




EL**TRONIKA**^{SRL}
|fm|tv|digital|broadcasting|

MIZAR
FM Transmitter System

Technical Manual

	CODE	APF073A APF074A	TITLE	MIZAR FM TRANSMITTER	REV	1.1	DATE	26/07/07
---	------	--------------------	-------	----------------------	-----	-----	------	----------

MIZAR Transmitter Family

POWER AUDIO	30W	300W
------------------------------	------------	-------------

MONO	APF073A MIZAR30	APF074A MIZAR300
STEREO	APF073A+OPT023 MIZAR30S	APF074A+OPT023 MIZAR300S



Registration number: IT-17686



Registration number: IT-24436

CE 0682 ⓘ

SS 96 Km 113
70027 Palo del Colle (Ba) **ITALY**
Tel. +39 (0)80 626755
Fax +39 (0)80 629262
E-mail: elettronika@elettronika.it
Web site: <http://www.elettronika.it>

Mizar Transmitter Family	2
Summaries	3
Warning	7
Warranty	8
Introduction	9
Content of the manual	9
Treatment of electrical shock	11
<i>First-aid</i>	12
<i>Treatment of electrical burns</i>	12
<i>Note</i>	12
RoHS Normative	13
MIZAR FM Transmitter System	15
Section 1 - Information	17
1.1 <i>Description</i>	18
1.2 <i>Technical characteristics</i>	19
1.3 <i>Front panels</i>	21
1.4 <i>Rear panels</i>	22
<i>Block Diagram</i>	23
Section 2 - Installation	25
2.1 <i>Operating environment</i>	26
2.2 <i>First installation</i>	26
2.3 <i>Installation of MIZAR Mono with external Stereo Coder</i>	27
2.4 <i>Installation of MIZAR Stereo with external RDS Coder</i>	27
2.5 <i>MIZAR remote control with Elettronika RCU</i>	28
Section 3 - Operation	29
3.1 <i>User interface and software settings</i>	30
3.2 <i>AGC Implementation</i>	32
3.3 <i>Alarms and automatic behaviours</i>	33
3.4 <i>Status LEDs</i>	33
Section 4 - Diagram	35
- <i>APF073A MIZAR30 Cable Diagram</i>	36
- <i>APF074A MIZAR300 Cable Diagram</i>	37
- <i>APF073A_ APF074A MIZAR Component list</i>	38
- <i>SCH0377A Mother Board</i>	39
- <i>Description</i>	39
- <i>SCH0377A Component layout</i>	40
- <i>Calibration procedure</i>	41
- <i>Instrument list</i>	41

- Description of the adjustment points	41
- Component layout for adjustment points	42
- RF Section	43
- Modulation Section.....	43
- Audio Section	43
- General	43
- SCH0377A Component list	44
- SCH0377A Electric Diagram	46
- OPT023 Stereo Coder Board	47
- Description	47
- SCH0378A Component layout	47
- Calibration procedure	48
- Instrument list	48
- Description of the adjustment points	48
- Component layout for adjustment points	49
- Coder Section	49
- SCH0378A Component list	50
- SCH0378A Electric Diagram	51
- SCH0372A Display Board	52
- Description	52
- SCH0372A Top layer Component layout.....	52
- SCH0372A Bottom layer Component layout	52
- SCH0372A Component list	53
- SCH0372A Electric Diagram	54
- MFF0025B 30W FM Amplifier Module	55
- Description	55
- Technical Characteristics	55
- MFF0025B Component list	55
- MFF0025B Component layout	56
- Calibration Procedure	56
- Calibration of the Output Filter	56
- Instrument list.....	56
- Polarisation of the BLF242 and BLF245 MOSFETs	58
- Instrument list.....	58
- Description of the adjustment points	58
- SCH0382B 30W FM Amplifier Board Component layout	59
- SCH0382B Component list	60
- SCH0382B Electric Diagram	61

- MFF0031A 300W Amplifier Module	63
- Description	63
- Technical Characteristics	63
- MFF0031A Component list	63
- MFF0031A Component layout	64
- Calibration Procedure	65
- Instrument list	65
- Output Filter Section	65
- Polarisation of the Transistor	65
- Instrument list	66
- Description of the adjustment points	67
- SCH0427A 300W FM Amplifier Board Component layout	68
- SCH0427A Component list	69
- SCH0426A FM Amplifier Interface Board Component layout	71
- SCH0426A Component list	71
- SCH0427A Electric Diagram	72
- SCH0426A Electric Diagram	74
- SCH0371B Interface Board	75
- SCH0371B Interface Board Component layout	75
- SCH0371B Component list	75
- SCH0371B Electric Diagram	76
- E0060 S-100F-24 Switching power supply	77
- Main Features	77
- Mechanical Specification	77
- Technical Characteristics	78
- E0050 PSP-650-48 DE2 Switching power supply	79
- Main Features	79
- Mechanical Specification	79
- Technical Characteristics	80
- Block Diagram	81
- Derating Curve	81
- Output Derating VS Input Voltage	81
- Control terminal instruction manual	82
- Parallel operation with remote setting	82
- E0050 Electric Diagram	83

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 ***Eletronika 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 ***Eletronika S.r.l.***

The use of anything enclosed in this technical manual without explicit authorization given by ***Eletronika 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 ***Eletronika 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 competitive 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 ELETTRONIKAS.r.l.

This manual is made up of different chapters, each made up of various sections.

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 nsticks 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.

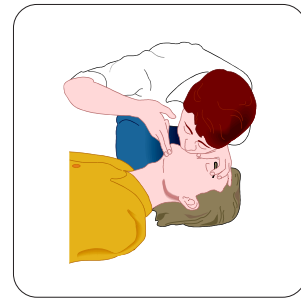
PLACE VICTIM FLAT ON HIS BACK ON A HARD SURFACE

A - AIRWAY



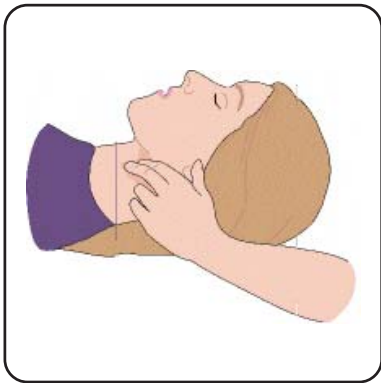
If unconscious, open airway lift up neck, push forehead back, clear out mouth if necessary, observe for breathing.

B - BREATHING

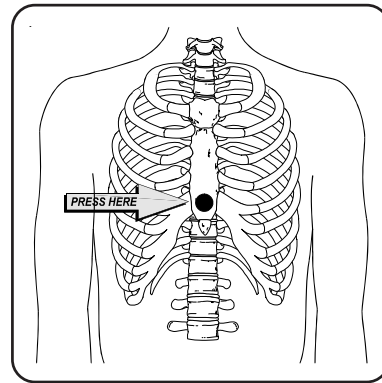


If not breathing, begin artificial breathing. Tilt head, pinch nostrils, make airtight seal, 4 quick full breaths. Remember mouth to mouth resuscitation must be commenced as soon as possible.

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.

Communication N°1 -2002/95/CE - RoHS Directive

Further to the directives issued by the European Community, 2002/95/CE, 2002/95/CE and 2003/108/CE, and to the Italian Decree of Law n° 151 dated 25 July 2005, this is to inform the customers of Elettronika S.r.l. living within the boundaries of the European Community about the following obligations:

- 1) It is forbidden to trash RAEE products (which includes all broadcasting products which are not expressly labelled as lead-free) along with normal wastes;
- 2) Such devices must be brought to proper centres able to perform the adequate processing in order to recycle their parts where possible and dispose of the raw materials contained therein;
- 3) For equipment purchased from Elettronika after the 13th of August 2005, the gathering, transport, processing, recycle and disposal operations are responsibility of Elettronika who will bear all related expenses;
- 4) For equipment purchased from Elettronika before the 13th of August 2005 , the gathering, transport, processing, recycle and disposal operations are responsibility of Elettronika, who will bear all related expenses, only if you are purchasing from us new equipment in substitution of the disposed one;
- 5) Electric and electronic devices contains lead in soldering, cables, etc. This substance pollutes the environment and may be accumulated in the organism of plants and mammals. It is dangerous for humans because it may affect blood, bone marrow, peripheral and central nervous system and kidneys, causing anaemia, encephalopathies (e.g., convulsions), peripheral neuropathies, cramps of the abdomen and kidney damages. Besides it affects human reproduction and growth.
These devices also contain mercury. From the environmental point of view, this substance is highly toxic for aquatic life, and can be accumulated in the organism of fish.
Long-term damages to humans can affect the central nervous system and the kidneys, producing irritability, emotional instability, tremors, damages to the mind and the memory, language disorders. It may also irritate and whiten the gums, and its effects may be cumulative. Based on tests on animals, it may affect the human reproduction or growth.
There is also chrome, which may result in irritation of the eyes and respiration system.
Cadmium is also present. In humans it may damage lungs, due to repeated or prolonged contact with its dust, and kidneys. It may cause cancer.
- 6) The symbol below marks the devices which cannot be disposed of along with normal wastes, as stated in 1) and 2) above.



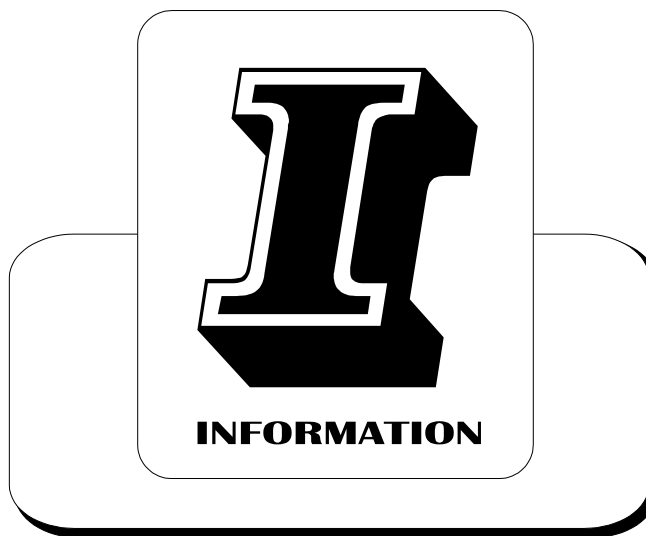
- 7) The payment of fees is foreseen for the non-allowed disposal of such devices.

FM TRANSMITTER SYSTEM



MIZAR

User's manual



Section 1 - Information

Contents:

- 1.1 Description*
- 1.2 Technical characteristics*
- 1.3 Front Panels*
- 1.4 Rear Panels*
- Block Diagram*

MIZAR FM SYSTEM



1.1 DESCRIPTION

The MIZAR represents a family of radio transmitters available with 30W and 300W power, completely controlled by microprocessor, used for radio transmissions in FM band, both stereo and mono.

The high technological content along with the use of surface mounting components allowed the realization of an apparatus with excellent performances and limited dimensions.

The extremely simplified wiring increases the reliability of the whole system and makes testing easier. Among the main characteristics there are:

- *availability of 30W (2U) and 300W (3U) version with extremely simplified wiring;*
- *repeatability of the performances, guaranteed by the completely mechanized assembling;*
- *good values of distortion and high S/N ratio;*
- *analogic telemetry signals available on DB9;*
- *RS232 (or RS485) connections for remote control;*
- *automatic output power level control;*
- *control of all the functions via 2x16 display;*
- *all the final stages with MOSFET technology;*
- *a stereo coder can be integrated in the cabinet.*

1.2 TECHNICAL CHARACTERISTICS

RF SECTION

Frequency Range / Step	87.5 - 108MHz / 10-50-100kHz (from front panel) 87.0 - 108MHz for China, other bands on request
Reference Stability	±2.5ppm (0° - 50°C)
Nominal Output Power	30W, 300W
Power Level	0-100% (from front panel)
Output Impedance / Connector	50Ω / N Female
RF Monitor Level / Connector	-40dBc ±3dB / BNC (*)
Off lock Attenuation	> 60dB
Asynchronous AM S/N ratio	> 65dB
Synchronous AM S/N ratio	> 60dB
Spurious and Harmonic supp.	Meets or exceeds all FCC and CCIR requirements
Modulation Capability	Meets or exceeds all FCC and CCIR requirements

MPX OPERATION

Audio Input Impedance	10kΩ
Audio Input Connector	BNC
Audio Input Level	2.2Vpp nominal, +6dB/-12dB adjustable from rear panel
Frequency Amplitude Response	±0.2dB 30Hz-100kHz
Harmonic Distortion	<0.1% 30Hz-100kHz (<0.05% 30Hz-53kHz)
S/N Ratio with CCIR unweighted	73dB
S/N Ratio with CCIR weighted	73dB

MONO OPERATION

Audio Input Impedance	Balanced 600Ω / 10kΩ (jumper)
Audio Input Connector	XLR
Audio Input Level	2.2Vpp nominal, +6dB/-12dB adjustable from rear panel
Frequency Amplitude Response	±0.5dB 30Hz-15kHz
Harmonic Distortion	<0.05% 30Hz-15kHz
Pre-emphasis	Flat, 50μs, 75μs (ON/OFF from display, 50/75 from jumper)
S/N Ratio with CCIR unw. filter	73dB
S/N Ratio with CCIR weig. filter	73dB

INTERNAL CODER OPERATION (OPT023 Stereo Coder Option)

Audio Input Impedance	Balanced 600Ω / 10kΩ (jumper)
Audio Input Connector	XLR
Audio Input Level	2.2Vpp nominal, +6dB/-12dB adjustable from rear panel
MPX Output Conn. / Impedance	BNC / 50Ω
MPX Output Level	5.6Vpp
Frequency Amplitude Response	±0.5dB 30Hz-15kHz
Harmonic Distortion	<0.05% 30Hz-15kHz
Pre-emphasis	Flat, 50μs, 75μs (ON/OFF from display, 50/75 from jumper)
Stereo separation	> 50dB (typ. 60dB) 30Hz-15kHz
S/N Ratio with CCIR unw.filter	70dB
S/N Ratio with CCIR weig. filter	70dB

SCA OPERATION (2 Inputs)

SCA Input impedance	10k Ω
SCA Input connector	BNC
Input level	2V _{pp} nominal for ± 7.5 kHz deviation
Frequency amplitude response	± 0.2 dB 50k-100kHz

AUXILIARY

Serial interface	RS232 / RS485 (internal selectable)
Telemetries	Forward, Reflected, Alarm and ON/OFF Control

PROTECTION THRS

Forward	MIZAR30	35W
	MIZAR300	330W
Reflected	MIZAR30	5W
	MIZAR300	30W
Temperature	75°C with reset at 70°C	

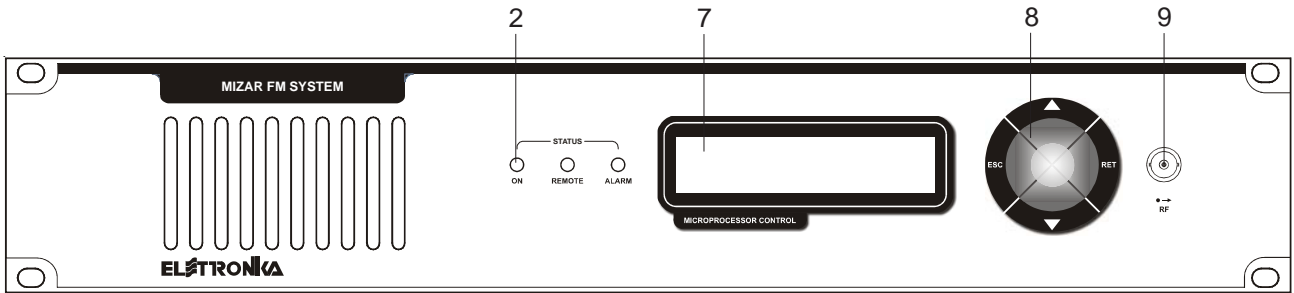
GENERAL

AC Power requirement	80-260Vac 50/60Hz
Dimensions / Weight	Rack 19" 2U-6kg (30W)
	Rack 19" 3U-11kg (300W)
Ambient temperature range	-5° to +45°C

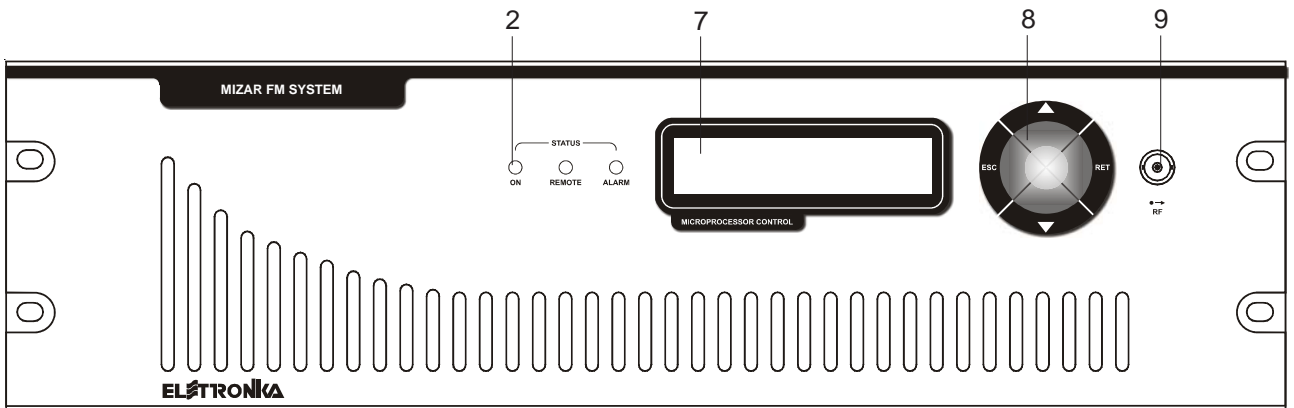
(*) It's subgest to use a directional coupler to make RF measures.

Specifications and characteristics are subject to change without notice.

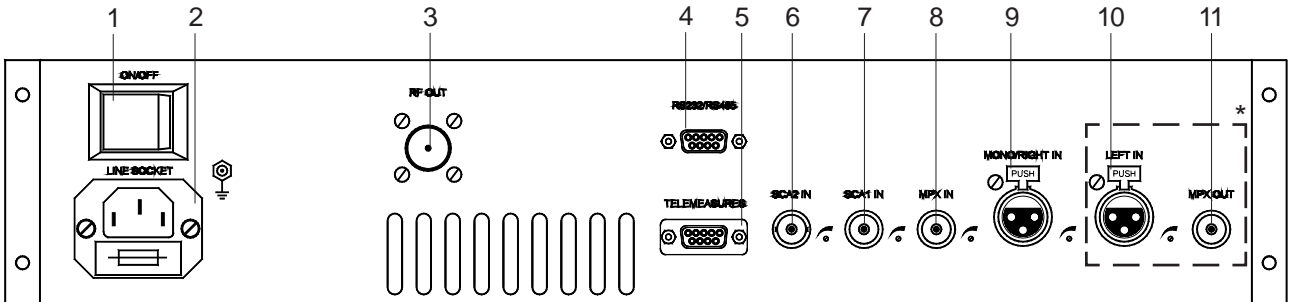
1.3 FRONT PANELS



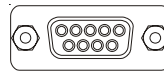
1. Status LEDs
2. LCD Display
3. Push Buttons
4. RF Monitor Connector



1.4 REAR PANELS



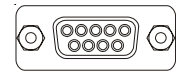
1. Main Switch
2. Power Supply Socket with Fuse (5A)
3. RF OUT Connector
4. RS232 / RS485 Socket
5. Telemeasures Socket
6. SCA2 Input
7. SCA1 Input
8. MPX Input Signal
9. MONO / RIGHT Input Signal
10. LEFT Input Signal
11. MPX Output Signal



RS232 / RS485 Connector(*)

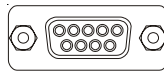
Use for direct connection to the RCU for remote control the MIZAR by ERCoS or any other system using a 4wire RS485 connection

Pin 2: RX- Pin 7: TX-
Pin 3: RX+ Pin 8: TX+
Pin 5: GND



Telemeasures Connector

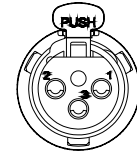
Pin 1: Temperature (Analog out)
Pin 2: REF power (Analog out)
Pin 3: FWD power (Analog out)
Pin 4: ON/OFF (Digital in)
GND=OFF - Open=ON
Pin 5: Alarm:
(Digital out - Open collector)
Closed if alarm is present
Pin 6-7-8-9: GND



RS232 / RS485 Connector(*)

