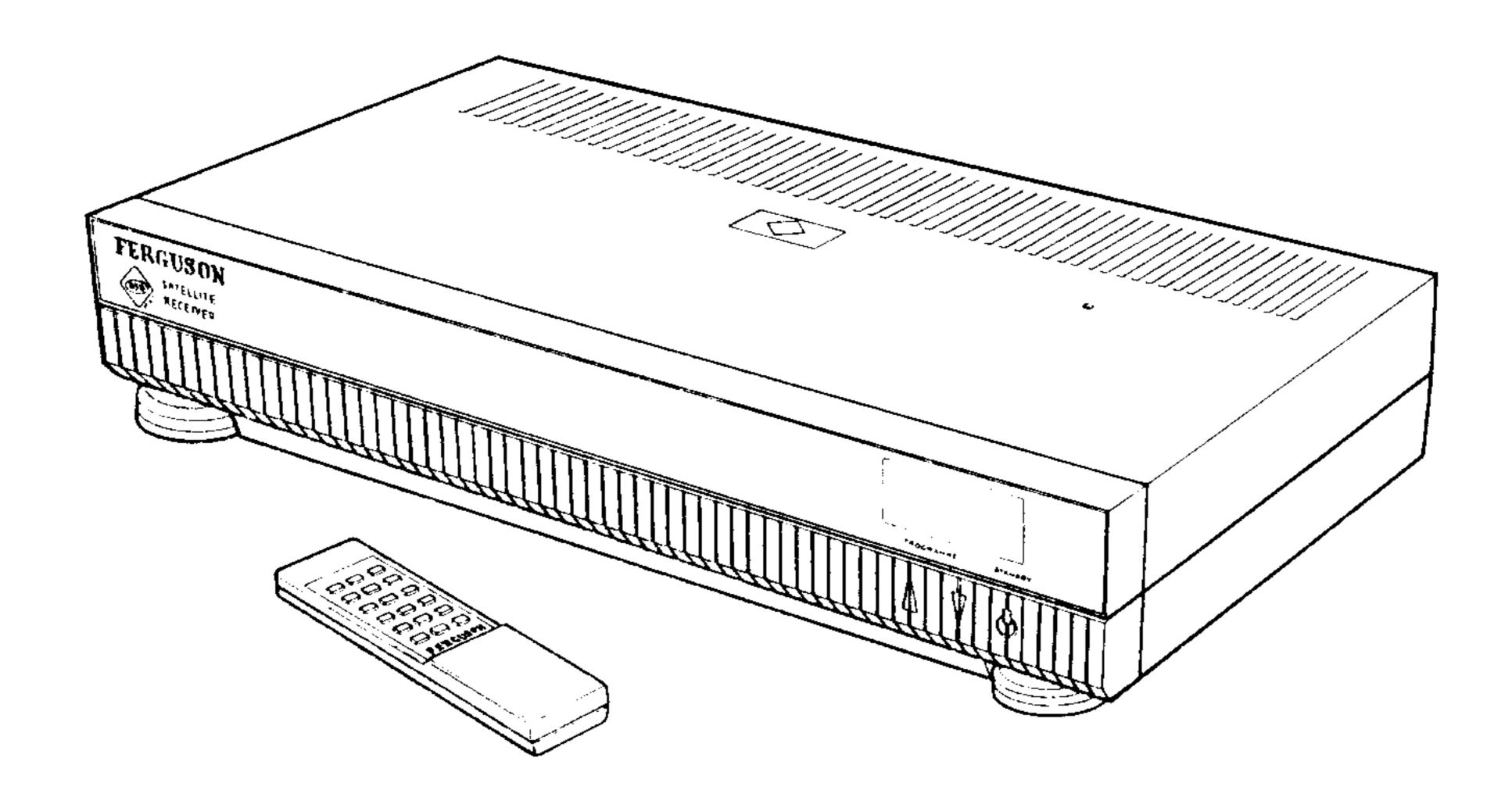
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SERVICE MANUAL

SERVICING NOTES

ACCESS FOR SERVICE

Disconnect the satellite receiver from the mains supply by removing the mains plug from the wall socket.

Remove the three screws at the back securing the lid to the case. Lift the rear of the cover up to gain access to the circuit board.

PRINTED CIRCUIT BOARD REMOVAL

The main PCB is held by five screws securing it to the cabinet base.

Disconnect BP01 which carries the low voltage a.c. to the circuit board, taking note of its orientation.

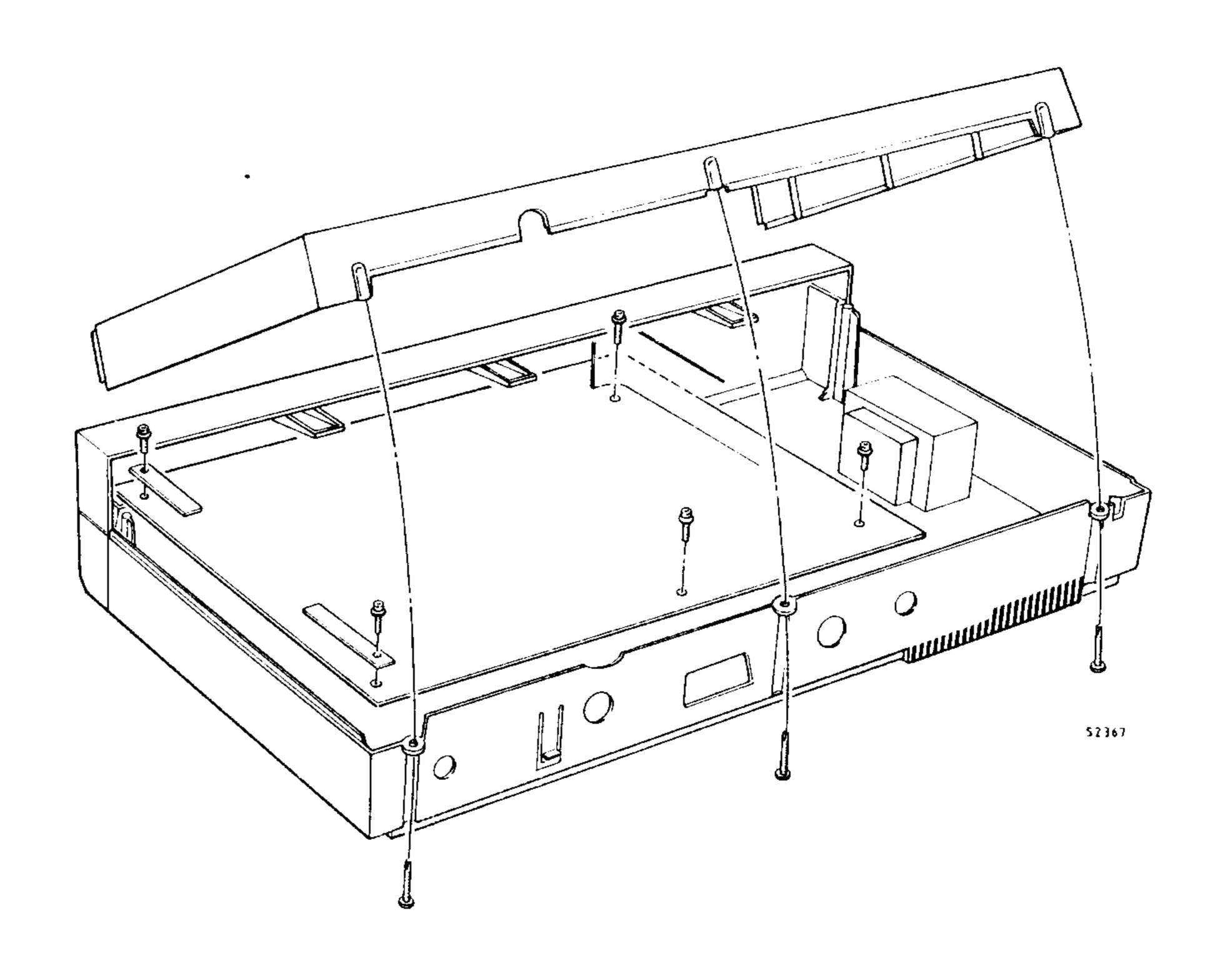
The main PCB can now be removed from the chassis.

D-MAC BOARD PC1451

This plugs into the main PCB and can be removed after first cutting the cable ties by carefully lifting it up at each end.

ACM PC1452

If you suspect a faulty ACM, do not unsolder the ACM module but return the complete satellite receiver to Ferguson Service Division for repair.



HANDLING ELECTROSTATIC SENSITIVE DEVICES

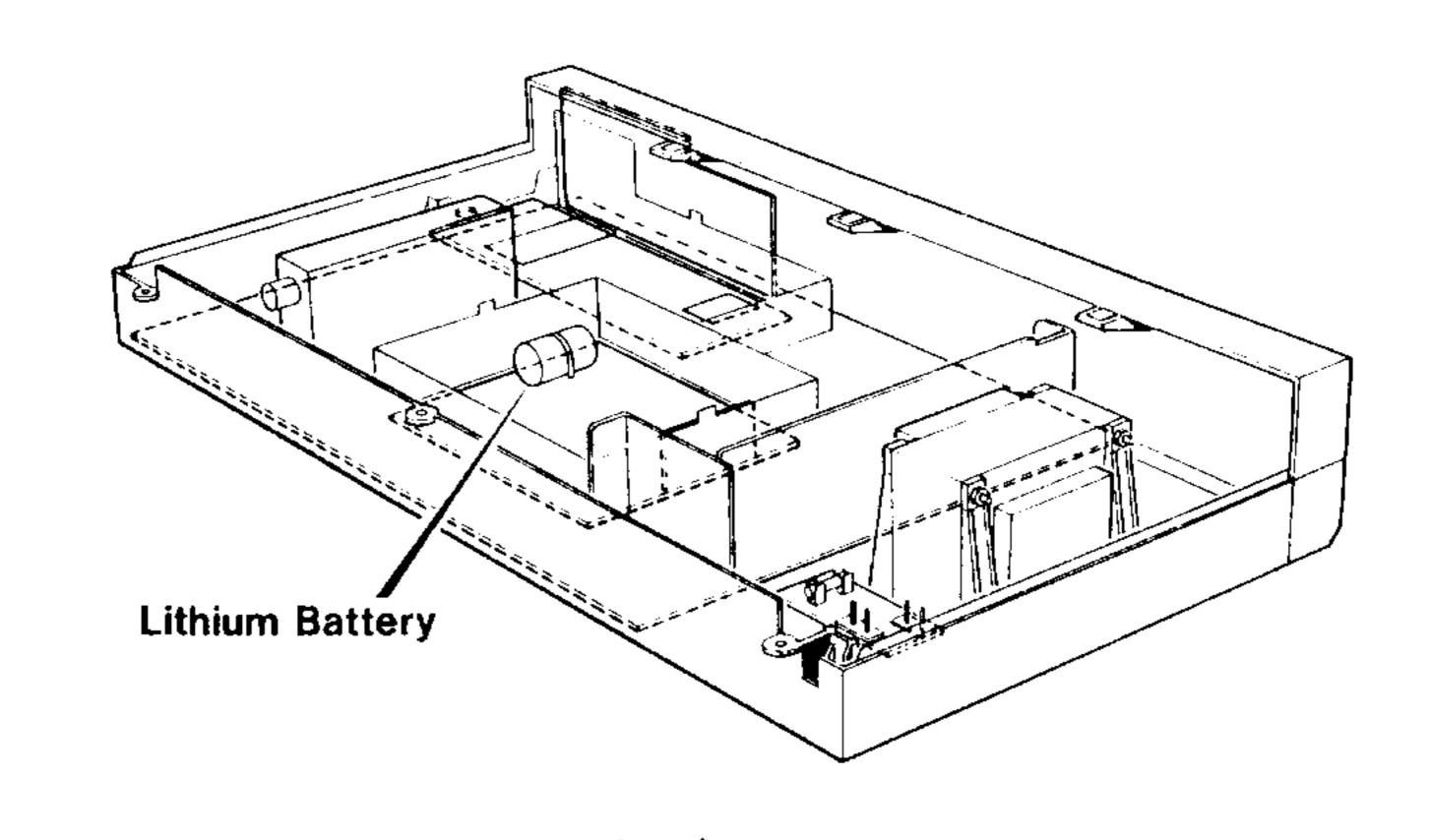
Some of the devices fitted to this receiver are electrostatically sensitive and the following precautions should be observed when handling them:

- i) Use a grounded-tip soldering iron only.
- ii) Do not remove an ES device from its protective package until you are ready to fit it. Prior to fitting, touch the protective material to the chassis or assembly in which the device is to be installed.
- iii) Use anti-static type solder removal devices.
- iv) Discharge any electrostatic charge on your body by touching a known earth prior to handling the device. Alternatively, wear a commercially available discharge wrist strap, which should be removed before applying power to avoid potential shock hazards.
- v) After removing an electrical assembly fitted with ES devices, place it on a conductive surface to prevent electrostatic charge build up.

LITHIUM BATTERY — WARNING

The battery may present a fire or chemical burn hazard if subjected to measurement, recharging, disconnection, short-circuit or heating above 100°C.

It forms part of the Access Control Module which is a non-serviceable item. The location of the battery and circuit configuration are designed for optimum safety and long service.



X-RAY WARNING NOTE

This satellite receiver should not be exposed to any form of machinery which emits x-rays, such as those in use in airports, as this can severely damage the ACM.

ALIGNMENT PROCEDURE PV01 De-emphasis adjustment

Connect the oscilloscope to the emitter of TV26.

Using a colour bar signal, adjust the oscilloscope timebase and sensitivity settings to view one of the steps and adjust PV01 to obtain a flat response free from undershoot or overshoot.

CV72 Colour Sub-carrier

Connect a high input impedance frequency counter between the 0V line and pin 17 of IV01.

Adjust CV72 to get the frequency as near as possible to the colour subcarrier of 4.43361875 MHz.

PV02 and PV03 Colour Sub-carrier interference

Connect the oscilloscope to pin 19 of the Peritelevision socket BV01.

Use a colour bar signal, and while looking in the black level area, adjust PV02 and PV03 for minimum colour sub-carrier.

After adjusting PV03, recheck the setting of PV02.

UHF Modulator channel adjustment

The modulator should be set to output on channel 38.

If a Frequency synthesis receiver is available then it should be set up to receive channel 38 and then with the test signal turned on, adjust the tuning capacitor mounted on top of the tuner to tune in the signal.

SERVICE MODE ADJUSTMENTS

Power the receiver up in the normal way.

Select standby mode, then while holding in the set-up key on the rear panel, enter the number sequence 159357 on the remote control.

NOTE: The sequence of numbers must be entered within five seconds of each other.

The receiver will now turn on with the service mode menu displayed on the screen and the programme number displayed by the LED indicators.

VCO Adjustment

Select 1 for VCO adjustment. The picture will unlock and the LED display will show the VCO value in hexadecimal.

This adjustment sets the 20.25 MHz clock and will need to be adjusted if the NVM IR05, Clock generator IV05, the 20.25 MHz crystal (QD01), or the D-MAC board is changed.

Note: This facility is only available on IR03 ICs coded FerR1.9r or later.

The software version can be found at the bottom of the Diagnostic page which is obtained by pressing 1 followed by 0 from the main menu.

Use the < and > keys on the remote control or PROG UP and PROG DOWN on the front panel until the picture stops rolling and has minimum jitter. The hexadecimal value shown on the LED will change when the adjustment is altered.

When satisfied with the adjustment, press standby to store the value.

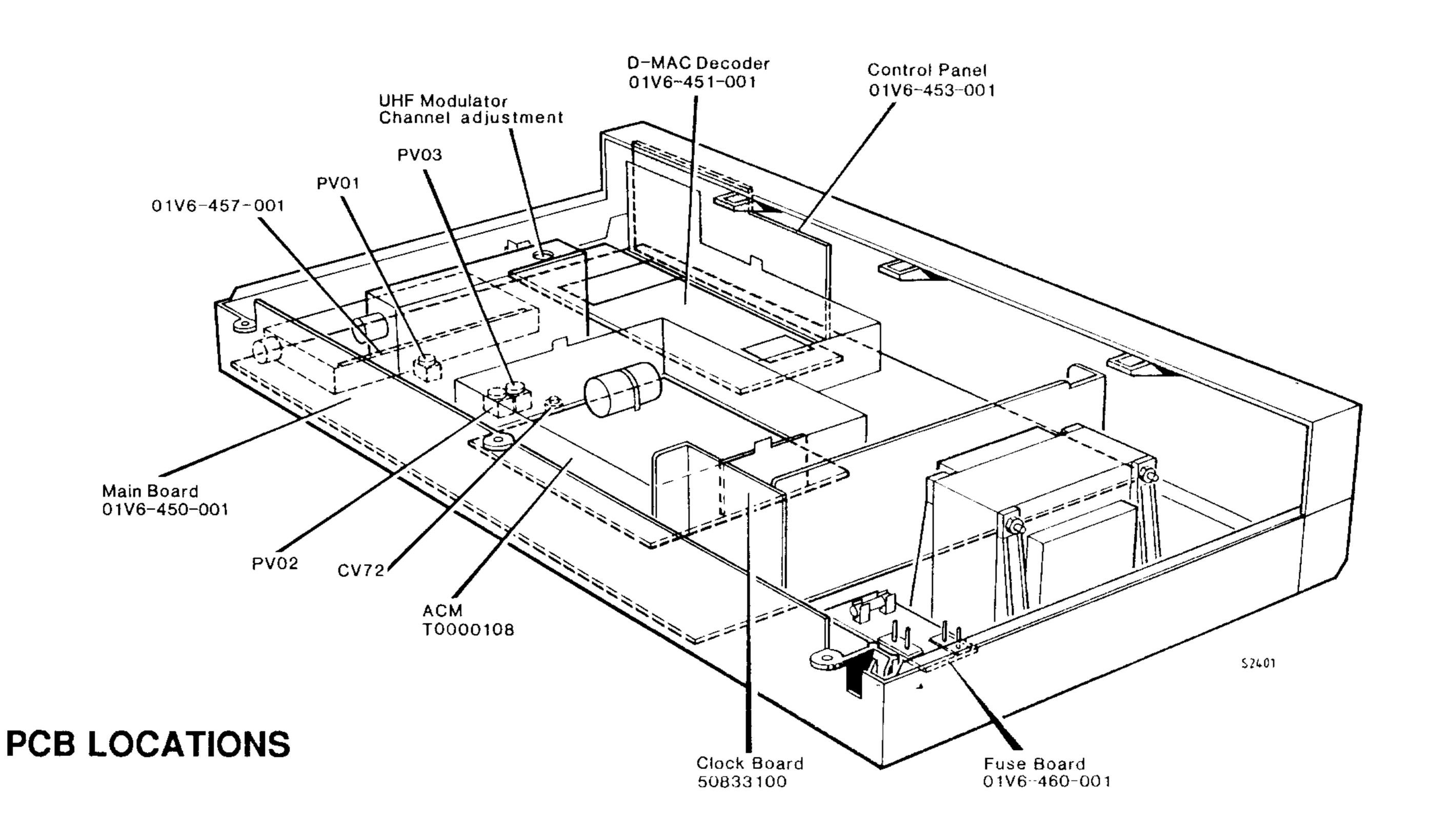
If there is a problem with verifying the stored value, error code 2 will be displayed followed by standby.

RGB levels

Selecting 2 allows the RGB levels to be individually adjusted. Details of how to do this can be obtained by pressing the SHIFT and HELP keys together.

NOTE: If the drive levels are set too high 'buzz' on sound may occur on RF because the modulator is overdriven.

This is not a fault with the receiver.



FAULT FINDING

PRECAUTIONS

Always disconnect the satellite receiver from the mains before removing or fitting the LNB as the cable carries power to the unit.

It is important that the LNB F connector is watertight otherwise this will seriously degrade the performance of the satellite receiver.

In order to remove integrated circuits from the PLCC sockets, a special tool will be required – do not try to use a screwdriver as this will result in a broken socket.

Note: With a loss of signal or corruption of line 625, the screen will go blank, however after a time out period the screen will come back on again.

The following is a general guide and not intended to be comprehensive

If any of the LEDs light up but the screen is full of snow, start by checking the output of the LNB with a portable signal strength meter. If you do not have one of these, then substitute a known good satellite receiver. If you still only get snow then suspect the LNB or cable.

Before changing the LNB, visually check that the satellite dish is aligned in the approximate direction.

As a general guide check the receiver sections in the following order PSU, CCU and then the ACM. The area in which the fault lies will have to be ascertained based on which functions of the receiver are working.

If the baseband video is tilted or 'bent', the decoding process will not function properly.

The following information is based on typical faults encountered on the receiver and is not intended as a comprehensive fault finding guide.:

Receiver LEDs do not light up

- a) Check all the power supply rails, if any are low also check the circuit protectors and fusible resistors.
- b) Check reset circuit (active high).
- c) CCU faulty.

Receiver LEDs light up but the receiver does not come out of standby

- a) IM bus not active Change DMA2285. Change AMU2481. Change DMA2280.
- b) I²C bus not active Check tuner PLL area.
- c) ACM faulty Change ACM.

Receiver comes out of standby but will not lock

- a) Adjust VCO as described under the alignment procedure.
- b) Check clamp circuitry RD3, RD5, RD25, CD23, CD41, TD01 and the DMA2280.
- c) Check the frequency response of the video signal at the input to the D-MAC decoder by examining the frequency bars test signal.
- d) Check the level of the baseband signal at the input to the D-MAC decoder. This should be 1.7V p-p, if not, check the operation of the AGC by breaking the loop at RM22 and feeding TM54 from a potentiometer connected across the +5V supply.

Receiver locks but has no sound

- a) Ensure that the sound is not present on either the modulator or Peritelevision baseband outputs. If only one is missing, then trace its path through.
- b) Check that RD26 is bent over, as if it is not it can short on a soldered link on the main board thus removing the +12V supply to the AMU2481 without blowing the fusible link.
- c) Check the DMA2280.
- d) Check the AMU2481.
- e) Check the DRAM ID02, although it is rare for this to fail.
- f) Check the status screen, if 'UNKNOWN' is displayed then change the DMA2285.

No colour on PAL output

- a) Check chroma path from pin 13 to pin 10 of IV01.
- b) Check operation of 4.433619 MHz chroma sub-carrier oscillator on IV01.

Buzz on sound

If the contrast level is set too high, 'buzz' on sound may result when using the RF connection due to the modulator being overdriven (not a receiver fault).

To rectify this problem, reduce the contrast level.

This condition does not occur when using a peritelevision lead.

DIAGNOSTIC DATA SCREEN

The Eurocypher Conditional Access System that controls BSB's scrambling enables receivers to descramble transmissions using messages sent over the air. These are split into two types:

- i) Unit Addressed messages, which are aimed at specific receivers to dictate which services are to be unscrambled or to convey personal text messages.
- ii) Service Related Messages, which carry programme related information about programme names, time of run and rating.

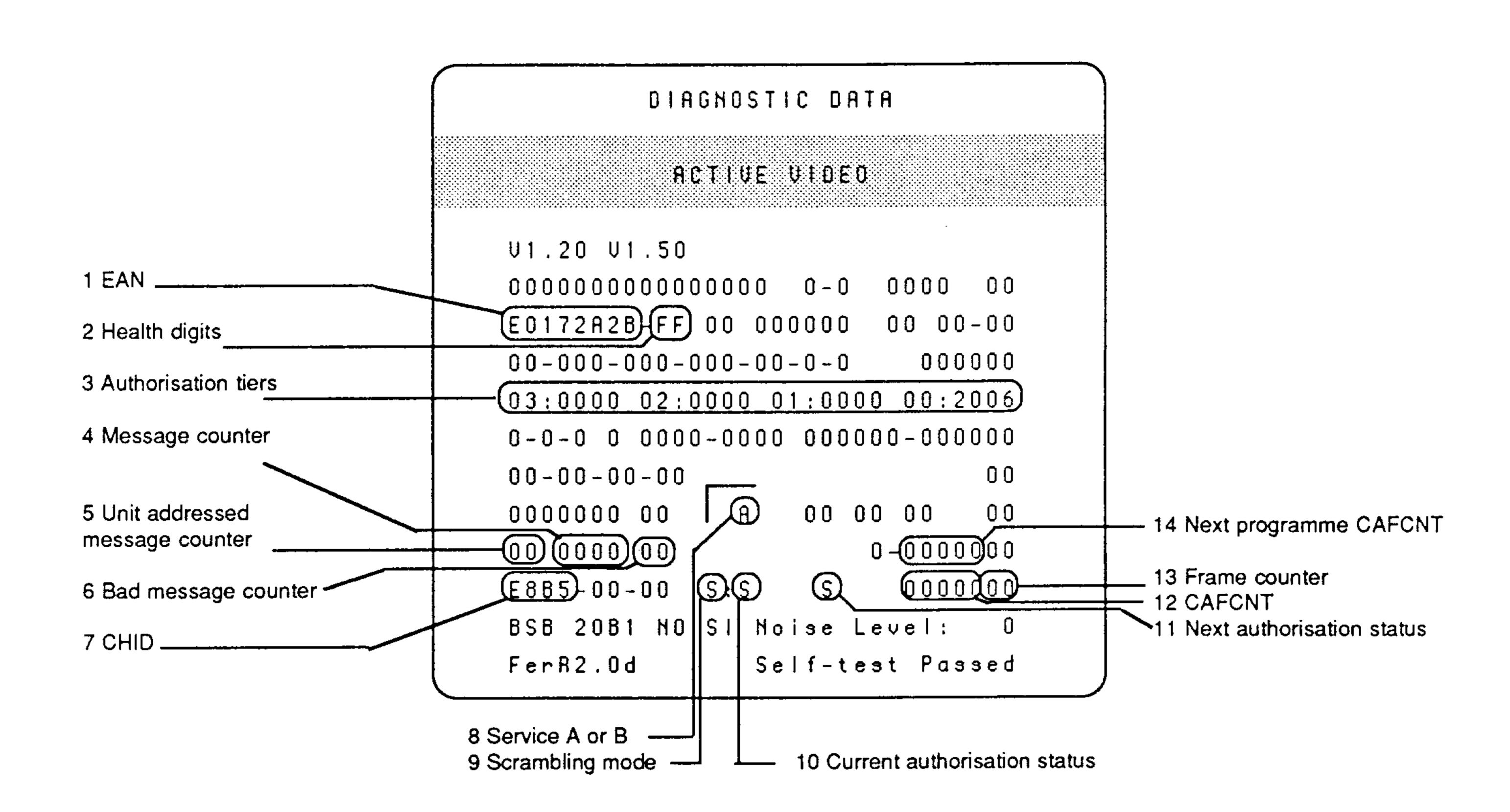
Unit addressed messages update the information the receiver requires for descrambling and are not transmitted very frequently.

Service related messages are repeated rapidly, so that the receiver can quickly obtain programme information.

If the receiver has all the information it needs from both messages, then decoding takes place.

The BSB menu system contains a diagnostic page which can be called up by pressing '0' when in the "PROGRAMME CONTROL" menu screen. It will appear as shown below.

Note the sections of the screen shown as zeros may contain different hexadecimal values but they are not relevant to the diagnostic information listed here.



THIS INFORMATION IS A GUIDE ONLY AND MAY BE SUBJECT TO CHANGE.

1. EAN (Equipment Authorisation Number)

This is the unique number assigned to each receiver. It must be quoted to BSB Customer Services in order to obtain descrambled pictures. It is also printed on a bar-code label on the rear of the receiver.

2. Health digits

These two digits indicate the 'health' of the Access Control Module and should be 'FF'. Any other value signifies a fault with the ACM.

3. Authorisation tiers

This line shows the current level of authorisation granted to the receiver by over-air messages. The tiers are organised in 32 groups of 4 digits each, of which 4 groups are displayed on screen. The remote control '< >' keys move through the tier groups on screen so that any one can be seen. Tier group 00 will normally have the following:

'0000' Not authorised.

'0002' Authorised for 4 channels + Movie Channel off-peak.

'2002' Authorised for 4 channels + Movie Channel off-peak.

'2006' Authorised for all 5 channels including Movie.

4. Message counter

This is a 4 digit hex counter which counts the number of incoming over-air messages.

5. Unit addressed message counter

This is a 2 digit hex counter which counts the number of unit addressed over-air messages, i.e. the number of messages specifically for this receiver. Equipment authorisation messages are of this form.

6. Bad message counter

This is a 2 digit hex counter which counts the number of over-air messages with errors.

NOTE: All 3 of the above counters can be reset to zero by pressing '0' on the remote control.

7. CHID (Channel identification)

This is the channel identification of the last service initialised in the ACM. When a new channel is selected and is locked the ACM is initialised with the new service. Thus, if there is no signal, the CHID will be that of the last channel initialised.

8. Service A or B

The ACM can handle 2 services at once. Service A is normally the TV service and Service B is normally for Datavision. Pressing '1' on the remote control toggles between the display of Service A and Service B information.

9. Scrambling mode

This shows the current scrambling mode. It may be one of the following:

'S' signal transmitted in fully scrambled form.
'U' uninitialised (no signal or clear transmission).
'F' signal transmitted with fixed key scrambling.

10. Current authorisation status

Authorisation status for the current programme. It may be one of the following:

'S' authorised to descramble current programme.

'-XS' ACM failure.

'-CA' considering authorisation.

'-NS' not authorised for current subscription service.

'-LS' parental control locked out.

'-MP' Missing some service related messages.

'-MU' ACM not authorised.

11. Next authorisation status

Authorisation status for the next programme. See current authorisation status.

12. CAFCNT (Conditional Access Frame Count)

Scrambling key changes every 256 frames (approx. 10 seconds) and this 5 digit hex counter is a system time reference which increments at every change.

13. Frame counter

This 2 digit hex counter counts frames.

14. Next programme CAFCNT

This shows the point when the next programme starts. When CAFCNT reaches this point the next programme becomes the current programme.

The bottom two lines of the diagnostic screen are defined by Ferguson as follows:

Signal reception field ('BSB 20B1')

This gives information on the current signal.

