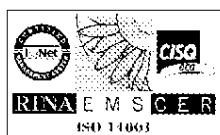


VEGA
UHF - TV System
User's manual

	CODE: APT139B	TITLE: VEGA	REV: 0	DATE: 10/06/04
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Registration number: **IT-17686**



Registration number: **IT-24436**

CE 0682

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WARNING

The apparatus described in this manual has been designed and manufactured with devices to safeguard the users. In any case it is recommended that during any operation of installation, maintenance, miscellaneous interventions and calibrations requiring the apparatus to be switched on,

THE USER TAKES ALL THE PRECAUTIONS AGAINST INCIDENTS

It is required to use the proper clothes and protection gloves in order to prevent damages from incidental contacts with high-voltage parts.

The manufacturer declines every responsibility in case the recommendations above are not followed.

IMPORTANT

The component lists attached to the relevant electrical diagrams indicate for each item the reference, the description and the type normally used.

The ***Elettronika S.r.l.*** though reserves the right to use or supply as spare parts components with equivalent characteristics but of a different type, assuring anyway the optimal work of the apparatus in accordance with the specifications.

The enclosed monographs are solely owned by ***Elettronika S.r.l.***

The use of anything enclosed in this technical manual without explicit authorization given by ***Elettronika S.r.l.*** will be prosecuted by the law.

The data and technical characteristics of the apparatus described in this manual are not compelling for the manufacturer.

The ***Elettronika S.r.l.*** reserves the right to make, without previous notice, modifications or updates in order to improve the quality of the product.

The general conditions of supply and sale are described in the contracts.

The delivery time are in accordance with the products and quantities ordered.

Summary of warranty

We, ELETTRONIKA S.r.l., SS096 Km 113 Z.I. PALO DEL COLLE (BA) ITALY, warrant to the ORIGINAL PURCHASER of a NEW product, for a period of one (1) year from the date of purchase by the original purchaser (the "warranty period") that the new ELETTRONIKA product is free of defects in materials and workmanship and will meet or exceed all advertised specifications for such a product. This warranty does not extend to any subsequent purchaser or user, and automatically terminates upon sale or other disposition of our product.

Items excluded from this ELETTRONIKA warranty

We are not responsible for product failure caused by misuse, accident, or neglect. This warranty does not extend to any product on which the serial number has been defaced, altered, or removed. It does not cover damage to loads or any other products or accessories resulting from ELETTRONIKA product failure. It does not cover defects or damage caused by use of unauthorized modifications, accessories, parts, or service.

What we will do

We will remedy any defect, in material or workmanship (except as excluded), in our sole discretion, by repair, replacement, or refund. If a refund is elected, then you must make the defective or malfunctioning component available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at our factory. Expenses in remedying the defect will be borne by ELETTRONIKA, including one-way surface freight shipping costs within the United States. (Purchaser must bear the expense of shipping the product between any foreign country and the port of entry in the United States and all taxes, duties, and other custom's fee(s) for such foreign shipments).

How to obtain warranty service

You must notify us of your need for warranty service not later than ninety (90) days after the expiration of the warranty period. We will give you an authorization to return the product for service. All components must be shipped in a factory pack or equivalent which, if needed, may

Disclaimer of consequential and incidental damages

You are not entitled to recover from us any consequential or incidental damages resulting from any defect in our product. This includes any damage to another product or products resulting from such a defect.

Warranty alterations

No person has the authority to enlarge, or modify this warranty. The warranty is not extended by the length of time for which you are deprived of the use of the product. Repairs and replacement parts are provided under the terms of this warranty shall carry only the unexpired portion of this warranty.

Design changes

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

Legal remedies of purchaser

There is no warranty which extends beyond the terms hereof. This written warranty is given in lieu of any oral or implied warranties not contained herein. We disclaim all implied warranties, including without limitation any warranties of merchantability or fitness for a particular purpose. No action to enforce this warranty shall be commenced later than ninety (90) days after expiration of the warranty period.

Warranty for electronic tubes

The warranty applied for electronic tubes is the one given by the manufacturer of the tube. In the event that the product shows anomalies within the deadline of the validity of the warranty given by the manufacturer of the product itself, the buyer will have to return it to the seller with the needed documents and the written description of the defect. The seller will ship the broken tube to the manufacturer in order to effect the necessary technical tests to find out the cause of the anomaly. Meanwhile the buyer of the tube who needs to use, and as such to replace immediately the product, will have to buy a new one and provide to the relevant payment, further to the issuing by the seller of a regular commercial invoice. After the adequate tests made by the manufacturer, should the result be positive, that is confirm the defect in manufacturing, the seller will issue a regular credit note in the name of the buyer and return the amount paid. Should the result be negative, that is detect a negligence in the installation or use by the buyer, he will have no right against the seller.

INTRODUCTION

The apparatus described in this manual is the latest of this series, offering high performances, remarkable reliability and a wide range of characteristics, it all at a low cost.

Its is easy to install and use. It only takes to follow the installation procedure as shown in this manual: after having removed all from the package, you only have to follow step by step the description in the various sections.

Before starting to use the apparatus, remember to:

- ☐ read carefully the general safety information contained in this section;
- ☐ follow the instructions for the installation and set up of the apparatus;
- ☐ read all the remaining sections of this manual in order to know well the apparatus and learn how to obtain the best of its characteristics.

CONTENTS OF THE MANUAL

The chapter composing this manual contain all the information concerning the use of the apparatus. For more information refer to ELETTRONIKA S.r.l.

This manual is made up of different chapters, each made up of various sections. Each individual chapter represents a single apparatus composing the whole station.

WARNING!

The currents and voltages in this equipment are dangerous!
Personnel must at all times observe safety regulation!

This manual is intended as a general guide for trained and qualified personnel who are aware of the dangers inherent in handling potentially hazardous electrical and electronic circuits.

It is not intended to contain a complete statement of all safety precautions which should be observed by personnel in using this or other electronic equipment.

The installation, operation, maintenance and service of this equipment involves risks both to personnel and equipment, and must be performed only by qualified personnel exercising due care.

Elettronika S.r.l. shall not be responsible for injury or damage resulting from improper procedures or from the use of improperly trained or inexperienced personnel performing such tasks.

During installation and operation of this equipment, local building codes and fire protection standards must be observed.

WARNING!

Always disconnect power before opening covers, doors, enclosures, gates, panels or shields.
Always use grounding sticks and short out high voltage points before servicing. Never make internal adjustments, perform maintenance or service when alone or when fatigued.

Do not remove, short-circuit or tamper with interlock switches on access covers, doors, enclosures, gates, panels or shields.

Keep away from live circuits, know your equipment and don't take chances.

WARNING!

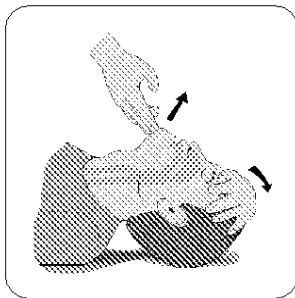
In case of emergency ensure that power has been disconnected.

Treatment of electrical shock

1) If victim is not responsive follow the A, B, C's of basic life support.

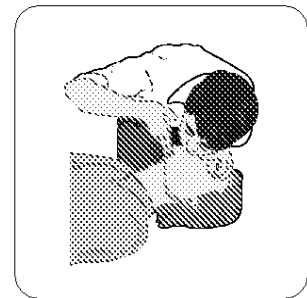
PLACE VICTIM FLAT ON HIS BACK ON A HARD SURFACE

A - AIRWAY



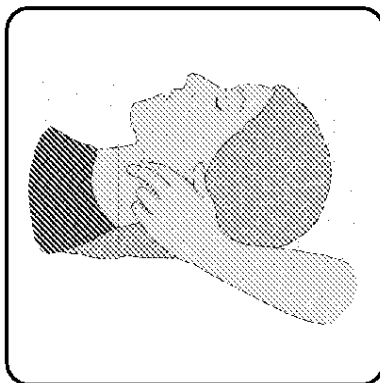
If unconscious, open airway lift up neck, push forehead back, clear out mouth if necessary, observe for breathing.

B - BREATHING

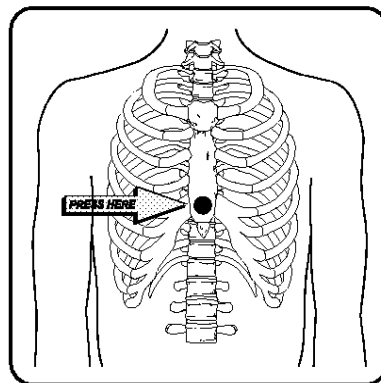


If not breathing, begin artificial breathing. Tilt head, pinch nostrils, make airtight seal, 4 quick full breaths. Remember mouth to mouth resuscitation must be commenced as soon as possible.

C - CIRCULATION



Check carotid pulse. If pulse absent, begin artificial circulation.



Approx. 80sec.: 1 rescuer, 15 compressions, 2 quick breaths.

Approx. 60sec.: 2 rescuers, 5 compressions, 1 breath.

NOTE: DO NOT INTERRUPT RHYTHM OF COMPRESSIONS WHEN SECOND PERSON IS GIVING BREATH.

Call for medical assistance as soon as possible.

2) If victim is responsive:

- keep them warm;
- keep them as quiet as possible;
- loosen their clothing (a reclining position is recommended).

FIRST-AID

Personnel engaged in the installation, operation, maintenance or servicing of this equipment are urged to become familiar with first-aid theory and practices. The following information is not intended to be a complete first-aid procedure, it is brief and is only to be used as a reference. It is the duty of all personnel using the equipment to be prepared to give adequate Emergency First Aid and thereby prevent avoidable loss of life.

TREATMENT OF ELECTRICAL BURNS

1) Extensive burned and broken skin.

- Cover area with clean sheet or cloth (cleansed available cloth article);
- do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment;
- treat victim for shock as required;
- arrange transportation to a hospital as quickly as possible;
- if arms or legs are effected keep them elevated.

NOTE

If medical help will not be available within an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold).

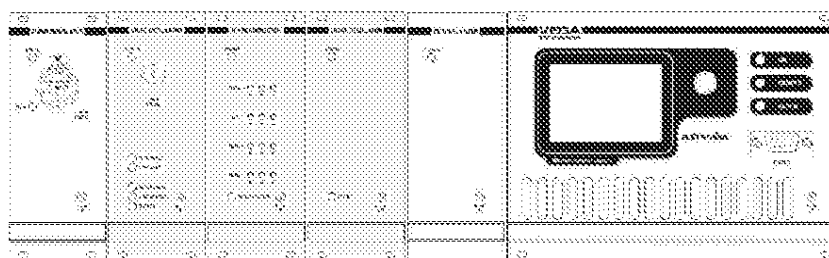
Allow victim to sip slowly about 4 ounces (half a glass) over a period of 15 minutes.

Discontinue fluid if vomiting occurs (do not give alcohol).

2) Less severe burns - (1st & 2nd degree).

- Apply cool (not ice cold) compresses using the cleansed available cloth article;
- do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment;
- apply clean dry dressing if necessary;
- treat victim for shock as required;
- arrange transportation to a hospital as quickly as possible;
- if arms or legs are affected keep them elevated.

