# Philips DCC600

# Onderhoud van een Philips DCC600:

- rechthoekige ladebovenklep eraf schroeven (ligt OP de cassette. TORX 6 nodig) en dan kun je bij de kop: goed schoonmaken met wattenstaafje en IPA. Let op: kop is zeer fragiel.
- rechthoekige bovenlade heeft 3 witte/gele nylon wieltjes: schoonmaken.
- de 2 kleine aandrukrolletjes eruit wippen en schoonmaken met IPA en daarna een nacht in verzadigde afwas laten weken.
- de 2 snaren vervangen: lade en loopwerk.
  - de snaar van de lade is vierkant: 80 mm diameter en 1 a 1,3 mm dik.
  - de snaar van het loopwerk is 3,5x0,5x150mm (breedte x dikte x lengte platgedrukt).
- de 2 capstans reinigen (IPA).
- loopvlak (zwart, op de 2 wielen) van de capstan-riemen schoonmaken.
- loopwerk smeren.
- eventueel druppeltje olie in de motoren.
- Het soldeerwerk van de voeding nalopen.

-servicemode aanzetten: dolby - play - en dan rec/pause indrukken. Laat o.a. dropouts zien.

-Er kan een probleem met de voeding zijn, losse pootjes van spanningsregelaars

-Vaak is de print zekering van t3.15ma op het main board defect. Deze gaat erdoor omdat de oude snaar vastplakt aan 1vd vliegwielen.

-Het LDU-1000 loopwerk zit in de DCC300, DCC380, DCC600 en de DCC450.

-Zie ook de Repair database onderaan de pagina

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# Modifications

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Looking at the manual......
PSU board
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Caps 2215, 2216, 2217 replace with same voltage larger uF caps. These are the PSU reservoir caps. Prob replace 2211 2213 with same value uF.
Probably limited by physical size here. Something like Panasonic FR or FC or TSUP if they fit.

Digital board
On the digital board, replace all the elcos with OsCon SEPC solid polymer much higher uF like 470uf 6.3v unless they are doing a specific job other than PSU. Check with the manual.

Analogue output stage
2257, 2258 2259 2260 are elco's in the signal path - replace with 4.7uf film caps like WIMA MKS2 (tiny with 5mm lead spacing) and very good.
Opamp 7305 replace with dual opamp of choice (LME49720 is my choice) and see if you can get some local elco's on the PSU pins
2351 & 2352 in the feedback loop with 470 pf Silver mica

Obviously do a bit at a time and listen in between........
These mods are suggested based on general experience modifying similar equipment and not the DCC600 directly......
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# Maintenance of a Philips DCC600:

- unscrew the rectangular drawer top cover (is located on top of the cassette, TORX 6 required) and then you can access the head: clean well with cotton swab and IPA. Note: head is very fragile.
- rectangular top drawer has 3 white / yellow nylon wheels: clean.
- flip out the 2 small pressure rollers and clean with IPA and then soak overnight in saturated detergent.
- replace the 2 strings: drawer and running gear.
  - the belt of the drawer is square: 80 mm diameter, or 130 mm flat, and 1 mm thick.
  - the belt of the running gear is 3.5x0.5x150mm (width x thickness x length flat).
- clean the 2 capstans (IPA).
- clean the tread path (black, on the 2 wheels) of the capstan belts.
- lubricate running gear.
- maybe drop of oil in the engines.
- Check the solderings in the power supply board.

-potential problem with the Power Supply. Voltage regulators with loose legs. Resolder. -often the fuse t3.15ma on the mainboard is defect.

# engage servicemode

To engage servicemode : dolby - play - and then press rec/pause. Shows the dropouts etc.

