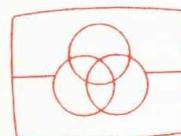


Car Digital Compact Cassette deck SCA-DCC 1.1

Service
Service
Service

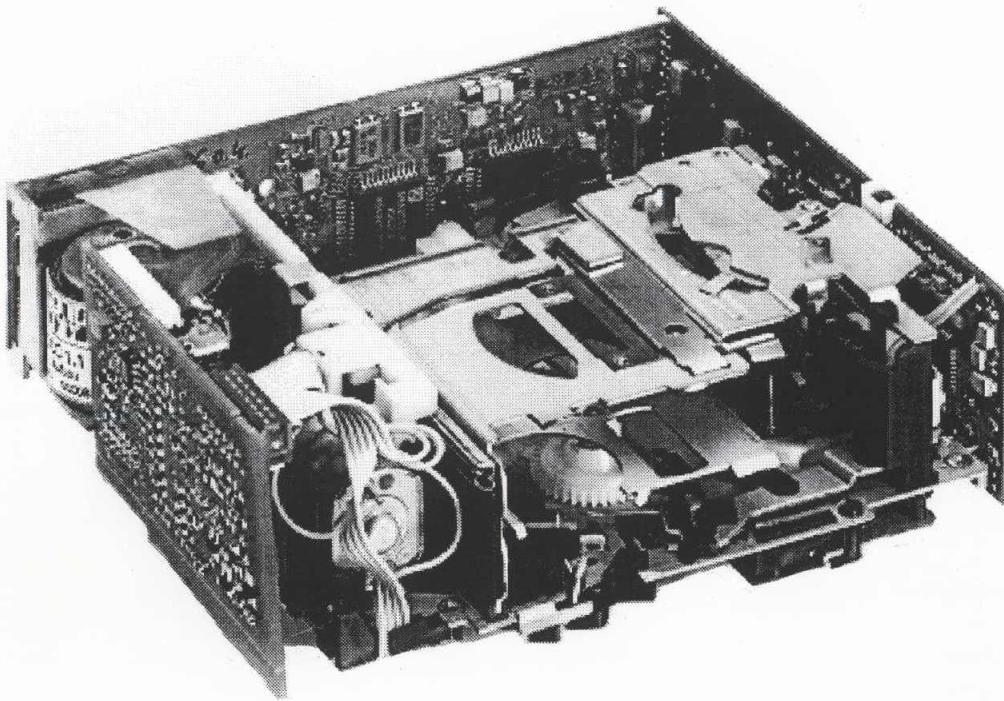


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Service Manual

12 V



DIGITAL
DCC
COMPACT CASSETTE

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1.1 MECHANICAL SPECIFICATIONS

Operating position	: Any position from horizontal -10° to +45°
Tape speed	: 4.76 cm/sec
Winding speed (C60 cassette)	: 100 sec.
Loading time	: < 3.5 sec.
Eject time	: < 3.5 sec.

1.2 ELECTRICAL SPECIFICATIONS

Supply voltages	: +14.2Vdc(-25%/+15%), +5Vdc(±10%), +9Vdc(±12%)
Bus interface	: I ² C (Inter-IC)

DIGITAL (DCC) OPERATION:

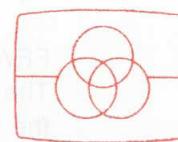
Bit System	: 16 bit linear
D/A conversion	: Bitstream, 256 times oversampled
Sampling frequencies	: 48 kHz, 44.1 kHz, 32 kHz (auto selected)
Frequency response	: 5 - 20,000 Hz (± 1dB)
Distortion	: 0.01% (1 kHz)
Wow and flutter	: unmeasurable
S/N ratio	: 92 dB
Channel separation	: 80 dB (1 kHz)

ANALOGUE (COMPACT CASSETTE) OPERATION:

Frequency response	: 40 - 14,000 Hz (-5 dB)
Wow and flutter	: < 0.2% (weighted)
S/N ratio	: > 50 dB (weighted) > 58 dB (Dolby B) > 66 dB (Dolby C)
No. of tracks	: 2 x 2
Channel separation	: 35 dB
Track separation	: 45 dB
Music Sensor System	: signal ≡ ≥ -30 dB; pause ≡ ≤ -40 dB

1.3 ACCESSORIES

DCC cleaning cassette SBC3500	:	4822 015 20646
Test cassette SBC419	:	4822 397 30069
Test cassette SBC420	:	4822 397 30071
Audio 1kHz test cassette	:	4822 397 30252
Audio performance test cassette	:	4822 397 30255
Friction test cassette	:	4822 395 30054
Puller for clutch	:	4822 395 60039



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2.1 FUNCTIONAL DESCRIPTION

The SCA-DCC tape deck is a full logic µP- and servo-controlled Auto-Reverse tape deck, which allows playing Digital Compact Cassette (DCC) and Analogue Compact Cassette (ACC) as well.

The principal devices are: Chassis and mechanism, Capstan motor, Servo motor, SCA-DCC hybrid control pcb, Audio pcb, Digital interface & DAC pcb and the DCC/ACC 'Thin-Film' head assy.

The interface between the deck and the host (e.g. radio set) exists of the I²C (Inter-IC) bus.

The tape deck offers the following features:

STANDARD FEATURES

PLAYBACK HEAD

DCC Thin Film head with Philips FATG (Fixed Azimuth Tape Guide).

CASSETTE INSERTION

The cassette is inserted until a click and counterforce is felt.

CASSETTE LOADING

After manual insertion and correct loading the cassette is moved by the servo motor to the 'play' position.

CASSETTE INSERTION AT POWER OFF

Cassette moves back automatically to the 'cassette insertion' position.

POWER DOWN MODE

In case of 'Power down' mode the 'cassette insertion' procedure will start.

TAPE TIGHTENING

Before a newly loaded cassette is played or before a cassette is ejected the tape transport mechanism will tighten the tape in the cassette, to prevent 'tape salad'.

TAPE TENSION

The servo motor controls constantly the tape tension during playing.

TAPE SALAD PROTECTION

If there is irregular tape transport, the mechanism changes the play direction and tries to correct the transport. If the tape transport is not correct yet after six attempts, the cassette is ejected.

EJECT

After enabling the 'eject' function the cassette is brought back to the loading position by the servo motor system.

TAPE END

When a tape end is reached, the servo motor system (automatic reverse) changes the tape play direction by 'switching' on other gears. The head stays in the same position (no moving head).

MANUAL REVERSE

When the 'Change Direction' command is activated the play direction is reversed in the same way as when the tape end is reached.

AUTOMATIC TAPE SELECTION

Type of cassette (Ferro-, Metal-, Chromium- or DCC-tape) is been detected automatically. The correct pre-amplifier stages and equalization circuits are also automatically selected.

FFW-/FRW FUNCTION

FFW = Fast Forward Winding; FRW = Fast Re-Wind.
The playback head falls back to the 'wind' position (it doesn't touch the tape anymore) and the servo motor speed is increased to shorten the 'wind' time.

STANDBY**a) Power off standby**

If the power is switched off during playback, the head and rollers are moved away from the tape.

b) Manual standby

If the tape deck is de-activated (e.g. set is switched to 'RADIO' mode) the deck is completely switched off and the head and rollers are moved away from the tape.

**WAIT MODE
(Pause)**

When the 'Wait' (pause) command is given, the normal or reverse play mode is interrupted and muting is enabled. All other modes are not interrupted.

TEST MODE 1

During this mode the tape transport and automatic tape reversion are switched off. This mode is helpful for special tape measurements, e.g. wind up torque and tape counter torque. This mode can be cleared only by giving a general reset.

DCC FEATURES**NEXT FUNCTION**

When 'Next' mode is activated, the track number is increased by one and playback resumes at the beginning of the next track/title. If the 'Next' command is given n times then the track number is incremented by n . When the 'Next' command is given during playing the last track, then the first track/title will be played.

PREVIOUS FUNCTION

When 'Previous' mode is activated within the first 10 sec of a track, playback resumes at the beginning of the *previous* track number. When 'Previous' mode is activated after the first 10 sec of a track, playback resumes at the beginning of the *current* track number. If the 'Previous' command is given n times then the track number is decremented by n . When the 'Previous' command is given during playing the first track, then the last track/title is be played.

Note: 'NEXT FUNCTION' and 'PREVIOUS FUNCTION' as described above are only valid for pre-recorded DCC tapes; for user-recorded tapes these functions are the same as the **analogue NEXT- and PREVIOUS functions**.

SCAN FUNCTION

After activating the 'Scan' function every track is played during 10 seconds. Tracks are played in an increasing sequence. After the last track the first track is played again. The 'Scan' function is stopped after giving any other command.

BLANK SKIP FUNCTION

When this function is enabled, and 'silent' areas of > 10 sec are detected, the 'Next' function is enabled automatically.

PLAY TIME and TRACK NO.

Via the IC bus this (digital) information is sent to the host µP (of the set where the SCA-DCC deck is built in), where it is used to display the play time and track number.

TEXT MODE

The (digital) title/text information recorded on the tape is sent via the I²C bus to the host µP (of the set where the SCA-DCC deck is built in), where it is used to display the title or text.

ANALOGUE FEATURES**NEXT FUNCTION**

When the 'Next' function is enabled, the tape is wound forward and the recorded information is detected. If there are pauses > 1 sec, the 'Next' function is stopped automatically at the beginning of the next recorded information, at which position the playback mode starts. If the 'Next' command is given n times, n recordings are skipped and the next recording is played. At reaching the tape end the 'Next' function is stopped and playback mode is activated.

PREVIOUS FUNCTION

When the 'Previous' function is enabled, the tape is wound backward and the recorded information is detected. If there is a recorded part > 10 sec, followed by a pause > 1 sec, the tape wind function will stop. If there is a recorded part of < 10 sec, the first pause (< 3 sec) is skipped and tape wind continues until the next pause > 1 sec. The tape wind function stops and playback mode starts. If the 'Previous' command is given n times, n recordings are skipped and the previous recording is played. At reaching the tape start the 'Previous' function is stopped and playback mode is activated.

SCAN FUNCTION

Same as 'DCC Scan' function.

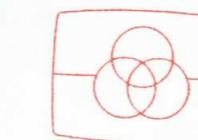
BLANK SKIP FUNCTION

Same as 'DCC Blank Skip' function.

Important note: On a DCC tape analogue tracks are on the top, the digital tracks are on the bottom of the tape. This should be kept in mind when adjusting the AUDIO PCB! See also the notes under the relevant sections.

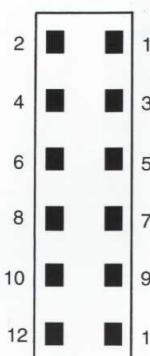
2.2 CONNECTIONS

Interface connection between host radio set and DCC deck

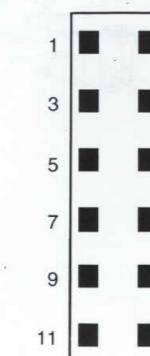


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Radio set main pcb
connector (top view)



DCC deck interface
connector (bottom view)



- | | |
|---|---|
| 1 | Servo ground |
| 2 | +5Vdc |
| 3 | Reset |
| 4 | I ² C bus CRQ (Communication ReQuest) line |
| 5 | Digital ground |
| 6 | I ² C bus SCL (Serial CLock) line |

- | | |
|----|---|
| 7 | +14.2Vdc |
| 8 | I ² C bus SDA (Serial DAta) line |
| 9 | Audio output Left |
| 10 | +9Vdc |
| 11 | Audio output Right |
| 12 | Audio (analogue) ground |

3.1 ESD

All IC's and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

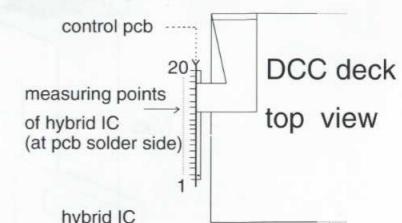
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

3.2 CHECKS AND MEASUREMENTS

In case of defects, first check all cables and connections. If they all are in good state, do the following step by measuring all voltages on pins 1-20 of the hybrid IC (Pos.7000) on the control pcb (see figure).

The voltages (all with respect to ground) should be as shown in the next table:

Pin	Voltage (DC value)	Pin	Voltage (DC value)
1	+5.0V (normal op.) / 0V (reset)	11	5.0V
2	+5.0V (cass_in) / 0V (cass_out)	12	2.3V (play) / 0.3V (reverse) 13.7V (ff_wind) / 0.2V (rewind) 0.1V (radio operation)
3	+5.0V (pulse during µP reset)	13	14.0V
4	0.0V	14	5.5V (radio) / 5.4V (cassette)
5	0.5V (radio) / 13.8V (cassette)	15	5.5V (DC level of SDA signal)
6	0.0V	16	5.5V (DC level of SCL signal)
7	0.0V (radio) / 13.1V (cassette)	17	1.1V (play) / 1.0V (reverse) 0.8V (ff_wind) / 0.6V (rewind) 0.2V (radio operation)
8	13.7V (radio) / 13.2V (cassette)	18	+5.0V
9	0.3V (play) / 2.3V (reverse) 13.7V (ff_wind) / 0.2V (rewind) 0.1V (radio operation)	19	GND
10	GND	20	0.2V



When one or more of the voltages mentioned in the table, has a wrong value, it is recommended to replace the complete control board assembly.

