

Cassette Car Radio 22RC548 - 578/00

CD Car Radio 22RC668 - 688/00

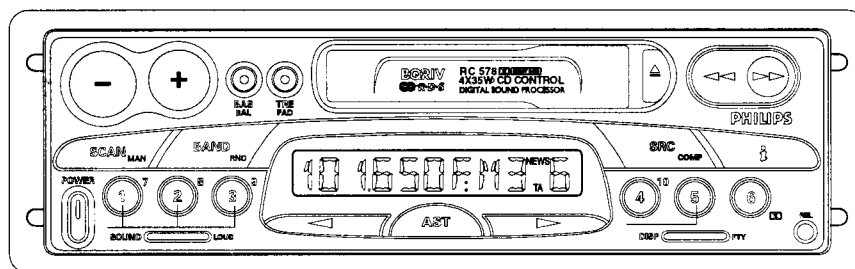
# Service Service Service

For repair information of the Cassette deck, see Service Manual No 4822 725 xxxxx of Auto Cassette Deck SCA4-3

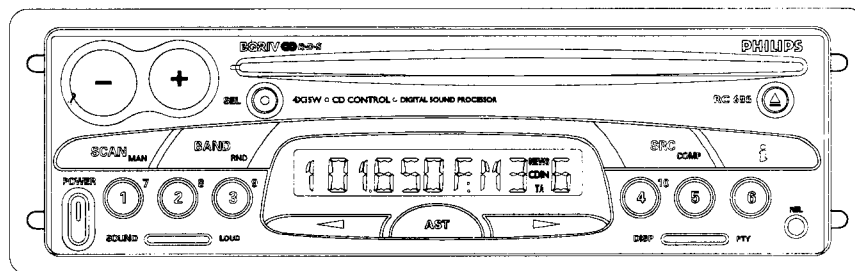
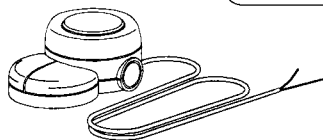
For repair information of the CD player, see Service Manual No 4822 725 xxxxx of CD mechanism CDM9-3A

# Service Manual

12 V 



Option



**COMPACT**  
**disc**  
DIGITAL AUDIO

CLASS 1  
LASER PRODUCT



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PCS 87 714



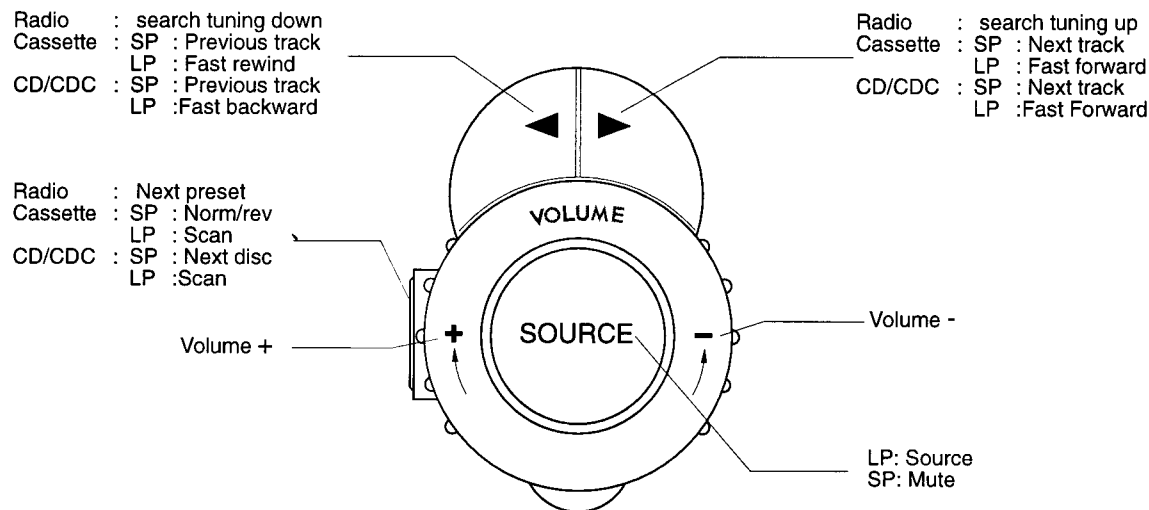
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## REMOTE CONTROL

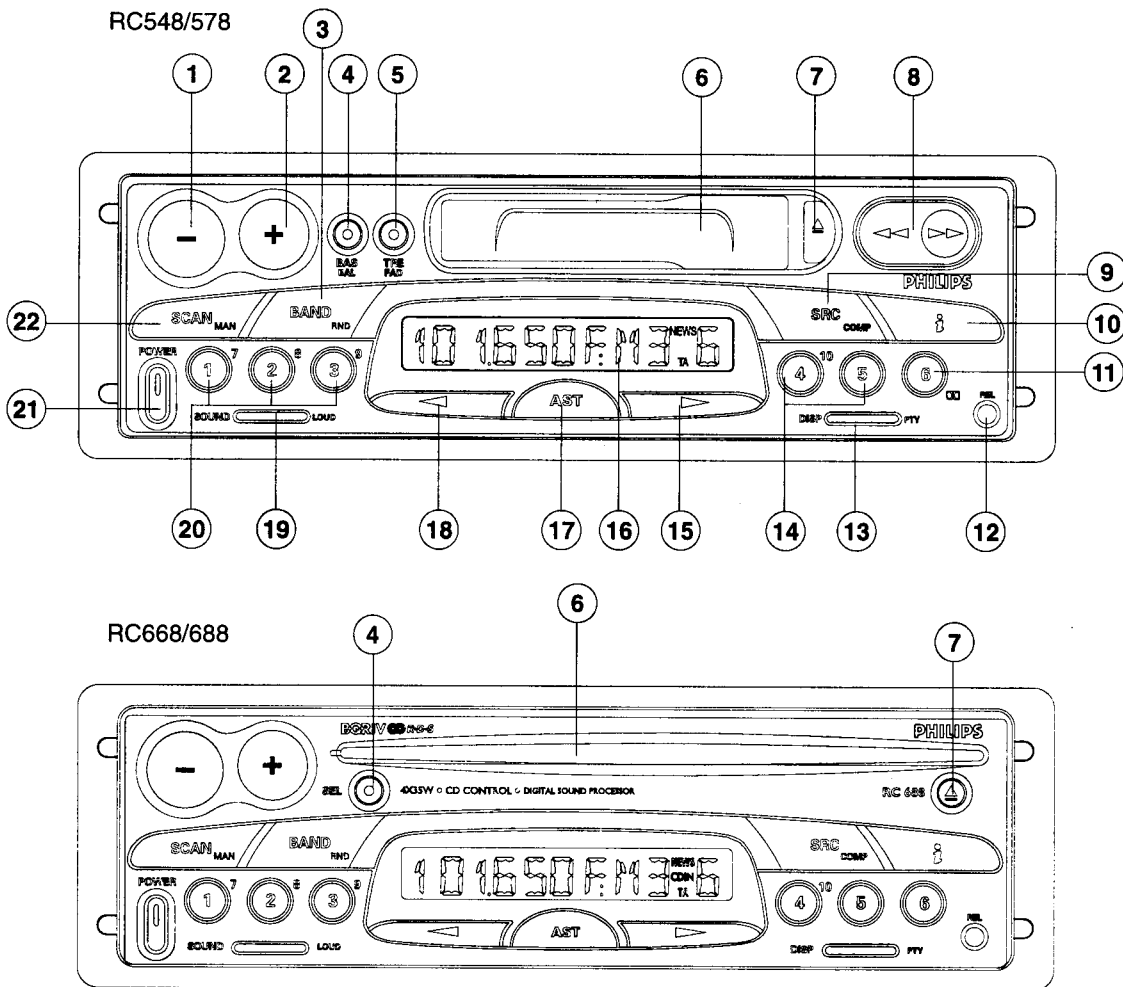
This set can be controlled also by a remote control allowing you to carry out some of the main functions of the set.

See the drawing below:

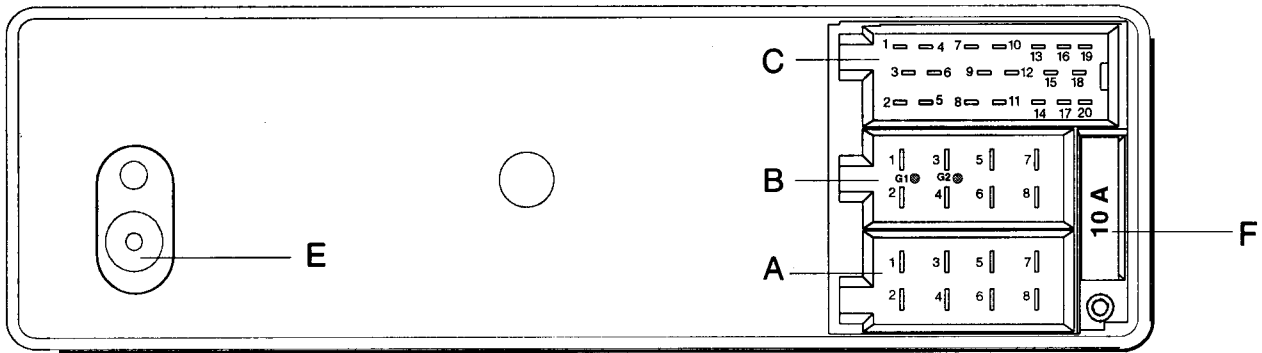


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# Commands



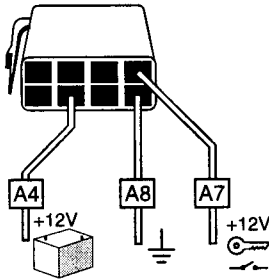
POS	RC548/00	RC578/00	RC668/00	RC688/00
1	VOL -			
2	VOL +			
3	Selection band	Selection band / Random		
4	Bass / Bal		Audio Selection	
5	Treb / Fad			
6	Cassette opening		CD opening	
7	Reverse / eject cassette		Disk eject	
8	FRW / FFW button			
9	Source selection		Source selection / compression	
10	Traffic information / News			
11	Preset 6 / Dolby		Preset 6	
12	Release button for detachable unit			
13	Display / Program type selection			
14	Preset 4, 5	Preset 4,5 / CDC sel n° 10	Preset 4, 5	Preset 4,5 / CDC sel n° 10
15	Search UP		Search UP / Track UP	
16	Display			
17	Autostore			
18	Search DOWN	Search DOWN / Track DOWN		
19	Sound / Loudness			
20	Preset 1, 2, 3	Preset 1, 2, 3 CDC sel n° 7, 8, 9	Preset 1, 2, 3	Preset 1, 2, 3 CDC sel n° 7, 8, 9
21	ON / OFF			
22	Scan frequency / Manual search selection	Scan frequency / Scan track Manual search selection		



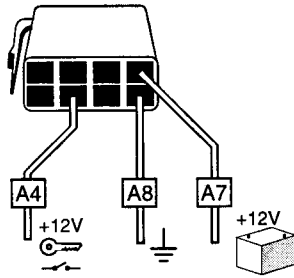
POS	FUNCTION	RC548/00	RC578/00	RC668/00	RC688/00
A1	Phone mute	X	X	X	X
A2	Remote GND	X	X	X	X
A3	Remote Input	X	X	X	X
A4	Plus accessories or permanent	X	X	X	X
A5	+ Antenna	X	X	X	X
A6	Pilot light	X	X	X	X
A7	Plus permanent or accessories	X	X	X	X
A8	GND	X	X	X	X
B1	Rear right +	X	X	X	X
B2	Rear right -	X	X	X	X
B3	Front right +	X	X	X	X
B4	Front right -	X	X	X	X
B5	Front left +	X	X	X	X
B6	Front left -	X	X	X	X
B7	Rear left +	X	X	X	X
B8	Rear left -	X	X	X	X
G1	Gateway (I2C bus access)	X	X	X	X
G2	Gateway (I2C bus access)	X	X	X	X
C1	C1	Line out RL	X	X	X
	C2	Line out RR	X	X	X
	C3	Line out GND	X	X	X
	C4	Line out FL	X	X	X
	C5	Line out FR	X	X	X
	C6	+ Switched	X	X	X
C3	C13	Bus D2B +	X		X
	C14	Bus D2B -	X		X
	C15	Bus GND	X		X
	C16	+ Permanent	X		X
	C17	+ Switched	X		X
	C18	Input reference	X		X
	C19	Input left	X		X
	C20	Input right	X		X
E	AERIAL PLUG	SLIDE IN			
F	FUSE	10A			

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 22RC668/00  
 22RC688/00

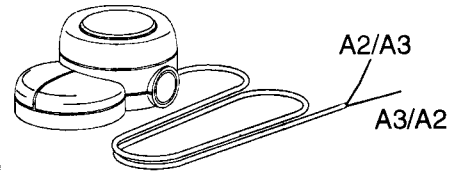
### Normal power supply connection



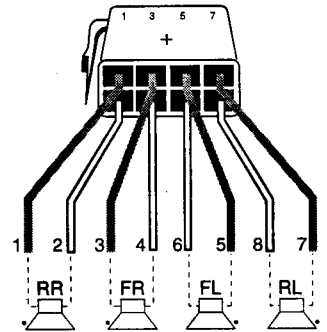
### Power supply connection for ON-OFF LOGIC



### Remote control (option)

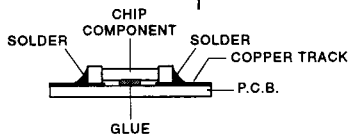
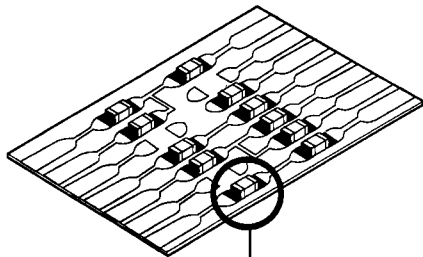


### 4X30W



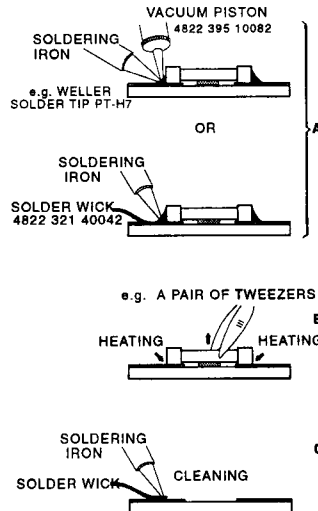
## HANDLING CHIP COMPONENTS

### GENERAL

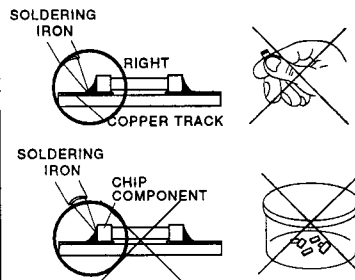


SERVICE PACKAGE

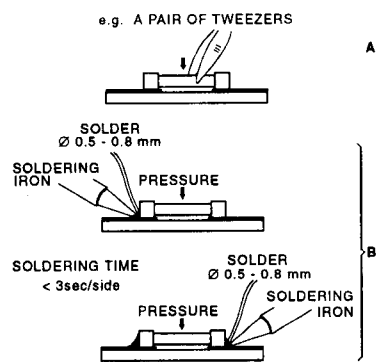
### DISMOUNTING



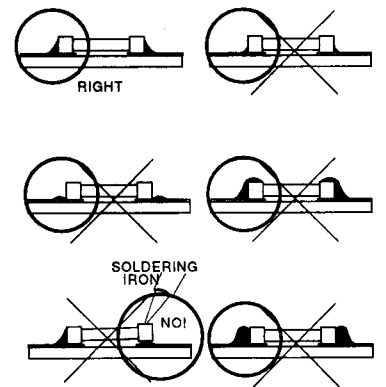
### PRECAUTIONS



### MOUNTING



### EXAMPLES



## TECHNICAL DATA

### GENERAL

Power supply	:10 to 16V DC
Dimensions	:180x160x51 mm
Front	: Full etachable
Security code	: No
Blinking LED	: Yes
Quiescent current (at 12.6V)	: <3mA (with clock and blinking LED)
Illumination color	: Orange / Green

### RADIO

LW	: 144-288 KHz -	steps Manual / Search : 1 KHz
MW (Europe)	: 531-1629 KHz -	steps Manual / Search : 1 / 9 KHz
MW ( USA)	: 530-1710 KHz -	steps Manual / Search : 1 / 10 KHz
SW	: 5.95-6.25 MHz -	steps Manual / Search : 1 KHz
FM (x3)	: 87.5-108 MHz -	steps Manual / Search : 50 / 100 KHz
IF-AM (1/2)	: 10.7 MHz / 450 KHz	
IF-FM (1/2)	: 72.2 MHz / 10.7 MHz	
Sensitivity 26dB S/N	: 38 $\mu$ V (LW)	
	: 30 $\mu$ V (MW)	
	: 25 $\mu$ V (SW)	
	: 4 $\mu$ V (FM)	
Limitation $\alpha$ -3dB	: 5 to 20 $\mu$ V	

### CASSETTE

Cassette mechanism	: SCA4.3/H
Number of tracks	: 2x2
Tape speed	: 4.76 cm/sec
Wow and flutter	: < 0.30%
Crosstalk	: > 45dB

### CD (only RC668/688)

CD mechanism	: CDM9-3A
Frequency response	: 30 - 16000Hz
Crosstalk L-R at 1KHz	: >30 dB

### AMPLIFIER

Output power	: 4x19W / 4 $\Omega$ (THD = 10%)
Treble control	: +10 / -10 at 10kHz
Bass control	: +12 / -12 at 80Hz
Balance control	: 70dB
Fader	: 70dB

ESD



#### 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 equipment available:

Anti-static table mat large 100X650X1.25mm	4822 466 10953
small 600X650X1.25mm	4822 466 10958
Connection box (1Mohm)	4822 395 10223
Extendible cable (to connect wrist band to connection box)	4822 320 11307
Connecting cable (to connect table mat to connection box)	4822 320 11305
Earth cable (to connect any product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 310 10671
wristband tester	4822 344 13999

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**INIT MODE:**

The customer may have modified some settings with the Init Mode.

Entering the Init Mode:

Switch ON the set. Press the BAND key for at least 2 seconds, until you hear a beep.

The display shows "INITIAL".

Press the ◀ or ▶ key one or more times until the option you want to modify is displayed.

Briefly press the AST key one or more times to adjust the choice.

- The choice shown on the display will be memorized by the set when you select another option or leave the "INIT" mode.

Press the BAND key for at least 2 seconds to leave the "INIT" mode.

Note: the set automatically leaves the "INIT" mode about 1 minute after your last operation.

List of "INIT" options: (Initial factory settings shown in **bold**).

Option ◀ or ▶	Choice (AST)	Usage
SRCH	<b>DX, LO</b>	Select LO if you wish to search only for strong stations during automatic tuning to a frequency.
SRC	<b>CDC, AUX</b>	Source connected to connector C3: - Select CDC for a Philips CD Changer (D2B type); - Select AUX for a portable audio player.
CD	-4 -3 -3 -1 <b>0</b> +1 +2 +3 +4	Volume level of CD relative to tuner.
CDC or AUX	-4 -3 -3 -1 <b>0</b> +1 +2 +3 +4	Volume level of CD changer or AUX input relative to tuner.
TA	-4 -3 -3 -1 <b>0</b> +1 +2 +3 +4	Volume level of Traffic Announcements, News bulletins and Alarm messages relative to tuner.
VIEW	-1 <b>0</b> +1	Select the viewing angle of the set's display.
COLOUR	<b>G 0</b>	Select the desired display colour: Green or Orange.
LOUD B	<b>1 2 3</b>	Select the level of correction for the low notes (Bass).
LOUD T	<b>0 1 2 3</b>	Select the level of correction for the high notes (Treble).
PHONE	<b>NO LO HI</b>	Select LO or HI according to phone (LO in most cases). Select NO if no phone connected.
BP TYP	<b>1 2 3 4</b>	Select type of confirmation beeps.
BP LEV	<b>1 2 3 4 5</b>	Select volume of confirmation beeps (useful if external amplifier is connected).
LW	OFF <b>ON</b>	Select OFF to suppress LW band if it is not used.
MW	OFF <b>ON</b>	Select OFF to suppress MW band if it is not used.
SW	OFF <b>ON</b>	Select OFF to suppress SW band if it is not used.
TUN	<b>EURO AMER</b>	Select the tuner according to European or American standards.
TIME	<b>12 H 24 H</b>	Select desired clock format.
CLKRDS	<b>N</b> <b>☐</b>	Select ☐ if you want the time to be updated automatically. <i>The transmitted time via RDS can be incorrect</i>
LOGI	OFF <b>ON</b>	Select ON to limit the use of the set to one hour, when the car ignition is switched off.
COMP	<b>1 2 3</b>	Select 1 to maintain the peaks in the volume. Select 3 to level out the volume.
BASS	<b>40 80</b>	Select average frequency of the low notes.
TREB	<b>5K 7K</b>	Select average frequency of the high notes.
SCAN	<b>5 10 15</b>	select how many seconds the set scans one station or track.
REG	OFF <b>ON AUTO</b>	Select ON to maintain the regional programme. Select OFF to directly switch to the programme of the next region. AUTO only switches when the next signal is stronger.
LED	OFF <b>ON</b>	Select OFF if you do not want the LED to blink when the front is removed.

## DEMO MODE (or Dealer Mode)

In this mode, the display shows in sequence the main features of the set.

Activating the Demo mode:

While keeping the preset 1 and preset 5 keys pressed, switch On the set.

*The set remains in this mode even if you switch the set OFF and ON again.*

To quit the Demo mode, follow exactly the same procedure as "Activating the Demo mode".

## TEST MODES:

### 1) Display test

This test is called by pressing simultaneously presets 1 and 6 keys (set On).

The display shows in sequence: all segments lit

the internal factory code of the microprocessor

the software release number. It is for these sets **1.04** or **1.05**, until further notice.

To quit this mode, switch Off the set .

### 2) Keyboard test

This test is called by switching the set On while keeping pressed the preset 3 key. The display shows: T - -  
Then press each key at least one time. A different number will appear each time you press a new key (e.g. T 0 1).

When all the keys are pressed, if all is correct, the display shows MOUSE.

Activate the [Vol -] command of the mouse. The display shows all segments lit. The test is now finished.

This test can be exited at any moment by switching Off the set.

### 3) Field test

This test is called by pressing simultaneously presets 2 and 4 keys (set On).

The display shows:

4 digits indicating the tuned frequency

5th digit: Level 0..F (F = best fieldstrength)

6th digit: Multipath 0..F ( 0 = no multipath)

7th digit: Noise 0..F (0 = no noise)

8th digit: Suppression counter (0 = no necessity to switch to another station)

This test can be exited by switching Off the set or by pressing again presets keys 2 and 4 at the same time.

### 4) Loudspeakers installation test (Only on software version 1.05)

This test is called by pressing simultaneously keys SCAN and ⏏

The display shows in sequence FRONT L - FRONT R - REAR R - REAR L while the corresponding loudspeaker beeps 5 times.

This test is exited by switching Off the set.

## EEPROM

Several values and adjustments are stored in the EEPROM. The EEPROMs available in Service are filled with mean values.

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Check and Alignment

For all measurements, please refer to the manual "General Check & Alignment procedures for Car Systems" 4822 725 25456, unless otherwise stated

Current and voltage

1) SET OFF

SET OFF	Voltage	Current +Acc ON	Current +Acc OFF	Supply mP pin 14 7513	V_LOW pin 34 7513
Acc Supply	+12.6V	< 3mA		min 4.8V max 5.2V	max 0.8V
Perm Supply	+12.6V	< 3mA	<3 mA		

2) SET ON

Reset pin 30	Supply mP pin 14 7513		V_LOW pin 34 7513		5V pin3 L7805 ABV		8.5V pin 3 L4885CV		V EEprom	
max 0.8V	min 4.8	max 5.2	min 2	max 5.7	min 4.8	max 5.2	min 8.2	max 8.8	min 4.8	max 5.2

Reference oscillator frequencies (to be measured via a X10 probe)

device	MSM 6307	83CE558	HEF4521	SAA7701
pin	24 & 25	51 & 52	4 & 6	63 & 64
frequency	6 MHz 0.5%	16 MHz 0.5%	4.194304 MHz 20 ppm	36.860 MHz 60 ppm

Checks:

1) FM

FM mute	98 MHz 1mV	output at load resistor R & L = 775 mV = REF
	no signal	output should be < -24 dB (REF - 24 dB)

Demodulated FM level	98 MHz	215 mV 2dB
	Input	MPX Output of IC96 (pin 10)

Limiting point $\alpha$ -3dB	FM 98MHz	FM	6 $\mu$ V	3 $\mu$ V	14 $\mu$ V
	RANGE	INPUT	NOMINAL	MIN	MAX

Search levels	Input	Dx: 10 $\mu$ V < X < 20 $\mu$ V Local : 190 $\mu$ V < X < 290 $\mu$ V
	98 MHz	

2) AM

Demodulated AM level	1053KHz - m=30% - 1KHz	230 mV 2dB
	Input	Audio output of IC96 (pin 19)

Sensitivity at 26dB S/N	162KHz	m = 30%	400Hz	< 38 $\mu$ V
	1053KHz			< 30 $\mu$ V
	6100KHz			<25 $\mu$ V

Search levels	Input	Dx: 7 $\mu$ V < X < 21 $\mu$ V Local : 35 $\mu$ V < X < 105 $\mu$ V
	1053KHz	

No alignment is needed for radio part. The tuner module IC96 is pre-aligned in the factory. Dolby alignment, crosstalk alignment and FM DC level curve learning procedure are performed via a special equipment and software, not yet available in Service.

