

TROUBLE SHOOTING CHART CDM4-I

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TROUBLE SHOOTING CHART CDM4 I

CHAPTER I: Failures with the illumination, display and power system generally.

1. Symptoms: No light, phonograph not working at all.

Cause: No power at wall socket; open primary circuit.

Possible faults: Wall socket defective. Main fuse blown. Fuse Si1 blown (ref. to chapter II). Internal break in line cord or plug. Line switch off or defective.

2. Symptoms: Illumination does not light. Phonograph otherwise works.

Cause: Defective lamp circuit (refer to chapter IX/1).

Possible faults: Lamp's circuit plug not in light socket at amplifier. Lamp not properly seated in holder. Defective starter, defective lamp.

3. Symptoms: Bubble tubes do not work, colour tubes do not rotate, lamp 24V does not light.

Cause: Defective 24V circuit.

Possible faults: Power supply leads from transformer to distribution interface interrupted. Fuses on interface (1A/M) defective. Caution: Short circuit in harness of heating resistors possible.

4. Symptoms: Digital display remains dark, phonograph otherwise works.

Cause: Signal supply leads to display interrupted.

Possible faults: 14-pole D.I.L. plug not set or wrong way round (right: flat cable is coming from LH side, orange below).

5. Symptoms: Digital display shows non-sense figures; phonograph otherwise works.

Cause: Signal lines Interchanged.

Possible faults: 14-pole D.I.L. plug displaced (not in line with the base). Computer defective, e.g. IC 7.

6. Symptoms: Digital display shows incomplete figures (missing segment). The fault is the same with all four digits.

Cause: Signal for one (or some) segments missing.

Possible faults: One pin (or some) of 14-pole plug broken off. One wire (or some) of flat cable broken. Broken connection at display PC-board. Computer defective, e.g. IC 7.

7. Symptoms: Digital display shows incomplete figures (missing segment). The fault, however, occurs with one (or on to three) of the four digits only.

Cause: Segment signal does not reach this digit.

Possible faults: Cracked connection on display PC-board. Defective display unit (4 identical one-digit units).

8. Symptoms: One of the digits of display completely off.

Cause: multiplex signal missing.

Possible faults: Defective D.I.L. plug or broken wire. (A1, A2, A3, A4). Computer defective (T23 - T26).

CHAPTER II: Fuses. Which one controls what circuit?

1. Main fuse: (In screw holder in chassis pan apron) T 3.15 (F 6.3 in US)

Symptoms if blown: No illumination, phonograph completely dead.

2. Fuses SI1 and SI2: Loudspeaker fuses.

Symptoms if blown: No sound on LH channel (SI1) or RH. channel; the reason for a blown fuse here might be a shorted power transistor.

3. Fuse SI3: 30 V negative supply.

Symptoms if blown: Amplifier distorting on both channels, green LED 1 not lit. Gripper arm is still moving on. Digital display shows a flashing 8 on the RH digit.

4. Fuse SI4: 30V positive supply.

Symptoms if blown: Amplifier silent. Gear motor not working. After power up disc carrier moves on and stops, relays M3 picks up, after this no further function.

5. Fuse SI5: 12V positive supply.

Symptoms if blown: S&CC unit dead - digital display dark (except red LED M still lightning up on coin insertion).

6. Fuse Si6: 30V AC supply.

Symptoms if blown: Disc carrier motor KM not working power supply for CD-Control unit (one digit display dark) and CD player interrupted. Break in credit circuit (LED M). After power up carrier latch solenoid picks up, digital display shows 0000 and then no further function.

CHAPTER III: Faults with the coin system. The Phonograph, however, operates normally with free credit established with the jumper in the column GP at S&CC unit (0-F).

The function of the coin system can be checked by observing the LED-light "M" at the computer, which should light up with every coin accepted. Credits also can be given with the credit bottom at the interface for electronic slug rejecter, if a mechanical slug rejecter is installed with credit bottom near to it.

1. Symptoms: Coins rejected as bad ones.

Cause: Disabled slug rejecter. No power supply (electronic slug rejecter).

Possible faults: Dirt, oil or dust particle in the rejecter; rejecter maladjusted. Reject lever jammed holding the coin acceptor open. Rejecter or entire phonograph not levelled. Interruption in harness from S&CC unit over slug rejecter interface to electronic slug rejecter. (Amplifier Si4 - Option socket pin 1 - Interface). Interface defective.