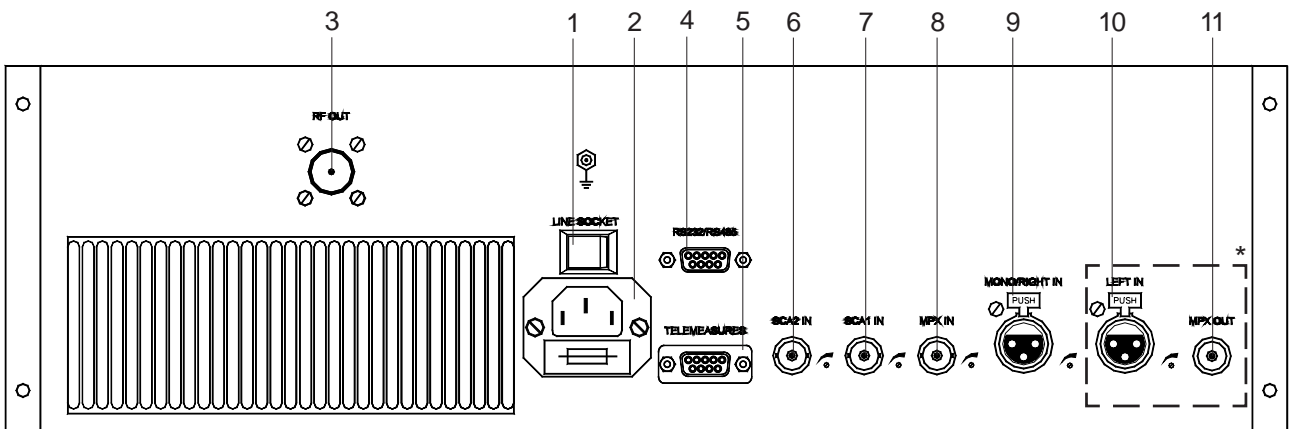
Used for direct connection to a PC

Pin 2: TX Pin 5: GND
Pin 3: RX



XLR Input Signal

Pin 1: Ground
Pin 2: Hot / +ve
Pin 3: Cold / -ve

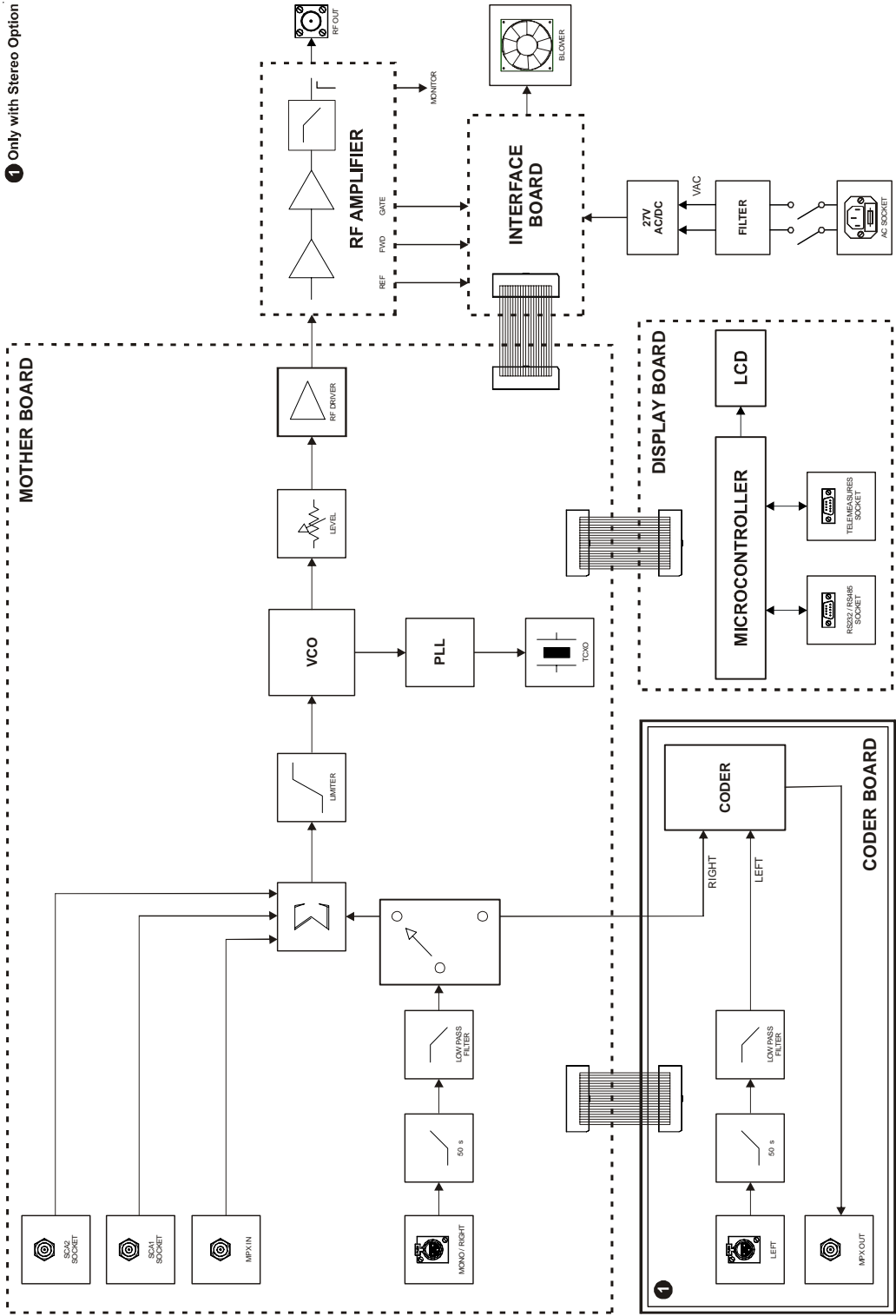


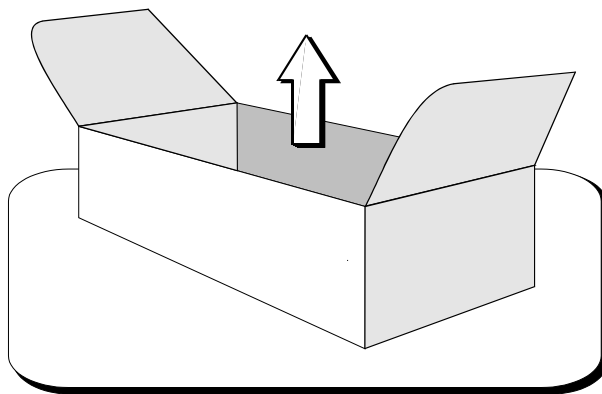
* Only with OPT023 STEREO CODER option

(*) The serial port can be choose between RS232 or RS485 connecting this connector to the RS232 or RS485 connector of the display board. No other selections are necessary.

Block diagram

① Only with Stereo Option





Section 2 - Installation

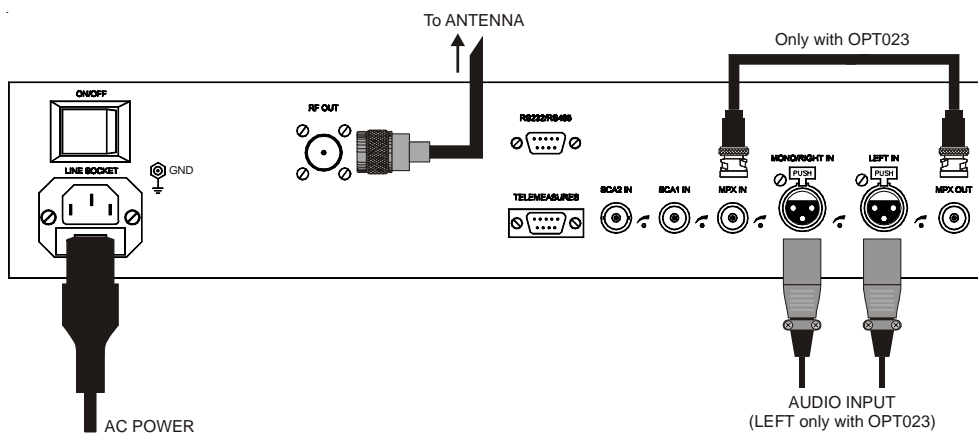
Contents:

- 2.1 Operating environment*
- 2.2 First installation*
- 2.3 Installation of MIZAR Mono with external Stereo Coder*
- 2.4 Installation of MIZAR Stereo with external RDS Coder*
- 2.5 MIZAR remote control with Elettronika RCU*

2.1 OPERATING ENVIRONMENT

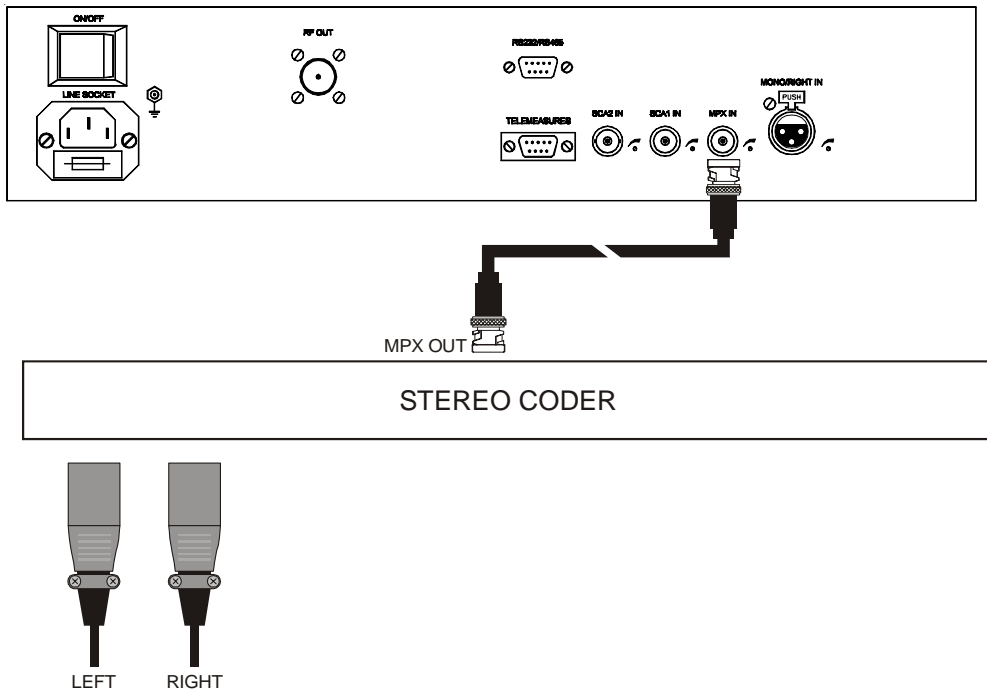
You can install the apparatus in a standard component rack or on a suitable surface such as a bench or desk. In any case, the area should be as clean and well-ventilated as possible. Do not locate the transmitter directly above a hot piece of equipment. The upper lid can be dismantled to allow an easy internal access. The equipment is designed with a modular design, that is each circuit is realized inside different modules or boards. All interconnections between modules are made by means of connectable cables which allow an easy and quick maintenance of damaged modules.

2.2 FIRST INSTALLATION

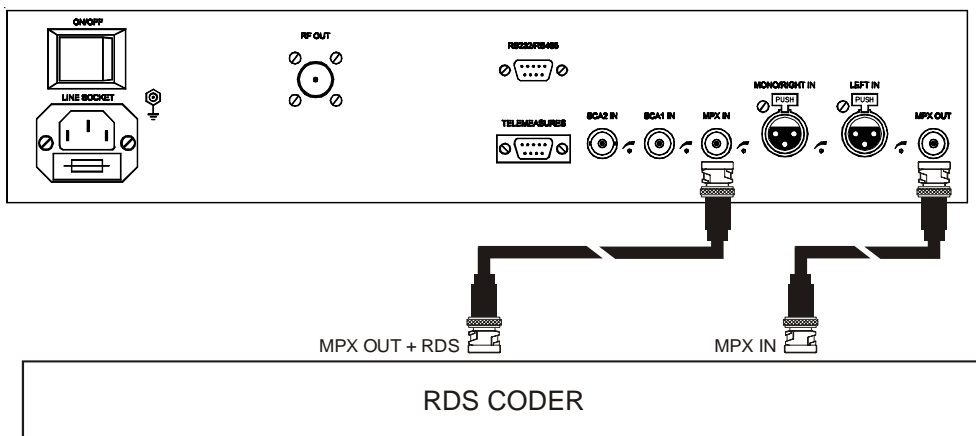


1. Connect Antenna cable
2. Connect AC POWER cord
3. Select step and frequency with display interface
4. Move power slowly up till nominal power and check the Reflected Power to be low. If Reflected Power increase check the RF Output connections

2.3 INSTALLATION OF MIZAR MONO WITH EXTERNAL STEREO CODER

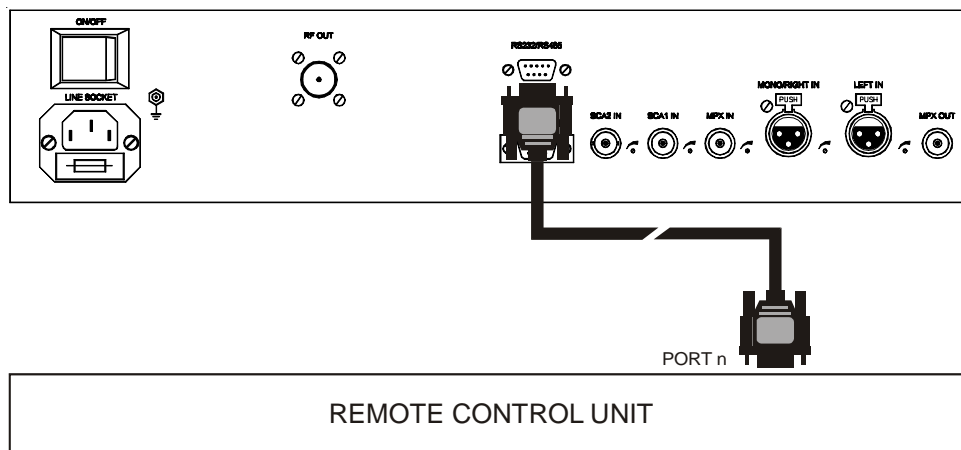


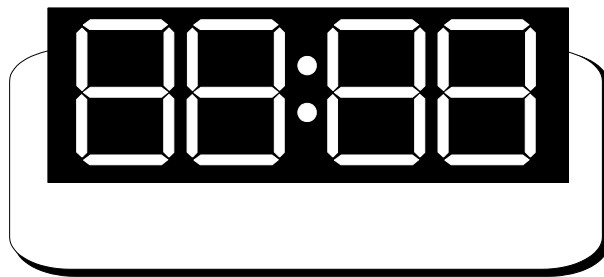
2.4 INSTALLATION OF MIZAR STEREO WITH EXTERNAL RDS CODER



2.5 MIZAR REMOTE CONTROL WITH ELETTRONIKA RCU

In order to connect MIZAR to RCU the RS232 / RS485 connector must be set to RS485. This choice is done cabling the rear panel connector to the J1 (RS485) or J2 (RS232) on the Display Board.





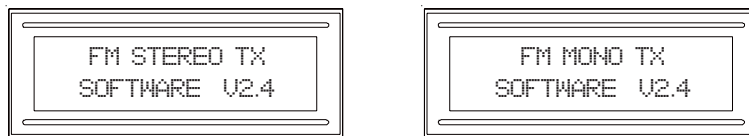
Section 3 - Operations

Contents:

- 3.1 User interface and Software settings*
- 3.2 AGC Implementation*
- 3.3 Alarms and automatic behaviours*
- 3.4 Status LEDs*

3.1 USER INTERFACE AND SOFTWARE SETTINGS

When the equipment is switched on, the display shows the presentation screen, containing the name of the device and the release number of the firmware.



The mono/stereo choice is made automatically by MIZAR, detecting the presence of the Stereo Coder Board (OPT023).

At this stage the device restores the last configuration saved of power, frequency and all other parameters. The other menu can be accessed by pressing the UP and DOWN keys.

All menus show the name of one or two parameter, which can be the reading of a status (e.g. lock/unlock) or a setting (e.g. Emphasis circuit ON/OFF). In the latter case, the setting may be changed by pressing the RET in the relevant menu. When the RET key is pressed while in a setting menu, the parameter name label starts blinking to show that the setting is being edited and not read.

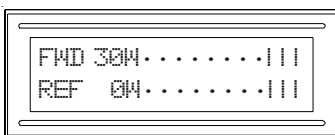
While the label blinks, the user can change the value shown by pressing the UP and DOWN keys. To exit the edit mode of a setting, and confirm any change made, press the RET key. To leave the edit mode without confirming any change, press ESC.

Pressing the ESC key while navigating into menu structure, the main menu with the presentation screen is reached.

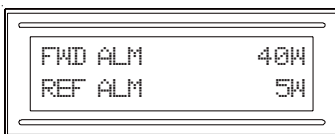
Some parameter can be modified only in a protected mode, this possibility will be highlighted in the menu list. To enter in the protected mode switch on the MIZAR with both UP and DOWN key pressed. The confirmation of the protected mode enter will be the display message below and the blinking red alarm led. This will remember that in protected mode all the alarms and protections will be disabled.



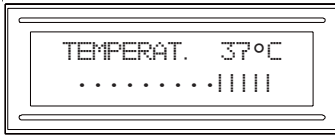
The existing menu, in the order they can be accessed by pressing the UP key, are briefly described below.



This shows the actual level of Forward and Reflected Power. The Forward Power level can be adjusted.



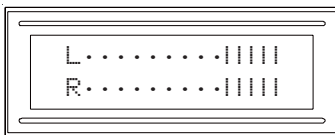
This shows the actual alarm threshold of Forward and Reflected Power. Both levels can be adjusted in protected menu.



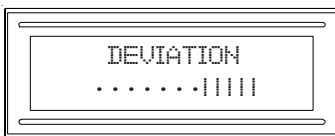
This shows the value of temperature of the heat sink.



This shows if the PLL generating the output frequency is locked or not.



Stereo with coder ON.



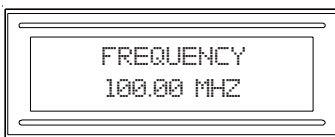
This shows the frequency deviation of the carrier.



This shows the Stereo Coder position. It is possible to choose either ON or OFF position.



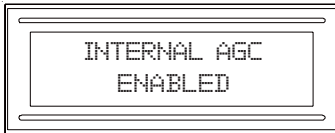
This shows the Emphasis position. It is possible to choose either ON or OFF position.



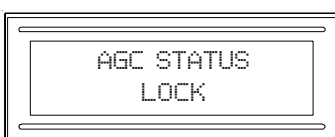
This shows the operating frequency of the MIZAR. It is possible to choose a frequency from 87.50 MHz (87.00 for China models) to 108.00 MHz.



This shows the frequency step (minimum distance between adjacent channels). It is possible to choose between 10kHz, 50kHz or 100 kHz.



This shows the internal AGC enabling status. It is possible to choose either Enabled or Disabled.

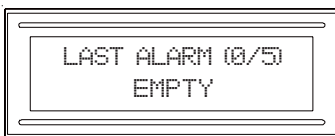


This shows the AGC working status. It can be:
- Disabled;
- Low Set: AGC stopped because reference power is too low;

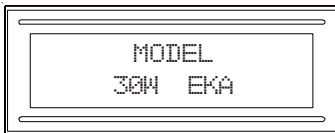
- Low Read: AGC stopped because power reading is too low;
- Lock: AGC goal has been reached;
- Max: AGC stopped because of maximum power increasing;
- Min: AGC stopped because of maximum power decreasing;
- Pull-up: AGC is increasing power;
- Pull-down: AGC is decreasing power.



This shows the remote control habilitation. It is possible to choose either ENABLED or DISABLED position. The TLM Command in the second line show the actual value of the static on/off command coming from Telemetries connector on the rear panel. If Remote is DISABLED this command will not be take in account, if ENABLED this will be the operating state of the MIZAR.



This show the last occurred alarm. The numbers in the first line are the number of occurred alarm and the maximum alarm number before the lock out of the MIZAR (five). To reset the lock out press RET and RET again. When an alarm occurs the menu is automatically changed to this menu.



This menu is available only in protected mode. It is possible to choose the Model of MIZAR FM Transmitter between 30W and 300W, between EKA, China and OIRT frequency bands.

3.2 AGC IMPLEMENTATION

The AGC goal is to maintain stable the output power. Output power in fact can change due to the increase of amplifier temperature. Note that when you change the operating frequency the output power change due to the different gain at different frequency, but this change is not stabilized by this AGC algorithm.

The AGC algorithm is based on the acquisition of the optimal output power level, stored when you change MIZAR output power. To keep the power stable the AGC change the power gain of MIZAR. When the goal power is achieved the AGC stops until the power moves up or down.

The AGC work is stopped immediately (output power remains blocked to that reached in the moment of the AGC stop) when one of this condition occurs:

- one of MIZAR alarms is triggered;
- input power level is to low;
- AGC has change the MIRA output power too much.

3.3 ALARMS AND AUTOMATIC BEHAVIOURS

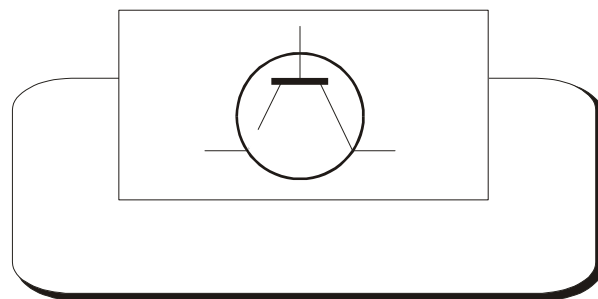
The apparatus signals a working anomaly when any of the following conditions is met:

- PLL Unlock
- Forward Power exceed the threshold
- Reflected Power exceed the threshold
- Temperature of the Heat Sink exceed the maximum allowed

In case of failure of any of these parameters, the apparatus automatically mute the output power and change the menu to the Log menu with the last alarm highlighted. The value of the failed parameter blinks in its menu, in order to highlight the anomalous working condition.