Some values are stored in the EEPROM.

The EEPROM available in service will contain mean values, that could affect slightly the performance of the set. It is the only solution until further notice. The service code of this EEPROM will be given in a next Service Newsletter.

If you change the tuner module, change also the EEPROM.

#### Deck part (for RC548/578)

Use test cassette SBC420 4822 397 30071 unless otherwise stated.

Tape speed and flutter: Use 3.15KHz test tone	Supply voltage	Tape speed	Flutter
	10.8 - 15.6 V	4.76cm/s 2%	< 0.3%

Crosstalk : use 1KHz 0dB crosstalk signal	< -35dB at speakers output R & L
---	----------------------------------

#### CD part (for RC668/688)

Test CD	Test	Result
Eccent-music 150um 4822 397 30279	Insert disk and play track 01	No failure
Vertical deviation 4822 397 30282	Check loading, display of number of tracks and total time. Select track no 9 time 00.20 listen to the disk during 4 seconds	no electrical nor mechanical noise

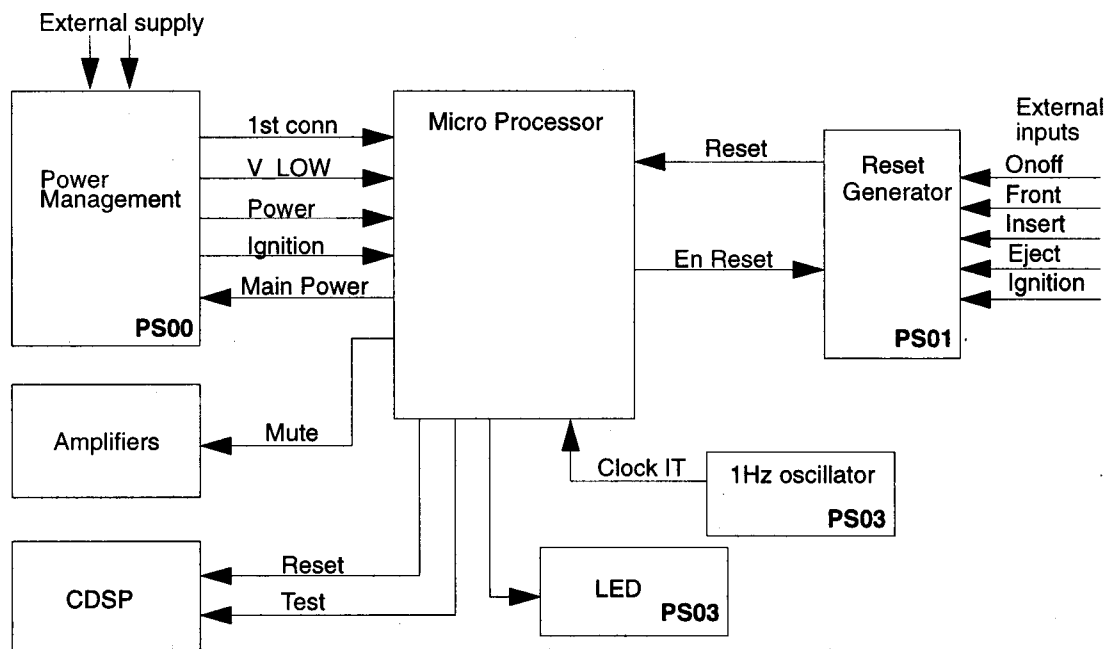
Test CD	Test		Result
Audio signal disk 1 4822 397 30184	Compression Off	Crosstalk track 67 and 71	Crosstalk < -65dB
	Compression On		Crosstalk < -60dB (comp 1 by default)

#### Signal to noise ratio

A weighted filter, track 1 versus track 49 of disk 1	
Compression Off	S / N > 80dB
Compression On (default 1)	S / N > 70dB

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## POWER SUPPLY ORGANIZATION



### Short explanation

The reset is generated after a user action by the reset generator. Its task is to generate resets to the micro p. at input change and at power recovery (when V\_LOW (pin 14 7403) is high again) only when EnReset (pin 12 7402) input is low.

If EnReset is high, no resets are expected (set is ON).

The Power Management device gives information about supply to the micro p. and provides two digital outputs (1st conn, V\_LOW (pin 11 7401)), two analog outputs (Power, Ignition) and one digital input (Main Power).

The 1st connection information is a fugitive information (around 100ms, available on RESET\_uC) which is memorized by the micro p. and leads to first connection actions such as RAM clear. The V\_LOW output is connected to an interrupt and goes LOW when power is falling under 8V (in fact 7.9 to 9.8V, due to spread of components). It goes high again when power comes back.

Power and Ignition analog outputs are provided to enable the micro p. to measure both supply voltages. Main power is an input that turns On and Off the power on the board.

Mute, reset and test output pins of the micro p. are performing actions on amplifiers and CDSP while the one hertz oscillator allows to update internal system clock.

#### 1) Reset at first connection

At the first connection of the set to supplies, a "Power-on-reset" (1st\_PWR\_ON) will be generated via regulator L4949. This hardware reset is active till the 5V for the micro p. is stable.

#### 2) Reset by input lines while set is OFF

The set is awoken by the an hardware reset while the micro p. is in OFF state (power down mode). Several inputs can generate the reset.

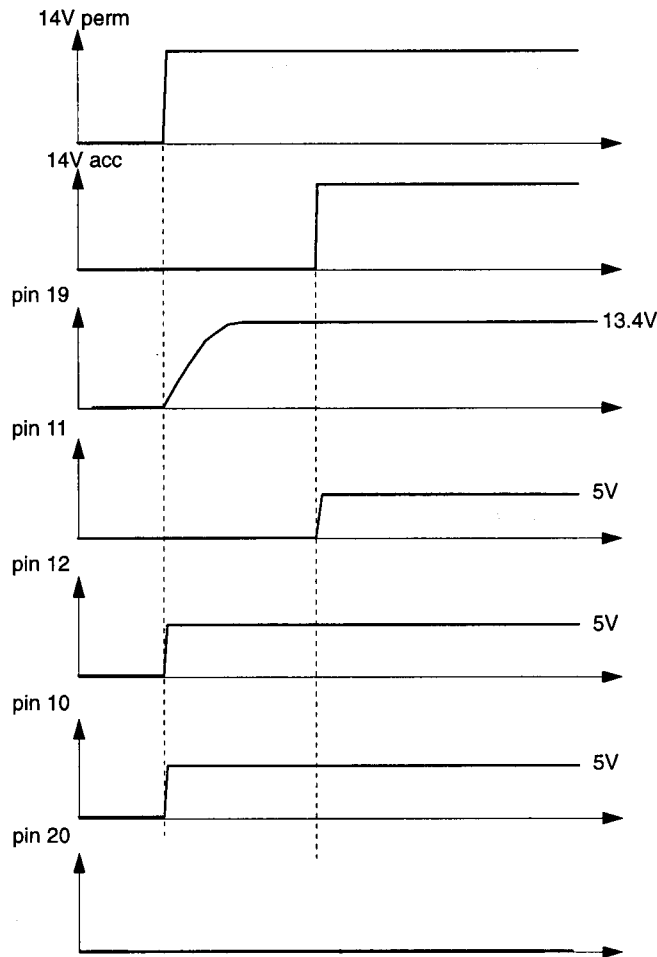
- Ignition key
- OnOff key
- Tape / CD insert
- Tape / CD eject
- Low voltage (V\_LOW) - transition low to high voltage
- Front detection

Via the different interface the inputs are connected to one of the two inputs of the reset circuitry (Pin 4 or 11 of 7402)

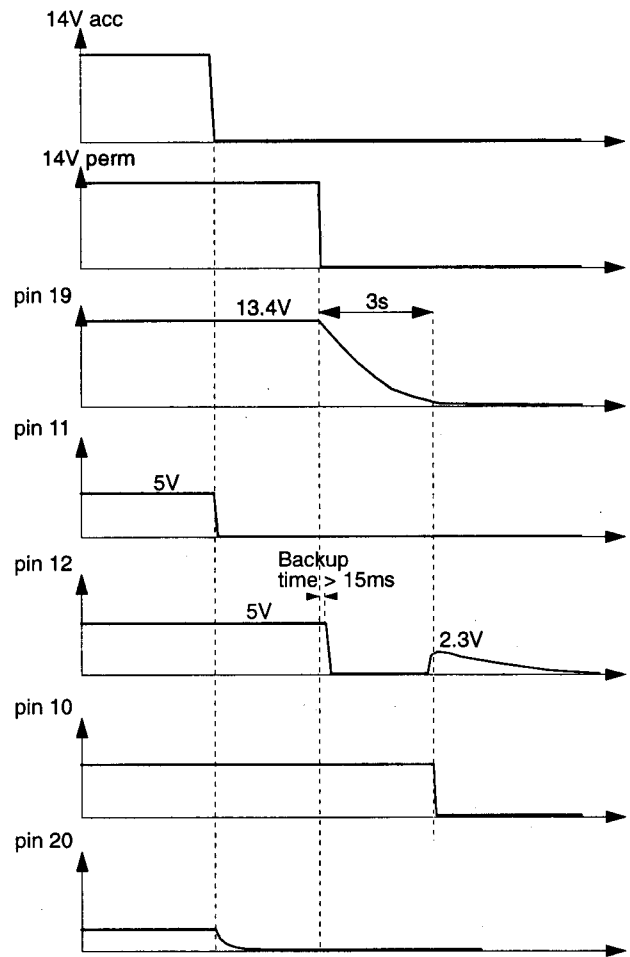
With a transition on any of the input lines, a 1ms duration reset (RESET\_uC in schematic PS01) is generated, which leads to wake up the micro p. from the power down mode. At the same time, the reset will be disabled. The micro p. is then able to check the reset origin and to decide at least if the set must switch on or not.

Waveforms on IC 7401 L4949N

1) Set OFF



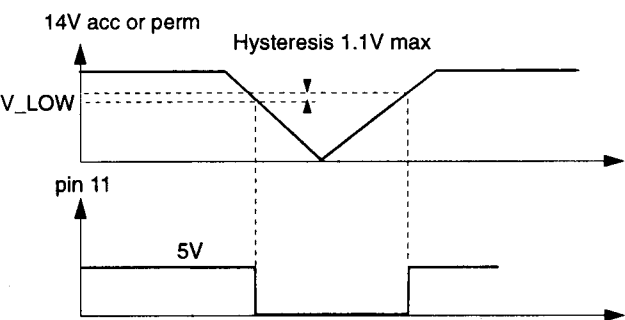
2) Set ON



3) V<sub>LOW</sub> handling

If a V<sub>LOW</sub> occurs during set is On or during set On/Off procedure is performed, the micro p. switches Off the set and finishes the write EEprom activities. After this actin the hardware reset generation will be enabled and the micro p. goes to power down.

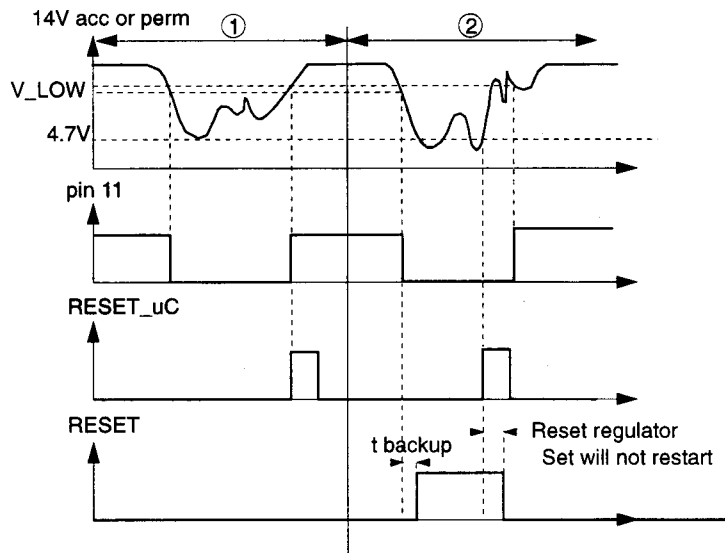
V<sub>LOW</sub> handling



Case ① The set is On, the permanent supply falls down but is over 4.7V

Case ② The set is On, the permanent supply falls down below 4.7V for longer than backup time

Behaviour while engine start



The CDSP chip can perform all the signal functions in front of the power amplifier and behind the AM and FM demodulation and tape input. These functions are: interference absorption, stereo decoding, RDS decoding, weak signal processing (soft-mute, sliding stereo, etc...), Dolby-B tape noise reduction and the audio volume controls (volume, balance, fader, tone, dynamic compression). Some functions have been implemented in hardware and are not freely programmable. Digital audio signals from external sources with I2S format are accepted. There are four independent analog output channels. This enables separate tone and equalisation control for front and rear speakers.

The DSP can contain a basic program which enables already a set with AM/FM reception, sophisticated FM weak signal functions, MSS, Dolby-B tape noise reduction system, CD play with compressor function, separate bass and treble tone control and fader/balance control.

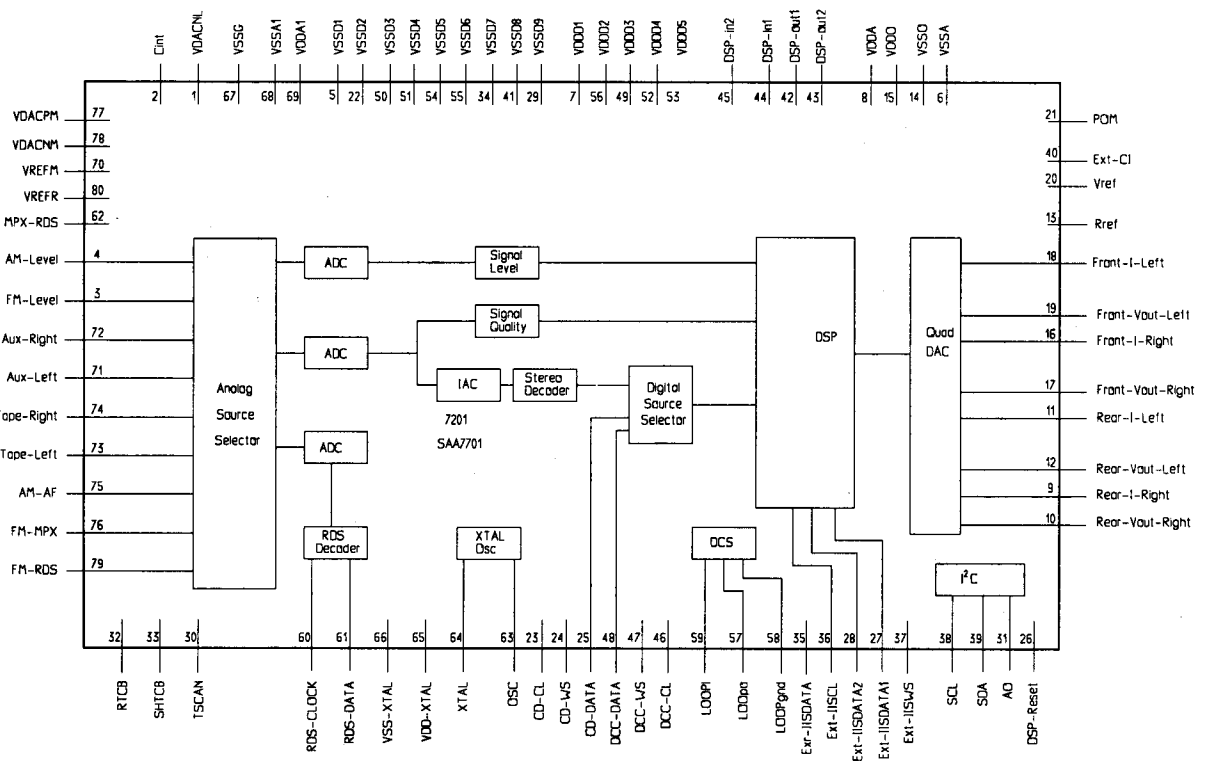
#### Hardware features

- Bit stream 3rd order Sigma-Delta A/D converters with anti aliasing broadband input filters
- D/A converters with four over sampling and noise shaping
- Digital stereo decoder
- Improved, digital IAC
- RDS processing with optional 16 bit buffer via separate channel (two tuner radio possible)
- Auxiliary analog CD input (CD-walkman, speech, economic CD-changer etc...)
- Two separate full I2S CD and DCC high performance interfaces
- Expandable with additional DSPs for sophisticated features through an I2S gateway
- Audio output short circuit protected
- I2C bus controlled
- Analog tape input
- -40 to +85° C operating temperature range

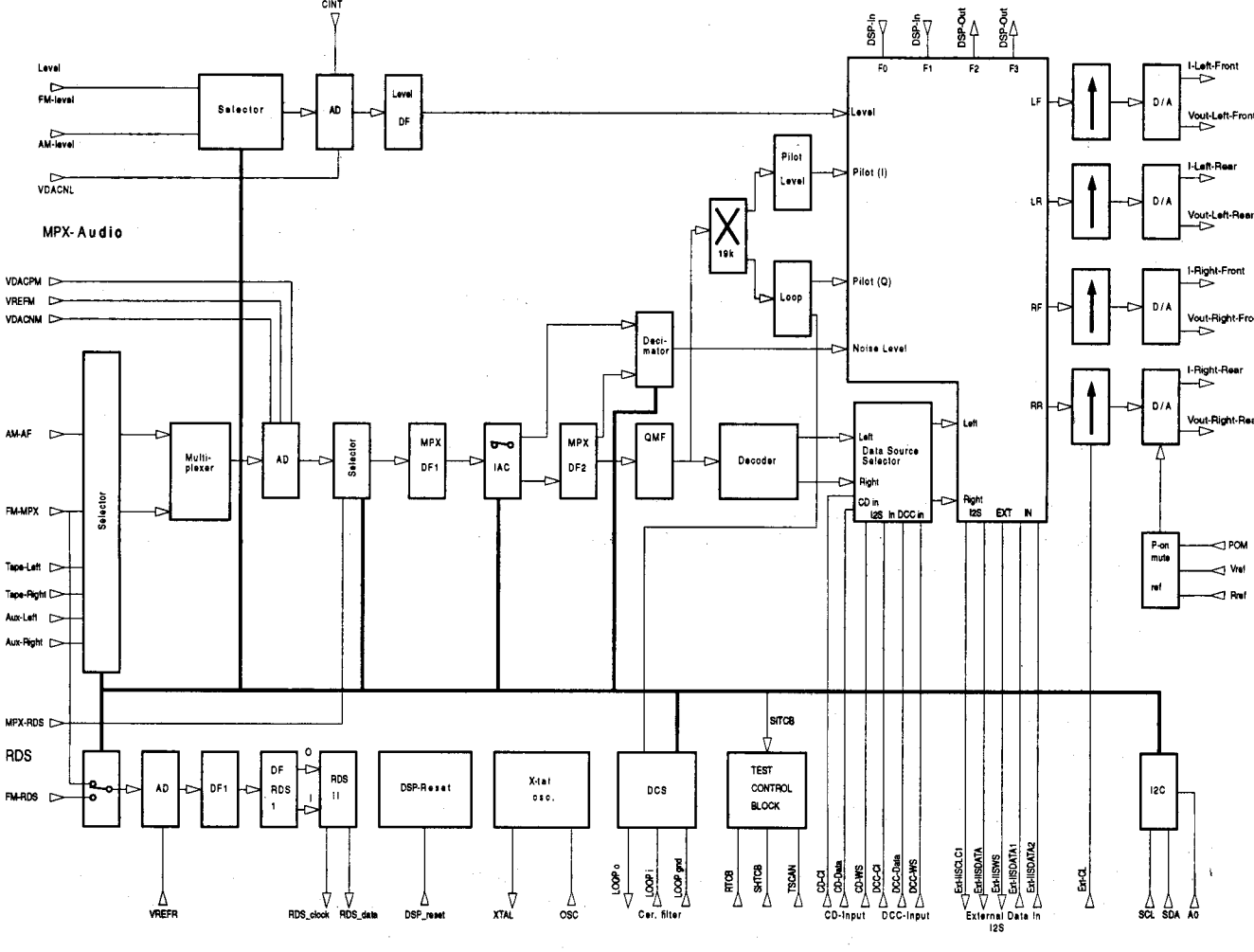
#### Software features

- Improved FM weak signal processing with more stereo
- Integrated 19KHz MPX filter and de-emphasis
- Electronic adjustments: FM/AM level, FM channel separation, Dolby level
- Baseband audio processing (treble/bass/balance/fader/volume)
- Dynamic loudness or bass boost
- Stereo 1 or 3 band parametric equaliser
- Automatic leveller (in combination with microprocessor)
- Tape equalisation (DCC analog playback)
- Music Search detection for tape (MSS)
- Pause detection for RDS updates
- Dolby-B tape noise reduction
- (adjustable) dynamic compressor
- CD/DCC De-emphasis processing
- Signal level, noise and multipath detection for RDS (I2C bus command)
- Hidden mute during RDS updates
- Improved AM reception

**BLOCK DIAGRAM**



**FUNCTIONAL DESCRIPTION**



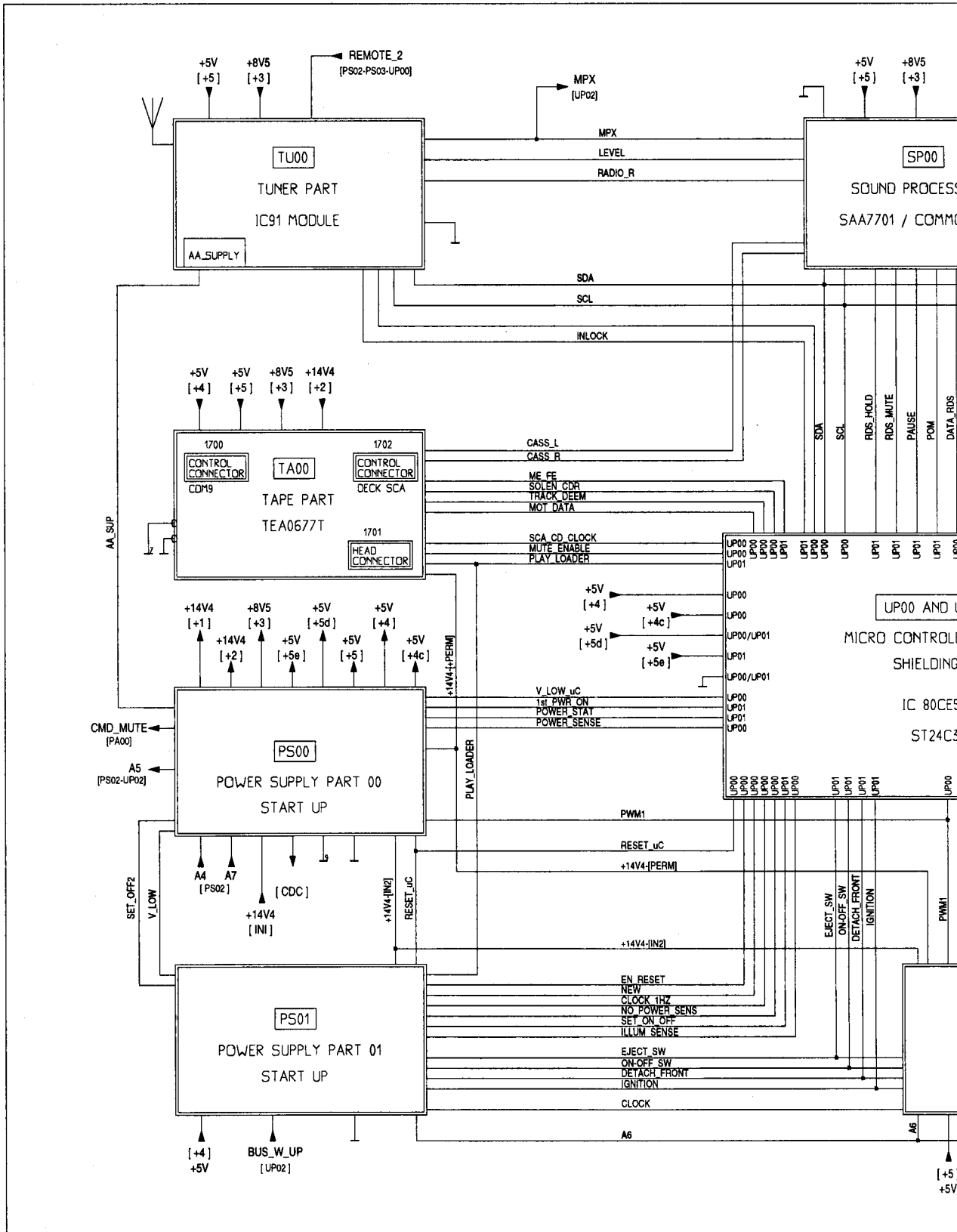
SYMBOL	PIN	DESCRIPTION
VDACNL	1	Ground Reference Level AD DAC LEVEL
CINT	2	Level AD switch mode integrator connection
FM-level	3	FM-level input pin. Via this pin the level of the received FM-radio signal is fed to the CDSP. The level information is needed for a correct functioning of the weak signal behaviour.
AM-level	4	AM-level input pin. Via this pin the level of the received AM-radio signal is fed to the CDSP.
VSSD1	5	Supply ground 1 digital circuitry DACs
VSSA	6	Supply ground analog circuitry DACs
VDDD1	7	Positive supply 1 digital circuitry DACs
VDDA	8	Positive supply analog circuitry DACs
Rear-I-Right	9	Analog audio current output for Rear-right speaker
Rear-Vout-Right	10	Analog audio voltage output for Rear-right speaker
Rear-I-Left	11	Analog audio current output for Rear-left speaker
Rear-Vout-Left	12	Analog audio voltage output for Rear-left speaker
Rref	13	Input for the internal reference current source of the D/A converter
VSSO	14	Supply ground for output Op-amps DAC
VDD0	15	Positive supply for output Op-amps DAC
Front-I-Right	16	Analog audio current output for Front-right speaker
Front-Vout-Right	17	Analog audio voltage output for Front-right speaker
Front-I-Left	18	Analog audio current output for Front-left speaker
Front-Vout-left	19	Analog audio voltage output for Front-left speaker
Vref	20	Voltage input for the internal reference buffer amplifier of the D/A converter.
POM	21	Activates the Power On Mute. Timing is determined with an external capacitor.
VSSD2	22	Ground supply 2 digital circuitry
CD-CI	23	I <sup>2</sup> S Clock input CD digital audio source. Also reference for 4* asf and asf. Selected if DIV-EXT/ <u>INT</u> is not set. / Output LIRS scan chain 6
CD-WS	24	I <sup>2</sup> S Word Select Input CD digital audio source / Input LIRS scan chain 6
CD-Data	25	I <sup>2</sup> S Left/Right Data Input CD digital audio source / Input LIRS scan chain 1
DSP-reset	26	Input to reset DSP-core (active low) / input LIRS scan chain 3
Ext_IISDATA1	27	I <sup>2</sup> S External Input Data channel 1 (front) from extra DSP chip / input CORE scan chain DIO
Ext_IISDATA2	28	I <sup>2</sup> S External Input Data channel 2 (rear) for extra DSP chip
VSSD9	29	Ground supply 9 digital circuitry
TSCAN	30	Scan control (active high)
A0	31	Slave sub-address I <sup>2</sup> C selection / Serial data input test control block (SITCB)
RTCB	32	Asynchronous Reset test control block (active high)
SHTCB	33	Shift clock test control block (active high)
VSSD7	34	Ground supply 7 digital circuitry
Ext_IISDATA	35	I <sup>2</sup> S External Output Data for extra DSP chip / output LIRS scan chain 4; controlled by ENA_IIS (bit 13)
Ext_IISCL	36	I <sup>2</sup> S External Output Clock for extra DSP chip / output LIRS scan chain 3; controlled by ENA_IIS (bit 13)
Ext_IISWS	37	I <sup>2</sup> S External input/output Word select for extra DSP chip / output CORE scan chain DIO; controlled by ENA_IIS (bit 13)
SCL	38	Serial clock input (I <sup>2</sup> C bus) / input LIRS scan chain 4
SDA	39	Serial data input/output (I <sup>2</sup> C bus)
EXT-CI	40	External reference clock input to generate 4*asf and ASF synchronisation. To be used in case the I <sup>2</sup> S clock inputs are not suitable. Selection if DIV-EXT/ <u>INT</u> is set / Latch signal DAC data words in analog test mode.
VSSD8	41	Ground supply 8 digital circuitry
DSP_out1	42	Digital output 1 from DSP-core (F2 of status register) / output CORE scan chain (tri-state for Debug board)
DSP_out2	43	Digital output 2 from DSP-core (F3 of status register) / IAC trigger output / output DAC scan chain 1; actived by AGC_TRIG (bit 15)

