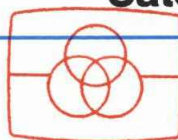


HERDRUK

Satellite tuner STU 902/05R



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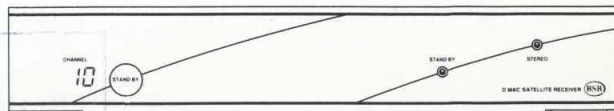
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Service Manual

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TECHNICAL DATA

MAINS VOLTAGE	: 240 V $\approx \pm 10\%$ - 50 Hz
POWER CONSUMPTION	: 22 W (ϕ 20 W)
TV SYSTEM	: DMAC Frequency modulated conditional acces according to the eurycypher system
FREQUENCY RANGE	: 950 - 1350 MHz
AERIAL INPUT IMPEDANCE	: 75 Ω

FREQUENCY TABLE

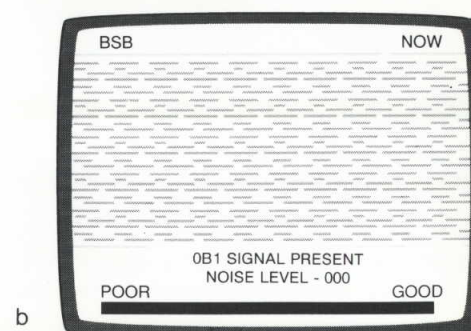
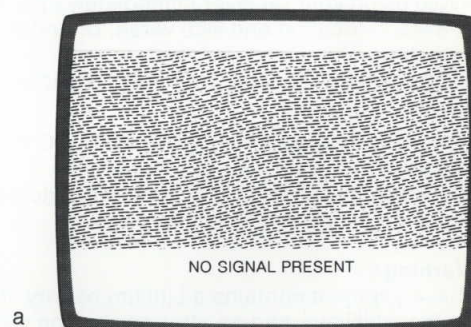
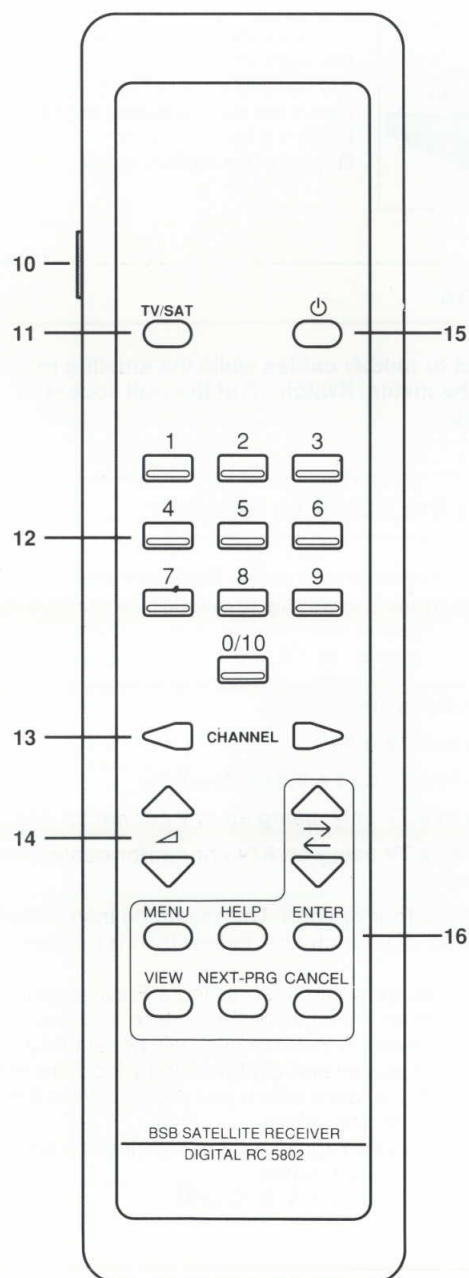
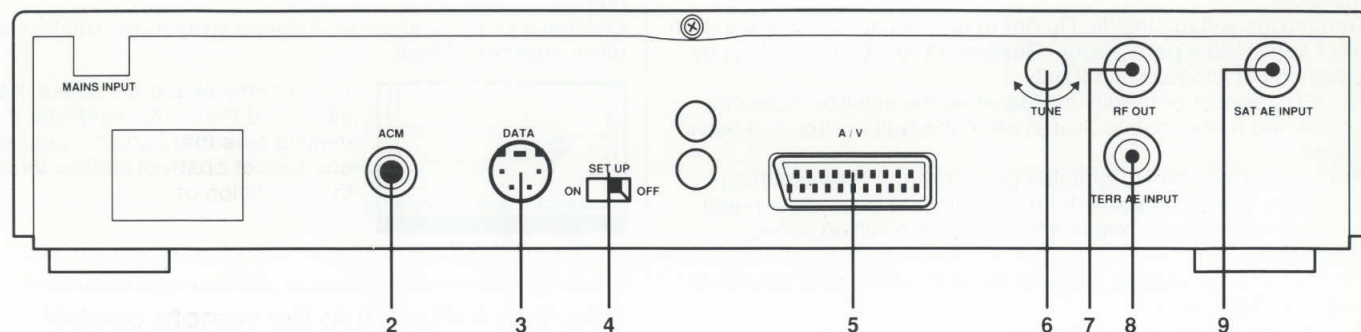
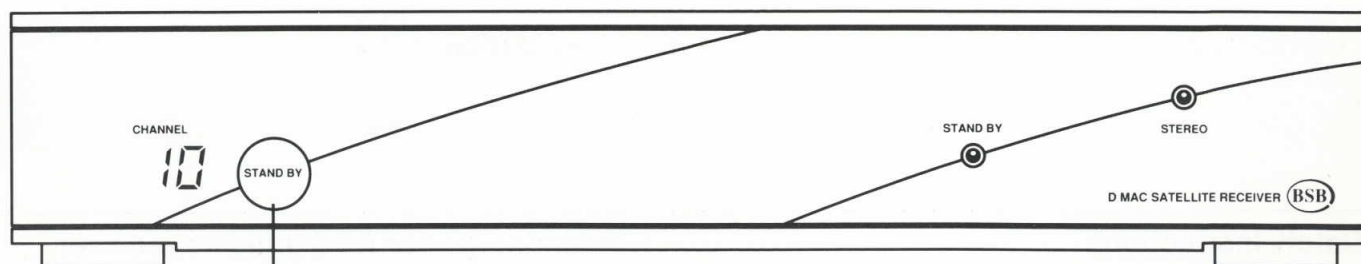
Channel	Program	SHF Frequency	Sat.Aerial Input Freq.
2	6	11746.66 MHz	977.48 MHz
4	5	11785.02 MHz	1015.84 MHz
6	7	11823.38 MHz	1054.20 MHz
8	3	11861.74 MHz	1092.56 MHz
10	8	11900.10 MHz	1130.92 MHz
12	2	11938.46 MHz	1169.28 MHz
14	9	11976.82 MHz	1207.64 MHz
16	4	12015.18 MHz	1246.00 MHz
18	10	12053.54 MHz	1284.36 MHz
20	1	12091.90 MHz	1322.72 MHz

UHF OUTPUT

STANDARD	: PAL/I
CHANNEL	: Adjustable from 30 to 39, preset on channel 38.
IMPEDANCE	: 75 Ω
LEVEL	: 73 ± 4 dB μ V peak value on 75 Ω at standard modulation.
SOUND	: Mono, freq. modulated $\Delta F = \pm 50$ kHz at 100 % modulation, 50 μ s preemphasis. Level relative to vision is -14 ± 4 dB. In case of stereo sound received, S = (L + R)/2.

SCART PLUG OUTPUT

- | | |
|--|---|
| 1. Audio ϕ R (0,5 V RMS) $\leq 1K\Omega$ | 12. |
| 2. | 13. Red $\perp$ |
| 3. Audio ϕ L (0,5 V RMS $\leq 1K\Omega$) | 14. |
| 4. Audio $\perp$ | 15. Red ϕ (0,7 V/75 Ω) |
| 5. Blue $\perp$ | 16. RGB blanking ϕ 0-0,4 V/75 Ω (L) 1-3 V/75 Ω (H) |
| 6. | 17. CVBS $\perp$ |
| 7. Blue ϕ (0,7 V/75 Ω) | 18. CVBS $\perp$ |
| 8. Status CVBS 0-2 V (L) 10-12 V (H) | 19. CVBS ϕ (1 V/75 Ω) |
| 9. Green $\perp$ | 20. |
| 10. | 21. Earth screen |
| 11. Green ϕ (0,7 V/75 Ω) | |



Introduction

1

Safety Instructions

To avoid short-circuits, which may cause fire or electric shock, do not expose this BSB satellite receiver to rain or moisture.

Dangerous voltage inside. Do not open the cabinet. There are no user serviceable parts inside. Repairs should be carried out by qualified service personnel only.

NEVER connect or modify cables while the satellite receiver is connected to the mains. Switch off at the wall socket or remove the plug.

Ensure that no objects or fluids pass through the ventilation openings. If liquid is spilt into the satellite receiver, disconnect the receiver from the mains and consult a qualified service technician.

Do not put your satellite receiver close to an external source of heat (radiator, etc.).

Ensure that air can circulate freely through the ventilation openings of the receiver.

Avoid using the receiver on soft surfaces or near appliances generating strong magnetic fields (e.g. motors, transformers). Do not use your satellite receiver in dusty places or where it may be subject to vibration.

Avoid using your receiver immediately after moving from a cold to a warm location and vice versa, or under conditions of high humidity.

If you have to transport your satellite receiver, avoid violent shocks.

Your satellite receiver supplies a 20V DC voltage to your satellite aerial.

Make sure you only connect your satellite aerial to the satellite aerial input, see 9, and nothing else.

Warning

This equipment contains a Lithium battery. It is not a user replaceable item and no attempt shall be made to replace it.

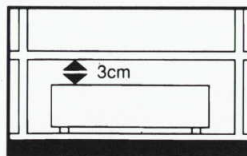
Installation

2

Positioning your BSB satellite receiver

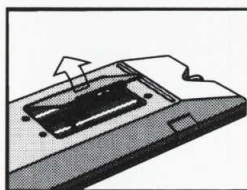
The receiver is intended for use in a domestic environment only and should never be operated or stored in excessively hot or humid atmospheres.

Choose a position at some distance away from radiators or other sources of heat.



Leave some space of no less than 3 cm all around the set for ventilation, making sure that curtains, cupboards etc. cannot obstruct air flow through the ventilation openings.

Inserting batteries in the remote control



Remove the battery cover located on the back of the remote control handset. Insert the two batteries supplied (type LR03 1.5 V). Replace the battery cover.

Connections

NEVER connect or modify cables while the satellite receiver is connected to the mains. Switch off at the wall socket or remove the plug.

Connecting the satellite receiver

Connecting your receiver to a Video Recorder and or TV

This section describes the ways you can connect your satellite receiver to the equipment you have at home, depending on the equipment you have, such as TV and Video Recorder.

The following options are possible:

- A Connection to a TV only**
- B Connection to a TV and a Video Recorder**
- C Connection to a TV only, using an A/V connector cable**
- D Connection to a TV using an A/V connector cable, and a Video Recorder**

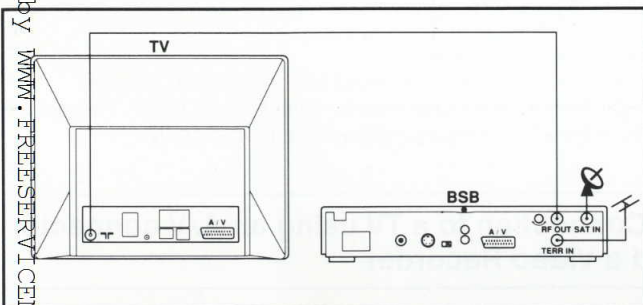
Select one of these four options. Then read the instructions for correct connection of your choice. Follow the instructions step by step.

Using an A/V connector cable (also called a Euroconnector cable or SCART cable) will improve the picture and sound quality of your satellite receiver. In this case you will benefit fully from the excellent picture quality and digital sound which the new DMAC transmission standard offers you. Consult your dealer about these A/V connector cables.

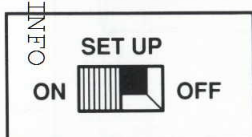
Stereo sound can only be reproduced by connecting a stereo TV receiver by means of an A/V cable.

For connections see sections **A**, **B**, **C** or **D**.

A. Connection to a TV only



- 1 Make the connections shown above using the cable supplied.
- 2 Now connect your satellite receiver to the mains socket.
- 3 Switch your TV ON.



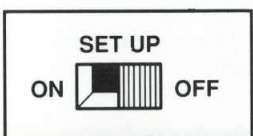
- 4 Switch the SETUP switch to ON, see (4).

- 5 Press 5 on your remote control. The channel indication on your satellite receiver will show 5.
- 6 Select a spare channel on your TV and tune your TV until you have found a picture from the satellite receiver. It should look like one of the pictures 'a' or 'b' on the fold-out flap. If necessary consult your TV operating instructions.