2. Symptoms: Wrong credits (or none) with one type of coin.

Cause: Coin actuates the wrong coin switch. Coin pulse does not reach the computer. Electronic slug rejecter defective.

Possible faults: Slug rejecter not properly positioned, leads the coin to an improper switch paddle or by passing it. One line of the coin switches to Computer cable broken, disconnected at either end or wrongly set at computer connector. Electronic slug rejecter: switching transistor at the interface defective. Using MMS 111 rejecter: coins may be blocked by D.I.L. micro switches at the interface. Input of computer defective (IC2 - IC4; diodes: D14-D25; capacitors: C20 - C27).

3. Symptoms: Permanent credit, display shows 0001 permanently, free selections.

Cause: jumper is set from 0 to F (Free Play).

4. Symptoms: Wrong credits, repetitive or all the time, with credits higher or lower of programmed pricing.

Cause: Programming mistake.

Possible faults: Jumper BR is not set, then reset to bonus level 1 (B1) if bonus level 4 is overstepped. Unintentional programming in "Happy Hour" programming level (service level 2 buttons 6 and 7). Programming jumper making poor contact (Note: changes in reposition of jumpers are only efficient by switch off or pressing the LT button).

5. Symptoms: No credit, coins are properly accepted. Free Play, with GP-jumper 0-F still possible.

Cause: All coin input lines disabled.

Cause: Credit inputs inactive (LED M does not light up). Checking of the single inputs (1, 2, 4, 5, T1, 10, 20) with a ground connected test wire.

Possible faults: 30V AC does not reach the computer (from amplifier Si6 to CD mechanism to plug red pin 1 at the S&CC unit). Computer defective (D7, LED M).

6. Symptoms: No credit although coins are registered (LED-M lights up). Even no free play credit with GP jumper set 0 to F.

Cause: Computer out of operation.

Possible faults: No 12V power supplied to the computer (pin 2 and 4 plug red), compare to chapter II/5. Computer defective.

7. Symptoms: No credit, LED - M lights permanently.

Cause: Permanent connection of one or more credit lines (check by displace the single credit plugs at the S&CC unit).

Defective transistors at the interface to the electronic coin acceptor (if build in).

Not complete defective transistors may cause credit giving by itself.

Function check of S&CC credit inputs by connect every single input pin to ground.

CHAPTER IV: Faults by selection entry (credit system does work).

1. Symptoms: No selections possible, digital display blinks with the given selection

Cause: Selection is not accepted.

Possible faults: Box has not got any credits or free play is not programmed (Attention: After setting of program jumpers press LT-button for one time).

The given selection is greater than the programmed number of CD's (Service level 1, button 5).

The selected CD is set only for BGM - Mode (Service level 3, button 8 is set of xx01).

The selected CD is disabled (Service level 2, button 4).

2. Symptoms: No selections; numbers of actuated keys not displayed (only credit is shown).

Cause: Open circuits in the keyboard wiring.

Possible faults: Plug yellow displaced or not inserted deep enough. Key RESET permanently closed or shorted to ground (pole 12, brown, plug yellow). Computer defective.

3. Symptoms: No selections. In standby the LH digit of display shows a number, but selection keys are disabled. With insertion of further coins the new credit is displayed properly.

Cause: Permanent selection signal from that key whose number is shown on the display. Jammed key permanently close key contact. Wire of this shorted to ground. Computer defective (C60 - C70, D44-D66 possibility of ground shorting, IC 8, IC 9). Check with digital multimeter: plug yellow pin 2 to 12 approximately 5V DC, function check with test wire to ground.

4. Symptoms: No response from one key (or some).

Cause: Open circuit with this key.

Possible faults: Malfunction of this key's contact. Insufficient key travel. Broken wire with this key. Plug yellow not seated good enough. Computer defective with a affected input circuit (R65 to 86, D45 to 65, IC 8, IC 9).

5. Symptoms: The CD played is not the one selected. The selection was properly displayed, the according track plays, too.

Cause: Improper counting of disc carrier's position.

Possible faults: Wrong adjustment of light control gates (ref. to chapt. IX/2). Illumination light affecting the Z light gate; reflections at the edges of carrier base plate. Record carrier latch delayed by mechanical friction or to widely opening (latching to late). Light control gate retarded (ref. to Chapt. IX/2).

6. Symptoms: After power up a track or more are played without a selection.

Cause: There are selections left in memory.

Possible faults: Credit and selection resetting after power down in service level 2 button 9 is not used.

