MEGALOOK

English Manual

Version: 1.00

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1 Description

MEGALOOK is a digital satellite-TV and TV-instrument with a spectrumanalyzer. MEGALOOK is developed and produced in Sweden by Emitor AB and helps professional users to do exact adjustments and maintenance of satellite dishes and of cable TV and terrestrial networks.

Since MEGALOOK is microprocessor controlled, all important functions can be controlled by a controlknob and a few controlbottons. The basic functions of the instrument are easy to learn and even beginners can start using it after basically a few minutes of instructions.

1.1 Digital- and analogue measurement data

TV-picture, a spectrum showing the entire frecuency band (or parts thereof) or digital measurement data are shown on a 4,5" black and white (B/W) monitor. Analogue satellite TV channels can be tuned in and watched (Multistandard Video – PAL, NTSC and SECAM) and soundfrequencies between 5.5-8.5 MHz can be tuned in and listened to.

MEGALOOK has a spectrumfunction that shows the frequency band 2-2150 MHz. This function makes it very easy to detect satellite signals. The spectrum can be expanded to make more precise adjustments possible (maximum “zoom in” is 250 MHz) or to do a cross-polarisation.

The instrument has a high resolution and accuracy. It presents measuring values with $\pm$ 2dB at room temperature, about 20°C. The tuning-in of a frequency is made by the controlknob (1step = 1MHz) and the tuned frequency is shown on the B/W monitor or on the LCD display.

By just pressing a few buttons on the right side of the instrument it is very easy to switch between TV-picture, spectrum- and digital mode. In digital mode the MEGALOOK presents digital information as BER (Bit Error Rate), constellation diagram (QPSK and QAM) and S/N (Signal/Noise ratio) for both DIRECTV, cable-TV, digital terrestrial TV and DVB format. The MEGALOOK also has a NIT function which is described below (see the NIT function).

1.2 NIT function

NIT is an abbreviation for Network Information Table. NIT is a part of the DVB standard which almost all satellites are using. MEGALOOK can by its NIT function identify a satellite and present its operator and orbital position add in some cases it also presents the name of the adherent TV-and radio channels.

1.3 Memory

MEGALOOK can save both spectrum pictures and frequencies (from both digital and analogue transponders). When performing measuring a saved spectrum picture can easily be compared with a spectrum picture from the current measurement. This facilitates an easy identification of the satellite and gives the possibility to check that the received signal level is optimal.

MEGALOOK offers the possibility to perform measuring on up to 10 saved frequencies at the same time. These are individually programmed with 13 or 18V and 22 kHz on or off. The chosen polarization, 13 or 18V and 22KHz on or off is indicated on the LCD display.

The instrument features circuitry protection to prevent short circuits during connection of the LNB.

1.4 DiSEqC compatibel

The DiSEqC-function controls all DiSEqC-accessoires (switches, LNB's etc.). The function is easily implemented and very flexible to use. Note that MEGALOOK can run DiSEqC actuators. It can be set-up for running DiSEqC 1.2 (these are the most common DiSEqC actuators), SatScan (Nokia) and SatSelect (Triax).

The MEGALOOK is powered by a built-in, rechargeable battery. The battery is recharged by the either the enclosed battery charger or the car-adaptor. Battery-status is shown on top of the LCD-display (in shape of a battery).

Despite all its functions the MEGALOOK is very light and flexible, it only weighs about 7kg including battery and the enclosed carrying-case.

DiSEqC is a trademark of EUTELSAT

2. Operation

In this section it is described how the instrument is operated.

2.1 Unpacking

Start with unpacking the instrument from the carton in which it has been transported and check that besides this manual the following items are included.

1. 1 pc MEGALOOK instrument
2. 1 pc Nylon carrying case with shoulder strap
3. 1 pc Power supply 220V/13,5V
4. 1 pc Auto Adapter cord (car charger) 12V
5. 1 pc Adapter BNC-male/F-female
6. 1 pc Adapter BNC-male/IEC-female

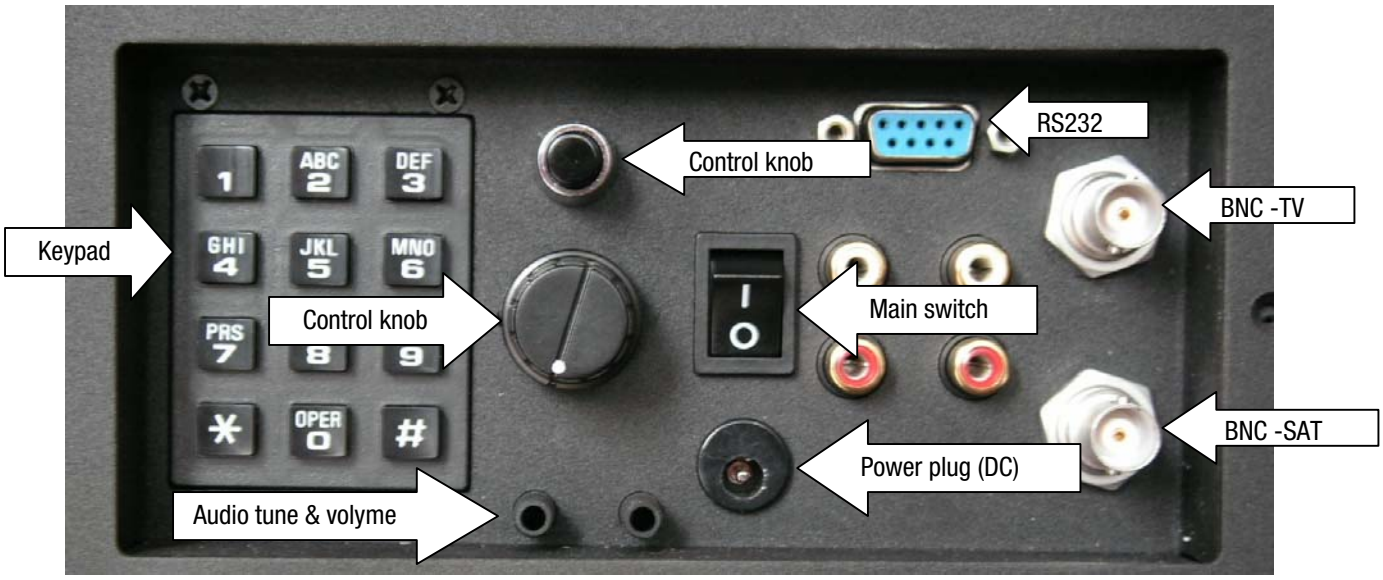


Figure 1. The instrument's control panel.
The MEGALOOK's control panel with keypad, control knobs, control button, voltage plug for charging and mains operation and main switch for switching the instrument on or off is shown in figure 1. The instrument also has a RS232 plug that is

used for connecting the instrument to a computer. Adjustments for contrast, brightness and vertical hold are located under the instrument.

2.2 Connection

Use the main switch to turn the instrument on and connect the signal source (SAT or TV) to the BNC plug. After a couple of seconds when the instrument is starting up you will be given the options SAT or TV on the LCD display. Choose the option that corresponds to the signal source that you have connected to the instrument by pressing the keypad, button no.1 for TV and button no.2 for SAT.

2.3 Maintenance

MEGALOOK is equipped with a rechargeable battery and it is important that the battery is maintained in a proper way. Recharging should be done with the enclosed car-adaptor (12V) or the power supply (220V/13.5V, 1.7A).

Note that the MEGALOOK can be operated by using the enclosed power supply during a short while but not during a long period since the instrument *is not made for* permanent operation by electric power.

When the battery-symbol in the upper right corner of the LCD-display is empty the battery needs to be recharged.

Remember that a cold battery has much lower capacity than a warm one.

MEGALOOK is designed for outdoor use in rough conditions but it should not be exposed for rain or snow as this can damage or shorten the life span of the instrument.

2.3.1 Battery check

As the MEGALOOK has been stored for some time before transportation it is important to check the condition of the battery.

To do this, turn the instrument on with the main switch (see figure 1). When the instrument starts up, the backlighting of the monitor screen and the LCD-display is turned on.

A symbol in shape of a battery placed in the upper right corner of the LCD-display shows the status of the battery. All black means that the battery is fully charged. If the symbol is empty it means that the battery is empty too.

