Professional Monitors 14" & 20"
BM5414/BM5420

User Manual
BM5414/20D11

Edición 01

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KROMA TELECOM

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SAFETY INFORMATION

WARNING: This product includes critical mechanical and electrical parts which are essential for X-Radiation safety.
For continued safety replace critical components indicated in the service schematic only with exact replacement parts given in the parts list of service Manual.
Operating high voltage for this product is 16 Kv. At minimum brightness. Refer to service manual for measurement procedures and proper service adjustments.

WARNING: Electric shock or fire hazard can be caused if critical components are replaced by non conform components. Refer to parts list of service manual.

CAUTION: High vacuum tube is dangerous to handle refer replacement to qualified personnel.
Replace with a tube of the same type for continued safety.

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1. INTRODUCTION

1.1. Aplications

The KROMA monitors described have been designed to use in Broadcast studios for signal evaluation requiring accurate picture reproduction. Also it can be used in production and post-production.

They incorporate microprocessor based control in all its operations, providing automatic color set-up, thus eliminating the operator´s subjetive factor.

1.1.1. FEATURES

BM5414 /BM5420 14” or 20”

Basic version CCVS: 2 inputs PAL and NTSC

Options:

Decoders:

- Analog Component RGB / YPrPb
- Serial digial video: 2 inputs at 10 Bits resolution according to (ITU-R BT601).

1.1.2. PICTURE TUBE

High resolution, in line guns an shadow mask tube, with 0.28mm dot pitch for 14” and 0.4mm for 20”. EBU or P22 phosphor for 14” and EBU or C phosphor for 20”.

1.1.3. COLOUR STABILITY

Beam current feedback,which allows to correct colour temperature drift caused by CRT variation and environmental conditions.

1.1.4. FLEXIBILITY

Modular configuration. It is provided with an analog and digital bus, allowing the exchange of signals between the options installed, making it a system of open architecture for future options.

1.1.5. AUTO SETUP SYSTEM

By use of the KROMA set AK5400X50, composed by a DG5400 test signal generator and a optical probe model SR5400. The generator is able to provide up to 34 patterns designed for monitors alignment.

With this combination, automatic grey scale adjustment can by carried out ,as well as being able to adjust automatically the chrominance signal´s amplitude and phase.

This set also allows transfering automatically the parameter setting of this setup to other monitors.

1.1.6. REMOTE CONTROL

The RS-485 bus included in the BM54XX KROMA monitors Is able to control for up to 128 monitors. These can be in group controlled, individually controlled or all of them can be controlled at the same time.

1.1.7. MENU

This help the operation, displaying the operating parameters and the commands to access at several functions.

The adjustmen operations to be done by the specialized personnel are protected by means of numerical code.

1.1.8. NORMAL SIZE, UNDERSCAN AND 16:9

The monitors are provided with facilities for normal picture size or underscand (95% reduced size) and aspect ratio 4:3 and 16:9 selectable from the front panel by size key.

1.1.9. MEMORIES

These monitors have 5 memories:

- All memories accessible through numerical code (only to store datas)
- Four memories for general use.
- One memorie for the system or factory.

1.2. TECHNICAL SPECIFICATIONS

1.2.1. SCAN & SYNC

Systems 625/50/2:1 15.625 Hz

525/60/2:1 15.734 Hz

Horizontal oscilator lock-in range: ± 750 Hz

H sync time constant:

Fast: 0.5 mS

Slow: 2.5 mS

1.2.2. PICTURE DISPLAY

Aspect Ratio: 4:3 and 16:9

- Lineality error: ≤ 2 % of the picture height.
- Geometry error: ≤ 1 % ídem.
- Convergence error:

TUBO	ZONE 1	CENTER
14″	0.4 mm	0.15 mm
20″	0.6 mm	0.20 mm

ZONE 1 IS WITHIN A CIRCLE CENTRED ON THE SCREEN WHOSE DIAMETER IS EQUAL TO PICTURE HEIGHT.

1.2.3. CRT

- 14" 0.28 mm pitch Phosphor: EBU and P22
- 20" 0.40 mm pitch Phosphor: EBU and C
- Resolution 14": > 900 TV lines in the centre
- Resolution 20": > 900 TV lines in the centre
- Colour Temperature: 6500º K ± 200º K (IN ALL MEMORIES)
- Black level: Set to 0.5 Nit (10 % APL WINDOW SIGNAL)
- White level: Set to 90 Nits (100% APL WINDOW SIGNAL)
- Beam current limiting: 180 Nit (FLAT FIELD SIGNAL)

1.2.4. DECODER PAL / NTSC PERFORMANCE

- Inputs A, B & C
  - Level : 1 V_{pp} +3/-6 dB
  - Impedance : 75 Ω ± 1% or loop-through (selectable)
  - Return Losses: 35 dB @ 5 Mhz.
  - Isolation between A, B and C inputs: > 60 dB @ 10 Mhz.
  - Mismatch between A and B: < 1% y < 1º @ 4.43 Mhz
- External sync input

- Level : 4 V_{PP} +6 dB / -28 dB
- Impedance : 75 Ω ± 1% or loop-through (selectable)
- Return Losses: > 35 dB @ 5 Mhz

- Auxiliary signal Input (Front panel)[1]
  - Format : CCVS similar to A and B
  - Impedance : 75 Ω ± 1%
  - Return Losses: > 25 dB @ 5 Mhz

1.2.5. LUMINANCE

- Frecuency response:

  Without *notch filter:* 100 Khz - 10 Mhz ± 1 dB

  Notch filter suppresion < - 30 dB @ 4.43 Mhz

- K factor

(APERTURE 0 dB)	WITHOUT FILTER	WITH FILTER
K_{pb}	< 0.5 %	< 1%
K_{2T}	< 0.3 %	< 1.2%

- Non lineality: < 1%
- Noise : (100 Khz - 5 Mhz) < 60 dB

1.2.6. CHROMINANCE

- Passband : 1.3 Mhz EQUIBAND
- Saturation Control: ± 6 dB
- Subcarrier oscilator lock-in range: 300 Hz
- Luminance-chrominance delay: < 50 nS

1.2.7. GENERAL

- Environmental Characteristics:
  - Warm-up : 20 minutes to meet specifications.
  - Temperature range:

    From 15 to 40 ºC (TO MEET SPECIFICATIONS)

    From 0 to 45 ºC (OPERATING ONLY)
  - Relative humidity: 0 to 90 % non condensing @ 40 ºC
  - Altitude : ≤ 3000 m.
  - X-ray emission: < 0.1 mR/Hr < 0.1 mR/hr @ 5 cm. monitor outside surface

Supply

[1] During the auto set-up it controls the channels RGB in parallel.

- ♦ Voltage : 110 / 220 V_{AC} ± 20%
- ♦ Power consumption BM5414: 85 W
- ♦ Power consumption BM5420: 105 W

- Dimensions

	Height	Width	Depth
Model 14″	256 mm. (6 UR.)	417 mm.	470 mm.
Model 20″	444 mm. (10UR.)	449 mm.	482 mm.

- Weight BM5414: 19.2 Kg
- Weight BM5420**:** 36 Kg

1.3. INSTALLATION

1.3.1. Incoming Inspection

After having removed the equipment from its original packing material, check for visible signs of damage which may have occurred during shipment. Report any shortage or damage to the freight carrier and ***KROMA*** or its representative inmediately.

Check that you have received the following accessories with the monitor:

- AC power cord, and
- User´s Manual.

If the equipment has to be reshipped to a long distance, it is recommended to use the original packing material in order to avoid damages during transport.

1.3.2. Safety Information

For electric shock protection, it is necessary to connect the chassis to a protective ground; to this purpose, the earth ground terminal of the plug is directly connected to the metal part of the monitor (green-yellow wire). Insert the power plug in a mating outlet with an earth ground contact.

Due to the presence of high voltages inside the equipment, the same can only be open, adjusted or repaired by QUALIFIED PERSONNEL.

