PHILIPS Telai TVCR 99 Delta/Delta 2000

Telaio TVCR 99 Delta AA/AB

ARISTONA
37 TR 215/03
51 TR 225/03

PHILIPS
14 PV 010/01
14 PV 101/39
14 PV 200/07/39
14 PV 201/39
14 PV 210/01/07/39/58/69/75/75S
14 PV 320/01/05/39
14 PV 325/05S/39S
14 PV 327/05B/39B
14 PV 340/01/05/39/58
14 PV 345/05S/39S
20 PV 210/01
20 PV 220/01/07
21 PV 210/69/75/75S
21 PV 320/01/05/39
21 PV 325/39S
21 PV 520/58
25 PV 720/07/39

RADIOLA
37 TR 105/39
37 TR 205/39
37 TR 215/39
51 TR 225/39

SCHNEIDER
37 TVB 50/39
51 TVB 60/39

Telaio TVCR Delta 2000 AA

ARISTONA
37 TR 216/03
51 TR 226/03

PHILIPS
14 PV 100/01/07/58
14 PV 200/01
14 PV 211/01/07/39/58
14 PV 217/01/07/39
14 PV 330/01/07/39
14 PV 334/01/07/39
14 PV 335/01/07/39
14 PV 400/01/07/39/58
14 PV 404/01/07/39
14 PV 405/01/07/39/58
14 PV 406/01/07/39
14 PV 503/01/07/39/58
14 PV 505/01/07/39/58
21 PV 330/01/07/39/58
21 PV 335/01/39
21 PV 355/39
21 PV 708/07/39
21 PV 715/07/39
25 PV 808/07/39
25 PV 815/07/39

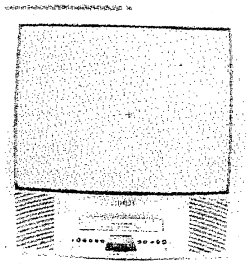
RADIOLA
37 TR 216/39
51 TR 226/39

SCHNEIDER
37 TVB 51/39
51 TVB 61/39

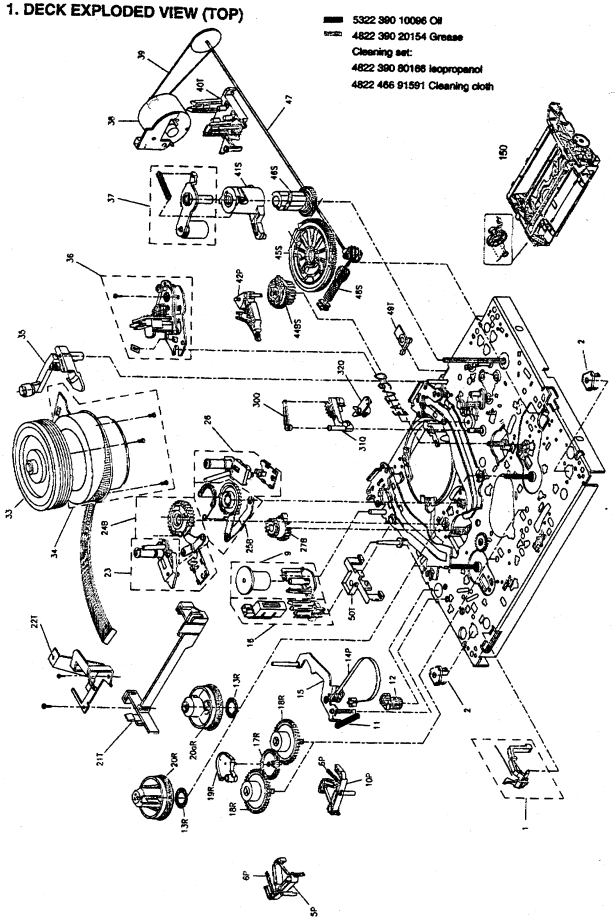
Telaio TVCR 99 Delta BA

PHILIPS
14 PV 200/07
14 PV 201/39
20 PV 210/01
20 PV 220/01/07
21 PV 325/39S

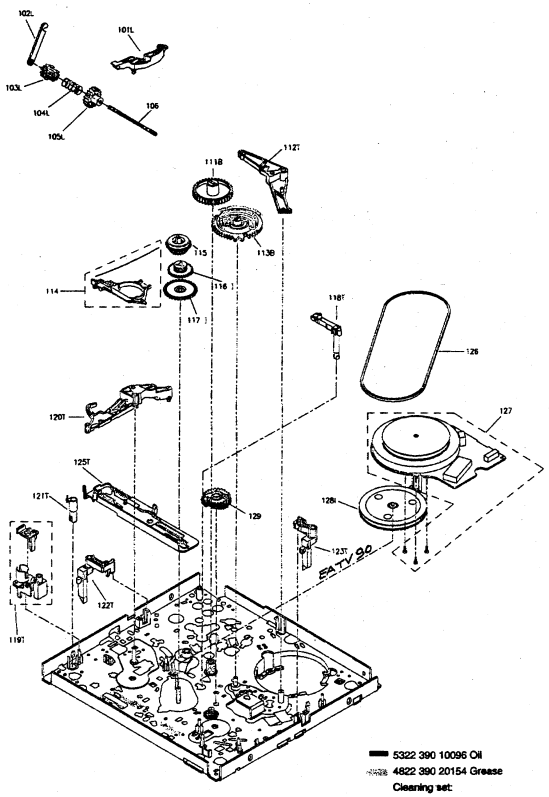
RADIOLA
37 TR 105/39



1. DECK EXPLODED VIEW (TOP)



2. DECK EXPLODED VIEW (BOTTOM)



ADJUSTMENT PROCEDURES

E. Service test program

Service Status Menu

```
SERVICE STATUS
INIT SWITCH              0
LOADING PULSES           1
TAPE BEGIN/END           1/1
RECORD PROTECTION        0
REEL PULSE L/R           1/1
TAPE DECK STATUS         0007
OPERATING HOURS          0150
BOOT SOFTWARE            YES
DECK ERROR               00 00 00
DECK ERROR STATUS        00 00 00
ERROR IIC BUS            00 00 00
DISPLAYED TUNER          TV
DUMMY MODE               OFF
DTAP1- U.054             DTU1- U.010
Exit:MENU                Co.Menu:OK
                         Keys:^v
```

Fig. 1-5

Service Control Menu

```
SERVICE CONTROL
GAP POSITION
OPTIONS  258F52FC2D C72B621070
CLOCK ADJUSTMENT         1.000008
TV DEFAULT VALUES
ABS LOOP                 ON
TV ADJUSTMENTS
TUNER 1 AGC              15
TUNER 2 AFC REF.
TUNER 1 TYPE             PH
TUNER 2 TYPE             PH
AUDIO LIN. PLAYBACK      07
SPC ADJUSTMENT
SERVICE STATUS MENU
Exit:MENU                Clear:OK 5sec
                         Keys:^v
```

Fig. 1-6

E.1 Introduction

The software for the microprocessors contains a test program for service test purposes (Service mode), which is divided into two different OSD pages:

Service status

This menu displays the drive status, the functions of various sensors and the last three errors to occur. The operating hours for the drive are also displayed, along with the mask numbers for the deck and control-µPs.

Service control

All software-controlled adjustments and resets can be performed on this level. Selecting the line "TV ADJUSTMENTS" leads to a third level which is used for various picture settings. During this process, the setting which is currently active is displayed on the top edge of the screen, and the rest of the menu is no longer displayed.

E.2 Calling up the service test program

Press the „STOP" button on the remote control, then the „PLAY" button on the unit, and hold down both buttons for approx. 5 seconds.
The first page in Service mode is displayed (see Fig. 1-5).

Note: If the key board is not connected (service position), the Play button on the RUBAD board (pos. 1910) can be used also. Pressing the Stop button on the remote control for at least 3 secs. ejects the cassette.

By selecting the "SERVICE CONTROL" line, you can access the second page in Service mode (see Fig. 1-6).

The service test program can be called up from all operating modes on the TVCR.

All drive functions are available from Service mode.

The service menu can be switched on and off by pressing the "MENU" button, and the Service mode remains activated. The normal menu for picture and audio settings, etc. is therefore only available again after Service mode is exited.

In Service Mode the Automatic Tracking is deactivated.

To exit the service test program, press the "STANDBY" button or switch off the unit.

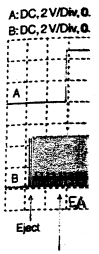
E.3 Service status menu

E.3.1 Function of the Init switch

```
SERVICE STATUS
INIT SWITCH              0
LOADING PULSES           1
```

The Init switch is located on the drive. This button is used to display the status or the position of the drive, in combination with the loading pulses.

The following diagram (Fig.1 -7) displays the status of the Init switch in relation to the drive positions.



E.3.2 Loading

E.3.3 Tape star

E.3.4 Record pt

E.3.5 Head drun

E.3.6 Drive stat

Drive positions:

Mc
Eject
Index/Win
Stop
Play/Paus
Reverse

A: DC, 2 V/Div, 0.5 s/Div
B: DC, 2 V/Div, 0.5 s/Div

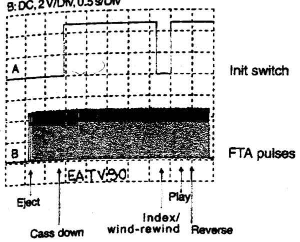


Fig. 1-7

E.3.2 Loading pulses

```
SERVICE STATUS
...
INIT SWITCH         0
LOADING PULSES      1
TAPE BEGIN/END      1/1
...
```

This display is used to indicate the evaluation of the „FTA" pulse (IC7900/pin4). This means that the rotations of the loading motor are recorded using a photo transistor, which results in the alternating display of „0" and „1".

E.3.3 Tape start/tape end detection

```
SERVICE STATUS
...
LOADING PULSES      1
TAPE BEGIN/END      1/1
RECORD PROTECTION   0
...
```

The start or end of the tape is detected by evaluating the „TAS" (Tape Start) and „TAE" (Tape End) signals. If the tape reaches the start or end of the tape, the display switches from „0" to „1".

E.3.4 Record protection

```
SERVICE STATUS
...
TAPE BEGIN/END      1/1
RECORD PROTECTION   0
REEL PULSE L/R      1/0
...
```

The control line „RECP" (Record Protection) gives information on whether or not the record protection on the tape is activated.

0 ... record protection OFF
1 ... record protection ON

E.3.5 Head drum pulses

```
SERVICE STATUS
...
RECORD PROTECTION   0
REEL PULSE L/R      1/0
TAPE DECK STATUS    0007
...
```

The evaluation of the tachometer winding signals „WTR" (Wind Tacho Right) and „WTL" (Wind Tacho Left) results in the alternating display of „0" and „1".

E.3.6 Drive status

```
SERVICE STATUS
...
REEL PULSE L/R      1/0
TAPE DECK STATUS    0007
OPERATING HOURS     0150
...
```

This involves a counter for the „FTA" pulses. The counter status gives information on the current position of the drive (see Fig. 1-7 and Fig. 1.8).

Drive positions:

Mode	Tape Deck Status
Eject	007 ±4
Index/Wind/Rewind	191 ±4
Stop	196 ±4
Play/Pause	214 ±4
Reverse	237 ±4

Fig. 1-8

E.3.7 Operating hours counter

```
SERVICE STATUS
TAPE DECK STATUS    0007
OPERATING HOURS     0150
BOOT SOFTWARE       YES
```

This counter displays the operating hours of the head motor.

E.3.8 Boot Software

```
SERVICE STATUS
...
OPERATING HOURS     0150
BOOT SOFTWARE       YES
DECK ERROR          F0 00 00
...
```

The "BOOT SOFTWARE" display gives information on the type of program memory used (IC7901/RUB). "YES" means that the unit is fitted with a FLASH module and therefore that a software update can be made via the service interface (1961). Where a conventional ROM/EPROM is fitted, "NO" will be displayed.

E.3.9 Drive error codes

```
SERVICE STATUS
...
BOOT SOFTWARE       YES
DECK ERROR          F0 00 00
DECK ERROR STATUS   C5 00 00
...
```

The last 3 drive errors to occur are stored in the EEPROM. The line „DECK ERROR" provides information on the type (Fig. 1-9) and „DECK ERROR STATUS" on the time (Fig. 1-10) of the error which has occurred.

The error data can be deleted by pressing the "CLEAR" button for at least 5 sec. with the line "DECK ERROR" or "DECK ERROR STATUS".

Error table

DECK ERROR	
00	No error
F0	Threading error
F1	Capstan error
F2	Tape broken
F3	Left reel blocked
F4	Right reel blocked
F5	Head drum blocked

Fig. 1-9

F0 Threading error

Occurs with missing threading pulses "FTA".

F1 Capstan error

This error occurs if there are no "FGD" pulses.

F2 Tape broken

The tacho signals from the left-hand reel "WTL" and the right-hand reel "WTR" are used as a reference for this monitoring function.

F3/F4 Left/right reel blocked

Missing reel pulse 'WTL' or "WTR".

F5 Head drum blocked

The "PG/FG" signal is used for this monitoring function. This is derived from the EMF from the non-current carrying coil in the head motor and provides information on the position and speed of the head drum.

Note: If one of the signals described is not available, the unit attempts to move the lift to the „EJECT" position.

Error status table

DECK ERROR STATUS			
0C	Standby	36	Stop
1F	Play -3	37	Record
29	Still Picture	70	Index
2A	Play +2	AC	Play -5
2C	Play -9	AD	Play +5
2D	Eject	C5	Standby Eject
2E	Play +9	D4	Slow motion 1/4
2F	Play -1	D7	Slow motion 1/7
30	Pause	D8	Slow motion 1/2
32	Rewind	DF	Gap adjustment
34	Wind	EE	Record Pause
35	Play	F7	Slow motion 1/10

Fig. 1-10

E.3.10 I²C-bus error

```
SERVICE STATUS
DECK ERROR STATUS   D5 00 00
ERROR IIC BUS       C2 00 00
DISPLAYED TUNER     TV
...
```

The communication between the µ-controller and all I²C-bus modules is checked each time the power is switched back on. If an error occurs during this process, the bus address for the relevant module is stored in the EEPROM. The 3 last error addresses to occur are stored and are saved even when the power is switched off. The error data can be deleted by pressing the „CLEAR" button for at least 5 sec. with the line „ERROR IIC BUS".

Note: If an error occurs during communication with the EEPROMs or with the TXT µC, it will no longer be possible to re-start the unit. For this eventuality, a visual signal has been included which uses the LEDs.

- Record LED is flashing >> Error in EEPROM1 (IC7818/RUB)
- Timer LED is flashing >> Error in EEPROM2 (IC7801/TVB)
- Std By LED is flashing >> Error in TXT µC (IC7804/TVB)

The following table gives an overview of all the I²C-bus modules and their bus addresses.

ERROR IIC BUS				
Address	Position	Board	Description	
88	7800	APDOD	DPL35xx	Dolby Processing
80	7801	APDOD	MSP34xx	Stereo Decoder 1/Audio Processing
84	7670	RUB	MSP315D	Stereo Decoder 2
--*	170x	TVB	UV1316	Tuner 1
--*	1301	RUB	UV1316	Tuner 2
--*	7004	RUB	LA71527M	Video /Linear Audio Processing
B6	7640	RUB	TDA9605H	FM-Audio Processing
20/21	7960	RUB	SDA5650	VPS/PDC Decoder
A2	7970	RUB	PCF8593P	Clock IC
8A/8B	7205	TVB	TDA 88xx	TV-Processing

Fig. 1-11

* .... Error detection not possible for technical reasons.

E.3.11 Display on the second tuner (only for 2 tuner sets)

```
SERVICE STATUS
ERROR IIC BUS       00 00 00
DISPLAYED TUNER     TV
DUMMY MODE          OFF
...
```

For repair work, it can be useful to display the picture from the second tuner, which is only used for recording. After selecting the „DISPLAYED TUNER" line, the cursor buttons "◄" an "►" can be used to switch over between tuner 1 (TV) and tuner 2 (VCR).

E.3.12 Dummy Mode – operation without a drive

```
SERVICE STATUS
DISPLAYED TUNER     TV
DUMMY MODE          OFF
SERVICE CONTROL MENU
...
```

For measurements and signal tracing without a drive, the unit can be switched to Dummy Mode. This switches off all the motors and the sensors are ignored. The drive can be removed following activation (see instructions for Removal). All drive statuses can now be selected (Play, Record,...) and the electronics (Video, Audio, IO) are switched to the relevant operating mode.
Dummy Mode can also be deactivated again with the drive installed, however the drive positions must not be changed whilst doing so, as the tape may otherwise be damaged.
Note: To prevent damage to the tape, Dummy Mode should not be switched On/Off whilst the tape is playing.
Caution: Unplug the unit from the mains before installing the drive.

E.3.13 µ-controller mask numbers

```
SERVICE STATUS
...
SERVICE CONTROL MENU
DTAP1- U.054        DTXU1- U.010
```

CONTROL-µC (AIO)   TXT-µC (Painter)

The mask and version numbers of the control and TXT-µC are displayed in the bottom line on the control menu. The first 5 characters identify the mask name (e.g. DTAP1), and the last 3 characters stand for the version number (e.g. U.054).

E.4 Service control menu

E.4.1 Deleting the EEPROMs

```
SERVICE CONTROL
...
EEPROM CLEAR
GAP POSITION
...
```

The EEPROMs (IC7818/RUB and IC7801/TVB) store all user-specific data (timer data, program data ....) and various setting values (gap position, picture settings ....). Under certain circumstances, it may sometimes be useful to delete this memory. By pressing the „CLEAR" button for at least 5 sec., the following data can be deleted:

- all timer data
- station data

The following values for the TV part, which are programmed at the factory, are taken from the ROM in the µ-controller:

- contrast
- brightness
- definition
- colour
- audio (volume, loudness, bass ....)

The following data are stored:

- all setting values
- option codes
- operating hours
- error codes

Caution:
After replacing the EEPROMs, only the values programmed at the factory are transferred. User-specific data and all setting values are reset to the medium values.
The unit should therefore be completely re-set (see Chapter 2 Settings) and configured.

E.4.2 Gap position

The description of this setting is given in Chapter 2.E. Electrical settings

E.4.3 Option codes

```
SERVICE CONTROL
...
GAP POSITION
OPTIONS    AABBCCDDEE FFGGHHIIJJ
CLOCK ADJUSTMENT      1.000000
...
```

The characteristics of the unit are defined using the option codes. These are ten two-figure hexadecimal codes (A to J) which are printed on the nameplate on the unit (Fig. 1-12). After replacing the EEPROM (IC7818/RUB), the codes should be entered in the same order as in the service control menu.

After selecting the "OPTIONS" line, the numerical buttons on the remote control or the menu arrow keys "◄" and "►" can be used to start the input. Hexadecimal characters can then only be selected using the "▲" and "▼" buttons. Press the "OK" button on the remote control to confirm.

Note: The input can be cancelled by pressing the "MENU" button (service menu is switched off and the old values are retained). Pressing "MENU" again switches the service menu back on.

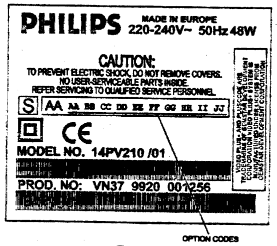


Fig. 1-12

E.4.4 Clock adjustment

The description of this setting is given in Chapter 2.E. Electrical settings

E.4.5 Basic TV settings

```
SERVICE CONTROL
...
CLOCK ADJUSTMENT      1.000000
TV DEFAULT VALUES
ABS LOOP              ON
...
```

For various adjustments in the TV section, the picture settings (contrast, brightness....) have to be set to defined values. By pressing the „OK" button for at least 5 sec. on the „TV DEFAULT VALUES" line, the values programmed at the factory are loaded.

E.4.6 Autom. black current control (ABS LOOP)

```
SERVICE CONTROL
...
TV DEFAULT VALUES
ABS LOOP              ON
TV ADJUSTMENTS
...
```

For repair purposes, it can be useful to deactivate the ABS (Automatic Black current Stabilisation). This deactivates the control, which, depending on the „ABS" information (IC 7205 pin 18), varies the level of the RGB outputs (pins 19,20,21).

The control loop can be switched ON/OFF using the menu arrow keys "◄" and "►".

Note: After leaving the service menu ("MENU" button or STD-BY), the ABS Loop is re-activated automatically.

E.4.7 TV adjustments

The descriptions of these settings are given in Chapter 2.E. Electrical settings

E.4.8 Tuner 1 AGC

The description of this setting is given in Chapter 2.E. Electrical settings

E.4.9 Tuner 1 Type

The description of this setting is given in Chapter 2.E. Electrical settings

E.4.10 Tuner 2 Type

The description of this setting is given in Chapter 2.E. Electrical settings

E.4.11 Tuner 2 AFC reference

The description of this setting is given in Chapter 2.E. Electrical settings

E.4.12 Audio linear playback

The description of this setting is given in Chapter 2.E. Electrical settings

E.4.13 SPC adjustment

The description of this setting is given in Chapter 2.E. Electrical settings

F. Hotel mode

For operation in hotels, hospitals, etc., there is the option of blocking various unit functions (settings) and limiting the volume to a required maximum level.

Proceed as follows to activate hotel mode:

- Set the volume to the maximum value required
- Select program number 38 (if it cannot be selected using program Up/Down, enter it directly using the numerical buttons)
- Hold down the "STOP" button on the remote control and on the unit together for approx. 5 sec. until "H+" appears on the screen.

Deactivating hotel mode:

- Select program number 38 (if it cannot be selected using program Up/Down, enter it directly using the numerical buttons)
- Hold down the "STOP" button on the remote control and on the unit together for approx. 5 sec. until "H-" appears on the screen

G. Customer Service Mode (CSM)

G.1 General

Answering customer questions on the phone is a lot easier if the customer could be more specific about his problem. Once the Customer Information Center CIC knows the problem in the most cases the answer is easy. The Customer Service Mode helps customers to be more specific in their questions by providing them with a built in menu driven on-screen diagnostics system. It therefore helps dealers and CIC to provide fast and correct answers via phone.

The system enables:

- Easier handling of non-technical calls.
- More reliable information to the customer that a repair action is necessary.
- Identification of software versions via phone.

The Customer Service Mode is a read only, menu based information system which can be called up by the customer at home.

G.2 Calling up the Customer Service Mode

To enter the customer service mode press first STOP on the set and then MENU on the remote control and keep the keys depressed for a period of 5 seconds.
This procedure works independently of the status of Child Lock (if this feature is available) or the VCR adress.

G.3 Operation inside the CSM

All deck functions are possible. Functions which need a menu are not allowed.
By the help of the cursor up/down the customer can step through all stored programs.
Toggling between two tables is possible by pressing the MENU button on the remote control.

G.4 Deactivation

The customer can deactivate the Customer Service Mode by pressing 'STANDBY' on the VCR.

G.5 Contents of the Customer Service Mode

Table 1

```
CUSTOMER SERVICE MODE                      13:47
1 VERSION DTA    0012      j DECK    F0 -- --
2 VERSION DTX    0002      k IIC     BA -- --
3 PRG 02 NAME ORF-2        l SYSTEM       PAL
4 TUNE 591 - 10            m DECODER      OFF
5 MODE TUNER          --   n CASS        E180
6 VCR ADDRESS         V1   o REMOTE        TV
7 PP VOLUME          025   p AUTO VOL     OFF
8 PP COLOUR          015   q E1 PIN8      LOW
9 PP BRIGHTNESS      023   r HOTEL        OFF
a PP CONTRAST        012   s 16:9         OFF
b SHARPNESS          006   t CHILDL       OFF
c CONTRAST+          OFF   u ENDLESSP      ON
d SMART V        NATURAL   v RECPROT      OFF
e SMART A     INCREDIB.    w DOLBY        YES
f AUDIO OUT       STEREO

g WARNING PROTECTED CASSETTE           EATV90
```

Indicator	Keyword	Values	Description
	XX:XX		current time, if clock not set „--:--"
1	VERSION DTA	e.g. 0001	Build number of the AIO (central controller)
2	VERSION DTX	e.g. 0001	Build number of painter (TXT, OSD,... Controller)
j	DECK		Deck Error Codes according to chapter 4.5.10
k	IIC		IIC Error Codes according to chapter 4.5.12
3	PRG	E1,E2,01...99	Program number (in playback „- -")
	NAME		Detected transmitter name (in Playback „-")
l	SYSTEM		depends on spec. of set, e.g. PAL BG, M, N SECAM / MESEC / NTSC or B/W; in REC/EE received colour system, in PB system from tape
4	TUNE		Frequency or Channel (dependent on actual selection) +optional value of fine tuning e.g. „591.25 -1" or „CH36 -1" or „CA:x", (during playback „-")

Indicator	Keyword	Values	Description
m	DECODER	ON, OFF	Decoder mode
5	MODE		Tape deck mode e.g. SCAN -11, Record Modes...,last 2 digits >> Tape Speed = LP or blank
6	VCR ADDRESS	V1, V2	VCR address (VCR1, VCR2)
7	PP VOLUME		Volume (not actual value but Personal Preference setting)
8	PP COLOUR		Colour (not actual value but Personal Preference setting)
9	PP BRIGHTNESS		Brightness (not actual value but Personal Preference setting)
a	PP CONTRAST		Contrast (not actual value but Personal Preference setting)
b	SHARPNESS		Sharpness setting
c	CONTRAST+	ON, OFF	Contrast +
d	SMART V	NATURAL, PERSONAL ,RICH,....	Smart picture setting according FRS only for sets with Smart picture, otherwise greyed out
e	SMART A	PERSONAL, INCREDIBLE, SPATIAL,...	Smart audio setting according FRSonly for sets with Smart audio, otherwise greyed out
f	AUDIO OUT		In Playback: MONO - L - R - ST - MIX In Record or TV-mode: MONO - STEREO - I - II
g	WARNING		Last warning info according (FRS) (is stored in RAM until power down)
n	CASS	e.g. E240	Cassette length. Displays "E - - -" if no cassette in or not yet detected.
o	REMOTE	TV, V1, V2	Last detected remote address (TV, VCR1, VCR2) DETECTION INDEPENDENT OF VCR ADDRESS
p	AUTO VOL	ON, OFF	Autom. Volume Control
q	E1 PIN8	HIGH, LOW	Scart 1 Pin 8
r	HOTEL	ON, OFF	Hotel mode
s	16:09	ON, OFF	16 by 9 mode
t	CHILDL	ON, OFF	Child lock
u	ENDLESSP	ON, OFF	Endless play (Repeat)
v	RECPROT	ON, OFF	Record Protection
w	DOLBY	YES, NO	Dolby signal detected.only for sets with Dolby, otherwise greyed out

```
YEAR 1999        MONTH 04        DAY 20

                                      VPS
  DATE  PROG.   START  END      LP  PDC  REP  .
1  21   CNN     12:38  14:38    -    *   ONCE
2  XX   XXXXX   XX:XX  XX:XX    -    -   XXXX  X
3  XX   XXXXX   XX:XX  XX:XX    -    -   XXXX  X
4  XX   XXXXX   XX:XX  XX:XX    -    -   XXXX  X
5  XX   XXXXX   XX:XX  XX:XX    -    -   XXXX  X
6  XX   XXXXX   XX:XX  XX:XX    -    -   XXXX  X

V/P DET VALID
```

Table 2

Keyword	Description
XX:XX	current time, if clock not set --:--"
YEAR	current year
MONTH	current month
DAY	current day
DATE	Timer date
PROG.	Timer programme
START	Start time
END	End time
LP	Longplay On,Off
VPS/PDC	VPS/PDC On,Off
REP.	Repetition (ONCE, WEEKL, ...)
V/P DET	Currently detected VPS/PDC signal (ERROR, VALID), in playback "-"

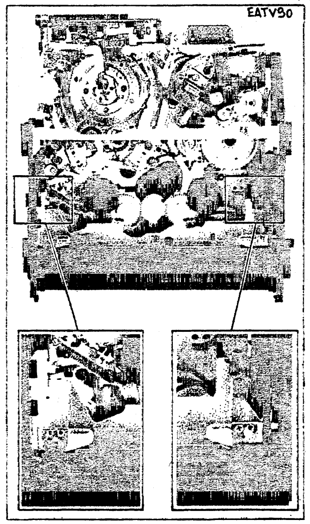


Fig. 1-13

H. How to move the cassette holder to the down position

To move the cassette holder in the down position without a cassette tape, use the following procedure.

1. Disconnect AC plug.
2. Remove the VCR unit from the set in the sequence described in the "dismantling cabinet parts" section (chapter 2).
3. Turn the loading pulley counterclockwise (front view) u n t i l the cassette compartment is locked by the right locking tab (fig. 1-13).
4. Clear the right locking tab by moving the lever forward (fig. 1-13).
5. Turn the loading pulley counterclockwise (front view) until the cassette compartment is locked by the left locking tab (fig. 1-13).
6. Clear the left locking tab by pressing down the lever (fig. 1-13).
7. Continue to turn the loading pulley until the cassette down position is obtained.