BSB E8B5 Movie Channel
BSB 48B3 The Sports Channel

BSB 70B2 Galaxy

BSB D0B4 The Power Station

BSB 20B1 Now NO SIG No Signal

DMAC Unrecognised D-MAC transmission

Packet Zero Field ('NO SI')

This gives information on the D-MAC Service Identification packet.

Examples:

NO SI

SI packet not received (or not checked)
SI GC

Golay coded SI packet received

Non Golay coded SI packet received

Bit Error Rate Field ('Noise Level: 0')

This gives the average Bit Error Rate.

The Bit Error Rate is updated every 8 seconds and varies from 0 (Good) to 246 (Poor).

Software Version Field ('FerR2.0d')

This gives the Ferguson software version number.

FerR1.9p FerR1.9r FerR2.0c FerR2.0d FerR2.0e

and subsequent higher versions

Note: It is important to quote the lower case letter suffix.

Control System Status Field ('Self-test Passed')

This gives information about detected faults.

IMPORTANT:

If a fault is indicated it is important to switch OFF and then switch ON MAINS POWER to the receiver. This will reset the current error status so as to prove the error still exists.

Not all faults are indicated here.

Examples:

Self-test Passed Normal operation
ROM failed Software corrupted in ROM
RAM failed CCU RAM verification failure
NVM failed NVM verification failure
DRAM failed DRAM verification failure

I²C bus failed I²C bus communications failed

i.e. Tuner PLL or NVM

IM bus 1 failed IM bus 1 communications failed

i.e. DMA2280 or DMA2285

IM bus 2 failed IM bus 2 communications failed

i.e. AMU2481

ACM failed ACM health digits failed

A further status field could also appear with the following format:

х:уууууууууууууууу

This error code sequence is of use only to Ferguson and if communicated to us it MUST be accompanied by the software version number (e.g. FerR2.0d).

THE MAC SYSTEM

MAC (Multiplexed Analogue Components) is the name given to the vision part of the D-MAC/Packet system. It offers improved quality and more facilities whilst retaining compatibility with the conventional 625-line picture format of PAL.

In MAC, the luminance and chrominance components of the picture are kept completely separate, so eliminating the spurious cross-colour patterning effects seen in PAL transmissions.

This is achieved by using separate signals for the luminance and the colour difference and sending them at different times. In other words, the luminance and colour signals are not transmitted at the same time but are sent in sequence by time-division multiplexing as shown below. Therefore, there is no need for a subcarrier.

This clever approach is achieved by time compressing the luminance and colour difference video signals before transmission.

By using time compression one of the colour difference signals (B-Y or R-Y) plus the luminance signal can be squeezed into one conventional line period (64µs for 625-line systems). Alternate lines contain the B-Y and R-Y, the blue and the red difference signals, whereas all picture lines contain the luminance signal. In this way the luminance and the colour difference signals are separated and cross-colour problems are eliminated. (Line 625 is quite different and contains no video information.)

Different aspect ratio pictures can be accommodated. For a conventional 4:3 aspect ratio each line of luminance is compressed by a factor of 3:2, which reduces the time needed from 52μs to just under 35μs. Similarly, each line of colour difference is compressed by a factor of 3:1 so reducing the time from 52μs to just over 17μs.

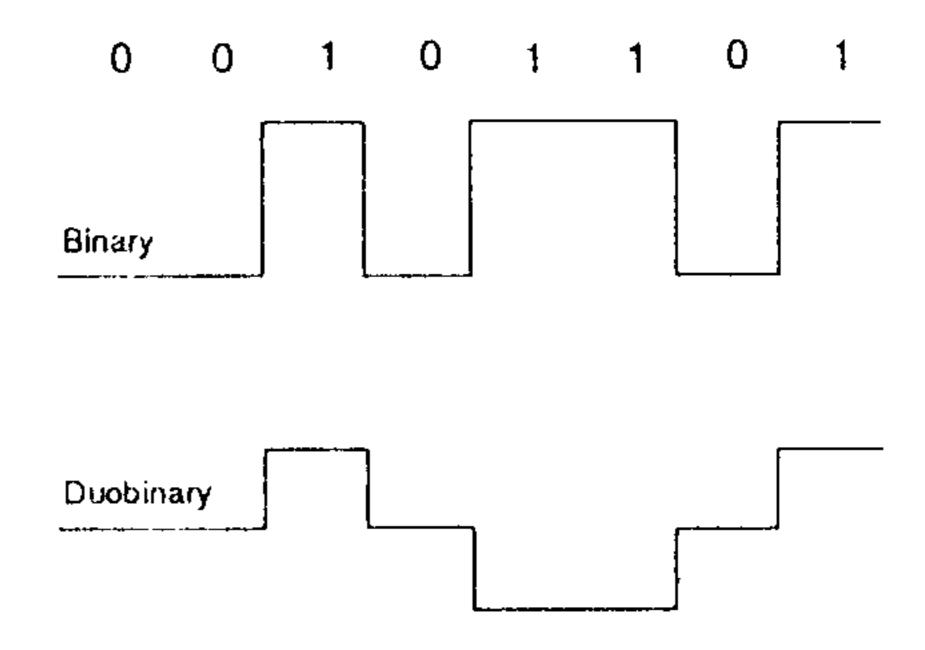
Taken together, one after the other, they occupy 52µs. Time compression results in an increase in baseband bandwidth. For luminance (before modulation) this gives a bandwidth of about 8.4 MHz compared to 5.6 MHz before compression, an increase which is easily accommodated in an FM satellite channel. The bandwidth for the colour difference signal is less than that for luminance.

SOUND AND DATA

The MAC system does not use the time consuming line synchronising pulses found in conventional television formats. In its place at the start of each picture line is a high-capacity data burst, a few bits of which provide the line rate synchronisation. The rest of the data burst contains both the sound and data information.

The data signal occupies about 11µs of each line period and consists of a 20.25 Mbits/s duobinary data burst inserted into the baseband signal. Each line carries 206 bits which gives a mean data rate of around 3 Mbit/s.

Duobinary is a three-level coding system which enables a given signal to be carried in a narrower bandwidth than is possible with the conventional two-level binary system as shown below.



Of the three levels the middle level represents a zero and the extremes both represent ones. A 20.25 Mbit/s data rate would normally need a bandwidth of over 10.125 MHz. By using duobinary, D-MAC/Packet can be carried by a 3dB bandwidth of just over 8.4 MHz. You will see that in D-MAC/Packet the final baseband is more dependent on the data burst requirements than on the vision signal.

Line 625 is different from the other lines. It is used for special signalling purposes and consists entirely of data, 1296 bits in all. If there is no picture to be transmitted, then all lines can be filled with data. This would give more than a six-fold increase in data capacity.

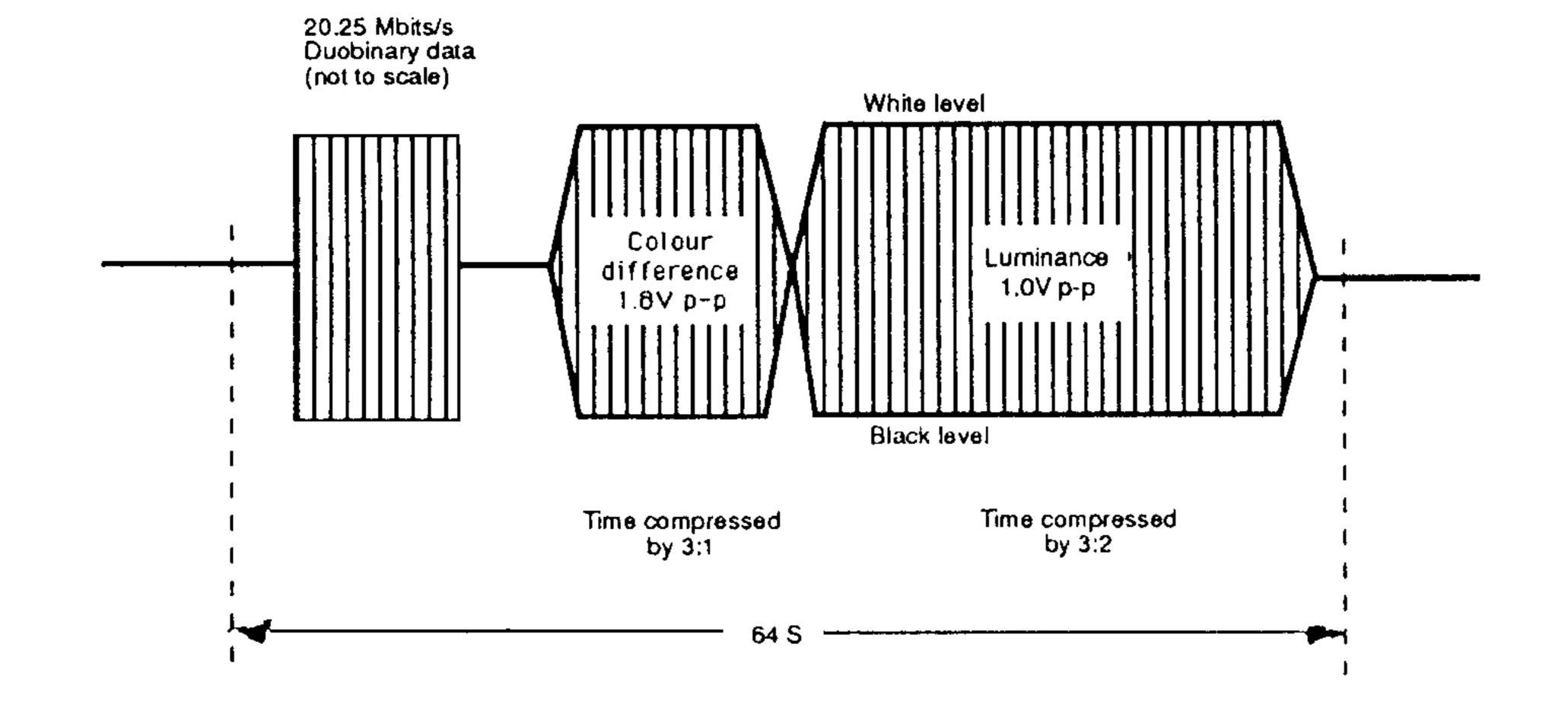
PICTURE SYNCHRONISATION

As we have seen the conventional line synchronisation pulses used with PAL are absent from MAC, the time slot they would normally occupy is instead used for the data burst, which contains the data and sound.

Line synchronisation is achieved by six synchronisation bits within the data burst. The pattern of these six bits varies from line to line. Towards the end of each frame, the pattern changes, signalling the start of the next frame. There is no field synchronisation as such at line 312.5.

This data is decoded within the DMA2280 to generate a composite sync signal.

An alternative method of frame synchronisation is available using a fixed pattern of bits which forms part of line 625 and which is inverted from frame to frame.



DATA PACKETS

In D-MAC the data burst is divided into two 'sub-frames' as shown below and the data itself (i.e. data and sound) is bundled into 'packets', each of which contains 751 bits.

Each television frame of 625 lines carries 164 packets, giving a total capacity of 4100 packets per second (164 x 25).

Each packet only contains data relating to one particular service, such as one stereo sound channel, and any such channel (sound or data) requires many packets. For example, a high quality mono sound channel will require from 500 to 900 packets/second.

To decide which service or channel a packet belongs to, each incorporates an address for identification. Packet address '0' serves a special purpose which is to provide a 'service identification' channel. This channel tells the receiver the number and types of services available.

SOUND

The digital sound system offers a choice of high-quality or medium-quality sound. The broadcaster can decide which to use for different programmes at different times. For example, music would normally be broadcast in stereo using high-quality sound whereas commentaries could use medium-quality sound. Medium quality sound is not used for stereo. Since several sound channels are available simultaneously, multilingual broadcasts are possible.

Although theoretically up to 8 highquality sound channels or 16 mediumquality sound channels are available, that would be very unusual since no capacity would be left for data use or for carrying information about conditional access.

The system is very flexible and can offer a mix of high-quality sound, medium-quality and data services, and can be varied at any time by the broadcaster. BSB will only be broadcasting original sound in high quality.

The mean data (i.e sound and data) rate is around 3 Mbit/s although the rate within the approximately 1µs long data burst is 20.25 Mbit/s.

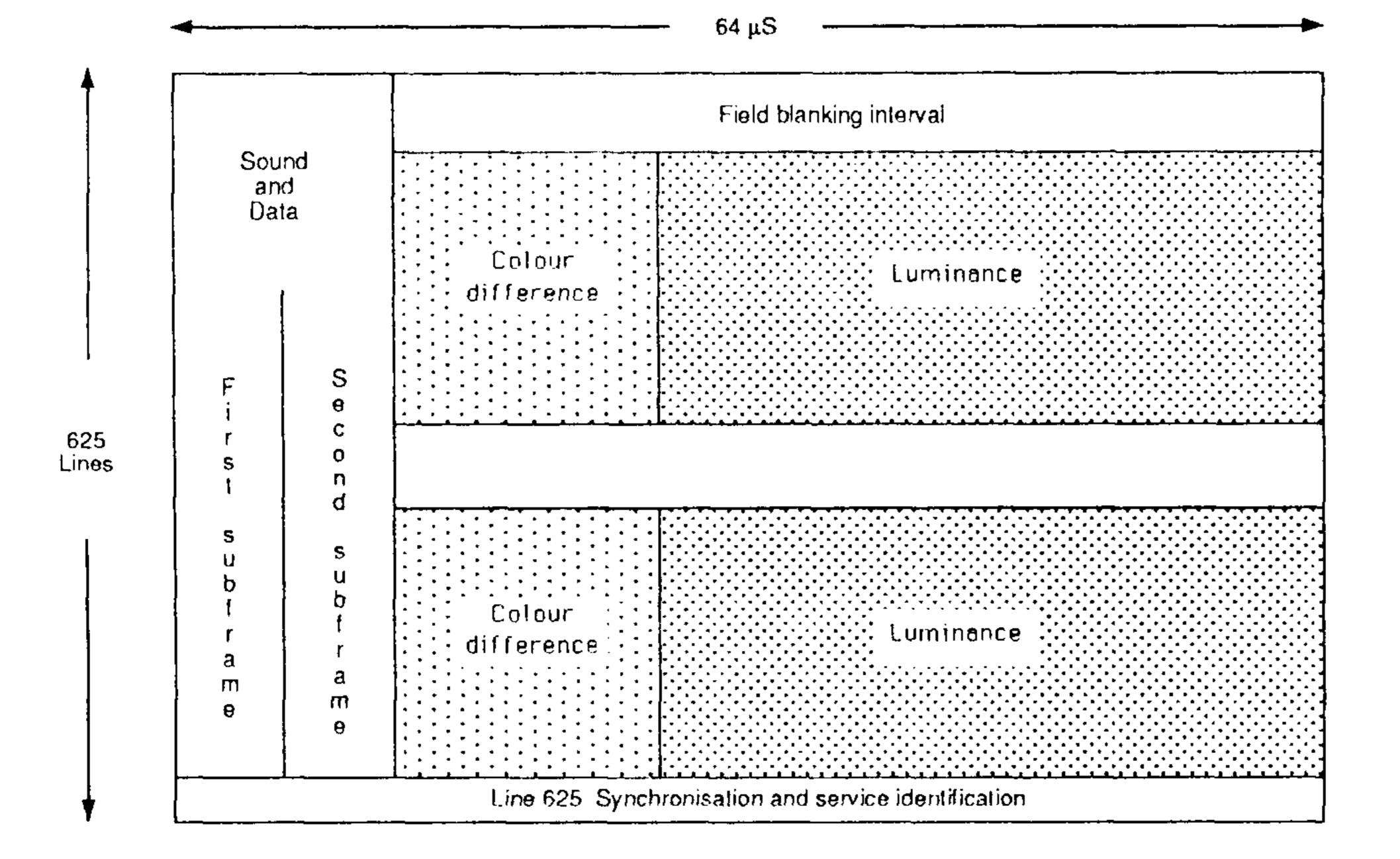
The high quality sound has a bandwidth of 15kHz which is obtained by sampling at the standard rate of 32 kHz. Halving the sampling rate gives medium quality sound with a bandwidth of around 7kHz. The signal will be sampled using 14 bits per sample. All 14 can be transmitted but there is an option for the 14 bits to be companded to 10 bits by the process known as Near Instantaneous Companding or NICAM.

CONDITIONAL ACCESS

D-MAC/Packet offers a vision scrambling system known as 'double-cut component rotation'. This allows conditional access which is considered essential for some services. It would be used for subscription, or pay-as-you-view television, for example. The vision scrambling ruins the picture, making it unwatchable unless the receiver is equipped with the 'key' needed to 'unlock' the signal. This 'key' is a pseudo-random digital sequence which is generated in a complex way from two sources. One source is in the receiver and the other is transmitted as part of the data burst.

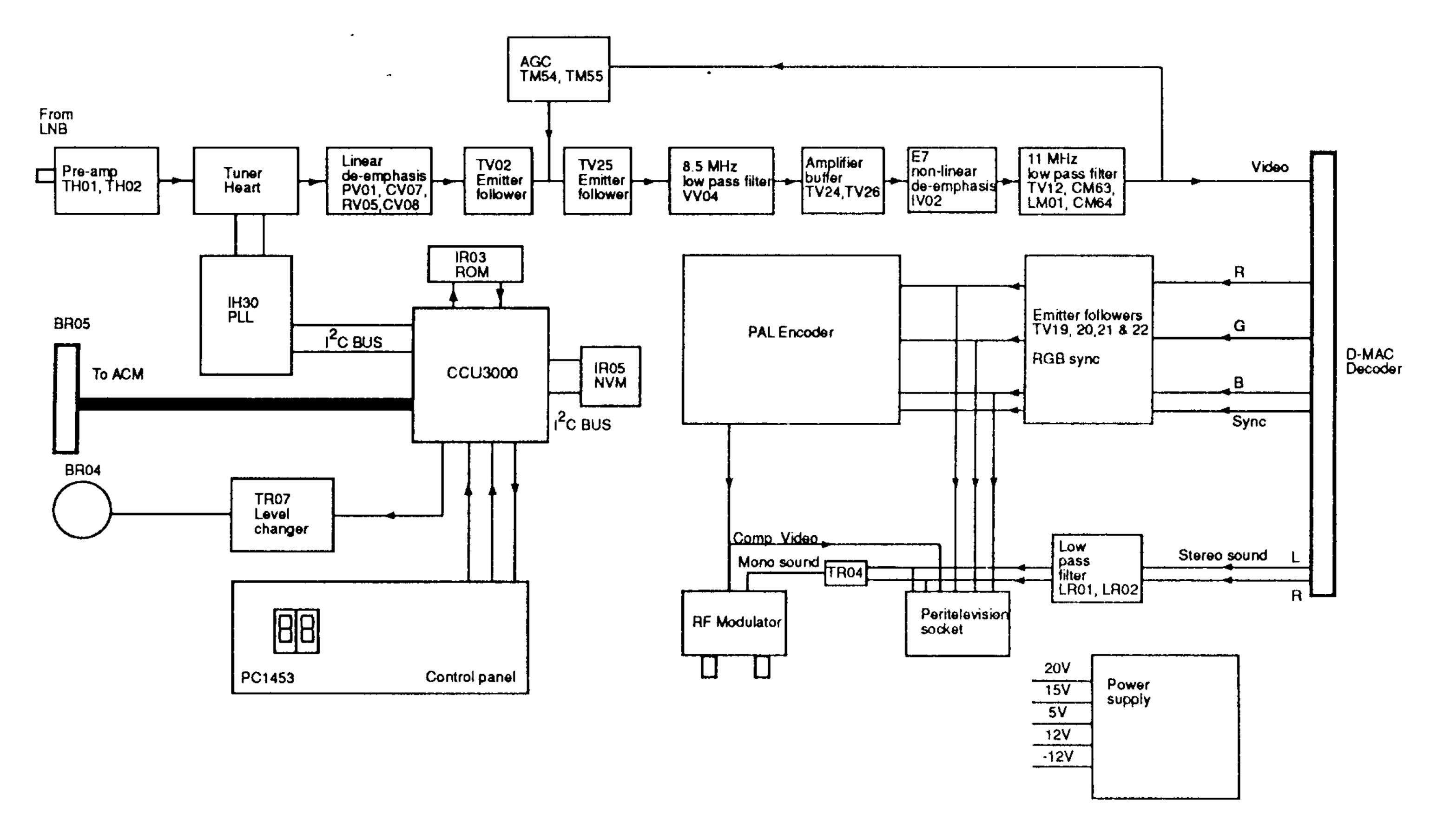
When subscription or pay-as-you-view services are offered, the broadcaster can restrict the 'key' to individual receivers or groups of receivers as desired.

Data and sound transmissions can also be independently scrambled for conditional access and a similar 'key' arrangement is used to allow access.



CIRCUIT DESCRIPTION

Block Diagram of Main Board



The main PC Board PC1450 receives the 1st IF signal from the antenna, selects the requested Channel and detects the D-MAC baseband video signal.

This video signal is then linearly deemphasized to the MAC E1 standard and has AGC, controlled by a signal from the D-MAC decoder (PC1451) applied. In order to avoid aliasing in the D-MAC decoding process, after AGC the video signal passes through an 8.5 MHz low pass filter to remove out of band frequencies before A-D conversion.

The final process before D-MAC decoding is to pass the signal through another de-emphasis circuit, this time a non-linear de-emphasis called E7, which improves the S/N ratio on 16/9 operation. The D-MAC baseband video signal then enters PC1451 for decoding and de-scrambling.

The signals leaving PC1451 are the audio, sync and RGB signals, which are all buffered by emitter followers. The RGB signals are split two ways, one to the PAL encoder and the other straight to the peritelevision (SCART) socket.

The sync signal is fed only to the PAL encoder. The composite video signal from the PAL encoder and the combined L/R audio signals from PC1451 are used to modulate an RF carrier in the Mixer/Modulator module. In this module the PAL RF satellite signal is combined with the terrestrial UHF signals. The composite video signal from the PAL encoder and separate L and R audio signals from PC1451 are fed directly to the peritelevision (SCART) socket.

The Access Control Module (ACM) is mounted on PC1450 for controlling the Descrambling of the MAC signal. This module interfaces directly with the central control unit (CCU) and also outputs RGB signals to the MAC decoder PCB for on-screen graphics. The CCU controls the operation of the MAC decoder PCB by two 3-wire Intermetall (IM) buses. It also drives the two seven segment displays on the front panel PCB PC1453 to indicate the selected Channel. This panel also provides inputs to the CCU for customer control via push buttons and the IR remote control input.

The Power Supply is also on PC1450 and is a conventional linear type supplied from a separate mains transformer.

POWER SUPPLY

This is a conventional linear power supply providing outputs required by the various stages. During standby, the CCU3000 (IR01) turns on TP03 which in turn turns off TP02 removing power from the RF modulator and PAL encoder IV01. All other parts of the circuit are active during standby to enable the unit to receive data from the BSB satellite. The unit should, therefore, always be left in standby when not in use to receive this data. The ACM contains a battery which is used to retain vital data in the event of a power failure.

TUNER

The satellite broadcasting band occupies the frequency range 11.7 GHz to 12.5 GHz. There is a fixed oscillator in the LNB which is mixed with the incoming frequency to produce the first IF. This IF signal enters the main board PC1450 where it is amplified by the broadband pre-amp comprising TH01 and TH02. This pre-amp has a low gain in the order of 4 to 5 dB, but also serves to isolate the aerial input from the Tuner oscillator for low radiation requirements. The +20V LNB supply is connected via LH01 to the aerial input socket.

The output from the pre-amp then passes to the Tuner Heart module which occupies nearly all the area within the tuner can on the top surface of the PCB.

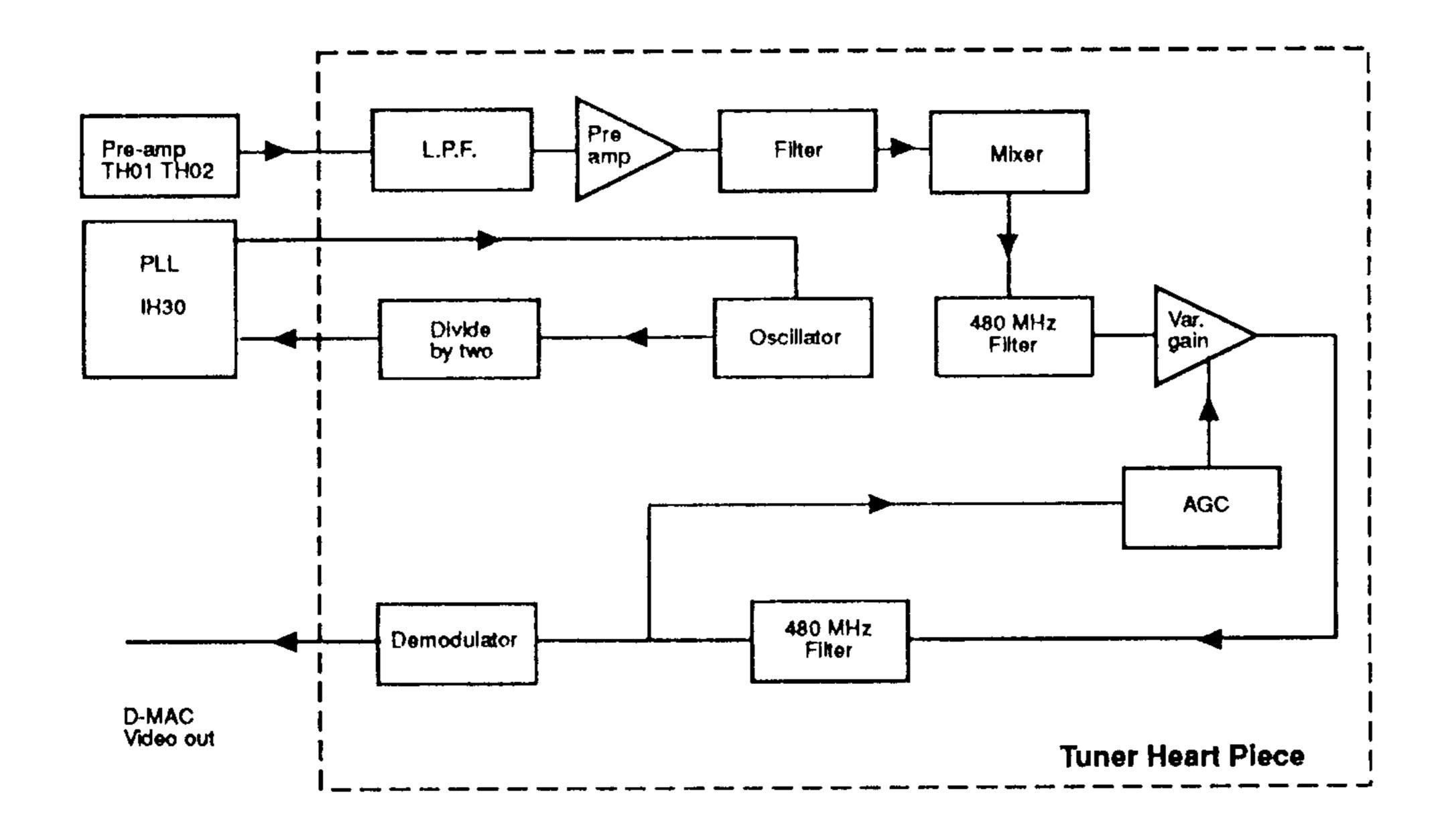
The Tuner Heart is a pre-aligned module and should not be adjusted in any way. This module converts the 1st IF signal to baseband D-MAC video signal using a PLL to provide frequency synthesis.

The first IF signal is filtered and amplified before entering the mixer where the second IF is produced at a fixed frequency of 480 MHz. The VCO is controlled by the PLL IC, IH30, mounted underneath the tuner heart on the opposite side of the PCB.

The oscillator signal from the VCO in the tuner heart is divided by 2 and then fed to the PLL IC SDA3202. It is then compared, after further division, with the PLL reference oscillator which runs at 4 MHz, determined by QH36. The divide ratio within the IH30 is controlled by the I²C Bus from the system controller CCU, IR01. Components RH41/CH41 and RH42/CH42 filter the Bus lines from external interference. The unconnected pins on IH30 are Bus controlled switches which are not used in this application.

The output from the phase detector in IH30 is filtered by an active LPF with an internal amplifier in IH30 and an external output transistor TH30. This integrates the current pulses and forms a control voltage for the tuner heart VCO.

The 480 MHz second IF signal has AGC applied before detection in an SL1452 IC before it exits from the Heart-piece from an emitter follower buffer as baseband D-MAC video.



Tuner Block Diagram

D-MAC BASEBAND VIDEO SIGNAL PROCESS PATH

The video signal is first de-emphasized to the standard MAC de-emphasis characteristic by PV01, CV07, RV05 and CV08. A pre-set is required within the de-emphasis time constant partly to take up component tolerances and partly to modify the characteristic to compensate for the fall in the tuner heart video response which is typically 3dB down at 10 MHz.

TV02 buffers the de-emphasis circuit output which is then fed via RV42 to another emitter follower TV25. RV42 and FET TM55, acting as a variable resistor, form a potential divider for the signal thus acting as an AGC circuit. TM55 is driven by TM54 which in turn is controlled by the AGC output from the D-MAC decoder IC DMA2280 on the D-MAC decoder PCB. This AGC control is derived by monitoring the black and white test signal on line 624. Too low a signal produces a low (GND) output, too high a signal a high (+5V) output and for a correct level the output is tristate.

TV25 ensures that the 8.5 MHz LPF VV04 is correctly matched and is not affected by the action of the AGC circuit.

The LPF is required to prevent out of band frequency components reaching the E7 de-emphasis and A/D converter in the D-MAC decoding process. It also ensures that the Data signal is as clean as possible for the sound and data processing.