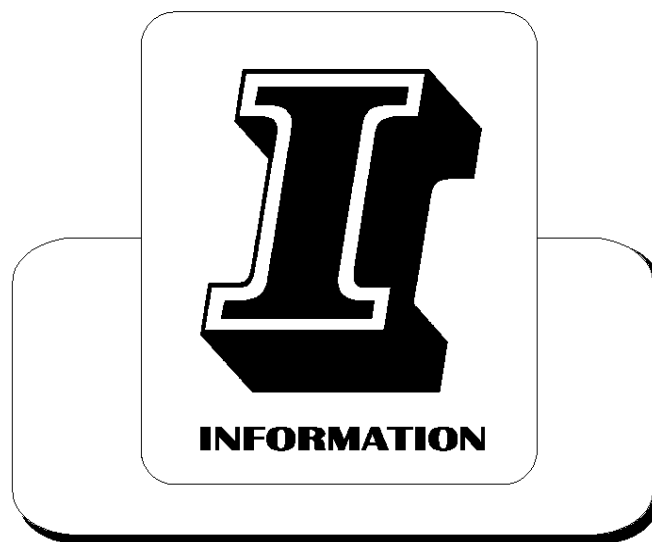
UHF - TV SYSTEM



VEGA

User's manual

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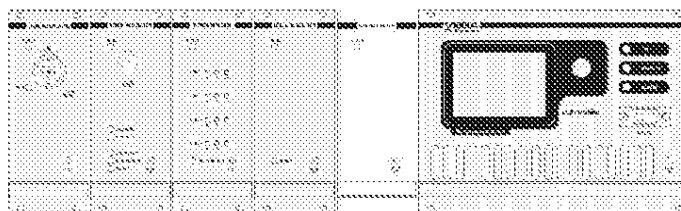
Section 1 - Information

Contents:

- 1.1 Description*
- 1.2 Main features*
- 1.3 Technical characteristics*

VEGA

UHF - TV SYSTEM



1.1 DESCRIPTION

The transmitters and transposers in this series VEGA are characterized by high performance and capability and by excellent linearity over the entire band thanks to the optimization of the RF circuits.

A high degree of reliability is guaranteed, moreover, by the use of oversized cooling devices and by control circuits operated by modern microprocessor technologies.

These units are used as low-power transmitters or transposers or as driver stages for amplifiers of greater power and are available in 2 to 20W versions. The excellent spectral purity of the conversion oscillator endows these units with an excellent signal/noise ratio of the radiated signal.

The synthesized local oscillator allows easy, rapid changing of the transmission channel from the front panel. The offset option allows frequency shifts in 1Hz (CCIR) or 0.999000999Hz (FCC) steps for operation in “precision offset” or “isofrequency” mode in the various television standards. The units are equipped with an input connector for an external reference signal at 5MHz.

1.2 MAIN FEATURES

- *Modular construction*
- *Programming of local oscillator from front panel*
- *SAW Vestigial filter*
- *Sync restore (SCT)*
- *Group delay precorrection (SCT)*
- *Automatic white level and sync limiter (SCT)*
- *Multistandard modulator (SCT)*
- *Available in stereo/dual sound version*
- *Possibility of use of common and separate carriers*

1.3 TECHNICAL CHARACTERISTICS

VIDEO PARAMETERS

Input impedance	75Ω
Input level	1V _{pp} ±6dB
White / Sync level limiter	95%
2T K factor	<1.5%
Amplitude / frequency response	±0.5dB (throughout the vision band)
Differential gain	<5%
Differential phase	<3°
Group delay	±35ns (throughout the vision band)
Sync pulse compression	<3%
S/N ratio (weighted)	> 60dB
Pre-emphasis	50μs or 75μs or flat
ICPM	<3°
Luminance non linearity	<4%
Field time bar tilt	<2%
Line time bar tilt	<2%

AUDIO PARAMETERS

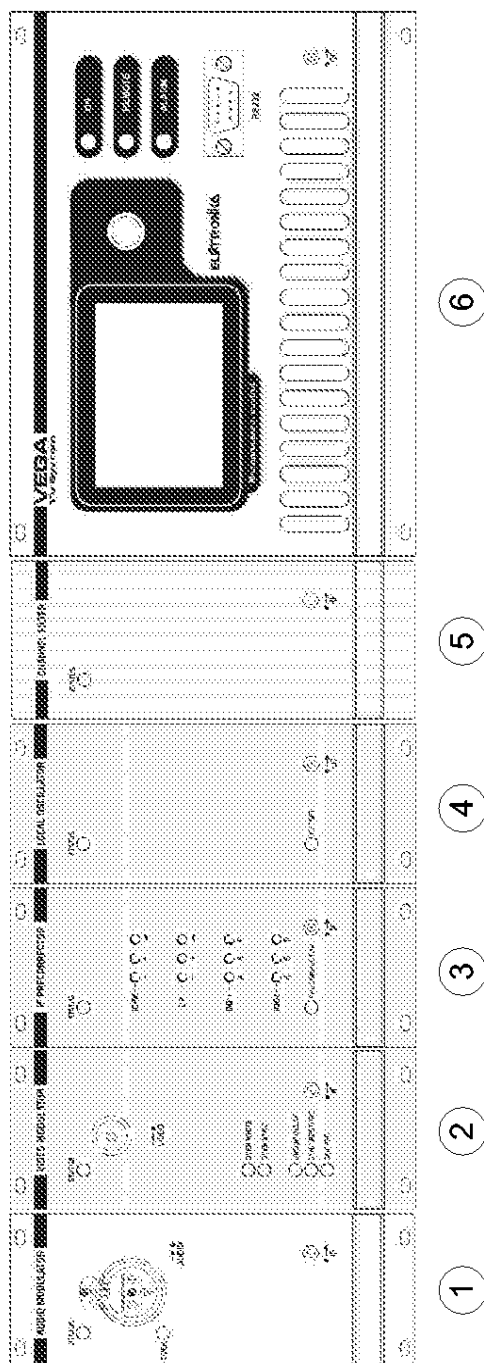
Input impedance	600Ω or 10k, selectable
Input level	0dBm ±8dB, 0.5dB step
Frequency response (30Hz to 15kHz)	±0.5dB (±0.2 typ.)
T.H.D. (30Hz to 15kHz)	<0.4% (better then 0.2% typ.)
S/N ratio (unweighted)	> 60dB
Pre-emphasis	50μs or flat
Stereo / Dual sound operation	Available
Stereo Crosstalk	> 37dB (better then 40dB typ.)

GENERAL

Output power	0 to 15W (Adj.)
Available standards	B, D, G, H, I, K, M, N
Cooling	Conventional
Operating temperature	-10°C to +45°C
Maximum relative humidity	90%, non condensing
Mains power supply	90 to 260VAC
External reference frequency input	5MHz or 10MHz
Output impedance	50Ω
Output connector	N Female
Dimensions	3U 19" Rackmount
Weight	15kg
Frequency stability	1ppm
I.M.D. at rated output power	Better than -60dBc (-63dBc typical)
Harmonics	-60dB or better
Sporious emissions	-60dB or better
External interfaces	Logic and analog signal outputs, enable input, RS485, RS232

Specifications and characteristics are subject to change without notice.

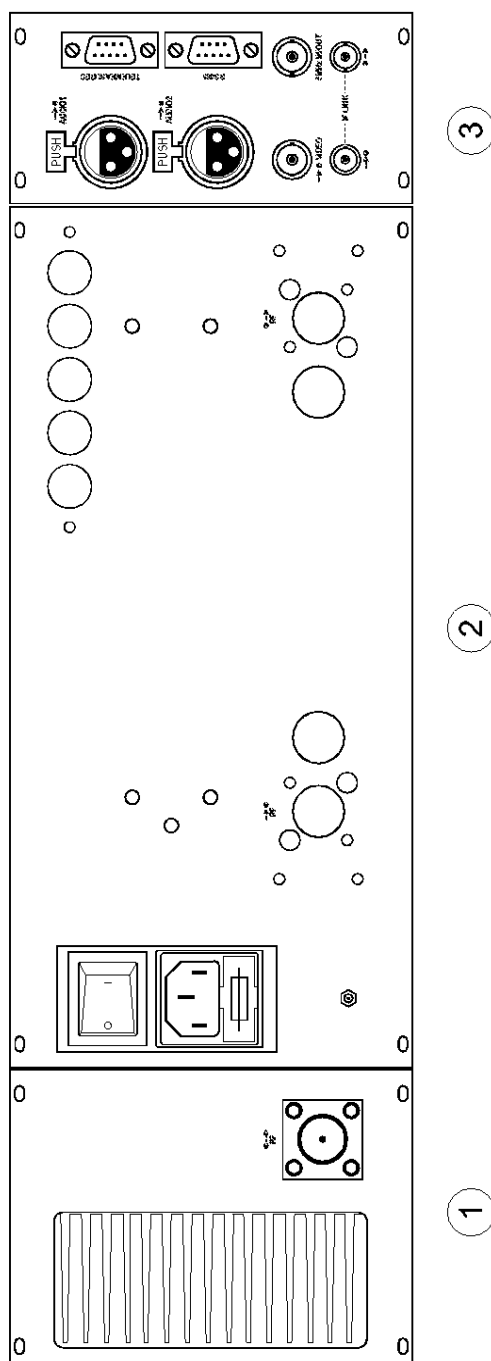
Front panel



DESCRIPTION

1	Mult. Mono Audio Modulator Module
2	Mult. Video Modulator Module
3	Mult. IF Precorrector Module
4	Mult. UHF Local Oscillator Module
5	Mult. UHF Channel Filter Module
6	Controller Module

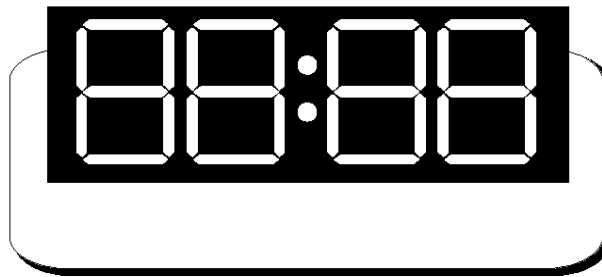
Rear panel



DESCRIPTION

1	RF Amplifier Module
2	Power Supply Module
3	External Referement Module

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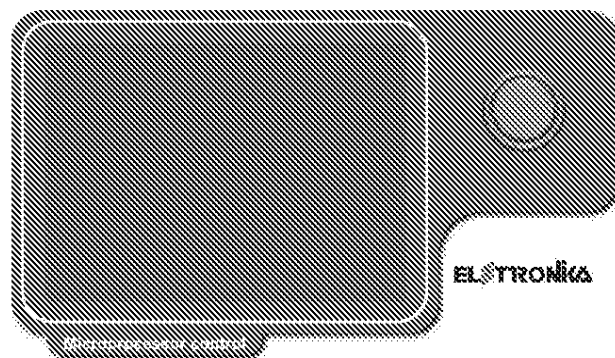
Section 2 - Operation

Contents:

- 2.1 Menu Management*
- 2.2 Manu Description*
- 2.3 Alarms and Automation*

2.1 MENU MANAGEMENT

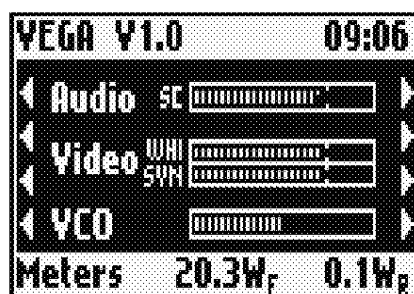
A large number of options of the VEGA TV exciter can be easily and intuitively controlled through the human-to-machine interface on the right side of the VEGA. It is composed by a graphic display and a clickable knob.



When the VEGA is switched on it initialise itself and query to all attached boards on bus the release number. During this period the display shows the screen below.



After the initialisation the VEGA goes to the main menu which contains the deviation bars of the audio IF carrier signals and the White and Synch bar of the video signal. The last bar on the bottom is the one of the VCO which shows the position of the control voltage of the local oscillator.

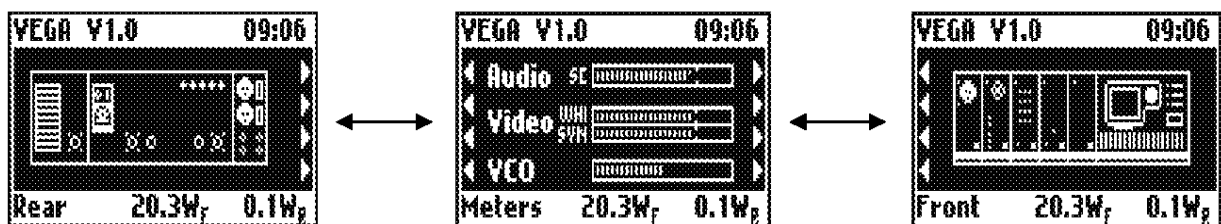


All of the menus of the VEGA contain a top bar which shows the name of the apparatus, the firmware version of the display board and the current time, and a bottom bar showing the reading of the output forward and reflected power and a summary of the current menu.

