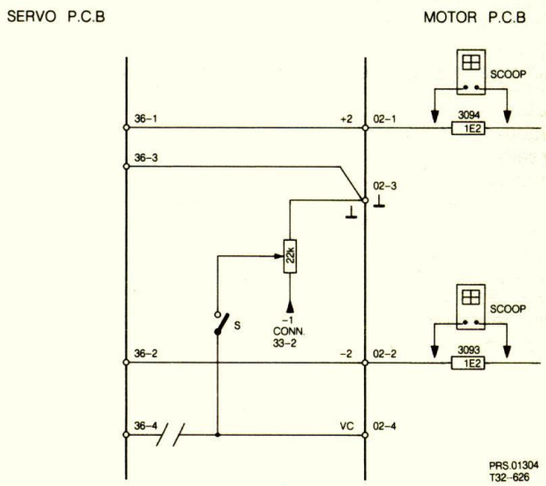


Fig. 5

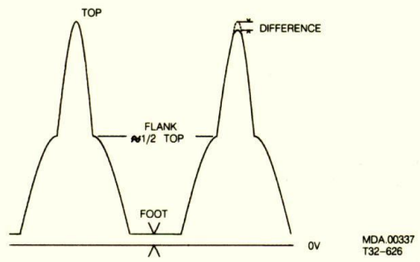


Fig. 6

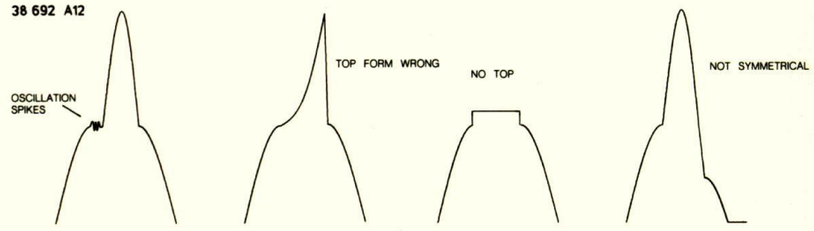


Fig. 7

GB

Checking the angle setting

The angle setting can be checked with the glass-disc method which is explained below.
Put glass disc 4822 395 90204 on the turntable.
Make sure that the glass disc beds down well on the turntable.
Place the CD mechanism under a light source, under which there is a straight line (e.g. under a fluorescent tube with grid).
Set the arm to mid-position of its radial track.
Turn the mechanism until the arm is parallel to the line under the light source (see figure 1).
Look into the direction and in the extension of the line to the reflection there of on the glass disc and in the objective.
Locate the CDM in such a way that the line reflected by the glass disc runs across the centre of the objective.
The line reflected by the objective should fall just within the surface of the objective. If this is the case, the two lines are not more than 4 mm apart and squareness is correct.
Turn the CD mechanism through 90° relative to the previous position. The arm must be kept in mid-position (see figure 3).
Repeat the previous check.

Adjusting the angle setting

For adjusting the angle setting one or both of the two locking knocks for the bearing plate on pos. 51 must be taken out.
If a check on the angle setting shows that the angle falls outside the tolerance, the angle should NOT be adjusted for minimum deviation, but it should be adjusted within the tolerance.
The new setting should lie between the old setting and the optimum setting. After adjusting the setting, the friction of the arm must be checked. This is done by means of a spring pressure gauge which is held against the magnet of the focusing unit.
The friction of the arm, measured over the entire meter reading, should not be greater than 25 mN.
When the friction appears to be too high, the RAFOC unit must be replaced and the angle between disc and light path adjusted.

The lock is adjusted as follows:
Loosen screws C (see figure 2) until bearing plate D can be displaced. Correct the angle setting by moving the bearing plate into the direction shown in figure below.
Tighten screws C, ensuring that the setting does not drift.
Then double check the setting in two directions.

Check of the motor control (Hall control) (see motor PCB)

Principle

With the oscilloscope the form of the voltage across resistor 3094 in the +2 lead and across resistor 3093 in the −2 lead is seen. This voltage is a consequence of the current and in this way current signals (pictures) are formed.
The current through the motor−coils A and B is sinusoidal. This current is switched on and controlled by the Hall ICs.
The Hall ICs are mounted at an angle of 90 degrees with respect to each other. Consequently the currents through A and B are shifted in phase 90 degrees.
In figure 4 the origin of the current signal through the +2 and −2 leads is shown graphically.

1. Interrupt the Vc connection by unsoldering the connector point 36−4 on the servo + preamplifier p.c.b.

2. Connect a trimming potentiometer of 22K Ohm to the motor print between 02−3( ) and connector 33−2(−1) on the servo board.

3. Connect the slider with 02−4(Vc) via switch S (see figure 5).

4. Measure with an oscilloscope first across 3094 and hereafter across 3093.
   Do not measure across both resistors at the sametime, since the currents are measured through the +2 lead and −2 lead.

5. Put the trimming potentiometer in the maximum position (the slider is then connected to connector 33−2(−1)).

6. With a disc on the turntable, put the set in service−loop 0 (see troubleshooting). Switch S on and adjust the trimming potentiometer back in such a way that 3 complete pulses are visible during 0.1 sec. (fig. 3). The polarity of the oscilloscope must be chosen so that the tops of the pulses are in upward position. The rotor magnet of the motor has 3 polespairs. Therefore the behaviour of the motor during one revolution with a speed of 600 r.p.m. is visible.

7. Measure with a DC−voltmeter on 02−4(Vc).
   A. V_c = −1.7 +/− 0.5 V.
   B. Measure across 3094, value 1 = maximum 56.4 mV.
   C. Measure across 3093, value 2 = maximum 58.8 mV.
   D. Difference: **(value 1 - value 2)** maximum 6 mV. If the difference exceeds 6 mV, while value 1 and value 2 are below the maximum the motor is then wrong!

8. For a good functioning the signal has to meet the following values:
   Top is not specified by value (see figure 6).
   Top difference <24 mV
   Flank difference <36 mV
   Foot is not specified

   Remark:
   Flank difference is at one asymmetrical pulse.
   Foot is DC offset.

9. Examples of the wave form faults: see figure 7.

10. Adjust the voltage on 02−4(Vc) with the potentiometer back to −0,9 V. The motor must still turn. Although the top height is much lower now the wave form has to be symmetrical and rounded.

(F)

Vérification du réglage de l'angle

La vérification du réglage de l'angle peut se faire grâce à la méthode du disque de verre expliquée ci-dessous.
Placer le disque de verre 4822 395 90204 sur le plateau tournant.
S'assurer que le disque repose convenablement sur le plateau.
Placer le mécanisme CD sous une source lumineuse où l'on voit une ligne droite (sous un tube fluorescent).
Placer le bras à la position intermédiaire de sa course radiale.
Faire fonctionner le mécanisme jusqu'à ce que le bras est parallèle à la ligne que forme la source lumineuse (voir fig. 1).
Vérifier à présent dans la direction et le prolongement de la ligne et leur réflexion sur le disque de verre et l'objectif: Disposer le mecanisme du lecteur de manière que le trait réfléchi traverse le centre de l'objectif. Ce trait réfléchi doit se trouver dans les limites de la surface de l'objectif. Dans ce cas, les deux lignes ne sont pas distantes de plus de 4 mm et l'angle est exact.

Faire tourner le mécanisme CD de 90° par rapport à la position qu'il occupait précédemment, le bras doit se maintenir à la position centrale (voir fig. 3).
Répéter la vérification précédente.

Mise au point du réglage de l'angle

Afin de pouvoir ajuster l'angle , les deux cames de positionnement du palier sur le rep. 51, doivent être brisées.
Si la vérification du réglage de l'angle montre que l'angle se trouve en dehors des tolérances, ne pas ajuster l'angle pour un balayage minumum, mais au contraire, l'ajuster dans les limites des tolérances.
Ce réglage répété doit se situer entre l'ancien réglage et le réglage optimal. Après cette mise au point, vérifier la friction du bras.
Effectuer cette vérification à l'aide d'un dynamomètre que l'on tiendra tout contre l'aimant de l'unité de focalisation.
la friction du bras mesurée sur l'affichage total de l'instrument, nu doit pas dépasser 25 mN.
Si la friction est trop élevée, remplacer l'unité RAFOC et ajuster l'angle entre le disque et le faisceau lumineux.

La plaque de support doit être ajustée comme suit:

Dévisser les vis C (voir fig. 2) jusqu'à ce que la plaque de support D puisse être déplacée. Ajuster le réglage de l'angle en déplaçant la plaque de support dans la direction illustrée par la figure ci-dessous. Serrer les vis C en s'assurant que ce réglage est effectivement stable, puis vérifier encore une fois le réglage dans les deux directions.

Vérification de la régulation du moteur (Régulation Hall) (voir platine moteur)

Principe

A l'oscilloscope on examine la forme qu'épouse la tension sur la résistance 3094. sur la liaison +2. cette tension est la conséquence du courant, ce qui provoque des formes diverses de courant.
Le courant dans les bobines A et B du moteur est de forme sinusoïdale et est généré et commandé par les IC Hall. Ces IC sont situés l'un en face de l'autre dans un angle de 90°, c'est pour cela que les courants dans A et B sont déphasés de 90°. La figure 4 donne la représentation graphique de la forme qu'adopte le courant dans les lignes +2 et −2.

1. Interrompre la liaison Vc en dessoudant le point de connecteure 36-4 sur la platine asservissement + préampli.
2. Brancher un potentiomètre d'ajustage de 22kΩ entre 02-31 (⊥) et le connecteur 33-2 (1) de la platine asservissement.
3. Relier le curseur à travers un commutateur S à 02-4 (Vc). (Voir fig. 5)
4. Avec un oscilloscope, mesurer d'abord sur 3094 et ensuite sur 3093.
   Ne pas mesurer en même temps sur les deux résistances.
   En effet, les courants sont mesurés par les liaisons +2 et −2.
5. Ajuster le potentiomètre au maximum (lorsque le curseur se place contre le connecteur 33-2 (−1).
6. Positionner l'appareil en boucle de service 0 (voir "troubleshooting"), mettre S en fonction et ramener le potentiomètre de'ajustage de manière – obtenir 3 impulsions complétes sur une période de 0,1 sec.(voir fig.3).
   Sélectionner la polarité de l'oscilloscope pour que les crêtes des impulsions soient dirigées vers le haut. L'aimant du rotor possède 3 paires de pôles; on voit ainsi la réaction du moteur pendant une révolution à une vitesse de 600 T/min.
7. Mesurer à l'aide d'un voltmètre DC sur 02-4 (Vc).
   A. Vc =−1,7 V ± 0,5 V
   B. Mesurer sur 3094, valeur 1 = max. 56,4 mV
   C. Mesurer sur 3093, valeur 2 = max. 58,8 mV
   D. La différence des valeurs 1 et 2 ne doit pas dépasser les 6 mV. Si cet écart est quand même supérieur alors que les indications de 1 et de 2 sont justes, le moteur est défectueux.
8. Le fonctionnement correct est lié aux conditions auxquelles le signal doit répondre:
   La valeur de crête n'est pas donnée, (fig. 6).

Différence de crête	< 24 mV
Différence de flanc	< 36 mV
"Foot" (base)	non spécifié

   Remarque: la différence de flanc est constatée lorsque la forme d'onde est asymétrique. La base est (le seuil du courant continu) DC offset.
9. Voici quelques exemples de déformations d'onde: (fig. 7)
10. Ramener à présent à l'aide du potentiomètre, la tension sur 02-4 à −0,9 V. Le moteur doit encore tourner, la hauteur de crête est alors nettement inférieure mais la forme d'onde doit être parfaitement symétrique et bouclée.

(D)

Kontrolle der Winkeleinstellung

Die Winkeleinstellung lässt sich kontrollieren mit der Glasscheibenmethode:
Die Glasscheibe 4822 395 90204 auf den Plattenteller legen. Dafür sorgen, dass die Glasscheibe an dem Plattenteller gut anliegt. Den CD-Mechanismus gerade unter eine Lichtquelle stellen, unter der sich eine gerade Linie befindet (z.B. unter eine Leuchtstoffleuchte mit Gitter).
Den Arm in die Mittelstellung seiner Radialbahn stellen.
Den Mechanismus so drehen, dass der Arm parallel zu der Linie unter der Lichtquelle steht (siehe Bild 1). In Richtung und in Verlängerung der Linie zu deren Reflexion auf die Glasscheibe und in das Objektiv schauen.
CDM dahin anordnen, dass die durch die Glasscheibe reflektierte Linie über die Mitte des Objektivs läuft. Die durch das Objektiv reflektierte Linie soll noch gerade innerhalb der Oberfläche des Objektivs liegen.
Wenn dies der Fall ist, liegen die zwei Linien nicht mehr als 4 mm auseinander und ist die Rechtwinkligkeit richtig.

Den CD-Mechanismus um 90° bezogen auf die vorhergehende Stellung drehen.
Der Arm muss in der Mittelstellung verbleiben (siehe Bild 3).
Die vorhergehende Kontrolle ist zu wiederholen.

Regeln der Winkeleinstellung

Um die Winkeleinstellung vornehmen zu können, müssen ein oder beide Positioniernocken für die Lagerplatte an Pos. 51 entfernt werden.
Wenn sich während der Kontrolle der Winkeleinstellung herausstellt, dass der Winkel ausserhalb der gegebenen Toleranz fällt, muss der Winkel NICHT auf Höchstabweichung sondern gerade innerhalb der Toleranz geregelt werden.
Die neue Einstellung muss zwischen der alten Einstellung und der optimalen Einstellung liegen.
Nach der Einstellung muss die Armreibung überprüft werden. Dies erfolgt mit Hilfe einer Federwaage, die am Magnet der Fokussiereinheit angelegt wird.
Die Armreibung darf, am vollen Ausschlag gemessen, nicht über 25 mN sein.
Wenn sich herausstellt dass die Reibung zu hoch ist, muss die RAFOC-Einheit ausgewechselt und der Winkel Platte/Lichtweg geregelt werden.
Der Winkel wird folgendermassen eingestellt:

Die Schrauben C (siehe Bild 2) so weit lösen, dass sich die Lagerplatte D sich verschieben lässt. Die Winkeleinstellung kontrollieren, dadurch dass die Lagerplatte verschoben wird in die Richtung die im untenstehenden Bild gezeigt wird.
Die Schrauben C anziehen und beachten, dass die Einstellung sich nicht ändert.
Dann erneut die Winkeleinstellung in den beiden Richtungen überprüfen.

Kontrolle der Motorregelung (Hall-Regelung)
(siehe Motorprint)

Prinzip

Mit dem Oszilloskop wird die Form der Spannung an Widerstand 3094 in der +2-Leitung und an Widerstand 3093 in der -2-Leitung beobachtet. Die Spannung ist die Folge des Stroms, und es ergeben sich gleichsam Strombilder. Der Strom durch die Motorspulen A und B ist sinusförmig; die Motorspulen werden durch die Hall-ICs eingeschaltet und gesteuert. Die Hall-ICs stehen in Winkel von 90° zu einander, und dadurch werden die Ströme durch A und B 90° phasenverschoben sein.
Im Bild 4 ist die Bildung des Strombildes durch die Leitungen +2 und −2 graphisch dargestellt.

1. Die Vc-Verbindung unterbrechen, dadurch dass der Konnektoranschluss 36-4 an der Leiterplatte "servo + preampl." entlötet wird.
2. Ein Einstellpotentiometer von 22 kΩ zwischen 02-31 (⊥) und Anschluss ("conn.") 33-2-1 am Servoprint schalten.
3. Den Schieber über einen Schalter S mit 02-4 (Vc) verbinden. (Bild 5)
4. Mit einem Oszilloskop zuerst über 3094 und anschliessend über 3093 messen. **Nicht gleichzeitig über beide Widerstände messen.** Die ströme durch die +2-Leitung und die −2-Leitung werden nämlich gemessen.
5. Das Einstellpotentiometer auf Maximum bringen (das ist, wenn der Schieber an Anschluss ("conn.") 33-2(-1) anliegt).
6. Das Gerät in die Servicestellung 0 (siehe "troubleshooting") bringen, S einschalten und das Einstellpotentiometer so zurückregeln, dass 3 vollständige Impulse für die Zeitdauer von 0,1 s erkennbar sind (siehe Bild 3).
   Die Polarität des Oszillskops dahin wählen, dass die Spitzen der Impulsen aufwärts zeigen. Der Rotormagnet des Motors hat 3 Polpaare, und man sieht nun das Verhalten des Motors während 1 Umdrehung bei einer Drehzahl von 600/min.
7. Mit einem Gleichspannungsmesser an 02-4 (Vc) messen.
   A. Vc =−1,7 V ± 0,5 V
   B. An 3094 messen; Wert 1 = zuhöchst 56,4 mV
   C. An 3093 messen; Wert 2 = zuhöchst 58,8 mV
   D. Die Differenz von Wert 1 mit Wert 2, also Wert 1 minus Wert 2, darf höchstens 6 mV sein.
   Wenn die Differenz über 6 mV ist, während Wert 1 und Wert 2 richtig sind, hat der Motor dennoch Schaden genommen.
8. Für die richtige Funktion muss das Signal folgender Werten genügen:
   Der Spitzenwert is nicht gegeben, siehe Bild 6.

"Difference"	< 24 mV
"Flank Difference"	< 36 mV
"Foot"	nicht angegeben

   Anmerkung: "Flank difference" ist bei 1 asymmetrischen Wellenform.
   "Foot" ist "DC offset".
9. Beispiele von Wellenformfehlern: (Bild 7)
10. Nun mit dem Potentiometer die Spannung an 02-4 (Vc) auf −0,9 V zurückregeln.
    Der Motor muss immer noch laufen, die Spitzenhöhe ist nun weit geringer, die Wellenform aber muss noch schön symmetrisch und abgerundet sein.