1.3.3. Connection to the Main

Before connecting the monitor to the mains, check that the mains voltage corresponds to that indicated in the voltage selector located in the rear panel, next to the mains connector.

If the mains voltage presetting is not the appropriate, carry out the change by removing the fuseholder and turning it until the desired value is shown in the window.

Fuses should be changed in accordance with the mains voltage presetting used, as per the following table:

POWER	FUSE
220 V	3.15 A Slow
110 V	4 A Slow

1.3.4. Location

Due to the CRT´s sensitivity to magnetic fields, avoid installing the monitor near this type of disturbance sources such as: Loudspeakers, electric motors, transformers, etc.

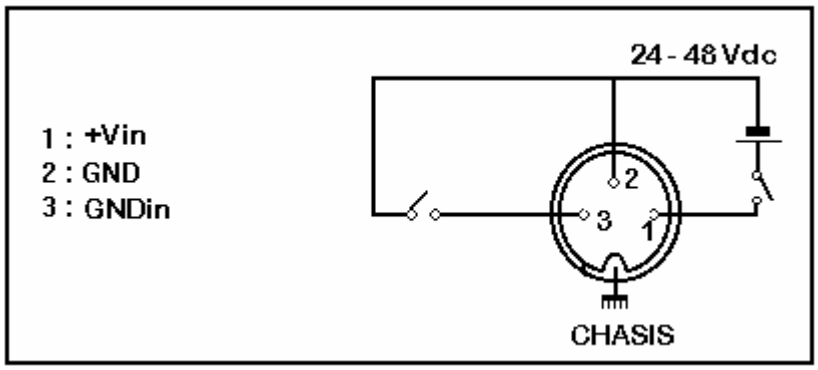
The monitor has a degaussing device incorporated which operates automatically when the equipment is switched on. It can also be activated manually from the front panel controls.

If the monitor is changed of location, some colour impurities may occur due to the variation of the earth magnetic field. This problem disappears by activating the degaussing circuit with the DEG key.

During the time this operation last avoid placing near the monitor items which have magnetic information such as: tapes, cassettes, cards, etc.

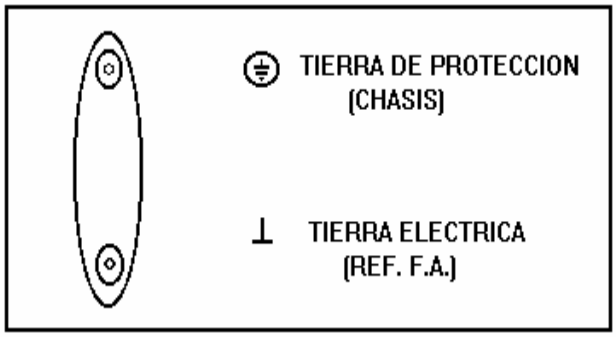
1.3.5. Tally Lamp

This lamp, located on the monitor´s front panel, can be activated with voltages within the range + 24V - + 48 V. or by closing of the contacts 1 and 3 of the connector located in the rear panel. (see figure)



1.3.6. Ground Terminals

There are two ground terminals: protective ground and electrical earth or ground from the power supply. They are normally connected by means of a metal jumper, but they can be isolated one another by eliminating jumper, in case it is necessary to avoid hum pickups due to the installation.



1.3.7. Remote Control Connectors (RS-485 Interface)

They are located at the rear of the video unit. The connectors, in loop through configuration, are prepared for connection of the *KROMA* RK-5400 remote control. These connectors are also useful for to update the futures software versions.

Configuration:

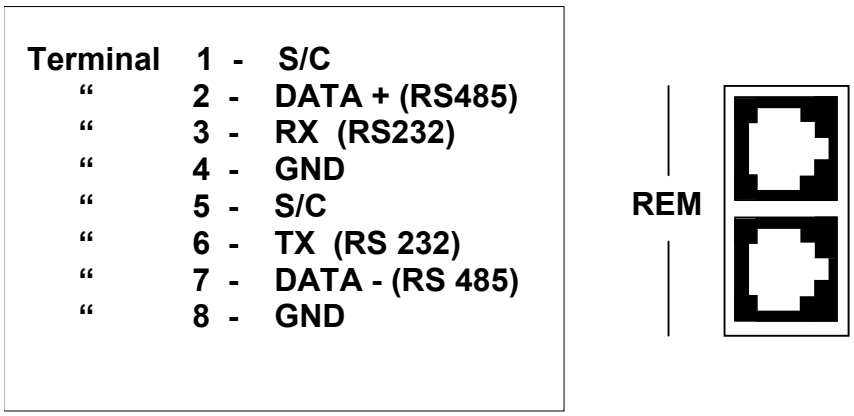


Figure 1

2. INPUTS SELECTION

2.1. CCVS KEY

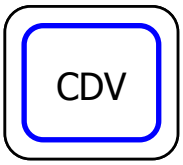
Key for the selection of one of the available composite inputs A , B y C. (C input is possible if the SYNC key is in the OFF mode).

The first time that is pressed appears the current and in the second time will switch the input at following. The number of states will be of 2 or 3, relying on the state of the SYNC key. When this key has been pressed will appear the message:

CCVS X

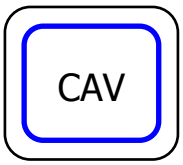
that it will disappear lapsed a few seconds, or by mean of the ESC key.

2.2. CDV KEY



Key for selection of the signals applied to the vídeo digital inputs S1 and S2**.** Upon pressing this key it will appear the message: S1 or S2, it will disappear automatically a few seconds after the key-press, or when you press the ESC key.

2.3. CAV KEY



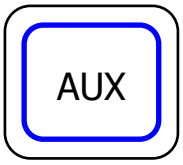
Similar operation to the previous cases, but for selection of inputs in analog components: RGB or YPrPb.

Upon pressing this key it will appear the message:

RGB or YPrPb

that will disappear automatically a few seconds after the key-press, or when you press the ESC key.

2.4. AUX KEY



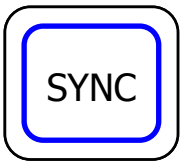
Similar operation to the CCVS Key, in this case, this is the key for the selection of the video signals AUX RGB and AUX DEC. When the selection is AUX RGB the signal applied to the BNC connector, in the front panel of monitor drives simultaneously to the three guns (R G B) of picture tube therefore we will see a blanck and white image.

Upon pressing this key it will appear the message: **AUX RGB or AUX CCVS**

that will disappear automatically a few seconds after the key-press, or when you press the ESC key.

3. AUXILIARY FUNCTIONS

3.1. SYNC KEY



Key for the selection of internal or external sync. However this function can be enabled by programming this option in sub-menu. In this case the input CCVSC will be selected with the CCVS key, as a third composite video input.

After pressing this key, will appear the following messages:

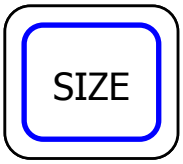
SYNC: INT or SYNC: EXT

or

SYNC-KEY OFF

The message disappears automatically from the screen 4 seconds after the last key-press or when you press ESC.

3.2. SIZE KEY



Key to select between overscan, normal size and underscan reduced size at 95%:

This selection is possible, as much being programmed the monitor with an aspect ratio 4:3 or 16:9. After to press this key, will appear the following messages:

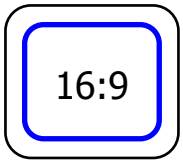
SIZE: NORM 4:3 or SIZE: U/S 4:3

or

SIZE: NORM 16:9 or SIZE: U/S 16:9

The message disappears automatically from the screen 4 seconds after the last key-press or when you press ESC.

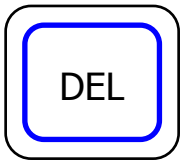
3.3. 16:9 KEY



This key allows to select the aspect ratio 4:3 or 16:9.When this key has been pressed, it will appear the message:

SIZE: 16: 9 SIZE: 4: 3

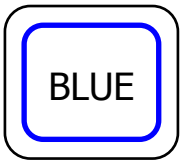
3.4. DEL KEY



Key for selection of the horizontal delay, vertical delay or both ("PULSE CROSS")
It allows to control the presentation of sync pulses in the screen, switching between:

NORMAL → H DEL → V DEL → H + V DEL In model A12

3.5. BLUE KEY

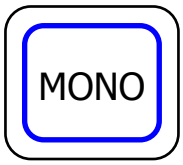


It operates under BLUE ONLY function ,when the selected video input is composite (CCVS). By means of this function the video signal corresponding to the blue color will be applied to the three guns of the picture tube.