If the battery needs recharging, use the enclosed power supply (220V/13.5V). When the recharging starts, a thermometer-scale indicating the capacity of the battery (0-100%) is shown on the LCD-display.

Note! The instrument shall be turned off when being recharged.

Recharging a fully discharged battery to about 98% of its capacity takes aproximately 30 hours.

When the battery has been recharged, the MEGALOOK is ready to be used.

3. SAT-TV mode

When choosing SAT-TV in the start up menu, the main menu shown in figure 2 will be shown on the LCD display.

Figure 2. The main menu in satellite TV mode.

Information such as the cursors position (frequency), the start frequency of the spectrum (920MHz), the end frequency of the spectrum (2150 MHz) and the bandwidth (1231 MHz) is shown on the monitor screen.

The most important measured data, the dB-value, is shown to the right on the monitor screen.
The dB-value is being updated a couple of times per second.

Functions that are controlled by the controlbutton:

A few important functions are contolled exclusively by the controlbutton and cannot be controlled by the menusystem on the LCD display. To be able to work with MEGALOOK in a smooth and easy way it is important to learn and remember the functions of the controlbutton in different modes.

In **SAT** mode start by pressing the controlbutton. The setting which is shown on the LCD-display will change from FREQ (frequency) to SPAN (frequency-span) or ZOOM. Another press of the button and the instrument returns to FREQ mode. See spectrum mode in the table below.

Spectrum mode:	**Picture mode:**	**Digital mode:**
Frecuency	Frecuency	Frecuency
Bandwidth (span)	Memory	Memory
Zoom		

Table 1. The function of the controlbutton in SAT mode.

When the instrument is in frequency mode, the cursor is controlled by the control knob. Move the cursor up/down by turning the control knob left or right.

The different functions that can be selected in the main menu in satellite TV mode are described below.

3.1 Picture mode

After having chosen a frequency by placing the cursor on it, it is easy to go to picture mode by choosing “picture” in the main menu (press button number 1).

In picture mode the frequency-position is changed by turning the control knob. If you want to switch between your saved memorypositions push the control button and turn the control knob. Press the control button to return to frequency mode. The chosen function is displayed at the top of the LCD display, for example in figure 2 frequency mode (FREQ) is selected.

Measuring on a tuned frequency can be performed in picture mode (the dB-value is shown on the LCD-display).

3.1.1 Functions in picture mode

1. Invert — Press button no. 1 to switch between normal video (KU-band) and inverted video (C-band). The selected mode is shown on the LCD display.

2. Sound — Press button no. 2 to listen to analogue audio. Audio volume and frequency (5.5 – 8.0 MHz) are adjusted with the two small knobs that are shown in figure no.2.

3. Memory — This function is used to save an analogue or digital frequency. Tune in a frequency according to your choice, for example 1720 MHz and press button no. 3, ”memory” (note that also the current setting of 13V or 18V and 22kHz on or off will be saved). Choose a memory position by turning the control knob (the number of the memoryposition, 0-99, is shown at the bottom of the LCD display) and press button no. 1, “save”.

   If the chosen memoryposition is already used for another frequency the text “Save are you sure?” will be shown on the display. If you want to change the saved frequency press button no. 1, “Yes” and if not press the the button with the sign, *, “No”, choose a new memoryposition and save it.

Figure 3. Text-editor.

Next step is to save the channel with a name, e.g. CNN. This can be done by using the text-editor that is shown on the monitor screen, see figure 3. Choose a character or a symbol by using the control knob and press the control knob to confirm. Repeat the same procedure until you have written the channel name. Use button no. 1, “delete”, to erase (one character at a time). Press the button with the sign, *, “save” when you are ready.

4. Atten — Press button no. 4 to turn the manual attenuation 15dB function on or off. The selected mode is shown on the LCD display.

0. 13/18V — Press button no. 0 to select 13V or 18V. The selected mode is shown on the LCD display.

#. 22kHz Press the button with the sign "#" to turn 22 kHz on or off. The selected mode is shown on the LCD display.

3.2 Digital mode

MEGALOOK can easily perform measuring on digital transponders (MPEG-streams). This kind of measuring serves to control and verify that an installation has been correctly performed (a "fingerprint" of the installation). It is less suitable to use to find a satellite or to adjust the cross-polarisation.

Therefore, start with finding the "right" satellite by using the spectrum-function. Check and adjust the cross-polarisation with the "Max zoom in" function. Choose a suitable transponder (put the cursor on the top of a "peak") and select function 2 in the mainmenu (in digital mode).

The so called constellation diagram (QPSK) is displayed on the monitor, in the left upper corner.

To the right of it, four "lock-parameters" and a time counter are shown. The time counter will start as soon as a digital bit stream is "locked" and it will show the "lock time".

The other measured data like the S/N-ratio (Signal/Noise ratio) and BER (Bit Error Rate) are displayed just under the constellation diagram in the shape of Bar-graph´s (thermometer-scales).

An example of a "locked" frequency is shown in figure 4.

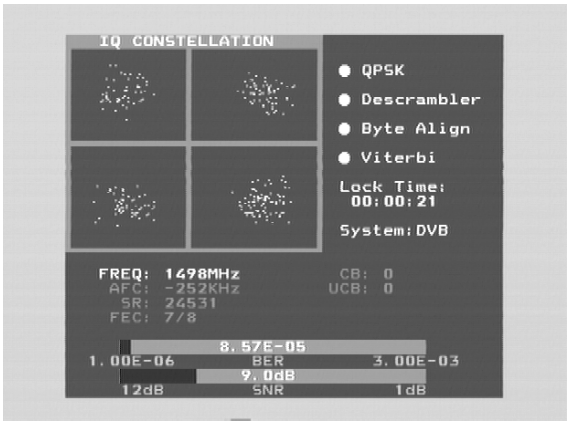


Figure 4. A "locked" frequency.

The following digital readout is also shown on the monitor screen.

Freq: The tuned in frequency.
AFC: Automatic Frequency Control -the instrument automatically adjust the frequency and tells the offset frequency from center of carrier.
SR: Symbol rate. The instrument automatically reads the correct symbol rate of the transmission.
FEC: Forward Error Correction. The instrument automatically reads the correct FEC.
CB: Corrected Bits – Bits that have been corrected in Viterbi and will therefore not be seen on the TV.
UCB: Uncorrected Blocks – Blocks unable to be repaired. This will be seen on the TV (in shape of mosaic).

3.2.1 NIT - Network Information Table

As soon as a digital transponder is found the word "searching" will appear on the right side of the picture. If the satellite is transmitting NIT information, the satellite position will appear after about 5-10 seconds (and in some cases also the name of the satellite, e.g. Astra 19.2)

Press button no. 4, "Channels" to see a list of the TV- and radio channels on the tuned transponder/frequency (see figure 5).

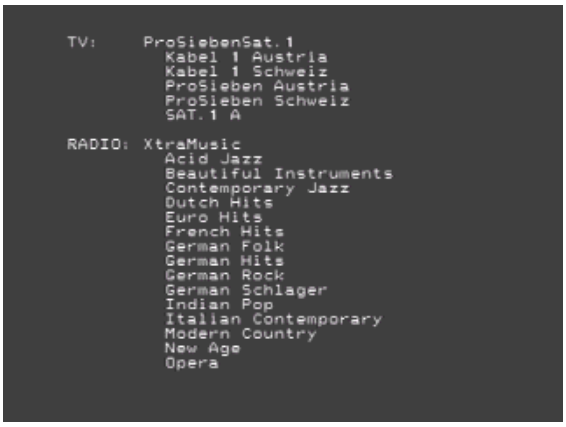


Figure 5. An example of a list of current TV and radio channels on a tuned frequency.

When performing digital installations, please notice:

- The constellation diagram is like a “charge of shot”. When there is no signal the noise, which is illustrated in the four squares, will be spread out. The better signal, the more concentrated and focused will the ”charges of shot” be.

- SNR. The Signal/Noise ratio should be as high as possible. A good signal has a S/N-ratio of 8.0 dB as a minimum.

