CD Car Radio 90RC648/00
90RC638/10/12/80
90RC628/00

Service
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Option

For repair information of the CDM-9 Mechanism see Service Manual of CDM-9 MOD-4 4822 725 23506.

Service Manual

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4822 725 23463

PCS 77 676

PHILIPS

Reference Table

	NEWS	TA	2CH LINE OUT	REMOTE CONTROL	FM ONLY	CLOCK	TEL_MUTE
RC648/00	X	X	X	X		X	X
RC638/80	X	X			X		
RC638/12			X	X		X	
RC638/10			X			X	
RC628/00	X	X				X	

Technical Specifications

General

Power Supply	:	10.5 - 16.0V
Quiescent Current (at 12.6V)	:	< 3.0mA
Fuse	:	10A

Radio

FM	:	87.5 - 108MHz
LW	:	144 - 288kHz
MW	:	531 - 1629kHz
IF-FM (1/2)	:	10.7MHz/72.2MHz
IF-AM(1/2)	:	10.7MHz/450kHz
α - 3dB	:	5 ± 3µV
FM sensitivity for 26dB S/N	:	≤5µV
MW sensitivity for 26dB S/N	:	≤50µV
LW sensitivity for 26dB S/N	:	≤38µV

CDM9

Frequency	:	20 - 20kHz
SNR (A-weighted)	:	75dB
Total Harmonic Distortion	:	0.5% at 1kHz

Amplifier

Output Power (D=10%)	:	4x20W ± 1dB/4Ω
Loudness	:	8 ± 2dB at 60Hz
Bass	:	12 ± 2dB at 60Hz
Treble	:	10 ± 2dB at 10kHz
Max. line out current *)	:	500mA
Max. line out voltage *)	:	1V

Tuner range table

Area	Bands	Frequency	Grids Manual/Search
Europe	FM	87.5 - 108MHz	50kHz/100kHz
	LW	144 - 288kHz	1kHz
	MW	531 - 1629kHz	1kHz/9kHz
USA	FM	87.5 - 108MHz	50kHz/100kHz
	AM	530 - 1710kHz	1kHz/10kHz
JAPAN	FM	76.0 - 90MHz	50kHz/100kHz
	MW	531 - 1629kHz	1kHz/9kHz

***) See Reference Table**

Service Hints

Tuner reception check (test mode)
Press Preset 2 and Preset 4 for more than 1 second to activate the test mode. The display shows :
FFFF FM S

FFFF - 4 figures of tuned frequency

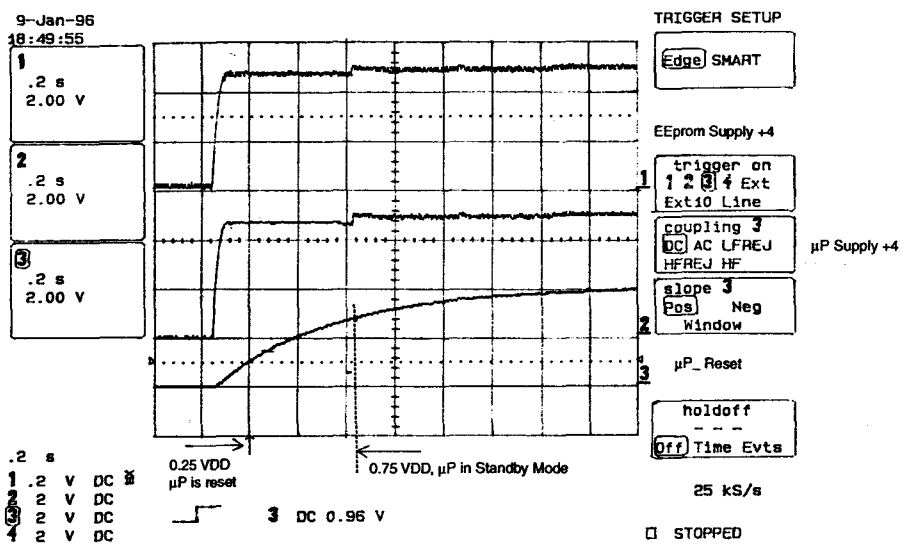
F- Field strength
range 0 ..... F hexadecimal
(corresponds to Poor signal strength ..... Good signal strength)

M - Multipath
range 0 ... F hexadecimal
(corresponds to No multipath signal ..... Multipath signal present)

S - Preset Station Number

Start up condition
It is very important that the uP is reset every time when the set is first connected with A4 or A7.

1. First time when supply A4 or A7 is connected :



During standby mode :
A4 = 14.4V
A7 = 14.4V
MC_ON/OFF = 0V

Note :
1. Set will go into standby mode only when the above condition are fulfilled.
2. Standby mode : Meaning that the set is ready to be power up by the Power key.

LCD Display Test

Press P1 and P5 for more than 1 second to activate the LCD Display Test.

Additional Function Check:

Item	Input	Output
Telephone Mute	Init Mode : Phone 'LO' Tune set to FM mode Connect A1 (T165) to GND	Set displays "CALL" Set speaker is muted.
Telephone Mute	Init Mode : Phone 'HI' Tune set to FM mode Connect A1 (T165) to +5V	Set displays "CALL" Set speaker is muted.
Auto Antenna Switch + Remote +	Switch on set. Connect a resistor of 470Ω	Measure at one end of the 470Ω a voltage from A5(T166) to GND.
Line-out	Tuner set to FM mode, 97MHz Inject 97Mhz, 22.5kHz dev. E=1mV, 1kHz mod. Set volume setting at 1Vrms at speaker output.	Measure at pin D4 (T113) to D7 (T116) a 1kHz AF signal of 50mVrms.

POWER IGNITION CHECK :

Steps	Permanent (A4)	Ignition (A7)	Action	Observation
1	ON	ON	Turn set ON with power key.	Set is turn on.
2	ON	OFF	Switch off ignition	Set switches off.
3	ON	ON	Switch on ignition.	Set will be on.

Detachable Front Unit

The Detachable front unit is part of the Car Radio. Hence it is necessary that the customer always bring the complete set (with detachable unit) when service is needed. This statement was also printed in the Instruction For Use.

Software Release Status

	RC638/80 RC648/00 RC628/00	RC638/10 RC638/12
Item	7701	7701
SW Release	R1.0	R1.0
Description	TMP47C1620F	TMP47C1620F
Display	CD - REL1	CD - REL1
Service Code	4822 209 14806	4822 209 14794

To read the 'checksum' of microprocessor
Power on the set, press simultaneously the preset 1 and preset 6 keys. Disply shows the software release version e.g. CD - REL1. Set will go back to the last mode of operation after about 5 seconds or after Power reset.

ESD

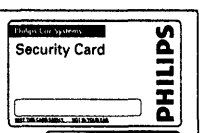
WARNING
All IC's and many semiconductors are suscepitible to electronic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you care connected to the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

ESD Equipment :	
Anti-static table mat	large 1200x650x1.25mm small 600x650x1.25mm
Anti-static wrist band	4822 395 10223
Connection box (1MOhm)	4822 320 11307
Extendible cable (to connect wrist band to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
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

OPERATING INSTRUCTIONS

THEFT PROTECTION

- Remove the 'Security Card' before installing the set. This card states the set's **unique identification number** (which is engraved on the set).
- Keep the 'Security Card' in a safe place (**not** in your car!).

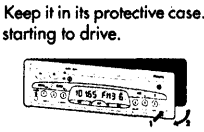


- Stick the supplied **'Security' warning stickers** on your car windows.

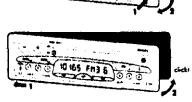
DETACHABLE FRONT

- Always take the detachable front with you when leaving the car. Keep it in its protective case.
- For safety reasons, always replace the detachable front before starting to drive.

■ **Removing Front**
1 Press the release key.
2 Remove the front.



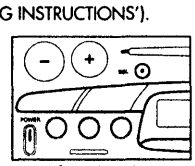
■ **Replacing Front**
1 Insert front starting with the left-hand side of the set.
2 Push the front until it clicks into the position.



FLASHING WARNING LED

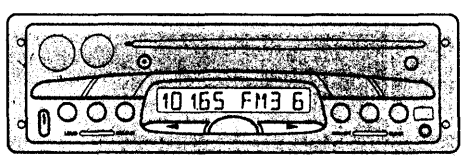
When the detachable front is removed with the ignition off, the red LED flashes to indicate that the set is protected (the set must be connected according to the 'MOUNTING INSTRUCTIONS').

AUDIO



- ■ **ON-OFF**: Press the POWER key.
- ■ **VOLUME**: Press the – key or + key to adjust the volume.
- ■ **BASS (low notes)/TREBLE (high notes)/BALANCE (left/right)/FADER (front/rear)**
  Select desired audio mode by SEL key and then the display shows the sequence of each audio mode: BASS -> TREBLE -> BAL -> FAD.
  Bass Adjust the setting with the – or + key (Min –7, Mid 0, Max +7)
  Treble Adjust the setting with the – or + key (Min –7, Mid 0, Max +7)
  Balance Adjust the setting with the – or + key (Max. Left 7--, Mid-0-, Max. Right --7).
  Fader Adjust the setting with the – or + key (Max. Rear 7--, Mid -0-, Max. Front --7).

Note: The bass and treble settings can be stored independently for the FM band, AM band*, Traffic



■ **ILLUMINATION COLOUR***
The illumination colour for the set's display can be changed to either green or orange.

Changing the colour
- Press the COLOUR key for at least 2 seconds (until you hear a beep).

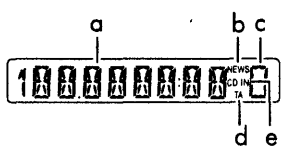
■ **CLOCK***
This set incorporates a clock. (You can choose between 12 hour or 24 hour format. See 'INITIALISATION', option 'TIME')

Displaying the time
- Press the CLOCK key for at least 2 seconds (until you hear a beep).
  – The display shows the time e.g. 'PM 12:00'.

Setting the correct time
1 Press the CLOCK key and at the same time press ► key (until you hear a beep).
2 Press the ◄ or ► key to adjust the time. (Keeping the key pressed changes the time quickly).
  – 10 seconds after the last clock setting, you will hear a beep and the set will return to the last mode of operation.
  – The clock starts operating from the selected time.

■ **LOUDNESS**
If desired you can switch on loudness to increase the high and low notes at low volume settings.
- Briefly press the LOUD key to switch loudness on or off.
  – The display briefly shows 'LOUD ON' or 'LOUD OFF'.

DISPLAY INFORMATION

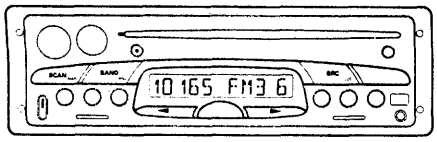


(a) **Information concerning function :** Radio, CD, Audio setting or initialisation.
(b) **NEWS :** Radio is in News mode to give priority to News bulletins.
(c) **1 to 6 :** Current Preset station from 1 to 6.
(d) **TA :** Radio is in TA mode to give priority to Traffic Announcements.
(e) **CD IN** : CD is inserted into the set.

■ **BASS (low notes)/TREBLE (high notes)/BALANCE (left/right)/FADER (front/rear)**
Select desired audio mode by SEL key and then the display shows the sequence of each audio mode: BASS -> TREBLE -> BAL -> FAD.

Bass Adjust the setting with the – or + key (Min –7, Mid 0, Max +7)
Treble Adjust the setting with the – or + key (Min –7, Mid 0, Max +7)
Balance Adjust the setting with the – or + key (Max. Left 7--, Mid-0-, Max. Right --7).
Fader Adjust the setting with the – or + key (Max. Rear 7--, Mid -0-, Max. Front --7).

Note: The bass and treble settings can be stored independently for the FM band, AM band*, Traffic Announcements/News Bulletin and CD.



TUNING TO A STATION

1 Briefly press the BAND key to select the desired waveband:
FM1, FM2, FM3, MW*, MW2*, LW*
2 Tune to a radio station using:
Search tuning; Manual tuning; Recalling a preset station; or Auto-Store (on FM3 and MW2* only).

SEARCH TUNING (to quickly search for a station)

1 Briefly press the ◄ key (lower frequency) or ► key (higher frequency).
- You will receive a station after a short time.
2 To search for another station, press the same key again.

Note: If the TA mode is switched on, search tuning only selects stations which enable the reception of Traffic Announcements.

■ **LOCAL / DISTANT (influences search tuning on FM)**

• Press the LOC key for at least 2 seconds (until you hear a beep) to switch between LOCAL and DISTANT mode. (The display briefly shows 'LOCAL' or 'DISTANT' respectively).
– In LOCAL mode the radio will first search for strong stations and then weaker stations.
– In DISTANT mode the radio will search for any receivable signal (useful in areas with weaker FM signals).

MANUAL TUNING (if you know the frequency of the required station)

1 Press the MAN key for at least 2 seconds (until you hear a beep) to switch from search tuning to manual tuning.
2 Tune to the desired frequency with the ◄ or ► key (keeping the key pressed changes the frequency quickly).

Note: The radio **automatically** switches back to search tuning (with a beep) after about 1 minute.

STORING STATIONS ON PRESET KEYS

This radio has storage locations for:

18 FM stations	6 x FM1, 6 x FM2, 6 x FM3	(FM3 also used for Auto-store)
12 MW* stations	6 x MW1, 6 x MW2	(MW2 also used for Auto-store)
6 LW* stations	6 x LW	

RDS is a system in which inaudible digital information is transmitted in addition to the normal FM radio broadcast. This car radio uses the RDS information to offer you many advantages, including:

- **Display of station-name:** The set displays the name of the station instead of its frequency.
- **Traffic information:** When the TA function is activated, the radio tunes to a station which may broadcast traffic information (TP = Traffic Programme) and receives Traffic Announcements (TA) when broadcast. You can receive Traffic Announcements even when listening to CD or during audio mute.
- **News bulletins:** When the NEWS function is activated, you can receive News bulletins , even when listening to CD or during audio mute.
- **Emergency announcements (PTY Alarm):** This set automatically receives emergency announcements made by the broadcaster using the RDS PTY alarm service. (During the message the display shows 'ALARM' and the station-name alternately).
- **Alternative Frequencies:** The broadcaster may transmit a list of Alternative Frequencies (AF) for the tuned radio. See 'RDS' function.

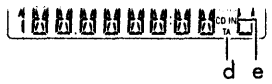
When an RDS transmission is received, the display shows the station name.

'RDS' FUNCTION (only for RDS stations)

You can use the 'RDS' function to select the best-received frequency in your area.

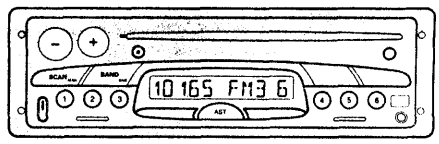
• Press the RDS key.
– The display shows 'BEST AF'.
– The radio checks the list of alternative frequencies available for the tuned station. This may take several seconds and during this period the radio is muted.
– If a better frequency is found the radio switches to that frequency.

Note:
– You may need to repeat this operation several times on a long journey when you drive through the reception areas of different transmitters.
– If the display shows 'NO AF', there are no alternative frequencies available for the tuned station.



d e

News bulletins.
(c) **1 to 6 :** Current Preset station from 1 to 6.
(d) **TA :** Radio is in TA mode to give priority to Traffic Announcements.
(e) **CD IN** : CD is inserted into the set.



PRESET STATIONS

■ **Storing a station (on the desired waveband)**
1 Tune in the desired station (See 'SEARCH TUNING' or 'MANUAL TUNING').
2 Press the desired preset key (1 – 6) **for at least 2 seconds** (until you hear a beep).
The display shows the preset number on which the station has been stored.

■ **Recalling a station (on the desired waveband)**
1 Briefly press the desired preset key (1 – 6).
– The display shows the frequency of the selected station. For RDS stations this is followed by the station-name.

■ **Frequency SCAN (quick impression of next available station for 10 seconds each)**
1 Briefly press the SCAN key.
– The display shows : 'SCAN' and the current waveband (for example 'FM3').
The set starts to search for next available station on current waveband and then the display shows : the new station name (or frequency) and the waveband.
– After 10 seconds, the set searches for the next available station.
2 To stop the scan, briefly press the SCAN key again when you hear a station you like.

AUTO-STORE (to automatically store 6 stations on FM3 or MW2*)

This function is useful when travelling through different reception areas.

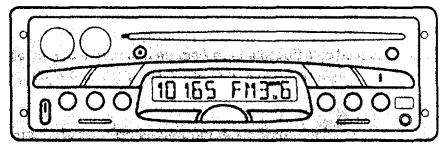
When you use Auto-Store, the new stations ***replace*** *any stations previously stored on the FM3 band (for FM) or the MW2* band (for MW*).*

■ **Automatically storing stations (on FM3 or MW2* only)**

1 Briefly press the AST key. The set gives a beep and then mutes.
– The display shows 'AST'. The radio starts searching from the current frequency and stores 6 stations on the FM3 or MW2* band. When it has finished you hear a beep.
– You then hear the Auto-store station on preset 1.

■ **Interrupting Auto-Store:** If Auto-store has been accidentally activated, the Auto-store can be aborted before the set completes the AST function. Switch the set **off** and then **on** again.

Note: Sometimes it may not be possible to find six stations. In this case, the remaining presets (for example 5 and 6) are programmed with '000'.



TRAFFIC ANNOUNCEMENTS ON FM

■ **Switching on TA mode (to receive traffic announcements when broadcast)**
1 Briefly press the ⫿ key. **The display shows 'TA'.**
– If the display shows 'NO TA': The radio was **not** already tuned to a station enabling the reception of Traffic Announcements. The radio automatically searches until it finds another station.
– You will now hear Traffic Announcements when broadcast.
– If you play a CD, or mute the set, while the TA mode is switched on, you will still hear Traffic Announcements when broadcast.

■ **Switching off TA mode**
• Briefly press the ⫿ key. **'TA' disappears from the display.**

Note: If the tuned station becomes too weak to enable the set to provide the RDS traffic service, you will hear **beeps repeated at intervals.** Use search tuning to find another station.

If the radio **continuously searches**, you are in an area where no Traffic Announcements are broadcast using the RDS system. Briefly press the ⫿ key to switch off the TA mode.

NEWS BULLETINS ON FM (PTY NEWS)

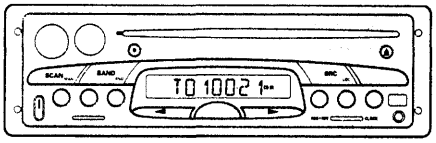
■ **Switching on NEWS mode (to receive News bulletins when broadcast)**
1 Press the ⫿ key for at least 2 seconds (until you hear a beep). **The display shows 'NEWS'.**
2 Tune to a station which broadcasts PTY NEWS.
– You will now hear news bulletins when broadcast.
– If you play a CD, or mute the set, while the NEWS mode is switched on you will still hear news bulletins when broadcast.

■ **Switching off NEWS mode**
• Press the ⫿ key for at least 2 seconds (until you hear a beep). **'NEWS' disappears from the display.**

To check if a station (stored on a preset) broadcasts PTY NEWS: Briefly press the preset key during a news bulletin. If 'NEWS' is displayed, this station broadcasts PTY NEWS.

■ **Interrupting a Traffic Announcement or a News bulletin:** If you do not wish to continue listening to a particular announcement, you can interrupt it without switching off the TA or NEWS mode.
• Press the ⫿ key briefly **during the announcement.**

Note: **TA mode has priority over NEWS mode:** News bulletins may be interrupted by Traffic Announcements (if the TA mode is switched on).



COMPACT DISC PLAYER

This CD player is suitable for both 8 cm (singles) and 12 cm discs.

CD PLAYBACK

Press the POWER key to switch on the set.

- Slide the disc (with the label facing upwards) into the slot.
  - The display briefly shows 'LOAD CD' and then 'CD'.
  - The display then shows the total number of tracks and the total playing time (for example 'T14 61:10').
  - The player starts playback, beginning with track 1.
  - The display then shows: 'T', the current track number and the elapsed time (for example 'T01 00:21').

If a disc is already inserted:

- Select 'CD' by briefly pressing the SRC key.

Notes:

- Inserting a disc does not automatically switches the set on. You must switch on the set in order to insert a CD.
- Traffic Announcements may interrupt CD playback if the TA mode is switched on.
- News bulletins may interrupt CD playback if the NEWS mode is switched on.

EJECTING DISC

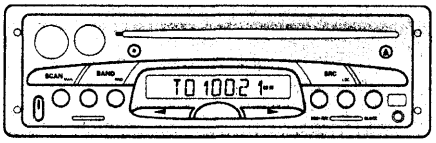
1. Press the ⏏ key.
   - The display shows 'EJECT CD'. The disc is ejected.
2. Carefully remove the disc from the player.

PLAYING A SPECIFIC TRACK (NEXT / PREVIOUS)

- Briefly press the ◄ or ► key one or more times to select the desired track (for example 'T01 > 02').
  - Playback resumes starting from the chosen track.

FAST FORWARD/BACKWARD

1. To quickly move to another part of the disc during playback, press the ◄ or ► key for at least 2 seconds.
2. Release the key to resume normal playback.



SCAN

The scan function enables you to become familiarized with the disc in a convenient way.

1. Briefly press the SCAN key.
   - The display shows 'SCAN' and the track number being scanned.
   - You hear the first 10 seconds of each track.
   - After the last track on the disc has been scanned, the set continues the scan from the first track on the disc.
2. Briefly press the SCAN key again when you hear a track which you like.
   - Normal playback resumes.

REPEAT TRACK

The repeat function enables you to replay your favourite track.

1. Press the RPT key.
   - The display shows 'RPT ON'.
   - The display then shows the track number and time.
   - When the end of the track is reached, the same track will be played again until the repeat function is switched off.
   - During the return to the beginning of the track the display briefly shows for example 'T12 RPT'.
2. To resume normal playback, press the RPT key again.

RANDOM PLAYBACK

You can play the tracks on the disc in a random order.

1. Press the RND key.
   - The display shows: 'R', the track number and the playing time (for example 'R01 10:45').

Notes:

- If you briefly press the ► key, a randomly-selected track will be played.
- If you briefly press the ◄ key, the previously played track will be recalled and played. (The set remembers the track numbers of the last three tracks played.)

2. To resume normal playback, press the RND key again.

CARE OF DISCS

Fingerprints: Avoid making fingerprints on the disc when you take it out.
Storage: Put the disc back in its box immediately after ejecting it, to protect the disc from damage and dust. Do not expose the disc to heat or direct sunlight.

