# SERVICE MANUAL
# FOR THE
# ORIC-1 and ORIC ATMOS
# MICROCOMPUTERS

This version typed and scanned by S D Marshall 2003

**www.48katmos.freeuk.com**

## AMENDMENT RECORD

| DATE ISSUED | AMENDMENT NUMBER | PAGES AFFECTED | REMARKS | RELEVANT MODIFICATION NUMBER OR SERVICE BULLETIN |
|---|---|---|---|---|

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**CONTENTS**

**APPENDICES**

## 1. **INTRODUCTION**

The information contained in this manual is intended to help you in understanding the work ings of the ORIC-1 and ATMOS computers and to advise you generally on fault finding.

As it is impossible to include all problems, we have divided the computer into a number of functional areas for the purpose of categorising faults. For each functional area you will find one or more common faults listed together with a checkout procedure (or instructions) and where necessary, the relevant waveforms and voltages you would expect to find on a fully serviceable unit, voltages are approximate.

The procedures, waveforms and likely faulty components are based upon records kept by the manufacturer and as such they represent the latest information available. Updated information will be issued as and when it becomes available.

## 2. DOCUMENTATION AMENDMENTS AND EQUIPMENT MODIFICATIONS

Whenever a design modification to the existing unit is implemented by the manufactures a modification leaflet will be issued to all dealers and service centres in possession of service manuals. The modification leaflet should be inserted in appendix 2 and modification components can be ordered as per instructions in Section 6. In the event that a modification to the equipment affects the service manual contents, revised pages will be issued under an amendment number for insertion into the manual. All such amendments should be recorded in the amendment record at the front of the manual.

From time to time, a list of modifications and amendments currently in existence will be circulated which will enable you to check if your manual is up to date. Service bulletins will also be issued from time to time with instructions for any work which can be carried out by authorised ORIC dealers. Service bulletins should be inserted in appendix 4.

Page 22 ( Section 5 Introduction ) contains some important modification information.

Modification leaflets service bulletins and amended/additional pages can be obtained from:-

Customer Services,
Oric Products International Ltd,
Coworth Park,
London Road,
Ascot,
Berks SL5 7SE.

(*Note: Address invalid. SDM)*

## 3. TECHNICAL DESCRIPTION

### Introduction

The ORIC-1 (16K and 48K) and ATMOS microcomputers are all designed round the 6502 microprocessor.

The ORIC-1 48K and the ATMOS are very similar as regards the hardware, most of the differences lie in the software. The ORIC-1 16K uses a different PCB and it's RAM is made up of 2 x TMS4416 as compared with the 48K machine which uses 8 x MMS4164. Furthermore, the 16K ORIC-1 is not suitable for use with disc drives.

### Address Map

The address map for the ORIC-1 48K and ATMOS is divided into three areas:-

When the 6502 addresses locations C000 to FFFF (the top 16K) it is accessing ROM (the BASIC interpreter and operating system). Locations 0000 to BFFF (the bottom 48K) access the dynamic RAM with the exception of 0300 to 03FF whose 255 locations are reserved for INPUT/OUTPUT (I/O - page 3 of RAM).

There is in fact a total of 64K of DRAM, 48K for user programs and 16K which remains unused (except for I/O expansion). The ROM is accessed directly from the 6502. In the ORIC-1 16K machine, the same processor is used (which can address up to 64K locations). The top 16K, as before is used to access ROM, and the remaining (bottom) 48K for DRAM. However, since there is only 16K of DRAM available, the top two address bits (A14 and A15) are ignored, and the bottom fourteen bits only are used to address a maximum of 16K.

## I/O and Expansion

The ORIC-1 48K and ATMOS both have a built in capability to expand the I/O to include extra hardware which can be either peripherals or memory (ROM or RAM). For this purpose an 'expansion port' in the form of PL2 gives access to the address and data bus lines. In addition, there are a number of signals, some generated by the microcomputer and some generated by the expansion device which are necessary for expanded I/O operation, these signals are as follows:-

I/O (Output) This is generated by the ULA whenever the 6502 addresses locations in the range 300 to 3FF (I/O). It is used internally by IC6 as well as being available at PL2 (expansion socket).

I/O Control This should be generated by the expansion device (Input) connected to PL2. It's purpose is to inhibit IC6 and thus prevent the keyboard and printer ports being interfaced with the data bus whilst the expansion device is being addressed.

MAP (Input) This should be generated by the expansion device. It's purpose is to modify operation of the internal ROM and DRAM's to ensure unimpeded operation of the expansion device.

ROMDIS (Input) A signal generated by the expansion device to disenable the internal ROM and thus prevent it using the data bus.

RESET(Input)  An externally generated 'power up' type reset signal.

02 (Output)  Timing signal.

R/W (Output)  Read or Write.

The output signals are utilized from existing internally generated signals used for non-expanded I/O operation. The I/O works in the following way:-

Whenever the 6502 generates an address in the range 0300 to 03FF, the ULA detects it and generates a signal which (as CS ) is used to enable the interface adapter IC6 and ( as I/O ) is fed to the expansion part PL2.

Provided the address is in the range 0300 to 030F, IC6 is enabled and the keyboard or printer interface ports are used. If however, the address falls in the range 030F to 03FF, the external device connected to PL2 should generate I/O CONTROL to inhibit the interface adapter IC6, thus leaving the data bus free for the expansion port.

All ORIC designed peripherals for use on the expansion port, have addresses from 0300 upwards. All non-ORIC designed peripherals should have addresses at or below 03FF, this way there is the least likelihood of a conflict of addresses.

The signal MAP deserves some explanation since it is this which modifies the address map for I/O expansion, and it works in the following way:-

The ULA which monitors the top 8 bits of the address bus, detects when the top 16K is being addressed, and when the bottom 48K is being addressed. If the top 16K is being addressed (C000-FFFF) when MAP is generated, the ULA (IC7) generates a signal CS which inhibits the ROM(s) from using the data bus. In addition, the entire 64K of RAM is enabled (made available to the data bus). This feature is used by the Microdisc drive system whose software (DOS) occupies the top 16K of DRAM, thus ensuring that the ROM and the DOS cannot use the data bus at the same time and maintaining the 48K of DRAM for user programs. If the bottom 48K is being addressed (0000 to BFFF) when MAP is detected, the entire 64K of DRAM is inhibited and the data bus is free to be used by

external memory (RAM or ROM) connected to PL2. MAP timing is important, MAP is a 250ns pulse, negative going with its leading edge occuring 80 to 100ns before the rising edge of phase 2 (output from pin 39 of IC5).

## Circuit descriptions

### Power supply regulation (IC1)

An unregulated +9 volt supply is fed into the computer from the plug-in external power unit. Regulation to +5 volts is provided by IC1 and associated components. IC1 is a negative regulator, however this does not matter as the dc supply in the computer is 'floating'. IC1 which is a 7905 requires 1 volt headroom.

### Basic system clock generator

XT1 provides a 12 MHz clock for the ULA (IC7), from which all synchronisation and phasing signals are derived.

System 'reset' (at power up)

System reset is generated by C21 and RPl providing a very simple means of generating a power up strobe. Timing here is important as the power and 12 MHz clock must be fully operational before RST becomes active. For this reason, it is best to reset the computer using the power connection on the rear of the ORIC as this provides a rapid build up of the 5 volt supply. Using the mains switch on the wall socket provides only a slow build up of the 5 volt supply due to the large reservoir capacitor in the power pack charging up.

Sound (IC2/IC4)

Sound is provided by IC4 and a small power amplifier IC2. IC4 cannot easily be directly connected to a 6502 bus and is, therefore, connected to port A of the 6522 (IC6). Data transfers are controlled by BC1 and BDIR of IC4. The current output of IC4 is converted to a voltage by R4 and attenuated by R2 and R3 as the LM385 has a fixed voltage gain of 20. Later models have a 22K resistor connected between pin 3 of IC2 and GND to prevent any build up of charge on C4 due to sometimes large input currents. This resistor can be connected into the cassette lead of earlier machines if necessary.

Keyboard circuitry (keyboard PCB)

The key switches are arranged electrically in columns and rows as shown on the keyboard circuit diagram. The eight rows are interrogated by IC1 whose input is a 3 bit binary count and the decoded output is fed to IC6 in the computer via transistor TR2. Column decoding is via eight lines from the keyboard to the sound circuit IC4 which also acts as a keyboard I/O port.

Gate array (IC7)

The gate array performs a number of functions which are: -

a) Generating synchronisation and phase pulses from the basic 12 MHz clock input.
b) Generating timing signals for the 64K DRAMS.
c) Address mapping and modification for I/O expansion.
d) Generating video refresh addresses, decoding character and colour attributes, reading data from RAM and generating the serial bit streams for the R, G and B outputs.

Cassette interface (IC3)

Two cassette loading and saving speeds are available: fast which is 2400 baud and slow which is 300 baud.

Fast mode is really for the user who is saving and loading own programs using just the one cassette recorder. Provided a good quality tape is used and the tape recorder is in good condition, fast mode is very reliable and has the obvious advantage of speed.

Slow mode is more suitable when transferring prog rams from one cassette to another or using bought in software. In slow mode, each data bit occupies a number of carrier cycles, and an average is taken when loading, to detect a logic '1' or ' 0 '. In this way one or two 'drop-outs' can be tolerated without affecting the average value. By comparison; in fast mode each data bit is represented by one cycle of the carrier, consequently any 'drop-out' results in a corrupted data bit. The circuitry of the cassette interface is very simple indeed. For TAPE OUT the counter timers in the 6522 are used to generate the pulse stream, which is attenuated by R12 and R13 to approximately 150 mv peak to peak and shaped by C7. TAPE IN also uses the counter

timers in the 6522, but this time to measure pulse widths. IC3 is a dual op-amp and converts the audio signal into a TTL signal. The first stage is a unity gain inverting buffer amplifier (in at pin 2 and out at pin 1).

The second stage is a positive feedback amplifier providing about 50 mv of hysteresis. TR1 provides buffering for the 6522 (IC4) and TR3 drives the remote control relay.

## PAL Encoder (IC23 and 27) and UHF Modulator

IC26 provides the colour burst gate pulse which occurs soon after the synch pulse input. This pulse is fed to IC23. IC27 is also triggered by synch pulses, its output is divided by 2 and provides a PAL switching input to IC23.

XT2, IC24 and IC25 provide two 4.43 MHz sample clocks in phase quadrature and the ULA provides the RGB signals plus the synch pulse.

Sampling of the RGB signals takes place at a rate of 8.86 MHz in the ROM (IC23) whose binary output drives a 'ladder' type D to A converter, providing a composite analogue video signal. This is fed via the UHF modulator to the television output socket.

## Printer interface

Port A of IC6 (6522) is multiplexed between the sound circuit (IC4) and the printer port. Printer strobe and acknowledge signals are provided by PB4 and CA1 respectively. Data at port A is therefore directed to the printer of IC4 depending on which control lines are active.