- BER. The Bit Error Rate should be as low as possible. As the values are really small, on the other side of zero (presented as something raised to minus something), “the minus value” should be as high as possible.
  - A BER at 5.00-05 is therefore better than 9.00-04.
  - A BER at 4.00-05 is therefore better than 5.00-05.
  It can be said, in general, that a signal should be at least X-04 to be accepted.

3.2.2 Functions in digital mode

1. Search + Automatic search for the next digital transponder higher in frequency. Returns to the same transponder if no transponder higher in frequency is found. Searching is displayed at the bottom of the monitor screen.

2. Search – Automatic search for the next digital transponder lower in frequency. Returns to the same transponder if no transponder lower in frequency is found. Searching is displayed at the bottom of the monitor screen.

3. Memory This function is used to save digital transponders.

- Tune in a frequency according to your choice, for example 1650 MHz and press button no. 3, ”memory” (note that also the current setting of 13V or 18V and 22kHz on or off will be saved).
- Choose a memory position by turning the control knob (the number of the memoryposition, 0-99, is shown at the bottom of the LCD display) and press button no. 1, “save”. Free positions are designated: “pos free”.

If the chosen memoryposition is already used for another frequency the text “Save are you sure?” will be shown on the display.

- If you want to change the saved frequency press button no. 1, “Yes” and if not press the the button with the sign, *, “No”, choose a new memoryposition and save it.

Next step is to save the channel with a name, e.g. Digital. This can be done by using the text-editor that is shown on the monitor screen, see figure 3.

- Choose a character or a symbol by using the control knob and press the control knob to confirm. Repeat the same procedure until you have written the channel name.
- Use button no. 1, “delete”, to erase (one character at a time). Press the button with the sign, *, “save” when you are ready.
- Load a memoryposition by pushing the control button. The word “Memory” will appear on top of the LCD and a memoryposition will be shown at the bottom of the LCD-display.
- Step between the stored memory-positions with the control knob.

4. Channels — Shows a list of the present TV- and radio channels on the tuned transponder/frequency (provided that the satellite is transmitting NIT).

5. DiSEqC — Choose between the different DiSEqC commands by using the keypad. Submenu 7 (SWx) shows the extended DiSEqC-commands (DiSEqC 1.1). Submenu 8 (Motor) shows the command-list for DiSEqC actuator-control (DiSEqC 1.2). Also 13V/18V and 22 kHz on or off can be adjusted in DiSEqC mode.

7. Beeper — It might be tricky to install a satellite dish and, at the same time, try to watch the signal-level on the instrument. Therefore the instrument has a very useful ”beeper” function to help finding the maximum signal strength. It works with a pitch tone that gets higher and higher the better the signal gets. The beeper is turned on or off with button no. 7.

0. 13V/18V — Selection of 13V or 18V. The selected choice is shown on the left side at the top of the LCD-display.

#. 22kHz — 22 kHz on or off. The selected choice is shown on the left side at the top of the LCD-display.

3.3 Span Min / Span Max

Use this function to switch between full spectrum (920-2150 MHz, see figure 6) and ”Max zoom in” (250 MHz bandwidth, see figure 7). By using the ”Max zoom in” function it is easy to adjust the cross-polarisation.

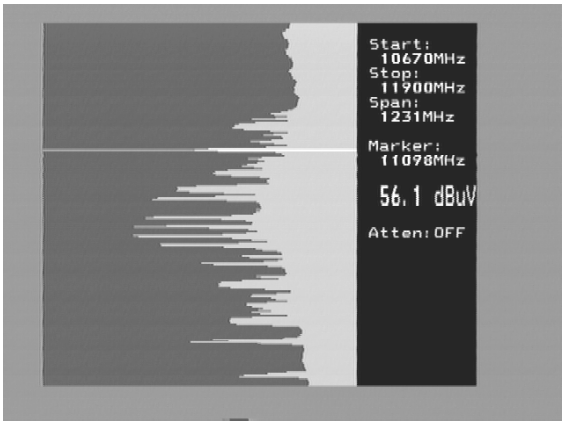


Figure 6. Full spectrum (920-2150 MHz).

- Move the cursor to a frequency of choice (a peak).
- Press button no.3 (span Min). The instrument will do a maximum ”zoom in” (250 MHz bandwidth) on the selected frequency.

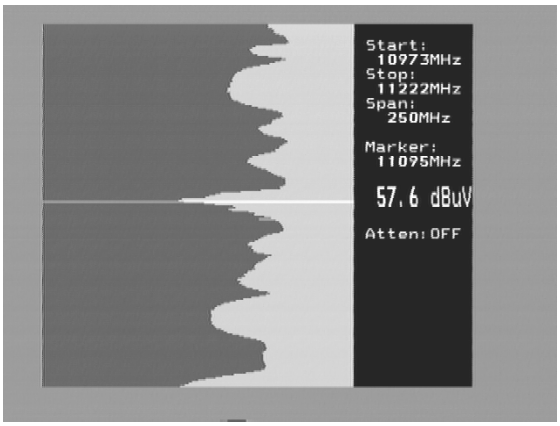


Figure 7. Maximum zoom in (250 MHz bandwidth).

Rotate the LNB so that either the horisontal or vertical polarisation will be in its maximum position, in other words; adjust the cross-polarisation. Press button no. 3 again (span Max), to return to ”Max zoom out”.

3.4 X-pol

Test the maximum cross-polarisation setting with the X-pol function. The instrument will measure the strength of the selected peak and then automatically switch to the other polarisation and measure there as well (same frequency and settings). The function is useful for checking the correct setting of the LNB cross-polarisation.

3.5 DiSEqC

Use the keypad to choose a DiSEqC command. Submenu 7 (SWx) shows the extended DiSEqC 1.1 commands. Submenu 8 (Motor) shows the DiSEqC actuator-control commands (DiSEqC 1.2).
Also 13V/18V and 22 kHz on or off can be adjusted in DiSEqC mode.

3.6 Setup

This function is used to set up some of the basic functions.

1. LNB L.O. Select the LNBs L.O. (Local Oscillator) for showing the correct LNB frequency. Default setting is button no. 9 (IF).

2. Analog Choose between KU-band (normal video) or C-band (inverted video).

3. Motor Choose the type of actuator to be used; standard DiSEqC 1.2, SatSelect or SATSCAN.

4. Display Submenu units: select dB-presentation: dbuV, Dbm or dBmV. Contrast (level) and backlite (on/off) can be set under submenu LCD.

5. AutoOff Choose between the different alternatives of automatic turn-off (timer).

6. Version Shows the serial number of the unit and manufacturing date.

7. Keyclick Keypad sound on or off.

8. TV/SAT Choose if you want SAT or TV to be the default start-up mode (always, without asking). When choosing SAT or TV the instrument will restart in the selected mode.

3.7 Beeper

It might be tricky to install a satellite dish and, at the same time, try to watch the signal-level on the instrument. Therefore the instrument has a very useful ”beeper” function to help finding the maximum signal strength. It works with a pitch tone that gets higher and higher the better the signal gets. The beeper is turned on or off with button no. 7.

Notice that the function works with a narrow bandwith (one transponder) and
not with the full bandwidth. To use the beeper function put the cursor on top of a selected ”peak” (transponder) and align the dish.

3.8 Special functions

Special functions. Select this function by pressing button no. 8 in the main menu and then you can choose between the functions described below.

1. Max hold

“Max hold” is an excellent function for observing a certain frequency-range over a longer time period to see if/how temporary signals/disturbances can affect the picture quality.

Adjust the frequency-bandwidth (see function 3 “span min - span max” below) and put the cursor on the frequency (peak) that you wish to observe (see figure 8).

Choose the ”max hold” function by pressing button no. 1. The instrument starts to sample all top-values in the shown bandwidth and will only update the presented values if the new measured data has higher dB-values than the previous measured data.

Turn off the “max hold” function by pressing button no. 1 (no hold).

The measured data can be stored. This procedure is described below; see function 4, “memory”.