INITIALISATION (to modify the set's initial settings to your preferences) - FOR /00/80 ONLY

■ **Selecting personal settings**

1. Press the BAND key **for at least 2 seconds** (until you hear a beep) to enter the 'INIT' mode. The display shows 'INIT' and then the setting to be changed.
2. Press the ◄ or ► one or more times until the **option** you want to modify is displayed (see list of 'INIT' options).
3. 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.
4. Press the BAND key **for at least 2 seconds** (until you hear a beep) to leave the 'INIT' mode.

Note: The set automatically leaves the 'INIT' mode (with a beep) about 1 minute after your last operation.

'INIT' options

Initial settings (when set leaves factory) are shown in **bold**. If you are unsure of the best choice, choose the factory setting.

Option	Choice	Usage
CD	[-2, -1, **O**, +1, +2]	Volume level of CD relative to tuner.
TA	[-2, -1, **O**, +1, +2]	Volume level of Traffic Announcements and News bulletins relative to tuner.
MW*	[**ON**, OFF]	Select 'OFF' to suppress MW band if it is not used.
LW*	[**ON**, OFF]	Select 'OFF' to suppress LW band if it is not used.
TUNER*	[**EUROPE**, USA , JAPAN]	Select desired AM Tuner range.
TIME*	[12H, **24H**]	Select desired clock format.
BLEEP	[-2, -1, **O**, +1, +2]	Select volume level of confirmation beeps (useful if external amplifier is connected).
PHONE*	[**NO**, LO, HI]	Select 'LO' or 'HI' according to phone ('LO' in most cases). Select 'NO' if no phone connected.
RMT*	[**PHILIPS**, OPEL, FIAT, RENAULT, RMT OFF]	Select desired types of wired remote control.

Note : (REF) Reference volume can be preset by using the volume up or down keys during the 'INIT' mode.

INITIALISATION (to modify the set's initial settings to your preferences) - FOR /10 ONLY

■ **Selecting personal settings**

1. Press the ⏏ key **for at least 2 seconds** (until you hear a beep) to enter the 'INIT' mode. The display shows 'INIT' and then the setting to be changed.
2. Press the ◄ or ► one or more times until the **option** you want to modify is displayed (see list of 'INIT' options).
3. 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.
4. Press the ⏏ key **for at least 2 seconds** (until you hear a beep) to leave the 'INIT' mode.

Note: The set automatically leaves the 'INIT' mode (with a beep) about 1 minute after your last operation.

'INIT' options

Initial settings (when set leaves factory) are shown in **bold**. If you are unsure of the best choice, choose the factory setting.

Option	Choice	Usage
CD	[-2, -1, **O**, +1, +2]	Volume level of CD relative to tuner.
MW	[**ON**, OFF]	Select 'OFF' to suppress MW band if it is not used.
LW	[**ON**, OFF]	Select 'OFF' to suppress LW band if it is not used.
TUNER	[**EUROPE**, USA , JAPAN]	Select desired AM Tuner range.
TIME	[12H, **24H**]	Select desired clock format.
BLEEP	[-2, -1, **O**, +1, +2]	Select volume level of confirmation beeps (useful if external amplifier is connected).

Note : (REF) Reference volume can be preset by using the volume up or down keys during the 'INIT' mode.

INITIALISATION (to modify the set's initial settings to your preferences) - FOR /12 ONLY

■ **Selecting personal settings**

1. Press the ⇕ key **for at least 2 seconds** (until you hear a beep) to enter the 'INIT' mode. The display shows 'INIT' and then the setting to be changed.
2. Press the ◄◄ or ►► one or more times until the **option** you want to modify is displayed (see list of 'INIT' options).
3. 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.
4. Press the ⇕ key **for at least 2 seconds** (until you hear a beep) to leave the 'INIT' mode.

Note: The set automatically leaves the 'INIT' mode (with a beep) about 1 minute after your last operation.

'INIT' options

Initial settings (when set leaves factory) are shown in **bold**. If you are unsure of the best choice, choose the factory setting.

Option	Choice	Usage
CD	[-2, -1, **0**, +1, +2]	Volume level of CD relative to tuner.
MW	[**ON**, OFF]	Select 'OFF' to suppress MW band if it is not used.
LW	[**ON**, OFF]	Select 'OFF' to suppress LW band if it is not used.
TUNER	[**EUROPE**, USA , JAPAN]	Select desired AM Tuner range.
TIME	[12H, **24H**]	Select desired clock format.
BLEEP	[-2, -1, **0**, +1, +2]	Select volume level of confirmation beeps (useful if external amplifier is connected).
RMT	[**PHILIPS**, OPEL, FIAT, RENAULT, RMT OFF]	Select desired types of wired remote control.

Note : (REF) Reference volume can be preset by using the volume up or down keys during the 'INIT' mode.

3-5

CHECKS BEFORE REQUESTING SERVICE

There may be times when you suspect that your car radio is not functioning as you expect it to. Before calling for service please read the operating / mounting instructions and check the following list. You may find that an apparent malfunction can easily be rectified.

Symptoms	Possible Cause / Remedy
General	
Set does not function, No Display.	Check fuse (set and car) and connections.
Set functions but with no or poor sound.	• Adjust volume of set. • Check fader and balance settings. • If car phone is connected, check setting for 'PHONE' option in 'INIT' mode.
Set mutes when you drive the car.	• Set 'PHONE' option to 'NO' in 'INIT' mode.
Detachable keyboard of set feels warm.	Some heat is always generated by the set.
Display shows 'TOO HOT' and the sound from the speakers is reduced.	A built-in safety circuit prevents the temperature in the set from exceeding a certain level. • Wait until 'TOO HOT' disappears from the display before increasing the volume.
Radio	
Poor radio reception.	• Check that the aerial is fully extended and properly connected.
Display shows 'SEARCH' and station name alternately.	Set is searching for the Station. This happens when broadcast is too weak. • Wait until set completes its search.
Display shows frequency (not station name).	Set is tuned to non-RDS station.
Display shows 'ALARM'.	Emergency announcements (PTY Alarm) is being broadcast.
Unable to tune to desired station with Search tuning.	– The desired station is too weak. • Repeat Search tuning with local search mode (LOC) OFF. • Tune to desired station using Manual Search. – Set is in TA mode: only stations with Traffic Announcements can be tuned in. • If necessary switch OFF TA mode. • Check that the aerial is fully extended.
Displays shows 'NO TA' and set bleeps.	Set is in TA mode but the selected station does not broadcast Traffic Announcements (TA). • Switch OFF TA mode or tune to another station.
CD	
Display shows 'NO DISC' or 'CD ERROR', or you hear a beep.	No CD inserted or CD inserted upside-down or damaged or dirty or of the wrong type.
Distorted sound during playback.	Player unable to read disc. CD damaged or dirty.
CD cannot be inserted into the set.	Inserting a disc does not automatically switches the set on. You must switch on the set in order to insert a CD.

If you still have to send your set for service, always send the complete set (with detachable keyboard). Do not try to open the set to service it yourself.

PREVENTIVE MAINTENANCE

Cleaning connectors for detachable front.

To ensure good connection between the set and the detachable part, it is advisable to clean the connectors with a cotton swab from time to time.

MOUNTING INSTRUCTIONS (see pages 3-4)

Aerial: Good reception is only possible with a good aerial. Position the aerial as far as possible from the ignition assembly. The aerial earthing bar or strap must contact clean metal. Protect this contact against corrosion with silicone grease or another rust preventer.

Adaptor cables: Specific adaptor cables (which simplify connection of the set) are available for many cars. Refer to the table at the end of this booklet. Contact your dealer for further information.

1 POWER SUPPLY

Voltage and polarity: The set must be connected to a 12 V car battery with negative terminal to earth (car chassis).

- Use the same earthing point for the radio and all other audio equipment (to minimize interference).

Note: Permanent 12V supply must be connected to ensure that CD* changer functions correctly.

⚠ **WARNING: To prevent short-circuiting, disconnect the negative car battery terminal until the set has been mounted and connected.**

PREPARING CONNECTOR A

1.1 Recommended power supply connections

1. **BROWN** lead [A8]: Connect to an earthing point on the car body.
2. **RED** lead [A7]: Connect to a **switched** 12 V supply.
3. **YELLOW/RED** lead [A4]: Connect to a **permanent** 12 V supply.

3-6

OPTIONAL CONNECTIONS

1.2 Electronic/motor aerial: Connect the **supply for an electronic aerial** or the **control lead for the relay of an** ***wautomatic motor aerial*** to pin [A5]. Use the small contact supplied.
Do not use this connection point for direct supply of the aerial motor!

1.3 Pilot light: When the car headlamps are switched on, the on/off control of the radio is illuminated (even when the radio is switched off). Connect pin [A6] to the dashboard illumination wiring of your car. Use the small contact supplied.

1.4 Telephone mute*: If your car telephone provides a mute signal, it can be used to automatically interrupt the set's audio output. Connect the telephone mute wire to connector [A1]. Use the small contact supplied. Choose required settings from INITIALISATION mode.

PREPARING CONNECTOR B (FOR LOUDSPEAKERS)

- **Only use loudspeakers which have an impedance of 4 ohms.**
- **Ensure that the loudspeakers are connected in phase by using marked speaker terminals for the phase (+) connections.**
- **Do not connect any of the loudspeaker leads to earth!**
- **Do not connect a booster/amplifier directly to the loudspeaker outputs!**
- **Do not connect loudspeakers via an external fader!**

only for certain versions.

MOUNTING INSTRUCTIONS (continued)

2. Connecting 4 loudspeakers (see illustration) **4 x 4Ω**

1 = Rear Right phase (RR +) 2 = Rear Right return (RR –)
3 = Front Right phase (FR +) 4 = Front Right return (FR –)
5 = Front Left phase (FL +) 6 = Front Left return (FL –)
7 = Rear Left phase (RL +) 8 = Rear Left return (RL –)

3. INSTALLING METAL SLEEVE

1. Insert metal sleeve into the opening of the car dashboard or console.
2. Fix metal sleeve into place by pressing the metal tags outwards using a screwdriver.

4. CONNECTING RADIO

4.1 Fit antenna adaptor if needed.
4.2 Insert aerial plug into aerial adaptor/socket.
4.3 Screw rubber buffer onto fixing stud at rear of set.
4.4 Insert power supply plug **A** into socket **A'**.
4.5 Insert loudspeaker plug **B** into socket **B'**.
4.6 (where applicable) **Line output (2 or 4-channel):** You can connect a power amplifier (with additional loudspeakers) to this set using the RCA cable **C** (see illustration 4).
Note : Remote ON/OFF wire **D** from the set should be connected to the Remote ON/OFF of the power amplifier.

5. MOUNTING RADIO

- Slide the radio into the metal sleeve until the springs at either side of the radio snap into the openings of the sleeve.
- **Reconnect** the negative car battery terminal.
  - Installation is now complete.

6. REMOVING RADIO (using the two U-brackets supplied) **(see illustration 6)**

Insert both U-brackets [x] into the holes [y] until they lock. Pull out the radio.

REPLACING FUSE (see illustration 4)

Replace with a blade-type fuse of the correct rating.

INTERFERENCE SUPPRESSION

Most modern cars have sufficient interference suppression. If you experience interference generated by the car, consult your garage.

Mounting Set in Japanese Car

REMOTE CONTROL

PREVENTIVE MAINTENANCE

Cleaning connectors for detachable front.
To ensure good connection between the set and the detachable part, it is advisable to clean the connectors with a cotton swab from time to time.

Aerial: Good reception is only possible with a good aerial. Position the aerial as far as possible from the ignition assembly. The aerial earthing bar or strap must contact clean metal. Protect this contact against corrosion with silicone grease or another rust preventer.

Adaptor cables: Specific adaptor cables (which simplify connection of the set) are available for many cars. Refer to the table at the end of this booklet. Contact your dealer for further information.

1 POWER SUPPLY

Voltage and polarity: The set must be connected to a 12 V car battery with negative terminal to earth (car chassis).

- Use the same earthing point for the radio and all other audio equipment (to minimize interference).

Note: Permanent 12V supply must be connected to ensure that CD* changer functions correctly.

⚠ **WARNING: To prevent short-circuiting, disconnect the negative car battery terminal until the set has been mounted and connected.**

PREPARING CONNECTOR A

1.1 Recommended power supply connections
1 **BROWN** lead [A8]: Connect to an earthing point on the car body.
2 **RED** lead [A7]: Connect to a **switched** 12 V supply.
3 **YELLOW/RED** lead [A4]: Connect to a **permanent** 12 V supply.

OPTIONAL CONNECTIONS

1.2 Electronic/motor aerial: Connect the supply for an electronic aerial or the control lead for the relay of an wautomatic motor aerial to pin [A5]. Use the small contact supplied.
Do not use this connection point for direct supply of the aerial motor!

1.3 Pilot light: When the car headlamps are switched on, the on/off control of the radio is illuminated (even when the radio is switched off). Connect pin [A6] to the dashboard illumination wiring of your car. Use the small contact supplied.

1.4 Telephone mute*: If your car telephone provides a mute signal, it can be used to automatically interrupt the set's audio output. Connect the telephone mute wire to connector [A1]. Use the small contact supplied. Choose required settings from INITIALISATION mode.

PREPARING CONNECTOR B (FOR LOUDSPEAKERS)
- Only use loudspeakers which have an impedance of 4 ohms.
- Ensure that the loudspeakers are connected in phase by using marked speaker terminals for the phase (+) connections.
- Do not connect any of the loudspeaker leads to earth!
- Do not connect a booster/amplifier directly to the loudspeaker outputs!
- Do not connect loudspeakers via an external fader!

*only for certain versions.

3-6

MOUNTING INSTRUCTIONS (continued)

2. Connecting 4 loudspeakers (see illustration) **4 x**
1 = Rear Right phase (RR +) 2 = Rear Right return (RR –)
3 = Front Right phase (FR +) 4 = Front Right return (FR –)
5 = Front Left phase (FL +) 6 = Front Left return (FL –)
7 = Rear Left phase (RL +) 8 = Rear Left return (RL –)

3. INSTALLING METAL SLEEVE
1 Insert metal sleeve into the opening of the car dashboard or console.
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4. CONNECTING RADIO
4.1 Fit antenna adaptor if needed.
4.2 Insert aerial plug into aerial adaptor/socket.
4.3 Screw rubber buffer onto fixing stud at rear of set.
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4.6 (where applicable) **Line output (2 or 4-channel):** You can connect a power amplifier (with additional loudspeakers) to this set using the RCA cable **C** (see illustration 4).
Note : Remote ON/OFF wire **D** from the set should be connected to the Remote ON/OFF of the power amplifier.

5. MOUNTING RADIO
- Slide the radio into the metal sleeve until the springs at either side of the radio snap into the openings of the sleeve.
- **Reconnect** the negative car battery terminal.
  – Installation is now complete.

6. REMOVING RADIO (using the two U-brackets supplied) **(see illustration 6)**
Insert both U-brackets [x] into the holes [y] until they lock. Pull out the radio.

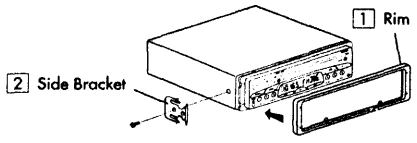
REPLACING FUSE (see illustration 4)
Replace with a blade-type fuse of the correct rating.

INTERFERENCE SUPPRESSION
Most modern cars have sufficient interference suppression. If you experience interference generated by the car, consult your garage.

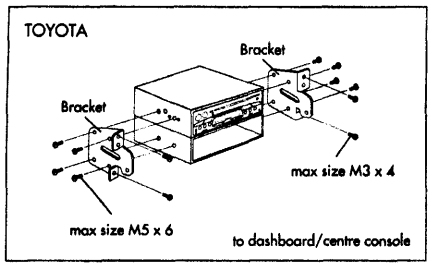
Mounting Set in Japanese Car

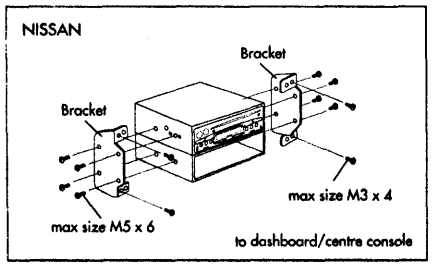
This set may not installed in some makes of car.

■ **Preparing the Set**
1 Remove the rim from the fixed front.
2 Remove the side bracket.



■ **Mounting the Set**
1 Install the set according to the example illustration below.
(Use only existing parts supplied to your car)

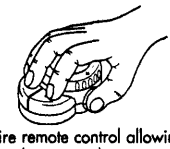




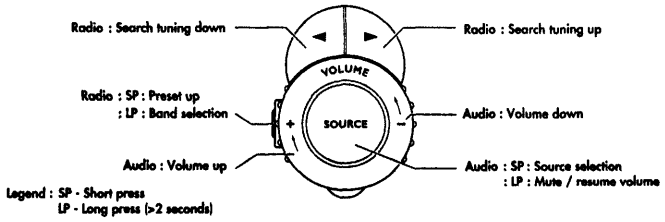
Note : Do not use improper screw. The maximum usable size is 'M5x6 screw' (Left) and 'M3x4 screw' (Right). Using other screw can result in damage of the unit.

3-7

REMOTE CONTROL



This set can be equipped with a wire remote control allowing you to carry out some of the main functions of the set. Thanks to the large buttons and ergonomic design, you can easily control the set without the need to take your eyes off the road while driving. This gives you increased security.
• The following functions are available :



Legend : SP - Short press
LP - Long press (>2 seconds)

■ INSTALLING REMOTE CONTROL

Fixing remote control (Fig. 7)

The remote control has to be fitted in a position which is easily accessible by a natural movement, either on the dashboard or between the two seats.

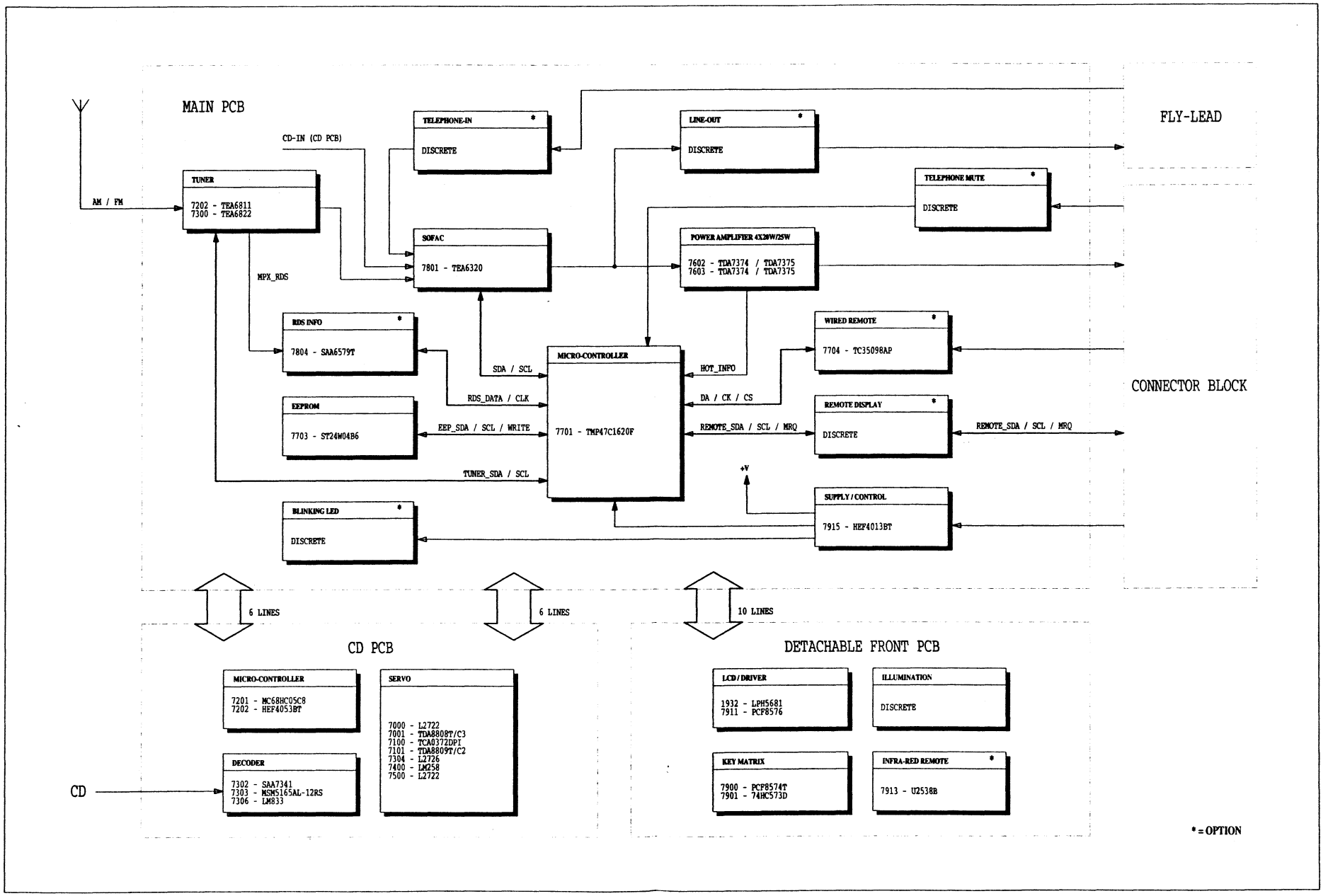
⚠ **The remote control, or its cable, must in no way interfere with normal use of the steering wheel! Never mount the remote control on the steering wheel itself!**

- First fix the support temporarily using the adhesive tape. You can then check for ease of use in that position.
- After you have determined the ideal position, fix the remote control as follows:
  - **Fix the metallic support using the supplied screws.** Then slide the remote control into its support. **For security reasons always leave the remote control fitted in its support!**