The associated message to this key will be:

BLUE ONLY ON or **BLUE ONLY OFF**

3.6. MONO KEY



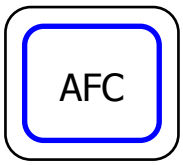
This key has 3 different states, that could switch in cyclic mode::

COLOUR: MONO, AUTO or **FBW**

Mono: In this position it is suspended the chrominance signal and presents/displays the filtered luminance.
Auto: In this case, the monitor presents color images, if the signal has "BURST"

FBW: Position “Full Band Width”. The monitor will present only the luminance without filter with all the complete band.

3.7. AFC KEY



This key switches in cyclic mode between fast or slow time constant in the capture of synchronism H.

When this key has been pressed, will appear the message:

AFC: FAST or **AFC: SLOW**

3.8. DEG KEY

Key to manually degauss the CRT of the monitor.

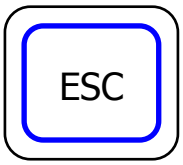
Indirect action by means of relay microprocessor controlled

- Time of activation: 4 seconds.

Minimal time for the next activation after the degaussing > 5 min.

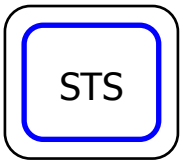
After to press this key, will appear the following messages: **DEGAUSSING**

3.9. ESC KEY



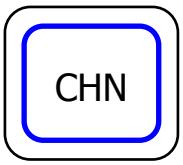
This key will allow us to return to previous menu and interrupt procedures. When you return from the previous menu or shown some of the controls (BLK, CNT,...), if any parameter has been modified,it will save in static mode in the working memory.

3.10. STS (Status) KEY



This key allows the programming of the internal parameters of the monitor through menus. In the Status menu. This key operates in recurrent mode. When pressed, are displayed the configuration parameters or return to the main menu.

3.11. CHN KEY



It allows to change the associated audio channels to the SDI inputs, when the monitor incorporates this option with desembedded audio extractor.

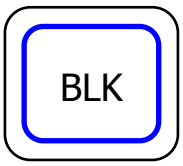
Pressing repeatedly it selects the 4 channels: **CHN 1-2 or CHN 3-4**

3.12. VOL / MUTE KEY

When the monitor has included the Digital option with audio, once this key is pressed the audio signal is inhibited, indicating this situation by means of a symbol located on the screen bottom left hand size. The presentation of this symbol, can be deactivated in the PROG. FUNCTION menu.

4. COMMAND KEYS FUNCTION

4.1. BLK KEY (BLacK Level / Bright)



By pressing of this key from the normal mode, a message appears in the screen, indicating the current value of the black level, (Brightness) and if the value has been calibrated or not.

BLACK LEVEL 00 CAL or BLACK LEVEL +10 UNCAL

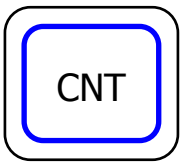
starting from this instant are entered in the modification mode of this value by means of the ORE^2, increasing in the clockwise and decrease in counterclockwise.

The maximum value of BLK is of +20 and the minimum is of -20.

If being in this mode of work, the CAL key is pressed , the value of the black level is updated regarding the calibration value (see Appendix A), also is possible to reach the calibration value by pressing of the ORE.

The exit from this mode of control of Level of Black (Brightness), to mode normal (without messages in screen) it is performed: automatically, after 4 seconds with no press any key or manually by means of the ESC key.

4.2. CNT (CONTRAST)



Similar behavior to the described above, for BLCK but concerning to the gain of the final video amplifier (Contrast).

The messages that could appear are:

CONTRAST 00 CAL or CONTRAST -12 UNCAL

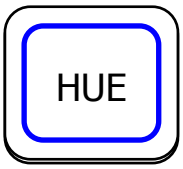
4.3. SATURATION/COLOUR

Similar behavior to the described above, for CNT but concerning to the gain of the decoder´s chrominance amplifier.

This key acts on two parameters. If the input signal active is NTSC, the system internally will select the saturation of NTSC. For any another system will adjust the same parameter.

SATURATION 00 CAL or SATURATION +8 UNCAL

4.4. HUE/TINT (Only in NTSC)



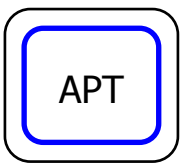
Similar behavior to the described above, for CNT but concerning to the chrominance phase regarding to the *burst* in the decoder. Because is a parameter of the NTSC system will only be permitted their modification when the active signal corresponds to this system.

The messages that could appear are:

HUE 00 CAL or HUE -3 UNCAL

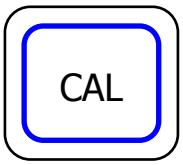
NO AVAILABLE (if the connected signal is not NTSC)

4.5. APT (APERTURE)



It allows to control the transitory response of the luminance channel of the decoder in order to enhance, if it proceed, the "fine"details of the image, or attenuate the possible noise in this band (2.8 Mhz/ NTSC- 4 Mhz/ PAL approximately).

4.6. CAL KEY



Two operating modes:

1. When CAL is pressed, being in one of the modes: BLCK, CNTR, APT, HUE or SAT,the behavior is the described already.
2. The monitor utilizes different menus on those that there is diverse active options.. with the ORE select the option and with the CAL key executes the selected option.
3. In Calibración of values in set-up manual..

5. INDICATORS

5.1. UNCAL LED

This LED is keep activated (Red LED lit) if any of the variables:BLK, CNTR, APT, HUE or SAT, has a different value of the calibratión.

In order to proceed to the calibratión of this variable, see previous paragraph, and the behavior of the CAL key with the modes BLCK , CNTR, APT, HUE or SAT.

6. MENU OPERATION

The STS key shows the menu of STATUS through the which gives up pass to all the sub-menus, which they allow to configure all the parameters and functions from the monitor.

6.1. STATUS MENU

When the STS key is pressed from the normal manner of operation, the following menu will appear:

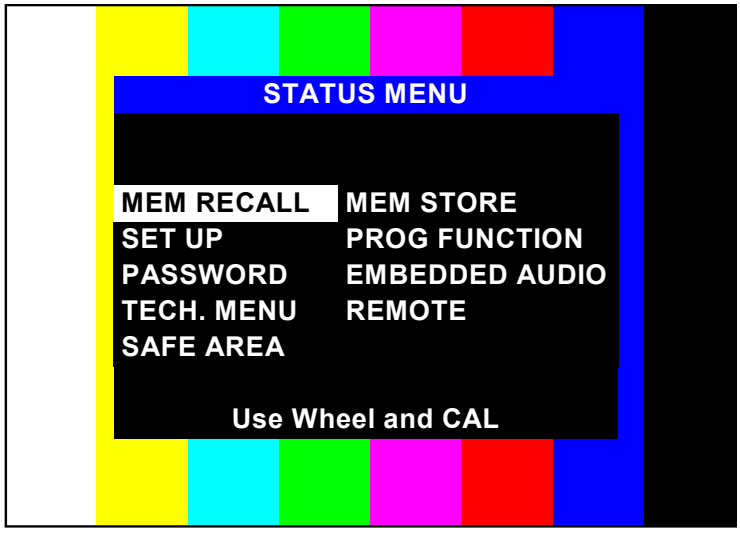


Figure 2

The selection of the different options is carried out by means of the C.O.A. (Optical Rotary Encoder), and in order to activate the function we will press CAL.

6.2. MEMORY RECALL MENU

It allows to load in the working memory. the content of whatever of the existent memories in the monitor (USER 0, USER 1, USER 2 , USER 3 or SYSTEM).