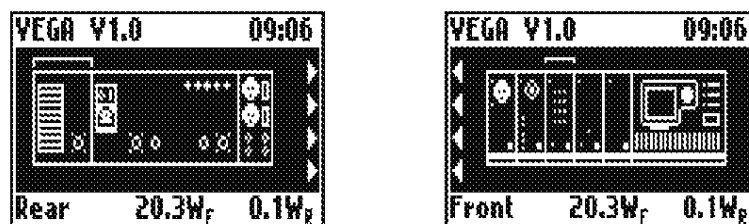
Since the number of menus of the VEGA is high, we give hereby a detailed description of all menus.

Note that the same firmware works either with the mono audio modulator and the stereo one. The firmware only needs to be set to mono or stereo from the relevant menu. Depending on the selection, the look of some menus may vary.

From the default menu, the bar meters menu, the user can navigate to other 2 menus. To navigate the menus, rotate the knob. The presence of a menu on the left or the right of the current one is shown as arrows at the left or the right respectively.



To enter the menu of the individual modules, select the module from the menu with the graphical image of VEGA, both the rear and the front view. After clicking, a blinking arc will show in what module you can enter clicking on the knob. To change module, rotate the knob.



Below are listed all the menus of all modules. Some symbols and functioning are always the same, and are:

- The EXIT menu is always on the first position of the leftmost menu and sends back to the default menu containing the deviation bars. So to go back to the default menu you have always to go all menus left and click 2 times, the first for selection and the second for confirmation.
- The parameters may be represented in different ways depending on their type. In detail:
 - the read-only parameters are represented by the name of the parameter and its current value. In case of failure of a parameter, its value blinks;
 - the parameter which can be set within a range of values are represented by the name of the parameter and its set value, followed by an arrow pointing downward to show that the value is part of a list of possible

settings;

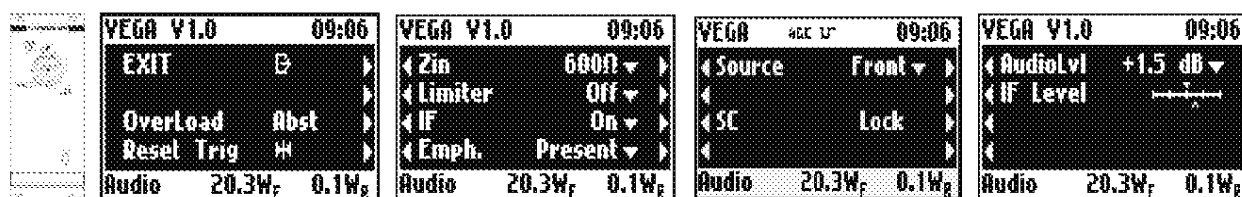
- the parameters which can be continuously set are represented by a bar showing the indication of the current value (light) and of the one set at the factory (dark);

- Actions (e.g. "Clear History") are always followed by the ->|<- symbol. By selecting this voice and confirming, the action will be executed.

- Pressing the knob while in any of the menus turns on a blinking cursor which can be used to select any parameter simply by turning the control. Then the knob can be pressed again to open the window allowing to change the selected parameter. In this window the control allows to choose the value, which has then to be confirmed when requested.

2.2 MENU DESCRIPTION

- Multistandard Audio Mono Section



EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

Overload

Shows whether there is (**Prst**), there isn't (**Abst**) or there was (**Trig**) an overload of the audio signal. In Absent and Triggered case, the label blinks.

Reset Trig

Clicking on the knob, after selecting this voice, delete the triggered indication from the overload.

Zin

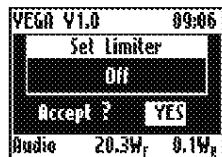
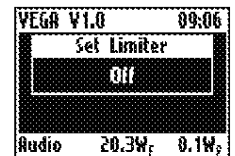
Clicking on then knob, after selecting this voice, goes into the menu that allows to change the impedance of the audio signal input connectors from 600Ohm to 10kOhm and back. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Limiter

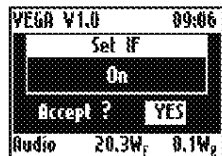
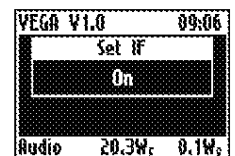
Clicking on then knob, after selecting this voice, goes into the menu that allows to change the Enables or Disables the limitation circuit. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

IF

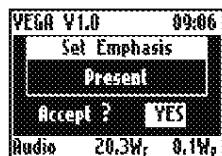
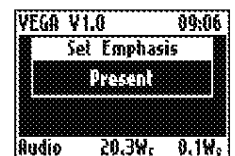
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggles between on and off of the IF. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Emph.

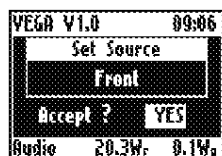
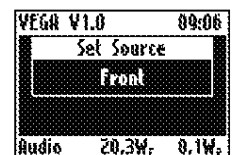
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggles between presence and absence of the emphasis. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Source

Clicking on then knob, after selecting this voice, goes into the menu that allows to choose whether to sample the input signal from the front or rear panel. Rotate the knob to select the desired value and click on it.



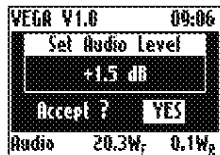
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

SC

Shows the PLL lock or unlock of the subcarrier. In case of unlock, the label blinks.

AudioLvl

Clicking on then knob, after selecting this voice, goes into the menu that allows to sets the input audio signals level. Rotate the knob to select the desired value and click on it.

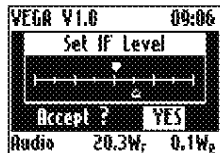
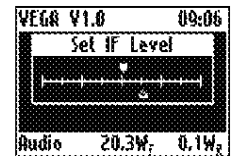


Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

IF Level

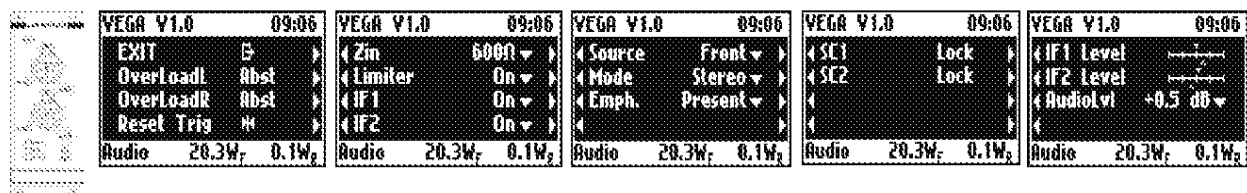
Clicking on then knob, after selecting this voice, goes into the menu that allows to sets the IF level. Rotate the knob to select the desired value and click on it.

The actual level is represented by the empty arrow, the full arrow represent the value of the factory setting of this level. This 'factory default marker' can help you to set-up the exciter to a good value, without ant instrumentation.

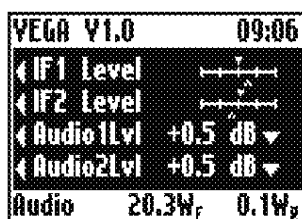


Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

- Multistandard Audio Stereo Section (Option)



The last menu is showed as in stereo or mono mode settings. If the mode is set for a dual sound audio modulation the last menu become the one below, because you can select to adjust the audio level to different values.



EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

OverloadL and OveroadR

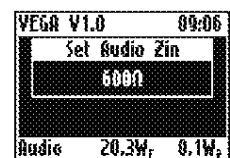
Shows whether there is (Prst), there isn't (Abst) or there was (Trig) an overload of the audio left and right signal. In Absent and Triggered case, the label blinks.

Reset Trig

Clicking on the knob, after selecting this voice, delete the triggered indication from the overload.

Zin

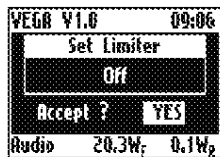
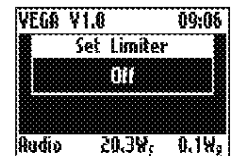
Clicking on then knob, after selecting this voice, goes into the menu that allows to change the impedance of the audio signal input connectors from 600Ω to 10kΩ and back. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Limiter

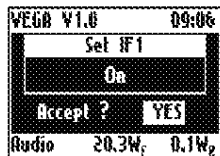
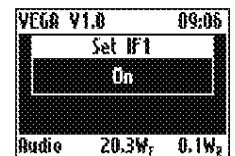
Clicking on then knob, after selecting this voice, goes into the menu that allows to change the Enables or Disables the limitation circuit. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

IF1

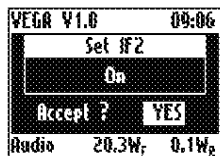
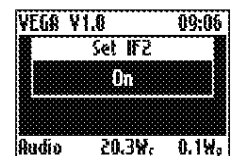
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggles between on and off of the IF1. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

IF2

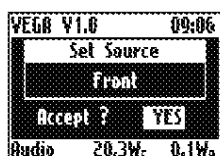
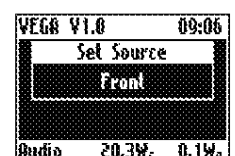
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggles between on and off of the IF2. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Source

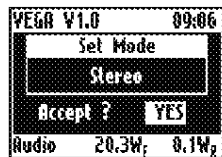
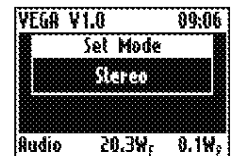
Clicking on then knob, after selecting this voice, goes into the menu that allows to choose whether to sample the input signal from the front or rear panel. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Mode

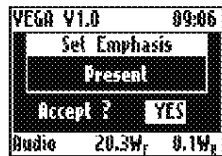
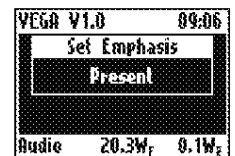
Clicking on then knob, after selecting this voice, goes into the menu that allows to choose the operating mode between mono, stereo or dual sound. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Emph.

Clicking on then knob, after selecting this voice, goes into the menu that allows to toggles between presence and absence of the emphasis. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

SC1

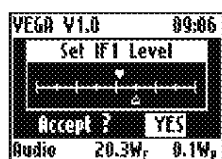
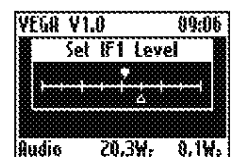
Shows the PLL lock or unlock of the subcarrier 1. In case of unlock, the label blinks.

SC2

Shows the PLL lock or unlock of the subcarrier 2. In case of unlock, the label blinks.

IF1 Level

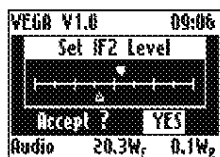
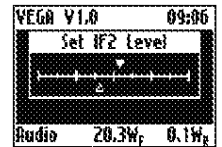
Clicking on then knob, after selecting this voice, goes into the menu that allows to sets the IF1 level. Rotate the knob to select the desired value and click on it. The actual level is represented by the empty arrow, the full arrow represent the value of the factory setting of this level. This 'factory default marker' can help you to set-up the exciter to a good value, without ant instrumentation.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob

IF2 Level

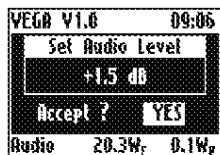
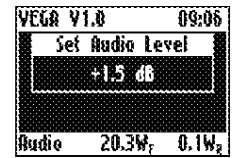
Clicking on then knob, after selecting this voice, goes into the menu that allows to sets the IF2 level. Rotate the knob to select the desired value and click on it. The actual level is represented by the empty arrow, the full arrow represent the value of the factory setting of this level. This 'factory default marker' can help you to set-up the exciter to a good value, without ant instrumentation.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

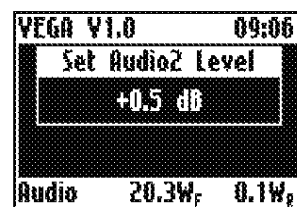
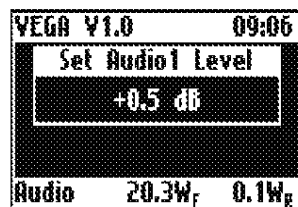
AudioLvl

Clicking on then knob, after selecting this voice, goes into the menu that allows to sets the input audio signals level. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

If the mode is set for a dual sound audio modulation you can select to adjust the audio level to different values, so the set audio level menu become two different menus for audio1 and audio2 level setting as showed below:



- Multistandard Video Section



EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

White Clip

Shows whether there is (Prst), there isn't (Abst) or there was (Trig) the clipper intervention on white. In Absent and Triggered case, the label blinks.

