# SECTION 3 SET-UP ADJUSTMENTS

3-1. How to enter Service Mode

Service adjustments to this model can be performed using the supplied remote Commander RM-ED008.

1. Turn on the power to the TV set and enter into the stand-by mode.
2. Press the following sequence of buttons on the Remote Commander.
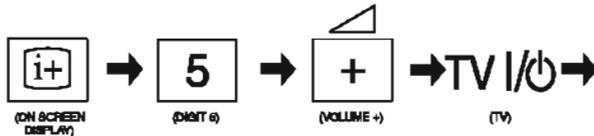
3. The following menu will then appear on the screen.

	⬜ Analogue
MAIN VER.	0800
H PACK VER.	1008
S PACK VER.	1009
CHECK SUM	CDA9
NVM VER.	0327
EMMA VER.	2.5.15
STARTER	0.0.13
ETI	0h 42m

4. Move to the relevant command using the up or down arrow buttons on the remote commander.
5. Press the right arrow button to enter into the required menu item.
6. Press the 'Menu' button on the remote commander to quit the Service Mode when all adjustments have been completed.

Note :

*   After carrying out the service adjustments, to prevent the customer accessing the 'Service Menu' switch the TV set OFF and then ON.

3-2. Signal Level Adjustment

3-2-1. Set up of AD calibration1 adjustment for terrestrial analog.

The following adjustments are done via ECS.

1. Send ECS_ADJUST_LEVEL_SETTING_INIT command.
2. Ensure noise reduction NR=3 (High), GAMMA_EN=0, P4_CVD2_85=0.
3. Set the following registration items.

Screen Size	32"	40"	46"
TARGET_Y_RF(PAL)	165	165	165
ADJ_COLOR_Y_ATT(PAL)	128	128	128
ADJ_COLOR_PAL(PAL)	3	3	3

3-2-2. Y signal calibration1 adjustment for terrestrial analog.

1. Input PAL colour bar 75%Y, 75%C via terrestrial input.
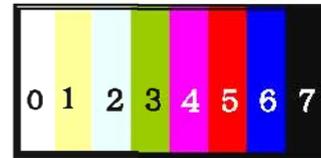
2. Send ECS_ADJUST_TCD3_CONT_RF command.
3. Read the value of S-REG:APL_LUMA via ECS. Confirming that the value is within spec of the table below.

AD-Adjust RF Spec	Spec.
Reference register name	
S-REG: APL_LUMA	TARGET_Y_RF±2

3-2-3. Set up of C signal calibration1 adjustment for terrestrial analog.

1. Input PAL colour bar 75%Y, 75%C via terrestrial input.
2. Send ECS_ADJUST_LEVEL_SETTING_INIT command.
3. Ensure noise reduction NR=3 (High), GAMMA_EN=0, P4_CVD2_85=0.

3-2-4. C signal calibration1 adjustment for terrestrial analog.

1. Send ECS_ADJUST_TCD3_HUE_RF command.
2. Read S-REG: READ_BACK_B00 via ECS. (READ_AREA=0).
3. Read S-REG: READ_BACK_B01 via ECS. (READ_AREA=6).
4. Confirm that 8 bits of MSB of item number 2) and 3) are within spec of the table below.

Reference Item	Spec.
READ_BACK_B0*difference value	±2

5. Switch the TV set OFF and then ON again to retain adjustment values.

3-2-5. Set up of AD calibration1 adjustment for video.

1. Send ECS_ADJUST_LEVEL_SETTING_INIT command.
2. Ensure noise reduction NR=1 (Low), GAMMA_EN=0, P4_CVD2_85=0.
3. Set the following registration items.

Screen Size	32"	40"	46"
TARGET_Y_RF(PAL)	165	165	165
ADJ_COLOR_Y_ATT(PAL)	128	128	128
ADJ_COLOR_PAL(PAL)	3	3	3

3-2-6. Y signal calibration1 adjustment for video.
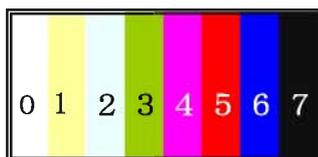
1. Input PAL colour bar 75%Y, 75%C via AV1 input.

2. Send ECS_ADJUST_TCD3_CONT_V command.
3. Read the value of S-REG:APL_LUMA via ECS. Confirming that the value is within spec of the table below.