I. How to remove the lift assembly

The lift can be removed and refitted in all deck positions with the exception of the "EJECT" position (the best position is: cassette compartment down, click stop).

To remove the cassette-up assembly:

1. Free the holding bracket (fig. 1-14) by rotating it up and back from the upper end.
2. Unscrew the 4 screws on the underside of the deck (fig. 1-15)
3. Carefully remove the cassette-up assembly vertically, noting the position of the record protect operating lever (at top).

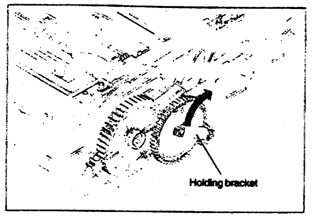


Fig. 1-14

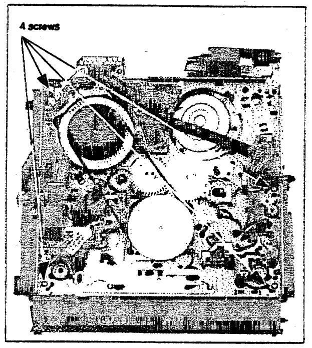


Fig. 1-15

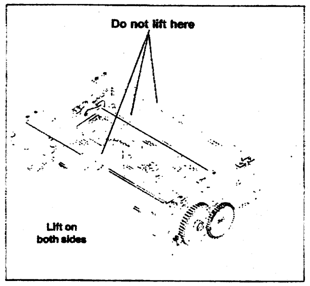


Fig. 1-16

J. Variable voltage isolation transformer

Because a hot chassis ground exists in the switched mode power supply circuit, an isolation transformer must be used. To have the option of increasing the input voltage slowly for troubleshooting, a variable isolation transformer is required for this type of power supply circuit.

K. Cleaning with 91% isopropyl alcohol

All isopropyl alcohol must be removed from the tape path after cleaning with a dry head cleaning stick as otherwise the tape could be damaged.

L. High voltage components

Avoid touching the following high voltage components:

- the CRT board
- the deflection yoke connections
- the anode cap
- transistors 7330 and 7583
- the terminals of the Flyback transformer.

M. Servicing the UHF/VHF tuner

As UHF/VHF tuners are pre-adjusted at the factory, do not try to adjust UHF/VHF tuner. The UHF/VHF tuner replacement part is only available as a complete assembly.

N. Remote control

The remote control replacement part is only available as a complete assembly. Do no try to dismantle the remote control.

3. ADJUSTMENT PROCEDURES

1. Upper cylinder replacement

Work with extreme care when removing or replacing the head disc. Do not touch video heads during servicing.

Removal:
- Remove the deck from the large signal board (refer to disassembly method on page 2-1, steps 2, 5 and 6).
- Nylon gloves should be worn when handling the upper cylinder.
- Remove 2 screws from the head amplifier bracket to gain access to the upper cylinder.
- Turn the upper cylinder until the oblong hole in the inner rotor is seen through the bigger hole of the lower portion of the cylinder motor.
- Insert reference pin C (included with each service upper cylinder) through the bigger hole of the lower cylinder motor until the pin snaps into the oblong hole on the inner rotor.

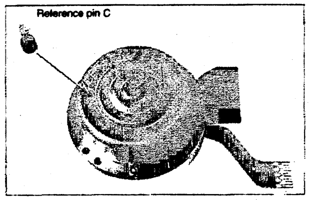


Fig. M2

- Align the upper cylinder removal tool's reference element with the ∇ symbol (Fig. M3) to remove the upper cylinder's upper clamping plate (short pins).

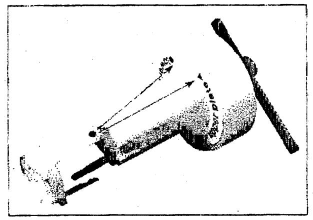


Fig. M3

- Position the upper tool's arm in the closed position, then place it on the upper clamping plate through the three holes. Turn the tool's arm 90° to the open position and remove the upper clamping plate from the upper cylinder (fig. M4).

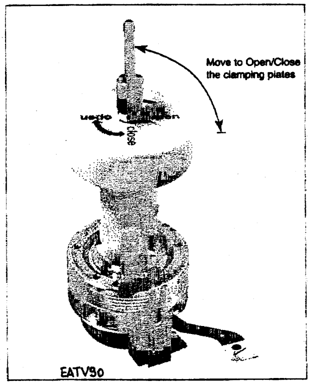


Fig. M4

- Pull the Upper Cylinder Removal Tool's reference element and align it with the O for the removal of the upper cylinder's lower clamping plate (long pins; see fig. M3).
Position the upper tool's arm in the CLOSED position, then place it on the lower clamping plate through the three holes of the upper cylinder. Ensure that all three pins snap into the lower clamping plate.
Loosen the clamping plate by turning the tool's arm 90° in the OPEN position. Remove the upper cylinder.


Fig. M5

Installation:
- Before installing the new head disc, make sure that the lower cylinder motor shaft is clean and undamaged. (The shaft has to be free of grease and must not be touched with bare hands).
- Insert the two mylar foils (included with each new upper cylinder) in the upper cylinder. (Fig. M6)

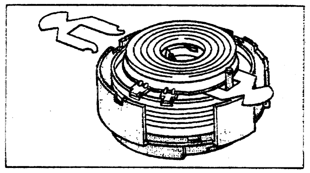


Fig. M6

- Position the tool (reference: lower clamping plate) on the new upper cylinder (with its protective cover) and loosen the lower clamping plate by turning the arm 90°.

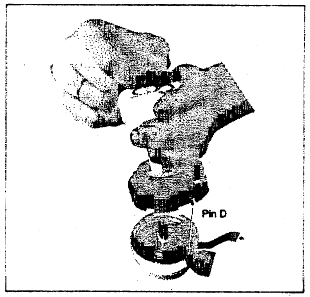


Fig. M7

- Position the upper cylinder so that pin D of the protective cover engages in the hole of the stator (the arrow on the protective cover must point towards the lower cylinder print; see fig. M7).

- Reach the exact position by pressing the tool down with a force of 1N and fix the lower clamping element by turning the arm towards "CLOSED".
- Remove the tool.
- Change the tool to "upper clamping plate" and position the clamping element exactly (see fig. M8).

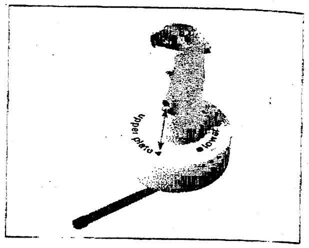


Fig. M8

- Tighten the clamping plate by turning the lever towards "OPEN".
- Position the tool evenly on the head disc, and fix the clamping element by bringing the arm to the "CLOSED" position (see fig. M4)
- Remove the protecting cap from the head disc, withdraw the two mylar foils and remove the reference pin C from the bottom of the lower cylinder.

After replacing the upper cylinder, carry out the following adjustments and checks:
- Head switching pulse
- Record current adjustments 2-36).
- Tape path alignment

2. Replacing the scanner assy. / head drum motor

Work with extreme care when removing or replacing the scanner assy./lower cylinder motor. Do not touch Video Heads during servicing.

1. Remove the VCR unit
2. Remove the tape deck assembly from the VCR unit.
3. Remove the head amplifier bracket and the upper cylinder.
4. Remove the 3 screws holding the head drum motor.

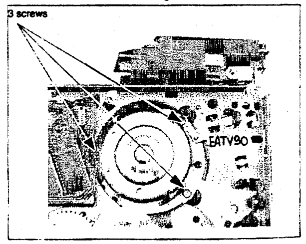


Fig. M9

5. Reinstall the new scanner assy./head drum motor onto the chassis by reversing the procedure previously described.

Note:
If any of the parts of the tape path are touched, clean them with a cleaning cloth saturated with 91% isopropyl alcohol.

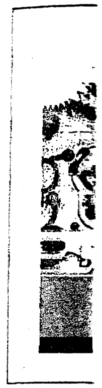
3. Position adjustment of the tension arm

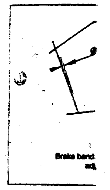
3.1 Brake band adjustment

- Set the drive to PLAY mode.
- Adjust the brake band my means of adjusting tool (from the underside of the deck) until the edge of the elbow of the tape tension arm overlaps with the left inner edge of the left guide (see fig. M10/M11).

3.2 Tape tension adjustment

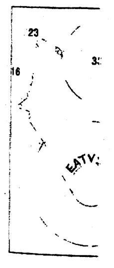
- Play a cassette tape (E180) from the beginning of the tape.
- Measure the tape tension before the left roller unit with a Tentelometer.
- Adjust (from the underside of the drive) the tension arm spring, pos. 11, to a tape tension of 0.24N ± 0.02N e.g. 24g ± 2g with the adjustment tool (see fig. M10/11).



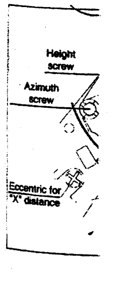


4. Tape path (final adju

4.1 View of t



4.2 Tape path



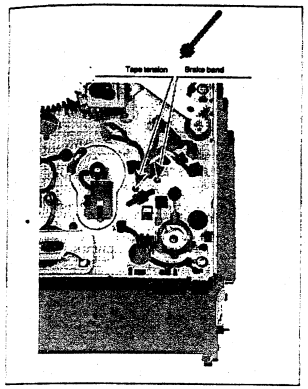


Fig. M10

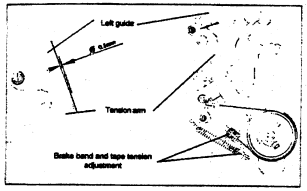


Fig. M11

4. Tape path adjustment (final adjustment)

4.1 View of the tape path

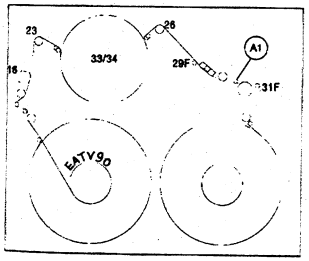


Fig. M12

4.2 Tape path adjustment

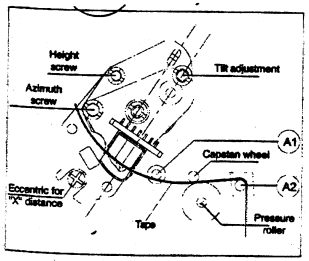


Fig. M13

4.2.1 Audio/CTL head adjustments Tilt angle adjustment

- Set the drive to the "SEARCH FORWARD" mode.

Adjustment with tape guide A1:
- By means of the tilt angle adjusting screw, move the tape until the lower edge just touches the tape guide A1 (see fig. M14) ; the tape must not be distorted by the lower edge.

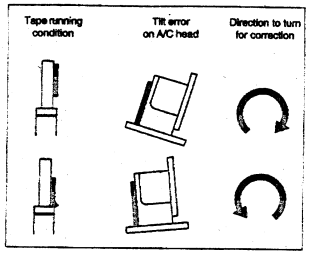


Fig. M14

4.2.2 Height and azimuth adjustments

The height of the A/C head assembly has already been adjusted at the factory, so it is only necessary to check the adjustments.

Symptom of incorrect adjustment.
If the control signal is not properly picked up, servo operation cannot be achieved.

This control is required if the A/C head has been replaced, or if it is completely incorrectly adjusted.

1. Basic height adjustment

Looking at the lower edge of the control head, with a E180 cassette tape in motion, ensure that the lower edge of the tape runs 0.25 mm above the lower edge of the control head.

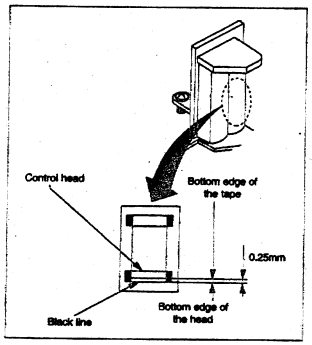


Fig. M15

2. Final height and azimuth adjustment

Symptom of incorrect adjustment:
If the position of the A/C head is not properly adjusted, the audio S/N ratio is poor.

- Connect an oscilloscope to the linear audio output.
- Play the 1 kHz audio section on the test cassette.
- Adjust for maximum output voltage by means of the height adjustment screw (see fig. M15).
- Play the 6 kHz audio section on the test cassette.
- Adjust to maximum output voltage by means of the azimuth adjustment screw. (fig. M15)
- If necessary, repeat this procedure
- Check the tilt angle adjustment (see chapter 4.2.1).

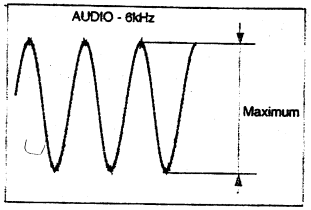


Fig. M16

If the tape path was completely out of adjustment or if several components in the tape path have been replaced, the above mentioned adjustments might have to be repeated several times.

4.2.3 "x" distance adjustment

- Before starting this adjustment, set the VCR in the "EJECT" position.
- Activate the Service Mode according to the description on page 1-11 (automatic Tracking is not active in Service Mode).
- Insert the test cassette and enter the PLAY mode.
- Playback the Black & White part of the test cassette.
- Display the TRIV signal on an oscilloscope (DC-coupled) and adjust for maximum voltage by means of the eccentric screw (fig M13).

5. Control with the TRIV signal of the tape path adjustment

Symptom of incorrect adjustment:
If the envelope output is poor, the picture will contain a lot of noise. In this case the tracking will lose precision and the playback picture will be distorted by any slight variation of the tracking control circuit.

5.1 Left and right roller unit

Preparation:
- Connect one input of a dual trace oscilloscope to observe the tape sync pulse and the other input (DC coupled) to observe the tracking information TRIV.
- Trigger the oscilloscope externally on the head pulse HP1.
- Playback the black and white section of the alignment tape.

1. Enter the manual tracking mode (Menu "TAPE" > "TRACKING") and change the tracking value with the ▶ or ◀ keys on the remote control.
2. Watch the tape sync pulse move to the left in relation to the TRIV signal.
3. Note the extreme left hand position reached by the sync pulse. Repeat as necessary.
4. Stop the movement of the pulse when the TRIV signal reduces from 1/2 to 2/3 of its maximum amplitude. A noisy picture (disturbance) is visible on the TV set and the CTL pulse should be to the left of the display.
This position will be stored unless the tape is ejected or the tracking is manually modified.
This condition works only if X-distance is correctly adjusted (see chapter 4.2.3).

Adjustment:
Adjust the left and right roller units to obtain the tracking signal TRIV as straight and flat as possible. (Fig. M17)

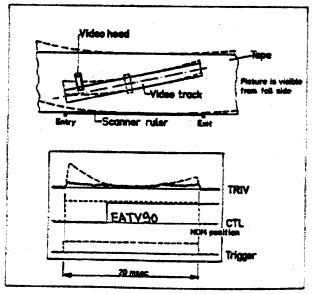
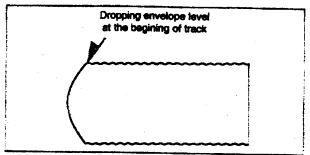
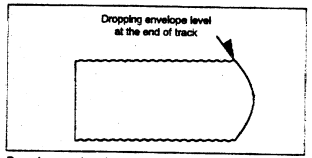


Fig. M17

When looking at the envelope output, the following possibilities are given (test point: pin 9 connector 1902):

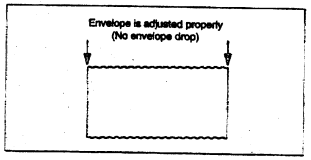


Dropping envelope level at the beginning of track (test point: pin 9 connector 1902).



Dropping envelope level at the end of track (test point: pin 9 connector 1902).

When left and right roller units are adjusted properly, there is no envelope drop at the beginning or end of the tracks as shown in the above illustration.



The tape path is properly adjusted.

6. Friction clutch control in playback

- Set the drive to "PLAY" mode.
- Place the torque meter on the right reel.
- Turn the capstan motor to move the right reel clockwise.
- Keep turning until the indication at the torque meter no longer changes (see fig. M18)
- The torque has to be 10.5 mNm ± 25% (105 gFcm ± 25%).

7. Reverse brake control

- Set the drive in the "SEARCH REVERSE" position.
- Place a torque meter on the right reel and turn the reel anti-clockwise, until the reel just starts to flip.
- The value indicated at the torque meter must be 7 mNm ± 3 mNm (70 gFcm ± 30 gFcm).

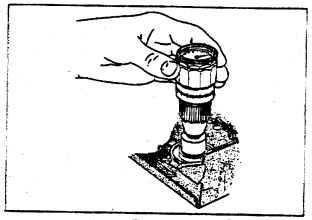


Fig. M18

8. Capstan motor replacement

- Set the drive assembly to the "EJECT" position.
- Remove the capstan belt on the underside.
- Remove the three capstan motor fixing screws (see fig. M19) and withdraw the capstan motor downward from the drive assembly.

Reassemble in reverse order. Make sure that the capstan shaft is free of grease.

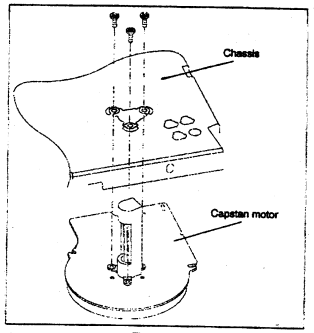
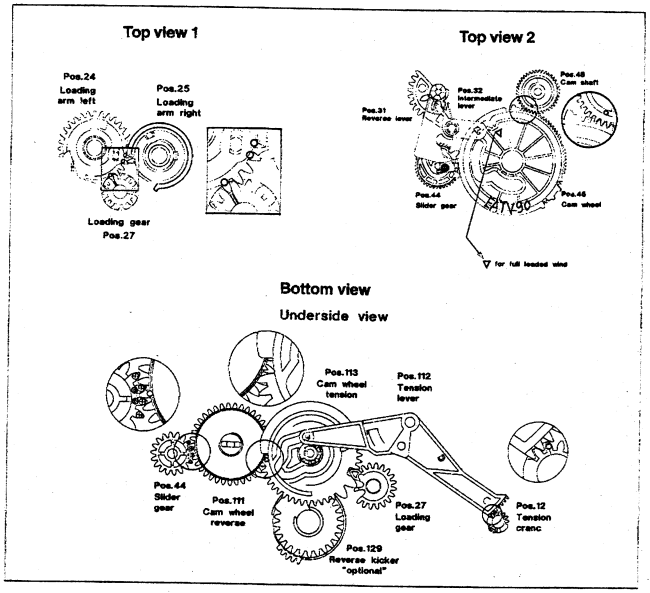


Fig. M19

9. Mechanical alignment procedures

The deck must be in "CASSETTE DOWN" position.
The following diagrams indicate the relative position of the gear wheels and levers when the deck is in the "CASSETTE DOWN" position.



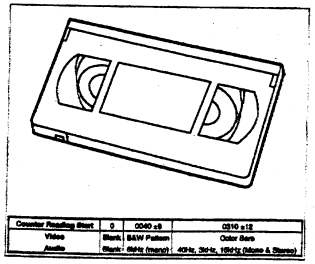
ELECTRICAL SETTINGS

1. MEASURING INSTRUMENTS

The following instruments are required to carry out the electrical setting work:

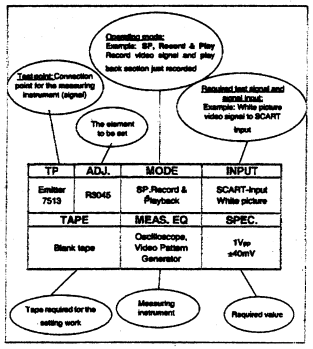
1. Dual trace oscilloscope
   Voltage range : 0.001 – 50V/Div.
   Frequency range : DC – 50 MHz
   Probe : 10:1; 1:1
2. Digital Multimeter
3. Frequency meter
4. Sine-wave generator : 0 – 50MHz
5. Test pattern generator
6. Plastic adjustment tool
7. Isolating transformer (regulating transformer)
8. VHS test cassette 4822 397 30103
   SPC test cassette 4822 397 30268

VHS test cassette

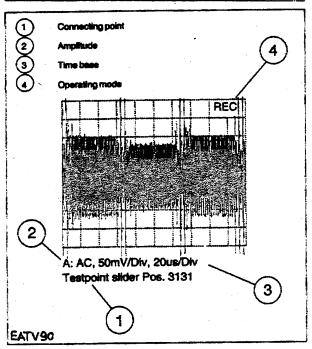


Counter Reading Start	0	0040 ± 8	0310 ± 15
Video	Blank	B&W Pattern	Color Bars
Audio	Blank	6kHz (mono)	400Hz, 3kHz, 15kHz (Mono & Stereo)

2. SETTING INSTRUCTIONS



TP	ADJ.	MODE	INPUT
Emitter 7513	R3045	SP,Record & Playback	SCART-Input White picture
TAPE		MEAS. EQ	SPEC.
Blank tape		Oscilloscope, Video Pattern Generator	1Vpp ±40mV



3. SETTINGS

The following settings are described below:

1. Power supply unit
2. Clock setting
3. Tuner 1
4. Tuner 2
5. Servo-system
6. Luminance and chrominance
7. Audio part
8. TV and picture tube part

3.1 Power supply unit (PS)

3.1.1 UBAT [R3348]

Purpose: Ensure correct functioning

Consequences of incorrect settings:
The correct functioning of the TV and VCR is not guaranteed.

TP	ADJ.	MODE	INPUT
C2353	R3348	Mains switch ON	SCART-Input No signal
TAPE		MEAS. EQ	SPEC.
		Digital Voltmeter	14",20",21" = 95V 25" = 138V (see description below)

Note: C2353 and R3348 are located on the TVB-board (PS part)

PROCEDURE:

- Set potentiometer R3348 to the centre position.
- Switch the device to the SCART input; do not apply a signal.
- Set the brightness and contrast to minimum.
- Connect the multimeter to C2353.
- Set a voltage of 95V (for 14",20" and 21") or 138V (for 25") using the potentiometer R3348.
- After making the setting, reset the original brightness and contrast values.

3.2 Clock setting

Purpose: Precise setting of the clock

Consequences of incorrect settings:
The clock gains or loses time.

TP	ADJ.	MODE	INPUT
IC7970 Pin 7	Service Menu	Service Mode	No input signal
TAPE		MEAS. EQ	SPEC.
		Frequ. Counter	See description below

Note: IC7970 is located on the RUB-board (CVB part)

PROCEDURE:

- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- Connect the frequency meter to IC 7970 pin 7 and measure the 1Hz signal to at least 6 decimal places
- In the Service menu, select the "SERVICE CONTROL" line using the " ▼ " button and press " ▶ ".
- Select the "CLOCK ADJUSTMENT MENU " line using the " ▼ " button
- Use the number keys to enter the value measured and hold down the "OK" button for 5 seconds until "STORED" appears.

Note: The input can be cancelled by pressing the "MENU" button (Service menu is switched off). Pressing "MENU" again switches the Service menu back on

3.3 Tuner 1 (TV)

3.3.1 Automatic frequency control AFC1 [5707] (only for Stereo)

Purpose: Correct functioning of the demodulator switching.

Consequences of incorrect settings:
Poor or distorted reception in TV circuits

Preparation:
Connect pin 1 on tuner 1700/1701 to pin 10.

TP	ADJ.	MODE	INPUT
IC7720 Pin 17	L5707	TV	38,9MHz / 200mVpp on Pin 11 Tuner 1700/1701
TAPE		MEAS. EQ	SPEC.
		Digital Voltmeter, Frequ. Generator	2,5V ±0,2V

Note: IC7720 and L5707 are located on the TVB-board (TU1 part).

3.3.2 Automatic gain control AGC 1

Purpose: Set the automatic gain control

Consequences of incorrect settings:
If the input level is too low, the AGC synchronisation will not function correctly in the TV circuits. If the level is too high, the picture may be distorted.

TP	ADJ.	MODE	INPUT
Tuner 1700/1701 Pin 11	Service Menu	Service Mode	5mV (74dBµV) on aerial input channel 24 PAL-White picture no audio carrier
TAPE		MEAS. EQ	SPEC.
		Oscilloscope (10:1 Probe), Video Pattern Generator	550mVpp -1dB (See description below)

PROCEDURE:

- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the " ▼ " button to select the "SERVICE CONTROL MENU" line and press " ▶ "
- Select the "TUNER 1 AGC" line using the " ▼ " button
- Use the " ◀ " and " ▶ " arrow buttons to set the level on the tuner output to 550 mVpp and hold down the "OK" button for approx. 5 seconds until "STORED" appears

Note: Tuner 1700/1701 is located on the TVB-board (TU1 part).

3.3.3 40.4 MHz suppression in tuner 1 [5701] (for SECAM only)

Purpose: Suppress residual band I carriers.

Consequences of incorrect settings:
Poor or distorted reception in TV circuits due to a weakening of the PAL picture carrier (38.9 MHz).

TP	ADJ.	MODE	INPUT
SAW 1706 Pin 1	L5701	TV	40,4MHz / 200mVpp on Pin 11 Tuner 1700/1701
TAPE		MEAS. EQ	SPEC.
EATV90		Oscilloscope (10:1 Probe), Frequ. Generator	Adjust to minimum amplitude

Note: SAW1706 and L5701 are located on the TVB-board (TU1 part).

3.3.4 Tuner 1 Type

Purpose: Set the tuner type used

Consequences of incorrect settings:
No reception in UHF range.

TP	ADJ.	MODE	INPUT
	Service Menu	Service Mode	5mV (74dBµV) on aerial input channel 40 (623MHz)
TAPE		MEAS. EQ	SPEC.
		Video Pattern Generator	See description below

PROCEDURE:

- In Manual Tuning Mode set channel 40 and save it under a program number.
- Call up Service Mode (press the "STOP" button on the remote control, then the "PLAY" button on the unit, and hold down both buttons for approx. 5 seconds).
- In the Service Menu, select the "SERVICE CONTROL MENU" line using the " ▼ " button and press " ▶ ".
- Select the line "TUNER 1 TYPE" using the " ▼ " button.
- Use the arrow buttons " ◀ " and " ▶ " to switch between "PH" and "AL" and the position at which the test picture is displayed, save using the "OK" button (hold down for 5 secs.).

3.4 Tuner 2 (TU2)

3.4.1 Automatic frequency control AFC2 [5300]

Purpose: Correct functioning of the demodulator switching.

Consequences of incorrect settings:
Poor or distorted reception in VCR circuits

Preparation:
Connect pin 1 of tuner 1301 to pin 10.

TP	ADJ.	MODE	INPUT
IC7309 Pin 17	L5300	TV	38,9MHz / 200mVpp on Pin 11 Tuner 1301
TAPE		MEAS. EQ	SPEC.
		Digital Voltmeter, Frequ. Generator	2,5V ±0,2V

Note: IC7309 and L5300 are located on the RUB-board (TU2 part).

3.4.2 AFC 2 reference

Purpose: Adjust the synchronous operation of tuner 1 and tuner 2.

Consequences of incorrect settings:
Poor or distorted reception in TV or circuits.

Preparation:
Connect pin 1 of tuner 1301 to pin 10.

TP	ADJ.	MODE	INPUT
	Service Menu	Service Mode, PAL-Mode	38,9MHz / 200mVpp on Pin 11 Tuner 1301
TAPE		MEAS. EQ	SPEC.
		Frequ. Generator	See description below

PROCEDURE

- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the " ▼ " button to select the "SERVICE CONTROL MENU" line and press " ▶ ".
- Use the " ▼ " button to select the "TUNER 2 AFC REF." line and press " ▶ ".

3.4.3 Automatic gain control AGC 2 [3307]

Purpose: Set the automatic gain control

Consequences of incorrect settings:
If the input level is too low, the AGC synchronisation will not function correctly in the VCR circuits. If the level is too high, the picture may be distorted.

TP	ADJ.	MODE	INPUT
Tuner 1301 Pin 11	R3307	TV	5mV (74dBµV) on aerial input channel 24 PAL-White picture no audio carrier
TAPE		MEAS. EQ	SPEC.
		Oscilloscope (10:1 Probe), Video Pattern Generator	550mVpp -1dB

Note: Tuner 1301 and R3307 are located on the RUB-board (TU2 part).

3.4.4 40.4 MHz suppression in tuner 2 [5301] (for SECAM only)

Purpose: Suppress residual band I carriers.

Consequences of incorrect settings:
Poor or distorted reception in VCR circuits due to a weakening of the PAL picture carrier (38.9 MHz)

TP	ADJ.	MODE	INPUT
SAW 1300 Pin 1	L5301	TV mode tuned to SECAM Bd I channel	40,4MHz / 200mVpp on Pin 11 Tuner 1301
TAPE		MEAS. EQ	SPEC.
		Oscilloscope (10:1 Probe), Frequ. Generator	Adjust to minimum amplitude

Note: SAW1300 and L5301 are located on the RUB-board (TU2 part).