(NL)

Kontrole van de hoekinstelling

De hoekinstelling kan gekontroleerd worden met de glasplaat-methode:

Leg de glasplaat 4822 395 90204 op de draaitafel.
Zorg ervoor dat de glasplaat goed aanligt op de draaitafel. Plaats het CD-mechanisme recht onder een lichtbron waaronder zich een lichte lijn bevindt, (b.v. onder een TL-armatuur met rooster).
Zet de arm in de middenstand van z'n radiale baan.
Draai het mechanisme zo dat de arm evenwijds staat aan de lijn onder de lichtbron (zie figuur 1).
Kijk in de richting en in het verlengde van de lijn naar de reflektie hiervan op de glasplaat en in het objectief.
Plaat het CDM zodanig dat de door de glasplaat gereflecteerde lijn over het midden van het objectief loopt. De door het objectief gereflecteerde lijn moet juist binnen het oppervlak van het objectief liggen. Indien dit het geval is dan liggen de twee lijnen niet meer dan 4 mm uit elkaar en is de haaksheid correct.

Draai het CD-mechanisme 90° ten opzichte van de vorige stand.
De arm moet in de middenstand blijven staan (zie figuur 3).
Herhaal de vorige kontrole.

Afregelen van de hoekinstelling

Om de hoekinstelling te kunnen doen, moet een of beide positioneer nokken voor de lagerplaat op pos. 51 worden afgebroken.
Indien bij de kontrole van de hoekinstelling blijkt dat de hoek buiten de gegeven tolerantie valt moet de hoek niet op minimale afwijking maar juist binnen de tolerantie worden afgeregeld.
De nieuwe instelling moet liggen tussen de oude instelling en de optimale instelling.
Na de instelling moet de wrijving van de arm worden gekontroleerd. Dit gebeurt met behulp van een veerdrukmeter welke wordt aangelegd bij de magneet van de focusunit.
De wrijving van de arm mag gemeten over de hele uitslag niet groter zijn dan 25 mN.
Wanneer de wrijving te hoog blijkt te zijn moet de RAFOC-unit vervangen worden en de hoek plaat-lichtweg afgeregeld worden.

Het afregelen van de hoek geschiedt als volgt:

Draai de schroeven C (zie figuur 2) zover los dat de lagerplaat D verschoven kan worden.
Korrigeer de hoekinstelling door de lagerplaat in de richting te verschuiven welke in de onderstaande figuur wordt aangegeven.
Draai de schroeven C vast en let er hierbij op dat de instelling niet verloopt.
Kontroleer hierna nogmaals de hoekinstelling in de twee richtingen.

Kontrole van de motorregeling (Hall-regeling)
(zie motorprint)

Principe

Met de oscilloscoop wordt gekeken naar de vorm van de spanning over weerstand 3094 in de +2 leiding en over weerstand 3093 in de −2 leiding. Die spanning is het gevolg van de stroom en er ontstaan a.h.w. stroombeelden.
De stroom door de motorspoelen A en B zijn sinus vormig en worden door de Hall IC's ingeschakeld en gestuurd. De Hall IC's staan onder een hoek van 90° t.o.v. elkaar en daardoor zullen de stromen door A en B 90° in fase verschoven zijn.
In figuur 4 is het onstaan van de stroombeeld door de +2 en de −2 leiding grafisch weergegeven.

1. Onderbreek de Vc verbinding door connectorpunt 36–4 op de servo + preampl. print te desolderen.
2. Sluit een instelpotmeter aan van 22k Ohm tussen 02–3(⊥) en conn. 33–2(−1) op de servoprint.
3. Verbind de loper, via een schakelaar S met 02–4(Vc). (Zie figuur 5.)
4. Meet met een oscilloscoop eerst over 3094 en daarna over 3093.
   Niet tegelijkertijd over beide weerstanden meten.
   De stromen door de +2 leiding en de −2 leiding worden n.l. gemeten.
5. Zet de instelpotmeter op maximaal (dit is wanneer de loper tegen conn. 33–2(−1) ligt.
6. Breng het apparaat in service lus 0 (zie "troubleshooting), schakel S in en regel de instelpotmeter zodanig terug dat er 3 volledige pulsen over een tijd van 0.1 sec. zichtbaar zijn (zie fig. 3).
   Kies de polariteit van de osciloscoop zo, dat de toppen van de pulsen naar boven gericht zijn. De rotormagneet van de motor heeft 3 polen paren en men ziet nu het gedrag van de motor tijdens 1 omwenteling bij een toerental van 600 T/min.
7. Meet met een DC-voltmeter op 02–4(Vc).
   A. V_c = −1.7 V +/− 0.5 V.
   B. Meet over 3094, waarde 1 = maximaal 56.4 mV.
   C. Meet over 3093, waarde 2 = maximaal 58.8 mV.
   D. Verschil: **(waarde 1 - waarde 2)** mag maximaal 6 mV zijn.
   Als het verschil groter is dan 6 mV, terwijl waarde 1 en waarde 2 juist zijn, is de motor toch defect.
8. Voor een goede werking moet het signaal aan de volgende waarden voldoen:
   Top waarde is niet gegeven, (zie figuur 6)

Difference	< 24 mV
Flank difference	< 36 mV
Foot	niet gespecificeerd

   Opmerking:
   Flank difference is bij 1 asymmetrische golfvorm.
   Foot is DC offset.
9. Voorbeelden van golfvorm fouten: zie figuur 7.
10. Regel nu met de potmeter de spanning op 02–4 terug naar −0,9 V. De motor moet nog blijven draaien, de tophoogte is nu veel kleiner maar de golfvorm moet nog mooi symmetrisch en afgerond zijn.

(I)

Verifica della regolazione angolare (disco-raggio di luce)

L'angolazione può essere verificata con il metodo del disco di vetro descritto sotto.

Mettere sul piatto giradischi il disco di vetro 4822 395 90204.
Assicurarsi che il disco di vetro sia ben posizionato sul piatto.
Mettere il meccanismo CD sotto una sorgente luminosa (un tubo fluorescente con griglia, per esempio) in modo tale che una linea retta sia visibile come risultato della riflessione del disco di vetro posto sul meccanismo CD.
Mettere il braccio nella sua posizione intermedia.
Posizionare il meccanismo in modo tale che il braccio sia parallelo alla linea riflessa sotto la sorgente luminosa (vedere figura 1).
Guardare, nella direzione e nell'estensione della linea, alla riflessione della stessa sul disco di vetro e sull'obiettivo.
Disporre il meccanismo del lettore in modo chè la linea riflessa deve trovarsi nei limiti della superficie dell'obiettivo. In questo caso le due linee non debbono essere a più di 4 mm l'una dall' altra e l'angolo è quello quisto.
Ruotare il meccanismo CD di 90° rispetto alla precedente posizione. Il braccio deve essere mantenuto in posizione intermedia (vedere la figura 3).
Ripetere la precedente verifica.

Regolazione angolare

Per poter regolare l'angolo, le due came di posizionamento del cuscinetto della pos. 51, debbono essere rimosse.
Se la verifica dell'angolazione indica che la stessa è fuori tolleranza, l'angolazione NON deve essere regolata per la minima deviazione, ma essa deve essere regolata entro le tolleranze.
La nuova angolazione deve posizionarsi tra la precedente e l'angolazione ottimale. La frizione del braccio deve esser controllata dopo la regolazione angolare. Ciò si può effettuare utilizzando un dinamometro che deve essere posto contro l'unità di focalizzazione.
La frizione del braccio, misurata sull'intero percorso dello stesso, non deve essere maggiore di 25 mN.
Quando la frizione è troppo elevata, l'unità RAFOC deve essere sostituita regolando successivamente l'angolazione tra il disco ed il raggio di luce.
La regolazione angolare viene effettuata nel seguente modo:

Allentare le viti C (vedere figura) in modo tale da consentire lo spostamento della piastra di supporto D.
Correggere l'angolazione spostando la piastra nella direzione indicata dalla figura sottostante.
Serrare le viti C assicurandosi che l'angolazione non si sposti.
Verificare l'angolazione due volte nelle due direzioni.

Verifica della regolazione del motore Hall (vedi stampato motore)

Principio

Nell'oscilloscopio si osserva la forma che ha la tensione sulla resistenza 3094 della linea del +2 e sulla resistenza 3093, sul la linea del −2. Questa tensione è la consequenza della corrente, il chè risulta in rappresentazioni di genere diversi.
La corrente tra le bobine A e B del motore è di forma sinusoidale e viene generato e controllato dai IC Hall.
Questi IC sono posti l'uno di fronte all'altro in angolo di 90°, è perció chè i correnti dentro A e B sono sfasati di 90°.
La figura 4 fa vedere la rappresentazione grafica della forma che presenta la corrente sulle linee del +2 e −2.

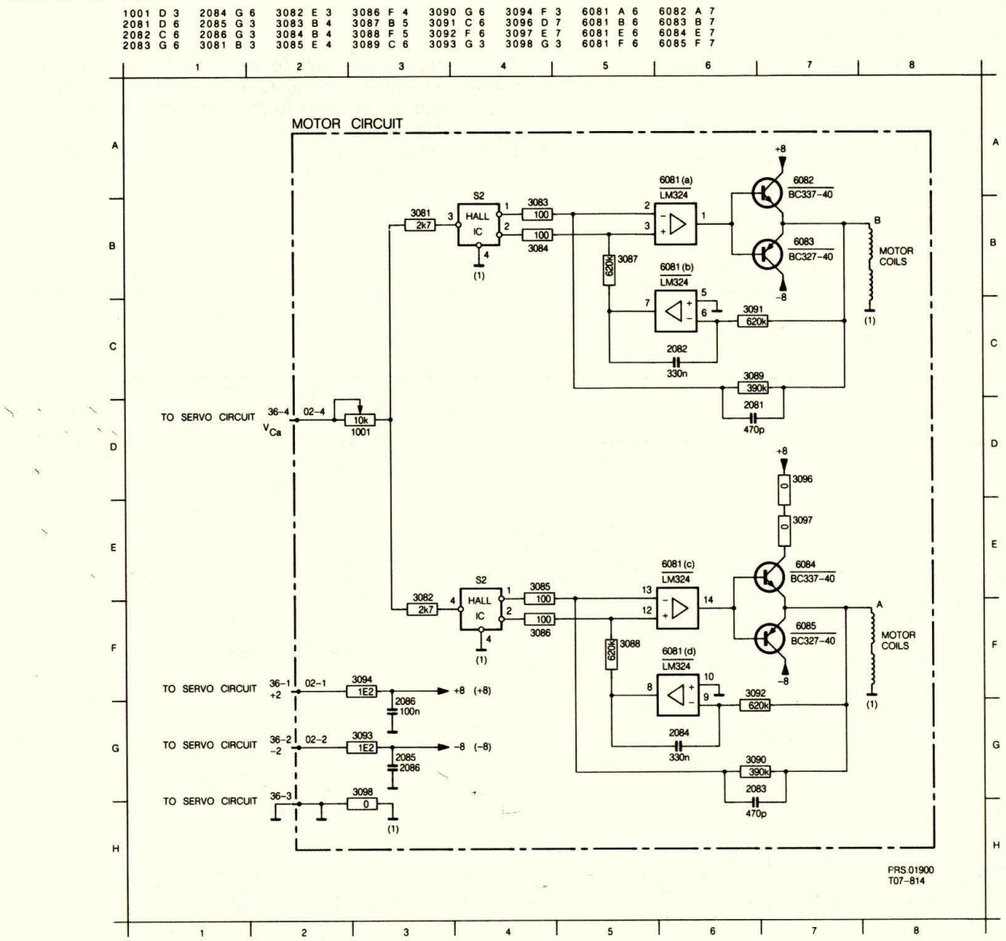
1. Interrompere il collegamento Vc mentre si dissalda il punto del connettore 36-4 sullo stampato servo + preamplificatore.
2. Collegare un potenziometro di regolazione di 2 kΩ fra 02-31 (1) e il connettore 33-2 (1) dello stampato servo.
3. Collegare il cursore tramite un commutatore S à 02-4 (Vc) (vedere la figura 5).
4. Per mezzo di un oscilloscopio, misurare prima su di 3094 e e dopo su di 3093.
   Non misurare contemporaneamente sulle due resistenze.
   Infatti i correnti attraversando le linee dei +2 e −2 vengono misurati.
5. Regolare il potenziometro al massimo (quando il cursore viene posizionato contro il connettore 33-2 (−1).
6. Mettere l'apparecchio nel circuito di servizio 0 (vedere "troubleshooting"), mettere S in marcia e rimettere il potenziometro di regolazione in modo da ottenere 3 impulsi completi in un periodo di 0,1 sec. (vedi fig. 3).
   Selezionare la polarità dell'oscilloscopio in modo che i pichi degli impulsi siano diretti insù. La calamita del rotor présenta 3 pari di poli; così si vede la reazione del motore durante una rivoluzione, ad una velocità di 600 T/min.
7. Misurare per mezzo di un voltmetro DC su di 02-4 (Vc).
   A. VC =−1,7V ±0,5V
   B. Misurare su di 3094, indicazione 1 = mas. 56,4 mV
   C. Misurare su di 3093, indicazione 2 = mas. 58,8 mV
   D. La differenza dei valori su di **1** e **2** non deve superare i 6 mV. Se questa rimane superiore nonostante il fatto chè le indicazioni 1 e 2 siano guisto, il motore sarà difettoso.

8. Il buon funziomento dipende dalle condizioni ai quali il segnale risponde:
   Il valore di pico non viene indicato, vedere figura 6.
   Differenza (Top difference) <24 mV
   Differenza di fianco (flank difference) <36 mV
   Base (Foot) non specificato

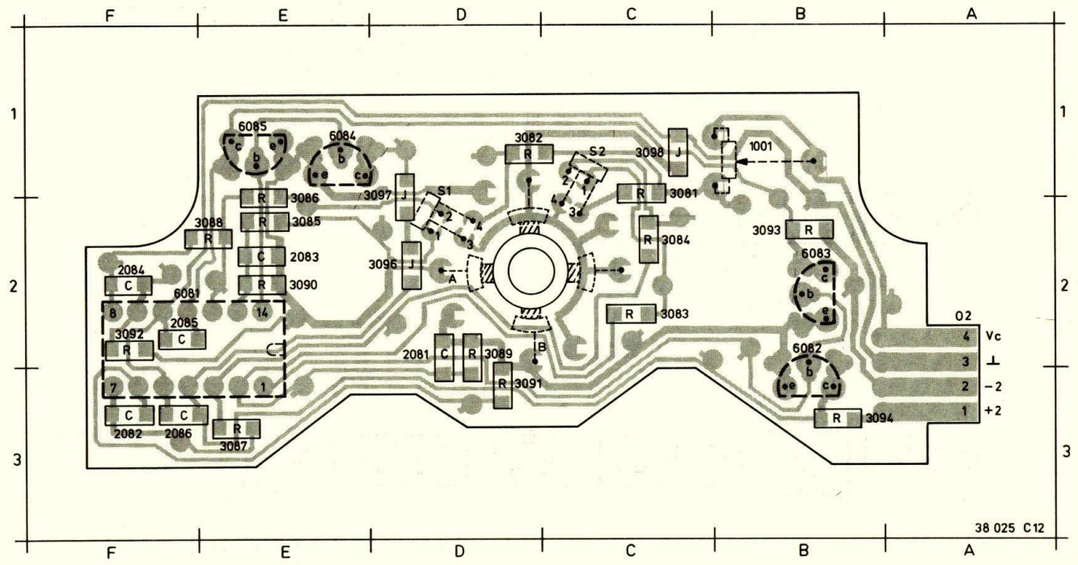
   Osservazione: la differenza dei fianchi viene verificata quando la forma d'onda è asimetrica. La base à infatti la sogliola della corrente continua (DC ofset).
9. Troverete qui sotto alcuni esempi di deformazioni d'onda: (vedere figura 7)

10. Per mezzo del potenziometro, rimettere la tensione su di 02-4 a −0,9V. Il motore deve ancore girare, l'altezza del pico è decisamente inferiore ma la forme d'onda deve essere perfettamente simetrica e chiusa.

MOTOR CIRCUIT



MOTOR PANEL

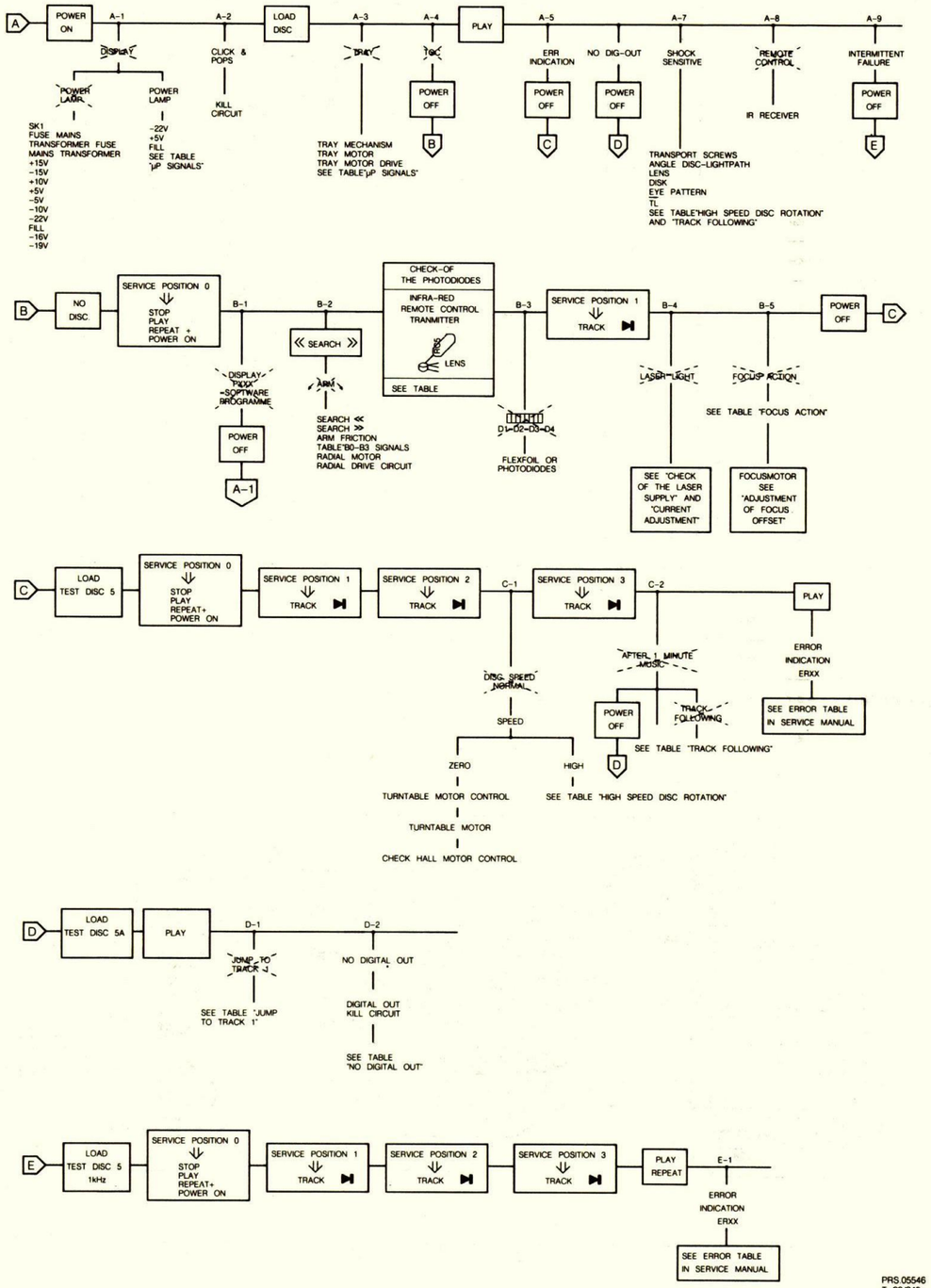


TROUBLE SHOOTING

Working with the faultfinding tree

Follow the path of the faultfinding tree, beginning at the top left. Perform the actions you come across in the various blocks.
Look at the various side branches to find out if the information you see there applies to your problem. If, for instance, you find the indication display this means that no picture appears on the display.

