

# ARCHIMEDE 1000

## Manual for Systems and Procedures



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<b>Edit./Rev.</b>	<b>Date (gg/mm/aa)</b>	<b>Reason</b>	<b>Approved by:</b>
ARC1000A/00	20/06/2011	First Edition	Micalizzi - Scandelli
ARC1000A/02	20/12/2013	Second Edition	Micalizzi - Scandelli
ARC1000A/03	21/10/2015	Third Edition	Micalizzi - Scandelli

# Warranty

ITALAB warranty covers the product's materials and fabrication defects for a period of 2 years from the date of delivery. The standard warranty can be extended beyond this period. The conditions for such extensions are shown on the sales order per each purchased product. They are valid throughout the extension period of each product.

During the warranty period, ITALAB takes responsibility for repair or substitution of the defected product. The warranty applies only if the product is returned to ITALAB after the assistance has been granted and only in case maintenance procedures are performed, as indicated on the manual.

ITALAB retains the right of substitution of defected products or their components with new products or new revised parts. The warranty does not cover repair of products that have been damaged by mishandling or through improper use. Warranty does not cover the product if it has been manipulated. The warranty does not cover power Mosfets because there is already a constructor's warranty and moving parts.

## **NO OTHER WARRANTY APPLIES**

**THE ITALAB WARRANTY DOES NOT COVER DAMAGE OR DEFECTS AS A CONSEQUENCE OF USE, OR IMPROPER USE OF THE PRODUCT (USE DIFFERENT FROM WHAT THE PRODUCT HAS BEEN DESIGNED FOR). THE WARRANTY DOES NOT COVER IMPROPER CONNECTION OF THE DEVICE TO OTHER DEVICES.**

If you think your device needs repairing, please call ITALAB immediately and request customer support. It is important you contact ITALAB immediately as most problems can be rapidly solved by telephone or by email. Please have the registration number of the product ready before you contact ITALAB and clearly describe the nature of the problem.

Once you have recognized the malfunction and you are sure the product needs to be repaired, we will send you an electronic spreadsheet which needs filling out with name, address, telephone number, email and an accurate description of the problem. In the spreadsheet there will be an RMA number for the delivery of the unit with a **pre-paid** delivery to the lab at the indicated location. The product must be sent in its original packaging or within an adequate container that will protect the item.

**ITALAB will not be held responsible for damage which has taken place during transport.** Please verify that the **RMA** number is clearly indicated on the packaging. Our standard conditions for repairs are of 5 working days from product reception.

In case we needed to order additional components for your repair and this were to take more than 5 working days, our technical service will contact you and inform you about the variation on delivery lead time.

In order to repair a product out of its warranty time, we will have to follow the same procedure described above but you will have to tick the box "not under warranty".

The warranty is valid only if the adequate maintenance procedures have been respected as described on the manual. Damage caused by incorrect use of the product will NOT be covered by the warranty.

## Warranty Service

The Archimede 1000 is a highly reliable device. Nevertheless, as it happens for all devices active 24 hours over a number of years, some malfunctions may take place. Repair of the modules within the amplifier is very difficult on site, it is recommended you contact our client assistance service:

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## FIRST AID TIPS

If a possible victim seems unable to break free from the contact of electrical shock, turn off the power before providing relief. A muscle spasm or possible unconsciousness can make the victim unable to get away from the mains.

If power can not be turned off immediately, create a loop very carefully to a suitable length to your safety, the loop must be perfectly dry and non-conductive material (such as a rope, insulating material or a piece of clothing not conducting) place it around the victim and pull up to release it.

Also do not allow the clothing of any victim to be in contact with you until they will have it delivered! **DO NOT TOUCH** the victim or parts of his clothing before the power is off, you may also become a victim of electric shock!



### Step 1

Check the victim's responsiveness. If there is no response immediately call medical assistance and, if possible, do not abandon them.



### Step 2

Place the victim on their back (on a solid surface, ie. floor, table etc.)  
Kneel at their side and place a hand on their forehead and the other on the chin. Bend their head backwards slightly and lift the chin until the teeth almost touch each other. Look at and listen to their breathing.



### Step 3

If the victim cannot breathe properly, close their nose and start artificial breathing.  
Give them 2 deep breaths, the victim's chest will inflate if you supply sufficient air.

**Step 4**

Place the tips of your fingers on their Adam's Apple, make the fingers slide towards the trachea. Feel the pulse on their wrist. If you cannot feel the pulse or you are unsure, proceed to the next step.

**Step 5**

Place your hands at the center of the chest, between the nipples. Place one hand on top of the other.

**Step 6**

Push energetically with your 2 thumbs. Push on the chest 15 times.

CONTINUE ARTIFICIAL BREATHING UNTIL THE AMBULANCE OR FIRST AID ARRIVES

**TREATMENT FOR MAJOR BURNS**

- Continue aid to the victim of electrical current.
- Verify the presence and location of entry and exit points of the current.
- Cover the burnt surface(s) with clean medication.
- Remove all clothing from the burnt area. Eventually cut the clothing which has attached to the skin but do not remove it, keep the patient covered except for the harmed area.
- Block, if possible, all fractures with a rigid "stick". (Violent muscular contractions can cause fractures).

# Safety Instructions

To optimize the user safety and to guarantee correct functioning of the device, all our instructions are contained in the present manual and must be very carefully followed.

## OPERATIONAL CONDITIONS

The device has been designed to work:

- With power tension of 240 Volt +/- 30 Volt alternated at 50÷60 Hz
- Room temperature must be between 0 and 40 ° C.
- Maximum height of 4000 m. slm

**THE REMOVAL OF ANY PANEL HAS TO BE DONE BY AUTHORIZED AND QUALIFIED PERSONNEL**

**ATTENTION:** there are dangerous tensions within the device.

## PROTECTION GROUNDING

To protect people from the risk of fulguration, the amplifier frame must be connected to an electric mass through the network power cable. The third cable (green yellow) must be connected to an electric mass (safety ground) within the power socket. Any interruption of the ground conductor will cause a potential fulguration danger which could cause personal lesions. If the amplifier is powered by other devices, you must verify the frame has been connected to a separate security ground.

## DO NOT USE IN EXPLOSIVE ENVIRONMENTS

Running Archimede 1000 in presence of flammable gasses or vapours can be the source of danger for people near site.

## DO NOT TRY TO REPAIR ARCHIMEDE

Maintenance, repair and substitution of internal parts must be performed only by qualified ITB personnel.

## Fuses

In case the fuses break, after having removed the cause of the problem, please substitute them with the same kind. They must have the same current, tension and intervention time features.

## Exit Connector

The RF exit "7/16" connector creates an RF signal which is dangerously high and can cause shock and burns. Do not use the amplifier without having correctly connected the connector to a load of adequate proportions or to the antenna.

## Electrostatic Charges (ESD)

An unexpected electric electrostatic charge can destroy devices sensitive to static electricity or to micro circuits. To avoid this, correct grounding techniques must be performed. Please use standard procedures to avoid these events.

## General Safety Rules

- The device must be used following described norms.
- To perform the electrical installation within interior environments it will be necessary to follow conformity norms aligned with the current safety guidelines.
- Ensure there are no cables in areas where people transit or work, especially cables which power the devices.
- Do not use a network connection shared with other users to power the device. Do not use an extension cable.
- Only use the power cable supplied or, in case the length was not sufficient, prepare one with the same accessories and features as those of the original one.
- The amplifier must be totally disconnected from the power network **only** when the power cable is removed. For this reason, the power cable must be easy to access.
- Do not install the device near sources of heat or in humid areas. Ensure the device has adequate ventilation.
- The amplifier must not be near water or objects containing water.
- The amplifier must be located in such manner as to avoid interference with ventilation necessary to cool it down. For example, the device must not be inserted within enclosed furniture such as a bookshelf or a cupboard. This could interfere with air expulsion flow through the openings.
- All cable connectors must be well screwed and fixed to the carcass.
- The device has been designed to be used in a horizontal position.
- When the device shows visible damage or has not been used for a while, or it has not been stored as described, it will no longer be safe to operate.
- In case there were technical problems or in case of any doubt, please immediately contact our technicians in order to avoid possible abnormalities.
- In case of visible damage or malfunctioning of Archimede 1000, it is advised to turn the power off.
- The maintenance and repair can be made only by authorized ITALAB staff.
- Before removing the Archimede 1000 cover, please turn off the power switch. This can be found on the rear of the device. The auto-power cable must be removed from the electric socket.

## Environmental Conditions

To optimize performance of the apparatus, in terms of output power, life-span etc, the following environmental parameters must be followed:

- Room temperature must be between 0 and 40°C
- Humidity must be below 80% and must not create condensation

The device can also work at different parameters from the ones specified above but ITALAB cannot guarantee the uninterrupted service. If the device reaches temperatures above 50° within, it will automatically go in standby mode.

It is advised to regulate the conditions of the room which will host the device. What is necessary is a good ventilation in order to maintain the temperature lower than or equal to 40°C.

If the device is placed within a Rack cupboard, please ensure that the rear is not closed. This will allow expulsion of hot air from the fans within the amplifier. If the device stays closed, please provide an adequate extraction fan system.

## DEVICE DESCRIPTION

This chapter describes how to perform installation, setup and how to perform controls on the amplifier.

The information is addressed to a system manager, expert in the knowledge of high-performance transmission systems. The Archimede 1000 has been designed for 19" Racks.



**ARCHIMEDE 1000** is a Wide Band amplifier which operates between 87.5 and 108 MHz. frequency ranges. The RF part is made up of an amplifier unit (MD 1200P – FM) able to supply 1200 Watt power in continuous service. ITALAB's philosophy is to avoid components from working under stress, to this aim, the output power has been reduced to 1000 Watt at full regime. This ensures the product is reliable.

The radiofrequency part (made up of RF Pallet, Low-Pass Filter and of the output coupler) is placed within a box so it is screened from all other components that complete this device.

The power supply is switching, ultra-compact and of optimum quality. We have been generous with its features to ensure optimal performance.

All the ARCHIMEDE 1000 functionalities (RF temperature, incoming air temperature, internal temperature, output power and reflected power) are managed by a microprocessor which controls them in real time. This allows the device to work in optimal conditions.



# TECHNICAL FEATURES

## Technology

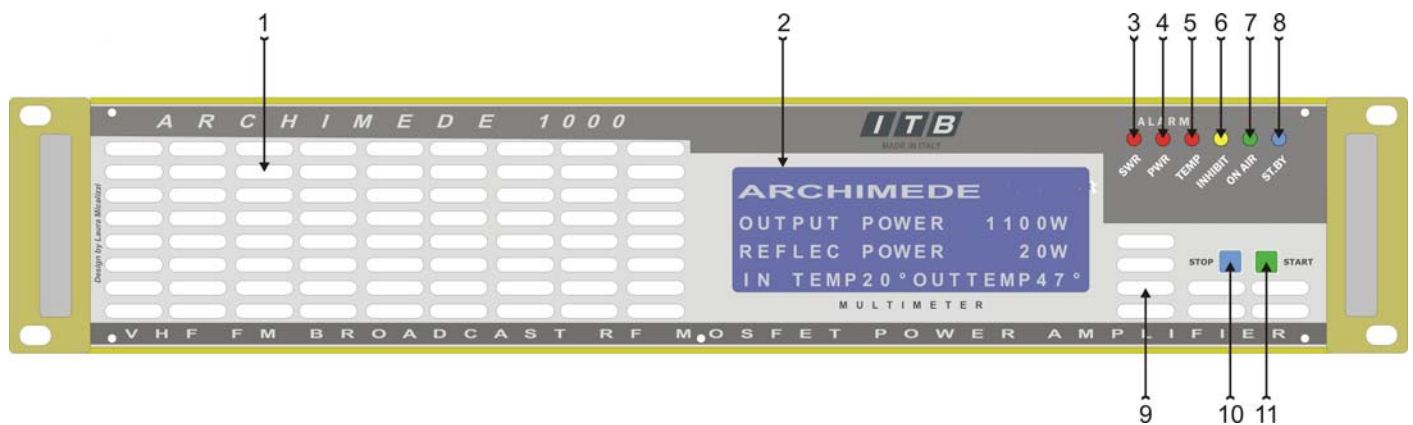
- solid state MOSFET
- microprocessor control with recorded program

Operational Frequency	87.5 – 108 MHz
Piloting Power	5 – 7 Watt
Output Power	1000 Watt
Harmonic Product	≤ - 70 dBc
Input RF Connector	Type N
Output RF Connector	Type 7/16"
SWR Protection	Threshold at 100 W ±0.5dB
Output power protection	Threshold at 1000 W ±0.2dB
RF State Temperature Protection	Threshold at 75°C. sul Mosfet
Room Temperature Protection	Threshold at 40°C.
Ventilation	Forced, 4 ventilators
Working Temperature	0 – 40°C.
MAX Working Altitude	4000 mt. S.I.m.
Maximum Working Relative Humidity	≤ 90%
Control System	2 buttons
Data Visualization	LCD 4 lines
Power Supply	195 – 250 Vac
Dimensions	Rac 2 U 19", P = 530 mm
Weight	16 Kg ±5%

## **“CE” Conformity Norms for FM Transmitters**

If this amplifier is used with a generator to create an FM transmitter destined to audio operational frequencies which are not harmonized in the country where the device is meant to work, the user will need to obtain a license before using the product in the destination country and will have to guarantee that the license requirements are respected in the country where it will be powered. The use limitations can be applied in terms of operational frequency, transmitter output power and/or distance between channels.