3.4.5 Tuner 2 Type

Purpose: Set the tuner type used

Consequences of incorrect settings:
No reception in UHF range.

TP	ADJ.	MODE	INPUT
	Service Menu	Service Mode	5mV (74dBµV) on aerial input channel 40 (623MHz)
TAPE		MEAS. EQ	SPEC.
		Video Pattern Generator	See description below

PROCEDURE:

- In Manual Tuning Mode set channel 40 and save it under a program number.
- Call up Service Mode (press the "STOP" button on the remote control, then the "PLAY" button on the unit, and hold down both buttons for approx. 5 seconds).
- In the Service Menu, select the "SERVICE CONTROL MENU" line using the " ▼ " button and press " ▶ "
- Select the line "TUNER 2 TYPE" using the " ▼ " button.
- Use the arrow buttons " ◀ " and " ▶ " to switch between "PH" and "AL" and the position at which the test picture is displayed, save using the "OK" button (hold down for 5 secs.).

3.5 SERVO-SYSTEM (DE)

3.5.1 Gap position

Purpose: Ensure correct head changeover during playback.

Consequences of incorrect settings:
Poor head changeover, changeover visible in picture, or picture fluctuations.

TP	ADJ.	MODE	INPUT
	Service Menu	Service Mode, Playback	
TAPE		MEAS. EQ	SPEC.
VHS Alignment Tape 4822 397 30103			See description below

PROCEDURE

- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the " ▼ " button to select the "SERVICE CONTROL MENU" line and press " ▶ ".
- Use the " ▼ " button to select the "GAP POSITION" line. Play back the VHS test cassette (4822 397 30103) and press " ▶ "

The setting is made automatically and the corresponding values are stored in the EEPROM.
The device switches to STOP after the setting has been made.
If the setting has not been completed correctly, the device ejects the cassette.

Possible causes:
Poor video signal.
Head disc is defective.
µP defective.

3.6 Luminance and chrominance (VS,VSEC)

3.6.1 SECAM recording current [R3086]

Purpose: Ensure optimal chrominance level during recording.

Consequences of incorrect settings:
If the chroma level is too high during recording, cross patterns may appear in coloured areas.
If the level is too low, colour noise interference may occur.

TP	ADJ.	MODE	INPUT
C2077/ R3100	R3086	Record	SECAM-Red picture (75% Saturation) on SCART
TAPE		MEAS. EQ	SPEC.
Blank Tape		Oscilloscope, Video Pattern Generator	A=100mVpp ±10mV (see Fig. E4)

Notes: With varying frame amplitudes, the setting is made for the greatest amplitude.R3086 is located on the RUB-board (VSEC part).

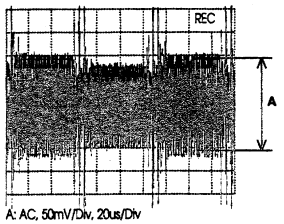


Fig. E4

3.6.2 3.9MHz adjustment [R3089] (only for SECAM)

Purpose: To adjust the mixing oscillator

Consequences of incorrect settings:
Cross patterns in coloured areas, coloured noise.

TP	ADJ.	MODE	INPUT
	R3089	SP. Record & Playback	SECAM-Red picture (75% Saturation) on SCART
TAPE		MEAS. EQ	SPEC.
Blank Tape		Video Pattern Generator	See description below

PROCEDURE:

- Play back red image recorded.
- Use R3089 to set the interference to a minimum level.

Note: R3089 is located on the RUB board (VSEC part).

3.6.3 Studio picture control SPC

Purpose: Set the reference level for the SPC.

Consequences of incorrect settings:
Resolution too low or "streys" during playback.

TP	ADJ.	MODE	INPUT
	Service Menu	Service Mode, Stop	PAL-Black picture on SCART
TAPE		MEAS. EQ	SPEC.
SPC-Alignment Tape 4822 397 30268		Video Pattern Generator	See description below

PROCEDURE

- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the " ▼ " button to select the "SERVICE CONTROL MENU" line and press " ▶ "
- Use the " ▼ " button to select the "SPC ADJUSTMENT" line.
- Play back the VHS test cassette (4822 397 30268) and press " ▶ "

The setting is made automatically and the corresponding values are stored in the EEPROM.
The device switches to STOP after the setting has been made.
If the setting has not been completed correctly, the device ejects the cassette.

Possible causes:
Poor video signal.
Head disc is defective.
µP defective.

3.7 Audio part

3.7.1 Erase frequency

Purpose: Set optimal erase frequency.

Consequences of incorrect settings:
Erase frequency or harmonic waves may cause interference.

TP	ADJ.	MODE	INPUT
Connector 1961 Pin1	L5602	Record	PAL-White picture with audio on SCART
TAPE		MEAS. EQ	SPEC.
Blank Tape		Frequ. Counter Video Pattern Generator	70kHz ±10kHz

Note: Connector 1961 and L5602 are located on the RUB-board (AL part).

3.7.2 BIAS magnetic biasing current [R3630]

Purpose: Set optimal magnetic biasing current.

Consequences of incorrect settings:
If the level is too high, the treble response in the linear tone is too low. If the level is too low, the treble response is too great, and the harmonic distortion is increased.

TP	ADJ.	MODE	INPUT
R3629	R3630	Record	PAL-White picture with audio on SCART
TAPE		MEAS. EQ	SPEC.
Blank Tape EATV90		AC-Millivoltmeter, Video Pattern Generator	16mVrms ±1mV (see description below)

Note: R3629 and R3630 are located on the RUB-board (AL part).

Checking the magnetic biasing current setting:
Apply a sine-wave signal with an amplitude of 50mVeff to the SCART audio input. Record the 1kHz signal and 10kHz signal for 30 seconds each. Play back the recording and check that the amplitude difference is in the ±3dB range. If this is not the case, correct the value for the magnetic biasing current. If the treble is too low, the bias current should be reduced slightly. If the distortion is too great, the bias current should be increased slightly. (approximate value: +1mV = -1dB Treble).

3.7.3 Audio playback level

Purpose: Ensure a uniform level for recording and playback.

Consequences of incorrect settings:
Level fluctuations during playback.

STEREO sets

TP	ADJ.	MODE	INPUT
Pin 1 SCART (AudOutR)	Service Menu	SP. Record & Playback	PAL-White picture 500mVrms/1kHz on Pin 2 and 4 SCART
TAPE		MEAS. EQ	SPEC.
Blank Tape		AC-Millivoltmeter, Video Pattern Generator	500mVrms ±50mV (see description below)

SPEC.
ee description below

on on the remote a, and hold down
select the "SER- /STMENT" line. 30268) and press
esponding values
as been made. the device ejects

ay cause

INPUT
AL-White picture with audio on SCART
SPEC.
70kHz ±10kHz

on the RUB-board

nt [R3630]

n the linear tone esponse is too sed.

INPUT
AL-White picture with audio on SCART
SPEC.
18mVrms ±1mV (see description below)

B-board (AL part).

of 50mVeff to the d 10kHz signal for nd check that the is is not the case, ant. If the treble is tly. If the distortion ed slightly.

and playback.

INPUT
PAL-White picture 500mVrms/1kHz on Pin 2 and 4 SCART
SPEC.
500mVrms ±50mV (see description below)

PROCEDURE:
- Play back the 1kHz sine-wave signal recorded.
- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the "▼" button to select the "SERVICE CONTROL MENU" line and press "▶".
- Use the "▼" button to select the "AUDIO LIN. PLAYBACK" line.
- Switch over to mono using the "AUDIO" button.
- Use the arrow buttons "◀" and "▶" to set the audio level on the SCART output to 500mVRMS and hold down the "OK" button for 5 seconds until "STORED" appears.

Note: The input can be cancelled by pressing the "MENU" button (Service menu is switched off). Pressing "MENU" again switches the Service menu back on.

MONO sets

TP	ADJ.	MODE	INPUT
* Pin 1 SCART (AudOutR)	R3638	SP. Record & Playback	PAL-White picture 500mVrms/1kHz on Pin 2 and 4 SCART
TAPE		MEAS. EQ	SPEC.
Blank Tape		AC-Millivoltmeter, Video Pattern Generator	500mVrms ±50mV

Note: R3638 is located on the RUB-board (AL part).

3.8 TV and picture tube settings (TV, LS)

Preparation:
- Demagnetise the picture tube (connect the device – cooled to room temperature – to the mains).
- Allow the device to warm up for around 15 minutes.
- Set up the screen to face eastwards
- ABS Loop ON (Service menu)
  Switch "CONTRAST PLUS" in the "PICTURE" menu to "OFF".

3.8.1 Cut-off

Purpose: Set the operating point setting for ABS Loop

Consequences of incorrect settings:
Incorrect colour temperature with a dark picture. White peak missing.

TP	ADJ.	MODE	INPUT
Conn. 1955 Pins 6,8,11 Conn. 1958 Pins 3,7,9	SCREEN on Line transf.	TV EATV90	PAL-Black picture with Burst on SCART
TAPE		MEAS. EQ	SPEC.
		Digital Voltmeter, Video Pattern Generator	14" = 140V 20,21,25" = 150V (see description below)

PROCEDURE:
- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the "▼" button to select the "SERVICE CONTROL MENU" line and press "▶".
- Use the "▼" button to select the "TV DEFAULT VALUES" line and press "OK".
- Increase the brightness so that the black picture becomes slightly brighter.
- On the picture tube connector 1958 on the R,G,B pins 8,6 and 11 (for 20",21" and 25") or 1956 pins 3,7 and 9 (for 14") (see square contact surfaces) as certain the cathode connection to which the greatest voltage is being applied.
- Set the cathode (with the highest voltage) to 140V (for 14") or 150V (for 20,21,25") using the SCREEN controller on the line transformer.
  Remark: SCREEN is the lower controller on the transformer.

3.8.2 Focus

Purpose: Ensure optimal picture sharpness.

Consequences of incorrect settings:
Blurred picture

TP	ADJ.	MODE	INPUT
	FOCUS on Line Transf.	TV	Crosshatch pattern on SCART
TAPE		MEAS. EQ	SPEC.
		Video Pattern Generator	Best picture sharpness

Note: Before adjustment, set the sharpness in the "PICTURE" menu to the centre value. Remark: FOCUS is the upper controller on the transformer.

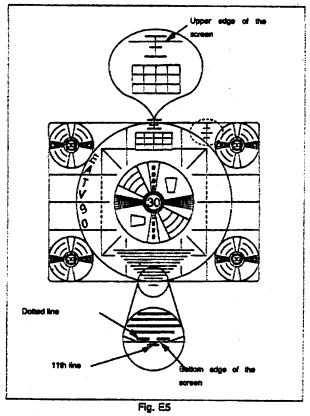


Fig. E5

3.8.3 Horizontal picture position

Purpose: Ensure correct horizontal picture position

Consequences of incorrect settings:
Missing picture information on the edge of the screen

TP	ADJ.	MODE	INPUT
	Service Menu	Service Mode, Playback	
TAPE		MEAS. EQ	SPEC.
VHS-Alignment Tape 4822 397 30103			See description below (and Fig. E5)

PROCEDURE:
- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the "▼" button to select the "SERVICE CONTROL MENU" line and press "▶".
- Use the "▼" button to select the "TV ADJUSTMENTS" line and press "OK".
- Start the playback
- Use the arrow buttons "◀" and "▶" to position the test picture precisely in the centre of the screen (left and right-hand corners are of equal size).
  Hold down the "OK" button for 5 seconds until "STORED" appears.

Note: The input can be cancelled by pressing the "MENU" button (Service menu is switched off). Pressing "MENU" again switches the Service menu back on.

3.8.4 Vertical picture position, picture amplitude and slope

Purpose: Set optimal vertical picture size and position

Consequences of incorrect settings:
Missing picture information on the edge of the screen, or a distorted picture.

TP	ADJ.	MODE	INPUT
	Service Menu	Service Mode, Playback	
TAPE		MEAS. EQ	SPEC.
VHS-Alignment Tape 4822 397 30103			See description below (and Fig. E5)

PROCEDURE:
- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the "▼" button to select the "SERVICE CONTROL MENU" line and press "▶".
- Use the "▼" button to select the "TV ADJUSTMENTS" line and press "OK".
- Start the playback

1) Slope
- Press the "▼" button several times until "VERTICAL SLOPE" appears (the bottom half of the picture is blanked).
- Use the arrow keys "◀" and "▶" to set the middle line of the test picture precisely in the centre of the vertical screen.
- Hold down the "OK" button for 5 seconds until "STORED" appears.

2) Picture position
- Press the "▼" button several times until "VERTICAL SHIFT" appears.
- Use the arrow keys "◀" and "▶" to adjust the test picture in the vertical middle of the screen.
- Hold down the "OK" button for 5 seconds until "STORED" appears.

3) Picture amplitude
- Press the "▼" button several times until "VERTICAL AMPLITUDE" appears (the bottom half of the picture is blanked).
- Use the arrow keys "◀" and "▶" to set the bottom and the top edge of the circular test picture according to figure E5.
- Hold down the "OK" button for 5 seconds until "STORED" appears.

Note: The input can be cancelled by pressing the "MENU" button (Service menu is switched off). Pressing "MENU" again switches the Service menu back on.

3.8.5 East/West adjustments (for 25"only)

Purpose: Set optimal horizontal picture size and position

Consequences of incorrect settings:
Missing picture information on the edge of the screen, or a distorted picture.

PROCEDURE:
- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the "▼" button to select the "SERVICE CONTROL MENU" line and press "▶".
- Use the "▼" button to select the "TV ADJUSTMENTS" line and press "OK".

1) East/West-width

TP	ADJ.	MODE	INPUT
	Service Menu	Service Mode, Playback	
TAPE		MEAS. EQ	SPEC.
VHS-Alignment Tape 4822 397 30103		EATV90	See description below (and Fig. E5)

- Press the "▼" button several times until "E/W WIDTH" appears.
- Start the playback
- Use the arrow keys "◀" and "▶" to adjust the test picture in the horizontal middle of the screen.
- Hold down the "OK" button for 5 seconds until "STORED" appears.

2) East/West-parabola

TP	ADJ.	MODE	INPUT
	Service Menu	TV	Crosshatch pattern on SCART
TAPE		MEAS. EQ	SPEC.
		Video Pattern Generator	See description below

- Activate TV-mode and apply a crosshatch pattern testpicture to the SCART input.
- Press the "▼" button several times until "E/W PARABOLA" appears.
- Use the arrow keys "◀" and "▶" to adjust the left and right hand vertical lines to minimum distortions (see Fig. E6).
- Hold down the "OK" button for 5 seconds until "STORED" appears.

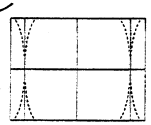


Fig. E6

3) East/West corner parabola
- Activate TV-mode and apply a crosshatch pattern testpicture to the SCART input.
- Press the "▼" button several times until "E/W CORNER" appears.
- Use the arrow keys "◀" and "▶" to adjust the corners to minimum distortions (see Fig. E7).
- Hold down the "OK" button for 5 seconds until "STORED" appears.

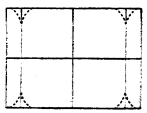


Fig. E7

4) East/West trapezium
- Activate TV-mode and apply a crosshatch pattern testpicture to the SCART input.
- Press the "▼" button several times until "E/W TRAPEZIUM" appears.
- Use the arrow keys "◀" and "▶" to adjust the left and right hand vertical lines parallel to the screen edge (see Fig. E8)
- Hold down the "OK" button for 5 seconds until "STORED" appears.

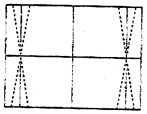


Fig. E8

3.8.6 Adjusting the whiteness

Purpose: Setting the R,G,B cathode ray currents

Consequences of incorrect settings:
Incorrect depiction of colours.

TP	ADJ.	MODE	INPUT
	Service Menu	TV	PAL-Black/White picture on SCART
TAPE		MEAS. EQ	SPEC.
		Video Pattern Generator	See description below

PROCEDURE:
- Adjust the "SMART PICTURE" picture setting to "NATURAL" using the "SMART □" button.
- Set the tint in the "PICTURE" menu to "NATURAL".
- Call up Service mode (press the "STOP" button on the remote control, then the "PLAY" button on the device, and hold down both buttons for approx. 5 seconds).
- In the Service menu, use the "▼" button to select the "SERVICE CONTROL MENU" line and press "▶".
- Use the "▼" button to select the "TV ADJUSTMENTS" line and press "OK".
- Press the "▼" button several times until "BLUE" appears.
- Use the "◀" and "▶" arrow buttons to set the blue level required and hold down the "OK" button for 5 seconds until "STORED" appears.
- Press the "▼" button until "RED" appears.
- Use the "◀" and "▶" arrow buttons to set the red level required and hold down the "OK" button for 5 seconds until "STORED" appears.
- If necessary, press the "▼" button several times until "BLUE" or "RED" appears, and repeat the adjustment.

Note: The setting for the green cathode "GREEN" should not be changed if possible.

Variant List Tuner 2 - Recorder Unit Board (RUBAD)

Pos.	PAL BG	PAL I	PAL SEC DK,K1	PAL, SEC, BG/DK	PAL, BG/I, SEC L/L'	PAL, SEC BG/I/DK, SEC L/L'
	FM-Mono	FM- Mono	FM-Mono	FM-Mono	FM-, AM-Mono	FM, AM, NICAM Stereo
1300		—		—	K3953M	K3953M
1301	UV 1316	UV 1316	UV 1316	UV 1316	UV 1316	UV 1316
1302	G1961M	J1980M	K2955M	G3956M		G3956M
1305		—		K9463M	K9456M	K9456M
1304	TPS 5,5	TPS 6,0	TPS 6,5	TPS 5,5	TPS 5,5	TPS 5,5
1306	EFC 5,5	EFC 6,0	EFC 6,5	EFC 5,5	EFC 5,5	—
1307		—		EFC 6,5	EFC 6,0	—
2311		—		—	100n	100n
2316		—		—	220p	220p
2317		—		—	120p	120p
2322	22n	22n	22n	22n	22n	—
2323	22µ	22µ	22µ	22µ	22µ	—
3310	470R	470R	470R	470R	470R	—
3312		—		470R	470R	—
3302		—		—	5k6	5k6
3306		—		—	—	4k7
3308		—		—	100R	100R
3311		—		3k3	3k3	3k3
3313		—		220R	220R	220R
3314	330R	270R	270R	270R	270R	270R
3316		—		—		4k7
3321		—		4k7	4k7	4k7
3322		—		4k7	4k7	4k7
3323	2k7	2k7	2k7	2k7	2k7	—
3325		—		4k7	4k7	4k7
4301		—		—		—
4302		—		—	0R	—
4303	0R	0R	0R	0R		—
4304		—		—		0R
4305	0R	0R	0R	—		—
4306	0R	0R	0R	—		—
4307	0R	0R	0R	—		—
5301		—		—	41645	41645
5306		—		—		—
5307		—		—		—
6300		—		—		BA792
6301		—		—		BA792
6303		—		BA792	BA792	BA792
6304		—		BA792	BA792	BA792
7300		—		—	PDCT124ET	PDCT124ET
7301		—		HEF4053	HEF4053	HEF4053
7302		—		—		PDCT124ET
7304		—		—		PDCT124ET
7307		—		PDCT124ET	PDCT124ET	PDCT124ET
7308		—		PDCT124ET	PDCT124ET	PDCT124ET
7309	TDA 9817 T	TDA 9817 T	TDA 9817 T	TDA 9817 T	TDA 9818 T	TDA 9818 T
Demodulator for:					EATV90	
Video	IC 7309	IC 7309	IC 7309	IC 7309	IC 7309	IC 7309
Audio (FM-mono)	IC 7309	IC 7309	IC 7309	IC 7309	IC 7309	—
Audio (FM-stereo)		—		—		IC 7670 (AP)
NICAM		—		—		IC 7670 (AP)
Audio AM	IC 7309	IC 7309	IC 7309	IC 7309	IC 7309	IC 7309

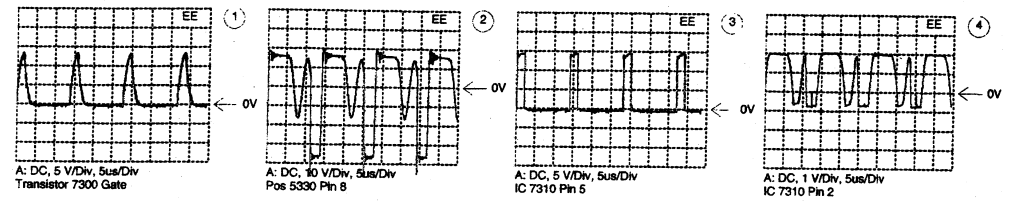
PHILIPS Telai TVCR 99 Delta/Delta 2000

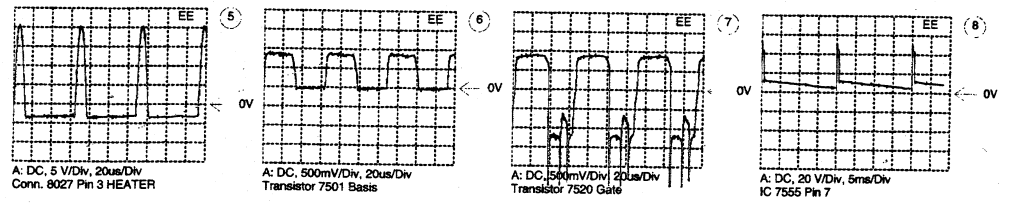
Variant List Tuner 1 - TV Board (TVBAD)

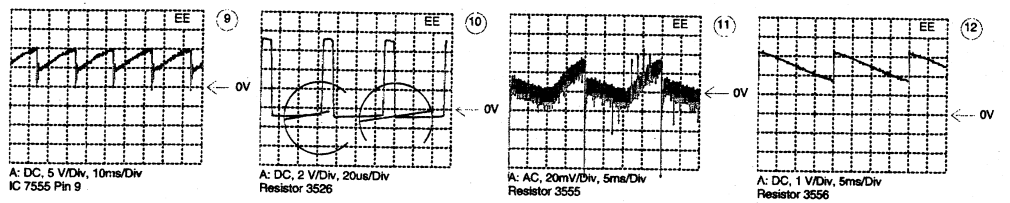
Pos.	PAL BG FM- Mono	PAL I FM- Mono	PAL,SEC DK,K1 FM-Mono	PALBG/I (1 Tuner sets only) FM-Mono	PAL, SEC, BG/DK FM-Mono	PAL, BG/I, SEC L/L' FM-, AM-Mono	PAL, SEC BG/I/DK, SEC L/L' FM, AM, NICAM, Stereo
1700	UV 1316T / AI	UV 1316T / AI	UV 1316T / AI	—	UV 1316T / AI	UV 1316T / AI	UV 1316T / AI
1701	UV 1316	UV 1316	UV 1316	UV 1316	UV 1316	UV 1316	UV 1316
1702	EFC 5,5	EFC 6,0	EFC 6,5	EFC 5,5	EFC 5,5	EFC 5,5	—
1703	—	—	—	EFC 6,0	EFC 6,5	EFC 6,0	—
1704	TPS 5,5	TPS 6,0	TPS 6,5	TPS 5,5	TPS 5,5	Double TPS 5,5/6,0	TPS 5,5
1705	—	—	—	TPS 6,0	TPS 6,5	—	—
1707	G1961M	J1980M	K2955M	G1965M	G1961M	—	—
1708	—	—	—	—	K2955M	G1965M	K3953M
1709	—	—	—	—	—	—	G3956M
1710	—	—	—	—	—	—	K9456M
1711	—	—	—	—	—	K9456M	—
2701	—	—	—	—	—	220p	120p
2708	—	—	—	—	—	47p	47p
2719	3n3	3n3	3n3	3n3	3n3	3n3	—
2720	—	—	—	—	—	2µ2	2µ2
2721	—	—	—	—	—	120p	220p
2722	22µ	22µ	22µ	22µ	22µ	22µ	—
2723	0,47µ	0,47µ	0,47µ	0,47µ	0,47µ	—	—
2740	47µ	47µ	47µ	47µ	47µ	47µ	—
2725	—	—	—	—	—	470n	470n
3702	—	—	—	270R	180R	1R	1R
3703	—	—	—	—	4k7	—	—
3704	—	—	—	1k2	1k2	1k2	—
3705	470R	470R	470R	470R	470R	470R	—
3706	—	—	—	470R	470R	470R	—
3707	560R	560R	560R	1k2	1k2	1k2	560R
3710	—	—	—	—	4k7	—	—
3711	560R	560R	560R	560R	560R	560R	820R
3713	—	—	—	1k	1k5	0R	0R
3714	330R	270R	270R	270R	270R	180R	—
3716	—	—	—	1k5	1k5	1k5	1k5
3717	1k5	1k5	1k5	1k5	1k5	1k5	—
3719	—	—	—	—	—	1k5	1k5
3724	—	—	—	4k7	4k7	4k7	4k7
3725	1k5	1k0	1k5	1k5	1k5	1k5	1R
3727	—	—	—	—	—	—	330R
3728	—	—	—	—	—	—	4k7
3729	—	—	—	—	—	—	4k7
3733	—	—	—	—	—	100R	100R
3740	—	—	—	—	—	4k7	—
3741	—	—	—	—	—	4k7	—
3742	390k	390k	390k	390k	390k	390k	—
3743	1k	1k	1k	1k	1k	1k	—
3744	680R	680R	680R	680R	680R	680R	—
3745	470R	470R	470R	470R	470R	470R	—
4700	0R	0R	0R	—	—	—	—
4701	0R	0R	0R	—	—	—	—
4702	—	—	—	—	0R	—	—
4704	—	—	—	—	—	0R	0R
4707	0R	0R	0R	0R	—	—	0R
4711	—	—	—	—	0R	—	—
4730	—	—	—	—	—	—	not used
5700	1µH	1µH	1µH	1µH	1µH	—	—
5701	—	—	—	—	—	41645	41645
5702	—	—	—	—	—	—	—
5704	15µH	15µH	15µH	15µH	15µH	10µH	—
5712	—	—	—	15µH	15µH	—	—
6700	—	—	—	—	BA792	—	—
6701	—	—	—	—	—	—	BA792
6702	—	—	—	—	—	—	BA792
6705	—	—	—	—	BA792	—	—
6706	—	—	—	—	—	BA792	—
6707	—	—	—	—	—	BA792	—
7205	TDA 8840/41	TDA 8840/41	TDA 8842	TDA 8840/41	TDA 8842	TDA 8842	TDA 8842* / TDA 8844
7701	—	—	—	HEF 4053	HEF 4053	HEF 4053	HEF 4053
7705	—	—	—	—	—	TDA9830	—
7709	—	—	—	—	PDCT124ET	—	—
7710	—	—	—	—	PDCT124ET	—	—
7711	BC 847B	BC 847B	BC 847B	BC 847B	BC 847B	BC 847B	—
7713	—	—	—	—	—	—	PDCT124ET
7714	—	—	—	—	—	—	PDCT124ET
7715	—	—	—	—	—	PDCT124ET	—
7716	—	—	—	—	—	PDCT124ET	—
7720	—	—	—	—	—	—	TDA 9818T
9701	0R	0R	0R	0R	0R	0R	—
9705	—	—	—	—	—	—	0R
9706	—	—	—	—	—	—	0R
Demodulator for:							
Video	IC 7205	IC 7205	IC 7205	IC 7205	IC 7205	IC 7205	IC 7205
Video (PAL BG)	IC 7205	—	—	IC 7205	IC 7205	IC 7205	IC 7720
Audio (FM-mono)	IC 7205	IC 7205	IC 7205	IC 7205	IC 7205	IC 7205	—
Audio (FM-stereo)	—	—	—	—	—	—	IC 7801 (APDOD)
NICAM	—	—	—	—	—	—	IC 7801 (APDOD)
Audio AM	—	—	—	—	—	IC 7705	IC 7720

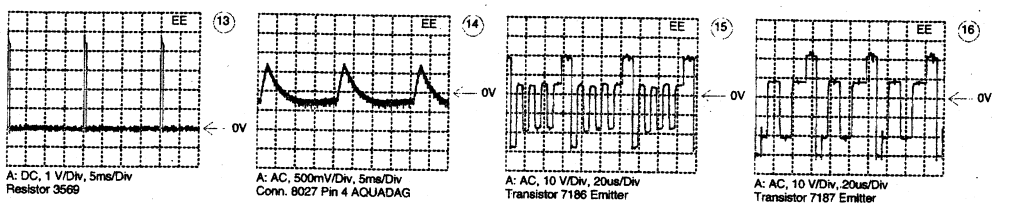
TDA 9818T: + 2728, 2729, 2730, 2731, 2732, 2733, 2734, 2735, 3735, 3736, 3737, 3738, 5707, 5708, 7712, 9702.
TDA 9830 : + 2714, 2716, 2717.