(If the satellite signal is present the noise level indication bar may be used to optimise the position of your BSB satellite antenna. The longer the bar, the better you will receive the BSB programmes.)

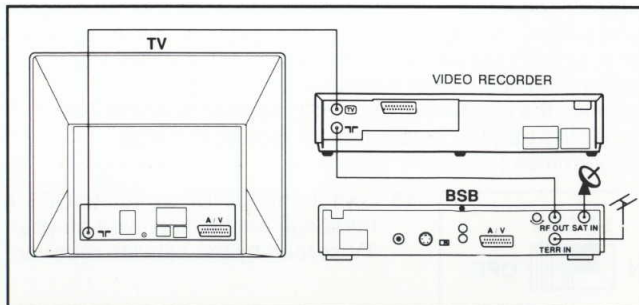


- 7 If the reception of any TV station is of poor quality as a result of adding the satellite receiver, using a small screwdriver turn the tuning control (6) on the satellite receiver until the reception is good. Then repeat step 6 above.
- 8 If the picture on your TV screen is as picture 'a' on the fold-out flap, your BSB satellite antenna is not properly positioned or not connected. It will be necessary to re-position your antenna until the picture on your TV screen is as picture 'b'. Please refer to the installation instructions for your BSB satellite antenna. (When the satellite signal is present the noise level indication bar may be used to optimise the position of your BSB satellite antenna. The longer the bar, the better you will receive the BSB programmes.)



- 10 Now please follow the instructions in the BSB booklet 'Important Instructions How to switch on to BSB'. You will also find the instructions in this booklet in section 'E'.

B. Connection to a TV and a Video Recorder



- 1 Make the connections as shown above.
- 2 Now connect your satellite receiver to the mains socket.
- 3 Switch your TV ON.



- 4 Switch the SETUP switch to ON, see (4).

- 5 Press 5 on your remote control. The channel indication on your satellite receiver will show 5.
- 6 Switch your Video Recorder to ON.
- 7 Select the channel, on your TV, which you use to view your Video Recorder.



- 8 Do you have patterning on the picture? If there is patterning adjust the TUNE control (6) on the back of the satellite receiver. Only a small adjustment, sufficient to remove the patterning, should be made at a time.

- 9 Select a spare channel on your TV and tune your TV until you have found a picture from the satellite receiver. It should look like one of the pictures 'a' or 'b' on the fold-out flap. If necessary consult your TV operating instructions.

(If the satellite signal is present the noise level indication bar may be used to optimise the position of your BSB satellite antenna. The longer the bar, the better you will receive the BSB programmes.)

- 10 Switch your TV to each of the BBC, ITV etc channels in turn and check whether the picture is satisfactory. If all is well **proceed to step 14 below**. If there is patterning repeat steps 7, 8, 9 and 10 above.

Note: If you have repeated steps 7, 8, 9 and 10 several times without obtaining satisfactory reception on all channels it may be necessary to retune the 30-39 channel control on your Video Recorder:

- 11 Retune your Video Recorder 30-39 channel control (see your instruction manual).
- 12 Retune your TV to the Video Recorder channel.
- 13 Go to step 8 above.
- 14 Select the channel, on your TV, which you use to view your Video Recorder.
- 15 Tune your Video Recorder to the satellite channel. You will obtain a picture like one of the pictures 'a' or 'b' on the fold-out flap.
- 16 Select the channel, on your TV, which you have chosen in step 9 to view your satellite receiver.

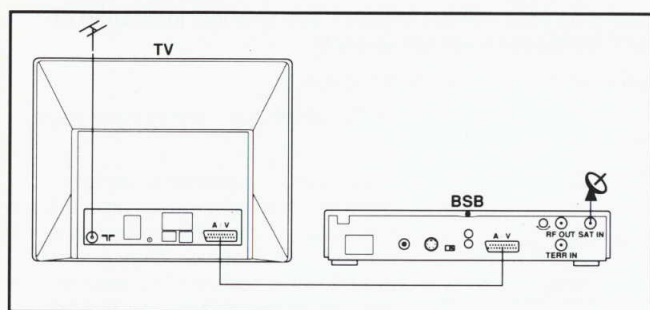
- 17 If the picture on your TV screen is as picture 'a' on the fold-out flap, your BSB satellite antenna is not properly positioned or not connected. It will be necessary to re-position your antenna until the picture on your TV screen is as picture 'b'. Please refer to the installation instructions for your BSB satellite antenna. (When the satellite signal is present the noise level indication bar may be used to optimise the position of your BSB satellite antenna. The longer the bar, the better you will receive the BSB programmes.)



- 18 Switch the SETUP switch to OFF. A message will be displayed on your TV screen by the satellite receiver.

Now please follow the instructions in the booklet called 'Important Instructions How to switch on BSB'. You will also find the instructions in this booklet in section 'E'.

C. Connection to a TV only, using an A/V connector cable



- 1 Make the connections as shown above.
- 2 Now connect your satellite receiver to the mains socket.
- 3 Switch your TV ON.



- 4 Switch the SETUP switch to ON, see (4).

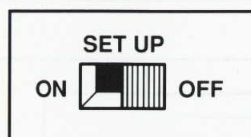
- 5 Press 5 on your remote control. The channel indication on your satellite receiver will show 5.
- 6 You should now see a picture on your TV receiver. It should look like one of the pictures 'a' or 'b' on the fold-out flap. If you do not see a picture you may have to select the A/V input on your TV.

(If the satellite signal is present the noise level indication bar may be used to optimise the position of your BSB satellite antenna. The longer the bar, the better you will receive the BSB programmes.)

With some TV sets it may be impossible to select a normal TV programme while the satellite receiver is switched on. If this occurs press the green TV/SAT button, see (11) on your remote control **once**. You are now able to select and watch TV programmes.

(If you wish to return later on to the satellite programmes, press the green TV/SAT button **once** again.)

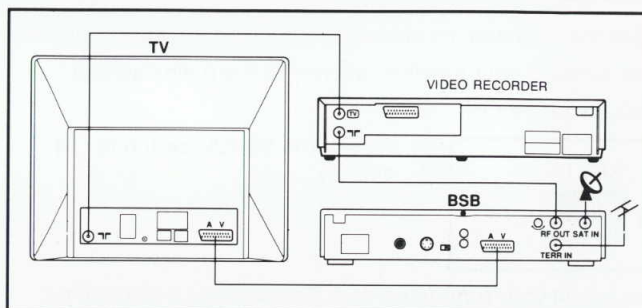
- 7 If the picture on your TV screen is as picture 'a' on the fold-out flap, your BSB satellite antenna is not properly positioned or not connected. It will be necessary to re-position your antenna until the picture on your TV screen is as picture 'b'. Please refer to the installation instructions for your BSB satellite antenna. (When the satellite signal is present the noise level indication bar may be used to optimise the position of your BSB satellite antenna. The longer the bar, the better you will receive the BSB programmes.)



- 8 Switch the SETUP switch OFF. A message will be displayed on your TV screen by the satellite receiver.

- 9 Now please follow the instructions in the BSB booklet 'Important Instructions How to switch on to BSB'. You will also find the instructions in this booklet in section 'E'.

D. Connection to a TV using an A/V connector and a Video Recorder



- 1 Make the connections as shown above.
- 2 Now connect your satellite receiver to the mains socket.
- 3 Switch your TV ON.



- 4 Switch the SETUP switch to ON, see (4).

- 5 Press 5 on your remote control. The channel indication on your satellite receiver will show 5.
- 6 You should now see a picture on your TV receiver. It should look like one of the pictures 'a' or 'b' on the fold-out flap. If you do not see a picture you may have to select the A/V input on your TV.

(If the satellite signal is present the noise level indication bar may be used to optimise the position of your BSB satellite antenna. The longer the bar, the better you will receive the BSB programmes.)

With some TV sets it may be impossible to select a normal TV programme while the satellite receiver is switched on. If this occurs press the green TV/SAT button, see (11) on your remote control **once**. You are now able to select and watch TV programmes and Video Recorder.

(If you wish to return later on to the satellite programmes, press the green TV/SAT button **once** again.)

- 7 Switch your Video Recorder to ON.
- 8 Select the channel, on your TV, which you use to view your Video Recorder.



- 9 Do you have patterning on the picture? If there is patterning adjust the TUNE control (6) on the back of the satellite receiver. Only a small adjustment, sufficient to remove the patterning, should be made at a time.

- 10 Switch your TV to each of the BBC, ITV etc channels in turn and check whether the picture is satisfactory. If all is well **proceed to step 14 below**. If there is patterning repeat steps 8 and 9 above.

Note: If you have repeated steps 8, 9 and 10 several times without obtaining satisfactory reception on all channels it may be necessary to retune the 30-39 channel control on your Video Recorder:

- 11 Retune your Video Recorder 30-39 channel control (see your instruction manual).
- 12 Retune your TV to the Video Recorder channel.
- 13 Go to step 8 above.
- 14 Select the channel, on your TV, which you use to view your Video Recorder.
- 15 Tune your Video Recorder to the satellite channel. You will obtain a picture like one of the pictures 'a' and 'b' on the fold-out flap.
- 16 Select the satellite receiver, on your TV, by selecting the A/V input on your TV, or by pressing the green TV/SAT button.
- 17 If the picture on your TV screen is as picture 'a' on the fold-out flap, your BSB satellite antenna is not properly positioned or not connected. It will be necessary to re-position your antenna until the picture on your TV screen is as picture 'b'. Please refer to the installation instructions for your BSB satellite antenna. (When the satellite signal is present the noise level indication bar may be used to optimise the position of your BSB satellite antenna. The longer the bar, the better you will receive the BSB programmes.)



- 18 Switch the SETUP switch to OFF. A message will be displayed on your TV screen by the satellite receiver.

Now please follow the instructions in the booklet called 'Important Instructions How to switch on BSB'. You will also find the instructions below.

E. Authorisation

Once your receiver has been correctly installed it must be authorised by BSB before you can watch any BSB programmes, even those supplied free. This is done by a simple phone call to BSB's Customer Services identifying your receiver with its unique Equipment Authorisation Number.

To obtain your Equipment Authorisation Number follow these simple steps:

- Press MENU on your remote control for the PROGRAMME CONTROL list.
- Press 1 on your remote control for EQUIPMENT AUTHORISATION.

Your Equipment Authorisation Number will appear on the screen. You now need to phone BSB's Customer Services on **0345 345 888**.

(If you make a mistake simply press MENU and start again).

Operation

3

Note: The only control on your satellite receiver is the STAND-BY switch. The remote control is necessary for all other adjustments.

Switching ON

If your satellite receiver is on STAND-BY (the red light on the front is on), you can switch the receiver on by either pressing a channel number 1...0/10 on your remote control, see (12), or pressing the STAND-BY button, see (1) on the satellite receiver.

Switching OFF

Press , see (15) on your remote control, or the STAND-BY button, see (1), on your satellite receiver.

A red light on the satellite receiver indicates that it is now in STAND-BY.

The sending of the authorisation signals by BSB to individual receivers is a continuous process. In order for your receiver to continue to be authorised to receive and unscramble the signals it should be kept in STAND-BY mode when not being used.

Your receiver is designed to be kept safely on STAND-BY at all times, even when you're not watching BSB programmes. You should therefore not switch off at the wall socket or disconnect the receiver from the mains unless you suspect a fault to have occurred.

Should you need to unplug your receiver for more than four weeks at a time you may need to contact BSB's Customer Services before you can watch BSB programmes again. If this is necessary, a message on the TV screen will tell you what to do.

Remember, we recommend that you keep your receiver in STAND-BY mode whenever you're not watching BSB.

Selecting BSB channels

Press a digit 1...0/10 on your remote control, see (12).

The selected channel appears on the screen.

You may also use the  CHANNEL  buttons, see (13).

When you change a programme the text 'Please wait' appears for several moments.

If there is no programme available on the channel selected the text 'no signal on this channel' appears.

The green TV/SAT button

With some TV sets it may be impossible to select a normal TV programme while the satellite receiver is switched on. This may be the case if e.g.:

you have your satellite receiver connected to your TV by means of an A/V connector cable and
you want to make a recording of a BSB programme while watching a normal TV programme.

If this occurs, you should press the **green TV/SAT button**, see (11), on your remote control **once**. Now you can select and watch TV programmes.

If you wish to return to the satellite programmes, press the same green TV/SAT button **once**, see (11), again.

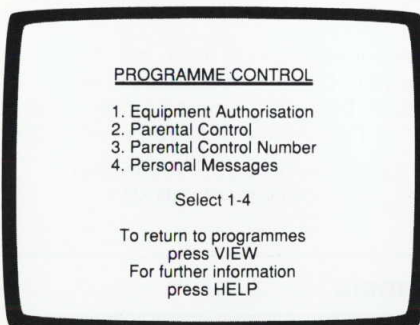
If you do not have any problem changing TV channels while your satellite receiver is switched on, you do not need to use the green TV/SAT button.