# FRONT PANEL

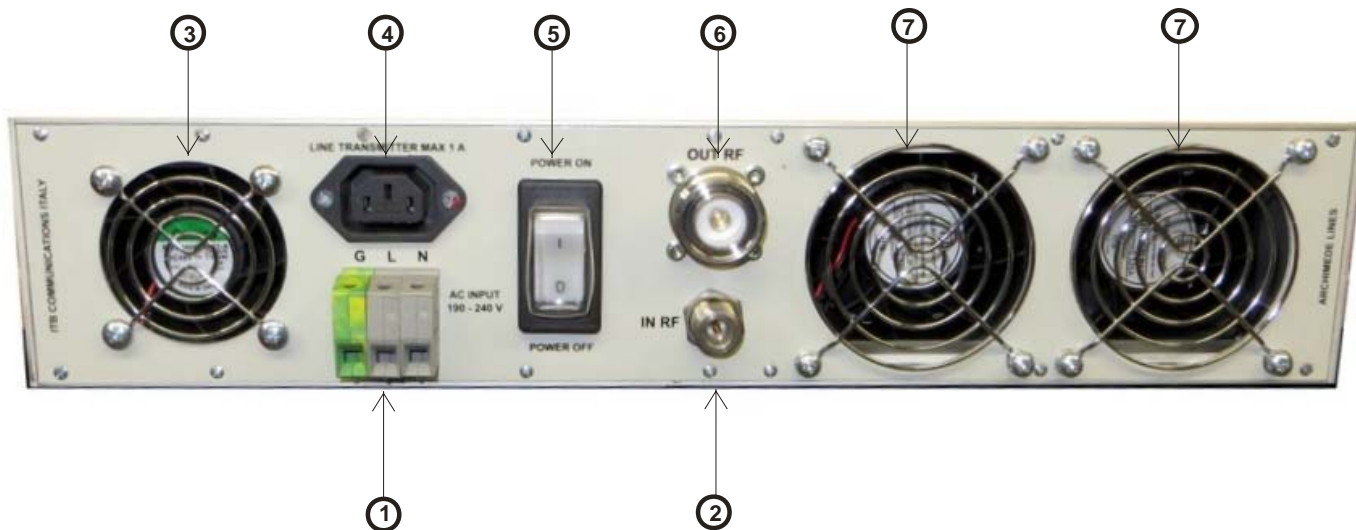


- |                  |  |
|------------------|--|
| 1. GRID          | Ventilation grid for RF Pallet             |
| 2. DISPLAY       | Visualization Display for device functions |
| 3. LED SWR       | Alarm LED for Reflected Power              |
| 4. LED PWR       | Alarm LED for Direct Power                 |
| 5. LED TEMP      | Alarm LED for overheating                  |
| 6. LED INHIBIT   | Inhibit LED                                |
| 7. LED ON AIR    | Broadcast Transmission LED                 |
| 8. LED ST.BY     | Stand-By LED                               |
| 9. GRLL          | Ventilation Grid for device interior       |
| 10. STOP BUTTON  | STOP Button                                |
| 11. START BUTTON | START Button                               |

## FUNCTIONS DESCRIPTION:

- LED SWR:** *Flashing:* indicates it is limiting the output RF power in order to reduce the reflected one.  
*ON Constantly:* indicates reflected power is more than 12% of the device's rated power.
- LED PWR:** *Flashing:* indicates the device is limiting the output power to maintain the nominal value.  
*ON Constantly:* indicates the output power value is higher than the nominal one.
- LED TEMP:** *ON Constantly:* indicates the internal temperature of the device or of the pallets is higher than the device's parameters.
- LED INHIBIT:** *ON Constantly:* indicates the device has removed the pallet enabling tension.
- LED ON AIR:** *Flashing:* indicates the device is in transmission but does not detect the output power.  
*ON Constantly:* indicates the device is detecting the output power.
- LED STAND BY:** *ON:* indicates the device is on Stand-By.
- STOP BUTTON:** By pressing the button, the device will go in stand-by mode and the pallet will remove auxiliary output power from the device.
- START BUTTON:** By pressing the button, the device will set the pallet in transmission mode and auxiliary output power will be supplied.

# REAR PANEL VIEW



- 1 Network A.C. input (240 Vac.) L= Phase N= Neutral G= Earth
- 2 RF Input
- 3 Power Supply Air Exit ac/dc
- 4 A.C. Auxiliary Commanded Tension Exit (TX)
- 5 General Switch
- 6 Output RF Connector
- 7 Section RF Cooling Air Exit

# INTERNAL VIEW



- 1 COLD AIR INPUT VENTILATORS
- 2 RADIOFREQUENCY BOX
- 3 RF BOX INTERFACE
- 4 CPU
- 5 AC/DC SWITCHING POWER SUPPLY
- 6 RF SECTION HOT AIR EXIT VENTILATORS

# STARTUP INSTALLATION PROCEDURE

If you require assistance or have any questions regarding the installation, ITALAB technical staff will be at your service to solve any problems. Please do not perform modifications which could damage the product.

Before installing the amplifier, verify that the room containing it conforms to the following guidelines:

- There should not be excessive dust
- There should not be deposits of corrosive chemical products such as chlorine, sulphur etc..
- Sources of heat (radiators, hot air ventilation etc.) should be at least 2 meters away;
- Room temperature must be included between 0 and +40 ° with relative humidity not higher than 90% without condensation

After having removed the amplifier from its packaging, verify that this has not undergone damage during transport.

## Electrical Connections


- The connection with primary power supply of 230 Vac must be performed with the power supply cable which has been provided with the amplifier or with a cable with 3 conductors and with minimal conductor section of 2.5 square millimetres.
- For safety and good practice reasons, have a dedicated 2.5mm section cable available which is directly derived from the primary panel with an adequate magneto-thermic switch.
- Check that the ON / OFF switch on the rear panel on the amplifier is OFF.
- Connect the power supply cable in the dedicated clamps at the rear of the amplifier respecting the specified polarities shown in the rear view image.
- Insert the other network power supply cable end to the socket with the correct connector.
- Connect the exciter network power supply cable (**supplied in the package**) to the auxiliary socket on the rear of the amplifier panel. This socket will be powered only when the amplifier is ready to function.
- The maximum detectable current from the auxiliary socket is of 1.5 & 230 Volts.

## RF Connections

- Connect the antenna coaxial cable (with 50  $\Omega$  impedance) to the RF output (7/16") connector on the rear of the amplifier panel.
- Connect the exciter RF output to the amplifier RF input with a coaxial cable with 50  $\Omega$  impedance.

## Final Control before Start-up Procedure

Before you power the amplifier, verify once again the following safety measures:

	The amplifier must have a <b>ground</b> connection
	The 230 Vac power supply and its protections must be properly connected.
	The power supply cable between the exciter and the amplifier must be connected correctly.
	The antenna cable must be connected and fixed properly.
	The RF connection cable between the exciter and the amplifier must be connected.
	Please ensure Power reaching the amplifier is not higher than 2 Watts. <b>An excessively high input power will damage the device.</b>

# SYSTEM STARTUP

When the power supply switch is turned on, it will take a few seconds before the power supplier activates after the start-up procedure has been performed.

Successively, the display will show the amplifier start-up procedure. After this, the amplifier is ready for transmission. When the “ON AIR” LED is flashing, slowly increase the exciter output power until you have reached the output power you require, not higher than 1000 Watt.

The “ON AIR” LED stops flashing when the output power is  $15\% \leq$  than the nominal power. If the output power of the amplifier exceeds 1000 Watts, the “PWR” LED will flash and the Mosfet Amplifier polarizing tension will be automatically reduced in order to maintain the output power within the safety parameters. It is therefore useless to increase the input power, conversely, if it is increased, it will damage the RF power Mosfet, which is not covered by warranty.

Do not remove the input primary power supply without having first performed the STOP procedure. If the amplifier is disconnected from power supply without having first removed the input power, damage may occur within the device.

When the start-up procedure is complete, the correct functioning of the device is visible on the display. It will show the following:

			A	R	C	H	I	M	E	D	E	1	0	0	0			
O	U	T		P	O	W	E	R			.	.	.	.	W	A	T	T
S	W	R		P	O	W	E	R		_	_	_	_	_	_	1	0	0
H	s			.	.	°	C			I	n			.	.	°	C	

On the fourth row of the display the following will alternate:

- The pallet temperature (MAX 80° C) and the incoming air temperature (MAX 45° C)
- Date and Time

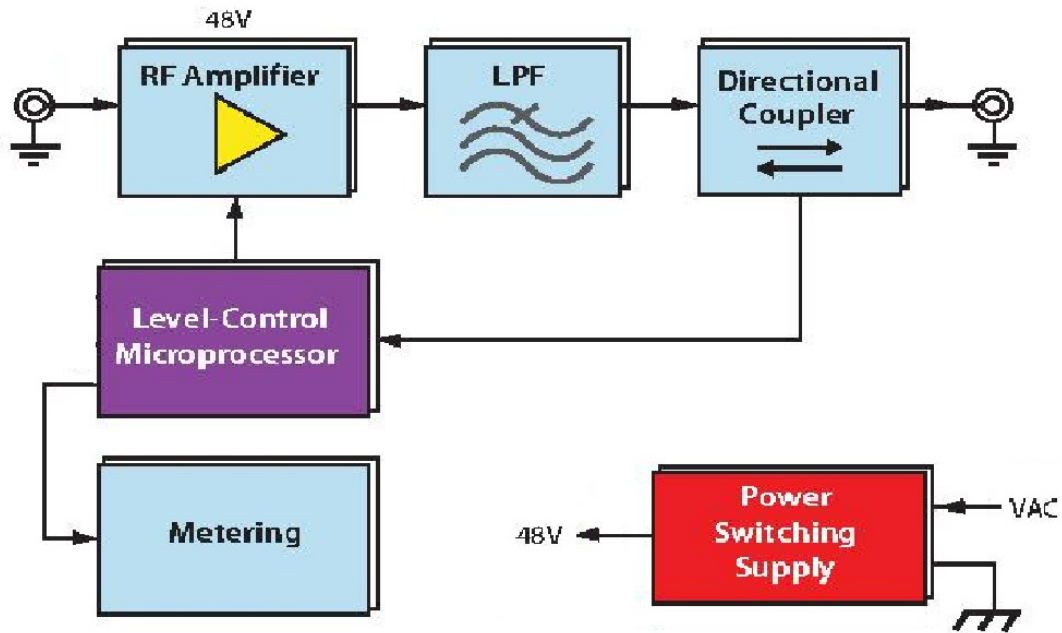
In order to guarantee the amplifier works properly it is necessary to supply adequate ventilation to the area where the device is installed. In order to maintain the internal temperature values as low as possible, we recommend values ranging of  $5 \div 30$  °. Even though the device can sustain up to 40 ° C, its working “life” will be compromised by extreme temperatures.