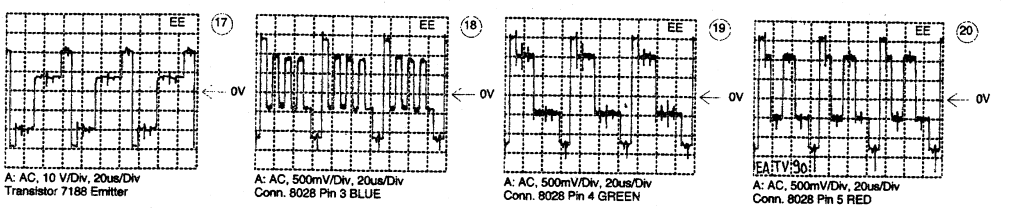
*TDA 8844 for tubes with 25°
*TDA 8841 for non-standard NTSC-Pb

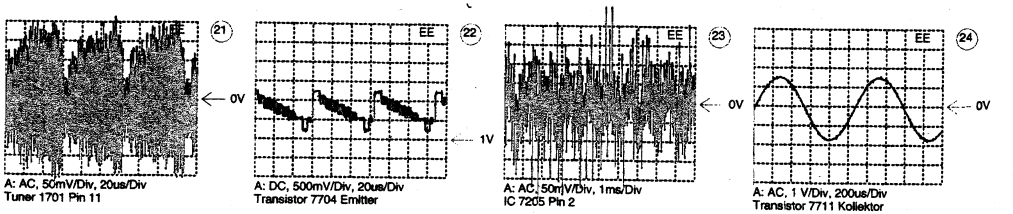


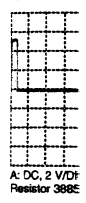


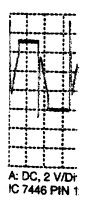


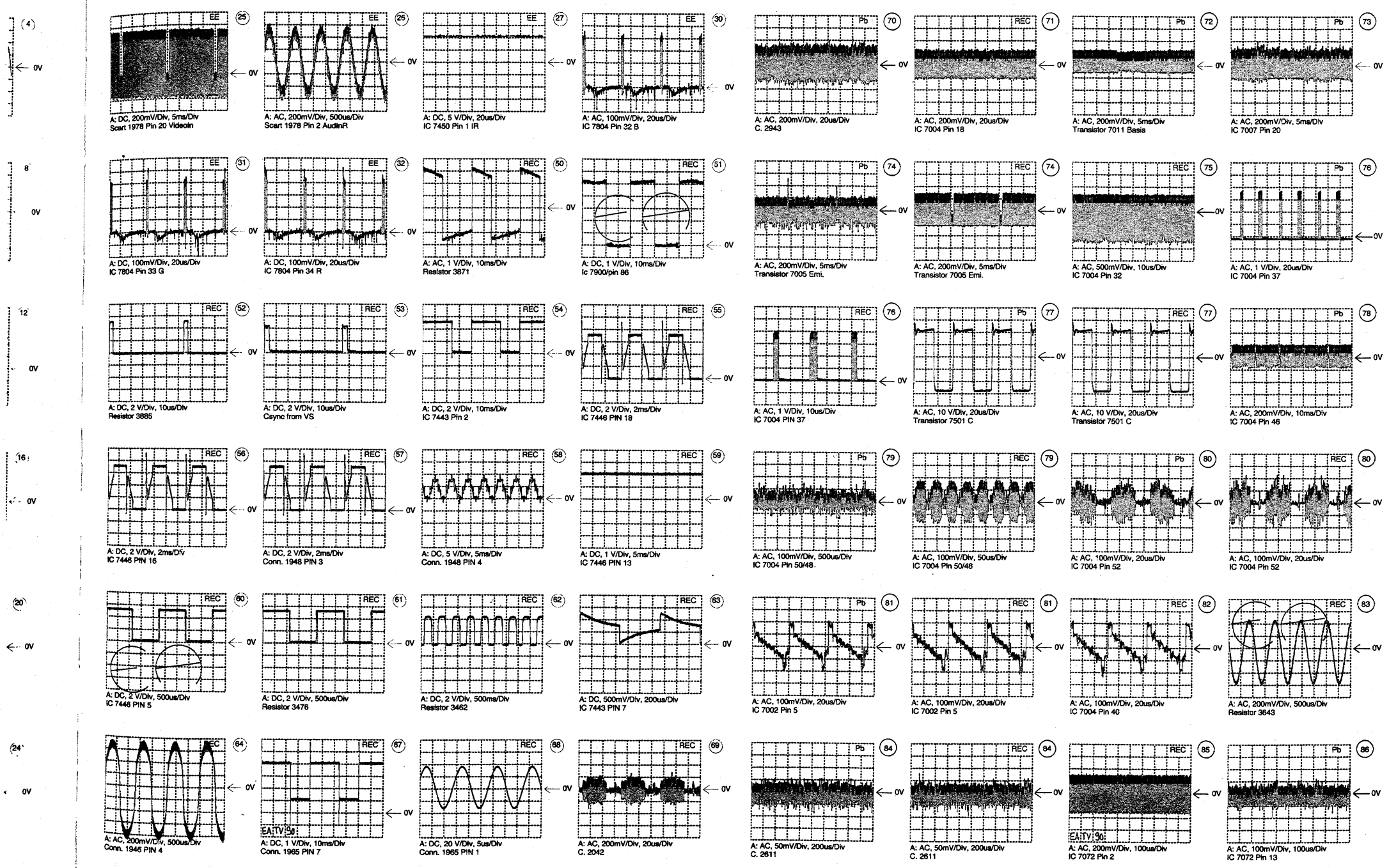


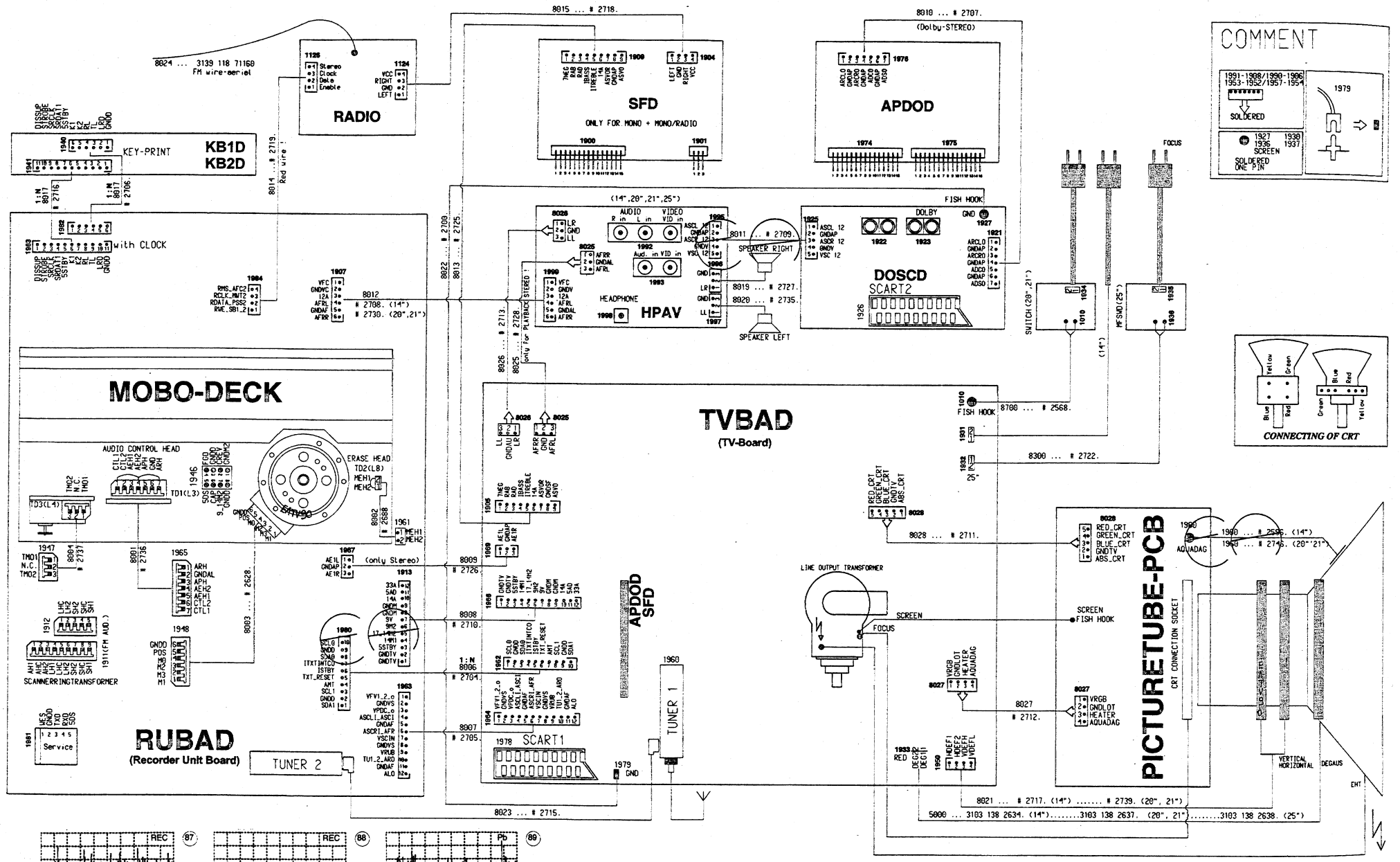






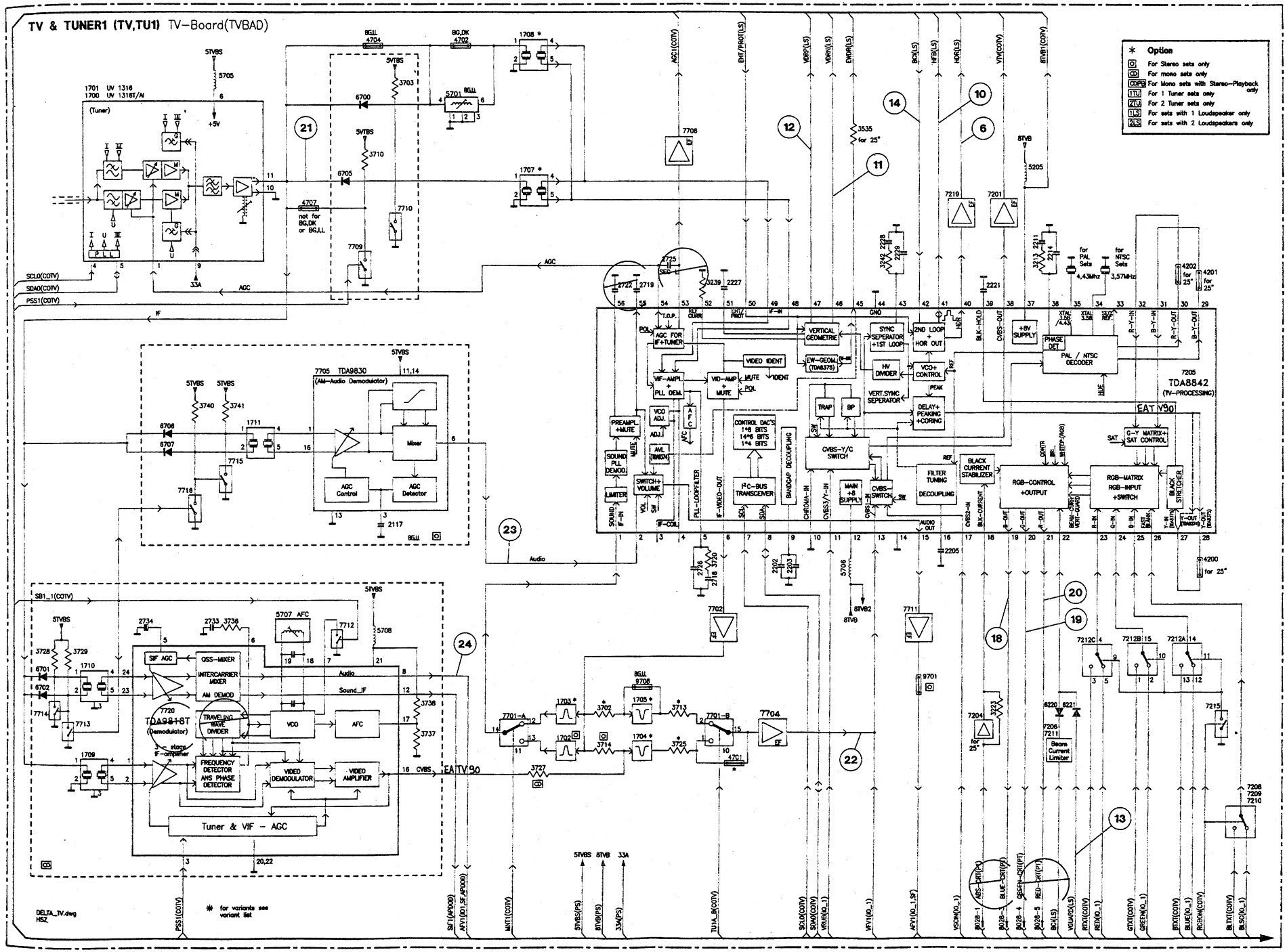



(4)
0V
EE
25
A: DC, 200mV/Div, 5ms/Div
Scart 1978 Pin 20 Videoin
EE
26
A: AC, 200mV/Div, 500us/Div
Scart 1978 Pin 2 AudinR
EE
27
A: DC, 5 V/Div, 20us/Div
IC 7450 Pin 1 IR
EE
30
A: AC, 100mV/Div, 20us/Div
IC 7804 Pin 32 B
Pb
70
A: AC, 200mV/Div, 20us/Div
C. 2943
REC
71
A: AC, 200mV/Div, 20us/Div
IC 7004 Pin 18
Pb
72
A: AC, 200mV/Div, 5ms/Div
Transistor 7011 Basis
Pb
73
A: AC, 200mV/Div, 5ms/Div
IC 7007 Pin 20
8
0V
EE
31
A: DC, 100mV/Div, 20us/Div
IC 7804 Pin 33 G
EE
32
A: DC, 100mV/Div, 20us/Div
IC 7804 Pin 34 R
REC
50
A: AC, 1 V/Div, 10ms/Div
Resistor 3871
REC
51
A: DC, 1 V/Div, 10ms/Div
Ic 7900/pin 86
Pb
74
A: AC, 200mV/Div, 5ms/Div
Transistor 7005 Emi.
REC
74
A: AC, 200mV/Div, 5ms/Div
Transistor 7005 Emi.
REC
75
A: AC, 500mV/Div, 10us/Div
IC 7004 Pin 32
Pb
76
A: AC, 1 V/Div, 20us/Div
IC 7004 Pin 37
12
0V
REC
52
A: DC, 2 V/Div, 10us/Div
Resistor 3885
REC
53
A: DC, 2 V/Div, 10us/Div
Csync from VS
REC
54
A: DC, 2 V/Div, 10ms/Div
IC 7443 Pin 2
REC
55
A: DC, 2 V/Div, 2ms/Div
IC 7446 PIN 18
REC
76
A: AC, 1 V/Div, 10us/Div
IC 7004 PIN 37
Pb
77
A: AC, 10 V/Div, 20us/Div
Transistor 7501 C
REC
77
A: AC, 10 V/Div, 20us/Div
Transistor 7501 C
Pb
78
A: AC, 200mV/Div, 10ms/Div
IC 7004 Pin 46
16
0V
REC
56
A: DC, 2 V/Div, 2ms/Div
IC 7446 PIN 16
REC
57
A: DC, 2 V/Div, 2ms/Div
Conn. 1948 PIN 3
REC
58
A: DC, 5 V/Div, 5ms/Div
Conn. 1948 PIN 4
REC
59
A: DC, 1 V/Div, 5ms/Div
IC 7446 PIN 13
Pb
79
A: AC, 100mV/Div, 500us/Div
IC 7004 Pin 50/48
REC
79
A: AC, 100mV/Div, 50us/Div
IC 7004 Pin 50/48
Pb
80
A: AC, 100mV/Div, 20us/Div
IC 7004 Pin 52
REC
80
A: AC, 100mV/Div, 20us/Div
IC 7004 Pin 52
20
0V
REC
60
A: DC, 2 V/Div, 500us/Div
IC 7446 PIN 5
REC
61
A: DC, 2 V/Div, 500us/Div
Resistor 3476
REC
62
A: DC, 2 V/Div, 500ms/Div
Resistor 3462
REC
63
A: DC, 500mV/Div, 200us/Div
IC 7443 PIN 7
Pb
81
A: AC, 100mV/Div, 20us/Div
IC 7002 Pin 5
REC
81
A: AC, 100mV/Div, 20us/Div
IC 7002 Pin 5
REC
82
A: AC, 100mV/Div, 20us/Div
IC 7004 Pin 40
REC
83
A: AC, 200mV/Div, 500us/Div
Resistor 3643
24
0V
REC
64
A: AC, 200mV/Div, 500us/Div
Conn. 1946 PIN 4
REC
67
EA:TV:30
A: DC, 1 V/Div, 10ms/Div
Conn. 1965 PIN 7
REC
68
A: DC, 20 V/Div, 5us/Div
Conn. 1965 PIN 1
REC
69
A: AC, 200mV/Div, 20us/Div
C. 2042
Pb
84
A: AC, 50mV/Div, 200us/Div
C. 2611
REC
84
A: AC, 50mV/Div, 200us/Div
C. 2611
REC
85
EA:TV:30
A: AC, 200mV/Div, 100us/Div
IC 7072 Pin 2
Pb
86
A: AC, 100mV/Div, 100us/Div
IC 7072 Pin 13

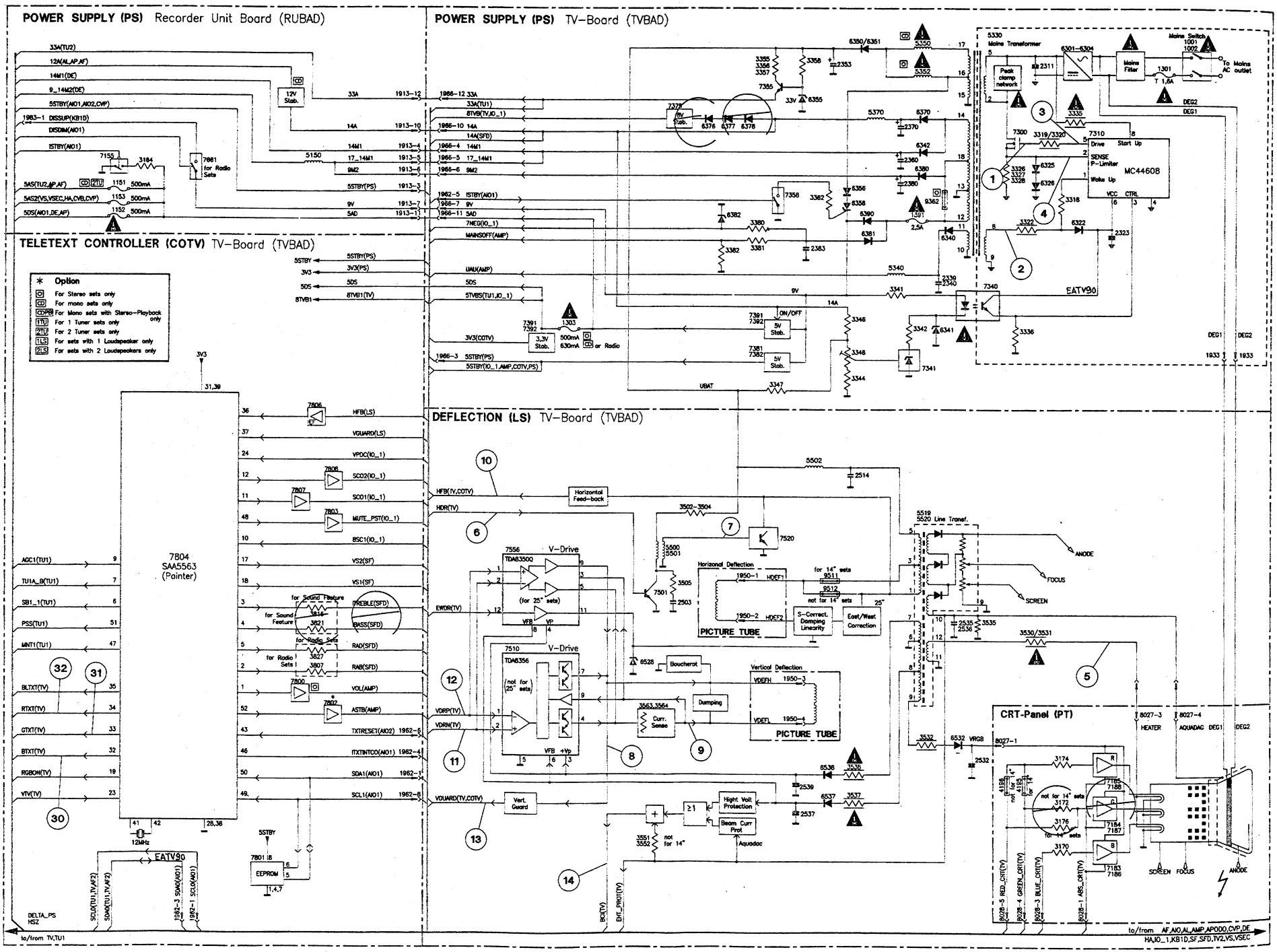


INTERCONNECTION WIRING DIAGRAM

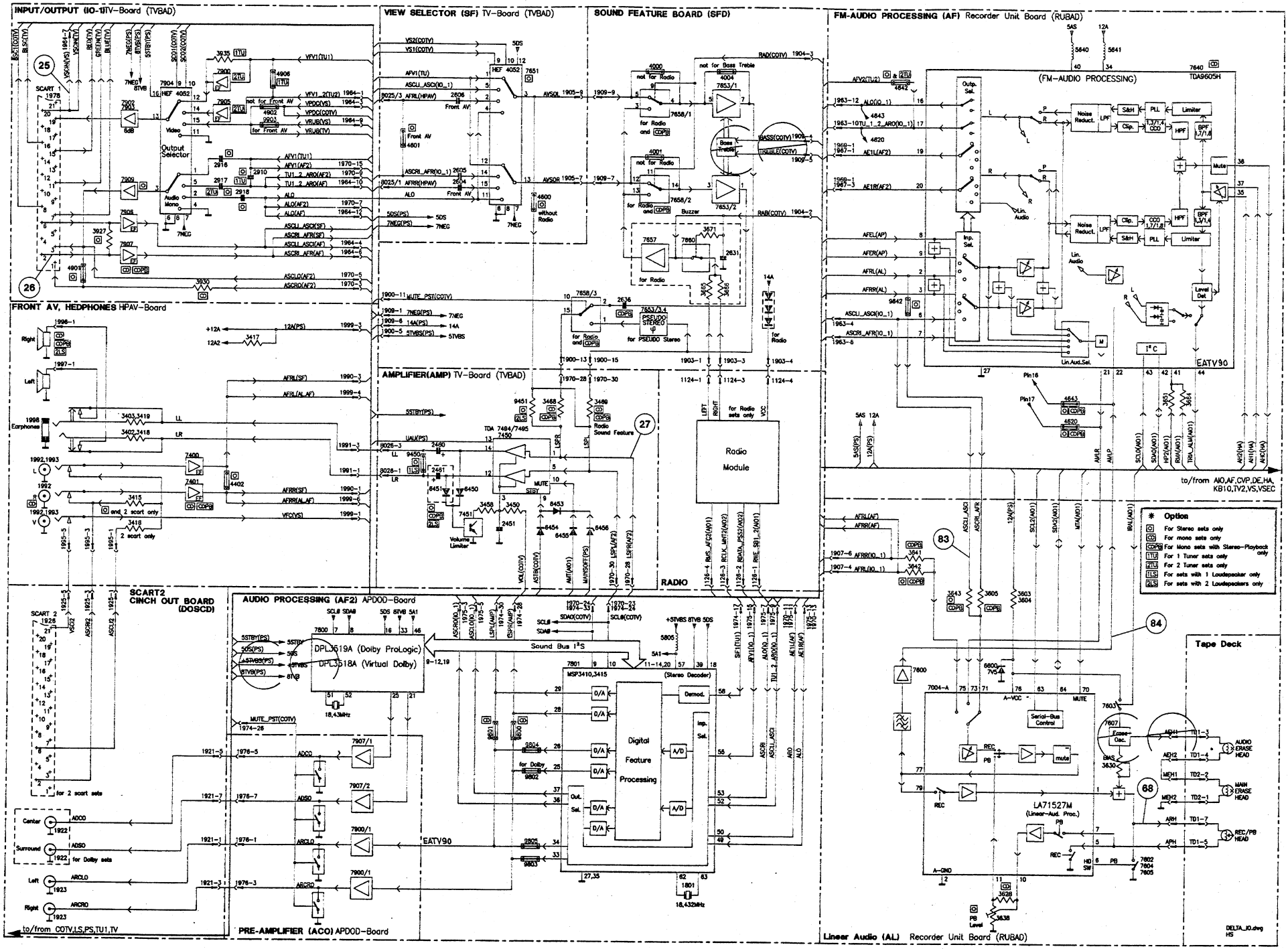
TUNER 1 AND TV - BLOCK DIAGRAM



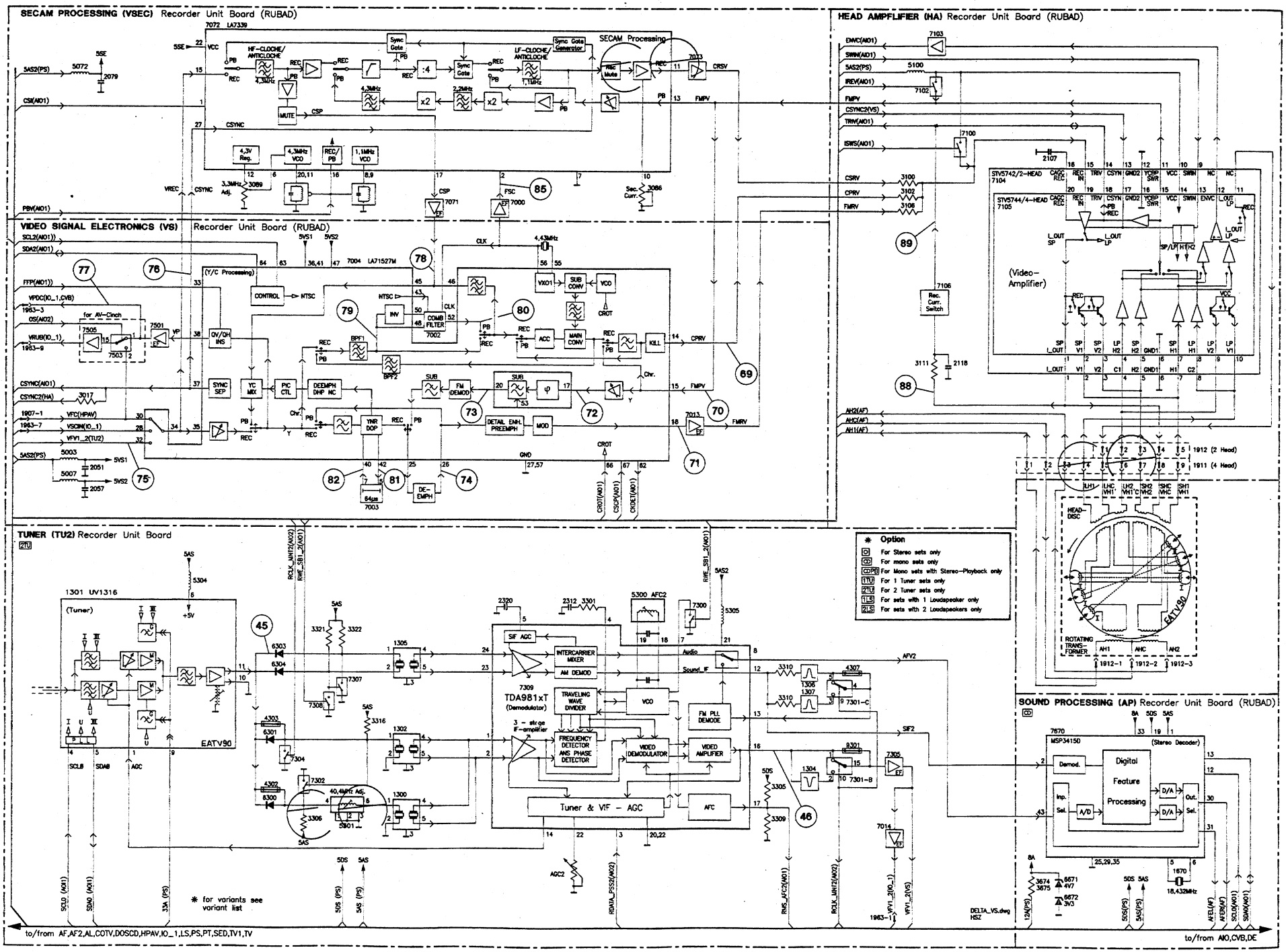
POWER SUPPLY, LARGE SIGNAL AND TXT - BLOCK DIAGRAM