DIGITAL INTERFACE & DAC PCB

The Digital Interface & DAC pcb should be replaced, when:

- the deck does not operate properly after checking and/or replacing the control pcb.
- digital information is not being processed (properly) by the host set (DCC tape can not be played, display shows no or faulty information etc.)

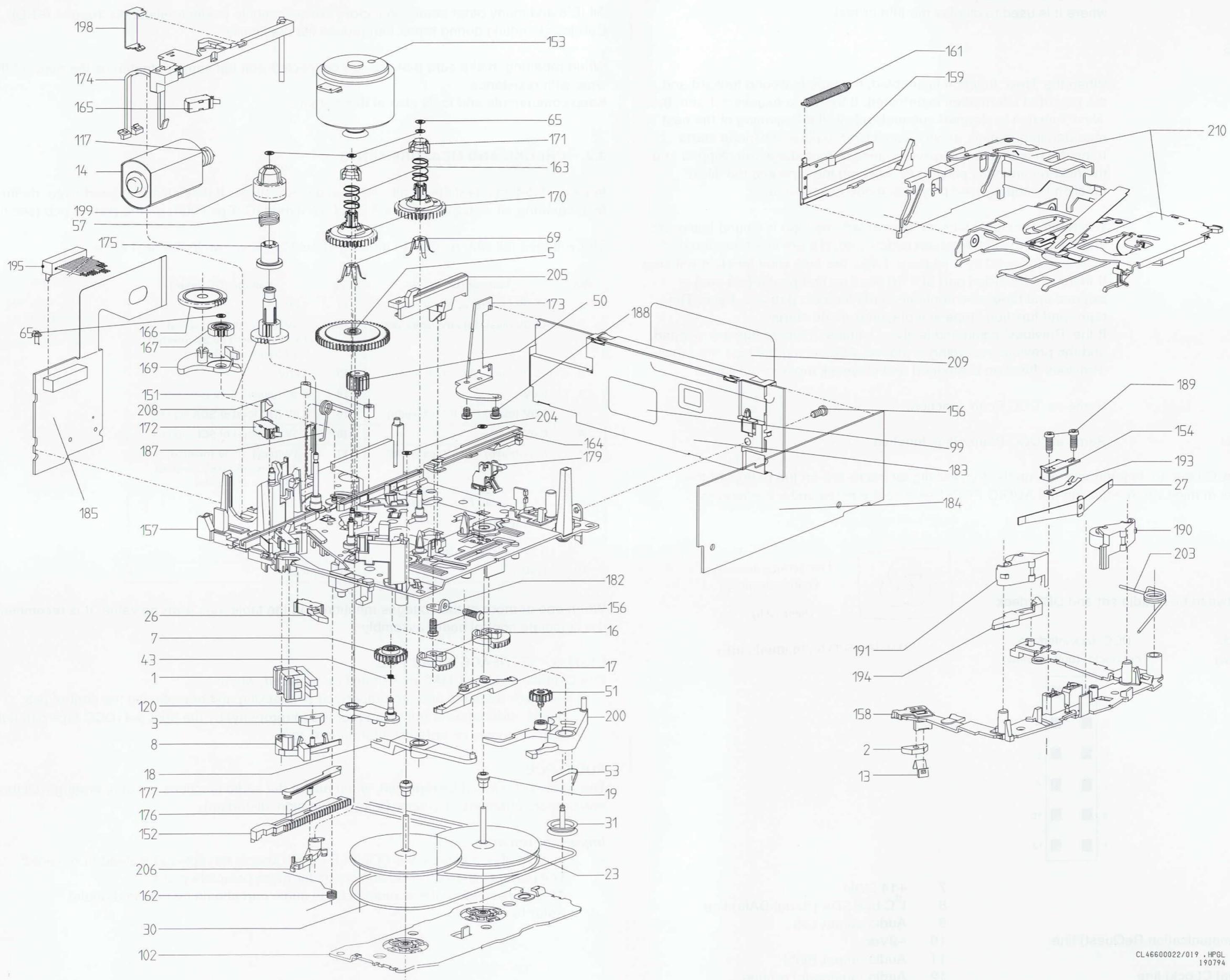
AUDIO PCB

The Audio pcb should be replaced, when any of the audio functions is not operating well (no sound from one or more channels, improper Dolby® operation, distortion).

Important remarks:

- In case of pcb defects the COMPLETE pcb should be replaced instead of repaired!
The partslist shows the service codes for these complete pcb's.
- After replacement of the audio pcb the audio part should be adjusted again!
Refer to chapter 4.

EXPLODED VIEW



3.3 DISASSEMBLY INSTRUCTIONS

HANDLING AND DEMOUNTING NOTES

- Protect the tape deck against ESD!
- Plastic catches and snap connections must be released carefully with a screwdriver or tweezers.
- Cables must be laid in the defined cable guidings after mounting.
- For lubrication see the indications in the 'Lubricating Instructions' overview (section 9.1).
- To clean the tape transport and head, only use moist cleaning tapes or a piece of cloth. Take care that no fluid (alcohol) drops into the bearings.
- For transport the lift/cARRIER assy must be in the 'eject' position. Do not carry the deck by holding the lift/cARRIER.
- Use a screwdriver with a 2.5mm blade and an insulated shaft for adjusting the capstan motor speed (for minimum wow & flutter).
- Screw the deck into the (radio) set in the following order: Front right, front left, rear left and rear right.

DISASSEMBLY PROCEDURES

NOTE: Refer to the exploded view for those parts not shown in figures 2, 3 and 4 of this section.

1. Carrier/Lift assy (pos.210)

- 1.1 Unlock the carrier/lift assy (if necessary) with the lock lever on top of the cassette carrier holder, so that the carrier/lift can be shifted backwards.
- 1.2 Remove the holding spring (pos.198).
- 1.3 Loosen the guiding rod (pos.174) by loosening first the 'arm' which secures the servo motor; unlock the two other fixing points at the bottom by using a small screwdriver.
Remove, if necessary, the capstan motor wires from the conduction. The guiding rod can be taken out now.
- 1.4 Pull the carrier/lift assy upwards out of the deck.
- 1.5 The cassette carrier holder can be removed from the carrier itself by shifting the holder so that the two conductions become free from the grooves.

2. Head support (pos.158)

- 2.1 Take out first the carrier/lift assy acc. point 1.
- 2.2 Remove the flat connector pcbs of the Control pcb and the head unit from their respective connectors. Disconnect the ground wire of the head assy.
- 2.3 Remove the Digital-DAC pcb (pos.183) and Audio pcb (pos.184) by loosening the screws as indicated in the figure below.

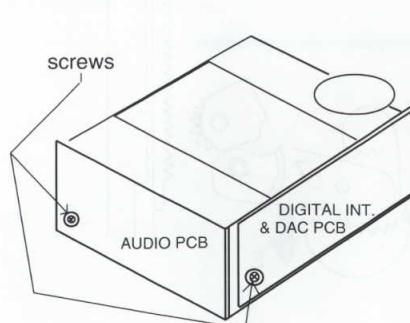
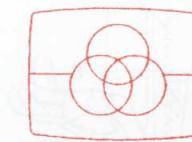


Fig. 1



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- 2.4 Remove the head carrier spring (pos.203).
- 2.5 Remove the carrier guide (pos.205) by pulling it carefully from the carrier guide support. Turn the support to the left so that the head support becomes free.
- 2.6 Remove the lift guide (pos.164) by freeing the snap-in at the bottom of the deck and shifting the lift guide backwards.
- 2.7 Remove the locking lever (pos.194) by pulling it upwards and turning to the left simultaneously.
- 2.8 Remove the subpressure assy (pos.179).

2. Head support (continued)

- 2.9 Pull away the locking pin of the head support axle, free the plastic end of the head support and take the head support assy out.

!!! TAKE CARE NOT TO BEND THE HEAD CARRIER !!!

- 2.10 Unscrew the two hex-bolts (pos.189), loose the flat pcb cable from the conduction and take out the head.
- 2.11 Push pressure spring (pos.27) and remove it.
- 2.12 Release the plastic fixation hooks of the roller bearings to pull rollers (pos.190/191) out.
- 2.13 Take off anchor spring (pos.13), rotate anchor (pos.2) 90° to take it out.

3. Capstan motor (pos.153)

- 3.1 Remove belt (pos.30) from the motor pulley, desolder connection cables, unscrew the two torx screws (pos.188) at the bottom of the chassis and take out the motor.

!!! TAKE CARE OF CORRECT AND UNTWISTED MOUNTING OF BELT !!!

4. Servo motor (pos.14)

- 4.1 First remove the guiding rod (pos.174) acc. point 1.3.
- 4.2 Desolder connection cables and lever up the motor out of its clamps.

5. Clutch assy (pos.57/151/175/199)

- 5.1 Remove servo motor acc. point 4.
- 5.2 Cut disk (pos.65) and remove it (has to be renewed!).
- 5.3 Pull clutch from the axle.

6. Anchor holder (pos.8) and magnet double (pos.1)

(Refer to fig.2 on next page).

- 6.1 Desolder cables of magnet.
- 6.2 Swivel anchor holder counter-clockwise and press it off applying force near the pivoting point.
- 6.3 Release plastic clamps of magnet holder and press magnet out from top of the chassis.

7. Driving belt (pos.30), flywheels (pos.23) and bearings (pos.19)

- 7.1 Release pivot plate (pos.102) by turning the two plastic hooks (at front and rear of the chassis).
- 7.2 Remove pivot plate and driving belt.

!!! TAKE CARE OF CORRECT AND UNTWISTED MOUNTING OF BELT !!!

- 7.3 Pull out flywheels.

!!! TAKE CARE NOT TO LOSE THE SEALING RINGS (POS.204) !!!

- 7.4 Press bearings out of plastic housings from top side of chassis plate, use a plastic tool with diameter of 4mm in order not to damage the housings.
- 7.5 After mounting new flywheels, bearings or pivot plate the wow and flutter because every deck is adjusted individually for these components. If the wow and flutter are still out of specification, the COMPLETE deck has to be exchanged!
- 7.6 Degrease capstan axis after re-mounting the flywheels.

8. Connection wheel (pos.5), take-up wheel (pos.163/170/171) and backtension springs (pos.69)

- 8.1 Take out first the carrier/lift assy acc. point 1.
- 8.2 Lever up connection wheel from axle (HAS TO BE RENEWED!).
- 8.3 Cut disks (pos.65) from the take-up wheel axles (have to be renewed).
- 8.4 Unclamp and pull up wheels with puller (4822 395 60039).
- 8.5 Take out backtension springs.

9. ME/CR switch (pos.172)

- 9.1 Desolder connection cables.
- 9.2 Push with a small pin through the hole at the bottom of the chassis, directly under the switch.

10. ON/OFF switch (pos.26)

- 10.1 Desolder connection cables.
- 10.2 Lever up switch or push with a small pin through the hole at the bottom of the chassis, directly under the switch if servo motor and clutch were removed previously.

11. Control pins (pos.16), gear lever (pos.17) and play reverse lever (pos.18)

- 11.1 Remove the flywheels acc. point 7.
- 11.2 Remove play reverse lever.
- 11.3 Put control pins into mounting position acc. fig.3-D/E.
- 11.4 Take out gear lever.
- 11.5 Pull out control pins.

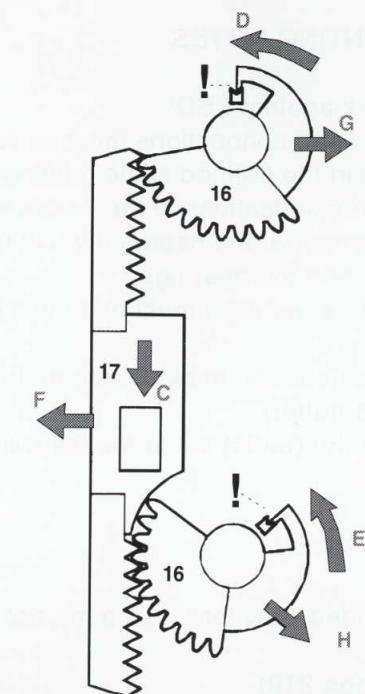
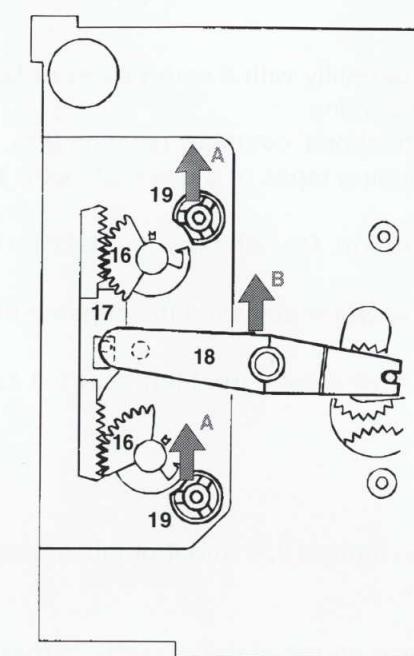


Fig. 3

12. Switching lever (pos.200) and swivel wheel assy (pos.7/120/43)

- 12.1 Release spring (pos.53) from black plastic pin.
- 12.2 Turn switching lever acc. fig.4-A.
- 12.3 Lever up switching lever from axle.
- 12.4 Remove connection wheel acc. point 8.
- 12.5 Take out swivel wheel assembly.

13. Latch (pos.206), transport rod (pos.152) and control rod (pos.177)

- 13.1 Remove ON/OFF switch acc. point 10.
- 13.2 Loosen spring (pos.162) and lever up latch from axle.
- 13.3 Remove switching lever acc. point 12.
- 13.4 Take out transport- and control rod.