If you establish this fault, follow the branch and perform the recommended actions. Check the signals mentioned. In a number of branches further reference is made to measurements you could carry out.
These measurements are explained in several tables further on in this manual.



PRS.05546
T-26/845

A1 µP-SIGNALS

SIGNAL	MODE	◇			REMARKS
RESET	POWER ON	103		PULSE "HIGH"	
X-TAL	STAND BY	31		8MHz	
TRAY IN/OUT	OPEN/CLOSE	83			"HIGH" WHEN TRAY IS CLOSING "LOW" WHEN TRAY IS OPENING
TRAY ON/OFF	OPEN/CLOSE	83A			"HIGH" WHEN TRAY IS MOVING
E	STAND BY	96		2MHz	SQUARE WAVE
AS	STAND BY	97		2MHz	SQUARE WAVE
DATA I	STAND BY	98			ACTIVITY
DATA 0	STAND BY	99			ACTIVITY
SCK	STAND BY	100			ACTIVITY
ACK	STAND BY	101			ACTIVITY
$\overline{ATSB}$	PLAY,SEARCH	89		PULSE "LOW"	"LOW" DURING SEARCH
$\overline{MUTE}$	PLAY,SEARCH	67		PULSES "LOW"	SQUARE WAVE (HARD TO TRIGGER)
RP/4	PLAY	94			SQUARE WAVE (HARD TO TRIGGER)
RP/4 SELECT	PLAY,NEXT OR PREVIOUS	110		PULSES "HIGH"	BECOMES ONLY "HIGH" WHEN RADIAL ARM HAS TO MAKE BIG JUMPS

B2
B0... B3 SIGNALS

MDA.01663
T-26/845

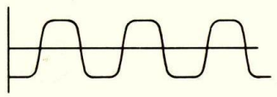
SIGNAL	MODE	◇			REMARKS
B0	SERVICE POSITION 0 OR 1; SEARCH ≫	36		"LOW"	
	SERVICE POSITION 0 OR 1; SEARCH ≪	36		"LOW"	
B1	SERVICE POSITION 0 OR 1; SEARCH ≫	34		"LOW"	
	SERVICE POSITION 0 OR 1; SEARCH ≪	34		"LOW"	
B2	SERVICE POSITION 0 OR 1; SEARCH ≫	33		"HIGH"	
	SERVICE POSITION 0 OR 1; SEARCH ≪	33		"HIGH"	
B3	SERVICE POSITION 0 OR 1; SEARCH ≫	32		"LOW"	
	SERVICE POSITION 0 OR 1; SEARCH ≪	32		"LOW"	

MDA.01657
T-26/846

B3 CHECK OF THE PHOTODIODES

STEP	SIGNAL	MODE	◇				REMARKS
1	–	STAND BY	4 6 7 8	–	–	SEE DRAWING 38314A12	SIGNAL DEPENDS ON DISTANCE LENS ⟵ IR LED OF REMOTE CONTROL REMOTE CONTROL CDM-4

MDA.01378
T-08 847



38 314 A12

B4 CHECK OF LASER SUPPLY (WITH DEMOUNTED CDM AND ADDITIONAL CIRCUIT)

STEP	SIGNAL	MODE	◇				REMARKS
1	LO	SERV. POS. 2	9 V	–	1.8 < V < 2.3	–	Si=1 21, A K, LITTLE LIGHT, 330 GREEN LED, to LO, to LM, SK, 180, to ⊥, CONNECTED DIRECTLY TO PANEL
	LM	SK	11 V	–	170 < mV < 220	–	
2	LO	SERV. POS. 2	9 V	–	1.8 < V < 2.3	–	Si=1 21, A K, LITTLE LIGHT, 330 GREEN LED, to LO, to LM, SK, 180, to ⊥, CONNECTED DIRECTLY TO PANEL
	LM	SK	11 V	–	170 < mV < 220	–	
3	LO	POWER ON	9 V	–	0V ± 0.2V	–	A K, NO LIGHT, Si=0 21

MDA.01379
T-08 824

B4 LASER CURRENT ADJUSTMENT

STEP	SIGNAL	MODE	◇				REMARKS
1	–	POWER OFF	11 ∞ GND	R3106	1k	–	PRE-ADJUSTMENT OHMIC VALUE
2	EYE-PATTERN HF	TEST DISC 5 PLAY	PIN 25 DECODER A (SAA7210) 0V GND	–	–	SEE DRAWING 37017B8	IF NO SIGNAL SEE: "START UP PROCEDURE"
3	LASER CURRENT ≙ VOLTAGE ACROSS R3102	TEST DISC 5 PLAY TRACK 1	1 V 2	R3106	50mV DC	–	HIGH-OHMIC MEASUREMENT

MDA.01658
T-26/845

B5 ADJUSTMENT OF FOCUS OFFSET

STEP	SIGNAL	MODE	◇				REMARKS
1	–	POWER ON	–	R3146	–	–	ADJUST FOR OPTICAL MID-POSITION
2	FE LAG	PLAY TEST DISC 5 TRACK 1	27	R3146	400mV ±40mV DC	–	FINE ADJUSTMENT

MDA.01659
T-26/845

B5 FOCUS ACTION

SIGNAL	MODE	◇			REMARKS
$\overline{SI}$	SERVICE POSITION 1 WHEN REPEATING START UP PROCEDURE	21		PULS "LOW"	SEE DRAWING: MDA.01673 NO DISC INSERTED
RD	SERVICE POSITION 1 WHEN REPEATING START UP PROCEDURE	24		SQUARE WAVE	SEE DRAWING: MDA.01673
FE	TEST DISC 5A, SERVICE POSITION 1 WHEN REPEATING START UP PROCEDURE	26			SEE DRAWING: MDA.01413 NO DISC
FE-LAG	TEST DISC 5A,	27			SEE: ADJUSTMENT OF FOCUS-OFFSET

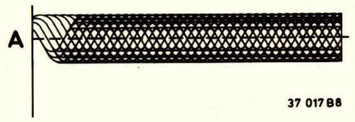
MDA.01664
T-26/845

C1 HIGH SPEED DISC ROTATION

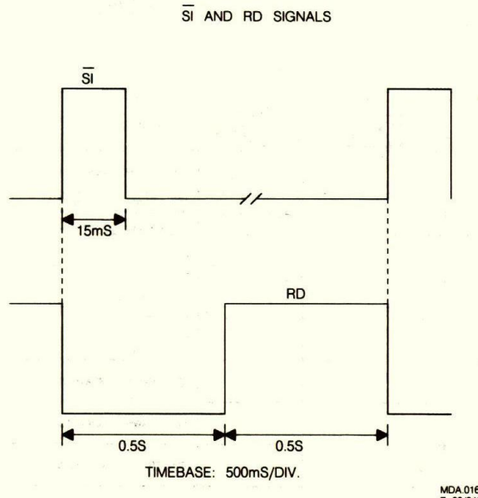
SIGNAL	MODE	◇			REMARKS
$\overline{TL}$	TEST DISC 5, PLAY, OR SERVICE POSITION 2	16		PULSES "LOW"	WHEN THE DISC IS SLOWLY BRAKED BY HAND
TCMP	TEST DISC 5, PLAY OR SERVICE POSITION 2	14	+5V		AFTER 4 $\overline{TL}$ PULSES
HFI	TEST DISC 5, PLAY OR SERVICE POSITION 2	65			SEE DRAWING: 37017B8 IN SERVICE POSITION 2 THE SIGNAL IS NOT STABLE
X-tal	TEST DISC 5A, PLAY OR SERVICE POSITION 2	69		11.28MHz	IF THIS FREQUENCY DEVIATES CHECK X-OUT ON FILTER-B
CEFM	TEST DISC 5A, PLAY OR SERVICE POSITION 2	68		4.32MHz	
MC	TEST DISC 5, PLAY OR SERVICE POSITION 2	12			SEE DRAWING: 38849A12
Vc	TEST DISC 5A, PLAY OR SERVICE POSITION 2	8	APPROX -1.5V		VOLTAGE DEPENDS ON FRICTION OF TURNTABLE

MDA.01660
T-26/845

HF-EYE PATTERN

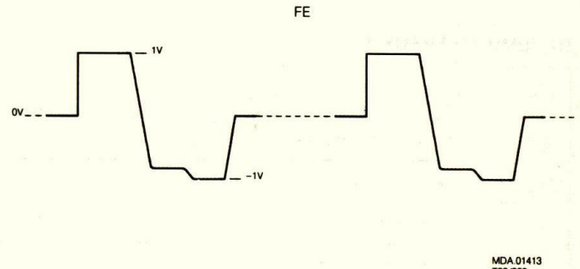


$\overline{Si}$ AND RD-SIGNALS



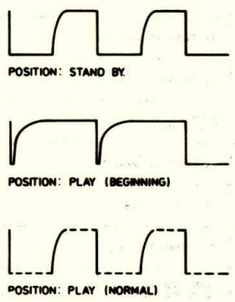
MDA.01673
T-26/846

FE-SIGNAL



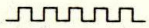
MDA.01413
T33/823

MC-SIGNAL



38 849 A12

C2 TRACK FOLLOWING

SIGNAL	MODE	◇			REMARKS
RE dig	TEST DISC 5, PLAY OR SERVICE POSITION 3	37		2mS	
RE lag	TEST DISC 5, PLAY OR SERVICE POSITION 3	41	APPROX 2.5V DC		
C osc1	TEST DISC 5, PLAY OR SERVICE POSITION 3	30		650Hz	
C osc2	TEST DISC 5, PLAY OR SERVICE POSITION 3	31		650Hz	
RE1	TEST DISC 5, SERVICE POSITION 2	18			SEE DRAWING 30743B12/A TIME BASE 2mS/DIV
RE2	TEST DISC 5, SERVICE POSITION 2	22			SEE DRAWING 30743B12/A TIME BASE 2mS/DIV

MDA.01661
T-26/845

D1 JUMP TO TRACK 1

SIGNAL	MODE	◇			REMARKS
$\overline{DODS}$	TEST DISC 5A, SEARCH ≫ OR SEARCH ≪	19			SEE DRAWING: MDA.01143
HFD/$\overline{PLLH}$	TEST DISC 5A: TRACK 15, PLAY	23		PULSES "LOW"	SEE DRAWING: MDA.00240 WHEN THE DISC IS SLOWLY BRAKED BY HAND
QRA	TEST DISC 5A, PLAY	75			SEE DRAWING: MDA.00453
QDA	TEST DISC 5A, PLAY	77			
QCL	TEST DISC 5A, PLAY	76			
SWAB	TEST DISC 5A, PLAY	78			SEE DRAWING: MDA.00239
SCAB	TEST DISC 5A, PLAY	79			SEE DRAWING: MDA.00239
SDAB	TEST DISC 5A, PLAY	80			SEE DRAWING: MDA.00239

MDA.01388
T-08 825

D2 NO DIGITAL OUTPUT

SIGNAL	MODE	◇			REMARKS
WSAB	DISC, PLAY	71			SEE DRAWING: 38847C12
CLAB	DISC, PLAY	72			SEE DRAWING: 38847C12
DAAB	DISC, PLAY	73		ACTIVITY	SEE DRAWING: 38847C12
EFAB	TEST DISC 5A,	74		PULSES	WHEN THE DISC IS SLOWLY BRAKED BY HAND
CLBD	DISC, PLAY	87			SEE DRAWING: 38848C12
DABD	DISC, PLAY	86		ACTIVITY	SEE DRAWING: 38848C12
WSBD	DISC, PLAY	85			SEE DRAWING: 38848C12
$\overline{MUSB}$	DISC, PLAY, NEXT OR PREVIOUS	90		PULSES "LOW"	"LOW" DURING TRACK JUMPING
$\overline{CRI}$	DISC, PLAY, NEXT OR PREVIOUS	19		PULSE "LOW"	

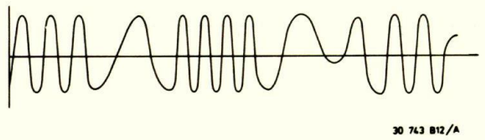
MDA.01662
T-26/845

D9 DIGITAL OUTPUT DOBM SIGNAL

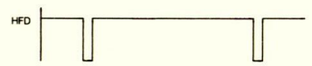
SIGNAL	MODE	◇			REMARKS
DOBM	TEST DISC 5A, PLAY	88			SEE DRAWING: MDA.00238

MDA.01391
T-08 823

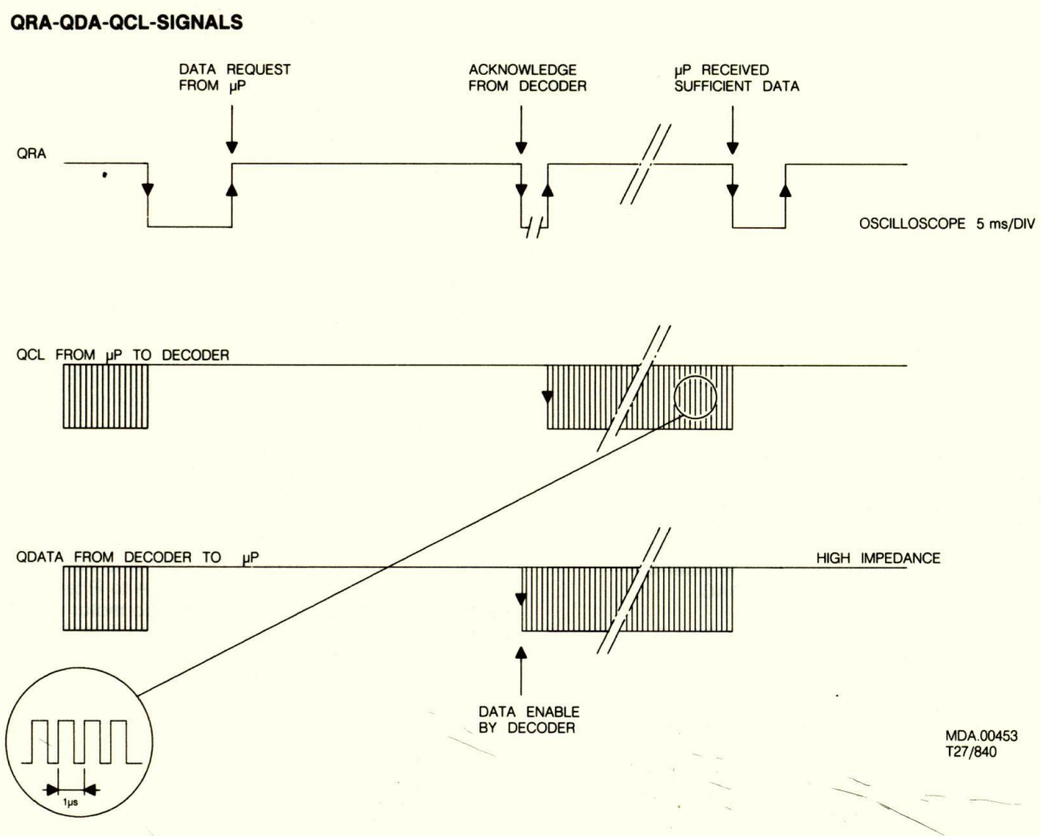
RE-1 AND RE-2 SIGNAL



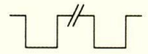
HFD-SIGNAL



QRA-QDA-QCL-SIGNALS

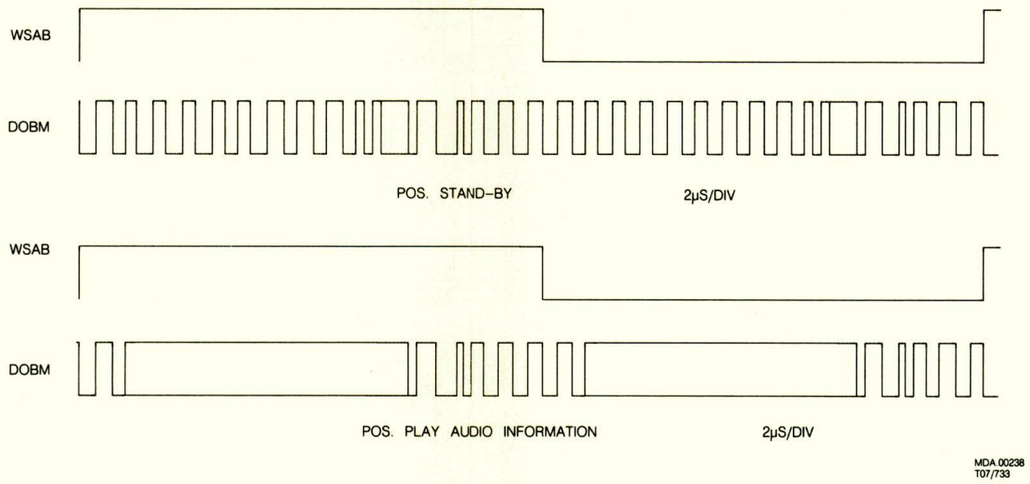


DODS-SIGNAL

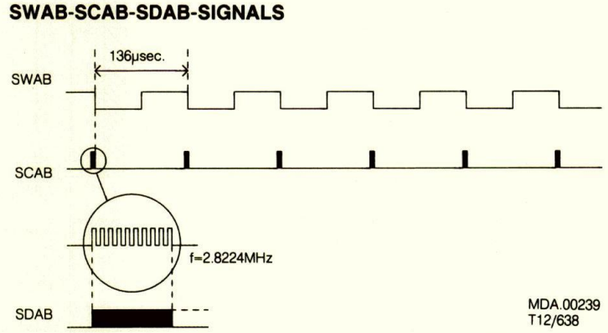
POSITION PLAYER	POWER ON	SERVICE POSITION 3 POSITION PLAY	PLAY	SEARCH, PAUSE
$\overline{\text{DODS}}$ SIGNAL	"LOW"	"HIGH"	"HIGH"	