After the LPF the signal is amplified by TV24 to 1.7V p-p which is the level required by the next process, another de-emphasis circuit, this time a non-linear E7 de-emphasis circuit. This de-emphasis circuit is included to compensate for the noise penalty incurred when the BSB receiver is operating with a Wide MAC transmission. W-MAC is the 16/9 High Definition Standard to be transmitted in the future and the increase in noise is due partly to an increase in bandwidth and partly to an increase in de-compression ratio. The expected improvement in S/N ratio due to E7 is 4-5 dB for a W-MAC signal and 3 dB for a basic D-MAC signal.

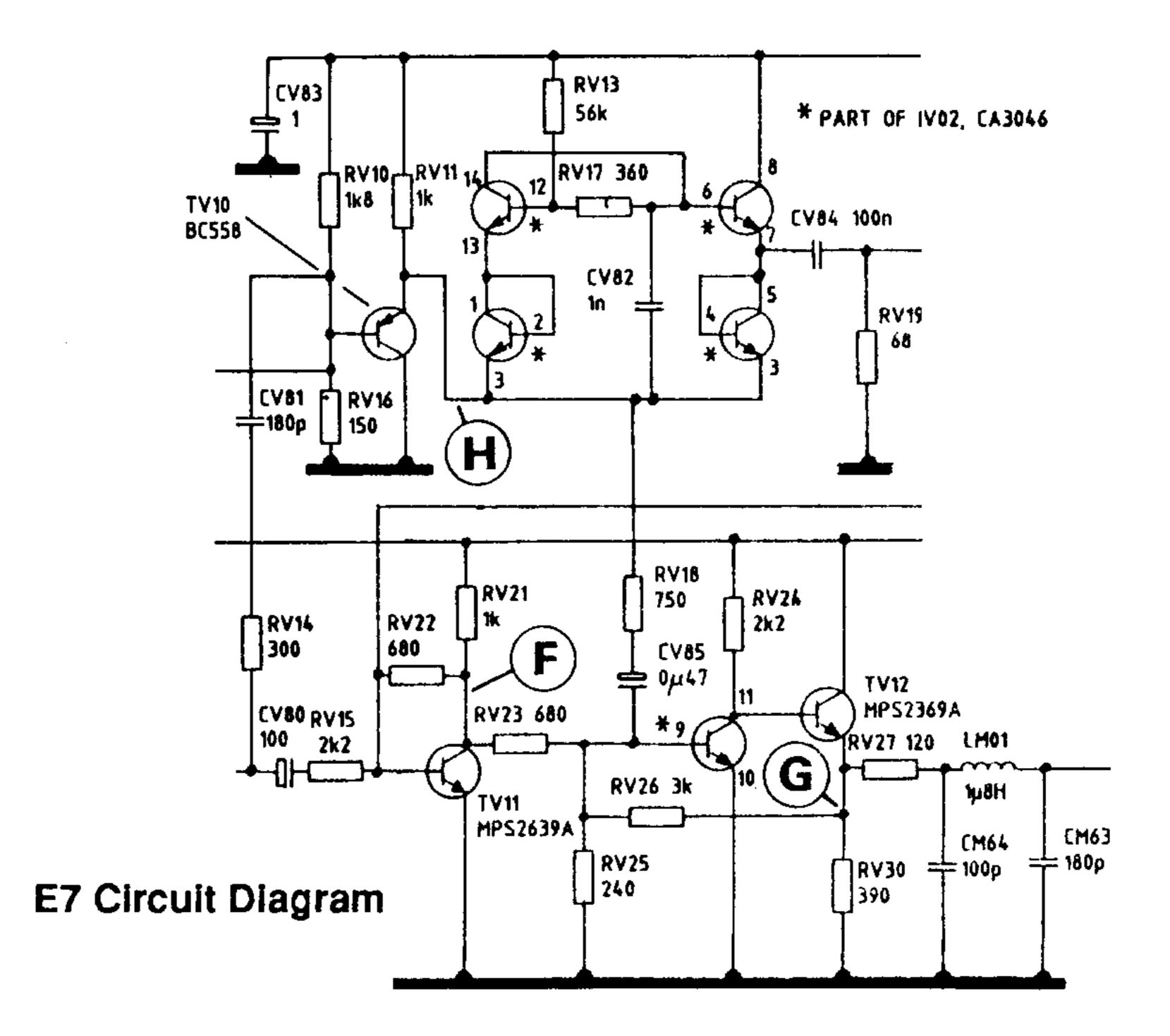
E7 has a flat frequency response for the reference signal level but as the relative input level decreases, the high frequencies in the transmitted video signal are boosted until, at the extreme low level of the range, the boost is +6 dB for the top of the video frequency band. It acts, therefore, in a fashion analogous to the Dolby audio noise reduction circuit. The circuit in the receiver has a complimentary response to that at the transmitter.

It is a requirement of the EBU that E7 pre-emphasis is switched off during the data period of the transmitted D-MAC signal. If E7 de-emphasis is left connected in the receiver during the data period then the data signal is affected resulting in an increased bit error rate (BER). Therefore, E7 de-emphasis is switched off and on at the correct instance by an FET switch (TV27) driven by a line rate pulse from the D-MAC Decoder.

A simplified block diagram for the implementation of the system in the BSB receiver is shown below.

The baseband D-MAC signal is split into two paths, the top section on the block diagram being the high frequency path determined by the 2MHz HPF. This signal is then further attenuated according to the E7 characteristic by a non-linear circuit and fed to a combiner.

The low frequency path is obtained by a subtraction process whereby the high pass signal is subtracted from the flat signal at A. Since a single HP filter is used, the LF and HF paths are complimentary and when both paths are re-combined a flat overall frequency results for the reference level signal. An attenuator is included in the LF path to match filter insertion losses in the HF path. The switch SW shorts the signal at the HPF output to GND for the data portion of the signal so the non-linear attenuator is inoperative.



The non-linear attenuation of the high frequency portion of the signal above 2 MHz is achieved by passing the signal through two forward biased diodes, the attenuation being controlled by the current through the diodes which is in turn varied by the amplitude of the signal. In the circuit used, the diodes are formed by connecting two transistors from the transistor array IC IV02 as diodes, to achieve good matching of their characteristics. The circuit is shown above.

The lower section of the circuit forms the basic video path. The HF signal from the non-linear attenuator described above is combined with the original signal in TV11 and the output from the HP filter subtracted from this signal at the output of TV11 by virtue of the phase difference across TV11.

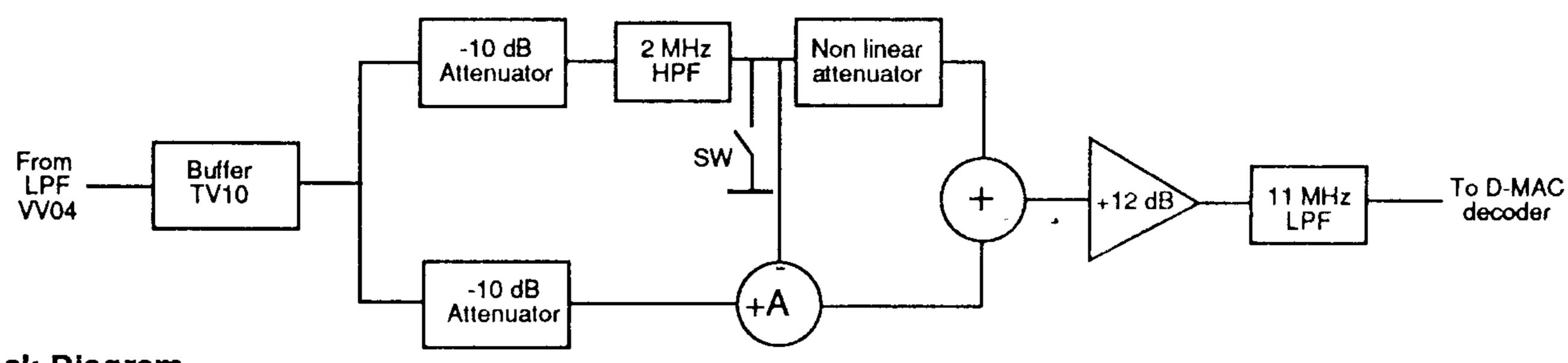
The combined signal is then amplified by a transistor in the array IV02 and buffered by TV12 to isolate the LPF formed by CM63/LM01/CM64 which has a turnover frequency of about 11 MHz.

This filter removes the inter-modulation products of the non-linear network and does not supplant in any way the 8.5 MHz LPF VV04 which has a much sharper roll-off characteristic.

VIDEO PROCESSING PATH

The decoded video signal leaves the D-MAC processing PCB at BM04 in the form of Sync and RGB signals.

The RGB signals are attenuated by potential dividers and buffered by emitter followers TV20, TV21 and TV22. The signal level at each emitter is nominally set to 1.4V p-p, the component signals then being fed via 75 ohm resistors to the Peritelevision (SCART) connector so that the standard output of 0.7V p-p is available at the output. Although this is the nominal output level, these levels can be varied independently to suit any non-standard TV peritelevision (SCART) input by commands from the remote control via the CCU3000 and D-MAC processor. The RGB emitter follower load resistors are split to provide additional outputs of 1V p-p which are fed to the PAL encoder IC IV01. The sync signal from the D-MAC decoder PCB is also required by the PAL encoder and this is buffered by TV19 and fed to pin 2 of IV01.



E7 Block Diagram

The RGB inputs are matrixed within the PAL encoder to produce R-Y, B-Y and luminance signals. The two colour difference signals are then fed to two balanced modulators with a carrier source obtained from an integral oscillator running at the colour subcarrier frequency 4.433619 MHz set by crystal QV01 and adjusted by CV72. The oscillator output is followed by a 90 degree phase shifter which provides the quadrature drive to the R-Y modulator. the output from this modulator is then alternately switched in phase from 90 to 270 degrees on successive lines. The direct output from the oscillator is fed straight to the B-Y modulator as 0 degree reference. Both modulator outputs are combined and amplified before leaving the IC at pin 13.

The colour burst is fed to both modulators to produce a burst phase of 225/135 degrees. The position of the burst is determined by a ramp generator within the IC with the ramp timing determined by CV75/CV94 and RV84. Two level sensors provide references, one to start the colour burst and the second to stop it, accurate timing being attained since only the beginning of the exponential ramp is utilized with the sync input starting the commencement of the ramp. The sync input level to the IC is non-critical in that during the sync period the input should be less than +0.9V but should not be allowed to fall below -0.5V. Between sync pulses the signal should be above +1.7V and below the internal +8.2V regulator on pin 16.

To return to the chroma signal at pin 13, this signal is band pass filtered in VV01 to limit the chroma bandwidth to approximately +/- 0.5 MHz to match the receiver bandwidth and then re-enters IV01 at pin 10 where it is combined with the luma and sync signals in the output amplifier.

The luma signal is obtained from the RGB input matrix and, before combining with the chroma signal, passes through VV02, a standard 400nS delay line used to match the delay incurred by the chroma band pass circuit.

Due to imperfections primarily in modulator balance which will vary from device to device, some residual subcarrier will be noticeably present in black areas of the picture.

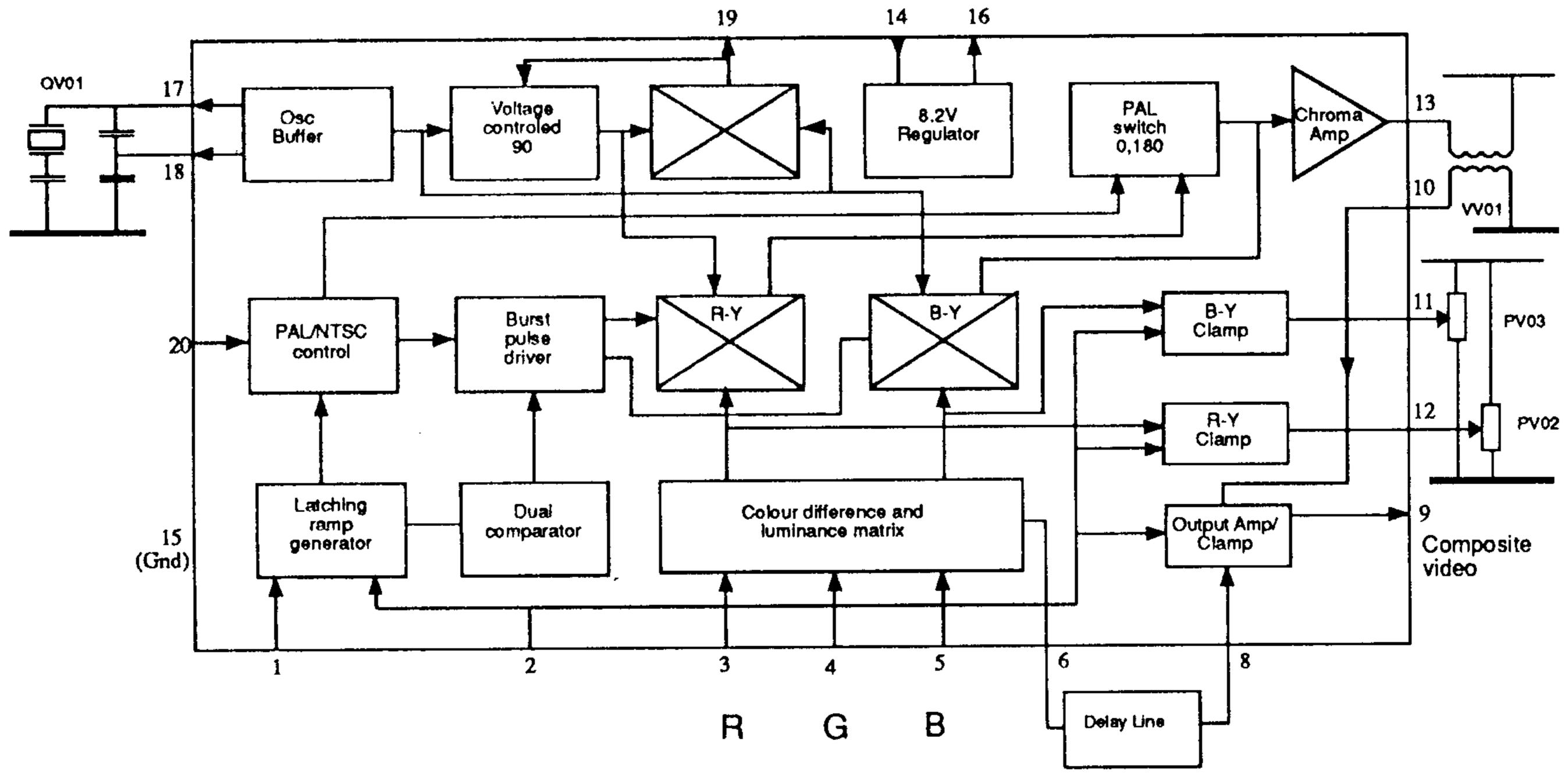
This can be nulled out by PV02 and PV03 which sink or source a small current into the R-Y and B-Y clamps respectively. Any residual colour in the white areas can only be reduced by altering the relative levels of the RGB inputs through software control.

The output level of the Composite Video Signal at pin 9 of IV01 is 2V p-p and is determined by the level of the RGB input signals. The composite video signal (CVS) output is buffered by TV23 and then fed to the peritelevision (SCART) connector resistor RV74 providing a matched signal level of 1V p-p at the peritelevision (SCART) connector. This signal will also act as the sync signal for the RGB outputs.

The CVS at the emitter of TV23 is attenuated by RV76/RV77 and then fed to the Modulator module MPM8010. This modulator acts in a similar fashion to a VCR modulator in that it produces a PAL UHF signal from D-MAC video and audio modulation, which it then combines with the terrestrial PAL UHF signal input and then outputs these signals to the TV UHF aerial input.

AUDIO PROCESS PATH

The L and R audio channels leave the D-MAC PCB at BM02. They are then buffered by TR03 and TR06 and fed to 15kHz Low Pass Filters LR01 and LR02 via matching resistors RR30 and RR31. These filters are required to remove any residual sampling frequency and harmonics. The filter outputs are correctly matched by the buffer amplifiers TR08 and TR09 which feed the L and R audio outputs to the peritelevision (SCART) connector. The L and R signals at TR06 and TR03 emitters are amplified and combined in TR04 to provide a mono audio signal for the modulator VV03.



PAL Encoder Block Diagram

CENTRAL CONTROL UNIT AND ACCESS CONTROL MODULE

The overall operation of the Satellite Receiver is controlled by IR01. This is a 68 pin plastic leaded chip carrier (PLCC), the CCU3000.

The interface with the customer for this control IC is via the Control and Display board PC1453. This board houses the remote control IR amplifier IE01 and the Channel Up, Channel Down and Standby switches. Indication of the selected Channel is by 7 segment LED displays GE02 and GE03.

The CCU3000 has external ROM in IR03 and the CCU clock is controlled by a 4 MHz crystal QR01. The CCU provides 3 control bus outputs, an I²C bus to control the tuner PLL and NVM and two IM buses, one for video and audio processing control in the D-MAC decoder, and the other for audio processing control in the AMU2481. Separate IM buses are required due to the different operational speeds of the two processes.

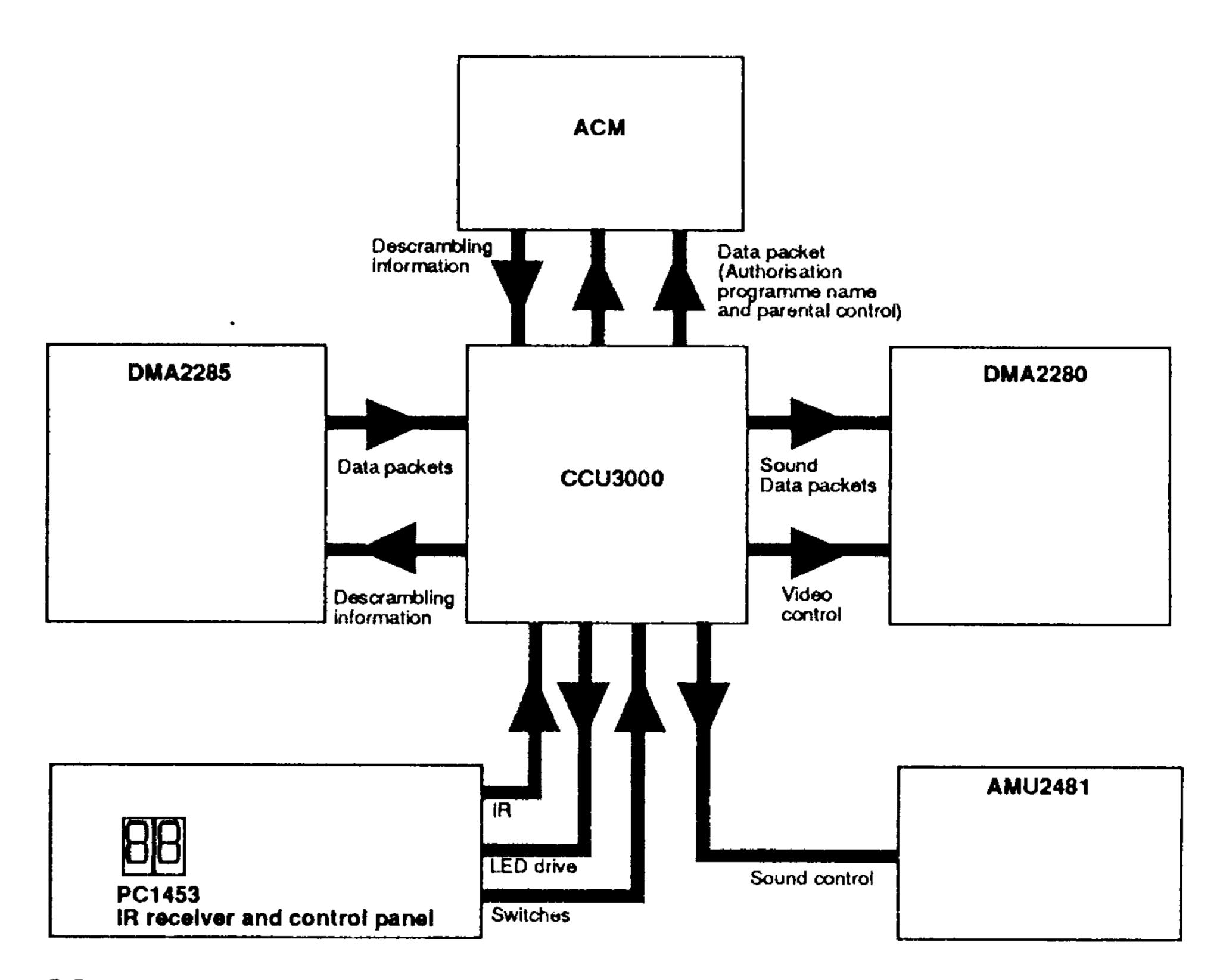
TR01 and TR02 form a reset circuit to provide the correct timing for the +5V reset level on switch-on. The reset line is active high.

Outputs from the CCU are provided to connect with the ACM via an eight line data bus and three line control bus. In addition the 7 segment LED displays on PC1453 are driven from the CCU3000 with eight segment lines and two digit select lines.

Four of the segment drive lines are also connected to the three front panel controls and the Set-up switch so that the CCU3000 can monitor these customer controlled switches.

Since a D-MAC signal has a high data rate capability in addition to its audio data rate capacity, a means is provided to output this data, if required, for external processing. This is achieved from pin 14 of the CCU3000 in the form of an RS232 format data stream via TR07 to the 8 pin DIN socket BR04.

Pins 44 and 57 from the CCU3000 control the blanking pins 8 and 16 respectively on the peritelevision (SCART) socket via level converters TR15, TR13 and TR14. This enables separate control of pins 8 and 16 of the peri socket. This allows the implementation of a record lock feature by setting both pins low when signal is available on the video output pin. Also it allows versatile control of the TV via pins 8 and 16.



CCU 3000 Block Diagram

In addition when a 16/9 MAC transmission is received, pin 57 outputs a 50% duty cycle square wave, which is integrated by RR49 and CR23 to give a half level out of pin 8, which signals to a wide screen TV that a 16:9 signal is being fed in via the peritelevision socket.

The CCU3000 acts as a gateway for 'packets' from the 2285 to the ACM. These 'packets' contain authorisation data, programmed name, personal list messages, etc. If any of these messages are failing to reach the ACM then either the 2285 or the ACM (or DRAM) is likely to be the cause.

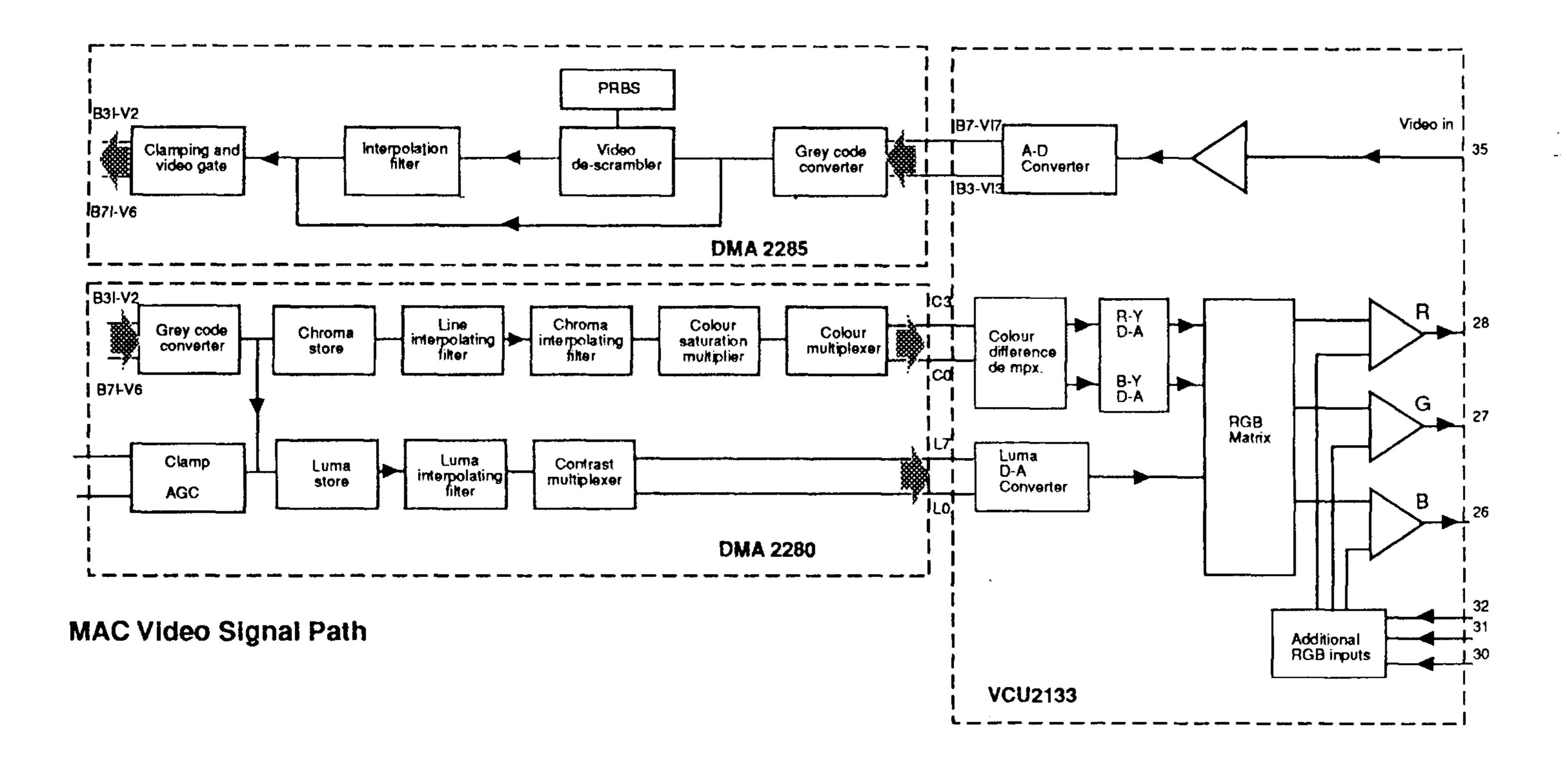
The CCU3000 also checks sound configuration data read from BI packets acquired by the DMA2285, this information is displayed on the STATUS screen.

If a signal is present, known to be carrying sound, and UNKNOWN is written on the STATUS screen then the DMA2285 is likely to be faulty.

The ACM is plugged into the main PC board at BR05 which is a gold plated pin header to match the gold plated socket on the ACM board supplied by the manufacturers GI. Besides the connections from BR05 to the CCU3000 already mentioned, a bi-directional line to the RS404 standard is supplied for connection to an external ACM at Phono connector BR03.

In order to display menu information on-screen, connections are made from the ACM to the D-MAC decoder board for sync and RGB signals at BM08. Inputs for sync and the 20.25 MHz clock are fed from the D-MAC decoder PCB to the ACM.

The 20.25 MHz clock leaves the D-MAC decoder as a 1V p-p sine wave but due to the requirements of the ACM circuitry, this signal is converted to a TTL level square wave by two high speed NOR gates in IR04. The sharp edges inherent in this conversion have harmonics which lie in the UHF band and are likely to produce interference on terrestrial transmissions.



D-MAC BOARD PC1451

This module is responsible for the decoding and descrambling of the baseband D-MAC signal, and the combining of on screen graphics (OSG) from the access control module (ACM).

The board receives baseband D-MAC video from the main board after de-emphasis and filtering. After processing the MAC board delivers descrambled RGB, stereo audio and control signals to the main board.

GENERAL DESCRIPTION

The MAC board contains 4 main IC's: DMA 2280 Decodes video and audio. DMA 2285 Descrambles MAC video. VCU 2133 Video A/D, D/A and audio. AMU 2481 Sound mixing and D/A.

These ICs are controlled from the CCU 3000 on the main board via 2 IM buses. A 1MHz bus controls the DMA2280/DMA2285, and a 100kHz bus controls the AMU2481.

VIDEO PATH DMA 2285

The scrambled baseband MAC signal is fed to the VCU2133. AGC is carried out on the main board so that the signal is at the optimum level, and the signal is clamped at a DC level of 6V. The DMA 2280 controls these functions.

The VCU2133 digitises the signal and passes it to the DMA2285 in a parallel 7 bit Grey code format. The DMA2285 converts this to a 7 bit binary code.

Descrambling is carried out next using 2 video RAMs and a shift register on board the DMA2285. The luma and chroma are stored in the RAM in scrambled form and read out in the correct order using control words provided by a video pseudo random binary sequence (PRBS) generator. The shift register is used to store the data burst while this is carried out. This process causes a delay of one line.

The next stage is the interpolation filter. This provides a 4:3 compatible picture from a 16:9 transmission. At this stage the 7 bit data bus is converted to 8 bit.

The signal then feeds into the clamping and video gate block. This is basically a video switch. During the clamp period the original video is selected because the line delay inherent in the descrambling process would cause problems in the clamping loop, otherwise the delayed video is selected.

The video is now transferred via an 8 line bus to the DMA 2280.

DMA 2280

The first block in the DMA2280 is a Grey code converter identical to that in the DMA2285, which is not used in this application. The signal is then passed to several blocks for processing.