## 4. **TEST EQUIPMENT**

There is no requirement for any specialized test equipment, however we recommend you have an oscilloscope capable of dealing with up to 25 MHZ and a tonerneter for PCB work.

## 5. **FAULT FINDING**

### Introduction

Since the ORIC-1 was first launched, one or two modifications to the circuit have been implemented at various times. The circuit diagram and parts list reflects Issue 4 of the circuit, however it is possible that if you receive an early model to repair, there may be some slight circuit differences between it and the circuit diagram/and/or parts list.

Do not confuse PCB issue number with circuit issue number as per your circuit diagram. The circuit issue number changes each time the circuit changes electrically. The PCB issue number changes whenever physical changes are made to the board, irrespective of whether or not the circuit is changed electrically.

Your circuit diagram indicates which modification state it reflects by quoting the last modification number (called C/N for change note).

To date, four modifications have been introduced which affects components on the circuit diagram (Nos 52, 53 and 56 and 63). The leaflets for these modifications are in Appendix 2.

You will notice that the numbers of some components removed in No. 52 have been reused in 53 and 56, the same applies to No. 53 and 56. This practice has now ceased.

We recommend that for all ORIC-1 computers returned for repair, you check the modification state using the modification leaf lets in Appendix 2, and modify as required to bring the computer up to the PCB Issue 4 and the latest circuit diagram issue.

The method of cutting through the pin of an integrated circuit is the best way of removing the load or source from a line to eliminate the IC. It is quite acceptable to re-solder the cut pin provide you use a heat sink to protect the circuit, and easier than replacing the entire circuit.

We suggest that if you are going to use an oscilloscope extensively, you solder a wire to the 0V line on the main PCB for connection to the earth clip on your oscilloscope probe.

The only other possibility is to use the 0V side of the

*[??? This sentence isn't finished – SDM]*

All components on the circuit diagrams have circuit references by which they are identified on the printed circuit boards. In general these references are clearly visible on the PCBs although the odd one or two are obscured by 'disc' capacitors.

The waveforms for ICs 4 , 5, 6 and 7 at the end of this section are common and therefore not associated with any other fault. These and all other waveforms were monitored on a known serviceable ORIC ATMOS with no external peripherals connected.

**Disassembly**

The procedure is the same for both the ORIC-1 and ATMOS computers:-

Remove the bottom part of the outer case which is secured to the top part by six screws. Once this is done you will see the main printed circuit board which is secured to the keyboard printed circuit board by a screw in two of the four corners. The electrical connections between the main PCB and keyboard PCB are via a 15 way connector. On the ORIC-1 this is a rigid plug/socket connection, but on the ATMOS, a ribbon cable termination in a socket is used and connects with pins on the main PCB of which pin 1 is nearest to the loudspeaker.

All the 15 pins protrude through to the upper side of the PCB for monitoring purposes. You will notice that the ribbon cable used on the ATMOS has a different coloured wire at one end, this is to identify pin 1 of the socket so you don't connect it the wrong way round.

To remove the main PCB, unscrew the two screws and unplug the keyboard connection.

**Screen faults**

By 'screen faults' we mean those associated with the video encoder circuits (IC23 to IC27 , XT2 and the modulator) and the RGB monitor output circuit (IC22).

A common fault is the absence of any data at all on the screen, there are other screen faults resulting in incorrect characters, patterns or rubbish, however these are usually due to other faults and are covered later in the chapter.

The first thing to do is find out if the fault occurs on a video monitor, an ordinary television, or both.

If the fault is on the video (RGB) monitor and the television, check with an oscilloscope the RGB signals on pins 19, 20 and 21 of IC7 which should each show square pulses from -1 volt to +1 volt.

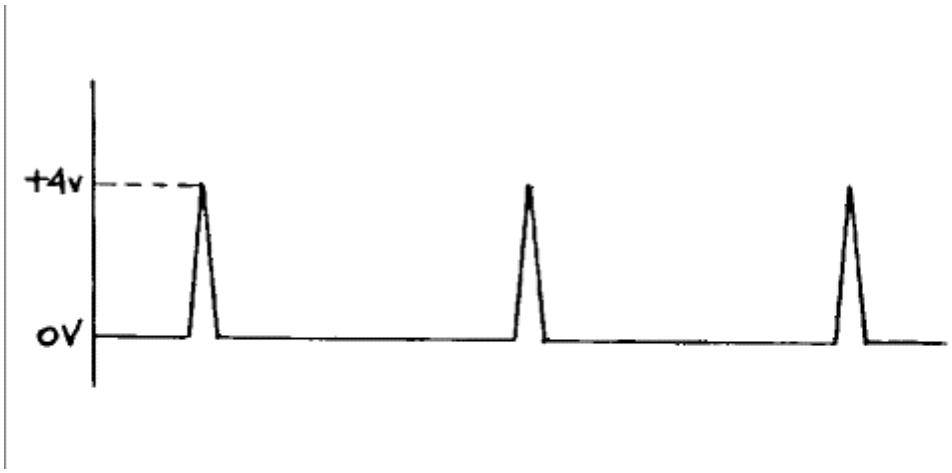
If these signals are not present, try replacing first IC7 and then IC23, both of which are 'plug-in', if the fault remains, replace IC22. The only other possibility is processor IC5 (it's usually IC7).

If the fault is only on the RGB video monitor, the most likely causes are IC22 and video output socket SK1 and resistor pack RP2.

If the fault is only on a television set, the RGB signals to IC23 (and IC22) must be correct, so check the video encoder and output chain as follows:-

Check the modulator signal input with an oscilloscope on the middle of the three connections at an end of the modulator casing. The signals won't make much sense but you should see a peak to peak amplitude of about 0.2 volts about a dc level of 0V. If these signals are present change the modulator after first checking its +5 volt power supply, otherwise check the outputs and inputs of IC23 follows:-

Pin 7 (sync)

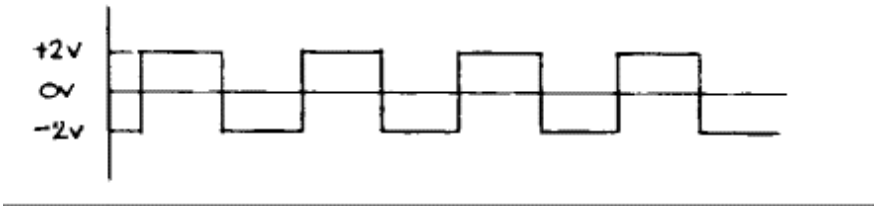



This signal could be pulled low if IC23, IC26 or IC27 are faulty

Pin 1 as for pin 7 but phase shifted.

If not present replace IC23 then IC26

Pin 15




If not present replace IC23 then IC27

Pins 5 and 6

Oscillator output of 2 volts peak to peak about 0v dc,

Another fault you may see is horizontal block bars moving up and down the screen. This is usually due to faulty DRAMS but it can also be due to the +5 volt line having excessive ripple (a typically faulty line shows 30 mv peak to peak). To locate the faulty DRAM, monitor the +5 volt line and cut the VCC pin of each DRAM in turn starting with IC13. You will also find that often, more than one DRAM is faulty, and that the faulty ones get quite hot, this can be checked before you start cutting pins.

If the quality of the picture deteriorates, this can be due either to poor colour or sound-on-vision.

For poor colour, first try the re-tuning procedure which is detailed on page 4 of the ORIC ATMOS MANUAL. If this does not solve the problem, the fault probably lies with variable capacitor CV1 or the associated components of IC25. Check also that the three RGB signals to IC23 pins 2,3 and 4 are approximately the same amplitude (for sound on vision, faults), RV1 or the RC network between the output from IC4 and the Input to IC2 are likely causes.

**Picture quality adjustment**

There are two adjustments which affect the signal out of the UHF modulator. RV1 controls the bias on the composite video signal feed into the UHF modulator. If RV1 is incorrectly set in one direction, sync pulses are compressed, causing the picture to jump out of line hold and frame hold, if incorrectly set in the other direction, compression of the video takes place causing yellows to turn white. The best way to adjust is to use the yellow PAPER and adjust RV1 until it just starts to turn white.

The other adjustment is the frequency of the colour subcarrier control led by CVl. First and foremost, it must be within a small tolerance of the correct frequency of 4-43361875 MHz. Also important is its relationship with the video line frequency, which itself is derived from 12 MHz clock. If the relationship is incorrect or too far out then colour fringing occurs on vertical boundaries and on text. This adjustment should be made when the ORIC has reached its normal working temperature, the correct position being the one that gives the best colour picture.

**Sound faults**

A common fault is the absence of any sound and before doing anything else, check the loudspeaker and the connections to it from the sound power amplifier IC2.

Next, type in a short routine to generate continuous sounds:-

```
1    ZAP
2    GO TO  1
3    RETURN
```

Using the oscilloscope, check IC4 pins 1/4/5, you should see positive going square pulses from 0v to about 800 mv amiplitude.  If there signals are absent, the fault is likely to be the sound circuit IC4 or IC6 .

Next, check IC2 pin 3,(the pulses should be about 1mv above 0V) and pin 5 where the signals should be 1.5 volts peak to peak about a dc level of +2.5 volts.

Finally, check the speaker terminal which is the same as IC2 pin 5 with a dc level of 0 volts.

**Keyboard faults**

If a number of keys fail to function correctly, first refer to the keyboard PCB circuit diagram and check if the problem keys make up a complete row or a complete column (the circuit diagram show clearly how the keys are arranged electrically into columns and rows.

A faulty row of keys (producing no characters or intermittent characters) points to IC1 or its pin connections being faulty. It's possible that IC6 on the main PCB is faulty, but unlikely.

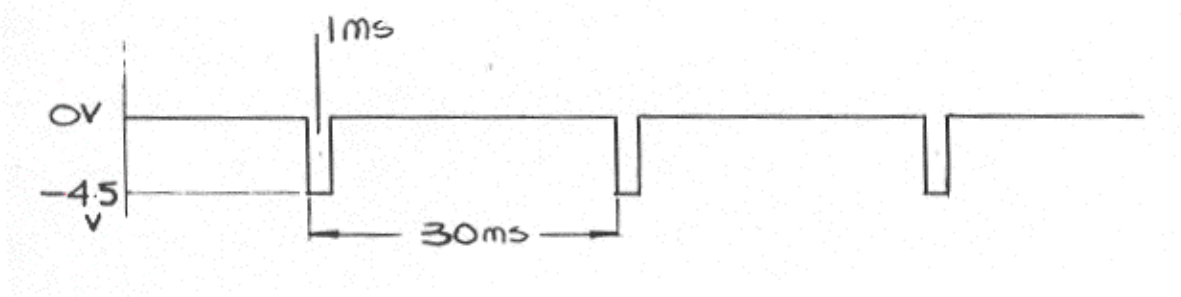
A faulty column of keys is likely to be due to a bad connection on PL3 which connects with the sound circuit, or the sound circuit itself (IC4).