Any openings within the walls must be covered with a metal grid or mesh (to prevent rodents, birds etc. to access the space). The openings should also be supplied with anti-dust and anti-insect filters as these could find their way within the device raising its temperature and causing damage and alarms to sound.

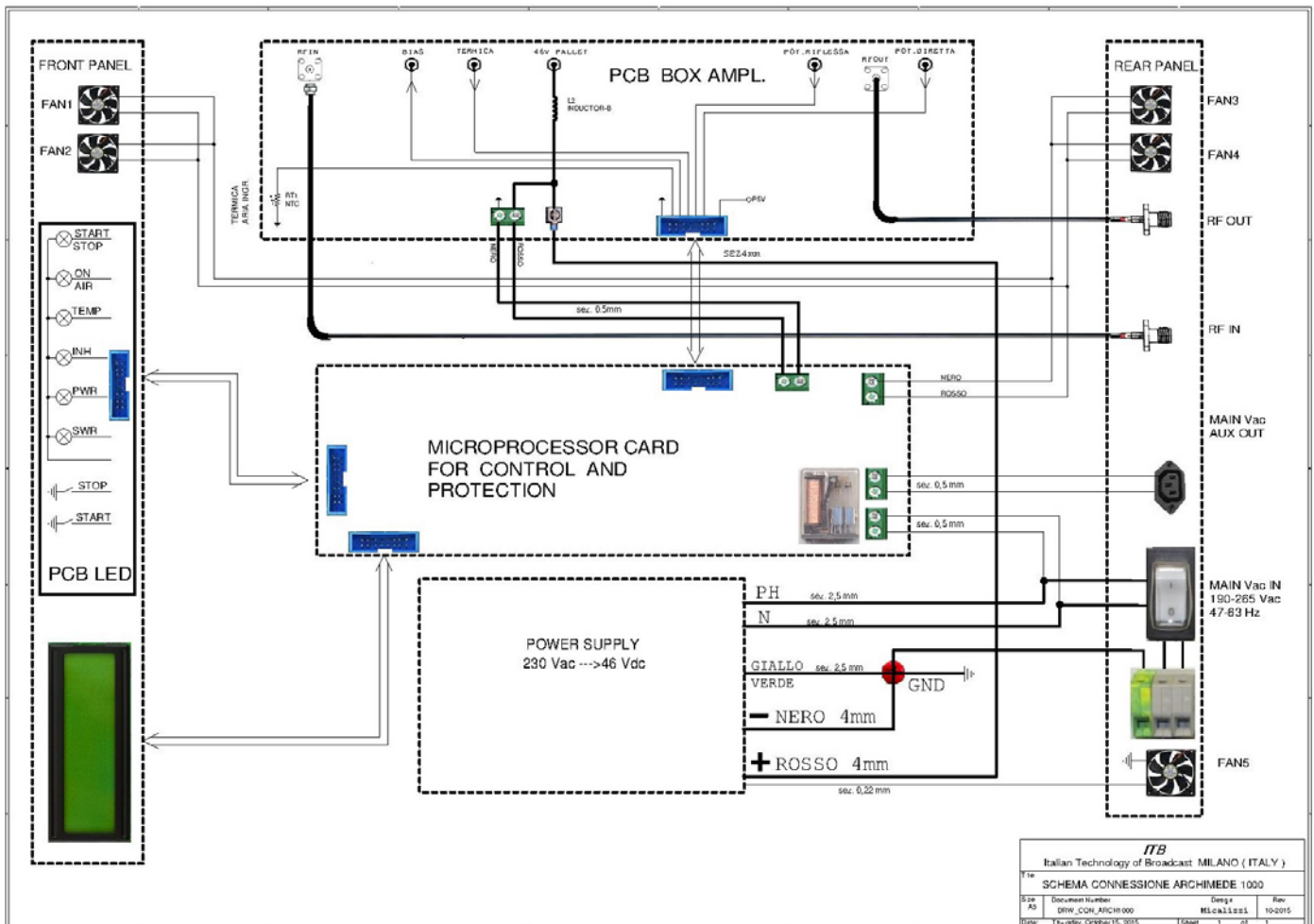
You must be absolutely certain that the floor will not flood in case of heavy rain.

Also humidity can cause condensation within the amplifier. This can cause destructive electric arches during on/off power phases of the system which could cause damage not covered by the warranty.

# SYSTEM BLOCK SCHEME



# INTERNAL CONNECTIONS SCHEME

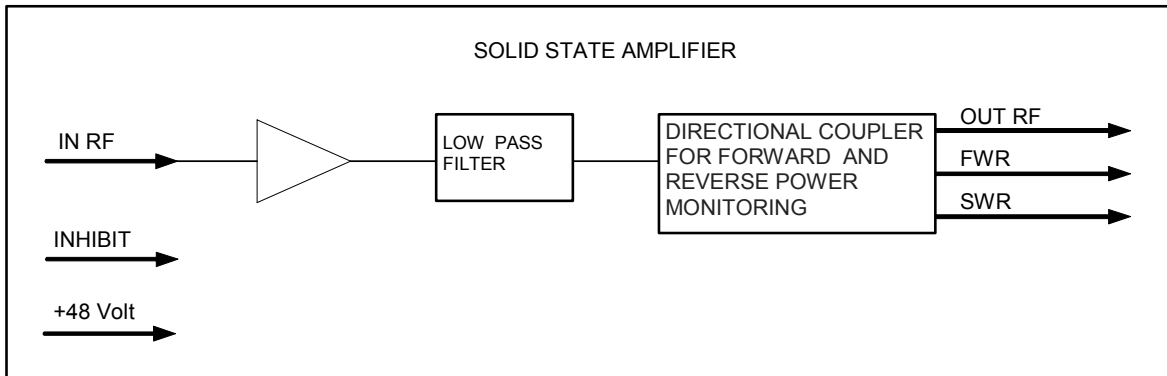


<b>ITB</b> Italian Technology of Broadcast MILANO ( ITALY )			
Title	SCHEMA CONNESSIONE ARCHIMEDE 1000		
Size	Document Number	Design	Rev
A3	DRW_CON_ARCHI000	Micalizzi	10-2015
Date	File: 15/10/2015	Sheet	1 of 1



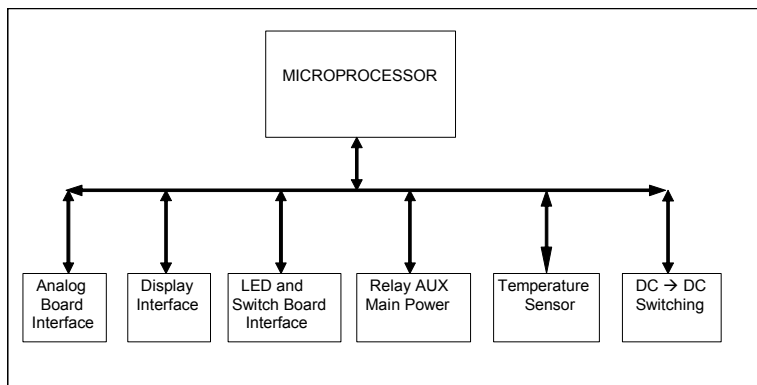
# CIRCUIT DESCRIPTION

## 1. RF AMPLIFIER BOX



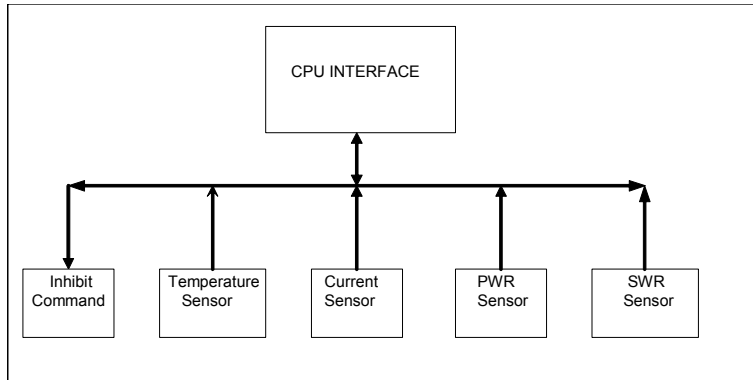
The RF section is made up of 1 amplifier module featuring 1000Watt (MD1200P) and a Low Pass filter to reduce the harmonics levels. A directional coupler measures the Direct and the Reflected Power at the exit of the Low Pass filter. The coupler sends the parameters to the microprocessor which manages the alarm and the normal functions of the device. The whole RF section is screened; this makes it one piece with the radiator in order to minimize any irradiations. The circuits have all been implemented in a planar manner to allow immediate access and inspection. In compliance with EMI requirements, the whole RF group is completely screened by means of a metal box.

## 2. CPU CARD



The CPU card is the heart of the amplifier. The card contains an ST micro-controller with an internal management software which controls the device. The software can be modified locally by qualified personnel. The CPU is connected to all other cards with flat cables which read sensors (PWR, SWR, temperature, etc.) and perform all other necessary actions which allow the device to work normally. Within the card there are various switching DC/DC converters. These produce the low tension power supply from the principal 48V for all electronic circuits and existing elements within the device.

### 3. ANALOG CARD



The analogue card is the interface between the RF box and the CPU card. This regulates the RF signal level from the RF box to the CPU and from the CPU to the RF box.

### 4. LED CARD

This card features a number of LEDs: alarm, device state and 2 buttons meant mainly for start-up and switching off. The buttons have a second function of reading / modifying the function parameters of the amplifier.

### 5. LCD - DISPLAY

The LCD display at the front allows monitoring of the amplifier parameters (PWR, SWR, temperature etc.)

### 6. POWER SUPPLY

The module performs an efficient 240 Vac input tension reconversion from the 48Vdc power supply tension for the RF pallet CPU card.

High efficiency of the device means very little heat is created during this regulation process.

# TYPICAL DISPLAY SCREENS

The Archimede 1000 is supplied with an excellent display with 4 rows by 20 characters. This guarantees optimal view of the messages.

## 1.1 TURNING ON THE AMPLIFIER

The following text appears on start-up of the amplifier which was previously in STOP mode. It appears before the display turns off and at the end of start-up phase:

			A	R	C	H	I	M	E	D	E		1	0	0	0			
						P	u	s	h		S	T	A	R	T				

## 1.2 TRANSMISSION START

The following text appears after having pressed the start button, before the display turns off and at the end of set up phase:

			A	R	C	H	I	M	E	D	E		1	0	0	0			
A	t	t	e	s	a		s	e	t	u	p		s	i	s	t	e	m	a
H	s						°	C			I	n						°	C

At the end of the set up phase, the display will show the following text:

			A	R	C	H	I	M	E	D	E		1	0	0	0			
O	U	T		P	O	W	E	R		.	.	.	.	W	A	T	T		
S	W	R		P	O	W	E	R		-	-	-	-	-	-	1	0	0	
H	s			.	.	°	C			I	n			.	.	°	C		

On the fourth row of the display date and time will show for a few seconds, this alternates with the temperature parameters.

Amplifier data and parameters will show on the display sequentially when pressing the start button and during transmission phase.

### 1.3 STOP SEQUENCE

By pressing STOP during transmission phase, the standby procedure will take place and the display will show the following:

			S	T	O	P		s	e	q	u	e	n	c	e				

Power supply will be removed from the auxiliary socket on the rear panel at the same time as the polarizing tension to the Mosfet behind the Amplifier pallet is interrupted, (the voltage becomes negative).

At the end of the sequence, the display will say:

			A	R	C	H	I	M	E	D	E		1	0	0	0			
							P	u	s	h		S	T	A	R	T			

# ALARM MESSAGES

## 1.4 DIRECT POWER ALARM (SWR)

When the “PWR” surpasses 105% of the nominal power, the PWR LED starts flashing and the CPU will start reducing the MOSFET polarization tension to reach the nominal level of output power. If PWR does not comply with the nominal levels and surpasses 110%, the CPU will set itself in standby and the display will say:

								A	l	a	r	m						
			P	W	R			l	i	m	i	t	a	t	i	o	n	

After a few seconds the CPU will run the start-up sequence again. If at the end of the sequence the PWR returns to its normal parameters, the transmission will continue, if the parameters are incorrect, the alarm cycle will activate.