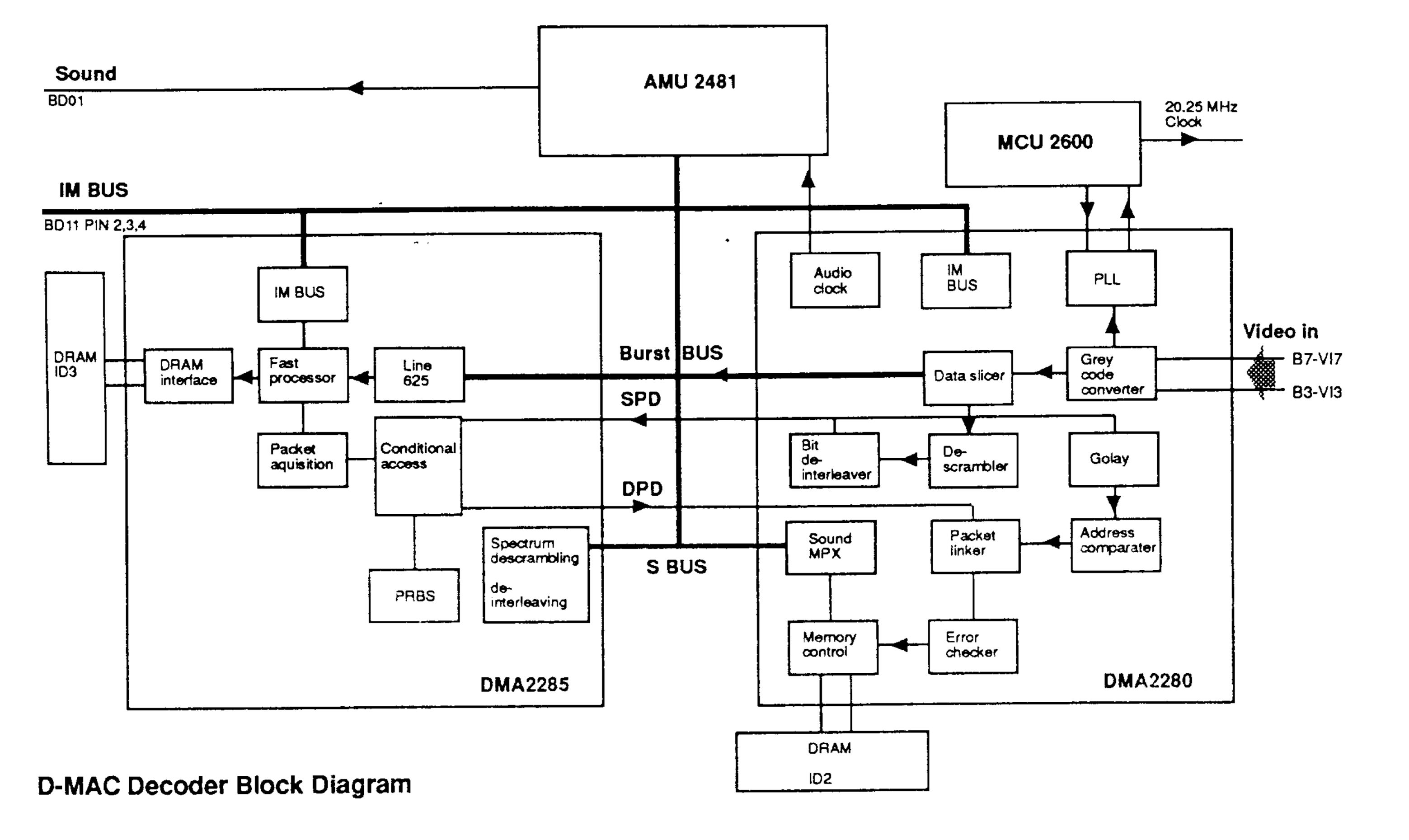
The clamp circuit measures the midgrey level transmitted every line and compares it to 6V dc. Clamp pulses are fed to an external RC circuit to maintain the input signal at 6V d.c.

The AGC circuit measures the black/ white transition on line 624, and feeds pulses to an external circuit which maintains the input signal at an optimum value (~1.7V).

The video is split into two paths, luma and chroma. These components are read into two on-chip RAMs at 20.25MHz. Read out clocks are 13.5MHz for luma and 6.75MHz for the chroma, so as to time expand the signal.

The next luma block is the luma interpolating filter. This is used to interpolate from 13.5MHz to 20.25MHz so that a second system clock of 13.5MHz is not needed. Also this simplifies design in the D/A stage of the VCU2133.

Next, the luma passes to the contrast multiplier. This adjusts the contrast of the signal under CCU3000 control.



The chroma first passes through a line interpolating filter. This is due to the two colour difference signals being sent on alternate lines. The signal then passes through the chroma interpolating filter (6.75MHz to 20.25MHz) and into the colour saturation multiplier.

Colour saturation can be altered under CCU3000 control. The digitised signals now pass to the VCU2133.

VCU 2133

The luma information is passed to the VCU2133 via an 8 line bus. The chroma data, however, is multiplexed and sent via a 4 wire bus. The VCU2133 demultiplexes the chroma data and then feeds the signals to its D/A converters. The analogue luma and chroma signals are then fed into an RGB matrix to form the baseband RGB signals. Inputs are provided on the VCU2133 for an additional RGB signal which can be combined with the RGB out. This is used for the display of on screen graphics.

The RGB and sync outputs are then fed out to the main board.

DATA AND CLOCK RECOVERY

The phase comparator and PLL filter in the DMA 2280 are used to lock the clock to the data burst. There are two control lines on the DMA 2280 which send values to the clock generator IC ID5 (This is set up with the VCO adjustment). The DMA2280 also has its own PLL system so that the final adjustment and locking to the incoming video is done automatically. This loop has a limited range however.

The data slicer and synchronization blocks are used to obtain a data stream and data synchronization pulses. The data slicer is only used on the data burst and line 625. The data is then fed back to the DMA 2285 on the DM bus.

In order to send correctly sampled data the system must be completely synchronized. The synchronization is performed by reading the frame sync word transmitted in line 625. This is a fixed 64 bit word. When it is detected, it needs to be locked to for 8 successive frames.

Then the system can generate all the necessary sync and blanking signals in phase with the luma and chroma outputs.

The data is descrambled and decoded by the DMA 2285. This is performed by the following blocks.

Packet descrambler.

Packet acquisition.

Line 625 acquisition.

Sound block.

Packet PRBS generator.

Video PRBS generator.

These blocks are controlled by the onchip fast processor, which has access to an external DRAM for packet storage. The processor also has internal ROM and RAM for its own processing. The processor cannot be directly accessed from the IM bus, but various read/write registers are available for control and monitoring of the system.

DATA DECODING AND CONTROL

The data is split into two, for decoding data and audio. The DMA 2280 decodes the audio in this application, the DMA 2285 descrambles the audio and data. The DMA2285 also decodes the data.

Initially the DMA 2280 is told which subframe to examine for audio data. The data stream is initially spectrum descrambled (used for energy dispersal), and then bit de-interleaved (used to minimize burst errors). This data is then sent out via the scrambled packet data line (SPD) to the DMA2285 where the descrambling is performed with the packet descrambling block. The data is then sent back to the DMA2280 on the descrambled packet data (DPD) line for audio decoding. This is the first path the data can take.

The Burst bus is used for the transfer of all data to the DMA2285. This sends both subframes on the DM bus. In the DMA2285 the first stage is to spectrum descramble the data and bit de-interleave it. The data is then sent to the packet descrambler. This has four PRBS generators which control the descrambling.

Then the audio subframe selected by the DMA 2285 is sent to the DMA2280 for sound decoding.

The rest of the data is sent to the packet acquisition block. The main task of this block is to decide which packets are required and retrieve them. It then error corrects them if necessary, and stores them in the external DRAM. This is the second path the data can take.

The line 625 processor receives the Burst bus directly. It is identified by the frame sync word. The information carried in this line is essential to obtain SI information, and for real time control of the system. This information is not scrambled or bit interleaved.

The information contained in the data burst is used for overall system control. The relevant control and access data is fed to the ACM via the fast processor and the CCU3000.

After processing by the ACM, control words are fed back to the DMA2280/DMA2285. These control words are used by the PRBS generators in the DMA2285.

All the blocks in the DMA2285 are controlled by the fast processor. This provides the interface with the IM bus, and allows direct access to the packet buffer external DRAM.

SOUND DECODING

The sound decoding is performed by the DMA2280. As described earlier, the DMA2280 receives the subframe that it selects directly from the data stream. This is then sent to the DMA2285 on the SPD line for descrambling. It is returned to the DMA2280 on the DPD line.

The 18.432MHz clock, which is generated by the 2280 and fed to the 2285, is required to ensure correct clock sync for the D/A conversion in the AMU2481.

There are six main sound blocks. The first block which receives a scrambled data signal is used to decode the packet addresses and data groups. This information is not scrambled. However it is Golay coded for error correction purposes.

The next block is an address comparator which is used to find the selected packets. The packet linker is used to detect the selected descrambled packets and check that they are sent to the audio processor in the correct sequence. The packet is then error corrected, NICAM decoded, and error concealment is carried out. This is performed with the use of an external DRAM and a memory control block.

The packet data is then sent out on a three line S-bus to the AMU 2481 for D/A conversion and digital mixing. The MAC chips and the AMU can process sound in any of the transmitted formats, i.e. linear or NICAM, first or second level protected.

The AMU receives the S-bus data, selects the relevant channels and converts them to analogue. The AMU is capable of handling four channels via the S-bus. A stereo signal takes two channels on the S-bus and a mono channel one.

If mixing of audio channels is required then this is performed digitally in the AMU before D/A conversion. The AMU also controls the audio level and applies the necessary J17 de-emphasis. The analogue audio is then sent to the main board.

BUS LINE DESCRIPTION

This information was obtained from the ITT data sheets.

The S Bus Interface

The S bus has been designed to connect the digital sound output of the DMA 2280 D-MAC Decoder to the audio-processing IC AMU 2481 Audio Mixer. The S bus is an undirectional, digital bus which transmits the sound information in one direction only.

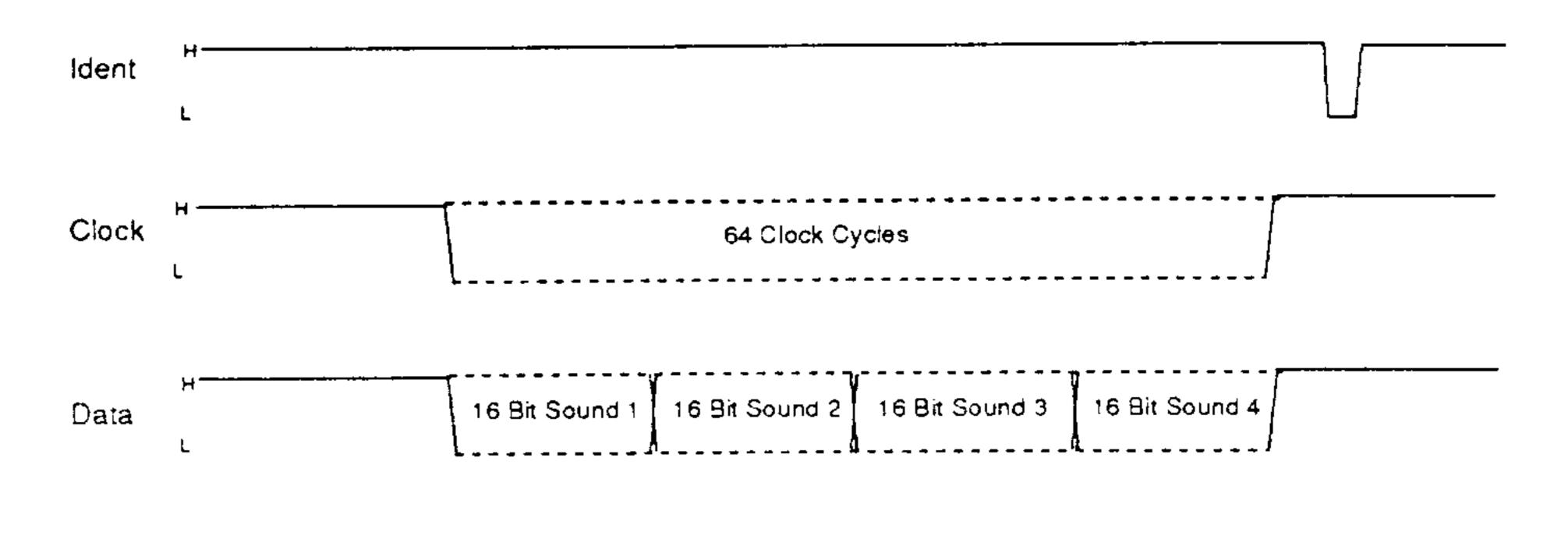
The S bus consists of the three lines SCLK, SIDENT and SDATA. The DMA 2280 generates the signals SCLK and SIDENT, which control the data transfer between the various processors which follow the DMA 2280. SDATA output of the DMA 2280 is connected to the SDATA input of the AMU2481, and DMA2285.

The sound information is transmitted in frames of 64 bits, divided into four successive 16-bit samples. Each sample represents one sound channel. The timing of a complete transmission of four samples is shown below.

The transmission starts with the LSB of the first sample. The S-Clock signal is used to write the data into the receiver's input register. The S-Ident signal marks the end of one frame of 64 bits and is used as a latch pulse for the input register.

The repetition rate of the S-Ident pulses is identical to the sampling rate of the D-MAC or NICAM sound signal; thus it is possible to transfer four sound channels simultaneously.

The S bus interface of the DMA 2280 mainly consists of an output register, 64-bit wide. The timing to write bit by bit is supplied by the SCLK signal. In the case of an SIDENT pulse, the contents of the output register are written to the SDATA output.



The IM Bus

The INTERMETALL Bus (IM Bus for short) has been designed to control the DIGIT 2000 ICs by the CCU3000 Central Control Unit. The CCU3000 can write data to the ICs or read data from them. This means the CCU3000 acts as a master whereas all controlled ICs are slaves.

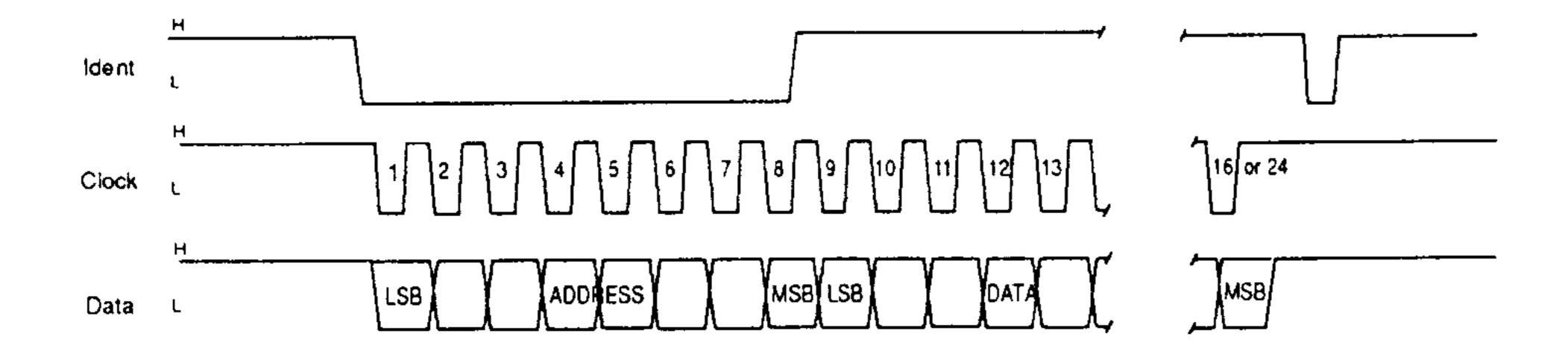
The IM bus consists of three lines for the signal ident (SIDENT), Clock (SCL) and Data (SDATA). Ident and clock are undirectional from the CCU3000 to the slave ICs, Data is bidirectional. The timing of a complete IM Bustransaction is shown below.

In the non-operative state the signals of all three bus lines are high. To start a transaction the CCU3000 sets the ID signal to low level, indicating an address transmission, and sets the CL signal to low level as well to clock the first bit on the Data line. Thereafter eight address bits are transmitted beginning with the LSB. Data takeover in the slave ICs occurs at the positive edge of the clock signal.

At the end of the address byte the ID signal goes high, initiating the address comparison in the slave circuits. In the addressed slave the IM bus interface switches over to Data read or write, because these functions are correlated to the address.

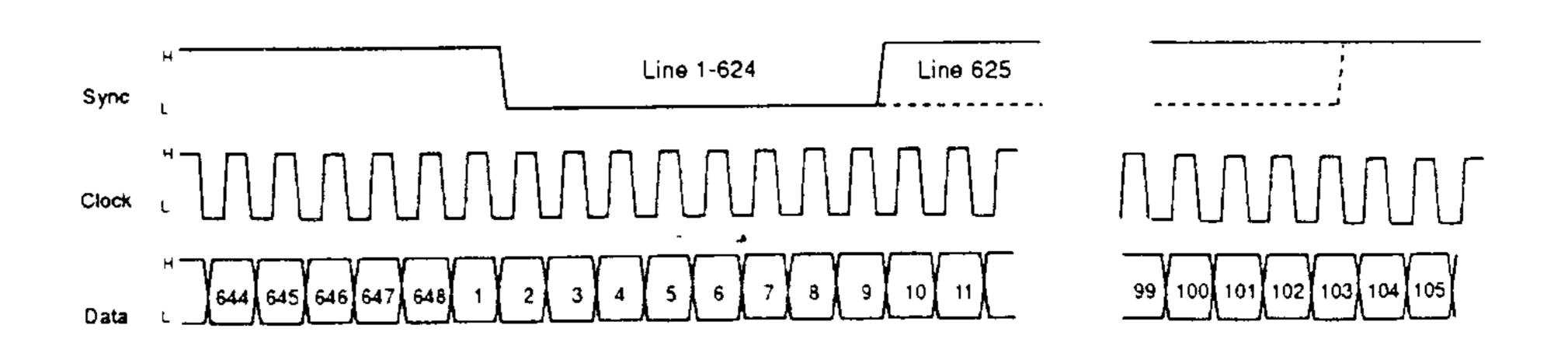
Also controlled by the address the CCU3000 now transmits eight or sixteen clock pulses, and accordingly one or two bytes of data are written into the addressed IC or read out from it, beginning with the LSB.


The completion of the bus transaction is signalled by a short Low state pulse of the ID signal. This initiates the storing of the transferred data.

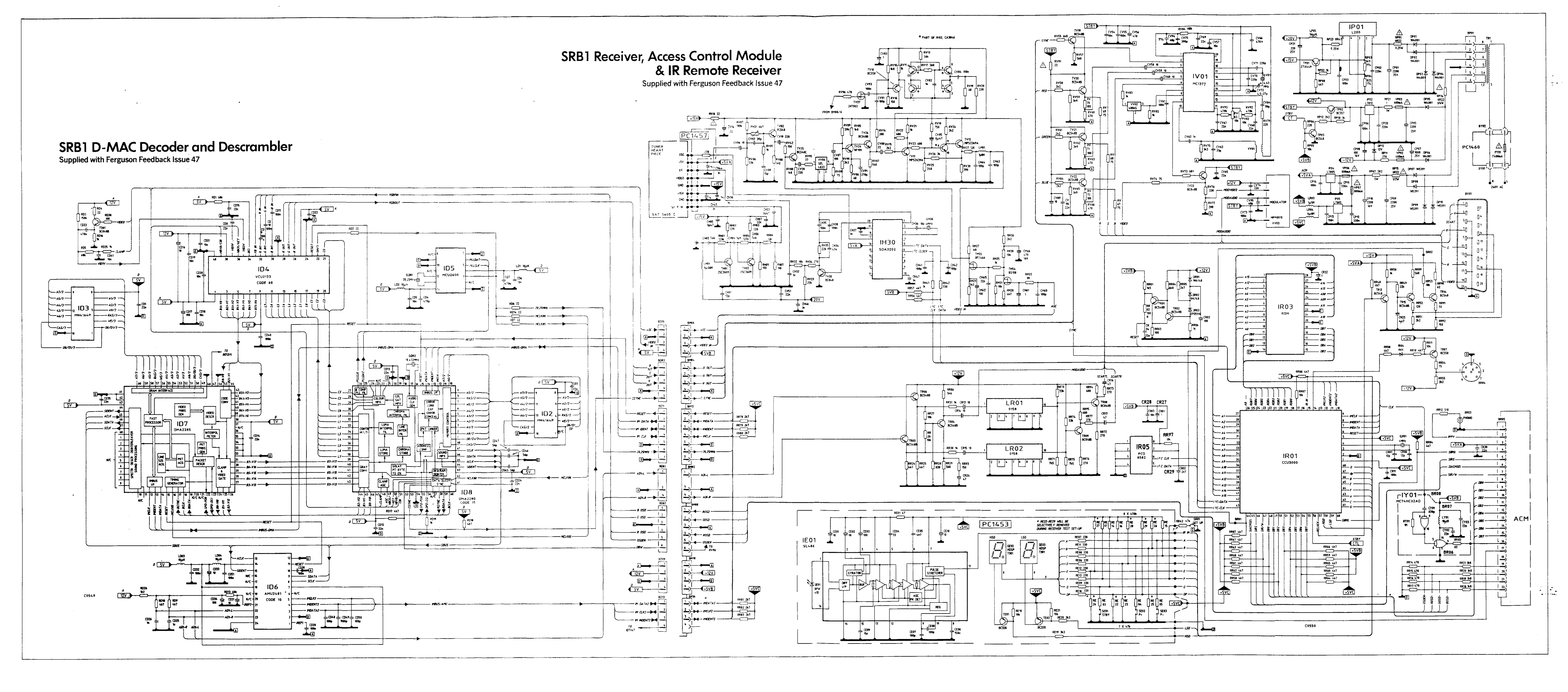


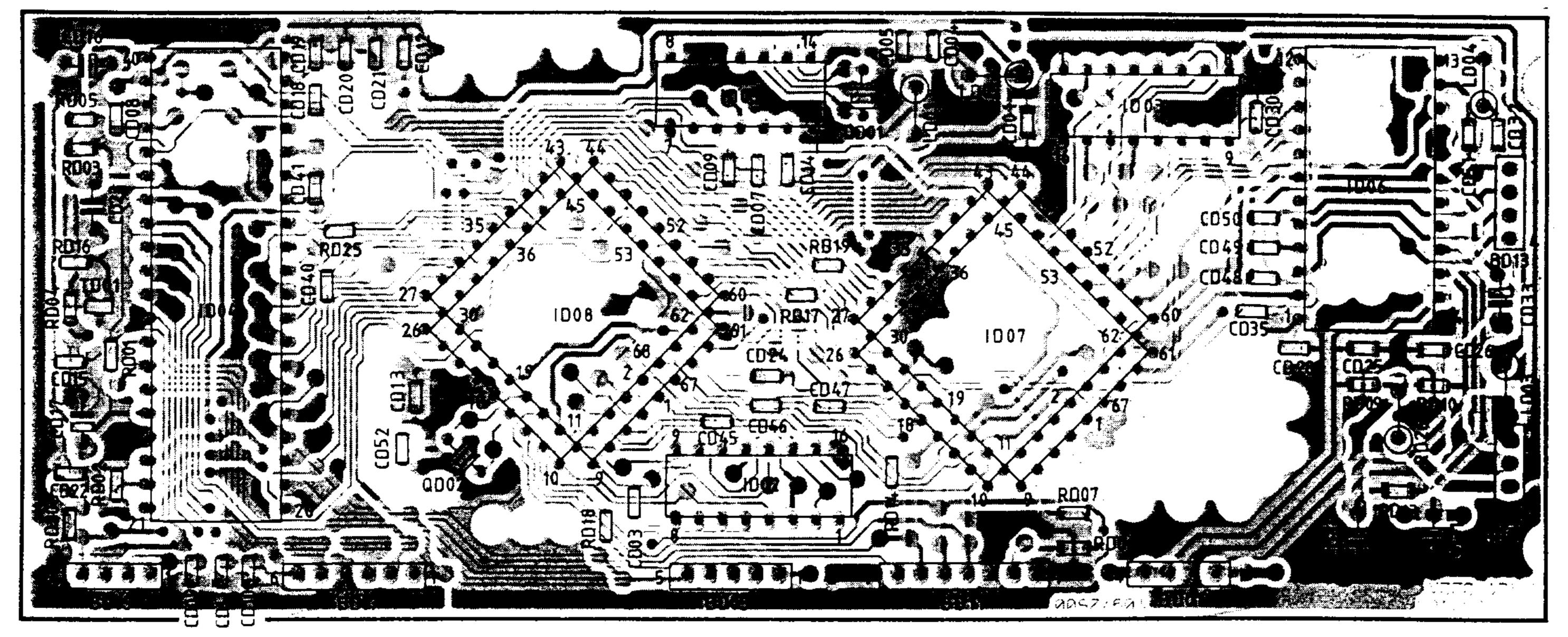
The Burst Bus

The Burst bus serves for transfer of the digitized D-MAC baseband signal, after code conversion, lowpass filtering and slicing to the DMA2285. Timing of the Burst bus is shown below.



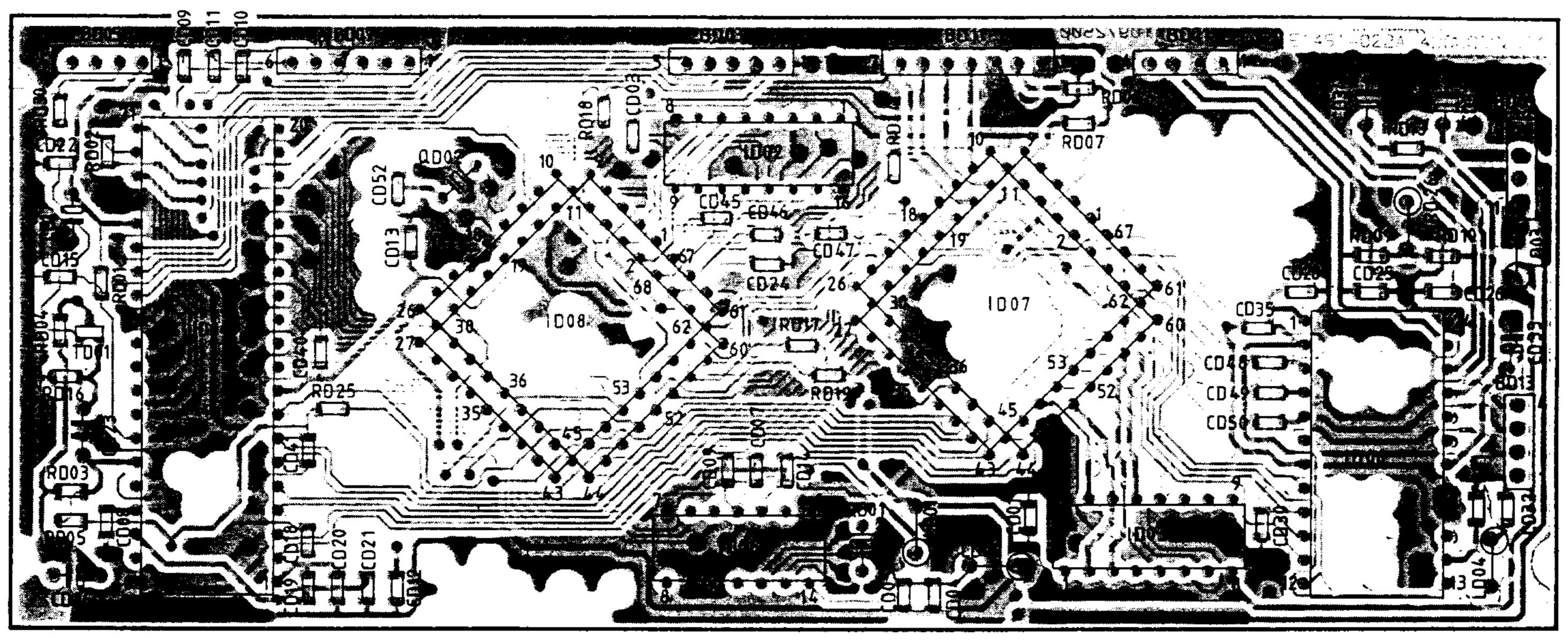






D-MAC Decoder 01V6-451-001 Component Location Diagram - Reverse of Component Side

Note: The copper on the component side is shown in green the reverse of the component side is in black.