# OFFICIAL PHILIPS REPAIR DATABASE:

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MODEL: DCC600
SYMPTOM: The display does not light up at all.
CURE: Check the -30V. If not available, check T7201 (4822 130 41327).
MODEL: DCC600
SYMPTOM: Totally inoperative.
CURE: Check solder joints of mainsswitch S1204.
MODEL: DCC600
SYMPTOM: Totally inoperative. (No display and no functions)
CURE: Check the main and front uP.
MODEL: DCC600
SYMPTOM: No tape transport. The capstan motor does not run.
CURE: Check for short circuit in the deck motor PCB.
MODEL: DCC600
SYMPTOM: Digital no sound, analog weak, reading and winding all the time.
CURE: Clean the head.
MODEL: DCC600
SYMPTOM: DCC sound interrupting. CC plays O.K.
CURE: Check Dig. PCB (4822 214 33899).
MODEL: DCC600
SYMPTOM: On Playback of DCC tapes the Audio drops out.
CURE: Set up as per the Service Manual the CASS motor speed (3264)
MODEL: DCC600
SYMPTOM: No recording, play back O.K.
CURE: Check digital PCB. Codenr. 4822 214 33899
MODEL: DCC600
SYMPTOM: Stops playing DCC tapes after a few seconds.
CURE: Check whether connector 1327 is mounted well.
MODEL: DCC600
SYMPTOM: Totally inoperative after some time.
CURE: Check transistor T7349.
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MODEL: DCC600
SYMPTOM: The digital sound is sometimes interrupted.
CURE: Replacing the digital printed board will solve the problem. The service codenumber of this board reads: 4822 214 33899. REMARKS : All sets from production week 9323 onwards have been modified.
MODEL: DCC600
SYMPTOM: First 200 msec. no sound after next and prevous.
CURE: Replace main processor to software version V72.
MODEL: DCC600
SYMPTOM: Sometimes no sound on right speaker.
CURE: Check Dig.PCB 4822 214 33899.
MODEL: DCC600
SYMPTOM: Sound distorsion by interfering of a TV set.
CURE: When the set is placed in the neighbourhood of a TV set (K40 type) the sound from the DCC is distorted. The distortion disappears as soon as the TV set is switched-off. As all DCC recorder complies the Philips requirements concerning magnetic fields it is advised to rearrange the set-up. It is known that some strong fields will interfere with the head connections. For this reason in the IFU is published: Do not place the DCC...near magnetic fields ... , ..) Placing the DCC at the other side of the TV-set (away from the high voltage transformer) can solve the problem. Adding an additional metal screen is also possible but is not a 'nice' solution in a home set-up.
MODEL: DCC600
SYMPTOM: After about 5 minutes, set stops playing and relay starts clicking.
CURE: Check IC7711 (PLC) 4822 209 31993.
MODEL: DCC600
SYMPTOM: After some time noisy sound.
CURE: Check digital PCB. It might be that ADC (AK5326) is heat sensitive. Replace digital PCB. (4822 214 33899)
MODEL: DCC600
SYMPTOM: Sometimes middle and right-hand segments of display are failing.
CURE: Check solder joints of the front processor and the FTD.
MODEL: DCC600
SYMPTOM: Distortion of TV signal when DCC is in Play mode.
CURE: Add screening (item 568) between DCC loader part and transformer/supply part.
MODEL: DCC600
SYMPTOM: In some cases DCC cleaning cassette SBC3500 does not work properly.
CURE: This problem is caused by a too long capstan (marginal difference compared with DCC900) which carries the cleaning cassette from the inside. In this case the DCC sensor switches are not activated and cassette is not accepted. Either fix a piece of adhesive tape at the bottom side of the cassette housing or drill a hole of 4.5 mm through the housing. REMARKS : Existing stock of Philips Service Warehouse is being reworked by drilling the hole. New stock will