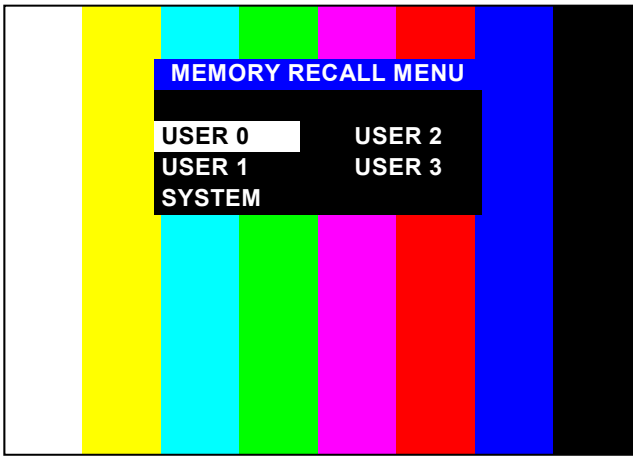


Figure 3

In order to select the memory that is wanted to recover one must ,press CAL in order to transfer the content as active value.

6.3. SET UP MENU

From this menu it could be modified and adjust the parameters of the GRAY SCALE (LL/ HL and intermediate values) and the CALIBRATION values of BLCK, CNTR, SAT, HUE, VOL and APT.

When selecting this menu will appear the following sub-menu:

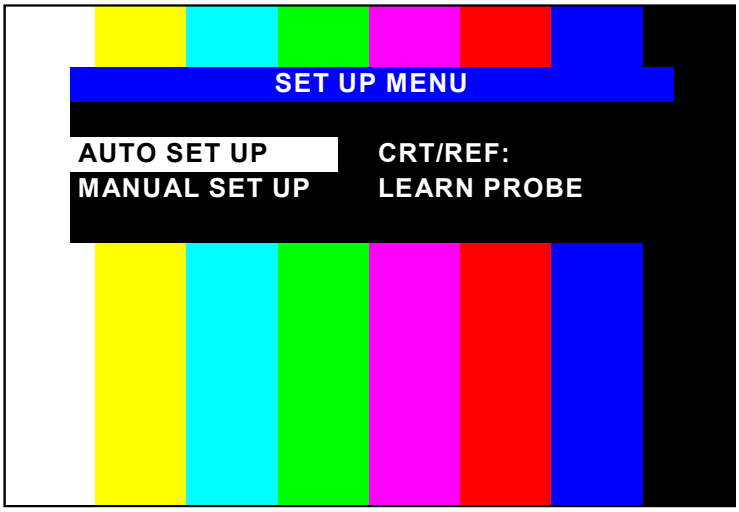


Figure 4

6.3.1. OPTION: AUTO SET UP

It can be carried out, by means of the set Generator/ Analizer KROMA DG5400 and probe AK4400X50 especially designed for this use.

When CAL key is pressed, will appear a flashing message in the lower line, requesting the technical password. If the password is correct, the system will permit pass to one of the auxiliary inputs, (AUX RGB or AUX CCVS). In the same menu, will appear the message "SELECT INPUT: AUX CCVS however; you could select any of the available inputs by pressing the keys associated to the inputs (AUX, CCVS, CDV).

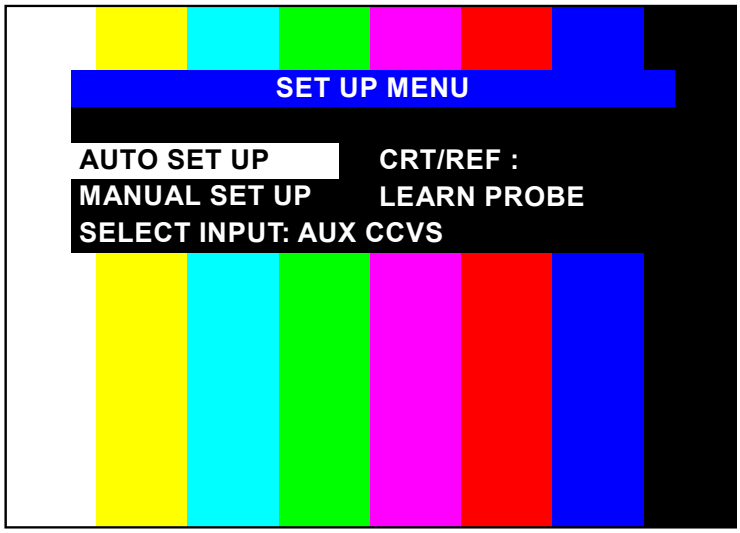


Figure 5

In order to obtain an accurate adjustment, the monitor carries out a different adjustment for the digital inputs. For this purpose select one of the digital inputs (S1 or S2) and the system will carry out an independent adjustment of any another input. In this mode, when you change a digital input, the system will program the values of HLs and the LLs, corresponding to the digital adjustment. Consequently, will note a better response of the monitor.

Independently of the type of input selected, this should coincide with the DG54xx.

Once selected the inputs signal and the phosphor reference, press the key CAL in order to start the adjustment. If during any step you doubt of any parameter, you could stop the process by pressing ESC.

Next appears the message: "PUT PROBE & PRESS CAL", put on the optical probe on the center of the screen and fix it to the center of the window that it will appear after a short time. Starting from this moment and during the adjustment time, don´t move the probe and not disconnect the A.S.U connector. because it will block the system owing initiate again the monitor. However, their parameters won't be affected.

The adjustment is finished when appears the message: "Ok AUTO SET UP SUCCESSFULLY."

Once completed with success the adjustment, also there will be exist auto-calibrated in the working memory. If you desire to keep the adjustment you could use one of the four memories (See MEMORY STORE MENU).

The adjustment procedure informs about several events that don´t allow carry out it correctly. The messages are the following:

· "CANNOT CONNECT":

· "UNCOHERENT DATES":

· "Not CONVERGED": it could be originated for diverse causes, the most common is the input level of the signal. Check the termination switch (HP/75 Ω).

The conclusions reached are:

- White D 6500 ± 200 ºK or another optional (see SEL CRT/REF)
- 0.5 NIT for window signal with 10% APL
- 90 NITS for window signal with 100% APL

6.3.2. OPTION : CRT/REF

With this option you will select a group of parameters as reference for an Auto Set Up, or to specify the group that will be modified when you select the option LEARN PROBE.

With the CAL key, you will select in cyclical mode ,one of the 4 groups of parameters. Three of these are identified with the model of a C.R.T. and one of them has been reserved for the user.

6.3.3. OPTION: LEARN PROBE OPTION

With this option you will store some characteristics of colorimetry in the meter in order to adjust other monitors in the same conditions. For example, if the conditions of brightness of your study modify the subjective perception of the color of the monitor, or you prefer a tendency toward a determined color, then, you modify manually the characteristics of a monitor in order to take it as reference. Next, you utilize one of the four groups of parameters with the option CRT/ REF, with preference, the group of user (USER) and select the option LEARN PROBE with the key CAL.

The operation of this option is similar to AUTO SET UP. You will have connected a DG5400 generator with specific patterns, in order to make the learning. Likewise ,it will request you a technical password and will also to put the measuring probe on the screen and press the CAL key in order to start the process or ESC in order to stop it. Due to the risk of data loss the operation, this should only be carried out for technical personnel. This operation is longer than the AUTO SET UP and it is essential don't move the probe during the process.

6.4. OPTION: MANUAL SET UP

When you select this option MANUAL SET UP from the SET UP menu, you would be able to adjust all the values of parameters of monitor ,as much the current values as the calibration values. ie: CNT, BLK, SAT, VOL, APT and HUE; as well as the parameters LL´S and HL´S or grey scale, and the geometry.