**Please Note: if the alarm cycle repeats 5 times in the distance of a few hours, the amplifier will block and the display will say:**

		S	t	o	p		b	y		n	u	m	b	e	r		5	
			m	a	x	.		O	u	t		P	o	w	e	r		

**To restart the system, the Amplifier must be turned off and on again through the general switch.**

## 1.5 REFLECTED POWER ALARM (SWR)

When the “SWR” exceeds 7% of the rated power, the SWR LED, on the rear of the card, starts flashing. IF the SWR exceeds the 10% threshold, the CPU will start to reduce the MOSFET polarizing tension to reduce the SWR. If this is not within the safety parameters, the standby sequence will start and the display will show the followingand the text:

								A	l	a	r	m						
			P	W	R			l	i	m	i	t	a	t	i	o	n	

After a few seconds, the CPU runs the sequence. If at the end of the sequence the SWR returns to normal parameters, the transmission will continue, if not, it will return to the alarm cycle.

**Please Note: if the alarm cycle repeats 5 times in the distance of a few hours, the amplifier will block. The amplifier must be turned off and on in order to restart the system.**

### 1.6 TEMPERATURE ALARM

When the CPU detects temperature values are above the programmed threshold, it will run the standby process and the display will show the following flashing text:

		T	e	m	p	e	r	a	t	u	r	e		S	T	O	P		

The amplifier will remain in a state of alarm until the temperature returns to the programmed values.

**Please Note: if the alarm cycle repeats 5 times in the distance of a few hours, the amplifier will block and the display will say:**

		S	t	o	p		b	y		n	u	m	b	e	r		5		
		t	e	m	p	e	r	a	t	u	r	e		s	t	o	p	s	

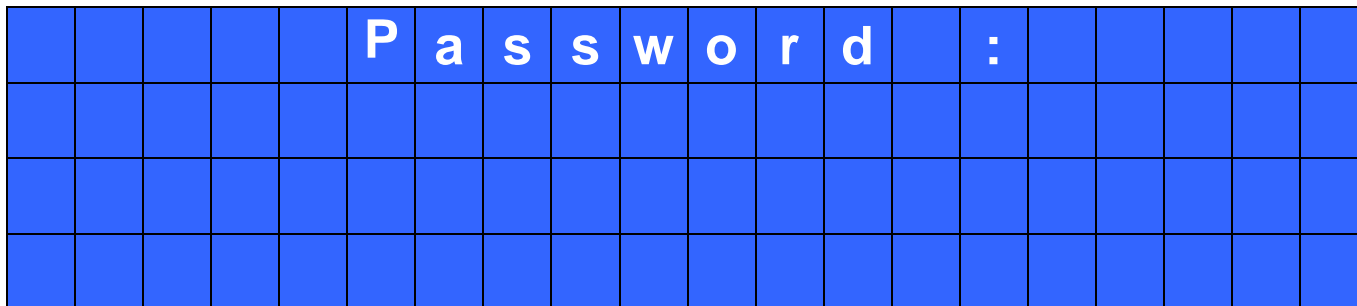
**To restart the system, the Amplifier must be turned off and on again through the general switch.**

# USER PROGRAM

The final user can modify a number of parameters without affecting the device's performance. These are: clock, language and name. These appear on the display when on standby mode.

To do this, please follow the indicated procedure below.

Keep the STOP button pressed until the display says:

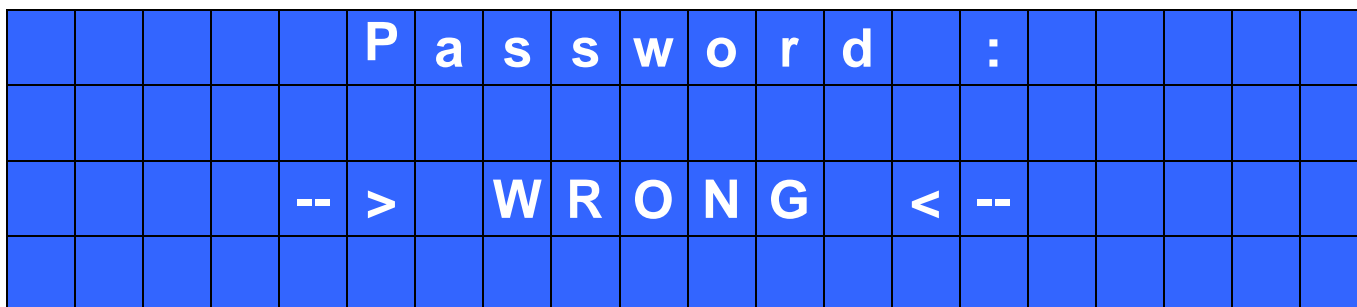


Now insert the password as follows:

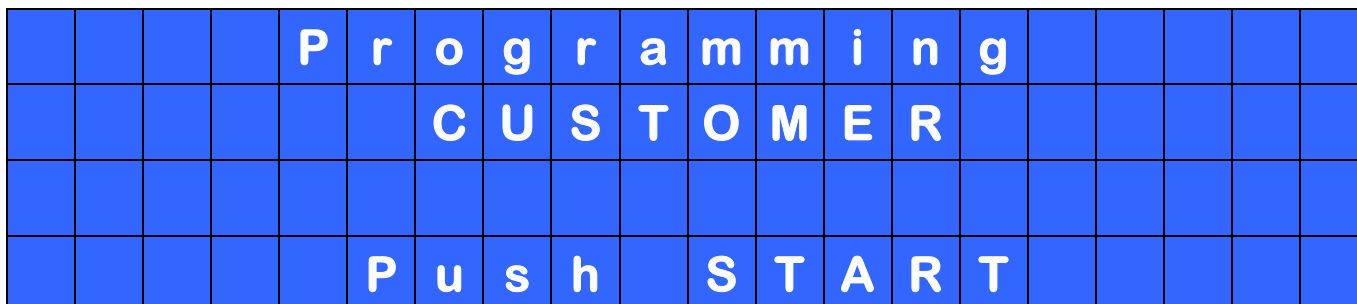
- Press 3 times the STOP button
- Press 3 times the START button

Every time the buttons are pressed, the display will show a symbol to confirm the insertion.

If the procedure is not followed correctly, the display will show what follows:



After a few seconds, the display text will prompt password insertion. Please repeat the sequence. When the correct password is inserted, you will see what follows:



## CABLE CONNECTION CHECK

After having pressed the START button, you will see:

				P	r	o	g	r	a	m	m	i	n	g				
			U	S	E	R		S	E	T	T	T	I	N	G	S		

If the STOP button is pressed, the next menu will show (**clock setup**) while if the START button is pressed, the **cable connection setup** menu will show.

				P	r	o	g	r	a	m	m	i	n	g					
A	N	T	E	N	N	A	/	D	R	I	V	E	R		C	H	E	C	K
					--	>		Y	E	S					<	--			

To modify the parameters, press STOP. To confirm, press START. If the function is disabled at the start up the connection to antenna and driver will be not checked.

When confirming the display will show:

				P	r	o	g	r	a	m	m	i	n	g					
			U	S	E	R		S	E	T	T	I	N	G	S				

With this screen, if START is pressed, the display will send you back to the **clock setup** menu. If STOP is pressed, the language menu will show and the display will look like this:

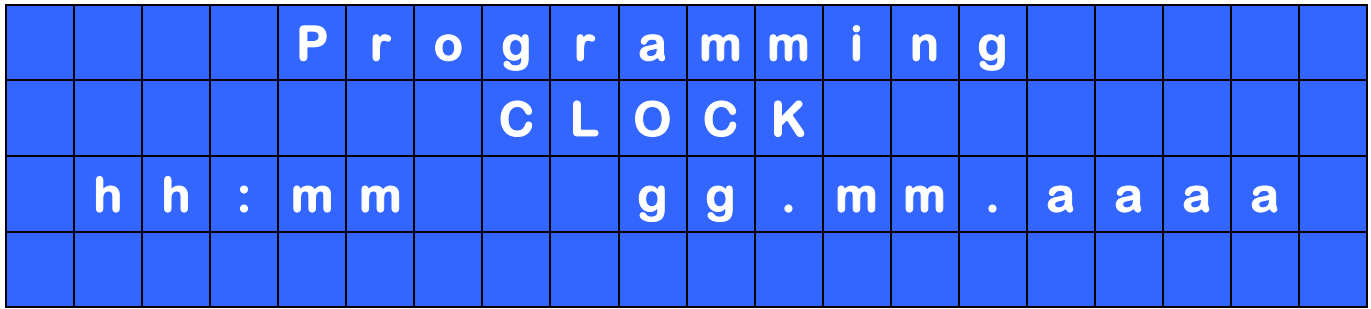
## CLOCK SET-UP

After having pressed the START button, you will see:

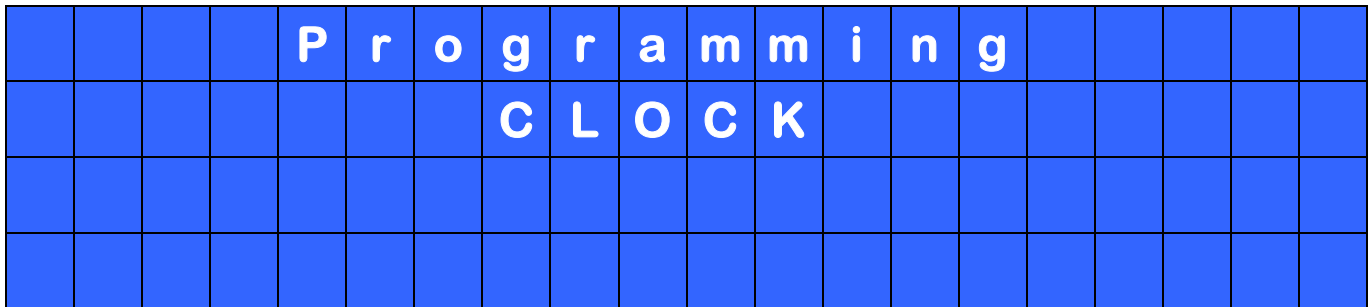
				P	r	o	g	r	a	m	m	i	n	g					
								C	L	O	C	K							

If the STOP button is pressed, the next menu will show (**language setup**) while if the START button is pressed, the **clock setup** menu will show.



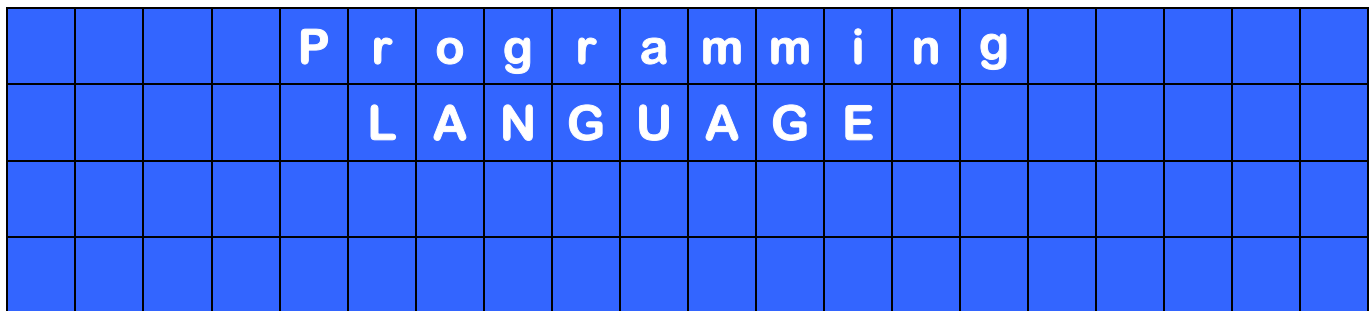


To modify the parameters, press STOP. To confirm, press START. When confirming, the screen automatically shows the next parameter. At the end of the operation, the display will show:



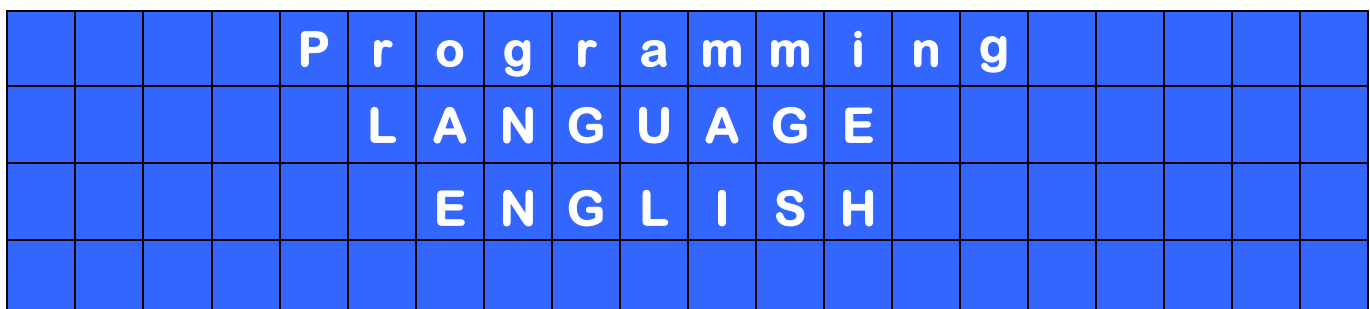
With this screen, if START is pressed, the display will send you back to the **clock setup** menu. If STOP is pressed, the language menu will show and the display will look like this:

**LANGUAGE SET-UP**



If at this point STOP is pressed, the next menu (**name set-up**) will show, while if START is pressed, the display will show the language menu and will look as follows:  
 Each time STOP is pressed, the display will show a supported language (English, French, Spanish and Italian). Pressing START will confirm language selection.