3.4 STATUS LEDs

• ON (Green)	Blinking	RF Output Power is growing from 0 to nominal
	Lit	RF Output Power at nominal value
• REMOTE (Yellow)	Unlit	Remote disabled
	Lit	Remote enabled
• ALARM (Red)	Blinking	Protected mode entered
	Lit	Alarm present

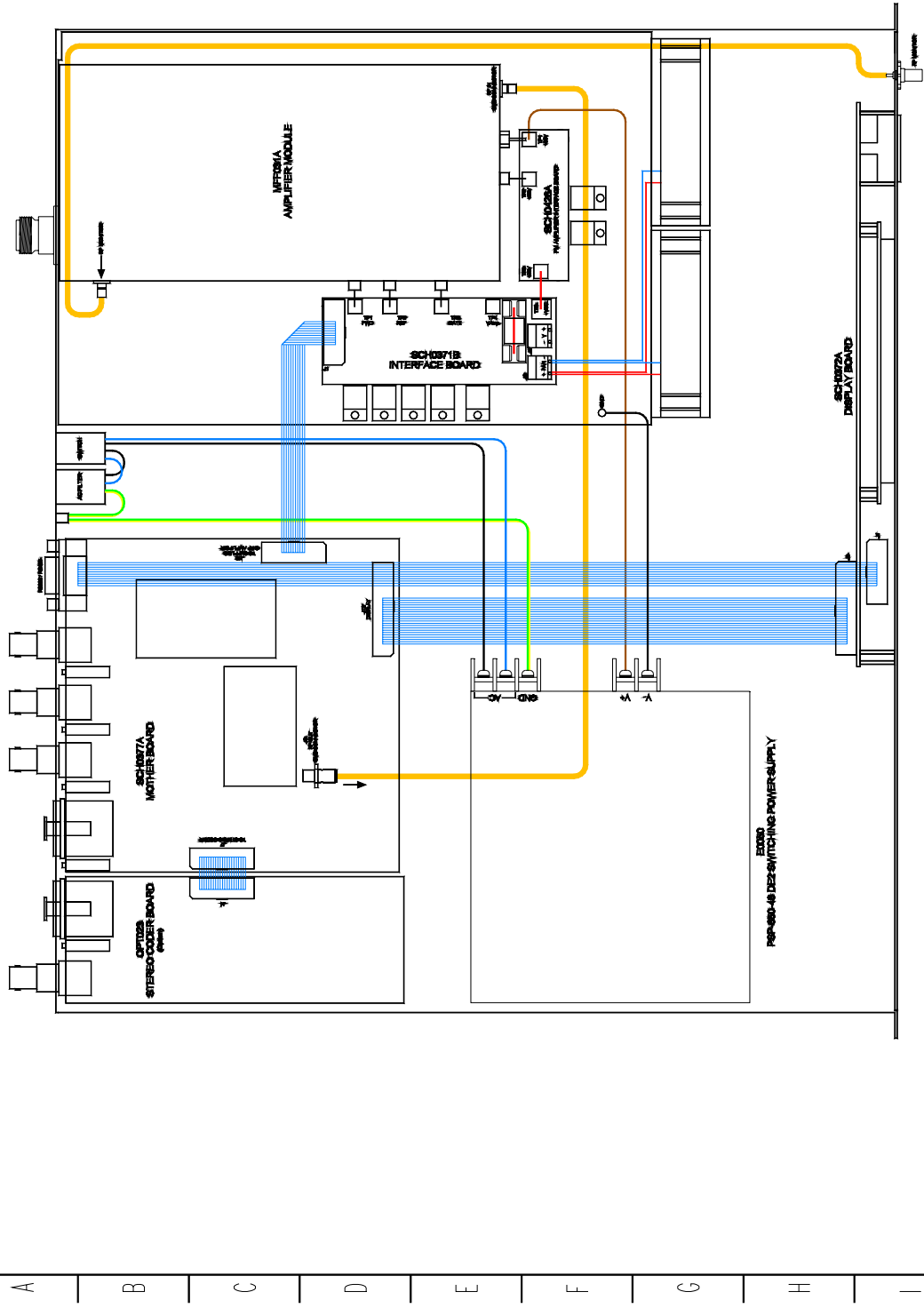


Section 4 - Diagram

Contents:

- APF073A MIZAR30 Cable diagram*
- APF074A MIZAR300 Cable Diagram*
- APF073A_APF074A MIZAR Component list*
- Modules description*

0 1 2 3 4 5 6 7 8 9



	CABLE DIAGRAM		DESIGNER	LATTANZIO	SIGNATURE	DATE	26/02/07
	ASSEMBLY CODE	APF074A	PCB DESIGNER	LATTANZIO	SIGNATURE	PCB REF	APF074A
TITLE	MIZAR300 FM TRANSMITTER SYSTEM			SHEET	1/1		

Component list**APF073A_APF074A - MIZAR**

Part Name Code	Description	Qty	
02035	BNC CONNECTOR FOR RG316 CABLE	1	
02513	90 SMB SOCKET cod. R114186000W	2 (APF073A)	1 (APF074A)
02518	SMB SOCKET FOR RG174 CABLE code R114082000W	1 (APF073A)	2 (APF074A)
02695	DB9 CONNECTOR FOR IU008059 CABLE	1	
02699	FEMALE 10WIRE CONNECTOR	1	
02700	FEMALE 16WIRE CONNECTOR	2	
02833	AC SOCKET WITH FUSE-HOLDER	1 (APF074A)	
02841	3 POLES CANON PLUG	1	
02855	FEMALE 26WIRE CONNECOTR	2	
05069	TOROIDAL FILTER	1 (APF074A)	
05551B	2U HANDLE KIT	2 (APF073A)	
05552B	3U HANDLE KIT	2 (APF074A)	
07522	LIGHTED SWITCH	1 (APF073A)	
07524A	BLACK SWITCH	1 (APF074A)	
07602	BLOWER GRID	1 (APF073A)	2 (APF074A)
07613	PAPST BLOWER	1 (APF073A)	2 (APF074A)
07918	AC FILTER	1 (APF073A)	
07924	PVC PROTECTION	1 (APF074A)	
07925	PVC PROTECTION	1	
07926	PVC PROTECTION	1 (APF073A)	
08502	RG 316 50Ω CABLE	0.70 (APF073A)	0.90 (APF074A)
CON0306	CON0306R0 COVER	1	
CON0340S	CON0340R1S MIZAR30 BOX	1 (APF073A)	
CON0354R2S	CON0354R2 MIZAR300 BOX	1 (APF074A)	
DET1220	DET1220R1 BLOWER CONVEYER	1 (APF073A)	
DET1317R0P	DET1317R0P MECHANICAL DETAIL	1 (APF074A)	
DET1361R0P	DET1361R0 MECHANICAL DETAIL	1 (APF074A)	
E0050	PSP-650-48 DE2 SWITHCING POWER SUPPLY	1 (APF074A)	
E0060	S-100F-24 SWITCHING POWER SUPPLY	1 (APF073A)	
FUS5A	5A FUSE	2 (APF073A)	
FUS10B	10A FUSE	2 (APF074A)	
MFF0025BR0	30W FM AMPLIFIER MODULE	1 (APF073A)	
MFF0031AR0	300W FM AMPLIFIER MODULE	1 (APF074A)	
PAN0141	PAN0141R1 FRONT PANEL	1 (APF073A)	
PAN0153R0P	FRONT PANEL	1 (APF074A)	
SCH0372AR1	DISPLAY BOARD	1	
SCH0377AR2	MOTHER BOARD	1	
V0761	BLACK PLASTIC TAP	1	
V0768	BLACK PLASTIC TAP	1	

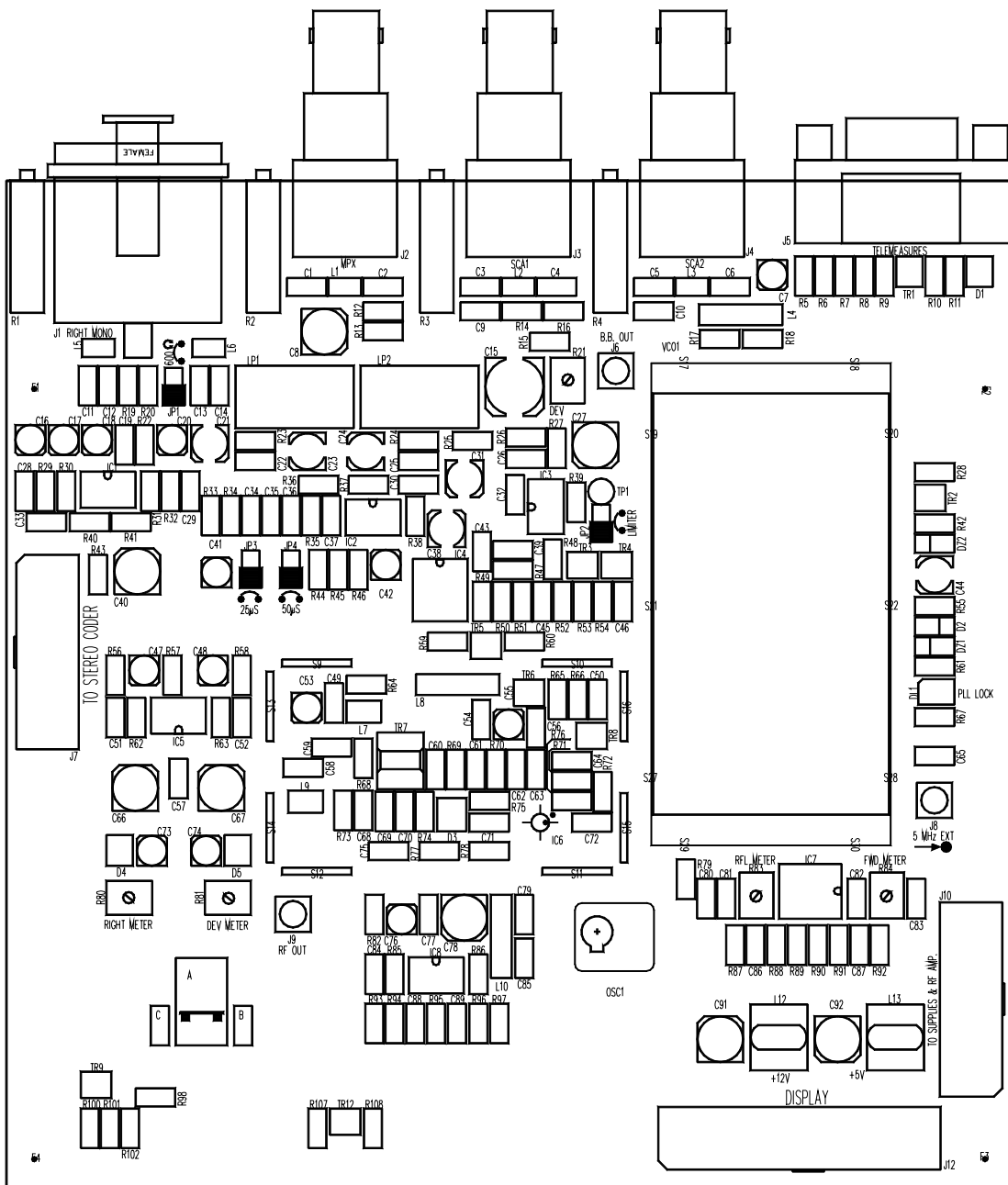
DESCRIPTION

The board contains the stages needed to condition the audio MONO or RIGHT signals and modulate in frequency a synthesised oscillator. It provides an output radio frequency signal in the II-VHF band, to drive the final amplification stage. The various sections are analysed below:

1. **Balanced/Unbalanced Converter:** the conversion from balanced to unbalanced and the input interface of the audio signal are realised electronically by the IC1-A operational circuit. This assures an high degree of immunity from disturbances and a perfect symmetry in unbalancing.
2. **Pre-emphasis:** after the level adjustment, there is the active pre-emphasis stage (IC1-B), with amplification to high frequencies. The time constant is chosen between 25 and 50 microseconds by means of two jumpers (JP3-4). When they are both enables they give 75us (for the FCC standard). The insertion of the pre-emphasis is managed from the frontal panel by activating the electronic switch IC4.
3. **Low-pass Filter:** the use of two filtering stages with elliptical filters LP1 and LP2 assures the adequate suppression of input signals at frequencies 19k and 38kHz.
4. **Additioner:** depending on the operating mode selected by the frontal panel (Stereo or Mono) the MONO signal, after the low-pass filter, is sent to the internal stereo coder (as RIGHT signal) or added to the auxiliary inputs (SCA1-2 and MPX) in the stage composed by IC3-A.
5. **Peak Detector:** at the output of the additioner, part of the signal is sampled for the indication of the deviation on the front panel. IC5-A serves as buffer for the duplicator and peak detector. Aside from the peak detector for the indication of the modulation level, the board also includes a second detector (IC5-B and D4) used to measure the level of the RIGHT signal.
6. **Limitation circuit:** TR3 and TR4 realise the deviation limitation circuit by cutting the audio signal which exceeds the set voltage threshold on the relevant basis, by means of the resistor network R51-54.
7. **Oscillator:** a frequency synthesis oscillator with PLL generates the radiofrequency carrier which is modulated in frequency in the same circuit. The reference frequency is generated by a 5.0MHz TCXO with good temperature stability.
8. **RF Driver:** after the oscillator there is a PIN diode stage (D3) to check the amplitude of the signal and modify the output power. The dynamic is greater than 40dB. The monolith amplifier (IC6) serves as buffer in order to make the load effects on the oscillator circuit irrelevant. Finally, the stage with TR7 amplifies the signal to the adequate levels for driving the power module. A circuit monitoring the power supply of TR7, composed by TR6 and TR8, activates to switch the transistor off in case of alarms (such as PLL unlock or any anomaly detected by the control board).

9. **Telemetry:** the most important analogue signals – forward and reflected power, switch on/off, alarms and temperature – are buffered and made available on the J5 socket for connecting remote control systems.

SCH0377AR2 Component layout



CALIBRATION PROCEDURE

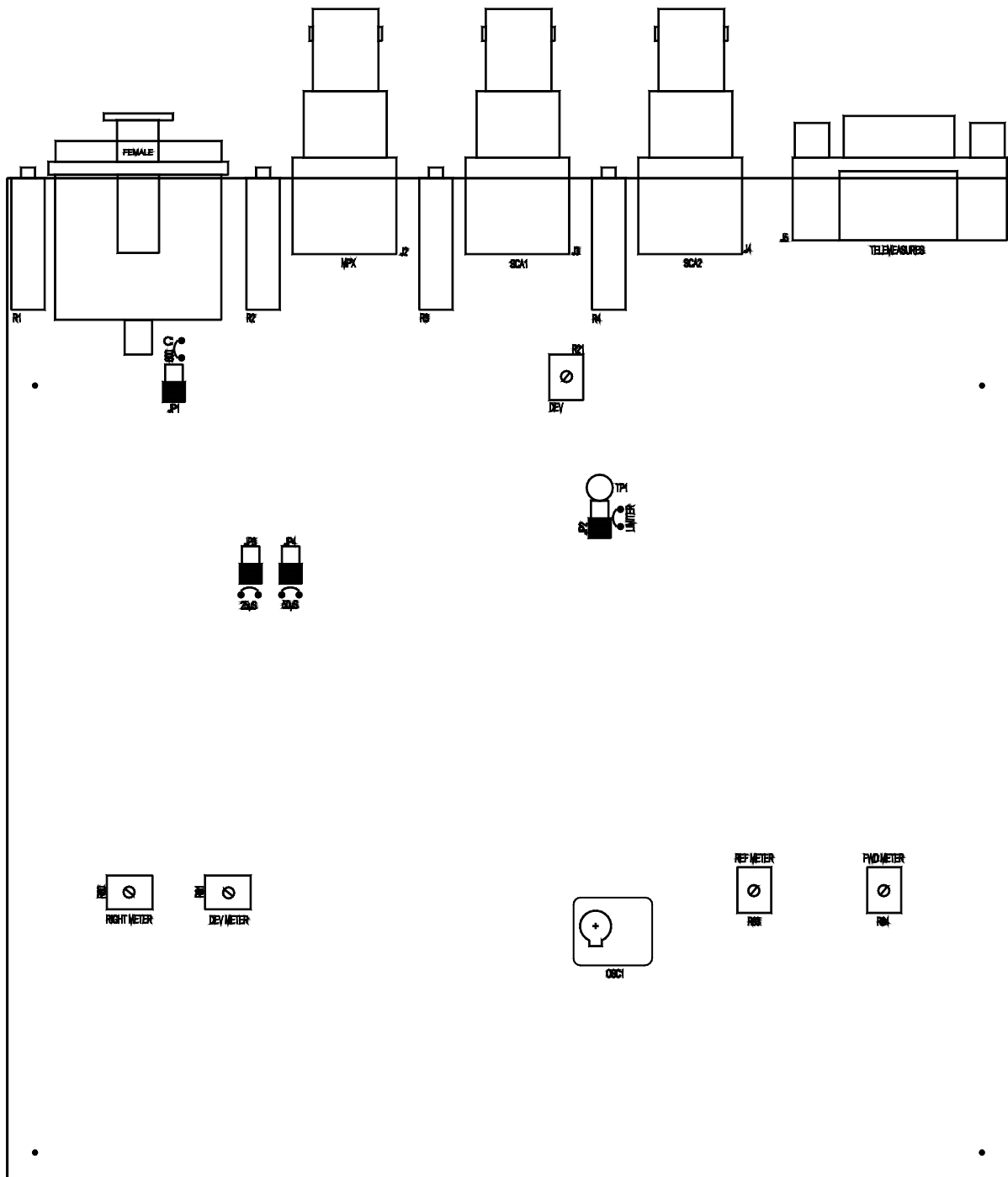
- Instrument list

MEASURE	INSTRUMENT
RF Signal level	- <i>Spectrum Analyser</i>
Frequency	- <i>Spectrum Analyser</i>
Audio	- <i>Audio Generator</i>
Modulation	- <i>FM/AM Modulation Analyser</i>
Limiter intervention	- <i>Oscilloscope</i>

Description of the adjustment points

COMPONENT	DESCRIPTION
R1	MONO/RIGHT Audio Input level
R2	MPX Input level
R3	SCA1 Input level
R4	SCA2 Input level
R21	Modulation depth adjustment
R80	Indication of the RIGHT signal deviation on display (only if the stereo option is installed)
R81	Indication of the deviation on the display
R83	Indication of the Reflected Power on the display
R84	Indication of the Forward Power on the display
LP1, LP2	Notch and Low-pass Filter at 19 and 38kHz
OSC1	RF Signal output frequency calibration
JP1	If inserted, sets the MONO Input impedance to 600Ω
JP2	If inserted, enables the deviation limiter
JP3	If inserted, enables the 25μs pre-emphasis
JP4	If inserted, enables the 50μs pre-emphasis

Component layout for adjustment points



RF Section

- Check the lock of the oscillator on the whole operating range (87 - 108MHz).
- If the synthesised frequency is not correct, try to correct it by means of the capacitive trimmer of the **OSC1** reference.
- Verify the signal-to-noise ration (CCIR) of the oscillator, which should be >73dB on the whole band.
- Verify the output level by the **J9** (RF OUT) connector, higher than 24.5dBm on the whole band.
- Verify that the final stage is switched off when the PLL of the oscillator unlocks.

Modulation Section

- Disable the emphasis (from the display).
- Insert the **JP1** jumper (so to have an input impedance of 600Ω).
- Insert the **JP2** jumper to enable the limitation circuit.
- Provide a 400Hz, 2.2Vpp balanced signal to the MONO input.
- Adjust **R1** in order to have an amplitude of 3.2Vpp on **TP1** (on which the oscilloscope is connected).
- Adjust **R21** to obtain a deviation of ±75kHz.
- Adjust **R81** to obtain the indication of the nominal deviation on the display.
- Double the level of the input signal (4.4Vpp) and check that the modulation increase is no more than 1dB.

Audio Section

- With modulation analyser and audio signal on the MONO input at 2.2Vpp, verify the frequency response from 30 to 15kHz without emphasis. Correct any deviation from the nominal range by acting on **LP1** and **LP2**.
- Insert the **JP4** jumper (50μs) and enable the emphasis from the display. Check the frequency response.
- Insert the **JP3** jumper (25+50μs) as well and check again the frequency response.
- Verify the frequency response of the MPX input from 30 to 100kHz, calibrating **R2** for the nominal deviation with 2.2Vpp signal amplitude.
- Verify the frequency response of the SCA1 and SCA2 inputs from 50k to 100kHz, calibrating **R3** and **R4** for the nominal deviation (±7.5kHz) with 2.2Vpp signal amplitude.

General

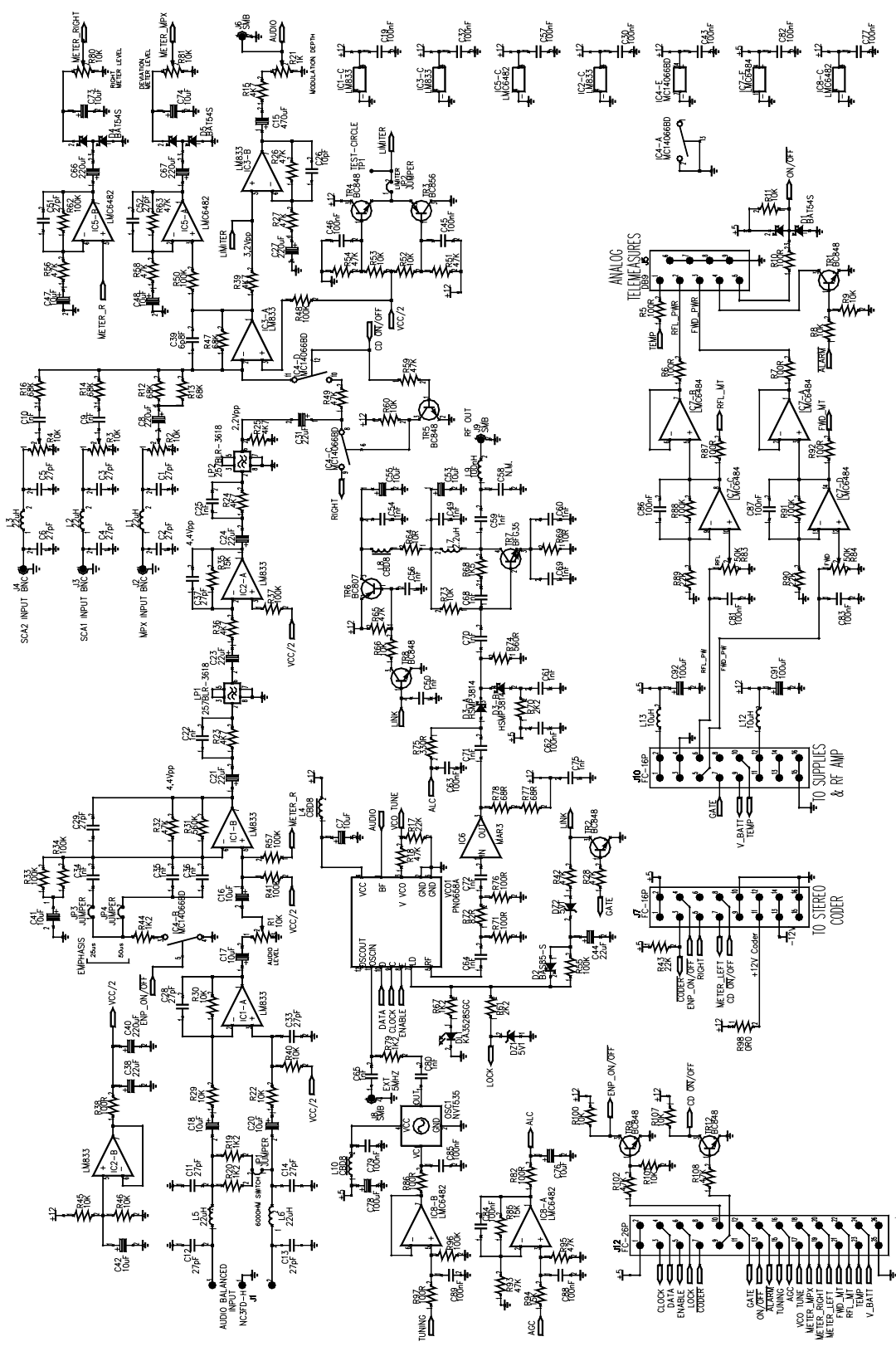
- Verify the remote switch-off function by short-circuiting pin 5 of **J5** to ground.