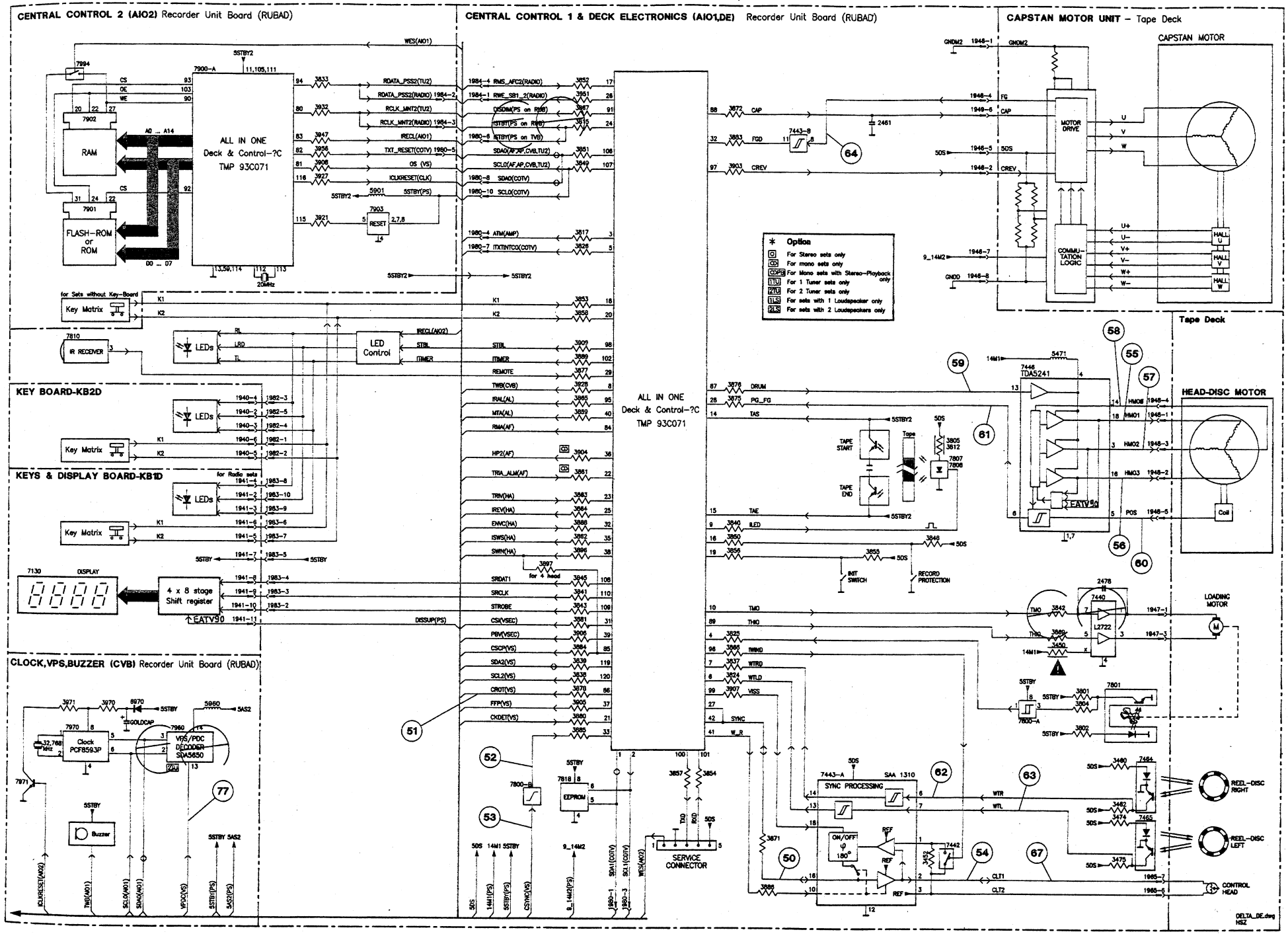
IN/OUT AND AUDIO PROCESSING - BLOCK DIAGRAM



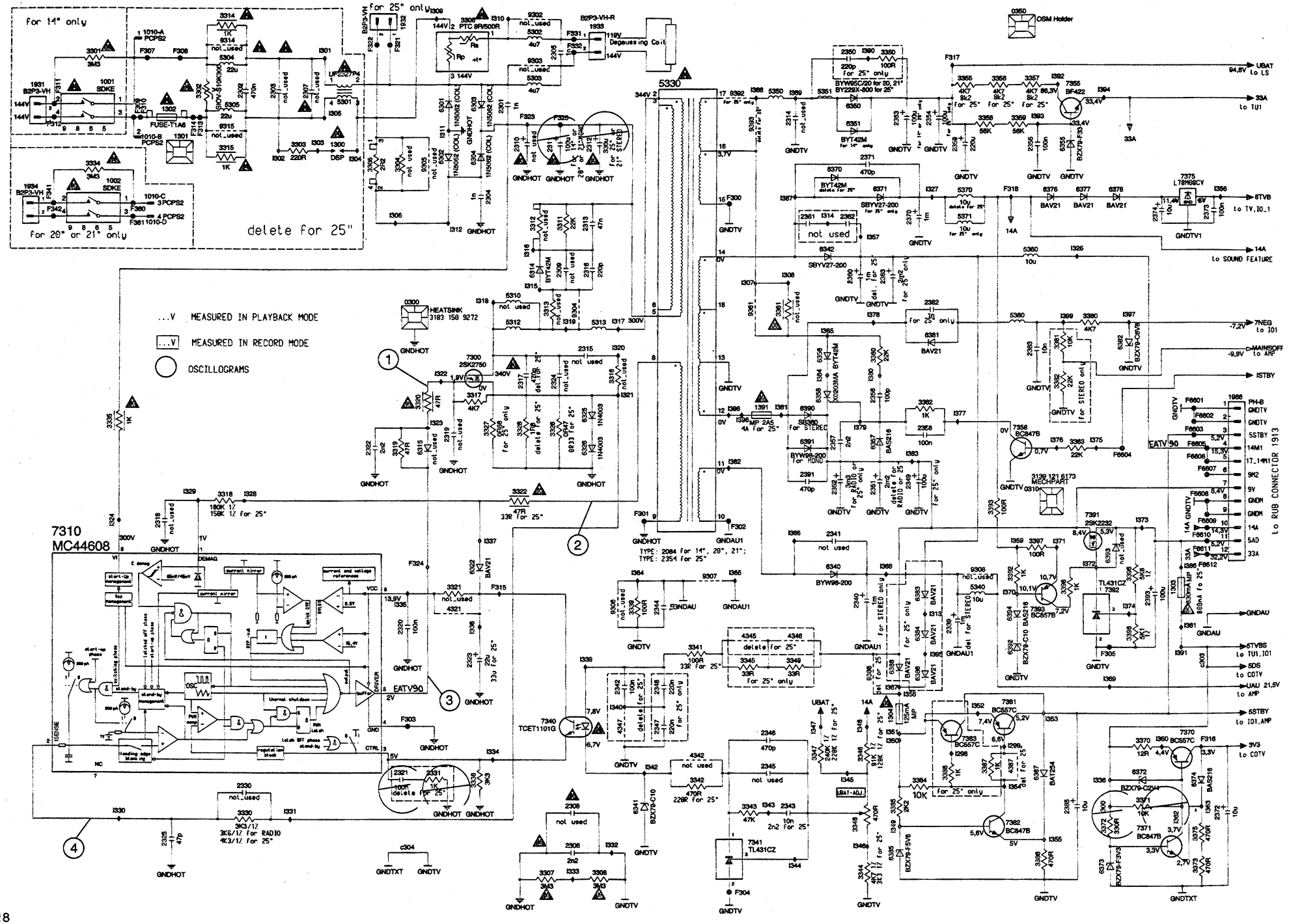
TUNER 2 AND VIDEO PROCESSING - BLOCK DIAGRAM



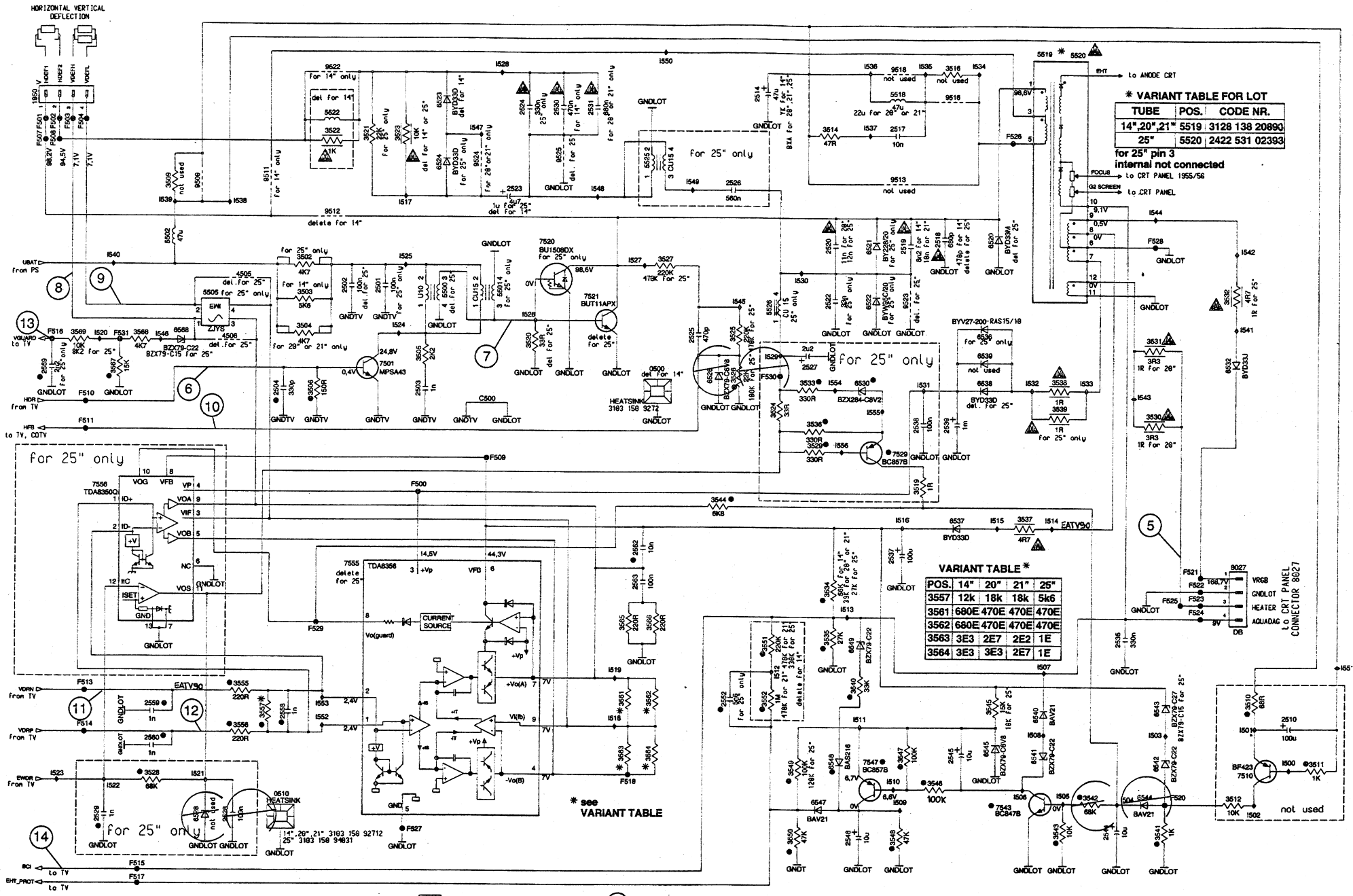
CENTRAL CONTROL AND DECK ELECTRONICS - BLOCK DIAGRAM



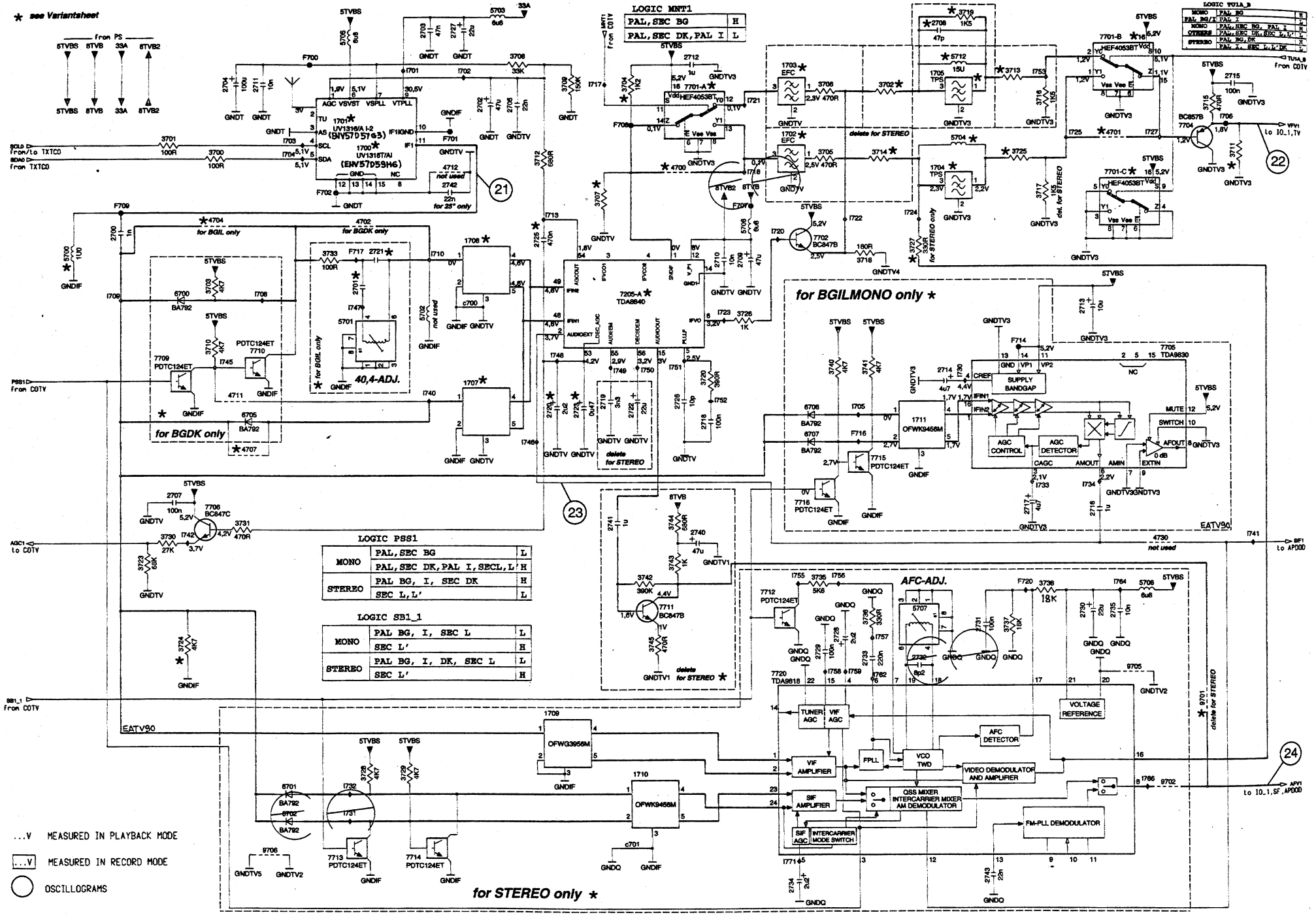
Power Supply (PS) - TV Board (TVB)



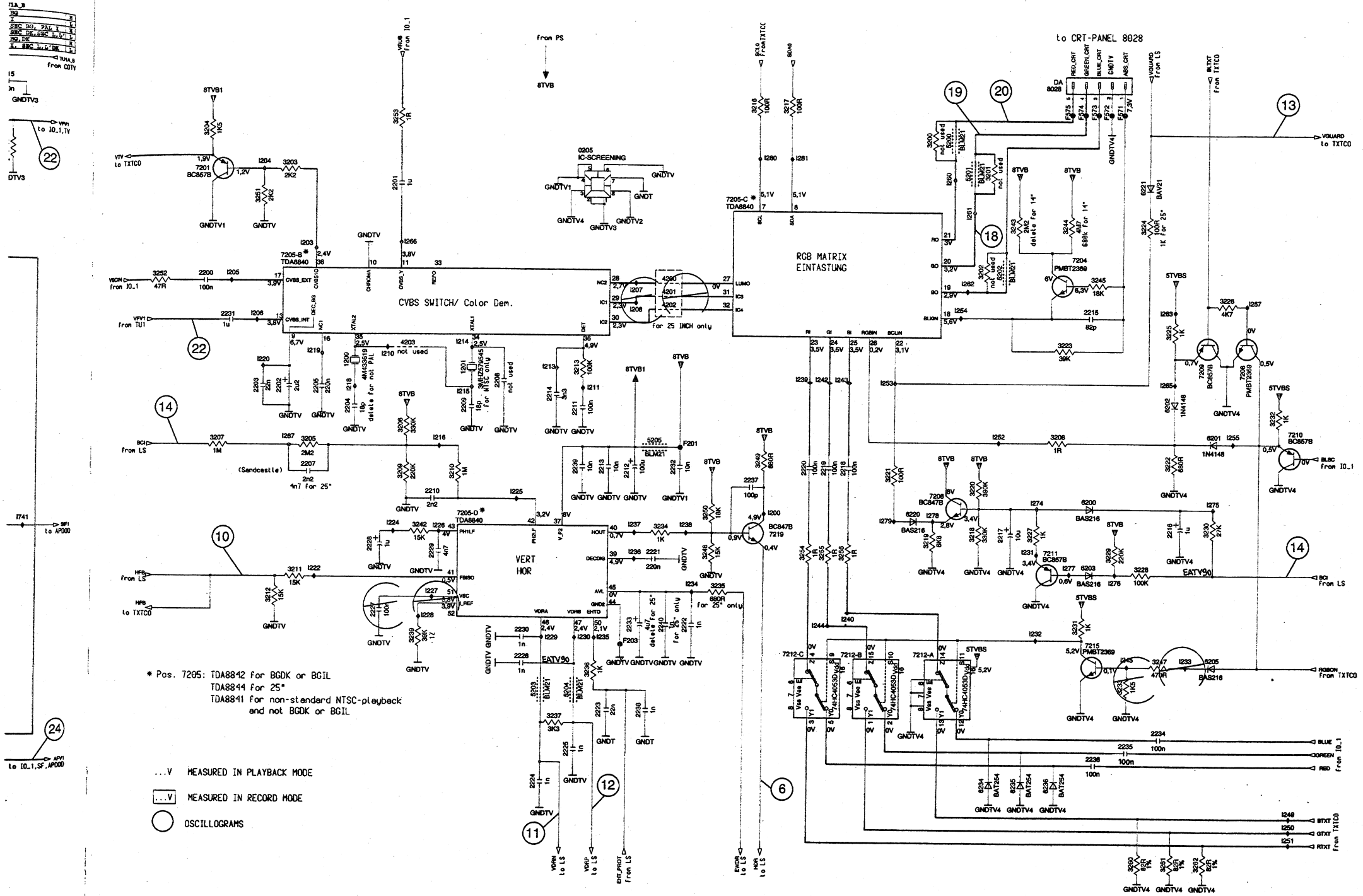
Deflection (LS) - TV Board (TVB)



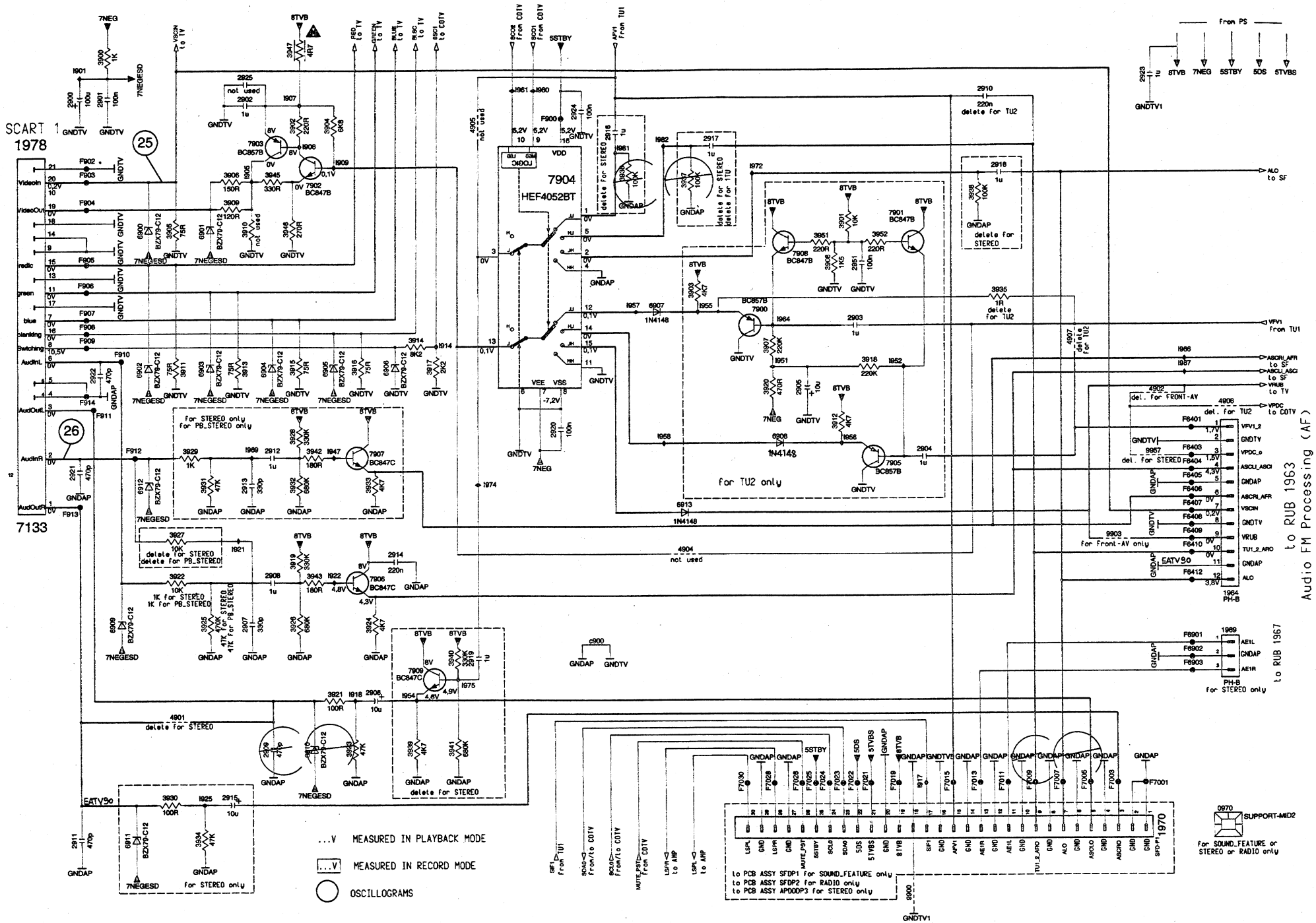
Tuner 1 (TU1) - TV Board (TVB)

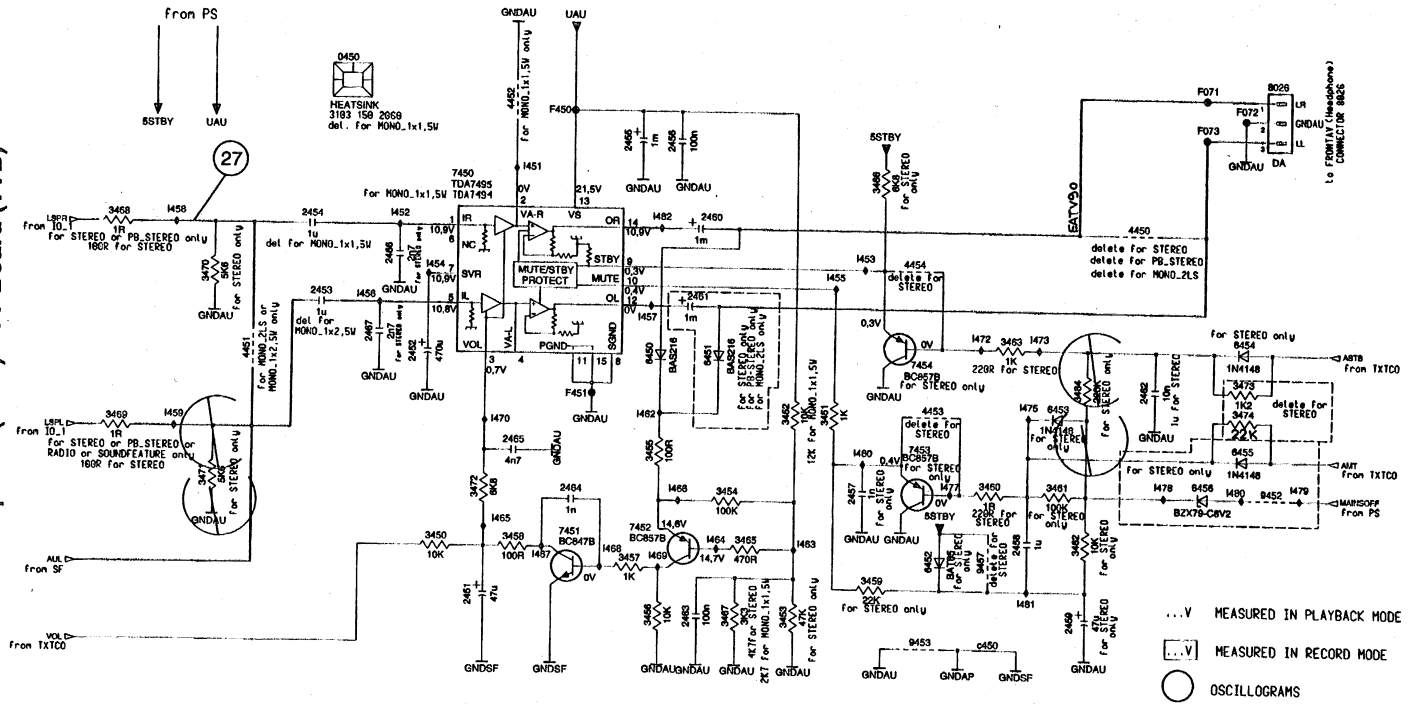


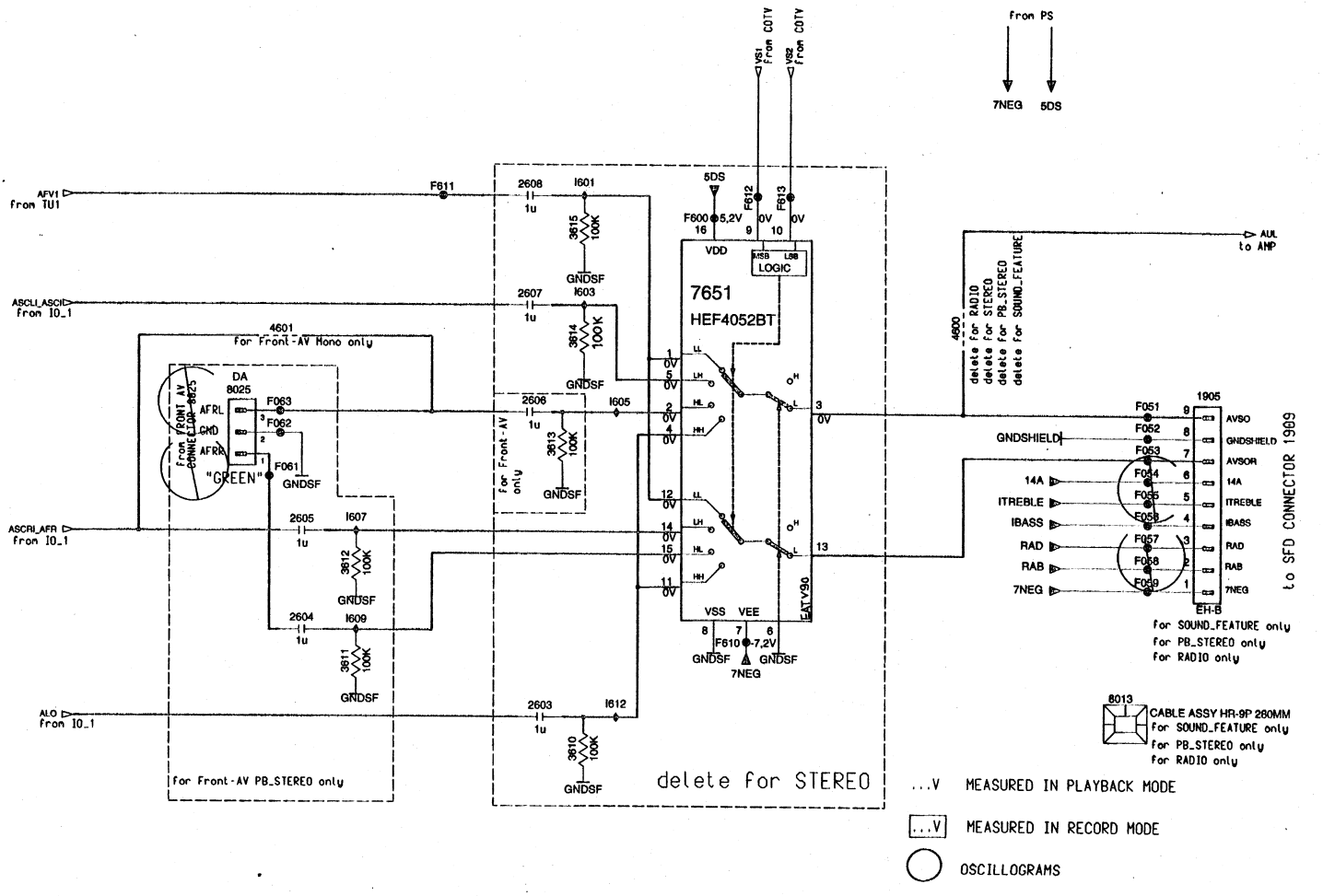
TV-Processing (TV) - TV Board (TVB)