Once selected this option will request the technical password with four digits code:

If correct, we will enter in the following menu:

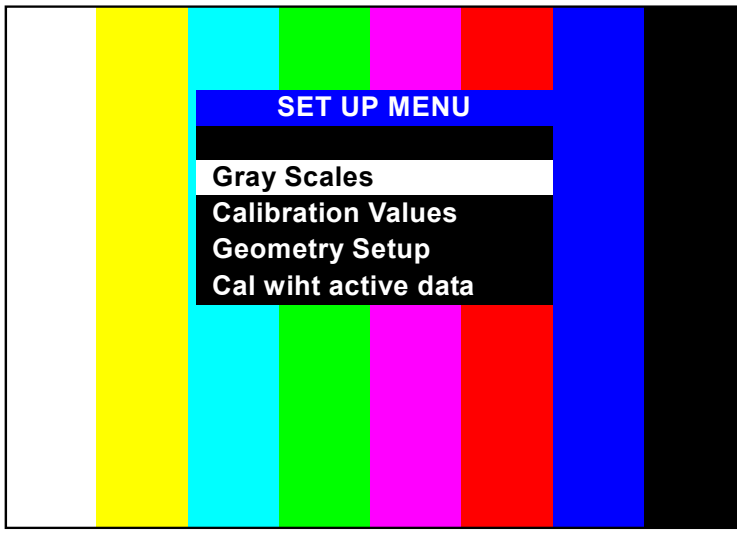


Figure 6

6.4.1. OPTION: MENU GRAY SCALES

By selecting this option,you may carry out a manually adjustment, of the current biasing levels, of the cathode of the CRT (LLs) and the gain of the RGB video amplifier, (HLs).

The new menu will be the following:

Figure 7

Once selected one of the options the symbols (_ _ _) located in the right hand of the lower part of the screen going to indicate the value of the state of the variable. If the CAL key is pressed again then will be stored the last current value, the dashed lines appear again and one may select another variable.

By the other hand, if ESC key is also pressed, will store the modified value of the variable but it will return to the previous menu.

6.4.2. OPTION: MENU CALIBRATION VALUES

In this menu we could modify the associate parameters to the primary controls of the monitor.

The menu from wich one we could modify the parameters is the following:

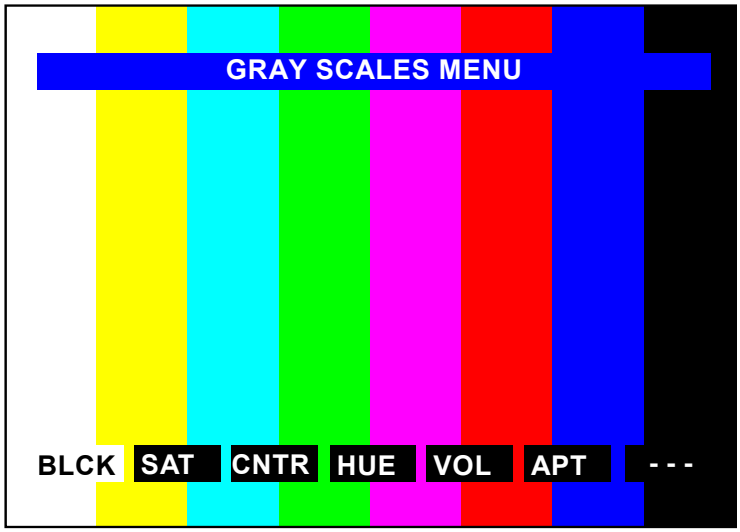


Figure 8

The operation is the same as in the previous case, the dashed lines, of the right hand in lower part of screen, when pressing CAL, they will give the values of the variable. However, there are parameters with some particularities that are kept in mind:

1. **The Saturation (SAT):** The monitor detects if you are viewing a NTSC system signal, in whose case will modify the associate parameter to this system. In any other case always modifies the other parameter. But anyway both parameters represent the saturation.

2. **The Volume** (VOL): Although functions exist associated to the VOL key, the system of control won't give you access to this variable, except for the monitor carries incorporate the audio option.

3. **The Hue Option**: It will only has access, if the active input signal is NTSC.

4. **The Aperture (APT):** it will only give access to modify their value if the monitor incorporates the option.

5. Option: GEOMETRY SET UP

By means of this menu could be modified the parameters in relation to the format of the picture, and another with more technical content. The menu through the one will be able to carry out the change is the following:

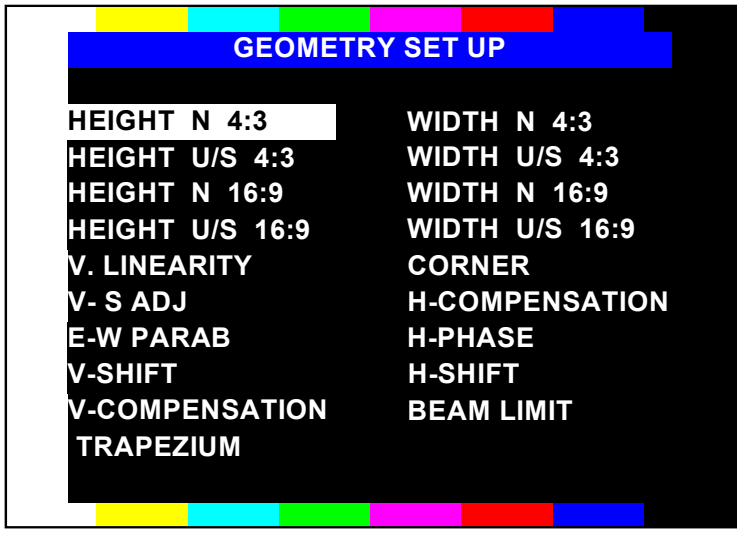


Figure 9

In order to modify a parameter, this will be selected, with aid of the ORE, and we pressing CAL key,then will appear in the lower line of the menu: the name and the value of the parameter, at the moment it is updated in the monitor. In the same way that in the previous menu, the operation of both keys CAL and ESC are the same.

This option, provides access to the adjustment of all the variables involved with the geometry alignment of the monitor.

Option: CAL WITH ACTIVE DATA

With this option you will convert all the current values of the parameters, in calibration values,this option is very appropriate after carrying out an adjustment and before of saving the data in one of the user memories.

During the process of calibration will appear in the 2nd line of the menu, MANUAL SET UP MENU the message: "UPDATING."

6.5. OPTION: CHANGE PASSWORD MENU

This new option allows us to change the access password for the several menus. Selecting "PASWORDS", it will get the following menu:

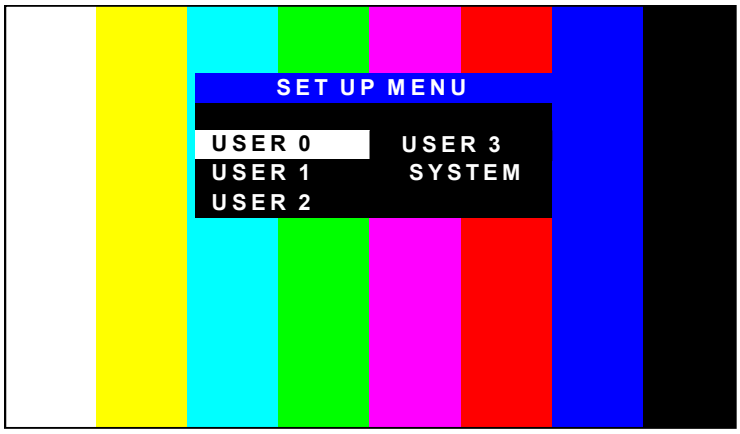


Figure 20

Once the "USER" is selected, the menu that allows to change the technical key is:

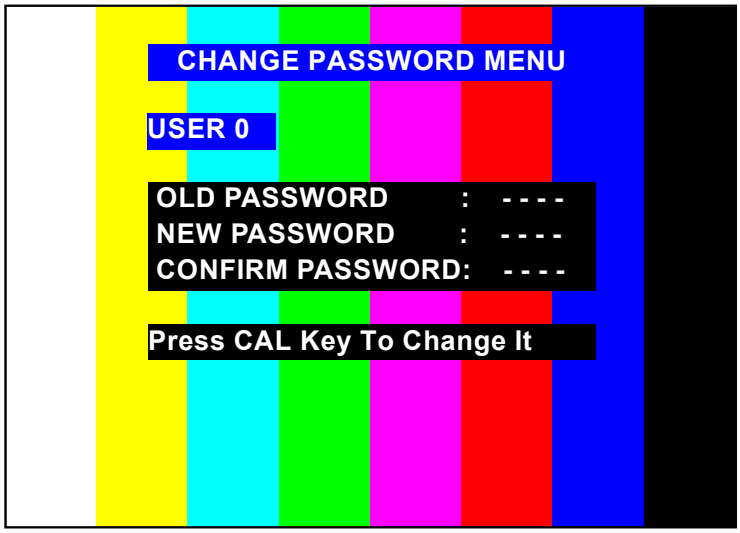


Figure 31

When this option is selected the system presents/displays a "password menu". where the key/code can be chosen to change individualized for each user, (By defect all the monitors leave factory with the key/code: 1111) next, it requests the new key/code of access and a confirmation of this one.