One or more faulty keys not all in one particular column or row is due either to faulty key switching mechanism (s) or soldered connections of keys to keyboard.

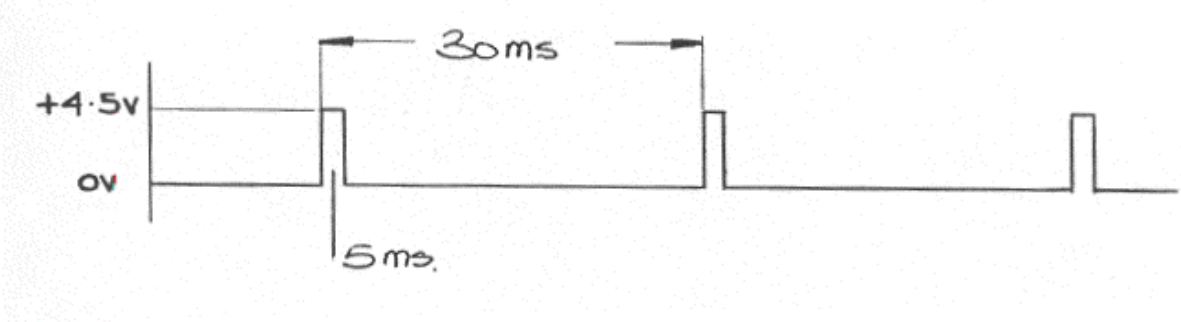
If a key or keys start to give the wrong characters on the screen, this can be due to short circuits (column and row) on the keyboard PCB or ICs 4 or 6 on the main PCB.

The following are keyboard interface waveforms monitored at PL3:-

Pins 2, 3, 4, 5, 9, 11, 12

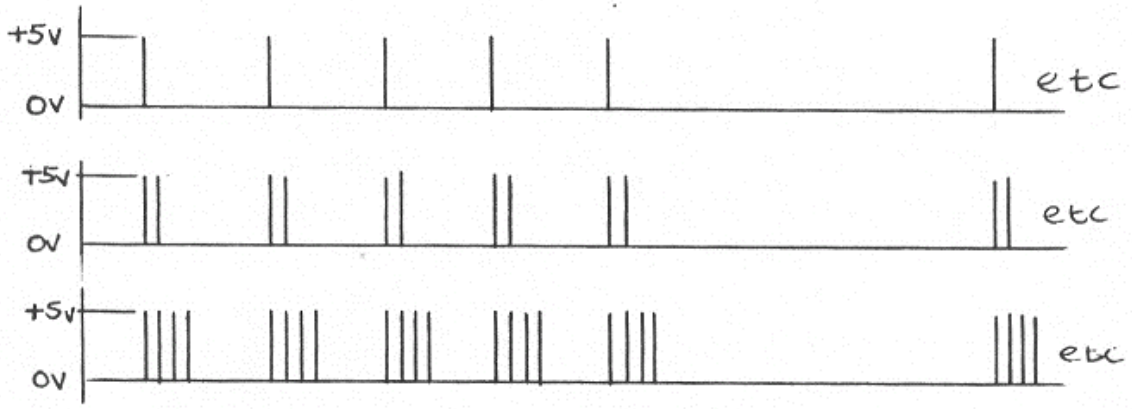



**Pin 1**




Pressing any key causes the relevant (column) pin to go to 0 volts except for pin 1 which goes to +4.5 volts.

Pins 6, 7 and 8 (3 bit binary count)




Pressing a key causes the lines to go to +5 volts dc.

Pin 13 is –2 volts dc, when a key is pressed it goes to –5 volts.

**Powering up (initialization) faults**

If after powering up, the screen is covered with black horizontal bars or random patterns, this indicates that the contents of the ROM (language interpreter and operating system) have not been correctly loaded into DRAM. One thing to check is that modification 63b on IC21 has been implemented. If not, this can result in initialization faults, because of the relative timing between RESET (on power up) becoming active, and the start of clock pulse generation. It is important that the clock generator circuit is working before RESET is active. Next, the following procedure checks initialization, after power has been applied.

1. Checking the data bus

Monitor the data bus lines at the input (pin 14/2) of each DRAM (IC12 to IC19). Each pin should show pulse signals of about 4,0 volts amplitude. In the case of IC18 you will see additional signals of slightly greater amplitude, this is an inherent design feature not a fault.

If any line is significantly higher or lower than the others, check PL5 for shorts on the pins, then cut the connection of the DRAM pin input and re-power up. If the line returns to +4.0 volt signals, change the DRAM, if not, apply the same technique to eliminate IC5, IC6, IC7, IC9/10. If all the data lines are correct, check the address lines as follows.

2. Checking the address bus

Use the same technique as for the data lines, and check lines A0 to A16 (pins 9 to 25 excluding 21) of the processor, IC5. You should see pulses about +4V amplitude and if any line is faulty, cut the line at it's connection to the output pin of the processor. If pulses appear change IC5, if not, apply the same technique to IC7, IC8, IC20, IC 9 and/or IC I0/11.

If a line is significantly high and the computer is left switched on, it will be necessary to change one or more of IC5, IC7, IC9, or IC10 as damage will almost certainly have occurred.

In the event that no signals are present on any data or address bus lines:-

First check the +5 volt line and if low voltage, use a tone meter to locate the short or partial short. Next, check the 12 MHZ clock from XT1 to IC7 , if the signal is not present, cut the connection at IC7 and check again - if the clock returns change IC7 otherwise the fault is probabiy IC 21 or XT1.

Finally, there maybe instances where all the address and data bus lines appear satisfactory and yet there is a fault:-

The next course of action is to introduce a fault by shorting two address lines together so that initialization cannot take place, then check the data bus again and it is possible a fault may show up.

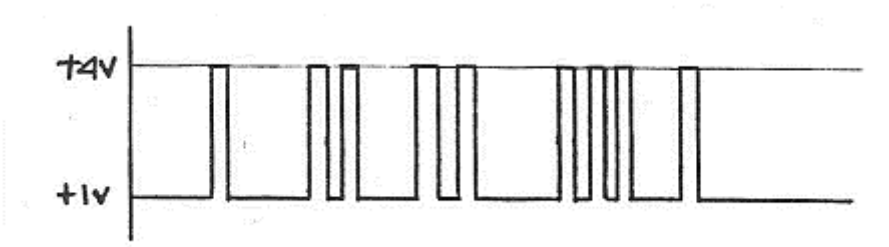
**Tape cassette loading faults**

The procedure for checking cassette loading is as follows:-

1. Insert a long cassette (one which takes a few minutes to load) and load it.

2. Monitor the signal at IC3 pin 2 (input from the cassette). You won't be able to distinguish individual signals but the arnplitude should be at least 100 m volts peak to peak.

   The output of IC3 (pin 7) should look something like this : -



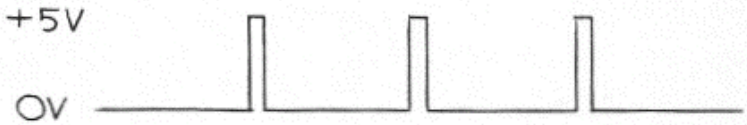

3. Check the input to IC6 (pin 18), the pulses should be similar to those at IC3 pin 7 but from 0 volts to +5 volts. If these signals are present, the likely problem is IC6.

In the vast majority of cases there is nothing wrong with the ORIC, it is nearly always a case of finding the correct playback level and using good quality tape. Cassette recorder heads must be clean and, in general, the recorder must be in good condition. Try not to use batteries as these generally produce a slightly different tape speed and, as a result, the frequency of the tones change. Another course to watch for is a damaged pinch wheel. Sometimes, if the recorder is unpowered and the PLAY button is left depressed for an extended period of time, a lump can be impressed on the pinch wheel by the capstan and this will produce a slight perturbation in tape speed every revolution of the pinch wheel.