Sync Clip

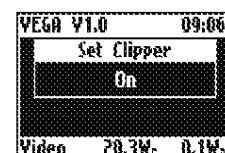
Shows whether there is (Prst), there isn't (Abst) or there was (Trig) the clipper intervention on sync. In Absent and Triggered case, the label blinks.

Reset Trig

Clicking on the knob, after selecting this voice, delete the triggered indication from the clippers.

Clipper

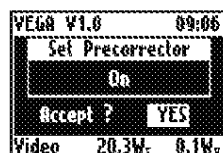
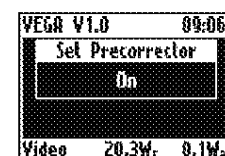
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggle the clipper intervention. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Precorr

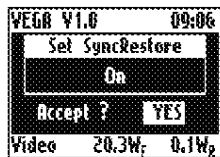
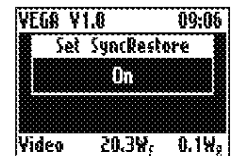
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggle the group delay pre-corrector. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Sync Restore

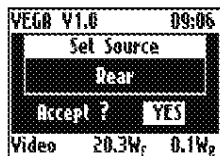
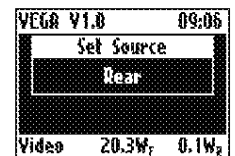
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggle the sync restore intervention. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Source

Clicking on then knob, after selecting this voice, goes into the menu that allows to choose whether to sample the input signal from the front or rear panel. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

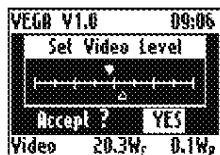
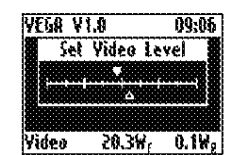
Video

Shows the PLL lock or unlock of the video. In case of unlock, the label blinks.

Video Level

Clicking on then knob, after selecting this voice, goes into the menu that allows to sets the video level. Rotate the knob to select the desired value and click on it.

The actual level is represented by the empty arrow, the full arrow represent the value of the factory setting of this level. This 'factory default marker' can help you to set-up the exciter to a good value, without ant instrumentation.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

- Multistandard IF Precorrector Section

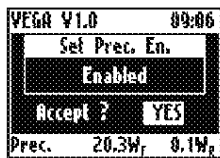
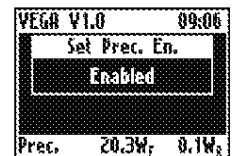


EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

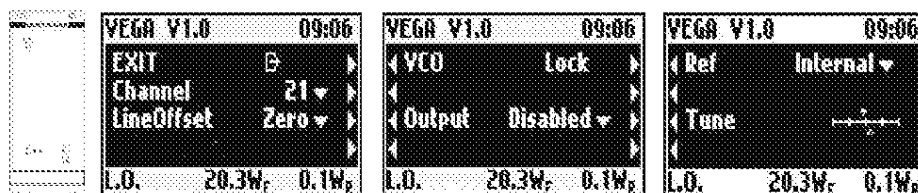
Prec

Clicking on then knob, after selecting this voice, goes into the menu that allows to toggle the non-linearity pre-corrector. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

- Multistandard Local Oscillator Section with Line Offset

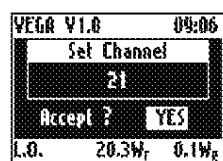
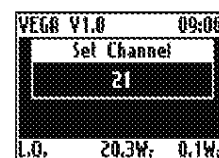


EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

Channel

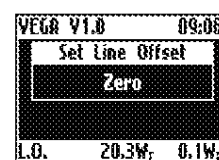
Clicking on then knob, after selecting this voice, goes into the menu that allows to select the transmission channel for the selected standard. Rotate the knob to select the desired value and click on it.



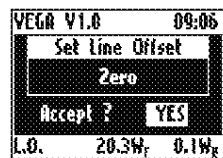
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Line offset

Clicking on then knob, after selecting this voice, goes into the menu that allows to set the line offset in either positive (P) or negative(M) steps from 15M to 15P. Rotate the knob to select the desired value and click on it.



$$\text{Offset[Hz]} = \text{LineOffset[Step]} * (\text{LineFrequency[Hz]} / 12)$$



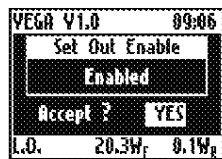
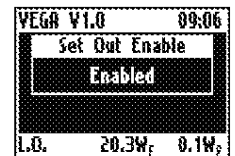
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

VCO

Shows the oscillator PLL lock or unlock. In case of unlock, the label blinks.

Output

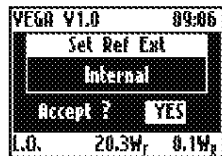
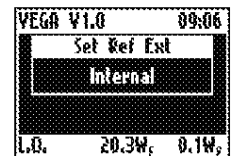
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggle the oscillator output. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Ref

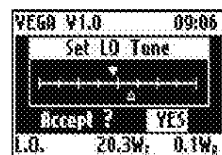
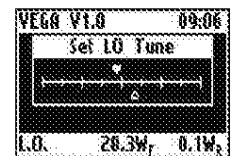
Clicking on then knob, after selecting this voice, goes into the menu that allows to select whether the reference is internal or external . Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

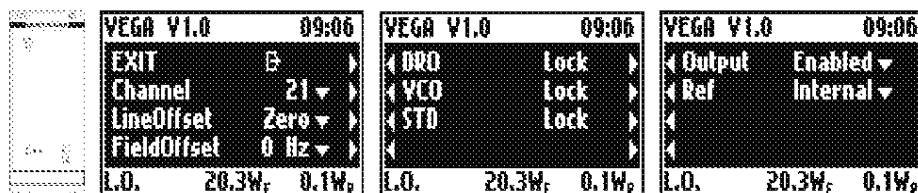
L.O. Tune

Clicking on then knob, after selecting this voice, goes into the menu that allows to fine adjust the frequency of Local Oscillator, usefull only in case of absence of an external reference. Rotate the knob to select the desired value and click on it. The actual level is represented by the empty arrow, the full arrow represent the value of the factory setting of this level. This 'factory default marker' can help you to set-up the exciter to a good value, without ant instrumentation.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

- Multistandard Local Oscillator Section with Field Offset (Option)

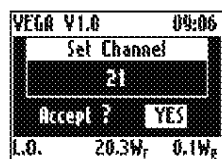
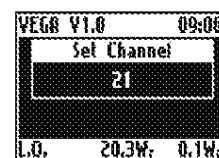


EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

Channel

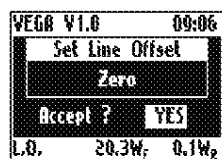
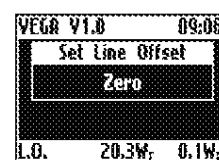
Clicking on then knob, after selecting this voice, goes into the menu that allows to select the transmission channel for the selected standard. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Line offset

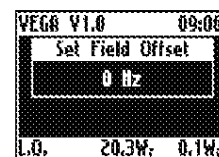
Clicking on then knob, after selecting this voice, goes into the menu that allows to set the line offset in either positive (P) or negative(M) steps from 15M to 15P. Rotate the knob to select the desired value and click on it.



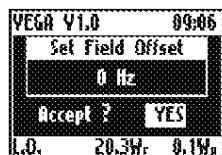
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Field offset

Clicking on then knob, after selecting this voice, goes into the menu that allows to set the filed offset in Hertz from -700Hz to +700Hz. This is added to the line offset. Rotate the knob to select the desired value and click on it.



$$\text{TotalOffset[Hz]} = \text{FieldOffset[Hz]} + \text{LineOffset[Step]} * (\text{LineFrequency[Hz]} / 12)$$



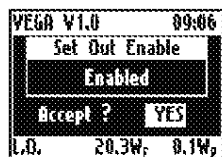
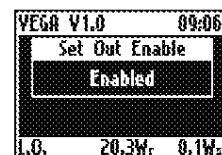
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

DRO, VCO, STD

Shows the oscillator PLLs lock or unlock. In case of unlock, the label blinks.

Output

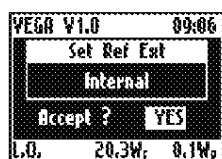
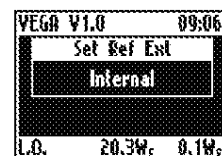
Clicking on then knob, after selecting this voice, goes into the menu that allows to toggle the oscillator output. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

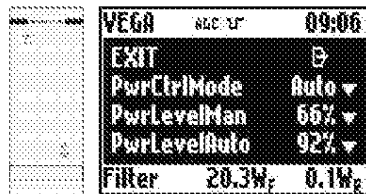
Ref

Clicking on then knob, after selecting this voice, goes into the menu that allows to select whether the reference is internal or external . Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

- Multistandard Channel Filter Section

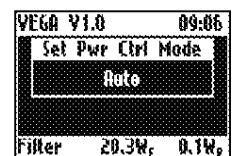


EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

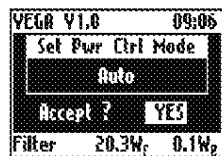
PwrCtrlMode

Clicking on then knob, after selecting this voice, goes into the menu that allows to switch between the manual and automatic (AGC) power control mode. Rotate the knob to select the desired value and click on it. The Auto or Manual selection will be always displayed on the top bar.



ATTENTION: for safety operation is better to set 0% to the power level that in not selected.

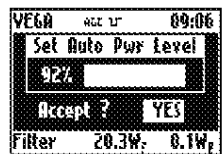
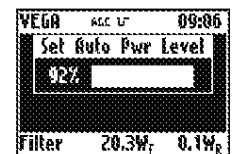
For example is AUTO power control mode is selected, is better to set 0% to the Power Level in manual mode. In this way, after a change, the power will start from 0W.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Auto Pwr level

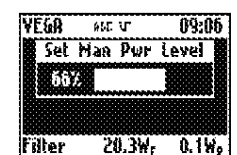
Clicking on then knob, after selecting this voice, goes into the menu that allows to select the operating level of the power in case of automatic power control mode selected. Rotate the knob to select the desired value and click on it.

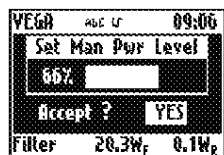


Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Manual Pwr level

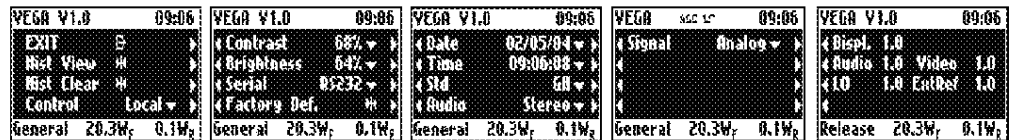
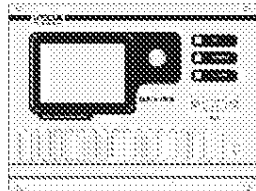
Clicking on then knob, after selecting this voice, goes into the menu that allows to select the operating level of the power in case of manual power control mode selected. Rotate the knob to select the desired value and click on it.





Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

- Control Section

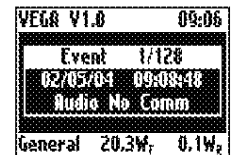


EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

Hist View

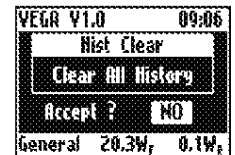
Clicking on then knob, after selecting this voice, goes into the menu that allows to show all the events stored into the non volatile memory of the VEGA. In the title bar is showed the current event number and the total events actually stored into the log. To move inside the log simply rotate the knob. Click the knob to exit from the history view.



Hist Clear

Clicking on then knob, after selecting this voice, goes into the menu that allows to clear all the events stored in the history log.

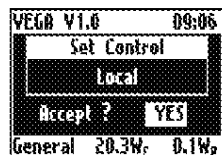
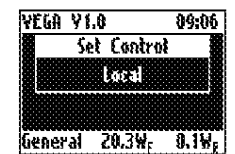
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.



Control

Clicking on then knob, after selecting this voice, goes into the menu that allows totoggle the local or remote control mode. Rotate the knob to select the desired value and click on it.

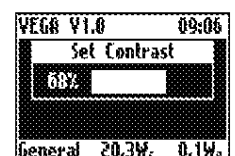
When in remote mode either the telemeasuring connector or the serial port can be used to control the exciter. Telemeasuring connector and serial port can be always used to monitor the exciter.

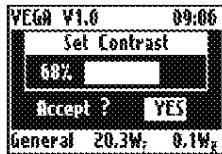


Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Contrast

Clicking on then knob, after selecting this voice, goes into the menu that allows to adjust the contrast settings of the display. Rotate the knob to select the desired value and click on it.

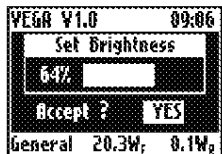
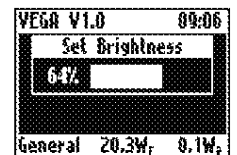




Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Brightness

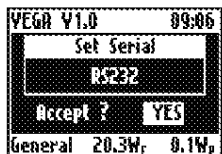
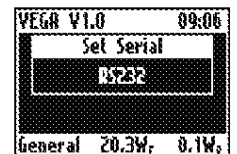
Clicking on then knob, after selecting this voice, goes into the menu that allows to adjust the brightness settings of the display. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Serial

Clicking on then knob, after selecting this voice, goes into the menu that allows to toggle between the possibility for serial port control: RS232 on the front panel and RS485 on the rear panel. Rotate the knob to select the desired value and click on it.

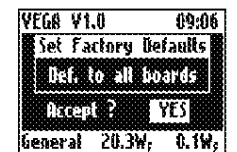


Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Factory Def

Clicking on then knob, after selecting this voice, goes into the menu that allows to reset all of the parameters of the VEGA to values set during the factory tests.

Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

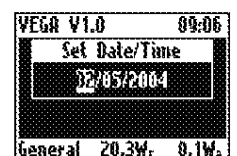


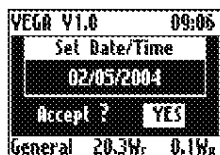
Date

Clicking on then knob, after selecting this voice, goes into the menu that allows to set the date of the internal clock of the display board.

Rotate the knob to select the desired value and click on it, the selection will go to the next filed.

The date format is day/month/year.



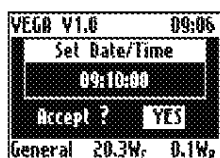


Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Time

Clicking on then knob, after selecting this voice, goes into the menu that allows to set the time of the internal clock of the display board. Rotate the knob to select the desired value and click on it, the selection will go to the next filed.

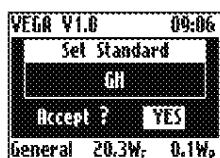
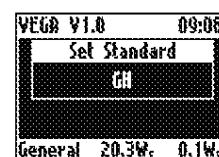
The time format is hour/minute/second.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Std

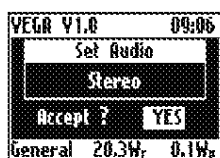
Clicking on then knob, after selecting this voice, goes into the menu that allows to set the standard used. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Audio

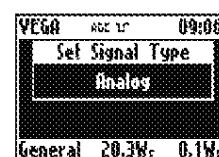
Clicking on then knob, after selecting this voice, goes into the menu that allows to sets the VEGA to work with either the mono or the stereo audio board. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Signal

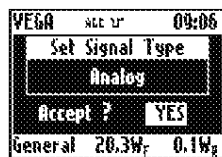
Clicking on then knob, after selecting this voice, goes into the menu that allows to select the signal type handled by the VEGA. Rotate the knob to select the desired value and



click on it.

If 'Digital' signal type is selected the sync detection is disabled. In the same way is disabled the 3dB power reduction feature in case of AGC power control and Sync lost.

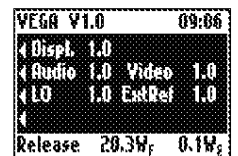
In case of Digital signal type selection the sync icon in the top bar will be replaced by a 'DIG' icon.



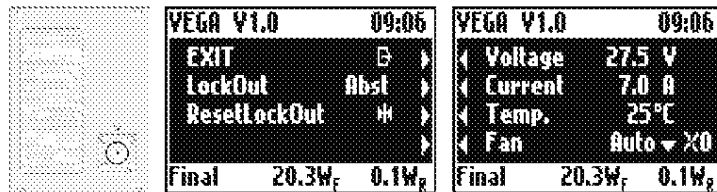
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Releases

Clicking on then knob, after selecting this voice, goes into the menu that allows to view all the release history of all the microcontrollers around the VEGA boards. The display board is showed in the first line and then the audio, video, local oscillator and external reference.



- Final Section



EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

LockOut

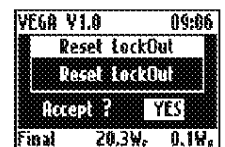
Shows whether the LockOut state is present or absent. In case of presence of LockOut, the label blinks. Below is detailed the functioning of LockOut.

While an alarm is present the exciter switch off the output power. When the alarm disappear, the power is switched on again. After 5 times the exciter switch off the output power, the exciter goes in LockOut state: the power remains off till the user reset the LockOut. If the fails are far more that 1 hour than the LockOut counter is automatically cleaned.

ResetLockOut

Clicking on then knob, after selecting this voice, goes into the menu that allows to clear LockOut counter.

Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.



Voltage

Shows the measure of the power supply voltage of the final power stage. In case of abnormal value, the label blinks.

Current

Shows the measure of the power supply current of the final power stage. In case of abnormal value, the label blinks.

Temp.

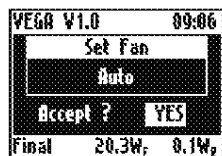
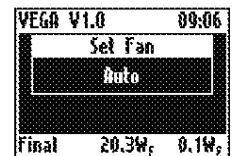
Shows the measure of the working temperature of the final power stage. In case of abnormal value, the label blinks.

Fan

Shows the operating mode of the fan, which may run at low or high speed, be still or be programmed to work

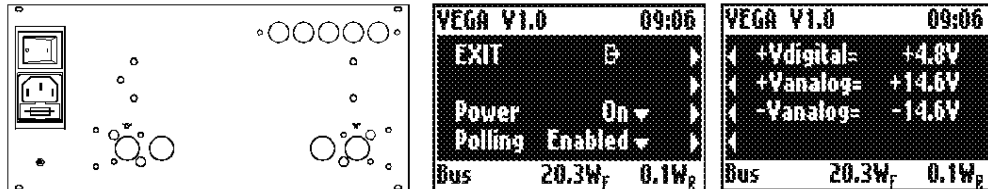
automatically depending on the temperature of the final stage. The fan symbol on the right shows the fan speed: 0, 1 or 2 means respectively stopped, low and high speed.

Clicking on then knob, after selecting this voice, goes into the menu that allows to set the standard used. Rotate the knob to select the desired value and click on it.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

- BUS Section

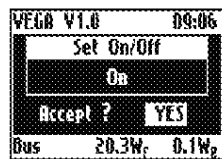
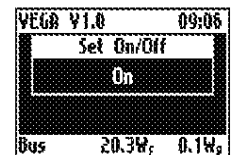


EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

Power

Clicking on then knob, after selecting this voice, goes into the menu that allows to turns on or off the power supply of the whole BUS. Rotate the knob to select the desired value and click on it.

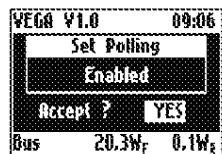
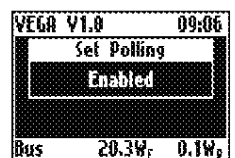


Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

Polling

Clicking on then knob, after selecting this voice, goes into the menu that allows to turns on or off the BUS polling feature. Rotate the knob to select the desired value and click on it.

If 'BUS polling' enabled the display board will poll continuously all the board to obtain the data values. If 'BUS polling' disabled the boards will inform by using an interrupt line that a value has changed on them.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

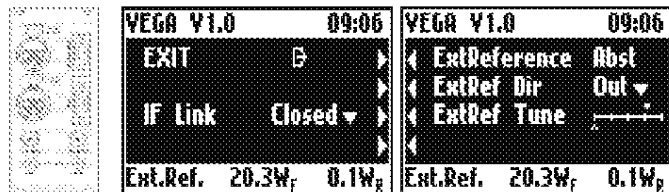
+Vdigital

Shows the measure of the +5V power supply voltage of the bus. In case of abnormal value, the label blinks.

+/-V analog

Shows the measure of the +/-15V power supply voltage of the bus. In case of abnormal value, the label blinks.

- External Reference Section

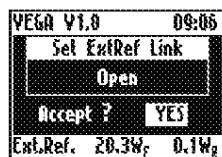
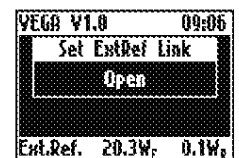


EXIT

Clicking on the knob, after selecting this voice, goes back to the default menu.

IF link

Clicking on then knob, after selecting this voice, goes into the menu that allows to choose whether the IF connection is internal or located on the rear panel. Rotate the knob to select the desired value and click on it.



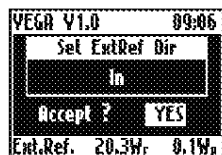
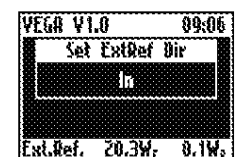
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

ExtReference

Shows whether the external reference is present.

ExtRef Dir

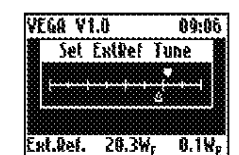
Clicking on then knob, after selecting this voice, goes into the menu that allows to set the direction of the reference. Rotate the knob to select the desired value and click on it.



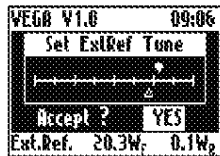
Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

ExtRef Tune

Clicking on then knob, after selecting this voice, goes into the menu that allows to fine adjust the frequency of the external reference. Rotate the knob to select the desired value and click on it. The actual level is represented by the empty arrow, the full arrow represent the value of the VEGA factory setting of this level. This 'factory default marker' can help you to set-up the exciter to



a good value, without ant instrumentation.



Answer to the confirming question, selecting between accept or not. The answer starts always from "Accept: NO", so to exit quickly form this menu simply click 2 times on the knob.

2.3 ALARMS AND AUTOMATION

In case of alarm the red LED lights up and the icon of a bell appears in the upper bar of the display. If the alarm disappears, the red LED is turned off and the bell starts blinking, in order to show that an anomaly occurred. To know the details of the anomaly and when it occurred, the history menu can be used. Once this menu is accessed, the blinking bell icon disappears.

In case of alarms of a board on the bus, such as the audio or the video modulator, the green status led on the board, will start blinking. When the board is working correctly the led is lit continuously.

While an alarm is present the exciter switch off the output power. When the alarm disappear, the power is switched on again. After 5 times the exciter switch off the output power, the exciter goes in LockOut state: the power remains off till the user reset the LockOut. If the fails are far more that 1 hour than the LockOut counter is automatically cleaned.