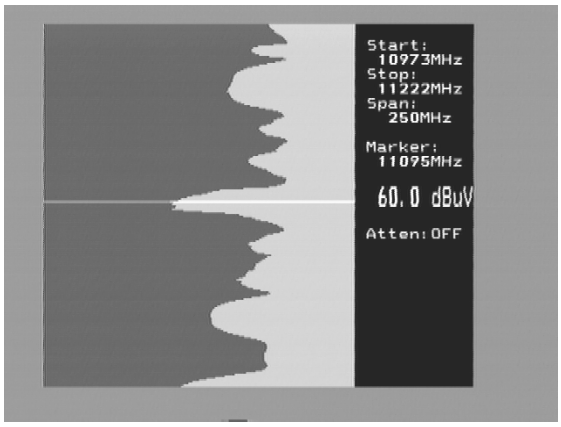


Figure 8. The cursor placed on a signal peak.

2. Reference cursor

MEGALOOK has the capability to perform reference measuring in form of signal and picture-carrier/audio-carrier measuring.

Do like this:

- Select function no. 2 “Refmrkr”.
- Tune in a frequency with the cursor (put it on the ”top” of the signal that you wish to measure on).
- Press button no. 1, ”ref set”, and a new cursor will appear on top of the earlier.
- Turn the control knob and place the new cursor on another carrier or on the noise-floor.
- The relation between cursor no. 1 and cursor no. 2 is presented in the lower right hand corner of the monitor screen.

Notice that 13/18V and 22 kHz on/off can be adjusted in this mode with the ”0” and ”#” buttons.

3. Span Min – Span Max

Push button no. 3 (Span Min) to do a maximum “zoom in” at the chosen frequency (250 MHz bandwidth). Push button no. 3 again (Span Max) to return to ”Max zoom out”.

This function is described in detail under the heading of 3.3, “Full spectrum, ”Max zoom in”, Span Min /Span Max.

4. Memory

Memory for storing spectrum pictures. This function works the same way as the one described under the heading of 3.9, “memory”.

6. Attenuator

Attenuation 15dB on or off. The selected mode is displayed at the upper right hand side of the monitor screen.

0. 13/18V

Adjustment of 13V/18V. The selected mode is displayed at the upper left side of the LCD-display.

#. 22 kHz

Adjustment of 22 kHz on/off. The selected mode is displayed at the upper left side of the LCD-display.

3.9 Memory for storing spectrum pictures

All spectrum-pictures can be stored in the MEGALOOK. This is useful since documentation of performed measurements can be used on a later occasion for recognizing/identifying the characteristic spectrum of a satellite. This function is also useful to find and point out faults when performing service work.

The Mix-function helps to find and identify already known (and previously stored) satellites by placing a previously memorized spectrum picture as a background on the monitor screen. When the wanted satellite is found its spectrum picture will fit like glove with the stored spectrum picture.

To store measured data, do like this:

- Choose a spectrum picture and press button no. 9, “memory”, to store it (note that also the current setting of 13V or 18V and 22kHz on or off will be saved).

- Choose a memory position by turning the control knob (the number of the memoryposition, 0-99, is shown at the bottom of the LCD display) and press button no. 2, “save”. Free positions are designated: “pos free”.

If the chosen memoryposition is already used for another frequency the text “Save are you sure?” will appear on the display. If you want to change the saved frequency press button no. 1, “Yes” and if not press the the button with the sign, *, “No”, choose a new memoryposition and save it.
Text-editor:

Next step is to save the spectrum picture with a name, e.g. ASTRA 1D. This can be done by using the text-editor that is shown on the monitor screen, see figure 3. Choose a character or a symbol by using the control knob and press the control knob to confirm. Repeat the same procedure until you have written the channel name. Use button no. 1, “delete”, to erase (one character at a time). Press the button with the sign, *, “save” when you are ready.

Do like this to load a stored spectrum picture:

-Choose ”memory” from the main menu (press button no. 9).
-Choose a memory position at choice (0-99) with the control knob.
-Press button no. 1, “load” and the chosen spectrum picture will be shown on the monitor screen.
-Note that the “reference cursor” function (ref mrkr) is enabled when a stored memory position is downloaded.

To mix a stored spectrum picture with an ongoing measuring, do like this:

- Enter the ”memory” function in the mainmenu (see figure no. 2) by pressing button no. 9.
- Select a stored spectrum picture by using the control knob (the chosen position, 00-99, is displayed at the right bottom side of the monitor screen).
- Mix the spectrum picture with the ongoing measuring by pushing button no. 4.

Turn off the “mix-memory” function by pushing button no. 4.

4. TV mode

When choosing TV mode in the start up menu, the main menu shown in figure no. 9 will be shown on the LCD display.

On the monitor screen information such as the cursors position (frequency), the start frequency of the spectrum (2.00MHz), the end frequency of the spectrum (902.00 MHz) and the bandwidth (900.00 MHz) are shown.

Frequency and channel (CH) are shown for the position where the cursor is placed. “A” stands for analogue channel and “D” for digital channel. The current value (in dB) of the automatic attenuation (“ATT”) is also shown.

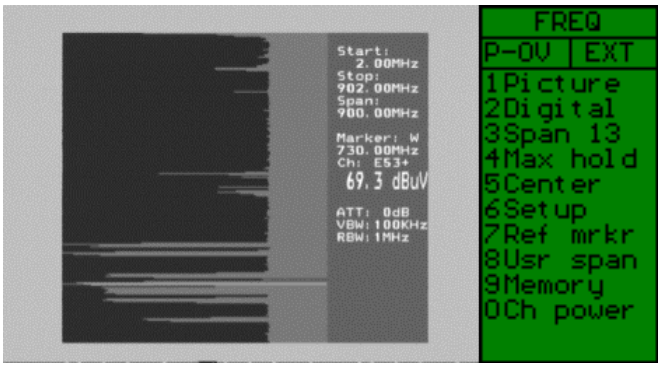


Figure 9. Information and main menu in spectrum mode.

VBW and RBW stand for Video-Bandwidth and Resolution-Bandwidth which is explained later on in this manual.

The maybe most important measured data, the dB-value, is being updated a couple of times per second.

Functions that are controlled by the controlbutton:

A few important functions of the MEGALOOK can only be accessed by using the control button and not by using the menu system on the LCD display. Therefore in order to handle the MEGALOOK in an easy way it is important to remember which functions that are solely controlled by control button.

When the instrument is set to work in TV mode these are the functions of the control button in spectrum and picture mode:

Spectrum mode	Picture mode
Frequency	Frequency
Bandwidth(span)	Channel (chan.)
Attenuation (atten.)	Mem pos

Table 2. The function of the control button in TV mode.

In frequency mode, the cursor is controlled by the control knob. Try to move the cursor up/down by turning the knob left/right.

4.1 Picture mode

Choose a frequency by placing the cursor on it and go to picture mode by choosing “picture” in the main menu (press button number 1), see figure 9.

In picture mode the control knob is used to change the frequency-position. When pushing the control button the function of the control knob changes and instead you can switch channel by turning it. Press the control button again to return to frequency mode.

The chosen function is displayed at the top of the LCD display, for example in figure 11 frequency mode (FREQ) is selected.

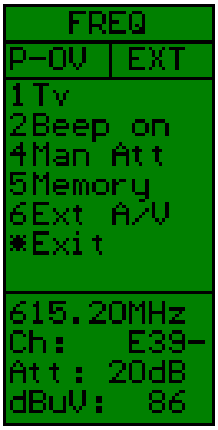


Figure 11. Menu in picture mode.

Figure 12. Menu in TV mode.

Measuring on a TV-channel is done in picture mode since both TV picture and dB-level are shown at the same time.

4.1.1 TV

A more precise check of the picture quality can be done in TV mode (press button no. 1, see figure 11). In TV mode the TV picture is not affected by the measuring filter which is normally enabled (the measuring filter can cause picture disturbances). The menu in TV mode is shown in figure 12.

4.1.1.1 Text

Select teletext by pressing button no. 1, “text”. If the tuned in TV channel transmits teletext information (Ceefax) it will appear on the monitor screen. Select page (100-899) by turning the control knob. Press button no. 2 to watch TV picture and teletext at the same time (the teletext becomes transparent). Hidden text can be displayed with button no. 1 (reveal).

4.1.1.2 Sound

This version of MEGALOOK can be set for the three most common TV-sound systems in Europe (the distance between the picture-carrier and sound carrier is tuned in). The setting is made by choosing ”sound” from the TV-menu. Select with button 1-3 any of the three versions.