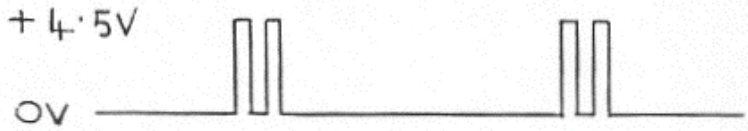
IC4 Waveforms

Pins 7 to 13

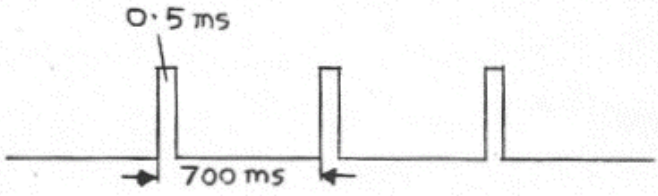

Pin 14



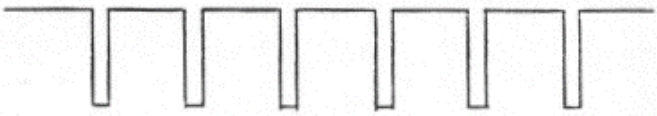

Pin 18




Pin 20



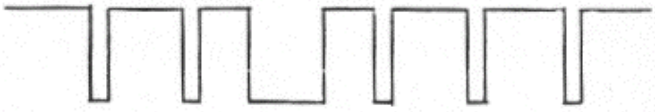

Pin 21



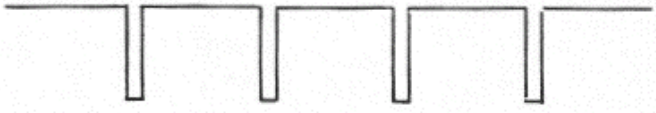
Pin 22

Pin 23

Pin 24

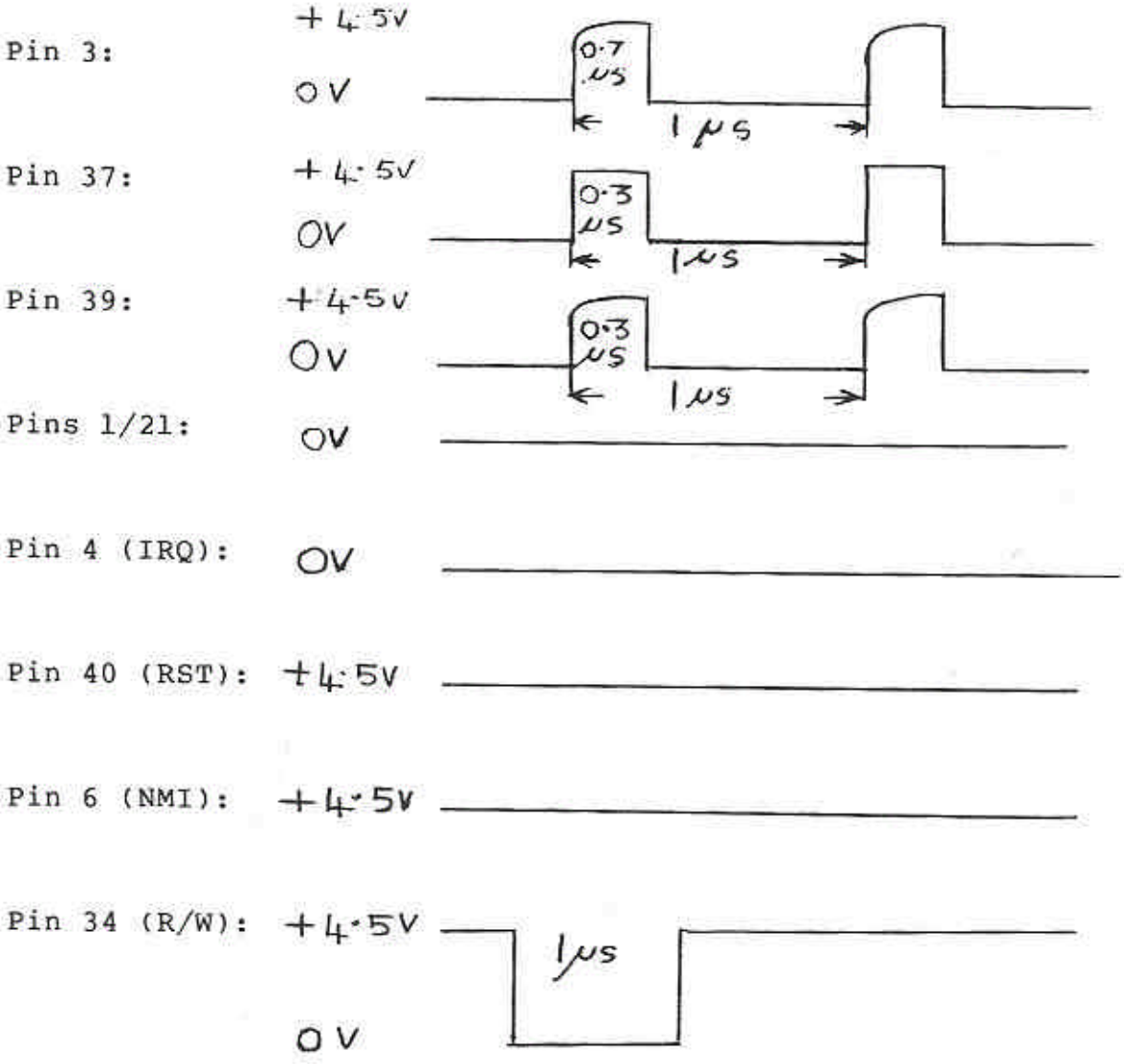


Pin 25, 26, 27



When a key is pressed pins 21-28 go to 0V, pin 20 goes to +4.5V.

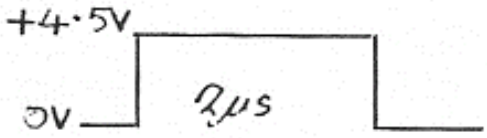
IC5 Waveforms




This pulse will not be stable so trigger the 'scope timebase internally from the channel you are using to monitor the waveform.

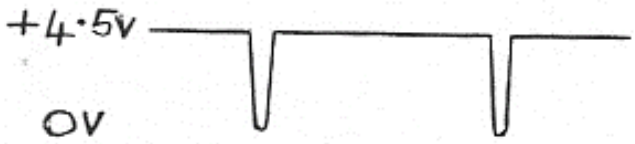
IC6 Waveforms

Pins 19, 39,




Pin 34 (RST): +4·5V

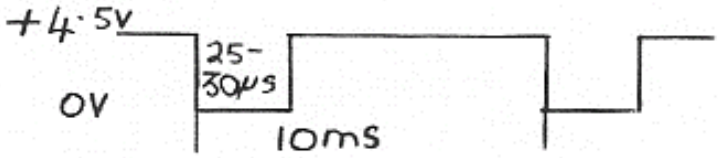
Pin 21 (IRQ):




Pin 35 - 38 (RS0-3): +3·5V

Pin 22 (R/W): As for IC5 pin 34

Pin 21 ( :




Pin 24 (CS): +4·5V

Pin 40 0V

Pin 18 +4·5V

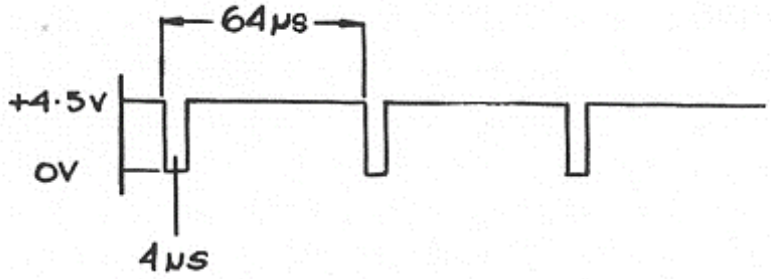
IC7 Waveforms

Pin 7:

(Clock)

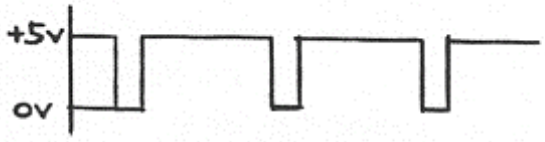

Pin 16:

(Synch)




Pins 19,20,21:

(Video)

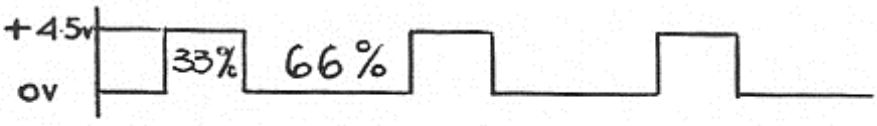



Pin 27 (R/W): AS PER IC6 PIN 22

Pin 25 (I/O): +5v

Pin 14

1 MHZ



## 6. ORDERING COMPONENTS AND RETURNING FAULTY ITEMS

All parts/components either for modification or repair can be obtained by order in the usual way from:-

ORIC PRODUCTS INTERNATIONAL,
SALES DEPARTMENT,
COWORTH PARK,
LONDON ROAD,
ASCOT,
BERKS SL5 7SE

The components are shipped direct from the manufacturing plant.

All faulty items requiring service should be sent, together with details of the fault, to: -

ORIC MANUFACTURING,
UNIT 11,
HAMPTON FARM INDUSTRIAL ESTATE,
HAMPTON ROAD,
HANWORTH,
MIDDLESEX.

(Addresses no longer valid – SDM)

We ask that you supply as many details as possible regarding defective items in order that the item(s) be returned to you in the shortest possible time.

## APPENDIX 1 - PARTS LISTS

The following parts lists are supplied:-

| | | |
|---|---|---|
| ORIC-1 48K | Main item list | BN0127 |
| ORIC-1 16K | Main item list | BN0128 |
| ORIC-1 16K & 48K | Keyboard assembly | BN0129 |
| ORIC-1 48K | Main PCB | BN0130 |
| ORIC-1 16K | Main PCB | BN0135 |
| ATMOS | Main item list | BN0140 |

You will note there is no parts list for the ATMOS main PCB and keyboard assembly. The ATMOS uses the same main PCB as the ORIC-1 48K, see ATMOS main items list which calls up BN0130 (main PCB). The ATMOS keyboard assembly is a bought in item and the only part which can be replaced is the integrated circuit IC1, the part number for this is in parts list BN0129 since all keyboards use the same circuit.

ITEMS LIST FOR ORIC 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QTY |
|---|---|---|---|---|---|
| | Top Cover | 1 | MT0117 | | |
| | | | | | |
| | 57 Piece Key Set | 1 | MT0118 | | |
| | | | | | |
| | Keyboard Label | 1 | MT0119 | | |
| | Logo Label | 1 | MT0120 | | |
| | Serial No Label | 1 | MT0126 | | |
| | Switch Membrane | 1 | MT0121 | | |
| | | | | | |
| | Oric Keyboard PCB Assy | 1 | BN0129 | | |
| | | | | | |
| | Screw No 4 Self Tap x ¼″ LG | 10 | FS9002 | PAN HD POZI | |
| | Screw No 4 Self Tap x 3/8″ LG | 3 | FS9003 | PAN HD POZI | |
| | Self Adhesive Foam Pad | 1 | MC0045 | PCB/PCB | |
| | | | | | |
| | | | | | |
| | Oric PCB Assy 48K | 1 | BN0130 | | |
| | | | | | |
| | | | | | |
| | Bottom Cover | 1 | MT0122 | | |
| | Feet | 4 | HA0038 | Self Adhesive | |
| | Screw no 6 Self Tap x 3/8″ LG | 6 | FS9005 | PAN HD POZI | |

| | | | |
|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | TITLE<br>ORIC 48k |
| ISSUE | **1**.30/11/82 | | PART NO: BN0127 |
| | **2**.4/1/83 | | SHEET NO: 1 of 2 |

ITEMS LIST FOR ORIC 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QTY |
|---|---|---|---|---|---|
| | Aerial Lead 2M | 1 | LA0015 | RCA Phono to 75ohm Co-axial | |
| | (shrink rap or poly bag) | | | | |
| | Mains Adaptor * | 1 | MT0046 | 240 50Hz to 9V 600Ma Unreg | |
| | 13A plug to 2,5mm Female Jack | | | | |
| | Lead Assy 3 pin DIN- 3 Pin DIN | 1 | LA0016 | Cassette | |
| | User Manual | 1 | MN0020 | | |
| | Guarantee Card | 1 | MN5001 | | |
| | Polystyrene Pack | 1 | PK0002 | 2 Pieces | |
| | Cardboard Sleeve - Inner | 1 | PK0001 | | |
| | Cardboard Sleeve - Outer | 1 | PK0003 | | |
| | Polythene Bag – 13″ x 8″ | 1 | MC0047 | ORIC | |
| | | | | | |
| | Welcome Cassette | 1 | DK5001 | | |
| | | | | | |
| | Oric User Magazine | 1 | MN1001 | | |
| | | | | | |
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| | | | | | |
| | * Supplied in Polythene Bags | | | | |

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|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | TITLE<br>ORIC 48k |
| ISSUE | **1.** 30/11/82 | **2.** C/N56 26/9/83 | PART NO: BN0127 SHEET NO: 2 of 2 |

