CLEARTONE CMU350

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Extracted from the Amateur Radio AX25 BBS

Cleartone info

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Description:

The Cleartone CMU350 is a UHF 10 channel pmr transceiver with built in ctcss
encode and decode as well as scan and priority channel.

Identification:

 The radio has a 2 tone brown plastic case with a slanting front panel, on which
are the radio's controls. On/off/volume control, squelch control, day/night
switch, monitor switch and a 16 key membrane type keypad.

On the left hand side of the radio is a 5 pin din socket for the mic and scan
control connections.

On the rear panel the power connector and PL259 aerial socket.

Programming:

BEFORE any attempts to program the radio (rig), it is strongly recommended that
the radio is given an "Air check" to make sure the rig works correctly.

The rig has to put into the programming mode before the information can be
entered from the front key-pad. To do this do the following.....

1) Remove the 4 cross head screws from the base of the radio.

2) Carefully lift the top cover off by raising the rear of the cover (take care
not to break the speaker wires when doing this)

3) Carefully pull out the grey 9 way ribbon cable from the key pad to the
connector in the middle of the main pcb.

4) Remove the 14 way grey ribbon cable from the key pad to the main pcb.

5) To the right of the 14 way socket you will see a link marked J401 on the pcb.
With a jumper lead or similar, make this link.

6) Replace the 2 ribbon cables in their sockets.

7) Connect the radio to a suitable power supply and turn the radio on.

8) Press the PRO.PRIOR. button

9) Press the 0 (10 in prog mode) button

10) You are now in the programming mode.

11) Enter the 6 digits of the receive freq (no decimal point)

12) Press 0 for simplex, 8 for half duplex

13) Press 2 for ctcss is to be used (see below) or 0 for no ctcss.

14) If ctcss is to be used the next 2 digits are entered as below (00 for none)

01 67.0 Hz	02 71.9 Hz	03 74.4 Hz	04 77.0 Hz
05 79.7 Hz	06 82.5 Hz	07 85.4 Hz	08 88.5 Hz
09 91.5 Hz	10 94.8 Hz	11 97.4 Hz	12 100.0 Hz
13 103.5 Hz	14 107.2 Hz	15 110.9 Hz	16 114.8 Hz
17 118.8 Hz	18 123.0 Hz	19 127.3 Hz	20 131.8 Hz
21 136.5 Hz	22 141.3 Hz	23 146.2 Hz	24 151.4 Hz
25 156.7 Hz	26 162.2 Hz	27 167.9 Hz	28 173.8 Hz
29 179.9 Hz	30 186.2 Hz	31 192.8 Hz	32 203.5 Hz
33 210.7 Hz	34 218.1 Hz	35 225.7 Hz	36 233.6 Hz
37 241.8 Hz			

15) If 8 was pressed in 12) above, enter the six digit Tx freq. If simplex go to next stage.

16) Press enter button followed by the channel number which the above is to be stored in.........repeat from step 11) for all channels.

Note:

To review a channels contents,
Press MANUAL key followed by channel number.

To delete a channel,
Press DELETE key followed by ENTER and channel number.

To leave programming mode: Turn off radio and clip or remove J401.

Next Align radio....See separate file....73 de Dave G7UZN @ GB7CIP.

Cleartone Rx

This file gives details of the receive alignment of a Cleartone CMU350 UHF radio.

Note:-

M2 is an orange insulated wire in an elongated slot on the VCO screening can on the right side of the radio. This wire should be carefully stripped to give access to an electrical contact and an insulated probe used to take readings.

M1 is located under the key pad ribbon. To gain access it may be necessary to remove this ribbon from the main pcb. This should be done with care and the ribbon replaced before the checks are carried out.

Receiver Alignment

1) Connect a DC voltmeter to M4. Adjust the 3 helicals L405, L406 and L407 for minimum voltage on M4.(An alternative method is adjusting for max 455 KHz signal on M5 with a signal generator connected to the aerial socket set to the correct rf freq for that channel.

2) With the radio un-squelched and the mon switch set to mon. Set a signal generator to the correct rf freq for the channel selected and adjust its level to give 100 mV peak to peak on M5. Tune L401, L402, L403 and L404 for maximum signal on M5.

3) Tune L408 and L409 for max signal on M5.

4) Retune L405, L406 and L407 for minimum DC voltage on M4.

5) Repeat step 2) above.

6) With the signal generator set to 100 micro volts on the correct freq modulated with a 1 KHz tone at 3 KHz deviation, adjust L410 for maximum audio output.

7) Tune L408 and L409 for best Sinad.

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Transmitter Alignment

1) Position all helical coil screws (L401 to L407 and L502, L503) for a distance of 0.2 inches above their cans.

2) Position core of L408 10 turns and L409 4 turns from the top of their formers.

Note:-

On the highest transmit freq, the VCO control voltage must be as high as possible but not exceed 8 volts on M1. On the highest receive freq the VCO control voltage must be as high as possible, but not exceed 7.0 volts on M1. Both conditions must be met for optimum performance.