The menu buttons on your remote control

The menu buttons, located in the blue field on your remote control, see (16), enable you to control a number of additional features of your satellite receiver. They enable you to see your Equipment Authorisation Number, set your personal Parental Control ratings, see information about the next programme on the channel you're watching, etc.

MENU

When this button is pressed, the PROGRAMME CONTROL list will be displayed.



Buttons 1-4 select the menu screens for equipment authorisation etc. Press MENU again if you wish to return to the Programme Control list or press VIEW to return to satellite TV programmes.

If you press 2, while seeing the PROGRAM CONTROL list, you have selected Parental Control.

Refer to the next section for further use of this feature.

Parental Control

The Parental Control mode may be used to exclude certain types of programmes from being viewed. All programmes are rated by their contents of sex, violence and bad language.

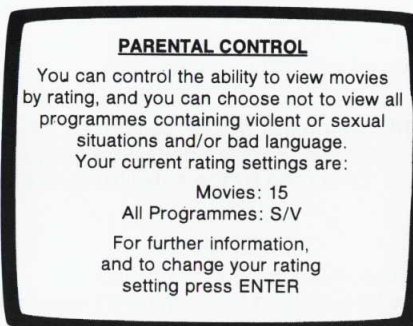
All movies are also rated by BSB according to their suitability for particular age groups: U, PG, 12, 15 and 18.

Programmes with selected ratings can be 'locked out' and only viewed by using a Parental Control Number.

When first delivered your satellite receiver is able to receive all programmes * without restriction and the Parental Control Number is preset to **1234**.

Note: If you wish to use Parental Control you will probably want to change the number to one of your own choice. In order to do so see 'Changing your Parental Control Number' below.

To see your ratings press 2 from the Programme Control List. You will see the screen below.



Enter the Parental Control Number with your remote control (which will be 1234 unless you have already changed it) and follow the instructions on your TV screen. These will guide you through the use of the Parental Control facility.

When you have made the selection you require press VIEW to return to programmes.

* The MOVIE Channel is a subscription channel during the evening and you will not be able to receive these programmes unless you have subscribed to the BSB service.

Changing your Parental Control Number

In order to change your Parental Control Number first obtain the Programme Control list by pressing MENU. Then press 3 to obtain the Parental Control Number Screen. Follow the instructions on the screen and when you have finished press MENU to return to the Programme Control list or VIEW to return to programmes.

If you make a mistake at any time press MENU which will return you to the Programme Control list and start again.

You must remember or make a note of your Parental Control Number. It is *only known by you* and will never be known by BSB.

However, If you forget your Parental Control Number phone BSB Customer Services and they will help you.

ENTER

It is sometimes necessary to press the ENTER button (e.g. after you have entered your Parental Control number). You will always be told when to use this button by means of the message on the screen.

VIEW

Use this button to return to normal pictures when you have been using text menus.

If you press VIEW while watching a BSB programme some information about the programme will be displayed for several moments and disappear automatically.

If for any reason your TV screen is black while you wish to watch a BSB programme, pressing VIEW will give you information about the status of your authorisation.

HELP

Press this button for the HELP function. Additional information will be displayed. Follow the instructions as necessary.



In the HELP screen there is an indication of the present setting of your TV screen format.

At present this setting should be STANDARD.

The new transmission standard DMAC, used by BSB, offers the possibility to also transmit programmes in a so-called WIDESCREEN format. This format is similar to what you see in the cinema. BSB will not start immediately with this kind of transmissions, and a special TV with a WIDESCREEN format will be needed to benefit from this feature. However, your satellite receiver is already prepared for the future use of this feature.

If you want to change the format from STANDARD to WIDESCREEN or vice-versa, press ENTER. You can now select your screen format, using the ← or → buttons.



NEXT PRG

When you press this button information about the next programme on the channel you are watching will be displayed. The information will disappear automatically after a few moments.

CANCEL

If you make a mistake in pressing some buttons, don't worry. Press CANCEL and you will return to the previous situation. Also the text on the screen may sometimes ask you to press CANCEL.

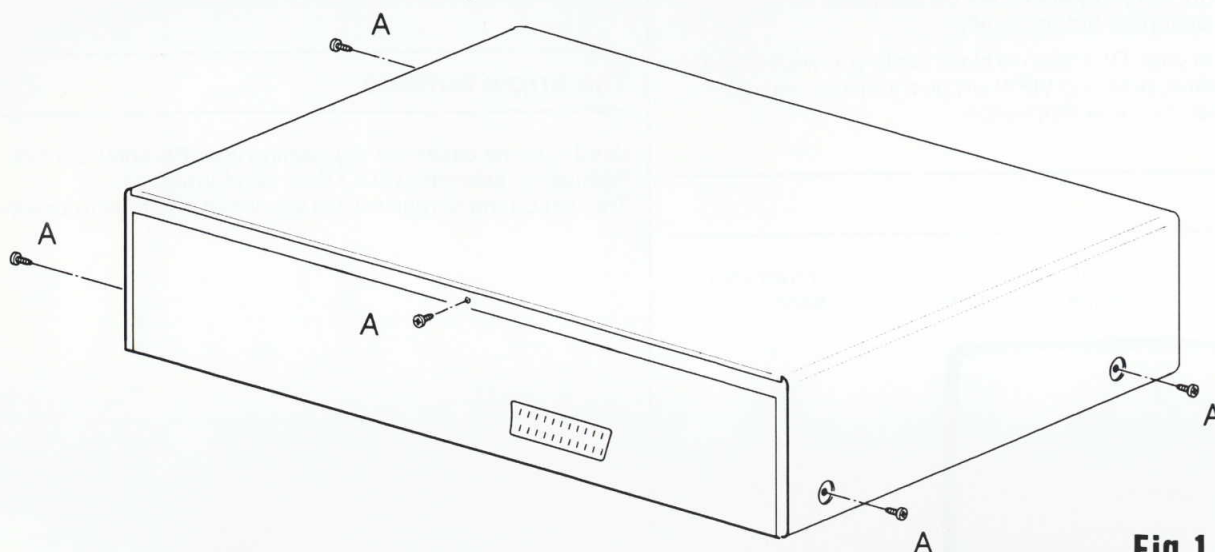
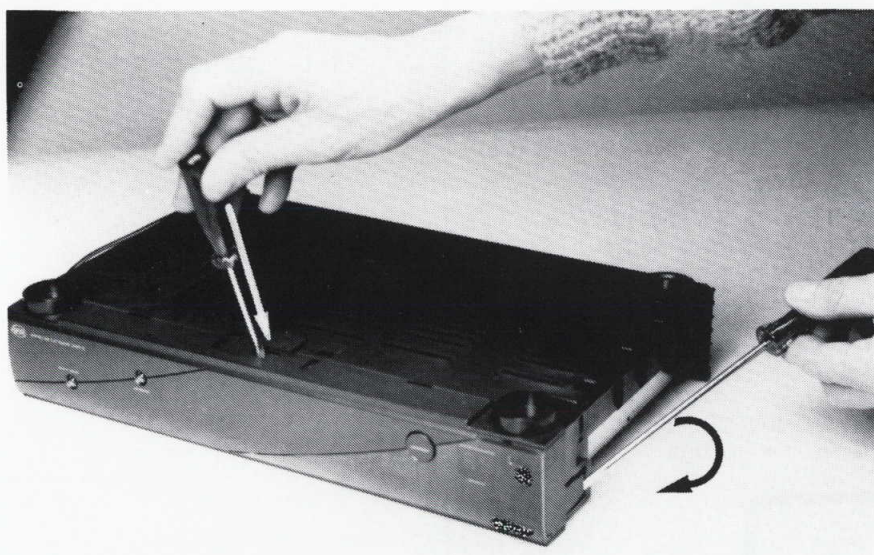
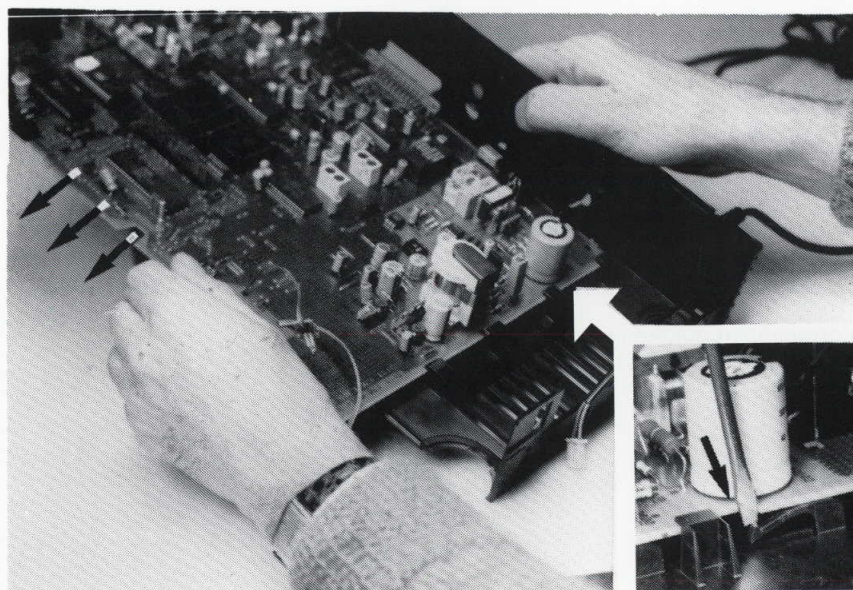
The arrow buttons

Used in some cases for e.g. setting your Parental Control Ratings, or selecting your TV screen format. The text on the screen will tell you when and how to use them.

MECHANICAL INSTRUCTIONS

- Before placing the set in the servicing position, first remove the top of the housing, see Fig. 1.
- Remove the front plate, see Fig. 2
- Remove the chassis, see Fig. 3

REMARK : There are bolts on the left and right.

**Fig.1****Fig.2****Fig.3**

- 11
- WARNINGS**

- Safety regulations demand that set be restored to its original condition and that components identical to the original types be used.
 - Safety components are marked by the symbol 
 - ACM module contains a lithium battery
 - a) Danger of explosion if battery is incorrectly replaced. Must only be replaced by a person having expert knowledge and only with a battery of the same make and type.
 - b) The ambient temperature of the battery must not exceed 50°C. Precautions must be taken by repair shops for storage of ACM modules.

ESD

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected via a wrist wrap with resistance to the same potential as the mass of the set. Keep components and tools at this same potential.

A set to be repaired should always be connected to the mains via a suitable isolating transformer.

Never replace any modules or any other parts while the set is switched on.

Use plastic instead of metal alignment tools in order to preclude short-circuits or to prevent a specific circuit from being rendered unstable.

REMARKS

The direct voltages and waveforms should be measured relative to the nearest earthing point on the printed circuit board.

An unscrambled colour bar pattern has been selected.

The semiconductors specified in the circuit diagram and parts lists are for each position fully interchangeable with the semiconductors in the set, regardless of their type indication.

ADJUSTMENT INSTRUCTIONS

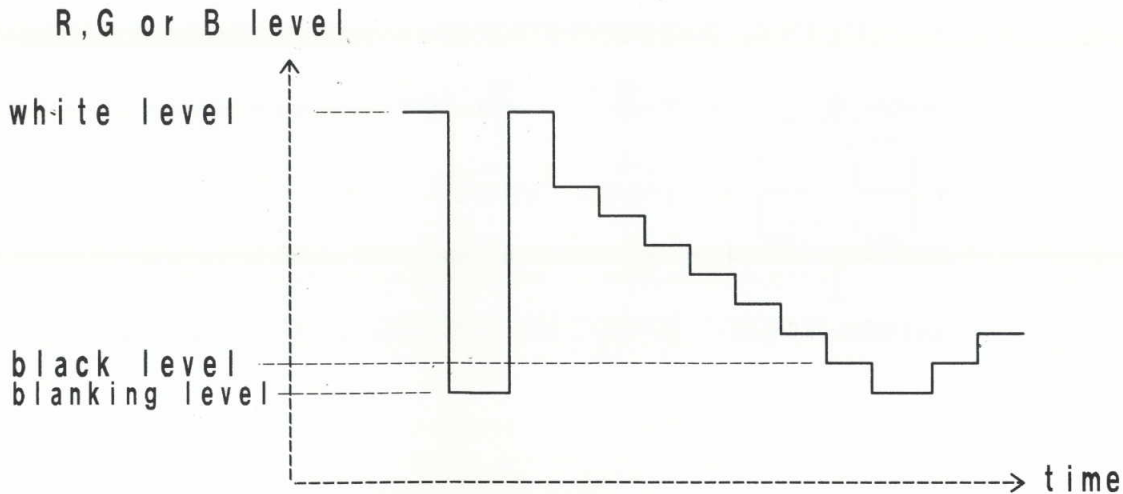
- I ADJUSTMENT OF 3618**
- Plug in the set on 240 V AC. Adjust 3618 to have between strap 9607 and secondary ground 5,05 V  .
- II INSTALLATION MENU**
- Set-Up Position = Off (switch 4)**

The decoder must be connected to a TV set (via the scart plug, for example). Short-circuit positions 9505 and 9506 until "INSTALLATION MENU" appears on screen. Each mode (corresponding to one adjustment) can be selected with the remote control by pressing on the digit belonging to the item needed.