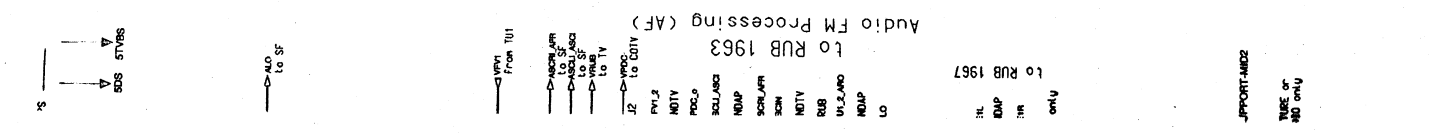


Input/Output (IO_1) - TV Board (TVB)

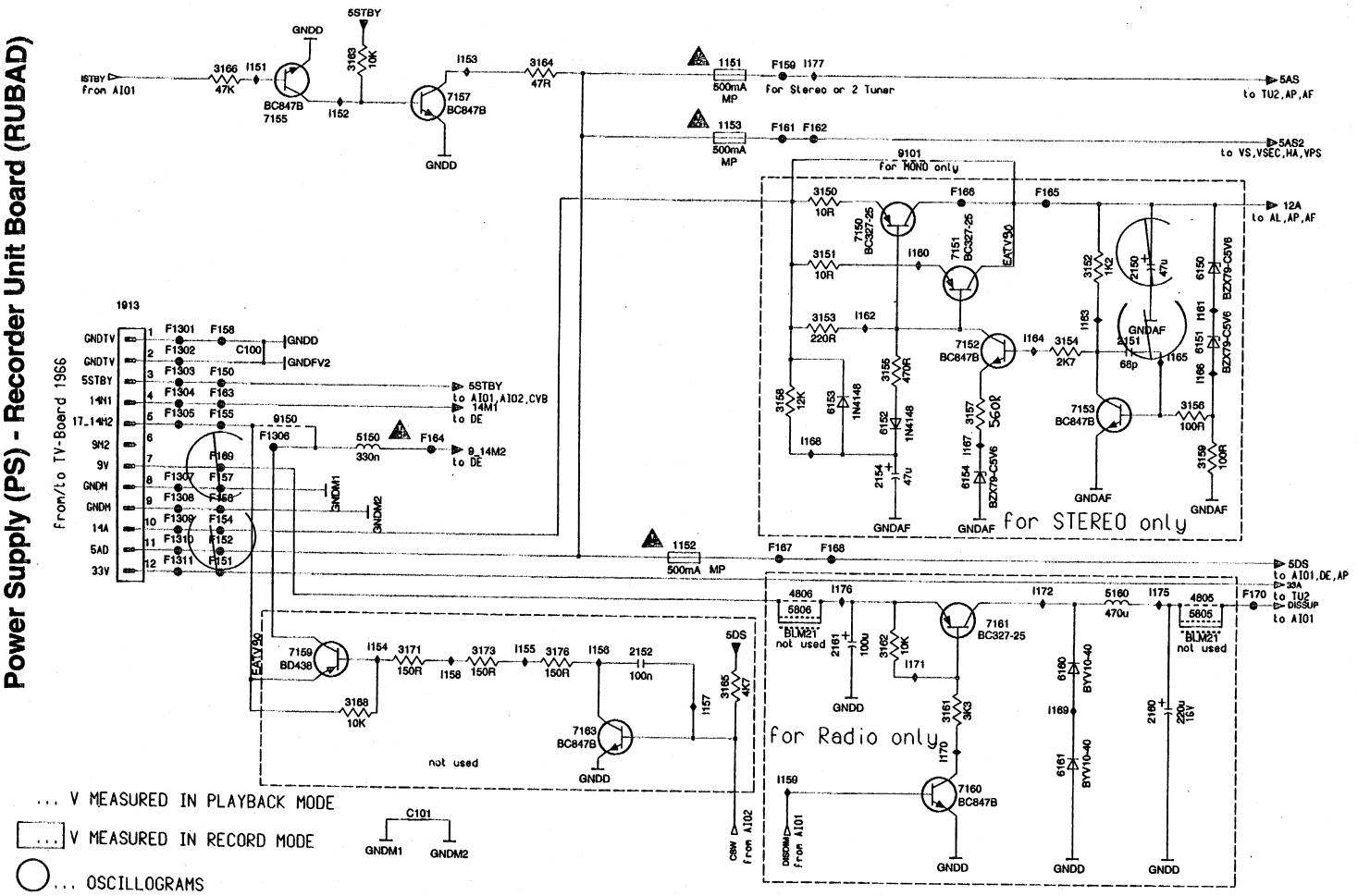



from PS
5STBY
UAU
HEATSINK
3103 150 2069
del. for MONO_1x1,5W
GNDAU
F4500
7450
TDA7495
TDA7494
for MONO_1x1,5W
VA-R
VS
VA-L
PGND
SGND
MUTE/STBY PROTECT
STBY
MUTE
SVR
NC
IR
IL
VOL
F4510
F071
F072
F073
8026
LR
LL
DA
to FRONTAV (Headphone) CONNECTOR 8826
SATV90
delete for STEREO
delete for PB_STEREO
delete for MONO_2LS
for STEREO only
1N4148
BZX79-C8V2
BC857B
BC847B
BAS216
ASTB from TXTCO
AMT from TXTCO
MAINSOFF from PS
LSPR from IO_1
LSPL from IO_1
AUL from SF
VOL from TXTCO
for STEREO or PB_STEREO or RADIO or SOUNDFEATURE only
160R for STEREO
...V MEASURED IN PLAYBACK MODE
...V MEASURED IN RECORD MODE
OSCILLOGRAMS

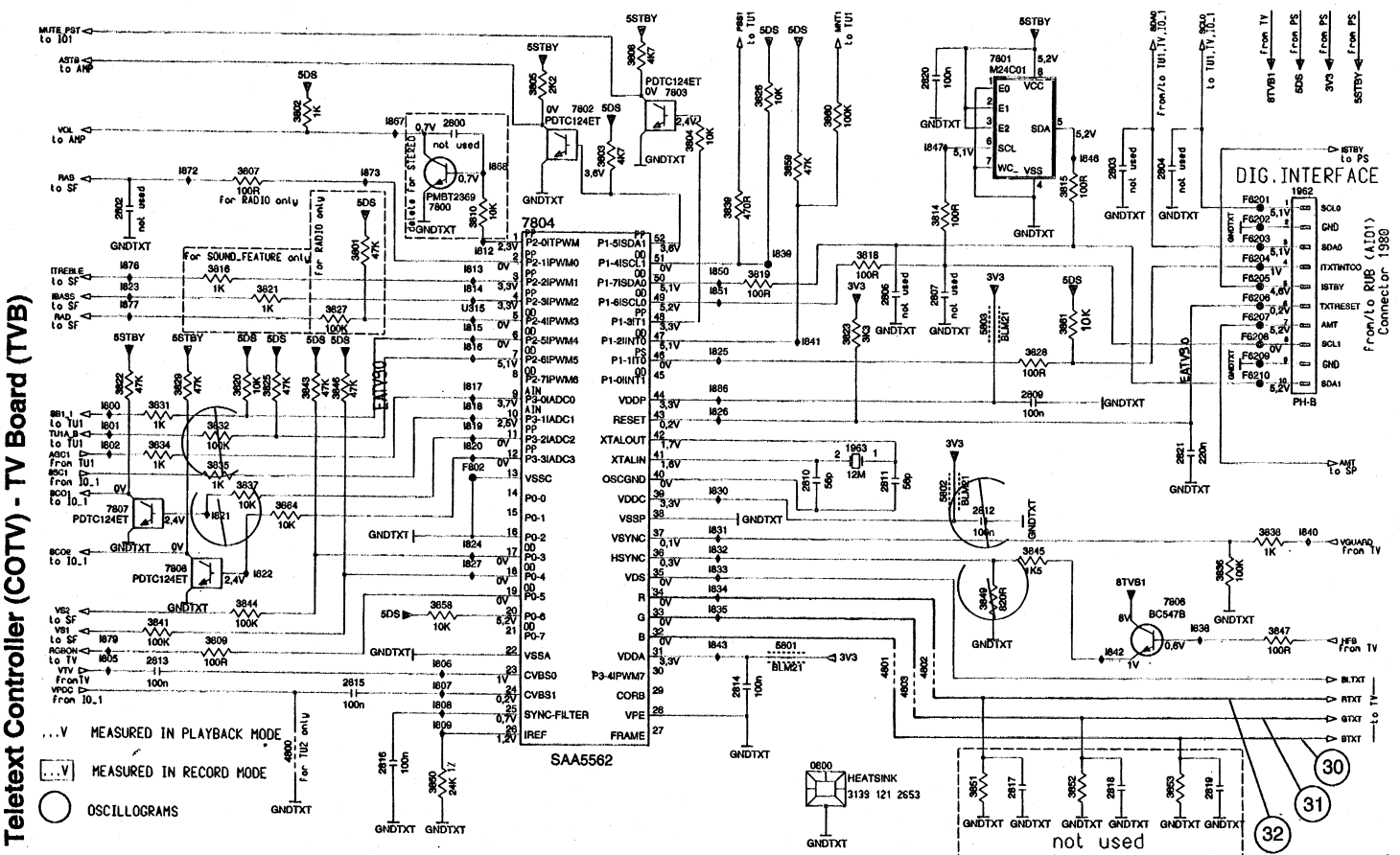

from PS
7NEG
5DS
VSI from COTV
VSO from COTV
AFV1 from TU1
ASCLI_ASCR from IO_1
ASCRI_AFR from IO_1
ALO from IO_1
AUL to AMP
7651
HEF4052BT
VDD
VSS
VEE
LOGIC
4601
for Front-AV Mono only
DA
8025
FRONT AV CONNECTOR 8825
AFRL
GND
AFRR
"GREEN"
for Front-AV only
for Front-AV PB_STEREO only
delete for STEREO
4600
delete for RADIO
delete for STEREO
delete for PB_STEREO
delete for SOUND_FEATURE
1905
AVSO
GNDSHIELD
AVSOR
14A
ITREBLE
IBASS
RAD
RAB
7NEG
EH-8
to SFD CONNECTOR 1989
for SOUND_FEATURE only
for PB_STEREO only
for RADIO only
8013
CABLE ASSY HR-9P 280MM
for SOUND_FEATURE only
for PB_STEREO only
for RADIO only
...V MEASURED IN PLAYBACK MODE
...V MEASURED IN RECORD MODE
OSCILLOGRAMS


Audio FM Processing (AF)
to RUB 1963
to RUB 1967
5DS 5TVBS
ALO to SF
VPV1 from TU1
ASCRI_AFR to SF
ASCLI_ASCR to SF
VRUB to TV
VPOC to COTV
only
JPPORT-AMD2
TVBS or AMD only

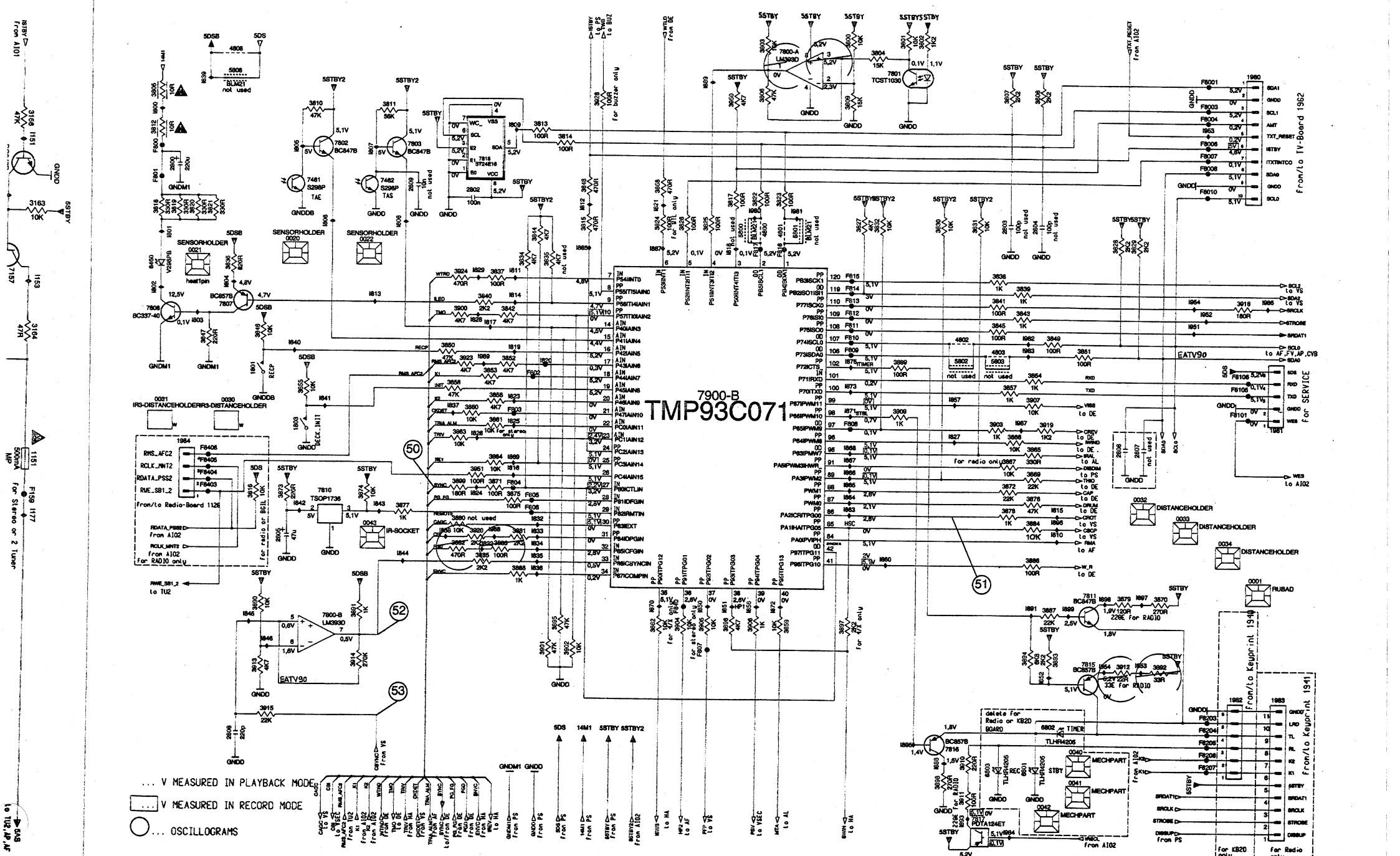
Power Supply (PS) - Recorder Unit Board (RUBAD)



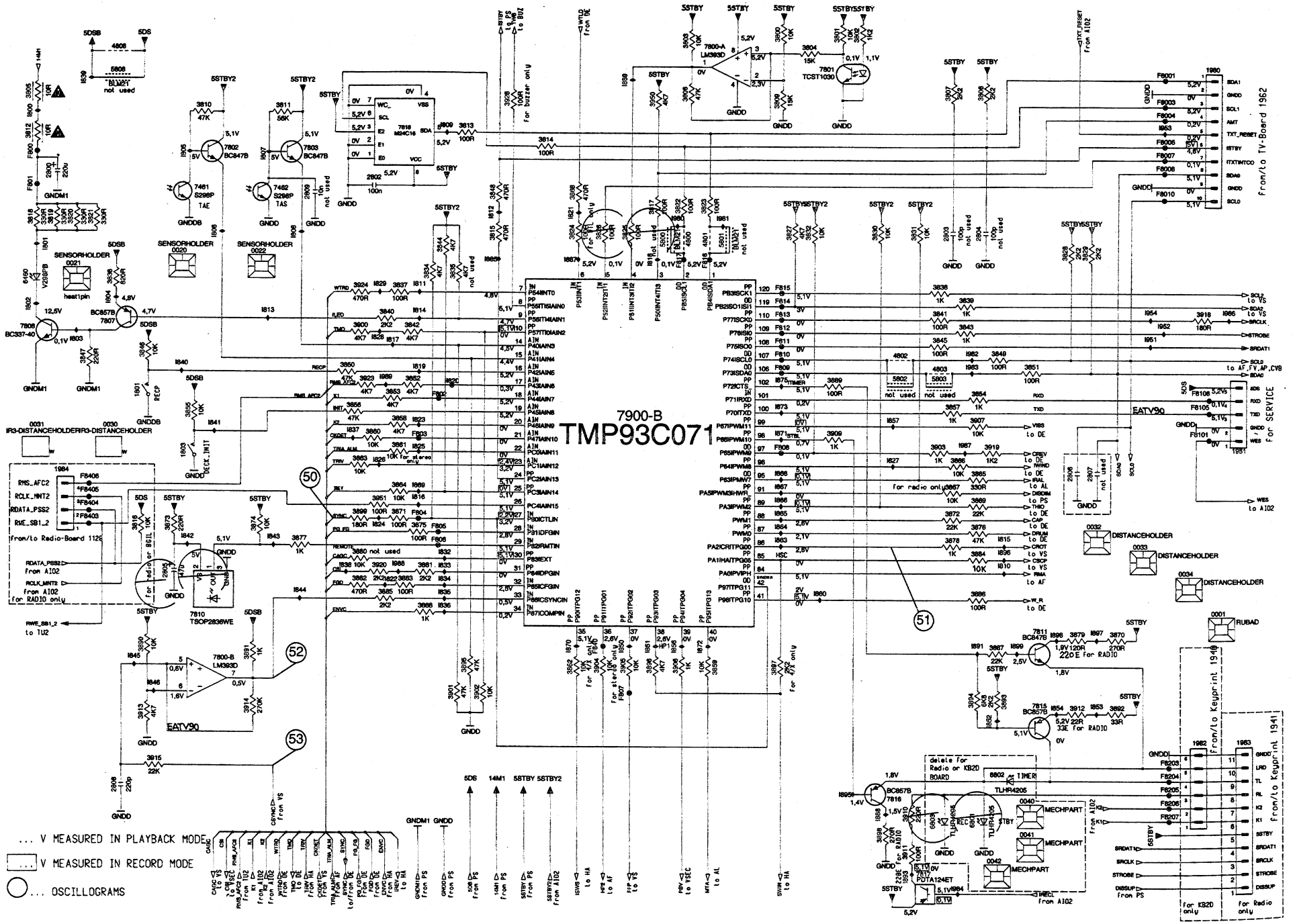
PHILIPS Telai TVCR 99 Delta/Delta 2000
Teletext Controller (COTV) - TV Board (TVB)

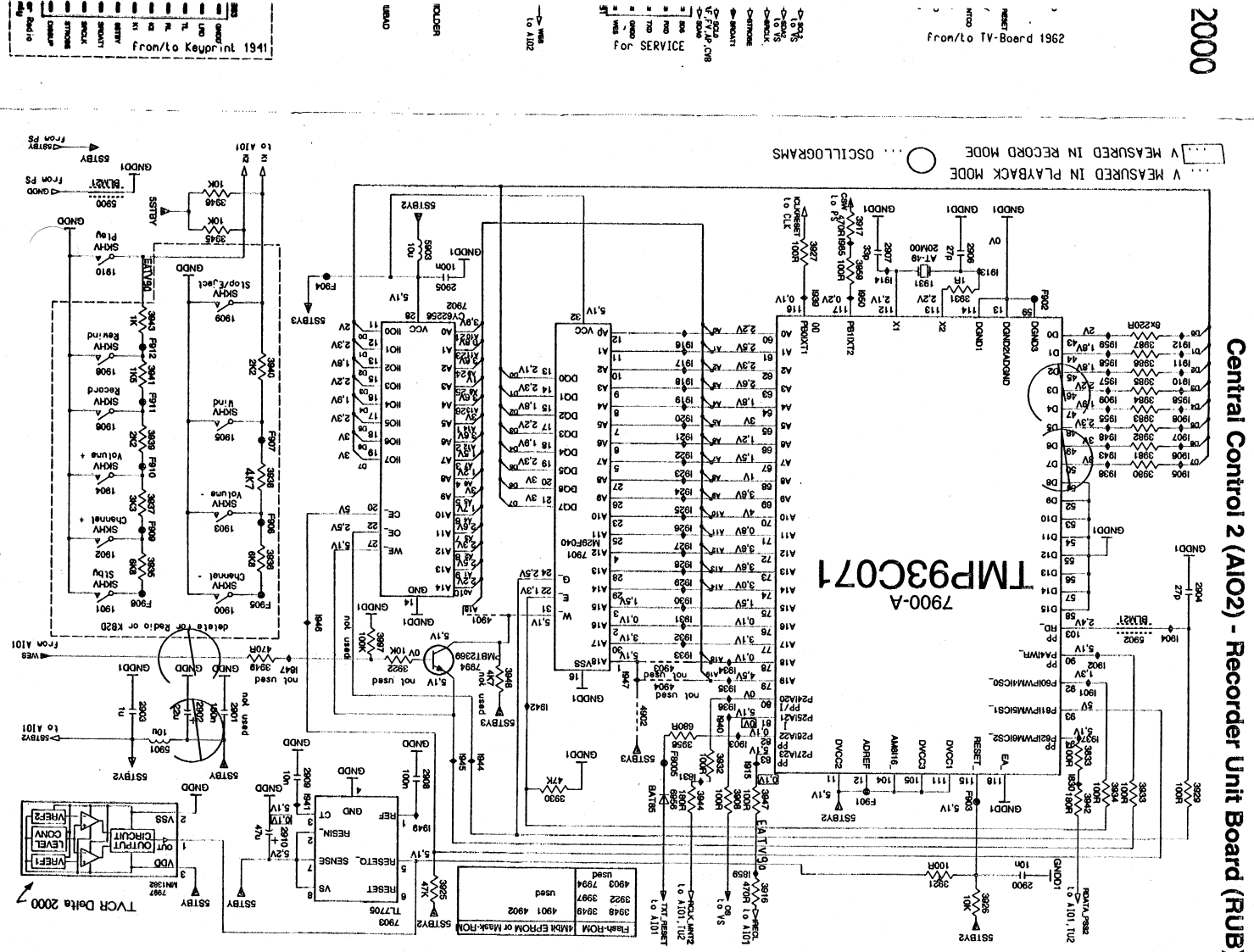


Central Control 1 (AIO1) - Recorder Unit Board (RUBAD) TVCR 99 Delta

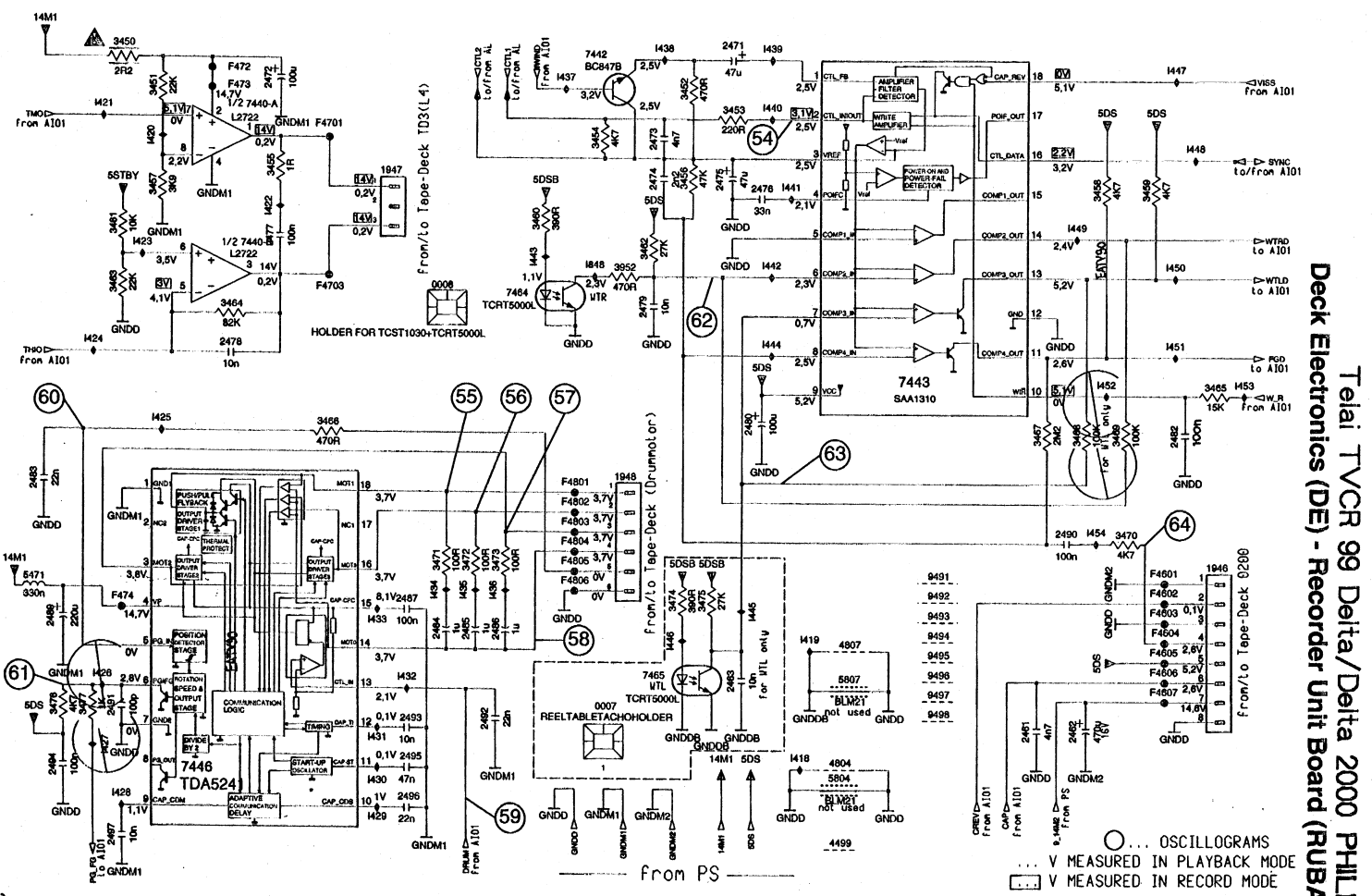


Central Control 1 (AIO1) - Recorder Unit Board (RUB) TVCR Delta 2000

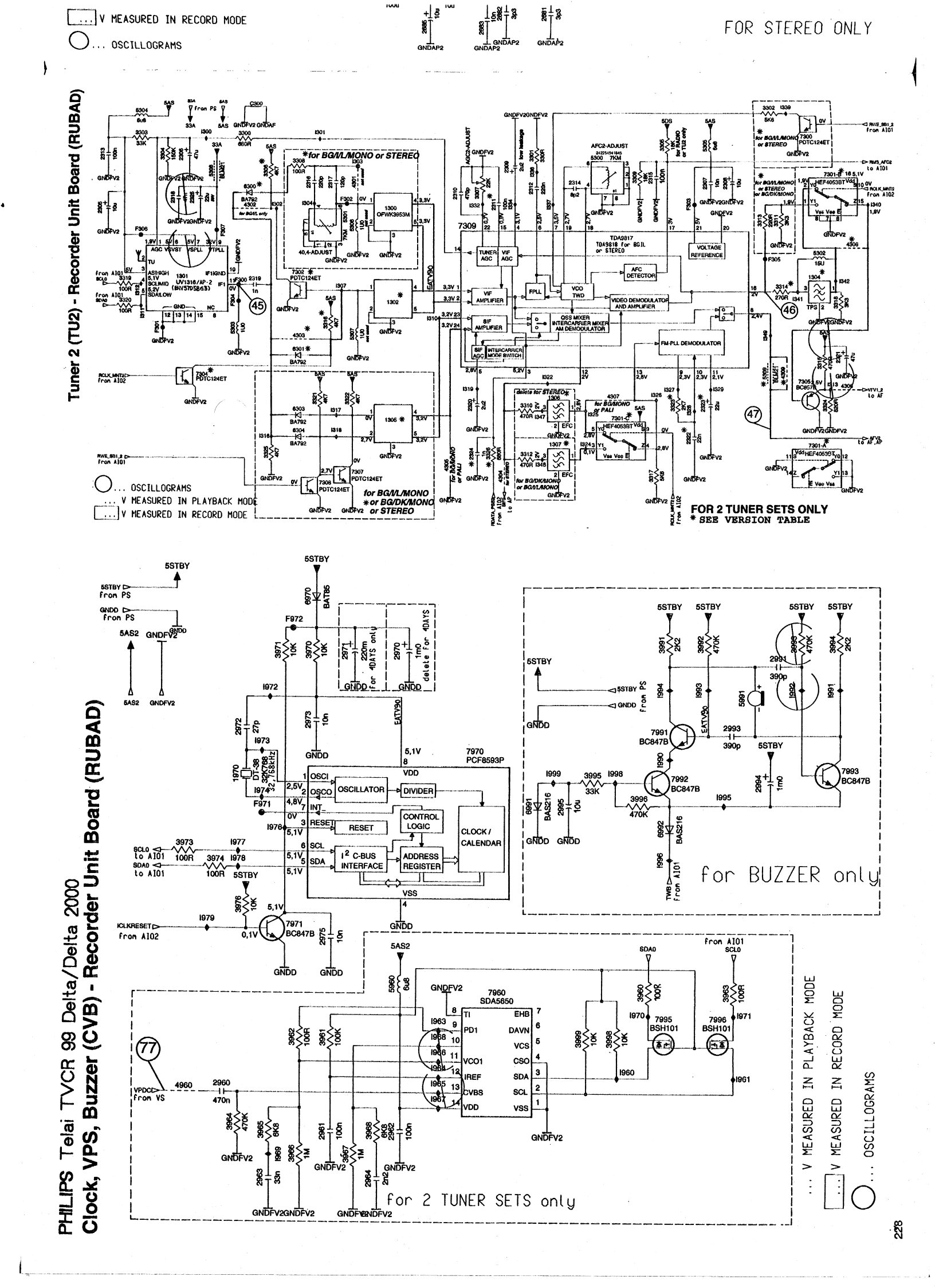




Central Control 2 (AIO2) - Recorder Unit Board (RUB)