AD-Adjust Video Spec	Spec.
Reference register name	
S-REG: APL_LUMA	TARGET_Y_V±2

3-2-7. Set up of C signal calibration1 adjustment for video.

1. Input PAL colour bar 75%Y, 75%C via AV1 input.
2. Send ECS_ADJUST_LEVEL_SETTING_INIT command.
3. Ensure noise reduction NR=1 (Low), GAMMA_EN=0, P4_CVD2_85=0.
4. Set the following registration items.

Screen Size	32"	40"	46"
ADJ_COLOR_Y_ATT(PAL)	128	128	128
ADJ_COLOR_PAL(PAL)	3	3	3

3-2-8. C signal calibration1 adjustment for video.

1. Send ECS_ADJUST_TCD3_HUE_V command.
2. Read S-REG: READ_BACK_B00 via ECS. (READ_AREA=0).
3. Read S-REG: READ_BACK_B01 via ECS. (READ_AREA=6).
4. Confirm that 8 bits of MSB of item number 2) and 3) are within spec of the table below.

Reference Item	Spec.
READ_BACK_B0*difference value	±2

5. Read S-REG: TCD3_SATURATION via ECS.
6. Switch the TV set OFF and then ON again to retain adjustment values.

3-2-9. Set up of AD calibration2 adjustment for video.

1. Send ECS_ADJUST_LEVEL_SETTING_INIT command.
2. Ensure noise reduction NR=1 (Low), GAMMA_EN=0, P4_CVD2_85=0.
3. Set the following registration items.

Screen Size	32"	40"	46"
TARGET_Y_V(SECAM)	165	165	165
ADJ_COLOR_Y_ATT(SECAM)	128	128	128
ADJ_COLOR_PAL(SECAM)	2	2	2

3-2-10. Y signal calibration2 adjustment for video.
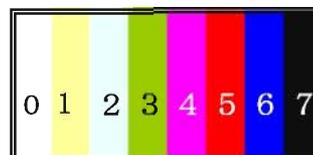
1. Input SECAM colour bar 75%Y, 75%C via AV1 input.

2. Send ECS_ADJUST_TCD3_CONT_V command.
3. Read the value of S-REG:APL_LUMA via ECS. Confirming that the value is within spec of the table below.

AD-Adjust Video Spec	Spec.
Reference register name	
S-REG: APL_LUMA	TARGET_Y_V±2

3-2-11. Set up of C signal calibration2 adjustment for video.

1. Input SECAM colour bar 75%Y, 75%C via AV1 input.
2. Send ECS_ADJUST_LEVEL_SETTING_INIT command.
3. Ensure noise reduction NR=1 (Low), GAMMA_EN=0, P4_CVD2_85=0.
4. Set the following registration items.

Screen Size	32"	40"	46"
ADJ_COLOR_Y_ATT(SECAM)	128	128	128
ADJ_COLOR_PAL(SECAM)	2	2	2

3-2-12. C signal calibration2 adjustment for video.

1. Send ECS_ADJUST_TCD3_HUE_V command.
2. Read S-REG: READ_BACK_B00 via ECS. (READ_AREA=0).
3. Read S-REG: READ_BACK_B01 via ECS. (READ_AREA=6).
4. Confirm that 8 bits of MSB of item number 2) and 3) are within spec of the table below.

Reference Item	Spec.
READ_BACK_B0*difference value	±2

5. Read S-REG: TCD3_SATURATION via ECS.
6. Switch the TV set OFF and then ON again to retain adjustment values.

3-3. Gamma Adjustment

The following adjustments are done via ECS.

Note: Before Gamma adjustment can begin the set needs 1 hour aging.

3-3-1. Set up mode for Gamma Adjustment

1. Send ECS_ADJUST_LEVEL_SETTING_INIT command.
2. Ensure COL_MATRIX_INDEX=15.
3. Ensure G_GAMMA_IDX_OFST=15.
4. Ensure DYNAMIC_EN=0.
5. Ensure U_BRT_OFFSET=128.
6. Ensure P1_D_P_26=0.
7. Ensure P1_D_P_28=0.