In order to indicate in that phase of the process is, the four dashed lines (----) of the numerical clave code, the password will be flashing. Also, in proportion to we introduce the characters the scripts they are substituted for asterisks (****).

They are considered forbidden all those password that conatin the "0".

If it has been made correctly, the monitor will show the text "OK," in the last line, if not, it will show "ERROR" and it will return to the main menu.

6.6. OPTION: TECH. MENU

This menu consist of options reserved to KROMA´s technicians, updatings and specific operations.

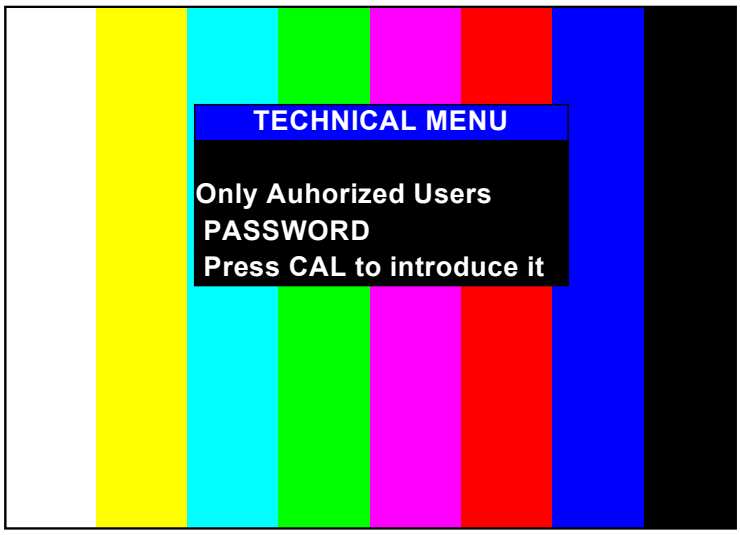


Figure 12

6.7. Option: SAFE AREA MENU

We understand for “Safe Area” a closed frame that defines an area. The menu where you will find options in order to configure the "safe area" it is the following:

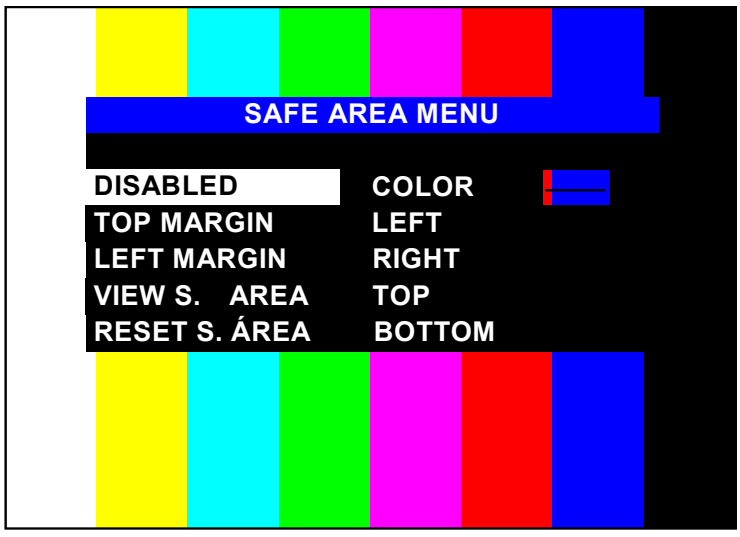


Figure 13

Next they are detailed each one of the options of the menu.

6.7.1. Option: DISABLE

In alternated mode, you could activate or disable the "Safe Area" by pressing the CAL key.

There are several conditions so that don't appear the "Safe Area":

1. Message "NO SYNC" active.
2. Identification number of monitor activated
3. Any message on the screen.
4. Be modifying menus.
5. Incorrect programming. Use the RESET S.A. option in order to begin the "Safe Area".

When they are activated so much the "Grid" as the "Safe Area", it will have priority the "Safe Area."

6.7.2. Option: TOP MARGIN

The option TOP MARGIN determines the distance between the superior margin of the image and the superior border of the frame (option: TOP). This parameter permits a more precise adjustment of the frame.

With aid of the ORE select TOP MARGIN and after press CAL key, it will appear the "Safe Area" with the last established conditions. Move the ORE clockwise and couterclocwise in order to adjust the frame in the desired position. Once determined their position pulses ESC in order to validate and store returning to the SAFE AREA MENU.

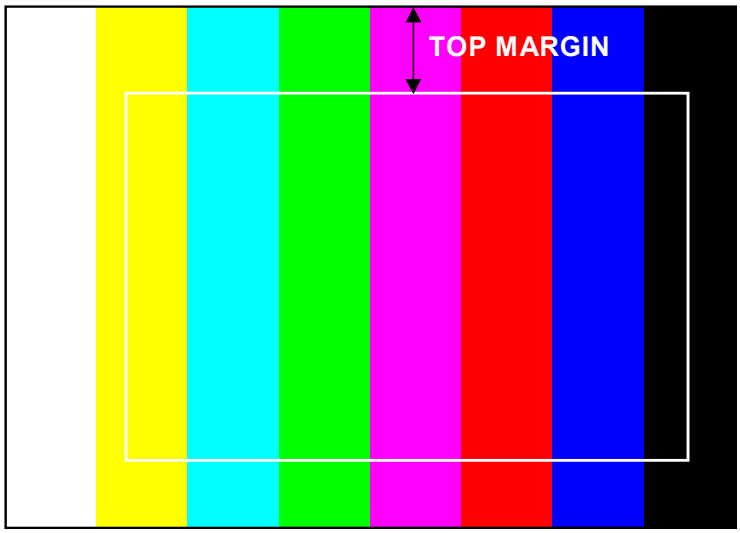


Figure 14

6.7.3. Option: LEFT MARGIN

In the same way as the previous option, it allows to modify a parameter of fine adjustment of the "Safe Area." In this case, it is the distance between the left limit of the image and the frame.

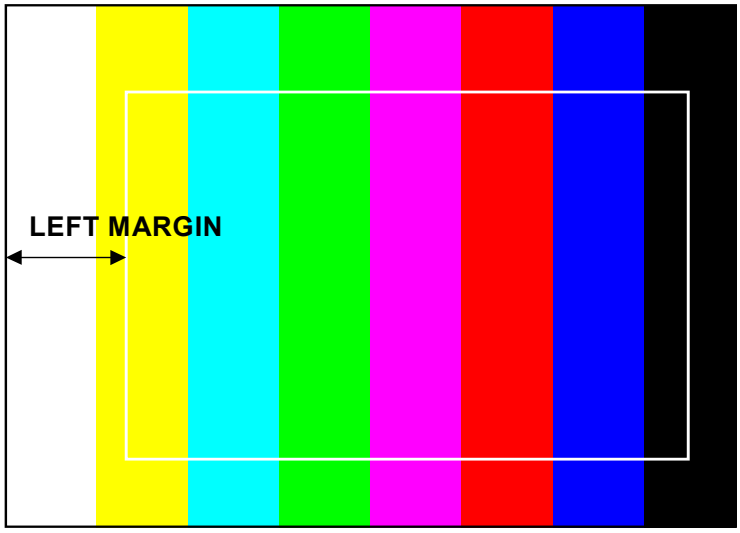


Figure 15

The procedure of adjustment is identical to the one before:

6.7.4. Option: COLOR

It is possible to modify the color of the "Safe Area" for matching the image to the background. Pressing the CAL key, we could choose one of the 8 colours. Associate to the option COLOR, on the right hand there is a window in order to see the chosen color.