**English:**



Each time STOP is pressed, the display will show a supported language (English, French, Spanish and Italian). Pressing START will confirm language selection.

**French:**

				P	r	o	g	r	a	m	m	i	n	g				
				L	A	N	G	U	A	G	E							
				F	R	A	N	C	A	I	S							

**Spanish:**

				P	r	o	g	r	a	m	m	i	n	g				
				L	A	N	G	U	A	G	E							
				E	S	P	A	N	O	L								

**Italian:**

				P	r	o	g	r	a	m	m	i	n	g				
				L	A	N	G	U	A	G	E							
				I	T	A	L	I	A	N	O							

Pressing START will confirm the language for future usage.

				P	r	o	g	r	a	m	m	i	n	g				
				L	A	N	G	U	A	G	E							

With this screen, if START is pressed, the display sends the user back to the *language setup*, while pressing STOP will allow access to name setup. This shows in the first line of the display, which will look like this:

**NAME SET-UP**

				P	r	o	g	r	a	m	m	i	n	g				
									N	A	M	E						

If STOP is pressed, the next menu will show (exit setup) while, if START is pressed, the name setup menu will show and the display will look like this:

				P	r	o	g	r	a	m	m	i	n	g				
									N	A	M	E						
				"	C	u	s	t	o	m	e	r		n	a	m	e	"

Pressing STOP will allow selection of supported letters and numbers. START confirms the selected character. The operation must be performed for each character of the row. At the end of the 20<sup>th</sup> character, the display will automatically exit and look like this:

				P	r	o	g	r	a	m	m	i	n	g				
									N	A	M	E						

With the display above, if START is pressed, the user will return to the name setup menu, if STOP is selected, this will allow exit from setup and the display will look like this:

**EXIT SET-UP**

				P	r	o	g	r	a	m	m	i	n	g					
		P	R	O	G	R	A	M	M	I	N	G		E	X	I	T		

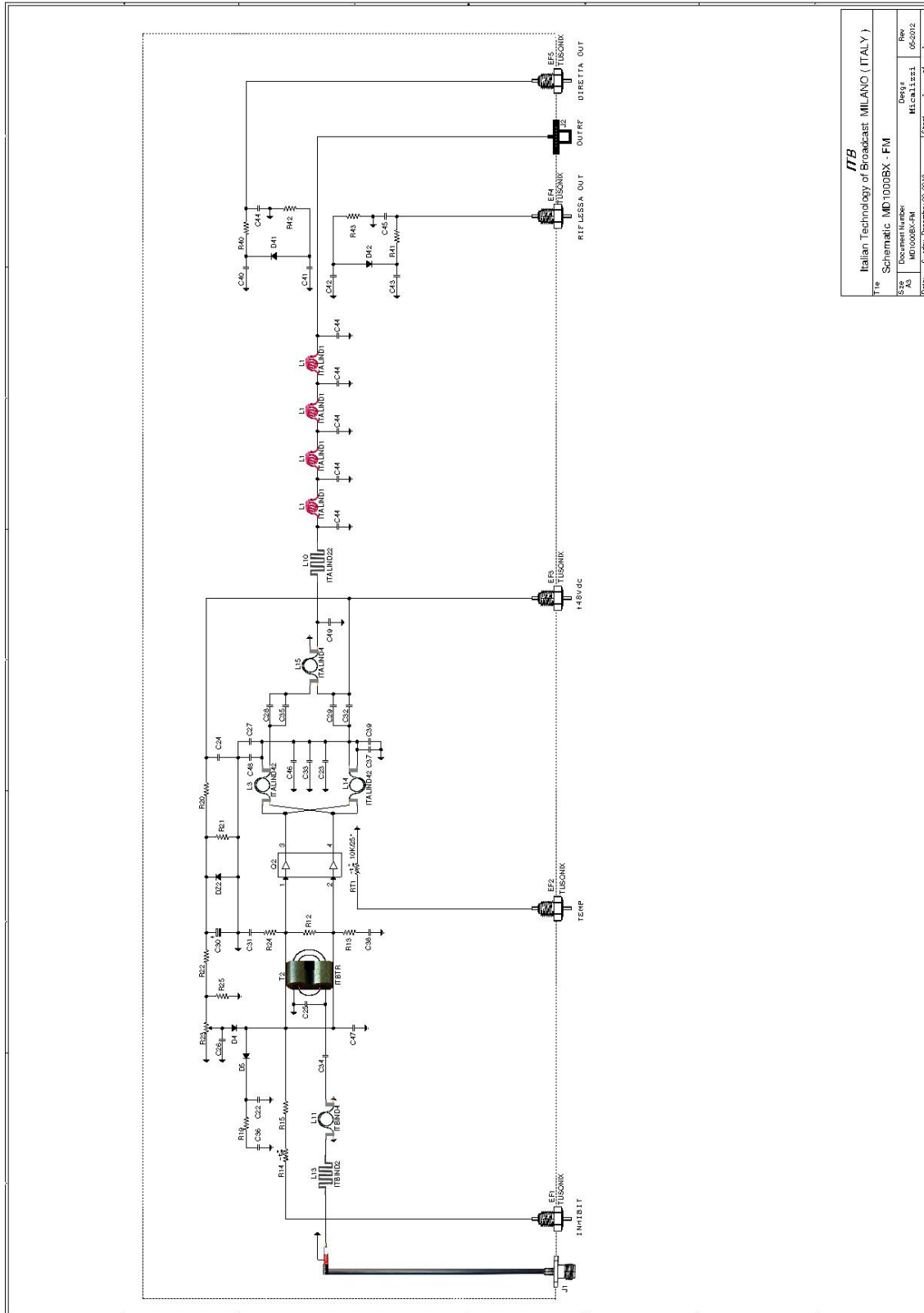
When this text shows, if START is pressed, the user will return to **clock setup**. If STOP is pressed, the user will return to the exit setup screen and the display will look as follows:

				P	r	o	g	r	a	m	m	i	n	g					
		P	R	O	G	R	A	M	M	I	N	G		E	X	I	T		
					P	U	S	H		S	T	A	R	T					

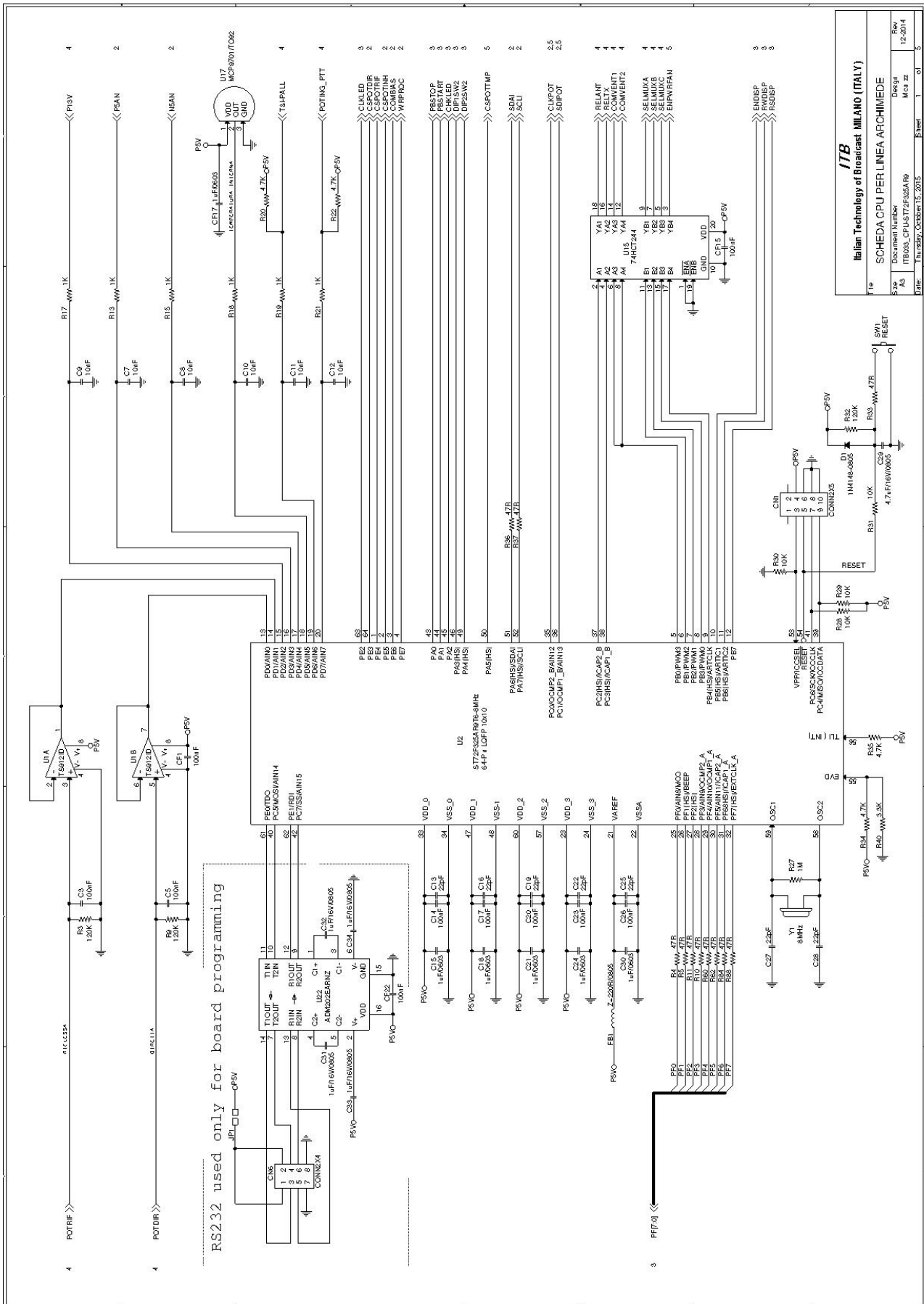
When this text shows, if START is pressed, the display will return to **start transmission**. If STOP is pressed the user exits setup.