arrive with a thinner housing at the position the capstan is touching the housing.
MODEL: DCC600
SYMPTOM: The player is reading and winding continuously.
CURE: Check digital PCB (4822 214 33899)
MODEL: DCC600
SYMPTOM: Too much wow and flutter on side A.
CURE: Check pressure roller side A.
MODEL: DCC600
SYMPTOM: After some time maximum error rate.
CURE: Check digital PCB (DDSP IC7506 temperature sensitive ?). Service codenumber digital PCB is 4822 214 33899.
MODEL: DCC600
SYMPTOM: Noisy and weak sound on the left channel with ACC. DCC OK.
CURE: Tape drive unit defective. Replace tape drive unit.
MODEL: DCC600
SYMPTOM: Does not play DCC cassettes. Max. error rate after cleaning head
CURE: Replace the tape drive unit.
MODEL: DCC600
SYMPTOM: Scratching sound audible when switching on.
CURE: Check motor holder pos. 120 (4822 256 92024).
MODEL: DCC600
SYMPTOM: Display inoperative. No light in the display.
CURE: No -30V. Check safety resistor R3203.
MODEL: DCC600
SYMPTOM: Transistor 7355 (BC817/40) in solenoid control circuit defective.
CURE: Replace defective transistor by a new one (4822 130 42615). Check soldering of diode 6308 (BAS16) and the functioning of transistor 7205 (BD434) on main board. Check also the cooling of transistor 7205 on main board. REMARKS : Insufficient pressure of transistor clips will cause an increasing supply voltage of the play magnet (voltage on solenoid > 15V), which can destroy transistor 7355.
MODEL: DCC600
SYMPTOM: Audio recorded on digital tape, no time or track nr. recorded.
CURE: By replacing the tape deck mechanism it was found that this was actually causing the fault. Codenr. 4822 691 20833.
MODEL: DCC600
SYMPTOM: Sometimes the use-again marker not found on customer recorded DCC.
CURE: (Endless loops during append) Cut off minus lead of Electrolytic Capacitor 2711 on read/write board. Solder wire from minus lead of 2711 to pin 11 of IC 7703 (Read amplifier TDA1317). REMARKS : This phenomenon occurs only on Printed Circuit Boards with production stage .4 and is caused by crosstalk from WDATA to INAUX signal line.
MODEL: DCC600

SYMPTOM: Set comes in a hang-up situation.
CURE: The reset circuit has been improved to prevent hang-up, by changing item 3419 (refer to service manual page 48, mapping code M12) from 47k into 4k7 (4822 051 20472). (From productionweek 9316 onwards.)
MODEL: DCC600
SYMPTOM: At first time cassette plays normally, second time set stops.
CURE: Second time set stops in the middle of cassette. Resolder resistor 3263. Maybe this chip resistor 3263 was not good soldered and sometimes it does not make contact. This results in failing of the capstan motor. CAUSE : Temporally this resistor was hand mounted. From week 9312 onwards this mounting process has been changed.
MODEL: DCC600
SYMPTOM: Noisy tray, squeaking sound during open/close
CURE: Grease guiding parts of drawer pos. 209 resp. catch lever assembly pos. 216. with Molykote, service code 4822 390 20139.
MODEL: DCC600
SYMPTOM: Poor loading function
CURE: Slider opener (pos. 216-219 of Exploded View) lands on top of cassette. REASON: Shutter (pos. 552) out of form. Left side touches either bracket (pos. 551) or controlling lever (pos. 556). SOLUTION: Bend left side of shutter so, that there is no contact to other parts (min. distance between pos. 551 and pos. 552>= 0,1mm). REMARKS: Loading assemblies, marked with a red cross on the top of bracket 551, are already checked by the factory.
MODEL: DCC600
SYMPTOM: Cassette gets stuck behind the front when lifted at left side
CURE: This occurs when cassette is lifted at left side in order to remove it from the opened tray. The switch is opened/closed by a ridge, located at the back righthand corner of the drawer. To delay the switch actuation cut off some plastic of the ridge. Attention: This modification also takes an influence on the feature touch to close. If too much plastic is removed the tray might already close while a cassette is inserted ! Try to find an optimal compromise. CAUSE: The drawer (pos. 209) does not open far enough, because the tray-out switch (pos. 1437) is actuated too early. REMARKS: This publication will be followed by a service information.
MODEL: DCC600
SYMPTOM: When using an ACC (analogue cassette) the drawer does not open.
CURE: Plastic edge inside loading causes an analog cassette to get stuck. Remove the plastic edge.
MODEL: DCC600
SYMPTOM: Drawer does not open.
CURE: Check pos.212 (4822 403 70851)
MODEL: DCC600
SYMPTOM: Gives DCC with CC cassette. Sometimes cass.blocked.
CURE: Slide opener lands on top of cassette. Check position of the mounting tape foot.