4.1.1.3 Manual attenuation

The default attenuation setting in TV-mode is automatic attenuation (in spectrum mode the signal is always attenuated manually). This is to make sure that the measuring devices in the instrument are working in the best way.

However, under some circumstances, for example when the incoming signal is very strong, it might be better to attenuate manually in order to be able to view/measure on a certain carrier.
The manual attenuation is controlled like this in TV mode:

- In spectrum mode: push the control button until ”atten” is shown at the top of the LCD-display.
- Select a suitable attenuation value by turning the knob (the chosen attenuation value is shown on the monitor screen to the right.
- In TV mode: push button no. 4 ”Man att” (manual attenuation) and select a suitable attenuation value with the knob (the chosen attenuation value is shown on the LCD-display).
- Return to automatic attenuation by pushing button no. 4 ”Auto att”.

4.1.2 Beeper

It might be tricky to install/align a TV antenna and at the same time try to watch the signal level meter on the instrument. Therefore MEGALOOK has a very useful ”beeper” function to help finding the maximum signal strength. It works with a pitch tone that gets higher and higher the better the TV signal gets. The beeper is turned on or off with button no. 2.

4.1.3 Manual attenuation

The manual attenuation is controlled like this in picture mode:

- Push button no. 4 ”Man att” (manual attenuation) and select a suitable attenuation value with the knob (the chosen attenuation value is shown on the LCD-display).
- Return to automatic attenuation by pushing button no. 4 ”Auto att”.

For more information see 4.1.1.3.

4.1.4 Memory

Choose “memory” with button no.5. In this mode you can save or delete a memory position for a channel or a frequency. With the control button you can switch between “mem pos”, frequency and channel mode.

Choose a memory position in “mem pos” mode by turning the control knob. Press the control button to go to frequency mode where you can save or erase a frequency or go to channel mode where you can save/erase a channel. Browse through the saved frequencies/channels in “freq”/channel mode by turning the control knob.

4.1.5 Ext A/V

An external video and audio signal can be presented on the MEGALOOK (e.g. TV-signals from a head-end). Connect the video/audio signals via the phono-jacks on the side of the instrument and press button no. 6 ”Ext A/V” (in picture mode).

4.2 Digital mode

In digital mode you can choose if you want to measure on cable TV or terrestial TV signals. See figure 13.

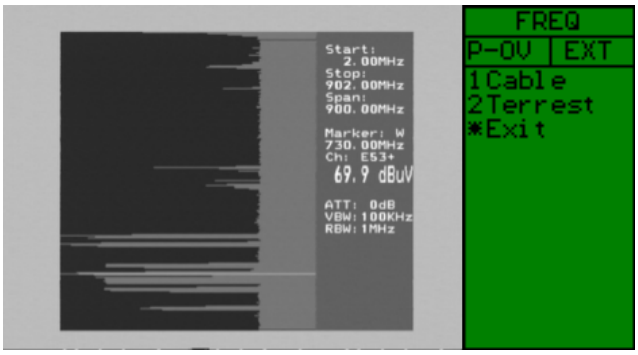


Figure 13. Menu in digital mode.

4.2.1 Cable

When choosing the ”cable” function for measuring on a cable TV signal you will find the following information on the monitor screen:

- Locking; if the signal is locked and the lock time.
- Eb/N_0-value.
- CB – Corrected Bits.
- UCB – Uncorrected Blocks.
- BER (Bit Error Rate)-value.
- Constellation diagram.

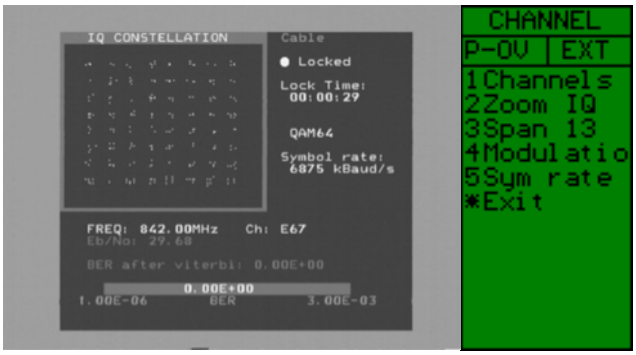


Figure 14. Information and menu in cable TV mode.

Available settings in cable TV mode:

- Zoom – zoom in the constellation diagram by using button no. 2.
- Frequency – change by turning the control knob.
- Modulation – change by change by pressing button no. 4.
- Symbol rate – change by pressing button no. 5.

4.2.1.1 Channels

Press button no. 1, “channels”, to see information about which TV channels that are transmitted on the tuned frequency.

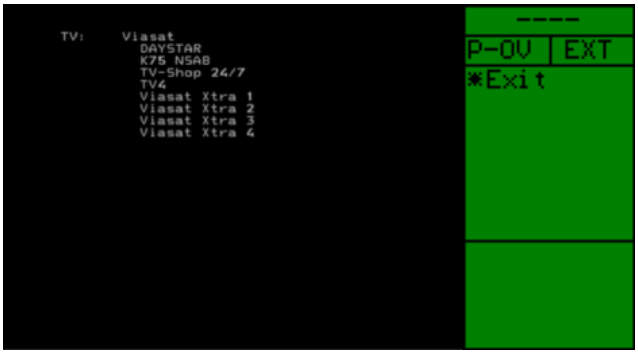


Figure 15. A list of current TV channels.

4.2.1.2 Zoom IQ

Press button no. 2 to zoom in the IQ constellation.

4.2.1.3 Span 13

- Put the cursor on a signal peak of your choice and press button no.3 (span 13) to do a maximum zoom in on the chosen frequency (13Mhz bandwidth).

- Press button no. 3, “span 900”, to return to the original (full) bandwidth.

- Use the “*” button (exit) to go back in the menu system.

- To centre the chosen signal peak on the picture screen press button no.5 (center).

You can always adjust the bandwidth in spectrum mode by using the “span” function. Press the control button to enter “span” mode. In “span” mode you can set the bandwidth by tuning the control knob. The starting point for the zoom in is the cursors position on the spectrum picture and the bandwidth is reduced from both ends so to say. The most narrow bandwidth is 13 MHz (maximum zoom in) and full bandwidth is 900 MHz.

4.2.1.4 Modulation

To enter modulation mode press button no. 4. The modulation values to choose between will be shown on the LCD display. Choose a modulation value by pressing the correspondent numerical button:

Button no. 1	QAM16
Button no. 2	QAM32
Button no. 3	QAM64
Button no. 4	QAM128
Button no. 5	QAM256

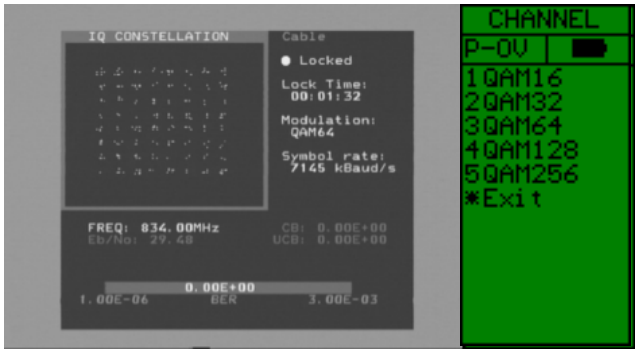


Figure 16. Modulation mode.

4.2.1.5 Symbol rate

To change the symbol rate press button no. 4, “sym rate” and turn the control knob (possible values are: 2000-7300). In the menu (see figure no. 17) you can choose between coarse (button no.1) and fine (button no.2).

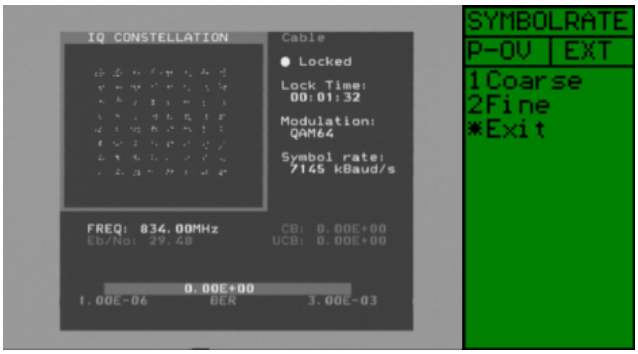


Figure 17. Symbol rate mode.