ITEMS LIST FOR ORIC 16K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QTY |
|---|---|---|---|---|---|
| | Top Cover | 1 | MT0117 | | |
| | | | | | |
| | 57 Piece Key Set | 1 | MT0118 | | |
| | | | | | |
| | Keyboard Label | 1 | MT0119 | | |
| | Logo Label | 1 | MT0120 | | |
| | Serial No Label | 1 | MT0126 | | |
| | Switch Membrane | 1 | MT0121 | | |
| | | | | | |
| | Oric Keyboard PCB Assy | 1 | BN0129 | | |
| | | | | | |
| | Screw No 4 Self Tap x ¼″ LG | 10 | FS9002 | PAN HD POZI | |
| | Screw No 4 Self Tap x 3/8″ LG | 3 | FS9003 | PAN HD POZI | |
| | Self Adhesive Foam Pad | 1 | MC0045 | PCB/PCB | |
| | | | | | |
| | | | | | |
| | Oric PCB Assy 16K | 1 | BN0135 | | |
| | | | | | |
| | | | | | |
| | Bottom Cover | 1 | MT0122 | | |
| | Feet | 4 | HA0038 | Self Adhesive | |
| | Screw no 6 Self Tap x 3/8″ LG | 6 | FS9005 | PAN HD POZI | |

| | | | | |
|---|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | TITLE<br>ORIC 16k | |
| ISSUE | 1.30/11/82 | | PART NO:<br>BN0128 | SHEET NO:<br>1 of 2 |

ITEMS LIST FOR ORIC 16K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QTY |
|---|---|---|---|---|---|
| | Aerial Lead 2M | 1 | LA0015 | RCA Phono to 75ohm Co-axial | |
| | (shrink rap or poly bag) | | | | |
| | Mains Adaptor * | 1 | MT0046 | 240 50Hz to 9V 600Ma Unreg | |
| | 13A plug to 2,5mm Female Jack | | | | |
| | Lead Assy 3 pin DIN- 3 Pin DIN | 1 | LA0016 | Cassette | |
| | User Manual | 1 | MN0020 | | |
| | Guarantee Card | 1 | MN5001 | | |
| | Polystyrene Pack | 1 | PK0002 | 2 Pieces | |
| | Cardboard Sleeve - Inner | 1 | PK0001 | | |
| | Cardboard Sleeve - Outer | 1 | PK0003 | | |
| | Polythene Bag – 13″ x 8″ | 1 | MC0047 | ORIC | |
| | Voucher £40 Oric-1 | 1 | MN5002 | | |
| | | | | | |
| | Oric User Magazine | 1 | MN1001 | | |
| | | | | | |
| | Welcome Cassette | 1 | DK5001 | | |
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| | * Supplied in Polythene Bags | | | | |

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|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | TITLE<br>ORIC 16k |
| ISSUE **1**.30/11/82 **2**.C/N56 26/9/83 | PART NO: BN0128<br>SHEET NO: 2 of 2 |

ITEMS LIST FOR ORIC KEYBOARD PCB ASSY

| **ITEM** | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QTY |
|---|---|---|---|---|---|
| 1 | Oric Keyboard PCB | 1 | MT0115 | Drilling Drg<br>Assy Drg | |
| | | | | | |
| 3 | IC 4051B | 1 | IC0059 | | |
| | | | | | |
| 5 | Socket 14 Way | 1 | SK0022 | R.N. SBF-14-100T | |
| | | | | | |
| 7 | 20 SWG Tinned Copper Wire | A/R | WR0009 | (300mm) | |
| | | | | | |
| 9 | Solder 63/37 Tin - Lead | A/R | MC0043 | | |
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| ORIC PRODUCTS INTERNATIONAL LTD | | | TITLE<br>ORIC KEYBOARD PCB ASSY |
| ISSUE | 1.30/11/82 | | PART NO: BN0129<br>SHEET NO: 1 of 1 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QTY |
|---|---|---|---|---|---|
| 1 | Oric PCB | 1 | MT0116 | Drilling Drg<br>Assy Drg | |
| | | | | | |
| 3 | Loudspeaker 25ohm 2½" Dia | 1 | MC0005 | | |
| 4 | Mounting Pad | 1 | MC0044 | Double sided foam<br>15x5x2 | |
| 5 | Modulator | 1 | MC0010 | Astec 1233<br>Lunghwa LUM8E36 | |
| | | | | | |
| 7 | Heatsink Redpoint TV5 | 1 | HA0037 | ICI | |
| 8 | Insulator | 1 | MT0127 | ICI | |
| 9 | Screw M3 x 8LG PAN HD POZI | 1 | FS3081 | ICI | |
| 10 | Washer M3 Shakeproof | 1 | FW0103 | ICI | |
| 11 | Nut M3 | 1 | FN0003 | ICI | |
| | | | | | |
| 13 | 20 SWG Tinned Co Wire | A/R | WR0009 | LK | |
| | | | | | |
| 15 | Solder 65/35 Tin Lead | A/R | MC0043 | | |
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|---|---|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | | TITLE<br>ORIC PCB ASSY 48K | |
| ISSUE | **1**.02/11/82 | **2**.4/1/83 | **3**.C/N56 26/9/83 | PART NO:<br>BN0130 | SHEET NO:<br>1 of 8 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| **ITEM** | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| IC1 | Voltage Reg 7905 | 1 | SC2008 | T0-220 Plastic | |
| IC2 | AUDIO AMP OPTION | 1 | BN0147 | Alternative BN0148 | |
| IC3 | IC LM358 | 1 | IC0004 | | |
| IC4 | IC AY3-8912 | 1 | IC0067 | G.I. | |
| IC5 | IC 6502A | 1 | IC0066 | | |
| IC6 | IC 6522A | 1 | IC0049 | | |
| IC7 | ULA-ORIC 1 | 1 | IC0069 | HCS10017 | |
| IC8 | \ ICSN74LS257A | 2 | IC9257 | | |
| IC20 | / | | | | |
| IC21 | \ ICSN74LS04 | 2 | IC9004 | | |
| IC25 | / | | | | |
| IC22 | IC SN74LS365 | 1 | IC9365 | | |
| IC23 | IC TBP24S10 | 1 | IC0071 | 256x4 PROM | |
| IC24 | \ IC SN74LS74 | 2 | IC9074 | | |
| IC27 | / | | | | |
| IC26 | IC SN74LS123 | 1 | IC9123 | | |
| IC9 | IC 23128 BC184C | 1 | IC0072 | See note on options (BN01333) | |
| TR1 | \ | | | | |
| TR2 | }- Transister BC184C | 3 | SC4001 | | |
| TR3 | / | | | | |
| | | | | | |

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|---|---|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | | TITLE<br>ORIC PCB ASSY 48K | |
| ISSUE | **1**.30/11/82 | **2**.C/N53 9/12/82 | **3**.C/N54 7/2/83 | **4**. C/N63 12/4/84 | |
| | | | | PART NO: BN0130 | SHEET NO: 2 of 8 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| D1 | Diode IN4148 | 1 | SC0002 | | |
| | | | | | |
| XTAL1 | XTAL 12MHz | 1 | XT0008 | PCB Mounted | |
| XTAL2 | XTAL 8.8672375MHz | 1 | XT0003 | PCB Mounted | |
| | | | | | |
| RP1 | S.I.L Resister Pack 8 Pin 2K2 | 1 | RE8005 | 7 resistors | |
| RP2 | S.I.L Resister Pack 8 Pin 220R | 1 | RE8006 | 4 resistors | |
| RP3 | S.I.L Resister Pack 8 Pin 10K | 1 | RE8005 | 4 resistors | |
| | | | | | |
| R3 | Resistor CR25 470R | 1 | RE0471 | 5% | |
| R2 | Resistor CR25 4K7 | 1 | RE0472 | 5% | |
| R3 | Resistor CR25 220K | 1 | RE0224 | 5% | |
| R11 | \ | | | | |
| R16 | \| | | | | |
| R4 | \| | | | | |
| R7 | \| | | | | |
| R9 | \| | | | | |
| R10 | } Resistor CR 1K | 9 | RE0102 | 5% | |
| R13 | \| | | | | |
| R20 | \| | | | | |
| R21 | / | | | | |

| ORIC PRODUCTS INTERNATIONAL LTD | | | | | | | TITLE<br>ORIC PCB ASSY 48K |
|---|---|---|---|---|---|---|---|
| ISSUE | **1**.30/11/82 | **2**. C/N52 6/12/82 | **3**. 4/1/83 | **4**. C/N54 7/2/83 | **5**. C/N56 26/9/83 | **6**. C/N63 16/4/84 | PART NO: BN0130 SHEET NO: 3 of 8 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| R5 | \ Resistor CR25 10K | 2 | RE0103 | 5% | |
| R23 | / | | | | |
| | | | | | |
| R8 | Resistor CR25 100K | 1 | RE0104 | 5% | |
| R12 | Resistor CR25 22K | 1 | RE0223 | 5% | |
| | | | | | |
| | | | | | |
| R15 | Resistor CR25 62R | 1 | RE9007 | 2% | |
| | | | | | |
| R30 | Resistor CR25 220R | 1 | RE0221 | | |
| | | | | | |
| R17 | \ Resistor CR25 4K7 | 2 | RE0222 | 5% | |
| R26 | / | | | | |
| R18 | Resistor CR25 3K9 | 1 | RE0392 | 5% | |
| | | | | | |
| R19 | Resistor CR25 8K2 | 1 | RE0822 | 5% | |
| R22 | \ | | | | |
| R24 | } Resistor CR25 47K | 3 | RE0473 | 5% | |
| R25 | / | | | | |
| R29 | Resistor CR25 12K | 1 | RE0123 | | |
| R31 | Resistor CR25 560R | 1 | RE0561 | | |

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|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | TITLE<br>ORIC PCB ASSY 48K |
| ISSUE **1**.30/11/82 **2**. C/N52 6/12/82 **3**. C/N53 9/12/82 **4**. 4/1/83 **5**. C/N54 7/2/83 12/4/84 | PART NO: BN0130 SHEET NO: 4 of 8 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| RV1 | Skeleton Preset Resistor 220R | 1 | RE7221 | | |
| | | | | | |
| | | | | | |
| C2 | \ | | | | |
| C6 | \| | | | | |
| C7 | \| | | | | |
| C9 | } Capacitor Ceramic Disc 467n | 18 | CA1001 | 0.2″ Pitch | |
| C18 | \| (includes C9 to C18) | | | | |
| C20 | \| | | | | |
| C22 | \| | | | | |
| C23 | \| | | | | |
| C34 | \| | | | | |
| C35 | / | | | | |
| | | | | | |
| C3 | Capacitor Tantalum 10uF 6V3 | 1 | CA4008 | 0.2″ Pitch | |
| | | | | | |
| C4 | Capacitor Tantalum 2u2 25V | 1 | CA4010 | 0.2″ Pitch | |
| | | | | | |
| | | | | | |