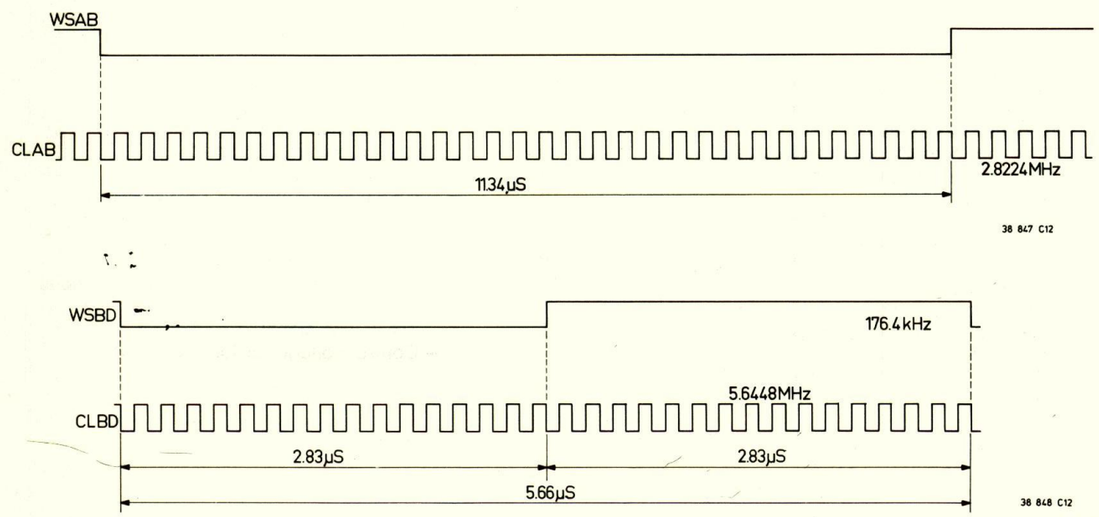
MDA.01143
T12 –651

WSAB- AND DOBM SIGNALS



SWAB-SCAB-SDAB-SIGNALS





Errors indicated in display when player is set in play-mode in service-position 3:

ERROR TABLE

System errors

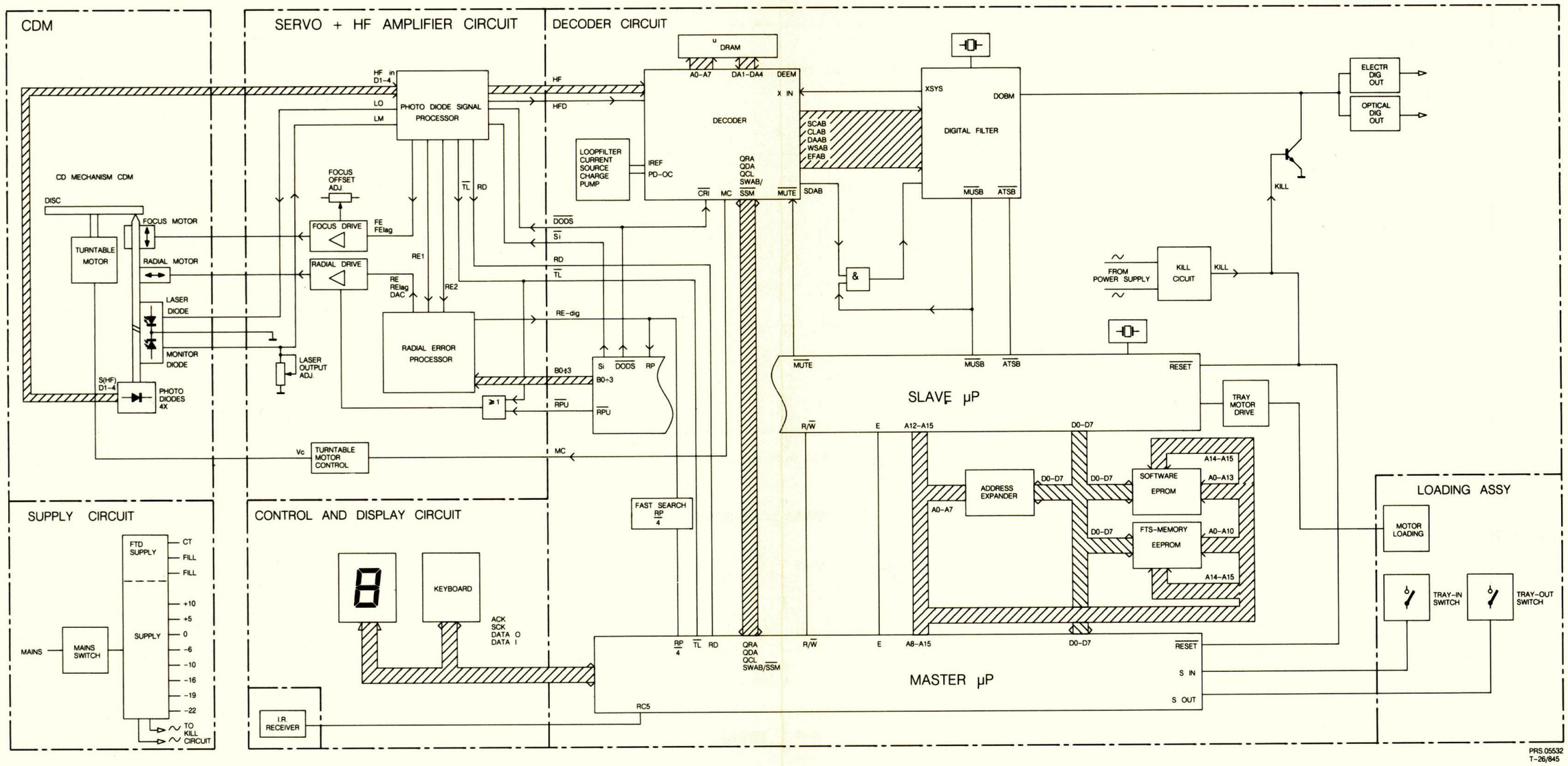
Er 01: RD pulse is missing. Check the start capacity Sc, the RD signal and the photodiode signal processor. (Starting error)
Er 02: $\overline{\text{TL}}$ pulse is missing during start-up. Check the $\overline{\text{TL}}$ signal, the HF-signal and the Photodiode signal processor. (Starting error)
Er 03: Lead-in track not found. Check the disc used. Check also that the radial arm rests againsdt the inside. Check the RE-dig signal and the Radial error processor. (Starting error)
Er 04: Too many $\overline{\text{TL}}$ pulses during play. Check the quality of the disc used. Check the $\overline{\text{HFD}}$ signal. (Error during PLAY)
Er 05: $\overline{\text{TL}}$ pule is low for more than 50 msec. Check the disc used. Check the HF-in signal and the photodiodes (Error during PLAY)
Er 06: No $\overline{\text{TL}}$ pulse received within 0.5 sec. in case of track jumping. Check the RE-lag circuit. (Error during SEARCH or NEXT/PREVIOUS)
Er 07: Subcode error. In case of track loss during play the information of the subcode is used to determine the place of the last information that was still well readable. In case of an interruption of HF or other signals, this will lead to Er 07. (Error during PLAY)
Er 08: TOC error (Table of Contents). Check the quality of the disc used. Check the initial speed of the turntable motor and the motor control. Check also that the radial arm rests against the inside. (Starting error)

Operating errors

Er 30: NEXT when repeat is off.
Er 31: PREVIOUS when repeat is off.
Er 32: INDEX selected when no track selected.
Er 33: Selected index does not exist on this CD.
Er 34: Review error: no program.
Er 35: Program memory full.
Er 36: Programmed track is non existing on this CD.
Er 37: Selected track is non existing on this CD.
Er 60: Fast forward bound.
Er 61: Fast reverse bound.

CS 19 579

BLOCK DIAGRAM



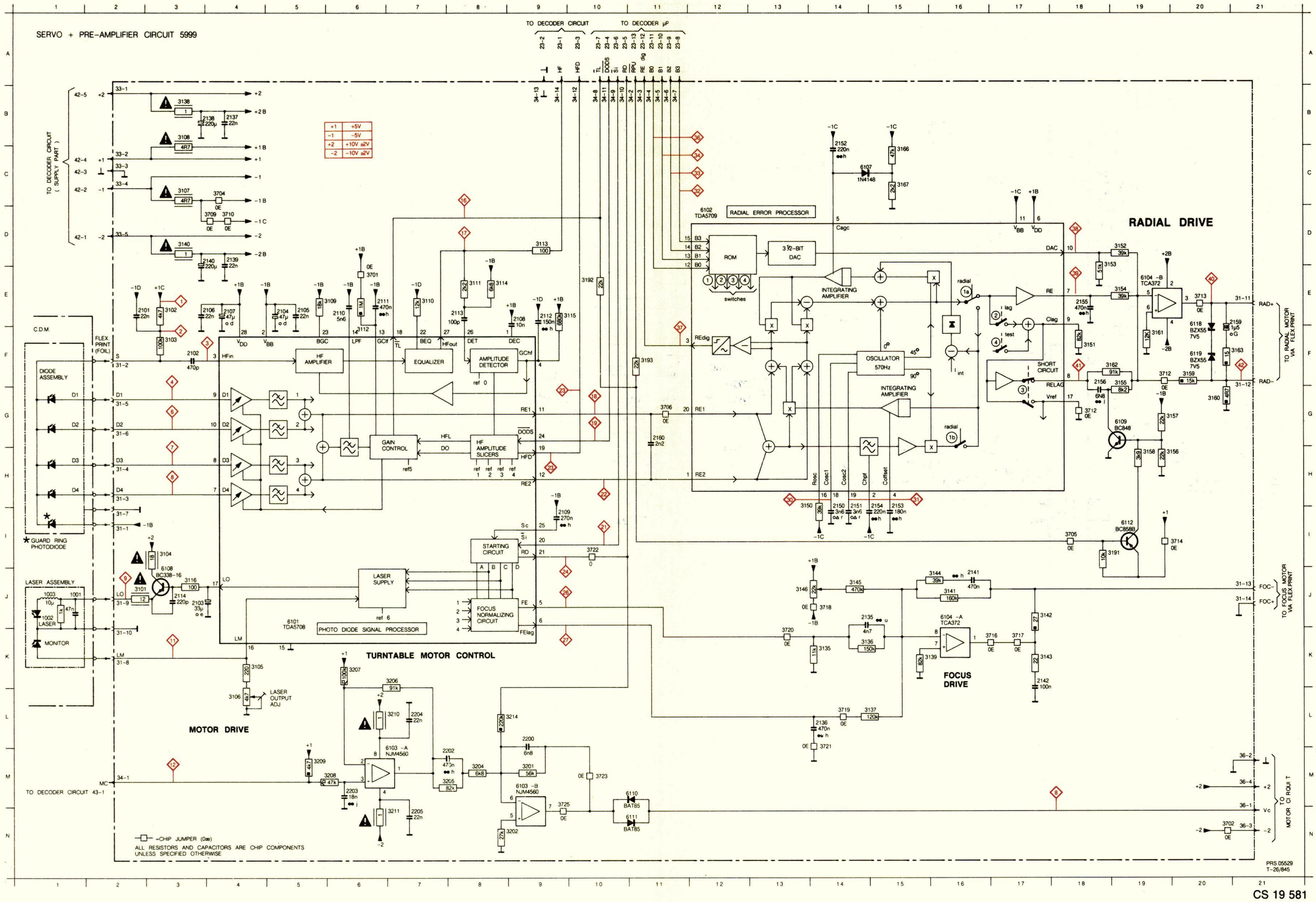
B0÷B3 – Control bits for radial circuit
DAC – Current output for track jumping (Digital to Analogue Converted)
DODS – Drop out detector suppression
D1÷4 – Photodiode currents
FE – Focus error signal
FE lag – Focus error signal for LAG network
HF – HF output for DEMOD
HFD – HF detector output for DEMOD
HF-in – HF current input
LM – Laser monitor diode input
LO – Laser amplifier current output
MC – Motor control signal
RE – Radial error signal (Amplified RE_2-RE_1 currents

RE1 – Radial error signal 1 (summation of amplified currents D_3 and D_4
RE2 – Radial error signal 2 (summation of amplified currents D_1 and D_2
RE dig – Radial error digital = RP
RE lag – Radial error signal for LAG network
RD – Ready signal, Starting up procedure finished.
RPU – Radial puls after track jumping
Si – On/off control for laser supply and focus circuit
TL – Track loss signal
Vc – Control voltage for turntable motor

ATSB – Attenuation of Audio level in Search position (Cueing)
CD ROM Switch – Digital Data information on disc signal
CEFM – Clock Eight-to-Fourteen Modulator
CLAB – Clock signal Decoder-A to Filter-B
CLBD – Clock signal Filter-B to DAC
CRI – Counter Reset Inhibit
DAAB – Data signal Decoder-A to Filter-B
DABD – Data signal Filter-B to DAC
DEEM – Deemphasis
DOBM – Digital out signal
EFAB – Error flag Decoder-A to Filter-B
CREF – Reference Current
MUTE – Mute signal

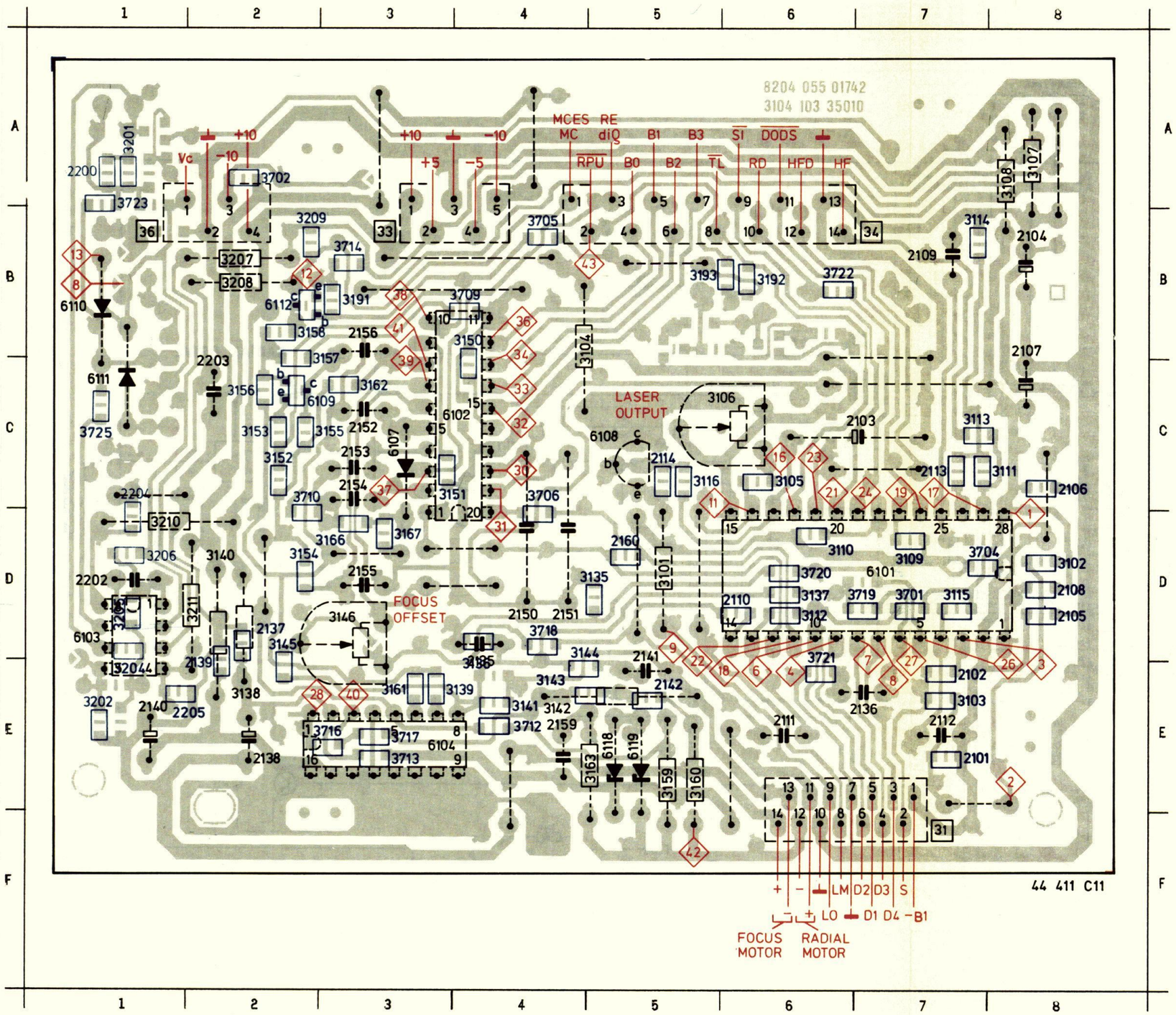
MUSB – Soft Mute signal
PD/OC – Phase detector - oscillator control
QCL – Q-channel Clock signal
QDA – Q-channel Data signal
QRA – Q-channel Request Aknowledge
SCAB – Subcode clock Decoder-A to Filter-B
SDAB – Subcode data Decoder-A to Filter-B
SWAB/SSM – Subcode Word/Start-stop motor signal
WSAB – Word select Decoder-A to Filter-B
WSBD – Word Select Filter-B to DAC
XIN – Oscillator signal in Decoder-A
XSYS – Oscillator signal out Filter-B