MODEL: DCC600

SYMPTOM: Updating uPs

CURE: Updating uPs During the course of production the uP's in 70DCC300, 70DCC380 and 70DCC600 have been modified. Sets produced between week 9302 and week 9331 have old versions. In case one of the two uP's has to be exchanged in those sets, the other uP has to be replaced too, because in spare parts warehouse only the last versions are taken on stock. From week 9331 onwards front uP (item 7410) reads TMP870M70AF-6123 MASK V67 (available with service code 4822 209 32528). Main uP (item 7335) reads P83C528FBP/054 MASK V69 (available with 4822 209 32974).

REMARKS: This publication will be followed by service information a93-362

MODEL: DCC600

SYMPTOM: Service Manual correction Electrical partslist

CURE: Service Manual correction Electrical partslist digital board Codenumber for A/D-converter AK5339 (pos. 7514) was 4822 209 31622, should read 4822 209 33849.

MODEL: DCC600

SYMPTOM: Guidance form

CURE: Guidance form - Next Guidance form is enclosed at repairable unit 4822 691 20833. Please notice the wiring which should be included with the returned unit. GUIDANCE FORM REPAIRABLE UNIT 4822 691 20833 Please fill in this form and return it with the defective unit. TYPENUMBER (Unit demounted from set) : Serial number: COMPLAINT DESCRIPTION: INFORMATION GATHERED VIA SERVICE MODE EXTENDED PLAYMODE (selected via PLAY) WITH ERROR INDICATION (On display): MORE DETAILED OBSERVATIONS : YES NO TRAY LOADING OK DCC SOUND OK ANALOGUE SOUND OK MECHANICAL NOISE OK SPEED OK FRICTIONS OK TAPE TRANSPORT OK Return the defective unit complete assembled according to the drawing on the backside of this paper to: Invoice to: Philips Consumer Electronics B.V. 670005 Consumer Service - Price centre 5600 MD Eindhoven building SBP5 The Netherlands Ship to: Philips Consumer Electronics B.V. 676723 Consumer Service 5600 MD Eindhoven building SDM5 The Netherlands ATT: Mr. C. Lieberwirth CORRECTIVE ACTION/SOLUTION (to be filled in at central repair workshop): Report number:

MODEL: DCC600

SYMPTOM: Customer problems when using DCC

CURE: Customer problems when using DCC In general playing back pre-recorded DCC-cassettes does not bring problems to users, because playback of such a cassette is more or less simular to operating a CD-player. A number of problems are found in the playing back and/or recording of the user-recorded DCC-cassettes, caused by not proper 'initializing' of ALL these cassettes. Initializing is important because this is closely linked to basic customer-expectations of a digital product: - Track number; - Time indication. The DCC-standard distinguishes 2 different formats of user-recorded DCC-tapes: a. Super-user format b. User format But there are also combinations of the 2 user-recorded formats possible: c. Combinations of the 2 formats. And there is the pre-recorded DCC tape format: d. Pre-recorded DCC SUMMARIZED CHARACTERISTICS: a. Super-user format: - continuous absolute time information available (remaining time is calculated by the set) - Track numbering and track title at start of track are possible. (this means that also renumber is possible) - Initialization required - TOC (Table of Contents)

possible at start of track 1 For figures see Audio Service newsletter 63.01 On Display when super-user format is loaded at position a: TRACKTIME - -10:51 b. User format: - No continuous absolute time information available on tape - No track numbering/title. (this means that renumber is not possible) - No initialization required The start markers are only used for track access. On Display when user format is loaded at position b: TRACKTIME : Notice: track is blank! Some DCC typenumbers show counter settings, others the estimated time based on the tacho-signals. c. Combination of the 2 formats. - This format usually happens when the APPEND function is not used. - The APPEND function is designed to guarantee the Super-user format in case a recording is made at the end of a partially recorded tape. When a recording is started on a blank area, the result will always be a User-format. Correction by renumbering is not possible. d. Pre-recorded DCC - Continuous time information available (inclusive absolute time, track time, remaining time etc.) - Track information continuous available - TOC information continuous available - Track title information continuous available. - Display will show on what ever position loaded the track and time information. example: TRACKTIME 210:51