Note : To return from each mode to main menu (called "INSTALLATION MENU"), press "menu". To return to normal working, press "view".
- III TUNING**
- Use "INSTALLATION MENU"

ADJUSTMENT OF 3468
 - Inject an unmodulated carrier (1.015800 GHz level : –45 dBm) via the antenna input via a capacitor of 100 nF.
 - Connect pin 6 of 7401 (LM 358) to ground via a 10 µF.
 - Select "TUNING" menu and "FREQUENCY 1.015800 GHz".
 - Measure signal at pin 11 of 7409, the level of this signal must change when value of 3468 go from minimum to maximum. Adjust this value to be as near as possible of the level change at pin 11. If adjustment is good, this level is low (0 V) when "FREQUENCY 1.015925 GHz" is selected and high (5 V) when "FREQUENCY 1.015675 GHz" is selected.

- IV E7 DE-EMPHASIS**
- IV.1 ADJUSTMENT OF 3343**
- Short circuit 3348.
Short circuit 2337.
Connect pin 9 of 7320 to GND via a 10 Kohms resistor.
Inject a signal (frequency : 100 KHz, amplitude : 1.75 Vpp) at emitter of 7323 through a 10 µF capacitor.
Connect gate of 7313 to GND (warning : remove this short circuit after adjustment), adjust 3343 to minimize as much as possible signal amplitude (peak to peak) on the capacitor 2369 (Vpp ≤ 15mV).
- IV.1 ADJUSTMENT OF 3369**
- Short circuit 3348.
Connect gate of 7313 to GND (same remark as above).
Inject a signal (frequency : 10 KHz, amplitude : 0,7 Vpp) at emitter of 7323 through a 10 µF capacitor.
Measure signal amplitude peak to peak (V1) on the capacitor 2369.
Change frequency of injected signal to 5 Mhz (be sure that injected signal amplitude is 0,7 Vpp).
Measure again signal amplitude (V2) and ajust 3369 to have : $V2 = 0,7 \times V1 (\pm 2\%)$.
- V DMAC**
- Use "INSTALLATION MENU".
Use a 100% black & white bar pattern not scrambled. Connect decoder to TV set via the scart plug.
- V.1 VCO ADJUSTMENT**
- In "INSTALLATION MENU", select "VCO" menu and adjust with key "→" or key "←" to stabilize as much as possible the picture on screen. To store the value, press "menu" and then select "STORE".
- V.2 R,G,B ADJUSTMENT**
- Be sure that loads on R,G and B outputs are 75 ohms ± 1%.
In "INSTALLATION MENU" select "RGB" and N° 1 (RED) menu and adjust with key "→" or key "←" the values to have :
RED amplitude (pin 15 of 1003) : 700 mV ± 5mV (between white level and black level : see following diagram).
GREEN amplitude (pin 11 of 1003) : ± 3mV in comparison with RED amplitude.
BLUE amplitude (pin 7 of 1003) : ± 3mV in comparison with RED amplitude.
To store the values, press "menu" and then select "STORE".
- V.3 CUT OFF ADJUSTMENT**
- Be sure that loads on R,G and B outputs are 75 ohms ± 1%.
Select "CUT" menu and adjust with key "→" or key "←" the values to have :
CUT R, CUT G, CUT B = 30mV ± 3mV (between blanking level and black level : see following diagram).
To store the values, press "menu" and then select "STORE".



VI PAL ENCODEUR

Measure frequency of the signal on pin 18 of 7001 (MC 1377) and adjust 2004 to have 4433619 Hz ± 100 Hz.

- 1. PRESENTATION**
- 1.1 BLOCK DIAGRAM**
- The BSB satellite tuner consists of **one single PCB** (printed circuit board) which integrate power supply, controls, control access, satellite reception and DMAC signals (video, sound and data) descrambling and decoding.
- 1.1.1 CONTROL PART**
- The **control microprocessor** 7507, fitted with is own memories (**PROM**: 7502, **RAM** 7501, and **EEPROM** 7527) controls different processes :
- Remote control** : The signal transmitted by the remote control is received by the RC5 receiver and input to the control microprocessor.

Access control module management : via an 8 bits data bus

Channel & mode display : The control microprocessor drives, the segments of the **display** 7508 (channel selection) and two leds indicating : the standby mode for the **Red led** 6502, the stereo mode for the **Green led** 6503, across the **demultiplexer** 7514.

Inputs control : The control microprocessor reads the positions of the switches and push button via the **demultiplexer** 7515

Outputs control : The control microprocessor drives different signals via demux 7515 :
 - slow and fast blanking of the scart plug
 - standby command for power supply
 - restart signal for ITT circuits

Tuner management : The control microprocessor initials the divider of the satellite tuner via the I²C bus

Customers set-up are stored in the non-volatile memory EEPROM 7527 via the I²C bus

DMAC circuits control across IM bus for sound mixer 7304, Fast IM bus for DMAC descrambler 7306 and DMAC decoder 7305.

- 1.1.2 DMAC SIGNAL ADAPTATION**
- The DMAC signal, coming from the antenna low noise converter passes successively through the following circuits :
- The **tuner** where it is converted in DMAC baseband by a frequency divider

The **mac de-emphasis cell** (7420 & associated elements)

The **8.5 MHz filter** 5320 (anti-aliasing filter)

The **automatic gain control cell** (control is done by pin 49 of the expander 7305)

The **E7 de-emphasis cell** for noise reduction, this cell is "gated" during the data burst.

This signal is clamped before the **video coder unit** 7326 (control is done by pin 48 of the expander) in order to set the input DC voltage level between 5 and 7 volts (5.5 at clamp level)

- 1.1.3 DMAC SIGNAL DIGITIZING**
- The baseband DMAC signal is converted in a 7 bits Gray coded signal in the **primary part** of the VCU 7326. Then video and sound components of the signal are de-emrypted by the **DMAC descrambler** 7306, the pseudo random binary sequence generators for video, sound & data are previously loaded by the control microprocessor via IM bus, with a control word generated by the **Access Control Module**
- The de-encrypted signal is fed to the **DMAC expander** 7305 where the components : sound & data, chrominance and luminance of the signal are separated, time expanded and processed. Synchro signal is generated for the **PAL encoder**

1.1.4 VIDEO RECOVERING

The chrominance and luminance are transmitted respectively via a 4 bits bus and a 8 bits bus to the **second part of the video coder unit VCU 7326** where they are re-converted in analog RGB signals.

1M The control microprocessor can select RGB signal coming from DMAC expander (normal way) or RGB signal coming from Access Control Module for On Screen Display inserting.

These signals are buffered and sent to the **PAL encoder** and to the scart plug (7,11,15) across a switch controlled by the fast blanking command.

The CVBS output of the encoder is sent to the scart plug (19) and to the **UHF PAL I modulator** (channels 30 to 39)

1.1.5 SOUND RECOVERING

The sound is transmitted via the sound bus (serial bus) to the **Audio Mixer Unit 7304** where it is digitally filtered, demultiplexed in two stereo channels and finally re-converted in analog way.

These channels are filtered by two **15 KHz filters**, amplified and transmitted to the scart plug (1 for right, 3 for left) and, after addition, to the **UHF modulator**.

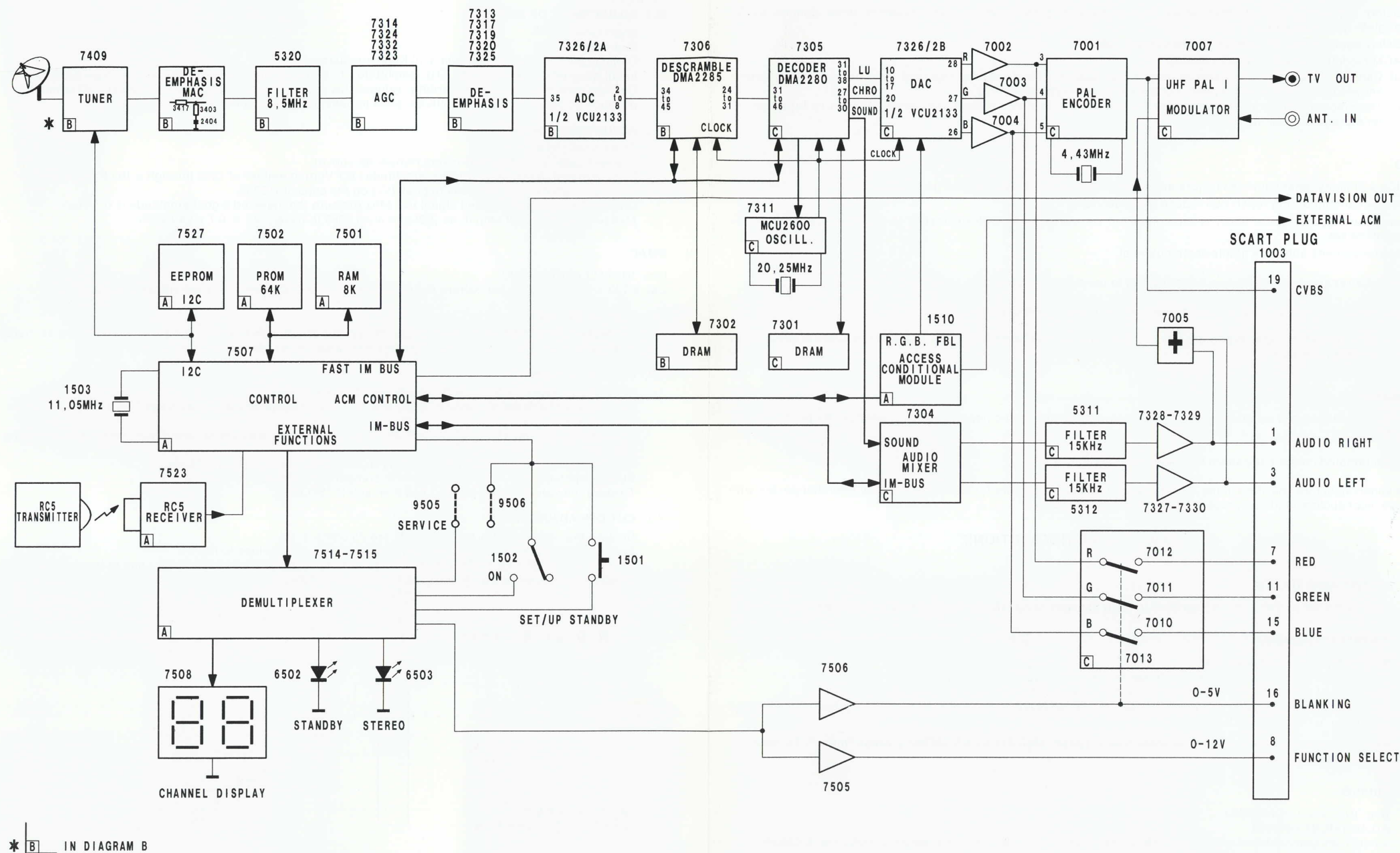
LIST OF ERRORS MESSAGES

When more than one error occurs, only the error with the highest priority will be displayed (one is the highest priority)

MESSAGE PRIORITY	DISPLAY	ACM DIAGNOSTIC SCREEN (KEYS MENU + 0)	OBSERVATIONS
10	-	Self Test Passed	No Error detected In normal operation
9	E 1	Memory Failed	Power on test Ram is working but some bytes are wrong Message disappears after channel change
8	-	NV Ram Reinitialised *	Power on test If EEPROM has been reinitialised Message disappears after doing a STORE in Installation Menu
7	E 3	NV Ram Full *	Permanent test If the receiver tries to write a byte in EEPROM in the last available byte and it does not work
7	E 4	Tuner Never Locked	Permanent test The receiver tries to tune on a frequency but the tuner PLL is not able to lock on this frequency
4	E 5	IIC Bus Error	Permanent test The receiver tries a conversation on IIC Bus. No acknowledge or Not able to change the bus level.
3	E 6	IM Bus Error	Permanent test The receiver tries a conversation on slow IM Bus. Not able to change the bus level.
1	E 7	Fast IM Bus Error	Power on test Write a value in DMA2285 ram with slow IM Bus, try to read it with fast IM Bus and compare the value Message disappears after channel change
2	E 8	DMA2285 Busy Error	Permanent test Try to read or write in DMA2285 ram, the busy line never be ready
5	E 9	ACM Error	Permanent test Try a conversation with ACM, but bit SIBYTERDY of ACM never egal 1