SERVO + PREAMPL. CIRCUIT DIAGRAM



5-3

SERVO + PREAMPL. PANEL



PRS.02853
DRA AA0

ELECTRICAL PARTSLIST SERVO

2101	E	7	3146	D	3						
2102	E	7	3150	B	4						
2103	C	7	3151	C	4						
2104	B	8	3152	C	2						
2105	D	8	3153	C	2						
2106	C	8	3154	D	2						
2107	B	8	3155	C	3						
2108	D	8	3156	C	2						
2109	B	7	3157	C	3						
2110	D	6	3158	B	2						
2111	E	6	3159	E	5						
2112	E	7	3160	E	5						
2113	C	7	3161	E	3						
2114	C	5	3162	C	3						
2117	C	6	3163	E	5						
2135	E	4	3166	D	3						
2136	E	7	3167	D	3						
2137	D	2	3191	B	3						
2138	E	2	3192	B	6						
2139	E	2	3193	B	5						
2140	E	1	3201	A	1						
2141	D	5	3202	E	1						
2142	E	5	3204	E	1						
2150	D	4	3205	D	1						
2151	D	4	3206	D	1						
2152	C	3	3207	B	2						
2153	C	3	3208	B	2						
2154	C	3	3209	B	2						
2155	D	3	3210	D	1						
2156	B	3	3211	D	2						
2159	E	4	3701	D	7						
2160	D	5	3702	A	2						
2200	A	1	3704	D	7						
2202	D	1	3705	B	4						
2203	C	2	3706	C	4						
2204	C	1	3709	B	4						
2205	E	2	3710	C	2						
3101	D	5	3712	E	4						
3102	D	8	3713	E	3						
3103	E	7	3714	B	3						
3104	B	5	3716	E	3						
3105	C	6	3717	E	3						
3106	C	6	3718	D	4						
3107	A	8	3720	D	6						
3108	A	8	3721	D	5						
3109	D	7	3722	B	6						
3110	D	6	3723	A	1						
3111	C	8	3725	C	1						
3112	D	6	6101	D	7						
3113	C	7	6103	D	1						
3114	B	7	6104	E	3						
3115	D	7	6105	C	4						
3116	C	5	6107	C	3						
3119	D	7	6108	C	5						
3135	D	4	6109	C	2						
3135	E	4	6110	B	1						
3137	D	6	6111	C	1						
3138	E	2	6112	B	2						
3139	E	4	6118	E	5						
3140	D	2	6119	E	5						
3141	E	4									
3142	E	4									
3143	E	4									
3144	D	4									
3145	D	2									

TDA5708		4822 209 72938
TDA5709		4822 209 83203
NJM4560D		4822 209 83274
TCA0372DP2		4822 209 72587
BC848B		5322 130 41982
BC858B		5322 130 41983
BC338-16		4822 130 40892
BAT85		4822 130 31983
HZ7C2		4822 130 32862
1N4148		4822 130 30621
BZX55C7V5		4822 130 81101
14P	Flex print connector	4822 290 60602
2150,2151	3.6 nF-160 V-1%	4822 121 51001
ELCO bipolar	1.5µF	4822 124 41601
⚠ safety res.12 Ω		4822 111 30511
⚠ safety res.18 Ω		4822 111 30515
⚠ safety res.1 Ω		4822 111 30483
22 kΩ Trimpot		4822 100 20522
4.7 kΩ Trimpot		4822 101 10685
⚠ safety res.4.7 Ω		4822 111 30499

CS 19 582

ELECTRICAL PARTSLIST DECODER PANEL

MC68HC11A0/..	4822 209 72537
MC68HC24/..	4822 209 72538
MC74HC00N	4822 209 72542
MC74HC373N	4822 209 72543
MC79M05CT	4822 209 11079
M27128A-2F1	4822 209 72541
PC74HC74P	5322 209 82575
SAA7210P/04	4822 209 71001
SAA7220P/B	4822 209 72545
SN74LS08N (MTLA)	5322 209 81626
TDA1541A/N2/S1	4822 209 72969
UPD41416C-20	4822 209 50582
X2816BP	4822 209 72102

BC328	4822 130 44104
BC338	4822 130 44121
BC548B	4822 130 40937
BC558B	4822 130 44197
BC818-25	4822 130 42696
BC848B	5322 130 41982
BC858C	4822 130 42513
BD135	4822 130 40823
BF450	4822 130 44237

BAT85	4822 130 31983
HZ4B2	4822 130 32843
1N4002	5322 130 30684
1N4148	4822 130 30621

5301	4822 148 80281	Transformer
5302	4822 157 50963	Coil 2.2µH

3302	4822 111 30499	Res. safety 4E7 5% 0.33W
3305	4822 111 30499	Res. safety 4E7 5% 0.33W
3306	4822 111 30499	Res. safety 4E7 5% 0.33W
3309	4822 111 90252	Res. chip 1M0 2% 0.125W
3336	4822 111 30499	Res. safety 4E7 5% 0.33W
3338	4822 111 90366	Res. chip 620E 2% 0.125W
3339	5322 111 90113	Res. chip 560E 2% 0.125W
3360	4822 111 30499	Res. safety 4E7 5% 0.33W
3367	4822 111 90163	Res. chip CHIP JUMPER
3369	4822 111 30483	Res. safety 1R 5% 0.33W
3380	5322 111 90096	Res. chip 1K2 2% 0.125W
3381	4822 111 30499	Res. safety 4E7 5% 0.33W
3383	4822 111 30499	Res. safety 4E7 5% 0.33W
3384	4822 111 30499	Res. safety 4E7 5% 0.33W
3385	4822 111 30499	Res. safety 4E7 5% 0.33W
3388	4822 111 30499	Res. safety 4E7 5% 0.33W
3389	4822 111 30499	Res. safety 4E7 5% 0.33W
3390	4822 111 30499	Res. safety 4E7 5% 0.33W
3391	5322 111 90096	Res. chip 1K2 2% 0.125W
3392	5322 111 90096	Res. chip 1K2 2% 0.125W
3396	4822 111 30483	Res. safety 1R 5% 0.33W
3399	4822 111 90569	Res. chip 2K7 2% 0.125W
3404	4822 116 52494	Res. metal film 10M 5% 0.5W

2302	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2303	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2305	4822 124 40246	CAP. Electrolyt. 47UF 20% 63V
2309	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2310	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2311	4822 122 33156	CAP. Chip 100nF 63V
2313	4822 122 33156	CAP. Chip 100nF 63V
2316	4822 122 33144	CAP. Chip 1.8nF 10% 50V
2320	4822 124 40246	CAP. Electrolyt. 4.7UF 20% 63V
2325	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2330	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2351	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2354	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2355	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2357	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2359	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2360	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2361	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2362	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V
2363	4822 122 10454	CAP. Ceramic 330nF 50V
2365	4822 122 10289	CAP. Ceramic 22nF 100V
2367	4822 124 41184	CAP. Electrolyt. Elcap 47UF 25V
2369	4822 121 51228	CAP. Foil 220nF 63V
2370	4822 124 40433	CAP. Electrolyt. 47UF 20% 25V

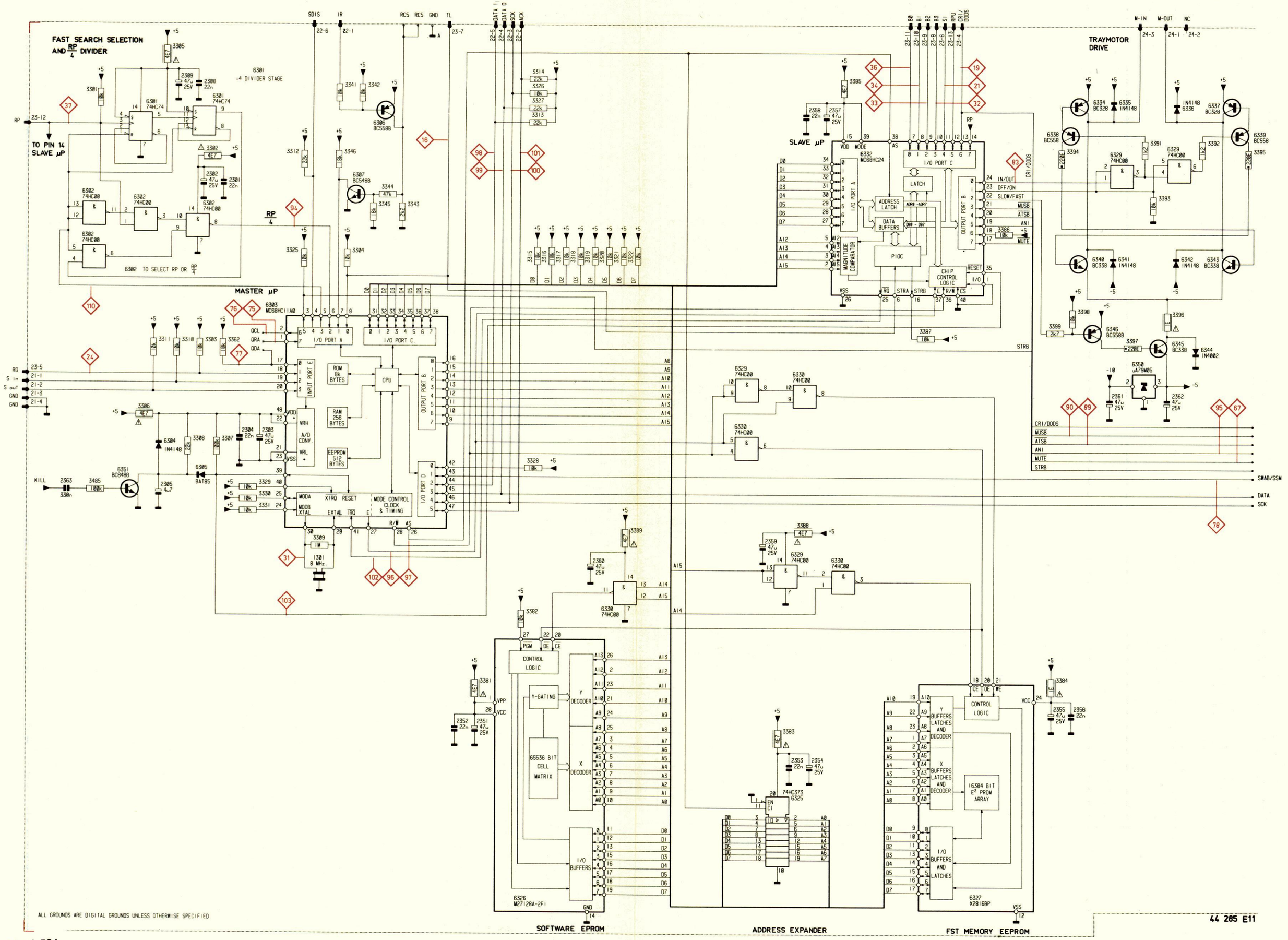
Miscellaneous

	4822 255 40179	Spring clip
	4822 265 20374	Cinch socket 1 pin
	4822 267 10223	Cinch socket 2 pin
1301	4822 242 72066	Crystal CST8.00MT
1302	4822 242 71644	Crystal 11.2896 MHz
1303	4822 218 20752	Transmitter TOTX172