SYMBOL	PIN	DESCRIPTION
DSP_in1	44	Digital input 1 for DSP-core (F0 of status register) / input LIRS scan chain 2
DSP_in2	45	Digital input 2 for DSP-core (F1 of status register) / input CORE scan chain
DCC-CI	46	I <sup>2</sup> S Clock input DCC digital audio source. Also reference for 4*asf and asf. Selected if DIV-EXT/ <u>INT</u> is not set. / Input DAC digital scan chain 1 / input DAC analog scan chain LEFT / input external MPX ADC if SEL-EXT/ <u>ADC</u> is set.
DCC-WS	47	I <sup>2</sup> S Word Select input DCC digital audio source / input DAC digital scan chain 2 / input DAC analog scan chain RIGHT / input external RDS ADC if SEL-EXT/ <u>ADC</u> is set.
DCC-Data	48	I <sup>2</sup> S Left/RIGHT Data input DCC digital audio source / output LIRS scan chain 5 / input external LEVEL ADC if SEL-EXT/ <u>ADC</u> is set.
VDDD3	49	Positive supply 3 digital circuitry
VSSD3	50	Ground supply 3 digital circuitry
VSSD4	51	Ground supply 4 digital circuitry
VDDD4	52	Positive supply 4 digital circuitry
VDDD5	53	Positive supply 5 digital circuitry
VSSD5	54	Ground supply 5 digital circuitry
VSSD6	55	Ground supply 6 digital circuitry
VDDD2	56	Positive supply 2 digital circuitry
LOOPo	57	Unfiltered DCS clock output / output DAC scan chain 2 / LEVEL A/D bitstream output in analog A/D test mode / bit slicer output in slicer test mode
LOOPgnd	58	Ground connection DCS filter
LOOPi	59	Filtered DCS clock input / Bit slicer input in slicer test mode
RDS-Clock	60	Radio Data System bit clock output / output LIRS scan chain 1 / MPX A/D bitstream output in analog AD test mode / RDS external clock input; controlled by SEL-BUF/ <u>BUF</u> (bit 7) / X-tal output in slicer test mode.
RDS-Data	61	Radio Data System data output / output LIRS scan chain 2 / RDS A/D bitstream output in analog AD test mode
MPX-RDS	62	Selects in FM-mode between FM-MPX and RDS-MPX input signal to the MPX decimation filter / input LIRS scan chain 5 / input A/D scan chain in analog test mode
OSC	63	Crystal oscillator output: Drive output to 36.860 MHz crystal or forced input in slave mode
XTAL	64	Crystal oscillator input: local crystal oscillator sense
VDD_XTAL	65	Positive supply X-TAL circuitry
VSS_XTAL	66	Ground supply X-TAL circuitry
VSSG	67	Ground guards ADs
VSSA1	68	Ground supply ADs analog
VDDA1	69	Positive supply ADs analog
VREFM	70	Mid ref voltage MPX AD and buffers
Aux-Left	71	Analog input pin for Auxiliary-Left signal
Aux-Right	72	Analog input pin for Auxiliary-Right signal
Tape-Left	73	Analog input pin for Tape-Left signal
Tape-Right	74	Analog input pin for Tape-Right signal
AM-AF	75	Analog input pin for AM audio frequency
FM-MPX	76	Analog input pin for FM-Multiplex signal
VDACPM	77	Positive reference voltage AD DAC MPX and RDS
VDACNM	78	Ground reference voltage AD DAC MPX and RDS
FM-RDS	79	Analog FM-MPX input pin for RDS decoding
VREFR	80	Mid ref voltage RDS AD, LEVEL AD and buffers

Explanation: LIRS is the abbreviation of the level, IAC, RDS and Stereo decoder part.

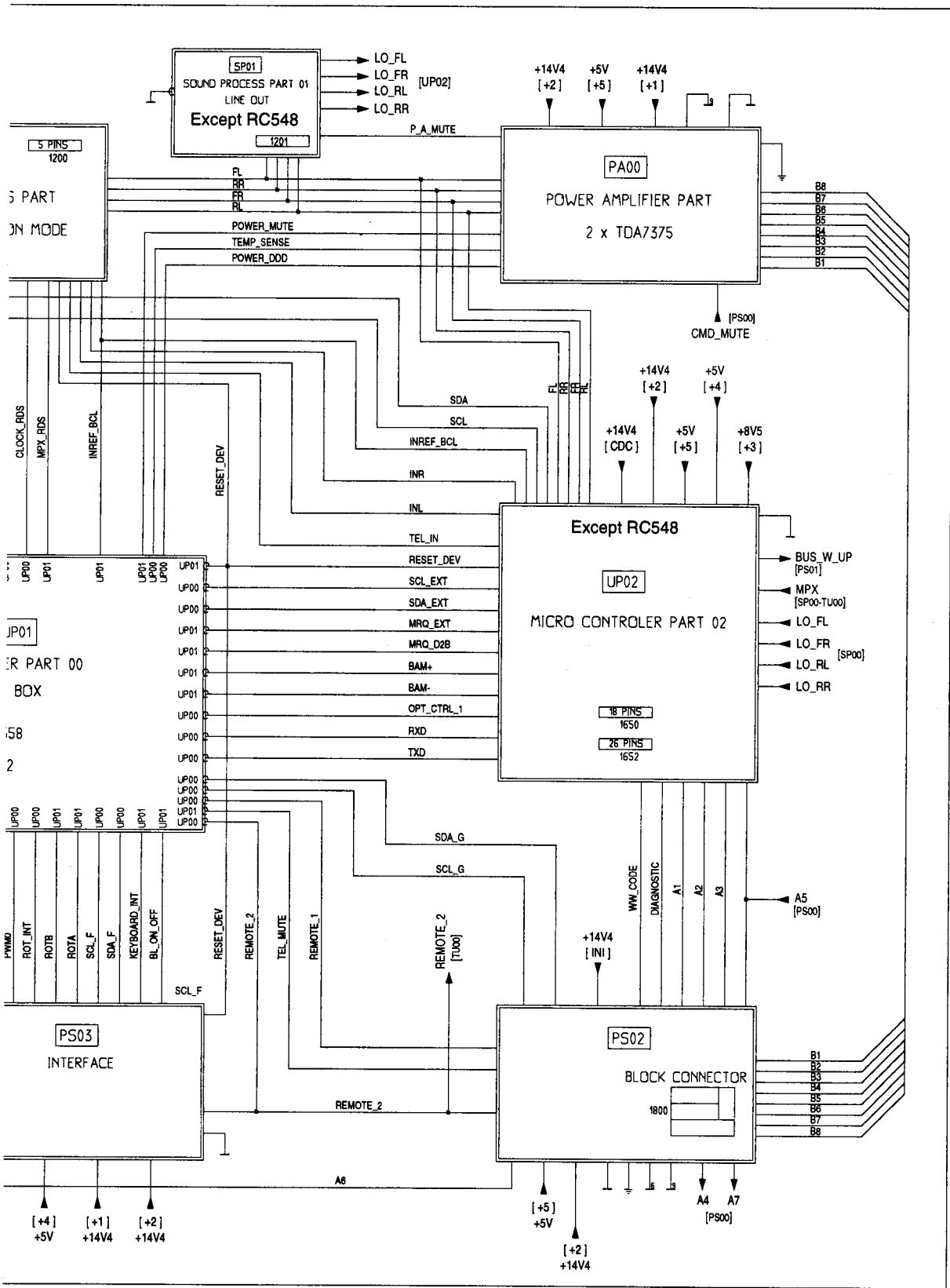
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22RC578/00  
22RC668/00  
22RC688/00



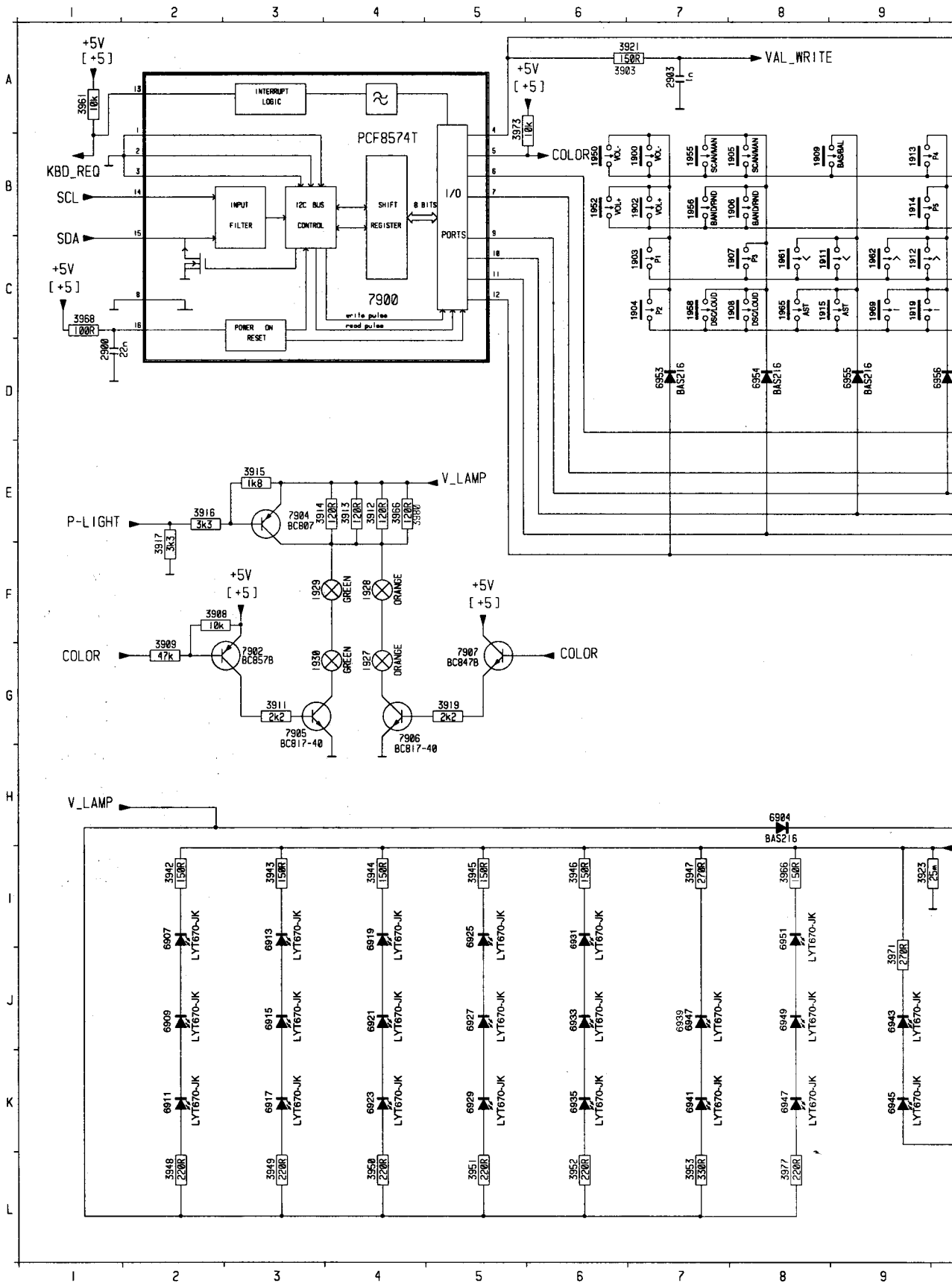


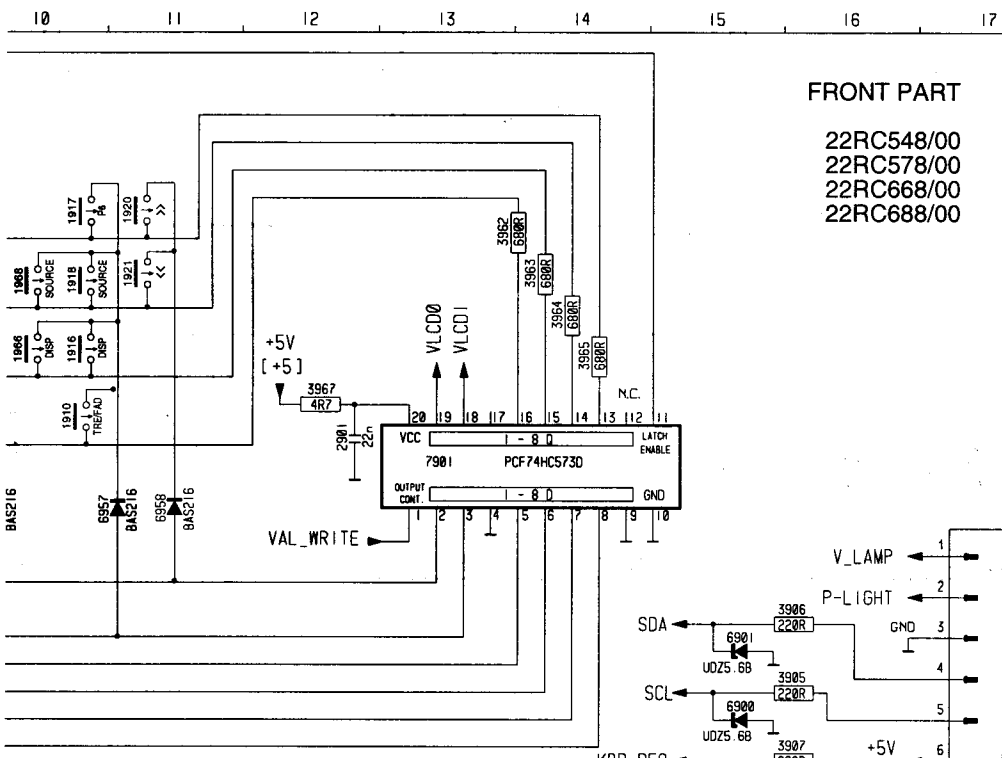
ELECTRICAL BLOC DIAGRAM

22DC548/00  
 22DC578/00  
 22DC668/00  
 22DC688/00



IN BLUE: COMPONENTS FOR 22RC668/688 ONLY

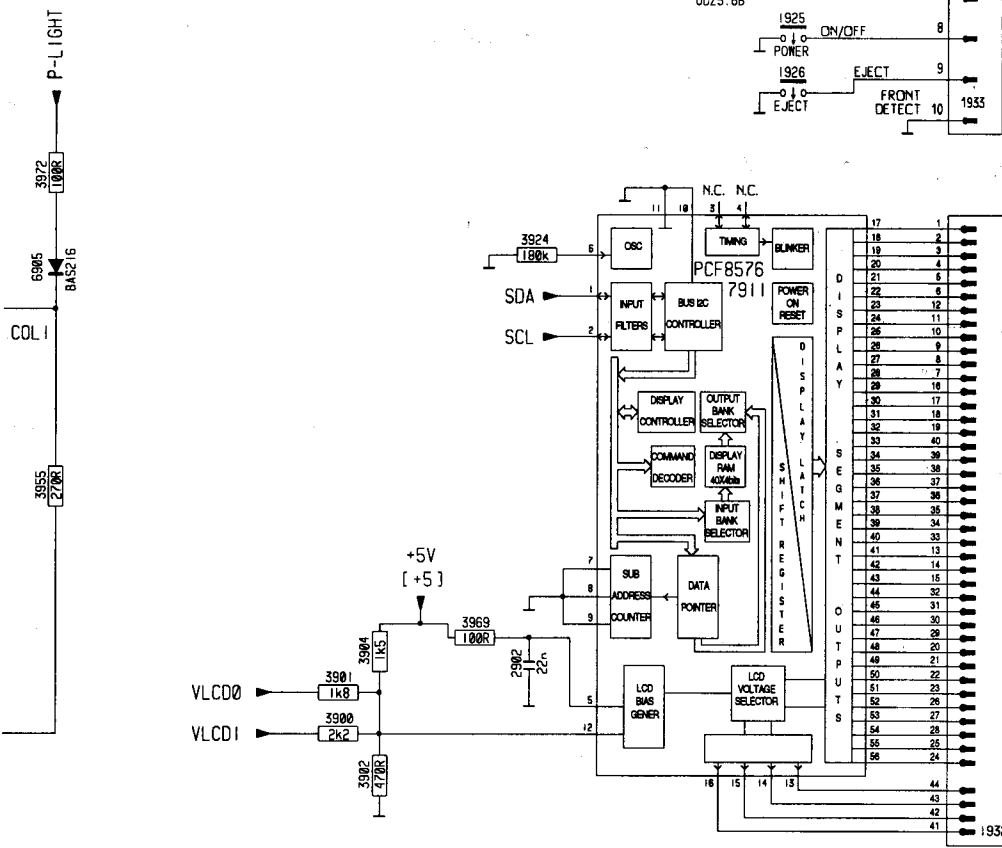




FRONT PART

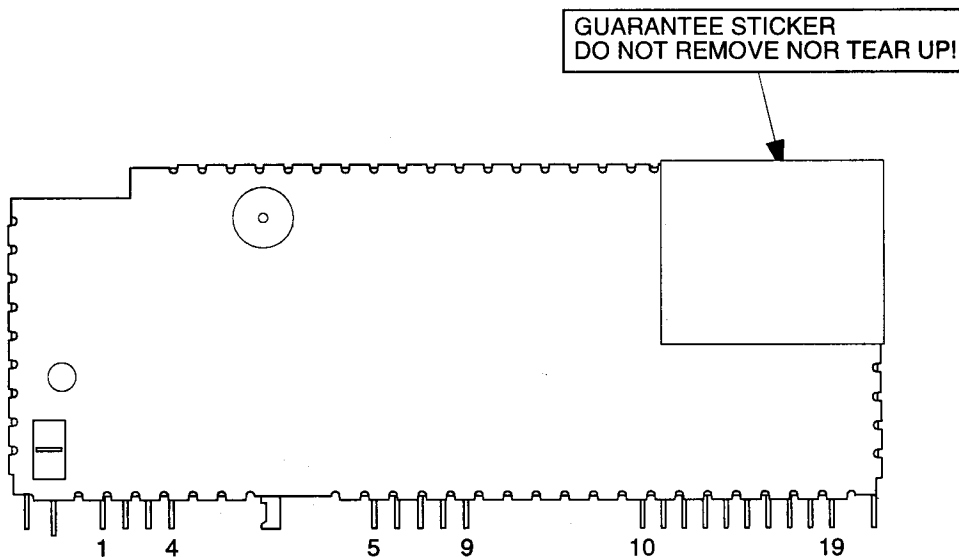
22RC548/00  
22RC578/00  
22RC668/00  
22RC688/00

1900	B 7	3953	L 7
1902	B 7	3955	J10
1903	C 7	3961	A 1
1904	C 7	3962	B13
1905	B 8	3963	B14
1906	B 8	3964	B14
1907	C 8	3965	C14
1908	C 8	3966	E 4
1909	B 8	3966	I 8
1910	C10	3967	C12
1911	C 8	3968	C 1
1912	C 9	3969	K13
1913	B 9	3971	J 9
1914	C 9	3972	G10
1915	C 8	3973	A 5
1916	C10	3977	L 8
1917	B10	6900	E15
1918	B10	6901	E15
1919	C 9	6902	F15
1920	B11	6904	H 8
1921	B11	6905	H10
1925	F16	6907	I 2
1926	G16	6909	J 2
1927	G 4	6911	K 2
1928	F 4	6913	I 3
1929	F 3	6915	J 3
1930	G 3	6917	K 3
1932	L17	6919	I 4
1933	G17	6921	J 4
1950	B 6	6923	K 4
1952	B 6	6925	I 5
1955	B 7	6927	J 5
1956	B 7	6929	K 5
1958	C 7	6931	I 6
1961	C 8	6933	J 6
1962	C 9	6935	K 6
1965	C 8	6941	K 7
1968	C10	6943	J 9
1968	B10	6945	K 9
1969	C 9	6947	J 7
2900	D 1	6947	K 8
2901	C12	6949	J 8
2902	K14	6951	I 8
2903	A 7	6953	D 7
3900	K12	6954	D 8
3901	K12	6955	D 9
3902	L12	6956	D10
3904	K12	6957	D11
3905	E16	6958	D11
3906	E16	7900	C 4
3907	F16	7901	D13
3908	F 2	7902	G 3
3909	G 2	7904	E 3
3911	G 3	7905	E 3
3912	E 4	7906	G 4
3913	E 4	7907	G 5
3914	E 3	7911	H15
3915	E 3		
3916	E 2		
3917	F 2		
3919	G 5		
3921	A 7		
3923	I 9		
3924	H14		
3942	I 2		
3943	I 3		
3944	I 4		
3945	I 5		
3946	I 6		
3947	I 7		
3948	L 2		
3949	L 3		
3950	L 4		
3951	L 5		
3952	L 6		



# IC96 MODULE

Not reparable module. Do not open and do not try to repair yourself!