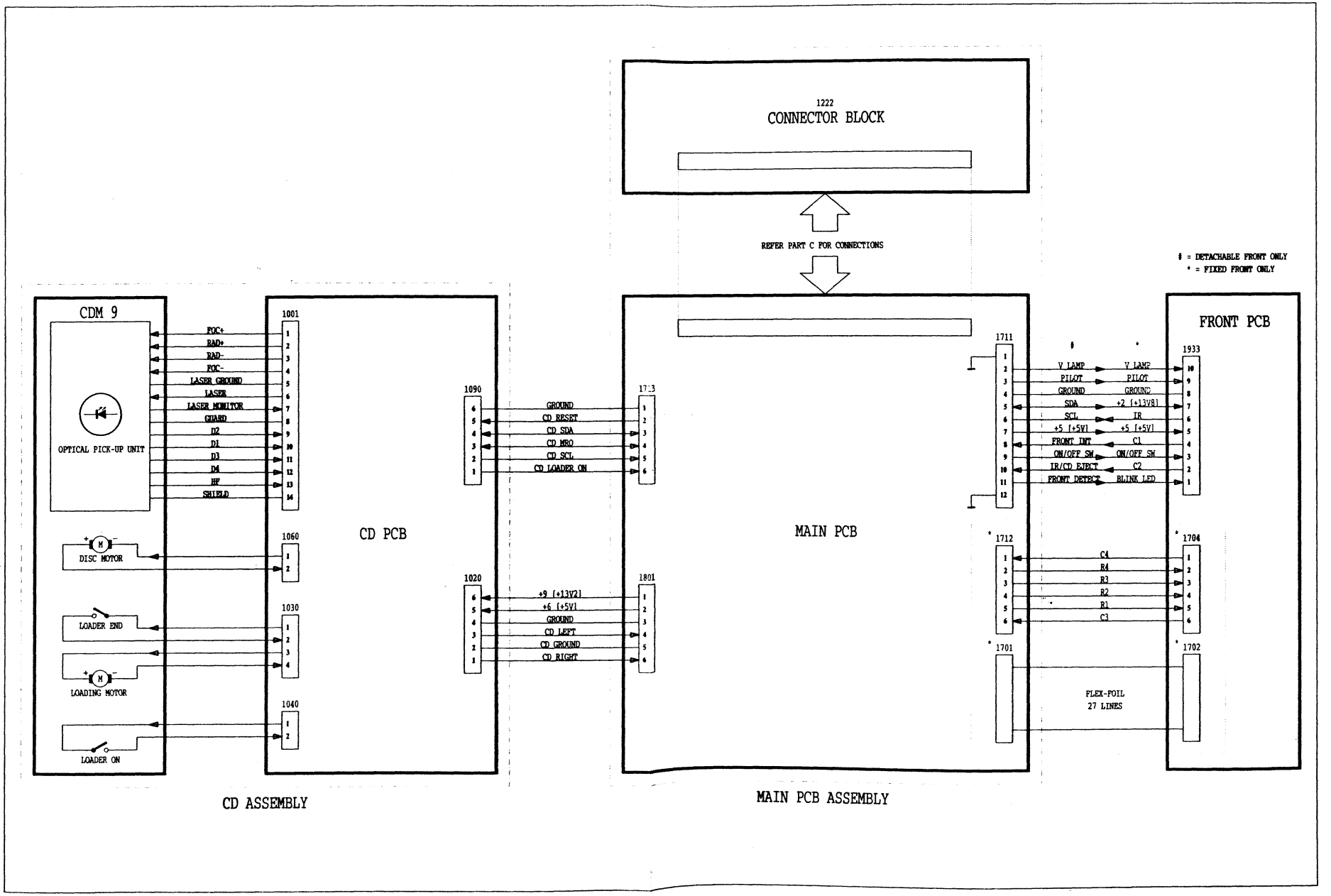
Connecting remote control (Fig. 8)

- Determine the best way to pass the cable through or below the console. This depends on the location of the remote control and the configuration of your car.
- If you need to drill a hole, the required diameter is 8 mm. Be careful not to drill into any existing wiring! Protect the remote control cable from sharp edges. Use a rubber grommet if necessary.
- Insert the 2 mini-connectors into positions [A2] and [A3] of connector **A**.
  If you later want to disconnect the remote control, do this by disconnecting the intermediate connector **G**.
- Fix the remote control cable with adhesive tape underneath the carpet.
  Run the cable in such a way that you cannot tread on it and that it does not get in the way when driving!

PART A : ELECTRICAL ARCHITECTURE

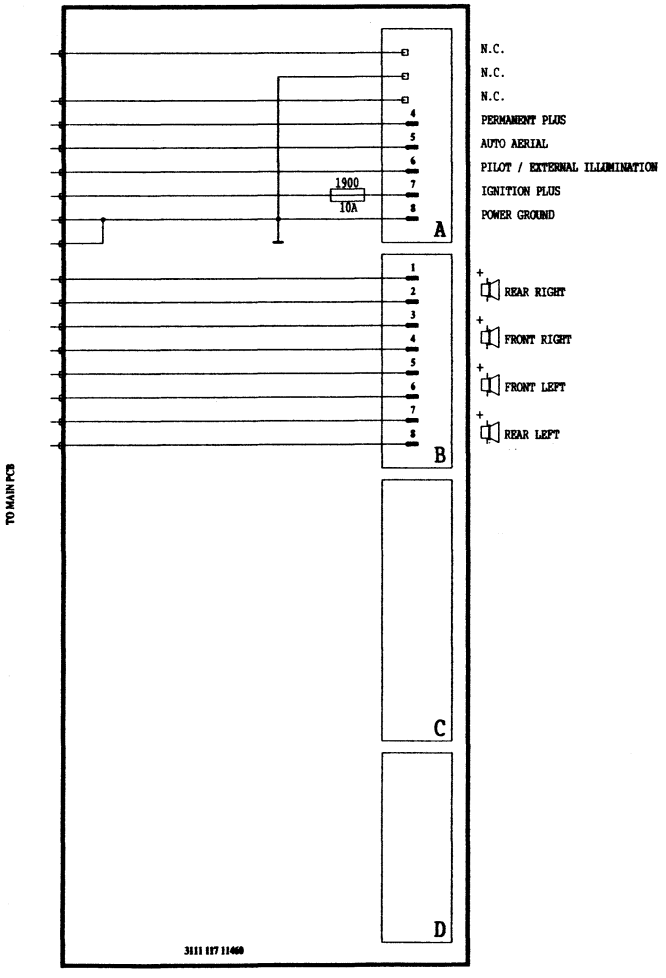


PART B : WIRING DIAGRAM



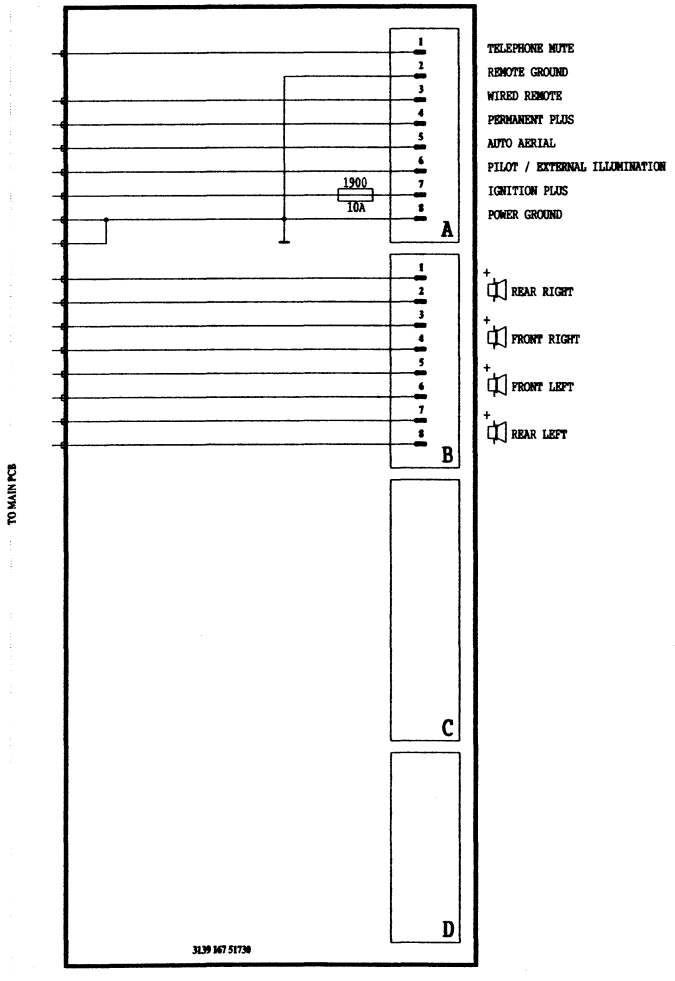
PART C : CONNECTOR BLOCK

4X20W CONNECTOR BLOCK

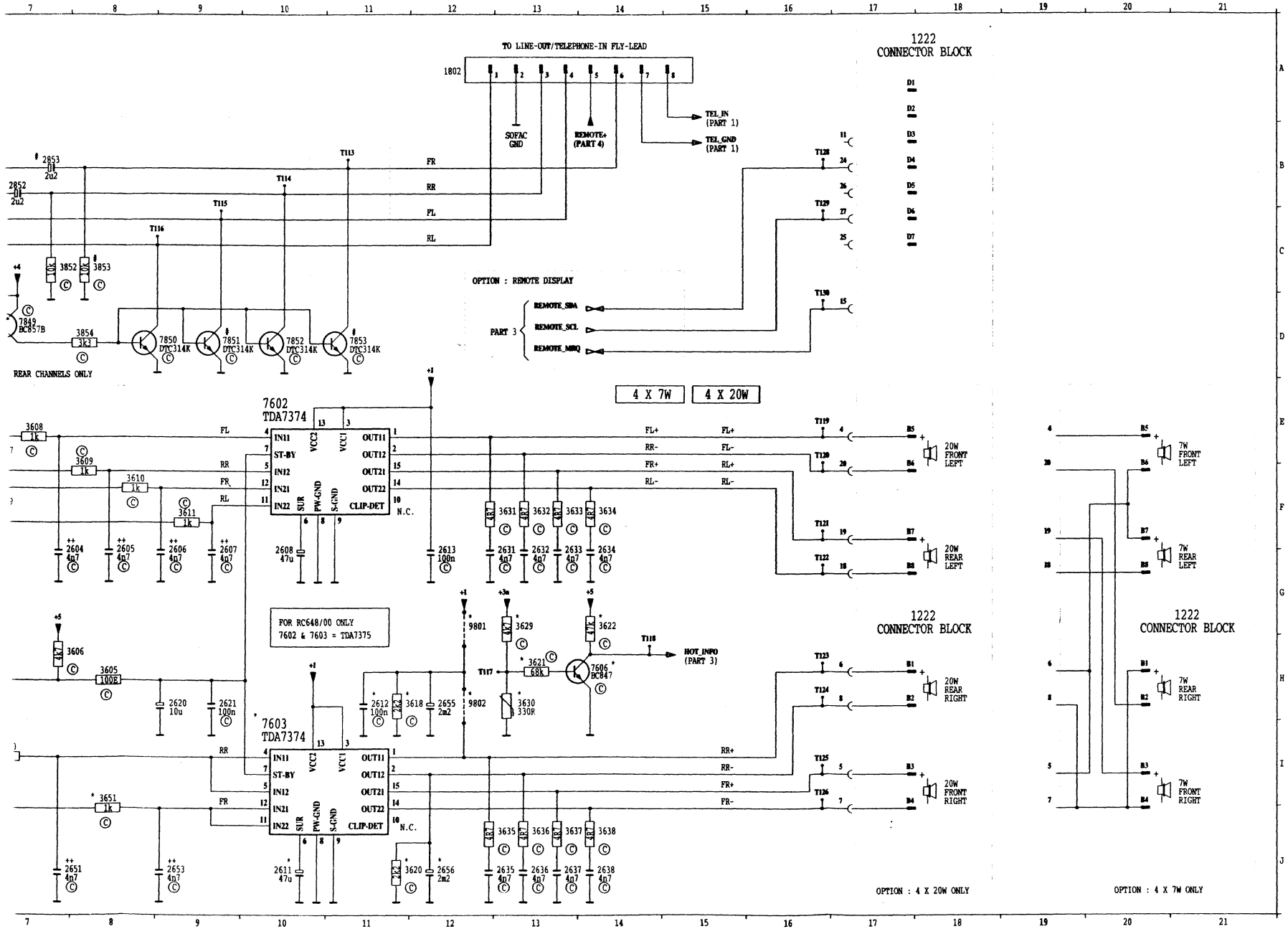


FOR RC628/00, RC638/10, RC638/80

4X20W CONNECTOR BLOCK



FOR RC638/12, RC648/00



.....	I16	TEL_GND	B15	SOFAC GND	B13	REMOTE_MRQ	D13	T115	C9	PA_MUTE	D5	FRONT_RIGHT	F3
.....	I16	MOT_INFO	H15	REMOTE_SDA	D13	T113	B11	T116	C9	FRONT_LEFT	E3	REAR_LEFT	F3
.....	A15	REMOTE+	B14	REMOTE_SCL	D13	T114	C10	PA_MUTE	H6	REAR_RIGHT	F3		

Voltage measured in FM mode with
A4 = 14.4V
A7 = 14.4V
unless otherwise stated.

(OFF) = Power off
(ON) = Power on

+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	
2.44V	

7602 TDA7374
7603 TDA7374

1	6V
2	6V
3	12.3V
4	4.5V
5	0.6V
6	0.6V
7	4.5V
8	GND
9	GND
10	N.C.
11	0.6V
12	0.6V
13	12.3V
14	6V
15	6V

7606 BC847

C	5V
	0V ("too hot")
B	0V
	0.7V ("too hot")
E	0V

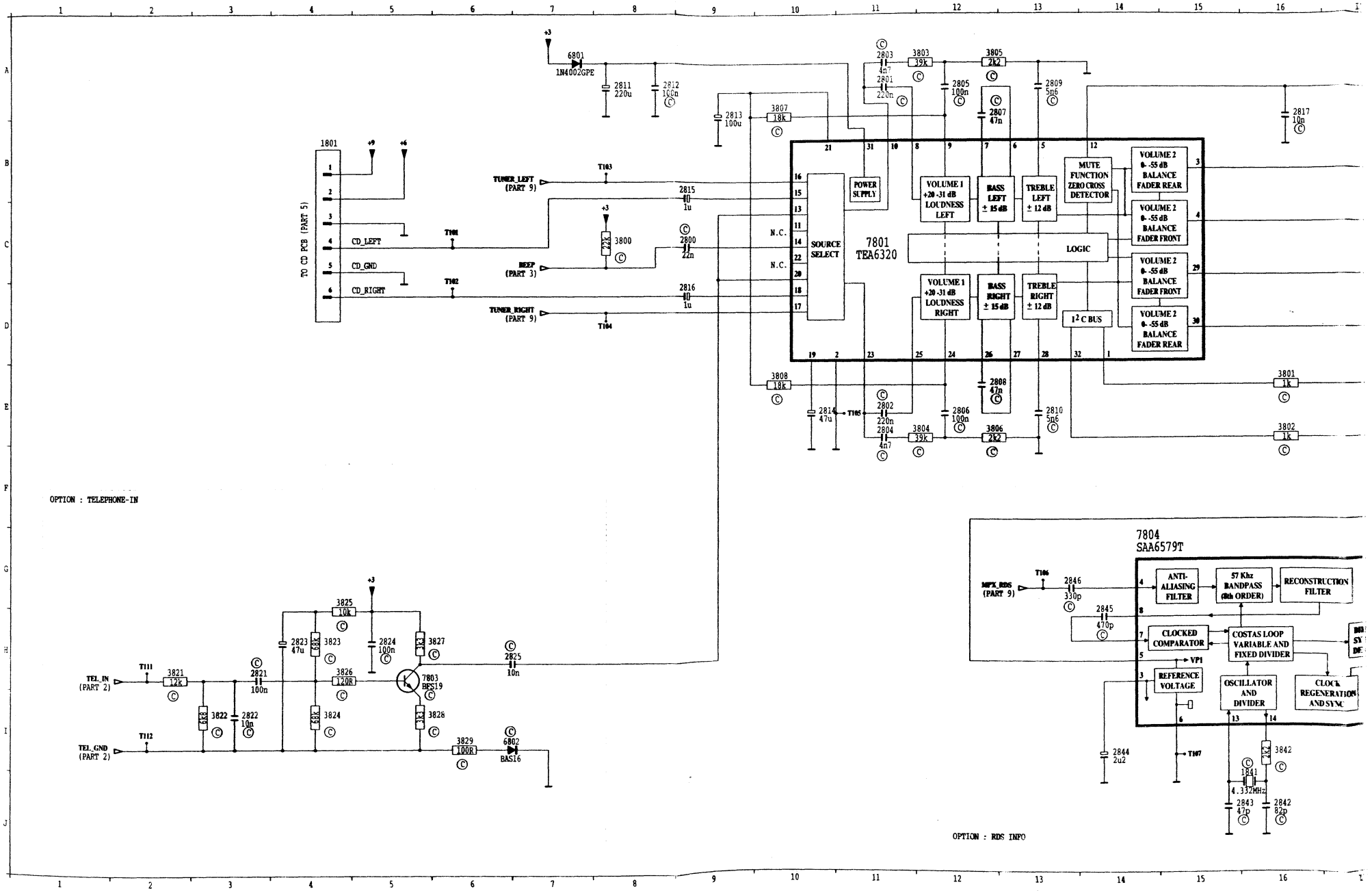
7849 BC857B

C	0V (ON)
	4.8V (OFF)
B	4.8V (ON)
	4.2V (OFF)
E	4.9V (ON)
	4.83V (OFF)

7850 - 7853 DTC314K

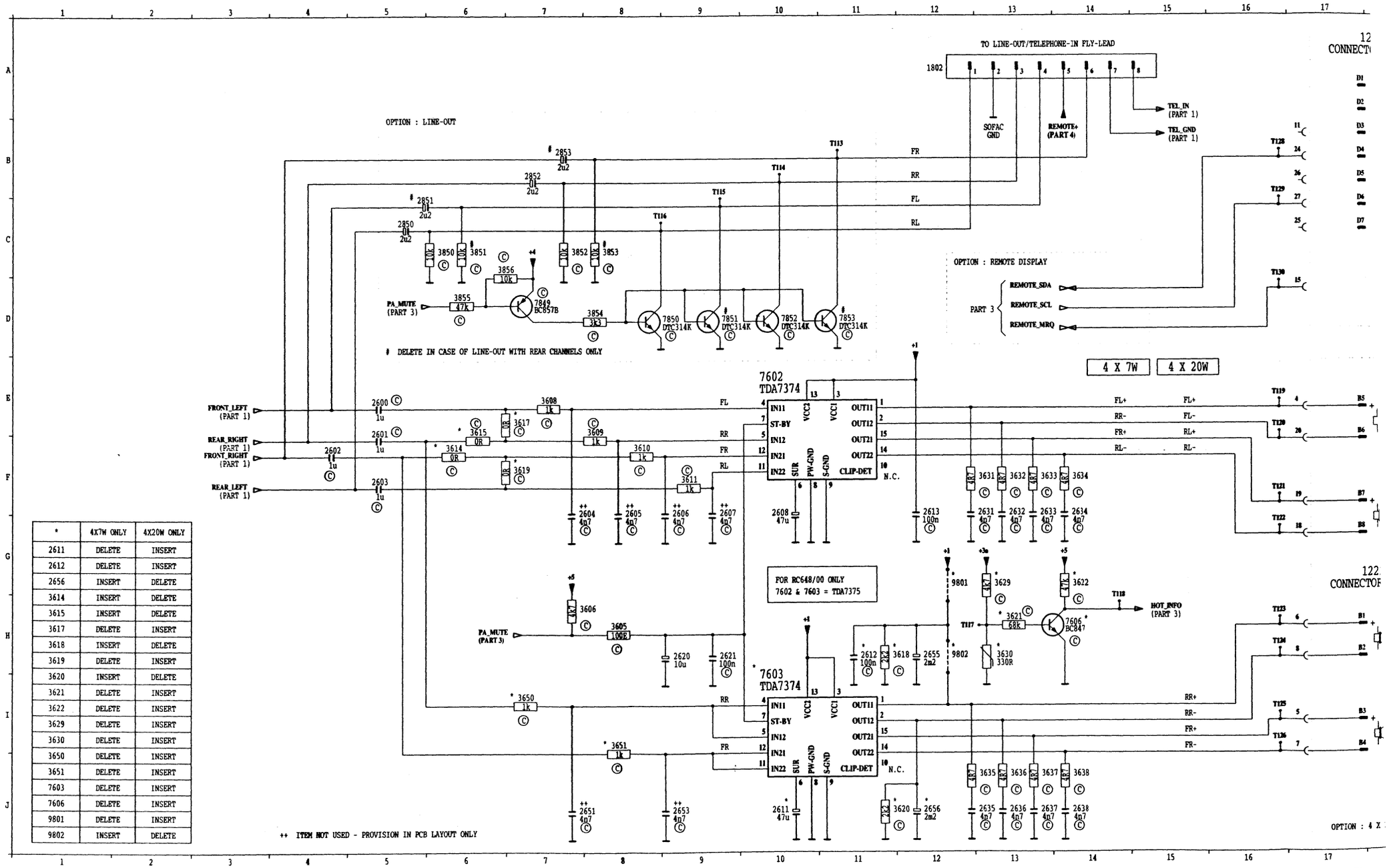
C	0V (ON)
	GND (OFF)
B	0V (ON)
	3.1V (OFF)
E	GND

PART 1 : RDS, SOFAC & TELEPHONE-IN (MAIN PCB)