14. DCC control pcb (pos.185)

- 14.1 Remove the flat connector pcb of the Control pcb from the connector on the Digital Interface & DAC pcb (pos.183).
- 14.2 Remove the cable plug (pos.195) from the connector on the Control pcb.
- 14.3 The Control pcb can be taken out now.

!!! IF THE FLAT CONNECTOR PCB OF THE CONTROL PCB BECOMES DAMAGED, THE **COMPLETE** CONTROL PCB HAS TO BE REPLACED !!!

15. Digital Interface & DAC pcb / Audio pcb

- 15.1 Follow the steps acc. points 2.2 and 2.3.
- 15.2 Desolder all connections of the connector at the outside of the audio pcb.
- 15.3 The Digital Interface & DAC pcb is delivered completely with the metal shield. So it is not necessary to remove the shield from the old pcb.

!!! AFTER REPLACING THE DIGITAL INTERFACE & DAC PCB AND/OR THE AUDIO PCB THE AUDIO PART HAS TO BE CHECKED AND RE-ALIGNED !!!

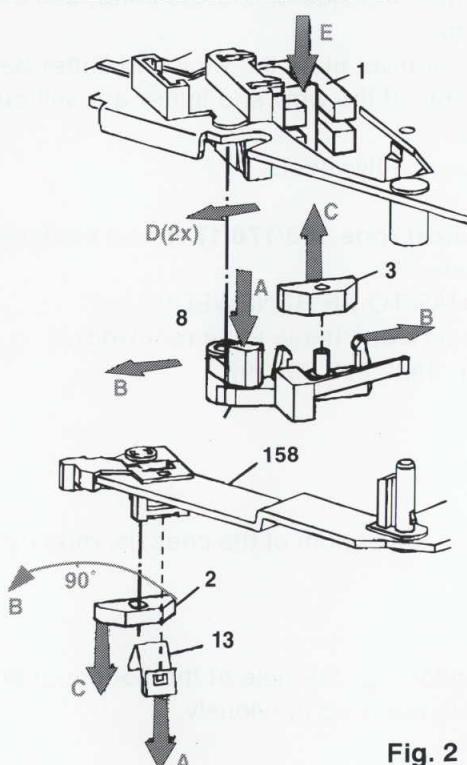


Fig. 2

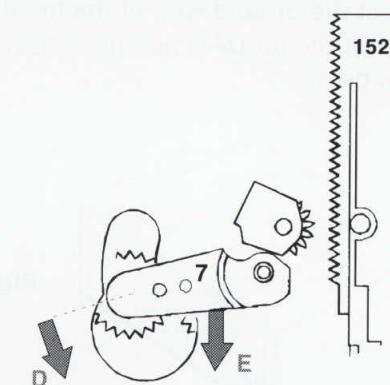
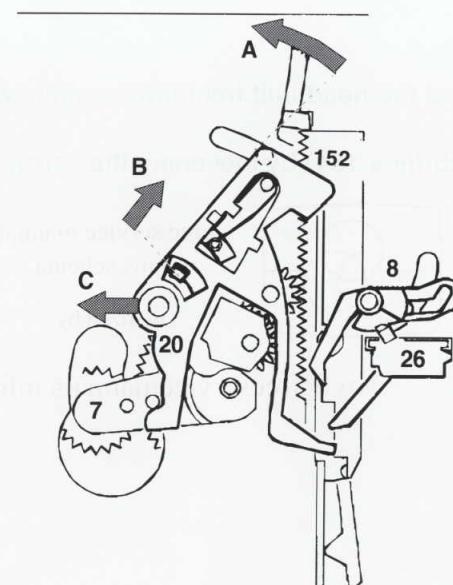
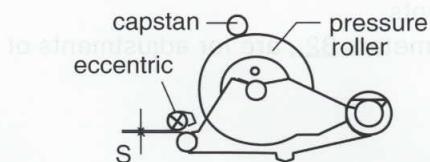


Fig. 4

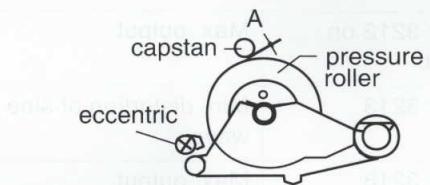
4. ADJUSTMENTS

PRESSURE ROLLER AND CAPSTAN

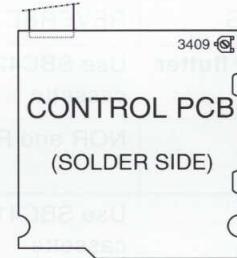
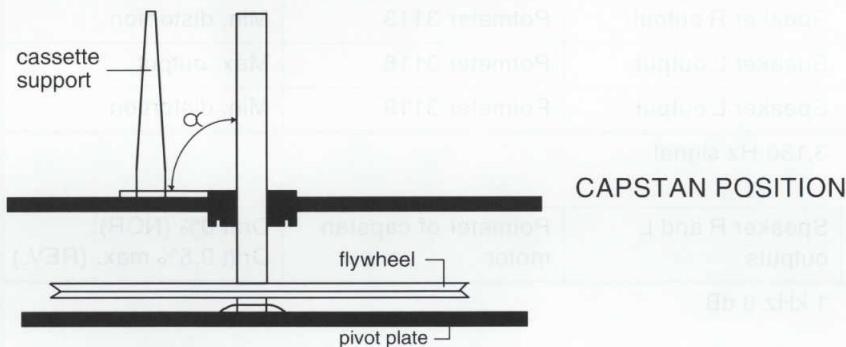
Adjust the clearance of the 'Play-NORMAL' position between pressure roller and stop head carrier (see figure) by rotating the eccentric. The distance $S = 0.3 \pm 0.05$ mm.



Adjust the clearance of the 'Fast ForWard' position between pressure roller and capstan (see figure) by rotating the eccentric. The distance $A \geq 0.05$ mm.



Check the position of the capstan to the chassis plate. The angle α should be $90^\circ \pm 4'$. See the figure below.



POTMETER 3409 POSITION (ISERVO ADJ.)

TORQUE OF REELS (FRICTION)

Use for this adjustment a friction test cassette (4822 395 30054). The 'analogue detection edge' should be removed when measuring/adjusting the torque during DCC operation. (Switch pos. 1003 may NOT be actuated!)

Adjust potmeter pos. 3409 (see figure above) to adjust I_{servo} at a value of 59 ± 3 mA. When reaching this value the friction test cassette must show the following values at:

DCC - NOR: 6.0 ± 1 mNm

DCC - REV: $5.5 +1.5/-1$ mNm

ACC - NOR: $8.5 +1/-1.5$ mNm

ACC - REV: 8.0 ± 1.5 mNm

Back tension should be $0.3 - 0.7$ mNm. If these values deviate, check lubrication points, clutch, take-up wheels and back tension springs.

WOW, FLUTTER AND TAPE SPEED (refer also to the 'ANALOGUE ADJUSTMENTS table')

Connect the wow-and-flutter meter to the loudspeaker outputs of the radio set and play the 3150 Hz signal track of the test cassette SBC420 (4822 397 30071). The value should be max. 0.5% (unweighted).

If this value deviates, check motors, pressure rollers, flywheels, belt, pulley and back tension springs. The tape speed can be adjusted by potmeter of the capstan motor. Use a screwdriver with insulated shaft!

AUDIO CHECKS AND ADJUSTMENTS

- Notes:
- Every time after replacement of the head or audio pcb the audio part should be adjusted again!
 - For all audio performance measurements a '20-20,000 Hz' filter is to be used, unless otherwise specified.
 - The lowest value of the measured outputs during the audio analogue pre-adjustments should be used as REFERENCE value for the definitive audio analogue adjustments.
 - Potmeters 31.. are for adjustments of the REV amplifiers and potmeters 32.. are for adjustments of the NOR amplifiers, both in ACC mode.

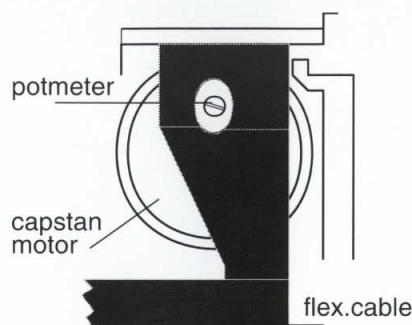
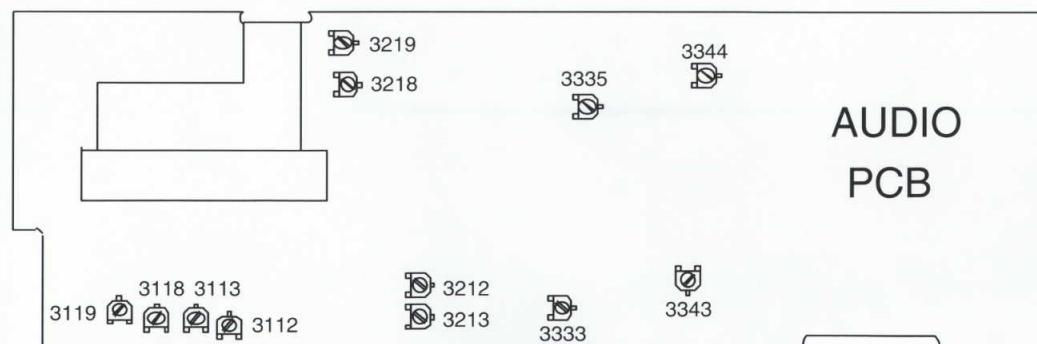
ANALOGUE PART ADJUSTMENTS

Adjustment	Conditions	Measure at:	Adjust:	Check for:
Analogue pre-adjustments	Use SBC419 test cassette	1 kHz 0 dB		
Channel R feedback	NORMAL operation	Speaker R output of radio set	Potmeter 3212 on Audio pcb	Max. output
Channel R BIAS	NORMAL operation	Speaker R output	Potmeter 3213	Min. distortion of sine wave
Channel L feedback	NORMAL operation	Speaker L output	Potmeter 3218	Max. output
Channel L BIAS	NORMAL operation	Speaker L output	Potmeter 3219	Min. distortion
Channel R feedback	REVERSE operation	Speaker R output	Potmeter 3112	Max. output
Channel R BIAS	REVERSE operation	Speaker R output	Potmeter 3113	Min. distortion
Channel L feedback	REVERSE operation	Speaker L output	Potmeter 3118	Max. output
Channel L BIAS	REVERSE operation	Speaker L output	Potmeter 3119	Min. distortion
Speed, wow & flutter adjustment	Use SBC420 test cassette	3,150 Hz signal		
Tape speed	NOR and REV oper.	Speaker R and L outputs	Potmeter of capstan motor	Drift 0% (NOR); Drift 0.5% max. (REV.)
Analogue def. adjustments	Use SBC419 test cassette	1 kHz 0 dB		
Channel R feedback	NORMAL operation	Speaker R output	Potmeter 3212 on Audio pcb	10.5 ± 0.5 dB below REFERENCE value (See 'Notes')
Channel R BIAS	NORMAL operation	Speaker R output	Potmeter 3213	Minimum value of 2 nd harmonic signal
Channel L feedback	NORMAL operation	Speaker L output	Potmeter 3218	REF.-(10.5±.5) dB
Channel L BIAS	NORMAL operation	Speaker L output	Potmeter 3219	Min. value of 2 nd h.
Channel R feedback	REVERSE operation	Speaker R output	Potmeter 3112	REF.-(10.5±.5) dB
Channel R BIAS	REVERSE operation	Speaker R output	Potmeter 3113	Min. value of 2 nd h.
Channel L feedback	REVERSE operation	Speaker L output	Potmeter 3118	REF.-(10.5±.5) dB
Channel L BIAS	REVERSE operation	Speaker L output	Potmeter 3119	Min. value of 2 nd h.
Output level adjust	Use SBC419 cass.	400 Hz/200 nWb/m		
Channel R amplification	NORMAL operation	Speaker R output	Potmeter 3333	300 ± 10 mV
Channel L ampl.	NORMAL operation	Speaker L output	Potmeter 3335	300 ± 10 mV
Channel R ampl.	REVERSE operation	Speaker R output	Potmeter 3112	300 ± 10 mV
Channel L ampl.	REVERSE operation	Speaker L output	Potmeter 3118	300 ± 10 mV

ANALOGUE PART CHECKS

Check	Conditions	Measure at:	Check for:
Distortion	Use SBC419 cassette		
THD of Right and Left channel	NORMAL operation; 1 kHz -10 dB	Speaker R and L output of radio set	THD \leq 1.5%
THD of R and L ch.	NORMAL operation; 1 kHz 0 dB	Speaker R and L output	THD \leq 2.0%
THD of R and L ch.	REVERSE operation; 1 kHz -10 dB	Speaker R and L output	THD \leq 1.5%
THD of R and L ch.	REVERSE operation; 1 kHz 0 dB	Speaker R and L output	THD \leq 2.0%
Channel separation	Use SBC419 cassette	1 kHz -10 dB	Channel sep. signal
Channel 1-2 sep.	NORMAL operation <i>Note:</i> Use a 1 kHz filter	Speaker R or L output	\geq +36 dB
Channel 3-4 sep.	REVERSE operation <i>Note:</i> Use a 1 kHz filter	Speaker R or L output	\geq +36 dB
Crosstalk	Use SBC419 cassette	1 kHz -10 dB	Crosstalk signal
Channel 2-3 cr.talk	NORMAL operation	Speaker R or L output	\leq -46 dB
Freq. response	Use SBC419 cassette	3180 μ s & 120 μ s	
	12.5 kHz / 315 Hz; NORM & REV oper.	Speaker R and L output	0 ± 3 dB *)
	31.5 Hz / 315 Hz; NORM & REV oper.	Speaker R and L output	$0 \text{--} +2.5$ dB *)
Freq. response	Use SBC419 cass.	3180 μ s & 70 μ s	
	12.5 kHz / 315 Hz	Speaker R and L output	0 ± 3 dB *)
Azimuth	Use SBC419 cass. and suitable phase meter		
Phase deviation	f = 10 kHz	Speaker R or L output	$\leq 120^\circ$

*) Note: When the level of the 12.5 kHz output signal is out of range, adjust trimmer 3344 (on the Audio pcb) for the left channel; adjust trimmer 3343 for the right channel.

