

ROTEL

RMZ-950

Multizone Custom Controller

Service Information

ISSUE-1 April 1995

ROTEL SERVICE INFORMATION RMZ950 CUSTOM CONTROLLER

Brief Description

The RMZ950 is built from four boards:-

The Motherboard
The Mains Card
The Translator Card
The Data Transmission Card (Data Tx)

The Motherboard

This provides the power supplies for all the audio and control circuits. The extensive use of regulators ensures minimal interaction between zones and the control logic. Input selection, volume control and power amplification are all dealt with on this board. The two plug-in cards provide the remaining logic control.

The audio inputs are buffered and fed along an audio bus to the four zone circuits. Each zone circuit has a PPM decoder (MV601) which feeds the PIC16C56RC. This controls the four stereo input TDA7318 pre-amp IC which feeds the TDA2030 power amp ICs. The zone PIC inhibits the IR flood/IR output whenever the zone is off. It also "talks" to both the translator card and data tx card using the I2C clock and data lines. The zone inhibits (from the zone PICs) are also fed to the translator card. It should be noted that if a zone PIC or TDA7318 becomes faulty it can block the other zones from working.

The Data Tx Card

This board processes the I2C information sent to it from the zones and sends I2C to the Eyes connected to the unit. This board also controls the "Mains relay", switching it on whenever a zone is on and switching it off after a master power down.

The Mains Card

This is a very simple board. Apart from routing the mains supply to the direct outlet it also routes the switched outlet via the "Mains relay". The wire jumper from it to the motherboard should be red wire to the left (looking at it from the front). This wire connects the relay coil to the Data Tx card via the motherboard.

The Translator Card

This board translates the I2C received from the zones into the source equipment codes. Each zone PIC on the motherboard "talks" to a zone dedicated PIC on the Translator card using the I2C bus. The relevant LED on the board lights for the zone concerned. All of the codes are stored in the IC11 which are accessed by an address bus fed from the surrounding PICs. IC9 is a programmable PIC which tells IC11 which equipment codes

to use. This happens every time the RMZ950 is switched on or after leaving set-up mode. LD3 flashes six times whilst this information is written across. If two zones want two codes translated simultaneously then the first code is completed and then the second is processed. Only one LED will light at any one time.

The board also has a digital mixer to allow the IR out from a second RMZ950 to control the flood transmitters and/or window emitters. This is based around IC6 which also processes the RC-5 output.

Motherboard Test Voltages

All these are w.r.t. ground TP1 by SK4

Body of bridge rectifier.....Floating (if -18.5V then one or more TDA2030 shorting to heatsink)

FS2 power amp supply.....+18.5V @ 110Vac

FS3 power amp supply.....-18.5V @ 110Vac

Power amp offsets.....+/- 15mV max

Pin 4 IC1,2 audio buffer.....+14.4 to +15.5V

Pin 11 IC1,2 audio buffer.....-14.4 to -15.5V

Cathode 1D7 relay supply.....+19.5 to +12V relays off/on

Pin 3 1SK3-4SK3 Eye supplies.....+11.5V +/-0.25V

Pin 2 TDA7318s.....+9.7V +/-0.25V

1REG3 to 4REG3 5V logic.....+5V +/-0.25V

P.T. hole in front of REG4.....+12V +/-0.5V
(IR Flood supply)

Pins 17,18 1IC5 - 4IC5.....+5V (unless data is being sent)
(Data & clock I2C lines)

Pin 3 PL3 Translator supply.....+18.5V @ 110Vac

Pin 1 PL9 Data Tx supply.....+5V +/-0.25V

Translator Card Test Points

Top pin IC4 (7812).....+12V +/-0.5V

Top pin IC5 (7805).....+5V +/-0.25V

Pin 4 IC7,8,9,10.....+4.8V

Pin 28 IC11.....+4.8V

I2C lines.....+5V (unless data is being sent)

Zone A....LD3 lights whilst code is sent to card to be translated

Zone B....LD4 " " " " " " " " " "

Zone C....LD2 " " " " " " " " " "

Zone D....LD1 " " " " " " " " " "

ROTEL SERVICE INFORMATION RKP900 KEYPAD

Brief Description

The keypad generates PPM codes which are sent down the data cable to the Controller. These are pre-programmed into the PIC16C54XT IC4. It has a digital mixer formed by IC2 4011BE to allow diasy chaining to another Eye/Keypad with the output buffered by IC3 4502.

The circuit diagram is shown overleaf.