SCH0377AR2 COMPONENT LIST

Part Name/Number	Description	Qty.	Comps.	Page 1/2
257BLR-3618N05010	05010 AUDIO TOKO FILTER	2	LP1-2	
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR		20	C19, C30, C32, C43, C45-46, C57, C62-63,
				C77, C79, C81-89
CC 10pF-S 01086	01086 SMD 1206 CAPACITOR	1		C26
CC 1206 N. M.	N. M. SMD 1206 CAPACITOR	1		C58
CC 1nF-2%-S 01041D	01041D SMD 1206 CAPACITOR	23		C9-10, C22, C25, C34-36, C49-50, C54, C56, C59-61, C64-65, C68-72, C75, C80
CC 27pF-S 01022B	01022B SMD 1206 CAPACITOR	16		C1-6, C11-14, C28-29, C33, C37, C51-52
CC 6p8F-S 01084	01084 SMD 1206 CAPACITOR	1		C39
CE 100uF16V-S 01792A	01792A ELET. SMD CAPACITOR	3		C78, C91-92
CE 10uF16V-S 01776A	01776A ELET. SMD CAPACITOR	14		C7, C16-18, C20, C41-42, C47-48, C53, C55, C73-74, C76
CE 220uF16V-S	01824A ELET. SMD CAPACITOR	5		C8, C27, C40, C66-67
CE 22uF16V-S	01780A ELET. SMD CAPACITOR	6		C21, C23-24, C31, C38, C44
CE 470uF-S 16V-S	01804B ELET. SMD CAPACITOR	1		C15
D BAS85-S	03024 SMD DIODE SCHOTTKY	1		D2
D BAT54S	03199 SMD SCHOT. DIODE A-K T	3		D1, D4-5
D HSMP3814	03202 SMD DIODE	1		D3
DL KA-3528SGC 03057	03057 GREEN SMD LED DIODE	1		DL1
DZ 5V1-S 03128	03128 SMD ZENER DIODE	2		DZ1-2
IC LM833-S 04643A	04643A SMD INTEG CIRCUIT	3		IC1-3
IC LMC6482-S	04632 SMD INTEG CIRCUIT	2		IC5, IC8
IC LMC6484-S	04634 SMD INTEG CIRCUIT	1		IC7
IC MAR3 04367	04367 SMD INTEG CIRCUIT	1		IC6
IC MC14066BD-S 4708B	4708B SMD INTEG CIRCUIT	1		IC4
IND 100nH-S 05093A	05093A INDUCTOR	1		L9
IND 22uH-S 5023D	5023D INDUCTOR	5		L1-3, L5-6
IND 2u2H-S 05020A	05020A INDUCTOR	1		L7
IND CBD8 05072	05072 INDUCTOR	3		L4, L8, L10
IND MS85 10uH-S	04948 INDUCTOR 2.7A	2		L12-13
J BNC-90G-PCB SHIELD	02034A PCB SHIELDED CONNEC.	3		J2-4
J DB9-90G 02797	02797 PCB CONNECTOR	1		J5
J FC-16P 02701-02700	02701+02700 PCB CONNECTOR	2		J7, J10
J FC-26P 02855-02854	02855+02854 PCB CONNECTOR	1		J12
J NC3FD-H 02862	02862 XLR-90G-PCB SOCKET F.	1		J1
J SMB-PCB 2PIN 02516	02516 PCB CONNECTOR	3		J6, J8-9
JU JUMP2 02739-02742	02739+02742 MASCHIO PAN2	4		JP1-4
OSC NVT535 05168	05168 TCXO	1		OSC1
PN0658A SCH0007AR0	SCH0007AR0 VCO FM INTEG	1		VCO1
R 0R0-S 00001	00001 RES 1/4W 5% SMD 1206	1		R98
R 100K-1%-S 00065B	00065B RES 1/4W 1% SMD 1206	12		R33-34, R37, R41, R48, R50, R55, R57, R62, R88, R91, R96

Part Name/Number	Description	Qty.	Comps.	Page 2/2
R 100R-S 00029A	00029A RES 1/4W 5% SMD 1206	12	R5-7, R10, R38, R71, R76, R82, R86-87, R92, R97	
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	17	R8-9, R11, R22, R29-30, R40, R45-46, R52, R53, R60, R66, R73, R100-101, R107	
R 10R-S 00017A	00017A RES 1/4W 5% SMD 1206	2	R64, R69	
R 15K-1%-S 00055B	00055B RES 1/4W 1% SMD 1206	3	R35, R85, R94	
R 1K2-1%-S 00042A	00042A RES 1/4W 1% SMD 1206	5	R19-20, R44, R67, R79	
R 1K5-S 00043A	00043A RES 1/4W 5% SMD 1206	1	R68	
R 22K-S 00057A	00057A RES 1/4W 5% SMD 1206	4	R17, R43, R89-90	
R 2K2-S 00045A	00045A RES 1/4W 5% SMD 1206	2	R61, R70	
R 330R-1%-S 00035A	00035A RES 1/4W 1% SMD 1206	1	R75	
R 47K-1%-S 00061B	00061B RES 1/4W 1% SMD 1206	18	R18, R26-28, R32, R42, R49, R51, R54, R56, R58-59, R63, R65, R93, R95, R102, R108	
R 4K7-S 00049A	00049A RES 1/4W 5% SMD 1206	6	R15, R23-25, R36, R39	
R 560K-S	00074B RES 1/4W 5% SMD 1206	1	R31	
R 560R-1%-S 00038B	00038B RES 1/4W 1% SMD 1206	1	R74	
R 68K-1%-S 00063B	00063B RES 1/4W 1% SMD 1206	5	R12-14, R16, R47	
R 68R-S 00027A	00027A RES 1/4W 5% SMD 1206	2	R77-78	
R 82R-S 00028A	00028A RES 1/4W 5% SMD 1206	1	R72	
RV 10K-M-H 00777	00777 VARIABLE RESISTOR	4	R1-4	
RV 10K-S-H/S 00793	00793 SMD VARIABLE RESISTOR	2	R80-81	
RV 1K-S-H/S 00792	00792 SMD VARIABLE RESISTOR	1	R21	
RV 50K-S-H/S 00797	00797 SMD VARIABLE RESISTOR	2	R83-84	
TR BC807 03453	03453 PNP SMD TRANSISTOR	1	TR6	
TR BC848 03457	03457 NPN SMD TRANSISTOR	7	TR1-2, TR4-5, TR8-9, TR12	
TR BC856 03455	03455 PNP SMD TRANSISTOR	1	TR3	
TR BFG35 03990	03990 NPN SMD TRANSISTOR	1	TR7	

0 1 2 3 4 5 6 7 8 9



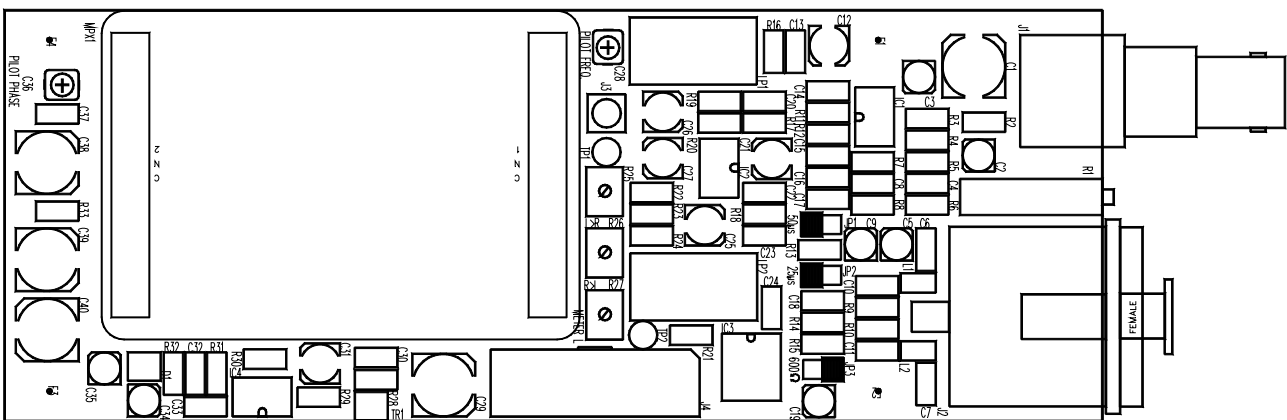
ELECTRIC DIAGRAM		DESIGNER	DI MODUGNO	SIGNATURE	DATE	29/06/06
		MOTHER BOARD		PCB DESIGNER	TULLO	SIGNATURE
ASSEMBLY CODE		TITLE		SHEET		1/1
SCH0377A						

DESCRIPTION

The board contains the stages needed for the conditioning of the Left channel audio signal and for realising the stereo encoding in compliance with the standard ITU racc. 450. The Right signal is provided through the connection to the Mother board. The various sections are analysed below:

1. **Balanced/Unbalanced Converter:** the conversion from balanced to unbalanced and the input interface of the audio signal are realised electronically by the IC1-A operational circuit. This assures an high degree of immunity from disturbances and a perfect symmetry in unbalancing.
2. **Pre-emphasis:** after the level adjustment, there is the active pre-emphasis stage (IC1-B), with amplification to high frequencies. The time constant is chosen between 25 and 50 microseconds by means of two jumpers (JP1-2). When they are both enables they give 75 μ s (for the FCC standard). The insertion of the pre-emphasis is managed from the frontal panel by activating the electronic switch IC3.
3. **Low-pass Filter:** the use of two filtering stages with elliptical filters LP1 and LP2 assures the adequate suppression of input signals at frequencies 19k and 38kHz.
4. **Peak Detector:** before the emphasis circuit, part of the audio signal is sampled to provide the indication of the LEFT channel deviation on the frontal display. IC4-A serves as buffer for the duplicator and peak detector.
5. **Stereo Coder:** stereo encoding is realised inside the MPX1 block, providing the MPX signal in output.

SCH0378AR2 Component layout



CALIBRATION PROCEDURE

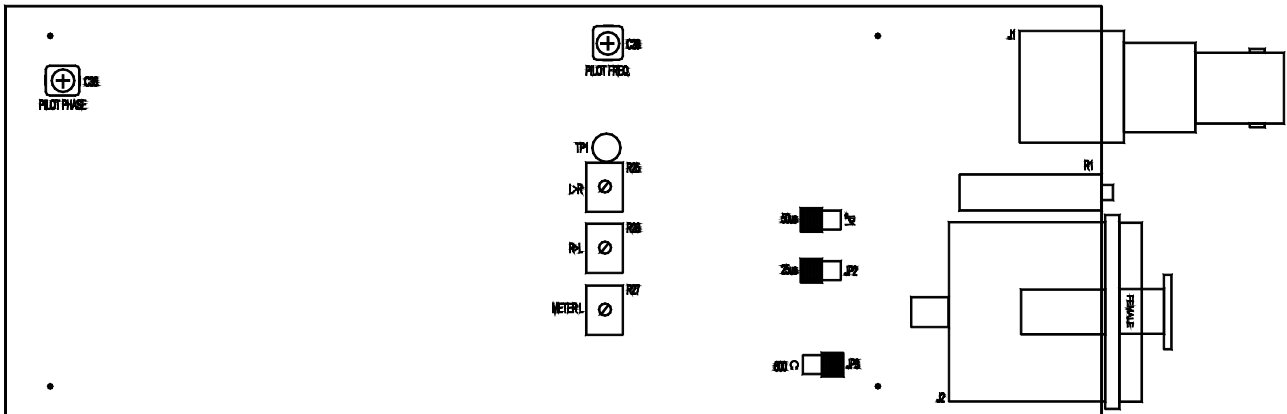
- Instrument list

MEASURE	INSTRUMENT
RF Signal level	- <i>Spectrum Analyser</i>
Frequency	- <i>Spectrum Analyser</i>
Audio	- <i>Audio Generator</i>
Modulation	- <i>FM/AM Modulation Analyser</i>
Limiter intervention	- <i>Oscilloscope</i>

Description of the adjustment points

COMPONENT	DESCRIPTION
R1	LEFT Audio Input level
R25	Adjusts Left on Right signal crosstalk
R26	Adjusts Right on Left signal crosstalk
R27	Indication of the LEFT signal deviation on the display
C28	Adjusts the 19kHz pilot tone frequency
C36	Adjusts the pilot tone phase
LP1, LP2	Notch and Low-pass Filter at 19 and 38kHz
JP3	If inserted, sets the LEFT Input impedance to 600Ω
JP2	If inserted, enables the 25μs pre-emphasis
JP1	If inserted, enables the 50μs pre-emphasis

Component layout for adjustment points



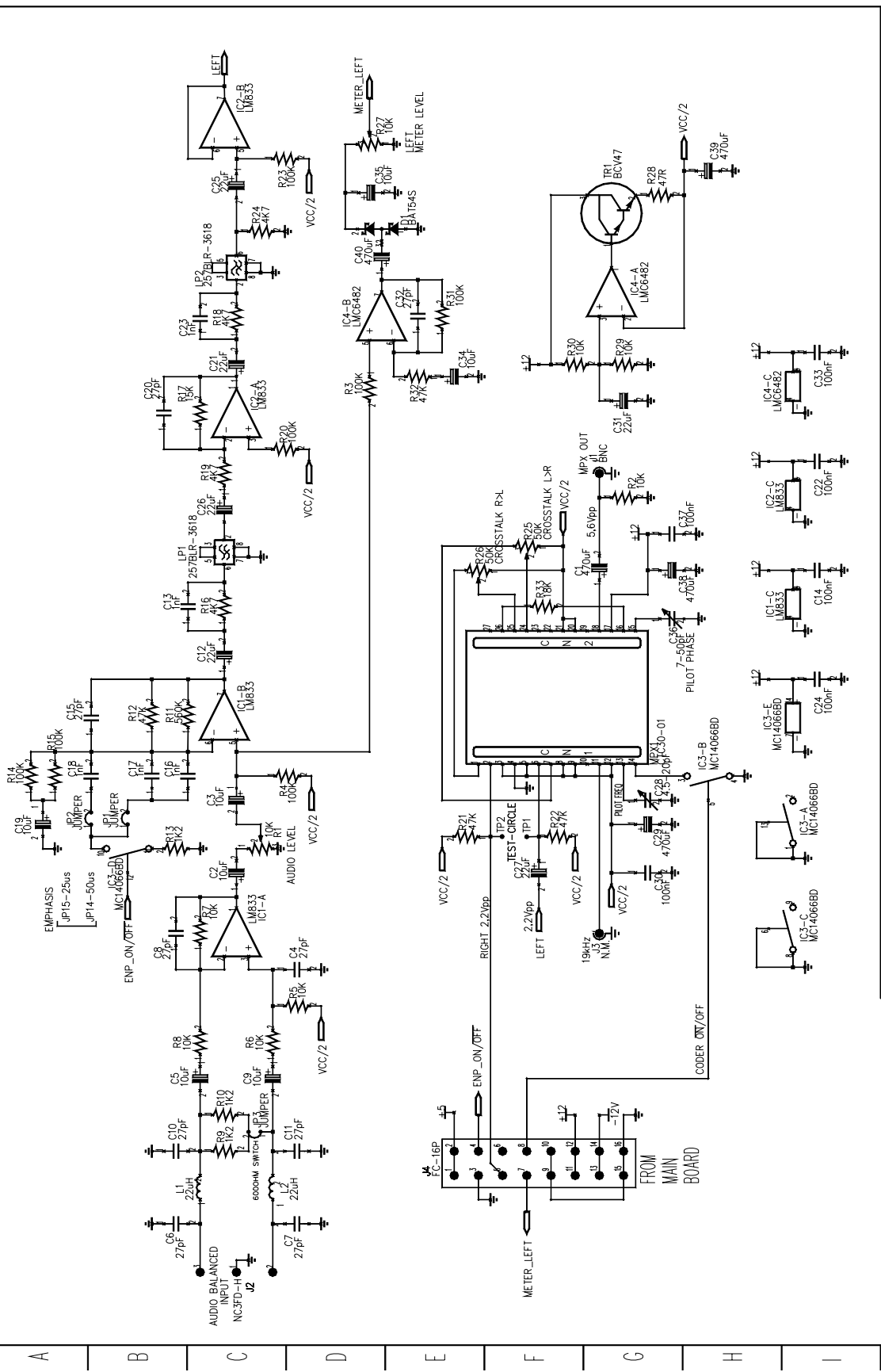
Coder Section

- Enable the Stereo mode from display.
- Measure, and correct by means of **C28** if needed, the frequency of the pilot tone (19kHz)
- With modulation analyser and audio signal on the LEFT input at 2.2Vpp, verify the frequency response from 30 to 15kHz without emphasis. Correct any deviation from the nominal range by acting on **LP1** and **LP2**.
- Insert the **JP4** jumper (50μs) and enable the emphasis from the display. Check the frequency response.
- Insert the **JP3** jumper (25+50μs) as well and check again the frequency response.
- Check the crosstalk between the two channels and act on **C36**, **R25** and **R25** to bring it to the nominal levels.

SCH0378AR2 COMPONENT LIST

Part Name/Number	Description	Qty.	Comps.
257BLR-3618N05010	05010 AUDIO TOKO FILTER	2	LP1-2
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	6	C14, C22, C24, C30, C33, C37
CC 1nF-2%-S 01041D	01041D SMD 1206 CAPACITOR	5	C13, C16-18, C23
CC 27pF-S 01022B	01022B SMD 1206 CAPACITOR	9	C4, C6-8, C10-11, C15, C20, C32
CE 10uF16V-S 01776A	01776A ELET. SMD CAPACITOR	7	C2-3, C5, C9, C19, C34-35
CE 22uF16V-S	01780A ELET. SMD CAPACITOR	6	C12, C21, C25-27, C31
CE 470uF-S 16V-S	01804B ELET. SMD CAPACITOR	5	C1, C29, C38-40
CV 4.5-20pF-S 01481	01481 VARIABLE CAPACITOR	1	C28
CV 7-50pF-S 01474	01474 VARIABLE CAPACITOR	1	C36
D BAT54S	03199 SMD SCHOT. DIODE A-K T	1	D1
ICLM833-S 04643A	04643A SMD INTEG CIRCUIT	2	IC1-2
ICLMC6482-S	04632 SMD INTEG CIRCUIT	1	IC4
ICMC14066BD-S 4708B	4708B SMD INTEG CIRCUIT	1	IC3
IND 22uH-S 5023D	5023D INDUCTOR	2	L1-2
JBNC-90G-PCB SHIELD	02034A PCB SHIELDED CONNEC.	1	J1
JFC-16P 02701-02700	02701+02700 PCB CONNECTOR	1	J4
JNC3FD-H 02862	02862 XLR-90G-PCB SOCKET F.	1	J2
J SMB-PCB N. M.	SMB PCB N. M.	1	J3
JU JUMP2 02739-02742	02739+02742 PAN2 MALE	3	JP1-3
MPX CTC30-01	04894 STEREO ENCODER	1	MPX1
R 100K-1%-S 00065B	00065B RES 1/4W 1% SMD 1206	7	R3-4, R14-15, R20, R23, R31
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	7	R2, R5-8, R29-30
R 15K-1%-S 00055B	00055B RES 1/4W 1% SMD 1206	1	R17
R 18K-S 00056B	00056B RES 1/4W 5% SMD 1206	1	R33
R 1K2-1%-S 00042A	00042A RES 1/4W 1% SMD 1206	3	R9-10, R13
R 47K-1%-S 00061B	00061B RES 1/4W 1% SMD 1206	4	R12, R21-22, R32
R 47R-S 00025A	00025A RES 1/4W 5% SMD 1206	1	R28
R 4K7-S 00049A	00049A RES 1/4W 5% SMD 1206	4	R16, R18-19, R24
R 560K-S	00074B RES 1/4W 5% SMD 1206	1	R11
RV 10K-M-H 00777	00777 VARIABLE RESISTOR	1	R1
RV 10K-S-H/S 00793	00793 SMD VARIABLE RESISTOR	1	R27
RV 50K-S-H/S 00797	00797 SMD VARIABLE RESISTOR	2	R25-26
TRBCV47	03465 NPN SMD TRANSISTOR	1	TR1

0 1 2 3 4 5 6 7 8 9



		ELECTRIC DIAGRAM		DESIGNER	SIGNATURE	DATE
				DI MODUGNO		20/06/06
ASSEMBLY CODE		TITLE		PCB DESIGNER	SIGNATURE	PCB REF
SCH0378A		STEREO CODER BOARD		TULLO		PN126263
						SHEET
						1/1

DESCRIPTION

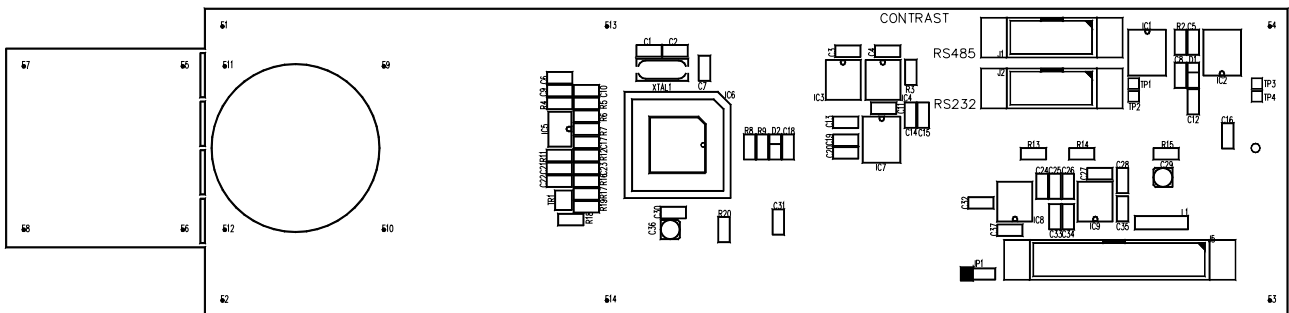
The MIZAR display board contains the HMI (human machine interface) of the equipment composed by a alphanumeric 2 rows x 16 columns display and a keys series, a connector for collecting and sending datas towards the equipment mother-board and its thinking heart made by a Flash microcontroller.