| ORIC PRODUCTS INTERNATIONAL LTD | TITLE<br>ORIC PCB ASSY 48K |
|---|---|
| ISSUE **1**.30/11/82 **2**. C/N52 6/12/82 **3**. C/N53 9/12/82 **4**. 4/1/83 **5**. C/N54 7/2/83 **6**. C/N54 16/4/84 | PART NO: BN0130 SHEET NO: 5 of 8 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| C5 | Capacitor Cer. Plate 10n | 1 | CA2002 | | |
| | | | | | |
| C8 | Capacitor Elec. 100uF 10V | 1 | CA4009 | | |
| C21 | Capacitor Elec. 1uF 10V | 1 | CA4012 | Radial 0.2″P | |
| C19 | Capacitor Cer Plate 2n2 | 1 | CA2009 | Mullard 630 06222 | |
| | | | | | |
| C25 | \ Capacitor Cer Disc 100n | 2 | CA1004 | 0.2″ Pitch | |
| C8 | / | | | | |
| | | | | | |
| C26 | \ Capacitor Cer Plate 120uF | 2 | CA2006 | 0.2″ Pitch | |
| C31 | / | | | | |
| | | | | | |
| | | | | | |
| C29 | Capacitor Tant 33uF 6V3 | 1 | CA4007 | 0.2″ Pitch | |
| | | | | | |
| | | | | | |
| | | | | | |
| C32 | \ Capacitor Cer. Plate 100pf | 2 | CA2003 | | |
| C33 | / | | | | |
| | | | | | |
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| ORIC PRODUCTS INTERNATIONAL LTD | TITLE<br>ORIC PCB ASSY 48K |
|---|---|
| ISSUE **1**.30/11/82 **2**. C/N52 6/12/82 **3**. C/N53 9/12/82 **4**. 4/1/83 **5**. C/N54 7/2/83 **6**. C/N56 26/9/83 12/4/84 | PART NO: BN0130<br>SHEET NO: 6 of 8 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| CV1 | Capacitor Variable 2.22pF | 1 | CA9001 | Mullard 808-11229 | |
| | | | | | |
| RL1 | Relay | 1 | RL006 | Alternative RL005 | |
| | | | | | |
| SW1 | Switch Momentary | 1 | SW0002 | Reset | |
| | | | | | |
| PL3 | Wafer 14 Way | 1 | PL0026 | RN WTS-14S-3-T | |
| | | | | | |
| SK3 | Jack Socket 2.5mm | 1 | SK0037 | Similar to LD-0202 (ITR) | |
| | | | | | |
| SK1 | Skt DIN 5 Way 180° Rt Angle | 1 | SK0016 | Eurocomp | |
| SK2 | Skt DIN 7 Way 270° Rt Angle | | SK20024 | Eurocomp | |
| | | | | | |
| PL1 | 20 Way IDC plug Rt Angle | 1 | PL0024 | R.N. IDH-20LP-SR3-TG | |
| PL2 | 20 Way IDC plug Rt Angle | 1 | PL0008 | R.N. IDH-20LP-SR3-TG | |
| | Socket DIL 28 Way | 1 | SK0008 | IC9 | |
| | | | | | |
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|---|---|---|---|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | | | | TITLE<br>ORIC PCB ASSY 48K | |
| ISSUE | **1**.30/11/82 | **2**. 4/1/83 | **3**. C/N54 7/2/83 | 12/4/84 | | PART NO:<br>BN0130 | SHEET NO:<br>7 of 8 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| IC12 | \ | | | | |
| \| | } IC4164 | 8 | IC0073 | Used on 48K RAM | |
| IC19 | / 64K 'D' RAM 150ns | | | Pack Units | |
| | | | | | |
| | (Includes all ICs 12-19) | | | | |
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| ORIC PRODUCTS INTERNATIONAL LTD | | | TITLE<br>ORIC PCB ASSY 48K | |
| ISSUE | **1**.30/11/82 | **2**.4/1/83 | PART NO:<br>BN0130 | SHEET NO:<br>8 of 8 |

ITEMS LIST FOR Oric-1 16K PCB Assembly

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QTY |
|---|---|---|---|---|---|
| 1 | Oric 16K PCB | 1 | MT0123 | | |
| | | | | | |
| 3 | Loudspeaker 25ohm 2½" Dia | 1 | MC0005 | As per sample | |
| 4 | Mounting Pad | 1 | MC0044 | Double sided Foam 15x5x2 | |
| 5 | Modulator Astec 1233 | 1 | MC0010 | | |
| | | | | | |
| 7 | Heatsink Redpoint TV5 | 1 | HA0037 | ICI | |
| 8 | Insulator | 1 | MT0127 | ICI | |
| 9 | Screw M3x8LG PAN HD POZI | 1 | FS3081 | ICI | |
| 10 | Washer M3 Shakeproof | 1 | FW0103 | ICI | |
| 11 | Nut M3 | 1 | FN0003 | ICI | |
| | | | | | |
| 13 | 20 SWG Tinned Cu Wire | A/R | WR0009 | LK | |
| | | | | | |
| 15 | Solder 65/35 Tin Lead | A/R | MC0043 | | |
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|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | TITLE<br>ORIC-1 16K PCB ASSY |
| ISSUE | 1.4/3/83 | | PART NO: BN0135 SHEET NO: 1 of 6 |

ITEMS LIST FOR ORIC-1 16K PCB ASSEMBLY

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| IC1 | Voltage Reg 7905 | 1 | SC2008 | T0-220 Plastic | |
| IC2 | LM386 | 1 | IC0068 | | |
| IC3 | LM358 | 1 | IC0004 | | |
| IC4 | AY-3-8912 | 1 | IC0067 | | |
| IC5 | R6502AP | 1 | IC0066 | | |
| IC6 | R6522AP | 1 | IC0049 | | |
| IC7 | HCS10017 | 1 | IC0069 | | |
| IC8 | \ SN74LS257A | 2 | IC9257 | | |
| IC20 | / | | | | |
| IC21 | \ SN74LS04 | 2 | IC9004 | IC21 must be National | |
| IC25 | / | | | | |
| IC22 | IC SN74LS365 | 1 | IC9365 | | |
| IC23 | IC TBP24S10 | 1 | IC0071 | Programmed | |
| IC24 | \ IC SN74LS74 | 2 | IC9074 | | |
| IC27 | / | | | | |
| IC26 | SN74LS123 | 1 | IC9123 | | |
| IC9 | 23128 BC184C | 1 | IC0072 | Hitachi/See note on options | BN01333 |
| IC12 | \ TMS4416-15NL (RAM) | 2 | IC0070 | Texas | |
| IC19 | / | | | | |
| TR1 | \ | | | | |
| TR2 | } Transister BC184C | 3 | SC4001 | | |
| TR3 | / | | | | |

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|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | TITLE<br>ORIC-1 16K PCB ASSY |
| ISSUE | 1.4/3/83 | | PART NO: BN0135 SHEET NO: 2 of 6 |

ITEMS LIST FOR ORIC PCB ASSY 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| D1 | IN4148 | 1 | SC0002 | | |
| XTAL1 | XTAL 12MHz | 1 | XT0008 | PCB Mounted | |
| XTAL2 | XTAL 8.8672375 MHz | 1 | XT0003 | PCB Mounted | |
| RP1 | SIL Resister Pack 8 Pin 2K2 | 1 | RE8005 | 7 resistors | |
| RP2 | SIL Resister Pack 8 Pin 220R | 1 | RE8006 | 4 resistors | |
| RP3 | SIL Resister Pack 8 Pin 10K | 1 | RE8005 | 4 resistors | |
| - | Resistor CR25 10R | 1 | RE0100 | 5% | |
| R2 | Resistor CR25 4K7 | 1 | RE0472 | 5% | |
| R2 | Resistor CR25 4K7 | 1 | RE0472 | 5% | |
| R4 | \ | | | | |
| R7 | \| | | | | |
| R9 | \| | | | | |
| R10 | \| | | | | |
| R11 R13 | \| | | | | |
| R13 | } Resistor CR 1K | 9 | RE0102 | 5% | |
| R16 | \| | | | | |
| R20 | \| | | | | |
| R21 | / | | | | |
| R5 /R23 | Resistor CR25 10K | 2 | RE0103 | 5% | |
| R12 | Resistor CR25 22K | 1 | RE223 | 5% | |
| R15 | Resistor CR25 62K | 1 | RE9007 | 2% | |
| R26/R17 | Resistor CR25 2K2 | 2 | RE0222 | 5% | |

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|---|---|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | | TITLE<br>ORIC-1 16K PCB ASSY | |
| ISSUE | **1**.30/11/82 | **2**.C/N54 7/2/83 | **3**. C/N56 26/9/83 | PART NO:<br>BN0135 | SHEET NO:<br>3 of 6 |

ITEMS LIST FOR ORIC-1 16K PCB ASSEMBLY

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| R18 | Resistor CR25 3K9 | 2 | RE0392 | 5% | |
| R19 | Resistor CR25 8K2 | 1 | RE0822 | 5% | |
| R3 | Resistor CR25 470R | 1 | RE0471 | 5% | |
| R22 | \ | | | | |
| R24 | } Resistor CR25 47K | 3 | RE0473 | 5% | |
| R25 | / | | | | |
| R6 | Resistor CR25 220K | 1 | RE0224 | 5% | |
| R8 | Resistor CR25 100K | 1 | RE0104 | 5% | |
| RV1 | Skeleton Preset Resistor 220R | 1 | RE7221 | | |
| C1 | Capacitor Elec 220uF 10V | 1 | CA0018 | | |
| C2 | \ | | | | |
| C6 | \| | | | | |
| C7 | \| | | | | |
| C9 | \| | | | | |
| \| | \| (All- C9 through C13) | | | | |
| C13 | \| | | | | |
| C34 | } Capacitor Cer Disc 47nF | 13 | CA1001 | 0.2″ Pitch | |
| C20 | \| | | | | |
| C22 | \| | | | | |
| C23 | \| | | | | |
| C35 | / | | | | |
| C19 | Capacitor Cerm Plate 2n2 | 1 | CA2009 | Mullard 630 06222 | |

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|---|---|---|---|---|---|
| ORIC PRODUCTS INTERNATIONAL LTD | | | | TITLE<br>ORIC-1 16K PCB ASSY | |
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ITEMS LIST FOR ORIC-1 16K PCB ASSEMBLY

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| | | | | | |
| C3 | Capacitor Tant. 10uF 6V3 | 1 | CA4008 | 0.2″ Pitch | |
| C4 | Capacitor Tant. 2u2 25V | 1 | CA4010 | 0.2″ Pitch | |
| C5 | Capacitor Cer Plate 10n | 1 | CA2002 | 0.2″ Pitch | |
| C8 | Capacitor Elec 100uF 10V | 1 | CA4009 | Radial 0.2″ Pitch | |
| C21 | Capacitor Elec 1uF 10V | 1 | CA4012 | Radial 0.2″ Pitch | |
| C25 | \ Capacitor Cer Disc 100n | 2 | CA3013 | 0.2″ Pitch | |
| C28 | / | | | | |
| C29 | Capacitor Tant 33u 6V3 | 1 | CA4007 | Connected direct To modulator | |
| C26 | \ Capacitor Cer Plate 120pF | 2 | CA2006 | 0.2″ Pitch | |
| C31 | / | | | | |
| C32 | \ Capacitor Cer Plate 100pF | 2 | CA2003 | 5% 0.2″ Pitch | |
| C33 | / | | | | |
| | | | | | |
| CV1 | Capacitor Variable 2-22pF | 1 | CA9001 | Mullard 808-11229 | |
| | | | | | |
| RL1 | Relay OKI RRD51A05 | 1 | RL0005 | 5VDC (without diode) | |
| | | | | | |
| SW1 | Switch Momentary | 1 | SW0001 | Reset | |
| SK1 | 5Pin DIN Socket PCB Mounting | 1 | SK0016 | | |
| SK2 | 7Pin DIN Socket PCB Mounting | 1 | SK0024 | | |
| SK3 | Jack Socket 2.5mm | 1 | SK0037 | | |