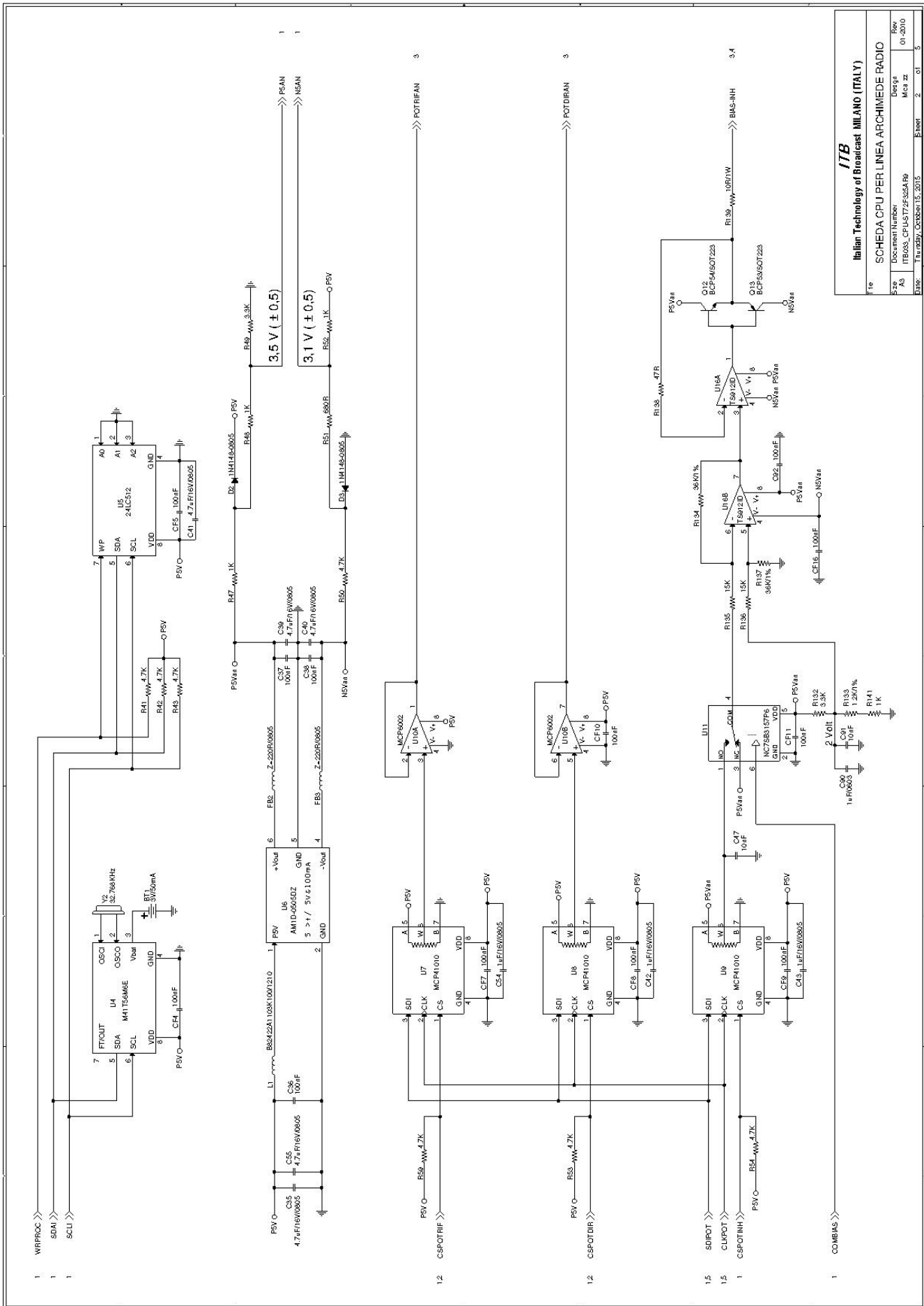
# MATERIALS LIST SCHEDULES

## BOX RF

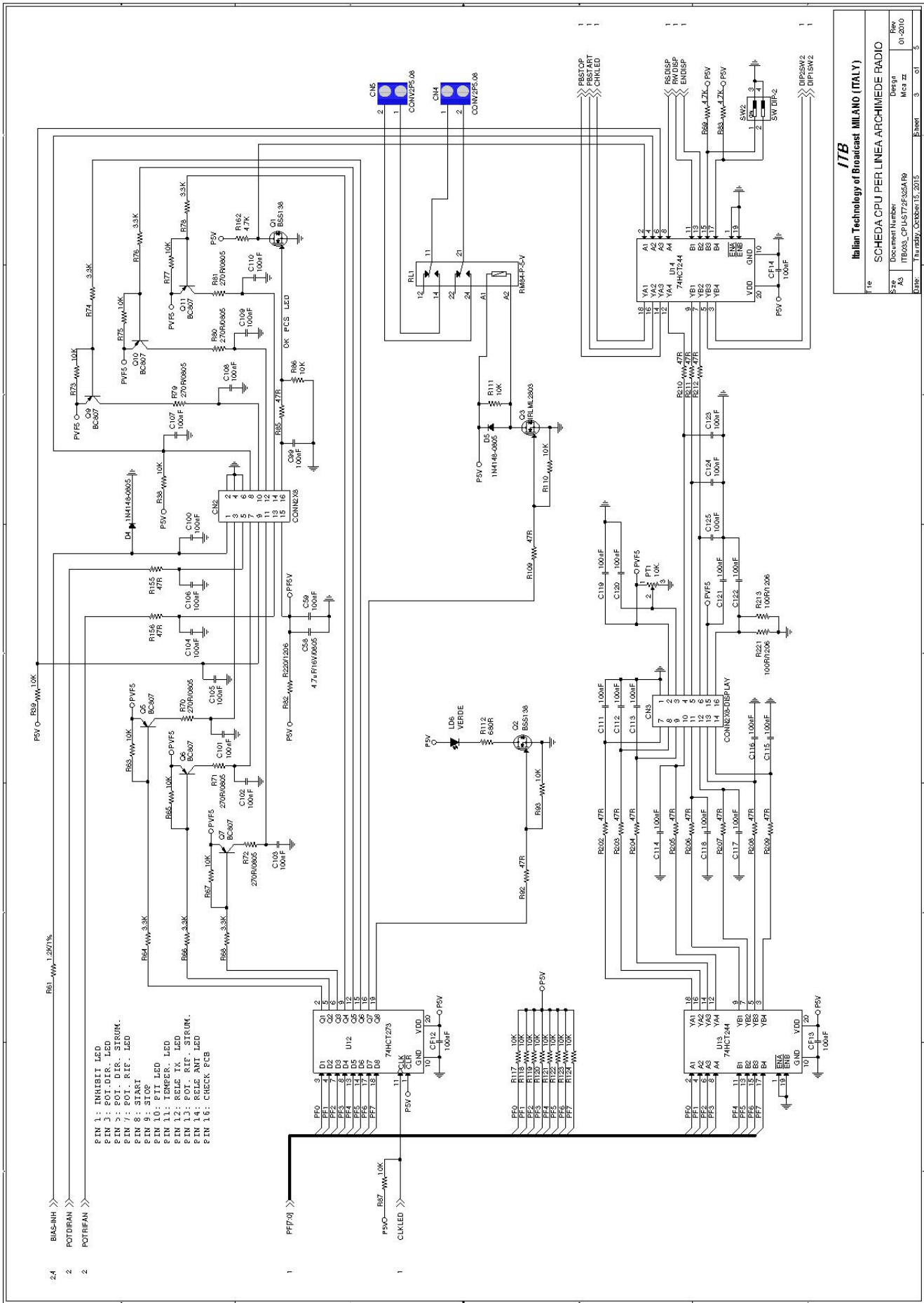


<b>ITB</b> Italian Technology of Broadcast MILANO ( ITALY )			
File	Schematic MD1000BX - FM		
Size	Document Number	Design	Rev
A3	MD1000BX-FM	M1ca1.L1zz1	05/2012
Date	Sunday, December 22, 2013	Sheet	1 of 1