The board is able of reading 8 analogic signals coming from mother-board. These are only buffered on the board and therefore their conditioning is made on the mother-board.

The remaining digital input and output signals are conneted directly to the micro, where is necessary some interverntion speed, or are multiplexed on shift register where the speed is less important.

The board moreover provide the remotability to the equipment by an asynchronous serial, configurable as RS232 or RS485 simply connecting the output connector to one of the two serial connectors present on the display board.

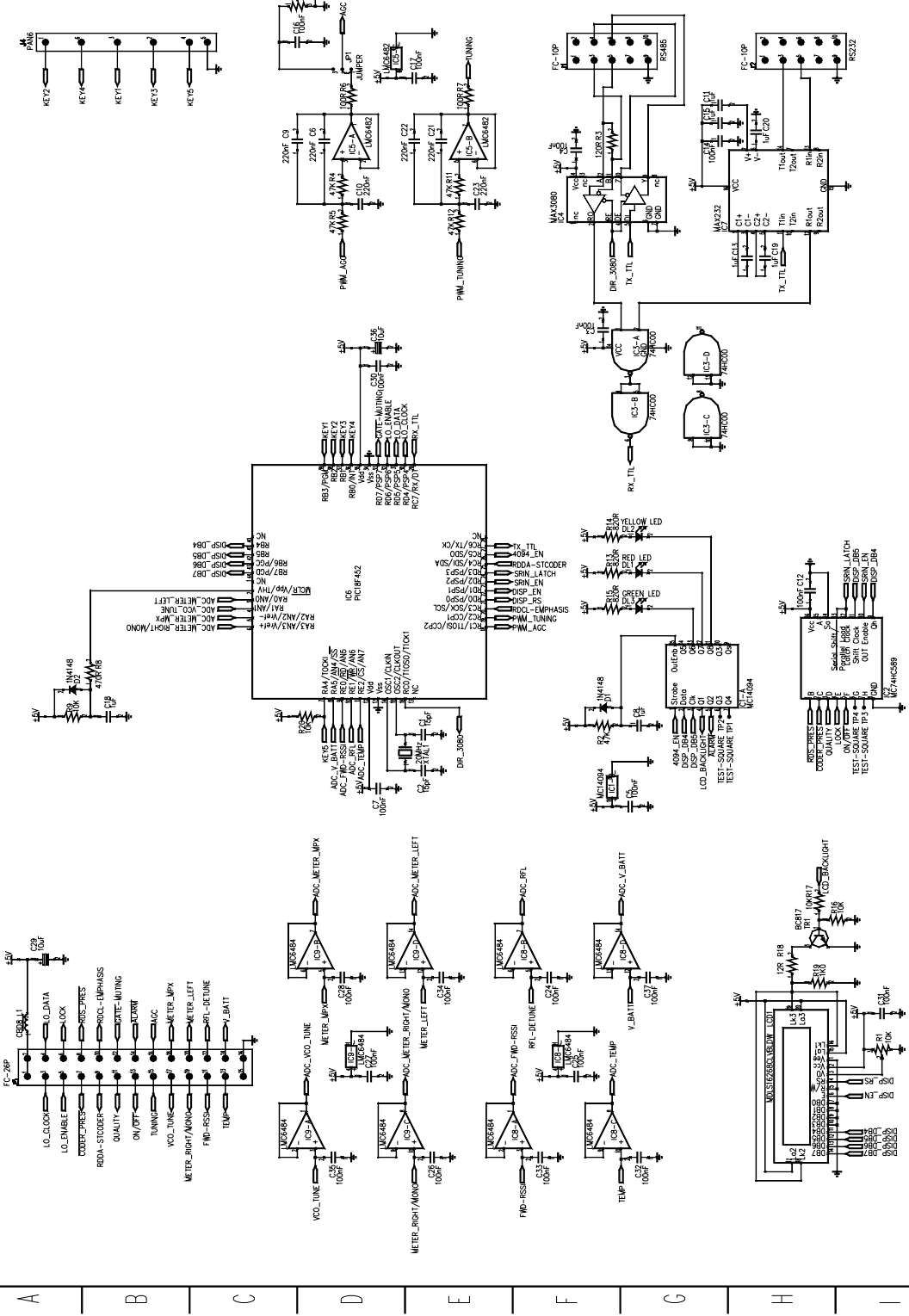
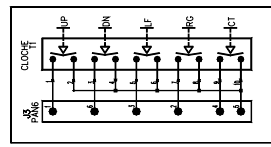
SCH0372AR1 Top layer Component layout



SCH0372ARI COMPONENT LIST

Part Name/Number	Description	Qty.	Comps.
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	20	C3-5, C7, C12, C14, C16-17, C24-28, C30, C31-35, C37
CC 15pF-S 01088	01088 SMD 1206 CAPACITOR	2	C1-2
CC 1uF100V-S 01760A	01760A Y5V 1206 50V CAPAC.	7	C8, C11, C13, C15, C18-20
CC 220nF-S 1069A	1069A Y5V 1206 CAPACITOR	6	C6, C9-10, C21-23
CE 10uF16V-S 01776A	01776A ELET. SMD CAPACITOR	2	C29, C36
D 1N4148-S 03002	03002 SMD DIODE	2	D1-2
DIS MDLS16268CLVBLDW	03072C DISPLAY 2 X 16 WIDE	1	LCD1
DL LEDG5 03060	03060 GREEN LED DIODE 5mm	1	DL3
DL LEDR5 03061	03061 RED LED DIODE 5mm	1	DL1
DL LEDY5 03054B	03054B YELL. LED DIODE 5mm	1	DL2
IC 74HC00-S 4762A	4762A SMD INTEG CIRCUIT	1	IC3
IC LMC6482-S	04632 SMD INTEG CIRCUIT	1	IC5
IC LMC6484-S	04634 SMD INTEG CIRCUIT	2	IC8-9
IC MAX232-S 04804B	04804B SMD INTEG CIRCUIT	1	IC7
IC MAX3080-S 04770	04770 SMD INTEG CIRCUIT	1	IC4
IC MC14094BD 04718	04718 SMD INTEG CIRCUIT	1	IC1
IC MC74HC589 4874	04874 SMD INTEG CIRCUIT	1	IC2
IC PIC18F452-S	04807C + 07509C INTEG CIRCUIT	1	IC6
IND CBD8 05072	05072 INDUCTOR	1	L1
JFC-10P 02697-02699	02697+02699 PCB CONNEC. POL	2	J1-2
JFC-26P 02855-02854	02855+02854 PCB CONNEC. POL	1	J5
J PAN6 02713-14-15	02713+02714+02715 PCB CONN.	2	J3-4
JU JUMP3 02707-02742	02707+02742 MASCHIO PAN3	1	JP1
R 100R-S 00029A	00029A RES 1/4W 5% SMD 1206	2	R6-7
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	4	R9, R16-17, R20
R 120R-S 00030A	00030A RES 1/4W 5% SMD 1206	1	R3
R 12R-S 00018A	00018A RES 1/4W 5% SMD 1206	1	R18
R 1K0-S 00041A	00041A RES 1/4W 5% SMD 1206	1	R19
R 470R-S 00037A	00037A RES 1/4W 5% SMD 1206	1	R8
R 47K-S 00061A	00061A RES 1/4W 5% SMD 1206	5	R2, R4-5, R11-12
R 820R-S 00040A	00040A RES 1/4W 5% SMD 1206	3	R13-15
RV 10K-3266X 00807	00807 VARIABLE RESISTOR	1	R1
RV 5K-M-V 00783	00783 VARIABLE RESISTOR	1	R10
TCLOCHE GREY WITH BLUE CENTER	4x xxxxxx + 4x xxxxxx + xxxxx	1	T1
TR BC817 03454	03454 NPN SMD TRANSISTOR	1	TR1
XTAL 20MHz-S	CXS00001 QUARTZ	1	XTAL1

0 1 2 3 4 5 6 7 8 9



ELECTRONIKA s.r.l.	ASSEMBLY CODE	TITLE		DESIGNER	SIGNATURE	DATE
	SCH0372A	DISPLAY BOARD		DE ROBERTIS	DE ROBERTIS	27/01/06
				PCB DESIGNER	SIGNATURE	PCB REF
				TULLO		PN12554R2
						SHEET
						1/1

DESCRIPTION

The MFF0025B amplifier module is designed to amplify the FM modulated carriers in the 87-108MHz band, and can provide an output of 30W CW. In order to obtain the desired gain, the amplifier is made up by two gain stages: the pilot stage uses a BLF242 MOSFET, while the final stage uses a BLF245 MOSFET.

An input adaptation circuit allows the adaptation of the module to the various driving levels. The output power regulation is made by controlling the power level of the input signal of the module. The final stage of the module also has a control terminal allowing to disable the MOSFET immediately, if needed. The output of the module is completed by a 9th order (4 cell) low-pass filter to attenuate the level of the harmonics of the signal, and by two high-directivity directional couplers needed to sample part of the Forward and Reflected Power in order to measure their levels. The final is provided with the needed circuits (SCH0371B Interface Board) to read the output Forward and Reflected Power, the heatsink temperature and the voltage supplied.

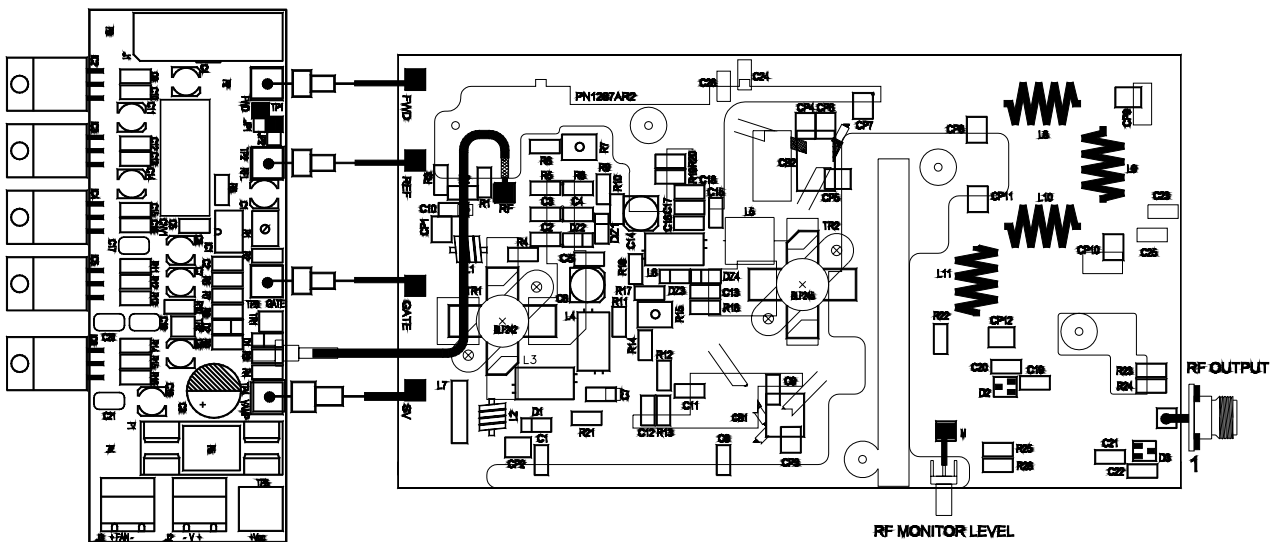
TECHNICAL CHARACTERISTICS

Frequency Range	87 - 108MHz
Output Power	30W
Input Return Loss	>25dB
Power Supply	+27V
RF Input Impedance	50Ω
RF Output Impedance	50Ω
Bias Current	BLF242 with Vdd = +27V: 220mA
Bias Current	BLF245 with Vdd = +27V: 220mA
Gain	20dB
Efficiency	54%

MFF0025BR0 COMPONENT LIST

Part Name/Number	Description	Qty.
SCH0382BR0	30W FM AMPLIFIER BOARD	1
01400	BYPASSING CAPACITOR	1
01408	BYPASSING CAPACITOR	3
DET1304	DET1304R0 30W DISSIPATOR	1
DET1276	DET1276R0 AMPLIFIER REAR BAR	1
DET1277	DET1277R1 AMPLIFIER INPUT BAR	1
DET1239	DET1239R1 AMPLIFIER MODULE COVER	1
SCH0371BR0	INTERFACE BOARD	1
07907	TO220 INSULATOR	2
07910	TO220 INSULATOR	2
02515	SMB SCREW cod. R114313000	1
08502	RG 316 50Ω CABLE	0.15
02516	SMB CONNECTOR FOR PCB	1
02248	17x17 NF FLANGE CONNECTOR	1

MFF0025BR0 Component layout



CALIBRATION PROCEDURE

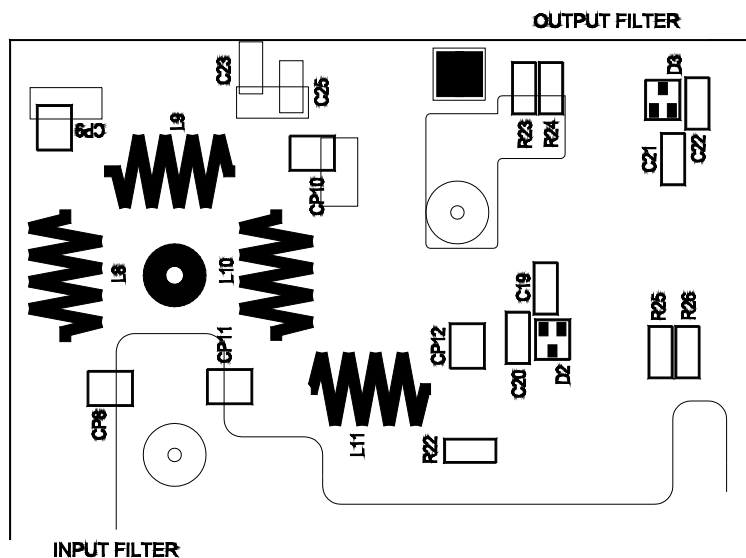
The calibration procedure is mainly made of three step:

1. Calibration of the Output Filter
2. Polarization of the BLF242 and BLF245 MOSFETS

1. Calibration of the Output Filter

- Instrument list

MEASURE	INSTRUMENT
Calibration of the Output Filter	Network analyser or alternately Spectrum analyser with tracking generator and SWR Bridge



- Calibrate the spectrum analyser after setting a 100MHz span centered ad 100MHz (10MHz/div - 5dB/div).
- Connect the input of the filter to port 1 of the network analyser, connect the output of the filter to a dummy load.
- Display the reflection coefficient (parameter s11). The calibration consists in acting on the coils (**L8, L9, L10, L11**) to obtain a curve as the one shown in picture A after closing the module.



2. Polarisation of the BLF242 and BLF245 MOSFETs

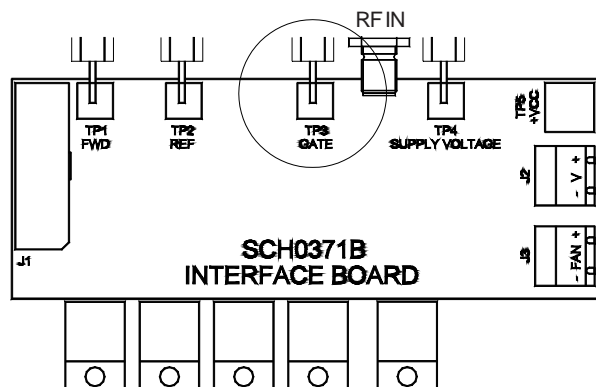
- Instrument list

MEASURE	INSTRUMENT
Polarisation of BLF242 and BLF245 Transistors	Two Digital meter

- Description of the adjustment points

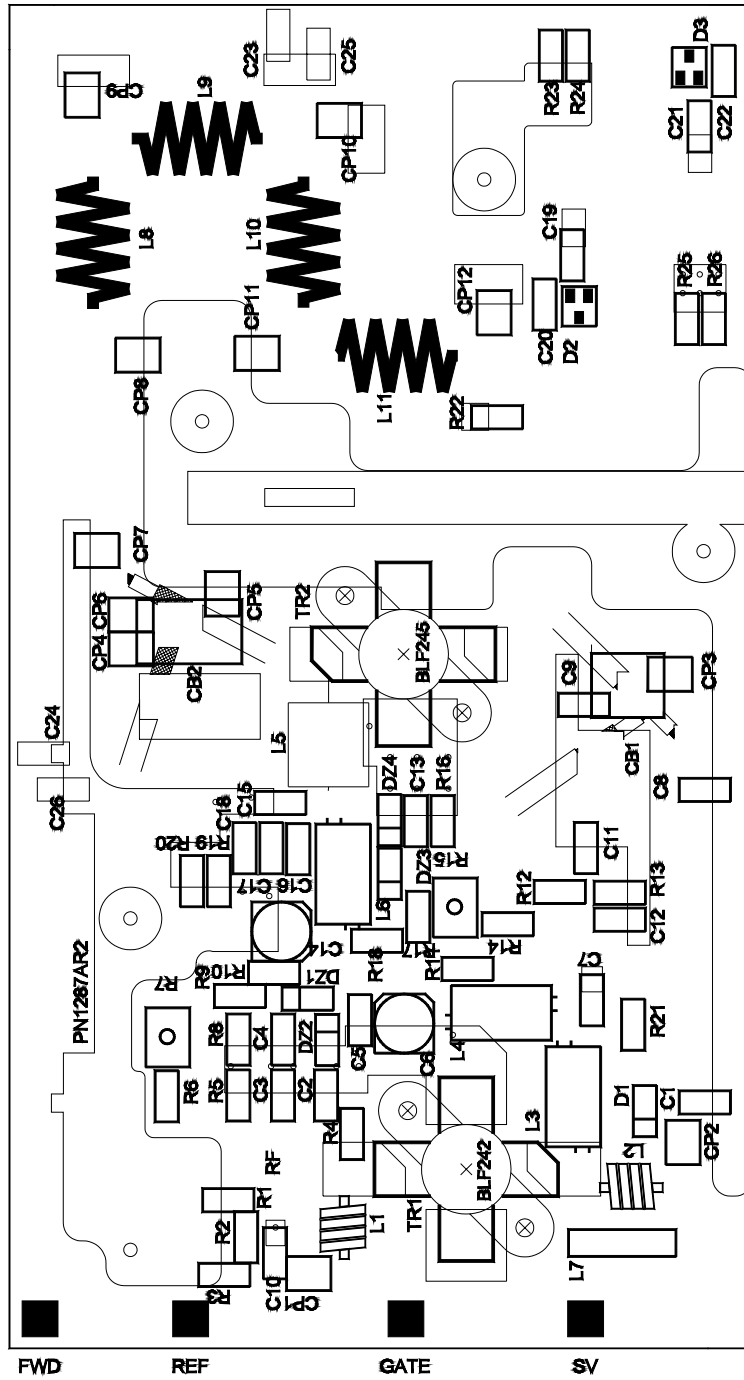
COMPONENT	DESCRIPTION
R15, R7	Adjust polarisation

- Disconnect the input terminal of the module, connect the dummy load to the output terminal and connect a tester as amperometer (10A cc capacity) on the power supply line (in place of the fuse).
- Turn **R7** and **R15** completely clockwise (so to interdict the VDMOS). Disconnect the passing connector from **TP3 Gate**. See details in picture below.



- Power the module and check that there are +27V on **TP4** (see previous picture).
- Turn the **R15** trimmer counterclockwise until the display of the amperometer shows 220mA absorption.
- Turn the **R7** trimmer counterclockwise until the display of the amperometer shows an increase of 220mA; the whole module should absorb more or less 440mA at 27V.
- Re-connect the passing connector to **TP3 Gate**.