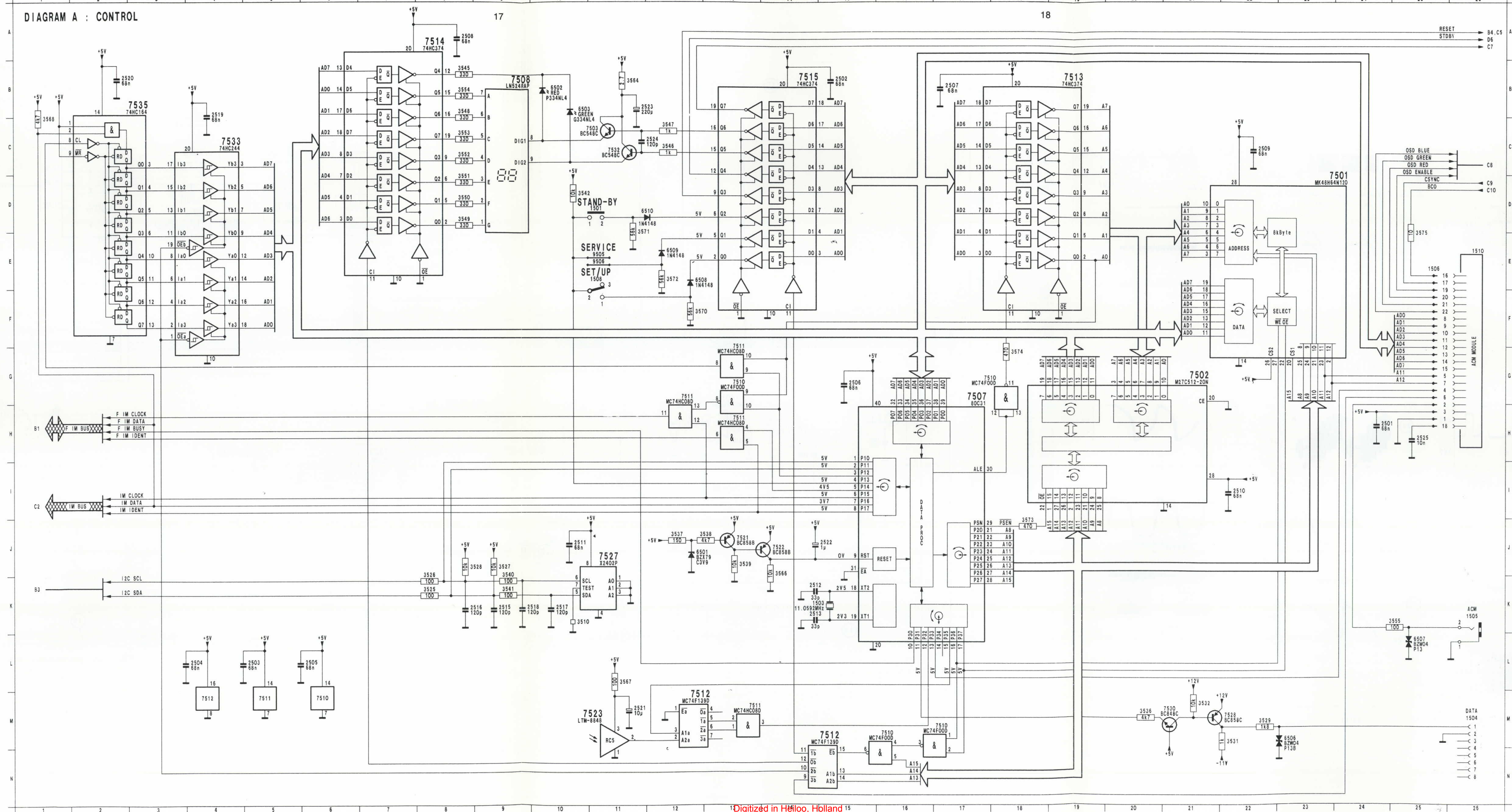
* NV ram = EEPROM

BLOCK DIAGRAM



* B IN DIAGRAM B

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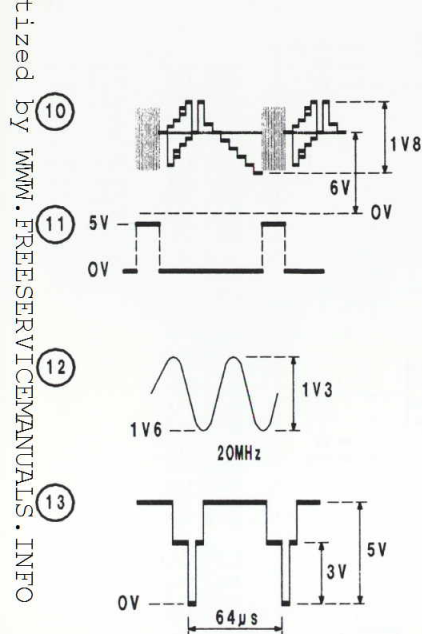
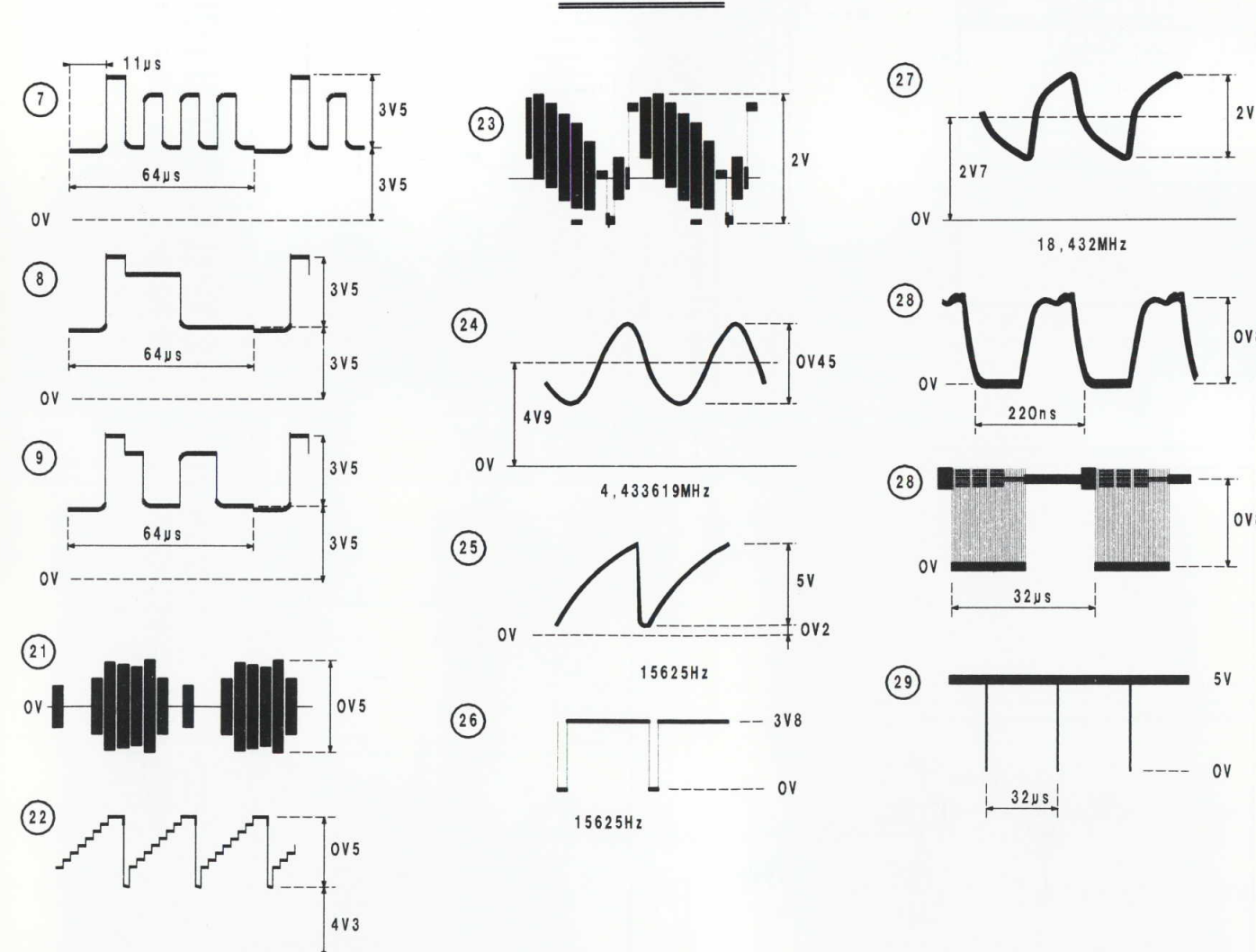
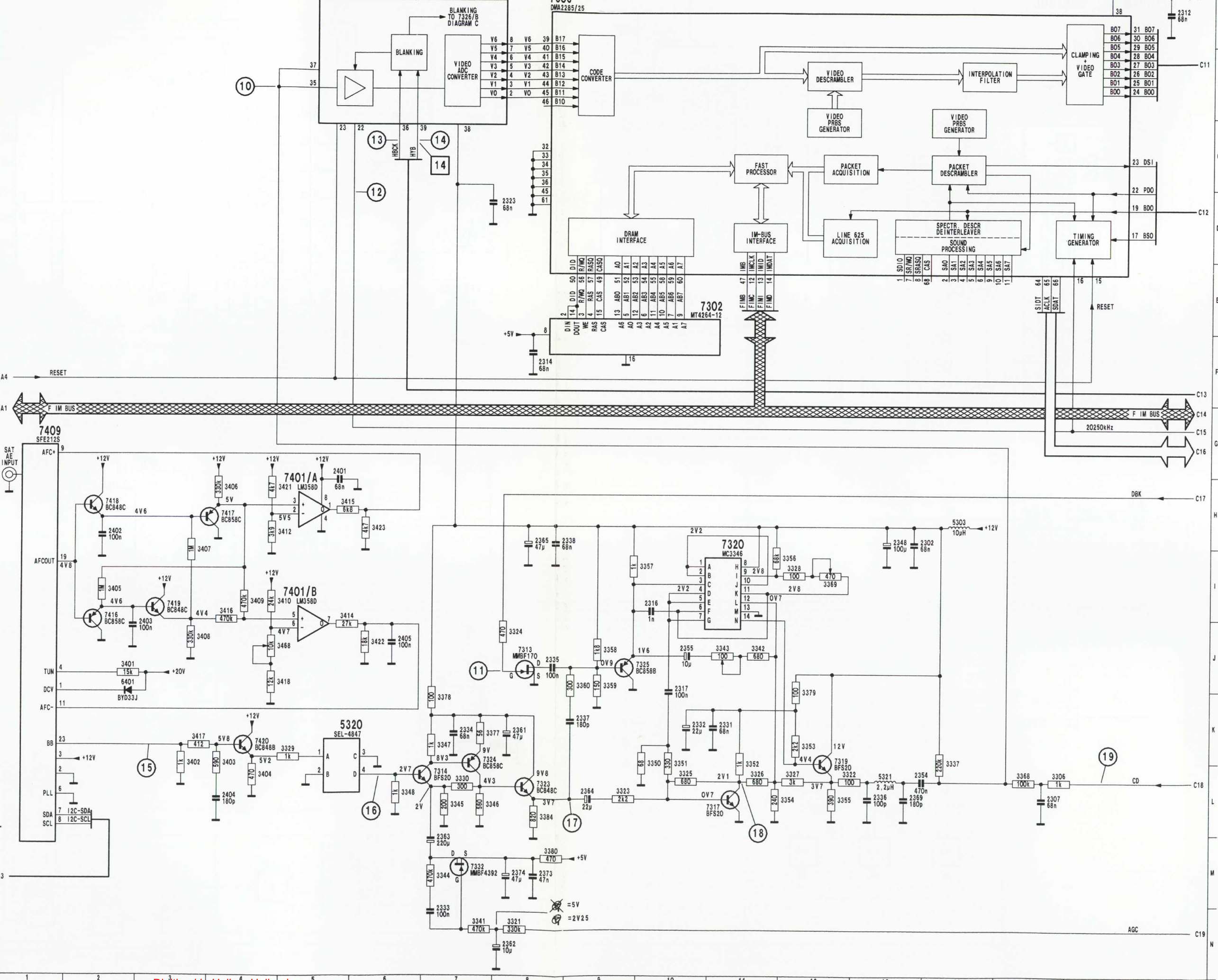


DIAGRAM C



2302 13H	7313 8J
2307 15L	7314 7L
2312 17A	7317 11L
2314 8F	7319 12K
2316 10I	7320 11H
2317 10J	7323 8L
2323 8D	7324 7K
2331 11K	7325 10J
2332 10K	7326 5A
2333 7N	7332 7M
2334 7K	7401 5I
2335 8J	7401 5H
2336 13L	7409 1G
2337 9K	7416 2I
2338 8H	7417 4H
2348 13H	7418 2H
2354 13L	7419 3I
2355 10J	7420 4K
2361 8K	
2362 8N	
2363 7M	
2364 9L	
2365 8H	
2369 13L	
2373 8M	
2374 8M	
2401 5G	
2402 2H	
2403 3J	
2404 4L	
2405 6J	
3306 15L	
3321 8N	
3322 12L	
3323 9L	
3324 8J	
3325 10L	
3326 11L	
3327 12L	
3328 12I	
3329 5K	
3330 7L	
3337 14L	
3341 7N	
3342 11J	
3343 11J	
3344 7M	
3345 7L	
3346 7L	
3347 7K	
3348 6L	
3350 10L	
3351 10L	
3352 11L	
3353 12K	
3354 12L	
3355 12L	
3356 12I	
3357 10I	
3358 9J	
3359 9J	
3360 9J	
3368 15L	
3369 12I	
3377 7K	
3378 7K	
3379 12K	
3380 8M	
3384 8L	
3401 2J	
3402 3L	
3403 4L	
3404 4L	
3405 2I	
3406 4H	
3407 3I	
3408 3J	
3409 4I	
3410 4I	
3412 4H	
3414 5I	
3415 5H	
3416 4I	
3417 3K	
3418 4J	
3421 4H	
3422 6J	
3423 6H	
3468 4J	
5303 14H	
5320 6K	
5321 13L	
6401 2J	
7302 11E	
7306 8A	