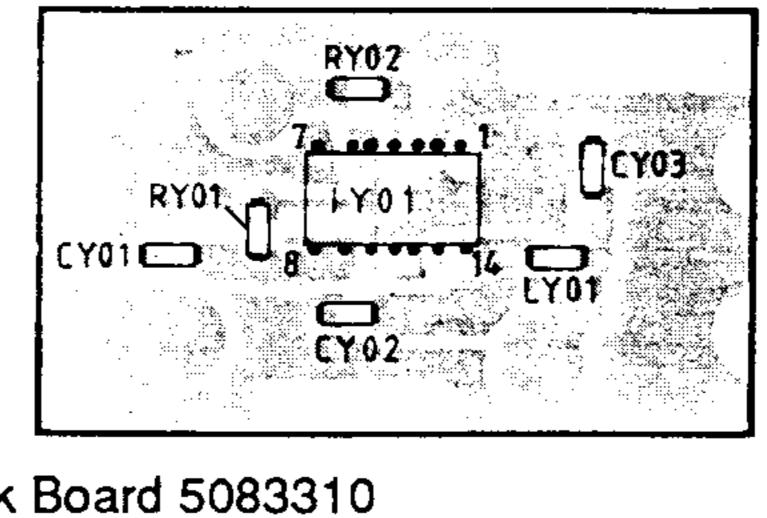


D-MAC Decoder 01V6-451-001 Component Location Diagram - Component Side

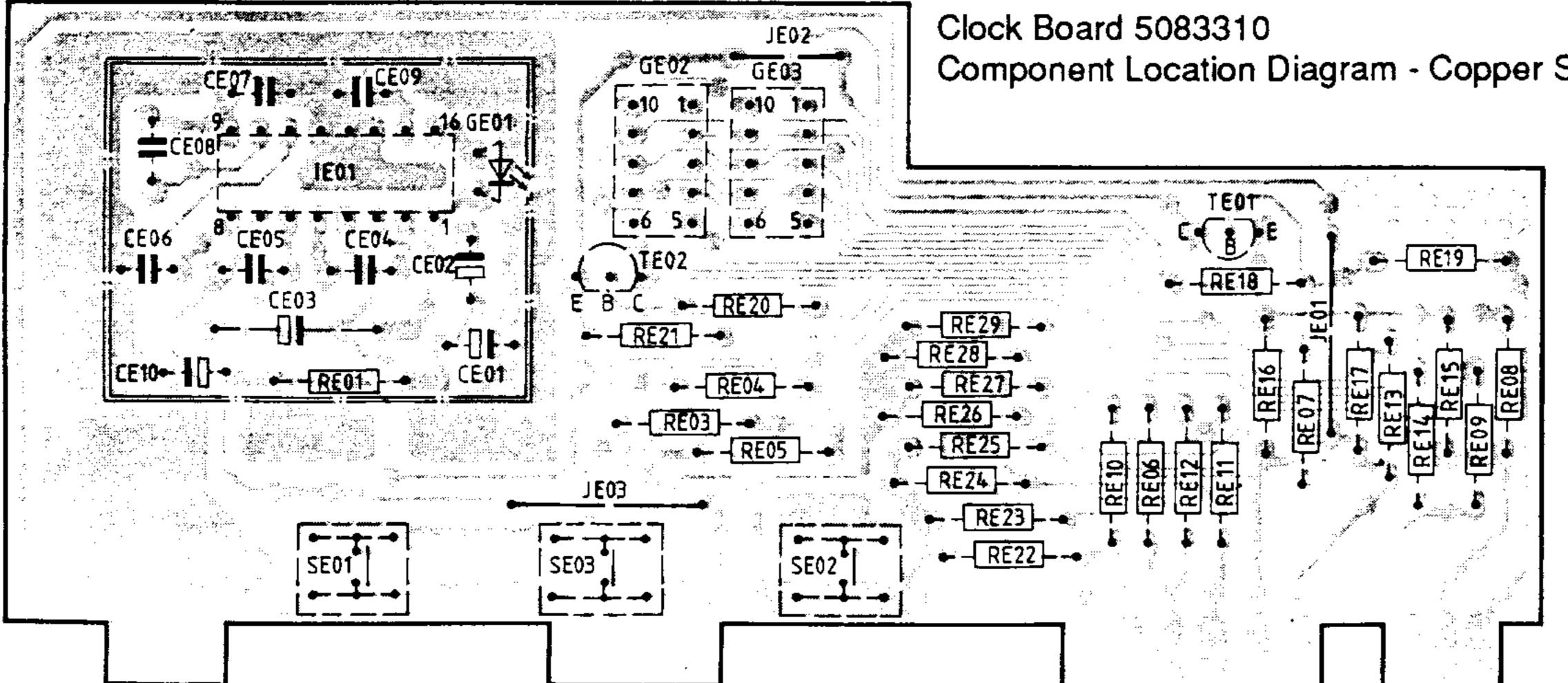
Note: The copper on the reverse of the component side is shown in green, the component side is in black.



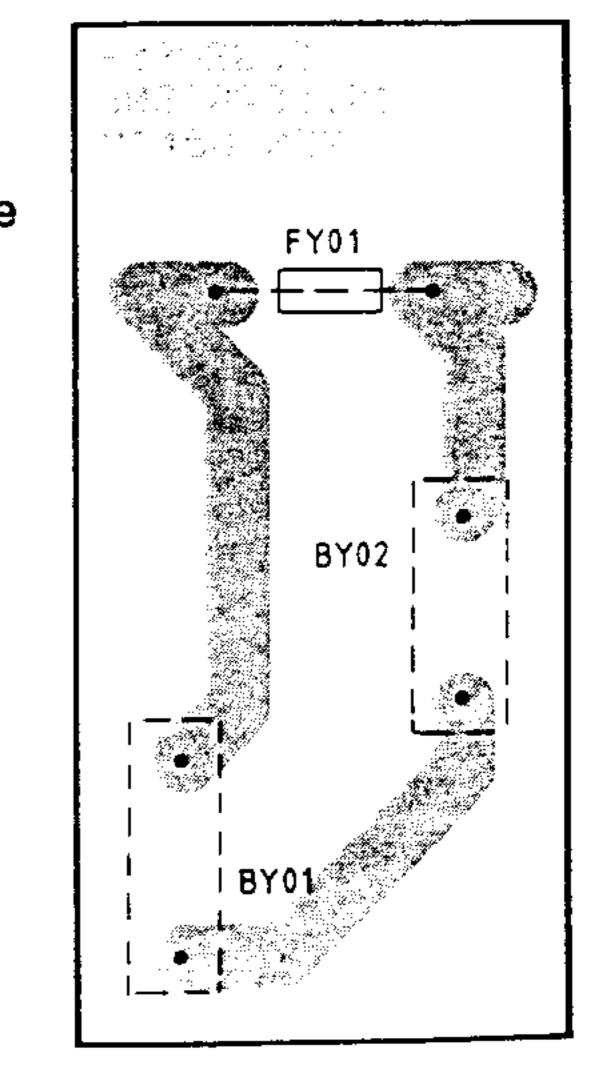
Tuner Interconnect Board 01V6-457-001 Component Location Diagram - Copper Side



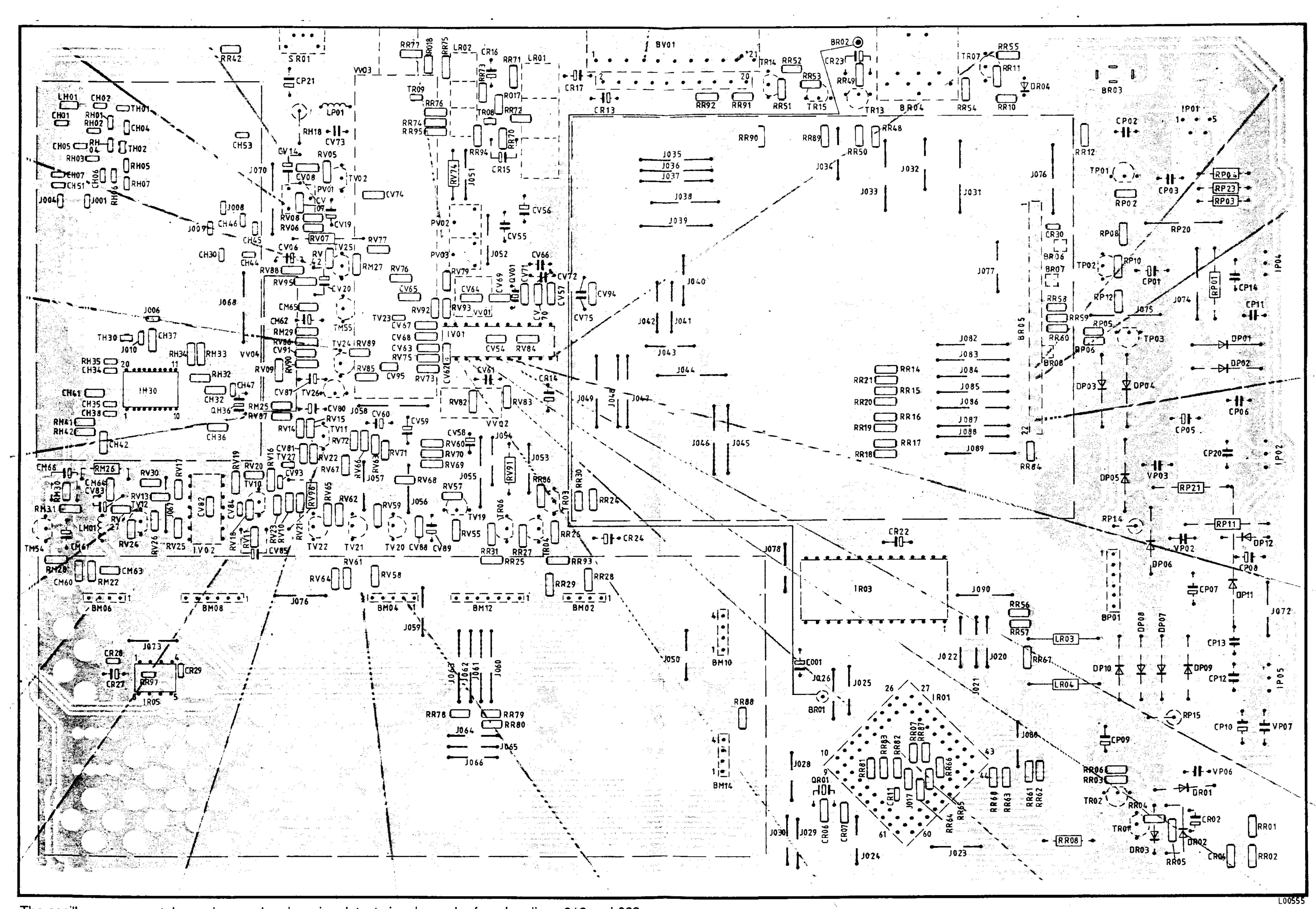
Component Location Diagram - Copper Side



Control Panel 01 V6-453-001 Component Location Diagram - Copper Side



Fuse Board 01V6-460-001 Component Location Diagram -Copper Side



The oscillograms were taken using a colour bar signal, test signals can be found on lines 313 and 623.

They were taken at the points indicated by the corresponding letters on the circuit diagram. - Viewed from Copper Side.

GRID REFERENCES

The circuit diagram location is followed by the printed panel location

01V6-450-001 Main Board

U I V 0-45U-UU I	Main Board		
BM02 D1,C3	CV07 A1,A2	QH36 B3,B2	RR57 C3,C5
BM04 C1,C2	CV08 B1,A2	QR01 D6,D4	RR58 E5,B5
BM06 C1,C1	CV14 A1,A2	QV01 A5,B3	RR59 E6,B5
BM08 D1,C2	CV19 A2,A2		RR60 E6,B5
BM10 E1,C4	CV20 B2,B2	RH01 B1,A1	RR61 E5,D5
BM12 D1,C3	CV54 A4,B3	RH02 B1,A1	RR62 E5,D5
•	,	•	•
BM14 E1,D4	CV55 A4,A3	RH03 B1,A1	RR63 E5,D5
BP01 A7,C6	CV56 A4,A3	RH04 B1,A1	RR64 E6,D5
BR01 E5,C4	CV57 A5,B3	RH05 B1,A1	RR65 E6,D5
BR02 C7,A4	CV58 A4,B3	RH06 B1,A1	RR66 E6,D5
BR03 D7,A6	CV59 A5,B2	RH07 B2,A1	RR66 E6,D5
BR04 C7,A5	CV60 A5,B2	RH18 A1,A2	RR67 E5,C5
BR05 D7,B5	CV61 A5,B3	RH32 B2,B1	RR68 E5,D5
BR06 E7,A5	CV62 A5,B3	RH33 C2,B1	RR70 C4,A3
BR07 D7,B5	CV63 A5,B2	RH34 B2,B1	RR71 D4,A3
BR08 D7,B5	CV64 A5,B3	RH35 B2.B1	RR72 D4,A3
BV01 B7,A4	CV65 B5,B2	RH41 C3,B1	RR74 D4,A3
D V O 1 D7 ,744	•		·
OUO1 C1 A1	CV66 A5,B3	RH42 C3,B1	RR75 D4,A3
CH01 C1,A1	CV67 A5,82	RM22 C3,C1	RR76 D4,A5
CH02 B1,A1	CV68 A5,B2	RM25 B3,B2	RR78 D1,D3
CH04 B1,A1	CV69 A5,B3	RM26 B3,B1	RR79 D1,D3
CH05 B1,A1	CV70 A5,B3	RM27 B3,B2	RR80 D1,D3
CH06 B1,A1	CV71 A5,B3	RM28 C3,C1	RR81 E1,D5
CH07 B1,A1	CV72 A5,83	RM29 C3.B2	RR82 E1,D5
CH30 B1,A2	CV73 B5,A2	RM30 B3,C1	RR83 E1,D5
CH32 C2,B2	CV74 B5,A2	RM31 C3,C1	RR84 D7,B5
CH34 B2,B1	CV75 A5,B3	RO17 C4,A3	RR86 C3,C3
CH35 B2,B1	CV80 B2,B2	RO18 D4,A3	RR87 E5,D5
CH36 B3,B2	CV81 A2,B2	RP01 A6,B6	RR88 C6,D4
CH37 B2,B1	CV82 A3,C2	RP02 A6,A6	RR89 C7,A4
CH38 B2,B1	CV83 A2,C1	RP03 A6,A6	RR90 C7,A4
CH41 B3,B1	·	·	
•	CV84 A3,C2	RP04 A6,A6	RR91 C7,A4
CH42 B3,B1	CV85 A3,C2	RP05 A6,B6	RR92 C7,A4
CH44 B1,82	CV87 B2,B2	RP06 A6,B6	RR93 D3,C3
CH45 B1,A2	CV88 B4,C2	RP08 A6,A6	RR94 C4,A3
CH46 C2,A2	CV89 B4,C3	RP10 A6,B6	RR95 D4,A3
CH47 CB,23	CV91 B2,B2	RP11 B6,C6	RR96 D5,C1
CH51 C2,A1	CV93 A2,C2	RP12 A6,B6	RV05 B1,A2
CH53 B2,A2	CV94 A5,B3	RP14 A7,C6	RV06 B1,A2
CM60 C4,C1	CV95 B5,B2	RP15 B6,D6	RV07 A1,A2
CM61 C3,C1		RP21 A6,C6	RV08 B2,A2
CM62 C3,B2	DP01 A7,B6	RP23 A6,A6	RV09 B2,A2
CM63 B3,C1	DP02 A7,B6	RR01 C4,D6	RV10 A2,C2
CM64 B3,C1	DP03 A7,B6	RR02 C4,D6	RV11 A3,C2
CM65 C3,B2	DP04 A7,B6	RR03 C4,D6	RV13 A3,C1
CM66 B3,B1	DP05 A7,B6	RR04 C5,D6	RV14 A2,B2
CP01 A6,B6	DP06 B7,C6	RR05 C5,D6	RV15 82,82
CP02 A6,A6	DP07 B7,C6	RR06 C5,D6	RV16 A2,C2
•			•
CP03 A6,A6	DP08 B7,C6	RR07 C6,D5	RV17 A3,C1
CP05 A6,B6	DP09 B7,C6	RR08 C6,D5	RV18 A3,C2
CP06 A6,B6	DP10 B7,C6	RR10 C7,A5	RV19 A3,C2
CP07 B7,C6	DP11 A6,C6	RR11 C7,A5	RV20 A3,B2
CP08 B6,C6	DP12 B6,C6	RR12 D7,A6	RV21 A3,C2
CP09 B6,D6	DR01 C5,D6	RR14 E6,85	RV22 A3,B2
CP10 B6,D6	DR02 C5,D6	RR15 E6,B5	RV23 B3,C2
CP11 B6,B6	DR03 C5,D6	RR16 E6,B5	RV24 A3,C1
CP13 B6,C6	DR04 C6,A5	RR17 E6,B5	RV25 B3,C1
CP14 B6,86		RR18 E7,B5	RV26 B3,C1
CP20 A6,B6	IH30 B2,B1	RR19 E7,B5	RV27 B3,C1
CP21 A6,A2	IP01 A6,A6	RR20 E7,B5	RV30 B3,C1
CR02 C5,D6	IP02 A6,B6	RR21 E7,B5	RV42 A2.B2
CR04 C4,D6	IP04 B6,B6	RR24 D3,C3	RV55 A4,C3
CR06 D6,D4	IP05 B6,C6	RR25 D3,C3	RV57 A4,C3
CR07 D6,D4	IR01 D6,D5	RR26 D3,C3	RV58 A4,C2
CR11 D6,D5	IR03 C5,C4	RR27 D3,C3	RV59 A4,C2
CR13 D3,A3	IR05 D4,C1	RR28 D3,C3	·
·	•	•	RV60 A4,B3
CR14 D3,B3	IV01 A5,B3	RR29 D3,C3	RV61 A4,C2
CR15 D3,A3	LUMA DA AA	RR30 D3,C3	RV62 A4,C2
CR16 C4,A3	LH01 B1,A1	RR31 D3,C3	RV63 B4,B2
CR17 D4,A3	LM01 B3,C1	RR42 E5,A2	RV64 B4,C2
CR22 C6,C5	LP01 A6,A2	RR48 C6,A5	RV65 B4,C2
CR23 C6,A4	LR01 D3,A3	RR49 C6,A4	RV66 B4,B2
CR24 D3,C3	LR02 D3,A3	RR50 C6,A4	RV67 B4,B2
CR27 D5,C1	LR03 B6,C5	RR51 C7,A4	RV68 B4,C2
CR28 D4,C1	LR04 B6,C5	RR52 C7,A4	RV69 A4,B3
CR29 D5,C1	,	RR53 C7,A4	RV70 A4,B3
CR30 D7,A5	PV01 A1,A2	RR54 C7,A5	RV71 B4,B2
CV06 B1,B2	PV02 A5,A3	RR55 C7,A5	RV72 B4,B2
	PV03 A5,A3	RR56 C3,C5	RV73 B5,B2

PC 1451 D-MAC Decoder

RV74... B4,A3

RV75 ... B5,B2

RV76 ... B5,B2

RV77 ... B5,A2

RV79 ... A5,B3

RV82... A4,B3

RV83... A4,B3

RV84 ... A5,B3

RV85 ... A2,B2

RV86 ... B2,B2

RV87... B2,B2

RV88 ... B2,B2

RV89... A2,B2

RV90... B2,B2

RV91 ... A4,B3

RV92... A5,B3

RV93... A5,B3

RV95... B2,B2

RV96... A2,C2

SR01 ... E5,A2

TH01 ... B1,A1

TH02 ... B1,A1

TH30 ... C2,B1

TM54 .. C3,C1

TM55 .. B3,B2

TP01 ... A6,A6

TP02 ... A6,B6

TP03 ... A6,B6

TR01 ... C5,D6

TR02 ... C5,D6

TR03 ... D3,C3

TR04 ... D3,C3

TR06 ... C3,C3

TR07 ... C7,A5

TR08 ... D4,A3

TR09 ... D4,A2

TR13 ... C6,A4

TR14... C7,A4

TR15 ... C6,A4

TV02 ... A2,A2

TV10 ... A2,C2

TV11 ... B3,B2

TV12 ... A3,C1

TV19 ... A4,C3

TV20 ... A4,C2

TV21 ... A4,C2

TV22 ... B4,C2

TV23 ... B5,B2

TV24 ... B2,B2

TV25 ... B2,B2

TV26 ... A2,B2

TV27 ... A2,B2

VP02 ... B6,C6

VP03 ... A6,B6

VP06 ... B6,D6

VP07 ... B6,D6

VV01 ... B5,B3

VV02 ... A4,B3

VV03 ... B5,A2

VV04 ... B2,B2

CD01 B1,B2	CD35 B1,A1	RD06 B4,A1
CD03 B5,A2	CD40 B2,B3	RD07 B4,A1
CD04 A4,B2	CD41 A1,B3	RD09 D2,A1
CD05 A3,B2	CD45 C4,A2	RD10 D1,A1
CD06 A4,B2	CD46 C4,A2	RD13 D2,A1
CD07 A4,B2	CD47 C4,A2	RD14 B4,A2
CD08 A2,B3	CD48 D3,B1	RD16 A1,B3
CD09 A2,A3	CD49 D3,B1	RD17 C3,A2
CD10 A2,A3	CD50 D3,B1	RD18 C3,A2
CD11 A2,A3	CD51 D2,B1	RD18 C4,A2
CD12 C3,B3	ID02 B4,A2	RD19 C4,B2
CD13 B3,A3	ID03 B1,B1	RD25 A1,B3
CD14 C2,B2	ID04 A2,A3	RD26 D1,A1
CD15 A2,A3	ID05 A4,B2	RD30 A1,A3
CD16 A2,B3	ID06 D2,B1	, , , , , , , , , , , , , , , , , , ,
CD17 B2,A3	ID07 C2,A2	RE17 E4,B4
CD18 B2,B3	ID08 C4,A2	RE18 E3.84
CD19 A2,83	,,	RE19 E4,84
CD20 A2,B3	LD01 A4.B2	RE20 E4.B2
CD21 A2,B3	LD02 A3 B2	RE21 E4,B2
CD22 A3,A3	LD03 D2,A1	,
CD23 A1,B3	LD04 D2,B1	SE01 E4,C1
CD24 C4,A2	•	SE02 E4,C3
CD25 D2,A1	QD01 A3,B2	SE03 E5,C2
CD26 D1,A1	QD02 B3,A3	
CD28 D3,A1	,	TE01 E3,A4
CD30 D3,B1	RD01 A2,A3	TE02 E4,B2
CD31 D2,A1	RD02 A3,A3	 · ,
CD32 D2,B1	RD03 A1,83	
CD33 D2,A1	RD04 A1,A3	
CD34 D2,A1	RD05 A1,B3	
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PC1453 Control Panel

	.	
CE01 E2,B2	IE01 E2,A1	RE14 E4,B4
CE02 E2,B2		RE15 E5,84
CE03 E2,B1	RE01 D3,B1	RE16 E4,B4
CE04 E2,B2	RE03 E4,B2	
CE05 E3,B1	RE04 E4,B2	
CE06 E3,B1	RE05 E5,B2	
CE07 E3,A1	RE06 E4,B3	
CE08 E3,A1	RE07 E4,B4	
CE09 E2,A2	RE08 E4,B4	
CE10 E3,B1	RE09 E4,B4	
	RE10 E4,B3	
GE01 E3,B1	RE11 E4,84	
GE02 E3,A2	RE12 E4,B4	
GE03 E4,A3	RE13 E4,B4	

5038100 Clock

CY01... D7,B1 CY02... E7,B2 IY01 ... E7,A2 RY01... E7,A1 RY02... E7,A1 LY01 ... E7,B2 CY03... E7,A2

PC1460 Fuse board

BY01 ... B7,A2

BY02... A7,B1

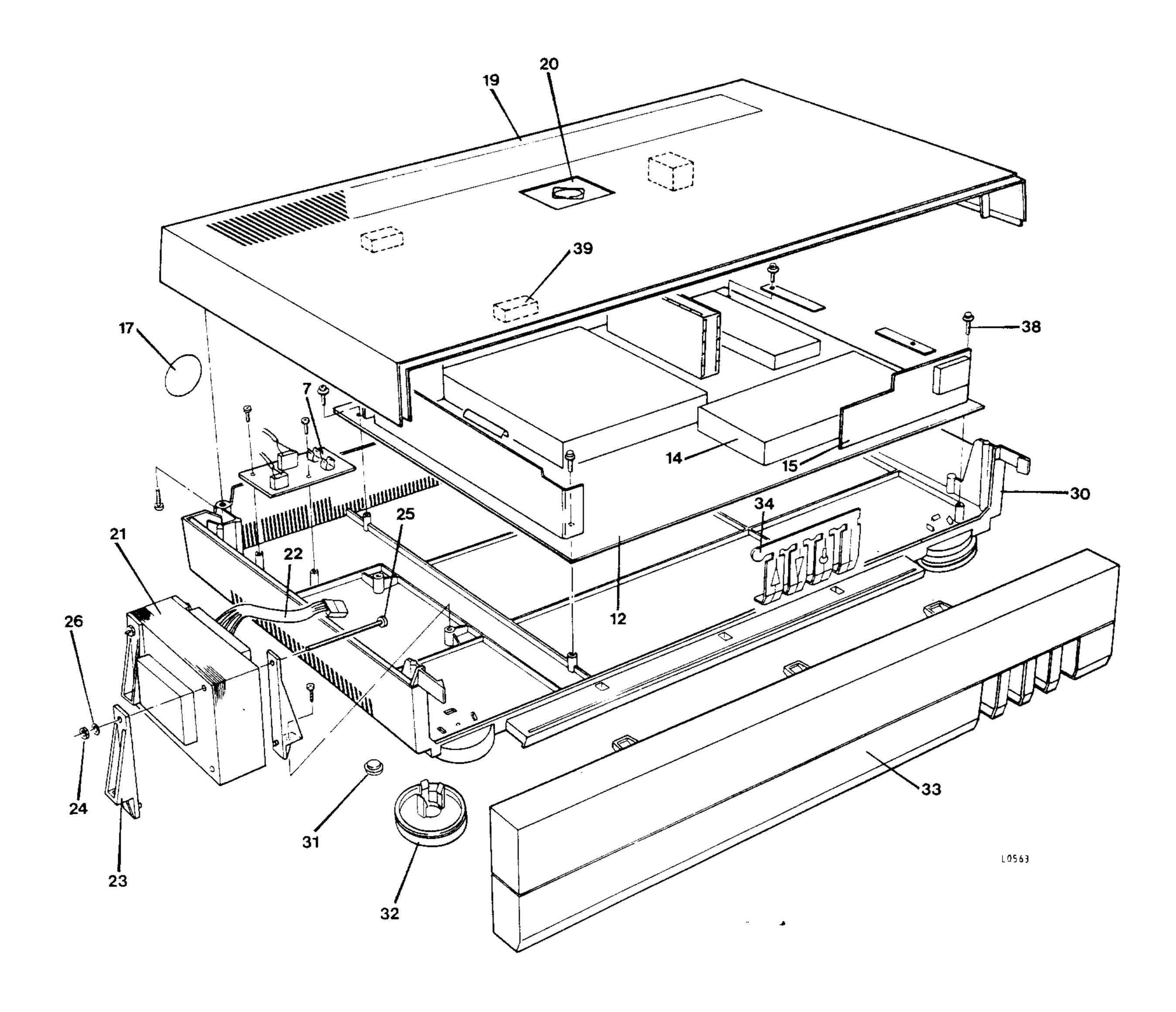
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COMPONENT DETAILS

CABINET AND MISCELLANEOUS

1.0	Battery 1.5V R03S pack of 2	00E6069002
2.0	Screw 12mm pozipan	
3.0	Lead assy interconnect	01G074000101G
4.0	Lead assy mains interconnect	01G078200101G
5.0	Poly fitting left & right	01P2068002
6.0	Carton printed SRB1	01P2070002
7.0	PCB assy fuse	
10.0	Trim front BSB	02A40820020CAA
11.0	Chassis assy SRB1	
12.0	PCB assy main SRB1	01V6450001
13.0	PCB assy sub BSB clock	
14.0	PCB assy D-MAC SRB1	
15.0	PCB assy control panel SRB1	
16.0	Label model No SRB1	
17.0	Label BEAB	
18.0	Rem cont transmitter assy RH882	
19.0	Top cabinet SRB1	
20.0	Trim cabinet top SRB1	
21.0	Transformer assy	
22.0	Lead assy transformer	

23.0	Support moulding transformer	02C81050010AAA
24.0	Nut M4 hex full	
24.1	Nut M4 hex full	
25.0	Screw M4X45 machine	
25.1	Screw M40 x 40 machine	
26.0	Washer 4mm spring	
27.0	Leaflet BREMA safety large	
28.0	Instruction leaflet SRB1	
28.1	Instruction booklet SRB1	
29.0	Booklet customer BSB	
30.0	Bottom cabinet	
30.1	Bottom cabinet	11005392
31.0	Foot cabinet	10939100 or
31.1	Foot	90A8014001
32.0	Foot moulded large	80380200 or
32.1	Foot moulded large	11004925
33.0	Front cabinet assy	80385000 or
33.1	Front cabinet assy	
33.2	Front cabinet assy	80406604 or
33.3	Front cabinet assy	11005756
34.0	Button moulding SRB1	30883500
35.0	Screw no.6 1/2" black	
36.0	Large BSB voltage	90540858
37.0	SRB1 prov service information	
38.0	Screw no.6 x 1/2" sems	00L603500801G
39.0	Foam self adhesive	00P3152001