## Connections

1	AM/FM Aerial input	10	Multiplex / RDS output signal
2	Ground	11	Unweighted level output
5	Inlock detector pin	12	I <sup>2</sup> C SDA
6	Vcc 8.5V	13	I <sup>2</sup> C SCL
7	Ground	14	SDS time constant pin
8	Vcc 5.0V	17	Ground
9	V reference	19	AM audio output

## Quick reference data:

- |   |   |
|---|---|
| 1) AM part  | 1) FM part  |
| -Longwave/Mediumwave 144-1710 KHz (inclusive USA)   | -FM 87.5 - 108MHz                                 |
| -Shortwave 5850-6250 KHz - 49 meter band            | -FM double super concept                          |
| -AM double super concept                            | -FM IF1 72.2MHz                                   |
| -AM IF1 10.7MHz                                     | -FM IF2 10.7MHz                                   |
| -AM IF2 450KHz                                      | -First VCO frequency above input signal frequency |
| -First VCO frequency above input signal frequency   | -Second X-tal oscillator frequency below IF1      |
| -Second X-tal oscillator frequency below IF1        | -Usable sensitivity $\alpha 26dB = 2.5\mu V$ typ. |
| -Usable sensitivity $\alpha 26dB MW = 14\mu V$ typ. | -THD 1mV $\delta f = 75KHz = 0.5\%$ typ           |
|   | -Signal to noise ratio = 65dB typ                 |
|   | -Locktime synthesizer <2mSec                      |

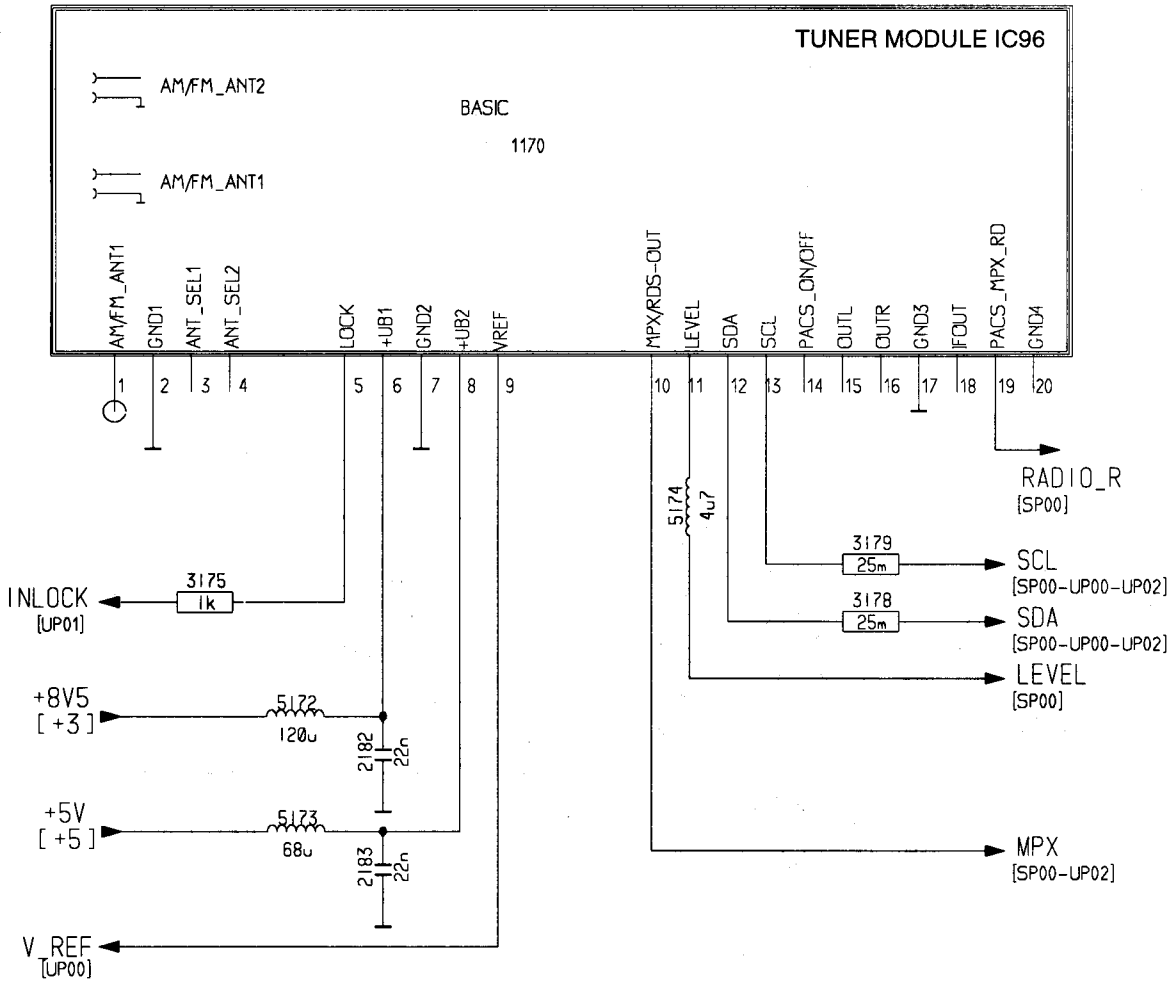
# TUNER PART

[TU00]

## TUNER MODULE IC96

BASIC

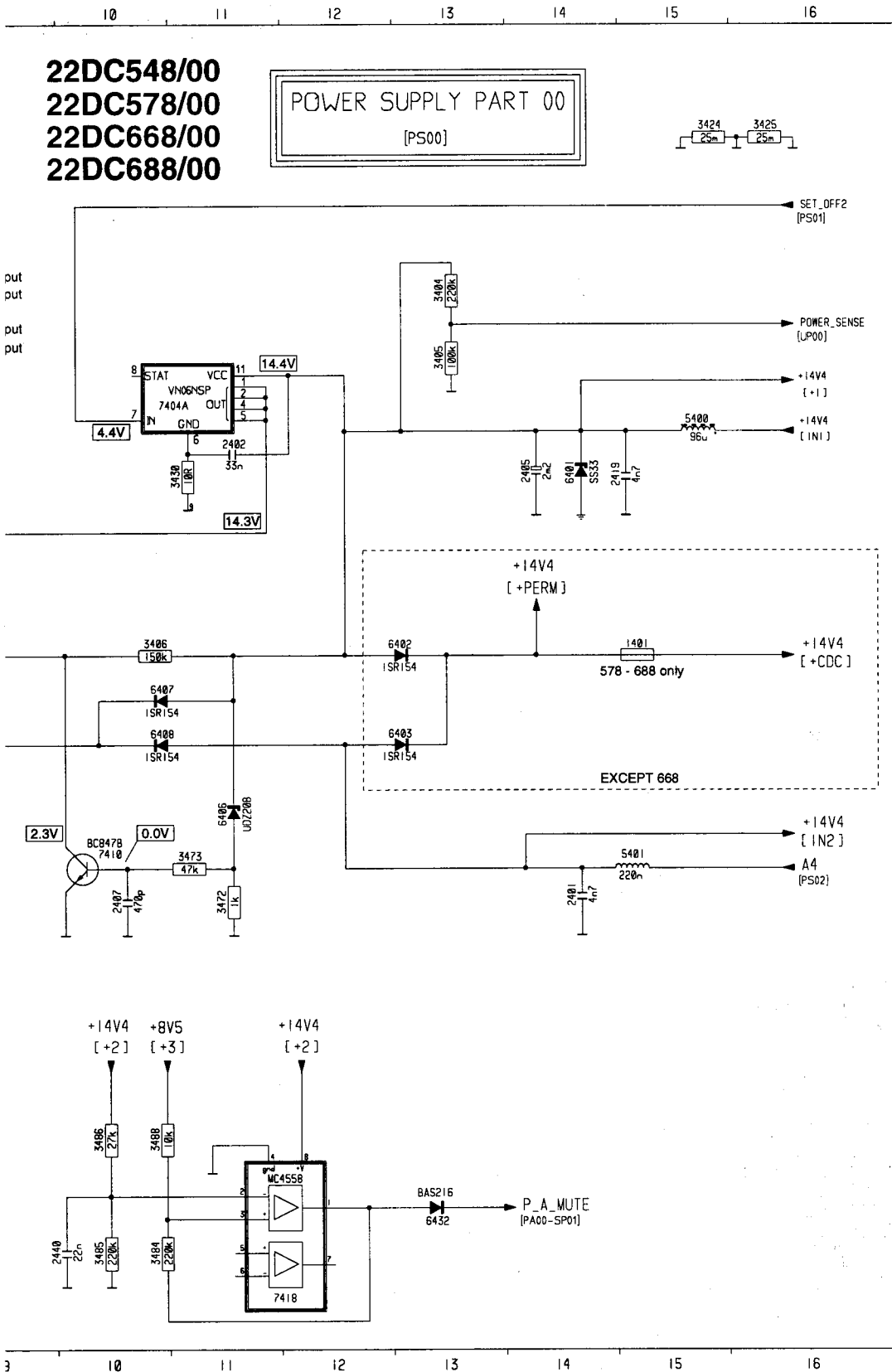
1170



22RC548/00  
 22RC578/00  
 22RC668/00  
 22RC688/00

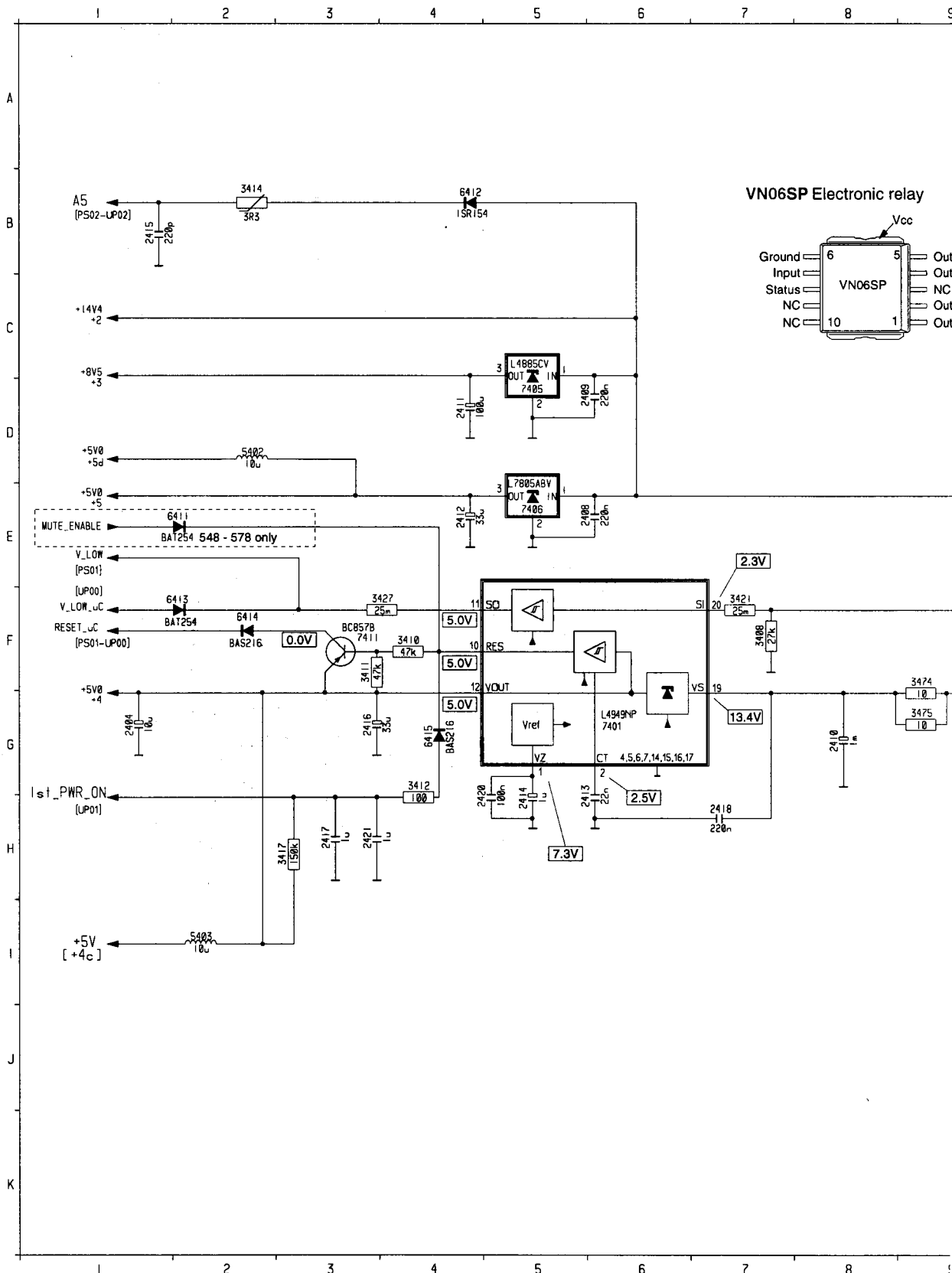
22DC548/00  
 22DC578/00  
 22DC668/00  
 22DC688/00

POWER SUPPLY PART 00  
 [PS00]



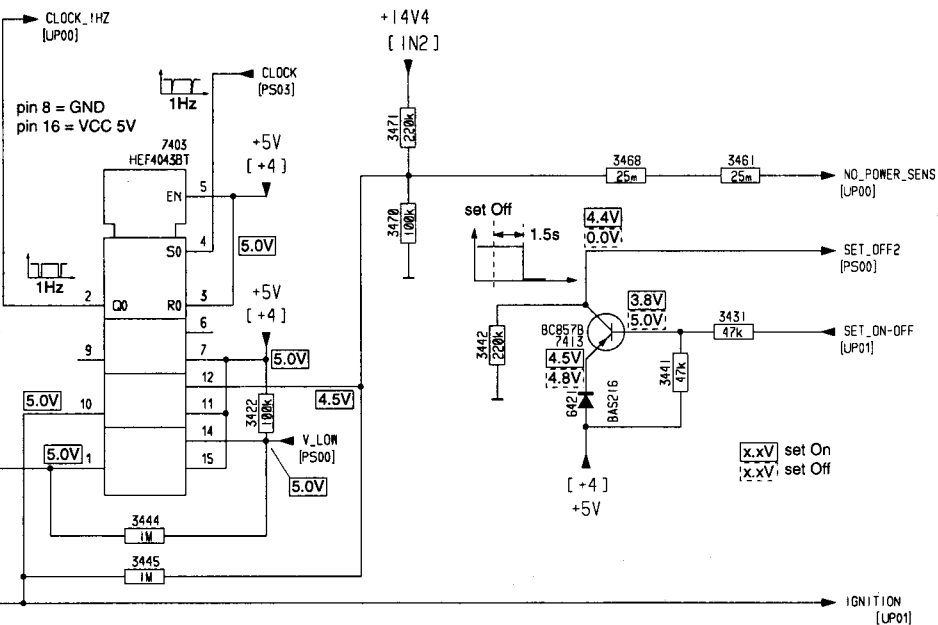
	1401	F15
	2401	H14
	2402	D11
	2404	G1
A	2405	D14
	2407	H10
	2408	E6
	2409	D6
	2410	G8
	2411	D4
B	2412	E4
	2413	H6
	2414	H5
	2415	B1
	2416	G3
	2417	H3
	2418	H7
C	2419	D15
	2420	H5
	2421	H3
	2440	K10
	3404	B13
	3405	C13
D	3406	F10
	3408	F7
	3410	F4
	3411	F3
	3412	G4
	3414	B2
E	3417	H3
	3421	F7
	3424	A15
	3425	A16
	3427	F4
	3430	D11
F	3472	H11
	3473	H11
	3474	F9
	3475	G9
	3484	K10
	3485	K10
G	3486	J10
	3488	J10
	5400	D15
	5401	H15
	5402	D2
	5403	I2
H	6401	D14
	6402	F13
	6403	F13
	6406	G11
	6407	F10
	6408	F10
I	6411	E2
	6412	B4
	6413	F2
	6414	F2
	6415	G4
	6432	K13
	7401	G6
J	7404	D10
	7405	D5
	7406	E5
	7410	H10
	7411	F3
	7418	K11
K		

A4 .....H16      RESET\_μC ..... F1  
 A5 .....B1      SET\_OFF2 ..... B16  
 Ist\_PWR\_ON .....G1      V\_LOW ..... E1  
 MUTE\_ENABLE .....E1      V\_LOW\_μC ..... F1  
 POWER\_SENSE .....C16  
 P\_A\_MUTE .....K14



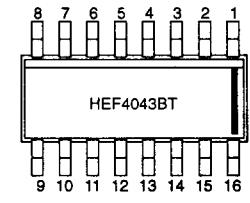


For item 7403, DC voltage are identical for both set On/set OFF



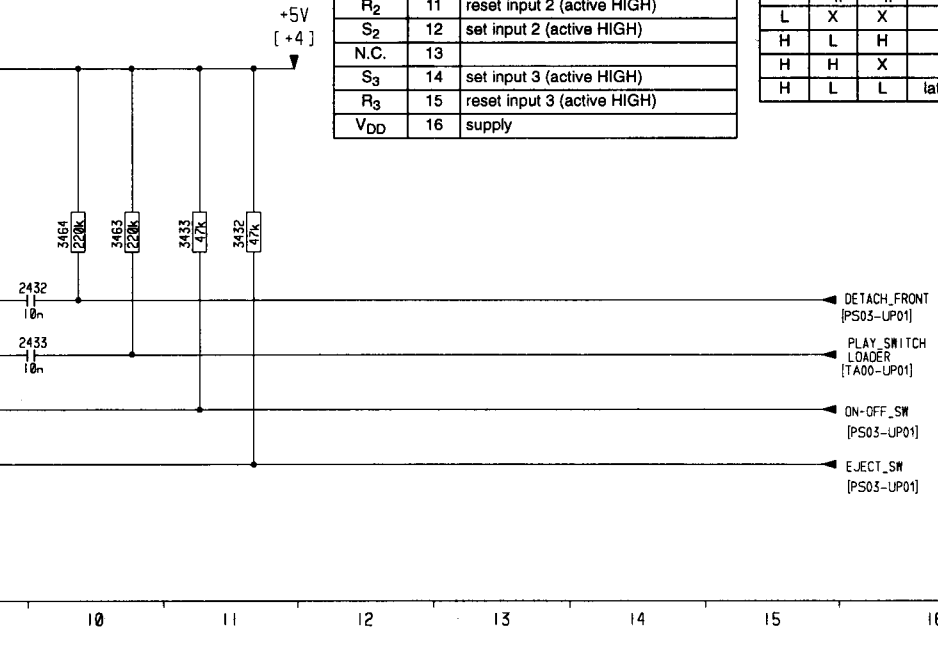
**HEF4043BT Quad R/S latch with 3-state outputs**

Symbol	PIN	DESCRIPTION
O <sub>3</sub>	1	3-state buffered latch output 3
O <sub>0</sub>	2	3-state buffered latch output 0
R <sub>0</sub>	3	reset input 0 (active HIGH)
S <sub>0</sub>	4	set input 0 (active HIGH)
E <sub>0</sub>	5	common output enable input
S <sub>1</sub>	6	set input 1 (active HIGH)
R <sub>1</sub>	7	reset input 1 (active HIGH)
V <sub>SS</sub>	8	ground
O <sub>1</sub>	9	3-state buffered latch output 1
O <sub>2</sub>	10	3-state buffered latch output 2
R <sub>2</sub>	11	reset input 2 (active HIGH)
S <sub>2</sub>	12	set input 2 (active HIGH)
N.C.	13	
S <sub>3</sub>	14	set input 3 (active HIGH)
R <sub>3</sub>	15	reset input 3 (active HIGH)
V <sub>DD</sub>	16	supply



**FUNCTION TABLE**

E <sub>0</sub>	inputs		output O <sub>n</sub>
	S <sub>n</sub>	R <sub>n</sub>	
L	X	X	Z
H	L	H	L
H	H	X	H
H	L	L	latched



- 2425 G 5
- 2428 D 9
- 2429 E 9
- 2432 J10
- 2433 J10
- A 3422 D11
- 3423 C 5
- 3431 C15
- 3432 I11
- 3433 I11
- 3441 C14
- B 3442 C13
- 3444 E10
- 3445 E10
- 3447 E 8
- 3448 G 7
- 3449 D 8
- C 3451 E 7
- 3452 D 6
- 3453 D 6
- 3454 F 6
- 3456 D 3
- 3458 I 6
- D 3460 I 9
- 3461 B15
- 3463 I10
- 3464 I10
- 3465 I 9
- 3468 B14
- 3470 B12
- E 3471 B12
- 3477 B 4
- 3478 C 6
- 6418 J 8
- 6421 D14
- F 6425 F 2
- 6426 G 2
- 6427 E 8
- 6428 D 8
- 6808 K 8
- 6811 K 8
- G 6817 J 8
- 7402 G 4
- 7403 B11
- 7413 C14
- 7416 D 6
- H
- I
- J
- K

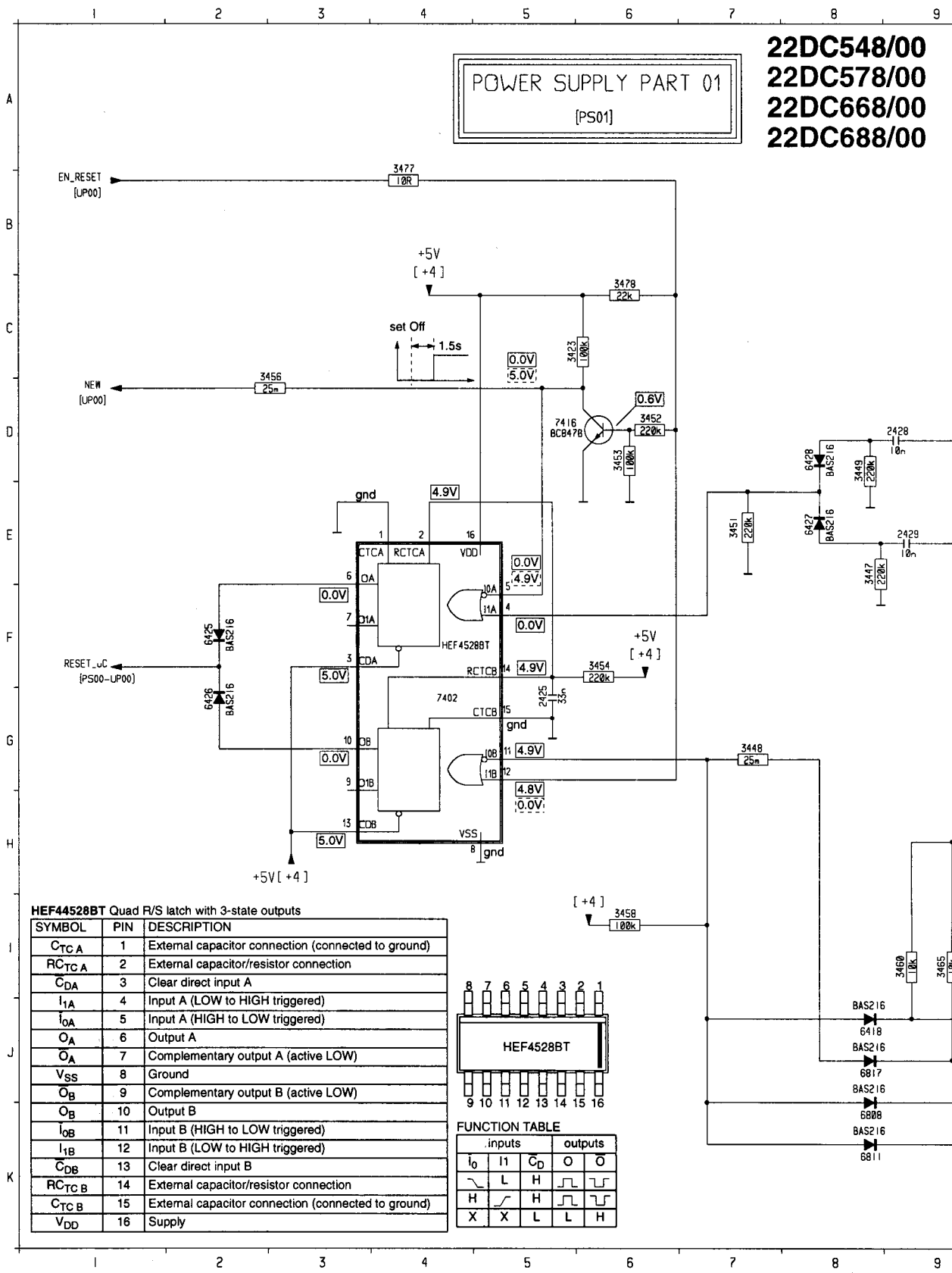
CLOCK .....A11  
 CLOCK\_1HZ .....A10  
 DETACH\_FRONT .....I15  
 EJECT\_SW .....K15  
 EN\_RESET .....B1  
 IGNITION .....E15

NEW .....D1  
 NO\_POWER\_SENS .....B15  
 ON\_OFF\_SW .....J15  
 PLAY\_SWITCH/ .....  
 LOADER .....J15  
 RESET\_uC .....F1

SET\_OFF2 .....B15  
 SET\_ON\_OFF .....C15  
 V\_LOW .....D11

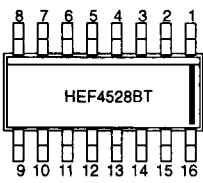
**POWER SUPPLY PART 01**  
 [PS01]