7. Symptoms: The CD played is the one selected, however, not the selected track.

Cause: Selection does not correspond to the label. Laser control board defective.

Possible faults: The selected track number is higher than the number of tracks on CD. After reaching the highest CD number the laser control board starts to count at track one again.

8. Symptoms: The selected CD will not be played, the CD carrier is rotating permanently.

Cause: Counting pulse "Z" or sensing pulse "K" missing.

Cause: Lamp of light gate dark. Breaks in harness to plug BLACK.
S&CC Computer defective (IC 10, C75 - C78, D92, D94 ref. to Chapt. IX/2C).

9. Symptoms: The selected CD is placed on the turntable, but it is not playing. After about 50 seconds CD will be returned to carrier.

Cause: No AC 30V for laser control board and player. Communication between S&CC unit and CD Control interrupted.

Possible faults: Display on CD-Controller dark: Fuse Si6 defective. Interrupts in lines from Amplifier (to changer, pin 1) to S&CC unit (line brown, plug RED) or from there to CD-Control. PTC at intermediate transformer on CD-Control faulty. Intermediate transformer defective. Display on CD-Controller is lightning: Data leads between S&C Computer and CD-Control interrupted (In this case operation is possible in mode 0 button T2; stop with T3) Permanently applied reset pulse caused in defective IC 29 at DW-CD-Control board. (def. IC 27, IC 28 - data)

10. Symptoms: The selected CD is placed on turntable, not played, but after about 12 seconds CD will be returned to carrier.

Cause: Failure between DW-CD-Control and laser control board or laser control board and player.

Cause: Leads not deep enough inserted between player, laser control board or DW-CD-Control. Player or laser control board defective.

11. Symptoms: Digital display shows the selection correctly, but after this the phonograph does not operate.

Cause: The S&CC unit gets the impression that a CD is still playing.

Possible faults: Caused by a defective or maladjusted K7 switch the voltage - 30V DC at pin 4 plug GREY is missing. This voltage usually indicates the replacing of CD in carrier after playing. If this circuit is interrupted the status of S&CC unit is the same as CD is playing, so it is not able to start the carrier for a new search. S&CC unit defective (T22: ref. Chap. IX/8).

CHAPTER V: Repetitive apply of selected or non-selected discs to turntable.

1. Symptoms: Permanently gripper arm movement (with disc or none) with the disc carrier is not making a rotation between a complete cycle. This continues even if plug BLUE is disconnected at the S&CC unit.

Cause: Main cam motor not stopping at the end of the play cycle.

Possible faults: Wiper switch K6 maladjusted. Breaking resistor R10 (47 Ohms) at motor MM open. Shortage in capacitor C4.

2. Symptoms: Permanently gripper arm movement; discontinued after plug BLUE is pulled off at the S&CC unit.

Cause: Computer running out of program.

Possible faults: Computer out of program routine (cut power to S&CC unit for a second, to initiate a restart of program). Computer defective (Relais 2, T2 or T22 def. ref. to chapt. XI/8).

CHAPTER VI: Failures of the record changer after a properly completed selection.

1. Symptoms: Record carrier permanently rotating, even after plug BLUE is pulled. If a selection is made the gripper arm randomly takes a disc on turntable.

Cause: Carrier latch permanently open.

Possible faults: Carrier latch or its solenoid jammed.

2. Symptoms: Record carrier permanently rotating. Sometimes the gripper arm randomly takes a disc on turntable, but the CD will not be played. Also by pressing the LT button the gripper arm takes a CD on turntable, the CD will not be played, too. After power off for short time a flashing 8 will appear on display additionally.

Cause: Carrier latch solenoid permanently switched on.

Possible faults: Grey line from M3 to pole 4 of plug BLUE shorted to ground. S&CC unit defective (rel. 4 sticks, T4 def.).

3. Symptoms: Carrier does not start after a properly completed selection. Carrier latch does not open.

Cause: Circuit of the carrier latch solenoid not completed.

Possible faults: DC supply -30V missing (Fuse SI3). Coil of latch solenoid open. Grey line from M3 to pole 4, or green line to pole 1 (relays common), plug BLUE, interrupted. Computer defective; go to service program, key 8, to check relay 4 (M3). Test only successful if -30V DC Voltage across the M3 coil reached pin 4 X4 of the S&CC unit (plug BLUE). Test the machine with a programming jumper from pin 1, green, to pin 4, grey.