01V6-450-001 Main Board

	PCB assy fuse	01V6460001
	Chassis assy SRB1	02M4107001
	Lead assemby	01G425000101G
	PCB assy main SRB1	01V6450001
	Heatsink control IC	00B6016001
	Heatsink BSB	00B6018001
	Strip 50 mm insulator edge	00C6142050
	Socket aerial coaxial	00F6496002
	Support post locking min	00L5074004
	Tuner screen	01B1025001
	Tuner screen UB	01 B 1026001
	Screen can ACM	
	Screen D-MAC	
	Screen lid tuner	
	Screen lid ACM	
	Top screen lid D-MAC	
	Tape double sided	
	Lead assy clock earth	
	Lead assy clock output	
	Lead assy clock	
	Lead assy clock input	
	Lid pre amp screen with hole	
	Transformer assy	
	Lead assy transformer	
	Support moulding transformer	
	Nut M4 Hex full	
	Screw M4x45 machine	
	Washer 4mm spring	
	Post miniture support	
	Cable tie ratchet type	
	Screen can ACM	
	Screen D-MAC	01B1028003
	Route card SRB1	10P1615002
	Pin clock input	50853699
BM02	Connector 4 way 2.54 pitch female	10451400
BM04	Connector 5 way 2.54 pitch female	80129200
	Connector 4 way 2.54 pitch female	
	Connector 6 way 2.54 pitch female	
BM10	Connector 4 way 2.54 pitch female	
BM12	Connector 7 way 2.54 pitch female	
BM14	Connector 4 way 2.54 pitch female	
BP01	Connector 6 way 2.5 pitch male	
BR01	Module ACM SRB1	10000108
DDAA	Carlos abana	
BR03	Socket phono	T0000139
BR04	Socket 8 pin	T0000139 T0000138
BR04 BR05	Socket 8 pin	T0000139 T0000138 T0000166
BR04 BR05 BV01	Socket 8 pin	T0000139 T0000138 T0000166 67003400
BR04 BR05	Socket 8 pin	T0000139 T0000138 T0000166 67003400
BR04 BR05 BV01 BV01	Socket 8 pin	T0000139 T0000138 T0000166 67003400 T0000308
BR04 BR05 BV01 BV01 CH01	Socket 8 pin	T0000139 T0000138 T0000166 67003400 T0000308
BR04 BR05 BV01 BV01	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat	T0000139 T0000138 T0000166 67003400 T0000308
BR04 BR05 BV01 BV01 CH01 CH02	Socket 8 pin	T0000139 T0000166 67003400 T0000308 43110650 43110750 43126650
BR04 BR05 BV01 BV01 CH01 CH02 CH04	Socket 8 pin	T0000139 T0000138 67003400 6700308 43110650 43110750 43126650 43310950
BR04 BR05 BV01 BV01 CH01 CH02 CH04 CH05	Socket 8 pin	T0000139 T0000166 67003400 T0000308 43110650 43126650 43310950 43110750
BR04 BR05 BV01 BV01 CH01 CH02 CH04 CH05 CH06	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat	T0000139T0000138T000016667003400T00003084311065043110750431107504311075043110750431107504311450
BR04 BR05 BV01 BV01 CH02 CH04 CH05 CH06 CH07 CH30 CH30	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 5% 50V cer chip flat	T0000139T0000138T000016667003400T00003084311065043110750431107504311075043110750431107504311075010311300-00
BR04 BR05 BV01 BV01 CH02 CH04 CH05 CH06 CH07 CH30 CH32 CH34	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat	T0000139T0000138T000016667003400T000030843110650431107504312665043110750431107504311075043110750431145010311300-0043243650
BR04 BR05 BV01 BV01 CH02 CH04 CH05 CH06 CH07 CH30 CH32 CH34 CH35	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat	T0000139T0000138T000016667003400T000030843110650431266504311075043110750431107504311075043110750431107504311075043144504324365043243650
BR04 BR05 BV01 BV01 CH02 CH04 CH05 CH06 CH07 CH30 CH36 CH35 CH36	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 18 pF 5% 50V cer cyl chip	T0000138T000016667003400T00003084311065043126650431107504311075043110750431107504311075043110750431107504311075050107700-00
BR04 BR05 BV01 BV01 CH02 CH04 CH05 CH06 CH07 CH30 CH36 CH35 CH36 CH37	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 18 pF 5% 50V cer cyl chip 1 nF 50V ceramic cyl chip	T0000139T0000138T000016667003400T00003084311065043126650431107504311075043110750431107504311300-00432436504342755050107700-0010311300-00
BR04 BR05 BV01 BV01 CH02 CH04 CH05 CH06 CH07 CH30 CH36 CH36 CH37 CH38	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 1 nF 50V ceramic cyl chip	T0000139T0000138T000016667003400T00003084311065043126650431107504311075080115300801153004324365010311300-004342755050107700-0010311300-00
BR04 BR05 BV01 CH02 CH04 CH05 CH06 CH07 CH36 CH36 CH36 CH36 CH36 CH37	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 1 nF 50V ceramic cyl chip	T0000139T0000138T000016667003400T00003084311065043126650431107504311075080115300801153004324365010311300-004342755050107700-0010311300-0010311300-00
BR04 BR05 BV01 CH02 CH04 CH05 CH06 CH36 CH36 CH36 CH36 CH36 CH36 CH36 CH3	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 1 nF 50V ceramic cyl chip 100 nF +80%-20% 50V cer chip flat 100 pF 10% 50V ceramic cyl chip 100 pF 10% 50V ceramic cyl chip	T0000139T0000138T000016667003400T00003084311065043126650431107504311075080115300801153004324365010311300-004342755050107700-0010311300-0090207100-00
BR04 BR05 BV01 CH02 CH04 CH05 CH06 CH07 CH36 CH35 CH36 CH36 CH37 CH36 CH41 CH42 CH44	Socket 8 pin	T0000139T0000138T000016667003400T00003084311065043126650431107504311075080115300431445010311300-004342755050107700-0010311300-0090207100-0090207100-0090207100-0090207100-00
BR04 BR05 BV01 CH01 CH02 CH04 CH05 CH06 CH07 CH36 CH35 CH36 CH36 CH36 CH41 CH42 CH44 CH45	Socket 8 pin	T0000139T0000138T000016667003400T000030843110650431266504311075043110750801153004311300-004324365010311300-004342755050107700-0010311300-0090207100-0090207100-0010311300-0010311300-00
BR04 BR05 BV01 CH02 CH04 CH05 CH06 CH07 CH36 CH36 CH36 CH41 CH44 CH45 CH46	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 1 nF 50V ceramic cyl chip	T0000139T0000138T000016667003400T00003084311065043110750431266504311075080115300801153004324365010311300-0010311300-0090207100-0090207100-0090207100-0010311300-0010311300-0010311300-00
BR04 BR05 BV01 BV01 CH02 CH04 CH05 CH06 CH07 CH30 CH35 CH36 CH36 CH41 CH42 CH44 CH45 CH46 CH47	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 1 nF 50V ceramic cyl chip	T0000139T0000138T000016667003400T000030843110650431266504311075080115300801153004324365010311300-0050107700-0050107700-0090207100-0090207100-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-00
BR04 BR05 BV01 CH02 CH04 CH05 CH06 CH06 CH30 CH36 CH36 CH37 CH44 CH44 CH45 CH45 CH45 CH45 CH45	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 18 pF 5% 50V cer cyl chip 1 nF 50V ceramic cyl chip 100 pF 10% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip	T0000139T0000138T000016667003400T0000308431106504311075043110750801153004311300-004324365010311300-0050107700-0050107700-0010311300-0090207100-0090207100-0090207100-0010311300-0010311300-0010311300-0090207100-0090207100-0090207100-0090207100-0090207100-0090207100-0090207100-00
BR04 BR05 BV01 BV01 CH02 CH04 CH05 CH06 CH07 CH30 CH35 CH36 CH36 CH41 CH42 CH44 CH45 CH46 CH47	Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 18 pF 5% 50V cer cyl chip 1 nF 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 100 pF 10% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 22 nF 20% 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat	T0000139T0000138T000016667003400T00003084311065043126650431107508011530043243650432436504342755050107700-0010311300-004342755090207100-0090207100-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-00
BR05 BV01 BV01 CH02 CH05 CH05 CH05 CH06 CH07 CH36 CH36 CH36 CH47 CH45 CH45 CH45 CH45 CH51 CH53	Socket 8 pin	T0000139T0000138T000016667003400T0000308431106504312665043110750431107508011530043243650432436504342755050107700-0010311300-0010311300-0010311300-0090207100-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-0010311300-00
BR05 BV01 CH02 CH05 CH05 CH05 CH05 CH05 CH35 CH35 CH41 CH45 CH45 CH45 CH45 CH45 CH60	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 18 pF 5% 50V cer cyl chip 1 nF 50V ceramic cyl chip 2 nF 20% 50V cer chip flat 3 nF 20% 50V cerchip 1 nF 50V ceramic cyl chip 2 nF 20% 50V cerchip 2 nF 20% 50V cerchip	T0000139T0000138T000016667003400T00003084311065043126650431107508011530043145010311300-004342755050107700-0010311300-0090207100-0090207100-0010311300-0090207100-0010311300-0090207100-0090207100-0010311300-0010311300-0010311300-0010311300-00
BR05 BV01 CH02 CH05 CH05 CH05 CH05 CH36 CH36 CH36 CH45 CH45 CH45 CH45 CH45 CH45 CH46 CH46 CH61	Socket 8 pin	T0000139T0000138T000016667003400T0000308431106504312665043110750431107508011530043243650432436504342755050107700-0010311300-004342755090207100-0010311300-00
BR05 BV01 CH02 CH05 CH05 CH05 CH05 CH05 CH36 CH36 CH36 CH46 CH47 CH45 CH46 CH46 CH46 CH46 CH61 CM62	Socket 8 pin	T0000139T0000138T000016667003400T000030843110650431266504311075080115300431445010311300-00432436504342755050107700-0010311300-0090207100-0010311300-00
BR05 BV01 CH02 CH05 CH05 CH05 CH05 CH05 CH05 CH05 CH05	Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 1 nF 50V ceramic cyl chip 22 nF 20% 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 100 pF 10% 50V ceramic cyl chip 1 μF -20+50% 50V ceramic cyl chip 1 μF -20+50% 50V ceramic cyl chip 1 μF -20+50% 50V ceramic cyl chip	T0000139T0000138T000016667003400T00003084311065043126650431075080115300431445010311300-004342755050107700-0010311300-0090207100-0010311300-0090207100-0010311300-00
BR05 BV01 CH02 CH05 CH05 CH05 CH05 CH05 CH05 CH05 CH05	Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 100 nF +80%-20% 50V cer chip flat 1 nF 50V ceramic cyl chip 2 nF 20% 50V cer chip flat 100 pF 10% 50V ceramic cyl chip 1 μF -20+50% 50V ceramic cyl chip 1 μF -20+50% 50V ceramic cyl chip 100 pF 10% 50V ceramic cyl chip 100 pF 10% 50V ceramic cyl chip 100 pF 10% 50V ceramic cyl chip	T0000139T0000138T000016667003400T00003084311065043126650431075080115300431445010311300-004324365050107700-0050107700-0010311300-00
BR05 BV01 BV01 CH02 CH05 CH05 CH05 CH05 CH05 CH36 CH36 CH36 CH46 CH46 CH46 CH46 CH46 CH66 CM66 CM66	Socket 8 pin	T0000139T0000138T000016667003400T00003084311065043110750431266504311075080115300431445010311300-004342755050107700-0010311300-0090207100-0010311300-00
BR05 BV01 BV01 CH02 CH05 CH05 CH05 CH05 CH05 CH35 CH35 CH35 CH45 CH45 CH45 CH45 CH63 CM65 CM65 CM66	Socket 8 pin	T0000139T0000138T000016667003400T00003084311065043110750431266504311075080115300431445010311300-004342755090207100-0010311300-00
BR05 BV01 CH02 CH05 CH05 CH05 CH05 CH05 CH05 CH05 CH05	Socket 8 pin	T0000139T0000138T000016667003400T00003084311065043110750431266504311075080115300431445010311300-004342755050107700-0010311300-0090207100-0090207100-0010311300-0010311300-0010311300-0090207100-0090207100-0010311300-00
BR05 BV01 CH02 CH04 CH05 CH06 CH06 CH07 CH36 CH36 CH36 CH36 CH36 CH36 CH36 CH36	Socket 8 pin	T0000139T0000138T000016667003400T00003084311065043110750431266504311075080115300431145010311300-004324365050107700-0010311300-0090207100-0010311300-00
BR05 BV01 CH02 CH04 CH05 CH06 CH07 CH36 CH36 CH36 CH36 CH36 CH36 CH46 CH46 CH46 CH66 CM66 CM66 CM66 CM66 CP06 CP06	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 100 nF +80%-20% 50V cer chip flat 100 pF 10% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 2 nF 20% 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 100 pF 10% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 2 nF -20+50% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 2 nF 20+50% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 2 nF -20+50% 25V elect 100 pF 10% 50V ceramic cyl chip 2 nF +80-20% 25V cer cyl chip 2 nF +80-20% 25V cer cyl chip 2 nF -20+50% 35V elect 2 nF 10% 63V metal poly 2 nF 20% 25V elect 2 nF 10% 63V metal poly	T0000139T0000138T000016667003400T0000308431106504312665043110750801153004331445010311300-004342755050107700-0010311300-004342755090207100-0010311300-00 .
BR05 BV01 CH02 CH05 CH05 CH05 CH05 CH05 CH05 CH05 CH05	Socket 8 pin Connector 22 way male Socket PERI TV	T0000139T0000138T000016667003400T000030843110750431266504311075080115300431445010311300-00432436504342755050107700-0010311300-00
BR05 BV01 CH02 CH04 CH05 CH06 CH07 CH36 CH36 CH36 CH36 CH36 CH36 CH46 CH46 CH46 CH66 CM66 CM66 CM66 CM66 CP06 CP06	Socket 8 pin Connector 22 way male Socket PERI TV Clock input pin 66998 12 pF 5% 50V ceramic chip flat 5.6 pF 1/4 pF 50V cer chip flat 3.9 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 5.6 pF 1/4 pF 50V cer chip flat 22 nF 20% 50V cer chip flat 1 nF 5% 50V cer chip flat 1 nF 50V ceramic cyl chip 47 nF 20% 25V cer chip flat 100 nF +80%-20% 50V cer chip flat 100 nF +80%-20% 50V cer chip flat 100 pF 10% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 2 nF 20% 50V cer chip flat 0.47 pF 1/4 pF 50V cer chip flat 100 pF 10% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 2 nF -20+50% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 2 nF 20+50% 50V ceramic cyl chip 1 nF 50V ceramic cyl chip 2 nF -20+50% 25V elect 100 pF 10% 50V ceramic cyl chip 2 nF +80-20% 25V cer cyl chip 2 nF +80-20% 25V cer cyl chip 2 nF -20+50% 35V elect 2 nF 10% 63V metal poly 2 nF 20% 25V elect 2 nF 10% 63V metal poly	T0000139T0000138T000016667003400T000030843110750431266504311075080115300431445010311300-00432436504342755050107700-0010311300-00

CP09	2200 μF 20% 25V elect	43224800
CP10	2200 μF +50-20% 16V elect	
CP11	330 nF 10% 63V met poly	
CP12	330 nF 10% 63V met poly	43049177
CP13	100 nF 10% 63V metal poly	
CP14	100 nF 10% 63V metal poly	
CP20	220 nF 10% 63V met poly	
CP21	220 μF -20+50% 25V elect	
CR02	100 μF -20+50% 25V elect	
CR04	22 nF +80-20% 25V cer cyl chip	
CR06	12 pF 5% 50V cer cyl chip C	
-	12 pF 5% 50V cer cyl chip C	
CR07 CR11	100 nF +80-20% 25V cer chip flat	
	·	
CR13	10 μF -20+50% 50V elect	
CR14	10 μF -20+50% 50V elect	
CR15	10 μF -20+50% 50V elect	
CR16	47 μF -20+50% 16V elect	
CR17	47 μF -20+50% 16V elect	
CR22	1 μF -20+50% 50V elect	
CR23	4.7 μF -20+50% 50V elect	
CR24	47 μF -20+50% 6.3V elect	T0000305
CR27	1 μF -20+50% 50V elect	43322157
CR28	10 nF 20% 16V ceramic cyl chip	30166500-00
CR29	2.7 nF 20% 16V	
CR30	22 nF +80-20% 25V cer cyl chip	
CV06	10 μF -20+50% 50V elect	
CV07	39 pF 5% 50V ceramic cyl chip	
CV08	15 pF 5% 50V cer cyl chip C	
CV14	22 µF -20+50% 16V elect	
•	•	
CV19	220 µF 20% 16V elect	
CV20	220 μF 20% 16V elect	
CV54	10 nF 20% 16V ceramic cyl chip	
CV55	100 nF 10% 63V metal poly	
CV56	470 μF -20+50% 16V elect	
CV57	10 nF 20% 16V ceramic cyl chip	
CV58	10 μF -20+50% 50V elect	
CV59	10 μF -20+50% 50V elect	43224257
CV60	10 μF -20+50% 50V elect	43224257
CV61	100 nF 10% 63V metal poly	43048477
CV62	1 nF 50V ceramic cyl chip	10311300-00
CV63	33 pF 5% 50V ceramic cyl chip	
CV64	39 pF 5% 50V ceramic cyl chip	
CV66	470 nF 10% 63V met poly	
CV67	22 nF +80-20% 25V cer cyl chip	
CV68	22 nF +80-20% 25V cer cyl chip	
CV69	22 nF +80-20% 25V cer cyl chip	
CV70	220 pF 10% 50V cer cyl chip 2B	
CV71	220 pF 10% 50V cer cyl chip 2B	
CV71	4.5 pF 27 pF trimming	
-	• •	
CV73	100 nF 10% 63V metal poly	
CV74	22 nF +80-20% 25V cer cyl chip	
CV75	390 pF 10% 50V cer cyl chip 2B	
CV80	22 μF -20+50% 16V elect	
CV81	180 pF 10% 50V ceramic cyl chip	
CV82	1 nF 50V ceramic cyl chip	
CV83	1 μF -20+50% 50V elect	
CV84	100 nF +80%-20% 50V cer chip flat	
CV85	470 nF -20+50% 5V elect	
CV87	100 μF -20+50% 16V elect	
CV88	22 nF +80-20% 25V cer cyl chip	
CV89	10 μF -20+50% 50V elect	
CV91	270 pF 10% 50V cer cyl chip	
CV93	100 nF +80%-20% 50V cer chip flat	
CV94	68 pF 50V ceramic cyl chip	
CV95	68 pF 50V ceramic cyl chip	10311100-00
DP01	1N4001	44008812
DP02	1N4001	44008812
DP03	1N4001	44008812
DP04	1N4001	44008812
DP05	1N4001	44008812
DP06	1N4001	
DP07	IN5391	
DP08	IN5391	
DP09	IN5391	
DP10	IN5391IN5391	
DP10	1N4001	_
DP11		
	ZPD12V 12V zener	
DR01	1N4148	
DR02	1N4148	_
DR03	5.6V zener	
DR04	BZX55C9V1 9.1V zener	44026501
	DEADOOS I S. I & Zerier	44020301
		4402030 1

1H30		00000400	nnae	the shows 50/ that one film out object	10227800 00
	SDA3202			1k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip	
IP01 IP01	Transistor dip			4.7k ohm 5% 1/4W carbon film	
IP02	Transistor dip			4.7k ohm 5% .1W car film cyl chip	
	IC MC7812/CT			10k ohm 5% .1W car film cyl chip	
	Transistor clip			510 ohm 5% .1W car film cyl chip	
IP04	IC UA7805CSP volt reg			470 ohm 5% .1W car film cyl chip	
IP05	Transistor dip			470 ohm 5% .1W car film cyl chip	
IP05	IC UA7805CSP volt reg		RR16	470 ohm 5% .1W car film cyl chip	60079600-00
IR01	IC THOM3000	T0000086		470 ohm 5% .1W car film cyl chip	
IR01	Connector PLCC	T0000141		1.8k ohm 5% .1W carbon film cyl chip	
IR03	Socket IC			1.8k ohm 5% .1W carbon film cyl chip	
IR03	IC TMS27PC256-2NL			1.8k ohm 5% .1W carbon film cyl chip	
1R05	PCD8582 NVM			1.8k ohm 5% .1W carbon film cyl chip	
IV01	IC MC1377	46050200		4.7k ohm 5% .1W car film cyl chip	
1004		44047050		4.7k ohm 5% .1W car film cyl chip	
J001	Strap istor metal glass cyl chip			10k ohm 5% .1W car film cyl chip	
J004	Strap istor metal glass cyl chip			10k ohm 5% .1W car film cyl chip	
J006	Strap istor metal glass cyl chip			560 ohm 5% .1W car film cyl chip	
J007	Strap istor metal glass cyl chip			1k ohm 5% .1W car film cyl chip	
J008	Strap istor metal glass cyl chip			1k ohm 5% .1W car film cyl chip	
J009 J010	Strap istor metal glass cyl chip			47k ohm 5% .1W car film cyl chip	
J010	Strap istor metal glass cyl chip			4.7k ohm 5% .1W car film cyl chip	
-	Strap istor carbon film cyl chip			22k ohm 5% .1W car film cyl chip	
J013	Strap istor carbon film cyl chip			1k ohm 5% .1W car film cyl chip	
J018	Strap istor carbon film cyl chip			2.2k ohm 5% .1W car film cyl chip	
5515	Strup istor ourself fill by only infilling			120 ohm 5% .1W car film cyl chip	
LH01	Inductor .56 mH SMT	T0000102		10k ohm 5% .1W car film cyl chip	
	Choke Coil 1.8 mH 10% fixed			75 ohm 5% .1W car film cyl chip	
	Coil 56 mH 5% fixed		RR55	2.2k ohm 5% .1W car film cyl chip	40077900-00
LR01	Filter A331LTMS-0158 low pass	48086800	RR56	4.7k ohm 5% .1W car film cyl chip	60079900-00
LR02	Filter A331LTMS-0158 low pass	48086800	RR57	4.7k ohm 5% .1W car film cyl chip	60079900-00
LR03	Coil 1.5 µH 10% fixed	70135800		4.7k ohm 5% .1W car film cyl chip	
LR04	Coil 6.8 µH 10% fixed	47074102		4.7k ohm 5% .1W car film cyl chip	
				4.7k ohm 5% .1W car film cyl chip	
	Pot 4.7K ohm pet horizontal			4.7k ohm 5% .1W car film cyl chip	
	Pot 10K ohm pet horizontal			4.7k ohm 5% .1W car film cyl chip	
PV03	Pot 10K ohm pet horizontal	42045100		4.7k ohm 5% .1W car film cyl chip	
-		40000700		4.7k ohm 5% .1W car film cyl chip	
	Filter 4 MHz Quartz			4.7k ohm 5% .1W car film cyl chip	
	Crystal 4 MHz Quartz			4.7k ohm 5% .1W car film cyl chip	
CAAOJ	Crystal 4.433 MHz Quartz	46004100		4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip	
DU01	120k ohm 5% 1/8W met gla flat chip	A1000850		33k ohm 5% .1W car film cyl chip	
	220 ohm 5% 1/8W met gla flat chip			7.5k ohm 5% .1W car film cyl chip	
	220 ohm 5% 1/8W met gla flat chip			270 ohm 5% .1W car film cyl chip	
	120k ohm 5% 1/8W met gla flat chip			33k ohm 5% .1W car film cyl chip	
	100 ohm 5% .1W car film cyl chip			7.5k ohm 5% .1W car film cyl chip	
	68 ohm 5% 1/8W met gla flat chip			270 ohm 5% .1W car film cyl chip	
				- · · · · · · · · · · · · · · · · · · ·	
	•	41083950	RR78	2.7k ohm 5% .1W car film cyl chip	
RH07	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus			2.7k ohm 5% .1W car film cyl chip 2.7k ohm 5% .1W car film cyl chip	60079700-00
RH07 RH18	100 ohm 5% 1/8W met gla chip flat	41024110	RR79	• • • • • • • • • • • • • • • • • • • •	60079700-00 60079700-00
RH07 RH18 RH32	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus	41024110 20110300-00	RR79 RR80	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00
RH07 RH18 RH32 RH33	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00	RR79 RR80 RR81	2.7k ohm 5% .1W car film cyl chip 2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 6Q079700-00
RH07 RH18 RH32 RH33 RH34	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 80078100-00	RR79 RR80 RR81 RR82 RR83	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00
RH07 RH18 RH32 RH33 RH34 RH35	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 80078100-00 60080300-00	RR79 RR80 RR81 RR82 RR83 RR84	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 60080300-00 10327800-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 60079900-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RH42	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079900-00 70080800-00 70080800-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RH42 RM22 RM25	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 70080800-00 60079900-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RH42 RM22 RM25 RM25	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90258500-00 41001812	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR88	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 60079900-00 60079900-00 60079900-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RH42 RM25 RM26 RM27	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.8k ohm 5% .1W carbon film cyl chip	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR89 RR89	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 60079900-00 60079900-00 60079900-00 60117500-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RH42 RM22 RM25 RM25 RM26 RM27 RM28	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1 k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W carbon film 1.8k ohm 5% .1W carbon film cyl chip 4.7k ohm 5% .1W car film cyl chip	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00	RR79 RR80 RR81 RR82 RR83 RR86 RR87 RR88 RR89 RR90 RR91	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 60079900-00 60079900-00 60079900-00 60117500-00 60117500-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RH42 RM25 RM26 RM27 RM28 RM28 RM29	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1 k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.2k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00 60079900-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR89 RR90 RR91 RR91	2.7k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060117500-0080119300-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RM22 RM25 RM26 RM27 RM28 RM29 RM30	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 12k ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00 60079900-00 20110100-00	RR79 RR80 RR81 RR82 RR83 RR86 RR87 RR88 RR89 RR90 RR91 RR92 RR93	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 60079900-00 60079900-00 60079900-00 60117500-00 80119300-00 80119300-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RM22 RM25 RM25 RM26 RM27 RM28 RM29 RM30 RM31	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00 60079900-00 20110100-00 20110300-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR89 RR90 RR91 RR92 RR93 RR94	2.7k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060117500-0080119300-0080119300-0080119300-00
RH07 RH18 RH32 RH33 RH34 RH35 RH41 RM25 RM25 RM26 RM27 RM28 RM29 RM30 RM31 R017	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1 k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00 60079900-00 20110100-00 20110300-00 20110300-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR89 RR90 RR91 RR92 RR93 RR94 RR95	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 60079900-00 60079900-00 60079900-00 60117500-00 80119300-00 80119300-00 80119300-00 80119300-00
RH07 RH18 RH32 RH33 RH35 RH41 RM25 RM25 RM26 RM27 RM28 RM29 RM30 RM31 R017 R018	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00 60079900-00 20110100-00 20110300-00 80078100-00	RR79 RR80 RR81 RR82 RR83 RR86 RR86 RR87 RR88 RR89 RR90 RR91 RR92 RR93 RR93 RR94 RR95 RR95	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 60079900-00 60079900-00 60079900-00 60117500-00 80119300-00 80119300-00 80119300-00 80119300-00
RH07 RH18 RH32 RH33 RH35 RH41 RM25 RM25 RM26 RM27 RM28 RM29 RM30 RM31 R017 R018 RP01	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00 60079900-00 20110100-00 20110300-00 80078100-00 80078100-00 80078100-00	RR79 RR80 RR81 RR82 RR83 RR86 RR87 RR88 RR89 RR90 RR91 RR92 RR93 RR93 RR94 RR95 RR97	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 60079900-00 60079900-00 60079900-00 60079900-00 60117500-00 60117500-00 80119300-00 80119300-00 80119300-00 80119300-00 80119300-00 80119300-00
RH07 RH18 RH32 RH34 RH35 RH41 RM25 RM26 RM27 RM28 RM29 RM30 RM31 R017 R018 RP01 RP02	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 90256500-00 41001812 40077800-00 60079900-00 20110100-00 20110300-00 20118400-00 80078100-00 80078100-00 80078100-00 80078100-00	RR79 RR80 RR81 RR82 RR83 RR86 RR87 RR88 RR89 RR90 RR91 RR92 RR93 RR94 RR95 RR95 RR95 RR95 RR95 RR95	2.7k ohm 5% .1W car film cyl chip	60079700-00 60079700-00 60079700-00 60079700-00 60079700-00 70080800-00 70080800-00 60079900-00 60079900-00 60117500-00 80119300-00 80119300-00 80119300-00 80119300-00 80119300-00 80119300-00 80119300-00
RH07 RH18 RH32 RH34 RH35 RH41 RH42 RM25 RM25 RM26 RM27 RM28 RM29 RM30 RM31 R017 R018 RP01 RP02 RP03	100 ohm 5% 1/8W met gla chip flat	41024110 20110300-00 60080300-00 60080300-00 10327800-00 10432000-00 90256500-00 41001812 40077800-00 60079900-00 20110100-00 20110300-00 40118400-00 80078100-00 80078100-00 80078100-00 80220GM0245RG 10327800-00 10327800-00	RR79 RR80 RR81 RR82 RR84 RR86 RR87 RR89 RR90 RR91 RR92 RR93 RR93 RR95 RR97 RV05 RV06 RV07	2.7k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060117500-0060117500-0080119300-0080119300-0080119300-0050128200-0050128200-0050186700-00
RH07 RH18 RH33 RH34 RH35 RH41 RM25 RM25 RM26 RM27 RM28 RM29 RM30 RM31 RO17 RO18 RP01 RP03 RP03 RP04	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 12k ohm 5% .1W car film cyl chip 130 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 21k ohm 5% .1W car film cyl chip 22 ohm 5% .1W car film cyl chip 25.11k ohm 1% .4W metal film 25.11k ohm 1% .4W met film 25.11k ohm 1% .4W met film	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010432000-0090256500-0010327800-004100181240077800-0020110100-0020110300-0020110300-0080078100-0080078100-0080078100-0080220GM0245RG10327800-004129801241293012	RR79 RR80 RR81 RR82 RR83 RR86 RR87 RR88 RR89 RR90 RR91 RR92 RR93 RR94 RR95 RR95 RR97 RV05 RV06 RV07 RV08	2.7k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060117500-0080119300-0080119300-0080119300-0050128200-0050128200-0050128200-0050128200-0050186700-0050186700-00
RH07 RH18 RH33 RH34 RH35 RH42 RM25 RM25 RM26 RM27 RM28 RM29 RM30 RM31 RO18 RP01 RP03 RP04 RP05	100 ohm 5% 1/8W met gla chip flat	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010432000-0090256500-0010327800-004100181240077800-0020110100-0020110300-0080078100-0080078100-0080078100-0080220GM0245RG10327800-0010327800-0080220GM0245RG10327800-0080220GM0245RG10327800-0080078100-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR89 RR90 RR91 RR92 RR93 RR93 RR95 RR95 RR97 RV05 RV06 RV07 RV08 RV09	2.7k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0060117500-0060117500-0080119300-0080119300-0050128200-0050128200-0050128200-0050186700-0050128100-00
RH07 RH18 RH33 RH34 RH35 RH42 RM25 RM25 RM26 RM27 RM28 RM30 RM31 R017 RP01 RP03 RP03 RP04 RP05 RP06	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 210 ohm 5% .1W car film cyl chip 22 ohm 5% .1W car film cyl chip 3.1k ohm 5% .1W car film cyl chip	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010432000-0090256500-0010327800-004100181240077800-0020110100-0020110300-0040118400-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-008007800-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR89 RR90 RR91 RR92 RR93 RR93 RR95 RR97 RV05 RV06 RV07 RV08 RV09 RV10	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 100k ohm 5% .1W car film cyl chip 100k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0060117500-0060119300-0080119300-0080119300-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-00
RH07 RH18 RH33 RH34 RH35 RH41 RM25 RM26 RM27 RM28 RM29 RM30 RM31 RO18 RP03 RP04 RP05 RP06 RP06 RP08	100 ohm 5% 1/8W met gla chip flat	4102411020110300-0060080300-0080078100-0060080300-0010327800-0010432000-0090256500-0010327800-004100181240077800-0020110100-0020110300-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080079900-0080077900-0080077900-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RR97 RV05 RV06 RV07 RV08 RV09 RV10 RV10	2.7k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060117500-0060117500-0080119300-0080119300-0050128200-0050128200-0050128200-0050186700-0050186700-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-00
RH07 RH18 RH32 RH33 RH34 RH35 RH42 RM25 RM26 RM27 RM28 RM29 RM30 RM31 RO17 RP03 RP04 RP03 RP04 RP05 RP06 RP06 RP06 RP06 RP10	100 ohm 5% 1/8W met gla chip flat	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010432000-0090256500-0010327800-004100181240077800-0020110100-0020110300-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-008007800-0080079900-0080077900-0080077900-0080077900-0080079900-0080079900-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RR97 RV05 RV06 RV07 RV08 RV09 RV10 RV11 RV13	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0060117500-0060117500-0080119300-0080119300-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050186700-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-00
RH07 RH18 RH33 RH34 RH35 RH35 RH35 RM26 RM27 RM28 RM29 RM30 RM31 RO18 RP03 RP04 RP05 RP06 RP10 RP11	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22 ohm 5% .1W car film cyl chip 3.1k ohm 5% .1W car film cyl chip 20 ohm 5% .1W car film cyl chip 21 ohm 5% .1W car film cyl chip 22 ohm 5% .1W car film cyl chip 3.1k ohm 1% .4W met film 4.7k ohm 5% .1W car film cyl chip 3.1k ohm 5% .1W car film cyl chip	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010327800-0010327800-0010327800-0060079900-0020110100-0020110300-0080078100-0080078100-0080078100-0080220GM0245RG10327800-00412980124129301220110300-0080077900-0080079900-0080079900-0080079900-0080079900-0080079900-0080079900-0080079900-0080079900-0080079900-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RR97 RV05 RV06 RV07 RV08 RV09 RV10 RV11 RV13	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 100k ohm 5% .1W car film cyl chip 100k ohm 5% .1W car film cyl chip 100k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060117500-0060117500-0080119300-0080119300-0080119300-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050186700-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050186600-0050186600-00
RH07 RH18 RH33 RH34 RH35 RH35 RH42 RM25 RM26 RM27 RM28 RM30 RM31 RP01 RP03 RP04 RP05 RP06 RP06 RP11 RP12	100 ohm 5% 1/8W met gla chip flat	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010432000-0090256500-0010327800-004100181240077800-0020110100-0020110300-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RR97 RV05 RV06 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 62 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 1680 ohm 5% .1W car film cyl chip 1680 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 1560 ohm 5% .1W car film cyl chip 158 ohm 5% .1W car film cyl chip 168 ohm 5% .1W car film cyl chip 175 ohm 5% .1W car film cyl chip 18k ohm 5% .1W car film cyl chip 18k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0060079900-0060117500-0060117500-0080119300-0080119300-0050128200-0050128200-0050128200-0050128200-0050186700-0050186700-0050186700-0050186600-0080119400-0080119400-0080119400-0080119400-00
RH07 RH18 RH32 RH33 RH34 RH35 RH42 RM26 RM26 RM27 RM28 RM29 RM30 RM31 RO18 RP03 RP04 RP05 RP06 RP06 RP11 RP14	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22 ohm 5% .1W car film cyl chip 3.1k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 220 ohm 5% .1W car film cyl chip 5.11k ohm 1% .4W met film 10k ohm 5% .1W car film cyl chip 5.11k ohm 5% .1W car film cyl chip 5.11k ohm 5% .1W car film cyl chip 5.11k ohm 5% .1W car film cyl chip 5.10k ohm 5% .1W car film cyl chip	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010432000-0090256500-004100181240077800-0020110100-0020110300-0080078100-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR89 RR90 RR91 RR92 RR93 RR94 RR95 RR97 RV05 RV06 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15 RV16	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 1680 ohm 5% .1W car film cyl chip 1680 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip 56k ohm 5% .1W car film cyl chip 1.8k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060117500-0060117500-0080119300-0080119300-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050186700-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-00
RH07 RH18 RH33 RH34 RH35 RH35 RM26 RM27 RM28 RM27 RM29 RM30 RM31 RP03 RP04 RP05 RP06 RP11 RP14 RP15	100 ohm 5% 1/8W met gla chip flat	4102411020110300-0060080300-0060080300-0060080300-0010327800-0090256500-0090256500-004100181240077800-0020110100-0020110300-0080078100-0080078100-0080078100-0080220GM0245RG10327800-00412980124129301220110300-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080220GM02DG2370000301	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RR97 RV05 RV06 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15 RV16 RV17	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 530 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0080078500-0080119300-0080119300-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-0050128200-005012800-0050128100-00
RH07 RH18 RH33 RH34 RH35 RH35 RH36 RM26 RM27 RM28 RM27 RM29 RM30 RM31 RP03 RP04 RP05 RP06 RP11 RP14 RP15 RP21	100 ohm 5% 1/8W met gla chip flat	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010327800-0010327800-0010327800-0010327800-0010327800-0010100-0020110100-0020110300-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-001298012129801220110300-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080220GM02DG2310000301	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RR97 RV05 RV06 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15 RV16 RV17 RV18	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 530 ohm 5% .1W car film cyl chip 540 ohm 5% .1W car film cyl chip 551 ohm 5% .1W car film cyl chip 551 ohm 5% .1W car film cyl chip 552 ohm 5% .1W car film cyl chip 553 ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0060079900-0060079900-0080078500-0080119300-0080119300-0050128200-0050128200-0050128200-0050128100-0050128100-0050128100-0050128100-0080078500-0050128100-0050128100-0050128100-0080078500-0050128100-0050128100-0050128100-0050128100-0050128100-0050186600-0050186600-0050186600-0050186600-0050186200-00
RH07 RH18 RH33 RH34 RH35 RH35 RH42 RM25 RM26 RM27 RM29 RM30 RM31 RO18 RP03 RP04 RP05 RP06 RP11 RP14 RP15 RP21 RP23	100 ohm 5% 1/8W met gla chip flat	4102411020110300-0060080300-0080078100-0060080300-0010327800-0010432000-0010327800-0010327800-0010327800-0010327800-0010007800-0020110100-0020110300-0080078100-0080078100-0080078100-0080220GM0245RG10327800-00412930124129301220110300-0080077900-0080077900-0080077900-0080077900-0010000116-06	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RV05 RV06 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15 RV16 RV17 RV18 RV19 RV20	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 50 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 11.8k ohm 5% .1W car film cyl chip 12.2k ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0060117500-0080119300-0080119300-0080119300-0050128200-0050128200-0050128200-0050128100-0050186700-0050186700-0050186600-0080119300-0050186600-0050186600-0050186600-0050186600-0050186600-0050186600-0050186600-0050186600-0050186600-0050186600-0050186600-0050186200-0050186200-0050186200-00
RH07 RH18 RH33 RH34 RH35 RH35 RM26 RM27 RM27 RM28 RM30 RM31 RP03 RP04 RP04 RP16 RP16 RP17 RP17 RP18 RP18 RP18 RP18 RP18 RP18 RP18 RP18	100 ohm 5% 1/8W met gla chip flat 22 ohm 5% .3W car film fus 10k ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22k ohm 5% .1W car film cyl chip 1k ohm 5% .1W car film cyl chip 330 ohm 5% .1W car film cyl chip 1 Meg ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 2.2k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 3.3k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip 22 ohm 5% .1W car film cyl chip 3.1k ohm 1% .4W metal film 1k ohm 5% .1W car film cyl chip 5.11k ohm 1% .4W met film 10k ohm 5% .1W car film cyl chip 220 ohm 5% .1W car film cyl chip 270 ohm 5% .1W car film cyl chip	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010432000-0090256500-0010327800-0040077800-0060079900-0020110300-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-00	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RV97 RV05 RV06 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15 RV16 RV17 RV18 RV19 RV20 RV20	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 62 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 1680 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 11k ohm 5% .1W car film cyl chip 11k ohm 5% .1W car film cyl chip 1560 ohm 5% .1W car film cyl chip 1560 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 11.8k ohm 5% .1W car film cyl chip 12.2k ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0060117500-0080119300-0080119300-0050128200-0050128200-0050128200-0050128200-0050128100-0050186700-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050186600-0050186600-0050186600-0050186200-0050186200-0050186200-0050186200-0050186200-0050186200-00
RH07 RH18 RH33 RH34 RH35 RH35 RM26 RM27 RM27 RM27 RM29 RM31 RP01 RP03 RP04 RP08 RP11 RP14 RP15 RP01 RP02 RP02	100 ohm 5% 1/8W met gla chip flat	4102411020110300-0060080300-0060080300-0060080300-0010327800-0010432000-0090256500-004100181240077800-0020110300-0020110300-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-0080078100-008007800-0010327800-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0080077900-0010000116-06	RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR95 RV97 RV05 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15 RV16 RV17 RV18 RV19 RV20 RV21 RV20	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 50 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 18k ohm 5% .1W car film cyl chip 18k ohm 5% .1W car film cyl chip 18k ohm 5% .1W car film cyl chip 19k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 11k ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip	60079700-0060079700-0060079700-0060079700-0060079700-0060079700-0060079900-0060079900-0060079900-0060079900-0060079900-0060079900-0060117500-0080119300-0080119300-0080119300-0050128200-0050128200-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050128100-0050186600-0050186600-0050186200-0050186200-0050186200-0050128200-00
RH07 RH32 RH33 RH34 RH35 RH35 RM26 RM27 RM27 RM29 RM30 RM31 RP03 RP04 RP04 RP12 RP13 RP14 RP13 RP03 RR04	100 ohm 5% 1/8W met gla chip flat		RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RV05 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15 RV16 RV17 RV18 RV17 RV20 RV21 RV22 RV23	2.7k ohm 5% .1W car film cyl chip 3.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 530 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip	
RH07 RH33 RH34 RH35 RH36 RM26 RM27 RM27 RM28 RM30 RM31 RP03 RP04 RP05 RP06 RP16 RP16 RP16 RP17 RP17 RP18 RP18 RP18 RP18 RP18 RP18 RP18 RP18	100 ohm 5% 1/8W met gla chip flat		RR79 RR80 RR81 RR82 RR83 RR84 RR86 RR87 RR88 RR90 RR91 RR92 RR93 RR94 RR95 RV05 RV07 RV08 RV09 RV10 RV11 RV13 RV14 RV15 RV16 RV17 RV18 RV17 RV20 RV21 RV22 RV23	2.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 5.6k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 4.7k ohm 5% .1W car film cyl chip 560 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 51 ohm 5% .1W car film cyl chip 50 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 680 ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip 18k ohm 5% .1W car film cyl chip 18k ohm 5% .1W car film cyl chip 18k ohm 5% .1W car film cyl chip 19k ohm 5% .1W car film cyl chip 10k ohm 5% .1W car film cyl chip 11k ohm 5% .1W car film cyl chip 150 ohm 5% .1W car film cyl chip	