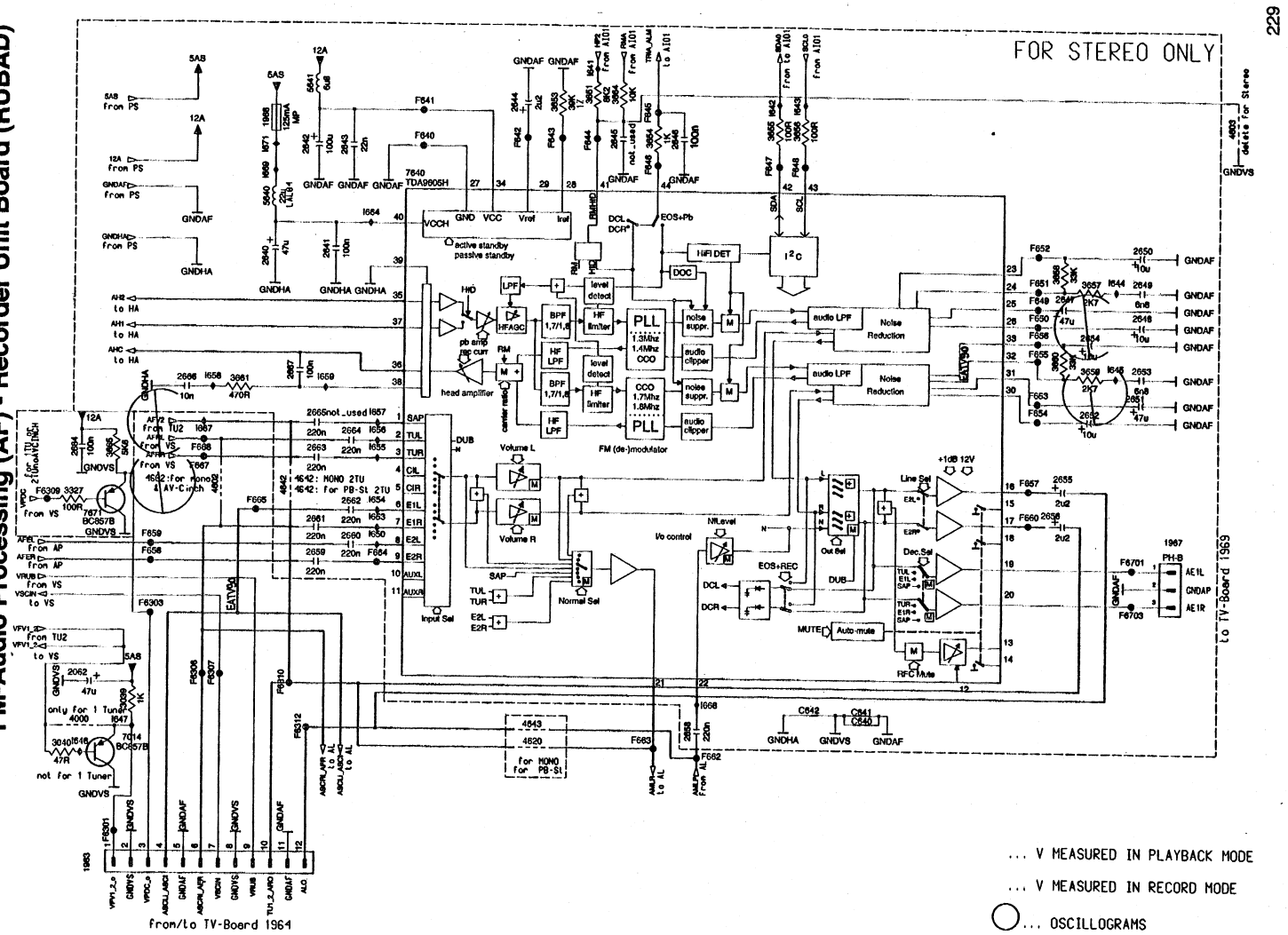


Teiai TVCR 99 Delta/Delta 2000 PHILIPS
Deck Electronics (DE) - Recorder Unit Board (RUBAD)


V MEASURED IN RECORD MODE
... OSCILLOGRAMS
FOR STEREO ONLY
Tuner 2 (TU2) - Recorder Unit Board (RUBAD)
*for BG/L/MONO or STEREO
for BG/L/MONO *or BG/DK/MONO or STEREO
FOR 2 TUNER SETS ONLY
* SEE VERSION TABLE
... V MEASURED IN PLAYBACK MODE
for BUZZER only
for 2 TUNER SETS only

Telai TVCR 99 Delta/Delta 2000 PHILIPS

FM-Audio Processing (AF) - Recorder Unit Board (RUBAD)

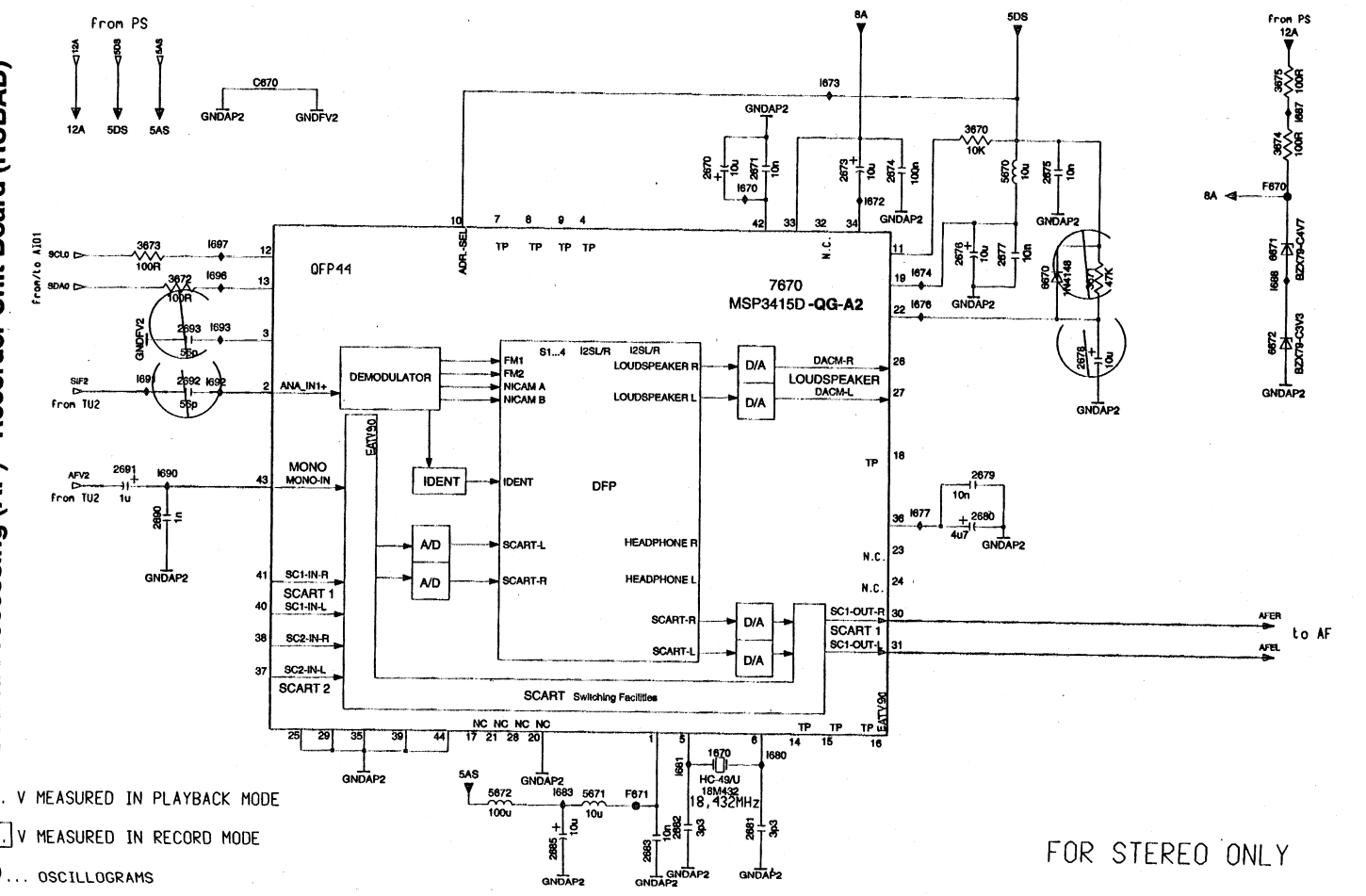


... V MEASURED IN PLAYBACK MODE

... V MEASURED IN RECORD MODE

... OSCILLOGRAMS

Sound Processing (AP) - Recorder Unit Board (RUBAD)



... V MEASURED IN PLAYBACK MODE

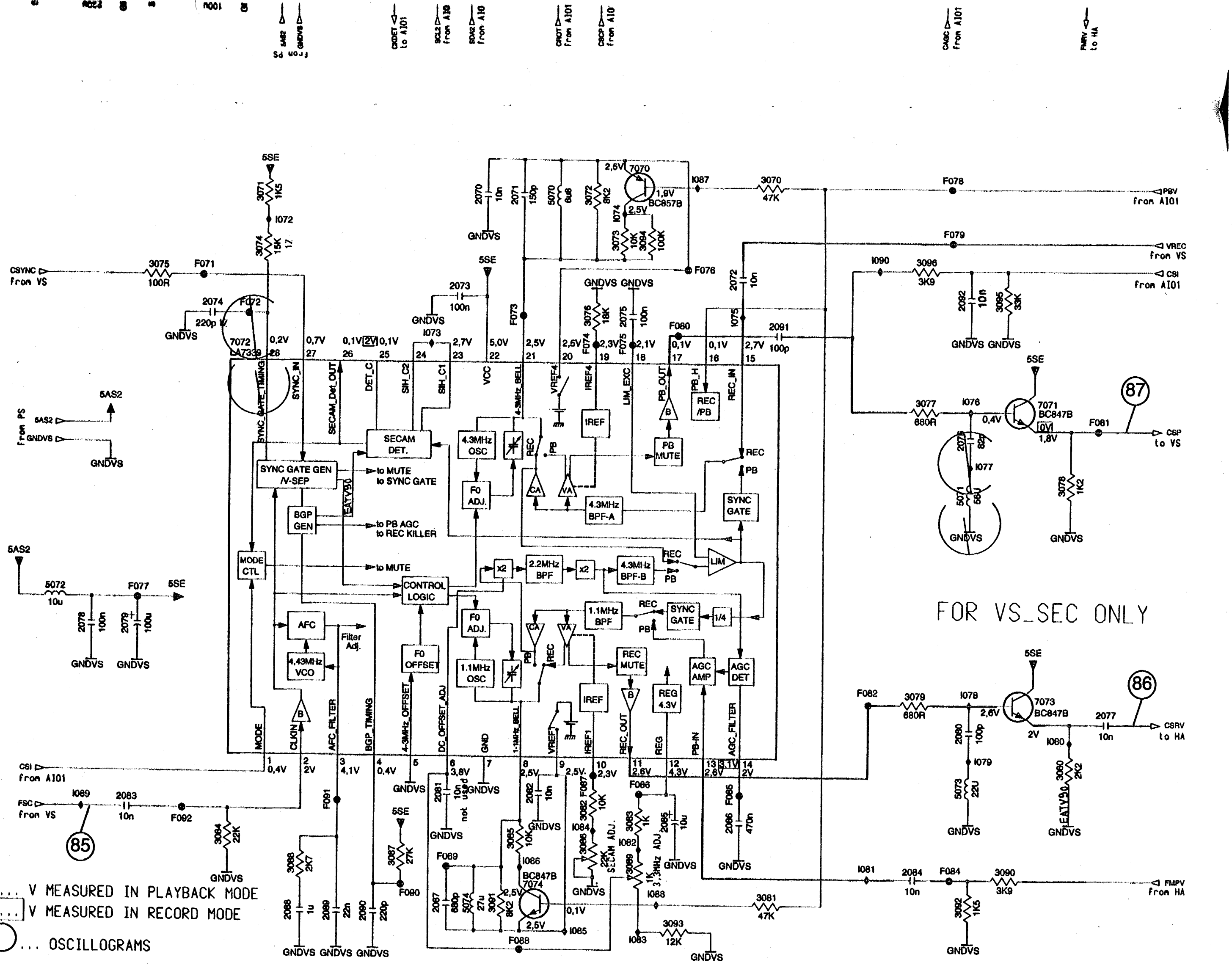
... V MEASURED IN RECORD MODE

... OSCILLOGRAMS

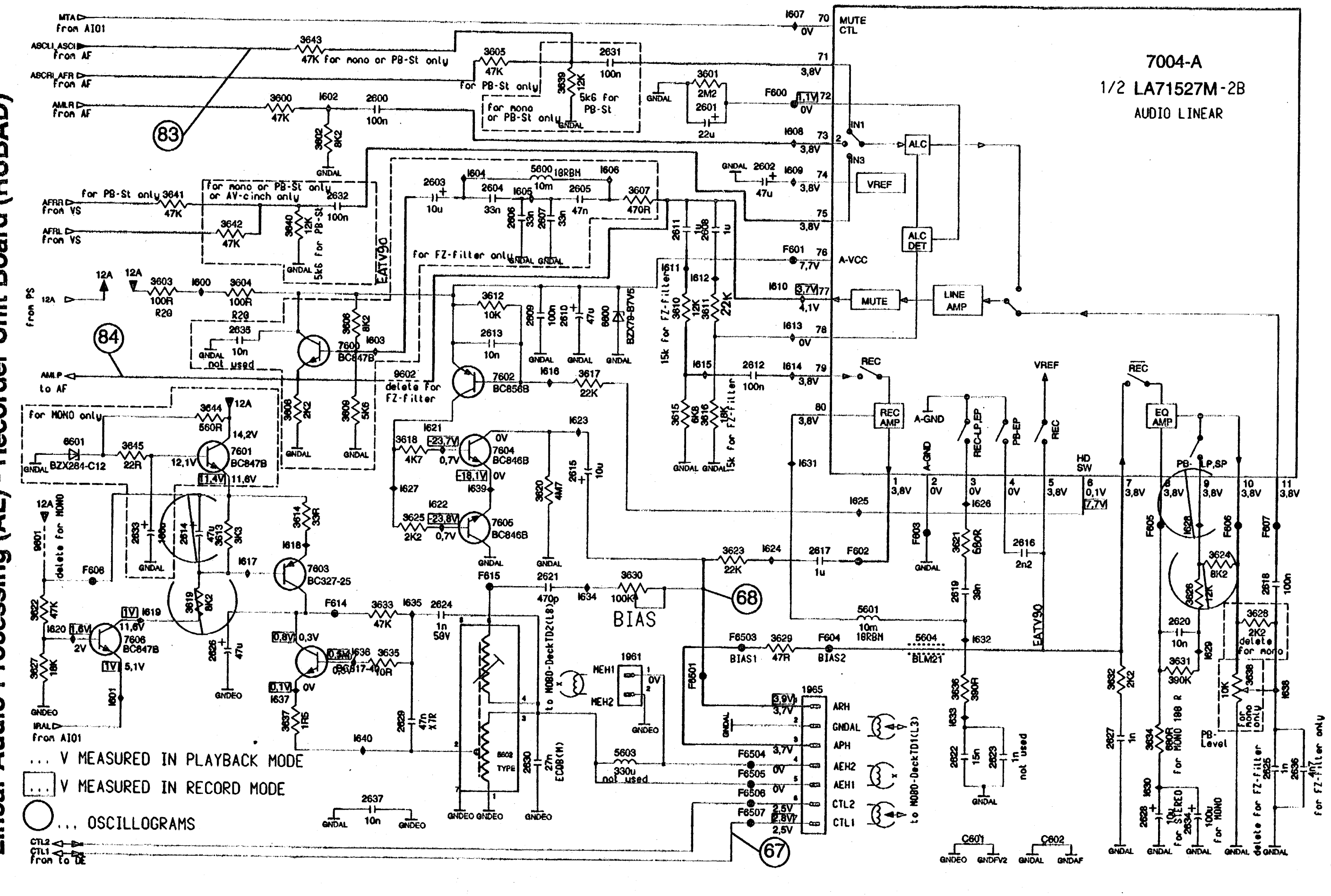
FOR STEREO ONLY

(RUBAD)

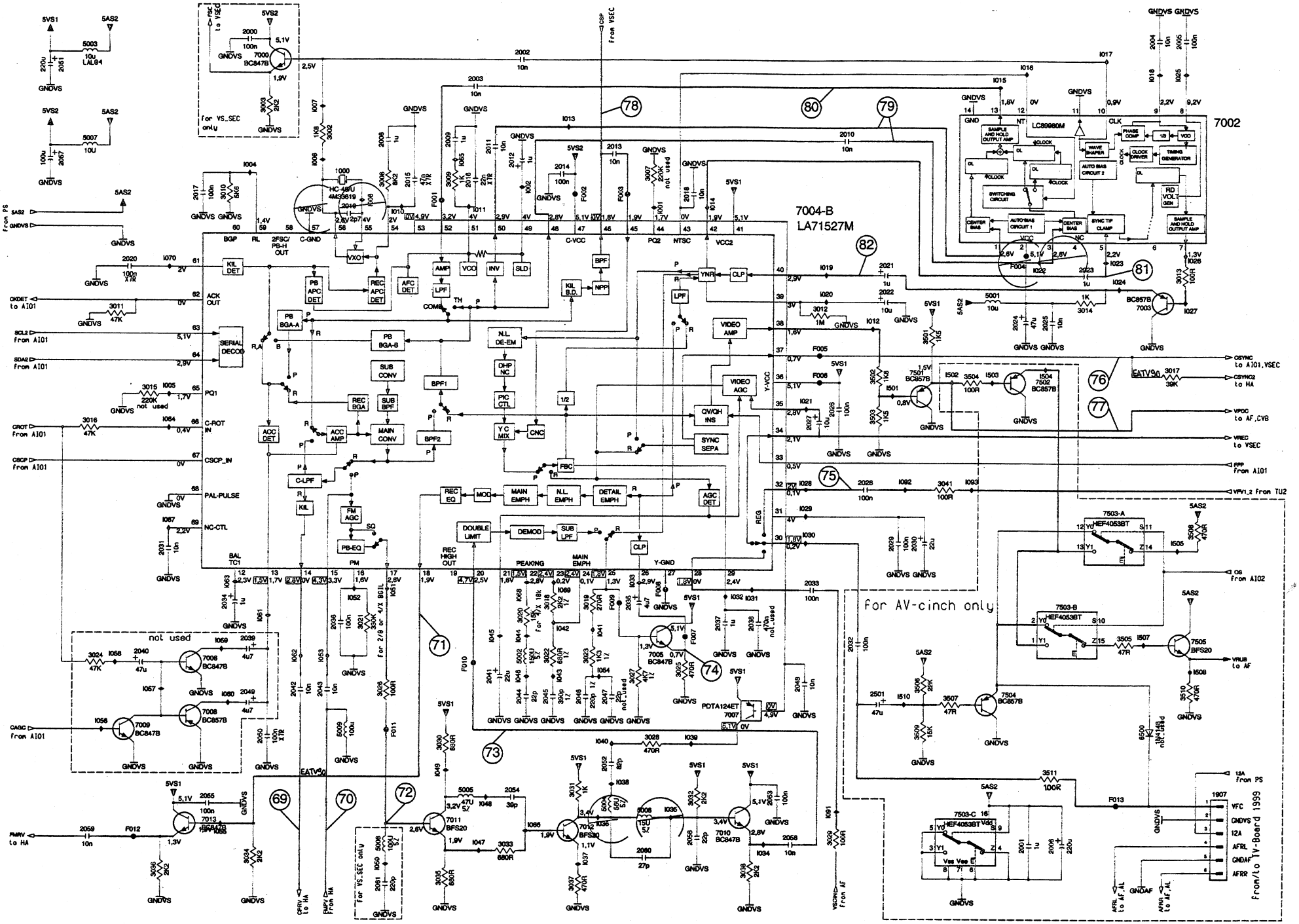
SECAM Processing (VSEC) - Recorder Unit Board (RUBAD)



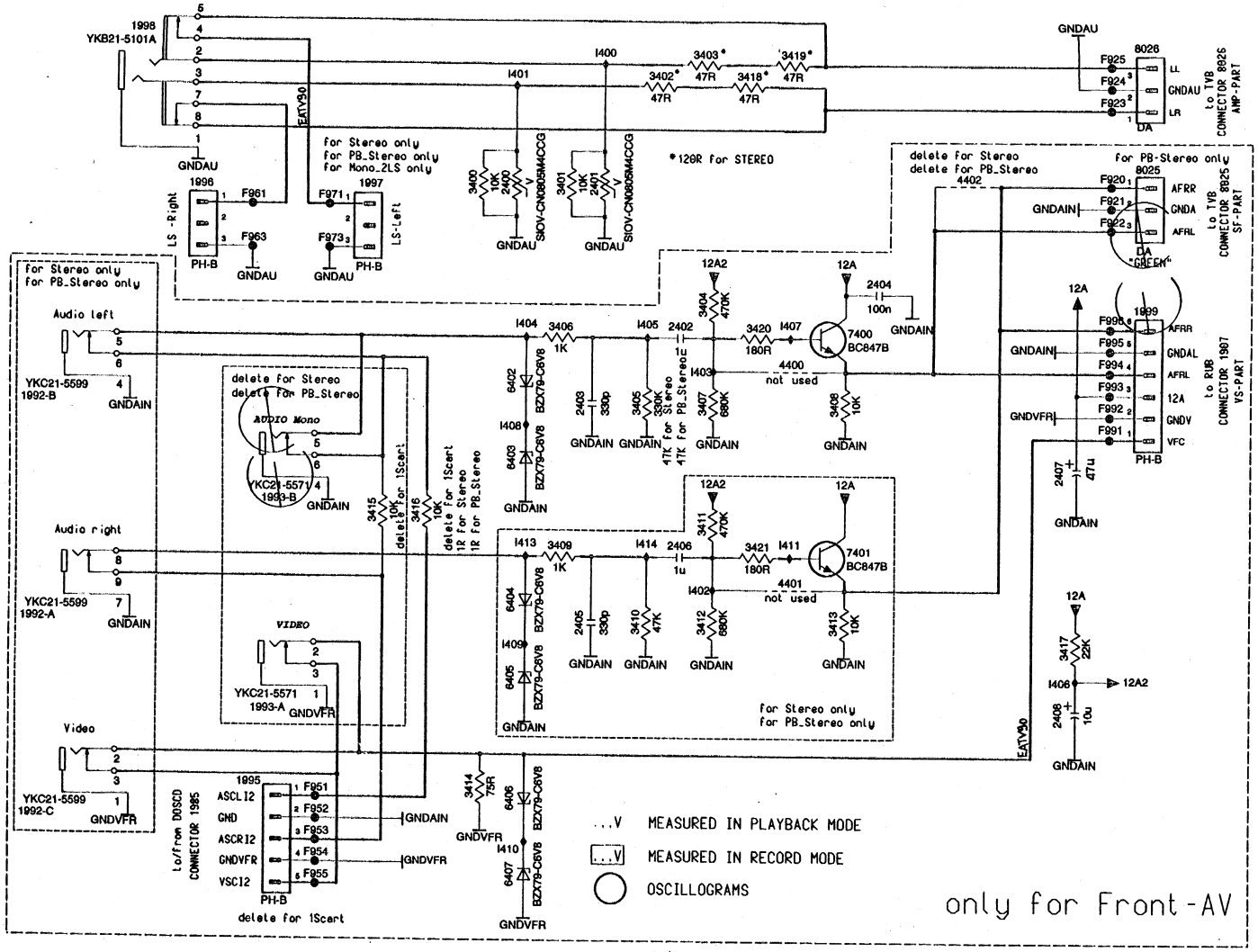
PHILIPS Telai TVCR 99 Delta/Delta 2000
Linear Audio Processing (AL) - Recorder Unit Board (RUBAD)