POSITION OF ADJUSTMENT CONTROLS

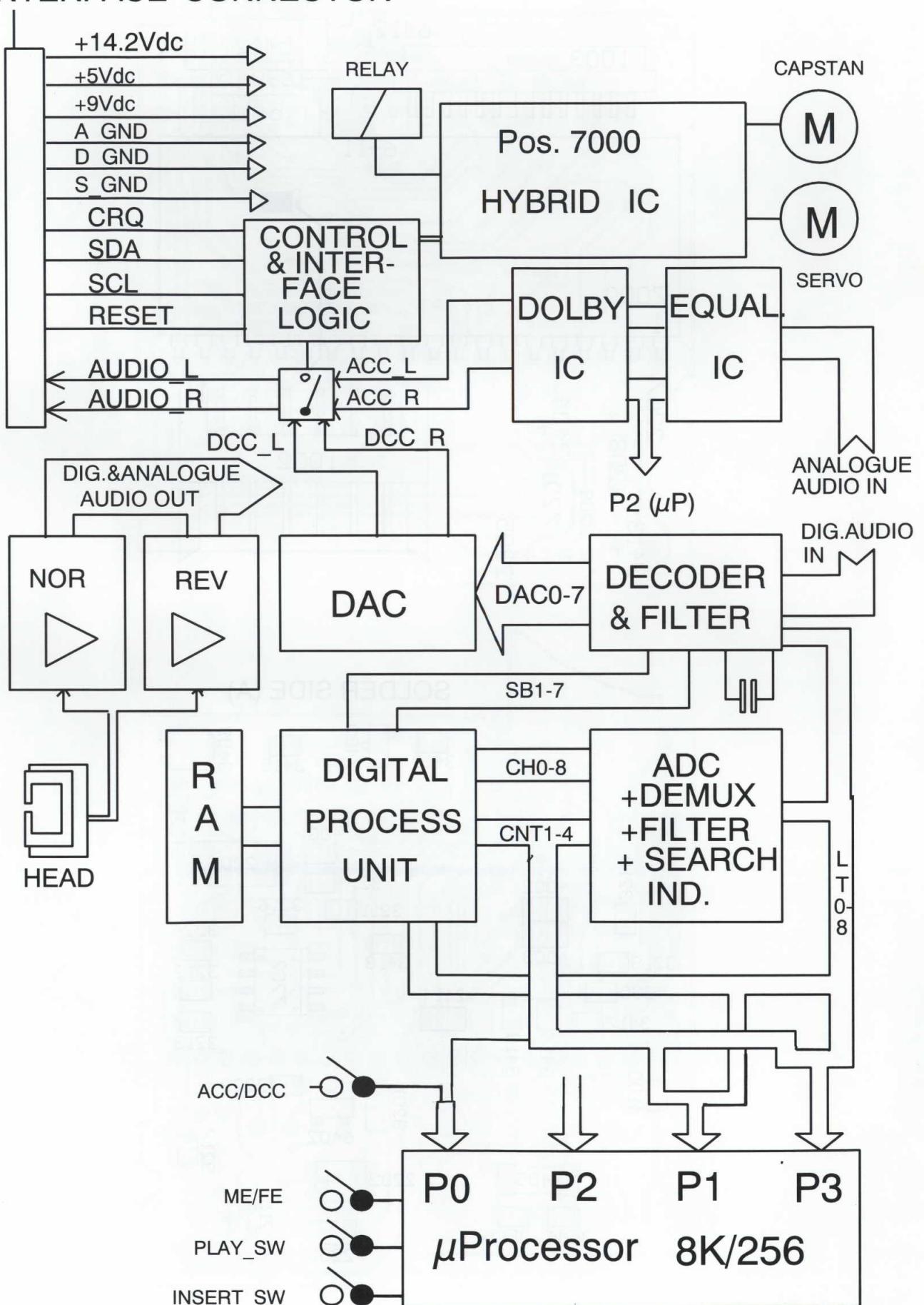
DIGITAL PART CHECKS

Check	Conditions	Measure at:	Check for:
Symbol Error Rate	Use Audio 1 kHz test cassette	(4822 397 30252)	
Aver. value ch.1-7	NORMAL and REVERSE operation; Measure <u>after</u> \geq 10s of play mode	Speaker R or L output	5E-5 (for 30 sec.)
Analog. output level	Use Audio Performance test cassette	(4822 397 30255)	
	NORMAL and REVERSE operation; 1 kHz signal full scale	Speaker R or L output	1.1 ± 0.15 V
Digital Mute	Use Audio Performance test cassette	(4822 397 30255)	
	Activate MSS FFW or MSSRW command; 1 kHz signal full scale	Speaker R and L output	-80 dB
Signal/Noise ratio	Use Audio Performance test cassette	(4822 397 30255)	
	NORMAL and REVERSE operation; 1 kHz signal full scale	Speaker R and L output	$\geq +85$ dB
Frequency response	Use Audio Performance test cassette	(4822 397 30255)	
Freq. response 20 kHz / 1 kHz	NORMAL and REVERSE operation; Do <u>NOT</u> use the 20-20,000 Hz filter	Speaker R and L output	0 ± 0.3 dB
Freq. response 20 Hz / 1 kHz	NORMAL and REVERSE operation; Do <u>NOT</u> use the 20-20,000 Hz filter	Speaker R and L output	0 ± 0.3 dB

Note: The Digital Interface & DAC pcb does not have adjustment controls.

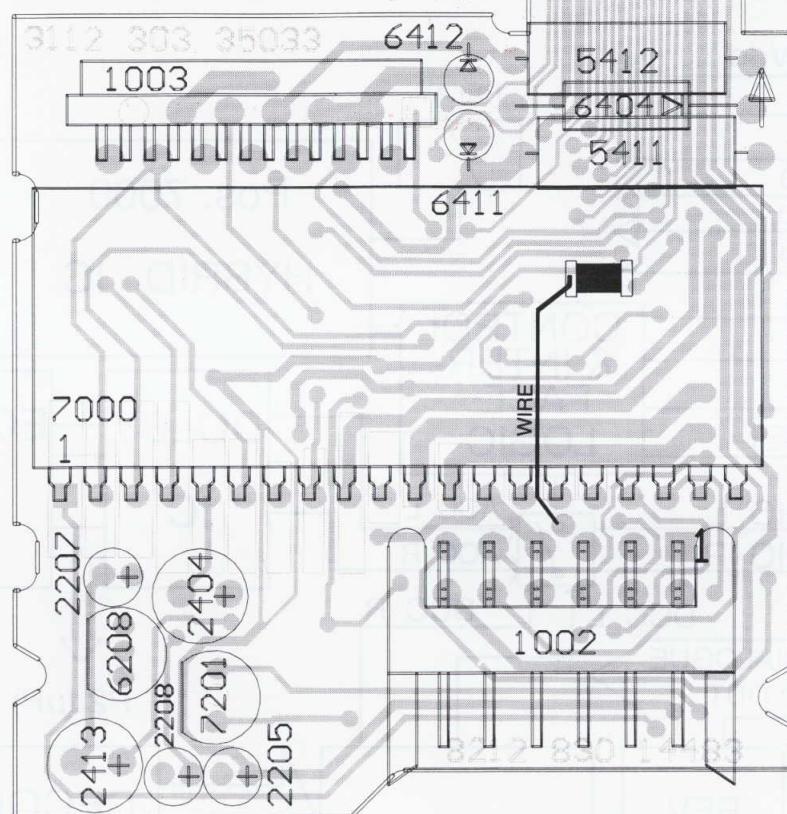
5. BLOCK DIAGRAM

INTERFACE CONNECTOR

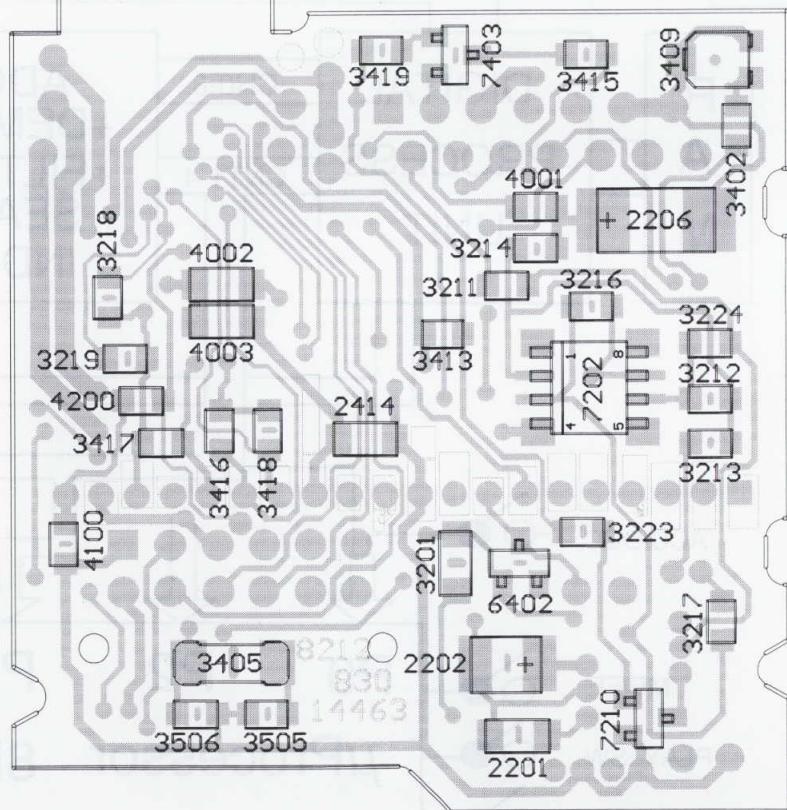


6.1 DCC CONTROL PCB LAYOUT

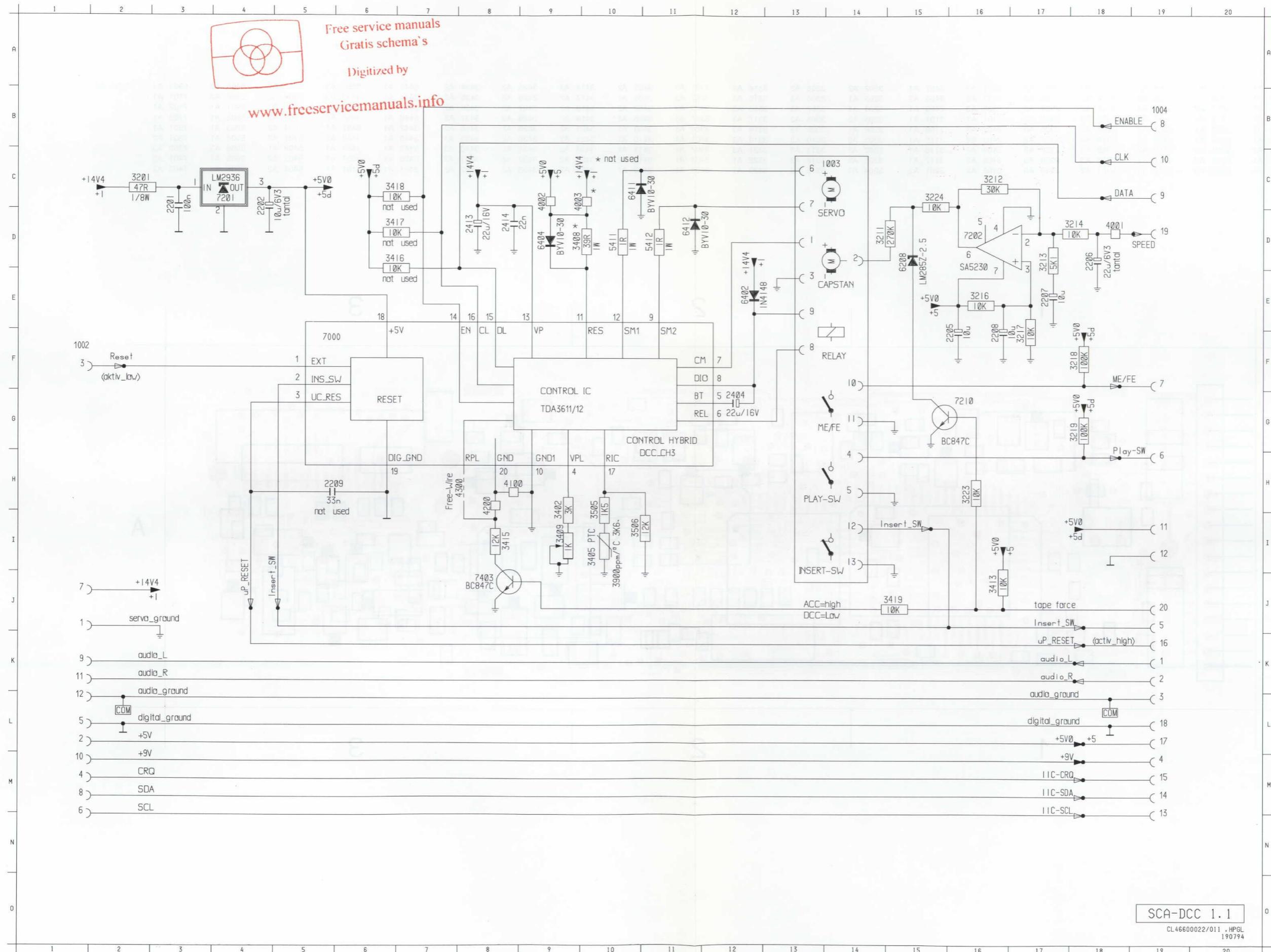
COMPONENT SIDE (B)