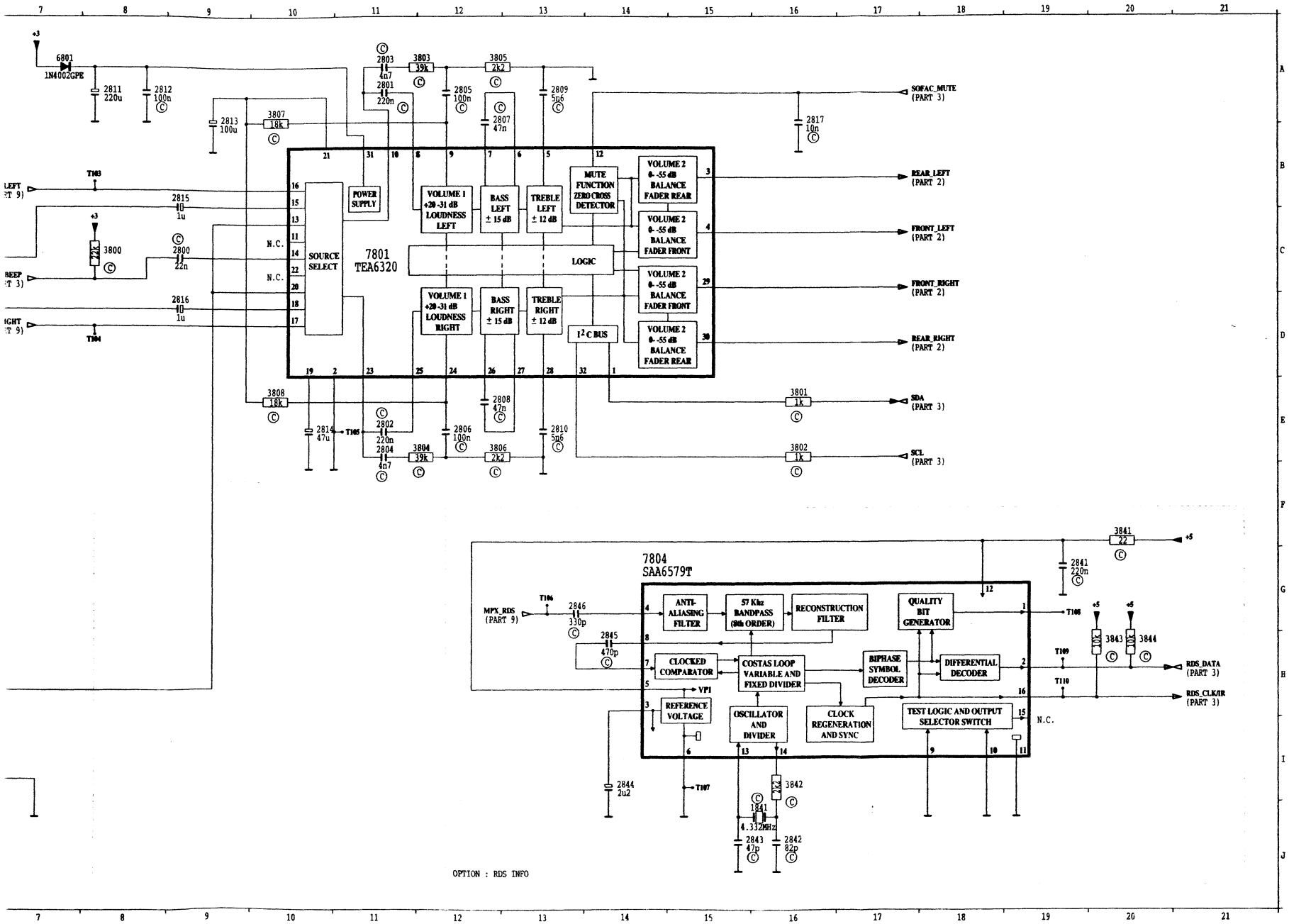
BEEP C8	CD_RIGHT D5	RDS_CLK/IR H21	REAR_RIGHT D17	SOFAC_MUTE A17	T103 ..... B8	T107 ..... I15	T109 ..... H19	T11
CD_GND C5	FRONT_LEFT C17	RDS_DATA H21	SCL E17	T101 ..... C6	T104 ..... D8	T108 ..... H19	T110 ..... H19	TEL
CD_LEFT C5	FRONT_RIGHT C17	REAR_LEFT B17	SDA E17	T102 ..... D6	T106 ..... G15	T109 ..... E11	T111 ..... H2	TEL

PART 2 : POWER AMPLIFIER & LINE-OUT (MAIN PCB)



*	4X7W ONLY	4X20W ONLY
2611	DELETE	INSERT
2612	DELETE	INSERT
2656	INSERT	DELETE
3614	INSERT	DELETE
3615	INSERT	DELETE
3617	DELETE	INSERT
3618	INSERT	DELETE
3619	DELETE	INSERT
3620	INSERT	DELETE
3621	DELETE	INSERT
3622	DELETE	INSERT
3629	DELETE	INSERT
3630	DELETE	INSERT
3650	DELETE	INSERT
3651	DELETE	INSERT
7603	DELETE	INSERT
7606	DELETE	INSERT
9801	DELETE	INSERT
9802	INSERT	DELETE

T128 ..... B16
T129 ..... B16
T130 ..... D16
T119 ..... E16
T120 ..... E16
T121 ..... F16
T122 ..... G16
T123 ..... H16
T124 ..... H16
T125 ..... I16
T126 ..... I16
TEL_IN A15
TEL_GND B15
HOT_INFO H15
REMOTE+ B14
SOFAC GND B13
REMOTE_SDA D13
REMOTE_SCL D13
REMOTE_MRQ D13
T113 ..... B11
T114 ..... C10
T115 ..... C9
T116 ..... C9
PA_MUTE H6
FRONT_LEFT
REAR_RIGHT



\R_RIGHT	D17	SOFAC_MUTE	A17	T103	B8	T107	I15	T109	H19	T112	I2	TUNER_LEFT	B6
	E17	T101	C6	T104	D8	T108	G19	T110	H19	TEL_GND	I2	TUNER_RIGHT	D6
\	E17	T102	D6	T106	G15	T109	E11	T111	H2	TEL_IN	H2		

Voltage measured in FM mode with
A4 = 14.4V
A7 = 14.4V
unless otherwise stated.

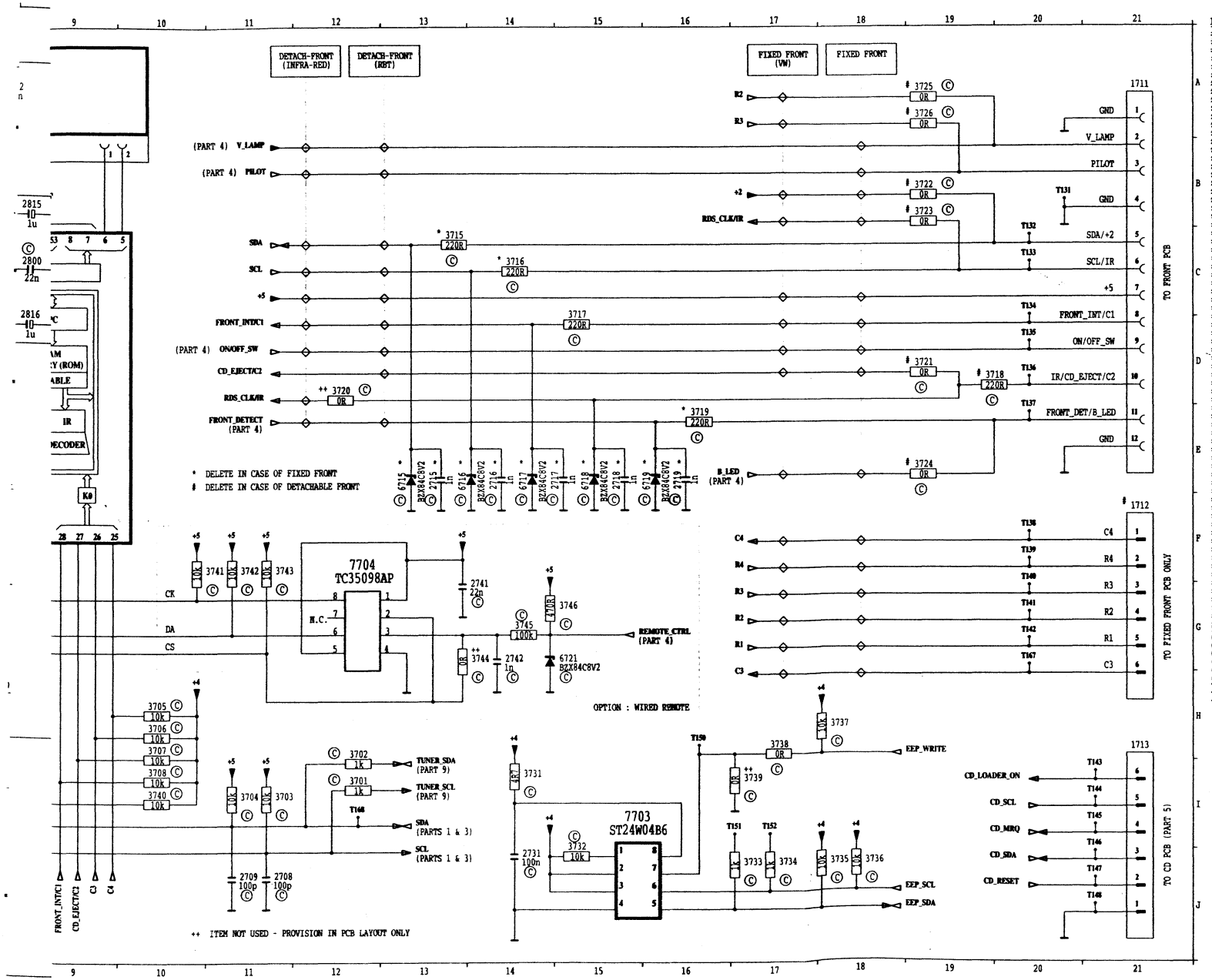
+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	
2.44V	

7801 TEA6320

1	4.6V
2	GND
3	4V
4	4V
5	4V
6	4V
7	4V
8	3.94V
9	4V
10	3.55V
11	N.C.
12	7.9V
13	4V
14	4V
15	4V
16	3.55V
17	3.55V
18	4V
19	7.88V
20	4V
21	4V
22	N.C.
23	3.55V
24	4V
25	4V
26	4V
27	4V
28	4V
29	4V
30	4V
31	3.55V
32	4.6V

7804 SAA6579T

1	Square wave 5Vp-p
2	Square wave 5Vp-p
3	2.5V
4	Audio signal
5	5V
6	<0.5V
7	Audio signal
8	Audio signal
9	0V
10	0V
11	0V
12	5V
13	Sine wave 0.6Vp-p
14	Sine wave 3.2Vp-p
15	N.C.
16	Square wave 5Vp-p



Voltage measured in FM mode with
A4 = 14.4V
A7 = 14.4V
unless otherwise stated.
(OFF) = Power off
(ON) = Power on

+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	
2.44V	

7703 ST24W04B6

1	5V
2	5V
3	5V
4	0V
5	5V
6	5V
7	5V
8	5V

7704 TC35098AP

1	5V
2	5V
3	5V
4	GND
5	5V
6	5V
7	N.C.
8	5V

RDS_DATA J5
REMOTE_CTRL G15
REMOTE_MRQ J8
REMOTE_SCL J7
REMOTE_SDA J8
RESET D2
SCL C11
SCL J13
SCL/IR C21
SDA B11
SDA J13
SDA/+2 ..... C21
SOFAC_MUTE J5
T132 ..... C20
T133 ..... C20
T134 ..... D20
T135 ..... D20
T136 ..... D20
T137 ..... E20
T138 ..... F20
T139 ..... F20
T140 ..... F20
T141 ..... G20
T142 ..... G20
T143 ..... I21
T144 ..... I21
T145 ..... I21
T146 ..... I21
T147 ..... J21
T148 ..... J21
T149 ..... J6
T150 ..... I17
T151 ..... I17
T152 ..... I17
T167 ..... H20
TEL_MUTE J8
TUNER_SCL I13
TUNER_SDA I13
V_LAMP B11
V_LAMP B21

EEP_SCL J6
SOPAC_I EEP_SDA J19
T101 ..... EEP_SDA J6
T102 ..... EEP_WRITE H19
EEP_WRITE J6

FRON_DET/B_LED E21
FRONT_DETECT E11
FRONT_INT/C1 ..... C21
FRONT_INT/C1 ..... D11
FRONT_INT/C1 ..... J9

GND A21
GND B21
GND E21
HOLD D2
HOT_INFO J8

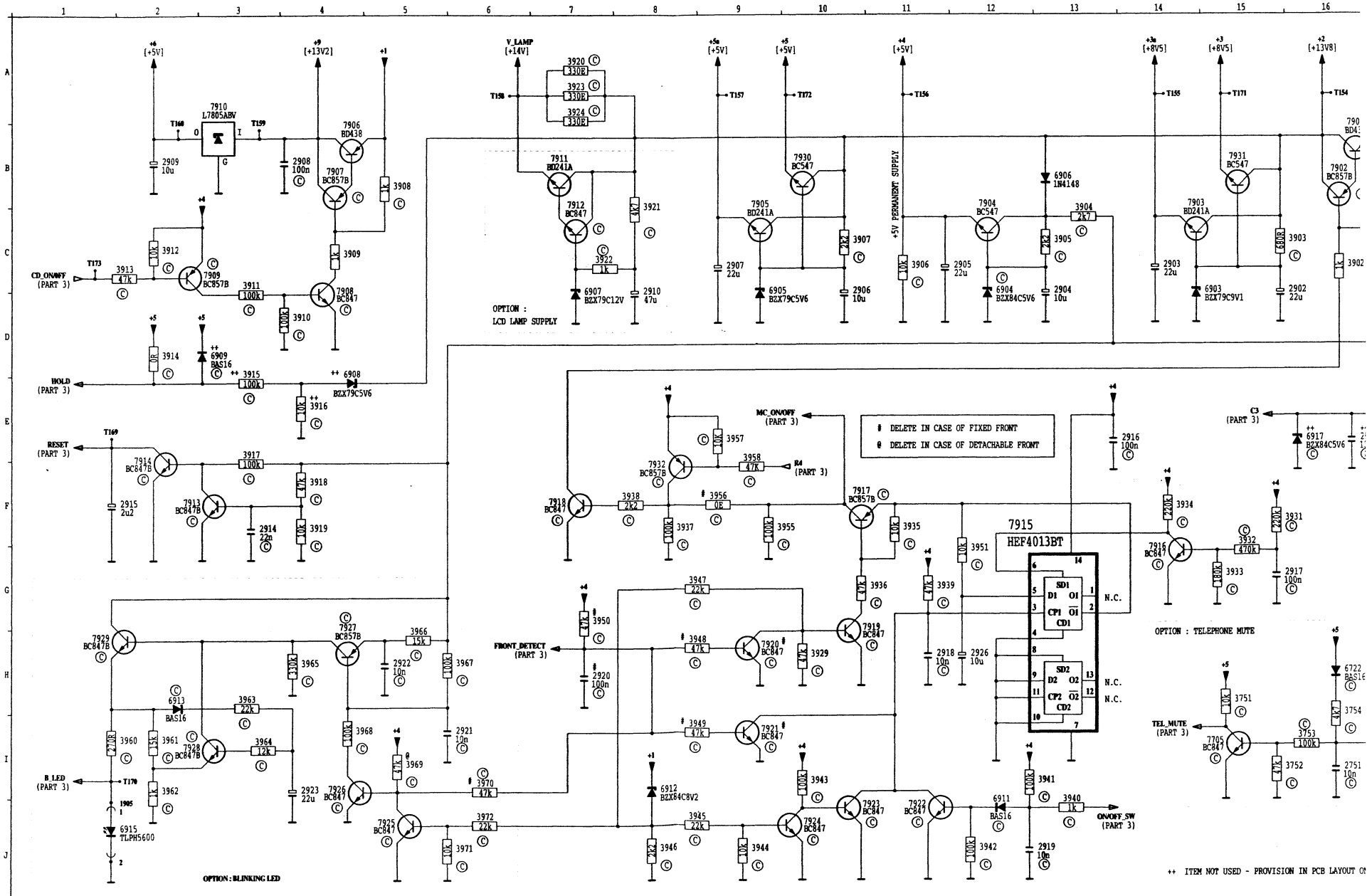
IR/CD_EJECT/C2 ..... D21
MC_ON/OFF J7
ON/OFF_SW D11
ON/OFF_SW D21
PA_MUTE J5

PILOT B11
PILOT B21
R1 ..... J4
R1 ..... G17
R2 ..... A17

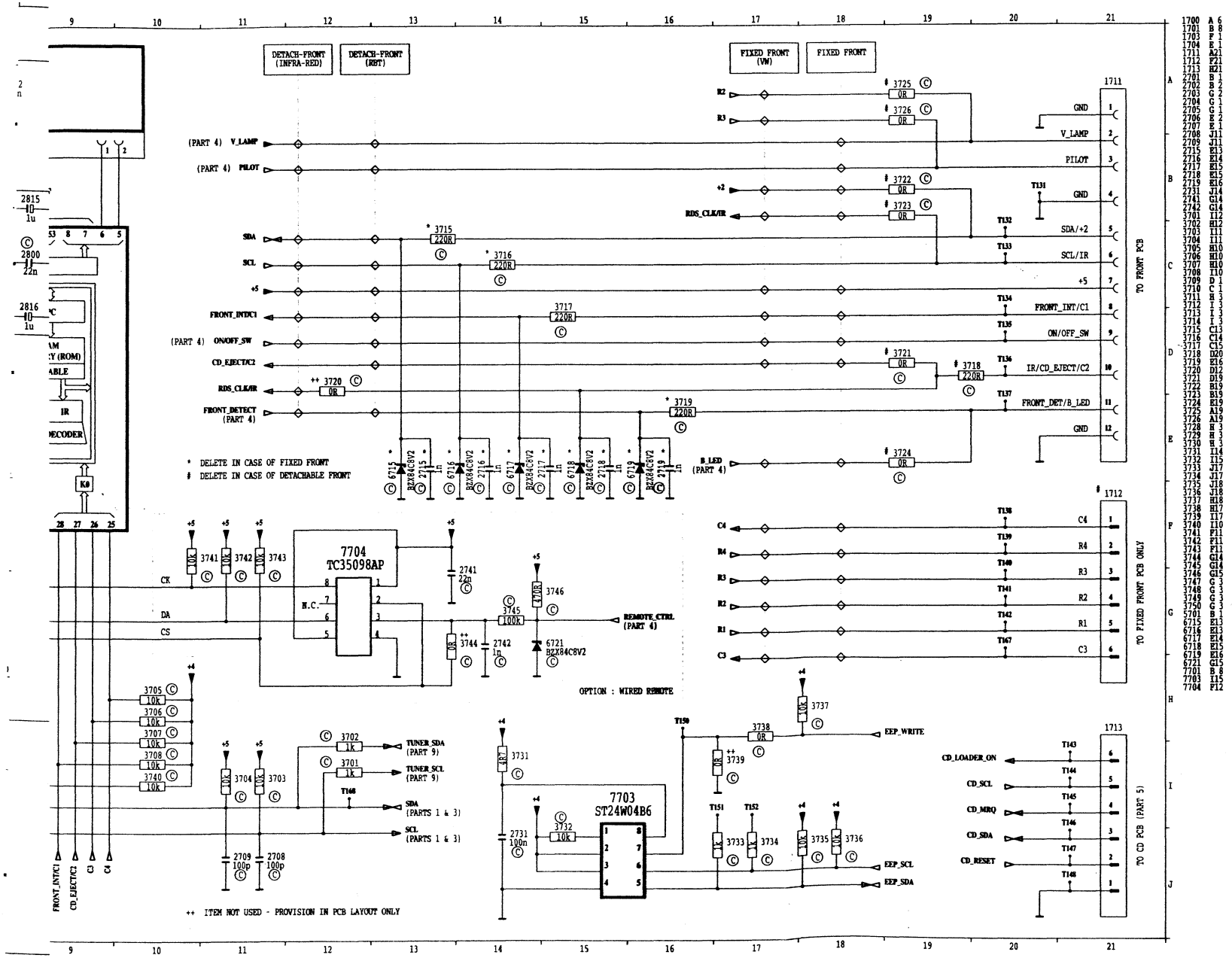
R2 ..... G17
R2 ..... J4
R3 ..... A17
R3 ..... G17
R3 ..... J4

R4 ..... F17
R4 ..... J4
RDS_CLK/IR J5
RDS_CLK/IR B17
RDS_CLK/IR D11

PART 4 : SUPPLY/CONTROL & TELEPHONE MUTE (MAIN PCB)



B_LED I1	FRONT_DETECT H6	ON/OFF_SW J13	REMOTE+ I19	T135 ..... A14	T154 ..... A16	T157 ..... A9	T161 ..... D19
C3 ..... E15	HOLD D1	PILOT H17	REMOTE_CRTL G17	T150 ..... B2	T155 ..... A14	T158 ..... A6	T162 ..... E19
CD_ON/OFF C1	MC_ON/OFF E9	R4 ..... F10	RESET D1	T153 ..... B19	T156 ..... A11	T159 ..... B3	T163 ..... G19



Voltage measured in FM mode with
A4 = 14.4V
A7 = 14.4V
unless otherwise stated.
(OFF) = Power off
(ON) = Power on

+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	
2.44V	

7703 ST24W04B6

1	5V
2	5V
3	5V
4	0V
5	5V
6	5V
7	5V
8	5V

7704 TC35098AP

1	5V
2	5V
3	5V
4	GND
5	5V
6	5V
7	N.C.
8	5V

RDS_DATA J5
REMOTE_CTRL G15
REMOTE_MRQ J8
REMOTE_SCL J7
REMOTE_SDA J8
RESET D2
SCL C11
SCL J13
SCL/IR C21
SDA B11
SDA J13
SDA/+2 ..... C21
SOFAC_MUTE J5
T132 ..... C20
T133 ..... C20
T134 ..... D20
T135 ..... D20
T136 ..... D20
T137 ..... E20
T138 ..... F20
T139 ..... F20
T140 ..... F20
T141 ..... G20
T142 ..... G20
T143 ..... I21
T144 ..... I21
T145 ..... I21
T146 ..... I21
T147 ..... J21
T148 ..... J21
T149 ..... J6
T150 ..... I17
T151 ..... I17
T152 ..... I17
T167 ..... H20
TEL_MUTE J8
TUNER_SCL I13
TUNER_SDA I13
V_LAMP B11
V_LAMP B21