6.7.5. Option: VIEW S.A.

It allows to make a preliminary viewing of the "Safe Area" during some seconds. Later on, go back to the menu: SAFE AREA MENU.

6.7.6. Option: RESET S.A.

If there is any problem with the form of the "Safe Area" or you want to start of some well-known conditions, then you select the option and press CAL, so, you will see the "Safe Area" during some seconds and you will memorize the initial conditions. You starting from this instant could modify the parameters in order to adapt the "Safe Area" to your convenience.

6.7.7. Option: LEFT

By selecting this option and pressing the CAL key appears the "Safe Area," with aid of the ORE you could move to the left and to the right, the left side of the frame. When you had selected its position, press the ESC key in order to store, and return to the menu: SAFE AREA MENU.

6.7.8. Option: RIGHT

With this option you could move the right side of the frame, toward left and right side.

The procedure of adjustment is identical to the LEFT option.

6.7.9. Option: TOP

With this option you could to move the upper side of the frame towards up or down side.

The procedure of adjustment is identical to the LEFT option.

6.7.10. Option: BOTTOM

With this option you could move the lower side of the frame towards up or down.

The adjustment procedure is identical to the LEFT option.

The adjustment for these last four options is showed in the following figure:

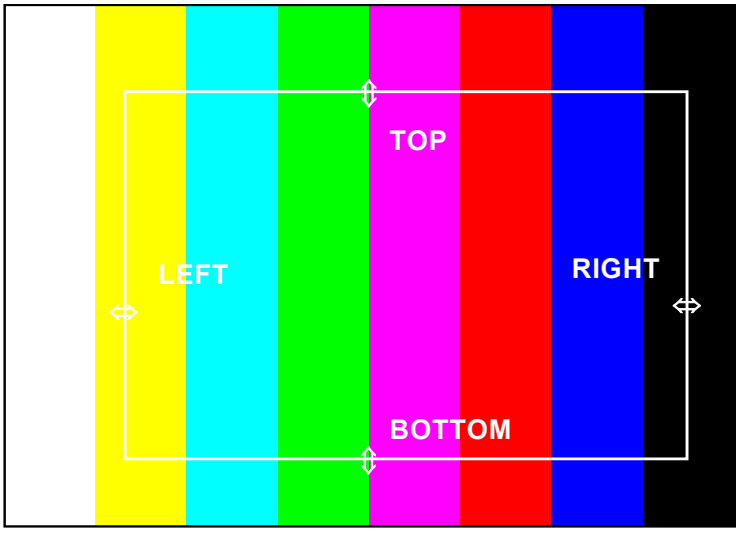


Figure 16

6.8. MEMORY STORE MENU

It allows to store in the working memory, with the content of any of of the existent memories in the monitor (USER 0, USER 1, USER 2, USER 3 and SYSTEM).

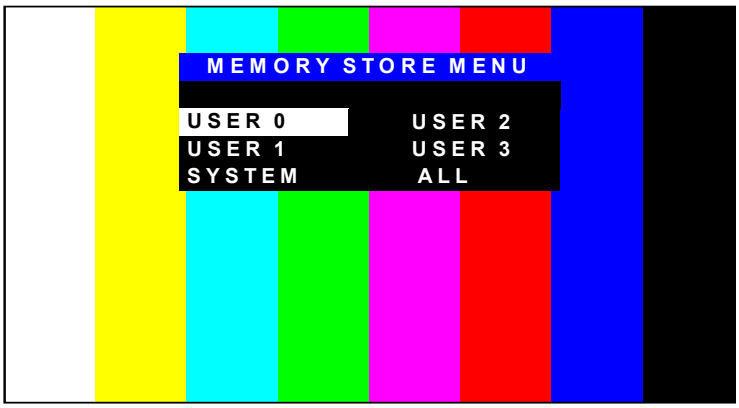


Figura 17

We selec the memory, the one we want to store, and we press CAL. In all the memory the technical key is asked for and while it stores the values appear message STORING in a "Flashing" way.

The mode ALL will allow to store all the data in all the user memories, at one time.

6.9. Option: PROG.FUNCTION

In this menu some of the actions of the monitor can be configurated. The menu configuration will have the following aspect:

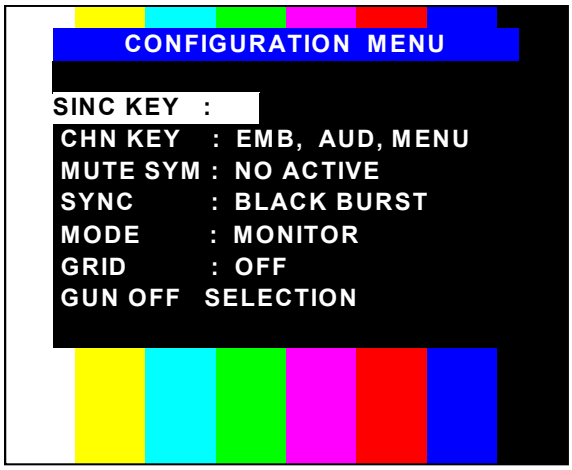


Figure 48

6.9.1. Option: SYNC KEY

It allows to program the SYNC key in order to switch between internal and external sync or disable it. Thereby, the INPUT and CCVS keys, could be switch to CCVSC input, making possible that the external sync input becomes an composite video input.

6.9.2. Option: CHN KEY

By means of this option the audio channels are configurated, when the monitor is equipped with the digital inputs module with embedded audio. By selecting the CHN KEY option it is acceded to the following menu:

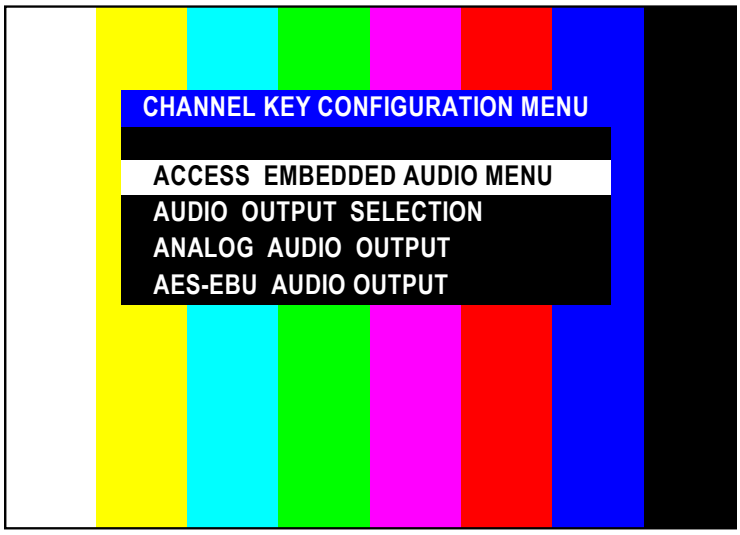


Figure 59

ACCESS EMBEDDED AUDIO MENU
Making this selection, it is transferred to the CHN key the AES-EBU or Analog channels control by means of the optical encoder and CAL Key.

AUDIO OUTPUT SELECTION
With this selection CHN key changes simultaneously the ANALOG and AES EBU output channels, chosen the EMBEDDED AUDIO menu.

ANALOG AUDIO OUTPUT
As in the previous case, the CHN key changes in this case only the channels with ANALOG output.

AES-EBU AUDIO OUTPUT

Fixing this selection only the channels with AES-EBU output, pressing CHN can change.

6.9.3. Option: MUTE SYM

When we select this option, the CAL key allows to activate and to disactivate the mute symbol displayed on the screen when pressing VOL/MUTE.