SOLDER SIDE (A)

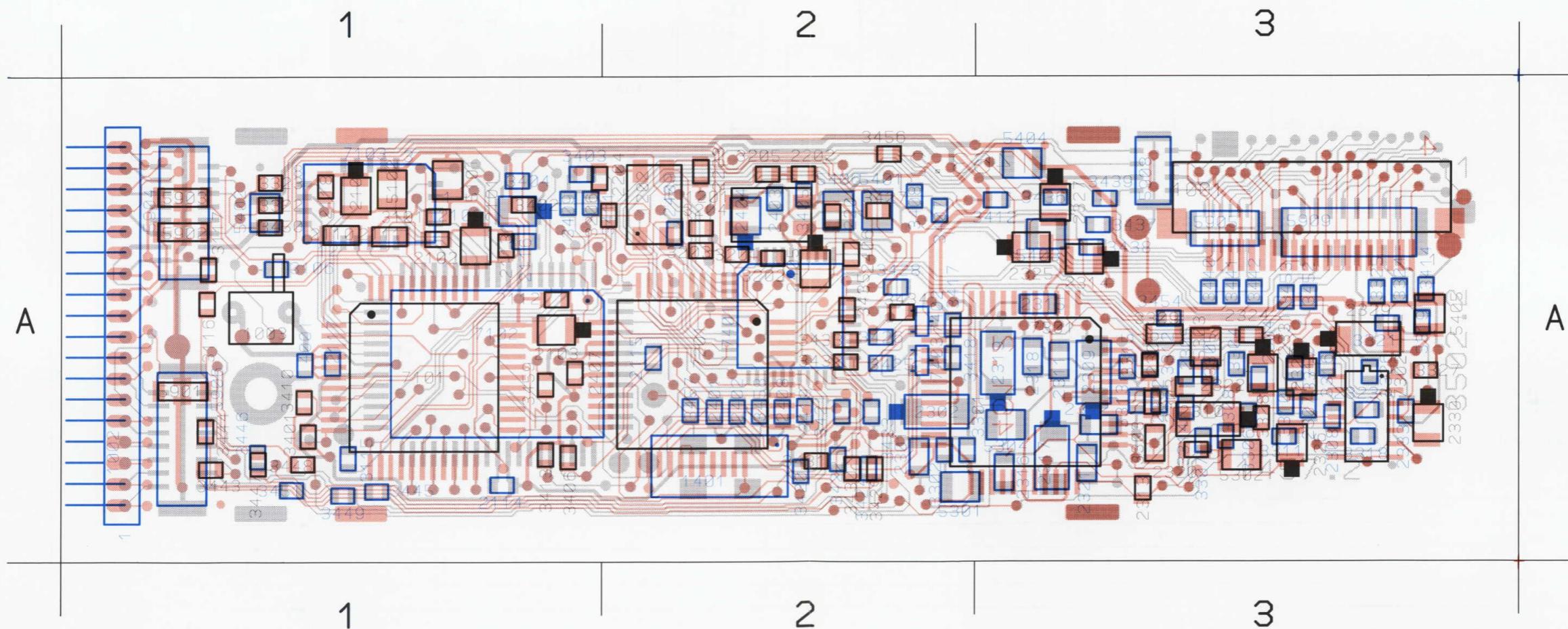


6.2 DCC CONTROL CIRCUIT DIAGRAM



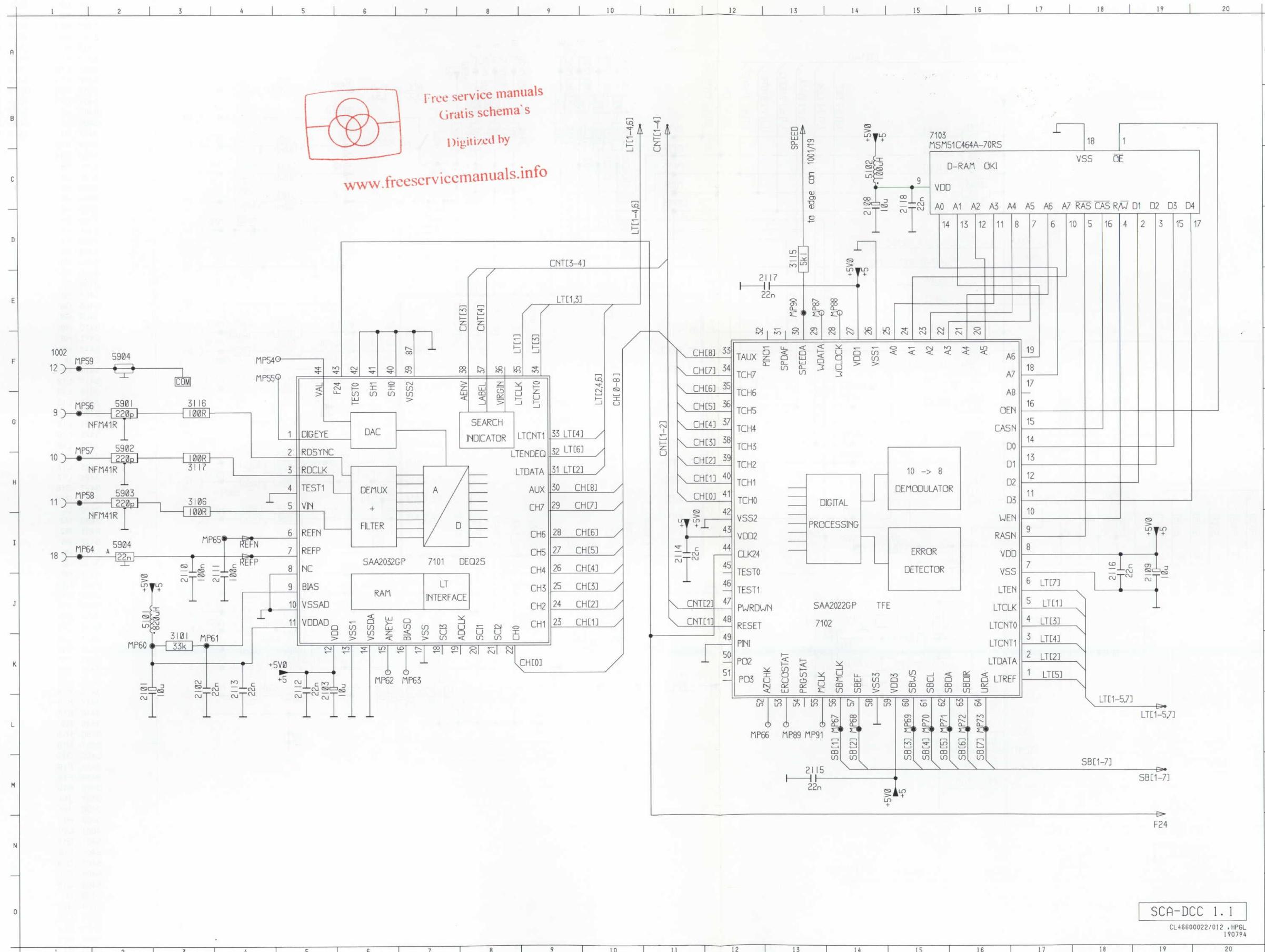
7.1 DIGITAL INTERFACE & DAC PCB LAYOUT

1001 A3	2108 A1	2117 A1	2304 A3	2313 A3	2322 A3	2331 A3	2407 A1	3202 A2	3305 A3	3314 A3	3324 A3	3405 A2	3414 A3	3425 A2	3434 A2	3443 A1	3452 A3	5102 A1	5405 A3	5909 A3	7403 A2
1002 A1	2109 A1	2118 A1	2305 A3	2314 A2	2323 A3	2332 A3	2408 A2	3203 A1	3306 A3	3315 A3	3325 A3	3406 A1	3417 A2	3426 A2	3435 A2	3444 A1	3453 A3	5301 A2	5406 A2	7101 A1	
1003 A1	2110 A1	2201 A2	2306 A3	2315 A2	2324 A3	2333 A3	2409 A1	3204 A1	3307 A3	3316 A3	3326 A3	3407 A2	3418 A2	3427 A2	3436 A2	3445 A1	3454 A3	5302 A3	5901 A1	7102 A1	
1201 A2	2111 A1	2202 A2	2307 A3	2316 A2	2325 A2	2401 A1	3101 A1	3205 A2	3308 A3	3317 A3	3327 A3	3408 A2	3419 A2	3428 A2	3437 A3	3446 A1	3456 A2	5303 A3	5902 A1	7103 A1	
1202 A1	2112 A1	2203 A1	2308 A3	2317 A2	2326 A3	2402 A2	3106 A1	3206 A1	3309 A3	3318 A3	3328 A3	3409 A1	3420 A2	3429 A2	3438 A3	3447 A1	3457 A1	5304 A2	5903 A1	7201 A1	
1401 A2	2113 A1	2204 A1	2309 A3	2318 A2	2327 A2	2403 A2	3115 A1	3301 A2	3310 A3	3319 A3	3401 A1	3410 A1	3421 A2	3430 A2	3439 A3	3448 A1	3458 A2	5401 A2	5904 A1	7301 A2	
2101 A1	2114 A1	2301 A2	2310 A3	2319 A2	2328 A3	2404 A2	3116 A1	3302 A2	3311 A3	3321 A3	3402 A1	3411 A1	3422 A2	3431 A2	3440 A3	3449 A1	3459 A1	5402 A1	5905 A3	7302 A3	
2102 A1	2115 A1	2302 A2	2311 A2	2320 A3	2329 A3	2405 A2	3117 A1	3303 A3	3312 A3	3322 A1	3403 A1	3412 A2	3423 A2	3432 A2	3441 A3	3450 A1	4001 A1	5403 A2	5906 A1	7401 A2	
2103 A1	2116 A1	2303 A3	2312 A3	2321 A2	2330 A3	2406 A2	3201 A2	3304 A3	3313 A3	3323 A1	3404 A1	3413 A1	3424 A2	3433 A2	3442 A3	3451 A1	5101 A1	5404 A2	5908 A3	7402 A2	



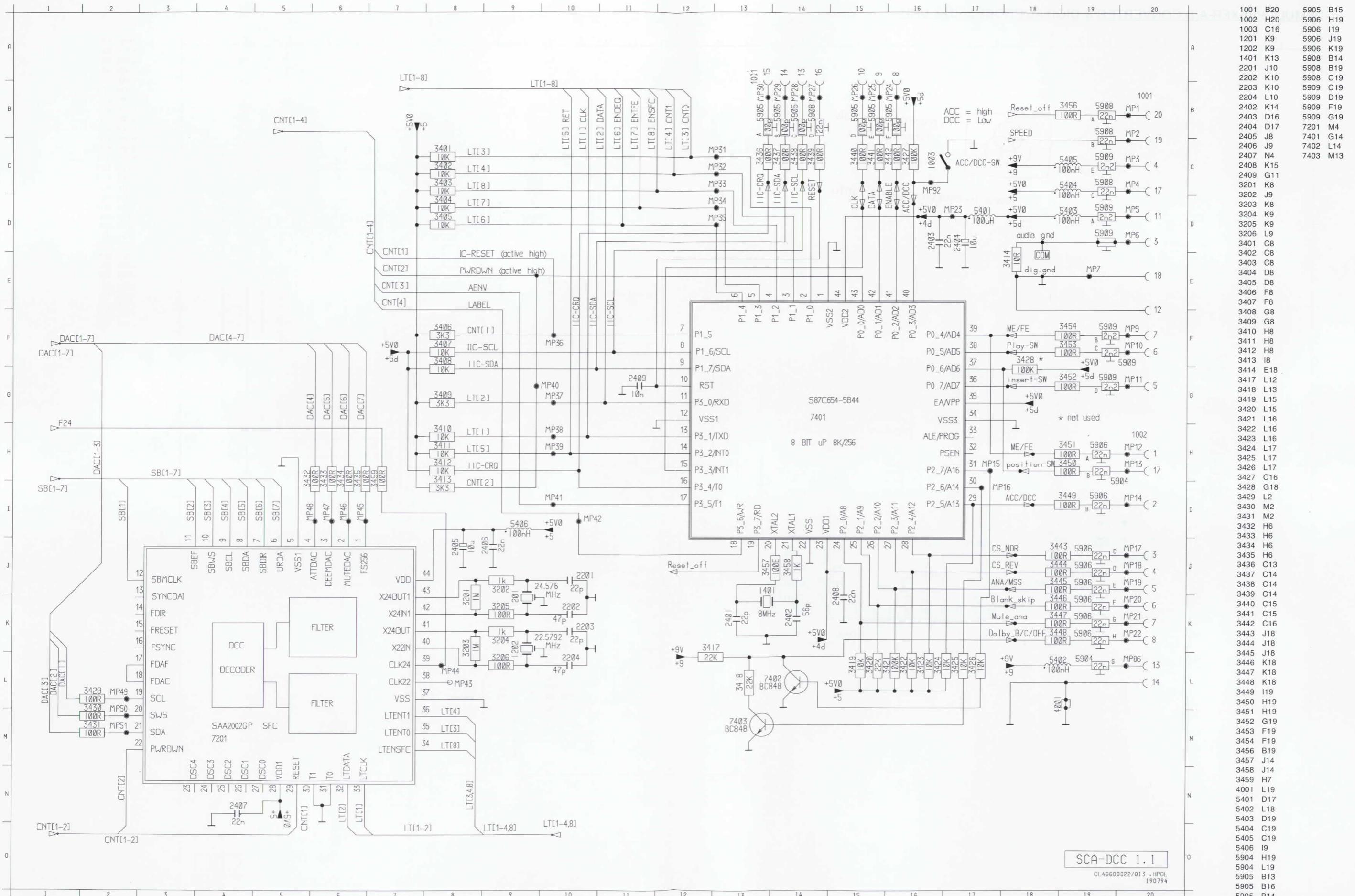
7.2 DIGITAL INTERFACE & DAC CIRCUIT DIAGRAMS