DIAGRAM B





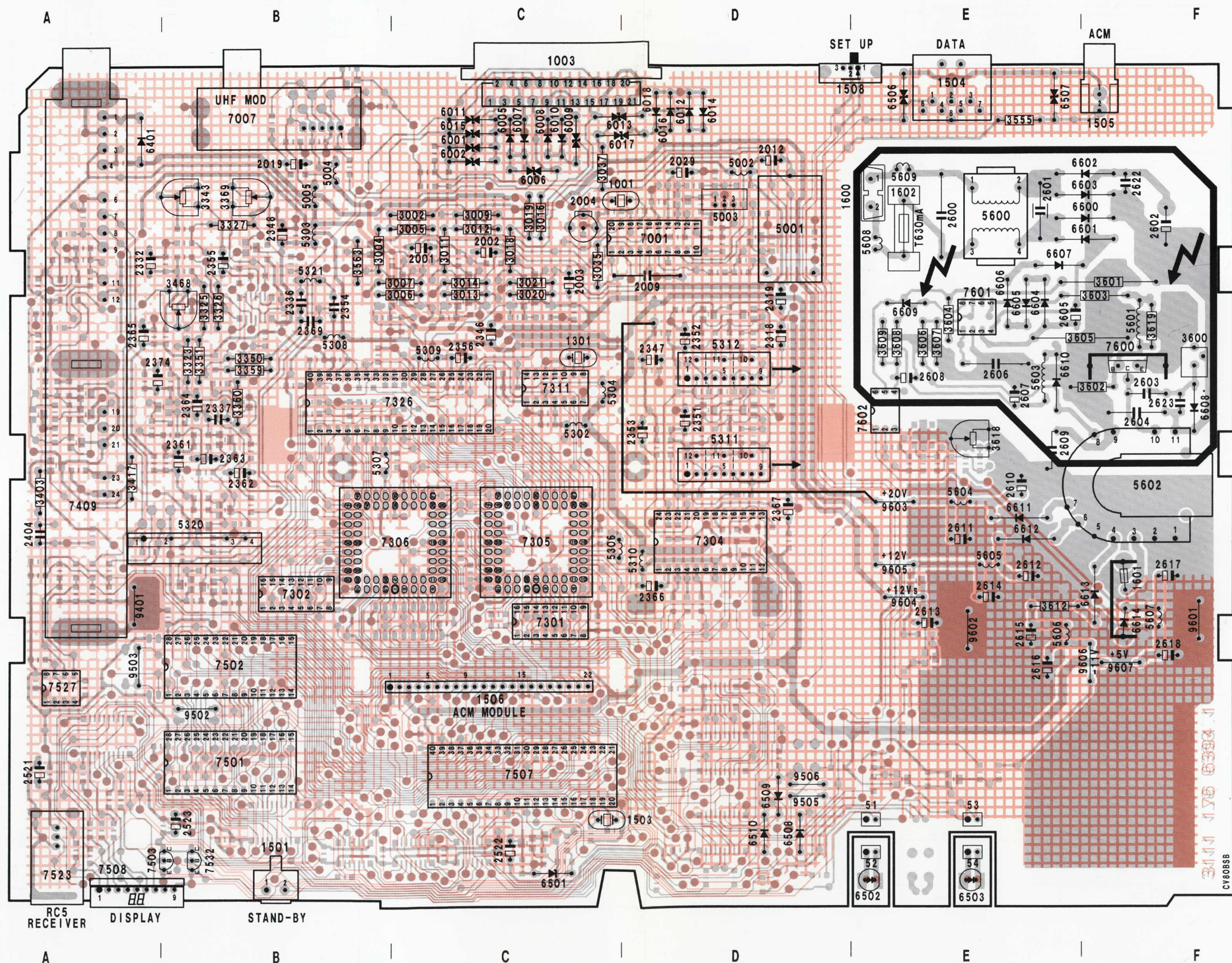
COMPONENTS SIDE

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52	E 4	3359	B 2	7311	C 2
53	E 4	3360	B 2	7326	C 2
54	E 4	3368	B 2	7409	A 3
1001	C 1	3403	A 3	7501	B 4
1003	C 1	3417	A 2	7502	B 3
1301	C 2	3468	B 2	7503	A 4
1501	B 4	3555	B 2	7507	C 4
1503	D 4	3563	B 2	7508	A 4
1504	E 1	3600	F 2	7523	A 4
1505	F 1	3601	F 2	7527	A 3
1506	C 3	3602	F 2	7532	B 4
1508	D 1	3603	F 2	7600	F 2
1600	E 1	3604	F 2	7601	E 2
1601	F 3	3605	F 2	7602	E 2
1602	E 1	3606	F 2	9401	A 3
2001	C 2	3607	F 2	9502	B 3
2002	C 1	3608	F 2	9503	A 3
2003	C 2	3609	F 2	9505	D 4
2004	C 1	3612	F 3	9506	D 4
2009	D 2	3618	F 2	9601	F 3
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2019	B 1	5001	D 1	9603	E 3
2029	D 1	5002	D 1	9604	E 3
2318	D 2	5003	D 1	9605	E 3
2319	D 2	5004	B 1	9606	F 3
2332	A 2	5005	B 1	9607	F 3
2336	B 2	5302	C 2		
2337	B 2	5303	C 2		
2346	C 2	5304	C 2		
2347	D 2	5306	C 3		
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2351	D 2	5308	B 2		
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2354	B 2	5311	D 2		
2355	B 2	5312	D 2		
2356	C 2	5320	B 3		
2361	B 2	5321	B 2		
2362	B 2	5600	E 1		
2363	B 2	5601	F 2		
2364	B 2	5602	F 2		
2365	A 2	5603	F 2		
2366	D 3	5604	E 3		
2367	D 3	5605	E 3		
2369	B 2	5606	E 3		
2374	A 2	5607	F 3		
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2522	C 4	6001	C 1		
2523	B 4	6002	C 1		
2600	E 1	6005	C 1		
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2602	F 1	6007	C 1		
2603	F 2	6008	C 1		
2604	F 2	6009	C 1		
2605	E 2	6010	C 1		
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2607	E 2	6012	D 1		
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2609	E 2	6014	D 1		
2610	E 2	6015	C 1		
2611	E 3	6016	D 1		
2612	E 3	6017	D 1		
2613	E 3	6018	D 1		
2614	E 3	6401	A 1		
2615	E 3	6501	C 4		
2616	E 3	6502	E 4		
2617	F 3	6503	E 4		
2618	F 3	6506	E 1		
2622	F 1	6507	E 1		
2623	F 2	6508	D 4		
3002	C 1	6509	D 4		
3004	B 1	6510	D 4		
3005	C 1	6600	F 1		
3006	C 2	6601	F 1		
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3325	B 2	7007	B 1		
3326	B 2	7301	C 3		
3327	B 1	7302	B 3		
3343	B 1	7304	D 3		
3350	B 2	7305	C 3		

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CARRIER PANEL: COMPONENTS SIDE

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CARRIER PANEL: COPPER SIDE

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COPPER SIDE

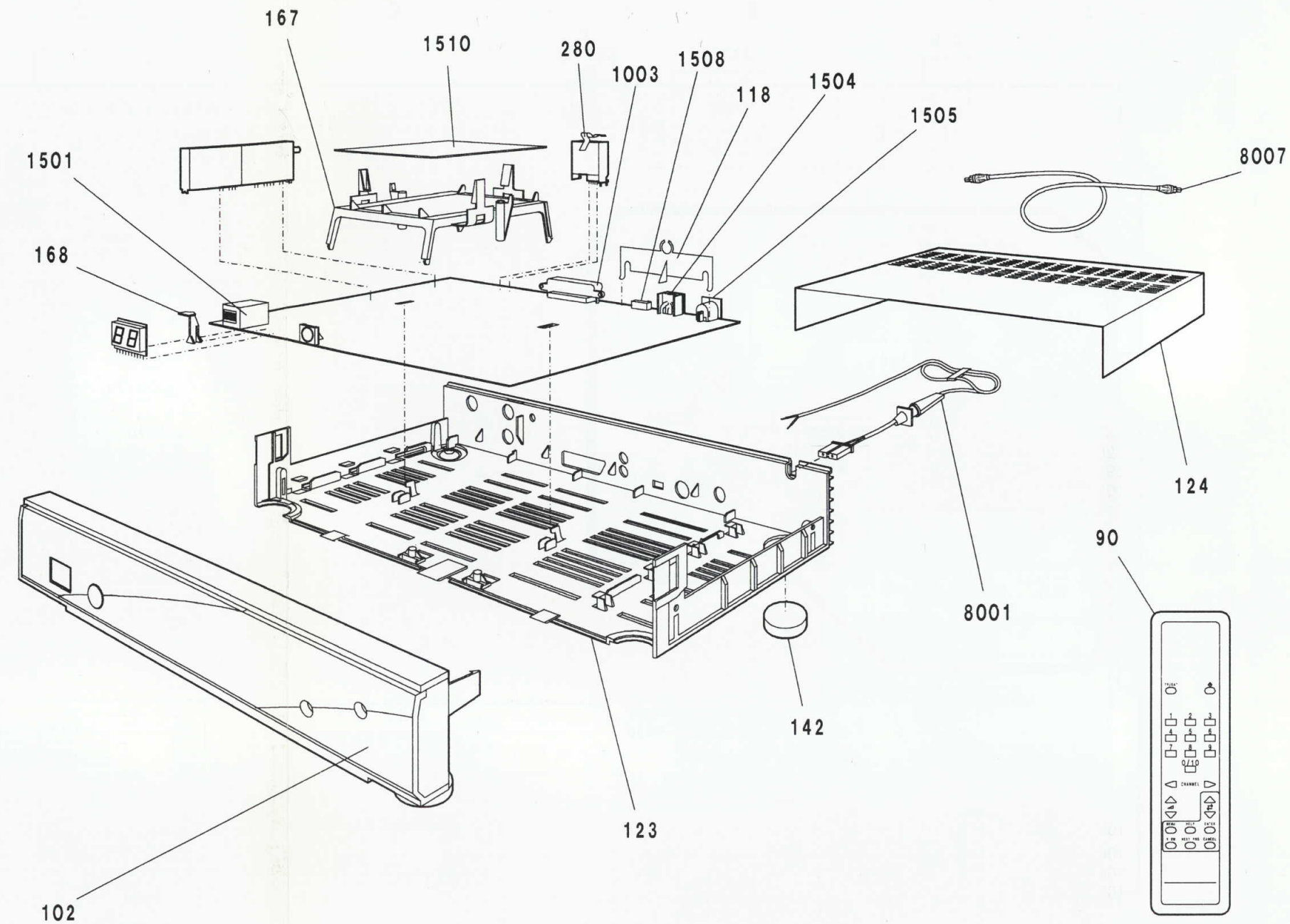
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54	B 4	2367	C 3	3042	D 2	3423	F 1	6008	D 1	7535	C 3
1001	D 1	2369	E 2	3043	E 2	3468	E 2	6009	D 1	7600	A 2
1003	D 1	2373	E 2	3044	C 1	3525	F 3	6010	D 1	7601	B 2
1301	D 2	2374	F 2	3045	C 1	3526	F 3	6011	D 1	7602	B 2
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1505	A 1	2402	F 2	3302	C 2	3531	B 4	6015	D 1	9305	C 3
1506	D 3	2403	F 2	3304	C 2	3532	B 4	6016	C 1	9307	C 2
1508	C 1	2404	F 3	3305	C 2	3536	B 4	6017	C 1	9401	F 3
1600	B 1	2405	F 1	3306	D 3	3537	D 4	6018	C 1	9502	E 3
1601	A 3	2501	D 3	3307	C 2	3538	D 4	6401	F 1	9503	F 3
1602	B 1	2502	C 4	3308	C 2	3539	D 4	6501	D 4	9505	C 4
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2002	D 1	2504	E 4	3310	C 2	3541	F 3	6503	B 4	9601	A 3
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2005	C 1	2507	E 4	3313	C 2	3546	C 4	6508	C 4	9604	B 3
2006	D 1	2508	C 1	3314	C 2	3547	C 4	6509	C 4	9605	B 3
2007	C 2	2509	E 4	3318	C 2	3548	F 4	6510	C 4	9606	A 3
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2009	C 2	2511	F 3	3322	E 2	3550	F 4	6601	A 1		
2010	C 1	2512	D 4	3323	E 2	3551	F 4	6602	A 1		
2011	C 1	2513	D 4	3324	E 2	3552	F 4	6603	A 1		
2012	C 1	2514	F 3	3325	E 2	3553	F 4	6604	B 2		
2013	C 1	2515	F 3	3326	E 2	3554	F 4	6605	B 2		
2014	C 2	2516	F 3	3327	E 1	3555	B 1	6606	B 2		
2015	C 1	2517	F 3	3328	E 1	3556	E 3	6607	B 1		
2016	D 2	2518	F 3	3329	F 3	3558	E 3	6608	A 2		
2017	C 1	2519	C 4	3330	E 2	3559	E 3	6609	B 2		
2018	C 1	2520	C 4	3332	D 2	3562	E 3	6610	B 2		
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2020	E 1	2522	D 4	3338	C 3	3564	E 4	6612	B 3		
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2310	D 3	2614	B 3	3357	E 2	3607	B 2	7305	D 3		
2311	D 3	2615	B 3	3358	E 2	3608	B 2	7306	D 3		
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2323	E 2	3002	D 1	3366	E 2	3616	B 2	7324	E 3		
2324	D 2	3003	C 2	3367	E 2	3617	B 2	7325	E 2		
2325	E 2	3004	E 1	3368	E 2	3618	B 2	7326	D 2		
2326	D 2	3005	D 1	3369	E 1	3619	A 2	7327	C 2		
2327	D 2	3006	D 2	3370	C 2	5001	C 1	7328	C 2		
2330	C 3	3007	D 2	3371	C 2	5002	C 1	7329	C 2		
2331	E 2	3009	D 1	3372	C 2	5003	C 1	7330	C 2		
2332	F 2	3010	E 2	3373	C 2	5004	E 1	7332	E 2		
2333	F 2	3011	D 1	3374	C 2	5005	E 1	7401	F 2		
2334	E 2	3012	D 1	3375	C 2	5302	D 2	7408	F 3		
2335	E 2	3013	D 2	3376	F 2	5303	E 1	7416	F 2		
2336	E 2	3014	D 2	3377	F 2	5304	D 2	7417	F 2		
2337	E 2	3016	D 1	3379	E 2	5306	D 3	7418	F 2		
2338	F 2	3018	D 1	3380	F 2	5307	E 2	7419	F 2		
2339	C 3	3019	D 1	3381	D 3	5308	E 2	7420	F 2		
2340	E 2	3020	D 2	3382	D 3	5309	D 2	7501	E 4		
2342	E 2	3021	D 2	3383	C 3	5310	C 3	7502	E 3		
2343	D 2	3022	D 1	3384	E 2	5311	C 3	7503	F 4		
2344	D 2	3023	D 1	3401	F 1	5312	C 2	7505	E 3		
2345	E 2	3024	D 1	3402	F 2	5320	E 3	7506	E 3		
2346	D 2	3025	D 1	3403	F 2	5321	E 2	7507	E 4		
2347	C 2	3026	E 1	3404	F 3	5600	B 1	7508	F 4		
2348	E 1	3027	E 1	3405	F 2	5601	A 2	7510	E 4		
2350	C 3	3028	D 2	3406	F 2	5602	A 2	7511	D 4		
2351	C 2	3029	D 2	3407	F 2	5603	B 2	7512	D 4		
2352	D 2	3030	D 2	3408	F 2	5604	B 2	7513	E 4		
2353	C 2	3031	E 1	3409	F 2	5605	B 3	7514	F 4		
2354	E 2	3032	E 1	3410	F 2	5606	B 3	7515	C 4		
2355	E 2	3033	C 1	3412	F 2	5607	A 3	7521	D 4		
2356	D 2	3034	C 1	3414	F 2	5608	B 1	7522	D 4		
2361	E 1	3035	B 1	3415	F 1	5609	B 1	7523	F 4		
2362	E 2	3036	C 1	3416	F 2	6001	D 1	7527	F 3		
2363	E 2	3037	D 1	3417	F 2	6002	D 1	7528	B 4		