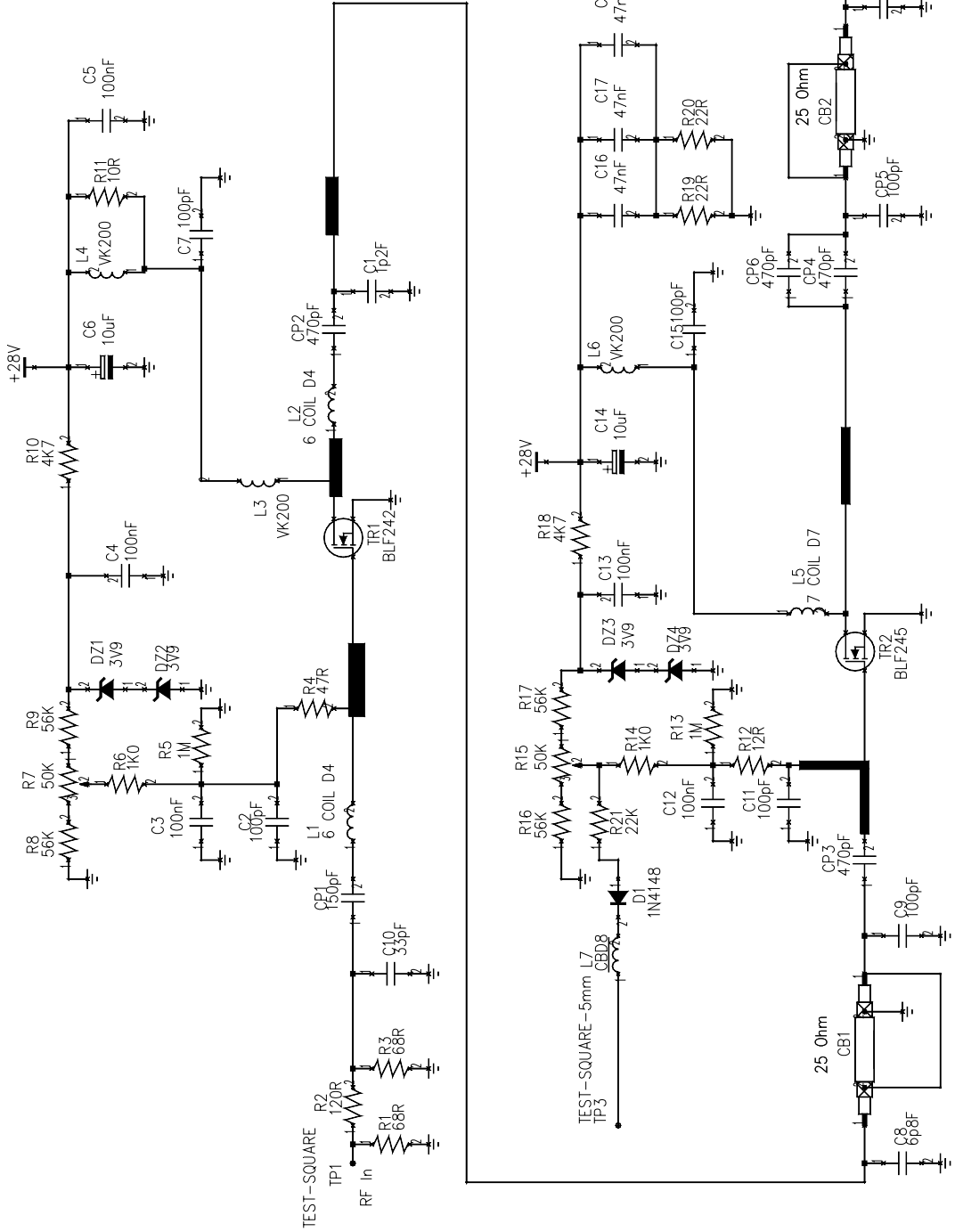
SCH0382BR0 30W FM Amplifier Board Component layout



SCH0382BR0 COMPONENT LIST

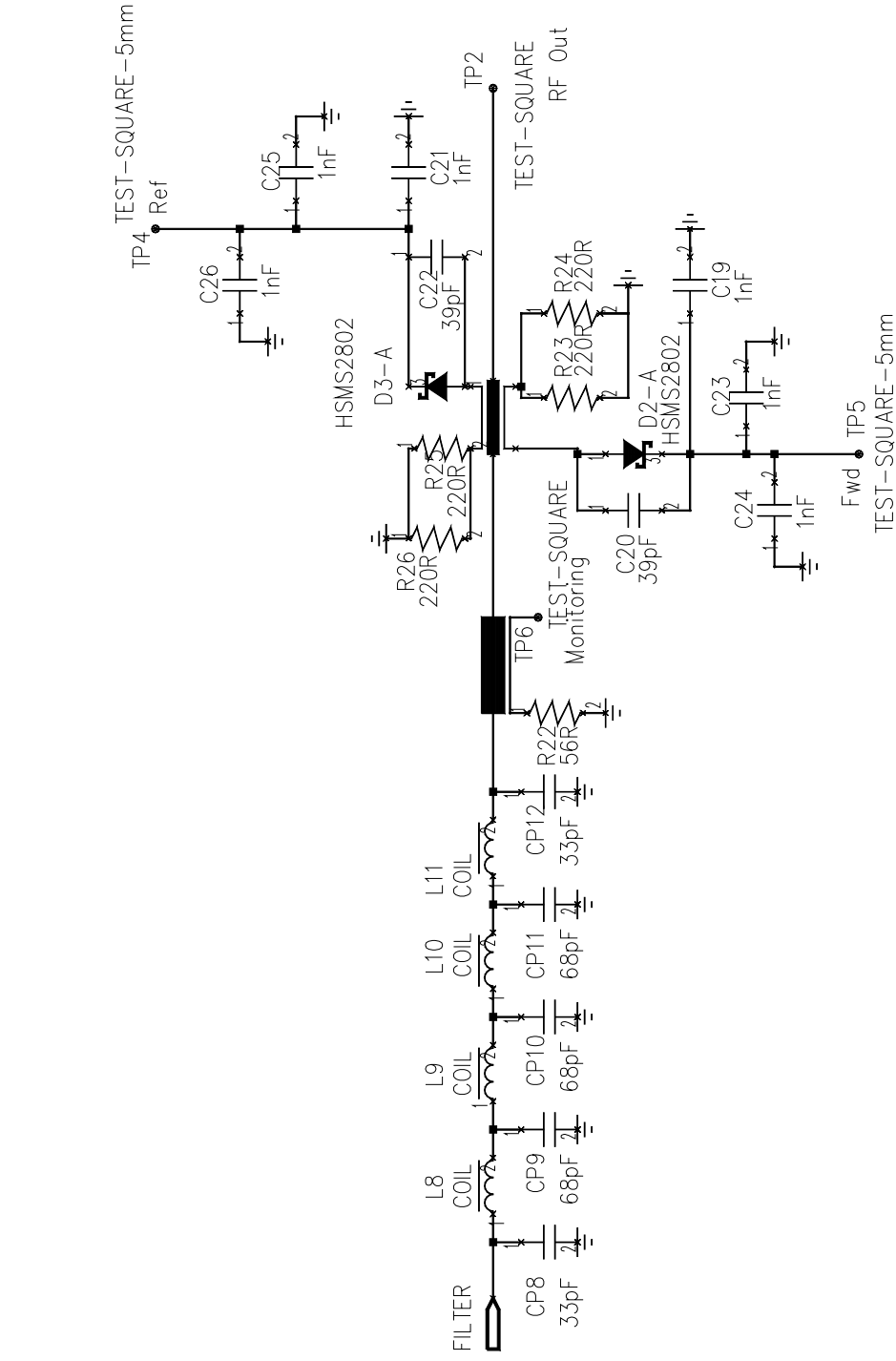
Part Name/Number	Description	Qty.	Comps.
250hm08523	08523 WHITE TEFLON RF CABLE	0.40	CB1-2
CC 100pF-S 01092	01092 SMD 1206 CAPACITOR	5	C2, C7, C9, C11, C15
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	5	C3-5, C12-13
CC 33pF-S 01023A	01023A SMD 1206 CAPACITOR	1	C10
CC 1p2F-S 01081	01081 SMD 1206 CAPACITOR	1	C1
CC 1nF-S 01096	01096 SMD 1206 CAPACITOR	6	C19, C21, C23-26
CC 39pF-S 1024A	1024A SMD 1206 CAPACITOR	2	C20, C22
CC 47nF-S 01061A	01061A SMD 1206 CAPACITOR	3	C16-18
CC 6p8F-S 01084	01084 SMD 1206 CAPACITOR	1	C8
CE 10uF50V-S 01779A	01779A ELET. SMD CAPACITOR	2	C6, C14
CP 100pF-S 01135	01135 CHIP CHB	1	CP5
CP 150pF-S 01137	01137 CHIP CHB	1	CP1
CP 33pF-S 01127	01127 CHIP CHB	2	CP8, CP12
CP 470pF-S 01143	01143 CHIP CHB	4	CP2-4, CP6
CP 68pF-S 01131	01131 CHIP CHB	3	CP9-11
CP 3p6F-S 01104B	01104B CHIP CHB	1	CP7
D 1N4148-S 03002	03002 SMD DIODE	1	D1
D HSMS2802 03207	03207 SMD DIODE	2	D2-3
DZ 3V9-S	03134 SMD ZENER DIODE	4	DZ1-4
IND 6 SP_D4_d0.8mm-S	05043 INDUCTOR	2	L1-2
IND 7 SP_D6_d0.8mm-S	07691 COATED WIRE	0.30	L5
IND 4 SP_D8_d1.2mm-S	07684 SILVER WIRE	0.80	L8-L11
IND CBD8 05072	05072 INDUCTOR	1	L7
IND VK200 05013	05013 INDUCTOR	3	L3-4, L6
R 10R-S 00017A	00017A RES 1/4W 5% SMD 1206	1	R11
R 120R-S 00030A	00030A RES 1/4W 5% SMD 1206	1	R2
R 12R-S 00018A	00018A RES 1/4W 5% SMD 1206	1	R12
R 1K0-S 00041A	00041A RES 1/4W 5% SMD 1206	2	R6, R14
R 1M-S 00077A	00077A RES 1/4W 5% SMD 1206	2	R5, R13
R 220R-S 00033A	00033A RES 1/4W 5% SMD 1206	4	R23-26
R 22K-S 00057A	00057A RES 1/4W 5% SMD 1206	1	R21
R 22R-S 00021A	00021A RES 1/4W 5% SMD 1206	2	R19-20
R 47R-S 00025A	00025A RES 1/4W 5% SMD 1206	1	R4
R 4K7-S 00049A	00049A RES 1/4W 5% SMD 1206	2	R10, R18
R 56K-S 00062A	00062A RES 1/4W 5% SMD 1206	2	R8-9, R16-17
R 56R-S 00026A	00026A RES 1/4W 5% SMD 1206	1	R22
R 68R-S 00027A	00027A RES 1/4W 5% SMD 1206	2	R1, R3
RV 50K-S-H/S 00797	00797 SMD VARIABLE RESISTOR	2	R7, R15
TR1 BLF242	04005 TRANSISTOR	1	TR1
TR2 BLF245	03985 TRANSISTOR	1	TR2

0 1 2 3 4 5 6 7 8 9



ELSATRONIKA s.r.l.	ELECTRIC DIAGRAM		DESIGNER	SIGNATURE	DATE
	ASSEMBLY CODE	TITLE	DESIGNER	SIGNATURE	DATE
SCH00382A	30W FM AMPLIFIER MODULE	LAVOLPE	TULLO		17/06/06
					PN1281AR2
					SHEET
					1/2

0 1 2 3 4 5 6 7 8 9



ELSTRONIKA
s.r.l.

ASSEMBLY CODE
SCH00382A

ELECTRIC DIAGRAM

TITLE
30W FM AMPLIFIER MODULE

DESIGNER
LAVOLPE

PCB DESIGNER
TULLO

SIGNATURE

SIGNATURE

DATE
17/06/06

PCB REF
PN1281AR2

SHEET
2/2

DESCRIPTION

The Amplifier Module MFF0031A was designed to amplify FM carriers in the 87 - 108MHz band, and is able to provide an output of 300W CW. Besides it is provided with an RF Monitor output with a level of -40dBc \pm 3dB. In order to obtain the desired gain, the amplifier is made up by two gain stages: the pilot stage uses a MOSFET BLF244, the final stage a MOSFET SD2942. An input adaptation circuit allows to adapt the module to various driving levels. The adjustment of the output is achieved by controlling the power level of the input signal. For both stages of the module there is a control terminal allowing to instantaneously disable the MOSFETs if needed. The output of the module is completed by an 9th order (4 cells) Low-pass Filter to attenuate the harmonic level of the esable signal, and by two high-directivity directional couplers needed to sample part of the Forward and Reflected Power for measuring their levels.

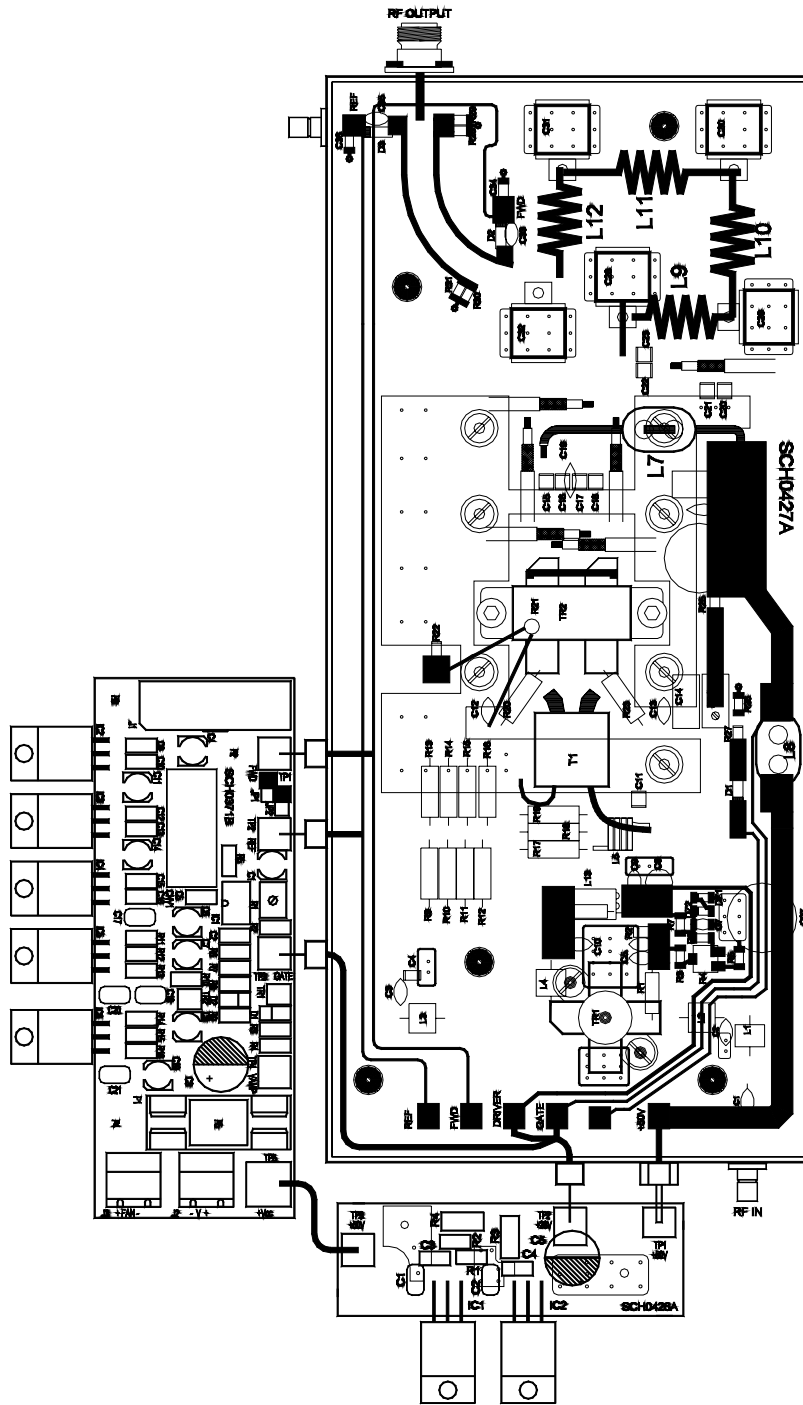
TECHNICAL CHARACTERISTICS

Frequency Range	87 - 108MHz	RF Output Impedance	50 Ω
Output Power	300W	Bias Current	BLF244 with Vdd = +28V: 300mA
Input Return Loss	>10dB	Bias Current	SD2942 with Vdd = +50V: 80mA
Power Supply	+50V	Gain	33dB (with 3dB interstage attenuation)
RF Input Impedance	50 Ω	Efficiency	54%

MFF0031AR0 COMPONENT LIST

Part Name/Number	Description	Qty.
00135	47 Ω 1/2W RESISTOR	1
00664	LM35DT THERMAL SENSOR	1
01003	0.5pF CERAMIC CAPACITOR	1
01092	100pF MULTITURN CHIP	1
01400	BYPASSING CAPACITOR	1
01403	BYPASSING CAPACITOR	4
02209	PANEL MOUNTING N CONNECTOR	1
02514	PANEL MOUNTING SMB R114553000	2
04315	LM7805 VOLTAGE REGULATOR	1
04321	LM7812 VOLTAGE REGULATOR	1
04340A	LM317HVT VOLTAGE REGULATOR	2
05742	COVER	1
07907	TO220 INSULATOR	4
07910	TO220 INSULATOR	4
DET1326R0P	DET1326R0 HEAT SINK	1
SCA0129R0B	SCA0129R0 FM AMPLIFIER BOX	1
SCH0371BR0	INTERFACE BOARD	1
SCH0426AR0	FM AMPLIFIER INTERFACE BOARD	1
SCH0427AR0	300W FM AMPLIFIER BOARD	1

MFF0031AR0 Component layout



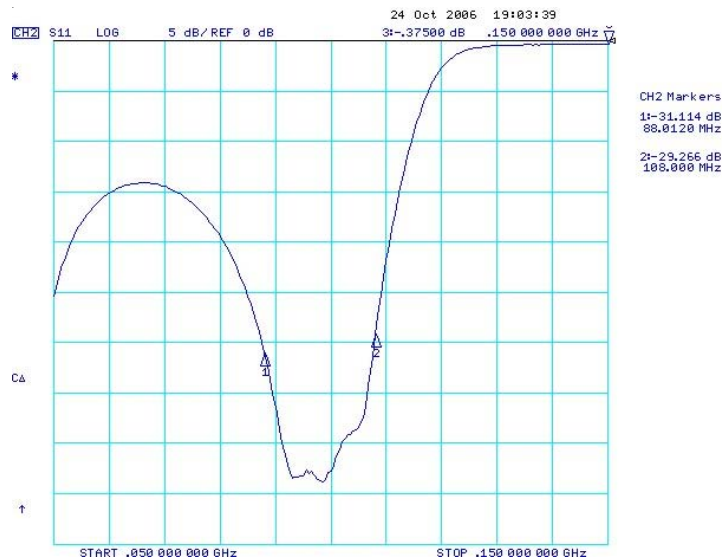
CALIBRATION PROCEDURE

- Instrument list

MEASURE	INSTRUMENT
Calibration of the Output Filter	Network analyser or alternately Spectrum analyser with tracking generator and SWR Bridge

Output Filter Section

- Calibrate the Network Analyser after setting a 100MHz span centred on 100MHz (**10MHz/div - 5dB/div**).
- Connect the input of the filter to port 1 of the Network Analyser.
- Connect the output of the filter to a dummy load. Display the Reflection coefficient (parameter s11). The calibration consists in acting on the coils (**L9, L10, L11, L12**) until a curve as below.



Polarisation of the Transistor

- After verifying that the power supply is properly connected to the passing capacitor next to the SMB connector, and before proceeding with the polarisation of the MOSFETs, disconnect the **L8** and **L13**

coils on the SCH0427A board. Power the module and check with a Digital Tester that the level of the voltages on the Interface Boards (SCH0426A and SCH0371B) matches the one shown in table *Tab.1* and *Tab.2* respectively:

CONTROL POINTS	VOLTAGE MEASUREMENT
TP1	+50V
TP2	+28V
TP3	+50V

Tab.1

CONTROL POINTS	VOLTAGE MEASUREMENT
PIN 3 of IC5 PIN 3 of IC6	+50V
PIN 2 of IC5	+20V
PIN 2 of IC6	+24V
PIN 3 of IC4	+12V
PIN 3 of IC3	+5V

Tab. 2

- Stop powering the module, then proceed with the polarisation of the MOSFETs.

- Instrument list

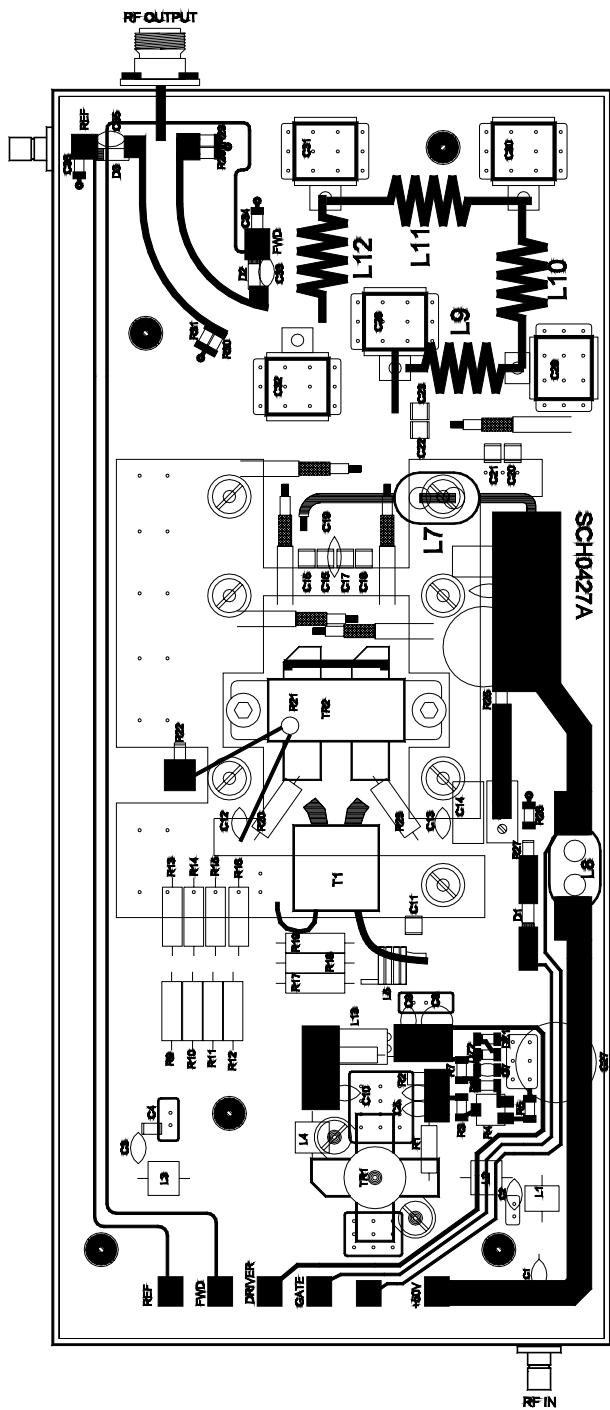
MEASURE	INSTRUMENT
Polarisation of BLF244 and SD2942 Transistors	<i>Two Digital meter</i>

- Description of the adjustment points

COMPONENT	DESCRIPTION
R4, R24	Adjust polarisation

- Disconnect the input terminal of the module. Connect the dummy load to the output terminal.
- Turn **R4** and **R24** completely clockwise (so to interdict the transistors).
- Disconnect the passing capacitor from **TP3 Gate**.
- Turn the **R4** trimmer counterclockwise until the display of the Amperometer shows an absorption of 300mA. Stop powering the module.
- Connect a Tester as Amperometer (10A cc scale) on the power supply line (in place of the **L8** coil) and power the module.
- Turn the **R24** trimmer counterclockwise until the display of the Amperometer shows an absorption of 80mA. Stop powering the module.
- Reconnect the passing capacitor to **TP3 Gate**.