MODEL: DCC600

SYMPTOM: Initialising DCC

CURE: Initialising DCC NEW DCC CASSETTE: How to initialize the cassette (= making a lead-in recording at the beginning of the tape) is stated in the Instructions for Use. In the various typenumbers the following keys have to be activated: For DCC091, DCC450: REWIND, APPEND For DCC170: REWIND, REC PAUSE For DCC300, DCC380: REWIND, APPEND For DCC600: REWIND, APPEND For DCC730, DCC951: REWIND, REC SELECT/PAUSE For DCC900: REWIND, APPEND For more details: see Instructions for Use of concerned typenumber; chapter recording. After this initialization the track number and (absolute) time information will be recorded on the user-recorded tape. The above shown survey is a simplified universal applyable operation. The most problems are caused by the fact that users are accustomed to apply the record function straight forward, like recording ACC-cassettes. PARTIALLY RECORDED For all typenumbers, except DCC170: Use APPEND to search for end of last recording in case of partially recorded DCC-tape and so proper coupling of old and new recordings is made. For DCC170: Search Manually for END indication of last recording and make new recordings from that spot onwards. OVERWRITING In case of completely overwriting a user-recorded DCC-tape the initializing procedure has to be performed again! CONCLUSION: It is very important to initialize a user-recorded DCC-tape. If a DCC-tape is initialized or not, can easily be seen on the display information in Play-back mode. Starting at the beginning of the tape track time An empty DCC tape:: Not initialized DCC tape (User format) 11 : 24 Initialized DCC tape (Super-user format)312 : 49

MODEL: DCC600

SYMPTOM: Adjustment head current

CURE: Adjustment head current - In case the read/write head of the DCC mechancism should be exchanged and/or the read/write IC's are defective the head current has to be re-adjusted. Because at this moment the needed test equipment is not available, this will be done in a central repair procedure. The following codenumbers are resorted in this repair procedure, at

Philips Consumer Service known with code (REPARI 1 and 4): For 70DCC900: The complete tape deck mechanism item service codenumber 001M 4822 691 20777 For 70DCC300, 70DCC380 and 70DCC600: The complete loading mechanism item service codenumber LDU4822 691 20833 and The complete digital board (PCB5) item service codenumber 4822 214 33899 In case of a repair one has to ship, without waiting, the defective item to: Invoice to: Philips Consumer Electronics B.V. 670005 Consumer Service - Price centre 5600 MD Eindhoven building SBP5 The Netherlands Ship to: Philips Consumer Electronics B.V. 676723 Consumer Service 5600 MD Eindhoven building SDM5 The Netherlands ATT: Mr. C. Lieberwirth Please enclose a copy of the invoice inside the carton. The rest of the instructions are according to the PCS repair procedure available at the desk of Mr. Lieberwirth, Repair Manager, Phone +31-40-735509, Fax +31-40-734515

MODEL: DCC600

SYMPTOM: Trackselection

CURE: Trackselection Direct track access is meant to search a wanted tracknumber by taking the shortest path to get to the track. Due to the differences in possible tapes, this topic is rather complex: * On a pre-recorded DCC tape, the Table Of Contents is always recorded continuously on the tape. This means that direct track access is possible. When jumping from track 3 to track 8. In this case the side is changed (from A to B) This is the SHORT SEARCH. * On a user-recorded tape, the Table Of Contents (TOC) cannot be recorded continuously. The TOC has be adapted all over the tape as soon as the recording on the tape is changed. For this reason the TOC can only be written at the start of track 1. This means that now jumping from track 3 to 8 results in so called SEQUENCIAL TRACK SEARCH. Jumping from track 3 to track 8 is done via track 4, 5, 6, and 7. In practise it has become clear that when a DCC is loaded, it is in many cases not positioned at the start of track 1. This means that the only alternative is sequential track search: The deck will in some cases not take the shortest path as the location of the required track is unknown. IMPLEMENTATION: DCC900 Writing TOC on user-recorded DCC was planned but did not fit into the microprocessor internal ROM capacity. To delete this possibility from the specification was a last minute decision. Unfortunately the Instruction For Use has not been adapted accordingly. That is why 10-key commands are not accepted (NO TOC message). There is no service solution available. DCC600 Writing TOC on user-recorded tape was also not possible because of the limitations of the microprocessor internal ROM capacity. Lessons are taken from DCC900, that is why the sequential search possibility has been implemented. When a 10-key command is issued and the TOC is not known, the deck will perform this above described sequential search. The result is that DCC600 will in only a few cases not respond to a 10-key command. Due to the fact that the microprocessor of the DCC900 is completely filled and no larger memory is available, a service solution which incorporates sequential search like DCC600 is not possible.