4.2.2 Terrestrial

When choosing the terrestrial function, “terrest”, from the menu in digital mode (see figure no. 13) for measuring on a terrestrial TV signal, the following information will be displayed on the monitor screen (see also figure 18):

- Locking: if the signal is locked and the lock time.
- Modulation: the current modulation.
- Eb/N_0-value.
- CB- Corrected Bits.
- UCB- Uncorrected Bits.
- BER (Bit Error Rate)-value
- Constellation diagram

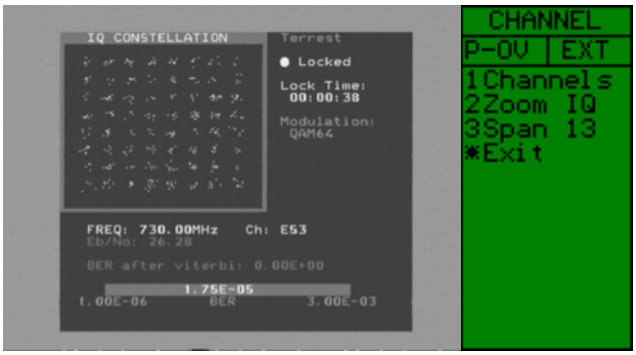


Figure 18. Information and menu in terrestrial mode

Available settings in terrestrial TV mode:

- Channel/frequency – change by turning the control knob. Switch between channel and frequency with the control button (channel is the default setting).

- Zoom in the constellation diagram by pressing button no. 2, “zoom IQ”. Press the button again to return to the previous mode.

4.2.2.1 Channels

Press button no. 3, “channels”, to see information about which TV channels that are transmitted on the tuned frequency.

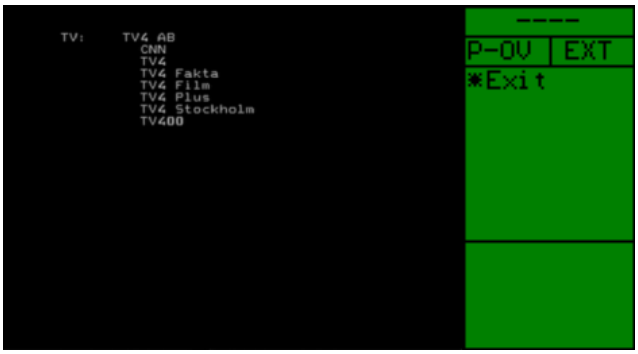


Figure 19. A list of current TV channels.

4.2.2.2 Zoom IQ

Press button no. 2 to zoom in the IQ constellation.

4.2.2.3 Span 13

See 4.3 below.

4.3 Span 13

- Put the cursor on a signal peak of your choice and press button no.3 (span 13) to do a maximum zoom in on the chosen frequency (13Mhz bandwidth).

- Press button no. 3, “span 900”, to return to the original (full) bandwidth.

You can always adjust the bandwidth in spectrum mode by using the “span” function. Press the control button to enter “span” mode. In “span” mode you can set the bandwidth by tuning the control knob. The starting point for the zoom in is the cursors position on the spectrum picture and the bandwidth is reduced from both ends so to say. The most narrow bandwidth is 13 MHz (maximum zoom in) and full bandwidth is 900 MHz.

4.4 Max hold

“Max hold” is an excellent function for observing a certain frequency-range over a longer time period to see if/how temporary signals/disturbances can affect the picture quality.

Choose a frequency-bandwidth (see section 3.3) and put the cursor on the frequency (peak) that you wish to observe (see figure 20).

Choose the ”max hold” function by pressing button no. 6. The instrument starts to sample all top-values in the selected bandwidth and will only update the presented values if the new measured data has higher dB-values than the previous measured data.

The measured data can be stored and transfered to a computer. This procedure is described in section 4.9.

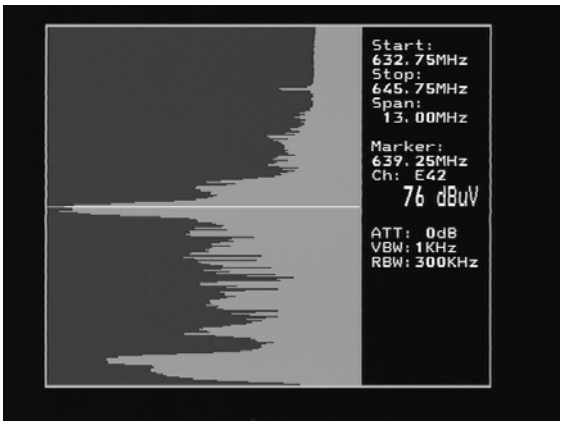


Figure 20. The cursor placed on a frequency (peak).

4.5 Center

To centre the chosen signal peak on the picture screen press button no.5 (center).

4.6 Set up

MEGALOOK can be set up according to your individual needs and to do special kinds of measurings.
These settings are done in the “Set up” menu. Press button no. 6 to choose “set up”.

The following parameters can be adjusted:

Button no. 1 Video Bandwidth (”Vid BW”) - videofilter.

The videofilter is situated after the measuring chip-set inside the instrument and is used for presenting the frequency-spectrum at varying resolutions.

The resolution of the details of a signal-carrier gets finer the more narrow the filter being used (but in return the sweep-time gets longer).
The available videofilters/settings are: auto-mode (default), 100 kHz, 10 kHz, 1 kHz or 100 Hz.

Button no. 2 Resolution Bandwidth (”Res BW”).

The resolution bandwidth shows the incoming signal before the measuring chip-set in the instrument. Choose between the narrow 300 kHz or the wider 1 MHz resolution. The default setting of the instrument is ”auto” mode.

Button no. 3 Power insert (”P-insert”).

This function is used to run external active accessories (like antenna-amplifiers) which needs a power-source to operate. The output voltage can be adjusted between 12-24 volt DC and is fed via the BNC plug.

The chosen output voltage is always shown in upper left hand of the LCD-display (next to the battery-symbol).
The default setting of the instrument is power-off (0 volt). Remember that miss-use of this function may cause irreparable damage to all connected equipment that is not made to be power-fed!

Button no. 4 Set up, with the following *sub-menu*:

Button no. 1 ("Lcd") LCD contrast and "backlite" (on/off) can be adjusted.
Button no. 2 ("S-saver") Screen-saver on/off. The default setting is "on".
Button no. 3 ("Display") Display with the following *sub-menu*:

Button no. 1, ("S-cursor")	Scan-cursor. Shows how fast the instrument "scans" a selected frequency-band. Try this function with different videofilters (see button no. 1 above) and you will notice a difference. The default setting is "off".
Button no. 2, ("Grat.")	Grating. Shows a grating-net which under some circumstances can facilitate the readout of the signal level. The default setting is "off".
Button no. 3, ("Units").	Units. Choose between signal strenght readout in dBuV, dBm or dBmV.
Button no. 4, ("TV level")	TV level. Shows the level which the automatic attenuation uses for the picture-presentation of the signal (should be between 53-63 dB).

Button no. 4 ("Version") Version. Shows e.g. the instrument's serial number, date of manufacture, software-version etc.
Button no. 5 ("CH-table") CH-Table. Choose between different (countries) channel-plans.

Button no. 5 FM/AM cursor ("FM mrkr").

Choose between FM or AM cursor.
FM = Normal spectrum measuring.
AM = Peak spectrum measuring (preferred when measuring on TV-signals since it faster detects the maximum value).

Button no. 6 SAT/TV

Choose if you want SAT or TV to be the default start-up mode (always, without asking). When choosing SAT or TV the instrument will restart in the selected mode.

Button no. 7 CAB/TER

In this mode you can choose to automatically enter cable mode ("cable") or terrestrial mode ("terrest") or if you always want to be given the option to choose between cable and terrestrial TV ("ask me") when entering digital mode (see 4.2).

4.7 Reference cursor

MEGALOOK has the capability to perform reference measuring in form of signal and picture-carrier/audio-carrier measuring.