SCH0427AR0 300W FM Amplifier Board Component layout

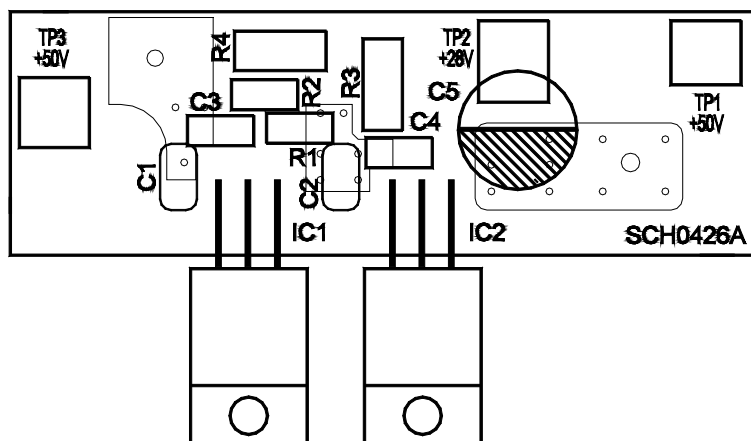


SCH0427AR0 COMPONENT LIST

Part Name/Number	Description	Qty.	Comps.	Page 1/2
01081	01081 1.2pF MULT. CHIP CAPAC.	1	C4	
CC 100pF01029	01029 100pF CAPACITOR	2	C5, C10	
CC 150pF01031	01031 150pF CAPACITOR	1	C1	
CC 220pF01033	01033 220pF CAPACITOR	1	C3	
01096	01096 1nF MULT. CHIP CAPAC.	2	C34, C36	
CC 10nF 01053	01053 10nF 500V CAPACITOR	2	C19, C25	
CC 47nF 01061	01061 47nF CAPACITOR	2	C12-13	
CC 100nF 01065	01065 100nF CAPACITOR	3	C6-7, C9	
01073A	01073A 470nF 100V POL. CAPAC.	2	C14, C26	
CC 39pF 01024	01024 39pF CAPACITOR	2	C33, C35	
01127	01127 33pF CHIP CAPACITOR	1	C11	
01779	01779 10uF 63V ELET. CAPAC.	1	C8	
01795B	01795B 100uF 100V ELET. CAPAC.	2	C24, C27	
01143	01143 470pF CHIP CAPACITOR	8	C15-18, C20-23	
01206	01206 27pF 500V 10% CAPACIT.	1	C32	
01210	01210 56pF 500V 10% CAPACIT.	2	C29, C31	
01211	01211 68pF 500V 10% CAPACIT.	1	C30	
R 220 00033A	00033A RES SMD 1206	4	R28-31	
R 1K 00041A	00041A RES SMD 1206	1	R3	
R 3K 00047A	00047A RES SMD 1206	1	R27	
R 2.7K 00046A	00046A RES SMD 1206	1	R7	
R 6.8K 00051A	00051A RES SMD 1206	1	R26	
R 33K 00059A	00059A RES SMD 1206	2	R5, R22	
R 100K 00065A	00065A RES SMD 1206	1	R25	
R 1M 00077A	00077A RES SMD 1206	1	R2	
R 10 00127	00127 RES 1/2W	3	R8, R20, R23	
R 18 00130	00130 RES 1/2W	3	R17-19	
R 22 00131	00131 RES 1/2W	2	R9, R12	
R 27 00132	00132 RES 1/2W	2	R10-11	
R 47 00135	00135 RES 1/2W	1	R1	
R 560 00148	00148 RES 1/2W	4	R13-16	
R 100K 00661	00661 NTC 100K 5%	1	R21	
R 100K 00791	00791 MULT. TRIMMER	1	R24	
R 50K 00797	00797 SMT TRIMMER	1	R4	
05043	05043 6 TURNS 4mm INDUCTOR	2	L3, L6	
05045	05045 15 TURNS 5mm INDUCTOR	1	L4	
05013	05013 VK 200	1	L13	
05064	05064 FERRITE	2	L7-8	
C0129	C0129 1.5mmq BLACK CABLE	0.15	L7-8	
05064	05064 FERRITE	1	T1	
08504	08504 50Ω RG58 CABLE	0.10	T1	
C0171	C0171 WHITE TEFLON CABLE	0.18	T1	
CAV105	CAV105 25Ω 201mm RG316 CABLE 2		CB1-2	

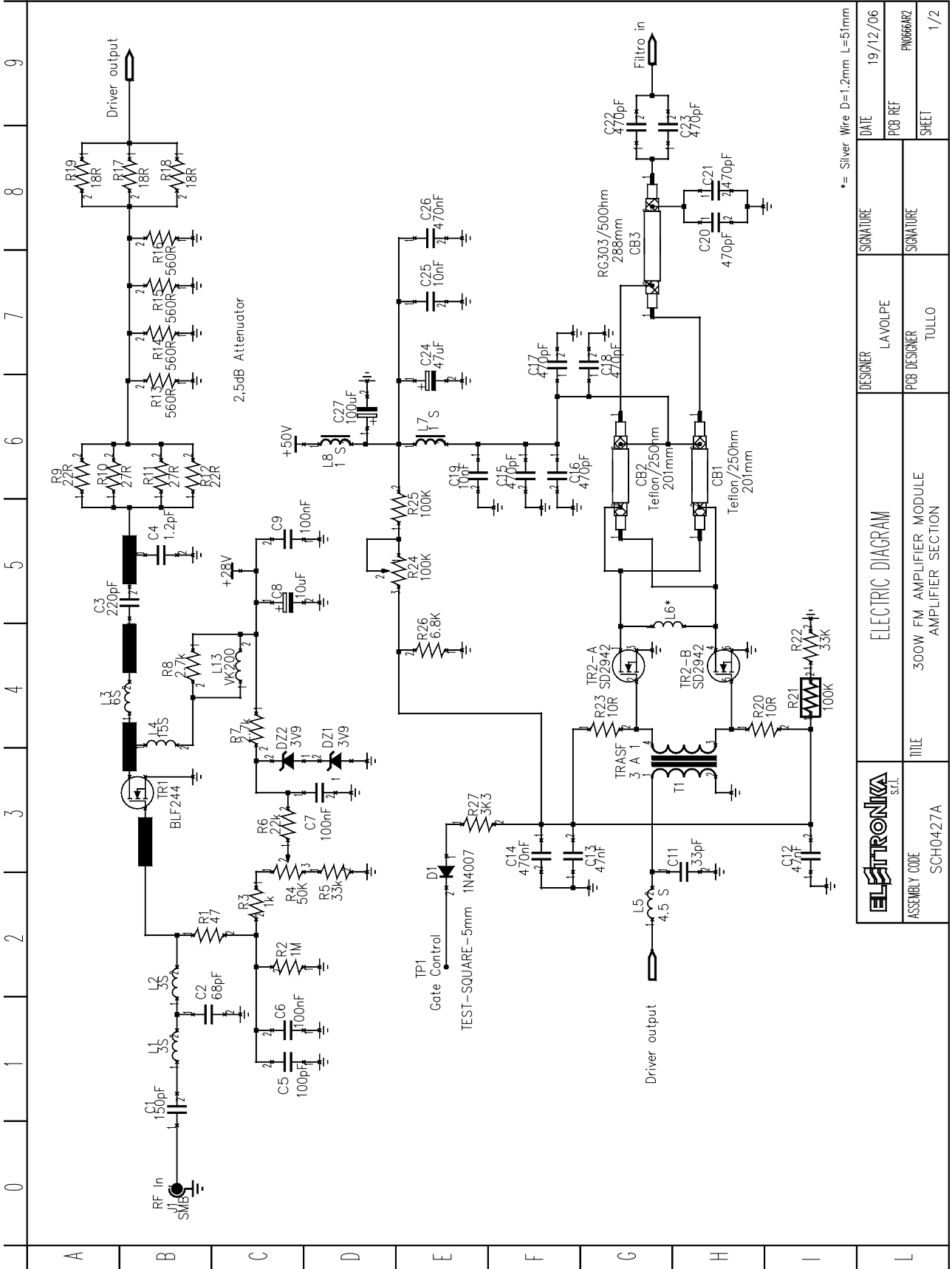
Part Name/Number	Description	Qty.	Comps.	Page 2/2
CAV095	CAV095 50Ω 288mm RG303 CABLE	1	CB3	
07684	1.2mm SILVER WIRE	0.70	L6,L9-12	
PN0666A	PRINTED CIRCUIT BOARD	1		
03009	1N4007 DIODE	1	D1	
03203	BAT83 DIODE	2	D2-3	
R 22K 00057A	00057A RES SMD 1206	1	R6	
03134	ZENER 3.9V DIODE	2	DZ1-2	
01027	01027 68pF CAPACITOR	1	C2	
05042	05042 3 TURNS 4mm INDUCTOR	2	L1-2	
01205	01205 22pF 500V CAPACITOR	1	C28	
03471	03471 SD2942 TRANSISTOR	1	TR2	
03981	03981 BLF244 TRANSISTOR	1	TR1	

SCH0426AR0 FM Amplifier Interface Board Component layout



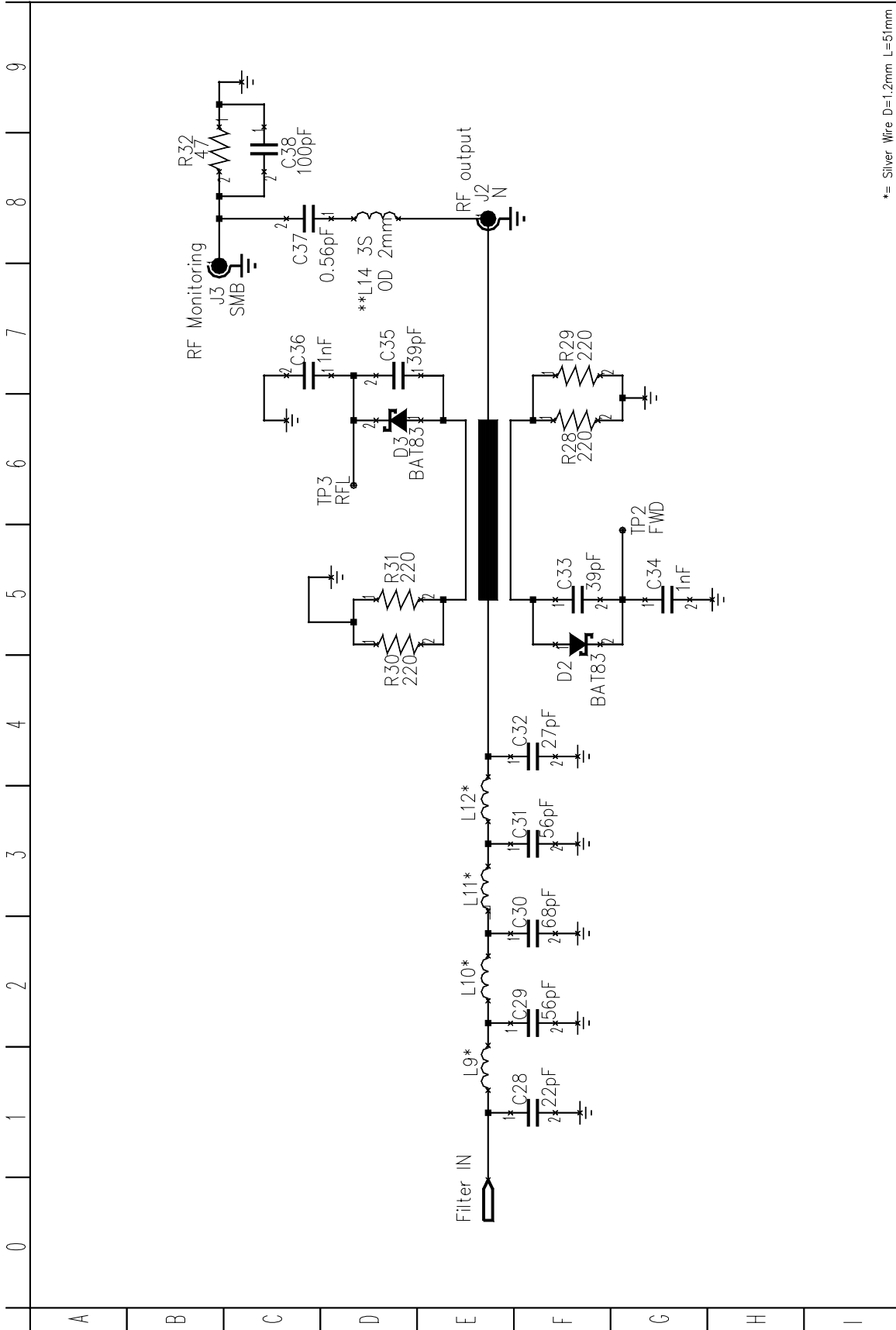
SCH0426AR0 COMPONENT LIST

Part Name/Number	Description	Qty.	Comps.
04340A	04340ALM317HVT LINEAR REG	2	IC1-2
01065I	01065I 100nF AVX CAPACITOR	2	C1-2
01065C	01065C 100nF CAPACITOR	2	C3-4
R 0.15 00405	00405 RES SMD 1W	2	R3-4
R 4.7K 00049B	00049B RES SMD 1206	1	R1
R 220 00033C	00033C RES SMD 1206	1	R2
01791A	01791A 47uF CAPACITOR	1	C5
PN1316AR1B	PRINTED CIRCUIT BOARD	1	




* = Silver Wire D=1.2mm L=51mm

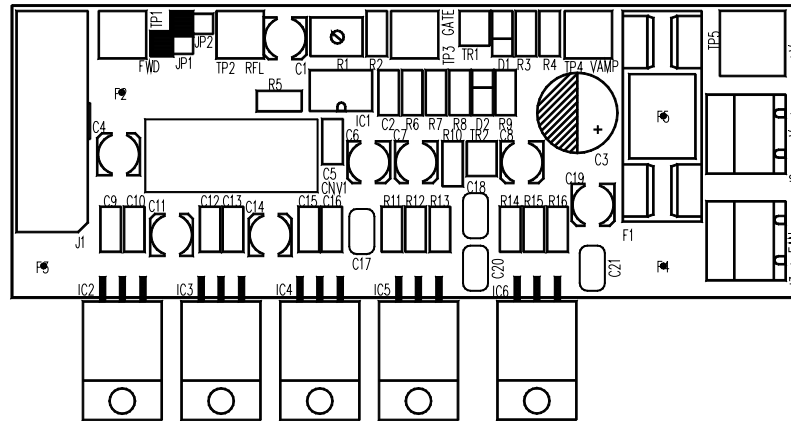
ELSTRONIKA s.r.l.		ELECTRIC DIAGRAM		DESIGNER		SIGNATURE		DATE	
ASSEMBLY CODE		TITLE		PCB DESIGNER		SIGNATURE		PCB REF	
SCH0427A		300W FM AMPLIFIER MODULE AMPLIFIER SECTION		LAVOLUPE		TULLO		19/12/06	
								PN066ARZ	
								SHEET	
								1/2	



* = Silver Wire D=1.2mm L=51mm

	ELECTRIC DIAGRAM		DESIGNER	LAVOLPE	SIGNATURE	DATE	19/12/06	
	ASSEMBLY CODE	SCH0427A	TITLE	300W FM AMPLIFIER MODULE FILTER SECTION	PCB DESIGNER	TULLO	PCB REF	PN066AR2
					SIGNATURE		SHEET	2/3

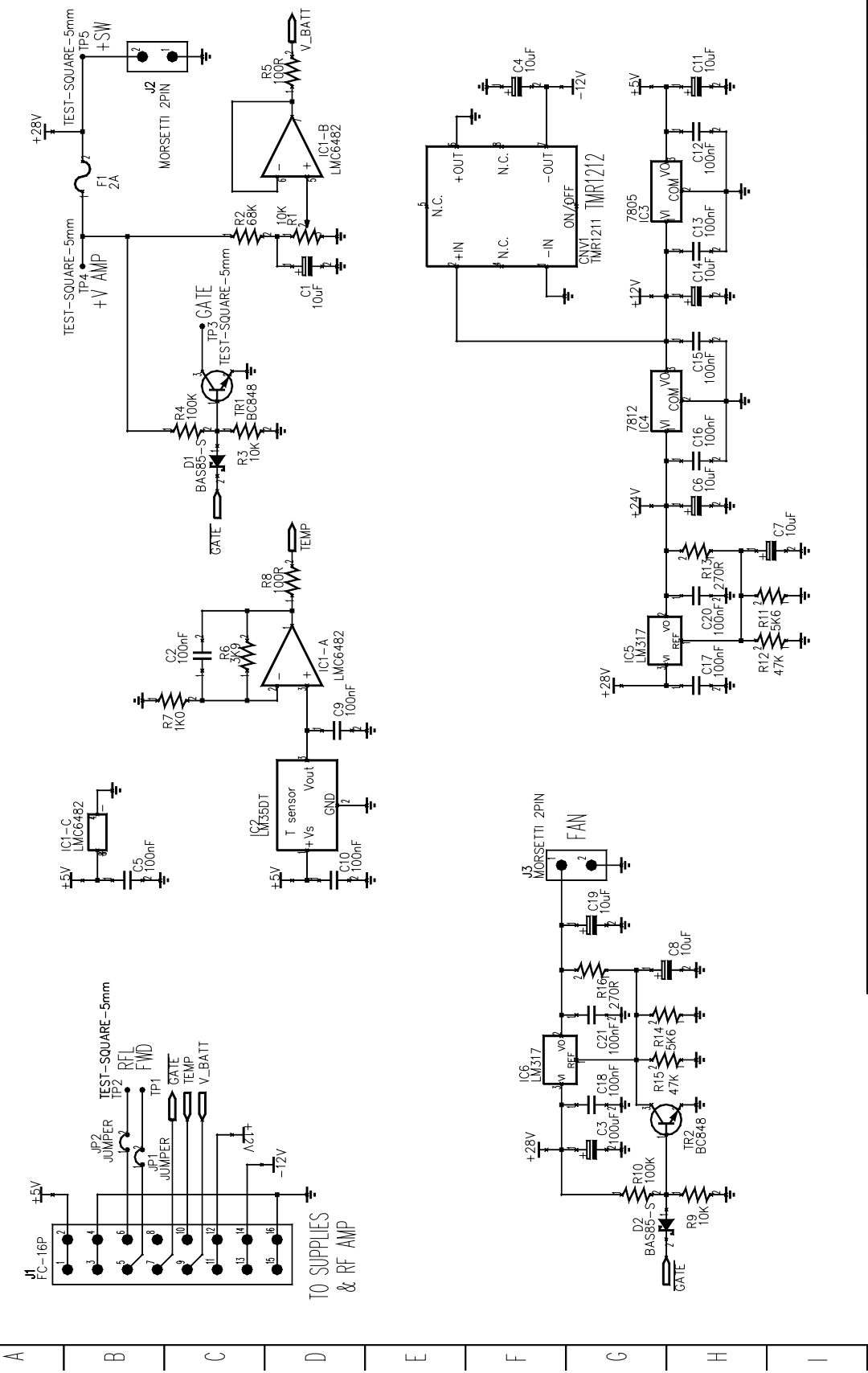
SCH0371BR0 Interface Board Component layout



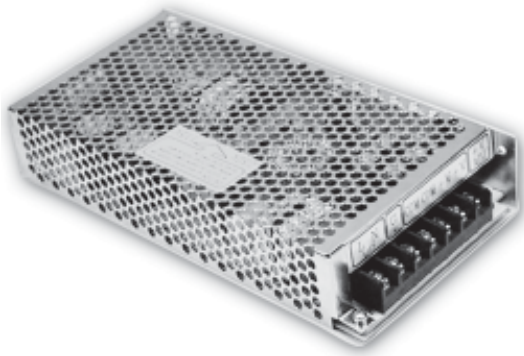
SCH0371BR0 COMPONENT LIST

Part Name/Number	Description	Qty.	Comps.
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	8	C2, C5, C9-10, C12-13, C15-16
CC 100nFAVX 01065A	01065A CERAMIC CAPACITOR	4	C17-18, C20-21
CE 100uF100V	01795B ELETT. CAPACITOR	1	C3
CE 10uF35V-S 01778A	01778A ELET. SMD CAPACITOR	8	C1, C4, C6-8, C11, C14, C19
CNV DC-DC TMR1211	04832B DC DCCONVER. IN 15V	1	CNV1
D BAS85-S	03024 SMD DIODE SCHOTTKY	2	D1-2
FUSE 2A-PCB 7543	7543 FUSE HOLDER+FUSE 5x2	1	F1
IC 7805 04315	04315 VOLTAGE REGULATOR	1	IC3
IC 7812 04321	04321 VOLTAGE REGULATOR	1	IC4
ICLM317 04340	04340 INTEG CIRCUIT	2	IC5-6
ICLM35DT 00664	00664 INTEG CIRCUIT	1	IC2
ICLMC6482-S	04632 SMD INTEG CIRCUIT	1	IC1
JFC-16P 02701-02700	02701+02700 PCB CONNECTOR	1	J1
J SCREWCONN2 02853	02853 PCB SCREW CONNECTOR	2	J2-3
JU JUMP2 02739-02742	02739+02742 MALE PAN2	2	JP1-2
R 100K-S 00065A	00065A RES 1/4W 5% SMD 1206	2	R4, R10
R 100R-S 00029A	00029A RES 1/4W 5% SMD 1206	2	R5, R8
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	2	R3, R9
R 1K0-1%-S 00041B	00041B RES 1/4W 1% SMD 1206	1	R7
R 270R-S 00034A	00034A RES 1/4W5% SMD 1206	2	R13, R16
R 3K9-1%-S 00048B	00048B RES 1/4W 1% SMD 1206	1	R6
R 47K-S 00061A	00061A RES 1/4W 5% SMD 1206	2	R12, R15
R 5K6-S 00050A	00050A RES 1/4W 5% SMD 1206	2	R11, R14
R 68K-S 00063A	00063A RES 1/4W 5% SMD 1206	1	R2
RV 10K-S-H/S 00793	00793 SMD VARIABLE RESISTOR	1	R1
TR BC848 03457	03457 NPN SMD TRANSISTOR	2	TR1-2