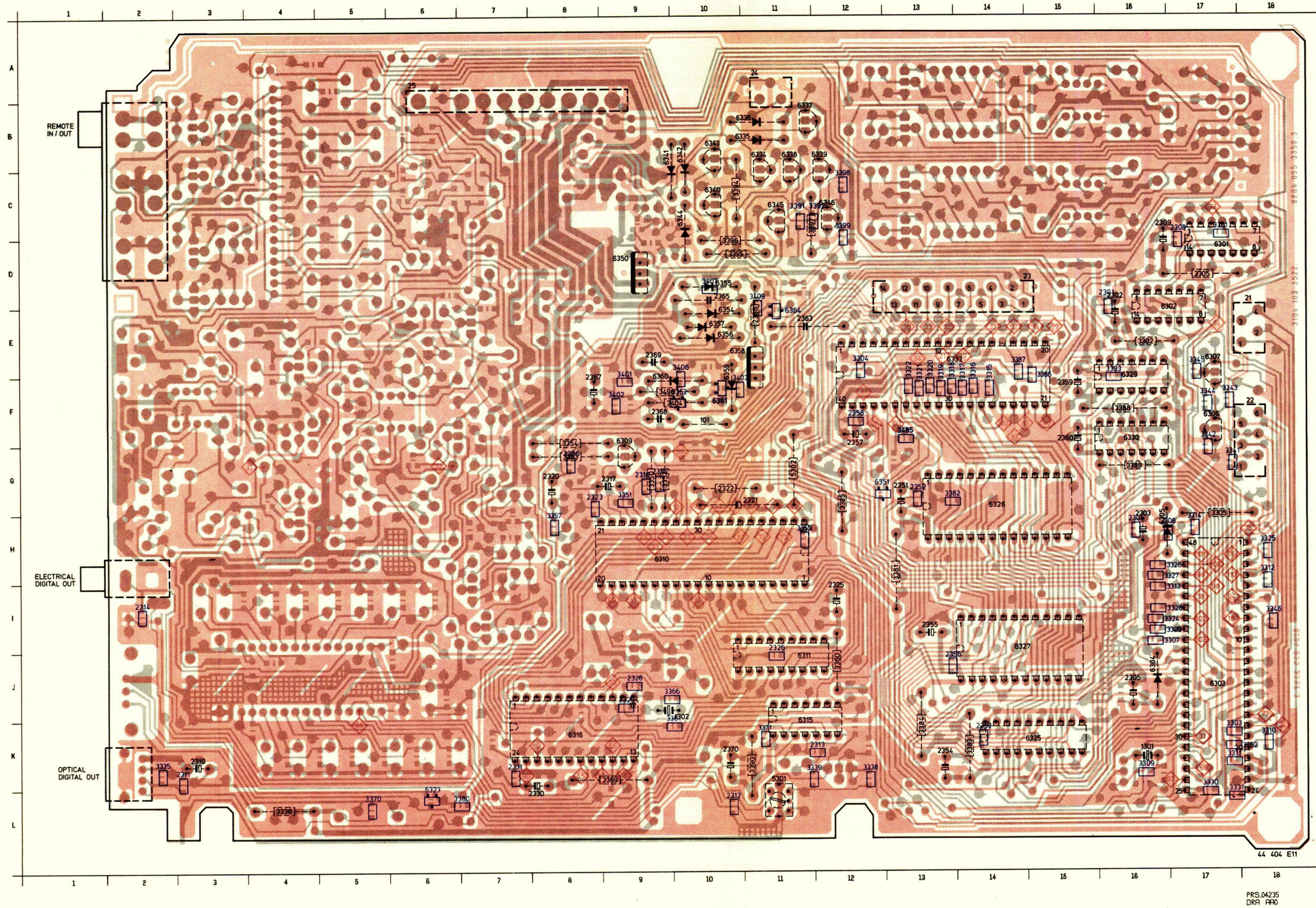
LIST OF STANDARD CHIP COMPONENTS

© Chips 50 V NP0 S1206			© Chips 0,125 W S1206			© Chips 0,125 W S1206			1U
1 pF	5%	4822 122 32479	4,7 E	5%	5322 111 90376	6,8 k	2%	4822 111 90544	
1,2 pF	5%	4822 122 33013	5,1 E	5%	4822 111 90393	7,5 k	2%	4822 111 90276	
1,5 pF	5%	4822 122 31792	5,6 E	5%	4822 111 90394	8,2 k	2%	5322 111 90118	
1,8 pF	5%	4822 122 32087	6,2 E	5%	4822 111 90395	9,1 k	2%	4822 111 90373	
2,2 pF	5%	4822 122 32425	6,8 E	5%	4822 111 90254	10 k	2%	4822 111 90249	
3,3 pF	5%	4822 122 32079	7,5 E	5%	4822 111 90396	11 k	2%	4822 111 90337	
3,9 pF	5%	4822 122 32081	8,2 E	5%	4822 111 90397	12 k	2%	4822 111 90253	
4,7 pF	5%	4822 122 32082	9,1 E	5%	4822 111 90398	13 k	2%	4822 111 90509	
5,6 pF	5%	4822 122 32506	10 E	2%	5322 111 90095	15 k	2%	4822 111 90196	
6,8 pF	5%	4822 122 32507	11 E	2%	4822 111 90338	16 k	2%	4822 111 90346	
8,2 pF	5%	4822 122 32083	12 E	2%	4822 111 90341	18 k	2%	4822 111 90238	
10 pF	5%	4822 122 31971	13 E	2%	4822 111 90343	20 k	2%	4822 111 90349	
12 pF	5%	4822 122 32139	15 E	2%	4822 111 90344	22 k	2%	4822 111 90251	
15 pF	5%	4822 122 32504	16 E	2%	4822 111 90347	24 k	2%	4822 111 90512	
18 pF	5%	4822 122 31769	18 E	2%	5322 111 90139	27 k	2%	4822 111 90542	
22 pF	10%	4822 122 31837	20 E	2%	4822 111 90352	30 k	2%	4822 111 90216	
27 pF	5%	4822 122 31966	22 E	2%	4822 111 90186	33 k	2%	5322 111 90267	
33 pF	5%	4822 122 31756	24 E	2%	4822 111 90355	36 k	2%	4822 111 90514	
39 pF	5%	4822 122 31972	27 E	2%	5322 111 90105	39 k	2%	5322 111 90108	
47 pF	5%	4822 122 31772	30 E	2%	4822 111 90356	43 k	2%	4822 111 90363	
56 pF	5%	4822 122 31774	33 E	2%	4822 111 90357	47 k	2%	4822 111 90543	
68 pF	5%	4822 122 31961	36 E	2%	4822 111 90359	51 k	2%	5322 111 90274	
82 pF	10%	4822 122 31839	39 E	2%	4822 111 90361	56 k	2%	4822 111 90573	
100 pF	5%	4822 122 31765	43 E	2%	5322 116 90125	62 k	2%	5322 111 90275	
120 pF	5%	4822 122 31766	47 E	2%	4822 111 90217	68 k	2%	4822 111 90202	
150 pF	5%	4822 122 31767	51 E	2%	4822 111 90365	75 k	2%	4822 111 90574	
180 pF	2%	4822 122 31794	56 E	2%	4822 111 90239	82 k	2%	4822 111 90575	
220 pF	5%	4822 122 31965	62 E	2%	4822 111 90367	91 k	2%	5322 111 90277	
270 pF	5%	4822 122 32142	68 E	2%	4822 111 90203	100 k	2%	4822 111 90214	
330 pF	10%	4822 122 31642	75 E	2%	4822 111 90371	110 k	2%	5322 111 90269	
390 pF	5%	4822 122 31771	82 E	2%	4822 111 90124	120 k	2%	4822 111 90568	
470 pF	5%	4822 122 31727	91 E	2%	4822 111 90375	130 k	2%	4822 111 90511	
560 pF	5%	4822 122 31773	100 E	2%	5322 111 90091	150 k	2%	5322 111 90099	
680 pF	5%	4822 122 31775	110 E	2%	4822 111 90335	160 k	2%	5322 111 90264	
820 pF	5%	4822 122 31974	120 E	2%	4822 111 90339	180 k	2%	4822 111 90565	
1 nF	10%	5322 122 31647	130 E	2%	4822 111 90164	200 k	2%	4822 111 90351	
1,2 nF	5%	4822 122 31807	150 E	2%	5322 111 90098	220 k	2%	4822 111 90197	
1,5 nF	10%	4822 122 31781	160 E	2%	4822 111 90345	240 k	2%	4822 111 90215	
1,8 nF	10%	4822 122 32153	180 E	2%	5322 111 90242	270 k	2%	4822 111 90302	
2,2 nF	10%	4822 122 31644	200 E	2%	4822 111 90348	300 k	2%	5322 111 90266	
2,7 nF	10%	4822 122 31783	220 E	2%	4822 111 90178	330 k	2%	4822 111 90513	
3,3 nF	10%	4822 122 31969	240 E	2%	4822 111 90353	360 k	2%	4822 111 90515	
3,9 nF	10%	4822 122 32566	270 E	2%	4822 111 90154	390 k	2%	4822 111 90182	
4,7 nF	10%	4822 122 31784	300 E	2%	4822 111 90156	430 k	2%	4822 111 90168	
5,6 nF	10%	4822 122 31916	330 E	2%	5322 111 90106	470 k	2%	4822 111 90161	
6,8 nF	10%	4822 122 31976	360 E	1%	4822 111 90288	510 k	2%	4822 111 90364	
10 nF	10%	4822 122 31728	360 E	2%	4822 111 90358	560 k	2%	4822 111 90169	
12 nF	10%	5322 122 31648	390 E	2%	5322 111 90138	620 k	2%	4822 111 90213	
15 nF	10%	4822 122 31782	430 E	2%	4822 111 90362	680 k	2%	4822 111 90368	
18 nF	10%	4822 122 31759	470 E	2%	5322 111 90109	750 k	2%	4822 111 90369	
22 nF	10%	4822 122 31797	510 E	2%	4822 111 90245	820 k	2%	4822 111 90205	
27 nF	10%	4822 122 32541	560 E	2%	5322 111 90113	910 k	2%	4822 111 90374	
33 nF	10%	4822 122 31981	620 E	2%	4822 111 90366	1 M	2%	4822 111 90252	
47 nF	10%	4822 122 32542	680 E	2%	4822 111 90162	1,1 M	5%	4822 111 90408	
56 nF	10%	4822 122 32183	750 E	2%	5322 111 90306	1,2 M	5%	4822 111 90409	
100 nF	10%	4822 122 31947	820 E	2%	4822 111 90171	1,3 M	5%	4822 111 90411	
180 nF	10%	4822 122 32915	910 E	2%	4822 111 90372	1,5 M	5%	4822 111 90412	
220 nF	20%	4822 122 32715	1 k	2%	5322 111 90092	1,6 M	5%	4822 111 90413	
			1,1 k	2%	4822 111 90336	1,8 M	5%	4822 111 90414	
© Chips 0,125 W S1206 NP0			1,2 k	2%	5322 111 90096	2 M	5%	4822 111 90415	
			1,3 k	2%	4822 111 90244	2,2 M	5%	4822 111 90185	
0 E	jumper	4822 111 90163	1,5 k	2%	4822 111 90151	2,4 M	5%	4822 111 90416	
1 E	5%	4822 111 90184	1,6 k	2%	5322 111 90265	2,7 M	5%	4822 111 90417	
1,1 E	5%	4822 111 90377	1,8 k	2%	5322 111 90101	3 M	5%	4822 111 90418	
1,2 E	5%	4822 111 90378	2 k	2%	4822 111 90165	3,3 M	5%	4822 111 90191	
1,3 E	5%	4822 111 90379	2,2 k	2%	4822 111 90248	3,6 M	5%	4822 111 90419	
1,5 E	5%	4822 111 90381	2,4 k	2%	4822 111 90289	3,9 M	5%	4822 111 90421	
1,6 E	5%	4822 111 90382	2,7 k	2%	4822 111 90569	4,3 M	5%	4822 111 90422	
1,8 E	5%	4822 111 90383	3 k	2%	4822 111 90198	4,7 M	5%	4822 111 90423	
2 E	5%	4822 111 90384	3,3 k	2%	4822 111 90157	5,1 M	5%	4822 111 90424	
2,2 E	5%	5322 111 90104	3,6 k	2%	5322 111 90107	5,6 M	5%	4822 111 90425	
2,4 E	5%	4822 111 90385	3,9 k	2%	4822 111 90571	6,2 M	5%	4822 111 90426	
2,7 E	5%	4822 111 90386	4,3 k	2%	4822 111 90167	6,8 M	5%	4822 111 90235	
3 E	5%	4822 111 90387	4,7 k	2%	5322 111 90111	7,5 M	5%	4822 111 90427	
3,3 E	5%	4822 111 90388	5,1 k	2%	5322 111 90268	8,2 M	5%	4822 111 90237	
3,6 E	5%	4822 111 90389	5,6 k	2%	4822 111 90572	9,1 M	5%	4822 111 90428	
3,9 E	5%	4822 111 90391	6,2 k	2%	4822 111 90545	10M	5%	5322 111 91141	
4,3 E	5%	4822 111 90392							

5-5 **DECODING I**



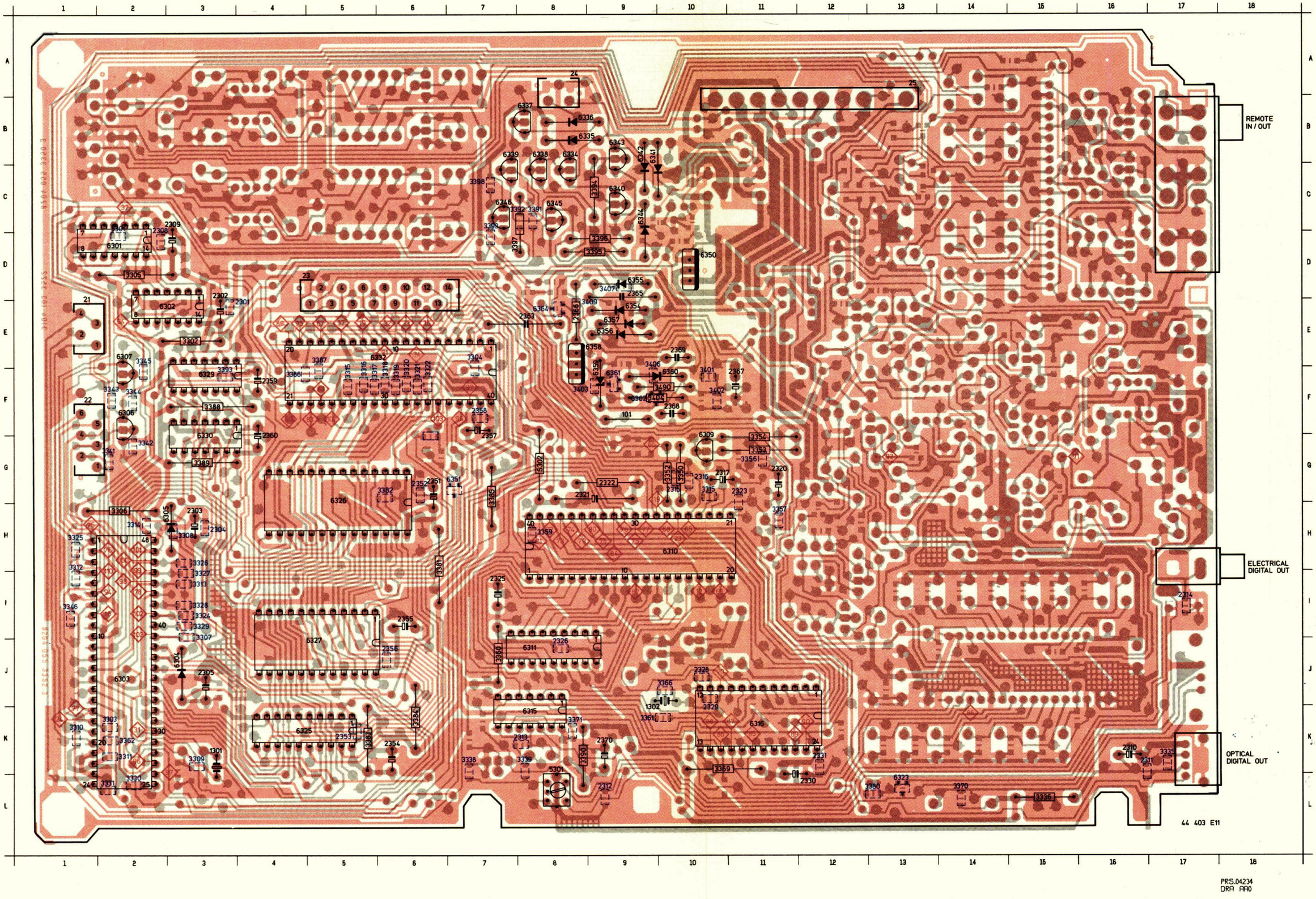
DECODER PANEL



I301	K16	3395	D11
I302	J10	3396	D11
2301	D16	3397	D12
2302	D16	3398	C12
2303	H16	3399	C12
2304	H16	3401	E 9
2305	J16	3402	F 9
2308	C17	3403	F11
2309	C17	3404	F10
2310	K 3	3406	E10
2311	K 3	3409	D11
2312	L11	3490	F10
2313	K12	5301	K11
2314	I 2	5302	G11
2315	G10	6301	D18
2316	G 9	6302	E17
2317	G 9	6303	J17
2320	G 8	6304	J17
2321	G11	6305	H17
2322	G10	6306	F17
2323	G 9	6307	E17
2325	I12	6309	F 9
2326	I11	6310	H10
2328	J 9	6311	J12
2329	J 9	6315	K12
2330	L 8	6316	K 8
2331	K 8	6323	K 6
2351	G13	6325	K15
2352	G13	6326	G14
2353	K14	6327	I15
2354	K14	6329	F16
2355	I13	6330	F16
2355	D10	6332	E14
2356	J14	6334	B11
2357	F12	6335	B11
2358	F12	6337	B12
2359	F15	6338	B11
2360	F15	6339	B12
2363	E12	6340	C10
2366	E11	6341	B10
2367	F 9	6342	B10
2368	F10	6343	B10
2369	E10	6344	C10
2370	K11	6345	C11
3301	C17	6346	C12
3302	E17	6350	D 9
3303	K18	6351	G13
3304	E12	6354	E10
3305	D17	6355	D10
3306	H17	6356	E11
3307	I16	6357	E10
3308	H17	6358	E11
3309	K16	6359	E11
3310	K18	6360	E10
3311	K17	6361	F10
3312	H18	6362	F10
3313	I16	6364	E11
3314	H17	6366	B11
3315	E14		
3315	G 9		
3316	E14		
3317	E14		
3318	E14		
3319	E13		
3320	E13		
3321	E13		
3322	E13		
3324	I16		
3325	H18		
3326	H16		
3327	H16		
3328	I16		
3329	I16		
3330	K17		
3331	L18		
3335	K 3		
3336	L 4		
3338	K13		
3339	K12		
3341	G18		
3342	G17		
3343	F18		
3344	F17		
3345	E17		
3346	I18		
3350	G 9		
3352	G10		
3353	G 8		
3354	F 8		
3356	G 8		
3357	H 8		
3359	H11		
3360	J12		
3361	K10		
3362	K17		
3366	J10		
3369	K 9		
3370	L 6		
3371	K11		
3380	L 7		
3381	H13		
3382	G14		
3383	K14		
3384	K13		
3385	F12		
3386	F15		
3387	E15		
3388	F16		
3389	G16		
3390	K11		
3391	C12		
3392	C12		
3393	E16		
3394	C11		