Please find below the list of the automatic interventions of the exciter in case of anomalies, and the relevant record in the history.

- Amplifier Voltage

No intervention. The history records and intervention if the value is too high or too low by the 10% of its nominal value (factory setting).

- Amplifier Current

No intervention. The history records an event if the value is too high or too low by the 20% of its nominal value (factory setting), only when the amplifier is on.

- Amplifier Temperature

The temperature is connected to the work of the fan, if it is set to automatic mode, in this way: there are 3 thresholds, $TH1 < TH2 < TH3$, all with histeresys.

Under the lowest threshold (TH1) the fan is off

Between TH1 and TH2 the fan is on and rotates slowly

Between TH2 and TH3 the fan is on and rotates fast

Beyond the higher threshold (TH3) the amplifier is switched off and an event is recorded in the history.

If the temperature drops again below TH3, the amplifier is switched back on.

A fast sequence of on/off switching causes a LockOut of the apparatus.

- BUS Voltages (+5V, +15V, -15V)

No intervention. The history records and intervention if the value is too high or too low by the 10% of its nominal value.

- Forward & Reflected Power

If the value of the forward power exceeds the threshold value (factory setting) the amplifier is switched off and the event is recorded in the alarm history.

- No communication with the boards on the BUS

No intervention. The history records the event only if Polling is enabled. If Polling is disabled, the 'No communication' is not detected.

- Non-corresponding standards

There is no intervention in case one or more boards on the BUS are set to work on different standards. The history records the event.

- IF Audio unlock

The audio board turns off its IF in case it becomes unlocked. The history records the event.

- Audio Overload

The menu of the audio board indicated the event with a blinking 'Triggered' message. The history does not record any event.

- IF Video unlock

The video board turns off its IF in case it becomes unlocked. The history records the event. Besides, the final amplifier is switched off.

- Video Clipper

The menu of the video board indicated the event with a blinking 'Triggered' message. The history does not record any event.

- L.O. unlock

The local oscillator board turns its output off if any of its PLL unlocks. The history records the event. Besides, the final amplifier is switched off.

- No Sync

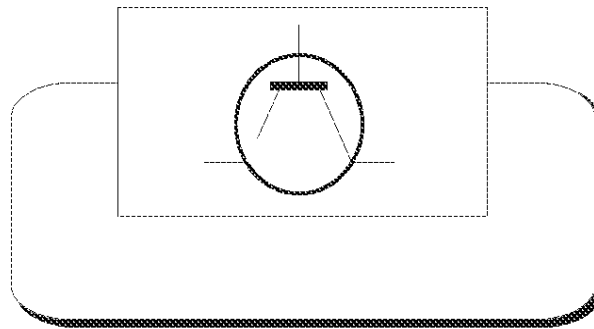
In case the synchronism is missing the sync icon in the top bar blinks.

In this case the value of the output power is decreased by 3dB only

if analog signal type is selected and AGC control is selected. In case of 3dB output power decrease, the output power value in the bottom bar will be written between brackets.



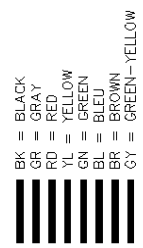
Meters (10.1W_F) 0.1W_R



Section 3 - Diagram

Contents:

- *Cable diagram*
- *Modules description*

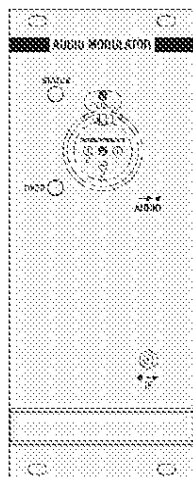


	CABLE DIAGRAM	DESIGNER	SIGNATURE	DATE
		MINERVINI		13/01/05
		CAD DESIGNER	SIGNATURE	REF
ASSEMBLY CODE S0007	TITLE VEGA TV TRANSMITTER SYSTEM	MINERVINI		SHEET 1 OF 1

Component list**APT139B - VEGA**

Part Name Code	Description	Qty
S0007	MODULAR STRUCTURE	1
MTG0077AR0	POWER SUPPLY MODULE	1
MTG0076AR0	EXTERNAL REFEREMENT MODULE	1
MTG0078AR0	MULT. AUDIO STEREO MODULATOR - OPT.	1
MTG0072AR0	MULT. VIDEO MODULATOR MODULE	1
MTG0073AR0	MULT. IF PRECORRECTOR MODULE	1
MTG0084AR0	MULT. LOCAL OSCILLATOR MODULE	1
MTG0075AR0	MULT. CHANNEL FILTER MODULE	1
MTG0079AR0	DISPLAY AND POWER SUPPLY MODULE	1
MTF0088AR1	15W UHF AMPLIFIER MODULE	1
05352	SAW FILTER SF0036BA01033T (EX 523)	1

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DESCRIPTION

The audio signal enters the module through one 600 Ω balanced or 10k Ω unbalanced XLR connection, which may be placed either on the front or rear panel and software-selected. It is conditioned by a digital power-meter with a ± 8 dB 0.5dB-step dynamic and muting. Then there are the emphasis and clipping stages (which can be inserted via software), before the frequency modulation of the audio carrier.

The control system of the audio subcarrier is a PLL which locking frequency can be selected via software depending to the transmission standard, while the reference frequency comes from the video module.

The control frequency comes from a VCTCXO inside the module to foresee the possibility of a separated-audio system, for which the 20MHz may be locked to a more precise system coming from the 5/10MHz bus.

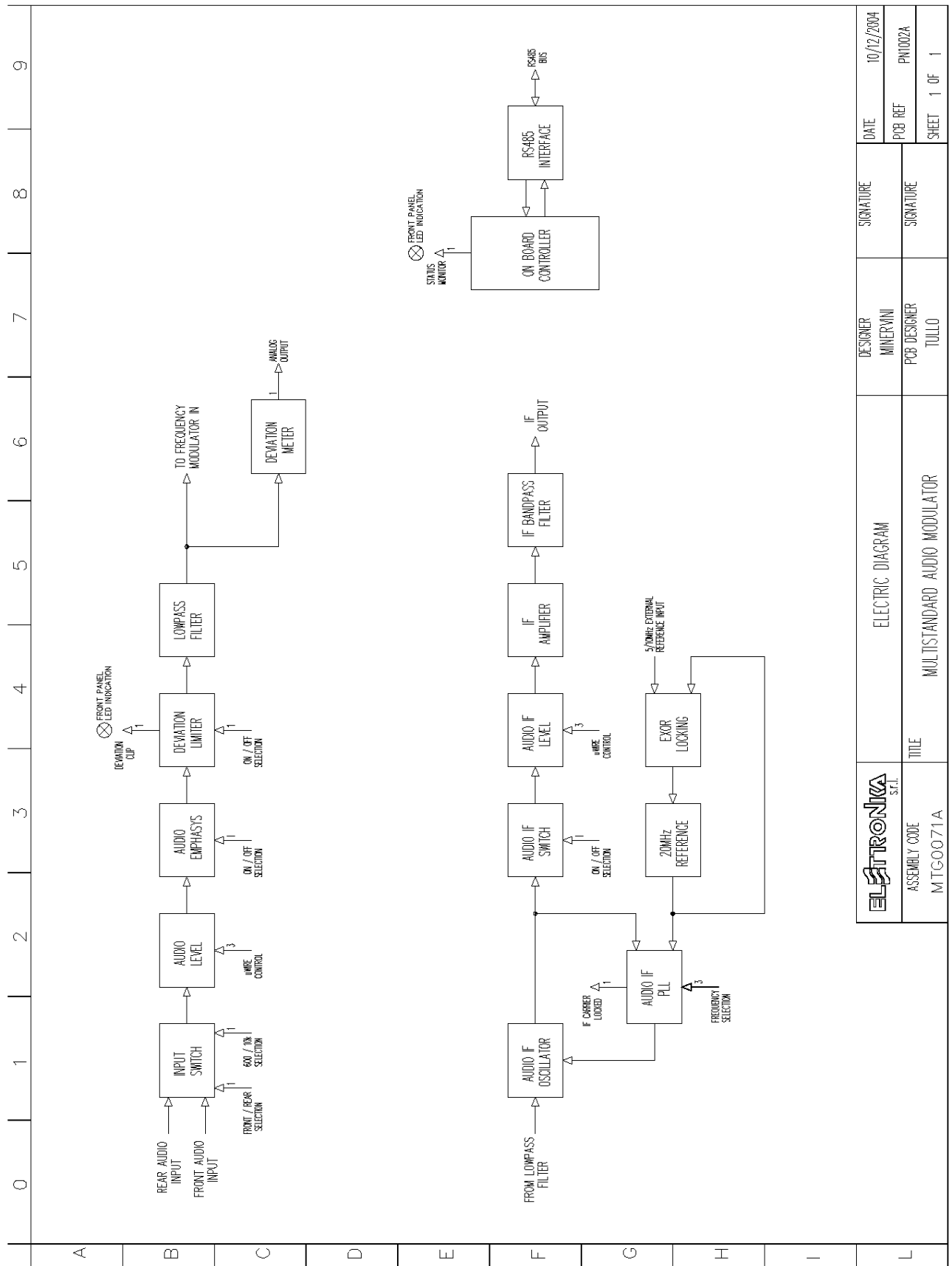
The carrier obtained this way is modulated in frequency and level-conditioned by an IF gain stage through a digital power-meter with a ± 3 dB dynamic in fine tuning before being added to the video carrier.

The following control signal for the modulator operation are present on the board: PLL lock status of the audio subcarrier, Overload on the audio input, Peak level of the deviation of the audio subcarrier.

All of the operating parameters of the board are managed by the built-in micro-processor. Communication to outside are performed through RS485 bus.

TECHNICAL CHARACTERISTICS

Input impedance	600 Ω - 10k Ω selectable
Nominal level	2V _{pp} ∞ /+8dB
Input	Front and back XLR selectable
Emphasis	FLAT-50 μ sec (FLAT-75 μ sec)
Deviation limiter	Selectable
Low-pass filter	15kHz excludible
Frequency response	$< \pm 0.5$ dB
THD	$< 0.5\%$
Intermodulation	< 60 dB (d2,d3)
Synchronous AM S/N	> 50 dB
Asynchronous AM S/N	> 70 dB
FM S/N CCIR	> 72 dB
Analog measures	Carrier FM deviation
Carrier frequency synthesis	PLL
Audio carrier characteristics	On/Off selection and level adjustment $> \pm 3$ dB
Frequency reference	Internal TCXO externally lockable
External interface	Microprocessor with RS485 protocol
Firmware	Re-configurable through RS485



The module contains the following blocks:

1. **Input relay** – chooses the audio source between the XLR on the front panel of the module and the one on the back of the apparatus and selects the input impedance to 600 Ω or 10k Ω ; both switching are managed by the software.
2. **Audio level regulation stage** – regulates the level of the audio signal by means of a digital potentiometer which can be programmed through a uWIRE interface (with 0.5dB step between -8dB and +8dB).
3. **Emphasis stage** – inserts an emphasis curve on the audio signal with a time constant depending on the standard (50,75 μ s); the choice can be selected via software.
4. **Deviation limiter** – cuts the audio level to limit the FM deviation; its intervention is handled by the software and the intervention of the clipper, if any, is signalled by a red LED on the front panel.
5. **Low-pass filter** – filters the audio signal before the modulation to suppress external residues from the audio band (20Hz-15kHz); the filter can be inserted by means of jumpers on the board.
6. **Audio signal level measurement** – this stage detects the peak level of the audio signal providing a conditioned analog voltage for the A/D conversion; the voltage will be processed by the microcontroller of the display board (see MTG0079) to be shown as VU-METER.
7. **Frequency modulator** – converts to intermediate frequency the audio signal as FM modulation of a carrier.
8. **Carrier level regulation stage** – switches on and off the audio carrier and the regulation within at least ± 3 dB of the level referring to the video carrier.
9. **IF amplifier** – amplifies the audio carrier to obtain an output level of -6dBm.
10. **Output low-pass filter** – filters the harmonics of the audio carrier.
11. **Audio IF oscillator** – generates the audio carrier performing the PLL frequency synthesis; the selectable standards and the lock indication are handled by the software.
12. **20MHz reference** – the frequency reference for the PLL synthesis of the carrier is generated by a TCXO which may be locked to a more precise 5/10MHz external reference (see MTG0076).
13. **Controller** – all of the described operations are managed by a microcontroller communicating to the user interface board (see MTG0079) by RS485 protocol; the local controller stores the status of the module and a reprogramming of the firmware (possible via RS485 from the display board) does not alter its contents.