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| ORIC PRODUCTS INTERNATIONAL LTD | | | | TITLE<br>ORIC-1 16K PCB ASSY | |
| ISSUE | **1.** 4/1/83 | **2.** C/N54 7/2/83 | | PART NO:<br>BN0135 | SHEET NO:<br>5 of 6 |

ITEMS LIST FOR ORIC-1 16K PCB ASSEMBLY

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| PL1 | 20 Way IDC Plug RT Angle | 1 | PL0024 | R.N. IDH-20LP-SR3-TG | |
| PL2 | 34 Way IDC Plug RT Angle | 1 | PL0008 | R.N. IDH-34LP-5R3-TG | |
| PL3 | 14 Way Wafer | 1 | PL0025 | R.N. WTS-14S-1-T | |
| | Socket DIL 28 Way | 1 | SK0008 | IC9 | |
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| ORIC PRODUCTS INTERNATIONAL LTD | | | TITLE<br>ORIC-1 16K PCB ASSY | |
| ISSUE | **1.** 4/1/83 | **2.** C/N54 7/2/83 | PART NO:<br>BN0135 | SHEET NO:<br>6 of 6 |

ITEMS LIST FOR ATMOS 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| | Top Cover | 1 | MT0140 | | |
| | Keyboard | 1 | BN0138 | | |
| | | | | | |
| | Label – Atmos 48K | 1 | MT0142 | | |
| | Serial No Label | 1 | MT0126 | | |
| | | | | | |
| | | | | | |
| | Screw No 4 Self Tap x ¼″ LG | 5 | FS9002 | PAN HD POZI | |
| | Screw No 4 Self Tap x 3/8″ LG | 3 | FS9003 | PAN HD POZI | |
| | | | | | |
| | Oric PCB Assy 48K | 1 | BN0130 | | |
| | | | | | |
| | Bottom Cover | 1 | MT0141 | | |
| | Feet | 4 | HA0038 | Self Adhesive | |
| | Screw No 6 Self Tap x 3/8″ LG | 6 | FS9005 | PAN HD POZI | |
| | *(Handwritten addition)* | | | | |
| | *Foam Pad* | *?* | *MC0049* | | |
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| ORIC PRODUCTS INTERNATIONAL LTD<br>ASCOT, BERKS. | | TITLE<br>ATMOS 48K | |
| ISSUE 1.7/12/83 | | PART NO:<br>BN0140 | SHEET NO:<br>1 of 2 |

ITEMS LIST FOR ATMOS 48K

| ITEM | DESCRIPTION | QTY | PART NO | REMARKS | BATCH QT |
|---|---|---|---|---|---|
| | Aerial Lead 2M * | 1 | LA0015 | RCA Phono to 75 Ohm Co-axial | |
| | (Shrink rap or poly bag ) | | | | |
| | Mains Adaptor * | 1 | MC0046 | 240 50Hz to 9V 600Ma Unreg | |
| | 13A plug to 2.5mm Female Jack | | | | |
| | Lead Assy 3 Pin DIN – 3 Pin DIN | 1 | LA0016 | Cassette | |
| | Users Manual – Atmos 48K | 1 | MN0021 | | |
| | Guarentee Card | 1 | MN5001 | | |
| | Polystyrene Pack | 1 | PK0005 | 2 Pieces | |
| | Cardboard Sleeve - Inner | 1 | PK0004 | | |
| | Cardboard Sleeve - Outer | 1 | PK0003 | | |
| | Polythene Bag – 13″ x 18″ | 1 | MC0047 | Oric | |
| | | | | | |
| | Welcome Cassette | 1 | DK5001 | | |
| | | | | | |
| | Oric User Magazine | 1 | MN1001 | | |
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| | * Supplied in Polythene Bags | | | | |

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| ORIC PRODUCTS INTERNATIONAL LTD<br>ASCOT, BERKS. | | TITLE<br>ATMOS 48K | |
| ISSUE 1.7/12/83 | | PART NO:<br>BN0140 | SHEET NO:<br>2 of 2 |

## APPENDIX 2 MODIFICATION LEAFLETS

Note:-

Where a Modification necessitates a change to the parts list, the details will be given on the leaflet, it is then up to you to ammend the applicable parts list.

# ORIC MODIFICATION LEAFLET

| MODIFICATION NUMBER<br>52 | | DATE OF ISSUE |
|---|---|---|
| UNIT (s) AFFECTED | | |
| MODEL<br><br>ORIC-1<br>16K and 48K | MAIN PCB ISSUE<br>1. All issues.<br>2. All issues.<br>3. All issues.<br>4. Issue 2 only. | CIRCUIT (DIAGRAM) ISSUE<br><br>Currently issue 7. |

REASON FOR MODICFICATION

1. Incorrect Componet positioning.
2. To improve speaker volume.
3. To support ULA test.
4. To achieve compatibility with Prestel

DETAIL OF MODIFICATION

1. Remove and discard C13, C19 and C39
2. Remove and discard R3
3. Fit R26 between IC22 pin and 0V order under part number RE0222.
4. Reverse the connections to pins 19 and 21 on IC7.

Note: C13 is located between IC12 and the PCB edge.
C19 is located between IC18 and the PCB edge.
C35 is located between IC6 and the PCB edge.

# ORIC MODIFICATION LEAFLET

| MODIFICATION NUMBER<br>53 | DATE OF ISSUE |
|---|---|

UNIT (s) AFFECTED

| MODEL | MAIN PCB ISSUE | CIRCUIT (DIAGRAM) ISSUE |
|---|---|---|
| ORIC-1<br>16K and 48K | 5. All issues.<br>6. Issue 3.<br>7. Issue 2. | Currently issue 7. |

REASON FOR MODICFICATION

5. Components not required.
6. Components not required.
7. Components previously removed, fiotted in new positions.

DETAIL OF MODIFICATION

5. Remove and discard the following components:-

   - R11, located just above IC21.
   - TR4, located to one side of IC7 (nopt speaker side).
   - C27, just above R11

6. Remove the follwing and discard:-
   - R14, located between IC7 and TR4.

7. Fit the following components:-

   - C35. This performs the same decoupling function as the C35 Removed in the modification 52. It’s new position is about 13mm to the left of the original position. Order under the same part number as the original C35.

   C13. It decouples the +5 volt power line and is positioned Immediately behind the ‘power in’ socket, Order under original part number.

# ORIC MODIFICATION LEAFLET

| MODIFICATION NUMBER<br>56 | | DATE OF ISSUE |
|---|---|---|
| UNIT (s) AFFECTED | | |
| MODEL<br>ORIC-1<br>16K and 48K | MAIN PCB ISSUE<br>8. All issues. | CIRCUIT (DIAGRAM) ISSUE<br>Currently issue 7. |

REASON FOR MODICFICATION

8. Improved Cassette Loading.

DETAIL OF MODIFICATION

8. a) Fit a 1.0K Ohms resistor between IC6 Pin8 and +5 volts. Order under part number RE0102. Circuit reference is R11.

b) Fit a 2.2 nano farad ceramic plate capacitor between IC6 pin 8 and 0 volts. Order under part number CA209. Circuit reference is C19.

Note: The circuit references used were previously made redundant By modifications numbered 52 and 53.

# ORIC MODIFICATION LEAFLET

| MODIFICATION NUMBER<br>63 (b) – part of 63 | | DATE OF ISSUE |
|---|---|---|
| UNIT (s) AFFECTED | | |
| MODEL<br>ORIC-1 16K and 48K<br>Oric Atmos | MAIN PCB ISSUE<br>9. All issues. | CIRCUIT (DIAGRAM) ISSUE<br>Currently issue 7. |

REASON FOR MODICFICATION

9. Improved Initialisation on ‘power up’.

DETAIL OF MODIFICATION

9. (a) Fit a 560 Ohms resistor between pins 7 and 24 of IC7.+5 volts. Order under part number RE0561.

(b) Cut the track between IC21 pin 2 and IC7 pin 7, and insert a 220 ohms resistor. Order under part number RE0221.

**APPENDIX 3 – INTEGRATED CICUIT DATA**

Note:-

All integrated Circuits with the exception of the following are TTL and their pin connections and other data can be found in the TEXAS TTL DATA BOOK:-

IC3 - NATIONAL SEMICONDUCTORS – Cassette interface

IC4 - GENERAL INSTRUMENTS - Sound/ keyboard interface

IC5 - SYNERTEK – Microprocessor

IC6 - SYNERTEK – Versatile interface adaptor

IC23 - TEXAS/ MMI – PROM

IC9 - ROM

Refer to the manufacturers data book for details of these circuits.

## APPENDIX 4 – SERVICE BULLETINS

# ORIC SERVICE BULLETIN

Number 1

UNIT/CIRCUIT/COMPONENT(S) AFFECTED

ORIC-1 16K and 48K microcomputers

Issued in February 1982

TECHNICAL BACKGROUND INFORMATION

In some cases, the sound circuit (IC4) overheats causing a deterioration in sound quality, followed by occassional faulty key operation and finally complete non-operation of the keyboard. The cause had been found to be pulse 'BDIR' which is the input to pin 18 of IC4.
The following actions reduces the pulse width to approximately 20 microseconds, and this has proved satisfactory for all makes of sound cicuit used on the Oric-1. In the ATMOS, the problem was eliminated by changing the V1.1 ROM software to give a reduced width BDIR pulse.