3-3-2. Set up Trident internal SG and brightness measurement

1. Ensure TEST_PATTEN_ON=1.
2. Ensure TEST_G_LEVEL=204.
3. Measure brightness A.
4. Ensure TEST_G_LEVEL=102.
5. Measure brightness B.
6. Set up G_GAMMA_OFST_01=brightness B/brightness A*10000. The result is written to G_GAMMA_OFST_01.
7. Send Gamma_Tbl_Search_1 command.
8. Ensure TEST_G_LEVEL=153.
9. Measure brightness C.
10. Set up G_GAMMA_OFST_02=brightness C/brightness A*10000. The result is written to G_GAMMA_OFST_02.
11. Send Gamma_Tbl_Search_2 command.
12. Save set up value in NVM in register G_GAM_IDX_OFST.

3-4. White Balance Adjustment

The following adjustments are done via ECS.

3-4-1. Set up mode for White Balance Adjustment

1. Send ECS_ADJUST_LEVEL_SETTING_INIT command.
2. Ensure COL_MATRIX_INDEX=15.
3. Ensure DYNAMIC_EN=0.
4. Ensure U_BRT_OFFSET=128.
5. Ensure P1_D_P_26=0.
6. Ensure P1_D_P_28=0.

3-4-2. White Balance of Colour Temperature "Cool"

1. Set up COLOR_TEMP=0.
2. Set up R_GAMMA_OFST_01=128.
3. R_GAMMA_OFST_02=128
   R_GAMMA_OFST_03=128
   R_GAMMA_OFST_04=128
   R_GAMMA_OFST_05=128
   R_GAMMA_OFST_06=128
   R_GAMMA_OFST_07=128
   B_GAMMA_OFST_01=128
   B_GAMMA_OFST_02=128
   B_GAMMA_OFST_03=128
   B_GAMMA_OFST_04=128
   B_GAMMA_OFST_05=128
   B_GAMMA_OFST_06=128
   B_GAMMA_OFST_07=128
4. Set up "Wait".
5. Set up TEST_R_LEVEL=204.
6. Set up TEST_G_LEVEL=204.
7. Set up TEST_B_LEVEL=204.
8. Adjust R_GAMMA_OFST_05 and B_GAMMA_OFST_05 chroma values so that they are within tolerance in the table below.

	x	Y	Tolerance
32"	0.2733	0.2792	0.5JND
40"	0.2702	0.2675	0.5JND
46"	0.2738	0.2679	0.5JND

9. Set up TEST_R_LEVEL=153.
10. Set up TEST_G_LEVEL=153.
11. Set up TEST_B_LEVEL=153.
12. Adjust R_GAMMA_OFST_04 and B_GAMMA_OFST_04 chroma values so that they are within tolerance in the table below.

	X	Y	Tolerance
32"	0.2733	0.2792	0.7JND
40"	0.2702	0.2675	0.7JND
46"	0.2738	0.2679	0.7JND

13. Set up TEST_R_LEVEL=102.
14. Set up TEST_G_LEVEL=102.
15. Set up TEST_B_LEVEL=102.
16. Adjust R_GAMMA_OFST_03 and B_GAMMA_OFST_03 chroma values so that they are within tolerance in the table below.

	X	Y	Tolerance
32"	0.2733	0.2792	1JND
40"	0.2702	0.2675	1JND
46"	0.2738	0.2679	1JND

17. Set up TEST_R_LEVEL=76.
18. Set up TEST_G_LEVEL=76.
19. Set up TEST_B_LEVEL=76.
20. Adjust R_GAMMA_OFST_02 and B_GAMMA_OFST_02 chroma values so that they are within tolerance in the table below.

	X	Y	Tolerance
32"	0.2733	0.2792	1JND
40"	0.2702	0.2675	1JND
46"	0.2738	0.2679	1JND

21. Set up TEST_R_LEVEL=51.
22. Set up TEST_G_LEVEL=51.
23. Set up TEST_B_LEVEL=51.
24. Adjust R_GAMMA_OFST_01 and B_GAMMA_OFST_01 chroma values so that they are within tolerance in the table below.

	X	Y	Tolerance
32"	0.2733	0.2792	1JND
40"	0.2702	0.2675	1JND
46"	0.2738	0.2679	1JND

25. The values of R_GAMMA_OFST_06 and 07 and B_GAMMA_OFST_06, and 07 are determined by the following conditions.

a). Adjustment value of B_GAMMA_OFST_05>180 and Adjustment value of R_GAMMA_OFST_05>128.