DEMULITPLEXER-A/D CONVERTER & DIGITAL PROCESSING UNIT

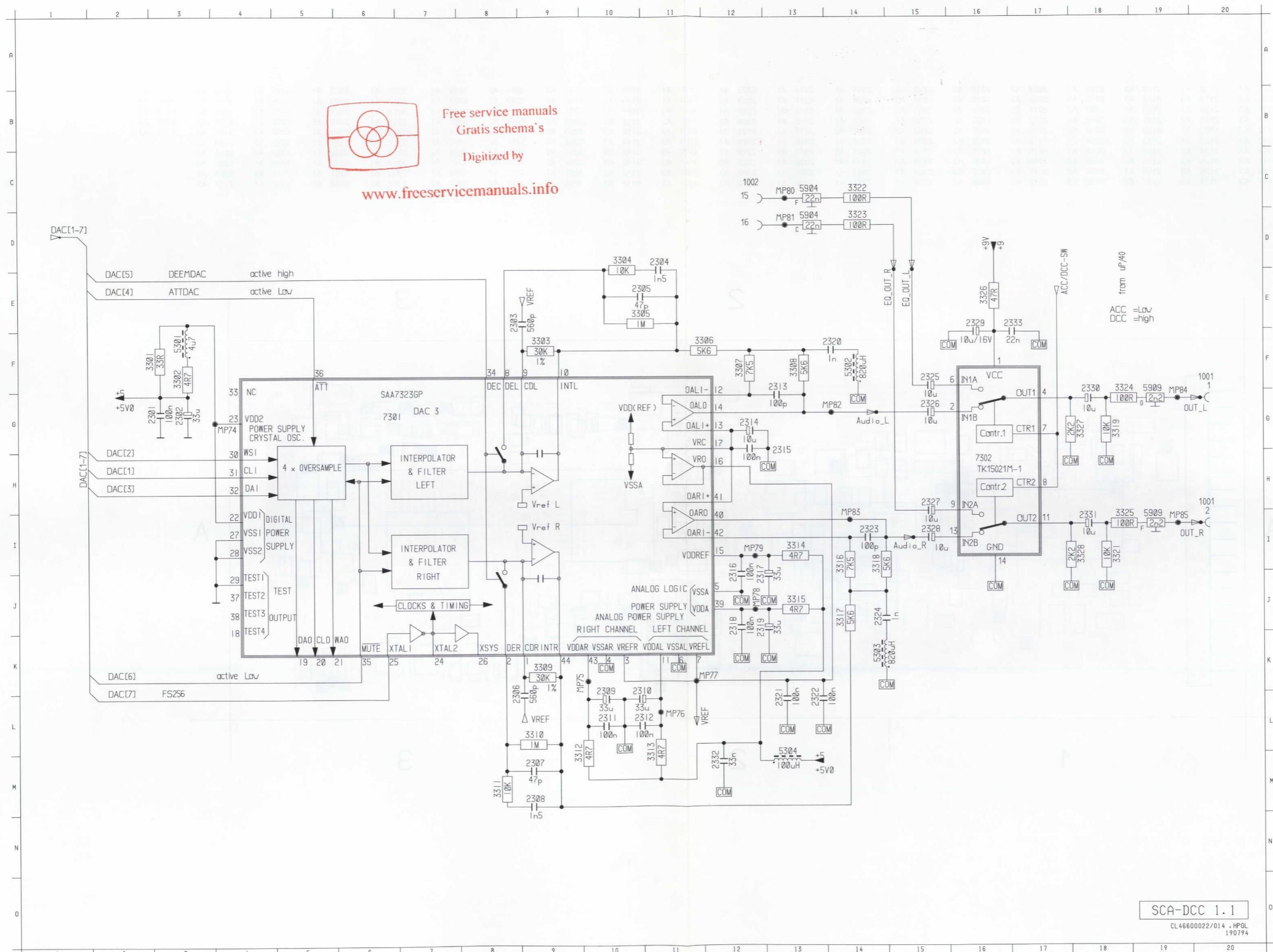


1002 F1
 2101 K3
 2102 K3
 2103 K5
 2108 C14
 2109 J19
 2110 J3
 2111 J4
 2112 K5
 2113 K4
 2114 I11
 2115 M13
 2116 J18
 2117 E13
 2118 C15
 3101 K3
 3106 H3
 3115 D13
 3116 G3
 3117 H3
 5101 J2
 5102 C14
 5901 G2
 5902 H2
 5903 H2
 5904 I2
 5904 F2
 7101 I7
 7102 J13
 7103 B15