RV25	240 ohm 5% .1W car film cyl chip	10431900-00
RV26	3k ohm 5% .1W car film cyl chip	10432800-00
RV27	120 ohm 5% .1W car film cyl chip	70080300-00
RV30	390 ohm 5% .1W car film cyl chip	10327300-00
RV42	150 ohm 5% .1W car film cyl chip	
RV55	6.8k ohm 5% .1W car film cyl chip	•
RV57	560 ohm 5% .1W car film cyl chip	
RV58	2.2k ohm 5% .1W car film cyl chip	
RV59	3.9k ohm 5% .1W car film cyl chip	
RV60	470 ohm 5% .1W car film cyl chip	
RV61	2.2k ohm 5% .1W car film cyl chip	
RV62	3.9k ohm 5% .1W car film cyl chip	
RV63	470 ohm 5% .1W car film cyl chip	
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RV64	2.2k ohm 5% .1W car film cyl chip	
RV65	3.9k ohm 5% .1W car film cyl chip	
RV66	470 ohm 5% .1W car film cyl chip	
RV67	75 ohm 5% .1W car film cyl chip	
RV68	75 ohm 5% .1W car film cyl chip	
RV69	75 ohm 5% .1W car film cyl chip	
RV70	180 ohm 5% .1W carbon cyl chip	
RV71	180 ohm 5% .1W carbon cyl chip	20109700-00
RV72	180 ohm 5% .1W carbon cyl chip	20109700-00
RV73	680 ohm 5% .1W car film cyl chip	50128200-00
RV74	75 ohm 5% 1/4W car film	41000212
RV75	3.3k ohm 5% .1W car film cyl chip	
RV76	330 ohm 5% .1W car film cyl chip	
RV77	390 ohm 5% .1W car film cyl chip	
RV79	220 ohm 5% .1W car film cyl chip	
RV82	1k ohm 5% .1W car film cyl chip	
RV83	1k ohm 5% .1W car film cyl chip	
RV84	110k ohm 5% .1W car film cyl chip	
RV85	1.8k ohm 5% .1W car film cyl chip	
RV86	68 ohm 5% .1W car film cyl chip	50186200-00
RV87	560 ohm 5% .1W car fil cyl chip	
RV88	1.8k ohm 5% .1W car film cyl chip	
RV89	39k ohm 5% .1W car film cyl chip	
RV90	3.3k ohm 5% .1W car film cyl chip	
RV91	22 ohm 5% .3W fuse carb film	
RV92	470k ohm 5% .1W car film cyl chip	
RV93	470k ohm 5% .1W car film cyl chip	
RV95	27 ohm 5% .1W car film cyl chip	
RV96	470 ohm 5% 1/4W carbon film	
SR01	Switch KSA	TARAMATER
•	Q11112011 112011 11111111111111111111111	10000150
TD01	BC848B	45061785
TD01 TE01	BC848BBC328	45061785 45028864
TE01 TE02	BC848B	45061785 45028864 45028864
TE01 TE02 TH01	BC848B	45061785 45028864 45028864 20126800-85
TE01 TE02 TH01 TH02	BC848B	45061785 45028864 45028864 20126800-85
TE01 TE02 TH01 TH02 TH30	BC848B	45061785 45028864 45028864 20126800-85 20126800-85
TE01 TE02 TH01 TH02 TH30 TM54	BC848B	45061785 45028864 45028864 20126800-85 20126800-85 45061785 30614360
TE01 TE02 TH01 TH02 TH30 TM54 TM55	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 T0000125-64
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 T0000125-64
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 T0000125-64 45018264 45017864
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 45018264 45017864 45002164
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR01 TR02	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 T0000125-64 45017864 45002164 45002164
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR02 TR03	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 T0000125-64 45018264 45017864 45002164 45002164 45002164
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR02 TR03 TR04	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 T0000125-64 45017864 45002164 45002164 45002164 45002164
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR02 TR03 TR04 TR06	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 T0000125-64 45018264 45017864 45002164 45002164 45002164 45002164
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR02 TR03 TR04 TR06 TR07	BC848B	45061785 45028864 20126800-85 20126800-85 30614360 45044664 10000125-64 45018264 45002164 45002164 45002164 45002164 45002164 45002164
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR02 TR03 TR04 TR06 TR07 TR08	BC848B	45061785 45028864 20126800-85 20126800-85 30614360 45044664 70000125-64 45018264 45017864 45002164 45002164 45002164 45002164 45002164 45002164 45002164
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR03 TR04 TR06 TR06 TR07 TR08 TR09	BC848B	45061785 45028864 20126800-85 20126800-85 30614360 45044664 45018264 45017864 45002164 45002164 45002164 45002164 45002164 45018264 45018264 45061785 45061785
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR03 TR04 TR06 TR06 TR07 TR08 TR09 TR13	BC848B	45061785 45028864 20126800-85 20126800-85 45061785 30614360 45044664 45018264 45017864 45002164 45002164 45002164 45002164 45002164 45018264 45061785 45061785 45017864
TE01 TE02 TH01 TH02 TM54 TM55 TP01 TP02 TP03 TR03 TR04 TR06 TR06 TR06 TR07 TR08 TR09 TR13 TR14	BC848B	45061785 45028864 45028864 20126800-85 20126800-85 45061785 30614360 45044664 45018264 45017864 45002164 45002164 45002164 45002164 45002164 45018264 45061785 45061785 45017864 45017864
TE01 TE02 TH01 TH02 TM54 TM55 TP01 TP02 TP03 TR04 TR06 TR06 TR06 TR07 TR08 TR09 TR13 TR14 TR15	BC848B	45061785 45028864 20126800-85 20126800-85 30614360 45061785 30614360 45018264 45018264 45017864 45002164 45002164 45002164 45061785 45061785 45017864 45017864 45017864 45017864 45017864
TE01 TE02 TH01 TH02 TH05 TP01 TP02 TP03 TR04 TR06 TR06 TR06 TR07 TR08 TR09 TR13 TR15 TV02	BC848B	45061785 45028864 45028864 20126800-85 20126800-85 45061785 30614360 45044664 45018264 45018264 45002164 45002164 45002164 45018264 45017864 45017864 45017864 45017864 45002164
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR02 TR03 TR04 TR06 TR07 TR08 TR07	BC848B BC328 BC328 2SC3609 2SC3609 BC848B BS108 silicon low power BF246A ZTX449 BC558 BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC558B	45061785 45028864 20126800-85 20126800-85 20126800-85 30614360 45044664 45018264 45018264 45002164 45002164 45002164 45002164 45018264 45018264 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864
TE01 TE02 TH01 TH02 TH30 TM54 TM55 TP01 TP02 TP03 TR01 TR03 TR04 TR06 TR07 TR08 TR07 TR08 TR07 TR08 TR07 TR08 TR07 TR08 TR07 TR08 TR07 TR01 TR01 TR01	BC848B BC328 BC328 2SC3609 2SC3609 BC848B BS108 silicon low power BF246A ZTX449 BC558 BC548B BC558B BC848B BC548B BC558B BC848B BC548B BC548B BC548B BC558B BC848B BC548B	45061785 45028864 20126800-85 20126800-85 20126800-85 45061785 30614360 45044664 45018264 45017864 45002164 45002164 45002164 45002164 45061785 45061785 45061785 45017864 45017864 45017864 45017864 45017864 45017864 45002664 45002664 45002664
TE01 TE02 TH01 TH02 TH05 TP01 TP02 TP03 TR04 TR06 TR07 TR08 TR08 TR07 TR08 TR09 TR13 TR15 TV10 TV11 TV12	BC848B	45061785 45028864 20126800-85 20126800-85 20126800-85 45061785 30614360 45044664 45018264 45018264 45002164 45002164 45002164 45002164 45018264 45018264 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864
TE01 TE02 TH01 TH02 TH05 TM55 TP02 TP03 TR04 TR06 TR07 TR08 TR08 TR08 TR15 TV10 TV11 TV12 TV19	BC848B	45061785 45028864 20126800-85 20126800-85 20126800-85 45061785 30614360 45044664 45018264 45018264 45002164 45002164 45002164 45002164 45017864
TE01 TE02 TH01 TH02 TH05 TP02 TP03 TR04 TR03 TR04 TR06 TR08 TR08 TR08 TR15 TV10 TV11 TV12 TV20	BC848B	45061785 45028864 20126800-85 20126800-85 3061785 30614360 45044664 45018264 45002164 45002164 45002164 45018264 45018264 45018264 45018264 45018264 45018264 45018264 45018264 45018264 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45002164 45002164 45002164 45002164 45002164 45002164 45002164
TE01 TE02 TH01 TH02 TH05 TP02 TP03 TR04 TR06 TR07 TR08 TR08 TR08 TR08 TR13 TR15 TV10 TV11 TV12 TV20 TV21	BC848B	45061785 45028864 45028864 20126800-85 20126800-85 45061785 30614360 45044664 10000125-64 45018264 45002164 45002164 45002164 45002164 45017864
TE01 TE02 TH01 TH02 TH05 TM55 TP02 TR03 TR04 TR06 TR07 TR08 TR08 TR15 TV10 TV11 TV12 TV20 TV21 TV21 TV22	BC848B	45061785450288644502886420126800-8520126800-853061436045061785306143644501826445002164450021644500216445017864450021644500216445002164
TE01 TE02 TH01 TH02 TH05 TM54 TM55 TP02 TP03 TR03 TR04 TR06 TR07 TR08 TR07 TR08 TR15 TV10 TV11 TV12 TV20 TV21 TV22 TV23	BC848B	45061785 45028864 45028864 20126800-85 20126800-85 45061785 30614360 45044664 T0000125-64 45018264 45002164 45002164 45002164 45061785 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45017864 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164 45002164
TE01 TE02 TH01 TH02 TH03 TM54 TM55 TP02 TP03 TR01 TR02 TR03 TR04 TR06 TR07 TR08 TR07 TR08 TR14 TR15 TV10 TV11 TV12 TV20 TV21 TV22 TV23 TV24	BC848B	45061785450288644502886420126800-8520126800-8530617853061436045044664450182644501786445002164450021644501786445002164450021644500216445002164450021644500216445002164450021644500216445002164450021644500216445002164450021644500216445002164450021644500216445002164
TE01 TE02 TH01 TH02 TH03 TM54 TM55 TP02 TR03 TR04 TR06 TR07 TR08 TR07 TR08 TR13 TR15 TV10 TV11 TV20 TV21 TV22 TV23 TV25	BC848B	450617854502886420126800-8520126800-85306178530614360450446644501826445017864450021644500216445017864450617854501786445017854501785
TE01 TE02 TH01 TH02 TH03 TM54 TM55 TP02 TP03 TR04 TR07 TR08 TR07 TR08 TR14 TV10 TV12 TV20 TV21 TV20 TV25 TV26	BC848B	45061785450288644502886420126800-8520126800-853061785306143604504466410000125-644501826445002164450021644500216445061785450178644501785
TE01 TE02 TH01 TH02 TH03 TM54 TM55 TP02 TR03 TR04 TR06 TR07 TR08 TR07 TR08 TR13 TR15 TV10 TV11 TV20 TV21 TV22 TV23 TV25	BC848B	45061785450288644502886420126800-8520126800-853061785306143604504466410000125-644501826445002164450021644500216445061785450178644501785
TE01 TE02 TH01 TH02 TH03 TM55 TP02 TR03 TR04 TR03 TR04 TR05 TR07 TR08 TR15 TV10 TV20 TV21 TV20 TV21 TV25 TV25 TV27	BC848B BC328 BC328 2SC3609 2SC3609 BC848B BS108 silicon low power BF246A ZTX449 BC558 BC548B	45061785 45028864 20126800-85 20126800-85 3061785 30614360 45044664 T0000125-64 45018264 45017864 45002164 45002164 45061785 45017864 45002164
TE01 TE02 TH01 TH02 TH01 TH02 TH05 TM55 TP02 TP03 TR01 TR03 TR06 TR07 TR08 TR07 TR08 TR13 TR14 TR15 TV12 TV20 TV21 TV20 TV21 TV25 TV26 TV27 VP02	BC848B BC328 BC328 2SC3609 2SC3609 BC848B BS108 silicon low power BF246A ZTX449 BC558 BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC558 BC848B BC548B BC64B BC64B BC64B BC66B BC6CB BC6C	45061785 45028864 20126800-85 20126800-85 3061785 30614360 45044664 T0000125-64 45018264 45002164 45002164 45002164 45061785 45061785 45017864 45017864 45017864 45017864 45017864 45002164
TE01 TE02 TH01 TH02 TH01 TH05 TH05 TM55 TP01 TR07 TR07 TR07 TR08 TR07 TR08 TR07 TR08 TR13 TR14 TR15 TV10 TV11 TV20 TV21 TV20 TV21 TV25 TV27 VP02 VP03	BC848B BC328 BC328 2SC3609 2SC3609 BC848B BS108 silicon low power BF246A ZTX449 BC558 BC548 BC548B BC548B BC548B BC548B BC548B BC548B BC558 BC548B BC558 BC848B BC558 BC848B BC548B BC64B BC64B BC64B BC64B BC66B BC66B BC66B BC66B BC66B BC66B BC66B BC66B BC66B BC6CB BC66B BC6CB BC6C	450617854502886420126800-8520126800-85450617853061436045044664T0000125-6445018264450178644500216445002164450617854501786445002164
TE01 TE02 TH01 TH02 TH02 TH05 TM55 TP02 TR03 TR06 TR07 TR08 TR07 TR08 TR13 TR15 TV10 TV12 TV20 TV21 TV25 TV26 TV20 VP06	BC848B BC328 BC328 2SC3609 2SC3609 BC848B BS108 silicon low power BF246A ZTX449 BC558 BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC558 BC848B BC548B BC658B BC66B BC6	45061785450288644502886420126800-8520126800-854506178530614360450446647000125-64450182644501826445002164450021644501826445017864450178644501786445017864450178644501786445017864450178644501786445002164
TE01 TE02 TH01 TH02 TH01 TH05 TH05 TM55 TP01 TR07 TR07 TR07 TR08 TR07 TR08 TR07 TR08 TR13 TR14 TR15 TV10 TV11 TV20 TV21 TV20 TV21 TV25 TV27 VP02 VP03	BC848B BC328 BC328 2SC3609 2SC3609 BC848B BS108 silicon low power BF246A ZTX449 BC558 BC548B BC648B BC648B BC668B	45061785450288644502886420126800-8520126800-85306178530614360450446647000125-6445018264450021644500216445002164450617854506178545061785450178644501786445002164
TE01 TE02 TH01 TH02 TH02 TH055 TP02 TR07 TR07 TR07 TR07 TR07 TR07 TR07 TR07	BC848B BC328 BC328 2SC3609 2SC3609 BC848B BS108 silicon low power BF246A ZTX449 BC558 BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC548B BC558 BC848B BC548B BC658B BC66B BC6	450617854502886420126800-8520126800-8530614360450446644501826445018264450021644500216445002164450178644500216445002

VV04	THOMSON MPM8010	
	-451-001 D-MAC Decoder	
CD01 CD03	22 nF 20% 25V ceramic chip flat	
CD04	470 pF 5% 50V cer chip flat C	
CD05	10 nF 20% 25V ceramic chip flat	
CD06 CD07	10 nF 20% 25V ceramic chip flat	
CD08	22 nF 20% 25V ceramic chip flat	
CD09	100 nF +80%-20% 50V cer chip flat	
CD10 CD11	100 nF +80%-20% 50V cer chip flat	
CD12	22 nF 20% 25V ceramic chip flat	
CD13	22 nF 20% 25V ceramic chip flat	43128850
CD14 CD15	22 nF 20% 25V ceramic chip flat	
CD15	10 μF -20+50% 50V elect	
CD17	100 μF -20+50% 16V elect	T0000143
CD18 CD19	10 nF 20% 25V ceramic chip flat	
CD19	10 nF 20% 25V ceramic chip flat	
CD21	10 nF 20% 25V ceramic chip flat	43191350
CD22 CD23	10 nF 20% 25V ceramic chip flat	
CD23	22 nF 20% 25V ceramic chip flat	
CD25	1 nF 20% 25V cer chip flat 2C	43451150
CD26 CD28	1 nF 20% 25V cer chip flat 2C 100 nF +80%-20% 50V cer chip flat	
CD30	100 nF +80%-20% 50V cer chip flat	
CD31	10 μF -20+50% 50V elect	
CD32 CD33	100 nF +80%-20% 50V cer chip flat 10 μF -20+50% 50V elect	
CD34	100 μF -20+50% 16V elect	
CD35	22 nF 20% 25V ceramic chip flat	
CD40 CD41	100 nF +80%-20% 50V cer chip flat	
CD45	56 pF 5% 50V cer chip flat	
CD46	56 pF 5% 50V cer chip flat	
CD47 CD48	56 pF 5% 50V cer chip flat	
CD49	100 pF 5% 50V cer chip flat	
CD50	100 pF 5% 50V cer chip flat	
CD51	100 nF +80%-20% 50V cer chip flat	43427550
1D02	Memory KM4164B-12 120nS	
ID03 ID04	Memory KM4164B-12 120nS VCU2133	
ID04	MCU2600	
ID06	AMU2481	
1D07	DMA2285	50155900-00
		50155900-00 T0000141
1D07 1D07	DMA2285 Connector PLCC	50155900-00 T0000141 40095500-00
ID07 ID08 ID08	DMA2285	50155900-00 T0000141 40095500-00 T0000141
1D07 1D07 1D08	DMA2285 Connector PLCC	50155900-00 70000141 40095500-00 T0000141
ID07 ID08 ID08 ID01 LD02 LD03	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 µH 10% fixed Coil 10 µH 10% fixed Coil 10 µH 10% fixed	50155900-0040095500-00T0000141470211764702117647021176
ID07 ID08 ID08 LD01 LD02	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed Coil 10 μH 10% fixed	50155900-0040095500-00T0000141470211764702117647021176
ID07 ID08 ID08 ID01 LD02 LD03	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 µH 10% fixed	50155900-0040095500-001000014147021176470211764702117647021176
ID07 ID08 ID08 ID01 LD02 LD03 LD04	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed	50155900-0040095500-001000014147021176470211764702117647021176
ID07 ID08 ID08 ID09 LD01 LD03 LD04	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 µH 10% fixed	50155900-001000014140095500-0010000141470211764702117647021176470211764806750048084200
ID07 ID08 ID08 ID08 LD01 LD04 QD01 QD01 QD02 RD01 RD02	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 µH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip	50155900-001000014140095500-00100001414702117647021176470211764702117648067500480842004105915041085650
ID07 ID08 ID08 ID08 LD01 LD04 CD02 RD01 RD02 RD03	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 150k ohm 5% 1/8W met gla flat chip	50155900-00T000014140095500-00T00001414702117647021176470211764702117648067500480842004105915041086150
ID07 ID08 ID08 ID08 LD01 LD04 QD01 QD01 QD02 RD01 RD02	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 µH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip	50155900-00700014140095500-007000141470211764702117647021176470211764806750048084200410591504108565041085650
ID07 ID08 ID08 ID08 LD01 LD02 LD03 LD04 QD02 RD01 RD02 RD03 RD04 RD05 RD06	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed Coil 10 μH 20% fixed Coil 10 μH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 150k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip	50155900-00T000014140095500-00T00001414702117647021176470211764702117648067500480842004105915041085650410856504108565041085650
ID07 ID08 ID08 ID08 ID01 ID02 ID03 ID04 ID02 RD01 RD02 RD03 RD04 RD05 RD06 RD07	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 150k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip	50155900-00T000014140095500-00T0000141470211764702117647021176470211764806750048067500410591504108565041085650410856504108565041085650
ID07 ID08 ID08 ID08 LD01 LD02 LD03 LD04 QD02 RD01 RD02 RD03 RD04 RD05 RD06	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed Coil 10 μH 20% fixed Coil 10 μH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 150k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip	50155900-00T000014140095500-00T00001414702117647021176470211764702117648067500480675004105915041085650410856504108565041085650410856504108565041085650
ID07 ID08 ID08 ID08 ID01 ID02 ID04 ID02 ID02 ID02 ID03 ID04 ID03 ID04 ID05 ID05 ID06 ID07 ID09 ID09 ID010 ID010 ID010	Connector PLCC DMA2280 Connector PLCC Coil 10 µH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip	50155900-007000014140095500-00700001414702117647021176470211764702117648067500480842004105915041085650410856504108565041085650410856504108565041085650410856504108565041085650410591504105875041059150
ID07 ID08 ID08 ID08 ID01 ID02 ID03 ID04 ID02 RD01 RD03 RD04 RD05 RD06 RD07 RD09 RD10 RD13 RD14	DMA2285 Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 150k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip	50155900-00700014140095500-00700014147021176470211764702117647021176480675004808420041059150410856504108565041085650410856504108565041085650410856504108565041085650
ID07 ID08 ID08 ID08 ID01 ID02 ID04 ID02 ID02 ID02 ID03 ID04 ID03 ID04 ID05 ID05 ID06 ID07 ID09 ID09 ID010 ID010 ID010	Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 150k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 18 ohm 5% 1/8W met gla flat chip 18 ohm 5% 1/8W met gla flat chip	50155900-00T000014140095500-00T00001414702117647021176470211764702117648067500480842004105915041085650410856504108565041085650410591504105935041059350
ID07 ID08 ID08 ID08 ID01 ID02 ID04 ID04 ID02 ID04 ID02 ID04 ID02 ID04 ID03 ID04 ID05 ID06 ID06 ID07 ID09 ID010 ID013 ID014 ID016 ID018	Connector PLCC DMA2280 Connector PLCC Coil 10 μH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 150k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 68k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 18k ohm 5% 1/8W met gla flat chip 19k ohm 5% 1/8W met gla flat chip 10k ohm 5% 1/8W met gla flat chip	50155900-00T000014140095500-00T000014147021176470211764702117647021176480675004808420041059150410856504108565041085650410587504105875041059350410587504105875041058750410587504105875041058750410587504105875041058750
ID07 ID08 ID08 ID08 ID09 ID01 ID02 ID04 ID02 ID04 ID02 ID04 ID02 ID04 ID03 ID04 ID05 ID06 ID07 ID09 ID10 ID13 ID14 ID16 ID17 ID18 ID19	Connector PLCC DMA2280 Connector PLCC Coil 10 µH 10% fixed Crystal 20.25 MHz Quartz Crystal 18 MHz Quartz 68k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 150k ohm 5% 1/8W met gla flat chip 22 ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 4.7k ohm 5% 1/8W met gla flat chip 18k ohm 5% 1/8W met gla flat chip	50155900-00T000014140095500-00T000014147021176470211764702117648067500480842004105915041085650410856504108565041058750410593504105875041058750410587504105875041058750410587504105875041058750410587504105875041058750410587504105875041058750410587504105875041058750
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01V6-453 -001 Control Panel