· B(R)_GAMMA_OFST_06 = B(R)_GAMMA_OFST_05 - {B(R)_GAMMA_OFST_05 - B(R)_GAMMA_OFST_04} / 2.
· B(R)_GAMMA_OFST_07 = 128.

b). Adjustment value of R_GAMMA_OFST_05=<128.

· R_GAMMA_OFST_06 = R_GAMMA_OFST_07 =R_GAMMA_OFST_04.

c). Adjustment value of B_GAMMA_OFST_05=<180.

· B(R)_GAMMA_OFST_06 = B(R)_GAMMA_OFST_07 =B(R)_GAMMA_OFST_05.

26. Send WB_SAVE command.

3-4-3. White Balance of Colour Temperature "Neutral"

1. Set up initial White Balance condition.
2. Set up COLOR_TEMP=1.
3. Set up TEST_R_LEVEL 204, TEST_G_LEVEL=204 and TEST_B_LEVEL=204 and adjust R_DRIVE and B_DRIVE values to within the spec of the table below.

	X	Y	Spec.
32"	0.2827	0.2920	0.0014
40"	0.2840	0.2826	0.0014
46"	0.2865	0.2845	0.0014

4. Set up TEST_R_LEVEL=51, TEST_G_LEVEL=51 and TEST_B_LEVEL=51 and adjust R_BKG and B_BKG values to within the spec of the table below.

	X	Y	Spec.
32"	0.2827	0.2920	0.0028
40"	0.2840	0.2826	0.0028
46"	0.2865	0.2845	0.0028

5. Continue tracking the values of items 3) and 4) until they are all within spec.
6. Send COLOR_SAVE command.

3-4-4. White Balance of Colour Temperature "Warm 1"

1. Set up initial White Balance condition.
2. Set up COLOR_TEMP=2.
3. Set up TEST_R_LEVEL 204, TEST_G_LEVEL=204 and TEST_B_LEVEL=204 and adjust R_DRIVE and B_DRIVE values to within the specof the table below.

	X	Y	Spec.
32"	0.2961	0.3096	0.0014
40"	0.2955	0.2999	0.0014
46"	0.2963	0.2972	0.0014

4. Set up TEST_R_LEVEL=51, TEST_G_LEVEL=51 and TEST_B_LEVEL=51 and adjust R_BKG and B_BKG values to within the spec of the table below.

	X	Y	Spec.
32"	0.2961	0.3096	0.0028
40"	0.2955	0.2999	0.0028
46"	0.2963	0.2972	0.0028

5. Continue tracking the values of items 3) and 4) until they are all within spec.
6. Send COLOR_SAVE command.

3-4-5. White Balance of Colour Temperature "Warm 2"

1. Set up initial White Balance condition.
2. Set up COLOR_TEMP=3.
3. Set up TEST_R_LEVEL 204, TEST_G_LEVEL=204 and TEST_B_LEVEL=204 and adjust R_DRIVE and B_DRIVE values to within the spec of the table below.

	X	Y	Spec.
32"	0.3083	0.3244	0.0014
40"	0.3146	0.3190	0.0014
46"	0.3092	0.3127	0.0014

4. Set up TEST_R_LEVEL=51, TEST_G_LEVEL=51 and TEST_B_LEVEL=51 and adjust R_BKG and B_BKG values to within the spec of the table below.

	X	Y	Spec.
32"	0.3083	0.3244	0.0028
40"	0.3146	0.3190	0.0028
46"	0.3092	0.3127	0.0028

5. Continue tracking the values of items 3) and 4) until they are all within spec.
6. Send COLOR_SAVE command.

3-5. Panel Replacement

When replacing the panel please reset the gamma and white balance before performing W/B (See page 26, 3-4) for new panel.

3-6. Board Replacement

3-6-1. AE Board Replacement

When replacing the 'AE' board please readjust the AD (See page 24, 3-2) and readjust the W/B (See page 26, 3-4).

3-6-2. B2H Board Replacement

When replacing the 'B2H' board please readjust the AD (See page 24, 3-2) and readjust the W/B (See page 26, 3-4).

Note :

In the event of a 'B2H' board being re-used in service, please ensure that the Serial number is cleared in the NVM.