EEP_SCL J6
SOPAC_I EEP_SDA J19
101 ..... EEP_SDA J6
102 ..... EEP_WRITE H19
EEP_WRITE J6

FRON_DET/B_LED E21
FRONT_DETECT E11
FRONT_INT/C1 ..... C21
FRONT_INT/C1 ..... D11
FRONT_INT/C1 ..... J9

GND A21
GND B21
GND E21
HOLD D2
HOT_INFO J8

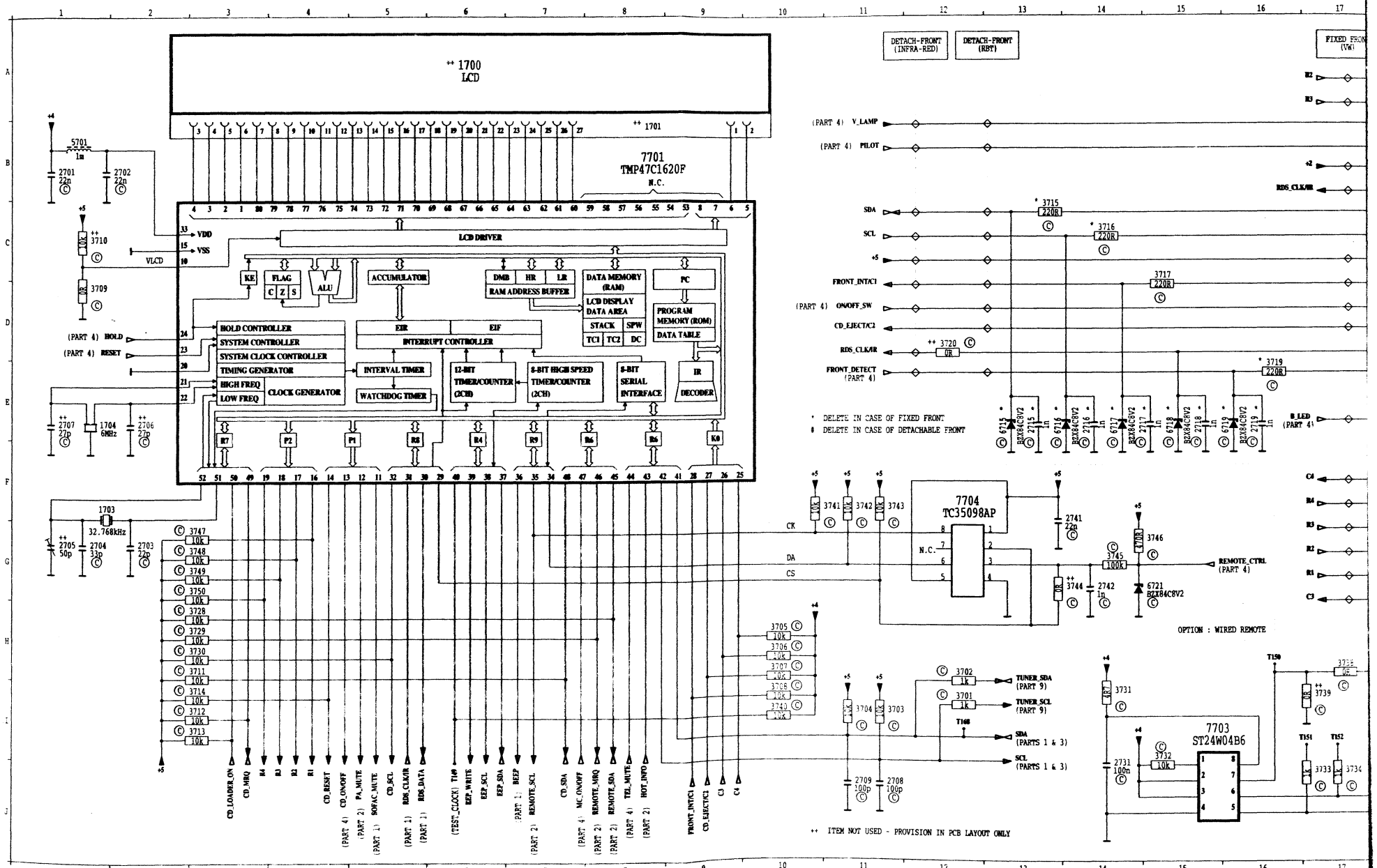
IR/CD_EJECT/C2 ..... D21
MC_ON/OFF J7
ON/OFF_SW D11
ON/OFF_SW D21
PA_MUTE J5

PILOT B11
PILOT B21
R1 ..... J4
R1 ..... G17
R2 ..... A17

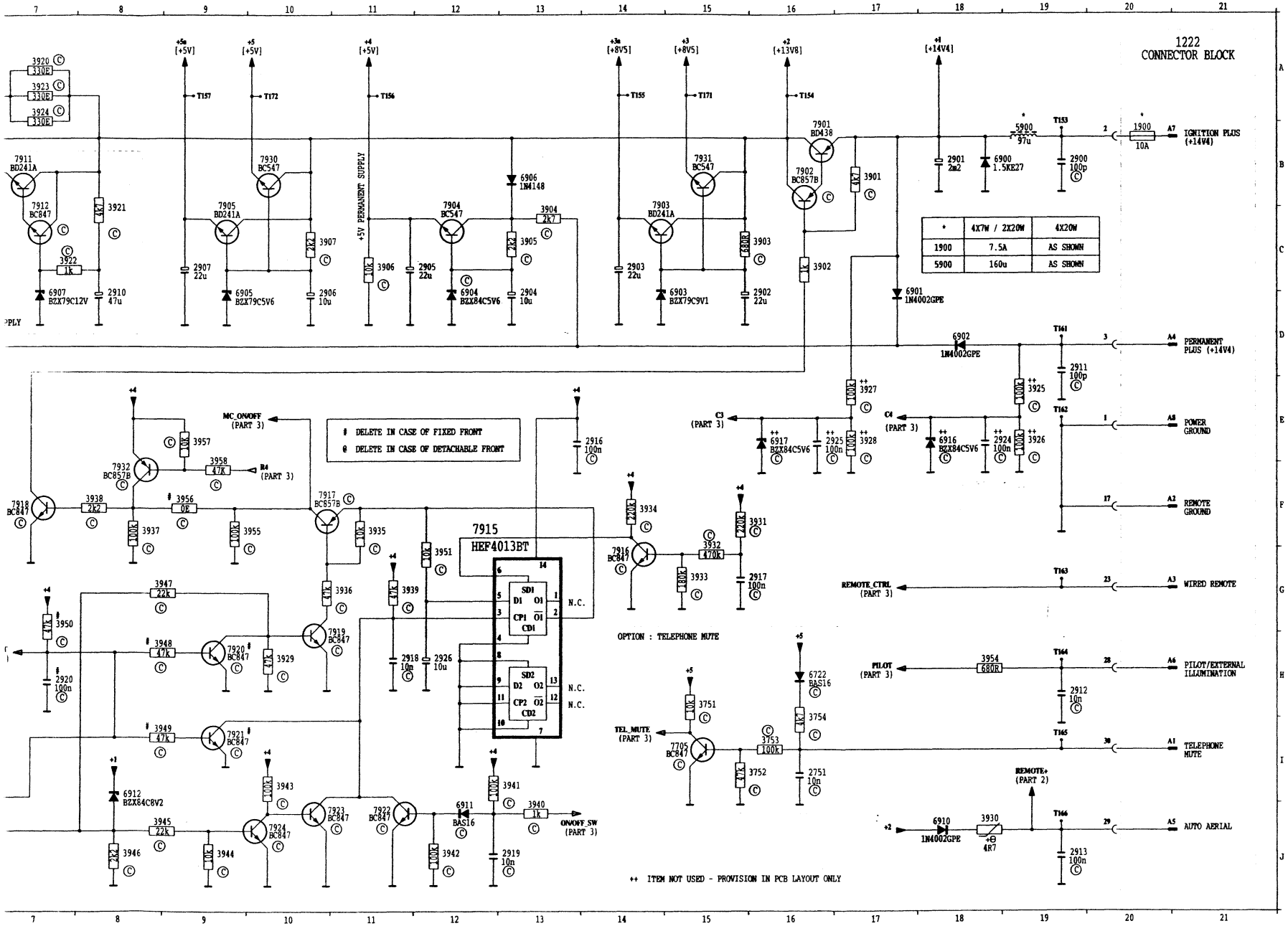
R2 ..... G17
R2 ..... J4
R3 ..... A17
R3 ..... G17
R3 ..... J4

R4 ..... F17
R4 ..... J4
RDS_CLK/IR J5
RDS_CLK/IR B17
RDS_CLK/IR D11

PART 3 : MICRO-CONTROLLER, EEPROM & REMOTE CONTROL INTERFACE (MAIN PCB)



B_LED E17	C4 ..... J9	CD_MQR I20	CD_SCL I20	EEP_SCL J6	FRON_DET/B_LED E21	GND A21	IR/CD_EJECT/C2 ..... D21
BEEP J7	CD_EJECT/C2 ..... D11	CD_MRQ J3	CD_SCL J5	EEP_SDA J19	FRONT_DETECT E11	GND B21	MC_ON/OFF J7
C3 ..... H17	CD_EJECT/C2 ..... J9	CD_ON/OFF J4	CD_SDA J20	EEP_SDA J6	FRONT_INT/C1 ..... C21	GND E21	ON/OFF_SW D11
C3 ..... J9	CD_LOADER_ON I20	CD_RESET J20	CD_SDA J7	EEP_WRITE H19	FRONT_INT/C1 ..... D11	HOLD D2	ON/OFF_SW D21
C4 ..... F17	CD_LOADER_ON J3	CD_RESET J4	EEP_SCL J19	EEP_WRITE J6	FRONT_INT/C1 ..... J9	HOT_INFO J8	PA_MUTE J5



*	4X7W / 2X20W	4X20W
1900	7.5A	AS SHOWN
5900	160u	AS SHOWN

Voltage measured in FM mode with
A4 = 14.4V
A7 = 14.4V
unless otherwise stated.

(OFF) = Power off
(ON) = Power on
(CD) = SOURCE CD
(TUNER) = SOURCE TUNER

+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	
2.44V	

7915 HEF4013BT
1 N.C.
2 4.56V
3 0V
4 GND
5 4.56V
6 0V
7 GND
8 GND
9 GND
10 GND
11 GND
12 N.C.
13 N.C.
14 5V

7901 BD438
C 13.8V (ON)
0V (OFF)
B 13.7V (ON)
14.4V (OFF)
E 14.4V

7902 BC857B
C 13.8V (ON)
0V (OFF)
B 12.9V (ON)
14.4V (OFF)
E 13.7V (ON)
14.4V (OFF)

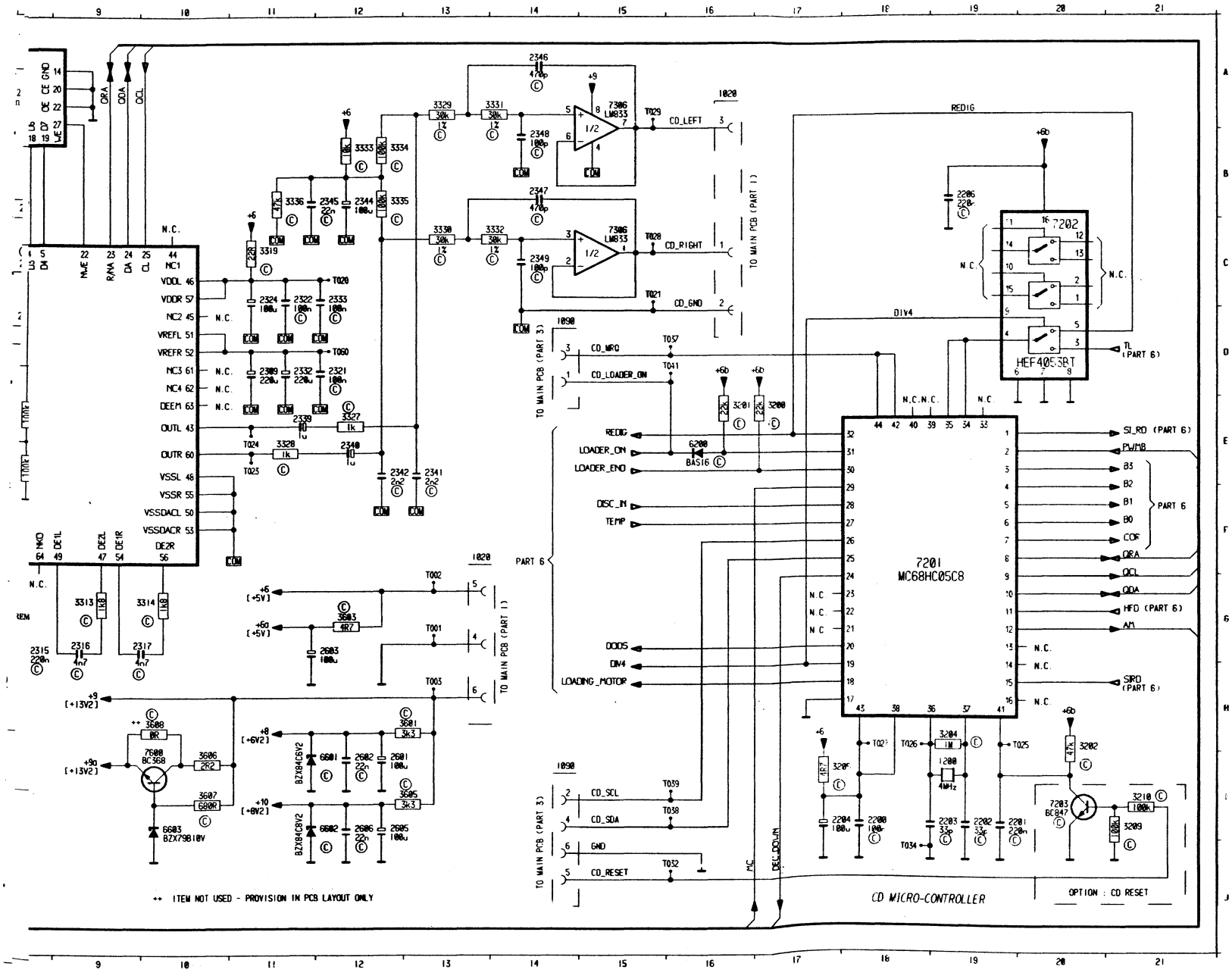
7909 BC857B
C 4.9V (CD)
0V (TUNER)
B 4.35V (CD)
4.92V (TUNER)
E 4.9V (CD)
4.9V (TUNER)

7908 BC847
C 0.2V (CD)
14V (TUNER)
B 0.7V (CD)
0V (TUNER)
E 0.4V (CD)
0V (TUNER)

7907 BC857B
C 13.2V (CD)
0.5V (TUNER)
B 12.47V (CD)
4.04V (TUNER)
E 13.24V (CD)
13.6V (TUNER)

7910 L7805ABV
I 13.2 (CD)
0.48(TUNER)
O 5(CD)
0.79(TUNER)
G GND

7705 BC847
C 0V
B 0.6V
E 0V



Voltage measured in CD PLAY mode with
A4 = 14.4V
A7 = 14.4V
unless othersise stated.

+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	
2.44V	

7304 L2726

1	13.2V
2	4.14V
9	4.2V
10	4.2V
11	4.82V
12	4.84V
20	4.84V

7203 BC847

C	4.8V
B	0
E	0

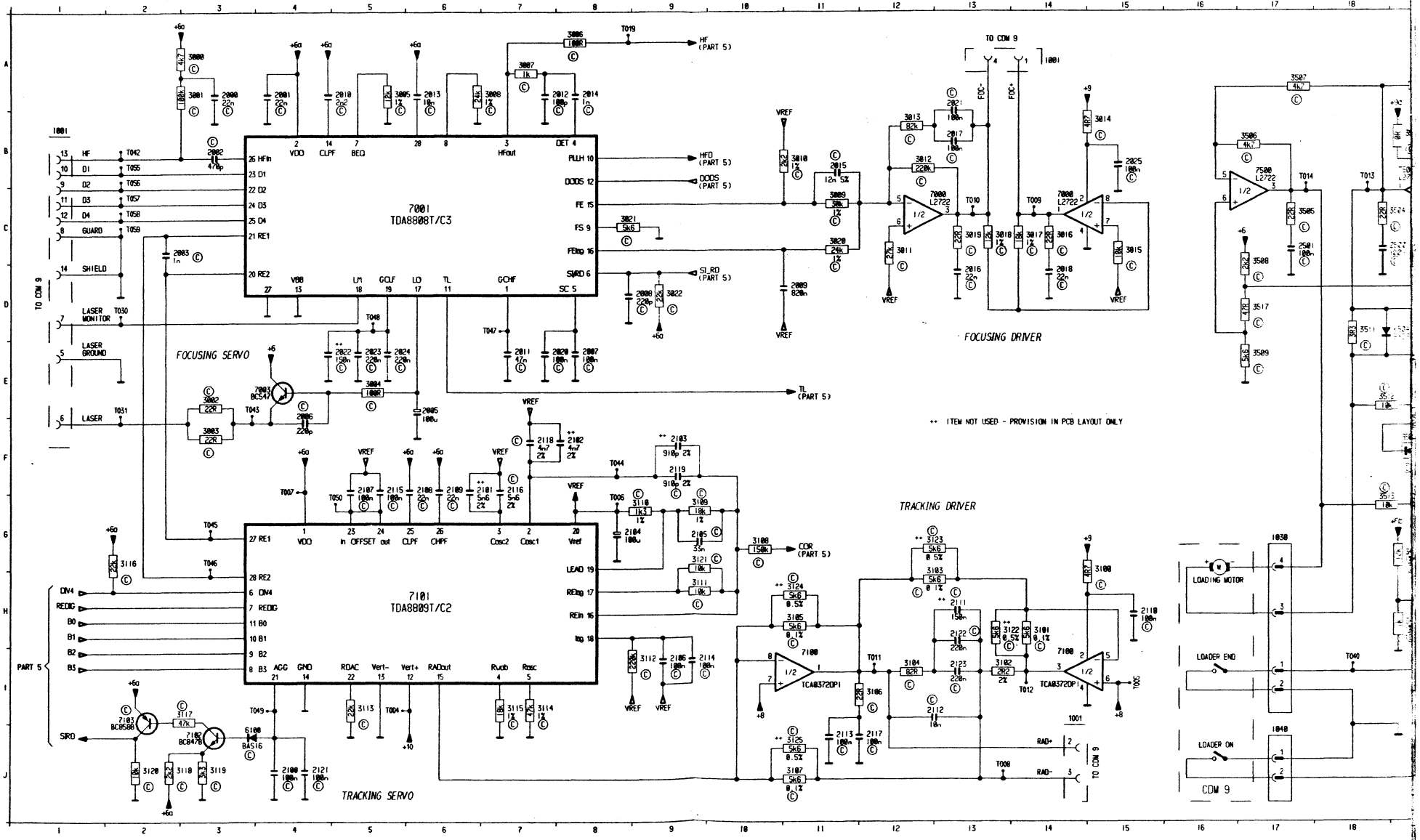
7202 HEF4053BT

3	4.81V
4	4.81V
5	2.58V
9	4.71V
16	4.85V

7306 LM833

1	4.17V
2	4.17V
3	4.10V
4	0V
5	4.10V
6	4.17V
7	4.17V
8	13.2V

PART 6 : CD SERVO (CD PCB)



COR G11	DOOS B11	HF A9	LOADER_ON J21	RAD- J14	SIRD J1	T006 ..... G8	T010 ..... C13		
DISC_IN F21	FOC+ A13	HFD B9	LOADING MOTOR B21	REDG H1	T004 ..... J8	T008 ..... J13	T011 ..... I12		
DIV4 ..... H1	FOC- A13	LOADER_END I21	RAD+ J14	SI_RD C11	T005 ..... I15	T009 ..... C13	T012 ..... I13		

ALIGNMENT TABLE

For more information see general information " General alignment procedures for car radio"

Alignment	SK					
RF Coil	AM	1611kHz (OIRT : 288kHz no signal	B		2226	On T003 6.5V±0.5V DC (OIRT : 7V±0.5V)
RF Coil	FM	(OIRT : 70.01MHz) 88MHz no signal	A		5201	On T003 1.2V±30mV DC (OIRT : 1.25V±30mV)
FM – RF	FM	88MHz, 44µV (OIRT : 70.01MHz) Unmodulated	A		5100	On T004 Max. V DC
RF Trimmer	FM	104MHz, 44µV Unmodulated	A		2226	On T004 Max. V DC
FM – IF	FM	97MHz, 44µV Unmodulated	A		5210 5209	On T004 Max. V DC
FM – IF	FM	97MHz, 44µV Unmodulated	A		5208	On T004 Max. V DC
AM – IF	AM	1053kHz, 44µV 1kHz, AM = 30%	B		5301	On T004 Max. V DC
SDS 10dB Crosstalk	FM	97MHz, 150µV Δf = 22.5kHz mod= 1kHz stereo - R	A		3303	L(T103) - R(T104) ≥ 10dB
α – 3 dB	FM	93 MHz, 1 mV Δ f = 22.5 kHz f mod. = 1kHz	A			T103 = 0 dB
		93 MHz, 5 µV Δ f = 22.5 kHz f mod. = 1kHz			3321	T103 - 3 dB

CHECK TABLE

Check	SK				Setting of controls	
VC – FM	FM	no signal		88MHz		1.17VDC < T003 < 1.23VDC
				108MHz		T003 > 5.0VDC
VC – AM	LW	no signal		144 kHz		T003 > 1.5VDC
	MW			1611 kHz		T003 < 7VDC

Some useful tips on Micro-processor

Voltage and waveform are measured with A4 and A7 connected with 14.4V unless otherwise stated.