**22DC548/00**  
**22DC578/00**  
**22DC668/00**  
**22DC688/00**



**HEF4528BT Quad R/S latch with 3-state outputs**

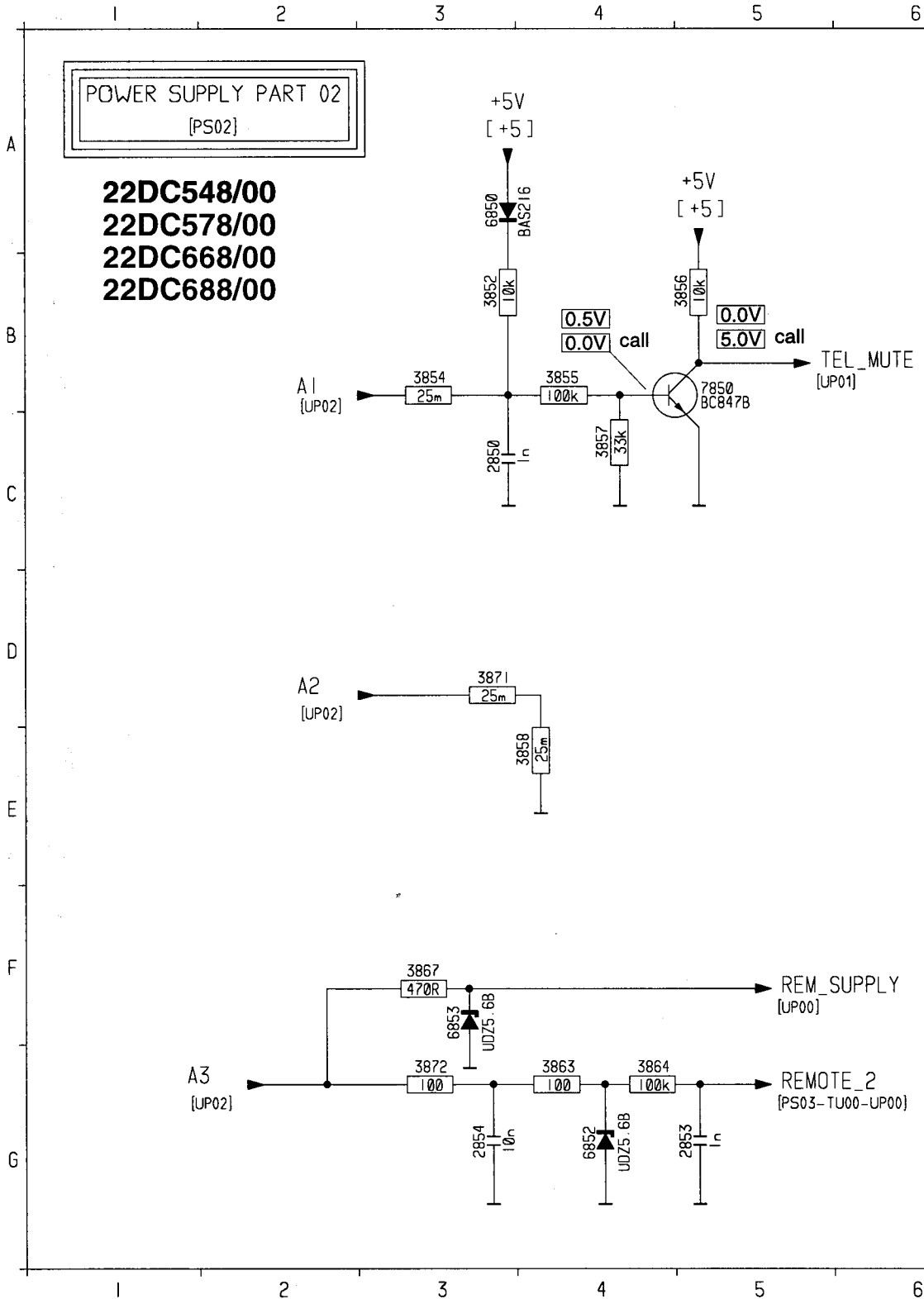
SYMBOL	PIN	DESCRIPTION
CTCA	1	External capacitor connection (connected to ground)
RCTCA	2	External capacitor/resistor connection
CDA	3	Clear direct input A
I1A	4	Input A (LOW to HIGH triggered)
I0A	5	Input A (HIGH to LOW triggered)
O <sub>A</sub>	6	Output A
O <sub>A</sub>	7	Complementary output A (active LOW)
VSS	8	Ground
O <sub>B</sub>	9	Complementary output B (active LOW)
O <sub>B</sub>	10	Output B
I0B	11	Input B (HIGH to LOW triggered)
I1B	12	Input B (LOW to HIGH triggered)
CDB	13	Clear direct input B
RCTCB	14	External capacitor/resistor connection
CTCB	15	External capacitor connection (connected to ground)
VDD	16	Supply

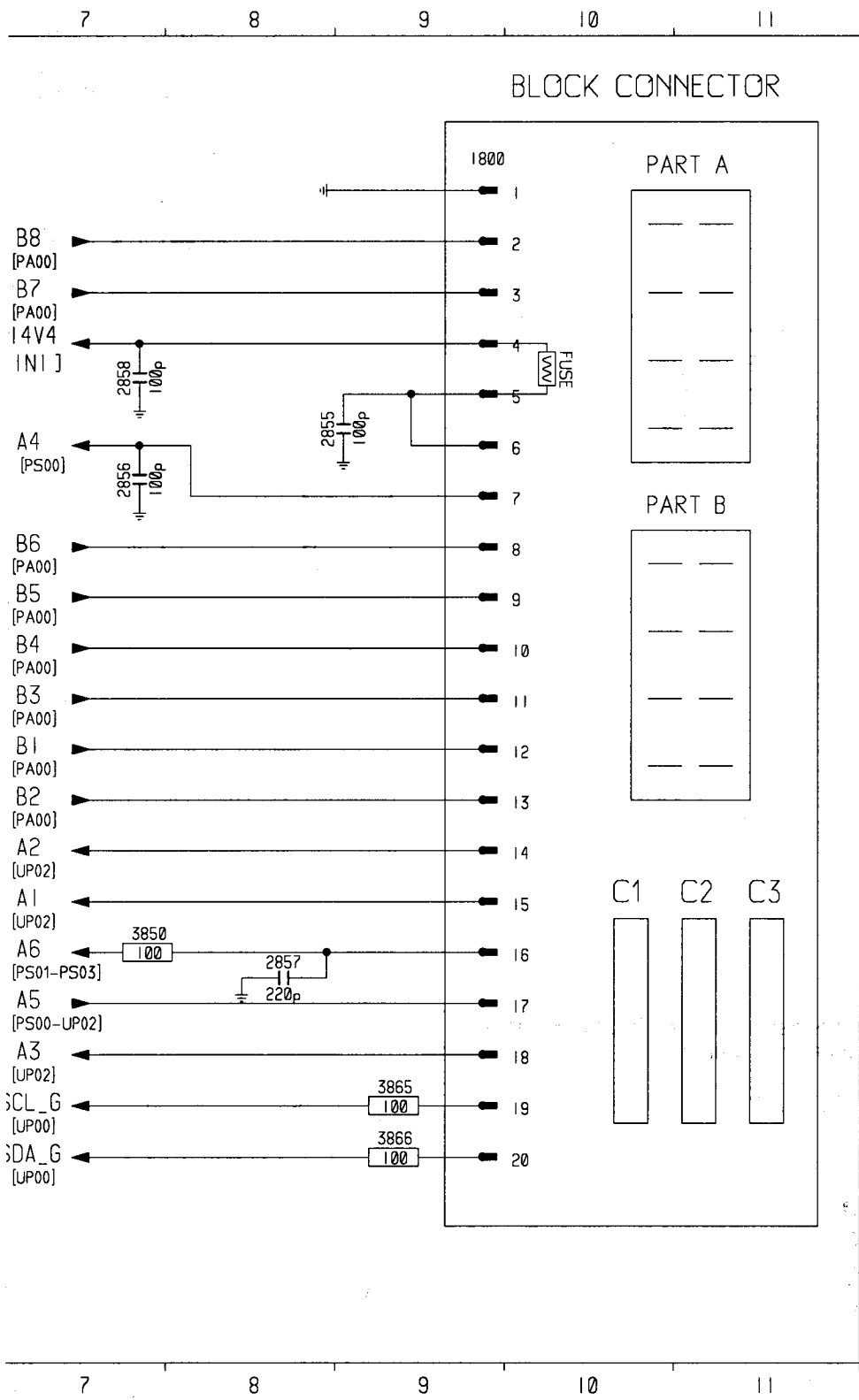


**FUNCTION TABLE**

.inputs		.outputs	
I <sub>0</sub>	I <sub>1</sub>	O	O
L	H	H	L
H	H	H	H
X	X	L	H

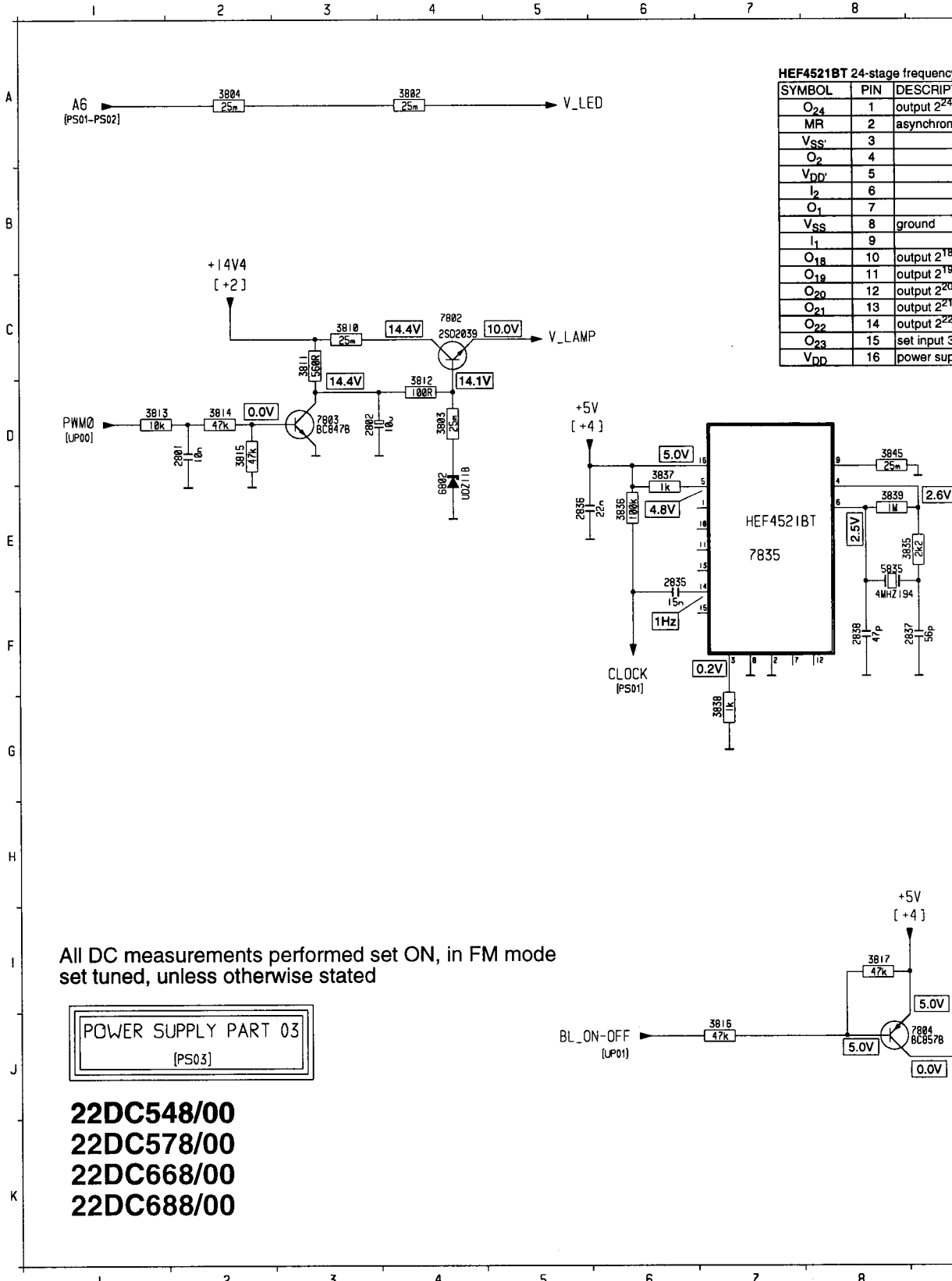
A1 .....	B2/E7	B1 .....	D7	B7 .....	B7
A2 .....	E7/D2	B2 .....	E7	B8 .....	A7
A3 .....	F7/G2	B3 .....	D7	REMOTE_2 .....	G5
A4 .....	B7	B4 .....	D7	REM_SUPPLY .....	F5
A5 .....	F7	B5 .....	C7	SCL_G .....	F7
A6 .....	E7	B6 .....	C7	SDA_G .....	G7





	1800	A 9
	2850	C 3
	2853	G 5
	2854	G 3
A	2855	B 8
	2856	C 7
	2857	F 8
	2858	B 7
	3850	E 7
	3852	B 3
	3854	B 3
	3855	B 4
B	3856	B 5
	3857	C 4
	3858	E 4
	3863	G 4
	3864	G 4
	3865	F 9
C	3866	G 9
	3867	F 3
	3871	D 3
	3872	G 3
	6850	A 3
	6852	G 4
	6853	F 3
D	7850	B 5
E		
F		
G		

A1 ..... ON-OFF\_SW .....G10  
 J6 ..... BL\_ON-OFF .....D1  
 F6 ..... CLOCK .....D13  
 I12 ..... DETACH\_FRONT .....E13  
 H10 ..... EJECT\_SW .....C5/I13  
 E13 ..... KEYBOARD\_INT .....V\_LED .....A5/H13



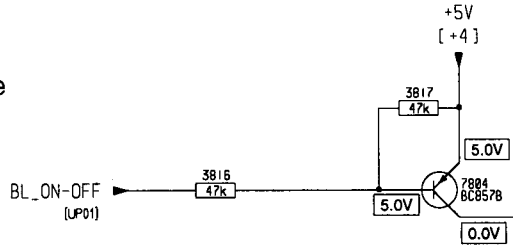
**HEF4521BT 24-stage frequency**

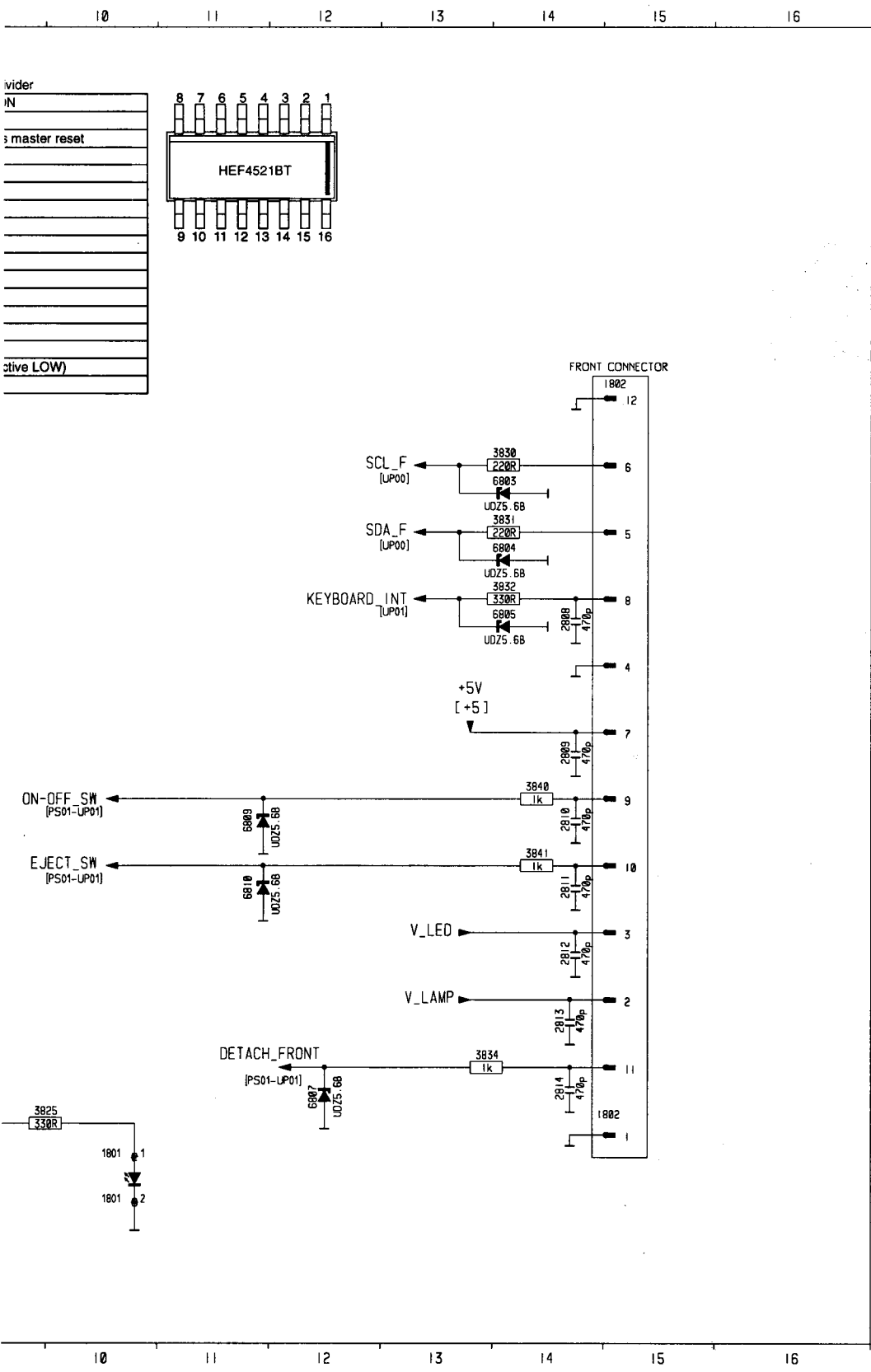
SYMBOL	PIN	DESCRIPT
O <sub>24</sub>	1	output 2 <sup>24</sup>
MR	2	asynchron
V <sub>SS</sub>	3	
O <sub>2</sub>	4	
V <sub>DD</sub>	5	
I <sub>2</sub>	6	
O <sub>1</sub>	7	
V <sub>SS</sub>	8	ground
I <sub>1</sub>	9	
O <sub>18</sub>	10	output 2 <sup>18</sup>
O <sub>19</sub>	11	output 2 <sup>19</sup>
O <sub>20</sub>	12	output 2 <sup>20</sup>
O <sub>21</sub>	13	output 2 <sup>21</sup>
O <sub>22</sub>	14	output 2 <sup>22</sup>
O <sub>23</sub>	15	set input 3
V <sub>DD</sub>	16	power supp

All DC measurements performed set ON, in FM mode set tuned, unless otherwise stated

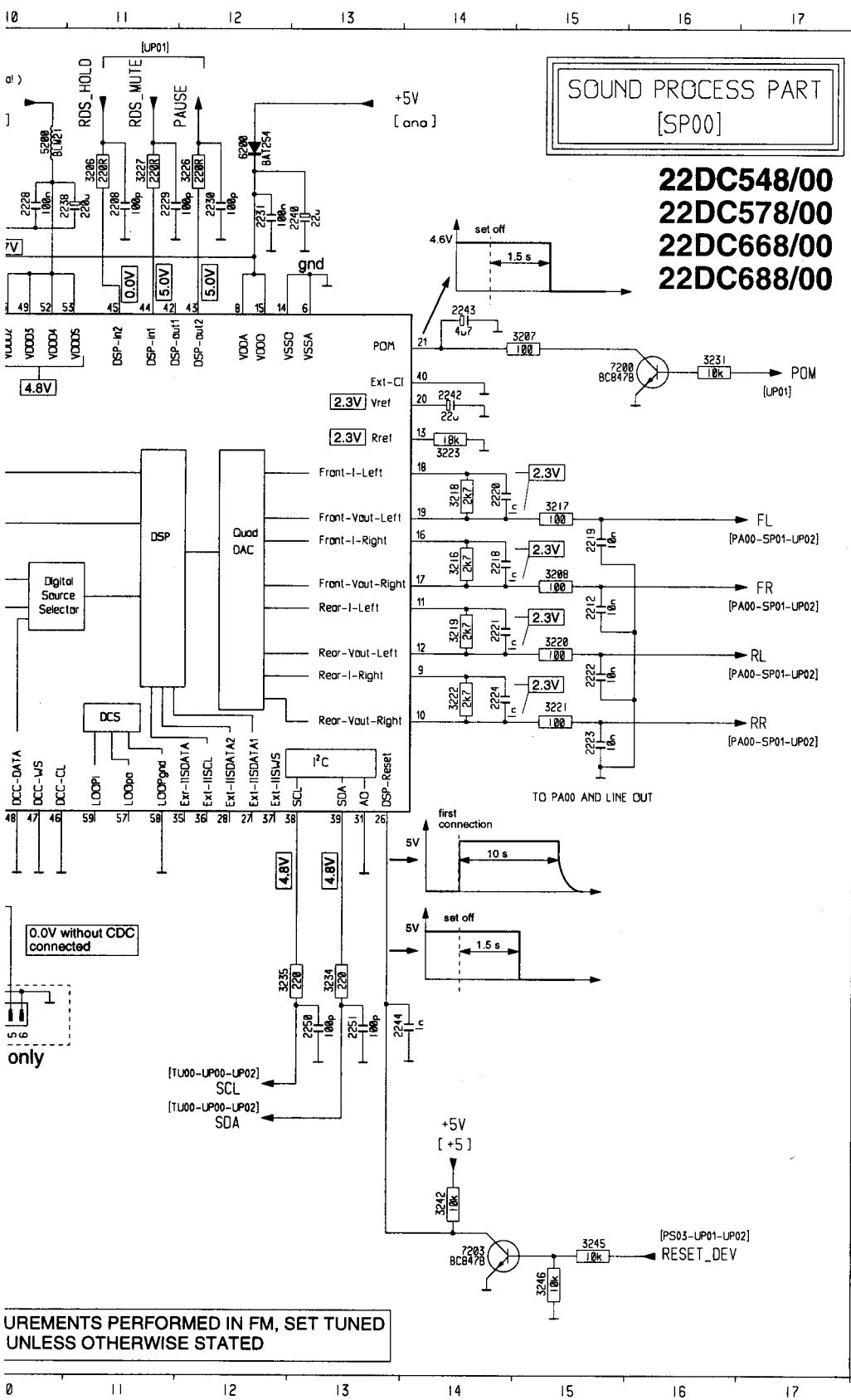
POWER SUPPLY PART 03  
[PS03]

**22DC548/00**  
**22DC578/00**  
**22DC668/00**  
**22DC688/00**



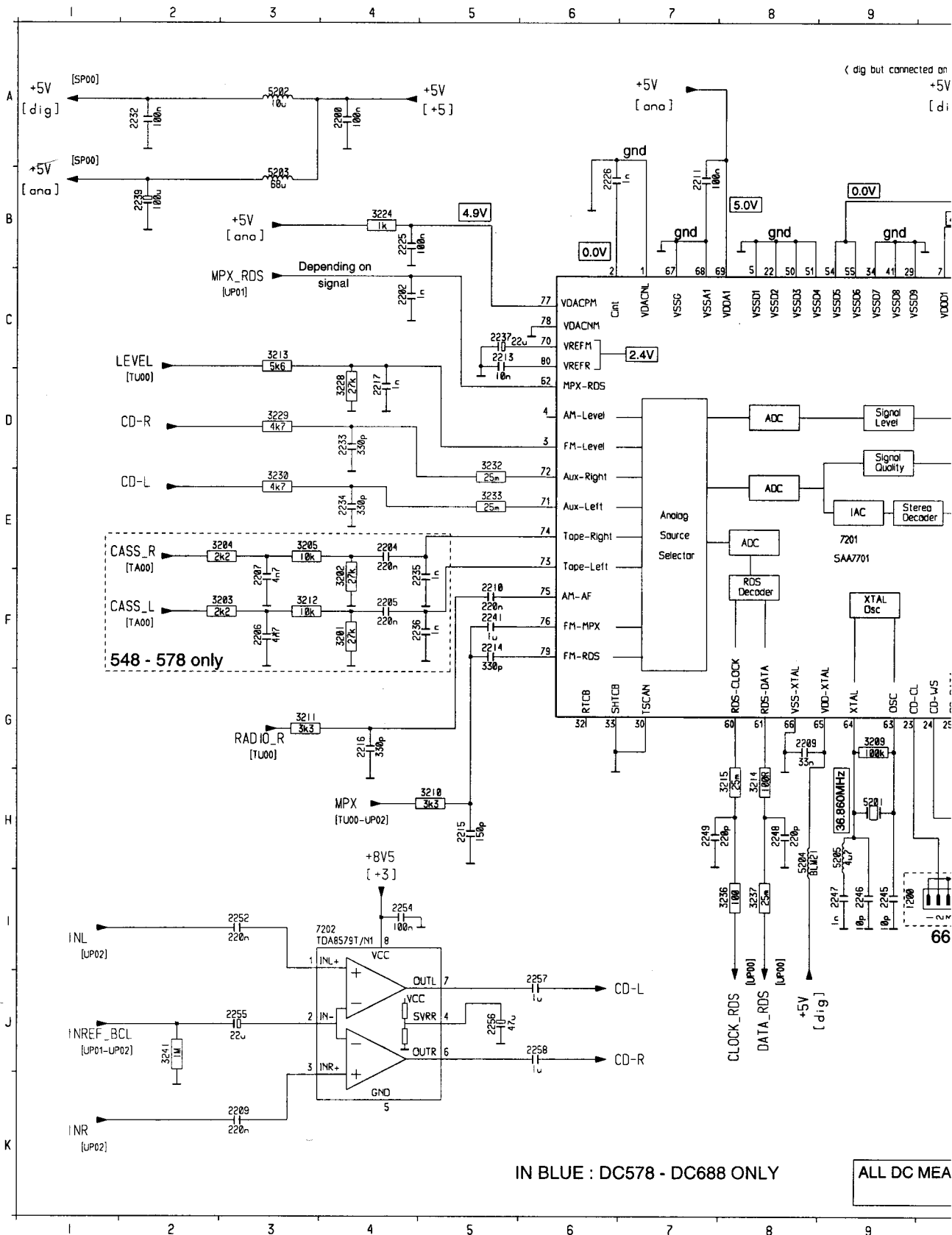


A	1801	K10
	1802	C14
	2801	D 2
	2802	D 3
	2808	E14
	2809	G14
	2810	G14
	2811	H14
	2812	H14
	2813	I14
B	2814	J14
	2835	E 6
	2836	E 5
	2837	F 9
	2838	F 8
C	3802	A 4
	3803	D 4
	3804	A 2
	3810	C 4
	3811	C 3
D	3812	D 4
	3813	D 1
	3814	D 2
	3815	D 2
	3816	J 7
E	3817	I 8
	3825	J10
	3830	D14
	3831	E14
	3832	E14
F	3834	I13
	3835	E 9
	3836	E 6
	3837	D 6
	3838	G 7
G	3839	E 8
	3840	G14
	3841	H14
	3845	D 8
	5835	E 8
H	6802	D 4
	6803	D14
	6804	E14
	6805	E14
	6807	J12
	6809	G11
	6810	H11
	7802	C 4
	7803	D 3
	7804	J 9
I	7835	E 7
J		
K		