4. Symptoms: Disc carrier does not rotate although the carrier latch opens after a selection.

Cause: Carrier motor KM disabled.

Possible faults: Micro switch M3 (at carrier latch) maladjusted or defective. Micro switch K8 (at gripper arm) maladjusted or gripper arm not fully in rest position (ref. to chap. IX/3). Defective motor KM, broken wiring.

5. Symptoms: Gripper arm does not move to take the disc out of the carrier although the selected disc was properly brought forward. After approx. 1 second relay M drops out. The phonograph does not work and takes no notice of any input.

Cause: Main cam motor (MM) does not work.

Possible faults: Motor MM defective. Pre resistor R15 interrupted. DC 30V supply missing (Fuse Si4). Blue wire to motor broken. Shortage in capacitor C5 or in motor itself (then R15 hot).
Test: Connecting plug BLUE pin 1 (green) with pin 2 (blue) with jumper wire of S&CC unit. If motor is moving on then S&CC unit defective (rel. 2, T2). test also with service program level 1 key 7.

6. Symptoms: Disc on turntable returned to carrier before play has started.

Cause: Main cam motor not resting when system in play position.

Possible faults: Wiper switch K1 does not open. Cancel button at amplifier jammed in "cancel" position, same with cancel button of the remote control; shorted remote control cable. Retarding resistor R10 at motor MM open (ref. Chapt IX/3C).

CHAPTER VII: Failures with sound reproduction.

1. Symptoms: Clicks and bang noises during CD playing, jump over of traces.

Cause: Reading of CD data disturbed.

Possible faults: CD defective (error correction for insignificant defects only). Dirty optic caused of nicotine and/or dust particle. Maladjusted optic assembly. Faults in CD player or laser control board.

2. Symptoms: CD moves on but no sound.

Cause: Faults in the system of CD-Control - amplifier - speaker.

Possible faults: Audio frequency cable at CD-Control or amplifier (chinch socket) not inserted. Audio cable is inserted in the phono input of amplifier not in CD-input. Fuses Si1 and/or Si2 blown (Speaker fuses). Fuse Si4 blown (then motor MM does not

work, too). Wire grey (pin 8) amplifier to mechanic shorted to ground (ref. Chapt. IX/6). Amplifier defective (Transistor 2).

CHAPTER VIII: CD not properly returned to carrier.

1. Symptoms: Gripper arm does not move to bring the disc home.

Cause: Main cam motor does not starting.

Possible faults: Error at MM-motor could have developed while a disc was playing (ref. to Chapt. VI/5).

2. Symptoms: Returned disc not properly unclamped (not freed) in the carrier.

Cause: Main cam motor switched off to early.

Possible faults: Wiper switch wrongly adjusted (compare with Chapt. IX/3).

3. Symptoms: Disc missing in compartment is found in other compartment or somewhere about the chassis.

Cause: Gripper arm generally moving to fast. (Time for one complete cam rotation is 11 to 13 seconds).

Possible faults: Disadjustment of gripper arm. Gripper arm sticks to the centring disc (e holder arm, ref. to Chapt. IX/7) Wrong adjustment of puck arm height. Cam motor to fast. Retarding resistor interrupted or value to low.

CHAPTER IX: Hints for trouble shooting

Note 1: There are always 220V in plug-in unit for fluorescent lamps on amplifier disregarding the actual voltage the phonograph is adjusted to or operating with. Possible operating voltages are 100V, 117V, 210V, 220V, 230V and 240V. Lamp, starter and ballast is a matched group, never use replacements of other wattage.

Note 2A: A selected disc can properly be located as long as the light gate controls are working properly. The counting pulses can be checked easily by observing the LED indicator Z which has to light up rhythmically when the carrier is rotating (manually unlock the carrier latch for check). LED Z is dark, whenever the carrier is at a standstill but has to light up as soon as a tooth of the carrier's base plate has passed the carrier latch's front edge for about 1-2 mm. For a check lift the carrier off its friction drive wheel a little, unlock the carrier latch with the other hand and advance the carrier slowly manually.