WARNING:
This terminal is equipped
with two different grounds.
The primary ground is
connected to the mains.

Primary ground:

Secondary ground:

Digitized in Heiloo, Holland



10	4822 290 60959	CONNECTING STRIP
90	4822 218 20893	RC 5802
102	4822 432 10847	FRONT
123	4822 432 10846	BOTTOM
124	4822 432 92648	COVER
142	4822 462 41706	FOOT
167	4822 404 31094	SUPPORT ACM
168	4822 404 31096	SUPPORT DISPLAY
280	4822 492 70618	SPRING BELT
1003	4822 267 60289	CONNECTOR SCART
1501	4822 276 10863	PUSH BUTTON
1504	4822 266 40169	PLUG DIN 8P
1505	4822 267 31209	PLUG ACM
1508	4822 276 12927	SWITCH
8001	4822 321 10689	MAINS CORD
8007	4822 321 60753	ANTENNA CORD
	5322 255 44047	IC-SOCKET 28 P PLCC
	4822 255 40932	IC-SOCKET 68 P PLCC
	4822 255 40932	IC-SOCKET 68 P PLCC
	4822 265 20172	CONNECTOR 2P MALE
	4822 256 30274	FUSE HOLDER

FIG 1

ELECTRICAL PARTS

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various					
1001	4822 242 70933	CRYSTAL 4,433619 MHz	2336	4822 122 31316	100pF 100V
1301	4822 242 72455	CRYSTAL 20,250 MHz	2337	5322 122 31907	180pF 100V
1503	4822 242 73649	CRYSTAL 11,0592 MHz	2338	4822 122 32891	68nF 63V
1602	4822 070 36301	FUSE 0,63A T	2339	4822 122 32891	68nF 63V
7007	4822 212 23489	UHF MODULATOR	2340	4822 122 32891	68nF 63V
7409	4822 210 10396	TUNER SFE212 S	2342	4822 122 32891	68nF 63V
7523	4822 212 22983	IR RECEIVER	2343	4822 122 33104	100nF 63V
					
2001	4822 124 40804	22μF 40V	2344	4822 122 33104	100nF 63V
2002	4822 124 40804	22μF 40V	2345	4822 122 33104	100nF 63V
2003	4822 124 40804	22μF 40V	2346	4822 124 42027	470μF 6V3
2004	4822 125 50062	1,4 - 10pF	2347	4822 124 40198	470μF 16V
2005	4822 122 31965	220pF 63V	2348	4822 124 40198	470μF 16V
2006	4822 122 31965	220pF 63V	2350	4822 122 32891	68nF 63V
2007	4822 122 31766	120pF 63V	2351	4822 124 40196	220μF 16V
2008	4822 122 32442	10nF 63V	2352	4822 124 40196	220μF 16V
2009	4822 121 43066	1nF 400V	2353	4822 124 41719	10μF 25V
2010	4822 122 32891	68nF 63V	2354	5322 121 42979	470nF 63V
2011	4822 122 31746	1nF 63V	2355	4822 124 41719	10μF 25V
2012	4822 124 40804	22μF 40V	2356	4822 124 41719	10μF 25V
2013	4822 122 33104	100nF 63V	2361	4822 124 40433	47μF 25V
2014	4822 122 32442	10nF 63V	2362	4822 124 41719	10μF 25V
2015	4822 122 33104	100nF 63V	2363	4822 124 41715	220μF 6V3
2016	4822 122 32444	33pF 63V	2364	4822 124 40804	22μF 40V
2017	4822 122 33104	100nF 63V	2365	4822 124 40433	47μF 25V
2018	4822 122 32891	68nF 63V	2366	4822 124 40804	22μF 40V
2019	4822 124 40804	22μF 40V	2367	4822 124 40178	100μF 10V
2020	4822 122 32891	68nF 63V	2369	5322 122 31907	180pF 100V
2021	4822 122 32891	68nF 63V	2373	4822 122 32542	47nF 63V
2023	4822 122 31765	100pF 63V	2374	4822 124 40433	47μF 25V
2024	4822 122 31765	100pF 63V	2375	4822 122 32082	4,7pF 63V
2025	4822 122 31765	100pF 63V	2376	4822 122 32082	4,7pF 63V
2026	4822 122 32891	68nF 63V	2401	4822 122 32891	68nF 63V
2027	4822 122 31769	18pF 63V	2402	4822 122 33104	100nF 63V
2028	4822 122 32444	33pF 63V	2403	4822 122 33104	100nF 63V
2029	4822 124 40804	22μF 40V	2404	5322 122 31907	180pF 100V
2030	4822 122 32444	33pF 63V	2405	4822 122 33104	100nF 63V
2301	4822 122 32891	68nF 63V	2501	4822 122 32891	68nF 63V
2302	4822 122 32891	68nF 63V	2502	4822 122 32891	68nF 63V
2303	4822 122 31727	470pF 63V	2503	4822 122 32891	68nF 63V
2304	4822 122 32891	68nF 63V	2504	4822 122 32891	68nF 63V
2305	4822 122 31727	470pF 63V	2505	4822 122 32891	68nF 63V
2306	4822 122 32891	68nF 63V	2506	4822 122 32891	68nF 63V
2307	4822 122 32891	68nF 63V	2507	4822 122 32891	68nF 63V
2309	4822 122 32891	68nF 63V	2508	4822 122 32891	68nF 63V
2310	4822 122 32891	68nF 63V	2509	4822 122 32891	68nF 63V
2311	4822 122 32891	68nF 63V	2510	4822 122 32891	68nF 63V
2312	4822 122 32891	68nF 63V	2511	4822 122 32891	68nF 63V
2314	4822 122 32891	68nF 63V	2512	4822 122 32444	33pF 63V
2316	4822 122 31746	1nF 63V	2513	4822 122 32444	33pF 63V
2317	4822 122 33104	100nF 63V	2515	4822 122 31766	120pF 63V
2318	4822 124 41719	10μF 25V	2516	4822 122 31766	120pF 63V
2319	4822 124 41719	10μF 25V	2517	4822 122 31766	120pF 63V
2322	4822 122 31971	10pF 63V	2518	4822 122 31766	120pF 63V
2323	4822 122 32891	68nF 63V	2519	4822 122 32891	68nF 63V
2324	4822 122 32891	68nF 63V	2520	4822 122 32891	68nF 63V
2325	4822 122 32891	68nF 63V	2521	4822 124 41719	10μF 25V
2326	4822 122 32891	68nF 63V	2522	4822 124 40242	1μF 63V
2327	4822 122 31746	1nF 63V	2523	4822 124 40196	220μF 16V
2330	4822 122 31746	1nF 63V	2524	4822 122 31766	120pF 63V
2331	4822 122 32891	68nF 63V	2525	4822 122 32442	10nF 63V
2332	4822 124 40804	22μF 40V	2600	4822 124 42023	150nF 300V
2333	4822 122 33104	100nF 63V	2601	4822 121 41984	47nF 400V
2334	4822 122 32891	68nF 63V	2602	4822 124 22798	68μF 385V
2335	4822 122 33104	100nF 63V	2603	4822 121 40399	1,2nF 630V
			2604	4822 121 41984	47nF 400V
			2605	4822 124 42024	10μF 50V