CALIBRATION PROCEDURE

- Instrument list

MEASURE	INSTRUMENT
Lock of the carriers and reference	- <i>Spectrum analyser</i> - <i>Oscilloscope</i> - <i>Tester</i>
Calibration of the audio parameters after the FM modulation	- <i>Audio generator</i> - <i>FM Audio receiver</i> - <i>Audio parameters analyser</i>

Description of the adjustment points

COMPONENT	DESCRIPTION
R6	FM deviation level
R36	Unused
R37	Audio carrier level (-6dBm)
R99	VU-METER deviation
C17	Tuning of the local oscillator of the audio carrier
L5	Fine tuning of the local oscillator of the audio carrier
J7	IF video testpoint (50kHz)
J10	Unused
J3	VCO control voltage testpoint (7...8V)
J6	TCXO testpoint (50kHz)
J11	Unused
J12	External reference testpoint (100kHz)
J2	Audio input (panel)
J5	IF Monitor (panel)

The calibration procedure of the module requires a complete structure of display board (see MTG0079) and extension module (see MTG0095) in order to perform the software selection which will be referred to later and power the module itself.

Menu of the Multistandard Mono Audio Modulator Module

VEGA V1.0 09:06	VEGA V1.0 09:06	VEGA V1.0 09:06	VEGA V1.0 09:06
EXIT B	← Zin 600Ω	← Source Front	← AudioLvl +1.5 dB
OverLoad Abst	← Limiter Off	← Osc From video	← IF Level
Reset Trig W	← IF On	← SC Lock	
Audio 20.3W _F 0.1W _P	← Emph. Present	Audio 20.3W _F 0.1W _P	Audio 20.3W _F 0.1W _P

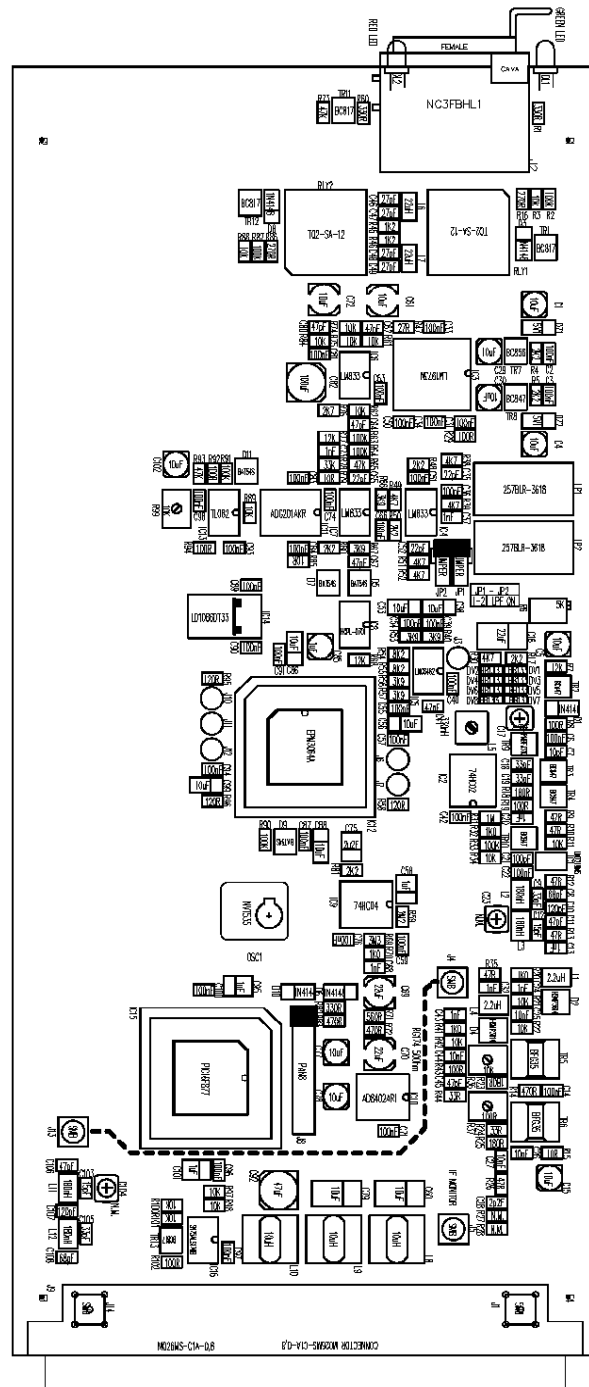
Verification of the IF oscillator section – connect a spectrum analyser to the monitor of the **J5** module and check the sections in it:

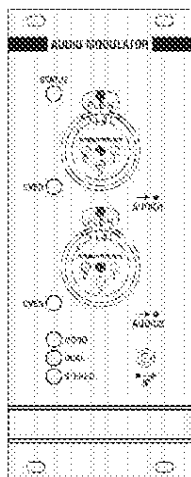
- ☐ Configure the module with **IF On** and **IF Level** at ½ of the scale and calibrate **C17**, **L5** to lock the audio carrier to the intermediate frequency of the set standard (to change the standard refer to the standard change procedure) and obtain a lock voltage between 7V and 8V on **J3**, checking that **SC** is on **Lock** in the menu of the display.
- ☐ In case of problems in obtaining the lock, check that on **J6**, **J7** and **J12** there are the frequencies listed in the table of the description of the adjustment points.

Verification of the audio base-band section – connect an audio source to **J2** and an FM demodulator with audio parameters measurement capability to the IF monitor of **J5** and check the sections in it:

- ☐ Configure the module with **Audio Lvl** at 0dB, **Zin** on 600Ω, **Limiter** off, **Emph** present and **Source** front.
- ☐ Calibrate **R6** to obtain the correct level of audio deviation.
- ☐ Increase **Audio Lvl** to +6dB and set **Limiter** on, check that the over LED lighted up and that **Overload** indicates **Pres**, restore **Audio Lvl** to 0dB and check that the LED becomes unlit and **Overload** indicates **Trig**, if needed reset this indication with **Reset Trig** and check that it goes to **Abst**.
- ☐ Calibrate **R99** for the correct indication of the VU-METER.

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DESCRIPTION

This modulator allows the Mono, Stereo and Dual Sound coding of TV audio signal.

The boards accept two input audio channels with a nominal amplitude of $2V_{pp} \pm 8dB$ on a selectable impedance of either 600Ω balanced or $10k\Omega$ unbalanced. The selection of the input impedance is made by means of a relay, the adjustment of the input level is made by means of a digital power-meter. The audio inputs are through balanced XLRF audio connectors on the front panel or through the bus connector. The audio source, either from front or back, is switched by a relay.

The modulator allows to add a pre-emphasis circuit, which time constant can be set in factory to either 50 or 75 microseconds.

It is possible to add a deviation circuit to prevent an overdrive of the modulator by an excessive-level base-band signal.

The base-band audio signals are limited in frequency through low-pass filters which suppress frequencies higher than 15kHz.

The deviation level is monitored by two peak detectors, one for each audio channel.

The Mono, Stereo or Dual Sound coding is analog. The pilot tone identifying the codification is overlapped to the audio signal which modulates the secondary audio subcarrier. This tone is represented by a 54.6875kHz pilot frequency, synthesised locally and locked by a PLL to the line frequency of the video signal in base band. The coding requires this pilot frequency to be non-modulated for monophonic audio. The pilot frequency is AM modulated with a frequency equal to 117.5Hz, 50% modulation depth, for Stereo. It is AM modulated with a frequency of 274.1Hz, 50% modulation depth, for Dual Sound audio.

The coded audio signal modulates the two subcarriers generated by the VCO, PLL locked to a reference frequency of 20MHz. Each of the subcarriers can be disabled, and the nominal level can be changed by $\pm 3dB$. On the board there is an IF input for the 38.9MHz video carrier. The latter is added to the two audio subcarriers and sent to the output.

The following control signal for the modulator operation are present on the board:

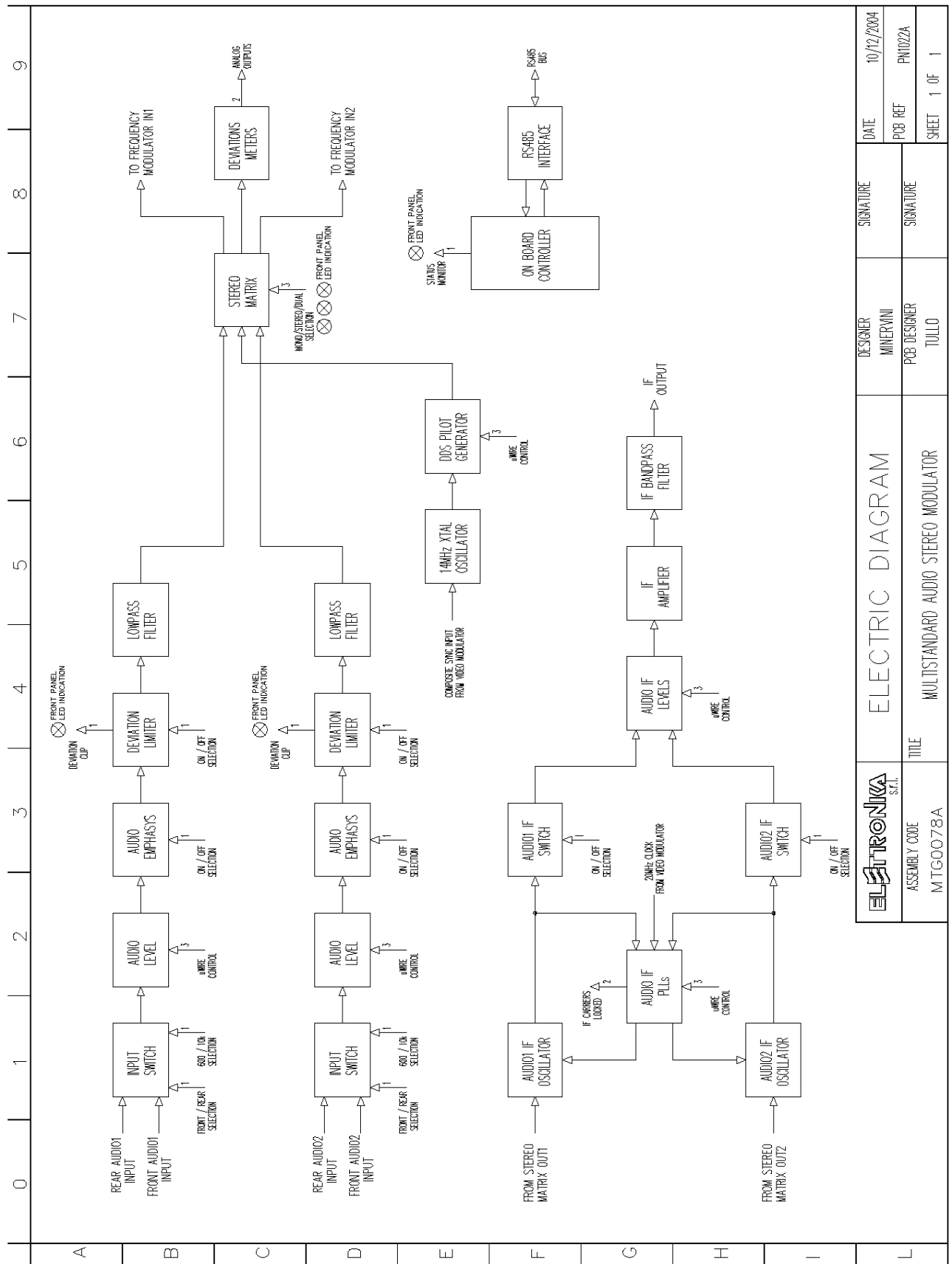
- PLL lock status of the primary audio subcarrier.
- PLL lock status of the secondary audio subcarrier.
- PLL lock status of the pilot tone.
- Overload on the main audio input.
- Overload on the secondary audio input.
- Peak level of the deviation of the primary audio subcarrier.