Typical voltages are shown below:-

Supply.....	10-11.5V
Data In / Data Out	0V
IC1 LM317LZ output.....	5V
IC2 4011BE pin 14.....	5V
pin 7.....	0V
IC3 4502 pin 16.....	5V
pin 8.....	0V
IC4 PIC16C54XT pin 14.....	5V
pin 5.....	0V
pin 4.....	5V

Suggested Service Set-up

To check a RMZ950 Custom Controller, RSM900 Eye or a RKP900 Keypad you need at least one working controller, one Eye and one Keypad. Replacement Translator and Data Tx cards would be useful. Below are some hints on how to check a faulty RMZ950 Controller. As a faulty Translator or Data Tx card could "lock-up" the system I have included details as to how the system would react if they were removed.

The idea is to check one zone at a time for input selection, volume control, correct Eye display and translator function. It is advisable to do the following first:-

- a) Disable the flood IR transmitter by removing the wire link.
- b) Only use one zone, or if you need two use an Eye and a Keypad on different zones.
- c) If you need to use several Eyes (to simulate a realistic situation) then ensure they are optically isolated from each other. Do not 'fire' codes at the Eyes simultaneously as they will display incorrectly. If the flood transmitters output is picked up by an Eye (whose zone is on) then there will be an IR loop which will inhibit the operation the RMZ950 and Eye! Hence a)

If a zone doesn't respond at all then check the green "Code" LED on the front panel for that zone. It should light whenever a Keypad or RR950 code is received proving that the code has reached the decoder and been decoded.

The RMZ950 will work(ish) without the Translator or Data Tx cards plugged in. This is NOT the same as if one or the other is faulty as that could inhibit other functions.

a) Without Data Tx Card

The system will work with the exception that the Eyes will only display "-" and there would be no master power down via the Eye(s) or Keypad(s).

b) Without Translator Card

The system will work with the exception that the translator function won't work. There would also be no IR Out, RC-5 Out and IR In wouldn't go anywhere. The flood transmitters could be used by wiring INT Out to Flood In on SK7 however.

c) Without Both

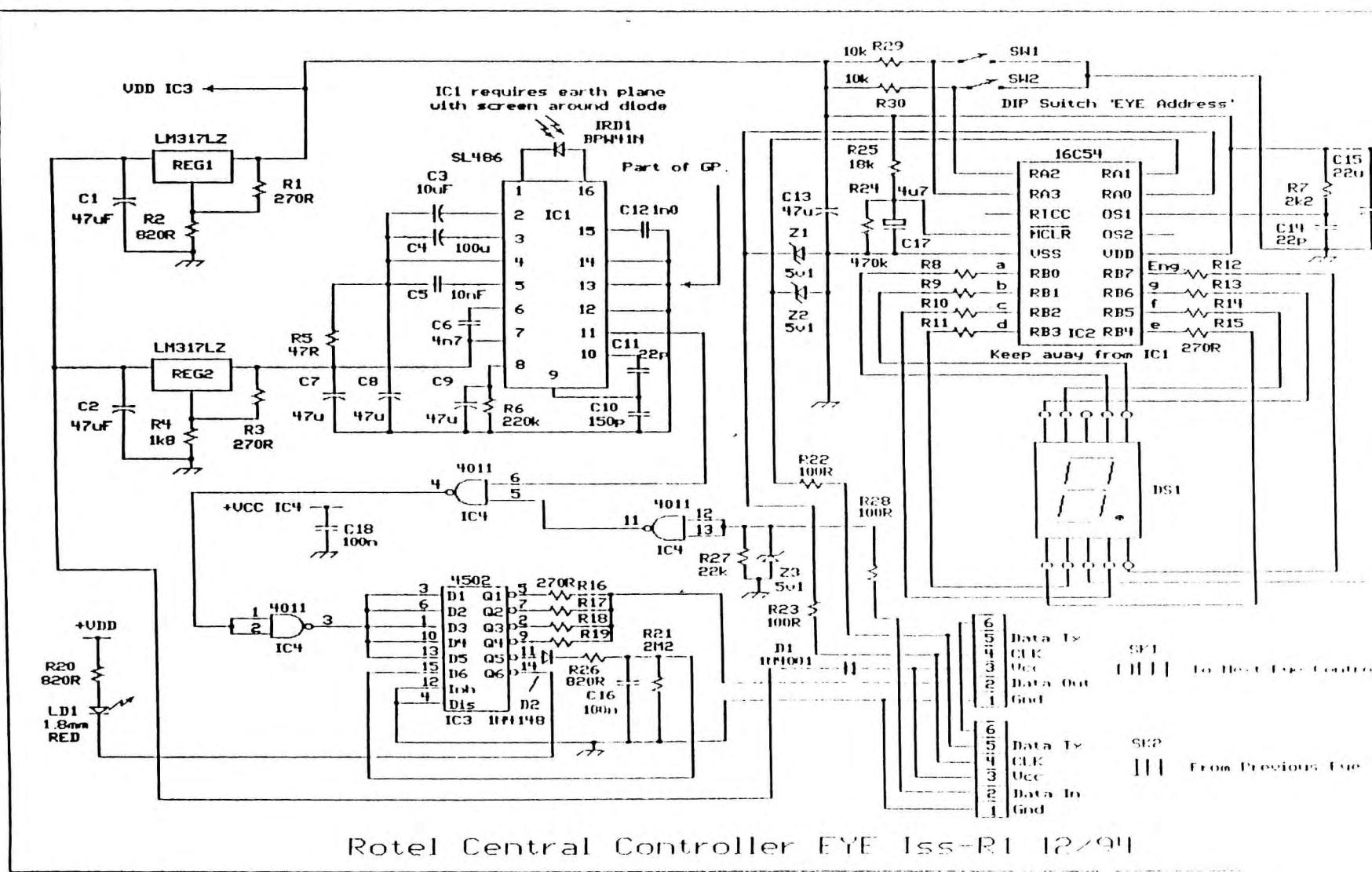
Only the audio and IR flood would work (if set-up as above).

