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
   SERVICE CONTROL MENU
   DTAP1- U.054     DTXU1- U.010
   Exit:MENU          Co.Menu:OK
                        Keys:∧∨
```

Fig. 1-5

Service Control Menu

```
           SERVICE CONTROL
   EEPROM CLEAR
   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:∧∨
```

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

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.

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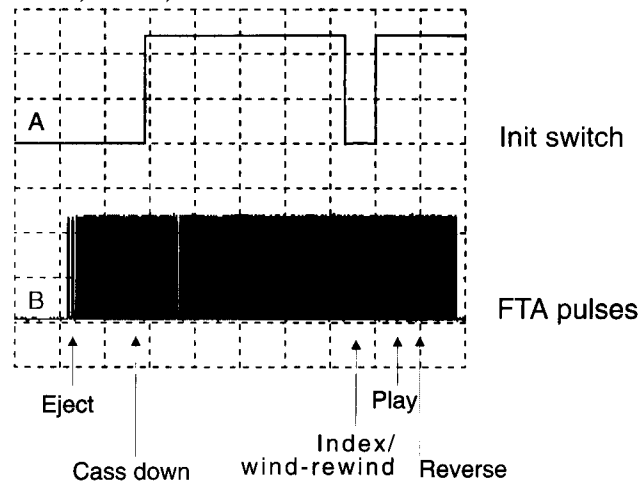B: DC, 2 V/Div, 0.5 s/Div

Fig. 1-7

E.3.2 Loading pulses

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

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

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	198 ±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             FO 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 (1981). Where a conventional ROM/EPROM is fitted, "NO" will be displayed.

E.3.9 Drive error codes

```
       SERVICE STATUS
  . . .
  BOOT SOFTWARE          YES
  DECK ERROR             FO 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.
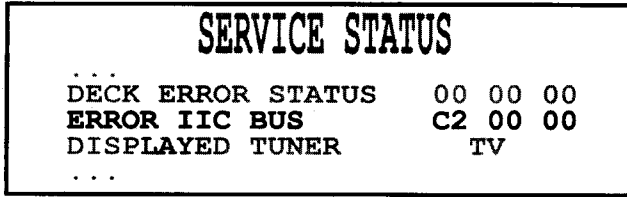
Note: If one of the signals described is not available, the unit attempts to move the lift to the „EJECT" position.

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     00 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)
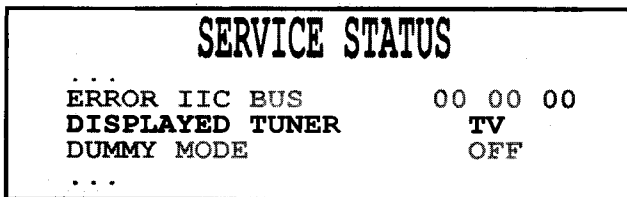- Std By LED is flashing >> Error in TXT µC (IC7804/TVB)

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
B8	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
. . .
```
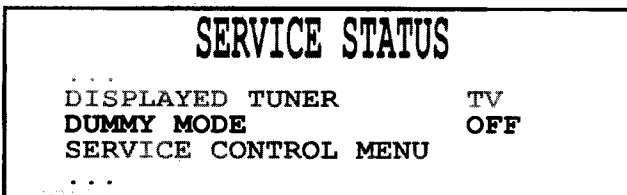
For measurements and signal tracing without a drive, the unit can be switched to Dummy Mode. This switches off all the motors and the sensors are ignored. The drive can be removed following activation (see Instructions for Removal). All drive statuses can now be selected (Play, Record,...) and the electronics (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
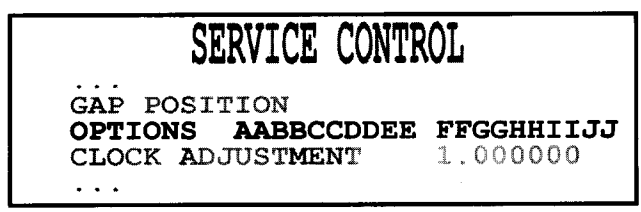- operating hours
- error codes

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 "MENÜ" button (service menu is switched off and the old values are retained). Pressing "MENÜ" again switches the service menu back on.
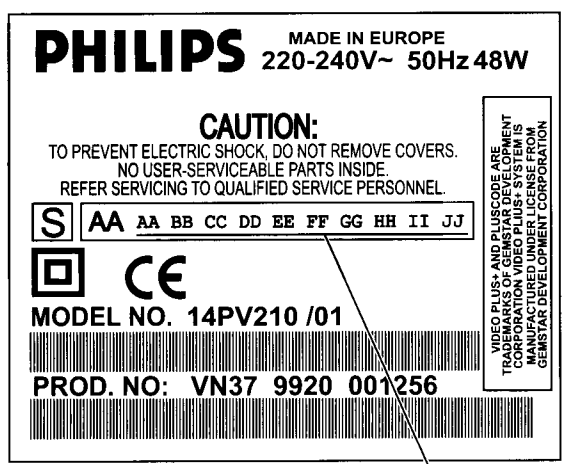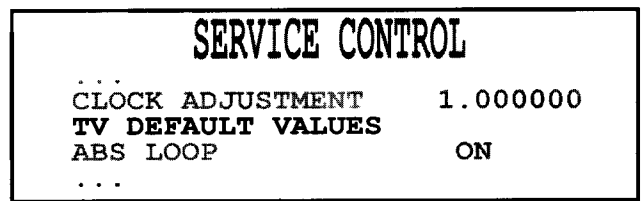

Fig. 1-12

E.4.4 Clock adjustment

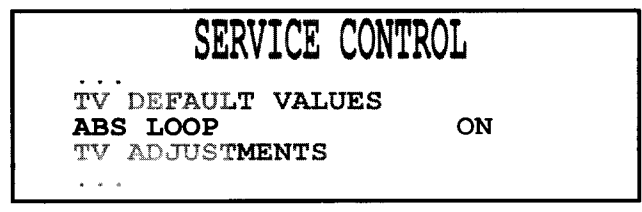The description of this setting is given in **Chapter 2.E. Electrical settings**

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