- Peak level of the deviation of the secondary audio subcarrier.

All of the operating parameters of the board are managed by the built-in micro-processor. Communication to outside are performed through RS485 bus.

TECHNICAL CHARACTERISTICS

Input impedance	600Ω - 10kΩ selectable
Nominal level	2V _{pp} -∞/+8dB
Input	Front and rear XLR selectable
Emphasis	FLAT-50μsec (FLAT-75μsec)
Deviation limiter	Selectable
Low-pass filter	15kHz excludable
Frequency response	<±0.5dB
THD	<0.5%
Stereo crosstalk	<-40dB
Intermodulation	< 60dB (d2,d3)
Synchronous AM S/N	> 50dB
Asynchronous AM S/N	> 70dB
FM S/N CCIR	> 72dB
Analog measures	FM deviation of the carriers
Carrier frequency synthesis	A PLL
Audio carrier characteristics	On/Off selection and level adjustment > ±3dB
Pilot tone characteristics	54687.5Hz (3/2fs)±10Hz
Pilot tone modulation	AM 50%
Modulation frequency	274.12Hz (1/57fs) 117.48Hz(1/133fs)
Frequency reference	Internal TCXO externally lockable
External interface	Microprocessor with RS485 protocol
Firmware	Re-configurable via RS485



The module contains the following blocks:

1. **Input relays (2)** – chooses the audio source between the XLR on the front panel of the module and the one on the back of the apparatus and selects the input impedance to 600 Ω or 10k Ω ; both switching are managed by the software.
2. **Audio level regulation stages (2)** – regulates the level of the audio signal by means of a digital potentiometer which can be programmed through a uWIRE interface (with 0.5dB step between –8dB and +8dB).
3. **Emphasis stages (2)** – inserts an emphasis curve on the audio signal with a time constant depending on the standard (50,75 μ s); the choice can be selected via software.
4. **Deviation limiters (2)** – cuts the audio level to limit the FM deviation; its intervention is handled by the software and the intervention of the clipper, if any, is signalled by a red LED on the front panel.
5. **Low-pass filters (2)** – filters the audio signal before the modulation to suppress external residues from the audio band (20Hz-15kHz); the filter can be inserted by means of jumpers on the board.
6. **Stereo matrix** – encodes the two audio signals depending on the transmission mode set and adds the modulated pilot tone to define the transmission standard as either mono, stereo or dual sound; the selection can be made via software and is indicated by three yellow LEDs on the frontal panel.
7. **14MHz quartz oscillator** – generates the clock needed to synthesise the pilot tone locked to the line-synchronism frequency of the video signal coming from the video modulator module (see MTG0072).
8. **Synthesised pilot tone generator** – synthesises the pilot tone by means of DDS programmed through an uWire interface.
9. **Audio signal level measurement** – this stage detects the peak level of the audio signal providing two conditioned analog voltages for the A/D conversion; the voltages will be processed by the microcontroller of the display board (see MTG0079) to be displayed as VU-METERS.
10. **Frequency modulators (2)** – converts to intermediate frequency the audio signal as FM modulation of a carrier.
11. **Carrier level regulation stages (2)** – switches on and off the audio carrier and the regulation within at least ± 3 dB of the level referring to the video carrier.
12. **IF amplifier** – amplifies the audio carrier to obtain an output level of -6dBm.
13. **Output low-pass filter** – filters the harmonics of the audio carrier.
14. **Audio IF oscillators (2)** – generates the audio carrier performing the PLL frequency synthesis; the selectable standards and the lock indication are handled by the software.
15. **20MHz reference** – the frequency reference for the PLL-synthesis of the audio carrier is obtained from the video module (see MTG0072) to keep a perfect intercarrier lining.
16. **Controller** – all of the described operations are managed by a microcontroller communicating to the user interface board (see MTG0079) by RS485 protocol; the local controller stores the status of the module and a reprogramming of the firmware (possible via RS485 from the display board) does not alter its contents.

CALIBRATION PROCEDURE

- Instrument list

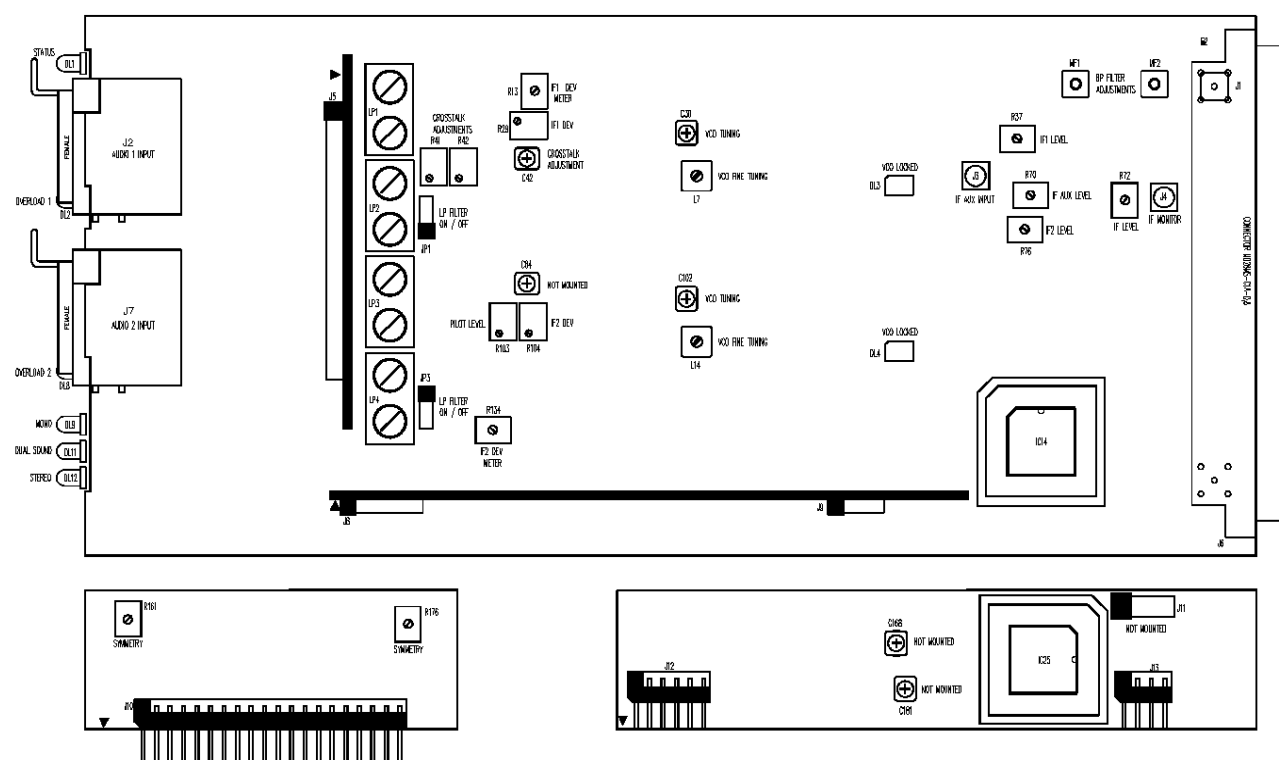
MEASURE	INSTRUMENT
Lock of the carriers and reference	- Spectrum analyser - Oscilloscope - Tester
Calibration of the audio parameters after the FM modulation	- Audio generator - FM Audio receiver - Audio spectrum analyser

- Description of the adjustment points

COMPONENT	DESCRIPTION
R161	Clipper symmetry, left channel
R176	Clipper symmetry, right channel
R13	Indication of the main carrier deviation
R134	Indication of the secondary carrier deviation
LP1, LP2, LP3, LP4	Frequency response adjustment
R41, R42, C42	Crosstalk adjustment
R103	Pilot tone level adjustment
R29	Adjustment of the main carrier deviation
R104	Adjustment of the secondary carrier deviation
C30, L7	Adjustment of the main carrier frequency
C102, L14	Adjustment of the secondary carrier frequency
R37	Adjustment of the main carrier output level
R76	Adjustment of the secondary carrier output level
R70	Adjustment of the video carrier (Unused)
R72	Adjustment of the carriers output level

COMPONENT	DESCRIPTION
MF1, MF2	Adjustment of the output filter
J2, J7	Audio inputs (panel)
J4	IF monitor (panel)

Component layout for adjustment points



The calibration procedure of the module requires a complete structure of display board (see MTG0079) and extension module (see MTG0095) in order to perform the software selection which will be referred to later and power the module itself.

- Menu of the Multistandard Stereo Audio Modulator Module

VEGA V1.0	09:06	VEGA V1.0	09:06	VEGA V1.0	09:06	VEGA V1.0	09:06	VEGA V1.0	09:06
EXIT B		Zin 600Ω		Source Front		SC1 Lock		IF1 Level	
OverLoadL Abst		Limiter On		Mode Stereo		SC2 Lock		IF2 Level	
OverLoadR Abst		IF1 On		Emph. Present				AudioLvl +0.5 dB	
Reset Trig H		IF2 On							
Audio 20.3W _F 0.1W _R		Audio 20.3W _F 0.1W _R		Audio 20.3W _F 0.1W _R		Audio 20.3W _F 0.1W _R		Audio 20.3W _F 0.1W _R	

Verifica sezione oscillatore a IF – collegare un analizzatore di spettro sulla monitoria del cassetto J5 e controllare la funzionalità delle sezioni in esso presenti:

- ☐ Configure the module with **IF1 and IF2 On** and **IF1 Level** and **IF2 Level** at ½ of the scale and calibrate C30 and L7 (C102 and L14) to lock the audio carriers to the intermediate frequency of the set standard (to change the standard refer to the standard change procedure) and obtain a lock voltage between 2V and 3V on C4 (C113), checking that SC1 and SC2 are on Lock in the menu of the display.
- ☐ Connect a spectrum analyser in tracking mode between J3 and the output of the J1 module and check the response of the filter calibrating MF1 and MF2 to the minimum ripple.
- ☐ Calibrate the R37 trimmer to obtain on J1 the maximum level of the main carrier in output and calibrate R76 for a level of the secondary carrier -7dBc compared to the main, then calibrate R72 to obtain a level of the main carrier of -6dBm.

Verification of the audio base-band section – connect an audio source to J2 and J7 and an FM demodulator with audio parameters measurement capability to the IF monitor of J4 and check the sections in it:

- ☐ Configure the module with **Mode DualSound**, **Audio1 Lvl 0dB**, **Audio2 Lvl 0dB**, **Zin 600Ω**, **Limiter off**, **Emph present** and **Source front**.
- ☐ Calibrate R29 and R104 to obtain the correct level of audio deviation for both subcarriers.
- ☐ Increase **Audio1(2) Lvl** to +6dB set **Limiter on**, check that the over LED lighted up and that **OverloadL(R)** indicates Pres, and that the limitation circuit acts symmetrically on both polarities of the audio signal, using an oscilloscope on pin3 of JP1 (JP3), and retouch if needed R161 (R176), restore **Audio1(2) Lvl** to 0dB and check that the LEDs become unlit and **OverloadL(R)** indicates Trig, if needed reset this indication with **Reset Trig** and check that it goes to Abst.
- ☐ Calibrate R13 and R134 for the correct indication of the VU-METERS.
- ☐ Configure the module with **Mode Mono** and calibrate R103 to a 2.5kHz deviation of the pilot tone with no audio sources connected on J2 and J7.
- ☐ Configure the module with **Mode Stereo** and connect an audio signal to J7, calibrate R41, R42 and C42 to maximise the crosstalk of the right channel over the left channel.