To Check an Eye or Keypad

The easiest way is to connect it to a working RMZ950 and check input selection and the LEDs on the translator board. The green "Code" LED on the front panel should also light. You could use window emitters on some Rotel / RC-5 equipment to check the translator and/or set-up routine.

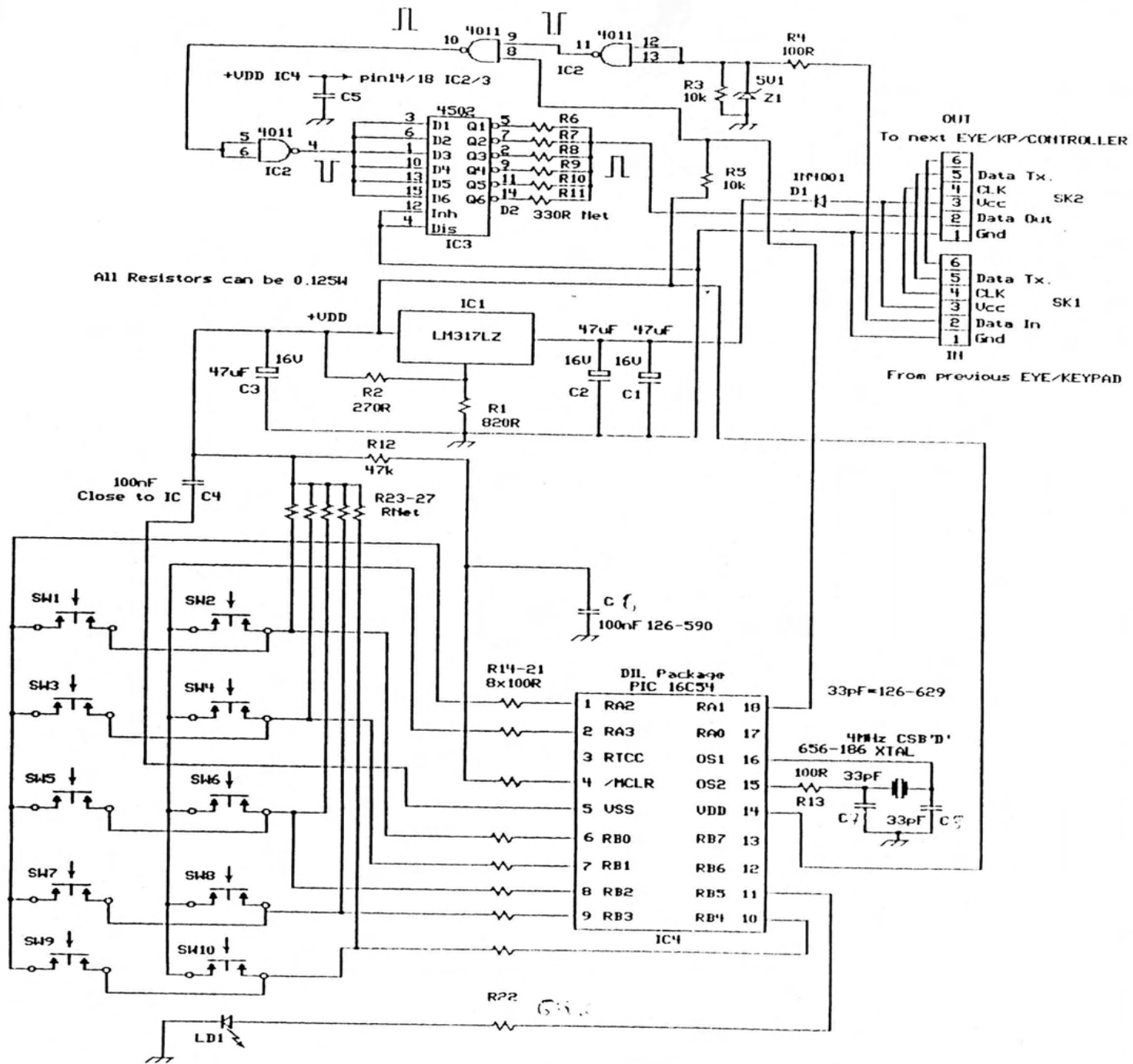
Do not forget:-

- a) Set the address switch in the Eye to the zone selected (unplugging and replugging the Eye will provide the master clear necessary to "re-program" it).
- b) If trying the set-up routine you must use zone A.
- c) You can not sensibly test the "Engaged" function using the same Eye to turn all of the zones on! Use an Eye and keypad on different zones to do this.
- d) The Eye is made up of two boards wired together. The wire is twisted to bring the two boards together. Please ensure it doesn't run close to the SL486 IR Pre-amp. It could pick up interference from the I2C bus otherwise.



Rotel Central Controller EYE I ss-R1 12/94

spr. v1.1 r6 Fri Apr 21 15:47:17 1995



Rotel Keypad U1 0 15/11/94

IMPORTANT NOTICE

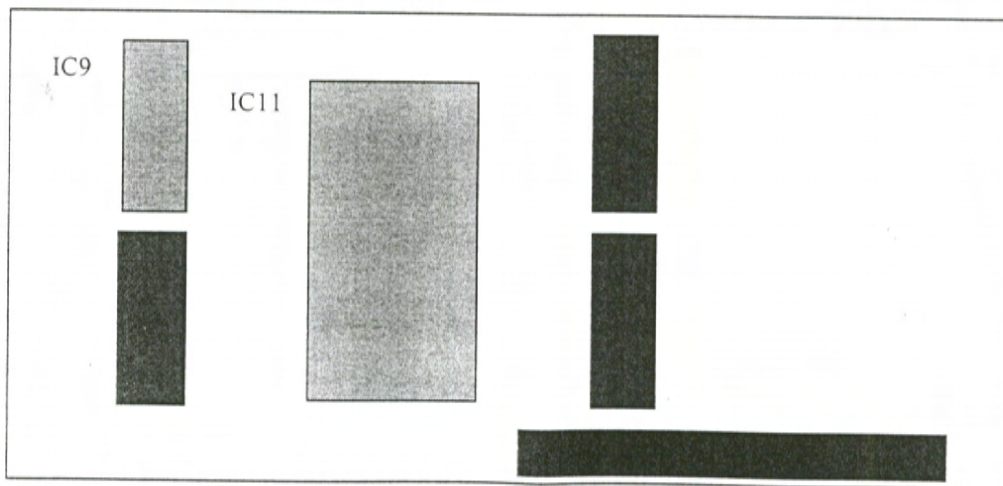
CHANGE IN SET-UP OPERATION

Change.. For the new Code Settings *to take effect* the controller **MUST** be turned OFF (using the front panel power button), and then turned ON again after 30 seconds.

Instructions for Software Update.

If you have a Controller that appears to be losing its Set-up configuration, you should install the new software as follows:-

- 1) Disconnect the Controller from the AC Mains supply.
- 2) Remove the Top cover.
- 3) Remove the 2 IC's IC9 & IC11 from the Translator Card (vertically mounted at the rear of the unit on the left hand side).



Position of IC's on Translator Card.

Super IC9 PIC16C84
IC11 QL206
IC7,8,10 PIC16C54

IC4 main PCB
All PIC16C56-PC/P

- 4) Replace IC's ensuring that the 'notch' on the package is pointing upwards.
- 5) Visually check to ensure that all the legs of each IC are located correctly in sockets.
- 6) Replace the Top cover and then reconnect the AC Mains supply.
- 7) Set-up the code configuration for the source equipment as described in the Installation Manual.

Turn the unit OFF and then ON for the new Set-up to take effect.

Note: Updated IC's are marked QCA210 and QX40.