ACTION TO BE TAKEN

1. Order the components in the usual way under the following part Numbers:-
   Resistor 22K Ohms – RE0223
   Capacitor 1.0 nf – CA2004

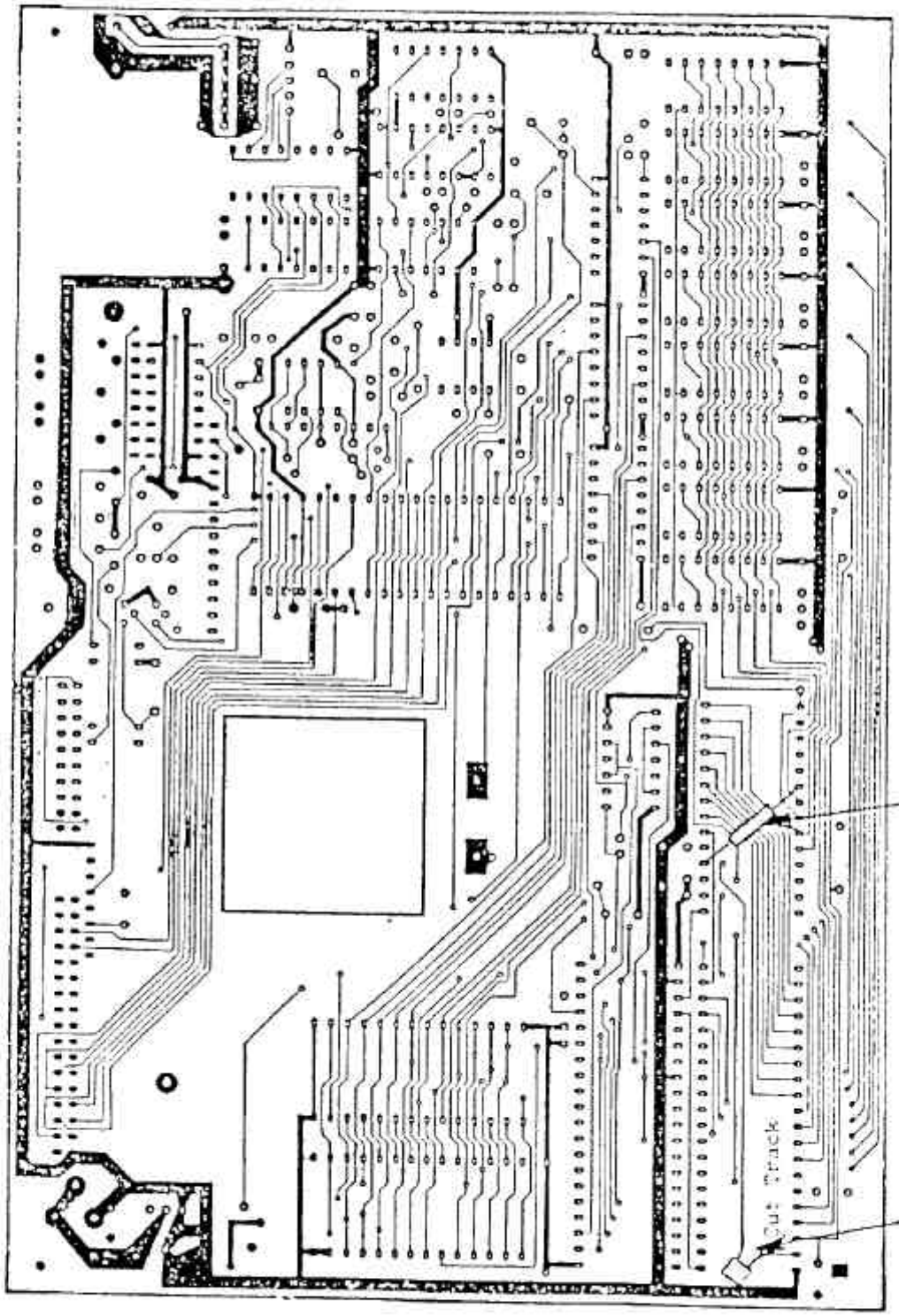
2. Cut the track between pin 18 of IC4 and pin 19 of IC6, then Fit capacitor as shown on sheet 2.

3. Fit the resistor between pin 6 and 18 of IC4 as shown on sheet 2.

4. Do not ammend the parts list as this is not a production item Change affecting all models. We recommend however, you ammend The circuit diagram by drawing in the components and Identifying them SB1 (service Bulletin number 1).

ORIC SERVICE BULLETIN

Number 1




Sheet 2 of 2

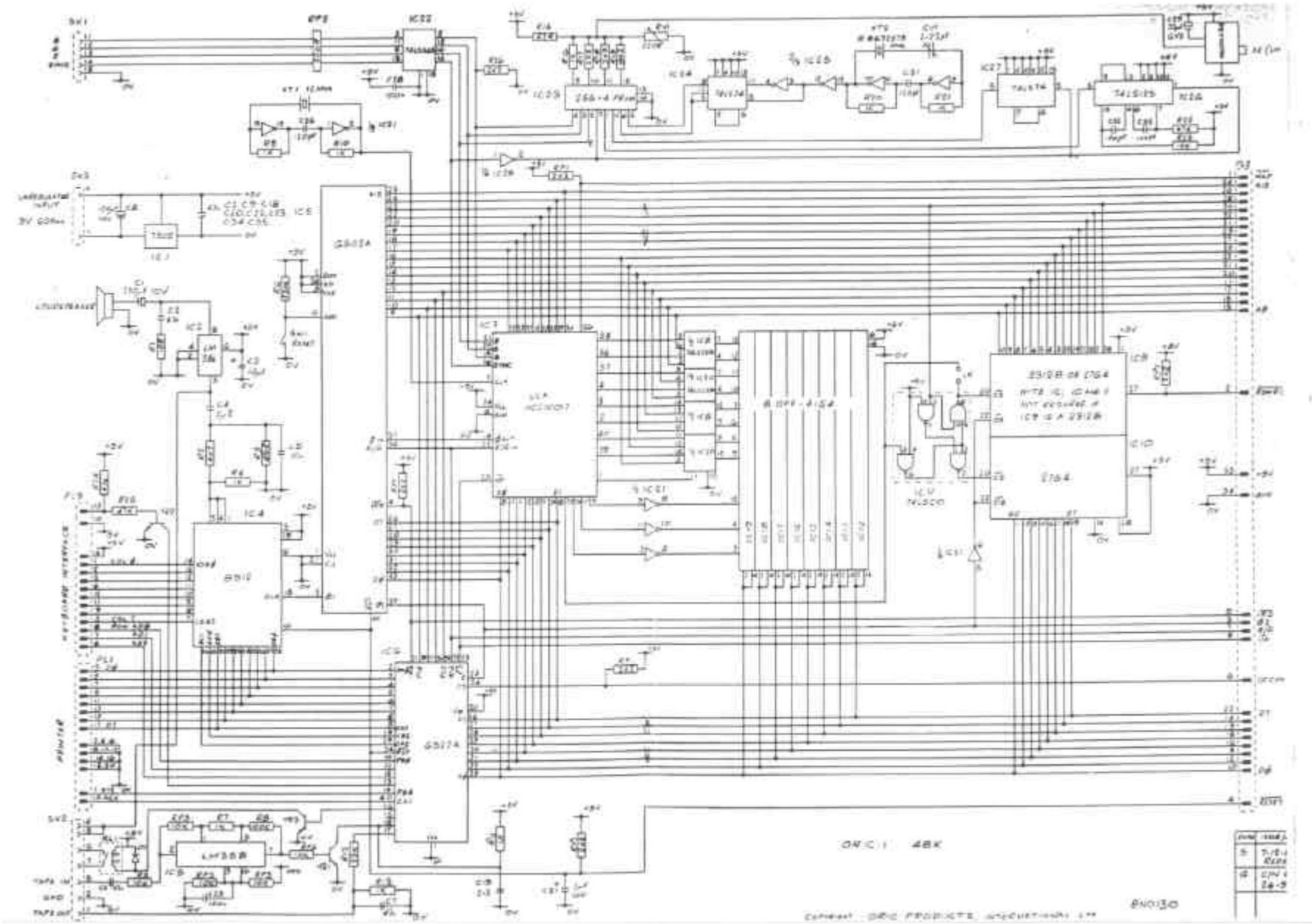
DRAWINGS

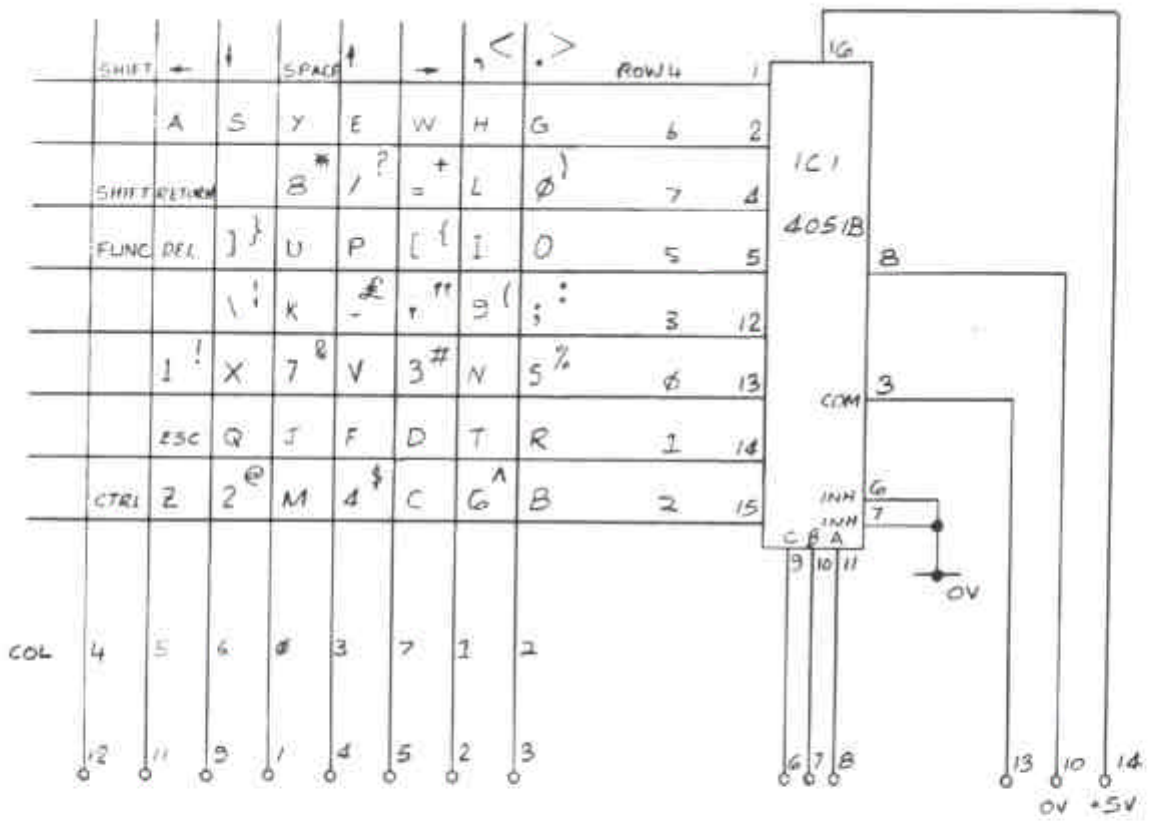
The following are supplied:-

ORIC-1 48K main printed circuit board circuit diagram. This can also be used for the ORIC-1 and the ATMOS. The only difference is in the ORIC-1 16K which uses only two DRAMs as compared with eight for the 48K models

ORIC – ATMOS keybaord circuit diagram.

This can also be used for the ORIC-1, the only difference is that the ATMOS has an extra key labelled FUNCT.






| ISS | DATE / CHANGE |
|---|---|
| 1 | 20-10-83 |
| 2 | 9 - 11 -83 |
| | |

ORIC KEYBOARD
BND 138