(on) = Power on
(off) = Power off

Pin.No.	Name	I/O	Function / Description	Voltage/Waveform
1-4		O	LCD segment driver output.	Square wave, 1.2Vdc, 50% duty cycle (on) Square wave, 0Vdc, 50% duty cycle (off)
5-6		O	Common drive output.	Staircase waveform, 1.2Vdc (on) Staircase waveform, 0Vdc (off)
7-9			No connection	
10		I	LCD driver power supply	1.7V (on), 0V (off)
11	SOFAC_MUTE	O	To mute SOFAC	0V (Mute), 8.5V (non mute)
12	PA_MUTE	O	Power amplifier line out mute.	0V (mute), 5V (non mute)
13	CD_ON/OFF	O	To activate/de-activate CD supply.	0V (CD), 5V (other source)
14	CD_RESET	O	To reset CD uP.	0V (CD), 5V (other source)
15			uP ground	
16	R1	O	Row Keyboard scan	
17	R2	O	Row Keyboard scan	
18	R3	O	Row Keyboard scan	
19	R4	O	Row Keyboard scan	
20	GND		Ground	
21			Crystal oscillator for clock	
22			Crystal oscillator for clock	
23	RESET		uP Reset	4V when either A4 or A7 is connected.
24	HOLD			4.8V (on), 0V (off)
25	C4	I	Column Keyboard scan	
26	C3	I	Column Keyboard scan	4.9V
27	C2/CD_EJECT	I	Column Keyboard scan	
28	C1/FRONT_INT	I	Column Keyboard scan	To inform Main uP that some key has been acticated on the front panel.
29	CS		Chip select	
30	RDS_DATA	I/O		4.9V (on), 0V (off)
31	RDS_CLK	I		4.8V (on), 0V (off)
32	CD_SCL		CD serial Clock	
33	VDD		uP supply	4.58V (on) & (off)
34	DA		Serial Data	
35	REMOTE_SCL/CK	O	Remote Serial Clock/Serial Clock	5V (on), 0V (off)
36	BEEP	O	Beep output.	
37	EEP_SDA	I/O	EEprom serial data	5V (on), 0V (off)
38	EEP_SCL	O	EEprom serial clock	5V (on), 0V (off)
39	EEP_WRITE	O	EEprom write enable	0V (Write enable), 5V (write disable)
40	TEST CLOCK		For Clock accuracy alignment	
41	SDA	I/O	Serial data	5V (on), 0V (off)
42	SCL	O	General I²C bus control	5V (on), 0V (off)
43	HOT_INFO	I	For Thermal shutdown.	5V when temperature of set is ok. 0V when temperature of set is too high. Display shows "hot". Volume will be reduce automatically.
44	TEL_MUTE	I	TEL_MUTE (Phone "Lo")	5V (set is muted and display shows "CALL") 0V (set play as normal)
			TEL_MUTE (Phone "Hi")	5V (set play as normal) 0V (set is muted and display shows "CALL")
45	REMOTE_SDA	I/O	Remote Serial Data	5V (on), 0V (off)
46	REMOTE_MRQ	I/O	Remote Master Request	4.9V (on), 0V (off)
47	MC_ON/OFF	I	Main uP on/off status	4.4V (on), 0V (off, standby mode)
48	CD_SDA	I/O	CD Serial Data	
49	CD_MRQ	I/O	CD Master Request	
50	CD_LOADER_ON	I	To check if a disc is inserted.	
51			Crystal oscillator	Sine wave, 0.5Vdc
52			Crystal oscillator	Sine wave, 2Vdc.
53-59			No connection	
60-80		O	LCD driver output	Square wave, 1.2Vdc, 50% duty cycle (on) Square wave, 0Vdc, 50% duty cycle (off)

CD SERVICE TIPS

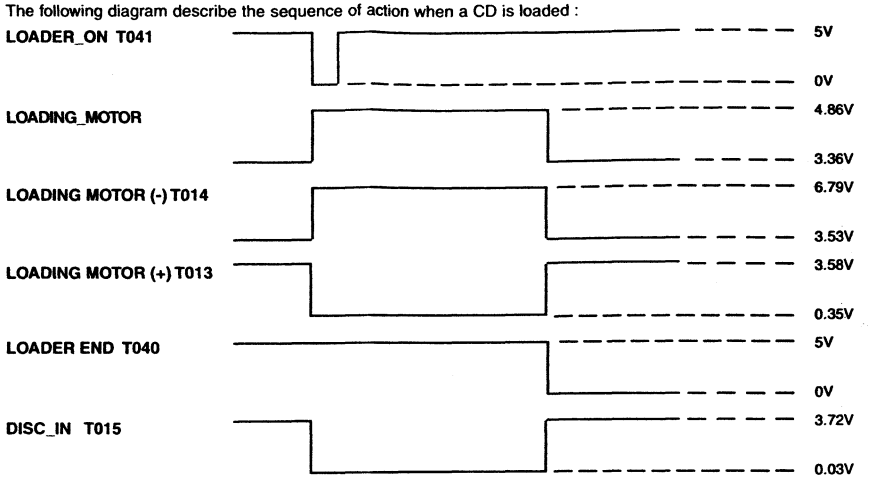
CD PCB TEST POINT ASSIGNMENT

TEST POINT (T)	DESCRIPTION	VOLT DC
001	GND	
002	6	5
003	+9	14.4
004	+10	8.2
005	+8	6
006	Vref	2.44
007	+6a	4.9
008	RAD-	4.9
009	FOC+	2.44
010	FOC-	2.44
011	RAD+	6
012	PIN 3 TCA0372	6
013	PIN 1 L2722	3.6
014	PIN 3 L2722	3.57
015	DISC IN	3.74
016	TEMP	3.74
017	PIN 1 L2722	5
018	PIN 3 L2722	5
019	HF	2.4
020	VDDL	4.4
021	AUDIO GND	
022	VDDA	5
023	OUTR	2.2
024	OUTL	2.2
025	RESET	5
026	OSC2	5
027	VDD	5
028	CD RIGHT	4
029	CD LEFT	4
030	MONITOR	
031	LASER	
032	CD-RESET	
033	VDD	
035	XOUT	
036	GND	
037	CD MRQ	
038	CD_SDA	
039	CD_SCL	
040	LOADER_END	
041	LOADER_ON	
042	HF_IN	
044	PIN 2 TDA8809	
045	PIN 27 TDA8809	
046	PIN 28 TDA8809	
047	PIN 1 TDA8808	2.4
048	PIN 19 TDA8808	1.81
049	PIN 21 TDA8809	2.56
050	PIN 23 TDA8809	2.22
051	PWMA	5
052	KTC	5
055	D1	
056	D2	
057	D3	
058	D4	
059	GUARD	
060	VREFL	2.5

Some useful tips on CD Board

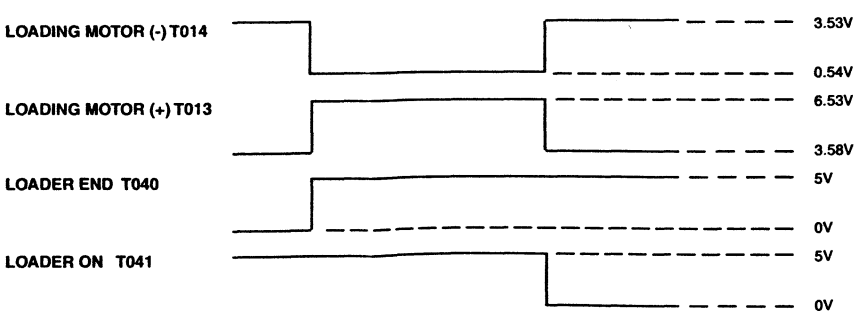
1. CD LOADING SEQUENCE (refer to circuit diagram Part 6 : CD Servo)

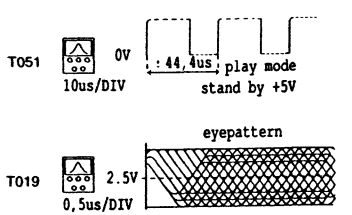
The following diagram describe the sequence of action when a CD is loaded :

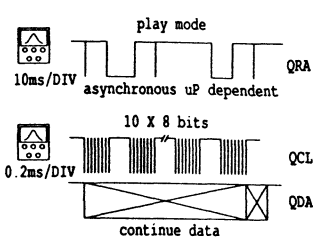


2. CD UN-LOADING SEQUENCE (refer to circuit diagram Part 6 : CD Servo)

The following diagram describe the sequence of action when a CD is eject:







4. Block diagram SAA7341

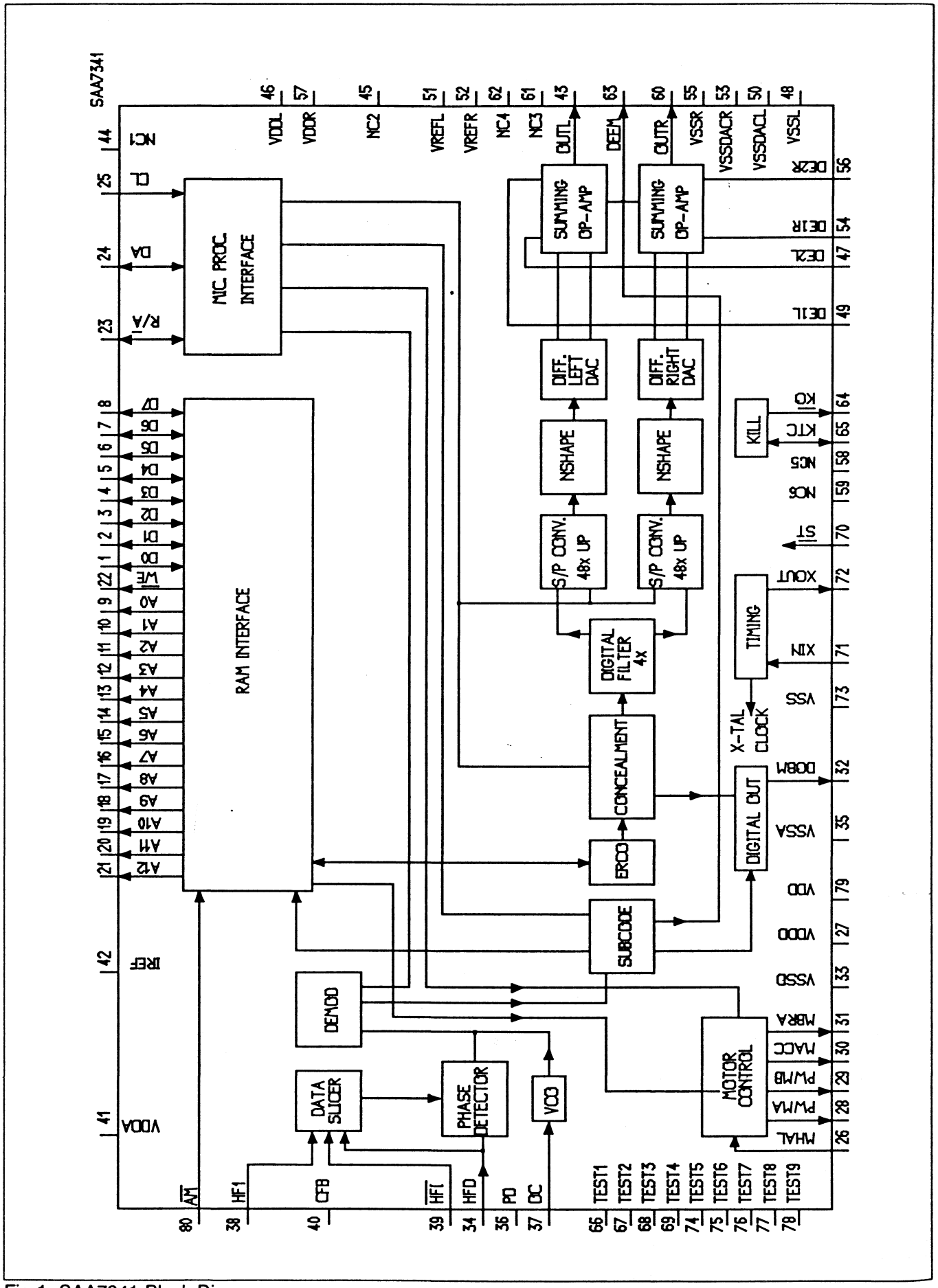
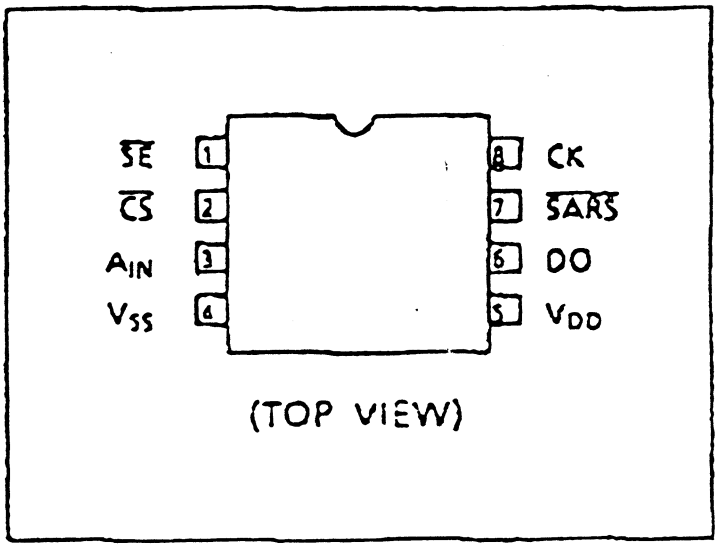
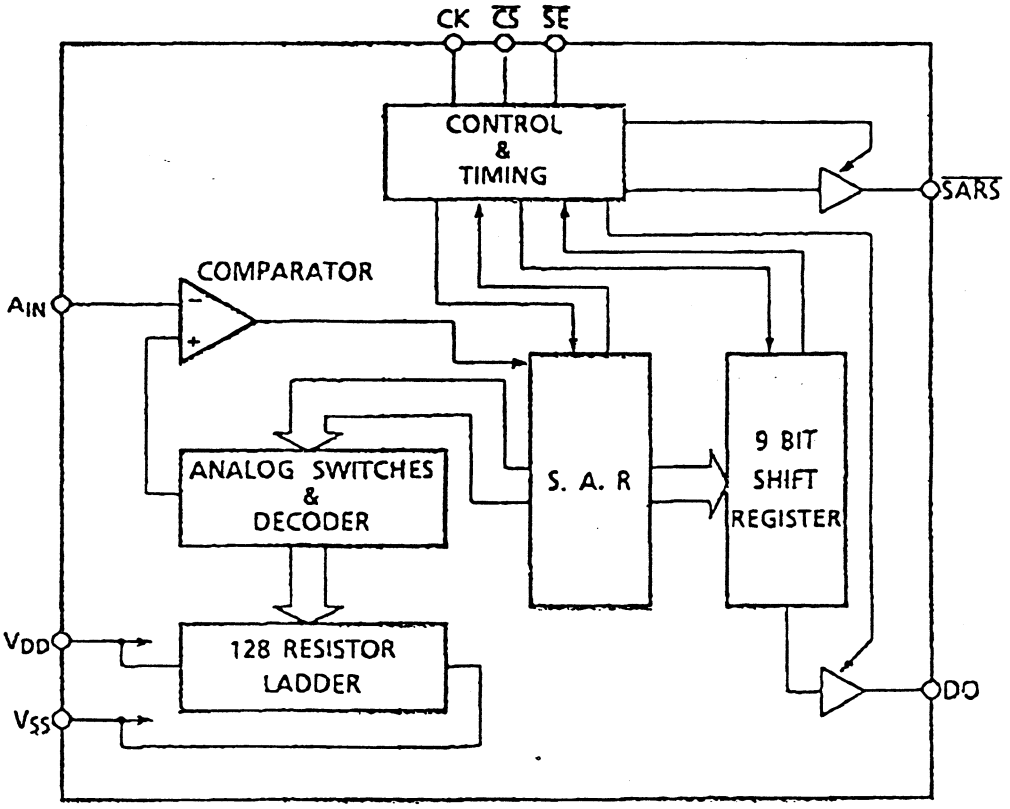


Fig 1: SAA7341 Block Diagram



3. SYSTEM DESCRIPTION



5. Pin description SAA7341

Symbol	pin	description
D0 to D7	1 to 8	data inputs/outputs to external RAM
A0 to A12	9 to 21	adress outputs to external RAM
WE(-)	22	Write enable: output signal to external RAM(active LOW)
R/ACK	23	request/acknowledge: input/output microprocessor interface This pin has an open drain output with internal pull-up of 50 kΩ; input is debounced by two 4,2336 MHz clock cycles.
DA	24	Microprocessor interface data input/output line; input is debounced by two 4,2336 MHz clock cycles.
CL	25	Microprocessor interface clock input debounced by two 4,2336 MHz clock cycles.
MHAL	26	hall effect detector for motor; input for motor reversal, with internal pull-up of 50 kΩ
VDDD	27	+5V supply for digital audio output(DOBM) and motor speed control(MSC) output buffers.
PWMA	28	Pulse width modulated motor control acceleration signal: output active during acceleration; single ended mode output.
PWMB	29	Pulse width modulated motor control brake signal; output active during braking.
MACC	30	motor accelerate signal output
MBRA	31	motor brake signal output
DOBM	32	biphase-mark digital audio output: this output conforms to the format defined by IEC 958.
VSSD	33	ground for digital audio output(DOBM) and motor speed control(MSC) outputs.
HFD	34	high-frequency detector: when HIGH this input enables the fine frequency and phase detector outputs and also the feedback from the data slicer; this input has an internal pull-up of 50 kΩ
VSSA	35	analog ground for front end
PD	36	phase detector: the phase detector output and fine/coarse frequency outputs are combined internally and the resultant signal controls the VCO frequency.
OC	37	VCO control input
HFI	38	non-inverting data slicer input: normally AC-coupled to EFM data source.
HFI(-)	39	inverting data slicer input: normally connected via external capacitor to ground of EFM data source.
CFB	40	data slicer feedback output to capacitor: disabled when a data run length violation is detected or HFD is LOW to stop the slicing level from drifting.
VDDA	41	+5V analog supply for front end.
IREF	42	current reference output: reference current for internal current sources, nominally 114 μA, requires external resistor connected to ground.
OUTL	43	left channel output
n.c.	44	not connected
n.c.	45	not connected

Symbol	pin	description
VDDL	46	+5V analog supply for left channel integrator and operational amplifier.
DE2L	47	pin 2 for external de-emphasis capacitor and resistor(left channel).
VSSL	48	analog ground for left channel integrator and operational amplifier.
DE1L	49	pin 1 for external de-emphasis capacitor and resistor(left channel).
VSSDACL	50	analog ground for DAC(left channel).
VREFL	51	internal reference voltage node for DAC left channel requiring an external decoupling capacitor.
VREFR	52	internal reference voltage node for DAC right channel requiring an external decoupling capacitor.
VSSDACR	53	analog ground for DAC (right channel).
DE1R	54	pin 1 for external de-emphasis capacitor and resistor(right channel).
VSSR	55	analog ground for right channel integrator and operational amplifier.
DE2R	56	pin 2 for external de-emphasis capacitor and resistor (right channel).
VDDR	57	+5V analog supply for the right channel integrator and operational amplifier.
n.c.	58	not connected
n.c.	59	not connected
OUTR	60	right channel output
n.c.	61	not connected
n.c.	62	not connected
DEEM	63	output for external de-emphasis switches
KO(-)	64	output pulse(LOW) used to activate external kill circuit during power on/off
KTC	65	input/output connection to external capacitor used for the timing of the kill pulse at power on.
TEST1 to 4	66 to 69	these outputs pins should be left open-circuit
ST(-)	70	standby-mode, input active LOW, internal 50 kΩ pull-up resistor.
XIN	71	input from crystal oscillator or external clock input(16,9344 MHz typ.)
XOUT	72	output to clock crystal
VSS	73	ground for digital section
TEST5	74	this output pin should be left open-circuit
TEST6 to 9	75 to 78	these input pins should be tied HIGH
VDD	79	+5V supply for digital section
AM(-)	80	this input pin is normally held HIGH; should track loss occur this pin should be taken LOW and then the data is corrupted before the FIFO stage; this pin has an internal 50 kΩ pull-up resistor.

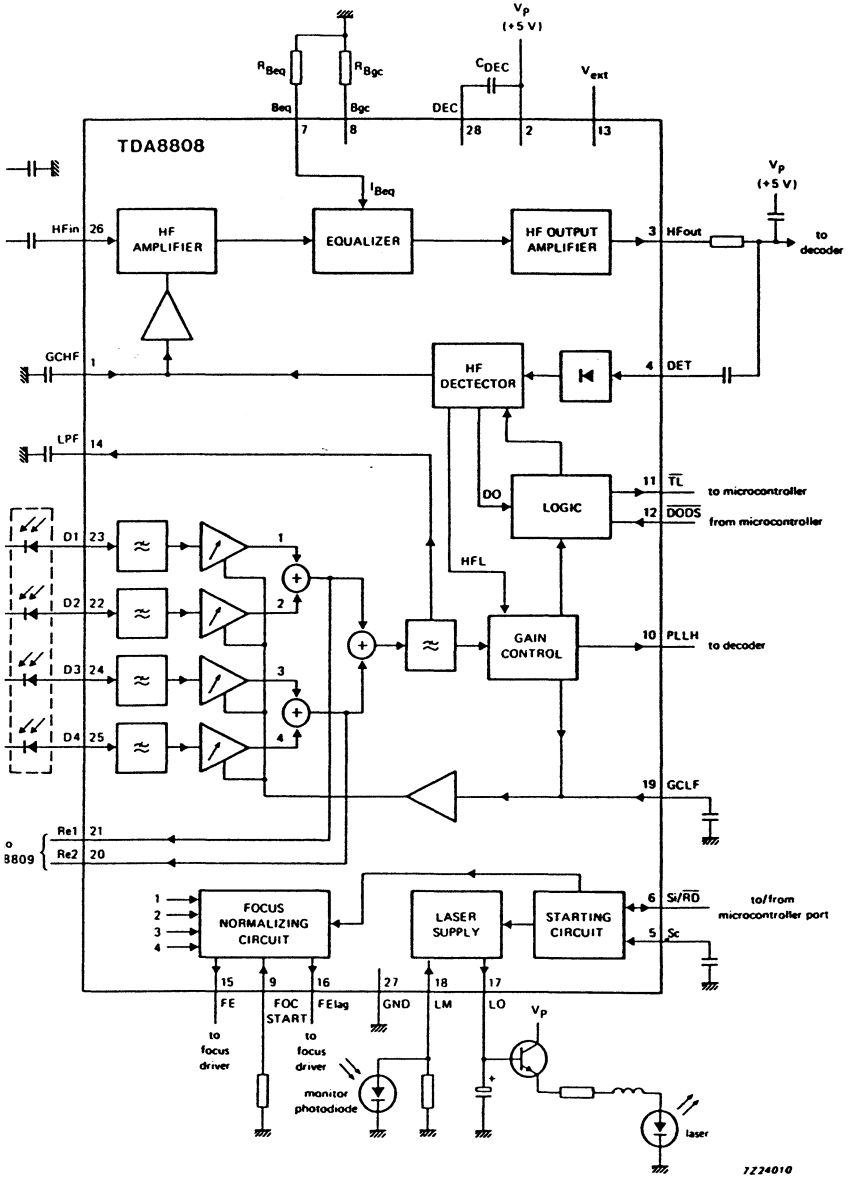
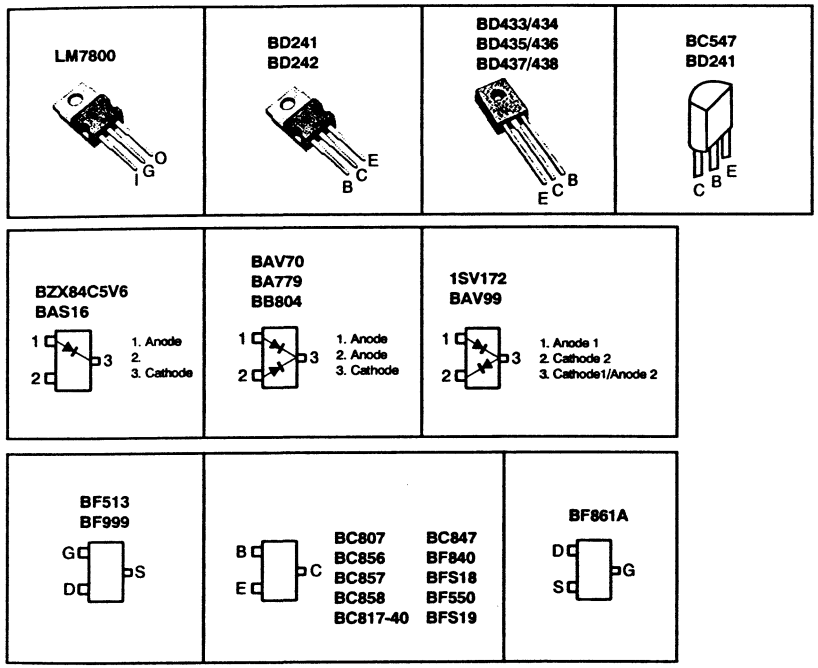


Fig. 1 Block diagram.