1200	I 9	3214	H 8
2200	A 4	3215	H 8
2202	C 4	3216	E14
2204	E 4	3217	D15
2205	F 4	3218	D14
A			
2206	F 3	3219	E14
2207	F 3	3220	E15
2208	B11	3221	F15
2209	K 3	3222	F14
2209	G 8	3223	D14
B			
2210	F 5	3224	B 4
2211	B 7	3226	A12
2212	E15	3227	A11
2213	C 5	3228	D 4
2214	F 5	3229	D 3
C			
2215	H 5	3230	E 3
2216	G 4	3231	C16
2217	D 4	3232	D 5
2218	E14	3233	E 5
2219	E15	3234	H13
D			
2220	D14	3235	H12
2221	E14	3236	I 8
2222	F15	3237	I 8
2223	F15	3241	J 2
2224	F14	3242	J14
E			
2225	B 4	3245	K15
2226	B 6	3246	K15
2228	B10	5200	A10
2229	B11	5201	H 9
2230	B12	5202	A 3
F			
2231	B12	5203	B 3
2232	A 2	5204	H 8
2233	D 4	5205	H 9
2234	E 4	6200	A12
2235	F 5	7200	C16
G			
2241	F 5		
2242	C14		
2243	C14		
2244	I14		
2245	I 9		
H			
2246	I 9		
2247	I 9		
2248	H 8		
2249	H 7		
2250	I13		
I			
2251	I13		
2252	I 3		
2254	I 4		
2255	J 3		
2256	J 5		
J			
2257	J 6		
2258	J 6		
3201	F 4		
3202	F 4		
3203	F 3		
K			
3204	E 3		
3205	E 3		
3206	A11		
3207	C15		
3208	E15		
3209	G 9		
3210	G 5		
3211	F 4		
3212	F 3		
3213	C 3		

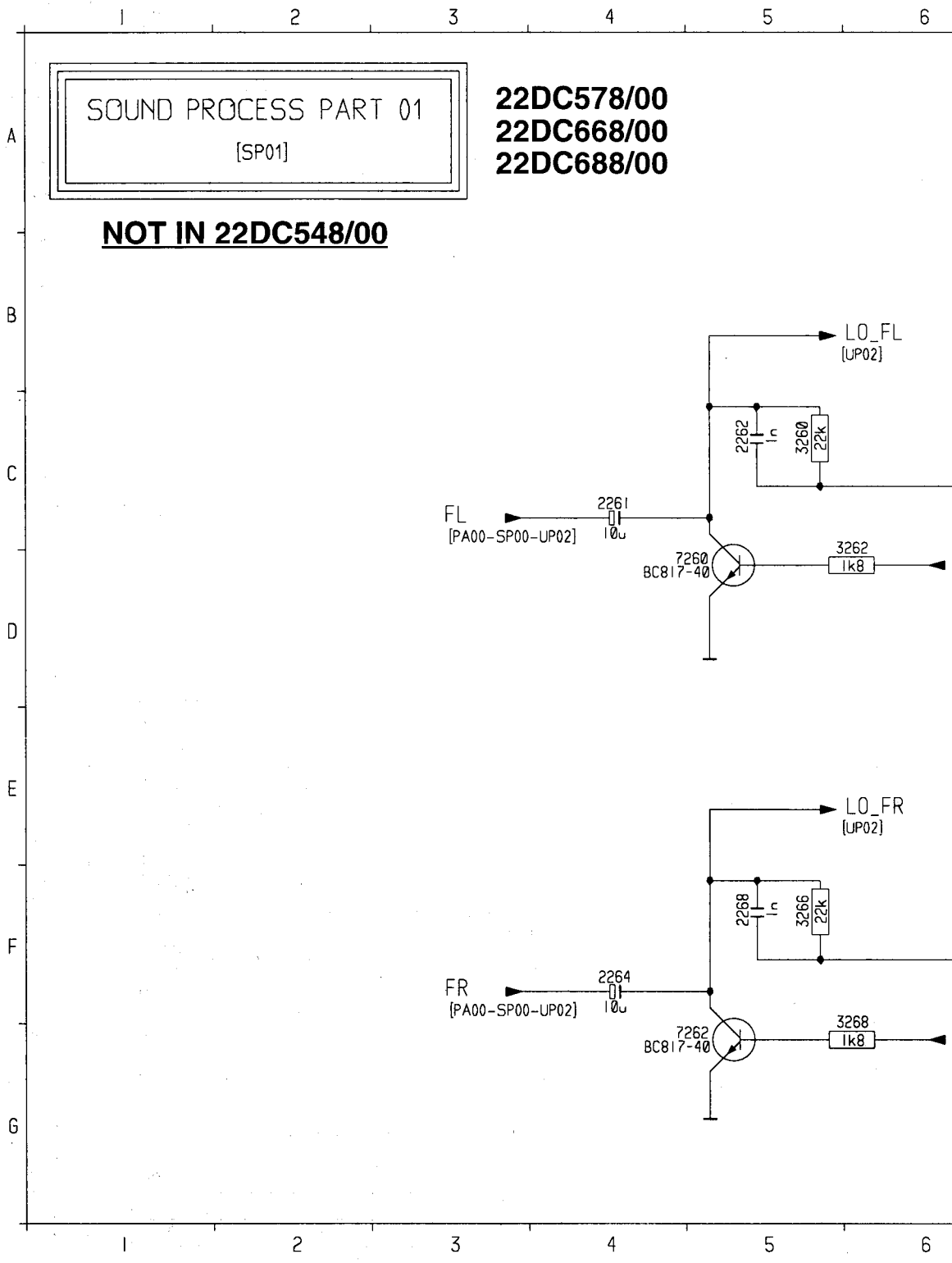
CASS_L ..... F2	FL ..... D17	MPX ..... H4	RDS_MUTE ..... A11
CASS_R ..... E2	FR ..... E17	MPX_RDS ..... C3	RESET_DEV ..... K16
CD_L ..... E2/J6	INL ..... I1	PAUSE ..... A12	RL ..... F17
CD_R ..... D2/J6	INR ..... K1	POM ..... C17	RR ..... F17
CLOCK_RDS ..... J8	INREF_BCL ..... J1	RADIO_R ..... G3	SCL ..... I12
DATA_RDS ..... J8	LEVEL ..... C2	RDS_HOLD ..... A11	SDA ..... J12

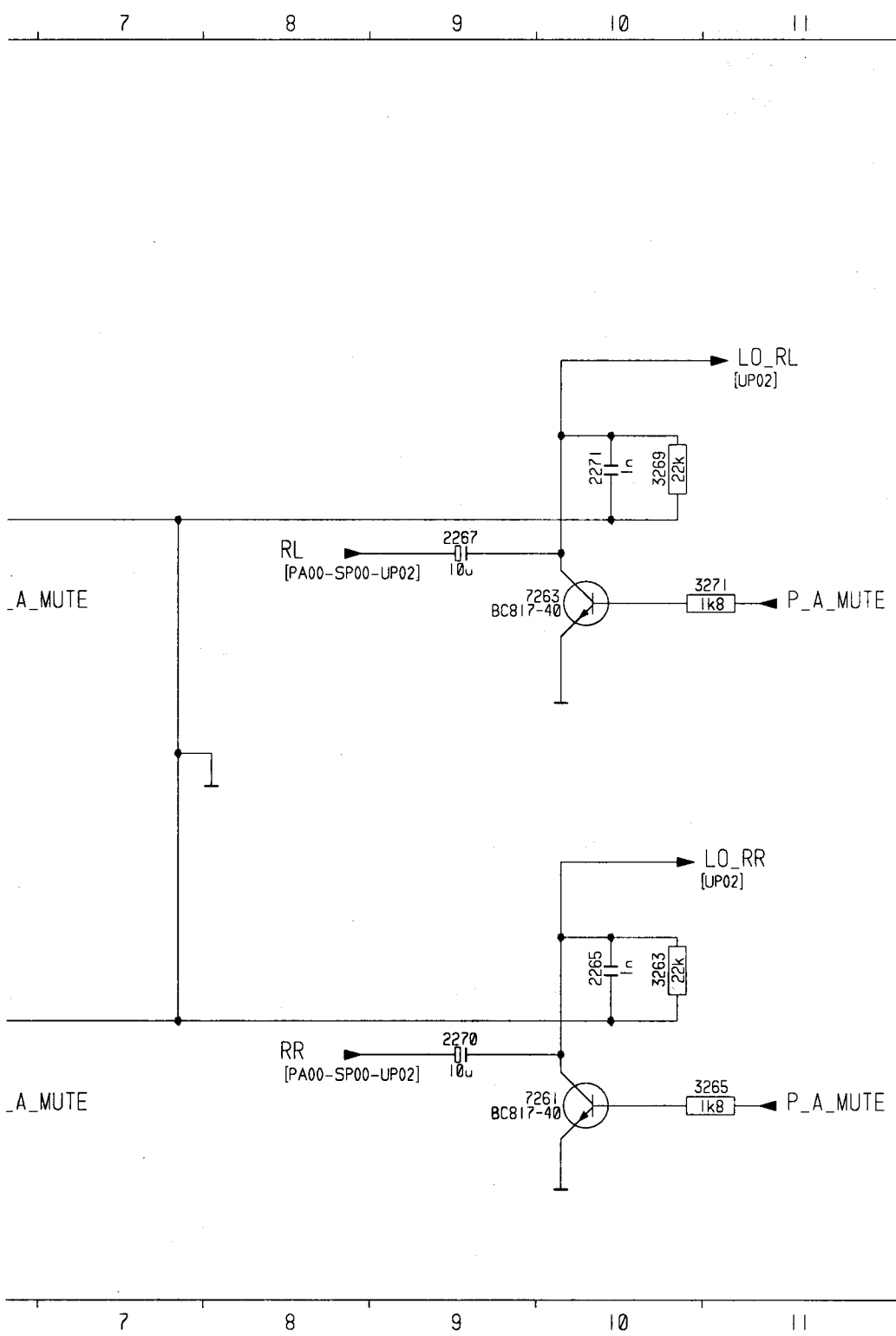




FL .....C3  
 FR .....F3  
 LO\_FL .....B5  
 LO\_FR .....E5  
 LO\_RL .....B11  
 LO\_RR .....E11

P\_A\_MUTE .....D11/G11  
 P\_A\_MUTE .....D6/G6  
 RL .....C8  
 RR .....F8

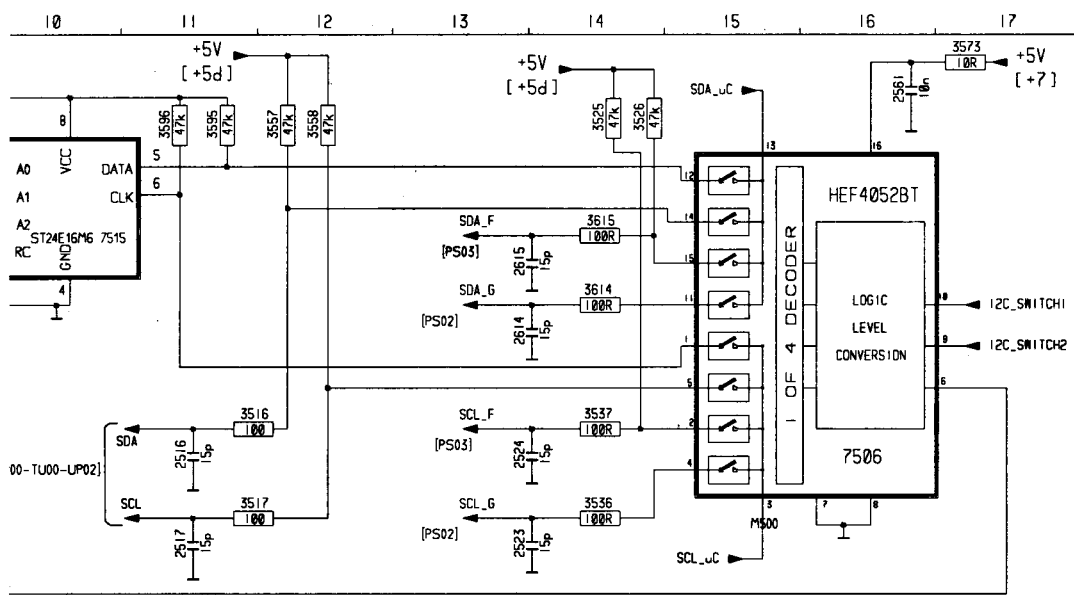




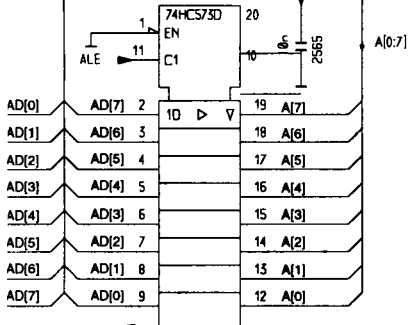
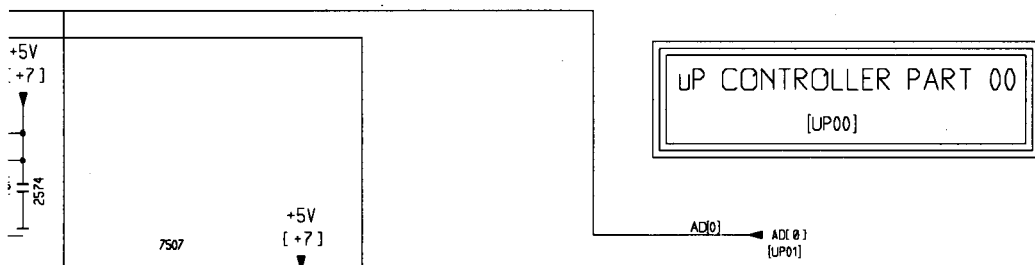
2261	C 4
2262	C 5
2264	F 4
2265	F 10
A 2267	C 9
2268	F 5
2270	F 9
2271	C 10
3260	C 5
3262	D 6
B 3263	F 10
3265	G 11
3266	F 5
3268	G 6
3269	C 10
3271	D 11
7260	D 5
C 7261	G 10
7262	G 5
7263	D 10

D  
E  
F  
G

.....D6/F8	RESET_uC .....C9	SCL_uC .....D13	ST_BY .....D11/12/F8G3
10 .....B9	SCA_CLOCK .....E1	SCL_uC .....D7/D15	TEMP_SENSE .....J1
.....14	SCA_DATA .....F1	SDA .....C11	V_LOW_uC .....F2
OTE_2 .....L1	SCA_ENABLE .....G1	SDSDA_F .....B13	V_REF .....K1
_SUPPLY .....C1	SCL .....C11	SDA_G .....B13	WRITE .....I4
ET .....K9	SCL_F .....C13	SDA_uC .....D7/A15	



- A 1500 B 5 3573 A17
- 2501 K 8 3574 D 3
- 2516 C11 3576 E 1
- 2517 D11 3578 E 2
- 2518 B 8 3579 F 3
- 2520 B 8 3580 F 3
- 2521 D 8 3583 H 3
- 2522 C 8 3587 F 3
- 2523 D13 3588 K 6
- B 2524 C13 3589 K 5
- 2525 K 8 3591 L 5
- 2527 K12 3592 L 5
- 2529 J 8 3593 L 6
- 2530 L 8 3595 A11
- 2531 G 2 3596 A11
- C 2532 G 2 3597 B 9
- 2533 F 2 3598 K 8
- 2535 D 2 3599 L 8
- 2536 E 1 3614 B14
- 2541 H 2 3615 B14
- 2543 J 2 5501 B 2
- D 2544 K 2 5503 C 4
- 2546 L 3 6500 G 4
- 2549 I 2 7505 D 3
- 2550 I 2 7506 D16
- 2551 B 2 7507 F11
- 2552 C 3 7512A E 9
- E 2554 B 3 7513 B 5
- 2555 I11 7514 I11
- 2561 A16 7515 B11
- 2565 G12
- 2574 F10
- 2577 A 2
- F 2578 B 5
- 2614 C13
- 2615 B13
- 3500 K 8
- 3502 F 4
- 3503 I10
- G 3505 I 8
- 3516 C11
- 3517 D11
- 3518 B 8
- 3520 B 8
- 3521 D 8
- H 3522 C 8
- 3523 C 7
- 3524 C 7
- 3525 A14
- 3526 A14
- 3529 J11
- I 3531 J 8
- 3533 G 2
- 3534 F 2
- 3535 E 3
- 3536 D14
- 3537 C14
- J 3538 E 2
- 3543 H 2
- 3545 J 2
- 3546 K 2
- 3548 K 3
- 3551 I 2
- K 3552 I 2
- 3553 D 6
- 3555 I11
- 3556 J10
- 3557 A12
- 3558 A12
- 3560 I10
- L 3567 D 3
- 3568 C 2
- 3569 C 3
- 3571 B 7
- 3572 K 2

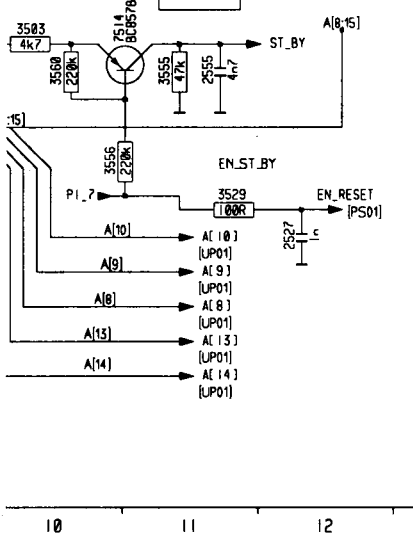


**74HC573D Octal D-type transparent latch; 3-state**

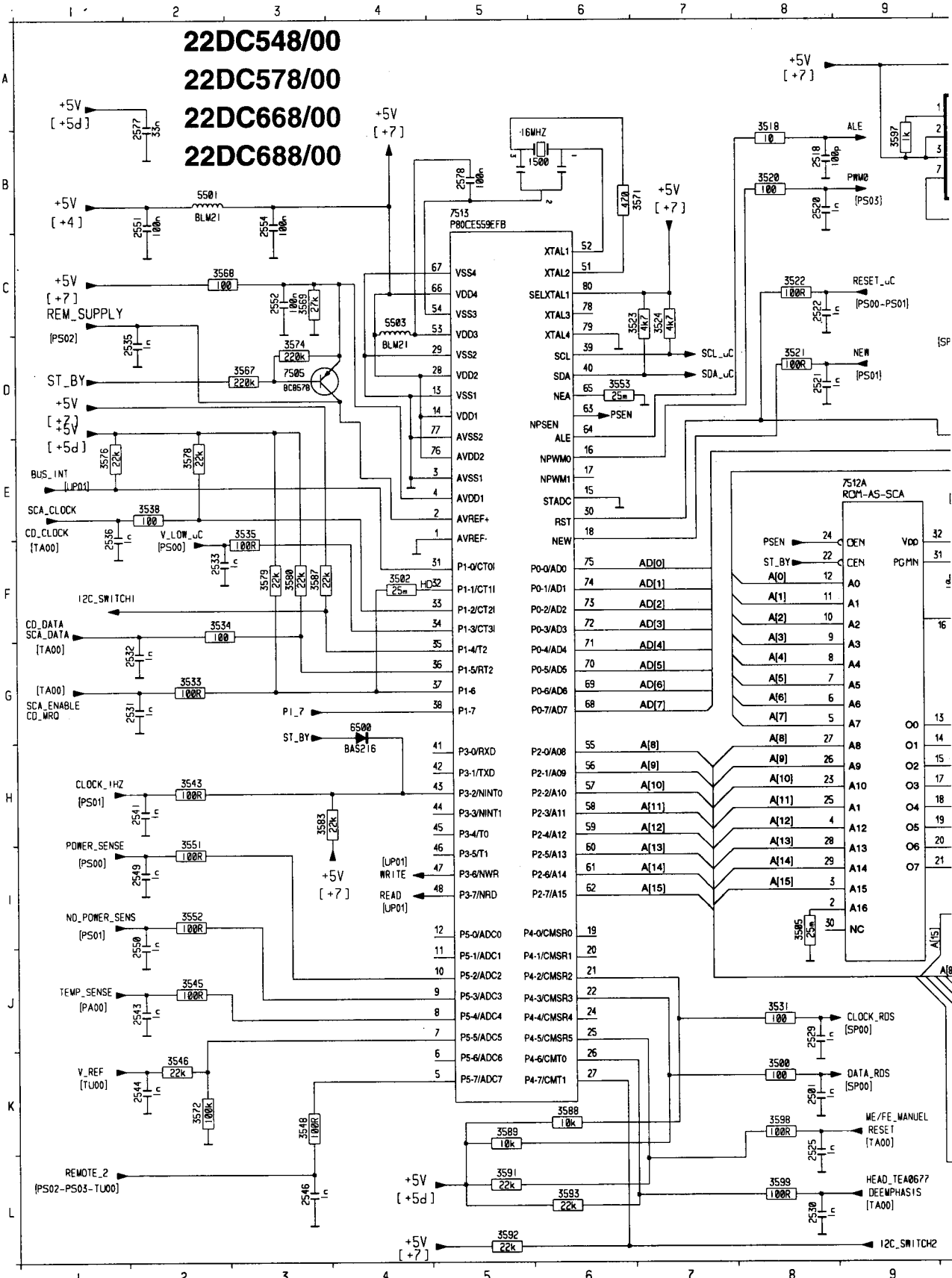
SYMBOL	PIN	DESCRIPTION
OE	1	3-state output enable input (active LOW)
D <sub>0</sub> to D <sub>7</sub>	2 to 9	data inputs
GND	10	Ground (0V)
LE	11	latch enable input (active HIGH)
Q <sub>7</sub> to Q <sub>0</sub>	12 to 19	3-state latch outputs
VCC	20	positive supply voltage


**IN BLUE : ALTERNATIVE COMPONENTS**

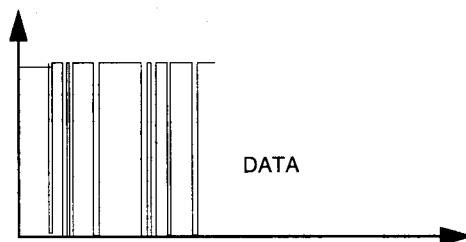
	DC548	DC578	DC668	DC688
3576		X		X
3502		X		X
3591			X	X
3598			X	X
2525			X	X



AD[0] .....	F15	A[9] .....	K11	CLOCK_RDS .....	J9	I2C_SWITCH2 .....	L9/C17	PSEI .....	
ALE .....	B5/G10	BUS_INT .....	E1	DATA_RDS .....	K9	ME/FE_MANUEL .....	K9	PWN .....	
A[10] .....	K11	CD_CLOCK .....	E1	DEEMPHASIS .....	L9	NEW .....	D9	REA .....	
A[13] .....	K11	CD_DATA .....	F1	EN_RESET .....	J12	NO_POWER_SENS .....	I1	REM .....	
A[14] .....	L11	CD_MRQ .....	G1	HEAD_TEA0677 .....	L9	PI_7 .....	G3/J10	REM .....	
A[8] .....	K11	CLOCK_1HZ .....	H1	I2C_SWITCH1 .....	F1/B17	POWER_SENSE .....	I1	RES .....	