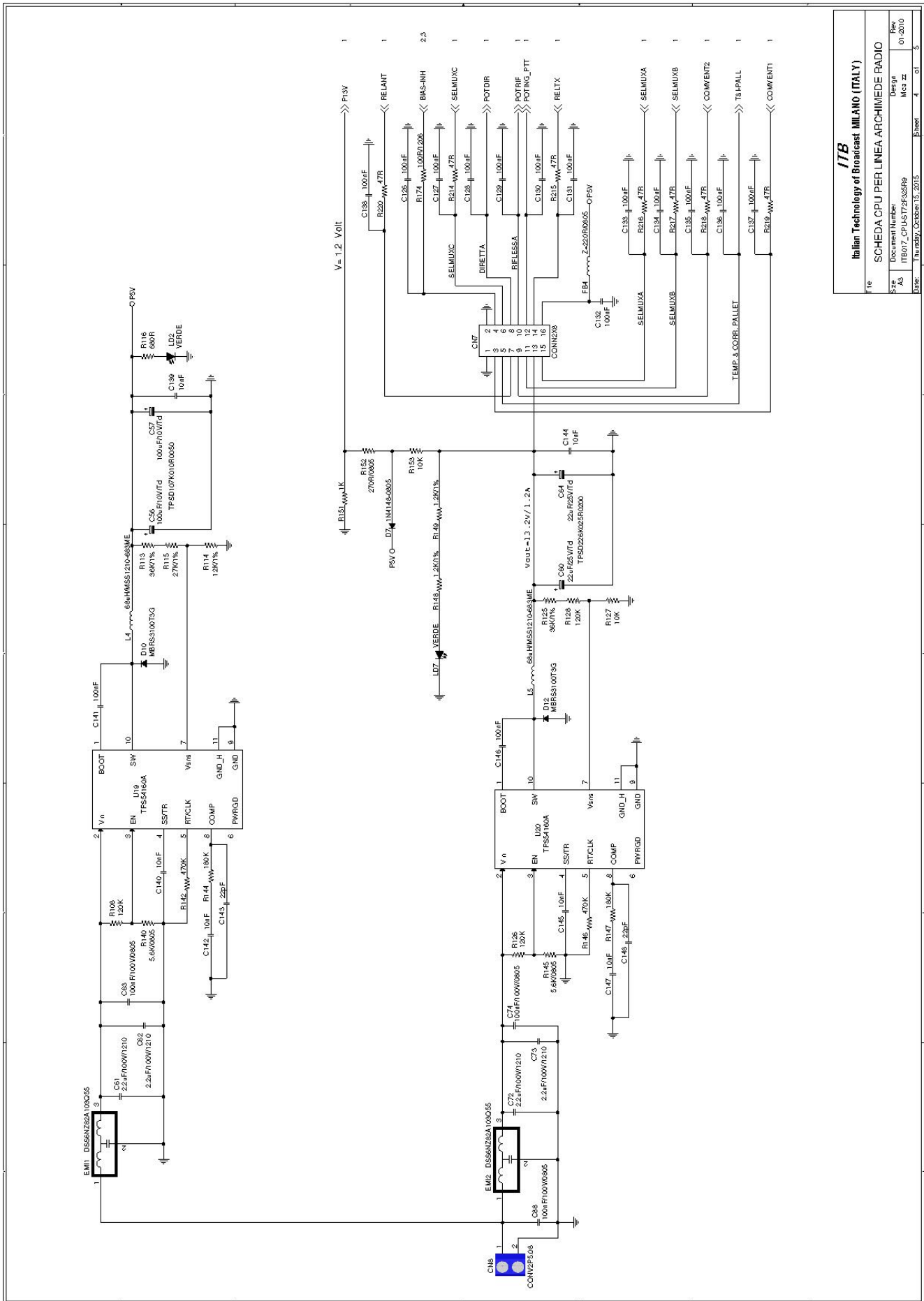


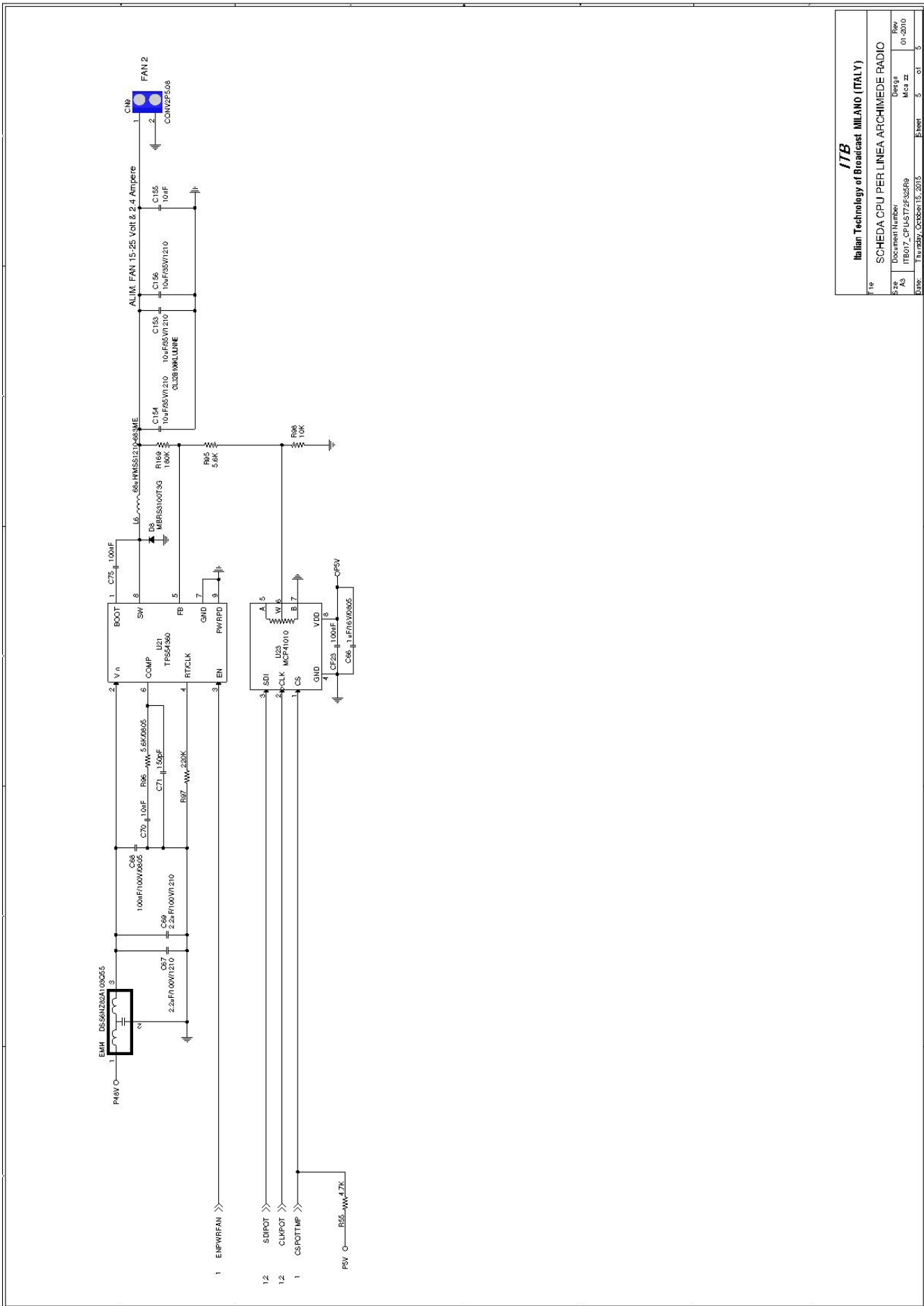
<b>ITB</b> Italian Technology of Broadcast MILANO (ITALY)	
File	SCHEDA CPU PER LINEA ARCHIMEDE RADIO
Size	Document Number
AD	ITB003_CPU17ZF-255A.Pc
Date:	Thursday, October 15, 2015
Sheet	2 of 5



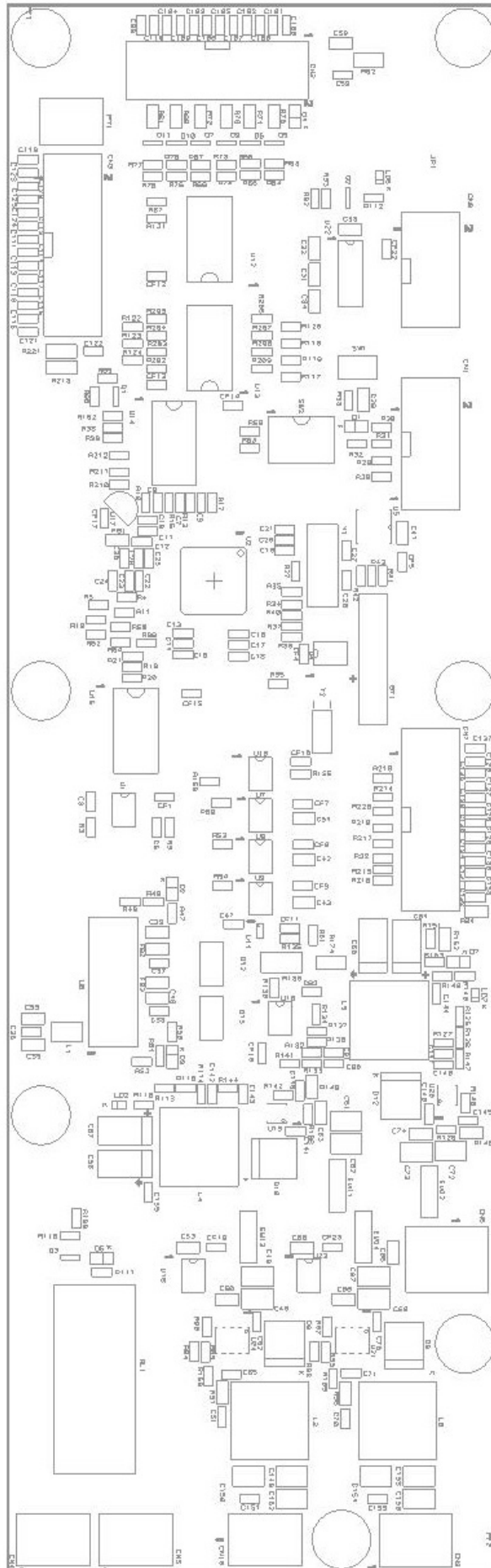
<b>ITB</b> Italian Technology of Broadcast MILANO (ITALY)		
File	SCHEDA CPU PER LINEA ARCHIMEDE RADIO	
Descr	DESCRIZIONE	
Aut	AUTORE	
Date	DATA	
Rev	REVISIONE	
01-2010	01-2010	
3	3	
01	01	
3	3	







<b>ITB</b> Italian Technology of Broadcast MILANO (ITALY)				
File	SCHEDA CPU PER LINEA ARCHIMEDE RADIO			
Size	Document Number	Design	Rev	
AS	ITB07_CPU157252R6	Mca zz	01-2010	
Date	Thursday, October 15, 2010	Sheet	5	of 5