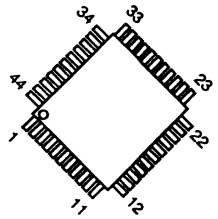
Pin functions

pin	mnemonic	description
1	GCHF	Gain control input of HF amplifier. Current output from HF amplitude detector
2	Vp	Positive supply voltage
3	HFout	HF amplifier and equalizer voltage output
4	DET	HF detector voltage input
5	Sc	Starting up capacitor input
6	Si/$\overline{RD}$	On/off control (start input); ready signal output (starting up procedure successful)
7	Beq	Equalizer reference current input
8	Bgc	DC and LF gain control reference current input
9	FOC START	Focus normalizing circuit starting current
10	PLLH	PLL on hold output
11	$\overline{TL}$	Track loss output
12	$\overline{DODS}$	Drop out detector suppression input
13	V_{ext}	TDA8808T Negative supply connection for FE and FElag output stage; also substrate connection TDA8808AT Positive supply connection for FE and FElag output stage
14	LPF	Low pass filter for I_{ret}, used in track loss ($\overline{TL}$) detector and LF gain control
15	FE	Current output of normalized, switched focus error signal
16	FElag	Current output of switched focus error signal, intended for lag network
17	LO	Laser amplifier current output
18	LM	Laser monitor diode input
19	GCLF	Gain control input for AC and LF amplifiers. Current output from LF amplitude detector
20	Re2	Summation of amplified currents from D3 and D4
21	Re1	Summation of amplified currents from D1 and D2
23, 22	D1, D2	Current inputs to DC and LF photo diode amplifier
24, 25	D3, D4	Current inputs to DC and LF photo diode amplifier
26	HFin	Current input to HF amplifier
27	GND	Ground connection of device: also substrate connection for TDA8808AT
28	DEC	Decoupling input (internal bypass)

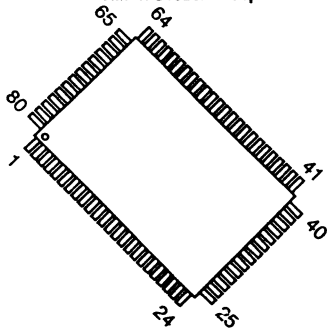
TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

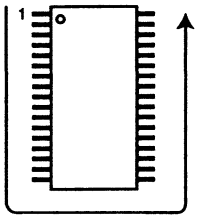


7201 MC68HC05C8 44pin



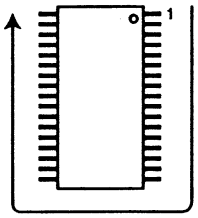
7302 SAA7341 80pin
7701 TMP47C1620F 80pin





7000	L2722	8pin
7001	TDA8808T/C3	28pin
7100	TCA0372DPI	8pin
7101	TDA8809/C2	28pin
7202	HEF4053BT	16pin
7203	MC45581DT	8pin
7300	TEA6822T	56pin
7303	MSM5165AL	28pin
7304	L2722	8pin
7400	LM258	8pin
7500	L2722	8pin
7703	24W04C6	8pin
7704	35098A	8pin
7801	TEA6320	32pin
7804	SAA6579T	16pin
7915	HEF4013BT	14pin

7202 TEA6811V 40pin



Pinning

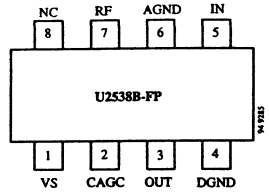


Figure 2.

Pin Description

Pin	Symbol	Function
1	VS	Supply voltage
2	CAGC	AGC capacitor
3	OUT	Data output
4	DGND	GND – DEM/INT/ST
5	IN	Input pin diode
6	AGND	GND amplifier
7	RF	Frequency determination
8	NC	Not connected

Block Diagram

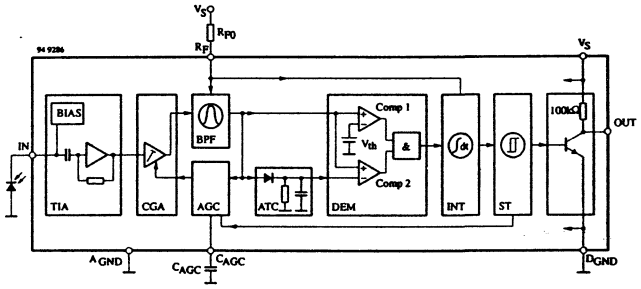


Figure 3.

TIA Trans impedance amplifier
CGA Controlled-gain amplifier
BPF Bandpass filter
AGC Automatic gain control
ATC Automatic threshold control
DEM Demodulator
INT Integrator
ST Schmitt Trigger

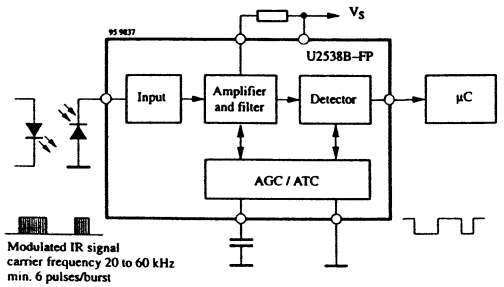


Figure 1.

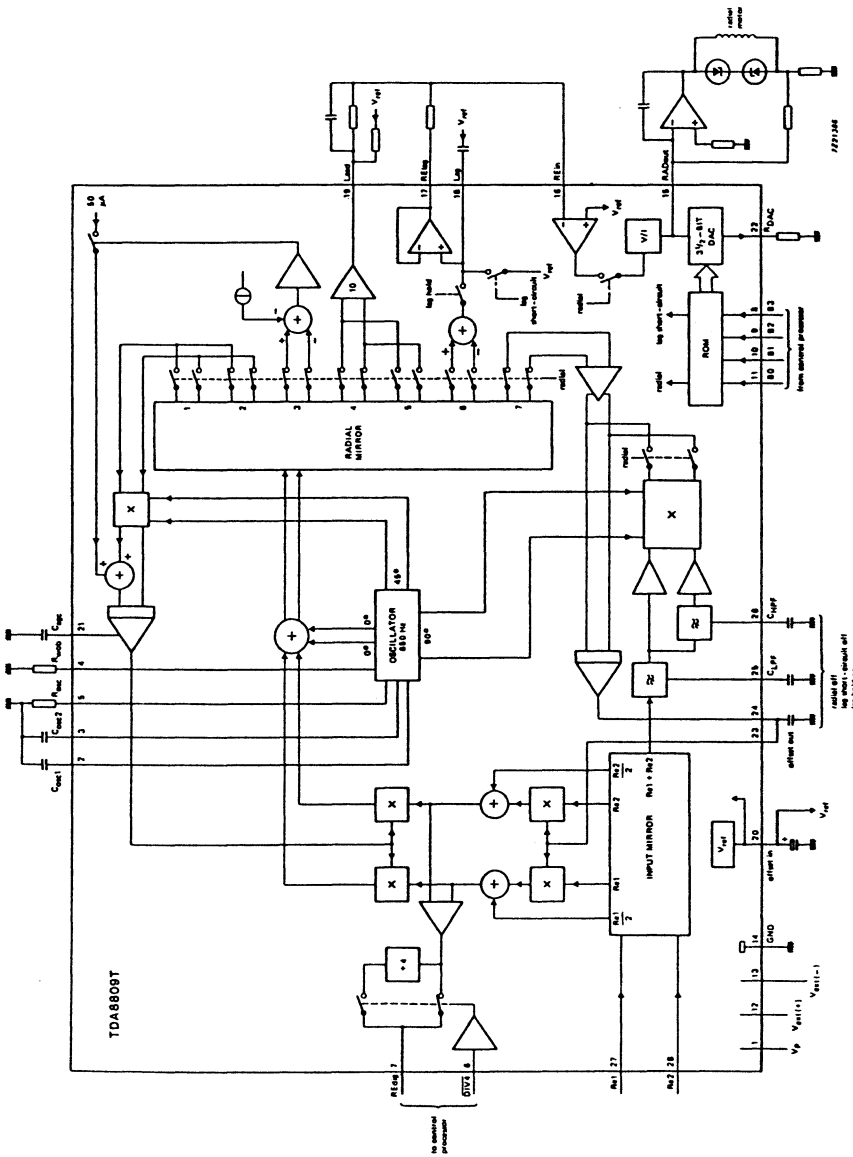
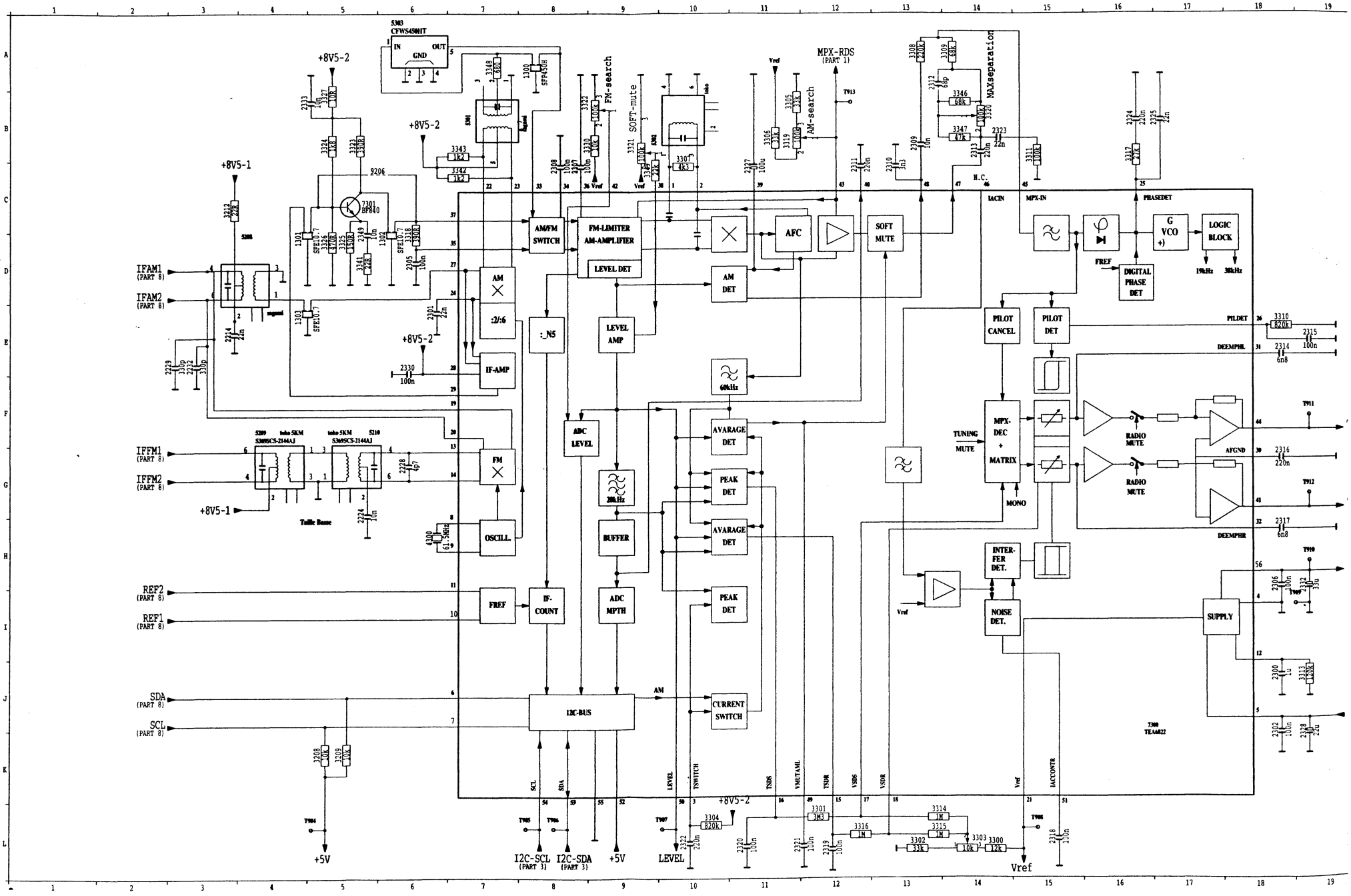


Fig. 1 Block diagram.

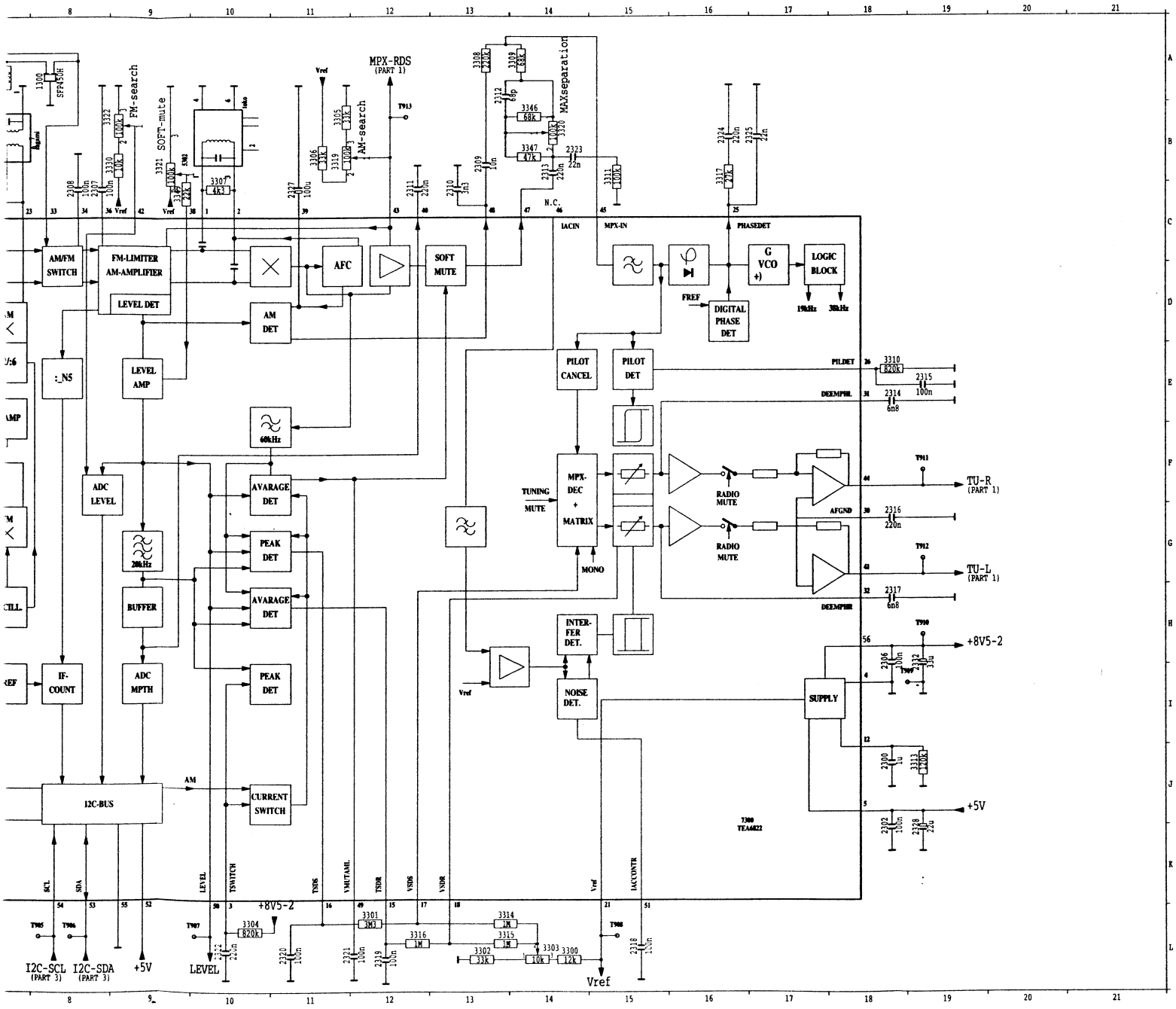
Pin functions

pin	mnemonic	description
1	V_P	Positive supply voltage
2	C_{osc1}	Frequency setting capacitors for oscillator
3	C_{osc2}	
4	R_{wob}	Wobble generator input
5	R_{osc}	Biassing resistor for oscillator frequency and internal amplitude
6	$\overline{DIV4}$	Divide-by-4 input
7	REdig	Digital output of sign (Re2 - Re1)
8	B3	Input control bits for off-, catch-, play-status and DAC output current
9	B2	
10	B1	
11	B0	
12	$V_{ext(+)}$	Positive external voltage input
13	$V_{ext(-)}$	Negative external voltage input (also substrate connection)
14	GND	Negative supply connection
15	RADout	Current output of amplified (Re2 - Re1) input currents
16	REin	Radial error input
17	RElag	Voltage output of integrated (Re2 - Re1) input currents
18	Lag	Connection of integrator capacitor for (Re1 - Re2) input currents
19	Lead	Lead output
20	V_{ref}	Internal reference voltage output
21	AGC	Gain control input for radial error signal
22	R_{DAC}	Biassing resistor for current output for track jumping (3½ bits)
23	offset in	Offset control input for radial offset
24	offset out	Offset control output for radial offset
25	C_{LPF}	Low-pass filter for Re1 and Re2, used for radial offset control
26	C_{HPF}	High-pass filter for Re1 and Re2, used for radial offset control
27	Re1	Input for amplified currents from photo-diodes D1 and D2
28	Re2	Input for amplified currents from photo diodes D3 and D4

PART 9 : TUNER IC96 (MAIN PCB)



IFAM1 ..... D2	IFFM1 ..... F2	REF1 ..... I2	SCL J2	T904 ..... L5	T906 ..... L8	LEVEL L10	Vref L15	T912	
IFAM2 ..... D2	IFFM2 ..... G2	REF2 ..... I2	SDA J2	T905 ..... L7	T907 ..... L10	T908 ..... L15	T910 ..... H19	T911	



SCL J2
SDA J2

T904 ..... L5
T905 ..... L7

T906 ..... L8
T907 ..... L10

LEVEL L10
T908 ..... L15

Vref L15
T910 ..... H19

T912 ..... G18
T911 ..... F19

MPX_RDS A12
TU-R F20

TU-L G20

Voltage measured in FM mode with
A4 = 14.4V
A7 = 14.4V
unless othersise stated.

(OFF) = Power off
(ON) = Power on

+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	2.44V

7300 TEA6821

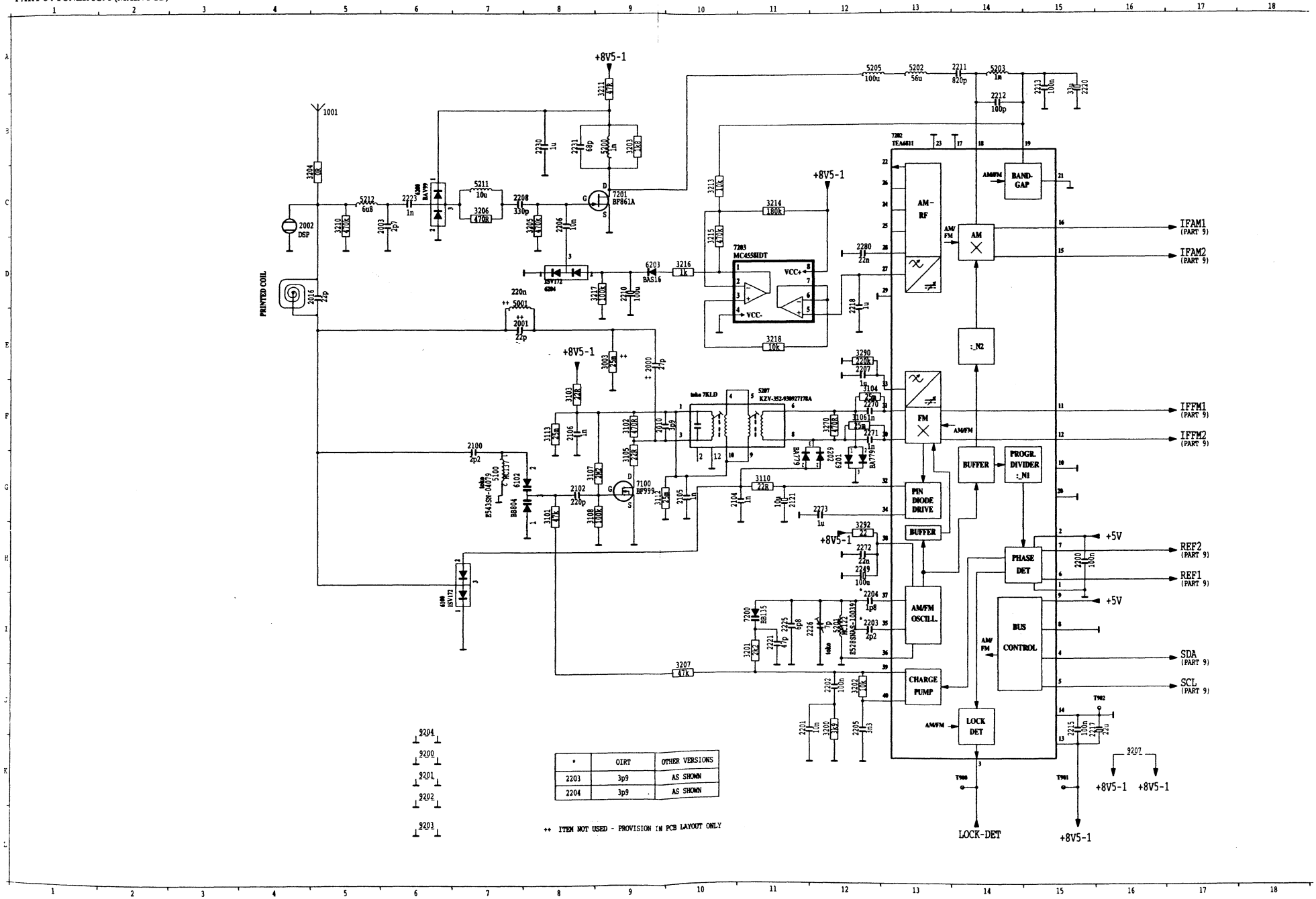
1	4V
2	4V
3	1V
4	0V
5	5V
6	5V
7	5V
8	4V
9	4V
10	Pulse waveform 0.24V p-p 5V dc
11	Pulse waveform 0.24V p-p 5V dc
12	5V
13	2.2V
14	2.2V
15	4.5V
16	4.5V
17	2.5V
18	2.5V
19	8.5V
20	8.5V
21	5V
22	8.5V
23	8.5V
24	3V
25	5V
26	3.6V
27	3V
28	8.5V
29	6V
30	1.8V
31	2.3V
32	2.3V
33	0.7V
34	1V
35	2.8V
36	2.8V
37	2.8V
38	2.6V
39	3.2V
40	0.6V
41	Radio Left
42	0V
43	MPX_RDS
44	Radio Right
45	2.9V
46	0V
47	Audio signal
48	5V
49	5V
50	4.5V
51	6V
52	5V
53	Data
54	Data
55	0V
56	8.5V