SCA-DCC 1.1
CL4660022/012 , HPGL
190794

PROCESSOR & DECODER/FILTER

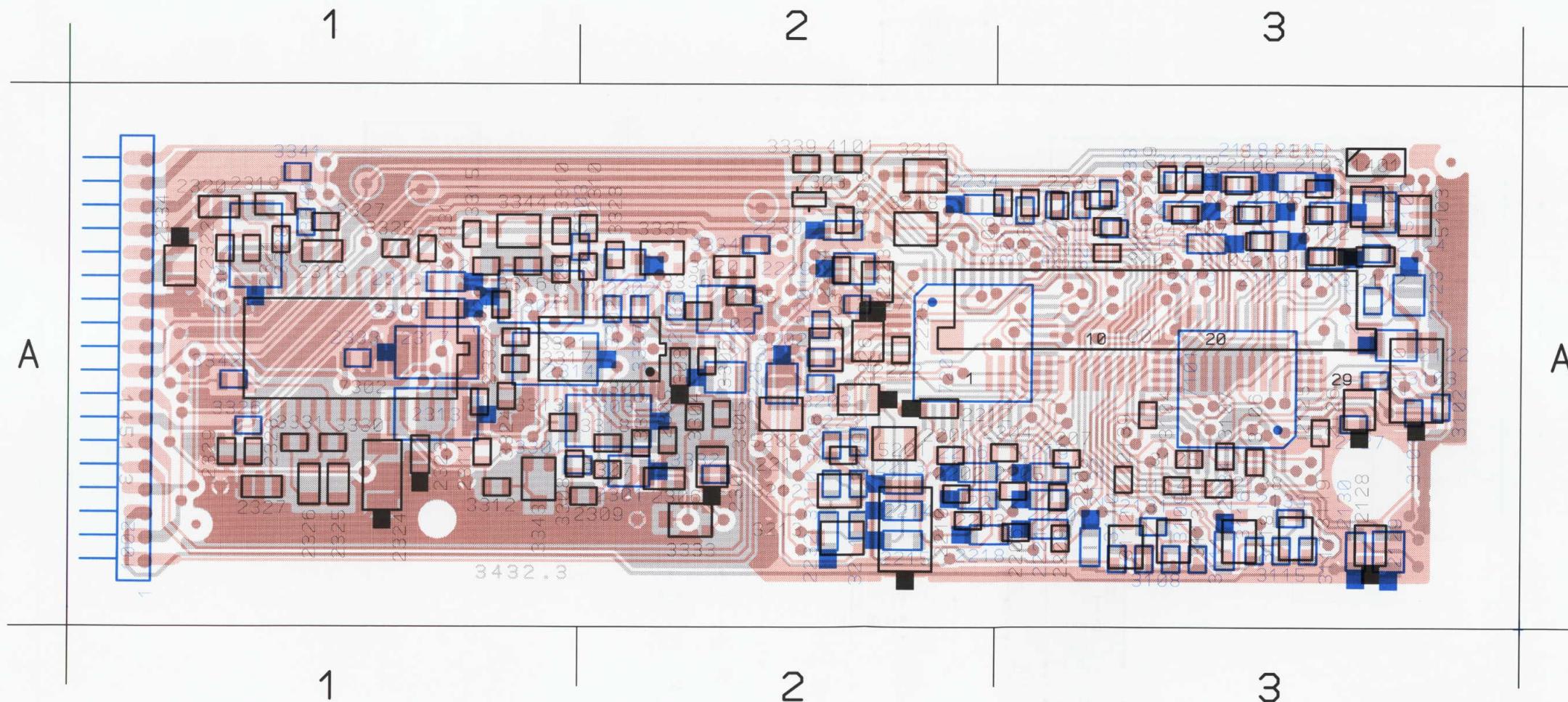
D/A CONVERTER & ACC/DCC SWITCH



8.1 AUDIO PCB LAYOUT

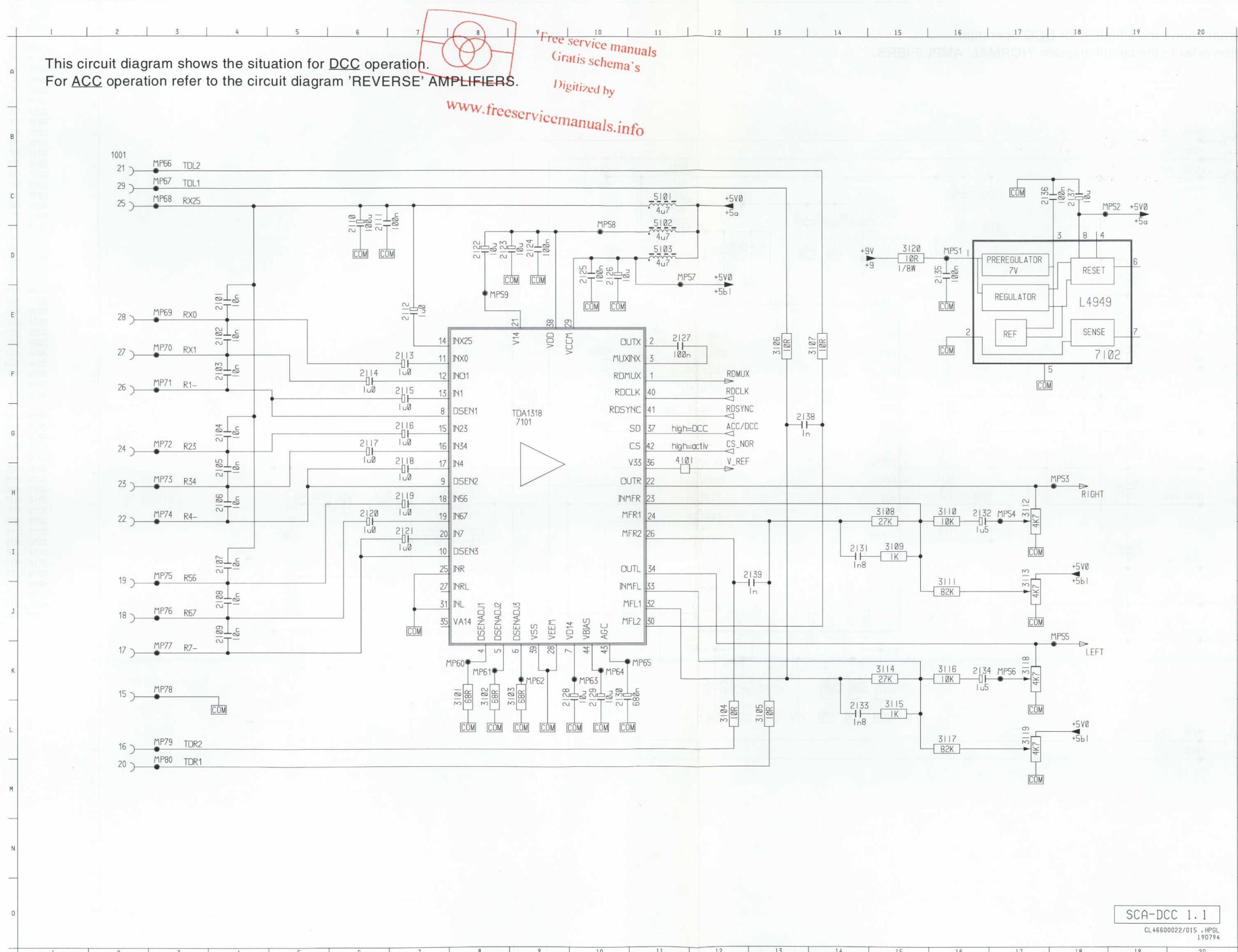
DRAFTING 200.000 A RETRIEVAL AD

1001 A3	2108 A3	2118 A3	2128 A3	2138 A3	2209 A2	2219 A2	2229 A2	2303 A1	2313 A1	2323 A1	2333 A1	3109 A3	3119 A3	3209 A2	3219 A2	3310 A1	3322 A1	3333 A1	3343 A1	7102 A2
1002 A1	2109 A3	2119 A3	2129 A3	2139 A3	2210 A2	2220 A2	2230 A2	2304 A1	2314 A1	2324 A1	2334 A1	3110 A2	3120 A2	3210 A2	3301 A1	3312 A1	3323 A1	3334 A2	3344 A1	7201 A2
1401 A3	2110 A3	2120 A3	2130 A3	2201 A2	2211 A2	2221 A2	2231 A2	2305 A1	2315 A1	2325 A1	3101 A3	3111 A3	3201 A2	3211 A2	3302 A1	3313 A1	3324 A1	3335 A1	4101 A2	7301 A1
2101 A3	2111 A3	2121 A3	2131 A3	2202 A2	2212 A2	2222 A2	2232 A2	2306 A1	2316 A1	2326 A1	3102 A3	3112 A3	3202 A2	3212 A2	3303 A1	3315 A1	3325 A1	3336 A1	5101 A3	7302 A1
2102 A3	2112 A3	2122 A3	2132 A2	2203 A2	2213 A2	2223 A2	2233 A2	2307 A2	2317 A1	2327 A1	3103 A3	3113 A3	3203 A2	3213 A2	3304 A1	3316 A1	3326 A1	3337 A1	5102 A3	7303 A2
2103 A3	2113 A3	2123 A3	2133 A3	2204 A2	2214 A2	2224 A2	2234 A2	2308 A1	2318 A1	2328 A1	3104 A3	3114 A3	3204 A2	3214 A2	3305 A2	3317 A1	3327 A1	3338 A2	5103 A3	
2104 A3	2114 A3	2124 A3	2134 A3	2205 A2	2215 A2	2225 A2	2235 A2	2309 A1	2319 A1	2329 A1	3105 A3	3115 A3	3205 A2	3215 A2	3306 A2	3318 A1	3328 A1	3339 A2	5201 A2	
2105 A3	2115 A3	2125 A3	2135 A2	2206 A2	2216 A2	2226 A2	2236 A2	2310 A1	2320 A1	2330 A1	3106 A3	3116 A3	3206 A2	3216 A2	3307 A1	3319 A1	3330 A1	3340 A1	5202 A2	
2106 A3	2116 A3	2126 A3	2136 A1	2207 A2	2217 A2	2227 A2	2237 A2	2301 A1	2311 A1	2321 A1	3107 A3	3117 A3	3207 A2	3217 A2	3308 A1	3320 A1	3331 A1	3341 A1	5203 A2	
2107 A3	2117 A3	2127 A3	2137 A2	2208 A2	2218 A2	2228 A2	2238 A2	2302 A1	2312 A1	2322 A1	3108 A3	3118 A3	3208 A2	3218 A2	3309 A1	3321 A1	3332 A2	3342 A1	7101 A3	