6.9.4. Option: SYNC

This option allows to select the level of external synchro. It can decide by a Black burst signal or on a standardized synchro signal of $V_{pp.}$

6.9.5. Option: MODE

By means of this option the operation way can be chosen:

MONITOR: Operation according to the specifications defined at the beginning of the manual.

TV: In this way some of their specifications are modified adapting to the own TV receiver characteristics. In this case the chrominance signal edges are heightened and the luminance bandwidth is reduced to 5 MHz.

6.9.6. Option: GRID

This option allows to generate a chess of white squares on the picture. Their functionality is an approach in order to hide partially pictures with a reserved content .

Once selected this option with the ORE, pressing CAL key, the window will be activated changing to blue color. From this point, and using again the new optical encoder, it can be chosen the three sizes of the square (2, 4, 8). Finally the function is activated with the CAL Key.

As difference from other options this can not been configured as static, for this reason have to activate it every time when you switch on the monitor or after it has been deactivated by means of ESC.

6.9.7. Option: GUN OFF SELECTION

This option can eliminate each one of the guns from the image tube. Then, it will show following menu:

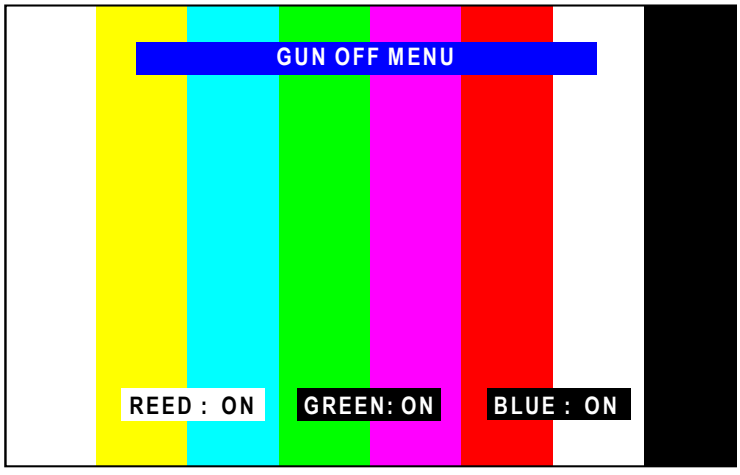


Figure 20

With the ORE the gun is selected and pressing CAL key the corresponding gun will be disactivated. Never can be suppressed more than two guns simultaneously.

6.10. Option: EMBEDDED AUDIO

In this menu we obtain data/information relative to the audio that is inserted in the signal, in this graph we can see the number of channels occupied by group and if these are stereo or mono according to the color (Reed - stereo & Green - mono).

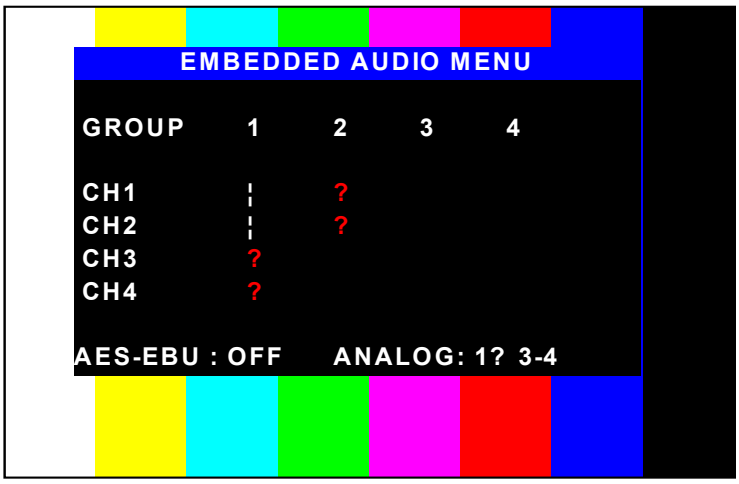


Figure 21

The AES-EBU & ANALOG output in the lower part, it can be selected with the slider moving the ORE. Pressing "CAL" Key we will be able to select the group and the wished channel.

6.11. Option: REMOTE MENU

In this menu appears two options, one of them is common to all the versions after to 1.9 and the other is associated to particular software versions. The menu that goes to the control related to the remote control is the following one:

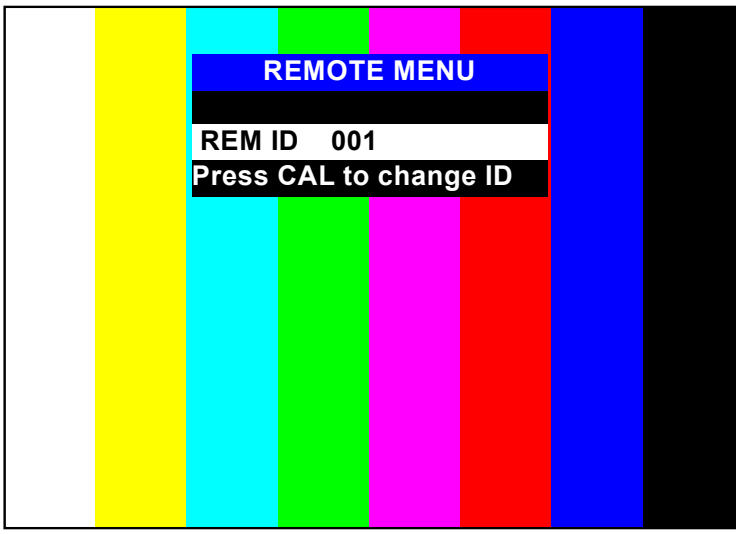


Figure 22

6.11.1. Option: REM ID

It allows to assign to each monitor an identification number that it will be recognized for the remote control, when it is activated.

By pressing the CAL key in this option, it will appear three dashed lines and the identification number of the monitor, the system wait until you introduce the three last numbers of the new identification. If you want to stop the operation, you will press the ESC key.

Once carried out this operation the monitor is identified with this number, for all the remote control functions. When the remote control is activated, the monitor keeps the keyboard functions, but it has preference the remote control. (See remote control RK5400 information).

6.11.2. Option: REMOTE MODE

This option is associated to specific "software" version. When the monitor is selected, it is converted in a remote control. If the monitor is not prepared in order to behave as remote, when you press the CAL key on this option, it won't have effect.

Because of the explanation of this option it is associated to a "software" version, it will be included in a separated appendix.

6.12. Option: CONFIG VALUES

This option presents/displays on the screen the calibration parameters values. The appearance of this menu is the following one:

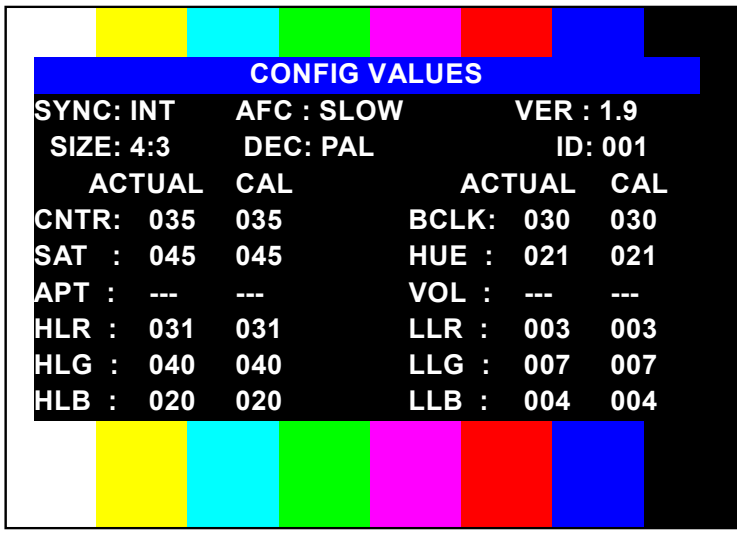


Figure 23

This graphic informs to the user about the parameters values of the monitor, along with other informative datas.

In order to have access to this menu the STS Key must be pressed twice consecutively.