7301 BF840

C	6.4V
B	1V
E	0.2V

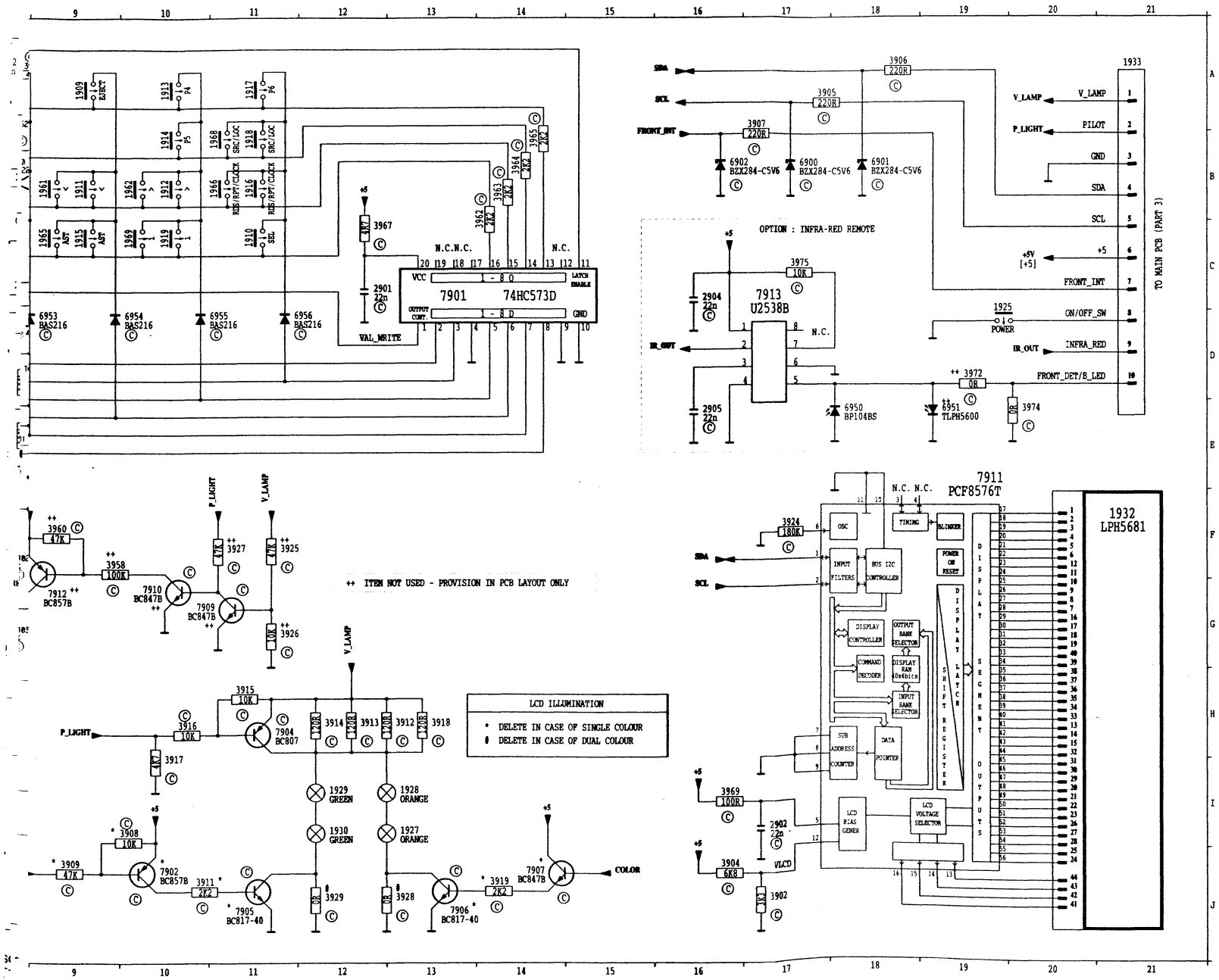
905 A 4
952 A 1
953 A 1
954 A 1
955 A 1
956 A 1
900 A 1
901 A 1
902 A 4
904 A 4
905 A 4
906 A 4
907 A 4
909 A 4
910 A 4
911 A 2
912 A 4
913 A 4

PART 8 : TUNER IC96 (MAIN PCB)



*	OIRT	OTHER VERSIONS
2203	3p9	AS SHOWN
2204	3p9	AS SHOWN

IFAM1 ..... C17 IFAM2 ..... D17 IFFM1 ..... F17 IFFM2 ..... F17 LOCK_DET ..... L14 REF1 ..... H17 REF2 ..... H17 SCL J17



Voltage measured in FM mode with
A4 = 14.4V
A7 = 14.4V
unless othersise stated.

(OFF) = Power off
(ON) = Power on

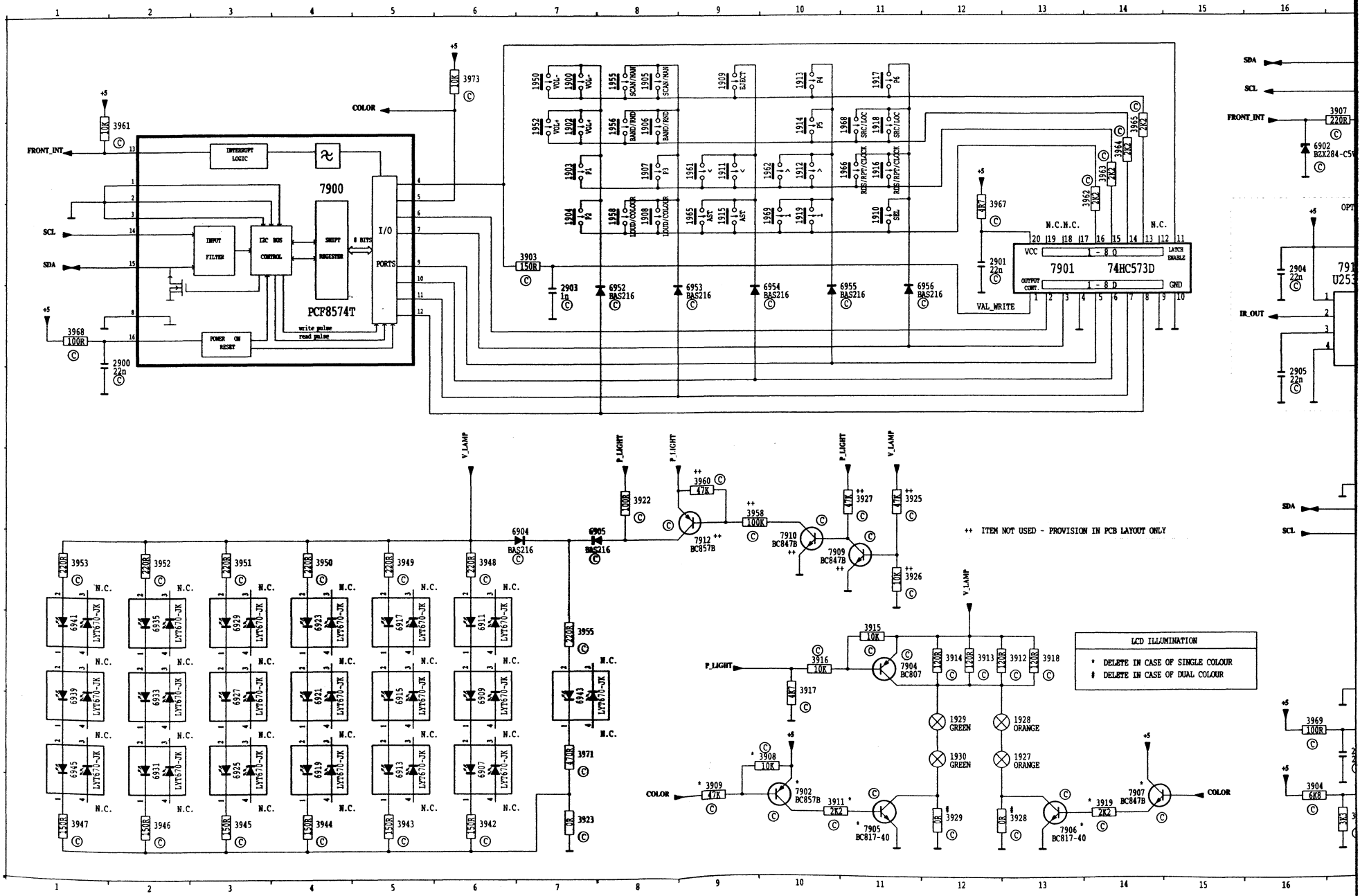
+1	14.4V	
+2	13.8V	
+3,+3a		8.5V
+3a	8.5V	
+4	5V	
+5, +5a		5V
+6, +6a, +6c		5V
+8, +10		8.2V
+9, +9a		13.2V
V_LAMP		+14V
VREF		2.44V

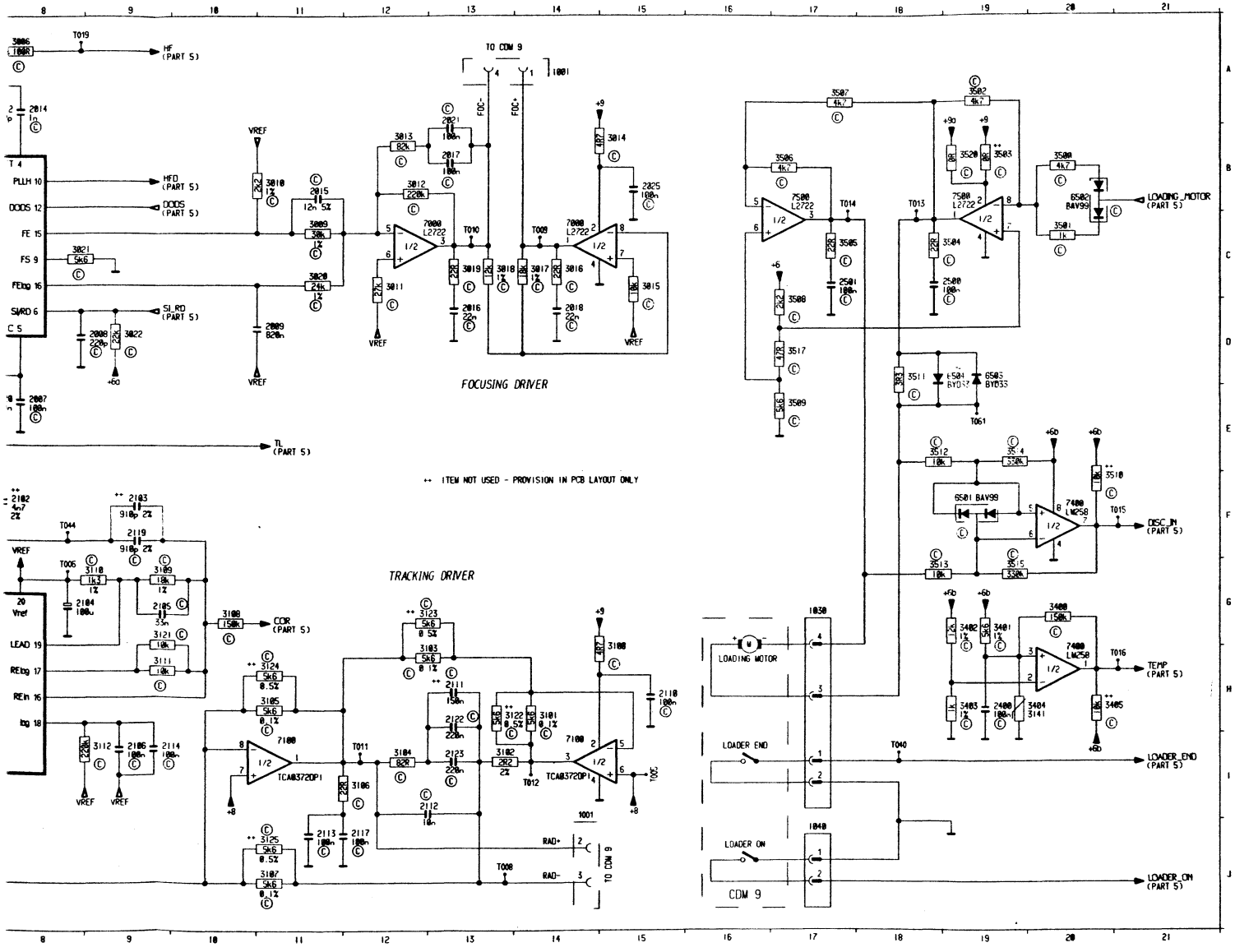
7909 BC847
(ON) = Set is turn on.
(OFF) = Set is turn off and apply 14.4V at pinA6.
C 0V (ON)
0.6V (OFF)
B 0.6V (ON)
0V (OFF)
E GND

7910 BC847
(ON) = Set is turn on.
(OFF) = Set is turn off and apply 14.4V at pinA6.
C 0V (ON)
0V (OFF)
B 0V (ON)
0.6V (OFF)
E GND

7912 BC857B
(ON) = Set is turn on.
(OFF) = Set is turn off and apply 14.4V at pinA6.
C 0V (ON)
14.37V (OFF)
B 0V (ON)
13.36V (OFF)
E 0V (ON)
14.4V (OFF)

PART 7 : LARGE DETACHABLE FRONT





Voltage measured in CD PLAY mode with
A4 = 14.4V
A7 = 14.4V
unless othersise stated.

+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	
2.44V	

7500 L2722

1	3.55V
2	9.5V
3	3.55V
4	GND
5	3.55V
6	3.55V
7	3.57V
8	9.5V

7400 LM258

1	3.6V (temperature o.k.)
	0V ("too hot")
2	0.38V
3	2.03V
4	GND
5	3.55V
6	3.52V
7	3.72V
8	4.83V

7500 L2722

1	2.45V
2	11V
3	2.45V
4	GND
5	2.45V
6	2.45V
7	2.45V
8	2.42V

7100 TCA0372DPI

1	6.25V
2	12V
3	6.42V
4	GND
5	6.33V
6	6.33V
7	6.33V
8	6.32V

7001 TDA8808T/C3

1	2.38V
2	4.89V
3	Eye pattern
4	Eye pattern
5	4.78V
6	2.82V
7	0.58V
8	1.26V
9	0V
10	4.8V
11	4.8V
12	4.93V
13	GND
14	3.05V
15	2.45V
16	2.45V
17	3.25V
18	1.8V
19	1.77V
20	1.5V
21	3.19V
22	1.31V
23	1.31V
24	1.32V
25	1.32V
26	3.33V
27	GND
28	3.45V

7101 TDA8809T/C2

1	4.85V
2	sine wave 1.2V p-p
3	sine wave 1.2V p-p
4	0.12V
5	1.25V
6	4.7V
7	4.8V p-p pulse wa
8	0V
9	4.95V
10	4.95V
11	4.95V
12	8.2V
13	GND
14	GND
15	6.31V
16	2.45V
17	2.45V
18	2.45V
19	sine wave 0.1V p-p
	2.45Vdc
20	2.45V
21	2.11V
22	1.23V
23	2.3V
24	2.3V
25	2.93V
26	2.25V
27	3.15V
28	3.19V

7003 BC547

C	5V
B	3.23V
E	2.48V

DER_ON J21	RAD- J14	SIRD J1	T006 ..... G8	T010 ..... C13	T013 ..... B18	T016 ..... H21
DING MOTOR B21	REDG H1	T004 ..... J8	T008 ..... J13	T011 ..... I12	T014 ..... B17	T019 ..... A8
+ J14	SI_RD C11	T005 ..... I15	T009 ..... C13	T012 ..... I13	T015 ..... F21	T030 ..... D2

T031	E2
T040	I18
T042	B2
T044	F8
T046	G3
T047	D8
T048	D8
T049	I4
T055	B2
T056	B2
T057	C2
T058	C2
T059	C2
TEMP	H21
TL	E11
VREF	D15/D12/B11/I9

PART 5 : CD4+ DECODER & CD MICRO-CONTROLLER (CD PCB)

Voltage measured in FM mode with
A4 = 14.4V
A7 = 14.4V
unless otherwise stated.

(OFF) = Power off
(ON) = Power on
(CD) = SOURCE CD
(TUNER) = SOURCE TUNER

+1	14.4V
+2	13.8V
+3,+3a	8.5V
+3a	8.5V
+4	5V
+5, +5a	5V
+6, +6a, +6c	5V
+8, +10	8.2V
+9, +9a	13.2V
V_LAMP	+14V
VREF	
2.44V	

7915 HEF4013BT
1 N.C.
2 4.56V
3 0V
4 GND
5 4.56V
6 0V
7 GND
8 GND
9 GND
10 GND
11 GND
12 N.C.
13 N.C.
14 5V

7901 BD438
C 13.8V (ON)
0V (OFF)
B 13.7V (ON)
14.4V (OFF)
E 14.4V

7902 BC857B
C 13.8V (ON)
0V (OFF)
B 12.9V (ON)
14.4V (OFF)
E 13.7V (ON)
14.4V (OFF)

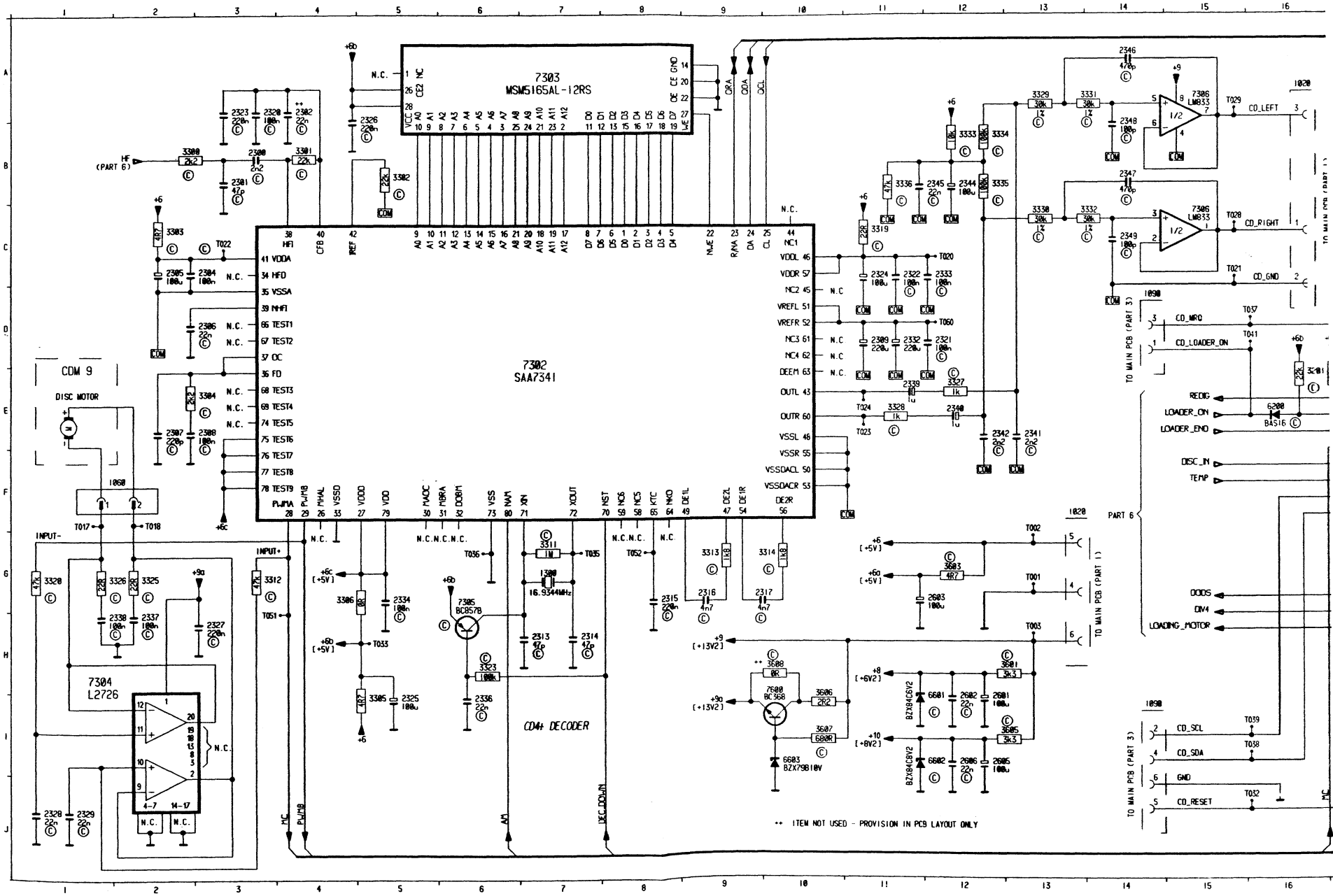
7909 BC857B
C 4.9V (CD)
0V (TUNER)
B 4.35V (CD)
4.92V (TUNER)
E 4.9V (CD)
4.9V (TUNER)

7908 BC847
C 0.2V (CD)
14V (TUNER)
B 0.7V (CD)
0V (TUNER)
E 0.4V (CD)
0V (TUNER)

7907 BC857B
C 13.2V (CD)
0.5V (TUNER)
B 12.47V (CD)
4.04V (TUNER)
E 13.24V (CD)
13.6V (TUNER)

7910 L7805ABV
I 13.2 (CD)
0.48(TUNER)
O 5(CD)
0.79(TUNER)
G GND

7705 BC847
C 0V
B 0.6V
E 0V



AM G21
AM J6
B0 ..... F21

B1 ..... F21
B2 ..... E21
B3 ..... E21

CD_GND D15
CD_GND D16
CD_LEFT A16

CD_LEFT B15
CD_LOADER_ON D15
CD_MRQ D15

CD_RESET J15
CD_RIGHT C15
CD_RIGHT C16

CD_SCL I15
CD_SDA I15
COR F21

DEC_DOWN J8
DISC MOTOR E2
DISC_IN F15

DIV4 ..... H15
DOOS H15
HF B2