Note 2B: The locating pulse "01" can be checked with the LED indicator K. For a check bring the disc preceding "00" ("50", if fifty discs in carrier) beneath the gripper arm. Then advance the carrier slowly (lift off the drive as explained with note 2A): K now has to light up by all means before Z but a very little advance in time is sufficient and K must still be alight when Z lights up. Which LED then goes out first does not matter but K by all means must be out before Z lights up again for the next disc approaching the gripper arm. If K lights up behind Z, the S&CC unit cannot find its starting position and the disc to be located will never be found, the carrier then rotates permanently. If K is still alight when Z lights up for 03/04, the S&CC will consider this one as 01 and any disc located will be that one "behind" the one actually selected. The light gate assembly can be shifted for about 1 mm to find a proper timing. Four K signalise succession without a selection played in between causes a memory erase same as if the LT button is actuated. Therefore, rotation checks with the carrier should be terminated with an actuation of LT button to prevent complaints raised by the first patron making a selection after the service, that he lost his money because his selection led the fourth K-signal in succession!

Note 2C: The lamp of light gates is one of 24 Volts, 3 Watts. The relieved power supply is 12 Volts, comes from amplifier fuse Si5. The photo transistors can be checked with an Ohm-meter at plug BLACK when disconnected. Read between poles 3 and 5 for the gate K and between poles 2 and 3 for gate Z. Results will be obtained only if poles 2 or 5 are positive to pole 3, hence, interchange the poles for a test. With an open light gate the Ohms reading should be below 2 Kilo-Ohms (Digital-Multimeter about 300 Ohms) and with the light broken it should be above 2 Meg.-Ohms (Digital-Multimeter shows overflow).

Note 3: Micro switch K8 is actuated by the large disc clamp of the gripper arm. If this switch is maladjusted or if the main cam gear box stops before this disc clamp is fully retraced, K8 will not be actuated. This disables the changer for the next search run and keeps the turntable running all the time. The same situation, however, can be produced by a main cam and gear box overrunning the proper rest positions and stopping finally at a time when K8 is released again. Symptom 4 of chapter VI refers to the first situation, symptom 2 of chapter VIII to the second.
To test, actuate K8 manually and run the changer through some play cycles. The disc clamp has to actuate K8 before it reaches the most retraced position and has come to rest before it has passed this position; compare the adjustment instructions.
If the system overruns the most retraced position with a K6 switch of proper adjustment, check R10, the braking resistor parallel to (and located at) the motor, it should not read more than 55 Ohms.

Note 4: With a dead motor MM check the carbon brushes. Worn-out brushes are not likely before some years of service, however, a lack of contact pressure is feasible (binding brush holder). Watch for the insulation ring at one end of brush's tension spring; without this ring the motor is shorted and resistor R 15 will burn-out.

Note 5: A detail of circuit timing: Main cam motor MM is started by relay 2 of the S&CC unit for about 3 sones. After thus the transfer switch K6 should made well within these seconds. If K6 is maladjusted or defective, the main cam motor will stop in this moment, that is when the gripper arm is about half way between the disc carrier and the turntable.

Note 6: The amplifier muting at an electronic circuit is governed by transistor Tr2, and controlled by switch K1 via the grey line, pole 8, amplifier-to-changer cable. The amplifier is mute as long as this line is grounded, hence, the amplifier works outside the phonograph without any need of unmuting.

Note 7: The gripper arm is linked with the cam & gear shaft by two-way spring clutch. If the gripper arm somehow is locked with the centring disc and the arm is unable to take it off, the gear box still does advance and load the clutch spring. Finally, the spring at a certain tension will free the disc and then the arm flips to catch up. The disc then is thrown about and may land in wrong compartment or any where.

With a main cam and gear unit generally moving to fast, the arm may run the returning record into the neighbour compartment or even lose it. A complete gear cycle normally takes about 12 seconds, never permit times shorter then ten seconds. To check time, make a selection and hold the cancel button (amplifier) down all the time the arm moves. Time is counted from the moment the disc carrier stops till the homed disc is unclamped and micro switch K8 is actuated. If there is a second disc in one compartment and the original disc is selected, there is a 50% chance that the wrong one is played; the service call to be expected in such a case will be likely one of a "wrong selection".

Note 8: Transistor T22 pulls its collector to L as soon as the negative supply of the changer appears at the switch of relay 4 thus indicating that the disc just been played is now back in the carrier. If this circuit is defective, the computer does not sense this because it gets impression that the disc is still playing. Hence it will not start a new search run although it has accepted coins and selections properly. Typical for this fault is that after power off the main cam motor is still moving on and on digital display a flashing "8" in the RH digit appears. For a start short the collector of T22 to ground momentarily.

If transistor T22 is permanently shorted to ground the just playing disc can not be cancelled while it is playing. After this last play and also after power off the phonograph does not do anything.

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