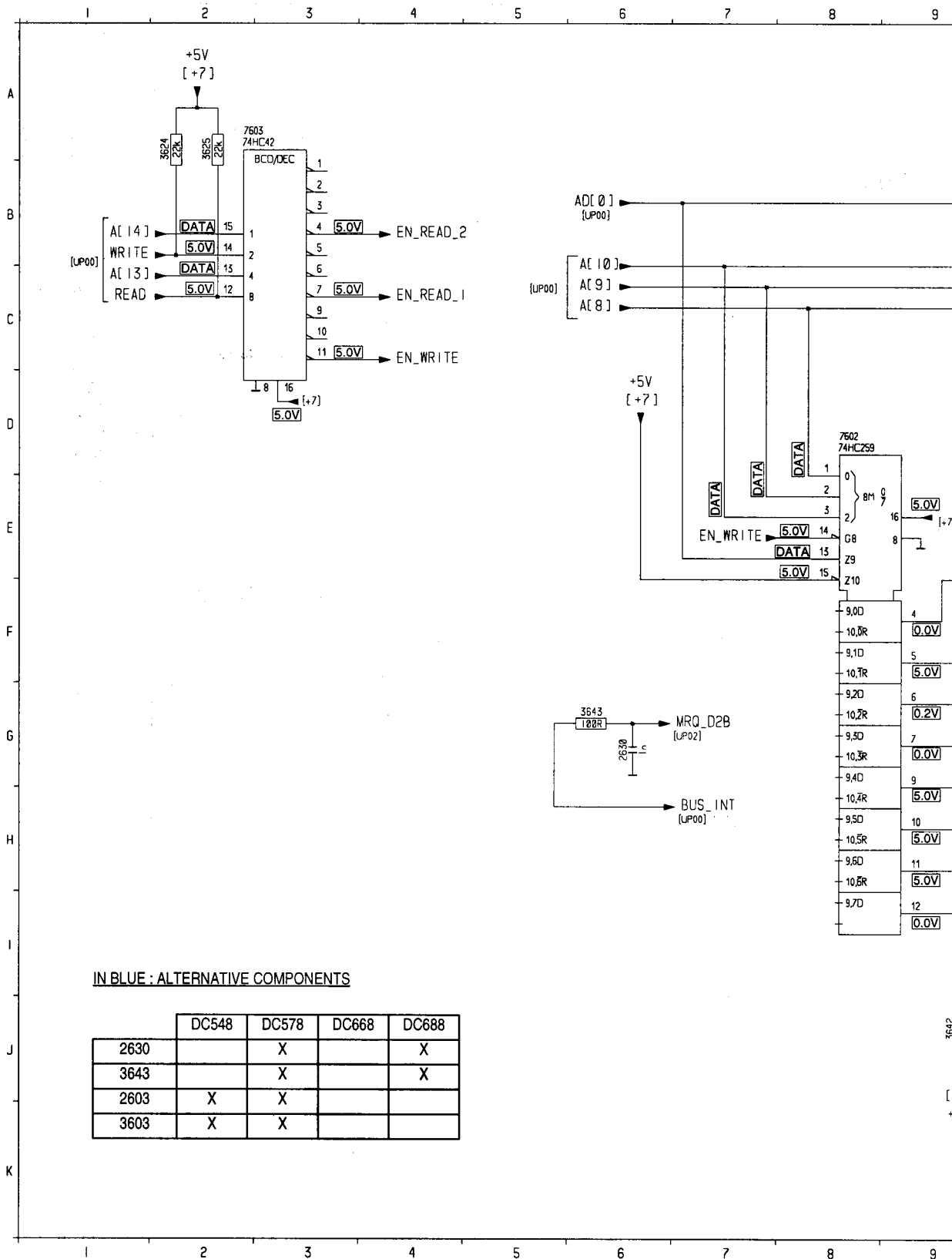


1	0.0V GND	41	N.C.
2	4.8V	42	N.C.
3	0.0V GND	43	5.0V  1Hz
4	4.9V VDD	44	N.C.
5	4.8V	45	N.C.
6	N.C.	46	N.C.
7	4.0V	47	5.0V
8	0.6V	48	5.0V
9	4.5V	49	0.0V
10	4.4V	50	0.0V
11	N.C.	51	2.5V 16MHz
12	N.C.	52	2.1V 16MHz
13	0.0V GND	53	5.0V VDD
14	5.0 V VDD	54	GND
15	0.0V GND	55	DATA
16	0.0V	56	DATA
17	N.C.	57	DATA
18	0.0V	58	DATA
19	N.C.	59	DATA
20	N.C.	60	DATA
21	4.9V	61	DATA
22	4.2V	62	DATA
23	0.0V	63	2.5V
24	N.C.	64	1.6V
25	N.C.	65	0.0V
26	5.2V	66	5.0V VDD
27	0.0V	67	GND
28	5.0V VDD	68	DATA
29	0.0V GND	69	DATA
30	0.0V	70	DATA
31	N.C.	71	DATA
32	N.C.	72	DATA
33	5.0V	73	DATA
34	5.0V	74	DATA
35	5.0V	75	DATA
36	5.0V	76	5.0V VDD
37	5.0V	77	GND
38	4.8V	78	N.C.
39	5.0V	79	0.0V
40	4.8V	80	5.0V



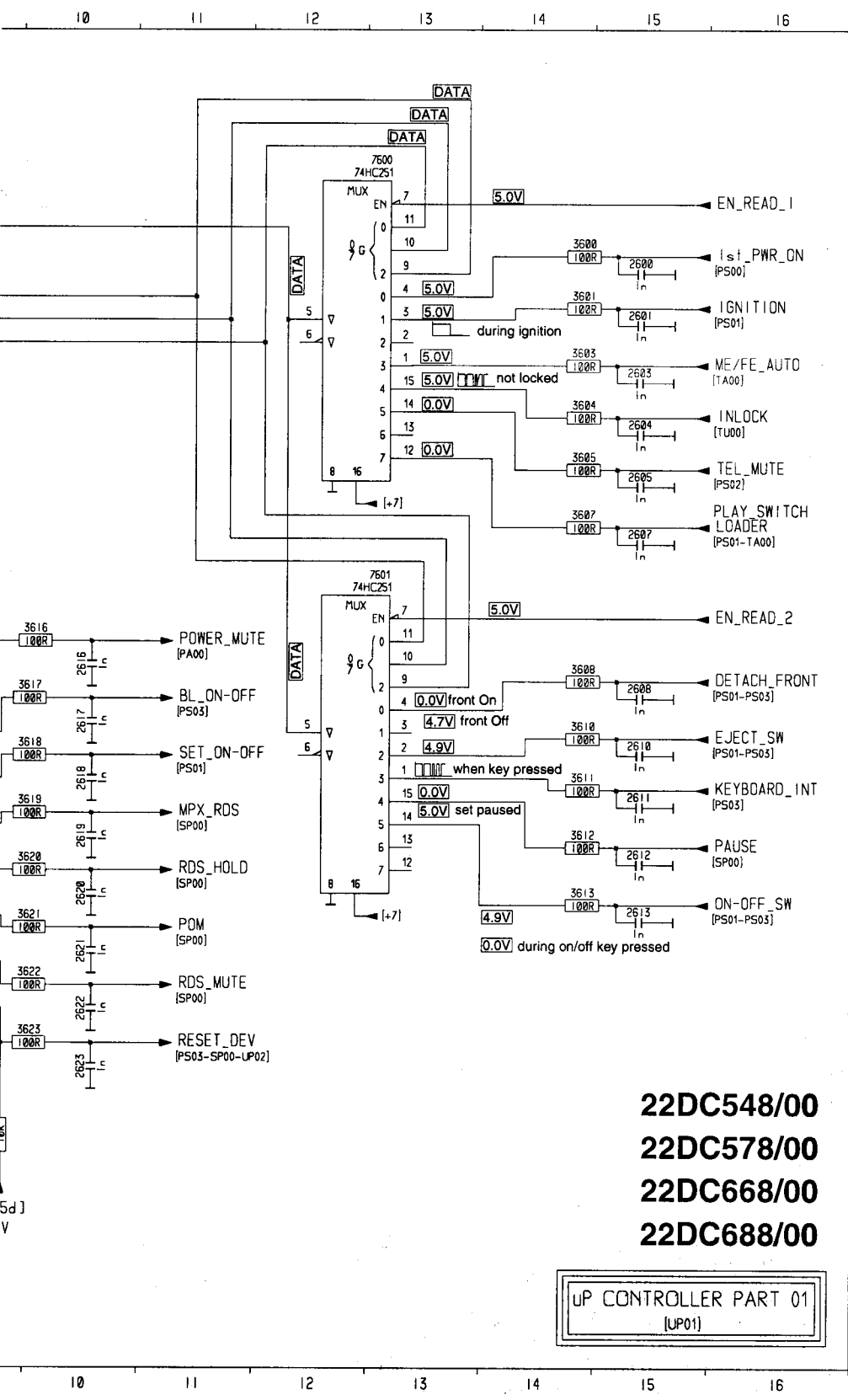


AD[0] .....B6	BL_ON-OFF .....F11	EN_WRITE .....C4/E7	MPX_RDS .....G11
A[10] .....C6	BUS_INT .....H7	IGNITION .....C15	MRQ_D2B .....G7
A[13] .....C2	DETACH_FRONT .....F15	INLOCK .....D15	ON-OFF_SW .....H15
A[14] .....B2	EJECT_SW .....F15	KEYBOARD_INT .....G15	PAUSE .....G15
A[8] .....C6	EN_READ_1 .....C4/B15	LOADER .....D15	PLAY_SWITCH .....D15
A[9] .....C6	EN_READ_2 .....B4/E14	ME/FE_AUTO .....C15	POM .....H11



POWER\_MUTE .....E11  
 RDS\_HOLD .....G11  
 RDS\_MUTE .....H11  
 READ .....C2  
 RESET\_DEV .....I11  
 SET\_ON-OFF .....F11

TEL\_MUTE .....D15  
 WRITE .....B2  
 Ist\_PWR\_ON .....B15



- A 2600 B15
- 2601 C15
- 2603 C15
- 2604 D15
- 2605 D15
- 2607 E15
- 2608 F15
- 2610 F15
- 2611 G15
- 2612 G15
- B 2613 H15
- 2616 F10
- 2617 F10
- 2618 G10
- 2619 G10
- C 2620 H10
- 2621 H10
- 2622 I10
- 2623 I10
- 2630 G 6
- D 3600 B14
- 3601 C14
- 3603 C14
- 3604 C14
- 3605 D14
- E 3607 D14
- 3608 F14
- 3610 F14
- 3611 G14
- 3612 G14
- F 3613 H14
- 3616 E10
- 3617 F10
- 3618 F10
- 3619 G10
- G 3620 G10
- 3621 H10
- 3622 H10
- 3623 I10
- 3624 A 2
- H 3625 A 2
- 3642 J 9
- 3643 G 6
- 7600 A13
- 7601 E13
- I 7602 D 8
- 7603 A 2
- J
- K

**22DC548/00**  
**22DC578/00**  
**22DC668/00**  
**22DC688/00**

UP CONTROLLER PART 01  
 [UP01]



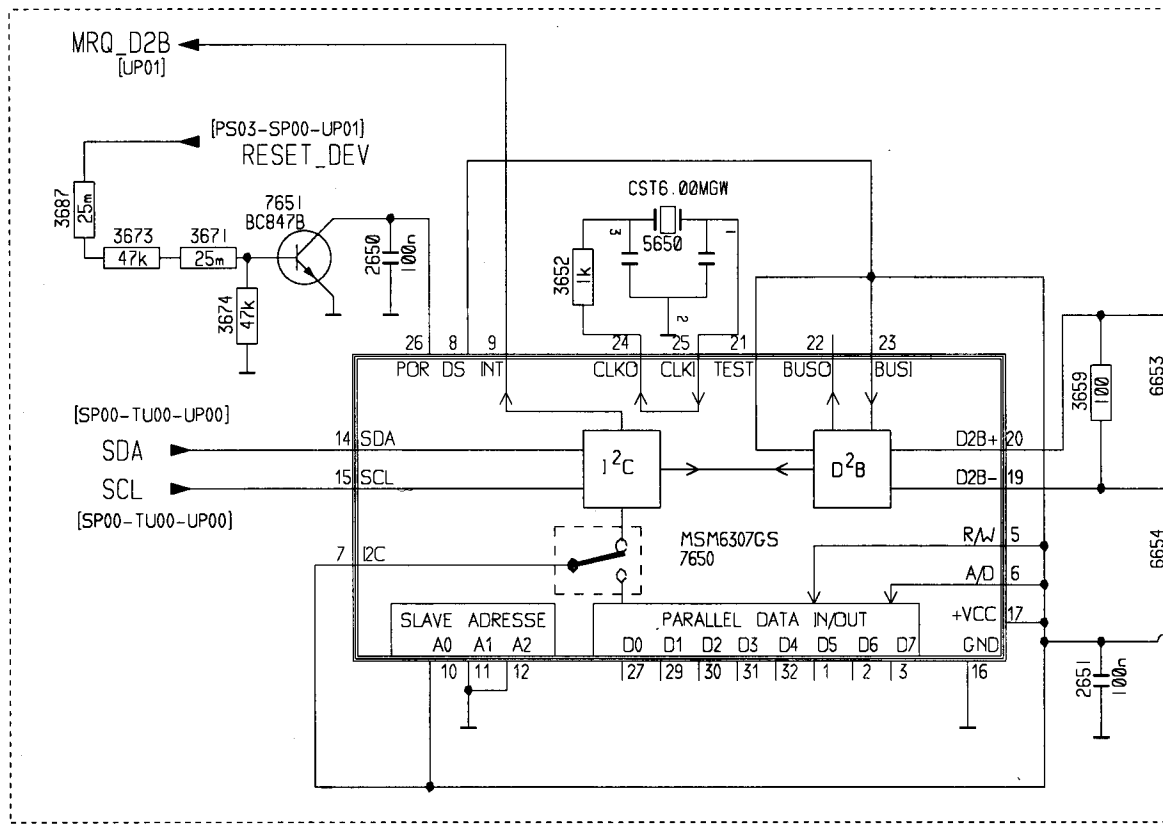
INL.....E9      LO\_RR.....A9  
 INR.....E9      MRQ\_D2B.....B1  
 INREF\_BCL.....D9      RESET\_DEV.....B1  
 LO\_FL.....A9      SCL.....D1  
 LO\_FR.....A9      SDA.....D1  
 LO\_RL.....A9

BUS ADAPTATOR CONTROL I2C / D2B FOR CD CHANGER

UP CONTROLLER PART 02  
 [UP02]

A  
B  
C  
D  
E  
F  
G

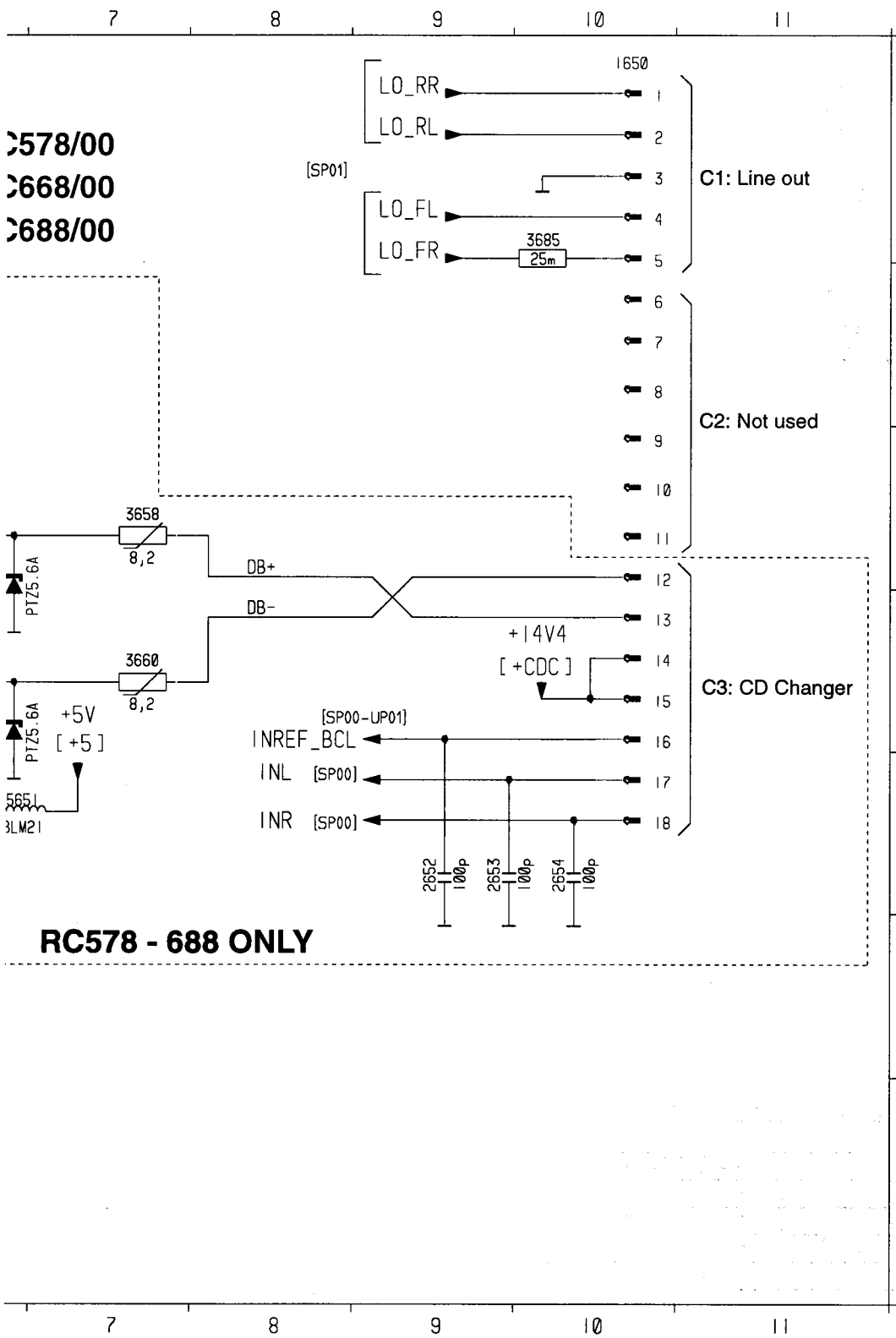
22D  
22D  
22D



**MSM6307GS D<sup>2</sup>B IC**

SYMBOL	I/O	DESCRIPTION
POR	I	Power on - reset
R / W	I	Read / Write selector
DS	I	Data strobe to access data bus
A / D	I	Selects address or data on D0 ~ d7
SDA	I/O	I <sup>2</sup> C data signal input / output
SCL	I/O	I <sup>2</sup> C clock signal input / output
I2C	I	Selects I <sup>2</sup> C or parallel interface
INT	O	Interrupt output
BUSIN	I	D2B input (TTL level)
BUSOUT	O	D2B output (TTL level)
DBN & DBP	I/Os	Differential D2B lines of the internal driver/receiver, to be terminated with 60Ω
TEST	I	Selects the test mode for factory purposes
6MCI	I	Clock input 6MHz resonator or X-TAL
6MCO	O	Clock output 6MHz resonator or X-TAL
D0 - D7	I/Os	8-bit bi-directional address or data bus
A0 - A2	I	Programmables I <sup>2</sup> C slave addresses

6

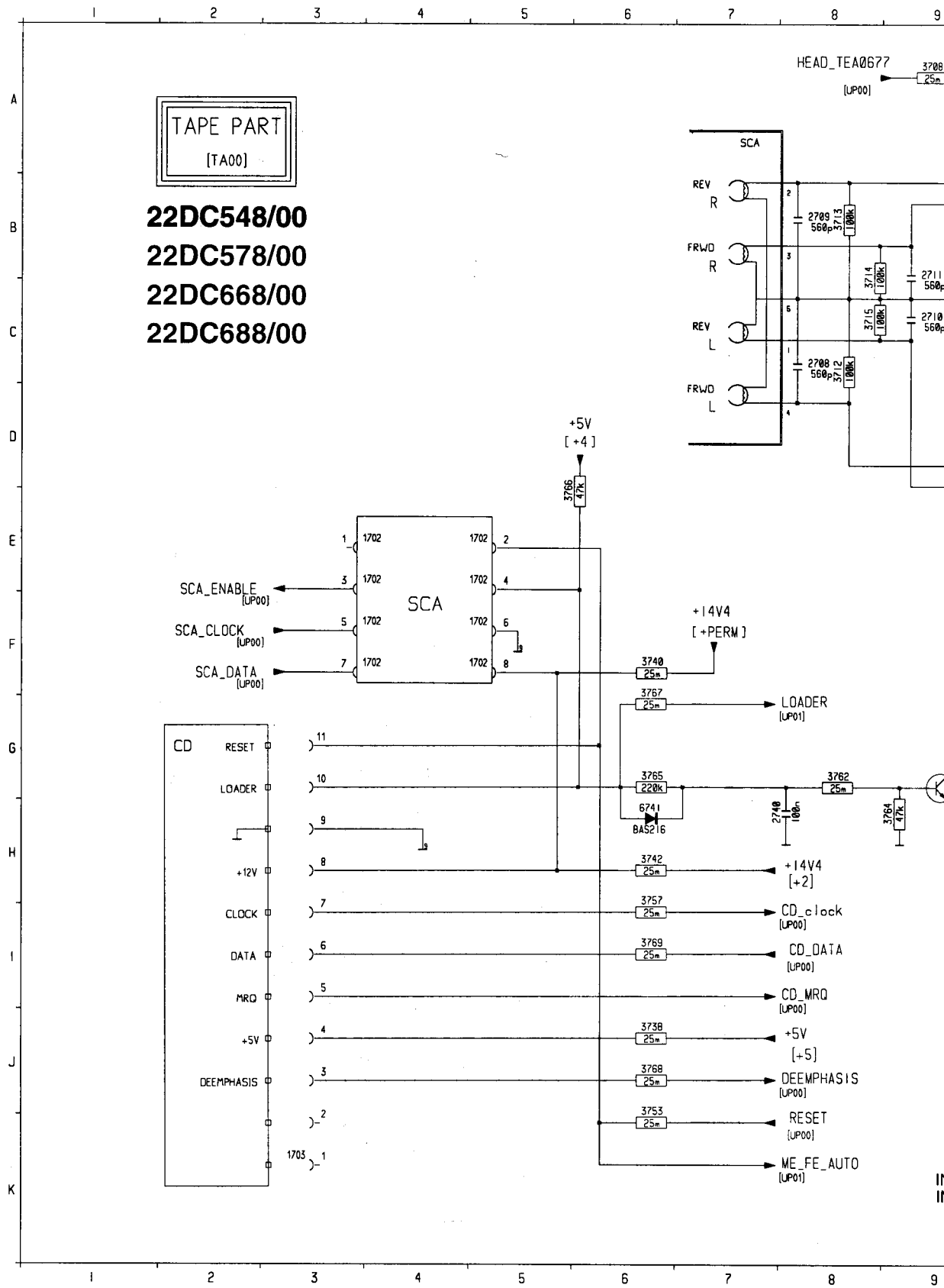


1650	A10
2650	C 2
2651	E 6
2652	E 9
2653	E 9
2654	E10
3652	C 3
3658	C 7
3659	D 6
3660	D 7
3671	C 1
3673	C 1
3674	C 1
3685	A10
3687	C 1
5650	C 3
5651	E 6
6653	C 6
6654	D 6
7650	D 3
7651	C 1

CASS\_L ..... E16  
 CASS\_R ..... A16  
 CD\_CLOCK ..... I7  
 CD\_DATA ..... I7  
 CD\_MRQ ..... I7  
 DEEMPHASIS ..... J7

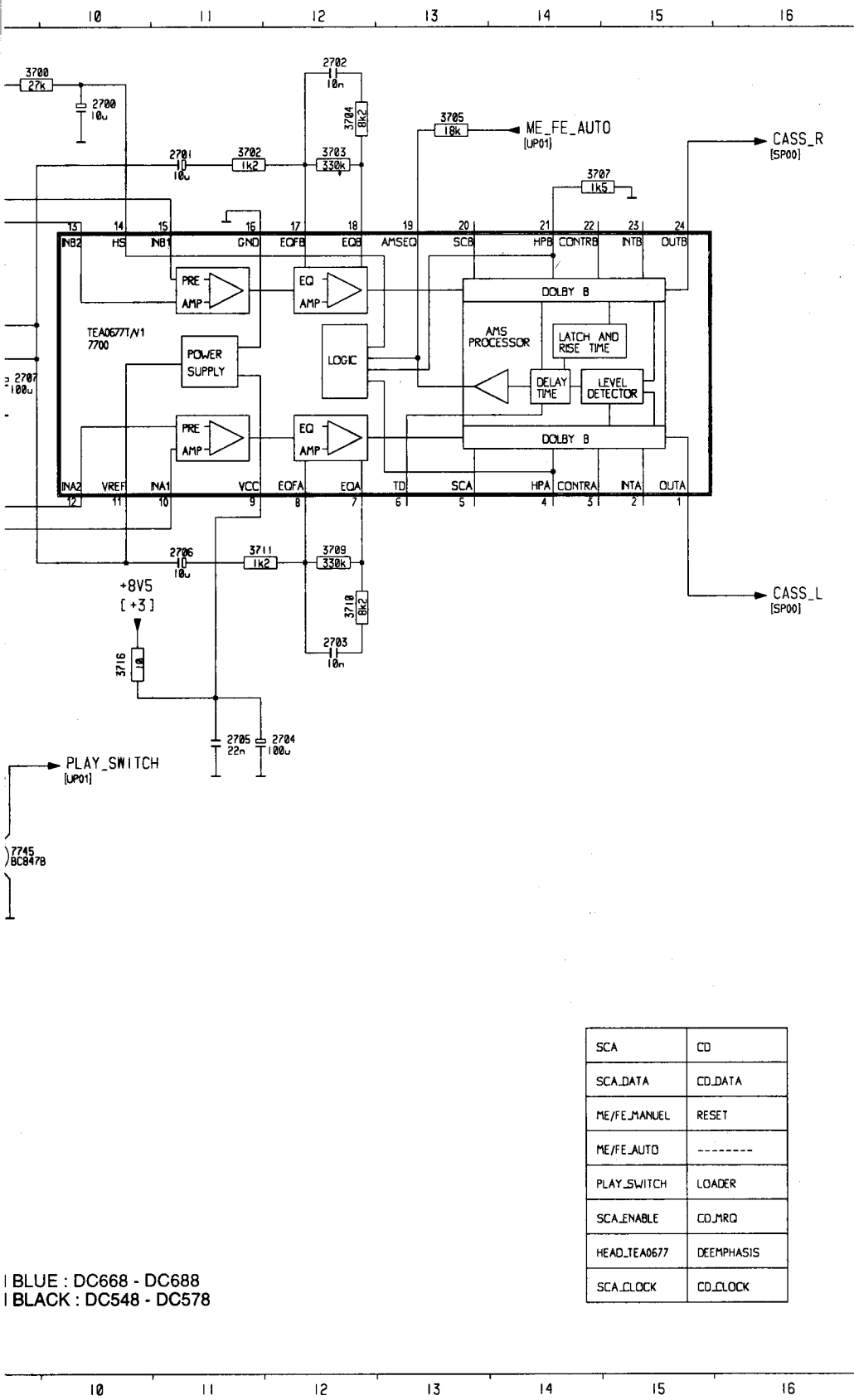
HEAD\_TEA0677 ..... A8  
 LOADER ..... G7  
 ME\_FE\_AUTO ..... A14/K7  
 PLAY\_SWITCH ..... G10  
 RESET ..... K7  
 SCA\_CLOCK ..... F3