Do like this:

- Place the cursor on a signal peak and zoom in by pressing button no. 3, "span 13".
- Select function no. 7, "Refmrkr".
- Tune in a frequency with the cursor (put it on the "top" of the signal that you wish to measure on)
- Press button no. 1, "ref set", and a new cursor will appear on top of the previous one.
- Turn the control knob and place the new cursor on another carrier or on the noise-floor.
- The relation between cursor no. 1 and cursor no. 2 is presented in the lower right hand corner of the monitor screen.

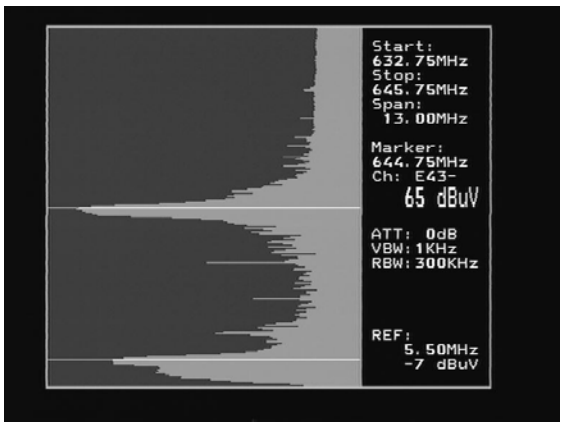


Figure no. 21. Reference measuring.

4.8 User Span

MEGALOOK is normally working with the whole frequency-range of 2-900 MHz (this is the default mode). This overview over the whole spectrum makes it easy to find all signals within the mentioned bandwidth.

In many cases, however, it might be better to divide the frequency-spectrum in the working-areas in which installations and service work are normally being done (e.g. the returnpath, FM, UHF etc.). These working-areas might vary a lot depending on where (geographically) the instruments are being used or by whom.

For that reason the MEGALOOK has the unique possibility to do a individual setup of such frequency-bands.

Programming of individual frequency-bands is done like this:

- Put the cursor approximately in the centre of the frequency-band that you want to programme (e.g. 2-65 MHz).

- Press the control button so that “Span” (bandwidth) is lit on top of the LCD-display.

- Turn the knob until the wanted frequency-band (2-65 MHz) is shown in the picture-screen.

Note! It might be a bit tricky to exactly tune in the wanted frequency-band, it is sometimes necessary to switch between “Freq” and “Span” a couple of times and also use the “zoom in” function “span13”. It is, however, well spent time since the programming is only needed to be done once – thereafter the frequency-bands are permanently programmed (until chosen to be deleted).

- When the wanted frequency-band is tuned in, push the ”Memory”-button (no. 9).

- Push button no. 2 “Usr span” and thereafter the ”Save”-button (no. 1).

- Choose a memory position by pressing the correspondent numerical button (e.g. no. 1). The chosen frequency-area is shown at the chosen memoryposition on the LCD-display.

- Repeat the above steps to memorize more frequency-bands (up to 8 bands).

To retrieve a programmed frequency-band do like this:

* Choose ”Usr span” (user span) from the main-menu (button no. 8).
* Choose any of the previously programmed frequency-bands from the list by pressing the correspondent numerical button.

Figure 22. A list of programmed frequency bands.

4.9 Memory

All spectrum pictures can be saved in MEGALOOK. This is useful since new installations, service and maintance work can be documented. The memory positions can easily be transfered to a personal computer (PC) by using the enclosed PC-software and also printed on a normal PC printer.

To save measured data, do like this:

- Tune in a spectrum picture of your choice and push button no. 9, “memory” (see menu in figure 9).
- Push button no. 1 ”spectrum” (the function of ”usr span”, button no. 2 is explained in section 4.8).
- Choose a memory position for the spectrum picture by turning the control knob (00-99). The selected position is shown at the right bottom side on the monitor screen.
- Push the ”save”-button (no. 1) and the memory position is saved.

To load saved data (memory positions), do like this:

- Choose, ”memory” from the main menu by pressing button no. 9.
- Choose ”spectrum” (button no. 1).
- Choose the memory position you want to retrieve by turning the control knob. The position is shown at the right bottom side on the monitor screen.
- Push the ”load” button (no. 2) and the memory position is retrieved and shown on the monitor screen.

4.10 Channelpower

MEGALOOK can measure, so called, “digital dB”, i.e. the output-level of digital transponders (for instance digital terrestrial transmissions).

Simply input the start and stop frequencies of the transponder to measure on (a digital transponder is normally 8 MHz wide) and the measured and corrected output-level (dBμV) will be presented in the bottom right-hand corner of the monitor screen.

Do like this:

- Put the cursor on a digital signal peak and zoom in with the ”span 13 ” button (no. 3 in the main menu). If needed, increase the shown bandwidth with the “span”-function. Choose span mode by pressing the control button and increase the bandwidth by turning the control knob. When the bandwidth is set, return to frequency mode by pressing the control button twice.

- Push button no. 0, “channelpower”.

- Tune in the start frequency with the control knob (so the cursor stands in the beginning of the digital transponder to measure on).

- Push button no. 1 (“set strt”) and a new cursor appears on top of the earlier.

- Turn the knob and place the new cursor at the end of the digital transponder (stop frequency).
The measured result (and the adjusted bandwidth –BW) is shown in the bottom right-hand corner of the monitor screen.

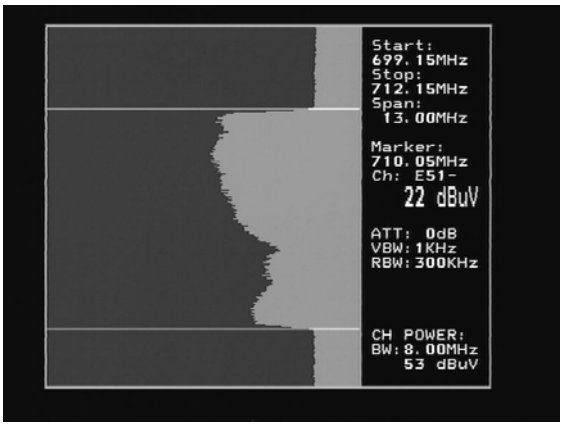


Figure no. 23. Measuring of a digital transponder.

5. PC-software

A CD rom with PC software is enclosed with the MEGALOOK. The software is used for the transfering of files (memory-positions) from the instrument to a personal computer. It also offers the possibility to add information (e.g. address information) to the performed measurements. In this way they can also be printed if you have a printer connected to your computer.

Installation:

The programme (software) can be used by all computers operated with Windows (minimum requirement is Win 95) and is easily installed from the enclosed CD rom (or downloaded from www.emitor.se)

- Place the file .EXE in a directory of your choice (might be on your desktop).
- Done !

Operation:

The instrument must be connected to the computer in order for the programme to work. This is because the computer (and software) continuously communicates with the instrument and scans the instrument’s memory positions.

To transfer data from the instrument to a computer, do like this:

- Connect the MEGALOOK to a computer with the enclosed PC-cable to any free com-port. (the cable is a strait male-female 9-pin dsub).
- Turn on the MEGALOOK.
- Make a double-click on the .EXE file.

- The software will thereafter automatically find the com-port to which the instrument is connected to.
- The screen picture below will appear on the PC-monitor.

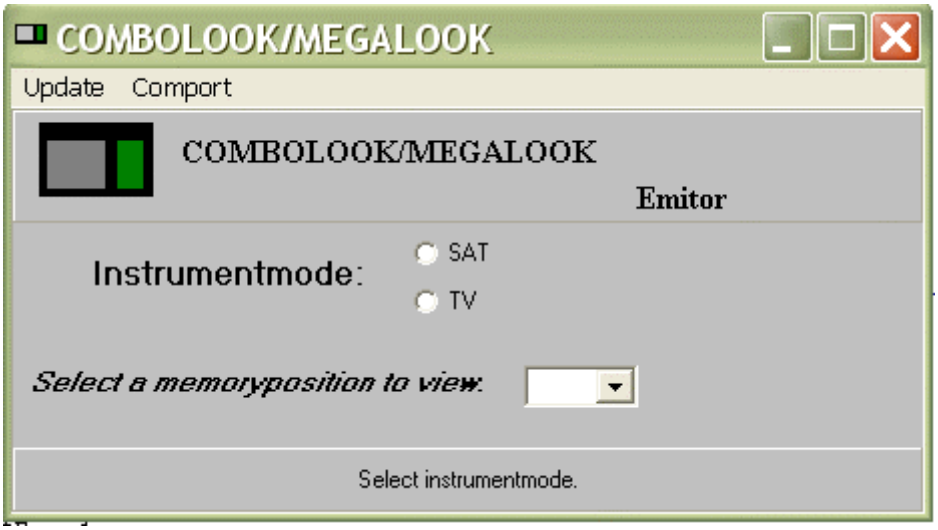


Figure no.24. Screen picture, PC software.