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2606	5322 121 50999	470pF 400V	3306	4822 051 10102	1kΩ
2607	4822 124 42026	220μF 25V	3307	5322 111 90098	150Ω
2608	4822 124 40242	1μF 63V	3308	5322 111 90098	150Ω
2609	4822 126 10878	470pF 400V	3309	4822 111 90249	10kΩ
2610	4822 124 40198	470μF 16V	3310	5322 111 90111	4,7kΩ
2611	5322 124 21189	100μF 40V	3311	4822 051 10102	1kΩ
2612	4822 124 40202	1500μF 16V	3312	5322 111 90096	1,2kΩ
2613	4822 124 41643	100μF 16V	3313	4822 111 90171	820Ω
2614	4822 124 41643	100μF 16V	3314	5322 111 90109	470Ω
2615	4822 124 41643	100μF 16V	3318	4822 111 90202	68kΩ
2616	4822 124 41643	100μF 16V	3321	4822 051 10334	330kΩ
2617	4822 124 42025	200μF 10V	3322	5322 111 90091	100Ω
2618	4822 124 41643	100μF 16V	3323	4822 050 22212	2,21kΩ
2619	4822 122 33104	100nF 63V	3324	5322 111 90109	470Ω
2620	4822 122 32542	47nF 63V	3325	4822 116 52924	680Ω
2622	4822 122 30114	2,2nF 100V	3326	4822 116 52924	680Ω
2623	5322 122 32846	220pF 500V	3327	4822 050 23002	3kΩ
			3328	5322 111 90091	100Ω
3002	4822 116 52891	10Ω	3329	4822 051 10102	1kΩ
3003	5322 111 90109	470Ω	3330	4822 051 10301	300Ω
3004	4822 050 21501	150Ω	3332	5322 111 90111	4,7kΩ
3005	4822 116 53794	120Ω	3337	4822 111 90197	220kΩ
3006	4822 116 52924	680Ω	3338	5322 111 90091	100Ω
3007	4822 050 23301	330Ω	3339	5322 111 90091	100Ω
3009	4822 116 52891	10Ω	3340	5322 111 90091	100Ω
3010	5322 111 90109	470Ω	3341	4822 111 90161	470kΩ
3011	4822 050 21501	150Ω	3342	4822 111 90366	620Ω
3012	4822 116 53794	120Ω	3343	4822 100 10503	100Ω
3013	4822 116 52924	680Ω	3344	4822 111 90161	470kΩ
3014	4822 050 23301	330Ω	3345	4822 111 90348	200Ω
3016	4822 116 52891	10Ω	3346	5322 111 90113	560Ω
3018	4822 050 21501	150Ω	3347	4822 051 10102	1kΩ
3019	4822 116 53794	120Ω	3348	4822 051 10102	1kΩ
3020	4822 116 52924	680Ω	3350	4822 116 53056	68Ω
3021	4822 050 23301	330Ω	3351	4822 050 23301	330Ω
3022	4822 111 90251	22kΩ	3352	4822 051 10102	1kΩ
3023	4822 111 90251	22kΩ	3353	4822 111 90248	2,2kΩ
3024	5322 111 90109	470Ω	3354	4822 111 90353	240Ω
3025	5322 111 90109	470Ω	3355	5322 111 90138	390Ω
3026	4822 111 90253	12kΩ	3356	4822 111 90202	68kΩ
3027	4822 051 10102	1kΩ	3357	4822 051 10102	1kΩ
3028	5322 111 90109	470Ω	3358	5322 111 90101	1,8kΩ
3029	5322 111 90109	470Ω	3359	4822 050 21501	150Ω
3030	5322 111 90106	330Ω	3360	4822 050 23001	300Ω
3031	5322 111 90096	1,2kΩ	3361	4822 111 90572	5,6kΩ
3032	4822 051 10102	1kΩ	3362	4822 111 90572	5,6kΩ
3033	5322 111 90096	1,2kΩ	3363	4822 111 90572	5,6kΩ
3034	4822 051 10102	1kΩ	3364	4822 111 90344	15Ω
3035	4822 050 25603	56kΩ	3365	4822 111 90238	18kΩ
3036	4822 051 10102	1kΩ	3366	4822 111 90238	18kΩ
3037	4822 116 52375	68Ω	3367	4822 111 90238	18kΩ
3038	5322 111 90109	470Ω	3368	4822 111 90214	100kΩ
3040	4822 111 90249	10kΩ	3369	4822 101 10651	470Ω
3041	4822 111 90249	10kΩ	3370	4822 111 90249	10kΩ
3042	4822 111 90249	10kΩ	3371	5322 111 90111	4,7kΩ
3043	4822 111 90249	10kΩ	3372	4822 051 10102	1kΩ
3044	5322 111 90109	470Ω	3373	5322 111 90096	1,2kΩ
3045	5322 111 90109	470Ω	3374	4822 111 90171	820Ω
3046	4822 111 90253	12kΩ	3375	5322 111 90109	470Ω
3047	5322 111 90109	470Ω	3377	4822 111 90239	56Ω
3301	4822 111 90162	680Ω	3378	5322 111 90091	100Ω
3302	4822 111 90162	680Ω	3379	5322 111 90091	100Ω
3304	4822 111 90157	3,3kΩ	3380	5322 111 90109	470Ω
3305	4822 111 90157	3,3kΩ	3381	4822 051 10109	10Ω
			3382	4822 051 10109	10Ω
			3383	4822 051 10109	10Ω

							
3384	4822 111 90171	820Ω		3604	4822 050 21004	100kΩ	
3401	4822 111 90196	15kΩ		3605	4822 116 82527	0,82Ω	
3402	4822 051 10102	1kΩ		3606	4822 050 23303	33kΩ	
3403	4822 116 53584	590Ω		3607	4822 116 52921	4,7kΩ	
3404	5322 111 90109	470Ω		3608	4822 050 21002	1kΩ	
3405	4822 051 10105	1MΩ		3609	4822 116 53025	2,2kΩ	
3406	4822 051 10334	330kΩ		3610	4822 111 90572	5,6kΩ	
3407	4822 051 10105	1MΩ		3611	4822 111 90249	10kΩ	
3408	4822 051 10334	330kΩ		3612	4822 111 30508	10Ω	
3409	4822 111 90161	470kΩ		3613	4822 111 90253	12kΩ	
3410	4822 111 90512	24kΩ		3614	5322 111 90109	470Ω	
3412	4822 111 90571	3,9kΩ		3615	5322 111 90111	4,7kΩ	
3414	4822 111 90542	27kΩ		3616	5322 111 90111	4,7kΩ	
3415	4822 111 90544	6,8kΩ		3617	5322 111 90118	8,2kΩ	
3416	4822 111 90161	470kΩ		3618	4822 101 20838	4,7kΩ	
3417	4822 050 24121	412Ω		3619	4822 116 52383	6,8Ω	
3418	4822 111 90253	12kΩ		9305	4822 051 10008	CHIP JUMPER	
3421	5322 111 90111	4,7kΩ		9307	4822 051 10008	CHIP JUMPER	
3422	4822 111 90238	18kΩ		9510	4822 051 10008	CHIP JUMPER	
3423	5322 111 90111	4,7kΩ					
3468	4822 101 10626	10kΩ					
3525	5322 111 90091	100Ω					
3526	5322 111 90091	100Ω		5001	4822 157 51056	DELAY LINE 330ns	
3527	4822 111 90249	10kΩ		5002	4822 157 62414	10μH	
3528	4822 111 90249	10kΩ		5003	4822 242 73652	FILTER 4,43 MHz	
3529	5322 111 90101	1,8kΩ		5004	4822 157 62414	10μH	
3531	4822 051 10102	1kΩ		5005	4822 157 62414	10μH	
3532	4822 111 90249	10kΩ		5301	4822 157 62414	10μH	
3536	5322 111 90111	4,7kΩ		5302	4822 157 62414	10μH	
3537	5322 111 90098	150Ω		5303	4822 157 62414	10μH	
3538	5322 111 90111	4,7kΩ		5304	4822 157 62414	10μH	
3539	4822 111 90249	10kΩ		5306	4822 157 62413	6,8μH	
3540	5322 111 90091	100Ω		5307	4822 157 62414	10μH	
3541	5322 111 90091	100Ω		5308	4822 157 62414	10μH	
3542	4822 111 90249	10kΩ		5309	4822 157 62414	10μH	
3545	5322 111 90106	330Ω		5310	4822 157 62414	10μH	
3546	4822 051 10102	1kΩ		5311	4822 242 73651	FILTER 15 kHz	
3547	4822 051 10102	1kΩ		5312	4822 242 73651	FILTER 15 kHz	
3548	5322 111 90106	330Ω		5320	4822 242 73653	FILTER 9 MHz	
3549	5322 111 90106	330Ω		5321	4822 157 62415	2,2μH	
3550	5322 111 90106	330Ω		5600	4822 156 21098	10μH	
3551	5322 111 90106	330Ω		5601	4822 157 51235	4,7μH	
3552	5322 111 90106	330Ω		5602	4822 148 81097	SWITCH MODE TRAFO	
3553	5322 111 90106	330Ω		5603	4822 157 62411	0,82μH	
3554	5322 111 90106	330Ω		5604	4822 157 62412	27μH	
3555	4822 116 52389	100Ω		5605	4822 157 62412	27μH	
3556	5322 111 90267	33kΩ		5606	4822 157 62412	27μH	
3558	4822 111 90571	3,9kΩ		5607	4822 157 62412	27μH	
3559	4822 051 10102	1kΩ		5608	5322 158 10052		
3562	4822 051 10102	1kΩ		5609	5322 158 10052		
3563	4822 116 52389	100Ω					
3564	4822 051 10278	2,7Ω					
3566	4822 111 90249	10kΩ		6001	4822 130 82141	BZW04	
3567	4822 051 10128	1,2Ω		6002	4822 130 82141	BZW04	
3568	5322 111 90111	4,7kΩ		6005	4822 130 30621	1N4148	
3569	5322 111 90111	4,7kΩ		6006	4822 130 81562	BZW04	
3570	4822 111 90573	56kΩ		6007	4822 130 30621	1N4148	
3571	4822 111 90573	56kΩ		6008	4822 130 30621	1N4148	
3572	4822 111 90573	56kΩ		6009	4822 130 81562	BZW04	
3573	5322 111 90109	470Ω		6010	4822 130 30621	1N4148	
3574	5322 111 90109	470Ω		6011	4822 130 81562	BZW04	
3575	4822 051 10109	10Ω		6012	4822 130 30621	1N4148	
3600	4822 113 80522	1,5kΩ		6013	4822 130 81562	BZW04	
3601	4822 053 12124	120kΩ		6014	4822 130 30621	1N4148	
3602	4822 116 52389	100Ω		6015	4822 130 81562	BZW04	
3603	5322 116 53628	3,3Ω					

							
6016	4822 130 30621	1N4148	7314	5322 130 42718	BFS20		
6017	4822 130 81562	BZW04	7317	5322 130 42718	BFS20		
6018	4822 130 30621	1N4148	7319	5322 130 42718	BFS20		
6401	4822 130 42606	BYD33J	7320	4822 209 62564	MC3346		
6501	4822 130 31981	BZX79/C3V9	7323	5322 130 42136	BC848C		
6502	5322 130 80779	LED P334NL-4	7324	4822 130 42513	BC858C		
6503	4822 130 82142	LED P334NL-4	7325	5322 130 41983	BC858B		
6506	4822 130 82141	BZW04	7326	4822 209 60458	VCU2133-60		
6507	4822 130 81562	BZW04	7327	5322 130 41983	BC858B		
6508	4822 130 30621	1N4148	7328	5322 130 41982	BC848B		
6509	4822 130 30621	1N4148	7329	5322 130 41983	BC858B		
6510	4822 130 30621	1N4148	7330	5322 130 41982	BC848B		
6600	4822 130 80229	BYD14J	7332	4822 130 62337	JFET MMBF		
6601	4822 130 80229	BYD14J	7401	5322 209 82941	LM358D		
6602	4822 130 80229	BYD14J	7416	4822 130 42513	BC858C		
6603	4822 130 80229	BYD14J	7417	4822 130 42513	BC858C		
6604	5322 130 81527	1N4004	7418	5322 130 42136	BC848C		
6605	5322 130 81527	1N4004	7419	5322 130 42136	BC848C		
6606	5322 130 81527	1N4004	7420	5322 130 41982	BC848B		
6607	5322 130 81527	1N4004	7501	4822 209 62566	MK48H64N		
6608	4822 130 32343	BYV26-C600V	7502	4822 209 62559	PROM BSB IND1		
6609	4822 130 34297	BZX79/C10V	7503	4822 130 44196	BC848C		
6610	4822 130 42606	BYD33J	7505	5322 130 42136	BC848C		
6611	4822 130 42606	BYD33J	7506	5322 130 41983	BC858B		
6612	5322 130 32043	BYV28-150V	7507	4822 209 62561	80C31		
6613	4822 130 42606	BYD33J	7508	4822 130 90388	LN524		
6614	4822 130 31627	BY229-200	7510	4822 209 62571	MC74F00D		
			7511	4822 209 62567	MC74HC08		
			7512	4822 209 62582	MC74F139		
7001	4822 209 71415	MC1377P	7513	4822 209 62568	MC74HC37		
7002	5322 130 41982	BC848B	7514	4822 209 62568	MC74HC37		
7003	5322 130 41982	BC848B	7515	4822 209 62568	MC74HC37		
7004	5322 130 41982	BC848B	7521	5322 130 41983	BC858B		
7005	5322 130 42136	BC848C	7522	5322 130 41983	BC858B		
7006	4822 130 42513	BC858C	7527	4822 209 62572	X2402P		
7008	5322 130 42136	BC848C	7528	5322 130 41983	BC858B		
7010	5322 130 41983	BC858B	7530	5322 130 41982	BC848B		
7011	5322 130 41983	BC858B	7532	4822 130 44196	BC848B		
7012	5322 130 41983	BC858B	7533	4822 209 62565	MC74HC24		
7013	5322 130 41982	BC848B	7535	4822 209 62569	MC74HC16		
7301	4822 209 61247	MT4264-12	7600	4822 130 42679	BUT11AF		
7302	4822 209 61247	MT4264-12	7601	4822 209 62583	TEA2018A		
7304	4822 209 60456	AMU2485-57	7602	4822 130 10025	CNX82A		
7305	4822 209 62563	DMA2280-11	7603	4822 130 42132	BC807		
7306	4822 209 62562	DMA2285-25	7604	5322 130 42136	BC848C		
7311	4822 209 62217	MCU2600-53	7605	4822 209 62581	TL431D		
7313	4822 130 62336	FET MMBF1					