CE01 CE03 CE04 CE05 CE06 CE07 CE08 CE09 CE10	10 μF -20+50% 50V elect 10 μF -20+50% 50V elect 100 μF 20% 10V elect 33 nF 10% 63V met poly 4.7 nF 10% 50V ceramic 2C 150 nF 10% 63V met poly 100 pF 1/4pF 50V ceramic 100 pF 1/4pF 50V ceramic 15 nF +80-20% 40V ceramic 2F 10 μF -20+50% 50V elect	20120500-57 CE310MX210MU64 43048077 43133377 43048677 43005677 43447877					
GE01 GE02 GE03	BPW41DLED display HDSP7301LED display HDSP7301	20226700					
IE01	SL486	T0000090					
RE01 RE03 RE04	47 ohm 5% .43W car film	41001912					
RE05	47k ohm 5% 1/4W carbon film						
RE06	330 ohm 5% 1/4W carbon film						
RE07	330 ohm 5% 1/4W carbon film						
RE08 RE09	330 ohm 5% 1/4W carbon film						
RE10	330 ohm 5% 1/4W carbon film						
RE11	330 ohm 5% 1/4W carbon film						
RE12	330 ohm 5% 1/4W carbon film						
RE13	330 ohm 5% 1/4W carbon film						
RE14	470k ohm 5% 1/8W car film						
RE15	470k ohm 5% 1/8W car film	≰1019412					
RE16	470k ohm 5% 1/8W car film	41019412					
RE17	470k ohm 5% 1/8W car film	41019412					
RE18	10k ohm 5% 1/4W carbon film	41001612					
RE19	3.3k ohm 5% 1/4W carbon film						
RE20	3.3k ohm 5% 1/4W carbon film						
RE21	10k ohm 5% 1/4W carbon film	41001612					
SE01	Switch KSA	T0000149					
SE02	Switch KSA						
SE03	Switch KSA						
50833100 Clock							
CY01	820 pF 10% 50V 1/2 pF cer cyl chip	10465500					
CY02	22 nF +80-20% 25V cer cyl chip						
CY03	22 nF +80-20% 25V cer cyl chip						
IY01	IC MC74HC02AD						
LY01	Coil 10 µH fixed chip						
RY01	1 Meg ohm 5% .1W car film cyl chip						
RY02	82 0hm 5% 1/8W met gla flat chip						
PC1460 Fuse board							
BY01	Base post 4 way top entry	00F6527N04M23					
BY02	Base post 4 way top entry	00F6527N04M23					
EV04	Euco holdor	67440707					
FY01 FY01	Fuse holder						
FIUI	TUST HOU HIM LIM LOUV DEAD I	1 1004000					

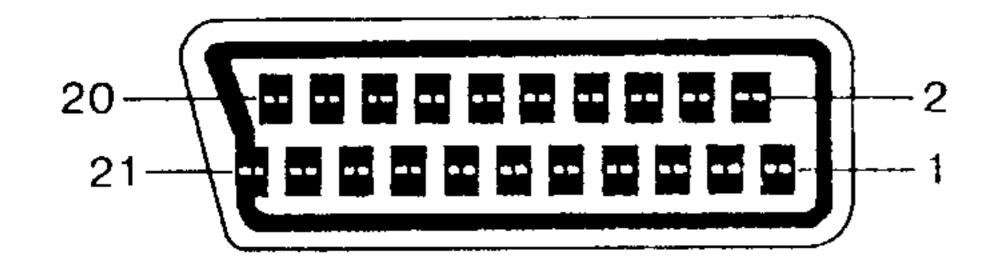
PLUG CONNECTIONS

PERITELEVISION (SCART)

- 1 Audio out RH
- 3 Audio out LH
- 4 Audio earth
- 5 Blue earth
- 7 Blue out
- 8 Function switching
- 9 Green earth
- 11 Green out
- 13 Red earth
- 15 Red out
- 16 Fast blanking out
- 17 Video earth
- 19 Video out
- 21 Casing socket earth

Pins 2, 6, 10, 12, 14, 18 and 20 are not used.

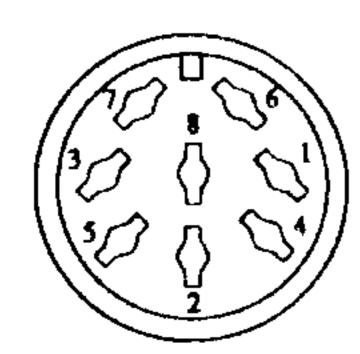
(Pins viewed from rear of plug)



8 - PIN DIN

- 1 Data output
- 2 Ground

Pins 3 to 8 are not used.



IC PIN OUT DETAILS

CCU 3000

Pin 1 - Supply

Pin 2 - Ground

Pins 3 and 4 - Quartz oscillator

Pin 5 - Supply

Pin 6 - RESET

Power up reset to enable correct start up procedure.

Pin 7 - IMDATA

IM bus data line.

Pin 8 - IMIDENT

This line goes high to indicate data and low for address.

Pin 9 - IMCLK Clock pulses to time the IM bus.

Pin 10 - IMDATA2
Data line for the second IM bus.

Pin 11 - IMIDENT2 Ident for the second IM bus.

Pin12 - IMCLK2
Clock pulses to time the second IM bus.

Pin 15 - IR IN Infra red signal from the output of the IR

Pin 18 - pin 25 RDB0 to RDB7 8 bit data lines for ROM (IR03).

Pin 26 - pin 41 A0 to A15 Sixteen bit address line for ROM (IR03).

Pin 42 - I²C Data

preamp IE01.

Internally generated data to control PLL and talk to the NVM IR05.

Pin 43 - I²C Clock

Internally derived for timing the I²C bus.

Pin 44

Drive for pin 16 of Peritelevision plug.

Pin 45 - SIACMSEL

Select/strobe line used to select the ACM which is used as if it were memory.

Pin 46 - SIRS Register select
Used to switch between Control or Data
for the ACM.

Pin 47 - SIR/W

Read/Write control for the ACM.

Pin 48 - pin 55 - DB0 to DB7 8 bit data line from ACM.

Pin 57 - RELOCK Record lock.

Pin 58 - MSD

Selects the most significant digit of the seven segment displays.

Pin 59 - LSD

Selects the least significant digit of the seven segment displays.

Pin 60 - SIRQ

Interrupt generated by the ACM.

Pins 61 to 66 and 68 - a-g
Drive for the seven segments of the

Pin 67 - dp

display.

Used to drive the decimal point (dp) on the seven segment display.

Note pins 61, 62, 63 and 64 are used as inputs or outputs so that they can be used to sense the state of the switches SE01 to SE03 on the front panel as well as drive the seven segment displays.

The two seven segment displays are multiplexed by the CCU3000, pin 59 and pin 58 being used to select the required segment while the corresponding data appears on pins 61 to 68.

DMA 2280 PIN CONNECTIONS

Pin	Signal Name	Symbol	Pin	Signal Name	Symbol
1	RAM Data Input/Output	DI/DO	39	Baseband Input 7 (MSB)	B7-VI7
2	RAM Address Output 0 (LSB)	A0	40	Baseband Input 6	B6-VI6
3	RAM Address Output 1	A1	41	Baseband Input 5	B5-VI5
4	RAM Address Output 2	A2	42	Baseband Input 4	B4-VI4
5	RAM Address Output 3	A3 .	43	Baseband Input 3	B3-VI3
6	RAM Address Output 4	A4	44	Baseband Input 2	B2-VI2
7	RAM Read/Write Output	WE	45	Baseband Input 1	B1-VI1
Ŕ	Row Address Select Output	RAS	46	Baseband Input 0 (LSB)	B0-V10
9	RAM Address Output 5	A5	47	Leave vacant	
10	RAM Address Output 6	A6	48	Clamping Output	CLAMP
11	RAM Address Output 7 (MSB)	A7	49	AGC Output	AGC
12	IM Bus Clock Input	IMCLK	50	Horizontal Blanking and Key	HBCK/KEY
13	IM Bus Ident Input	IMIDENT	51	Horizontal and Vertical Blanking	HBVB/CBI
14	IM Bus Data Input/Output	IMDATA	52	Data Burst Window Output	DBW
15	Reset Input	RESET	53	Composite Sync Output	CSYNC
16	18.432 MHz Output	—	54	Test Input/Output	
17	18.432 MHz Input		55	Packet Data Output	SPD-PDO
18	Output Disable Input		56	Descrambled Packet Data Input	DPD-DSI
19			57	N/C	TSYNC
20			58	Burst Sync Output	BSYNC
21	N/C	_	59	Burst Data Input/Output	BDATA
22	N/C	_	60	Burst Clock Output	BCLK
23	N/C	_	61	Ground	GND
24	N/C		62	Main Clock input	MCLK80
25	PLL Tuning Data Output	PLLDAT	63	Supply Voltage	VDD
26	PLL Tuning Clock Output	PLLCLK	64	Sound Bus Ident Output	SIDENT
27	Chroma Output 3	C3	65	Audio Clock Output	ACLK
28	Chroma Output 2	C2	66	Sound Bus Data Output	SDATA
29	Chroma Output 1	C1	67	Sound Bus Clock Output	SCLK
30	Chroma Output 0 (LSB)	Co	68	Column Address Select Output	CAS
31	Luma Output 0	LO			
32	Luma Output 1	L1			
33	Luma Output 2	L2			
34	Luma Output 3	L3			
35	Luma Output 4	L4			
36	Luma Output 5	L5			
37	Luma Output 6	L6			
38	Luma Output 7 (MSB)	L7			

Pin 1 - RAM data input/output RDAT. This serves as an output for writing data into the external RAM and as an input for reading data from the external RAM.

Pins 2 to 6 and 9 to 11 - RAM address outputs RA0 to RA7.

These pins are used for addressing the external RAM.

Pin 7 - RAM Write Enable output WE.

By means of this output the external

RAM is switched to read or write mode.

Pin 8 - Row Address Select output RAS.

This pin supplies the Row Address Select signal to the external RAM.

Pins 12, 13 and 14 - IMCLK, IMIDENT, IMDATA.

These pins connect the DMA 2280 to the IM bus.

Pin 15 - Reset input RESET.

This is used for hardware reset. Reset is actuated at Low level, at High level the DMA 2280 is ready for operation.

Pins 16 and 17 - XTAL1 output and XTAL2 input.

These oscillator pins are used to connect an 18.432 MHz crystal, which determines the ACLK audio clock signal supplied by pin 65. Alternatively, an 18.432 MHz clock may be fed to pin 17.

Pin 18 - Output Disable Input ODI.

Pins 21 to 24 - N/C

Pin 25 - PLL Tuning data output PLLD.

This pin supplies the 12-bit data word containing the PLL tuning information from the PLL filter of the DMA 2280 (ID8). This information is needed by the voltage controlled oscillator (VCO) contained on the MCU 2600 clock generator IC and closes the PLL which determines the main clock signal.

Pin 26 - PLL Tuning Clock output PLLC.

This pin supplies the data clock signal needed for the serial data transfer of the 12-bit PLL tuning information.

Pins 27 to 30 - Chroma Outputs C3 to C0.

Via these pins, the DMA 2270 delivers the digital chrominance signal (R-Y, B-Y). In multiplexed operation to the VCU 2133 (ID4) Video Codec Unit, where it is converted to an analogue signal.

Pin 31 to 38 - Luma Outputs L0 to L7. Via these pins, the DMA 2280 delivers the digital luminance signal to the VCU 2133 Video Codec Unit, where it is converted to an analogue signal.

Pins 39 to 46 - Baseband Input B7 to B0.

Via these inputs, the DMA 2280 receives the digitised baseband signal from the VCU 2133 (ID4) Video Codec.

Pin 47 - Not connected.

Pin 48 - Clamping output CLM.
This pin supplies a Pulse Density
Modulated (PDM) signal for clamping
the analogue baseband signal at the
input of the analogue to digital converter
(VCU 2133 Video Codec) using an
external RC circuit.

Pin 49 - AGC output.

This tristate-controlled output allows automatic gain control (AGC) with a three-level signal. High level means that the input level of the baseband signal is too low, low level means that the input level of the baseband signal is too high. In the high impedance state the level of the baseband signal is in the proper range.

Pin 50 - Combined output for Horizontal Blanking and Colour KEY.

This output is a tristate-controlled output. In conjunction with the input load represented by the VCU 2133 Video Codec, the three level blanking and key is produced. High level means active line, high impedance state means horizontal blanking and low level means colour key.

Pin 51 - Combined output for Horizontal and Vertical Blanking CBL.

In conjunction with the input load represented by VCU 2133 Video Codec, the three level combined blanking pulse is produced. High level means active line, high impedance means horizontal blanking and low level means vertical blanking.

Pin 52 - Data Burst Window DBW.

This output supplies the data burst window signal which is used to switch off the E7 de-emphasis circuit. This signal is active high in line 625 and during the data burst in each line.

Pin 53 - Composite Sync output CSYNC.

This output supplies a composite synchronization signal as it may be used by other units which need a composite synchronization signal which is not contained in the MAC baseband signal.

Pin 54 - Not used.

Pin 55 - Packet Data output PDAT.

PDAT is used to put out each received packet, de-interleaved, with Golay corrected header and with error-corrected BT Byte.

This pin is used to connect to the DMA 2285 MAC Descrambler IC.

Pin 56 - DPD.

Descrambled Packet Data input.

Pin 57 - N/C.

Pin 58 - Burst Sync output BSYNC.

This connection supplies a synchronization signal for the Burst Data output. The Sync Pulse marks the Line Synchronization Word (LSW) of each line, and the Clock Run In CRI and Frame Sync Word (FSW) in line 625.

Pin 59 - Burst Data output BDAT.

This output supplies the recovered and decoded duobinary data contained in a MAC signal. This signal may serve as an input signal for the DMA 2285 Descrambler processor.

Pin 60 - Burst Clock output BCLK.

This pin supplies the data clock signal required for the serial data transfer of the Burst Data signal. The frequency of this signal is equal MCLK or MCLK/2 controlled by parameter Data Rate Select DRS via IM Bus.

Pin 61 - Ground GND.

Pin 62 - Main Clock input MCLK.

By means of these input, the DMA 2280 receives the required main clock signal from the MCU 2600 Clock Generator IC.

Pin 63 - Supply VDD.

Pins 64, 66 and 67 - Sound Bus Ident SBI, Data SBD and Clock SBC.

These pins supply the Clock, Data and Ident signals to the AMU 2481 (ID6) Audio Mixing Unit via the serial three-line Sound Bus.

Pin 65 - Audio Clock output ACLK.

This pin supplies the ACLK Audio Clock signal for the AMU 2481.

Pin 68 - Column Address Select CAS.

This pin supplies the Column Address Select signal for the external RAM.

DMA 2285 PIN CONNECTIONS

PIN DESCRIPTIONS

Pins 1 to 11 - Not used.

Pins 12, 13, 14 - IM Bus connection. These pins connect the DMA 2285 to the IM bus. Via the IM bus the DMA 2285 communicates with the CCU Central Control Unit.

Pin 15 - Reset input.

This is used for hardware reset. Reset is actuated at Low level, and at High level the DMA 2285 is ready for operation.

Pin 16 - øM Main clock input.

By means of this input, the DMA 2285 receives the required main clock signal of 20.25MHz from the MCU 2600 Clock Generator IC.

Pin 17 - Burst sync input.

By means of this input, the DMA 2285 receives the required burst sync pulse from the DMA 2280. This sync pulse is used both as line sync and frame sync.

Pin 18 - Burst clock

Pin 19 - Burst data input.

By means of this input, the DMA 2285 receives the decoded burst data of each line from the DMA 2280.

Pin 20 - Not used.

Pin 21 - Not used.

Pin 22 - Packet data input.

Via this pin, the DMA 2285 receives packets of one subframe from the DMA 2280 which are de-interleaved, with Golay corrected header and error-corrected BT byte.

Pin 23 - Descrambled packet data output.

This pin supplies descrambled sound packets from one subframe required by the DMA 2280.

Pins 24 to 31 - Baseband B0 to B7 output.

Via these pins, the DMA 2285 delivers the digital baseband signal including the descrambled video signal to the DMA 2280, where it is decoded into luma, chroma and sound signals.

Pins 32 to 36 and 46, 48, 61 and 62.

Are connected to ground.

Pin 37 - Not used.

Pins 38 and 63-Supply Voltage.

Pins 39 to 45 - Baseband B7 to B1 input.

Via these pins, the DMA 2285 receives the digitised baseband signal coming either from the VCU 2133 Video Codec in a 7-bit parallel Grey code or from any other A/D converter in 8-bit parallel binary code.

Pin 47 - IM Bus busy output.

This pin supplies a signal which indicates that the IM bus interface of the DMA 2285 is busy. As long as this pin delivers a High level signal there should be no IM bus transfer to or from the DMA 2285.

Pin 49 - Column address select output.

This pin supplies the Column Address Select signal (CAS) to the external acquisition RAM.

Pin 50 - RAM data input/output. Pin 50 serves as an output for writing data to the external acquisition RAM and as an input for reading data from that RAM.

Pins 51 to 55 and 58 to 60 - RAM address A0 to A7 output.

These pins are used for addressing the external acquisition RAM.

Pin 56- RAM Read/Write output.

By means of this output the external acquisition RAM is switched to the read or write mode as required.

Pin 57 - RAM Row Address Select output.

This pin supplies the Row Address Select signal (RAS) to the external acquisition RAM.

Pin 64 - S Bus Ident Input.

Via this input, the DMA 2285 receives the ident signal of the serial 3-line S bus from the DMA 2280.

Pin 65 - Audio clock input.

By means of this input, the DMA 2285 receives the required audio clock signal of 18.432MHz from the DMA 2280.

Pin 66 - S Bus data output.

This pin supplies the digital sound signal to the AMU 2481 Audio Mixer and can be connected to the S Bus Data Output of the DMA 2280.

Pin 67 - S-Bus Clock.

The clock signal to drive the S-Bus is fed out on this pin.

Pin 68 - Not used.

VCU 2133 PIN CONNECTIONS

Pins 1,9, and 25 - Supply voltage, 5 V. The supply voltage is 5V. Pins 1 and 25 supply the analogue part.

Pins 2 to 8 - Outputs V0 to V6.

Via these pins the VCU 2133 supplies the digitised video signal in a parallel 7-bit Grey code to the DMA2285 (ID7).

Pins 10 to 17 - Inputs L7 to L0. Via these pins, the VCU 2133 receives the digital luminance signal from the DMA2280 in parallel 8-bit code.

Pins 18 to 21 - Inputs C0 to C3.

These are the inputs for the multiplexed colour difference signals from the DMA 2280.

Pin 22 - øM main clock input.

Via this pin, the VCU 2133 is supplied with the clock signal øM produced by the MCU 2600 clock generator IC. The clock frequency is 20.25 MHz for D-MAC.

Pin 23 - Reset and hold pulse input. Via this pin, the VCU 2133 is supplied with the reset and hold signals.

Pins 24 and 29 - Analogue ground.

These pins serve as ground connections for the supply and for the analogue signals (GND pin 24 for RGB).

Pins 26 to 28 - RGB outputs.

These three analogue outputs deliver an analogue signal which is supplied to the colour encoder IV01 and the Peritelevision connector. The output is 0.7V p-p.

Pins 30 to 32 - Additional analogue inputs R,G and B.

These serve to feed analogue RGB signals, for example on screen graphics or similar applications, and they are clamped during the colour key pulse at a 1V input, full brightness is reached. The bandwidth extends from 0 to 8 MHz.

OSDEN, On screen display enable.

ROSD. Red data for on screen display.

GOSD, Green data for on screen display.

BOSD, Blue data for on screen display.

Pin 33 - Fast Switching input.

It serves for fast switchover of the video channel between an internally produced video signal and an externally-applied video signal via pins 30 to 32. With 0V at pin 33, the RGB outputs will supply the internal video signal, and at a 1V input level, the RGB outputs are switched to the external video signal. Bandwidth is 0 to 4 MHz.

Pin 34 - Not used.

Pin 35 - Composite video signal. MAC video input for the A/D.

Pin 36 - Undelayed horizontal blanking and colour key pulse input.

The combined undelayed horizontal blanking and colour key pulses which are "sandcastled" are supplied by pin 19 of the DMA2280. The colour key pulse is used for clamping the RGB.

Pin 37 - Not used.

Pin 38 - Supply voltage, 12 V.

The 12V supply is needed for certain circuit parts to obtain the required input or output voltage range, at the video input and the RGB outputs.

Pin 39 - Vertical blanking and delayed horizontal blanking input.

This pin receives the combined vertical blanking and delayed horizontal blanking pulses from pin 51 of the DMA2280. Both pulses are "sandcastled" so that only one connection is needed for the transfer of two pulses. These two pulses are separated in the input circuitry of the VCU 2133, and are used for blanking the picture during vertical and horizontal flyback.

Pin 40 - Digital ground.

This pin is used as GND connection in conjunction with the pins 2 to 8 and 10 to 21 which carry digital signals.

AMU2481 PIN CONNECTIONS

- 1 Reference Current Input (for DAC 2)
- 2 Ground (Digital)
- 3 IM Bus Data Input
- 4 IM Bus Ident Input
- 5 IM Bus Clock Input
- 6 S-Data Output
- 7 V Supply Voltage (Digital)
- 8 S-Clock Input/Output
- 9 S-Data Input
- 10 V Internal Substrate Bias
- Voltage
- 11 Reset Input
- 12 Ground (Digital)
- 13 ØM Clock Input
- 14 V Clock Buffer Supply Voltage (Digital)
- 15 S-Ident Input/Output
- 16 PDM II Digital Input (R)
- 17 PDM | Digital Input (L)
- 18 V Supply Voltage (Digital)
- 19 DAC 2 Output Ch 3
- DAC 2 Output Ch 4
- 21 Reference Current Input (for
- DAC 1)
- DAC 1 Output Ch 1
- DAC 1 Output Ch 2
- 24 Ground (Analogue)

Pins 1 and 21 - Reference Current inputs.

These inputs require a current of 150mA called reference current 1 and serving for volume adjustment in the DAC interfaces.

Pins 2 and 12 - Digital ground.

These pins must be connected to the negative of the supply. They have to be used for ground connections in conjunction with digital signals.

Pins 3, 4 and 5 - IM Bus inputs.

Via these pins, the AMU 2481 is connected to the IM bus and receives instructions from the CCU.

Pins 6,8,9 and 15 - Serial audio interface (S Bus).

Pin 9 is the S-Data input and pin 6 the S-Data output. Pins 8 and 15 are S-Clock and S-Ident inputs/outputs, the status depending on bit 4 in coefficient k33.

Pins 7, 14 and 18 - 5V Supply.

These pins are connected to the 5V positive supply.

Pin 10 - V Internal substrate bias voltage.

The AMU 2481 has an on-chip substrate bias generator which produces a negative bias voltage of about 3.4V.

Pin 11 - Reset input.

In the steady state, high level is required at pin 11. A low level normalizes the AMU 2481.

Pin 13 - øM Main Clock input.

This pin receives the 18.432 MHz clock from the DMA 2280.

Pins 16 and 17 - Not used.

Pins 19 and 20 - Not used.

Pins 22 and 23 - DAC 1 Outputs Ch 1 and Ch 2.

These pins supply the audio signals output currents whose amplitude is determined by the reference current fed to pin 21. The output signal of pins 22 and 23 is influenced by the Vol 1 and Vol 2 volume control facilities.

Pin 24 - Analogue ground.

This pin must be connected to the negative of the supply. It serves as a ground connection for analogue signals.

MCU 2600

Pin 1 - Ground of Output Buffer.

This pin serves as a separate ground pin for the output buffer.

Pins 2, 8 and 11 - Not used.

Pin 3 - øM Main Clock output.

This pin supplies the main clock for clocking all signal processors used in this system.

Pin 4 - Output buffer supply.

A positive supply voltage of 5V is required which powers the output buffer.

Pin 5 - PLL Clock input.

Via this pin the MCU 2600 Clock Generator receives the PLL clock for transferring the tuning signal from the DMA 2280 to the VCO integrated in the MCU 2600.

Pin 6 - PLL Data Input.

The desired oscillator is selected by the signal fed to pin 6.
Additionally, pin 6 receives the digital PLL information supplied by the DMA 2280 to control the VCO included in the MCU 2600 clock generator.

Pin 7 - Ground.

Pin 8 to 13 - Crystal connections.

In addition to the oscillator function, the respective pin also serves for switching off the un-used oscillator by connecting it to ground.

Pin 14 - Supply voltage.

This pin is the supply pin for the whole IC except the output buffer supply (pin 4).

TECHNICAL SPECIFICATION

Channel Frequencies

Ch No.	Prog No.	Assigned Frequency	1st IF Frequency	*Service
2	6	11.74666 GHz	977.48 MHz	
4	5	11.78502 GHz	1015.84 MHz	Now
6	7	11.82338 GHz	1054.20 MHz	
8	3	11.86174 GHz	1092.56 MHz	Galaxy
10	8	11.90010 GHz	1130.92 MHz	
12	2	11.93846 GHz	1169.28 MHz	The Sports Channel
14	9	11.97682 GHz	1207.64 MHz	
16	4	12.01518 GHz	1246.00 MHz	The Power Station
18	10	12.05354 GHz	1284.36 MHz	
20	1	12.09190 GHz	1322.72 MHz	The Movie Channel

Inputs/Outputs RF

Frequency band : 950-1350MHz Level : -30 to > 60 dBm

Threshold : 7dB : 480MHz

IF bandwidth : 19MHz +1.5MHz

NF : < 13dBRF bandwidth : 120MHz Impedance : 75Ω Image rejection : > 50dBAdjacent channel rejection : > 30dBIntermod (three tone test) : > 46dBGain deviation : < 5dB Frequency selection : PLL Tuning Ambient temperature range : 0 to 35°C Max humidity : 90%

Humidity range : 60% to > 90% Storage temperature range : -10 to 50°C

Video performance

Frequency response 0.1 to 8.5MHz : +1/-3dBDiff gain : < 8%Diff phase : $< 5^{\circ}$

Connectors

1. Satellite IF input2. Baseband input/output3. Peritelevision (Scart)

3. External ACM/IPPV : Phono4. Data port : 8 Pin DIN

5. Aerial input
6. Aerial + AV BSB output
7. IEC Coaxial - Female
8. IEC Coaxial - Male
9. IEC Coaxial - Male

LNB supply

20 Volts ± 10 % @ 250 mA (short circuit protected)

Peritelevision socket (Scart)

RGB level : User adjustable Video PAL I baseband (CCIR 624-3) : User adjustable

d.c. level across 75Ω : < 2V

Audio system : NICAM HQ 14 bit Sound level : 2.8V Max r.m.s. Frequency range (Audio) : 20 Hz to > 15kHz

 $\begin{array}{lll} \text{Source impedance} & : < 1 k \Omega \\ \text{Cross talk} & : < -65 \text{ dB} \\ \text{Sound THD at 1kHz} & : < 0.1\% \text{ at 0dB} \\ \text{S/N} & : > 70 \text{ dB} \\ \end{array}$