3) Go to the channel with the highest RX freq. Connect a D.C. voltmeter to M3 and ground and set to 10V scale. Tune L501 for minimum voltage.

4) Go to the channel with the centre TX freq. Connect voltmeter to M2 on 10V scale. (TX mode)

5) Tune L502,L503 and C303 for peak voltage.

6) With a suitable load connected to the aerial socket, Tune C317,C314 and C307 for maximum output power.

7) Adjust R504 for a plus and minus 4.5 KHz deviation

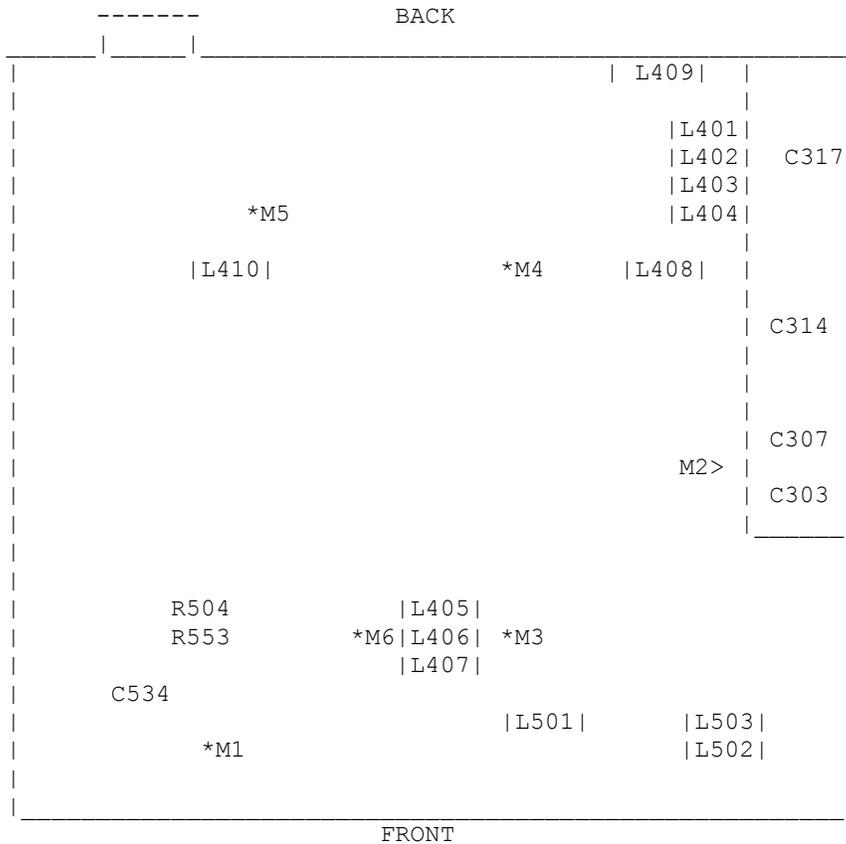8) Adjust R553 for a ctcss deviation (no modulation) of Plus and minus 750Hz.

9) Adjust C554 for the desired carrier freq.

The RX alignment is in a separate file.

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Cleartone layout

This is the layout of the Cleartone CMU350 UHF pmr radio.

```
            -------              BACK
  _____ |_____ |_____
 |                                      | L409|   |      |
 |                                      |     |   |      |
 |                                      |L401|   |      |
 |                                      |L402|  C317|
 |                                      |L403|   |      |
 |            *M5                       |L404|   |      |
 |                                      |     |   |      |
 |      |L410|              *M4      |L408|   |      |
 |                                      |     |   |      |
 |                                      | C314 |      |
 |                                      |     |   |      |
 |                                      |     |   |      |
 |                                      |     |   |      |
 |                                      | C307 |      |
 |                           M2> |      |   |
 |                                      | C303 |      |
 |                                      |_____|      |
 |                                               |
 |                                               |
 |      R504            |L405|                   |
 |      R553        *M6|L406|  *M3              |
 |                     |L407|                   |
 |   C534                                       |
 |                     |L501|    |L503|     |
 |      *M1                      |L502|     |
 |                                               |
 |_____|
                      FRONT
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Cleartone thoughts

Hi All, I hope you find the files on the Cleartone radio of use.....
We used to use them at work many years ago and it was the first pmr radio that I
ever converted (why spend money when they are just laying around hi)

They seemed to work quite well and friends have used them on packet. They are a
bit limited with only 10 channels and they have quite narrow front ends on the
receiver (plus and minus 1 or 2 Meg).
So don't expect them to work from 430-439 MHz !

I never managed to get the ctcss decode working....Perhaps our ones had been
modded ?

I seem to remember that to get them to scan pin 5 of the mic socket had to be
grounded although they made an annoying clicking/thumping noise whilst scanning
(just the thing to upset the missus whilst she is watching Coronation St!)

Well there you go....Good luck with the modding, I think there are still a few
in an old pile at work!
                73 de Dave G7UZN @ GB7CIP