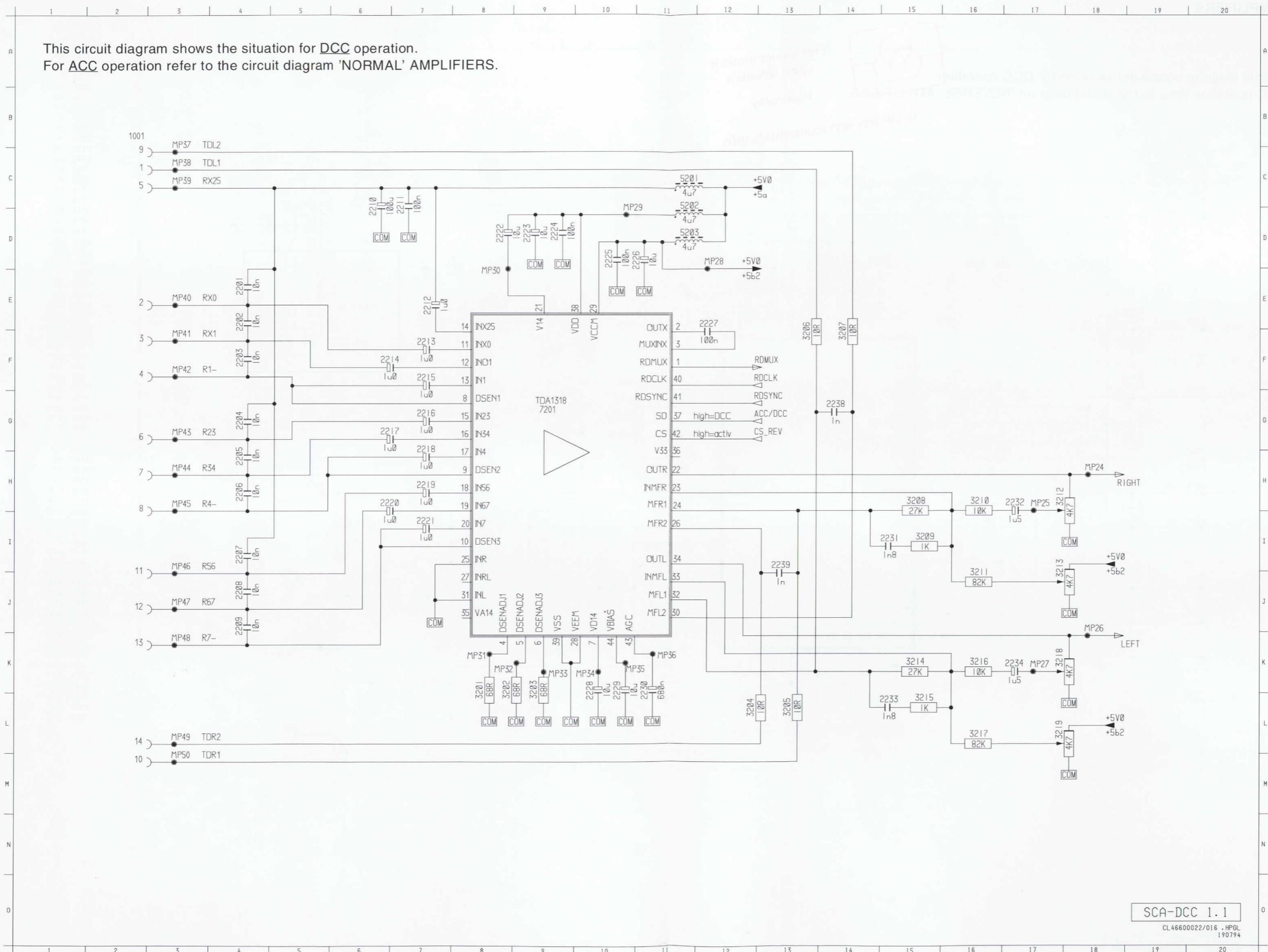


8.2 AUDIO PCB CIRCUIT DIAGRAM

'NORMAL' AMPLIFIERS

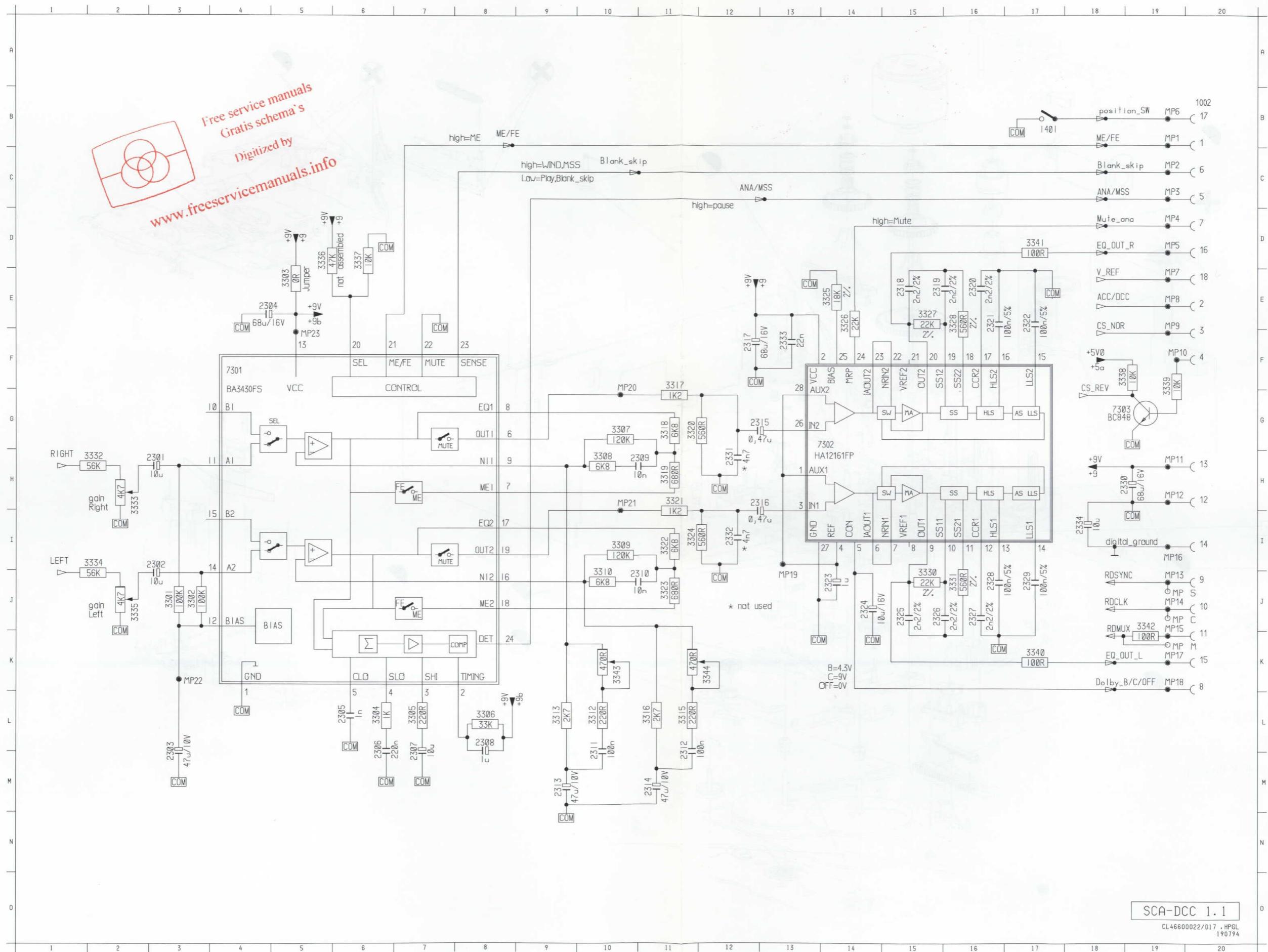


'REVERSE' AMPLIFIERS



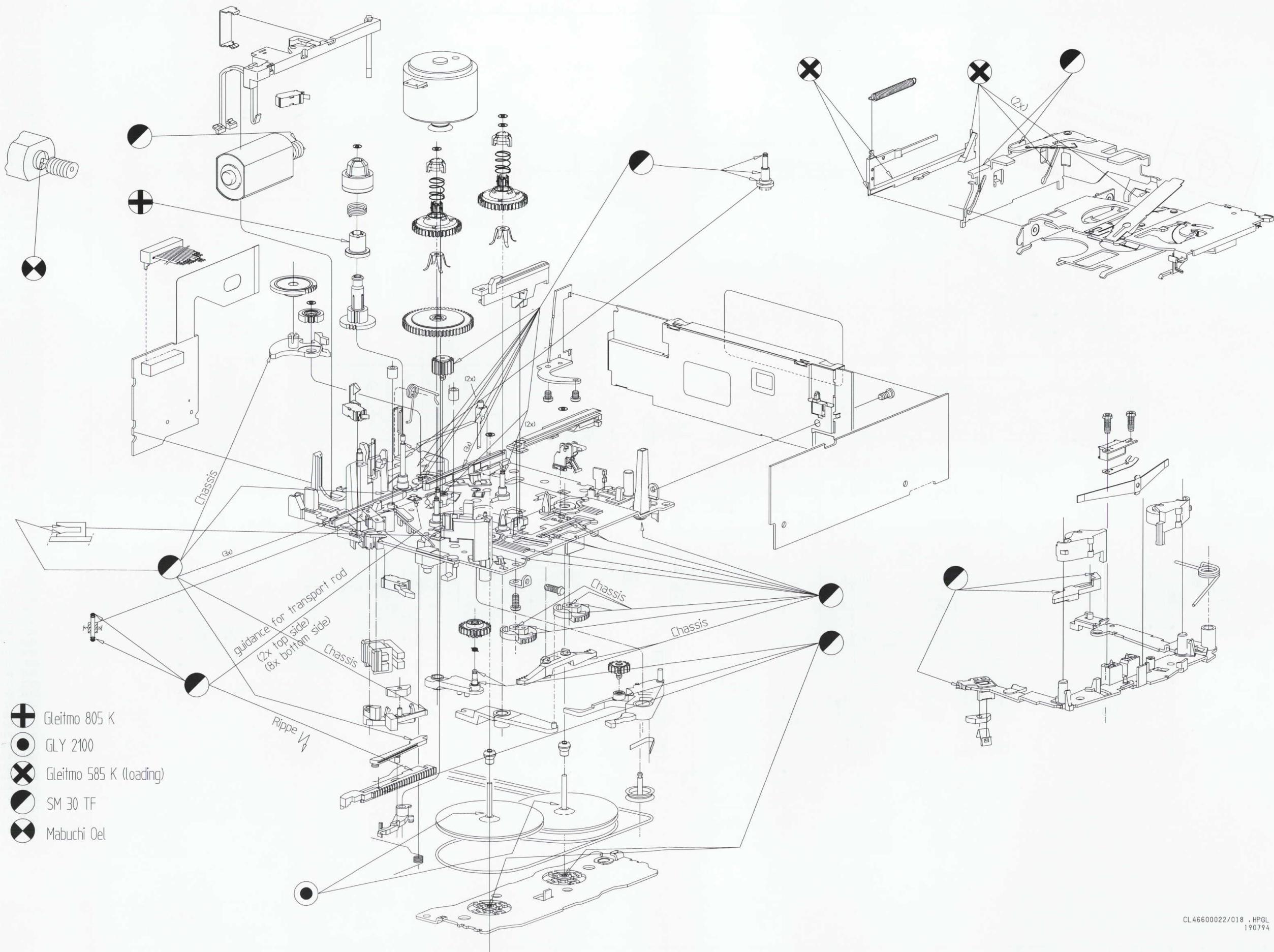
SCA-DCC 1.1
CL46600022/016 .HGPL
190794

EQUALIZATION & DOLBY B/C

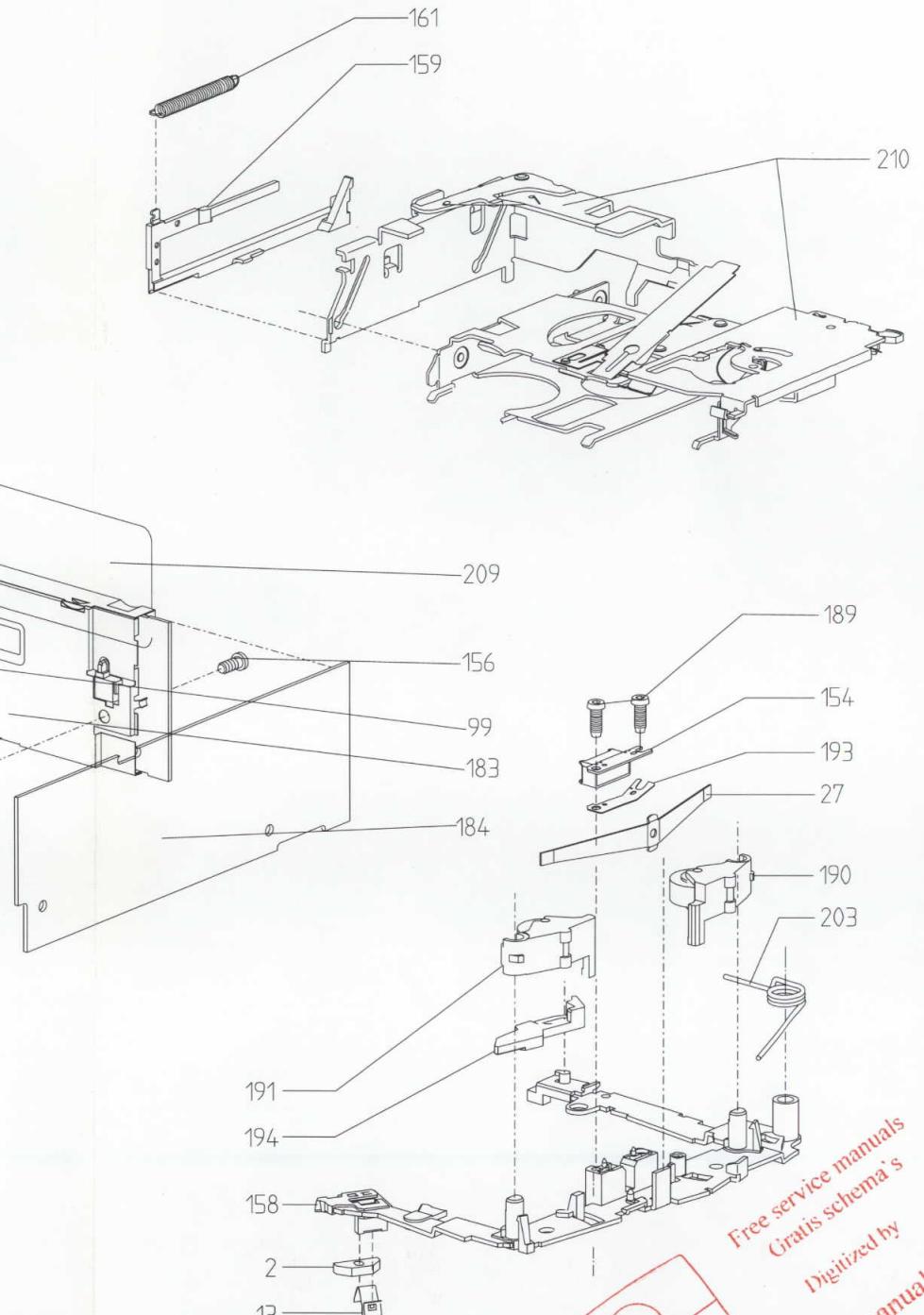
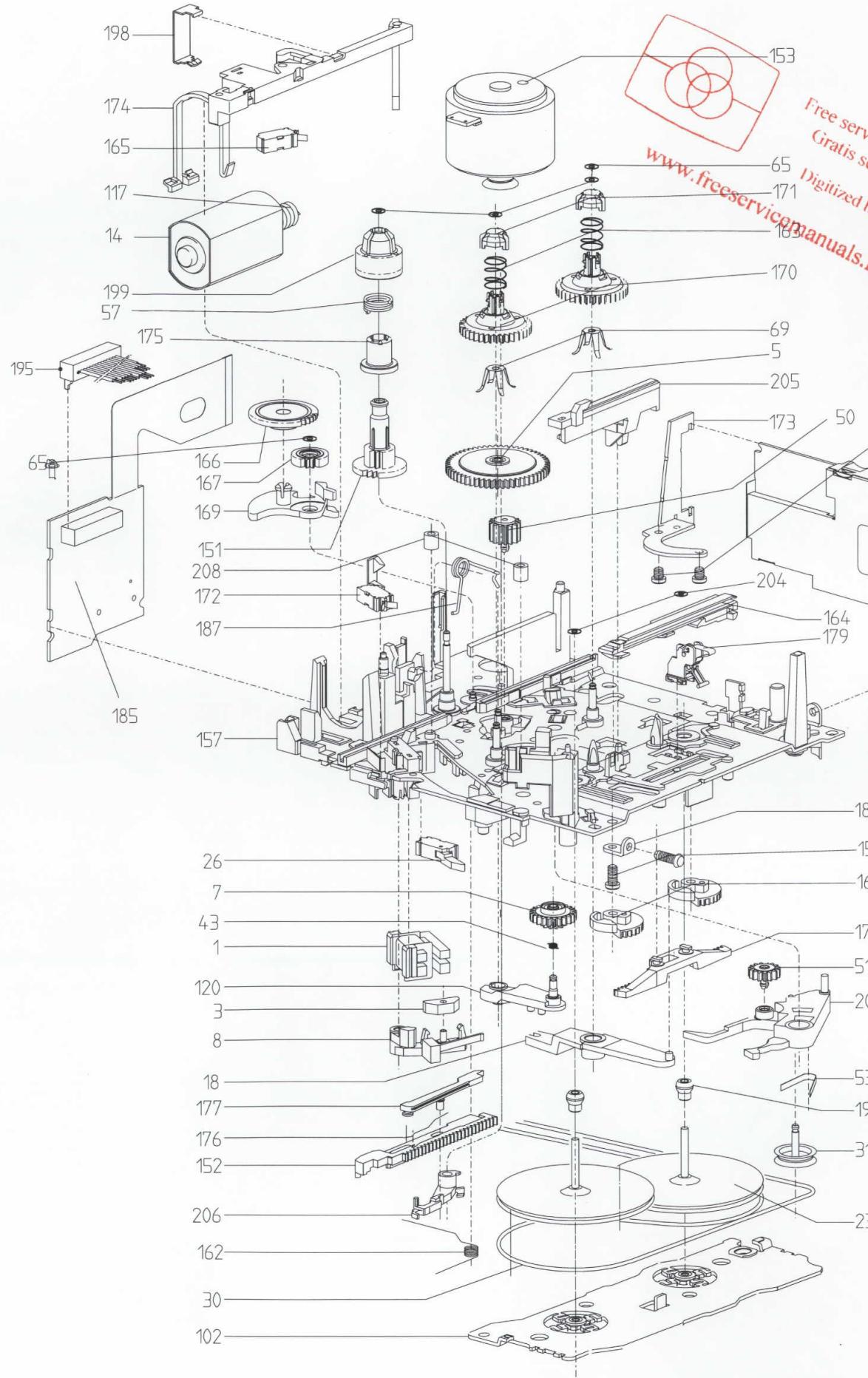


1002	B20
1401	B17
2301	H3
2302	I3
2303	L3
2304	E4
2305	L6
2306	L6
2307	L7
2308	L8
2309	H11
2310	J11
2311	L10
2312	L11
2313	M9
2314	M11
2315	G12
2316	H12
2317	F12
2318	E15
2319	E15
2320	E16
2321	E16
2322	E17
2323	J14
2324	J14
2325	J15
2326	J15
2327	J16
2328	J16
2329	J17
2330	H19
2331	H12
2332	I12
2333	F13
2334	I18
3301	J3
3302	J3
3303	E5
3304	L6
3305	L7
3306	L8
3307	G10
3308	H10
3309	I10
3310	J10
3311	L10
3312	L9
3313	L11
3314	L11
3315	F11
3316	G11
3317	H11
3318	G11
3319	J11
3320	J11
3321	F11
3322	F11
3323	J11
3324	J11
3325	E14
3326	E14
3327	E15
3328	E16
3329	E16
3330	E15
3331	E15
3332	E16
3333	E16
3334	D5
3335	D6
3336	F19
3337	F19
3338	F19
3339	F19
3340	K17
3341	D17
3342	K19
3343	K10
3344	K11
7301	F4
7302	G14
7303	G19

9.1 LUBRICATING INSTRUCTIONS



9.2 EXPLODED VIEW



10 PARTS LISTS

10.1 MECHANICAL PARTS

001	4822 281 11051	MAGNET DOUBLE
002	4822 404 21083	ANCHOR 1
003	4822 404 21084	ANCHOR 2
005	4822 522 32868	CONNECTION WHEEL
008	4822 404 21087	ANCHOR HOLDER
013	4822 492 70556	ANCHOR SPRING
016	4822 522 32869	CONTROL PIN
017	4822 404 21089	GEAR LEVER
019	4822 520 30566	CAPSTAN BEARING
023	4822 528 81378	FLYWHEEL
026	4822 277 11215	SWITCH ON/OFF
027	4822 492 70557	PRESSURE SPRING
030	4822 358 31053	DRIVING BELT
031	4822 528 81144	DIVERT. WHEEL
050	4822 522 32871	COUPLING WHEEL
065	4822 532 52348	DISC RING
069	4822 492 70926	SPRING BACK-TENSION
153	4822 361 30443	CAPSTAN MOTOR
154	4822 249 30214	HEAD ASSY
158	4822 403 71197	HEAD SUPPORT
159	4822 403 71196	LIFT ROD
161	4822 492 33477	LIFT ROD SPRING
162	4822 492 42734	ROTATION SPRING
164	4822 403 71195	LIFT GUIDE
165	4822 277 10749	MUTE SWITCH
166	4822 522 33517	TRANSPORT WHEEL
167	4822 522 33518	LIFT WHEEL
169	4822 403 71193	ROTARY LEVER
172	4822 271 30852	CR/ME SWITCH
174	4822 403 71194	GUIDING ROD
179	4822 403 71205	SUBPRESSURE ASSY
57/151/175/199	4822 528 20788	ASSY1 (CLUTCH)
163/170/171	4822 528 10907	ASSY2 (TAKE_UP WHEEL)
51/53/200	4822 403 71202	ASSY3 (SWITCH LEVER)
7/43/120	4822 403 71203	ASSY4 (SWIVEL WHEEL)
14/117	4822 361 30297	ASSY5 (SERVO MOTOR)
190	4822 528 81535	ROLLER ASSY, NOR
191	4822 528 81536	ROLLER ASSY, REV
193	4822 492 71612	HEAD SPRING
194	4822 403 71201	LOCKING LEVER
195	4822 320 50361	CABLE ASSY
198	4822 403 71204	HOLDING SPRING
204	4822 532 12268	RING
205	4822 403 71198	GUIDE CARRIER
206	4822 403 71199	LATCH
208	4822 532 12296	ATTENUATOR RING
210	4822 691 20978	CARRIER/LIFT ASSY
211	4822 532 52348	EARTH CABLE ASSY
LUBRICATING AIDS		
---	4822 390 10107	CONT. OIL 61MM2/S
---	4822 390 20128	ISOFLEX TOPAS L30

10.2 ELECTRICAL PARTS

183	4822 214 52227	DIGITAL&DAC PCB ASSY
184	4822 214 52226	AUDIO PCB ASSY
185	4822 214 52228	CONTROL PCB ASSY