CS 19 585

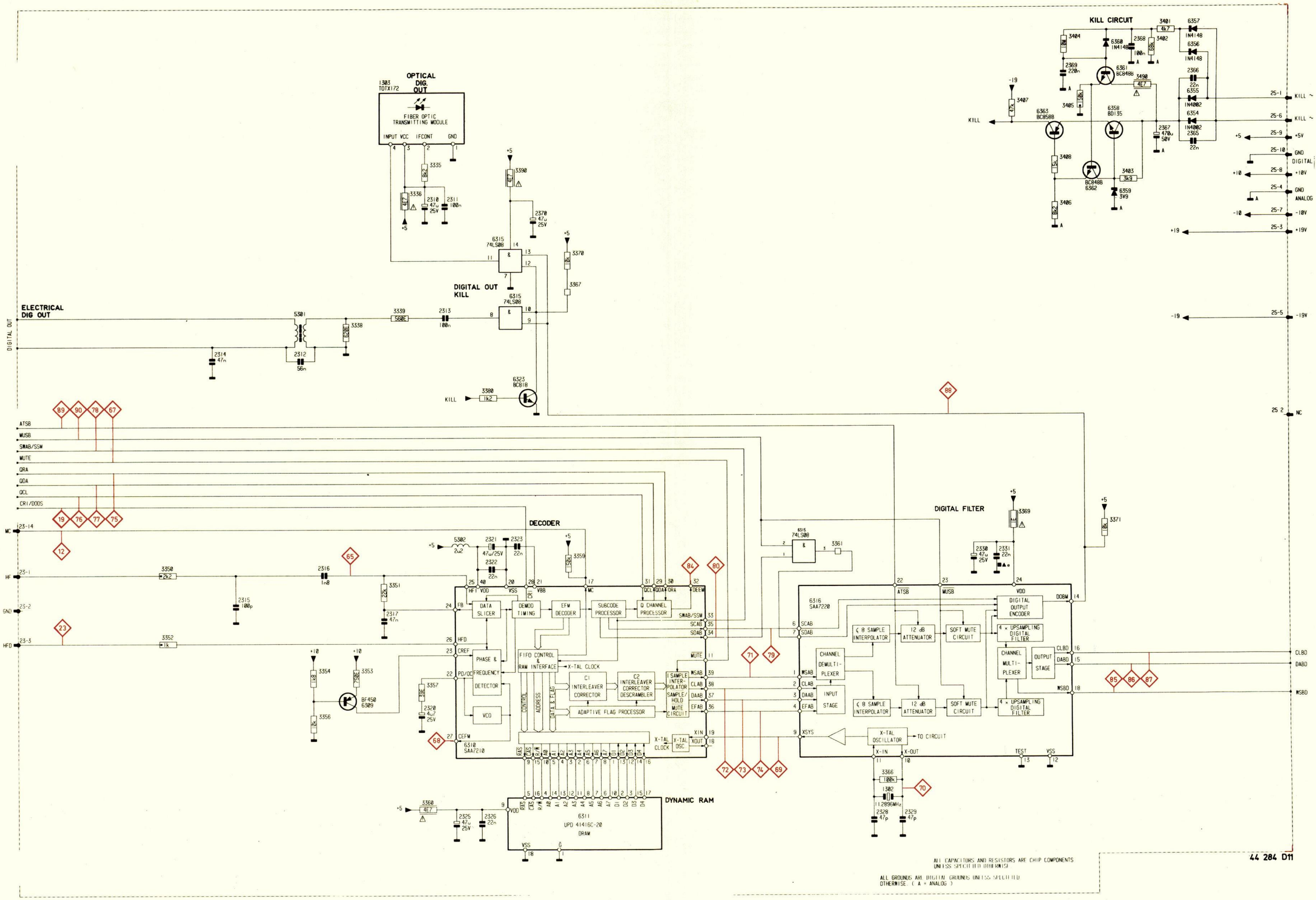
5-7 **DECODER PANEL**



1301	K 3	3395	D 9	2301	D 4	3397	D 8
1302	J 9	3396	D 9	2302	D 3	3398	C 7
2301	D 4	3397	D 8	2303	G 3	3399	C 7
2302	D 3	3398	C 7	2304	H 3	3401	E10
2303	G 3	3399	C 7	2305	J 3	3402	F10
2304	H 3	3401	E10	2308	C 2	3403	F 8
2305	J 3	3402	F10	2309	C 3	3404	F10
2308	C 2	3403	F 8	2310	K16	3406	E 9
2309	C 3	3404	F10	2311	K16	3409	D 9
2310	K16	3406	E 9	2312	L 9	3490	F10
2311	K16	3409	D 9	2313	K 8	5301	K 8
2312	L 9	3490	F10	2314	I17	5302	G 8
2313	K 8	5301	K 8	2315	G10	6301	D 2
2314	I17	5302	G 8	2316	G10	6302	E 2
2315	G10	6301	D 2	2317	G10	6303	J 2
2316	G10	6302	E 2	2320	G11	6304	J 3
2317	G10	6303	J 2	2321	G 8	6305	H 3
2320	G11	6304	J 3	2322	G 9	6306	F 2
2321	G 8	6305	H 3	2323	G11	6307	E 2
2322	G 9	6306	F 2	2325	I 7	6309	F10
2323	G11	6307	E 2	2326	I 8	6310	H10
2325	I 7	6309	F10	2328	J10	6311	J 8
2326	I 8	6310	H10	2329	J10	6315	K 8
2328	J10	6311	J 8	2330	L12	6316	K11
2329	J10	6315	K 8	2331	K12	6323	K13
2330	L12	6316	K11	2351	G 6	6325	K 4
2331	K12	6323	K13	2352	G 6	6326	G 5
2351	G 6	6325	K 4	2353	K 5	6327	I 5
2352	G 6	6326	G 5	2354	K 6	6329	F 3
2353	K 5	6327	I 5	2355	I 6	6330	F 3
2354	K 6	6329	F 3	2356	D 9	6332	F 6
2355	I 6	6330	F 3	2357	J 8	6334	B 8
2356	D 9	6332	F 6	2358	F 7	6335	B 8
2357	J 8	6334	B 8	2359	F 7	6337	B 8
2358	F 7	6335	B 8	2360	F 4	6338	B 8
2359	F 7	6337	B 8	2363	E 8	6339	B 7
2360	F 4	6338	B 8	2366	E 8	6340	C 9
2363	E 8	6339	B 7	2367	F11	6341	B10
2366	E 8	6340	C 9	2368	F10	6342	B 9
2367	F11	6341	B10	2369	E10	6343	B 9
2368	F10	6342	B 9	3301	C 2	6344	C 9
2369	E10	6343	B 9	3302	E 3	6345	C 8
3301	C 2	6344	C 9	3303	K 2	6346	C 7
3302	E 3	6345	C 8	3304	E 7	6350	D10
3303	K 2	6346	C 7	3305	D 2	6351	G 7
3304	E 7	6350	D10	3306	H 2	6354	E 9
3305	D 2	6351	G 7	3307	I 3	6355	D 9
3306	H 2	6354	E 9	3308	H 3	6356	E 9
3307	I 3	6355	D 9	3309	K 3	6357	E 9
3308	H 3	6356	E 9	3310	K 1	6358	E 9
3309	K 3	6357	E 9	3311	K 2	6359	E 9
3310	K 1	6358	E 9	3312	H 1	6360	E10
3311	K 2	6359	E 9	3313	I 3	6361	F 9
3312	H 1	6360	E10	3314	H 2	6362	F 9
3313	I 3	6361	F 9	3315	E 5	6364	E 8
3314	H 2	6362	F 9	3316	E 5	6366	B 9
3315	E 5	6364	E 8	3317	E 6		
3316	E 5	6366	B 9	3318	E 6		
3317	E 6			3319	E 6		
3318	E 6			3320	E 6		
3319	E 6			3321	E 6		
3320	E 6			3322	E 6		
3321	E 6			3324	I 3		
3322	E 6			3325	H 1		
3324	I 3			3326	H 3		
3325	H 1			3327	H 3		
3326	H 3			3328	I 3		
3327	H 3			3329	I 3		
3328	I 3			3330	K 2		
3329	I 3			3331	L 2		
3330	K 2			3335	K17		
3331	L 2			3336	L15		
3335	K17			3338	K 7		
3336	L15			3339	K 8		
3338	K 7			3341	G 2		
3339	K 8			3342	G 2		
3341	G 2			3343	F 2		
3342	G 2			3344	F 2		
3343	F 2			3345	E 2		
3344	F 2			3346	I 1		
3345	E 2			3350	G10		
3346	I 1			3352	G10		
3350	G10			3353	G11		
3352	G10			3354	F11		
3353	G11			3356	G11		
3354	F11			3357	H11		
3356	G11			3359	H 8		
3357	H11			3360	J 7		
3359	H 8			3361	K 9		
3360	J 7			3362	K 2		
3361	K 9			3366	J10		
3362	K 2			3369	K10		
3366	J10			3370	L14		
3369	K10			3371	K 8		
3370	L14			3380	L12		
3371	K 8			3381	H 6		
3380	L12			3382	G 6		
3381	H 6			3383	K 5		
3382	G 6			3384	K 6		
3383	K 5			3385	G 7		
3384	K 6			3386	F 4		
3385	G 7			3387	E 5		
3386	F 4			3388	F 3		
3387	E 5			3389	G 3		
3388	F 3			3390	K 8		
3389	G 3			3391	C 8		
3390	K 8			3392	C 8		
3391	C 8			3393	E 3		
3392	C 8			3394	C 9		
3393	E 3						
3394	C 9						

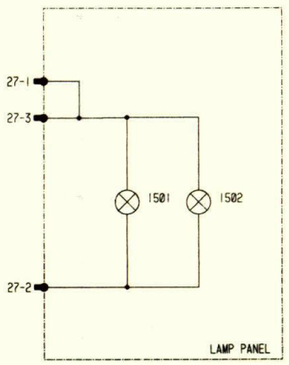
CS 19 586

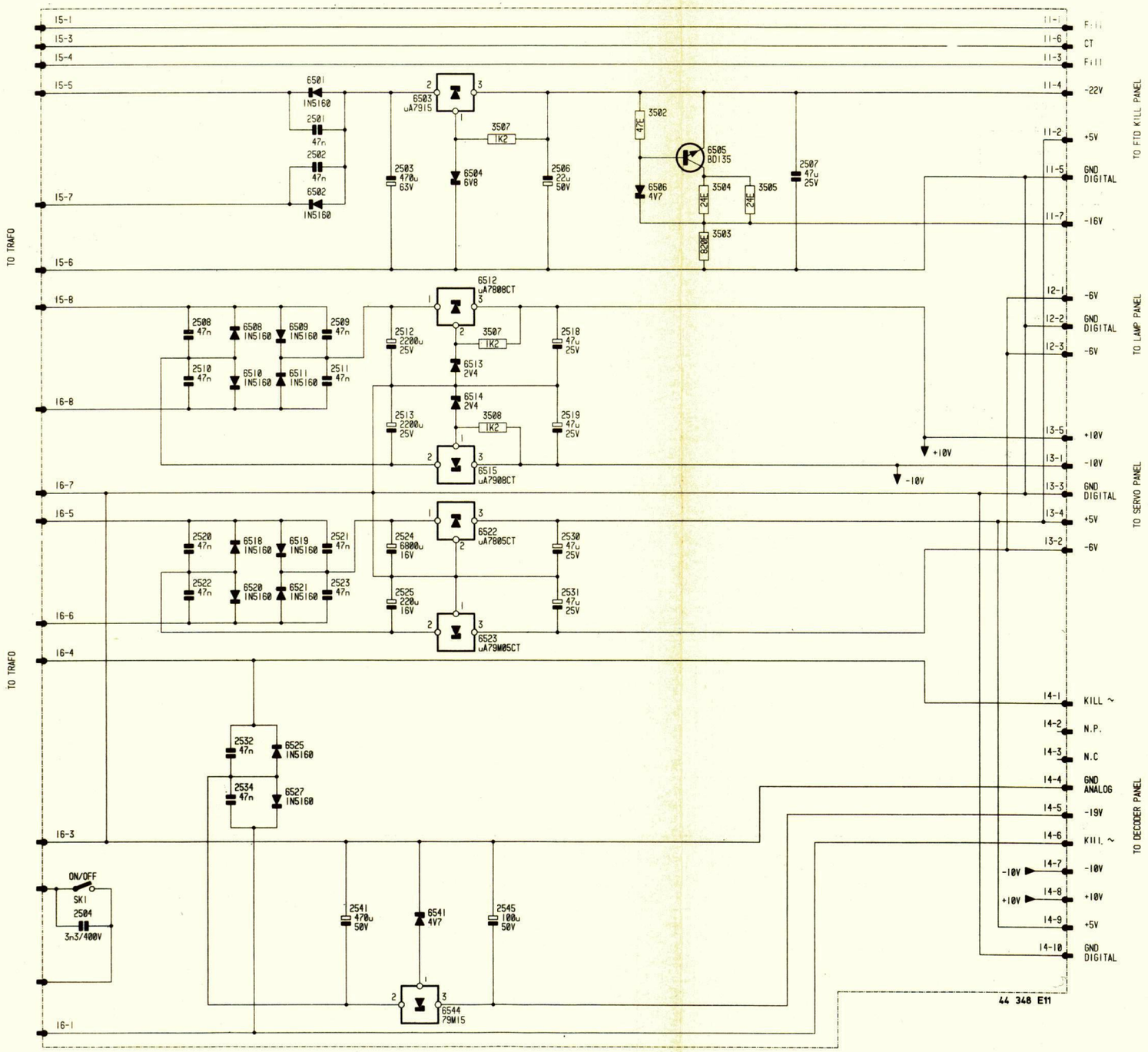
DECODING 2



CS 19 587

SUPPLY AND LAMP CIRCUIT





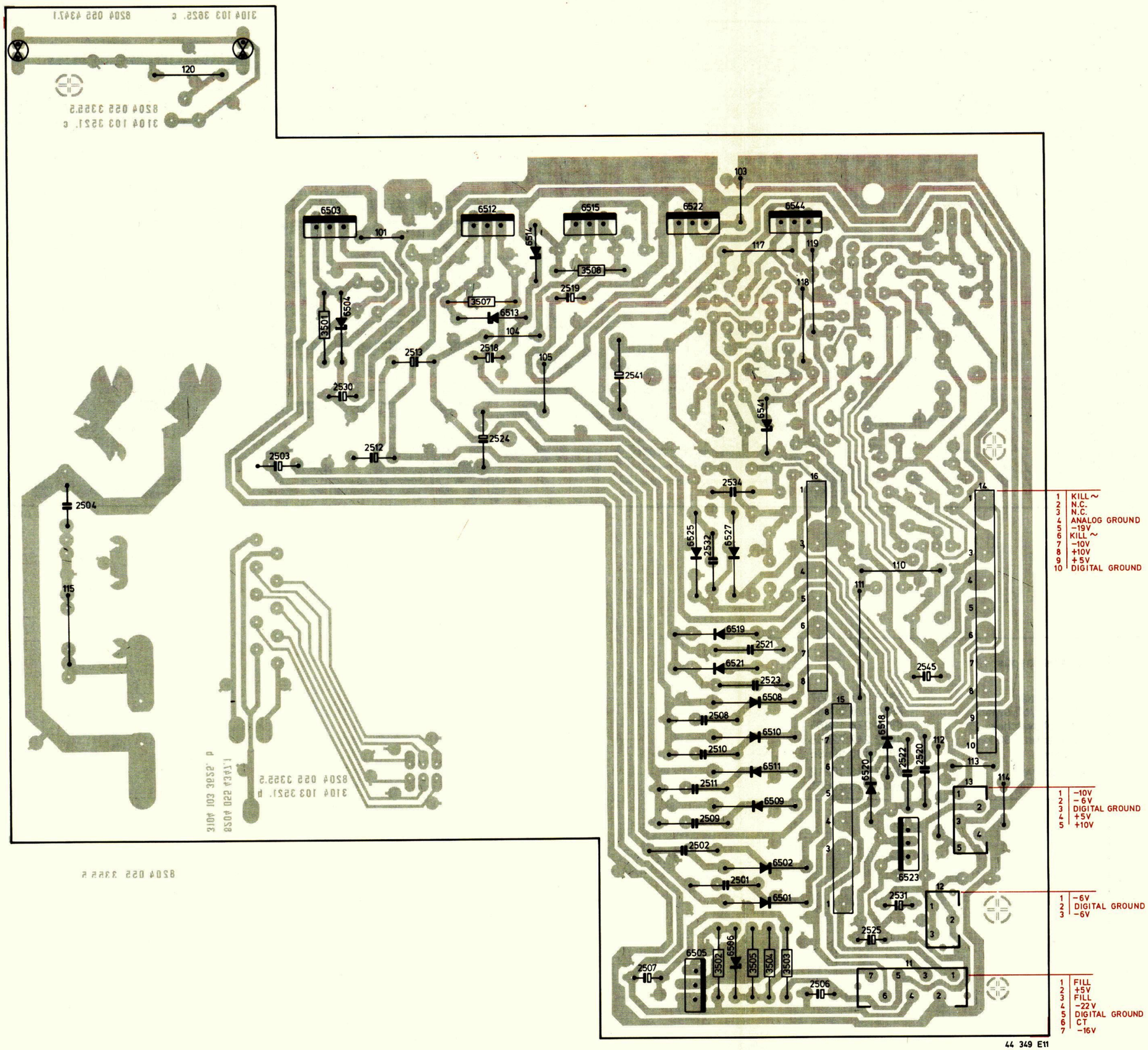
Electrical partslist – SUPPLY FTD AND LAMP PANEL

MC7915CT	5322 130 41899
	4822 130 40823
MC7808CT	4822 209 72554
MC7908CT	4822 209 82112
TY40408	4822 209 71579
MC7905	5322 209 11222
BC548B	4822 130 40937
BD135	4822 130 40823
BC558B	4822 130 44197
BC337	4822 130 40855
1N5060	4822 130 31164
BZX55-F6V8	4822 130 80513
BZX55-C4V7	5322 130 80275
BZX55-C2V4	4822 130 81048
1N4148	4822 130 30621
⚠ 2504 3N3/400V	4822 122 40327
2200µF 25V 20%	4822 124 21511
⚠ Safety res. 47E	4822 111 30526

Miscellaneous

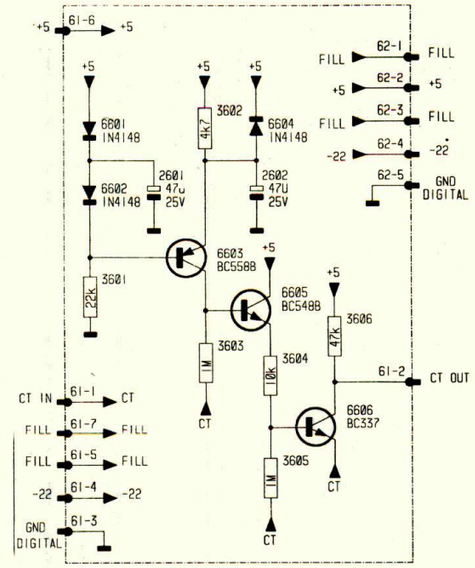
Mains switch SK1	4822 276 11309
Lamp	4822 134 40909
Spring clip for voltage reg.	4822 492 63076
⚠ Transformer mains	4822 146 30744