MODEL: DCC600

SYMPTOM: Modification speed control

CURE: Modification speed control In the course of production the temperature stability circuit of the speed control has been improved. This may influence the compatibility of the LDU1000 loading assy (4822 691 20833). This loading has to match with the various versions of the main

pcb because components on PCB3 (main pcb) and PCB6 (dcc-indicator) have been changed. Situation Loading marked LDU1000 WT00 and WT01: PCB3: R3262 (12k) with parallel to it potentiometer 3264 (10k). In series with this 3263 (12k). PCB6: NTC-resistor 3160 (150R) in series with capstan motor. Situation Loading marked LDU1000 WT02: PCB3: R3262 (deleted), potentiometer 3264 (4k7). In series with this potentiometer 3263 (15k). PCB6: Resistor 3160 (100k) in series with diode 6601 (kathode at 3263 and - (MINUS) capstan motor, anode at 3160) parallel to capstan motor. Therefore: In case the loading assy with with printed board PCB6 has to be replaced the built-in main pcb has to be matched to the production stage of the LDU1000 delivered. Replacement procedure: 1)When replacing a Loading marked LDU1000 WT00 or WT01 by a WT02 version, R3263 has to be changed from 12k to 15k! When replacing a Loading marked LDU1000 WT02 by a WT00 or WT01 version, R3263 has to be changed from 15k to 12k! 2)Adjust speed control as described on page 28 of service manual. 3)Check Tape up torque, wow and flutter (for limits see page 28 of Service Manual). 4)Check Analog feedback level and bias. (read/write pcb) 5)Check Dolby level if necessary (main pcb)

MODEL: DCC600

SYMPTOM: Codenumber information

CURE: Codenumber information DCC Cleaning cassette SBC3500 is from now on available with service codenumber 4822 015 20646.

MODEL: DCC600

SYMPTOM: Availability of front boards

CURE: Availability of front boards Front boards for DCC-recorders with mounted uP are available now: 70DCC300 : 4822 214 52176 front board 70DCC380 : 4822 214 52177 front board 70DCC600 : 4822 214 52178 front board

MODEL: DCC600

SYMPTOM: Correction partslist RED1 Tape Transport

CURE: Correction partslist RED1 Tape Transport Capstan motor item 1023 was 4822 361 21506 should read 4822 361 21646. 4822 361 21506 is capstan motor of REN and RER tape decks.

MODEL: DCC600

SYMPTOM: Corrections to the service manual

CURE: Corrections to the service manual - The service test program (page 25-26) Key test : Correct key to enter this test is 'MARK WRITE' Hole test: This test can only be entered if tray is in opened position. In tray test the tray is moved outside. So first start with tray test before hole test. IR test: RC-5 codes of TEXT and TIME have been exchanged in this publication. RC-5 code for TIME should read '11', RC-5 code for TEXT should read '122'. Adjustment table (page 28) Position number of potentiometer for take-up torque should read 3280. REMARKS: This publication will be followed by service information A93-362

MODEL: DCC600

SYMPTOM: Modification

CURE: Modification In course of production the power supply circuitry of the read/write board has been changed: * Double-diode pos. 6703 (BAV99 - 5322 130 34337) has been built-in in series to the voltage stabilizers 7701 and 7702. The double-diode reduces the input voltage of

the stabilizers and thus the power dissipation of these ICs. * Voltage stabilizer pos. 7708 has been changed to a type with low voltage drop (LM2931Z-5.0 - 5322 209 60749), capacitor pos. 2764 is changed from 10nF to 10æF (4822 124 23179). Both actions improve the plop-behaviour when the set is powered-off during a recording session from an analog source. REMARKS: Modifications have been taken place in read/write boards from production stage .5 onwards. Production stage can be identified by the last digit of the twelve-figure number, located at the lower right corner of the printed circuit board.

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