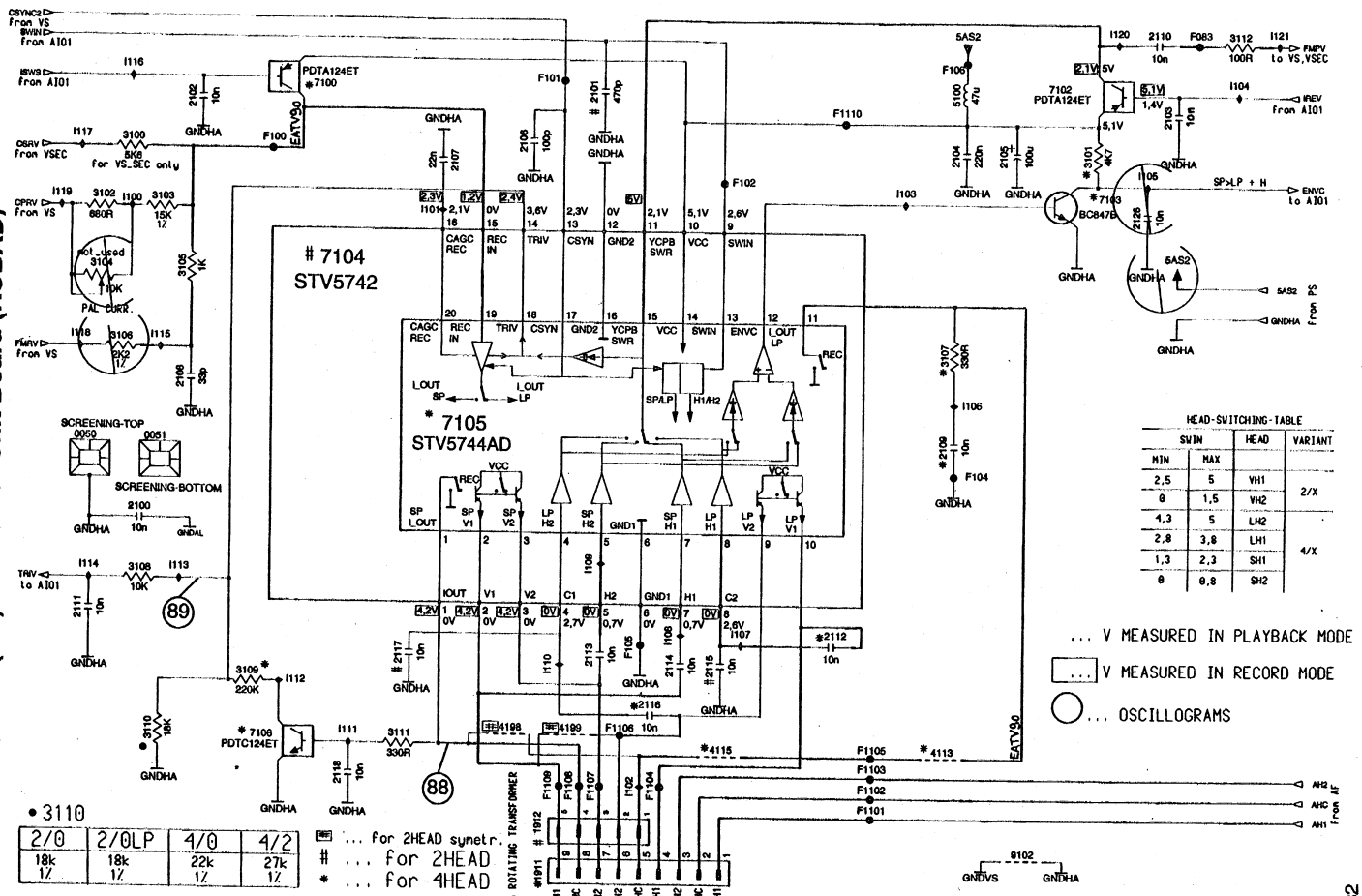


Video Signal Processing (VS) - Recorder Unit Board (RUBAD)



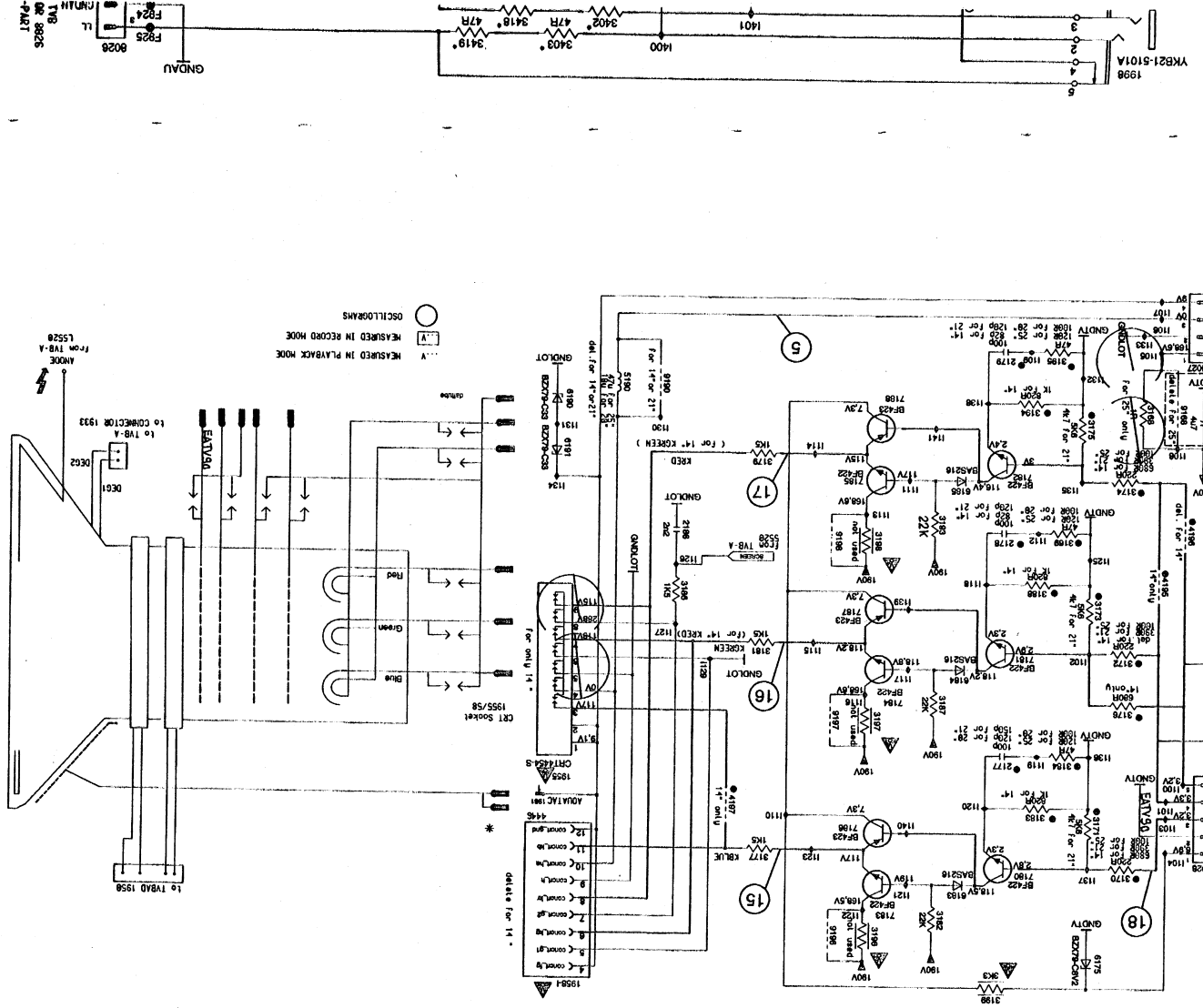
Headphone, Front-AV Board (HPAV)



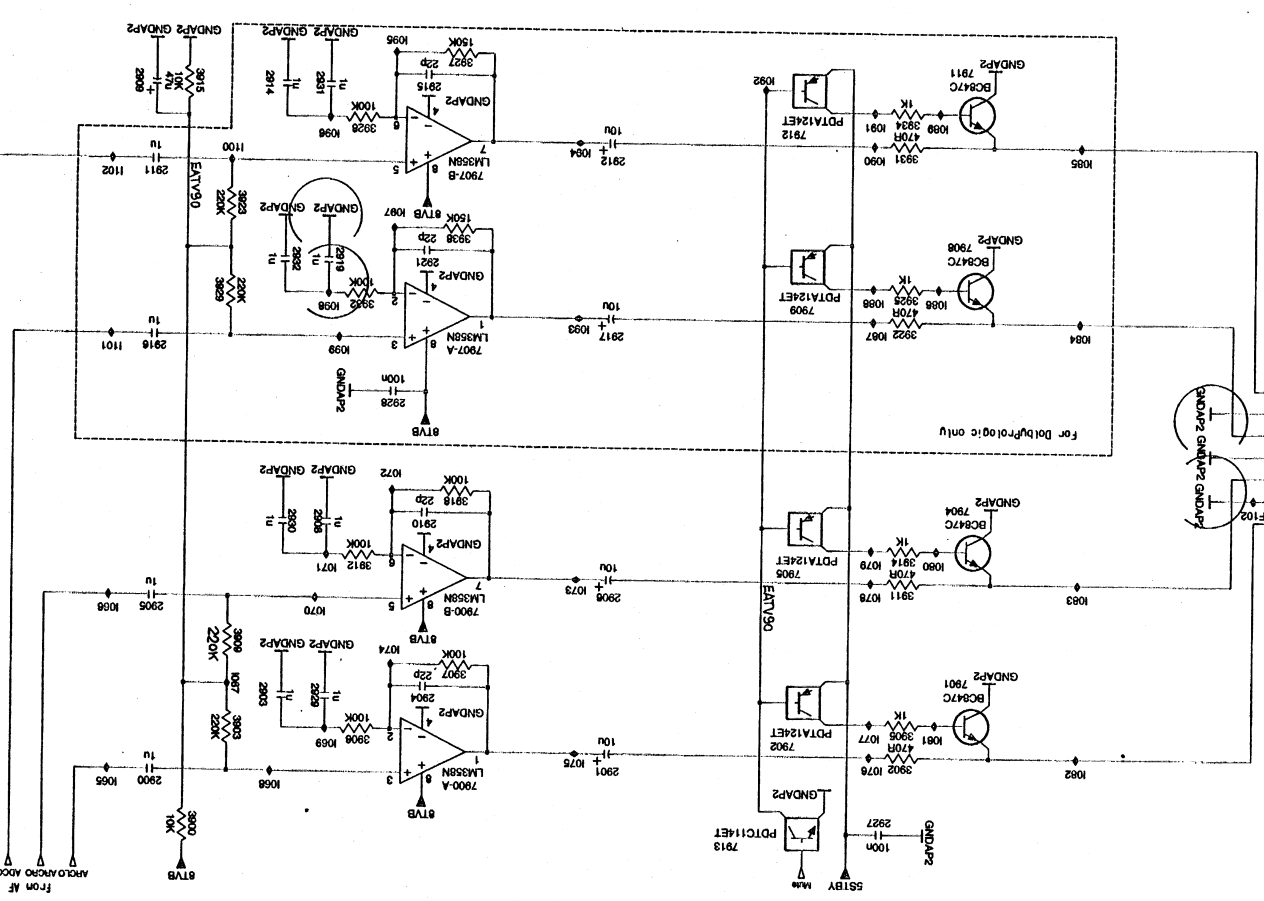


SWIN MIN	SWIN MAX	HEAD	VARIANT
2,5	5	VH1	2/X
0	1,5	VH2	
4,3	5	LH2	4/X
2,8	3,8	LH1	
1,3	2,3	SH1	
0	0,8	SH2	

2/0	2/0LP	4/0	4/2
18k 1%	18k 1%	22k 1%	27k 1%

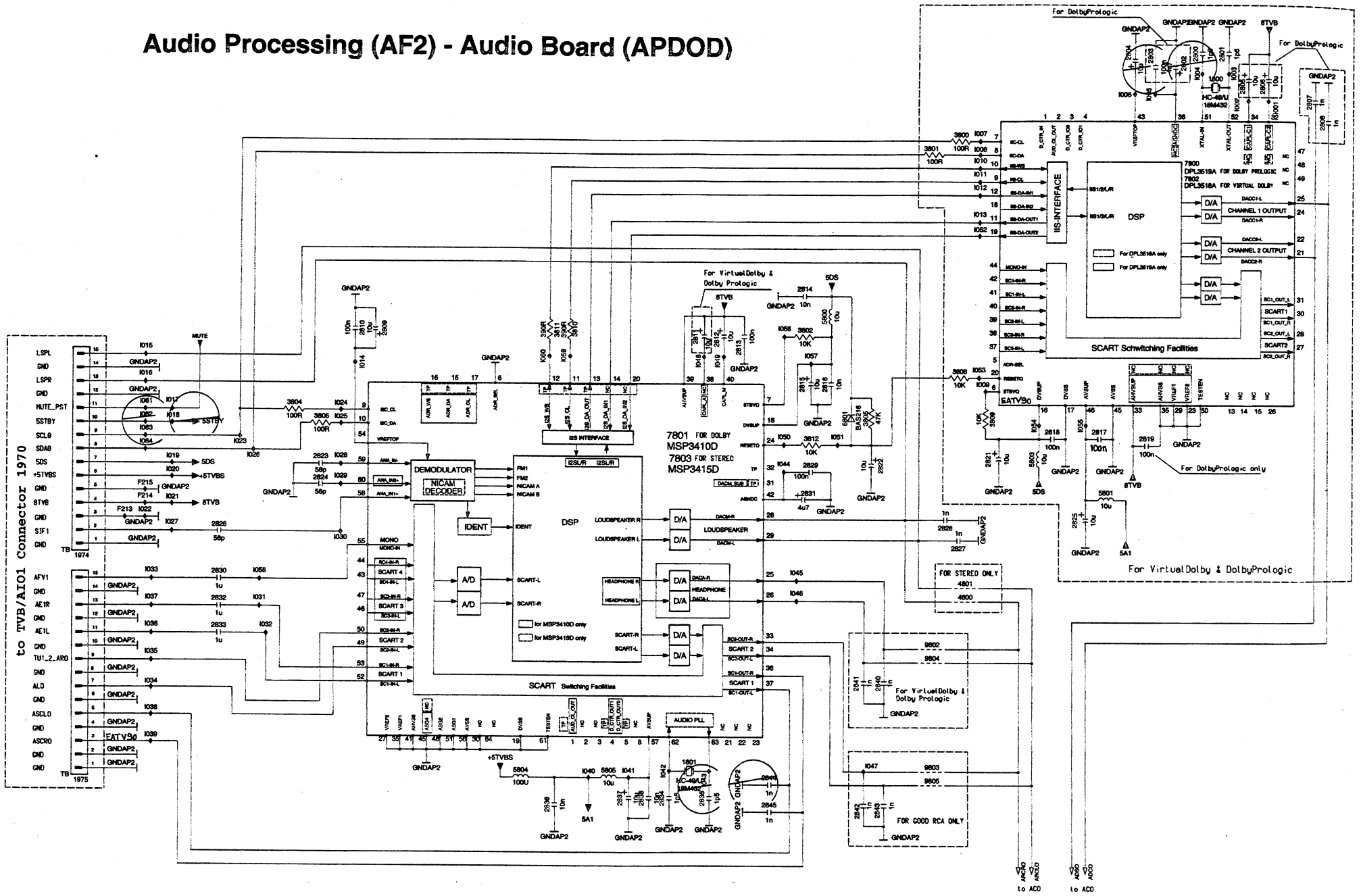


CRT-Board (PT)



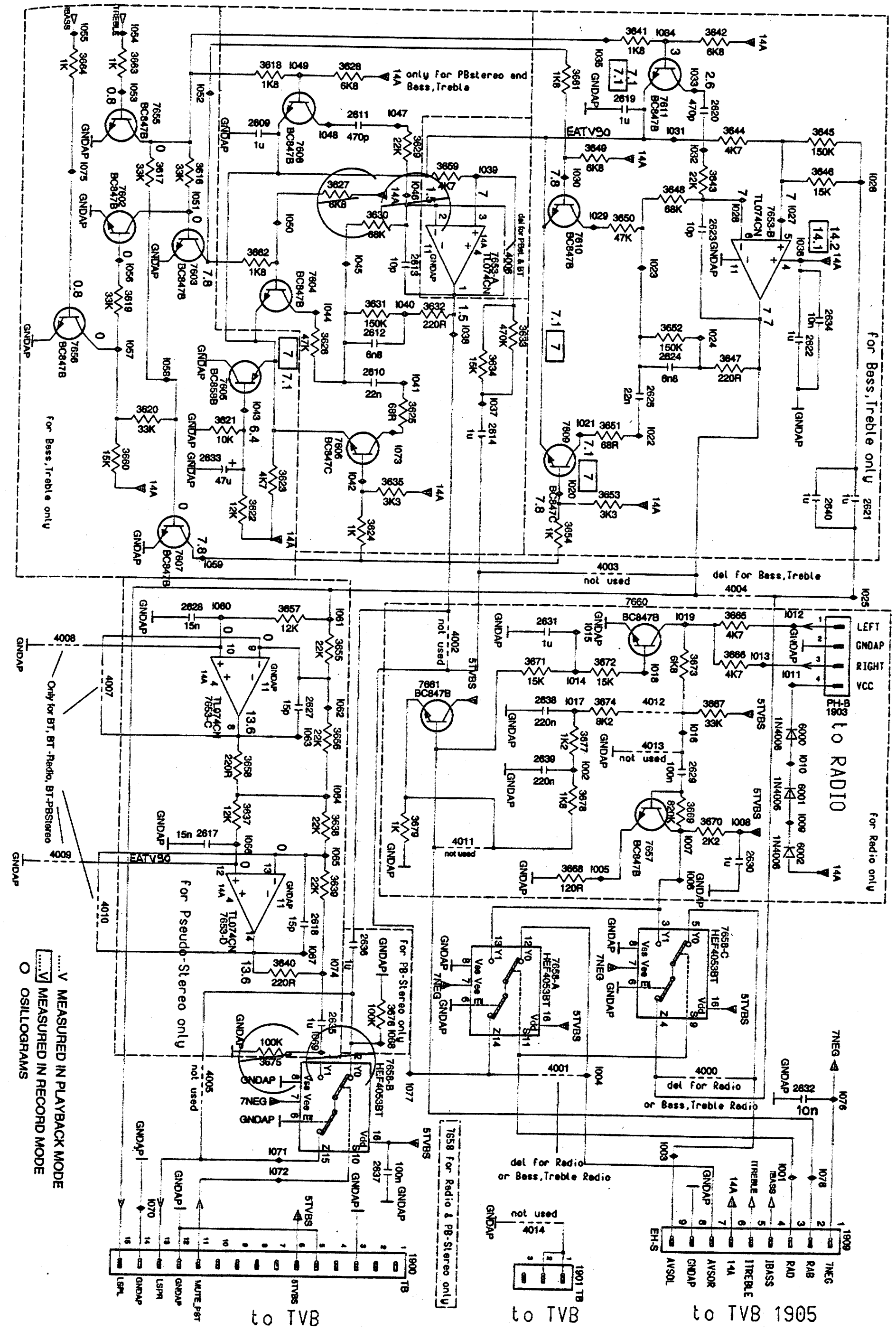
Telai TVCR 99 Delta/Delta 2000 PHILIPS
Pre Amplifier (ACO) - Audio Board (APDOD)

Audio Processing (AF2) - Audio Board (APDOD)

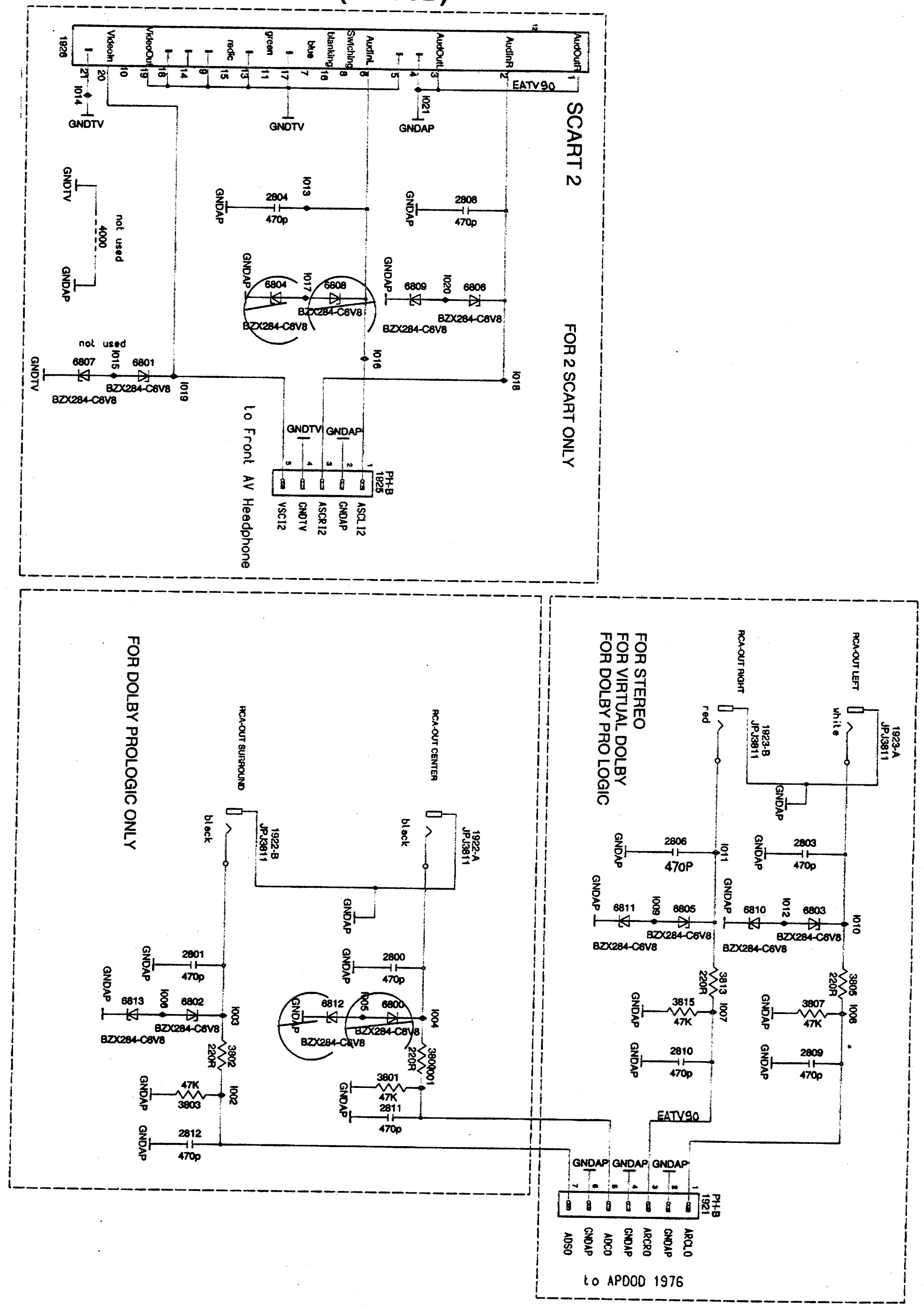


V MEASURED IN PLAYBACK MODE
O OSILLOGRAMS

Sound Feature Board (SFD)

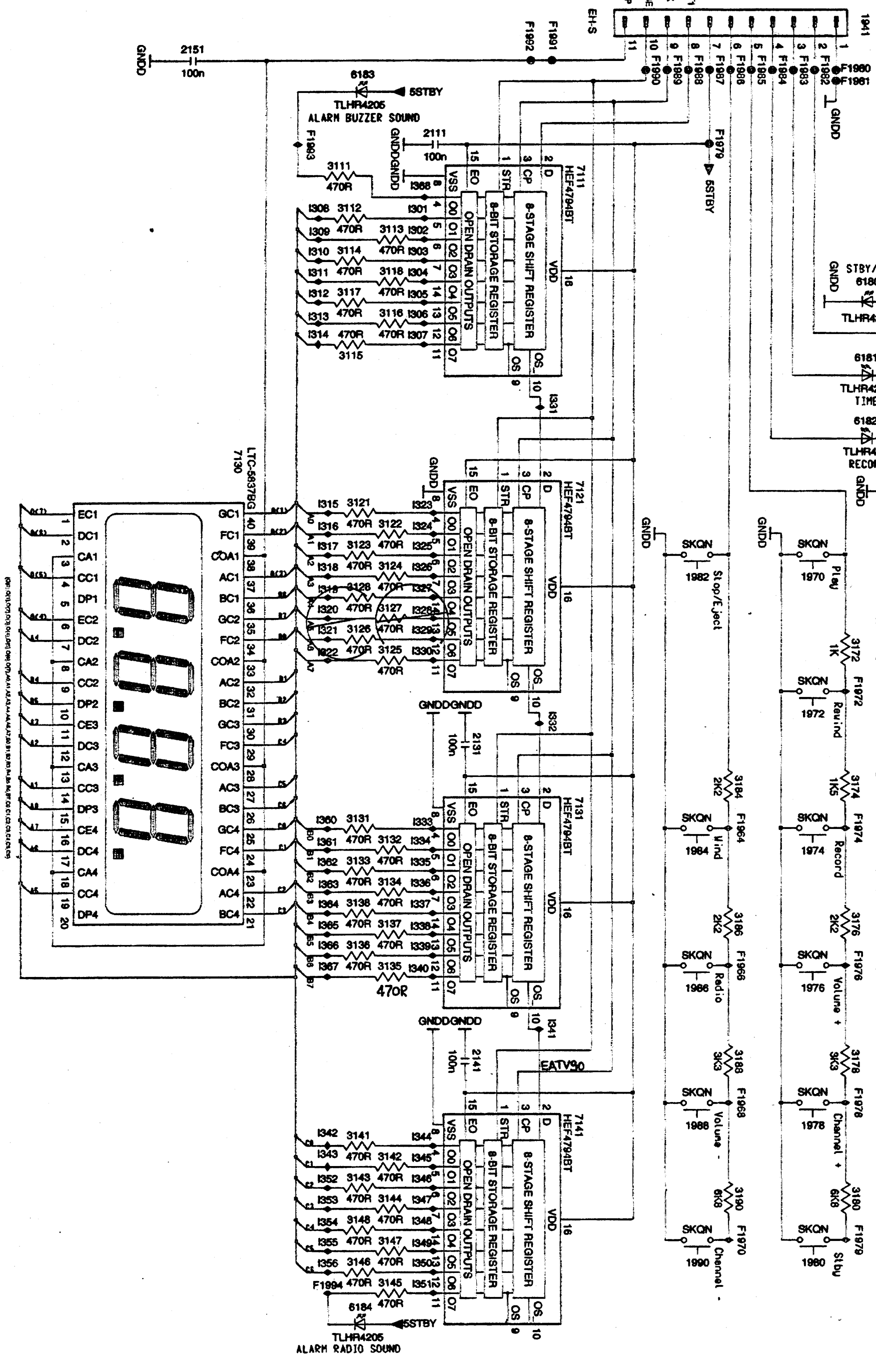


Cinch Out, Scart 2 Board (DOSCD)

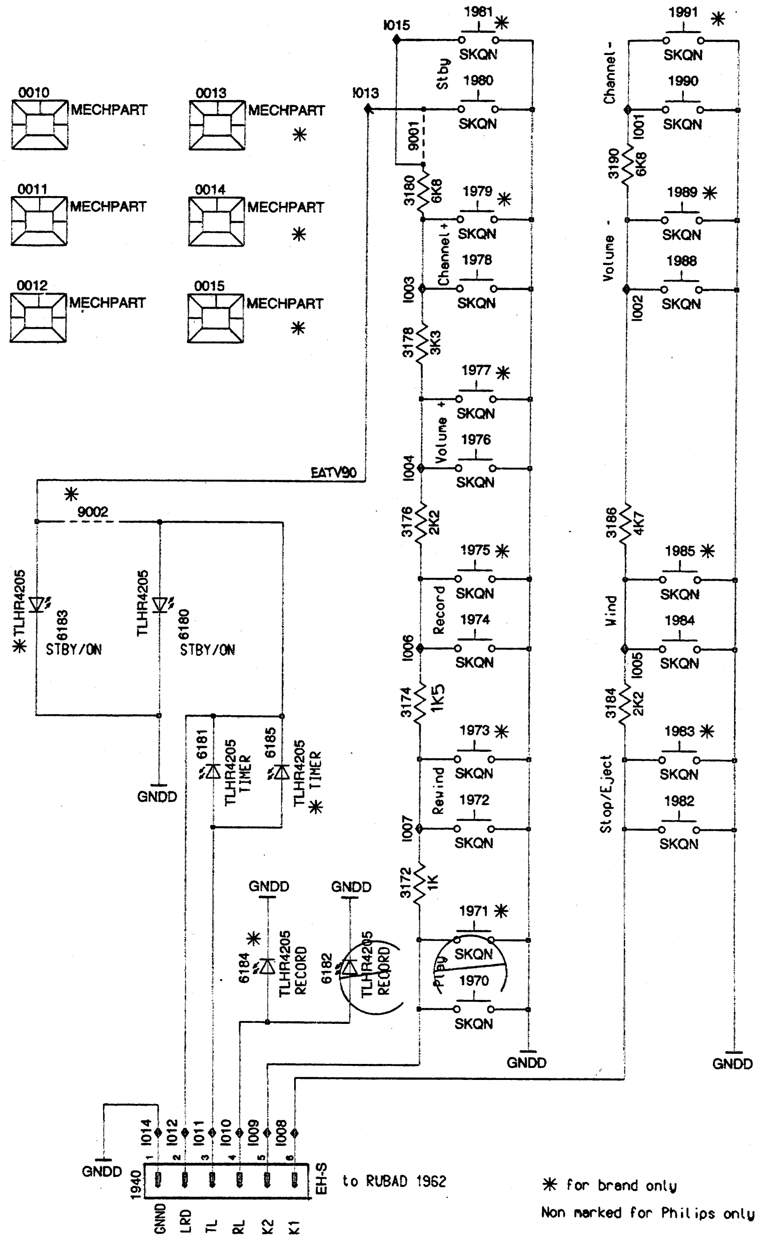


PHILIPS Telai TVCR 99 Delta/Delta 2000

Keys & Display Board (KB1D)



Key Board (KB2D)



Mainsfilter Board (MFSWD)