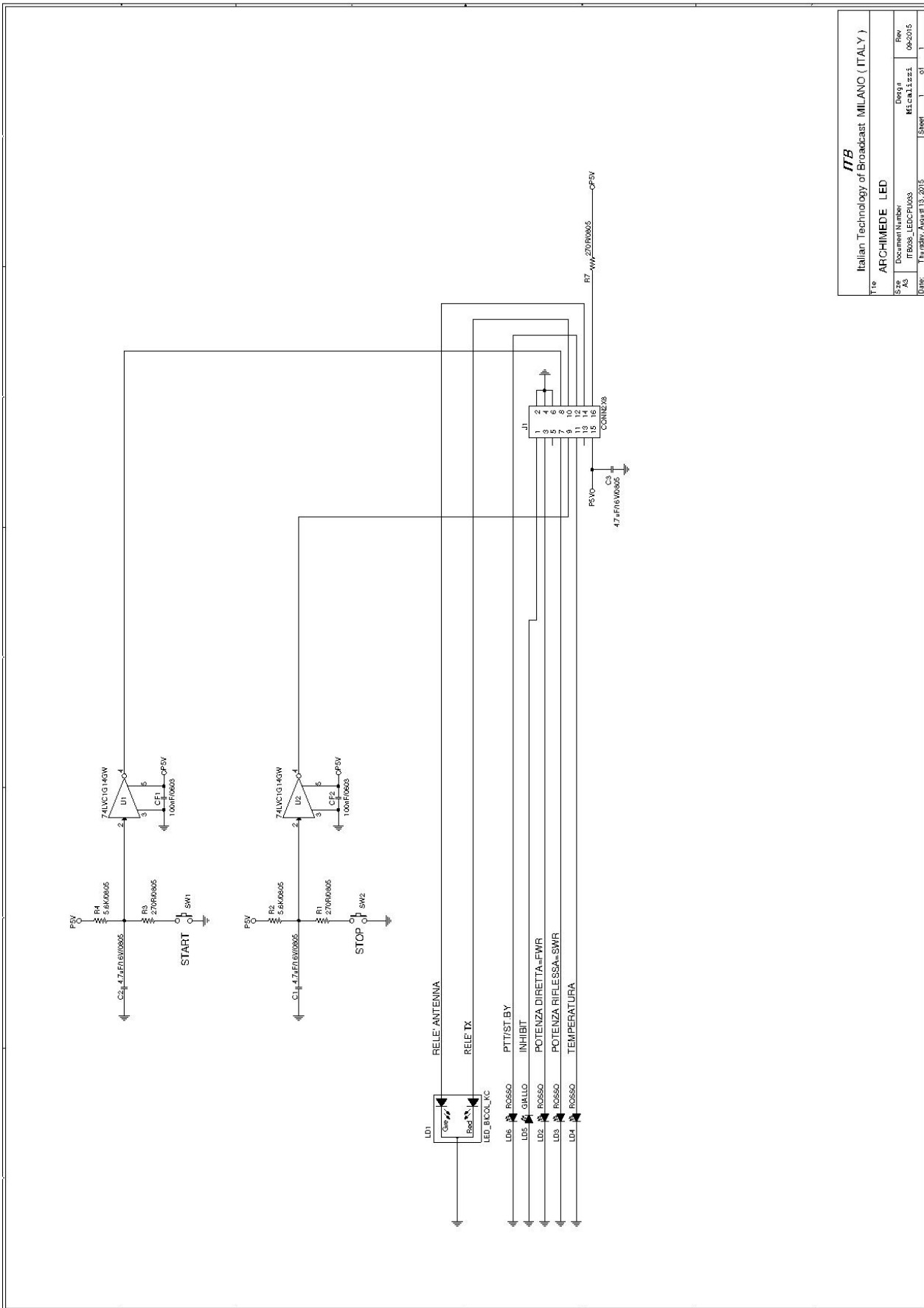


ITB MILANO  
ITB33  
ARCH. SPL  
VISTA DI MONTAGGIO

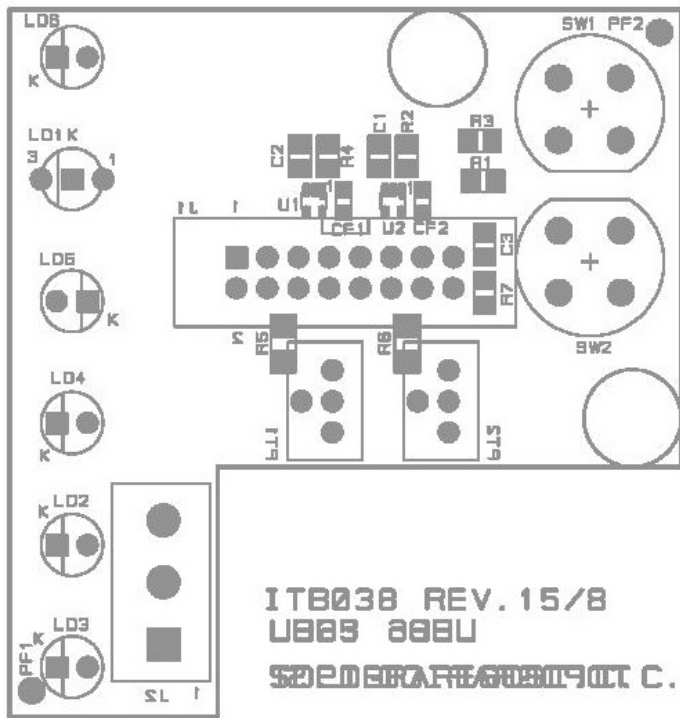
SCHEMA CPU PER LINEA ARCHIMEDE Revised: Tuesday, September 29, 2015		
ITB033_CPU-ST72F325AR9 Revision: 12-2014		
ITB Italian Technology of Broadcast MILANO ( ITALY )		
Bill Of Materials October 20,2015		
Qty	Reference	Part
1	BT1	3V/50mA
70	CF1,C3,CF4,CF5,C5,CF7,CF8,CF9,CF10,CF11,CF12, CF13,CF14,C14,CF15,CF16,C17,C20,CF22,CF23,C23, C26,C36,C37,C38,C59,C75,C92,C99,C100,C101,C102, C103,C104,C105,C106,C107,C108,C109,C110,C111,C112, C113,C114,C115,C116,C117,C118,C119,C120,C121,C122, C123,C124,C125,C126,C127,C128,C129,C130,C131,C132, C133,C134,C135,C136,C137,C138,C141,C146	100nF
7	C15,CF17,C18,C21,C24,C30,C90	1uF/0603
1	CN1	CONN2X5
2	CN2,CN7,CN3	CONN2X8
4	CN4,CN5,CN8,CN9	CONV2P5.08
1	CN6	CONN2X4
16	C7,C8,C9,C10,C11,C12,C47,C70,C91,C139,C140,C142, C144,C145,C147,C155	10nF
9	C13,C16,C19,C22,C25,C27,C28,C143,C148	22pF
7	C29,C35,C39,C40,C41,C55,C58	4.7uF/16V/0805
8	C31,C32,C33,C34,C42,C43,C54,C66	1uF/16V/0805
2	C56,C57	100uF/10V/Td
2	C60,C64	22uF/25V/Td
6	C61,C62,C67,C69,C72,C73	2.2uF/100V/1210
4	C63,C68,C74,C88	100nF/100V/0805
1	C71	150pF
3	C153,C154,C156	10uF/35V/1210
6	D1,D2,D3,D4,D5,D7	1N4148-0805
3	D8,D10,D12	MBRS3100T3G
3	EMI1,EMI2,EMI4	DSS6NZ82A103Q55
4	FB1,FB2,FB3,FB4	Z=220R/0805
3	LD2,LD6,LD7	LED 0805
1	L1	B82422A1103K100/1210
3	L4,L5,L6	68uH/MSS1210-683ME
1	PT1	10K
2	Q1,Q2	BSS138
1	Q3	IRLML2803
6	Q5,Q6,Q7,Q9,Q10,Q11	BC807
1	Q12	BCP54/SOT223
1	Q13	BCP53/SOT223
1	RL1	RM84-P-5-V

SCHEDA CPU PER LINEA ARCHIMEDE Revised: Tuesday, September 29, 2015 ITB033 CPU-ST72F325AR9 Revision: 12-2014		
Qty	Reference	Part
6	R3,R9,R32,R108,R126,R128	120K
35	R4,R5,R10,R11,R33,R36,R37,R60,R62,R84,R85,R88, R92,R109,R138,R155,R156,R202,R203,R204,R205,R206, R207,R208,R209,R210,R211,R212,R214,R215,R216,R217, R218,R219,R220	47R
11	R13,R15,R17,R18,R19,R21,R47,R48,R52,R141,R151	1K
15	R20,R22,R34,R35,R41,R42,R43,R50,R53,R54,R55,R59, R69,R83,R162	4.7K
1	R27	1M
28	R28,R29,R30,R31,R38,R39,R63,R65,R67,R73,R75,R77, R86,R87,R93,R98,R110,R111,R117,R118,R119,R120, R121,R122,R123,R124,R127,R153	10K
9	R40,R49,R64,R66,R68,R74,R76,R78,R132	3.3K
3	R51,R112,R116	680R
4	R61,R133,R148,R149	1.2K/1%
7	R70,R71,R72,R79,R80,R81,R152	270R/0805
1	R82	R220/1206
1	R95	5.6K
3	R96,R140,R145	5.6K/0805
1	R97	220K
4	R113,R125,R134,R137	36K/1%
1	R114	12K/1%
1	R115	27K/1%
2	R135,R136	15K
1	R139	10R/1W
2	R142,R146	470K
3	R144,R147,R169	180K
3	R174,R213,R221	100R/1206
1	SW1	PUSHBUTTON-V
1	SW2	SW DIP-2
2	U1,U16	TS912ID
1	U2	ST72F325AR9T6
1	U4	M41T56M6E
1	U5	24LC512
1	U6	AM1D-0505DZ
4	U7,U8,U9,U23	MCP41010
1	U10	MCP6002
1	U11	NC7SB3157P6
1	U12	74HCT273
3	U13,U14,U15	74HCT244
1	U17	MCP9701/TO92
2	U19,U20	TPS54160A
1	U21	TPS54360
1	U22	ADM202EARNZ
1	Y1	8MHz
1	Y2	32.768KHz

# LED

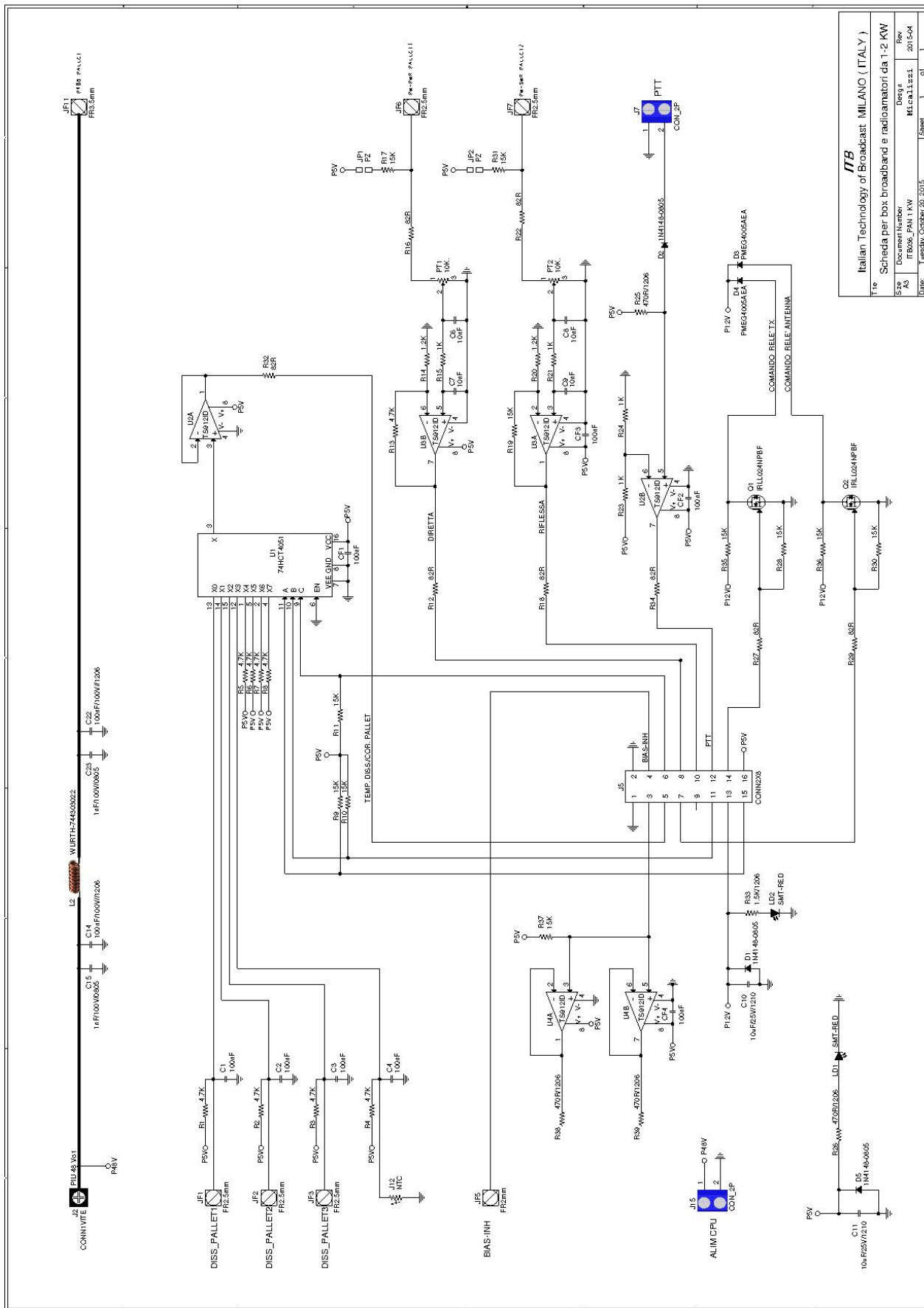


<b>ITB</b>			
Italian Technology of Broadcast MILANO ( ITALY )			
Titolo		ARCHIMEDE LED	
Size	Document Number	Design	Rev
P48	ITB008_LED_CPI0003	Mt.cra.1.12.1	06-2015
Date	Thursday, August 13, 2015	Sheet	1 of 1



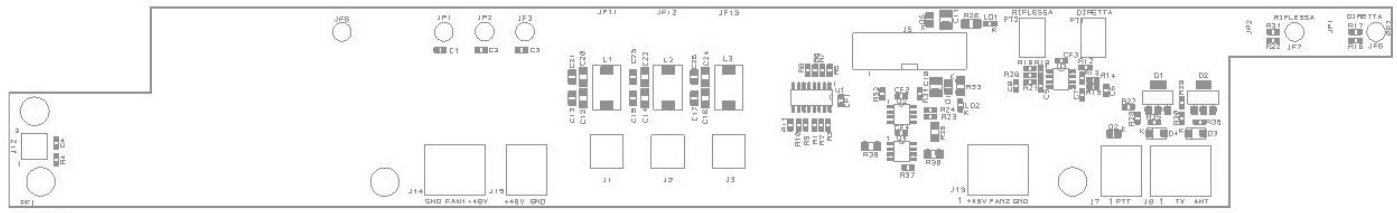
SCHEDA LED Revised: Wednesday, August 12, 2015		
ITB038 Led Revision: 09-2015		
ITB Italian Technology of Broadcast MILANO ( ITALY )		
Bill Of Materials October 20,2015		
Qty	Reference	Part
2	CF1,CF2	100nF/0603
4	C1,C2,C3	4.7uF/16V/0805
2	J1	CONN2X8
1	LD1	LED BICOL KC
4	LD2,LD3,LD4,LD6	ROSSO
1	LD5	GIALLO
3	R1,R3,R7	270R/0805
2	R2,R4	5.6K/0805
2	SW1,SW2	PUSHBUTTON-V
2	U1,U2	74LVC1G14GW

# ANALOG



**ITB**  
 Italian Technology of Broadcast MILANO ( ITALY )  
 Title Scheda per box broadband e radiomobili da 1-2 KW  
 Size ITB006\_PANT1.KW  
 Document Number Mical1221  
 Date Tuesday, October 20, 2015  
 Sheet 1 of 1  
 Rev 2011/04





ITALAB  
ITB036 1-2KW REV. 15-04  
PAN5 .SPL  
88016R3A08A

SCHEDA BOX RF PER LINEA ARCHIMEDE Revised: Tuesday, October 20, 2015		
ITB036 PAN 1 KW Revision: 2015-04		
ITB Italian Technology of Broadcast MILANO ( ITALY )		
Bill Of Materials October 20,2015		
Qty	Reference	Part
8	CF1,C1,CF2,C2,CF3,C3,CF4,	100nF
4	C6,C7,C8,C9	10nF
2	C10,C11	10uF/25V/1210
2	C14,C22	100nF/100V//1206
2	C15,C23	1nF/100V/0805
2	DX1,DX2	1N400X
3	D1,D2,D5	1N4148-0805
2	D3,D4	PMEG4005AEA
1	JP11	CONNVITE3
1	JP12	CONNVITE2
1	J2	CONN1VITE
1	J5	CONN2X8
2	J7,J15	CON 2P
1	J12	NTC
2	LD1,LD2	SMT-RED
1	L2	WURTH-744303022
2	PT1,PT2	10K.
2	Q1,Q2	IRLL024NPBF
9	R1,R2,R3,R4,R5,R6,R7,R8,R13	4.7K
11	R9,R10,R11,R17,R19,R28,R30,R31,R35,R36,R37	15K
8	R12,R16,R18,R22,R27,R29,R32,R34	82R
2	R14,R20	1.2K
4	R15,R21,R23,R24	1K
4	R25,R26,R38,R39	470R/1206
1	R33	1.5K/1206
1	U1	74HCT4051
3	U2,U3,U4	TS912ID