SCA\_DATA ..... F3  
 SCA\_ENABLE ..... E3



TAPE PART  
 [TA00]

**22DC548/00**  
**22DC578/00**  
**22DC668/00**  
**22DC688/00**



- 1702 F 5
- 1703 K 3
- 2700 A10
- 2701 A11
- 2702 A12
- A 2703 F12
- 2704 F12
- 2705 F11
- 2706 E11
- 2707 C 9
- 2708 C 8
- 2709 B 8
- B 2710 C 9
- 2711 B 9
- 2740 H 8
- 3700 A 9
- 3702 A11
- 3703 A12
- C 3704 A12
- 3705 A13
- 3707 A14
- 3708 A 9
- 3709 E12
- 3710 E12
- 3711 E11
- D 3712 C 8
- 3713 B 8
- 3714 B 8
- 3715 C 8
- 3716 F10
- E 3738 J 6
- 3740 F 6
- 3742 H 6
- 3753 J 6
- 3757 H 6
- 3762 G 8
- F 3764 H 9
- 3765 G 6
- 3766 E 5
- 3767 F 6
- 3768 J 6
- 3769 I 6
- G 6741 H 6
- 7700 C10
- 7745 G 9
- H
- I
- J
- K

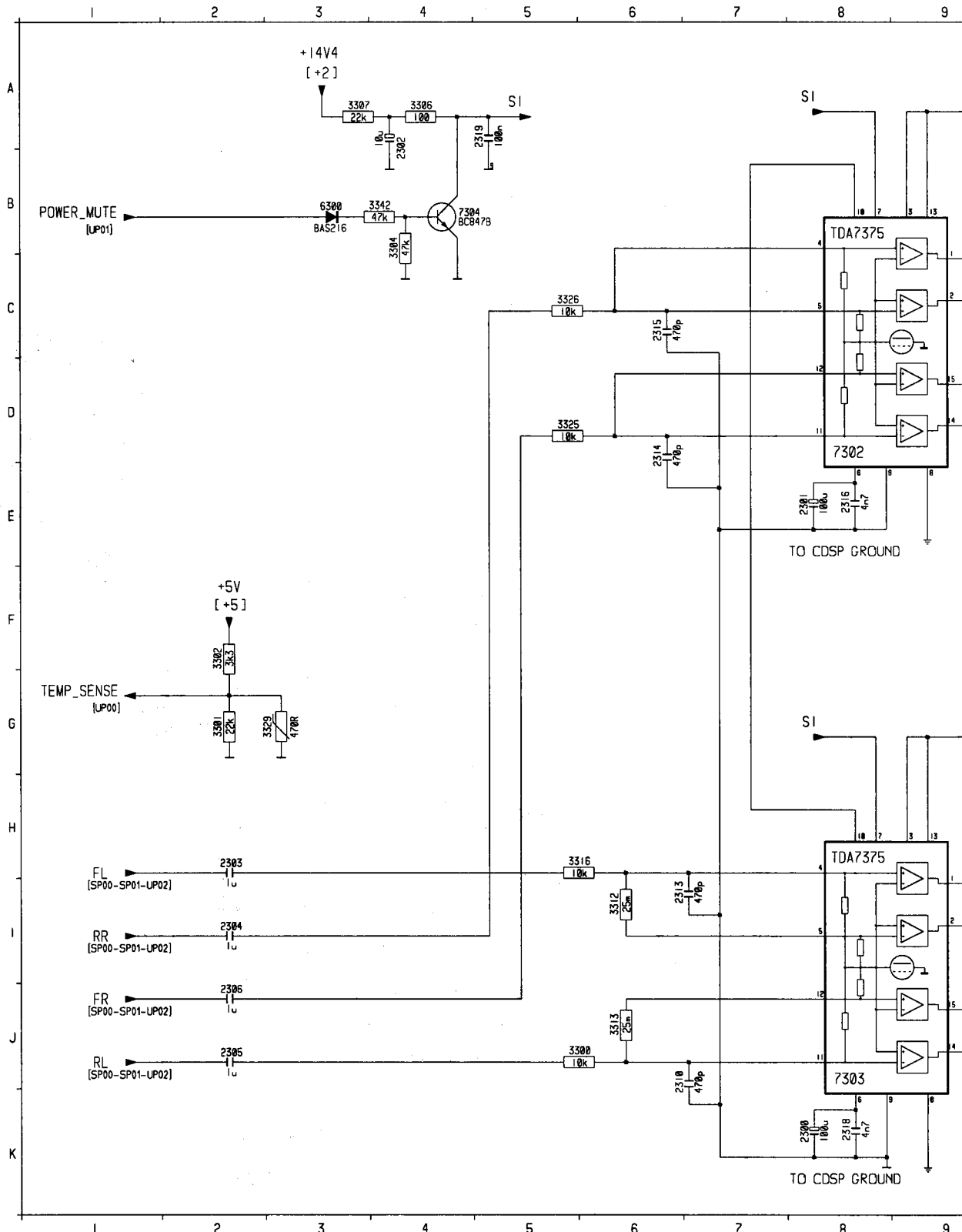
SCA	CD
SCA_DATA	CD_DATA
ME/FE_MANUEL	RESET
ME/FE_AUTO	-----
PLAY_SWITCH	LOADER
SCA_ENABLE	CD_MRD
HEAD_TEA0677	DEEMPHASIS
SCA_CLOCK	CD_CLOCK

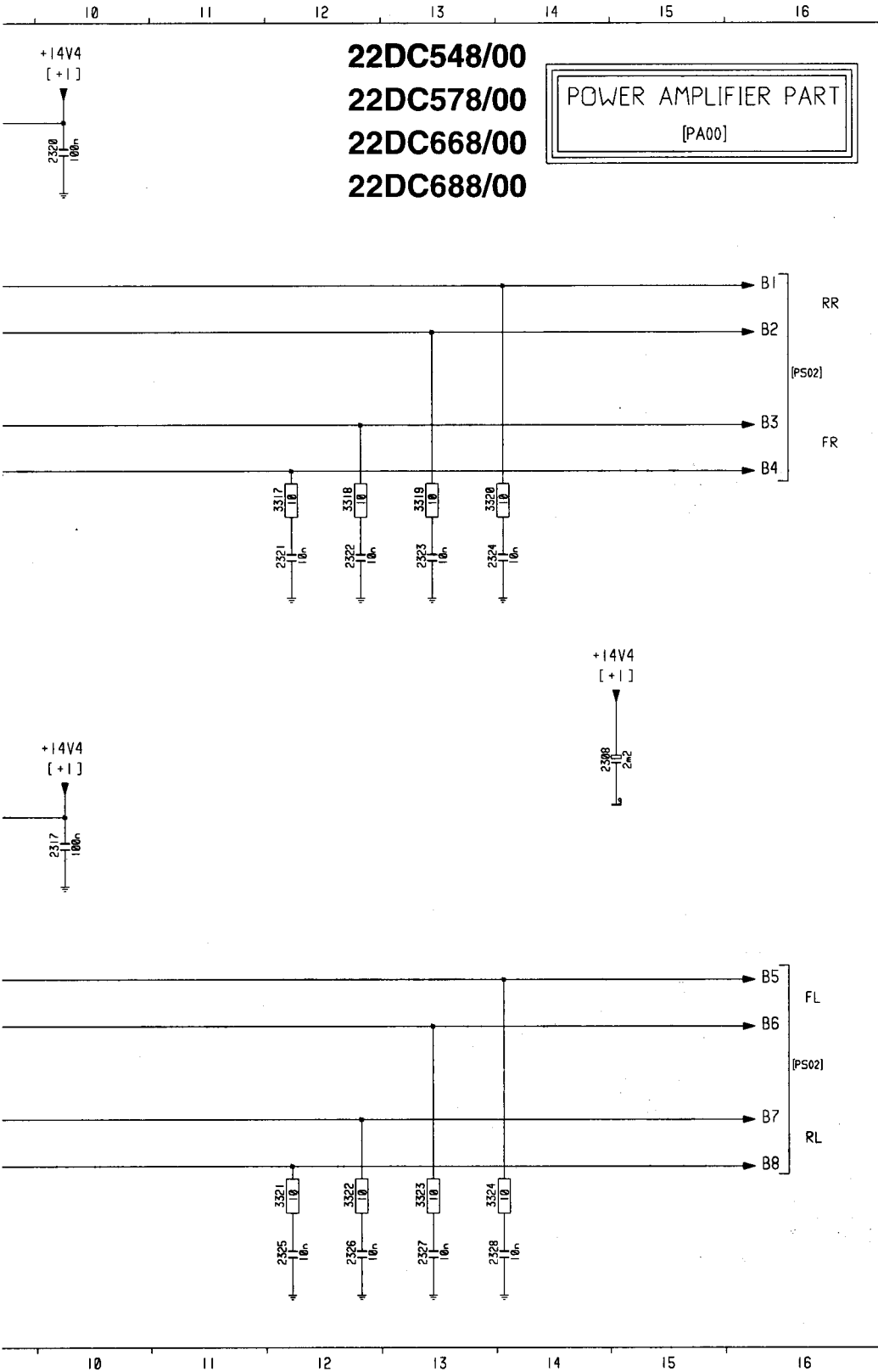
BLUE : DC668 - DC688  
 BLACK : DC548 - DC578

B1 ..... C16  
 B2 ..... C16  
 B3 ..... D16  
 B4 ..... D16  
 B5 ..... I16  
 B6 ..... I16

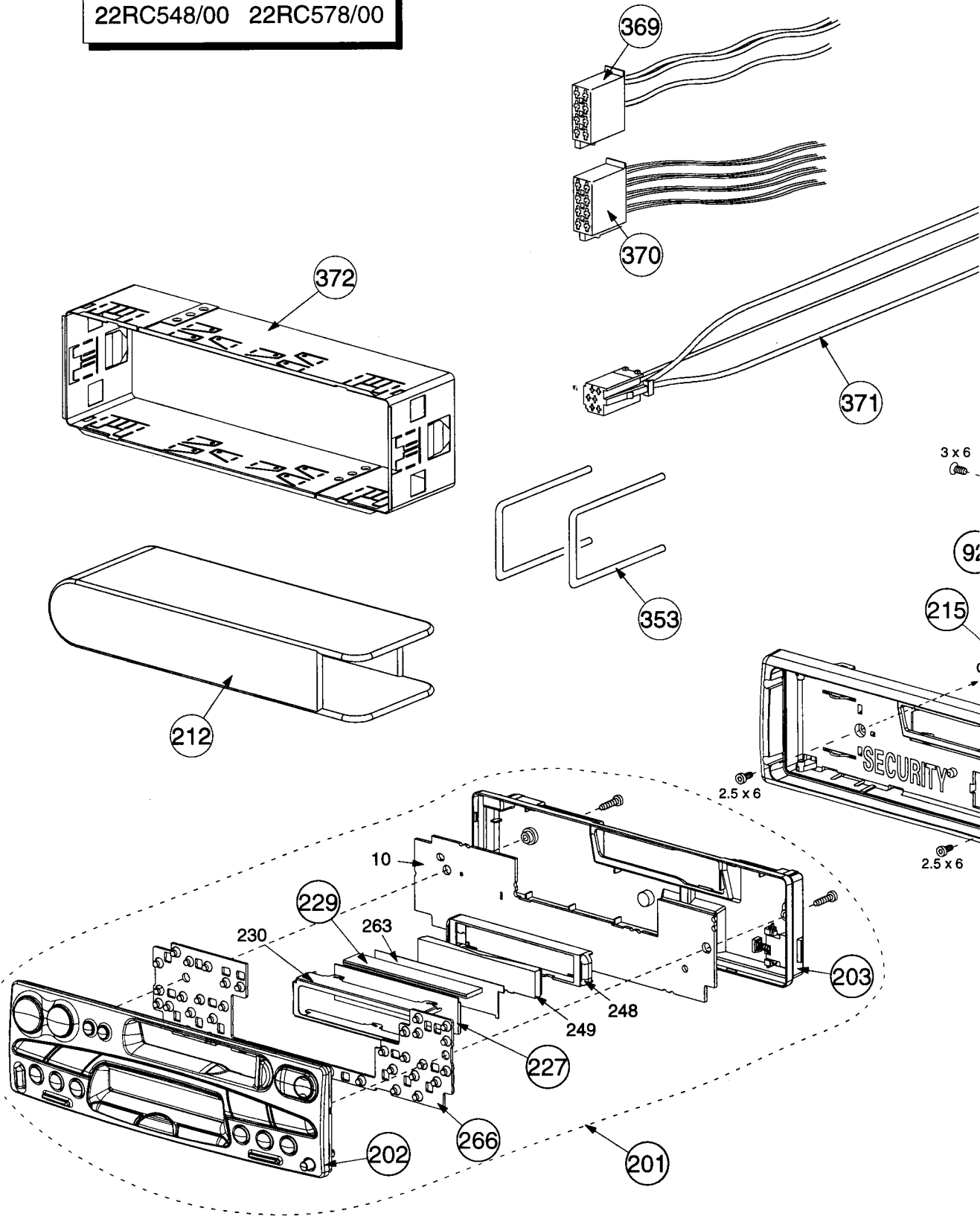
B7 ..... J16  
 B8 ..... J16  
 FL ..... H1  
 FR ..... J1  
 POWER\_MUTE ..... B1  
 RL ..... J1

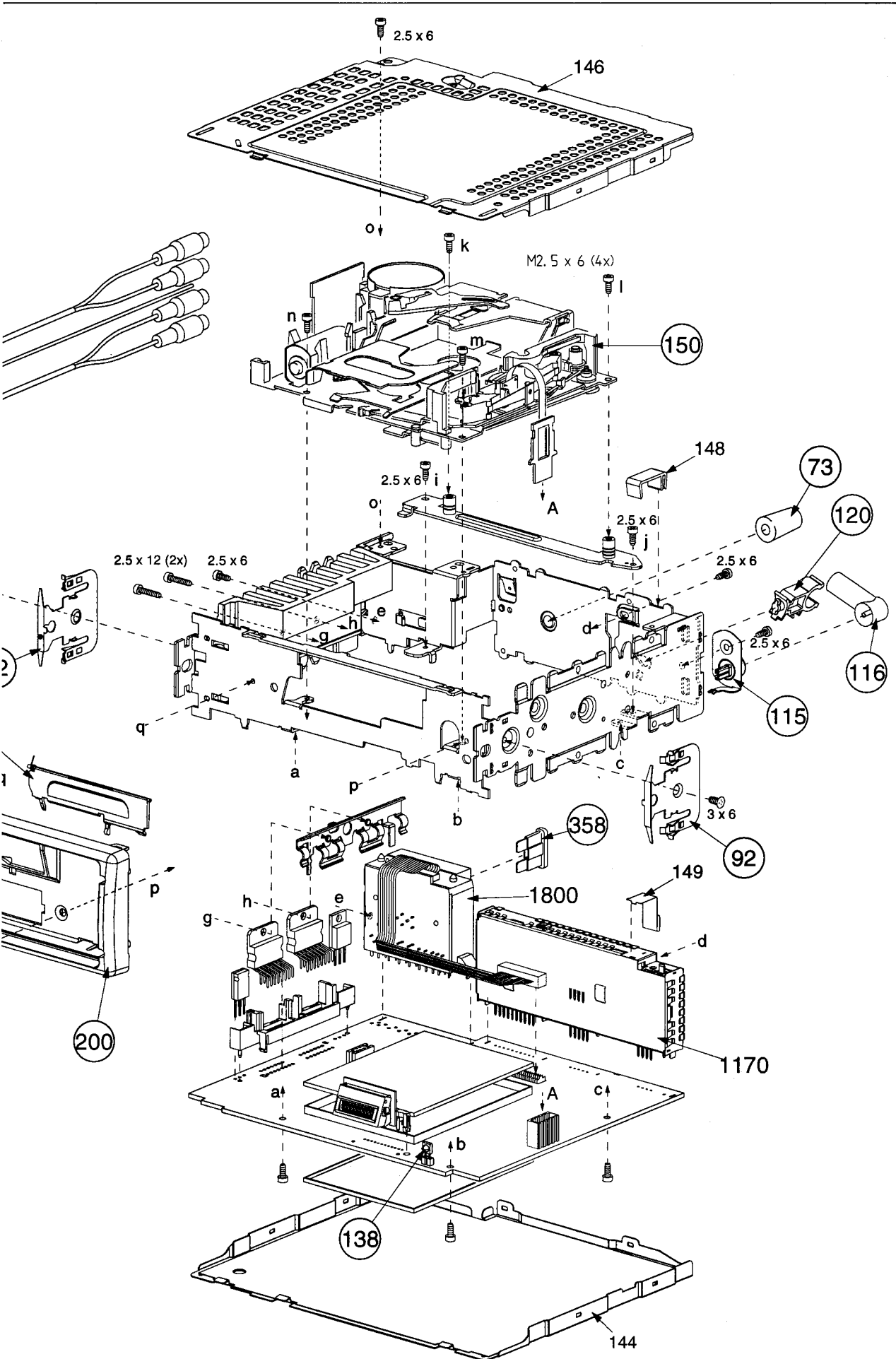
RR ..... I1  
 SI ..... A5-A8-G8  
 TEMP\_SENSE ..... G1





A	2300	K 8
	2301	E 8
	2302	A 4
	2303	H 2
	2304	I 2
	2305	J 2
	2306	J 2
	2308	G14
	2310	J 6
	2313	I 6
B	2314	D 6
	2315	C 6
	2316	E 8
	2317	G10
	2318	K 8
C	2319	A 5
	2320	A10
	2321	E 9
	2322	E10
	2323	E10
D	2324	E11
	2325	K16
	2326	K15
	2327	K15
	2328	K14
E	3300	J 6
	3301	G 2
	3302	F 2
	3304	B 4
	3306	A 4
F	3307	A 3
	3312	I 6
	3313	J 6
	3316	H 6
	3317	D 9
G	3318	D10
	3319	D10
	3320	D11
	3321	J16
	3322	J15
H	3323	J15
	3324	J14
	3325	D 5
	3326	C 5
	3329	G 3
I	3342	B 4
	6300	B 3
	7302	D 8
	7303	J 8
	7304	B 4







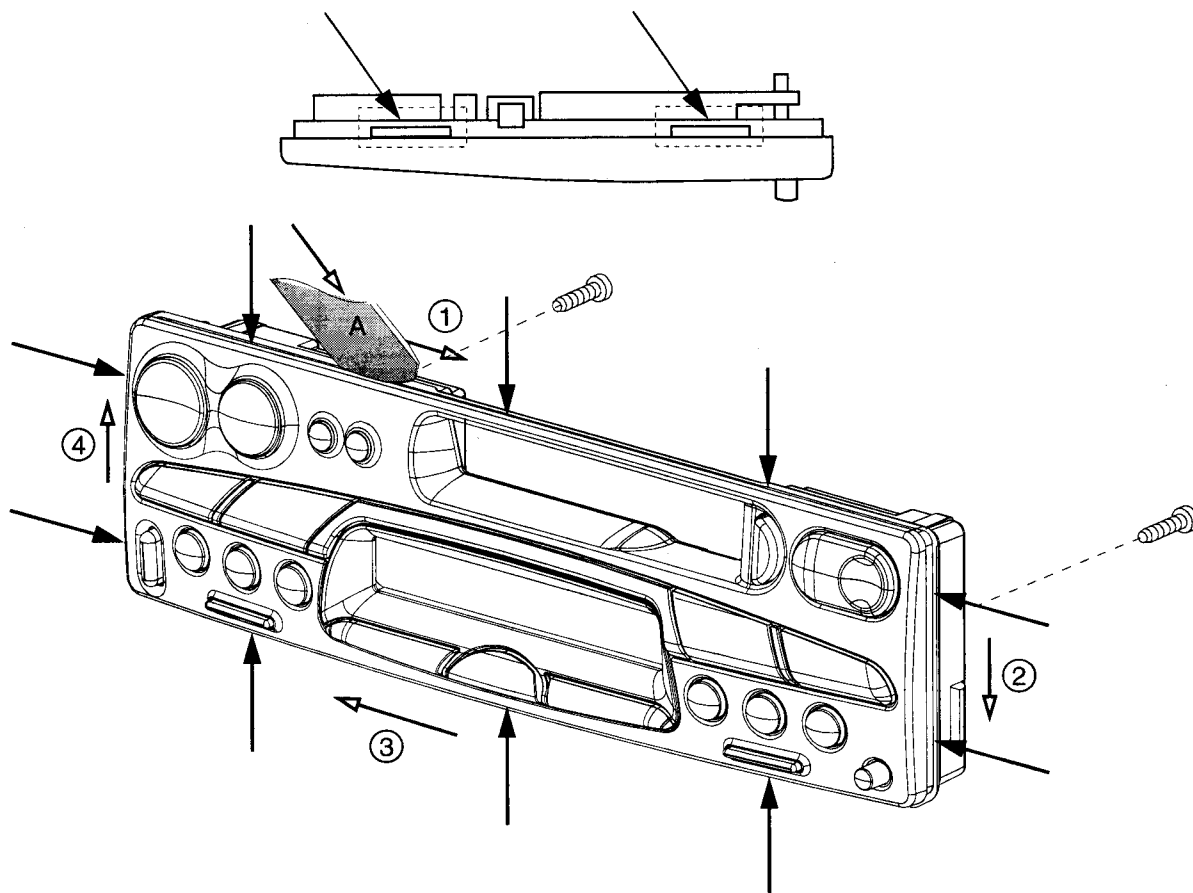
Mechanical partslist

Pos	Designation	Service code	548	578	668	688
73	Plastic holder	4822 532 11092	X	X	X	X
92	Fixing spring	4822 492 71046	X	X	X	X
115	Aerial bush assy	4822 265 10717	X	X	X	X
116	Aerial adaptor	4822 263 21164	X	X	X	X
120	Aerial adaptor holder	4822 256 10293	X	X	X	X
138	Blinking LED	4822 130 82996	X	X	X	X
170*	CDM9 car Loader	4822 691 10366			X	X
200	Fixed plate assy	4822 454 13145	X	X		
200	Fixed plate assy	4822 459 04316			X	X
201	Complete detachable front	4822 459 04334	X			
201	Complete detachable front	4822 459 04332		X		
201	Complete detachable front	4822 459 04331			X	
201	Complete detachable front	4822 459 04317				X
202	Cover front assy	4822 459 04335	X			
202	Cover front assy	4822 459 04333		X		
202	Cover front assy	4822 459 04329			X	
202	Cover front assy	4822 459 04318				X
203	Cover back assy	4822 442 00554	X	X		
203	Cover back assy	4822 426 10272			X	X
212	Box for detachable unit	4822 418 10123	X	X	X	X
215	Flap cassette printed	4822 443 10435	X			
215	Flap cassette printed	4822 443 10434		X		
227	LCD	4822 135 00013	X	X	X	X
229	Zebra connector	4822 267 10334	X	X	X	X
266	Switch mat	4822 410 10713	X	X		
266	Switch mat	4822 276 13791			X	X
353	Demounting brackets	4822 404 20437	X	X	X	X
355	Cable head CD3A	4822 320 11639			X	X
358	Fuse blade	4822 071 21003	X	X	X	X
369	Power supply cable	4822 321 11012	X	X	X	X
370	Loudspeakers cable	4822 320 11637	X	X	X	X
371	Line out cable	4822 320 11638		X	X	X
372	Sleeve	4822 443 30463	X	X	X	X
1800	Connector block	4822 265 10736	X			
1800	Connector block	4822 265 10716		X	X	X

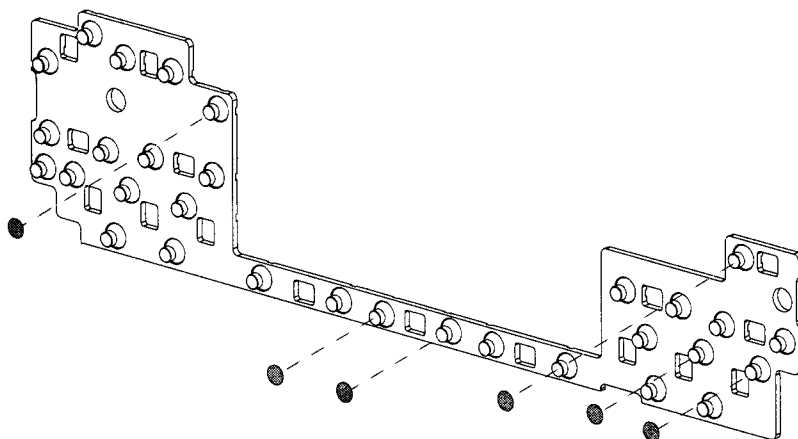
\* Item 170 is only the car loader (mechanical) part of the CD player.  
 For repair information about this car loader, please refer to Service manual 4822 725 23506  
 CD-mechanism CDM-9 MOD4, item 1002.

Opening the front:

Both parts (front and rear) are assembled by 2 screws and 10 locking clamps (arrows).  
To unassemble these parts, first remove the screws and then use part A on the 4 sides as indicated on the drawing. Part A must be a thin plastic part.  
This procedure is applicable also for CD front.  
**If you brake any part of the locking on the cover front, you must change the cover front. If not, it may cause further defaults like "button does not operate". . .**



Position of the plastic spacers (22RC668/688 only):



22RC548/00  
22RC578/00  
22RC668/00  
22RC688/00

22RC668/00 22RC688/00