SUPPLY AND LAMP PANEL



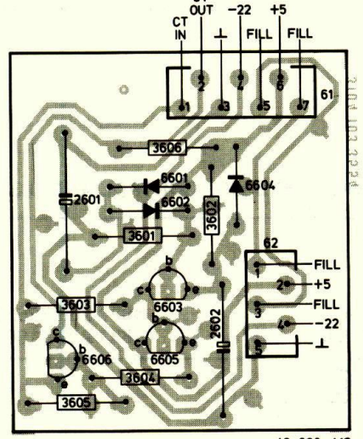
44 349 E11

FTD-KILL CIRCUIT



43 020 A12

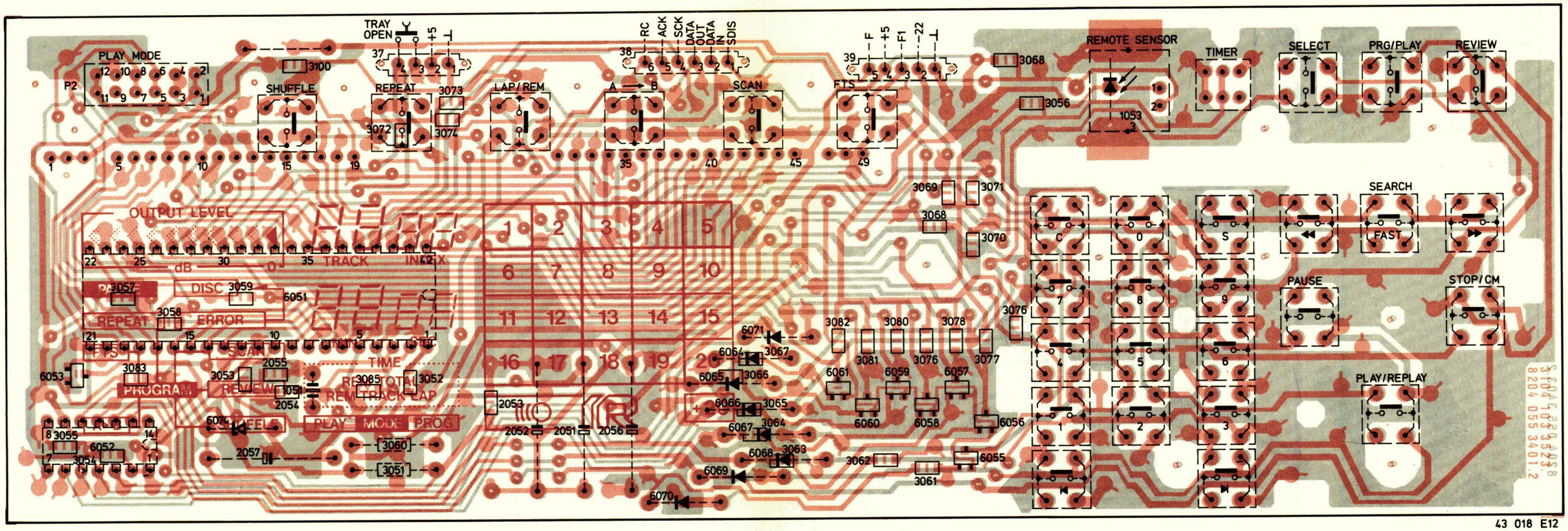
FTD-KILL PANEL



43 008 A12

CS 19 589

CONTROL & DISPLAY PANEL



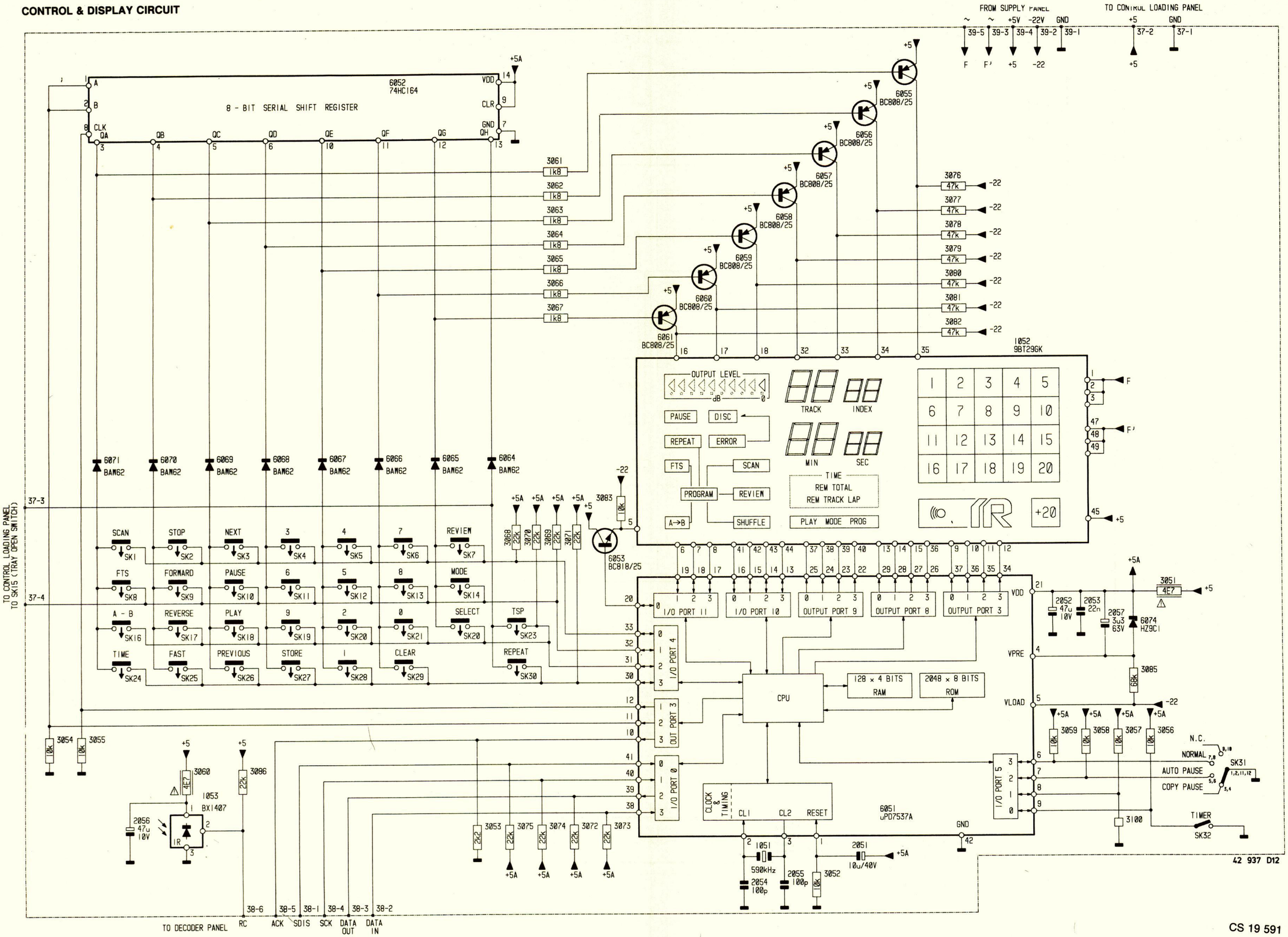
ELECTRICAL PARTS LIST CONTROL AND DISPLAY

4PD7537A	4822 209 72552
PC74HC164P	4822 209 11605
C	
BC818-25	4882 130 42696
BC808-25	5322 130 42048
BAW 62	4822 130 30613
6074 HZ9C1	4822 209 70289
Safety Res. 4E7	4822 111 30499

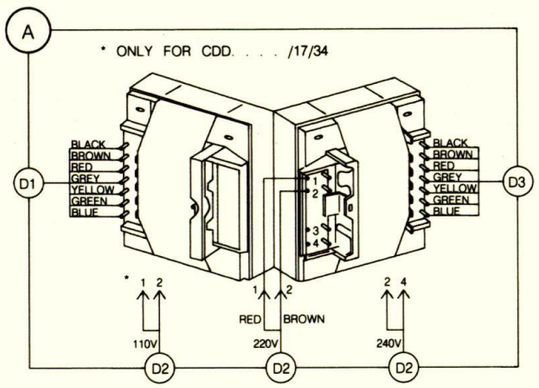
Miscellaneous

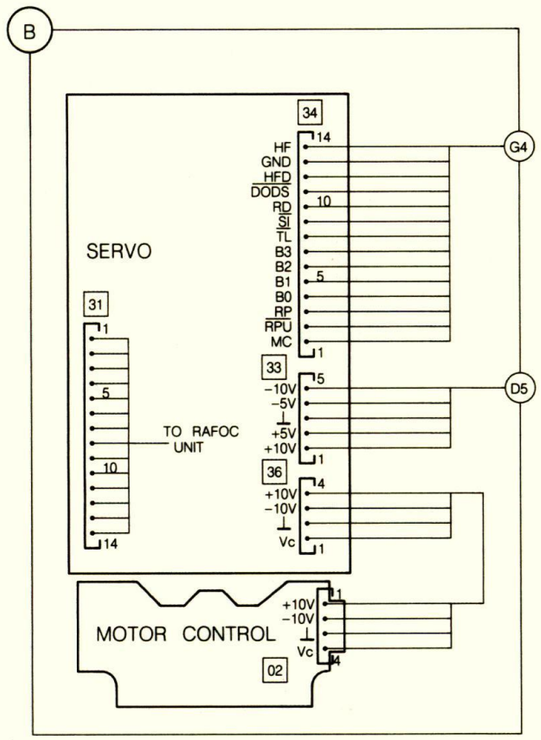
Slide switch	4822 277 21057
Timer on/off switch	4822 276 20463
Control switches	4822 276 12465
Cer. reson. 590 kHz	4822 242 72068
Display	4822 130 90496
I.R. receiver	4822 218 10212
I.R. transmitter	4822 218 20681

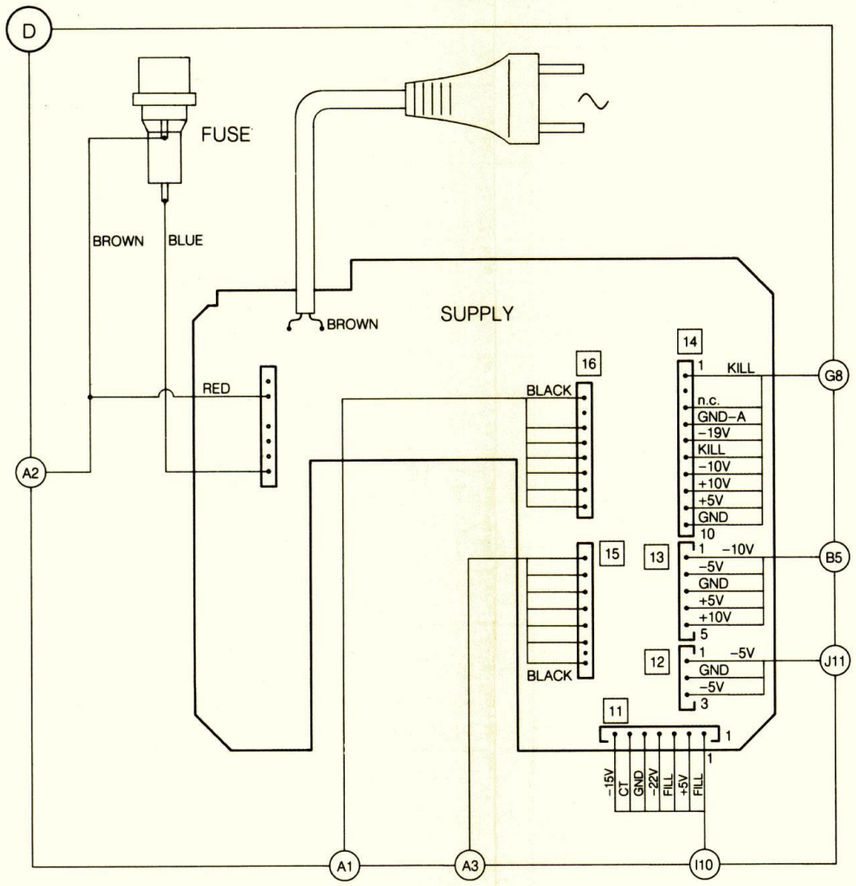
CONTROL & DISPLAY CIRCUIT

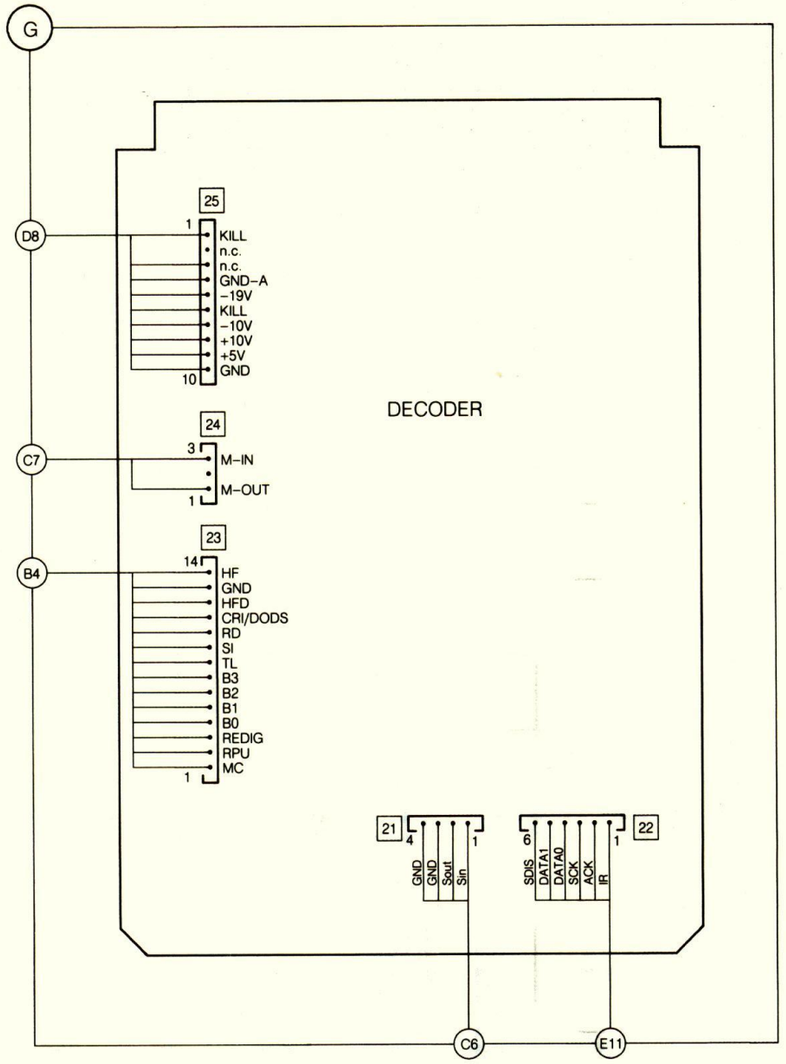


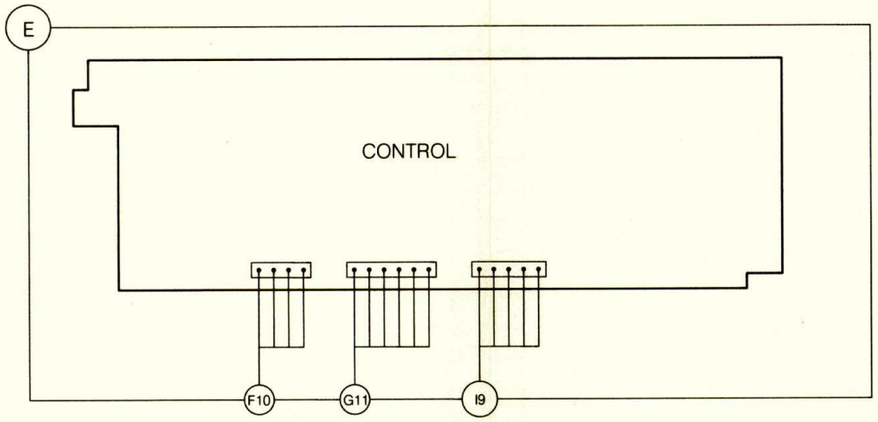
WIRING DIAGRAM

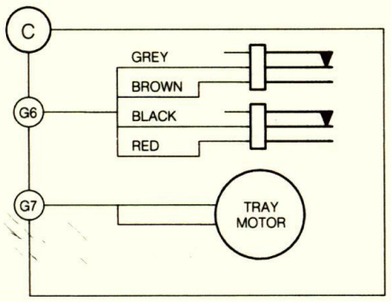


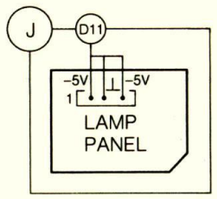


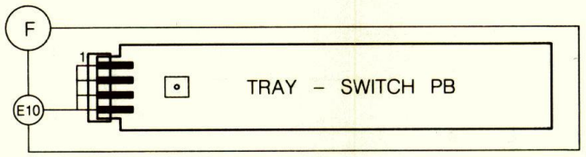


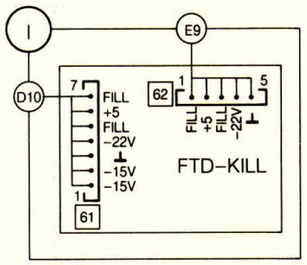






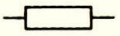
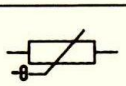
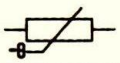
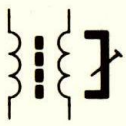


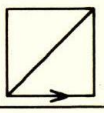
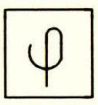
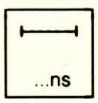
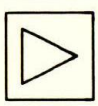




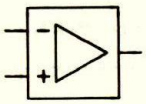
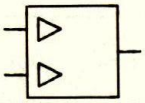
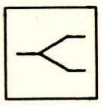
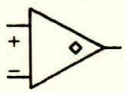
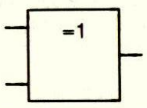
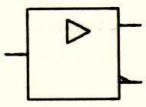
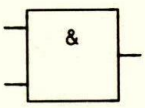
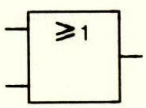
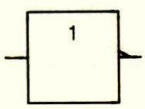
MDA 01655
T−26/845

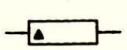
CS 19 592

SYMBOL	DESCRIPTION
	Capacitor, general
	Electrolytic capacitor (+ and − may be omitted)
	Bipolar electrolytic capacitor (+ may be omitted)
	Resistor, general
	N.T.C. resistor
	P.T.C. resistor
	Voltage divider with preset adjustment
	Chip jumper
	Pin contact
	Bus contact
	Coil, self-induction
	Transformer with electrically poor conducting core and adjustable pre-magnetization
	Diode
	Zener diode
	Stabistor
	Double variable capacity diode (in one envelope)
	Photo conductive diode
	L.E.D.

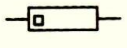
SYMBOL	DESCRIPTION
	Transistor (N.P.N.)
	Transistor (P.N.P.)
	Direct current (DC)
	Alternating current (AC)
	Earth (functional)
	Frame or chassis connection
	Direction in which AC voltages are passed on (optional present)
	Interrupted line
	Not-connected crossing lines
	Connected lines
	Cable tree with lead-outs
	Changer, general (arrow is optional)
	Voltage Controlled Oscillator
	Band-pass filter
	Phase changing network
	Delay element
	Amplifier, general

MDA.00083
T32-735

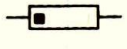
SYMBOL	DESCRIPTION
	Operational amplifier
	Differential amplifier
	Splitter
	Operational amplifier with open output
	Exclusive OR gate
	True/complement amplifier with high input
	Flip Flop
	AND gate
	OR gate
	Inverter with high input



0.2W (CR 16) ⩽ 220k 5%
> 270k 10%

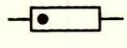


0.33W (CR 25) ⩽ 1M 5%
> 1M 10%

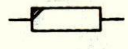


0.33W (SFR25) 5%

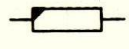
0.25W (VR 25) ⩽ 10M 5%
> 10M 10%



0.5W (CR 37) ⩽ 1M 5%
> 1M 10%



0.67W (CR 52) 5%



1.15W (CR 68) 5%

Ceramic plate

Polyester flat foil

Polyester mepolesco

Mylar
(Polyester flat foil small sized)

Micropoco

Tubular ceramic
(body colour pink or yellow/green)

Miniature single elco

Subminiature tantalum

* a=2,5V
b=4V
c=6,3V
d=10V
e=16V
f=25V
g=40V
h=63V
i=100V
j=125V
l=125V
m=150V
n=160V
q=200V
r=250V
s=300V
t=350V
u=400V
v=500V
w=630V
x=1000V
A=1.6V
B=6V
C=12V
D=15V
E=20V
F=35V
G=50V
H=75V
I=80V

MDA.00084
T32–735