- Note! The PC-software will not run if the communication between the PC and the instrument doesn't work.
- If there should be any problem, check the connection and try again.
- Choose if you want to communicate with the SAT or TV part of the instrument.

There are two menus in the upper left hand corner to choose between:

Update: is used for updating the memory-list if you have saved a new spectrum after starting the programme.

Comport: is used if the connection has failed and you want to try connecting again without restarting the programme.

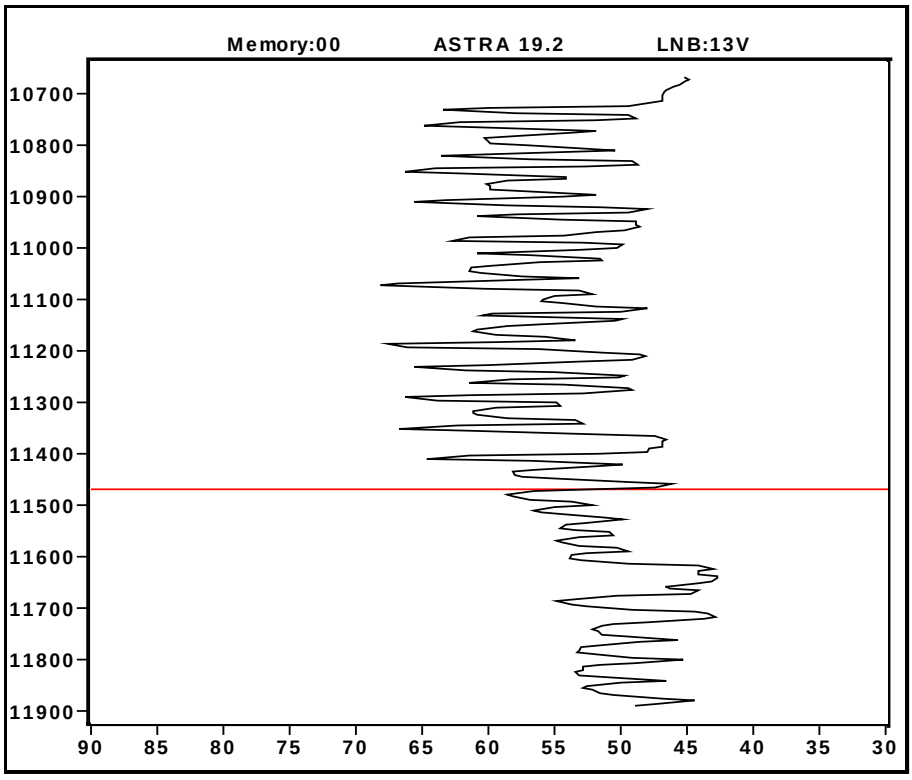
Retrieving memory positions:

As shown above there is a list of the memories where you can select one for viewing. If the list is empty you have to save a spectrum-memory in your MEGALOOK.

- Mark the memory-position you want to transfer to the PC, for example "Spec-Memory 01" by using the PC-mouse.
- The memory-position is transfered and the result can be viewed on the PC-monitor.
- The picture can be viewed more in detail with the zoom in function. This is done by pushing down the "shift"-button and at the same time draw a "box" with the PC-mouse around the area to enlarge.
- To zoom out, simply push down the "shift"-button and "click" with the PC-mouse in the enlarged area.

Print-outs/documentation:

- There are three menus in the view-window's upper left hand corner: Copy, View and Help.
- Push Copy and the picture is being copied to clipboard.
- View lets you change the look of the window.
- Help gives you a brief description of how to zoom and pan.
- Without closing the programme, start another programme, a suitable word-processing programme (like Word) and open a new document.
- Push the paste-button and the picture (memory position) is inserted to the document.
- The picture below shows such an example.



- The instrument programme makes it very easy to transfer memory-positions to a PC and make good looking - professional documentation.
- After finishing work, close the programme and don´t forget to turn the instrument off.

6. Firmware upgrade

To do a firmware upgrade do like this:

- Download the firmware and save it on your PC.
- Connect the RS 232 cable from the instrument to your PC.
- Turn on the instrument.

The firmware is zipped and you need to un-zip the file. There is one .hex file and one FDL-program (Firmware downloader).

- Start the loader by double click the FDL-program.
- Select the COM port that you have inserted the RS-232 cable. It will now search for the instrument.
- When it have found the instrument, turn the instrument OFF and plug in the external power supply.
- Press Send firmware.
- Select the .hex file that you want to use in the Open firmware file window that now appears on your PC.
- It will now download the firmware.
- You will see the progress on your PC, do not remove the power supply!
- The download is finished when the counter has reached 100%.
- You have now downloaded the new firmware to your instrument.

7. Technical specification

Common data:

Presentation of signal level (analogue):	dB on LCD/monitor screen. Pitch-tone.
TV standard:	Multi TV/ (PAL, NTSC).
Input impedance:	75 Ohm, BNC-con.
Picture screen:	4.5”-monitor, B/W.
Menus:	On LCD 64x128.
Memory:	- 100 spectrum pictures can be stored with name. Saved spectrum pictures can be mixed with an on-going measuring for an easy identification. - “Maxhold” function.
Favorite channels:	Both analogue and digital frequencies can be memorized and stored with name.
PC-connection:	RS232-output.
Battery:	Re-chargeable 12V, 7 amp/hour.
Accessories:	Nylon carrying-case. Power-supply of 220V/13.5V, 1.7amp. Car-charger, BNC/F-adapters.
Weight:	7.5 kg.

SAT-part:

Input frequency:	920-2150 MHz.
Min. level in:	Approx. 35 dBμV (noise).
Max. level in:	Approx. 90 dBμV.
Attenuation:	15 dB attenuator on/off.
Accuracy:	± 2 dB (at +20°C).
Presentation of signal level (digital):	S/N (Signal/Noise-ratio). BER (Bit Error Rate). Constellation (QPSK).
Satellite identification:	Yes, NIT- reading according to DVB-standard. Identifies satellite position, TV and radio channels.
KU-C-band:	Yes selectable.
Sat-TV power out:	13-18V.
DiSEqC	1.0, 1.1 and Toneburst on/off.
DiSEqC motor:	Built in positioner for DiSEqC 1.2, SatScan and SatSelect.

CATV/TV-part (analog):

Input frequency:	2-900 MHz.
Max input level, picture: Spectrum:	110 dByV. 120 dByV.
Attenuation:	45 dB in 1 dB step.
Accuracy:	±1 dB (at +20°C).
Resolution bandwidth:	1 MHz or 300 kHz.
Video bandwidth	100, 10, 1kHz or 100Hz.
CATV teletext (CEEFAX):	Yes.

Cable-part (dvb-C):

Input frequency:	47-860 MHz.
Input return loss:	7 dB.
Input level range:	-60 to -30 dBm.
C/N limit:	26 dB 1.
Bandwidth:	8 MHz.
DVB compliance:	DVB-C.
QEF reception with test signal :	64 QAM, C/N 26dB.
Presentation of signal level:	BER (Bit Error Rate), before and after Viterbi. Constellation.

Terrest – part (dvb-T):

Input frequency:	47-860 MHz.
Input return loss:	7 dB.
Input level range:	-65 to -30 dBm.
C/N limit:	18 dB.
Bandwidth:	6/7/8 MHz.
DVB standard:	DVB-T.
QEF reception with test signal:	8K, 64 QAM, ¼ guard interval, 2/3 FEC.
Presentation of signal level:	BER (Bit Error Rate), before and after Viterbi. Constellation.