0 1 2 3 4 5 6 7 8 9



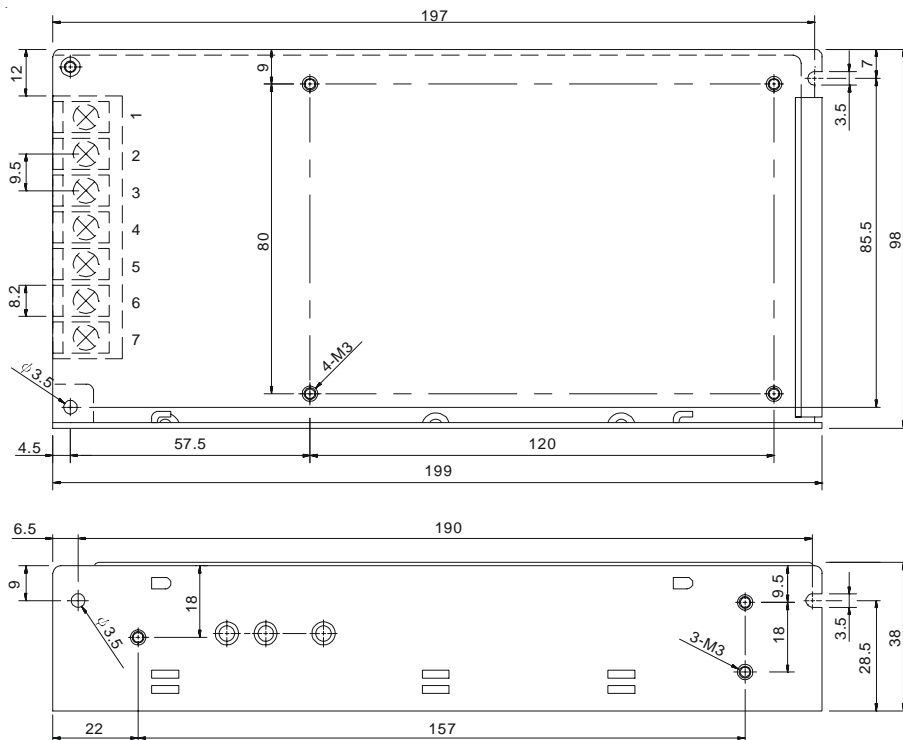
		ELECTRIC DIAGRAM		DESIGNER	SIGNATURE	DATE
		TITLE		PCB DESIGNER	SIGNATURE	PCB REF
ASSEMBLY CODE		RF I/O AND POWER SUPPLIES		TULLO		20/07/06
SCH0371B						PN12544R2
						SHEET
						1/1



MAIN FEATURES

- AC Input range selectable by switch
- Protections: Short circuit / Over load / Over voltage
- Cooling by free air convection
- 100% full load burn-in test
- Fixed switching frequency at 83kHz

MECHANICAL SPECIFICATION



TERMINAL Pin. No Assignment

PIN N°	ASSIGNMENT	PIN N°	ASSIGNMENT
1	AC/L	4, 5	DC OUTPUT -V
2	AC/N	6, 7	DC OUTPUT +V
3	FG		

TECHNICAL CHARACTERISTICS

MODEL		S-100F-15	S-100F-24
OUTPUT	DC VOLTAGE	15V	24V
	RATED CURRENT	6.7A	4.5A
	CURRENT RANGE	0 ~ 6.7A	0 ~ 4.5A
	RATED POWER	100.5W	108W
	RIPPLE & NOISE (max.) Note 2	125mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	13.5 ~ 16.5V	21.6 ~ 26.4V
	VOLTAGE TOLERANCE Note 3	± 1.0%	± 1.0%
	LINE REGULATION	± 0.5%	± 0.5%
	LOAD REGULATION	± 0.5%	± 0.5%
	SETUP, RISE, HOLD TIME	1s, 30ms, 15ms at full load	
INPUT	VOLTAGE RANGE	88 ~ 132VAC 176~ 370VAC selected by jumper or switch 248 ~ 370VAC	
	FREQUENCY RANGE	47 ~ 63Hz	
	EFFICIENCY (Typ.)	81%	83%
	AC CURRENT	3.15A/115VAC 1.5A/230VAC	
	INRUSH CURRENT (Max.)	COLD START 30A/115VAC 60A/230VAC	
	LEAKAGE CURRENT	<1mA/240VAC	
PROTECTION	OVER LOAD	105 ~ 150% rated output power	
		Protection type: Hiccup mode, recovers automatically after fault condition is removed	
	OVER VOLTAGE	17.25 ~ 20.25V	27.6 ~ 32.4V
		Protection type: Hiccup mode, recovers automatically after fault condition is removed	
ENVIRONMENT	WORKING TEMP.	-10 ~ +60°C (Refer to output load derating curve)	
	WORKING HUMIDITY	20 ~ 90% RH non-condensing	
	STORAGE TEMP., HUMIDITY	-20 ~ +85°C, 10 ~ 95% RH	
	TEMP. COEFFICIENT	± 0.03%/°C (0 ~ 50°C)	
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes	
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL1012, UL1950, TUV EN60950 Approved	
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC	
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-GD:100M Ohms/500VDC	
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B	
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3	
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, Light industry level, criteria A	
OTHERS	MTBF	314.9K hrs min. MIL-HDBK-217F (25°C)	
	DIMENSION	199*98*38mm (L*W*H)	
	PACKING	0.65kg; 20pcs/14.2kg/0.72CUFT	



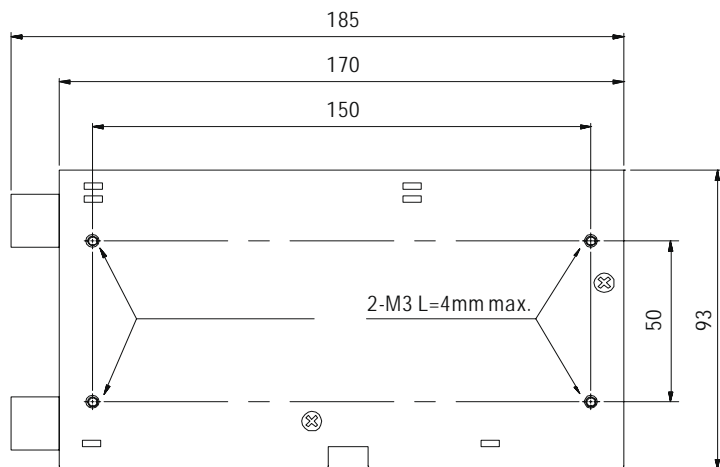
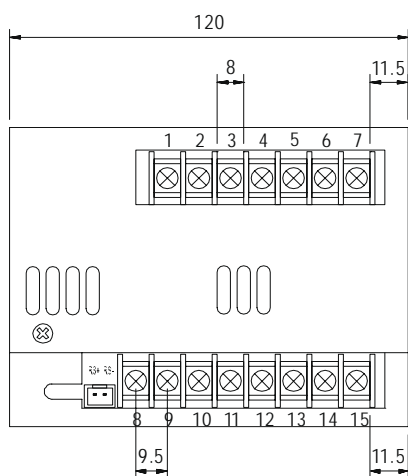
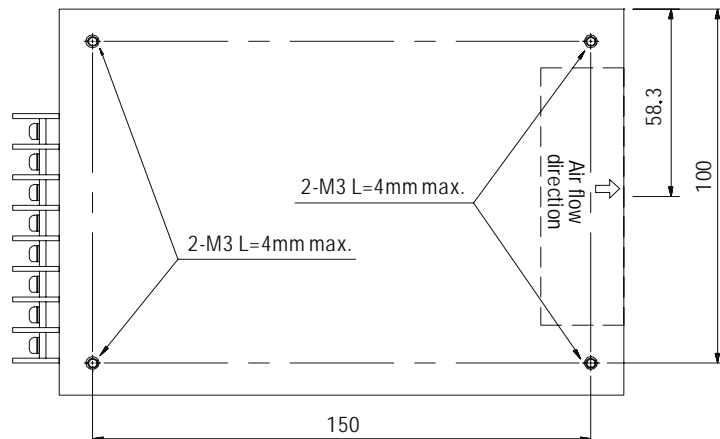
MAIN FEATURES

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- Protections: Short circuit / Over load / Over voltage / Over temp.
- Forced air cooling by built-in DC fan
- Current sharing up to 2400W (3+1)
- Built-in remote ON-OFF control
- Built-in remote sense function
- Fixed switching frequency at PFC:88kHz PWM:100kHz

MECHANICAL SPECIFICATION

Terminal Pin. No Assignment

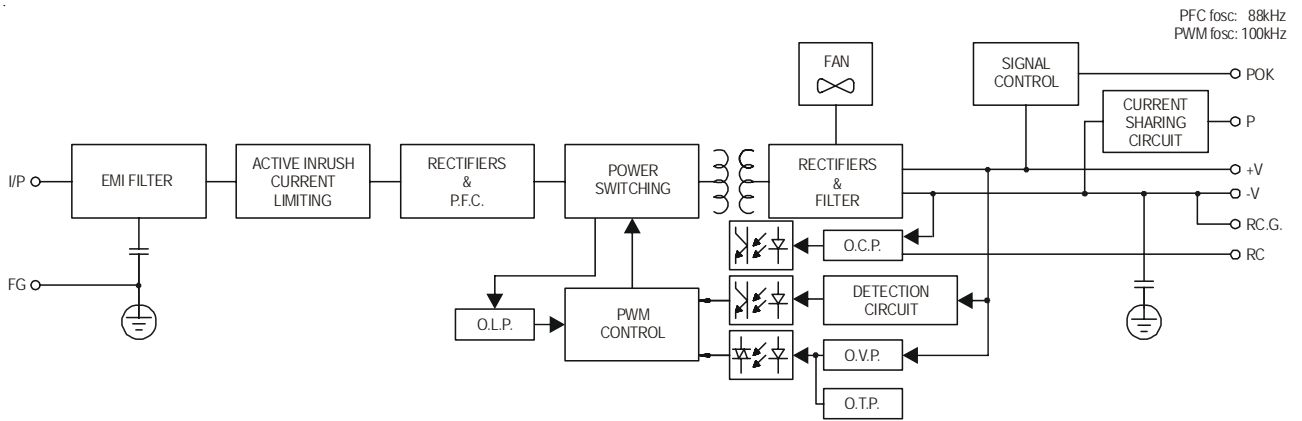
Pin No.	Assignment
1	AC/L
2	AC/N
3	FG \perp
4	P(Current Share)
5	POK
6	R.C. G
7	R.C.
8 ~ 11	DC OUTPUT +V
12 ~ 15	DC OUTPUT -V



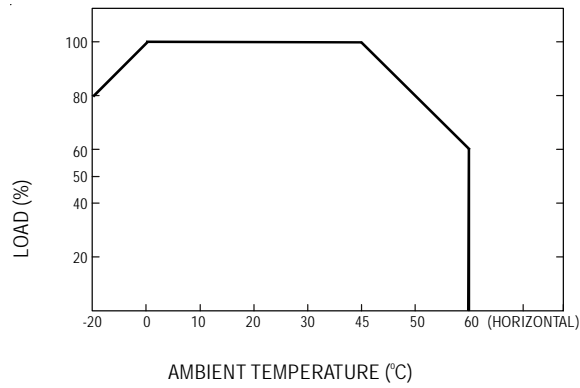
TECHNICAL CHARACTERISTICS

MODEL		PSP-650-48
OUTPUT	DC VOLTAGE	48V
	RATED CURRENT	13.5A
	CURRENT RANGE	0 ~ 13.5A
	RATED POWER	650W
	RIPPLE & NOISE (max.) Note 2	300mVp-p
	VOLTAGE ADJ. RANGE	41 ~ 56V
	VOLTAGE TOLERANCE Note 3	± 1.0%
	LINE REGULATION	± 0.5%
	LOAD REGULATION	± 0.5%
	SETUP, RISE, HOLD TIME	1500ms, 50ms, 16ms at full load
INPUT	VOLTAGE RANGE	88 ~ 264VAC 124 ~ 370VDC
	FREQUENCY RANGE	47 ~ 63Hz
	POWER FACTOR	PF>0.95/230VAC PF>0.98/115VAC at full load
	EFFICIENCY (Typ.)	87%
	AC CURRENT	8.2A/115VAC 4.1A/230VAC
	INRUSH CURRENT (Max.)	25A/115VAC 50A/230VAC
	LEAKAGE CURRENT	>1mA/240VAC
PROTECTION	OVER LOAD	105 ~ 135% rated output power Protection type: Fold back current limiting, recovers automatically after fault condition is removed
	OVER VOLTAGE	57.6 ~ 67.2V Protection type: Shut down o/p voltage, re-power on to recover
	OVER TEMPERATURE	+5V: 95°C(TSW1)Detect on heatsink of power diode +5V: 95°C(TSW2)Detect on heatsink of power transistor +12 ~ +48V: 85°C(TSW1)Detect on heatsink of power diode +12 ~ +48V: 80°C(TSW2)Detect on heatsink of power transistor Protection type: Shut down o/p voltage, recovers automatically after temperature goes down, than re-power on to recover
FUNCTION	REMOTE CONTROL	RC+/RC-: Short = power on; Open = power off
ENVIRONMENT	WORKING TEMP.	-20 ~ +50°C (Refer to output load derating curve)
	WORKING HUMIDITY	20 ~ 90% RH non-condensing
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH
	TEMP. COEFFICIENT	± 0.03%/°C (0 ~ 50°C)
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 Approved
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-GD:100M Ohms/500VDC
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, Light industry level, criteria A
OTHERS	MTBF	116.4K hrs min. ML-HDBK-217F (25°C)
	DIMENSION	170*120*93mm (L*W*H)
	PACKING	1.9kg; 8pcs/15.5kg/1.06CUFT

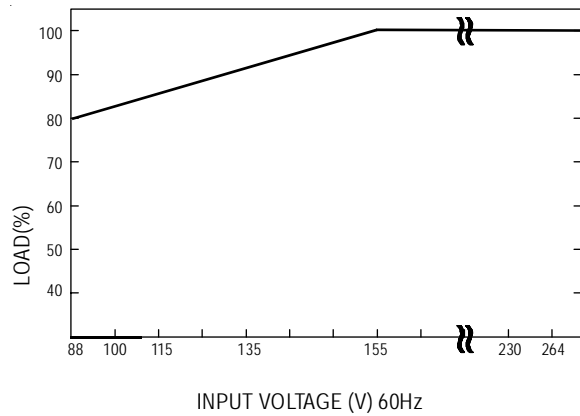
BLOCK DIAGRAM



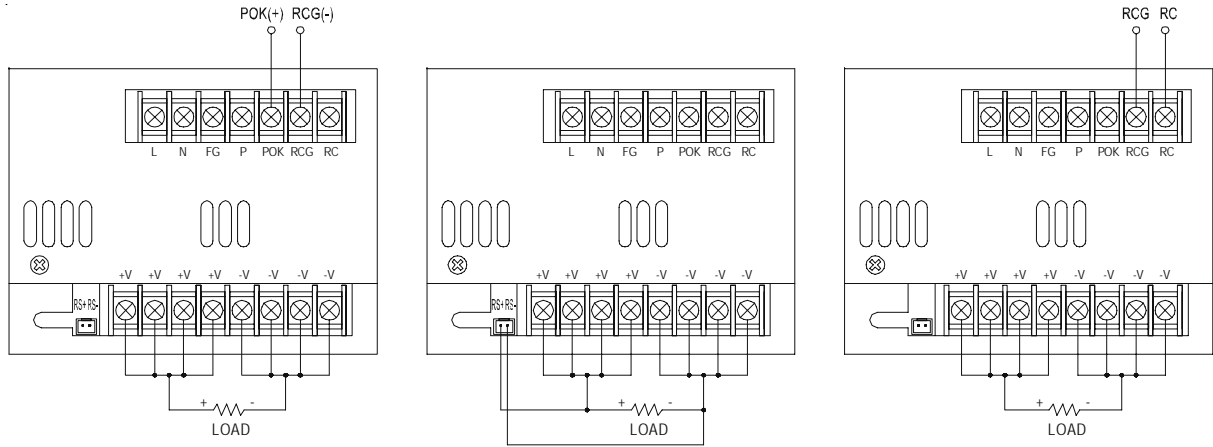
DERATING CURVE



OUTPUT DERATING VS INPUT VOLTAGE



CONTROL TERMINAL INSTRUCTION MANUAL



POK Signal

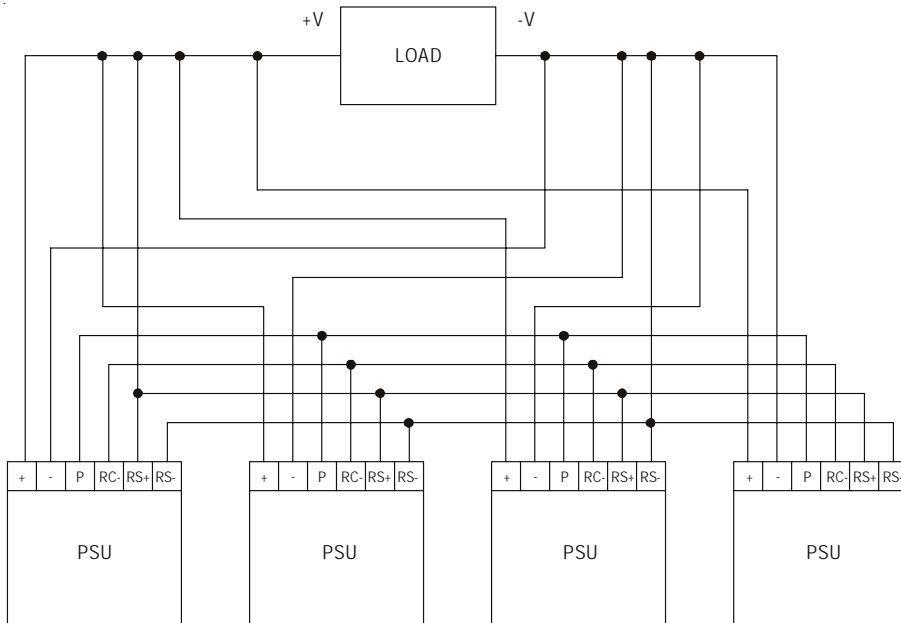
POK Signal is the voltage difference between "RCG" and "POK" pin output POK Signal for TTL level signal
 PSU turn on: 3.3V ~ 5.6V
 PSU turn off: 0V ~ 1V

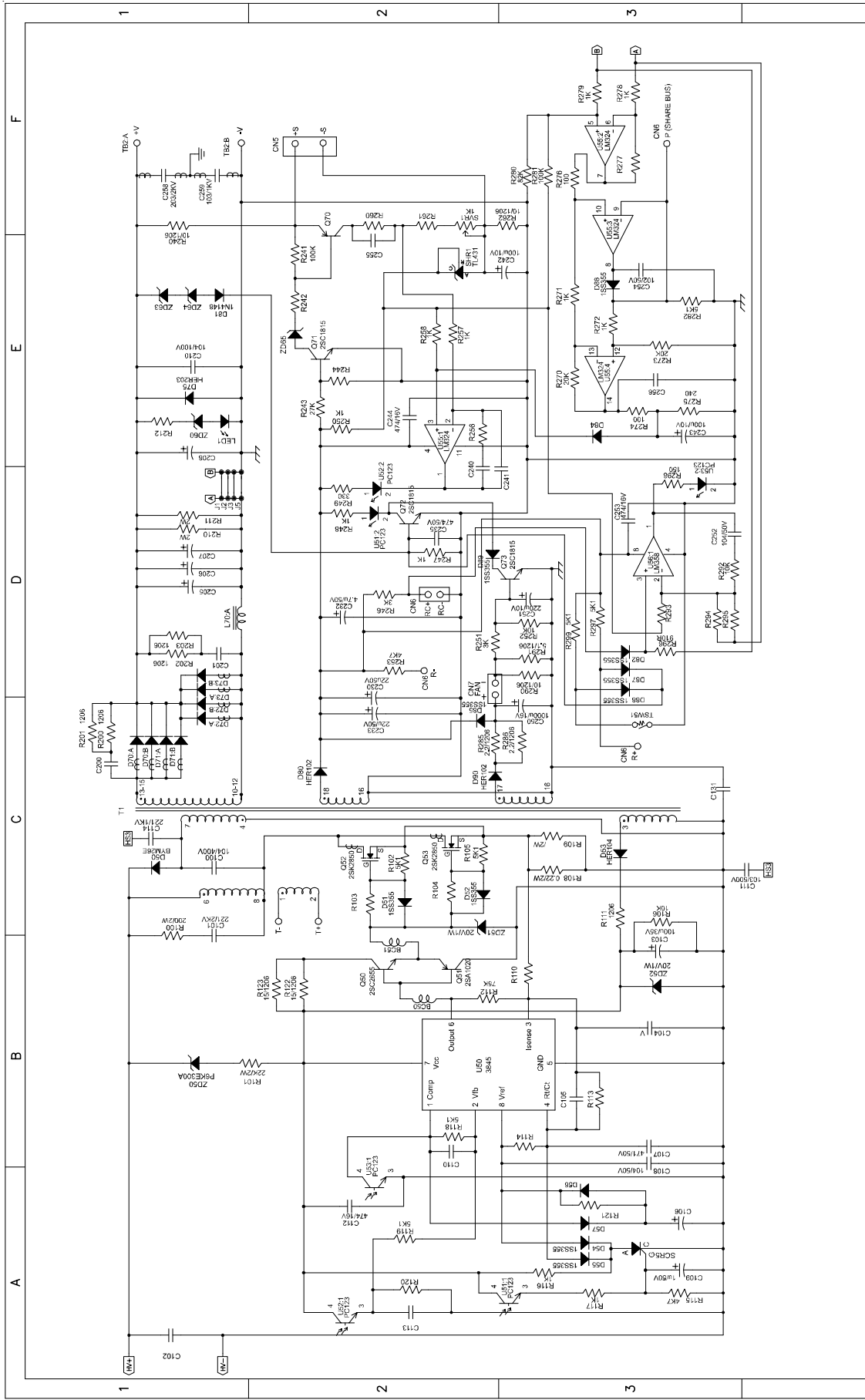
Remote Sensing

Remote Control

Power ON: RCG and RC for short
 Power OFF: RCG and RC for open

PARALLEL OPERATION WITH REMOTE SETTING





ECON.	CORE	DATE	DESCRIPTION	APPROVAL	DESIGNED	CHECKED	DRAWN	SUBJECT	
								PSP-600B	
								REVISION	R3
								FILENAME	PSP-600B-R3.sch
								Sheet	1 of 2



MEAN WELL ENTERPRISES CO., LTD.



S.S. 96 km 113 - Zona Industriale
70027 PALO DEL COLLE (Bari)
ITALY

Phone: +39 080 626755
Fax: +39 080 629262

www.elettronika.it
elettronika@elettronika.it